Technical Memo

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Date: July 30, 2015

Subject: HydroCAD Stormwater Modeling

Introduction

The purpose of this technical memorandum is to summarize the stormwater modeling completed using the HydroCAD model as presented in the Comprehensive Stormwater Management Plan (CSMP) submitted to the Rice Creek Watershed District (RCWD) for the portion of the former Twin Cities Army Ammunition Plant (TCAAP) Site being redeveloped by Ramsey County (County), the City of Arden Hills (City), the County's consultants (Kimley Horn, Wenck Associates Inc.), and future Developers. The Site, under 2012 existing conditions, provides few stormwater control structures to reduce discharge rate and just grassy swales as best management practices (BMPs) to improve water quality treatment before stormwater leaves the Site.

The Rice Creek Commons Site, under fully developed conditions, will meet RCWD's water quality treatment requirements through a combination of onsite infiltration and wet detention ponds. Water quality results are summarized in a separate *P8 Water Quality Modeling* technical memorandum. This technical memorandum details stormwater volume and discharge rate control measures proposed to meet RCWD's peak stormwater runoff control requirements.

Many figures referenced in this technical memorandum are from the CSMP document.

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1.0 Existing Site Conditions

1.1 Project Location

The 427-acre Rice Creek Commons Site, known as the former Twin Cities Army Ammunitions Plant (TCAAP), is located in the Ramsey County, Minnesota in the cities of Arden Hills and New Brighton. It is bounded by U.S. Interstate Highway 35 (I-35W) on the west, County State Aid Highway 96 (CSAH 96) to the south and U.S. Highway 10 (Hwy 10) to the southwest (**CSMP Figure 2-1**).

Rice Creek passes through the site near County Road H. Two-thirds of the site drain to Rice Creek and the remaining portion drains south to Round Lake. **CSMP Figure 2-2** shows the dividing line for areas draining to Rice Creek and Round Lake.

1.2 Existing Condition Subwatersheds

Wenck delineated 37 subwatersheds using topography (LiDAR data: Block F: 11-13-11 to 11-17-11, reflight 3-25-12) and information available on the US Army storm sewer network (**Figure 1**). Overland flow direction and drainage swales were identified using the available one foot contours. The existing conditions model explicitly represents 503.4 acres, which includes some off-site drainage.

There are nine subwatersheds (27-35 and County Rd H) that drain from the portion north of Rice Creek directly to Rice Creek. Stormwater exits at various, non-descript locations and discharges directly or ultimately to Rice Creek.

There are nine subwatersheds (12, 14-16 and 20-24), south of Rice Creek, that drain stormwater north discharging directly into Rice Creek by way of a ditch on the western site boundary or through various storm sewers.

There are five subwatersheds (17-19 and 25-26), south of Rice Creek, comprising the northeastern edge of the portion south of Rice Creek, where stormwater flows northeast to a wetland area, which eventually discharges to Rice Creek.

The southern third of the site drains to Round Lake by one of three outfalls (**CSMP Figure 4-7**). There are two subwatersheds (8, 13) that contribute runoff to Outfall #1, a 24-inch culvert passing beneath Hwy 10. There are eight subwatersheds (1, 4-6, 9-11, and 36) that contribute runoff to Outfall #2, a 60-inch culvert passing beneath Hwy 10. There are three subwatersheds (2, 3 and 7) that contribute runoff to Outfall #3, a 30-inch culvert which connects to the new storm sewer installed for CSAH 96.

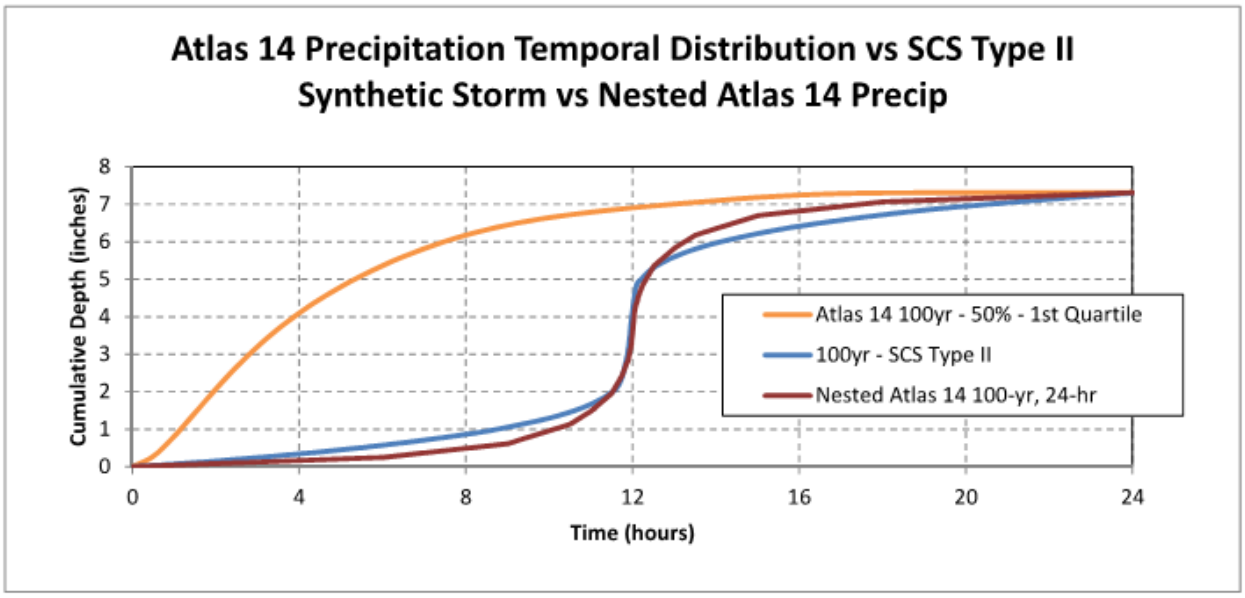
1.3 Subwatershed Runoff

Wenck evaluated stormwater runoff for 2-, 10-, and 100-year 24-hour design rainfall events. Precipitation depths were obtained from the National Oceanic and Atmospheric Administration (NOAA) Atlas 14. The 24-hour nested Atlas 14 rainfall depths used are:

- 2-Year Event 2.82 inches
- 10-Year Event 4.22 inches
- 100-Year Event 7.31 inches

The Atlas 14 nested curve is a hyetograph that encompasses short duration and long duration storms in one distribution (a conservative but effective approach for design). The Soil Conservation Service (SCS) Type II distribution is a nested curve developed using the Technical Paper (TP-40) data set. No areal reduction factor (a factor used to account for special variations in rainfall intensity) is applied based on individual subwatershed size. The rainfall distributions for the 100-year 24-hour design rainfall event are illustrated in **Figure 2**.

Figure 2 – Temporal nested Atlas 14 storm precipitation distribution compared to a SCS Type II distribution for the 100-yr, 24-hr rainstorms



The existing and proposed stormwater management calculations are based on the National Resources Conservation Service (NRCS) methodology using curve numbers (CN), time of concentration (T_c) and a design storm event approach. These variables and the other requisite NRCS inputs are used to complete calculations and to build a model in HydroCAD, a computer-aided design system for modeling the hydrology and hydraulics of stormwater runoff. The SCS Unit Hydrograph method is used to generate the subwatershed runoff hydrographs. A rainfall temporal distribution curve along with the drainage basin area, basin time of concentration, and drainage basin composite CN are required input parameters.

To reflect the 2012 site conditions the existing condition model does not have any stormwater ponds or basins.

1.3.1 Existing Condition Soils

The SCS classifies soils into four Hydrologic Soil Groups based on the soil's potential for runoff. The four Hydrologic Soil Groups (HSG) are A, B, C, and D. Type A soils generally have the least runoff potential and Type D soils have the greatest. Details for these classifications can be found in SCS TR-55 (SCS 1986). Soil data from the NRCS SSURGO database data is incomplete (**CSMP Figure 3-3**), with the bottom two-thirds of the site classified merely as "Urban". The geologic map of surficial geology (**CSMP Figure 3-4**) provides additional information about the site's geology. The portion south of Rice Creek has had the same land use for decades, the soil condition is poor and the soil is classified as Type C. The Type C soil classification is refined using geotechnical investigation information. Open spaces (including lawns, parks, and grasslands) are assigned a CN of 74 according to RCWD rules.

1.3.2 Existing Condition Land Cover

The 2012 aerial photograph provides sufficient land use data for the existing conditions. Roads and buildings are digitized and assigned a CN of 98 in compliance with RCWD rules. The portion of the site north of Rice Creek has Type A soils and is predominately open space, with some access trails.

1.3.3 Existing Condition Curve Number

Wenck determined curve numbers by intersecting the HSG map information with land cover data using GIS (**CSMP Figure 4-2**). Intersecting subwatershed area with curve number attribute information provided the composite curve number for each subwatershed (**Table 1**).

1.3.4 Existing Condition Time of Concentration

Time of concentration is the time it takes runoff to travel from the most distant point in the watershed to its outlet. The time of concentration is determined by a basin's geometry and flow types, which impact flow velocities. Runoff is assumed to travel as sheet flow, shallow concentrated flow, or channel flow. Time of concentration is estimated as the sum of travel times of these flows. The basin lag time is calculated for each subwatershed using **Equation 1**.

Equation 1 – Time of concentration

$$t_c = t_{sheet\ flow} + t_{shallow\ concentrated\ flow} + t_{channel\ flow}$$

where

$$t_{sheet\ flow} = 0.007 * \frac{(flow\ length * n)^{0.8}}{precipitation\ depth^{0.5}\ slope^{0.4}}$$

$$t_{shallow\ concentrated\ flow} = \frac{flow\ length}{C * slope^{0.5}}$$

where $C=16.1345$ for unpaved surfaces or $C=20.3282$ for paved surfaces

$$t_{channel\ flow} = \frac{flow\ length}{\{ [1.49 * (cross\ sectional\ area \div wetted\ perimeter)^{2/3} * slope^{0.5}] \div n \}}$$

Wenck calculates the time of concentration using existing topography, and surface channels. No storm sewer is included in the model for two reasons. First, available information about storm sewer layout and dimensions is insufficient to allow accurate representation in a model. Second, the United States Army ceased operations at TCAAP in 2002 and fitness of the storm sewer system in 2012 is unknown. Runoff travels as sheet flow for a maximum of 100 feet, at which point it transitions to shallow concentrated flow. Shallow concentrated flow then continues until intercepted by a surface channel or the receiving water body.

Table 1 - Input parameters for the Existing Condition HydroCAD Model

Subwatershed	T_c	Area	Composite CN
	min	*Acres*	-
1	16.3	15.3	87
2	12.2	4.9	77
3	32.8	15.5	75
4	11.3	24.0	85
5	44.5	27.2	83
6	46.4	22.5	79
7	27	9.8	66
8	9.5	28.7	83
9	12.7	9.3	82
10	37.7	30.0	81
11	32.9	4.4	80
12	14	3.3	80
13	36.2	2.3	82
14	8.94	2.5	84
15	28	61.3	82
16	26.3	44.8	81
17	11.5	8.0	88
18	15.8	28.4	83
19	7.3	6.4	78
20	17.1	15.9	85
21	10.8	7.2	90
22	19.6	26.6	82
23	9.42	13.8	92
24	19	13.9	85
25	22.6	6.7	75
26	38.2	0.8	66
27	13	2.0	66
28	23.8	5.8	44
29	26.9	1.3	39
30	26.8	31.6	42
31	30.2	0.9	39
32	27.6	0.9	39
33	19.9	3.2	48
34	12.1	1.2	49
35	16.7	6.2	43
36	61.5	11.2	84
County Road H	29.3	5.9	80
Total	-	503.4	-

2.0 Interim and Fully Developed Site Conditions

Wenck evaluated stormwater runoff for interim and fully developed conditions site conditions.

2.1 Interim Conditions (Interim Scenario 1)

The first phase of site development includes the construction of public infrastructure including Spine Road, I-35W improvements, alterations to County Road H and realignment of Rice Creek (**CSMP Figure 4-5)**. During this interim construction phase (Interim Scenario 1), a contractor, selected by Ramsey County will construct all wetlands and ponds except P-1, P-3, and P-14. Interim Scenario 1 reflects the first stage of site development which includes the construction of public infrastructure, described in the CSMP. The Water Quality Model evaluates Interim Scenario 1 and Interim Scenario 2. Interim Scenario 2 is not modeled explicitly in HydroCAD.

2.2 Fully Developed Conditions

The fully developed conditions site plan is only conceptual in nature, at this time, leaving final design for various parts of the Site to developers. Private developers will construct ponds P-1, P-3 and P-14. Fully developed conditions reflect proposed grading plans for initial site development (**CSMP Figure 4-5)** and master land use plan (**CSMP Figure 3-1)**.

2.3 Watershed Delineation

For the Interim Scenario 1 and fully developed conditions, Wenck reviewed proposed grading plans and delineated the Site into 30 subwatersheds (**CSMP Figure 4-7**), four subwatersheds in the portion north of Rice Creek and 26 in the portion south of Rice Creek.

There are four subwatersheds (22, 27, 29, and 1S) north of Rice Creek that drain to Rice Creek.

There are 13 subwatersheds (8-18, 26, and 28) south of Rice Creek that drain stormwater runoff to the north. The runoff is routed through a series of stormwater ponds in the Natural Resource Corridor and ultimately discharges to Rice Creek.

Two subwatersheds (20 and 21) encompass the relocated Rice Creek meander and its bank area. These subwatersheds are not included in the model because precipitation falling in these subwatersheds falls directly into Rice Creek.

There is one subwatershed (19), south of Rice Creek, comprising the northeastern edge of the site, where stormwater flows to a stormwater pond (P-14). The pond discharges beneath the trail and drains northeast to an existing wetland area, which eventually discharges to Rice Creek.

The southern third of site drains to Round Lake by one of three outfalls. There are two subwatersheds (5 and 6) that contribute runoff to Outfall #1, a 24-inch culvert passing beneath Hwy 10. There are seven subwatersheds (1-4, 7, 24 and 25) contributing runoff to Outfall #2, a 60-inch culvert passing beneath Hwy 10. Stormwater originating in offsite subwatershed 51 is diverted before entering the Rice Creek Commons property and discharges to Round Lake through an existing storm sewer. Fully developed conditions assume that the stormwater ponds P-1 and P-2 are not connected to the storm sewer catchbasin (CB 5004) which is routes runoff through a 15-inch pipe under CSAH 96. The stormwater ponds P-1 and P-2 are assumed to be connected to stormwater pond P-3 by a 60-inch pipe.

In the Interim Scenario 1 and fully developed condition HydroCAD models, 142.2 acres drain to Round Lake and 332.8 acres drain to Rice Creek. The Interim Scenario 1 and fully developed conditions total tributary area is 500.2 acres, 3.2 acres less than the existing tributary area. Two factors account for the change in total tributary area. First, the remeander of Rice Creek, causes subwatersheds 20 and 21 to include Rice Creek and its banks in the Interim Scenario 1 and fully developed conditions. For this reason, subwatersheds 20 and 21 (3.9 acres) are excluded from the Interim Scenario 1 and fully developed conditions model. Second, in the Interim Scenario 1 and fully developed conditions, 0.7 acres of additional tributary area are added due to expansion of I-35W and County Road H.

2.4 Stormwater Control Structures

To provide stormwater control in Interim Scenario 1, a contractor selected by Ramsey County will construct 14 stormwater ponds. During subsequent development, private developers will construct three additional ponds to provide further rate control (**CSMP Figure 4-6**). For water quality control, the required treatment volume is captures and treated in wet ponds or infiltration basins. For a detailed analysis of water quality controls, see the CSMP Appendix A: P8 Water Quality Modeling Technical Memorandum.

The Interim Scenario 1 and fully developed conditions grading plans include five newly created wetlands (W-1, W-2, W-3, W-4 and W-5) and preservation of one existing wetland (Wi). Wetlands are modeled to receive controlled inputs of water from the dead pool of adjacent stormwater ponds.

Through an iterative process, Wenck sized National Urban Runoff Program compliant stormwater control structures in collaboration with Kimley-Horn and Associates, Inc. Kimley-Horn provided a proposed grading plan indicating the approximate size and location of stormwater control structures, which Wenck translated into HydroCAD and P8 models. Based on model results, Wenck recommended alterations to stormwater control structure size and location. Kimley-Horn then revised the proposed grading plan to address stormwater control and water quality concerns identified by Wenck. After several iterations, Wenck and Kimley-Horn reached a proposed grading plan that satisfies RCWD discharge rate and water quality requirements. Kimley-Horn is preparing a RCWD permit application for Interim Scenario 1.

2.5 Routing

Each subwatershed's runoff is routed individually and directed to a pond and stormwater control structure, or drain directly to the receiving waterbody (**CSMP Figure 4-7**). Wenck did not consider storm sewers, other than what is considered public infrastructure. Developers will design and construct storm sewers conforming to the grading and stormwater control structures presented here.

2.6 Land Cover

Interim Scenario 1 and fully developed conditions plan drawings obtained from Kimley-Horn provided land cover data for the fully developed conditions condition (**CSMP Figure 3-1**). In accordance with SCS TR-55, the following land use designations were used:

- Residential areas – 38% impervious
- Commercial areas – 85% impervious
- Recreational areas – 30% impervious
- Open spaces – 2% impervious
- Pavement – 100% impervious

2.7 Curve Number

The Interim Scenario 1 and fully developed conditions curve numbers were assigned by intersecting the HSG map information with land cover data using GIS tools. Intersecting the area of each subwatershed with curve number attribute information provided the curve numbers for each subwatershed (**Table 2 and Table 3**). Wenck assigned separate areas and curve numbers for the pervious and impervious fraction of each subwatershed.

For both conditions, Wenck adjusted the CN of Type A and Type B soils upwards from 39 to 49 and from 61 to 74, respectively. This shift accounts for the effects of compaction and soil stratification that decrease the infiltration rate of Type A and B soils.

2.8 Time of Concentration

Because storm sewer design on Outlots is the responsibility of developers, time of concentration was calculated considering sheet flow and shallow concentrated flow only. Wenck calculated the time of concentration using fully developed conditions condition topography and stormwater control structures. Runoff travels as sheet flow for a maximum of 100 feet, at which point it transitions to shallow concentrated flow. Shallow flow calculations assume that runoff travels entirely over roads, parking lots, businesses and other paved surfaces. These are the most likely flow paths for unrouted flow in the fully developed conditions condition. Shallow concentrated flow then continues until intercepted by a stormwater control structure, or the receiving waterbody.

Table 2 - Input parameter for Interim Scenario 1 condition HydroCAD model

Subwatershed	Tc	Pervious		Impervious	
		Area	CN	Area	CN
1	53.1	52.1	74	0.0	-
2	16.6	11.0	74	0.4	100
3	15.3	34.7	74	2.9	-
4	5.9	0.3	74	0.3	100
5	59.3	7.4	74	0.5	100
6	20.3	0.9	74	0.1	100
7	5.7	21.6	74	0.0	-
8	47.1	27.9	74	1.6	100
9	30	25.8	74	0.0	100
10	7.3	6.1	74	0.3	100
11	11.7	2.1	74	1.2	100
12	9.5	1.1	74	0.3	100
13	9.4	2.2	74	0.8	100
14	4.3	8.6	74	1.6	-
15	31.3	58.5	74	0.0	-
16	12.1	30.6	74	1.9	100
17	4.3	3.9	74	3.7	100
18	33.5	52.8	74	0.0	-
19	24.7	21.2	74	0.0	-
20	0	2.7	74	0.0	-
21	0	1.2	74	0.0	-
22	41	41.9	74	0.0	-
23	No subwatershed assigned the number 23				
24	7.5	0.1	74	4.9	98
25	10.7	0.2	74	4.9	98
26	25.4	0.2	74	14.1	98
27	27.6	0.0	74	5.5	98
28	14.6	3.7	74	3.3	98
29	19.1	6.4	74	3.9	-
51	17.7	20.2	65**	5.0	98
1S		1.1	74	0.5	98
Total	-	442.5^	-	57.6^	-

*****Surface of ponds and wetlands assigned a CN of 100. All other impervious area assigned a CN of 98.

******Subwatersheds 20 and 21 are located directly over top of Rice Creek and are excluded from the model because precipitation falling in these subwatersheds falls directly into relocated Rice Creek.

^Excludes area of subwatershed 20 and 21.

Table 3 – Input parameter for fully developed conditions HydroCAD model

Subwatershed	T_c	Pervious		Impervious	
		Area	CN	Area	CN*
	min	*acres*	-	*acres*	-
1	53.1	27.0	74	25.2	98
2	16.6	1.8	74	9.6	98
3	15.3	22.1	74	15.6	98
4	5.9	0.5	74	0.1	100
5	59.3	2.3	74	5.5	98
6	20.3	0.8	74	0.2	100
7	5.7	3.3	74	18.3	98
8	47.1	20.7	74	8.9	98
9	30	17.2	74	8.6	98
10	7.3	5.9	74	0.5	98
11	11.7	2.2	74	1.1	100
12	9.5	0.8	74	0.5	98
13	9.4	2.1	74	0.9	100
14	4.3	5.9	74	4.4	98
15	31.3	30.3	74	28.2	98
16	12.1	21.6	74	10.9	98
17	4.3	3.9	74	3.7	100
18	33.5	8.2	74	44.7	98
19	24.7	12.7	74	8.5	98
20**	0	2.5	74	0.3	98
21**	0	1.2	74	0.0	98
22	41	7.5	49	34.5	98
23	No subwatershed assigned the number 23				
24	7.5	0.1	74	4.9	98
25	10.7	0.2	74	4.8	98
26	25.4	0.2	74	14.1	98
27	27.6	0.0	49	5.5	98
28	1.6	3.7	74	3.3	98
29	35.1	6.4	74	3.9	98
51	17.7	20.2	65	5.0	98
1S	25.5	1.1	74	0.5	98
Total:		228.5^	73	271.7^	98

***Surface of ponds and wetlands assigned a CN of 100. All other impervious area assigned a CN of 98.

****Subwatersheds 20 and 21 are located directly over top of Rice Creek and are excluded from the model because precipitation falling in these subwatersheds falls directly into relocated Rice Creek.

^Excludes area of subwatershed 20 and 21.

3.0 HydroCAD Model Results

The existing and proposed stormwater management calculations are based on NRCS methodology using CN, T_c, and a nested Atlas 14 24-hour rainfall distribution. The 24-hour nested Atlas 14 rainfall depths used are:

- 2-Year Event 2.82 inches
- 10-Year Event 4.22 inches
- 100-Year Event 7.31 inches

These, and other NRCS inputs, were combined in HydroCAD, a stormwater hydraulic and hydrology modeling software, to perform design calculations. Wenck used the Storage-Indication routing method, which routes flow according to storage capacity and neglects travel time, as the pond routing method. Reach routing utilized the Muskingum-Cunge channel flow routing method because this method accounts for both reach storage capacity and travel time through the reach. Analysis of the 10-day snowmelt event was not required as all proposed stormwater ponds have a defined outlet at an elevation below the 100-year high water level.

3.1 Existing vs. Proposed Runoff

Wenck evaluated the peak discharge rate of the existing and fully developed site conditions for the 2-, 10-, and 100-year 24-hour design rainfall events. Rice Creek Watershed District Rule C.7 requires that Interim Scenario 1 and fully developed conditions model predicted peak discharge rates not exceed 80% of existing peak discharge.

3.1.1 Summary for Resource of Concern (Round Lake)

Under existing conditions, stormwater is discharged to Round Lake by way of three culverts. The proposed peak discharge rates under Interim Scenario 1 and fully developed conditions at each location have been significantly reduced for all three design storms (**Table 4**). The proposed stormwater management plan eliminates discharges through Outfall #3 (**CSMP Figure 4-7**) for both the Interim Scenario 1 and fully developed conditions. Runoff originating in offsite subwatershed 51 is redirected to the south before entering Rice Creek Commons property and discharges to Round Lake by way of an existing storm sewer. The Interim Scenario 1 and fully developed conditions grading plan redirects stormwater from 29.8 acres, which drain to Round Lake under existing conditions, to the Rice Creek. This 15.2% reduction in Round Lake tributary and the construction of stormwater retention ponds accounts for the peak discharge rate reduction.

Under Interim Scenario 1 and fully developed conditions, the combined peak discharge rate to Round Lake will be reduced by >80% for all three storm events (**Table 4**).

Table 4 – Peak discharge rates to Round Lake for existing and proposed conditions

Outfall #1 to Round Lake	Drainage Area (acres)	Discharge (cfs)		
		2-yr	10-yr	100-yr
Existing	23.3	34	67	135
80% of Existing	-	27	54	108
Interim Scenario 1	8.8	2	3	11
Fully Developed Conditions	8.8	4	6	16
Outfall #2 to Round Lake	**Drainage Area (acres)**	**Discharge (cfs)**		
		2-yr	**10-yr**	**100-yr**
Existing	143.8	112	217	438
80% of Existing	-	90	174	350
Interim Scenario 1	133.4	37	94	272
Fully Developed Conditions	133.4	47	98	261
Outfall #3 to Round Lake	**Drainage Area (acres)**	**Discharge (cfs)**		
		2-yr	**10-yr**	**100-yr**
Existing	30.2	13	33	83
80% of Existing	-	10	26	67
Interim Scenario 1	0.0	0	0	0
Fully Developed Conditions	0.0	0	0	0
Offsite Subbasin 51 to Round Lake	**Drainage Area (acres)**	**Discharge (cfs)**		
		2-yr	**10-yr**	**100-yr**
Existing	25.3	0	0	0
80% of Existing	-	0	0	0
Interim Scenario 1	25.3	16	37	94
Fully Developed Conditions	25.3	16	37	94
Total in Aggregate to Round Lake	**Drainage Area (acres)**	**Discharge (cfs)**		
		2-yr	**10-yr**	**100-yr**
Existing	197.3	159	317	656
80% of Existing	-	127	254	525
Interim Scenario 1	167.5	55	134	377
Fully Developed Conditions	167.5	67	141	371

3.1.2 Summary for Resource of Concern (Rice Creek)

Under existing conditions, runoff south of Rice Creek reaches Rice Creek by storm sewer outfalls or overland flow discharging to Rice Creek (**CSMP Figure 4-1**). Stormwater from the north of Rice Creek discharges to Rice Creek by way of an overland flow at numerous uncontrolled locations.

Under existing and proposed conditions, Rice Creek Commons stormwater from the north and south of Rice Creek discharges to the Rice Creek within a single 1,500 foot section of stream. The travel time from the most upstream to most downstream outfalls is minimal (approximately two minutes) causing discharge from separate locations to compound one

another. As a result, the aggregate peak discharge to Rice Creek determines the impact to this resource of concern.

The proposed stormwater control structures (**CSMP Figure 4-5**) reduce peak discharge to Rice Creek by >80% for both the Interim Scenario 1 and fully developed conditions condition (**Table 5**). Compared to existing conditions, the Interim Scenario 1 and fully developed conditions, respectively, reduce peak discharge by 66.0% and 22.8% for the 2-yr storm event; 59.3% and 29.3% for the 10-yr storm; and 44.0% and 28.9% for the 100-yr storm event.

Table 7 - Total peak discharge to Rice Creek for existing and fully developed conditions (in aggregate)

Total Peak Discharge to Rice Creek	Drainage Area (acres)	Discharge (cfs)		
		2-yr	10-yr	100-yr
Existing	288.7	315	604	1219
80% of Existing	-	252	483	975
Interim Scenario 1	317.5	107	246	682
Fully developed conditions	317.5	243	427	867

Full supporting calculations for the existing, interim, and fully developed conditions condition HydroCAD Models are included in **Appendix A, B** and **C**, respectively.

3.2 Pond Outlet Control Structures

All pond designs include a multi-stage outlet control structure (OCS) to manage stormwater for each of the design events. Detailed summaries of tributary areas to each stormwater pond, outlet information, normal water elevations, emergency overflow elevations, dead pool storage, and high water levels, live storage and peak discharge rates for each design storm event (2-yr, 10-yr and 100-yr) are included in **Section 6.0**.

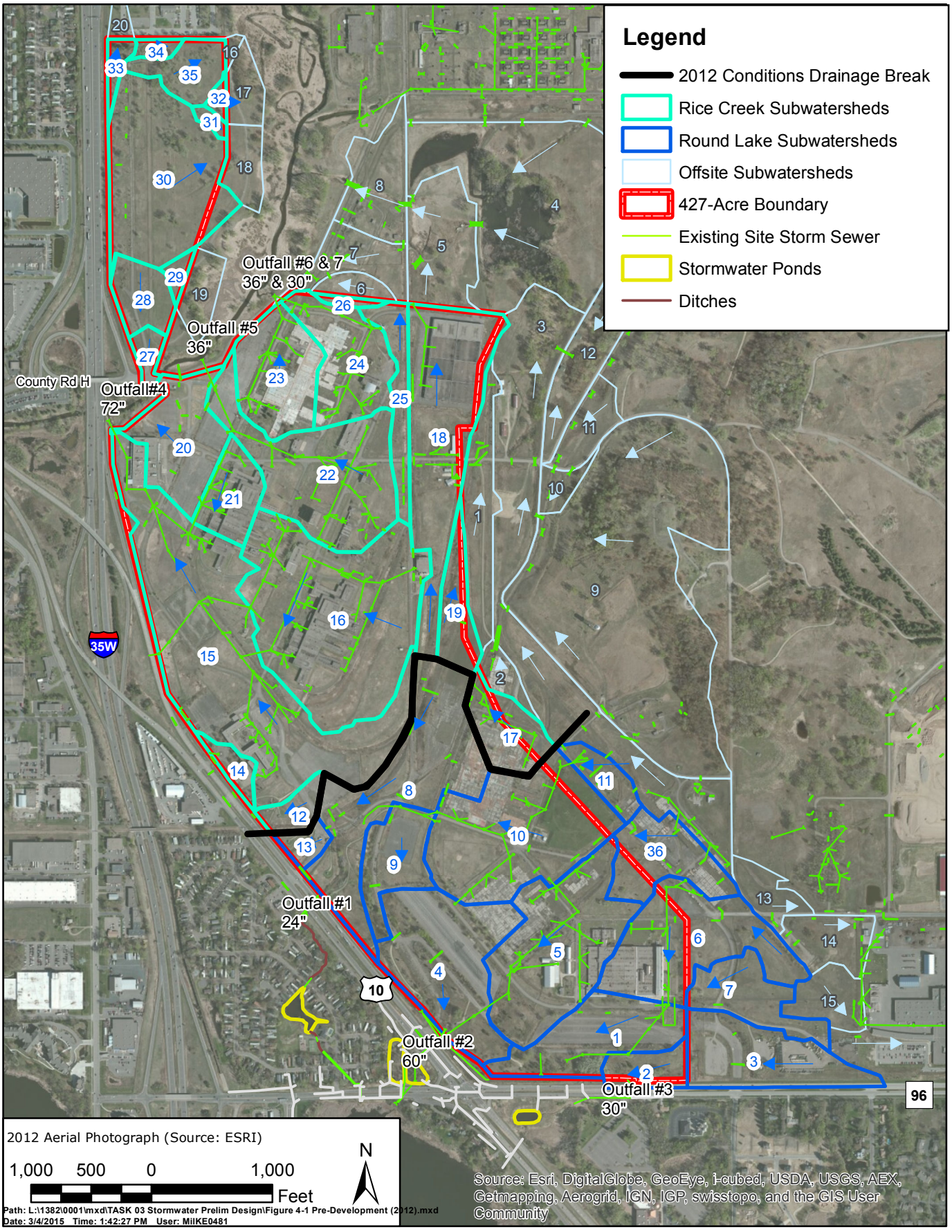
3.3 Infiltration Potential

Wenck reviewed the soil borings within the Site (**CSMP Figure 3-7**) and classified the soils in each boring log based on infiltration potential. If a boring had clay soils then it was considered no infiltration potential and labeled on **Figure 3** as a red dot. If there was a seam of sand or silt at depth, then the boring was classified as "infiltration potential at target seam" and labeled with an orange square on the Figure. If a particular soil boring showed favorable soils for infiltration, then it was labeled with a green star. If the soils showed potential at depth or at the surface, then it was labeled with a brown triangle and a yellow pentagon. **Figure 3** also shows the approximate location of the stormwater ponds (P-1 through P-14) in blue, the preliminary Outlots from the concept preliminary plat in purple, and areas excluded due to the potential concern relative to surficial (Unit 1) contaminated groundwater shown in red with diagonal lines. On an Outlot by Outlot basis, the infiltration is deemed feasible based on the majority of borings within an Outlot. Infiltration will be required in the portion north of Rice Creek and an area on the west side of the Spine Road alignment as shown in **CSMP Figure 5-1**.

4.0 Summary and Conclusions

Based on the HydroCAD modeling results presented herein, the RCWD peak runoff rate control standards will be met in aggregate for each Resource of Concern drainage area. Under Interim Scenario 1 and fully developed conditions, the total tributary area discharging to Round Lake decreases 15.2% to 167.4 acres and the total tributary area discharging to Rice Creek increases 8.7% to 332.8 acres when compared to existing conditions.

5. Figures



RAMSEY COUNTY

Pre-Development (2012): Subwatershed Map with Storm Sewers

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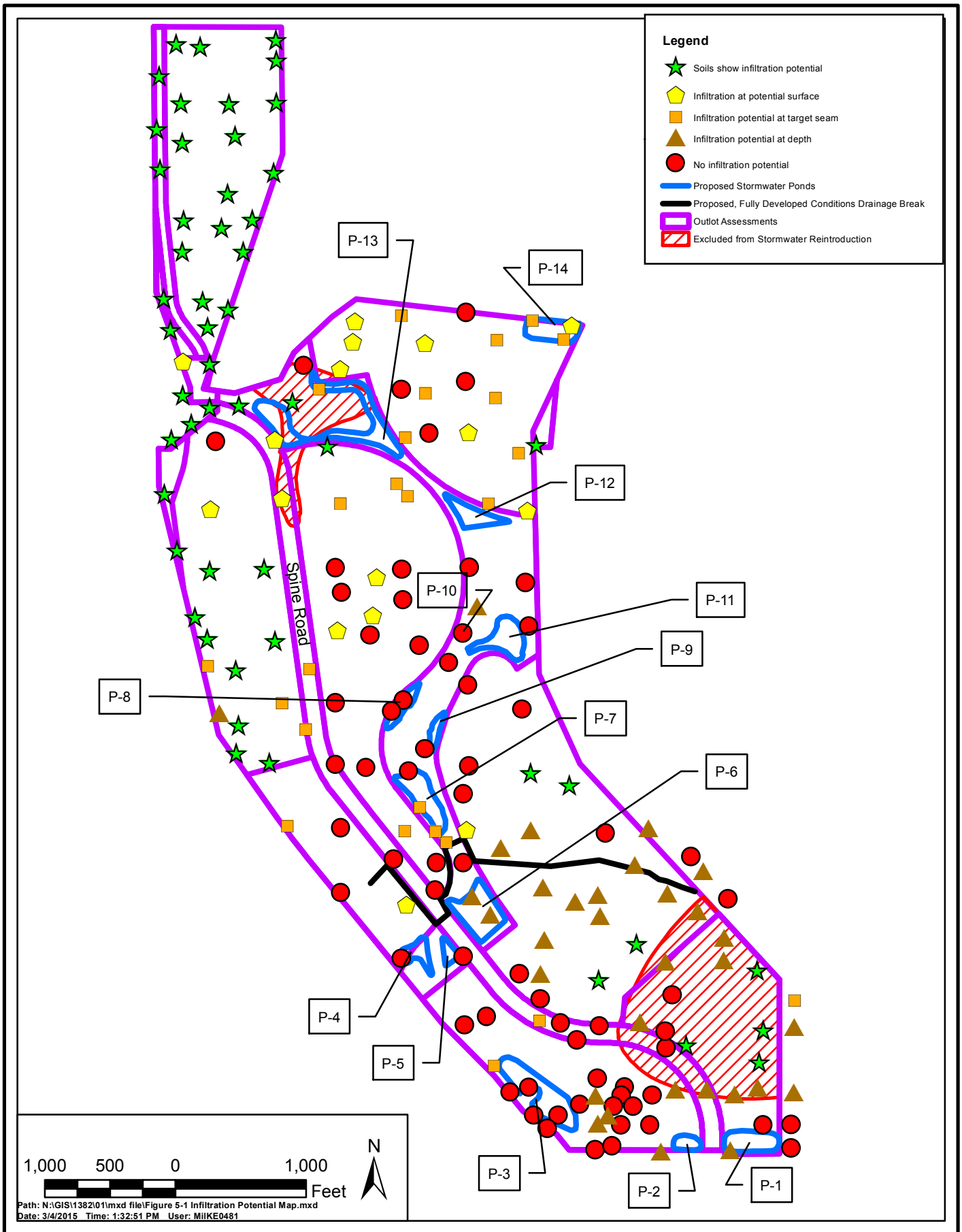
MAR 2015

Figure 1



RAMSEY COUNTY

Infiltration Potential Map

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Figure 3

6. Summary Tables

Stormwater Pond Data Summary Tables

HydroCAD Tech Memo
Section 6.0 Table 6-1, Pond Outlets

Stormwater Control Structure	Outlet structure	Pipe Size	Length (ft)	Slope	Max Velocity
			ft	*ft/ft*	*ft/sec*
P-1/P-2	6" horizontal orifice w/invert @ 924 ft Sharp crested box w/40' perimeter at 924.4 ft	60" RCP	2150	0.0050	10.7
P-3	12" horizontal orifice w/invent @ 914 ft Sharp crested rectangular weir w/invert at 915 ft and crest length = 7 ft Sharp crested rectangular weir w/invert at 918.25 ft and crest length = 10 ft	60" RCP	100	0.0085	13.9
P-4	6" horizontal orifice w/invent @ 915 ft 9" Diamater horizontal oriface w/invert @ 915 ft 24" RCP culvert w/inlet @ 915.95 ft	Connection to W-1 24" RCP	50	0.0050	5.8
P-5/P-6	12" horizontal orifice w/invert @ 930 ft 9" vertical oriface w/invert @ 930 ft 7 ft sharp crested weir @930.5 ft 10 ft sharp crested weir @ 931.5 ft dropping into a 48" pipe	48" RCP	830	0.0070	10.8
P-7	12" RCP W/invert at 915 75' broad crested weir @ 915 ft	Connection to W-3 Overland Flow to P-7 from P-9			
P-8	24" RCP w/invert at 897 ft	24" RCP	380	0.0028	3.9
P-9	80' broad crested weir @ 915 ft	Overland Flow to P-9 from P-11			
P-10	2.5 ft sharp crested rectangular baffel weir w/invert @ 896 ft dumping into 30" pipe 50 ft broad crested rectangular weir w/invert @ 897.4 ft	30" RCP Overland flow from broad crested wier to handle >10-yr stroms	750	0.0037	6.8
P-11	12" horizontal oriface w/invert @ 909 ft 12" horizontal orifice w/invert at 909 ft Two 24" RCPs w/invert at @ 910 ft 60 ft broad crested rectangular weir w/invert @ 912 ft	Connection to W-4 two 24" RCP Overland flow from broad crested wier to handle >10-yr stroms	200	0.0050	10.0
P-12	two 12" horizontal orifice w/invert at 893 ft four 44"x27" RCP arch culverts w/ invert at 893.5 ft	Overland flow via channel to P-13 from P-12			
P-13	five 12" RCP pipes w/invert at 883 ft 55 ft broad crested weir	Connection to W-5 Channel flow to Rice Creek			
P-14	12" horizontal orifice w/invert at 892 ft 18" Round RCP culvert w/invert at 893 ft	18" RCP is sufficient, specific reach not defined in model			
CRH-1	Infiltration	-	15 acres of infiltration ar		0.8 in/hr
	two 24" RCP pipes w/invert @ 877 ft	two 24" RCP	155	0.0065	2.5
CRH-2	Infiltration	-	.2 acres of infiltration are		0.8 in/hr
	two 24" RCP pipes w/invert @ 881.5 ft	two 24" RCP	155	0.0065	2.5
CRH-3	Infiltration	-	15 acres of infiltration ar		0.8 in/hr
	two 24" RCP pipes w/invert @ 878 ft	two 24" RCP	155	0.0065	2.5
W-1	6" horizontal orifice w/invert @ 914.75 ft	12" RCP	100	0.0010	1.6
W-2	12" RCP w/invert @ 929.1 ft	12" RCP	300	0.0437	2.6
W-3	12" RCP w/invert @ 914.75 ft	12" RCP	50	0.0380	2.5
W-4	12" RCP w/invert @ 908 ft	12" RCP	170	0.0020	2.0
W-5	Two 6 ft sharp crested rectangular baffel weir w/invert @ 882.75 ft	12" RCP	100	0.0050	3.7

HydroCAD Tech Memo
Section 6.0 Table 6-2, Interim Pond Geometery

Basin ID	Tributary Area				Basin Info		
	Tributary	Direct	Previously Ponded	Total	Outlet Elev/ NWL	Emergency Overflow	Dead Storage
		(acres)	(acres)	(acres)	(feet)	(feet)	(ac-ft)
Round Lake							
P-1	-	-	-	-	Constructed in Later Phase		
P-2	1, 2, 24	68.3	0.0	68.3	924.0	926.0	0.7
P-3	-	-	-	-	Constructed in Later Phase		
P-4	5	7.9	0.0	7.9	915.0	918.0	0.6
P-5	4, P-6	0.6	42.7	43.3	930.0	933.0	5.1
P-6	3, 25	42.7	0.0	42.7	930.0	933.0	
W-1	6	1.0	0.0	1.0	913.0	915.0	-
W-2	P-6	0.0	42.7	42.7	929.0	930.0	-
Offsite Subbasin 51	Offsite Subbasin 51	25.2	0.0	25.2	-	-	-
Rice Creek/Long Lake							
P-7	8	29.6	0.0	29.6	915.0	916.0	1.1
P-8	10	6.4	0.0	6.4	897.0	900.0	0.5
P-9	9, P-7, W-3	25.8	29.6	55.4	915.0	918.0	0.4
P-10	12, P-8, P-11	1.4	65.1	66.4	896.0	899.0	0.7
P-11	11, P-9	3.3	**55.4**	58.7	909.0	913.0	3.6
P-12	14, P-10, W-4	10.2	69.4	79.7	893.0	896.0	5.1
P-13	15, 16, 18, 26, P-12	158.1	79.7	237.8	883.0	886.0	4.3
P-14	19	21.2	0.0	21.2	Constructed in Later Phase		
Thumb	22, 27	48.5	0.0	48.5	-	-	-
CRH-1	28	7.0	0.0	5.7	876.0	879.0	-
CRH-2	29	10.2	0.0	10.2	881.5	884.0	-
CRH-3	CRH-2, 1S	1.6	10.2	11.8	876.0	879.0	-
W-3	P7	0.0	29.6	29.6	914.8	916.0	-
W-4	13	3.0	0.0	3.0	908.0	910.0	-
W-5	17	7.6	237.8	245.4	880.0	883.0	-

NOTE: Subbasins 20-22 and 27 are not routed through onsite ponds. No subbasin assigned number 23
Outlet information in Appendix 3, Table 2

HydroCAD Tech Memo
Section 6.0 Table 6-3, Interim Pond Discharge

Basin ID	Tributary Subbasins and Ponds	100-Year Storm			10-Year Storm			2-Year Storm		
		HWL (feet)	Live Storage (ac-ft)	Peak Outflow (cfs)	HWL (feet)	Live Storage (ac-ft)	Peak Outflow (cfs)	HWL (feet)	Live Storage (ac-ft)	Peak Outflow (cfs)
Round Lake										
P-1	-	-	-	-	-	-	-	-	-	-
P-2	1, 2, 24	925.5	0.6	146	925.0	0.4	59	924.7	0.3	25
P-3	-	-	-	272	-	-	94	-	-	37
P-4	5	917.3	0.8	8	916.2	0.4	1	915.4	0.1	1
P-5	4, P-6	931.5	5.6	113	930.5	3.2	29	929.9	1.8	10
P-6	3, 25									
W-1	6	915.3	0.4	3	915.1	0.2	2	915.0	0.1	1
W-2	P-6	929.6	0.7	1	929.5	0.6	1	929.4	0.4	0
Offsite Subbasin 51	Offsite Subbasin 51	-	-	94	-	-	37	-	-	16
Rice Creek/Long Lake										
P-7	8	915.9	0.4	77	915.8	0.4	32	915.8	0.4	14
P-8	10	899.0	0.9	12	898.1	0.4	4	897.6	0.2	1
P-9	9, P-7, W-3	915.8	0.2	148	915.4	0.1	60	915.3	0.1	25
P-10	12, P-8, P-11	898.4	0.8	127	897.6	0.5	25	896.8	0.2	5
P-11	11, P-9	912.7	5.2	136	911.4	3.2	26	910.2	1.5	7
P-12	14, P-10, W-4	895.5	4.5	118	894.1	1.9	23	893.6	0.9	6
P-13	15, 16, 18, 26, P-12	855.3	5.3	503	884.2	2.5	189	883.7	1.4	86
P-14	19	-	-	75	-	-	30	-	-	12
Thumb	22, 27	-	-	53	-	-	0	-	-	0
CRH-1	28	878.8	0.8	25	878.1	0.5	12	877.7	0.4	5
CRH-2	29	883.8	1.5	27	882.7	0.9	10	882.1	0.6	2
CRH-3	CRH-2, 1S	879.8	0.8	26	878.9	0.4	8	878.3	2.6	1
W-3	P7	915.2	0.9	1	915.1	0.6	0	915.0	0.5	0
W-4	13	909.3	1.3	4	908.9	0.9	3	908.7	0.6	2
W-5	17	-	-	-	883.1	1.6	7	882.9	0.9	3

NOTE: Subbasins 20-22 and 27 are not routed through onsite ponds. No subbasin assigned number 23

HydroCAD Tech Memo
Section 6.0 Table 6-4, Full Buildout Pond Geometery

Basin ID	Tributary Area				Basin Info		
	Tributary	Direct	Previously Ponded	Total	Outlet Elev/ NWL	Emergency Overflow	Dead Storage
		(acres)	(acres)	(acres)	(feet)	(feet)	(ac-ft)
Round Lake							
P-1	1	52.2	0.0	52.2	924.0	926.0	3.5
P-2	2, 24	16.1	52.2	68.3			
P-3	-	21.6	111.6	133.1	914.0	920.0	5.8
P-4	5	7.9	0.0	7.9	915.0	918.0	0.6
P-5	4, P-6	0.6	42.7	43.3	930.0	933.0	5.1
P-6	3, 25	42.7	0.0	42.7			
W-1	6	1.0	0.0	1.0	913.0	916.0	-
W-2	P-6	0.0	42.7	42.7	929.0	930.0	-
Offsite Subbasin 51	Offsite Subbasin 51	25.2	0.0	25.2	-	-	-
Rice Creek/Long Lake							
P-7	8	29.6	0.0	29.6	915.0	916.0	1.1
P-8	10	6.4	0.0	6.4	897.0	900.0	0.5
P-9	9, P-7, W-3	25.8	29.6	55.4	915.0	918.0	0.4
P-10	12, P-8, P-11	1.4	65.1	66.4	896.0	899.0	0.7
P-11	11, P-9	3.3	55.4	58.7	909.0	913.0	3.6
P-12	14, P-10, W-4	10.2	69.4	79.7	893.0	896.0	5.1
P-13	15, 16, 18, 26, P-12	158.1	79.7	237.8	883.0	886.0	4.3
P-14	19	21.2	0.0	21.2	892.0	895.5	4.5
Thumb	22, 27	48.5	0.0	48.5	-	-	-
CRH-1	28	7.0	0.0	7.0	876.0	879.0	-
CRH-2	29	10.2	0.0	10.2	881.5	884.0	-
CRH-3	CRH-2, 1S	1.6	10.2	11.8	876.0	879.0	-
W-3	P7	0.0	29.6	29.6	914.8	916.0	-
W-4	13	3.0	0.0	3.0	908.0	910.0	-
W-5	17	7.6	237.8	245.4	880.0	883.0	-

NOTE: Subbasins 20-22 and 27 are not routed through onsite ponds. No subbasin assigned number 23
Outlet information in Appendix 3, Table 2

HydroCAD Tech Memo
Section 6.0 Table 6-5, Full Buildout Pond Discharge

Basin ID	Tributary Area	100-Year Storm			10-Year Storm			2-Year Storm		
	Tributary	HWL	Live Storage	Peak Outflow	HWL	Live Storage	Peak Outflow	HWL	Live Storage	Peak Outflow
		(feet)	(ac-ft)	(cfs)	(feet)	(ac-ft)	(cfs)	(feet)	(ac-ft)	(cfs)
Round Lake										
P-1	1	925.7	2.4	174	925.2	1.6	90	924.9	1.3	53
P-2	2, 24									
P-3	-	919.7	13.3	261	918.0	7.9	98	916.5	5.2	47
P-4	5	917.8	1.0	13	916.8	0.6	4	916.2	0.4	2
P-5	4, P-6	932.6	8.4	123	931.5	5.6	29	930.7	3.8	7
P-6	3, 25									
W-1	6	915.4	0.5	3	915.2	0.3	2	915.1	0.2	2
W-2	P-6	929.6	0.7	1	929.5	0.6	1	929.4	0.4	0
Offsite Subbasin 51	Offsite Subbasin 51	-	-	94	-	-	37	-	-	16
Rice Creek/Long Lake										
P-7	8	915.9	0.4	86	915.8	0.4	40	915.8	0.4	21
P-8	10	899.1	0.9	12	898.1	0.4	4	897.6	0.2	1
P-9	9, P-7, W-3	915.9	0.2	167	915.5	0.1	78	915.4	0.1	42
P-10	12, P-8, P-11	898.5	0.9	169	897.8	0.6	39	897.5	0.5	22
P-11	11, P-9	912.8	5.4	161	912.0	4.2	40	910.9	2.5	16
P-12	14, P-10, W-4	895.8	5.2	141	894.4	2.3	37	893.8	1.4	12
P-13	15, 16, 18, 26, P-12	885.7	6.3	631	884.6	3.4	295	884.1	2.2	165
P-14	19	895.2	4.9	16	893.7	2.4	7	893.0	1.3	4
Thumb	22, 27	-	-	169	-	-	94	-	-	61
CRH-1	28	878.8	0.8	25	878.1	0.5	12	877.7	0.4	5
CRH-2	29	883.8	1.5	27	882.7	0.9	10	882.1	0.6	2
CRH-3	CRH-2, 1S	879.8	0.8	26	878.9	0.4	8	878.3	2.6	1
W-3	P7	915.2	0.9	1	915.1	0.7	1	915.0	0.5	0
W-4	13	909.4	1.4	4	909.0	0.9	3	908.8	0.8	3
W-5	17	-	-	-	883.2	2.4	12	883.1	1.7	8

NOTE: Subbasins 20-22 and 27 are not routed through onsite ponds. No subbasin assigned number 23

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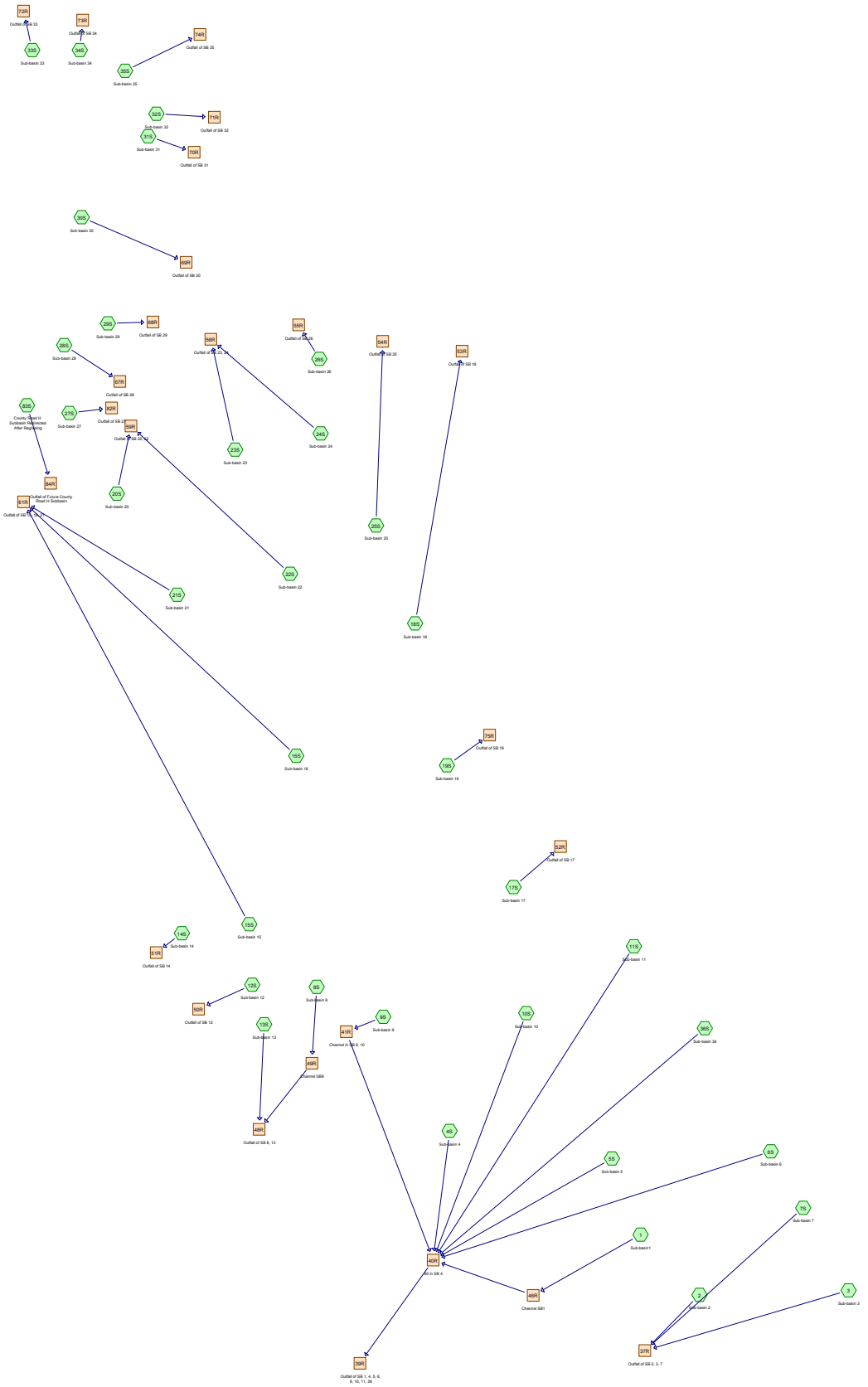
Appendix A

Existing Conditions (2012)
Hydrology and Hydraulics Modeling (HydroCAD)



Routing Diagram for Existing Conditions_HydroCAD Model
Prepared by Wenck Associates, Inc., Printed 6/8/2015
HydroCAD® 10.00 s/n 02201 © 2012 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
15.328	87	(1)
27.092	75	(2, 3, 25S)
53.741	85	(4S, 20S, 24S)
27.171	83	(5S)
28.829	78	(6S, 19S)
9.790	62	(7S)
95.827	81	(8S, 10S, 16S)
94.629	82	(9S, 13S, 15S, 22S)
4.343	76	(11S)
9.187	80	(12S, 83S)
38.195	84	(14S, 18S)
8.010	86	(17S)
7.156	90	(21S)
13.825	92	(23S)
2.861	66	(26S, 27S)
5.784	44	(28S)
3.017	39	(29S, 31S, 32S)
31.577	42	(30S)
3.237	48	(33S)
1.241	49	(34S)
6.229	43	(35S)
11.210	79	(36S)
498.279	**78**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
0.000	HSG C	
0.000	HSG D	
498.279	Other	1, 2, 3, 4S, 5S, 6S, 7S, 8S, 9S, 10S, 11S, 12S, 13S, 14S, 15S, 16S, 17S, 18S, 19S, 20S, 21S, 22S, 23S, 24S, 25S, 26S, 27S, 28S, 29S, 30S, 31S, 32S, 33S, 34S, 35S, 36S, 83S
498.279		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.000	0.000	0.000	498.279	498.279		1, 2, 3, 4S, 5S, 6S, 7S, 8S, 9S, 10S, 11S, 12S, 13S, 14S, 15S, 16S, 17S, 18S, 19S, 20S, 21S, 22S, 23S, 24S, 25S, 26S, 27S, 28S, 29S, 30S, 31S, 32S, 33S, 34S, 35S, 36S, 83S
0.000	**0.000**	**0.000**	**0.000**	**498.279**	**498.279**	**TOTAL AREA**	

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	40R	0.00	-23.69	718.0	0.0330	0.013	60.0	0.0	0.0

Time span=0.00-48.00 hrs, dt=0.02 hrs, 2401 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Muskingum-Cunge method - Pond routing by Stor-Ind method

Subcatchment1: Sub-basin1 Runoff Area=15.328 ac 0.00% Impervious Runoff Depth=1.58"
Tc=16.3 min CN=87 Runoff=26.50 cfs 2.022 af

Subcatchment2: Sub-basin 2 Runoff Area=4.913 ac 0.00% Impervious Runoff Depth=0.85"
Tc=12.2 min CN=75 Runoff=4.67 cfs 0.346 af

Subcatchment3: Sub-basin 3 Runoff Area=15.522 ac 0.00% Impervious Runoff Depth=0.85"
Tc=32.8 min CN=75 Runoff=9.18 cfs 1.093 af

Subcatchment4S: Sub-basin 4 Runoff Area=23.961 ac 0.00% Impervious Runoff Depth=1.44"
Tc=11.3 min CN=85 Runoff=44.38 cfs 2.872 af

Subcatchment5S: Sub-basin 5 Runoff Area=27.171 ac 0.00% Impervious Runoff Depth=1.30"
Tc=40.5 min CN=83 Runoff=23.85 cfs 2.950 af

Subcatchment6S: Sub-basin 6 Runoff Area=22.467 ac 0.00% Impervious Runoff Depth=1.00"
Tc=46.4 min CN=78 Runoff=13.57 cfs 1.877 af

Subcatchment7S: Sub-basin 7 Runoff Area=9.790 ac 0.00% Impervious Runoff Depth=0.33"
Tc=27.0 min CN=62 Runoff=1.66 cfs 0.268 af

Subcatchment8S: Sub-basin 8 Runoff Area=21.017 ac 0.00% Impervious Runoff Depth=1.18"
Tc=9.5 min CN=81 Runoff=33.39 cfs 2.061 af

Subcatchment9S: Sub-basin 9 Runoff Area=9.296 ac 0.00% Impervious Runoff Depth=1.24"
Tc=12.7 min CN=82 Runoff=13.79 cfs 0.960 af

Subcatchment10S: Sub-basin 10 Runoff Area=30.014 ac 0.00% Impervious Runoff Depth=1.18"
Tc=37.7 min CN=81 Runoff=24.50 cfs 2.943 af

Subcatchment11S: Sub-basin 11 Runoff Area=4.343 ac 0.00% Impervious Runoff Depth=0.90"
Tc=32.9 min CN=76 Runoff=2.75 cfs 0.324 af

Subcatchment12S: Sub-basin 12 Runoff Area=3.310 ac 0.00% Impervious Runoff Depth=1.12"
Tc=14.0 min CN=80 Runoff=4.17 cfs 0.308 af

Subcatchment13S: Sub-basin 13 Runoff Area=2.279 ac 0.00% Impervious Runoff Depth=1.24"
Tc=36.2 min CN=82 Runoff=2.01 cfs 0.235 af

Subcatchment14S: Sub-basin 14 Runoff Area=2.518 ac 0.00% Impervious Runoff Depth=1.37"
Tc=8.9 min CN=84 Runoff=4.89 cfs 0.287 af

Subcatchment15S: Sub-basin 15 Runoff Area=56.506 ac 0.00% Impervious Runoff Depth=1.24"
Tc=28.0 min CN=82 Runoff=57.14 cfs 5.833 af

Subcatchment16S: Sub-basin 16 Runoff Area=44.796 ac 0.00% Impervious Runoff Depth=1.18"
Tc=26.3 min CN=81 Runoff=44.07 cfs 4.393 af

Subcatchment17S: Sub-basin 17 Runoff Area=8.010 ac 0.00% Impervious Runoff Depth=1.51"
Tc=11.5 min CN=86 Runoff=15.45 cfs 1.008 af

Subcatchment18S: Sub-basin 18 Runoff Area=35.677 ac 0.00% Impervious Runoff Depth=1.37"
Tc=15.8 min CN=84 Runoff=53.72 cfs 4.072 af

Subcatchment19S: Sub-basin 19 Runoff Area=6.362 ac 0.00% Impervious Runoff Depth=1.00"
Tc=7.3 min CN=78 Runoff=9.29 cfs 0.531 af

Subcatchment20S: Sub-basin 20 Runoff Area=15.897 ac 0.00% Impervious Runoff Depth=1.44"
Tc=17.1 min CN=85 Runoff=24.29 cfs 1.905 af

Subcatchment21S: Sub-basin 21 Runoff Area=7.156 ac 0.00% Impervious Runoff Depth=1.82"
Tc=10.8 min CN=90 Runoff=17.27 cfs 1.085 af

Subcatchment22S: Sub-basin 22 Runoff Area=26.548 ac 0.00% Impervious Runoff Depth=1.24"
Tc=19.6 min CN=82 Runoff=32.17 cfs 2.741 af

Subcatchment23S: Sub-basin 23 Runoff Area=13.825 ac 0.00% Impervious Runoff Depth=1.99"
Tc=9.4 min CN=92 Runoff=38.34 cfs 2.294 af

Subcatchment24S: Sub-basin 24 Runoff Area=13.883 ac 0.00% Impervious Runoff Depth=1.44"
Tc=19.0 min CN=85 Runoff=20.15 cfs 1.664 af

Subcatchment25S: Sub-basin 25 Runoff Area=6.657 ac 0.00% Impervious Runoff Depth=0.85"
Tc=22.6 min CN=75 Runoff=4.76 cfs 0.469 af

Subcatchment26S: Sub-basin 26 Runoff Area=0.823 ac 0.00% Impervious Runoff Depth=0.46"
Tc=38.2 min CN=66 Runoff=0.20 cfs 0.032 af

Subcatchment27S: Sub-basin 27 Runoff Area=2.038 ac 0.00% Impervious Runoff Depth=0.46"
Tc=13.0 min CN=66 Runoff=0.77 cfs 0.078 af

Subcatchment28S: Sub-basin 28 Runoff Area=5.784 ac 0.00% Impervious Runoff Depth=0.01"
Tc=23.9 min CN=44 Runoff=0.01 cfs 0.003 af

Subcatchment29S: Sub-basin 29 Runoff Area=1.255 ac 0.00% Impervious Runoff Depth=0.00"
Tc=26.9 min CN=39 Runoff=0.00 cfs 0.000 af

Subcatchment30S: Sub-basin 30 Runoff Area=31.577 ac 0.00% Impervious Runoff Depth=0.00"
Tc=45.9 min CN=42 Runoff=0.01 cfs 0.001 af

Subcatchment31S: Sub-basin 31 Runoff Area=0.884 ac 0.00% Impervious Runoff Depth=0.00"
Tc=30.2 min CN=39 Runoff=0.00 cfs 0.000 af

Subcatchment32S: Sub-basin 32 Runoff Area=0.878 ac 0.00% Impervious Runoff Depth=0.00"
Tc=27.6 min CN=39 Runoff=0.00 cfs 0.000 af

Subcatchment33S: Sub-basin 33 Runoff Area=3.237 ac 0.00% Impervious Runoff Depth=0.04"
Tc=19.9 min CN=48 Runoff=0.01 cfs 0.010 af

Subcatchment34S: Sub-basin 34 Runoff Area=1.241 ac 0.00% Impervious Runoff Depth=0.05"
Tc=12.1 min CN=49 Runoff=0.01 cfs 0.005 af

Subcatchment35S: Sub-basin 35 Runoff Area=6.229 ac 0.00% Impervious Runoff Depth=0.00"
Tc=16.7 min CN=43 Runoff=0.00 cfs 0.001 af

Subcatchment36S: Sub-basin 36 Runoff Area=11.210 ac 0.00% Impervious Runoff Depth=1.06"
Tc=52.2 min CN=79 Runoff=6.74 cfs 0.989 af

Subcatchment83S: County Road H Runoff Area=5.877 ac 0.00% Impervious Runoff Depth=1.12"
Tc=19.1 min CN=80 Runoff=6.41 cfs 0.547 af

Reach 37R: Outfall of SB 2, 3, 7 Inflow=12.99 cfs 1.708 af
Outflow=12.99 cfs 1.708 af

Reach 39R: Outfall of SB 1, 4, 5, 6, 9, 10, 11, 36 Inflow=111.85 cfs 14.937 af
Outflow=111.85 cfs 14.937 af

Reach 40R: 60 in SB 4 Avg. Flow Depth=1.37' Max Vel=26.20 fps Inflow=111.84 cfs 14.937 af
60.0" Round Pipe n=0.013 L=718.0' S=0.0330 '/' Capacity=473.08 cfs Outflow=111.85 cfs 14.937 af

Reach 41R: Channel in SB 9, 10 Avg. Flow Depth=0.35' Max Vel=8.22 fps Inflow=13.79 cfs 0.960 af
n=0.050 L=1,660.0' S=0.0048 '/' Capacity=280.23 cfs Outflow=12.78 cfs 0.960 af

Reach 46R: Channel SB1 Avg. Flow Depth=0.61' Max Vel=5.16 fps Inflow=26.50 cfs 2.022 af
n=0.050 L=841.0' S=0.0071 '/' Capacity=296.86 cfs Outflow=26.13 cfs 2.022 af

Reach 48R: Outfall of SB 8, 13 Inflow=33.61 cfs 2.296 af
Outflow=33.61 cfs 2.296 af

Reach 49R: Channel SB8 Avg. Flow Depth=0.54' Max Vel=5.56 fps Inflow=33.39 cfs 2.061 af
n=0.050 L=521.0' S=0.0077 '/' Capacity=706.58 cfs Outflow=32.82 cfs 2.061 af

Reach 50R: Outfall of SB 12 Inflow=4.17 cfs 0.308 af
Outflow=4.17 cfs 0.308 af

Reach 51R: Outfall of SB 14 Inflow=4.89 cfs 0.287 af
Outflow=4.89 cfs 0.287 af

Reach 52R: Outfall of SB 17 Inflow=15.45 cfs 1.008 af
Outflow=15.45 cfs 1.008 af

Reach 53R: Outfall of SB 18 Inflow=53.72 cfs 4.072 af
Outflow=53.72 cfs 4.072 af

Reach 54R: Outfall of SB 25 Inflow=4.76 cfs 0.469 af
Outflow=4.76 cfs 0.469 af

Reach 55R: Outfall of SB 26 Inflow=0.20 cfs 0.032 af
Outflow=0.20 cfs 0.032 af

Reach 56R: Outfall of SB 23, 24	Inflow=51.42 cfs 3.958 af Outflow=51.42 cfs 3.958 af
Reach 59R: Outfall of SB 20, 22	Inflow=56.04 cfs 4.646 af Outflow=56.04 cfs 4.646 af
Reach 61R: Outfall of SB 15, 16, 21	Inflow=108.23 cfs 11.311 af Outflow=108.23 cfs 11.311 af
Reach 67R: Outfall of SB 28	Inflow=0.01 cfs 0.003 af Outflow=0.01 cfs 0.003 af
Reach 68R: Outfall of SB 29	Inflow=0.00 cfs 0.000 af Outflow=0.00 cfs 0.000 af
Reach 69R: Outfall of SB 30	Inflow=0.01 cfs 0.001 af Outflow=0.01 cfs 0.001 af
Reach 70R: Outfall of SB 31	Inflow=0.00 cfs 0.000 af Outflow=0.00 cfs 0.000 af
Reach 71R: Outfall of SB 32	Inflow=0.00 cfs 0.000 af Outflow=0.00 cfs 0.000 af
Reach 72R: Outfall of SB 33	Inflow=0.01 cfs 0.010 af Outflow=0.01 cfs 0.010 af
Reach 73R: Outfall of SB 34	Inflow=0.01 cfs 0.005 af Outflow=0.01 cfs 0.005 af
Reach 74R: Outfall of SB 35	Inflow=0.00 cfs 0.001 af Outflow=0.00 cfs 0.001 af
Reach 75R: Outfall of SB 19	Inflow=9.29 cfs 0.531 af Outflow=9.29 cfs 0.531 af
Reach 82R: Outfall of SB 27	Inflow=0.77 cfs 0.078 af Outflow=0.77 cfs 0.078 af
Reach 84R: Outfall of Future County Road H Subbasin	Inflow=6.41 cfs 0.547 af Outflow=6.41 cfs 0.547 af

Total Runoff Area = 498.279 ac Runoff Volume = 46.208 af Average Runoff Depth = 1.11"
100.00% Pervious = 498.279 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment 1: Sub-basin1

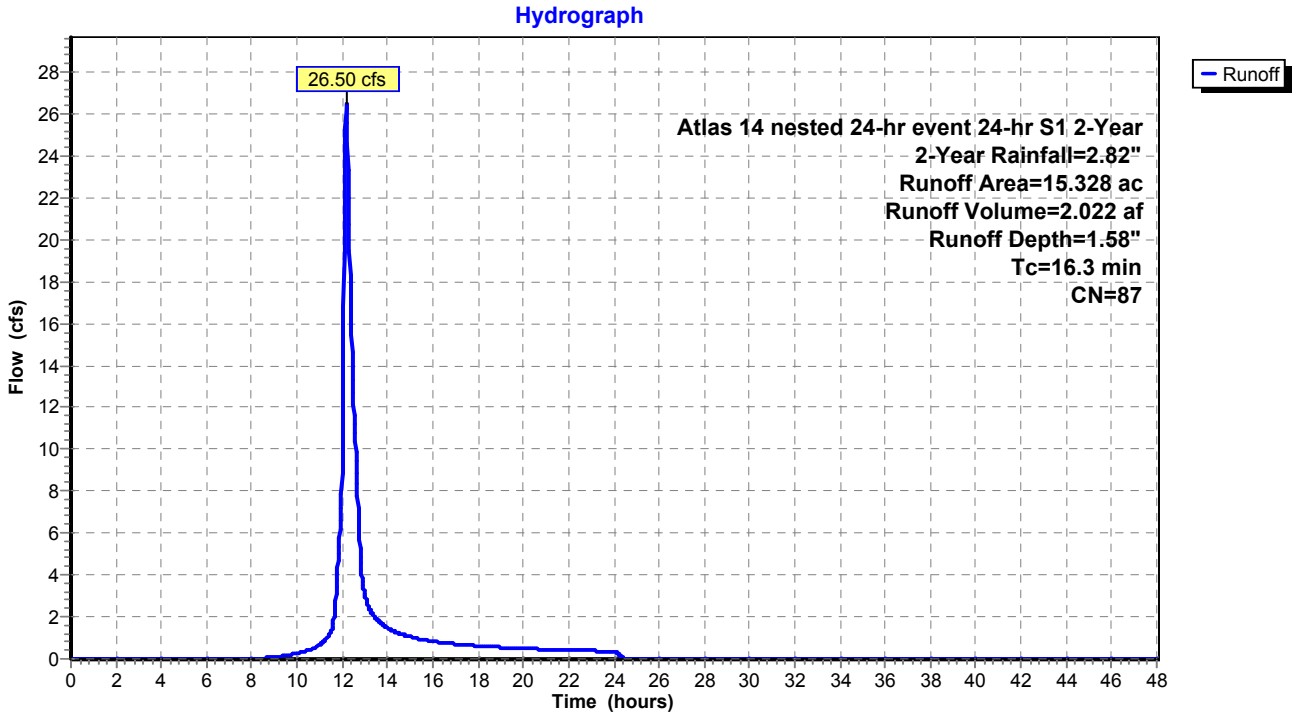
Runoff = 26.50 cfs @ 12.18 hrs, Volume= 2.022 af, Depth= 1.58"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
Atlas 14 nested 24-hr event 24-hr S1 2-Year 2-Year Rainfall=2.82"

	Area (ac)	CN	Description
*	15.328	87	
	15.328		100.00% Pervious Area

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

Subcatchment 1: Sub-basin1



Summary for Subcatchment 2: Sub-basin 2

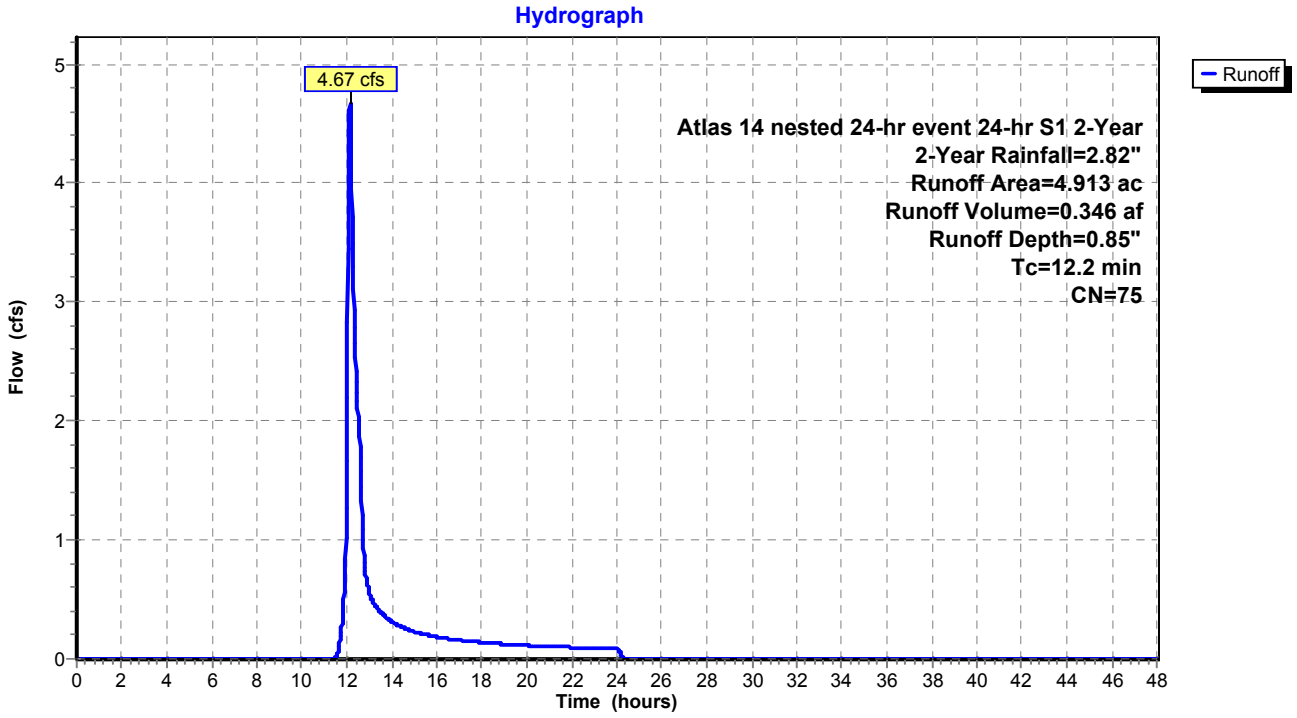
Runoff = 4.67 cfs @ 12.14 hrs, Volume= 0.346 af, Depth= 0.85"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
Atlas 14 nested 24-hr event 24-hr S1 2-Year 2-Year Rainfall=2.82"

	Area (ac)	CN	Description
*	4.913	75	
	4.913		100.00% Pervious Area

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

Subcatchment 2: Sub-basin 2



Summary for Subcatchment 3: Sub-basin 3

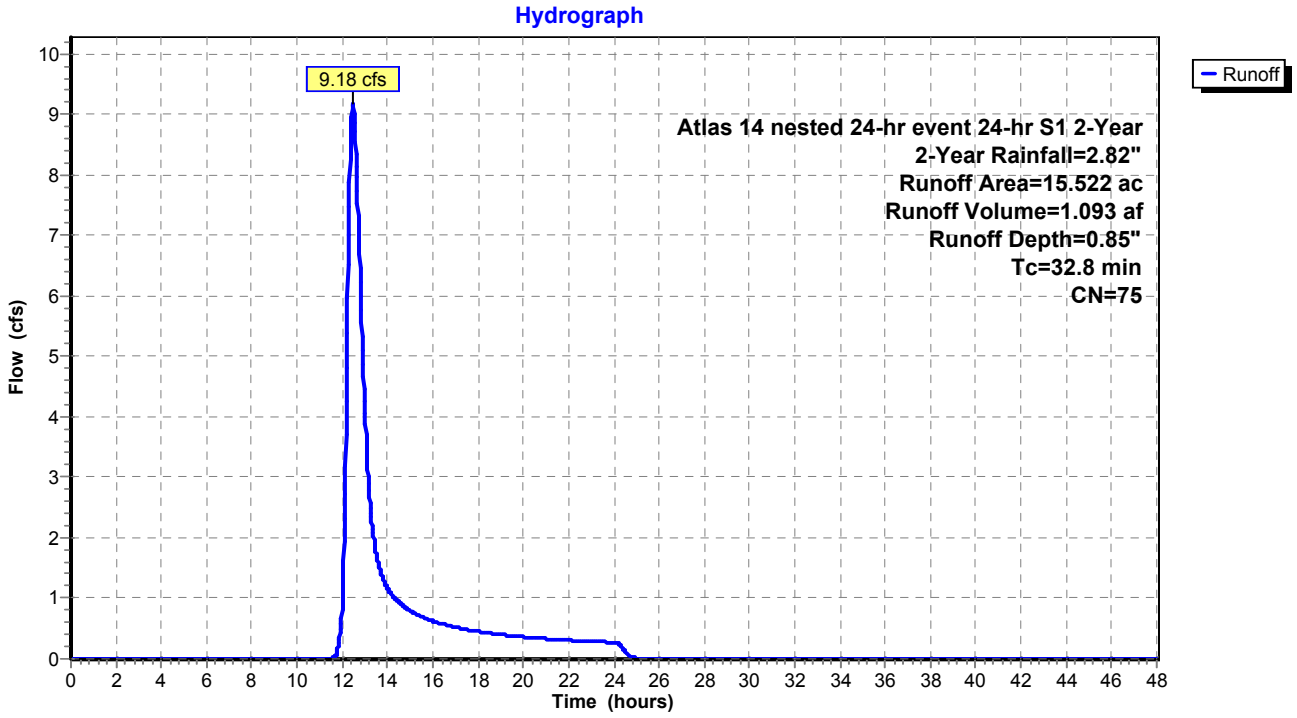
Runoff = 9.18 cfs @ 12.46 hrs, Volume= 1.093 af, Depth= 0.85"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
Atlas 14 nested 24-hr event 24-hr S1 2-Year 2-Year Rainfall=2.82"

	Area (ac)	CN	Description
*	15.522	75	
	15.522		100.00% Pervious Area

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

Subcatchment 3: Sub-basin 3



Summary for Subcatchment 4S: Sub-basin 4

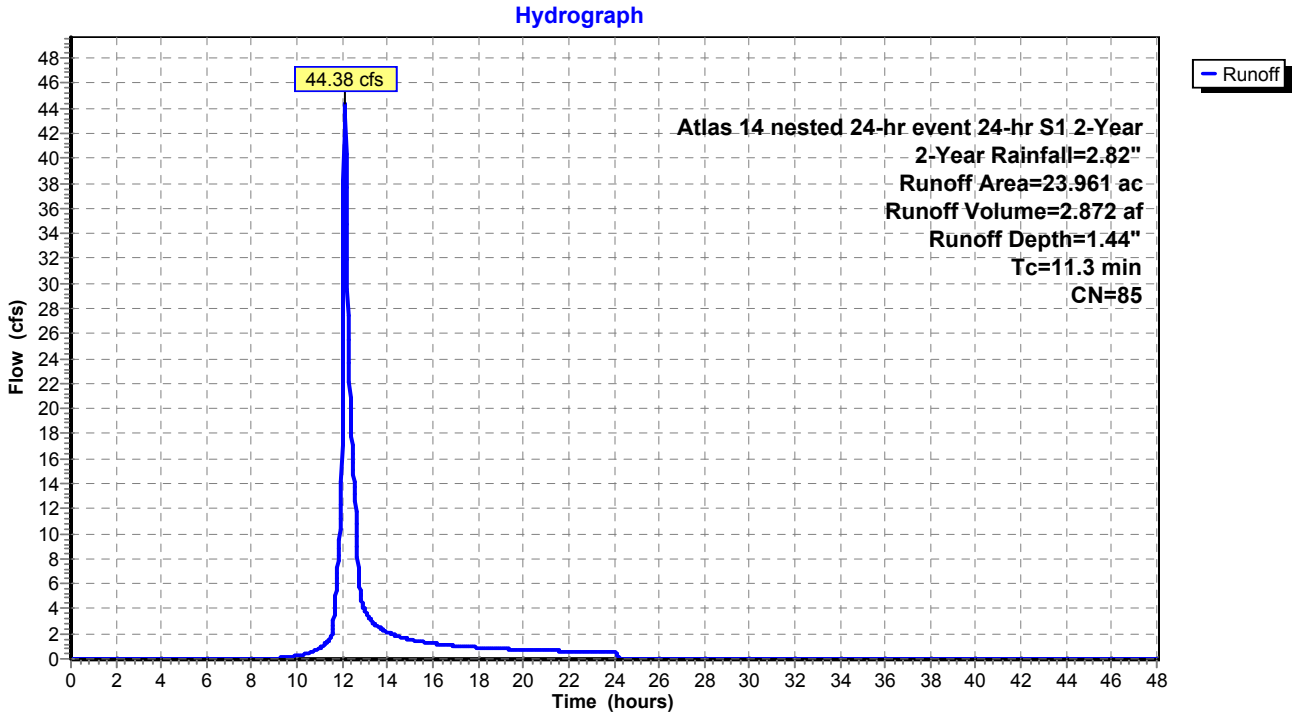
Runoff = 44.38 cfs @ 12.11 hrs, Volume= 2.872 af, Depth= 1.44"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
Atlas 14 nested 24-hr event 24-hr S1 2-Year 2-Year Rainfall=2.82"

	Area (ac)	CN	Description
*	23.961	85	
	23.961		100.00% Pervious Area

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

Subcatchment 4S: Sub-basin 4



Summary for Subcatchment 5S: Sub-basin 5

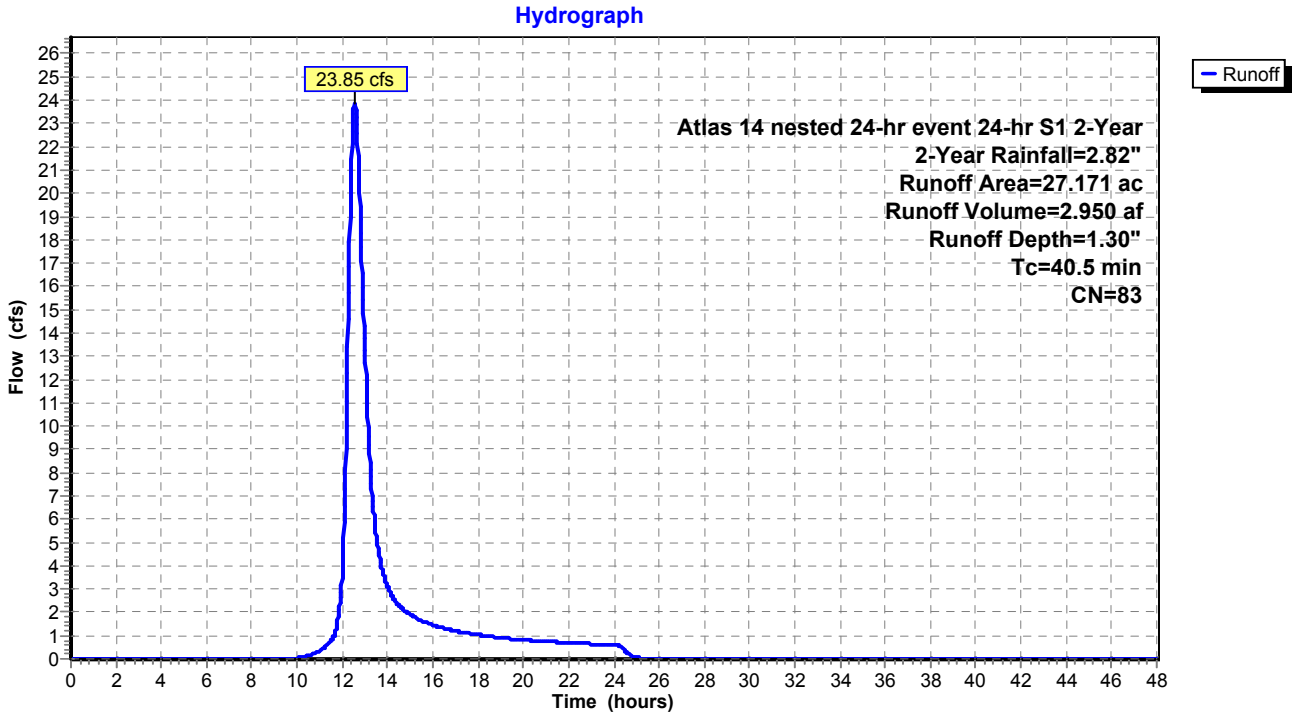
Runoff = 23.85 cfs @ 12.55 hrs, Volume= 2.950 af, Depth= 1.30"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
Atlas 14 nested 24-hr event 24-hr S1 2-Year 2-Year Rainfall=2.82"

	Area (ac)	CN	Description
*	27.171	83	
	27.171		100.00% Pervious Area

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

Subcatchment 5S: Sub-basin 5



Summary for Subcatchment 6S: Sub-basin 6

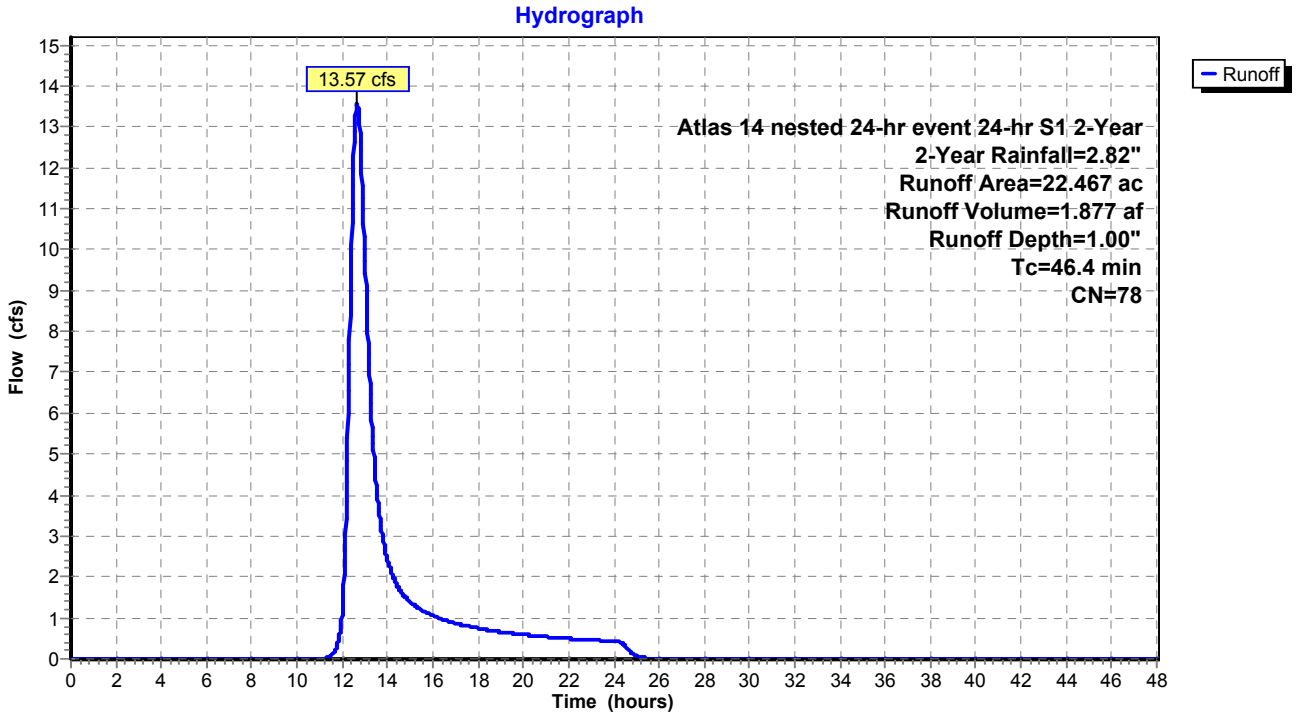
Runoff = 13.57 cfs @ 12.65 hrs, Volume= 1.877 af, Depth= 1.00"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
Atlas 14 nested 24-hr event 24-hr S1 2-Year 2-Year Rainfall=2.82"

	Area (ac)	CN	Description
*	22.467	78	
	22.467		100.00% Pervious Area

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

Subcatchment 6S: Sub-basin 6



Summary for Subcatchment 7S: Sub-basin 7

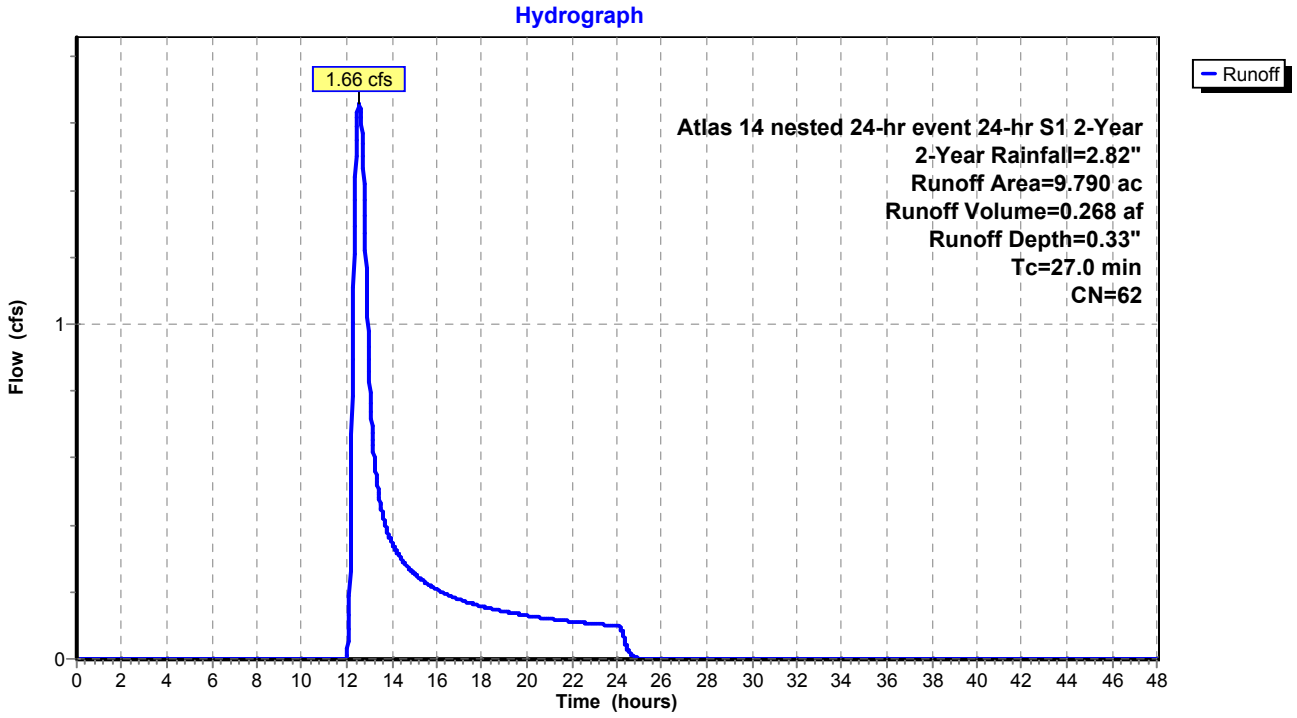
Runoff = 1.66 cfs @ 12.55 hrs, Volume= 0.268 af, Depth= 0.33"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
Atlas 14 nested 24-hr event 24-hr S1 2-Year 2-Year Rainfall=2.82"

	Area (ac)	CN	Description
*	9.790	62	
	9.790		100.00% Pervious Area

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

Subcatchment 7S: Sub-basin 7



Summary for Subcatchment 8S: Sub-basin 8

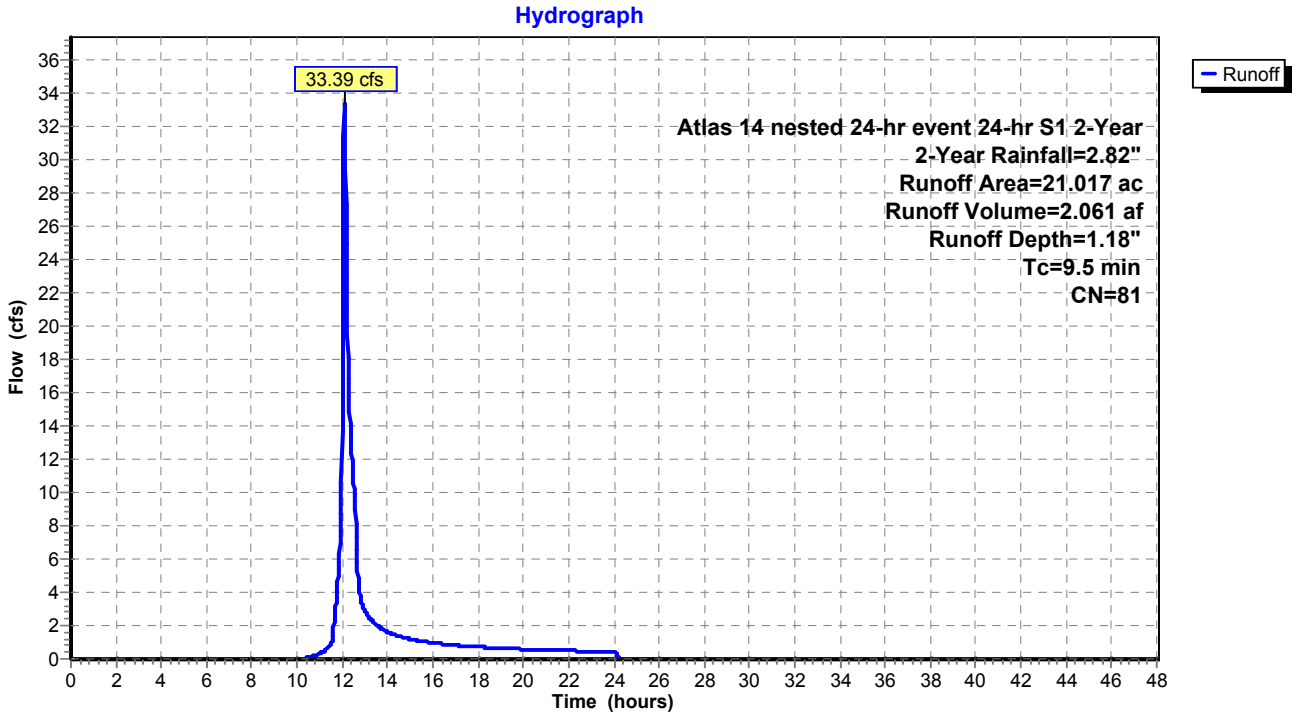
Runoff = 33.39 cfs @ 12.09 hrs, Volume= 2.061 af, Depth= 1.18"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
Atlas 14 nested 24-hr event 24-hr S1 2-Year 2-Year Rainfall=2.82"

	Area (ac)	CN	Description
*	21.017	81	
	21.017		100.00% Pervious Area

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

Subcatchment 8S: Sub-basin 8



Summary for Subcatchment 9S: Sub-basin 9

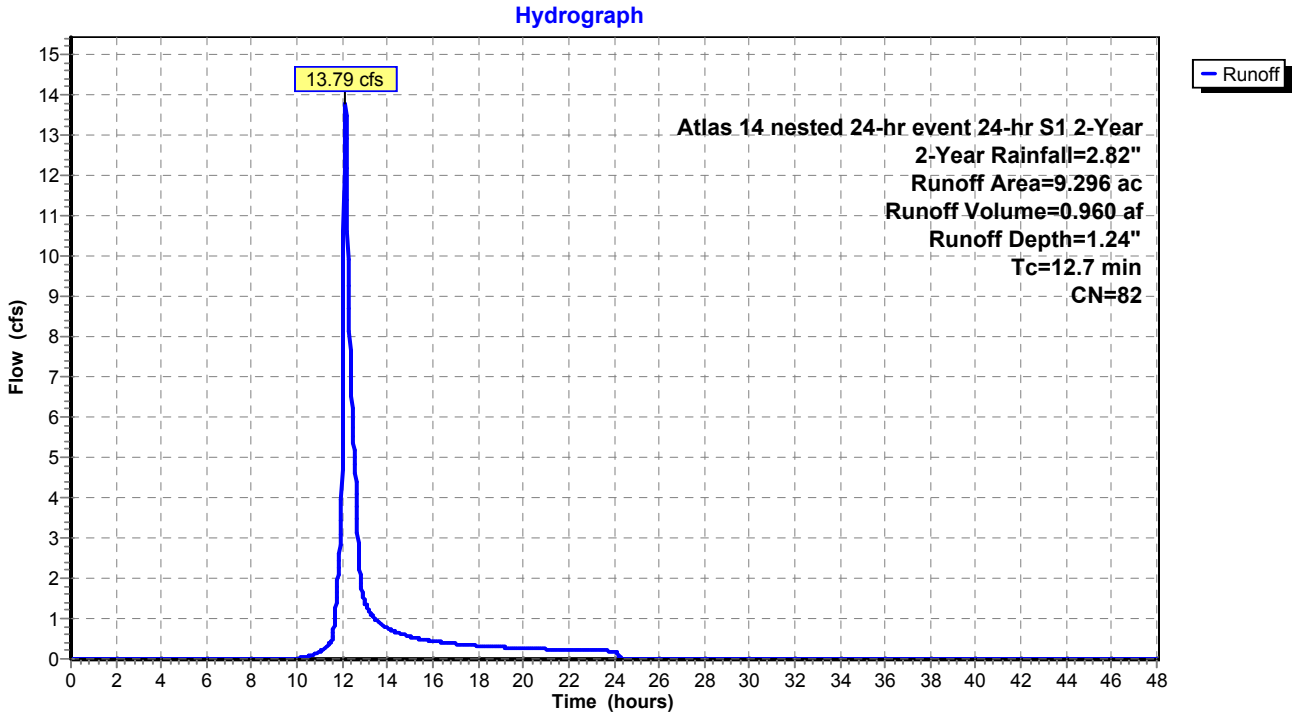
Runoff = 13.79 cfs @ 12.13 hrs, Volume= 0.960 af, Depth= 1.24"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
Atlas 14 nested 24-hr event 24-hr S1 2-Year 2-Year Rainfall=2.82"

	Area (ac)	CN	Description
*	9.296	82	
	9.296		100.00% Pervious Area

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

Subcatchment 9S: Sub-basin 9



Summary for Subcatchment 10S: Sub-basin 10

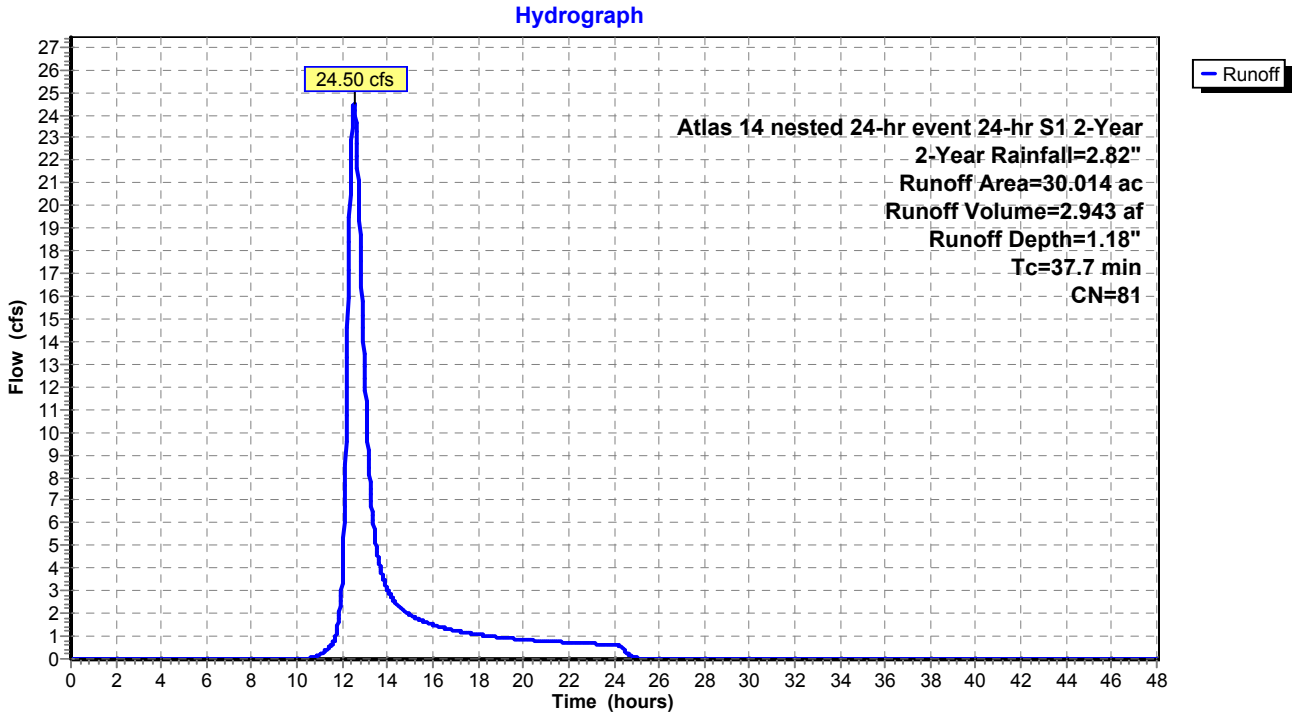
Runoff = 24.50 cfs @ 12.52 hrs, Volume= 2.943 af, Depth= 1.18"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
Atlas 14 nested 24-hr event 24-hr S1 2-Year 2-Year Rainfall=2.82"

	Area (ac)	CN	Description
*	30.014	81	
	30.014		100.00% Pervious Area

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

Subcatchment 10S: Sub-basin 10



Summary for Subcatchment 11S: Sub-basin 11

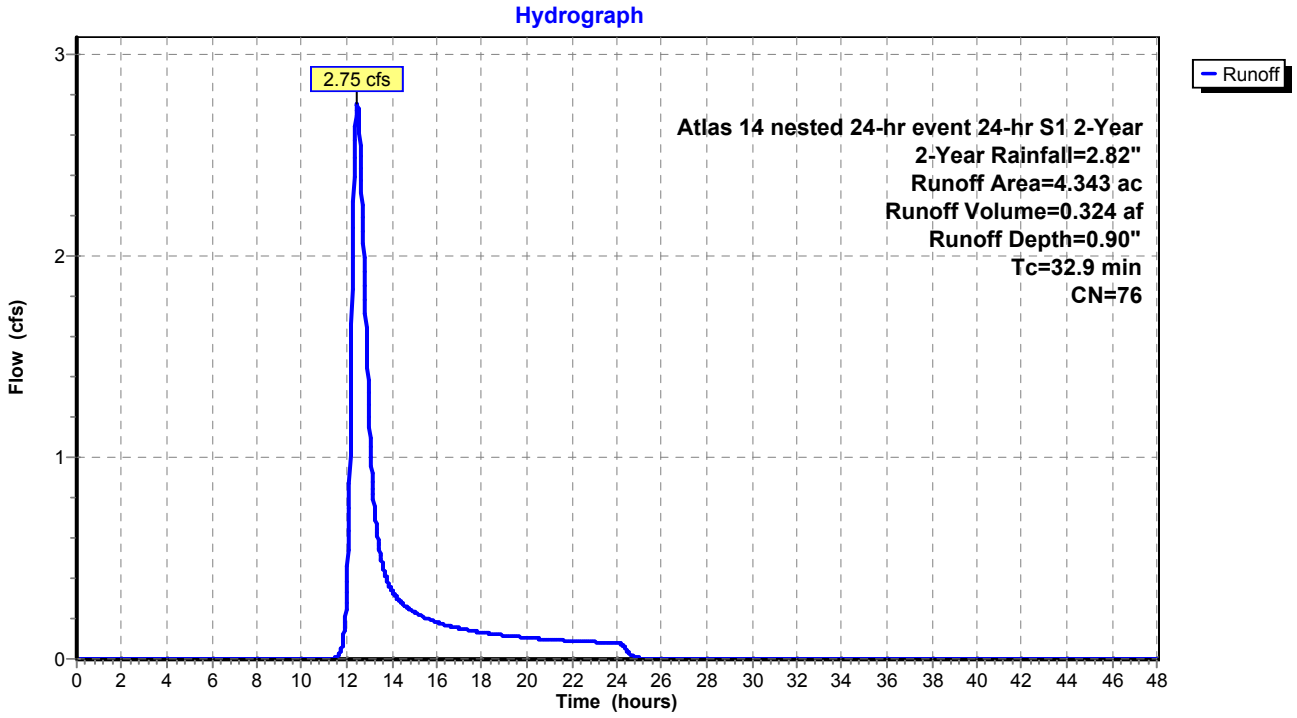
Runoff = 2.75 cfs @ 12.46 hrs, Volume= 0.324 af, Depth= 0.90"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
Atlas 14 nested 24-hr event 24-hr S1 2-Year 2-Year Rainfall=2.82"

	Area (ac)	CN	Description
*	4.343	76	
	4.343		100.00% Pervious Area

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

Subcatchment 11S: Sub-basin 11



Summary for Subcatchment 12S: Sub-basin 12

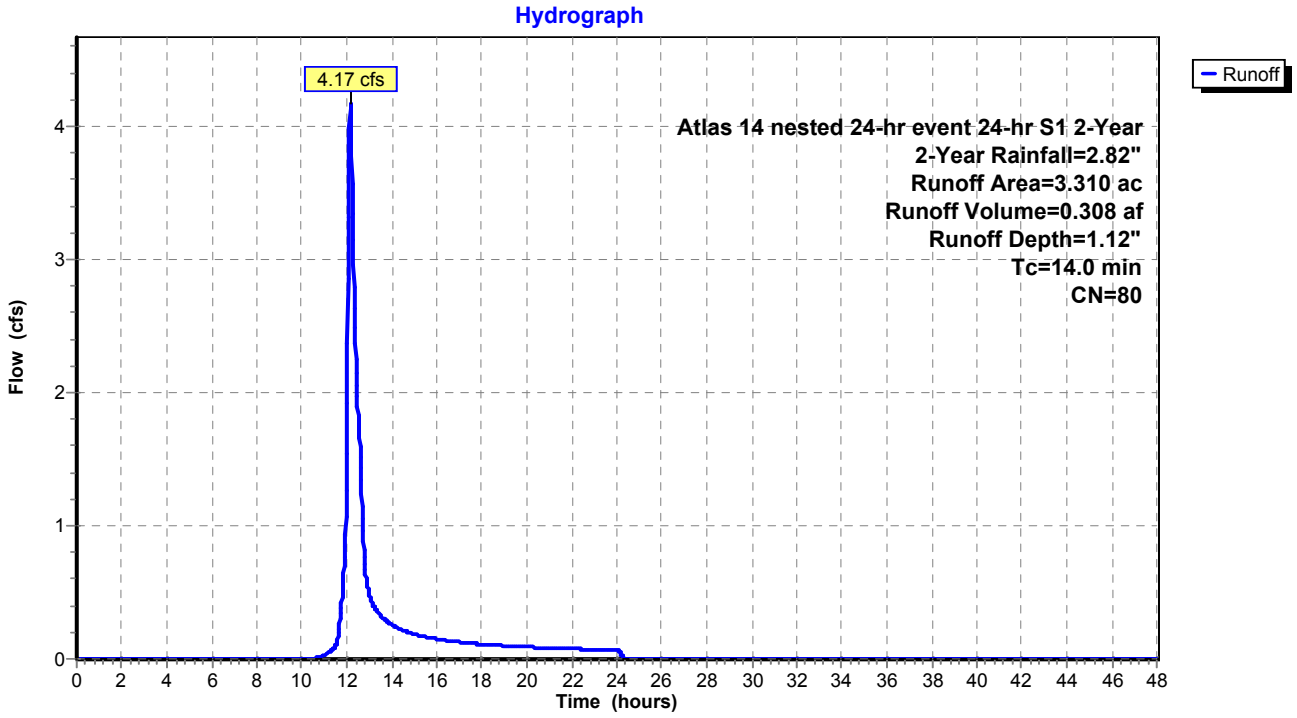
Runoff = 4.17 cfs @ 12.16 hrs, Volume= 0.308 af, Depth= 1.12"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
Atlas 14 nested 24-hr event 24-hr S1 2-Year 2-Year Rainfall=2.82"

	Area (ac)	CN	Description
*	3.310	80	
	3.310		100.00% Pervious Area

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

Subcatchment 12S: Sub-basin 12



Summary for Subcatchment 13S: Sub-basin 13

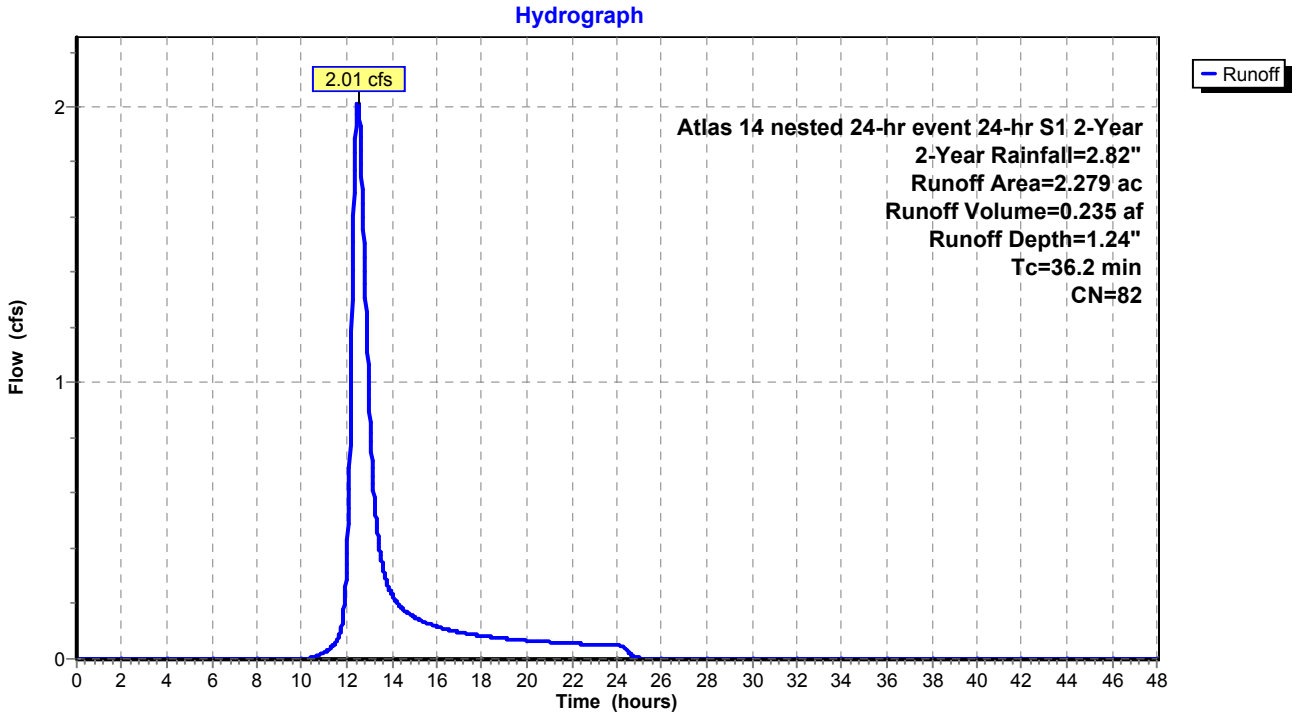
Runoff = 2.01 cfs @ 12.49 hrs, Volume= 0.235 af, Depth= 1.24"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
Atlas 14 nested 24-hr event 24-hr S1 2-Year 2-Year Rainfall=2.82"

	Area (ac)	CN	Description
*	2.279	82	
	2.279		100.00% Pervious Area

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

Subcatchment 13S: Sub-basin 13



Summary for Subcatchment 14S: Sub-basin 14

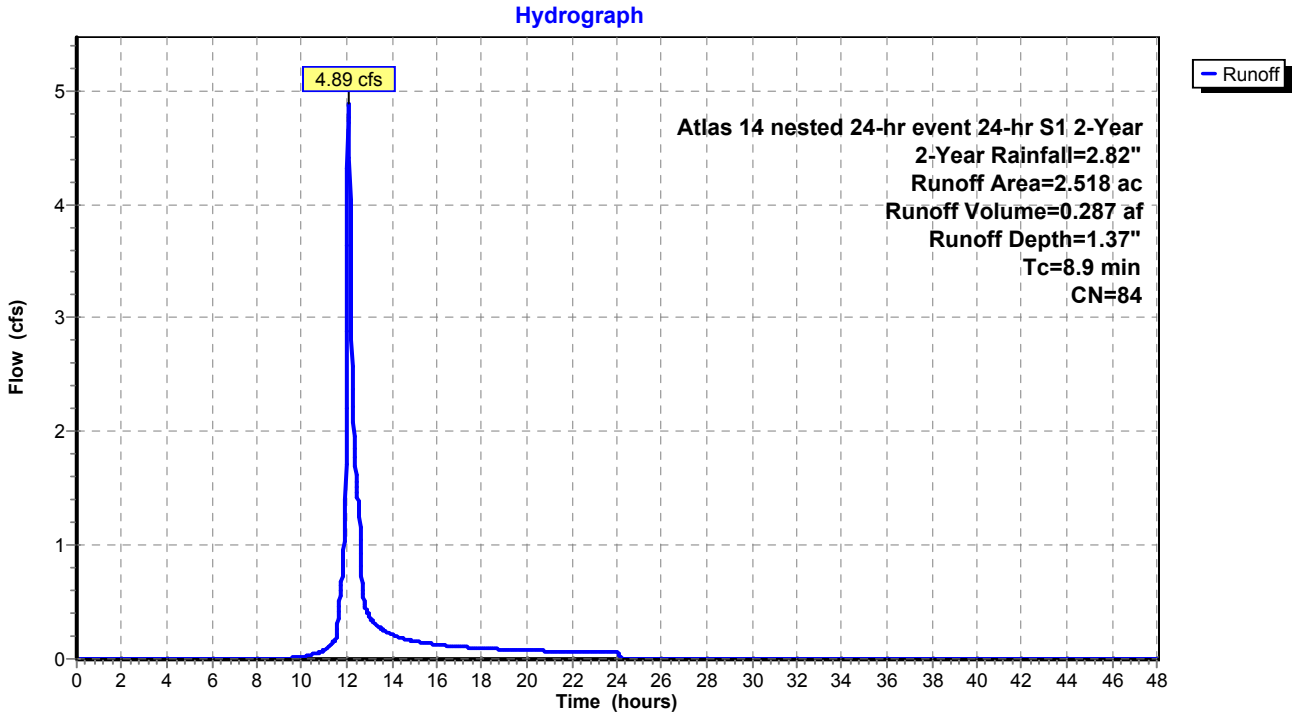
Runoff = 4.89 cfs @ 12.08 hrs, Volume= 0.287 af, Depth= 1.37"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
Atlas 14 nested 24-hr event 24-hr S1 2-Year 2-Year Rainfall=2.82"

	Area (ac)	CN	Description
*	2.518	84	
	2.518		100.00% Pervious Area

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

Subcatchment 14S: Sub-basin 14



Summary for Subcatchment 15S: Sub-basin 15

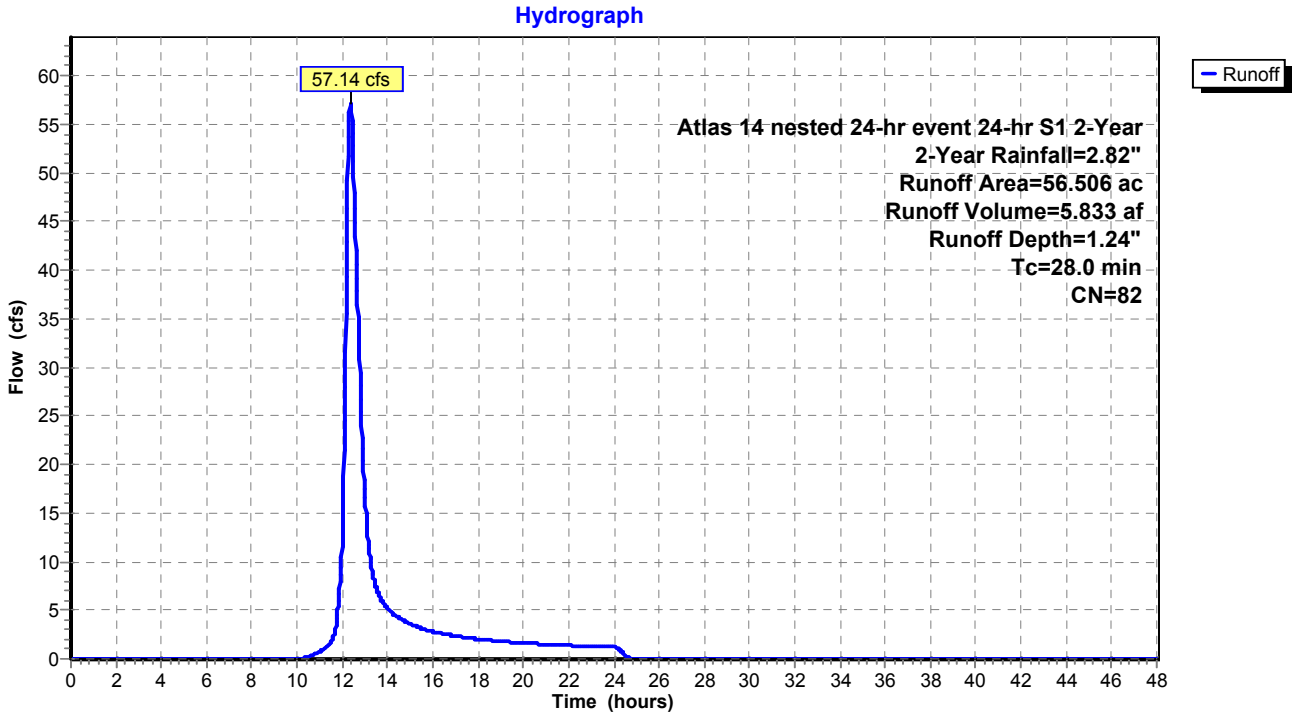
Runoff = 57.14 cfs @ 12.36 hrs, Volume= 5.833 af, Depth= 1.24"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
Atlas 14 nested 24-hr event 24-hr S1 2-Year 2-Year Rainfall=2.82"

	Area (ac)	CN	Description
*	56.506	82	
	56.506		100.00% Pervious Area

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

Subcatchment 15S: Sub-basin 15



Summary for Subcatchment 16S: Sub-basin 16

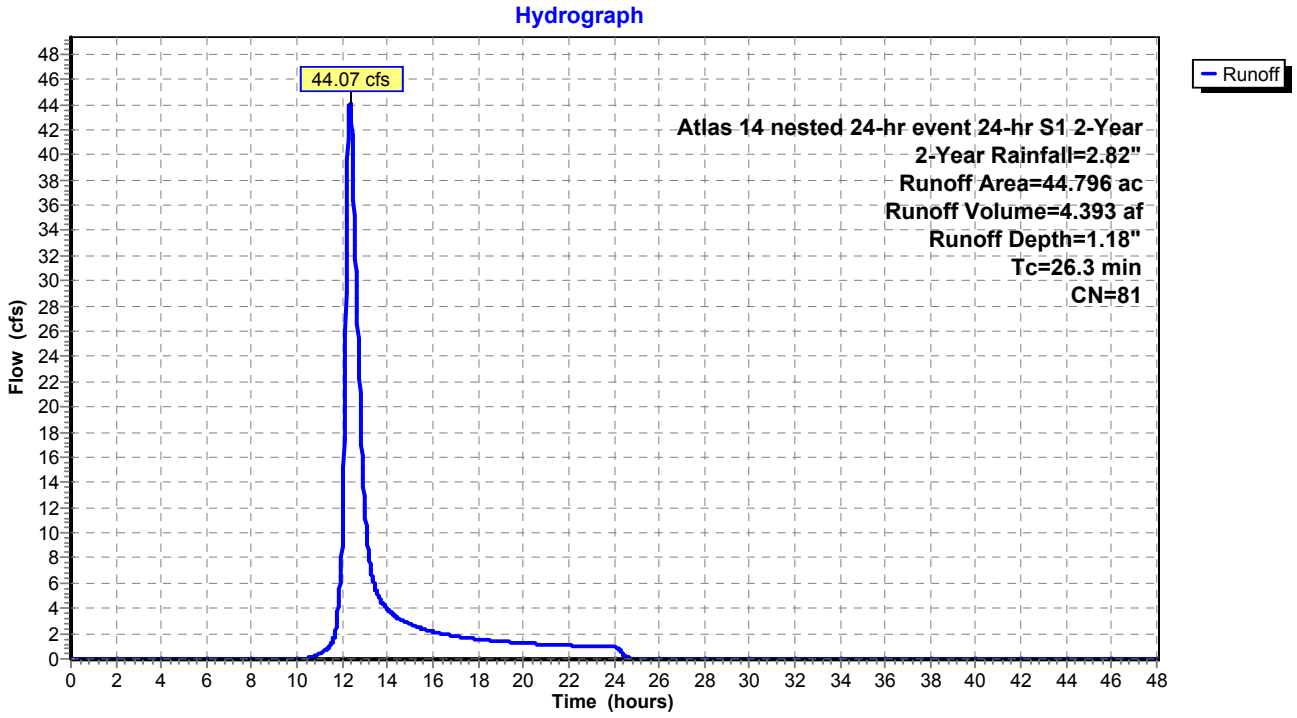
Runoff = 44.07 cfs @ 12.34 hrs, Volume= 4.393 af, Depth= 1.18"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
Atlas 14 nested 24-hr event 24-hr S1 2-Year 2-Year Rainfall=2.82"

	Area (ac)	CN	Description
*	44.796	81	
	44.796		100.00% Pervious Area

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

Subcatchment 16S: Sub-basin 16



Summary for Subcatchment 17S: Sub-basin 17

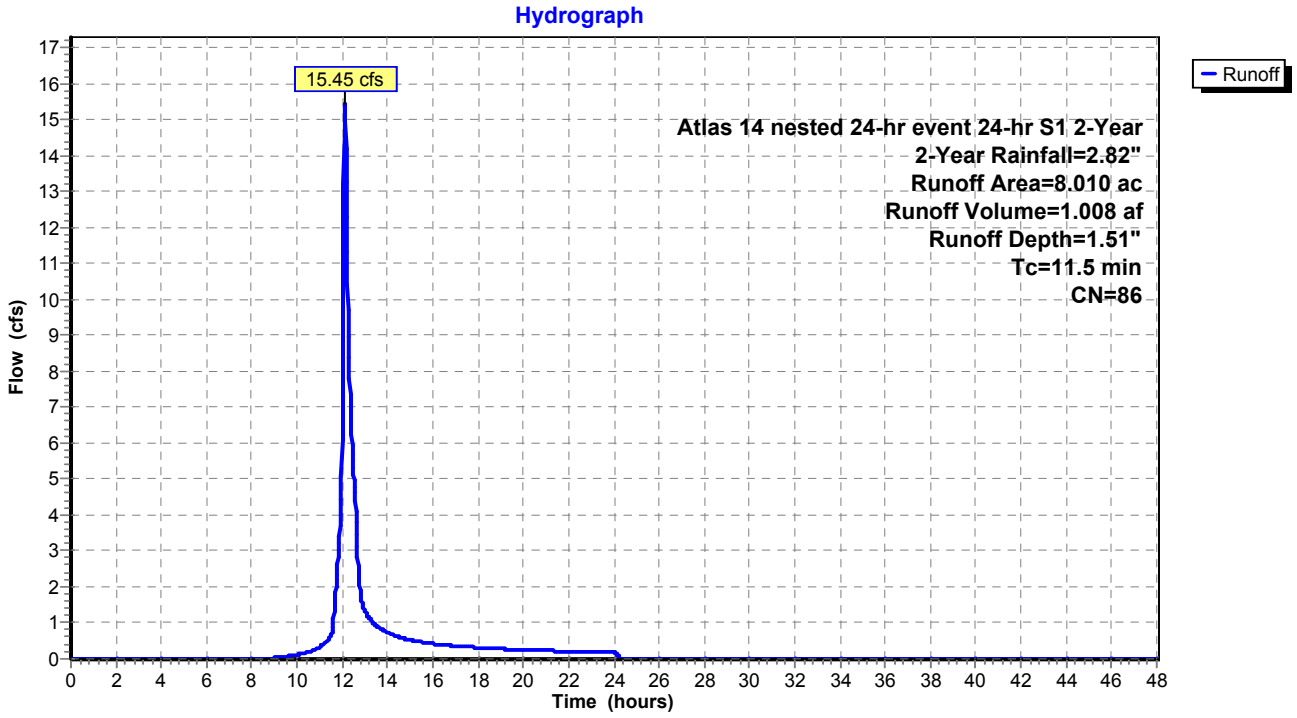
Runoff = 15.45 cfs @ 12.11 hrs, Volume= 1.008 af, Depth= 1.51"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
Atlas 14 nested 24-hr event 24-hr S1 2-Year 2-Year Rainfall=2.82"

	Area (ac)	CN	Description
*	8.010	86	
	8.010		100.00% Pervious Area

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

Subcatchment 17S: Sub-basin 17



Summary for Subcatchment 18S: Sub-basin 18

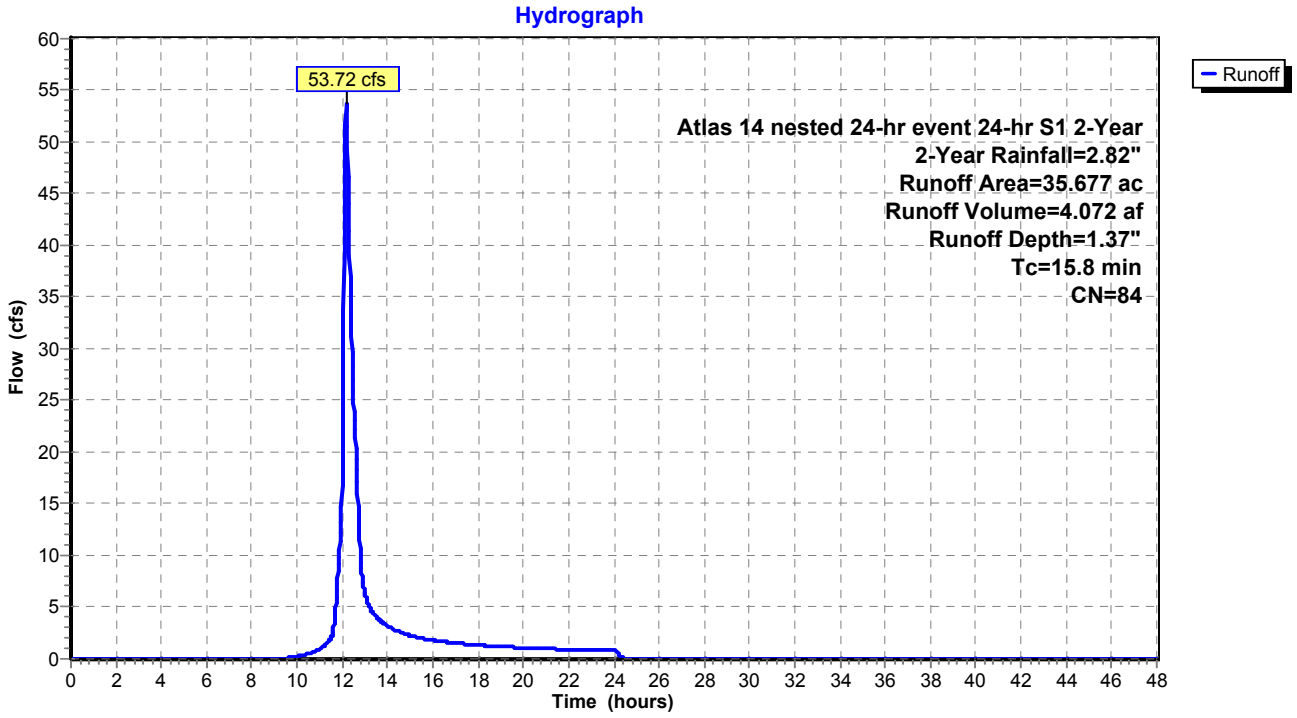
Runoff = 53.72 cfs @ 12.18 hrs, Volume= 4.072 af, Depth= 1.37"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
Atlas 14 nested 24-hr event 24-hr S1 2-Year 2-Year Rainfall=2.82"

	Area (ac)	CN	Description
*	35.677	84	
	35.677		100.00% Pervious Area

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

Subcatchment 18S: Sub-basin 18



Summary for Subcatchment 19S: Sub-basin 19

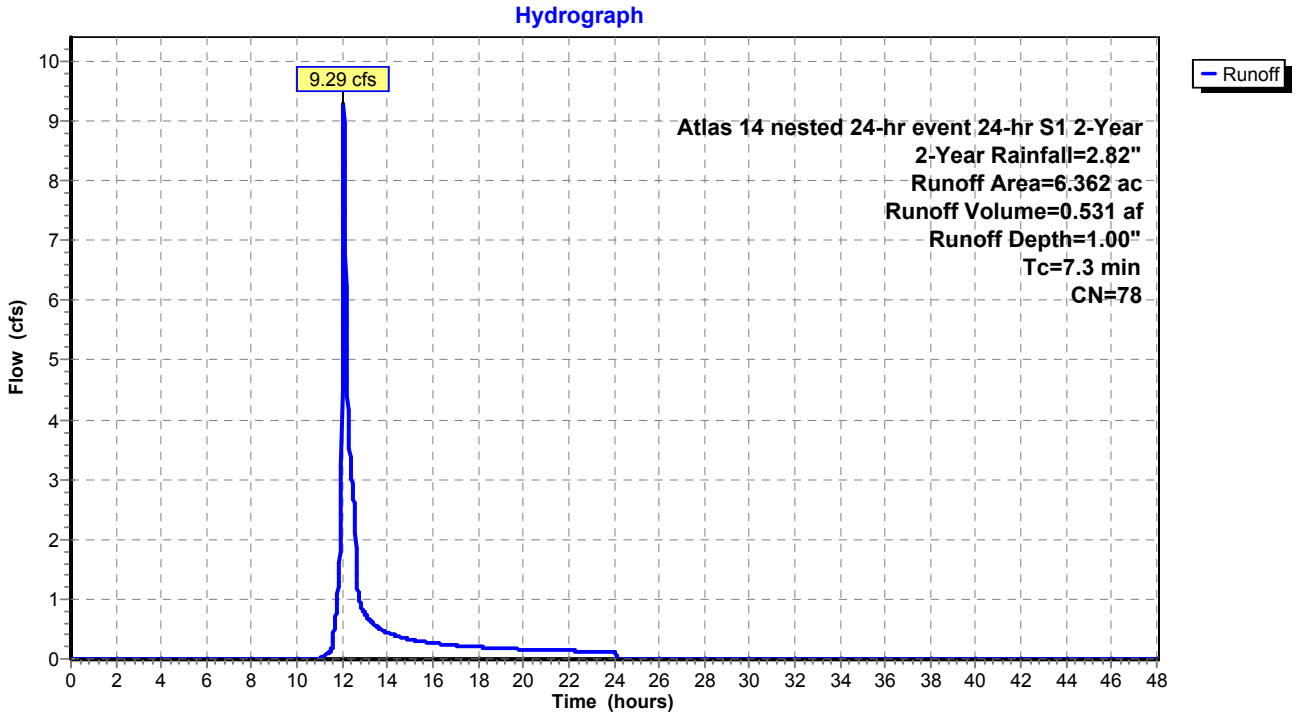
Runoff = 9.29 cfs @ 12.06 hrs, Volume= 0.531 af, Depth= 1.00"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
Atlas 14 nested 24-hr event 24-hr S1 2-Year 2-Year Rainfall=2.82"

	Area (ac)	CN	Description
*	6.362	78	
	6.362		100.00% Pervious Area

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

Subcatchment 19S: Sub-basin 19



Summary for Subcatchment 20S: Sub-basin 20

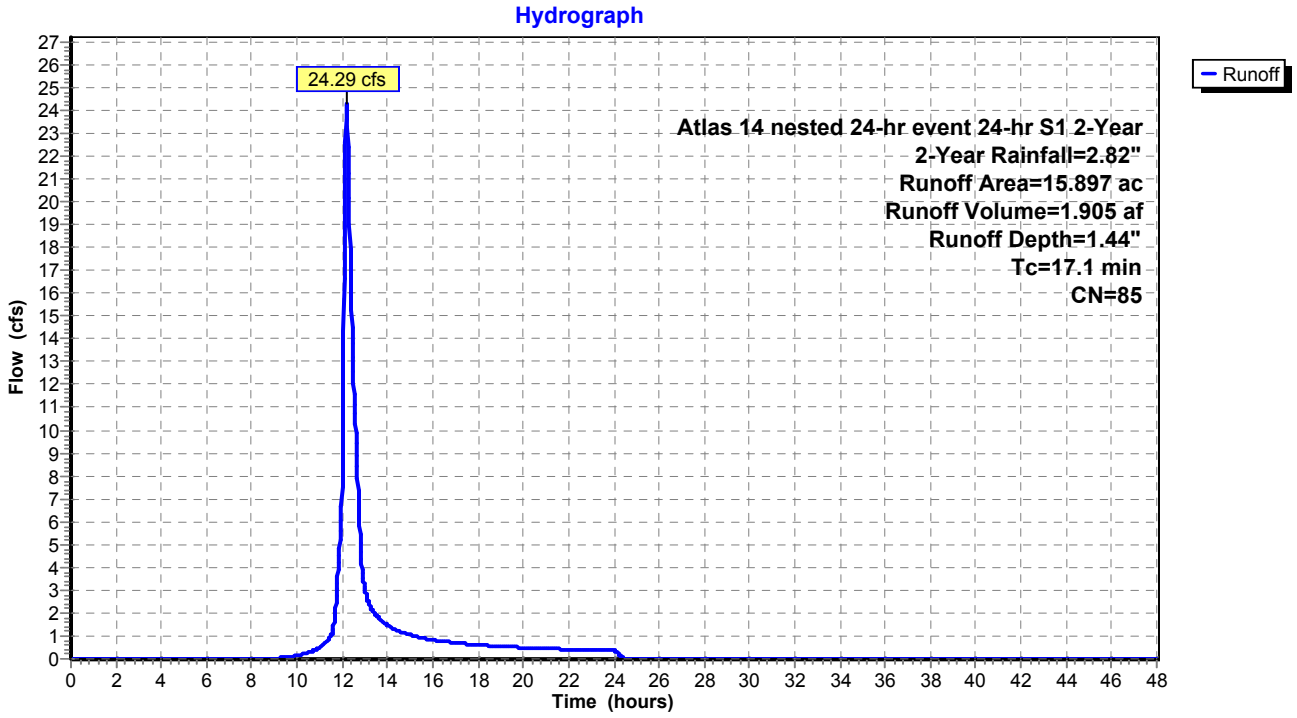
Runoff = 24.29 cfs @ 12.19 hrs, Volume= 1.905 af, Depth= 1.44"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
Atlas 14 nested 24-hr event 24-hr S1 2-Year 2-Year Rainfall=2.82"

	Area (ac)	CN	Description
*	15.897	85	
	15.897		100.00% Pervious Area

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

Subcatchment 20S: Sub-basin 20



Summary for Subcatchment 21S: Sub-basin 21

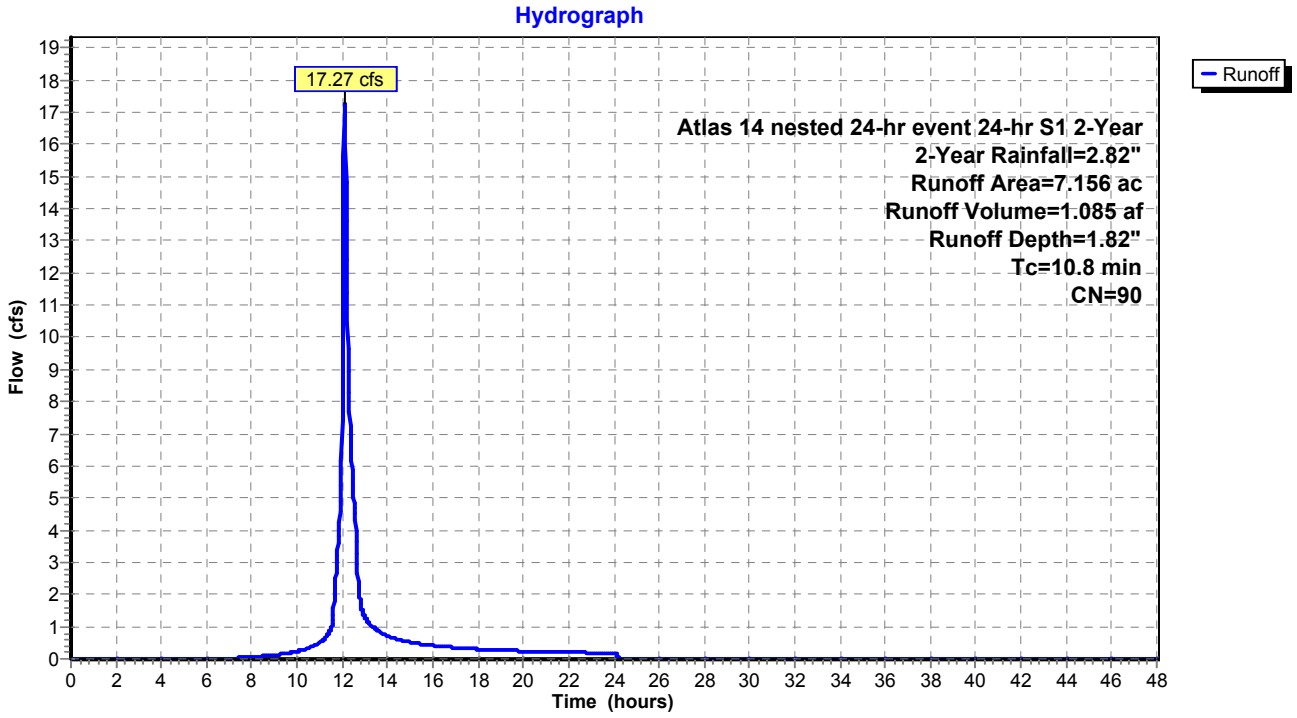
Runoff = 17.27 cfs @ 12.10 hrs, Volume= 1.085 af, Depth= 1.82"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
Atlas 14 nested 24-hr event 24-hr S1 2-Year 2-Year Rainfall=2.82"

	Area (ac)	CN	Description
*	7.156	90	
	7.156		100.00% Pervious Area

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

Subcatchment 21S: Sub-basin 21



Summary for Subcatchment 22S: Sub-basin 22

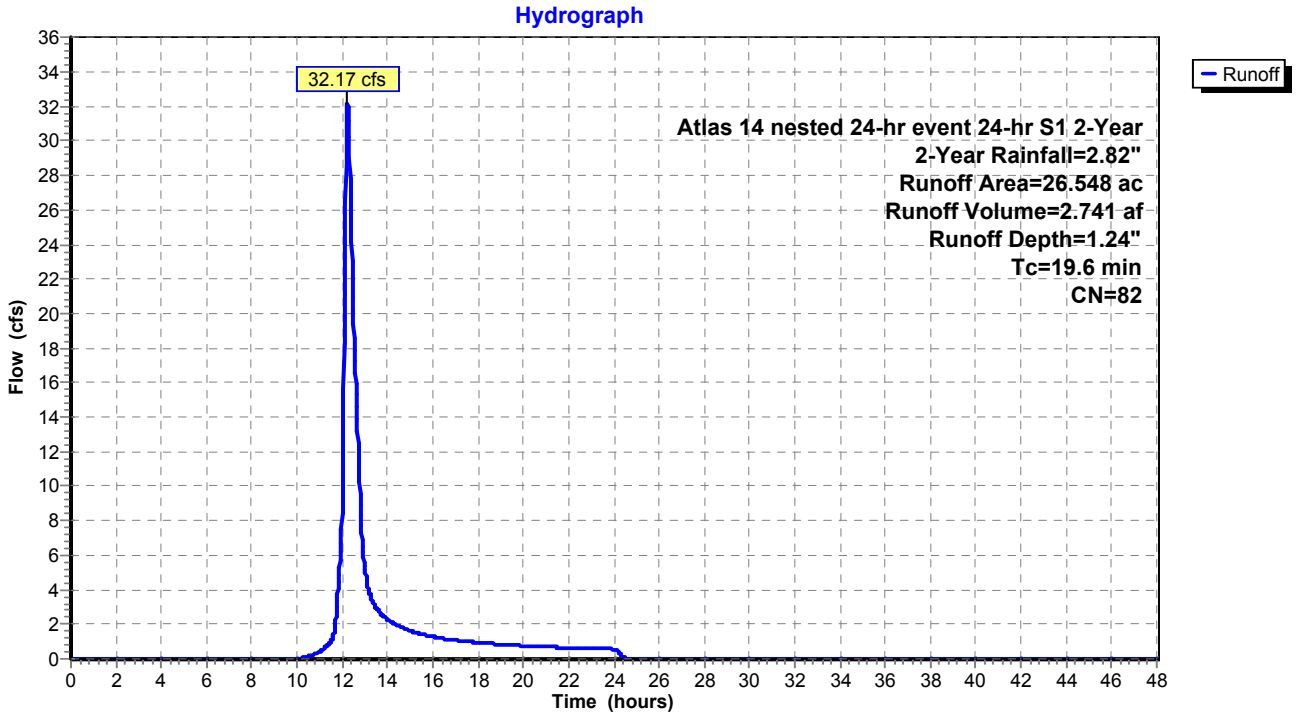
Runoff = 32.17 cfs @ 12.24 hrs, Volume= 2.741 af, Depth= 1.24"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
Atlas 14 nested 24-hr event 24-hr S1 2-Year 2-Year Rainfall=2.82"

	Area (ac)	CN	Description
*	26.548	82	
	26.548		100.00% Pervious Area

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

Subcatchment 22S: Sub-basin 22



Summary for Subcatchment 23S: Sub-basin 23

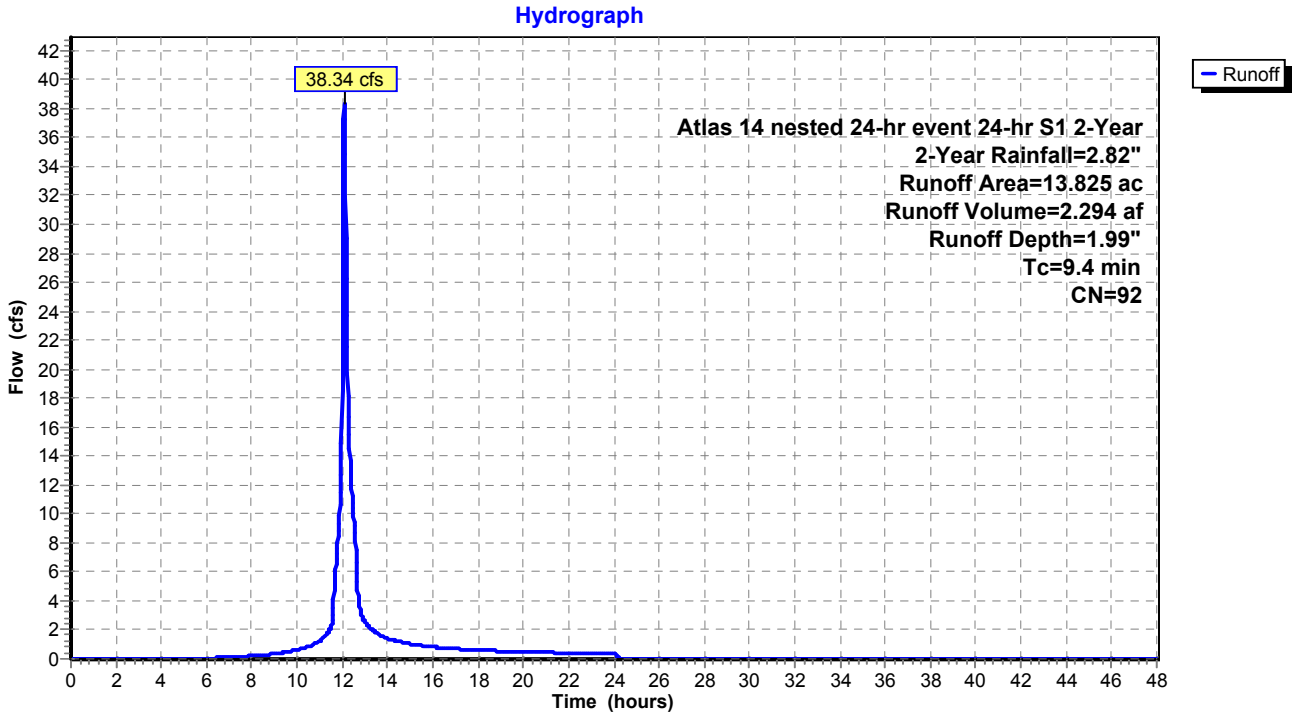
Runoff = 38.34 cfs @ 12.08 hrs, Volume= 2.294 af, Depth= 1.99"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
Atlas 14 nested 24-hr event 24-hr S1 2-Year 2-Year Rainfall=2.82"

	Area (ac)	CN	Description
*	13.825	92	
	13.825		100.00% Pervious Area

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

Subcatchment 23S: Sub-basin 23



Summary for Subcatchment 24S: Sub-basin 24

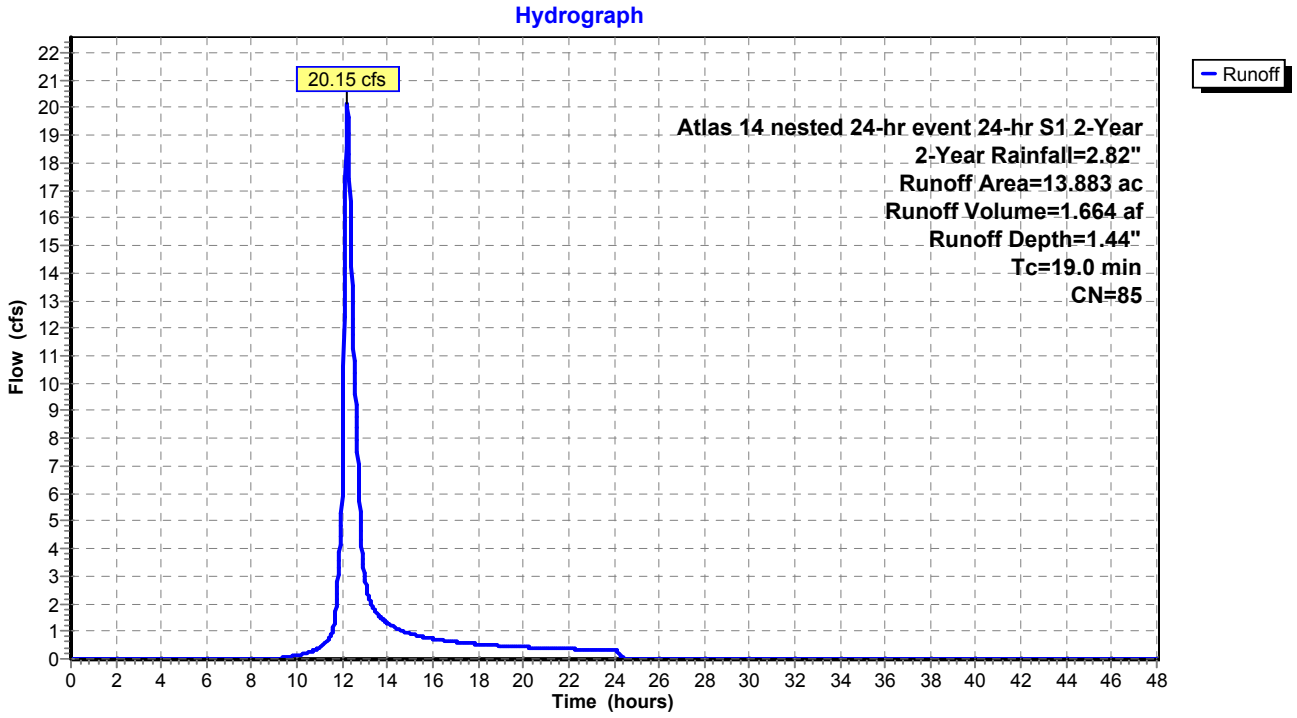
Runoff = 20.15 cfs @ 12.22 hrs, Volume= 1.664 af, Depth= 1.44"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
Atlas 14 nested 24-hr event 24-hr S1 2-Year 2-Year Rainfall=2.82"

	Area (ac)	CN	Description
*	13.883	85	
	13.883		100.00% Pervious Area

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

Subcatchment 24S: Sub-basin 24



Summary for Subcatchment 25S: Sub-basin 25

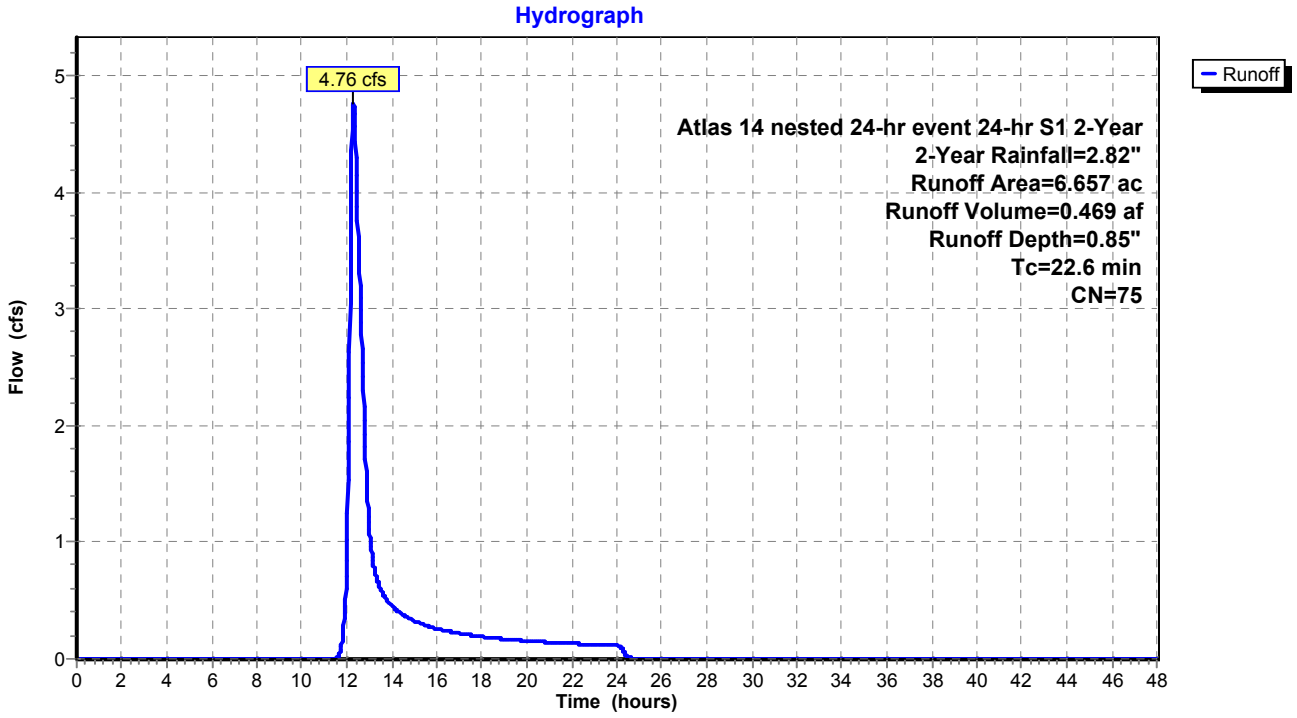
Runoff = 4.76 cfs @ 12.30 hrs, Volume= 0.469 af, Depth= 0.85"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
Atlas 14 nested 24-hr event 24-hr S1 2-Year 2-Year Rainfall=2.82"

	Area (ac)	CN	Description
*	6.657	75	
	6.657		100.00% Pervious Area

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

Subcatchment 25S: Sub-basin 25



Summary for Subcatchment 26S: Sub-basin 26

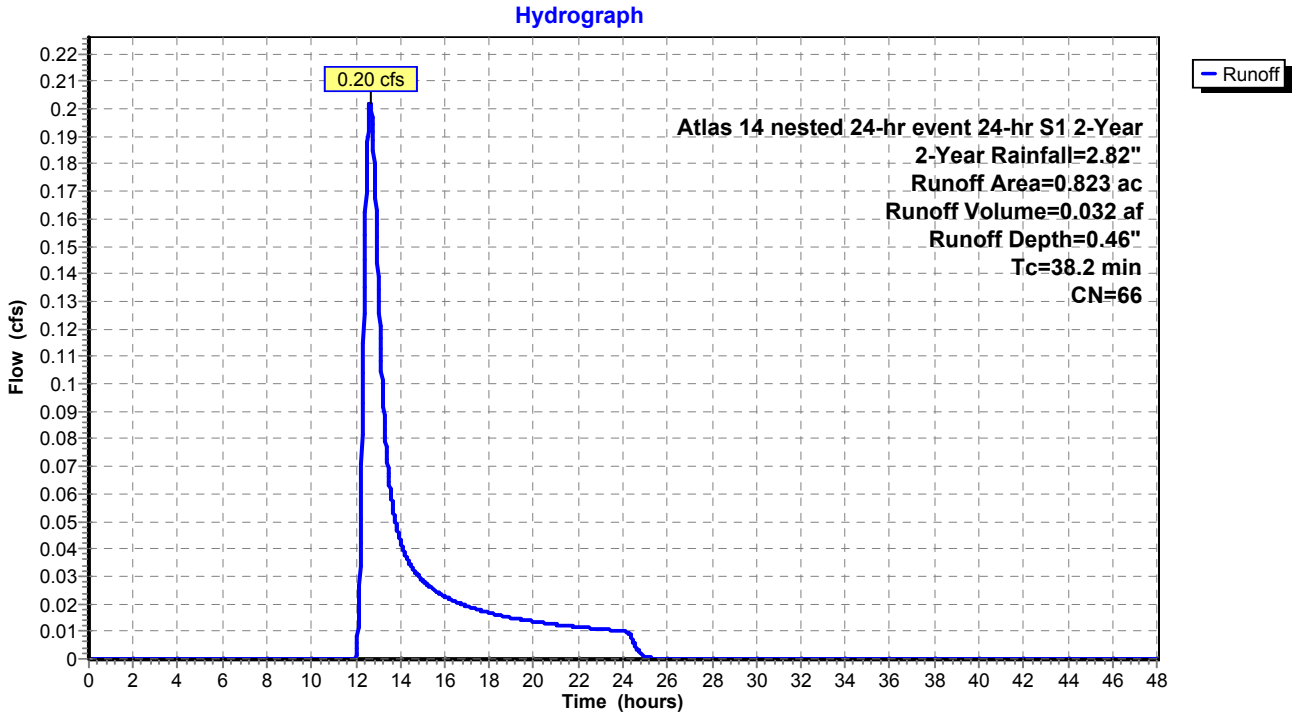
Runoff = 0.20 cfs @ 12.64 hrs, Volume= 0.032 af, Depth= 0.46"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
Atlas 14 nested 24-hr event 24-hr S1 2-Year 2-Year Rainfall=2.82"

	Area (ac)	CN	Description
*	0.823	66	
	0.823		100.00% Pervious Area

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

Subcatchment 26S: Sub-basin 26



Summary for Subcatchment 27S: Sub-basin 27

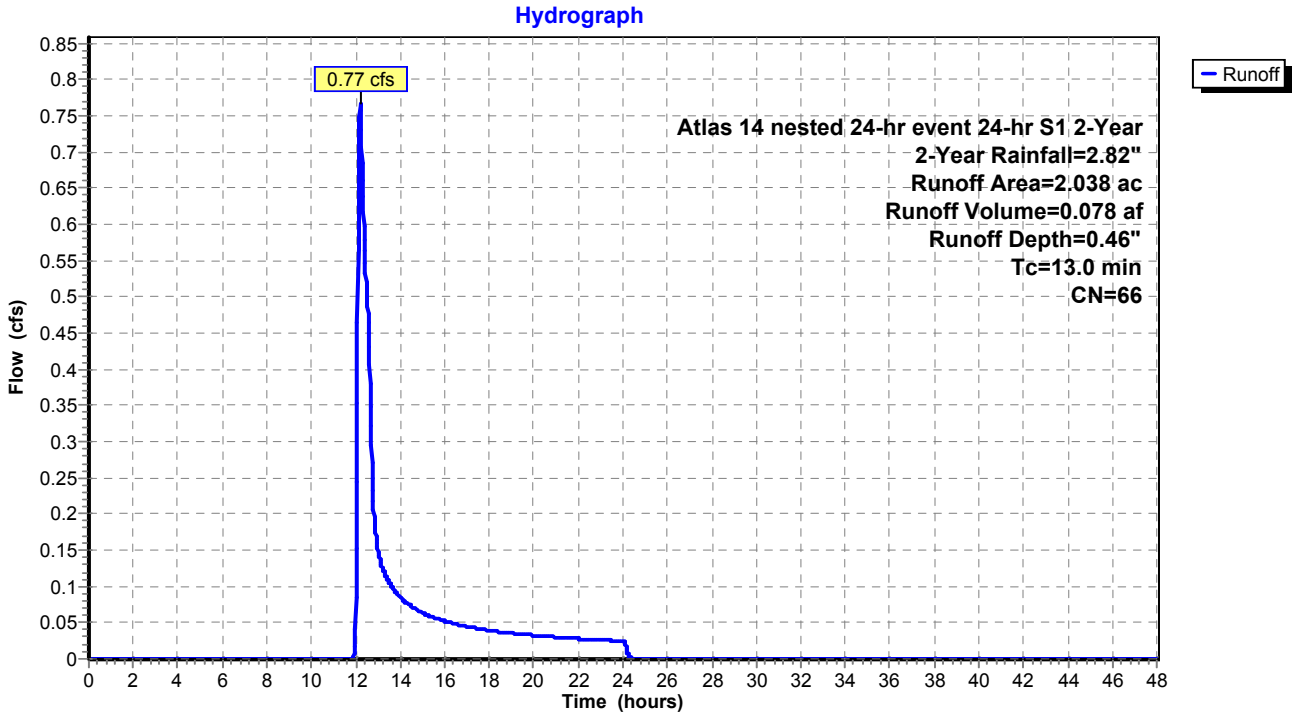
Runoff = 0.77 cfs @ 12.19 hrs, Volume= 0.078 af, Depth= 0.46"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
Atlas 14 nested 24-hr event 24-hr S1 2-Year 2-Year Rainfall=2.82"

	Area (ac)	CN	Description
*	2.038	66	
	2.038		100.00% Pervious Area

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

Subcatchment 27S: Sub-basin 27



Summary for Subcatchment 28S: Sub-basin 28

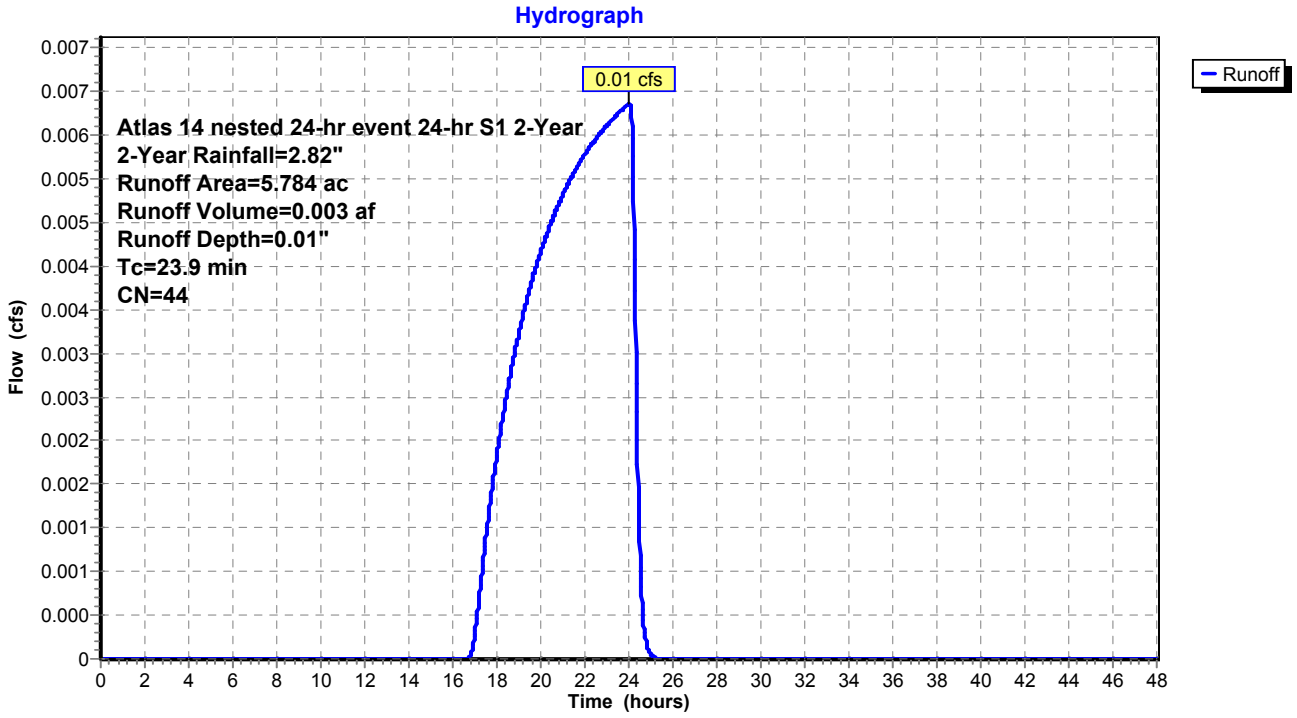
Runoff = 0.01 cfs @ 24.03 hrs, Volume= 0.003 af, Depth= 0.01"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
Atlas 14 nested 24-hr event 24-hr S1 2-Year 2-Year Rainfall=2.82"

	Area (ac)	CN	Description
*	5.784	44	
	5.784		100.00% Pervious Area

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

Subcatchment 28S: Sub-basin 28



Summary for Subcatchment 29S: Sub-basin 29

[45] Hint: Runoff=Zero

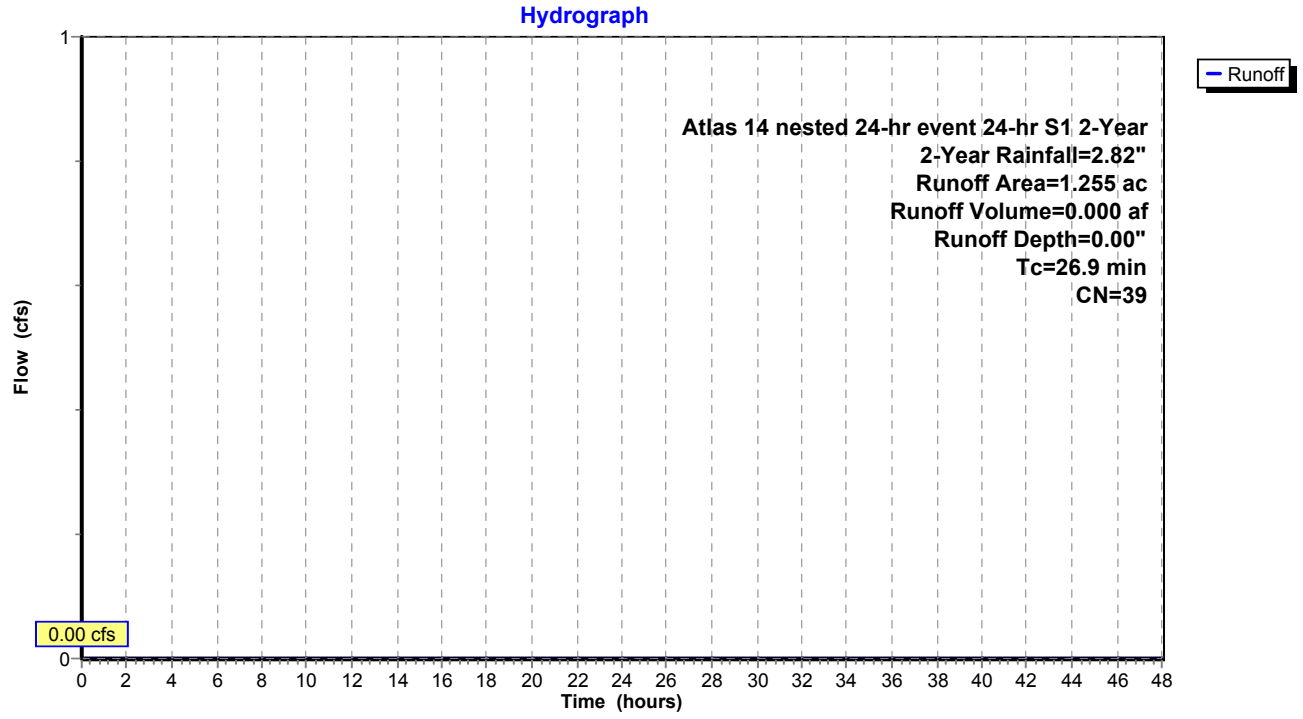
Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
Atlas 14 nested 24-hr event 24-hr S1 2-Year 2-Year Rainfall=2.82"

	Area (ac)	CN	Description
*	1.255	39	
	1.255		100.00% Pervious Area

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

Subcatchment 29S: Sub-basin 29



Summary for Subcatchment 30S: Sub-basin 30

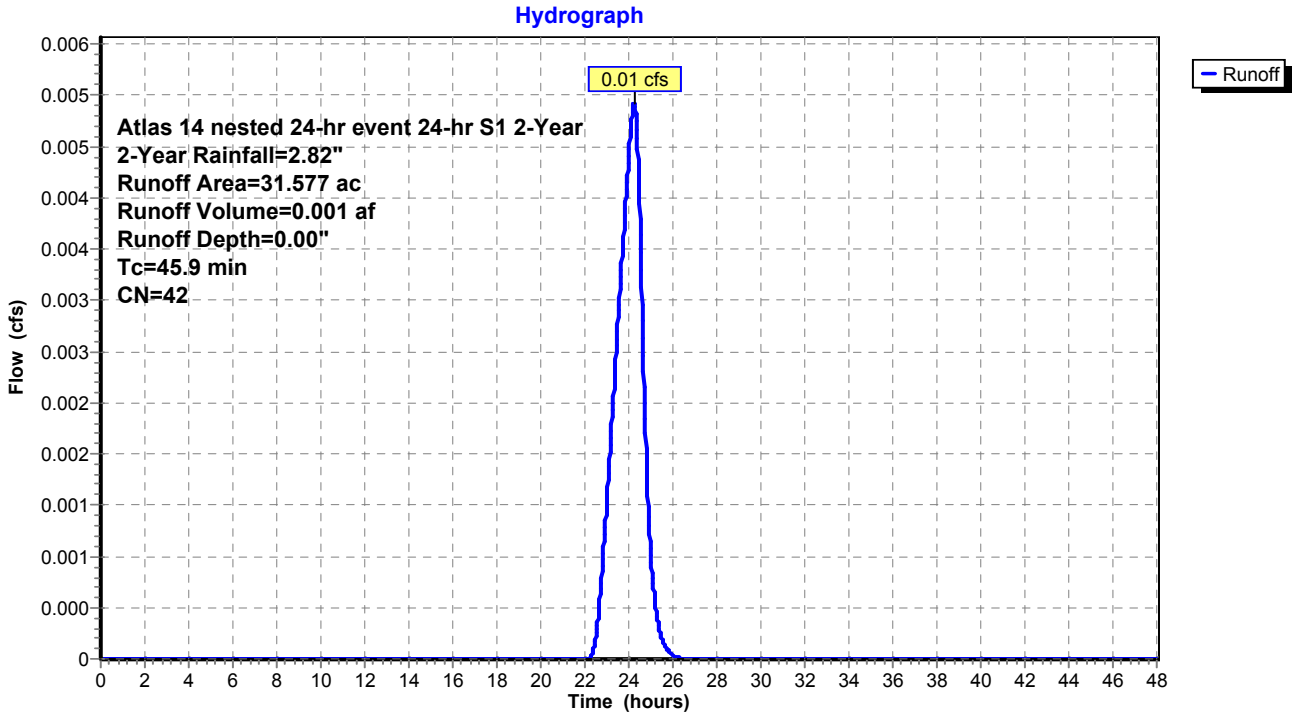
Runoff = 0.01 cfs @ 24.23 hrs, Volume= 0.001 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
Atlas 14 nested 24-hr event 24-hr S1 2-Year 2-Year Rainfall=2.82"

	Area (ac)	CN	Description
*	31.577	42	
	31.577		100.00% Pervious Area

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

Subcatchment 30S: Sub-basin 30



Summary for Subcatchment 31S: Sub-basin 31

[45] Hint: Runoff=Zero

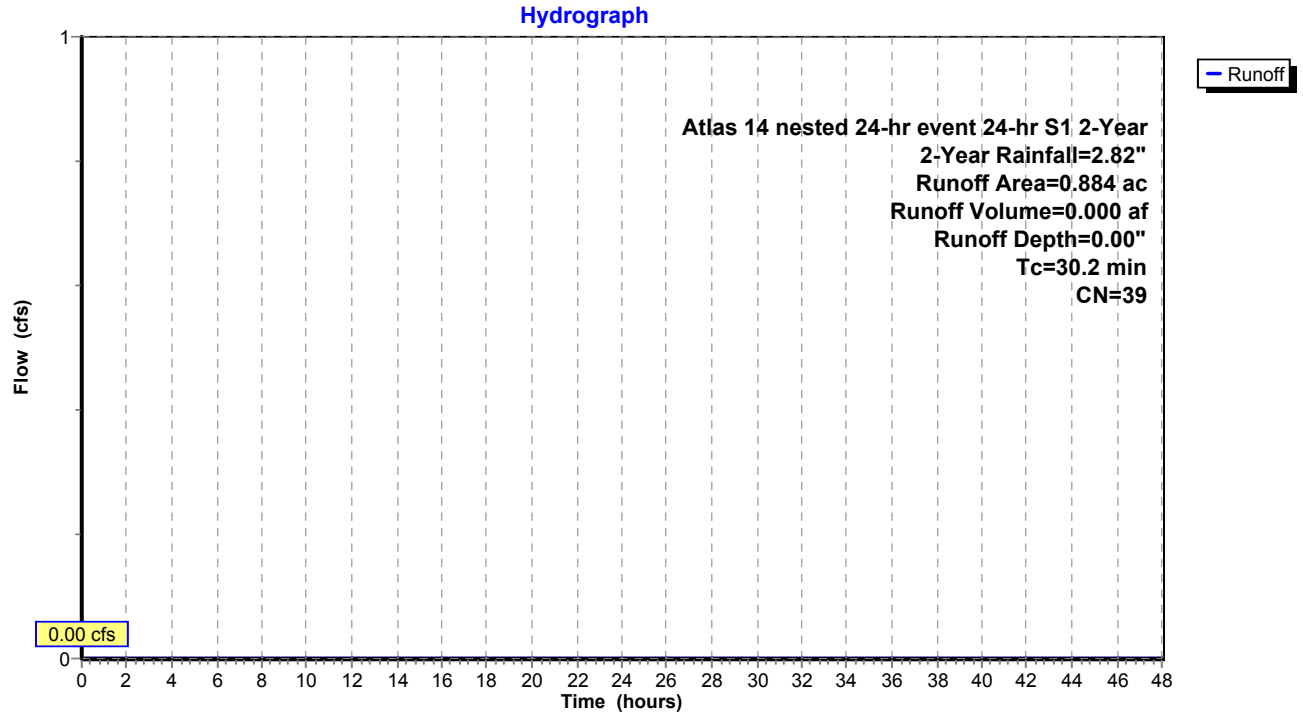
Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
Atlas 14 nested 24-hr event 24-hr S1 2-Year 2-Year Rainfall=2.82"

	Area (ac)	CN	Description
*	0.884	39	
	0.884		100.00% Pervious Area

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

Subcatchment 31S: Sub-basin 31



Summary for Subcatchment 32S: Sub-basin 32

[45] Hint: Runoff=Zero

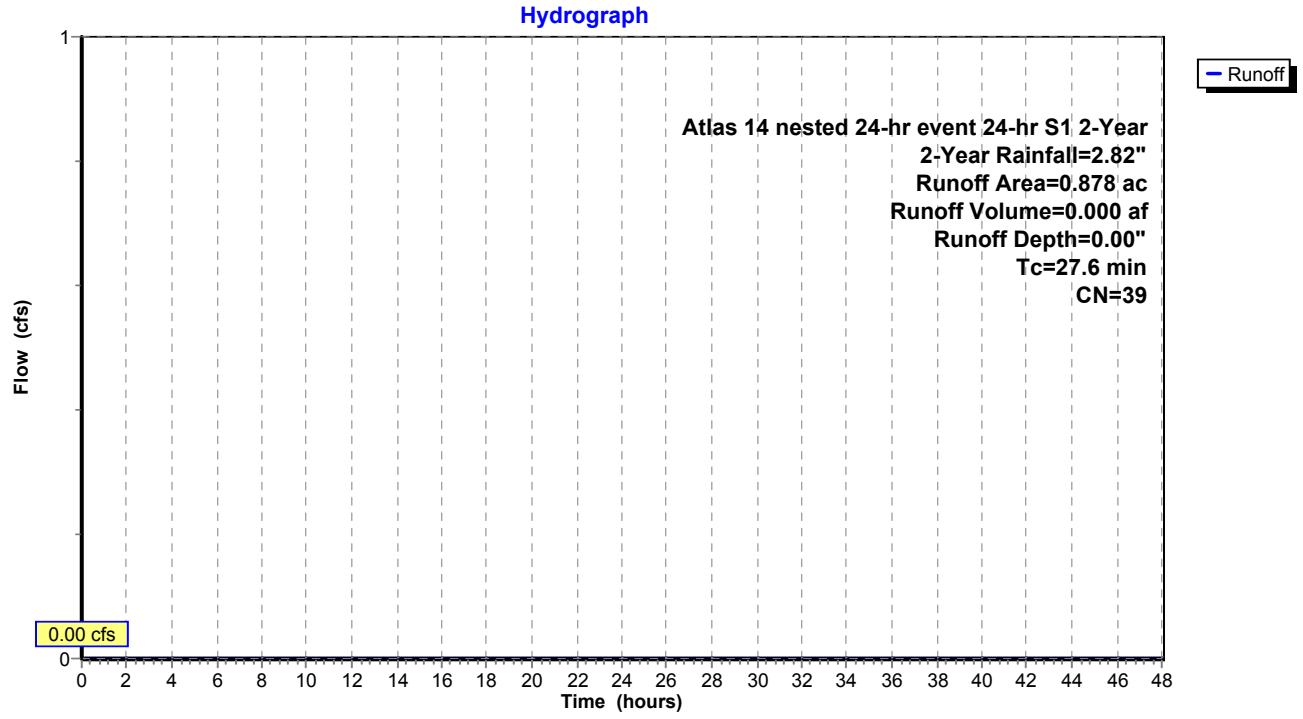
Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
Atlas 14 nested 24-hr event 24-hr S1 2-Year 2-Year Rainfall=2.82"

	Area (ac)	CN	Description
*	0.878	39	
	0.878		100.00% Pervious Area

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

Subcatchment 32S: Sub-basin 32



Summary for Subcatchment 33S: Sub-basin 33

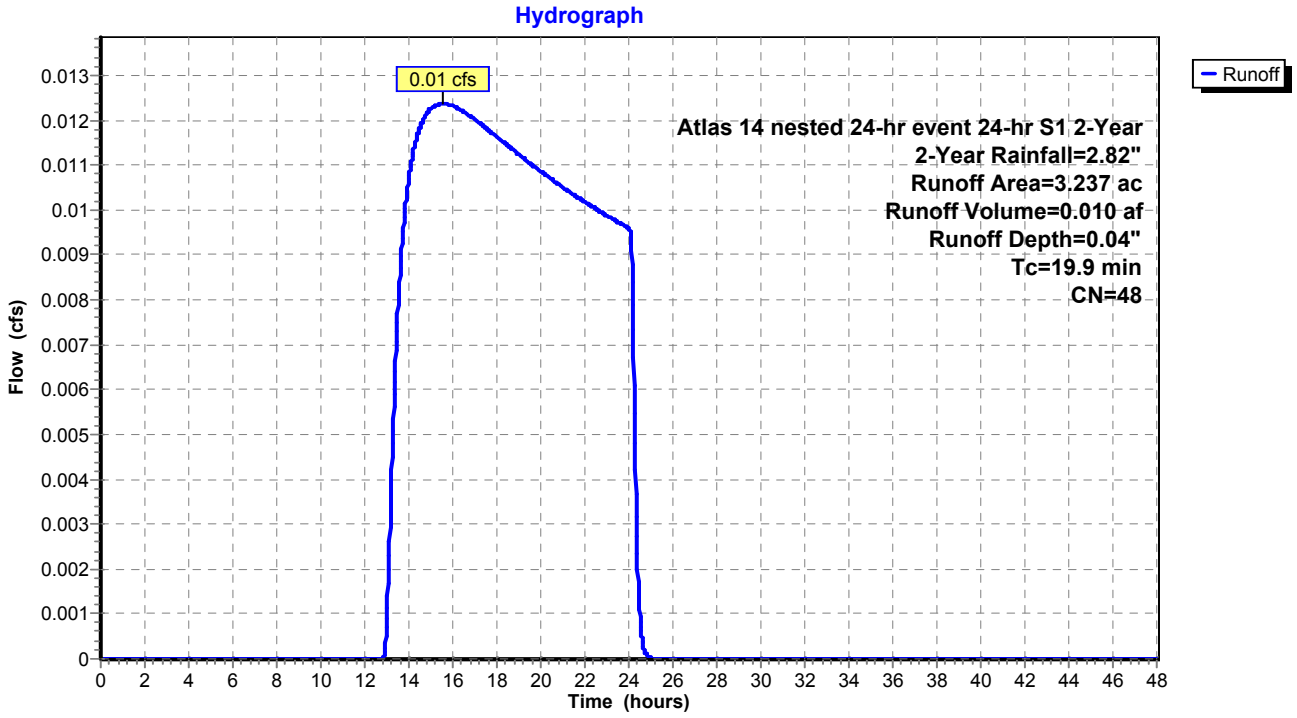
Runoff = 0.01 cfs @ 15.50 hrs, Volume= 0.010 af, Depth= 0.04"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
Atlas 14 nested 24-hr event 24-hr S1 2-Year 2-Year Rainfall=2.82"

	Area (ac)	CN	Description
*	3.237	48	
	3.237		100.00% Pervious Area

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

Subcatchment 33S: Sub-basin 33



Summary for Subcatchment 34S: Sub-basin 34

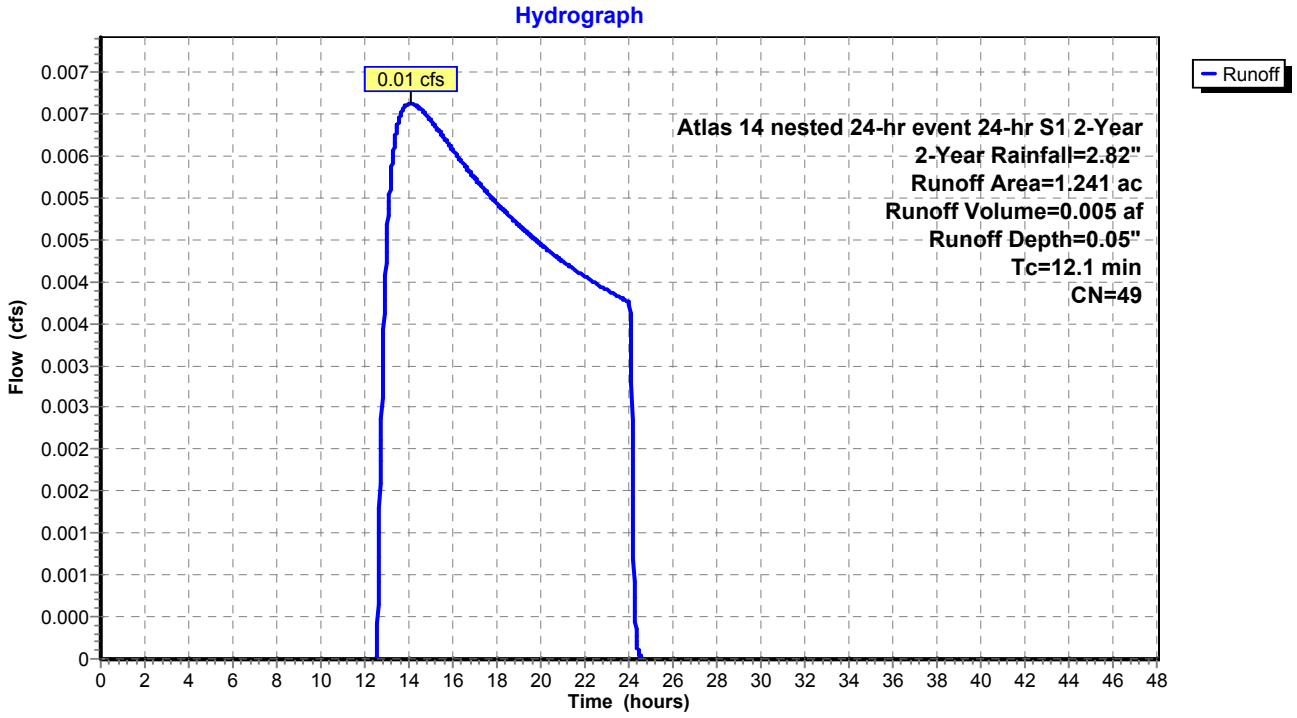
Runoff = 0.01 cfs @ 14.09 hrs, Volume= 0.005 af, Depth= 0.05"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
Atlas 14 nested 24-hr event 24-hr S1 2-Year 2-Year Rainfall=2.82"

	Area (ac)	CN	Description
*	1.241	49	
	1.241		100.00% Pervious Area

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

Subcatchment 34S: Sub-basin 34



Summary for Subcatchment 35S: Sub-basin 35

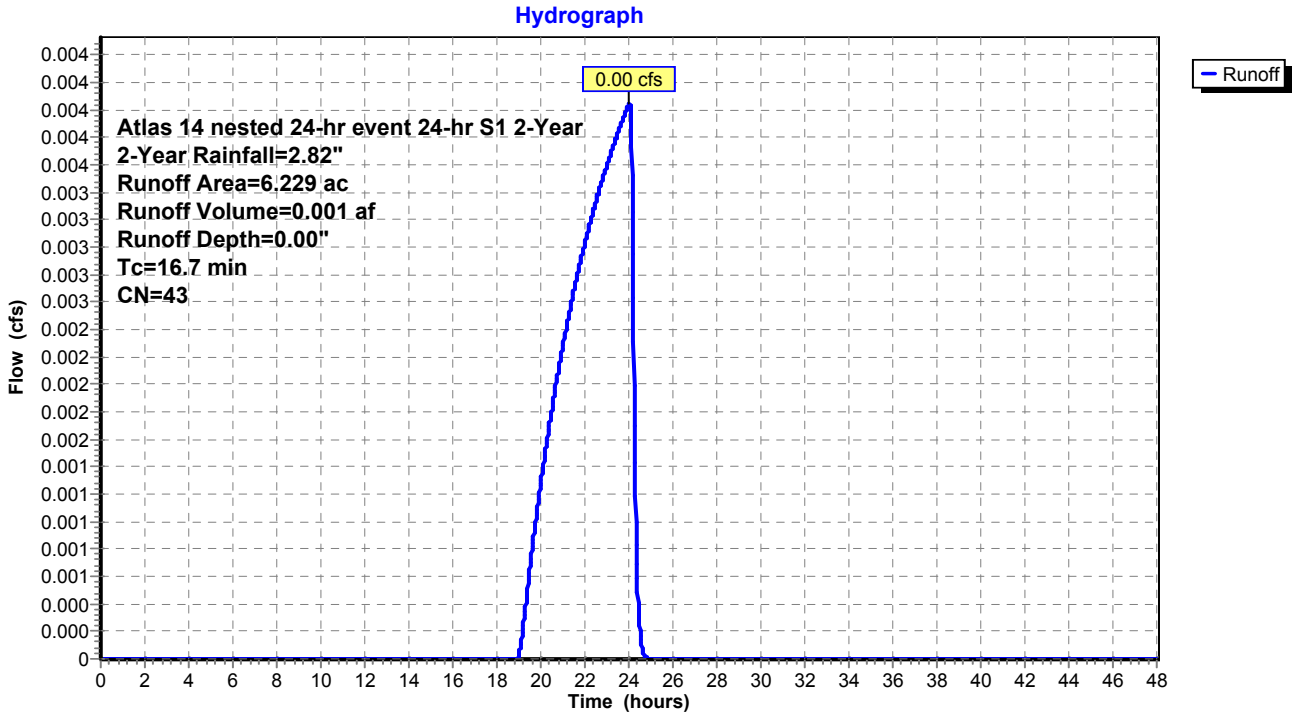
Runoff = 0.00 cfs @ 24.02 hrs, Volume= 0.001 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
Atlas 14 nested 24-hr event 24-hr S1 2-Year 2-Year Rainfall=2.82"

	Area (ac)	CN	Description
*	6.229	43	
	6.229		100.00% Pervious Area

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

Subcatchment 35S: Sub-basin 35



Summary for Subcatchment 36S: Sub-basin 36

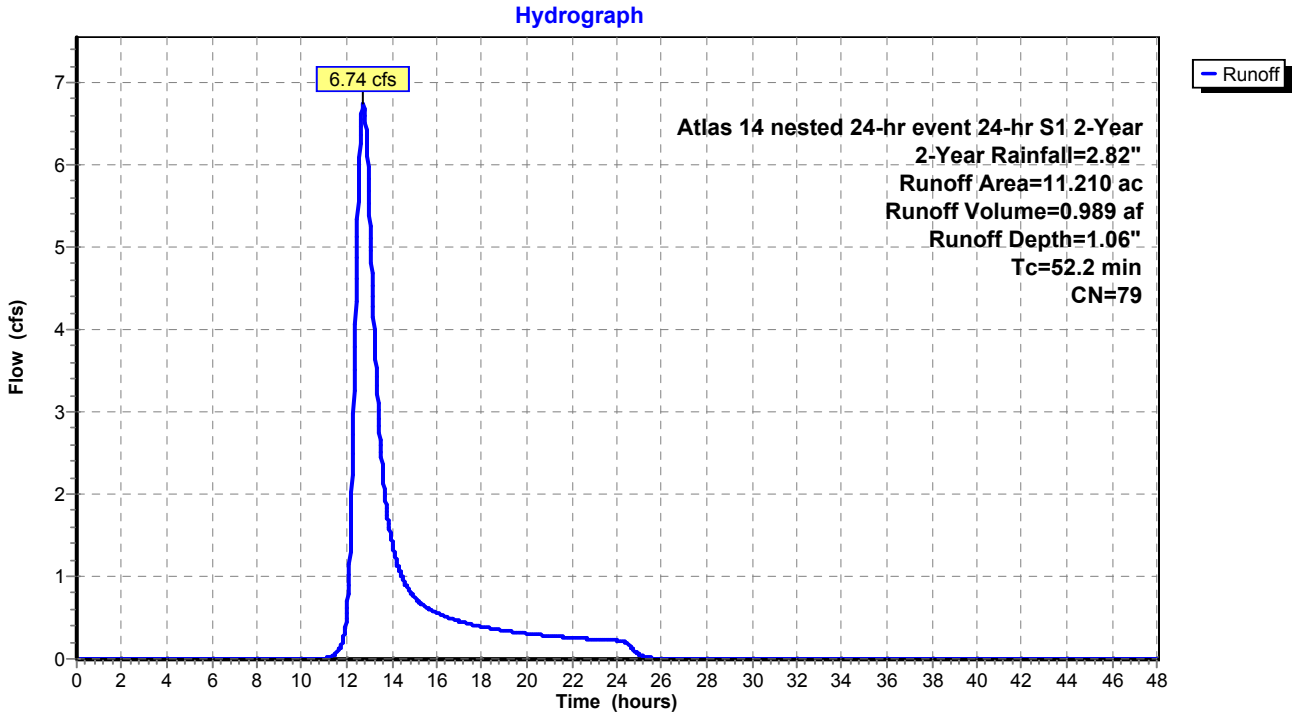
Runoff = 6.74 cfs @ 12.72 hrs, Volume= 0.989 af, Depth= 1.06"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
Atlas 14 nested 24-hr event 24-hr S1 2-Year 2-Year Rainfall=2.82"

	Area (ac)	CN	Description
*	11.210	79	
	11.210		100.00% Pervious Area

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

Subcatchment 36S: Sub-basin 36



Summary for Subcatchment 83S: County Road H Subbasin Redirected After Regrading

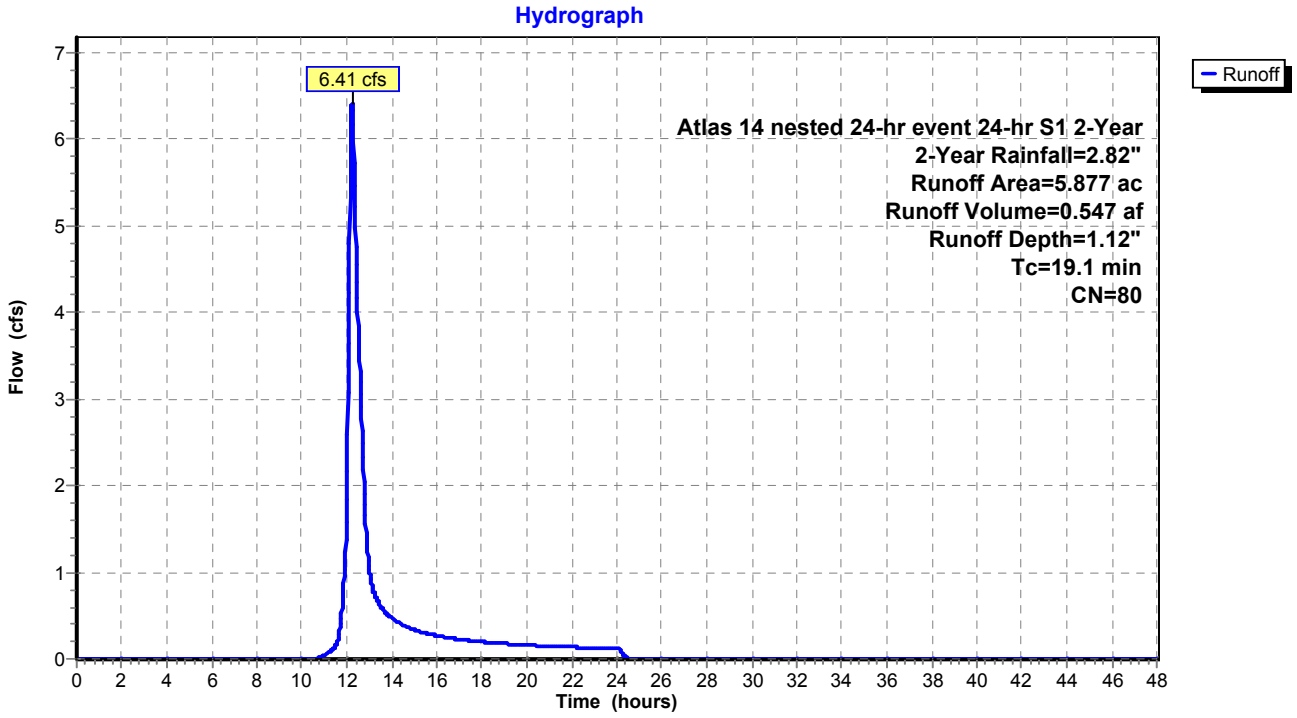
Runoff = 6.41 cfs @ 12.23 hrs, Volume= 0.547 af, Depth= 1.12"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
Atlas 14 nested 24-hr event 24-hr S1 2-Year 2-Year Rainfall=2.82"

	Area (ac)	CN	Description
*	5.877	80	
	5.877		100.00% Pervious Area

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

Subcatchment 83S: County Road H Subbasin Redirected After Regrading



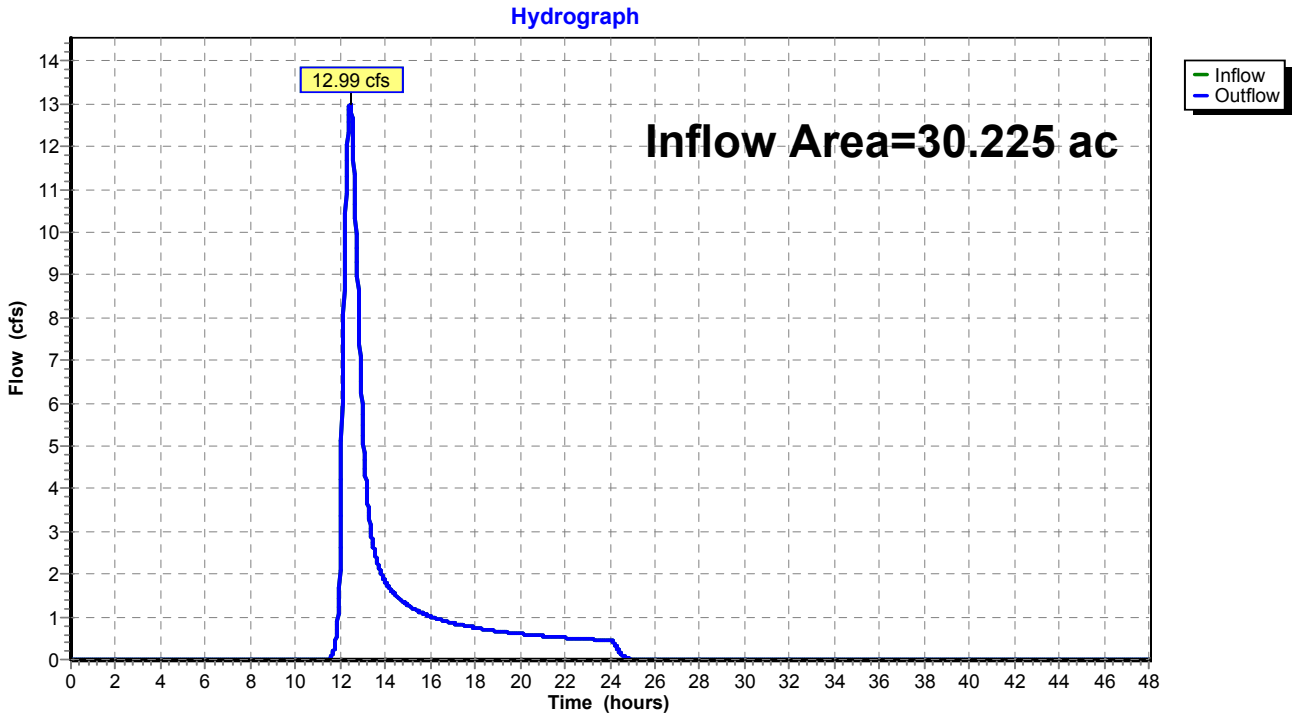
Summary for Reach 37R: Outfall of SB 2, 3, 7

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 30.225 ac, 0.00% Impervious, Inflow Depth = 0.68" for 2-Year event
Inflow = 12.99 cfs @ 12.44 hrs, Volume= 1.708 af
Outflow = 12.99 cfs @ 12.44 hrs, Volume= 1.708 af, Atten= 0%, Lag= 0.0 min

Routing by Muskingum-Cunge method, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs

Reach 37R: Outfall of SB 2, 3, 7



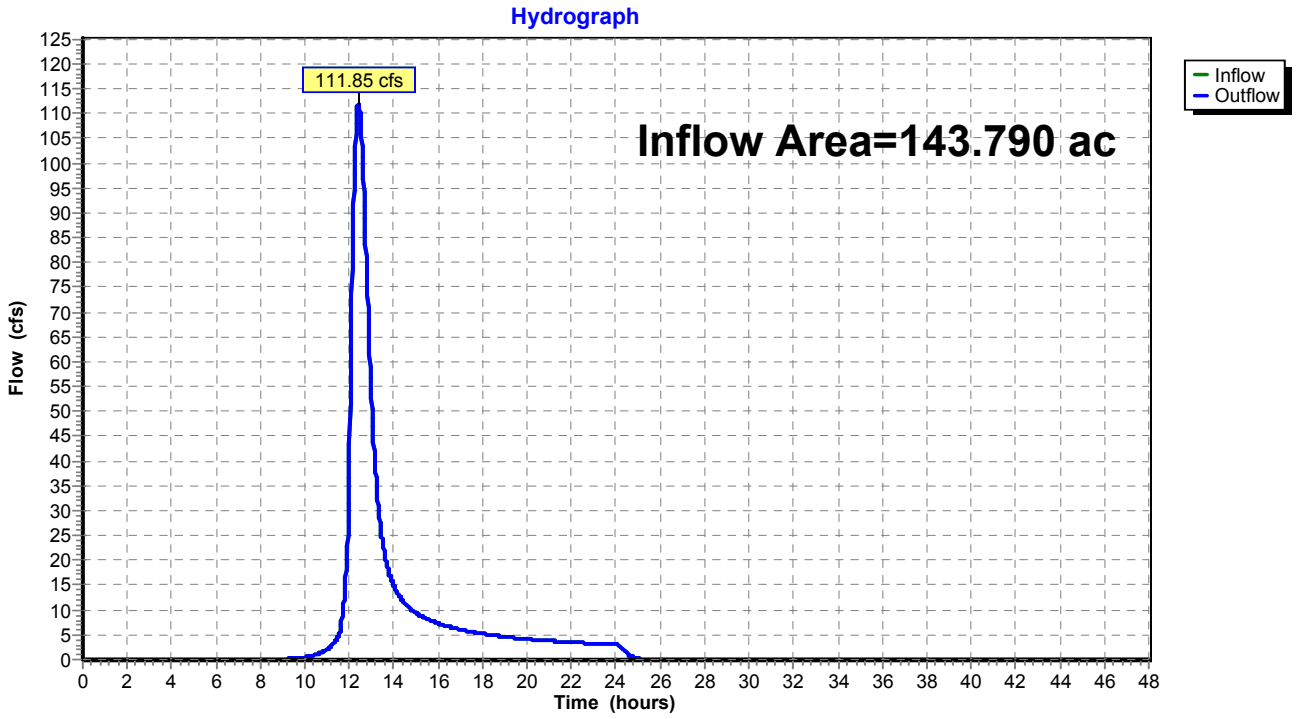
Summary for Reach 39R: Outfall of SB 1, 4, 5, 6, 9, 10, 11, 36

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 143.790 ac, 0.00% Impervious, Inflow Depth = 1.25" for 2-Year event
Inflow = 111.85 cfs @ 12.41 hrs, Volume= 14.937 af
Outflow = 111.85 cfs @ 12.41 hrs, Volume= 14.937 af, Atten= 0%, Lag= 0.0 min

Routing by Muskingum-Cunge method, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs

Reach 39R: Outfall of SB 1, 4, 5, 6, 9, 10, 11, 36



Summary for Reach 40R: 60 in SB 4

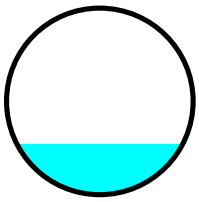
[52] Hint: Inlet/Outlet conditions not evaluated
[65] Warning: Inlet elevation not specified
[88] Warning: Qout>Qin may require Finer Routing>1

Inflow Area = 143.790 ac, 0.00% Impervious, Inflow Depth = 1.25" for 2-Year event
Inflow = 111.84 cfs @ 12.40 hrs, Volume= 14.937 af
Outflow = 111.85 cfs @ 12.41 hrs, Volume= 14.937 af, Atten= 0%, Lag= 0.4 min

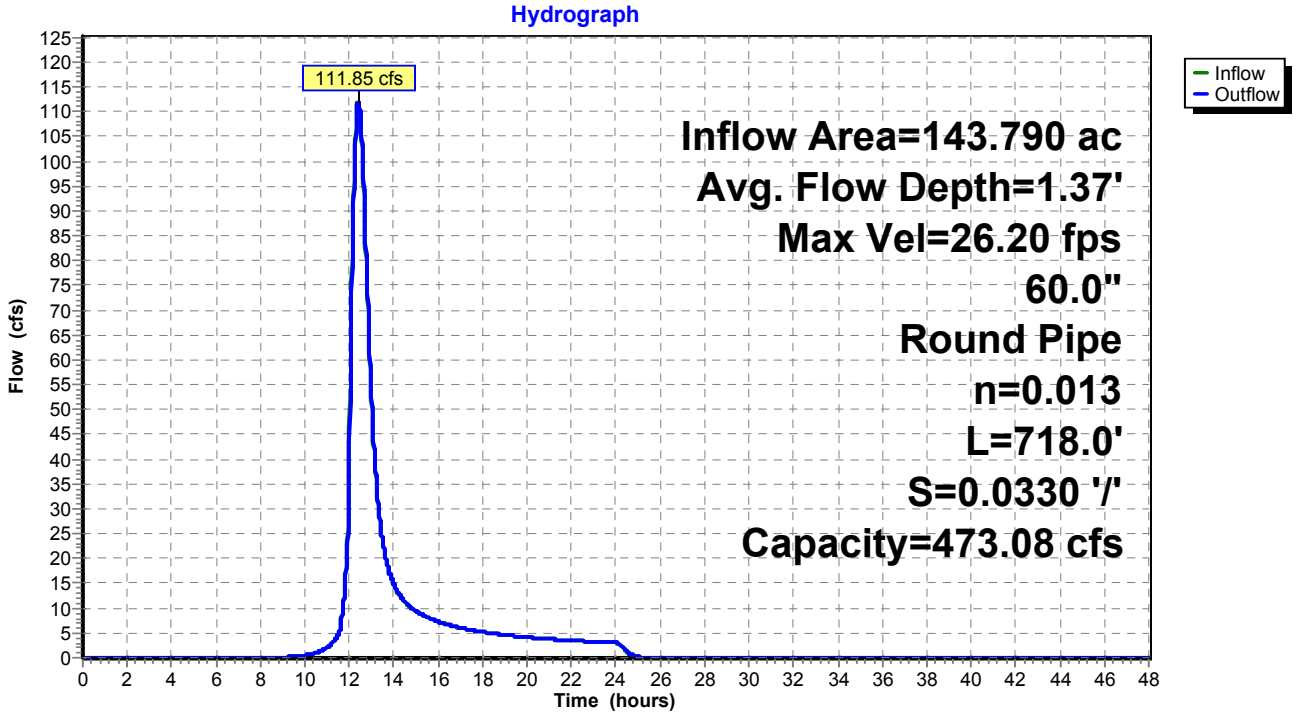
Routing by Muskingum-Cunge method, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
Reference Flow= 83.88 cfs Estimated Depth= 1.43' Velocity= 18.18 fps
m= 1.416, c= 25.74 fps, dt= 1.2 min, dx= 718.0' / 1 = 718.0', K= 0.5 min, X= 0.479
Max. Velocity= 26.20 fps, Min. Travel Time= 0.5 min
Avg. Velocity = 25.74 fps, Avg. Travel Time= 0.5 min

Peak Storage= 3,119 cf @ 12.40 hrs
Average Depth at Peak Storage= 1.37'
Bank-Full Depth= 5.00' Flow Area= 19.6 sf, Capacity= 473.08 cfs

60.0" Round Pipe
n= 0.013
Length= 718.0' Slope= 0.0330 '/'
Inlet Invert= 0.00', Outlet Invert= -23.69'



Reach 40R: 60 in SB 4



Summary for Reach 41R: Channel in SB 9, 10

[65] Warning: Inlet elevation not specified

Inflow Area = 9.296 ac, 0.00% Impervious, Inflow Depth = 1.24" for 2-Year event
Inflow = 13.79 cfs @ 12.13 hrs, Volume= 0.960 af
Outflow = 12.78 cfs @ 12.39 hrs, Volume= 0.960 af, Atten= 7%, Lag= 15.3 min

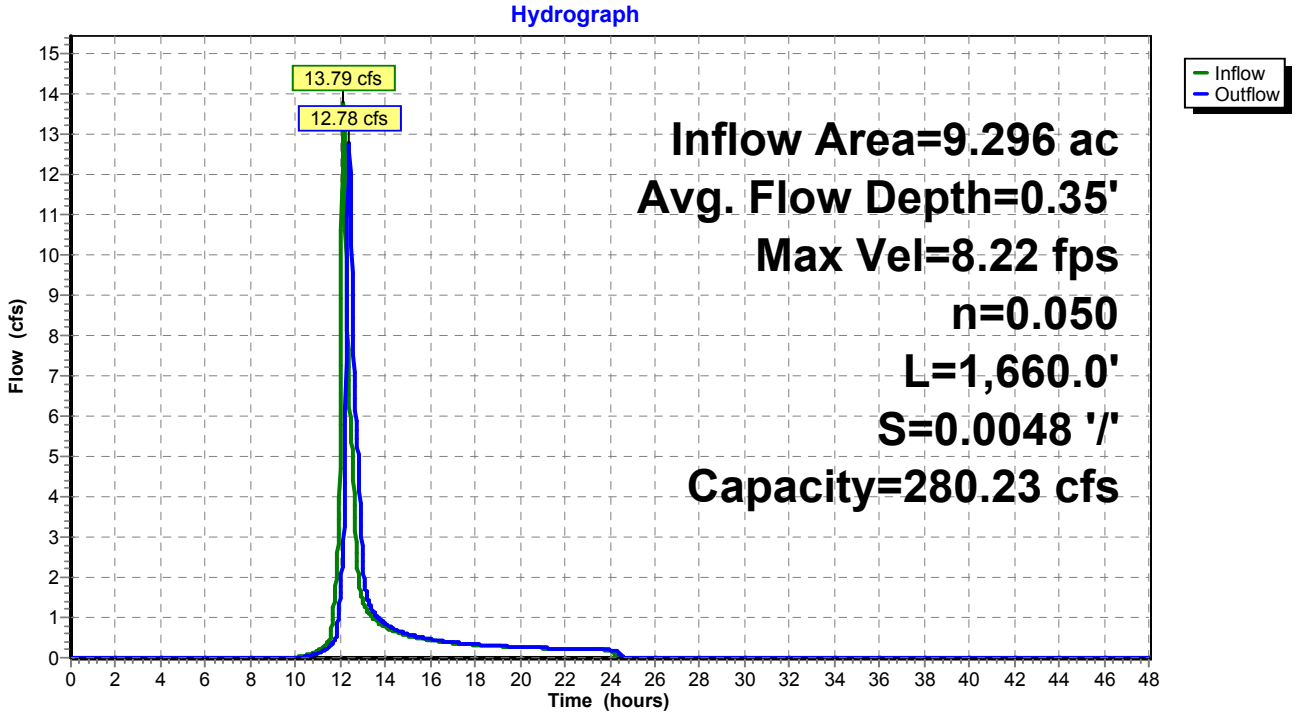
Routing by Muskingum-Cunge method, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
Reference Flow= 10.34 cfs Estimated Depth= 0.49' Velocity= 1.18 fps
m= 1.584, c= 1.88 fps, dt= 1.2 min, dx= 1,660.0' / 12 = 138.3', K= 1.2 min, X= 0.269
Max. Velocity= 8.22 fps, Min. Travel Time= 3.4 min
Avg. Velocity = 1.96 fps, Avg. Travel Time= 14.1 min

Peak Storage= 10,181 cf @ 12.29 hrs
Average Depth at Peak Storage= 0.35'
Bank-Full Depth= 3.00' Flow Area= 84.0 sf, Capacity= 280.23 cfs

16.00' x 3.00' deep channel, n= 0.050
Side Slope Z-value= 4.0 '/' Top Width= 40.00'
Length= 1,660.0' Slope= 0.0048 '/'
Inlet Invert= 0.00', Outlet Invert= -7.97'

‡

Reach 41R: Channel in SB 9, 10



Summary for Reach 46R: Channel SB1

[65] Warning: Inlet elevation not specified

Inflow Area = 15.328 ac, 0.00% Impervious, Inflow Depth = 1.58" for 2-Year event
Inflow = 26.50 cfs @ 12.18 hrs, Volume= 2.022 af
Outflow = 26.13 cfs @ 12.27 hrs, Volume= 2.022 af, Atten= 1%, Lag= 5.2 min

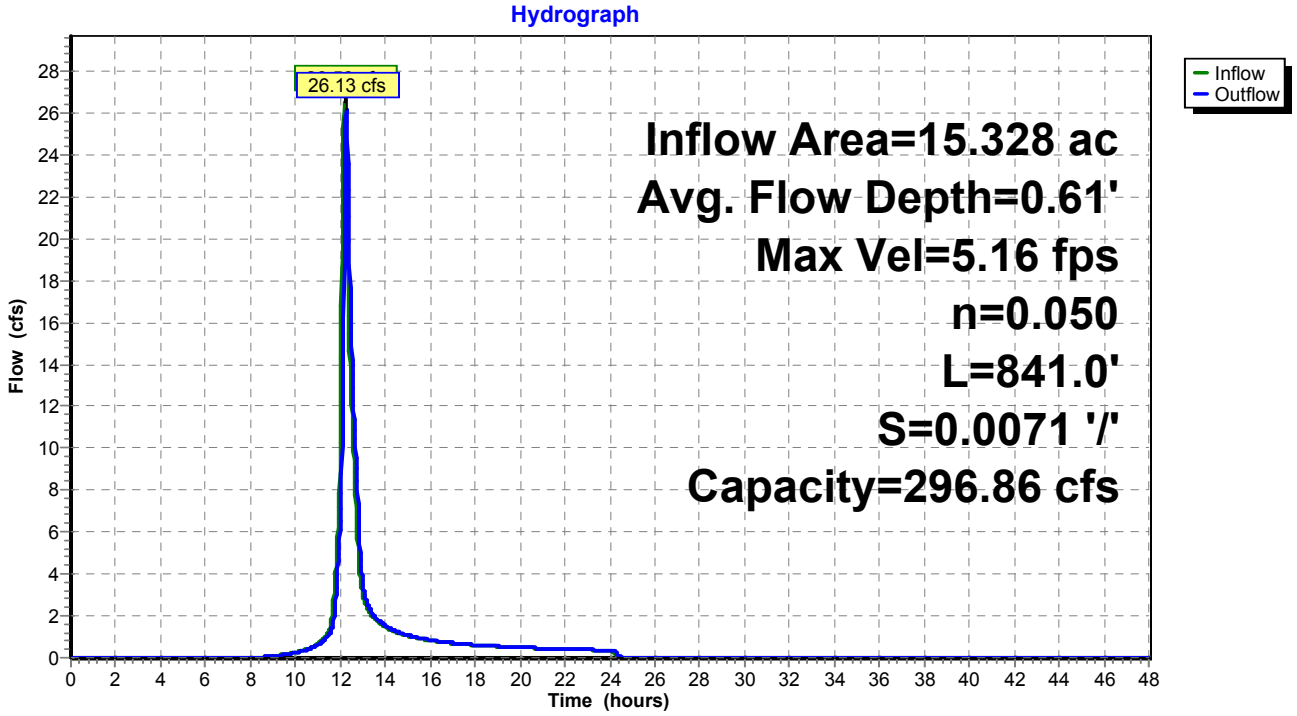
Routing by Muskingum-Cunge method, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
Reference Flow= 19.87 cfs Estimated Depth= 0.71' Velocity= 1.77 fps
m= 1.540, c= 2.73 fps, dt= 1.2 min, dx= 841.0' / 4 = 210.3', K= 1.3 min, X= 0.346
Max. Velocity= 5.16 fps, Min. Travel Time= 2.7 min
Avg. Velocity = 2.74 fps, Avg. Travel Time= 5.1 min

Peak Storage= 7,973 cf @ 12.23 hrs
Average Depth at Peak Storage= 0.61'
Bank-Full Depth= 3.00' Flow Area= 75.0 sf, Capacity= 296.86 cfs

13.00' x 3.00' deep channel, n= 0.050
Side Slope Z-value= 4.0 '/' Top Width= 37.00'
Length= 841.0' Slope= 0.0071 '/'
Inlet Invert= 0.00', Outlet Invert= -5.97'

‡

Reach 46R: Channel SB1



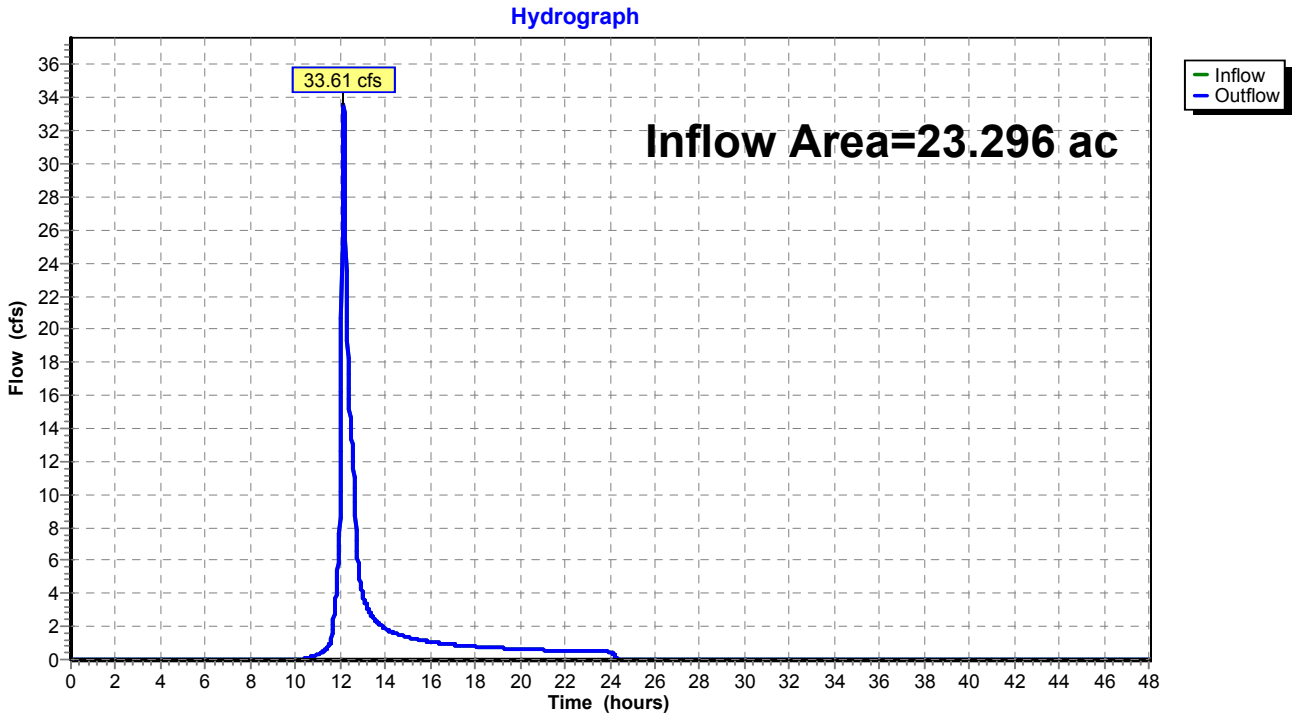
Summary for Reach 48R: Outfall of SB 8, 13

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 23.296 ac, 0.00% Impervious, Inflow Depth = 1.18" for 2-Year event
Inflow = 33.61 cfs @ 12.14 hrs, Volume= 2.296 af
Outflow = 33.61 cfs @ 12.14 hrs, Volume= 2.296 af, Atten= 0%, Lag= 0.0 min

Routing by Muskingum-Cunge method, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs

Reach 48R: Outfall of SB 8, 13



Summary for Reach 49R: Channel SB8

[65] Warning: Inlet elevation not specified

Inflow Area = 21.017 ac, 0.00% Impervious, Inflow Depth = 1.18" for 2-Year event
Inflow = 33.39 cfs @ 12.09 hrs, Volume= 2.061 af
Outflow = 32.82 cfs @ 12.14 hrs, Volume= 2.061 af, Atten= 2%, Lag= 3.2 min

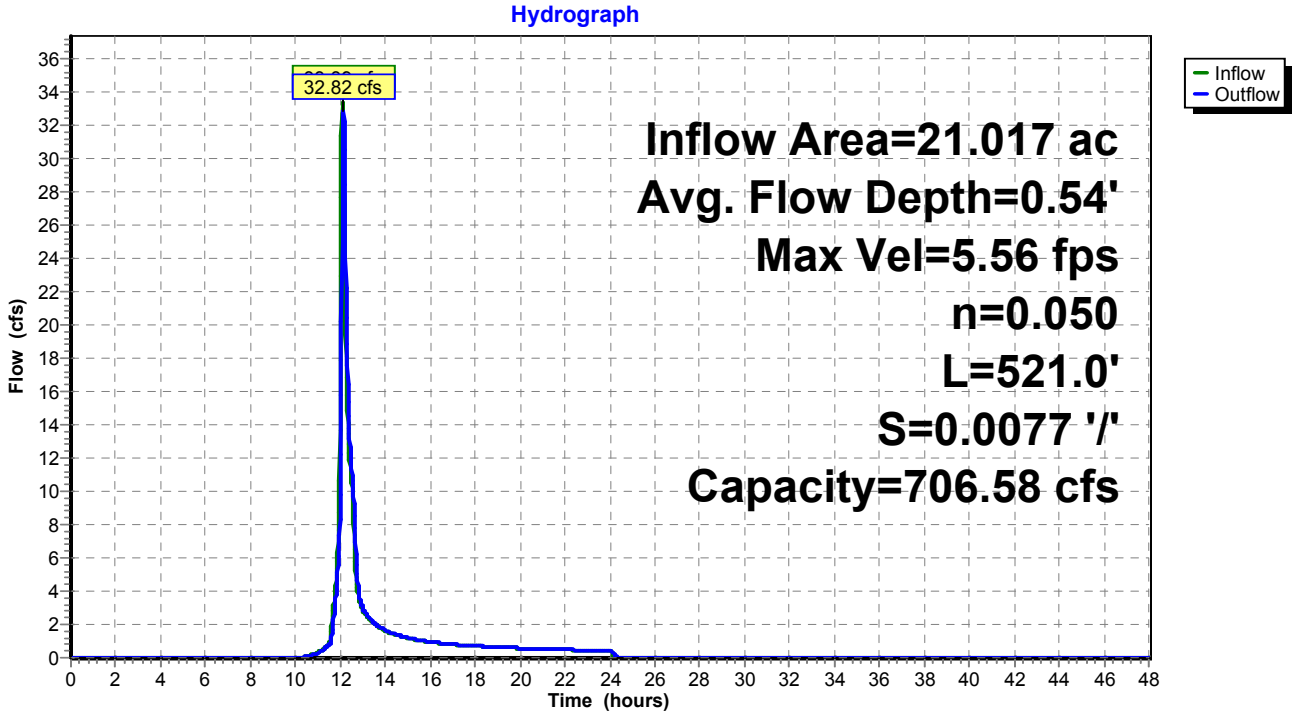
Routing by Muskingum-Cunge method, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
Reference Flow= 25.04 cfs Estimated Depth= 0.65' Velocity= 1.80 fps
m= 1.577, c= 2.83 fps, dt= 1.2 min, dx= 521.0' / 3 = 173.7', K= 1.0 min, X= 0.347
Max. Velocity= 5.56 fps, Min. Travel Time= 1.6 min
Avg. Velocity = 2.84 fps, Avg. Travel Time= 3.1 min

Peak Storage= 5,972 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.54'
Bank-Full Depth= 4.00' Flow Area= 140.0 sf, Capacity= 706.58 cfs

19.00' x 4.00' deep channel, n= 0.050
Side Slope Z-value= 4.0 '/' Top Width= 51.00'
Length= 521.0' Slope= 0.0077 '/'
Inlet Invert= 0.00', Outlet Invert= -4.01'

‡

Reach 49R: Channel SB8



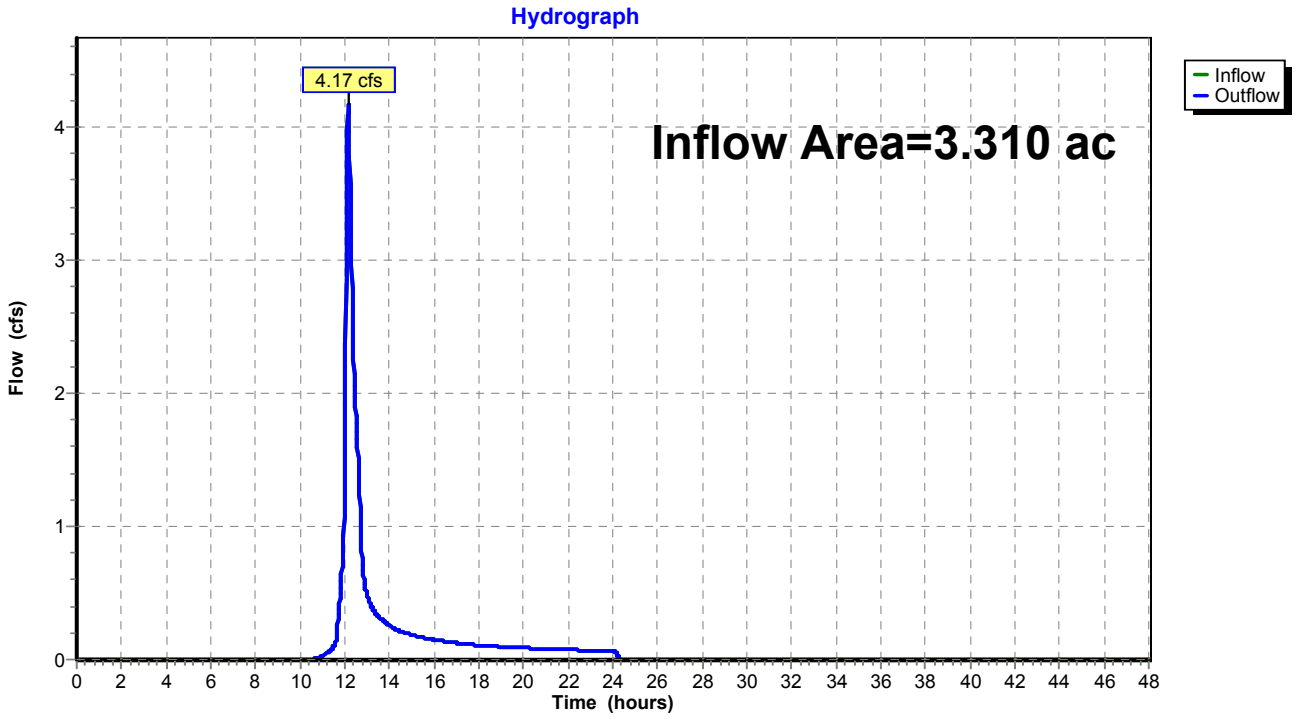
Summary for Reach 50R: Outfall of SB 12

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 3.310 ac, 0.00% Impervious, Inflow Depth = 1.12" for 2-Year event
Inflow = 4.17 cfs @ 12.16 hrs, Volume= 0.308 af
Outflow = 4.17 cfs @ 12.16 hrs, Volume= 0.308 af, Atten= 0%, Lag= 0.0 min

Routing by Muskingum-Cunge method, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs

Reach 50R: Outfall of SB 12



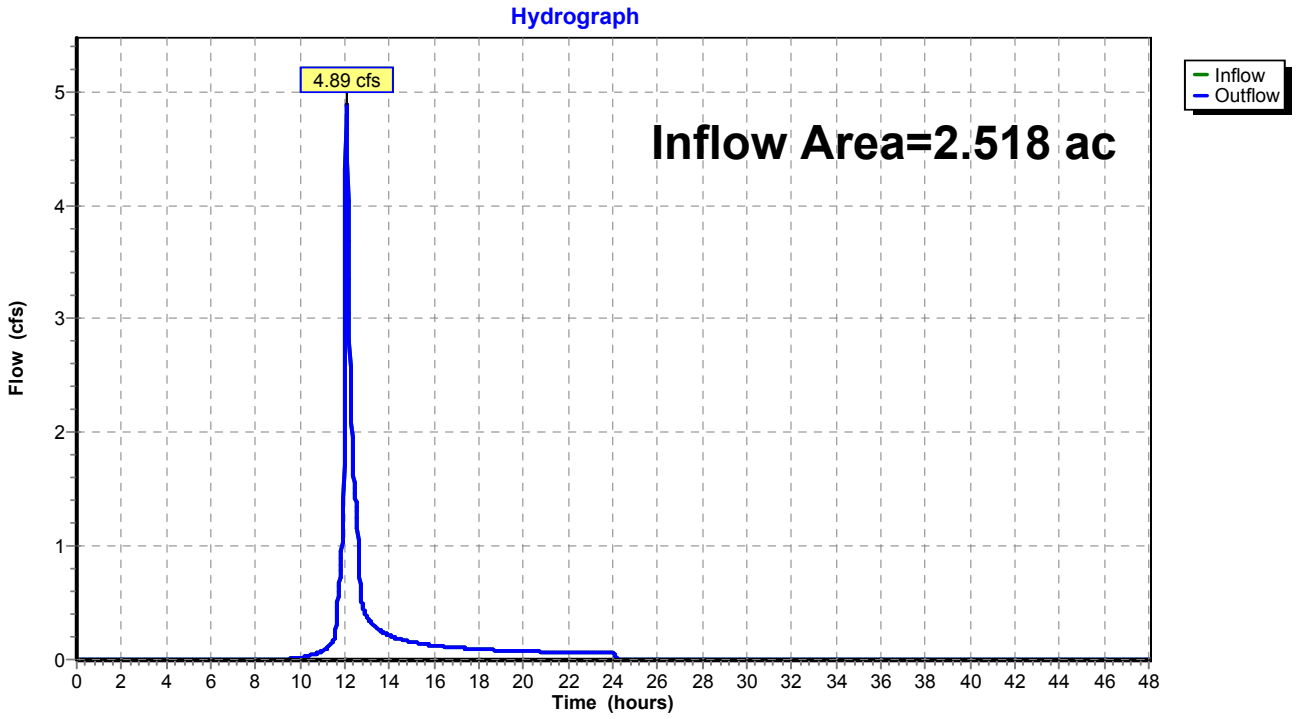
Summary for Reach 51R: Outfall of SB 14

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 2.518 ac, 0.00% Impervious, Inflow Depth = 1.37" for 2-Year event
Inflow = 4.89 cfs @ 12.08 hrs, Volume= 0.287 af
Outflow = 4.89 cfs @ 12.08 hrs, Volume= 0.287 af, Atten= 0%, Lag= 0.0 min

Routing by Muskingum-Cunge method, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs

Reach 51R: Outfall of SB 14



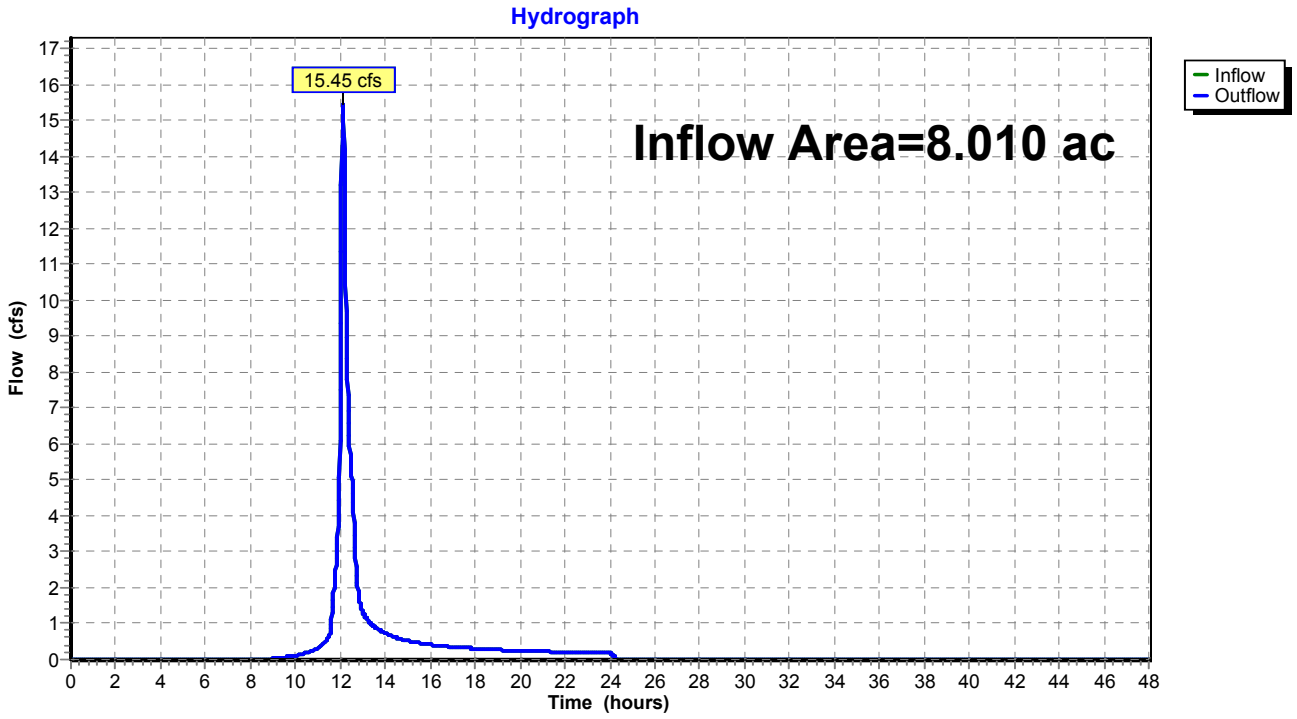
Summary for Reach 52R: Outfall of SB 17

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 8.010 ac, 0.00% Impervious, Inflow Depth = 1.51" for 2-Year event
Inflow = 15.45 cfs @ 12.11 hrs, Volume= 1.008 af
Outflow = 15.45 cfs @ 12.11 hrs, Volume= 1.008 af, Atten= 0%, Lag= 0.0 min

Routing by Muskingum-Cunge method, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs

Reach 52R: Outfall of SB 17



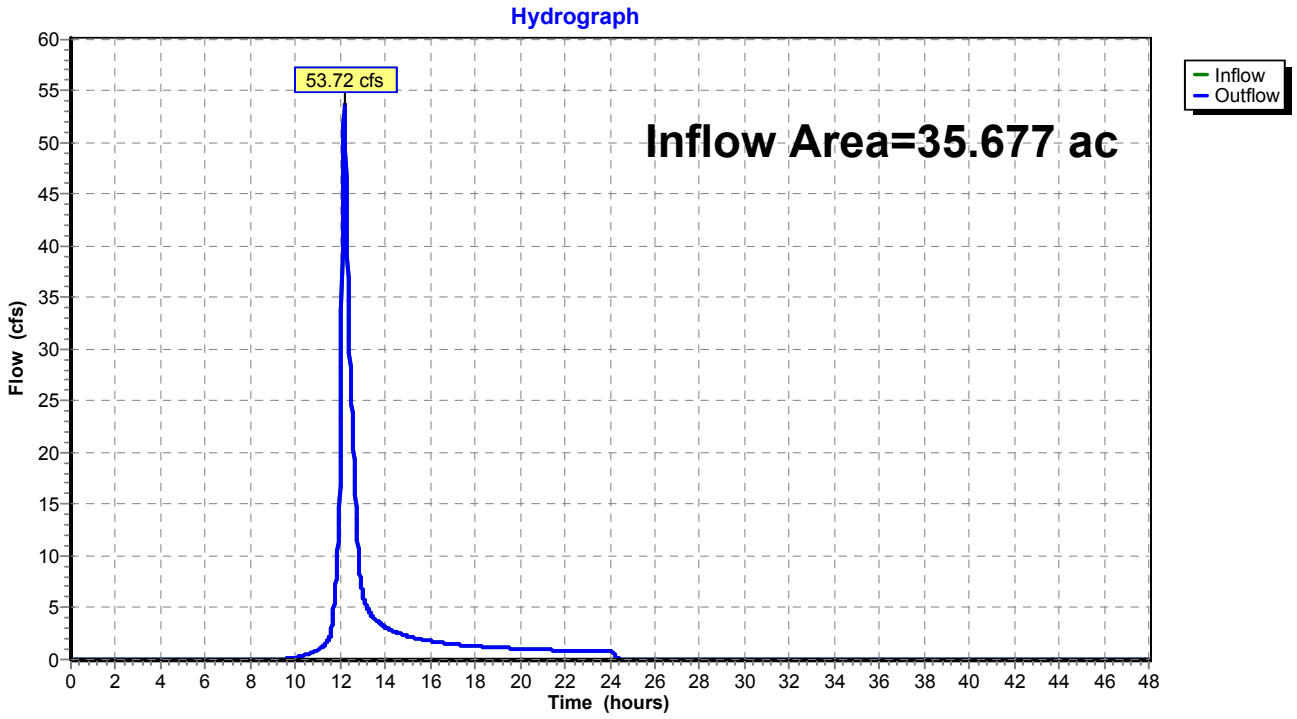
Summary for Reach 53R: Outfall of SB 18

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 35.677 ac, 0.00% Impervious, Inflow Depth = 1.37" for 2-Year event
Inflow = 53.72 cfs @ 12.18 hrs, Volume= 4.072 af
Outflow = 53.72 cfs @ 12.18 hrs, Volume= 4.072 af, Atten= 0%, Lag= 0.0 min

Routing by Muskingum-Cunge method, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs

Reach 53R: Outfall of SB 18



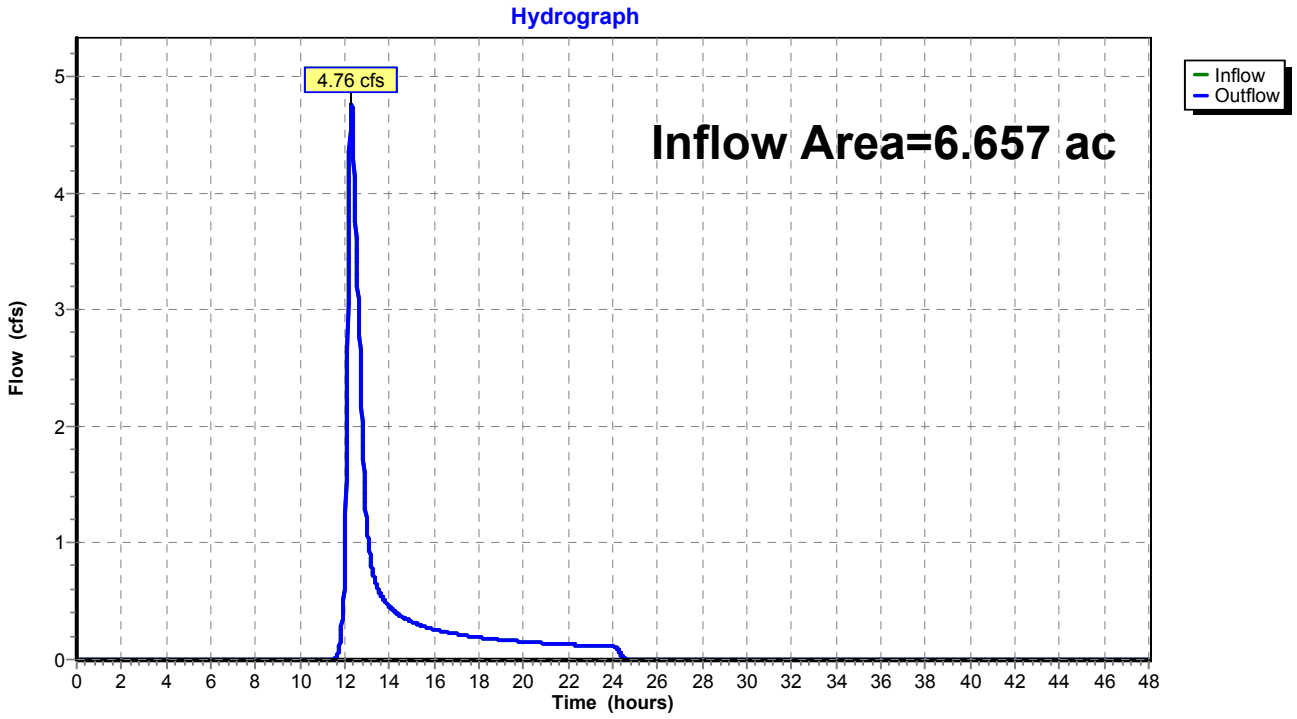
Summary for Reach 54R: Outfall of SB 25

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 6.657 ac, 0.00% Impervious, Inflow Depth = 0.85" for 2-Year event
Inflow = 4.76 cfs @ 12.30 hrs, Volume= 0.469 af
Outflow = 4.76 cfs @ 12.30 hrs, Volume= 0.469 af, Atten= 0%, Lag= 0.0 min

Routing by Muskingum-Cunge method, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs

Reach 54R: Outfall of SB 25



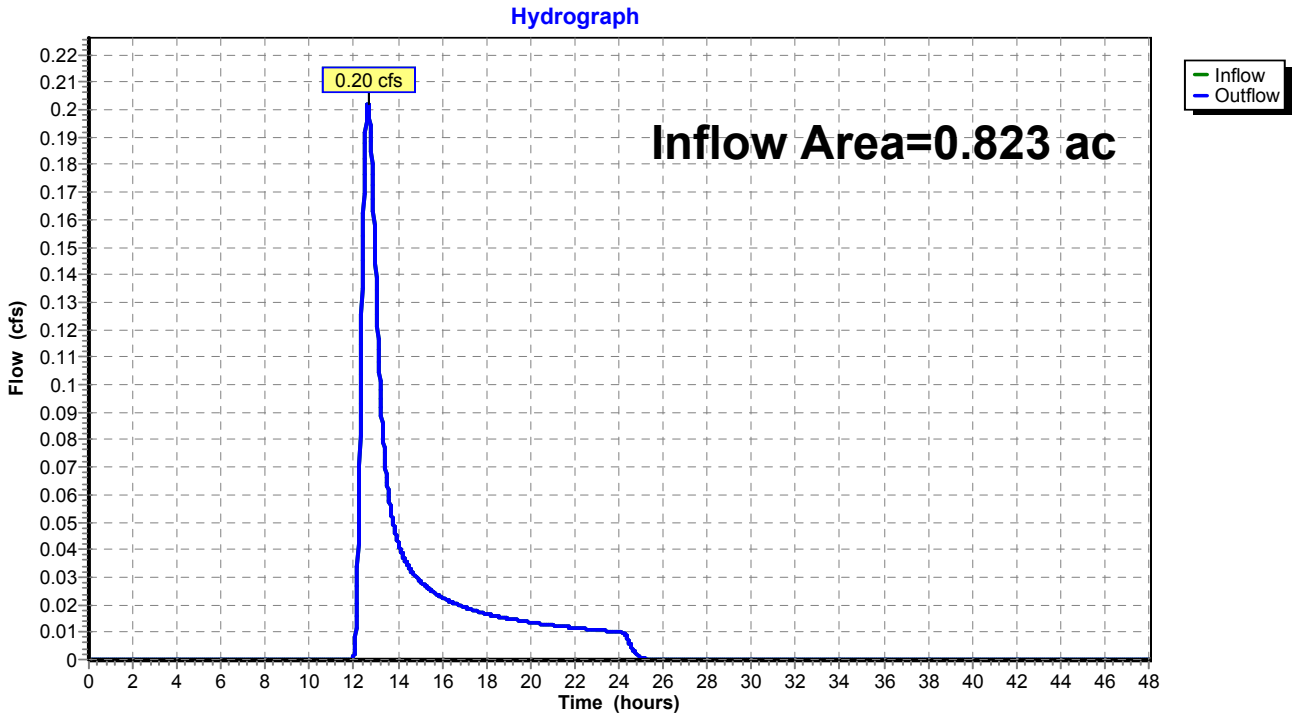
Summary for Reach 55R: Outfall of SB 26

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.823 ac, 0.00% Impervious, Inflow Depth = 0.46" for 2-Year event
Inflow = 0.20 cfs @ 12.64 hrs, Volume= 0.032 af
Outflow = 0.20 cfs @ 12.64 hrs, Volume= 0.032 af, Atten= 0%, Lag= 0.0 min

Routing by Muskingum-Cunge method, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs

Reach 55R: Outfall of SB 26



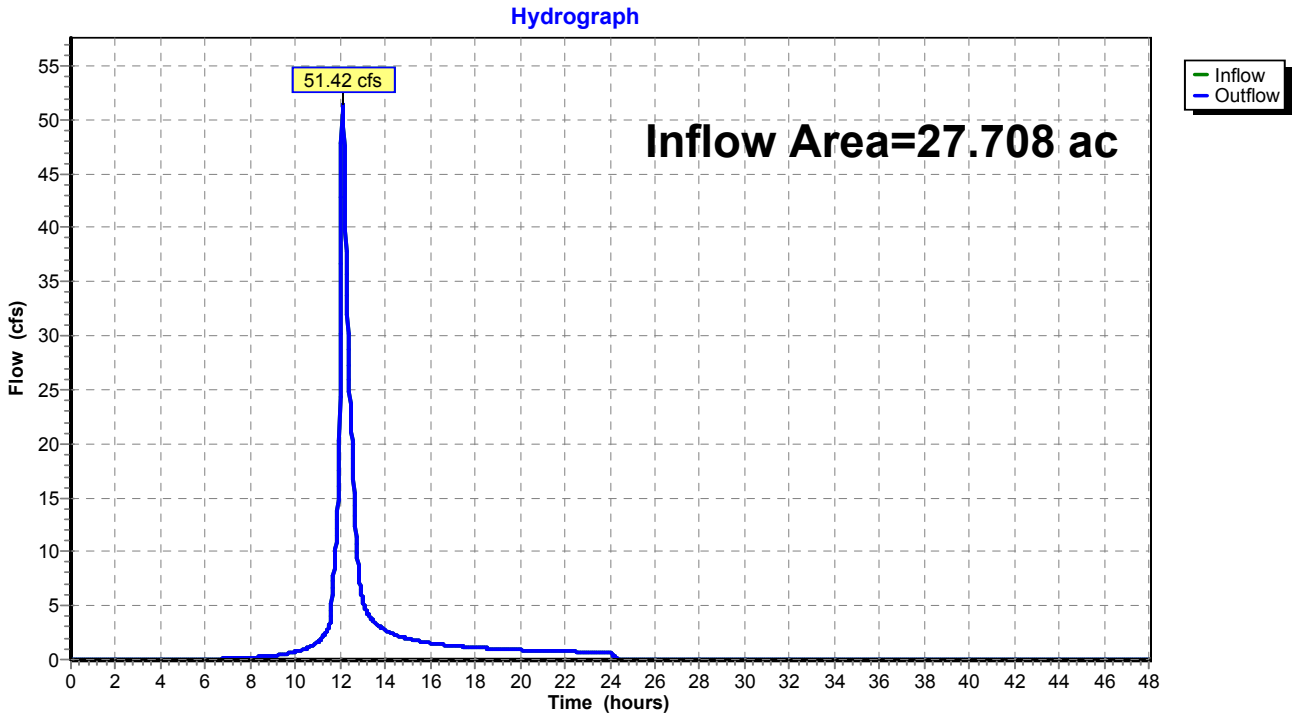
Summary for Reach 56R: Outfall of SB 23, 24

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 27.708 ac, 0.00% Impervious, Inflow Depth = 1.71" for 2-Year event
Inflow = 51.42 cfs @ 12.10 hrs, Volume= 3.958 af
Outflow = 51.42 cfs @ 12.10 hrs, Volume= 3.958 af, Atten= 0%, Lag= 0.0 min

Routing by Muskingum-Cunge method, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs

Reach 56R: Outfall of SB 23, 24



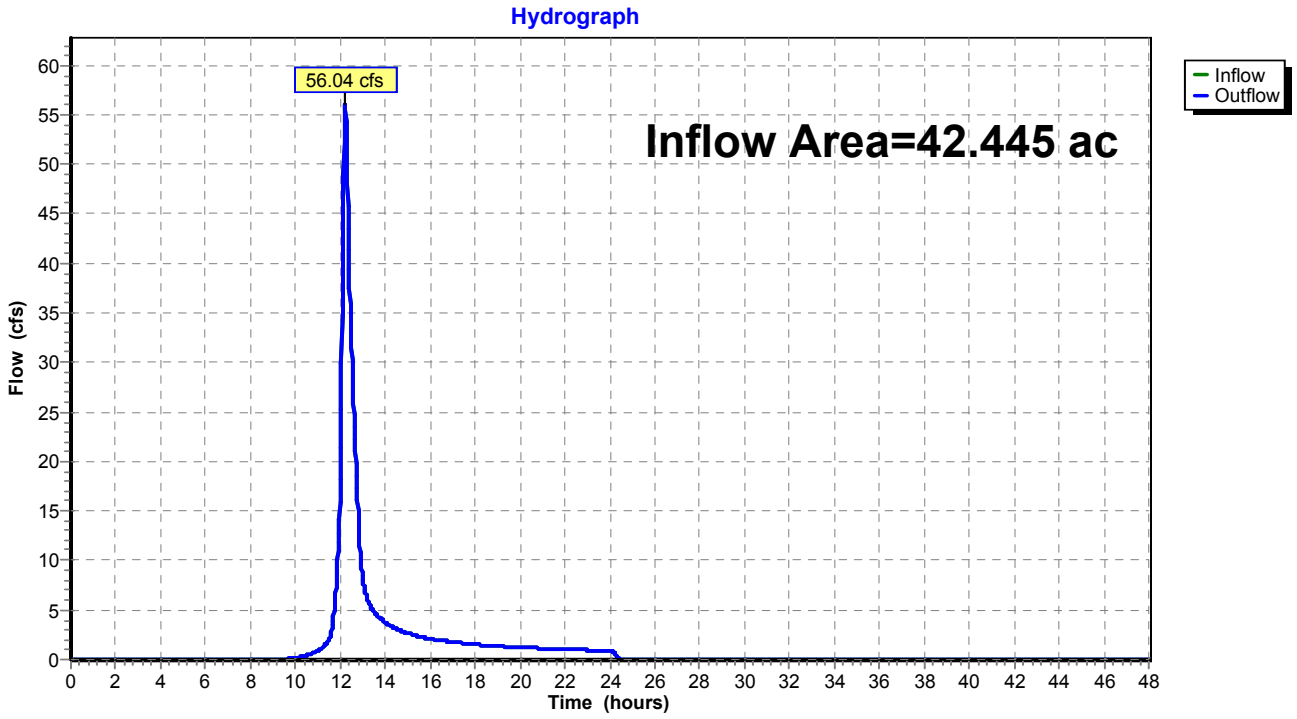
Summary for Reach 59R: Outfall of SB 20, 22

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 42.445 ac, 0.00% Impervious, Inflow Depth = 1.31" for 2-Year event
Inflow = 56.04 cfs @ 12.22 hrs, Volume= 4.646 af
Outflow = 56.04 cfs @ 12.22 hrs, Volume= 4.646 af, Atten= 0%, Lag= 0.0 min

Routing by Muskingum-Cunge method, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs

Reach 59R: Outfall of SB 20, 22



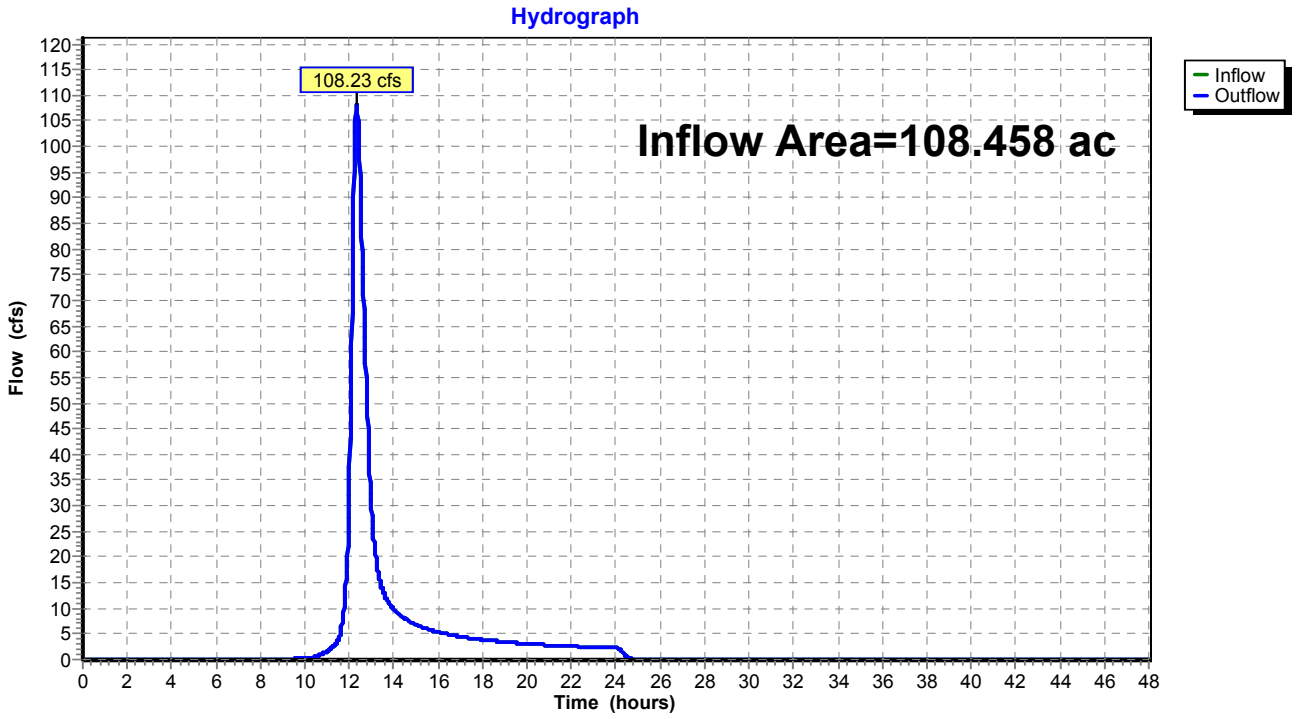
Summary for Reach 61R: Outfall of SB 15, 16, 21

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 108.458 ac, 0.00% Impervious, Inflow Depth = 1.25" for 2-Year event
Inflow = 108.23 cfs @ 12.34 hrs, Volume= 11.311 af
Outflow = 108.23 cfs @ 12.34 hrs, Volume= 11.311 af, Atten= 0%, Lag= 0.0 min

Routing by Muskingum-Cunge method, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs

Reach 61R: Outfall of SB 15, 16, 21



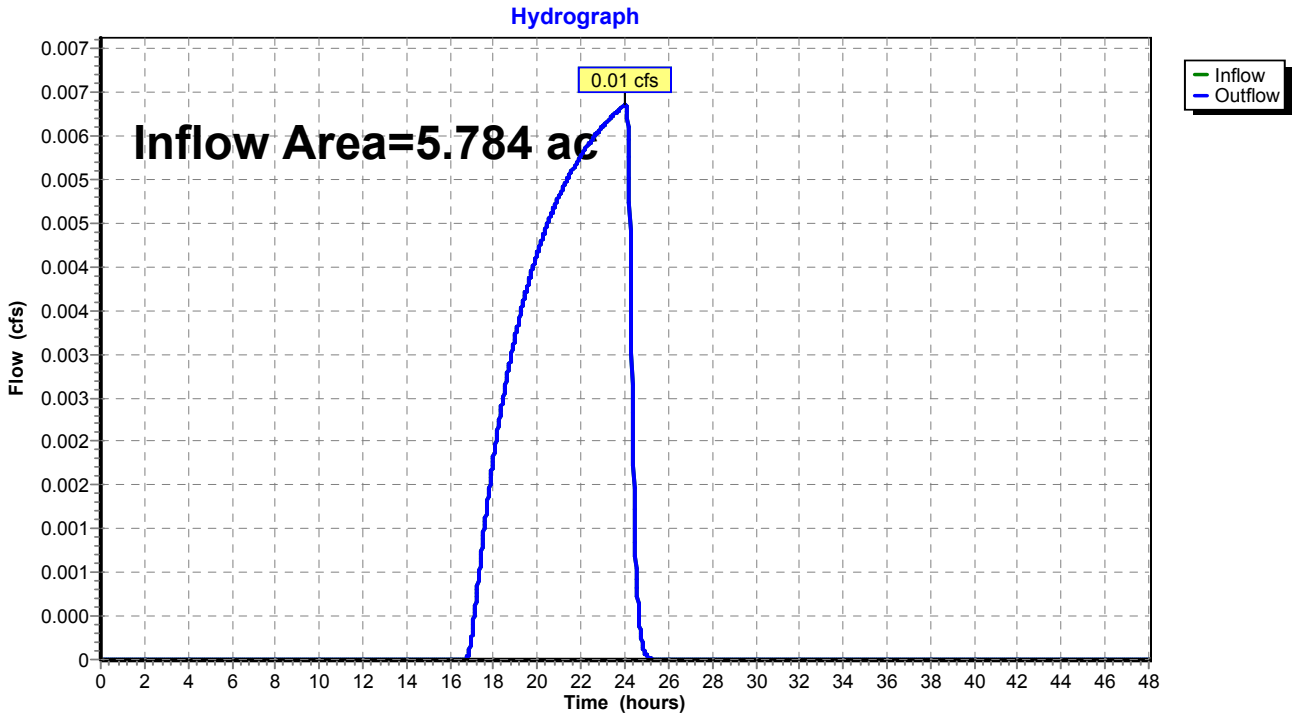
Summary for Reach 67R: Outfall of SB 28

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 5.784 ac, 0.00% Impervious, Inflow Depth = 0.01" for 2-Year event
Inflow = 0.01 cfs @ 24.03 hrs, Volume= 0.003 af
Outflow = 0.01 cfs @ 24.03 hrs, Volume= 0.003 af, Atten= 0%, Lag= 0.0 min

Routing by Muskingum-Cunge method, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs

Reach 67R: Outfall of SB 28



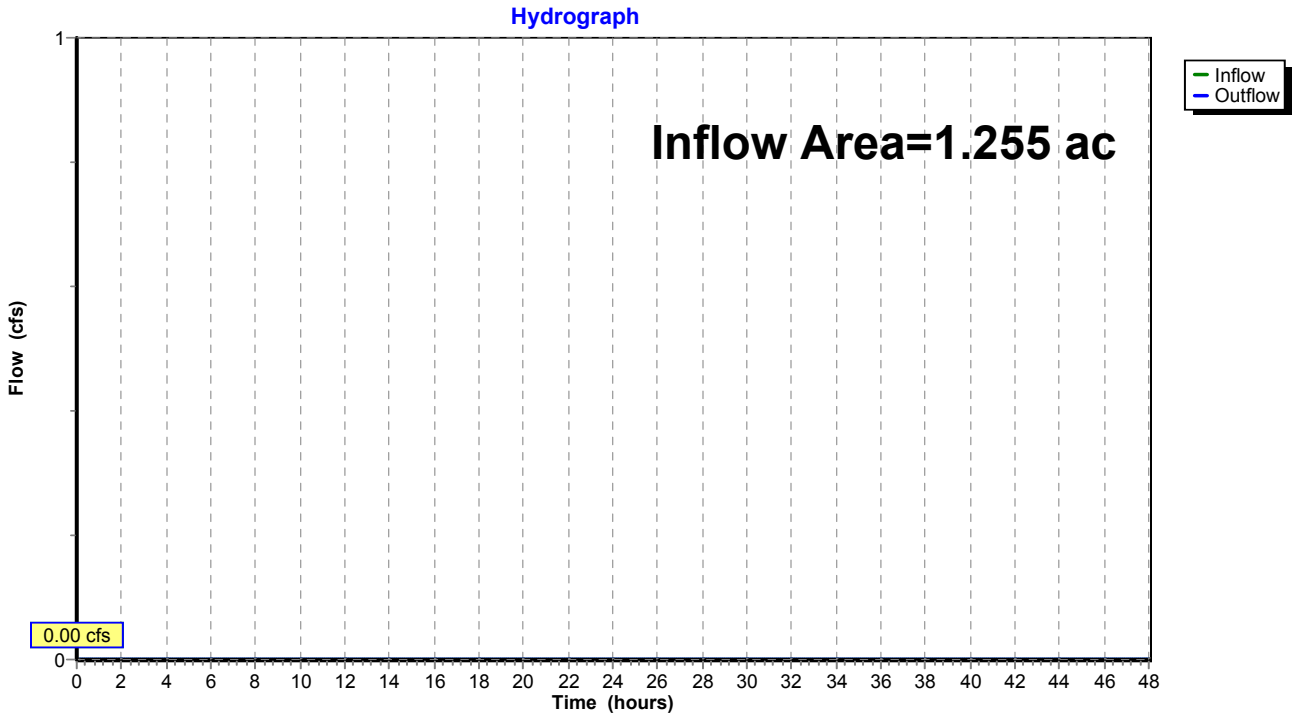
Summary for Reach 68R: Outfall of SB 29

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 1.255 ac, 0.00% Impervious, Inflow Depth = 0.00" for 2-Year 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 Muskingum-Cunge method, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs

Reach 68R: Outfall of SB 29



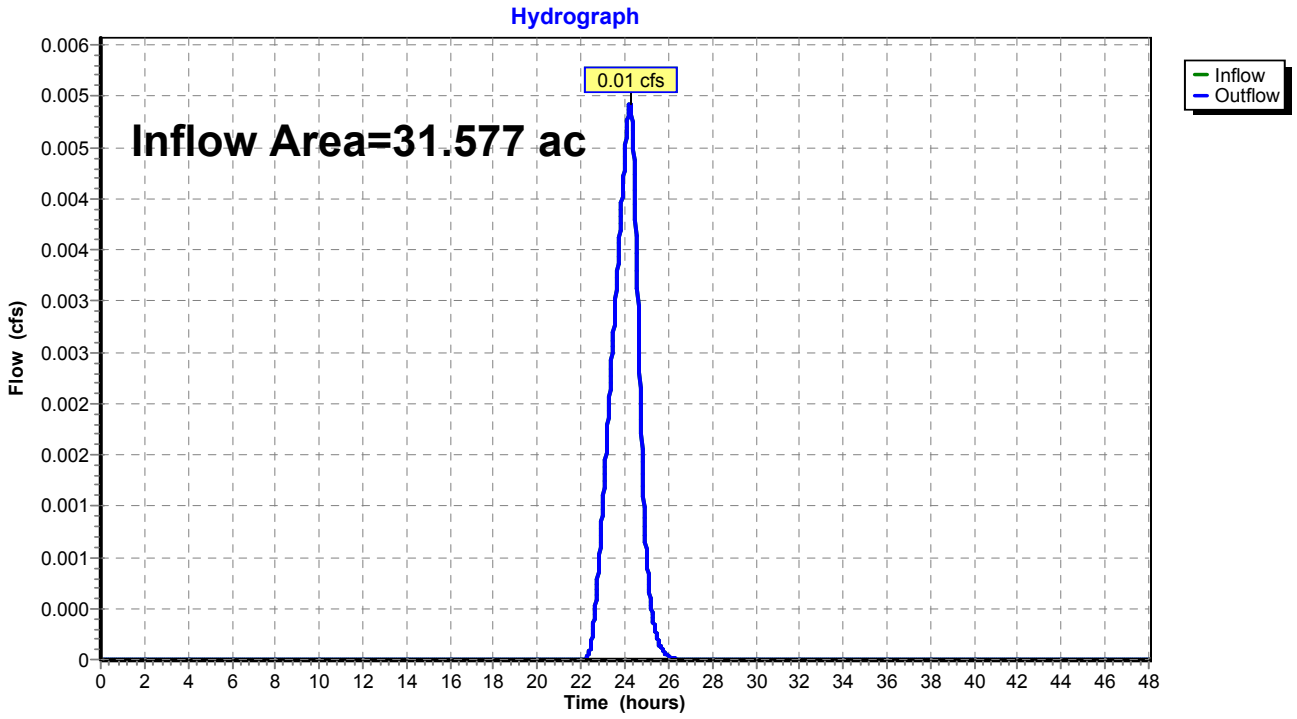
Summary for Reach 69R: Outfall of SB 30

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 31.577 ac, 0.00% Impervious, Inflow Depth = 0.00" for 2-Year event
Inflow = 0.01 cfs @ 24.23 hrs, Volume= 0.001 af
Outflow = 0.01 cfs @ 24.23 hrs, Volume= 0.001 af, Atten= 0%, Lag= 0.0 min

Routing by Muskingum-Cunge method, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs

Reach 69R: Outfall of SB 30



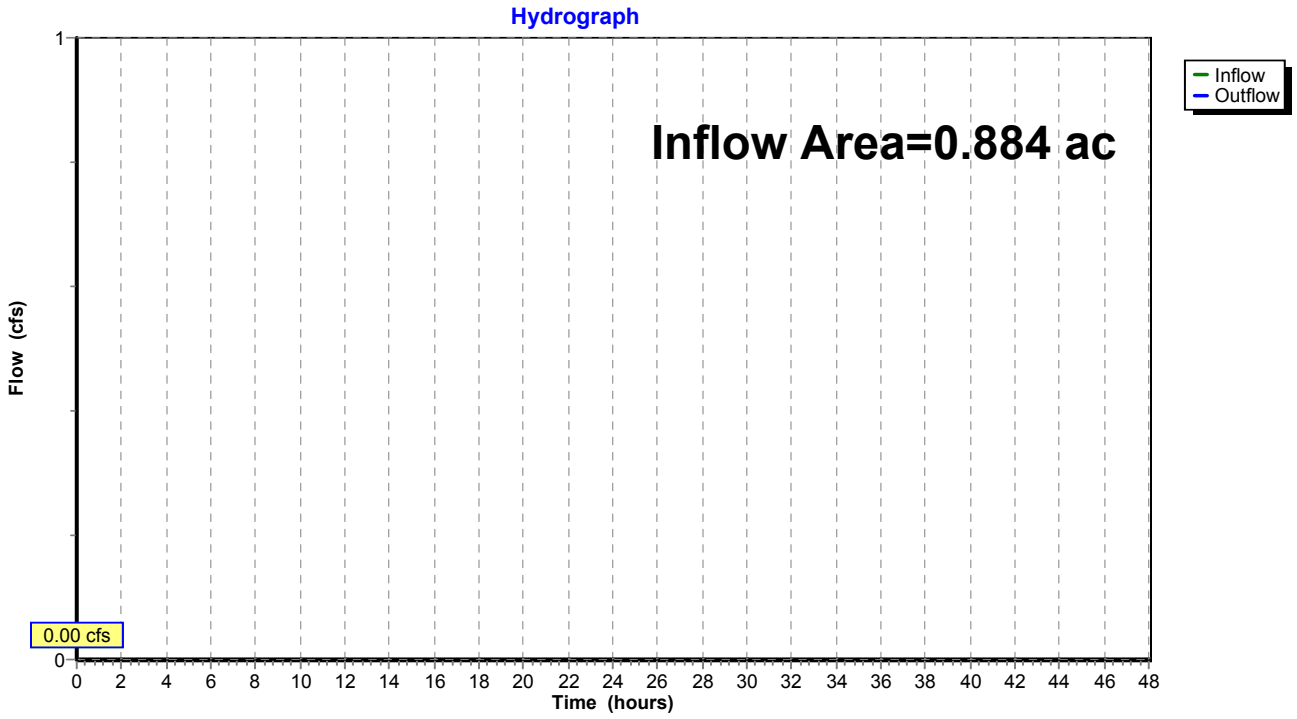
Summary for Reach 70R: Outfall of SB 31

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.884 ac, 0.00% Impervious, Inflow Depth = 0.00" for 2-Year 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 Muskingum-Cunge method, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs

Reach 70R: Outfall of SB 31



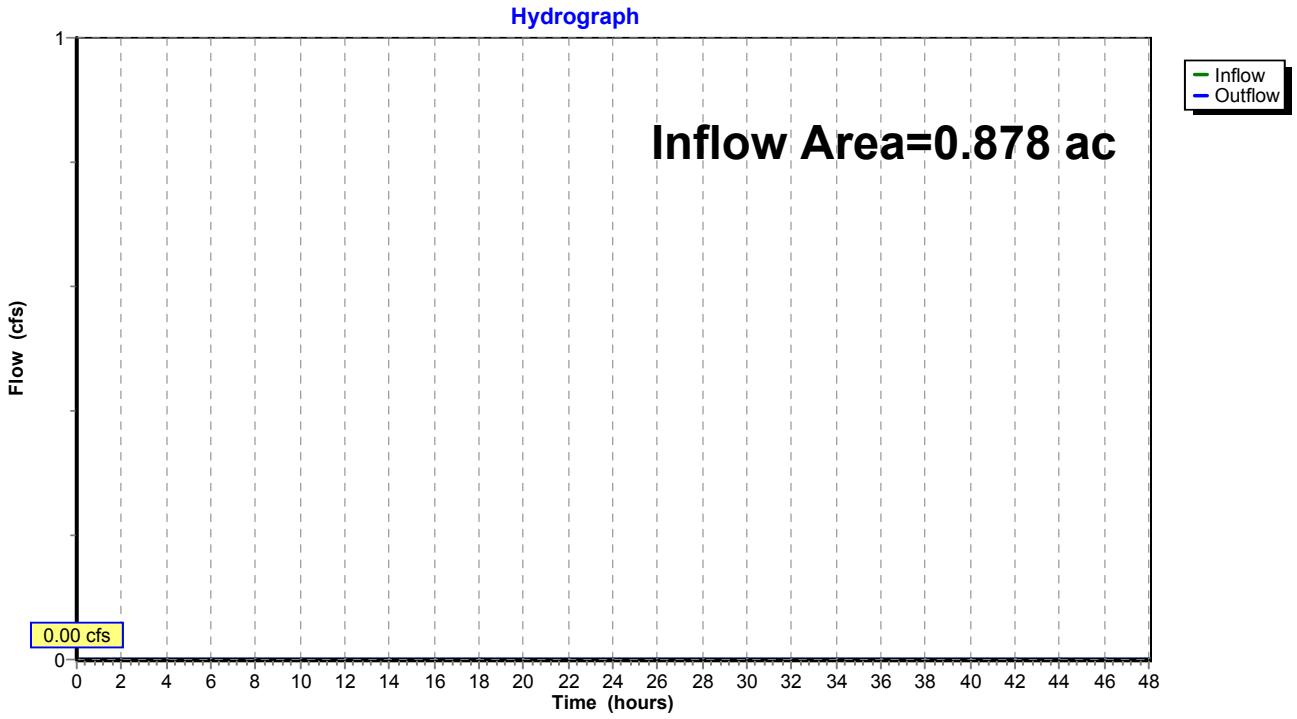
Summary for Reach 71R: Outfall of SB 32

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.878 ac, 0.00% Impervious, Inflow Depth = 0.00" for 2-Year 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 Muskingum-Cunge method, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs

Reach 71R: Outfall of SB 32



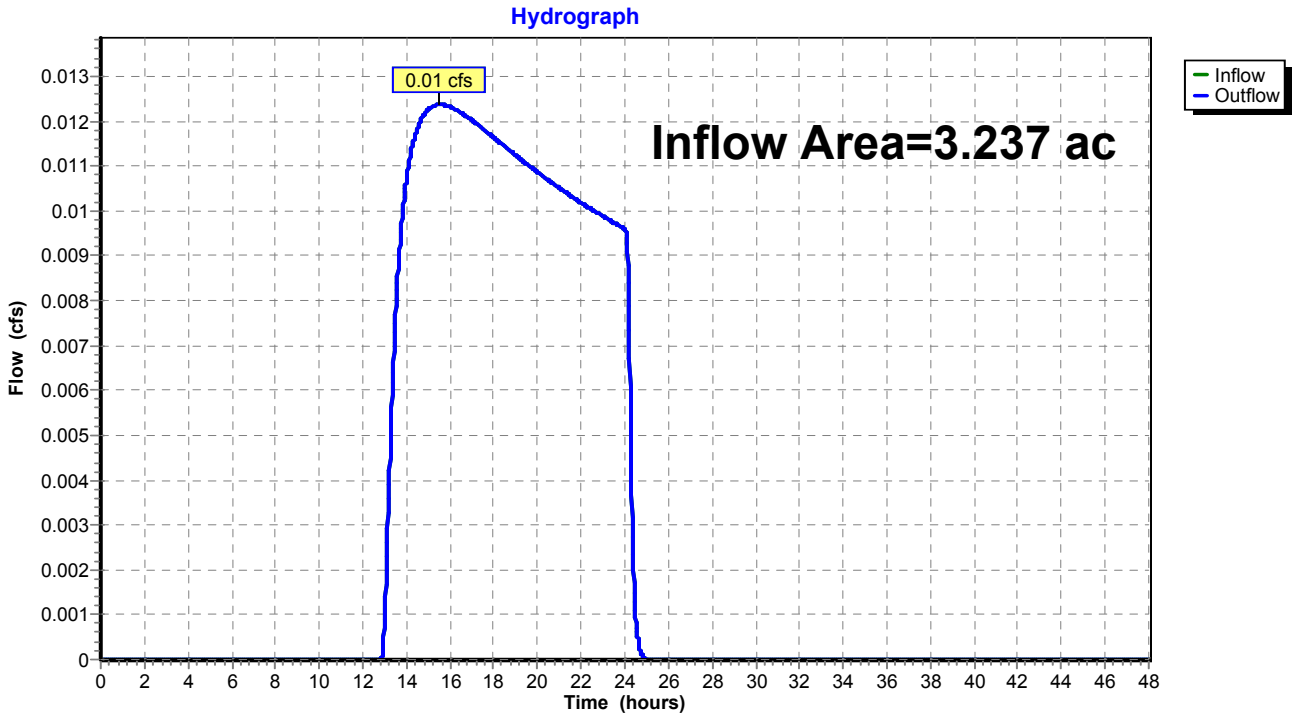
Summary for Reach 72R: Outfall of SB 33

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 3.237 ac, 0.00% Impervious, Inflow Depth = 0.04" for 2-Year event
Inflow = 0.01 cfs @ 15.50 hrs, Volume= 0.010 af
Outflow = 0.01 cfs @ 15.50 hrs, Volume= 0.010 af, Atten= 0%, Lag= 0.0 min

Routing by Muskingum-Cunge method, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs

Reach 72R: Outfall of SB 33



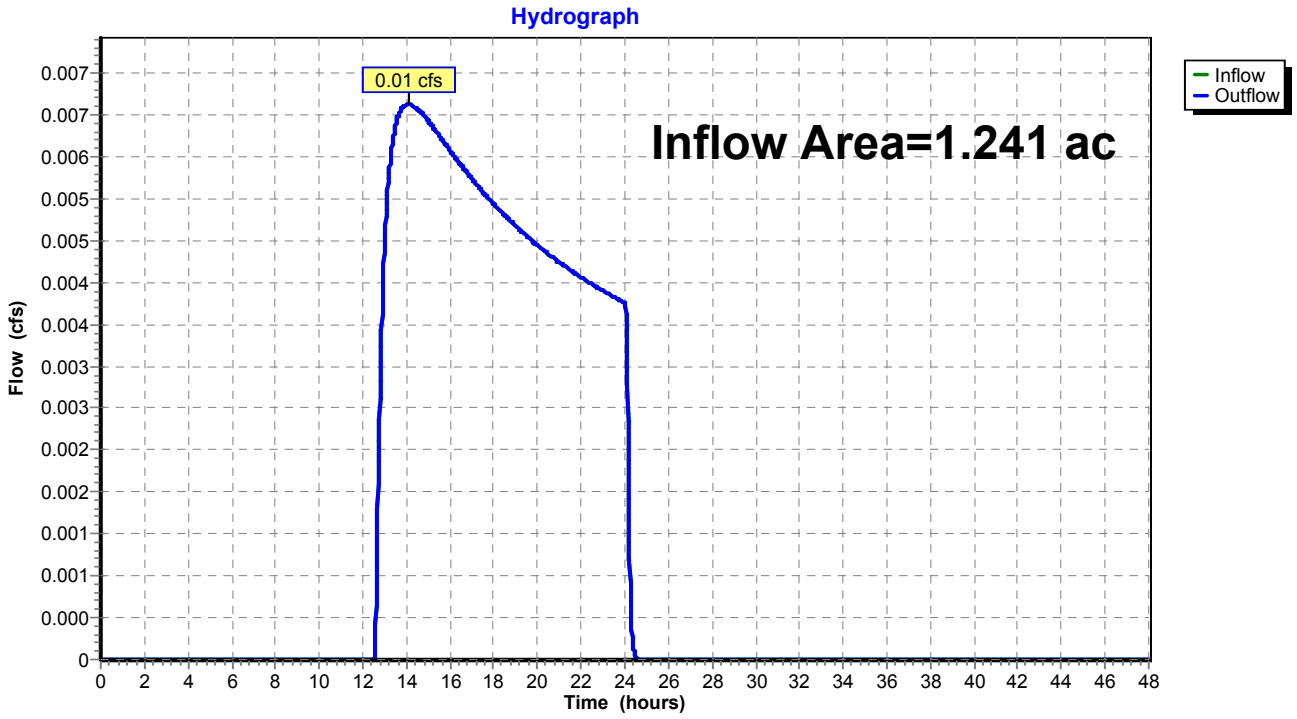
Summary for Reach 73R: Outfall of SB 34

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 1.241 ac, 0.00% Impervious, Inflow Depth = 0.05" for 2-Year event
Inflow = 0.01 cfs @ 14.09 hrs, Volume= 0.005 af
Outflow = 0.01 cfs @ 14.09 hrs, Volume= 0.005 af, Atten= 0%, Lag= 0.0 min

Routing by Muskingum-Cunge method, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs

Reach 73R: Outfall of SB 34



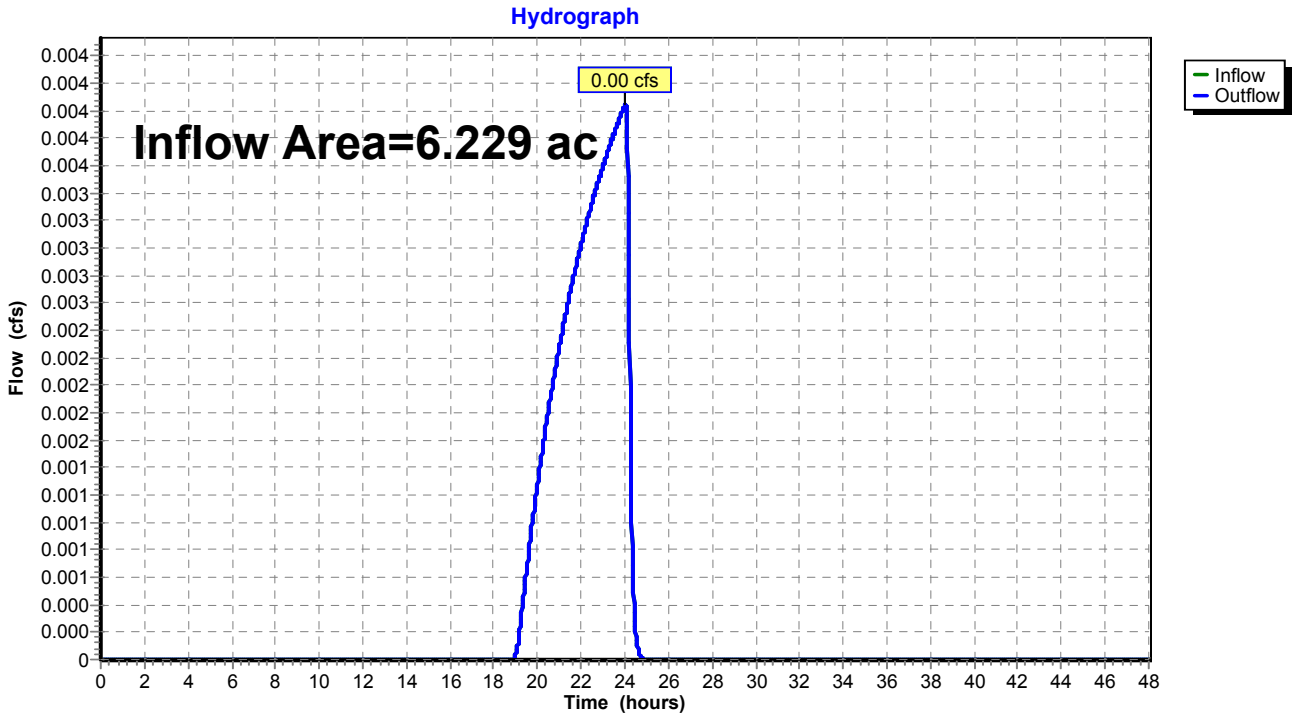
Summary for Reach 74R: Outfall of SB 35

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 6.229 ac, 0.00% Impervious, Inflow Depth = 0.00" for 2-Year event
Inflow = 0.00 cfs @ 24.02 hrs, Volume= 0.001 af
Outflow = 0.00 cfs @ 24.02 hrs, Volume= 0.001 af, Atten= 0%, Lag= 0.0 min

Routing by Muskingum-Cunge method, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs

Reach 74R: Outfall of SB 35



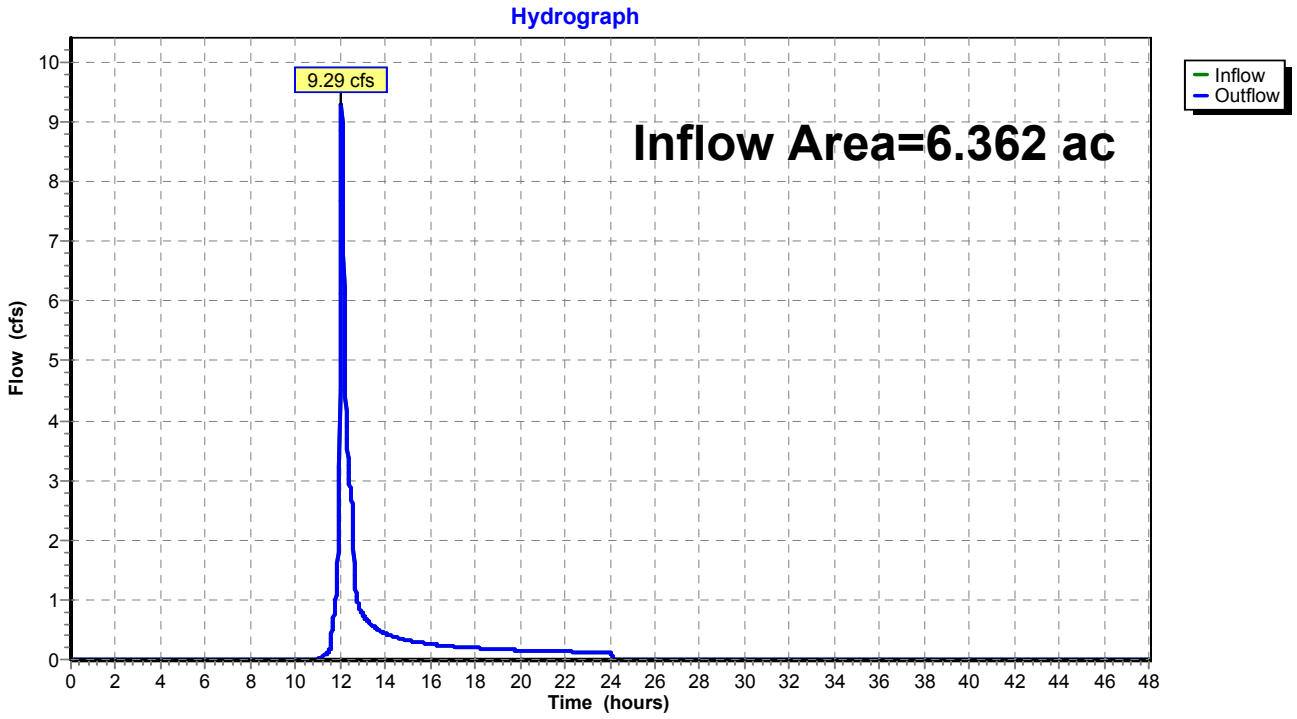
Summary for Reach 75R: Outfall of SB 19

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 6.362 ac, 0.00% Impervious, Inflow Depth = 1.00" for 2-Year event
Inflow = 9.29 cfs @ 12.06 hrs, Volume= 0.531 af
Outflow = 9.29 cfs @ 12.06 hrs, Volume= 0.531 af, Atten= 0%, Lag= 0.0 min

Routing by Muskingum-Cunge method, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs

Reach 75R: Outfall of SB 19



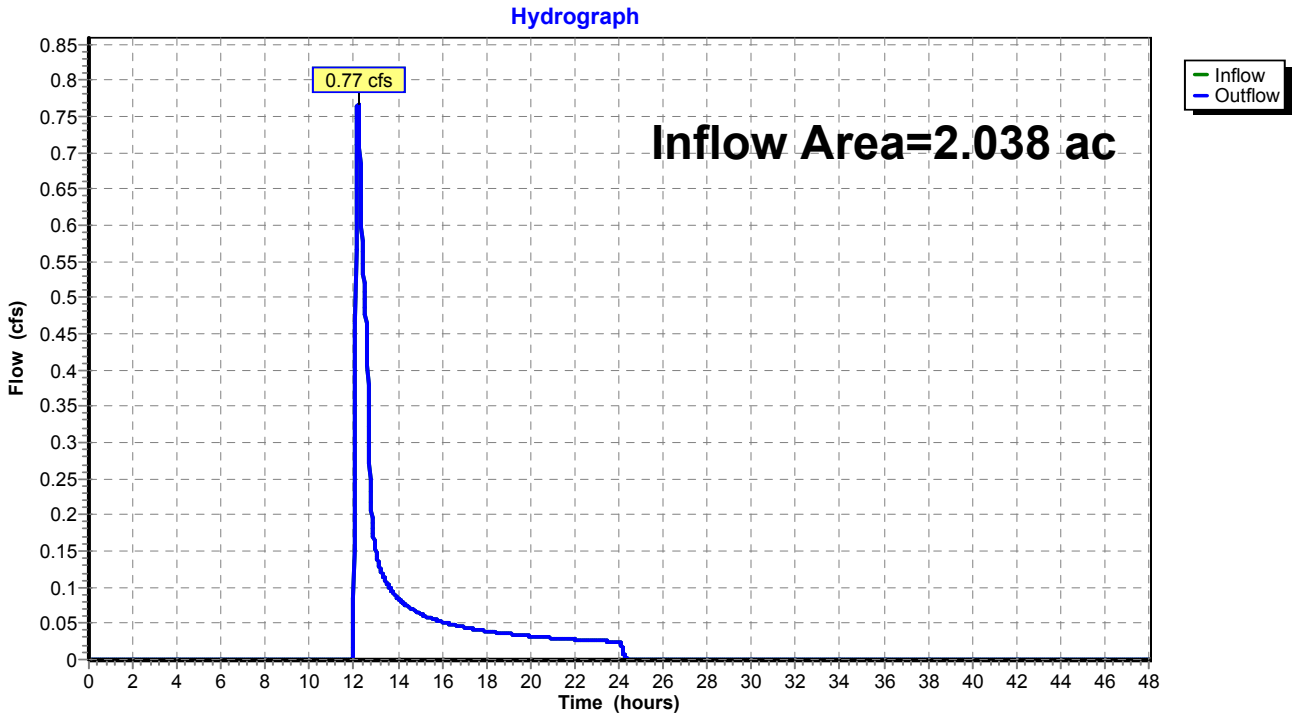
Summary for Reach 82R: Outfall of SB 27

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 2.038 ac, 0.00% Impervious, Inflow Depth = 0.46" for 2-Year event
Inflow = 0.77 cfs @ 12.19 hrs, Volume= 0.078 af
Outflow = 0.77 cfs @ 12.19 hrs, Volume= 0.078 af, Atten= 0%, Lag= 0.0 min

Routing by Muskingum-Cunge method, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs

Reach 82R: Outfall of SB 27



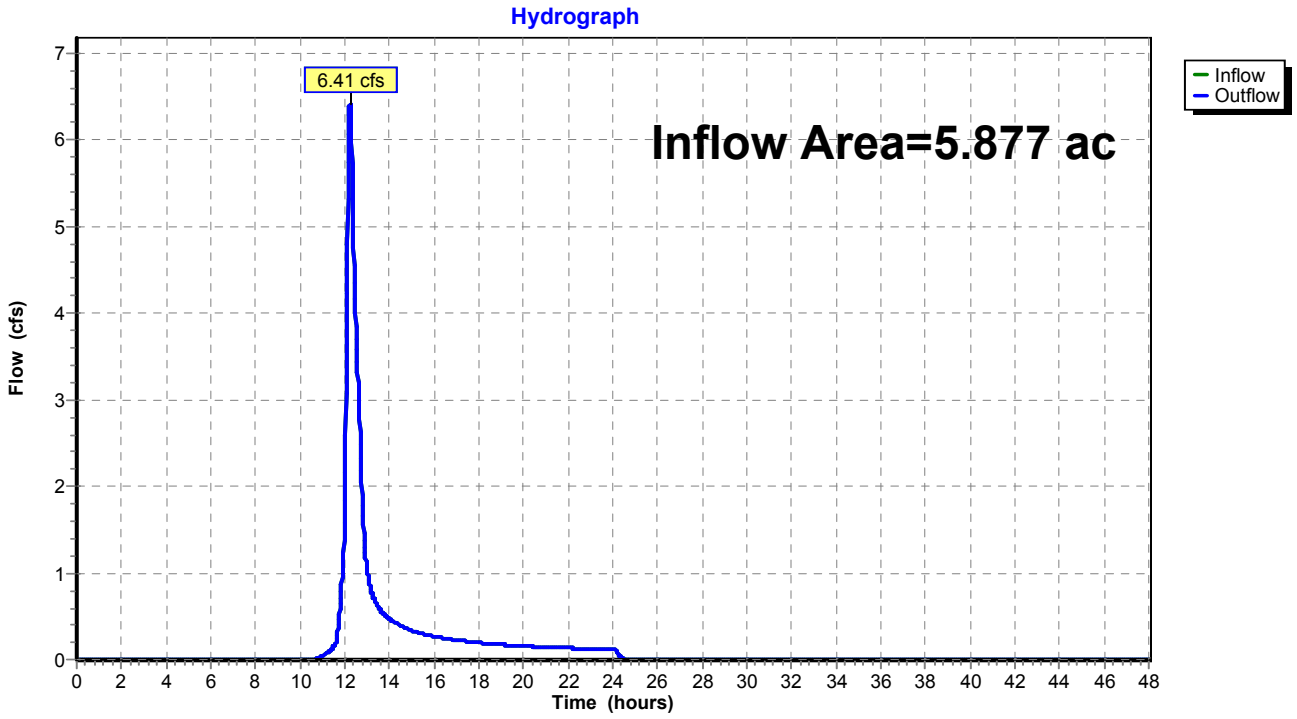
Summary for Reach 84R: Outfall of Future County Road H Subbasin

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 5.877 ac, 0.00% Impervious, Inflow Depth = 1.12" for 2-Year event
Inflow = 6.41 cfs @ 12.23 hrs, Volume= 0.547 af
Outflow = 6.41 cfs @ 12.23 hrs, Volume= 0.547 af, Atten= 0%, Lag= 0.0 min

Routing by Muskingum-Cunge method, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs

Reach 84R: Outfall of Future County Road H Subbasin



Time span=0.00-48.00 hrs, dt=0.02 hrs, 2401 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Muskingum-Cunge method - Pond routing by Stor-Ind method

Subcatchment1: Sub-basin1 Runoff Area=15.328 ac 0.00% Impervious Runoff Depth=2.84"
Tc=16.3 min CN=87 Runoff=47.16 cfs 3.626 af

Subcatchment2: Sub-basin 2 Runoff Area=4.913 ac 0.00% Impervious Runoff Depth=1.83"
Tc=12.2 min CN=75 Runoff=10.91 cfs 0.750 af

Subcatchment3: Sub-basin 3 Runoff Area=15.522 ac 0.00% Impervious Runoff Depth=1.83"
Tc=32.8 min CN=75 Runoff=21.31 cfs 2.371 af

Subcatchment4S: Sub-basin 4 Runoff Area=23.961 ac 0.00% Impervious Runoff Depth=2.65"
Tc=11.3 min CN=85 Runoff=82.03 cfs 5.301 af

Subcatchment5S: Sub-basin 5 Runoff Area=27.171 ac 0.00% Impervious Runoff Depth=2.48"
Tc=40.5 min CN=83 Runoff=45.83 cfs 5.610 af

Subcatchment6S: Sub-basin 6 Runoff Area=22.467 ac 0.00% Impervious Runoff Depth=2.06"
Tc=46.4 min CN=78 Runoff=29.03 cfs 3.863 af

Subcatchment7S: Sub-basin 7 Runoff Area=9.790 ac 0.00% Impervious Runoff Depth=0.98"
Tc=27.0 min CN=62 Runoff=6.82 cfs 0.801 af

Subcatchment8S: Sub-basin 8 Runoff Area=21.017 ac 0.00% Impervious Runoff Depth=2.31"
Tc=9.5 min CN=81 Runoff=66.85 cfs 4.041 af

Subcatchment9S: Sub-basin 9 Runoff Area=9.296 ac 0.00% Impervious Runoff Depth=2.39"
Tc=12.7 min CN=82 Runoff=27.07 cfs 1.853 af

Subcatchment10S: Sub-basin 10 Runoff Area=30.014 ac 0.00% Impervious Runoff Depth=2.31"
Tc=37.7 min CN=81 Runoff=49.02 cfs 5.770 af

Subcatchment11S: Sub-basin 11 Runoff Area=4.343 ac 0.00% Impervious Runoff Depth=1.91"
Tc=32.9 min CN=76 Runoff=6.20 cfs 0.691 af

Subcatchment12S: Sub-basin 12 Runoff Area=3.310 ac 0.00% Impervious Runoff Depth=2.22"
Tc=14.0 min CN=80 Runoff=8.55 cfs 0.613 af

Subcatchment13S: Sub-basin 13 Runoff Area=2.279 ac 0.00% Impervious Runoff Depth=2.39"
Tc=36.2 min CN=82 Runoff=3.95 cfs 0.454 af

Subcatchment14S: Sub-basin 14 Runoff Area=2.518 ac 0.00% Impervious Runoff Depth=2.57"
Tc=8.9 min CN=84 Runoff=9.18 cfs 0.538 af

Subcatchment15S: Sub-basin 15 Runoff Area=56.506 ac 0.00% Impervious Runoff Depth=2.39"
Tc=28.0 min CN=82 Runoff=112.23 cfs 11.261 af

Subcatchment16S: Sub-basin 16 Runoff Area=44.796 ac 0.00% Impervious Runoff Depth=2.31"
Tc=26.3 min CN=81 Runoff=88.44 cfs 8.612 af

Subcatchment17S: Sub-basin 17 Runoff Area=8.010 ac 0.00% Impervious Runoff Depth=2.75"
Tc=11.5 min CN=86 Runoff=28.00 cfs 1.833 af

Subcatchment18S: Sub-basin 18 Runoff Area=35.677 ac 0.00% Impervious Runoff Depth=2.57"
Tc=15.8 min CN=84 Runoff=101.21 cfs 7.627 af

Subcatchment19S: Sub-basin 19 Runoff Area=6.362 ac 0.00% Impervious Runoff Depth=2.06"
Tc=7.3 min CN=78 Runoff=19.90 cfs 1.094 af

Subcatchment20S: Sub-basin 20 Runoff Area=15.897 ac 0.00% Impervious Runoff Depth=2.65"
Tc=17.1 min CN=85 Runoff=44.95 cfs 3.517 af

Subcatchment21S: Sub-basin 21 Runoff Area=7.156 ac 0.00% Impervious Runoff Depth=3.13"
Tc=10.8 min CN=90 Runoff=29.08 cfs 1.865 af

Subcatchment22S: Sub-basin 22 Runoff Area=26.548 ac 0.00% Impervious Runoff Depth=2.39"
Tc=19.6 min CN=82 Runoff=63.21 cfs 5.291 af

Subcatchment23S: Sub-basin 23 Runoff Area=13.825 ac 0.00% Impervious Runoff Depth=3.33"
Tc=9.4 min CN=92 Runoff=62.35 cfs 3.836 af

Subcatchment24S: Sub-basin 24 Runoff Area=13.883 ac 0.00% Impervious Runoff Depth=2.65"
Tc=19.0 min CN=85 Runoff=37.26 cfs 3.071 af

Subcatchment25S: Sub-basin 25 Runoff Area=6.657 ac 0.00% Impervious Runoff Depth=1.83"
Tc=22.6 min CN=75 Runoff=11.10 cfs 1.017 af

Subcatchment26S: Sub-basin 26 Runoff Area=0.823 ac 0.00% Impervious Runoff Depth=1.22"
Tc=38.2 min CN=66 Runoff=0.64 cfs 0.084 af

Subcatchment27S: Sub-basin 27 Runoff Area=2.038 ac 0.00% Impervious Runoff Depth=1.22"
Tc=13.0 min CN=66 Runoff=2.67 cfs 0.207 af

Subcatchment28S: Sub-basin 28 Runoff Area=5.784 ac 0.00% Impervious Runoff Depth=0.19"
Tc=23.9 min CN=44 Runoff=0.36 cfs 0.094 af

Subcatchment29S: Sub-basin 29 Runoff Area=1.255 ac 0.00% Impervious Runoff Depth=0.07"
Tc=26.9 min CN=39 Runoff=0.01 cfs 0.007 af

Subcatchment30S: Sub-basin 30 Runoff Area=31.577 ac 0.00% Impervious Runoff Depth=0.14"
Tc=45.9 min CN=42 Runoff=0.75 cfs 0.366 af

Subcatchment31S: Sub-basin 31 Runoff Area=0.884 ac 0.00% Impervious Runoff Depth=0.07"
Tc=30.2 min CN=39 Runoff=0.01 cfs 0.005 af

Subcatchment32S: Sub-basin 32 Runoff Area=0.878 ac 0.00% Impervious Runoff Depth=0.07"
Tc=27.6 min CN=39 Runoff=0.01 cfs 0.005 af

Subcatchment33S: Sub-basin 33 Runoff Area=3.237 ac 0.00% Impervious Runoff Depth=0.33"
Tc=19.9 min CN=48 Runoff=0.49 cfs 0.088 af

Subcatchment34S: Sub-basin 34 Runoff Area=1.241 ac 0.00% Impervious Runoff Depth=0.36"
Tc=12.1 min CN=49 Runoff=0.23 cfs 0.038 af

Subcatchment35S: Sub-basin 35 Runoff Area=6.229 ac 0.00% Impervious Runoff Depth=0.17"
Tc=16.7 min CN=43 Runoff=0.33 cfs 0.086 af

Subcatchment36S: Sub-basin 36 Runoff Area=11.210 ac 0.00% Impervious Runoff Depth=2.14"
Tc=52.2 min CN=79 Runoff=14.13 cfs 2.002 af

Subcatchment83S: County Road H Runoff Area=5.877 ac 0.00% Impervious Runoff Depth=2.22"
Tc=19.1 min CN=80 Runoff=13.12 cfs 1.089 af

Reach 37R: Outfall of SB 2, 3, 7 Inflow=33.01 cfs 3.922 af
Outflow=33.01 cfs 3.922 af

Reach 39R: Outfall of SB 1, 4, 5, 6, 9, 10, 11, 36 Inflow=217.12 cfs 28.714 af
Outflow=217.12 cfs 28.714 af

Reach 40R: 60 in SB 4 Avg. Flow Depth=1.95' Max Vel=31.08 fps Inflow=217.16 cfs 28.714 af
60.0" Round Pipe n=0.013 L=718.0' S=0.0330 '/' Capacity=473.08 cfs Outflow=217.12 cfs 28.714 af

Reach 41R: Channel in SB 9, 10 Avg. Flow Depth=0.55' Max Vel=9.14 fps Inflow=27.07 cfs 1.853 af
n=0.050 L=1,660.0' S=0.0048 '/' Capacity=280.23 cfs Outflow=25.05 cfs 1.853 af

Reach 46R: Channel SB1 Avg. Flow Depth=0.87' Max Vel=6.34 fps Inflow=47.16 cfs 3.626 af
n=0.050 L=841.0' S=0.0071 '/' Capacity=296.86 cfs Outflow=46.50 cfs 3.626 af

Reach 48R: Outfall of SB 8, 13 Inflow=67.32 cfs 4.495 af
Outflow=67.32 cfs 4.495 af

Reach 49R: Channel SB8 Avg. Flow Depth=0.83' Max Vel=6.23 fps Inflow=66.85 cfs 4.041 af
n=0.050 L=521.0' S=0.0077 '/' Capacity=706.58 cfs Outflow=65.69 cfs 4.041 af

Reach 50R: Outfall of SB 12 Inflow=8.55 cfs 0.613 af
Outflow=8.55 cfs 0.613 af

Reach 51R: Outfall of SB 14 Inflow=9.18 cfs 0.538 af
Outflow=9.18 cfs 0.538 af

Reach 52R: Outfall of SB 17 Inflow=28.00 cfs 1.833 af
Outflow=28.00 cfs 1.833 af

Reach 53R: Outfall of SB 18 Inflow=101.21 cfs 7.627 af
Outflow=101.21 cfs 7.627 af

Reach 54R: Outfall of SB 25 Inflow=11.10 cfs 1.017 af
Outflow=11.10 cfs 1.017 af

Reach 55R: Outfall of SB 26 Inflow=0.64 cfs 0.084 af
Outflow=0.64 cfs 0.084 af

Reach 56R: Outfall of SB 23, 24 Inflow=87.74 cfs 6.907 af
Outflow=87.74 cfs 6.907 af

Reach 59R: Outfall of SB 20, 22 Inflow=107.32 cfs 8.807 af
Outflow=107.32 cfs 8.807 af

Reach 61R: Outfall of SB 15, 16, 21 Inflow=212.59 cfs 21.738 af
Outflow=212.59 cfs 21.738 af

Reach 67R: Outfall of SB 28 Inflow=0.36 cfs 0.094 af
Outflow=0.36 cfs 0.094 af

Reach 68R: Outfall of SB 29 Inflow=0.01 cfs 0.007 af
Outflow=0.01 cfs 0.007 af

Reach 69R: Outfall of SB 30 Inflow=0.75 cfs 0.366 af
Outflow=0.75 cfs 0.366 af

Reach 70R: Outfall of SB 31 Inflow=0.01 cfs 0.005 af
Outflow=0.01 cfs 0.005 af

Reach 71R: Outfall of SB 32 Inflow=0.01 cfs 0.005 af
Outflow=0.01 cfs 0.005 af

Reach 72R: Outfall of SB 33 Inflow=0.49 cfs 0.088 af
Outflow=0.49 cfs 0.088 af

Reach 73R: Outfall of SB 34 Inflow=0.23 cfs 0.038 af
Outflow=0.23 cfs 0.038 af

Reach 74R: Outfall of SB 35 Inflow=0.33 cfs 0.086 af
Outflow=0.33 cfs 0.086 af

Reach 75R: Outfall of SB 19 Inflow=19.90 cfs 1.094 af
Outflow=19.90 cfs 1.094 af

Reach 82R: Outfall of SB 27 Inflow=2.67 cfs 0.207 af
Outflow=2.67 cfs 0.207 af

Reach 84R: Outfall of Future County Road H Subbasin Inflow=13.12 cfs 1.089 af
Outflow=13.12 cfs 1.089 af

Total Runoff Area = 498.279 ac Runoff Volume = 89.375 af Average Runoff Depth = 2.15"
100.00% Pervious = 498.279 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment 1: Sub-basin1

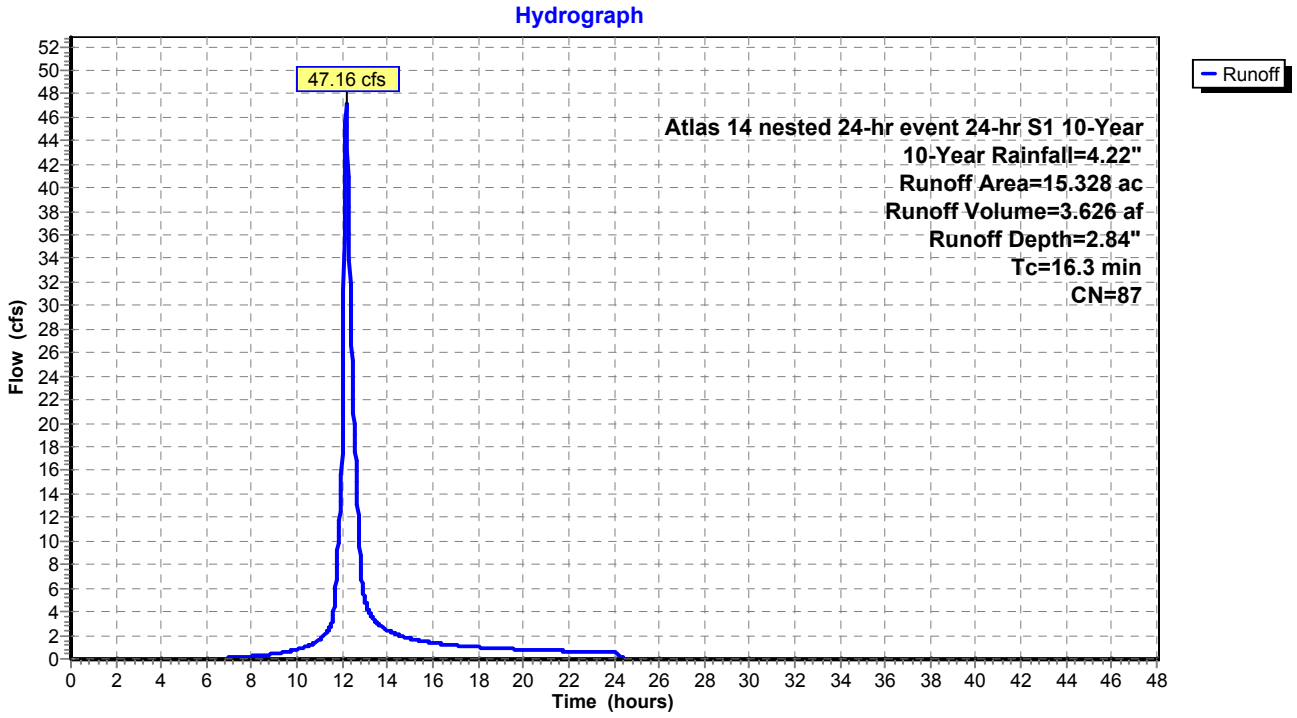
Runoff = 47.16 cfs @ 12.18 hrs, Volume= 3.626 af, Depth= 2.84"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
Atlas 14 nested 24-hr event 24-hr S1 10-Year 10-Year Rainfall=4.22"

	Area (ac)	CN	Description
*	15.328	87	
	15.328		100.00% Pervious Area

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

Subcatchment 1: Sub-basin1



Summary for Subcatchment 2: Sub-basin 2

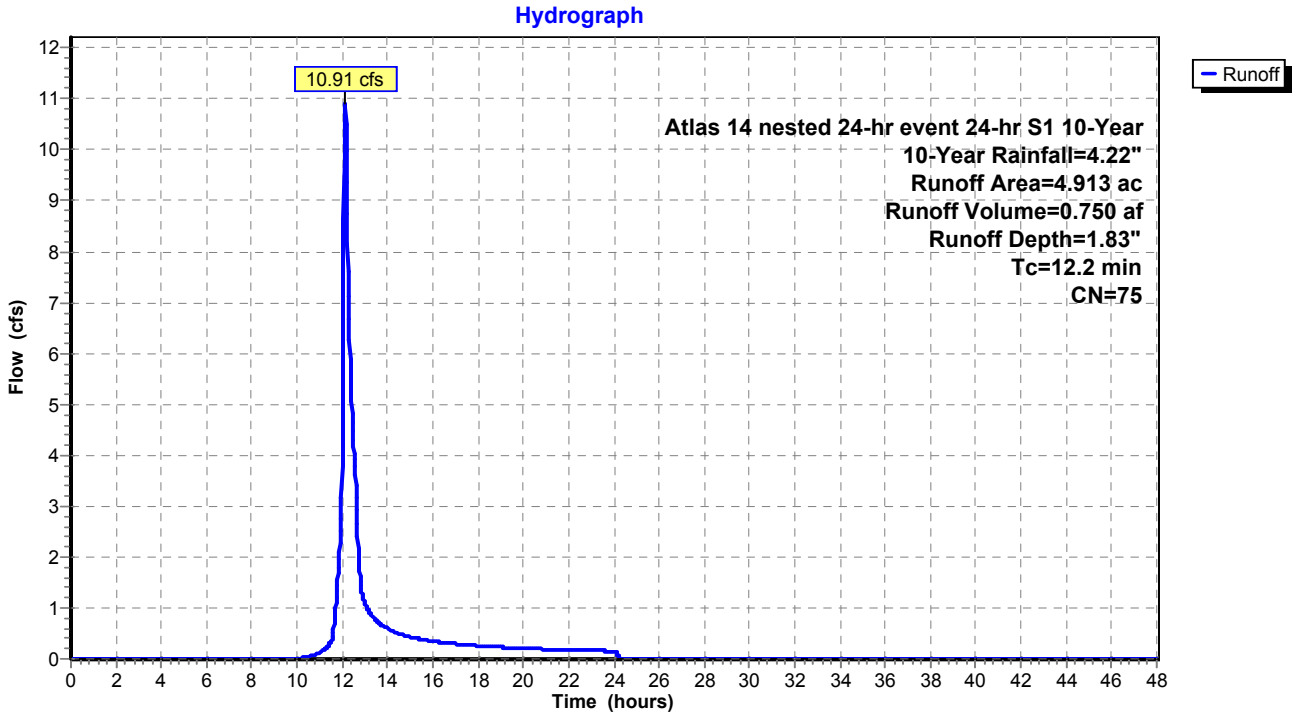
Runoff = 10.91 cfs @ 12.13 hrs, Volume= 0.750 af, Depth= 1.83"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
Atlas 14 nested 24-hr event 24-hr S1 10-Year 10-Year Rainfall=4.22"

	Area (ac)	CN	Description
*	4.913	75	
	4.913		100.00% Pervious Area

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

Subcatchment 2: Sub-basin 2



Summary for Subcatchment 3: Sub-basin 3

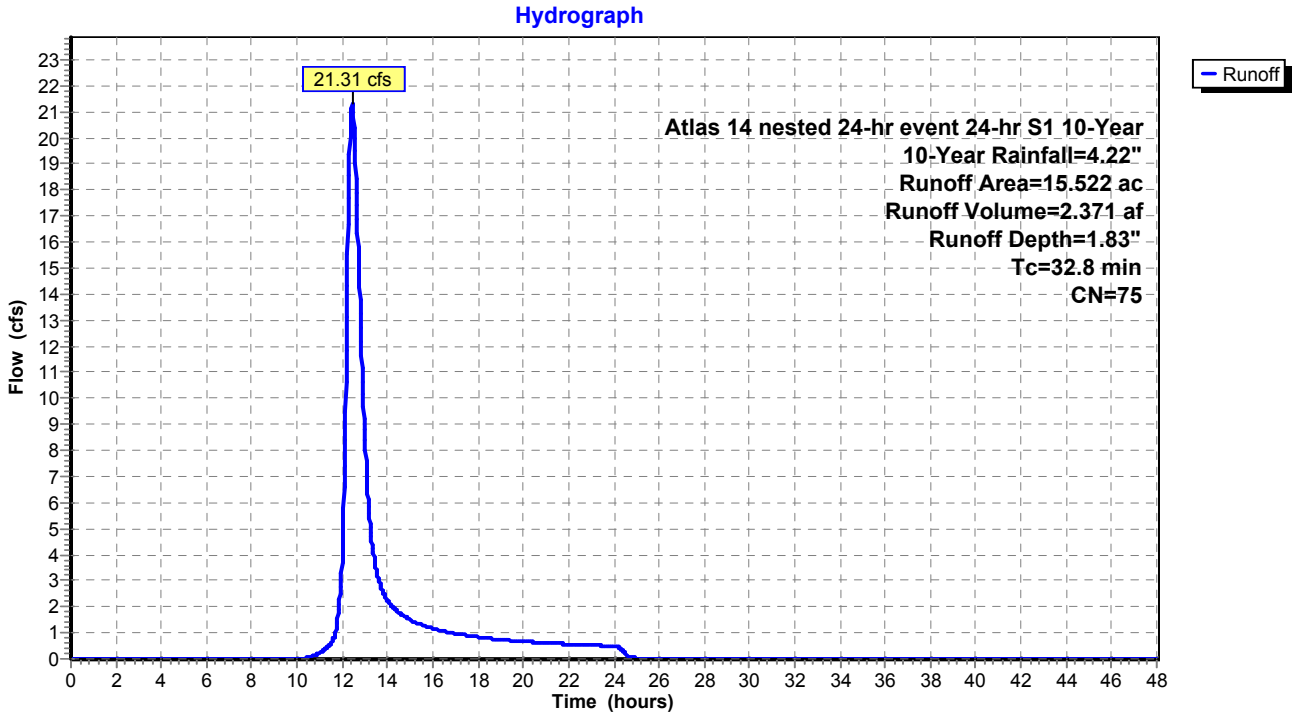
Runoff = 21.31 cfs @ 12.43 hrs, Volume= 2.371 af, Depth= 1.83"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
Atlas 14 nested 24-hr event 24-hr S1 10-Year 10-Year Rainfall=4.22"

	Area (ac)	CN	Description
*	15.522	75	
	15.522		100.00% Pervious Area

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

Subcatchment 3: Sub-basin 3



Summary for Subcatchment 4S: Sub-basin 4

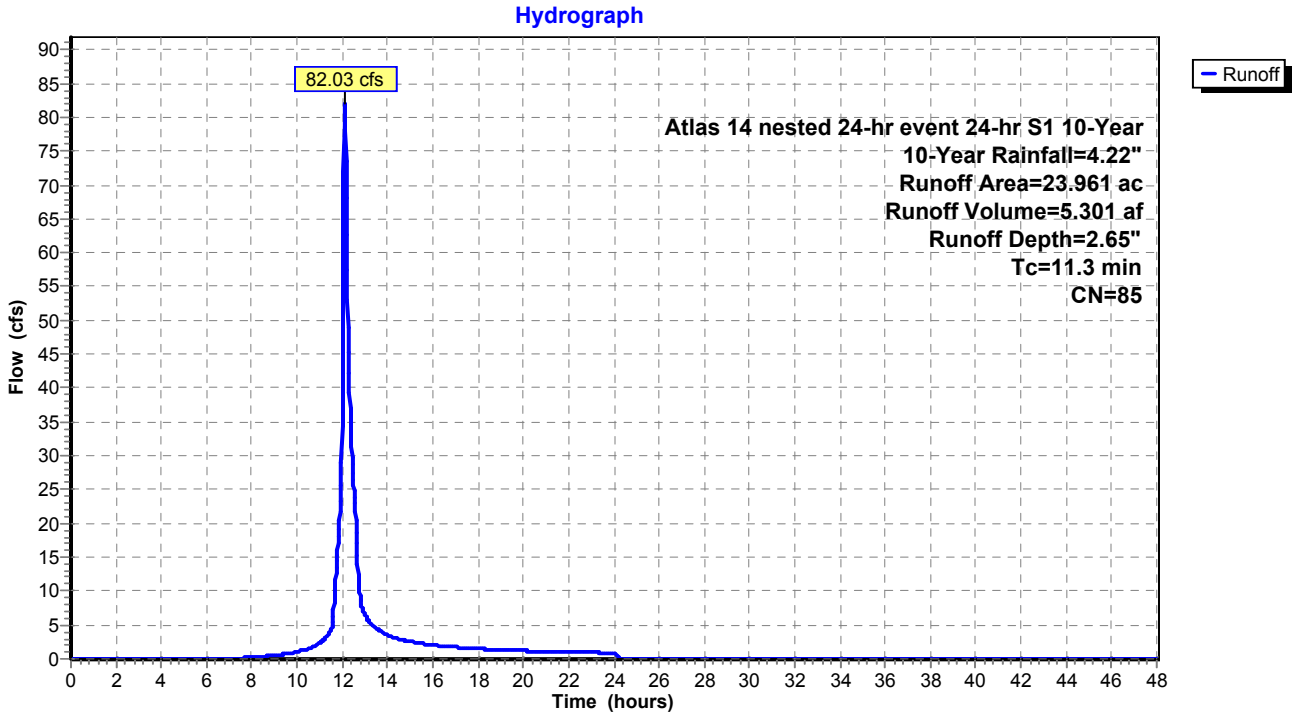
Runoff = 82.03 cfs @ 12.11 hrs, Volume= 5.301 af, Depth= 2.65"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
Atlas 14 nested 24-hr event 24-hr S1 10-Year 10-Year Rainfall=4.22"

	Area (ac)	CN	Description
*	23.961	85	
	23.961		100.00% Pervious Area

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

Subcatchment 4S: Sub-basin 4



Summary for Subcatchment 5S: Sub-basin 5

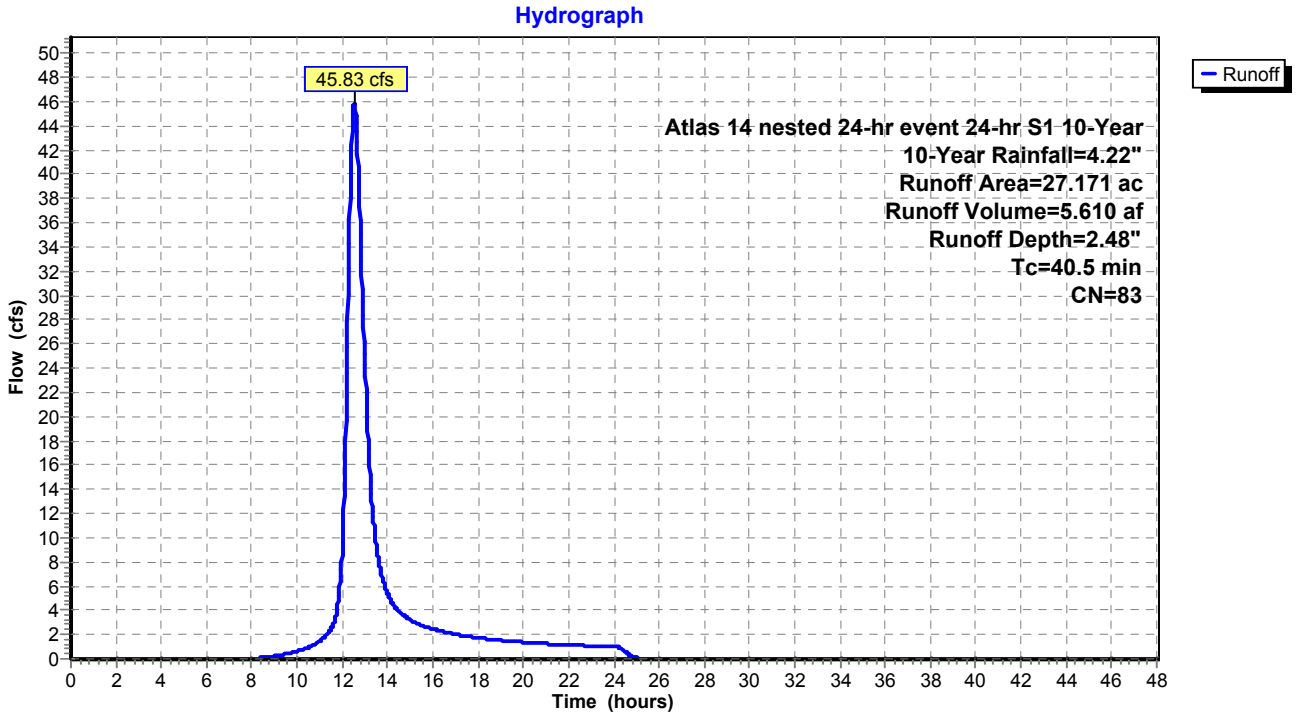
Runoff = 45.83 cfs @ 12.53 hrs, Volume= 5.610 af, Depth= 2.48"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
Atlas 14 nested 24-hr event 24-hr S1 10-Year 10-Year Rainfall=4.22"

	Area (ac)	CN	Description
*	27.171	83	
	27.171		100.00% Pervious Area

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

Subcatchment 5S: Sub-basin 5



Summary for Subcatchment 6S: Sub-basin 6

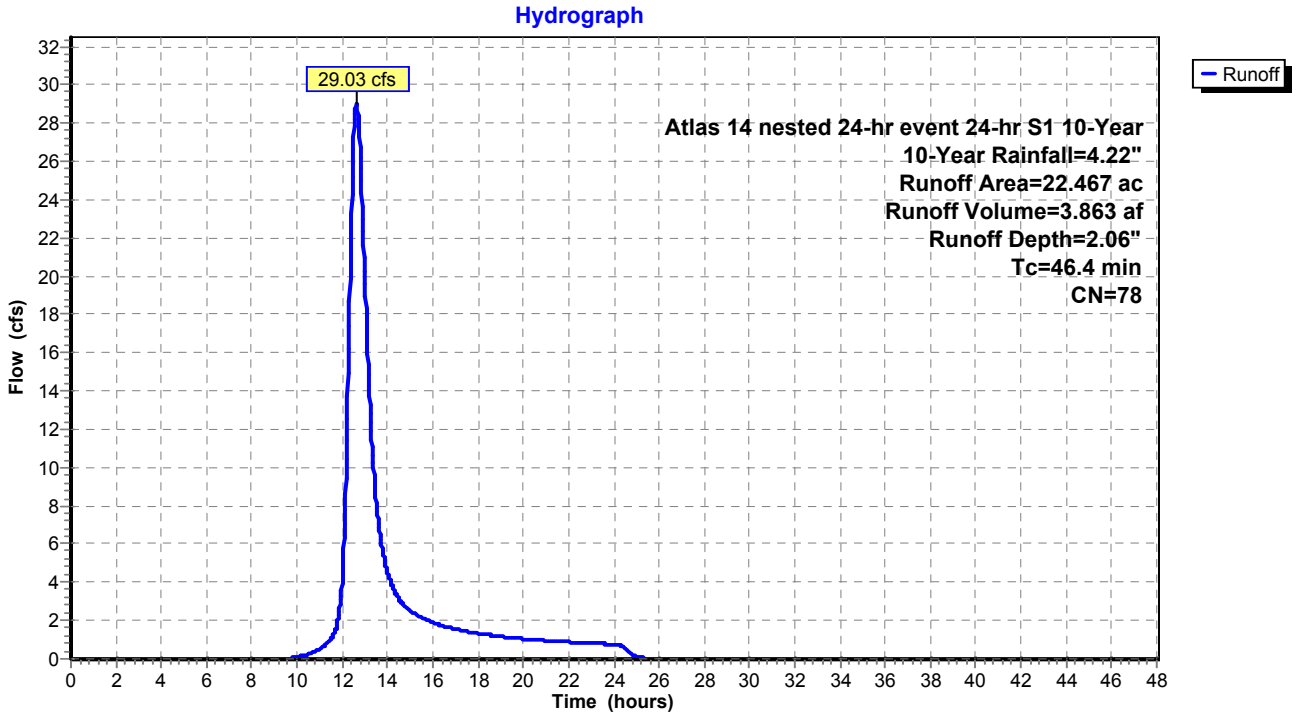
Runoff = 29.03 cfs @ 12.63 hrs, Volume= 3.863 af, Depth= 2.06"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
Atlas 14 nested 24-hr event 24-hr S1 10-Year 10-Year Rainfall=4.22"

	Area (ac)	CN	Description
*	22.467	78	
	22.467		100.00% Pervious Area

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

Subcatchment 6S: Sub-basin 6



Summary for Subcatchment 7S: Sub-basin 7

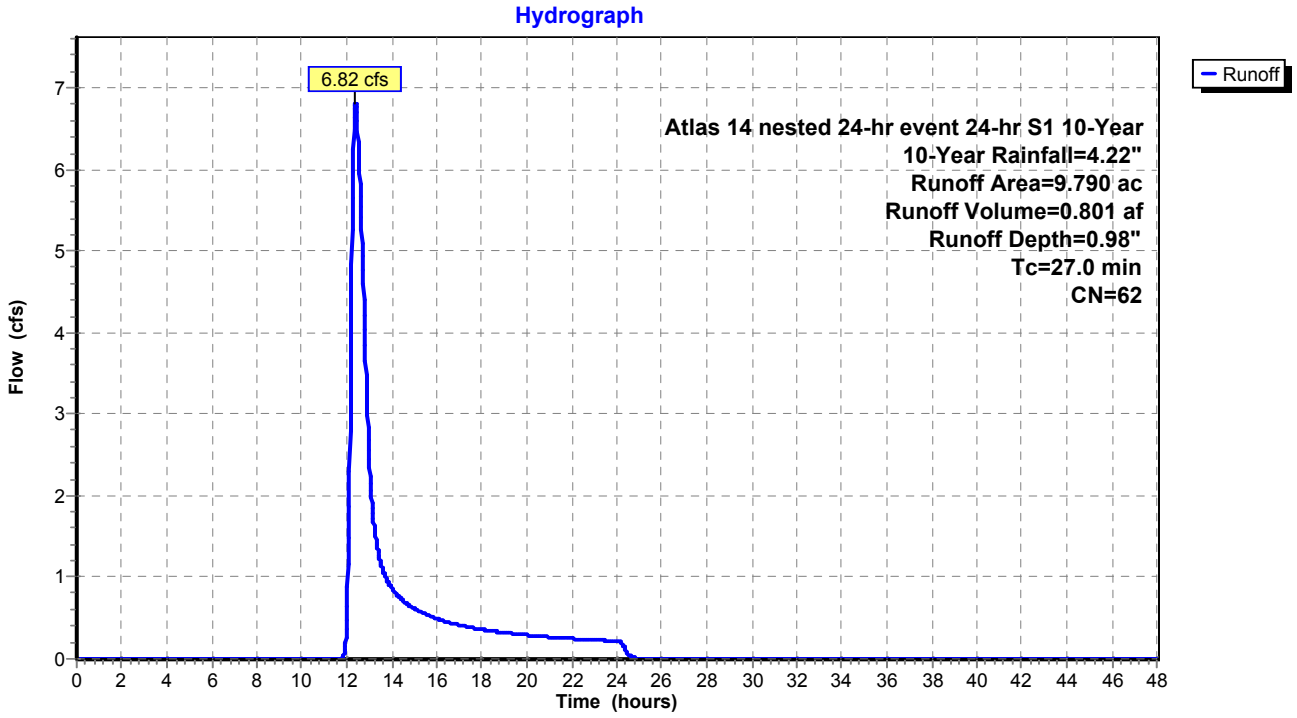
Runoff = 6.82 cfs @ 12.39 hrs, Volume= 0.801 af, Depth= 0.98"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
Atlas 14 nested 24-hr event 24-hr S1 10-Year 10-Year Rainfall=4.22"

	Area (ac)	CN	Description
*	9.790	62	
	9.790		100.00% Pervious Area

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

Subcatchment 7S: Sub-basin 7



Summary for Subcatchment 8S: Sub-basin 8

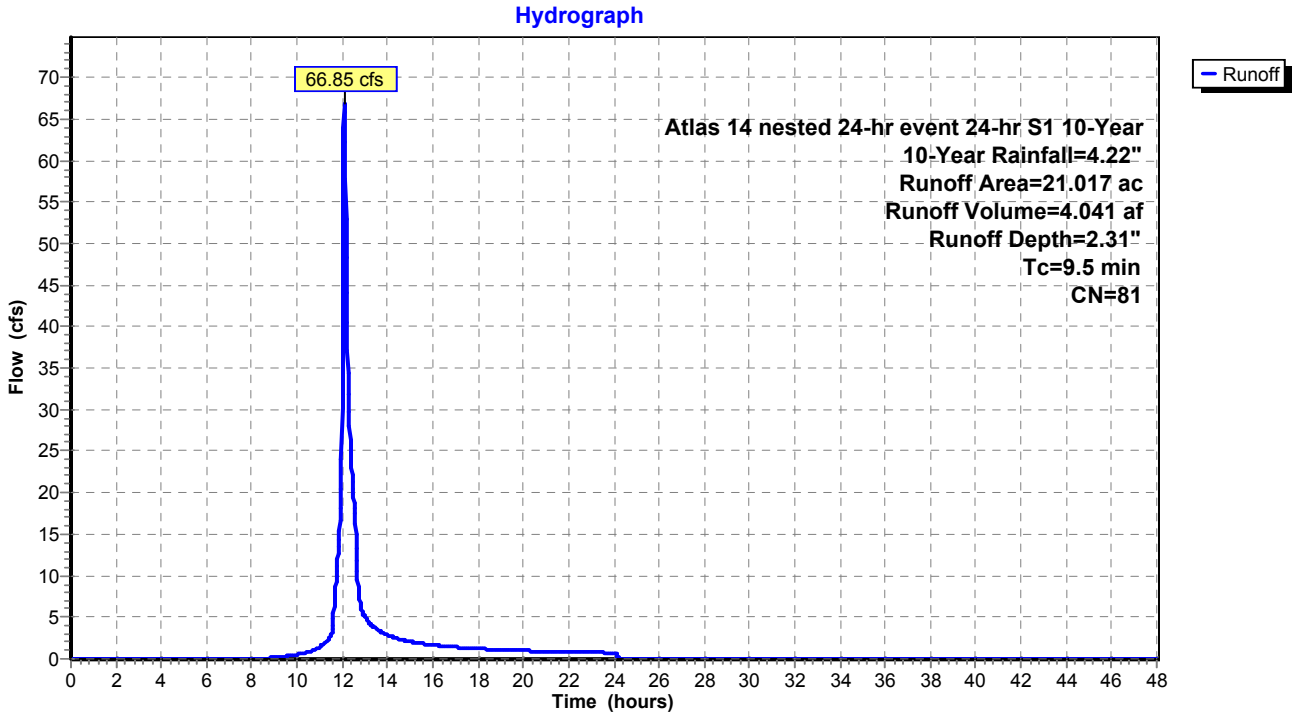
Runoff = 66.85 cfs @ 12.08 hrs, Volume= 4.041 af, Depth= 2.31"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
Atlas 14 nested 24-hr event 24-hr S1 10-Year 10-Year Rainfall=4.22"

	Area (ac)	CN	Description
*	21.017	81	
	21.017		100.00% Pervious Area

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

Subcatchment 8S: Sub-basin 8



Summary for Subcatchment 9S: Sub-basin 9

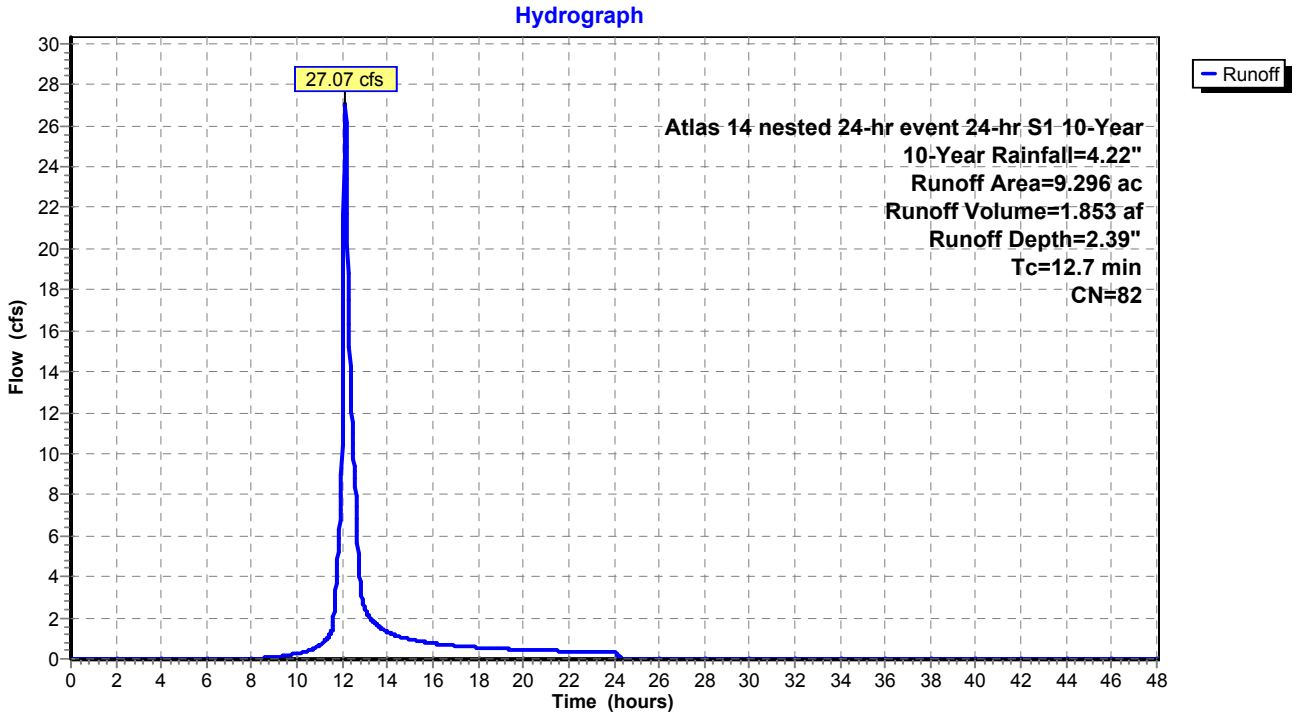
Runoff = 27.07 cfs @ 12.13 hrs, Volume= 1.853 af, Depth= 2.39"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
Atlas 14 nested 24-hr event 24-hr S1 10-Year 10-Year Rainfall=4.22"

	Area (ac)	CN	Description
*	9.296	82	
	9.296		100.00% Pervious Area

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

Subcatchment 9S: Sub-basin 9



Summary for Subcatchment 10S: Sub-basin 10

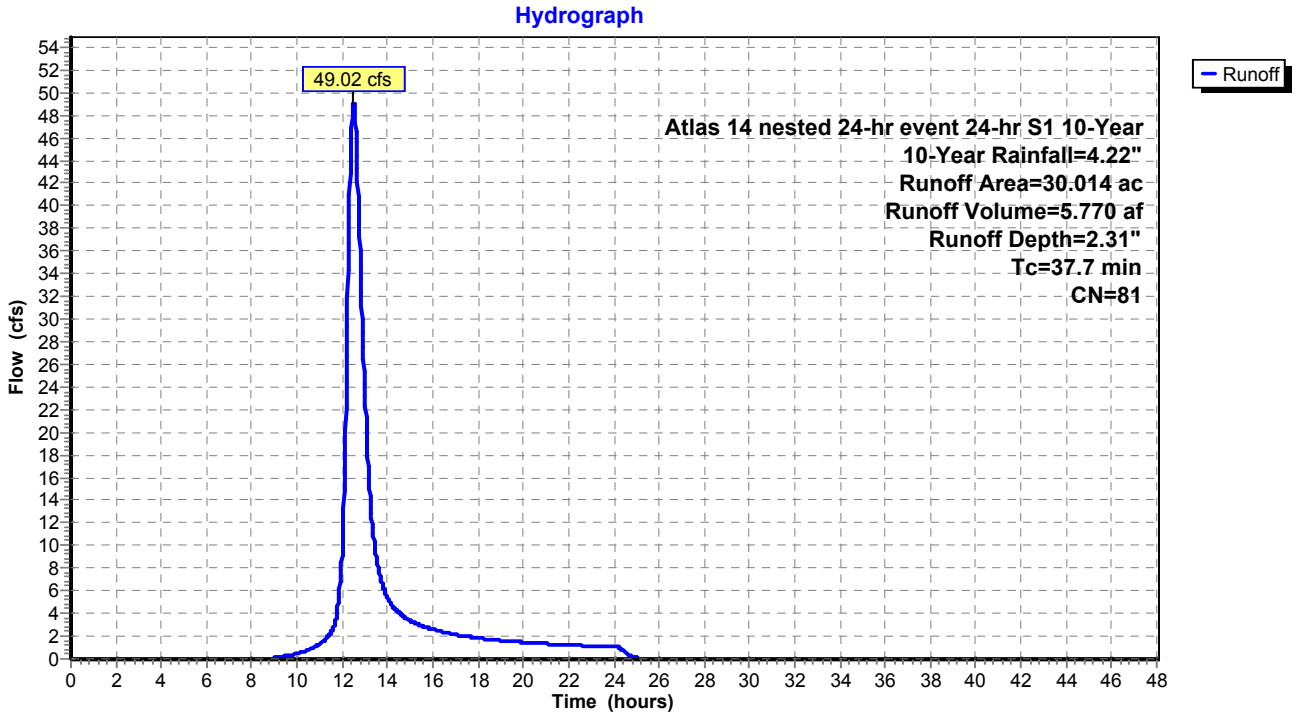
Runoff = 49.02 cfs @ 12.49 hrs, Volume= 5.770 af, Depth= 2.31"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
Atlas 14 nested 24-hr event 24-hr S1 10-Year 10-Year Rainfall=4.22"

	Area (ac)	CN	Description
*	30.014	81	
	30.014		100.00% Pervious Area

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

Subcatchment 10S: Sub-basin 10



Summary for Subcatchment 11S: Sub-basin 11

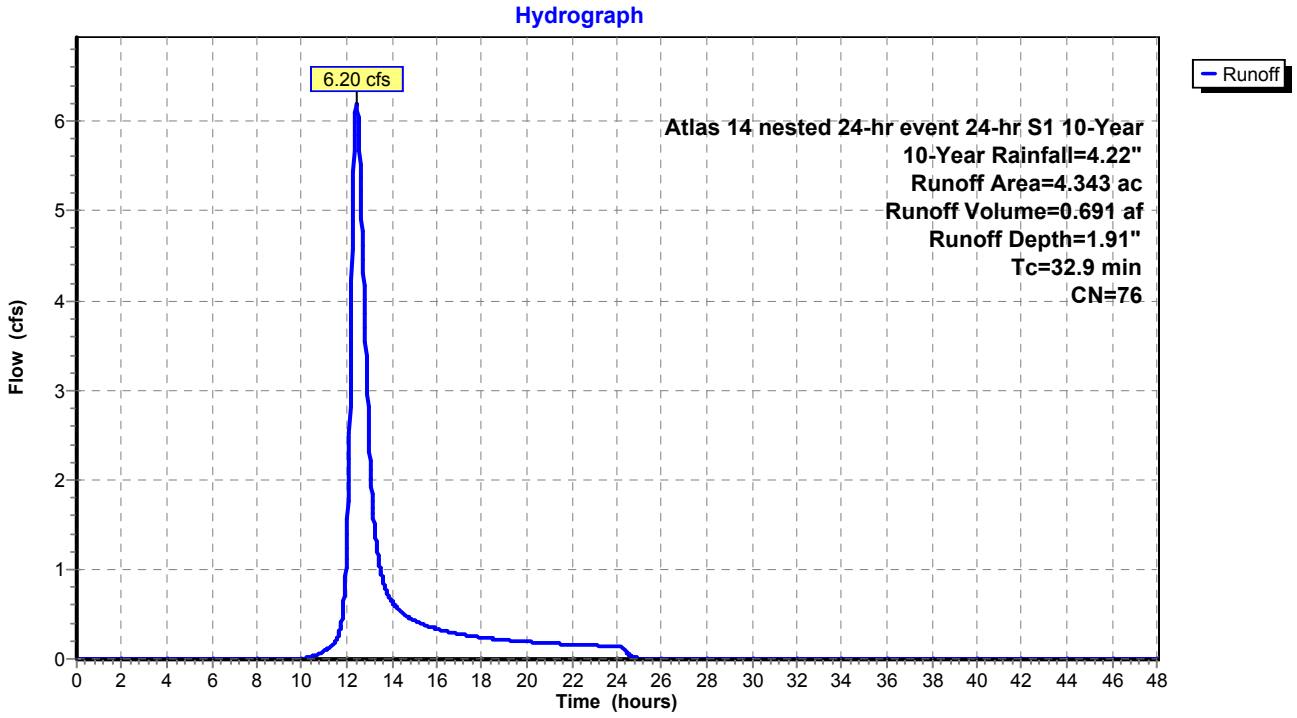
Runoff = 6.20 cfs @ 12.43 hrs, Volume= 0.691 af, Depth= 1.91"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
Atlas 14 nested 24-hr event 24-hr S1 10-Year 10-Year Rainfall=4.22"

	Area (ac)	CN	Description
*	4.343	76	
	4.343		100.00% Pervious Area

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

Subcatchment 11S: Sub-basin 11



Summary for Subcatchment 12S: Sub-basin 12

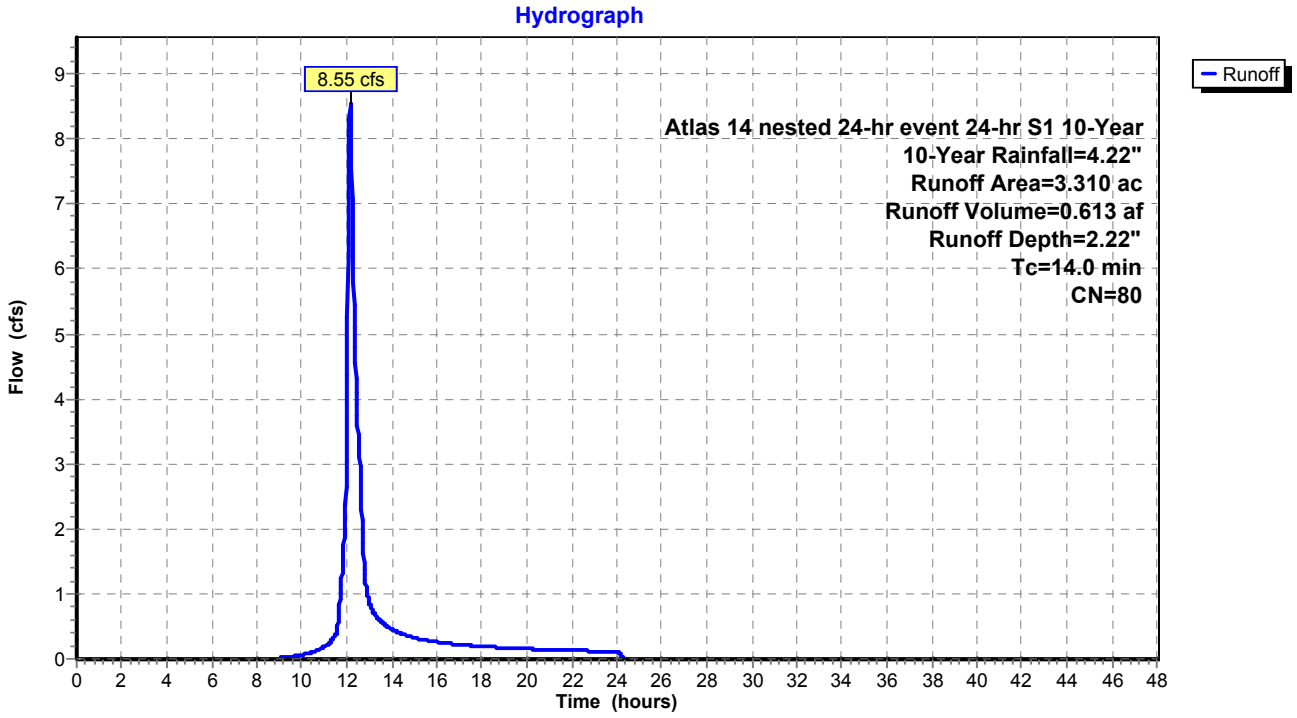
Runoff = 8.55 cfs @ 12.15 hrs, Volume= 0.613 af, Depth= 2.22"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
Atlas 14 nested 24-hr event 24-hr S1 10-Year 10-Year Rainfall=4.22"

	Area (ac)	CN	Description
*	3.310	80	
	3.310		100.00% Pervious Area

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

Subcatchment 12S: Sub-basin 12



Summary for Subcatchment 13S: Sub-basin 13

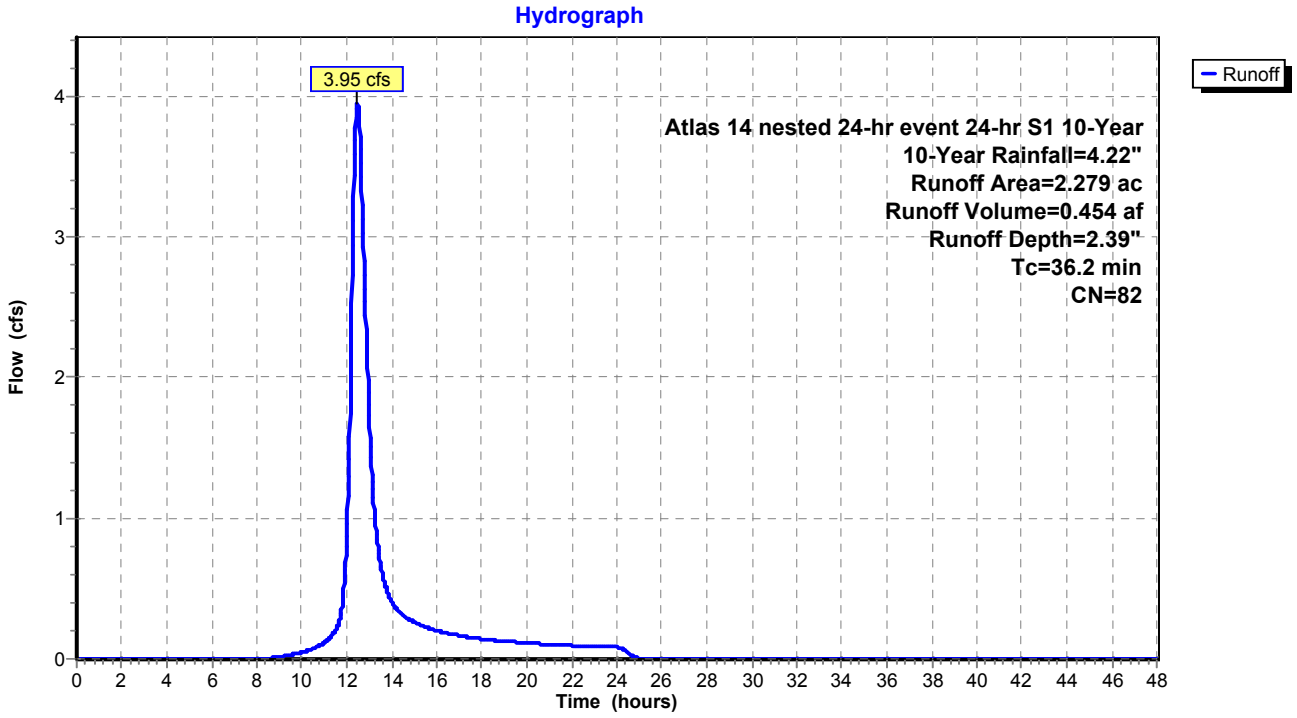
Runoff = 3.95 cfs @ 12.46 hrs, Volume= 0.454 af, Depth= 2.39"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
Atlas 14 nested 24-hr event 24-hr S1 10-Year 10-Year Rainfall=4.22"

	Area (ac)	CN	Description
*	2.279	82	
	2.279		100.00% Pervious Area

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

Subcatchment 13S: Sub-basin 13



Summary for Subcatchment 14S: Sub-basin 14

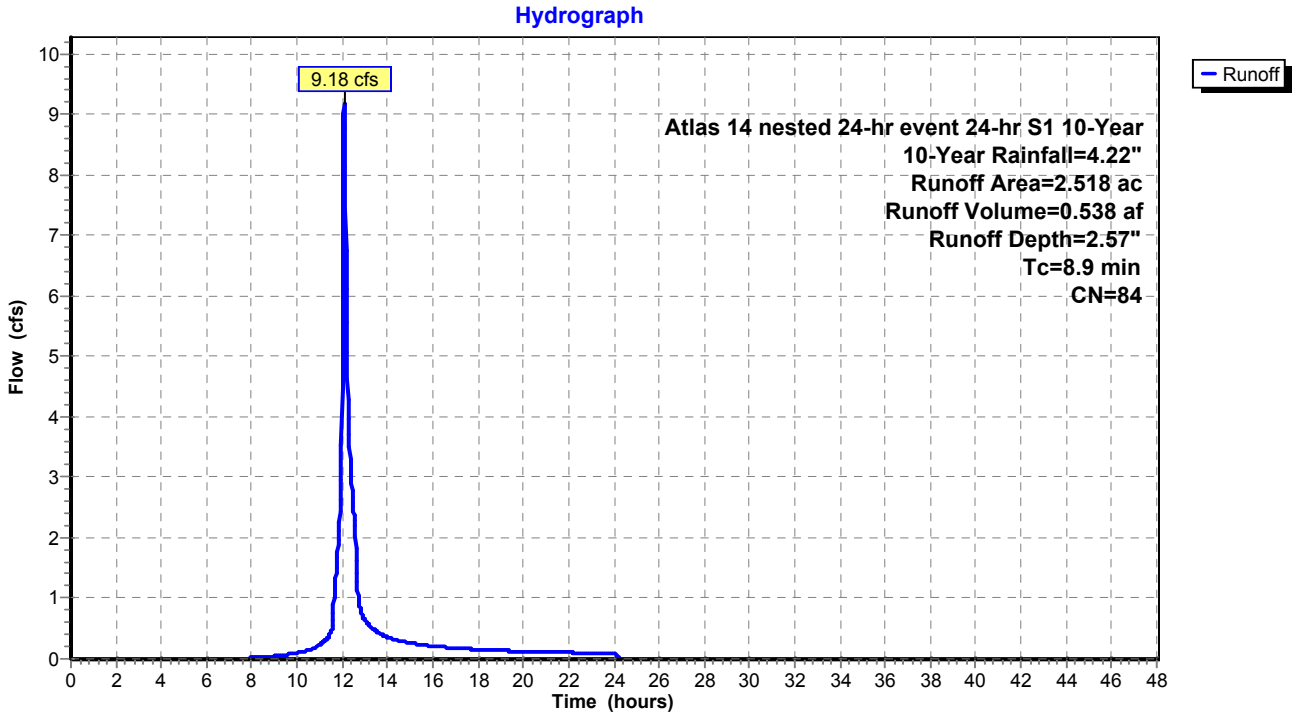
Runoff = 9.18 cfs @ 12.08 hrs, Volume= 0.538 af, Depth= 2.57"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
Atlas 14 nested 24-hr event 24-hr S1 10-Year 10-Year Rainfall=4.22"

	Area (ac)	CN	Description
*	2.518	84	
	2.518		100.00% Pervious Area

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

Subcatchment 14S: Sub-basin 14



Summary for Subcatchment 15S: Sub-basin 15

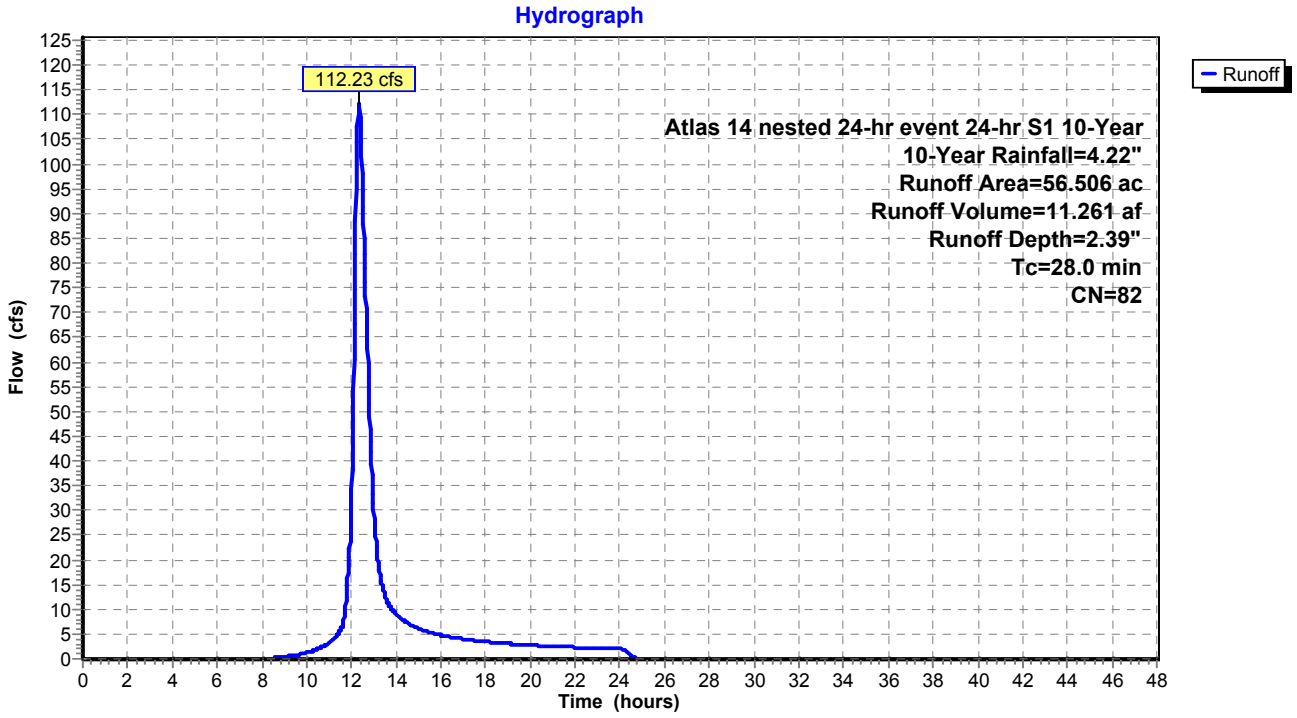
Runoff = 112.23 cfs @ 12.35 hrs, Volume= 11.261 af, Depth= 2.39"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
Atlas 14 nested 24-hr event 24-hr S1 10-Year 10-Year Rainfall=4.22"

	Area (ac)	CN	Description
*	56.506	82	
	56.506		100.00% Pervious Area

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

Subcatchment 15S: Sub-basin 15



Summary for Subcatchment 16S: Sub-basin 16

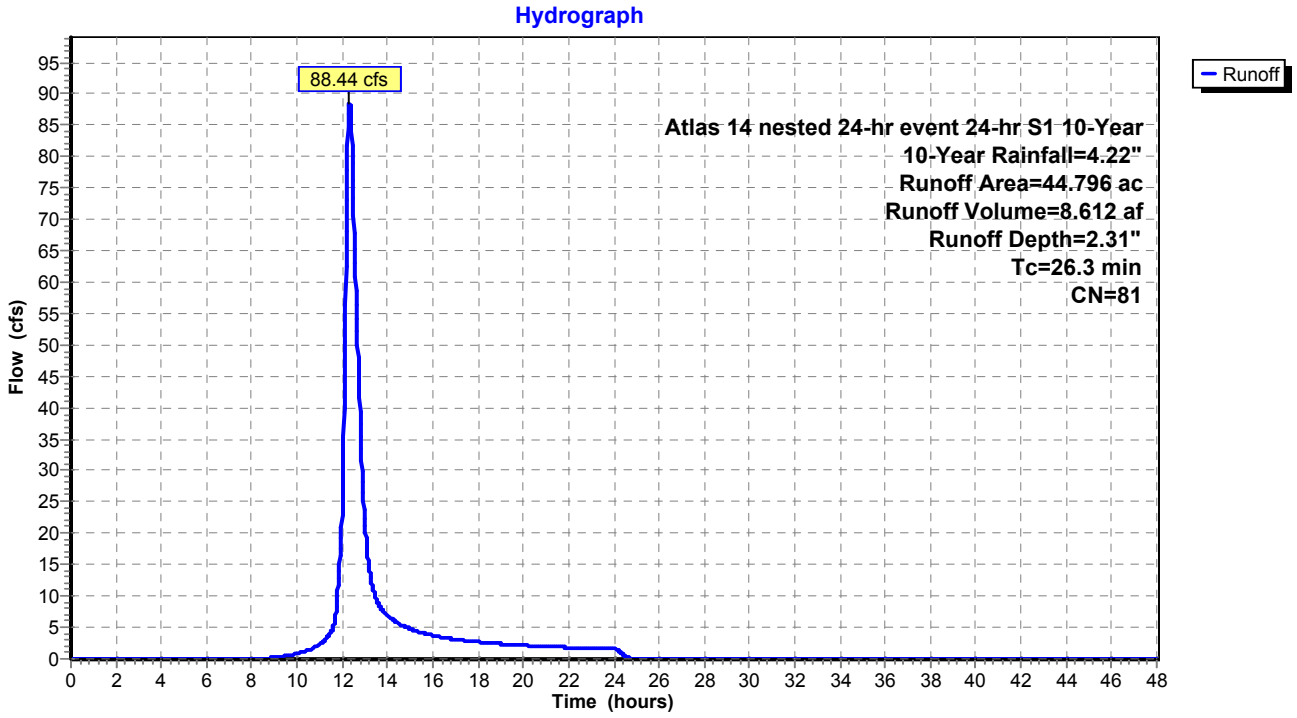
Runoff = 88.44 cfs @ 12.32 hrs, Volume= 8.612 af, Depth= 2.31"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
Atlas 14 nested 24-hr event 24-hr S1 10-Year 10-Year Rainfall=4.22"

	Area (ac)	CN	Description
*	44.796	81	
	44.796		100.00% Pervious Area

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

Subcatchment 16S: Sub-basin 16



Summary for Subcatchment 17S: Sub-basin 17

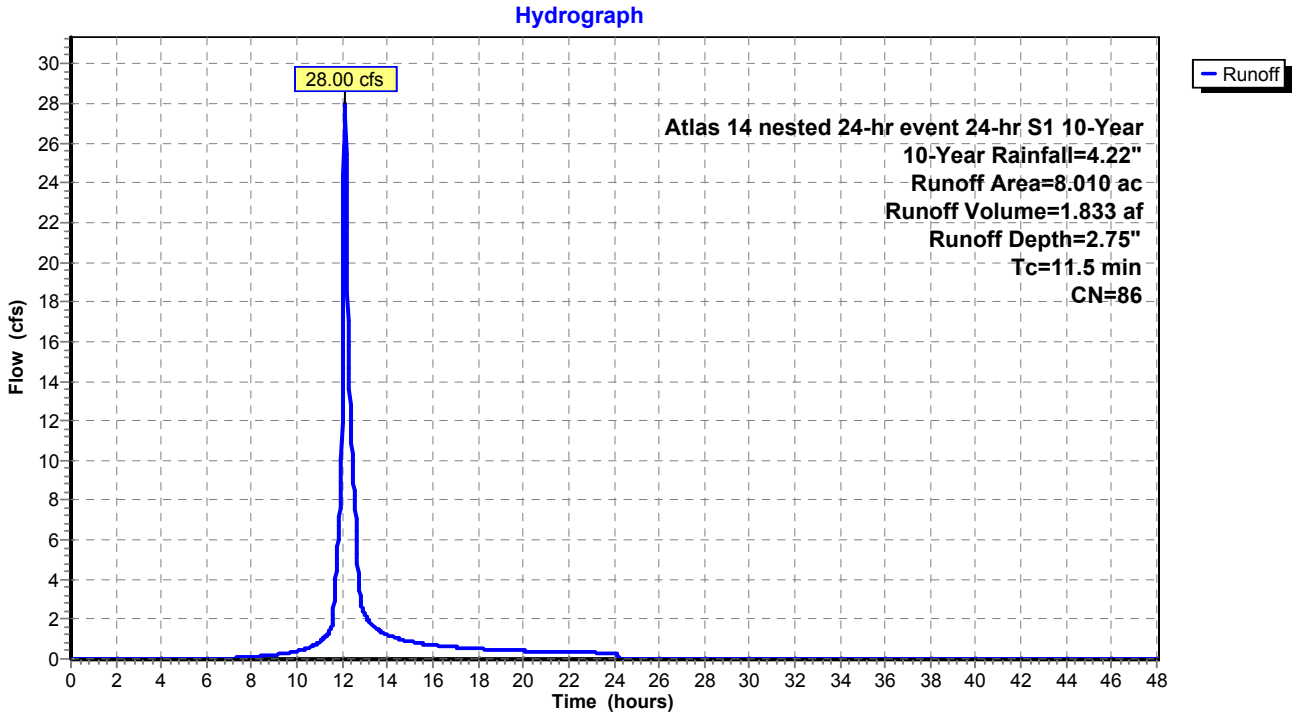
Runoff = 28.00 cfs @ 12.11 hrs, Volume= 1.833 af, Depth= 2.75"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
Atlas 14 nested 24-hr event 24-hr S1 10-Year 10-Year Rainfall=4.22"

	Area (ac)	CN	Description
*	8.010	86	
	8.010		100.00% Pervious Area

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

Subcatchment 17S: Sub-basin 17



Summary for Subcatchment 18S: Sub-basin 18

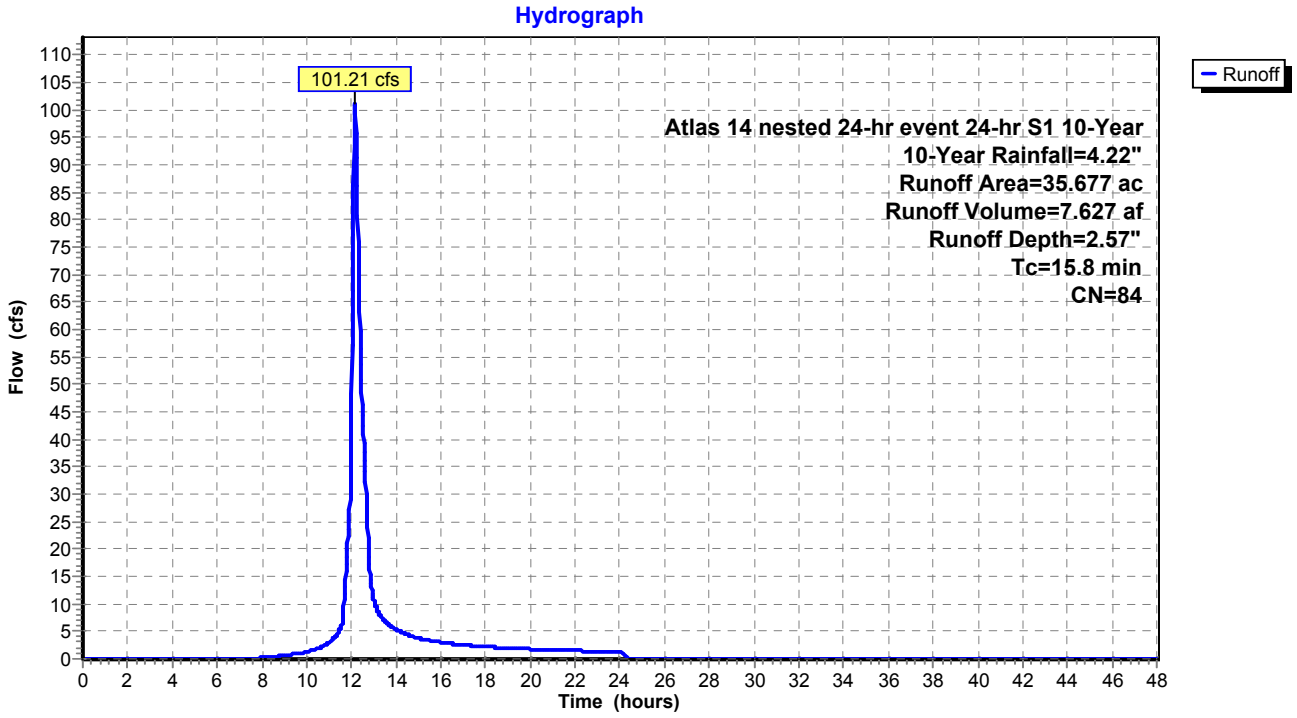
Runoff = 101.21 cfs @ 12.17 hrs, Volume= 7.627 af, Depth= 2.57"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
Atlas 14 nested 24-hr event 24-hr S1 10-Year 10-Year Rainfall=4.22"

	Area (ac)	CN	Description
*	35.677	84	
	35.677		100.00% Pervious Area

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

Subcatchment 18S: Sub-basin 18



Summary for Subcatchment 19S: Sub-basin 19

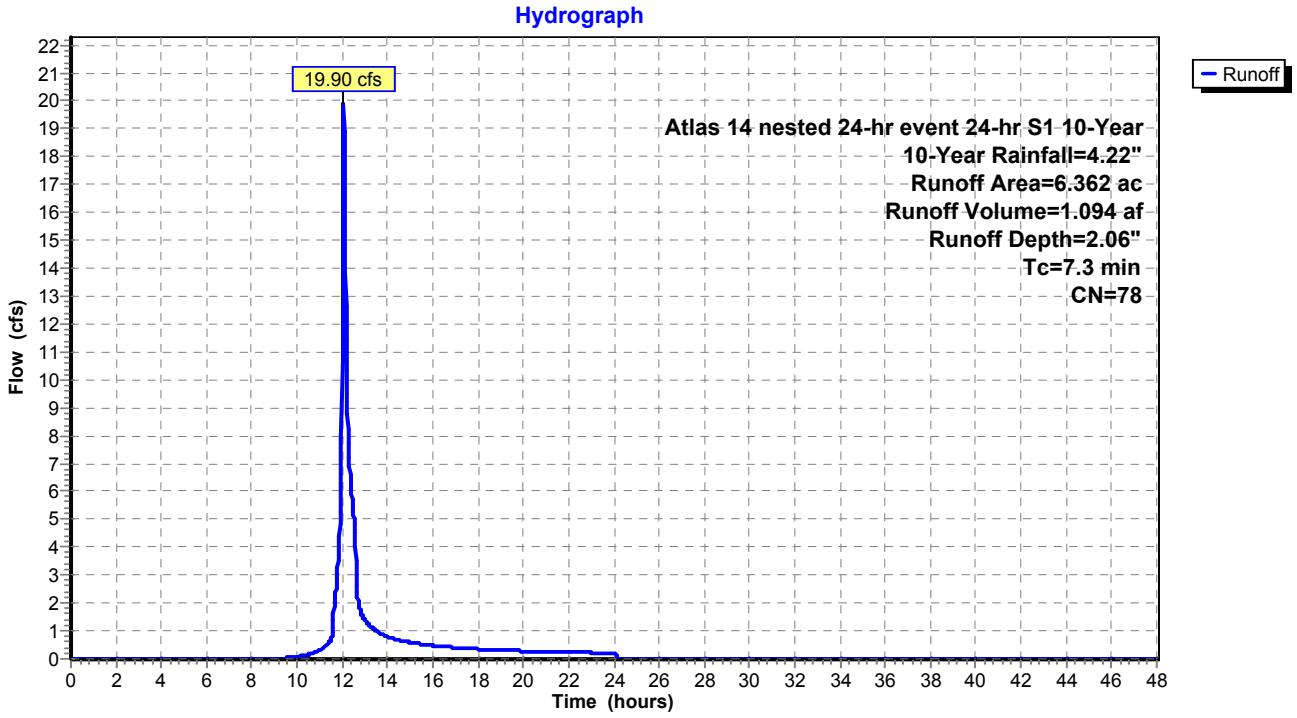
Runoff = 19.90 cfs @ 12.06 hrs, Volume= 1.094 af, Depth= 2.06"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
Atlas 14 nested 24-hr event 24-hr S1 10-Year 10-Year Rainfall=4.22"

	Area (ac)	CN	Description
*	6.362	78	
	6.362		100.00% Pervious Area

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

Subcatchment 19S: Sub-basin 19



Summary for Subcatchment 20S: Sub-basin 20

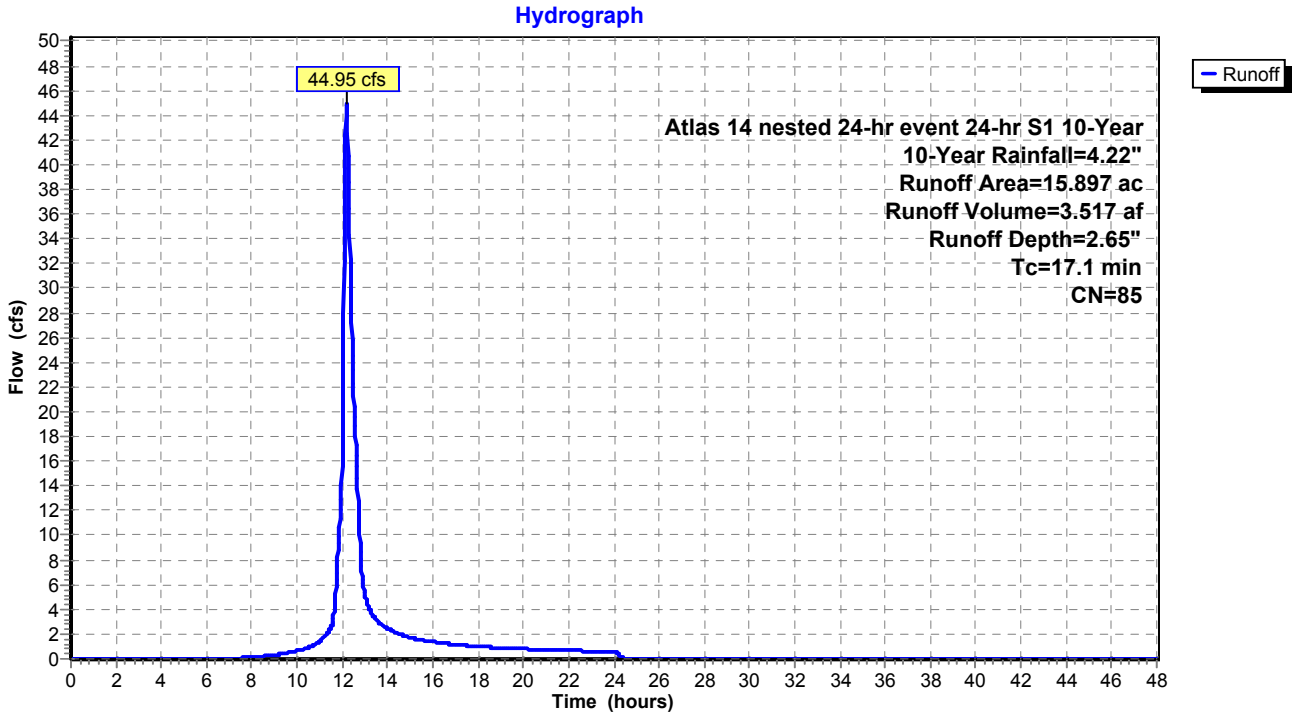
Runoff = 44.95 cfs @ 12.19 hrs, Volume= 3.517 af, Depth= 2.65"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
Atlas 14 nested 24-hr event 24-hr S1 10-Year 10-Year Rainfall=4.22"

	Area (ac)	CN	Description
*	15.897	85	
	15.897		100.00% Pervious Area

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

Subcatchment 20S: Sub-basin 20



Summary for Subcatchment 21S: Sub-basin 21

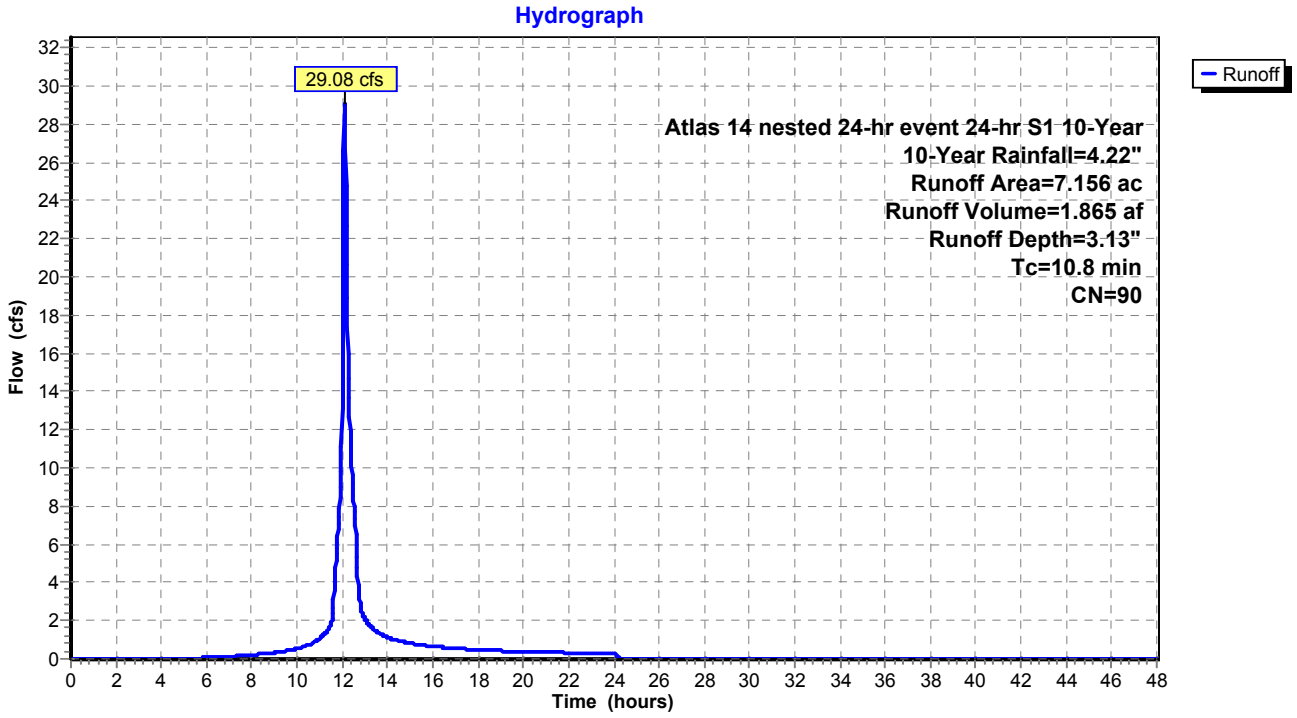
Runoff = 29.08 cfs @ 12.10 hrs, Volume= 1.865 af, Depth= 3.13"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
Atlas 14 nested 24-hr event 24-hr S1 10-Year 10-Year Rainfall=4.22"

	Area (ac)	CN	Description
*	7.156	90	
	7.156		100.00% Pervious Area

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

Subcatchment 21S: Sub-basin 21



Summary for Subcatchment 22S: Sub-basin 22

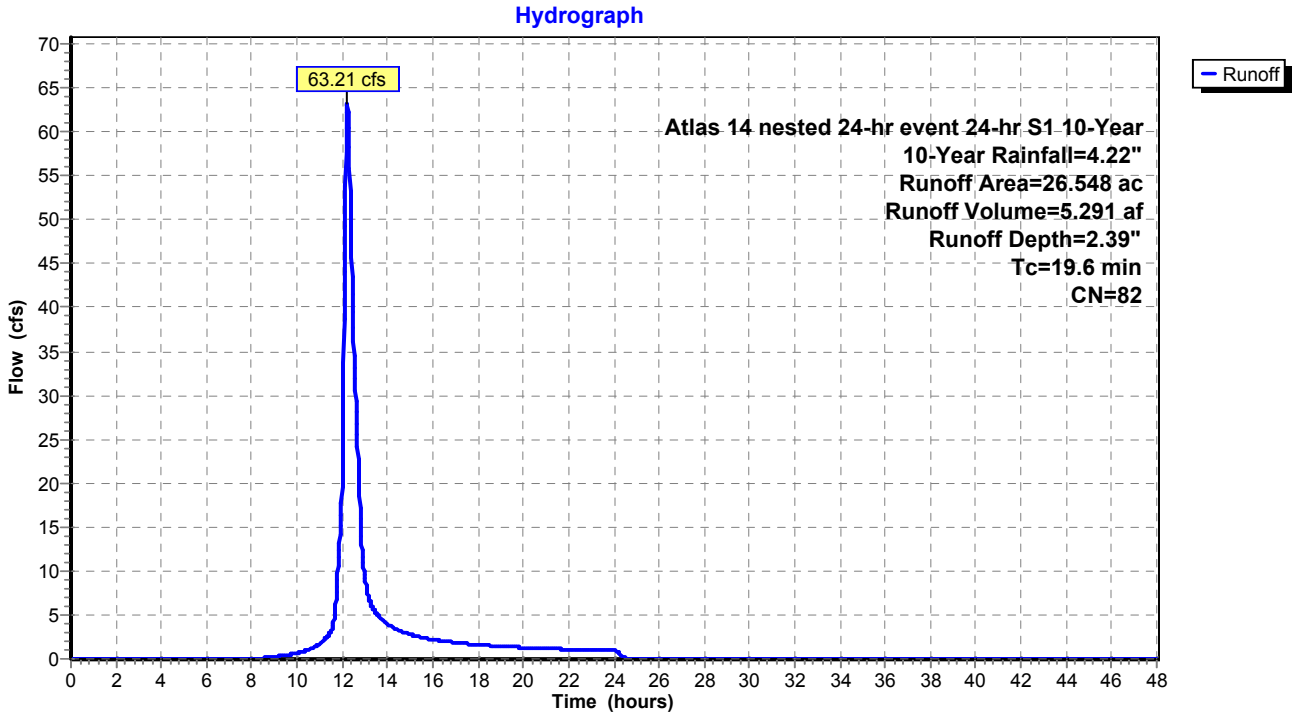
Runoff = 63.21 cfs @ 12.23 hrs, Volume= 5.291 af, Depth= 2.39"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
Atlas 14 nested 24-hr event 24-hr S1 10-Year 10-Year Rainfall=4.22"

	Area (ac)	CN	Description
*	26.548	82	
	26.548		100.00% Pervious Area

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

Subcatchment 22S: Sub-basin 22



Summary for Subcatchment 23S: Sub-basin 23

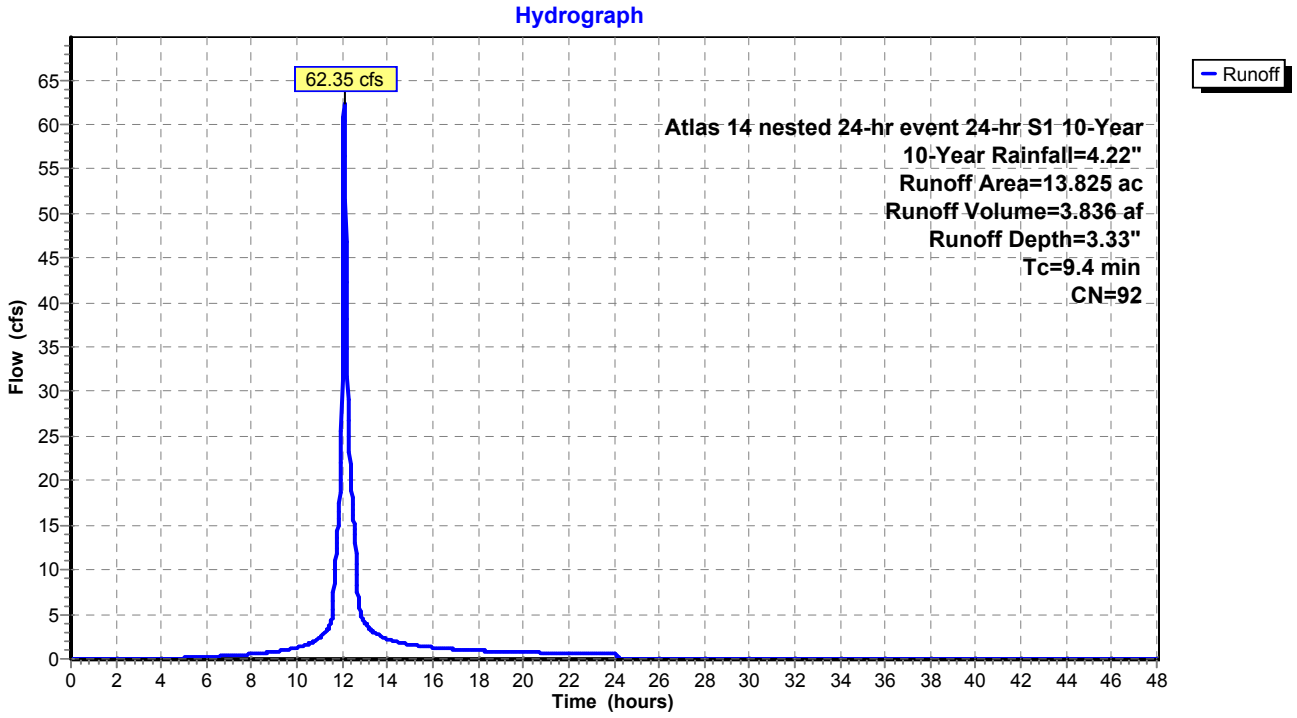
Runoff = 62.35 cfs @ 12.08 hrs, Volume= 3.836 af, Depth= 3.33"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
Atlas 14 nested 24-hr event 24-hr S1 10-Year 10-Year Rainfall=4.22"

	Area (ac)	CN	Description
*	13.825	92	
	13.825		100.00% Pervious Area

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

Subcatchment 23S: Sub-basin 23



Summary for Subcatchment 24S: Sub-basin 24

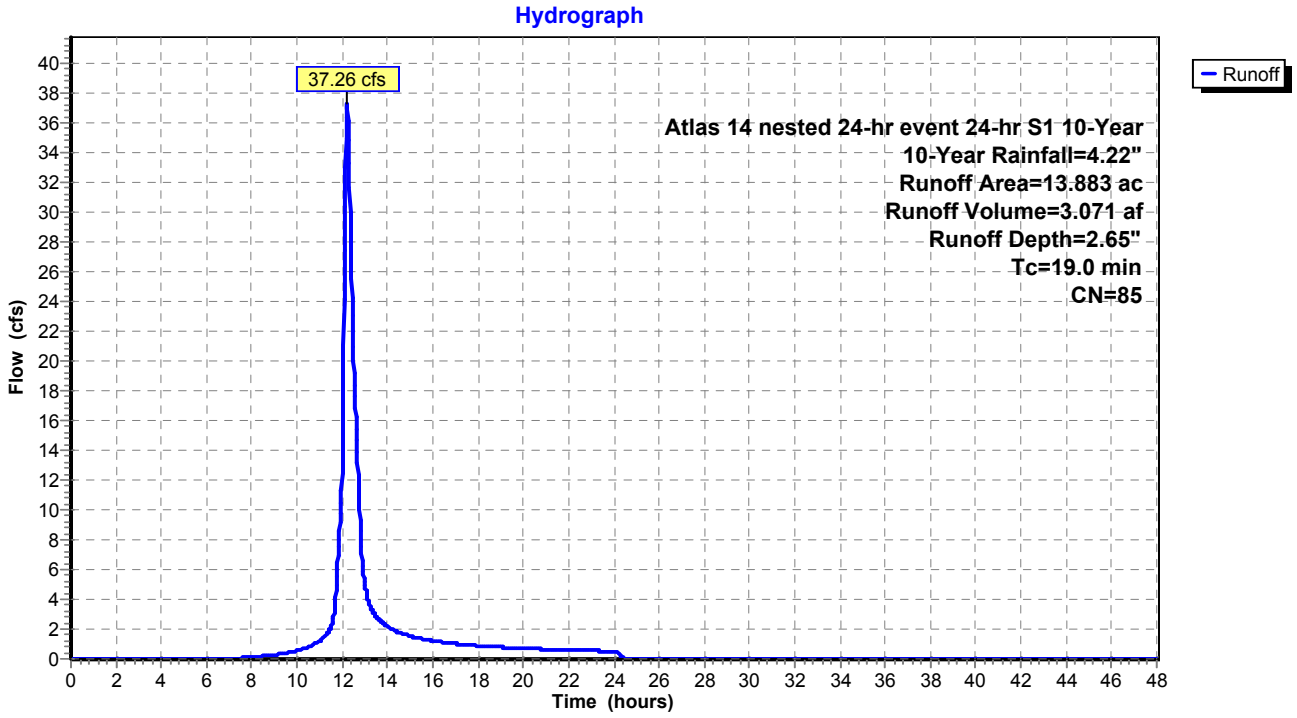
Runoff = 37.26 cfs @ 12.22 hrs, Volume= 3.071 af, Depth= 2.65"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
Atlas 14 nested 24-hr event 24-hr S1 10-Year 10-Year Rainfall=4.22"

	Area (ac)	CN	Description
*	13.883	85	
	13.883		100.00% Pervious Area

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

Subcatchment 24S: Sub-basin 24



Summary for Subcatchment 25S: Sub-basin 25

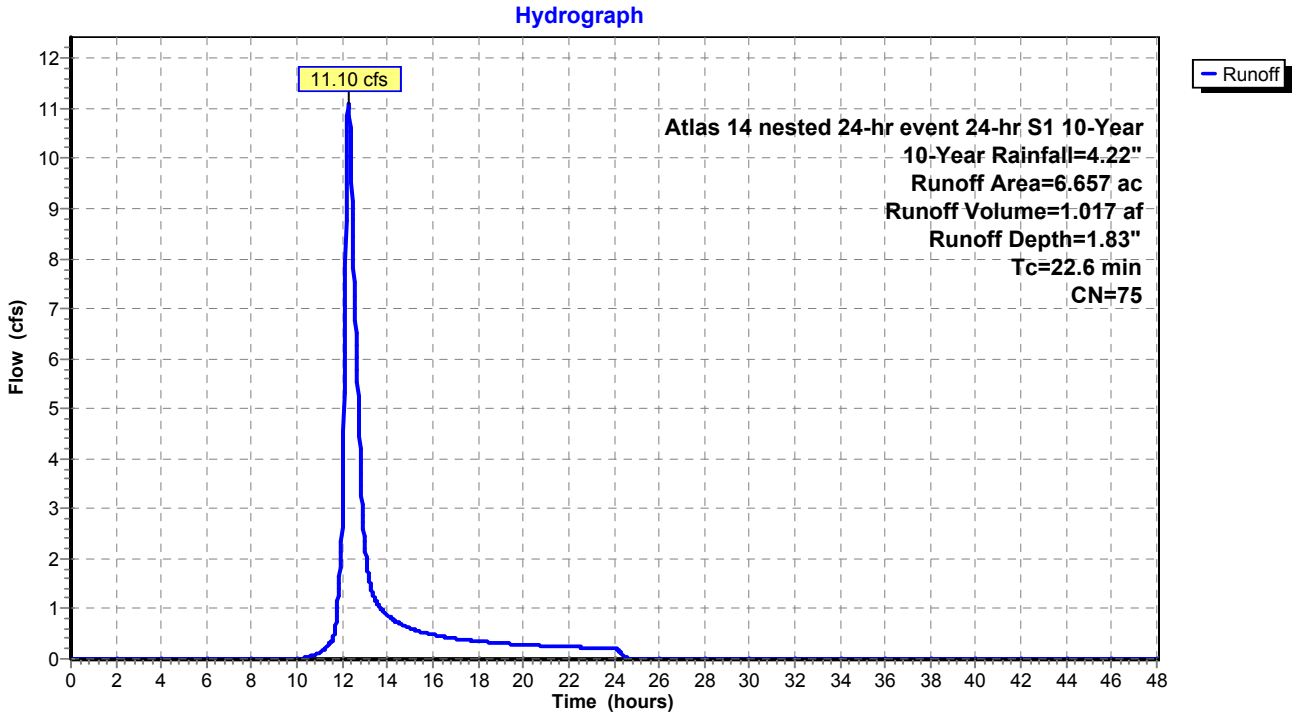
Runoff = 11.10 cfs @ 12.28 hrs, Volume= 1.017 af, Depth= 1.83"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
Atlas 14 nested 24-hr event 24-hr S1 10-Year 10-Year Rainfall=4.22"

	Area (ac)	CN	Description
*	6.657	75	
	6.657		100.00% Pervious Area

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

Subcatchment 25S: Sub-basin 25



Summary for Subcatchment 26S: Sub-basin 26

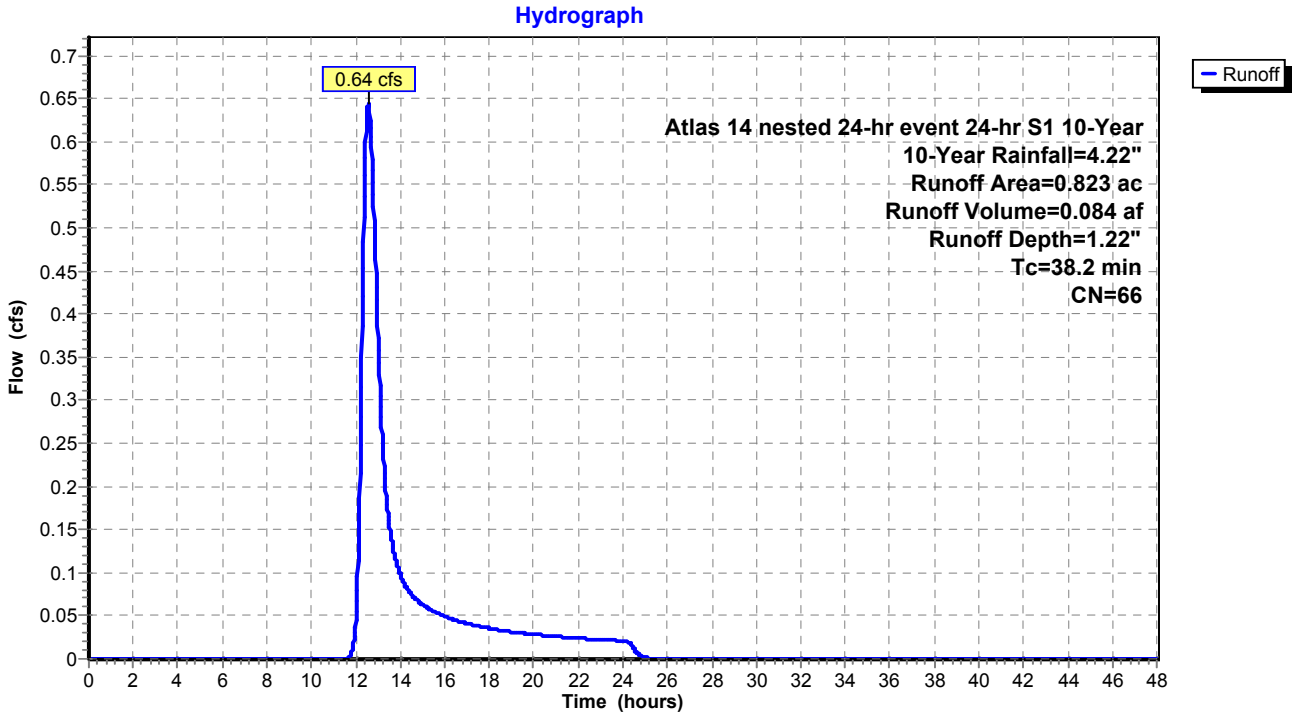
Runoff = 0.64 cfs @ 12.56 hrs, Volume= 0.084 af, Depth= 1.22"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
Atlas 14 nested 24-hr event 24-hr S1 10-Year 10-Year Rainfall=4.22"

	Area (ac)	CN	Description
*	0.823	66	
	0.823		100.00% Pervious Area

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

Subcatchment 26S: Sub-basin 26



Summary for Subcatchment 27S: Sub-basin 27

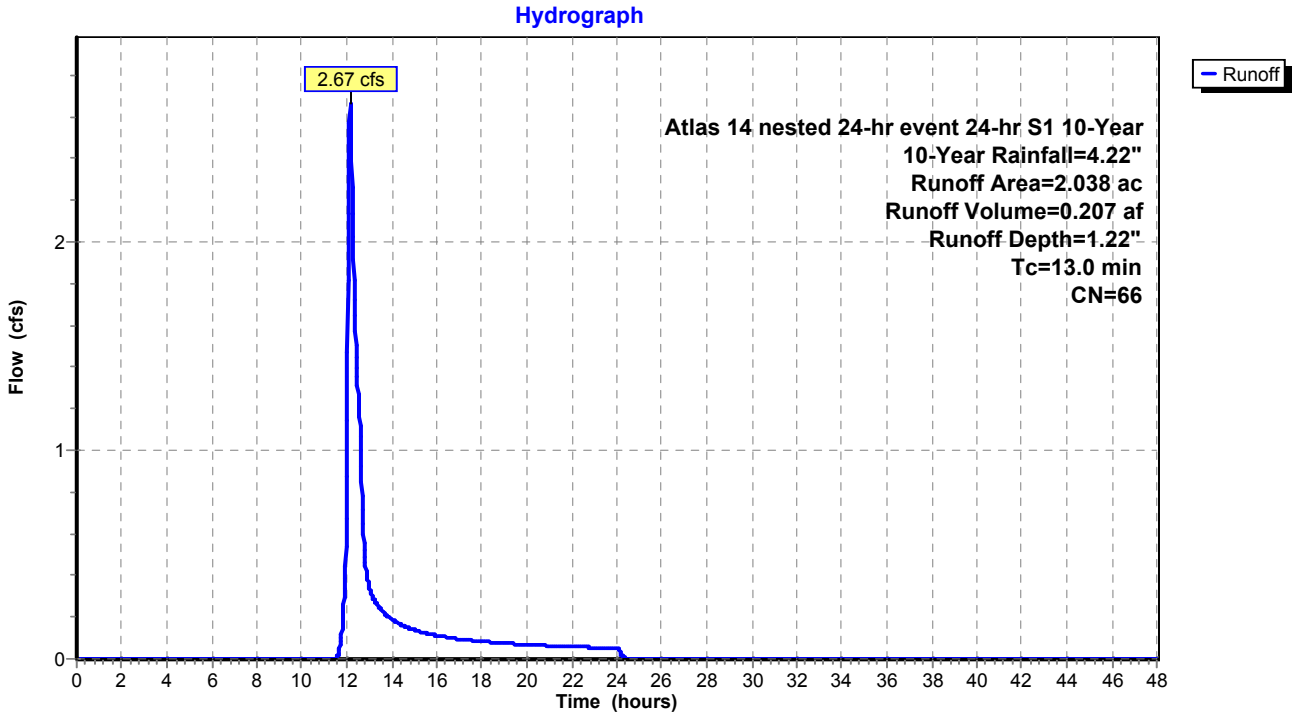
Runoff = 2.67 cfs @ 12.15 hrs, Volume= 0.207 af, Depth= 1.22"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
Atlas 14 nested 24-hr event 24-hr S1 10-Year 10-Year Rainfall=4.22"

	Area (ac)	CN	Description
*	2.038	66	
	2.038		100.00% Pervious Area

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

Subcatchment 27S: Sub-basin 27



Summary for Subcatchment 28S: Sub-basin 28

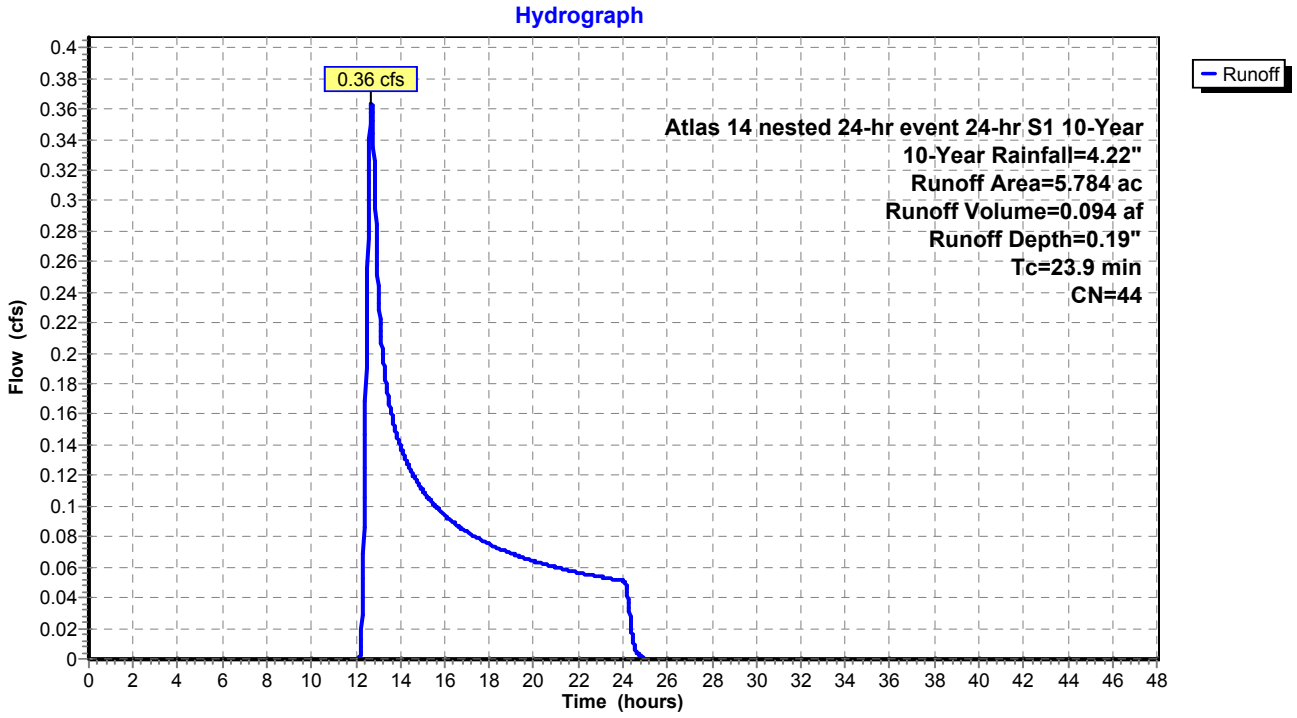
Runoff = 0.36 cfs @ 12.70 hrs, Volume= 0.094 af, Depth= 0.19"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
Atlas 14 nested 24-hr event 24-hr S1 10-Year 10-Year Rainfall=4.22"

	Area (ac)	CN	Description
*	5.784	44	
	5.784		100.00% Pervious Area

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

Subcatchment 28S: Sub-basin 28



Summary for Subcatchment 29S: Sub-basin 29

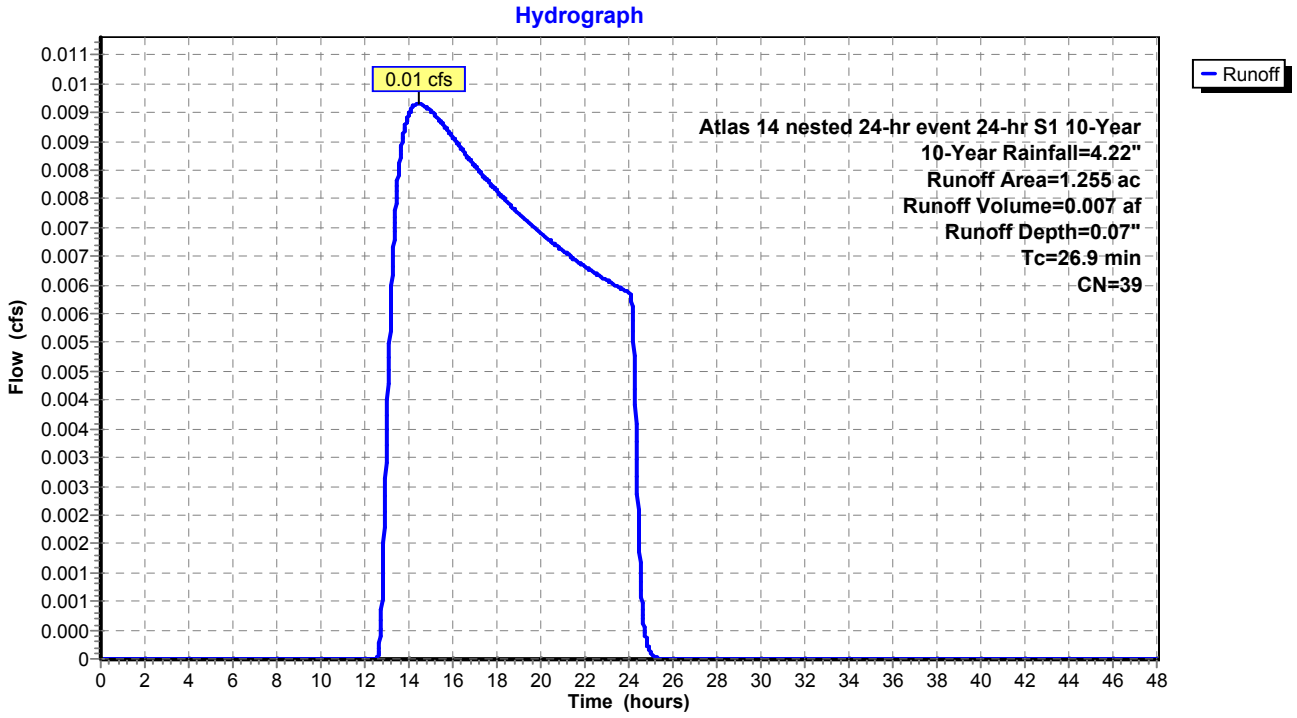
Runoff = 0.01 cfs @ 14.44 hrs, Volume= 0.007 af, Depth= 0.07"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
Atlas 14 nested 24-hr event 24-hr S1 10-Year 10-Year Rainfall=4.22"

	Area (ac)	CN	Description
*	1.255	39	
	1.255		100.00% Pervious Area

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

Subcatchment 29S: Sub-basin 29



Summary for Subcatchment 30S: Sub-basin 30

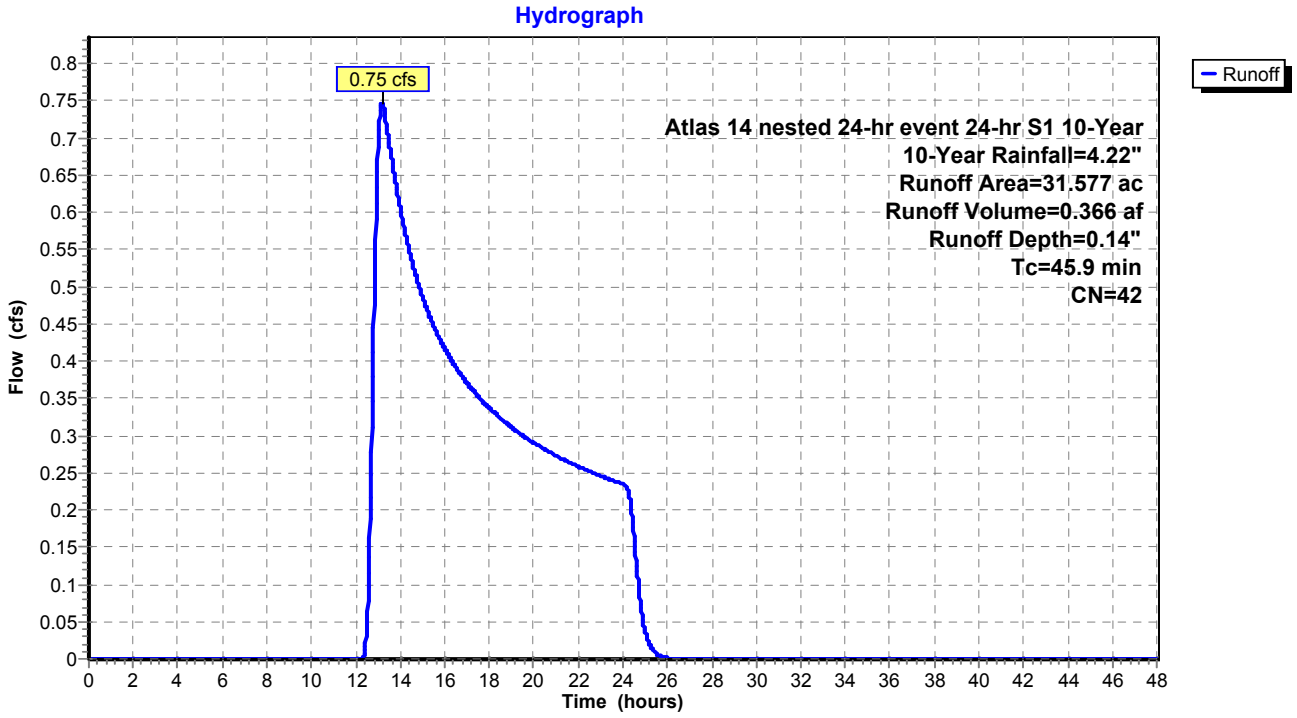
Runoff = 0.75 cfs @ 13.19 hrs, Volume= 0.366 af, Depth= 0.14"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
Atlas 14 nested 24-hr event 24-hr S1 10-Year 10-Year Rainfall=4.22"

	Area (ac)	CN	Description
*	31.577	42	
	31.577		100.00% Pervious Area

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

Subcatchment 30S: Sub-basin 30



Summary for Subcatchment 31S: Sub-basin 31

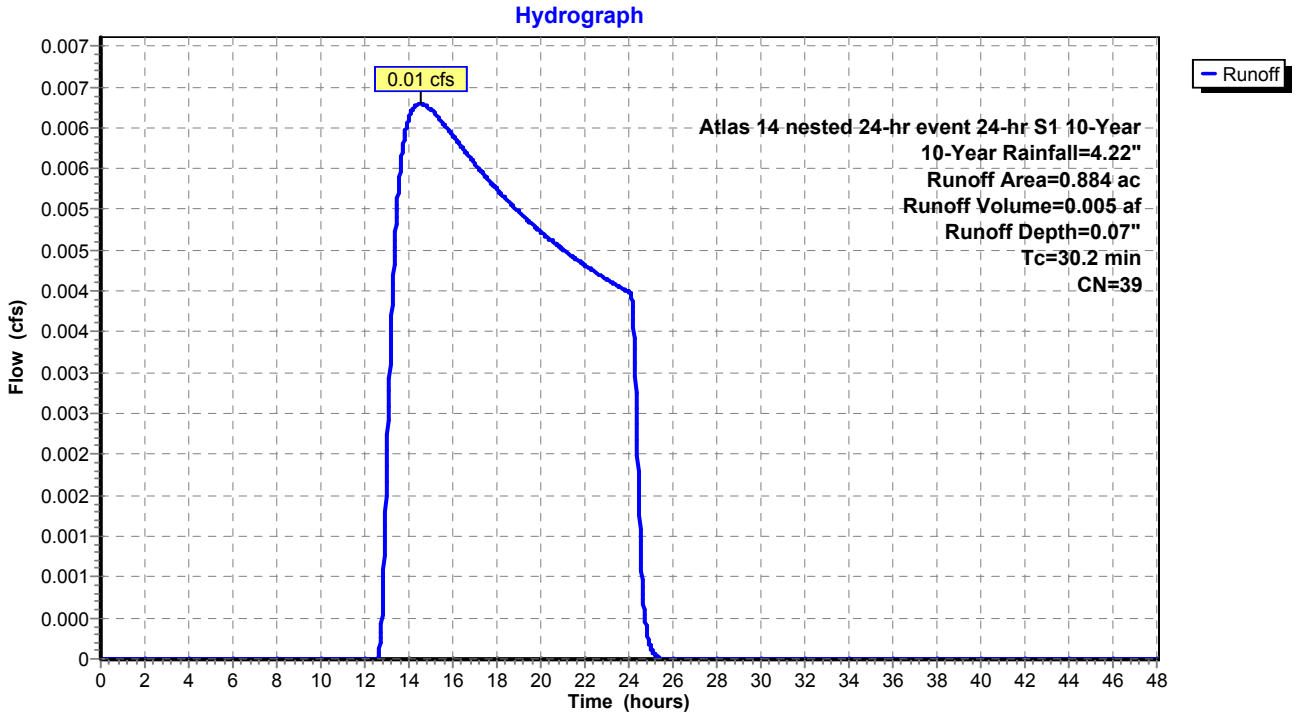
Runoff = 0.01 cfs @ 14.53 hrs, Volume= 0.005 af, Depth= 0.07"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
Atlas 14 nested 24-hr event 24-hr S1 10-Year 10-Year Rainfall=4.22"

	Area (ac)	CN	Description
*	0.884	39	
	0.884		100.00% Pervious Area

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

Subcatchment 31S: Sub-basin 31



Summary for Subcatchment 32S: Sub-basin 32

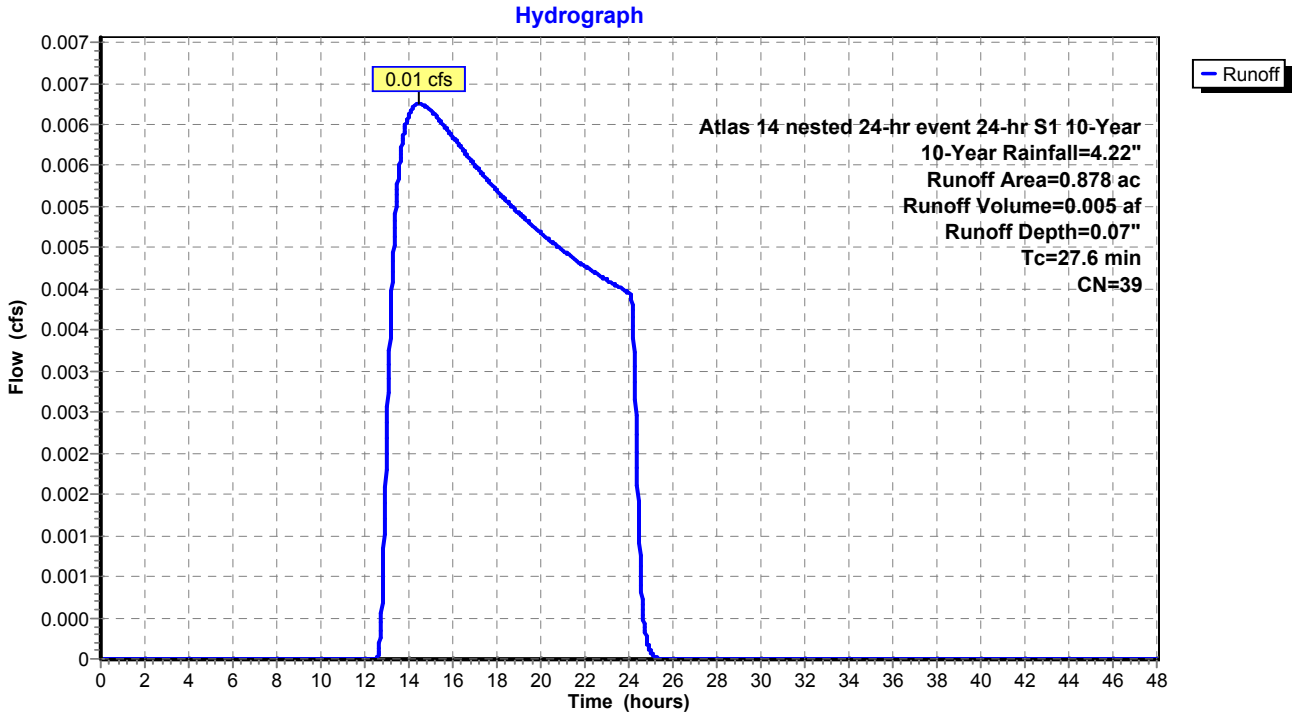
Runoff = 0.01 cfs @ 14.44 hrs, Volume= 0.005 af, Depth= 0.07"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
Atlas 14 nested 24-hr event 24-hr S1 10-Year 10-Year Rainfall=4.22"

	Area (ac)	CN	Description
*	0.878	39	
	0.878		100.00% Pervious Area

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

Subcatchment 32S: Sub-basin 32



Summary for Subcatchment 33S: Sub-basin 33

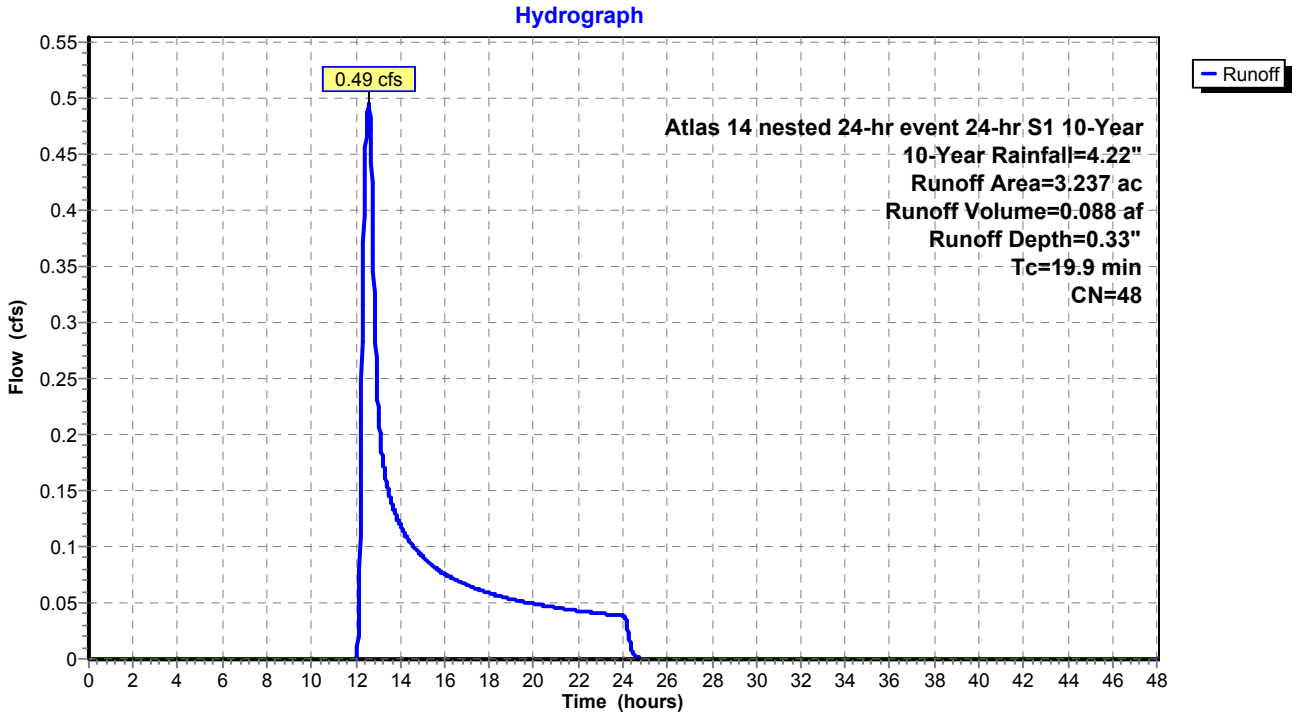
Runoff = 0.49 cfs @ 12.58 hrs, Volume= 0.088 af, Depth= 0.33"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
Atlas 14 nested 24-hr event 24-hr S1 10-Year 10-Year Rainfall=4.22"

	Area (ac)	CN	Description
*	3.237	48	
	3.237		100.00% Pervious Area

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

Subcatchment 33S: Sub-basin 33



Summary for Subcatchment 34S: Sub-basin 34

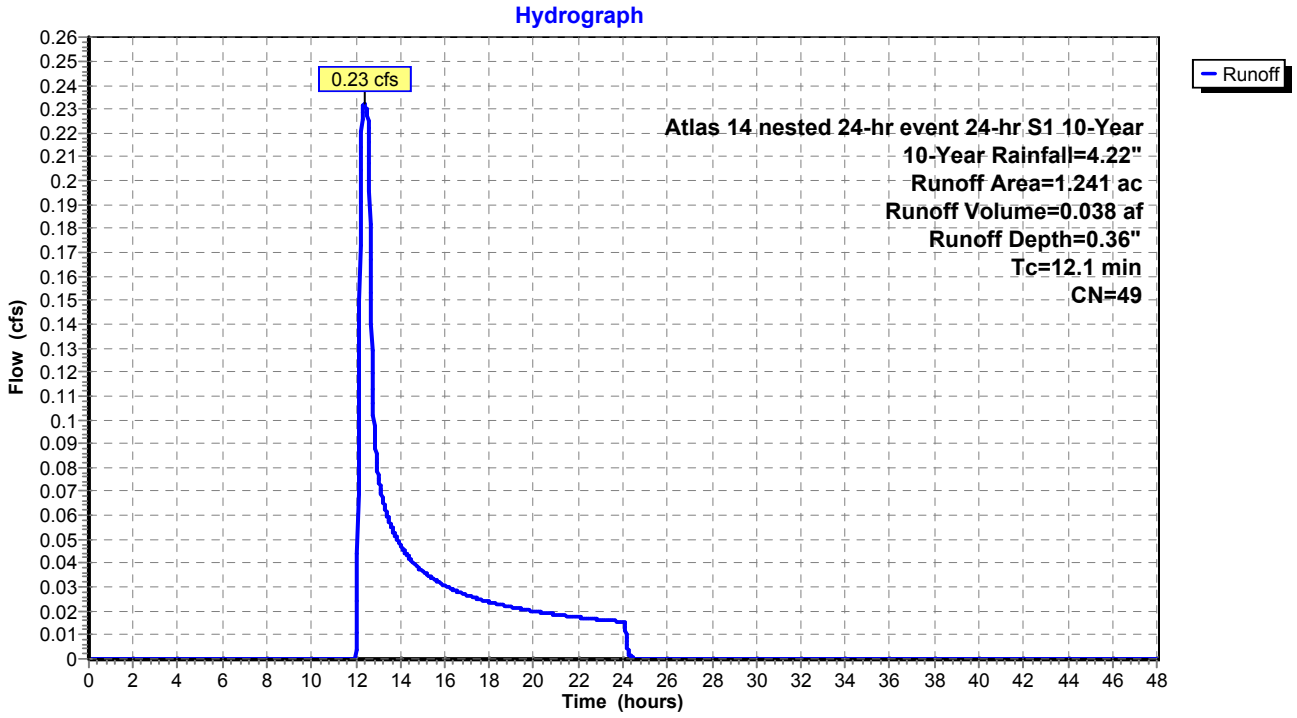
Runoff = 0.23 cfs @ 12.38 hrs, Volume= 0.038 af, Depth= 0.36"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
Atlas 14 nested 24-hr event 24-hr S1 10-Year 10-Year Rainfall=4.22"

	Area (ac)	CN	Description
*	1.241	49	
	1.241		100.00% Pervious Area

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

Subcatchment 34S: Sub-basin 34



Summary for Subcatchment 35S: Sub-basin 35

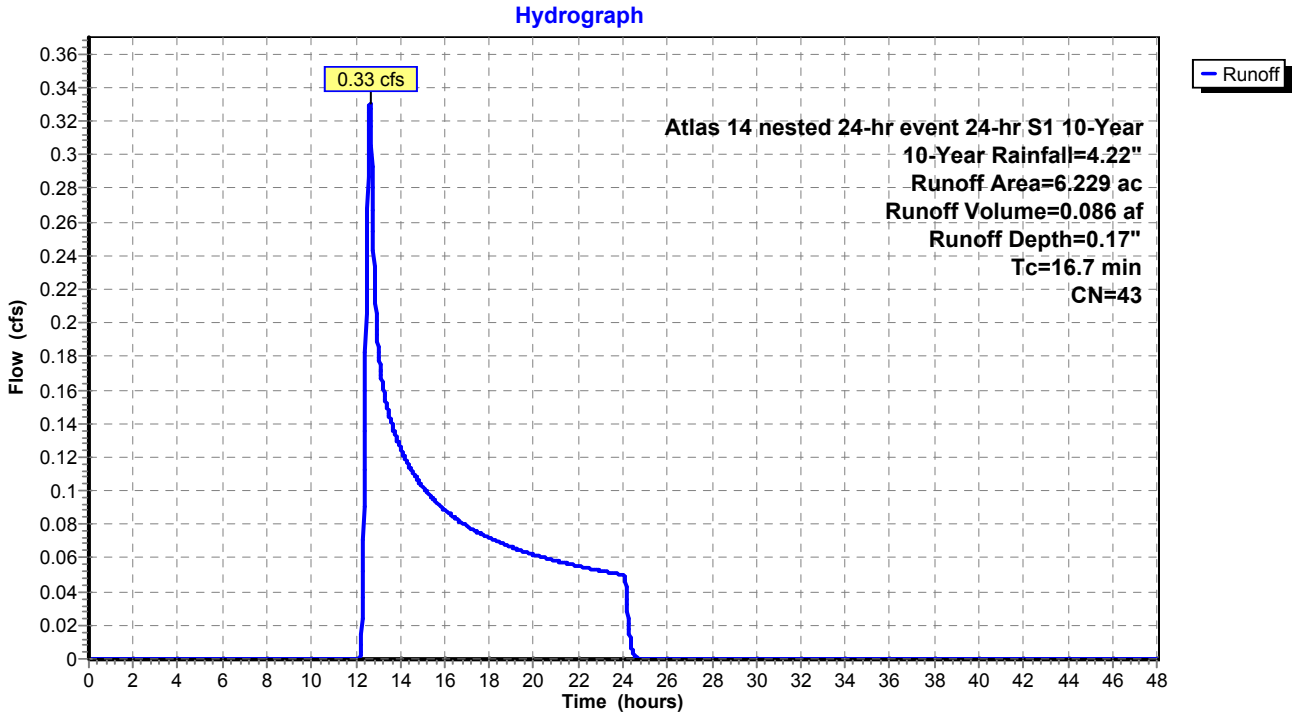
Runoff = 0.33 cfs @ 12.63 hrs, Volume= 0.086 af, Depth= 0.17"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
Atlas 14 nested 24-hr event 24-hr S1 10-Year 10-Year Rainfall=4.22"

	Area (ac)	CN	Description
*	6.229	43	
	6.229		100.00% Pervious Area

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

Subcatchment 35S: Sub-basin 35



Summary for Subcatchment 36S: Sub-basin 36

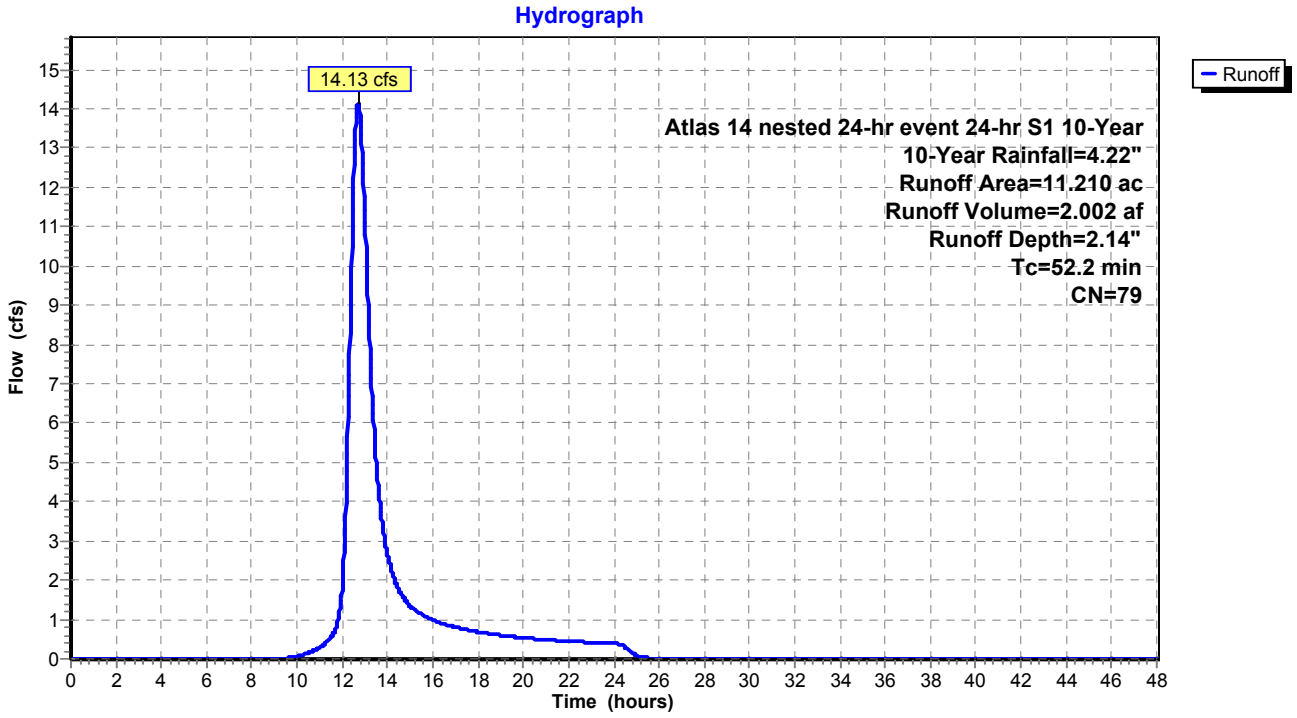
Runoff = 14.13 cfs @ 12.70 hrs, Volume= 2.002 af, Depth= 2.14"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
Atlas 14 nested 24-hr event 24-hr S1 10-Year 10-Year Rainfall=4.22"

	Area (ac)	CN	Description
*	11.210	79	
	11.210		100.00% Pervious Area

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

Subcatchment 36S: Sub-basin 36



Summary for Subcatchment 83S: County Road H Subbasin Redirected After Regrading

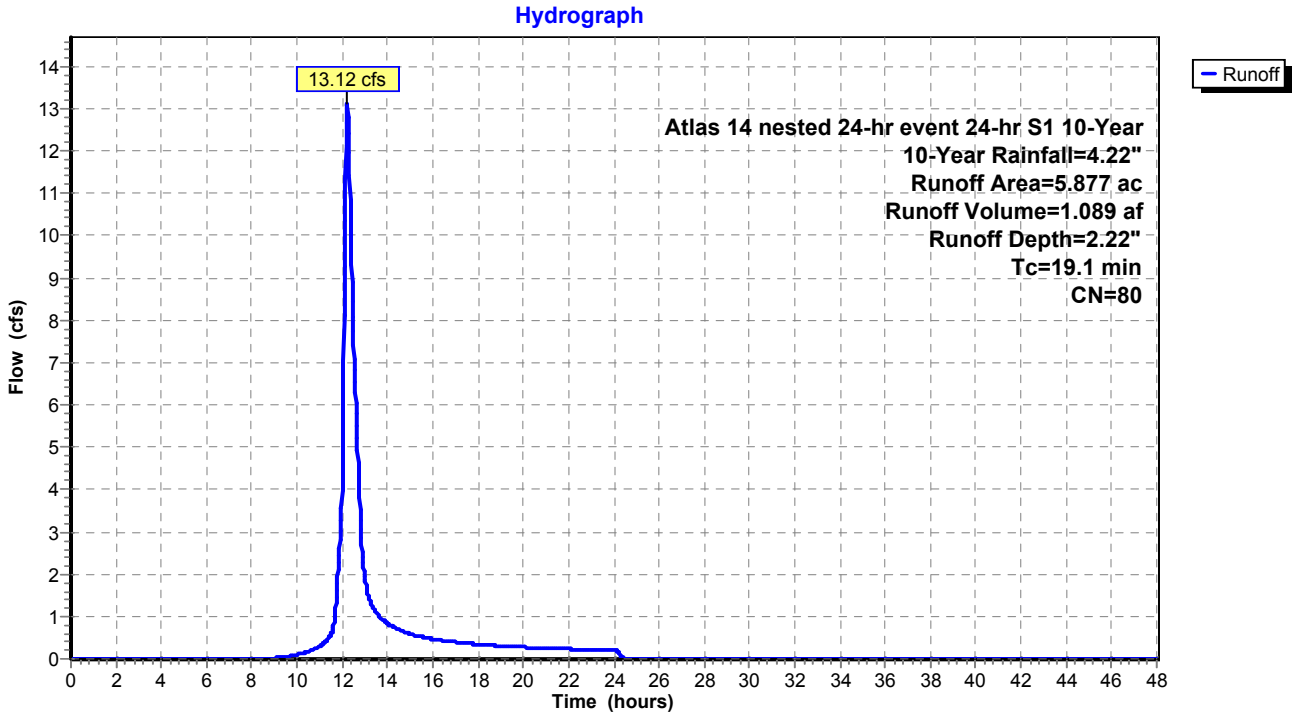
Runoff = 13.12 cfs @ 12.22 hrs, Volume= 1.089 af, Depth= 2.22"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
Atlas 14 nested 24-hr event 24-hr S1 10-Year 10-Year Rainfall=4.22"

	Area (ac)	CN	Description
*	5.877	80	
	5.877		100.00% Pervious Area

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

Subcatchment 83S: County Road H Subbasin Redirected After Regrading



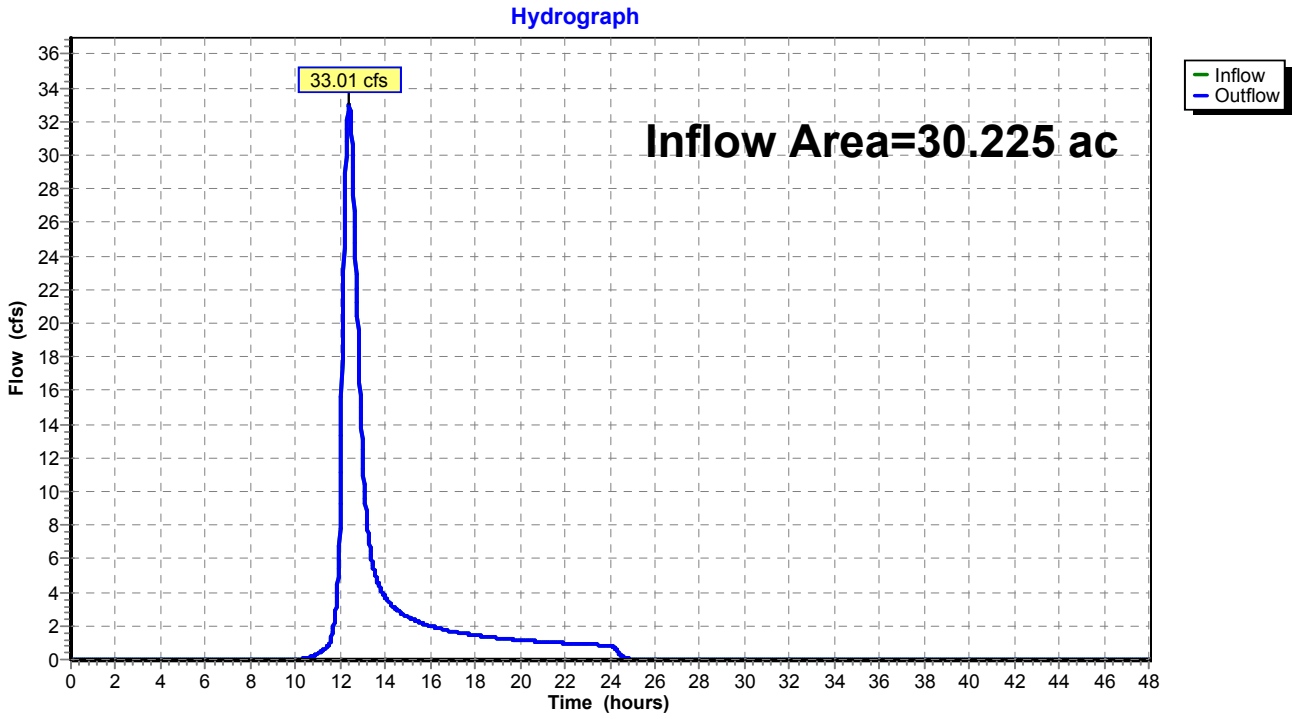
Summary for Reach 37R: Outfall of SB 2, 3, 7

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 30.225 ac, 0.00% Impervious, Inflow Depth = 1.56" for 10-Year event
Inflow = 33.01 cfs @ 12.39 hrs, Volume= 3.922 af
Outflow = 33.01 cfs @ 12.39 hrs, Volume= 3.922 af, Atten= 0%, Lag= 0.0 min

Routing by Muskingum-Cunge method, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs

Reach 37R: Outfall of SB 2, 3, 7



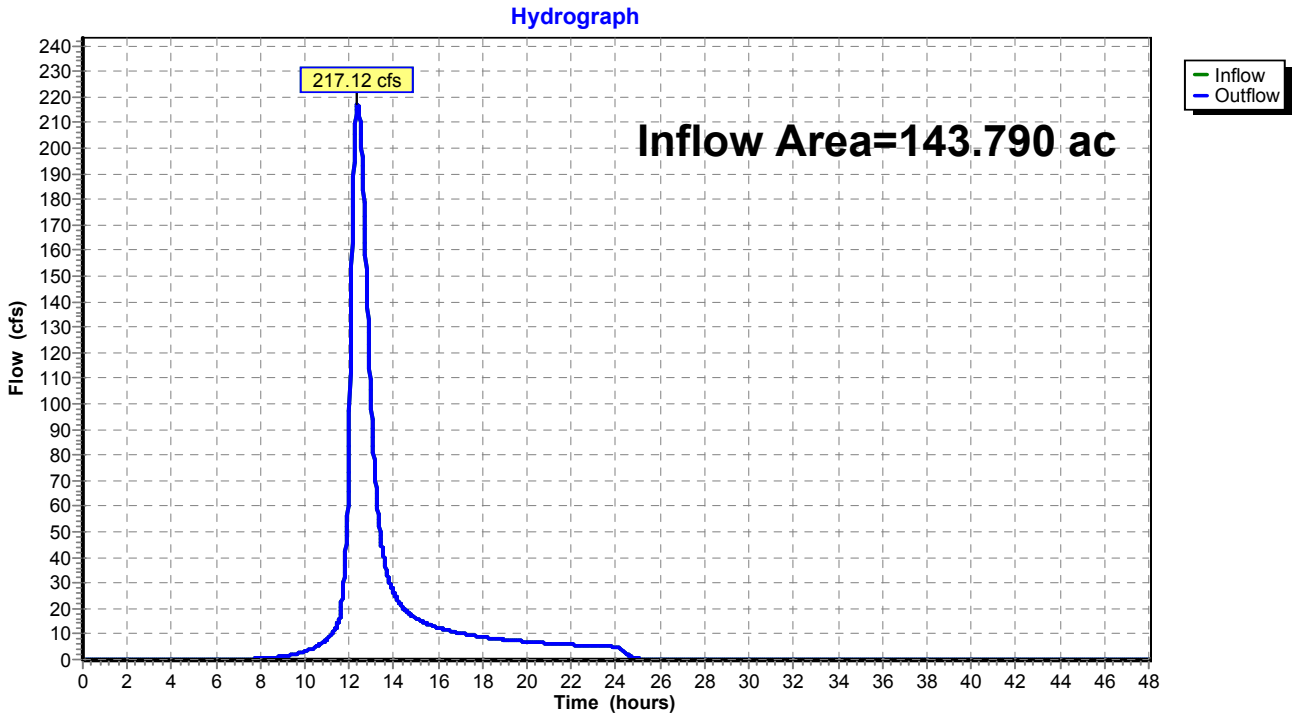
Summary for Reach 39R: Outfall of SB 1, 4, 5, 6, 9, 10, 11, 36

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 143.790 ac, 0.00% Impervious, Inflow Depth = 2.40" for 10-Year event
Inflow = 217.12 cfs @ 12.37 hrs, Volume= 28.714 af
Outflow = 217.12 cfs @ 12.37 hrs, Volume= 28.714 af, Atten= 0%, Lag= 0.0 min

Routing by Muskingum-Cunge method, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs

Reach 39R: Outfall of SB 1, 4, 5, 6, 9, 10, 11, 36



Summary for Reach 40R: 60 in SB 4

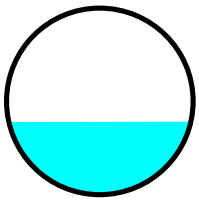
[52] Hint: Inlet/Outlet conditions not evaluated
[65] Warning: Inlet elevation not specified

Inflow Area = 143.790 ac, 0.00% Impervious, Inflow Depth = 2.40" for 10-Year event
Inflow = 217.16 cfs @ 12.36 hrs, Volume= 28.714 af
Outflow = 217.12 cfs @ 12.37 hrs, Volume= 28.714 af, Atten= 0%, Lag= 0.5 min

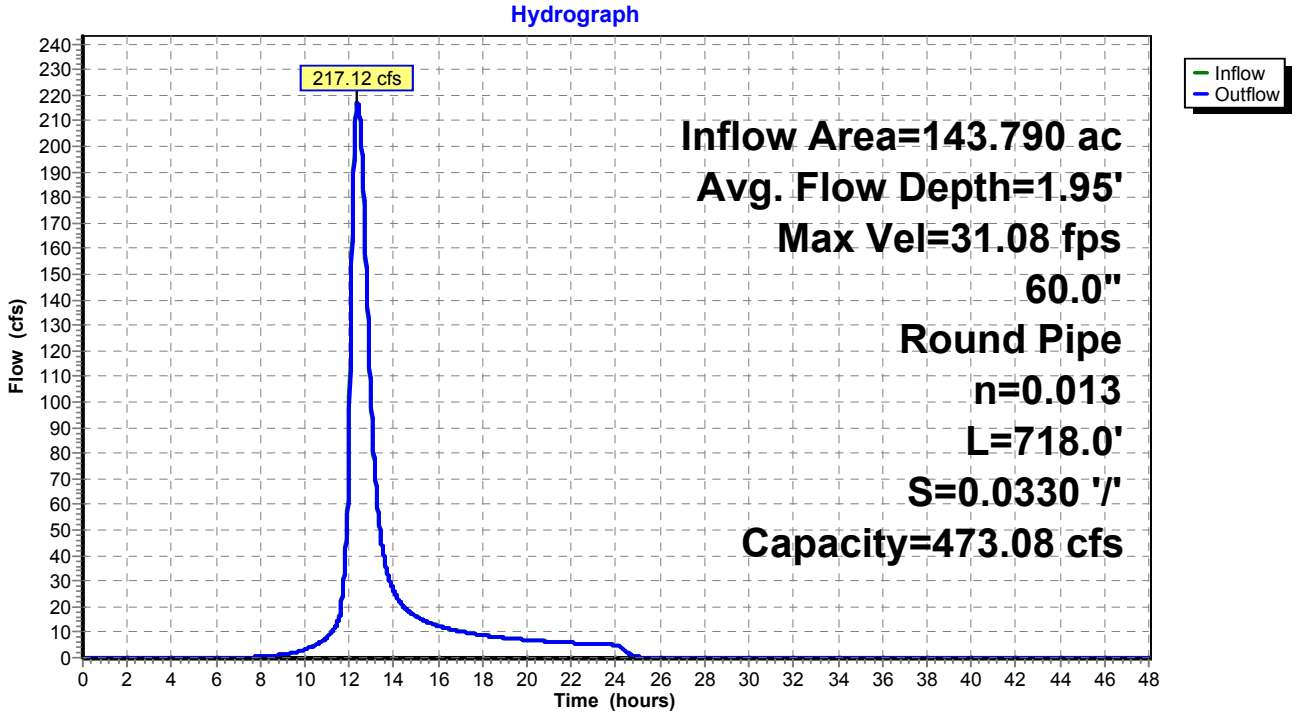
Routing by Muskingum-Cunge method, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
Reference Flow= 162.87 cfs Estimated Depth= 2.02' Velocity= 21.86 fps
m= 1.400, c= 30.61 fps, dt= 1.2 min, dx= 718.0' / 1 = 718.0', K= 0.4 min, X= 0.470
Max. Velocity= 31.08 fps, Min. Travel Time= 0.4 min
Avg. Velocity = 30.61 fps, Avg. Travel Time= 0.4 min

Peak Storage= 5,092 cf @ 12.36 hrs
Average Depth at Peak Storage= 1.95'
Bank-Full Depth= 5.00' Flow Area= 19.6 sf, Capacity= 473.08 cfs

60.0" Round Pipe
n= 0.013
Length= 718.0' Slope= 0.0330 '/'
Inlet Invert= 0.00', Outlet Invert= -23.69'



Reach 40R: 60 in SB 4



Summary for Reach 41R: Channel in SB 9, 10

[65] Warning: Inlet elevation not specified

Inflow Area = 9.296 ac, 0.00% Impervious, Inflow Depth = 2.39" for 10-Year event
Inflow = 27.07 cfs @ 12.13 hrs, Volume= 1.853 af
Outflow = 25.05 cfs @ 12.34 hrs, Volume= 1.853 af, Atten= 7%, Lag= 12.4 min

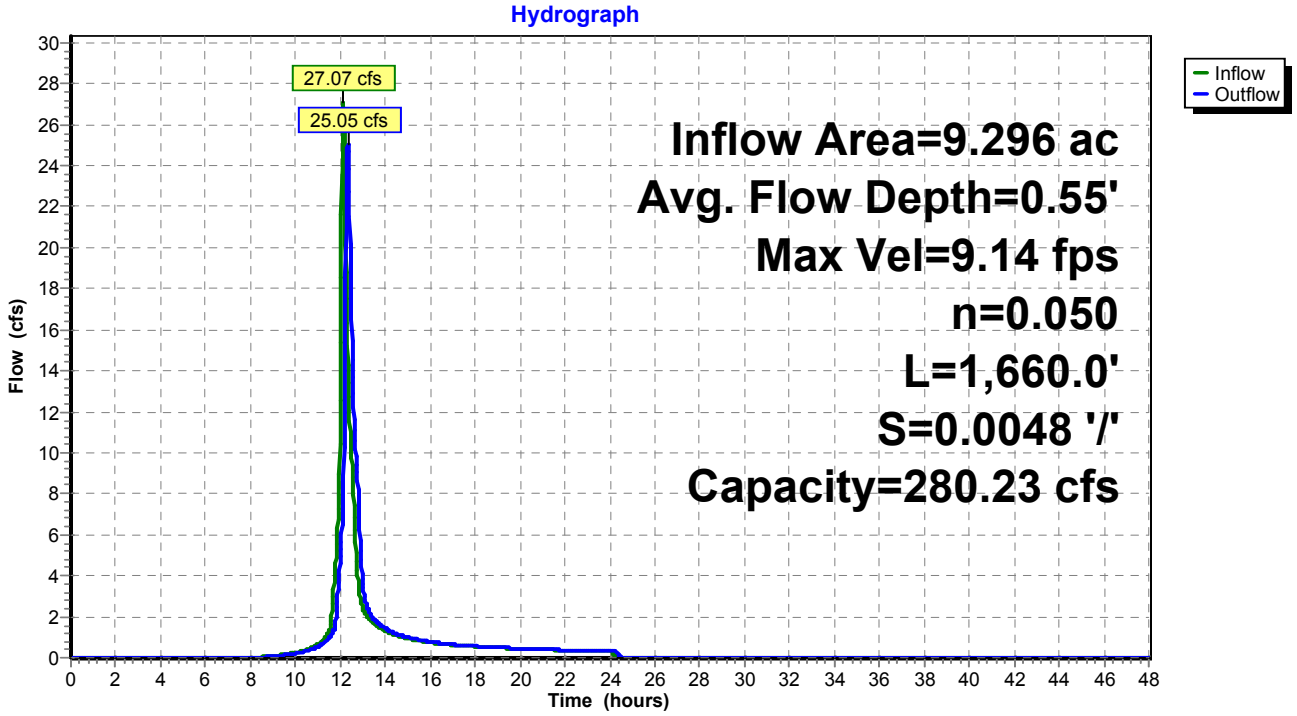
Routing by Muskingum-Cunge method, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
Reference Flow= 20.31 cfs Estimated Depth= 0.72' Velocity= 1.50 fps
m= 1.556, c= 2.33 fps, dt= 1.2 min, dx= 1,660.0' / 10 = 166.0', K= 1.2 min, X= 0.210
Max. Velocity= 9.14 fps, Min. Travel Time= 3.0 min
Avg. Velocity = 2.39 fps, Avg. Travel Time= 11.6 min

Peak Storage= 16,733 cf @ 12.25 hrs
Average Depth at Peak Storage= 0.55'
Bank-Full Depth= 3.00' Flow Area= 84.0 sf, Capacity= 280.23 cfs

16.00' x 3.00' deep channel, n= 0.050
Side Slope Z-value= 4.0 '/' Top Width= 40.00'
Length= 1,660.0' Slope= 0.0048 '/'
Inlet Invert= 0.00', Outlet Invert= -7.97'

‡

Reach 41R: Channel in SB 9, 10



Summary for Reach 46R: Channel SB1

[65] Warning: Inlet elevation not specified

Inflow Area = 15.328 ac, 0.00% Impervious, Inflow Depth = 2.84" for 10-Year event
Inflow = 47.16 cfs @ 12.18 hrs, Volume= 3.626 af
Outflow = 46.50 cfs @ 12.25 hrs, Volume= 3.626 af, Atten= 1%, Lag= 4.4 min

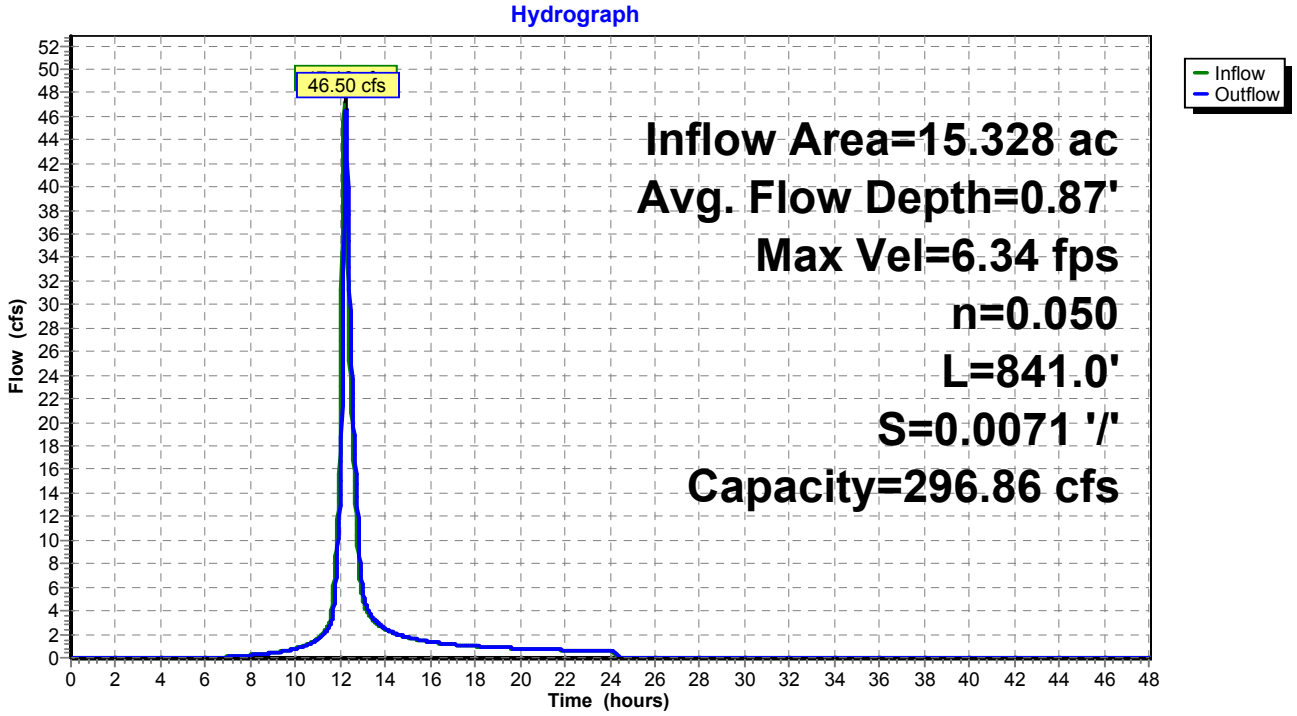
Routing by Muskingum-Cunge method, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
Reference Flow= 35.37 cfs Estimated Depth= 0.98' Velocity= 2.13 fps
m= 1.511, c= 3.22 fps, dt= 1.2 min, dx= 841.0' / 4 = 210.3', K= 1.1 min, X= 0.283
Max. Velocity= 6.34 fps, Min. Travel Time= 2.2 min
Avg. Velocity = 3.23 fps, Avg. Travel Time= 4.3 min

Peak Storage= 12,066 cf @ 12.22 hrs
Average Depth at Peak Storage= 0.87'
Bank-Full Depth= 3.00' Flow Area= 75.0 sf, Capacity= 296.86 cfs

13.00' x 3.00' deep channel, n= 0.050
Side Slope Z-value= 4.0 '/' Top Width= 37.00'
Length= 841.0' Slope= 0.0071 '/'
Inlet Invert= 0.00', Outlet Invert= -5.97'

‡

Reach 46R: Channel SB1



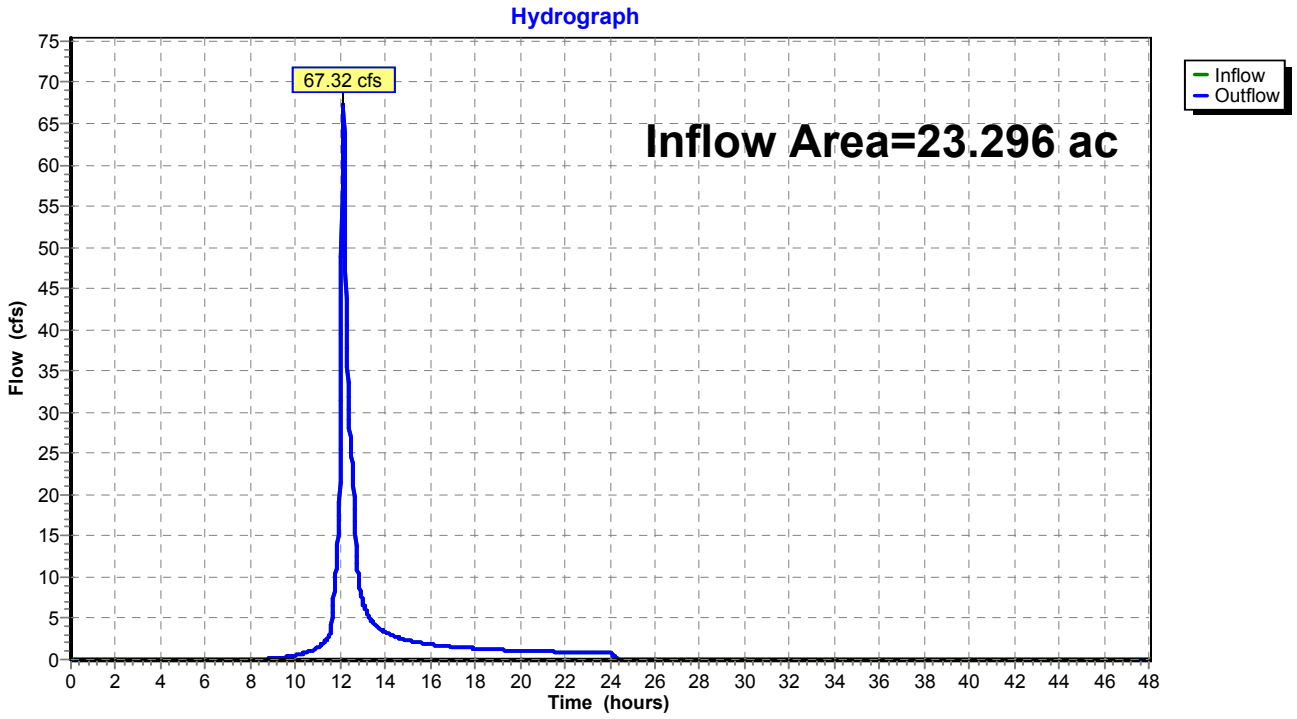
Summary for Reach 48R: Outfall of SB 8, 13

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 23.296 ac, 0.00% Impervious, Inflow Depth = 2.32" for 10-Year event
Inflow = 67.32 cfs @ 12.13 hrs, Volume= 4.495 af
Outflow = 67.32 cfs @ 12.13 hrs, Volume= 4.495 af, Atten= 0%, Lag= 0.0 min

Routing by Muskingum-Cunge method, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs

Reach 48R: Outfall of SB 8, 13



Summary for Reach 49R: Channel SB8

[65] Warning: Inlet elevation not specified

Inflow Area = 21.017 ac, 0.00% Impervious, Inflow Depth = 2.31" for 10-Year event
Inflow = 66.85 cfs @ 12.08 hrs, Volume= 4.041 af
Outflow = 65.69 cfs @ 12.13 hrs, Volume= 4.041 af, Atten= 2%, Lag= 2.5 min

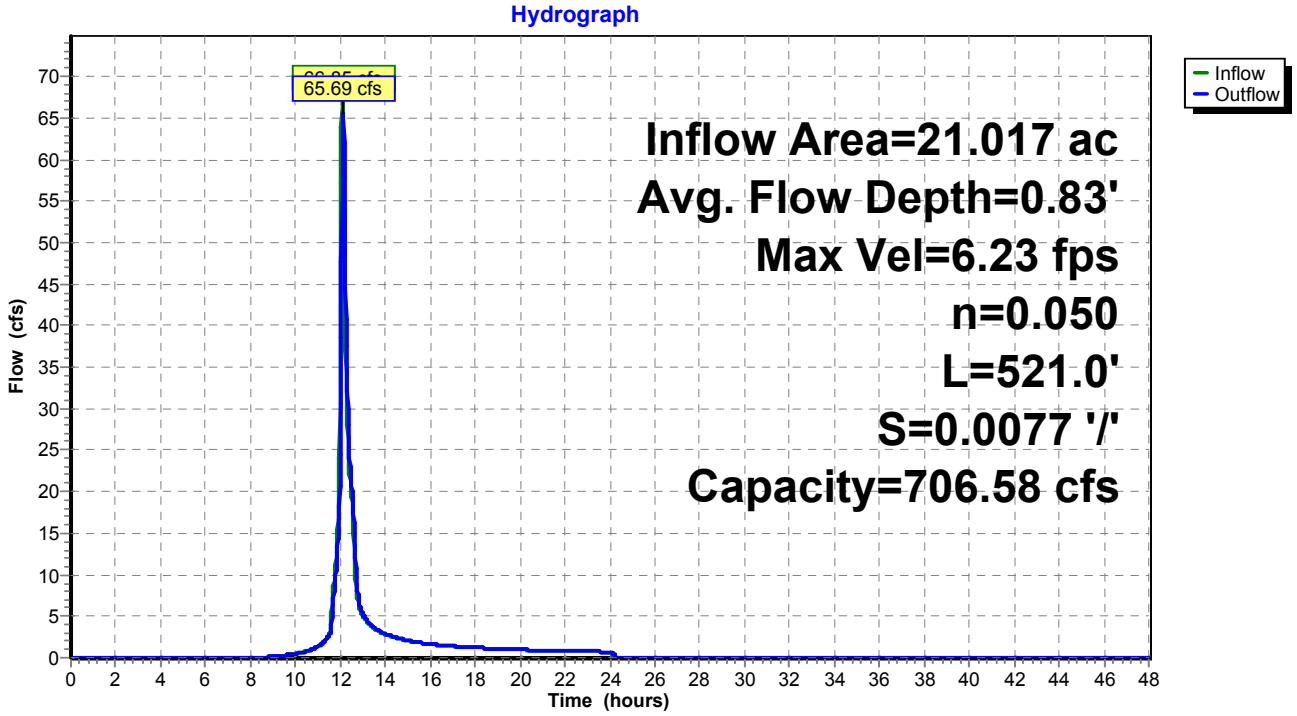
Routing by Muskingum-Cunge method, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
Reference Flow= 50.14 cfs Estimated Depth= 0.96' Velocity= 2.28 fps
m= 1.546, c= 3.52 fps, dt= 1.2 min, dx= 521.0' / 2 = 260.5', K= 1.2 min, X= 0.345
Max. Velocity= 6.23 fps, Min. Travel Time= 1.4 min
Avg. Velocity = 3.53 fps, Avg. Travel Time= 2.5 min

Peak Storage= 9,639 cf @ 12.11 hrs
Average Depth at Peak Storage= 0.83'
Bank-Full Depth= 4.00' Flow Area= 140.0 sf, Capacity= 706.58 cfs

19.00' x 4.00' deep channel, n= 0.050
Side Slope Z-value= 4.0 '/' Top Width= 51.00'
Length= 521.0' Slope= 0.0077 '/'
Inlet Invert= 0.00', Outlet Invert= -4.01'

‡

Reach 49R: Channel SB8



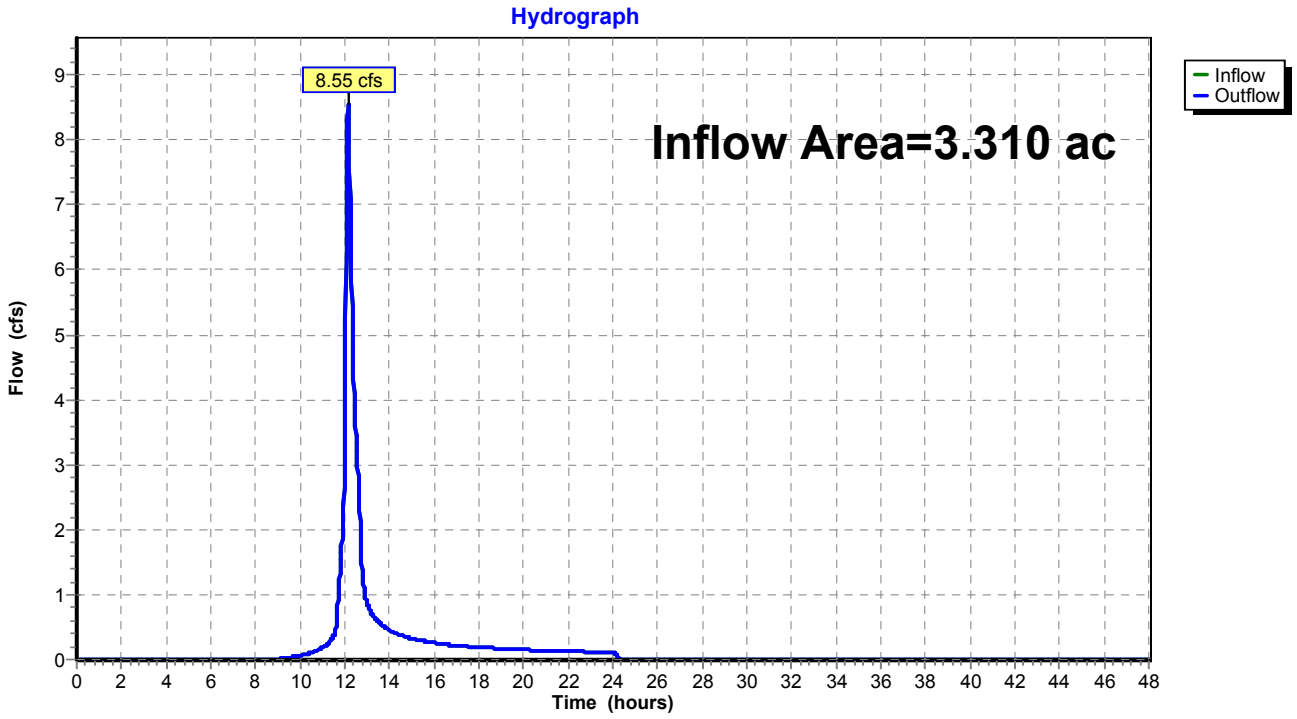
Summary for Reach 50R: Outfall of SB 12

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 3.310 ac, 0.00% Impervious, Inflow Depth = 2.22" for 10-Year event
Inflow = 8.55 cfs @ 12.15 hrs, Volume= 0.613 af
Outflow = 8.55 cfs @ 12.15 hrs, Volume= 0.613 af, Atten= 0%, Lag= 0.0 min

Routing by Muskingum-Cunge method, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs

Reach 50R: Outfall of SB 12



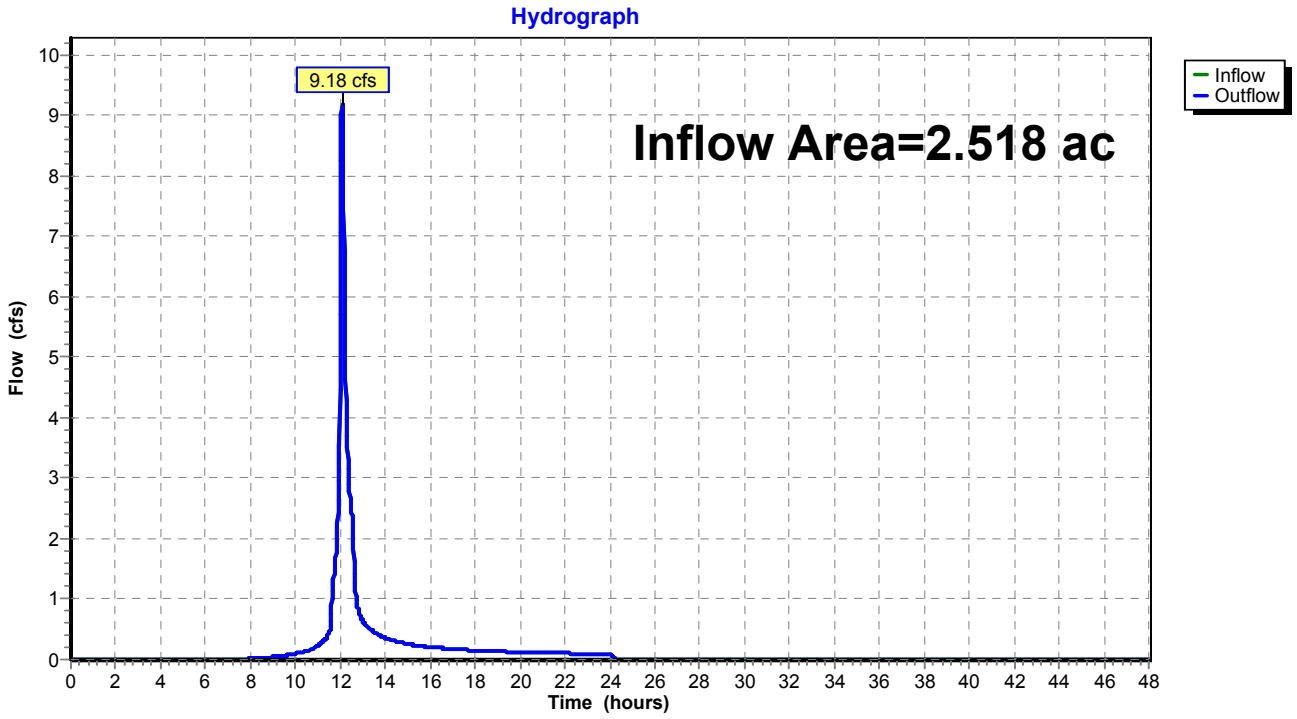
Summary for Reach 51R: Outfall of SB 14

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 2.518 ac, 0.00% Impervious, Inflow Depth = 2.57" for 10-Year event
Inflow = 9.18 cfs @ 12.08 hrs, Volume= 0.538 af
Outflow = 9.18 cfs @ 12.08 hrs, Volume= 0.538 af, Atten= 0%, Lag= 0.0 min

Routing by Muskingum-Cunge method, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs

Reach 51R: Outfall of SB 14



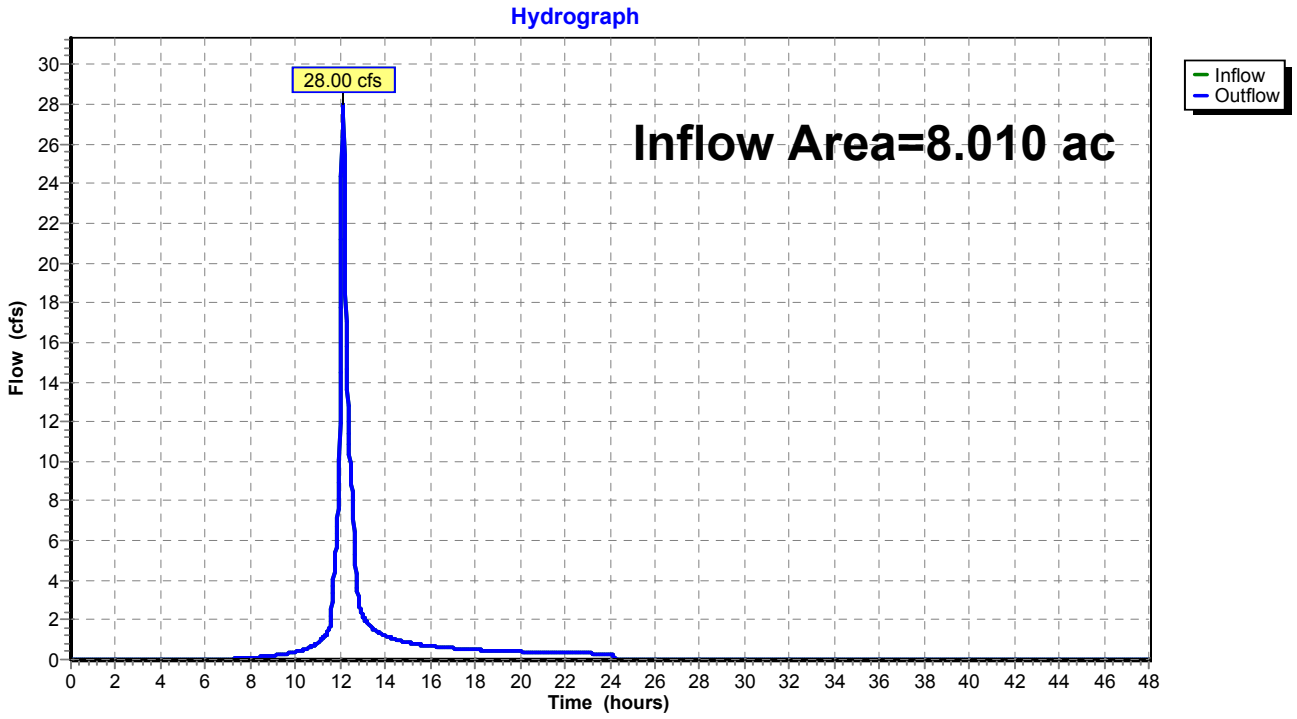
Summary for Reach 52R: Outfall of SB 17

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 8.010 ac, 0.00% Impervious, Inflow Depth = 2.75" for 10-Year event
Inflow = 28.00 cfs @ 12.11 hrs, Volume= 1.833 af
Outflow = 28.00 cfs @ 12.11 hrs, Volume= 1.833 af, Atten= 0%, Lag= 0.0 min

Routing by Muskingum-Cunge method, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs

Reach 52R: Outfall of SB 17



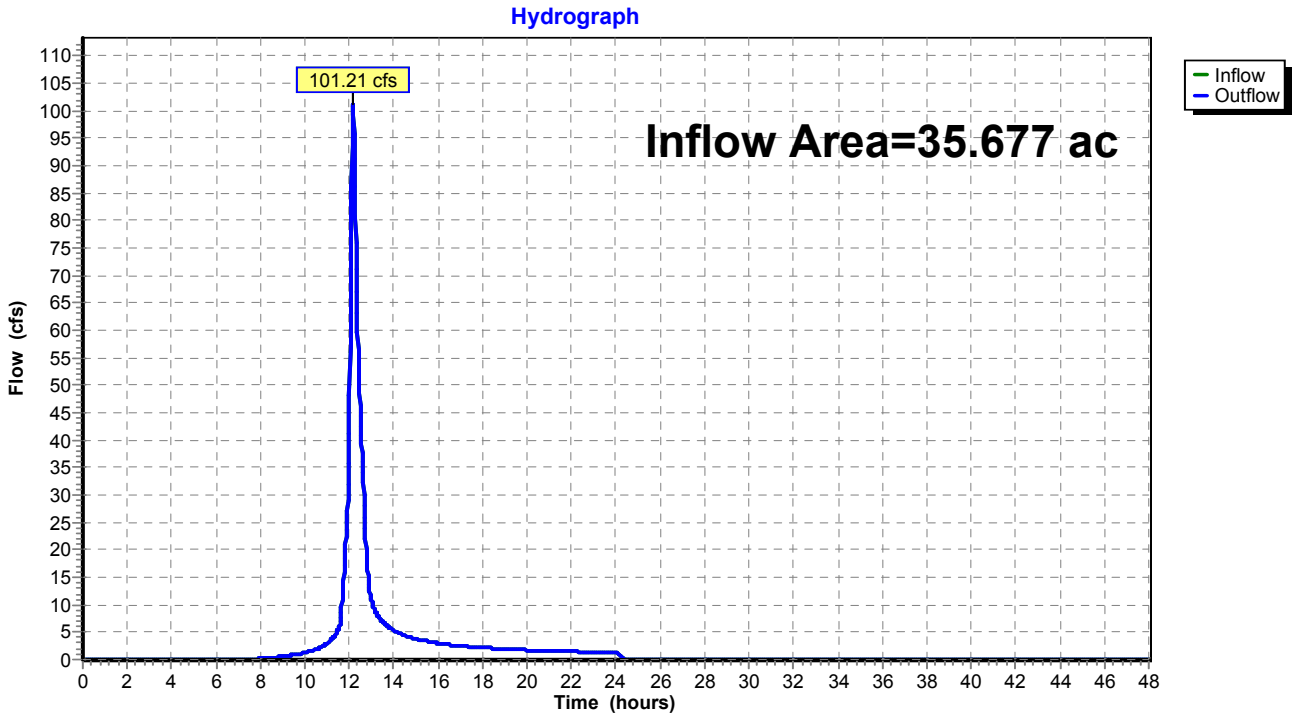
Summary for Reach 53R: Outfall of SB 18

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 35.677 ac, 0.00% Impervious, Inflow Depth = 2.57" for 10-Year event
Inflow = 101.21 cfs @ 12.17 hrs, Volume= 7.627 af
Outflow = 101.21 cfs @ 12.17 hrs, Volume= 7.627 af, Atten= 0%, Lag= 0.0 min

Routing by Muskingum-Cunge method, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs

Reach 53R: Outfall of SB 18



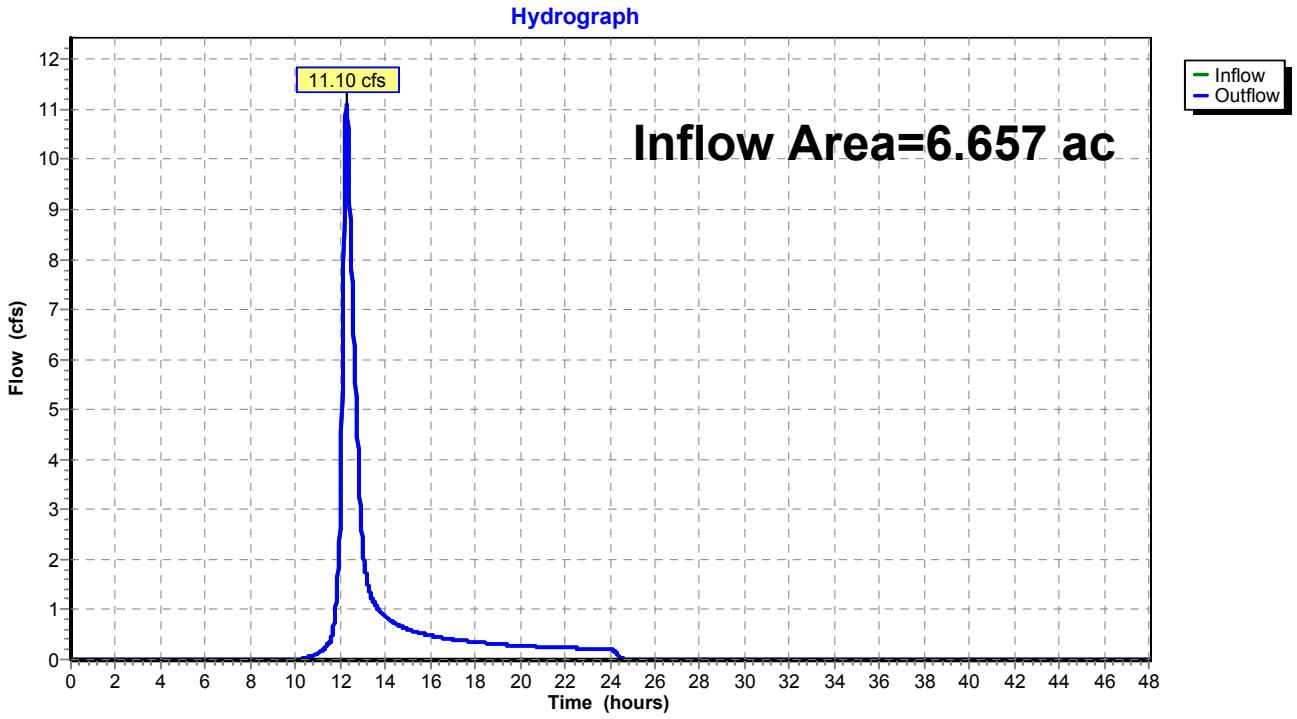
Summary for Reach 54R: Outfall of SB 25

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 6.657 ac, 0.00% Impervious, Inflow Depth = 1.83" for 10-Year event
Inflow = 11.10 cfs @ 12.28 hrs, Volume= 1.017 af
Outflow = 11.10 cfs @ 12.28 hrs, Volume= 1.017 af, Atten= 0%, Lag= 0.0 min

Routing by Muskingum-Cunge method, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs

Reach 54R: Outfall of SB 25



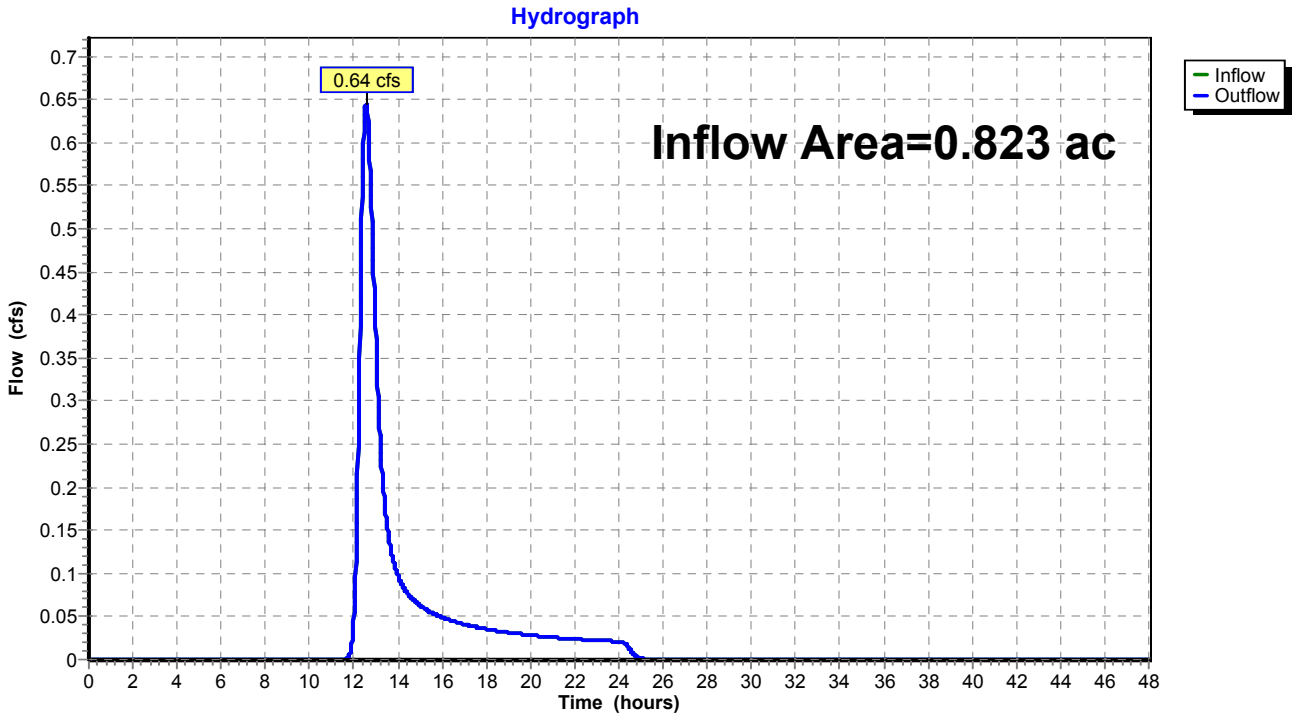
Summary for Reach 55R: Outfall of SB 26

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.823 ac, 0.00% Impervious, Inflow Depth = 1.22" for 10-Year event
Inflow = 0.64 cfs @ 12.56 hrs, Volume= 0.084 af
Outflow = 0.64 cfs @ 12.56 hrs, Volume= 0.084 af, Atten= 0%, Lag= 0.0 min

Routing by Muskingum-Cunge method, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs

Reach 55R: Outfall of SB 26



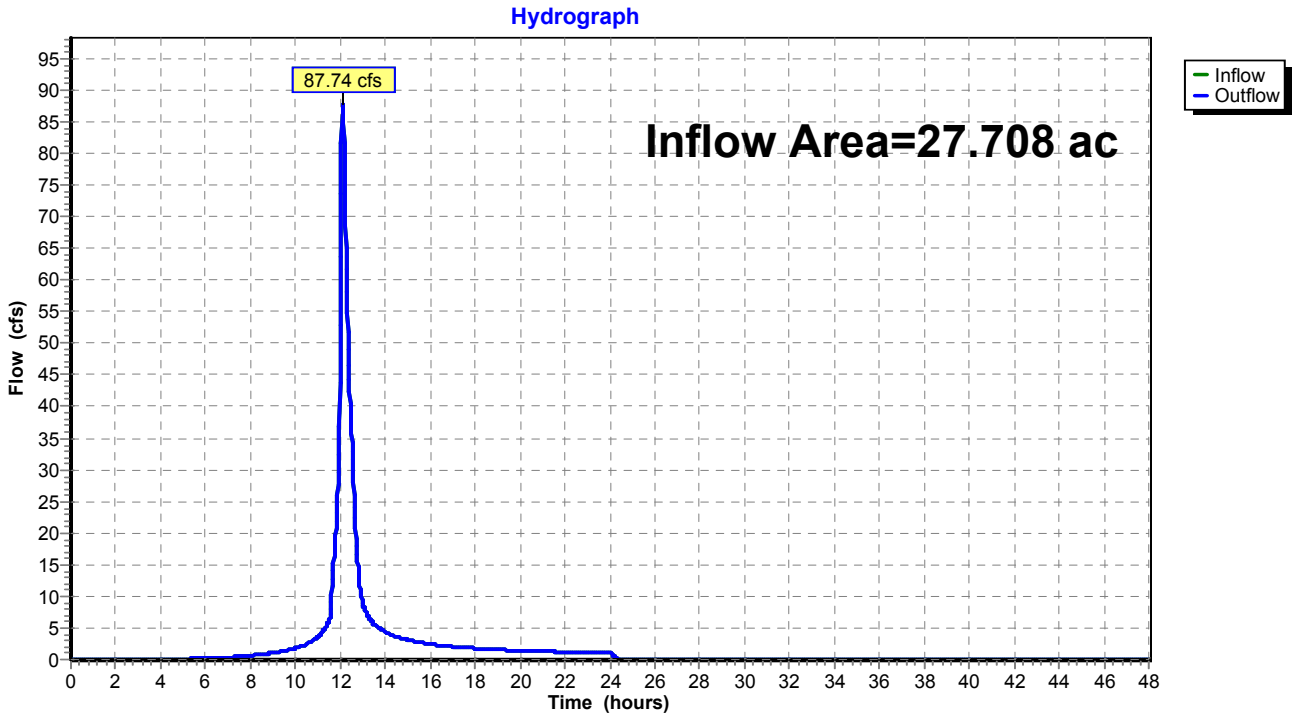
Summary for Reach 56R: Outfall of SB 23, 24

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 27.708 ac, 0.00% Impervious, Inflow Depth = 2.99" for 10-Year event
Inflow = 87.74 cfs @ 12.10 hrs, Volume= 6.907 af
Outflow = 87.74 cfs @ 12.10 hrs, Volume= 6.907 af, Atten= 0%, Lag= 0.0 min

Routing by Muskingum-Cunge method, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs

Reach 56R: Outfall of SB 23, 24



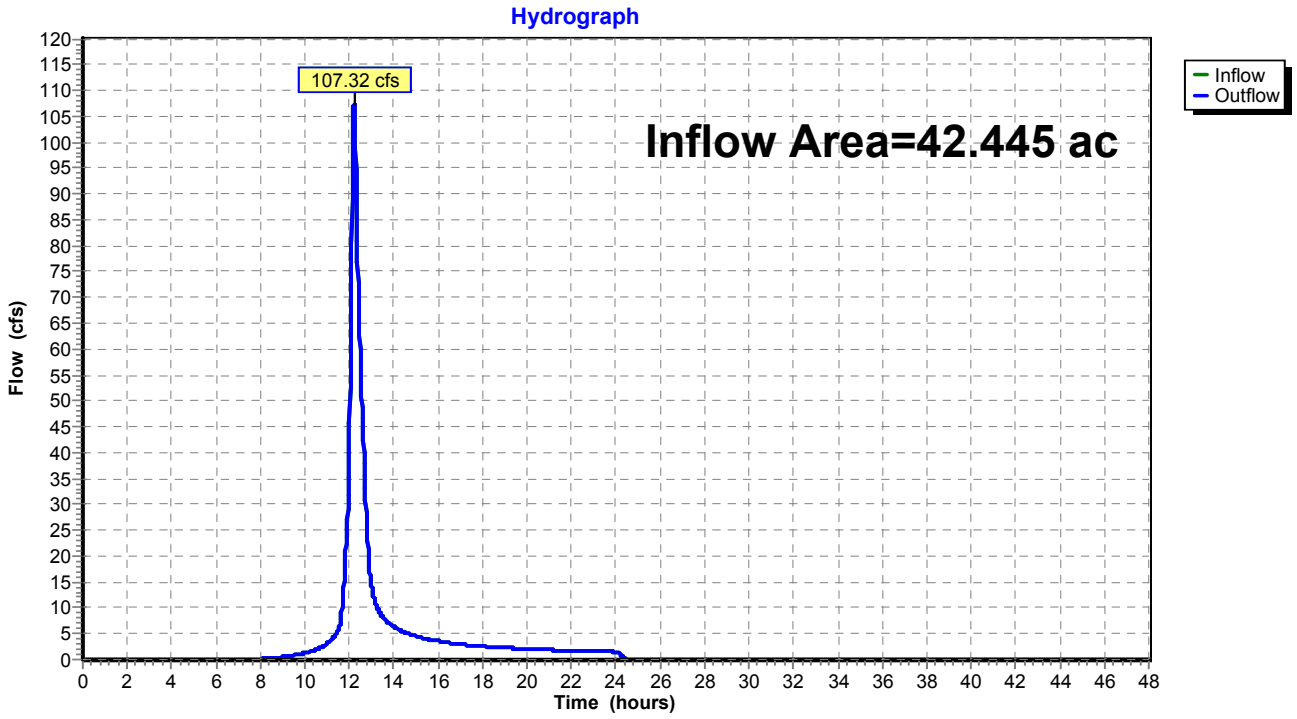
Summary for Reach 59R: Outfall of SB 20, 22

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 42.445 ac, 0.00% Impervious, Inflow Depth = 2.49" for 10-Year event
Inflow = 107.32 cfs @ 12.21 hrs, Volume= 8.807 af
Outflow = 107.32 cfs @ 12.21 hrs, Volume= 8.807 af, Atten= 0%, Lag= 0.0 min

Routing by Muskingum-Cunge method, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs

Reach 59R: Outfall of SB 20, 22



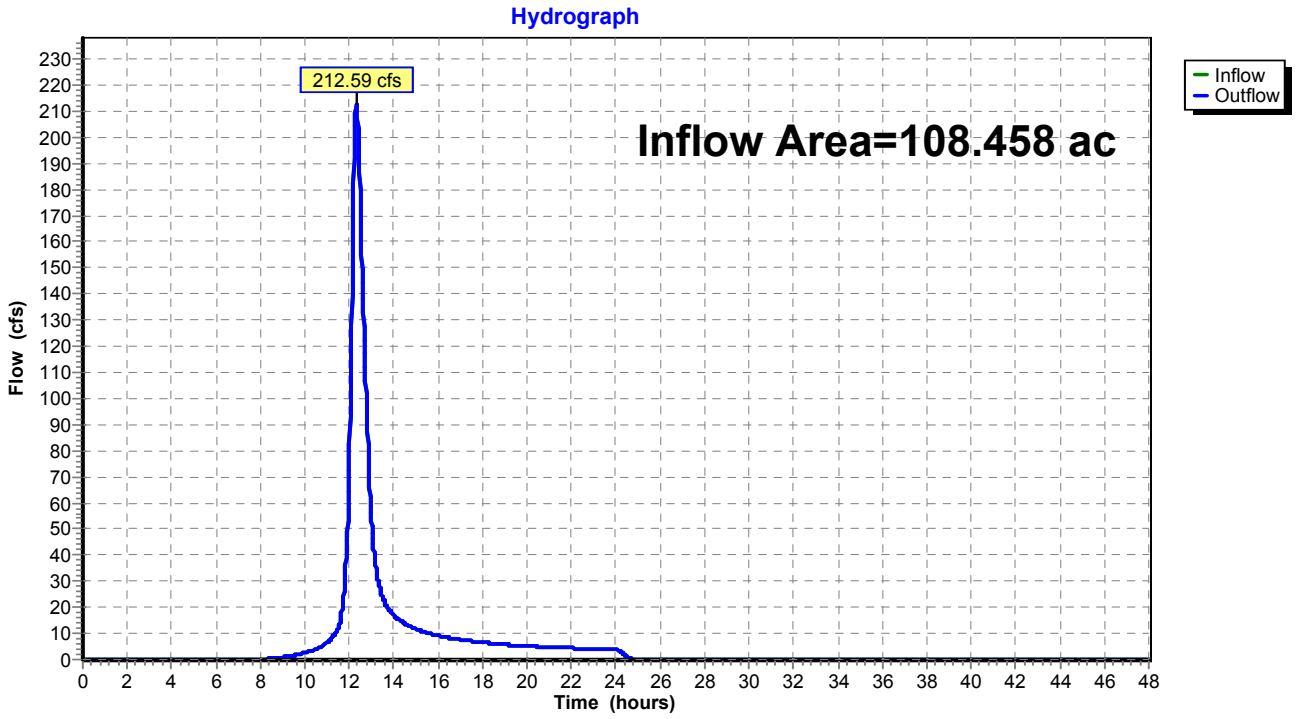
Summary for Reach 61R: Outfall of SB 15, 16, 21

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 108.458 ac, 0.00% Impervious, Inflow Depth = 2.41" for 10-Year event
Inflow = 212.59 cfs @ 12.32 hrs, Volume= 21.738 af
Outflow = 212.59 cfs @ 12.32 hrs, Volume= 21.738 af, Atten= 0%, Lag= 0.0 min

Routing by Muskingum-Cunge method, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs

Reach 61R: Outfall of SB 15, 16, 21



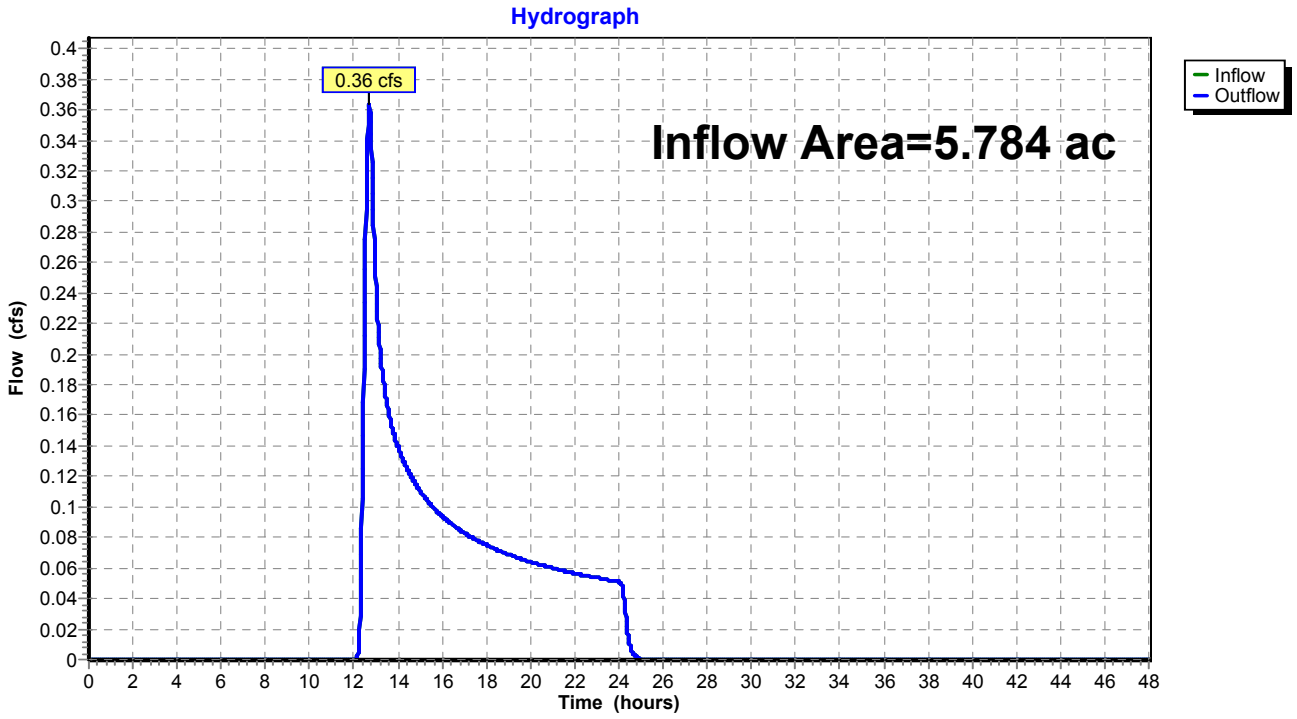
Summary for Reach 67R: Outfall of SB 28

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 5.784 ac, 0.00% Impervious, Inflow Depth = 0.19" for 10-Year event
Inflow = 0.36 cfs @ 12.70 hrs, Volume= 0.094 af
Outflow = 0.36 cfs @ 12.70 hrs, Volume= 0.094 af, Atten= 0%, Lag= 0.0 min

Routing by Muskingum-Cunge method, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs

Reach 67R: Outfall of SB 28



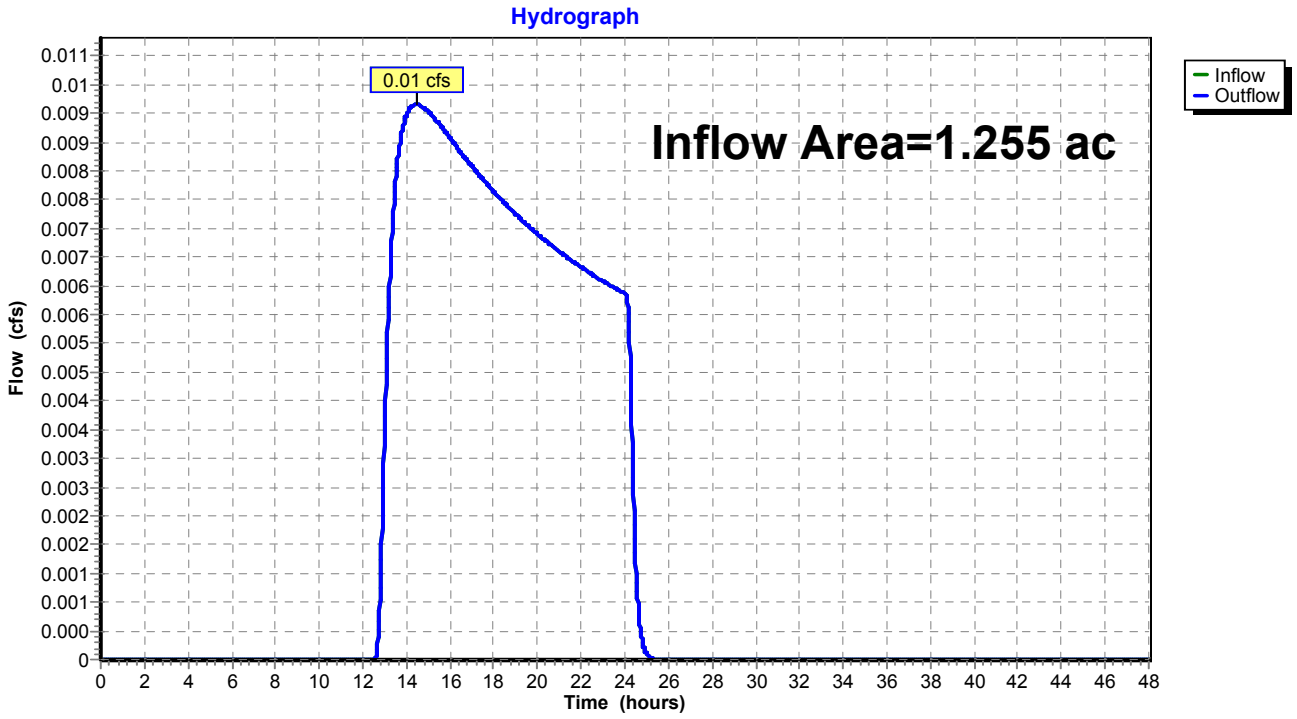
Summary for Reach 68R: Outfall of SB 29

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 1.255 ac, 0.00% Impervious, Inflow Depth = 0.07" for 10-Year event
Inflow = 0.01 cfs @ 14.44 hrs, Volume= 0.007 af
Outflow = 0.01 cfs @ 14.44 hrs, Volume= 0.007 af, Atten= 0%, Lag= 0.0 min

Routing by Muskingum-Cunge method, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs

Reach 68R: Outfall of SB 29



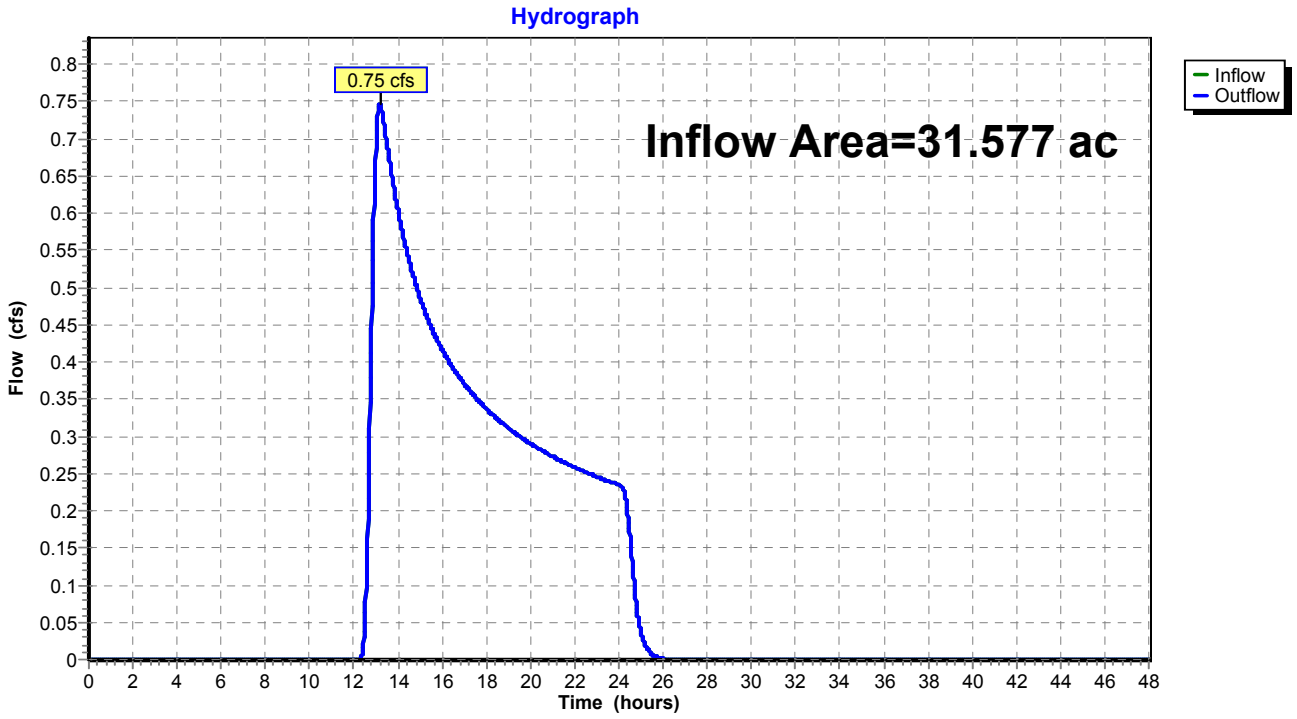
Summary for Reach 69R: Outfall of SB 30

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 31.577 ac, 0.00% Impervious, Inflow Depth = 0.14" for 10-Year event
Inflow = 0.75 cfs @ 13.19 hrs, Volume= 0.366 af
Outflow = 0.75 cfs @ 13.19 hrs, Volume= 0.366 af, Atten= 0%, Lag= 0.0 min

Routing by Muskingum-Cunge method, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs

Reach 69R: Outfall of SB 30



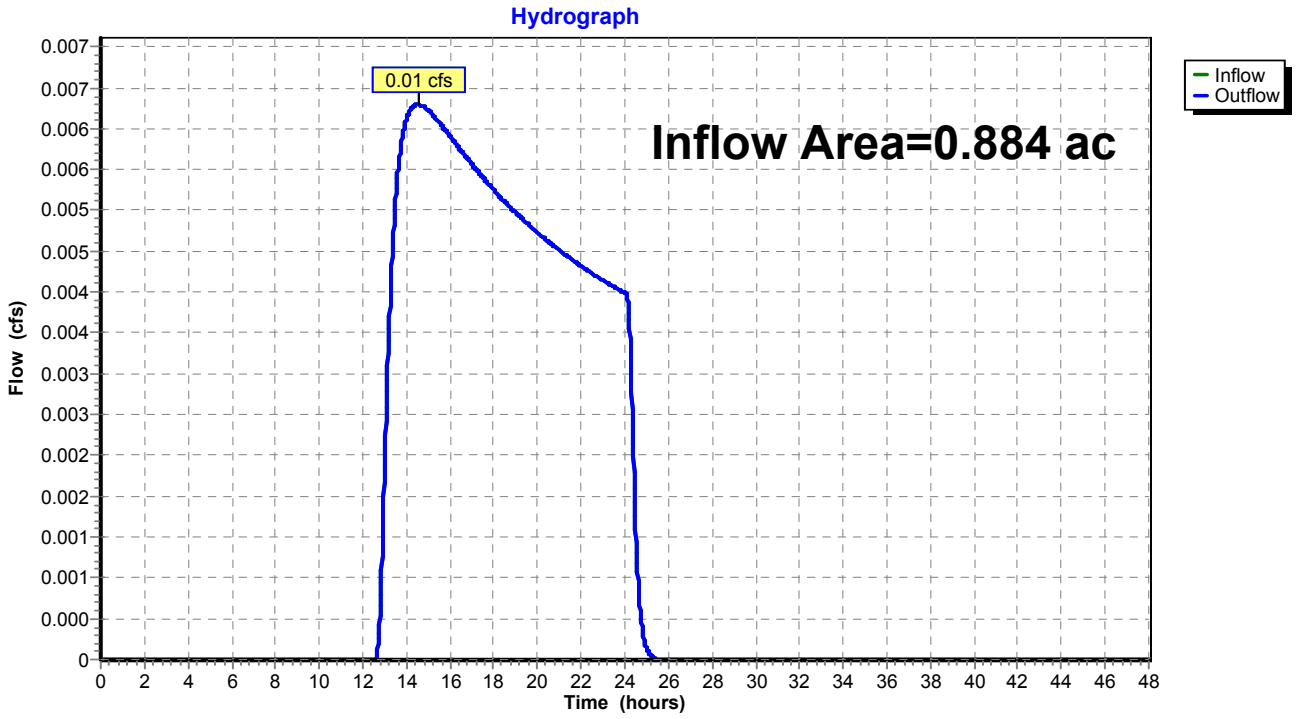
Summary for Reach 70R: Outfall of SB 31

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.884 ac, 0.00% Impervious, Inflow Depth = 0.07" for 10-Year event
Inflow = 0.01 cfs @ 14.53 hrs, Volume= 0.005 af
Outflow = 0.01 cfs @ 14.53 hrs, Volume= 0.005 af, Atten= 0%, Lag= 0.0 min

Routing by Muskingum-Cunge method, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs

Reach 70R: Outfall of SB 31



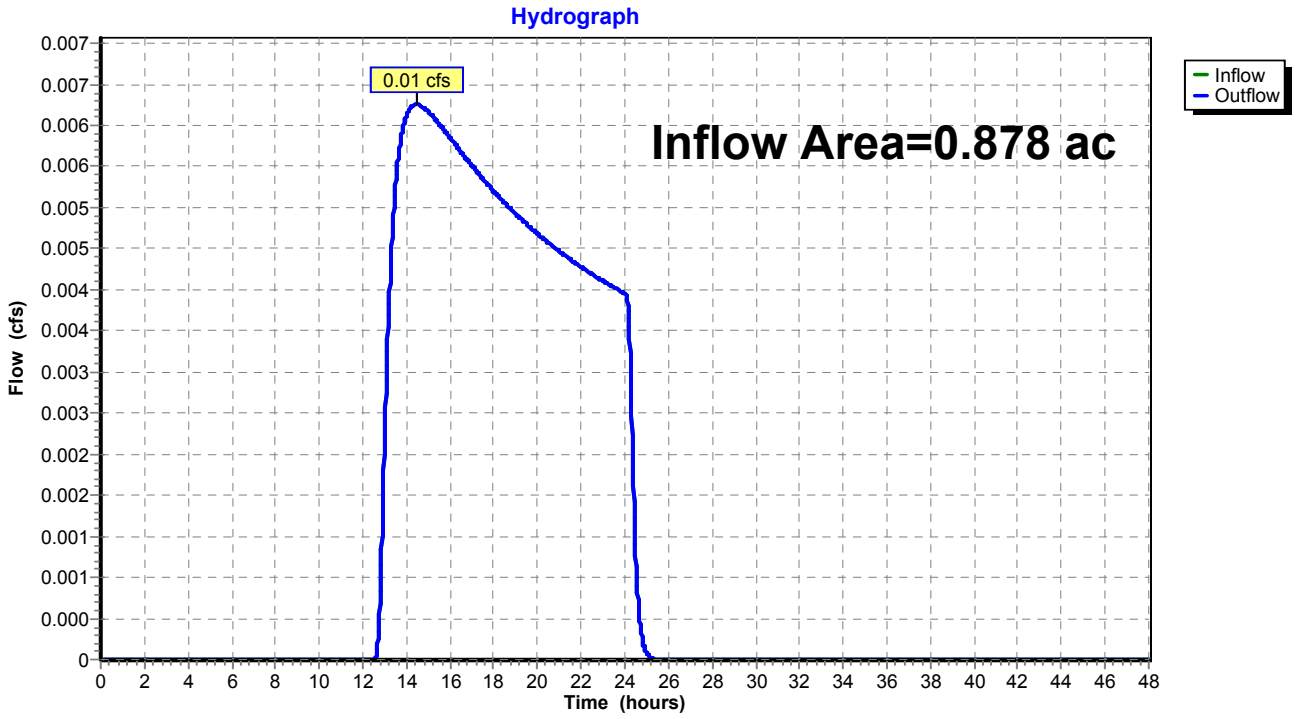
Summary for Reach 71R: Outfall of SB 32

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.878 ac, 0.00% Impervious, Inflow Depth = 0.07" for 10-Year event
Inflow = 0.01 cfs @ 14.44 hrs, Volume= 0.005 af
Outflow = 0.01 cfs @ 14.44 hrs, Volume= 0.005 af, Atten= 0%, Lag= 0.0 min

Routing by Muskingum-Cunge method, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs

Reach 71R: Outfall of SB 32



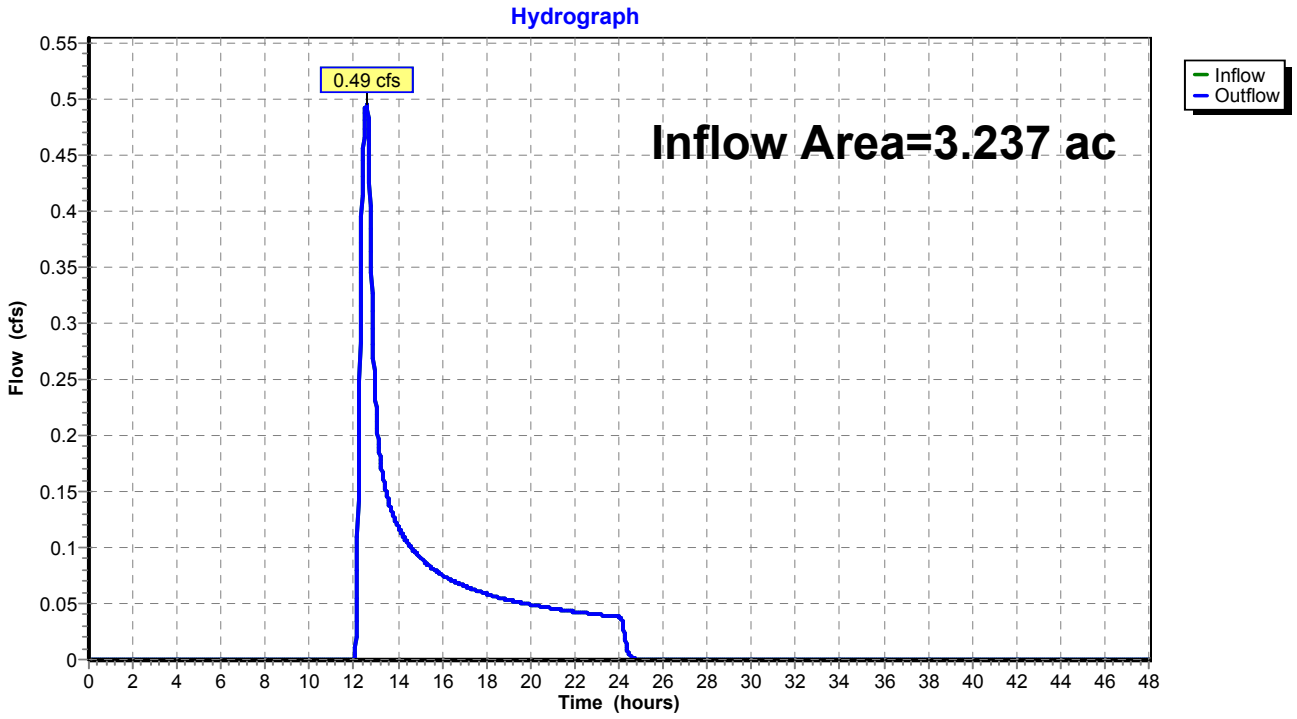
Summary for Reach 72R: Outfall of SB 33

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 3.237 ac, 0.00% Impervious, Inflow Depth = 0.33" for 10-Year event
Inflow = 0.49 cfs @ 12.58 hrs, Volume= 0.088 af
Outflow = 0.49 cfs @ 12.58 hrs, Volume= 0.088 af, Atten= 0%, Lag= 0.0 min

Routing by Muskingum-Cunge method, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs

Reach 72R: Outfall of SB 33



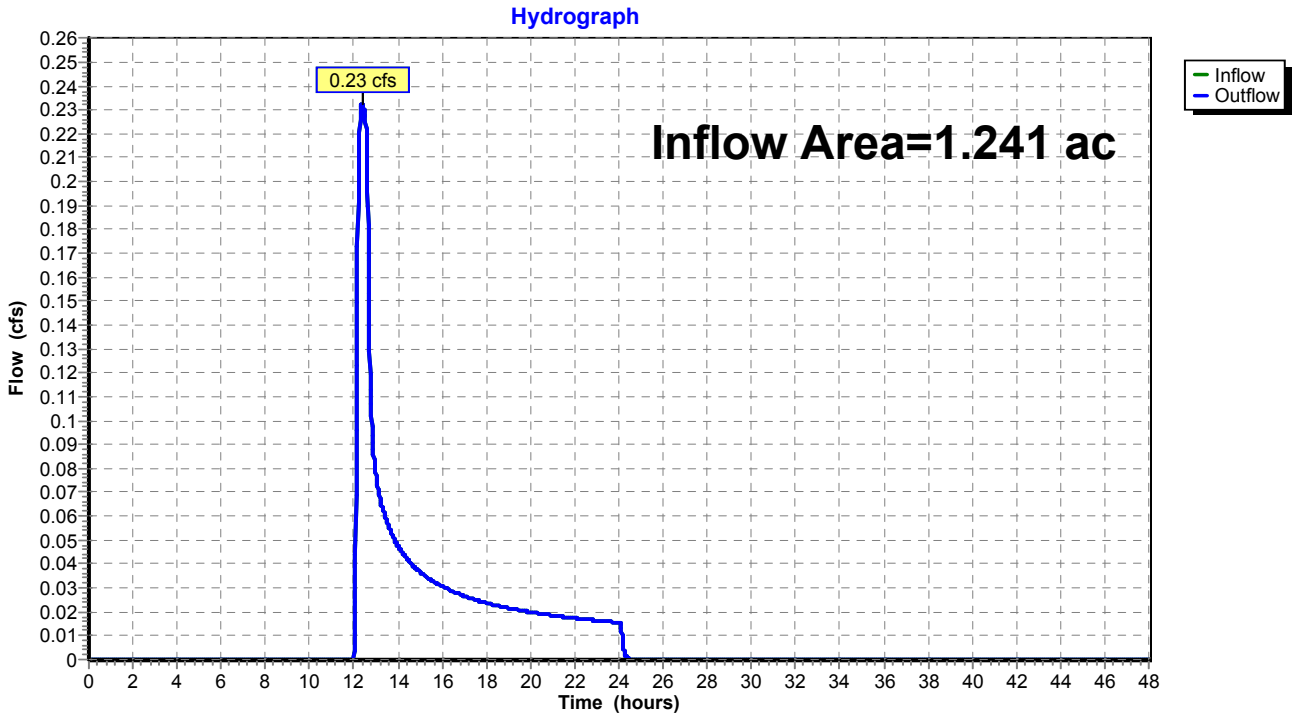
Summary for Reach 73R: Outfall of SB 34

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 1.241 ac, 0.00% Impervious, Inflow Depth = 0.36" for 10-Year event
Inflow = 0.23 cfs @ 12.38 hrs, Volume= 0.038 af
Outflow = 0.23 cfs @ 12.38 hrs, Volume= 0.038 af, Atten= 0%, Lag= 0.0 min

Routing by Muskingum-Cunge method, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs

Reach 73R: Outfall of SB 34



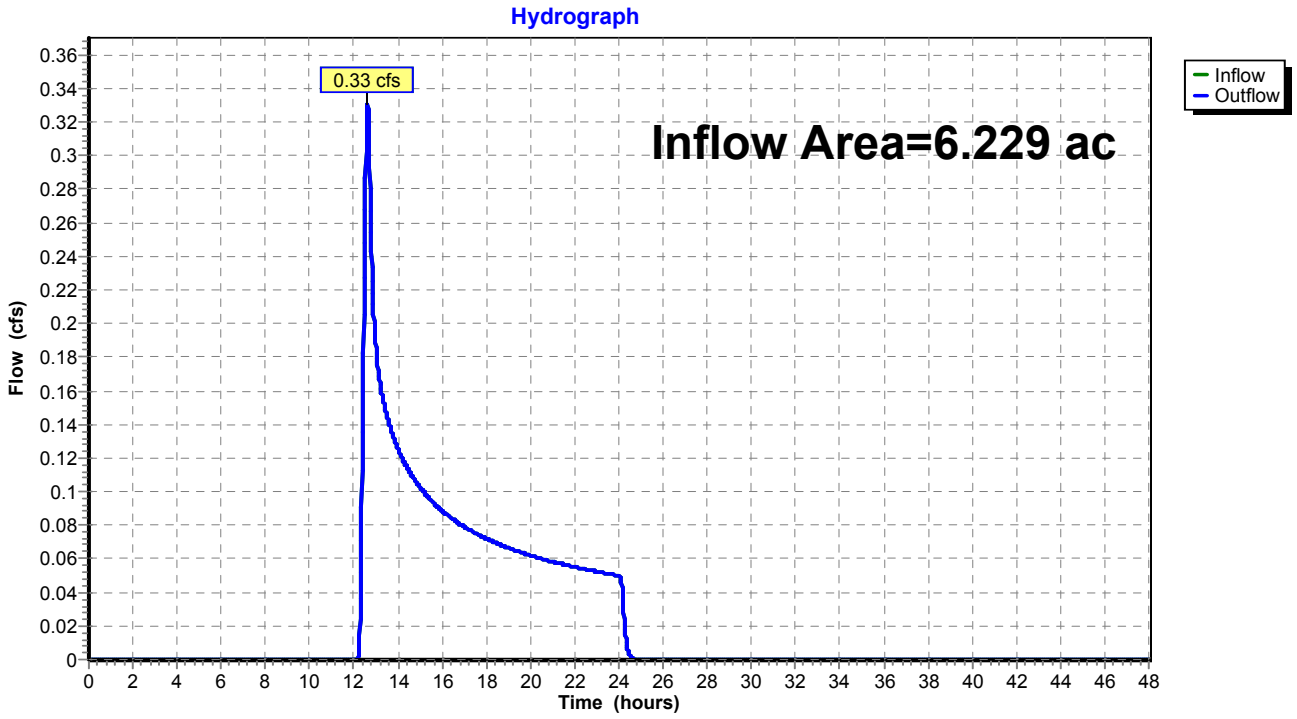
Summary for Reach 74R: Outfall of SB 35

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 6.229 ac, 0.00% Impervious, Inflow Depth = 0.17" for 10-Year event
Inflow = 0.33 cfs @ 12.63 hrs, Volume= 0.086 af
Outflow = 0.33 cfs @ 12.63 hrs, Volume= 0.086 af, Atten= 0%, Lag= 0.0 min

Routing by Muskingum-Cunge method, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs

Reach 74R: Outfall of SB 35



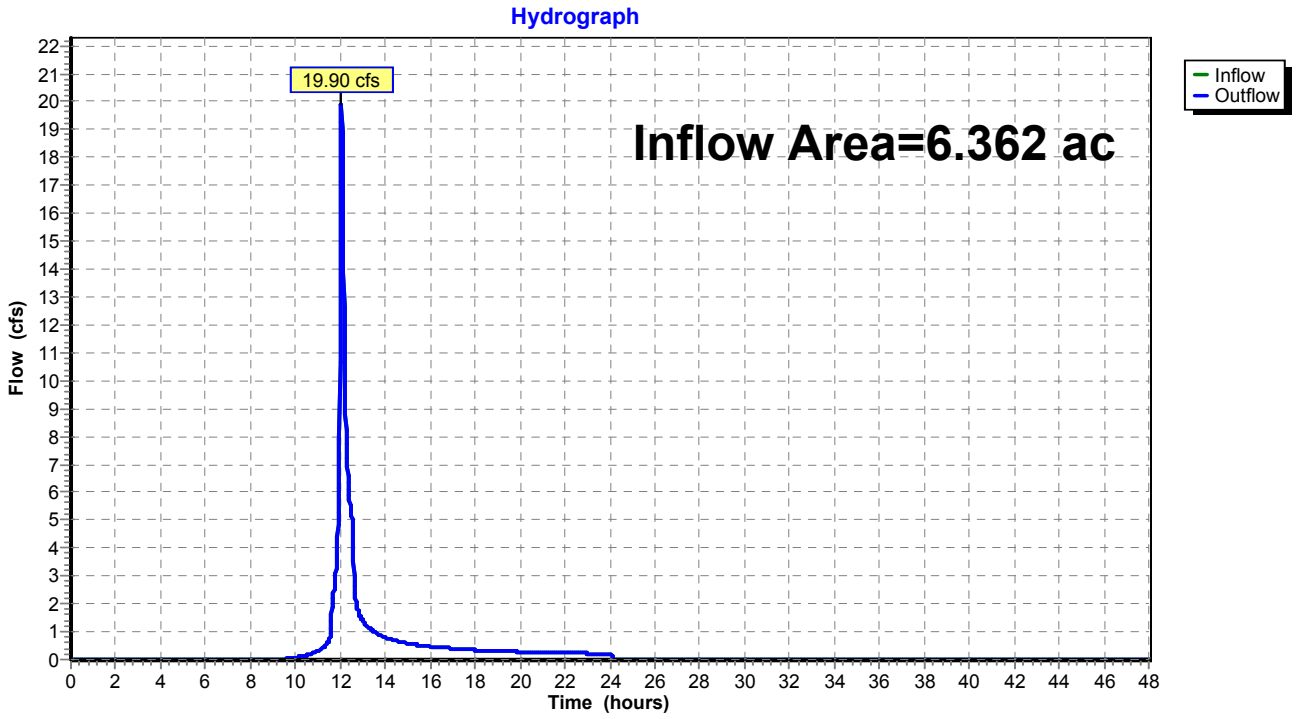
Summary for Reach 75R: Outfall of SB 19

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 6.362 ac, 0.00% Impervious, Inflow Depth = 2.06" for 10-Year event
Inflow = 19.90 cfs @ 12.06 hrs, Volume= 1.094 af
Outflow = 19.90 cfs @ 12.06 hrs, Volume= 1.094 af, Atten= 0%, Lag= 0.0 min

Routing by Muskingum-Cunge method, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs

Reach 75R: Outfall of SB 19



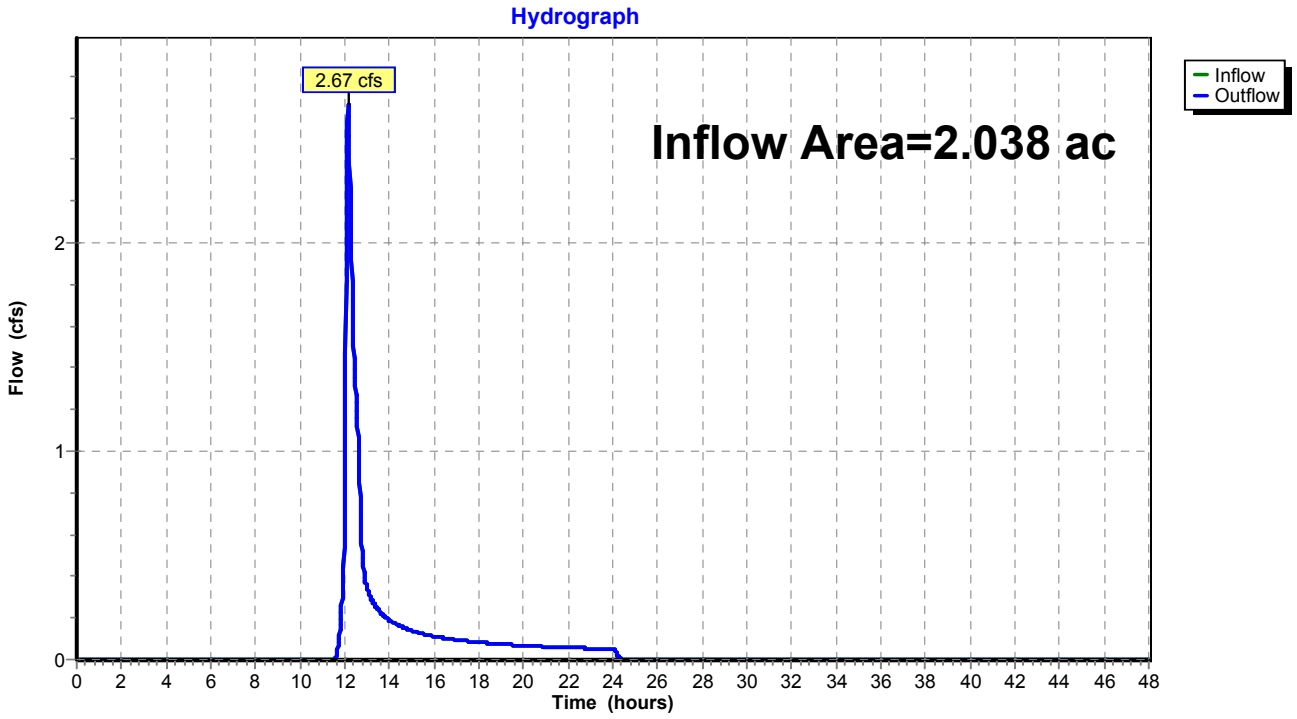
Summary for Reach 82R: Outfall of SB 27

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 2.038 ac, 0.00% Impervious, Inflow Depth = 1.22" for 10-Year event
Inflow = 2.67 cfs @ 12.15 hrs, Volume= 0.207 af
Outflow = 2.67 cfs @ 12.15 hrs, Volume= 0.207 af, Atten= 0%, Lag= 0.0 min

Routing by Muskingum-Cunge method, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs

Reach 82R: Outfall of SB 27



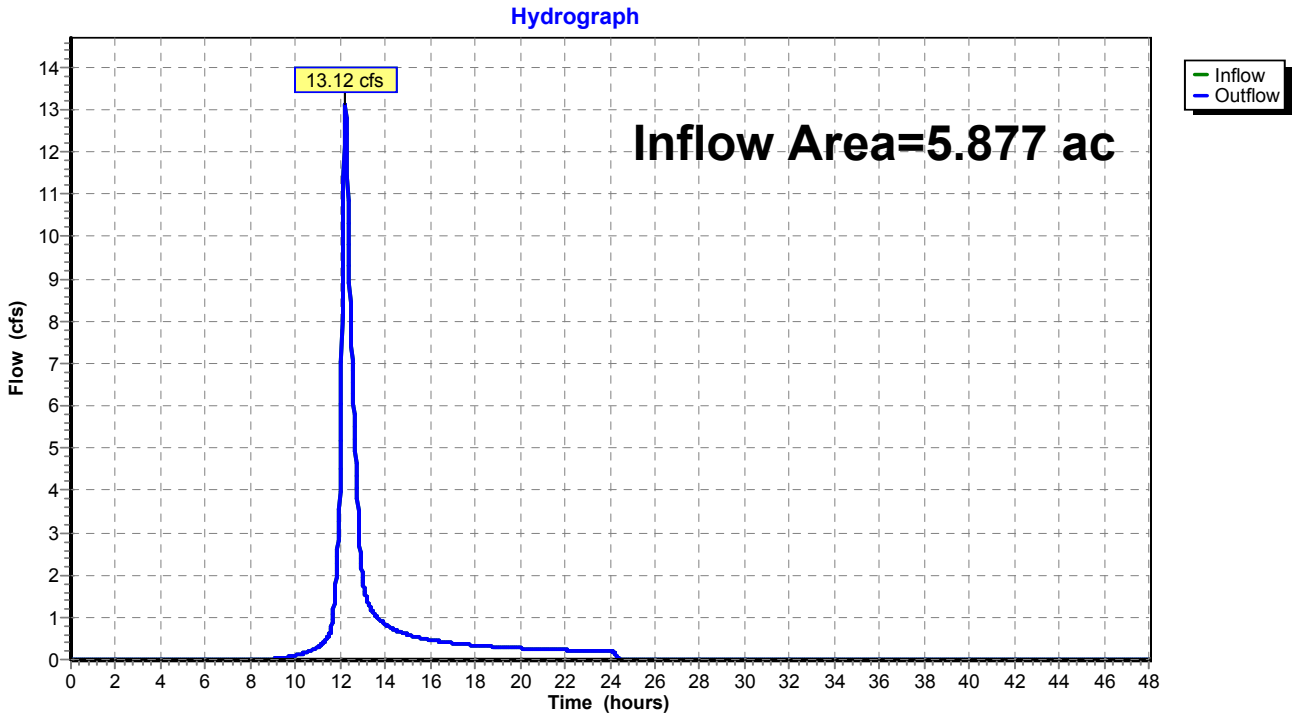
Summary for Reach 84R: Outfall of Future County Road H Subbasin

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 5.877 ac, 0.00% Impervious, Inflow Depth = 2.22" for 10-Year event
Inflow = 13.12 cfs @ 12.22 hrs, Volume= 1.089 af
Outflow = 13.12 cfs @ 12.22 hrs, Volume= 1.089 af, Atten= 0%, Lag= 0.0 min

Routing by Muskingum-Cunge method, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs

Reach 84R: Outfall of Future County Road H Subbasin



Time span=0.00-48.00 hrs, dt=0.02 hrs, 2401 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Muskingum-Cunge method - Pond routing by Stor-Ind method

Subcatchment1: Sub-basin1 Runoff Area=15.328 ac 0.00% Impervious Runoff Depth=5.78"
Tc=16.3 min CN=87 Runoff=86.42 cfs 7.383 af

Subcatchment2: Sub-basin 2 Runoff Area=4.913 ac 0.00% Impervious Runoff Depth=4.42"
Tc=12.2 min CN=75 Runoff=24.74 cfs 1.811 af

Subcatchment3: Sub-basin 3 Runoff Area=15.522 ac 0.00% Impervious Runoff Depth=4.42"
Tc=32.8 min CN=75 Runoff=49.25 cfs 5.723 af

Subcatchment4S: Sub-basin 4 Runoff Area=23.961 ac 0.00% Impervious Runoff Depth=5.55"
Tc=11.3 min CN=85 Runoff=153.95 cfs 11.082 af

Subcatchment5S: Sub-basin 5 Runoff Area=27.171 ac 0.00% Impervious Runoff Depth=5.32"
Tc=40.5 min CN=83 Runoff=91.61 cfs 12.049 af

Subcatchment6S: Sub-basin 6 Runoff Area=22.467 ac 0.00% Impervious Runoff Depth=4.76"
Tc=46.4 min CN=78 Runoff=63.49 cfs 8.907 af

Subcatchment7S: Sub-basin 7 Runoff Area=9.790 ac 0.00% Impervious Runoff Depth=3.03"
Tc=27.0 min CN=62 Runoff=22.73 cfs 2.473 af

Subcatchment8S: Sub-basin 8 Runoff Area=21.017 ac 0.00% Impervious Runoff Depth=5.09"
Tc=9.5 min CN=81 Runoff=134.02 cfs 8.923 af

Subcatchment9S: Sub-basin 9 Runoff Area=9.296 ac 0.00% Impervious Runoff Depth=5.21"
Tc=12.7 min CN=82 Runoff=53.64 cfs 4.034 af

Subcatchment10S: Sub-basin 10 Runoff Area=30.014 ac 0.00% Impervious Runoff Depth=5.09"
Tc=37.7 min CN=81 Runoff=101.31 cfs 12.742 af

Subcatchment11S: Sub-basin 11 Runoff Area=4.343 ac 0.00% Impervious Runoff Depth=4.53"
Tc=32.9 min CN=76 Runoff=14.07 cfs 1.641 af

Subcatchment12S: Sub-basin 12 Runoff Area=3.310 ac 0.00% Impervious Runoff Depth=4.98"
Tc=14.0 min CN=80 Runoff=17.60 cfs 1.374 af

Subcatchment13S: Sub-basin 13 Runoff Area=2.279 ac 0.00% Impervious Runoff Depth=5.21"
Tc=36.2 min CN=82 Runoff=8.02 cfs 0.989 af

Subcatchment14S: Sub-basin 14 Runoff Area=2.518 ac 0.00% Impervious Runoff Depth=5.44"
Tc=8.9 min CN=84 Runoff=17.43 cfs 1.141 af

Subcatchment15S: Sub-basin 15 Runoff Area=56.506 ac 0.00% Impervious Runoff Depth=5.21"
Tc=28.0 min CN=82 Runoff=226.35 cfs 24.522 af

Subcatchment16S: Sub-basin 16 Runoff Area=44.796 ac 0.00% Impervious Runoff Depth=5.09"
Tc=26.3 min CN=81 Runoff=181.67 cfs 19.018 af

Subcatchment17S: Sub-basin 17 Runoff Area=8.010 ac 0.00% Impervious Runoff Depth=5.66"
Tc=11.5 min CN=86 Runoff=51.71 cfs 3.781 af

Subcatchment18S: Sub-basin 18 Runoff Area=35.677 ac 0.00% Impervious Runoff Depth=5.44"
Tc=15.8 min CN=84 Runoff=194.75 cfs 16.160 af

Subcatchment19S: Sub-basin 19 Runoff Area=6.362 ac 0.00% Impervious Runoff Depth=4.76"
Tc=7.3 min CN=78 Runoff=41.96 cfs 2.522 af

Subcatchment20S: Sub-basin 20 Runoff Area=15.897 ac 0.00% Impervious Runoff Depth=5.55"
Tc=17.1 min CN=85 Runoff=85.17 cfs 7.352 af

Subcatchment21S: Sub-basin 21 Runoff Area=7.156 ac 0.00% Impervious Runoff Depth=6.13"
Tc=10.8 min CN=90 Runoff=50.44 cfs 3.654 af

Subcatchment22S: Sub-basin 22 Runoff Area=26.548 ac 0.00% Impervious Runoff Depth=5.21"
Tc=19.6 min CN=82 Runoff=126.46 cfs 11.521 af

Subcatchment23S: Sub-basin 23 Runoff Area=13.825 ac 0.00% Impervious Runoff Depth=6.36"
Tc=9.4 min CN=92 Runoff=104.89 cfs 7.329 af

Subcatchment24S: Sub-basin 24 Runoff Area=13.883 ac 0.00% Impervious Runoff Depth=5.55"
Tc=19.0 min CN=85 Runoff=70.75 cfs 6.421 af

Subcatchment25S: Sub-basin 25 Runoff Area=6.657 ac 0.00% Impervious Runoff Depth=4.42"
Tc=22.6 min CN=75 Runoff=25.47 cfs 2.454 af

Subcatchment26S: Sub-basin 26 Runoff Area=0.823 ac 0.00% Impervious Runoff Depth=3.45"
Tc=38.2 min CN=66 Runoff=1.86 cfs 0.237 af

Subcatchment27S: Sub-basin 27 Runoff Area=2.038 ac 0.00% Impervious Runoff Depth=3.45"
Tc=13.0 min CN=66 Runoff=7.67 cfs 0.586 af

Subcatchment28S: Sub-basin 28 Runoff Area=5.784 ac 0.00% Impervious Runoff Depth=1.30"
Tc=23.9 min CN=44 Runoff=4.65 cfs 0.626 af

Subcatchment29S: Sub-basin 29 Runoff Area=1.255 ac 0.00% Impervious Runoff Depth=0.88"
Tc=26.9 min CN=39 Runoff=0.54 cfs 0.092 af

Subcatchment30S: Sub-basin 30 Runoff Area=31.577 ac 0.00% Impervious Runoff Depth=1.13"
Tc=45.9 min CN=42 Runoff=15.95 cfs 2.966 af

Subcatchment31S: Sub-basin 31 Runoff Area=0.884 ac 0.00% Impervious Runoff Depth=0.88"
Tc=30.2 min CN=39 Runoff=0.37 cfs 0.065 af

Subcatchment32S: Sub-basin 32 Runoff Area=0.878 ac 0.00% Impervious Runoff Depth=0.88"
Tc=27.6 min CN=39 Runoff=0.38 cfs 0.065 af

Subcatchment33S: Sub-basin 33 Runoff Area=3.237 ac 0.00% Impervious Runoff Depth=1.66"
Tc=19.9 min CN=48 Runoff=4.03 cfs 0.447 af

Subcatchment34S: Sub-basin 34 Runoff Area=1.241 ac 0.00% Impervious Runoff Depth=1.75"
Tc=12.1 min CN=49 Runoff=2.05 cfs 0.181 af

Subcatchment35S: Sub-basin 35 Runoff Area=6.229 ac 0.00% Impervious Runoff Depth=1.21"
Tc=16.7 min CN=43 Runoff=5.16 cfs 0.629 af

Subcatchment36S: Sub-basin 36 Runoff Area=11.210 ac 0.00% Impervious Runoff Depth=4.87"
Tc=52.2 min CN=79 Runoff=30.42 cfs 4.549 af

Subcatchment83S: County Road H Runoff Area=5.877 ac 0.00% Impervious Runoff Depth=4.98"
Tc=19.1 min CN=80 Runoff=27.19 cfs 2.440 af

Reach 37R: Outfall of SB 2, 3, 7 Inflow=83.23 cfs 10.007 af
Outflow=83.23 cfs 10.007 af

Reach 39R: Outfall of SB 1, 4, 5, 6, 9, 10, 11, 36 Inflow=438.22 cfs 62.386 af
Outflow=438.22 cfs 62.386 af

Reach 40R: 60 in SB 4 Avg. Flow Depth=3.01' Max Vel=35.97 fps Inflow=438.10 cfs 62.386 af
60.0" Round Pipe n=0.013 L=718.0' S=0.0330 '/' Capacity=473.08 cfs Outflow=438.22 cfs 62.386 af

Reach 41R: Channel in SB 9, 10 Avg. Flow Depth=0.87' Max Vel=10.60 fps Inflow=53.64 cfs 4.034 af
n=0.050 L=1,660.0' S=0.0048 '/' Capacity=280.23 cfs Outflow=49.75 cfs 4.034 af

Reach 46R: Channel SB1 Avg. Flow Depth=1.24' Max Vel=6.91 fps Inflow=86.42 cfs 7.383 af
n=0.050 L=841.0' S=0.0071 '/' Capacity=296.86 cfs Outflow=85.24 cfs 7.383 af

Reach 48R: Outfall of SB 8, 13 Inflow=135.34 cfs 9.912 af
Outflow=135.34 cfs 9.912 af

Reach 49R: Channel SB8 Avg. Flow Depth=1.27' Max Vel=6.95 fps Inflow=134.02 cfs 8.923 af
n=0.050 L=521.0' S=0.0077 '/' Capacity=706.58 cfs Outflow=131.67 cfs 8.923 af

Reach 50R: Outfall of SB 12 Inflow=17.60 cfs 1.374 af
Outflow=17.60 cfs 1.374 af

Reach 51R: Outfall of SB 14 Inflow=17.43 cfs 1.141 af
Outflow=17.43 cfs 1.141 af

Reach 52R: Outfall of SB 17 Inflow=51.71 cfs 3.781 af
Outflow=51.71 cfs 3.781 af

Reach 53R: Outfall of SB 18 Inflow=194.75 cfs 16.160 af
Outflow=194.75 cfs 16.160 af

Reach 54R: Outfall of SB 25 Inflow=25.47 cfs 2.454 af
Outflow=25.47 cfs 2.454 af

Reach 55R: Outfall of SB 26 Inflow=1.86 cfs 0.237 af
Outflow=1.86 cfs 0.237 af

Reach 56R: Outfall of SB 23, 24	Inflow=155.89 cfs 13.749 af Outflow=155.89 cfs 13.749 af
Reach 59R: Outfall of SB 20, 22	Inflow=210.05 cfs 18.873 af Outflow=210.05 cfs 18.873 af
Reach 61R: Outfall of SB 15, 16, 21	Inflow=429.83 cfs 47.194 af Outflow=429.83 cfs 47.194 af
Reach 67R: Outfall of SB 28	Inflow=4.65 cfs 0.626 af Outflow=4.65 cfs 0.626 af
Reach 68R: Outfall of SB 29	Inflow=0.54 cfs 0.092 af Outflow=0.54 cfs 0.092 af
Reach 69R: Outfall of SB 30	Inflow=15.95 cfs 2.966 af Outflow=15.95 cfs 2.966 af
Reach 70R: Outfall of SB 31	Inflow=0.37 cfs 0.065 af Outflow=0.37 cfs 0.065 af
Reach 71R: Outfall of SB 32	Inflow=0.38 cfs 0.065 af Outflow=0.38 cfs 0.065 af
Reach 72R: Outfall of SB 33	Inflow=4.03 cfs 0.447 af Outflow=4.03 cfs 0.447 af
Reach 73R: Outfall of SB 34	Inflow=2.05 cfs 0.181 af Outflow=2.05 cfs 0.181 af
Reach 74R: Outfall of SB 35	Inflow=5.16 cfs 0.629 af Outflow=5.16 cfs 0.629 af
Reach 75R: Outfall of SB 19	Inflow=41.96 cfs 2.522 af Outflow=41.96 cfs 2.522 af
Reach 82R: Outfall of SB 27	Inflow=7.67 cfs 0.586 af Outflow=7.67 cfs 0.586 af
Reach 84R: Outfall of Future County Road H Subbasin	Inflow=27.19 cfs 2.440 af Outflow=27.19 cfs 2.440 af

Total Runoff Area = 498.279 ac Runoff Volume = 197.886 af Average Runoff Depth = 4.77"
100.00% Pervious = 498.279 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment 1: Sub-basin1

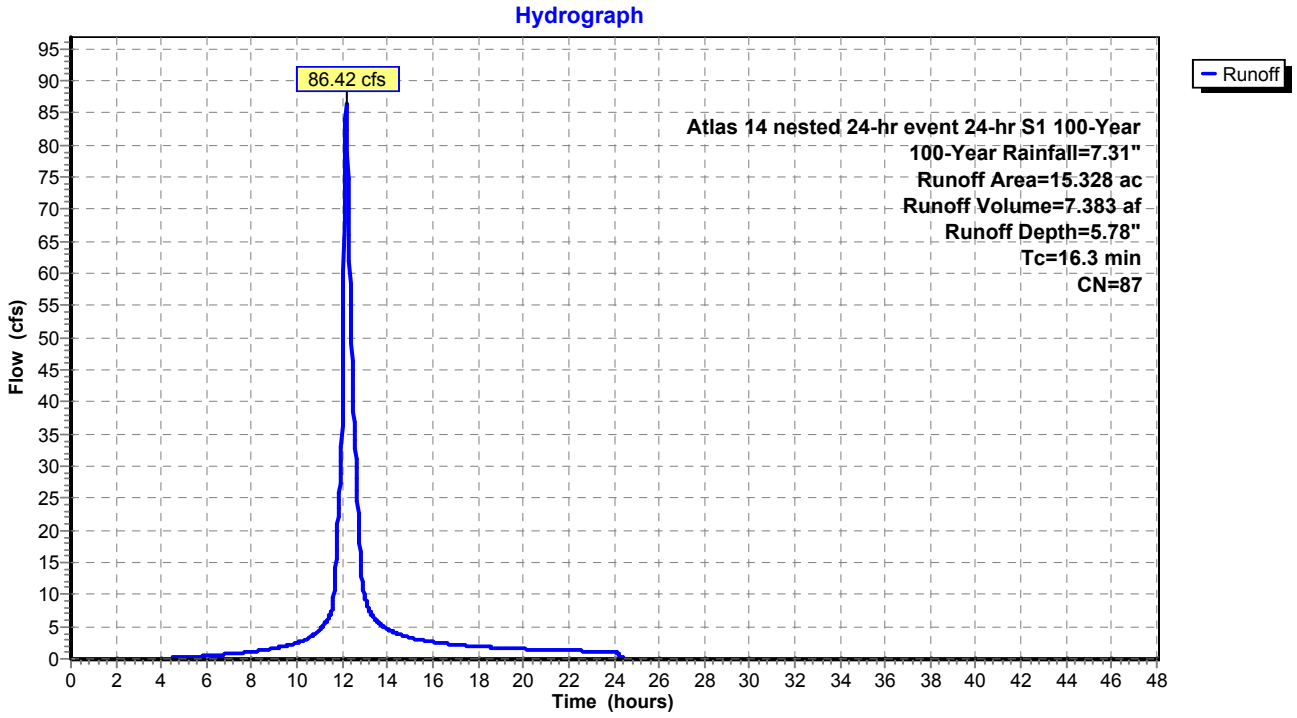
Runoff = 86.42 cfs @ 12.17 hrs, Volume= 7.383 af, Depth= 5.78"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
Atlas 14 nested 24-hr event 24-hr S1 100-Year 100-Year Rainfall=7.31"

	Area (ac)	CN	Description
*	15.328	87	
	15.328		100.00% Pervious Area

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

Subcatchment 1: Sub-basin1



Summary for Subcatchment 2: Sub-basin 2

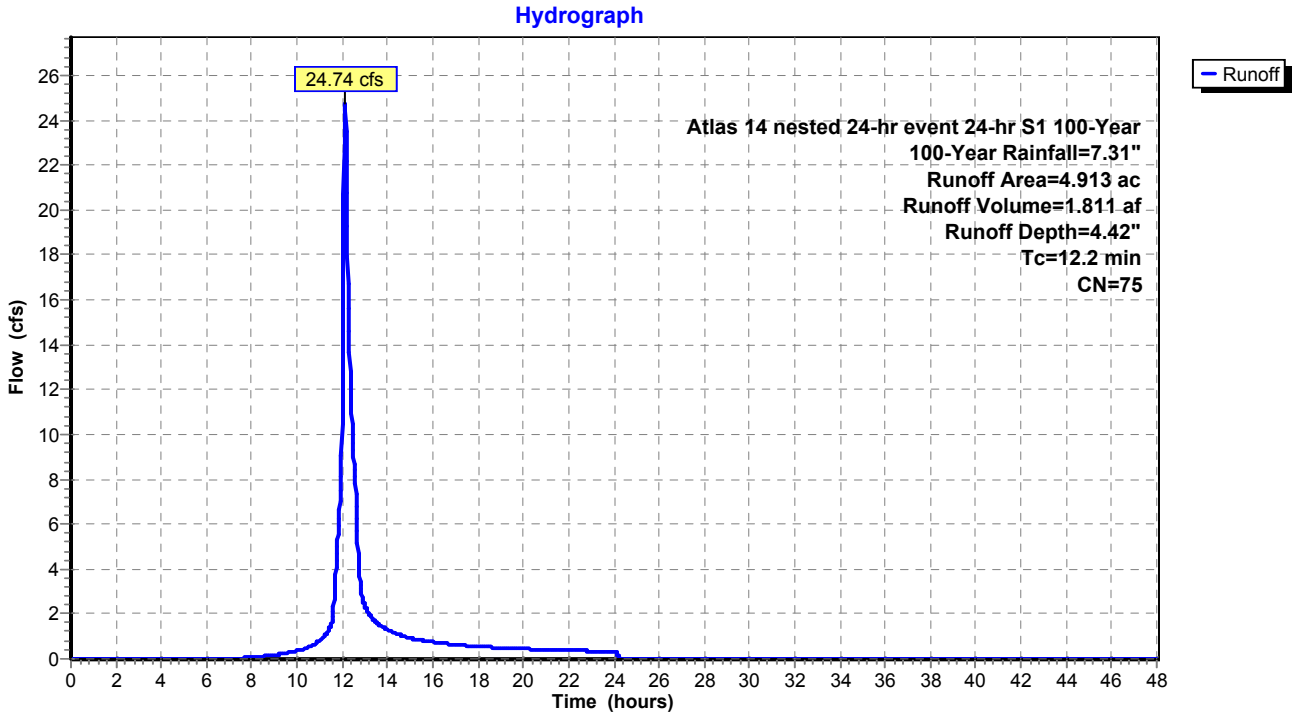
Runoff = 24.74 cfs @ 12.12 hrs, Volume= 1.811 af, Depth= 4.42"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
Atlas 14 nested 24-hr event 24-hr S1 100-Year 100-Year Rainfall=7.31"

	Area (ac)	CN	Description
*	4.913	75	
	4.913		100.00% Pervious Area

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

Subcatchment 2: Sub-basin 2



Summary for Subcatchment 3: Sub-basin 3

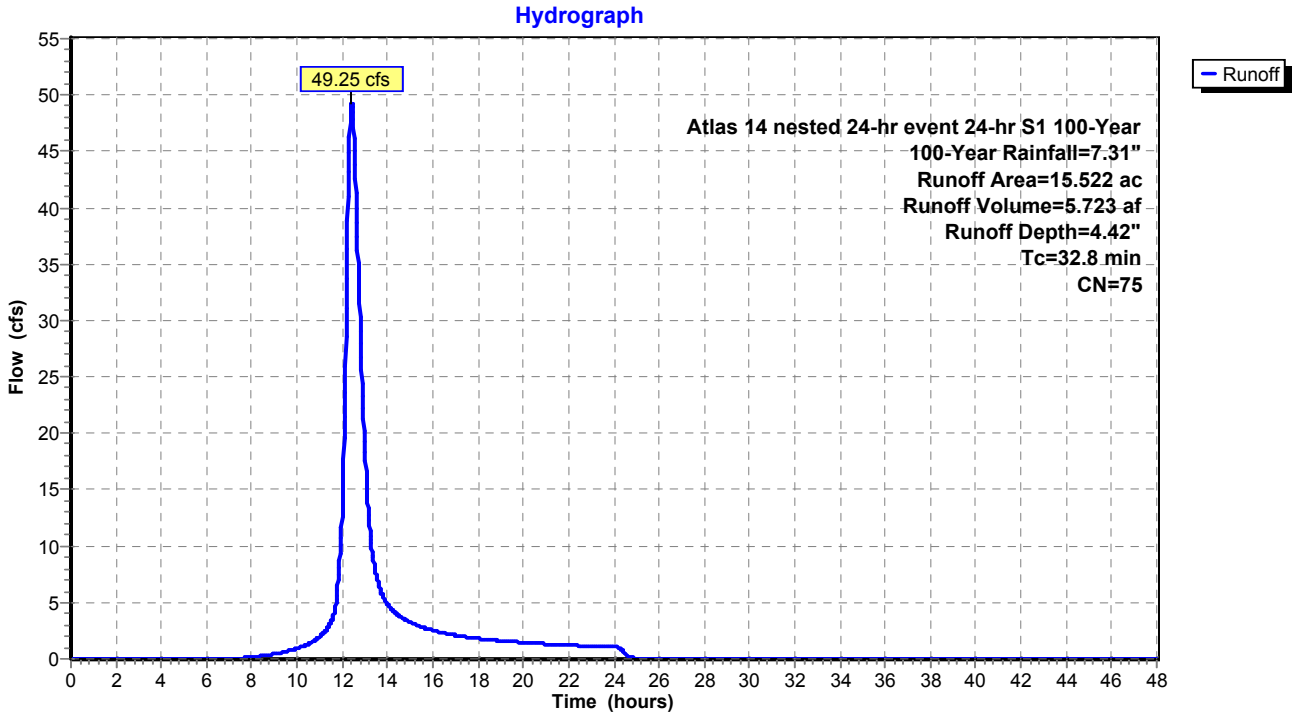
Runoff = 49.25 cfs @ 12.42 hrs, Volume= 5.723 af, Depth= 4.42"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
Atlas 14 nested 24-hr event 24-hr S1 100-Year 100-Year Rainfall=7.31"

	Area (ac)	CN	Description
*	15.522	75	
	15.522		100.00% Pervious Area

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

Subcatchment 3: Sub-basin 3



Summary for Subcatchment 4S: Sub-basin 4

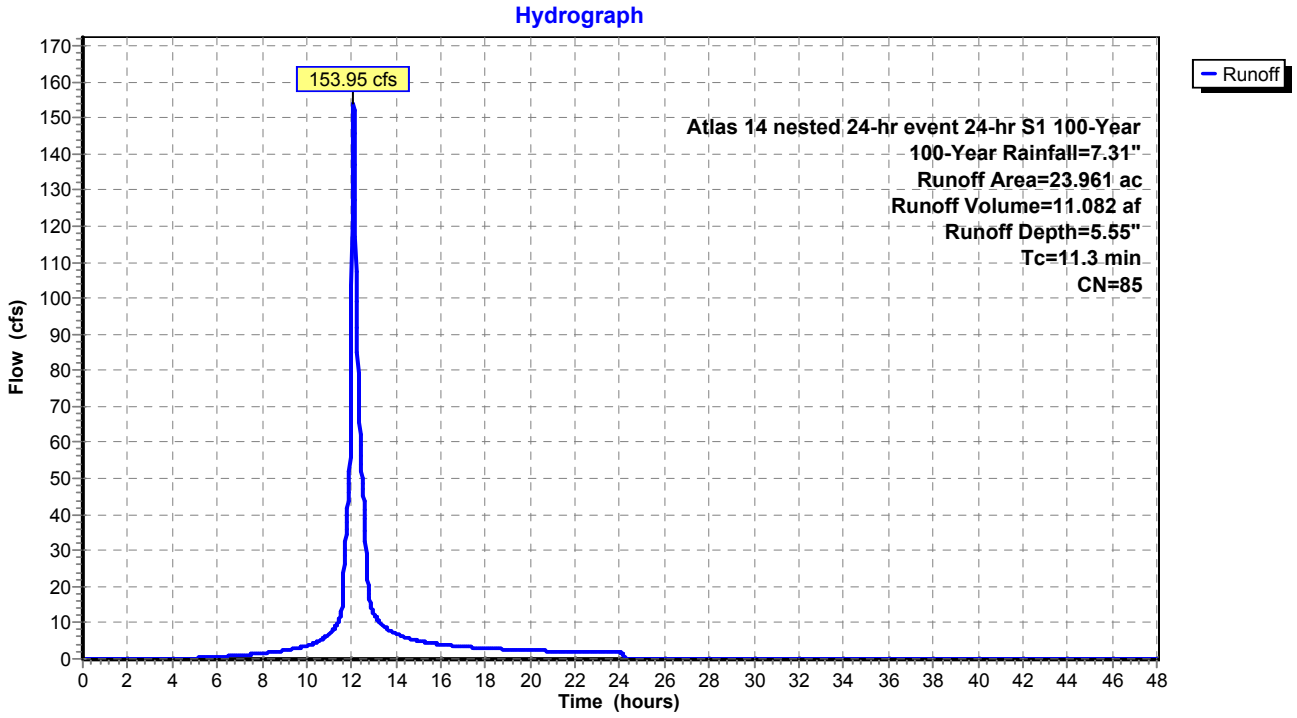
Runoff = 153.95 cfs @ 12.10 hrs, Volume= 11.082 af, Depth= 5.55"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
Atlas 14 nested 24-hr event 24-hr S1 100-Year 100-Year Rainfall=7.31"

	Area (ac)	CN	Description
*	23.961	85	
	23.961		100.00% Pervious Area

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

Subcatchment 4S: Sub-basin 4



Summary for Subcatchment 5S: Sub-basin 5

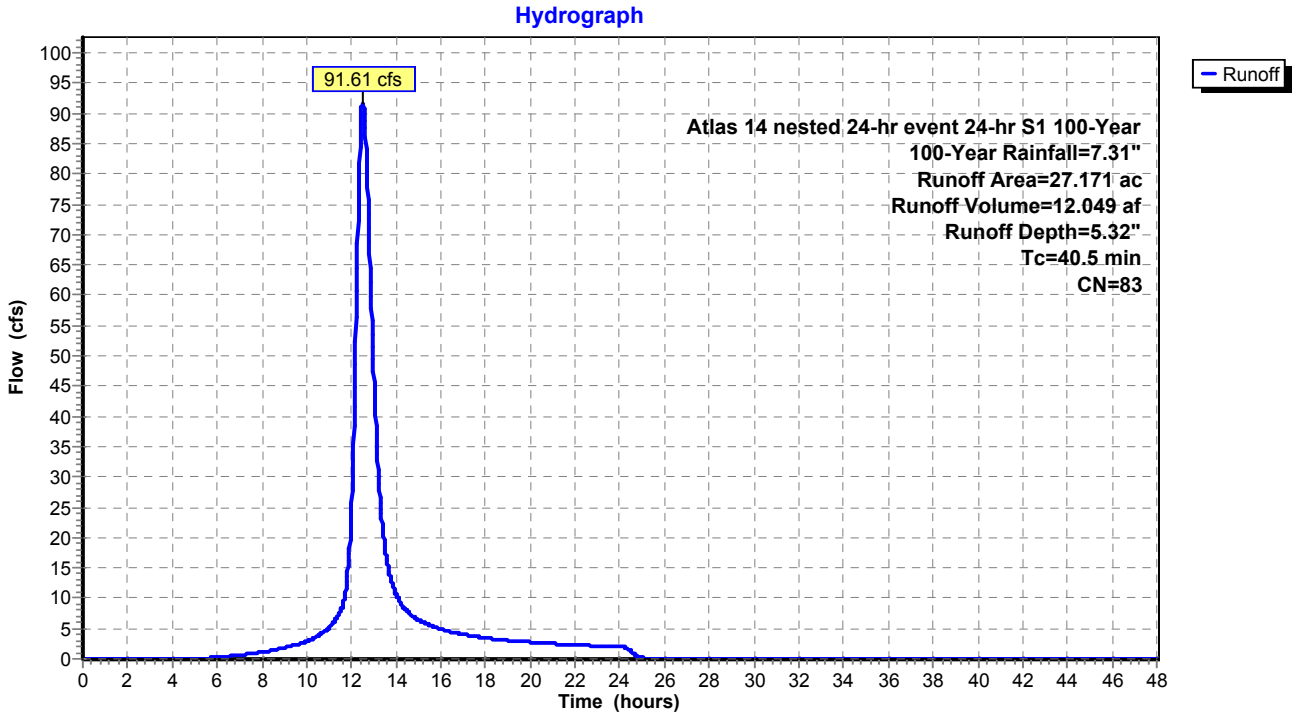
Runoff = 91.61 cfs @ 12.51 hrs, Volume= 12.049 af, Depth= 5.32"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
Atlas 14 nested 24-hr event 24-hr S1 100-Year 100-Year Rainfall=7.31"

	Area (ac)	CN	Description
*	27.171	83	
	27.171		100.00% Pervious Area

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

Subcatchment 5S: Sub-basin 5



Summary for Subcatchment 6S: Sub-basin 6

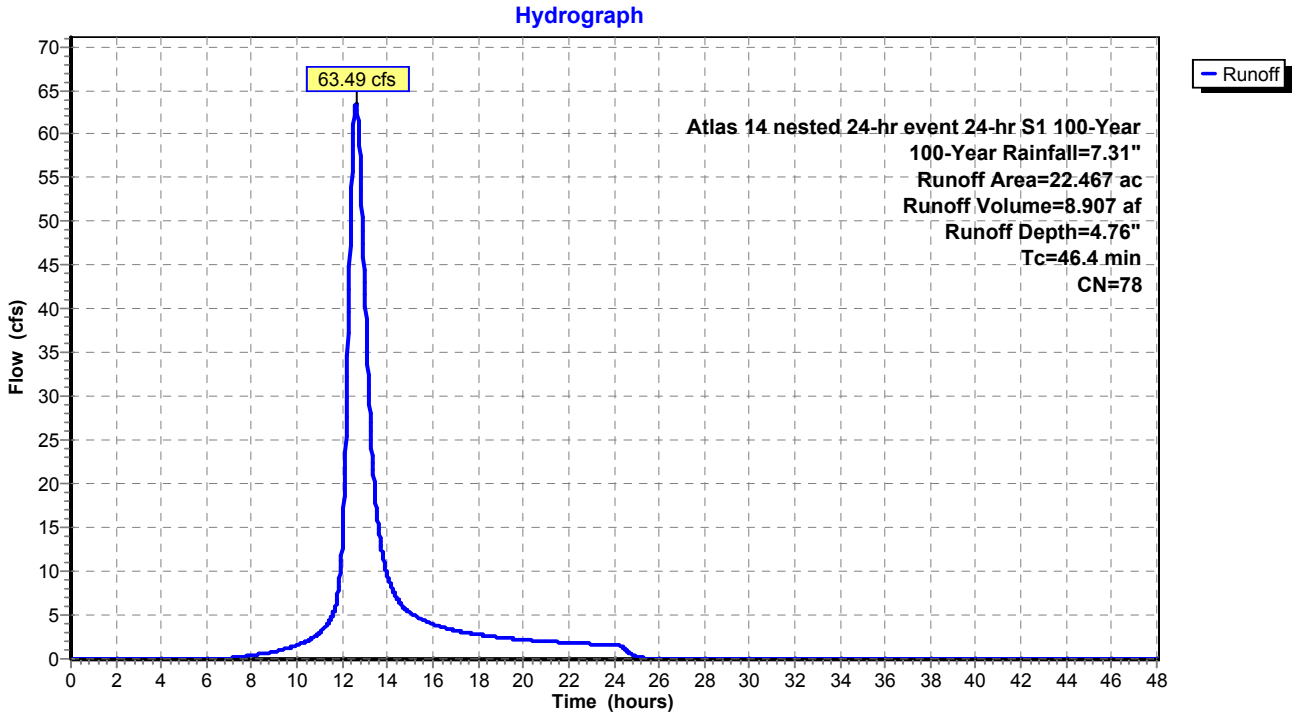
Runoff = 63.49 cfs @ 12.61 hrs, Volume= 8.907 af, Depth= 4.76"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
Atlas 14 nested 24-hr event 24-hr S1 100-Year 100-Year Rainfall=7.31"

	Area (ac)	CN	Description
*	22.467	78	
	22.467		100.00% Pervious Area

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

Subcatchment 6S: Sub-basin 6



Summary for Subcatchment 7S: Sub-basin 7

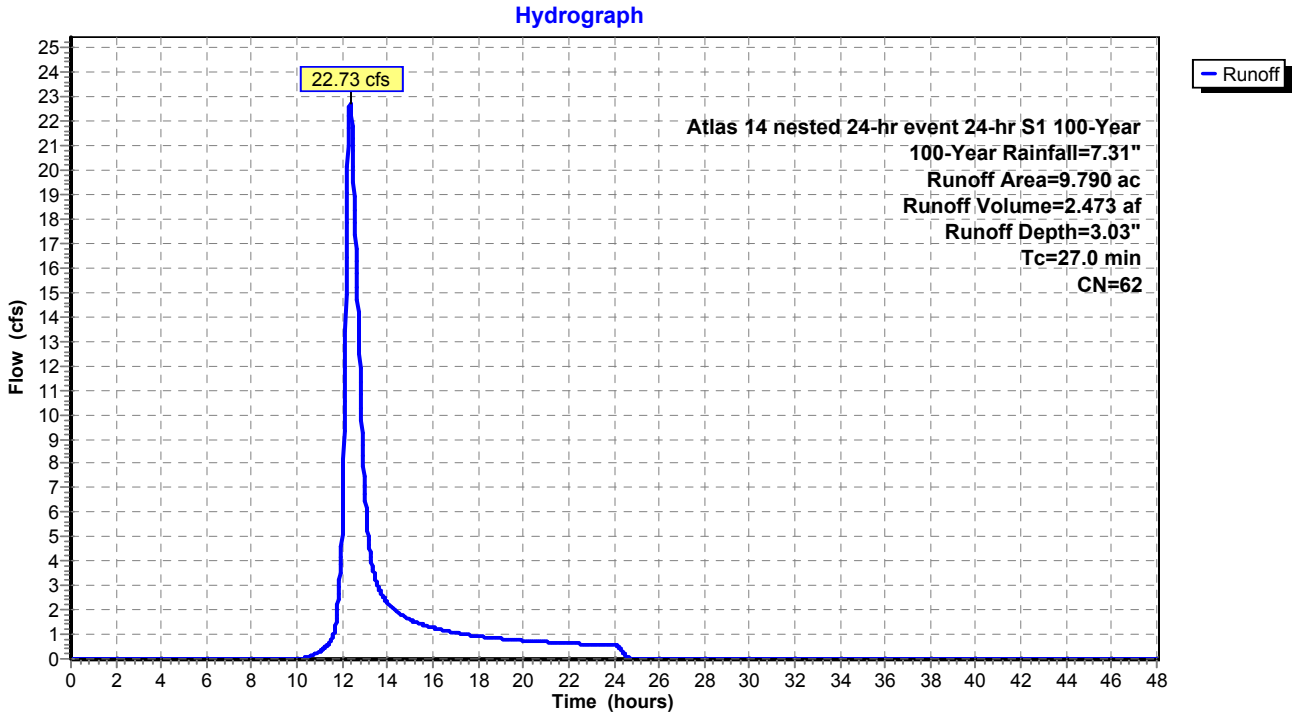
Runoff = 22.73 cfs @ 12.35 hrs, Volume= 2.473 af, Depth= 3.03"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
Atlas 14 nested 24-hr event 24-hr S1 100-Year 100-Year Rainfall=7.31"

	Area (ac)	CN	Description
*	9.790	62	
	9.790		100.00% Pervious Area

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

Subcatchment 7S: Sub-basin 7



Summary for Subcatchment 8S: Sub-basin 8

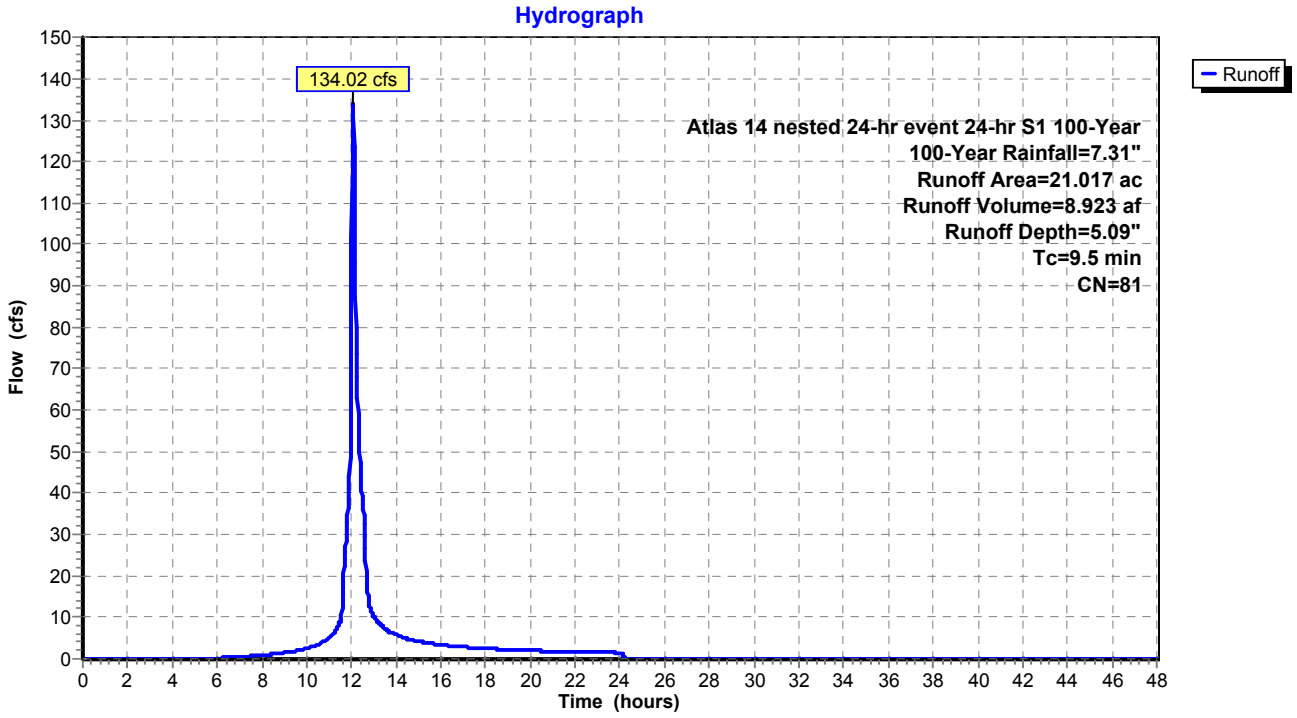
Runoff = 134.02 cfs @ 12.08 hrs, Volume= 8.923 af, Depth= 5.09"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
Atlas 14 nested 24-hr event 24-hr S1 100-Year 100-Year Rainfall=7.31"

	Area (ac)	CN	Description
*	21.017	81	
	21.017		100.00% Pervious Area

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

Subcatchment 8S: Sub-basin 8



Summary for Subcatchment 9S: Sub-basin 9

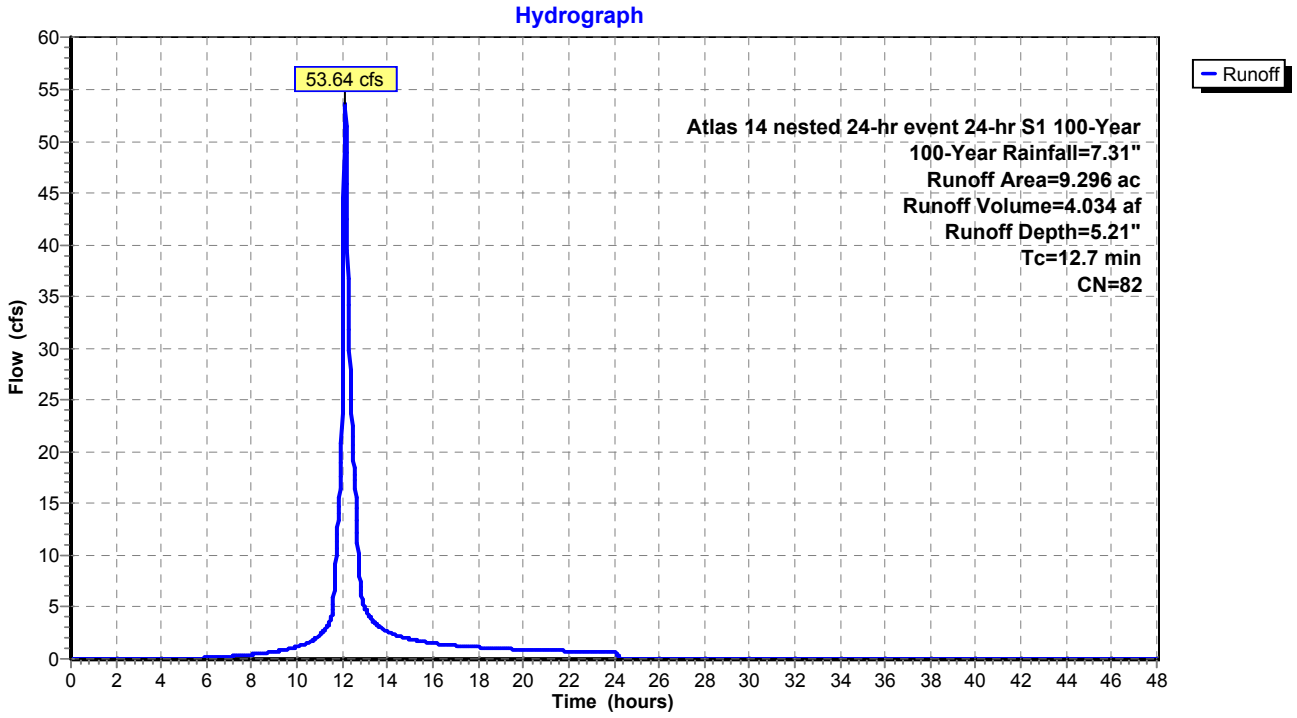
Runoff = 53.64 cfs @ 12.13 hrs, Volume= 4.034 af, Depth= 5.21"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
Atlas 14 nested 24-hr event 24-hr S1 100-Year 100-Year Rainfall=7.31"

	Area (ac)	CN	Description
*	9.296	82	
	9.296		100.00% Pervious Area

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

Subcatchment 9S: Sub-basin 9



Summary for Subcatchment 10S: Sub-basin 10

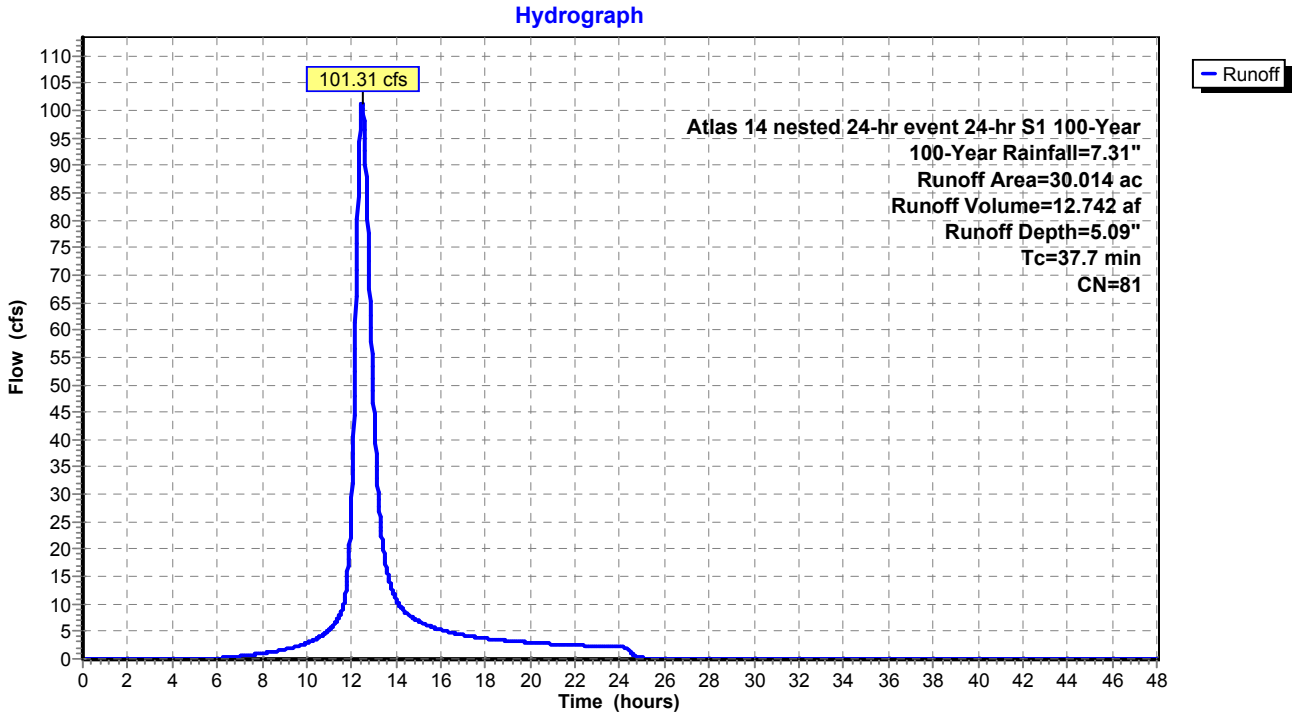
Runoff = 101.31 cfs @ 12.47 hrs, Volume= 12.742 af, Depth= 5.09"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
Atlas 14 nested 24-hr event 24-hr S1 100-Year 100-Year Rainfall=7.31"

	Area (ac)	CN	Description
*	30.014	81	
	30.014		100.00% Pervious Area

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

Subcatchment 10S: Sub-basin 10



Summary for Subcatchment 11S: Sub-basin 11

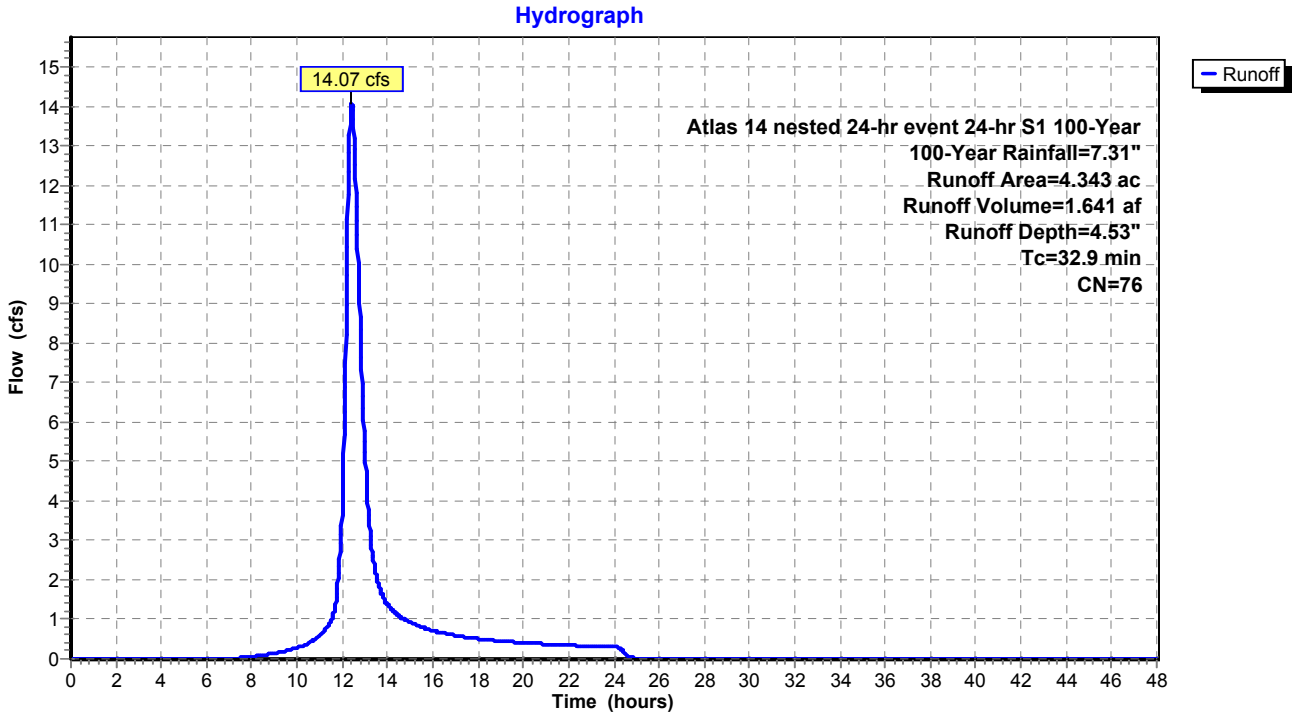
Runoff = 14.07 cfs @ 12.41 hrs, Volume= 1.641 af, Depth= 4.53"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
Atlas 14 nested 24-hr event 24-hr S1 100-Year 100-Year Rainfall=7.31"

	Area (ac)	CN	Description
*	4.343	76	
	4.343		100.00% Pervious Area

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

Subcatchment 11S: Sub-basin 11



Summary for Subcatchment 12S: Sub-basin 12

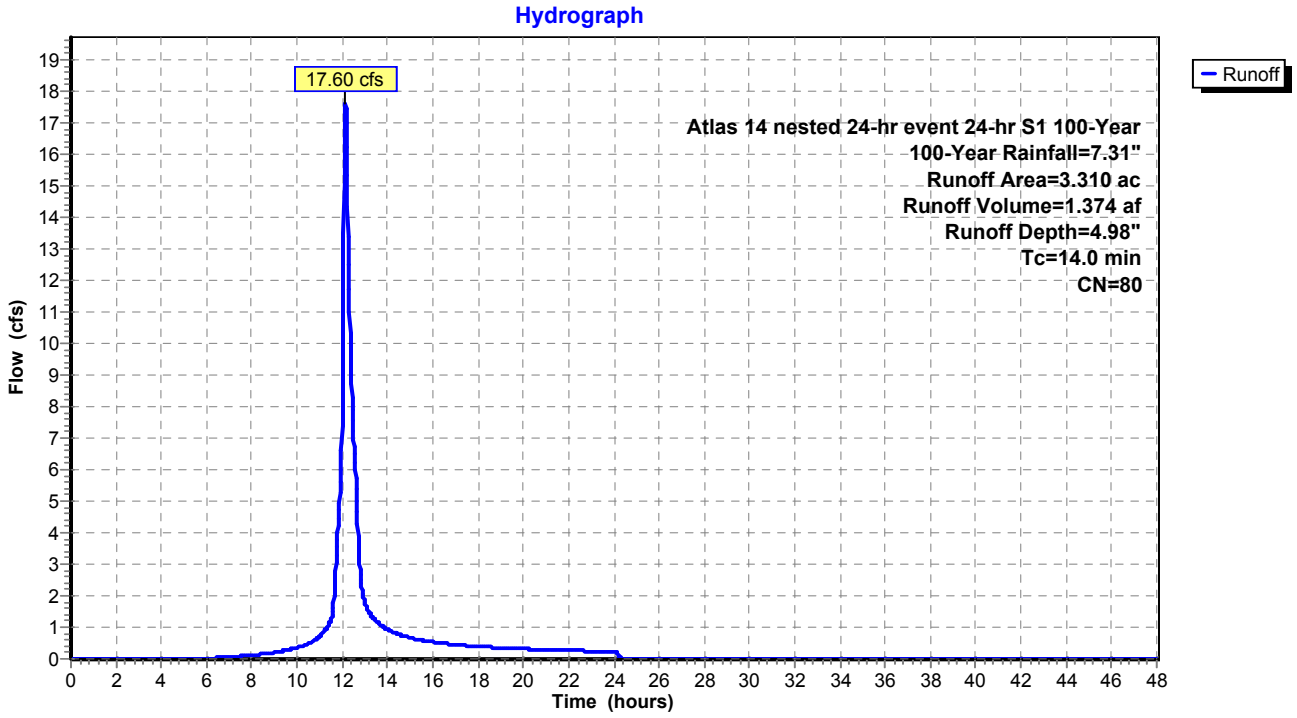
Runoff = 17.60 cfs @ 12.14 hrs, Volume= 1.374 af, Depth= 4.98"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
Atlas 14 nested 24-hr event 24-hr S1 100-Year 100-Year Rainfall=7.31"

	Area (ac)	CN	Description
*	3.310	80	
	3.310		100.00% Pervious Area

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

Subcatchment 12S: Sub-basin 12



Summary for Subcatchment 13S: Sub-basin 13

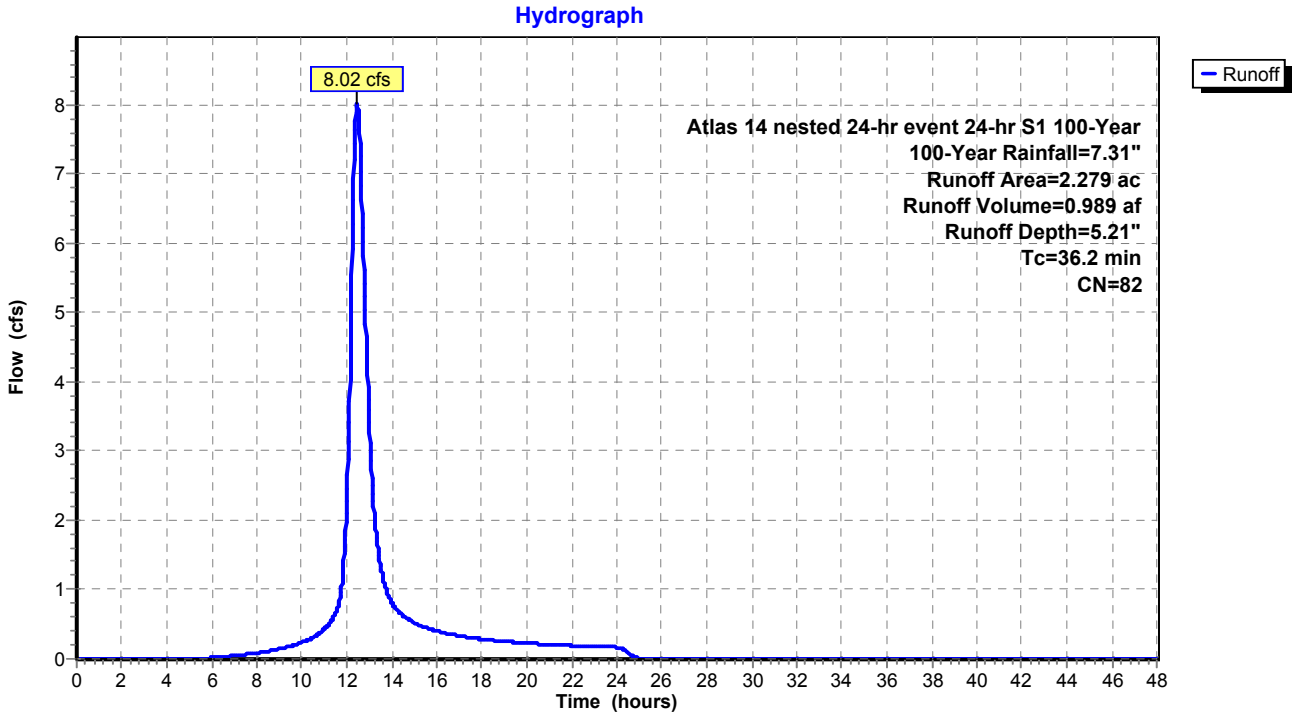
Runoff = 8.02 cfs @ 12.44 hrs, Volume= 0.989 af, Depth= 5.21"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
Atlas 14 nested 24-hr event 24-hr S1 100-Year 100-Year Rainfall=7.31"

	Area (ac)	CN	Description
*	2.279	82	
	2.279		100.00% Pervious Area

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

Subcatchment 13S: Sub-basin 13



Summary for Subcatchment 14S: Sub-basin 14

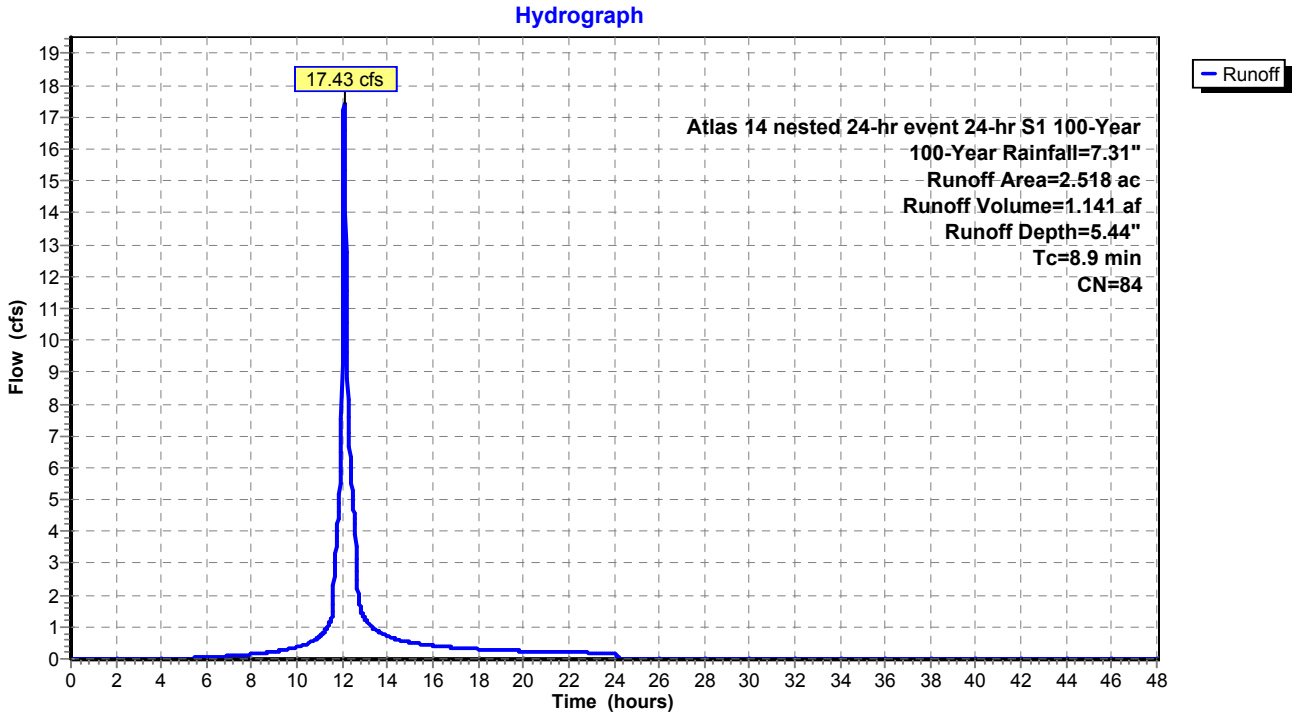
Runoff = 17.43 cfs @ 12.07 hrs, Volume= 1.141 af, Depth= 5.44"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
Atlas 14 nested 24-hr event 24-hr S1 100-Year 100-Year Rainfall=7.31"

	Area (ac)	CN	Description
*	2.518	84	
	2.518		100.00% Pervious Area

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

Subcatchment 14S: Sub-basin 14



Summary for Subcatchment 15S: Sub-basin 15

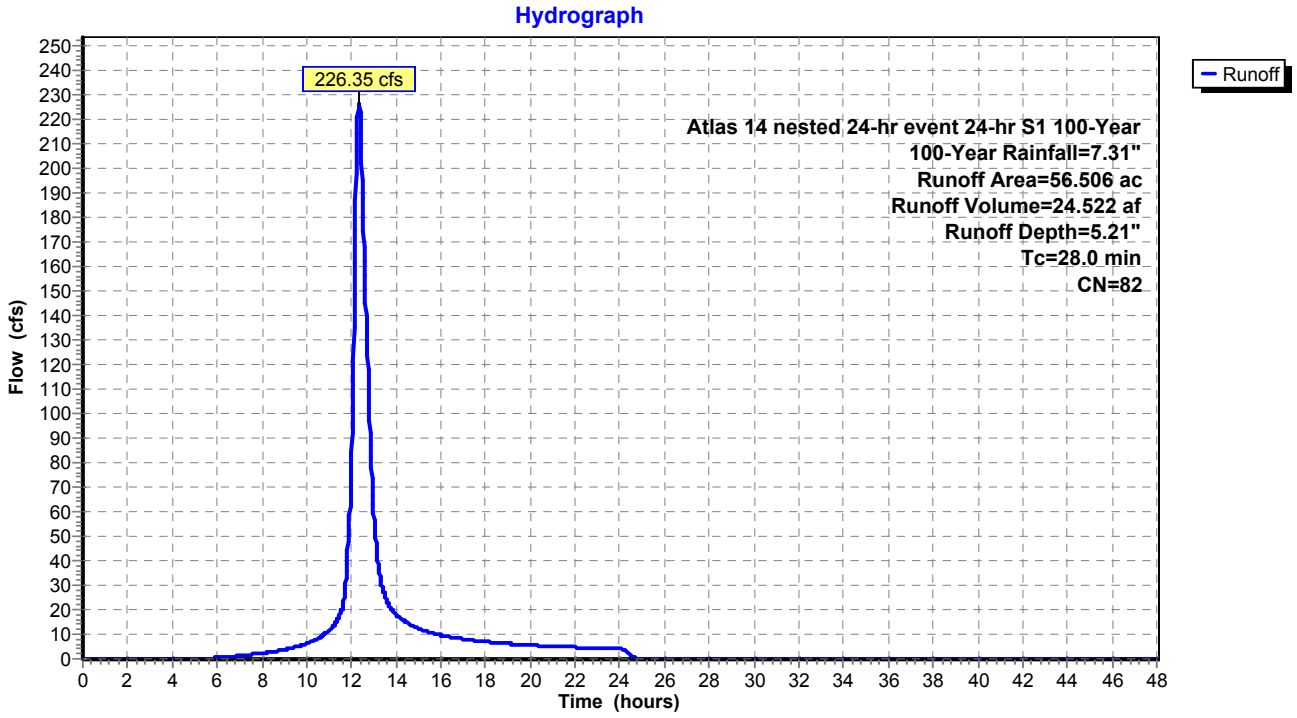
Runoff = 226.35 cfs @ 12.34 hrs, Volume= 24.522 af, Depth= 5.21"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
Atlas 14 nested 24-hr event 24-hr S1 100-Year 100-Year Rainfall=7.31"

	Area (ac)	CN	Description
*	56.506	82	
	56.506		100.00% Pervious Area

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

Subcatchment 15S: Sub-basin 15



Summary for Subcatchment 16S: Sub-basin 16

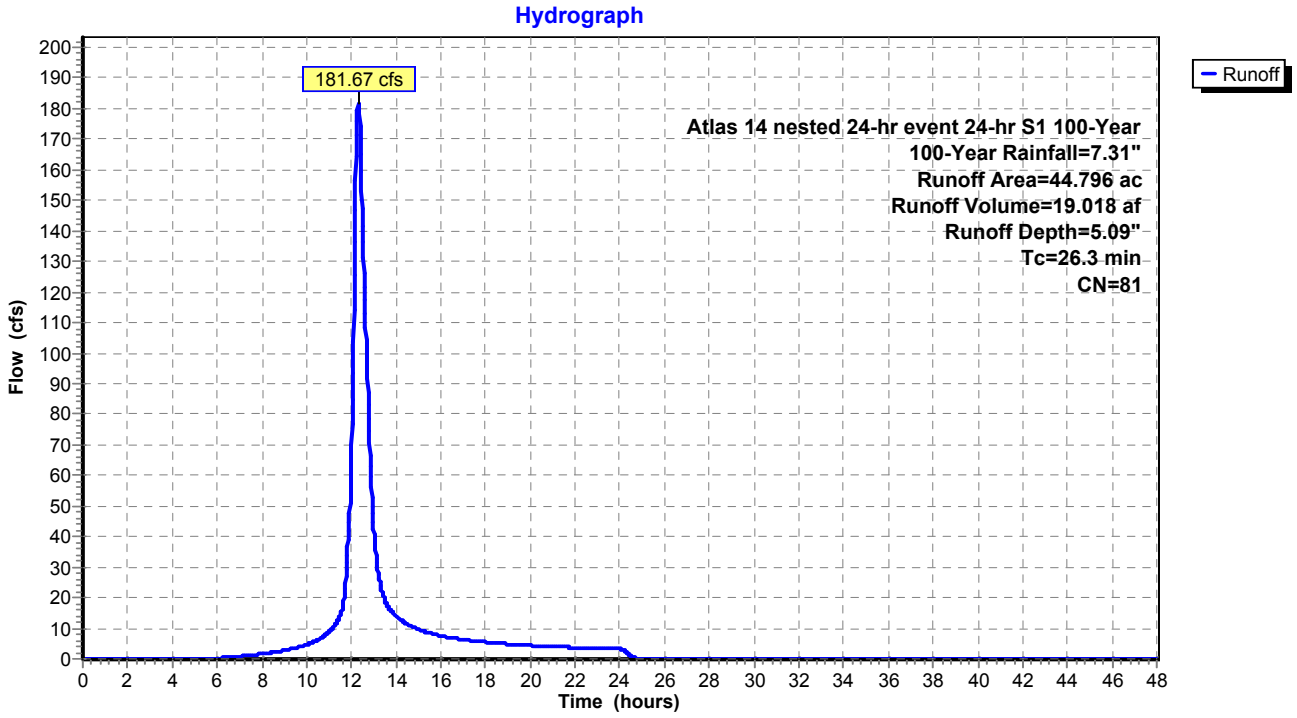
Runoff = 181.67 cfs @ 12.31 hrs, Volume= 19.018 af, Depth= 5.09"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
Atlas 14 nested 24-hr event 24-hr S1 100-Year 100-Year Rainfall=7.31"

	Area (ac)	CN	Description
*	44.796	81	
	44.796		100.00% Pervious Area

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

Subcatchment 16S: Sub-basin 16



Summary for Subcatchment 17S: Sub-basin 17

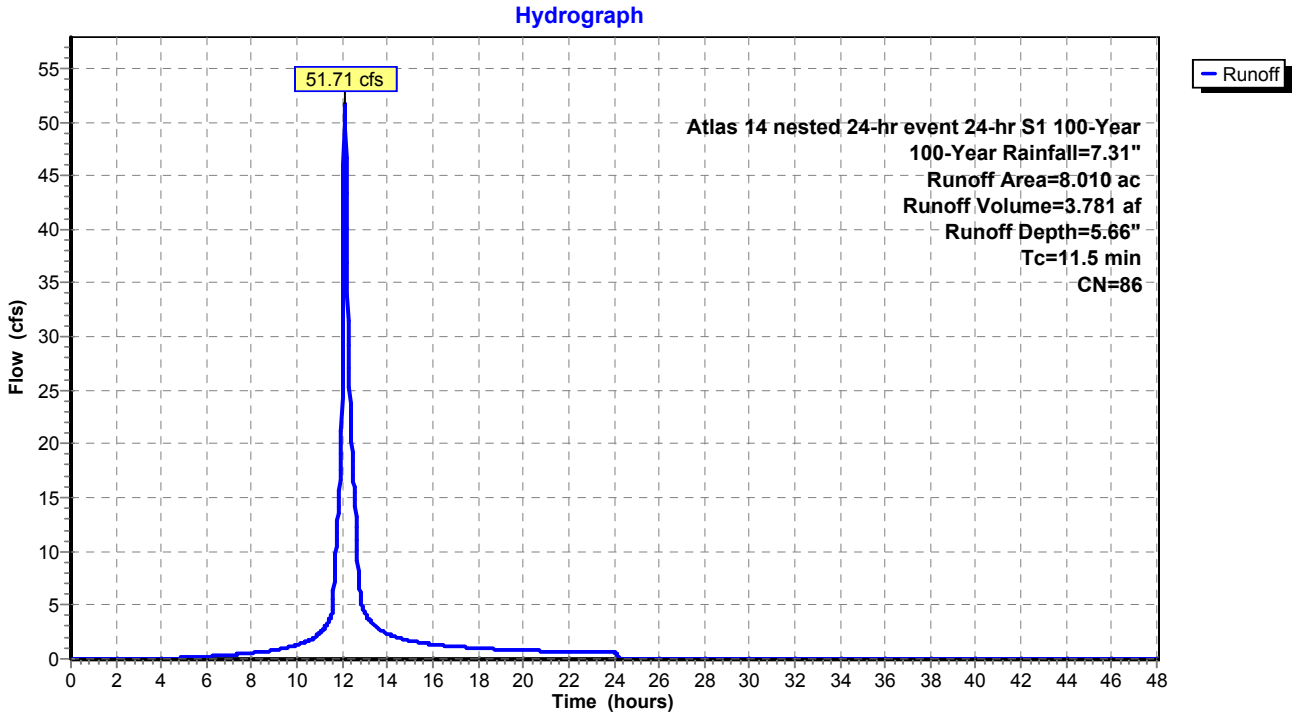
Runoff = 51.71 cfs @ 12.11 hrs, Volume= 3.781 af, Depth= 5.66"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
Atlas 14 nested 24-hr event 24-hr S1 100-Year 100-Year Rainfall=7.31"

	Area (ac)	CN	Description
*	8.010	86	
	8.010		100.00% Pervious Area

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

Subcatchment 17S: Sub-basin 17



Summary for Subcatchment 18S: Sub-basin 18

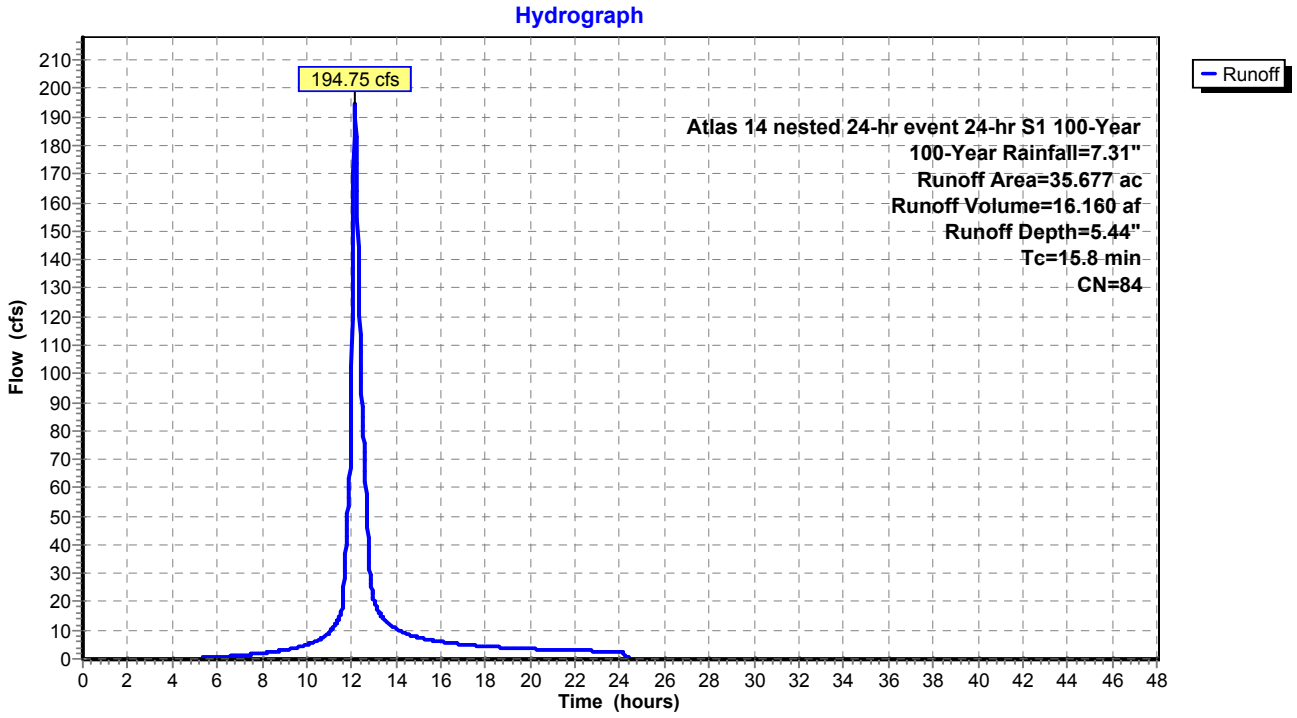
Runoff = 194.75 cfs @ 12.17 hrs, Volume= 16.160 af, Depth= 5.44"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
Atlas 14 nested 24-hr event 24-hr S1 100-Year 100-Year Rainfall=7.31"

	Area (ac)	CN	Description
*	35.677	84	
	35.677		100.00% Pervious Area

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

Subcatchment 18S: Sub-basin 18



Summary for Subcatchment 19S: Sub-basin 19

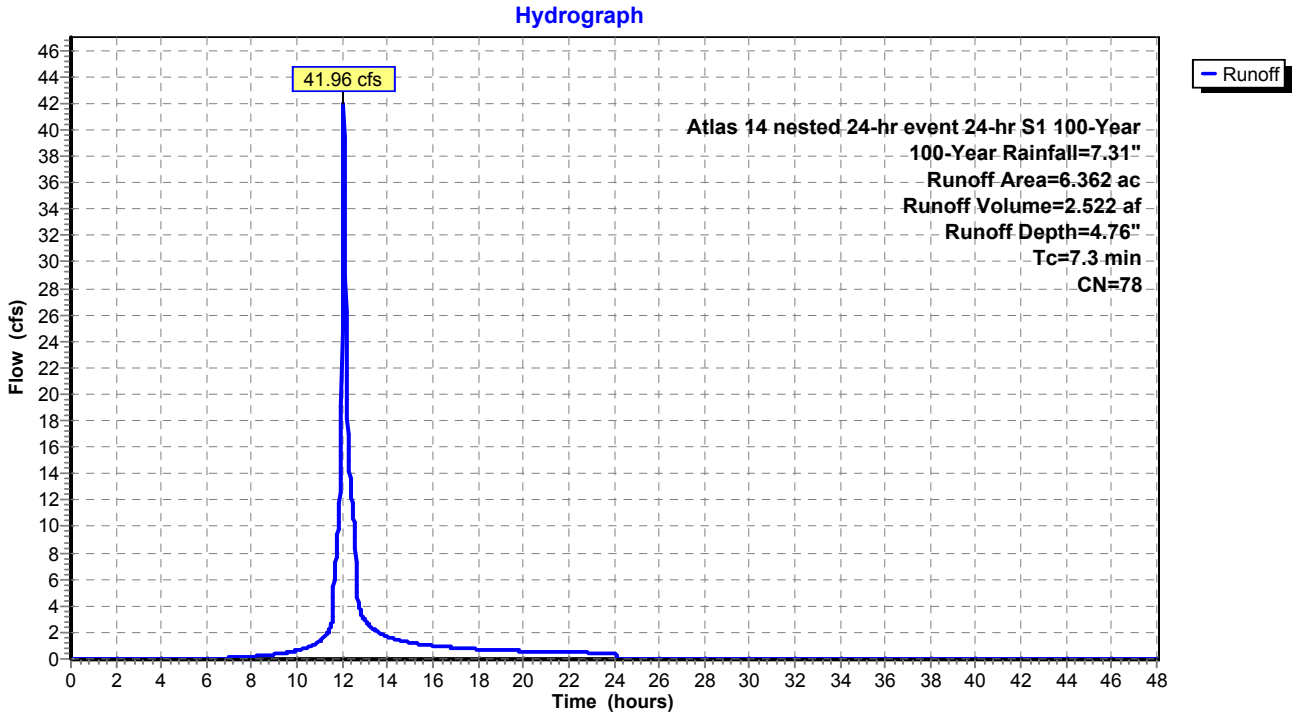
Runoff = 41.96 cfs @ 12.05 hrs, Volume= 2.522 af, Depth= 4.76"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
Atlas 14 nested 24-hr event 24-hr S1 100-Year 100-Year Rainfall=7.31"

	Area (ac)	CN	Description
*	6.362	78	
	6.362		100.00% Pervious Area

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

Subcatchment 19S: Sub-basin 19



Summary for Subcatchment 20S: Sub-basin 20

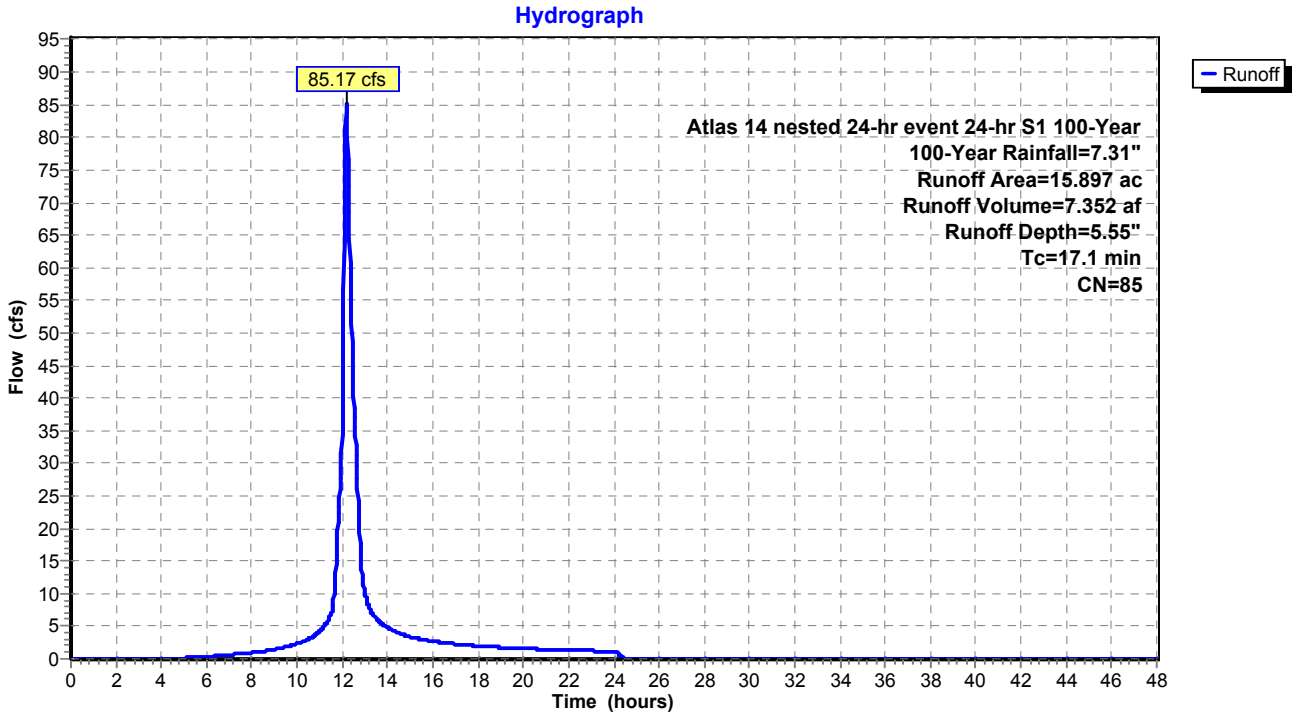
Runoff = 85.17 cfs @ 12.18 hrs, Volume= 7.352 af, Depth= 5.55"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
Atlas 14 nested 24-hr event 24-hr S1 100-Year 100-Year Rainfall=7.31"

	Area (ac)	CN	Description
*	15.897	85	
	15.897		100.00% Pervious Area

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

Subcatchment 20S: Sub-basin 20



Summary for Subcatchment 21S: Sub-basin 21

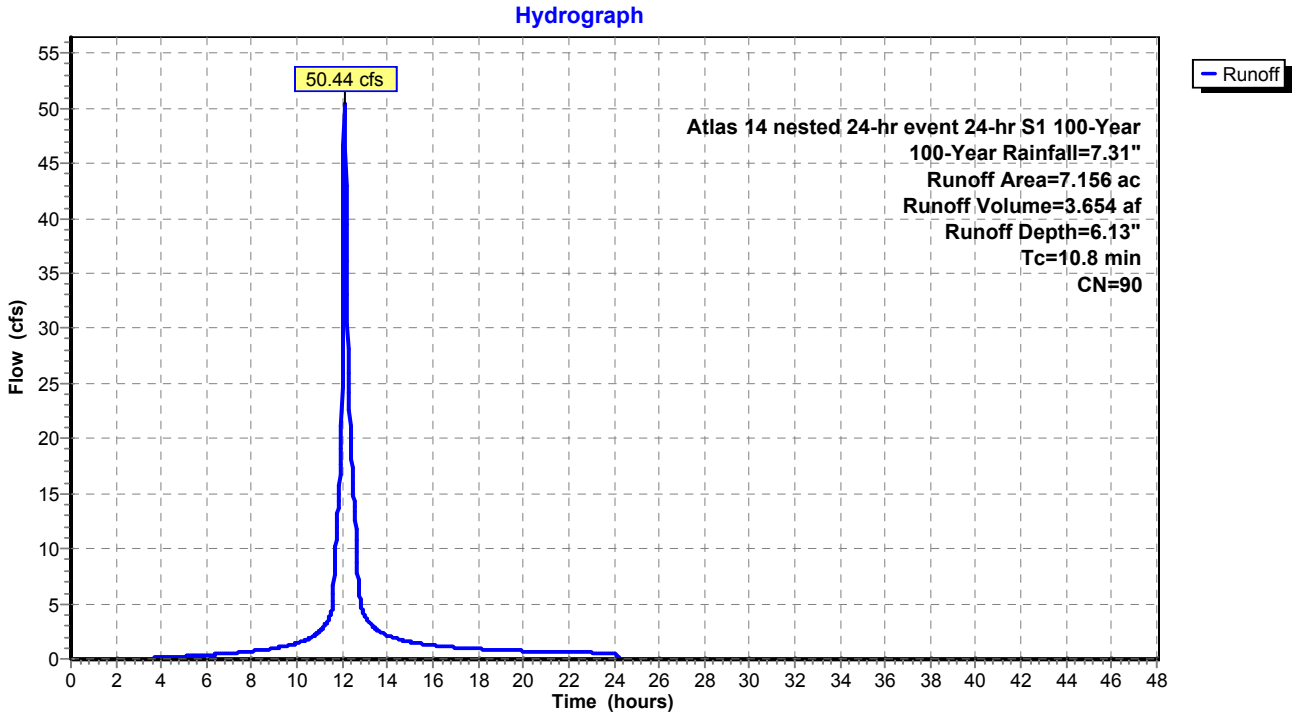
Runoff = 50.44 cfs @ 12.10 hrs, Volume= 3.654 af, Depth= 6.13"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
Atlas 14 nested 24-hr event 24-hr S1 100-Year 100-Year Rainfall=7.31"

	Area (ac)	CN	Description
*	7.156	90	
	7.156		100.00% Pervious Area

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

Subcatchment 21S: Sub-basin 21



Summary for Subcatchment 22S: Sub-basin 22

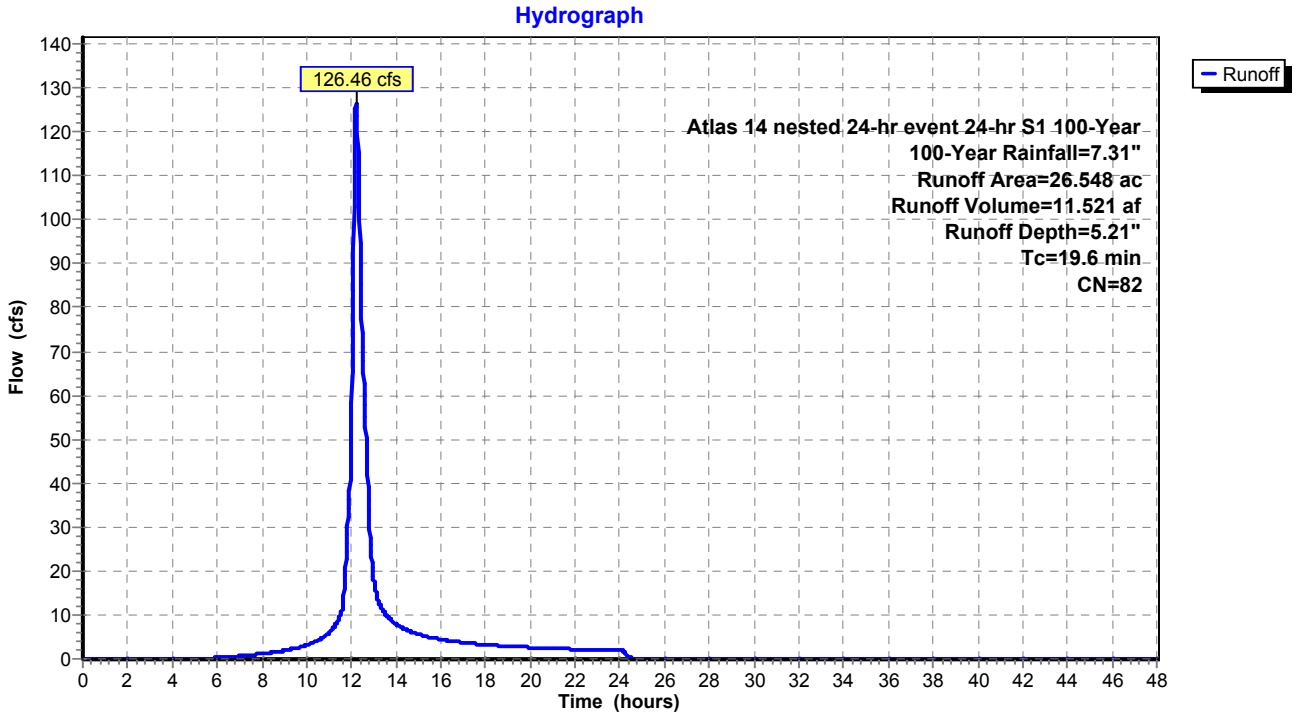
Runoff = 126.46 cfs @ 12.22 hrs, Volume= 11.521 af, Depth= 5.21"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
Atlas 14 nested 24-hr event 24-hr S1 100-Year 100-Year Rainfall=7.31"

	Area (ac)	CN	Description
*	26.548	82	
	26.548		100.00% Pervious Area

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

Subcatchment 22S: Sub-basin 22



Summary for Subcatchment 23S: Sub-basin 23

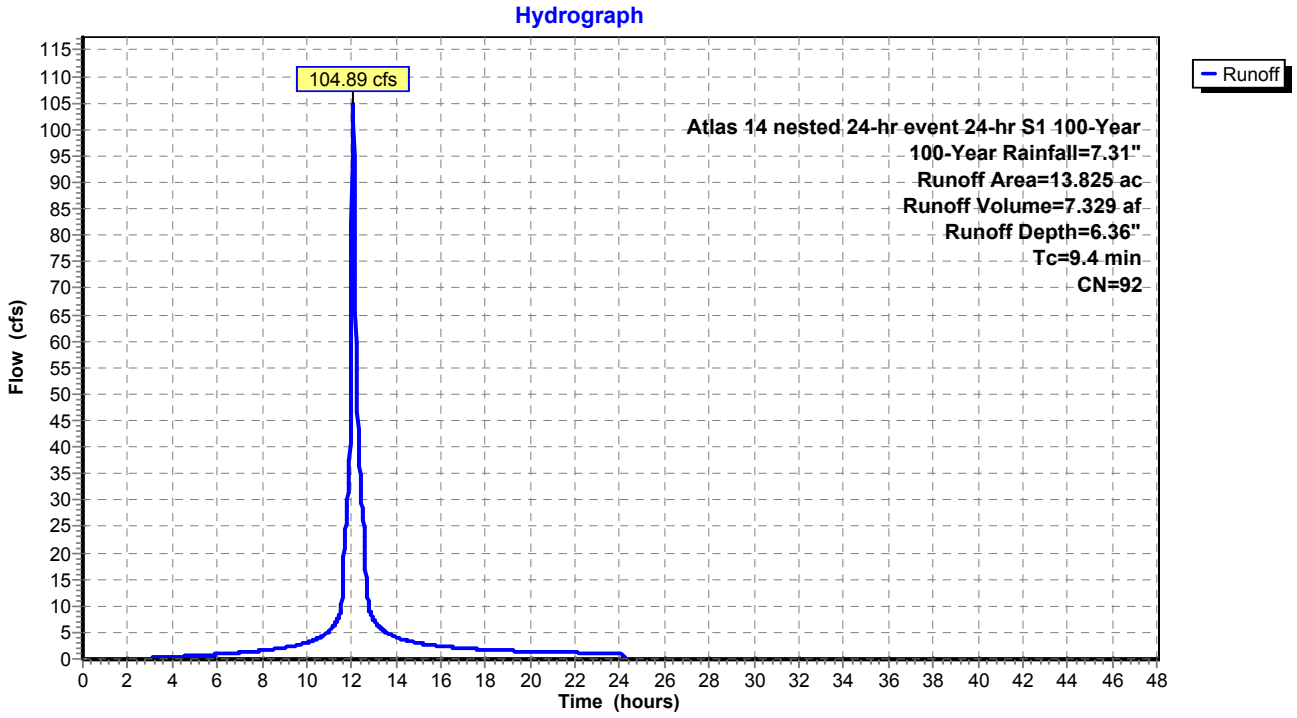
Runoff = 104.89 cfs @ 12.08 hrs, Volume= 7.329 af, Depth= 6.36"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
Atlas 14 nested 24-hr event 24-hr S1 100-Year 100-Year Rainfall=7.31"

	Area (ac)	CN	Description
*	13.825	92	
	13.825		100.00% Pervious Area

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

Subcatchment 23S: Sub-basin 23



Summary for Subcatchment 24S: Sub-basin 24

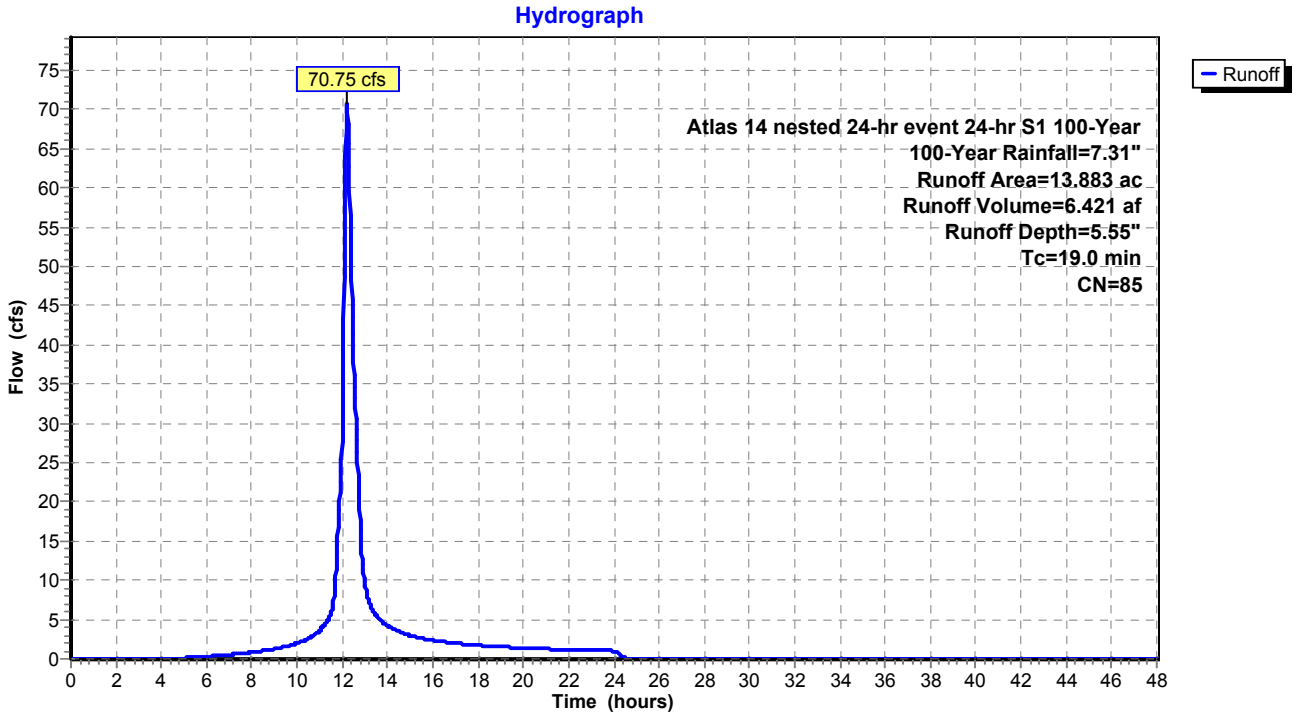
Runoff = 70.75 cfs @ 12.21 hrs, Volume= 6.421 af, Depth= 5.55"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
Atlas 14 nested 24-hr event 24-hr S1 100-Year 100-Year Rainfall=7.31"

	Area (ac)	CN	Description
*	13.883	85	
	13.883		100.00% Pervious Area

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

Subcatchment 24S: Sub-basin 24



Summary for Subcatchment 25S: Sub-basin 25

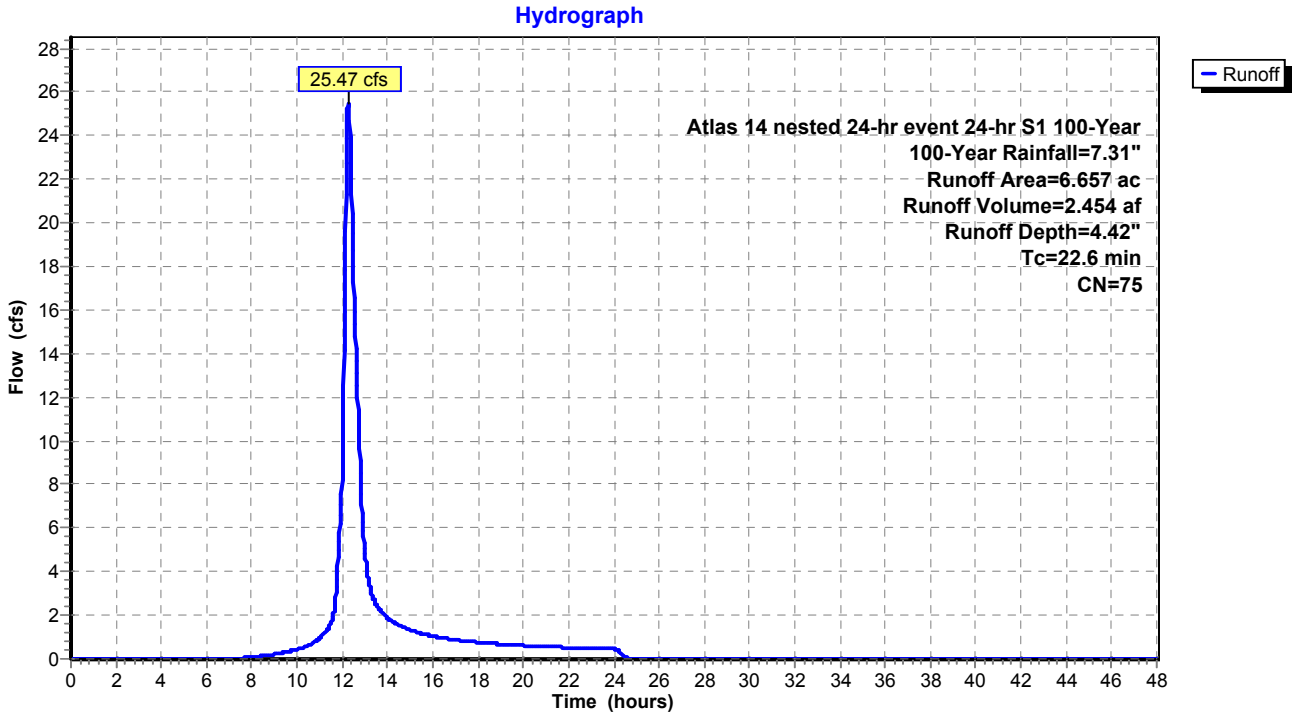
Runoff = 25.47 cfs @ 12.27 hrs, Volume= 2.454 af, Depth= 4.42"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
Atlas 14 nested 24-hr event 24-hr S1 100-Year 100-Year Rainfall=7.31"

	Area (ac)	CN	Description
*	6.657	75	
	6.657		100.00% Pervious Area

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

Subcatchment 25S: Sub-basin 25



Summary for Subcatchment 26S: Sub-basin 26

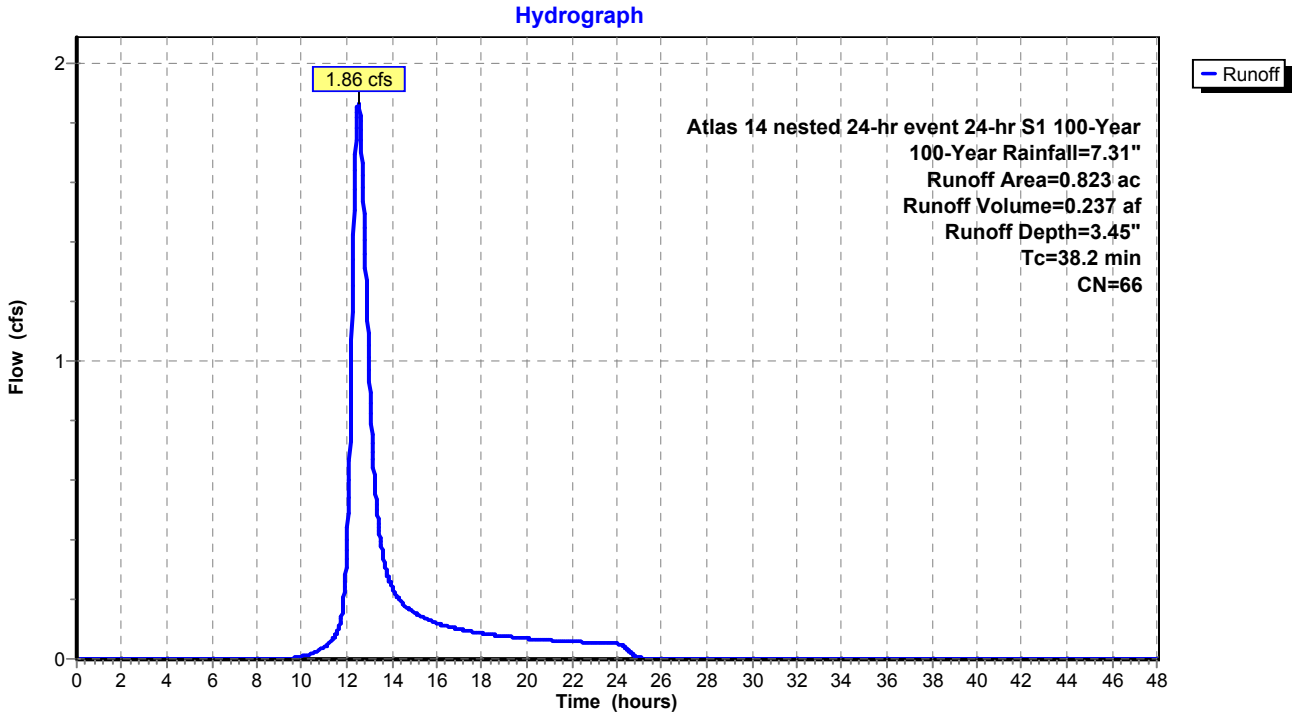
Runoff = 1.86 cfs @ 12.52 hrs, Volume= 0.237 af, Depth= 3.45"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
Atlas 14 nested 24-hr event 24-hr S1 100-Year 100-Year Rainfall=7.31"

	Area (ac)	CN	Description
*	0.823	66	
	0.823		100.00% Pervious Area

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

Subcatchment 26S: Sub-basin 26



Summary for Subcatchment 27S: Sub-basin 27

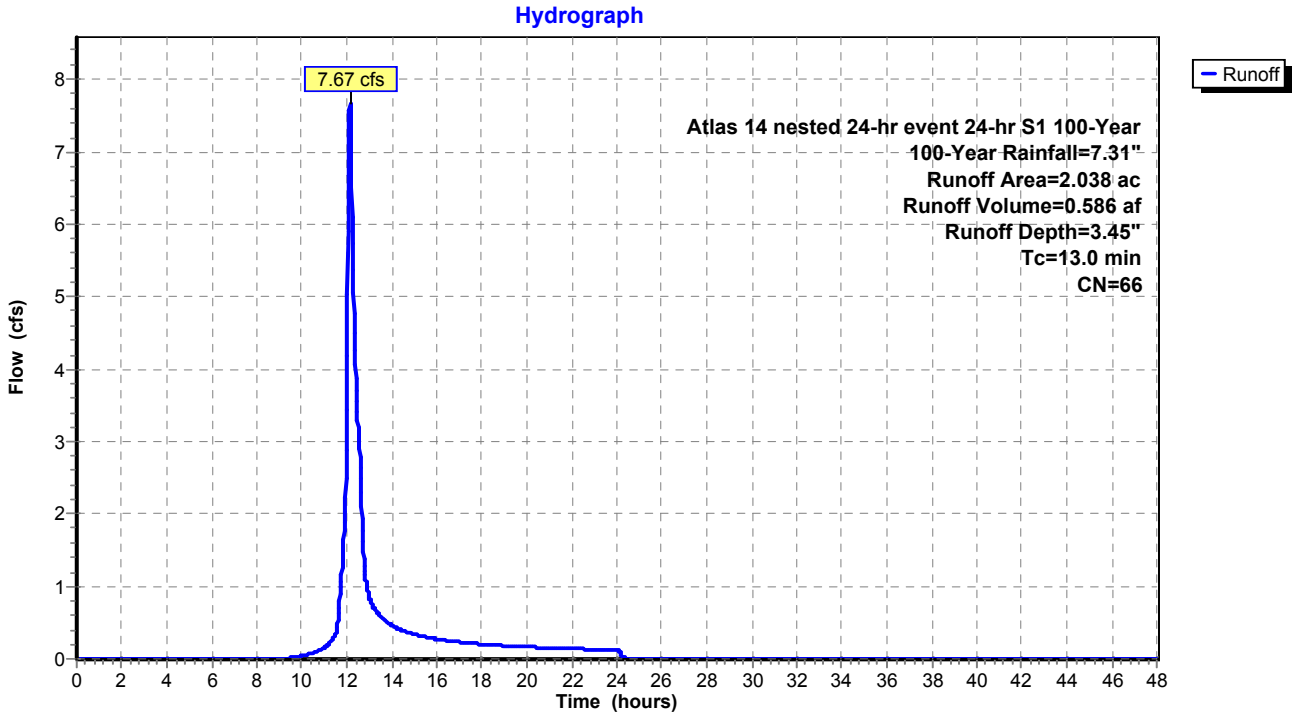
Runoff = 7.67 cfs @ 12.14 hrs, Volume= 0.586 af, Depth= 3.45"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
Atlas 14 nested 24-hr event 24-hr S1 100-Year 100-Year Rainfall=7.31"

	Area (ac)	CN	Description
*	2.038	66	
	2.038		100.00% Pervious Area

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

Subcatchment 27S: Sub-basin 27



Summary for Subcatchment 28S: Sub-basin 28

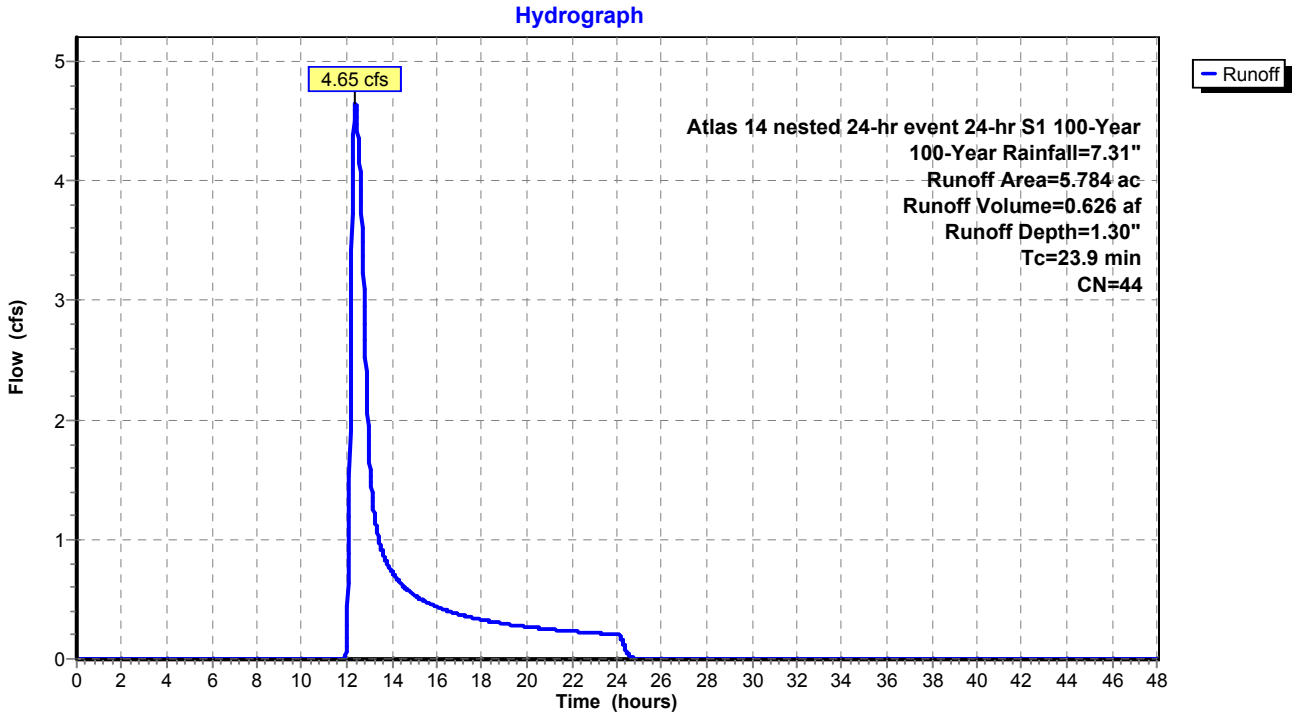
Runoff = 4.65 cfs @ 12.38 hrs, Volume= 0.626 af, Depth= 1.30"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
Atlas 14 nested 24-hr event 24-hr S1 100-Year 100-Year Rainfall=7.31"

	Area (ac)	CN	Description
*	5.784	44	
	5.784		100.00% Pervious Area

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

Subcatchment 28S: Sub-basin 28



Summary for Subcatchment 29S: Sub-basin 29

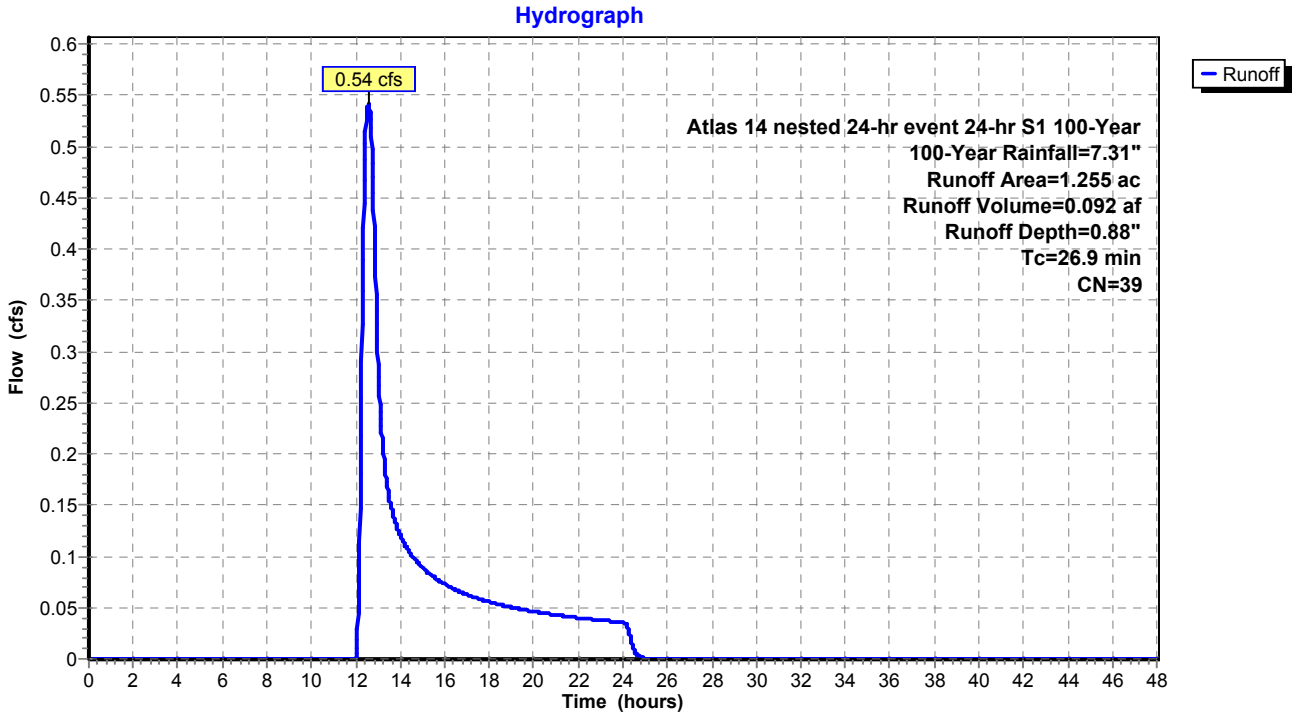
Runoff = 0.54 cfs @ 12.57 hrs, Volume= 0.092 af, Depth= 0.88"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
Atlas 14 nested 24-hr event 24-hr S1 100-Year 100-Year Rainfall=7.31"

	Area (ac)	CN	Description
*	1.255	39	
	1.255		100.00% Pervious Area

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

Subcatchment 29S: Sub-basin 29



Summary for Subcatchment 30S: Sub-basin 30

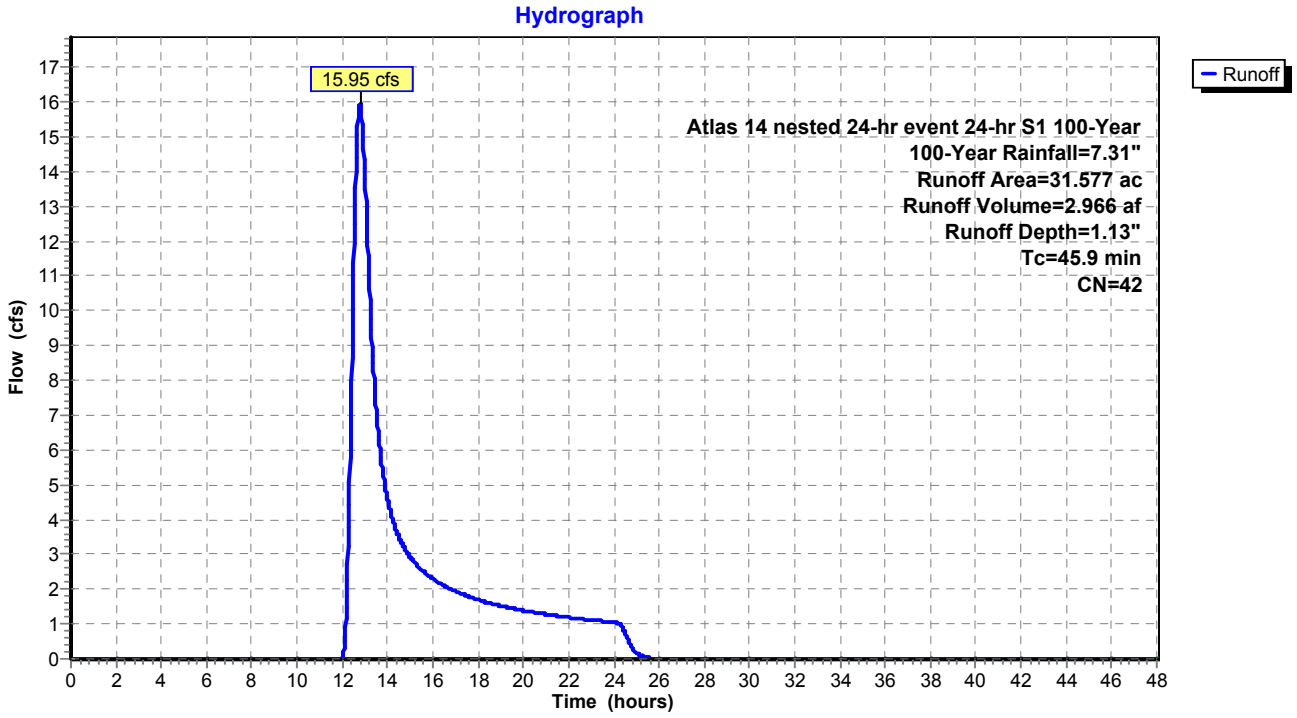
Runoff = 15.95 cfs @ 12.79 hrs, Volume= 2.966 af, Depth= 1.13"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
Atlas 14 nested 24-hr event 24-hr S1 100-Year 100-Year Rainfall=7.31"

	Area (ac)	CN	Description
*	31.577	42	
	31.577		100.00% Pervious Area

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

Subcatchment 30S: Sub-basin 30



Summary for Subcatchment 31S: Sub-basin 31

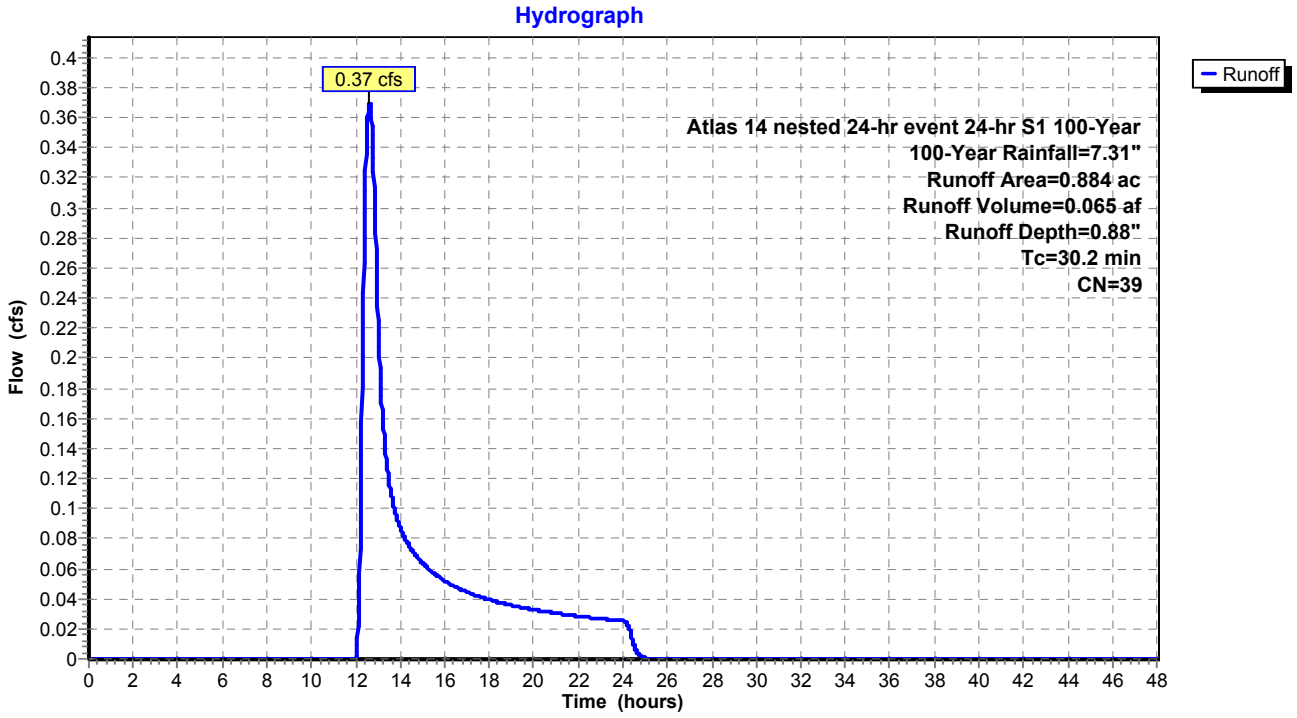
Runoff = 0.37 cfs @ 12.61 hrs, Volume= 0.065 af, Depth= 0.88"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
Atlas 14 nested 24-hr event 24-hr S1 100-Year 100-Year Rainfall=7.31"

	Area (ac)	CN	Description
*	0.884	39	
	0.884		100.00% Pervious Area

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

Subcatchment 31S: Sub-basin 31



Summary for Subcatchment 32S: Sub-basin 32

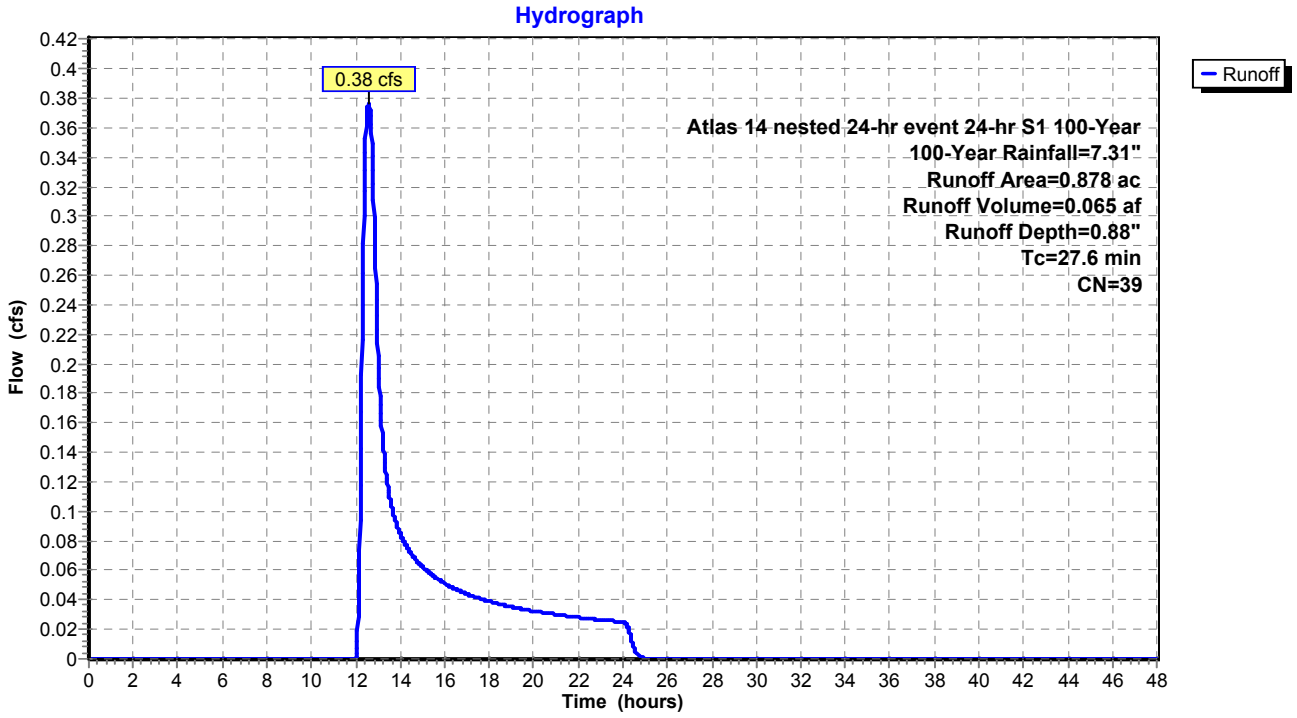
Runoff = 0.38 cfs @ 12.57 hrs, Volume= 0.065 af, Depth= 0.88"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
Atlas 14 nested 24-hr event 24-hr S1 100-Year 100-Year Rainfall=7.31"

	Area (ac)	CN	Description
*	0.878	39	
	0.878		100.00% Pervious Area

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

Subcatchment 32S: Sub-basin 32



Summary for Subcatchment 33S: Sub-basin 33

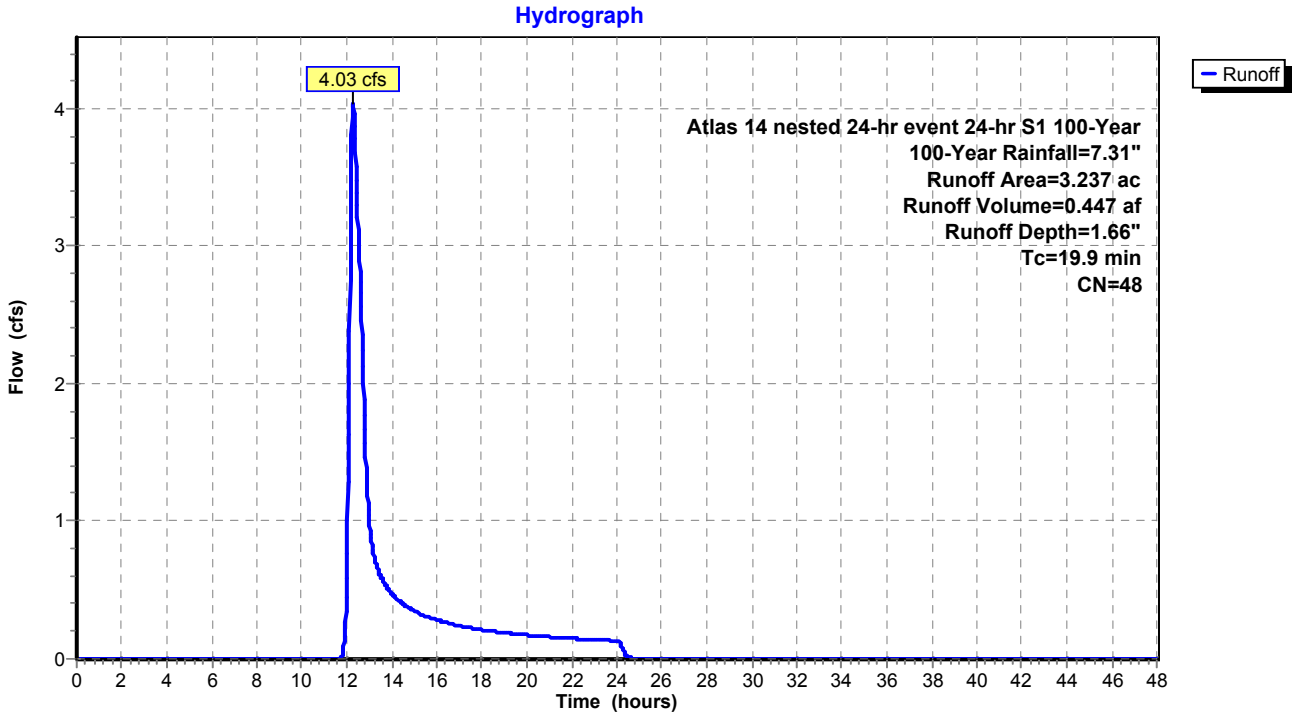
Runoff = 4.03 cfs @ 12.28 hrs, Volume= 0.447 af, Depth= 1.66"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
Atlas 14 nested 24-hr event 24-hr S1 100-Year 100-Year Rainfall=7.31"

	Area (ac)	CN	Description
*	3.237	48	
	3.237		100.00% Pervious Area

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

Subcatchment 33S: Sub-basin 33



Summary for Subcatchment 34S: Sub-basin 34

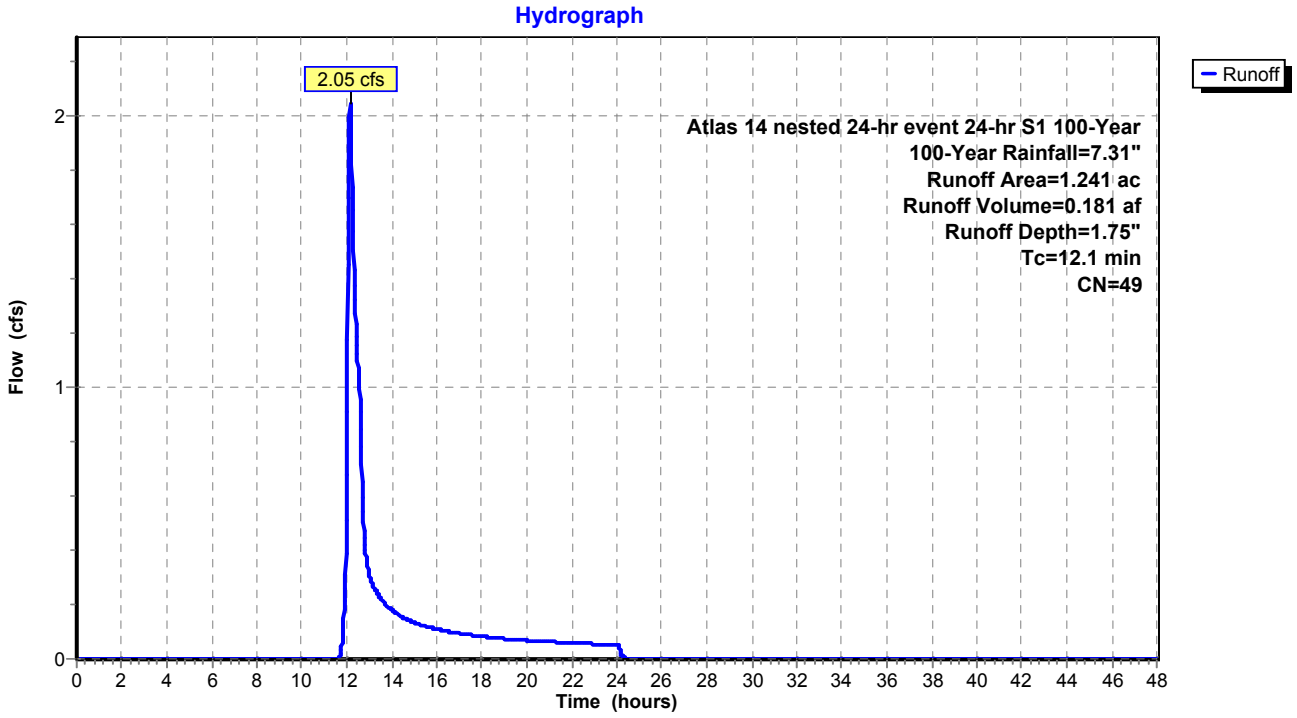
Runoff = 2.05 cfs @ 12.15 hrs, Volume= 0.181 af, Depth= 1.75"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
Atlas 14 nested 24-hr event 24-hr S1 100-Year 100-Year Rainfall=7.31"

	Area (ac)	CN	Description
*	1.241	49	
	1.241		100.00% Pervious Area

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

Subcatchment 34S: Sub-basin 34



Summary for Subcatchment 35S: Sub-basin 35

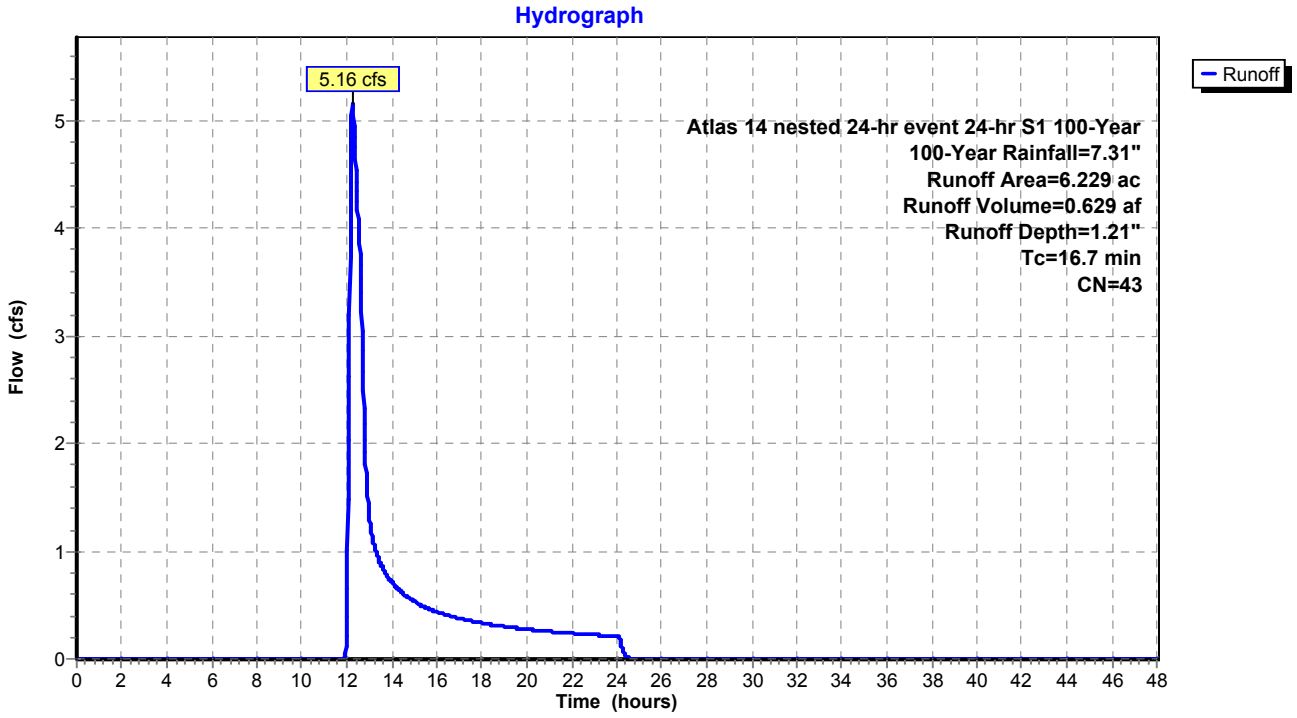
Runoff = 5.16 cfs @ 12.26 hrs, Volume= 0.629 af, Depth= 1.21"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
Atlas 14 nested 24-hr event 24-hr S1 100-Year 100-Year Rainfall=7.31"

	Area (ac)	CN	Description
*	6.229	43	
	6.229		100.00% Pervious Area

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

Subcatchment 35S: Sub-basin 35



Summary for Subcatchment 36S: Sub-basin 36

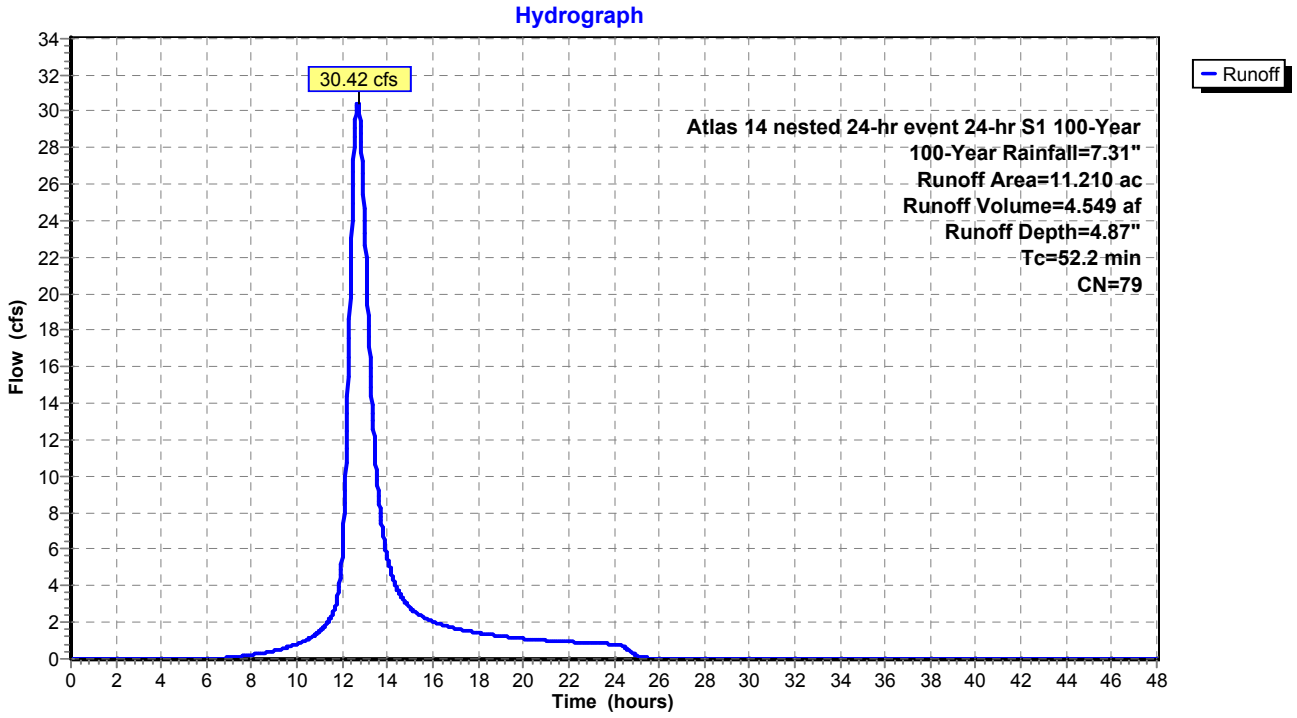
Runoff = 30.42 cfs @ 12.69 hrs, Volume= 4.549 af, Depth= 4.87"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
Atlas 14 nested 24-hr event 24-hr S1 100-Year 100-Year Rainfall=7.31"

	Area (ac)	CN	Description
*	11.210	79	
	11.210		100.00% Pervious Area

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

Subcatchment 36S: Sub-basin 36



Summary for Subcatchment 83S: County Road H Subbasin Redirected After Regrading

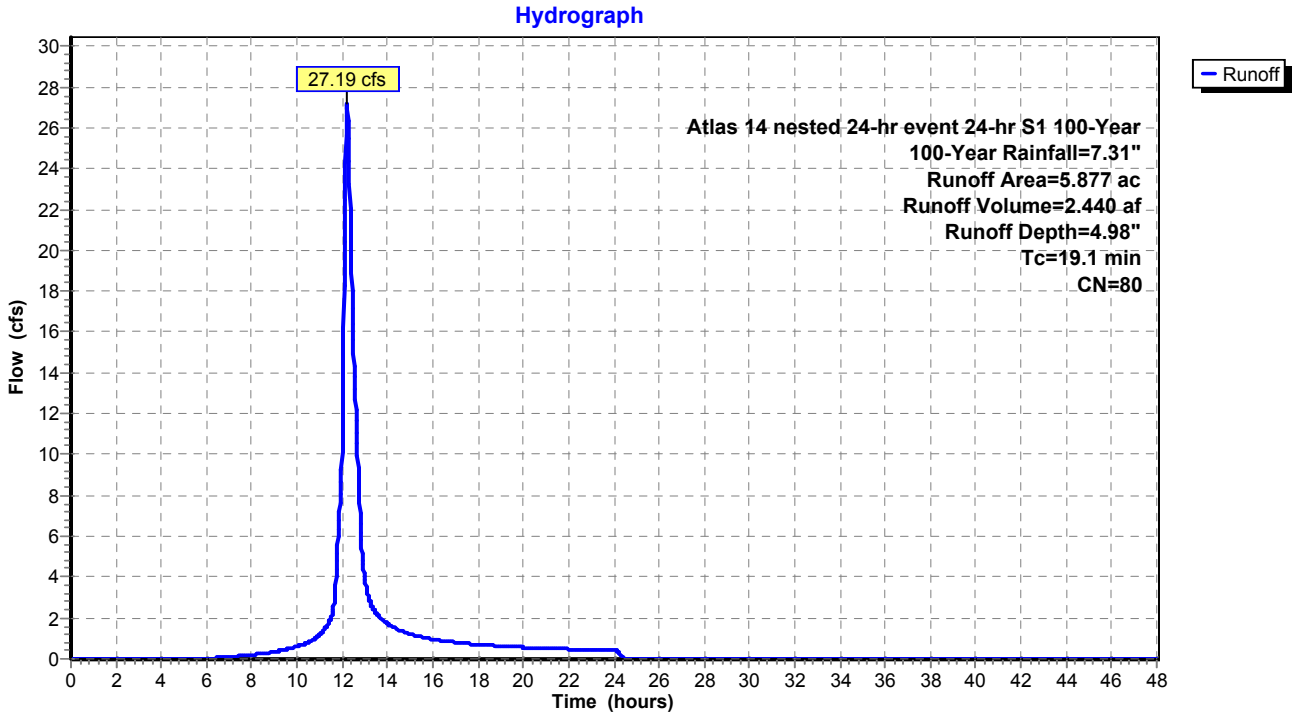
Runoff = 27.19 cfs @ 12.21 hrs, Volume= 2.440 af, Depth= 4.98"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
Atlas 14 nested 24-hr event 24-hr S1 100-Year 100-Year Rainfall=7.31"

	Area (ac)	CN	Description
*	5.877	80	
	5.877		100.00% Pervious Area

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

Subcatchment 83S: County Road H Subbasin Redirected After Regrading



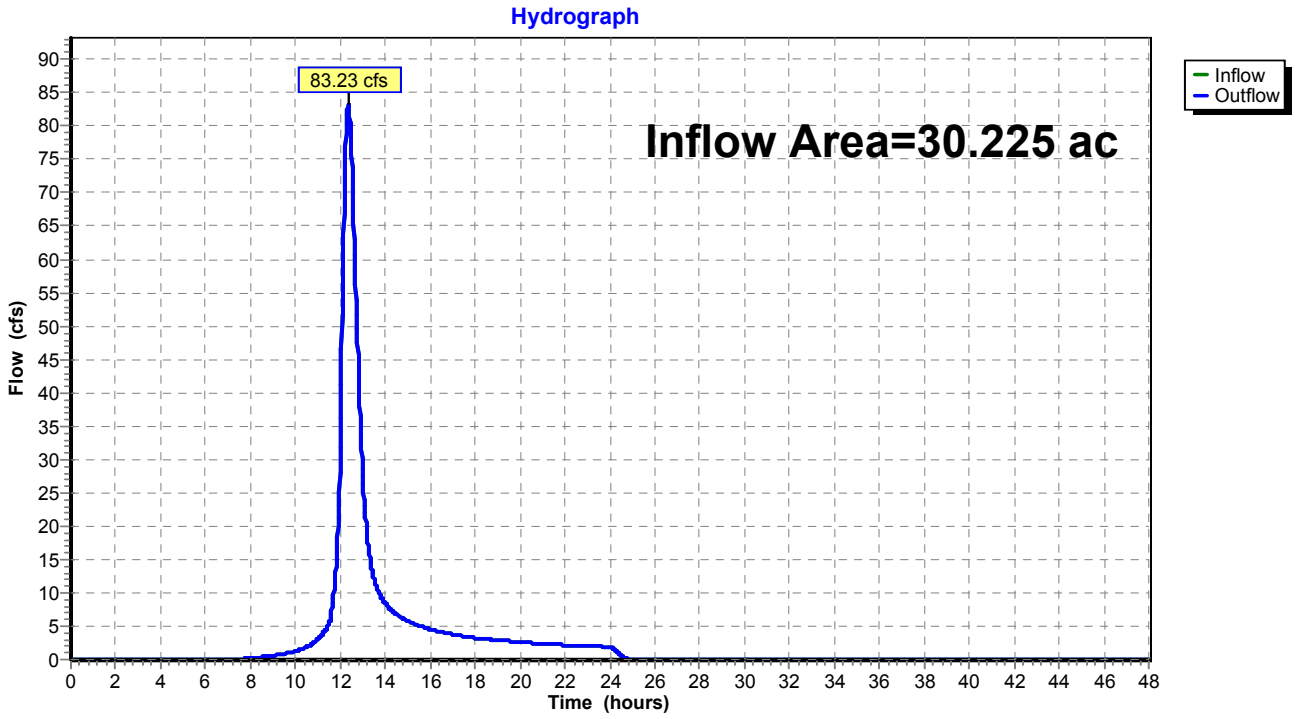
Summary for Reach 37R: Outfall of SB 2, 3, 7

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 30.225 ac, 0.00% Impervious, Inflow Depth = 3.97" for 100-Year event
Inflow = 83.23 cfs @ 12.36 hrs, Volume= 10.007 af
Outflow = 83.23 cfs @ 12.36 hrs, Volume= 10.007 af, Atten= 0%, Lag= 0.0 min

Routing by Muskingum-Cunge method, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs

Reach 37R: Outfall of SB 2, 3, 7



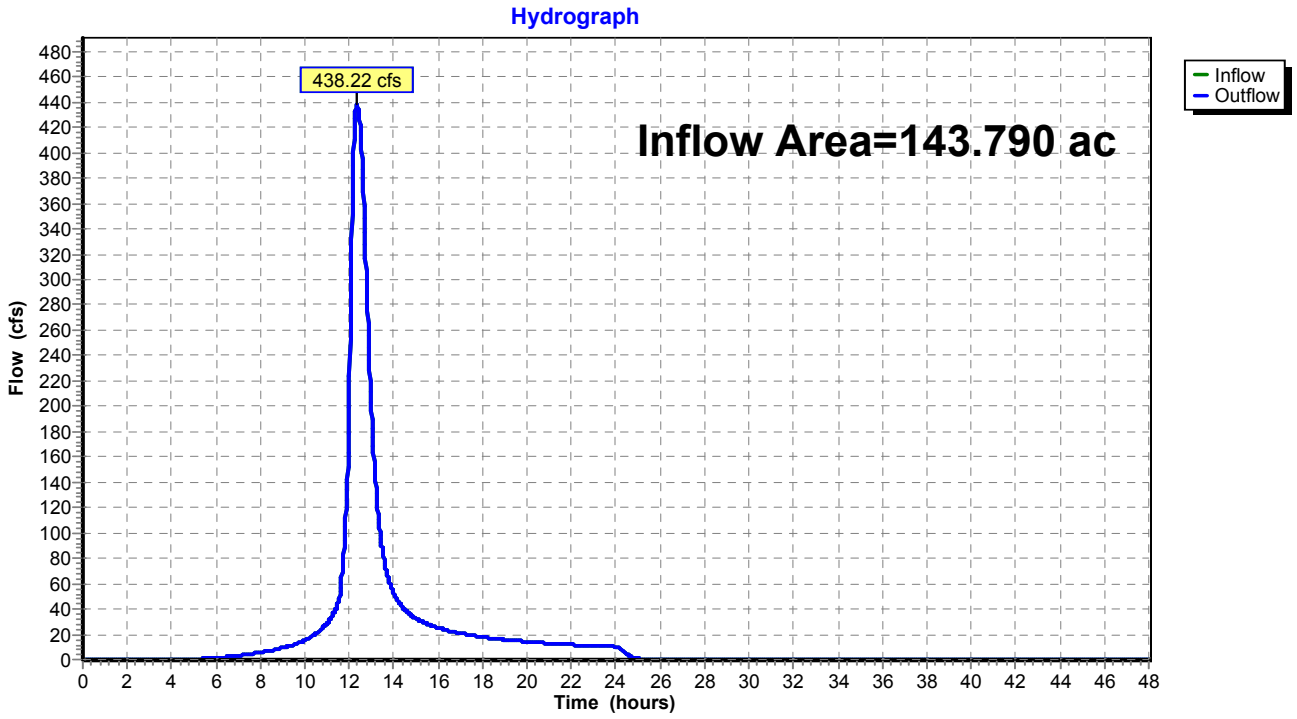
Summary for Reach 39R: Outfall of SB 1, 4, 5, 6, 9, 10, 11, 36

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 143.790 ac, 0.00% Impervious, Inflow Depth = 5.21" for 100-Year event
Inflow = 438.22 cfs @ 12.34 hrs, Volume= 62.386 af
Outflow = 438.22 cfs @ 12.34 hrs, Volume= 62.386 af, Atten= 0%, Lag= 0.0 min

Routing by Muskingum-Cunge method, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs

Reach 39R: Outfall of SB 1, 4, 5, 6, 9, 10, 11, 36



Summary for Reach 40R: 60 in SB 4

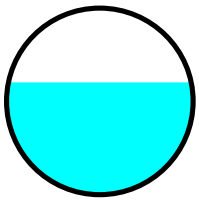
[52] Hint: Inlet/Outlet conditions not evaluated
[65] Warning: Inlet elevation not specified
[88] Warning: Qout>Qin may require Finer Routing>1

Inflow Area = 143.790 ac, 0.00% Impervious, Inflow Depth = 5.21" for 100-Year event
Inflow = 438.10 cfs @ 12.33 hrs, Volume= 62.386 af
Outflow = 438.22 cfs @ 12.34 hrs, Volume= 62.386 af, Atten= 0%, Lag= 0.5 min

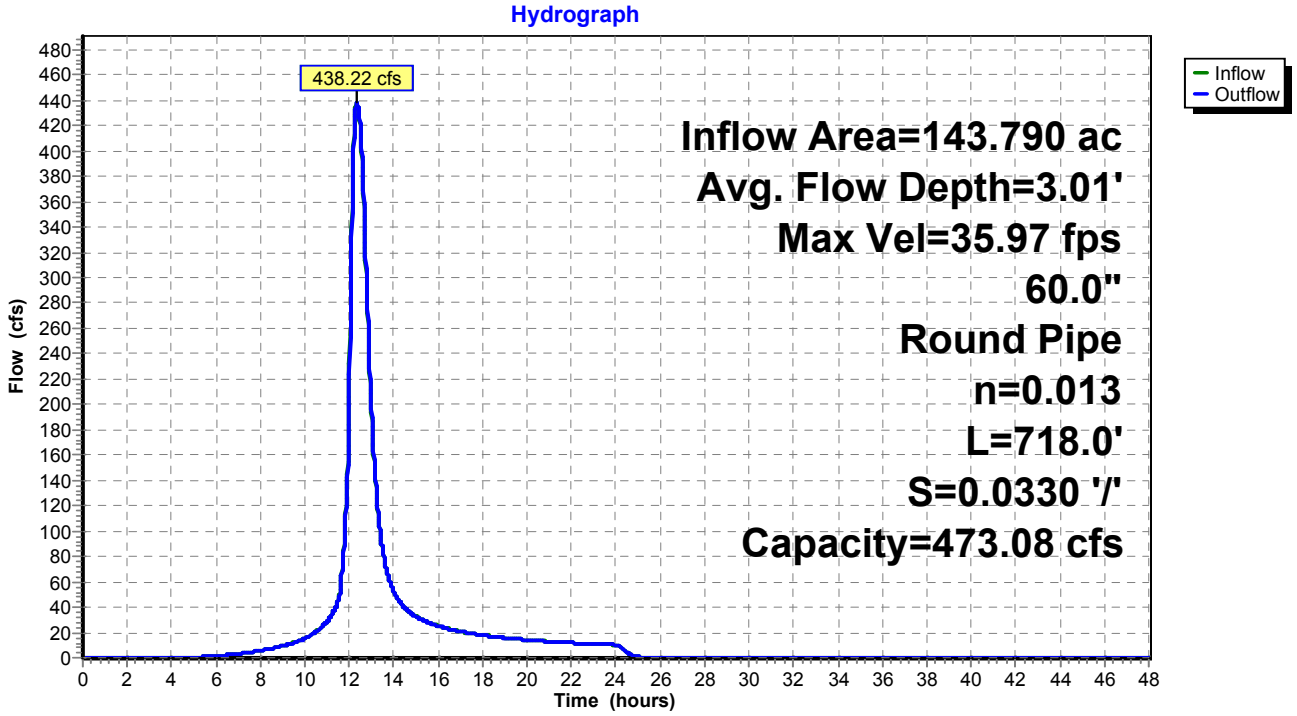
Routing by Muskingum-Cunge method, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
Reference Flow= 328.58 cfs Estimated Depth= 3.07' Velocity= 26.02 fps
m= 1.363, c= 35.46 fps, dt= 1.2 min, dx= 718.0' / 1 = 718.0', K= 0.3 min, X= 0.453
Max. Velocity= 35.97 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 35.46 fps, Avg. Travel Time= 0.3 min

Peak Storage= 8,871 cf @ 12.34 hrs
Average Depth at Peak Storage= 3.01'
Bank-Full Depth= 5.00' Flow Area= 19.6 sf, Capacity= 473.08 cfs

60.0" Round Pipe
n= 0.013
Length= 718.0' Slope= 0.0330 '/'
Inlet Invert= 0.00', Outlet Invert= -23.69'



Reach 40R: 60 in SB 4



Summary for Reach 41R: Channel in SB 9, 10

[65] Warning: Inlet elevation not specified

Inflow Area = 9.296 ac, 0.00% Impervious, Inflow Depth = 5.21" for 100-Year event
Inflow = 53.64 cfs @ 12.13 hrs, Volume= 4.034 af
Outflow = 49.75 cfs @ 12.29 hrs, Volume= 4.034 af, Atten= 7%, Lag= 10.1 min

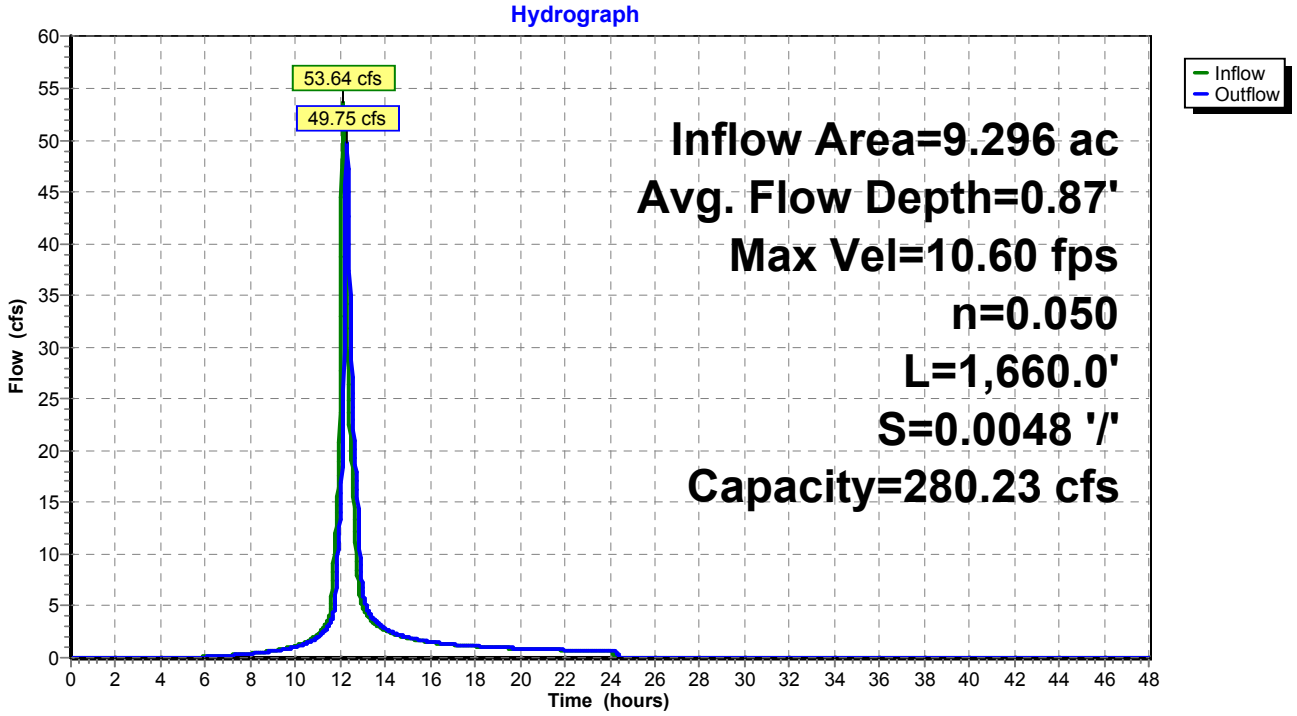
Routing by Muskingum-Cunge method, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
Reference Flow= 40.23 cfs Estimated Depth= 1.06' Velocity= 1.87 fps
m= 1.523, c= 2.85 fps, dt= 1.2 min, dx= 1,660.0' / 8 = 207.5', K= 1.2 min, X= 0.150
Max. Velocity= 10.60 fps, Min. Travel Time= 2.6 min
Avg. Velocity = 2.90 fps, Avg. Travel Time= 9.5 min

Peak Storage= 27,957 cf @ 12.22 hrs
Average Depth at Peak Storage= 0.87'
Bank-Full Depth= 3.00' Flow Area= 84.0 sf, Capacity= 280.23 cfs

16.00' x 3.00' deep channel, n= 0.050
Side Slope Z-value= 4.0 '/' Top Width= 40.00'
Length= 1,660.0' Slope= 0.0048 '/'
Inlet Invert= 0.00', Outlet Invert= -7.97'

‡

Reach 41R: Channel in SB 9, 10



Summary for Reach 46R: Channel SB1

[65] Warning: Inlet elevation not specified

Inflow Area = 15.328 ac, 0.00% Impervious, Inflow Depth = 5.78" for 100-Year event
Inflow = 86.42 cfs @ 12.17 hrs, Volume= 7.383 af
Outflow = 85.24 cfs @ 12.24 hrs, Volume= 7.383 af, Atten= 1%, Lag= 3.8 min

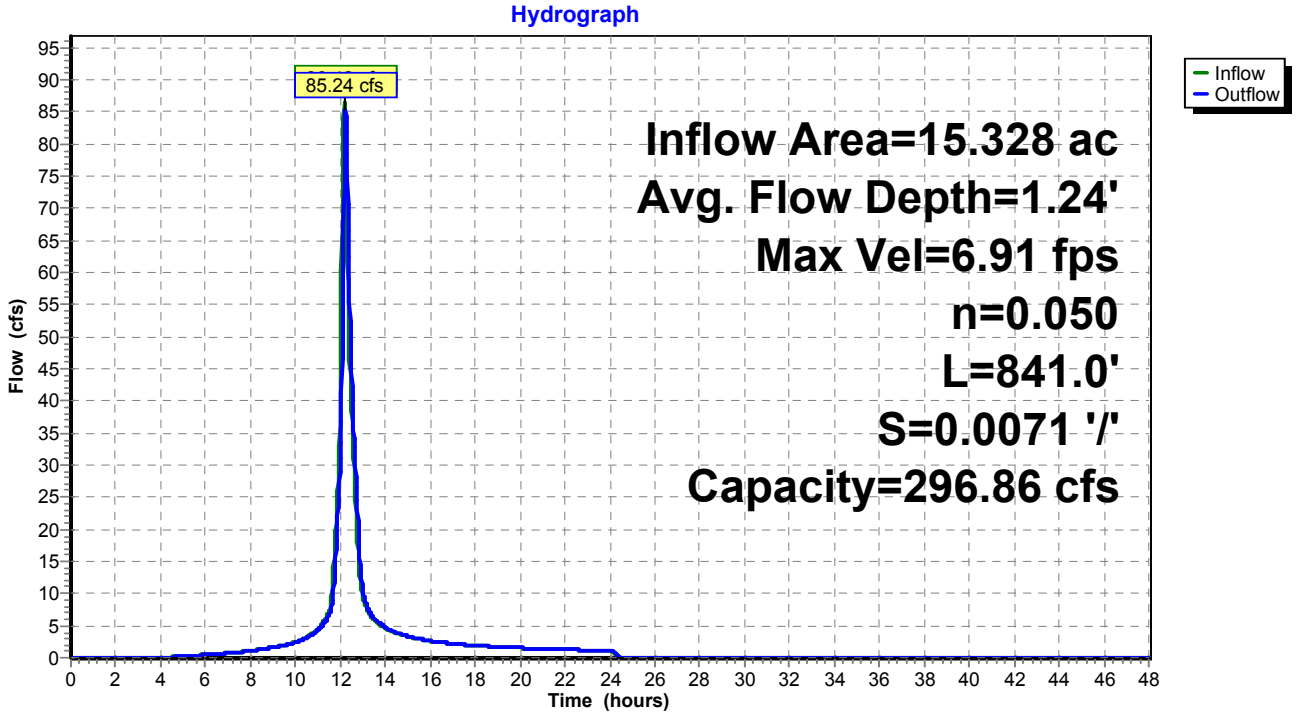
Routing by Muskingum-Cunge method, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
Reference Flow= 64.81 cfs Estimated Depth= 1.37' Velocity= 2.57 fps
m= 1.479, c= 3.80 fps, dt= 1.2 min, dx= 841.0' / 3 = 280.3', K= 1.2 min, X= 0.268
Max. Velocity= 6.91 fps, Min. Travel Time= 2.0 min
Avg. Velocity = 3.81 fps, Avg. Travel Time= 3.7 min

Peak Storage= 18,802 cf @ 12.21 hrs
Average Depth at Peak Storage= 1.24'
Bank-Full Depth= 3.00' Flow Area= 75.0 sf, Capacity= 296.86 cfs

13.00' x 3.00' deep channel, n= 0.050
Side Slope Z-value= 4.0 '/' Top Width= 37.00'
Length= 841.0' Slope= 0.0071 '/'
Inlet Invert= 0.00', Outlet Invert= -5.97'

‡

Reach 46R: Channel SB1



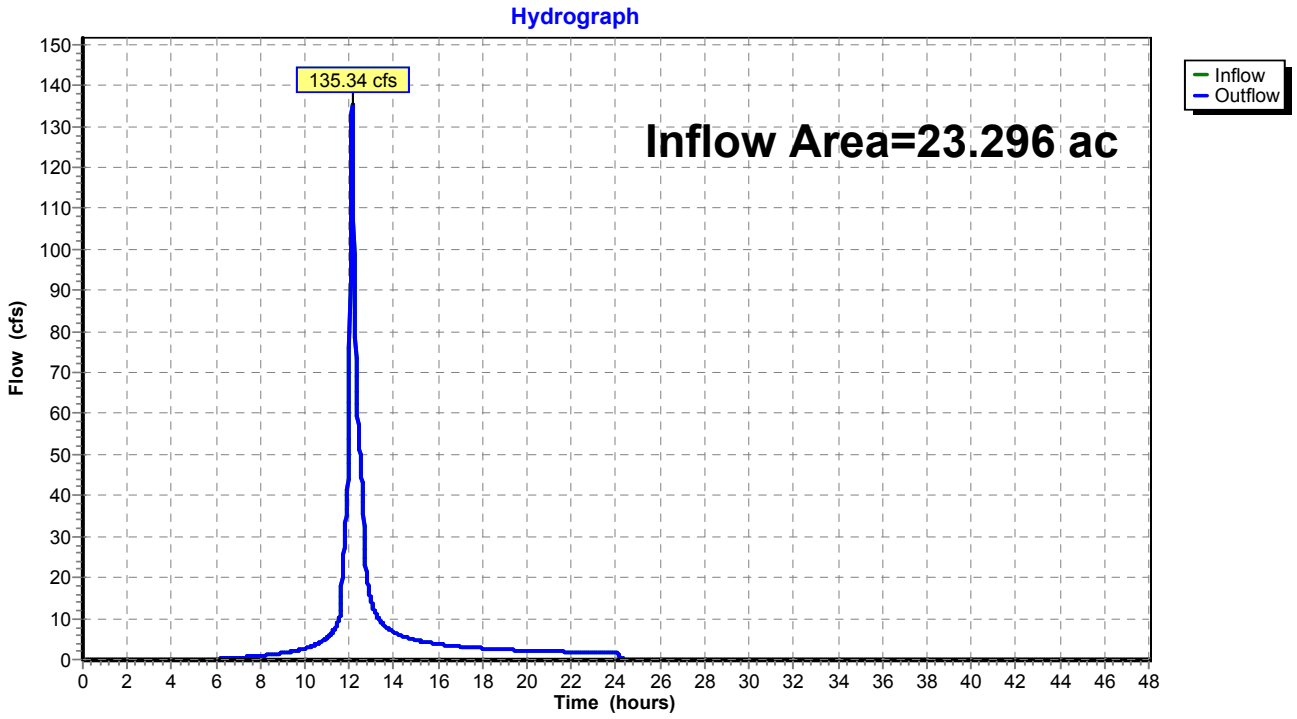
Summary for Reach 48R: Outfall of SB 8, 13

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 23.296 ac, 0.00% Impervious, Inflow Depth = 5.11" for 100-Year event
Inflow = 135.34 cfs @ 12.12 hrs, Volume= 9.912 af
Outflow = 135.34 cfs @ 12.12 hrs, Volume= 9.912 af, Atten= 0%, Lag= 0.0 min

Routing by Muskingum-Cunge method, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs

Reach 48R: Outfall of SB 8, 13



Summary for Reach 49R: Channel SB8

[65] Warning: Inlet elevation not specified

Inflow Area = 21.017 ac, 0.00% Impervious, Inflow Depth = 5.09" for 100-Year event
Inflow = 134.02 cfs @ 12.08 hrs, Volume= 8.923 af
Outflow = 131.67 cfs @ 12.12 hrs, Volume= 8.923 af, Atten= 2%, Lag= 2.1 min

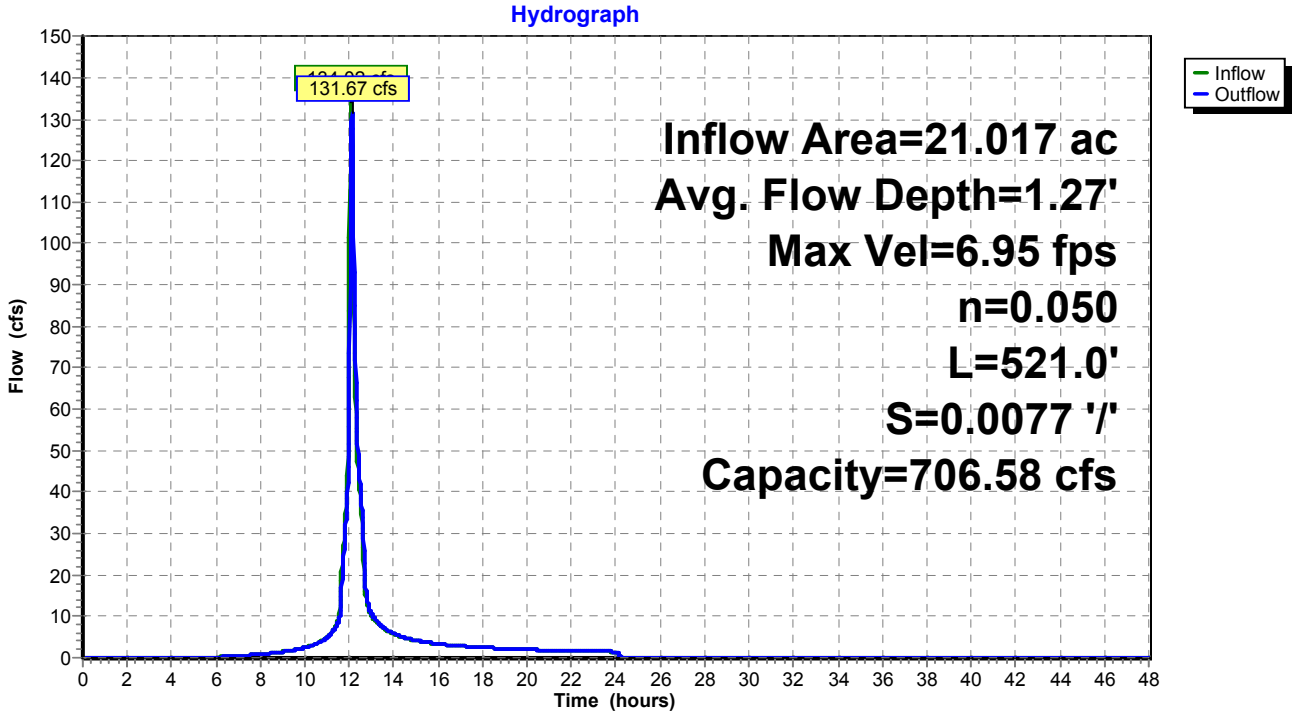
Routing by Muskingum-Cunge method, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
Reference Flow= 100.52 cfs Estimated Depth= 1.43' Velocity= 2.85 fps
m= 1.511, c= 4.31 fps, dt= 1.2 min, dx= 521.0' / 2 = 260.5', K= 1.0 min, X= 0.265
Max. Velocity= 6.95 fps, Min. Travel Time= 1.3 min
Avg. Velocity = 4.32 fps, Avg. Travel Time= 2.0 min

Peak Storage= 15,883 cf @ 12.10 hrs
Average Depth at Peak Storage= 1.27'
Bank-Full Depth= 4.00' Flow Area= 140.0 sf, Capacity= 706.58 cfs

19.00' x 4.00' deep channel, n= 0.050
Side Slope Z-value= 4.0 '/' Top Width= 51.00'
Length= 521.0' Slope= 0.0077 '/'
Inlet Invert= 0.00', Outlet Invert= -4.01'

‡

Reach 49R: Channel SB8



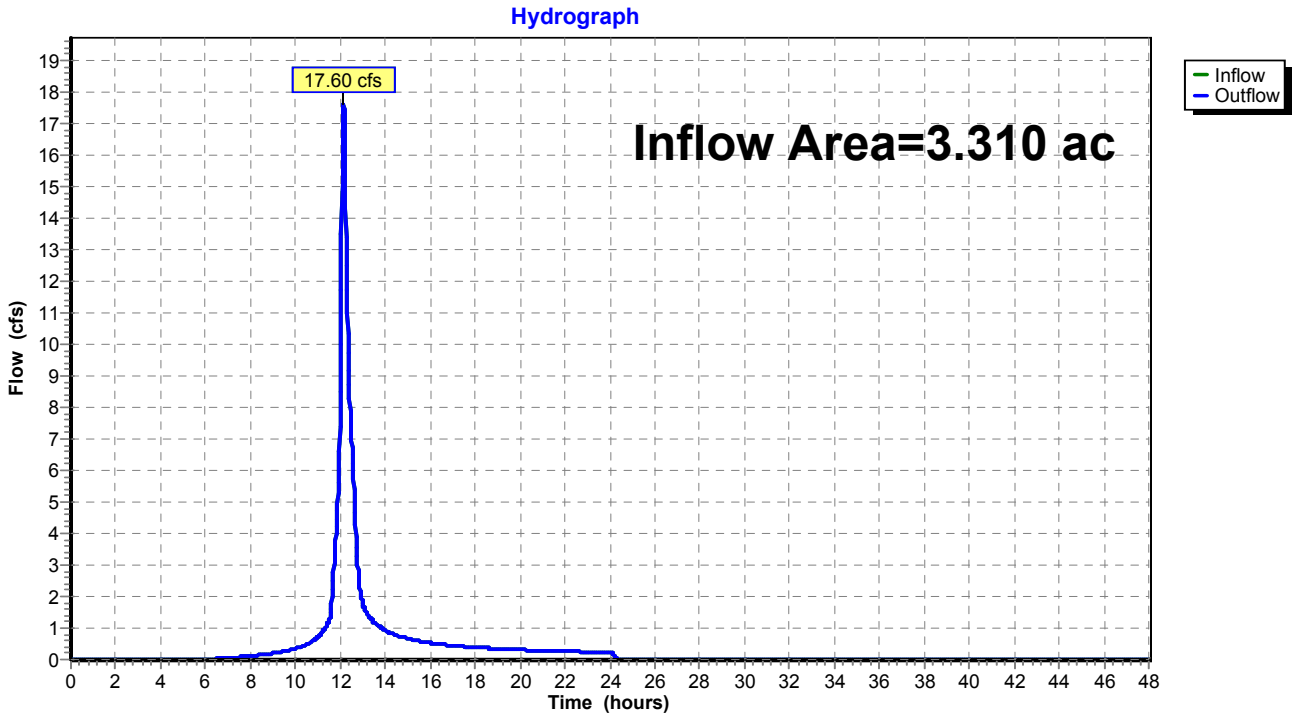
Summary for Reach 50R: Outfall of SB 12

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 3.310 ac, 0.00% Impervious, Inflow Depth = 4.98" for 100-Year event
Inflow = 17.60 cfs @ 12.14 hrs, Volume= 1.374 af
Outflow = 17.60 cfs @ 12.14 hrs, Volume= 1.374 af, Atten= 0%, Lag= 0.0 min

Routing by Muskingum-Cunge method, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs

Reach 50R: Outfall of SB 12



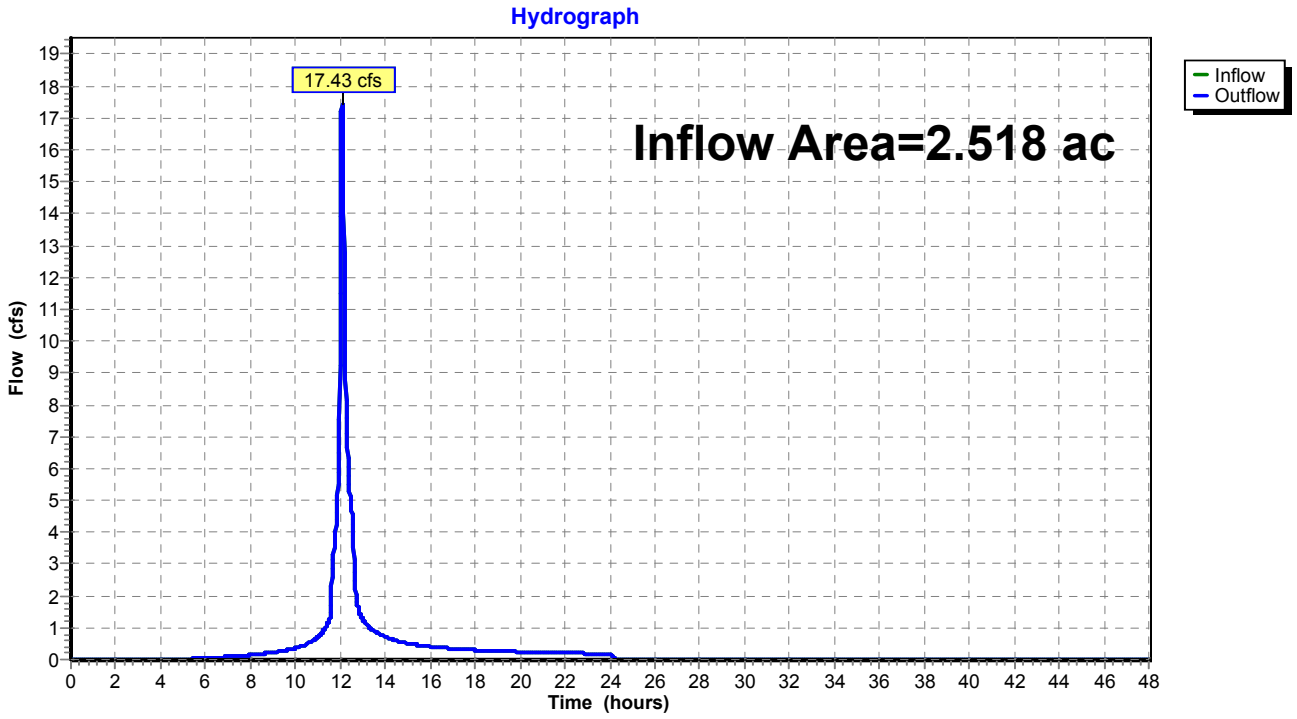
Summary for Reach 51R: Outfall of SB 14

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 2.518 ac, 0.00% Impervious, Inflow Depth = 5.44" for 100-Year event
Inflow = 17.43 cfs @ 12.07 hrs, Volume= 1.141 af
Outflow = 17.43 cfs @ 12.07 hrs, Volume= 1.141 af, Atten= 0%, Lag= 0.0 min

Routing by Muskingum-Cunge method, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs

Reach 51R: Outfall of SB 14



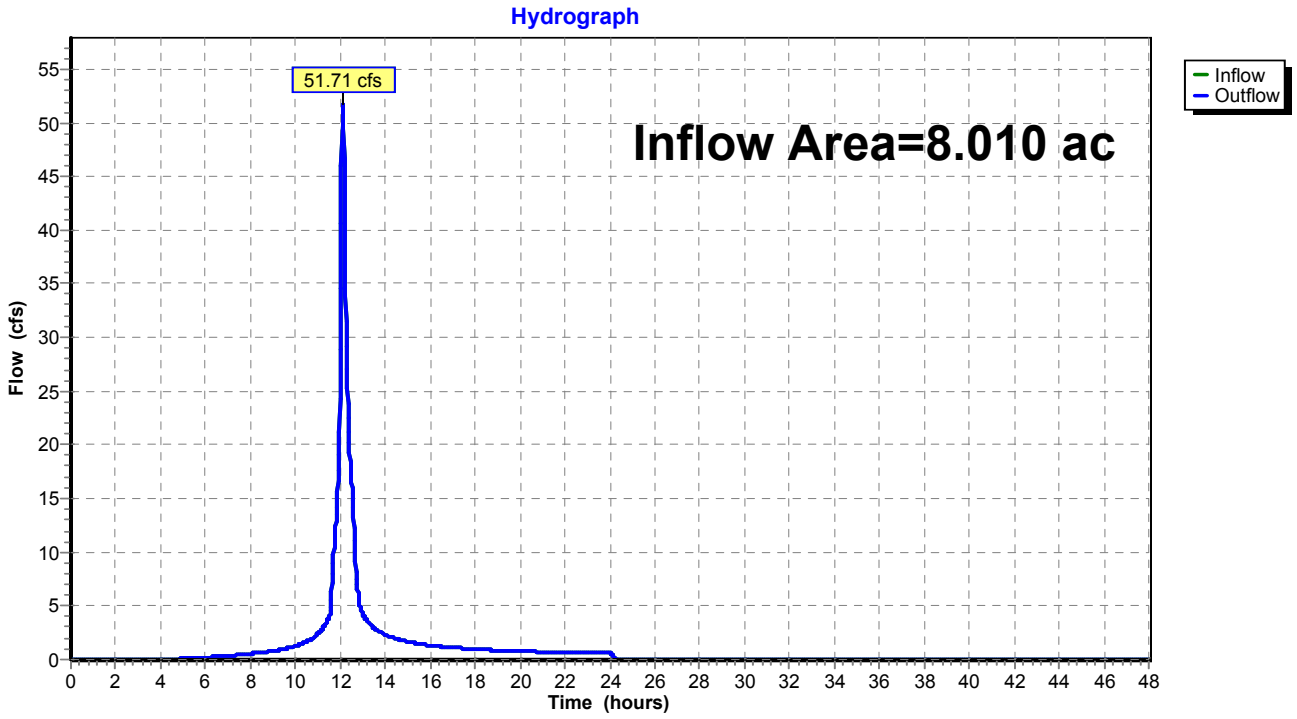
Summary for Reach 52R: Outfall of SB 17

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 8.010 ac, 0.00% Impervious, Inflow Depth = 5.66" for 100-Year event
Inflow = 51.71 cfs @ 12.11 hrs, Volume= 3.781 af
Outflow = 51.71 cfs @ 12.11 hrs, Volume= 3.781 af, Atten= 0%, Lag= 0.0 min

Routing by Muskingum-Cunge method, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs

Reach 52R: Outfall of SB 17



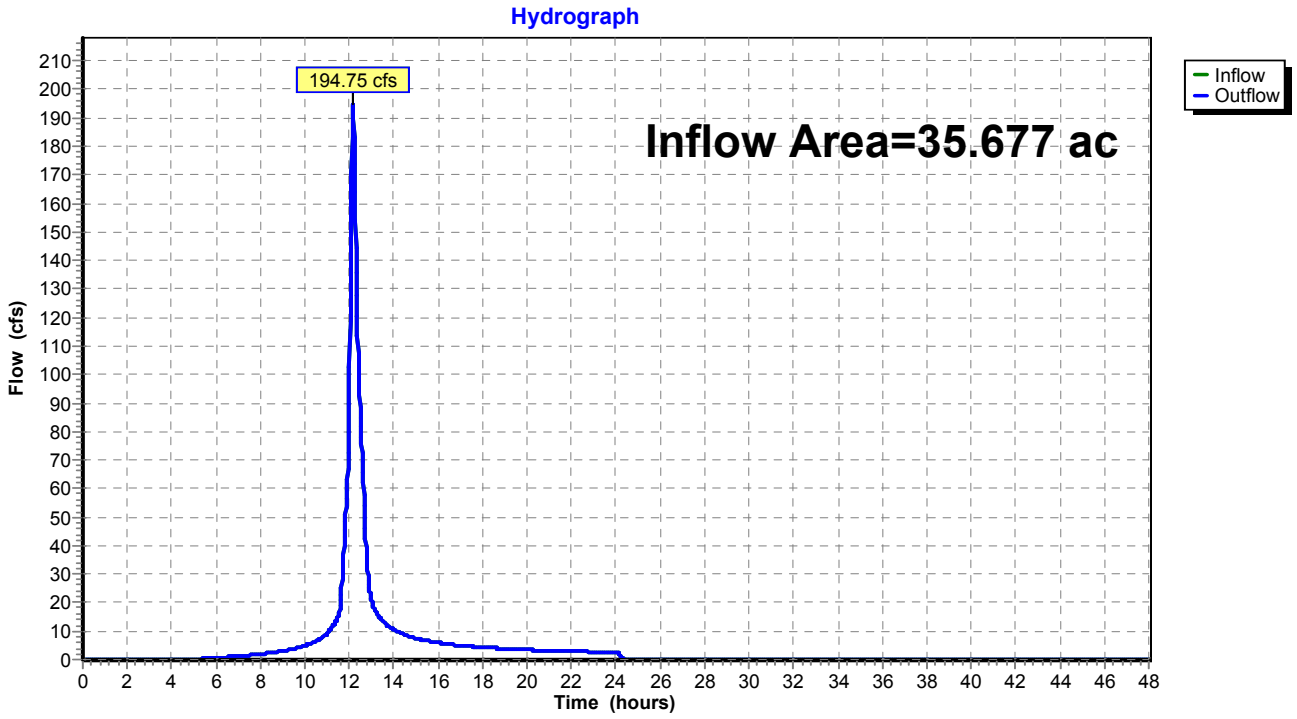
Summary for Reach 53R: Outfall of SB 18

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 35.677 ac, 0.00% Impervious, Inflow Depth = 5.44" for 100-Year event
Inflow = 194.75 cfs @ 12.17 hrs, Volume= 16.160 af
Outflow = 194.75 cfs @ 12.17 hrs, Volume= 16.160 af, Atten= 0%, Lag= 0.0 min

Routing by Muskingum-Cunge method, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs

Reach 53R: Outfall of SB 18



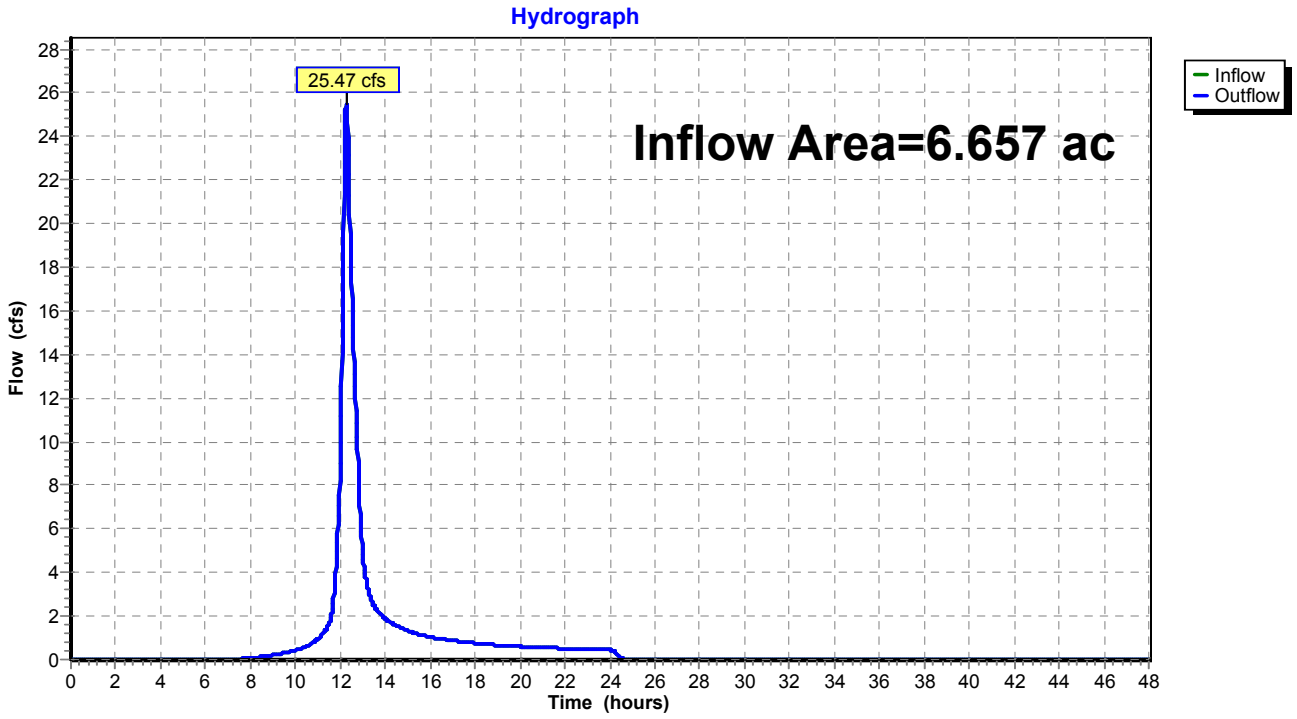
Summary for Reach 54R: Outfall of SB 25

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 6.657 ac, 0.00% Impervious, Inflow Depth = 4.42" for 100-Year event
Inflow = 25.47 cfs @ 12.27 hrs, Volume= 2.454 af
Outflow = 25.47 cfs @ 12.27 hrs, Volume= 2.454 af, Atten= 0%, Lag= 0.0 min

Routing by Muskingum-Cunge method, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs

Reach 54R: Outfall of SB 25



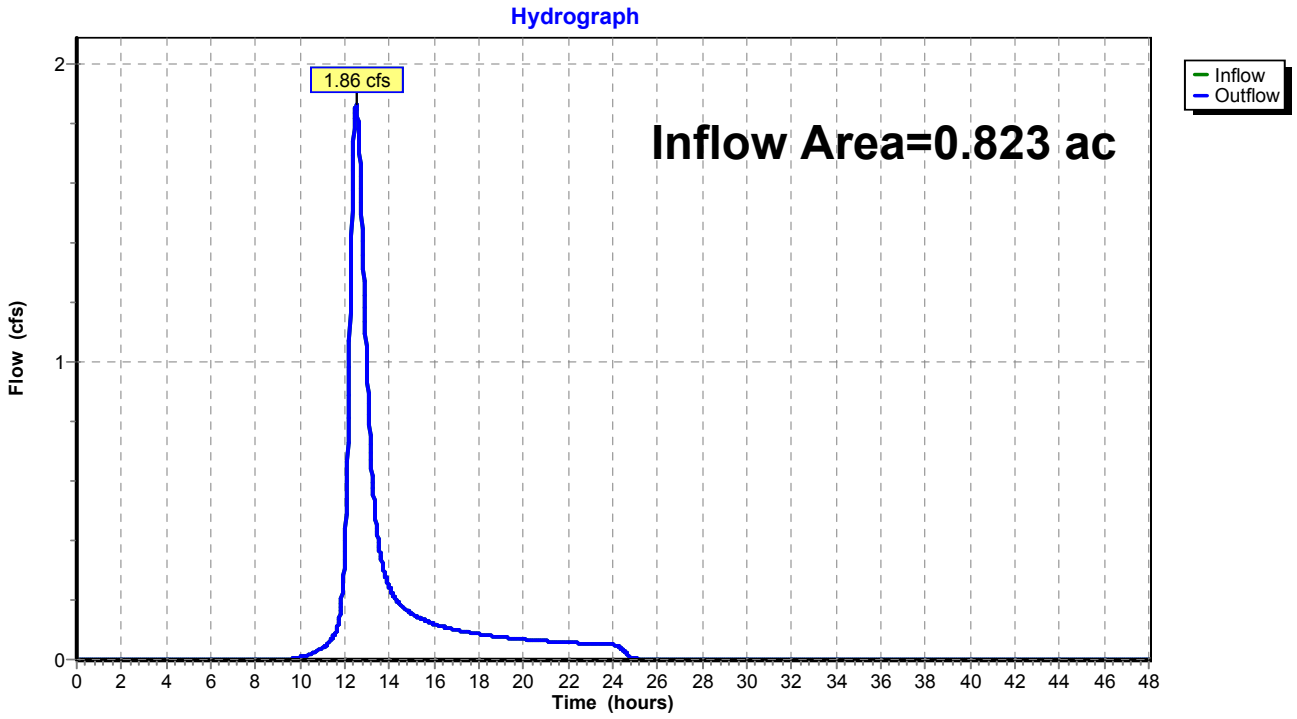
Summary for Reach 55R: Outfall of SB 26

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.823 ac, 0.00% Impervious, Inflow Depth = 3.45" for 100-Year event
Inflow = 1.86 cfs @ 12.52 hrs, Volume= 0.237 af
Outflow = 1.86 cfs @ 12.52 hrs, Volume= 0.237 af, Atten= 0%, Lag= 0.0 min

Routing by Muskingum-Cunge method, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs

Reach 55R: Outfall of SB 26



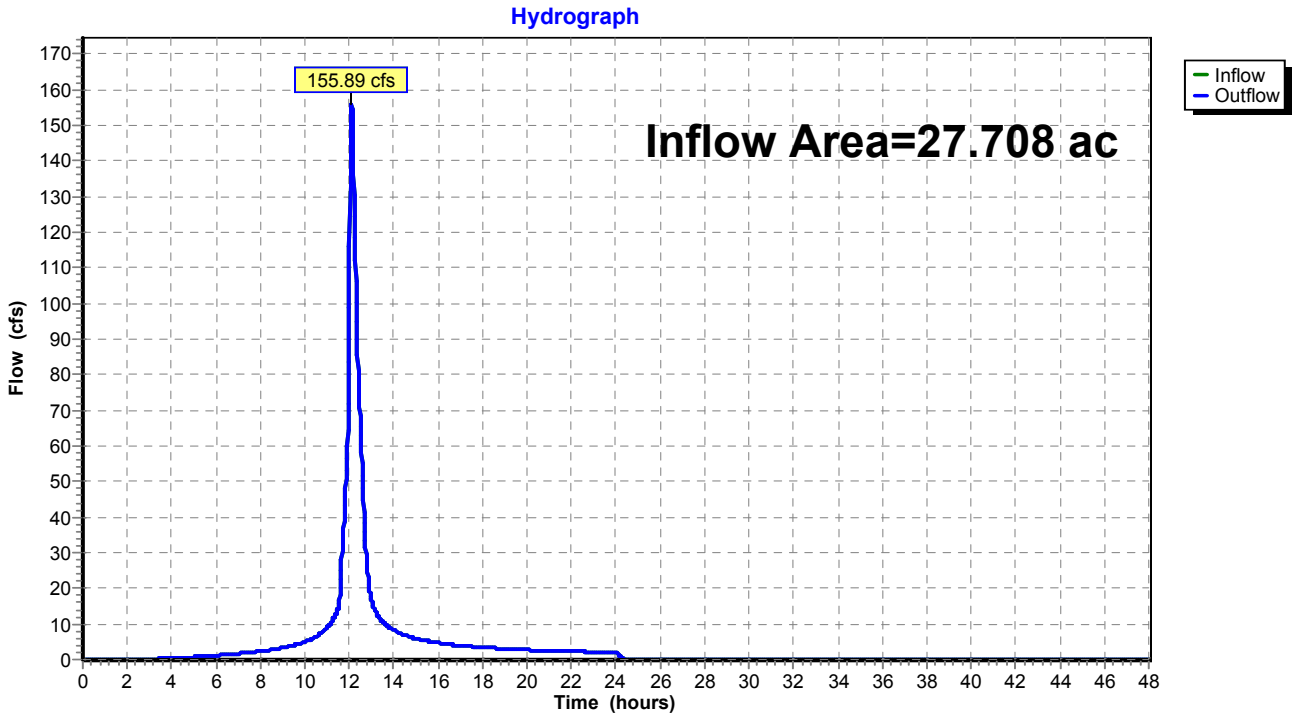
Summary for Reach 56R: Outfall of SB 23, 24

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 27.708 ac, 0.00% Impervious, Inflow Depth = 5.95" for 100-Year event
Inflow = 155.89 cfs @ 12.10 hrs, Volume= 13.749 af
Outflow = 155.89 cfs @ 12.10 hrs, Volume= 13.749 af, Atten= 0%, Lag= 0.0 min

Routing by Muskingum-Cunge method, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs

Reach 56R: Outfall of SB 23, 24



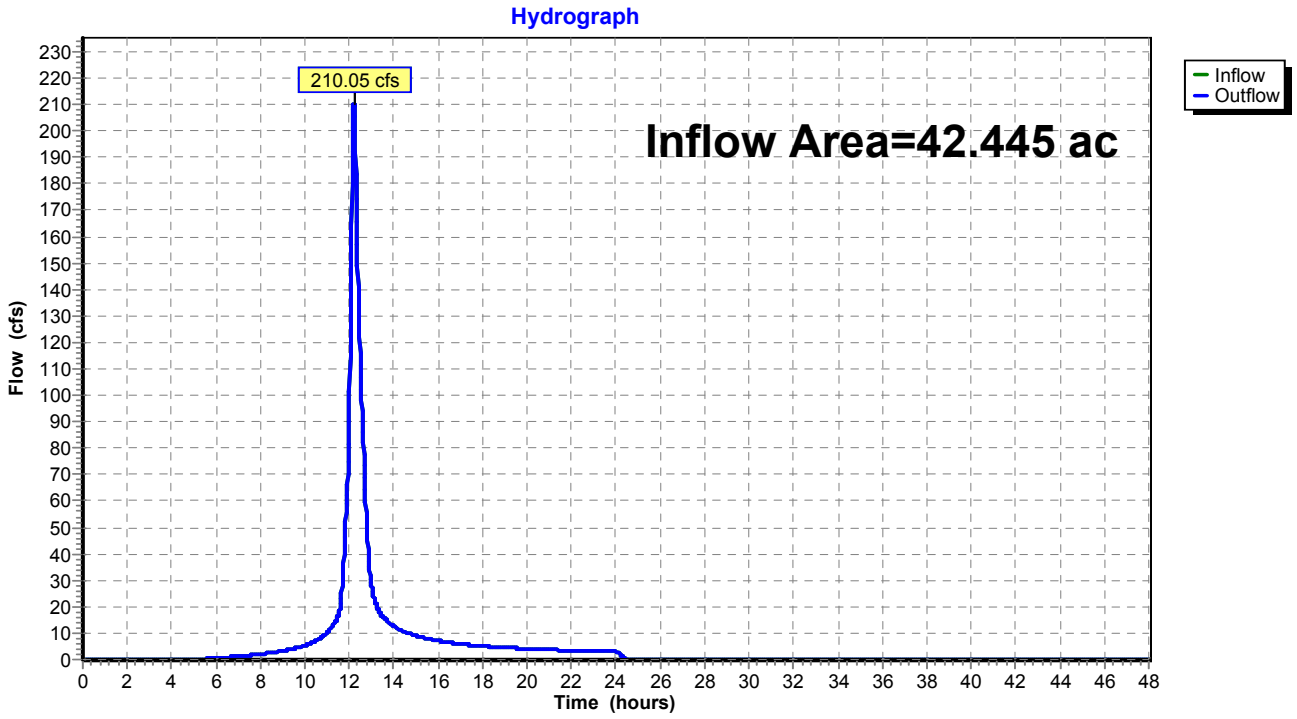
Summary for Reach 59R: Outfall of SB 20, 22

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 42.445 ac, 0.00% Impervious, Inflow Depth = 5.34" for 100-Year event
Inflow = 210.05 cfs @ 12.21 hrs, Volume= 18.873 af
Outflow = 210.05 cfs @ 12.21 hrs, Volume= 18.873 af, Atten= 0%, Lag= 0.0 min

Routing by Muskingum-Cunge method, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs

Reach 59R: Outfall of SB 20, 22



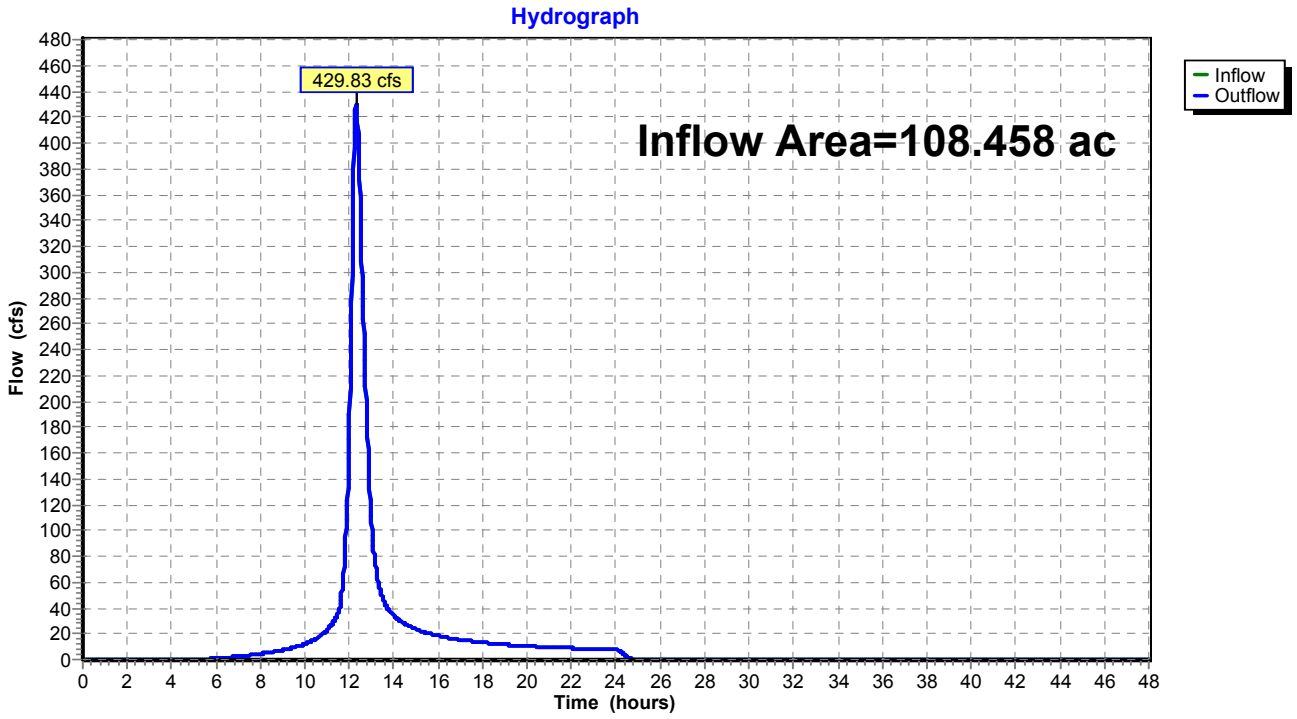
Summary for Reach 61R: Outfall of SB 15, 16, 21

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 108.458 ac, 0.00% Impervious, Inflow Depth = 5.22" for 100-Year event
Inflow = 429.83 cfs @ 12.31 hrs, Volume= 47.194 af
Outflow = 429.83 cfs @ 12.31 hrs, Volume= 47.194 af, Atten= 0%, Lag= 0.0 min

Routing by Muskingum-Cunge method, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs

Reach 61R: Outfall of SB 15, 16, 21



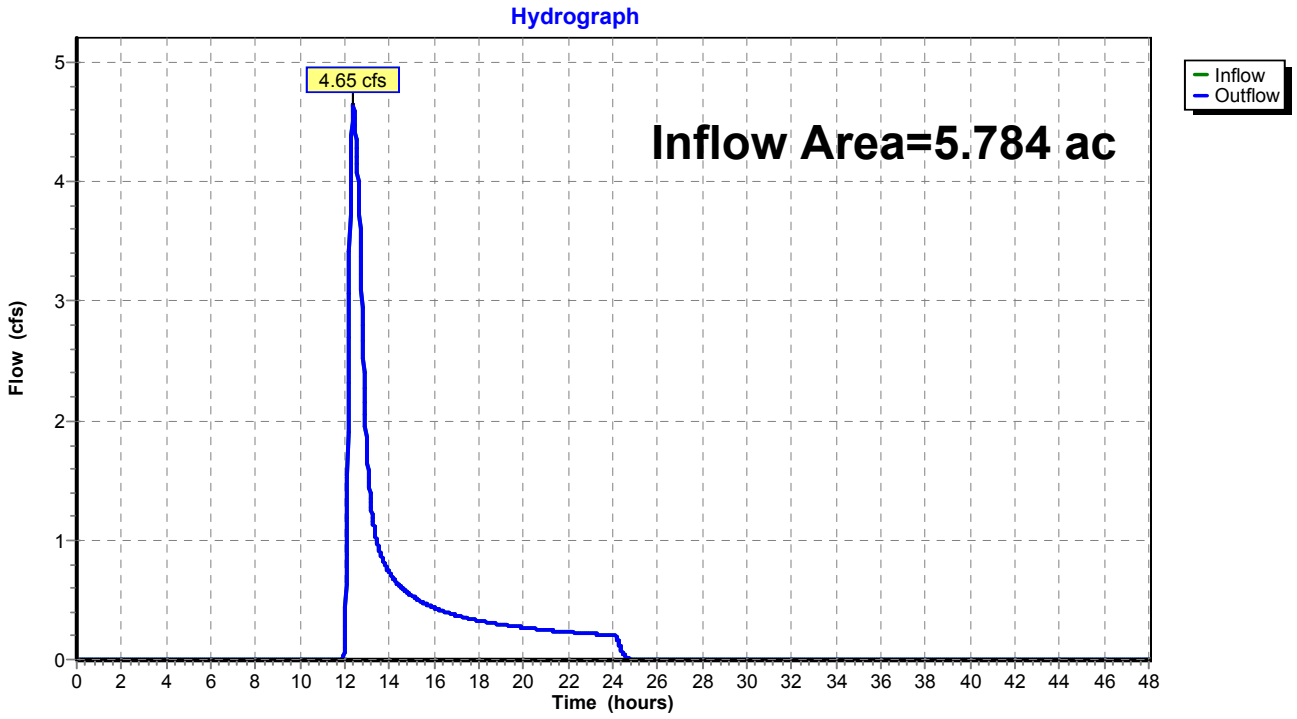
Summary for Reach 67R: Outfall of SB 28

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 5.784 ac, 0.00% Impervious, Inflow Depth = 1.30" for 100-Year event
Inflow = 4.65 cfs @ 12.38 hrs, Volume= 0.626 af
Outflow = 4.65 cfs @ 12.38 hrs, Volume= 0.626 af, Atten= 0%, Lag= 0.0 min

Routing by Muskingum-Cunge method, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs

Reach 67R: Outfall of SB 28



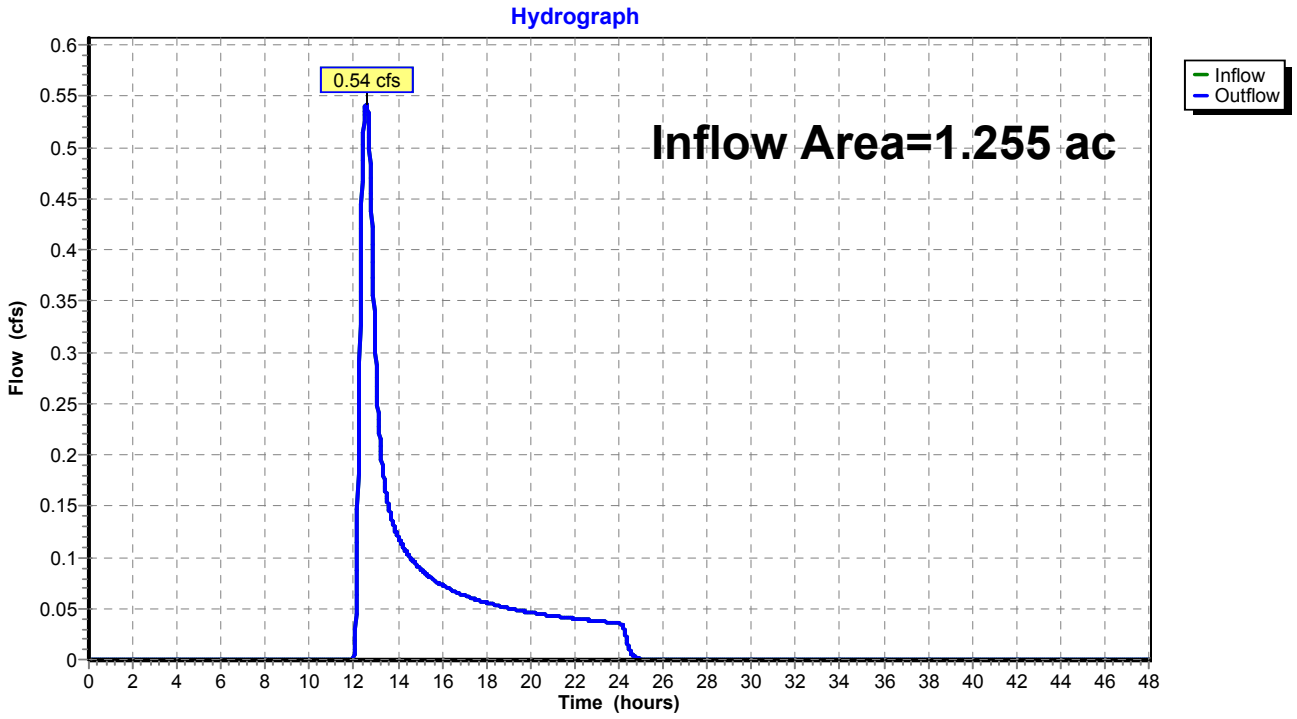
Summary for Reach 68R: Outfall of SB 29

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 1.255 ac, 0.00% Impervious, Inflow Depth = 0.88" for 100-Year event
Inflow = 0.54 cfs @ 12.57 hrs, Volume= 0.092 af
Outflow = 0.54 cfs @ 12.57 hrs, Volume= 0.092 af, Atten= 0%, Lag= 0.0 min

Routing by Muskingum-Cunge method, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs

Reach 68R: Outfall of SB 29



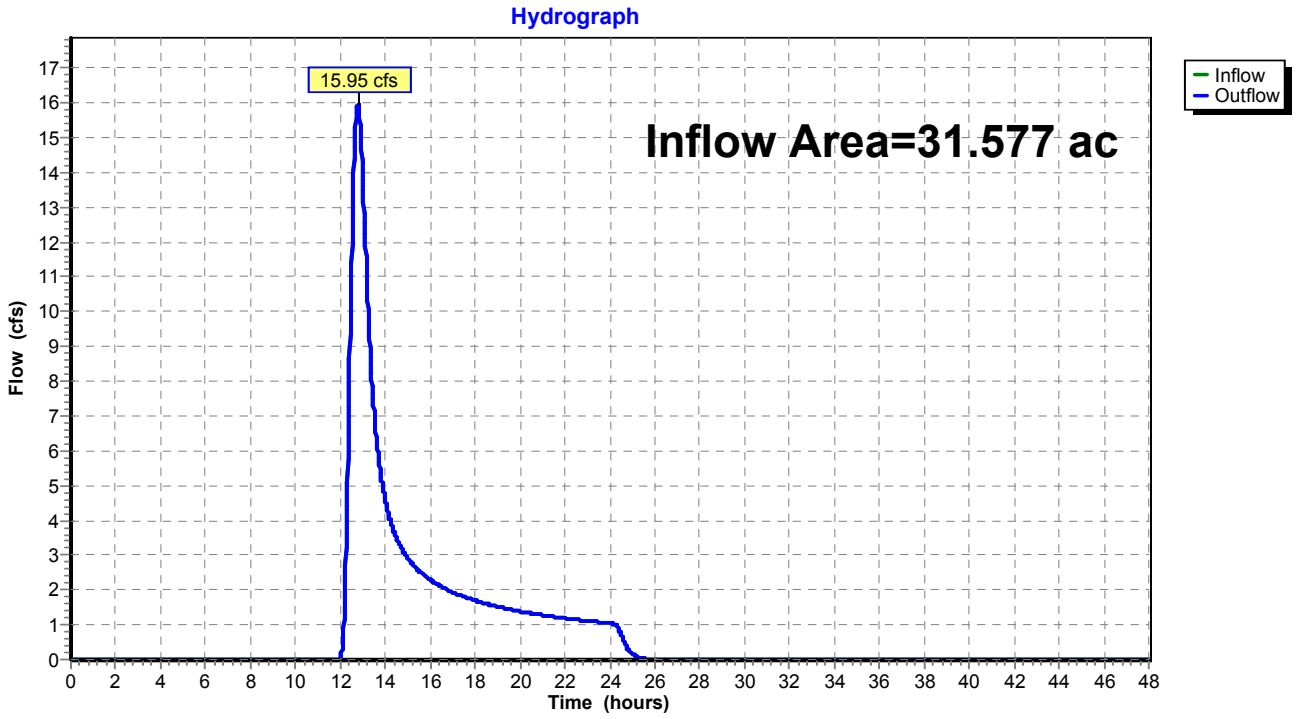
Summary for Reach 69R: Outfall of SB 30

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 31.577 ac, 0.00% Impervious, Inflow Depth = 1.13" for 100-Year event
Inflow = 15.95 cfs @ 12.79 hrs, Volume= 2.966 af
Outflow = 15.95 cfs @ 12.79 hrs, Volume= 2.966 af, Atten= 0%, Lag= 0.0 min

Routing by Muskingum-Cunge method, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs

Reach 69R: Outfall of SB 30



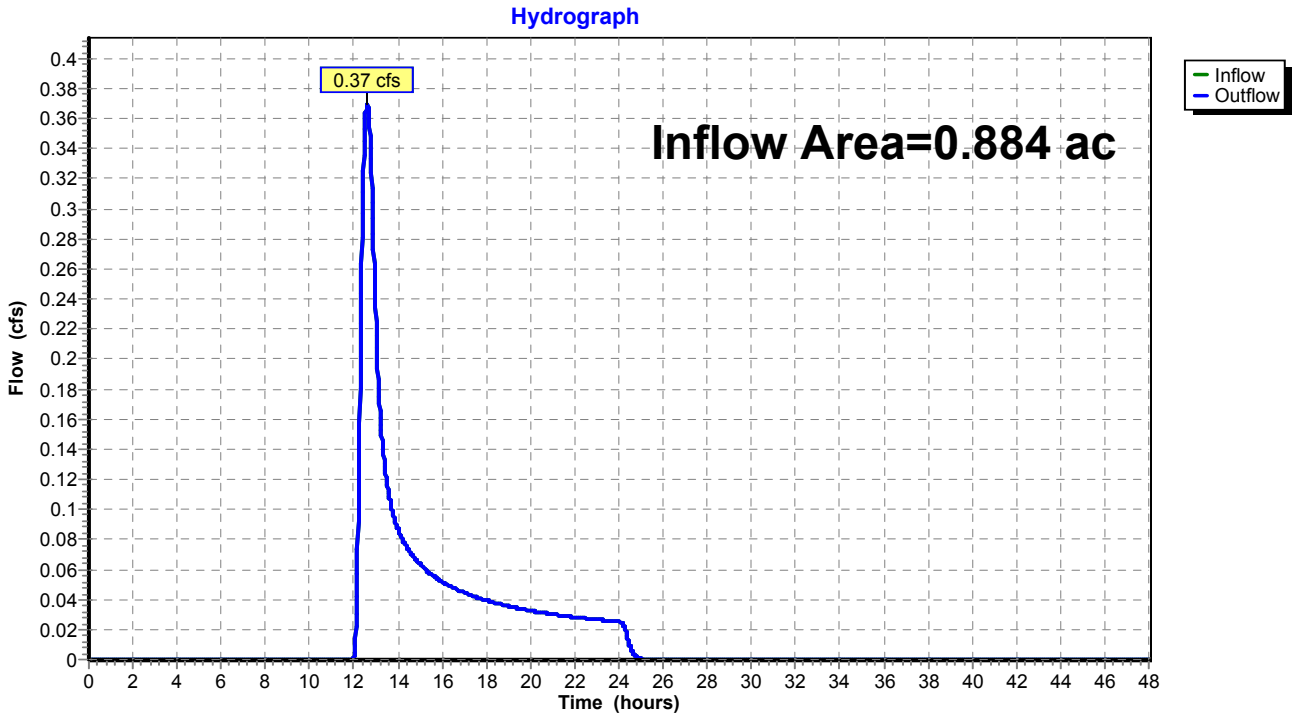
Summary for Reach 70R: Outfall of SB 31

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.884 ac, 0.00% Impervious, Inflow Depth = 0.88" for 100-Year event
Inflow = 0.37 cfs @ 12.61 hrs, Volume= 0.065 af
Outflow = 0.37 cfs @ 12.61 hrs, Volume= 0.065 af, Atten= 0%, Lag= 0.0 min

Routing by Muskingum-Cunge method, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs

Reach 70R: Outfall of SB 31



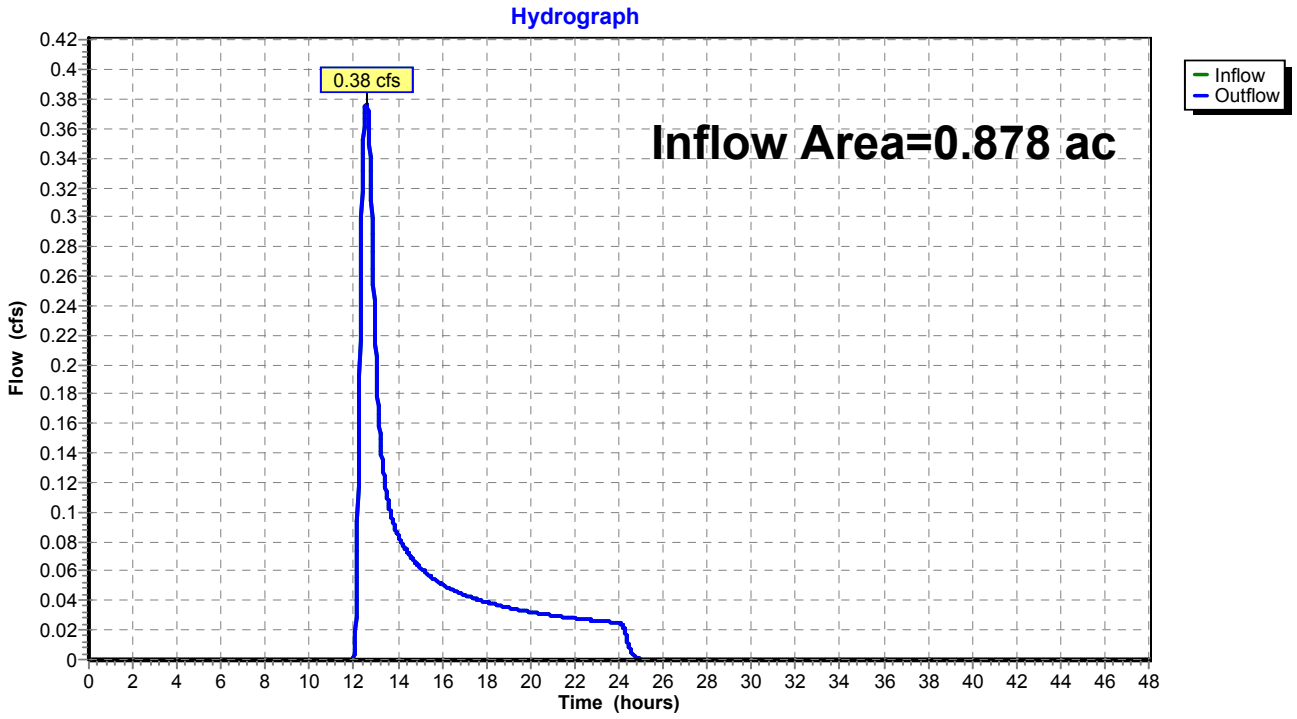
Summary for Reach 71R: Outfall of SB 32

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.878 ac, 0.00% Impervious, Inflow Depth = 0.88" for 100-Year event
Inflow = 0.38 cfs @ 12.57 hrs, Volume= 0.065 af
Outflow = 0.38 cfs @ 12.57 hrs, Volume= 0.065 af, Atten= 0%, Lag= 0.0 min

Routing by Muskingum-Cunge method, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs

Reach 71R: Outfall of SB 32



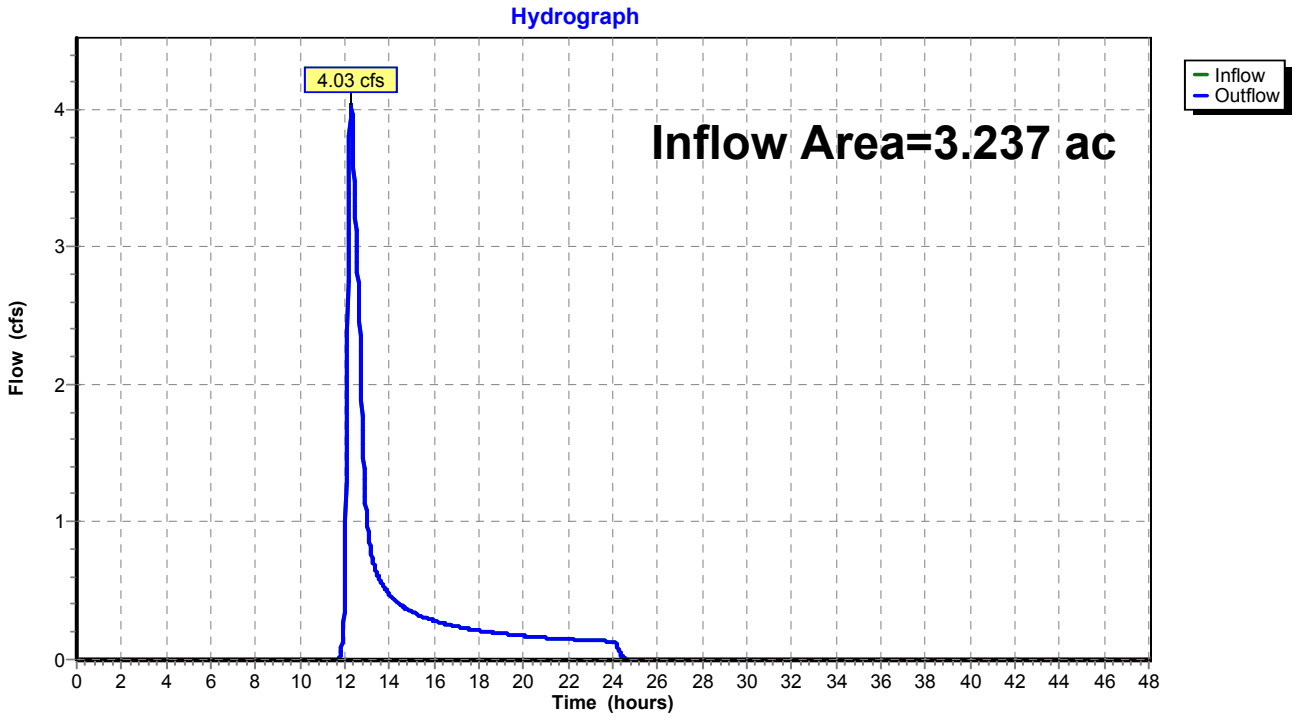
Summary for Reach 72R: Outfall of SB 33

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 3.237 ac, 0.00% Impervious, Inflow Depth = 1.66" for 100-Year event
Inflow = 4.03 cfs @ 12.28 hrs, Volume= 0.447 af
Outflow = 4.03 cfs @ 12.28 hrs, Volume= 0.447 af, Atten= 0%, Lag= 0.0 min

Routing by Muskingum-Cunge method, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs

Reach 72R: Outfall of SB 33



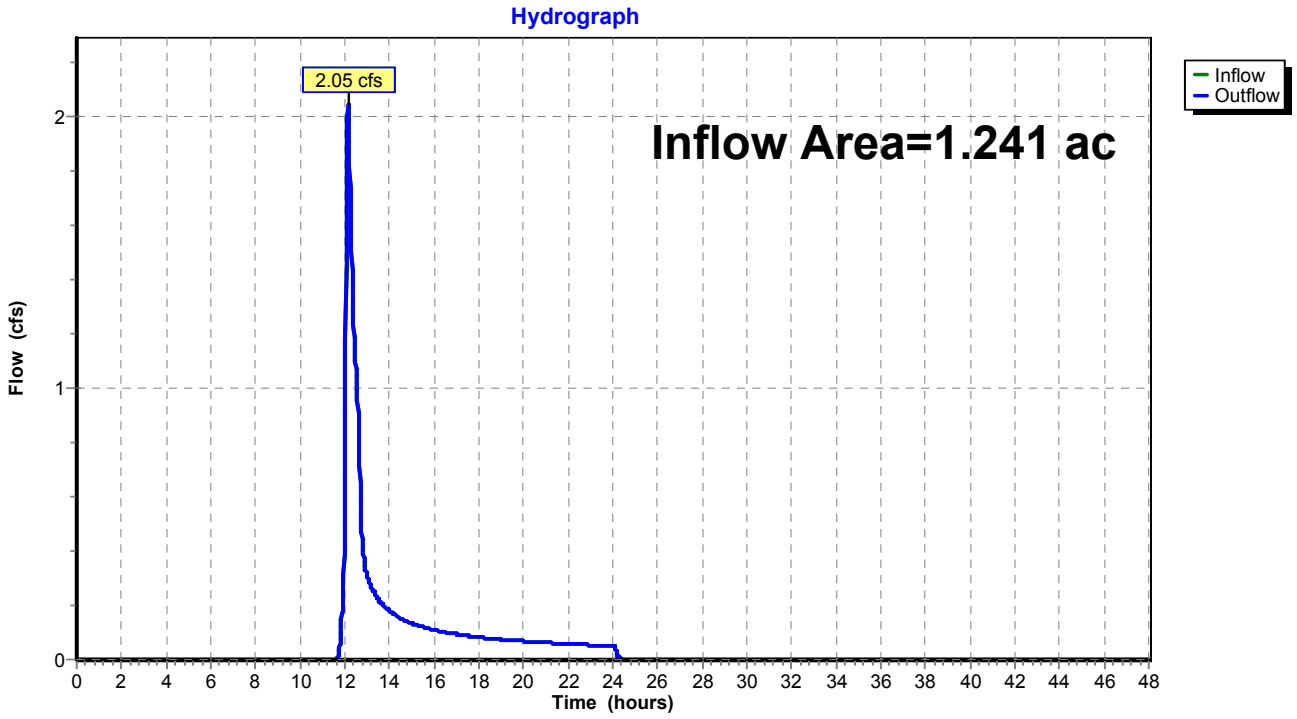
Summary for Reach 73R: Outfall of SB 34

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 1.241 ac, 0.00% Impervious, Inflow Depth = 1.75" for 100-Year event
Inflow = 2.05 cfs @ 12.15 hrs, Volume= 0.181 af
Outflow = 2.05 cfs @ 12.15 hrs, Volume= 0.181 af, Atten= 0%, Lag= 0.0 min

Routing by Muskingum-Cunge method, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs

Reach 73R: Outfall of SB 34



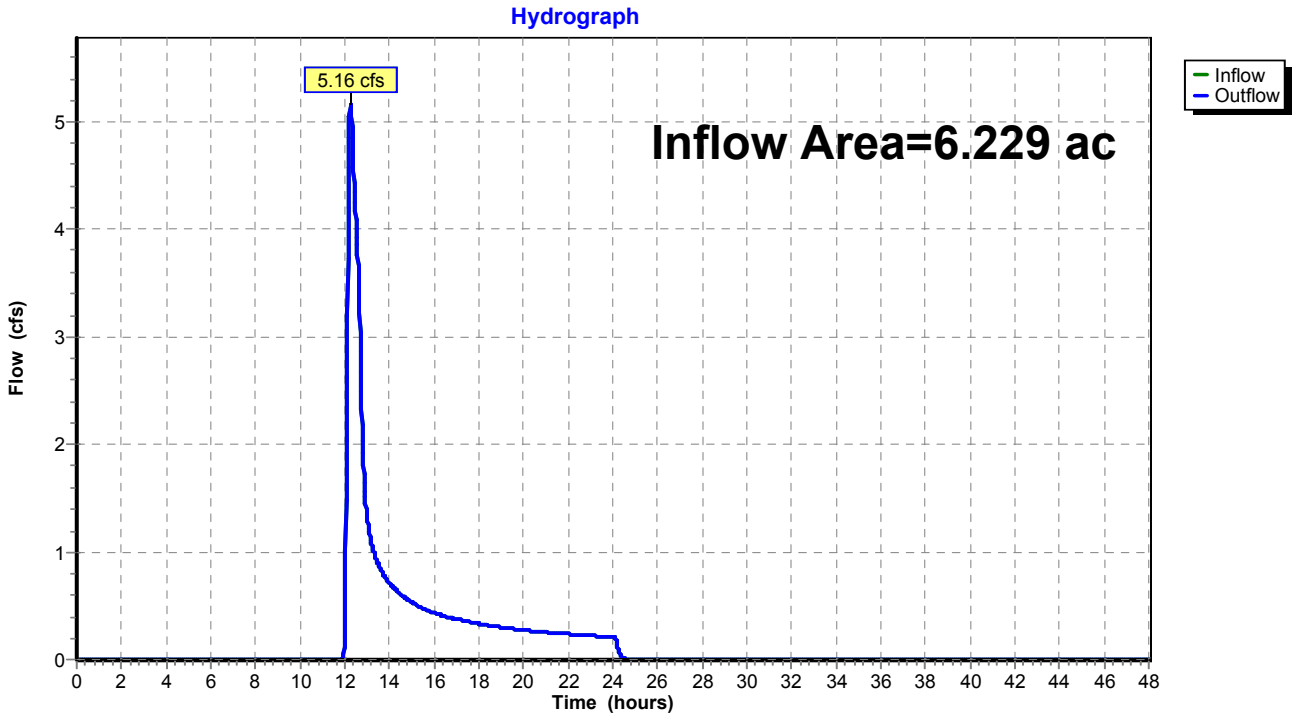
Summary for Reach 74R: Outfall of SB 35

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 6.229 ac, 0.00% Impervious, Inflow Depth = 1.21" for 100-Year event
Inflow = 5.16 cfs @ 12.26 hrs, Volume= 0.629 af
Outflow = 5.16 cfs @ 12.26 hrs, Volume= 0.629 af, Atten= 0%, Lag= 0.0 min

Routing by Muskingum-Cunge method, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs

Reach 74R: Outfall of SB 35



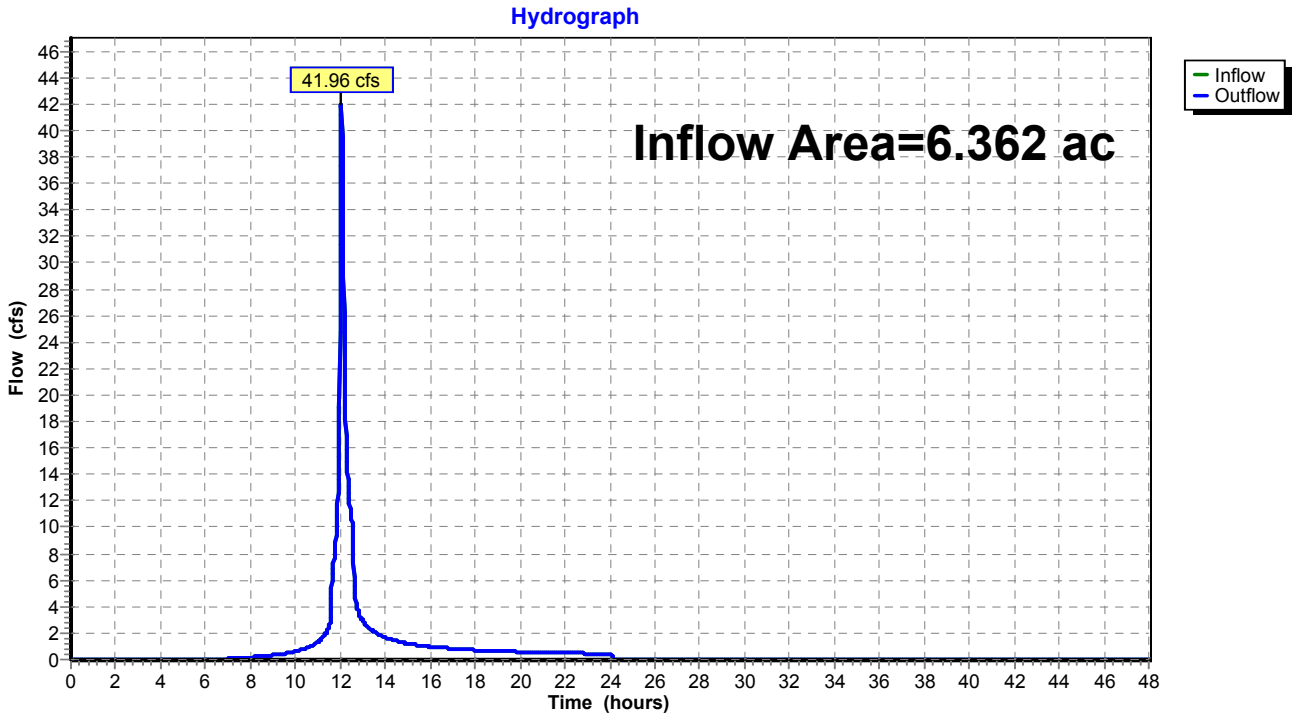
Summary for Reach 75R: Outfall of SB 19

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 6.362 ac, 0.00% Impervious, Inflow Depth = 4.76" for 100-Year event
Inflow = 41.96 cfs @ 12.05 hrs, Volume= 2.522 af
Outflow = 41.96 cfs @ 12.05 hrs, Volume= 2.522 af, Atten= 0%, Lag= 0.0 min

Routing by Muskingum-Cunge method, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs

Reach 75R: Outfall of SB 19



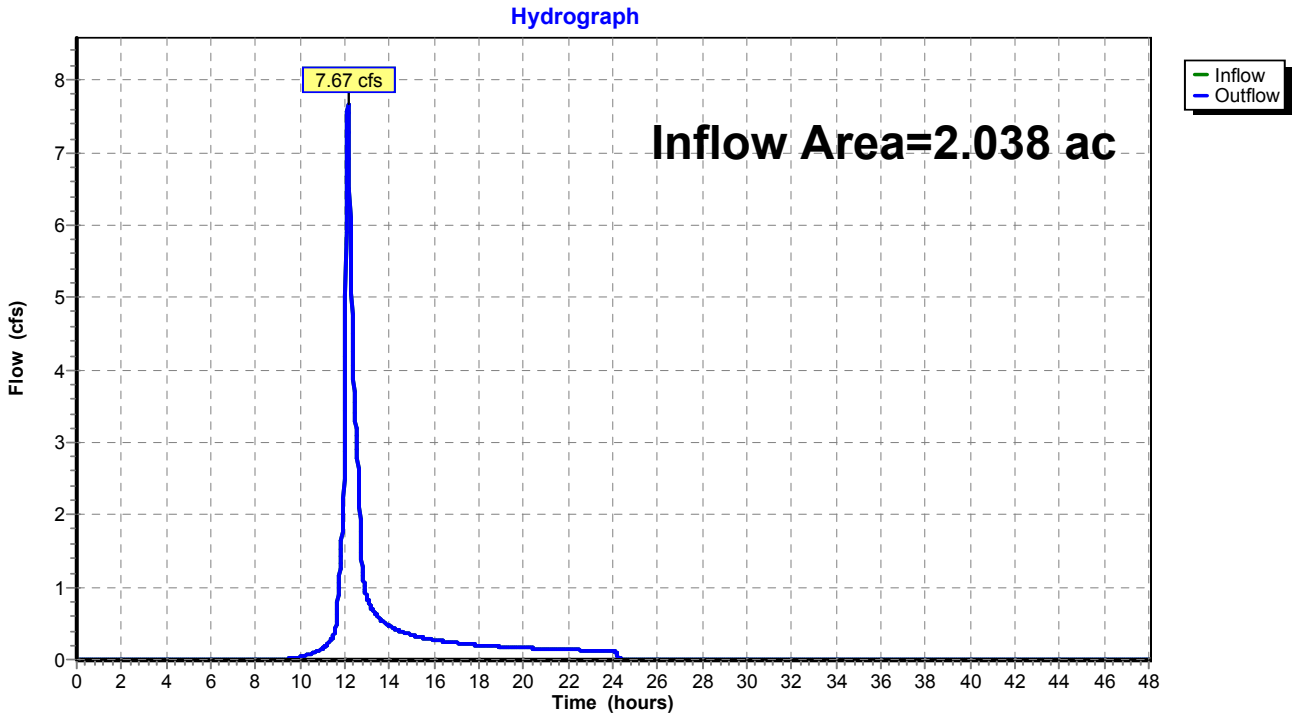
Summary for Reach 82R: Outfall of SB 27

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 2.038 ac, 0.00% Impervious, Inflow Depth = 3.45" for 100-Year event
Inflow = 7.67 cfs @ 12.14 hrs, Volume= 0.586 af
Outflow = 7.67 cfs @ 12.14 hrs, Volume= 0.586 af, Atten= 0%, Lag= 0.0 min

Routing by Muskingum-Cunge method, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs

Reach 82R: Outfall of SB 27



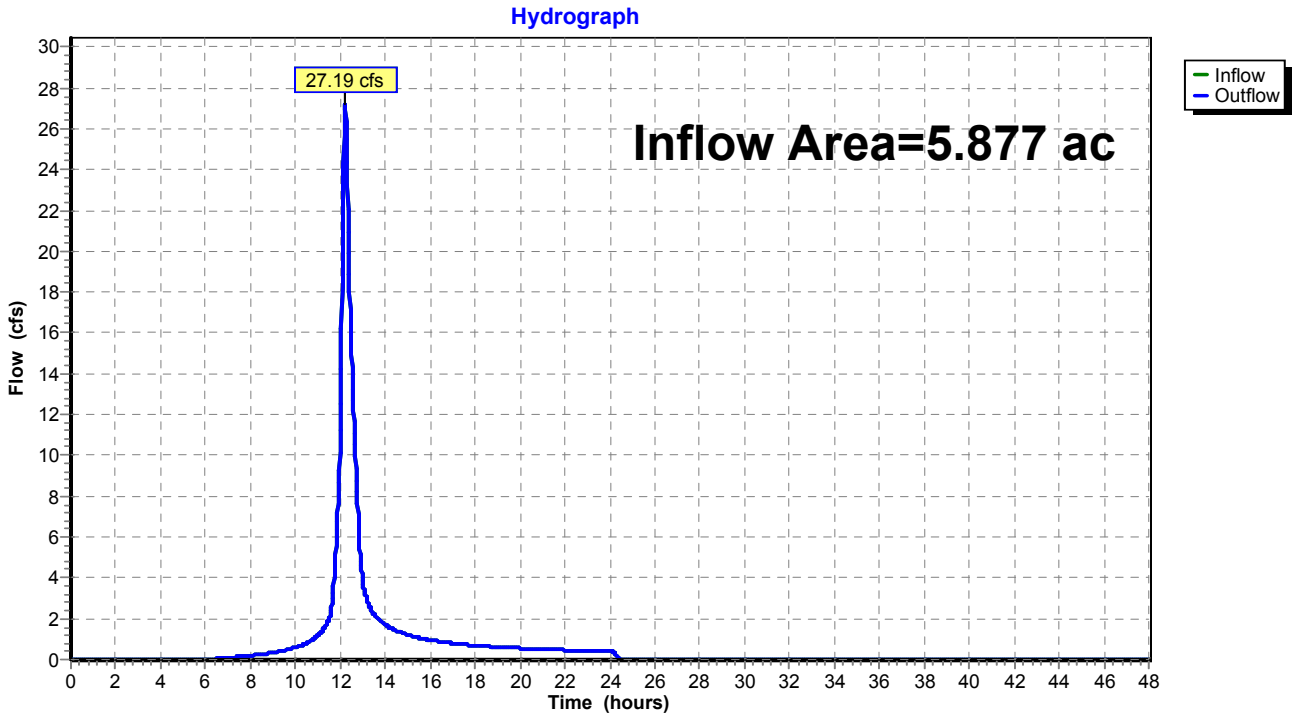
Summary for Reach 84R: Outfall of Future County Road H Subbasin

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 5.877 ac, 0.00% Impervious, Inflow Depth = 4.98" for 100-Year event
Inflow = 27.19 cfs @ 12.21 hrs, Volume= 2.440 af
Outflow = 27.19 cfs @ 12.21 hrs, Volume= 2.440 af, Atten= 0%, Lag= 0.0 min

Routing by Muskingum-Cunge method, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs

Reach 84R: Outfall of Future County Road H Subbasin



WENCK ASSOCIATES
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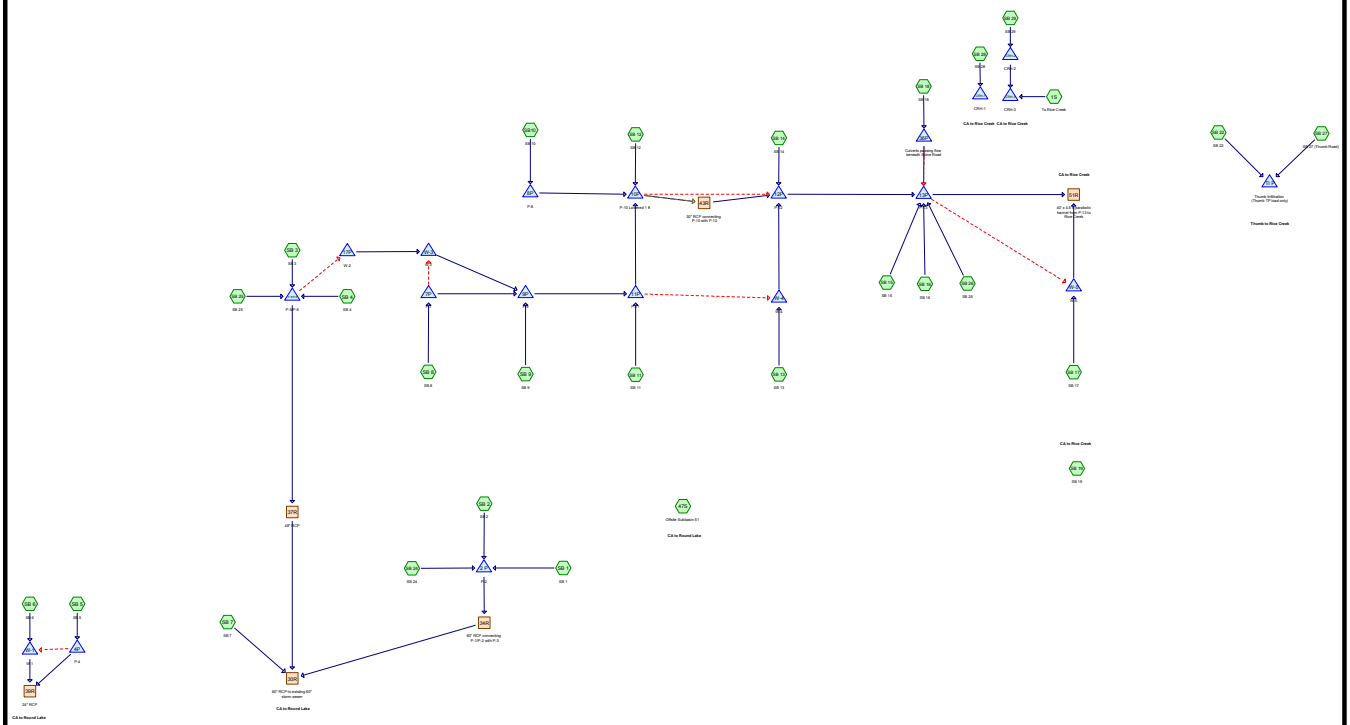
Appendix B

Interim Conditions (Public Infrastructure)
Hydrology and Hydraulics Modeling (HydroCAD)



Subcat Reach Pond Link

Routing Diagram for Interim Spine Road_HydroCAD Model_20150612 Grading Plan

Prepared by Wenck Associates, Inc., Printed 6/16/2015

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
5.038	98	(47S)
8.414	98	Impervious (SB 27, SB 3)
20.200	65	Offsite subbasin 51 (47S)
41.910	49	Pervious (SB 22)
35.825	74	Pervious (SB 27, SB 3)
4.950	98	impermiable (SB 24, SB 9)
32.898	98	impervious (1S, SB 12, SB 14, SB 15, SB 16, SB 2, SB 25, SB 26, SB 28, SB 29, SB 5, SB 8, SB10)
6.033	100	impervious (SB 11, SB 13, SB 17, SB 4, SB 6)
25.873	74	permiable (SB 24, SB 9)
319.995	74	pervious (1S, SB 1, SB 11, SB 12, SB 13, SB 14, SB 15, SB 16, SB 17, SB 18, SB 19, SB 2, SB 25, SB 26, SB 28, SB 29, SB 4, SB 5, SB 6, SB 7, SB 8, SB10)
501.136	**74**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
0.000	HSG C	
0.000	HSG D	
501.136	Other	1S, 47S, SB 1, SB 11, SB 12, SB 13, SB 14, SB 15, SB 16, SB 17, SB 18, SB 19, SB 2, SB 22, SB 24, SB 25, SB 26, SB 27, SB 28, SB 29, SB 3, SB 4, SB 5, SB 6, SB 7, SB 8, SB 9, SB10
501.136		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.000	0.000	0.000	5.038	5.038		47S
0.000	0.000	0.000	0.000	8.414	8.414	Impervious	SB 27, SB 3
0.000	0.000	0.000	0.000	20.200	20.200	Offsite subbasin 51	47S
0.000	0.000	0.000	0.000	77.735	77.735	Pervious	SB 22, SB 27, SB 3
0.000	0.000	0.000	0.000	4.950	4.950	impermiable	SB 24, SB 9
0.000	0.000	0.000	0.000	38.931	38.931	impervious	1S, SB 11, SB 12, SB 13, SB 14, SB 15, SB 16, SB 17, SB 2, SB 25, SB 26, SB 28, SB 29, SB 4, SB 5, SB 6, SB 8, SB10
0.000	0.000	0.000	0.000	25.873	25.873	permiable	SB 24, SB 9
0.000	0.000	0.000	0.000	319.995	319.995	pervious	1S, SB 1, SB 11, SB 12, SB 13, SB 14, SB 15, SB 16, SB 17, SB 18, SB 19, SB 2, SB 25, SB 26, SB 28, SB 29, SB 4, SB 5, SB 6, SB 7, SB 8, SB10
0.000	**0.000**	**0.000**	**0.000**	**501.136**	**501.136**	**TOTAL AREA**	

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	30R	0.00	-3.40	400.0	0.0085	0.013	60.0	0.0	0.0
2	34R	0.00	-10.75	2,150.0	0.0050	0.013	60.0	0.0	0.0
3	37R	0.00	-1.44	240.0	0.0060	0.013	48.0	0.0	0.0
4	39R	0.00	-0.45	90.0	0.0050	0.013	24.0	0.0	0.0
5	43R	896.00	893.23	750.0	0.0037	0.013	30.0	0.0	0.0
6	4P	915.80	915.95	50.0	-0.0030	0.013	24.0	0.0	0.0
7	7P	915.00	914.75	50.0	0.0050	0.130	12.0	0.0	0.0
8	8P	897.00	895.94	380.0	0.0028	0.013	24.0	0.0	0.0
9	11P	910.00	909.00	200.0	0.0050	0.013	24.0	0.0	0.0
10	11P	910.00	909.00	200.0	0.0050	0.013	24.0	0.0	0.0
11	11P	909.00	908.00	150.0	0.0067	0.013	12.0	0.0	0.0
12	12P	893.50	893.35	30.0	0.0050	0.013	43.8	26.6	0.0
13	12P	893.50	893.35	30.0	0.0050	0.013	43.8	26.6	0.0
14	12P	893.50	893.35	30.0	0.0050	0.013	43.8	26.6	0.0
15	12P	893.50	893.35	30.0	0.0050	0.013	43.8	26.6	0.0
16	13P	883.00	882.75	100.0	0.0025	0.013	12.0	0.0	0.0
17	13P	883.00	882.75	100.0	0.0025	0.013	12.0	0.0	0.0
18	13P	883.00	882.75	100.0	0.0025	0.013	12.0	0.0	0.0
19	13P	883.00	882.75	100.0	0.0025	0.013	12.0	0.0	0.0
20	13P	883.00	882.75	100.0	0.0025	0.013	12.0	0.0	0.0
21	17P	929.10	916.00	300.0	0.0437	0.013	12.0	0.0	0.0
22	36P	887.50	886.50	100.0	0.0100	0.013	18.0	0.0	0.0
23	36P	887.50	886.50	100.0	0.0100	0.013	18.0	0.0	0.0
24	36P	887.50	886.50	100.0	0.0100	0.013	18.0	0.0	0.0
25	36P	887.50	886.50	100.0	0.0100	0.013	18.0	0.0	0.0
26	36P	887.50	886.50	100.0	0.0100	0.013	18.0	0.0	0.0
27	36P	887.50	886.50	100.0	0.0100	0.013	18.0	0.0	0.0
28	36P	887.50	886.50	100.0	0.0100	0.013	18.0	0.0	0.0
29	36P	887.50	886.50	100.0	0.0100	0.013	18.0	0.0	0.0
30	CRH-1	877.00	876.00	155.0	0.0065	0.013	24.0	0.0	0.0
31	CRH-1	877.00	876.00	155.0	0.0065	0.013	24.0	0.0	0.0
32	CRH-2	881.50	881.00	155.0	0.0032	0.013	24.0	0.0	0.0
33	CRH-2	881.50	881.00	155.0	0.0032	0.013	24.0	0.0	0.0
34	CRH-3	878.00	877.00	155.0	0.0065	0.013	24.0	0.0	0.0
35	CRH-3	878.00	877.00	155.0	0.0065	0.013	24.0	0.0	0.0
36	W-3	914.75	912.85	50.0	0.0380	0.013	12.0	0.0	0.0
37	W-4	908.00	904.00	170.0	0.0235	0.013	12.0	0.0	0.0

Time span=0.00-96.00 hrs, dt=0.01 hrs, 9601 points
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious
Reach routing by Muskingum-Cunge method - Pond routing by Stor-Ind method

Subcatchment1S: To Rice Creek Runoff Area=1.601 ac 31.98% Impervious Runoff Depth=1.37"
Tc=5.7 min CN=74/98 Runoff=2.97 cfs 0.183 af

Subcatchment47S: Offsite Subbasin 51 Runoff Area=25.238 ac 19.96% Impervious Runoff Depth=0.86"
Tc=17.7 min CN=65/98 Runoff=16.36 cfs 1.805 af

SubcatchmentSB 1: SB 1 Runoff Area=52.150 ac 0.00% Impervious Runoff Depth=0.80"
Tc=53.1 min CN=74/0 Runoff=21.06 cfs 3.460 af

SubcatchmentSB 11: SB 11 Runoff Area=3.290 ac 36.78% Impervious Runoff Depth=1.54"
Tc=11.7 min CN=74/100 Runoff=5.05 cfs 0.422 af

SubcatchmentSB 12: SB 12 Runoff Area=1.390 ac 20.86% Impervious Runoff Depth=1.17"
Tc=9.5 min CN=74/98 Runoff=1.83 cfs 0.136 af

SubcatchmentSB 13: SB 13 Runoff Area=2.980 ac 26.17% Impervious Runoff Depth=1.33"
Tc=9.4 min CN=74/100 Runoff=4.32 cfs 0.329 af

SubcatchmentSB 14: SB 14 Runoff Area=10.230 ac 16.03% Impervious Runoff Depth=1.08"
Tc=4.3 min CN=74/98 Runoff=16.11 cfs 0.924 af

SubcatchmentSB 15: SB 15 Runoff Area=58.570 ac 0.05% Impervious Runoff Depth=0.80"
Tc=31.3 min CN=74/98 Runoff=30.89 cfs 3.890 af

SubcatchmentSB 16: SB 16 Runoff Area=32.440 ac 5.76% Impervious Runoff Depth=0.90"
Tc=12.1 min CN=74/98 Runoff=29.45 cfs 2.432 af

SubcatchmentSB 17: SB 17 Runoff Area=7.608 ac 48.41% Impervious Runoff Depth=1.78"
Tc=4.3 min CN=74/100 Runoff=18.70 cfs 1.126 af

SubcatchmentSB 18: SB 18 Runoff Area=52.790 ac 0.00% Impervious Runoff Depth=0.80"
Tc=33.5 min CN=74/0 Runoff=26.87 cfs 3.502 af

SubcatchmentSB 19: SB 19 Runoff Area=21.190 ac 0.00% Impervious Runoff Depth=0.80"
Tc=24.7 min CN=74/0 Runoff=12.45 cfs 1.406 af

SubcatchmentSB 2: SB 2 Runoff Area=11.067 ac 0.33% Impervious Runoff Depth=0.80"
Tc=16.6 min CN=74/98 Runoff=7.83 cfs 0.740 af

SubcatchmentSB 22: SB 22 Runoff Area=41.910 ac 0.00% Impervious Runoff Depth=0.05"
Tc=41.0 min CN=49/0 Runoff=0.21 cfs 0.171 af

SubcatchmentSB 24: SB 24 Runoff Area=5.043 ac 97.56% Impervious Runoff Depth=2.55"
Tc=7.5 min CN=74/98 Runoff=16.33 cfs 1.070 af

SubcatchmentSB 25: SB 25 Runoff Area=5.136 ac 95.72% Impervious Runoff Depth=2.51"
Tc=10.7 min CN=74/98 Runoff=14.24 cfs 1.075 af

Subcatchment SB 26: SB 26 Runoff Area=14.335 ac 98.27% Impervious Runoff Depth=2.56"
Tc=25.4 min CN=74/98 Runoff=27.53 cfs 3.056 af

Subcatchment SB 27: SB 27 (Thumb Road) Runoff Area=6.629 ac 83.33% Impervious Runoff Depth=2.29"
Tc=27.6 min CN=74/98 Runoff=10.90 cfs 1.265 af

Subcatchment SB 28: SB 28 Runoff Area=6.955 ac 46.76% Impervious Runoff Depth=1.63"
Tc=14.6 min CN=74/98 Runoff=10.87 cfs 0.947 af

Subcatchment SB 29: SB 29 Runoff Area=10.214 ac 37.73% Impervious Runoff Depth=1.47"
Tc=19.1 min CN=74/98 Runoff=12.67 cfs 1.253 af

Subcatchment SB 3: SB 3 Runoff Area=37.610 ac 7.68% Impervious Runoff Depth=0.93"
Tc=15.3 min CN=74/98 Runoff=32.32 cfs 2.927 af

Subcatchment SB 4: SB 4 Runoff Area=0.600 ac 43.33% Impervious Runoff Depth=1.67"
Tc=5.9 min CN=74/100 Runoff=1.29 cfs 0.084 af

Subcatchment SB 5: SB 5 Runoff Area=7.860 ac 5.98% Impervious Runoff Depth=0.90"
Tc=59.3 min CN=74/98 Runoff=3.34 cfs 0.592 af

Subcatchment SB 6: SB 6 Runoff Area=1.000 ac 10.00% Impervious Runoff Depth=1.00"
Tc=20.3 min CN=74/100 Runoff=0.79 cfs 0.083 af

Subcatchment SB 7: SB 7 Runoff Area=21.550 ac 0.00% Impervious Runoff Depth=0.80"
Tc=5.7 min CN=74/0 Runoff=22.95 cfs 1.430 af

Subcatchment SB 8: SB 8 Runoff Area=29.580 ac 5.51% Impervious Runoff Depth=0.89"
Tc=47.1 min CN=74/98 Runoff=14.20 cfs 2.206 af

Subcatchment SB 9: SB 9 Runoff Area=25.780 ac 0.12% Impervious Runoff Depth=0.80"
Tc=30.0 min CN=74/98 Runoff=13.82 cfs 1.715 af

Subcatchment SB10: SB 10 Runoff Area=6.390 ac 4.85% Impervious Runoff Depth=0.88"
Tc=7.3 min CN=74/98 Runoff=6.95 cfs 0.470 af

Reach 30R: 60" RCP to existing 60" Avg. Flow Depth=1.10' Max Vel=11.68 fps Inflow=36.95 cfs 10.097 af
60.0" Round Pipe n=0.013 L=400.0' S=0.0085 '/' Capacity=240.12 cfs Outflow=36.94 cfs 10.097 af

Reach 34R: 60" RCP connecting Avg. Flow Depth=1.03' Max Vel=9.10 fps Inflow=25.29 cfs 5.269 af
60.0" Round Pipe n=0.013 L=2,150.0' S=0.0050 '/' Capacity=184.16 cfs Outflow=25.28 cfs 5.269 af

Reach 37R: 48" RCP Avg. Flow Depth=0.63' Max Vel=6.94 fps Inflow=8.76 cfs 3.398 af
48.0" Round Pipe n=0.013 L=240.0' S=0.0060 '/' Capacity=111.27 cfs Outflow=8.76 cfs 3.398 af

Reach 39R: 24" RCP Avg. Flow Depth=0.35' Max Vel=4.23 fps Inflow=1.55 cfs 0.675 af
24.0" Round Pipe n=0.013 L=90.0' S=0.0050 '/' Capacity=16.00 cfs Outflow=1.55 cfs 0.675 af

Reach 43R: 30" RCP connecting P-10 Avg. Flow Depth=0.63' Max Vel=5.23 fps Inflow=5.04 cfs 4.041 af
30.0" Round Pipe n=0.013 L=750.0' S=0.0037 '/' Capacity=24.93 cfs Outflow=5.04 cfs 4.040 af

Reach 51R: 40' x 4.5 ft parabolic Avg. Flow Depth=1.40' Max Vel=4.29 fps Inflow=88.69 cfs 20.412 af
n=0.035 L=300.0' S=0.0050 '/' Capacity=733.43 cfs Outflow=88.63 cfs 20.412 af

Pond 2 P: P-2 Peak Elev=924.73' Storage=1.016 af Inflow=25.48 cfs 5.269 af
Outflow=25.29 cfs 5.269 af

Pond 4P: P-4 Peak Elev=915.44' Storage=0.773 af Inflow=3.34 cfs 0.592 af
Primary=0.63 cfs 0.211 af Secondary=1.41 cfs 0.381 af Outflow=2.04 cfs 0.592 af

Pond 7P: P-7 Peak Elev=915.77' Storage=1.437 af Inflow=14.20 cfs 2.206 af
Primary=13.99 cfs 1.619 af Secondary=0.21 cfs 0.506 af Outflow=14.20 cfs 2.126 af

Pond 8P: P-8 Peak Elev=897.58' Storage=0.693 af Inflow=6.95 cfs 0.470 af
24.0" Round Culvert n=0.013 L=380.0' S=0.0028 '/' Outflow=1.24 cfs 0.469 af

Pond 9P: P-9 Peak Elev=915.26' Storage=0.414 af Inflow=26.07 cfs 4.207 af
Outflow=25.45 cfs 4.207 af

Pond 10P: P-10 Lowered 1 ft Peak Elev=896.76' Storage=0.930 af Inflow=5.30 cfs 4.047 af
Primary=5.04 cfs 4.041 af Secondary=0.00 cfs 0.000 af Outflow=5.04 cfs 4.041 af

Pond 11P: P-11 Peak Elev=910.15' Storage=5.099 af Inflow=26.76 cfs 4.629 af
Primary=4.25 cfs 3.443 af Secondary=2.96 cfs 1.169 af Outflow=7.21 cfs 4.611 af

Pond 12P: P-12 Peak Elev=893.56' Storage=6.021 af Inflow=16.41 cfs 6.433 af
Outflow=5.86 cfs 6.414 af

Pond 13P: P-13 Peak Elev=883.70' Storage=5.656 af Inflow=99.37 cfs 19.294 af
Primary=86.39 cfs 18.503 af Secondary=5.30 cfs 0.787 af Outflow=91.69 cfs 19.290 af

Pond 17P: W-2 Peak Elev=929.37' Storage=0.420 af Inflow=1.50 cfs 0.686 af
12.0" Round Culvert n=0.013 L=300.0' S=0.0437 '/' Outflow=0.39 cfs 0.541 af

Pond 36P: Culverts passing flow beneath Peak Elev=887.11' Storage=0.000 af Inflow=26.87 cfs 3.502 af
Primary=26.87 cfs 3.502 af Secondary=0.00 cfs 0.000 af Outflow=26.87 cfs 3.502 af

Pond CRH-1: CRH-1 Peak Elev=877.67' Storage=0.356 af Inflow=10.87 cfs 0.947 af
Discarded=0.22 cfs 0.467 af Primary=4.63 cfs 0.480 af Outflow=4.86 cfs 0.947 af

Pond CRH-2: CRH-2 Peak Elev=882.05' Storage=0.620 af Inflow=12.67 cfs 1.253 af
Discarded=0.33 cfs 0.826 af Primary=2.36 cfs 0.427 af Outflow=2.69 cfs 1.253 af

Pond CRH-3: CRH-3 Peak Elev=878.31' Storage=0.262 af Inflow=2.97 cfs 0.610 af
Discarded=0.20 cfs 0.378 af Primary=1.02 cfs 0.232 af Outflow=1.22 cfs 0.610 af

Pond P-5/P-6: P-5/P-6 Peak Elev=929.88' Storage=6.893 af Inflow=44.72 cfs 4.086 af
Primary=8.76 cfs 3.398 af Secondary=1.50 cfs 0.686 af Outflow=10.26 cfs 4.083 af

Pond TI P: Thumb Infiltration (Thumb TP Peak Elev=901.44' Storage=1.436 af Inflow=10.90 cfs 1.436 af
Outflow=0.00 cfs 0.000 af

Pond W-1: W-1 Peak Elev=914.97' Storage=0.147 af Inflow=1.52 cfs 0.464 af
Outflow=1.04 cfs 0.464 af

Pond W-3: W-3 Peak Elev=914.98' Storage=0.473 af Inflow=0.60 cfs 1.048 af
12.0" Round Culvert n=0.013 L=50.0' S=0.0380 '/' Outflow=0.28 cfs 0.873 af

Pond W-4: W-4 Peak Elev=908.66' Storage=0.593 af Inflow=4.36 cfs 1.498 af
12.0" Round Culvert n=0.013 L=170.0' S=0.0235 '/' Outflow=1.90 cfs 1.469 af

Pond W-5: W-5 Peak Elev=882.93' Storage=4.297 af Inflow=19.24 cfs 1.912 af
Outflow=2.91 cfs 1.909 af

Total Runoff Area = 501.136 ac Runoff Volume = 38.698 af Average Runoff Depth = 0.93"
88.56% Pervious = 443.803 ac 11.44% Impervious = 57.333 ac

Summary for Subcatchment 1S: To Rice Creek

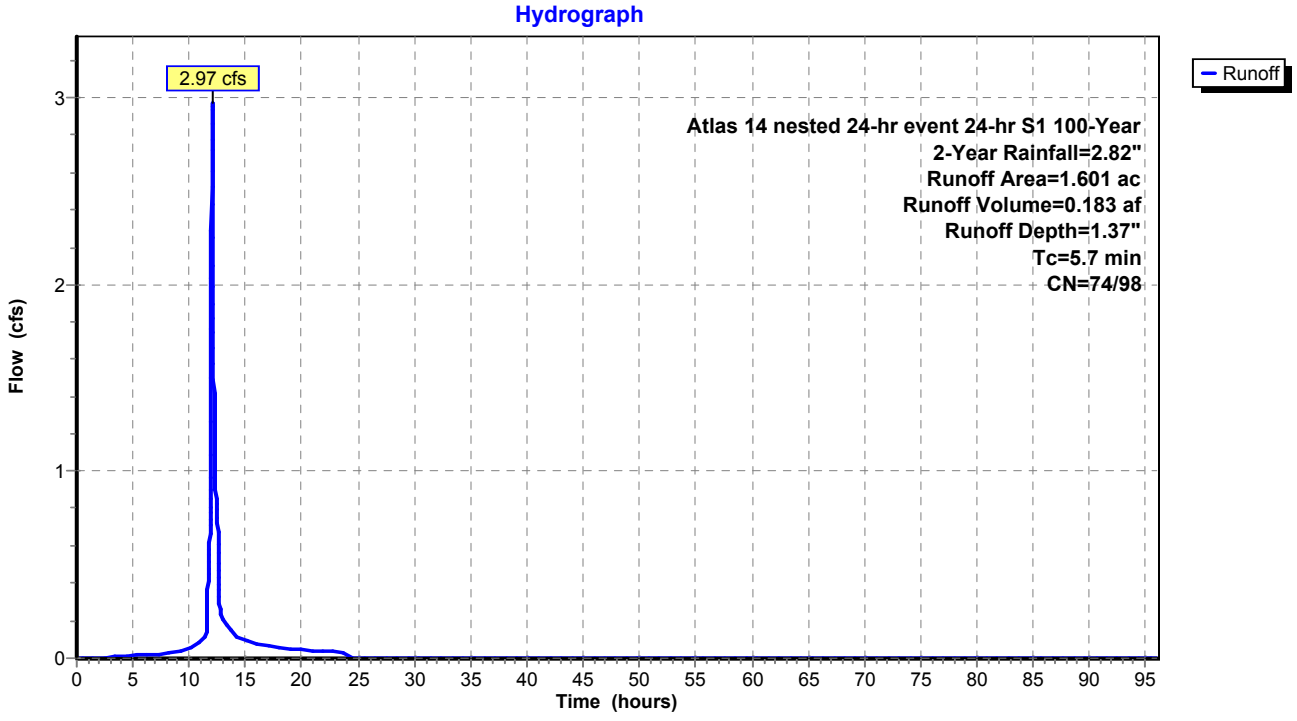
Runoff = 2.97 cfs @ 12.04 hrs, Volume= 0.183 af, Depth= 1.37"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 2-Year Rainfall=2.82"

	Area (ac)	CN	Description
*	0.512	98	impervious
*	1.089	74	pervious
	1.601	82	Weighted Average
	1.089	74	68.02% Pervious Area
	0.512	98	31.98% Impervious Area

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

Subcatchment 1S: To Rice Creek



Summary for Subcatchment 47S: Offsite Subbasin 51

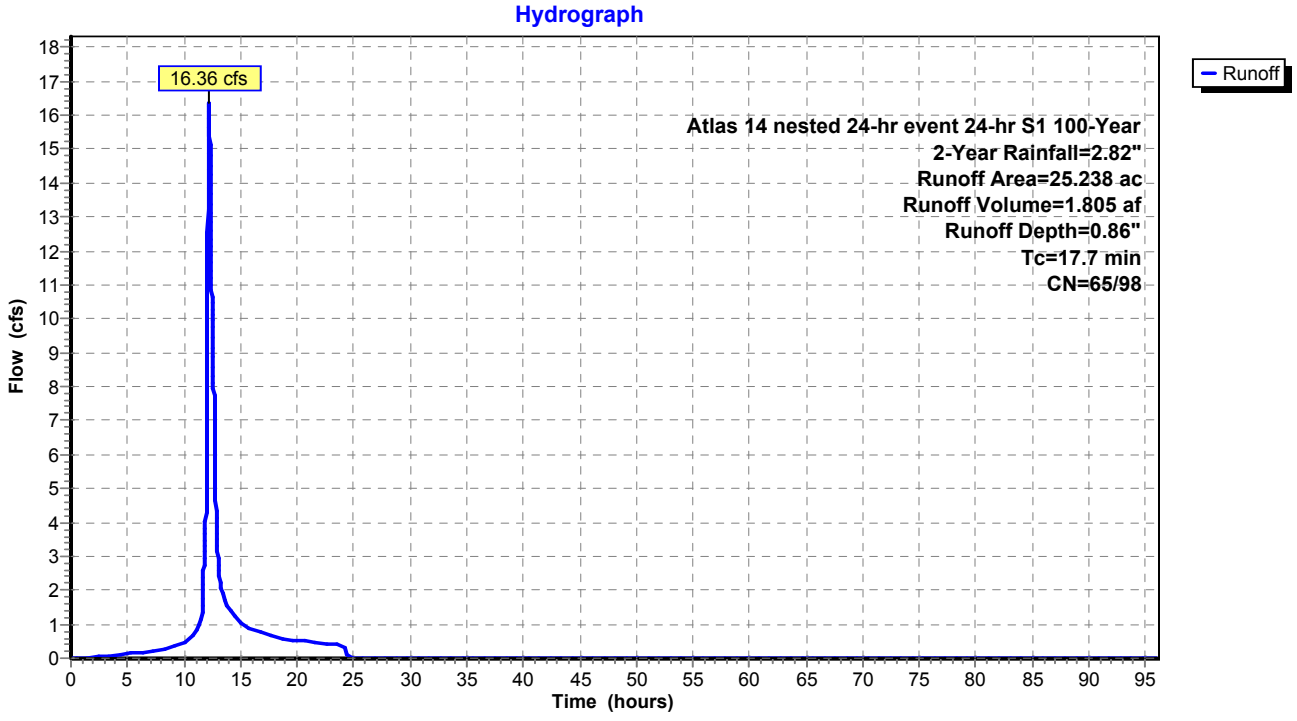
Runoff = 16.36 cfs @ 12.22 hrs, Volume= 1.805 af, Depth= 0.86"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 2-Year Rainfall=2.82"

	Area (ac)	CN	Description
*	20.200	65	Offsite subbasin 51
*	5.038	98	
	25.238	72	Weighted Average
	20.200	65	80.04% Pervious Area
	5.038	98	19.96% Impervious Area

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

Subcatchment 47S: Offsite Subbasin 51



Summary for Subcatchment SB 1: SB 1

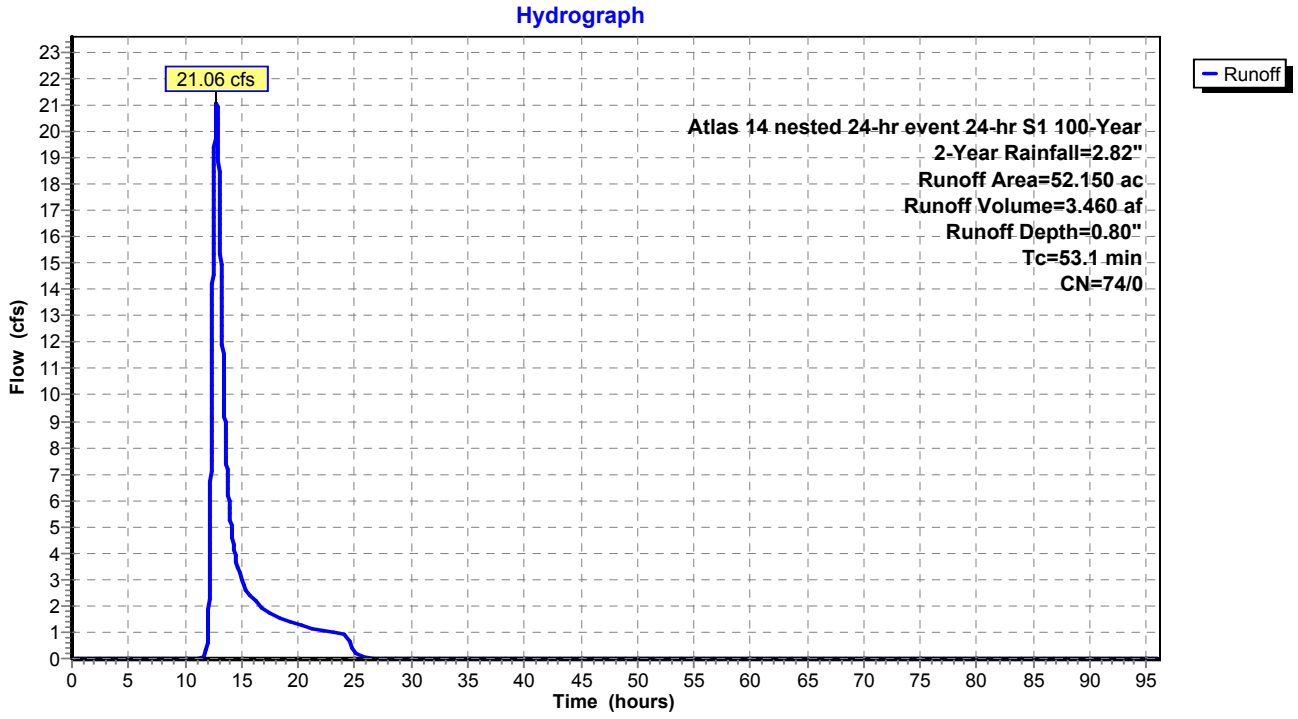
Runoff = 21.06 cfs @ 12.80 hrs, Volume= 3.460 af, Depth= 0.80"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 2-Year Rainfall=2.82"

	Area (ac)	CN	Description
*	52.150	74	pervious
*	0.000	98	impervious
	52.150	74	Weighted Average
	52.150	74	100.00% Pervious Area

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

Subcatchment SB 1: SB 1



Summary for Subcatchment SB 11: SB 11

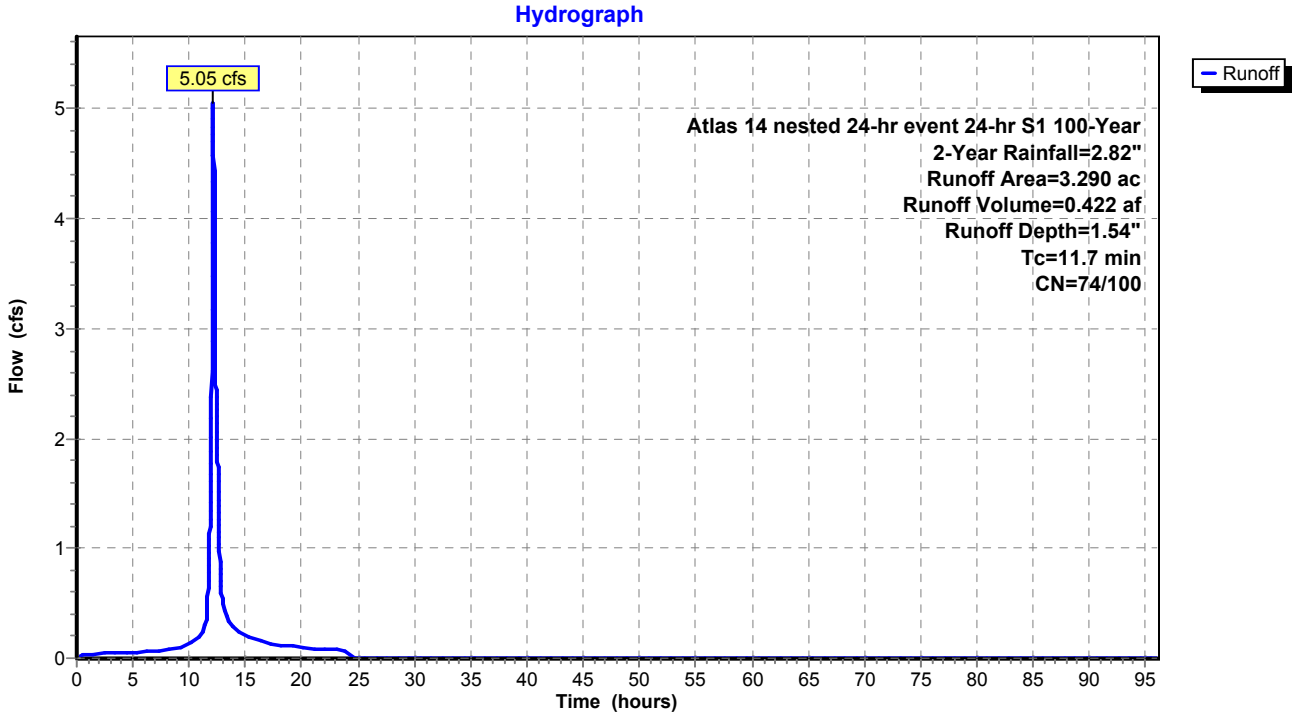
Runoff = 5.05 cfs @ 12.11 hrs, Volume= 0.422 af, Depth= 1.54"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 2-Year Rainfall=2.82"

	Area (ac)	CN	Description
*	2.080	74	pervious
*	1.210	100	impervious
	3.290	84	Weighted Average
	2.080	74	63.22% Pervious Area
	1.210	100	36.78% Impervious Area

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

Subcatchment SB 11: SB 11



Summary for Subcatchment SB 12: SB 12

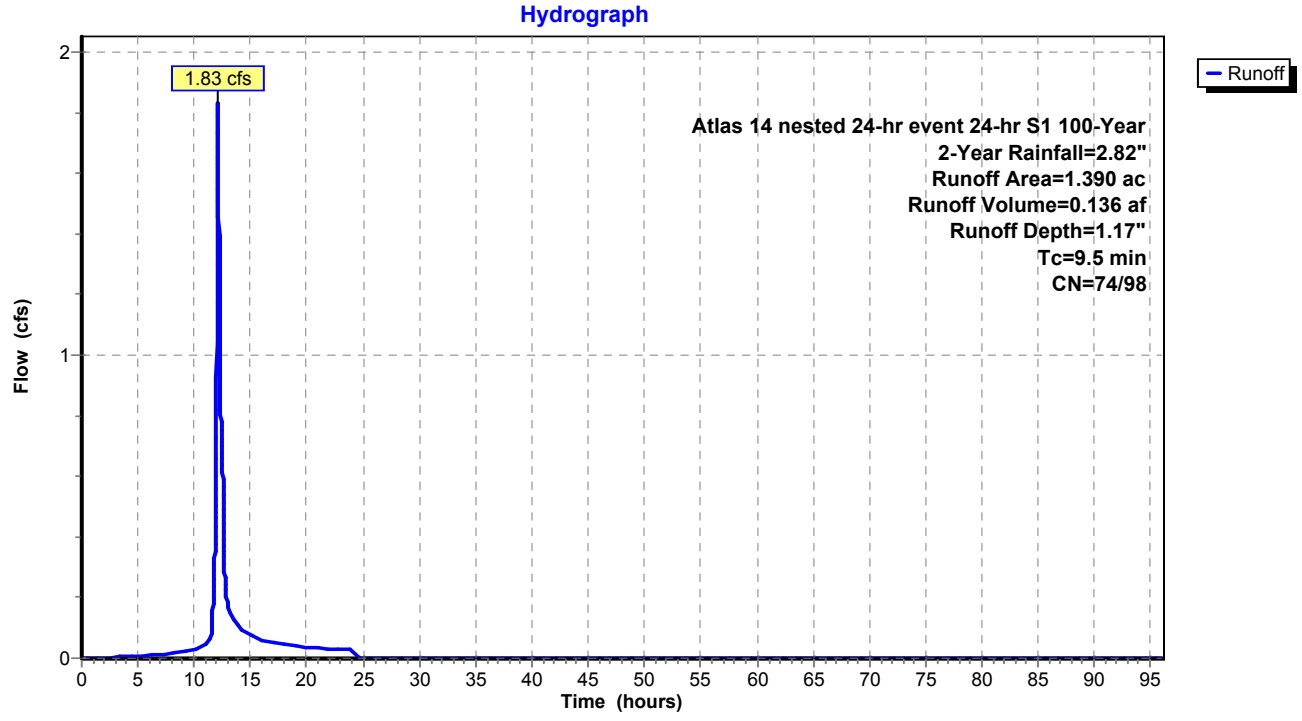
Runoff = 1.83 cfs @ 12.09 hrs, Volume= 0.136 af, Depth= 1.17"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 2-Year Rainfall=2.82"

	Area (ac)	CN	Description
*	1.100	74	pervious
*	0.290	98	impervious
	1.390	79	Weighted Average
	1.100	74	79.14% Pervious Area
	0.290	98	20.86% Impervious Area

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

Subcatchment SB 12: SB 12



Summary for Subcatchment SB 13: SB 13

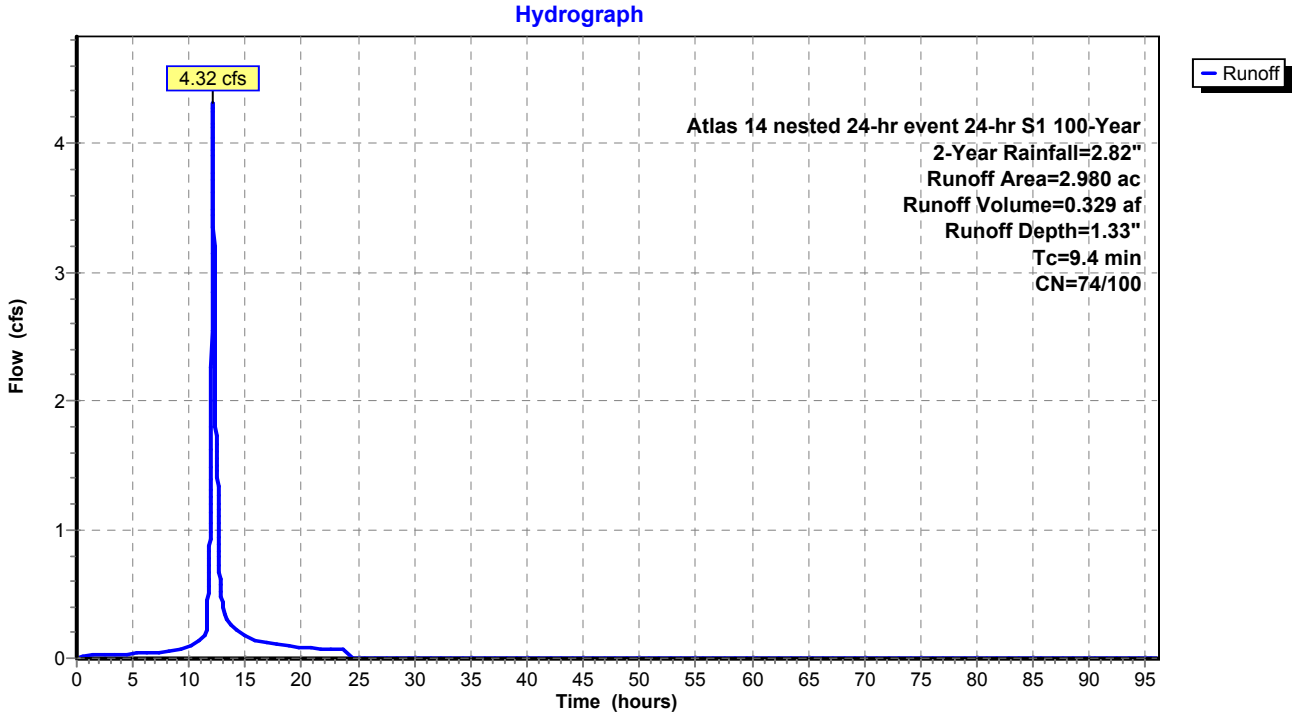
Runoff = 4.32 cfs @ 12.08 hrs, Volume= 0.329 af, Depth= 1.33"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 2-Year Rainfall=2.82"

	Area (ac)	CN	Description
*	2.200	74	pervious
*	0.780	100	impervious
	2.980	81	Weighted Average
	2.200	74	73.83% Pervious Area
	0.780	100	26.17% Impervious Area

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

Subcatchment SB 13: SB 13



Summary for Subcatchment SB 14: SB 14

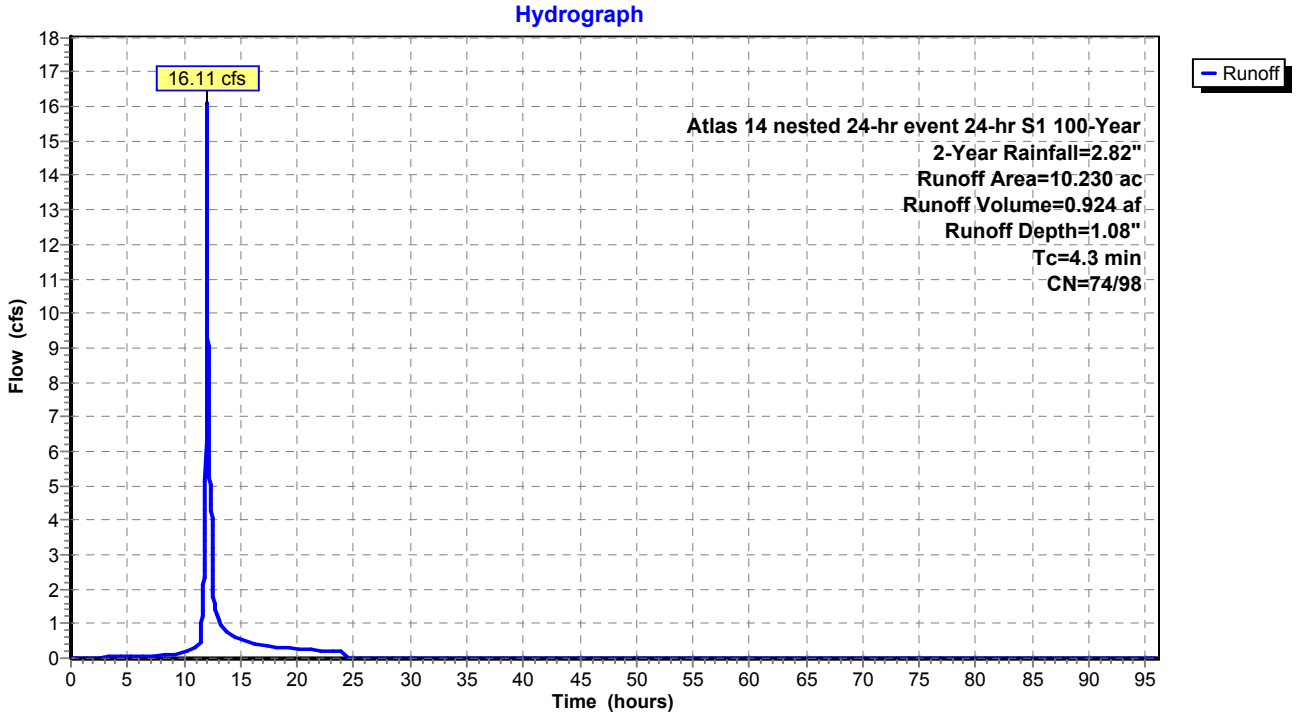
Runoff = 16.11 cfs @ 12.03 hrs, Volume= 0.924 af, Depth= 1.08"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 2-Year Rainfall=2.82"

	Area (ac)	CN	Description
*	8.590	74	pervious
*	1.640	98	impervious
	10.230	78	Weighted Average
	8.590	74	83.97% Pervious Area
	1.640	98	16.03% Impervious Area

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

Subcatchment SB 14: SB 14



Summary for Subcatchment SB 15: SB 15

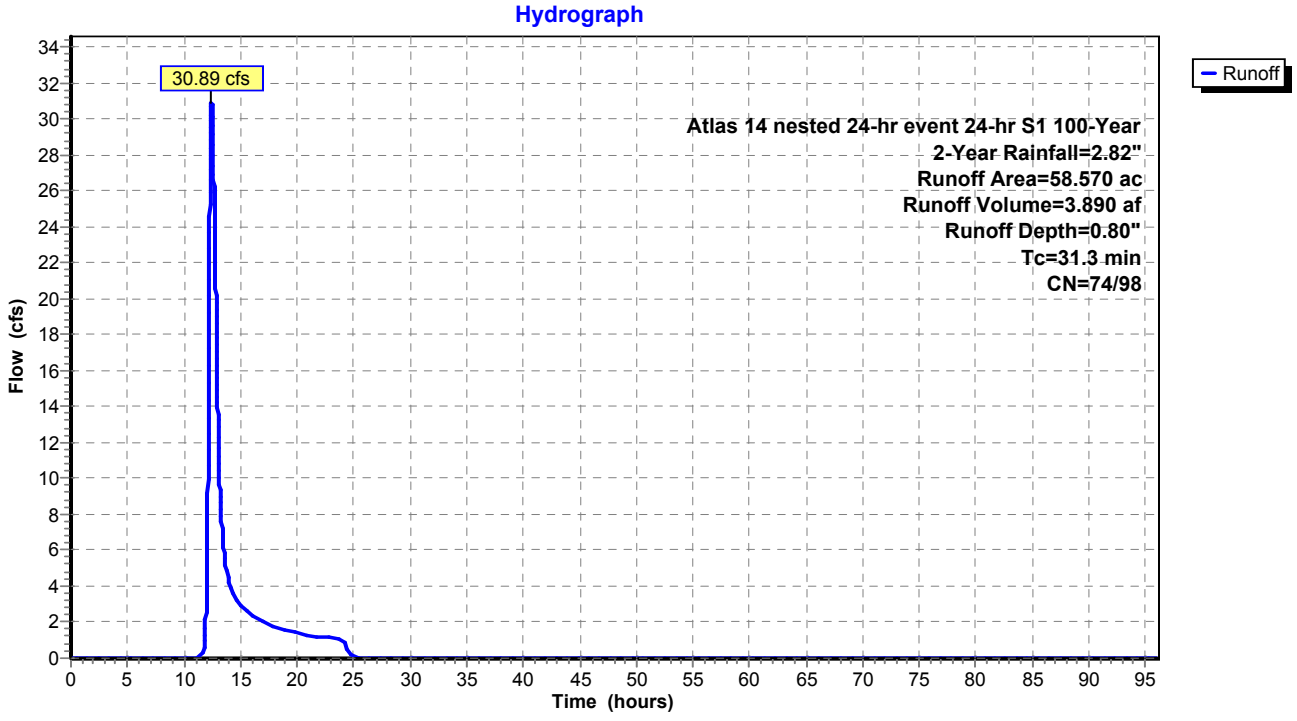
Runoff = 30.89 cfs @ 12.45 hrs, Volume= 3.890 af, Depth= 0.80"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 2-Year Rainfall=2.82"

	Area (ac)	CN	Description
*	58.540	74	pervious
*	0.030	98	impervious
	58.570	74	Weighted Average
	58.540	74	99.95% Pervious Area
	0.030	98	0.05% Impervious Area

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

Subcatchment SB 15: SB 15



Summary for Subcatchment SB 16: SB 16

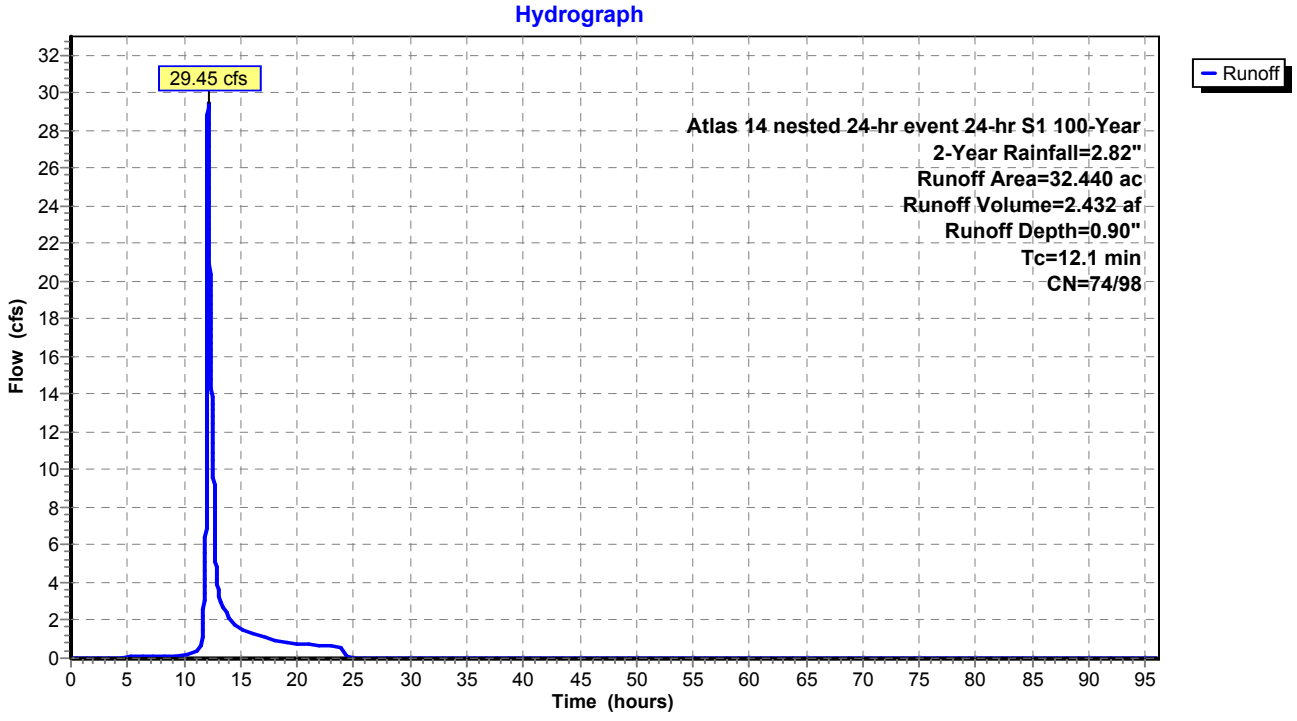
Runoff = 29.45 cfs @ 12.14 hrs, Volume= 2.432 af, Depth= 0.90"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 2-Year Rainfall=2.82"

	Area (ac)	CN	Description
*	30.570	74	pervious
*	1.870	98	impervious
	32.440	75	Weighted Average
	30.570	74	94.24% Pervious Area
	1.870	98	5.76% Impervious Area

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

Subcatchment SB 16: SB 16



Summary for Subcatchment SB 17: SB 17

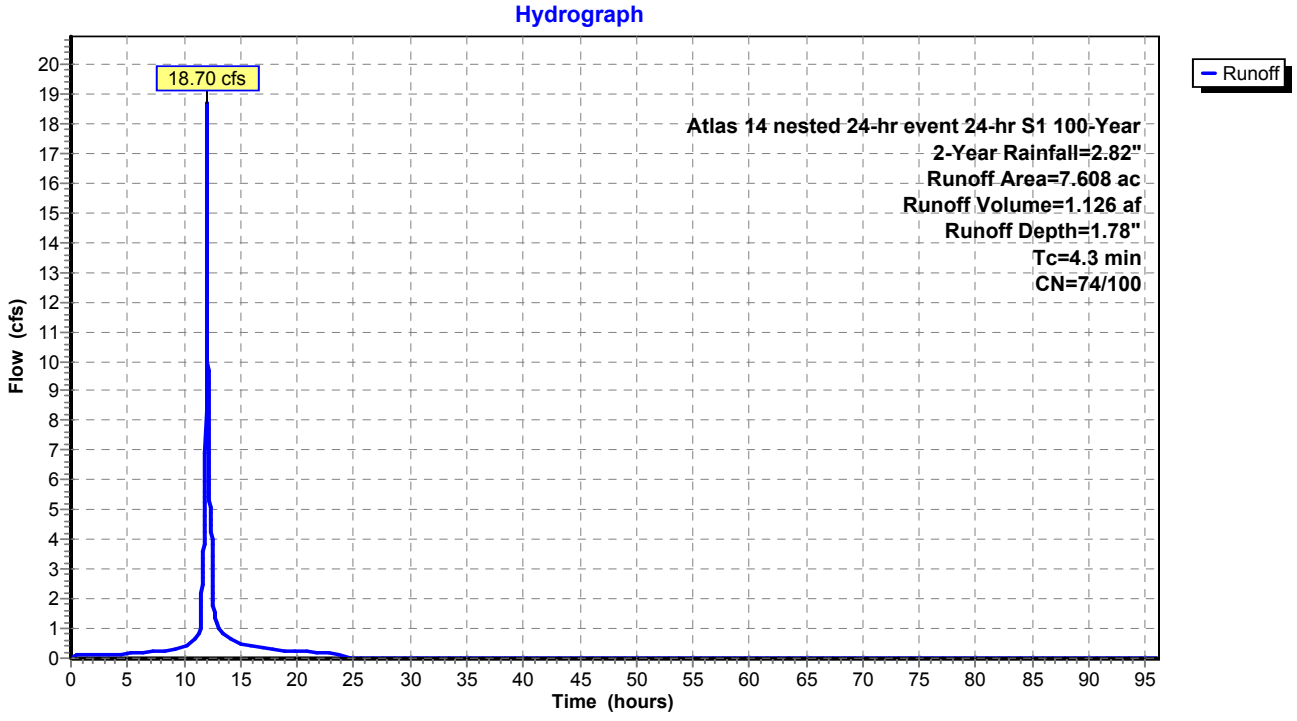
Runoff = 18.70 cfs @ 12.02 hrs, Volume= 1.126 af, Depth= 1.78"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 2-Year Rainfall=2.82"

	Area (ac)	CN	Description
*	3.925	74	pervious
*	3.683	100	impervious
	7.608	87	Weighted Average
	3.925	74	51.59% Pervious Area
	3.683	100	48.41% Impervious Area

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

Subcatchment SB 17: SB 17



Summary for Subcatchment SB 18: SB 18

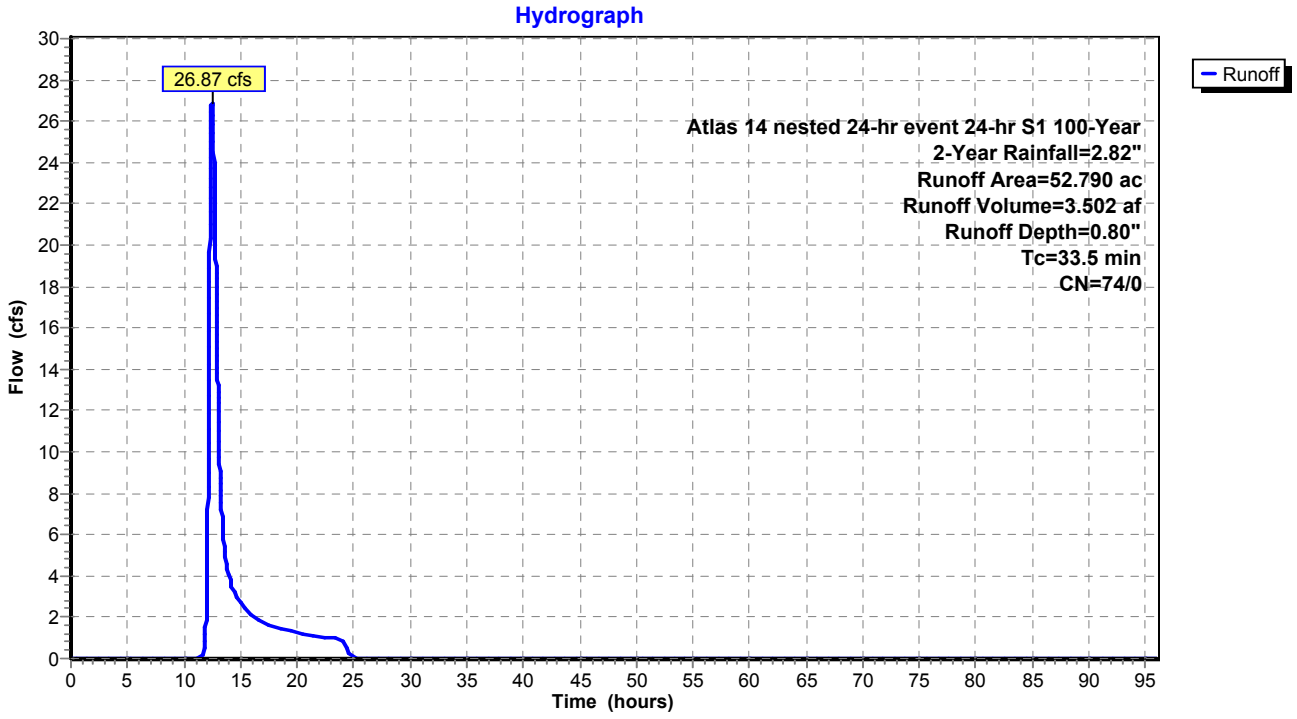
Runoff = 26.87 cfs @ 12.48 hrs, Volume= 3.502 af, Depth= 0.80"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 2-Year Rainfall=2.82"

	Area (ac)	CN	Description
*	52.790	74	pervious
*	0.000	98	impervious
	52.790	74	Weighted Average
	52.790	74	100.00% Pervious Area

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

Subcatchment SB 18: SB 18



Summary for Subcatchment SB 19: SB 19

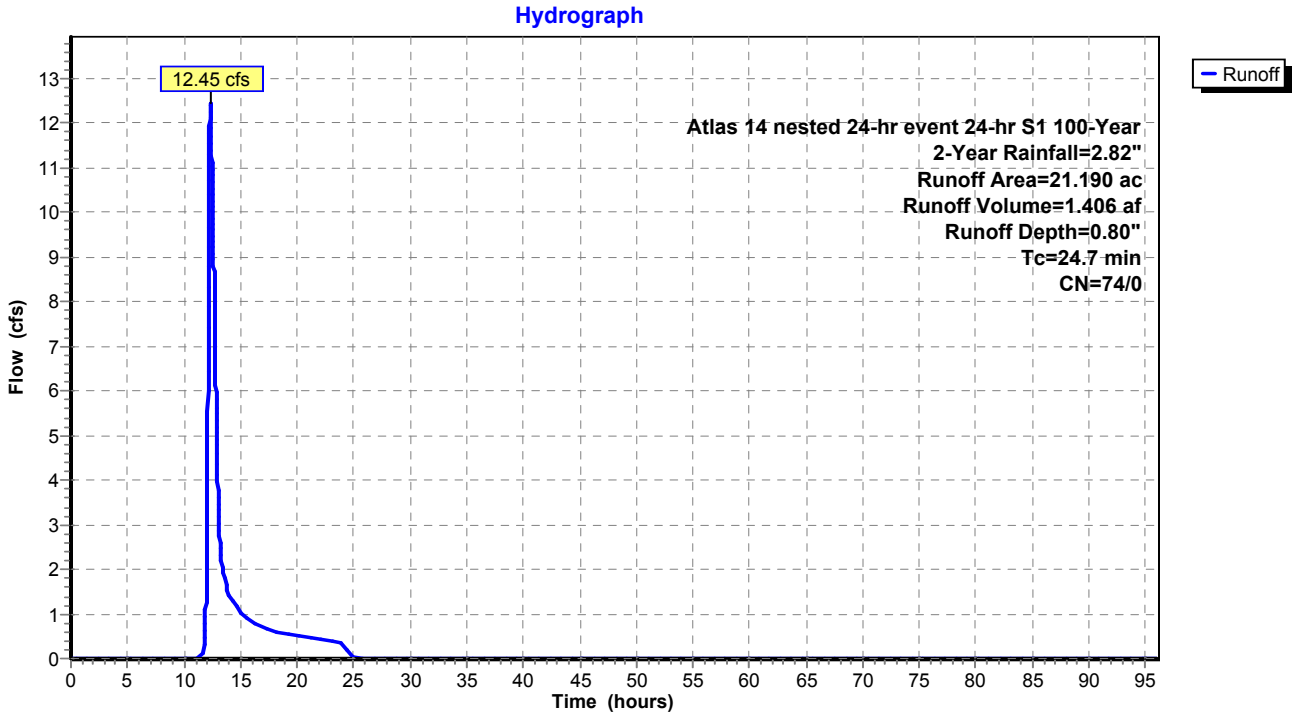
Runoff = 12.45 cfs @ 12.34 hrs, Volume= 1.406 af, Depth= 0.80"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 2-Year Rainfall=2.82"

	Area (ac)	CN	Description
*	21.190	74	pervious
*	0.000	98	impervious
	21.190	74	Weighted Average
	21.190	74	100.00% Pervious Area

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

Subcatchment SB 19: SB 19



Summary for Subcatchment SB 2: SB 2

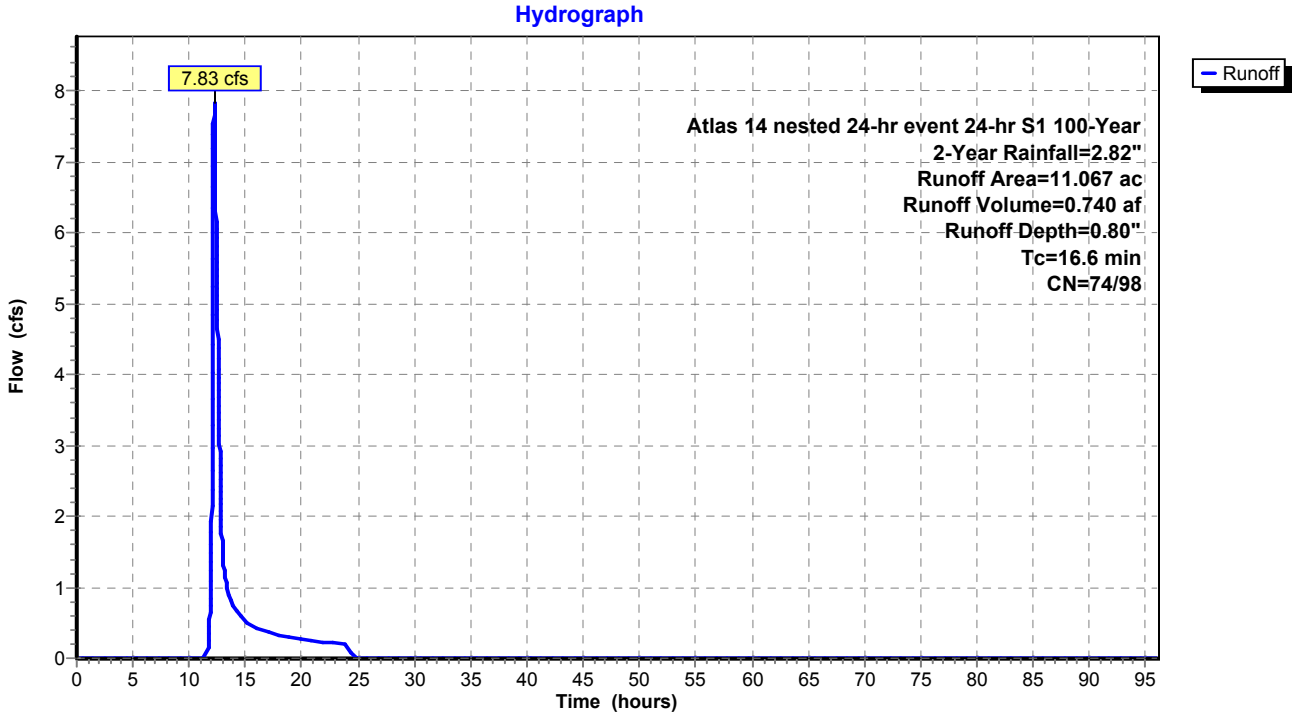
Runoff = 7.83 cfs @ 12.21 hrs, Volume= 0.740 af, Depth= 0.80"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 2-Year Rainfall=2.82"

	Area (ac)	CN	Description
*	11.030	74	pervious
*	0.037	98	impervious
	11.067	74	Weighted Average
	11.030	74	99.67% Pervious Area
	0.037	98	0.33% Impervious Area

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

Subcatchment SB 2: SB 2



Summary for Subcatchment SB 22: SB 22

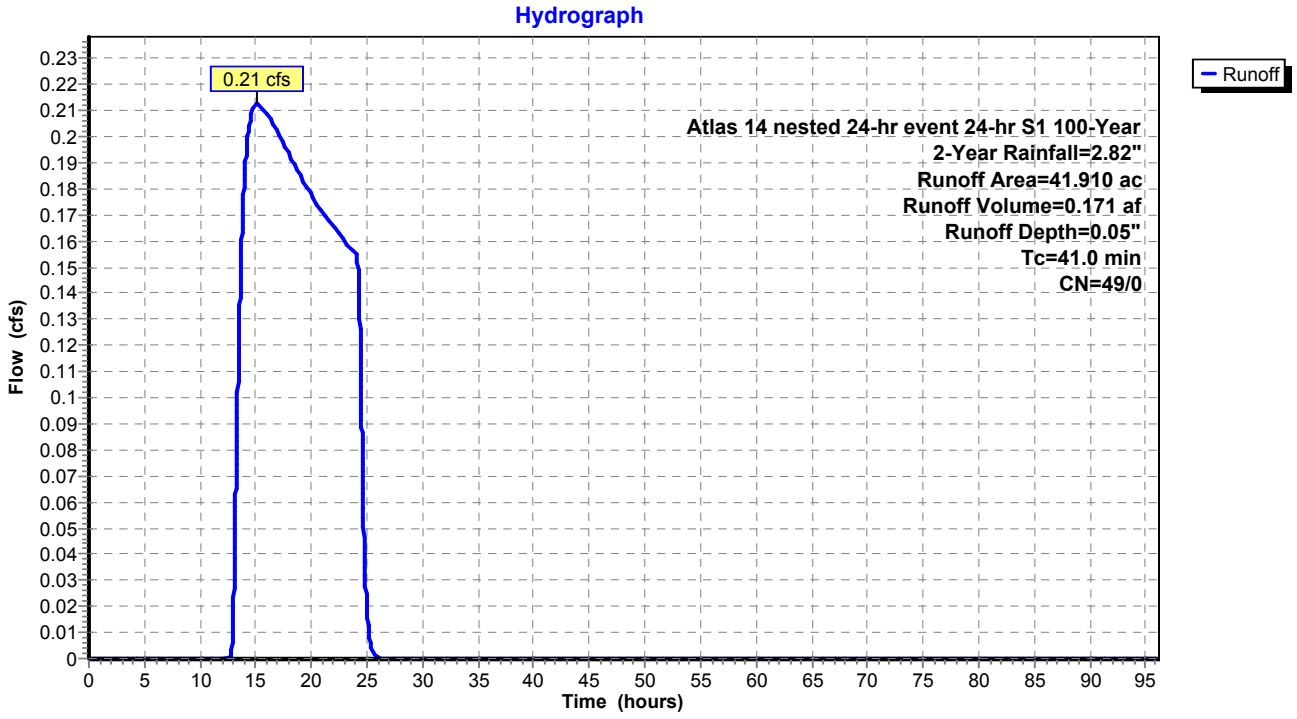
Runoff = 0.21 cfs @ 15.17 hrs, Volume= 0.171 af, Depth= 0.05"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 2-Year Rainfall=2.82"

	Area (ac)	CN	Description
*	41.910	49	Pervious
*	0.000	98	Impervious
	41.910	49	Weighted Average
	41.910	49	100.00% Pervious Area

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

Subcatchment SB 22: SB 22



Summary for Subcatchment SB 24: SB 24

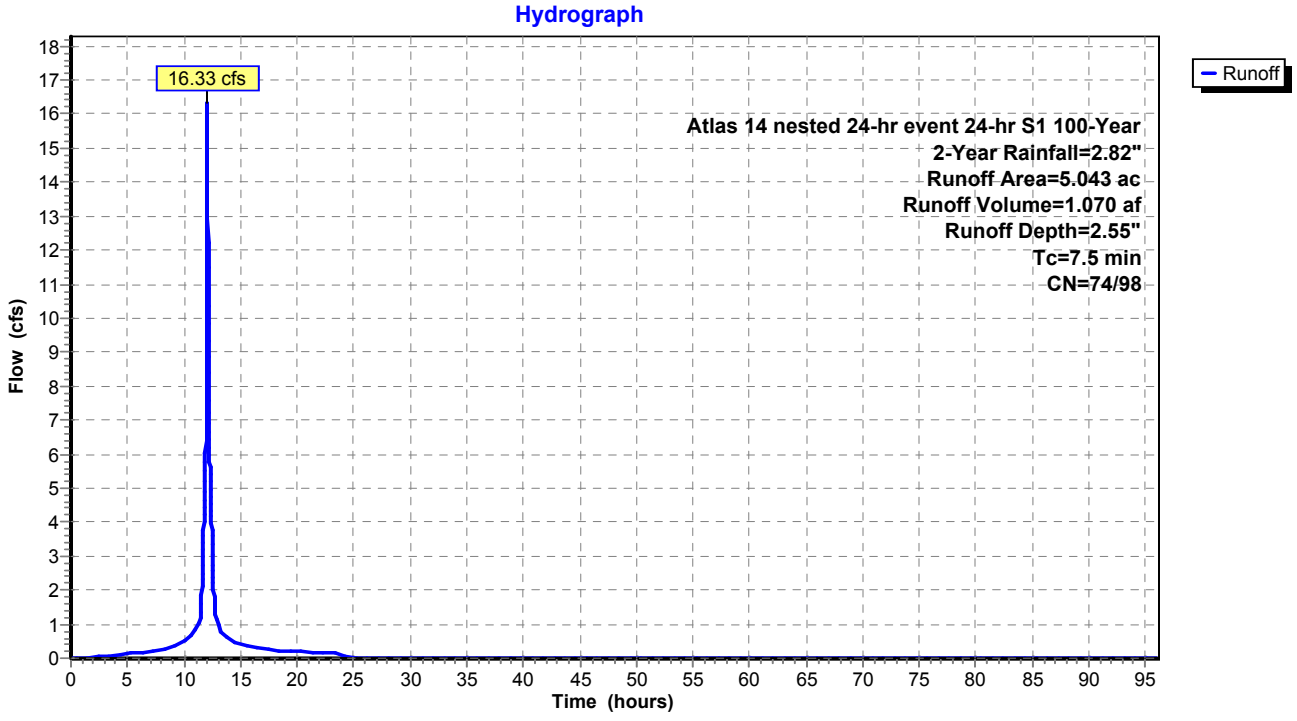
Runoff = 16.33 cfs @ 12.05 hrs, Volume= 1.070 af, Depth= 2.55"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 2-Year Rainfall=2.82"

	Area (ac)	CN	Description
*	0.123	74	permiable
*	4.920	98	impermiable
	5.043	97	Weighted Average
	0.123	74	2.44% Pervious Area
	4.920	98	97.56% Impervious Area

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

Subcatchment SB 24: SB 24



Summary for Subcatchment SB 25: SB 25

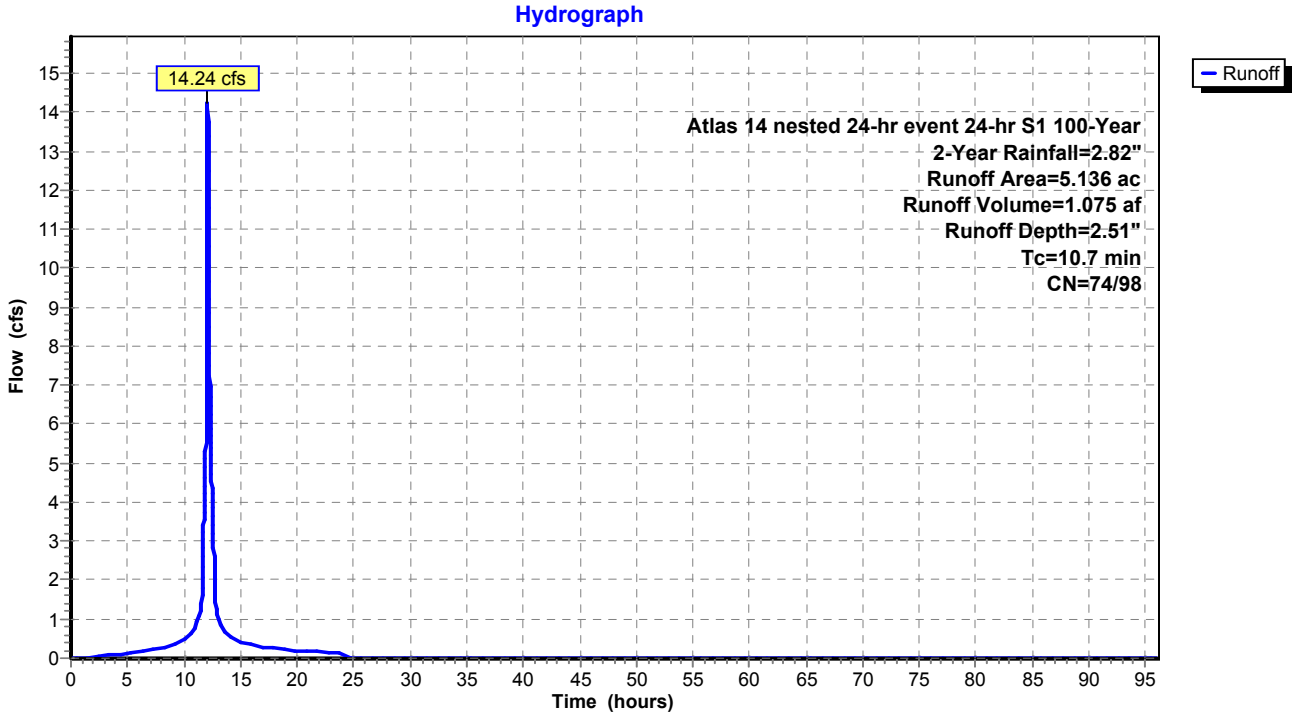
Runoff = 14.24 cfs @ 12.09 hrs, Volume= 1.075 af, Depth= 2.51"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 2-Year Rainfall=2.82"

	Area (ac)	CN	Description
*	0.220	74	pervious
*	4.916	98	impervious
	5.136	97	Weighted Average
	0.220	74	4.28% Pervious Area
	4.916	98	95.72% Impervious Area

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

Subcatchment SB 25: SB 25



Summary for Subcatchment SB 26: SB 26

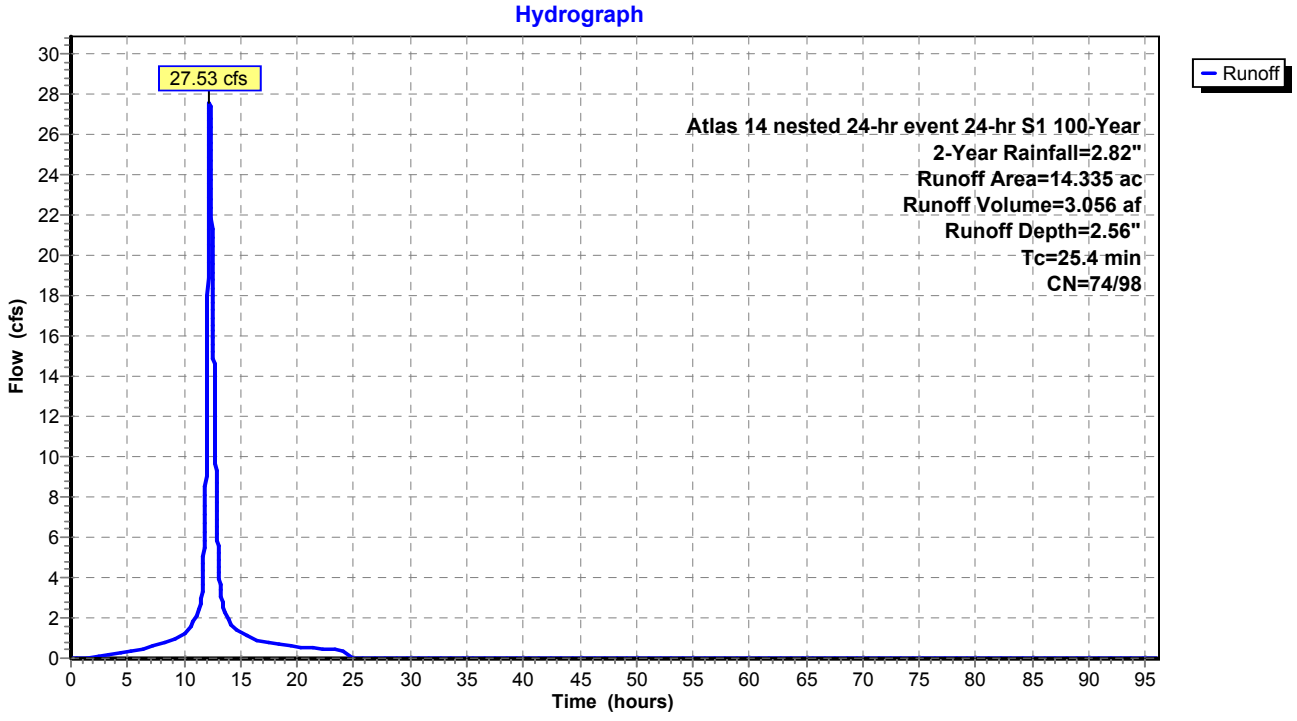
Runoff = 27.53 cfs @ 12.28 hrs, Volume= 3.056 af, Depth= 2.56"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 2-Year Rainfall=2.82"

	Area (ac)	CN	Description
*	0.248	74	pervious
*	14.087	98	impervious
	14.335	98	Weighted Average
	0.248	74	1.73% Pervious Area
	14.087	98	98.27% Impervious Area

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

Subcatchment SB 26: SB 26



Summary for Subcatchment SB 27: SB 27 (Thumb Road)

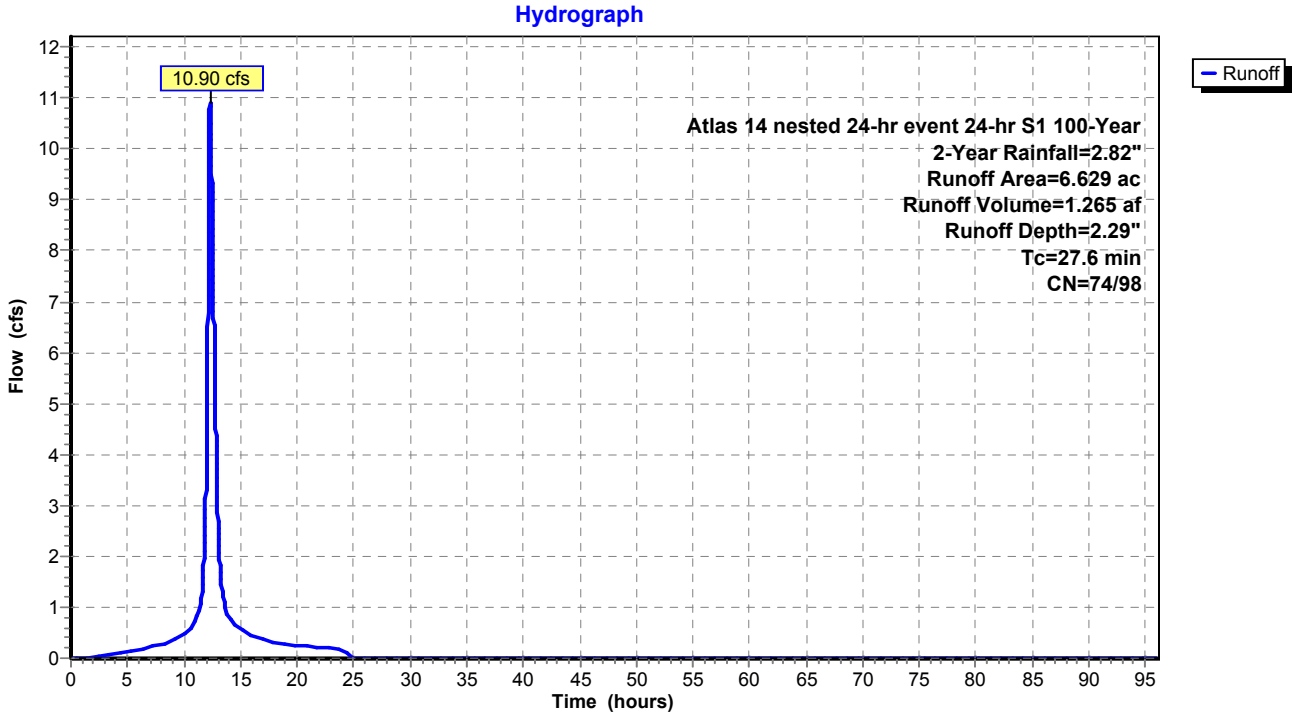
Runoff = 10.90 cfs @ 12.32 hrs, Volume= 1.265 af, Depth= 2.29"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 2-Year Rainfall=2.82"

	Area (ac)	CN	Description
*	1.105	74	Pervious
*	5.524	98	Impervious
	6.629	94	Weighted Average
	1.105	74	16.67% Pervious Area
	5.524	98	83.33% Impervious Area

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

Subcatchment SB 27: SB 27 (Thumb Road)



Summary for Subcatchment SB 28: SB 28

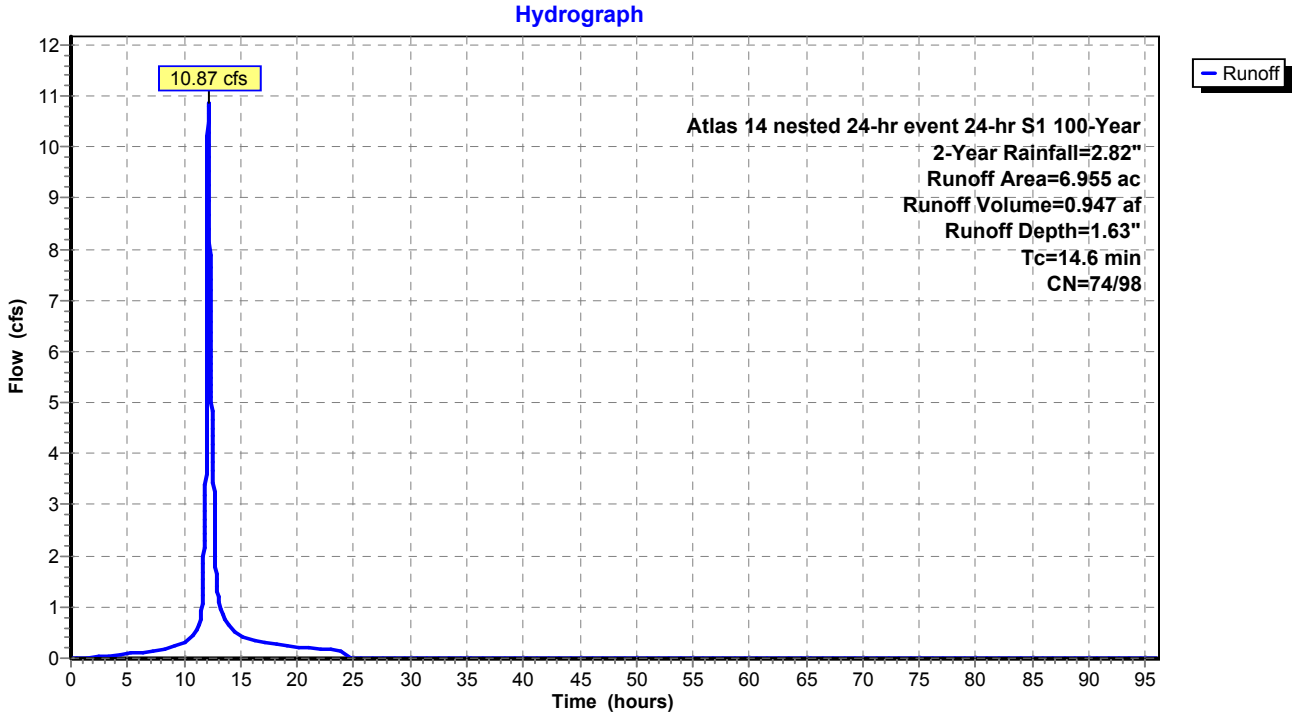
Runoff = 10.87 cfs @ 12.15 hrs, Volume= 0.947 af, Depth= 1.63"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 2-Year Rainfall=2.82"

	Area (ac)	CN	Description
*	3.703	74	pervious
*	3.252	98	impervious
	6.955	85	Weighted Average
	3.703	74	53.24% Pervious Area
	3.252	98	46.76% Impervious Area

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

Subcatchment SB 28: SB 28



Summary for Subcatchment SB 29: SB 29

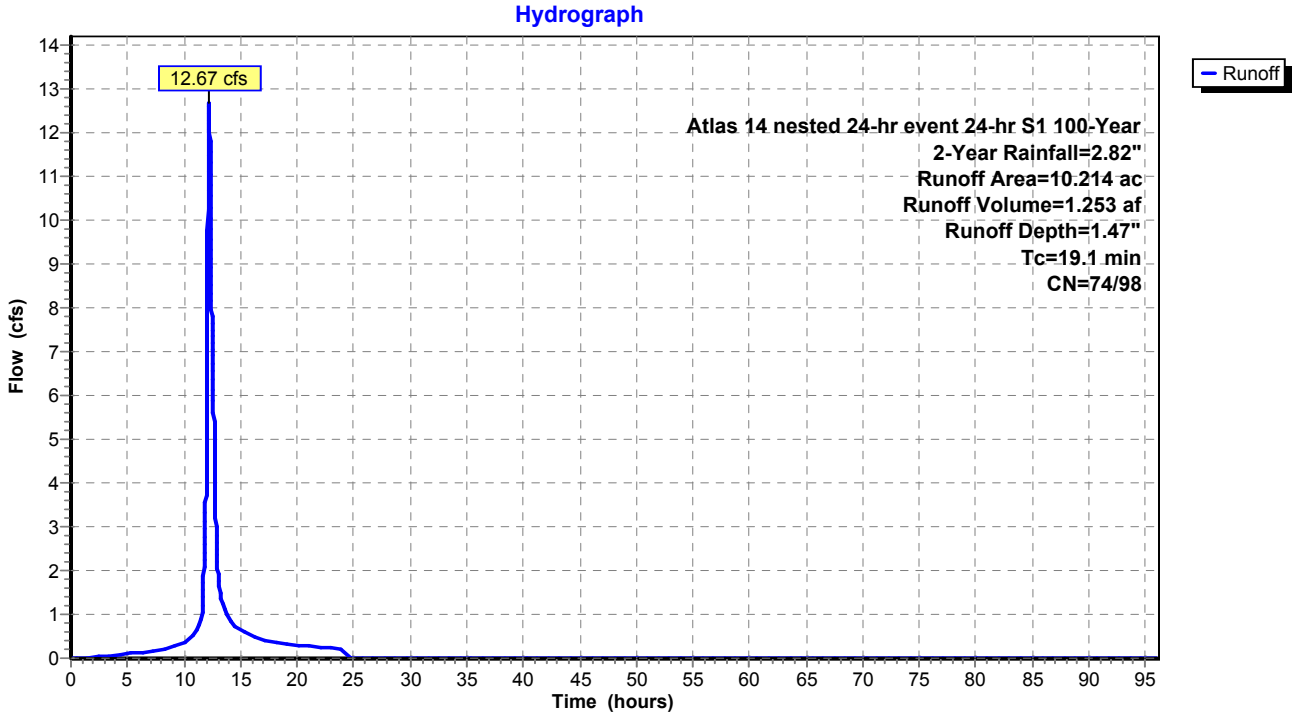
Runoff = 12.67 cfs @ 12.22 hrs, Volume= 1.253 af, Depth= 1.47"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 2-Year Rainfall=2.82"

	Area (ac)	CN	Description
*	6.360	74	pervious
*	3.854	98	impervious
	10.214	83	Weighted Average
	6.360	74	62.27% Pervious Area
	3.854	98	37.73% Impervious Area

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

Subcatchment SB 29: SB 29



Summary for Subcatchment SB 3: SB 3

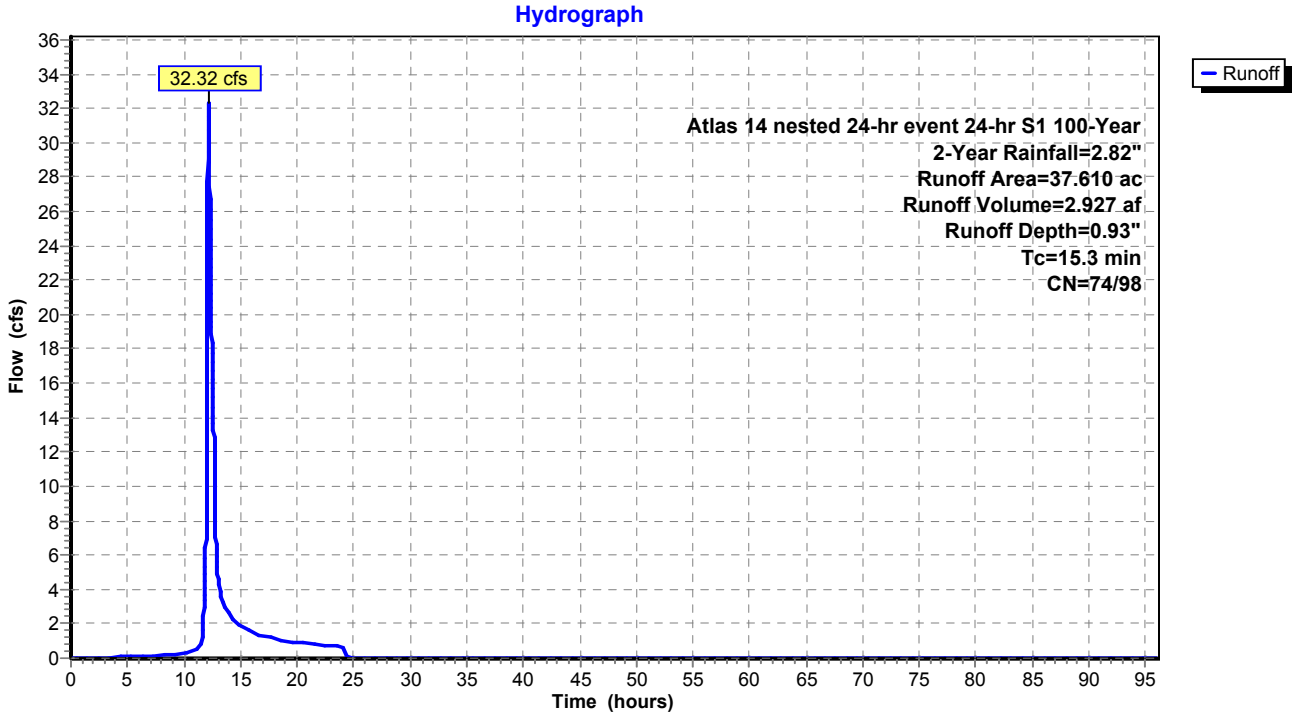
Runoff = 32.32 cfs @ 12.19 hrs, Volume= 2.927 af, Depth= 0.93"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 2-Year Rainfall=2.82"

	Area (ac)	CN	Description
*	34.720	74	Pervious
*	2.890	98	Impervious
	37.610	76	Weighted Average
	34.720	74	92.32% Pervious Area
	2.890	98	7.68% Impervious Area

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

Subcatchment SB 3: SB 3



Summary for Subcatchment SB 4: SB 4

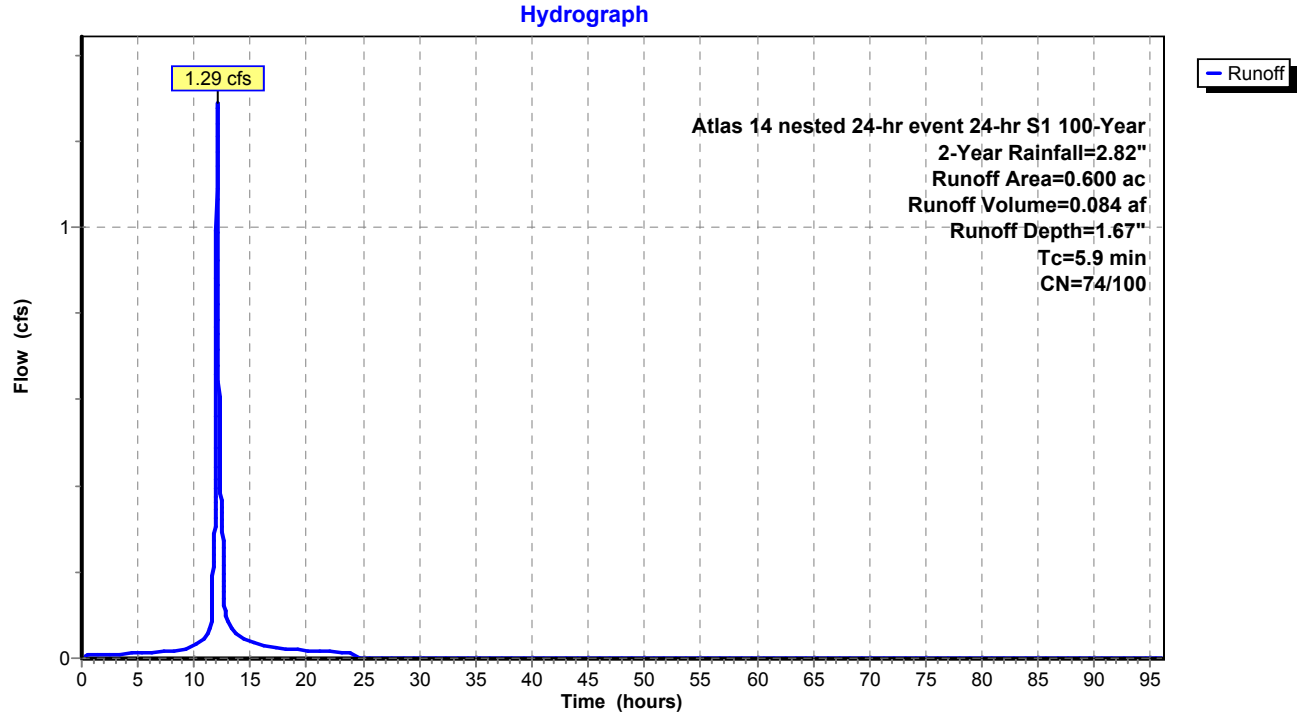
Runoff = 1.29 cfs @ 12.04 hrs, Volume= 0.084 af, Depth= 1.67"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 2-Year Rainfall=2.82"

	Area (ac)	CN	Description
*	0.340	74	pervious
*	0.260	100	impervious
	0.600	85	Weighted Average
	0.340	74	56.67% Pervious Area
	0.260	100	43.33% Impervious Area

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

Subcatchment SB 4: SB 4



Summary for Subcatchment SB 5: SB 5

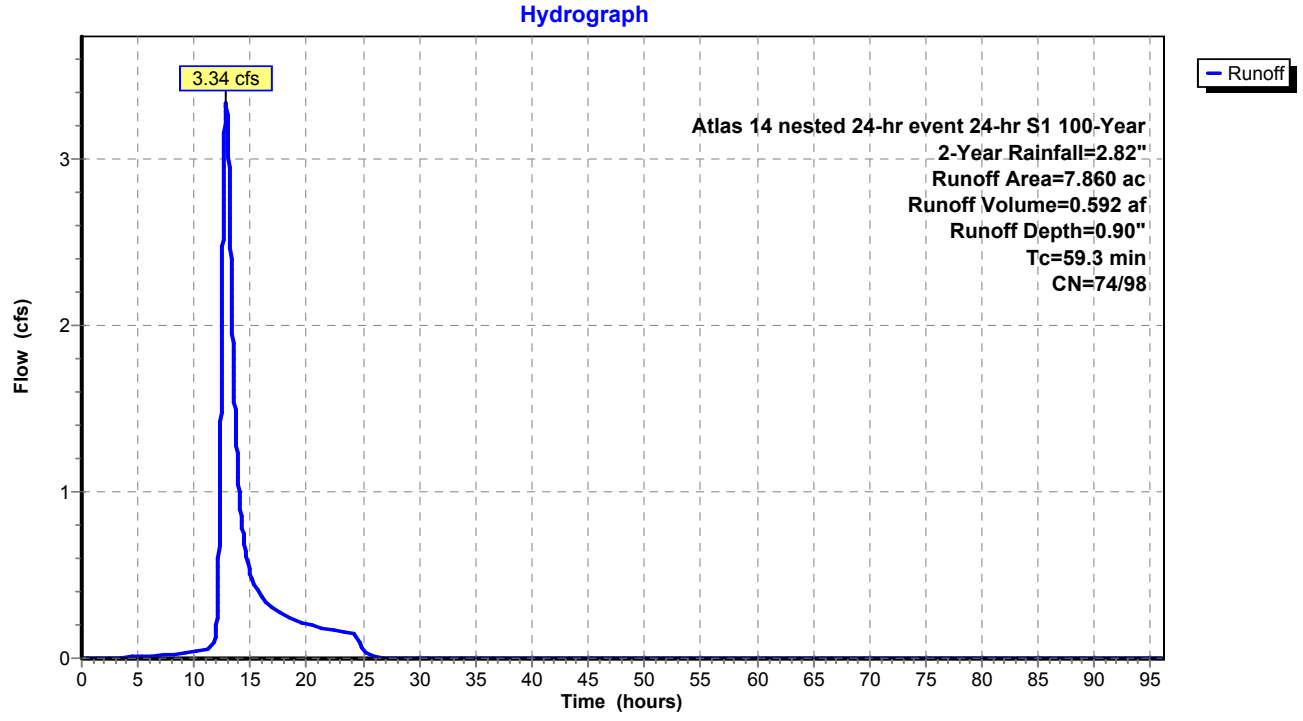
Runoff = 3.34 cfs @ 12.85 hrs, Volume= 0.592 af, Depth= 0.90"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 2-Year Rainfall=2.82"

	Area (ac)	CN	Description
*	7.390	74	pervious
*	0.470	98	impervious
	7.860	75	Weighted Average
	7.390	74	94.02% Pervious Area
	0.470	98	5.98% Impervious Area

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

Subcatchment SB 5: SB 5



Summary for Subcatchment SB 6: SB 6

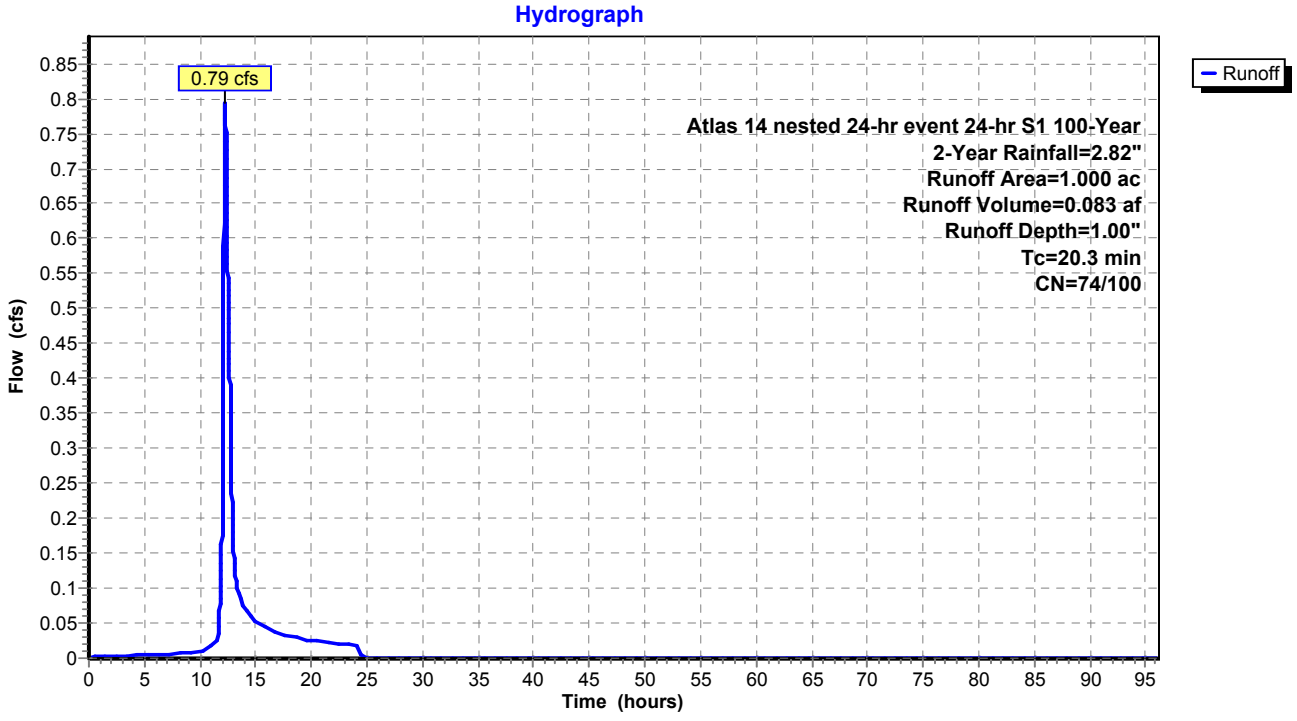
Runoff = 0.79 cfs @ 12.25 hrs, Volume= 0.083 af, Depth= 1.00"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 2-Year Rainfall=2.82"

	Area (ac)	CN	Description
*	0.900	74	pervious
*	0.100	100	impervious
	1.000	77	Weighted Average
	0.900	74	90.00% Pervious Area
	0.100	100	10.00% Impervious Area

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

Subcatchment SB 6: SB 6



Summary for Subcatchment SB 7: SB 7

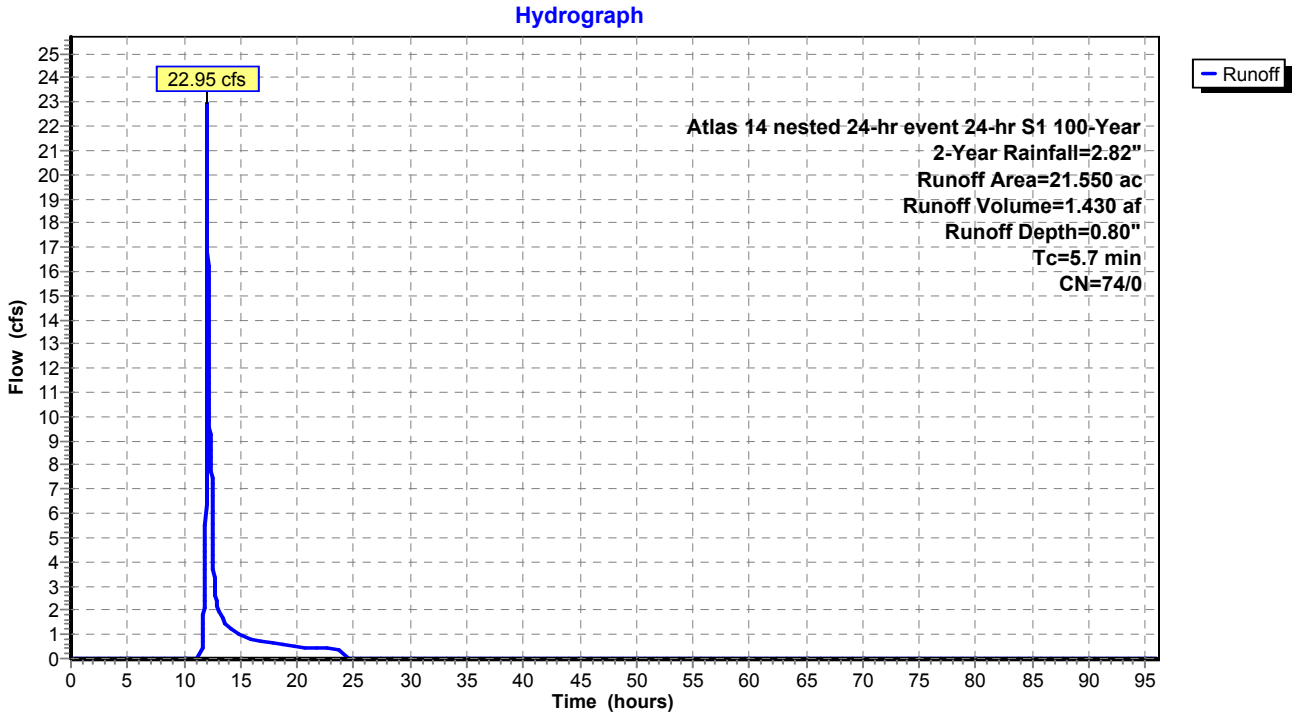
Runoff = 22.95 cfs @ 12.04 hrs, Volume= 1.430 af, Depth= 0.80"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 2-Year Rainfall=2.82"

	Area (ac)	CN	Description
*	21.550	74	pervious
*	0.000	98	impervious
	21.550	74	Weighted Average
	21.550	74	100.00% Pervious Area

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

Subcatchment SB 7: SB 7



Summary for Subcatchment SB 8: SB 8

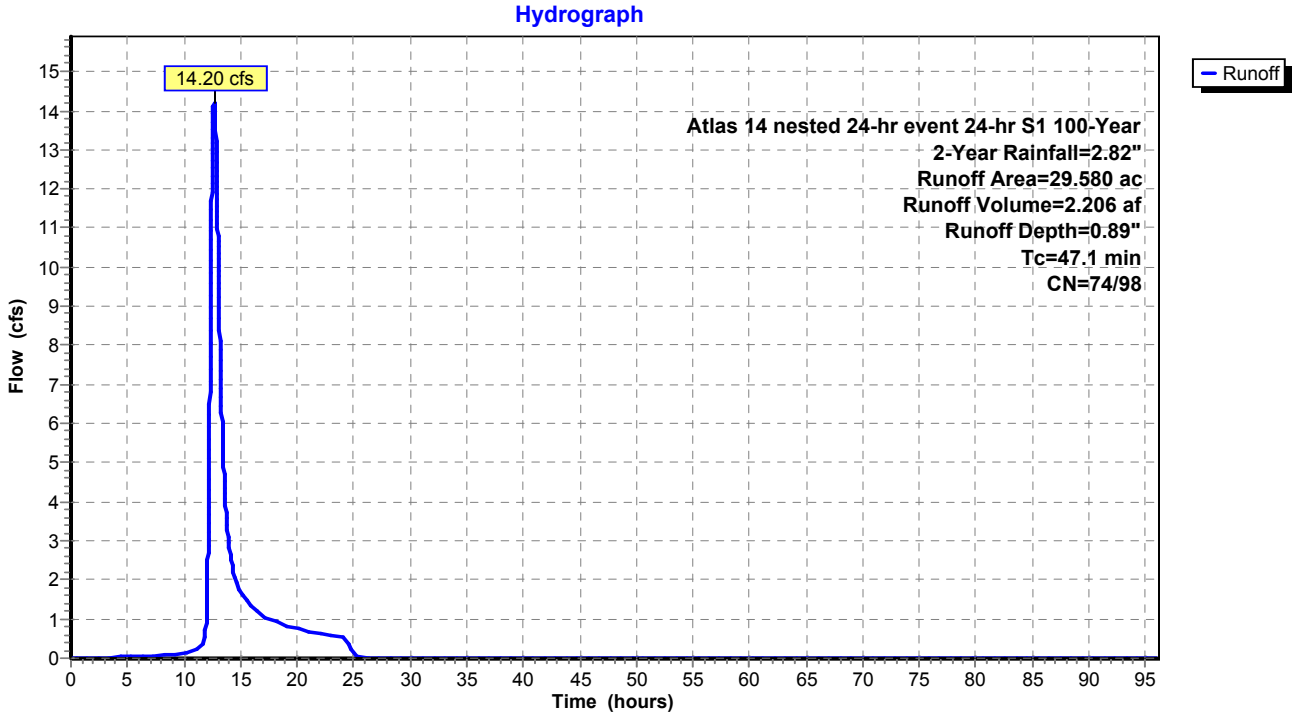
Runoff = 14.20 cfs @ 12.67 hrs, Volume= 2.206 af, Depth= 0.89"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 2-Year Rainfall=2.82"

	Area (ac)	CN	Description
*	27.950	74	pervious
*	1.630	98	impervious
	29.580	75	Weighted Average
	27.950	74	94.49% Pervious Area
	1.630	98	5.51% Impervious Area

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

Subcatchment SB 8: SB 8



Summary for Subcatchment SB 9: SB 9

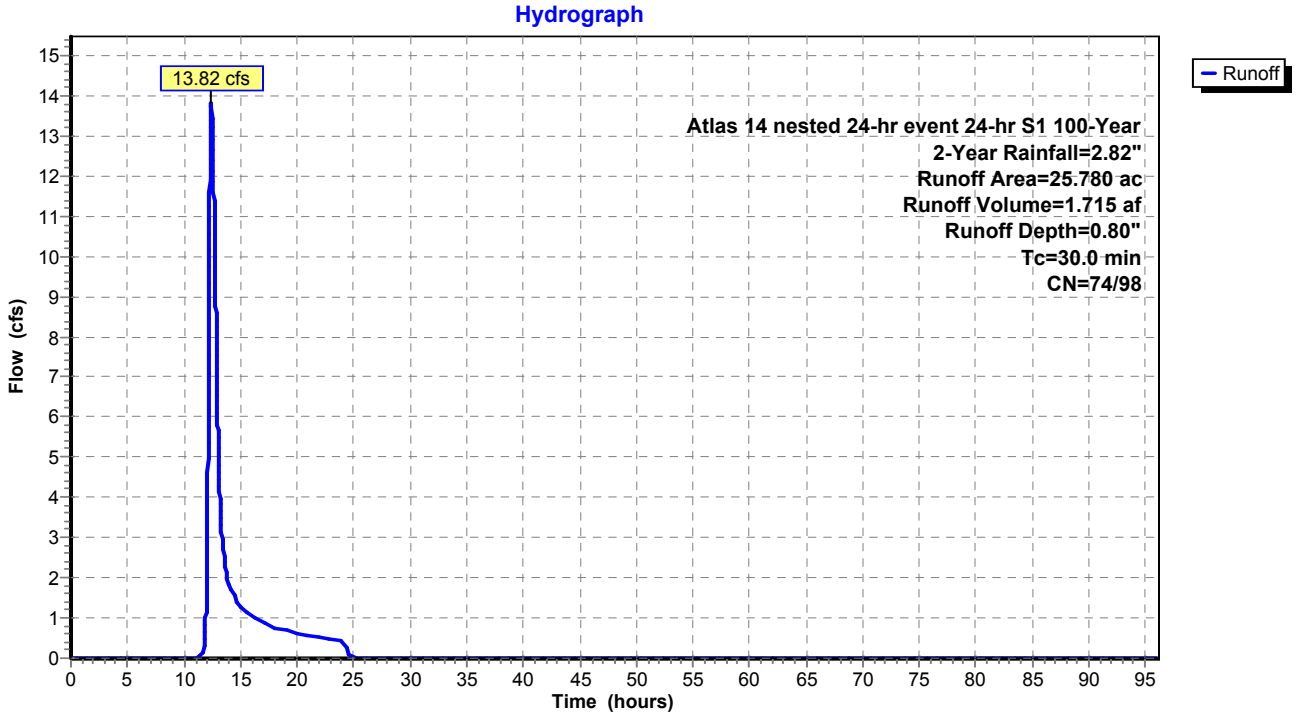
Runoff = 13.82 cfs @ 12.43 hrs, Volume= 1.715 af, Depth= 0.80"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 2-Year Rainfall=2.82"

	Area (ac)	CN	Description
*	25.750	74	permiable
*	0.030	98	impermiable
	25.780	74	Weighted Average
	25.750	74	99.88% Pervious Area
	0.030	98	0.12% Impervious Area

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

Subcatchment SB 9: SB 9



Summary for Subcatchment SB10: SB 10

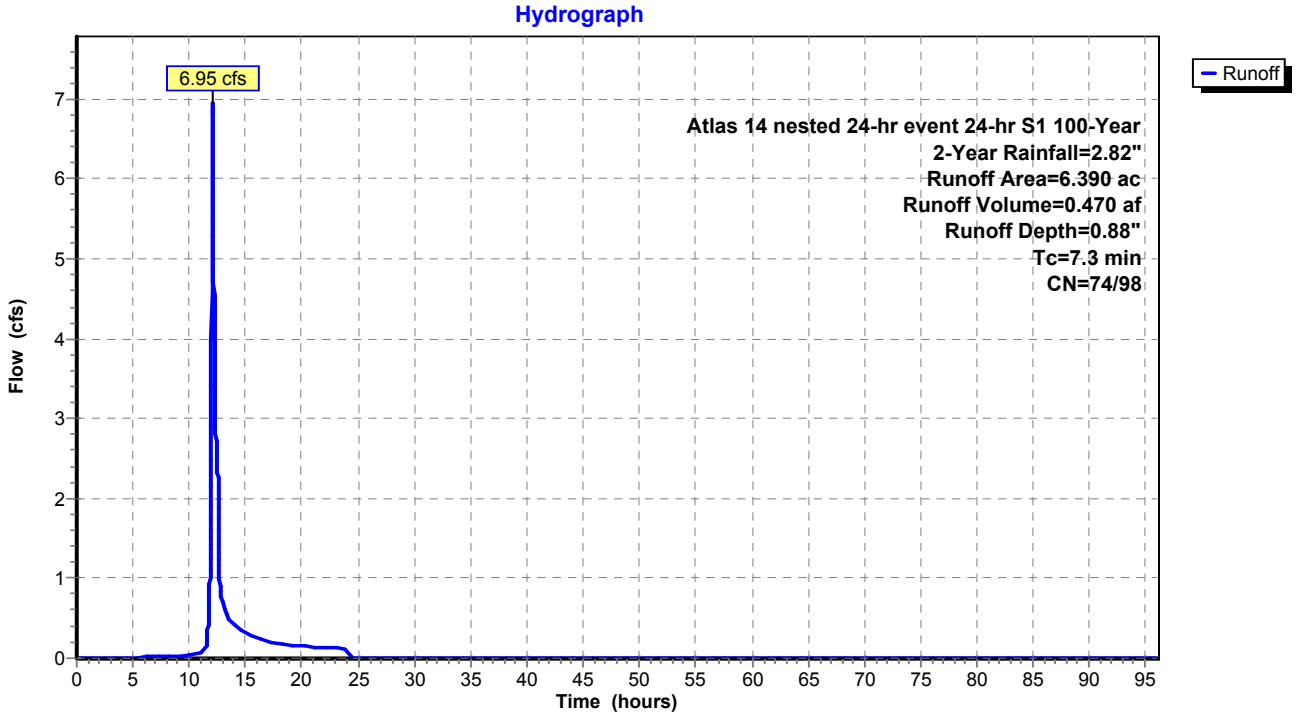
Runoff = 6.95 cfs @ 12.06 hrs, Volume= 0.470 af, Depth= 0.88"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 2-Year Rainfall=2.82"

	Area (ac)	CN	Description
*	6.080	74	pervious
*	0.310	98	impervious
	6.390	75	Weighted Average
	6.080	74	95.15% Pervious Area
	0.310	98	4.85% Impervious Area

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

Subcatchment SB10: SB 10



Summary for Reach 30R: 60" RCP to existing 60" storm sewer

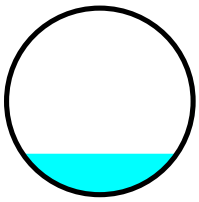
[52] Hint: Inlet/Outlet conditions not evaluated
[65] Warning: Inlet elevation not specified

Inflow Area = 133.156 ac, 9.78% Impervious, Inflow Depth = 0.91" for 2-Year event
Inflow = 36.95 cfs @ 12.54 hrs, Volume= 10.097 af
Outflow = 36.94 cfs @ 12.55 hrs, Volume= 10.097 af, Atten= 0%, Lag= 0.6 min

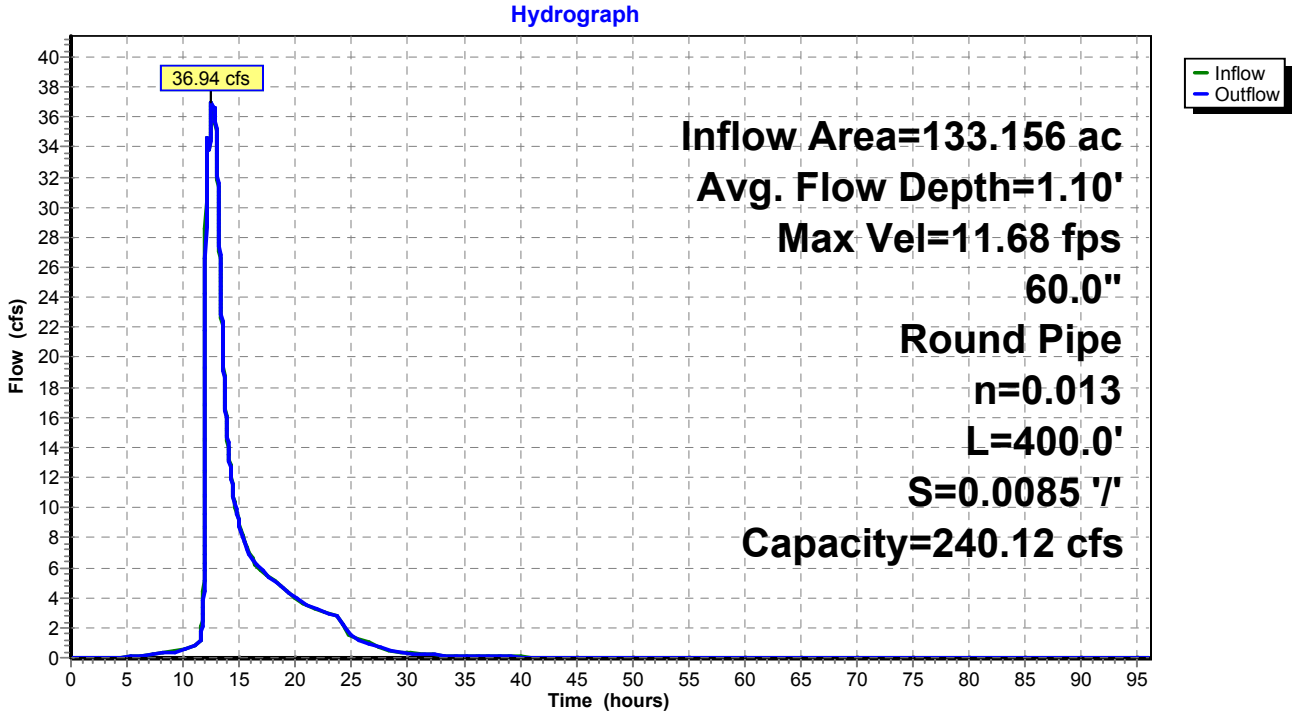
Routing by Muskingum-Cunge method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Reference Flow= 27.71 cfs Estimated Depth= 1.15' Velocity= 8.15 fps
m= 1.423, c= 11.60 fps, dt= 0.6 min, dx= 400.0' / 1 = 400.0', K= 0.6 min, X= 0.381
Max. Velocity= 11.68 fps, Min. Travel Time= 0.6 min
Avg. Velocity = 11.60 fps, Avg. Travel Time= 0.6 min

Peak Storage= 1,273 cf @ 12.55 hrs
Average Depth at Peak Storage= 1.10'
Bank-Full Depth= 5.00' Flow Area= 19.6 sf, Capacity= 240.12 cfs

60.0" Round Pipe
n= 0.013
Length= 400.0' Slope= 0.0085 '/'
Inlet Invert= 0.00', Outlet Invert= -3.40'



Reach 30R: 60" RCP to existing 60" storm sewer



Summary for Reach 34R: 60" RCP connecting P-1/P-2 with P-3

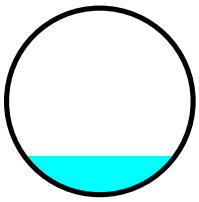
[52] Hint: Inlet/Outlet conditions not evaluated
[65] Warning: Inlet elevation not specified

Inflow Area = 68.260 ac, 7.26% Impervious, Inflow Depth = 0.93" for 2-Year event
Inflow = 25.29 cfs @ 12.69 hrs, Volume= 5.269 af
Outflow = 25.28 cfs @ 12.75 hrs, Volume= 5.269 af, Atten= 0%, Lag= 3.8 min

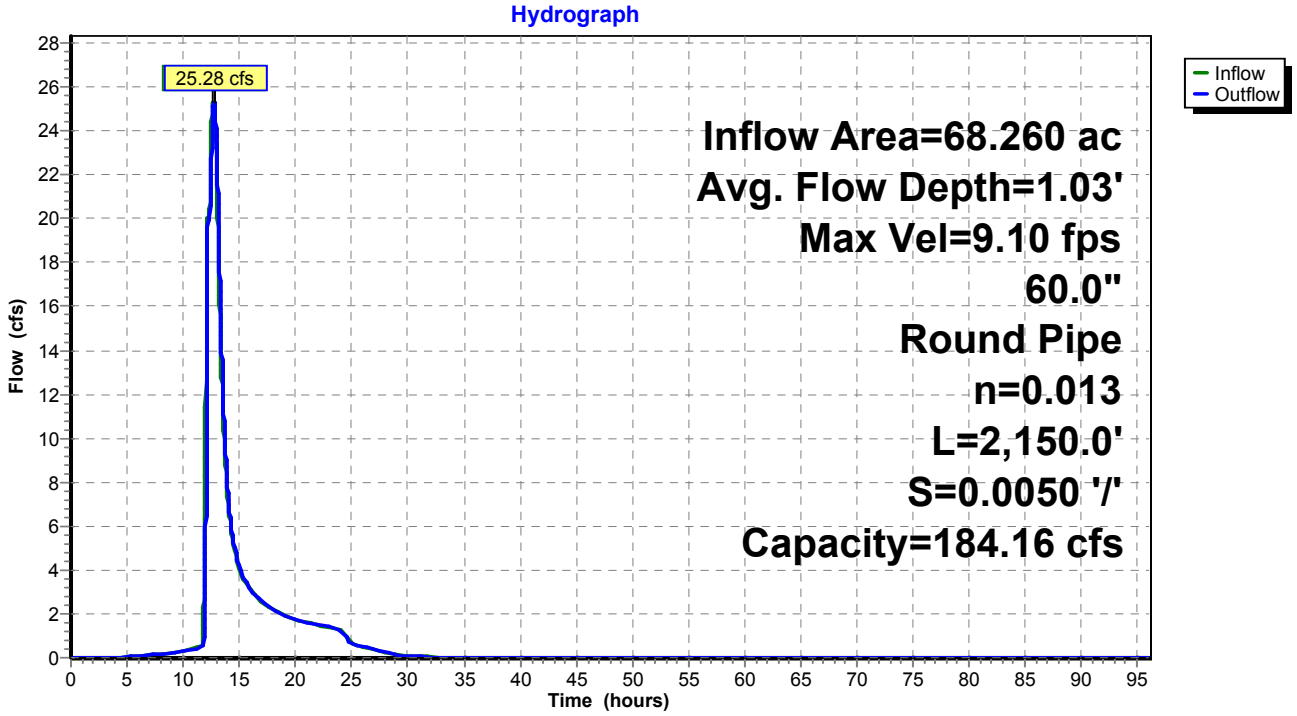
Routing by Muskingum-Cunge method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Reference Flow= 18.97 cfs Estimated Depth= 1.08' Velocity= 6.05 fps
m= 1.424, c= 8.61 fps, dt= 0.6 min, dx= 2,150.0' / 7 = 307.1', K= 0.6 min, X= 0.252
Max. Velocity= 9.10 fps, Min. Travel Time= 3.9 min
Avg. Velocity = 8.62 fps, Avg. Travel Time= 4.2 min

Peak Storage= 6,307 cf @ 12.72 hrs
Average Depth at Peak Storage= 1.03'
Bank-Full Depth= 5.00' Flow Area= 19.6 sf, Capacity= 184.16 cfs

60.0" Round Pipe
n= 0.013
Length= 2,150.0' Slope= 0.0050 '/'
Inlet Invert= 0.00', Outlet Invert= -10.75'



Reach 34R: 60" RCP connecting P-1/P-2 with P-3



Summary for Reach 37R: 48" RCP

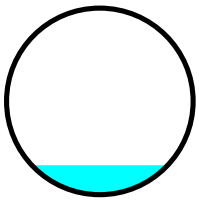
[52] Hint: Inlet/Outlet conditions not evaluated
[65] Warning: Inlet elevation not specified

Inflow Area = 43.346 ac, 18.61% Impervious, Inflow Depth > 0.94" for 2-Year event
Inflow = 8.76 cfs @ 12.76 hrs, Volume= 3.398 af
Outflow = 8.76 cfs @ 12.77 hrs, Volume= 3.398 af, Atten= 0%, Lag= 0.6 min

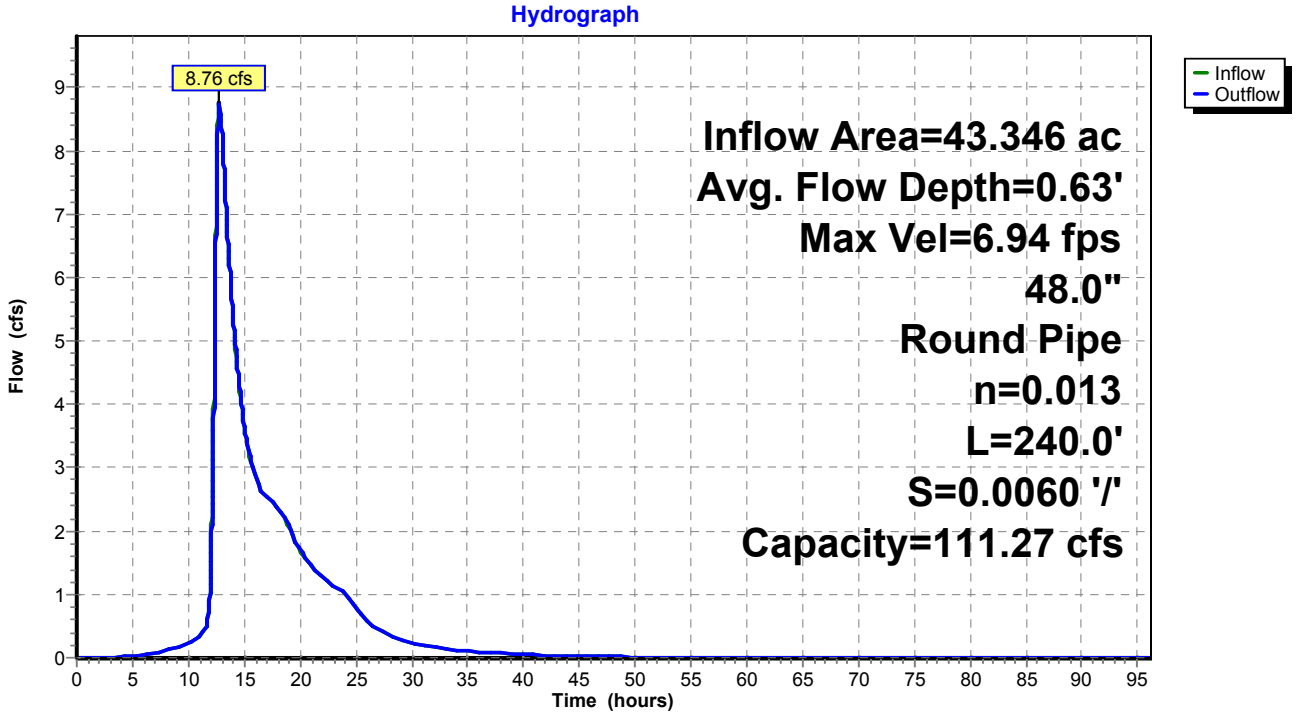
Routing by Muskingum-Cunge method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Reference Flow= 6.57 cfs Estimated Depth= 0.66' Velocity= 4.85 fps
m= 1.430, c= 6.93 fps, dt= 0.6 min, dx= 240.0' / 1 = 240.0', K= 0.6 min, X= 0.340
Max. Velocity= 6.94 fps, Min. Travel Time= 0.6 min
Avg. Velocity = 6.93 fps, Avg. Travel Time= 0.6 min

Peak Storage= 303 cf @ 12.76 hrs
Average Depth at Peak Storage= 0.63'
Bank-Full Depth= 4.00' Flow Area= 12.6 sf, Capacity= 111.27 cfs

48.0" Round Pipe
n= 0.013
Length= 240.0' Slope= 0.0060 '/'
Inlet Invert= 0.00', Outlet Invert= -1.44'



Reach 37R: 48" RCP



Summary for Reach 39R: 24" RCP

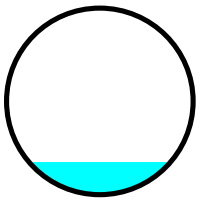
[52] Hint: Inlet/Outlet conditions not evaluated
[65] Warning: Inlet elevation not specified

Inflow Area = 8.860 ac, 6.43% Impervious, Inflow Depth = 0.91" for 2-Year event
Inflow = 1.55 cfs @ 14.16 hrs, Volume= 0.675 af
Outflow = 1.55 cfs @ 14.17 hrs, Volume= 0.675 af, Atten= 0%, Lag= 0.4 min

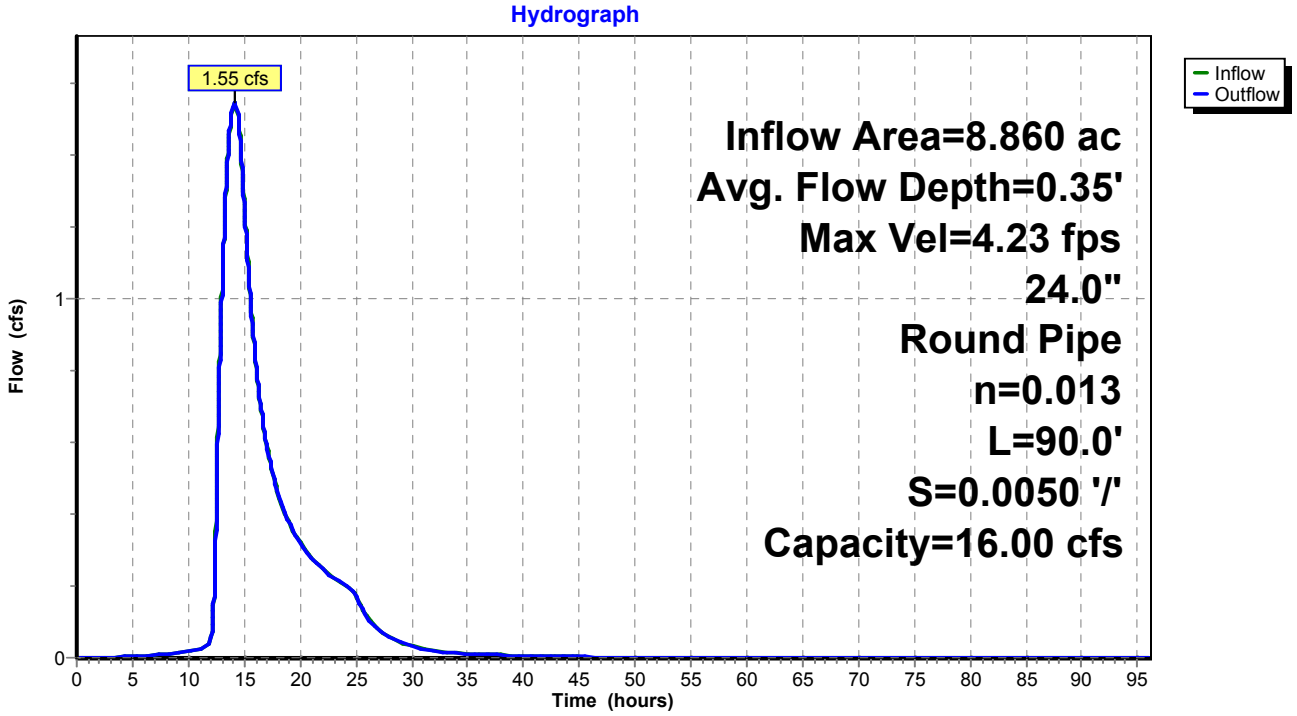
Routing by Muskingum-Cunge method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Reference Flow= 1.16 cfs Estimated Depth= 0.36' Velocity= 2.96 fps
m= 1.428, c= 4.23 fps, dt= 0.6 min, dx= 90.0' / 1 = 90.0', K= 0.4 min, X= 0.216
Max. Velocity= 4.23 fps, Min. Travel Time= 0.4 min
Avg. Velocity = 4.23 fps, Avg. Travel Time= 0.4 min

Peak Storage= 33 cf @ 14.17 hrs
Average Depth at Peak Storage= 0.35'
Bank-Full Depth= 2.00' Flow Area= 3.1 sf, Capacity= 16.00 cfs

24.0" Round Pipe
n= 0.013
Length= 90.0' Slope= 0.0050 '/'
Inlet Invert= 0.00', Outlet Invert= -0.45'



Reach 39R: 24" RCP



Summary for Reach 43R: 30" RCP connecting P-10 with P-12

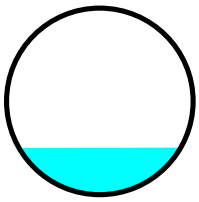
[52] Hint: Inlet/Outlet conditions not evaluated
[79] Warning: Submerged Pond 10P Primary device # 1 by 0.63'

Inflow Area = 66.430 ac, 5.22% Impervious, Inflow Depth > 0.73" for 2-Year event
Inflow = 5.04 cfs @ 13.92 hrs, Volume= 4.041 af
Outflow = 5.04 cfs @ 13.97 hrs, Volume= 4.040 af, Atten= 0%, Lag= 2.4 min

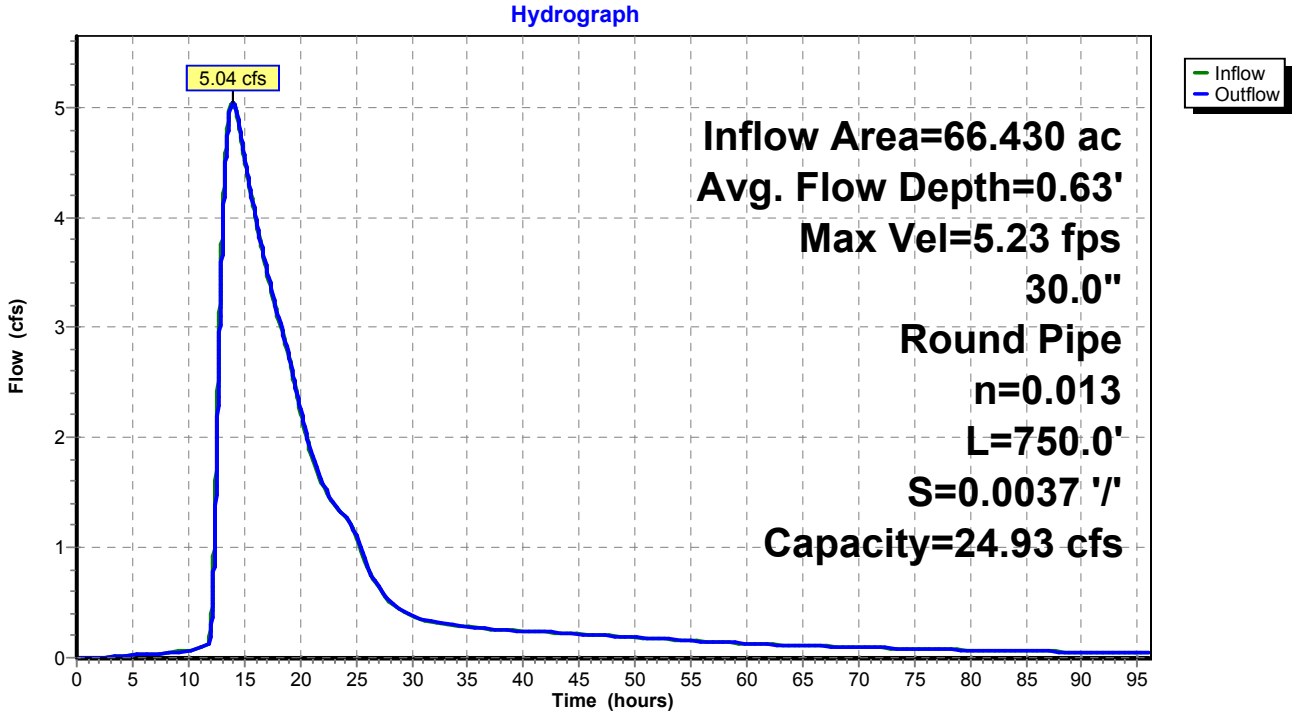
Routing by Muskingum-Cunge method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Reference Flow= 3.78 cfs Estimated Depth= 0.66' Velocity= 3.66 fps
m= 1.419, c= 5.20 fps, dt= 0.6 min, dx= 750.0' / 4 = 187.5', K= 0.6 min, X= 0.165
Max. Velocity= 5.23 fps, Min. Travel Time= 2.4 min
Avg. Velocity = 5.19 fps, Avg. Travel Time= 2.4 min

Peak Storage= 727 cf @ 13.95 hrs
Average Depth at Peak Storage= 0.63'
Bank-Full Depth= 2.50' Flow Area= 4.9 sf, Capacity= 24.93 cfs

30.0" Round Pipe
n= 0.013
Length= 750.0' Slope= 0.0037 '/'
Inlet Invert= 896.00', Outlet Invert= 893.23'



Reach 43R: 30" RCP connecting P-10 with P-12



Summary for Reach 51R: 40' x 4.5 ft parabolic hannel from P-13 to Rice Creek

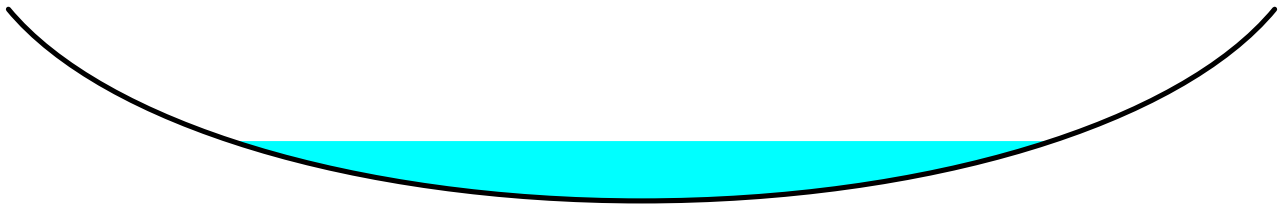
[65] Warning: Inlet elevation not specified
[97] Warning: Factor X out of range

Inflow Area = 245.383 ac, 10.42% Impervious, Inflow Depth > 1.00" for 2-Year event
Inflow = 88.69 cfs @ 12.53 hrs, Volume= 20.412 af
Outflow = 88.63 cfs @ 12.55 hrs, Volume= 20.412 af, Atten= 0%, Lag= 1.2 min

Routing by Muskingum-Cunge method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Reference Flow= 66.52 cfs Estimated Depth= 1.48' Velocity= 2.95 fps
m= 1.441, c= 4.25 fps, dt= 0.6 min, dx= 300.0' / 2 = 150.0', K= 0.6 min, X= 0.000
Max. Velocity= 4.29 fps, Min. Travel Time= 1.2 min
Avg. Velocity = 4.25 fps, Avg. Travel Time= 1.2 min

Peak Storage= 6,257 cf @ 12.54 hrs
Average Depth at Peak Storage= 1.40'
Bank-Full Depth= 4.50' Flow Area= 120.0 sf, Capacity= 733.43 cfs

40.00' x 4.50' deep Parabolic Channel, n= 0.035
Length= 300.0' Slope= 0.0050 '/'
Inlet Invert= 0.00', Outlet Invert= -1.50'



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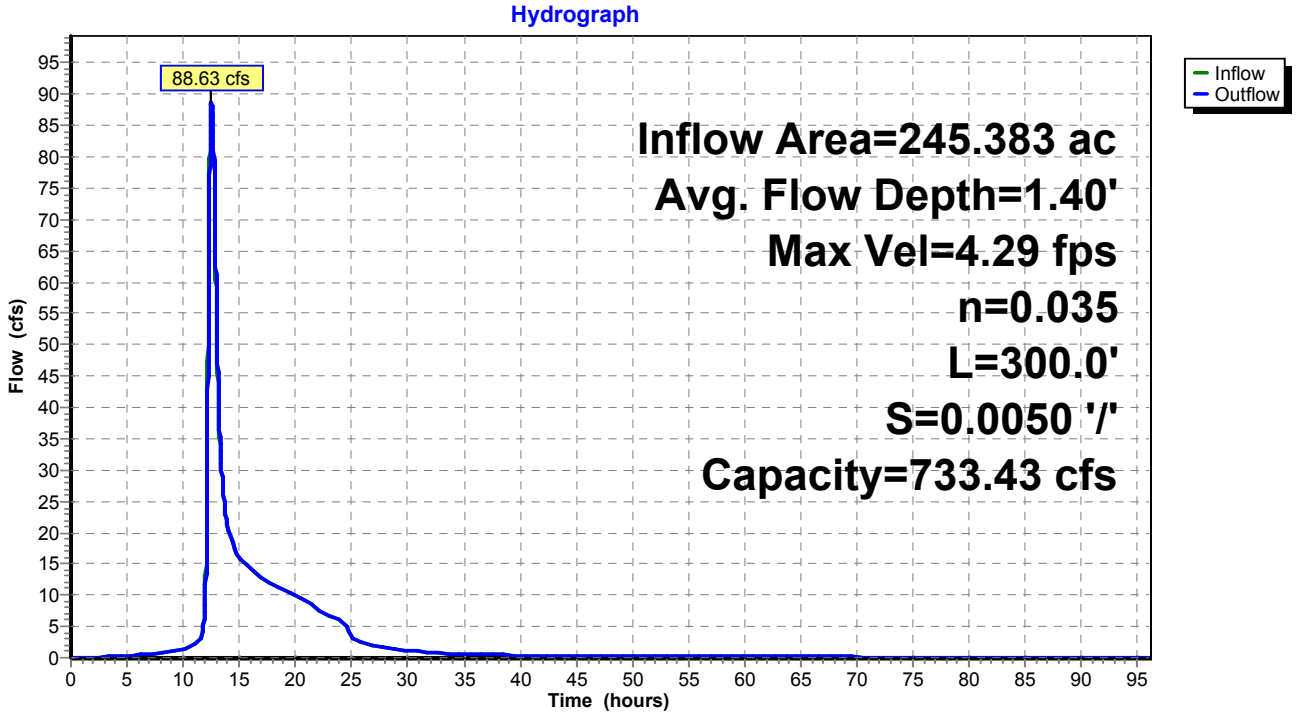
Reach 51R: 40' x 4.5 ft parabolic hannel from P-13 to Rice Creek



Summary for Pond 2 P: P-2

Inflow Area = 68.260 ac, 7.26% Impervious, Inflow Depth = 0.93" for 2-Year event
Inflow = 25.48 cfs @ 12.57 hrs, Volume= 5.269 af
Outflow = 25.29 cfs @ 12.69 hrs, Volume= 5.269 af, Atten= 1%, Lag= 6.8 min
Primary = 25.29 cfs @ 12.69 hrs, Volume= 5.269 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Starting Elev= 924.00' Surf.Area= 0.370 ac Storage= 0.730 af
Peak Elev= 924.73' @ 12.69 hrs Surf.Area= 0.417 ac Storage= 1.016 af (0.286 af above start)

Plug-Flow detention time= 138.1 min calculated for 4.539 af (86% of inflow)
Center-of-Mass det. time= 36.8 min (912.2 - 875.4)

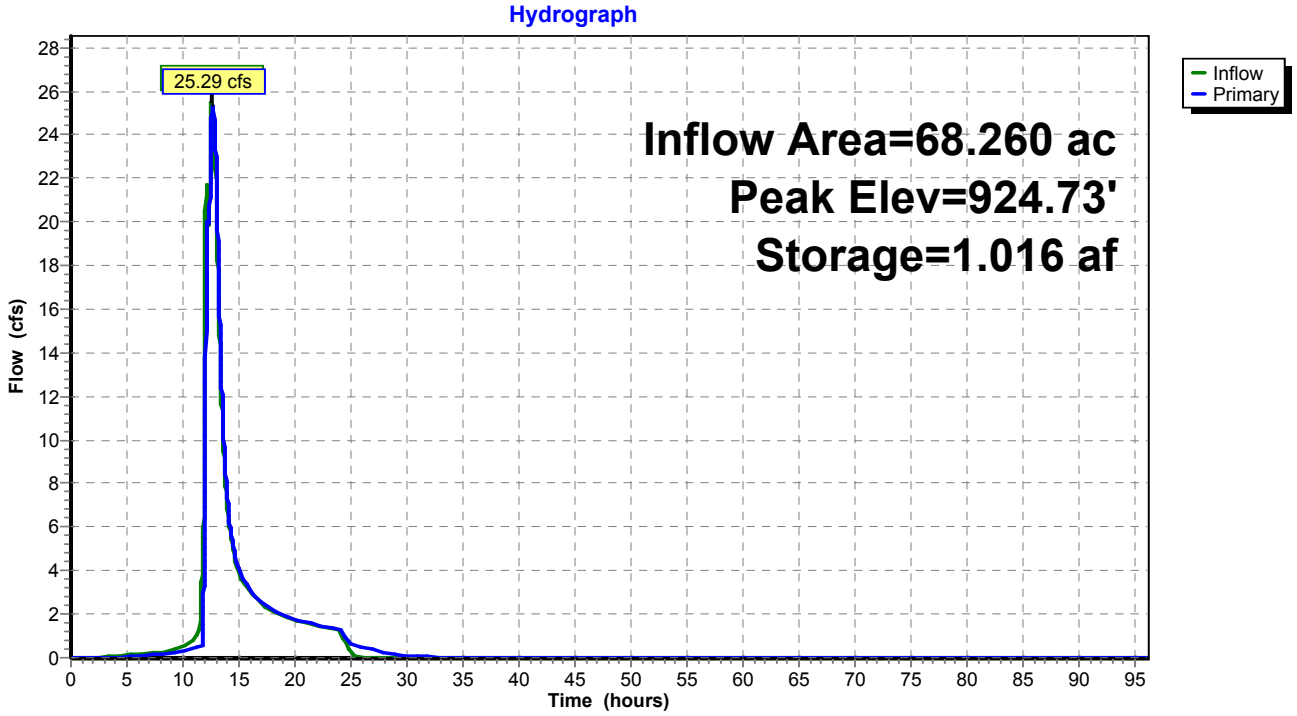
Volume	Invert	Avail.Storage	Storage Description
#1	920.00'	1.600 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
920.00	0.100	0.000	0.000
922.00	0.130	0.230	0.230
924.00	0.370	0.500	0.730
926.00	0.500	0.870	1.600

Device	Routing	Invert	Outlet Devices
#1	Primary	924.40'	**40.0' long x 1.00' rise Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#2	Primary	924.00'	**6.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=25.23 cfs @ 12.69 hrs HW=924.73' (Free Discharge)
1=Sharp-Crested Rectangular Weir (Weir Controls 24.43 cfs @ 1.87 fps)
2=Orifice/Grate (Orifice Controls 0.81 cfs @ 4.11 fps)

Pond 2 P: P-2


Hydrograph
25.29 cfs
Inflow Area=68.260 ac
Peak Elev=924.73'
Storage=1.016 af
Inflow
Primary
Flow (cfs)
Time (hours)
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
75
80
85
90
95

Summary for Pond 4P: P-4

Inflow Area = 7.860 ac, 5.98% Impervious, Inflow Depth = 0.90" for 2-Year event
Inflow = 3.34 cfs @ 12.85 hrs, Volume= 0.592 af
Outflow = 2.04 cfs @ 13.38 hrs, Volume= 0.592 af, Atten= 39%, Lag= 31.8 min
Primary = 0.63 cfs @ 13.38 hrs, Volume= 0.211 af
Secondary = 1.41 cfs @ 13.38 hrs, Volume= 0.381 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Starting Elev= 915.00' Surf.Area= 0.275 ac Storage= 0.646 af
Peak Elev= 915.44' @ 13.38 hrs Surf.Area= 0.299 ac Storage= 0.773 af (0.127 af above start)

Plug-Flow detention time= (not calculated: initial storage excedes outflow)
Center-of-Mass det. time= 47.6 min (945.4 - 897.8)

Volume	Invert	Avail.Storage	Storage Description
#1	910.90'	1.728 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

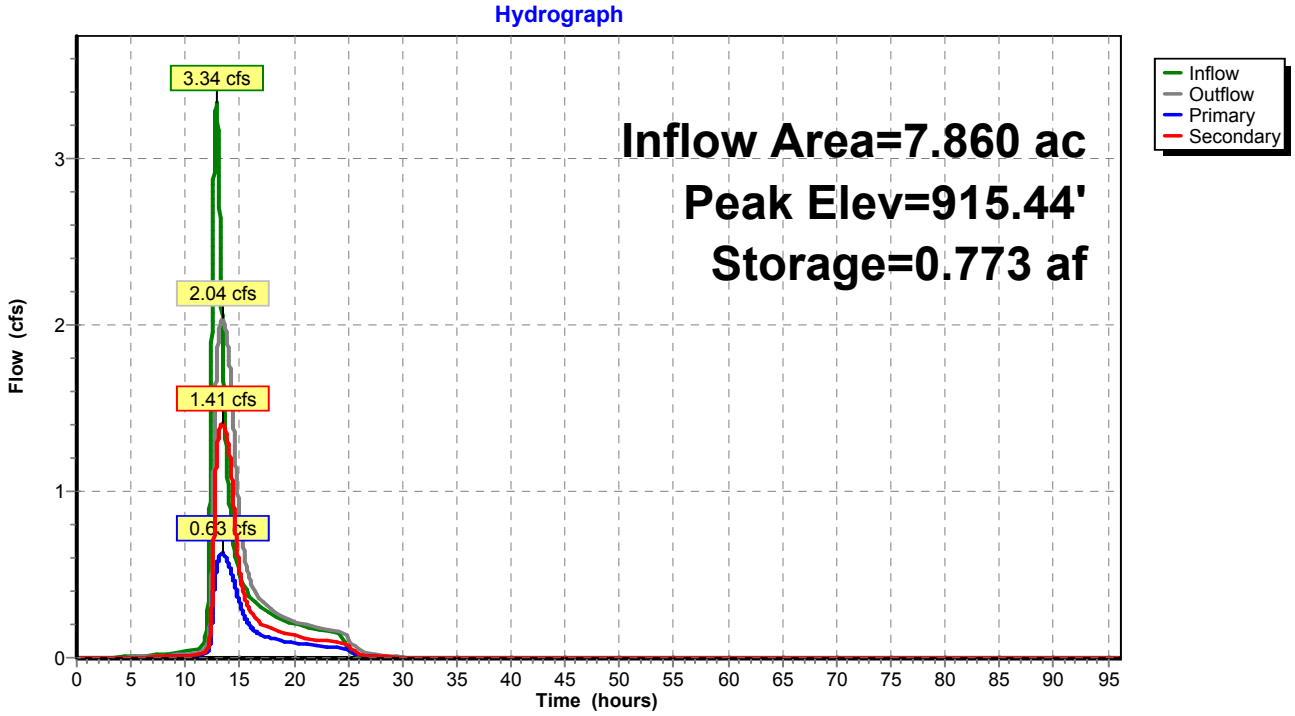
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
910.90	0.070	0.000	0.000
912.00	0.090	0.088	0.088
914.00	0.220	0.310	0.398
916.00	0.330	0.550	0.948
918.00	0.450	0.780	1.728

Device	Routing	Invert	Outlet Devices
#1	Primary	915.00'	**6.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Secondary	915.00'	**9.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Primary	915.95'	**24.0" Round RCP_Round 24"** L= 50.0' RCP, groove end w/headwall, Ke= 0.200 Inlet / Outlet Invert= 915.80' / 915.95' S= -0.0030 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf

Primary OutFlow Max=0.63 cfs @ 13.38 hrs HW=915.44' (Free Discharge)
↑—**1=Orifice/Grate** (Orifice Controls 0.63 cfs @ 3.20 fps)
└—**3=RCP_Round 24"** (Controls 0.00 cfs)

Secondary OutFlow Max=1.42 cfs @ 13.38 hrs HW=915.44' (Free Discharge)
↑—**2=Orifice/Grate** (Orifice Controls 1.42 cfs @ 3.20 fps)

Pond 4P: P-4


Hydrograph
Inflow Area=7.860 ac
Peak Elev=915.44'
Storage=0.773 af
3.34 cfs
2.04 cfs
1.41 cfs
0.63 cfs
Inflow
Outflow
Primary
Secondary
Flow (cfs)
Time (hours)
0
1
2
3
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95

Summary for Pond 7P: P-7

Inflow Area = 29.580 ac, 5.51% Impervious, Inflow Depth = 0.89" for 2-Year event
Inflow = 14.20 cfs @ 12.67 hrs, Volume= 2.206 af
Outflow = 14.20 cfs @ 12.68 hrs, Volume= 2.126 af, Atten= 0%, Lag= 0.8 min
Primary = 13.99 cfs @ 12.68 hrs, Volume= 1.619 af
Secondary = 0.21 cfs @ 12.68 hrs, Volume= 0.506 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Starting Elev= 915.00' Surf.Area= 0.440 ac Storage= 1.062 af
Peak Elev= 915.77' @ 12.68 hrs Surf.Area= 0.532 ac Storage= 1.437 af (0.375 af above start)

Plug-Flow detention time= 775.4 min calculated for 1.063 af (48% of inflow)
Center-of-Mass det. time= 269.5 min (1,157.5 - 887.9)

Volume	Invert	Avail.Storage	Storage Description
#1	910.95'	1.562 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

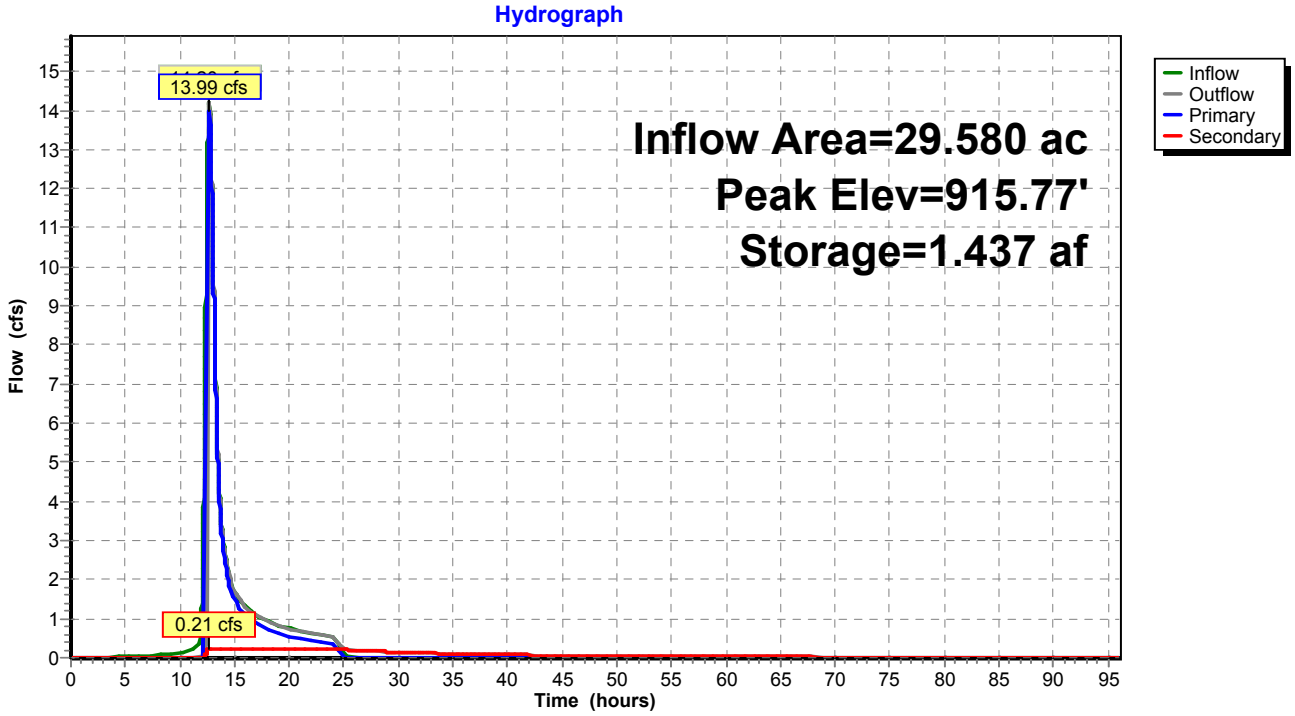
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
910.95	0.110	0.000	0.000
912.00	0.180	0.152	0.152
914.00	0.340	0.520	0.672
915.00	0.440	0.390	1.062
916.00	0.560	0.500	1.562

Device	Routing	Invert	Outlet Devices
#1	Primary	915.00'	**75.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88
#2	Secondary	915.00'	**12.0" Round RCP_Round 12"** L= 50.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 915.00' / 914.75' S= 0.0050 '/' Cc= 0.900 n= 0.130, Flow Area= 0.79 sf

Primary OutFlow Max=30.16 cfs @ 12.68 hrs HW=915.77' TW=915.76' (Fixed TW Elev= 915.76')
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 30.16 cfs @ 0.52 fps)

Secondary OutFlow Max=0.21 cfs @ 12.68 hrs HW=915.77' (Free Discharge)
↑—**2=RCP_Round 12"** (Barrel Controls 0.21 cfs @ 0.45 fps)

Pond 7P: P-7


Hydrograph
Inflow Area=29.580 ac
Peak Elev=915.77'
Storage=1.437 af
13.99 cfs
0.21 cfs
Inflow
Outflow
Primary
Secondary
Flow (cfs)
Time (hours)
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
75
80
85
90
95

Summary for Pond 8P: P-8

Inflow Area = 6.390 ac, 4.85% Impervious, Inflow Depth = 0.88" for 2-Year event
Inflow = 6.95 cfs @ 12.06 hrs, Volume= 0.470 af
Outflow = 1.24 cfs @ 12.64 hrs, Volume= 0.469 af, Atten= 82%, Lag= 34.8 min
Primary = 1.24 cfs @ 12.64 hrs, Volume= 0.469 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Starting Elev= 897.00' Surf.Area= 0.300 ac Storage= 0.495 af
Peak Elev= 897.58' @ 12.64 hrs Surf.Area= 0.387 ac Storage= 0.693 af (0.198 af above start)

Plug-Flow detention time= (not calculated: initial storage excedes outflow)
Center-of-Mass det. time= 253.0 min (1,105.8 - 852.8)

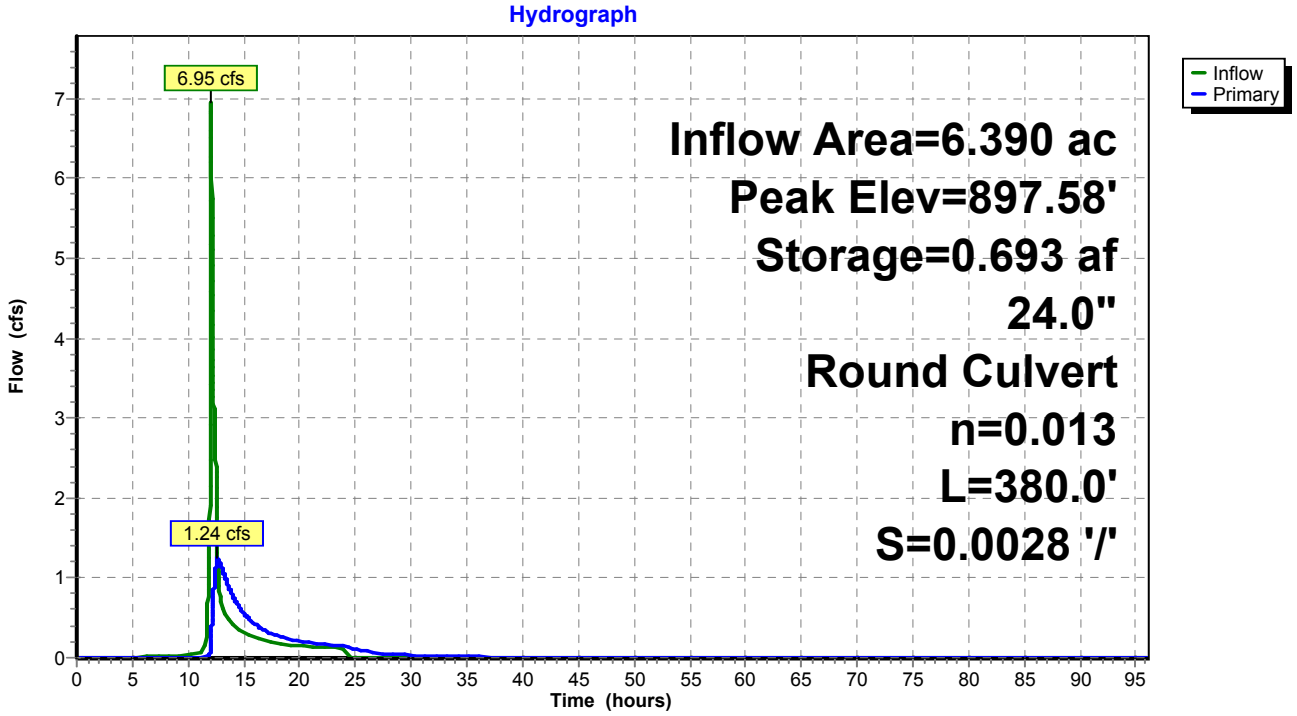
Volume	Invert	Avail.Storage	Storage Description
#1	893.00'	1.850 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
893.00	0.030	0.000	0.000
894.00	0.070	0.050	0.050
896.00	0.150	0.220	0.270
897.00	0.300	0.225	0.495
898.00	0.450	0.375	0.870
900.00	0.530	0.980	1.850

Device	Routing	Invert	Outlet Devices
#1	Primary	897.00'	**24.0" Round RCP_Round 24"** L= 380.0' RCP, groove end w/headwall, Ke= 0.200 Inlet / Outlet Invert= 897.00' / 895.94' S= 0.0028 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf

Primary OutFlow Max=1.24 cfs @ 12.64 hrs HW=897.58' (Free Discharge)
↑—**1=RCP_Round 24"** (Barrel Controls 1.24 cfs @ 2.48 fps)

Pond 8P: P-8


Hydrograph
6.95 cfs
1.24 cfs
Inflow Area=6.390 ac
Peak Elev=897.58'
Storage=0.693 af
24.0"
Round Culvert
n=0.013
L=380.0'
S=0.0028 '/'
Inflow
Primary
Flow (cfs)
Time (hours)
0
1
2
3
4
5
6
7
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95

Summary for Pond 9P: P-9

[81] Warning: Exceeded Pond W-3 by 0.51' @ 12.64 hrs

Inflow Area = 55.360 ac, 3.00% Impervious, Inflow Depth > 0.91" for 2-Year event
Inflow = 26.07 cfs @ 12.55 hrs, Volume= 4.207 af
Outflow = 25.45 cfs @ 12.64 hrs, Volume= 4.207 af, Atten= 2%, Lag= 5.3 min
Primary = 25.45 cfs @ 12.64 hrs, Volume= 4.207 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Starting Elev= 915.00' Surf.Area= 0.210 ac Storage= 0.353 af
Peak Elev= 915.26' @ 12.64 hrs Surf.Area= 0.262 ac Storage= 0.414 af (0.061 af above start)

Plug-Flow detention time= 295.2 min calculated for 3.854 af (92% of inflow)
Center-of-Mass det. time= 2.4 min (1,287.2 - 1,284.8)

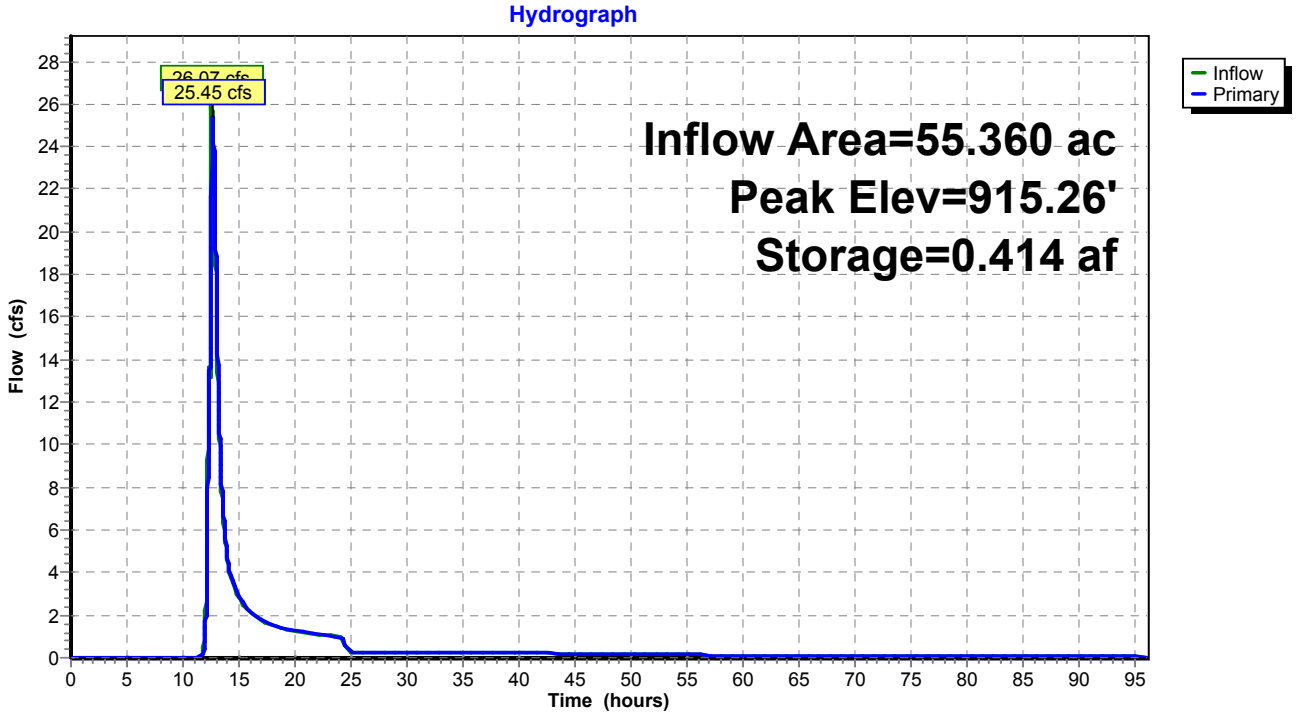
Volume	Invert	Avail.Storage	Storage Description
#1	910.50'	1.673 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
910.50	0.020	0.000	0.000
912.00	0.050	0.052	0.052
913.00	0.070	0.060	0.112
914.00	0.100	0.085	0.198
915.00	0.210	0.155	0.353
916.00	0.410	0.310	0.662
918.00	0.600	1.010	1.673

Device	Routing	Invert	Outlet Devices
#1	Primary	915.00'	**80.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=25.18 cfs @ 12.64 hrs HW=915.26' (Free Discharge)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 25.18 cfs @ 1.22 fps)

Pond 9P: P-9


Hydrograph
26.07 cfs
25.45 cfs
Inflow Area=55.360 ac
Peak Elev=915.26'
Storage=0.414 af
Inflow
Primary
Flow (cfs)
Time (hours)
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
75
80
85
90
95

Summary for Pond 10P: P-10 Lowered 1 ft

[79] Warning: Submerged Pond 8P Primary device # 1 OUTLET by 0.82'

Inflow Area = 66.430 ac, 5.22% Impervious, Inflow Depth > 0.73" for 2-Year event
Inflow = 5.30 cfs @ 13.44 hrs, Volume= 4.047 af
Outflow = 5.04 cfs @ 13.92 hrs, Volume= 4.041 af, Atten= 5%, Lag= 28.9 min
Primary = 5.04 cfs @ 13.92 hrs, Volume= 4.041 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Starting Elev= 896.00' Surf.Area= 0.290 ac Storage= 0.700 af
Peak Elev= 896.76' @ 13.92 hrs Surf.Area= 0.320 ac Storage= 0.930 af (0.230 af above start)

Plug-Flow detention time= 562.5 min calculated for 3.340 af (83% of inflow)
Center-of-Mass det. time= 43.5 min (1,472.3 - 1,428.7)

Volume	Invert	Avail.Storage	Storage Description
#1	892.00'	1.760 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

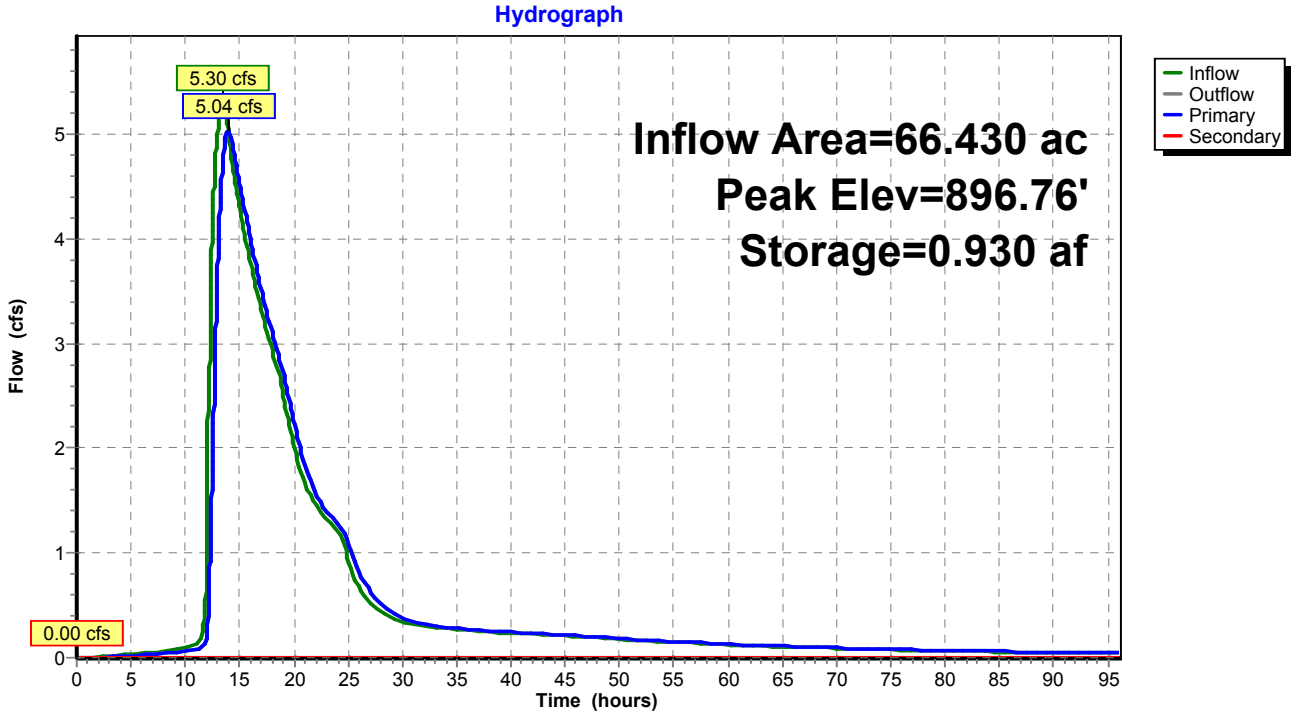
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
892.00	0.120	0.000	0.000
893.00	0.140	0.130	0.130
895.00	0.190	0.330	0.460
896.00	0.290	0.240	0.700
897.00	0.330	0.310	1.010
899.00	0.420	0.750	1.760

Device	Routing	Invert	Outlet Devices
#1	Primary	896.00'	**2.5' long x 1.00' rise Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#2	Secondary	897.40'	**50.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=5.04 cfs @ 13.92 hrs HW=896.76' (Free Discharge)
└**1=Sharp-Crested Rectangular Weir** (Weir Controls 5.04 cfs @ 2.84 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=896.00' (Free Discharge)
└**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 10P: P-10 Lowered 1 ft



Summary for Pond 11P: P-11

Inflow Area = 58.650 ac, 4.89% Impervious, Inflow Depth > 0.95" for 2-Year event
Inflow = 26.76 cfs @ 12.63 hrs, Volume= 4.629 af
Outflow = 7.21 cfs @ 13.59 hrs, Volume= 4.611 af, Atten= 73%, Lag= 57.7 min
Primary = 4.25 cfs @ 13.59 hrs, Volume= 3.443 af
Secondary = 2.96 cfs @ 13.59 hrs, Volume= 1.169 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Starting Elev= 909.00' Surf.Area= 1.210 ac Storage= 3.640 af
Peak Elev= 910.15' @ 13.59 hrs Surf.Area= 1.338 ac Storage= 5.099 af (1.459 af above start)

Plug-Flow detention time= 2,135.5 min calculated for 0.971 af (21% of inflow)
Center-of-Mass det. time= 149.8 min (1,390.5 - 1,240.6)

Volume	Invert	Avail.Storage	Storage Description
#1	905.00'	9.405 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

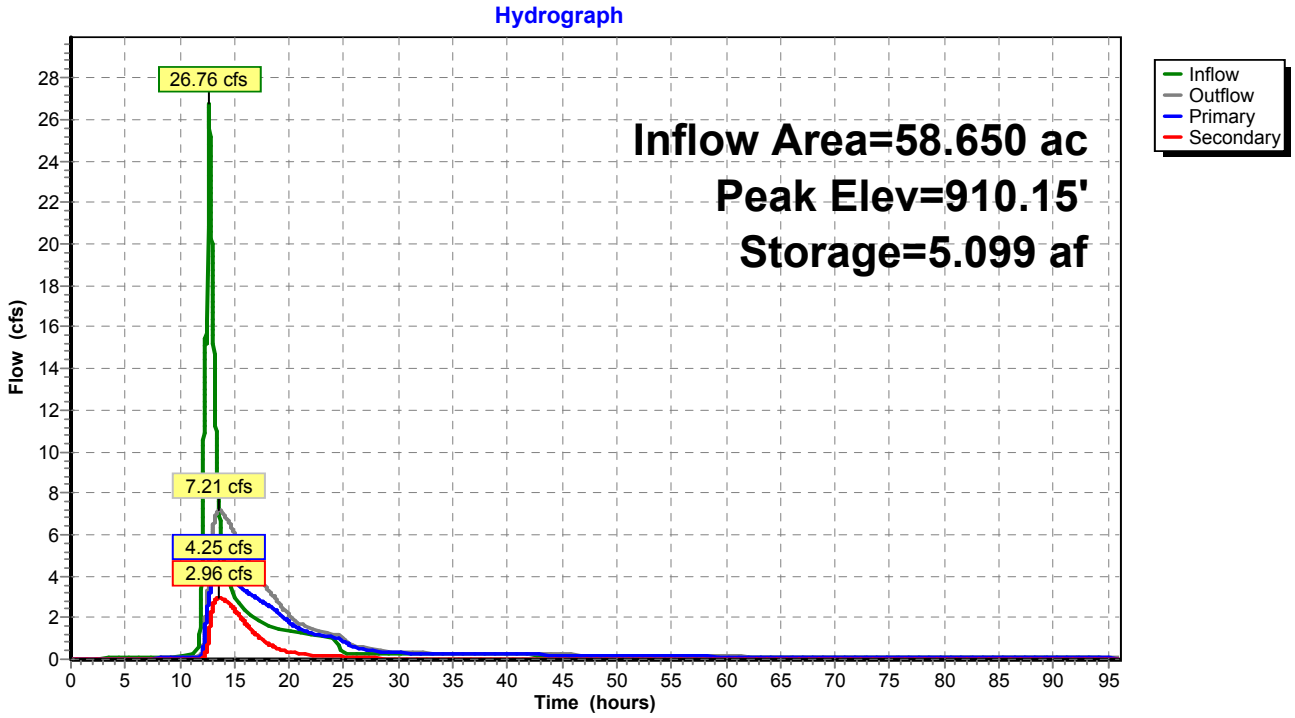
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
905.00	0.760	0.000	0.000
906.00	0.820	0.790	0.790
908.00	0.950	1.770	2.560
909.00	1.210	1.080	3.640
910.00	1.320	1.265	4.905
912.00	1.560	2.880	7.785
913.00	1.680	1.620	9.405

Device	Routing	Invert	Outlet Devices
#1	Primary	909.00'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	910.00'	**24.0" Round RCP_Round 24"** L= 200.0' RCP, groove end w/headwall, Ke= 0.200 Inlet / Outlet Invert= 910.00' / 909.00' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#3	Primary	910.00'	**24.0" Round RCP_Round 24"** L= 200.0' RCP, groove end w/headwall, Ke= 0.200 Inlet / Outlet Invert= 910.00' / 909.00' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#4	Primary	912.00'	**60.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88
#5	Secondary	909.00'	**12.0" Round RCP_Round 12"** L= 150.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 909.00' / 908.00' S= 0.0067 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=4.23 cfs @ 13.59 hrs HW=910.15' (Free Discharge)
- **1=Orifice/Grate** (Orifice Controls 4.05 cfs @ 5.15 fps)
- **2=RCP_Round 24"** (Barrel Controls 0.09 cfs @ 1.39 fps)
- **3=RCP_Round 24"** (Barrel Controls 0.09 cfs @ 1.39 fps)
- **4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Secondary OutFlow Max=2.97 cfs @ 13.59 hrs HW=910.15' (Free Discharge)
- **5=RCP_Round 12"** (Barrel Controls 2.97 cfs @ 4.13 fps)

Pond 11P: P-11



Summary for Pond 12P: P-12

[61] Hint: Exceeded Reach 43R outlet invert by 0.33' @ 16.74 hrs

Inflow Area = 79.640 ac, 7.40% Impervious, Inflow Depth > 0.97" for 2-Year event
Inflow = 16.41 cfs @ 12.03 hrs, Volume= 6.433 af
Outflow = 5.86 cfs @ 16.74 hrs, Volume= 6.414 af, Atten= 64%, Lag= 282.9 min
Primary = 5.86 cfs @ 16.74 hrs, Volume= 6.414 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Starting Elev= 893.00' Surf.Area= 1.640 ac Storage= 5.075 af
Peak Elev= 893.56' @ 16.74 hrs Surf.Area= 1.713 ac Storage= 6.021 af (0.946 af above start)

Plug-Flow detention time= 2,090.3 min calculated for 1.339 af (21% of inflow)
Center-of-Mass det. time= 121.8 min (1,470.4 - 1,348.7)

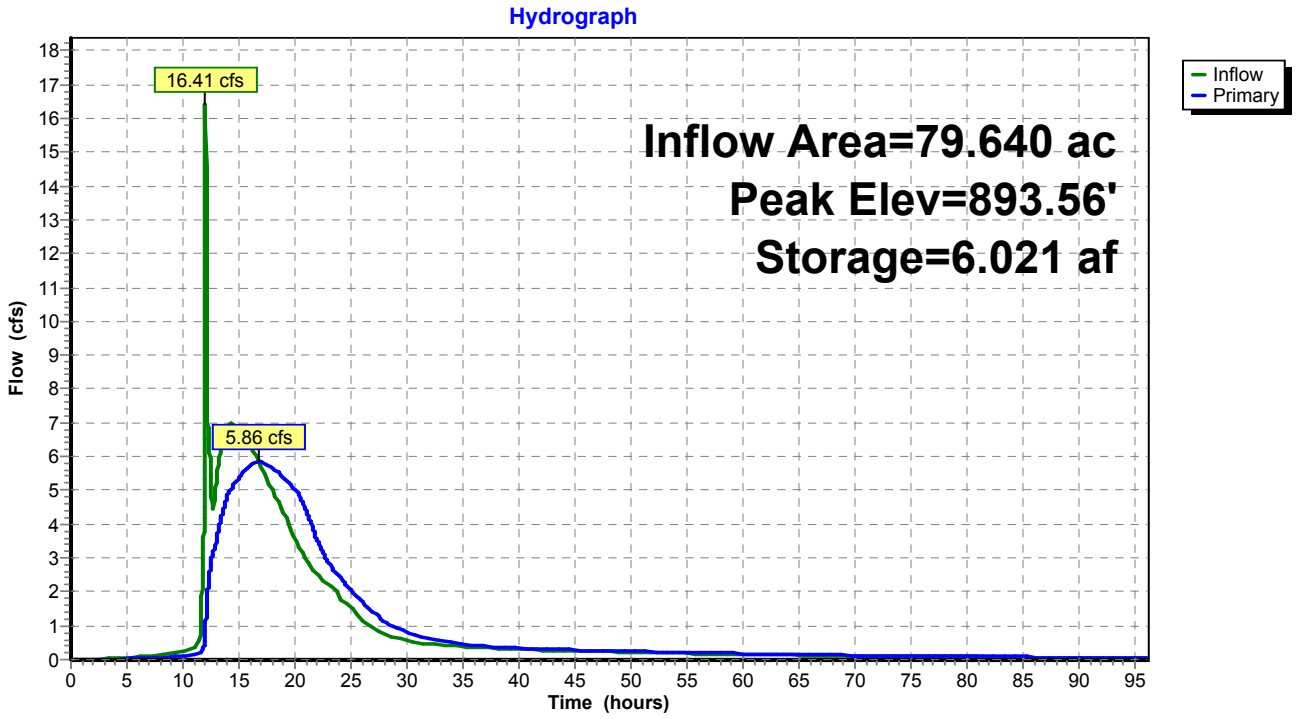
Volume	Invert	Avail.Storage	Storage Description
#1	889.00'	10.590 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
889.00	1.070	0.000	0.000
890.00	1.150	1.110	1.110
892.00	1.330	2.480	3.590
893.00	1.640	1.485	5.075
894.00	1.770	1.705	6.780
896.00	2.040	3.810	10.590

Device	Routing	Invert	Outlet Devices
#1	Primary	893.00'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	893.00'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Primary	893.50'	**43.8" W x 26.6" H, R=22.5"/62.0" Arch RCP_Arch 44x27** L= 30.0' Box, 30-75° wingwalls, rounded crown, Ke= 0.200 Inlet / Outlet Invert= 893.50' / 893.35' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 6.29 sf
#4	Primary	893.50'	**43.8" W x 26.6" H, R=22.5"/62.0" Arch RCP_Arch 44x27** L= 30.0' Box, 30-75° wingwalls, rounded crown, Ke= 0.200 Inlet / Outlet Invert= 893.50' / 893.35' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 6.29 sf
#5	Primary	893.50'	**43.8" W x 26.6" H, R=22.5"/62.0" Arch RCP_Arch 44x27** L= 30.0' Box, 30-75° wingwalls, rounded crown, Ke= 0.200 Inlet / Outlet Invert= 893.50' / 893.35' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 6.29 sf
#6	Primary	893.50'	**43.8" W x 26.6" H, R=22.5"/62.0" Arch RCP_Arch 44x27** L= 30.0' Box, 30-75° wingwalls, rounded crown, Ke= 0.200 Inlet / Outlet Invert= 893.50' / 893.35' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 6.29 sf

Primary OutFlow Max=5.83 cfs @ 16.74 hrs HW=893.56' (Free Discharge)
- **1=Orifice/Grate** (Orifice Controls 2.84 cfs @ 3.62 fps)
- **2=Orifice/Grate** (Orifice Controls 2.84 cfs @ 3.62 fps)
- **3=RCP_Arch 44x27** (Barrel Controls 0.04 cfs @ 0.82 fps)
- **4=RCP_Arch 44x27** (Barrel Controls 0.04 cfs @ 0.82 fps)
- **5=RCP_Arch 44x27** (Barrel Controls 0.04 cfs @ 0.82 fps)
- **6=RCP_Arch 44x27** (Barrel Controls 0.04 cfs @ 0.82 fps)

Pond 12P: P-12



Summary for Pond 13P: P-13

Inflow Area = 237.775 ac, 9.20% Impervious, Inflow Depth > 0.97" for 2-Year event
Inflow = 99.37 cfs @ 12.38 hrs, Volume= 19.294 af
Outflow = 91.69 cfs @ 12.52 hrs, Volume= 19.290 af, Atten= 8%, Lag= 8.4 min
Primary = 86.39 cfs @ 12.52 hrs, Volume= 18.503 af
Secondary = 5.30 cfs @ 12.52 hrs, Volume= 0.787 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Starting Elev= 883.00' Surf.Area= 1.870 ac Storage= 4.265 af
Peak Elev= 883.70' @ 12.52 hrs Surf.Area= 2.114 ac Storage= 5.656 af (1.391 af above start)

Plug-Flow detention time= 341.5 min calculated for 15.023 af (78% of inflow)
Center-of-Mass det. time= 21.8 min (1,082.9 - 1,061.2)

Volume	Invert	Avail.Storage	Storage Description
#1	878.00'	11.490 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
878.00	0.000	0.000	0.000
879.00	0.630	0.315	0.315
880.00	0.730	0.680	0.995
882.00	1.070	1.800	2.795
883.00	1.870	1.470	4.265
884.00	2.220	2.045	6.310
886.00	2.960	5.180	11.490

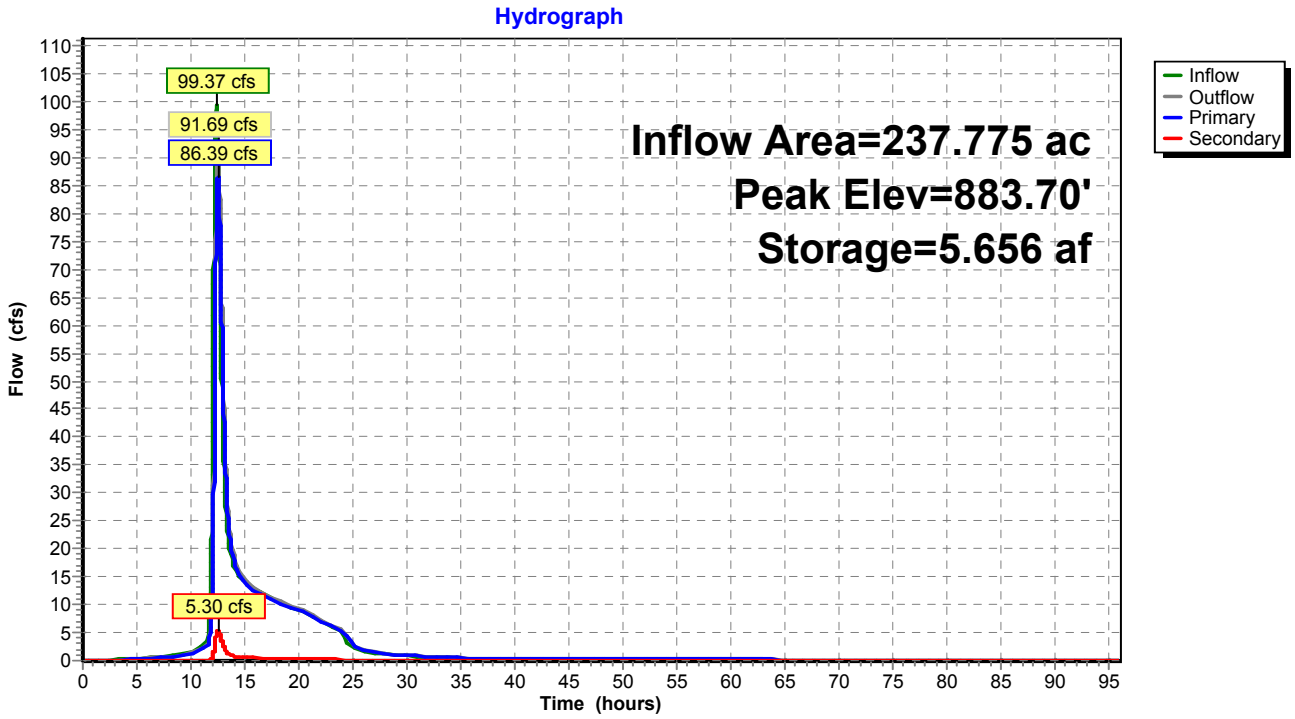
Device	Routing	Invert	Outlet Devices
#1	Primary	883.00'	**55.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88
#2	Secondary	883.00'	**12.0" Round RCP_Round 12"** L= 100.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 883.00' / 882.75' S= 0.0025 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#3	Secondary	883.00'	**12.0" Round RCP_Round 12"** L= 100.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 883.00' / 882.75' S= 0.0025 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#4	Secondary	883.00'	**12.0" Round RCP_Round 12"** L= 100.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 883.00' / 882.75' S= 0.0025 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#5	Secondary	883.00'	**12.0" Round RCP_Round 12"** L= 100.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 883.00' / 882.75' S= 0.0025 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

#6 Secondary 883.00' **12.0" Round RCP_Round 12"**
L= 100.0' RCP, groove end projecting, Ke= 0.200
Inlet / Outlet Invert= 883.00' / 882.75' S= 0.0025 '/' Cc= 0.900
n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=86.32 cfs @ 12.52 hrs HW=883.70' (Free Discharge)
└─**1=Broad-Crested Rectangular Weir** (Weir Controls 86.32 cfs @ 2.25 fps)

Secondary OutFlow Max=5.30 cfs @ 12.52 hrs HW=883.70' (Free Discharge)
├─**2=RCP_Round 12"** (Barrel Controls 1.06 cfs @ 2.54 fps)
├─**3=RCP_Round 12"** (Barrel Controls 1.06 cfs @ 2.54 fps)
├─**4=RCP_Round 12"** (Barrel Controls 1.06 cfs @ 2.54 fps)
├─**5=RCP_Round 12"** (Barrel Controls 1.06 cfs @ 2.54 fps)
└─**6=RCP_Round 12"** (Barrel Controls 1.06 cfs @ 2.54 fps)

Pond 13P: P-13



Summary for Pond 17P: W-2

[81] Warning: Exceeded Pond P-5/P-6 by 0.19' @ 31.21 hrs

Inflow	=	1.50 cfs @	12.76 hrs,	Volume=	0.686 af
Outflow	=	0.39 cfs @	19.02 hrs,	Volume=	0.541 af, Atten= 74%, Lag= 375.8 min
Primary	=	0.39 cfs @	19.02 hrs,	Volume=	0.541 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Peak Elev= 929.37' @ 19.02 hrs Surf.Area= 1.154 ac Storage= 0.420 af

Plug-Flow detention time= 869.9 min calculated for 0.541 af (79% of inflow)
Center-of-Mass det. time= 755.7 min (1,755.9 - 1,000.2)

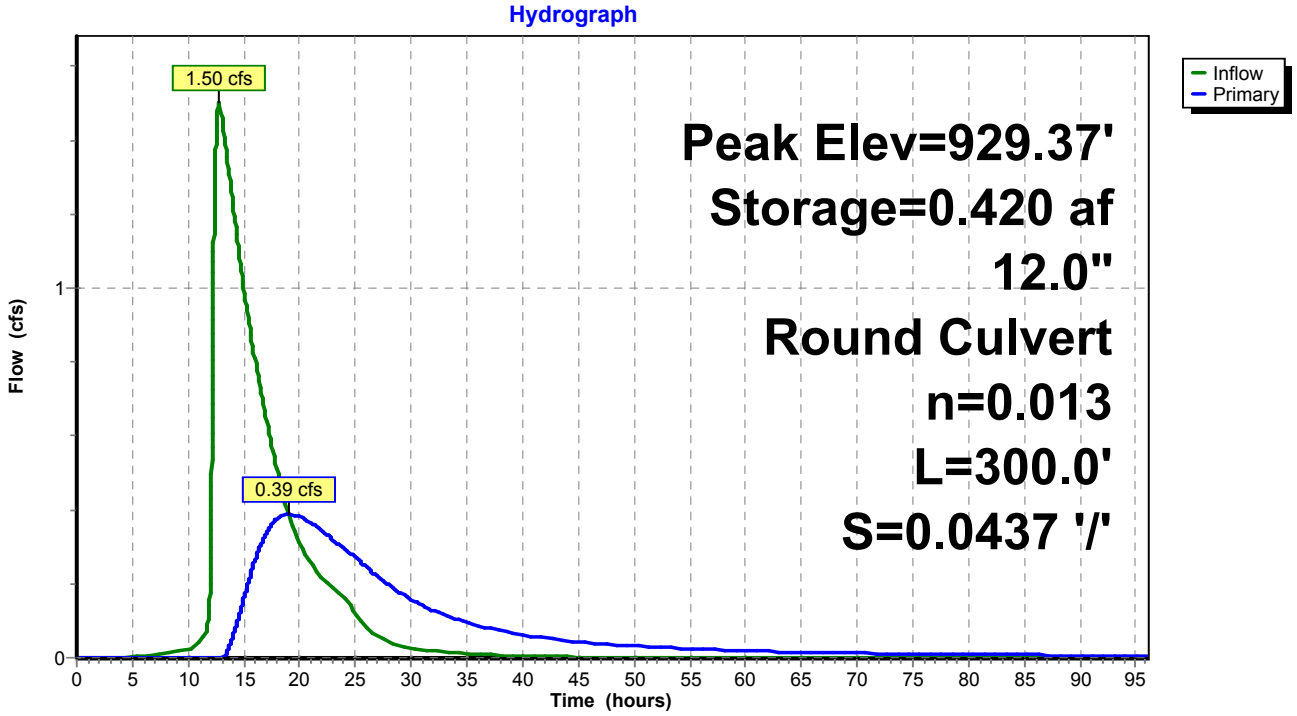
Volume	Invert	Avail.Storage	Storage Description
#1	929.00'	1.175 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
929.00	1.090	0.000	0.000
930.00	1.260	1.175	1.175

Device	Routing	Invert	Outlet Devices
#1	Primary	929.10'	**12.0" Round RCP_Round 12"** L= 300.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 929.10' / 916.00' S= 0.0437 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=0.39 cfs @ 19.02 hrs HW=929.37' (Free Discharge)
1=RCP_Round 12" (Inlet Controls 0.39 cfs @ 2.23 fps)

Pond 17P: W-2


Hydrograph
1.50 cfs
0.39 cfs
Peak Elev=929.37'
Storage=0.420 af
12.0"
Round Culvert
n=0.013
L=300.0'
S=0.0437 '/'
Inflow
Primary
Flow (cfs)
Time (hours)
0
1
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95

Summary for Pond 36P: Culverts passing flow beneath Spine Road

Inflow Area = 52.790 ac, 0.00% Impervious, Inflow Depth = 0.80" for 2-Year event
Inflow = 26.87 cfs @ 12.48 hrs, Volume= 3.502 af
Outflow = 26.87 cfs @ 12.48 hrs, Volume= 3.502 af, Atten= 0%, Lag= 0.0 min
Primary = 26.87 cfs @ 12.48 hrs, Volume= 3.502 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Peak Elev= 887.11' @ 12.48 hrs Surf.Area= 0.000 ac Storage= 0.000 af

Plug-Flow detention time= 0.0 min calculated for 3.502 af (100% of inflow)
Center-of-Mass det. time= 0.0 min (892.6 - 892.6)

Volume	Invert	Avail.Storage	Storage Description
#1	887.00'	0.026 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
887.00	0.000	0.000	0.000
887.50	0.002	0.001	0.001
890.50	0.007	0.014	0.014
892.00	0.009	0.012	0.026

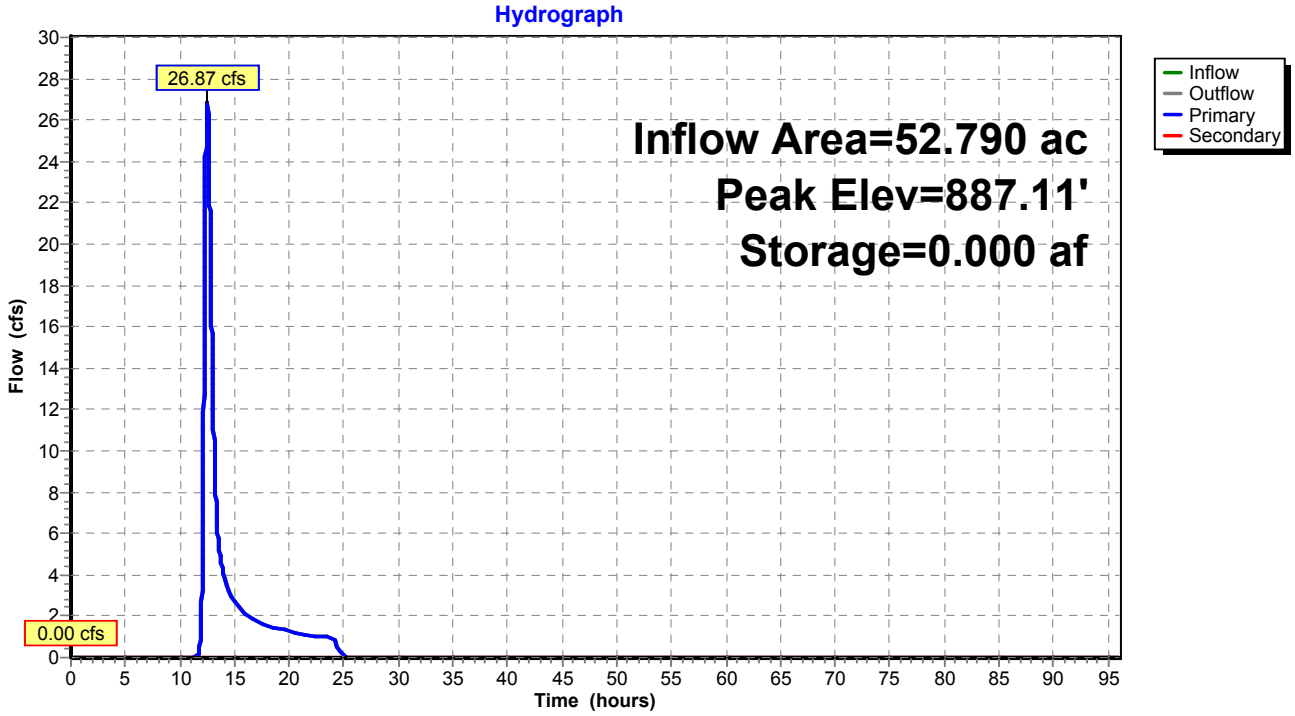
Device	Routing	Invert	Outlet Devices
#1	Primary	887.00'	**Special & User-Defined** Head (feet) 0.00 0.10 0.20 0.30 0.40 0.50 Disch. (cfs) 0.000 25.000 50.000 75.000 100.000 127.000
#2	Secondary	887.50'	**18.0" Round RCP_Round 18"** L= 100.0' RCP, groove end w/headwall, Ke= 0.200 Inlet / Outlet Invert= 887.50' / 886.50' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#3	Secondary	887.50'	**18.0" Round RCP_Round 18"** L= 100.0' RCP, groove end w/headwall, Ke= 0.200 Inlet / Outlet Invert= 887.50' / 886.50' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#4	Secondary	887.50'	**18.0" Round RCP_Round 18"** L= 100.0' RCP, groove end w/headwall, Ke= 0.200 Inlet / Outlet Invert= 887.50' / 886.50' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#5	Secondary	887.50'	**18.0" Round RCP_Round 18"** L= 100.0' RCP, groove end w/headwall, Ke= 0.200 Inlet / Outlet Invert= 887.50' / 886.50' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#6	Secondary	887.50'	**18.0" Round RCP_Round 18"** L= 100.0' RCP, groove end w/headwall, Ke= 0.200 Inlet / Outlet Invert= 887.50' / 886.50' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#7	Secondary	887.50'	**18.0" Round RCP_Round 18"** L= 100.0' RCP, groove end w/headwall, Ke= 0.200

			Inlet / Outlet Invert= 887.50' / 886.50' S= 0.0100 '/' Cc= 0.900
			n= 0.013, Flow Area= 1.77 sf
#8	Secondary	887.50'	**18.0" Round RCP_Round 18"**
			L= 100.0' RCP, groove end w/headwall, Ke= 0.200
			Inlet / Outlet Invert= 887.50' / 886.50' S= 0.0100 '/' Cc= 0.900
			n= 0.013, Flow Area= 1.77 sf
#9	Secondary	887.50'	**18.0" Round RCP_Round 18"**
			L= 100.0' RCP, groove end w/headwall, Ke= 0.200
			Inlet / Outlet Invert= 887.50' / 886.50' S= 0.0100 '/' Cc= 0.900
			n= 0.013, Flow Area= 1.77 sf

Primary OutFlow Max=26.87 cfs @ 12.48 hrs HW=887.11' (Free Discharge)
└─**1=Special & User-Defined** (Custom Controls 26.87 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=887.00' (Free Discharge)
- **2=RCP_Round 18"** (Controls 0.00 cfs)
- **3=RCP_Round 18"** (Controls 0.00 cfs)
- **4=RCP_Round 18"** (Controls 0.00 cfs)
- **5=RCP_Round 18"** (Controls 0.00 cfs)
- **6=RCP_Round 18"** (Controls 0.00 cfs)
- **7=RCP_Round 18"** (Controls 0.00 cfs)
- **8=RCP_Round 18"** (Controls 0.00 cfs)
- **9=RCP_Round 18"** (Controls 0.00 cfs)

Pond 36P: Culverts passing flow beneath Spine Road



Summary for Pond CRH-1: CRH-1

Inflow Area = 6.955 ac, 46.76% Impervious, Inflow Depth = 1.63" for 2-Year event
Inflow = 10.87 cfs @ 12.15 hrs, Volume= 0.947 af
Outflow = 4.86 cfs @ 12.47 hrs, Volume= 0.947 af, Atten= 55%, Lag= 19.3 min
Discarded = 0.22 cfs @ 12.47 hrs, Volume= 0.467 af
Primary = 4.63 cfs @ 12.47 hrs, Volume= 0.480 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Peak Elev= 877.67' @ 12.47 hrs Surf.Area= 0.275 ac Storage= 0.356 af

Plug-Flow detention time= 271.9 min calculated for 0.947 af (100% of inflow)
Center-of-Mass det. time= 271.9 min (1,066.6 - 794.7)

Volume	Invert	Avail.Storage	Storage Description
#1	876.00'	0.850 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

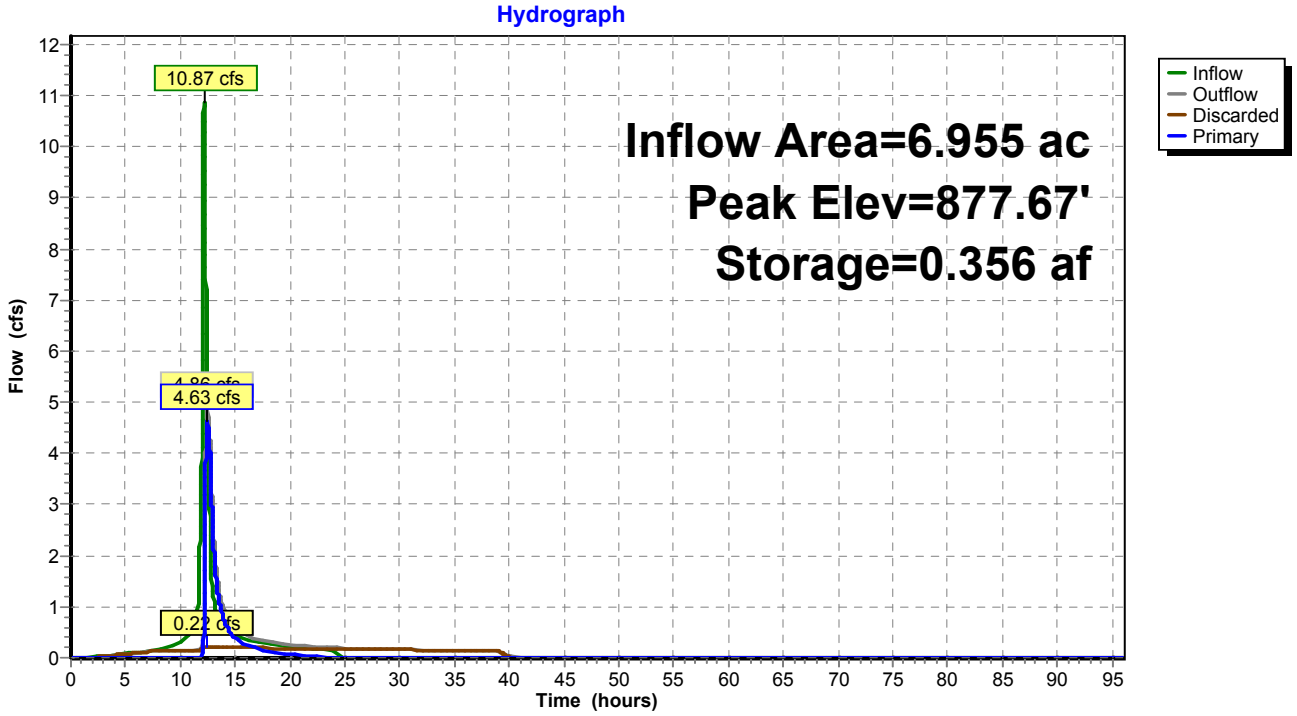
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
876.00	0.150	0.000	0.000
878.00	0.300	0.450	0.450
879.00	0.500	0.400	0.850

Device	Routing	Invert	Outlet Devices
#1	Discarded	876.00'	**0.800 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 0.00'
#2	Primary	877.00'	**24.0" Round Culvert** L= 155.0' Ke= 0.500 Inlet / Outlet Invert= 877.00' / 876.00' S= 0.0065 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#3	Primary	877.00'	**24.0" Round Culvert** L= 155.0' Ke= 0.500 Inlet / Outlet Invert= 877.00' / 876.00' S= 0.0065 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf

Discarded OutFlow Max=0.22 cfs @ 12.47 hrs HW=877.67' (Free Discharge)
└**1=Exfiltration** (Controls 0.22 cfs)

Primary OutFlow Max=4.63 cfs @ 12.47 hrs HW=877.67' (Free Discharge)
├**2=Culvert** (Barrel Controls 2.32 cfs @ 3.73 fps)
└**3=Culvert** (Barrel Controls 2.32 cfs @ 3.73 fps)

Pond CRH-1: CRH-1



Summary for Pond CRH-2: CRH-2

Inflow Area = 10.214 ac, 37.73% Impervious, Inflow Depth = 1.47" for 2-Year event
Inflow = 12.67 cfs @ 12.22 hrs, Volume= 1.253 af
Outflow = 2.69 cfs @ 12.87 hrs, Volume= 1.253 af, Atten= 79%, Lag= 38.9 min
Discarded = 0.33 cfs @ 12.87 hrs, Volume= 0.826 af
Primary = 2.36 cfs @ 12.87 hrs, Volume= 0.427 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Peak Elev= 882.05' @ 12.87 hrs Surf.Area= 0.405 ac Storage= 0.620 af

Plug-Flow detention time= 502.7 min calculated for 1.253 af (100% of inflow)
Center-of-Mass det. time= 502.8 min (1,310.0 - 807.2)

Volume	Invert	Avail.Storage	Storage Description
#1	880.00'	1.600 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

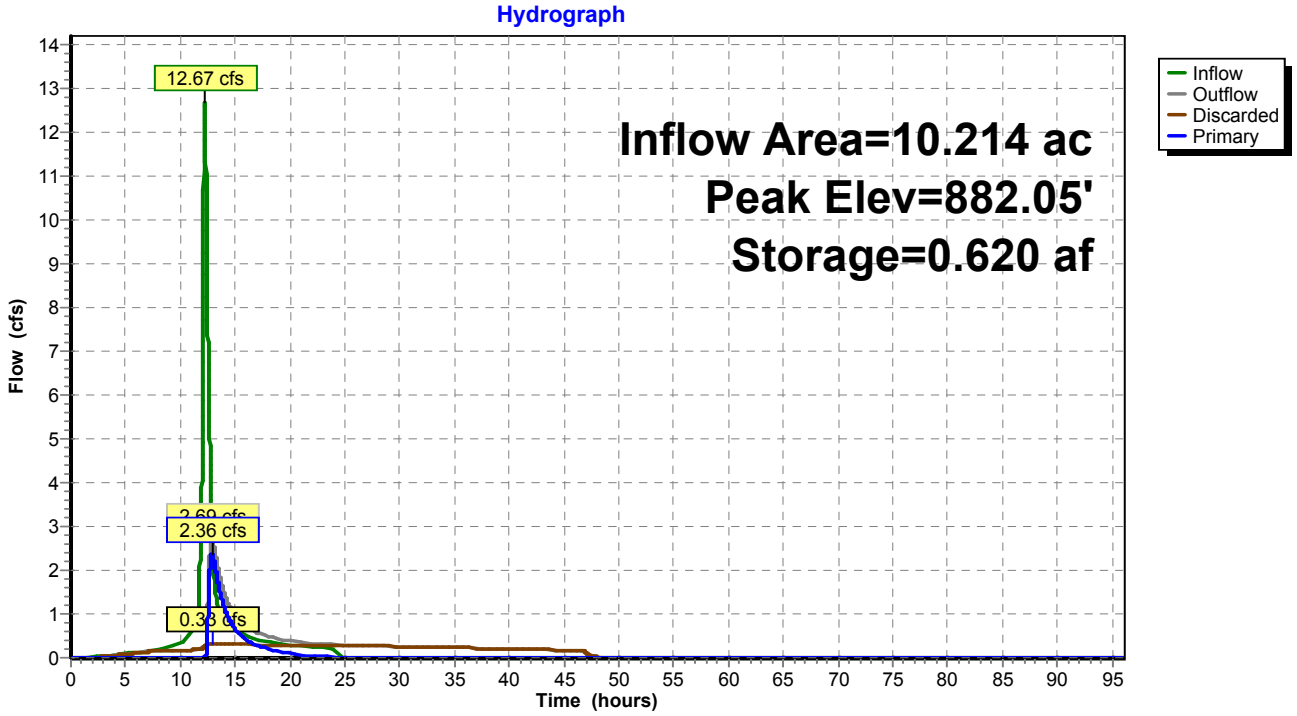
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
880.00	0.200	0.000	0.000
882.00	0.400	0.600	0.600
884.00	0.600	1.000	1.600

Device	Routing	Invert	Outlet Devices
#1	Primary	881.50'	**24.0" Round Culvert** L= 155.0' Ke= 0.500 Inlet / Outlet Invert= 881.50' / 881.00' S= 0.0032 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#2	Primary	881.50'	**24.0" Round Culvert** L= 155.0' Ke= 0.500 Inlet / Outlet Invert= 881.50' / 881.00' S= 0.0032 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#3	Discarded	880.00'	**0.800 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 0.00'

Discarded OutFlow Max=0.33 cfs @ 12.87 hrs HW=882.05' (Free Discharge)
└**3=Exfiltration** (Controls 0.33 cfs)

Primary OutFlow Max=2.36 cfs @ 12.87 hrs HW=882.05' (Free Discharge)
├**1=Culvert** (Barrel Controls 1.18 cfs @ 2.53 fps)
└**2=Culvert** (Barrel Controls 1.18 cfs @ 2.53 fps)

Pond CRH-2: CRH-2



Summary for Pond CRH-3: CRH-3

Inflow Area = 11.815 ac, 36.95% Impervious, Inflow Depth = 0.62" for 2-Year event
Inflow = 2.97 cfs @ 12.04 hrs, Volume= 0.610 af
Outflow = 1.22 cfs @ 14.06 hrs, Volume= 0.610 af, Atten= 59%, Lag= 121.2 min
Discarded = 0.20 cfs @ 14.06 hrs, Volume= 0.378 af
Primary = 1.02 cfs @ 14.06 hrs, Volume= 0.232 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Peak Elev= 878.31' @ 14.06 hrs Surf.Area= 0.248 ac Storage= 0.262 af

Plug-Flow detention time= 350.0 min calculated for 0.610 af (100% of inflow)
Center-of-Mass det. time= 350.0 min (1,206.9 - 856.9)

Volume	Invert	Avail.Storage	Storage Description
#1	877.00'	0.850 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

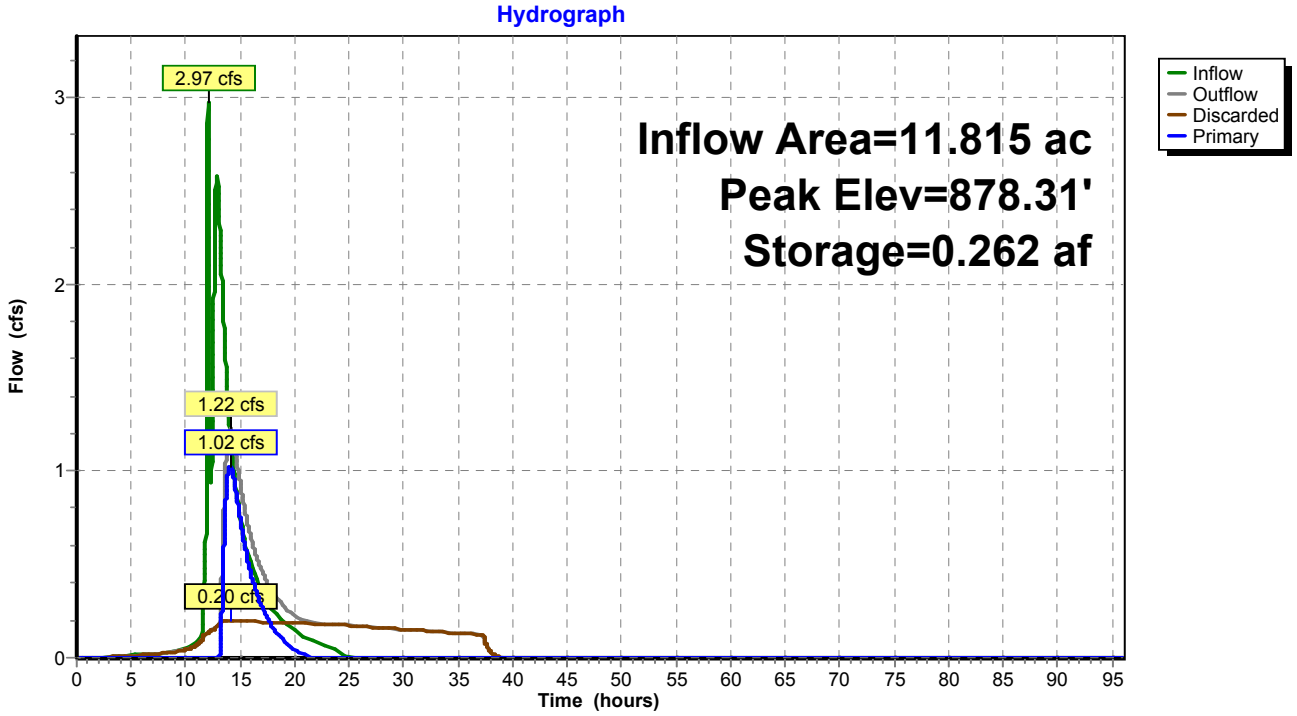
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
877.00	0.150	0.000	0.000
879.00	0.300	0.450	0.450
880.00	0.500	0.400	0.850

Device	Routing	Invert	Outlet Devices
#1	Discarded	877.00'	**0.800 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 0.00'
#2	Primary	878.00'	**24.0" Round Culvert** L= 155.0' Ke= 0.500 Inlet / Outlet Invert= 878.00' / 877.00' S= 0.0065 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#3	Primary	878.00'	**24.0" Round Culvert** L= 155.0' Ke= 0.500 Inlet / Outlet Invert= 878.00' / 877.00' S= 0.0065 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf

Discarded OutFlow Max=0.20 cfs @ 14.06 hrs HW=878.31' (Free Discharge)
└**1=Exfiltration** (Controls 0.20 cfs)

Primary OutFlow Max=1.02 cfs @ 14.06 hrs HW=878.31' (Free Discharge)
├**2=Culvert** (Barrel Controls 0.51 cfs @ 2.48 fps)
└**3=Culvert** (Barrel Controls 0.51 cfs @ 2.48 fps)

Pond CRH-3: CRH-3



Summary for Pond P-5/P-6: P-5/P-6

Inflow Area = 43.346 ac, 18.61% Impervious, Inflow Depth = 1.13" for 2-Year event
Inflow = 44.72 cfs @ 12.15 hrs, Volume= 4.086 af
Outflow = 10.26 cfs @ 12.76 hrs, Volume= 4.083 af, Atten= 77%, Lag= 36.4 min
Primary = 8.76 cfs @ 12.76 hrs, Volume= 3.398 af
Secondary = 1.50 cfs @ 12.76 hrs, Volume= 0.686 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Starting Elev= 929.00' Surf.Area= 1.975 ac Storage= 5.062 af
Peak Elev= 929.88' @ 12.76 hrs Surf.Area= 2.207 ac Storage= 6.893 af (1.830 af above start)

Plug-Flow detention time= (not calculated: initial storage excedes outflow)
Center-of-Mass det. time= 215.9 min (1,043.4 - 827.5)

Volume	Invert	Avail.Storage	Storage Description
#1	926.00'	14.650 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

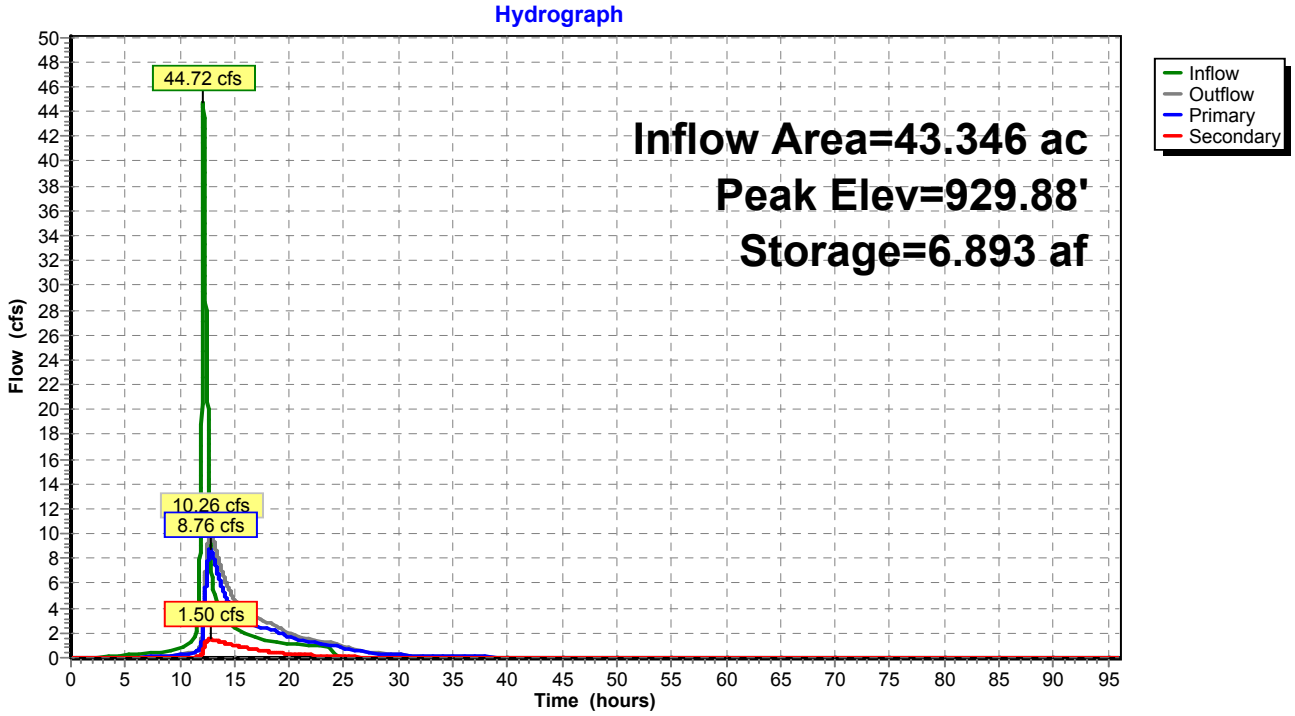
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
926.00	1.510	0.000	0.000
928.00	1.710	3.220	3.220
930.00	2.240	3.950	7.170
931.00	2.400	2.320	9.490
933.00	2.760	5.160	14.650

Device	Routing	Invert	Outlet Devices
#1	Primary	929.00'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	929.50'	**7.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#3	Primary	930.50'	**14.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#4	Secondary	929.00'	**9.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=8.75 cfs @ 12.76 hrs HW=929.88' (Free Discharge)
- **1=Orifice/Grate** (Orifice Controls 3.54 cfs @ 4.50 fps)
- **2=Sharp-Crested Rectangular Weir** (Weir Controls 5.21 cfs @ 2.00 fps)
- **3=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Secondary OutFlow Max=1.50 cfs @ 12.76 hrs HW=929.88' (Free Discharge)
- **4=Orifice/Grate** (Orifice Controls 1.50 cfs @ 3.41 fps)

Pond P-5/P-6: P-5/P-6



Summary for Pond TI P: Thumb Infiltration (Thumb TP load only)

Inflow Area = 48.539 ac, 11.38% Impervious, Inflow Depth = 0.36" for 2-Year event
Inflow = 10.90 cfs @ 12.32 hrs, Volume= 1.436 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= 0.00-96.00 hrs, dt= 0.01 hrs
Peak Elev= 901.44' @ 26.34 hrs Surf.Area= 1.000 ac Storage= 1.436 af

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

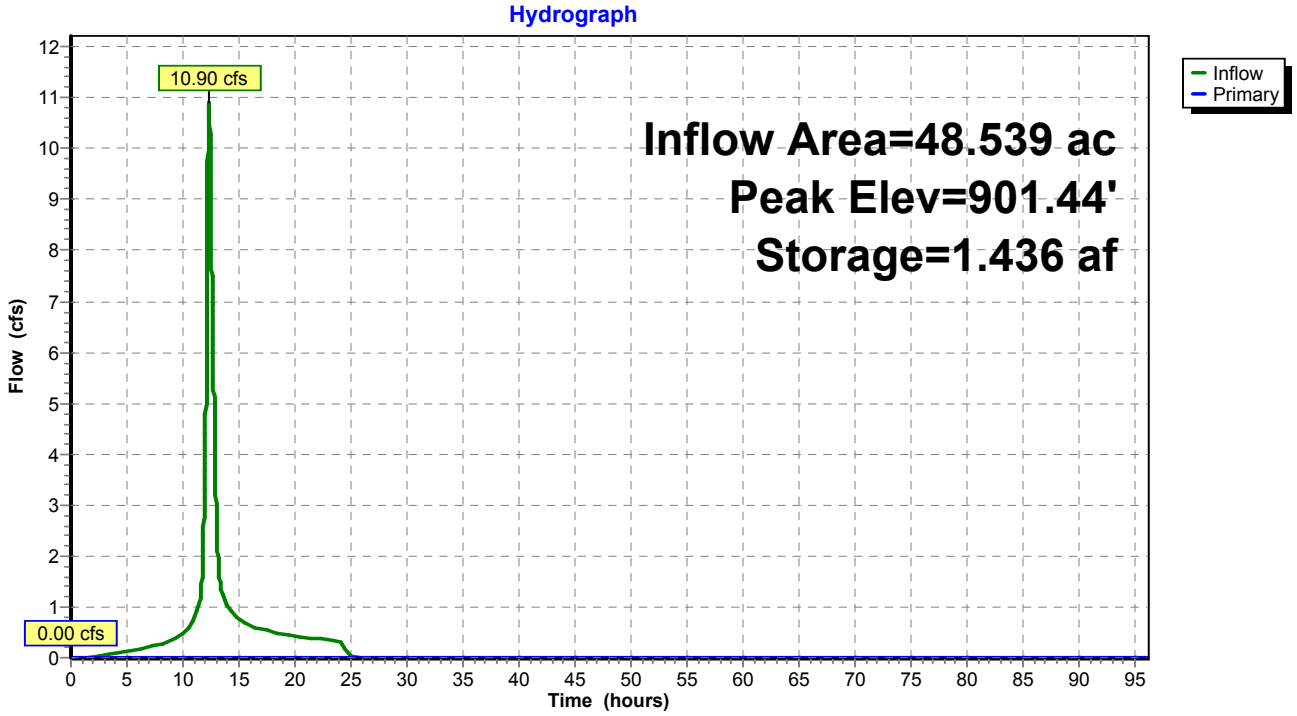
Volume	Invert	Avail.Storage	Storage Description
#1	900.00'	5.000 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
900.00	1.000	0.000	0.000
901.00	1.000	1.000	1.000
902.00	1.000	1.000	2.000
903.00	1.000	1.000	3.000
904.00	1.000	1.000	4.000
905.00	1.000	1.000	5.000

Device	Routing	Invert	Outlet Devices
#1	Primary	903.74'	**1,000.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s) 5.0' Crest Height

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=900.00' (Free Discharge)
↑—**1=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond TI P: Thumb Infiltration (Thumb TP load only)



Summary for Pond W-1: W-1

Inflow Area = 1.000 ac, 10.00% Impervious, Inflow Depth = 5.57" for 2-Year event
Inflow = 1.52 cfs @ 13.32 hrs, Volume= 0.464 af
Outflow = 1.04 cfs @ 14.38 hrs, Volume= 0.464 af, Atten= 31%, Lag= 63.8 min
Primary = 1.04 cfs @ 14.38 hrs, Volume= 0.464 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Peak Elev= 914.97' @ 14.38 hrs Surf.Area= 0.695 ac Storage= 0.147 af

Plug-Flow detention time= 150.2 min calculated for 0.464 af (100% of inflow)
Center-of-Mass det. time= 150.5 min (1,069.7 - 919.2)

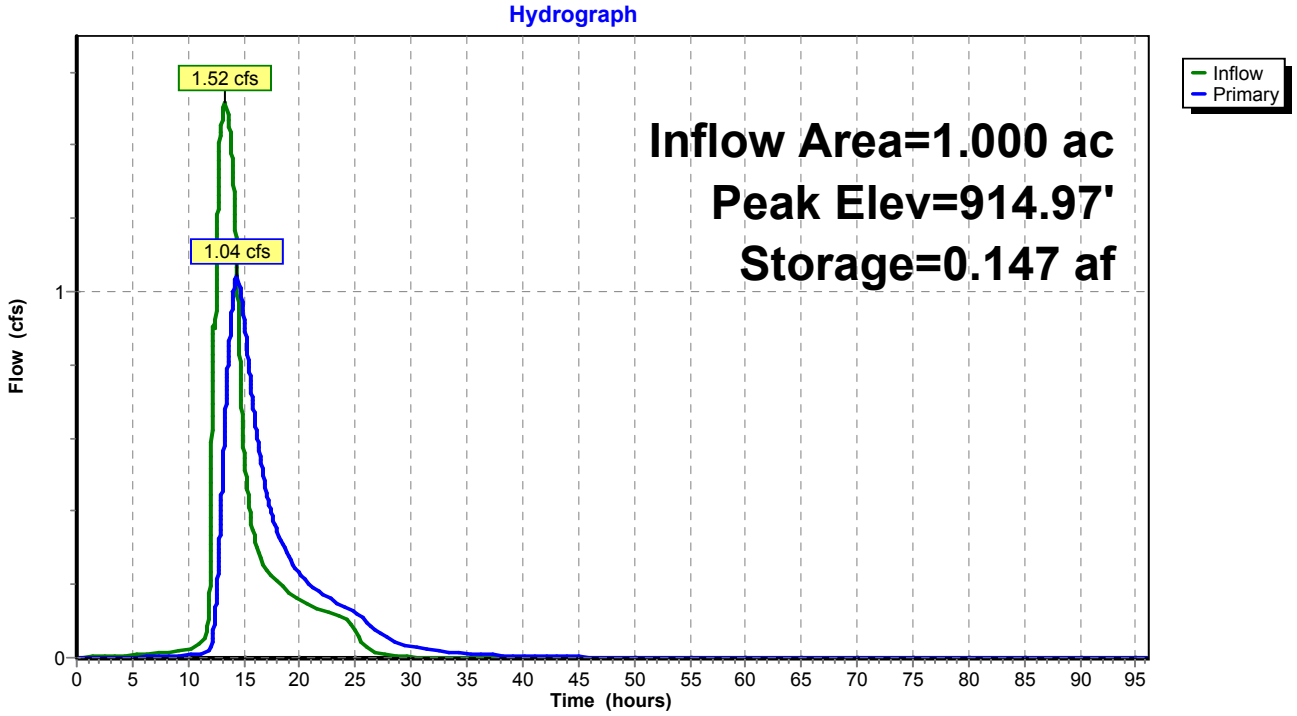
Volume	Invert	Avail.Storage	Storage Description
#1	914.75'	0.950 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
914.75	0.660	0.000	0.000
916.00	0.860	0.950	0.950

Device	Routing	Invert	Outlet Devices
#1	Primary	914.75'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=1.04 cfs @ 14.38 hrs HW=914.97' (Free Discharge)
↑—**1=Orifice/Grate** (Weir Controls 1.04 cfs @ 1.53 fps)

Pond W-1: W-1


Hydrograph
1.52 cfs
1.04 cfs
Inflow Area=1.000 ac
Peak Elev=914.97'
Storage=0.147 af
Inflow
Primary
Flow (cfs)
Time (hours)
0
1
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95

Summary for Pond W-3: W-3

[79] Warning: Submerged Pond 7P Secondary device # 2 OUTLET by 0.23'

Inflow	=	0.60 cfs @	19.02 hrs, Volume=	1.048 af
Outflow	=	0.28 cfs @	30.90 hrs, Volume=	0.873 af, Atten= 53%, Lag= 712.7 min
Primary	=	0.28 cfs @	30.90 hrs, Volume=	0.873 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Peak Elev= 914.98' @ 30.90 hrs Surf.Area= 2.077 ac Storage= 0.473 af

Plug-Flow detention time= 1,289.6 min calculated for 0.873 af (83% of inflow)
Center-of-Mass det. time= 913.2 min (2,780.8 - 1,867.6)

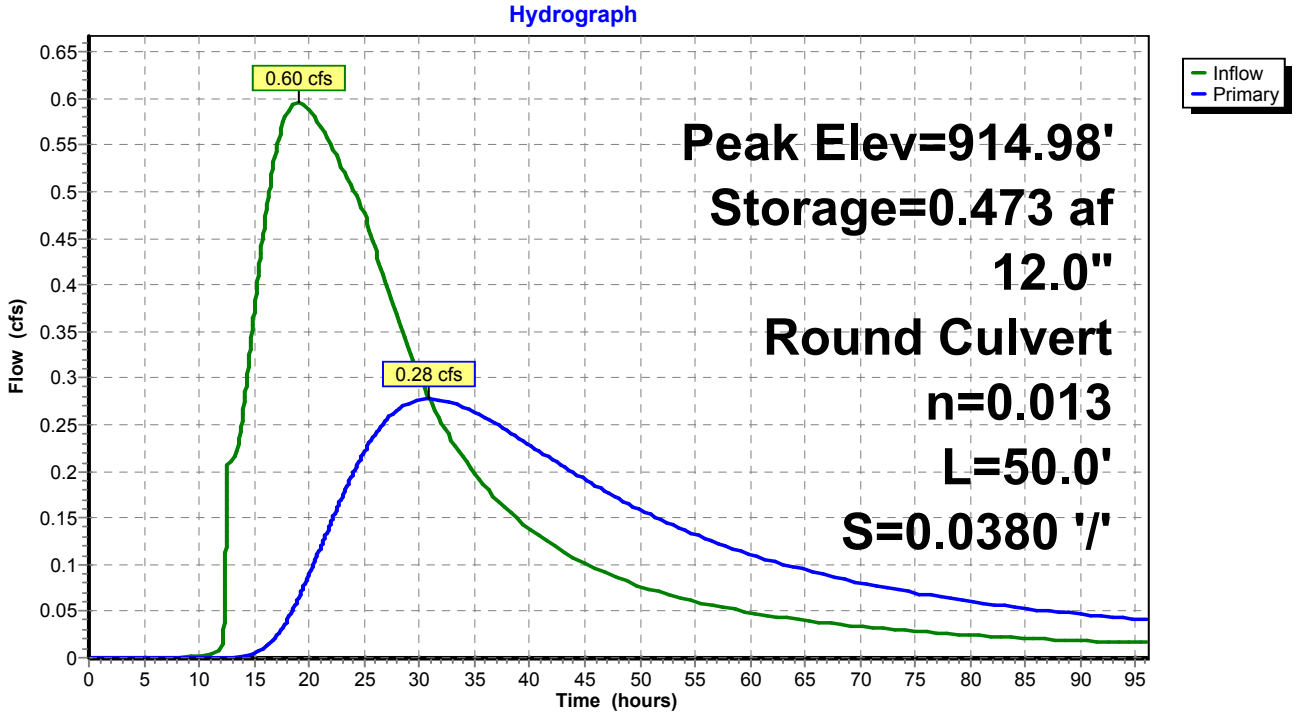
Volume	Invert	Avail.Storage	Storage Description
#1	914.75'	2.680 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
914.75	2.040	0.000	0.000
915.00	2.080	0.515	0.515
916.00	2.250	2.165	2.680

Device	Routing	Invert	Outlet Devices
#1	Primary	914.75'	**12.0" Round RCP_Round 12"** L= 50.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 914.75' / 912.85' S= 0.0380 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=0.28 cfs @ 30.90 hrs HW=914.98' (Free Discharge)
↑—**1=RCP_Round 12"** (Inlet Controls 0.28 cfs @ 2.04 fps)

Pond W-3: W-3


Hydrograph
0.60 cfs
0.28 cfs
Peak Elev=914.98'
Storage=0.473 af
12.0"
Round Culvert
n=0.013
L=50.0'
S=0.0380 '/'
Inflow
Primary
Flow (cfs)
Time (hours)
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
0.45
0.5
0.55
0.6
0.65
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
75
80
85
90
95

Summary for Pond W-4: W-4

[79] Warning: Submerged Pond 11P Secondary device # 5 OUTLET by 0.66'

Inflow Area = 2.980 ac, 26.17% Impervious, Inflow Depth > 6.03" for 2-Year event
Inflow = 4.36 cfs @ 12.08 hrs, Volume= 1.498 af
Outflow = 1.90 cfs @ 15.95 hrs, Volume= 1.469 af, Atten= 56%, Lag= 231.9 min
Primary = 1.90 cfs @ 15.95 hrs, Volume= 1.469 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Peak Elev= 908.66' @ 15.95 hrs Surf.Area= 1.018 ac Storage= 0.593 af

Plug-Flow detention time= 379.0 min calculated for 1.469 af (98% of inflow)
Center-of-Mass det. time= 317.9 min (1,332.4 - 1,014.6)

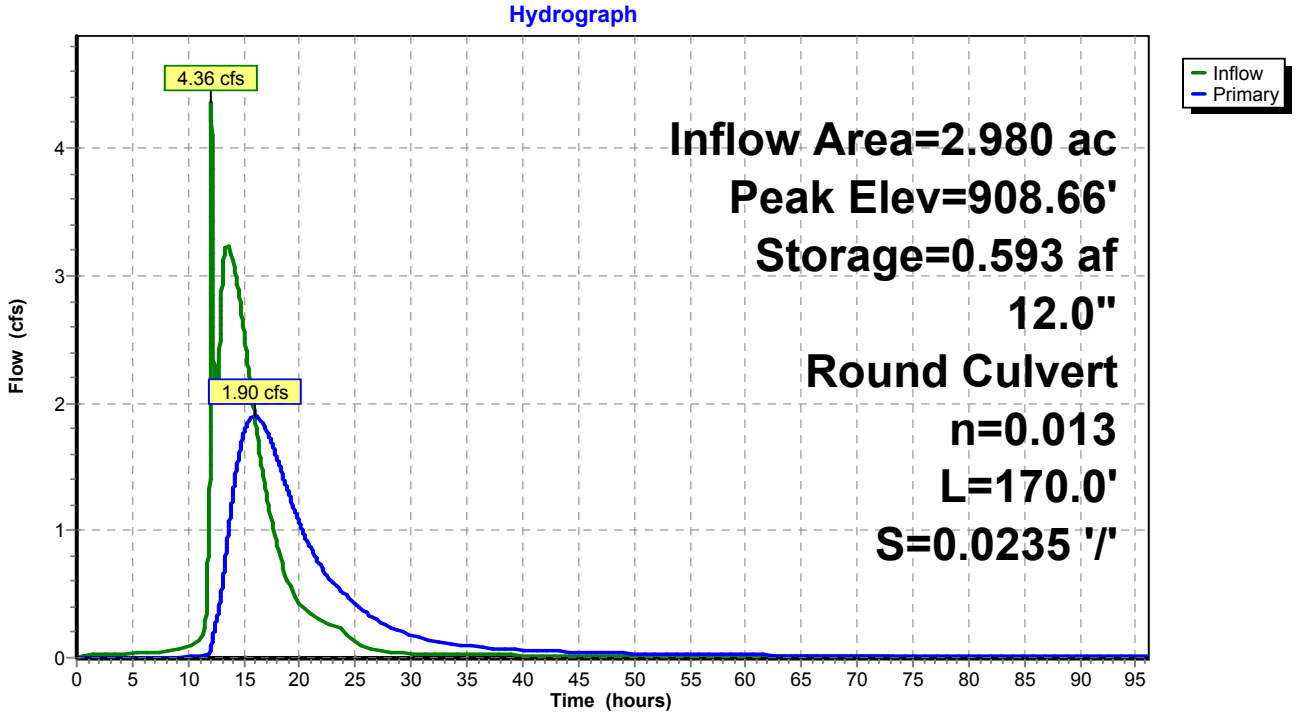
Volume	Invert	Avail.Storage	Storage Description
#1	908.00'	2.280 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
908.00	0.780	0.000	0.000
910.00	1.500	2.280	2.280

Device	Routing	Invert	Outlet Devices
#1	Primary	908.00'	**12.0" Round RCP_Round 12"** L= 170.0' RCP, groove end w/headwall, Ke= 0.200 Inlet / Outlet Invert= 908.00' / 904.00' S= 0.0235 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=1.90 cfs @ 15.95 hrs HW=908.66' (Free Discharge)
↑—**1=RCP_Round 12"** (Inlet Controls 1.90 cfs @ 3.46 fps)

Pond W-4: W-4


Hydrograph
4.36 cfs
1.90 cfs
Inflow Area=2.980 ac
Peak Elev=908.66'
Storage=0.593 af
12.0"
Round Culvert
n=0.013
L=170.0'
S=0.0235 '/'
Inflow
Primary
Flow (cfs)
Time (hours)
0
1
2
3
4
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95

Summary for Pond W-5: W-5

[79] Warning: Submerged Pond 13P Secondary device # 2 OUTLET by 0.18'
[79] Warning: Submerged Pond 13P Secondary device # 3 OUTLET by 0.18'
[79] Warning: Submerged Pond 13P Secondary device # 4 OUTLET by 0.18'
[79] Warning: Submerged Pond 13P Secondary device # 5 OUTLET by 0.18'
[79] Warning: Submerged Pond 13P Secondary device # 6 OUTLET by 0.18'

Inflow Area = 7.608 ac, 48.41% Impervious, Inflow Depth = 3.02" for 2-Year event
Inflow = 19.24 cfs @ 12.02 hrs, Volume= 1.912 af
Outflow = 2.91 cfs @ 13.19 hrs, Volume= 1.909 af, Atten= 85%, Lag= 70.1 min
Primary = 2.91 cfs @ 13.19 hrs, Volume= 1.909 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Starting Elev= 882.75' Surf.Area= 4.910 ac Storage= 3.412 af
Peak Elev= 882.93' @ 13.19 hrs Surf.Area= 5.080 ac Storage= 4.297 af (0.884 af above start)

Plug-Flow detention time= (not calculated: initial storage excedes outflow)
Center-of-Mass det. time= 327.9 min (1,165.7 - 837.8)

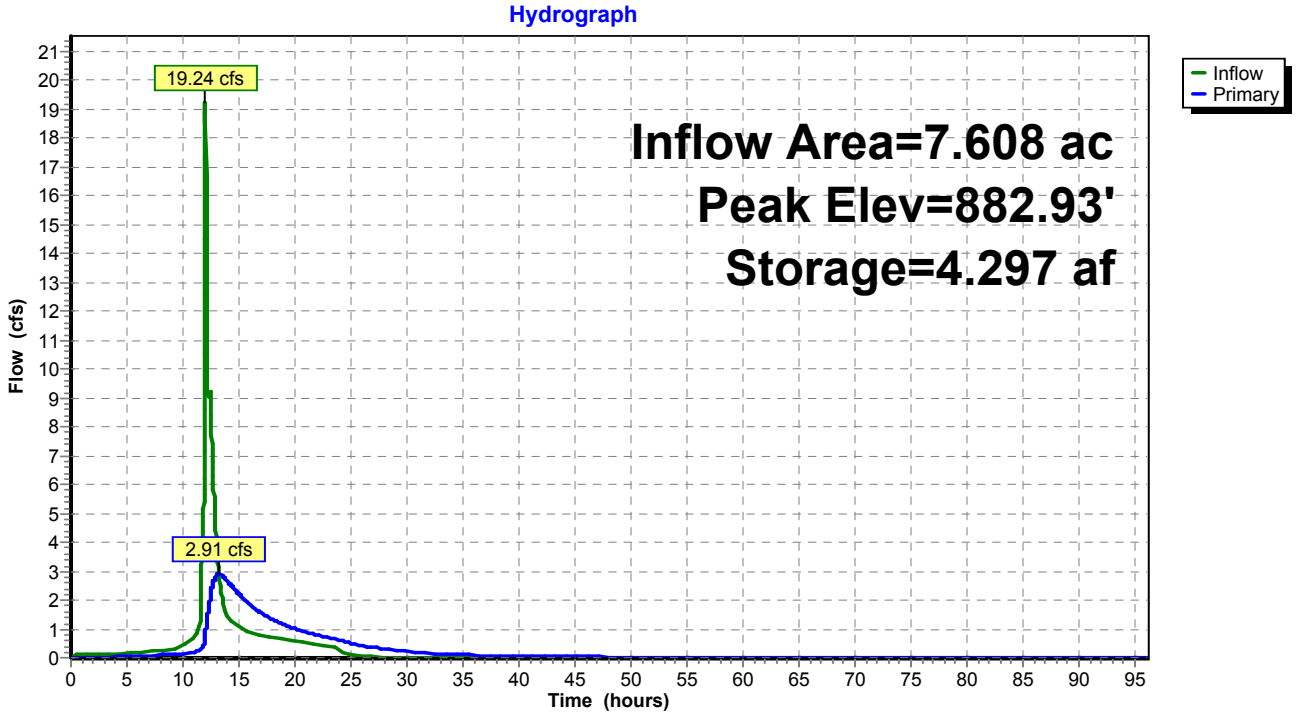
Volume	Invert	Avail.Storage	Storage Description
#1	882.00'	7.390 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
882.00	4.190	0.000	0.000
883.00	5.150	4.670	4.670
883.49	5.950	2.720	7.390

Device	Routing	Invert	Outlet Devices
#1	Primary	882.75'	**6.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#2	Primary	882.75'	**6.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=2.90 cfs @ 13.19 hrs HW=882.93' (Free Discharge)
1=Sharp-Crested Rectangular Weir (Weir Controls 1.45 cfs @ 1.38 fps)
2=Sharp-Crested Rectangular Weir (Weir Controls 1.45 cfs @ 1.38 fps)

Pond W-5: W-5


Hydrograph
19.24 cfs
2.91 cfs
Inflow Area=7.608 ac
Peak Elev=882.93'
Storage=4.297 af
Inflow
Primary
Flow (cfs)
Time (hours)
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95

Time span=0.00-96.00 hrs, dt=0.01 hrs, 9601 points
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious
Reach routing by Muskingum-Cunge method - Pond routing by Stor-Ind method

Subcatchment1S: To Rice Creek Runoff Area=1.601 ac 31.98% Impervious Runoff Depth=2.47"
Tc=5.7 min CN=74/98 Runoff=5.55 cfs 0.330 af

Subcatchment47S: Offsite Subbasin 51 Runoff Area=25.238 ac 19.96% Impervious Runoff Depth=1.72"
Tc=17.7 min CN=65/98 Runoff=37.07 cfs 3.622 af

SubcatchmentSB 1: SB 1 Runoff Area=52.150 ac 0.00% Impervious Runoff Depth=1.76"
Tc=53.1 min CN=74/0 Runoff=49.76 cfs 7.644 af

SubcatchmentSB 11: SB 11 Runoff Area=3.290 ac 36.78% Impervious Runoff Depth=2.66"
Tc=11.7 min CN=74/100 Runoff=9.15 cfs 0.730 af

SubcatchmentSB 12: SB 12 Runoff Area=1.390 ac 20.86% Impervious Runoff Depth=2.22"
Tc=9.5 min CN=74/98 Runoff=3.67 cfs 0.258 af

SubcatchmentSB 13: SB 13 Runoff Area=2.980 ac 26.17% Impervious Runoff Depth=2.40"
Tc=9.4 min CN=74/100 Runoff=8.31 cfs 0.597 af

SubcatchmentSB 14: SB 14 Runoff Area=10.230 ac 16.03% Impervious Runoff Depth=2.12"
Tc=4.3 min CN=74/98 Runoff=33.20 cfs 1.804 af

SubcatchmentSB 15: SB 15 Runoff Area=58.570 ac 0.05% Impervious Runoff Depth=1.76"
Tc=31.3 min CN=74/98 Runoff=73.90 cfs 8.591 af

SubcatchmentSB 16: SB 16 Runoff Area=32.440 ac 5.76% Impervious Runoff Depth=1.89"
Tc=12.1 min CN=74/98 Runoff=66.93 cfs 5.102 af

SubcatchmentSB 17: SB 17 Runoff Area=7.608 ac 48.41% Impervious Runoff Depth=2.95"
Tc=4.3 min CN=74/100 Runoff=32.13 cfs 1.870 af

SubcatchmentSB 18: SB 18 Runoff Area=52.790 ac 0.00% Impervious Runoff Depth=1.76"
Tc=33.5 min CN=74/0 Runoff=64.04 cfs 7.738 af

SubcatchmentSB 19: SB 19 Runoff Area=21.190 ac 0.00% Impervious Runoff Depth=1.76"
Tc=24.7 min CN=74/0 Runoff=29.93 cfs 3.106 af

SubcatchmentSB 2: SB 2 Runoff Area=11.067 ac 0.33% Impervious Runoff Depth=1.77"
Tc=16.6 min CN=74/98 Runoff=18.86 cfs 1.629 af

SubcatchmentSB 22: SB 22 Runoff Area=41.910 ac 0.00% Impervious Runoff Depth=0.36"
Tc=41.0 min CN=49/0 Runoff=5.43 cfs 1.272 af

SubcatchmentSB 24: SB 24 Runoff Area=5.043 ac 97.56% Impervious Runoff Depth=3.93"
Tc=7.5 min CN=74/98 Runoff=24.79 cfs 1.651 af

SubcatchmentSB 25: SB 25 Runoff Area=5.136 ac 95.72% Impervious Runoff Depth=3.89"
Tc=10.7 min CN=74/98 Runoff=21.69 cfs 1.664 af

Subcatchment SB 26: SB 26 Runoff Area=14.335 ac 98.27% Impervious Runoff Depth=3.95"
Tc=25.4 min CN=74/98 Runoff=41.75 cfs 4.713 af

Subcatchment SB 27: SB 27 (Thumb Road) Runoff Area=6.629 ac 83.33% Impervious Runoff Depth=3.61"
Tc=27.6 min CN=74/98 Runoff=17.05 cfs 1.996 af

Subcatchment SB 28: SB 28 Runoff Area=6.955 ac 46.76% Impervious Runoff Depth=2.80"
Tc=14.6 min CN=74/98 Runoff=18.97 cfs 1.622 af

Subcatchment SB 29: SB 29 Runoff Area=10.214 ac 37.73% Impervious Runoff Depth=2.60"
Tc=19.1 min CN=74/98 Runoff=23.01 cfs 2.212 af

Subcatchment SB 3: SB 3 Runoff Area=37.610 ac 7.68% Impervious Runoff Depth=1.93"
Tc=15.3 min CN=74/98 Runoff=71.94 cfs 6.049 af

Subcatchment SB 4: SB 4 Runoff Area=0.600 ac 43.33% Impervious Runoff Depth=2.83"
Tc=5.9 min CN=74/100 Runoff=2.26 cfs 0.141 af

Subcatchment SB 5: SB 5 Runoff Area=7.860 ac 5.98% Impervious Runoff Depth=1.89"
Tc=59.3 min CN=74/98 Runoff=7.43 cfs 1.239 af

Subcatchment SB 6: SB 6 Runoff Area=1.000 ac 10.00% Impervious Runoff Depth=2.01"
Tc=20.3 min CN=74/100 Runoff=1.72 cfs 0.167 af

Subcatchment SB 7: SB 7 Runoff Area=21.550 ac 0.00% Impervious Runoff Depth=1.76"
Tc=5.7 min CN=74/0 Runoff=55.54 cfs 3.159 af

Subcatchment SB 8: SB 8 Runoff Area=29.580 ac 5.51% Impervious Runoff Depth=1.88"
Tc=47.1 min CN=74/98 Runoff=31.84 cfs 4.638 af

Subcatchment SB 9: SB 9 Runoff Area=25.780 ac 0.12% Impervious Runoff Depth=1.76"
Tc=30.0 min CN=74/98 Runoff=33.02 cfs 3.784 af

Subcatchment SB10: SB 10 Runoff Area=6.390 ac 4.85% Impervious Runoff Depth=1.87"
Tc=7.3 min CN=74/98 Runoff=15.99 cfs 0.994 af

Reach 30R: 60" RCP to existing 60" Avg. Flow Depth=1.78' Max Vel=14.99 fps Inflow=93.90 cfs 20.847 af
60.0" Round Pipe n=0.013 L=400.0' S=0.0085 '/' Capacity=240.12 cfs Outflow=93.87 cfs 20.847 af

Reach 34R: 60" RCP connecting Avg. Flow Depth=1.60' Max Vel=11.51 fps Inflow=59.01 cfs 10.925 af
60.0" Round Pipe n=0.013 L=2,150.0' S=0.0050 '/' Capacity=184.16 cfs Outflow=58.97 cfs 10.925 af

Reach 37R: 48" RCP Avg. Flow Depth=1.10' Max Vel=9.51 fps Inflow=26.67 cfs 6.763 af
48.0" Round Pipe n=0.013 L=240.0' S=0.0060 '/' Capacity=111.27 cfs Outflow=26.66 cfs 6.763 af

Reach 39R: 24" RCP Avg. Flow Depth=0.49' Max Vel=5.14 fps Inflow=3.07 cfs 1.406 af
24.0" Round Pipe n=0.013 L=90.0' S=0.0050 '/' Capacity=16.00 cfs Outflow=3.07 cfs 1.406 af

Reach 43R: 30" RCP connecting P-10 Avg. Flow Depth=1.00' Max Vel=6.55 fps Inflow=11.90 cfs 7.524 af
30.0" Round Pipe n=0.013 L=750.0' S=0.0037 '/' Capacity=24.93 cfs Outflow=11.90 cfs 7.524 af

Reach 51R: 40' x 4.5 ft parabolic Avg. Flow Depth=2.02' Max Vel=5.43 fps Inflow=194.68 cfs 41.413 af
n=0.035 L=300.0' S=0.0050 '/' Capacity=733.43 cfs Outflow=194.58 cfs 41.413 af

Pond 2 P: P-2 Peak Elev=924.98' Storage=1.125 af Inflow=59.33 cfs 10.925 af
Outflow=59.01 cfs 10.925 af

Pond 4P: P-4 Peak Elev=916.17' Storage=1.004 af Inflow=7.43 cfs 1.239 af
Primary=1.35 cfs 0.429 af Secondary=2.30 cfs 0.810 af Outflow=3.65 cfs 1.239 af

Pond 7P: P-7 Peak Elev=915.78' Storage=1.444 af Inflow=31.84 cfs 4.638 af
Primary=31.62 cfs 4.039 af Secondary=0.22 cfs 0.518 af Outflow=31.84 cfs 4.558 af

Pond 8P: P-8 Peak Elev=898.05' Storage=0.890 af Inflow=15.99 cfs 0.994 af
24.0" Round Culvert n=0.013 L=380.0' S=0.0028 '/' Outflow=3.94 cfs 0.993 af

Pond 9P: P-9 Peak Elev=915.44' Storage=0.465 af Inflow=59.94 cfs 9.104 af
Outflow=59.85 cfs 9.104 af

Pond 10P: P-10 Lowered 1 ft Peak Elev=897.63' Storage=1.228 af Inflow=25.36 cfs 8.758 af
Primary=11.90 cfs 7.524 af Secondary=13.39 cfs 1.227 af Outflow=25.29 cfs 8.751 af

Pond 11P: P-11 Peak Elev=911.40' Storage=6.874 af Inflow=62.99 cfs 9.834 af
Primary=22.35 cfs 7.508 af Secondary=4.02 cfs 2.307 af Outflow=26.37 cfs 9.815 af

Pond 12P: P-12 Peak Elev=894.10' Storage=6.961 af Inflow=34.25 cfs 13.428 af
Outflow=23.44 cfs 13.407 af

Pond 13P: P-13 Peak Elev=884.19' Storage=6.732 af Inflow=213.45 cfs 39.551 af
Primary=189.47 cfs 37.657 af Secondary=11.41 cfs 1.890 af Outflow=200.88 cfs 39.546 af

Pond 17P: W-2 Peak Elev=929.49' Storage=0.553 af Inflow=2.25 cfs 1.088 af
12.0" Round Culvert n=0.013 L=300.0' S=0.0437 '/' Outflow=0.75 cfs 0.943 af

Pond 36P: Culverts passing flow beneath Peak Elev=887.26' Storage=0.000 af Inflow=64.04 cfs 7.738 af
Primary=64.04 cfs 7.738 af Secondary=0.00 cfs 0.000 af Outflow=64.04 cfs 7.738 af

Pond CRH-1: CRH-1 Peak Elev=878.13' Storage=0.489 af Inflow=18.97 cfs 1.622 af
Discarded=0.26 cfs 0.509 af Primary=11.83 cfs 1.114 af Outflow=12.10 cfs 1.622 af

Pond CRH-2: CRH-2 Peak Elev=882.67' Storage=0.890 af Inflow=23.01 cfs 2.212 af
Discarded=0.38 cfs 0.898 af Primary=9.88 cfs 1.314 af Outflow=10.26 cfs 2.212 af

Pond CRH-3: CRH-3 Peak Elev=878.91' Storage=0.422 af Inflow=10.91 cfs 1.644 af
Discarded=0.24 cfs 0.445 af Primary=8.07 cfs 1.198 af Outflow=8.31 cfs 1.644 af

Pond P-5/P-6: P-5/P-6 Peak Elev=930.49' Storage=8.296 af Inflow=91.40 cfs 7.854 af
Primary=26.67 cfs 6.763 af Secondary=2.25 cfs 1.088 af Outflow=28.92 cfs 7.851 af

Pond TI P: Thumb Infiltration (Thumb TP Peak Elev=903.27' Storage=3.268 af Inflow=18.36 cfs 3.268 af
Outflow=0.00 cfs 0.000 af

Pond W-1: W-1 Peak Elev=915.09' Storage=0.235 af Inflow=2.48 cfs 0.977 af
Outflow=2.05 cfs 0.977 af

Pond W-3: W-3 Peak Elev=915.06' Storage=0.641 af Inflow=0.96 cfs 1.461 af
12.0" Round Culvert n=0.013 L=50.0' S=0.0380 '/' Outflow=0.49 cfs 1.280 af

Pond W-4: W-4 Peak Elev=908.92' Storage=0.868 af Inflow=8.61 cfs 2.904 af
12.0" Round Culvert n=0.013 L=170.0' S=0.0235 '/' Outflow=3.08 cfs 2.873 af

Pond W-5: W-5 Peak Elev=883.06' Storage=4.995 af Inflow=34.77 cfs 3.760 af
Outflow=6.79 cfs 3.756 af

Total Runoff Area = 501.136 ac Runoff Volume = 78.323 af Average Runoff Depth = 1.88"
88.56% Pervious = 443.803 ac 11.44% Impervious = 57.333 ac

Summary for Subcatchment 1S: To Rice Creek

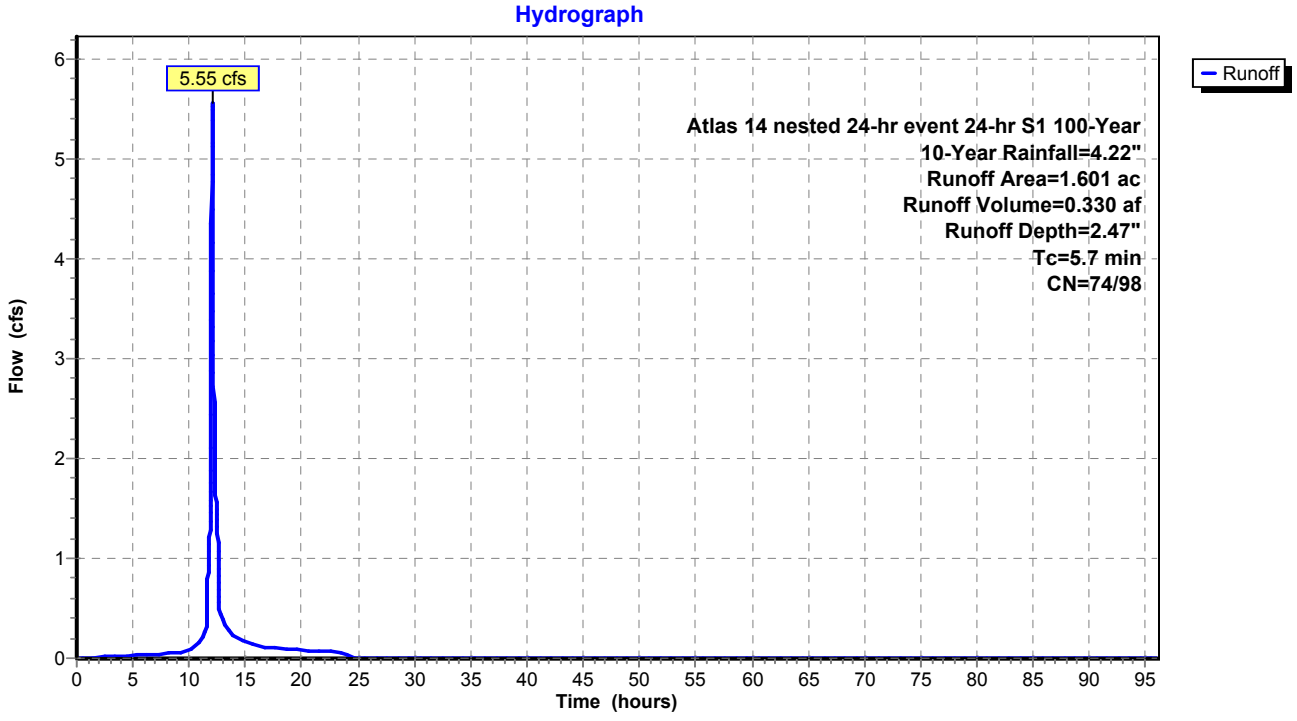
Runoff = 5.55 cfs @ 12.04 hrs, Volume= 0.330 af, Depth= 2.47"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 10-Year Rainfall=4.22"

	Area (ac)	CN	Description
*	0.512	98	impervious
*	1.089	74	pervious
	1.601	82	Weighted Average
	1.089	74	68.02% Pervious Area
	0.512	98	31.98% Impervious Area

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

Subcatchment 1S: To Rice Creek



Summary for Subcatchment 47S: Offsite Subbasin 51

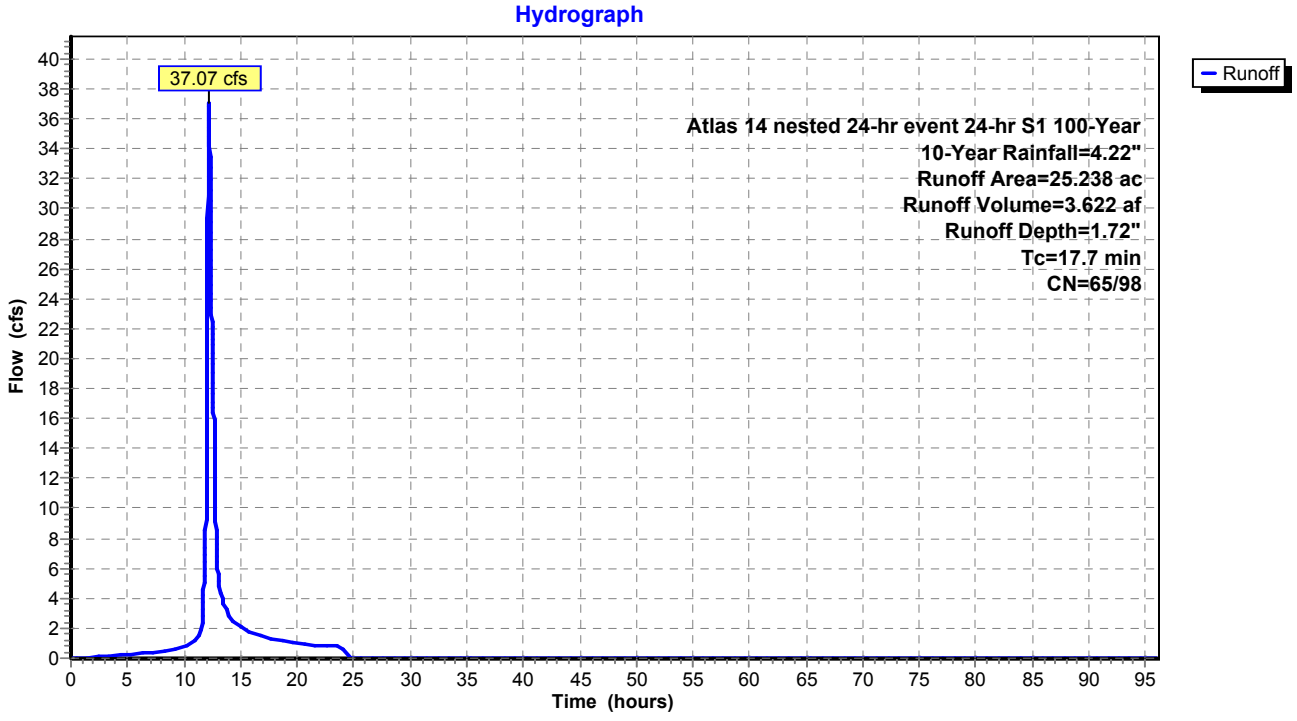
Runoff = 37.07 cfs @ 12.21 hrs, Volume= 3.622 af, Depth= 1.72"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 10-Year Rainfall=4.22"

	Area (ac)	CN	Description
*	20.200	65	Offsite subbasin 51
*	5.038	98	
	25.238	72	Weighted Average
	20.200	65	80.04% Pervious Area
	5.038	98	19.96% Impervious Area

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

Subcatchment 47S: Offsite Subbasin 51



Summary for Subcatchment SB 1: SB 1

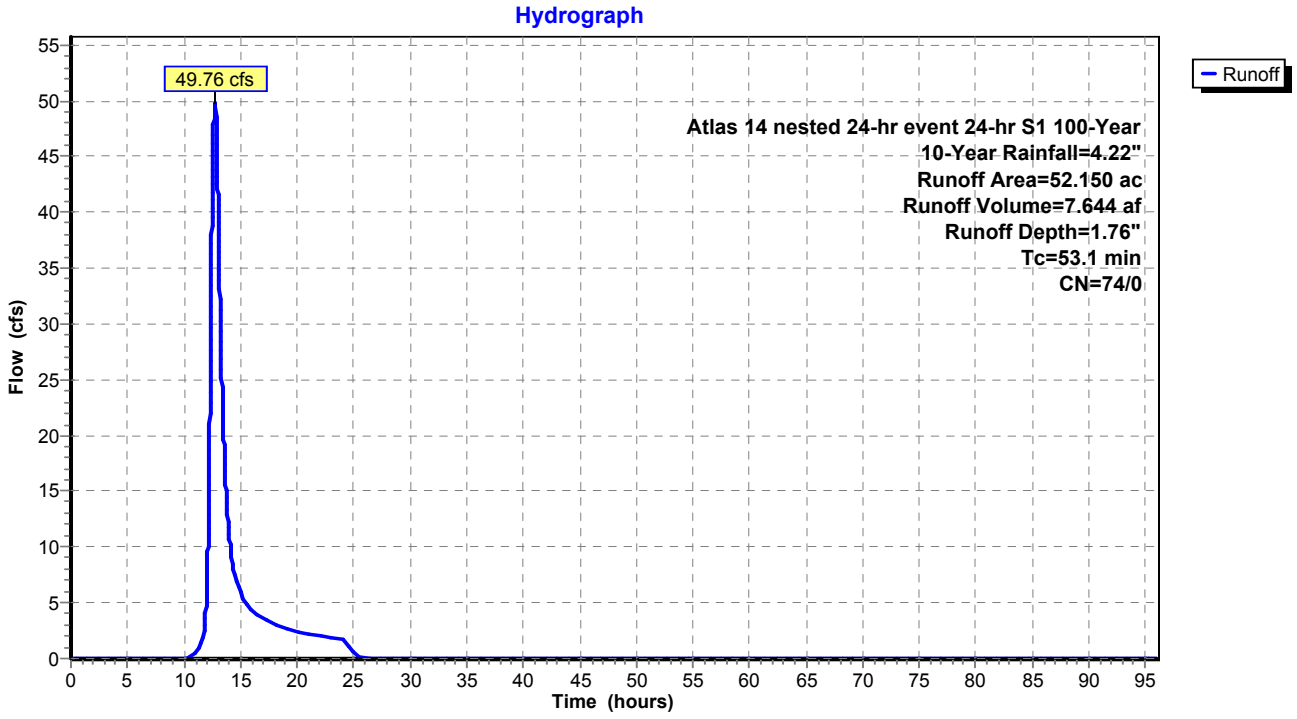
Runoff = 49.76 cfs @ 12.74 hrs, Volume= 7.644 af, Depth= 1.76"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 10-Year Rainfall=4.22"

	Area (ac)	CN	Description
*	52.150	74	pervious
*	0.000	98	impervious
	52.150	74	Weighted Average
	52.150	74	100.00% Pervious Area

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

Subcatchment SB 1: SB 1



Summary for Subcatchment SB 11: SB 11

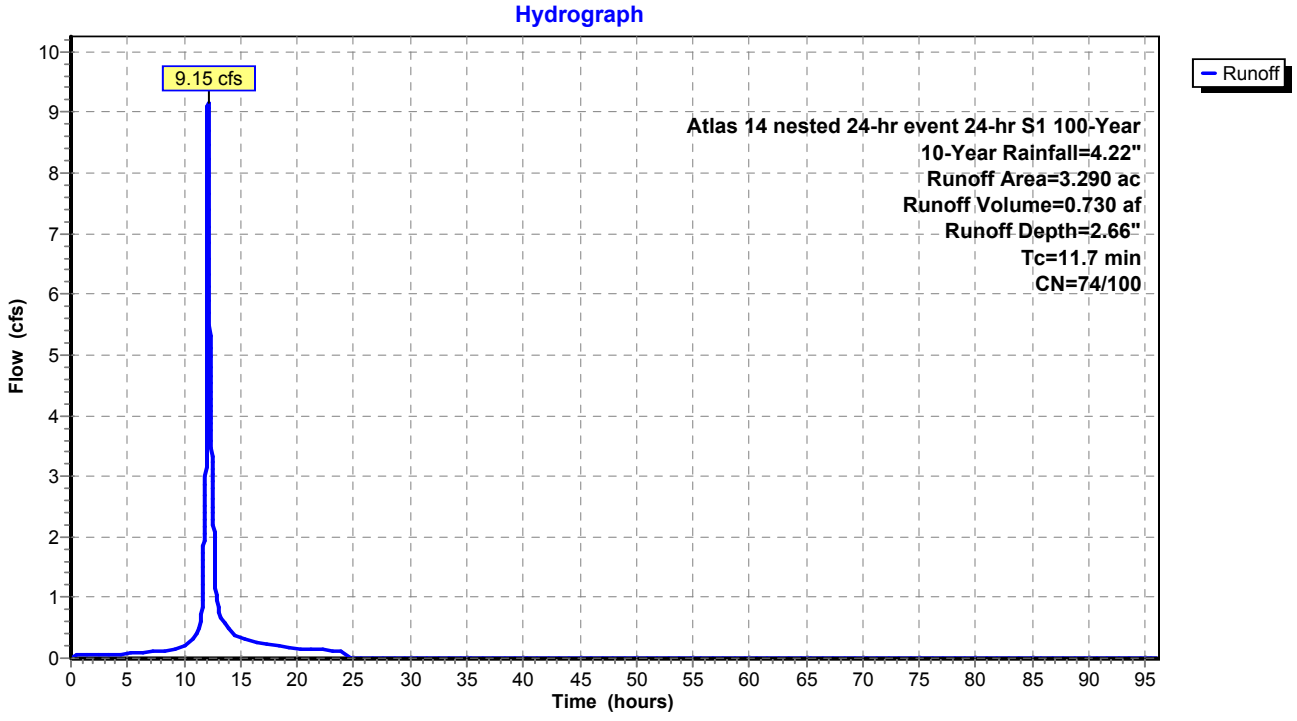
Runoff = 9.15 cfs @ 12.11 hrs, Volume= 0.730 af, Depth= 2.66"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 10-Year Rainfall=4.22"

	Area (ac)	CN	Description
*	2.080	74	pervious
*	1.210	100	impervious
	3.290	84	Weighted Average
	2.080	74	63.22% Pervious Area
	1.210	100	36.78% Impervious Area

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

Subcatchment SB 11: SB 11



Summary for Subcatchment SB 12: SB 12

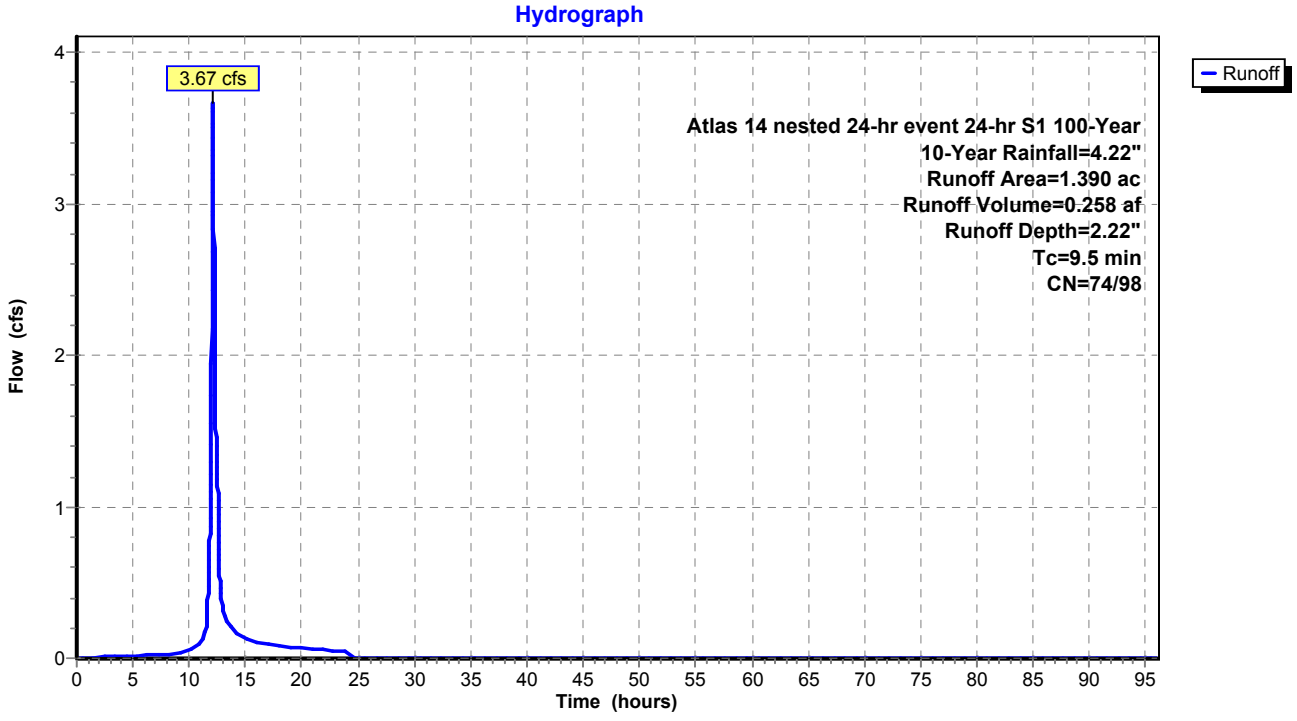
Runoff = 3.67 cfs @ 12.08 hrs, Volume= 0.258 af, Depth= 2.22"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 10-Year Rainfall=4.22"

	Area (ac)	CN	Description
*	1.100	74	pervious
*	0.290	98	impervious
	1.390	79	Weighted Average
	1.100	74	79.14% Pervious Area
	0.290	98	20.86% Impervious Area

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

Subcatchment SB 12: SB 12



Summary for Subcatchment SB 13: SB 13

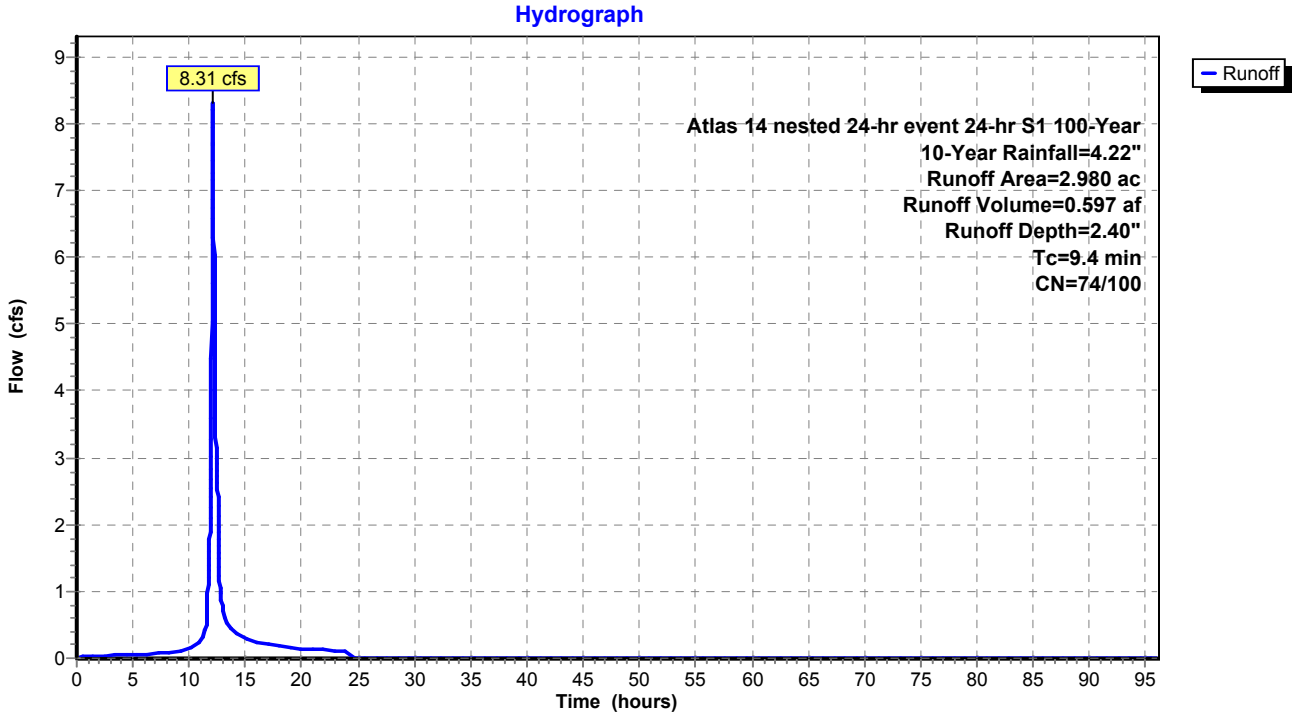
Runoff = 8.31 cfs @ 12.08 hrs, Volume= 0.597 af, Depth= 2.40"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 10-Year Rainfall=4.22"

	Area (ac)	CN	Description
*	2.200	74	pervious
*	0.780	100	impervious
	2.980	81	Weighted Average
	2.200	74	73.83% Pervious Area
	0.780	100	26.17% Impervious Area

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

Subcatchment SB 13: SB 13



Summary for Subcatchment SB 14: SB 14

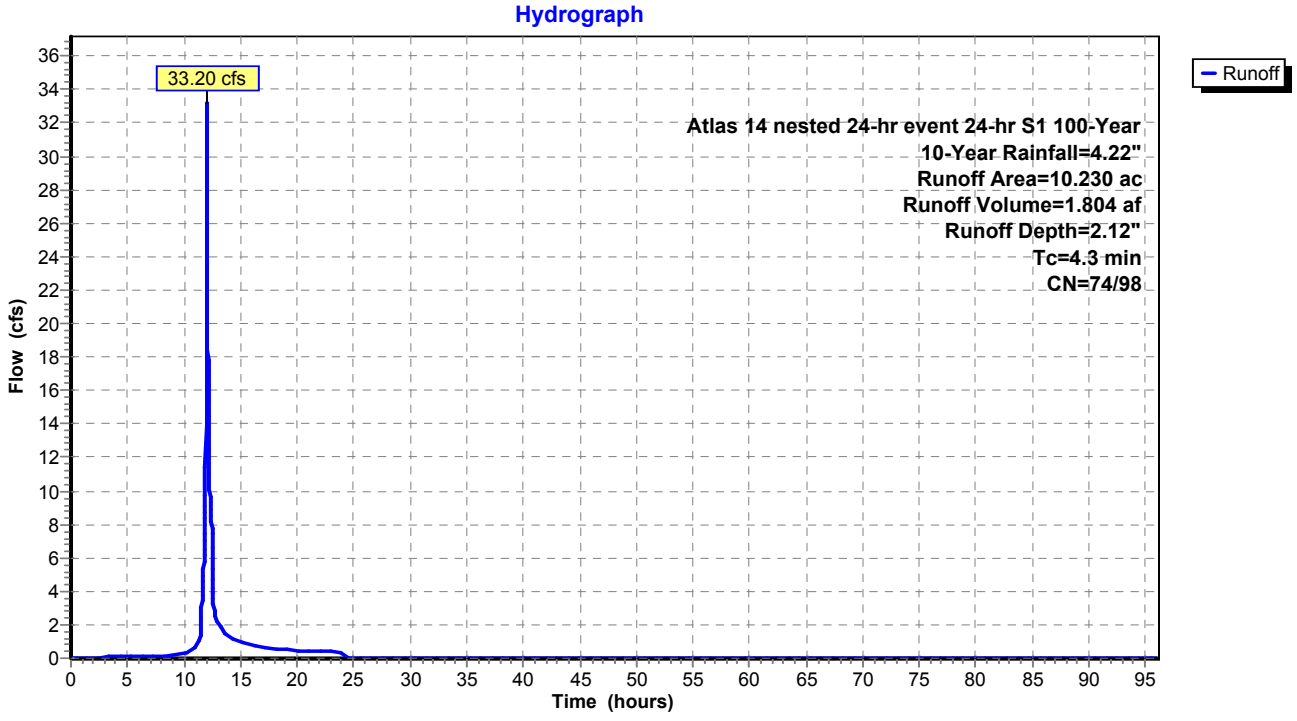
Runoff = 33.20 cfs @ 12.02 hrs, Volume= 1.804 af, Depth= 2.12"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 10-Year Rainfall=4.22"

	Area (ac)	CN	Description
*	8.590	74	pervious
*	1.640	98	impervious
	10.230	78	Weighted Average
	8.590	74	83.97% Pervious Area
	1.640	98	16.03% Impervious Area

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

Subcatchment SB 14: SB 14



Summary for Subcatchment SB 15: SB 15

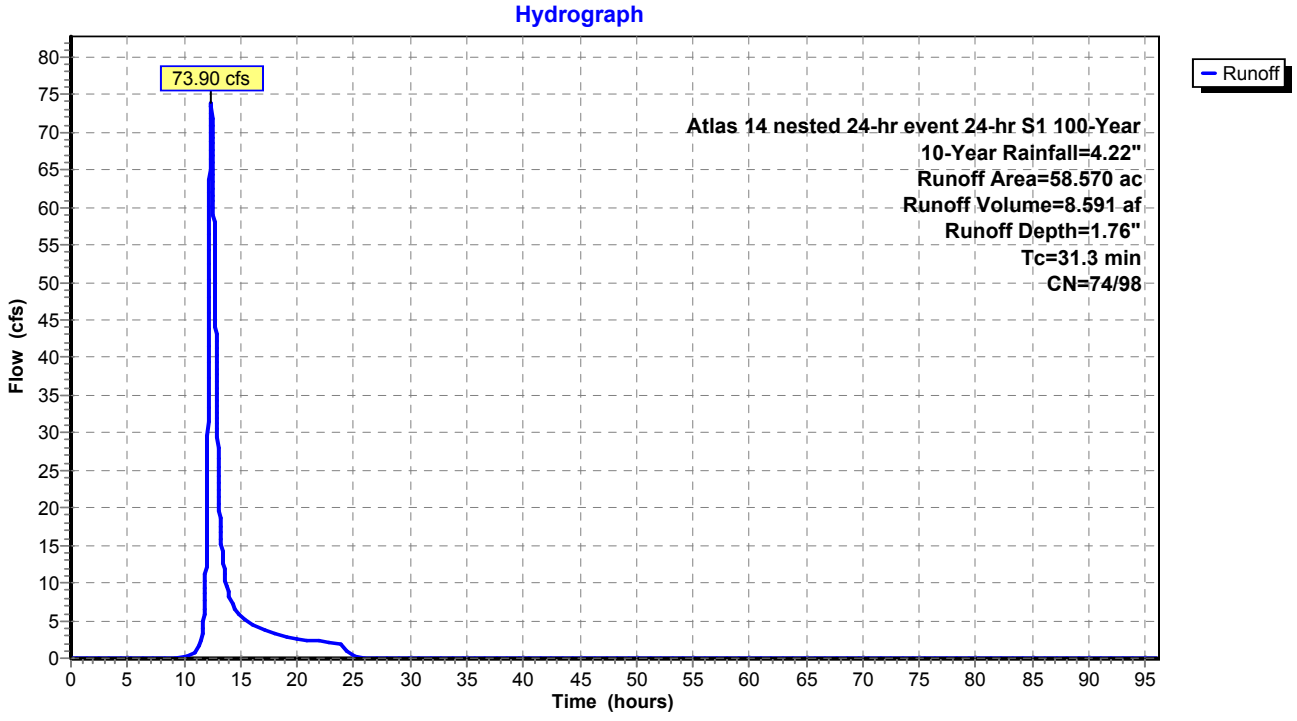
Runoff = 73.90 cfs @ 12.42 hrs, Volume= 8.591 af, Depth= 1.76"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 10-Year Rainfall=4.22"

	Area (ac)	CN	Description
*	58.540	74	pervious
*	0.030	98	impervious
	58.570	74	Weighted Average
	58.540	74	99.95% Pervious Area
	0.030	98	0.05% Impervious Area

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

Subcatchment SB 15: SB 15



Summary for Subcatchment SB 16: SB 16

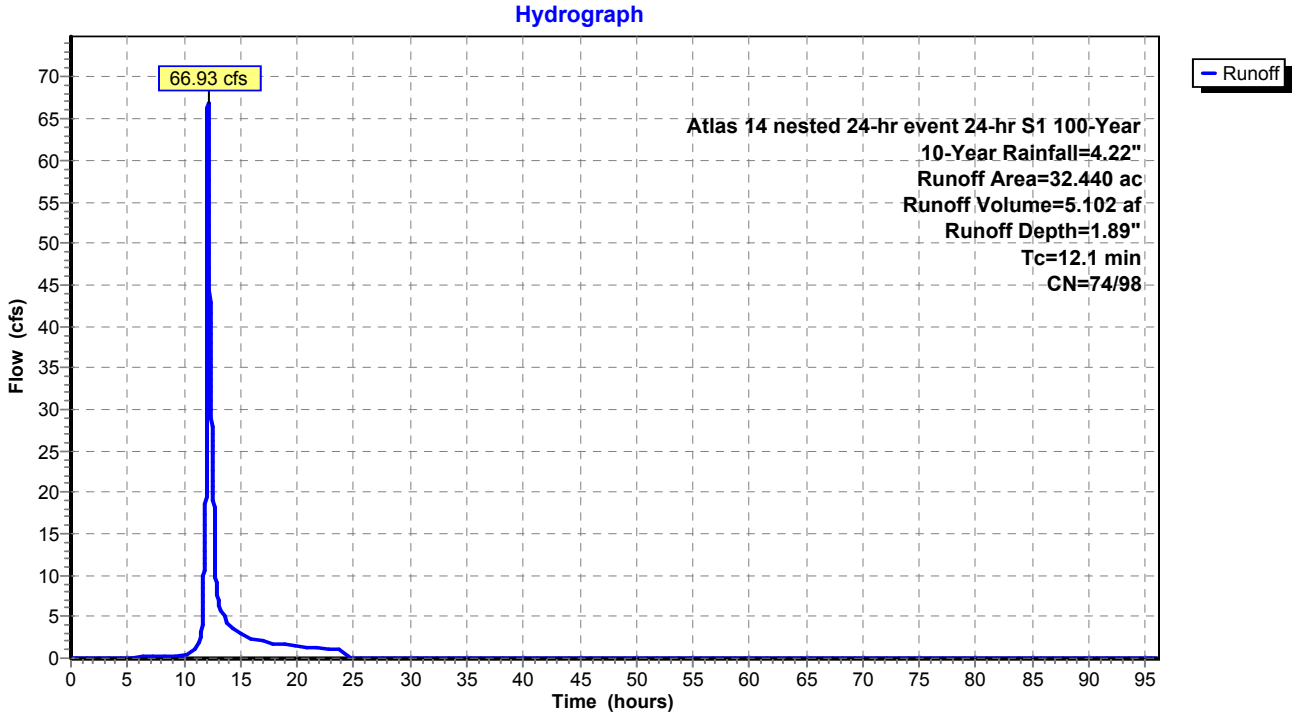
Runoff = 66.93 cfs @ 12.13 hrs, Volume= 5.102 af, Depth= 1.89"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 10-Year Rainfall=4.22"

	Area (ac)	CN	Description
*	30.570	74	pervious
*	1.870	98	impervious
	32.440	75	Weighted Average
	30.570	74	94.24% Pervious Area
	1.870	98	5.76% Impervious Area

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

Subcatchment SB 16: SB 16



Summary for Subcatchment SB 17: SB 17

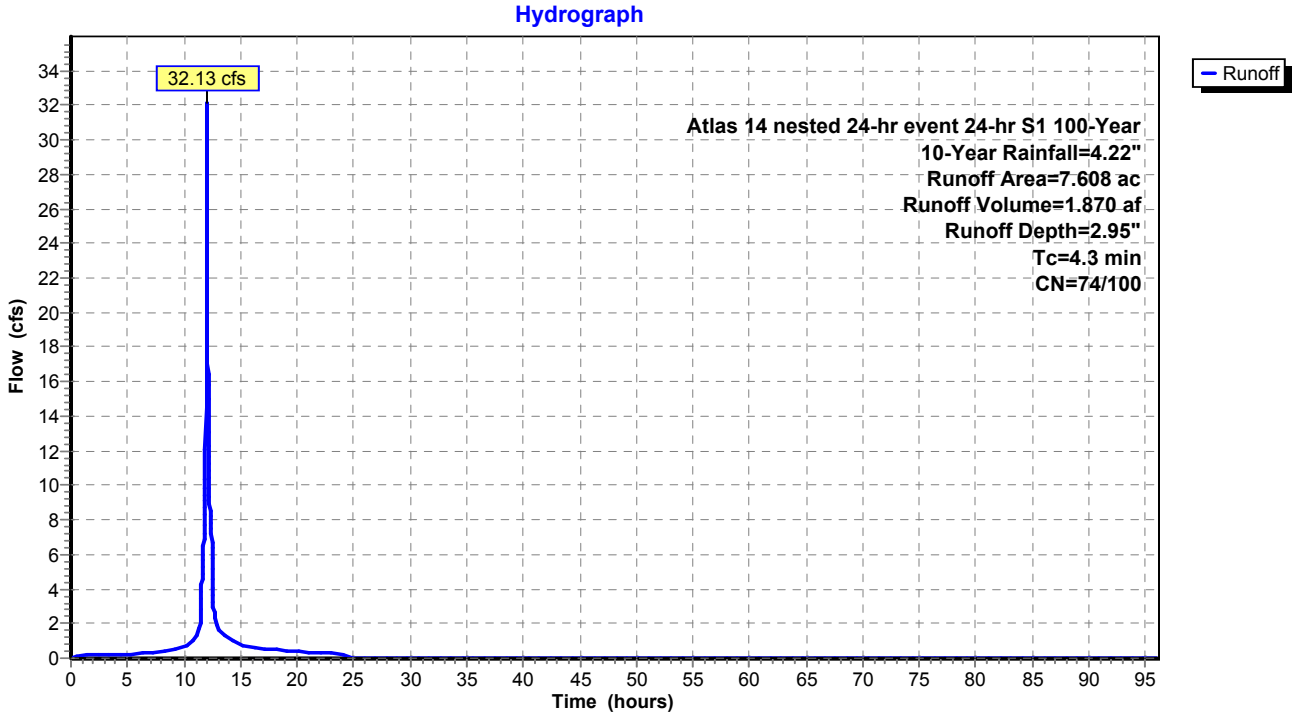
Runoff = 32.13 cfs @ 12.02 hrs, Volume= 1.870 af, Depth= 2.95"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 10-Year Rainfall=4.22"

	Area (ac)	CN	Description
*	3.925	74	pervious
*	3.683	100	impervious
	7.608	87	Weighted Average
	3.925	74	51.59% Pervious Area
	3.683	100	48.41% Impervious Area

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

Subcatchment SB 17: SB 17



Summary for Subcatchment SB 18: SB 18

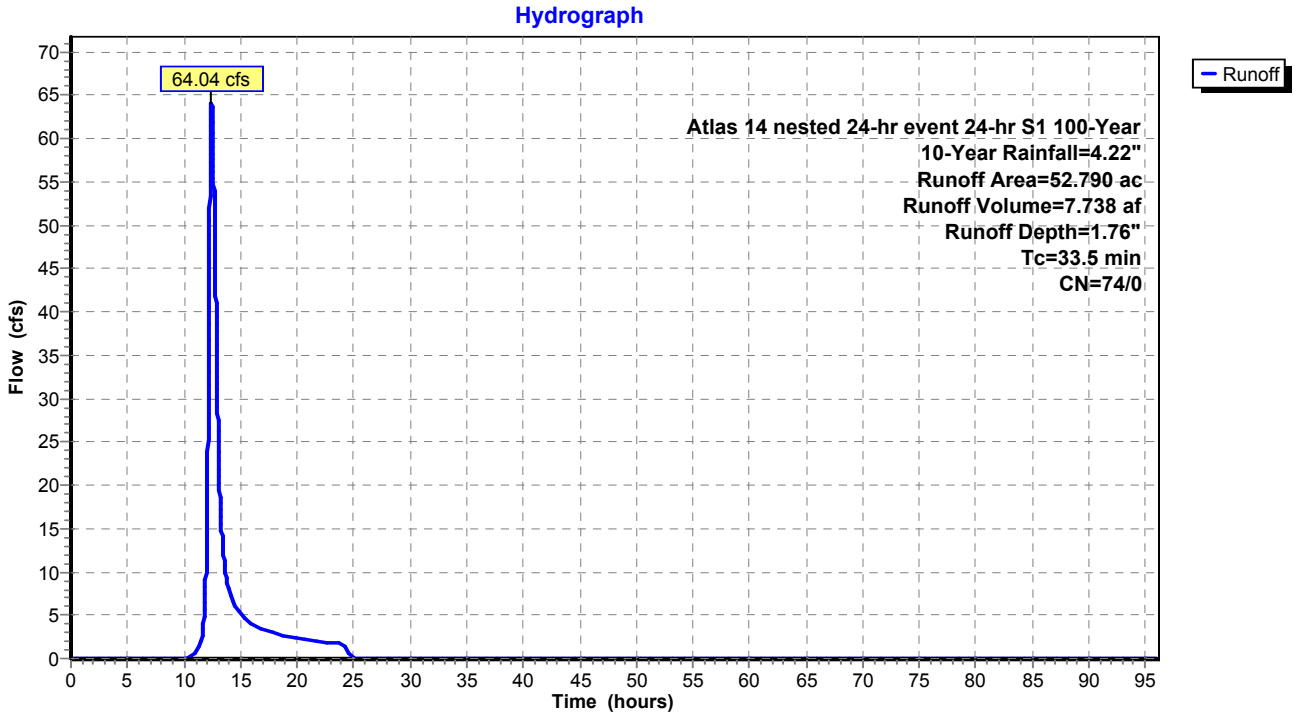
Runoff = 64.04 cfs @ 12.46 hrs, Volume= 7.738 af, Depth= 1.76"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 10-Year Rainfall=4.22"

	Area (ac)	CN	Description
*	52.790	74	pervious
*	0.000	98	impervious
	52.790	74	Weighted Average
	52.790	74	100.00% Pervious Area

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

Subcatchment SB 18: SB 18



Summary for Subcatchment SB 19: SB 19

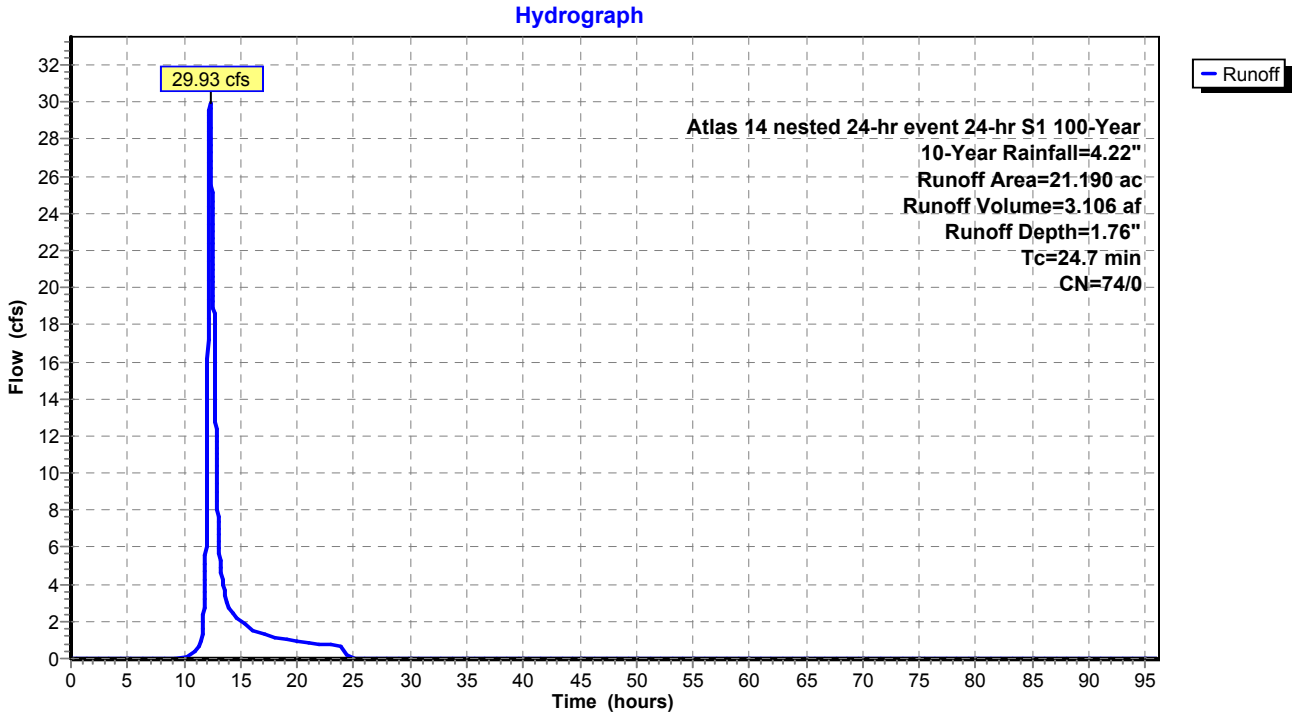
Runoff = 29.93 cfs @ 12.32 hrs, Volume= 3.106 af, Depth= 1.76"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 10-Year Rainfall=4.22"

	Area (ac)	CN	Description
*	21.190	74	pervious
*	0.000	98	impervious
	21.190	74	Weighted Average
	21.190	74	100.00% Pervious Area

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

Subcatchment SB 19: SB 19



Summary for Subcatchment SB 2: SB 2

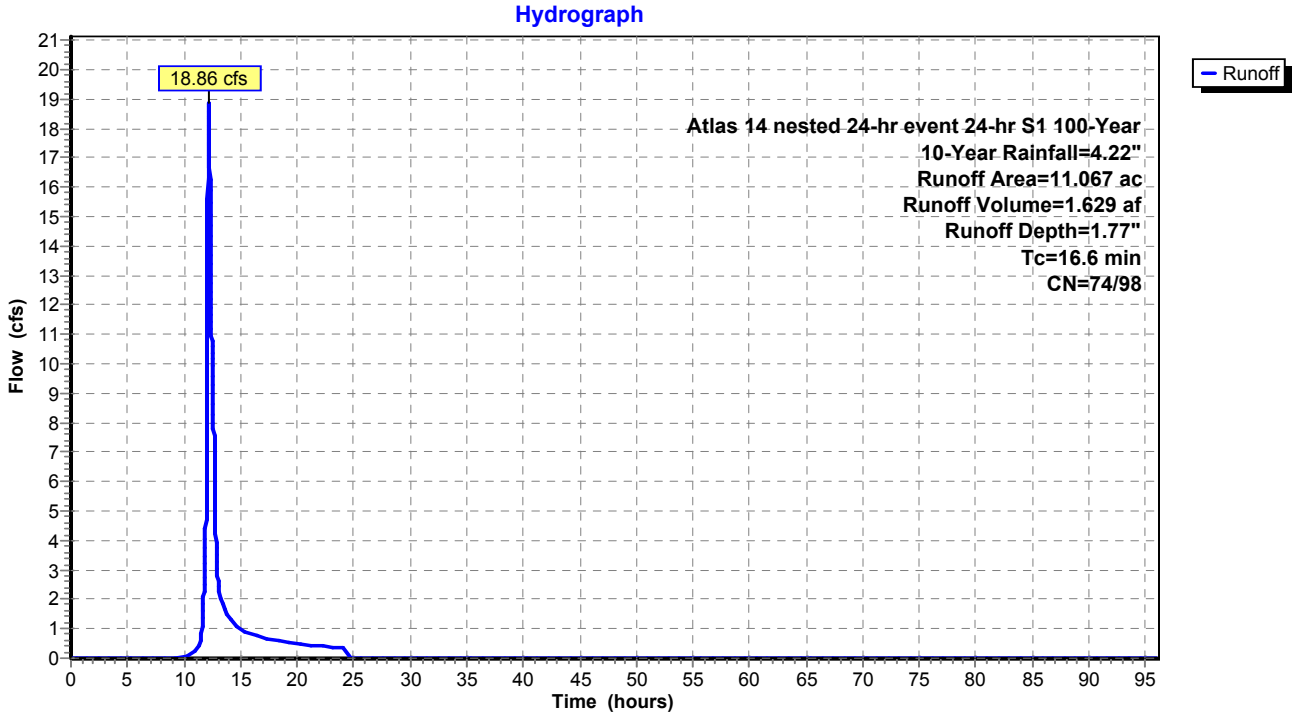
Runoff = 18.86 cfs @ 12.19 hrs, Volume= 1.629 af, Depth= 1.77"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 10-Year Rainfall=4.22"

	Area (ac)	CN	Description
*	11.030	74	pervious
*	0.037	98	impervious
	11.067	74	Weighted Average
	11.030	74	99.67% Pervious Area
	0.037	98	0.33% Impervious Area

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

Subcatchment SB 2: SB 2



Summary for Subcatchment SB 22: SB 22

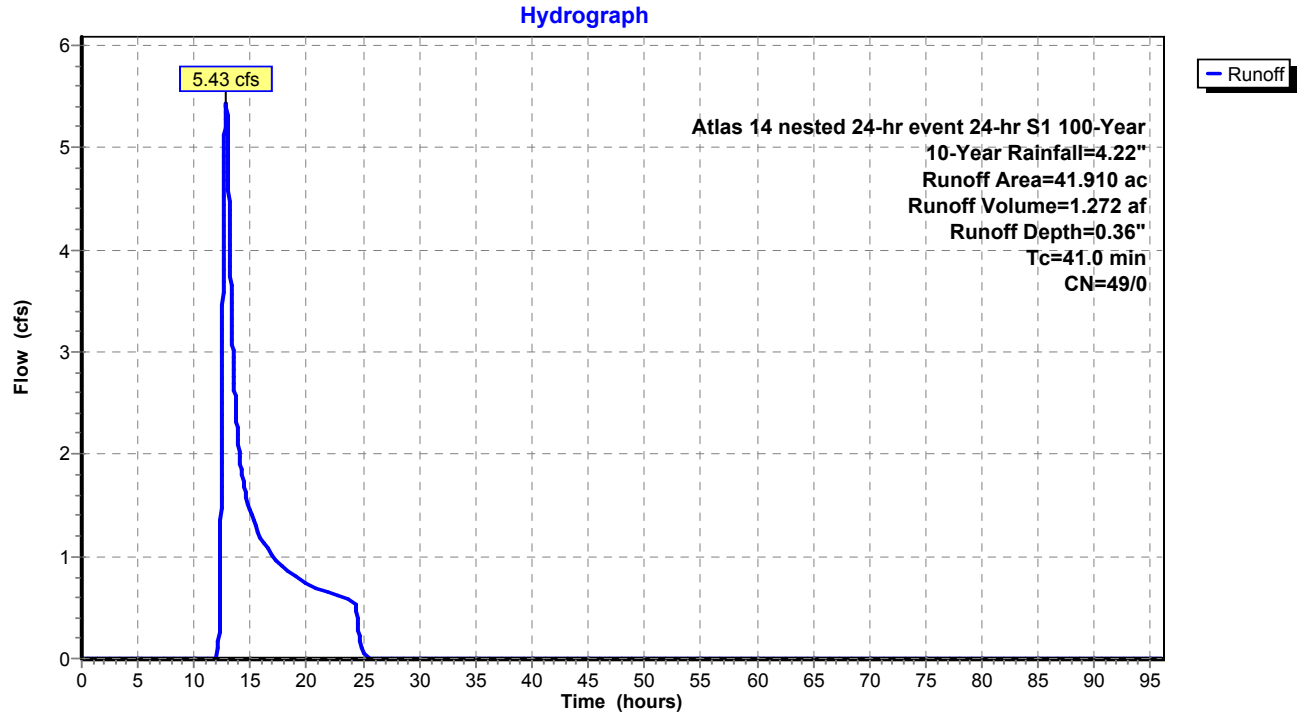
Runoff = 5.43 cfs @ 12.81 hrs, Volume= 1.272 af, Depth= 0.36"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 10-Year Rainfall=4.22"

	Area (ac)	CN	Description
*	41.910	49	Pervious
*	0.000	98	Impervious
	41.910	49	Weighted Average
	41.910	49	100.00% Pervious Area

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

Subcatchment SB 22: SB 22



Summary for Subcatchment SB 24: SB 24

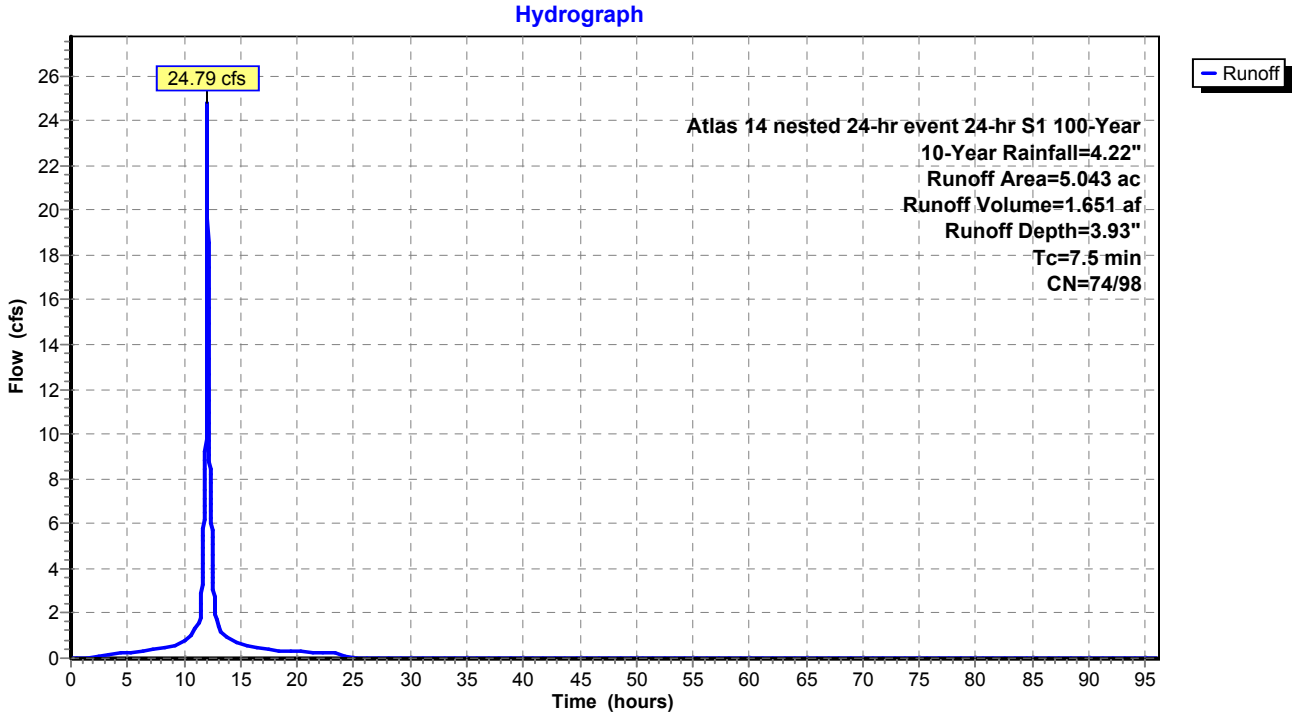
Runoff = 24.79 cfs @ 12.05 hrs, Volume= 1.651 af, Depth= 3.93"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 10-Year Rainfall=4.22"

	Area (ac)	CN	Description
*	0.123	74	permiable
*	4.920	98	impermiable
	5.043	97	Weighted Average
	0.123	74	2.44% Pervious Area
	4.920	98	97.56% Impervious Area

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

Subcatchment SB 24: SB 24



Summary for Subcatchment SB 25: SB 25

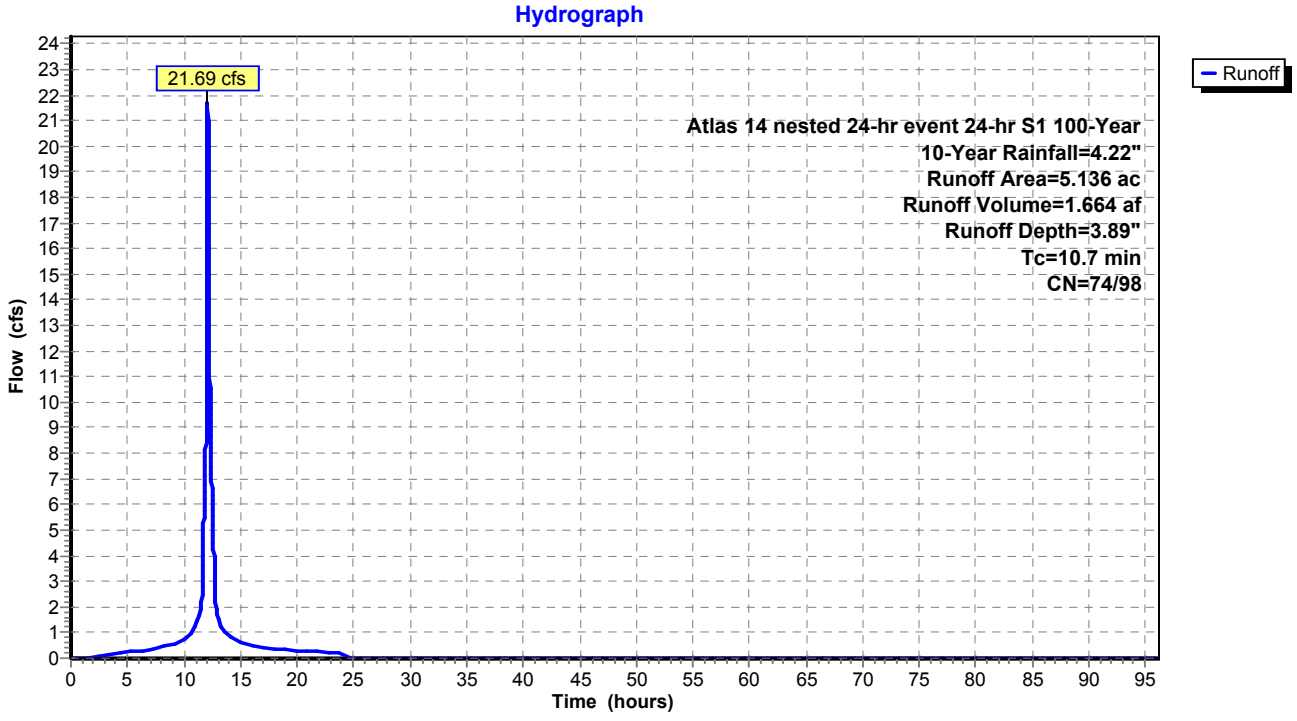
Runoff = 21.69 cfs @ 12.09 hrs, Volume= 1.664 af, Depth= 3.89"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 10-Year Rainfall=4.22"

	Area (ac)	CN	Description
*	0.220	74	pervious
*	4.916	98	impervious
	5.136	97	Weighted Average
	0.220	74	4.28% Pervious Area
	4.916	98	95.72% Impervious Area

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

Subcatchment SB 25: SB 25



Summary for Subcatchment SB 26: SB 26

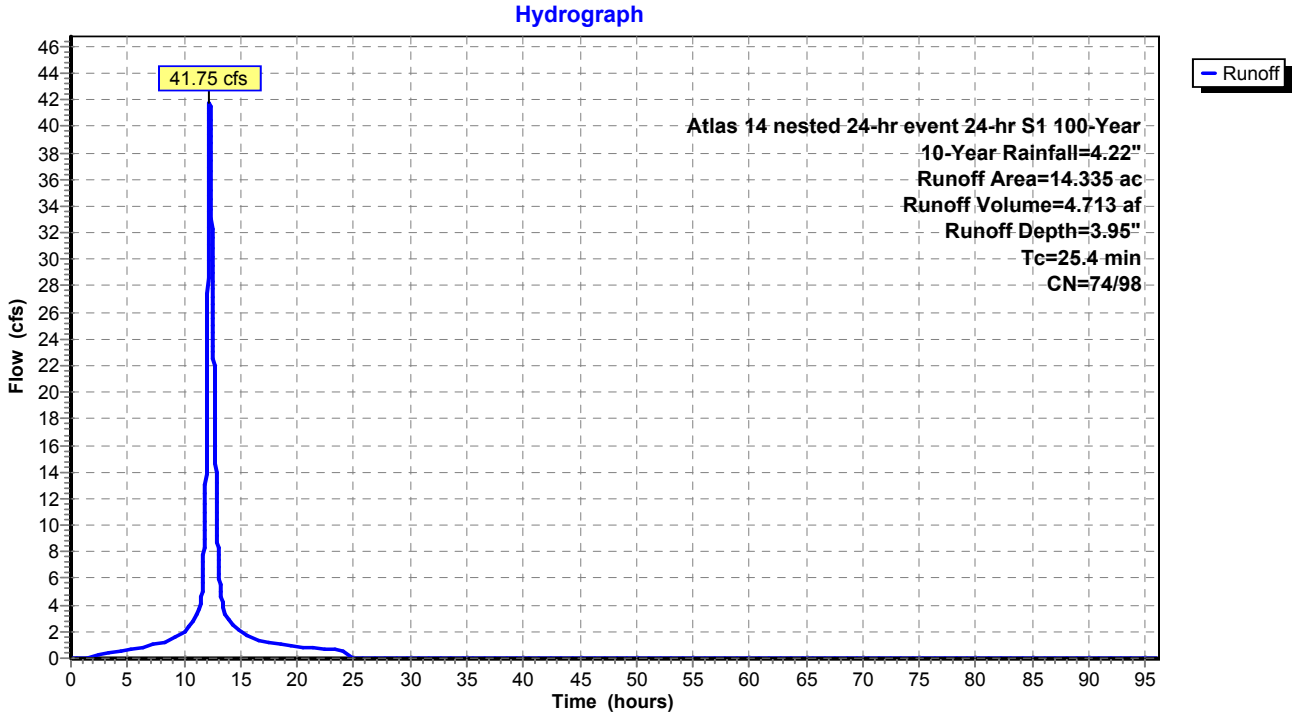
Runoff = 41.75 cfs @ 12.28 hrs, Volume= 4.713 af, Depth= 3.95"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 10-Year Rainfall=4.22"

	Area (ac)	CN	Description
*	0.248	74	pervious
*	14.087	98	impervious
	14.335	98	Weighted Average
	0.248	74	1.73% Pervious Area
	14.087	98	98.27% Impervious Area

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

Subcatchment SB 26: SB 26



Summary for Subcatchment SB 27: SB 27 (Thumb Road)

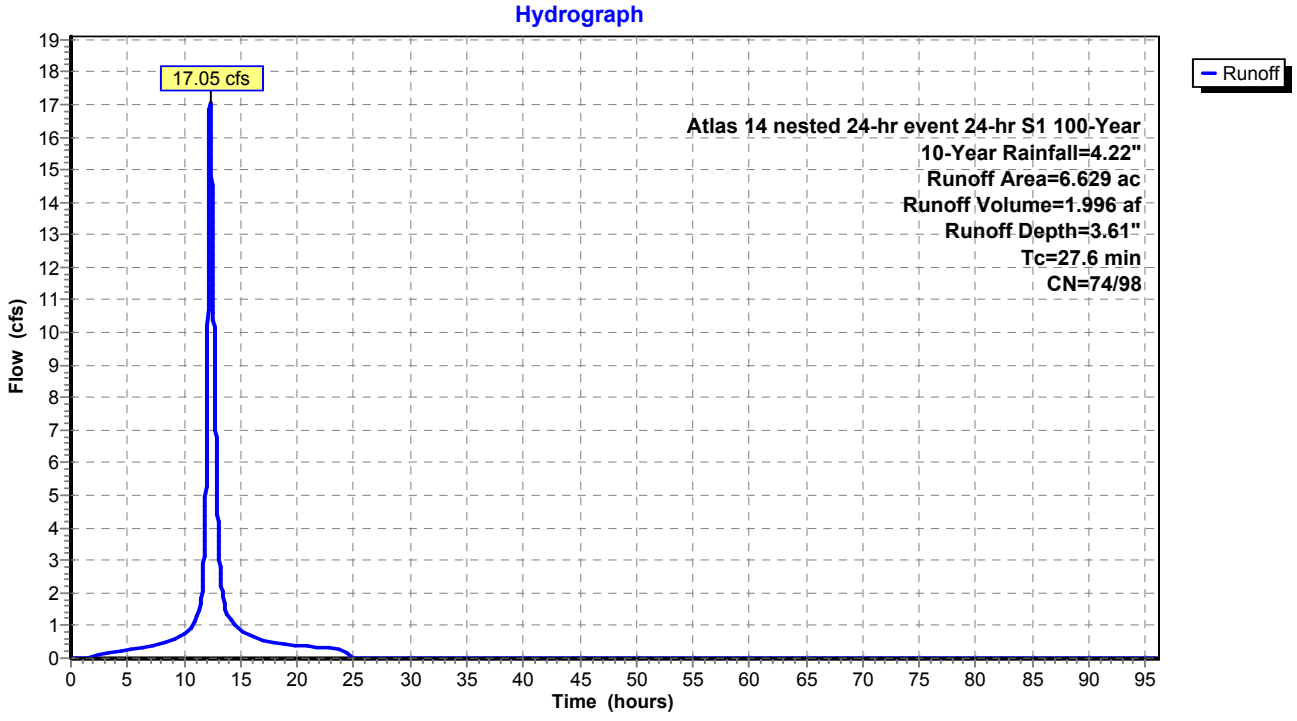
Runoff = 17.05 cfs @ 12.32 hrs, Volume= 1.996 af, Depth= 3.61"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 10-Year Rainfall=4.22"

	Area (ac)	CN	Description
*	1.105	74	Pervious
*	5.524	98	Impervious
	6.629	94	Weighted Average
	1.105	74	16.67% Pervious Area
	5.524	98	83.33% Impervious Area

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

Subcatchment SB 27: SB 27 (Thumb Road)



Summary for Subcatchment SB 28: SB 28

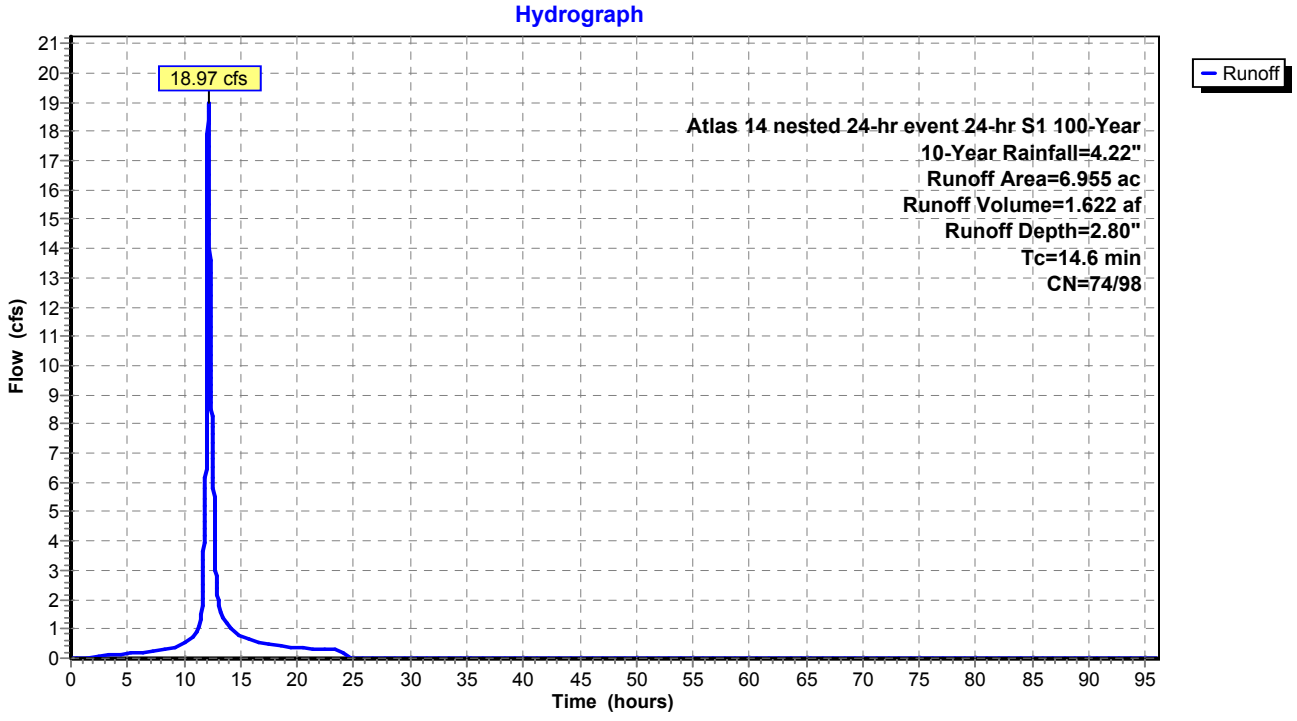
Runoff = 18.97 cfs @ 12.15 hrs, Volume= 1.622 af, Depth= 2.80"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 10-Year Rainfall=4.22"

	Area (ac)	CN	Description
*	3.703	74	pervious
*	3.252	98	impervious
	6.955	85	Weighted Average
	3.703	74	53.24% Pervious Area
	3.252	98	46.76% Impervious Area

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

Subcatchment SB 28: SB 28



Summary for Subcatchment SB 29: SB 29

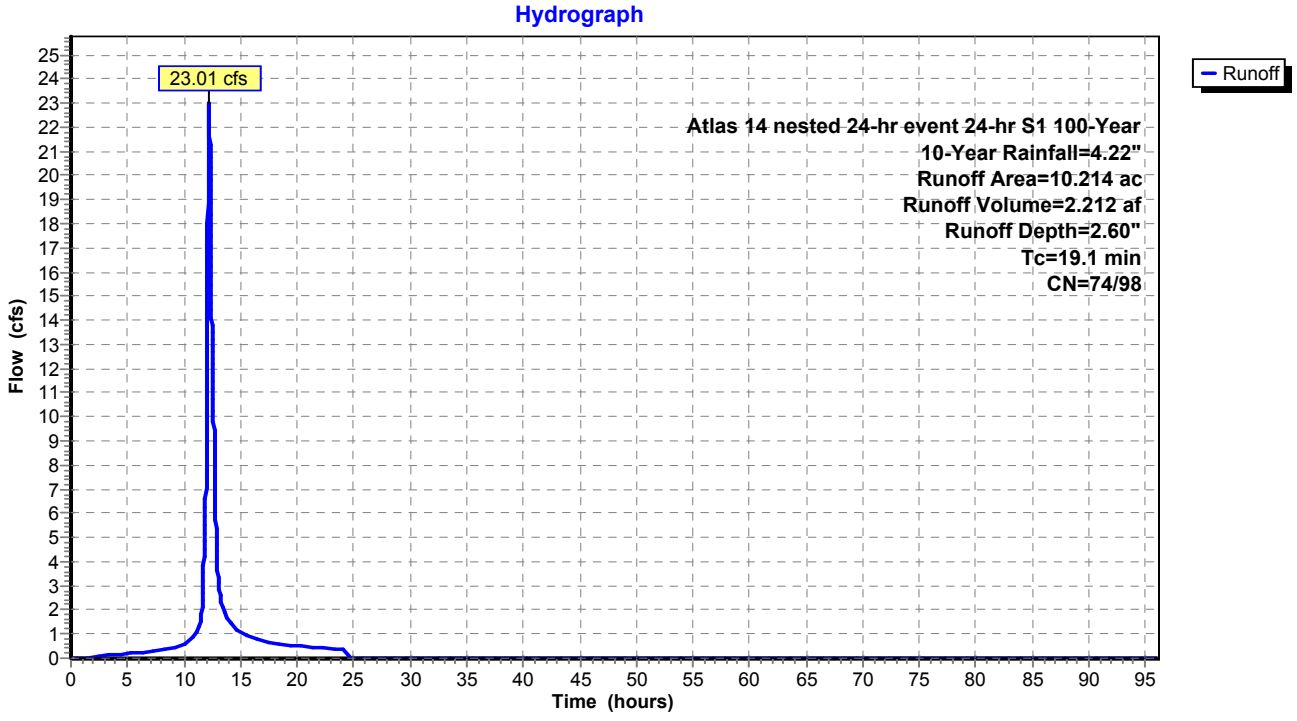
Runoff = 23.01 cfs @ 12.22 hrs, Volume= 2.212 af, Depth= 2.60"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 10-Year Rainfall=4.22"

	Area (ac)	CN	Description
*	6.360	74	pervious
*	3.854	98	impervious
	10.214	83	Weighted Average
	6.360	74	62.27% Pervious Area
	3.854	98	37.73% Impervious Area

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

Subcatchment SB 29: SB 29



Summary for Subcatchment SB 3: SB 3

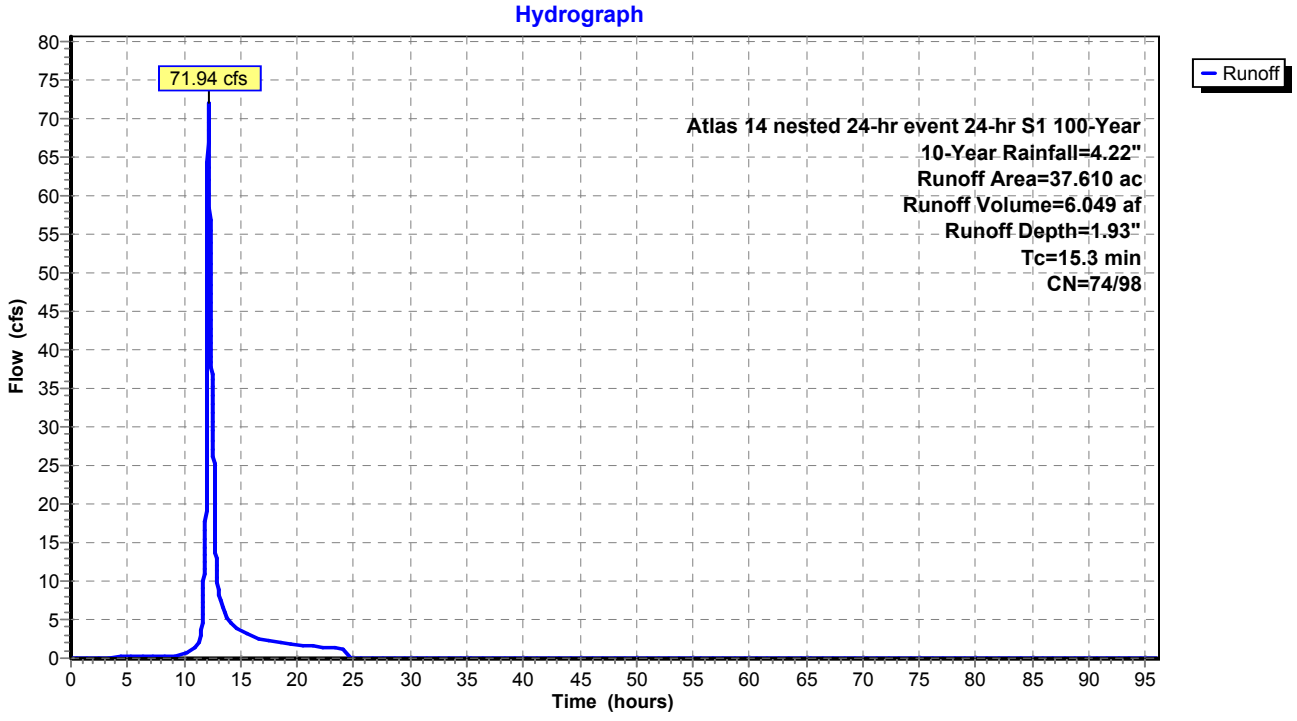
Runoff = 71.94 cfs @ 12.17 hrs, Volume= 6.049 af, Depth= 1.93"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 10-Year Rainfall=4.22"

	Area (ac)	CN	Description
*	34.720	74	Pervious
*	2.890	98	Impervious
	37.610	76	Weighted Average
	34.720	74	92.32% Pervious Area
	2.890	98	7.68% Impervious Area

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

Subcatchment SB 3: SB 3



Summary for Subcatchment SB 4: SB 4

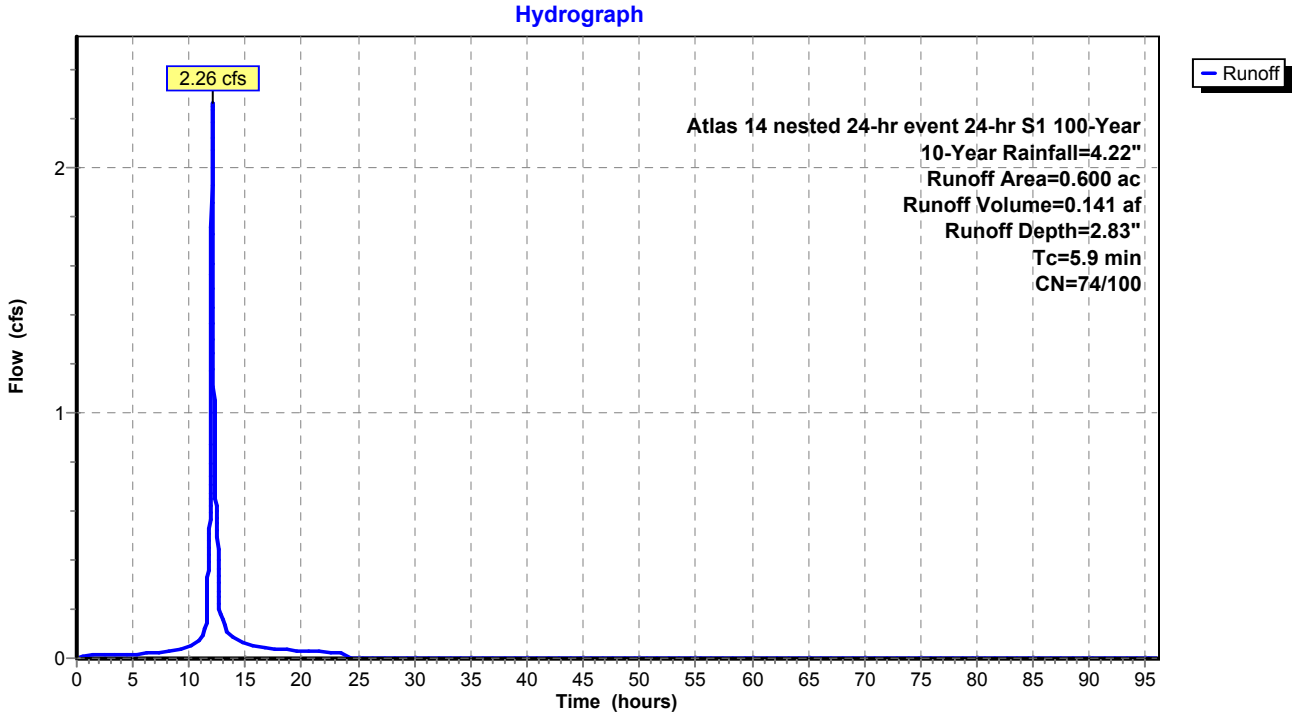
Runoff = 2.26 cfs @ 12.04 hrs, Volume= 0.141 af, Depth= 2.83"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 10-Year Rainfall=4.22"

	Area (ac)	CN	Description
*	0.340	74	pervious
*	0.260	100	impervious
	0.600	85	Weighted Average
	0.340	74	56.67% Pervious Area
	0.260	100	43.33% Impervious Area

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

Subcatchment SB 4: SB 4



Summary for Subcatchment SB 5: SB 5

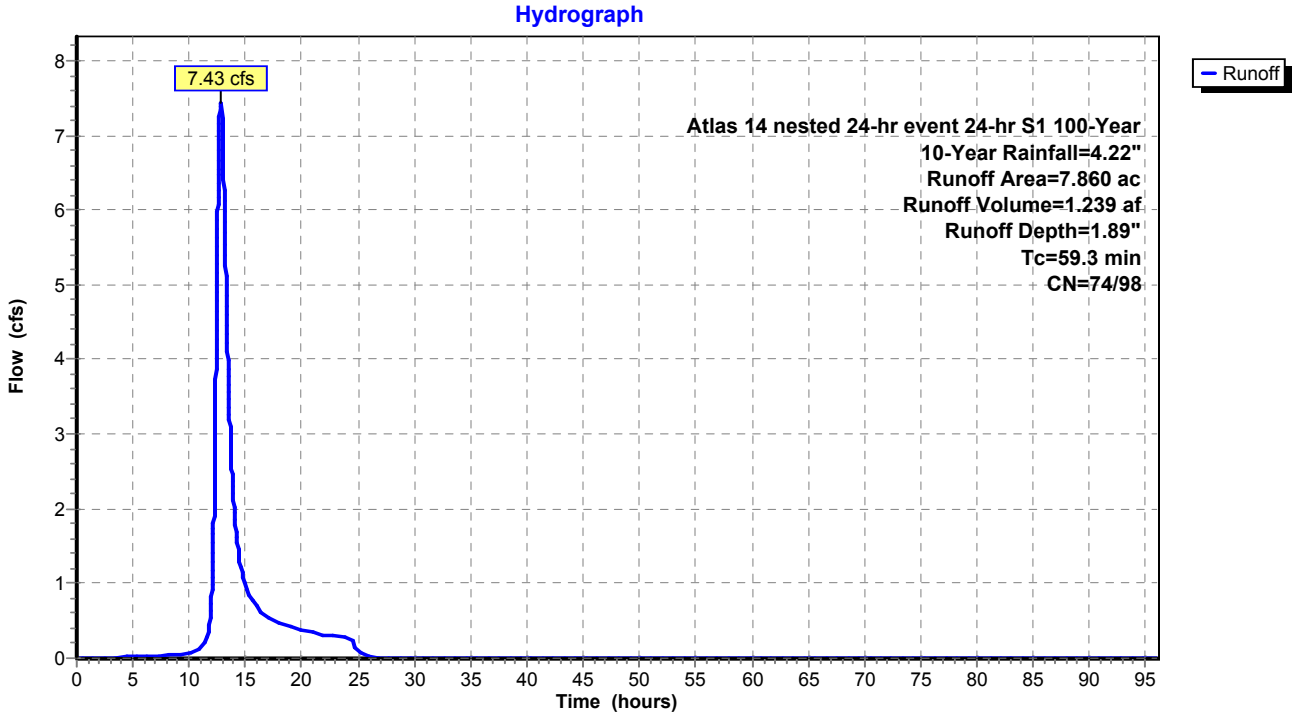
Runoff = 7.43 cfs @ 12.84 hrs, Volume= 1.239 af, Depth= 1.89"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 10-Year Rainfall=4.22"

	Area (ac)	CN	Description
*	7.390	74	pervious
*	0.470	98	impervious
	7.860	75	Weighted Average
	7.390	74	94.02% Pervious Area
	0.470	98	5.98% Impervious Area

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

Subcatchment SB 5: SB 5



Summary for Subcatchment SB 6: SB 6

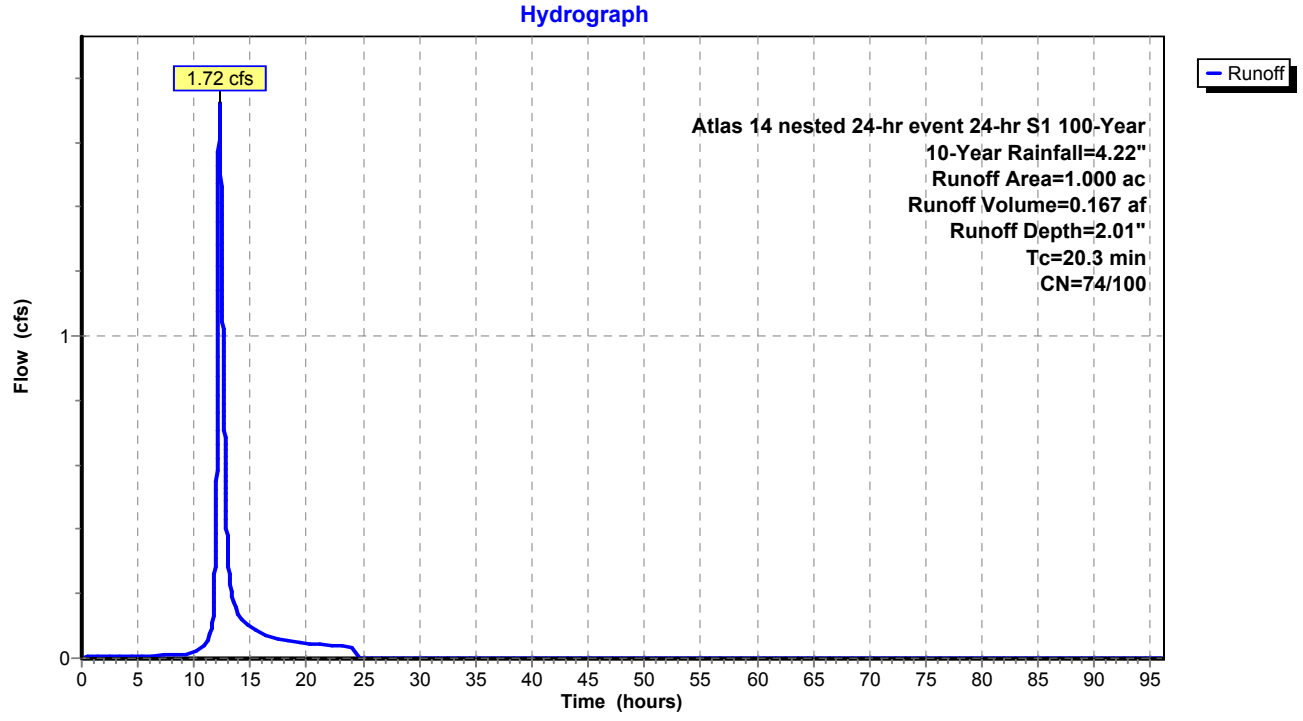
Runoff = 1.72 cfs @ 12.25 hrs, Volume= 0.167 af, Depth= 2.01"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 10-Year Rainfall=4.22"

	Area (ac)	CN	Description
*	0.900	74	pervious
*	0.100	100	impervious
	1.000	77	Weighted Average
	0.900	74	90.00% Pervious Area
	0.100	100	10.00% Impervious Area

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

Subcatchment SB 6: SB 6



Summary for Subcatchment SB 7: SB 7

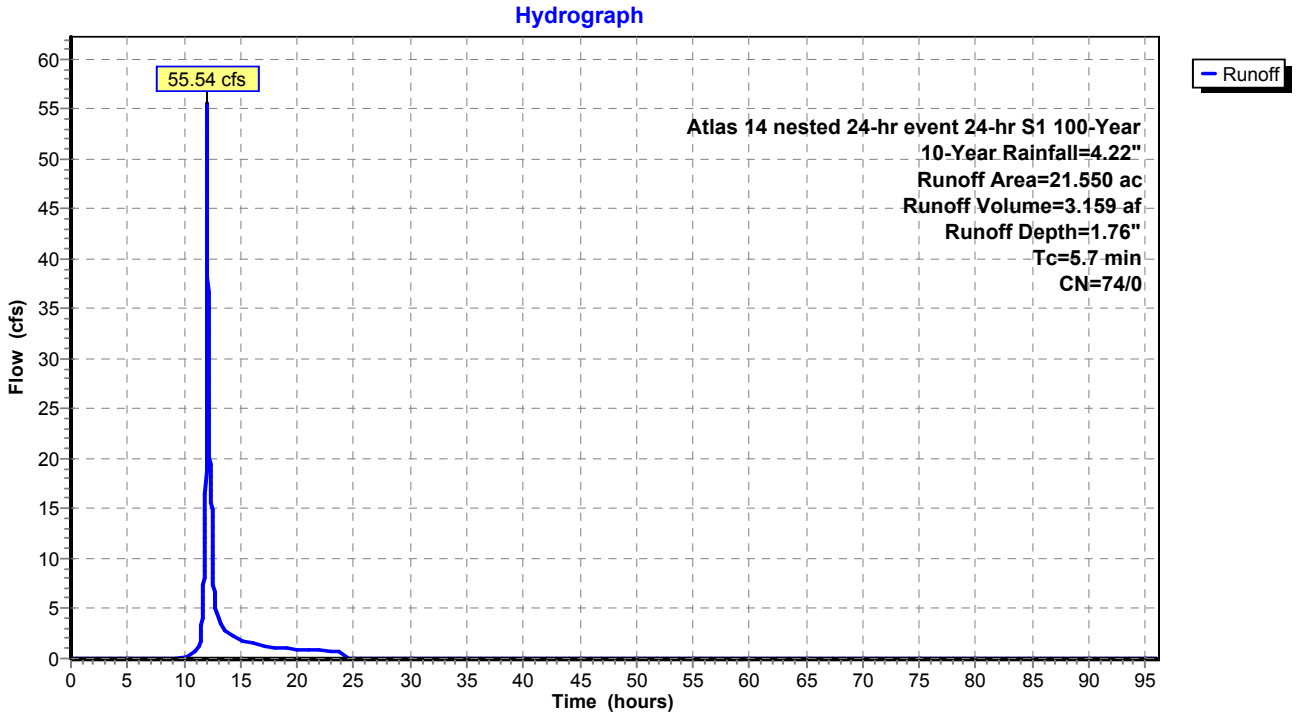
Runoff = 55.54 cfs @ 12.04 hrs, Volume= 3.159 af, Depth= 1.76"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 10-Year Rainfall=4.22"

	Area (ac)	CN	Description
*	21.550	74	pervious
*	0.000	98	impervious
	21.550	74	Weighted Average
	21.550	74	100.00% Pervious Area

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

Subcatchment SB 7: SB 7



Summary for Subcatchment SB 8: SB 8

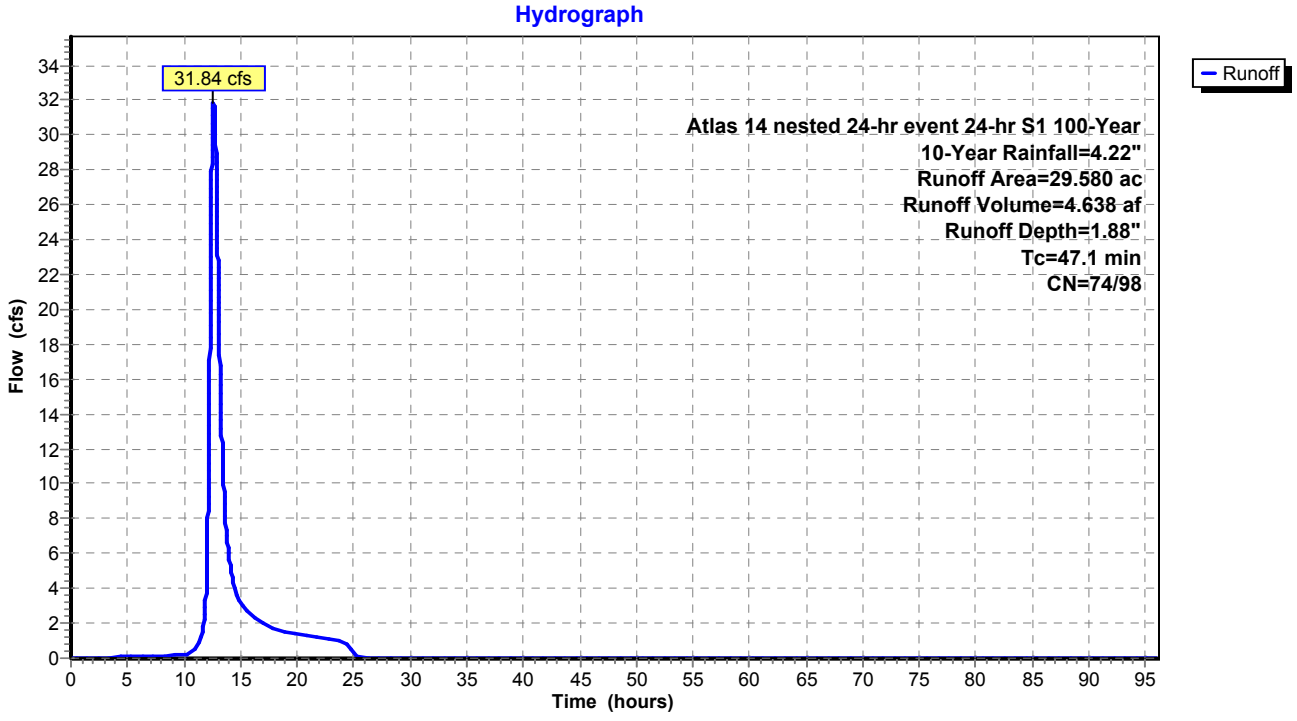
Runoff = 31.84 cfs @ 12.62 hrs, Volume= 4.638 af, Depth= 1.88"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 10-Year Rainfall=4.22"

	Area (ac)	CN	Description
*	27.950	74	pervious
*	1.630	98	impervious
	29.580	75	Weighted Average
	27.950	74	94.49% Pervious Area
	1.630	98	5.51% Impervious Area

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

Subcatchment SB 8: SB 8



Summary for Subcatchment SB 9: SB 9

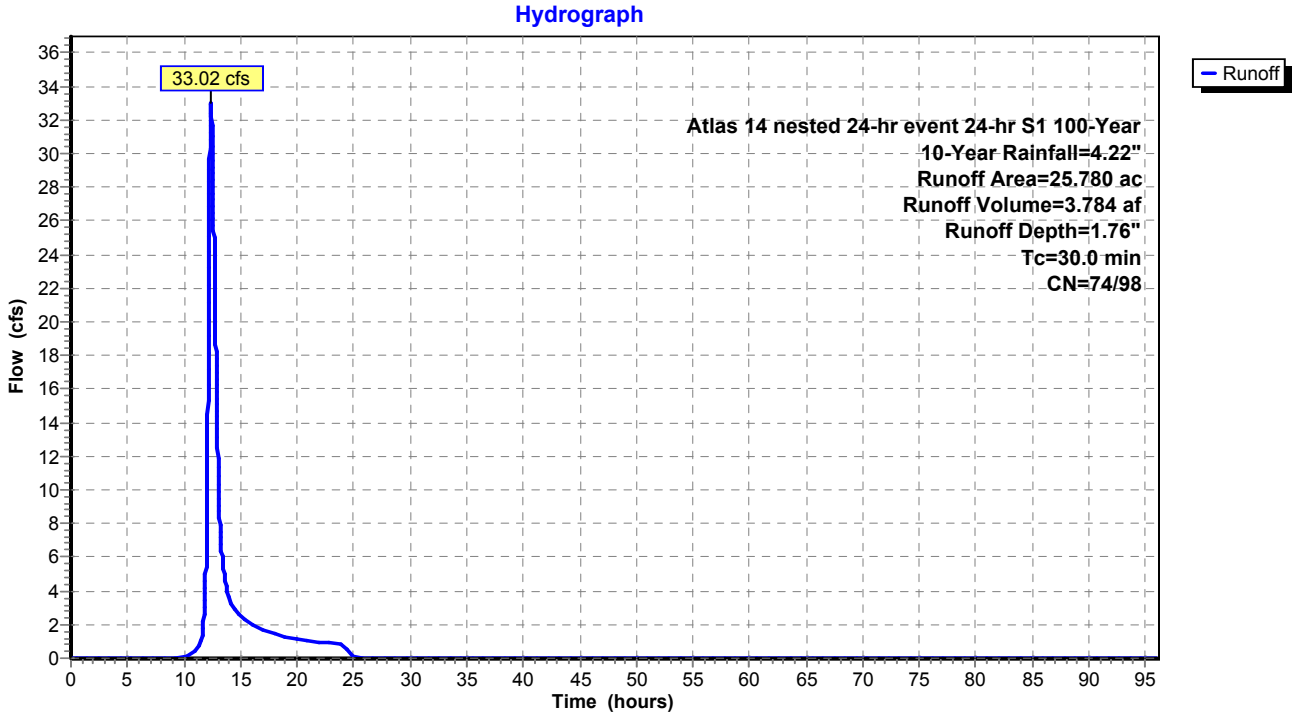
Runoff = 33.02 cfs @ 12.40 hrs, Volume= 3.784 af, Depth= 1.76"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 10-Year Rainfall=4.22"

	Area (ac)	CN	Description
*	25.750	74	permiable
*	0.030	98	impermiable
	25.780	74	Weighted Average
	25.750	74	99.88% Pervious Area
	0.030	98	0.12% Impervious Area

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

Subcatchment SB 9: SB 9



Summary for Subcatchment SB10: SB 10

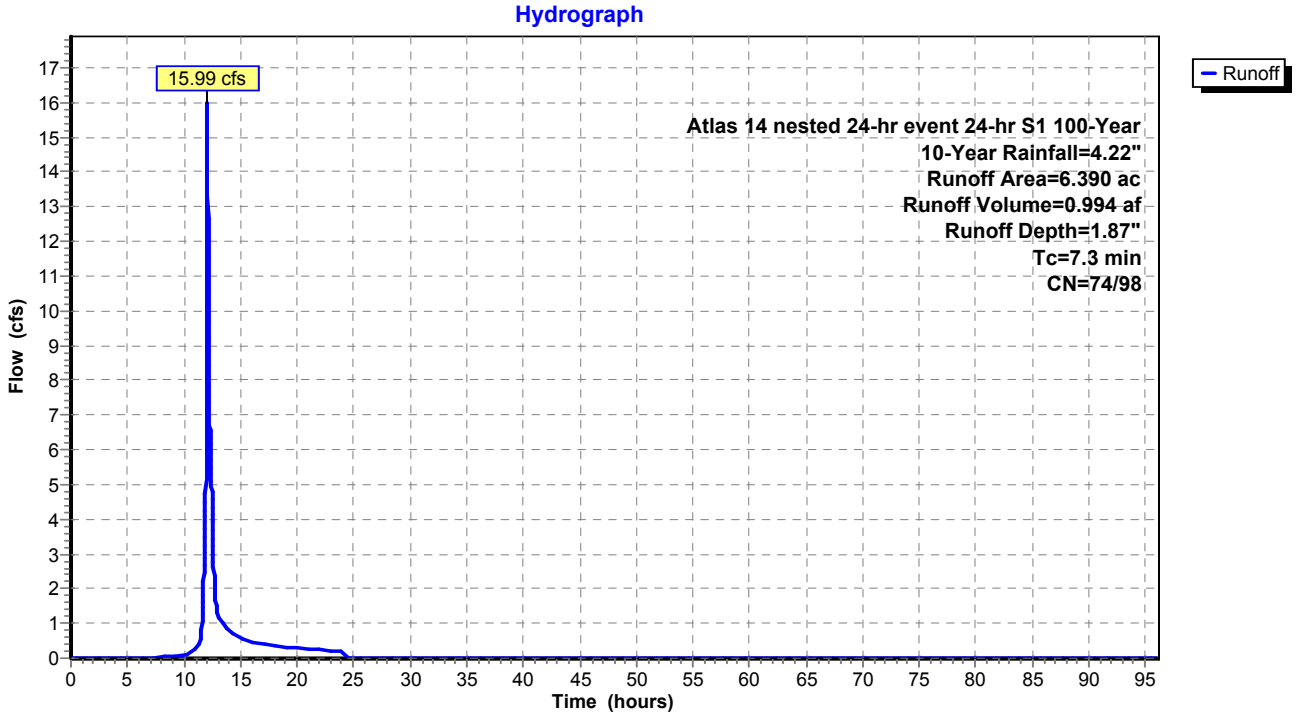
Runoff = 15.99 cfs @ 12.06 hrs, Volume= 0.994 af, Depth= 1.87"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 10-Year Rainfall=4.22"

	Area (ac)	CN	Description
*	6.080	74	pervious
*	0.310	98	impervious
	6.390	75	Weighted Average
	6.080	74	95.15% Pervious Area
	0.310	98	4.85% Impervious Area

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

Subcatchment SB10: SB 10



Summary for Reach 30R: 60" RCP to existing 60" storm sewer

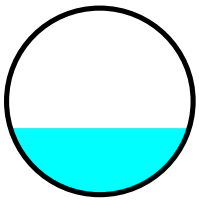
[52] Hint: Inlet/Outlet conditions not evaluated
[65] Warning: Inlet elevation not specified

Inflow Area = 133.156 ac, 9.78% Impervious, Inflow Depth = 1.88" for 10-Year event
Inflow = 93.90 cfs @ 12.54 hrs, Volume= 20.847 af
Outflow = 93.87 cfs @ 12.55 hrs, Volume= 20.847 af, Atten= 0%, Lag= 0.5 min

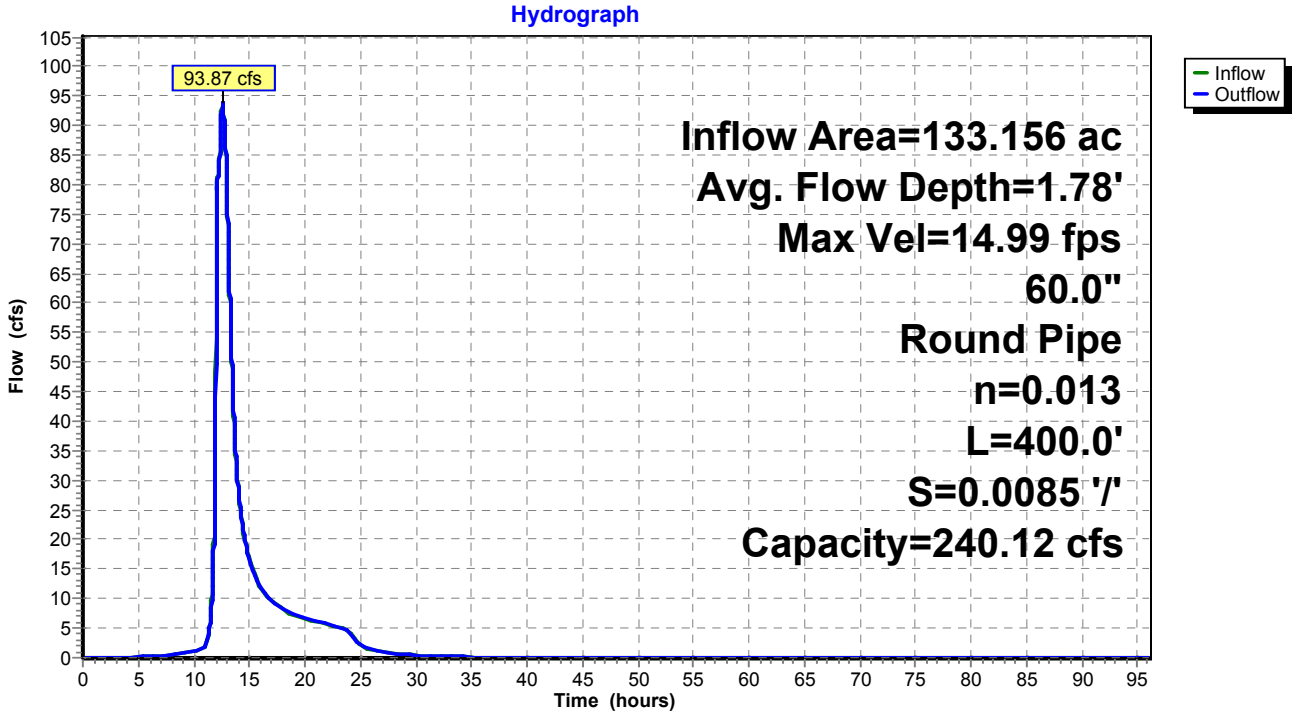
Routing by Muskingum-Cunge method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Reference Flow= 70.42 cfs Estimated Depth= 1.86' Velocity= 10.62 fps
m= 1.405, c= 14.93 fps, dt= 0.6 min, dx= 400.0' / 1 = 400.0', K= 0.4 min, X= 0.306
Max. Velocity= 14.99 fps, Min. Travel Time= 0.4 min
Avg. Velocity = 14.93 fps, Avg. Travel Time= 0.4 min

Peak Storage= 2,515 cf @ 12.55 hrs
Average Depth at Peak Storage= 1.78'
Bank-Full Depth= 5.00' Flow Area= 19.6 sf, Capacity= 240.12 cfs

60.0" Round Pipe
n= 0.013
Length= 400.0' Slope= 0.0085 '/'
Inlet Invert= 0.00', Outlet Invert= -3.40'



Reach 30R: 60" RCP to existing 60" storm sewer



Summary for Reach 34R: 60" RCP connecting P-1/P-2 with P-3

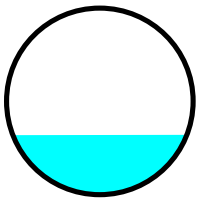
[52] Hint: Inlet/Outlet conditions not evaluated
[65] Warning: Inlet elevation not specified

Inflow Area = 68.260 ac, 7.26% Impervious, Inflow Depth = 1.92" for 10-Year event
Inflow = 59.01 cfs @ 12.64 hrs, Volume= 10.925 af
Outflow = 58.97 cfs @ 12.70 hrs, Volume= 10.925 af, Atten= 0%, Lag= 3.5 min

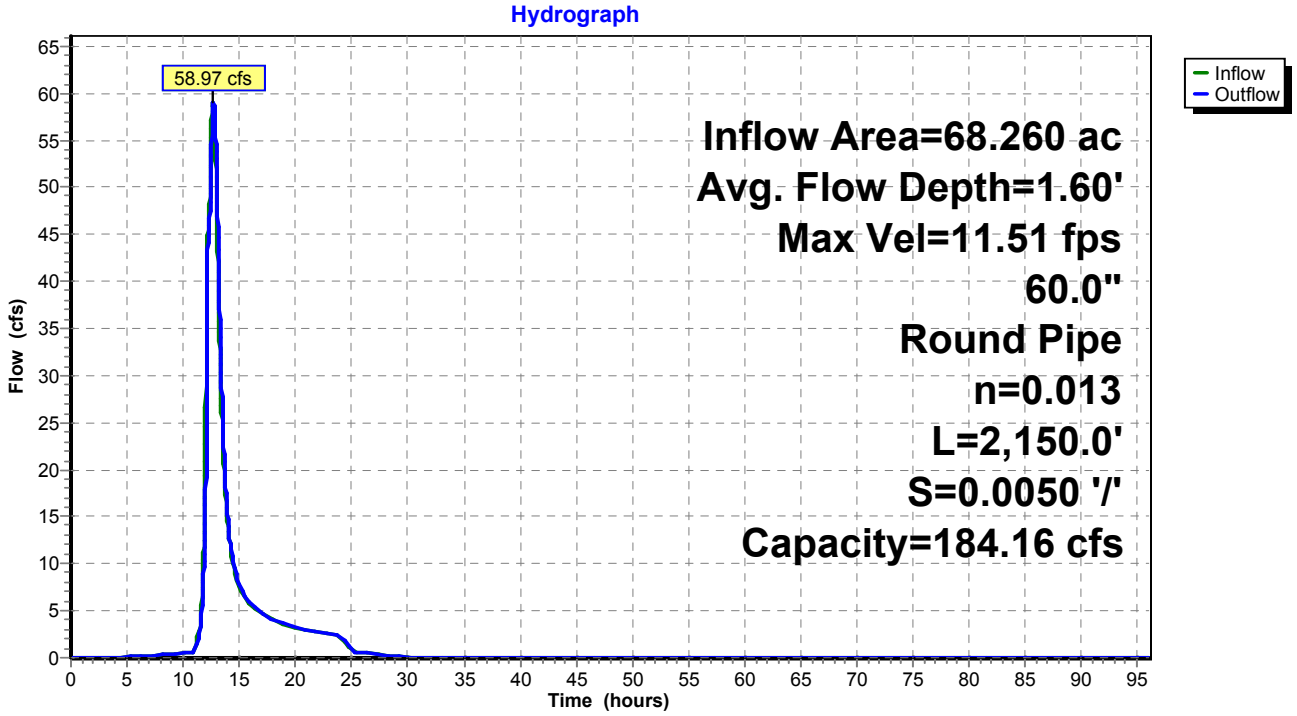
Routing by Muskingum-Cunge method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Reference Flow= 44.26 cfs Estimated Depth= 1.67' Velocity= 7.71 fps
m= 1.410, c= 10.87 fps, dt= 0.6 min, dx= 2,150.0' / 5 = 430.0', K= 0.7 min, X= 0.225
Max. Velocity= 11.51 fps, Min. Travel Time= 3.1 min
Avg. Velocity = 10.88 fps, Avg. Travel Time= 3.3 min

Peak Storage= 11,656 cf @ 12.67 hrs
Average Depth at Peak Storage= 1.60'
Bank-Full Depth= 5.00' Flow Area= 19.6 sf, Capacity= 184.16 cfs

60.0" Round Pipe
n= 0.013
Length= 2,150.0' Slope= 0.0050 '/'
Inlet Invert= 0.00', Outlet Invert= -10.75'



Reach 34R: 60" RCP connecting P-1/P-2 with P-3



Summary for Reach 37R: 48" RCP

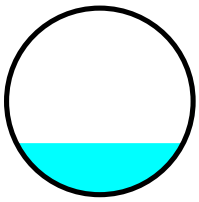
[52] Hint: Inlet/Outlet conditions not evaluated
[65] Warning: Inlet elevation not specified

Inflow Area = 43.346 ac, 18.61% Impervious, Inflow Depth = 1.87" for 10-Year event
Inflow = 26.67 cfs @ 12.65 hrs, Volume= 6.763 af
Outflow = 26.66 cfs @ 12.66 hrs, Volume= 6.763 af, Atten= 0%, Lag= 0.4 min

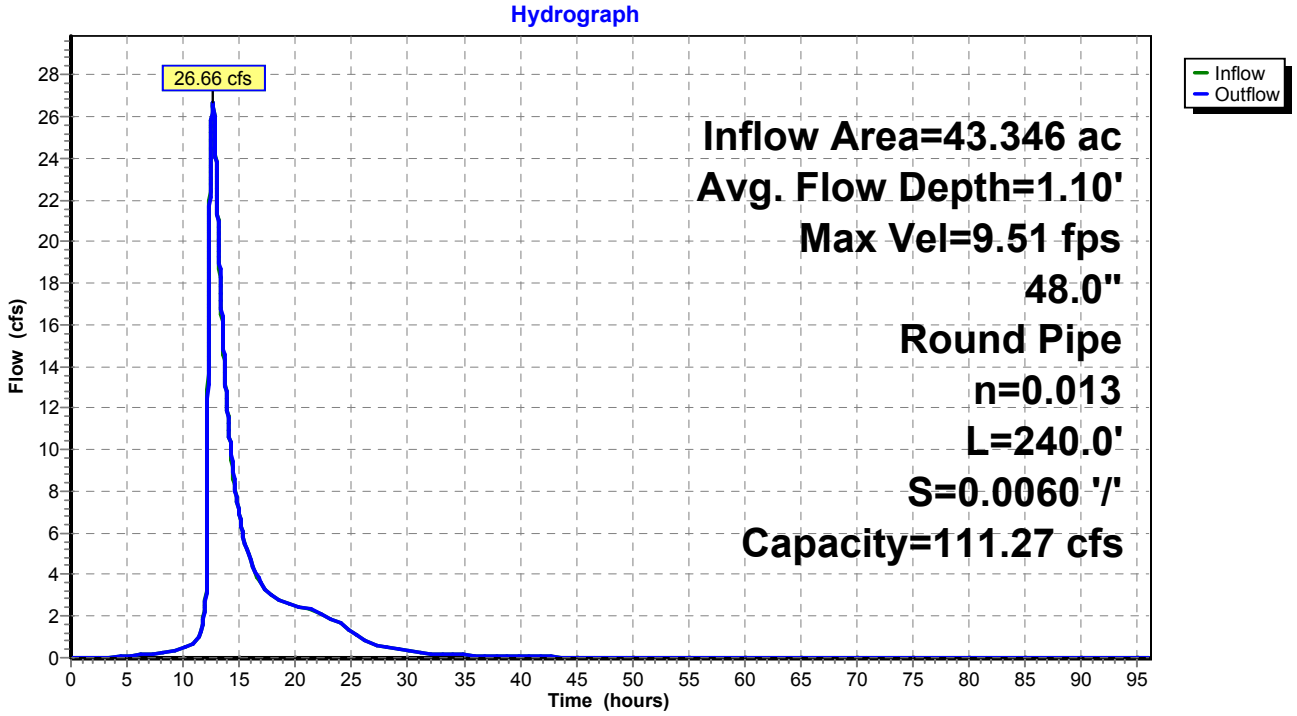
Routing by Muskingum-Cunge method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Reference Flow= 20.00 cfs Estimated Depth= 1.15' Velocity= 6.71 fps
m= 1.416, c= 9.50 fps, dt= 0.6 min, dx= 240.0' / 1 = 240.0', K= 0.4 min, X= 0.218
Max. Velocity= 9.51 fps, Min. Travel Time= 0.4 min
Avg. Velocity = 9.50 fps, Avg. Travel Time= 0.4 min

Peak Storage= 674 cf @ 12.66 hrs
Average Depth at Peak Storage= 1.10'
Bank-Full Depth= 4.00' Flow Area= 12.6 sf, Capacity= 111.27 cfs

48.0" Round Pipe
n= 0.013
Length= 240.0' Slope= 0.0060 '/'
Inlet Invert= 0.00', Outlet Invert= -1.44'



Reach 37R: 48" RCP



Summary for Reach 39R: 24" RCP

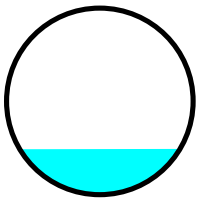
[52] Hint: Inlet/Outlet conditions not evaluated
[65] Warning: Inlet elevation not specified

Inflow Area = 8.860 ac, 6.43% Impervious, Inflow Depth = 1.90" for 10-Year event
Inflow = 3.07 cfs @ 13.74 hrs, Volume= 1.406 af
Outflow = 3.07 cfs @ 13.75 hrs, Volume= 1.406 af, Atten= 0%, Lag= 0.3 min

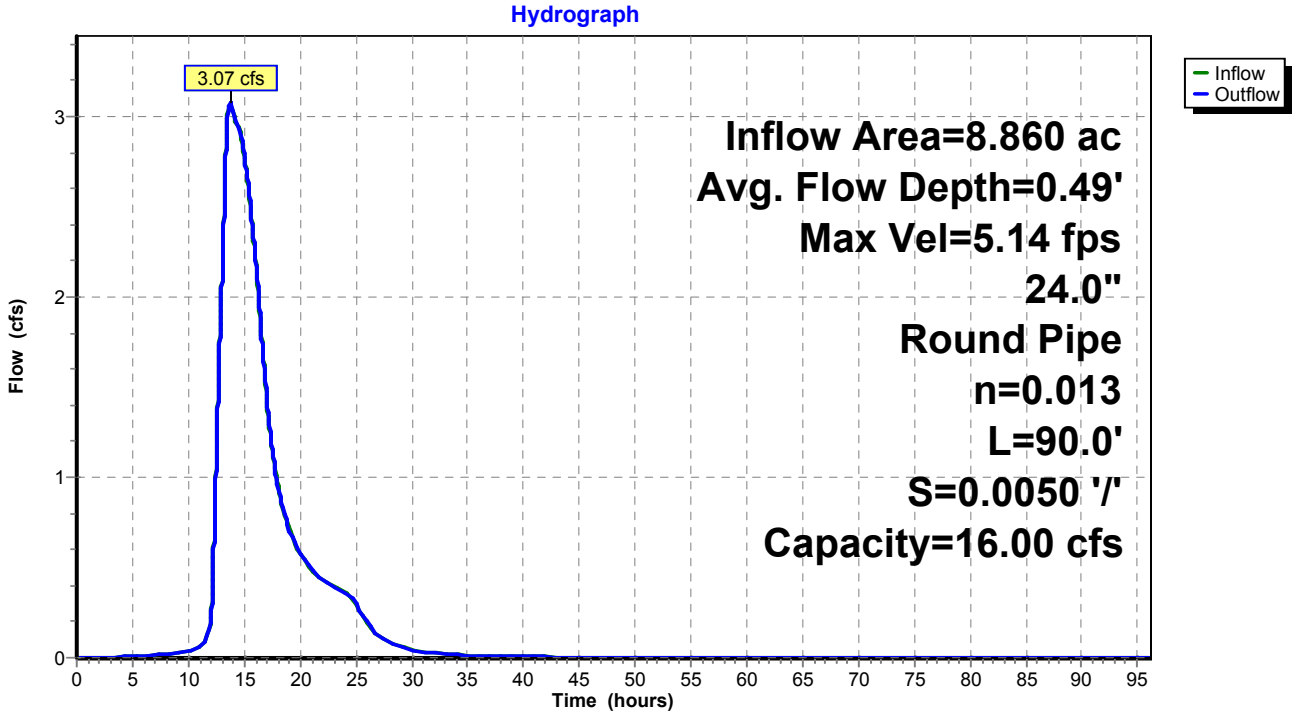
Routing by Muskingum-Cunge method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Reference Flow= 2.31 cfs Estimated Depth= 0.51' Velocity= 3.62 fps
m= 1.420, c= 5.14 fps, dt= 0.6 min, dx= 90.0' / 1 = 90.0', K= 0.3 min, X= 0.099
Max. Velocity= 5.14 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 5.14 fps, Avg. Travel Time= 0.3 min

Peak Storage= 54 cf @ 13.75 hrs
Average Depth at Peak Storage= 0.49'
Bank-Full Depth= 2.00' Flow Area= 3.1 sf, Capacity= 16.00 cfs

24.0" Round Pipe
n= 0.013
Length= 90.0' Slope= 0.0050 '/'
Inlet Invert= 0.00', Outlet Invert= -0.45'



Reach 39R: 24" RCP



Summary for Reach 43R: 30" RCP connecting P-10 with P-12

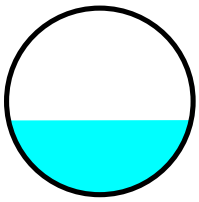
[52] Hint: Inlet/Outlet conditions not evaluated
[79] Warning: Submerged Pond 10P Primary device # 1 by 1.00'

Inflow Area = 66.430 ac, 5.22% Impervious, Inflow Depth > 1.36" for 10-Year event
Inflow = 11.90 cfs @ 13.20 hrs, Volume= 7.524 af
Outflow = 11.90 cfs @ 13.23 hrs, Volume= 7.524 af, Atten= 0%, Lag= 2.0 min

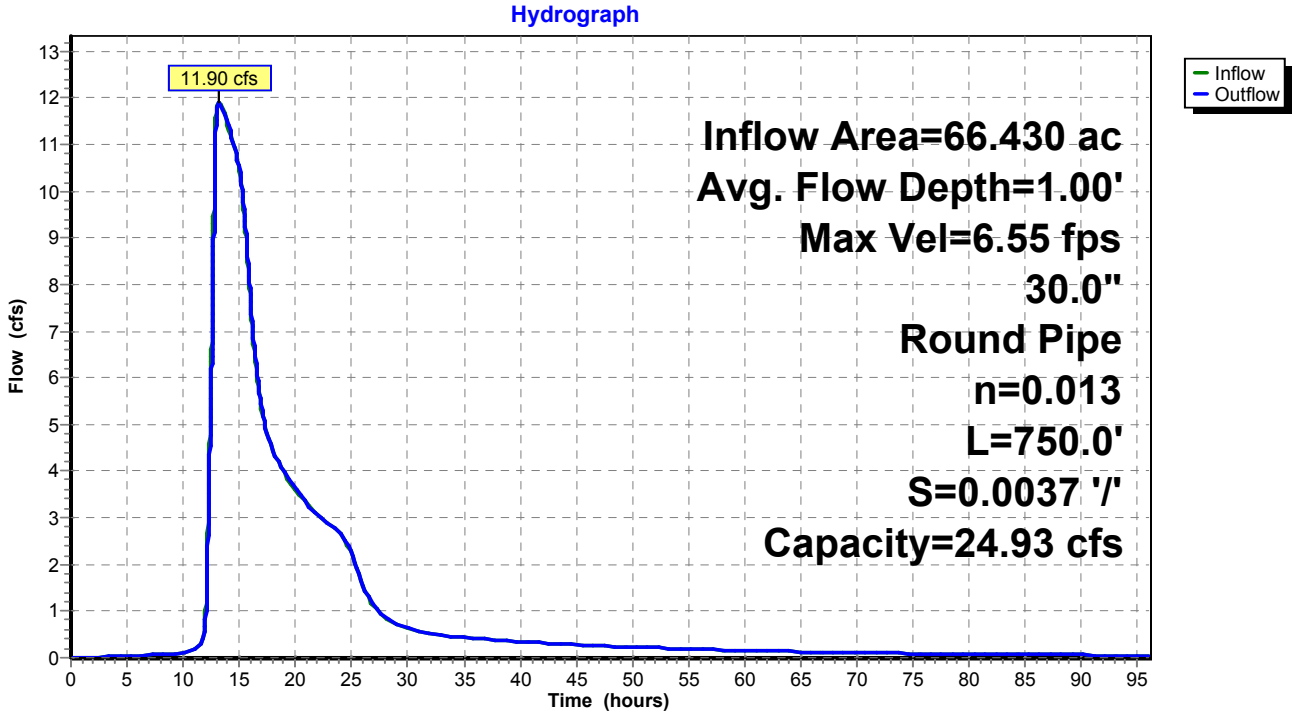
Routing by Muskingum-Cunge method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Reference Flow= 8.93 cfs Estimated Depth= 1.03' Velocity= 4.66 fps
m= 1.399, c= 6.51 fps, dt= 0.6 min, dx= 750.0' / 3 = 250.0', K= 0.6 min, X= 0.100
Max. Velocity= 6.55 fps, Min. Travel Time= 1.9 min
Avg. Velocity = 6.51 fps, Avg. Travel Time= 1.9 min

Peak Storage= 1,370 cf @ 13.22 hrs
Average Depth at Peak Storage= 1.00'
Bank-Full Depth= 2.50' Flow Area= 4.9 sf, Capacity= 24.93 cfs

30.0" Round Pipe
n= 0.013
Length= 750.0' Slope= 0.0037 '/'
Inlet Invert= 896.00', Outlet Invert= 893.23'



Reach 43R: 30" RCP connecting P-10 with P-12



Summary for Reach 51R: 40' x 4.5 ft parabolic hannel from P-13 to Rice Creek

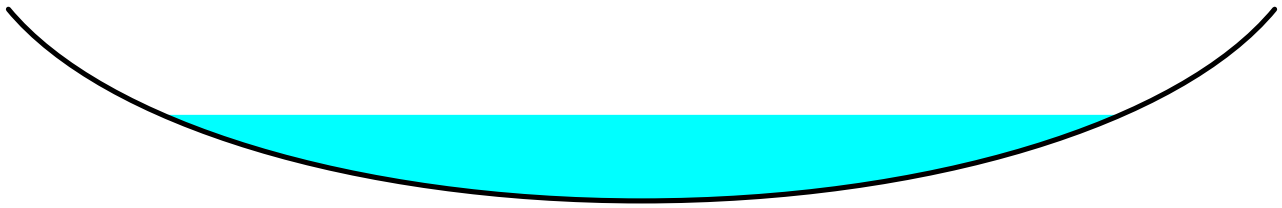
[65] Warning: Inlet elevation not specified
[97] Warning: Factor X out of range

Inflow Area = 245.383 ac, 10.42% Impervious, Inflow Depth > 2.03" for 10-Year event
Inflow = 194.68 cfs @ 12.48 hrs, Volume= 41.413 af
Outflow = 194.58 cfs @ 12.50 hrs, Volume= 41.413 af, Atten= 0%, Lag= 0.9 min

Routing by Muskingum-Cunge method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Reference Flow= 146.01 cfs Estimated Depth= 2.13' Velocity= 3.75 fps
m= 1.440, c= 5.40 fps, dt= 0.6 min, dx= 300.0' / 2 = 150.0', K= 0.5 min, X= 0.000
Max. Velocity= 5.43 fps, Min. Travel Time= 0.9 min
Avg. Velocity = 5.40 fps, Avg. Travel Time= 0.9 min

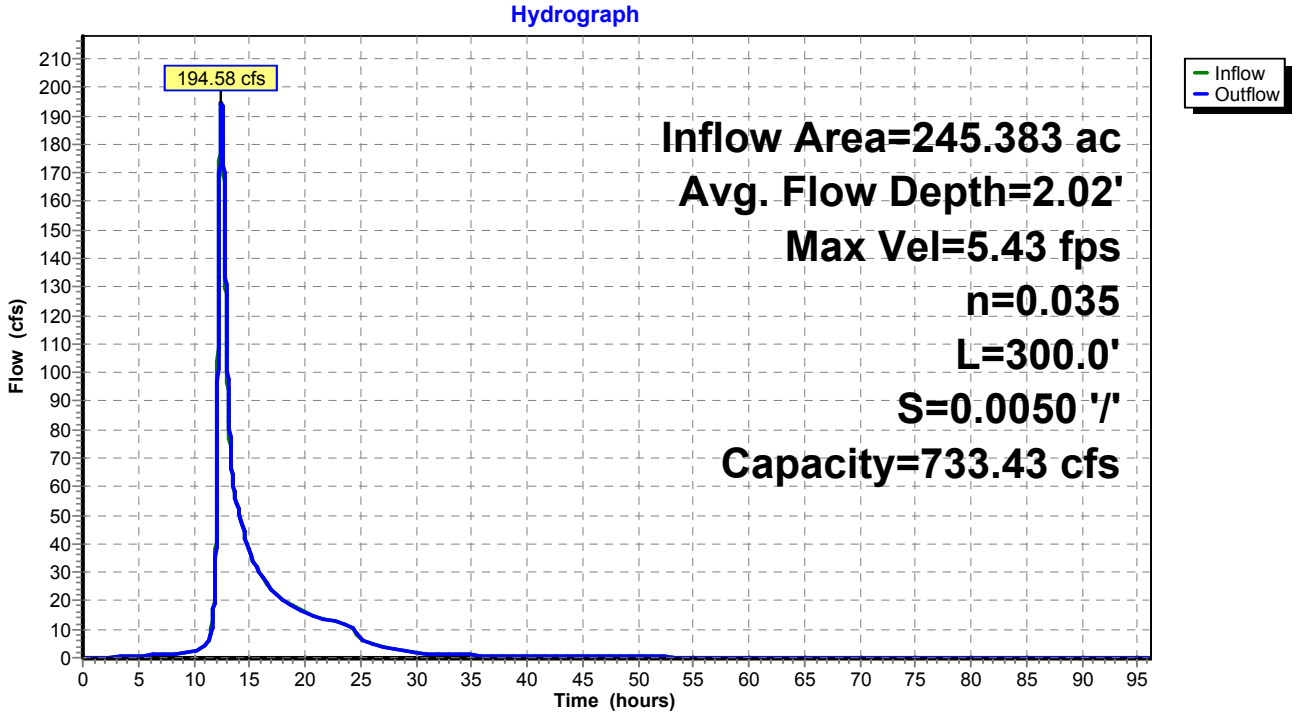
Peak Storage= 10,818 cf @ 12.50 hrs
Average Depth at Peak Storage= 2.02'
Bank-Full Depth= 4.50' Flow Area= 120.0 sf, Capacity= 733.43 cfs

40.00' x 4.50' deep Parabolic Channel, n= 0.035
Length= 300.0' Slope= 0.0050 '/'
Inlet Invert= 0.00', Outlet Invert= -1.50'



‡

Reach 51R: 40' x 4.5 ft parabolic hannel from P-13 to Rice Creek



Summary for Pond 2 P: P-2

Inflow Area = 68.260 ac, 7.26% Impervious, Inflow Depth = 1.92" for 10-Year event
Inflow = 59.33 cfs @ 12.57 hrs, Volume= 10.925 af
Outflow = 59.01 cfs @ 12.64 hrs, Volume= 10.925 af, Atten= 1%, Lag= 3.9 min
Primary = 59.01 cfs @ 12.64 hrs, Volume= 10.925 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Starting Elev= 924.00' Surf.Area= 0.370 ac Storage= 0.730 af
Peak Elev= 924.98' @ 12.64 hrs Surf.Area= 0.434 ac Storage= 1.125 af (0.395 af above start)

Plug-Flow detention time= 73.4 min calculated for 10.194 af (93% of inflow)
Center-of-Mass det. time= 21.0 min (882.7 - 861.8)

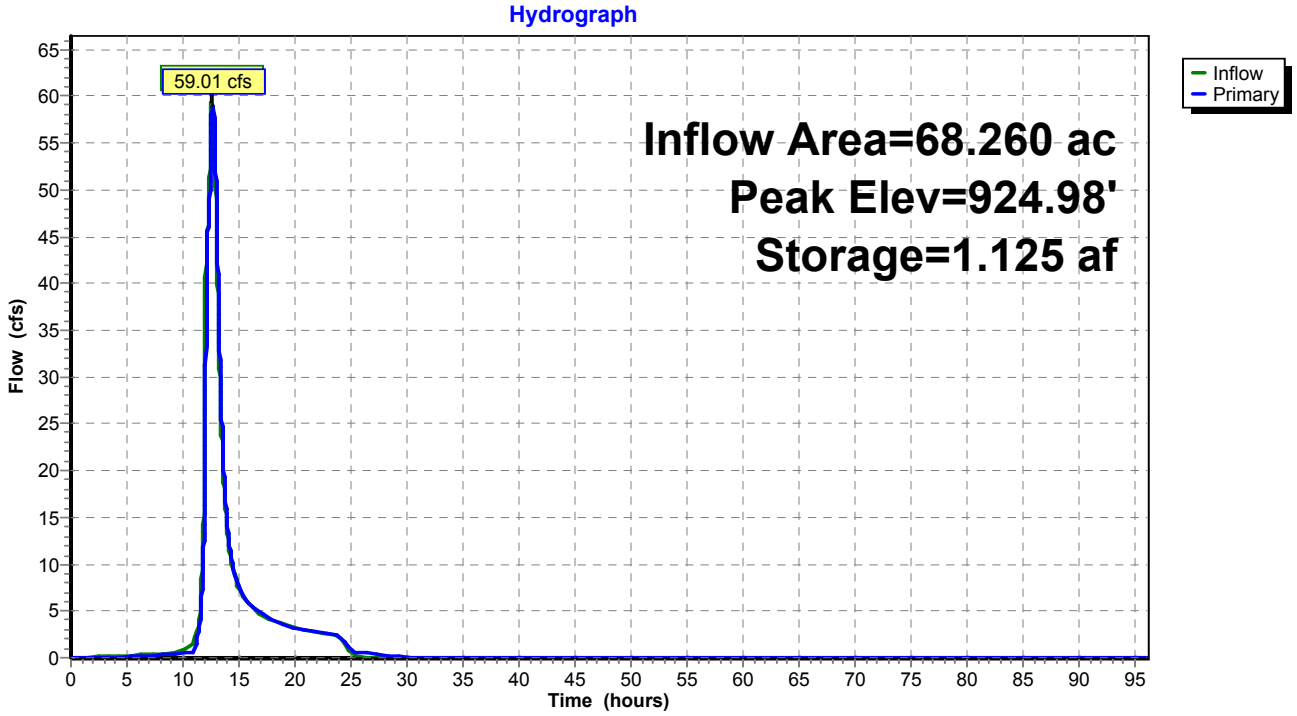
Volume	Invert	Avail.Storage	Storage Description
#1	920.00'	1.600 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
920.00	0.100	0.000	0.000
922.00	0.130	0.230	0.230
924.00	0.370	0.500	0.730
926.00	0.500	0.870	1.600

Device	Routing	Invert	Outlet Devices
#1	Primary	924.40'	**40.0' long x 1.00' rise Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#2	Primary	924.00'	**6.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=59.00 cfs @ 12.64 hrs HW=924.98' (Free Discharge)
└**1=Sharp-Crested Rectangular Weir** (Weir Controls 58.06 cfs @ 2.50 fps)
└**2=Orifice/Grate** (Orifice Controls 0.94 cfs @ 4.77 fps)

Pond 2 P: P-2


Hydrograph
59.01 cfs
Inflow Area=68.260 ac
Peak Elev=924.98'
Storage=1.125 af
Inflow
Primary
Flow (cfs)
Time (hours)
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
75
80
85
90
95

Summary for Pond 4P: P-4

Inflow Area = 7.860 ac, 5.98% Impervious, Inflow Depth = 1.89" for 10-Year event
Inflow = 7.43 cfs @ 12.84 hrs, Volume= 1.239 af
Outflow = 3.65 cfs @ 13.49 hrs, Volume= 1.239 af, Atten= 51%, Lag= 39.1 min
Primary = 1.35 cfs @ 13.49 hrs, Volume= 0.429 af
Secondary = 2.30 cfs @ 13.49 hrs, Volume= 0.810 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Starting Elev= 915.00' Surf.Area= 0.275 ac Storage= 0.646 af
Peak Elev= 916.17' @ 13.49 hrs Surf.Area= 0.340 ac Storage= 1.004 af (0.358 af above start)

Plug-Flow detention time= 332.6 min calculated for 0.594 af (48% of inflow)
Center-of-Mass det. time= 58.0 min (939.1 - 881.1)

Volume	Invert	Avail.Storage	Storage Description
#1	910.90'	1.728 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

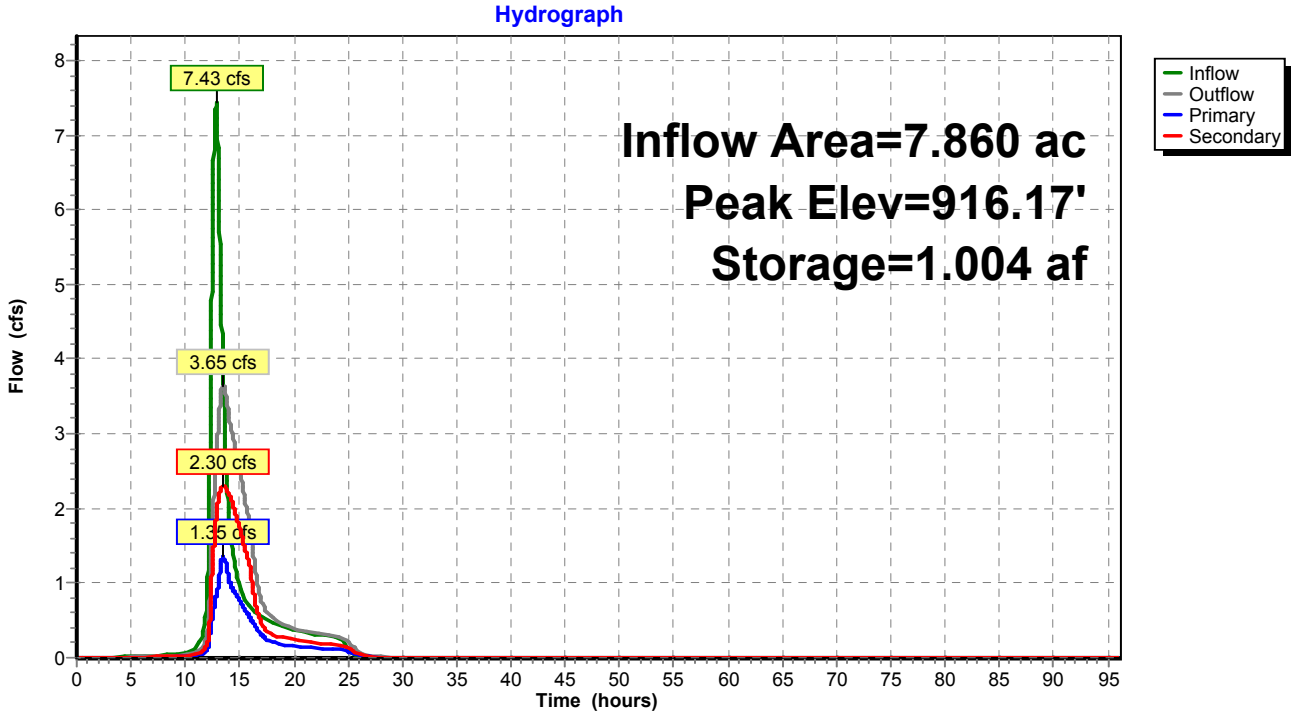
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
910.90	0.070	0.000	0.000
912.00	0.090	0.088	0.088
914.00	0.220	0.310	0.398
916.00	0.330	0.550	0.948
918.00	0.450	0.780	1.728

Device	Routing	Invert	Outlet Devices
#1	Primary	915.00'	**6.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Secondary	915.00'	**9.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Primary	915.95'	**24.0" Round RCP_Round 24"** L= 50.0' RCP, groove end w/headwall, Ke= 0.200 Inlet / Outlet Invert= 915.80' / 915.95' S= -0.0030 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf

Primary OutFlow Max=1.35 cfs @ 13.49 hrs HW=916.17' (Free Discharge)
└**1=Orifice/Grate** (Orifice Controls 1.02 cfs @ 5.20 fps)
└**3=RCP_Round 24"** (Barrel Controls 0.32 cfs @ 1.25 fps)

Secondary OutFlow Max=2.30 cfs @ 13.49 hrs HW=916.17' (Free Discharge)
└**2=Orifice/Grate** (Orifice Controls 2.30 cfs @ 5.20 fps)

Pond 4P: P-4


Hydrograph
Inflow Area=7.860 ac
Peak Elev=916.17'
Storage=1.004 af
7.43 cfs
3.65 cfs
2.30 cfs
1.35 cfs
Inflow
Outflow
Primary
Secondary
Flow (cfs)
Time (hours)
0
1
2
3
4
5
6
7
8
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95

Summary for Pond 7P: P-7

Inflow Area = 29.580 ac, 5.51% Impervious, Inflow Depth = 1.88" for 10-Year event
Inflow = 31.84 cfs @ 12.62 hrs, Volume= 4.638 af
Outflow = 31.84 cfs @ 12.63 hrs, Volume= 4.558 af, Atten= 0%, Lag= 0.7 min
Primary = 31.62 cfs @ 12.63 hrs, Volume= 4.039 af
Secondary = 0.22 cfs @ 12.63 hrs, Volume= 0.518 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Starting Elev= 915.00' Surf.Area= 0.440 ac Storage= 1.062 af
Peak Elev= 915.78' @ 12.63 hrs Surf.Area= 0.534 ac Storage= 1.444 af (0.381 af above start)

Plug-Flow detention time= 300.5 min calculated for 3.496 af (75% of inflow)
Center-of-Mass det. time= 129.6 min (1,000.4 - 870.8)

Volume	Invert	Avail.Storage	Storage Description
#1	910.95'	1.562 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

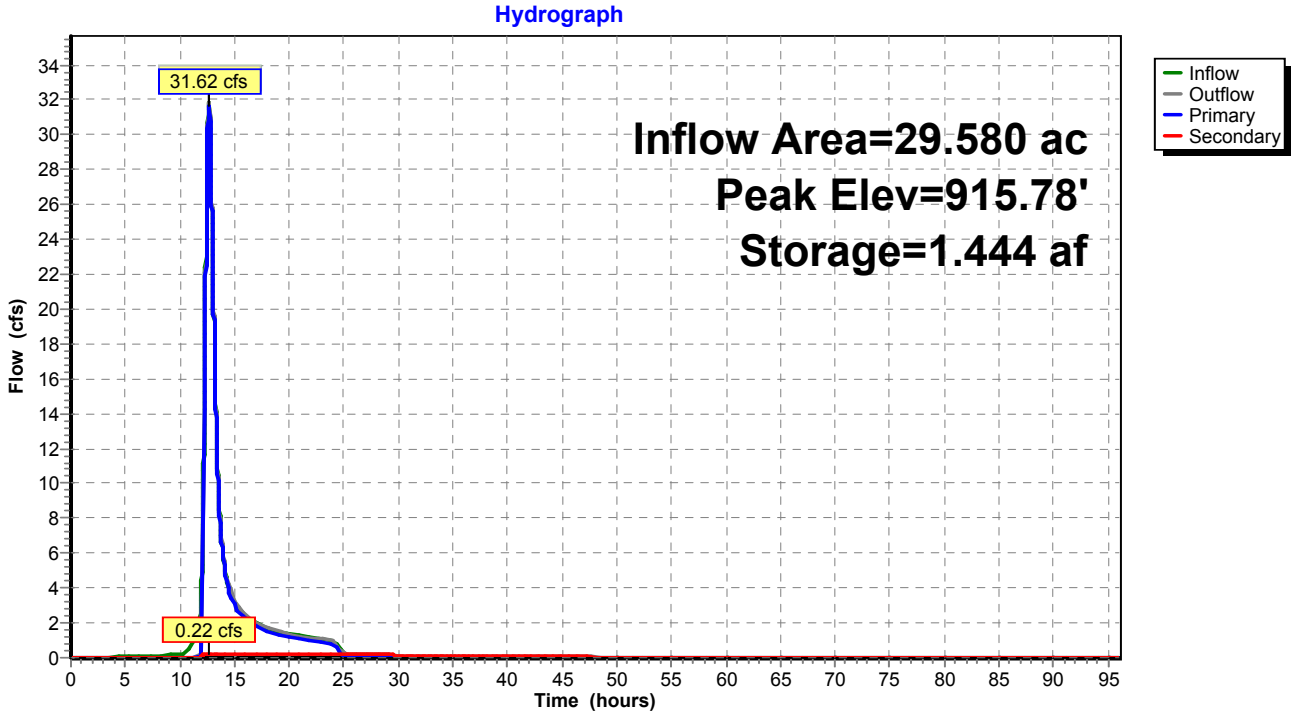
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
910.95	0.110	0.000	0.000
912.00	0.180	0.152	0.152
914.00	0.340	0.520	0.672
915.00	0.440	0.390	1.062
916.00	0.560	0.500	1.562

Device	Routing	Invert	Outlet Devices
#1	Primary	915.00'	**75.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88
#2	Secondary	915.00'	**12.0" Round RCP_Round 12"** L= 50.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 915.00' / 914.75' S= 0.0050 '/' Cc= 0.900 n= 0.130, Flow Area= 0.79 sf

Primary OutFlow Max=41.97 cfs @ 12.63 hrs HW=915.78' TW=915.76' (Fixed TW Elev= 915.76')
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 41.97 cfs @ 0.71 fps)

Secondary OutFlow Max=0.22 cfs @ 12.63 hrs HW=915.78' (Free Discharge)
↑—**2=RCP_Round 12"** (Barrel Controls 0.22 cfs @ 0.45 fps)

Pond 7P: P-7


Hydrograph
Inflow Area=29.580 ac
Peak Elev=915.78'
Storage=1.444 af
31.62 cfs
0.22 cfs
Inflow
Outflow
Primary
Secondary
Flow (cfs)
Time (hours)
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28
30
32
34
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
75
80
85
90
95

Summary for Pond 8P: P-8

Inflow Area = 6.390 ac, 4.85% Impervious, Inflow Depth = 1.87" for 10-Year event
Inflow = 15.99 cfs @ 12.06 hrs, Volume= 0.994 af
Outflow = 3.94 cfs @ 12.57 hrs, Volume= 0.993 af, Atten= 75%, Lag= 30.7 min
Primary = 3.94 cfs @ 12.57 hrs, Volume= 0.993 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Starting Elev= 897.00' Surf.Area= 0.300 ac Storage= 0.495 af
Peak Elev= 898.05' @ 12.57 hrs Surf.Area= 0.452 ac Storage= 0.890 af (0.395 af above start)

Plug-Flow detention time= 509.3 min calculated for 0.498 af (50% of inflow)
Center-of-Mass det. time= 164.7 min (999.8 - 835.1)

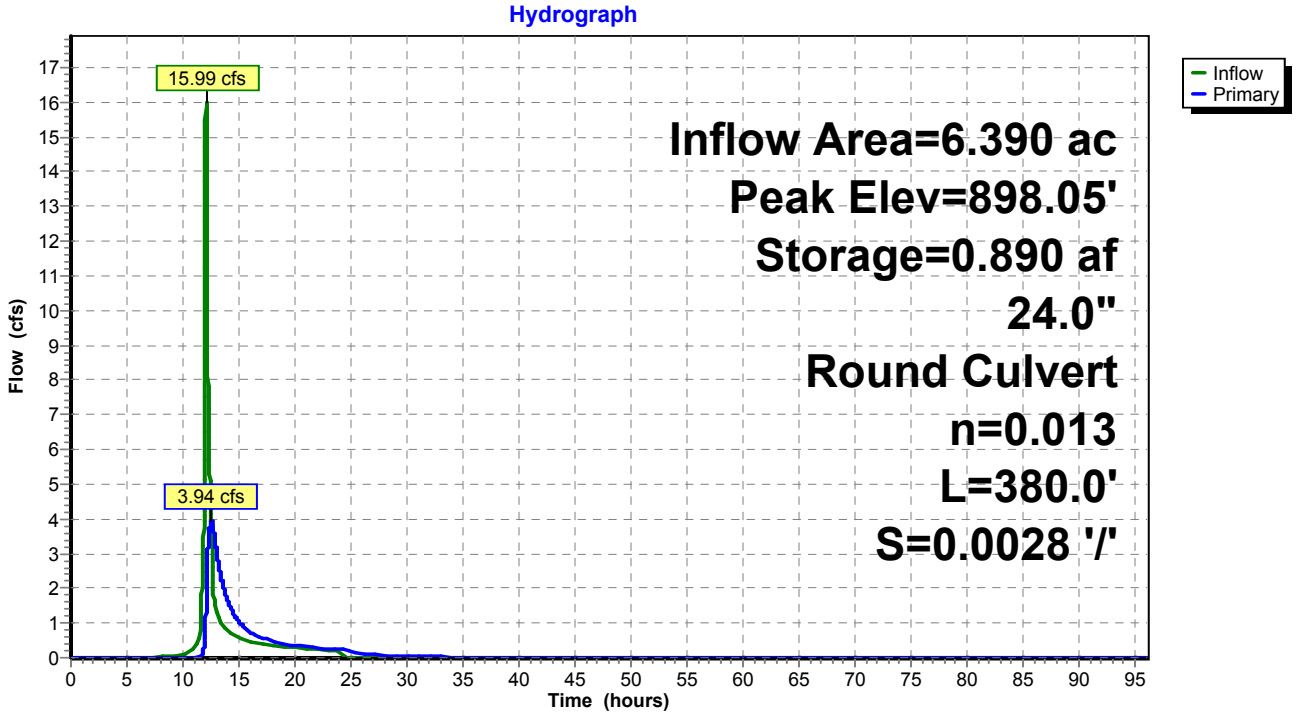
Volume	Invert	Avail.Storage	Storage Description
#1	893.00'	1.850 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
893.00	0.030	0.000	0.000
894.00	0.070	0.050	0.050
896.00	0.150	0.220	0.270
897.00	0.300	0.225	0.495
898.00	0.450	0.375	0.870
900.00	0.530	0.980	1.850

Device	Routing	Invert	Outlet Devices
#1	Primary	897.00'	**24.0" Round RCP_Round 24"** L= 380.0' RCP, groove end w/headwall, Ke= 0.200 Inlet / Outlet Invert= 897.00' / 895.94' S= 0.0028 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf

Primary OutFlow Max=3.94 cfs @ 12.57 hrs HW=898.05' (Free Discharge)
↑—**1=RCP_Round 24"** (Barrel Controls 3.94 cfs @ 3.45 fps)

Pond 8P: P-8


Hydrograph
15.99 cfs
3.94 cfs
Inflow Area=6.390 ac
Peak Elev=898.05'
Storage=0.890 af
24.0"
Round Culvert
n=0.013
L=380.0'
S=0.0028 '/'
Inflow
Primary
Flow (cfs)
Time (hours)
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95

Summary for Pond 9P: P-9

[81] Warning: Exceeded Pond W-3 by 0.69' @ 12.51 hrs

Inflow Area = 55.360 ac, 3.00% Impervious, Inflow Depth > 1.97" for 10-Year event
Inflow = 59.94 cfs @ 12.50 hrs, Volume= 9.104 af
Outflow = 59.85 cfs @ 12.52 hrs, Volume= 9.104 af, Atten= 0%, Lag= 0.8 min
Primary = 59.85 cfs @ 12.52 hrs, Volume= 9.104 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Starting Elev= 915.00' Surf.Area= 0.210 ac Storage= 0.353 af
Peak Elev= 915.44' @ 12.52 hrs Surf.Area= 0.298 ac Storage= 0.465 af (0.112 af above start)

Plug-Flow detention time= 136.4 min calculated for 8.751 af (96% of inflow)
Center-of-Mass det. time= 2.1 min (1,108.0 - 1,105.9)

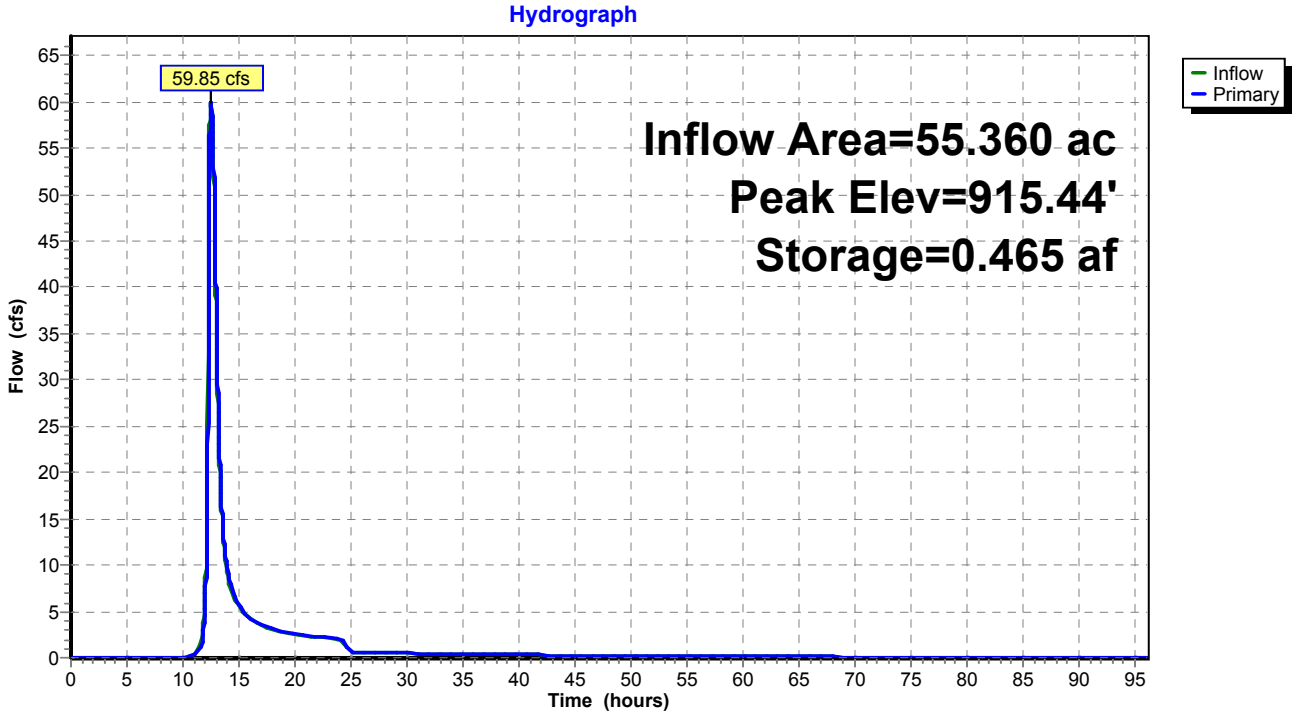
Volume	Invert	Avail.Storage	Storage Description
#1	910.50'	1.673 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
910.50	0.020	0.000	0.000
912.00	0.050	0.052	0.052
913.00	0.070	0.060	0.112
914.00	0.100	0.085	0.198
915.00	0.210	0.155	0.353
916.00	0.410	0.310	0.662
918.00	0.600	1.010	1.673

Device	Routing	Invert	Outlet Devices
#1	Primary	915.00'	**80.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=59.73 cfs @ 12.52 hrs HW=915.44' (Free Discharge)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 59.73 cfs @ 1.69 fps)

Pond 9P: P-9


Hydrograph
59.85 cfs
Inflow Area=55.360 ac
Peak Elev=915.44'
Storage=0.465 af
Inflow
Primary
Flow (cfs)
Time (hours)
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
75
80
85
90
95

Summary for Pond 10P: P-10 Lowered 1 ft

[95] Warning: Outlet Device #1 rise exceeded
[79] Warning: Submerged Pond 8P Primary device # 1 INLET by 0.63'

Inflow Area = 66.430 ac, 5.22% Impervious, Inflow Depth > 1.58" for 10-Year event
Inflow = 25.36 cfs @ 13.15 hrs, Volume= 8.758 af
Outflow = 25.29 cfs @ 13.20 hrs, Volume= 8.751 af, Atten= 0%, Lag= 3.0 min
Primary = 11.90 cfs @ 13.20 hrs, Volume= 7.524 af
Secondary = 13.39 cfs @ 13.20 hrs, Volume= 1.227 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Starting Elev= 896.00' Surf.Area= 0.290 ac Storage= 0.700 af
Peak Elev= 897.63' @ 13.20 hrs Surf.Area= 0.358 ac Storage= 1.228 af (0.528 af above start)

Plug-Flow detention time= 267.7 min calculated for 8.051 af (92% of inflow)
Center-of-Mass det. time= 32.2 min (1,242.6 - 1,210.4)

Volume	Invert	Avail.Storage	Storage Description
#1	892.00'	1.760 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

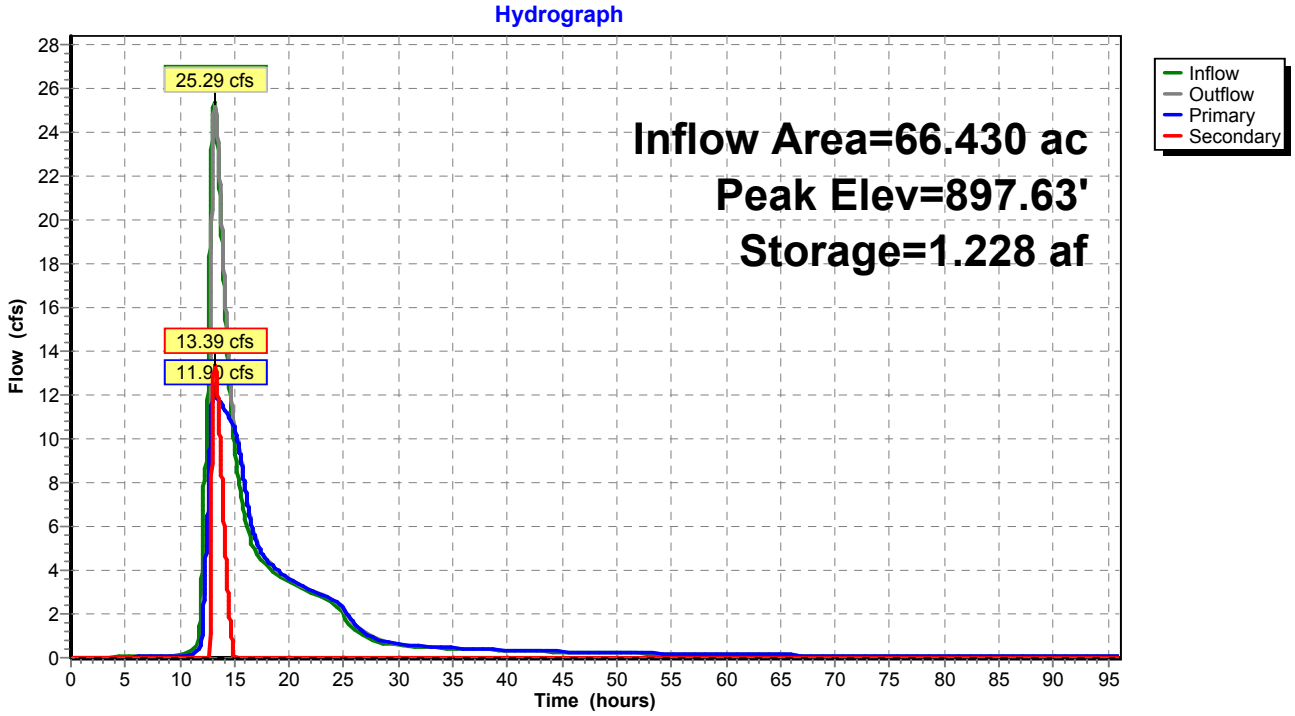
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
892.00	0.120	0.000	0.000
893.00	0.140	0.130	0.130
895.00	0.190	0.330	0.460
896.00	0.290	0.240	0.700
897.00	0.330	0.310	1.010
899.00	0.420	0.750	1.760

Device	Routing	Invert	Outlet Devices
#1	Primary	896.00'	**2.5' long x 1.00' rise Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#2	Secondary	897.40'	**50.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=11.90 cfs @ 13.20 hrs HW=897.63' (Free Discharge)
└**1=Sharp-Crested Rectangular Weir** (Orifice Controls 11.90 cfs @ 5.18 fps)

Secondary OutFlow Max=13.24 cfs @ 13.20 hrs HW=897.63' (Free Discharge)
└**2=Broad-Crested Rectangular Weir** (Weir Controls 13.24 cfs @ 1.14 fps)

Pond 10P: P-10 Lowered 1 ft



Summary for Pond 11P: P-11

Inflow Area = 58.650 ac, 4.89% Impervious, Inflow Depth > 2.01" for 10-Year event
Inflow = 62.99 cfs @ 12.51 hrs, Volume= 9.834 af
Outflow = 26.37 cfs @ 13.18 hrs, Volume= 9.815 af, Atten= 58%, Lag= 40.6 min
Primary = 22.35 cfs @ 13.18 hrs, Volume= 7.508 af
Secondary = 4.02 cfs @ 13.18 hrs, Volume= 2.307 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Starting Elev= 909.00' Surf.Area= 1.210 ac Storage= 3.640 af
Peak Elev= 911.40' @ 13.18 hrs Surf.Area= 1.488 ac Storage= 6.874 af (3.234 af above start)

Plug-Flow detention time= 687.8 min calculated for 6.175 af (63% of inflow)
Center-of-Mass det. time= 128.7 min (1,212.4 - 1,083.6)

Volume	Invert	Avail.Storage	Storage Description
#1	905.00'	9.405 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

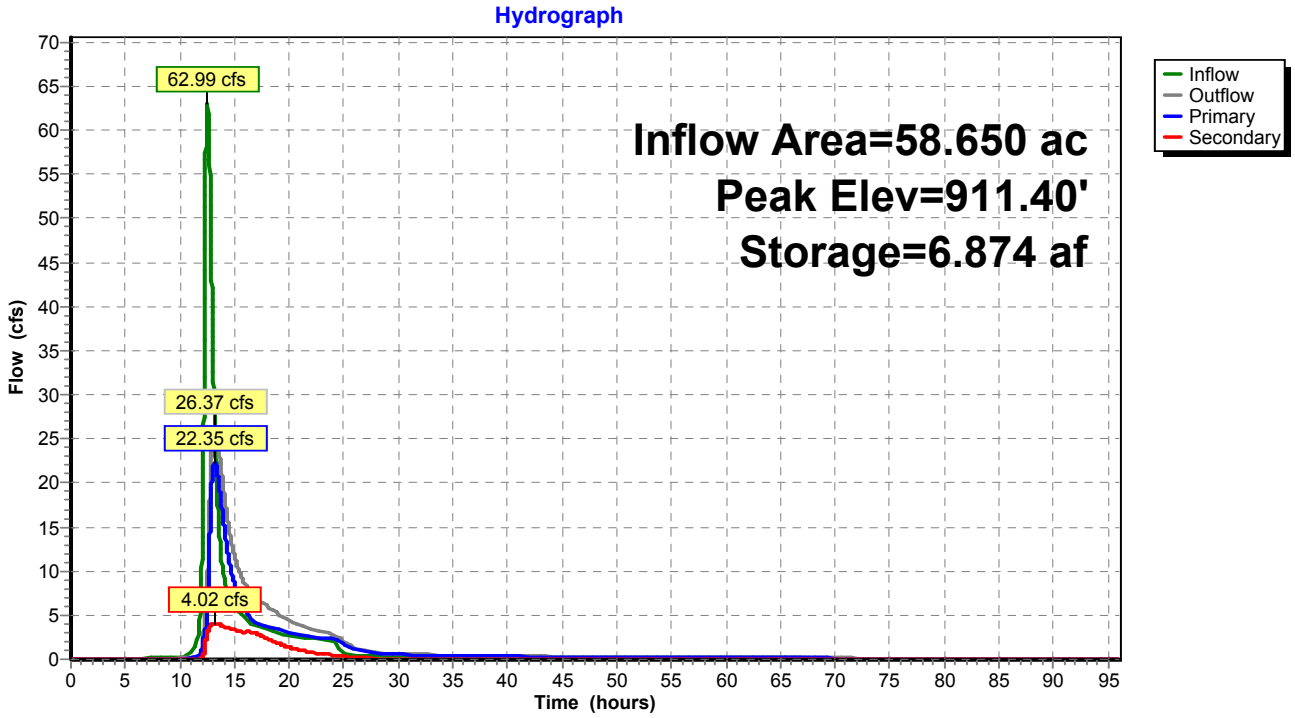
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
905.00	0.760	0.000	0.000
906.00	0.820	0.790	0.790
908.00	0.950	1.770	2.560
909.00	1.210	1.080	3.640
910.00	1.320	1.265	4.905
912.00	1.560	2.880	7.785
913.00	1.680	1.620	9.405

Device	Routing	Invert	Outlet Devices
#1	Primary	909.00'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	910.00'	**24.0" Round RCP_Round 24"** L= 200.0' RCP, groove end w/headwall, Ke= 0.200 Inlet / Outlet Invert= 910.00' / 909.00' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#3	Primary	910.00'	**24.0" Round RCP_Round 24"** L= 200.0' RCP, groove end w/headwall, Ke= 0.200 Inlet / Outlet Invert= 910.00' / 909.00' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#4	Primary	912.00'	**60.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88
#5	Secondary	909.00'	**12.0" Round RCP_Round 12"** L= 150.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 909.00' / 908.00' S= 0.0067 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=22.35 cfs @ 13.18 hrs HW=911.40' (Free Discharge)
- **1=Orifice/Grate** (Orifice Controls 5.86 cfs @ 7.46 fps)
- **2=RCP_Round 24"** (Barrel Controls 8.24 cfs @ 4.92 fps)
- **3=RCP_Round 24"** (Barrel Controls 8.24 cfs @ 4.92 fps)
- **4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Secondary OutFlow Max=4.02 cfs @ 13.18 hrs HW=911.40' (Free Discharge)
- **5=RCP_Round 12"** (Barrel Controls 4.02 cfs @ 5.12 fps)

Pond 11P: P-11



Summary for Pond 12P: P-12

[62] Hint: Exceeded Reach 43R OUTLET depth by 0.02' @ 17.91 hrs

Inflow Area = 79.640 ac, 7.40% Impervious, Inflow Depth > 2.02" for 10-Year event
Inflow = 34.25 cfs @ 12.02 hrs, Volume= 13.428 af
Outflow = 23.44 cfs @ 13.84 hrs, Volume= 13.407 af, Atten= 32%, Lag= 108.8 min
Primary = 23.44 cfs @ 13.84 hrs, Volume= 13.407 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Starting Elev= 893.00' Surf.Area= 1.640 ac Storage= 5.075 af
Peak Elev= 894.10' @ 13.84 hrs Surf.Area= 1.784 ac Storage= 6.961 af (1.886 af above start)

Plug-Flow detention time= 706.9 min calculated for 8.332 af (62% of inflow)
Center-of-Mass det. time= 98.1 min (1,292.0 - 1,193.9)

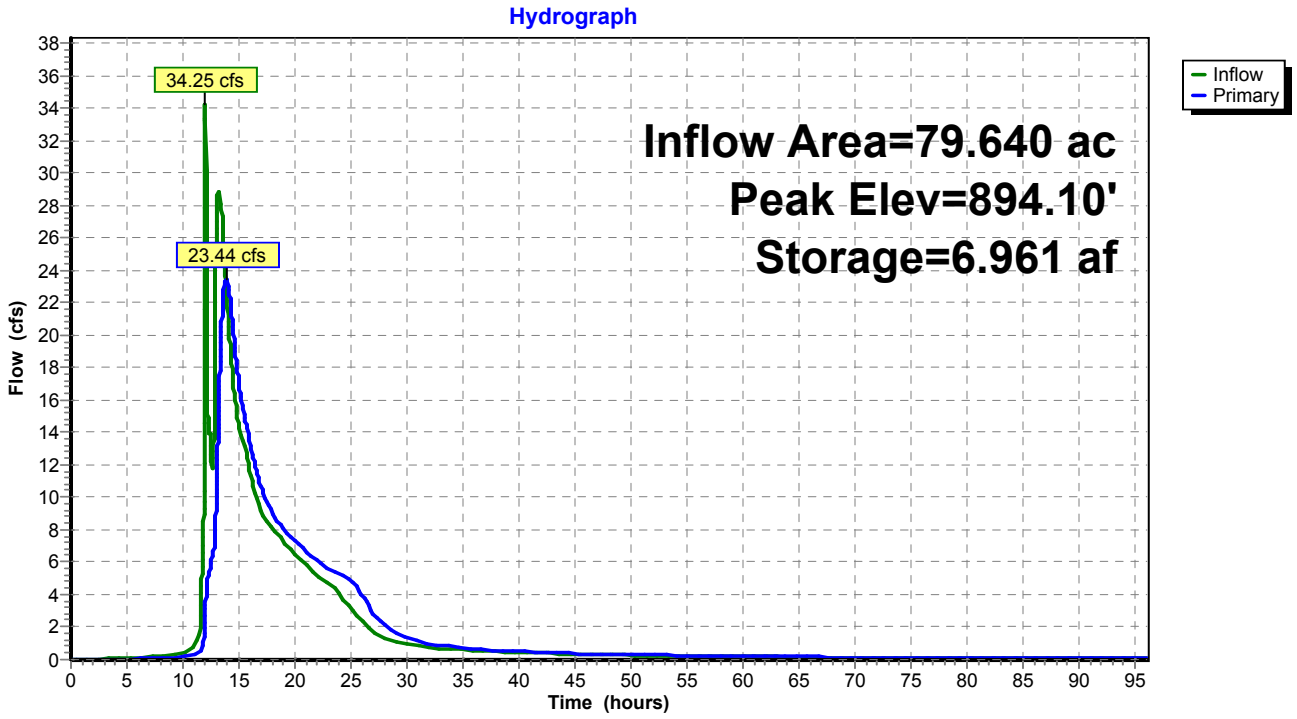
Volume	Invert	Avail.Storage	Storage Description
#1	889.00'	10.590 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
889.00	1.070	0.000	0.000
890.00	1.150	1.110	1.110
892.00	1.330	2.480	3.590
893.00	1.640	1.485	5.075
894.00	1.770	1.705	6.780
896.00	2.040	3.810	10.590

Device	Routing	Invert	Outlet Devices
#1	Primary	893.00'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	893.00'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Primary	893.50'	**43.8" W x 26.6" H, R=22.5"/62.0" Arch RCP_Arch 44x27** L= 30.0' Box, 30-75° wingwalls, rounded crown, Ke= 0.200 Inlet / Outlet Invert= 893.50' / 893.35' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 6.29 sf
#4	Primary	893.50'	**43.8" W x 26.6" H, R=22.5"/62.0" Arch RCP_Arch 44x27** L= 30.0' Box, 30-75° wingwalls, rounded crown, Ke= 0.200 Inlet / Outlet Invert= 893.50' / 893.35' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 6.29 sf
#5	Primary	893.50'	**43.8" W x 26.6" H, R=22.5"/62.0" Arch RCP_Arch 44x27** L= 30.0' Box, 30-75° wingwalls, rounded crown, Ke= 0.200 Inlet / Outlet Invert= 893.50' / 893.35' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 6.29 sf
#6	Primary	893.50'	**43.8" W x 26.6" H, R=22.5"/62.0" Arch RCP_Arch 44x27** L= 30.0' Box, 30-75° wingwalls, rounded crown, Ke= 0.200 Inlet / Outlet Invert= 893.50' / 893.35' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 6.29 sf

Primary OutFlow Max=23.42 cfs @ 13.84 hrs HW=894.10' (Free Discharge)
- **1=Orifice/Grate** (Orifice Controls 3.97 cfs @ 5.05 fps)
- **2=Orifice/Grate** (Orifice Controls 3.97 cfs @ 5.05 fps)
- **3=RCP_Arch 44x27** (Barrel Controls 3.87 cfs @ 3.21 fps)
- **4=RCP_Arch 44x27** (Barrel Controls 3.87 cfs @ 3.21 fps)
- **5=RCP_Arch 44x27** (Barrel Controls 3.87 cfs @ 3.21 fps)
- **6=RCP_Arch 44x27** (Barrel Controls 3.87 cfs @ 3.21 fps)

Pond 12P: P-12



Summary for Pond 13P: P-13

Inflow Area = 237.775 ac, 9.20% Impervious, Inflow Depth > 2.00" for 10-Year event
Inflow = 213.45 cfs @ 12.35 hrs, Volume= 39.551 af
Outflow = 200.88 cfs @ 12.48 hrs, Volume= 39.546 af, Atten= 6%, Lag= 7.5 min
Primary = 189.47 cfs @ 12.48 hrs, Volume= 37.657 af
Secondary = 11.41 cfs @ 12.48 hrs, Volume= 1.890 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Starting Elev= 883.00' Surf.Area= 1.870 ac Storage= 4.265 af
Peak Elev= 884.19' @ 12.48 hrs Surf.Area= 2.289 ac Storage= 6.732 af (2.467 af above start)

Plug-Flow detention time= 180.9 min calculated for 35.281 af (89% of inflow)
Center-of-Mass det. time= 17.0 min (1,013.0 - 996.0)

Volume	Invert	Avail.Storage	Storage Description
#1	878.00'	11.490 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
878.00	0.000	0.000	0.000
879.00	0.630	0.315	0.315
880.00	0.730	0.680	0.995
882.00	1.070	1.800	2.795
883.00	1.870	1.470	4.265
884.00	2.220	2.045	6.310
886.00	2.960	5.180	11.490

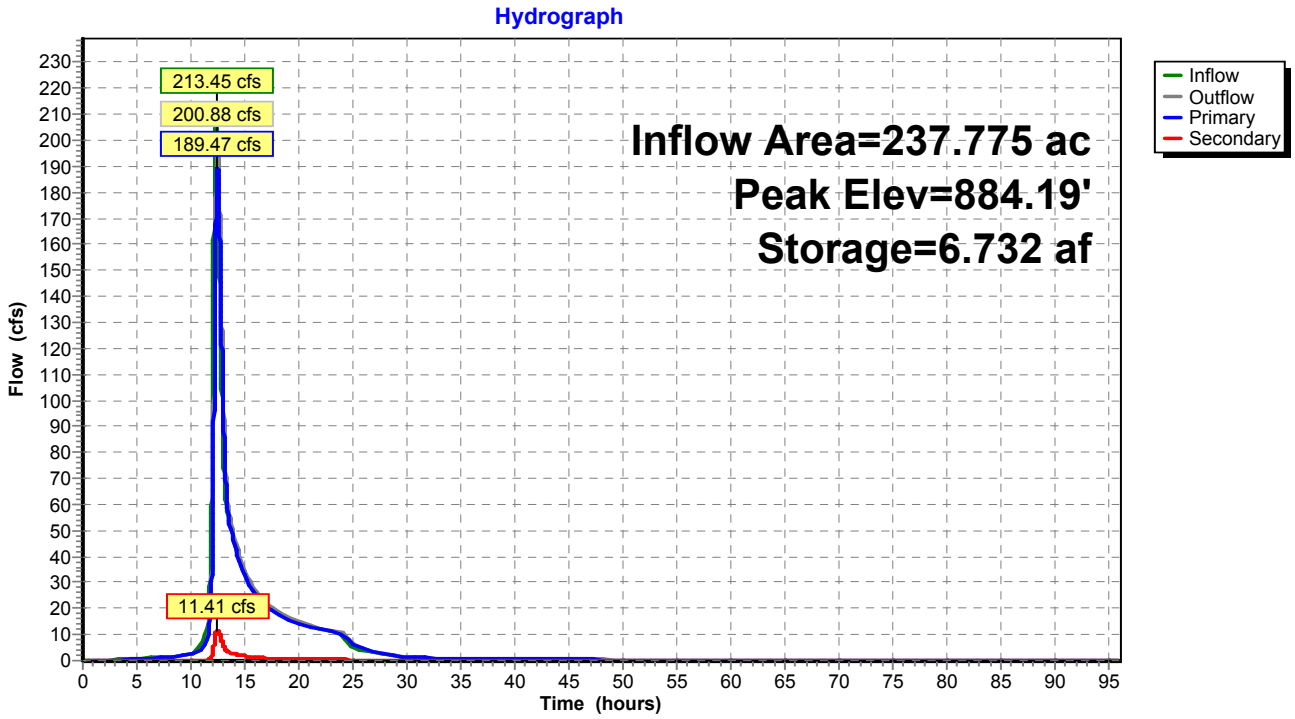
Device	Routing	Invert	Outlet Devices
#1	Primary	883.00'	**55.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88
#2	Secondary	883.00'	**12.0" Round RCP_Round 12"** L= 100.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 883.00' / 882.75' S= 0.0025 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#3	Secondary	883.00'	**12.0" Round RCP_Round 12"** L= 100.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 883.00' / 882.75' S= 0.0025 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#4	Secondary	883.00'	**12.0" Round RCP_Round 12"** L= 100.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 883.00' / 882.75' S= 0.0025 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#5	Secondary	883.00'	**12.0" Round RCP_Round 12"** L= 100.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 883.00' / 882.75' S= 0.0025 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

#6 Secondary 883.00' **12.0" Round RCP_Round 12"**
L= 100.0' RCP, groove end projecting, Ke= 0.200
Inlet / Outlet Invert= 883.00' / 882.75' S= 0.0025 '/' Cc= 0.900
n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=189.36 cfs @ 12.48 hrs HW=884.19' (Free Discharge)
└─**1=Broad-Crested Rectangular Weir** (Weir Controls 189.36 cfs @ 2.90 fps)

Secondary OutFlow Max=11.44 cfs @ 12.48 hrs HW=884.19' (Free Discharge)
├─**2=RCP_Round 12"** (Barrel Controls 2.29 cfs @ 3.10 fps)
├─**3=RCP_Round 12"** (Barrel Controls 2.29 cfs @ 3.10 fps)
├─**4=RCP_Round 12"** (Barrel Controls 2.29 cfs @ 3.10 fps)
├─**5=RCP_Round 12"** (Barrel Controls 2.29 cfs @ 3.10 fps)
└─**6=RCP_Round 12"** (Barrel Controls 2.29 cfs @ 3.10 fps)

Pond 13P: P-13



Summary for Pond 17P: W-2

[81] Warning: Exceeded Pond P-5/P-6 by 0.22' @ 29.64 hrs

Inflow	=	2.25 cfs @	12.65 hrs, Volume=	1.088 af
Outflow	=	0.75 cfs @	18.73 hrs, Volume=	0.943 af, Atten= 67%, Lag= 364.3 min
Primary	=	0.75 cfs @	18.73 hrs, Volume=	0.943 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Peak Elev= 929.49' @ 18.73 hrs Surf.Area= 1.173 ac Storage= 0.553 af

Plug-Flow detention time= 669.6 min calculated for 0.942 af (87% of inflow)
Center-of-Mass det. time= 588.0 min (1,595.8 - 1,007.8)

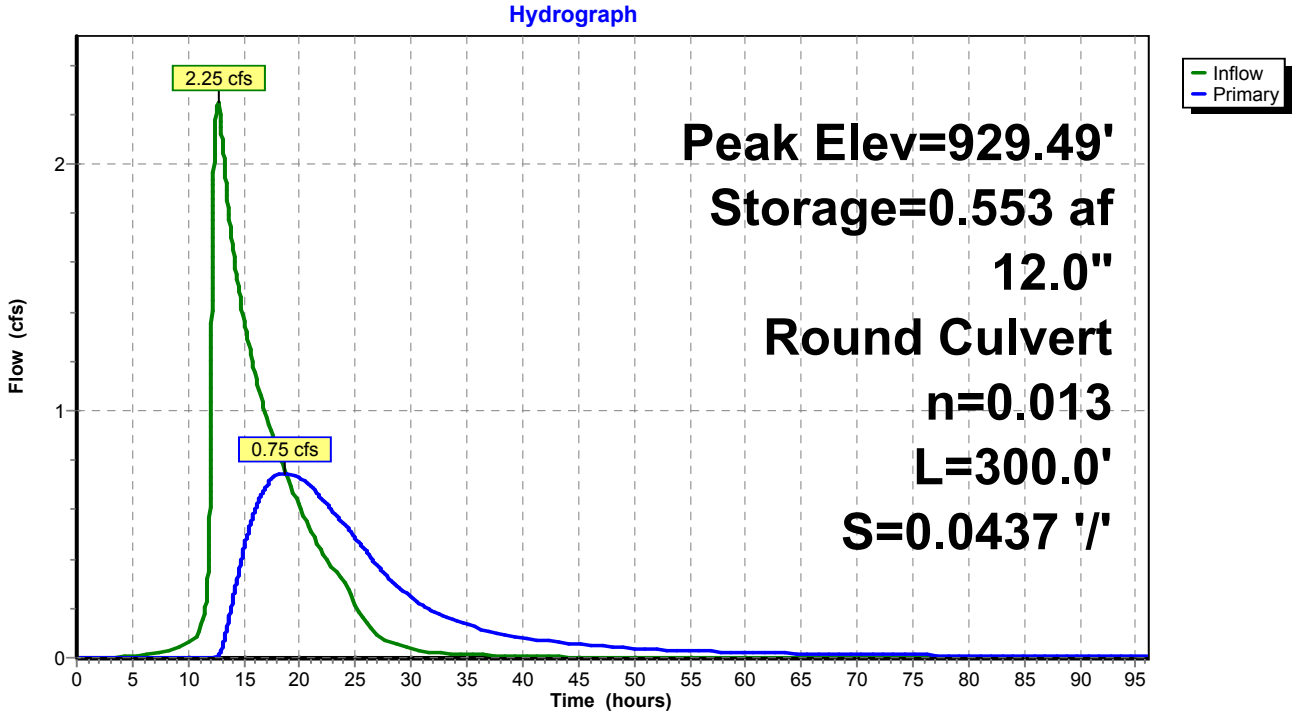
Volume	Invert	Avail.Storage	Storage Description
#1	929.00'	1.175 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
929.00	1.090	0.000	0.000
930.00	1.260	1.175	1.175

Device	Routing	Invert	Outlet Devices
#1	Primary	929.10'	**12.0" Round RCP_Round 12"** L= 300.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 929.10' / 916.00' S= 0.0437 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=0.75 cfs @ 18.73 hrs HW=929.49' (Free Discharge)
1=RCP_Round 12" (Inlet Controls 0.75 cfs @ 2.65 fps)

Pond 17P: W-2


Hydrograph
2.25 cfs
0.75 cfs
Peak Elev=929.49'
Storage=0.553 af
12.0"
Round Culvert
n=0.013
L=300.0'
S=0.0437 '/'
Inflow
Primary
Flow (cfs)
Time (hours)
0
1
2
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95

Summary for Pond 36P: Culverts passing flow beneath Spine Road

Inflow Area = 52.790 ac, 0.00% Impervious, Inflow Depth = 1.76" for 10-Year event
Inflow = 64.04 cfs @ 12.46 hrs, Volume= 7.738 af
Outflow = 64.04 cfs @ 12.46 hrs, Volume= 7.738 af, Atten= 0%, Lag= 0.0 min
Primary = 64.04 cfs @ 12.46 hrs, Volume= 7.738 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Peak Elev= 887.26' @ 12.46 hrs Surf.Area= 0.001 ac Storage= 0.000 af

Plug-Flow detention time= 0.0 min calculated for 7.737 af (100% of inflow)
Center-of-Mass det. time= 0.0 min (869.1 - 869.1)

Volume	Invert	Avail.Storage	Storage Description
#1	887.00'	0.026 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
887.00	0.000	0.000	0.000
887.50	0.002	0.001	0.001
890.50	0.007	0.014	0.014
892.00	0.009	0.012	0.026

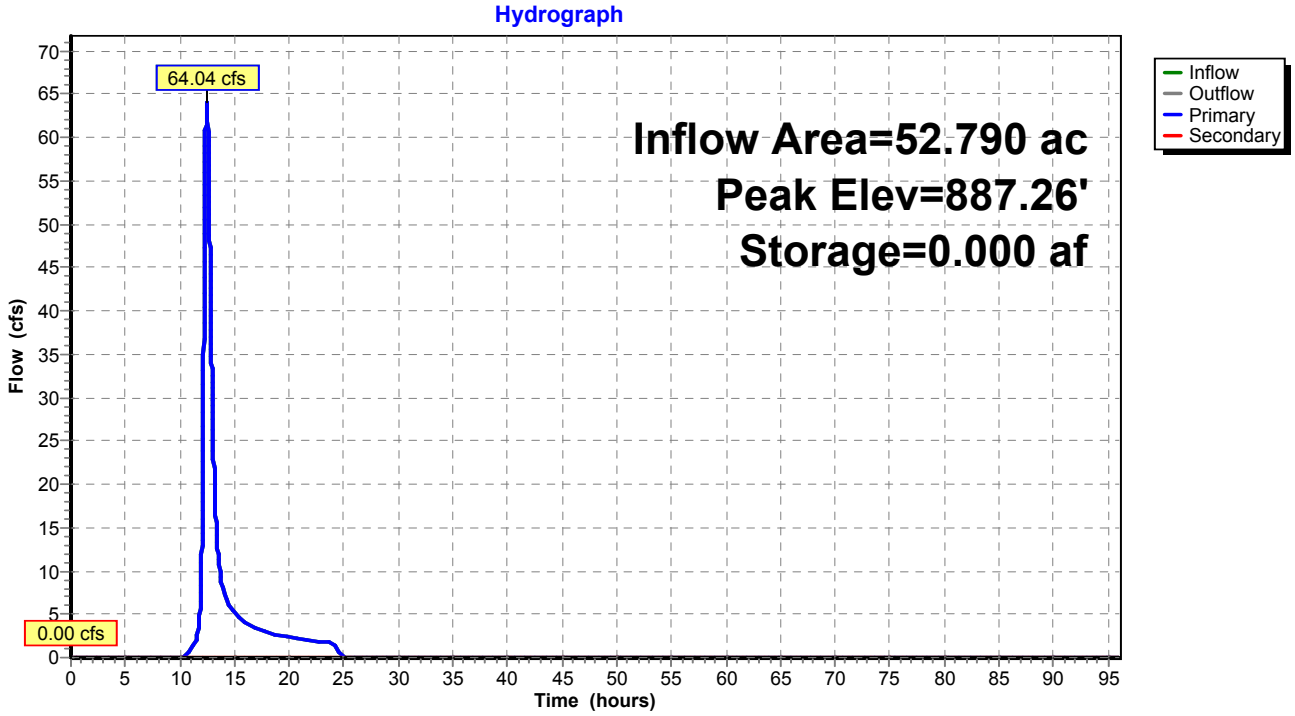
Device	Routing	Invert	Outlet Devices
#1	Primary	887.00'	**Special & User-Defined** Head (feet) 0.00 0.10 0.20 0.30 0.40 0.50 Disch. (cfs) 0.000 25.000 50.000 75.000 100.000 127.000
#2	Secondary	887.50'	**18.0" Round RCP_Round 18"** L= 100.0' RCP, groove end w/headwall, Ke= 0.200 Inlet / Outlet Invert= 887.50' / 886.50' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#3	Secondary	887.50'	**18.0" Round RCP_Round 18"** L= 100.0' RCP, groove end w/headwall, Ke= 0.200 Inlet / Outlet Invert= 887.50' / 886.50' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#4	Secondary	887.50'	**18.0" Round RCP_Round 18"** L= 100.0' RCP, groove end w/headwall, Ke= 0.200 Inlet / Outlet Invert= 887.50' / 886.50' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#5	Secondary	887.50'	**18.0" Round RCP_Round 18"** L= 100.0' RCP, groove end w/headwall, Ke= 0.200 Inlet / Outlet Invert= 887.50' / 886.50' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#6	Secondary	887.50'	**18.0" Round RCP_Round 18"** L= 100.0' RCP, groove end w/headwall, Ke= 0.200 Inlet / Outlet Invert= 887.50' / 886.50' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#7	Secondary	887.50'	**18.0" Round RCP_Round 18"** L= 100.0' RCP, groove end w/headwall, Ke= 0.200

			Inlet / Outlet Invert= 887.50' / 886.50' S= 0.0100 '/' Cc= 0.900
			n= 0.013, Flow Area= 1.77 sf
#8	Secondary	887.50'	**18.0" Round RCP_Round 18"**
			L= 100.0' RCP, groove end w/headwall, Ke= 0.200
			Inlet / Outlet Invert= 887.50' / 886.50' S= 0.0100 '/' Cc= 0.900
			n= 0.013, Flow Area= 1.77 sf
#9	Secondary	887.50'	**18.0" Round RCP_Round 18"**
			L= 100.0' RCP, groove end w/headwall, Ke= 0.200
			Inlet / Outlet Invert= 887.50' / 886.50' S= 0.0100 '/' Cc= 0.900
			n= 0.013, Flow Area= 1.77 sf

Primary OutFlow Max=64.03 cfs @ 12.46 hrs HW=887.26' (Free Discharge)
└─**1=Special & User-Defined** (Custom Controls 64.03 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=887.00' (Free Discharge)
- **2=RCP_Round 18"** (Controls 0.00 cfs)
- **3=RCP_Round 18"** (Controls 0.00 cfs)
- **4=RCP_Round 18"** (Controls 0.00 cfs)
- **5=RCP_Round 18"** (Controls 0.00 cfs)
- **6=RCP_Round 18"** (Controls 0.00 cfs)
- **7=RCP_Round 18"** (Controls 0.00 cfs)
- **8=RCP_Round 18"** (Controls 0.00 cfs)
- **9=RCP_Round 18"** (Controls 0.00 cfs)

Pond 36P: Culverts passing flow beneath Spine Road



Summary for Pond CRH-1: CRH-1

Inflow Area = 6.955 ac, 46.76% Impervious, Inflow Depth = 2.80" for 10-Year event
Inflow = 18.97 cfs @ 12.15 hrs, Volume= 1.622 af
Outflow = 12.10 cfs @ 12.33 hrs, Volume= 1.622 af, Atten= 36%, Lag= 10.6 min
Discarded = 0.26 cfs @ 12.33 hrs, Volume= 0.509 af
Primary = 11.83 cfs @ 12.33 hrs, Volume= 1.114 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Peak Elev= 878.13' @ 12.33 hrs Surf.Area= 0.325 ac Storage= 0.489 af

Plug-Flow detention time= 183.6 min calculated for 1.622 af (100% of inflow)
Center-of-Mass det. time= 183.7 min (973.1 - 789.5)

Volume	Invert	Avail.Storage	Storage Description
#1	876.00'	0.850 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

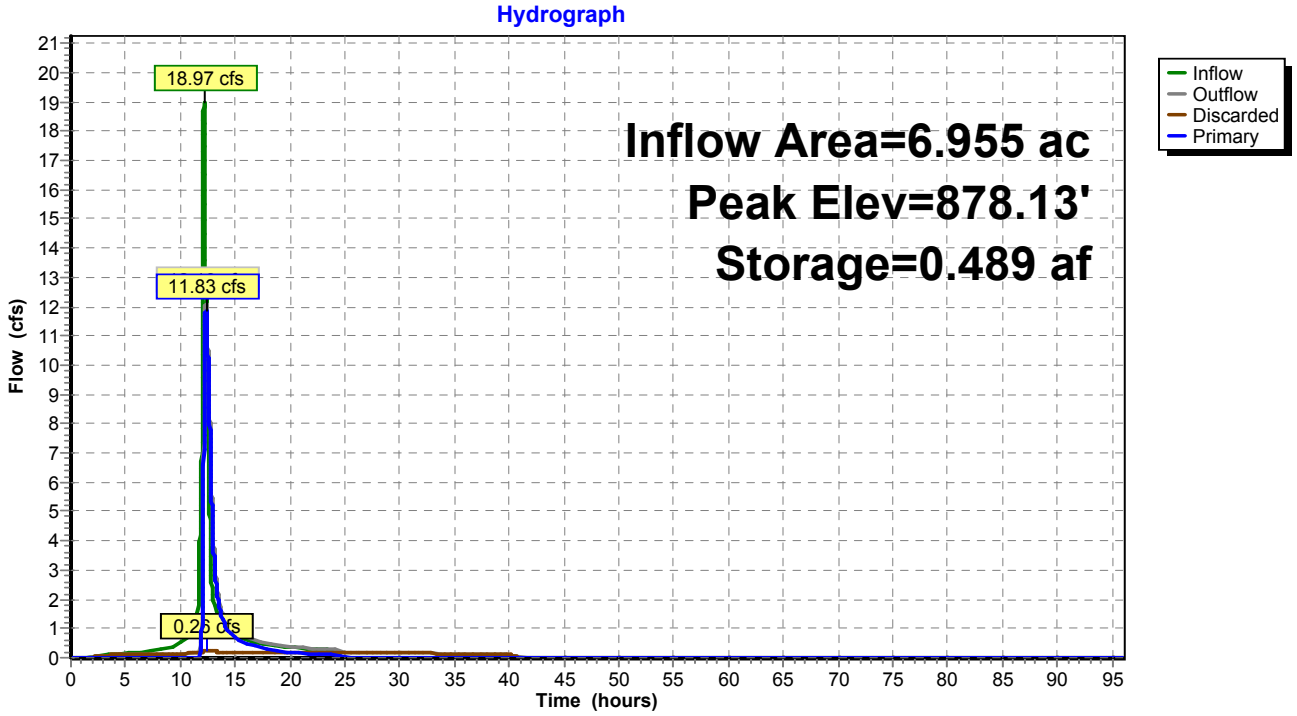
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
876.00	0.150	0.000	0.000
878.00	0.300	0.450	0.450
879.00	0.500	0.400	0.850

Device	Routing	Invert	Outlet Devices
#1	Discarded	876.00'	**0.800 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 0.00'
#2	Primary	877.00'	**24.0" Round Culvert** L= 155.0' Ke= 0.500 Inlet / Outlet Invert= 877.00' / 876.00' S= 0.0065 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#3	Primary	877.00'	**24.0" Round Culvert** L= 155.0' Ke= 0.500 Inlet / Outlet Invert= 877.00' / 876.00' S= 0.0065 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf

Discarded OutFlow Max=0.26 cfs @ 12.33 hrs HW=878.13' (Free Discharge)
└**1=Exfiltration** (Controls 0.26 cfs)

Primary OutFlow Max=11.83 cfs @ 12.33 hrs HW=878.13' (Free Discharge)
├**2=Culvert** (Barrel Controls 5.92 cfs @ 4.69 fps)
└**3=Culvert** (Barrel Controls 5.92 cfs @ 4.69 fps)

Pond CRH-1: CRH-1



Summary for Pond CRH-2: CRH-2

Inflow Area = 10.214 ac, 37.73% Impervious, Inflow Depth = 2.60" for 10-Year event
Inflow = 23.01 cfs @ 12.22 hrs, Volume= 2.212 af
Outflow = 10.26 cfs @ 12.62 hrs, Volume= 2.212 af, Atten= 55%, Lag= 24.0 min
Discarded = 0.38 cfs @ 12.62 hrs, Volume= 0.898 af
Primary = 9.88 cfs @ 12.62 hrs, Volume= 1.314 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Peak Elev= 882.67' @ 12.62 hrs Surf.Area= 0.467 ac Storage= 0.890 af

Plug-Flow detention time= 325.2 min calculated for 2.212 af (100% of inflow)
Center-of-Mass det. time= 325.3 min (1,127.1 - 801.7)

Volume	Invert	Avail.Storage	Storage Description
#1	880.00'	1.600 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

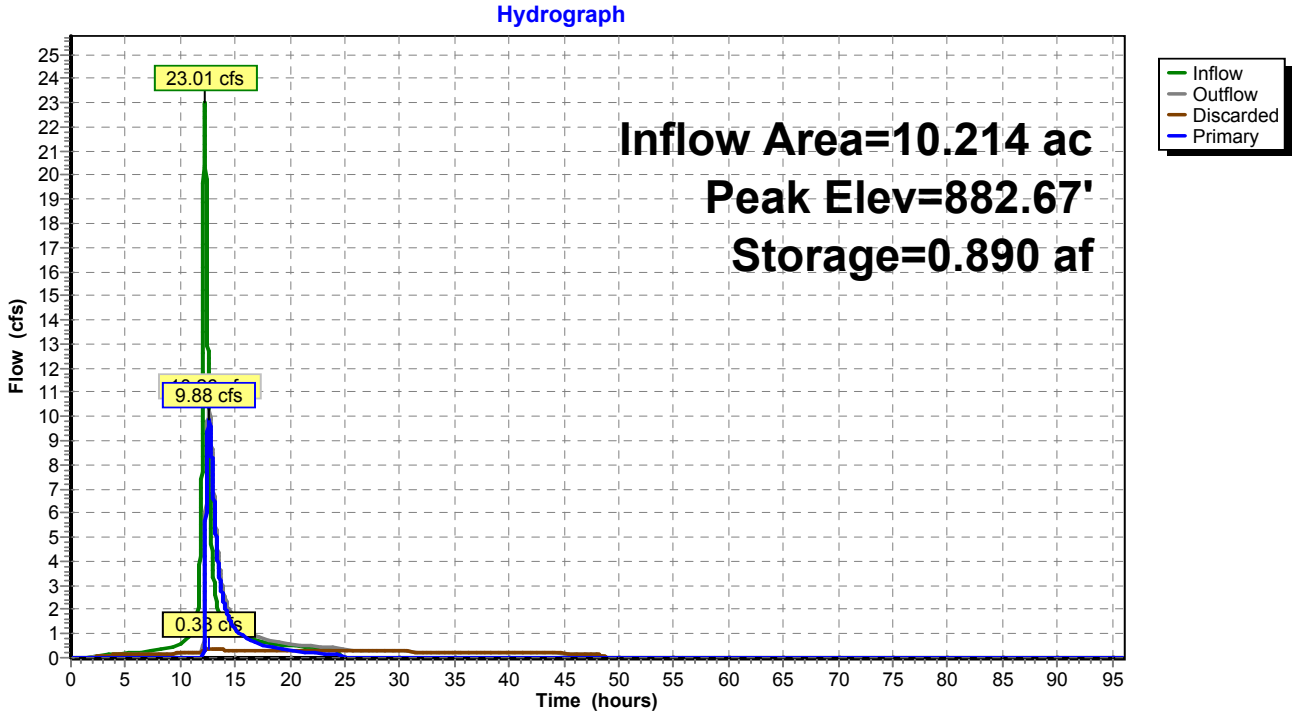
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
880.00	0.200	0.000	0.000
882.00	0.400	0.600	0.600
884.00	0.600	1.000	1.600

Device	Routing	Invert	Outlet Devices
#1	Primary	881.50'	**24.0" Round Culvert** L= 155.0' Ke= 0.500 Inlet / Outlet Invert= 881.50' / 881.00' S= 0.0032 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#2	Primary	881.50'	**24.0" Round Culvert** L= 155.0' Ke= 0.500 Inlet / Outlet Invert= 881.50' / 881.00' S= 0.0032 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#3	Discarded	880.00'	**0.800 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 0.00'

Discarded OutFlow Max=0.38 cfs @ 12.62 hrs HW=882.67' (Free Discharge)
└**3=Exfiltration** (Controls 0.38 cfs)

Primary OutFlow Max=9.88 cfs @ 12.62 hrs HW=882.67' (Free Discharge)
├**1=Culvert** (Barrel Controls 4.94 cfs @ 3.73 fps)
└**2=Culvert** (Barrel Controls 4.94 cfs @ 3.73 fps)

Pond CRH-2: CRH-2



Summary for Pond CRH-3: CRH-3

Inflow Area = 11.815 ac, 36.95% Impervious, Inflow Depth = 1.67" for 10-Year event
Inflow = 10.91 cfs @ 12.54 hrs, Volume= 1.644 af
Outflow = 8.31 cfs @ 12.90 hrs, Volume= 1.644 af, Atten= 24%, Lag= 21.8 min
Discarded = 0.24 cfs @ 12.90 hrs, Volume= 0.445 af
Primary = 8.07 cfs @ 12.90 hrs, Volume= 1.198 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Peak Elev= 878.91' @ 12.90 hrs Surf.Area= 0.293 ac Storage= 0.422 af

Plug-Flow detention time= 170.1 min calculated for 1.643 af (100% of inflow)
Center-of-Mass det. time= 170.2 min (1,017.9 - 847.7)

Volume	Invert	Avail.Storage	Storage Description
#1	877.00'	0.850 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

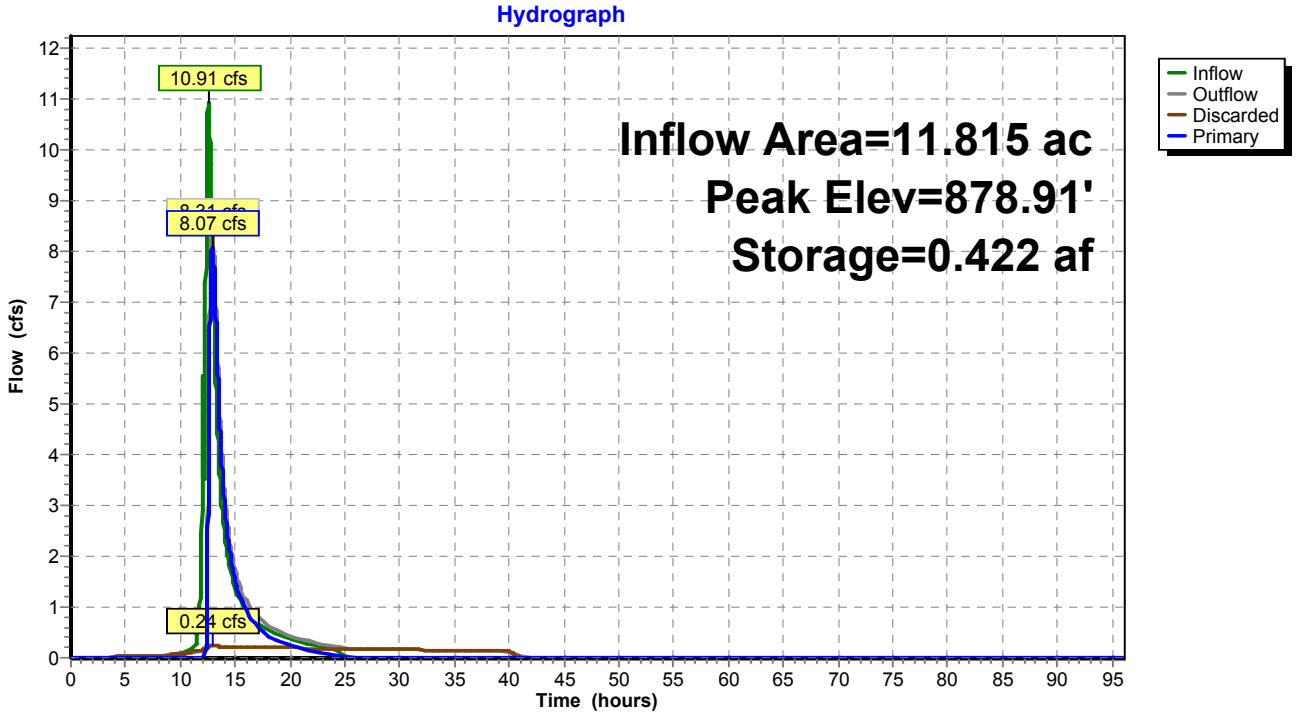
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
877.00	0.150	0.000	0.000
879.00	0.300	0.450	0.450
880.00	0.500	0.400	0.850

Device	Routing	Invert	Outlet Devices
#1	Discarded	877.00'	**0.800 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 0.00'
#2	Primary	878.00'	**24.0" Round Culvert** L= 155.0' Ke= 0.500 Inlet / Outlet Invert= 878.00' / 877.00' S= 0.0065 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#3	Primary	878.00'	**24.0" Round Culvert** L= 155.0' Ke= 0.500 Inlet / Outlet Invert= 878.00' / 877.00' S= 0.0065 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf

Discarded OutFlow Max=0.24 cfs @ 12.90 hrs HW=878.91' (Free Discharge)
└**1=Exfiltration** (Controls 0.24 cfs)

Primary OutFlow Max=8.07 cfs @ 12.90 hrs HW=878.91' (Free Discharge)
├**2=Culvert** (Barrel Controls 4.04 cfs @ 4.29 fps)
└**3=Culvert** (Barrel Controls 4.04 cfs @ 4.29 fps)

Pond CRH-3: CRH-3



Summary for Pond P-5/P-6: P-5/P-6

Inflow Area = 43.346 ac, 18.61% Impervious, Inflow Depth = 2.17" for 10-Year event
Inflow = 91.40 cfs @ 12.15 hrs, Volume= 7.854 af
Outflow = 28.92 cfs @ 12.65 hrs, Volume= 7.851 af, Atten= 68%, Lag= 30.1 min
Primary = 26.67 cfs @ 12.65 hrs, Volume= 6.763 af
Secondary = 2.25 cfs @ 12.65 hrs, Volume= 1.088 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Starting Elev= 929.00' Surf.Area= 1.975 ac Storage= 5.062 af
Peak Elev= 930.49' @ 12.65 hrs Surf.Area= 2.319 ac Storage= 8.296 af (3.234 af above start)

Plug-Flow detention time= 630.2 min calculated for 2.789 af (36% of inflow)
Center-of-Mass det. time= 161.7 min (980.7 - 819.0)

Volume	Invert	Avail.Storage	Storage Description
#1	926.00'	14.650 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

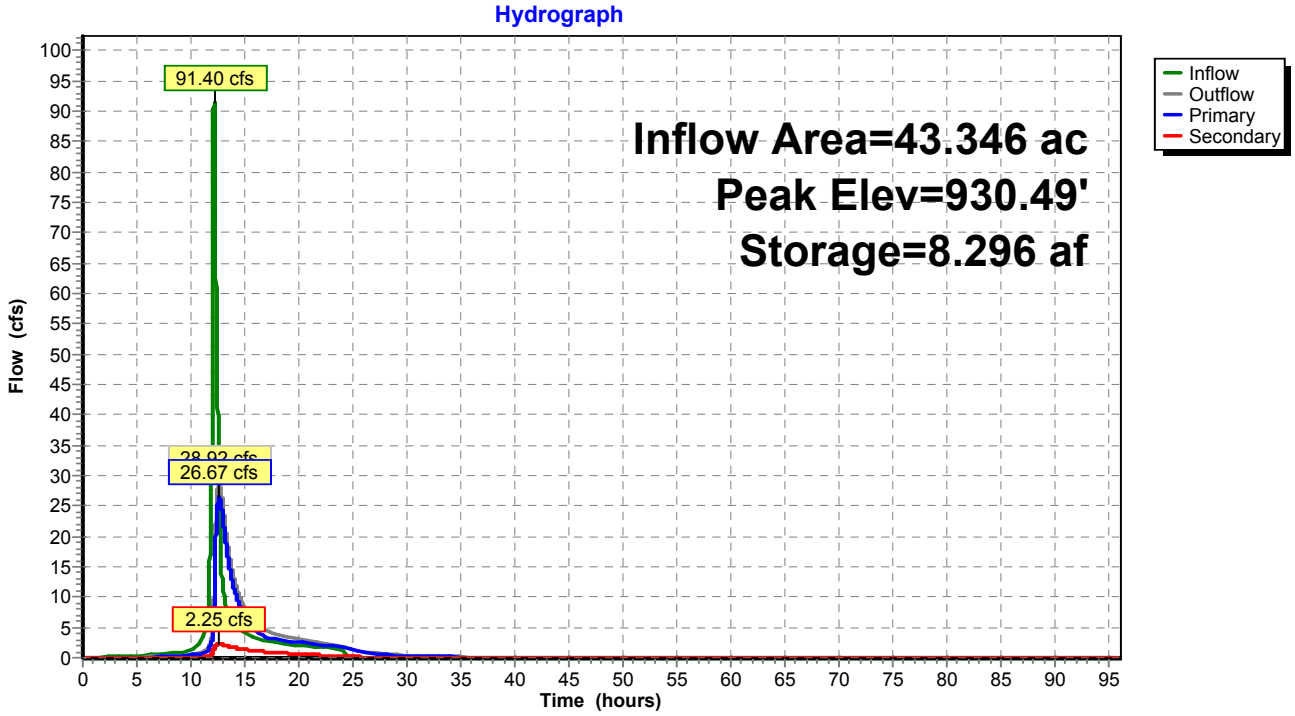
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
926.00	1.510	0.000	0.000
928.00	1.710	3.220	3.220
930.00	2.240	3.950	7.170
931.00	2.400	2.320	9.490
933.00	2.760	5.160	14.650

Device	Routing	Invert	Outlet Devices
#1	Primary	929.00'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	929.50'	**7.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#3	Primary	930.50'	**14.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#4	Secondary	929.00'	**9.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=26.66 cfs @ 12.65 hrs HW=930.49' (Free Discharge)
- **1=Orifice/Grate** (Orifice Controls 4.62 cfs @ 5.89 fps)
- **2=Sharp-Crested Rectangular Weir** (Weir Controls 22.04 cfs @ 3.26 fps)
- **3=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Secondary OutFlow Max=2.25 cfs @ 12.65 hrs HW=930.49' (Free Discharge)
- **4=Orifice/Grate** (Orifice Controls 2.25 cfs @ 5.09 fps)

Pond P-5/P-6: P-5/P-6



Summary for Pond TI P: Thumb Infiltration (Thumb TP load only)

Inflow Area = 48.539 ac, 11.38% Impervious, Inflow Depth = 0.81" for 10-Year event
Inflow = 18.36 cfs @ 12.36 hrs, Volume= 3.268 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= 0.00-96.00 hrs, dt= 0.01 hrs
Peak Elev= 903.27' @ 26.34 hrs Surf.Area= 1.000 ac Storage= 3.268 af

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

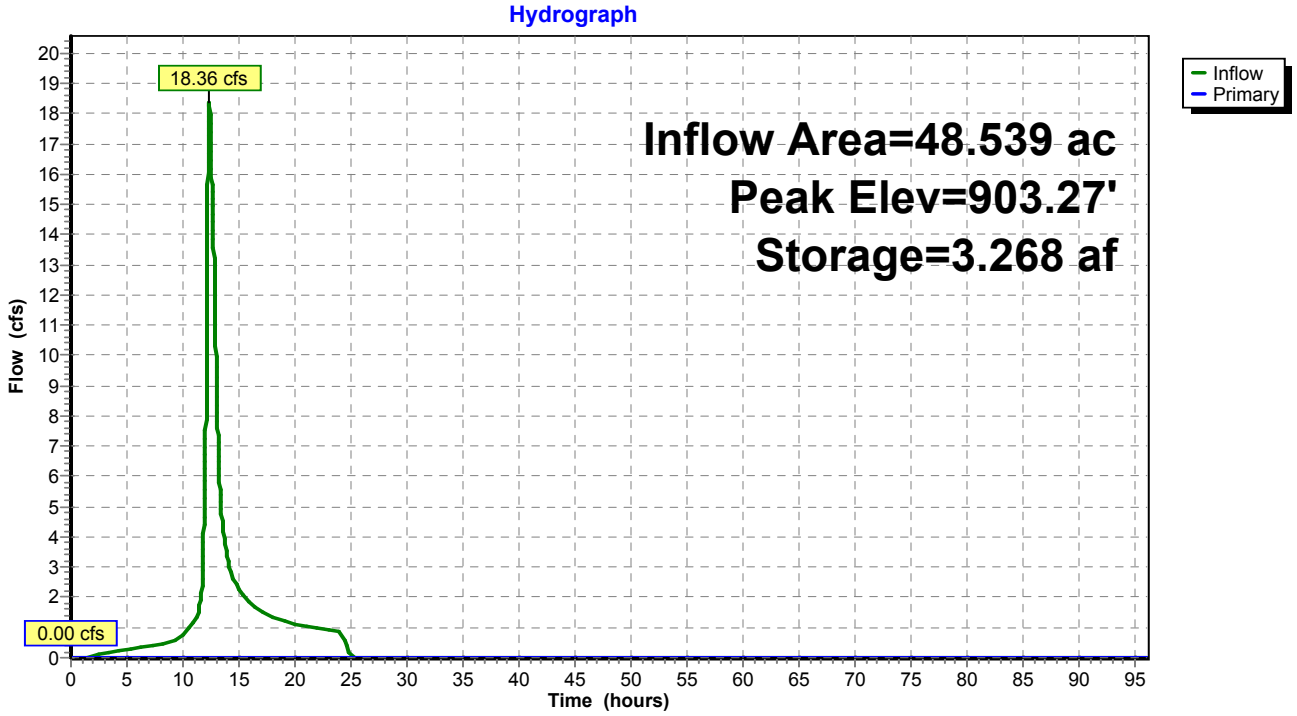
Volume	Invert	Avail.Storage	Storage Description
#1	900.00'	5.000 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
900.00	1.000	0.000	0.000
901.00	1.000	1.000	1.000
902.00	1.000	1.000	2.000
903.00	1.000	1.000	3.000
904.00	1.000	1.000	4.000
905.00	1.000	1.000	5.000

Device	Routing	Invert	Outlet Devices
#1	Primary	903.74'	**1,000.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s) 5.0' Crest Height

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=900.00' (Free Discharge)
↑—**1=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond TI P: Thumb Infiltration (Thumb TP load only)



Summary for Pond W-1: W-1

[79] Warning: Submerged Pond 4P Secondary device # 2 by 0.09'

Inflow Area = 1.000 ac, 10.00% Impervious, Inflow Depth = 11.73" for 10-Year event
Inflow = 2.48 cfs @ 13.38 hrs, Volume= 0.977 af
Outflow = 2.05 cfs @ 14.60 hrs, Volume= 0.977 af, Atten= 17%, Lag= 73.0 min
Primary = 2.05 cfs @ 14.60 hrs, Volume= 0.977 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Peak Elev= 915.09' @ 14.60 hrs Surf.Area= 0.715 ac Storage= 0.235 af

Plug-Flow detention time= 115.3 min calculated for 0.977 af (100% of inflow)
Center-of-Mass det. time= 115.3 min (1,030.7 - 915.3)

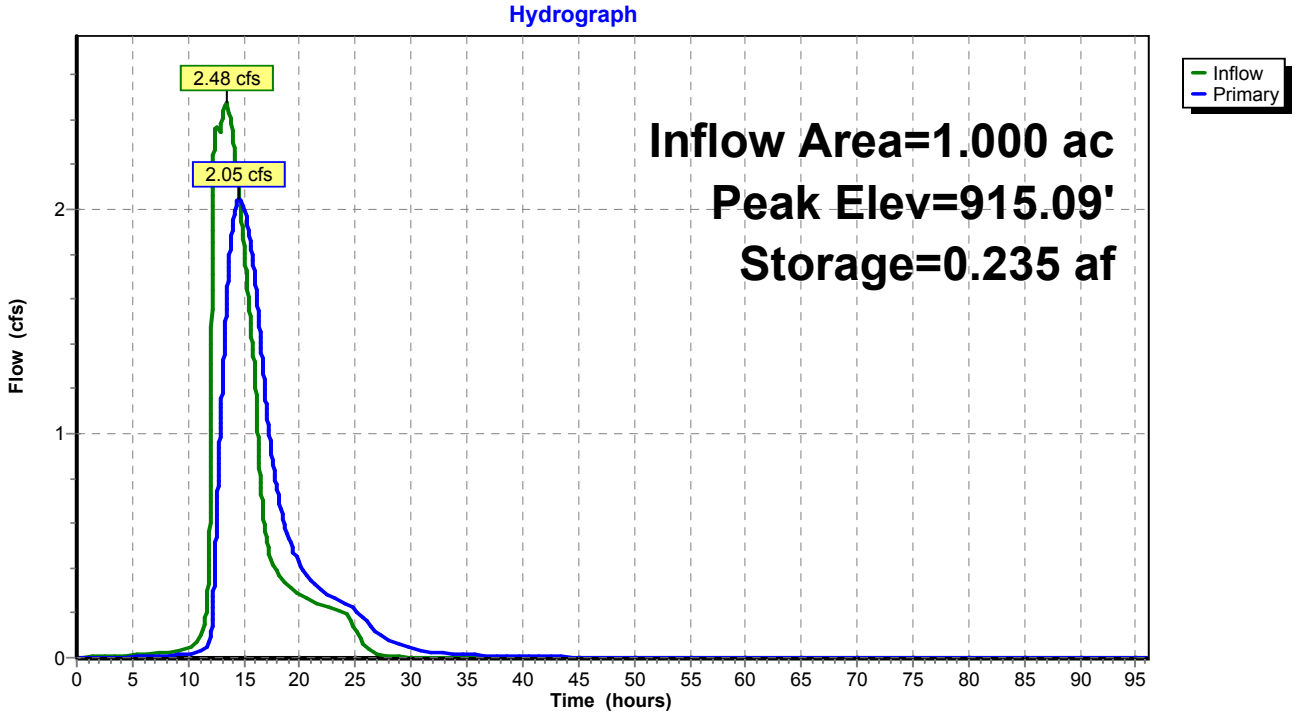
Volume	Invert	Avail.Storage	Storage Description
#1	914.75'	0.950 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
914.75	0.660	0.000	0.000
916.00	0.860	0.950	0.950

Device	Routing	Invert	Outlet Devices
#1	Primary	914.75'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=2.05 cfs @ 14.60 hrs HW=915.09' (Free Discharge)
↑**1=Orifice/Grate** (Weir Controls 2.05 cfs @ 1.91 fps)

Pond W-1: W-1


Hydrograph
2.48 cfs
2.05 cfs
Inflow Area=1.000 ac
Peak Elev=915.09'
Storage=0.235 af
Inflow
Primary
Flow (cfs)
Time (hours)
0
1
2
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95

Summary for Pond W-3: W-3

[79] Warning: Submerged Pond 7P Secondary device # 2 INLET by 0.06'

Inflow	=	0.96 cfs @	18.72 hrs, Volume=	1.461 af
Outflow	=	0.49 cfs @	27.97 hrs, Volume=	1.280 af, Atten= 48%, Lag= 555.0 min
Primary	=	0.49 cfs @	27.97 hrs, Volume=	1.280 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Peak Elev= 915.06' @ 27.97 hrs Surf.Area= 2.090 ac Storage= 0.641 af

Plug-Flow detention time= 1,100.5 min calculated for 1.280 af (88% of inflow)
Center-of-Mass det. time= 813.3 min (2,540.9 - 1,727.6)

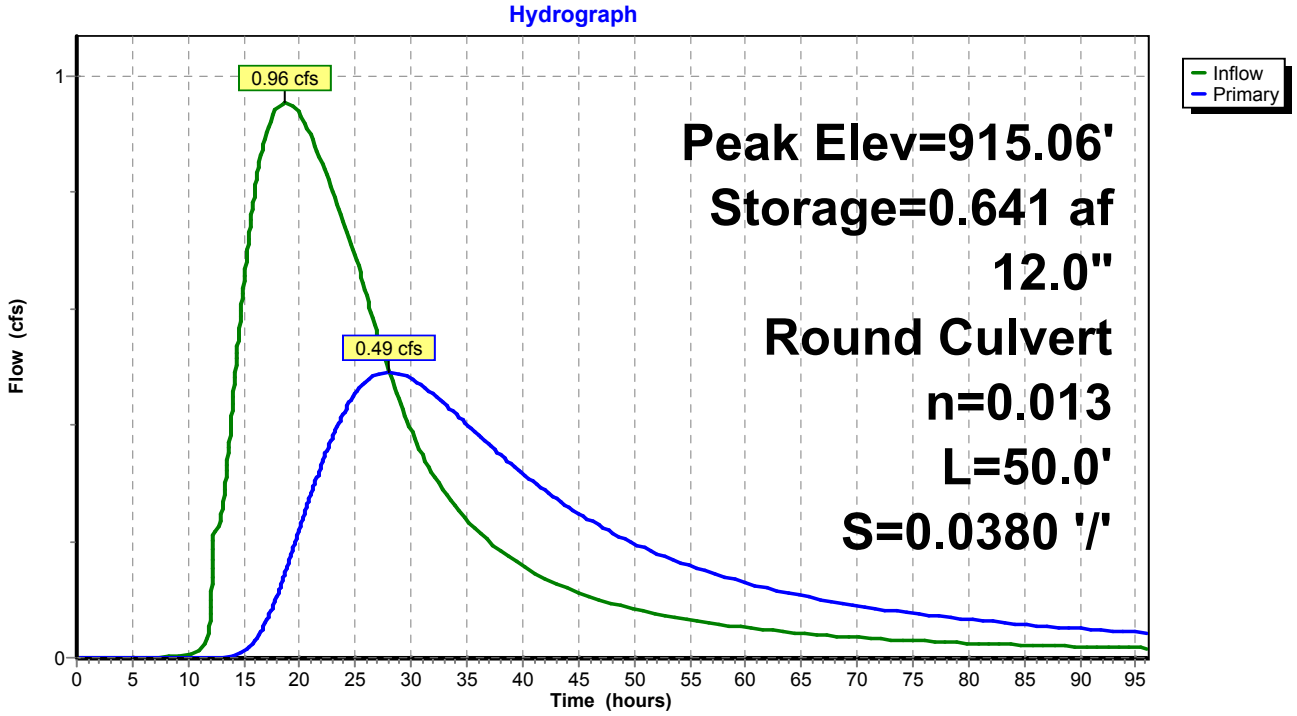
Volume	Invert	Avail.Storage	Storage Description
#1	914.75'	2.680 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
914.75	2.040	0.000	0.000
915.00	2.080	0.515	0.515
916.00	2.250	2.165	2.680

Device	Routing	Invert	Outlet Devices
#1	Primary	914.75'	**12.0" Round RCP_Round 12"** L= 50.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 914.75' / 912.85' S= 0.0380 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=0.49 cfs @ 27.97 hrs HW=915.06' (Free Discharge)
↑—**1=RCP_Round 12"** (Inlet Controls 0.49 cfs @ 2.37 fps)

Pond W-3: W-3


Hydrograph
0.96 cfs
0.49 cfs
Peak Elev=915.06'
Storage=0.641 af
12.0"
Round Culvert
n=0.013
L=50.0'
S=0.0380 '/'
Inflow
Primary
Flow (cfs)
Time (hours)
0
1
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95

Summary for Pond W-4: W-4

[79] Warning: Submerged Pond 11P Secondary device # 5 OUTLET by 0.92'

Inflow Area = 2.980 ac, 26.17% Impervious, Inflow Depth > 11.69" for 10-Year event
Inflow = 8.61 cfs @ 12.08 hrs, Volume= 2.904 af
Outflow = 3.08 cfs @ 17.00 hrs, Volume= 2.873 af, Atten= 64%, Lag= 295.1 min
Primary = 3.08 cfs @ 17.00 hrs, Volume= 2.873 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Peak Elev= 908.92' @ 17.00 hrs Surf.Area= 1.110 ac Storage= 0.868 af

Plug-Flow detention time= 289.2 min calculated for 2.873 af (99% of inflow)
Center-of-Mass det. time= 255.8 min (1,279.4 - 1,023.6)

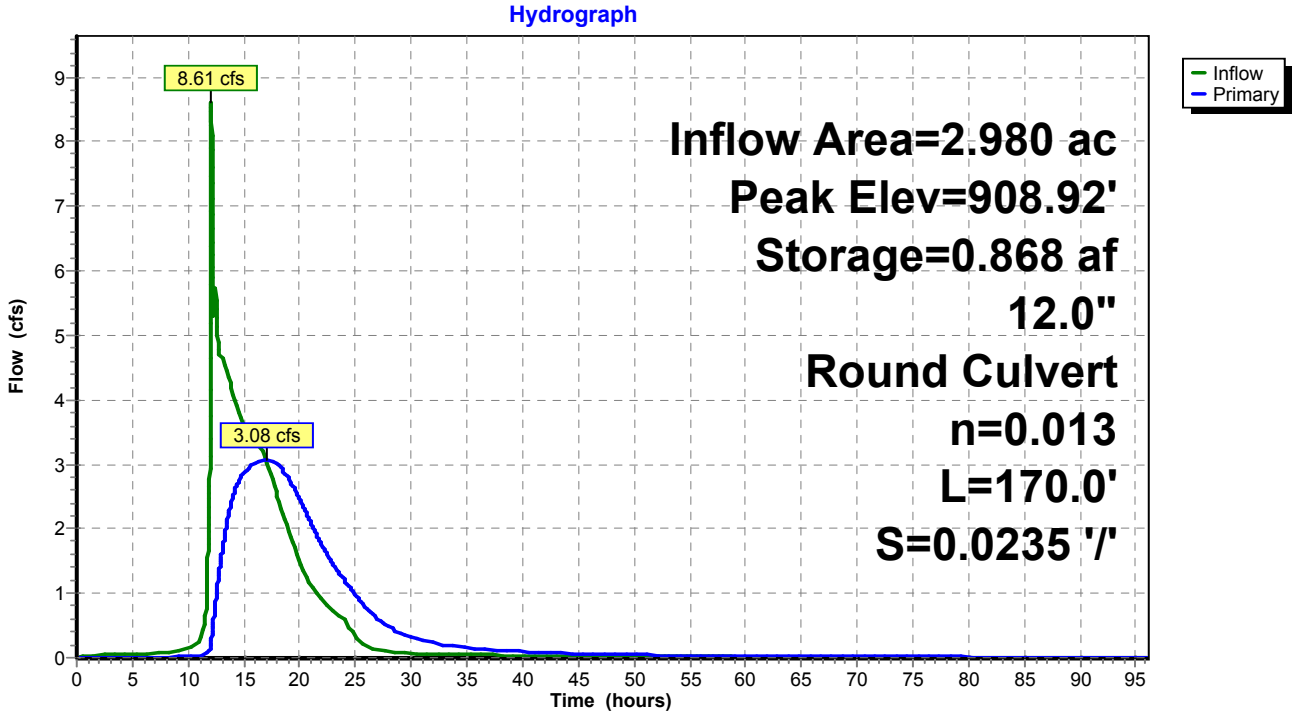
Volume	Invert	Avail.Storage	Storage Description
#1	908.00'	2.280 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
908.00	0.780	0.000	0.000
910.00	1.500	2.280	2.280

Device	Routing	Invert	Outlet Devices
#1	Primary	908.00'	**12.0" Round RCP_Round 12"** L= 170.0' RCP, groove end w/headwall, Ke= 0.200 Inlet / Outlet Invert= 908.00' / 904.00' S= 0.0235 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=3.08 cfs @ 17.00 hrs HW=908.92' (Free Discharge)
↑—**1=RCP_Round 12"** (Inlet Controls 3.08 cfs @ 4.08 fps)

Pond W-4: W-4


Hydrograph
8.61 cfs
3.08 cfs
Inflow Area=2.980 ac
Peak Elev=908.92'
Storage=0.868 af
12.0"
Round Culvert
n=0.013
L=170.0'
S=0.0235 '/'
Inflow
Primary
Flow (cfs)
Time (hours)
0
1
2
3
4
5
6
7
8
9
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
75
80
85
90
95

Summary for Pond W-5: W-5

[79] Warning: Submerged Pond 13P Secondary device # 2 INLET by 0.06'
[79] Warning: Submerged Pond 13P Secondary device # 3 INLET by 0.06'
[79] Warning: Submerged Pond 13P Secondary device # 4 INLET by 0.06'
[79] Warning: Submerged Pond 13P Secondary device # 5 INLET by 0.06'
[79] Warning: Submerged Pond 13P Secondary device # 6 INLET by 0.06'

Inflow Area = 7.608 ac, 48.41% Impervious, Inflow Depth = 5.93" for 10-Year event
Inflow = 34.77 cfs @ 12.02 hrs, Volume= 3.760 af
Outflow = 6.79 cfs @ 13.10 hrs, Volume= 3.756 af, Atten= 80%, Lag= 64.8 min
Primary = 6.79 cfs @ 13.10 hrs, Volume= 3.756 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Starting Elev= 882.75' Surf.Area= 4.910 ac Storage= 3.412 af
Peak Elev= 883.06' @ 13.10 hrs Surf.Area= 5.252 ac Storage= 4.995 af (1.583 af above start)

Plug-Flow detention time= 1,760.1 min calculated for 0.344 af (9% of inflow)
Center-of-Mass det. time= 254.6 min (1,096.4 - 841.8)

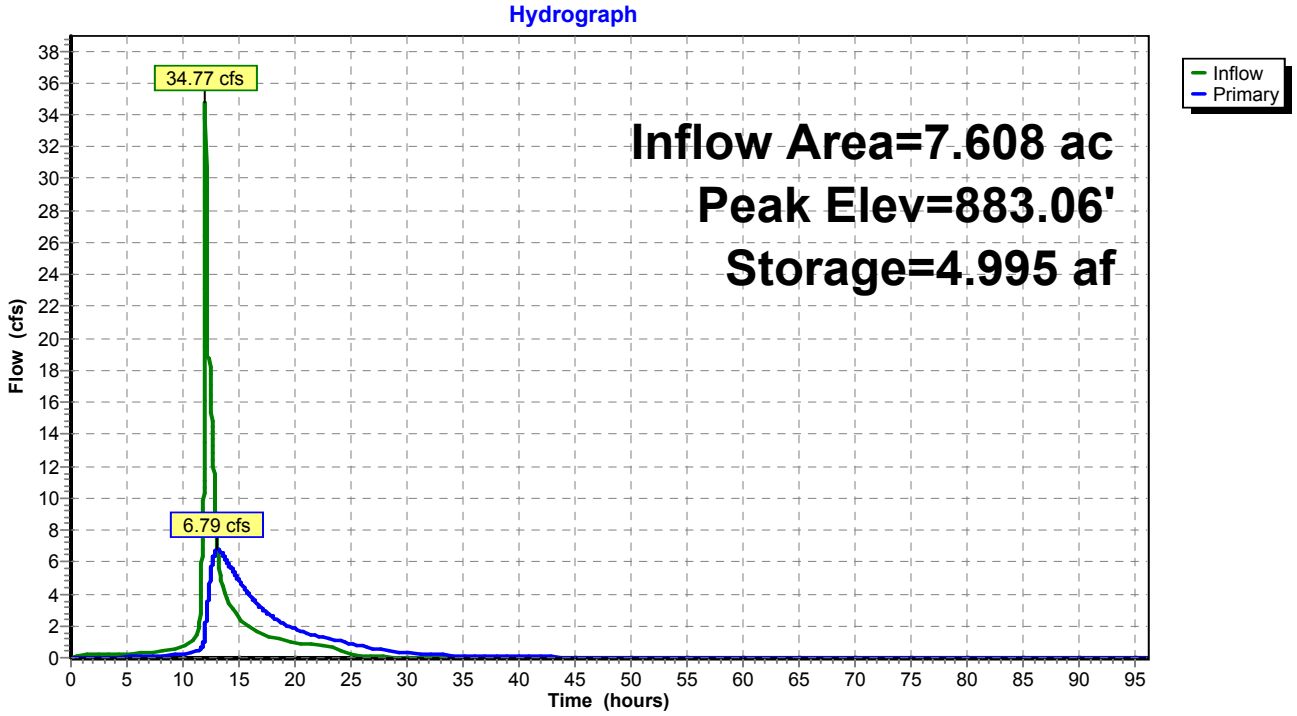
Volume	Invert	Avail.Storage	Storage Description
#1	882.00'	7.390 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
882.00	4.190	0.000	0.000
883.00	5.150	4.670	4.670
883.49	5.950	2.720	7.390

Device	Routing	Invert	Outlet Devices
#1	Primary	882.75'	**6.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#2	Primary	882.75'	**6.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=6.78 cfs @ 13.10 hrs HW=883.06' (Free Discharge)
└─**1=Sharp-Crested Rectangular Weir** (Weir Controls 3.39 cfs @ 1.83 fps)
└─**2=Sharp-Crested Rectangular Weir** (Weir Controls 3.39 cfs @ 1.83 fps)

Pond W-5: W-5


Hydrograph
Inflow
Primary
34.77 cfs
6.79 cfs
Inflow Area=7.608 ac
Peak Elev=883.06'
Storage=4.995 af
Flow (cfs)
Time (hours)
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28
30
32
34
36
38
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
75
80
85
90
95

Time span=0.00-96.00 hrs, dt=0.01 hrs, 9601 points
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious
Reach routing by Muskingum-Cunge method - Pond routing by Stor-Ind method

Subcatchment1S: To Rice Creek Runoff Area=1.601 ac 31.98% Impervious Runoff Depth=5.20"
Tc=5.7 min CN=74/98 Runoff=11.87 cfs 0.693 af

Subcatchment47S: Offsite Subbasin 51 Runoff Area=25.238 ac 19.96% Impervious Runoff Depth=4.09"
Tc=17.7 min CN=65/98 Runoff=94.36 cfs 8.599 af

SubcatchmentSB 1: SB 1 Runoff Area=52.150 ac 0.00% Impervious Runoff Depth=4.31"
Tc=53.1 min CN=74/0 Runoff=125.09 cfs 18.747 af

SubcatchmentSB 11: SB 11 Runoff Area=3.290 ac 36.78% Impervious Runoff Depth=5.42"
Tc=11.7 min CN=74/100 Runoff=19.16 cfs 1.485 af

SubcatchmentSB 12: SB 12 Runoff Area=1.390 ac 20.86% Impervious Runoff Depth=4.89"
Tc=9.5 min CN=74/98 Runoff=8.27 cfs 0.566 af

SubcatchmentSB 13: SB 13 Runoff Area=2.980 ac 26.17% Impervious Runoff Depth=5.10"
Tc=9.4 min CN=74/100 Runoff=18.22 cfs 1.266 af

SubcatchmentSB 14: SB 14 Runoff Area=10.230 ac 16.03% Impervious Runoff Depth=4.76"
Tc=4.3 min CN=74/98 Runoff=76.19 cfs 4.054 af

SubcatchmentSB 15: SB 15 Runoff Area=58.570 ac 0.05% Impervious Runoff Depth=4.32"
Tc=31.3 min CN=74/98 Runoff=185.61 cfs 21.062 af

SubcatchmentSB 16: SB 16 Runoff Area=32.440 ac 5.76% Impervious Runoff Depth=4.47"
Tc=12.1 min CN=74/98 Runoff=163.65 cfs 12.092 af

SubcatchmentSB 17: SB 17 Runoff Area=7.608 ac 48.41% Impervious Runoff Depth=5.76"
Tc=4.3 min CN=74/100 Runoff=64.20 cfs 3.655 af

SubcatchmentSB 18: SB 18 Runoff Area=52.790 ac 0.00% Impervious Runoff Depth=4.31"
Tc=33.5 min CN=74/0 Runoff=161.15 cfs 18.977 af

SubcatchmentSB 19: SB 19 Runoff Area=21.190 ac 0.00% Impervious Runoff Depth=4.31"
Tc=24.7 min CN=74/0 Runoff=75.36 cfs 7.618 af

SubcatchmentSB 2: SB 2 Runoff Area=11.067 ac 0.33% Impervious Runoff Depth=4.32"
Tc=16.6 min CN=74/98 Runoff=47.56 cfs 3.987 af

SubcatchmentSB 22: SB 22 Runoff Area=41.910 ac 0.00% Impervious Runoff Depth=1.75"
Tc=41.0 min CN=49/0 Runoff=40.68 cfs 6.106 af

SubcatchmentSB 24: SB 24 Runoff Area=5.043 ac 97.56% Impervious Runoff Depth=7.00"
Tc=7.5 min CN=74/98 Runoff=43.43 cfs 2.943 af

SubcatchmentSB 25: SB 25 Runoff Area=5.136 ac 95.72% Impervious Runoff Depth=6.95"
Tc=10.7 min CN=74/98 Runoff=38.17 cfs 2.976 af

Subcatchment SB 26: SB 26 Runoff Area=14.335 ac 98.27% Impervious Runoff Depth=7.02"
Tc=25.4 min CN=74/98 Runoff=73.07 cfs 8.390 af

Subcatchment SB 27: SB 27 (Thumb Road) Runoff Area=6.629 ac 83.33% Impervious Runoff Depth=6.61"
Tc=27.6 min CN=74/98 Runoff=30.89 cfs 3.652 af

Subcatchment SB 28: SB 28 Runoff Area=6.955 ac 46.76% Impervious Runoff Depth=5.60"
Tc=14.6 min CN=74/98 Runoff=38.37 cfs 3.247 af

Subcatchment SB 29: SB 29 Runoff Area=10.214 ac 37.73% Impervious Runoff Depth=5.35"
Tc=19.1 min CN=74/98 Runoff=48.13 cfs 4.557 af

Subcatchment SB 3: SB 3 Runoff Area=37.610 ac 7.68% Impervious Runoff Depth=4.53"
Tc=15.3 min CN=74/98 Runoff=173.90 cfs 14.184 af

Subcatchment SB 4: SB 4 Runoff Area=0.600 ac 43.33% Impervious Runoff Depth=5.61"
Tc=5.9 min CN=74/100 Runoff=4.61 cfs 0.281 af

Subcatchment SB 5: SB 5 Runoff Area=7.860 ac 5.98% Impervious Runoff Depth=4.48"
Tc=59.3 min CN=74/98 Runoff=18.03 cfs 2.934 af

Subcatchment SB 6: SB 6 Runoff Area=1.000 ac 10.00% Impervious Runoff Depth=4.61"
Tc=20.3 min CN=74/100 Runoff=4.09 cfs 0.384 af

Subcatchment SB 7: SB 7 Runoff Area=21.550 ac 0.00% Impervious Runoff Depth=4.31"
Tc=5.7 min CN=74/0 Runoff=140.12 cfs 7.747 af

Subcatchment SB 8: SB 8 Runoff Area=29.580 ac 5.51% Impervious Runoff Depth=4.47"
Tc=47.1 min CN=74/98 Runoff=77.55 cfs 11.008 af

Subcatchment SB 9: SB 9 Runoff Area=25.780 ac 0.12% Impervious Runoff Depth=4.32"
Tc=30.0 min CN=74/98 Runoff=83.43 cfs 9.275 af

Subcatchment SB10: SB 10 Runoff Area=6.390 ac 4.85% Impervious Runoff Depth=4.45"
Tc=7.3 min CN=74/98 Runoff=39.26 cfs 2.368 af

Reach 30R: 60" RCP to existing 60" Avg. Flow Depth=3.52' Max Vel=18.41 fps Inflow=271.82 cfs 49.136 af
60.0" Round Pipe n=0.013 L=400.0' S=0.0085 '/' Capacity=240.12 cfs Outflow=271.78 cfs 49.136 af

Reach 34R: 60" RCP connecting Avg. Flow Depth=2.71' Max Vel=14.06 fps Inflow=146.01 cfs 25.678 af
60.0" Round Pipe n=0.013 L=2,150.0' S=0.0050 '/' Capacity=184.16 cfs Outflow=145.87 cfs 25.678 af

Reach 37R: 48" RCP Avg. Flow Depth=2.52' Max Vel=13.15 fps Inflow=109.89 cfs 15.711 af
48.0" Round Pipe n=0.013 L=240.0' S=0.0060 '/' Capacity=111.27 cfs Outflow=109.87 cfs 15.711 af

Reach 39R: 24" RCP Avg. Flow Depth=0.99' Max Vel=7.10 fps Inflow=11.03 cfs 3.318 af
24.0" Round Pipe n=0.013 L=90.0' S=0.0050 '/' Capacity=16.00 cfs Outflow=11.03 cfs 3.318 af

Reach 43R: 30" RCP connecting P-10 Avg. Flow Depth=1.16' Max Vel=6.94 fps Inflow=15.37 cfs 11.336 af
30.0" Round Pipe n=0.013 L=750.0' S=0.0037 '/' Capacity=24.93 cfs Outflow=15.36 cfs 11.336 af

Reach 51R: 40' x 4.5 ft parabolic Avg. Flow Depth=3.12' Max Vel=7.16 fps Inflow=497.28 cfs 95.418 af
n=0.035 L=300.0' S=0.0050 '/' Capacity=733.43 cfs Outflow=497.06 cfs 95.417 af

Pond 2 P: P-2 Peak Elev=925.49' Storage=1.355 af Inflow=146.98 cfs 25.678 af
Outflow=146.01 cfs 25.678 af

Pond 4P: P-4 Peak Elev=917.33' Storage=1.439 af Inflow=18.03 cfs 2.934 af
Primary=8.40 cfs 1.470 af Secondary=3.24 cfs 1.464 af Outflow=11.64 cfs 2.934 af

Pond 7P: P-7 Peak Elev=915.85' Storage=1.480 af Inflow=77.55 cfs 11.008 af
Primary=77.12 cfs 10.371 af Secondary=0.25 cfs 0.557 af Outflow=77.37 cfs 10.928 af

Pond 8P: P-8 Peak Elev=899.03' Storage=1.355 af Inflow=39.26 cfs 2.368 af
24.0" Round Culvert n=0.013 L=380.0' S=0.0028 '/' Outflow=11.68 cfs 2.367 af

Pond 9P: P-9 Peak Elev=915.78' Storage=0.577 af Inflow=147.94 cfs 21.595 af
Outflow=147.76 cfs 21.595 af

Pond 10P: P-10 Lowered 1 ft Peak Elev=898.37' Storage=1.503 af Inflow=143.24 cfs 22.117 af
Primary=15.37 cfs 11.336 af Secondary=127.46 cfs 10.773 af Outflow=142.83 cfs 22.109 af

Pond 11P: P-11 Peak Elev=912.68' Storage=8.870 af Inflow=154.35 cfs 23.080 af
Primary=131.41 cfs 19.184 af Secondary=4.97 cfs 3.876 af Outflow=136.38 cfs 23.060 af

Pond 12P: P-12 Peak Elev=895.51' Storage=9.607 af Inflow=152.03 cfs 31.274 af
Outflow=117.94 cfs 31.251 af

Pond 13P: P-13 Peak Elev=885.22' Storage=9.296 af Inflow=522.85 cfs 91.772 af
Primary=483.99 cfs 87.567 af Secondary=18.34 cfs 4.200 af Outflow=502.34 cfs 91.767 af

Pond 17P: W-2 Peak Elev=929.60' Storage=0.689 af Inflow=3.09 cfs 1.726 af
12.0" Round Culvert n=0.013 L=300.0' S=0.0437 '/' Outflow=1.20 cfs 1.579 af

Pond 36P: Culverts passing flow Peak Elev=888.46' Storage=0.003 af Inflow=161.15 cfs 18.977 af
Primary=127.00 cfs 18.235 af Secondary=34.15 cfs 0.742 af Outflow=161.15 cfs 18.977 af

Pond CRH-1: CRH-1 Peak Elev=878.81' Storage=0.760 af Inflow=38.37 cfs 3.247 af
Discarded=0.37 cfs 0.560 af Primary=25.15 cfs 2.688 af Outflow=25.53 cfs 3.247 af

Pond CRH-2: CRH-2 Peak Elev=883.78' Storage=1.468 af Inflow=48.13 cfs 4.557 af
Discarded=0.47 cfs 0.981 af Primary=27.39 cfs 3.577 af Outflow=27.86 cfs 4.557 af

Pond CRH-3: CRH-3 Peak Elev=879.83' Storage=0.770 af Inflow=30.16 cfs 4.270 af
Discarded=0.38 cfs 0.516 af Primary=25.55 cfs 3.754 af Outflow=25.93 cfs 4.270 af

Pond P-5/P-6: P-5/P-6 Peak Elev=931.48' Storage=10.662 af Inflow=208.93 cfs 17.441 af
Primary=109.89 cfs 15.711 af Secondary=3.09 cfs 1.726 af Outflow=112.97 cfs 17.438 af

Pond TI P: Thumb Infiltration (Thumb TP Peak Elev=903.80' Storage=3.803 af Inflow=62.42 cfs 9.759 af
Outflow=52.86 cfs 6.019 af

Pond W-1: W-1 Peak Elev=915.31' Storage=0.392 af Inflow=5.54 cfs 1.848 af
Outflow=2.82 cfs 1.848 af

Pond W-3: W-3 Peak Elev=915.18' Storage=0.888 af Inflow=1.41 cfs 2.136 af
12.0" Round Culvert n=0.013 L=50.0' S=0.0380 '/' Outflow=0.89 cfs 1.950 af

Pond W-4: W-4 Peak Elev=909.26' Storage=1.268 af Inflow=21.33 cfs 5.142 af
12.0" Round Culvert n=0.013 L=170.0' S=0.0235 '/' Outflow=4.12 cfs 5.110 af

Pond W-5: W-5 Peak Elev=883.30' Storage=6.306 af Inflow=73.57 cfs 7.854 af
Outflow=15.85 cfs 7.850 af

Total Runoff Area = 501.136 ac Runoff Volume = 182.855 af Average Runoff Depth = 4.38"
88.56% Pervious = 443.803 ac 11.44% Impervious = 57.333 ac

Summary for Subcatchment 1S: To Rice Creek

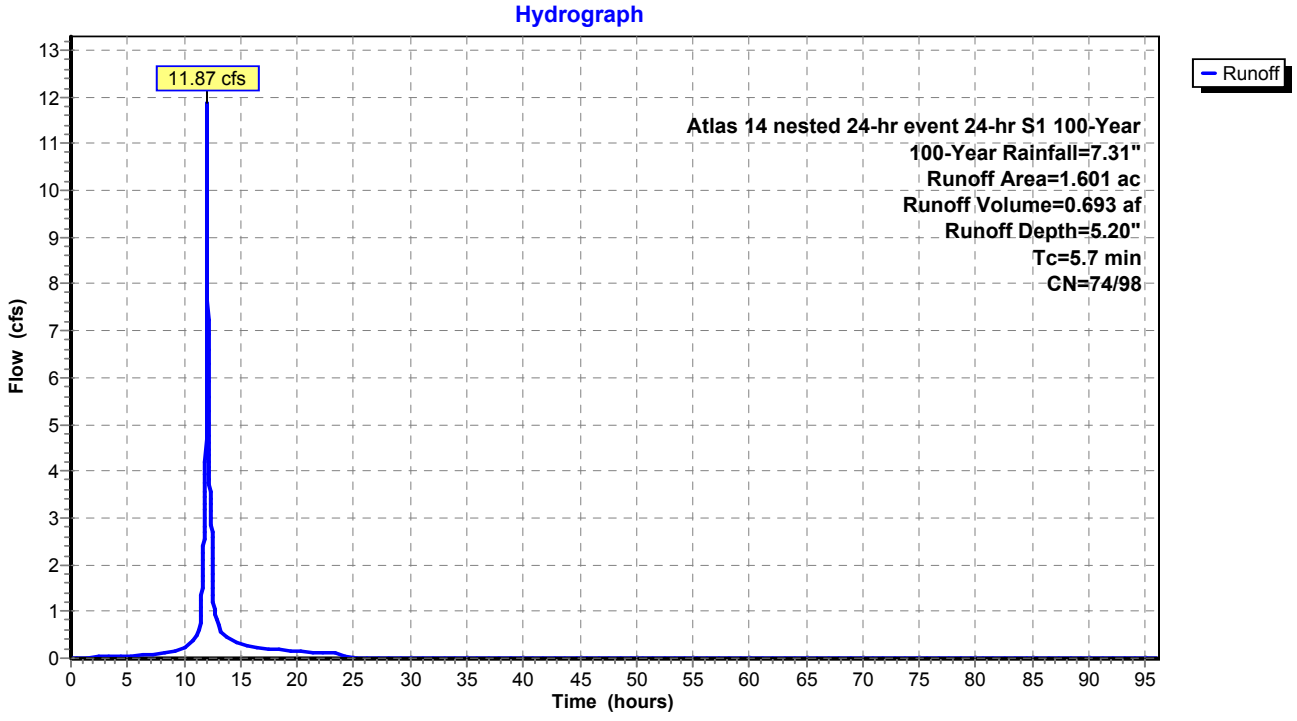
Runoff = 11.87 cfs @ 12.03 hrs, Volume= 0.693 af, Depth= 5.20"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 100-Year Rainfall=7.31"

	Area (ac)	CN	Description
*	0.512	98	impervious
*	1.089	74	pervious
	1.601	82	Weighted Average
	1.089	74	68.02% Pervious Area
	0.512	98	31.98% Impervious Area

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

Subcatchment 1S: To Rice Creek



Summary for Subcatchment 47S: Offsite Subbasin 51

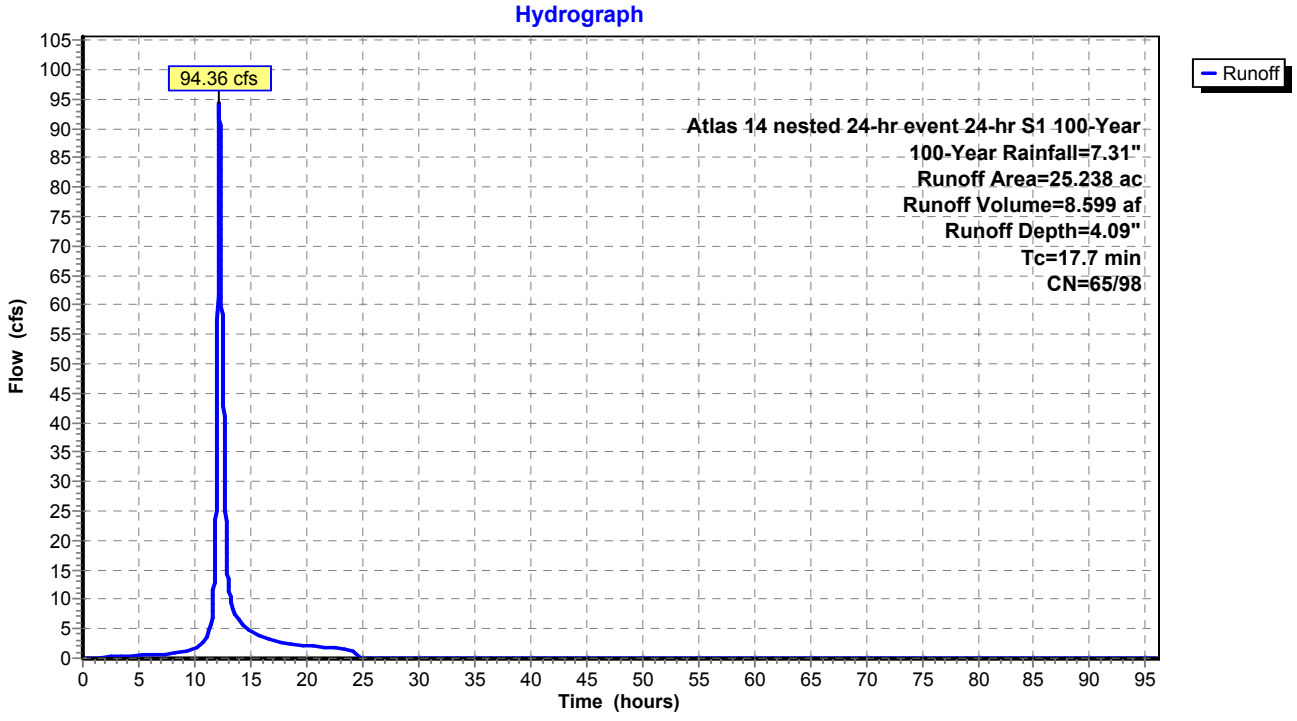
Runoff = 94.36 cfs @ 12.21 hrs, Volume= 8.599 af, Depth= 4.09"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 100-Year Rainfall=7.31"

	Area (ac)	CN	Description
*	20.200	65	Offsite subbasin 51
*	5.038	98	
	25.238	72	Weighted Average
	20.200	65	80.04% Pervious Area
	5.038	98	19.96% Impervious Area

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

Subcatchment 47S: Offsite Subbasin 51



Summary for Subcatchment SB 1: SB 1

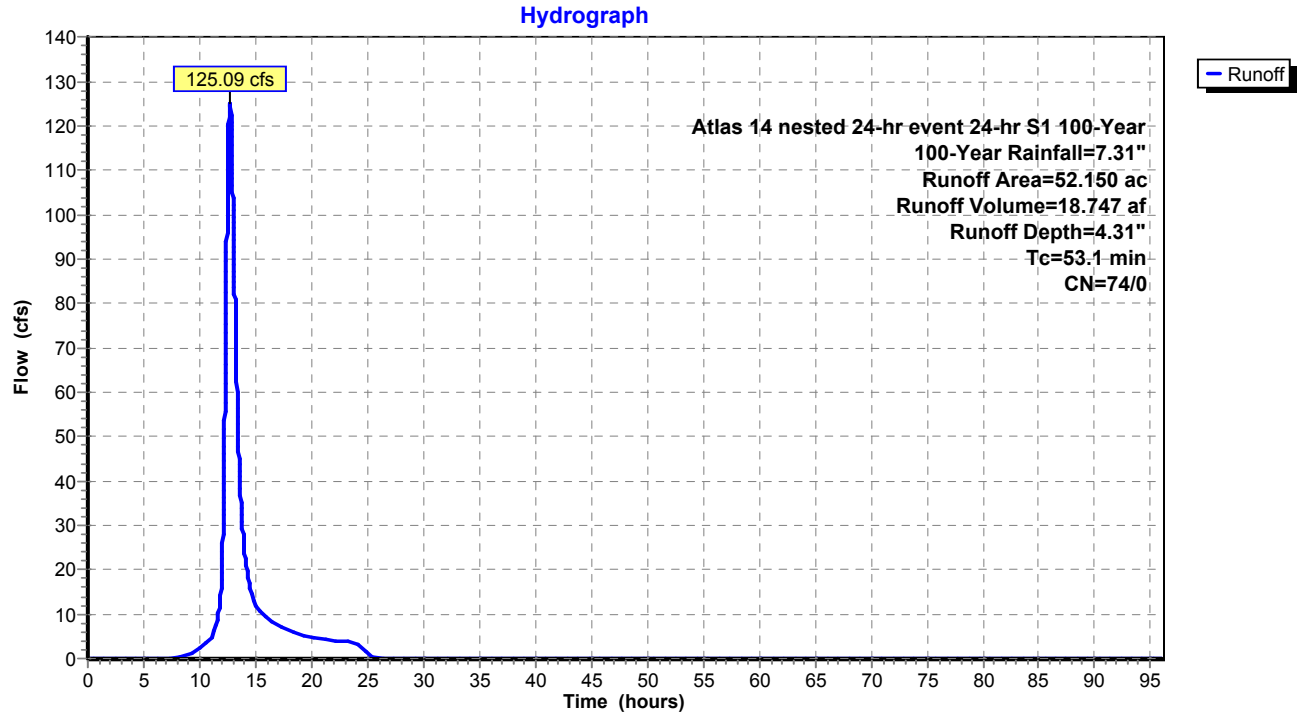
Runoff = 125.09 cfs @ 12.69 hrs, Volume= 18.747 af, Depth= 4.31"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 100-Year Rainfall=7.31"

	Area (ac)	CN	Description
*	52.150	74	pervious
*	0.000	98	impervious
	52.150	74	Weighted Average
	52.150	74	100.00% Pervious Area

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

Subcatchment SB 1: SB 1



Summary for Subcatchment SB 11: SB 11

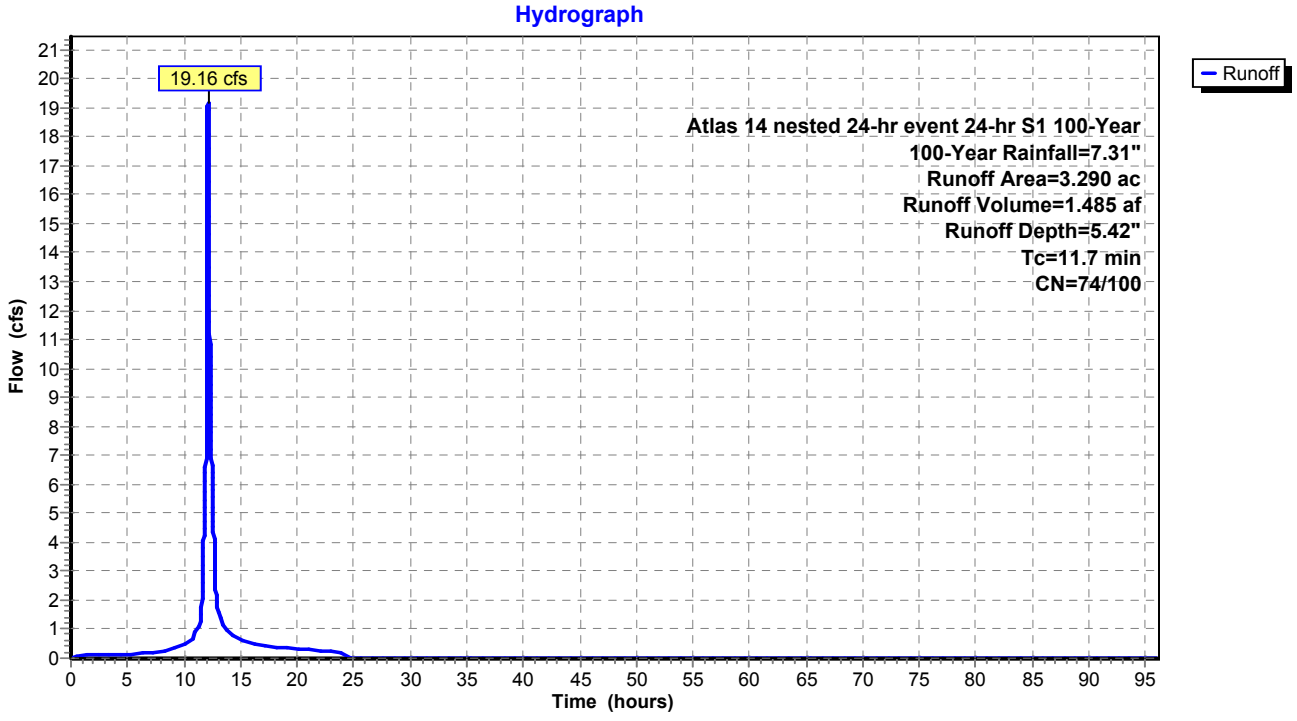
Runoff = 19.16 cfs @ 12.11 hrs, Volume= 1.485 af, Depth= 5.42"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 100-Year Rainfall=7.31"

	Area (ac)	CN	Description
*	2.080	74	pervious
*	1.210	100	impervious
	3.290	84	Weighted Average
	2.080	74	63.22% Pervious Area
	1.210	100	36.78% Impervious Area

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

Subcatchment SB 11: SB 11



Summary for Subcatchment SB 12: SB 12

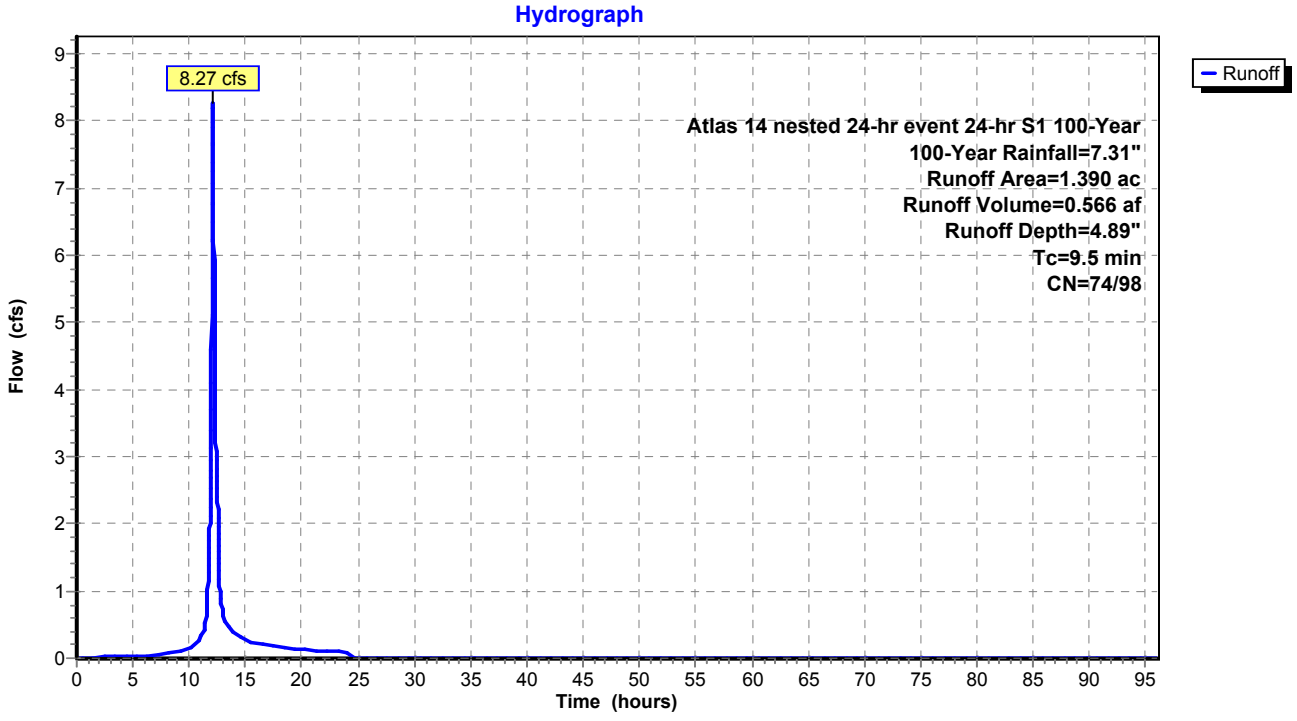
Runoff = 8.27 cfs @ 12.08 hrs, Volume= 0.566 af, Depth= 4.89"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 100-Year Rainfall=7.31"

	Area (ac)	CN	Description
*	1.100	74	pervious
*	0.290	98	impervious
	1.390	79	Weighted Average
	1.100	74	79.14% Pervious Area
	0.290	98	20.86% Impervious Area

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

Subcatchment SB 12: SB 12



Summary for Subcatchment SB 13: SB 13

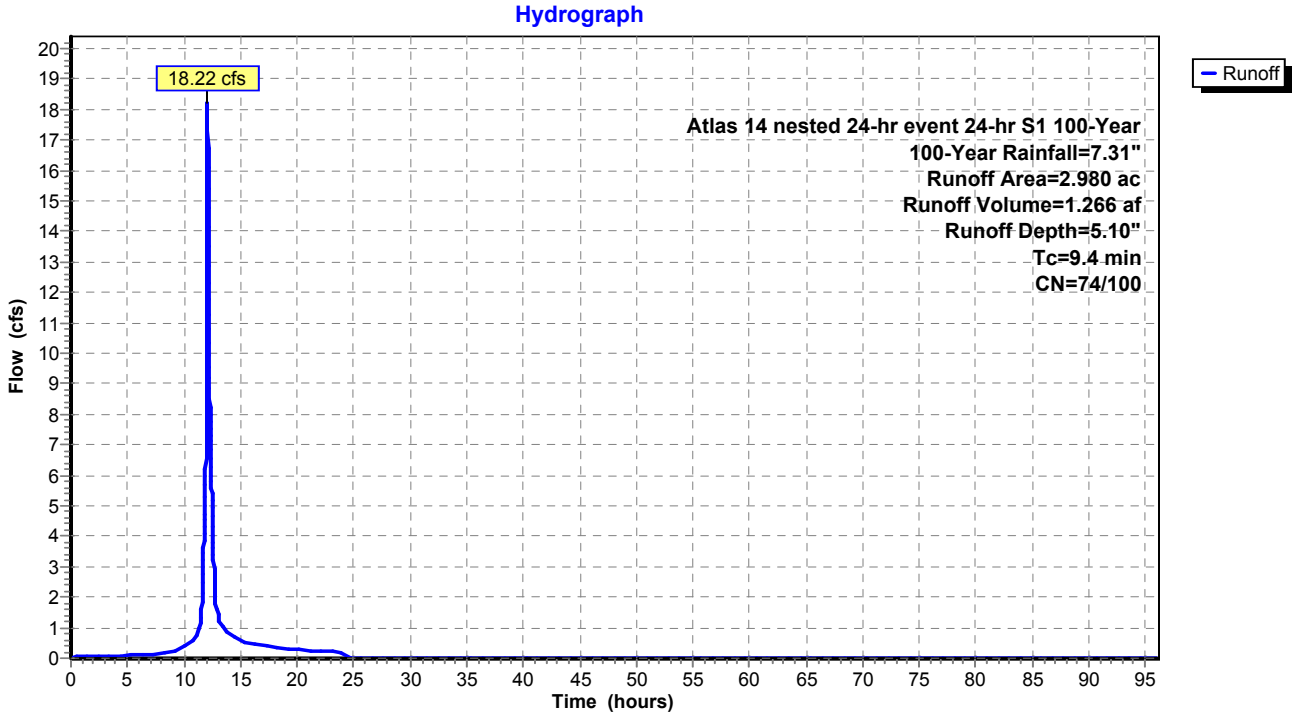
Runoff = 18.22 cfs @ 12.08 hrs, Volume= 1.266 af, Depth= 5.10"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 100-Year Rainfall=7.31"

	Area (ac)	CN	Description
*	2.200	74	pervious
*	0.780	100	impervious
	2.980	81	Weighted Average
	2.200	74	73.83% Pervious Area
	0.780	100	26.17% Impervious Area

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

Subcatchment SB 13: SB 13



Summary for Subcatchment SB 14: SB 14

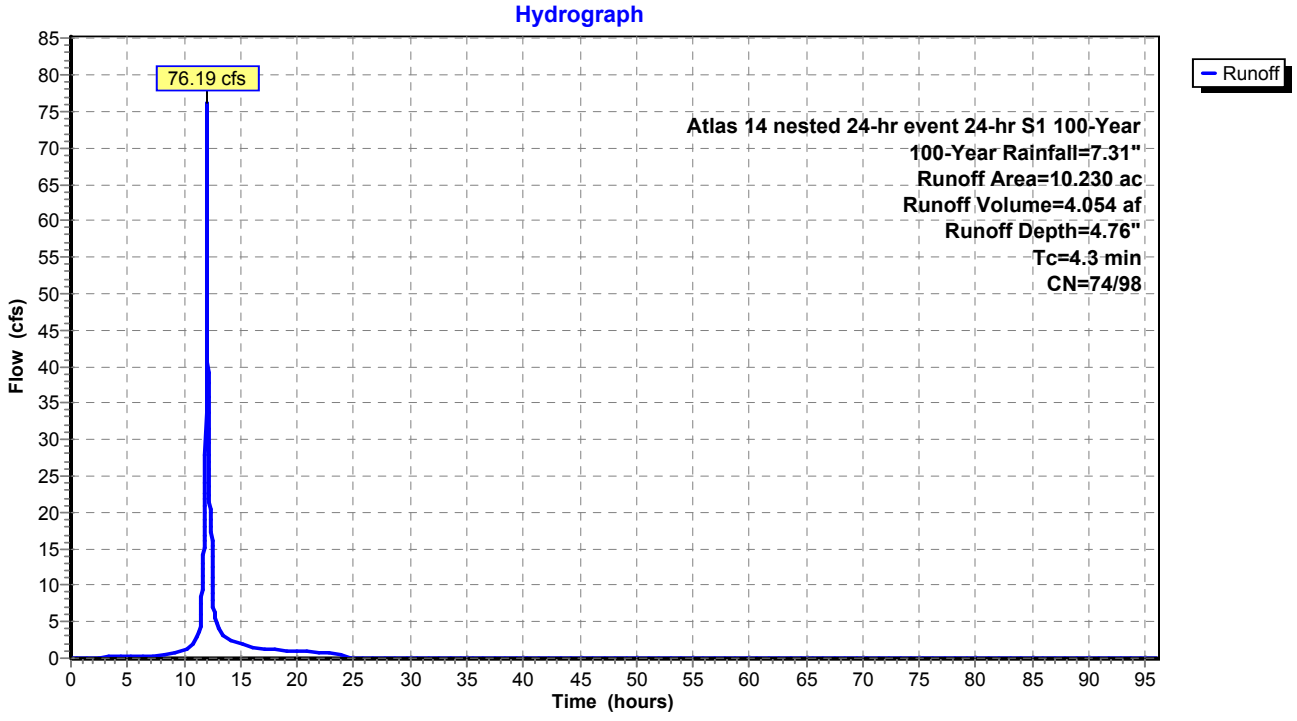
Runoff = 76.19 cfs @ 12.02 hrs, Volume= 4.054 af, Depth= 4.76"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 100-Year Rainfall=7.31"

	Area (ac)	CN	Description
*	8.590	74	pervious
*	1.640	98	impervious
	10.230	78	Weighted Average
	8.590	74	83.97% Pervious Area
	1.640	98	16.03% Impervious Area

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

Subcatchment SB 14: SB 14



Summary for Subcatchment SB 15: SB 15

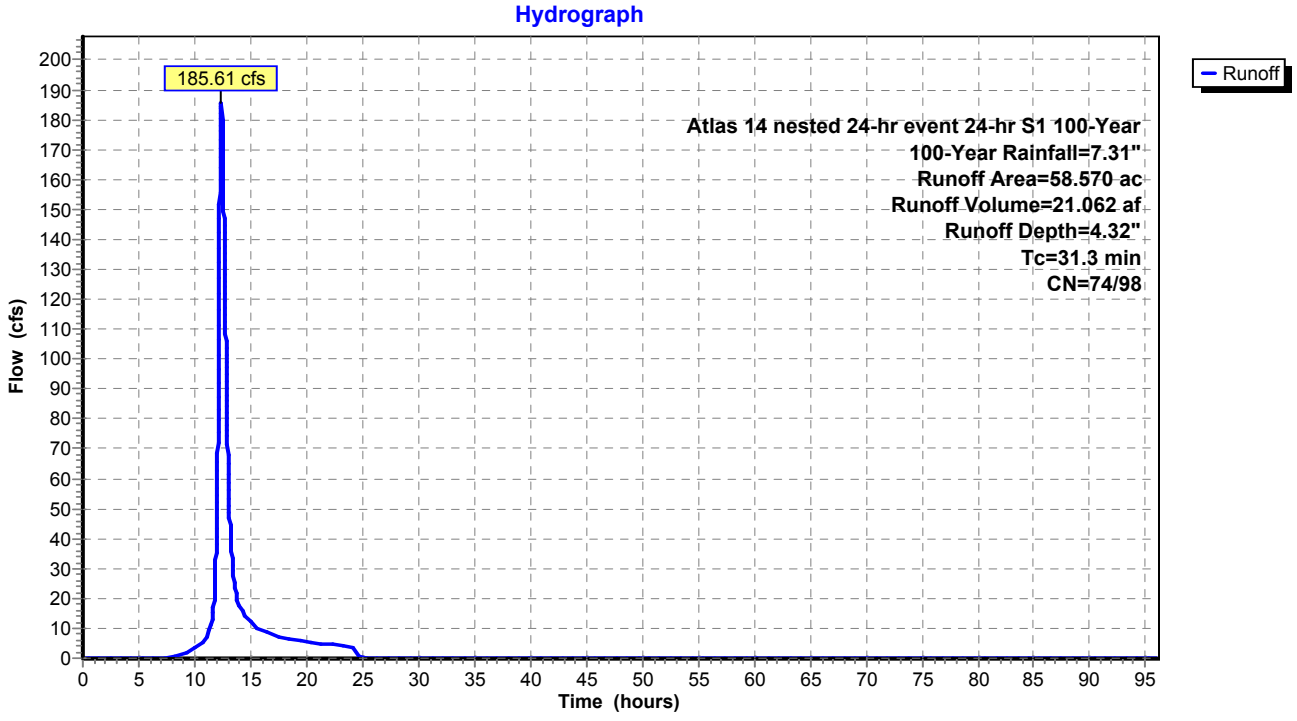
Runoff = 185.61 cfs @ 12.41 hrs, Volume= 21.062 af, Depth= 4.32"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 100-Year Rainfall=7.31"

	Area (ac)	CN	Description
*	58.540	74	pervious
*	0.030	98	impervious
	58.570	74	Weighted Average
	58.540	74	99.95% Pervious Area
	0.030	98	0.05% Impervious Area

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

Subcatchment SB 15: SB 15



Summary for Subcatchment SB 16: SB 16

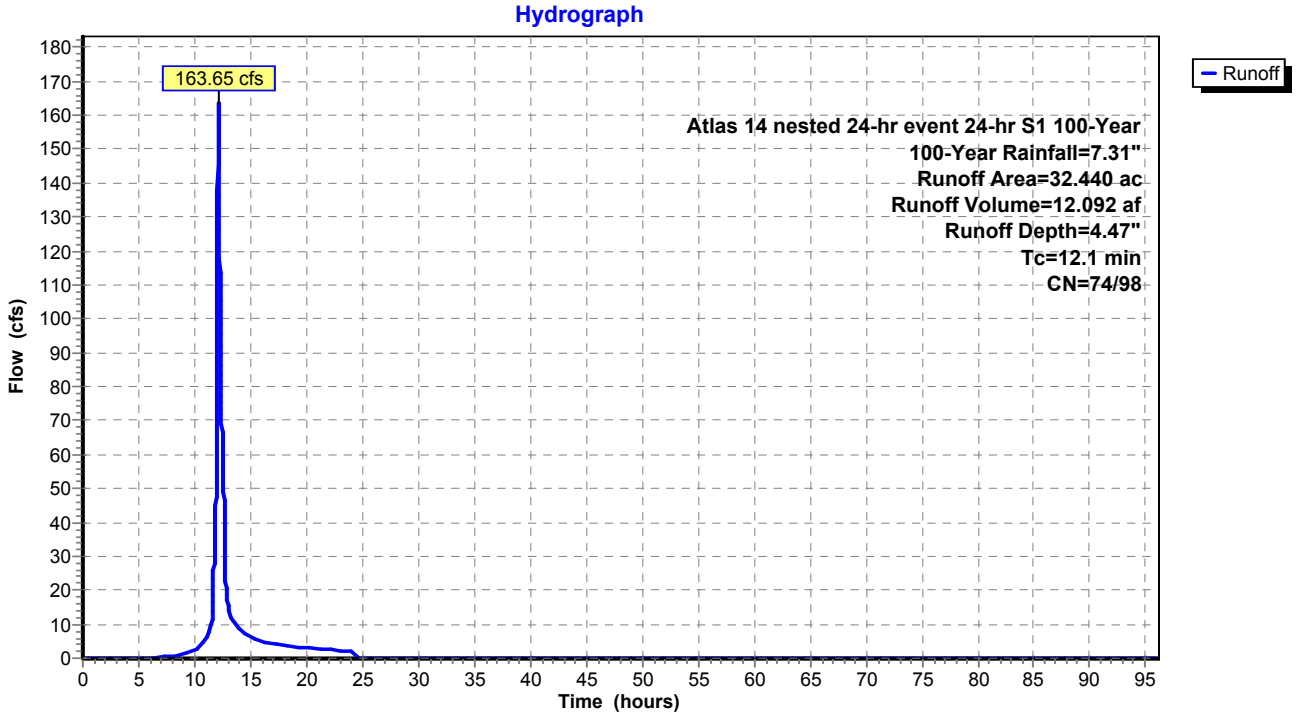
Runoff = 163.65 cfs @ 12.12 hrs, Volume= 12.092 af, Depth= 4.47"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 100-Year Rainfall=7.31"

	Area (ac)	CN	Description
*	30.570	74	pervious
*	1.870	98	impervious
	32.440	75	Weighted Average
	30.570	74	94.24% Pervious Area
	1.870	98	5.76% Impervious Area

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

Subcatchment SB 16: SB 16



Summary for Subcatchment SB 17: SB 17

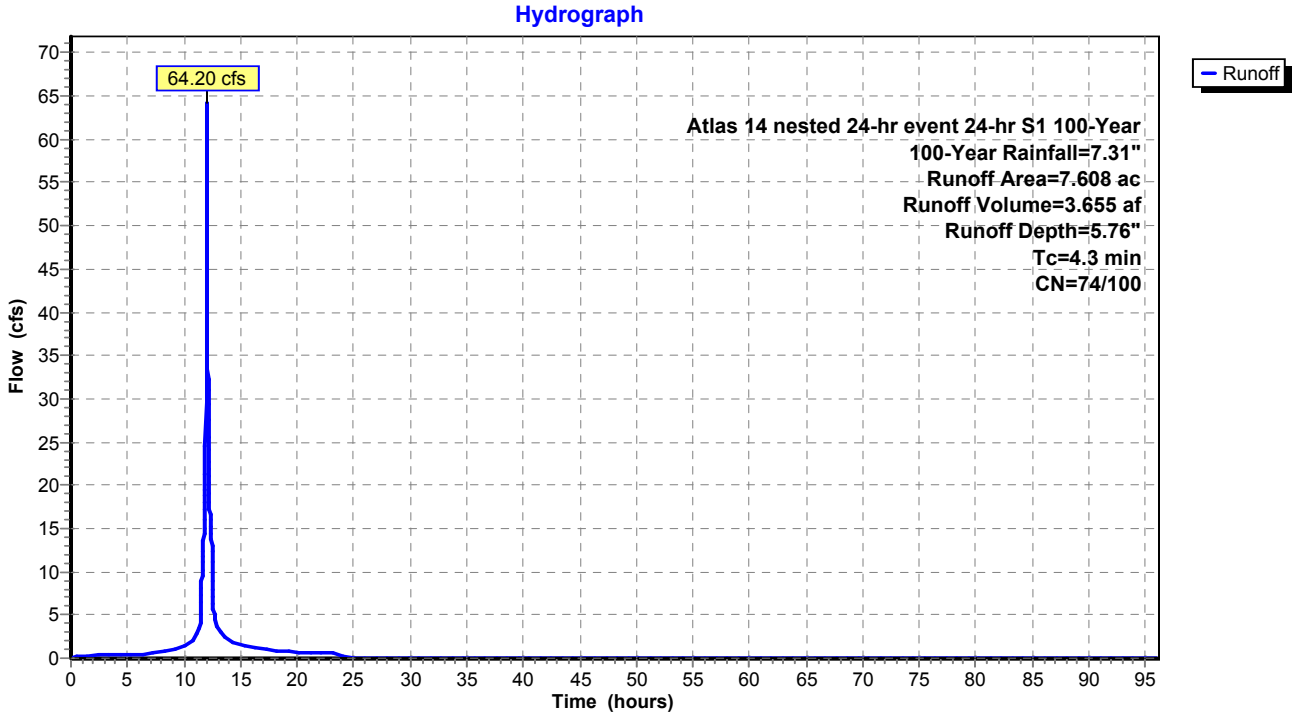
Runoff = 64.20 cfs @ 12.02 hrs, Volume= 3.655 af, Depth= 5.76"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 100-Year Rainfall=7.31"

	Area (ac)	CN	Description
*	3.925	74	pervious
*	3.683	100	impervious
	7.608	87	Weighted Average
	3.925	74	51.59% Pervious Area
	3.683	100	48.41% Impervious Area

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

Subcatchment SB 17: SB 17



Summary for Subcatchment SB 18: SB 18

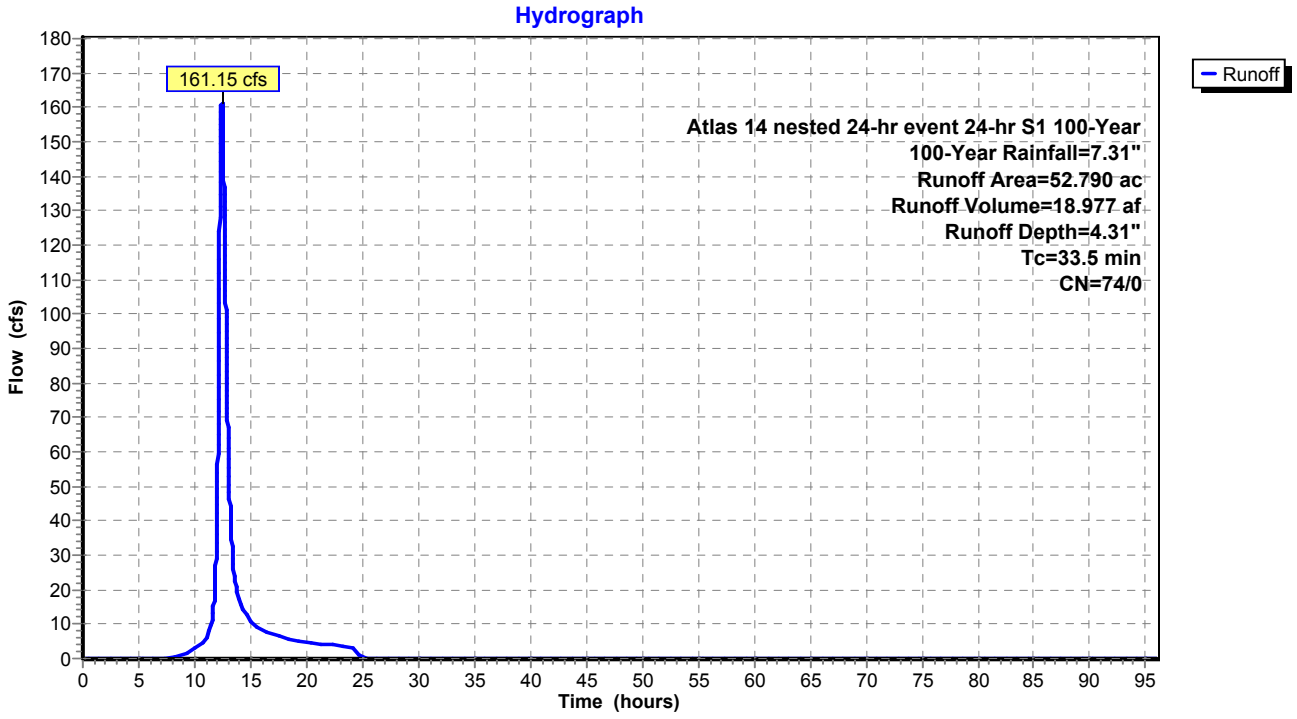
Runoff = 161.15 cfs @ 12.43 hrs, Volume= 18.977 af, Depth= 4.31"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 100-Year Rainfall=7.31"

	Area (ac)	CN	Description
*	52.790	74	pervious
*	0.000	98	impervious
	52.790	74	Weighted Average
	52.790	74	100.00% Pervious Area

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

Subcatchment SB 18: SB 18



Summary for Subcatchment SB 19: SB 19

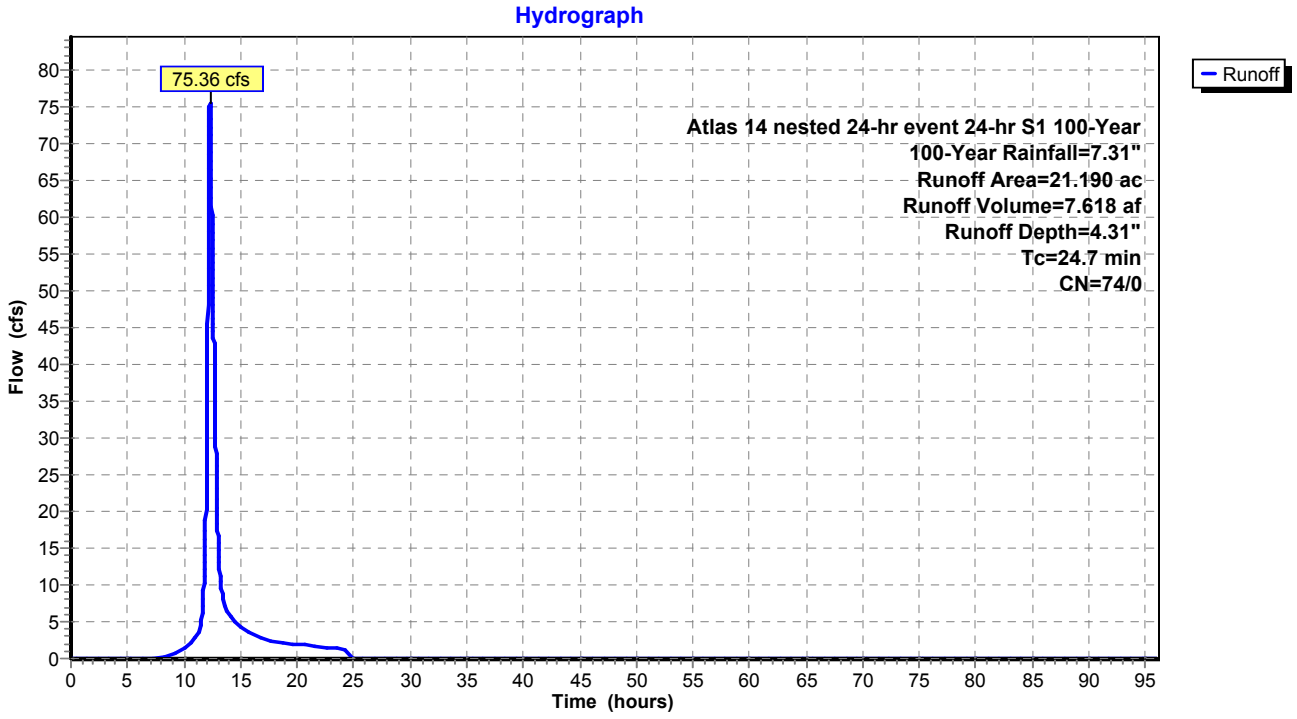
Runoff = 75.36 cfs @ 12.30 hrs, Volume= 7.618 af, Depth= 4.31"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 100-Year Rainfall=7.31"

	Area (ac)	CN	Description
*	21.190	74	pervious
*	0.000	98	impervious
	21.190	74	Weighted Average
	21.190	74	100.00% Pervious Area

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

Subcatchment SB 19: SB 19



Summary for Subcatchment SB 2: SB 2

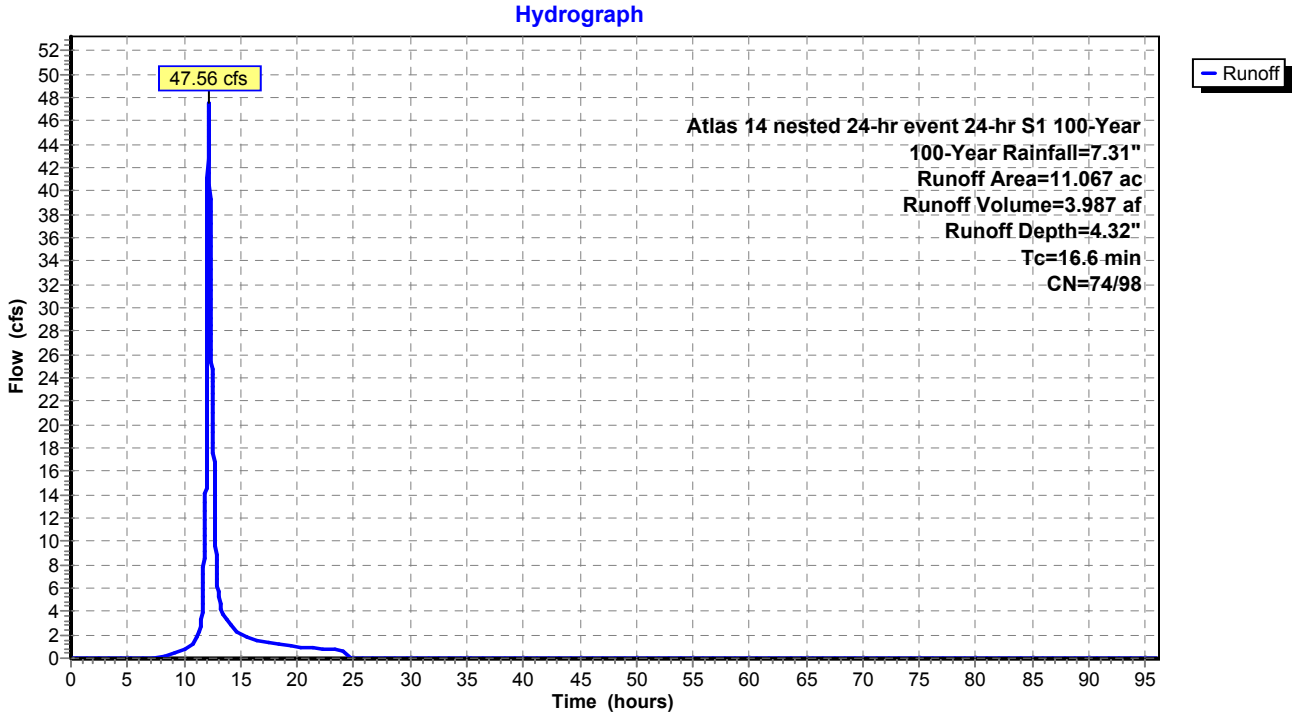
Runoff = 47.56 cfs @ 12.19 hrs, Volume= 3.987 af, Depth= 4.32"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 100-Year Rainfall=7.31"

	Area (ac)	CN	Description
*	11.030	74	pervious
*	0.037	98	impervious
	11.067	74	Weighted Average
	11.030	74	99.67% Pervious Area
	0.037	98	0.33% Impervious Area

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

Subcatchment SB 2: SB 2



Summary for Subcatchment SB 22: SB 22

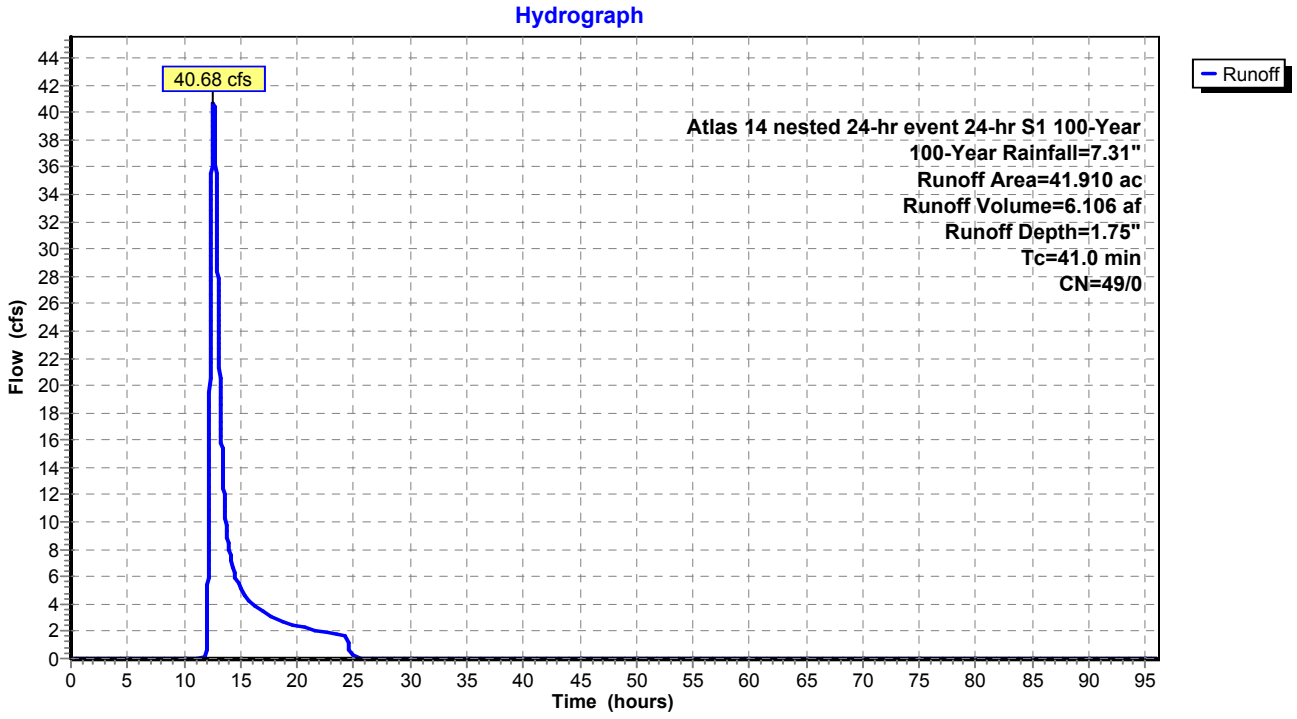
Runoff = 40.68 cfs @ 12.62 hrs, Volume= 6.106 af, Depth= 1.75"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 100-Year Rainfall=7.31"

	Area (ac)	CN	Description
*	41.910	49	Pervious
*	0.000	98	Impervious
	41.910	49	Weighted Average
	41.910	49	100.00% Pervious Area

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

Subcatchment SB 22: SB 22



Summary for Subcatchment SB 24: SB 24

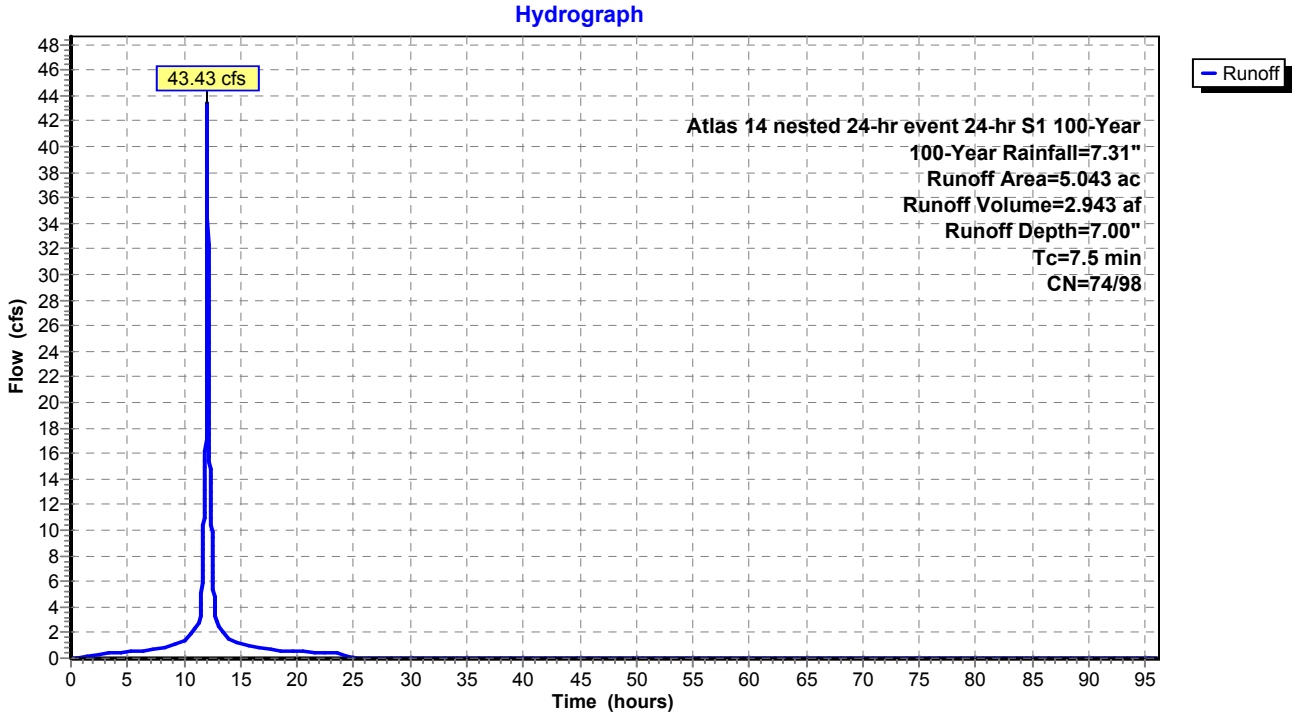
Runoff = 43.43 cfs @ 12.05 hrs, Volume= 2.943 af, Depth= 7.00"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 100-Year Rainfall=7.31"

	Area (ac)	CN	Description
*	0.123	74	permiable
*	4.920	98	impermiable
	5.043	97	Weighted Average
	0.123	74	2.44% Pervious Area
	4.920	98	97.56% Impervious Area

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

Subcatchment SB 24: SB 24



Summary for Subcatchment SB 25: SB 25

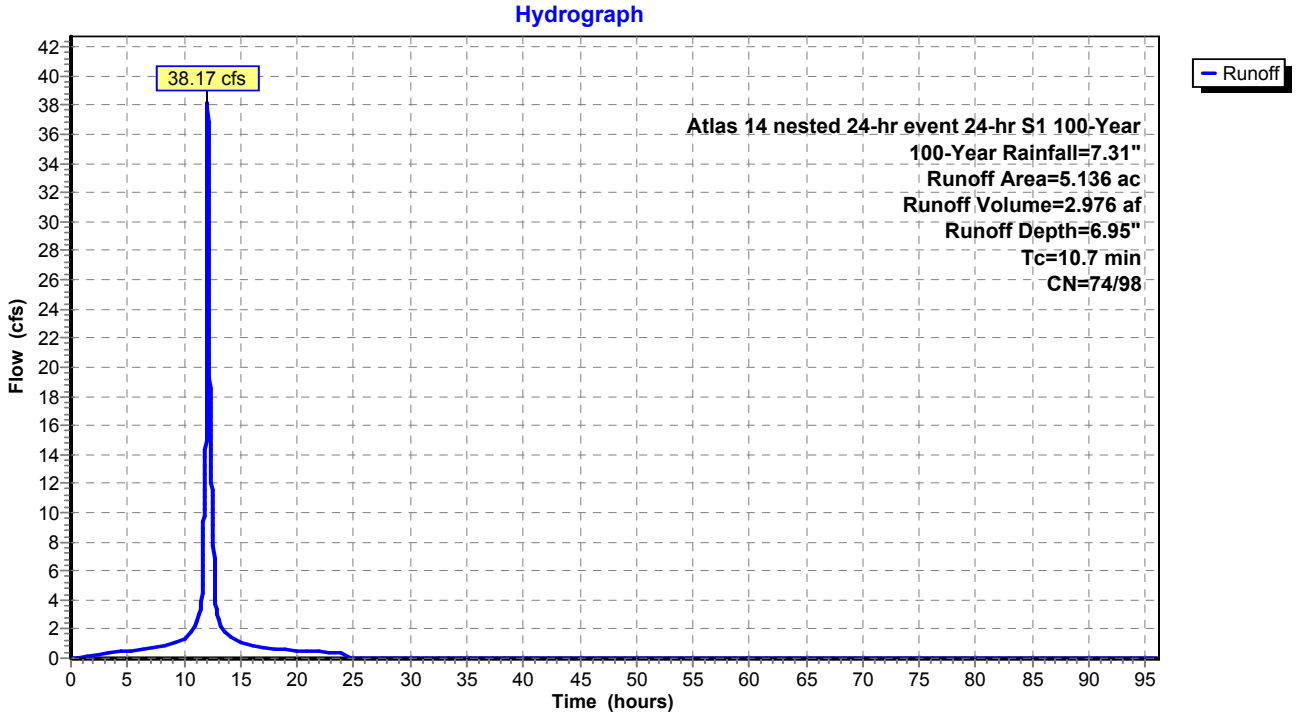
Runoff = 38.17 cfs @ 12.09 hrs, Volume= 2.976 af, Depth= 6.95"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 100-Year Rainfall=7.31"

	Area (ac)	CN	Description
*	0.220	74	pervious
*	4.916	98	impervious
	5.136	97	Weighted Average
	0.220	74	4.28% Pervious Area
	4.916	98	95.72% Impervious Area

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

Subcatchment SB 25: SB 25



Summary for Subcatchment SB 26: SB 26

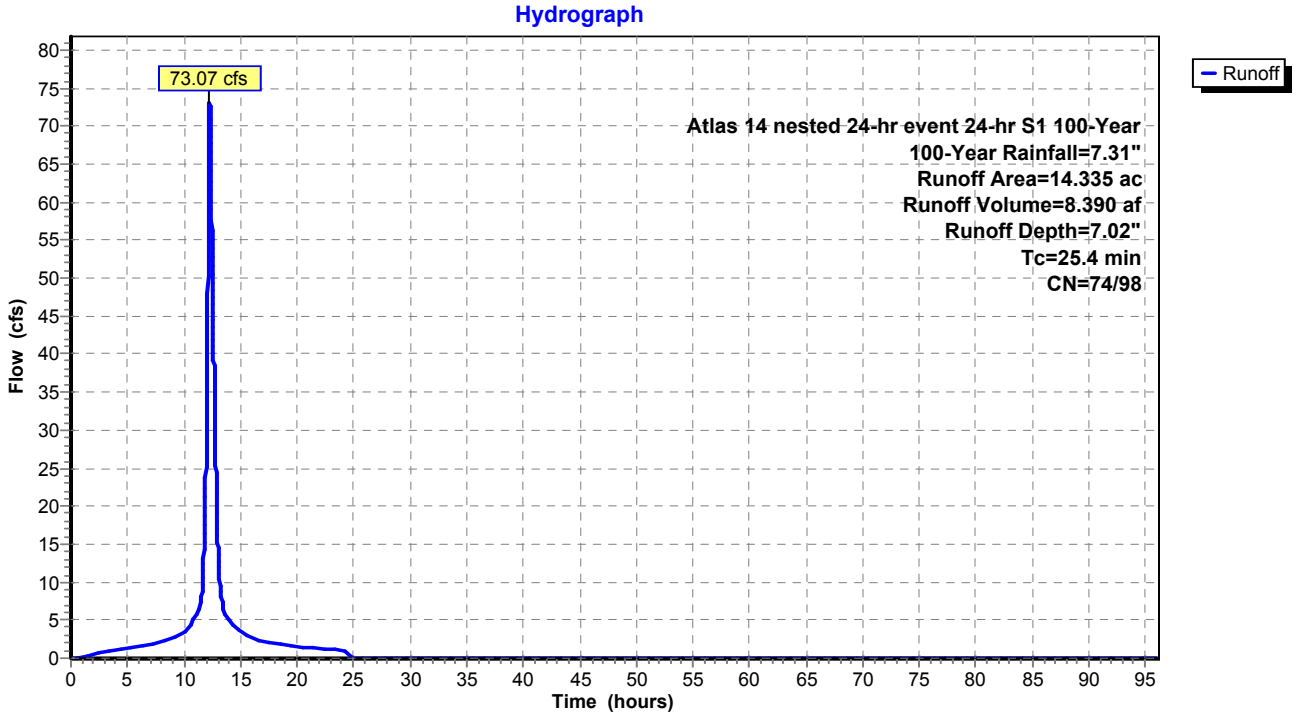
Runoff = 73.07 cfs @ 12.28 hrs, Volume= 8.390 af, Depth= 7.02"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 100-Year Rainfall=7.31"

	Area (ac)	CN	Description
*	0.248	74	pervious
*	14.087	98	impervious
	14.335	98	Weighted Average
	0.248	74	1.73% Pervious Area
	14.087	98	98.27% Impervious Area

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

Subcatchment SB 26: SB 26



Summary for Subcatchment SB 27: SB 27 (Thumb Road)

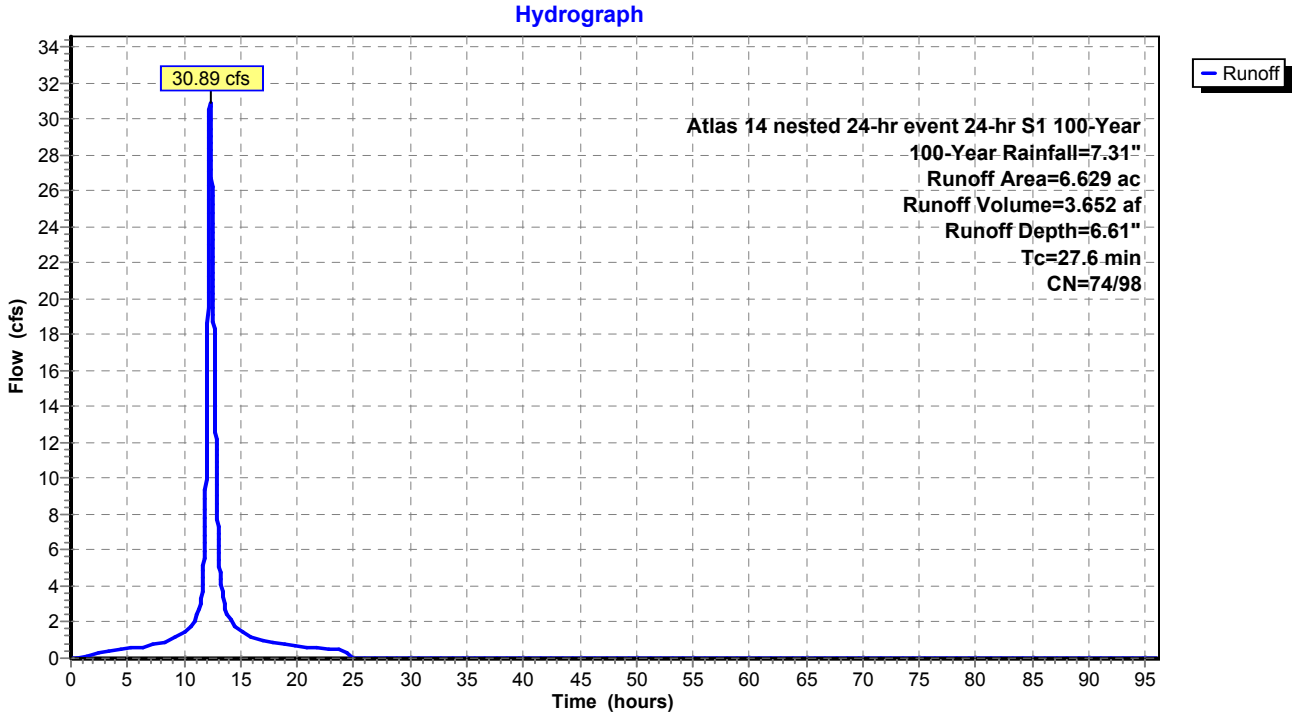
Runoff = 30.89 cfs @ 12.32 hrs, Volume= 3.652 af, Depth= 6.61"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 100-Year Rainfall=7.31"

	Area (ac)	CN	Description
*	1.105	74	Pervious
*	5.524	98	Impervious
	6.629	94	Weighted Average
	1.105	74	16.67% Pervious Area
	5.524	98	83.33% Impervious Area

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

Subcatchment SB 27: SB 27 (Thumb Road)



Summary for Subcatchment SB 28: SB 28

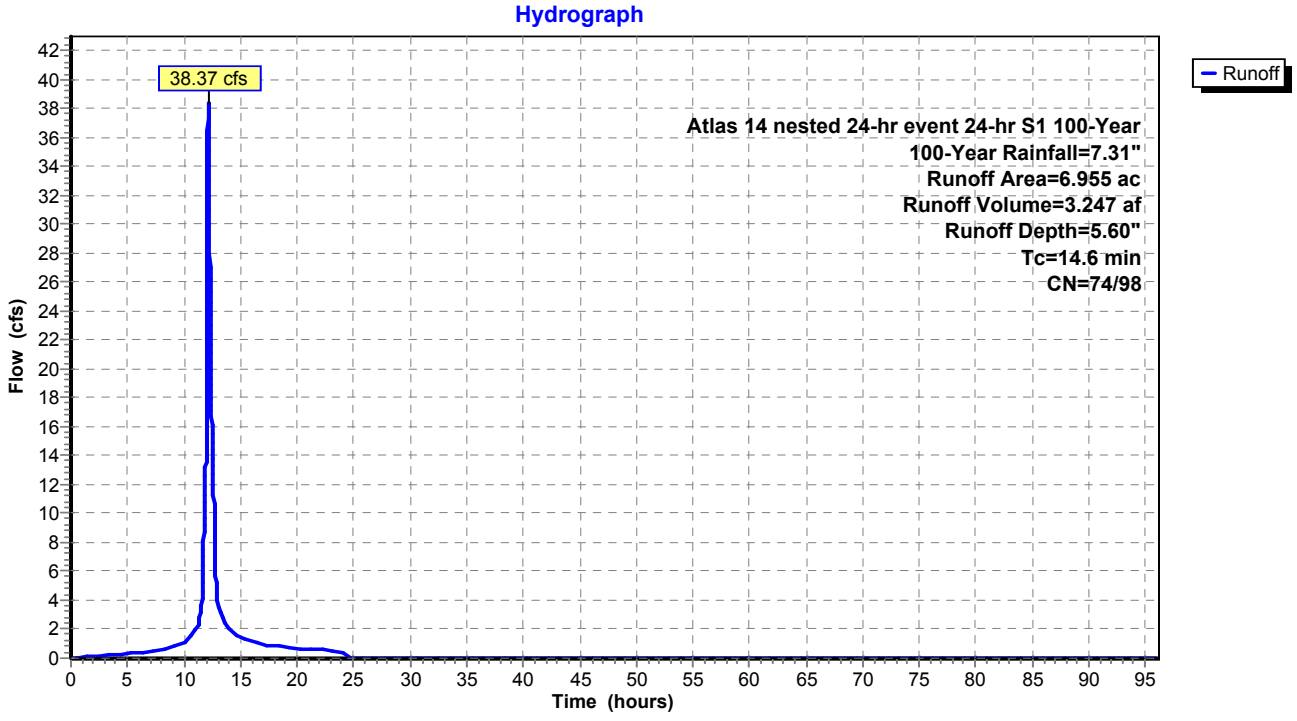
Runoff = 38.37 cfs @ 12.15 hrs, Volume= 3.247 af, Depth= 5.60"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 100-Year Rainfall=7.31"

	Area (ac)	CN	Description
*	3.703	74	pervious
*	3.252	98	impervious
	6.955	85	Weighted Average
	3.703	74	53.24% Pervious Area
	3.252	98	46.76% Impervious Area

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

Subcatchment SB 28: SB 28



Summary for Subcatchment SB 29: SB 29

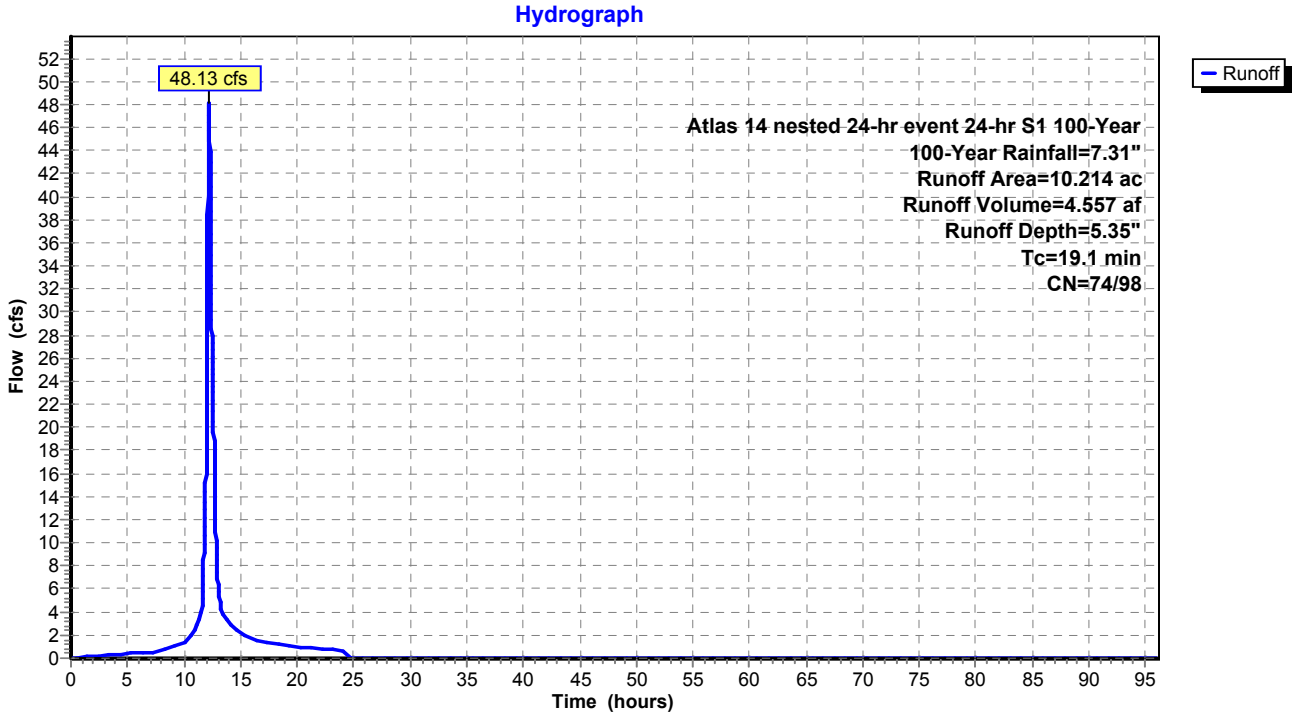
Runoff = 48.13 cfs @ 12.21 hrs, Volume= 4.557 af, Depth= 5.35"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 100-Year Rainfall=7.31"

	Area (ac)	CN	Description
*	6.360	74	pervious
*	3.854	98	impervious
	10.214	83	Weighted Average
	6.360	74	62.27% Pervious Area
	3.854	98	37.73% Impervious Area

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

Subcatchment SB 29: SB 29



Summary for Subcatchment SB 3: SB 3

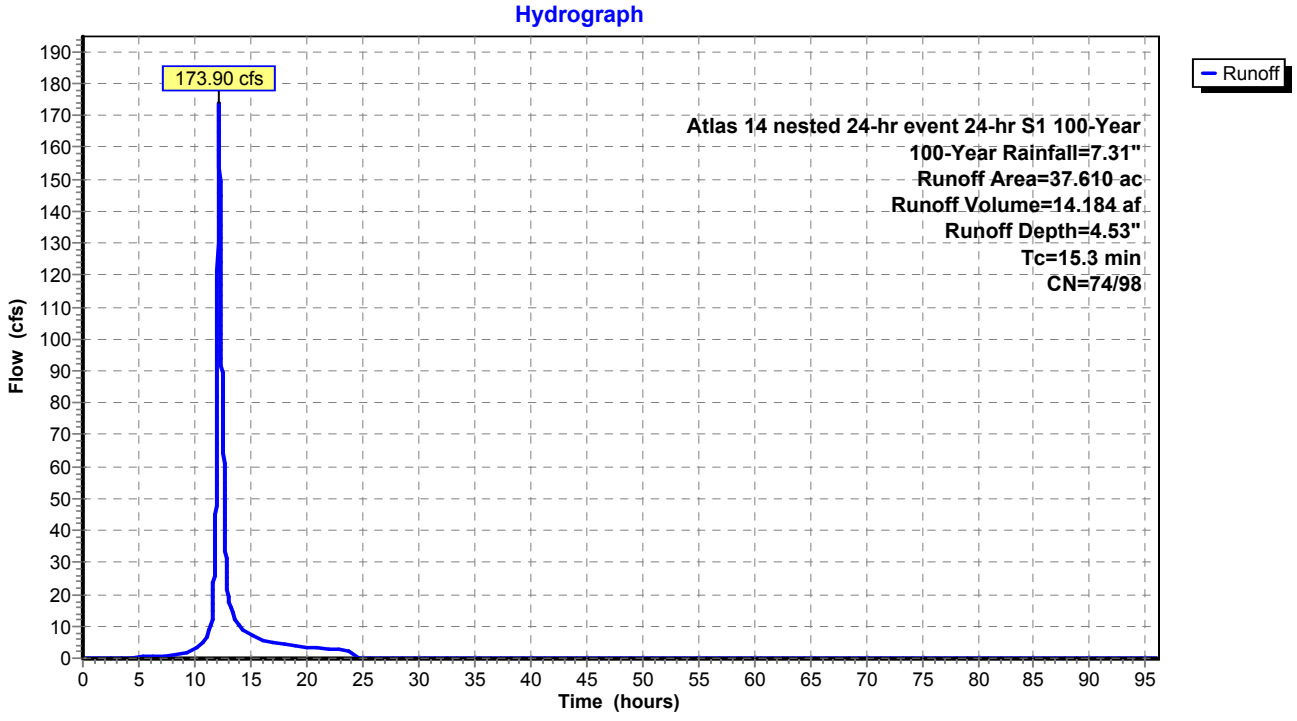
Runoff = 173.90 cfs @ 12.16 hrs, Volume= 14.184 af, Depth= 4.53"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 100-Year Rainfall=7.31"

	Area (ac)	CN	Description
*	34.720	74	Pervious
*	2.890	98	Impervious
	37.610	76	Weighted Average
	34.720	74	92.32% Pervious Area
	2.890	98	7.68% Impervious Area

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

Subcatchment SB 3: SB 3



Summary for Subcatchment SB 4: SB 4

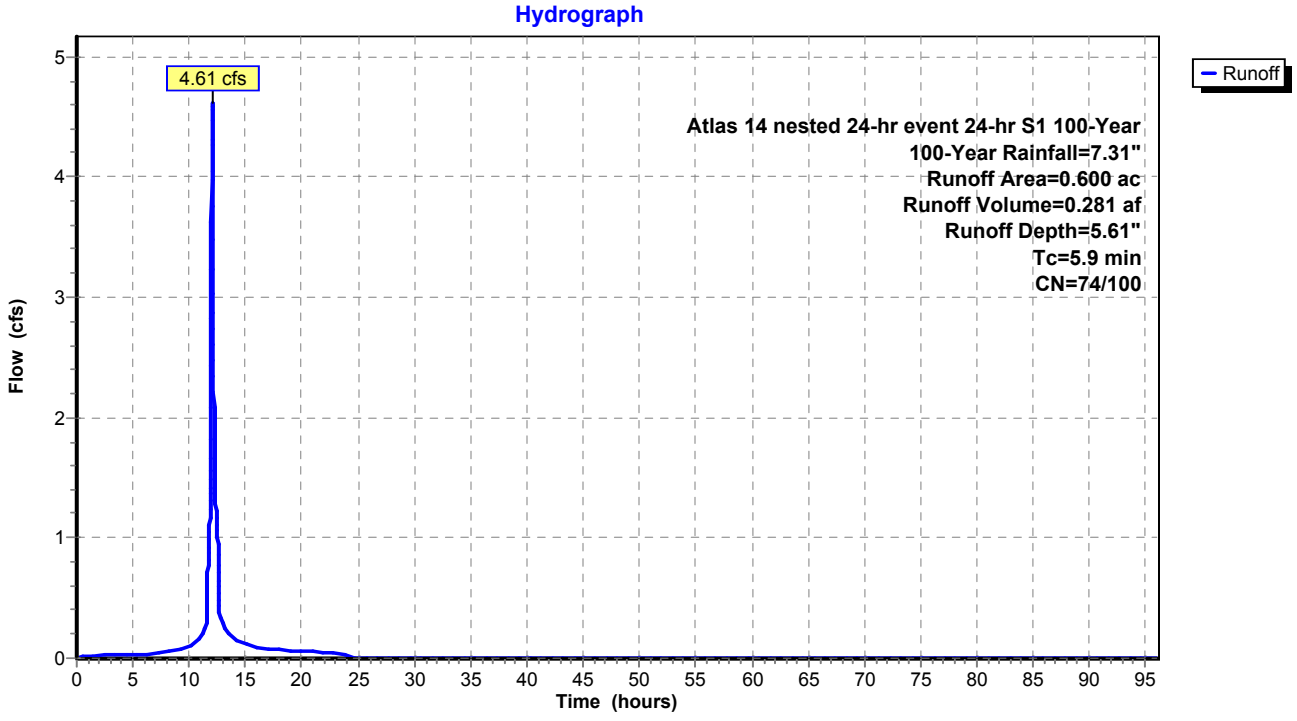
Runoff = 4.61 cfs @ 12.04 hrs, Volume= 0.281 af, Depth= 5.61"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 100-Year Rainfall=7.31"

	Area (ac)	CN	Description
*	0.340	74	pervious
*	0.260	100	impervious
	0.600	85	Weighted Average
	0.340	74	56.67% Pervious Area
	0.260	100	43.33% Impervious Area

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

Subcatchment SB 4: SB 4



Summary for Subcatchment SB 5: SB 5

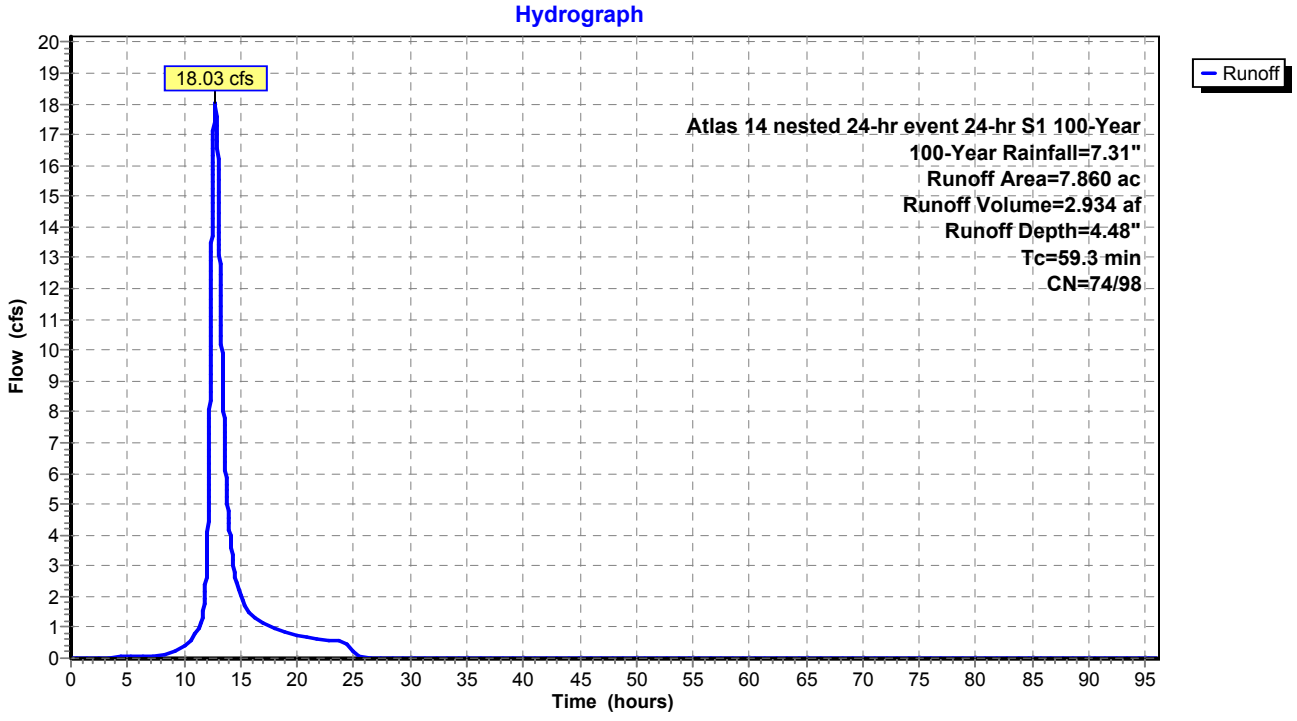
Runoff = 18.03 cfs @ 12.78 hrs, Volume= 2.934 af, Depth= 4.48"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 100-Year Rainfall=7.31"

	Area (ac)	CN	Description
*	7.390	74	pervious
*	0.470	98	impervious
	7.860	75	Weighted Average
	7.390	74	94.02% Pervious Area
	0.470	98	5.98% Impervious Area

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

Subcatchment SB 5: SB 5



Summary for Subcatchment SB 6: SB 6

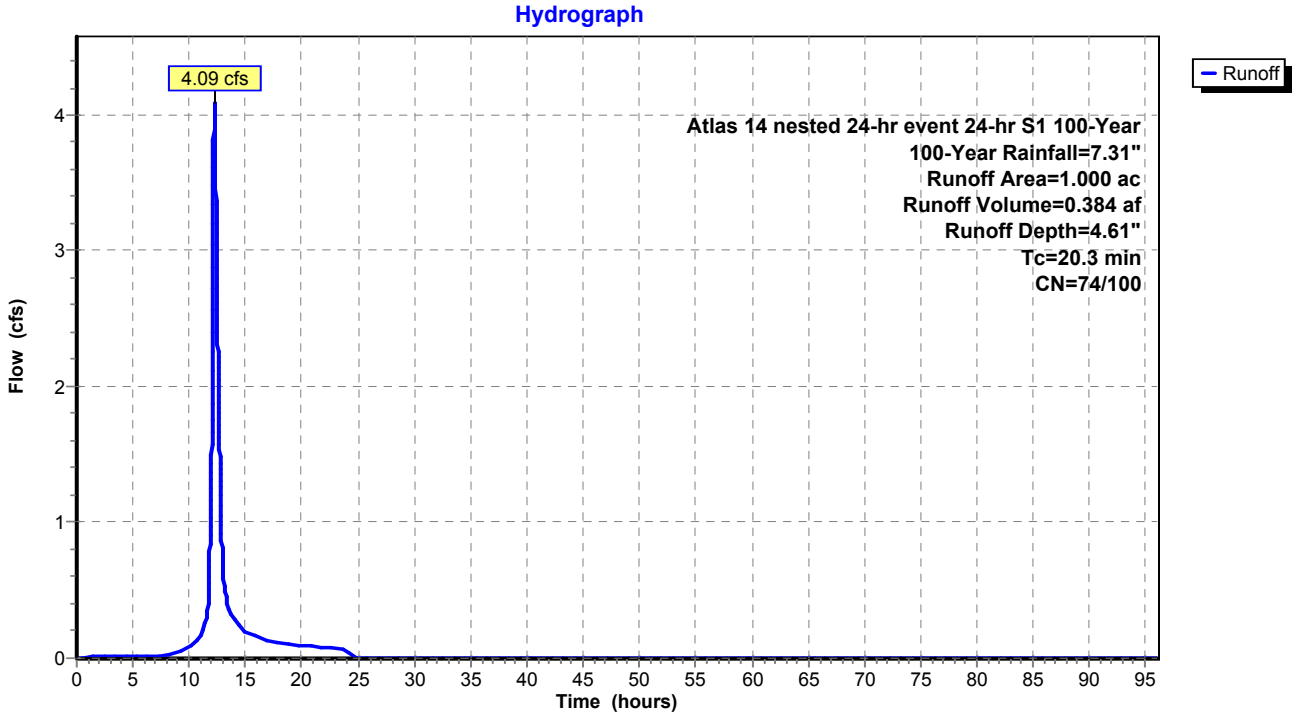
Runoff = 4.09 cfs @ 12.24 hrs, Volume= 0.384 af, Depth= 4.61"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 100-Year Rainfall=7.31"

	Area (ac)	CN	Description
*	0.900	74	pervious
*	0.100	100	impervious
	1.000	77	Weighted Average
	0.900	74	90.00% Pervious Area
	0.100	100	10.00% Impervious Area

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

Subcatchment SB 6: SB 6



Summary for Subcatchment SB 7: SB 7

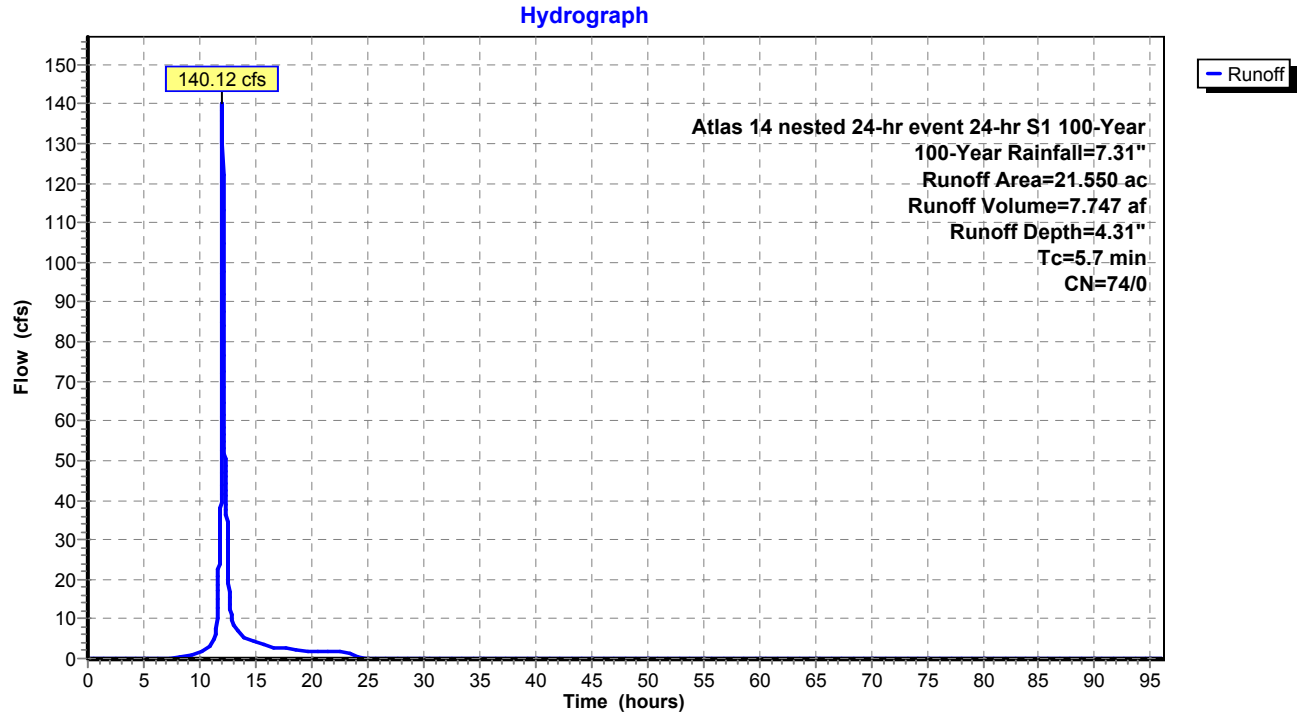
Runoff = 140.12 cfs @ 12.04 hrs, Volume= 7.747 af, Depth= 4.31"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 100-Year Rainfall=7.31"

	Area (ac)	CN	Description
*	21.550	74	pervious
*	0.000	98	impervious
	21.550	74	Weighted Average
	21.550	74	100.00% Pervious Area

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

Subcatchment SB 7: SB 7



Summary for Subcatchment SB 8: SB 8

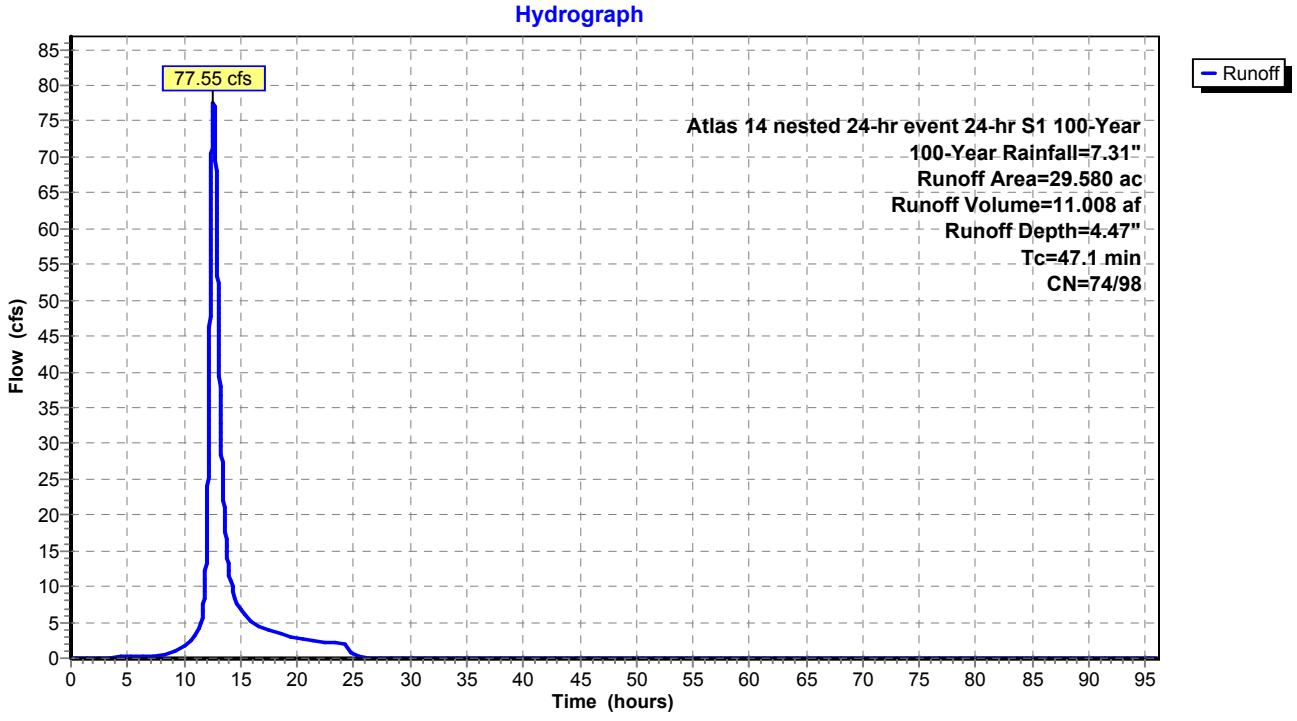
Runoff = 77.55 cfs @ 12.61 hrs, Volume= 11.008 af, Depth= 4.47"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 100-Year Rainfall=7.31"

	Area (ac)	CN	Description
*	27.950	74	pervious
*	1.630	98	impervious
	29.580	75	Weighted Average
	27.950	74	94.49% Pervious Area
	1.630	98	5.51% Impervious Area

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

Subcatchment SB 8: SB 8



Summary for Subcatchment SB 9: SB 9

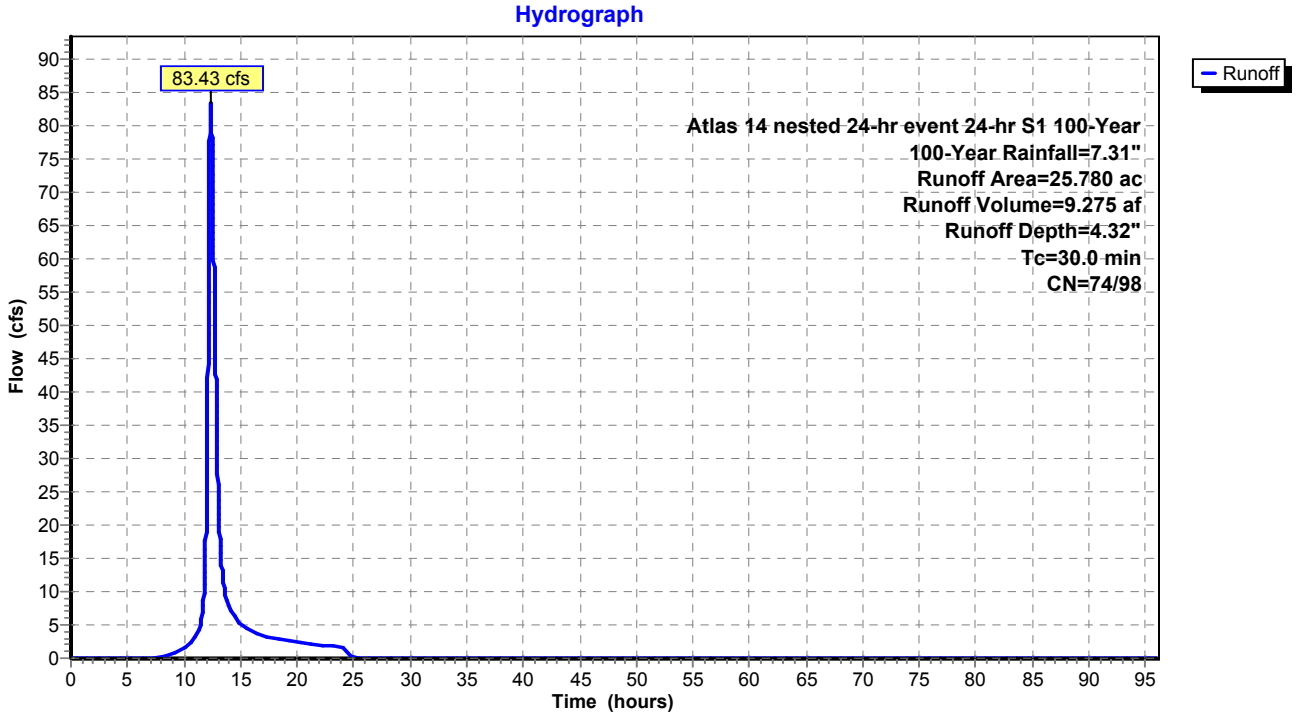
Runoff = 83.43 cfs @ 12.37 hrs, Volume= 9.275 af, Depth= 4.32"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 100-Year Rainfall=7.31"

	Area (ac)	CN	Description
*	25.750	74	permiable
*	0.030	98	impermiable
	25.780	74	Weighted Average
	25.750	74	99.88% Pervious Area
	0.030	98	0.12% Impervious Area

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

Subcatchment SB 9: SB 9



Summary for Subcatchment SB10: SB 10

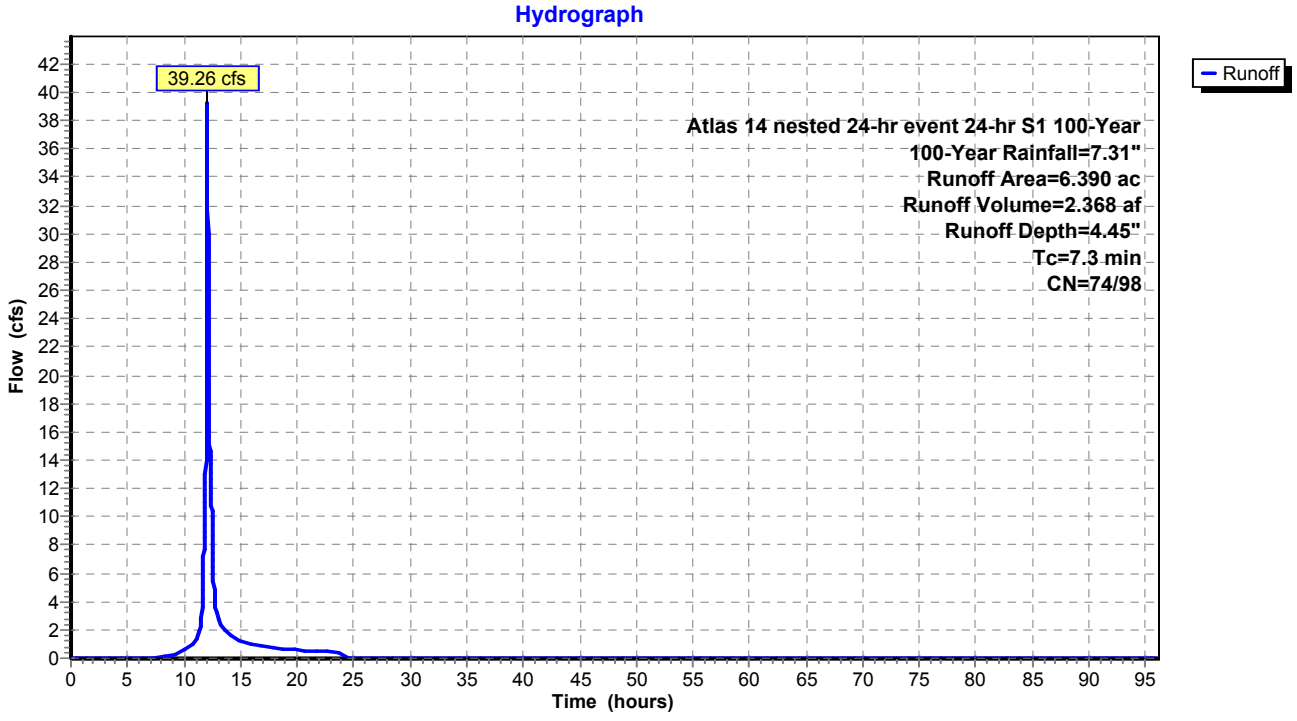
Runoff = 39.26 cfs @ 12.05 hrs, Volume= 2.368 af, Depth= 4.45"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 100-Year Rainfall=7.31"

	Area (ac)	CN	Description
*	6.080	74	pervious
*	0.310	98	impervious
	6.390	75	Weighted Average
	6.080	74	95.15% Pervious Area
	0.310	98	4.85% Impervious Area

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

Subcatchment SB10: SB 10



Summary for Reach 30R: 60" RCP to existing 60" storm sewer

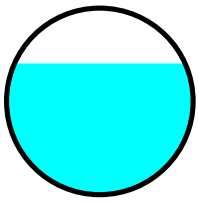
[52] Hint: Inlet/Outlet conditions not evaluated
[65] Warning: Inlet elevation not specified
[55] Hint: Peak inflow is 113% of Manning's capacity

Inflow Area = 133.156 ac, 9.78% Impervious, Inflow Depth = 4.43" for 100-Year event
Inflow = 271.82 cfs @ 12.52 hrs, Volume= 49.136 af
Outflow = 271.78 cfs @ 12.52 hrs, Volume= 49.136 af, Atten= 0%, Lag= 0.3 min

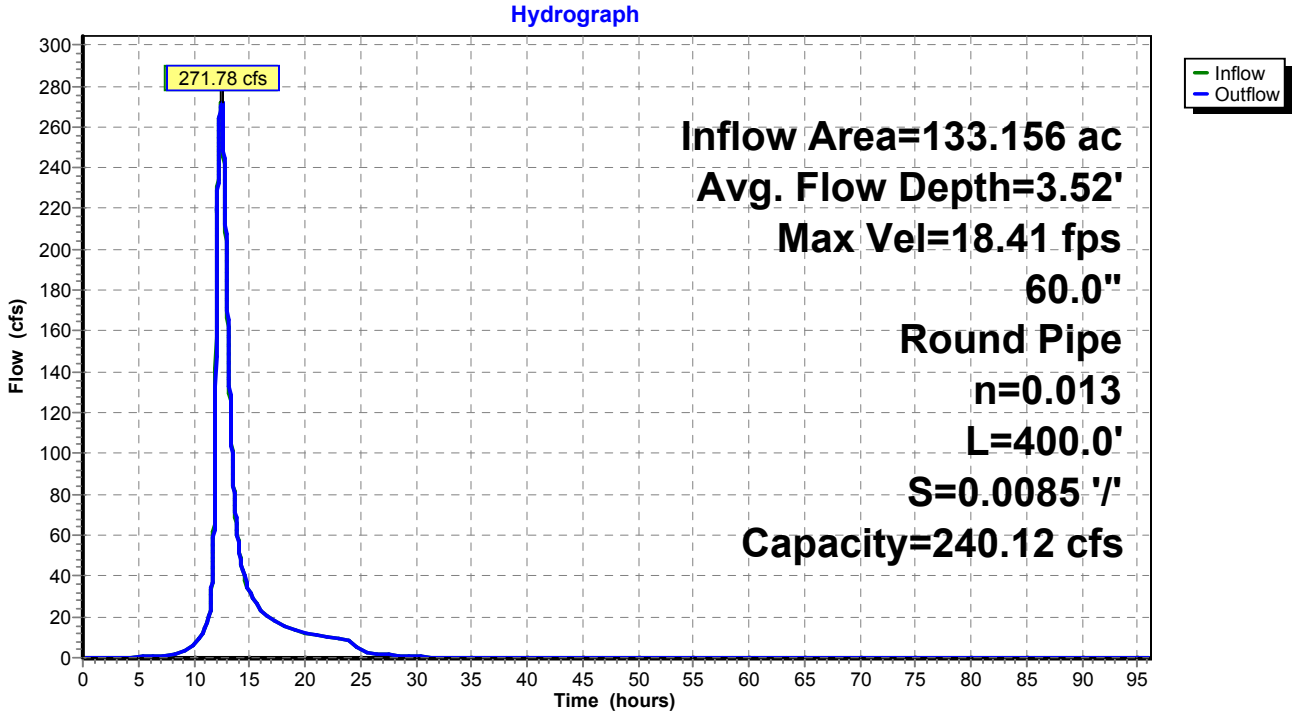
Routing by Muskingum-Cunge method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Reference Flow= 203.87 cfs Estimated Depth= 3.54' Velocity= 13.72 fps
m= 1.339, c= 18.38 fps, dt= 0.6 min, dx= 400.0' / 1 = 400.0', K= 0.4 min, X= 0.112
Max. Velocity= 18.41 fps, Min. Travel Time= 0.4 min
Avg. Velocity = 18.38 fps, Avg. Travel Time= 0.4 min

Peak Storage= 5,914 cf @ 12.52 hrs
Average Depth at Peak Storage= 3.52'
Bank-Full Depth= 5.00' Flow Area= 19.6 sf, Capacity= 240.12 cfs

60.0" Round Pipe
n= 0.013
Length= 400.0' Slope= 0.0085 '/'
Inlet Invert= 0.00', Outlet Invert= -3.40'



Reach 30R: 60" RCP to existing 60" storm sewer



Summary for Reach 34R: 60" RCP connecting P-1/P-2 with P-3

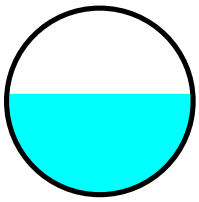
[52] Hint: Inlet/Outlet conditions not evaluated
[65] Warning: Inlet elevation not specified

Inflow Area = 68.260 ac, 7.26% Impervious, Inflow Depth = 4.51" for 100-Year event
Inflow = 146.01 cfs @ 12.63 hrs, Volume= 25.678 af
Outflow = 145.87 cfs @ 12.68 hrs, Volume= 25.678 af, Atten= 0%, Lag= 2.7 min

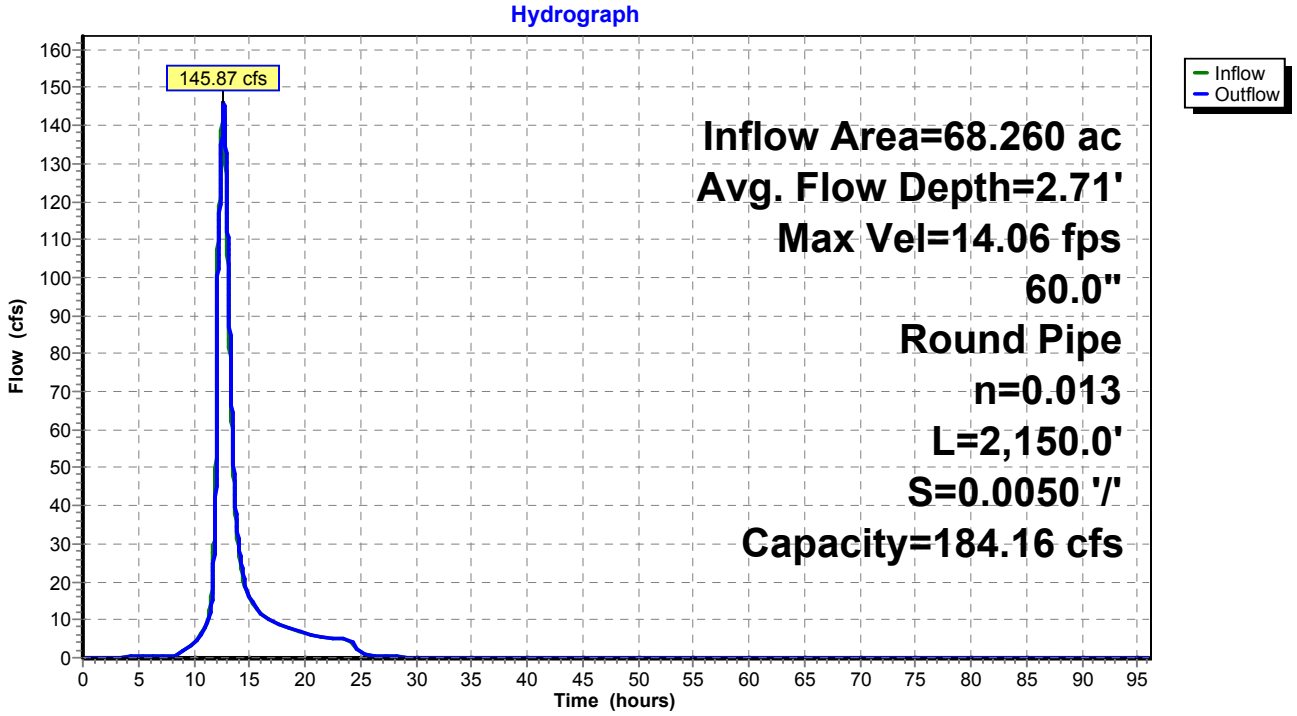
Routing by Muskingum-Cunge method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Reference Flow= 109.51 cfs Estimated Depth= 2.78' Velocity= 9.78 fps
m= 1.375, c= 13.45 fps, dt= 0.6 min, dx= 2,150.0' / 4 = 537.5', K= 0.7 min, X= 0.124
Max. Velocity= 14.06 fps, Min. Travel Time= 2.5 min
Avg. Velocity = 13.45 fps, Avg. Travel Time= 2.7 min

Peak Storage= 23,318 cf @ 12.66 hrs
Average Depth at Peak Storage= 2.71'
Bank-Full Depth= 5.00' Flow Area= 19.6 sf, Capacity= 184.16 cfs

60.0" Round Pipe
n= 0.013
Length= 2,150.0' Slope= 0.0050 '/'
Inlet Invert= 0.00', Outlet Invert= -10.75'



Reach 34R: 60" RCP connecting P-1/P-2 with P-3



Summary for Reach 37R: 48" RCP

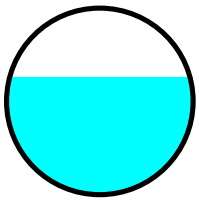
[52] Hint: Inlet/Outlet conditions not evaluated
[65] Warning: Inlet elevation not specified
[97] Warning: Factor X out of range

Inflow Area = 43.346 ac, 18.61% Impervious, Inflow Depth = 4.35" for 100-Year event
Inflow = 109.89 cfs @ 12.39 hrs, Volume= 15.711 af
Outflow = 109.87 cfs @ 12.40 hrs, Volume= 15.711 af, Atten= 0%, Lag= 0.3 min

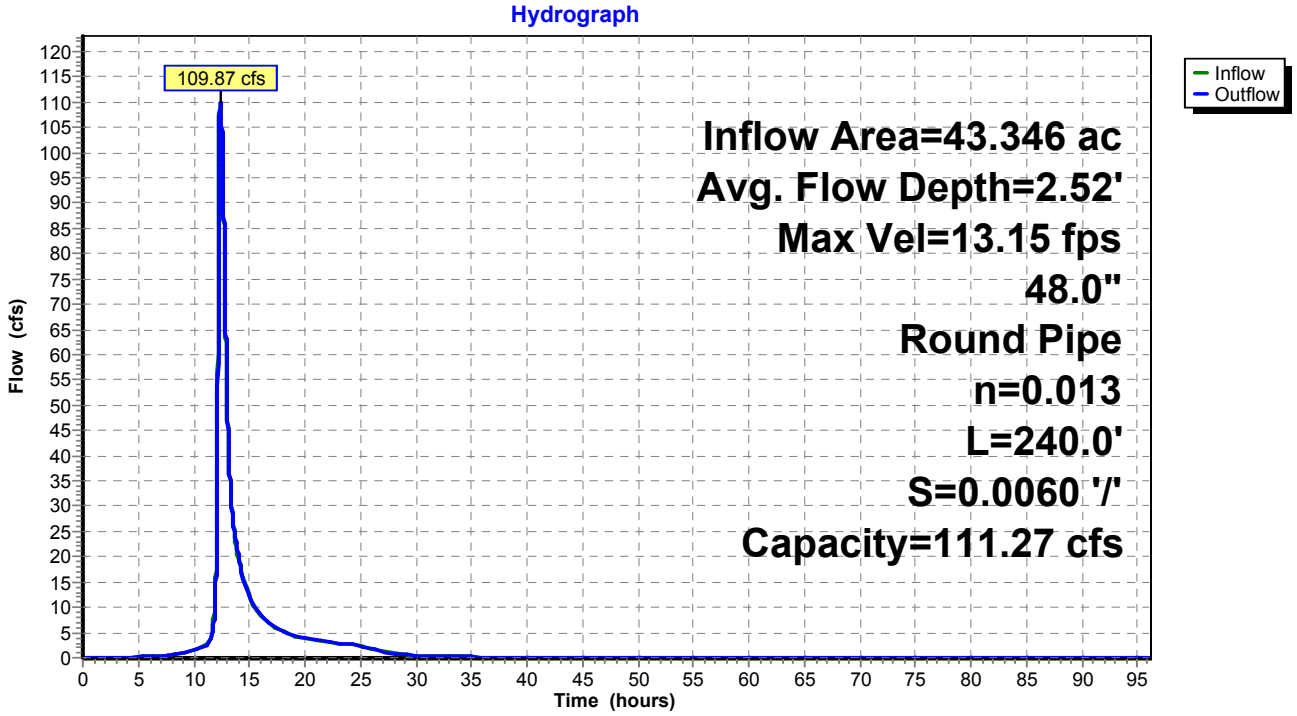
Routing by Muskingum-Cunge method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Reference Flow= 82.41 cfs Estimated Depth= 2.56' Velocity= 9.69 fps
m= 1.356, c= 13.15 fps, dt= 0.6 min, dx= 240.0' / 1 = 240.0', K= 0.3 min, X= 0.000
Max. Velocity= 13.15 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 13.15 fps, Avg. Travel Time= 0.3 min

Peak Storage= 2,006 cf @ 12.40 hrs
Average Depth at Peak Storage= 2.52'
Bank-Full Depth= 4.00' Flow Area= 12.6 sf, Capacity= 111.27 cfs

48.0" Round Pipe
n= 0.013
Length= 240.0' Slope= 0.0060 '/'
Inlet Invert= 0.00', Outlet Invert= -1.44'



Reach 37R: 48" RCP



Summary for Reach 39R: 24" RCP

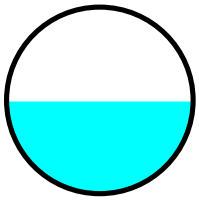
[52] Hint: Inlet/Outlet conditions not evaluated
[65] Warning: Inlet elevation not specified
[97] Warning: Factor X out of range

Inflow Area = 8.860 ac, 6.43% Impervious, Inflow Depth = 4.49" for 100-Year event
Inflow = 11.03 cfs @ 13.26 hrs, Volume= 3.318 af
Outflow = 11.03 cfs @ 13.27 hrs, Volume= 3.318 af, Atten= 0%, Lag= 0.2 min

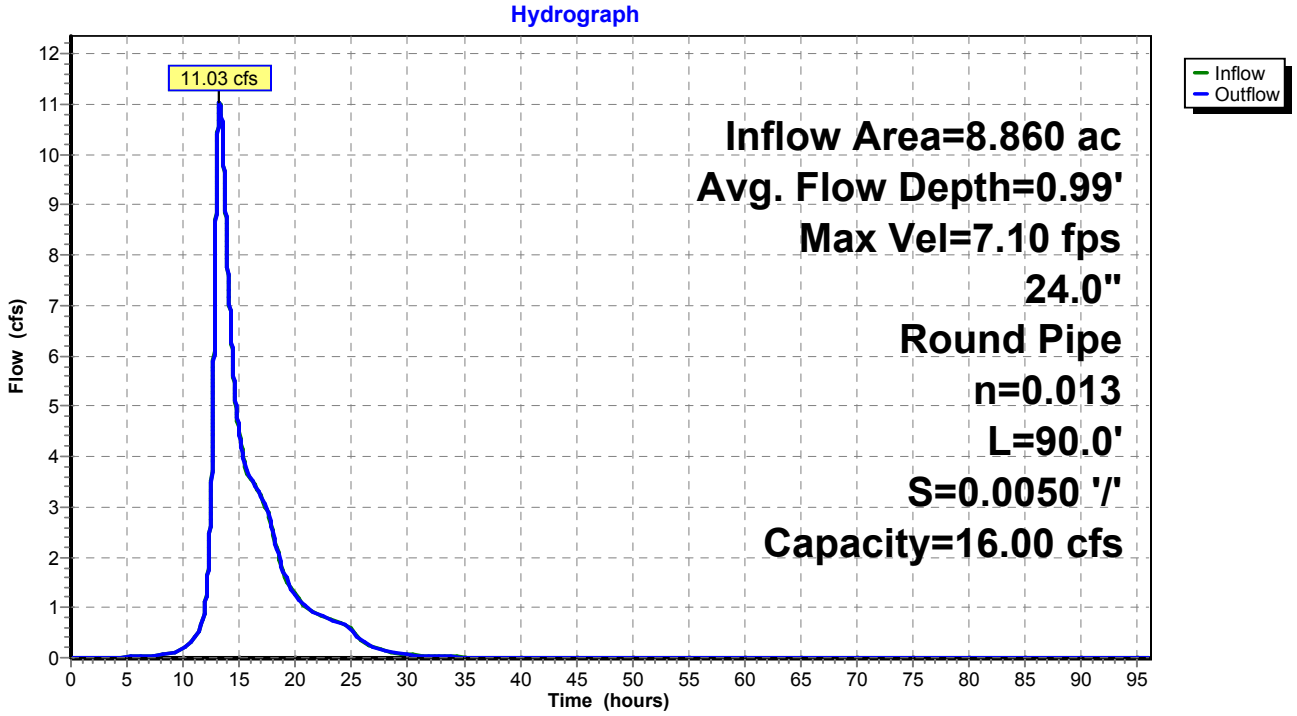
Routing by Muskingum-Cunge method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Reference Flow= 8.27 cfs Estimated Depth= 1.02' Velocity= 5.13 fps
m= 1.383, c= 7.10 fps, dt= 0.6 min, dx= 90.0' / 1 = 90.0', K= 0.2 min, X= 0.000
Max. Velocity= 7.10 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 7.10 fps, Avg. Travel Time= 0.2 min

Peak Storage= 140 cf @ 13.27 hrs
Average Depth at Peak Storage= 0.99'
Bank-Full Depth= 2.00' Flow Area= 3.1 sf, Capacity= 16.00 cfs

24.0" Round Pipe
n= 0.013
Length= 90.0' Slope= 0.0050 '/'
Inlet Invert= 0.00', Outlet Invert= -0.45'



Reach 39R: 24" RCP



Summary for Reach 43R: 30" RCP connecting P-10 with P-12

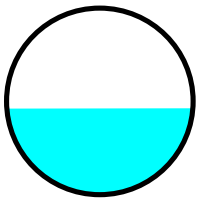
[52] Hint: Inlet/Outlet conditions not evaluated
[79] Warning: Submerged Pond 10P Primary device # 1 by 1.16'

Inflow Area = 66.430 ac, 5.22% Impervious, Inflow Depth > 2.05" for 100-Year event
Inflow = 15.37 cfs @ 12.70 hrs, Volume= 11.336 af
Outflow = 15.36 cfs @ 12.74 hrs, Volume= 11.336 af, Atten= 0%, Lag= 1.9 min

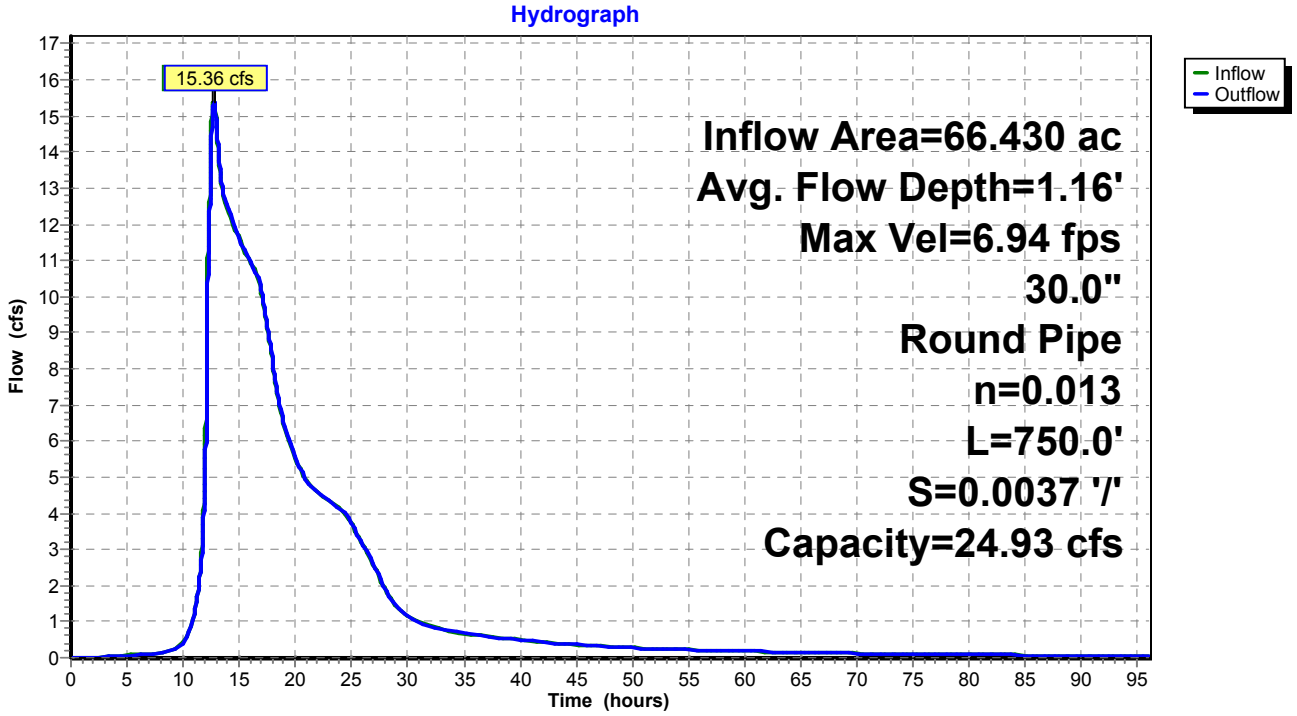
Routing by Muskingum-Cunge method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Reference Flow= 11.53 cfs Estimated Depth= 1.19' Velocity= 4.98 fps
m= 1.389, c= 6.91 fps, dt= 0.6 min, dx= 750.0' / 3 = 250.0', K= 0.6 min, X= 0.034
Max. Velocity= 6.94 fps, Min. Travel Time= 1.8 min
Avg. Velocity = 6.91 fps, Avg. Travel Time= 1.8 min

Peak Storage= 1,667 cf @ 12.73 hrs
Average Depth at Peak Storage= 1.16'
Bank-Full Depth= 2.50' Flow Area= 4.9 sf, Capacity= 24.93 cfs

30.0" Round Pipe
n= 0.013
Length= 750.0' Slope= 0.0037 '/'
Inlet Invert= 896.00', Outlet Invert= 893.23'



Reach 43R: 30" RCP connecting P-10 with P-12



Summary for Reach 51R: 40' x 4.5 ft parabolic hannel from P-13 to Rice Creek

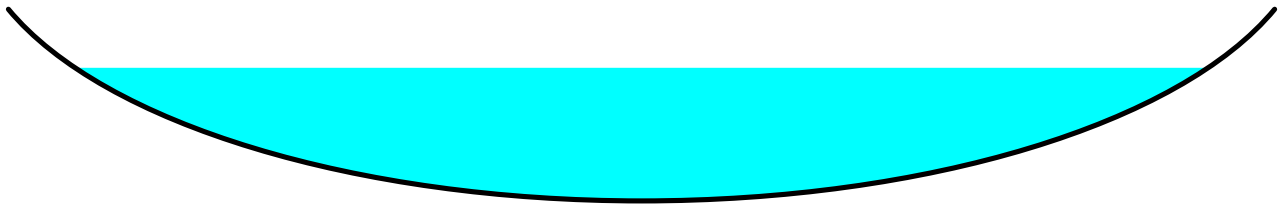
[65] Warning: Inlet elevation not specified
[97] Warning: Factor X out of range

Inflow Area = 245.383 ac, 10.42% Impervious, Inflow Depth > 4.67" for 100-Year event
Inflow = 497.28 cfs @ 12.47 hrs, Volume= 95.418 af
Outflow = 497.06 cfs @ 12.48 hrs, Volume= 95.417 af, Atten= 0%, Lag= 0.7 min

Routing by Muskingum-Cunge method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Reference Flow= 372.96 cfs Estimated Depth= 3.29' Velocity= 4.98 fps
m= 1.437, c= 7.16 fps, dt= 0.6 min, dx= 300.0' / 1 = 300.0', K= 0.7 min, X= 0.000
Max. Velocity= 7.16 fps, Min. Travel Time= 0.7 min
Avg. Velocity = 7.16 fps, Avg. Travel Time= 0.7 min

Peak Storage= 20,819 cf @ 12.48 hrs
Average Depth at Peak Storage= 3.12'
Bank-Full Depth= 4.50' Flow Area= 120.0 sf, Capacity= 733.43 cfs

40.00' x 4.50' deep Parabolic Channel, n= 0.035
Length= 300.0' Slope= 0.0050 '/'
Inlet Invert= 0.00', Outlet Invert= -1.50'



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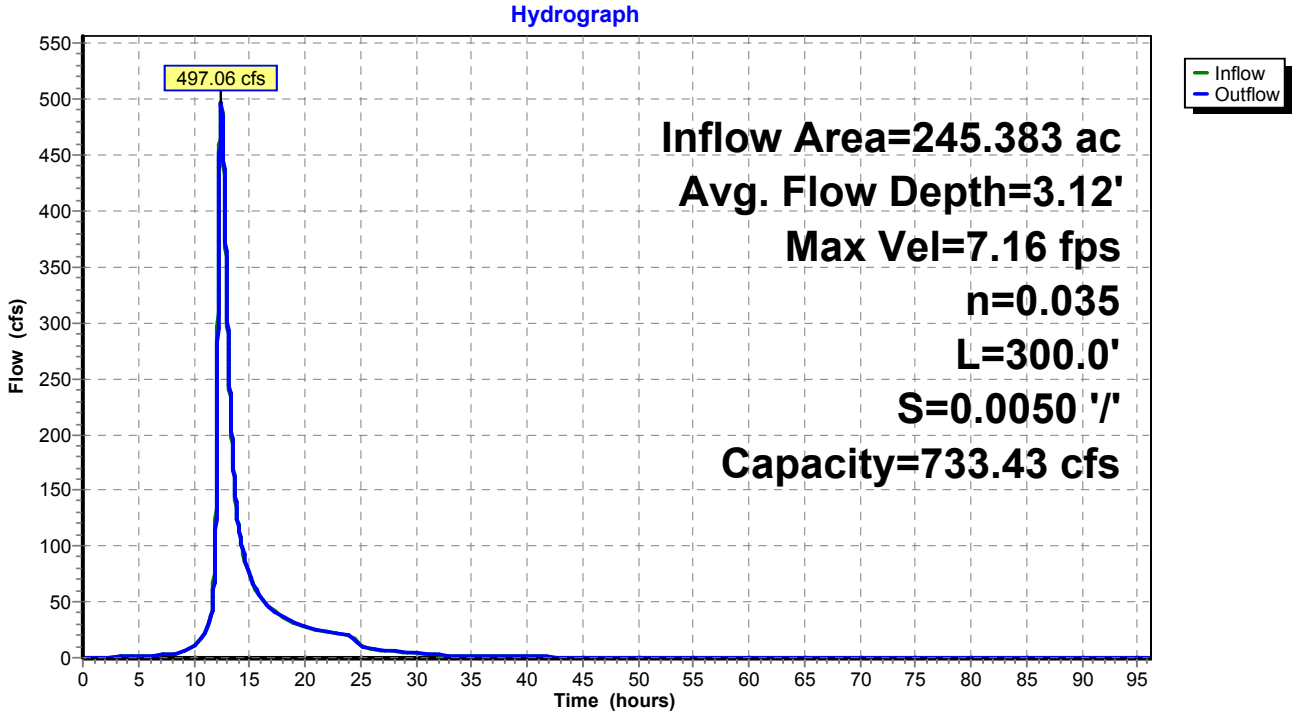
Reach 51R: 40' x 4.5 ft parabolic hannel from P-13 to Rice Creek



Summary for Pond 2 P: P-2

[95] Warning: Outlet Device #1 rise exceeded

Inflow Area = 68.260 ac, 7.26% Impervious, Inflow Depth = 4.51" for 100-Year event
Inflow = 146.98 cfs @ 12.57 hrs, Volume= 25.678 af
Outflow = 146.01 cfs @ 12.63 hrs, Volume= 25.678 af, Atten= 1%, Lag= 3.5 min
Primary = 146.01 cfs @ 12.63 hrs, Volume= 25.678 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Starting Elev= 924.00' Surf.Area= 0.370 ac Storage= 0.730 af
Peak Elev= 925.49' @ 12.63 hrs Surf.Area= 0.467 ac Storage= 1.355 af (0.625 af above start)

Plug-Flow detention time= 38.1 min calculated for 24.948 af (97% of inflow)
Center-of-Mass det. time= 11.6 min (855.1 - 843.5)

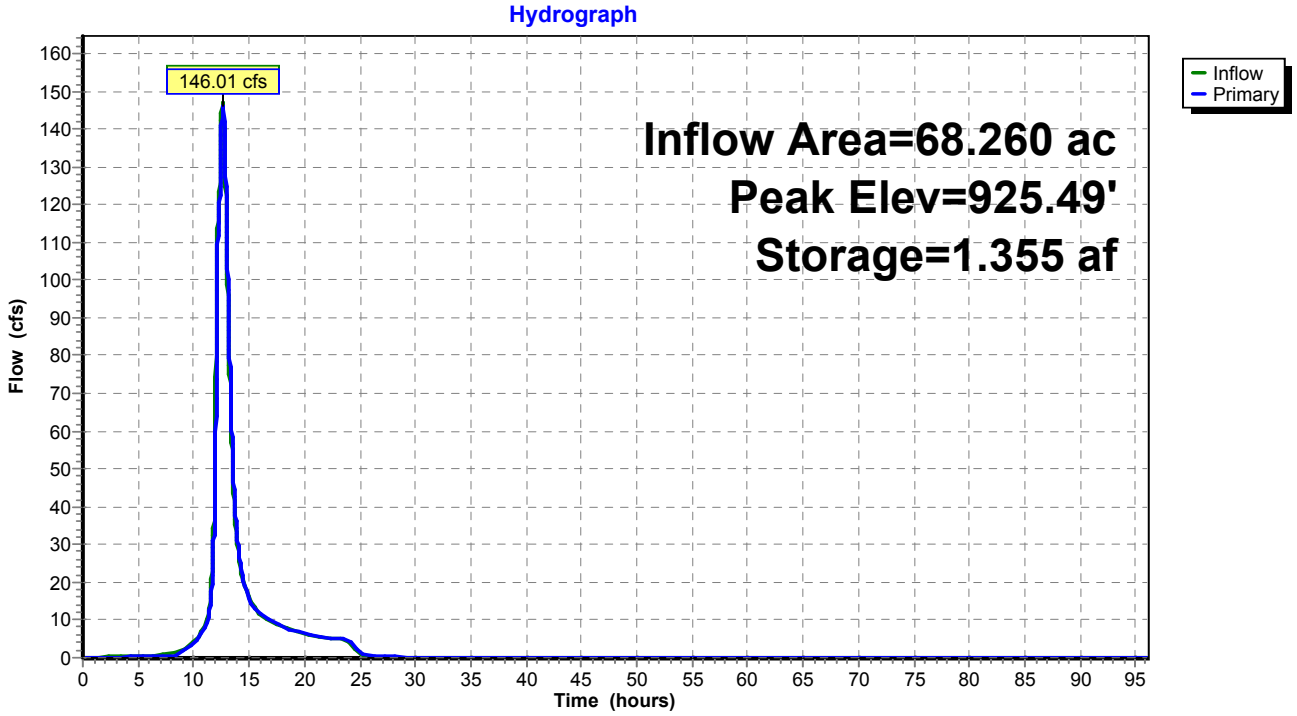
Volume	Invert	Avail.Storage	Storage Description
#1	920.00'	1.600 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
920.00	0.100	0.000	0.000
922.00	0.130	0.230	0.230
924.00	0.370	0.500	0.730
926.00	0.500	0.870	1.600

Device	Routing	Invert	Outlet Devices
#1	Primary	924.40'	**40.0' long x 1.00' rise Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#2	Primary	924.00'	**6.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=146.12 cfs @ 12.63 hrs HW=925.49' (Free Discharge)
└**1=Sharp-Crested Rectangular Weir** (Orifice Controls 144.96 cfs @ 3.64 fps)
└**2=Orifice/Grate** (Orifice Controls 1.16 cfs @ 5.88 fps)

Pond 2 P: P-2


Hydrograph
146.01 cfs
Inflow Area=68.260 ac
Peak Elev=925.49'
Storage=1.355 af
Inflow
Primary
Flow (cfs)
Time (hours)
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
160
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
75
80
85
90
95

Summary for Pond 4P: P-4

Inflow Area = 7.860 ac, 5.98% Impervious, Inflow Depth = 4.48" for 100-Year event
Inflow = 18.03 cfs @ 12.78 hrs, Volume= 2.934 af
Outflow = 11.64 cfs @ 13.25 hrs, Volume= 2.934 af, Atten= 35%, Lag= 28.5 min
Primary = 8.40 cfs @ 13.25 hrs, Volume= 1.470 af
Secondary = 3.24 cfs @ 13.25 hrs, Volume= 1.464 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Starting Elev= 915.00' Surf.Area= 0.275 ac Storage= 0.646 af
Peak Elev= 917.33' @ 13.25 hrs Surf.Area= 0.410 ac Storage= 1.439 af (0.793 af above start)

Plug-Flow detention time= 189.6 min calculated for 2.288 af (78% of inflow)
Center-of-Mass det. time= 54.5 min (915.3 - 860.7)

Volume	Invert	Avail.Storage	Storage Description
#1	910.90'	1.728 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

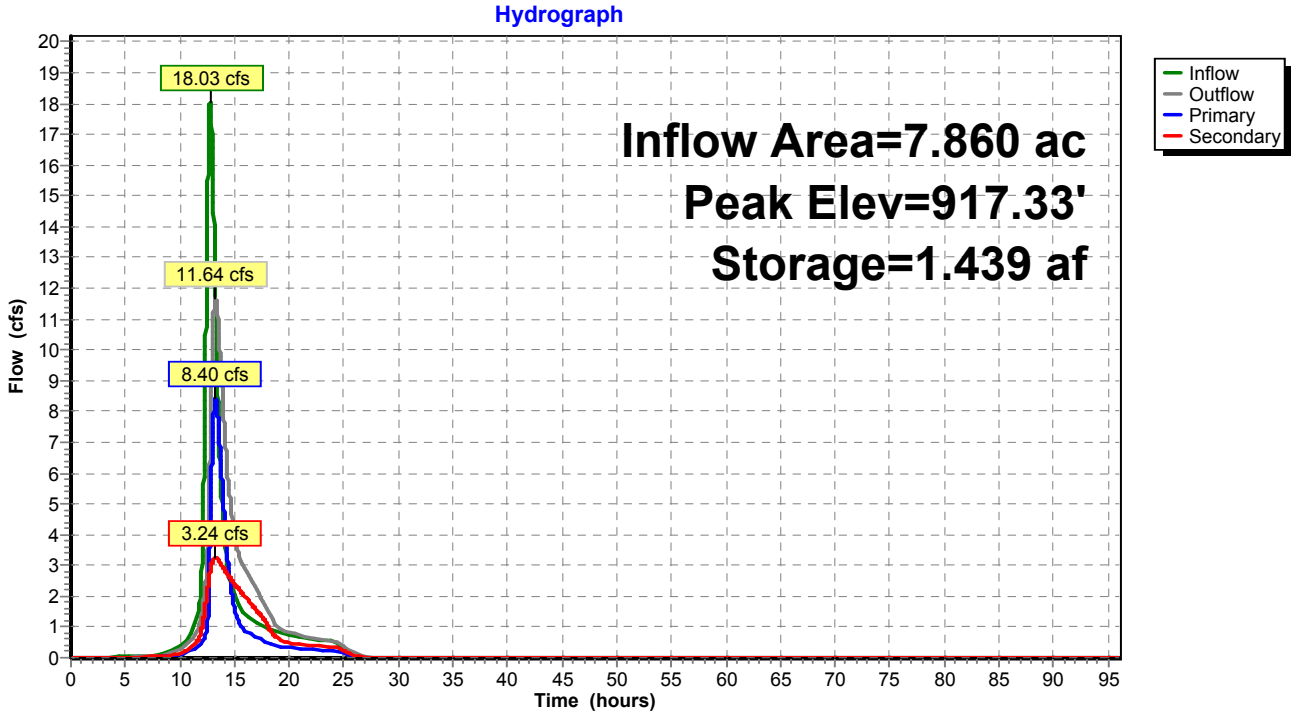
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
910.90	0.070	0.000	0.000
912.00	0.090	0.088	0.088
914.00	0.220	0.310	0.398
916.00	0.330	0.550	0.948
918.00	0.450	0.780	1.728

Device	Routing	Invert	Outlet Devices
#1	Primary	915.00'	**6.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Secondary	915.00'	**9.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Primary	915.95'	**24.0" Round RCP_Round 24"** L= 50.0' RCP, groove end w/headwall, Ke= 0.200 Inlet / Outlet Invert= 915.80' / 915.95' S= -0.0030 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf

Primary OutFlow Max=8.39 cfs @ 13.25 hrs HW=917.33' (Free Discharge)
└**1=Orifice/Grate** (Orifice Controls 1.44 cfs @ 7.34 fps)
└**3=RCP_Round 24"** (Barrel Controls 6.95 cfs @ 3.74 fps)

Secondary OutFlow Max=3.24 cfs @ 13.25 hrs HW=917.33' (Free Discharge)
└**2=Orifice/Grate** (Orifice Controls 3.24 cfs @ 7.34 fps)

Pond 4P: P-4


Hydrograph
Inflow Area=7.860 ac
Peak Elev=917.33'
Storage=1.439 af
18.03 cfs
11.64 cfs
8.40 cfs
3.24 cfs
Inflow
Outflow
Primary
Secondary
Flow (cfs)
Time (hours)
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95

Summary for Pond 7P: P-7

Inflow Area = 29.580 ac, 5.51% Impervious, Inflow Depth = 4.47" for 100-Year event
Inflow = 77.55 cfs @ 12.61 hrs, Volume= 11.008 af
Outflow = 77.37 cfs @ 12.63 hrs, Volume= 10.928 af, Atten= 0%, Lag= 0.9 min
Primary = 77.12 cfs @ 12.63 hrs, Volume= 10.371 af
Secondary = 0.25 cfs @ 12.63 hrs, Volume= 0.557 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Starting Elev= 915.00' Surf.Area= 0.440 ac Storage= 1.062 af
Peak Elev= 915.85' @ 12.63 hrs Surf.Area= 0.542 ac Storage= 1.480 af (0.418 af above start)

Plug-Flow detention time= 131.9 min calculated for 9.865 af (90% of inflow)
Center-of-Mass det. time= 58.5 min (908.6 - 850.1)

Volume	Invert	Avail.Storage	Storage Description
#1	910.95'	1.562 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

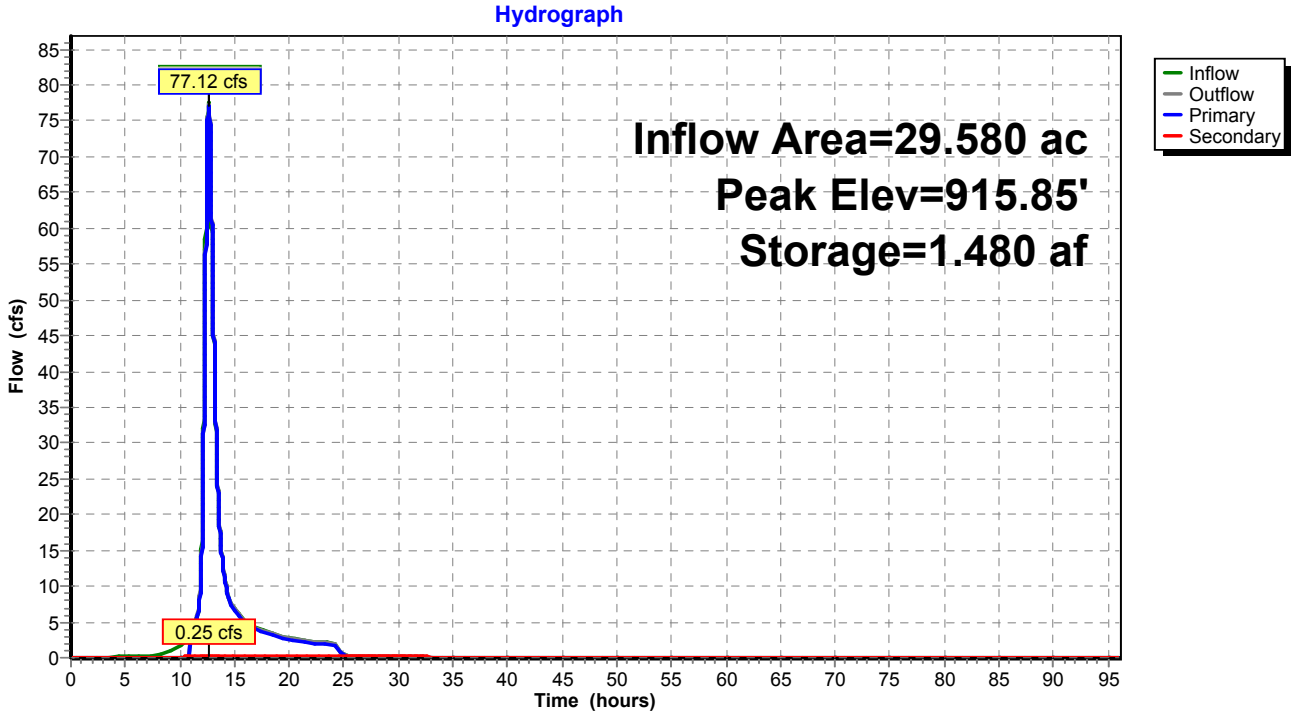
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
910.95	0.110	0.000	0.000
912.00	0.180	0.152	0.152
914.00	0.340	0.520	0.672
915.00	0.440	0.390	1.062
916.00	0.560	0.500	1.562

Device	Routing	Invert	Outlet Devices
#1	Primary	915.00'	**75.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88
#2	Secondary	915.00'	**12.0" Round RCP_Round 12"** L= 50.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 915.00' / 914.75' S= 0.0050 '/' Cc= 0.900 n= 0.130, Flow Area= 0.79 sf

Primary OutFlow Max=77.18 cfs @ 12.63 hrs HW=915.85' TW=915.76' (Fixed TW Elev= 915.76')
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 77.18 cfs @ 1.21 fps)

Secondary OutFlow Max=0.25 cfs @ 12.63 hrs HW=915.85' (Free Discharge)
↑—**2=RCP_Round 12"** (Barrel Controls 0.25 cfs @ 0.47 fps)

Pond 7P: P-7


Hydrograph
Inflow Area=29.580 ac
Peak Elev=915.85'
Storage=1.480 af
77.12 cfs
0.25 cfs
Inflow
Outflow
Primary
Secondary
Flow (cfs)
Time (hours)
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85

Summary for Pond 8P: P-8

Inflow Area = 6.390 ac, 4.85% Impervious, Inflow Depth = 4.45" for 100-Year event
Inflow = 39.26 cfs @ 12.05 hrs, Volume= 2.368 af
Outflow = 11.68 cfs @ 12.40 hrs, Volume= 2.367 af, Atten= 70%, Lag= 20.4 min
Primary = 11.68 cfs @ 12.40 hrs, Volume= 2.367 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Starting Elev= 897.00' Surf.Area= 0.300 ac Storage= 0.495 af
Peak Elev= 899.03' @ 12.40 hrs Surf.Area= 0.491 ac Storage= 1.355 af (0.860 af above start)

Plug-Flow detention time= 241.8 min calculated for 1.872 af (79% of inflow)
Center-of-Mass det. time= 107.2 min (921.1 - 813.9)

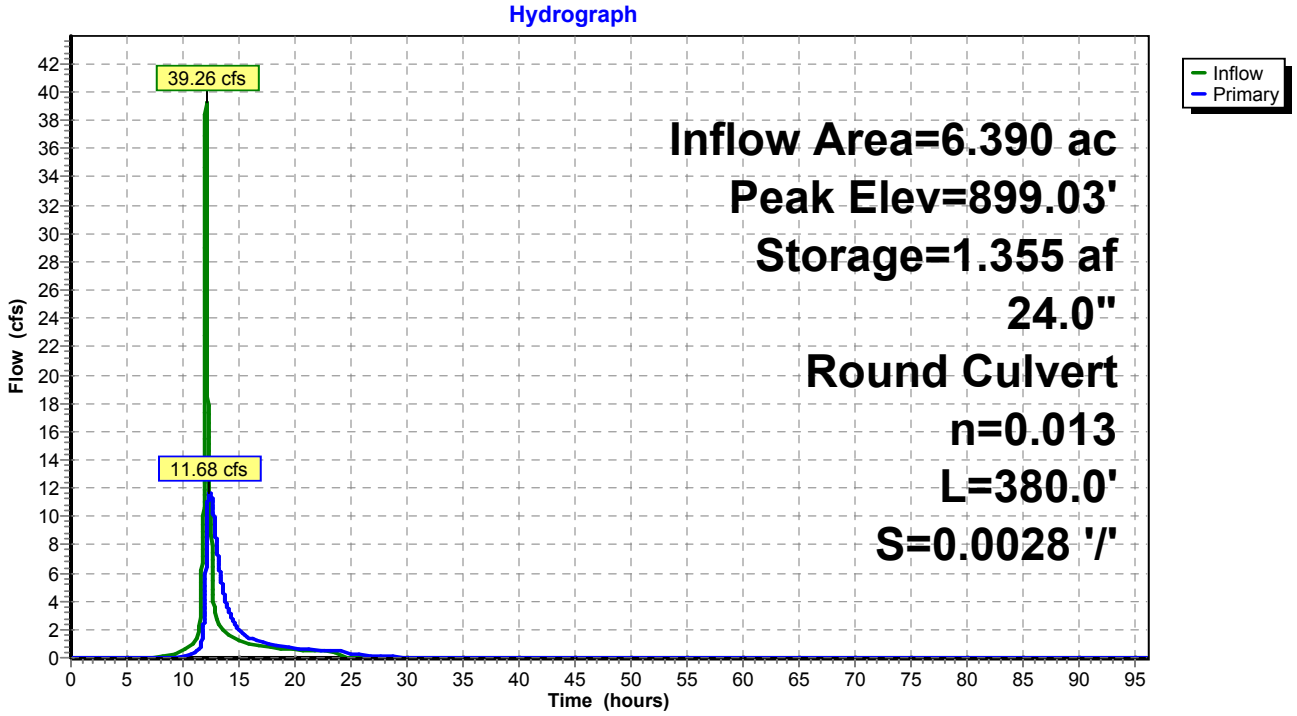
Volume	Invert	Avail.Storage	Storage Description
#1	893.00'	1.850 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
893.00	0.030	0.000	0.000
894.00	0.070	0.050	0.050
896.00	0.150	0.220	0.270
897.00	0.300	0.225	0.495
898.00	0.450	0.375	0.870
900.00	0.530	0.980	1.850

Device	Routing	Invert	Outlet Devices
#1	Primary	897.00'	**24.0" Round RCP_Round 24"** L= 380.0' RCP, groove end w/headwall, Ke= 0.200 Inlet / Outlet Invert= 897.00' / 895.94' S= 0.0028 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf

Primary OutFlow Max=11.68 cfs @ 12.40 hrs HW=899.03' (Free Discharge)
↑—**1=RCP_Round 24"** (Barrel Controls 11.68 cfs @ 4.55 fps)

Pond 8P: P-8


Hydrograph
39.26 cfs
11.68 cfs
Inflow Area=6.390 ac
Peak Elev=899.03'
Storage=1.355 af
24.0"
Round Culvert
n=0.013
L=380.0'
S=0.0028 '/'
Inflow
Primary
Flow (cfs)
Time (hours)
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95

Summary for Pond 9P: P-9

[79] Warning: Submerged Pond 7P Primary device # 1 by 0.78'
[81] Warning: Exceeded Pond W-3 by 1.01' @ 12.48 hrs

Inflow Area = 55.360 ac, 3.00% Impervious, Inflow Depth > 4.68" for 100-Year event
Inflow = 147.94 cfs @ 12.47 hrs, Volume= 21.595 af
Outflow = 147.76 cfs @ 12.49 hrs, Volume= 21.595 af, Atten= 0%, Lag= 1.0 min
Primary = 147.76 cfs @ 12.49 hrs, Volume= 21.595 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Starting Elev= 915.00' Surf.Area= 0.210 ac Storage= 0.353 af
Peak Elev= 915.78' @ 12.49 hrs Surf.Area= 0.366 ac Storage= 0.577 af (0.224 af above start)

Plug-Flow detention time= 60.3 min calculated for 21.243 af (98% of inflow)
Center-of-Mass det. time= 1.8 min (982.6 - 980.8)

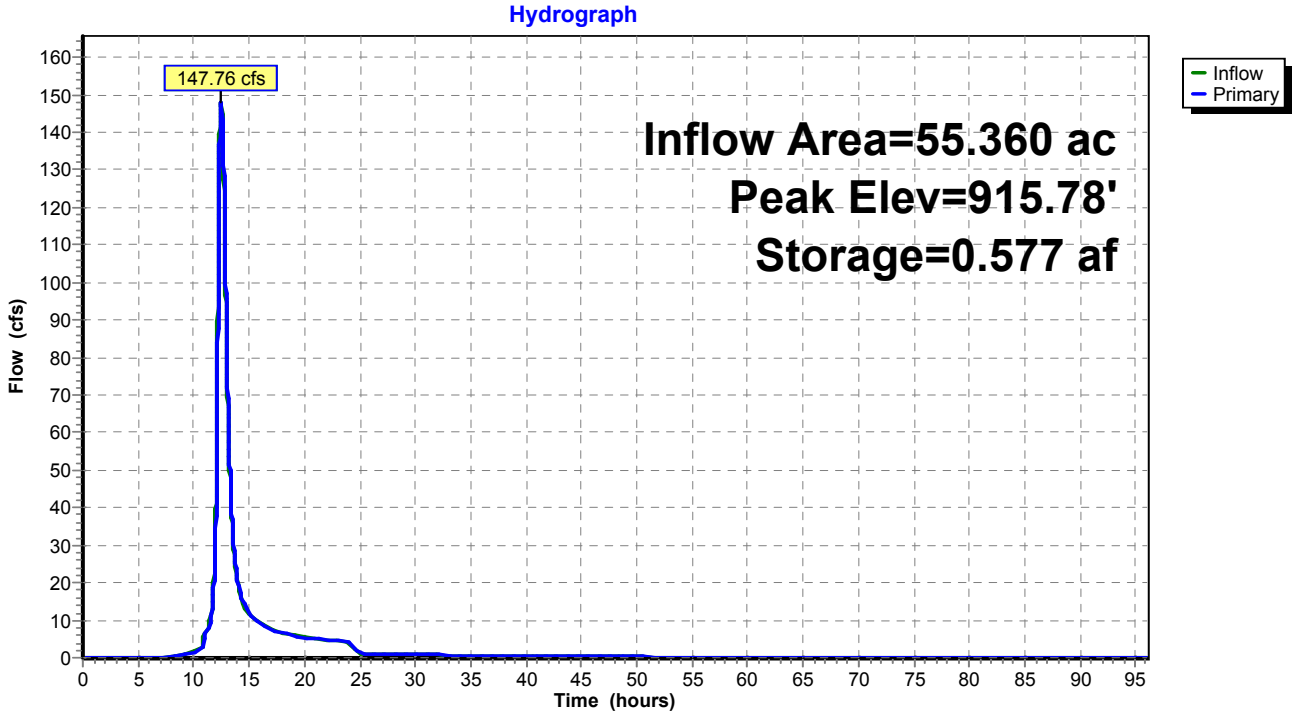
Volume	Invert	Avail.Storage	Storage Description
#1	910.50'	1.673 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
910.50	0.020	0.000	0.000
912.00	0.050	0.052	0.052
913.00	0.070	0.060	0.112
914.00	0.100	0.085	0.198
915.00	0.210	0.155	0.353
916.00	0.410	0.310	0.662
918.00	0.600	1.010	1.673

Device	Routing	Invert	Outlet Devices
#1	Primary	915.00'	**80.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=147.59 cfs @ 12.49 hrs HW=915.78' (Free Discharge)
1=Broad-Crested Rectangular Weir (Weir Controls 147.59 cfs @ 2.37 fps)

Pond 9P: P-9


Hydrograph
147.76 cfs
Inflow Area=55.360 ac
Peak Elev=915.78'
Storage=0.577 af
Inflow
Primary
Flow (cfs)
Time (hours)
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
160
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
75
80
85
90
95

Summary for Pond 10P: P-10 Lowered 1 ft

[95] Warning: Outlet Device #1 rise exceeded
[79] Warning: Submerged Pond 8P Primary device # 1 INLET by 1.37'

Inflow Area = 66.430 ac, 5.22% Impervious, Inflow Depth > 4.00" for 100-Year event
Inflow = 143.24 cfs @ 12.68 hrs, Volume= 22.117 af
Outflow = 142.83 cfs @ 12.70 hrs, Volume= 22.109 af, Atten= 0%, Lag= 1.6 min
Primary = 15.37 cfs @ 12.70 hrs, Volume= 11.336 af
Secondary = 127.46 cfs @ 12.70 hrs, Volume= 10.773 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Starting Elev= 896.00' Surf.Area= 0.290 ac Storage= 0.700 af
Peak Elev= 898.37' @ 12.70 hrs Surf.Area= 0.392 ac Storage= 1.503 af (0.803 af above start)

Plug-Flow detention time= 113.1 min calculated for 21.407 af (97% of inflow)
Center-of-Mass det. time= 18.4 min (1,043.6 - 1,025.2)

Volume	Invert	Avail.Storage	Storage Description
#1	892.00'	1.760 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

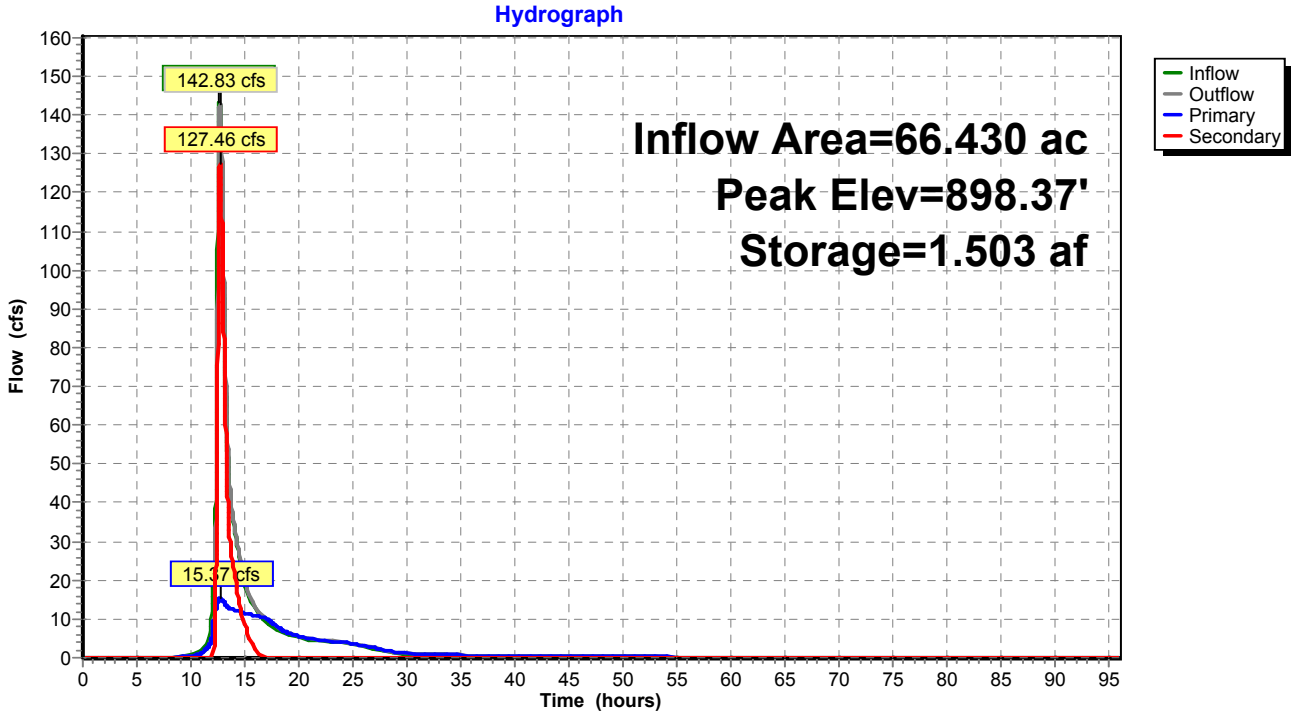
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
892.00	0.120	0.000	0.000
893.00	0.140	0.130	0.130
895.00	0.190	0.330	0.460
896.00	0.290	0.240	0.700
897.00	0.330	0.310	1.010
899.00	0.420	0.750	1.760

Device	Routing	Invert	Outlet Devices
#1	Primary	896.00'	**2.5' long x 1.00' rise Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#2	Secondary	897.40'	**50.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=15.37 cfs @ 12.70 hrs HW=898.37' (Free Discharge)
└**1=Sharp-Crested Rectangular Weir** (Orifice Controls 15.37 cfs @ 6.68 fps)

Secondary OutFlow Max=127.43 cfs @ 12.70 hrs HW=898.37' (Free Discharge)
└**2=Broad-Crested Rectangular Weir** (Weir Controls 127.43 cfs @ 2.64 fps)

Pond 10P: P-10 Lowered 1 ft



Summary for Pond 11P: P-11

Inflow Area = 58.650 ac, 4.89% Impervious, Inflow Depth > 4.72" for 100-Year event
Inflow = 154.35 cfs @ 12.48 hrs, Volume= 23.080 af
Outflow = 136.38 cfs @ 12.69 hrs, Volume= 23.060 af, Atten= 12%, Lag= 12.8 min
Primary = 131.41 cfs @ 12.69 hrs, Volume= 19.184 af
Secondary = 4.97 cfs @ 12.69 hrs, Volume= 3.876 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Starting Elev= 909.00' Surf.Area= 1.210 ac Storage= 3.640 af
Peak Elev= 912.68' @ 12.69 hrs Surf.Area= 1.641 ac Storage= 8.870 af (5.230 af above start)

Plug-Flow detention time= 318.4 min calculated for 19.420 af (84% of inflow)
Center-of-Mass det. time= 91.1 min (1,060.4 - 969.4)

Volume	Invert	Avail.Storage	Storage Description
#1	905.00'	9.405 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

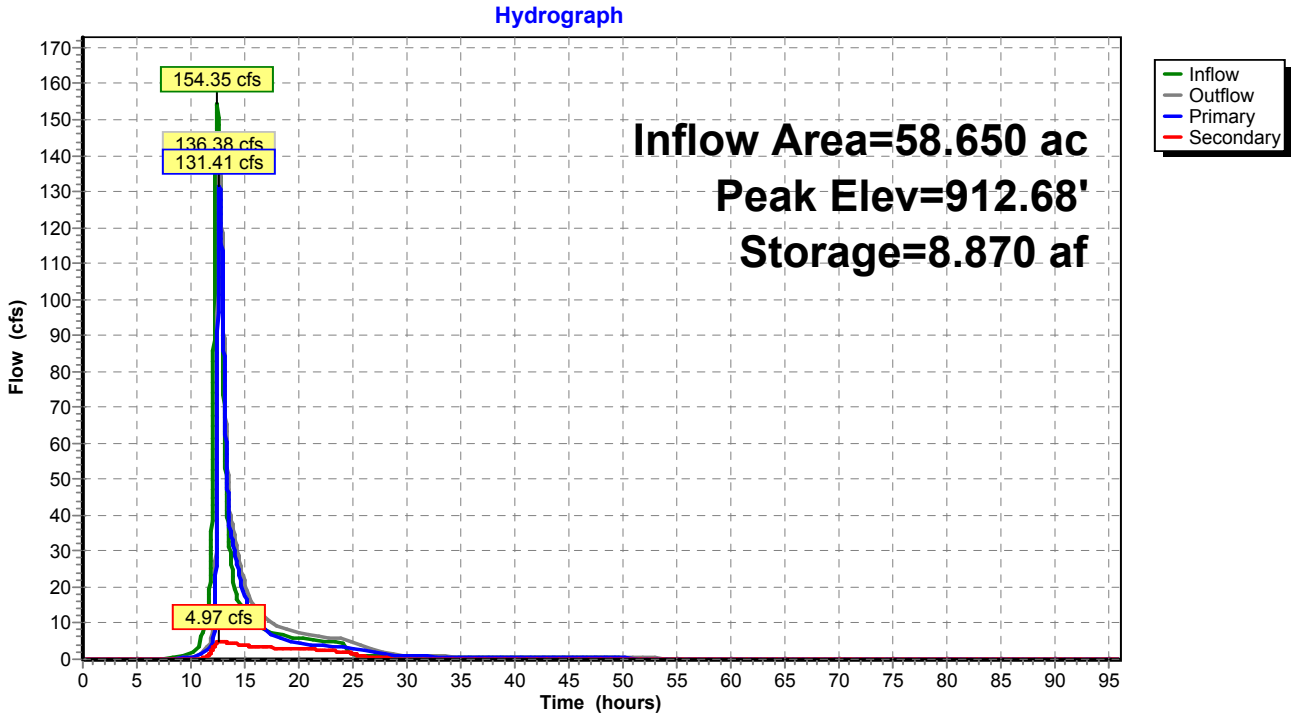
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
905.00	0.760	0.000	0.000
906.00	0.820	0.790	0.790
908.00	0.950	1.770	2.560
909.00	1.210	1.080	3.640
910.00	1.320	1.265	4.905
912.00	1.560	2.880	7.785
913.00	1.680	1.620	9.405

Device	Routing	Invert	Outlet Devices
#1	Primary	909.00'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	910.00'	**24.0" Round RCP_Round 24"** L= 200.0' RCP, groove end w/headwall, Ke= 0.200 Inlet / Outlet Invert= 910.00' / 909.00' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#3	Primary	910.00'	**24.0" Round RCP_Round 24"** L= 200.0' RCP, groove end w/headwall, Ke= 0.200 Inlet / Outlet Invert= 910.00' / 909.00' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#4	Primary	912.00'	**60.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88
#5	Secondary	909.00'	**12.0" Round RCP_Round 12"** L= 150.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 909.00' / 908.00' S= 0.0067 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=131.34 cfs @ 12.69 hrs HW=912.68' (Free Discharge)
- **1=Orifice/Grate** (Orifice Controls 7.25 cfs @ 9.23 fps)
- **2=RCP_Round 24"** (Barrel Controls 16.99 cfs @ 5.41 fps)
- **3=RCP_Round 24"** (Barrel Controls 16.99 cfs @ 5.41 fps)
- **4=Broad-Crested Rectangular Weir** (Weir Controls 90.10 cfs @ 2.22 fps)

Secondary OutFlow Max=4.97 cfs @ 12.69 hrs HW=912.68' (Free Discharge)
- **5=RCP_Round 12"** (Barrel Controls 4.97 cfs @ 6.33 fps)

Pond 11P: P-11



Summary for Pond 12P: P-12

[62] Hint: Exceeded Reach 43R OUTLET depth by 1.16' @ 13.03 hrs

Inflow Area = 79.640 ac, 7.40% Impervious, Inflow Depth > 4.71" for 100-Year event
Inflow = 152.03 cfs @ 12.70 hrs, Volume= 31.274 af
Outflow = 117.94 cfs @ 12.99 hrs, Volume= 31.251 af, Atten= 22%, Lag= 17.3 min
Primary = 117.94 cfs @ 12.99 hrs, Volume= 31.251 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Starting Elev= 893.00' Surf.Area= 1.640 ac Storage= 5.075 af
Peak Elev= 895.51' @ 12.99 hrs Surf.Area= 1.974 ac Storage= 9.607 af (4.532 af above start)

Plug-Flow detention time= 315.7 min calculated for 26.173 af (84% of inflow)
Center-of-Mass det. time= 64.8 min (1,117.7 - 1,052.9)

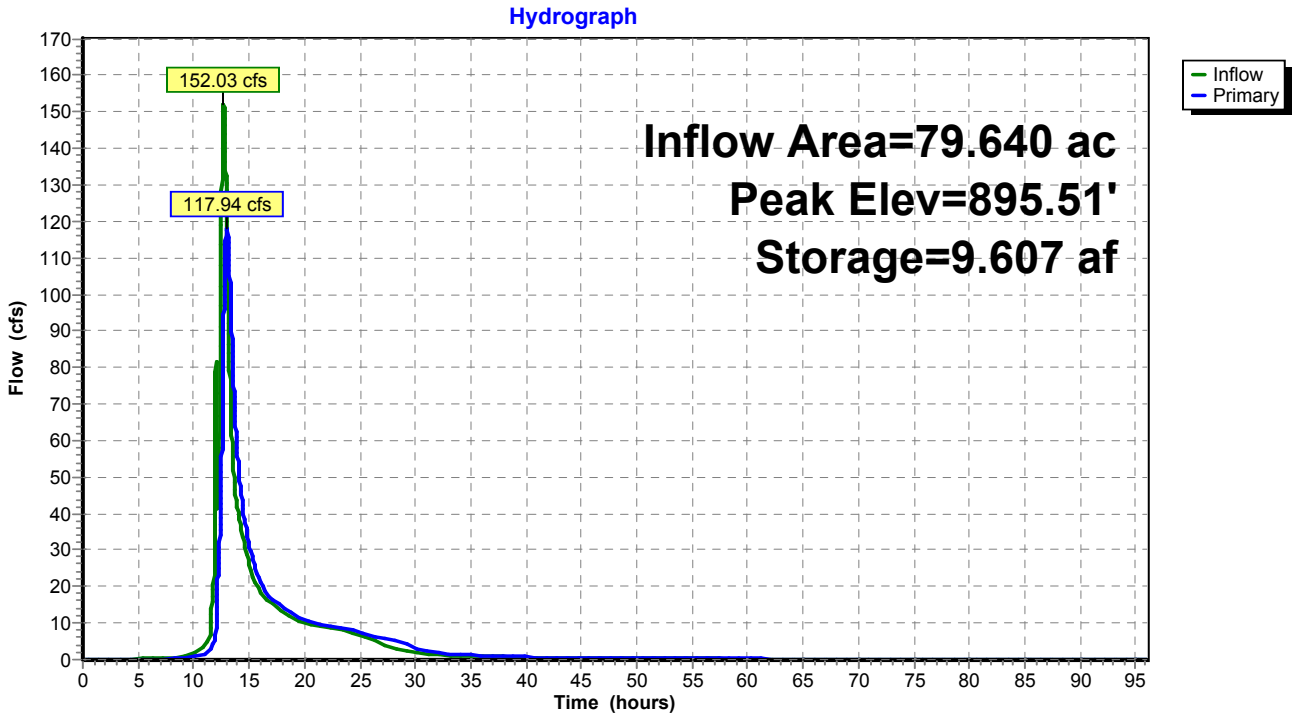
Volume	Invert	Avail.Storage	Storage Description
#1	889.00'	10.590 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
889.00	1.070	0.000	0.000
890.00	1.150	1.110	1.110
892.00	1.330	2.480	3.590
893.00	1.640	1.485	5.075
894.00	1.770	1.705	6.780
896.00	2.040	3.810	10.590

Device	Routing	Invert	Outlet Devices
#1	Primary	893.00'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	893.00'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Primary	893.50'	**43.8" W x 26.6" H, R=22.5"/62.0" Arch RCP_Arch 44x27** L= 30.0' Box, 30-75° wingwalls, rounded crown, Ke= 0.200 Inlet / Outlet Invert= 893.50' / 893.35' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 6.29 sf
#4	Primary	893.50'	**43.8" W x 26.6" H, R=22.5"/62.0" Arch RCP_Arch 44x27** L= 30.0' Box, 30-75° wingwalls, rounded crown, Ke= 0.200 Inlet / Outlet Invert= 893.50' / 893.35' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 6.29 sf
#5	Primary	893.50'	**43.8" W x 26.6" H, R=22.5"/62.0" Arch RCP_Arch 44x27** L= 30.0' Box, 30-75° wingwalls, rounded crown, Ke= 0.200 Inlet / Outlet Invert= 893.50' / 893.35' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 6.29 sf
#6	Primary	893.50'	**43.8" W x 26.6" H, R=22.5"/62.0" Arch RCP_Arch 44x27** L= 30.0' Box, 30-75° wingwalls, rounded crown, Ke= 0.200 Inlet / Outlet Invert= 893.50' / 893.35' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 6.29 sf

Primary OutFlow Max=117.94 cfs @ 12.99 hrs HW=895.51' (Free Discharge)
- **1=Orifice/Grate** (Orifice Controls 5.99 cfs @ 7.63 fps)
- **2=Orifice/Grate** (Orifice Controls 5.99 cfs @ 7.63 fps)
- **3=RCP_Arch 44x27** (Barrel Controls 26.49 cfs @ 5.48 fps)
- **4=RCP_Arch 44x27** (Barrel Controls 26.49 cfs @ 5.48 fps)
- **5=RCP_Arch 44x27** (Barrel Controls 26.49 cfs @ 5.48 fps)
- **6=RCP_Arch 44x27** (Barrel Controls 26.49 cfs @ 5.48 fps)

Pond 12P: P-12



Summary for Pond 13P: P-13

Inflow Area = 237.775 ac, 9.20% Impervious, Inflow Depth > 4.63" for 100-Year event
Inflow = 522.85 cfs @ 12.35 hrs, Volume= 91.772 af
Outflow = 502.34 cfs @ 12.46 hrs, Volume= 91.767 af, Atten= 4%, Lag= 6.5 min
Primary = 483.99 cfs @ 12.46 hrs, Volume= 87.567 af
Secondary = 18.34 cfs @ 12.46 hrs, Volume= 4.200 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Starting Elev= 883.00' Surf.Area= 1.870 ac Storage= 4.265 af
Peak Elev= 885.22' @ 12.46 hrs Surf.Area= 2.672 ac Storage= 9.296 af (5.031 af above start)

Plug-Flow detention time= 93.4 min calculated for 87.493 af (95% of inflow)
Center-of-Mass det. time= 12.7 min (938.4 - 925.6)

Volume	Invert	Avail.Storage	Storage Description
#1	878.00'	11.490 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
878.00	0.000	0.000	0.000
879.00	0.630	0.315	0.315
880.00	0.730	0.680	0.995
882.00	1.070	1.800	2.795
883.00	1.870	1.470	4.265
884.00	2.220	2.045	6.310
886.00	2.960	5.180	11.490

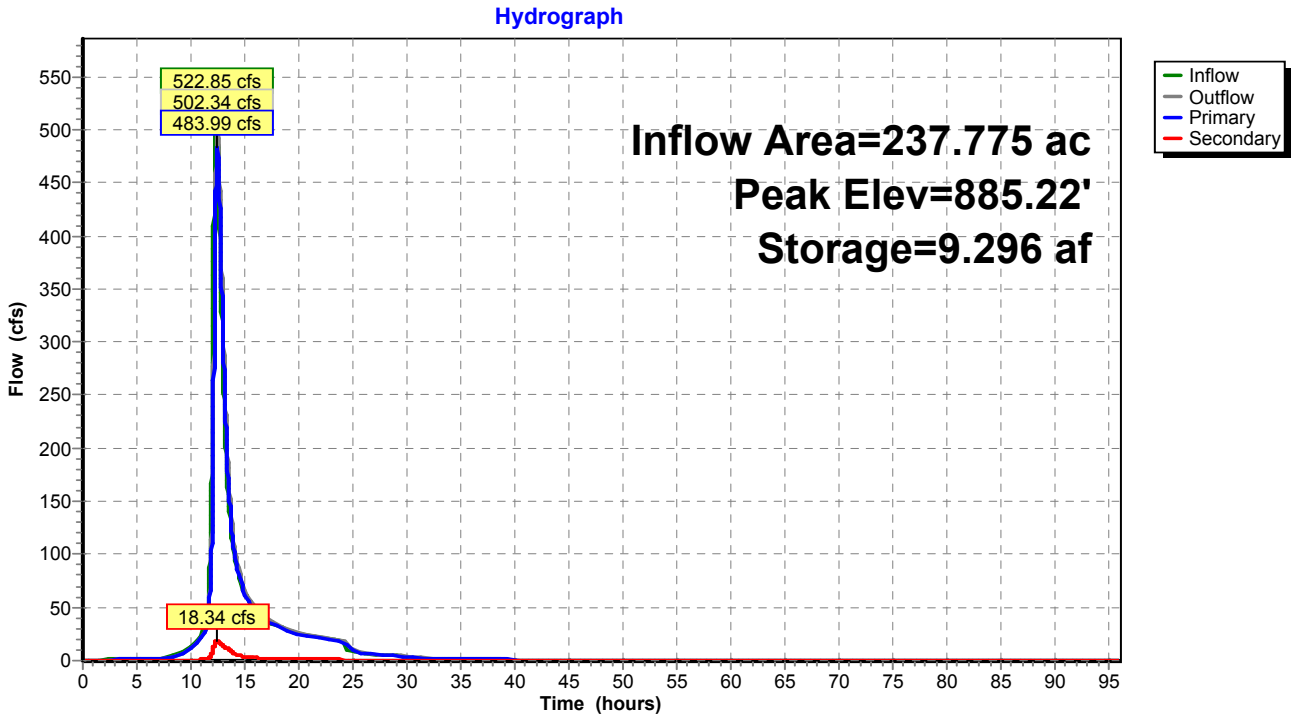
Device	Routing	Invert	Outlet Devices
#1	Primary	883.00'	**55.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88
#2	Secondary	883.00'	**12.0" Round RCP_Round 12"** L= 100.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 883.00' / 882.75' S= 0.0025 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#3	Secondary	883.00'	**12.0" Round RCP_Round 12"** L= 100.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 883.00' / 882.75' S= 0.0025 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#4	Secondary	883.00'	**12.0" Round RCP_Round 12"** L= 100.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 883.00' / 882.75' S= 0.0025 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#5	Secondary	883.00'	**12.0" Round RCP_Round 12"** L= 100.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 883.00' / 882.75' S= 0.0025 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

#6 Secondary 883.00' **12.0" Round RCP_Round 12"**
L= 100.0' RCP, groove end projecting, Ke= 0.200
Inlet / Outlet Invert= 883.00' / 882.75' S= 0.0025 '/' Cc= 0.900
n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=483.91 cfs @ 12.46 hrs HW=885.22' (Free Discharge)
└─**1=Broad-Crested Rectangular Weir** (Weir Controls 483.91 cfs @ 3.96 fps)

Secondary OutFlow Max=18.35 cfs @ 12.46 hrs HW=885.22' (Free Discharge)
├─**2=RCP_Round 12"** (Barrel Controls 3.67 cfs @ 4.67 fps)
├─**3=RCP_Round 12"** (Barrel Controls 3.67 cfs @ 4.67 fps)
├─**4=RCP_Round 12"** (Barrel Controls 3.67 cfs @ 4.67 fps)
├─**5=RCP_Round 12"** (Barrel Controls 3.67 cfs @ 4.67 fps)
└─**6=RCP_Round 12"** (Barrel Controls 3.67 cfs @ 4.67 fps)

Pond 13P: P-13



Summary for Pond 17P: W-2

[81] Warning: Exceeded Pond P-5/P-6 by 0.25' @ 29.50 hrs

Inflow	=	3.09 cfs @	12.39 hrs, Volume=	1.726 af
Outflow	=	1.20 cfs @	18.16 hrs, Volume=	1.579 af, Atten= 61%, Lag= 346.2 min
Primary	=	1.20 cfs @	18.16 hrs, Volume=	1.579 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Peak Elev= 929.60' @ 18.16 hrs Surf.Area= 1.193 ac Storage= 0.689 af

Plug-Flow detention time= 533.7 min calculated for 1.579 af (91% of inflow)
Center-of-Mass det. time= 475.4 min (1,499.6 - 1,024.2)

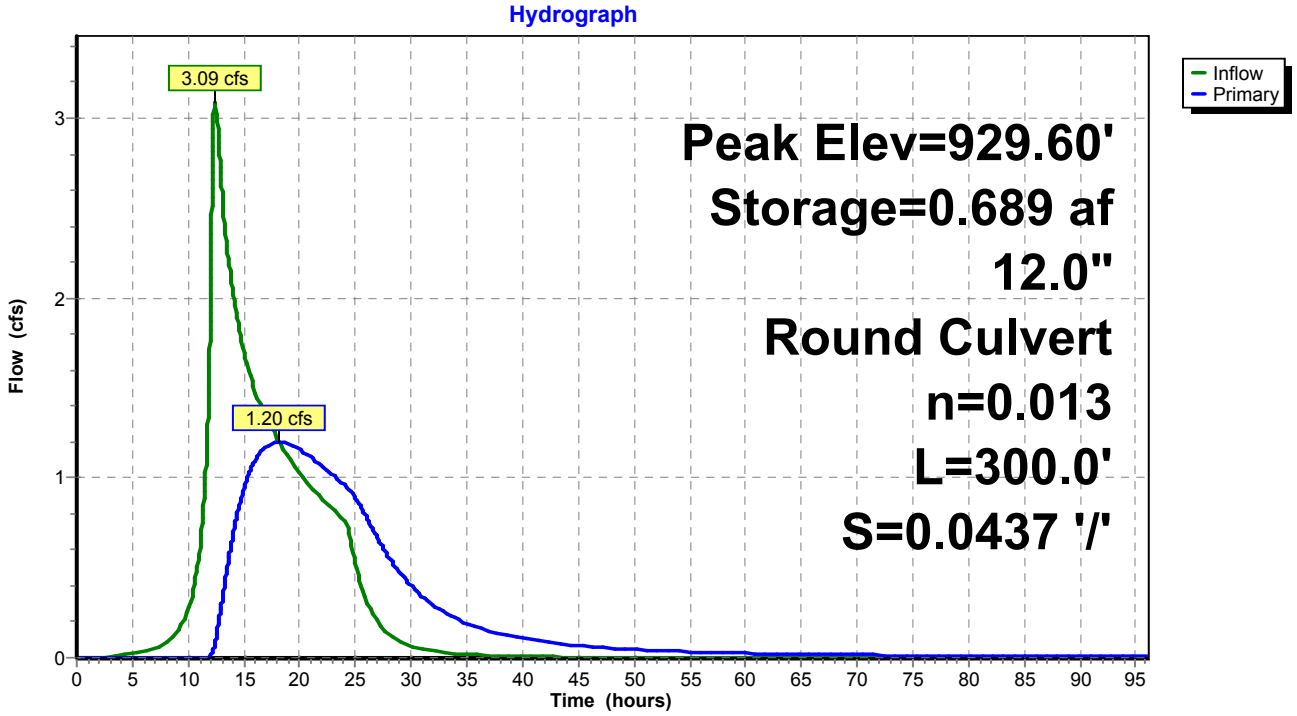
Volume	Invert	Avail.Storage	Storage Description
#1	929.00'	1.175 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
929.00	1.090	0.000	0.000
930.00	1.260	1.175	1.175

Device	Routing	Invert	Outlet Devices
#1	Primary	929.10'	**12.0" Round RCP_Round 12"** L= 300.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 929.10' / 916.00' S= 0.0437 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=1.20 cfs @ 18.16 hrs HW=929.60' (Free Discharge)
↑**1=RCP_Round 12"** (Inlet Controls 1.20 cfs @ 3.02 fps)

Pond 17P: W-2


Hydrograph
3.09 cfs
1.20 cfs
Peak Elev=929.60'
Storage=0.689 af
12.0"
Round Culvert
n=0.013
L=300.0'
S=0.0437 '/'
Inflow
Primary
Flow (cfs)
Time (hours)
0
1
2
3
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95

Summary for Pond 36P: Culverts passing flow beneath Spine Road

[95] Warning: Outlet Device #1 rise exceeded

Inflow Area = 52.790 ac, 0.00% Impervious, Inflow Depth = 4.31" for 100-Year event
Inflow = 161.15 cfs @ 12.43 hrs, Volume= 18.977 af
Outflow = 161.15 cfs @ 12.43 hrs, Volume= 18.977 af, Atten= 0%, Lag= 0.0 min
Primary = 127.00 cfs @ 12.25 hrs, Volume= 18.235 af
Secondary = 34.15 cfs @ 12.43 hrs, Volume= 0.742 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Peak Elev= 888.46' @ 12.43 hrs Surf.Area= 0.004 ac Storage= 0.003 af

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 0.0 min (844.2 - 844.2)

Volume	Invert	Avail.Storage	Storage Description
#1	887.00'	0.026 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
887.00	0.000	0.000	0.000
887.50	0.002	0.001	0.001
890.50	0.007	0.014	0.014
892.00	0.009	0.012	0.026

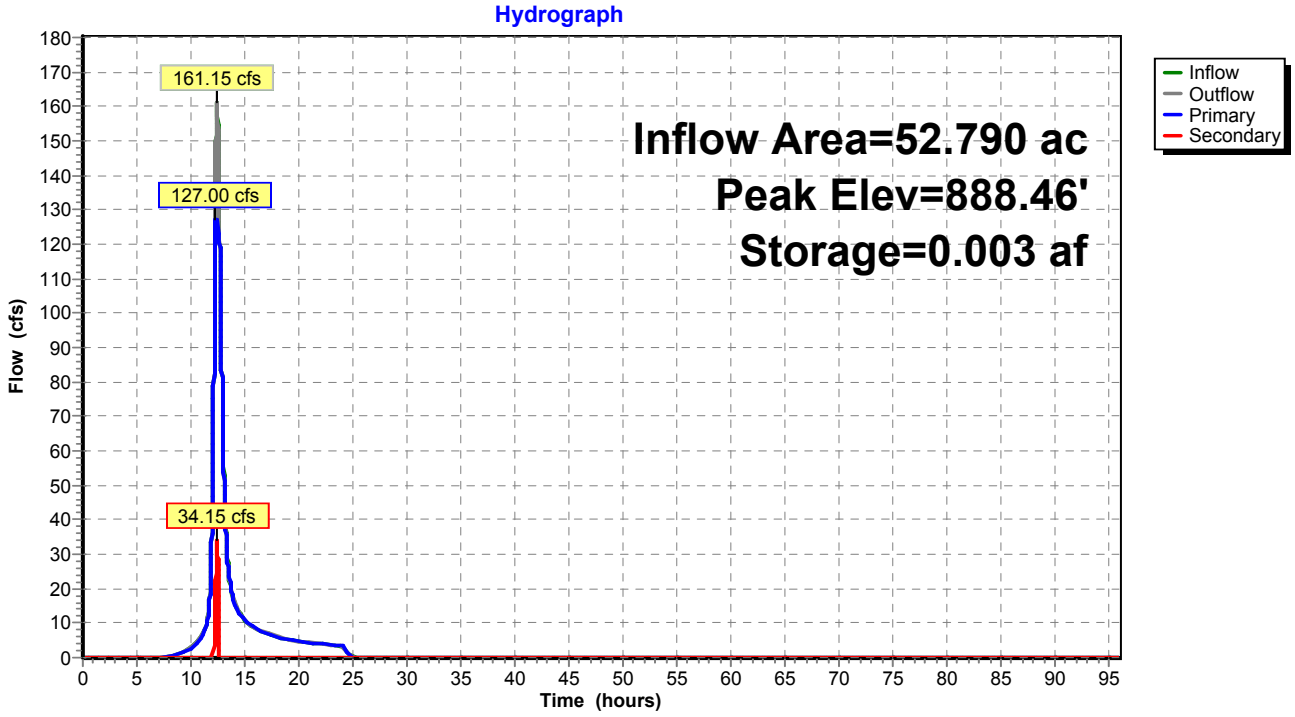
Device	Routing	Invert	Outlet Devices
#1	Primary	887.00'	**Special & User-Defined** Head (feet) 0.00 0.10 0.20 0.30 0.40 0.50 Disch. (cfs) 0.000 25.000 50.000 75.000 100.000 127.000
#2	Secondary	887.50'	**18.0" Round RCP_Round 18"** L= 100.0' RCP, groove end w/headwall, Ke= 0.200 Inlet / Outlet Invert= 887.50' / 886.50' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#3	Secondary	887.50'	**18.0" Round RCP_Round 18"** L= 100.0' RCP, groove end w/headwall, Ke= 0.200 Inlet / Outlet Invert= 887.50' / 886.50' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#4	Secondary	887.50'	**18.0" Round RCP_Round 18"** L= 100.0' RCP, groove end w/headwall, Ke= 0.200 Inlet / Outlet Invert= 887.50' / 886.50' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#5	Secondary	887.50'	**18.0" Round RCP_Round 18"** L= 100.0' RCP, groove end w/headwall, Ke= 0.200 Inlet / Outlet Invert= 887.50' / 886.50' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#6	Secondary	887.50'	**18.0" Round RCP_Round 18"** L= 100.0' RCP, groove end w/headwall, Ke= 0.200 Inlet / Outlet Invert= 887.50' / 886.50' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf

#7	Secondary	887.50'	**18.0" Round RCP_Round 18"** L= 100.0' RCP, groove end w/headwall, Ke= 0.200 Inlet / Outlet Invert= 887.50' / 886.50' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#8	Secondary	887.50'	**18.0" Round RCP_Round 18"** L= 100.0' RCP, groove end w/headwall, Ke= 0.200 Inlet / Outlet Invert= 887.50' / 886.50' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#9	Secondary	887.50'	**18.0" Round RCP_Round 18"** L= 100.0' RCP, groove end w/headwall, Ke= 0.200 Inlet / Outlet Invert= 887.50' / 886.50' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf

Primary OutFlow Max=127.00 cfs @ 12.25 hrs HW=887.60' (Free Discharge)
└─**1=Special & User-Defined** (Custom Controls 127.00 cfs)

Secondary OutFlow Max=34.12 cfs @ 12.43 hrs HW=888.46' (Free Discharge)
- **2=RCP_Round 18"** (Barrel Controls 4.26 cfs @ 5.08 fps)
- **3=RCP_Round 18"** (Barrel Controls 4.26 cfs @ 5.08 fps)
- **4=RCP_Round 18"** (Barrel Controls 4.26 cfs @ 5.08 fps)
- **5=RCP_Round 18"** (Barrel Controls 4.26 cfs @ 5.08 fps)
- **6=RCP_Round 18"** (Barrel Controls 4.26 cfs @ 5.08 fps)
- **7=RCP_Round 18"** (Barrel Controls 4.26 cfs @ 5.08 fps)
- **8=RCP_Round 18"** (Barrel Controls 4.26 cfs @ 5.08 fps)
- **9=RCP_Round 18"** (Barrel Controls 4.26 cfs @ 5.08 fps)

Pond 36P: Culverts passing flow beneath Spine Road



Summary for Pond CRH-1: CRH-1

Inflow Area = 6.955 ac, 46.76% Impervious, Inflow Depth = 5.60" for 100-Year event
Inflow = 38.37 cfs @ 12.15 hrs, Volume= 3.247 af
Outflow = 25.53 cfs @ 12.31 hrs, Volume= 3.247 af, Atten= 33%, Lag= 9.5 min
Discarded = 0.37 cfs @ 12.31 hrs, Volume= 0.560 af
Primary = 25.15 cfs @ 12.31 hrs, Volume= 2.688 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Peak Elev= 878.81' @ 12.31 hrs Surf.Area= 0.463 ac Storage= 0.760 af

Plug-Flow detention time= 114.7 min calculated for 3.247 af (100% of inflow)
Center-of-Mass det. time= 114.8 min (896.0 - 781.2)

Volume	Invert	Avail.Storage	Storage Description
#1	876.00'	0.850 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

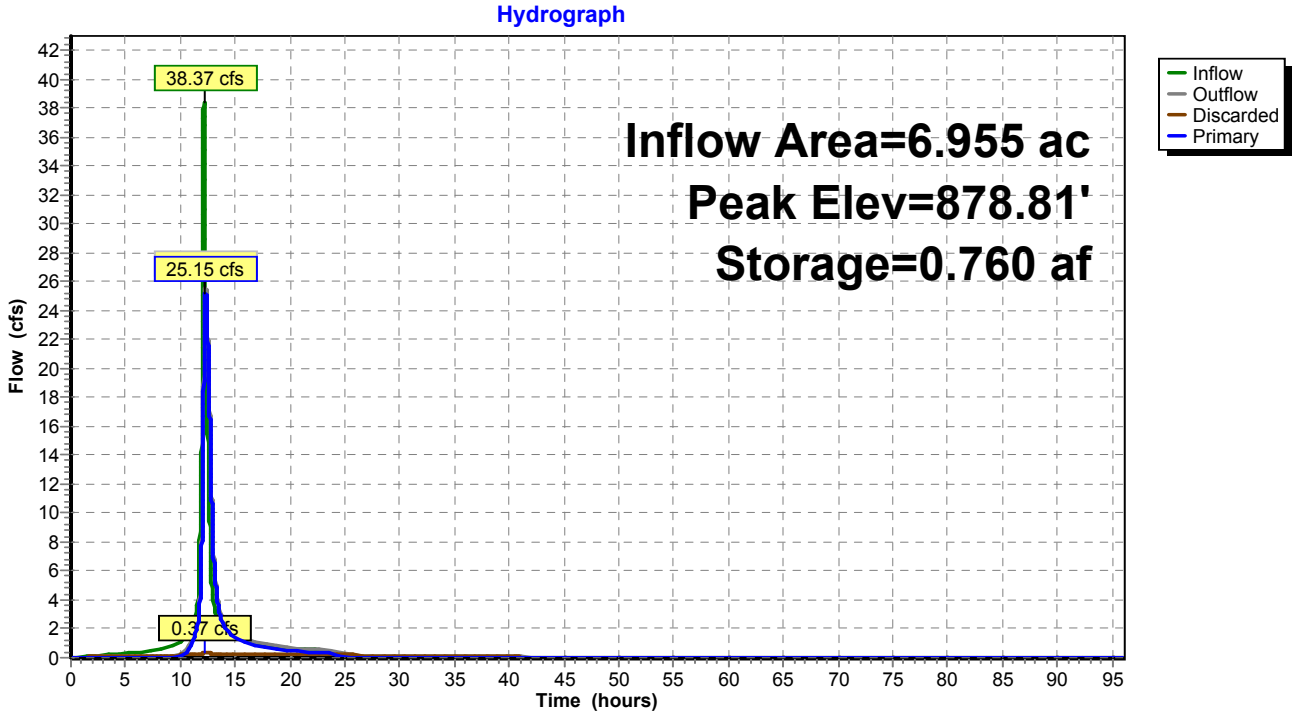
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
876.00	0.150	0.000	0.000
878.00	0.300	0.450	0.450
879.00	0.500	0.400	0.850

Device	Routing	Invert	Outlet Devices
#1	Discarded	876.00'	**0.800 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 0.00'
#2	Primary	877.00'	**24.0" Round Culvert** L= 155.0' Ke= 0.500 Inlet / Outlet Invert= 877.00' / 876.00' S= 0.0065 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#3	Primary	877.00'	**24.0" Round Culvert** L= 155.0' Ke= 0.500 Inlet / Outlet Invert= 877.00' / 876.00' S= 0.0065 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf

Discarded OutFlow Max=0.37 cfs @ 12.31 hrs HW=878.81' (Free Discharge)
└**1=Exfiltration** (Controls 0.37 cfs)

Primary OutFlow Max=25.15 cfs @ 12.31 hrs HW=878.81' (Free Discharge)
├**2=Culvert** (Barrel Controls 12.58 cfs @ 5.53 fps)
└**3=Culvert** (Barrel Controls 12.58 cfs @ 5.53 fps)

Pond CRH-1: CRH-1



Summary for Pond CRH-2: CRH-2

Inflow Area = 10.214 ac, 37.73% Impervious, Inflow Depth = 5.35" for 100-Year event
Inflow = 48.13 cfs @ 12.21 hrs, Volume= 4.557 af
Outflow = 27.86 cfs @ 12.47 hrs, Volume= 4.557 af, Atten= 42%, Lag= 15.6 min
Discarded = 0.47 cfs @ 12.47 hrs, Volume= 0.981 af
Primary = 27.39 cfs @ 12.47 hrs, Volume= 3.577 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Peak Elev= 883.78' @ 12.47 hrs Surf.Area= 0.578 ac Storage= 1.468 af

Plug-Flow detention time= 191.1 min calculated for 4.557 af (100% of inflow)
Center-of-Mass det. time= 191.0 min (983.5 - 792.4)

Volume	Invert	Avail.Storage	Storage Description
#1	880.00'	1.600 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

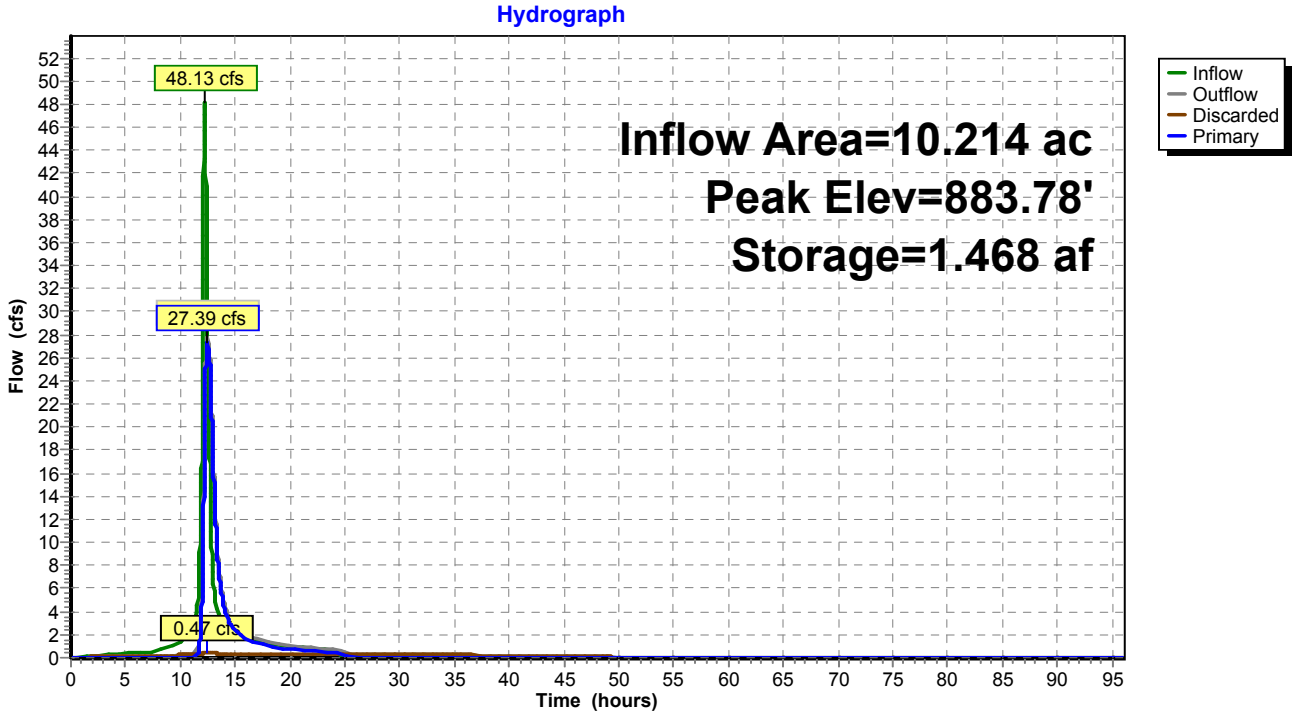
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
880.00	0.200	0.000	0.000
882.00	0.400	0.600	0.600
884.00	0.600	1.000	1.600

Device	Routing	Invert	Outlet Devices
#1	Primary	881.50'	**24.0" Round Culvert** L= 155.0' Ke= 0.500 Inlet / Outlet Invert= 881.50' / 881.00' S= 0.0032 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#2	Primary	881.50'	**24.0" Round Culvert** L= 155.0' Ke= 0.500 Inlet / Outlet Invert= 881.50' / 881.00' S= 0.0032 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#3	Discarded	880.00'	**0.800 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 0.00'

Discarded OutFlow Max=0.47 cfs @ 12.47 hrs HW=883.78' (Free Discharge)
└**3=Exfiltration** (Controls 0.47 cfs)

Primary OutFlow Max=27.40 cfs @ 12.47 hrs HW=883.78' (Free Discharge)
├**1=Culvert** (Barrel Controls 13.70 cfs @ 4.79 fps)
└**2=Culvert** (Barrel Controls 13.70 cfs @ 4.79 fps)

Pond CRH-2: CRH-2



Summary for Pond CRH-3: CRH-3

Inflow Area = 11.815 ac, 36.95% Impervious, Inflow Depth = 4.34" for 100-Year event
Inflow = 30.16 cfs @ 12.44 hrs, Volume= 4.270 af
Outflow = 25.93 cfs @ 12.70 hrs, Volume= 4.270 af, Atten= 14%, Lag= 15.7 min
Discarded = 0.38 cfs @ 12.70 hrs, Volume= 0.516 af
Primary = 25.55 cfs @ 12.70 hrs, Volume= 3.754 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Peak Elev= 879.83' @ 12.70 hrs Surf.Area= 0.467 ac Storage= 0.770 af

Plug-Flow detention time= 82.3 min calculated for 4.270 af (100% of inflow)
Center-of-Mass det. time= 82.4 min (919.5 - 837.0)

Volume	Invert	Avail.Storage	Storage Description
#1	877.00'	0.850 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

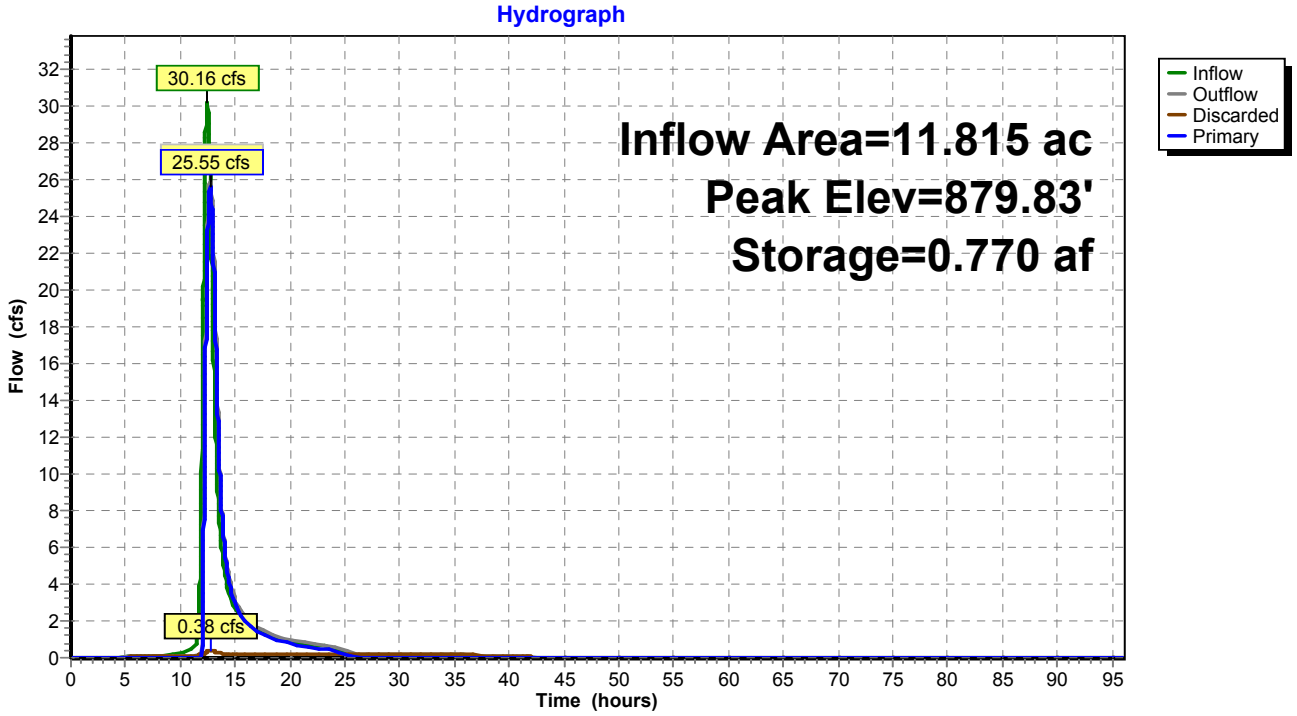
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
877.00	0.150	0.000	0.000
879.00	0.300	0.450	0.450
880.00	0.500	0.400	0.850

Device	Routing	Invert	Outlet Devices
#1	Discarded	877.00'	**0.800 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 0.00'
#2	Primary	878.00'	**24.0" Round Culvert** L= 155.0' Ke= 0.500 Inlet / Outlet Invert= 878.00' / 877.00' S= 0.0065 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#3	Primary	878.00'	**24.0" Round Culvert** L= 155.0' Ke= 0.500 Inlet / Outlet Invert= 878.00' / 877.00' S= 0.0065 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf

Discarded OutFlow Max=0.38 cfs @ 12.70 hrs HW=879.83' (Free Discharge)
└**1=Exfiltration** (Controls 0.38 cfs)

Primary OutFlow Max=25.55 cfs @ 12.70 hrs HW=879.83' (Free Discharge)
├**2=Culvert** (Barrel Controls 12.78 cfs @ 5.55 fps)
└**3=Culvert** (Barrel Controls 12.78 cfs @ 5.55 fps)

Pond CRH-3: CRH-3



Summary for Pond P-5/P-6: P-5/P-6

Inflow Area = 43.346 ac, 18.61% Impervious, Inflow Depth = 4.83" for 100-Year event
Inflow = 208.93 cfs @ 12.15 hrs, Volume= 17.441 af
Outflow = 112.97 cfs @ 12.39 hrs, Volume= 17.438 af, Atten= 46%, Lag= 14.5 min
Primary = 109.89 cfs @ 12.39 hrs, Volume= 15.711 af
Secondary = 3.09 cfs @ 12.39 hrs, Volume= 1.726 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Starting Elev= 929.00' Surf.Area= 1.975 ac Storage= 5.062 af
Peak Elev= 931.48' @ 12.39 hrs Surf.Area= 2.486 ac Storage= 10.662 af (5.599 af above start)

Plug-Flow detention time= 287.0 min calculated for 12.375 af (71% of inflow)
Center-of-Mass det. time= 109.6 min (914.9 - 805.3)

Volume	Invert	Avail.Storage	Storage Description
#1	926.00'	14.650 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

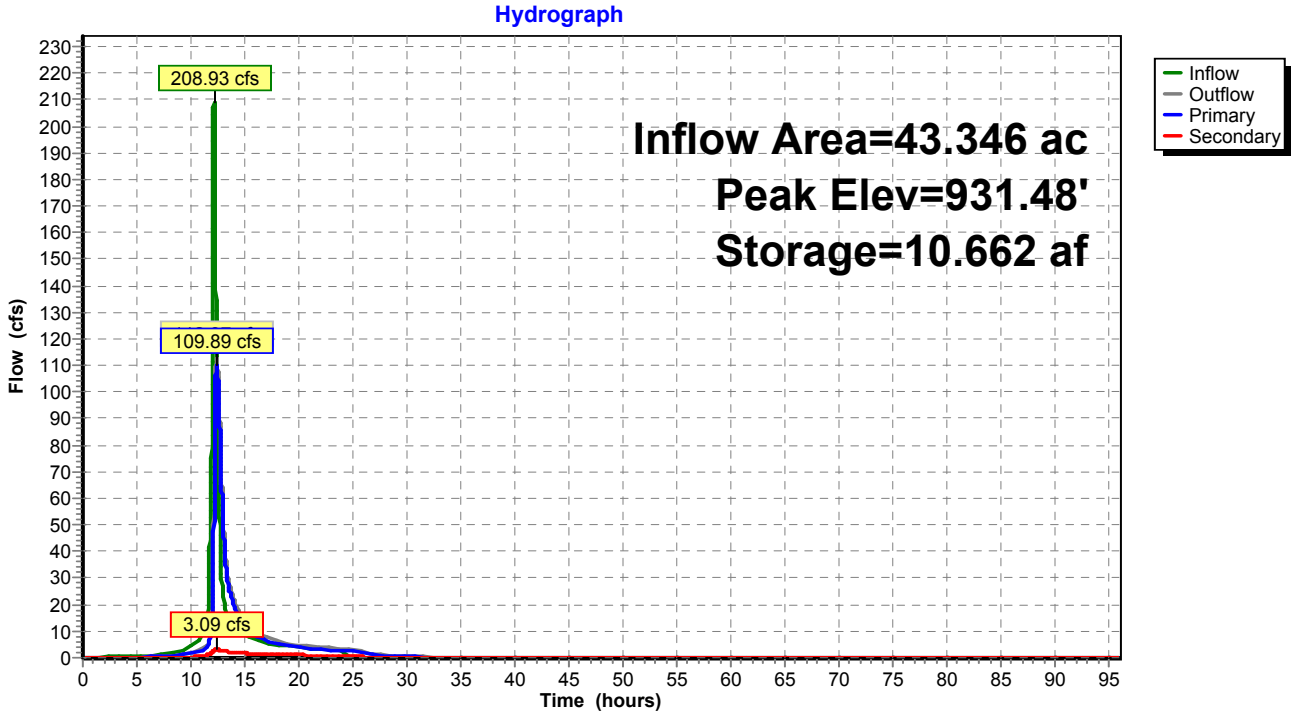
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
926.00	1.510	0.000	0.000
928.00	1.710	3.220	3.220
930.00	2.240	3.950	7.170
931.00	2.400	2.320	9.490
933.00	2.760	5.160	14.650

Device	Routing	Invert	Outlet Devices
#1	Primary	929.00'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	929.50'	**7.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#3	Primary	930.50'	**14.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#4	Secondary	929.00'	**9.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=109.85 cfs @ 12.39 hrs HW=931.48' (Free Discharge)
- **1=Orifice/Grate** (Orifice Controls 5.95 cfs @ 7.58 fps)
- **2=Sharp-Crested Rectangular Weir** (Weir Controls 60.14 cfs @ 4.60 fps)
- **3=Sharp-Crested Rectangular Weir** (Weir Controls 43.76 cfs @ 3.24 fps)

Secondary OutFlow Max=3.09 cfs @ 12.39 hrs HW=931.48' (Free Discharge)
- **4=Orifice/Grate** (Orifice Controls 3.09 cfs @ 6.98 fps)

Pond P-5/P-6: P-5/P-6



Summary for Pond TI P: Thumb Infiltration (Thumb TP load only)

Inflow Area = 48.539 ac, 11.38% Impervious, Inflow Depth = 2.41" for 100-Year event
Inflow = 62.42 cfs @ 12.48 hrs, Volume= 9.759 af
Outflow = 52.86 cfs @ 12.76 hrs, Volume= 6.019 af, Atten= 15%, Lag= 16.3 min
Primary = 52.86 cfs @ 12.76 hrs, Volume= 6.019 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Peak Elev= 903.80' @ 12.76 hrs Surf.Area= 1.000 ac Storage= 3.803 af

Plug-Flow detention time= 229.1 min calculated for 6.018 af (62% of inflow)
Center-of-Mass det. time= 101.4 min (958.7 - 857.2)

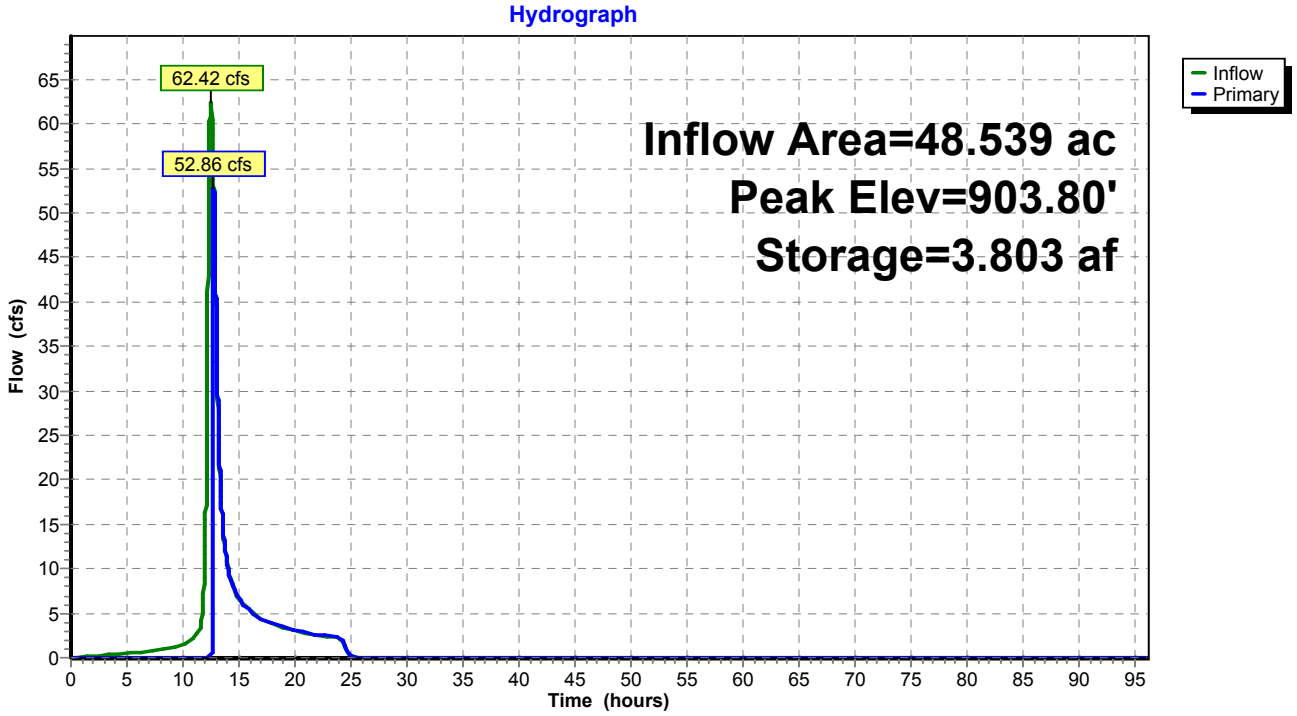
Volume	Invert	Avail.Storage	Storage Description
#1	900.00'	5.000 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
900.00	1.000	0.000	0.000
901.00	1.000	1.000	1.000
902.00	1.000	1.000	2.000
903.00	1.000	1.000	3.000
904.00	1.000	1.000	4.000
905.00	1.000	1.000	5.000

Device	Routing	Invert	Outlet Devices
#1	Primary	903.74'	**1,000.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s) 5.0' Crest Height

Primary OutFlow Max=52.11 cfs @ 12.76 hrs HW=903.80' (Free Discharge)
↑—**1=Sharp-Crested Rectangular Weir** (Weir Controls 52.11 cfs @ 0.82 fps)

Pond TI P: Thumb Infiltration (Thumb TP load only)



Summary for Pond W-1: W-1

[79] Warning: Submerged Pond 4P Secondary device # 2 by 0.31'

Inflow Area = 1.000 ac, 10.00% Impervious, Inflow Depth = 22.18" for 100-Year event
Inflow = 5.54 cfs @ 12.25 hrs, Volume= 1.848 af
Outflow = 2.82 cfs @ 14.57 hrs, Volume= 1.848 af, Atten= 49%, Lag= 139.5 min
Primary = 2.82 cfs @ 14.57 hrs, Volume= 1.848 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Peak Elev= 915.31' @ 14.57 hrs Surf.Area= 0.749 ac Storage= 0.392 af

Plug-Flow detention time= 106.5 min calculated for 1.848 af (100% of inflow)
Center-of-Mass det. time= 106.7 min (1,023.8 - 917.1)

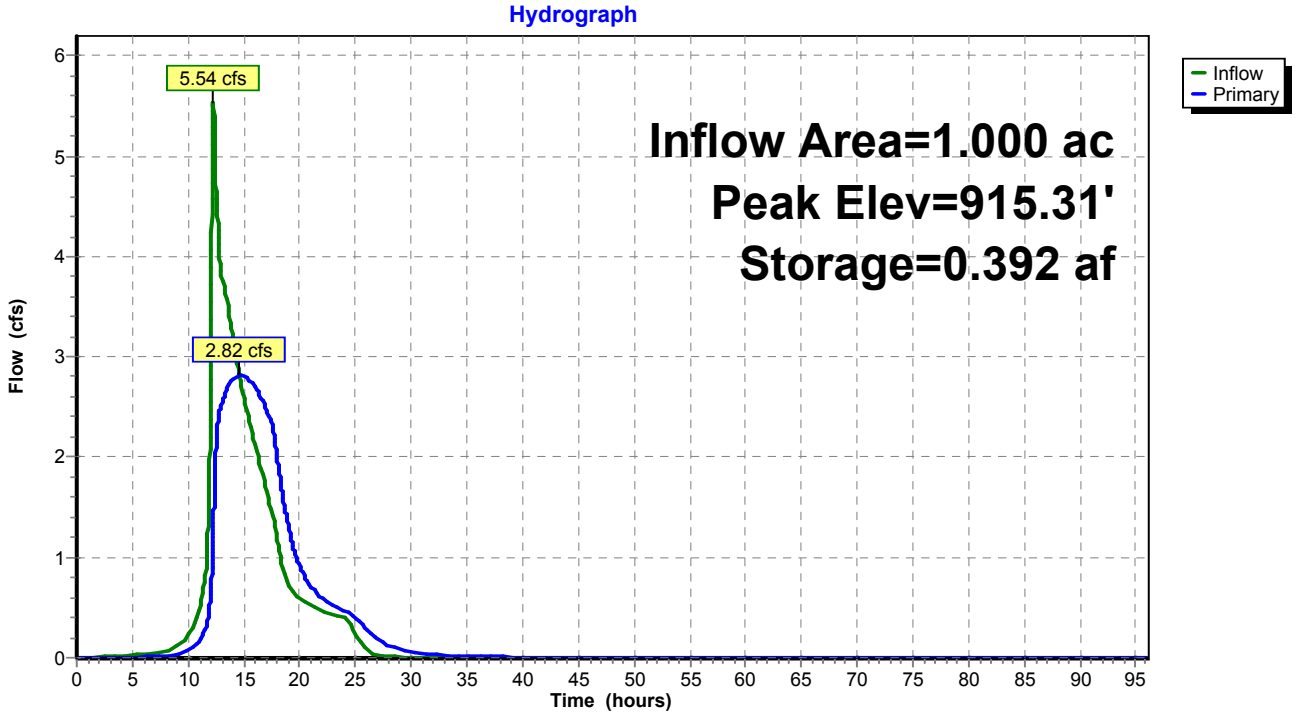
Volume	Invert	Avail.Storage	Storage Description
#1	914.75'	0.950 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
914.75	0.660	0.000	0.000
916.00	0.860	0.950	0.950

Device	Routing	Invert	Outlet Devices
#1	Primary	914.75'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=2.82 cfs @ 14.57 hrs HW=915.31' (Free Discharge)
↑—**1=Orifice/Grate** (Orifice Controls 2.82 cfs @ 3.59 fps)

Pond W-1: W-1


Hydrograph
Inflow Area=1.000 ac
Peak Elev=915.31'
Storage=0.392 af
5.54 cfs
2.82 cfs
Inflow
Primary
Flow (cfs)
Time (hours)
0
1
2
3
4
5
6
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95

Summary for Pond W-3: W-3

[79] Warning: Submerged Pond 7P Secondary device # 2 INLET by 0.18'

Inflow	=	1.41 cfs @	18.16 hrs, Volume=	2.136 af
Outflow	=	0.89 cfs @	26.63 hrs, Volume=	1.950 af, Atten= 36%, Lag= 508.2 min
Primary	=	0.89 cfs @	26.63 hrs, Volume=	1.950 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Peak Elev= 915.18' @ 26.63 hrs Surf.Area= 2.110 ac Storage= 0.888 af

Plug-Flow detention time= 918.9 min calculated for 1.950 af (91% of inflow)
Center-of-Mass det. time= 710.2 min (2,311.0 - 1,600.8)

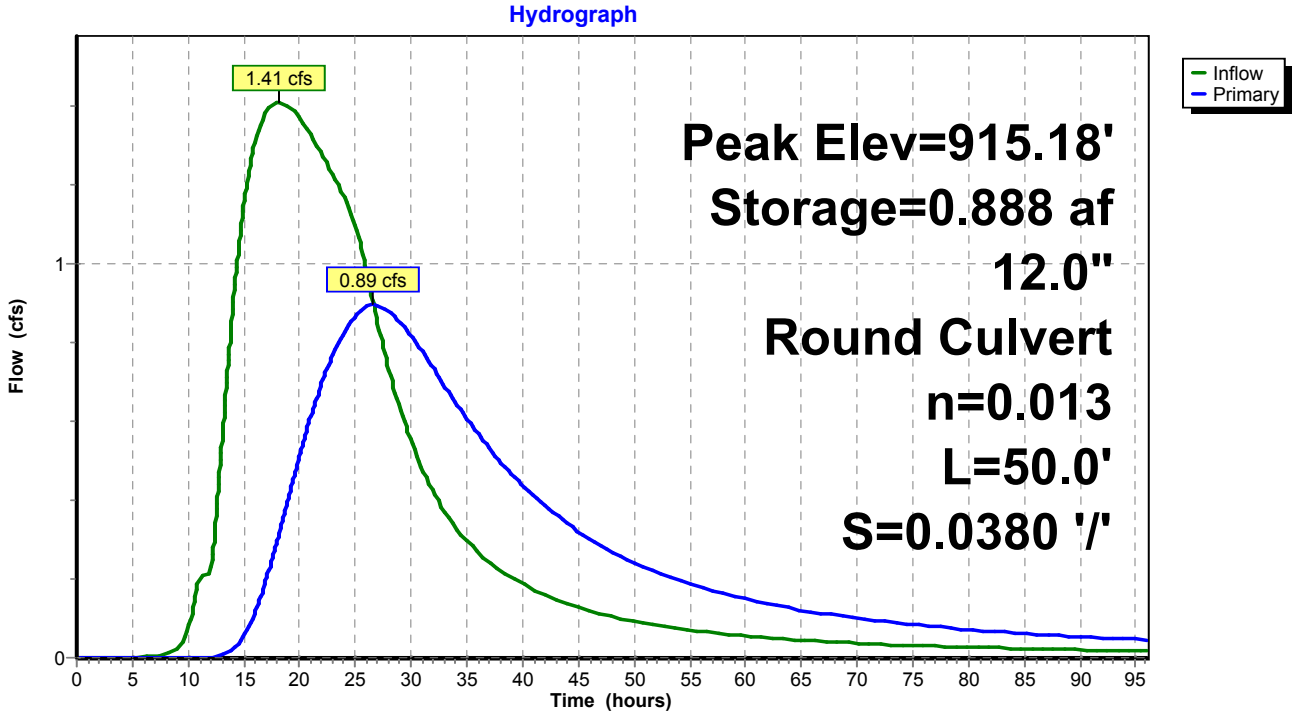
Volume	Invert	Avail.Storage	Storage Description
#1	914.75'	2.680 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
914.75	2.040	0.000	0.000
915.00	2.080	0.515	0.515
916.00	2.250	2.165	2.680

Device	Routing	Invert	Outlet Devices
#1	Primary	914.75'	**12.0" Round RCP_Round 12"** L= 50.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 914.75' / 912.85' S= 0.0380 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=0.89 cfs @ 26.63 hrs HW=915.18' (Free Discharge)
↑—**1=RCP_Round 12"** (Inlet Controls 0.89 cfs @ 2.78 fps)

Pond W-3: W-3


Hydrograph
1.41 cfs
0.89 cfs
Peak Elev=915.18'
Storage=0.888 af
12.0"
Round Culvert
n=0.013
L=50.0'
S=0.0380 '/'
Inflow
Primary
Flow (cfs)
Time (hours)
0
1
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95

Summary for Pond W-4: W-4

[79] Warning: Submerged Pond 11P Secondary device # 5 INLET by 0.26'

Inflow Area = 2.980 ac, 26.17% Impervious, Inflow Depth > 20.71" for 100-Year event
Inflow = 21.33 cfs @ 12.08 hrs, Volume= 5.142 af
Outflow = 4.12 cfs @ 15.51 hrs, Volume= 5.110 af, Atten= 81%, Lag= 206.1 min
Primary = 4.12 cfs @ 15.51 hrs, Volume= 5.110 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Peak Elev= 909.26' @ 15.51 hrs Surf.Area= 1.233 ac Storage= 1.268 af

Plug-Flow detention time= 258.6 min calculated for 5.109 af (99% of inflow)
Center-of-Mass det. time= 239.0 min (1,290.5 - 1,051.5)

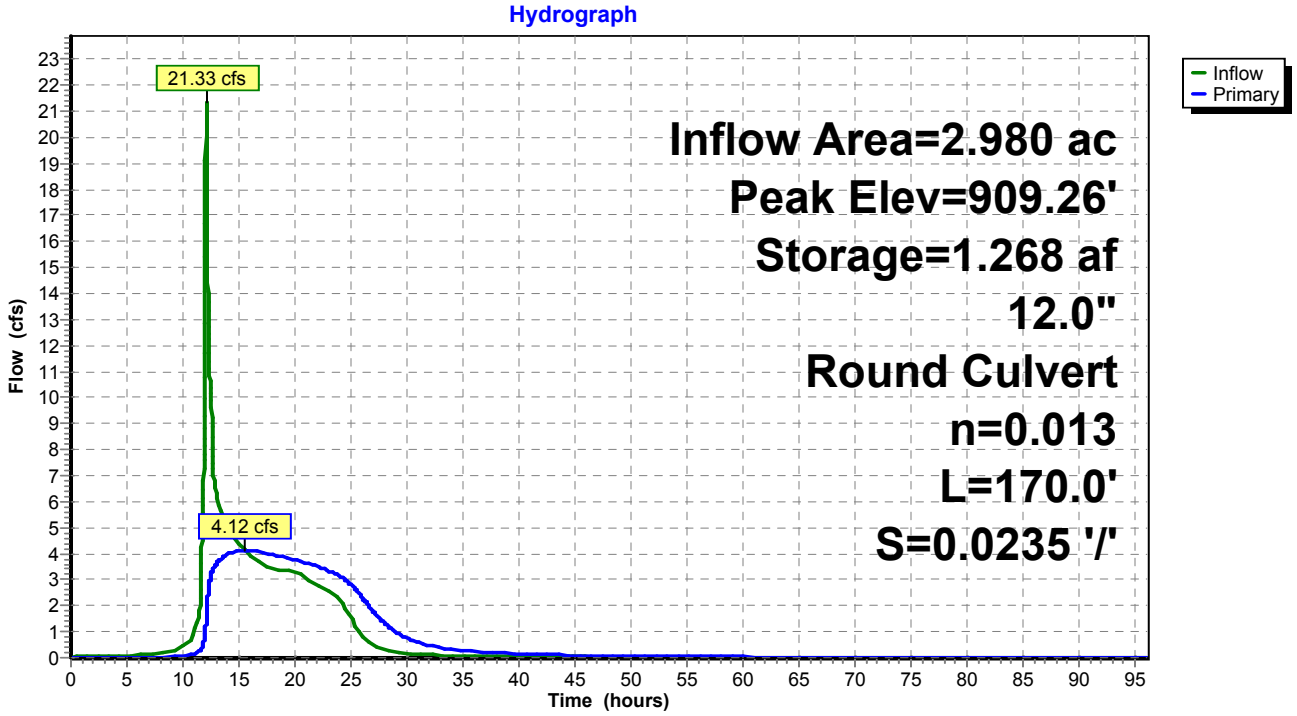
Volume	Invert	Avail.Storage	Storage Description
#1	908.00'	2.280 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
908.00	0.780	0.000	0.000
910.00	1.500	2.280	2.280

Device	Routing	Invert	Outlet Devices
#1	Primary	908.00'	**12.0" Round RCP_Round 12"** L= 170.0' RCP, groove end w/headwall, Ke= 0.200 Inlet / Outlet Invert= 908.00' / 904.00' S= 0.0235 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=4.12 cfs @ 15.51 hrs HW=909.26' (Free Discharge)
↑—**1=RCP_Round 12"** (Inlet Controls 4.12 cfs @ 5.24 fps)

Pond W-4: W-4


Hydrograph
Inflow
Primary
21.33 cfs
4.12 cfs
Inflow Area=2.980 ac
Peak Elev=909.26'
Storage=1.268 af
12.0"
Round Culvert
n=0.013
L=170.0'
S=0.0235 '/'
Flow (cfs)
Time (hours)
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95

Summary for Pond W-5: W-5

[79] Warning: Submerged Pond 13P Secondary device # 2 INLET by 0.30'
[79] Warning: Submerged Pond 13P Secondary device # 3 INLET by 0.30'
[79] Warning: Submerged Pond 13P Secondary device # 4 INLET by 0.30'
[79] Warning: Submerged Pond 13P Secondary device # 5 INLET by 0.30'
[79] Warning: Submerged Pond 13P Secondary device # 6 INLET by 0.30'

Inflow Area = 7.608 ac, 48.41% Impervious, Inflow Depth = 12.39" for 100-Year event
Inflow = 73.57 cfs @ 12.02 hrs, Volume= 7.854 af
Outflow = 15.85 cfs @ 13.13 hrs, Volume= 7.850 af, Atten= 78%, Lag= 66.6 min
Primary = 15.85 cfs @ 13.13 hrs, Volume= 7.850 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Starting Elev= 882.75' Surf.Area= 4.910 ac Storage= 3.412 af
Peak Elev= 883.30' @ 13.13 hrs Surf.Area= 5.645 ac Storage= 6.306 af (2.894 af above start)

Plug-Flow detention time= 536.9 min calculated for 4.438 af (56% of inflow)
Center-of-Mass det. time= 196.1 min (1,033.8 - 837.6)

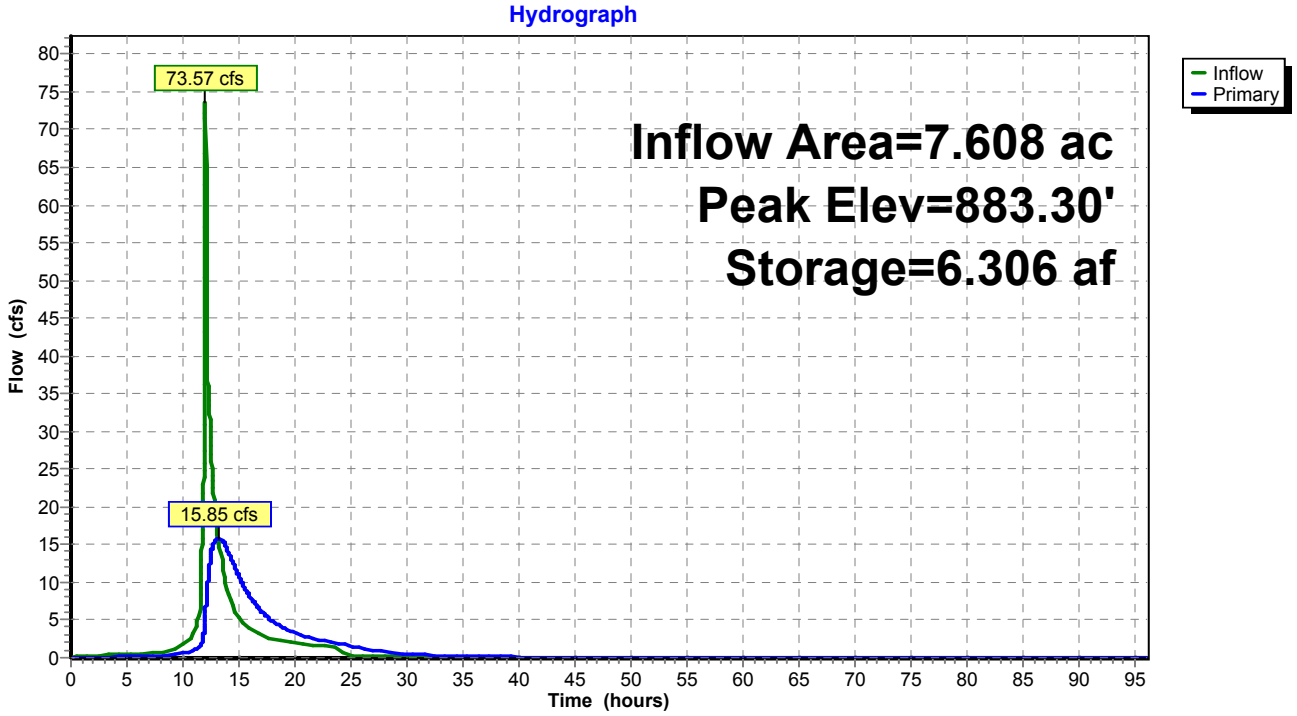
Volume	Invert	Avail.Storage	Storage Description
#1	882.00'	7.390 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
882.00	4.190	0.000	0.000
883.00	5.150	4.670	4.670
883.49	5.950	2.720	7.390

Device	Routing	Invert	Outlet Devices
#1	Primary	882.75'	**6.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#2	Primary	882.75'	**6.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=15.84 cfs @ 13.13 hrs HW=883.30' (Free Discharge)
└─**1=Sharp-Crested Rectangular Weir** (Weir Controls 7.92 cfs @ 2.43 fps)
└─**2=Sharp-Crested Rectangular Weir** (Weir Controls 7.92 cfs @ 2.43 fps)

Pond W-5: W-5


Hydrograph
Inflow
Primary
73.57 cfs
15.85 cfs
Inflow Area=7.608 ac
Peak Elev=883.30'
Storage=6.306 af
Flow (cfs)
Time (hours)
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
75
80
85
90
95

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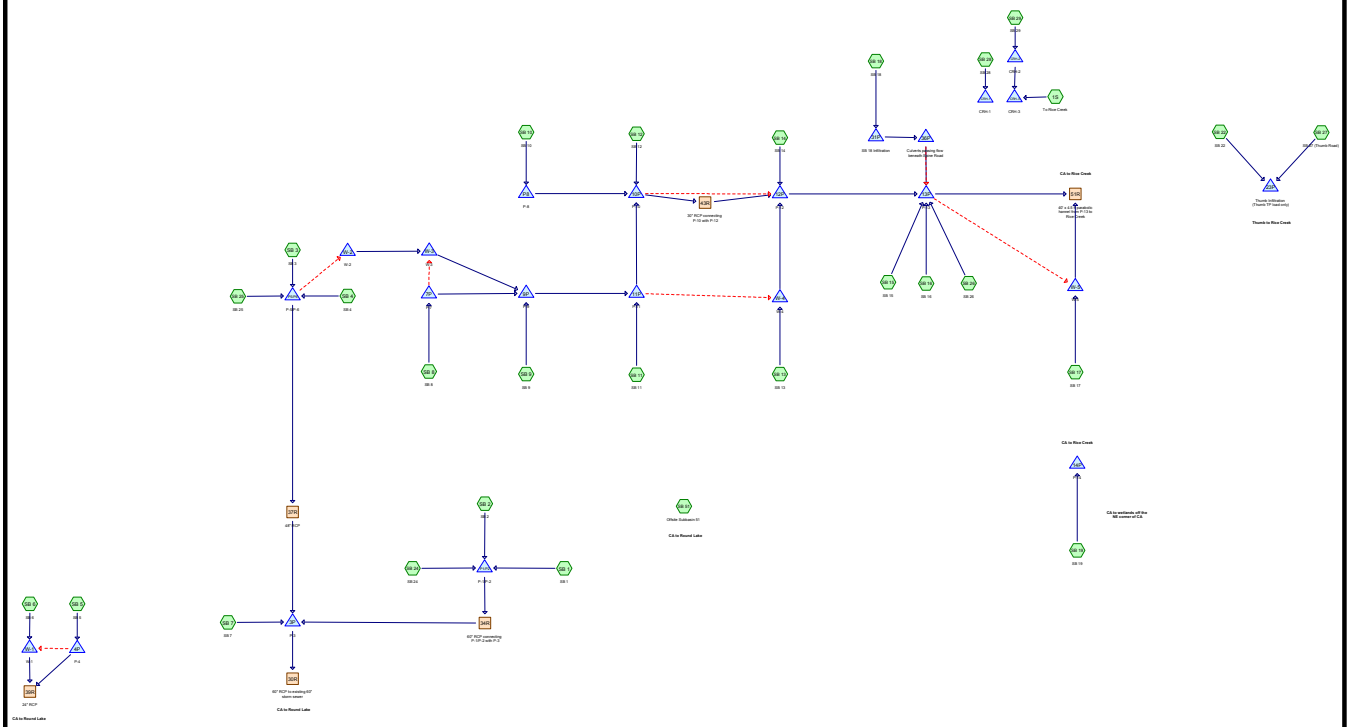
Appendix C

Fully Developed Conditions
Hydrology and Hydraulics Modeling (HydroCAD)



Subcat Reach Pond Link

Routing Diagram for Full Buildout_HydroCAD_20150612 Grading Plan Model

Prepared by Wenck Associates, Inc., Printed 6/16/2015

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
5.038	98	(SB 51)
56.502	98	Impervious (SB 22, SB 27, SB 3)
20.200	65	Offsite subbasin 51 (SB 51)
7.656	49	Pervious (SB 22, SB 27)
22.050	74	Pervious (SB 3)
13.406	98	impermiable (SB 24, SB 9)
191.729	98	impervious (1S, SB 1, SB 10, SB 12, SB 14, SB 15, SB 16, SB 18, SB 19, SB 2, SB 25, SB 26, SB 28, SB 29, SB 5, SB 7, SB 8)
6.029	100	impervious (SB 11, SB 13, SB 17, SB 4, SB 6)
17.322	74	permiable (SB 24, SB 9)
161.530	74	pervious (1S, SB 1, SB 10, SB 11, SB 12, SB 13, SB 14, SB 15, SB 16, SB 17, SB 18, SB 19, SB 2, SB 25, SB 26, SB 28, SB 29, SB 4, SB 5, SB 6, SB 7, SB 8)
501.462	**86**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
0.000	HSG C	
0.000	HSG D	
501.462	Other	1S, SB 1, SB 10, SB 11, SB 12, SB 13, SB 14, SB 15, SB 16, SB 17, SB 18, SB 19, SB 2, SB 22, SB 24, SB 25, SB 26, SB 27, SB 28, SB 29, SB 3, SB 4, SB 5, SB 51, SB 6, SB 7, SB 8, SB 9
501.462		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.000	0.000	0.000	5.038	5.038		SB 51
0.000	0.000	0.000	0.000	56.502	56.502	Impervious	SB 22, SB 27, SB 3
0.000	0.000	0.000	0.000	20.200	20.200	Offsite subbasin 51	SB 51
0.000	0.000	0.000	0.000	29.706	29.706	Pervious	SB 22, SB 27, SB 3
0.000	0.000	0.000	0.000	13.406	13.406	impermiable	SB 24, SB 9
0.000	0.000	0.000	0.000	197.758	197.758	impervious	1S, SB 1, SB 10, SB 11, SB 12, SB 13, SB 14, SB 15, SB 16, SB 17, SB 18, SB 19, SB 2, SB 25, SB 26, SB 28, SB 29, SB 4, SB 5, SB 6, SB 7, SB 8
0.000	0.000	0.000	0.000	17.322	17.322	permiable	SB 24, SB 9
0.000	0.000	0.000	0.000	161.530	161.530	pervious	1S, SB 1, SB 10, SB 11, SB 12, SB 13, SB 14, SB 15, SB 16, SB 17, SB 18, SB 19, SB 2, SB 25, SB 26, SB 28, SB 29, SB 4, SB 5, SB 6, SB 7, SB 8
0.000	**0.000**	**0.000**	**0.000**	**501.462**	**501.462**	**TOTAL AREA**	

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	30R	0.00	-3.40	400.0	0.0085	0.013	60.0	0.0	0.0
2	34R	0.00	-10.75	2,150.0	0.0050	0.013	60.0	0.0	0.0
3	37R	0.00	-1.44	240.0	0.0060	0.013	48.0	0.0	0.0
4	39R	0.00	-0.45	90.0	0.0050	0.013	24.0	0.0	0.0
5	43R	896.00	893.23	750.0	0.0037	0.013	30.0	0.0	0.0
6	4P	915.80	915.95	50.0	-0.0030	0.013	24.0	0.0	0.0
7	7P	915.00	914.75	50.0	0.0050	0.130	12.0	0.0	0.0
8	11P	910.00	909.00	200.0	0.0050	0.013	24.0	0.0	0.0
9	11P	910.00	909.00	200.0	0.0050	0.013	24.0	0.0	0.0
10	11P	909.00	908.00	150.0	0.0067	0.013	12.0	0.0	0.0
11	12P	893.50	893.35	30.0	0.0050	0.013	43.8	26.6	0.0
12	12P	893.50	893.35	30.0	0.0050	0.013	43.8	26.6	0.0
13	12P	893.50	893.35	30.0	0.0050	0.013	43.8	26.6	0.0
14	12P	893.50	893.35	30.0	0.0050	0.013	43.8	26.6	0.0
15	13P	883.00	882.75	100.0	0.0025	0.013	12.0	0.0	0.0
16	13P	883.00	882.75	100.0	0.0025	0.013	12.0	0.0	0.0
17	13P	883.00	882.75	100.0	0.0025	0.013	12.0	0.0	0.0
18	13P	883.00	882.75	100.0	0.0025	0.013	12.0	0.0	0.0
19	13P	883.00	882.75	100.0	0.0025	0.013	12.0	0.0	0.0
20	14P	893.00	892.75	50.0	0.0050	0.013	18.0	0.0	0.0
21	36P	887.50	886.50	100.0	0.0100	0.013	18.0	0.0	0.0
22	36P	887.50	886.50	100.0	0.0100	0.013	18.0	0.0	0.0
23	36P	887.50	886.50	100.0	0.0100	0.013	18.0	0.0	0.0
24	36P	887.50	886.50	100.0	0.0100	0.013	18.0	0.0	0.0
25	36P	887.50	886.50	100.0	0.0100	0.013	18.0	0.0	0.0
26	36P	887.50	886.50	100.0	0.0100	0.013	18.0	0.0	0.0
27	36P	887.50	886.50	100.0	0.0100	0.013	18.0	0.0	0.0
28	36P	887.50	886.50	100.0	0.0100	0.013	18.0	0.0	0.0
29	CRH-1	877.00	876.00	155.0	0.0065	0.013	24.0	0.0	0.0
30	CRH-1	877.00	876.00	155.0	0.0065	0.013	24.0	0.0	0.0
31	CRH-2	881.50	881.00	155.0	0.0032	0.013	24.0	0.0	0.0
32	CRH-2	881.50	881.00	155.0	0.0032	0.013	24.0	0.0	0.0
33	CRH-3	878.00	877.00	155.0	0.0065	0.013	24.0	0.0	0.0
34	CRH-3	878.00	877.00	155.0	0.0065	0.013	24.0	0.0	0.0
35	P8	897.00	895.94	380.0	0.0028	0.013	24.0	0.0	0.0
36	W-2	929.10	916.00	300.0	0.0437	0.013	12.0	0.0	0.0
37	W-3	914.75	912.85	50.0	0.0380	0.013	12.0	0.0	0.0
38	W-4	908.00	904.00	170.0	0.0235	0.013	12.0	0.0	0.0

Time span=0.00-96.00 hrs, dt=0.01 hrs, 9601 points
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious
Reach routing by Muskingum-Cunge method - Pond routing by Stor-Ind method

Subcatchment1S: To Rice Creek Runoff Area=1.601 ac 31.98% Impervious Runoff Depth=1.37"
Tc=5.7 min CN=74/98 Runoff=2.97 cfs 0.183 af

SubcatchmentSB 1: SB 1 Runoff Area=52.192 ac 48.35% Impervious Runoff Depth=1.66"
Tc=53.1 min CN=74/98 Runoff=44.04 cfs 7.233 af

SubcatchmentSB 10: SB 10 Runoff Area=6.389 ac 7.62% Impervious Runoff Depth=0.93"
Tc=7.3 min CN=74/98 Runoff=7.36 cfs 0.497 af

SubcatchmentSB 11: SB 11 Runoff Area=3.293 ac 32.16% Impervious Runoff Depth=1.45"
Tc=11.7 min CN=74/100 Runoff=4.75 cfs 0.397 af

SubcatchmentSB 12: SB 12 Runoff Area=1.382 ac 38.71% Impervious Runoff Depth=1.49"
Tc=9.5 min CN=74/98 Runoff=2.34 cfs 0.172 af

SubcatchmentSB 13: SB 13 Runoff Area=2.985 ac 30.99% Impervious Runoff Depth=1.42"
Tc=9.4 min CN=74/100 Runoff=4.64 cfs 0.354 af

SubcatchmentSB 14: SB 14 Runoff Area=10.225 ac 42.62% Impervious Runoff Depth=1.56"
Tc=4.3 min CN=74/98 Runoff=23.23 cfs 1.330 af

SubcatchmentSB 15: SB 15 Runoff Area=58.564 ac 48.22% Impervious Runoff Depth=1.66"
Tc=31.3 min CN=74/98 Runoff=64.93 cfs 8.104 af

SubcatchmentSB 16: SB 16 Runoff Area=32.428 ac 33.53% Impervious Runoff Depth=1.40"
Tc=12.1 min CN=74/98 Runoff=46.47 cfs 3.776 af

SubcatchmentSB 17: SB 17 Runoff Area=7.608 ac 48.41% Impervious Runoff Depth=1.78"
Tc=4.3 min CN=74/100 Runoff=18.70 cfs 1.126 af

SubcatchmentSB 18: SB 18 Runoff Area=52.908 ac 84.55% Impervious Runoff Depth=2.31"
Tc=33.5 min CN=74/98 Runoff=79.77 cfs 10.194 af

SubcatchmentSB 19: SB 19 Runoff Area=21.198 ac 39.93% Impervious Runoff Depth=1.51"
Tc=24.7 min CN=74/98 Runoff=23.92 cfs 2.671 af

SubcatchmentSB 2: SB 2 Runoff Area=11.400 ac 84.29% Impervious Runoff Depth=2.31"
Tc=16.6 min CN=74/98 Runoff=23.93 cfs 2.192 af

SubcatchmentSB 22: SB 22 Runoff Area=41.911 ac 82.19% Impervious Runoff Depth=2.14"
Tc=41.0 min CN=49/98 Runoff=52.40 cfs 7.462 af

SubcatchmentSB 24: SB 24 Runoff Area=4.939 ac 98.22% Impervious Runoff Depth=2.56"
Tc=7.5 min CN=74/98 Runoff=16.07 cfs 1.052 af

SubcatchmentSB 25: SB 25 Runoff Area=5.012 ac 95.71% Impervious Runoff Depth=2.51"
Tc=10.7 min CN=74/98 Runoff=13.90 cfs 1.049 af

Subcatchment SB 26: SB 26 Runoff Area=14.335 ac 98.27% Impervious Runoff Depth=2.56"
Tc=25.4 min CN=74/98 Runoff=27.53 cfs 3.056 af

Subcatchment SB 27: SB 27 (Thumb Road) Runoff Area=6.629 ac 97.12% Impervious Runoff Depth=2.52"
Tc=27.6 min CN=49/98 Runoff=12.02 cfs 1.390 af

Subcatchment SB 28: SB 28 Runoff Area=6.955 ac 46.76% Impervious Runoff Depth=1.63"
Tc=14.6 min CN=74/98 Runoff=10.87 cfs 0.947 af

Subcatchment SB 29: SB 29 Runoff Area=10.214 ac 37.73% Impervious Runoff Depth=1.47"
Tc=19.1 min CN=74/98 Runoff=12.67 cfs 1.253 af

Subcatchment SB 3: SB 3 Runoff Area=37.668 ac 41.46% Impervious Runoff Depth=1.54"
Tc=15.3 min CN=74/98 Runoff=54.30 cfs 4.833 af

Subcatchment SB 4: SB 4 Runoff Area=0.599 ac 19.70% Impervious Runoff Depth=1.19"
Tc=5.9 min CN=74/100 Runoff=0.93 cfs 0.060 af

Subcatchment SB 5: SB 5 Runoff Area=7.853 ac 70.37% Impervious Runoff Depth=2.06"
Tc=59.3 min CN=74/98 Runoff=7.70 cfs 1.347 af

Subcatchment SB 51: Offsite Subbasin 51 Runoff Area=25.238 ac 19.96% Impervious Runoff Depth=0.86"
Tc=17.7 min CN=65/98 Runoff=16.36 cfs 1.805 af

Subcatchment SB 6: SB 6 Runoff Area=0.997 ac 24.47% Impervious Runoff Depth=1.29"
Tc=20.3 min CN=74/100 Runoff=1.01 cfs 0.107 af

Subcatchment SB 7: SB 7 Runoff Area=21.555 ac 84.83% Impervious Runoff Depth=2.32"
Tc=5.7 min CN=74/98 Runoff=68.54 cfs 4.162 af

Subcatchment SB 8: SB 8 Runoff Area=29.595 ac 30.01% Impervious Runoff Depth=1.33"
Tc=47.1 min CN=74/98 Runoff=21.21 cfs 3.290 af

Subcatchment SB 9: SB 9 Runoff Area=25.789 ac 33.17% Impervious Runoff Depth=1.39"
Tc=30.0 min CN=74/98 Runoff=24.30 cfs 2.989 af

Reach 30R: 60" RCP to existing 60" Avg. Flow Depth=1.23' Max Vel=12.40 fps Inflow=46.57 cfs 17.779 af
60.0" Round Pipe n=0.013 L=400.0' S=0.0085 '/' Capacity=240.12 cfs Outflow=46.57 cfs 17.779 af

Reach 34R: 60" RCP connecting Avg. Flow Depth=1.51' Max Vel=10.94 fps Inflow=52.67 cfs 10.473 af
60.0" Round Pipe n=0.013 L=2,150.0' S=0.0050 '/' Capacity=184.16 cfs Outflow=52.64 cfs 10.473 af

Reach 37R: 48" RCP Avg. Flow Depth=0.51' Max Vel=6.09 fps Inflow=5.61 cfs 3.148 af
48.0" Round Pipe n=0.013 L=240.0' S=0.0060 '/' Capacity=111.27 cfs Outflow=5.61 cfs 3.148 af

Reach 39R: 24" RCP Avg. Flow Depth=0.50' Max Vel=5.22 fps Inflow=3.24 cfs 1.454 af
24.0" Round Pipe n=0.013 L=90.0' S=0.0050 '/' Capacity=16.00 cfs Outflow=3.24 cfs 1.454 af

Reach 43R: 30" RCP connecting P-10 Avg. Flow Depth=0.95' Max Vel=6.42 fps Inflow=10.95 cfs 5.792 af
30.0" Round Pipe n=0.013 L=750.0' S=0.0037 '/' Capacity=24.93 cfs Outflow=10.95 cfs 5.792 af

Reach 51R: 40' x 4.5 ft parabolic Avg. Flow Depth=1.88' Max Vel=5.20 fps Inflow=167.98 cfs 32.167 af
n=0.035 L=300.0' S=0.0050 '/' Capacity=733.43 cfs Outflow=167.86 cfs 32.167 af

Pond 3P: P-3 Peak Elev=916.51' Storage=10.988 af Inflow=85.65 cfs 17.783 af
Outflow=46.57 cfs 17.779 af

Pond 4P: P-4 Peak Elev=916.23' Storage=1.024 af Inflow=7.70 cfs 1.347 af
Primary=1.51 cfs 0.478 af Secondary=2.36 cfs 0.869 af Outflow=3.87 cfs 1.347 af

Pond 7P: P-7 Peak Elev=915.78' Storage=1.440 af Inflow=21.21 cfs 3.290 af
Primary=21.00 cfs 2.673 af Secondary=0.21 cfs 0.537 af Outflow=21.21 cfs 3.210 af

Pond 9P: P-9 Peak Elev=915.35' Storage=0.439 af Inflow=41.79 cfs 6.563 af
Outflow=41.73 cfs 6.562 af

Pond 10P: P-10 Peak Elev=897.47' Storage=1.169 af Inflow=13.95 cfs 5.875 af
Primary=10.95 cfs 5.792 af Secondary=2.02 cfs 0.076 af Outflow=12.98 cfs 5.868 af

Pond 11P: P-11 Peak Elev=910.89' Storage=6.133 af Inflow=43.52 cfs 6.960 af
Primary=12.65 cfs 5.208 af Secondary=3.57 cfs 1.734 af Outflow=16.21 cfs 6.942 af

Pond 12P: P-12 Peak Elev=893.84' Storage=6.501 af Inflow=24.45 cfs 9.256 af
Outflow=12.13 cfs 9.236 af

Pond 13P: P-13 Peak Elev=884.08' Storage=6.489 af Inflow=197.48 cfs 31.047 af
Primary=164.94 cfs 29.623 af Secondary=10.37 cfs 1.419 af Outflow=175.31 cfs 31.042 af

Pond 14P: P-14 Peak Elev=892.95' Storage=5.835 af Inflow=23.92 cfs 2.671 af
Outflow=3.68 cfs 2.671 af

Pond 23P: Thumb Infiltration (Thumb TP Peak Elev=903.81' Storage=3.809 af Inflow=62.51 cfs 8.852 af
Outflow=61.28 cfs 5.112 af

Pond 31P: SB 18 Infiltration Peak Elev=903.40' Storage=3.403 af Inflow=79.77 cfs 10.194 af
Outflow=79.68 cfs 6.874 af

Pond 36P: Culverts passing flow beneath Peak Elev=887.32' Storage=0.000 af Inflow=79.68 cfs 6.874 af
Primary=79.71 cfs 6.874 af Secondary=0.00 cfs 0.000 af Outflow=79.71 cfs 6.874 af

Pond CRH-1: CRH-1 Peak Elev=877.67' Storage=0.356 af Inflow=10.87 cfs 0.947 af
Discarded=0.22 cfs 0.467 af Primary=4.63 cfs 0.480 af Outflow=4.86 cfs 0.947 af

Pond CRH-2: CRH-2 Peak Elev=882.05' Storage=0.620 af Inflow=12.67 cfs 1.253 af
Discarded=0.33 cfs 0.826 af Primary=2.36 cfs 0.427 af Outflow=2.69 cfs 1.253 af

Pond CRH-3: CRH-3 Peak Elev=878.31' Storage=0.262 af Inflow=2.97 cfs 0.610 af
Discarded=0.20 cfs 0.378 af Primary=1.02 cfs 0.232 af Outflow=1.22 cfs 0.610 af

Pond P1/P2: P-1/P-2 Peak Elev=924.94' Storage=4.759 af Inflow=54.34 cfs 10.477 af
Outflow=52.67 cfs 10.473 af

Pond P5/P6: P-5/P-6 Peak Elev=930.72' Storage=8.829 af Inflow=66.74 cfs 5.941 af
Primary=5.61 cfs 3.148 af Secondary=1.26 cfs 0.685 af Outflow=6.87 cfs 3.834 af

Pond P8: P-8 Peak Elev=897.61' Storage=0.706 af Inflow=7.36 cfs 0.497 af
24.0" Round Culvert n=0.013 L=380.0' S=0.0028 '/' Outflow=1.39 cfs 0.495 af

Pond W-1: W-1 Peak Elev=915.09' Storage=0.235 af Inflow=2.47 cfs 0.976 af
Outflow=2.05 cfs 0.976 af

Pond W-2: W-2 Peak Elev=929.37' Storage=0.413 af Inflow=1.26 cfs 0.685 af
12.0" Round Culvert n=0.013 L=300.0' S=0.0437 '/' Outflow=0.37 cfs 0.540 af

Pond W-3: W-3 Peak Elev=914.98' Storage=0.483 af Inflow=0.58 cfs 1.078 af
12.0" Round Culvert n=0.013 L=50.0' S=0.0380 '/' Outflow=0.29 cfs 0.901 af

Pond W-4: W-4 Peak Elev=908.81' Storage=0.752 af Inflow=5.02 cfs 2.088 af
12.0" Round Culvert n=0.013 L=170.0' S=0.0235 '/' Outflow=2.62 cfs 2.058 af

Pond W-5: W-5 Peak Elev=882.98' Storage=8.292 af Inflow=20.49 cfs 2.545 af
Outflow=4.35 cfs 2.544 af

Total Runoff Area = 501.462 ac Runoff Volume = 73.031 af Average Runoff Depth = 1.75"
45.62% Pervious = 228.758 ac 54.38% Impervious = 272.704 ac

Summary for Subcatchment 1S: To Rice Creek

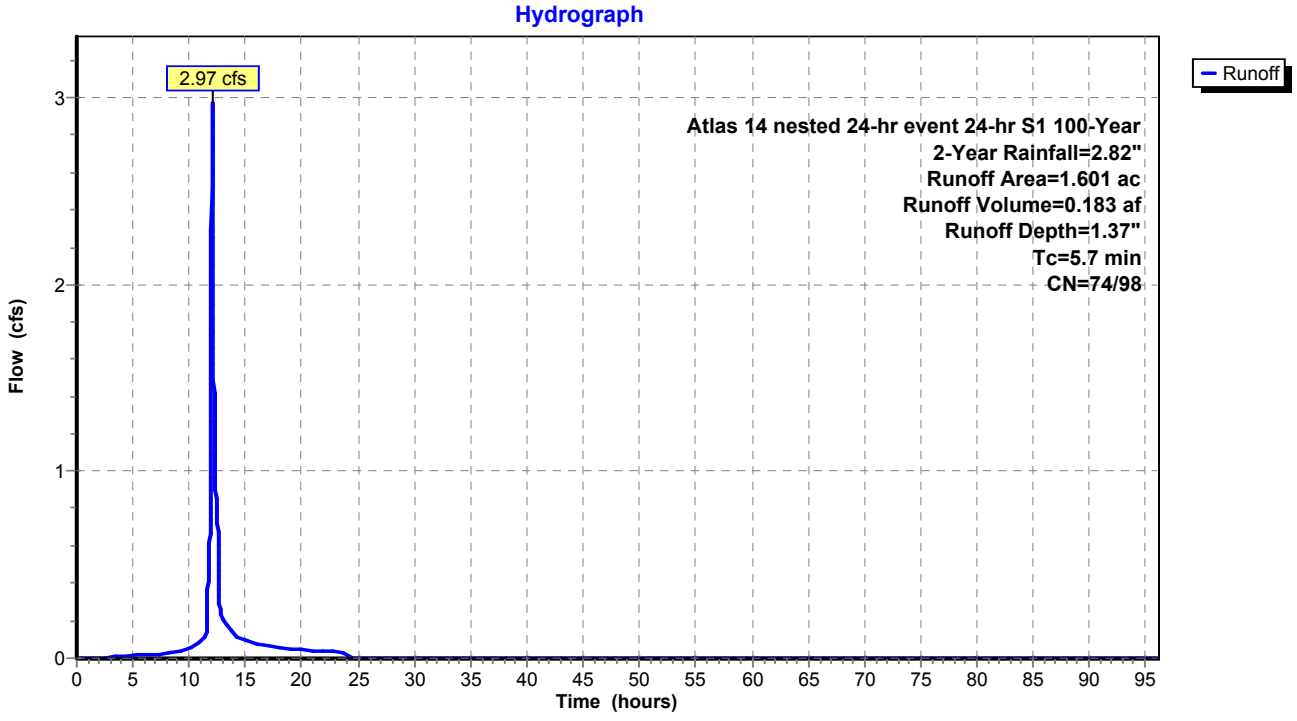
Runoff = 2.97 cfs @ 12.04 hrs, Volume= 0.183 af, Depth= 1.37"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 2-Year Rainfall=2.82"

	Area (ac)	CN	Description
*	0.512	98	impervious
*	1.089	74	pervious
	1.601	82	Weighted Average
	1.089	74	68.02% Pervious Area
	0.512	98	31.98% Impervious Area

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

Subcatchment 1S: To Rice Creek



Summary for Subcatchment SB 1: SB 1

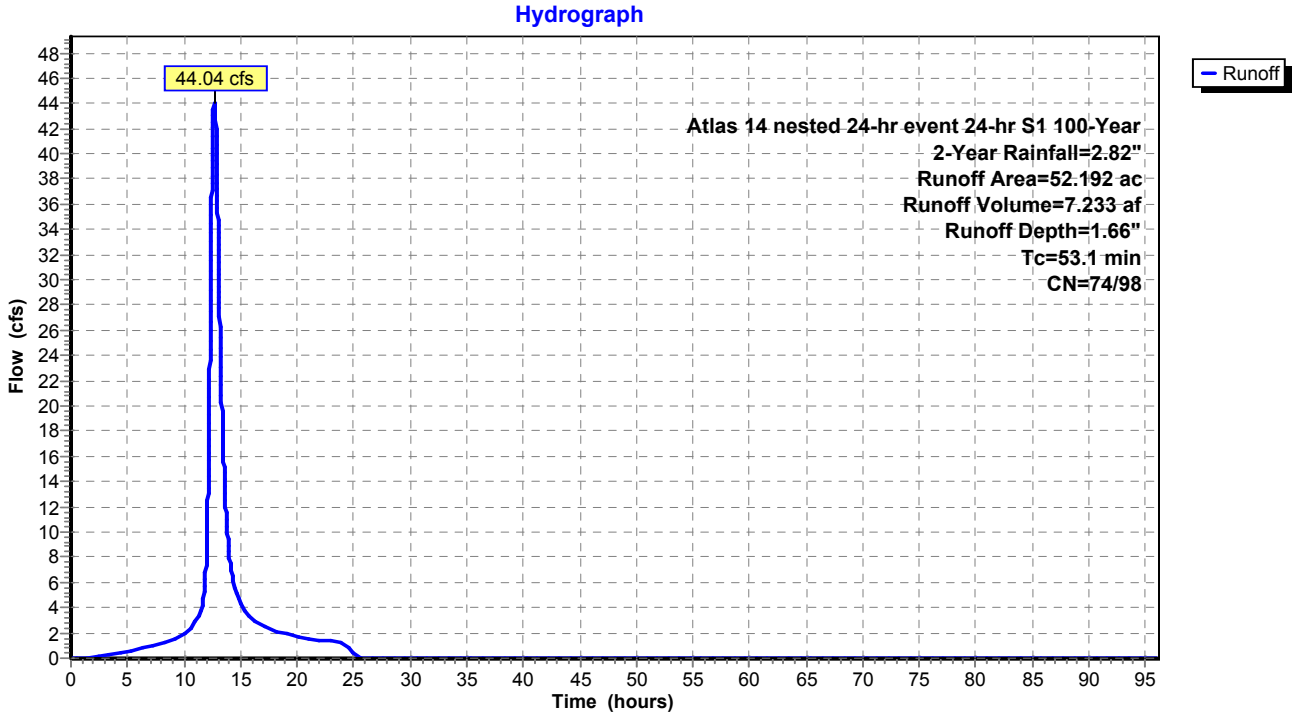
Runoff = 44.04 cfs @ 12.69 hrs, Volume= 7.233 af, Depth= 1.66"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 2-Year Rainfall=2.82"

	Area (ac)	CN	Description
*	26.958	74	pervious
*	25.234	98	impervious
	52.192	86	Weighted Average
	26.958	74	51.65% Pervious Area
	25.234	98	48.35% Impervious Area

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

Subcatchment SB 1: SB 1



Summary for Subcatchment SB 10: SB 10

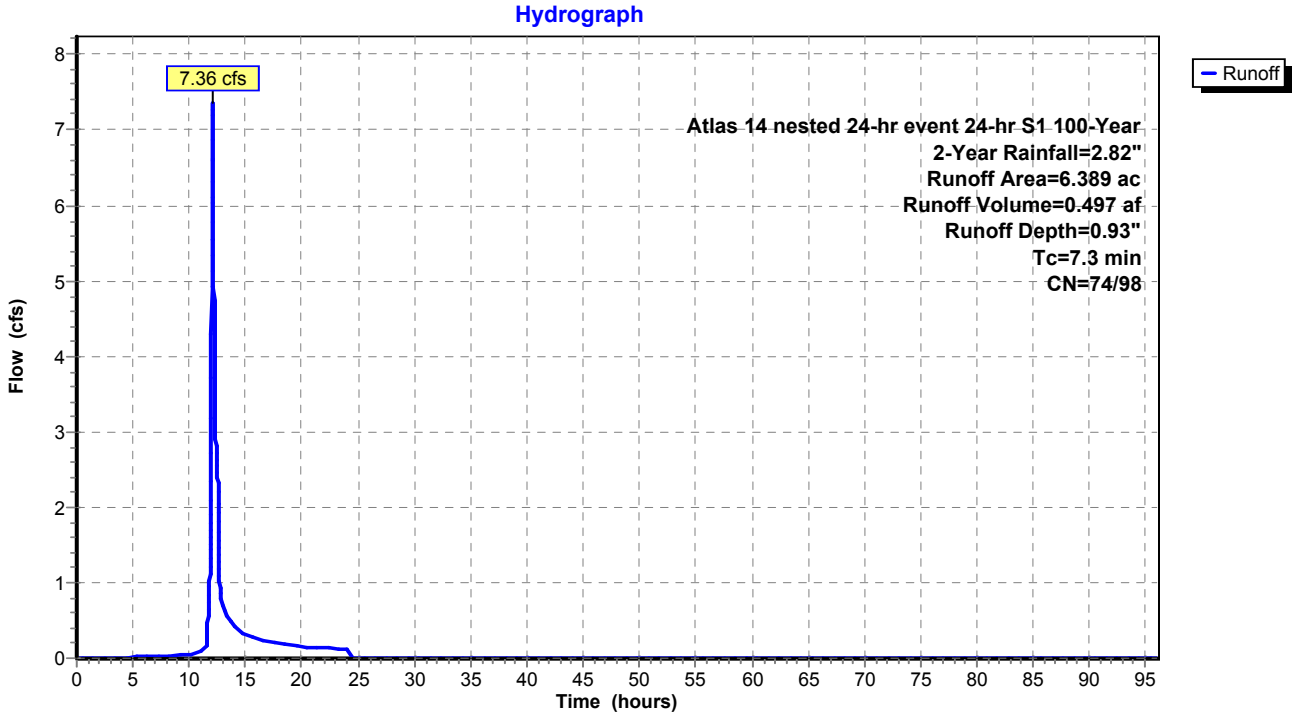
Runoff = 7.36 cfs @ 12.06 hrs, Volume= 0.497 af, Depth= 0.93"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 2-Year Rainfall=2.82"

	Area (ac)	CN	Description
*	5.902	74	pervious
*	0.487	98	impervious
	6.389	76	Weighted Average
	5.902	74	92.38% Pervious Area
	0.487	98	7.62% Impervious Area

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

Subcatchment SB 10: SB 10



Summary for Subcatchment SB 11: SB 11

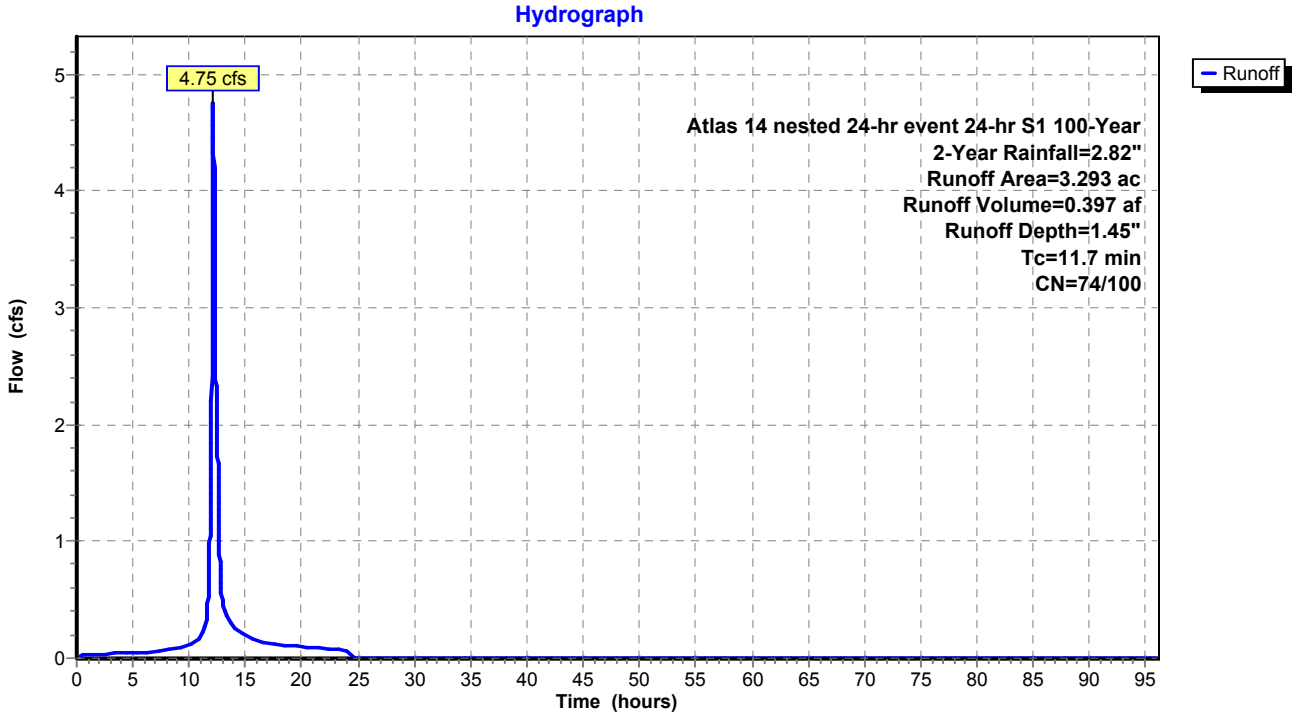
Runoff = 4.75 cfs @ 12.12 hrs, Volume= 0.397 af, Depth= 1.45"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 2-Year Rainfall=2.82"

	Area (ac)	CN	Description
*	2.234	74	pervious
*	1.059	100	impervious
	3.293	82	Weighted Average
	2.234	74	67.84% Pervious Area
	1.059	100	32.16% Impervious Area

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

Subcatchment SB 11: SB 11



Summary for Subcatchment SB 12: SB 12

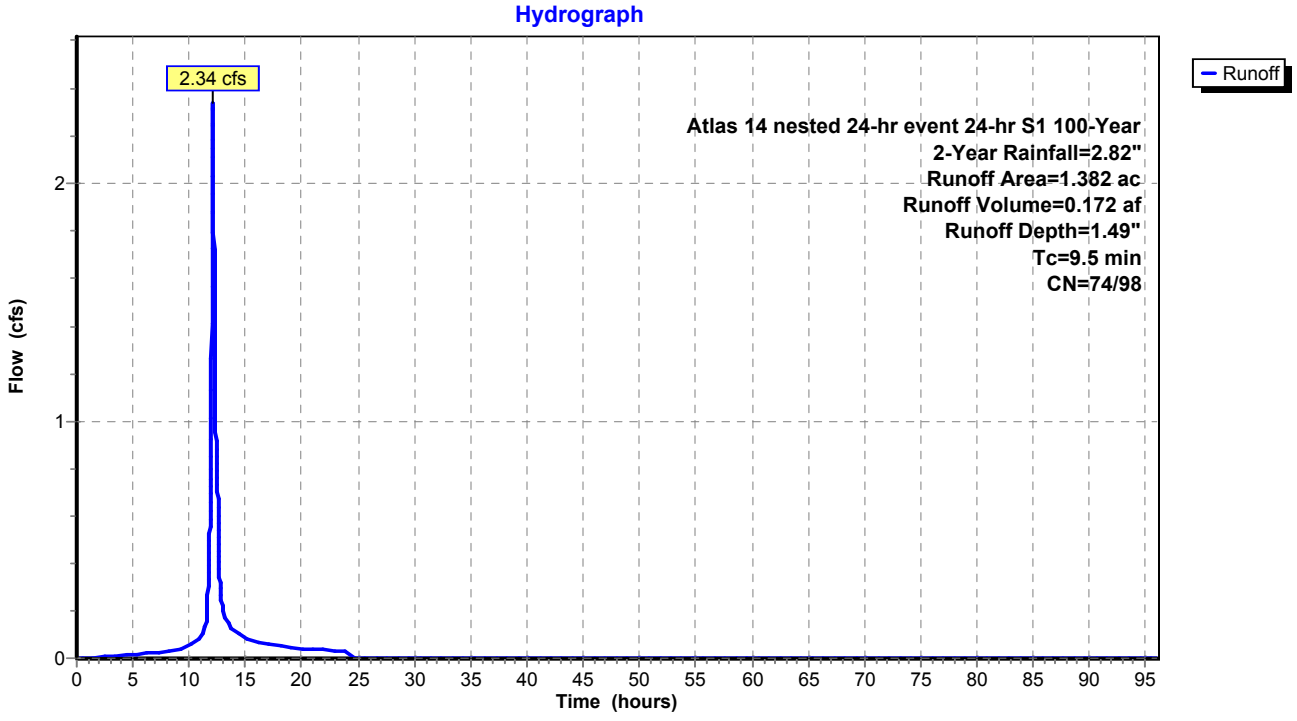
Runoff = 2.34 cfs @ 12.08 hrs, Volume= 0.172 af, Depth= 1.49"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 2-Year Rainfall=2.82"

	Area (ac)	CN	Description
*	0.847	74	pervious
*	0.535	98	impervious
	1.382	83	Weighted Average
	0.847	74	61.29% Pervious Area
	0.535	98	38.71% Impervious Area

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

Subcatchment SB 12: SB 12



Summary for Subcatchment SB 13: SB 13

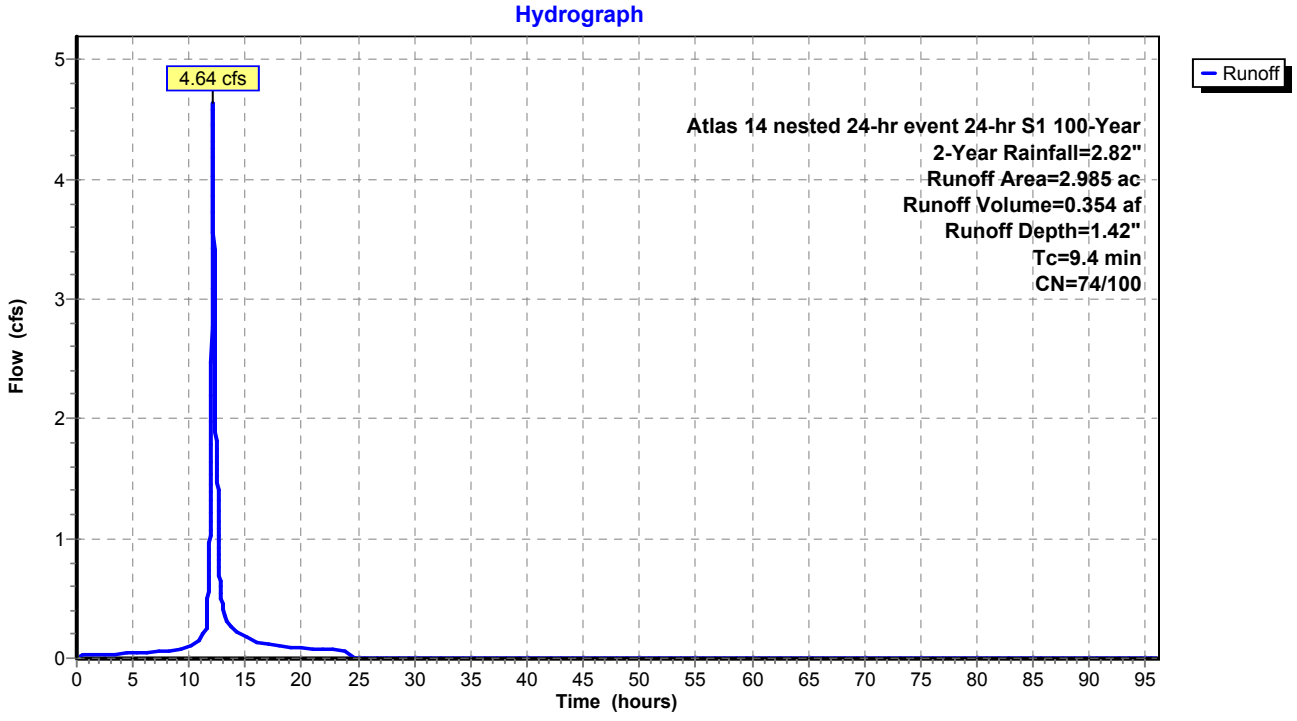
Runoff = 4.64 cfs @ 12.08 hrs, Volume= 0.354 af, Depth= 1.42"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 2-Year Rainfall=2.82"

	Area (ac)	CN	Description
*	2.060	74	pervious
*	0.925	100	impervious
	2.985	82	Weighted Average
	2.060	74	69.01% Pervious Area
	0.925	100	30.99% Impervious Area

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

Subcatchment SB 13: SB 13



Summary for Subcatchment SB 14: SB 14

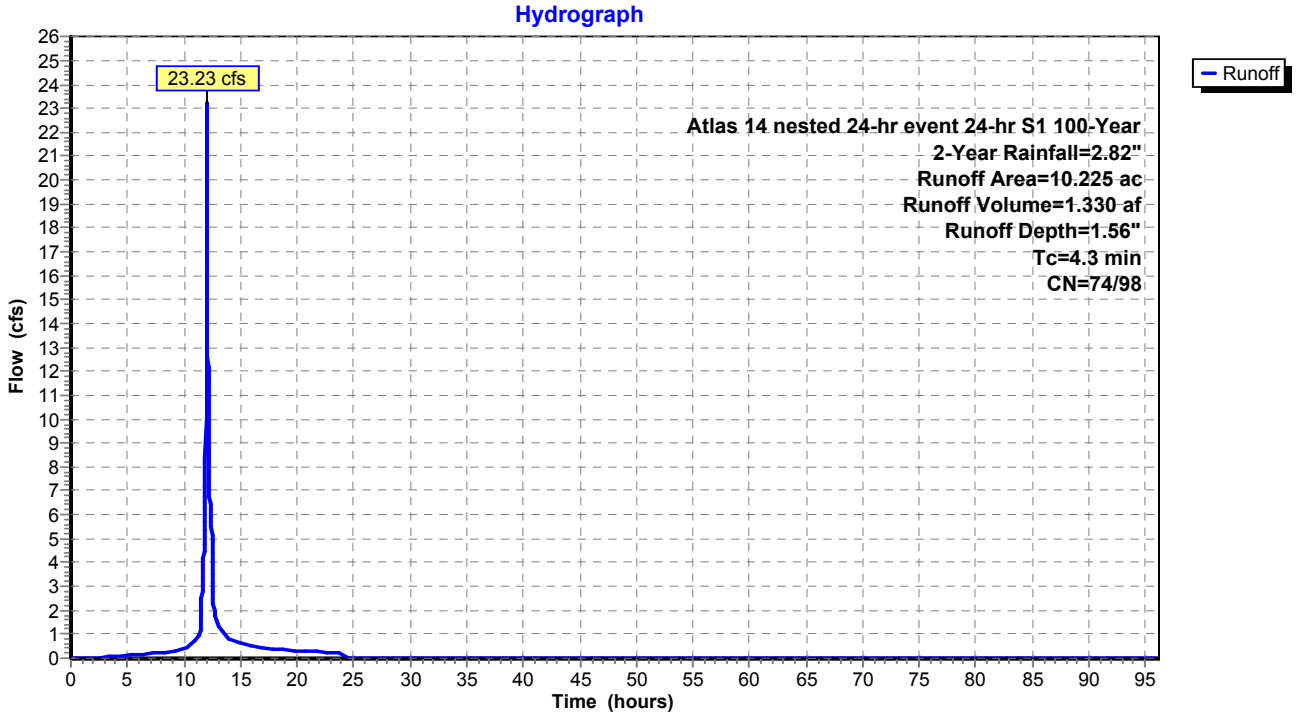
Runoff = 23.23 cfs @ 12.02 hrs, Volume= 1.330 af, Depth= 1.56"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 2-Year Rainfall=2.82"

	Area (ac)	CN	Description
*	5.867	74	pervious
*	4.358	98	impervious
	10.225	84	Weighted Average
	5.867	74	57.38% Pervious Area
	4.358	98	42.62% Impervious Area

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

Subcatchment SB 14: SB 14



Summary for Subcatchment SB 15: SB 15

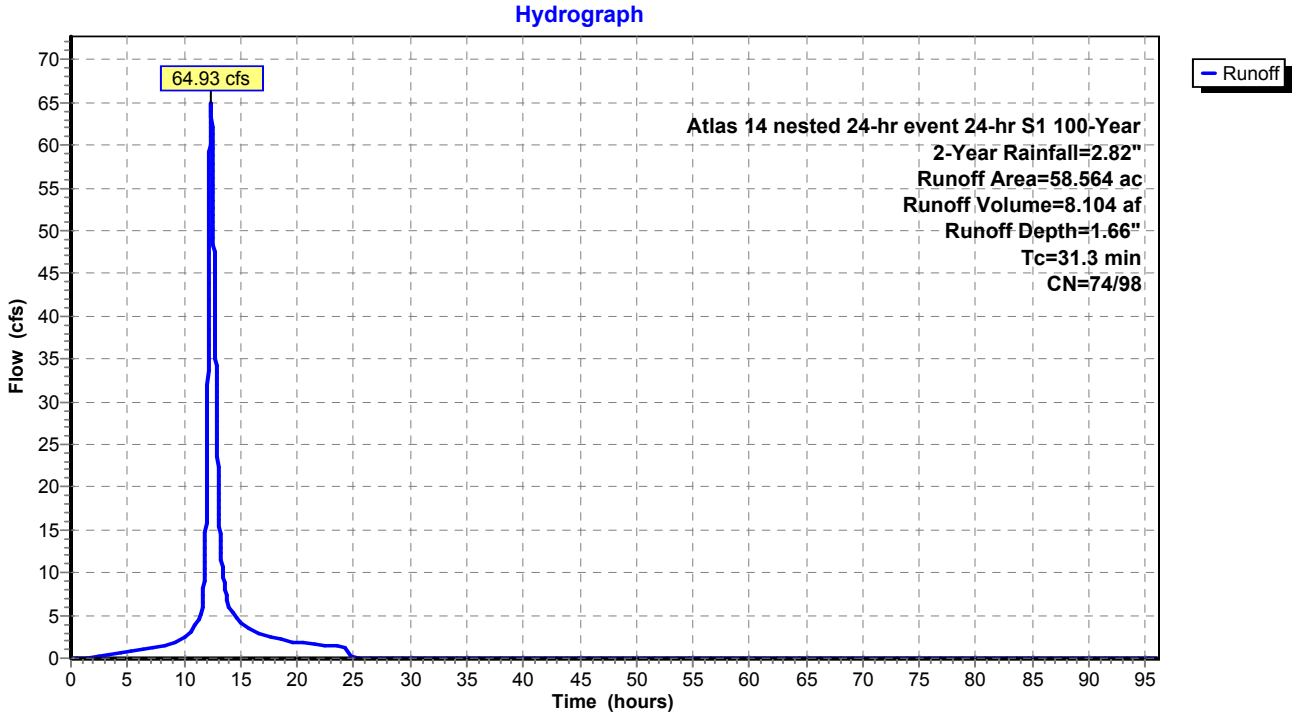
Runoff = 64.93 cfs @ 12.39 hrs, Volume= 8.104 af, Depth= 1.66"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 2-Year Rainfall=2.82"

	Area (ac)	CN	Description
*	30.326	74	pervious
*	28.238	98	impervious
	58.564	86	Weighted Average
	30.326	74	51.78% Pervious Area
	28.238	98	48.22% Impervious Area

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

Subcatchment SB 15: SB 15



Summary for Subcatchment SB 16: SB 16

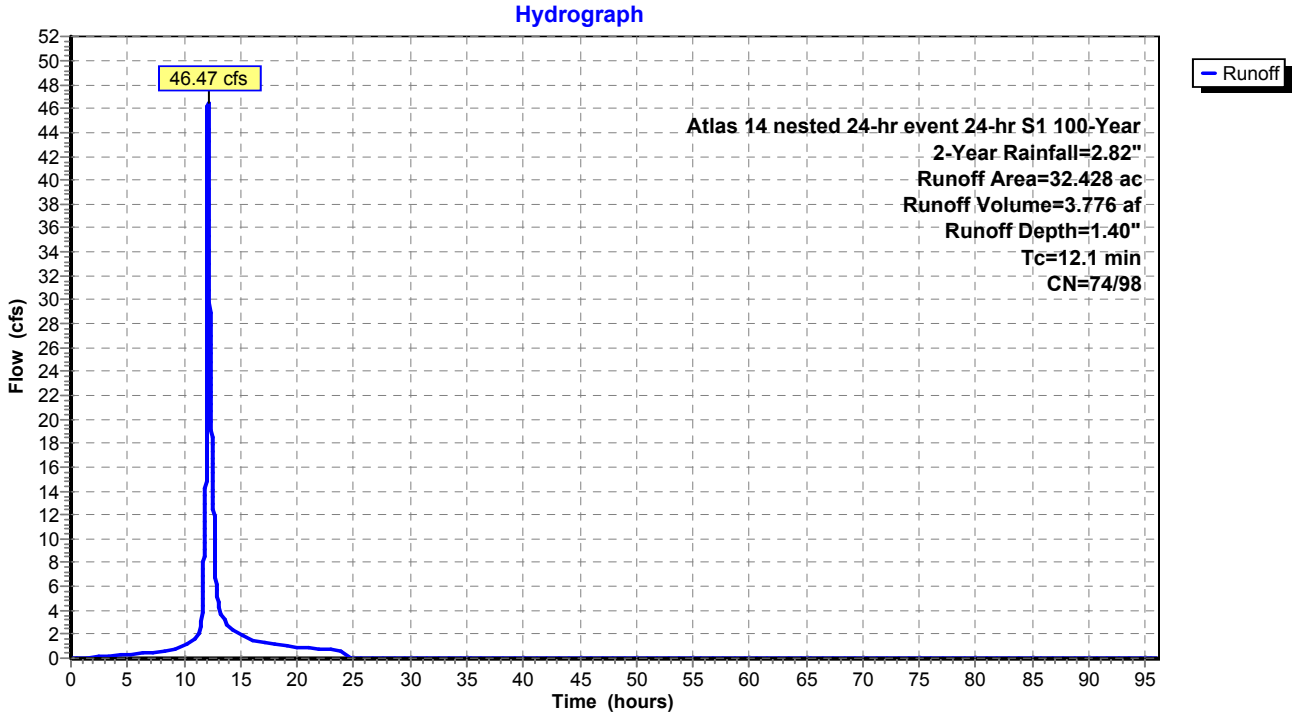
Runoff = 46.47 cfs @ 12.12 hrs, Volume= 3.776 af, Depth= 1.40"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 2-Year Rainfall=2.82"

	Area (ac)	CN	Description
*	21.555	74	pervious
*	10.873	98	impervious
	32.428	82	Weighted Average
	21.555	74	66.47% Pervious Area
	10.873	98	33.53% Impervious Area

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

Subcatchment SB 16: SB 16



Summary for Subcatchment SB 17: SB 17

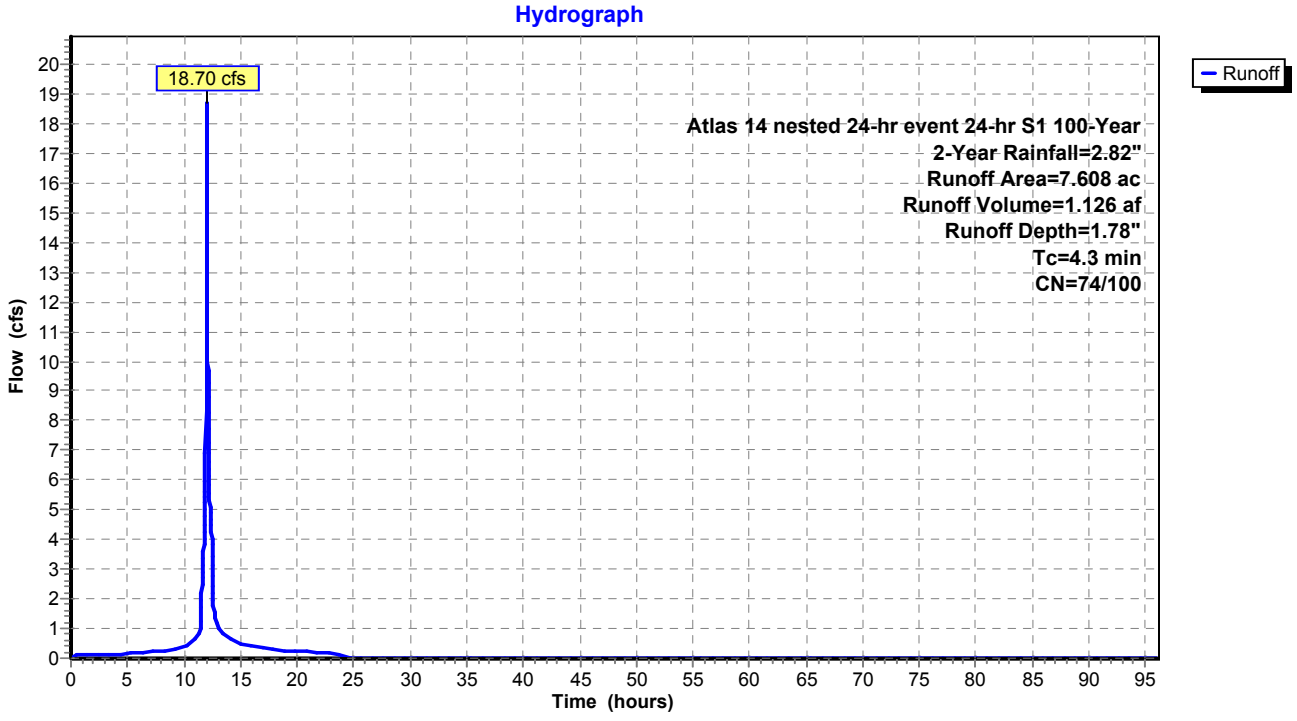
Runoff = 18.70 cfs @ 12.02 hrs, Volume= 1.126 af, Depth= 1.78"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 2-Year Rainfall=2.82"

	Area (ac)	CN	Description
*	3.925	74	pervious
*	3.683	100	impervious
	7.608	87	Weighted Average
	3.925	74	51.59% Pervious Area
	3.683	100	48.41% Impervious Area

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

Subcatchment SB 17: SB 17



Summary for Subcatchment SB 18: SB 18

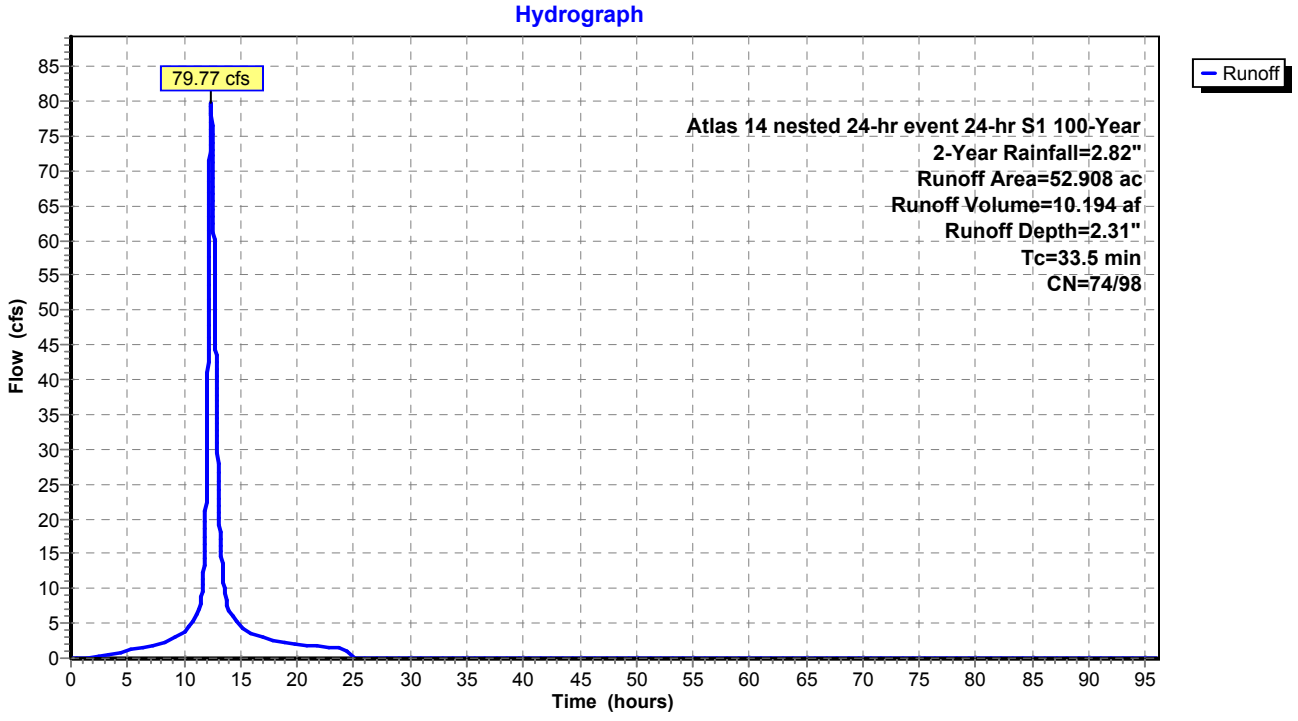
Runoff = 79.77 cfs @ 12.40 hrs, Volume= 10.194 af, Depth= 2.31"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 2-Year Rainfall=2.82"

	Area (ac)	CN	Description
*	8.172	74	pervious
*	44.736	98	impervious
	52.908	94	Weighted Average
	8.172	74	15.45% Pervious Area
	44.736	98	84.55% Impervious Area

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

Subcatchment SB 18: SB 18



Summary for Subcatchment SB 19: SB 19

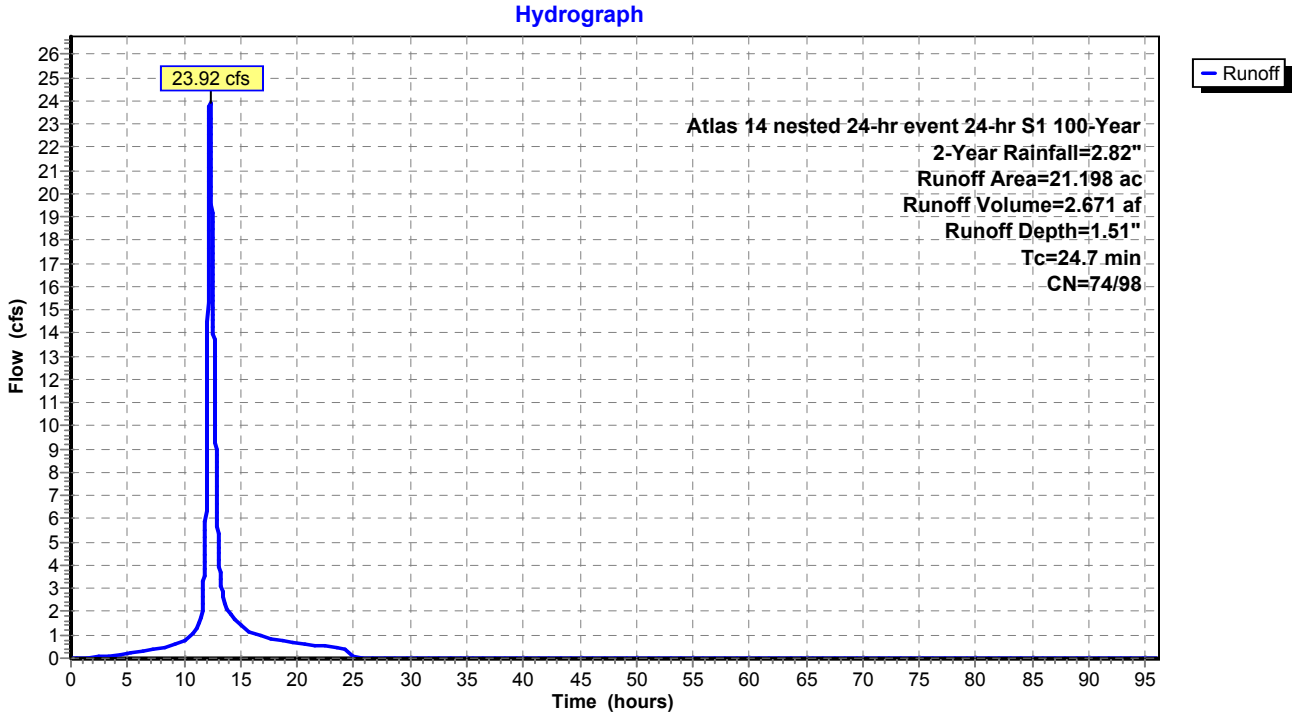
Runoff = 23.92 cfs @ 12.30 hrs, Volume= 2.671 af, Depth= 1.51"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 2-Year Rainfall=2.82"

	Area (ac)	CN	Description
*	12.734	74	pervious
*	8.464	98	impervious
	21.198	84	Weighted Average
	12.734	74	60.07% Pervious Area
	8.464	98	39.93% Impervious Area

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

Subcatchment SB 19: SB 19



Summary for Subcatchment SB 2: SB 2

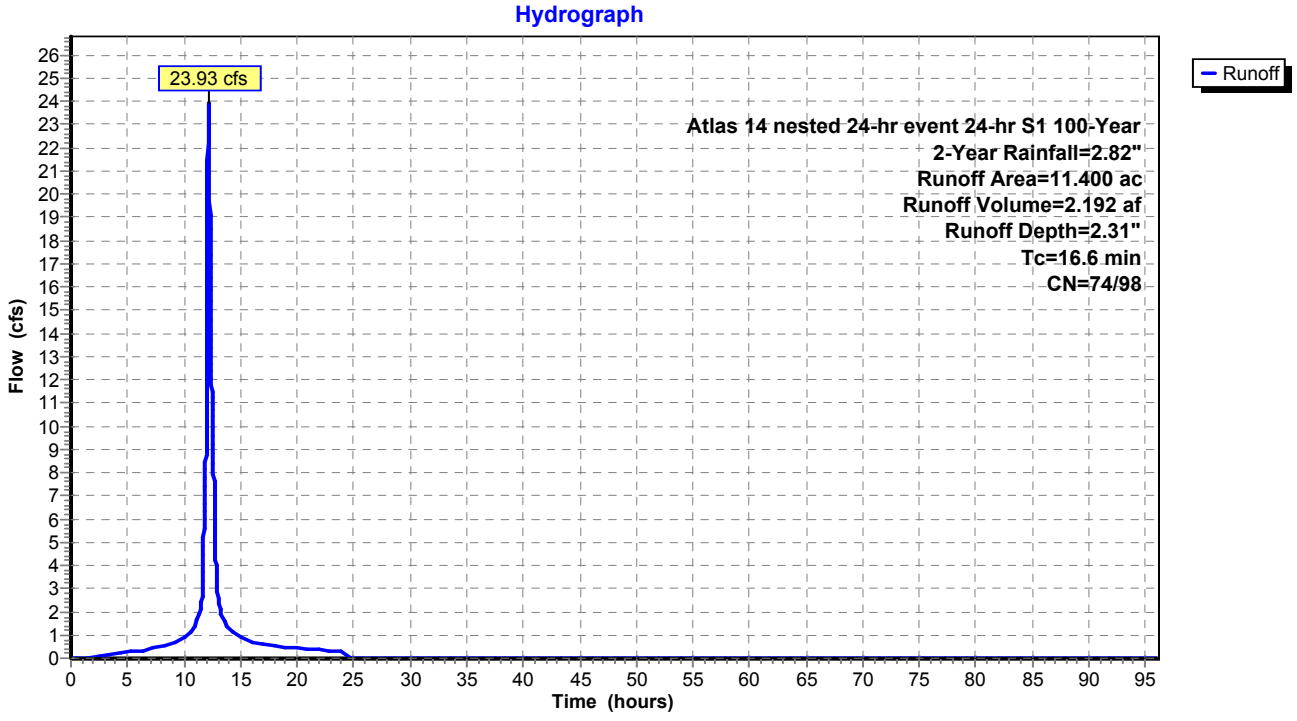
Runoff = 23.93 cfs @ 12.18 hrs, Volume= 2.192 af, Depth= 2.31"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 2-Year Rainfall=2.82"

	Area (ac)	CN	Description
*	1.791	74	pervious
*	9.609	98	impervious
	11.400	94	Weighted Average
	1.791	74	15.71% Pervious Area
	9.609	98	84.29% Impervious Area

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

Subcatchment SB 2: SB 2



Summary for Subcatchment SB 22: SB 22

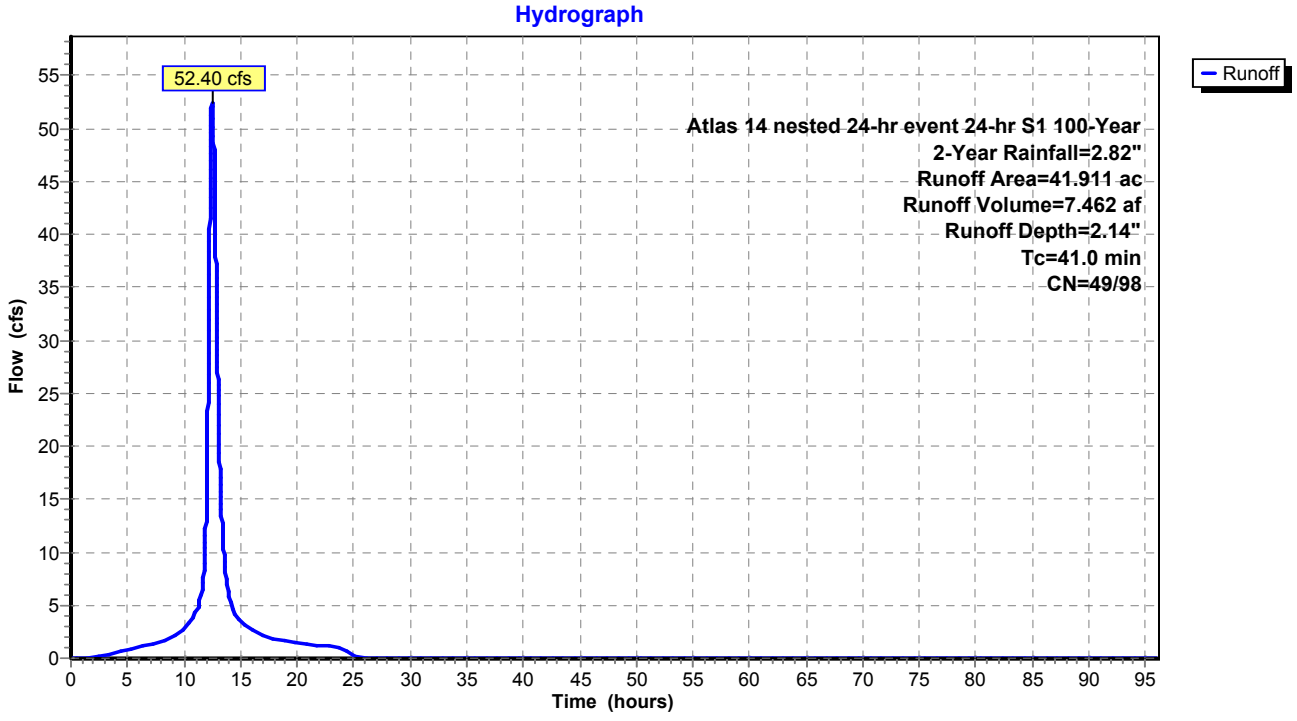
Runoff = 52.40 cfs @ 12.52 hrs, Volume= 7.462 af, Depth= 2.14"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 2-Year Rainfall=2.82"

	Area (ac)	CN	Description
*	7.465	49	Pervious
*	34.446	98	Impervious
	41.911	89	Weighted Average
	7.465	49	17.81% Pervious Area
	34.446	98	82.19% Impervious Area

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

Subcatchment SB 22: SB 22



Summary for Subcatchment SB 24: SB 24

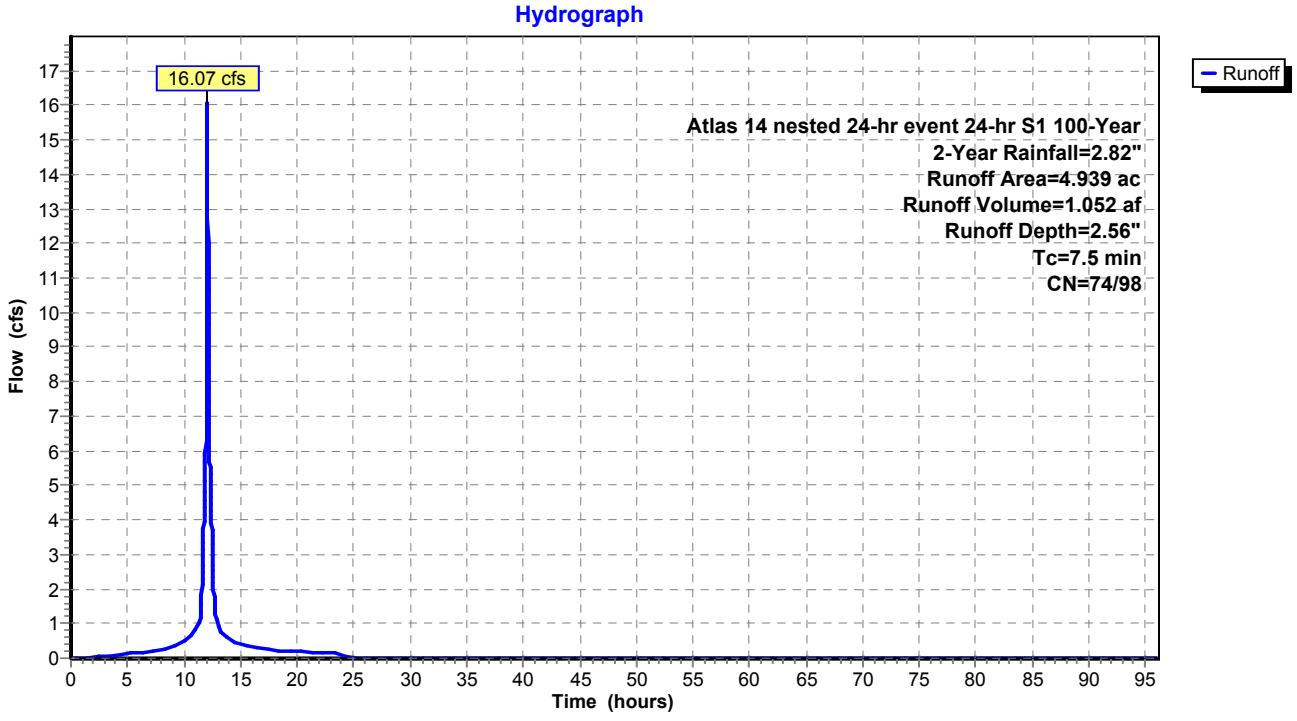
Runoff = 16.07 cfs @ 12.05 hrs, Volume= 1.052 af, Depth= 2.56"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 2-Year Rainfall=2.82"

	Area (ac)	CN	Description
*	0.088	74	permiable
*	4.851	98	impermiable
	4.939	98	Weighted Average
	0.088	74	1.78% Pervious Area
	4.851	98	98.22% Impervious Area

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

Subcatchment SB 24: SB 24



Summary for Subcatchment SB 25: SB 25

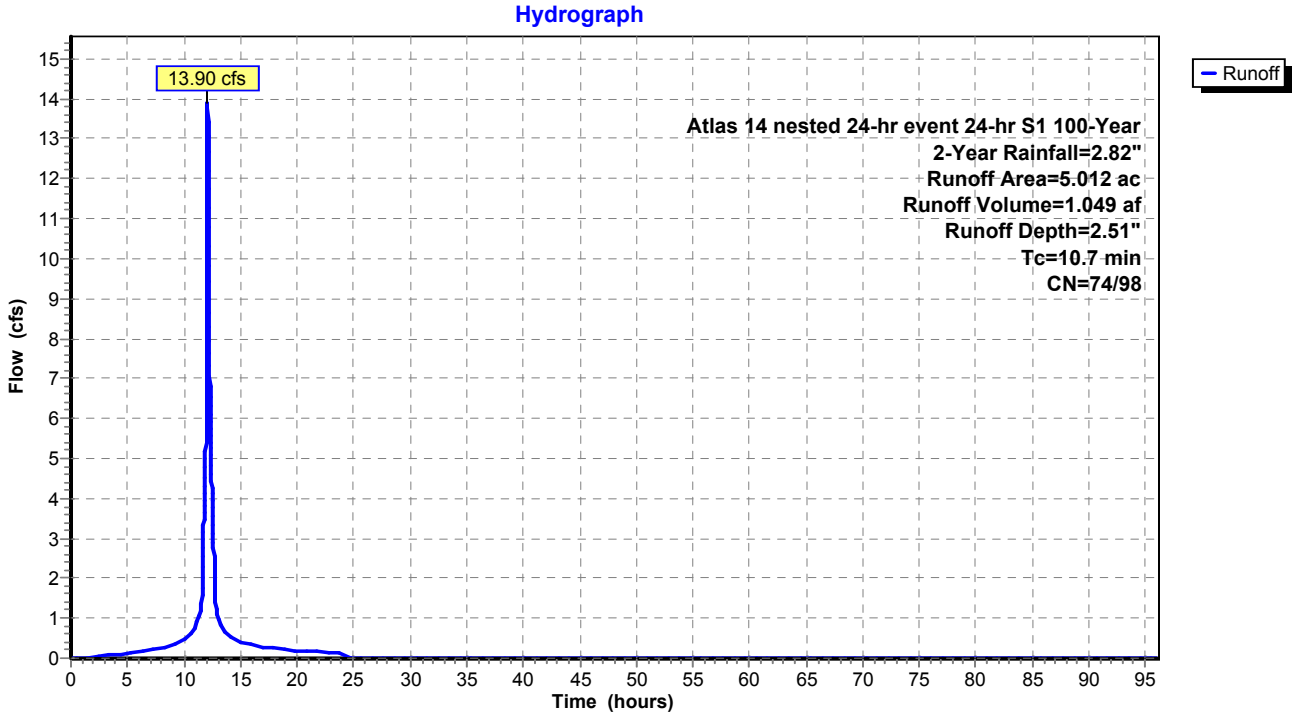
Runoff = 13.90 cfs @ 12.09 hrs, Volume= 1.049 af, Depth= 2.51"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 2-Year Rainfall=2.82"

	Area (ac)	CN	Description
*	0.215	74	pervious
*	4.797	98	impervious
	5.012	97	Weighted Average
	0.215	74	4.29% Pervious Area
	4.797	98	95.71% Impervious Area

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

Subcatchment SB 25: SB 25



Summary for Subcatchment SB 26: SB 26

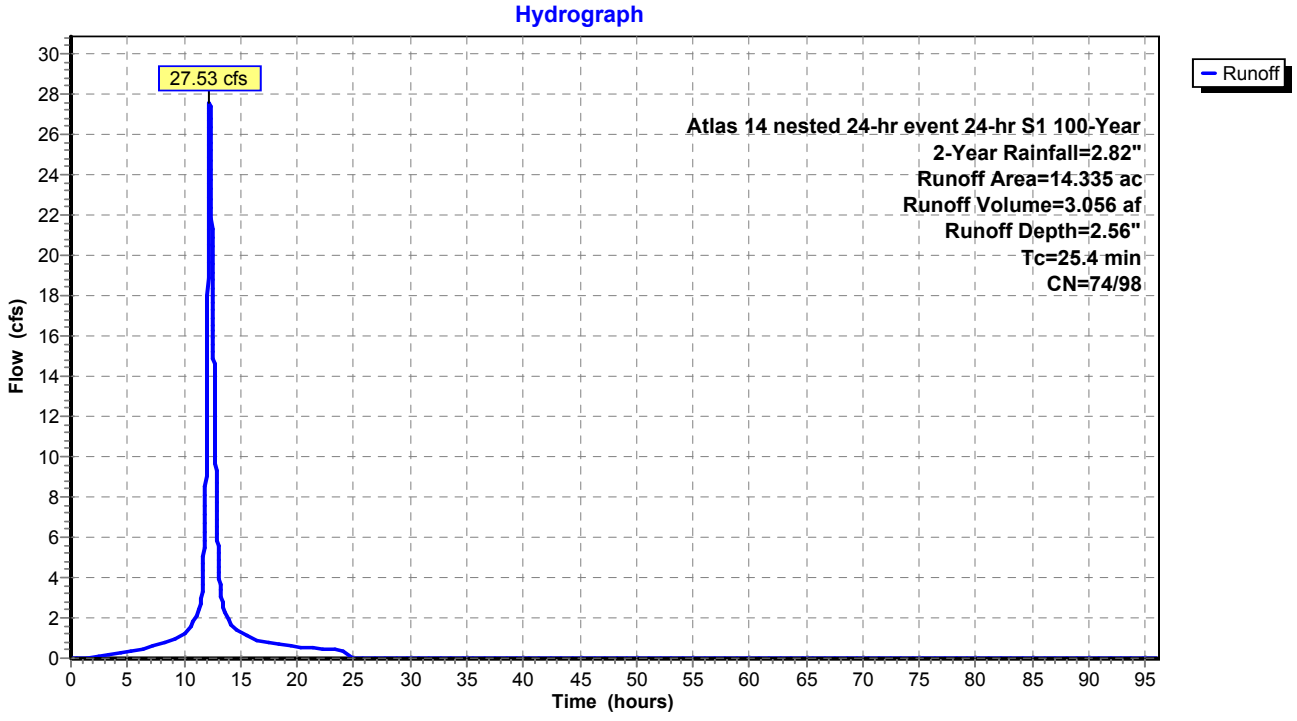
Runoff = 27.53 cfs @ 12.28 hrs, Volume= 3.056 af, Depth= 2.56"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 2-Year Rainfall=2.82"

	Area (ac)	CN	Description
*	0.248	74	pervious
*	14.087	98	impervious
	14.335	98	Weighted Average
	0.248	74	1.73% Pervious Area
	14.087	98	98.27% Impervious Area

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

Subcatchment SB 26: SB 26



Summary for Subcatchment SB 27: SB 27 (Thumb Road)

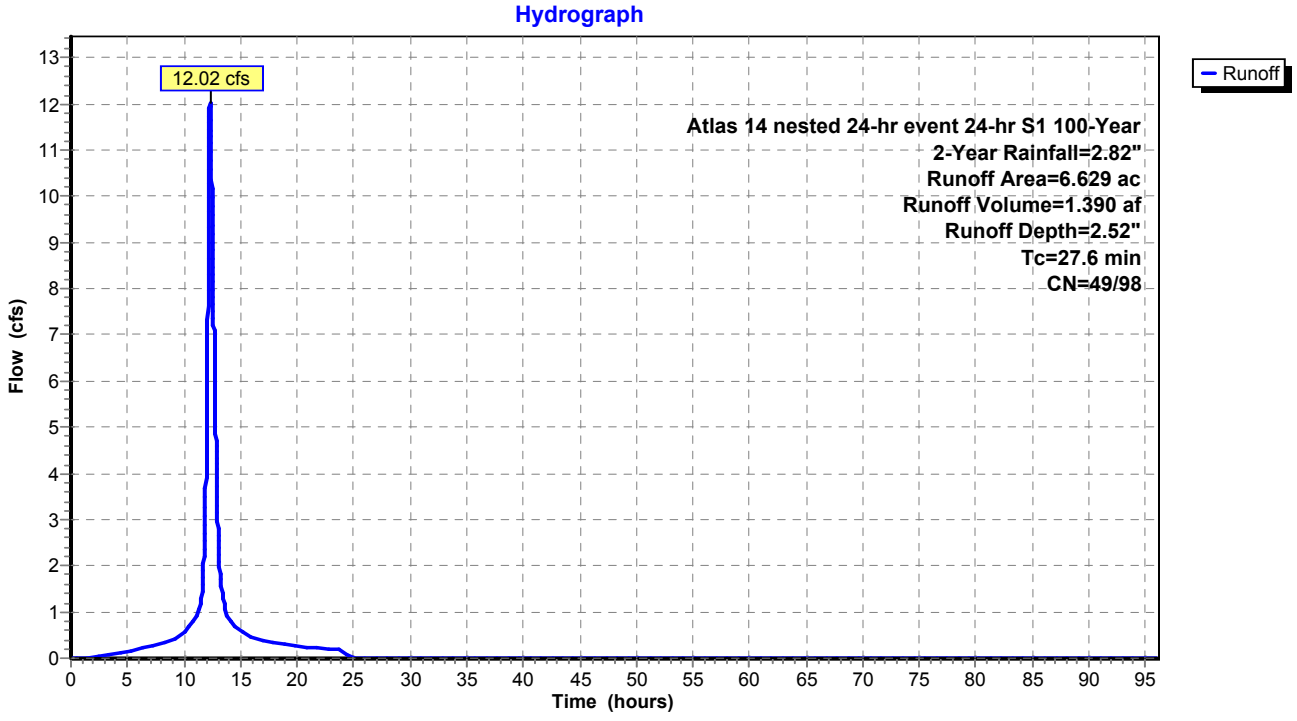
Runoff = 12.02 cfs @ 12.32 hrs, Volume= 1.390 af, Depth= 2.52"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 2-Year Rainfall=2.82"

	Area (ac)	CN	Description
*	0.191	49	Pervious
*	6.438	98	Impervious
	6.629	97	Weighted Average
	0.191	49	2.88% Pervious Area
	6.438	98	97.12% Impervious Area

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

Subcatchment SB 27: SB 27 (Thumb Road)



Summary for Subcatchment SB 28: SB 28

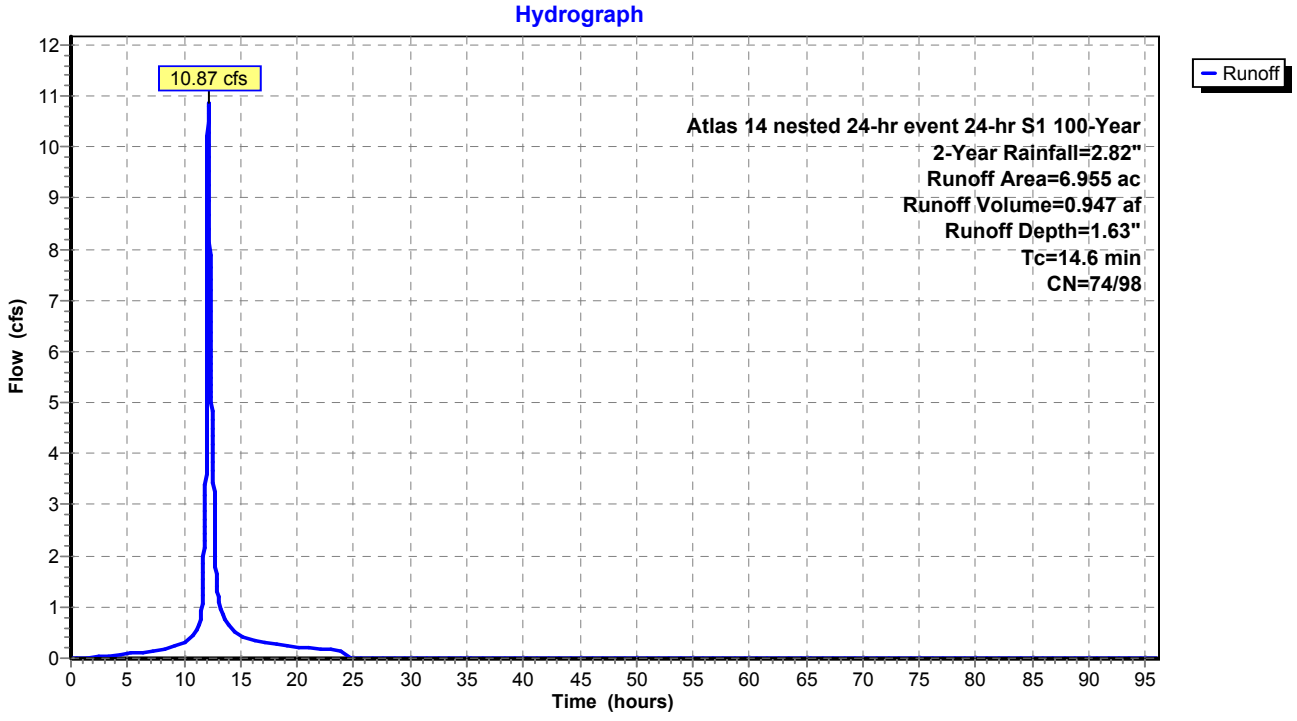
Runoff = 10.87 cfs @ 12.15 hrs, Volume= 0.947 af, Depth= 1.63"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 2-Year Rainfall=2.82"

	Area (ac)	CN	Description
*	3.703	74	pervious
*	3.252	98	impervious
	6.955	85	Weighted Average
	3.703	74	53.24% Pervious Area
	3.252	98	46.76% Impervious Area

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

Subcatchment SB 28: SB 28



Summary for Subcatchment SB 29: SB 29

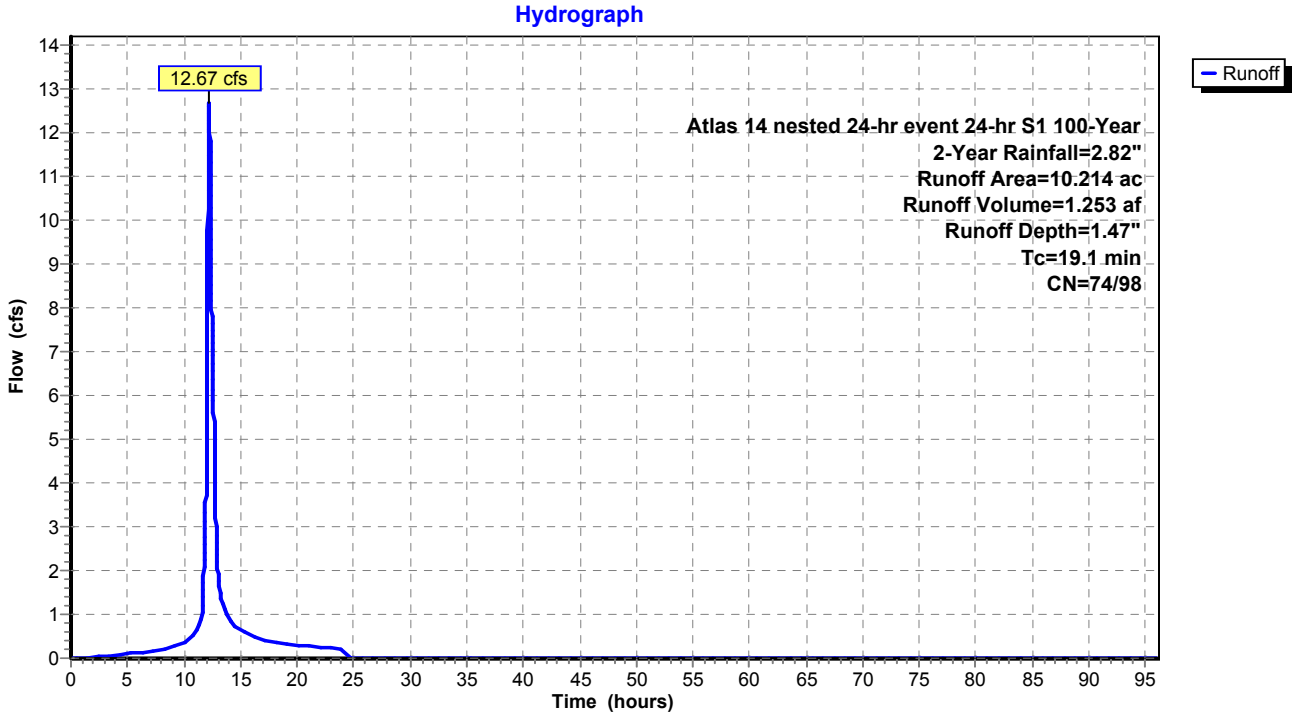
Runoff = 12.67 cfs @ 12.22 hrs, Volume= 1.253 af, Depth= 1.47"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 2-Year Rainfall=2.82"

	Area (ac)	CN	Description
*	6.360	74	pervious
*	3.854	98	impervious
	10.214	83	Weighted Average
	6.360	74	62.27% Pervious Area
	3.854	98	37.73% Impervious Area

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

Subcatchment SB 29: SB 29



Summary for Subcatchment SB 3: SB 3

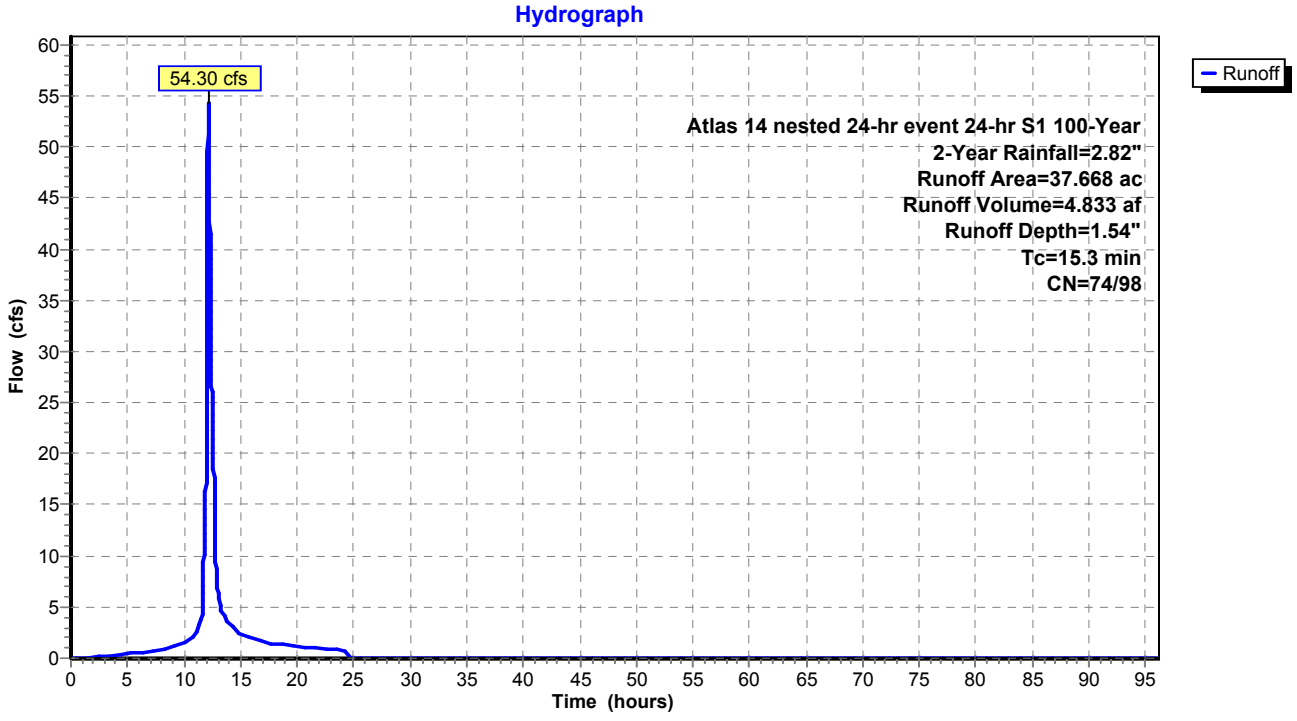
Runoff = 54.30 cfs @ 12.16 hrs, Volume= 4.833 af, Depth= 1.54"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 2-Year Rainfall=2.82"

	Area (ac)	CN	Description
*	22.050	74	Pervious
*	15.618	98	Impervious
	37.668	84	Weighted Average
	22.050	74	58.54% Pervious Area
	15.618	98	41.46% Impervious Area

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

Subcatchment SB 3: SB 3



Summary for Subcatchment SB 4: SB 4

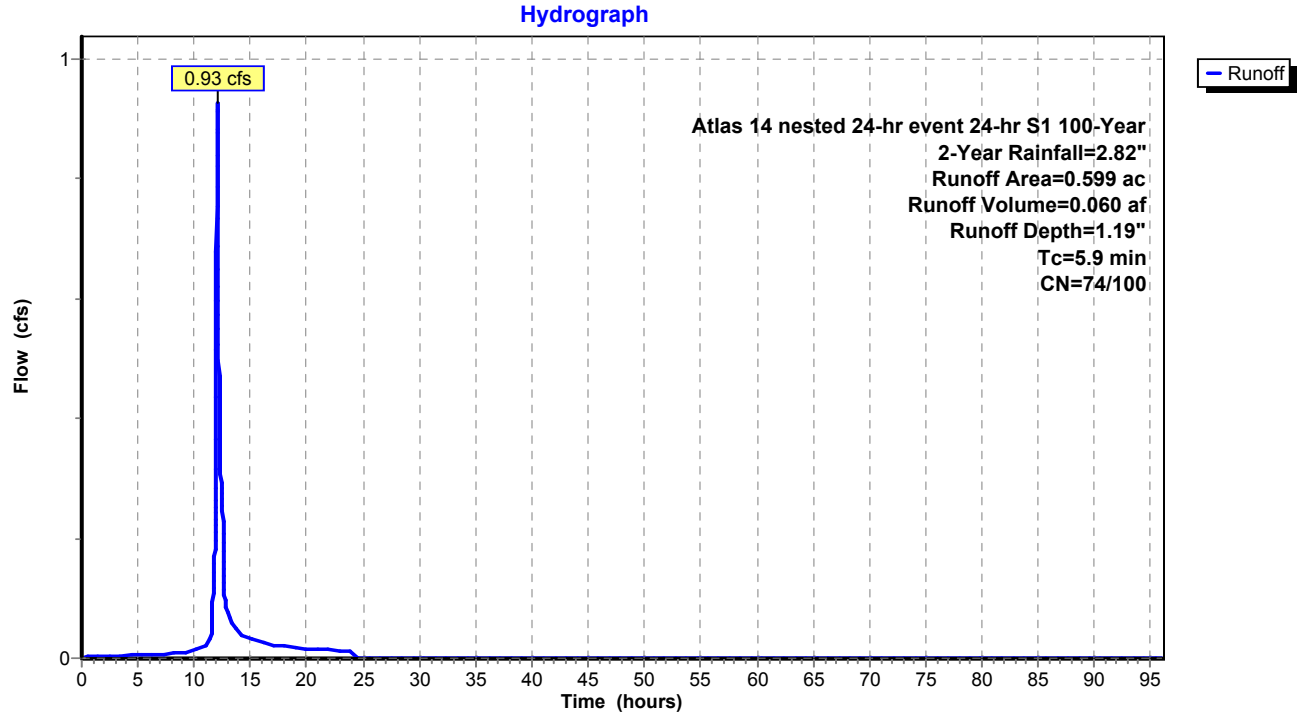
Runoff = 0.93 cfs @ 12.04 hrs, Volume= 0.060 af, Depth= 1.19"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 2-Year Rainfall=2.82"

	Area (ac)	CN	Description
*	0.481	74	pervious
*	0.118	100	impervious
	0.599	79	Weighted Average
	0.481	74	80.30% Pervious Area
	0.118	100	19.70% Impervious Area

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

Subcatchment SB 4: SB 4



Summary for Subcatchment SB 5: SB 5

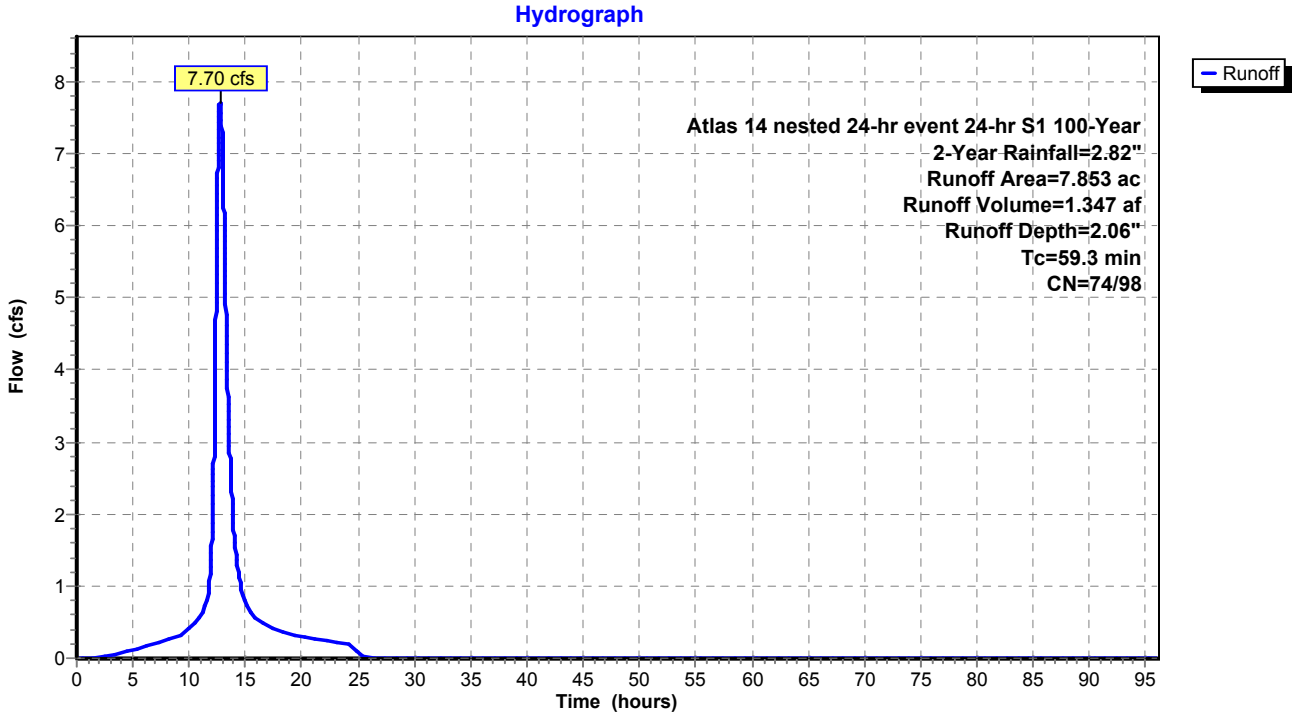
Runoff = 7.70 cfs @ 12.72 hrs, Volume= 1.347 af, Depth= 2.06"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 2-Year Rainfall=2.82"

	Area (ac)	CN	Description
*	2.327	74	pervious
*	5.526	98	impervious
	7.853	91	Weighted Average
	2.327	74	29.63% Pervious Area
	5.526	98	70.37% Impervious Area

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

Subcatchment SB 5: SB 5



Summary for Subcatchment SB 51: Offsite Subbasin 51

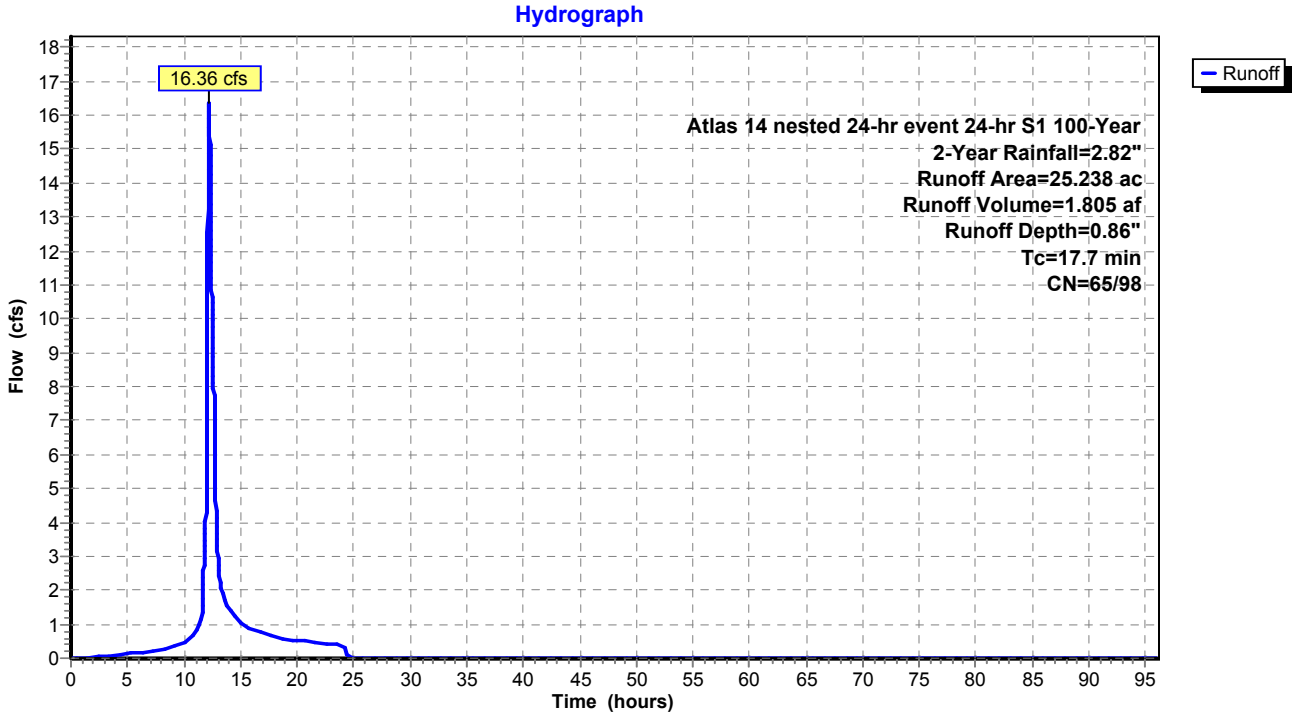
Runoff = 16.36 cfs @ 12.22 hrs, Volume= 1.805 af, Depth= 0.86"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 2-Year Rainfall=2.82"

	Area (ac)	CN	Description
*	20.200	65	Offsite subbasin 51
*	5.038	98	
	25.238	72	Weighted Average
	20.200	65	80.04% Pervious Area
	5.038	98	19.96% Impervious Area

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

Subcatchment SB 51: Offsite Subbasin 51



Summary for Subcatchment SB 6: SB 6

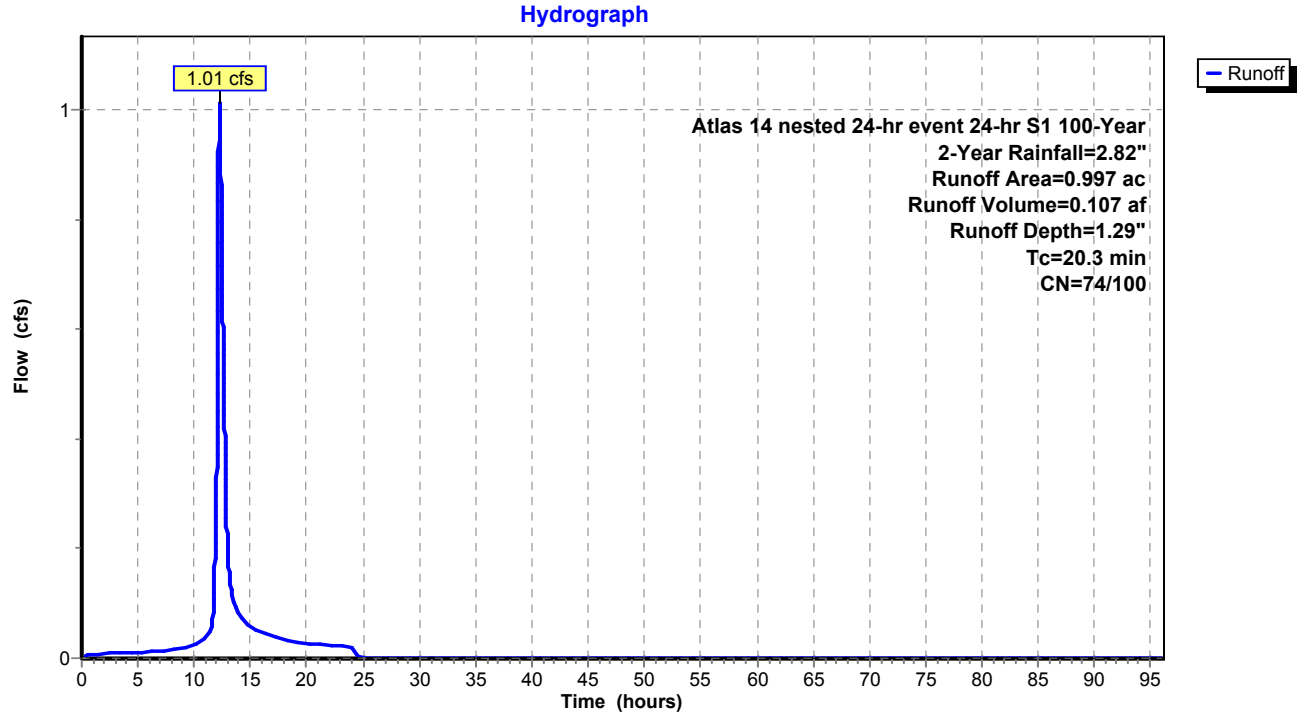
Runoff = 1.01 cfs @ 12.25 hrs, Volume= 0.107 af, Depth= 1.29"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 2-Year Rainfall=2.82"

	Area (ac)	CN	Description
*	0.753	74	pervious
*	0.244	100	impervious
	0.997	80	Weighted Average
	0.753	74	75.53% Pervious Area
	0.244	100	24.47% Impervious Area

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

Subcatchment SB 6: SB 6



Summary for Subcatchment SB 7: SB 7

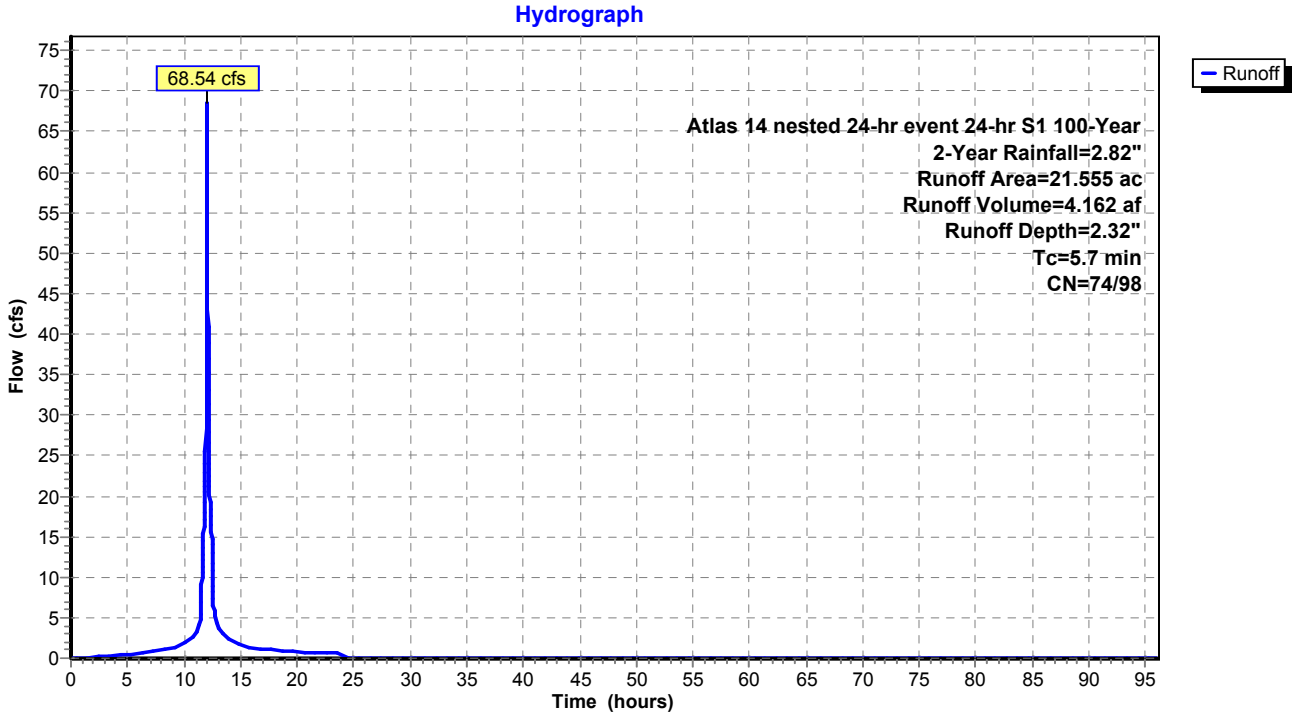
Runoff = 68.54 cfs @ 12.03 hrs, Volume= 4.162 af, Depth= 2.32"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 2-Year Rainfall=2.82"

	Area (ac)	CN	Description
*	3.269	74	pervious
*	18.286	98	impervious
	21.555	94	Weighted Average
	3.269	74	15.17% Pervious Area
	18.286	98	84.83% Impervious Area

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

Subcatchment SB 7: SB 7



Summary for Subcatchment SB 8: SB 8

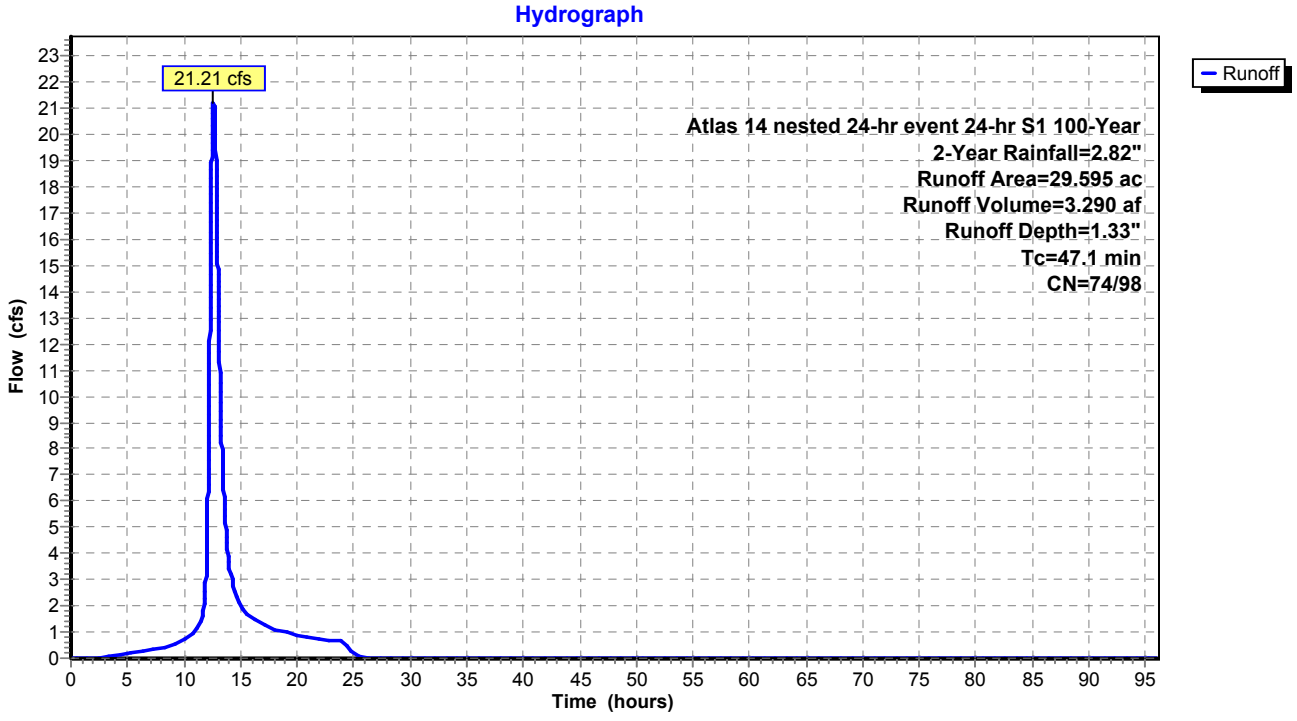
Runoff = 21.21 cfs @ 12.62 hrs, Volume= 3.290 af, Depth= 1.33"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 2-Year Rainfall=2.82"

	Area (ac)	CN	Description
*	20.714	74	pervious
*	8.881	98	impervious
	29.595	81	Weighted Average
	20.714	74	69.99% Pervious Area
	8.881	98	30.01% Impervious Area

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

Subcatchment SB 8: SB 8



Summary for Subcatchment SB 9: SB 9

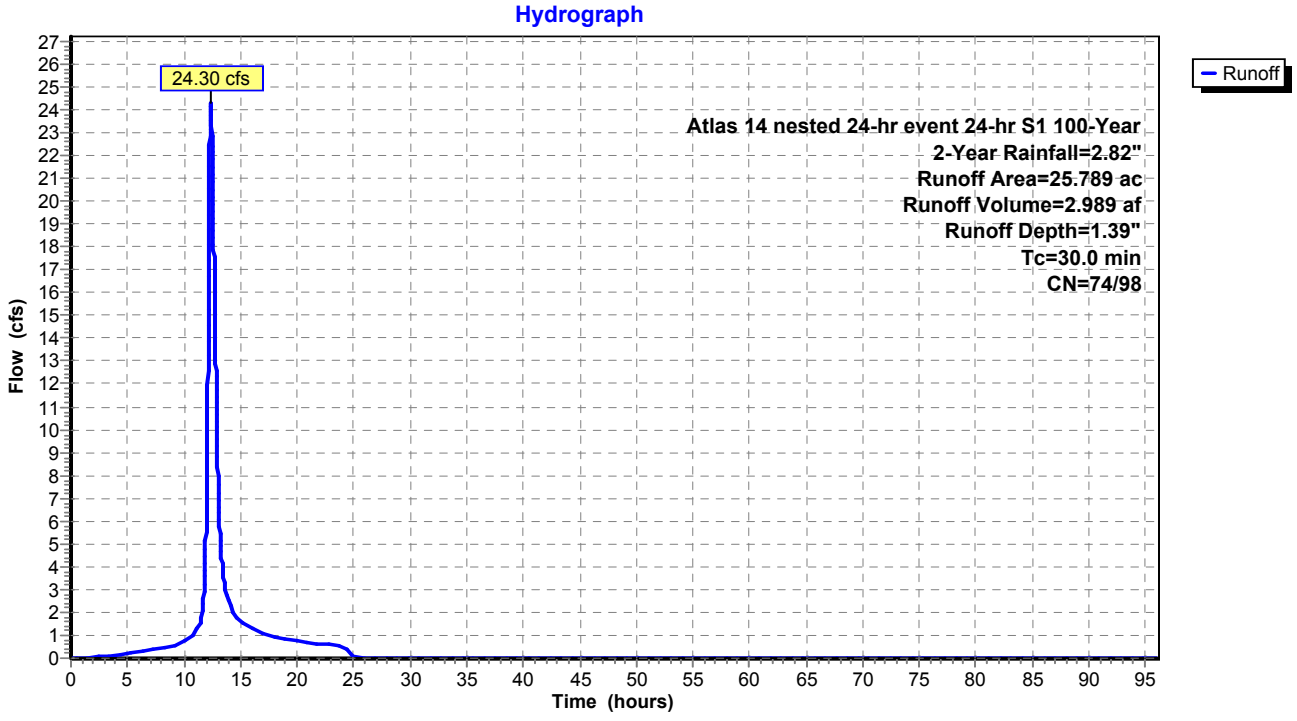
Runoff = 24.30 cfs @ 12.37 hrs, Volume= 2.989 af, Depth= 1.39"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 2-Year Rainfall=2.82"

	Area (ac)	CN	Description
*	17.234	74	permiable
*	8.555	98	impermiable
	25.789	82	Weighted Average
	17.234	74	66.83% Pervious Area
	8.555	98	33.17% Impervious Area

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

Subcatchment SB 9: SB 9



Summary for Reach 30R: 60" RCP to existing 60" storm sewer

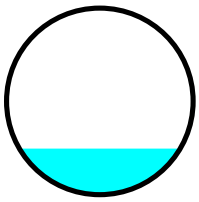
[52] Hint: Inlet/Outlet conditions not evaluated
[65] Warning: Inlet elevation not specified

Inflow Area = 133.365 ac, 58.87% Impervious, Inflow Depth > 1.60" for 2-Year event
Inflow = 46.57 cfs @ 13.19 hrs, Volume= 17.779 af
Outflow = 46.57 cfs @ 13.20 hrs, Volume= 17.779 af, Atten= 0%, Lag= 0.5 min

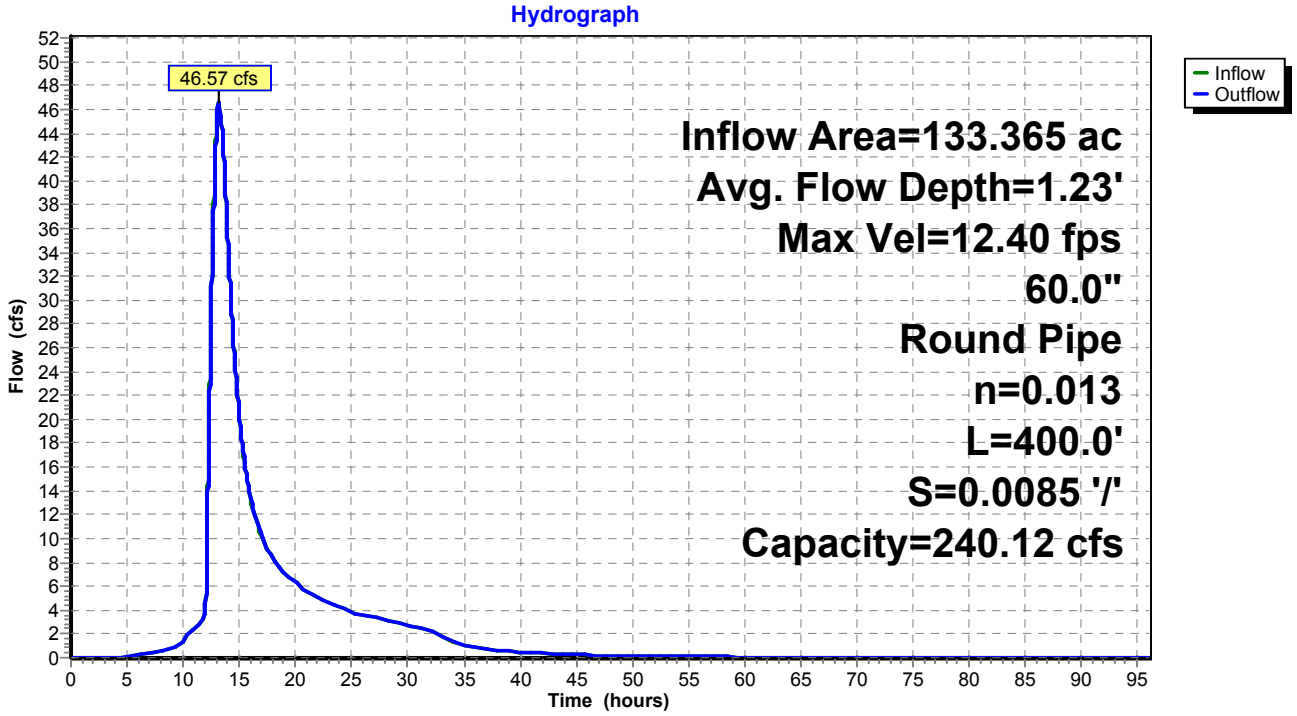
Routing by Muskingum-Cunge method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Reference Flow= 34.93 cfs Estimated Depth= 1.29' Velocity= 8.72 fps
m= 1.420, c= 12.37 fps, dt= 0.6 min, dx= 400.0' / 1 = 400.0', K= 0.5 min, X= 0.367
Max. Velocity= 12.40 fps, Min. Travel Time= 0.5 min
Avg. Velocity = 12.37 fps, Avg. Travel Time= 0.5 min

Peak Storage= 1,505 cf @ 13.20 hrs
Average Depth at Peak Storage= 1.23'
Bank-Full Depth= 5.00' Flow Area= 19.6 sf, Capacity= 240.12 cfs

60.0" Round Pipe
n= 0.013
Length= 400.0' Slope= 0.0085 '/'
Inlet Invert= 0.00', Outlet Invert= -3.40'



Reach 30R: 60" RCP to existing 60" storm sewer



Summary for Reach 34R: 60" RCP connecting P-1/P-2 with P-3

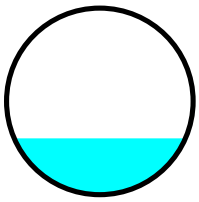
[52] Hint: Inlet/Outlet conditions not evaluated
[65] Warning: Inlet elevation not specified

Inflow Area = 68.531 ac, 57.92% Impervious, Inflow Depth = 1.83" for 2-Year event
Inflow = 52.67 cfs @ 12.67 hrs, Volume= 10.473 af
Outflow = 52.64 cfs @ 12.72 hrs, Volume= 10.473 af, Atten= 0%, Lag= 3.4 min

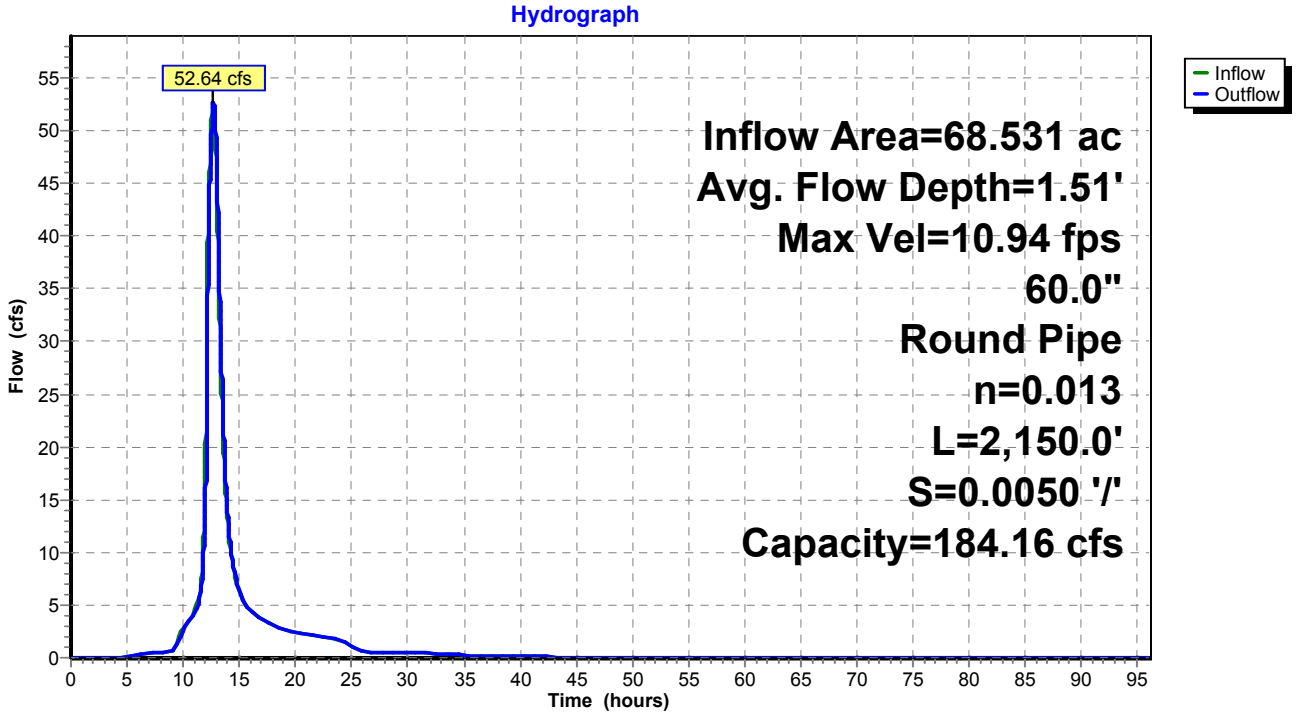
Routing by Muskingum-Cunge method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Reference Flow= 39.51 cfs Estimated Depth= 1.57' Velocity= 7.47 fps
m= 1.413, c= 10.55 fps, dt= 0.6 min, dx= 2,150.0' / 6 = 358.3', K= 0.6 min, X= 0.189
Max. Velocity= 10.94 fps, Min. Travel Time= 3.3 min
Avg. Velocity = 10.55 fps, Avg. Travel Time= 3.4 min

Peak Storage= 10,725 cf @ 12.70 hrs
Average Depth at Peak Storage= 1.51'
Bank-Full Depth= 5.00' Flow Area= 19.6 sf, Capacity= 184.16 cfs

60.0" Round Pipe
n= 0.013
Length= 2,150.0' Slope= 0.0050 '/'
Inlet Invert= 0.00', Outlet Invert= -10.75'



Reach 34R: 60" RCP connecting P-1/P-2 with P-3



Summary for Reach 37R: 48" RCP

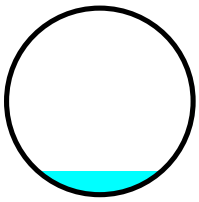
[52] Hint: Inlet/Outlet conditions not evaluated
[65] Warning: Inlet elevation not specified

Inflow Area = 43.279 ac, 47.44% Impervious, Inflow Depth = 0.87" for 2-Year event
Inflow = 5.61 cfs @ 13.07 hrs, Volume= 3.148 af
Outflow = 5.61 cfs @ 13.08 hrs, Volume= 3.148 af, Atten= 0%, Lag= 0.7 min

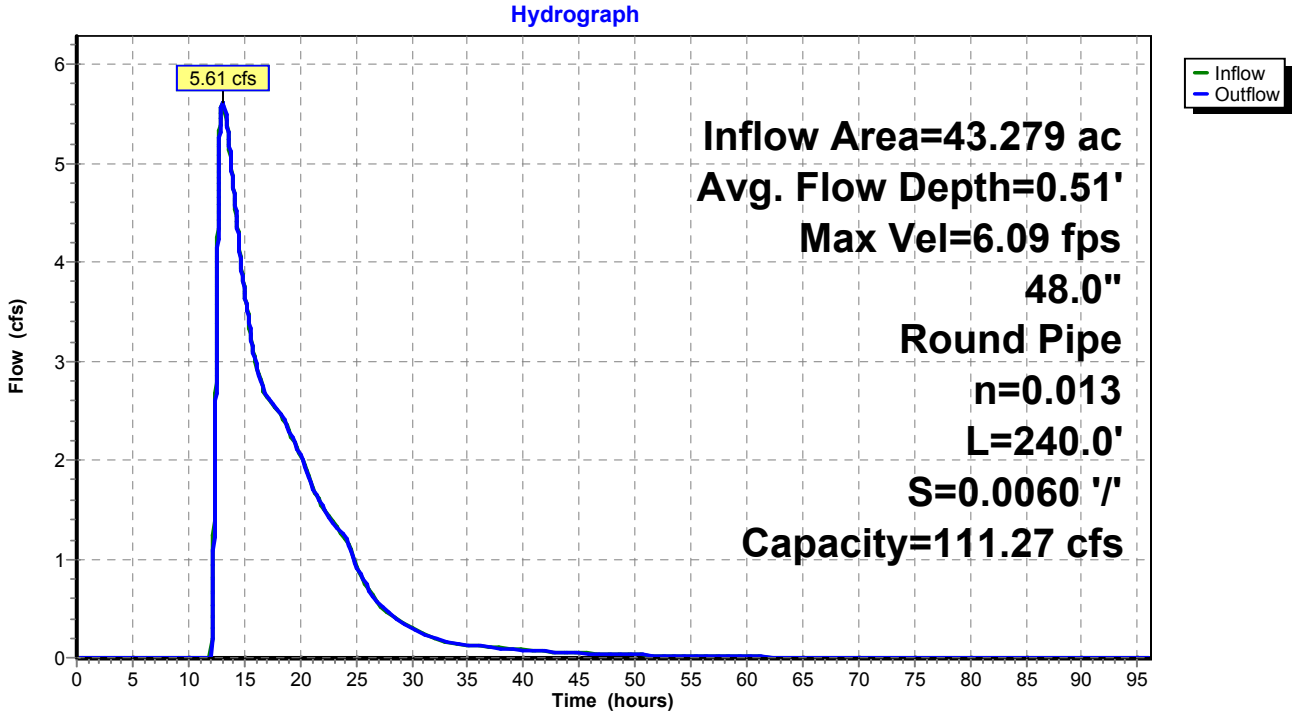
Routing by Muskingum-Cunge method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Reference Flow= 4.21 cfs Estimated Depth= 0.53' Velocity= 4.24 fps
m= 1.433, c= 6.08 fps, dt= 0.6 min, dx= 240.0' / 1 = 240.0', K= 0.7 min, X= 0.371
Max. Velocity= 6.09 fps, Min. Travel Time= 0.7 min
Avg. Velocity = 6.08 fps, Avg. Travel Time= 0.7 min

Peak Storage= 222 cf @ 13.08 hrs
Average Depth at Peak Storage= 0.51'
Bank-Full Depth= 4.00' Flow Area= 12.6 sf, Capacity= 111.27 cfs

48.0" Round Pipe
n= 0.013
Length= 240.0' Slope= 0.0060 '/'
Inlet Invert= 0.00', Outlet Invert= -1.44'



Reach 37R: 48" RCP



Summary for Reach 39R: 24" RCP

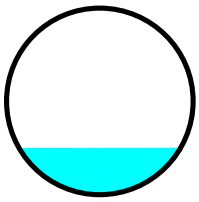
[52] Hint: Inlet/Outlet conditions not evaluated
[65] Warning: Inlet elevation not specified

Inflow Area = 8.850 ac, 65.20% Impervious, Inflow Depth = 1.97" for 2-Year event
Inflow = 3.24 cfs @ 13.61 hrs, Volume= 1.454 af
Outflow = 3.24 cfs @ 13.61 hrs, Volume= 1.454 af, Atten= 0%, Lag= 0.3 min

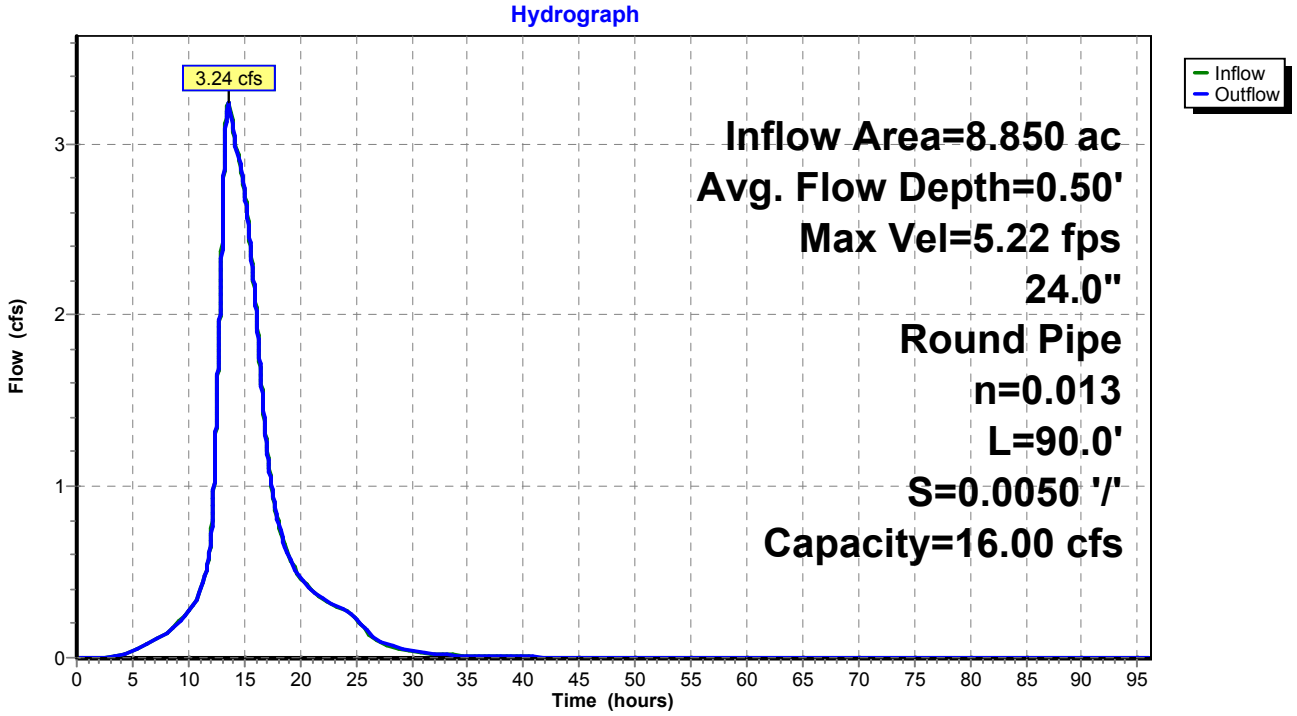
Routing by Muskingum-Cunge method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Reference Flow= 2.43 cfs Estimated Depth= 0.53' Velocity= 3.68 fps
m= 1.419, c= 5.22 fps, dt= 0.6 min, dx= 90.0' / 1 = 90.0', K= 0.3 min, X= 0.087
Max. Velocity= 5.22 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 5.22 fps, Avg. Travel Time= 0.3 min

Peak Storage= 56 cf @ 13.61 hrs
Average Depth at Peak Storage= 0.50'
Bank-Full Depth= 2.00' Flow Area= 3.1 sf, Capacity= 16.00 cfs

24.0" Round Pipe
n= 0.013
Length= 90.0' Slope= 0.0050 '/'
Inlet Invert= 0.00', Outlet Invert= -0.45'



Reach 39R: 24" RCP



Summary for Reach 43R: 30" RCP connecting P-10 with P-12

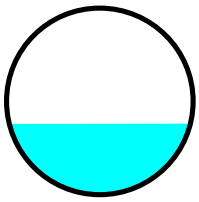
[52] Hint: Inlet/Outlet conditions not evaluated
[79] Warning: Submerged Pond 10P Primary device # 1 by 0.95'

Inflow Area = 66.448 ac, 29.37% Impervious, Inflow Depth > 1.05" for 2-Year event
Inflow = 10.95 cfs @ 13.51 hrs, Volume= 5.792 af
Outflow = 10.95 cfs @ 13.54 hrs, Volume= 5.792 af, Atten= 0%, Lag= 2.1 min

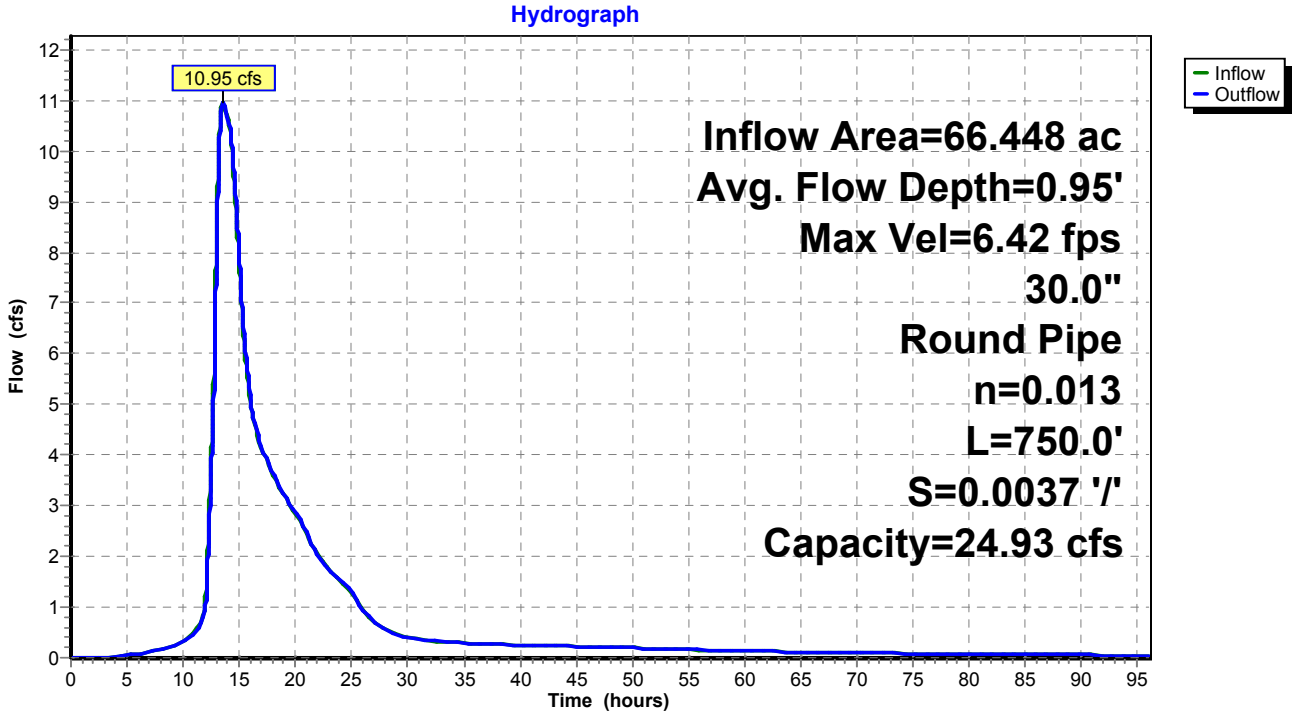
Routing by Muskingum-Cunge method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Reference Flow= 8.22 cfs Estimated Depth= 0.99' Velocity= 4.55 fps
m= 1.402, c= 6.38 fps, dt= 0.6 min, dx= 750.0' / 3 = 250.0', K= 0.7 min, X= 0.118
Max. Velocity= 6.42 fps, Min. Travel Time= 1.9 min
Avg. Velocity = 6.38 fps, Avg. Travel Time= 2.0 min

Peak Storage= 1,287 cf @ 13.53 hrs
Average Depth at Peak Storage= 0.95'
Bank-Full Depth= 2.50' Flow Area= 4.9 sf, Capacity= 24.93 cfs

30.0" Round Pipe
n= 0.013
Length= 750.0' Slope= 0.0037 '/'
Inlet Invert= 896.00', Outlet Invert= 893.23'



Reach 43R: 30" RCP connecting P-10 with P-12



Summary for Reach 51R: 40' x 4.5 ft parabolic hannel from P-13 to Rice Creek

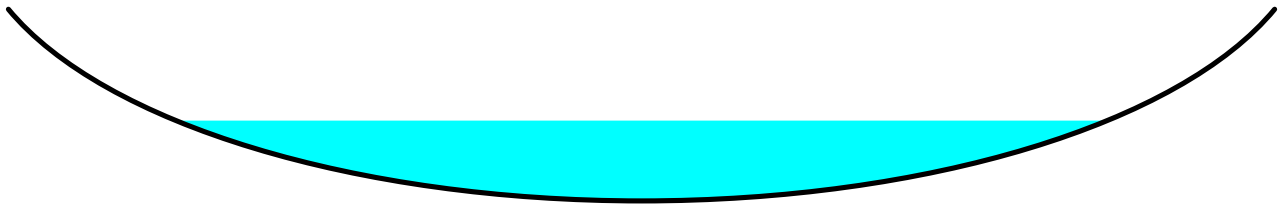
[65] Warning: Inlet elevation not specified
[97] Warning: Factor X out of range

Inflow Area = 245.501 ac, 51.49% Impervious, Inflow Depth > 1.57" for 2-Year event
Inflow = 167.98 cfs @ 12.52 hrs, Volume= 32.167 af
Outflow = 167.86 cfs @ 12.54 hrs, Volume= 32.167 af, Atten= 0%, Lag= 1.0 min

Routing by Muskingum-Cunge method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Reference Flow= 125.98 cfs Estimated Depth= 1.98' Velocity= 3.58 fps
m= 1.440, c= 5.16 fps, dt= 0.6 min, dx= 300.0' / 2 = 150.0', K= 0.5 min, X= 0.000
Max. Velocity= 5.20 fps, Min. Travel Time= 1.0 min
Avg. Velocity = 5.16 fps, Avg. Travel Time= 1.0 min

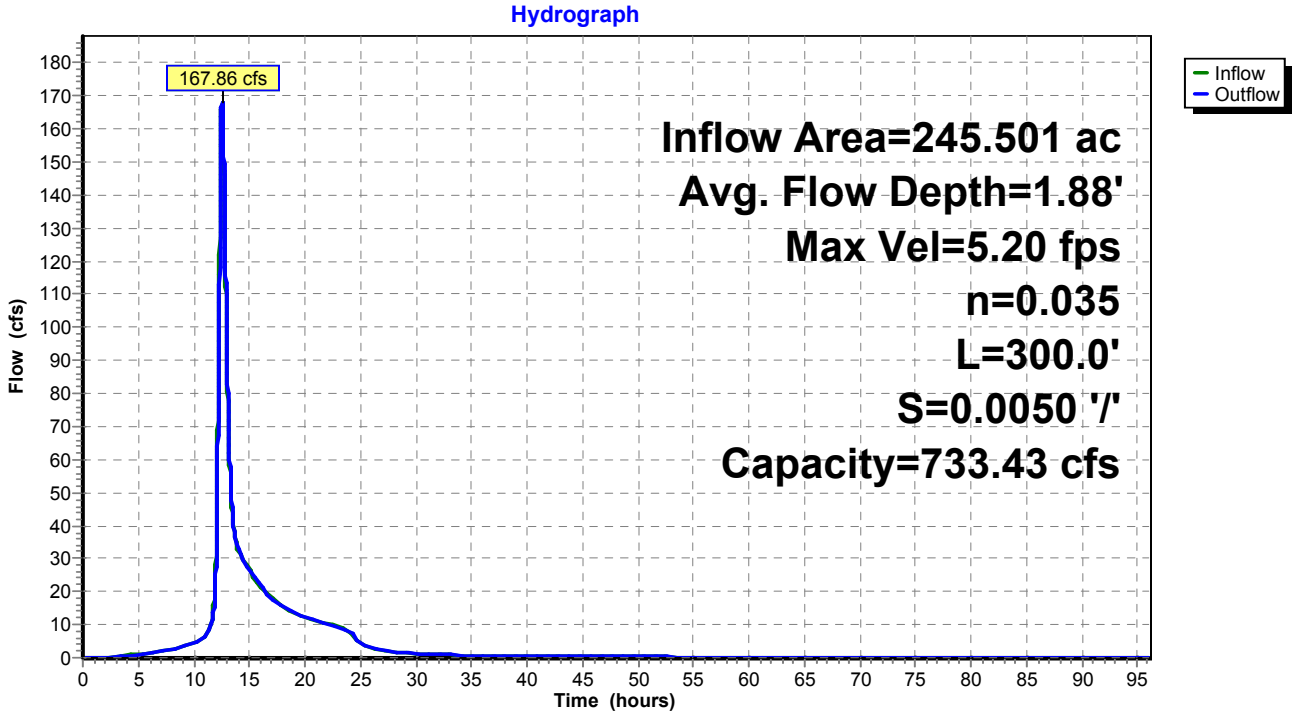
Peak Storage= 9,759 cf @ 12.53 hrs
Average Depth at Peak Storage= 1.88'
Bank-Full Depth= 4.50' Flow Area= 120.0 sf, Capacity= 733.43 cfs

40.00' x 4.50' deep Parabolic Channel, n= 0.035
Length= 300.0' Slope= 0.0050 '/'
Inlet Invert= 0.00', Outlet Invert= -1.50'



‡

Reach 51R: 40' x 4.5 ft parabolic hannel from P-13 to Rice Creek



Summary for Pond 3P: P-3

Inflow Area = 133.365 ac, 58.87% Impervious, Inflow Depth = 1.60" for 2-Year event
Inflow = 85.65 cfs @ 12.04 hrs, Volume= 17.783 af
Outflow = 46.57 cfs @ 13.19 hrs, Volume= 17.779 af, Atten= 46%, Lag= 69.4 min
Primary = 46.57 cfs @ 13.19 hrs, Volume= 17.779 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Starting Elev= 914.00' Surf.Area= 1.790 ac Storage= 5.827 af
Peak Elev= 916.51' @ 13.19 hrs Surf.Area= 2.309 ac Storage= 10.988 af (5.161 af above start)

Plug-Flow detention time= 520.6 min calculated for 11.951 af (67% of inflow)
Center-of-Mass det. time= 183.6 min (1,101.2 - 917.6)

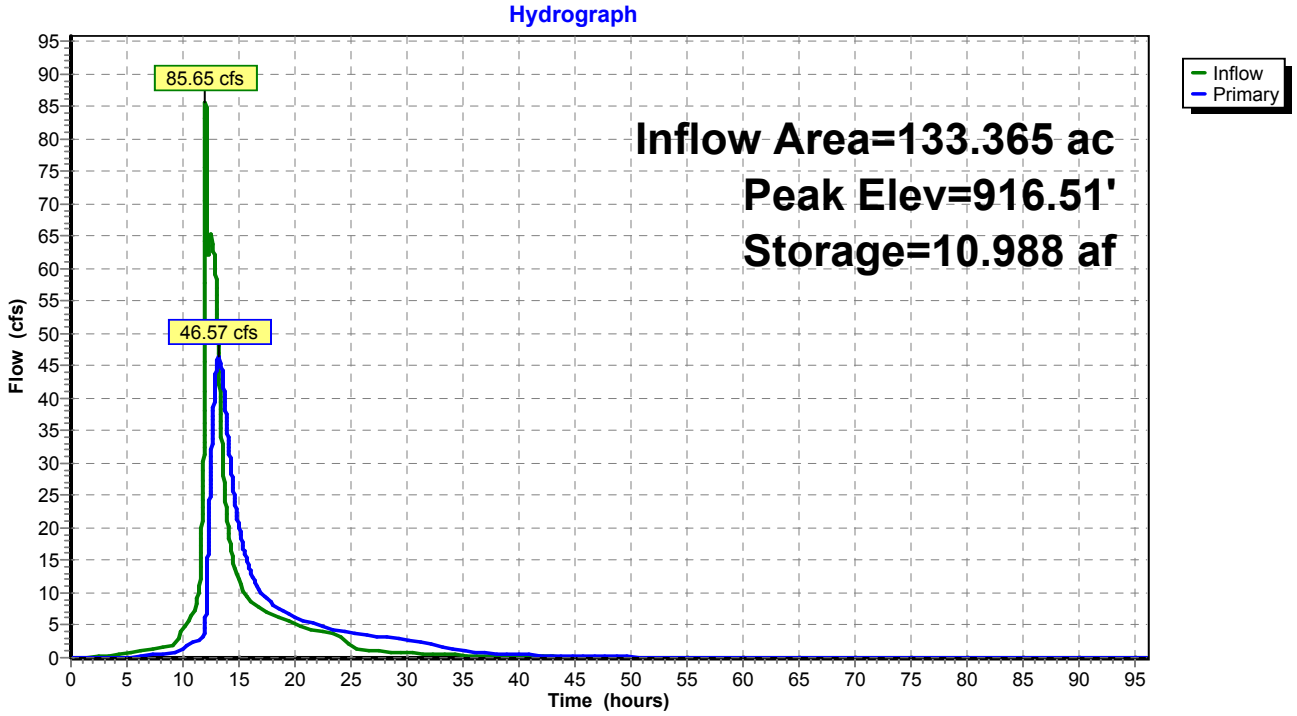
Volume	Invert	Avail.Storage	Storage Description
#1	909.85'	20.423 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
909.85	1.130	0.000	0.000
912.00	1.360	2.677	2.677
916.00	2.220	7.160	9.837
918.00	2.570	4.790	14.627
920.10	2.950	5.796	20.423

Device	Routing	Invert	Outlet Devices
#1	Primary	914.00'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	918.25'	**10.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#3	Primary	915.00'	**7.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=46.57 cfs @ 13.19 hrs HW=916.51' (Free Discharge)
- **1=Orifice/Grate** (Orifice Controls 5.99 cfs @ 7.63 fps)
- **2=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)
- **3=Sharp-Crested Rectangular Weir** (Weir Controls 40.58 cfs @ 4.02 fps)

Pond 3P: P-3


Hydrograph
85.65 cfs
46.57 cfs
Inflow Area=133.365 ac
Peak Elev=916.51'
Storage=10.988 af
Inflow
Primary
Flow (cfs)
Time (hours)
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
75
80
85
90
95

Summary for Pond 4P: P-4

Inflow Area = 7.853 ac, 70.37% Impervious, Inflow Depth = 2.06" for 2-Year event
Inflow = 7.70 cfs @ 12.72 hrs, Volume= 1.347 af
Outflow = 3.87 cfs @ 13.39 hrs, Volume= 1.347 af, Atten= 50%, Lag= 40.2 min
Primary = 1.51 cfs @ 13.39 hrs, Volume= 0.478 af
Secondary = 2.36 cfs @ 13.39 hrs, Volume= 0.869 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Starting Elev= 915.00' Surf.Area= 0.275 ac Storage= 0.646 af
Peak Elev= 916.23' @ 13.39 hrs Surf.Area= 0.344 ac Storage= 1.024 af (0.379 af above start)

Plug-Flow detention time= 318.4 min calculated for 0.701 af (52% of inflow)
Center-of-Mass det. time= 57.8 min (878.1 - 820.3)

Volume	Invert	Avail.Storage	Storage Description
#1	910.90'	1.728 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

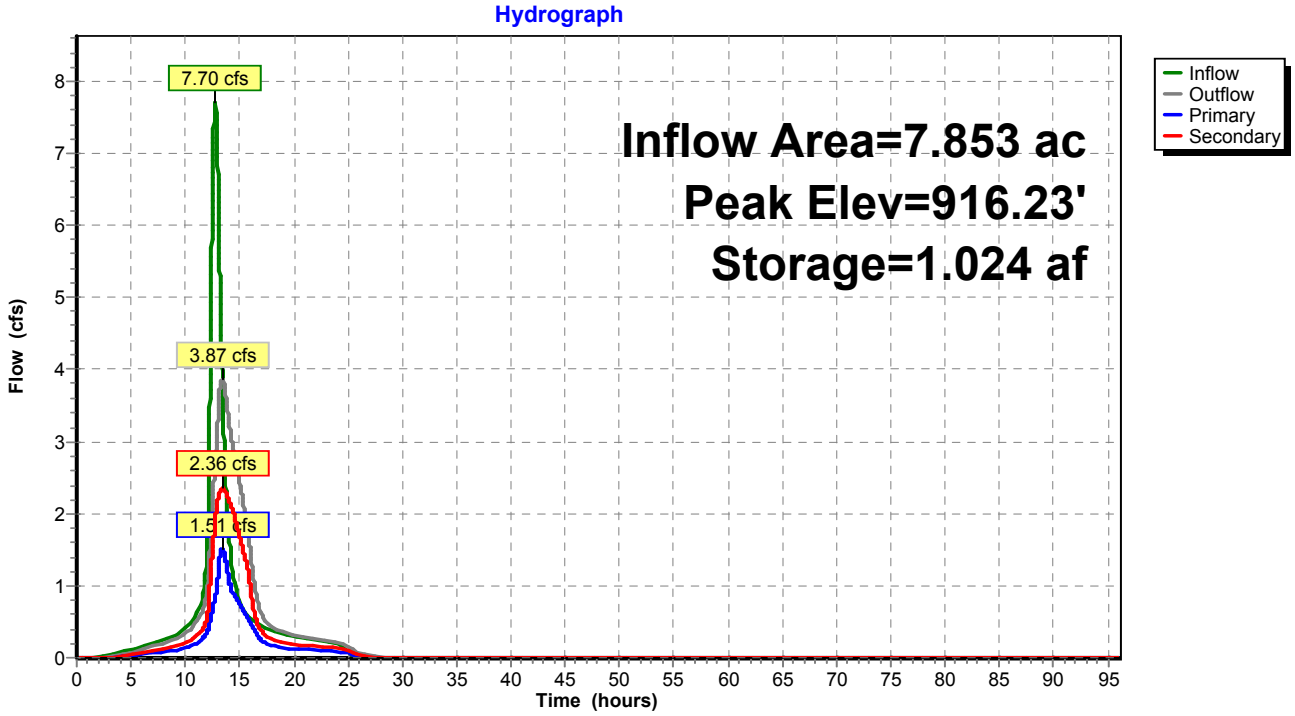
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
910.90	0.070	0.000	0.000
912.00	0.090	0.088	0.088
914.00	0.220	0.310	0.398
916.00	0.330	0.550	0.948
918.00	0.450	0.780	1.728

Device	Routing	Invert	Outlet Devices
#1	Primary	915.00'	**6.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Secondary	915.00'	**9.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Primary	915.95'	**24.0" Round RCP_Round 24"** L= 50.0' RCP, groove end w/headwall, Ke= 0.200 Inlet / Outlet Invert= 915.80' / 915.95' S= -0.0030 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf

Primary OutFlow Max=1.51 cfs @ 13.39 hrs HW=916.23' (Free Discharge)
└**1=Orifice/Grate** (Orifice Controls 1.05 cfs @ 5.33 fps)
└**3=RCP_Round 24"** (Barrel Controls 0.46 cfs @ 1.43 fps)

Secondary OutFlow Max=2.36 cfs @ 13.39 hrs HW=916.23' (Free Discharge)
└**2=Orifice/Grate** (Orifice Controls 2.36 cfs @ 5.33 fps)

Pond 4P: P-4


Hydrograph
Inflow Area=7.853 ac
Peak Elev=916.23'
Storage=1.024 af
7.70 cfs
3.87 cfs
2.36 cfs
1.51 cfs
Inflow
Outflow
Primary
Secondary
Flow (cfs)
Time (hours)
0
1
2
3
4
5
6
7
8
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95

Summary for Pond 7P: P-7

Inflow Area = 29.595 ac, 30.01% Impervious, Inflow Depth = 1.33" for 2-Year event
Inflow = 21.21 cfs @ 12.62 hrs, Volume= 3.290 af
Outflow = 21.21 cfs @ 12.62 hrs, Volume= 3.210 af, Atten= 0%, Lag= 0.4 min
Primary = 21.00 cfs @ 12.62 hrs, Volume= 2.673 af
Secondary = 0.21 cfs @ 12.62 hrs, Volume= 0.537 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Starting Elev= 915.00' Surf.Area= 0.440 ac Storage= 1.062 af
Peak Elev= 915.78' @ 12.62 hrs Surf.Area= 0.533 ac Storage= 1.440 af (0.377 af above start)

Plug-Flow detention time= 448.3 min calculated for 2.148 af (65% of inflow)
Center-of-Mass det. time= 194.2 min (1,036.2 - 842.0)

Volume	Invert	Avail.Storage	Storage Description
#1	910.95'	1.562 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

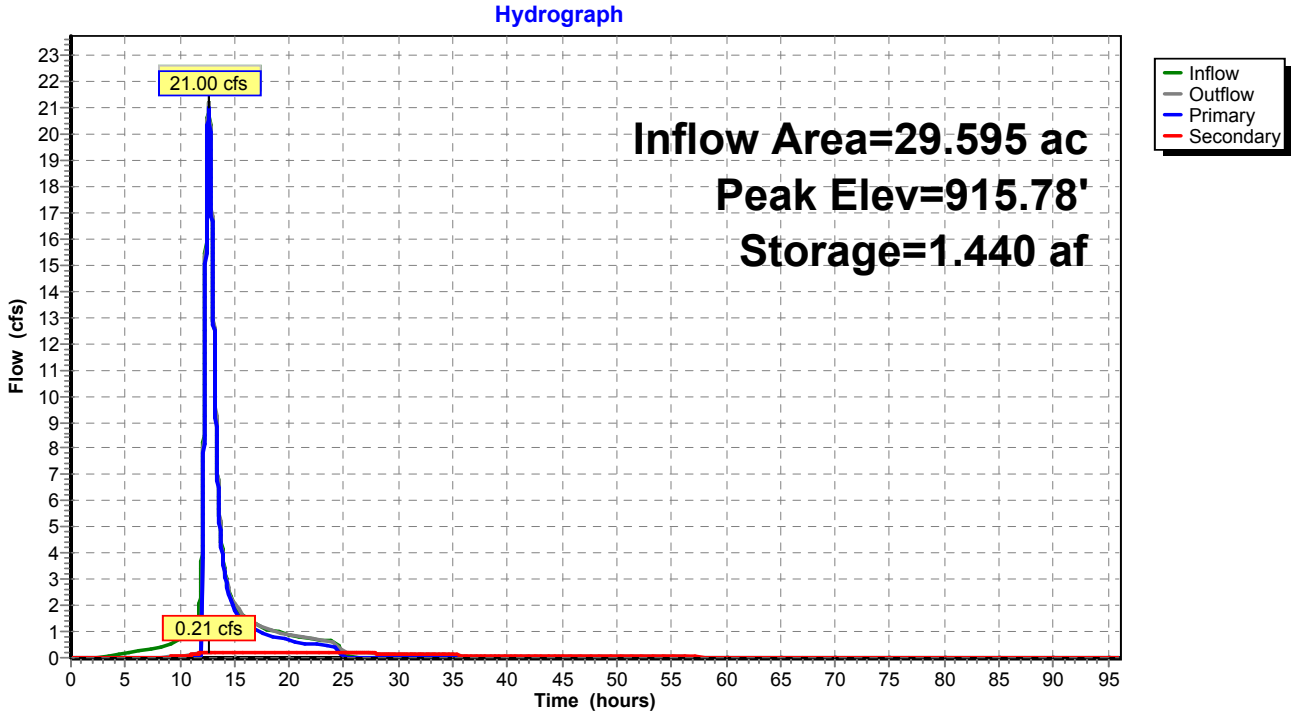
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
910.95	0.110	0.000	0.000
912.00	0.180	0.152	0.152
914.00	0.340	0.520	0.672
915.00	0.440	0.390	1.062
916.00	0.560	0.500	1.562

Device	Routing	Invert	Outlet Devices
#1	Primary	915.00'	**75.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88
#2	Secondary	915.00'	**12.0" Round RCP_Round 12"** L= 50.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 915.00' / 914.75' S= 0.0050 '/' Cc= 0.900 n= 0.130, Flow Area= 0.79 sf

Primary OutFlow Max=35.49 cfs @ 12.62 hrs HW=915.78' TW=915.76' (Fixed TW Elev= 915.76')
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 35.49 cfs @ 0.61 fps)

Secondary OutFlow Max=0.21 cfs @ 12.62 hrs HW=915.78' (Free Discharge)
↑—**2=RCP_Round 12"** (Barrel Controls 0.21 cfs @ 0.45 fps)

Pond 7P: P-7


Hydrograph
Inflow Area=29.595 ac
Peak Elev=915.78'
Storage=1.440 af
21.00 cfs
0.21 cfs
Inflow
Outflow
Primary
Secondary
Flow (cfs)
Time (hours)
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23

Summary for Pond 9P: P-9

[81] Warning: Exceeded Pond W-3 by 0.59' @ 12.49 hrs

Inflow Area = 55.384 ac, 31.48% Impervious, Inflow Depth > 1.42" for 2-Year event
Inflow = 41.79 cfs @ 12.47 hrs, Volume= 6.563 af
Outflow = 41.73 cfs @ 12.49 hrs, Volume= 6.562 af, Atten= 0%, Lag= 1.5 min
Primary = 41.73 cfs @ 12.49 hrs, Volume= 6.562 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Starting Elev= 915.00' Surf.Area= 0.210 ac Storage= 0.353 af
Peak Elev= 915.35' @ 12.49 hrs Surf.Area= 0.281 ac Storage= 0.439 af (0.087 af above start)

Plug-Flow detention time= 196.2 min calculated for 6.209 af (95% of inflow)
Center-of-Mass det. time= 2.2 min (1,108.3 - 1,106.1)

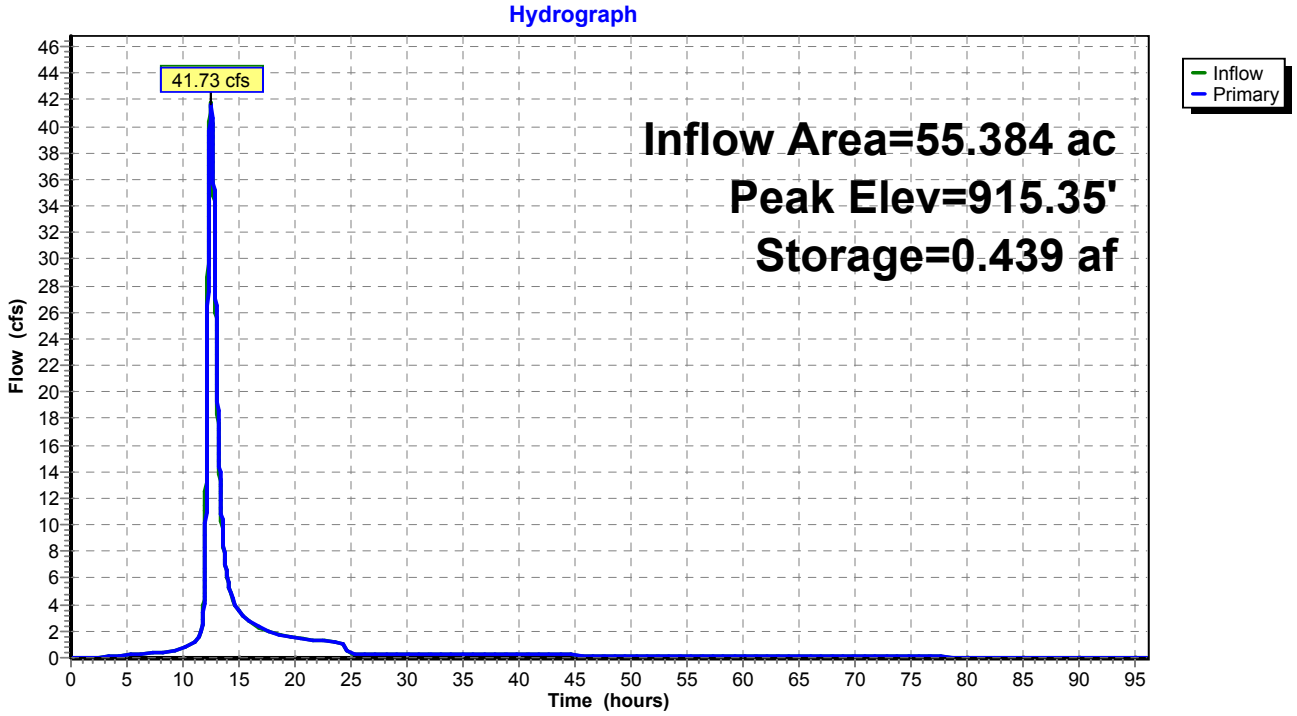
Volume	Invert	Avail.Storage	Storage Description
#1	910.50'	1.673 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
910.50	0.020	0.000	0.000
912.00	0.050	0.052	0.052
913.00	0.070	0.060	0.112
914.00	0.100	0.085	0.198
915.00	0.210	0.155	0.353
916.00	0.410	0.310	0.662
918.00	0.600	1.010	1.673

Device	Routing	Invert	Outlet Devices
#1	Primary	915.00'	**80.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=41.52 cfs @ 12.49 hrs HW=915.35' (Free Discharge)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 41.52 cfs @ 1.47 fps)

Pond 9P: P-9


Hydrograph
41.73 cfs
Inflow Area=55.384 ac
Peak Elev=915.35'
Storage=0.439 af
Inflow
Primary
Flow (cfs)
Time (hours)
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28
30
32
34
36
38
40
42
44
46
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
75
80
85
90
95

Summary for Pond 10P: P-10

[95] Warning: Outlet Device #1 rise exceeded
[79] Warning: Submerged Pond P8 Primary device # 1 INLET by 0.47'

Inflow Area = 66.448 ac, 29.37% Impervious, Inflow Depth > 1.06" for 2-Year event
Inflow = 13.95 cfs @ 13.20 hrs, Volume= 5.875 af
Outflow = 12.98 cfs @ 13.51 hrs, Volume= 5.868 af, Atten= 7%, Lag= 18.3 min
Primary = 10.95 cfs @ 13.51 hrs, Volume= 5.792 af
Secondary = 2.02 cfs @ 13.51 hrs, Volume= 0.076 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Starting Elev= 896.00' Surf.Area= 0.290 ac Storage= 0.700 af
Peak Elev= 897.47' @ 13.51 hrs Surf.Area= 0.351 ac Storage= 1.169 af (0.469 af above start)

Plug-Flow detention time= 387.9 min calculated for 5.168 af (88% of inflow)
Center-of-Mass det. time= 38.9 min (1,303.2 - 1,264.3)

Volume	Invert	Avail.Storage	Storage Description
#1	892.00'	1.760 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

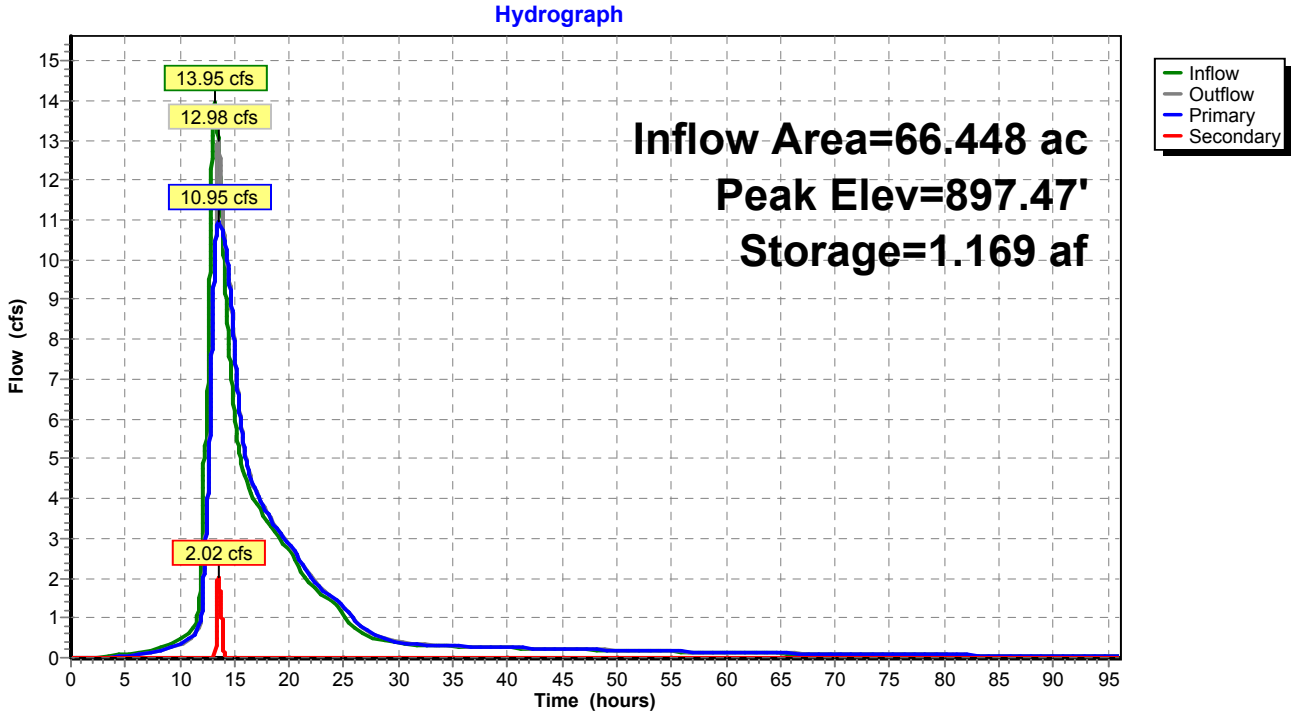
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
892.00	0.120	0.000	0.000
893.00	0.140	0.130	0.130
895.00	0.190	0.330	0.460
896.00	0.290	0.240	0.700
897.00	0.330	0.310	1.010
899.00	0.420	0.750	1.760

Device	Routing	Invert	Outlet Devices
#1	Primary	896.00'	**2.5' long x 1.00' rise Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#2	Secondary	897.40'	**50.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=10.95 cfs @ 13.51 hrs HW=897.47' (Free Discharge)
└**1=Sharp-Crested Rectangular Weir** (Orifice Controls 10.95 cfs @ 4.76 fps)

Secondary OutFlow Max=1.97 cfs @ 13.51 hrs HW=897.47' (Free Discharge)
└**2=Broad-Crested Rectangular Weir** (Weir Controls 1.97 cfs @ 0.60 fps)

Pond 10P: P-10


Hydrograph
13.95 cfs
12.98 cfs
10.95 cfs
2.02 cfs
Inflow Area=66.448 ac
Peak Elev=897.47'
Storage=1.169 af
Inflow
Outflow
Primary
Secondary
Flow (cfs)
Time (hours)
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95

Summary for Pond 11P: P-11

Inflow Area = 58.677 ac, 31.52% Impervious, Inflow Depth > 1.42" for 2-Year event
Inflow = 43.52 cfs @ 12.48 hrs, Volume= 6.960 af
Outflow = 16.21 cfs @ 13.22 hrs, Volume= 6.942 af, Atten= 63%, Lag= 44.4 min
Primary = 12.65 cfs @ 13.22 hrs, Volume= 5.208 af
Secondary = 3.57 cfs @ 13.22 hrs, Volume= 1.734 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Starting Elev= 909.00' Surf.Area= 1.210 ac Storage= 3.640 af
Peak Elev= 910.89' @ 13.22 hrs Surf.Area= 1.427 ac Storage= 6.133 af (2.493 af above start)

Plug-Flow detention time= 958.2 min calculated for 3.302 af (47% of inflow)
Center-of-Mass det. time= 141.8 min (1,231.5 - 1,089.7)

Volume	Invert	Avail.Storage	Storage Description
#1	905.00'	9.405 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

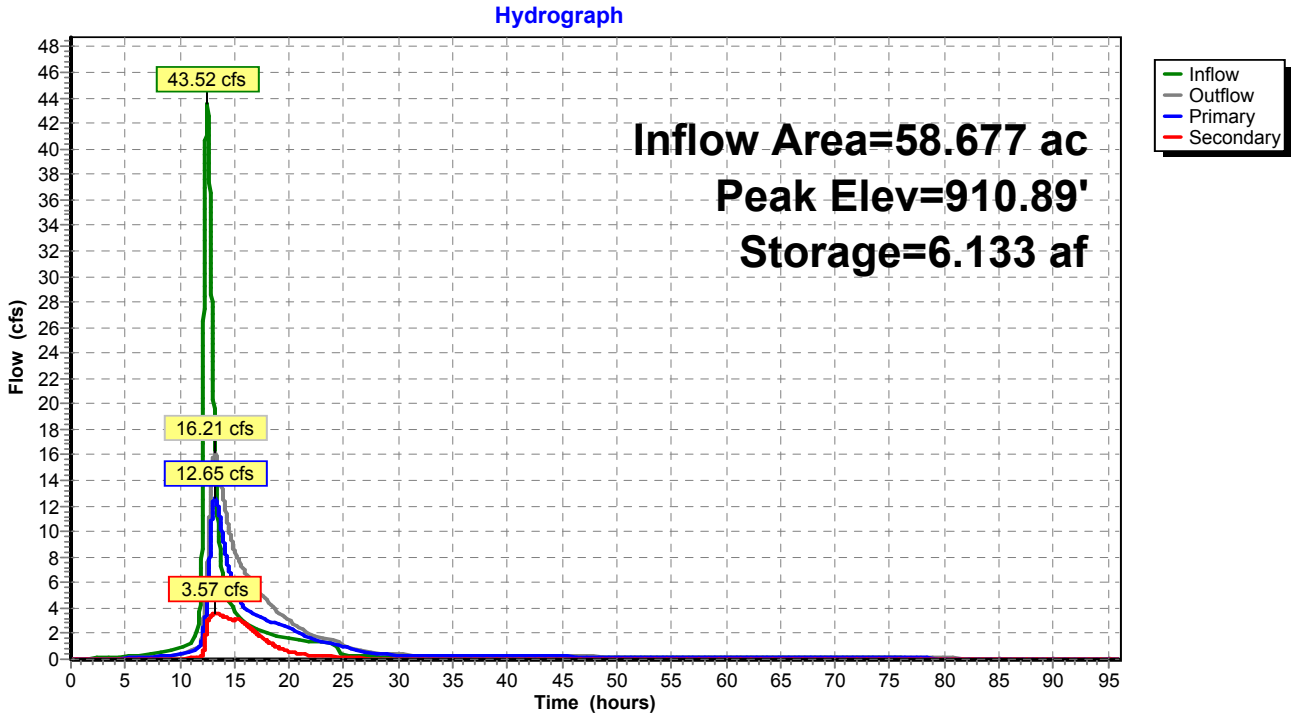
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
905.00	0.760	0.000	0.000
906.00	0.820	0.790	0.790
908.00	0.950	1.770	2.560
909.00	1.210	1.080	3.640
910.00	1.320	1.265	4.905
912.00	1.560	2.880	7.785
913.00	1.680	1.620	9.405

Device	Routing	Invert	Outlet Devices
#1	Primary	909.00'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	910.00'	**24.0" Round RCP_Round 24"** L= 200.0' RCP, groove end w/headwall, Ke= 0.200 Inlet / Outlet Invert= 910.00' / 909.00' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#3	Primary	910.00'	**24.0" Round RCP_Round 24"** L= 200.0' RCP, groove end w/headwall, Ke= 0.200 Inlet / Outlet Invert= 910.00' / 909.00' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#4	Primary	912.00'	**60.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88
#5	Secondary	909.00'	**12.0" Round RCP_Round 12"** L= 150.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 909.00' / 908.00' S= 0.0067 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=12.64 cfs @ 13.22 hrs HW=910.89' (Free Discharge)
- **1=Orifice/Grate** (Orifice Controls 5.20 cfs @ 6.63 fps)
- **2=RCP_Round 24"** (Barrel Controls 3.72 cfs @ 4.02 fps)
- **3=RCP_Round 24"** (Barrel Controls 3.72 cfs @ 4.02 fps)
- **4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Secondary OutFlow Max=3.57 cfs @ 13.22 hrs HW=910.89' (Free Discharge)
- **5=RCP_Round 12"** (Barrel Controls 3.57 cfs @ 4.54 fps)

Pond 11P: P-11



Summary for Pond 12P: P-12

[61] Hint: Exceeded Reach 43R outlet invert by 0.61' @ 14.64 hrs

Inflow Area = 79.658 ac, 31.13% Impervious, Inflow Depth > 1.39" for 2-Year event
Inflow = 24.45 cfs @ 12.02 hrs, Volume= 9.256 af
Outflow = 12.13 cfs @ 14.64 hrs, Volume= 9.236 af, Atten= 50%, Lag= 156.9 min
Primary = 12.13 cfs @ 14.64 hrs, Volume= 9.236 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Starting Elev= 893.00' Surf.Area= 1.640 ac Storage= 5.075 af
Peak Elev= 893.84' @ 14.64 hrs Surf.Area= 1.749 ac Storage= 6.501 af (1.426 af above start)

Plug-Flow detention time= 1,045.0 min calculated for 4.161 af (45% of inflow)
Center-of-Mass det. time= 112.8 min (1,336.7 - 1,223.9)

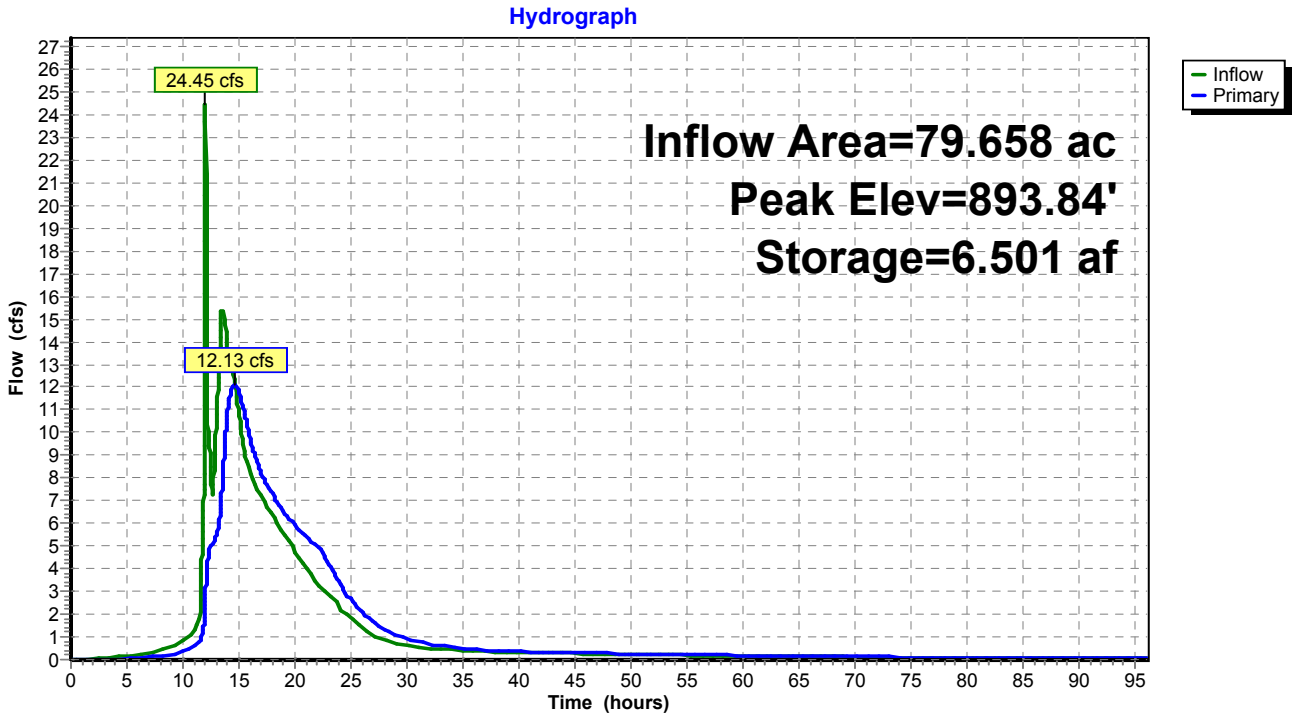
Volume	Invert	Avail.Storage	Storage Description
#1	889.00'	10.590 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
889.00	1.070	0.000	0.000
890.00	1.150	1.110	1.110
892.00	1.330	2.480	3.590
893.00	1.640	1.485	5.075
894.00	1.770	1.705	6.780
896.00	2.040	3.810	10.590

Device	Routing	Invert	Outlet Devices
#1	Primary	893.00'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	893.00'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Primary	893.50'	**43.8" W x 26.6" H, R=22.5"/62.0" Arch RCP_Arch 44x27** L= 30.0' Box, 30-75° wingwalls, rounded crown, Ke= 0.200 Inlet / Outlet Invert= 893.50' / 893.35' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 6.29 sf
#4	Primary	893.50'	**43.8" W x 26.6" H, R=22.5"/62.0" Arch RCP_Arch 44x27** L= 30.0' Box, 30-75° wingwalls, rounded crown, Ke= 0.200 Inlet / Outlet Invert= 893.50' / 893.35' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 6.29 sf
#5	Primary	893.50'	**43.8" W x 26.6" H, R=22.5"/62.0" Arch RCP_Arch 44x27** L= 30.0' Box, 30-75° wingwalls, rounded crown, Ke= 0.200 Inlet / Outlet Invert= 893.50' / 893.35' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 6.29 sf
#6	Primary	893.50'	**43.8" W x 26.6" H, R=22.5"/62.0" Arch RCP_Arch 44x27** L= 30.0' Box, 30-75° wingwalls, rounded crown, Ke= 0.200 Inlet / Outlet Invert= 893.50' / 893.35' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 6.29 sf

Primary OutFlow Max=12.11 cfs @ 14.64 hrs HW=893.84' (Free Discharge)
- **1=Orifice/Grate** (Orifice Controls 3.47 cfs @ 4.42 fps)
- **2=Orifice/Grate** (Orifice Controls 3.47 cfs @ 4.42 fps)
- **3=RCP_Arch 44x27** (Barrel Controls 1.29 cfs @ 2.35 fps)
- **4=RCP_Arch 44x27** (Barrel Controls 1.29 cfs @ 2.35 fps)
- **5=RCP_Arch 44x27** (Barrel Controls 1.29 cfs @ 2.35 fps)
- **6=RCP_Arch 44x27** (Barrel Controls 1.29 cfs @ 2.35 fps)

Pond 12P: P-12



Summary for Pond 13P: P-13

Inflow Area = 237.893 ac, 51.59% Impervious, Inflow Depth > 1.57" for 2-Year event
Inflow = 197.48 cfs @ 12.35 hrs, Volume= 31.047 af
Outflow = 175.31 cfs @ 12.52 hrs, Volume= 31.042 af, Atten= 11%, Lag= 9.8 min
Primary = 164.94 cfs @ 12.52 hrs, Volume= 29.623 af
Secondary = 10.37 cfs @ 12.52 hrs, Volume= 1.419 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Starting Elev= 883.00' Surf.Area= 1.870 ac Storage= 4.265 af
Peak Elev= 884.08' @ 12.52 hrs Surf.Area= 2.250 ac Storage= 6.489 af (2.224 af above start)

Plug-Flow detention time= 216.9 min calculated for 26.775 af (86% of inflow)
Center-of-Mass det. time= 18.5 min (994.5 - 976.0)

Volume	Invert	Avail.Storage	Storage Description
#1	878.00'	11.490 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
878.00	0.000	0.000	0.000
879.00	0.630	0.315	0.315
880.00	0.730	0.680	0.995
882.00	1.070	1.800	2.795
883.00	1.870	1.470	4.265
884.00	2.220	2.045	6.310
886.00	2.960	5.180	11.490

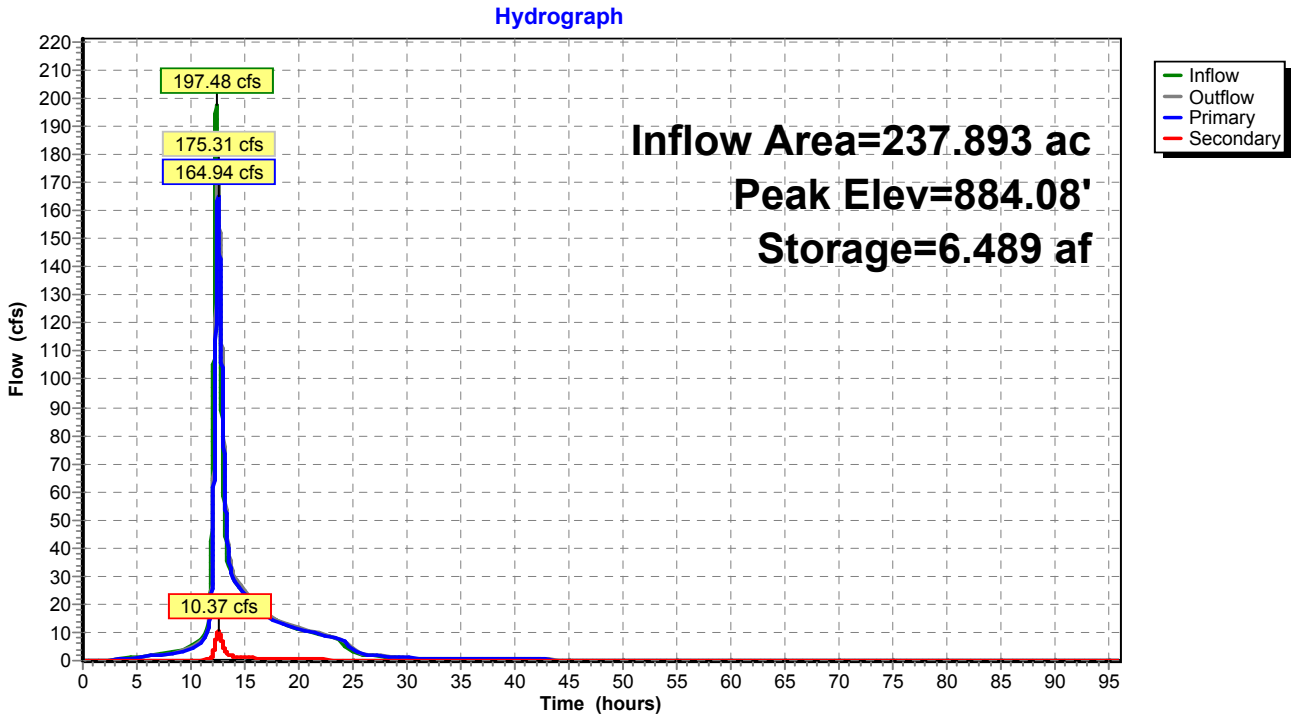
Device	Routing	Invert	Outlet Devices
#1	Primary	883.00'	**55.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88
#2	Secondary	883.00'	**12.0" Round RCP_Round 12"** L= 100.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 883.00' / 882.75' S= 0.0025 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#3	Secondary	883.00'	**12.0" Round RCP_Round 12"** L= 100.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 883.00' / 882.75' S= 0.0025 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#4	Secondary	883.00'	**12.0" Round RCP_Round 12"** L= 100.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 883.00' / 882.75' S= 0.0025 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#5	Secondary	883.00'	**12.0" Round RCP_Round 12"** L= 100.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 883.00' / 882.75' S= 0.0025 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

#6 Secondary 883.00' **12.0" Round RCP_Round 12"**
L= 100.0' RCP, groove end projecting, Ke= 0.200
Inlet / Outlet Invert= 883.00' / 882.75' S= 0.0025 '/' Cc= 0.900
n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=164.92 cfs @ 12.52 hrs HW=884.08' (Free Discharge)
└**1=Broad-Crested Rectangular Weir** (Weir Controls 164.92 cfs @ 2.78 fps)

Secondary OutFlow Max=10.37 cfs @ 12.52 hrs HW=884.08' (Free Discharge)
- **2=RCP_Round 12"** (Barrel Controls 2.07 cfs @ 3.04 fps)
- **3=RCP_Round 12"** (Barrel Controls 2.07 cfs @ 3.04 fps)
- **4=RCP_Round 12"** (Barrel Controls 2.07 cfs @ 3.04 fps)
- **5=RCP_Round 12"** (Barrel Controls 2.07 cfs @ 3.04 fps)
- **6=RCP_Round 12"** (Barrel Controls 2.07 cfs @ 3.04 fps)

Pond 13P: P-13



Summary for Pond 14P: P-14

Inflow Area = 21.198 ac, 39.93% Impervious, Inflow Depth = 1.51" for 2-Year event
Inflow = 23.92 cfs @ 12.30 hrs, Volume= 2.671 af
Outflow = 3.68 cfs @ 13.21 hrs, Volume= 2.671 af, Atten= 85%, Lag= 54.4 min
Primary = 3.68 cfs @ 13.21 hrs, Volume= 2.671 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Starting Elev= 892.00' Surf.Area= 1.380 ac Storage= 4.490 af
Peak Elev= 892.95' @ 13.21 hrs Surf.Area= 1.465 ac Storage= 5.835 af (1.345 af above start)

Plug-Flow detention time= (not calculated: initial storage excedes outflow)
Center-of-Mass det. time= 234.8 min (1,045.0 - 810.2)

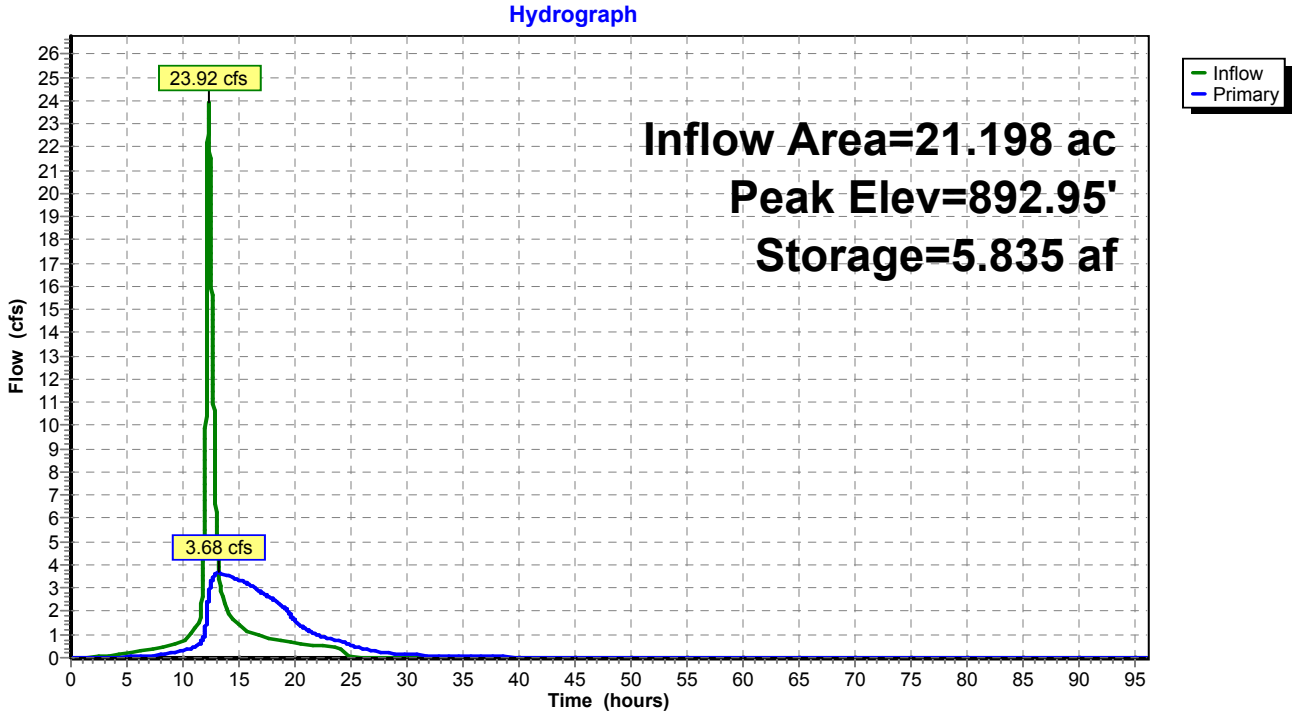
Volume	Invert	Avail.Storage	Storage Description
#1	888.00'	9.910 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
888.00	0.950	0.000	0.000
890.00	1.080	2.030	2.030
892.00	1.380	2.460	4.490
893.00	1.470	1.425	5.915
894.00	1.570	1.520	7.435
895.50	1.730	2.475	9.910

Device	Routing	Invert	Outlet Devices
#1	Primary	892.00'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	893.00'	**18.0" Round RCP_Round 18"** L= 50.0' RCP, groove end w/headwall, Ke= 0.200 Inlet / Outlet Invert= 893.00' / 892.75' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf

Primary OutFlow Max=3.68 cfs @ 13.21 hrs HW=892.95' (Free Discharge)
└**1=Orifice/Grate** (Orifice Controls 3.68 cfs @ 4.68 fps)
└**2=RCP_Round 18"** (Controls 0.00 cfs)

Pond 14P: P-14


Hydrograph
Inflow Area=21.198 ac
Peak Elev=892.95'
Storage=5.835 af
23.92 cfs
3.68 cfs
Inflow
Primary
Flow (cfs)
Time (hours)
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95

Summary for Pond 23P: Thumb Infiltration (Thumb TP load only)

Inflow Area = 48.540 ac, 84.23% Impervious, Inflow Depth = 2.19" for 2-Year event
Inflow = 62.51 cfs @ 12.44 hrs, Volume= 8.852 af
Outflow = 61.28 cfs @ 12.53 hrs, Volume= 5.112 af, Atten= 2%, Lag= 5.5 min
Primary = 61.28 cfs @ 12.53 hrs, Volume= 5.112 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Peak Elev= 903.81' @ 12.53 hrs Surf.Area= 1.000 ac Storage= 3.809 af

Plug-Flow detention time= 214.2 min calculated for 5.112 af (58% of inflow)
Center-of-Mass det. time= 103.5 min (893.7 - 790.2)

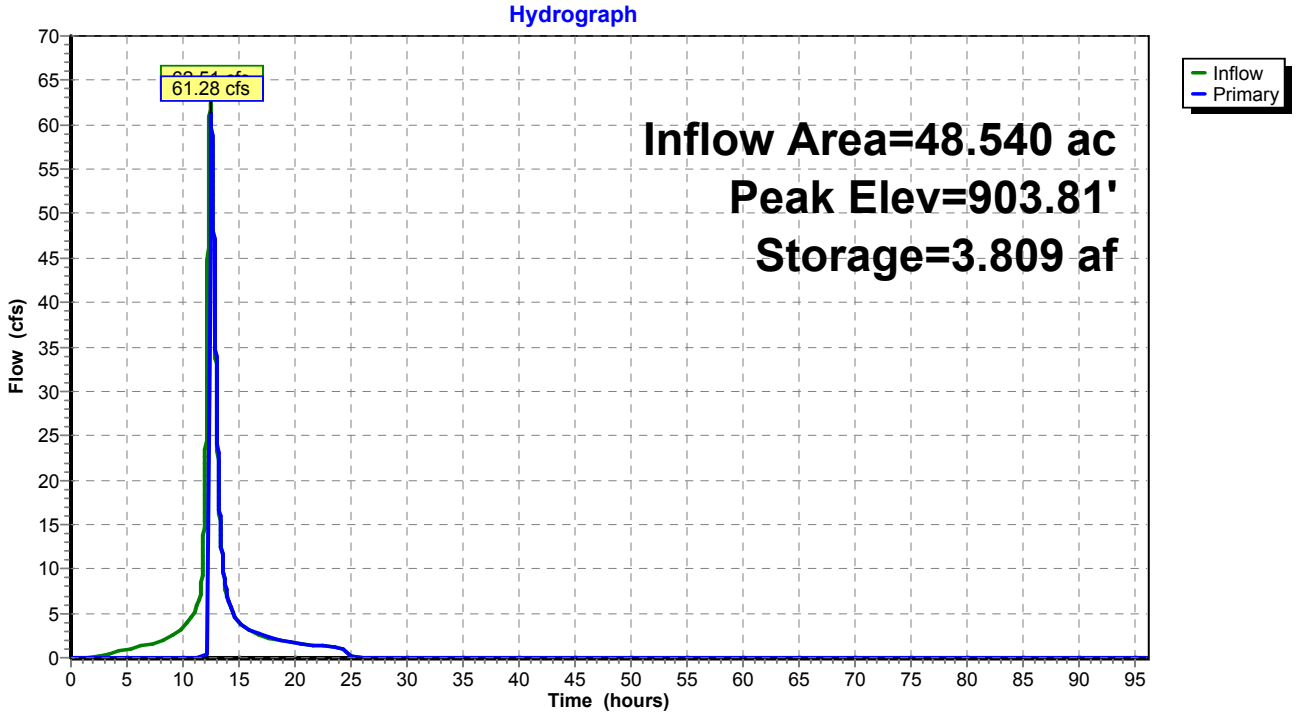
Volume	Invert	Avail.Storage	Storage Description
#1	900.00'	5.000 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
900.00	1.000	0.000	0.000
901.00	1.000	1.000	1.000
902.00	1.000	1.000	2.000
903.00	1.000	1.000	3.000
904.00	1.000	1.000	4.000
905.00	1.000	1.000	5.000

Device	Routing	Invert	Outlet Devices
#1	Primary	903.74'	**1,000.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s) 5.0' Crest Height

Primary OutFlow Max=59.53 cfs @ 12.53 hrs HW=903.81' (Free Discharge)
↑—**1=Sharp-Crested Rectangular Weir** (Weir Controls 59.53 cfs @ 0.86 fps)

Pond 23P: Thumb Infiltration (Thumb TP load only)



Summary for Pond 31P: SB 18 Infiltration

Inflow Area = 52.908 ac, 84.55% Impervious, Inflow Depth = 2.31" for 2-Year event
Inflow = 79.77 cfs @ 12.40 hrs, Volume= 10.194 af
Outflow = 79.68 cfs @ 12.41 hrs, Volume= 6.874 af, Atten= 0%, Lag= 0.4 min
Primary = 79.68 cfs @ 12.41 hrs, Volume= 6.874 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Peak Elev= 903.40' @ 12.41 hrs Surf.Area= 1.000 ac Storage= 3.403 af

Plug-Flow detention time= 178.7 min calculated for 6.874 af (67% of inflow)
Center-of-Mass det. time= 80.8 min (870.6 - 789.8)

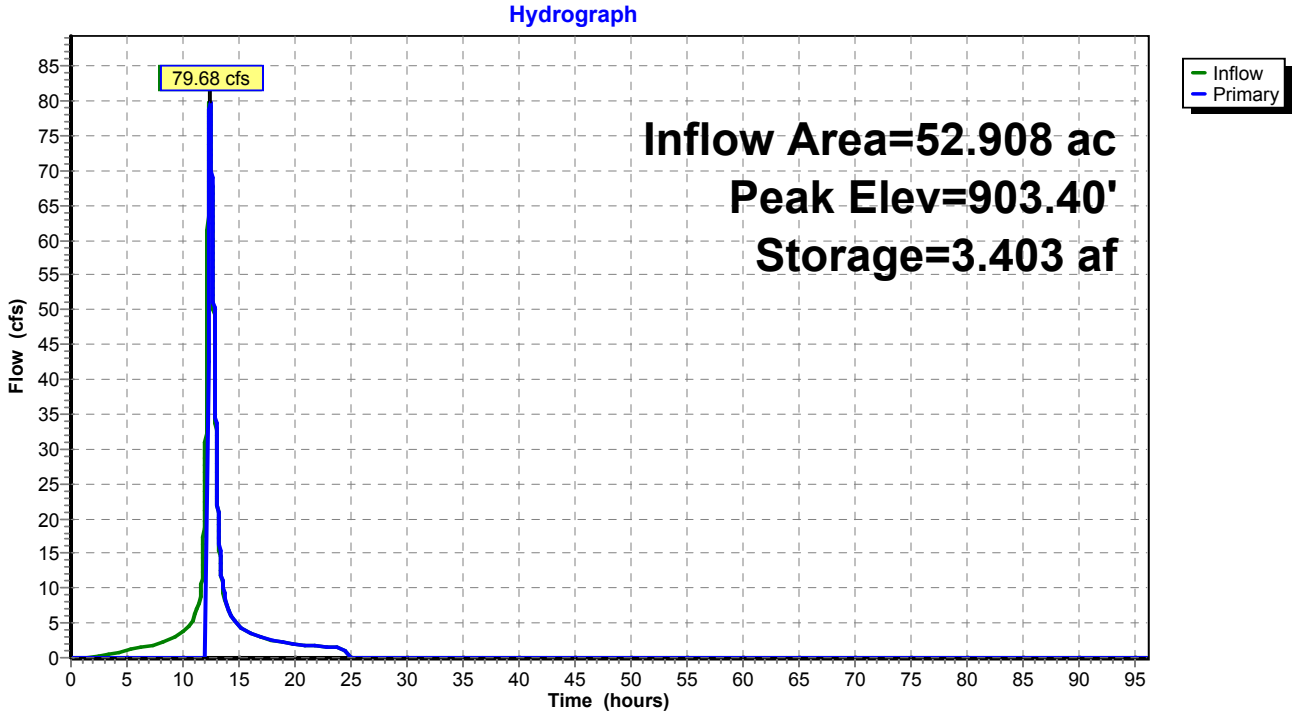
Volume	Invert	Avail.Storage	Storage Description
#1	900.00'	5.000 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
900.00	1.000	0.000	0.000
901.00	1.000	1.000	1.000
902.00	1.000	1.000	2.000
903.00	1.000	1.000	3.000
904.00	1.000	1.000	4.000
905.00	1.000	1.000	5.000

Device	Routing	Invert	Outlet Devices
#1	Primary	903.32'	**1,000.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s) 0.8' Crest Height

Primary OutFlow Max=79.08 cfs @ 12.41 hrs HW=903.40' (Free Discharge)
↑—**1=Sharp-Crested Rectangular Weir** (Weir Controls 79.08 cfs @ 0.95 fps)

Pond 31P: SB 18 Infiltration



Summary for Pond 36P: Culverts passing flow beneath Spine Road

[88] Warning: Qout>Qin may require Finer Routing>1

Inflow Area = 52.908 ac, 84.55% Impervious, Inflow Depth = 1.56" for 2-Year event
Inflow = 79.68 cfs @ 12.41 hrs, Volume= 6.874 af
Outflow = 79.71 cfs @ 12.40 hrs, Volume= 6.874 af, Atten= 0%, Lag= 0.0 min
Primary = 79.71 cfs @ 12.40 hrs, Volume= 6.874 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Peak Elev= 887.32' @ 12.40 hrs Surf.Area= 0.001 ac Storage= 0.000 af

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 0.0 min (870.6 - 870.6)

Volume	Invert	Avail.Storage	Storage Description
#1	887.00'	0.026 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
887.00	0.000	0.000	0.000
887.50	0.002	0.001	0.001
890.50	0.007	0.014	0.014
892.00	0.009	0.012	0.026

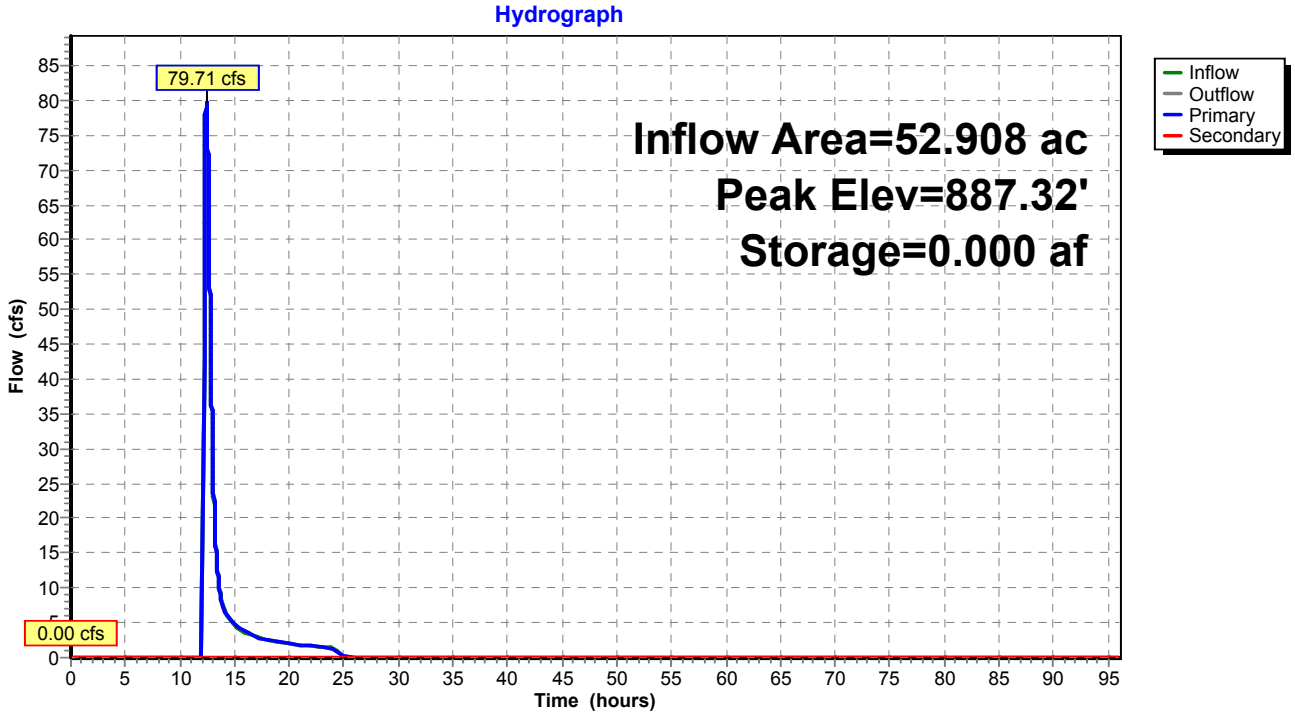
Device	Routing	Invert	Outlet Devices
#1	Primary	887.00'	**Special & User-Defined** Head (feet) 0.00 0.10 0.20 0.30 0.40 0.50 Disch. (cfs) 0.000 25.000 50.000 75.000 100.000 127.000
#2	Secondary	887.50'	**18.0" Round RCP_Round 18"** L= 100.0' RCP, groove end w/headwall, Ke= 0.200 Inlet / Outlet Invert= 887.50' / 886.50' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#3	Secondary	887.50'	**18.0" Round RCP_Round 18"** L= 100.0' RCP, groove end w/headwall, Ke= 0.200 Inlet / Outlet Invert= 887.50' / 886.50' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#4	Secondary	887.50'	**18.0" Round RCP_Round 18"** L= 100.0' RCP, groove end w/headwall, Ke= 0.200 Inlet / Outlet Invert= 887.50' / 886.50' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#5	Secondary	887.50'	**18.0" Round RCP_Round 18"** L= 100.0' RCP, groove end w/headwall, Ke= 0.200 Inlet / Outlet Invert= 887.50' / 886.50' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#6	Secondary	887.50'	**18.0" Round RCP_Round 18"** L= 100.0' RCP, groove end w/headwall, Ke= 0.200 Inlet / Outlet Invert= 887.50' / 886.50' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf

#7	Secondary	887.50'	**18.0" Round RCP_Round 18"** L= 100.0' RCP, groove end w/headwall, Ke= 0.200 Inlet / Outlet Invert= 887.50' / 886.50' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#8	Secondary	887.50'	**18.0" Round RCP_Round 18"** L= 100.0' RCP, groove end w/headwall, Ke= 0.200 Inlet / Outlet Invert= 887.50' / 886.50' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#9	Secondary	887.50'	**18.0" Round RCP_Round 18"** L= 100.0' RCP, groove end w/headwall, Ke= 0.200 Inlet / Outlet Invert= 887.50' / 886.50' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf

Primary OutFlow Max=79.67 cfs @ 12.40 hrs HW=887.32' (Free Discharge)
└─**1=Special & User-Defined** (Custom Controls 79.67 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=887.00' (Free Discharge)
- **2=RCP_Round 18"** (Controls 0.00 cfs)
- **3=RCP_Round 18"** (Controls 0.00 cfs)
- **4=RCP_Round 18"** (Controls 0.00 cfs)
- **5=RCP_Round 18"** (Controls 0.00 cfs)
- **6=RCP_Round 18"** (Controls 0.00 cfs)
- **7=RCP_Round 18"** (Controls 0.00 cfs)
- **8=RCP_Round 18"** (Controls 0.00 cfs)
- **9=RCP_Round 18"** (Controls 0.00 cfs)

Pond 36P: Culverts passing flow beneath Spine Road



Summary for Pond CRH-1: CRH-1

Inflow Area = 6.955 ac, 46.76% Impervious, Inflow Depth = 1.63" for 2-Year event
Inflow = 10.87 cfs @ 12.15 hrs, Volume= 0.947 af
Outflow = 4.86 cfs @ 12.47 hrs, Volume= 0.947 af, Atten= 55%, Lag= 19.3 min
Discarded = 0.22 cfs @ 12.47 hrs, Volume= 0.467 af
Primary = 4.63 cfs @ 12.47 hrs, Volume= 0.480 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Peak Elev= 877.67' @ 12.47 hrs Surf.Area= 0.275 ac Storage= 0.356 af

Plug-Flow detention time= 271.9 min calculated for 0.947 af (100% of inflow)
Center-of-Mass det. time= 271.9 min (1,066.6 - 794.7)

Volume	Invert	Avail.Storage	Storage Description
#1	876.00'	0.850 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

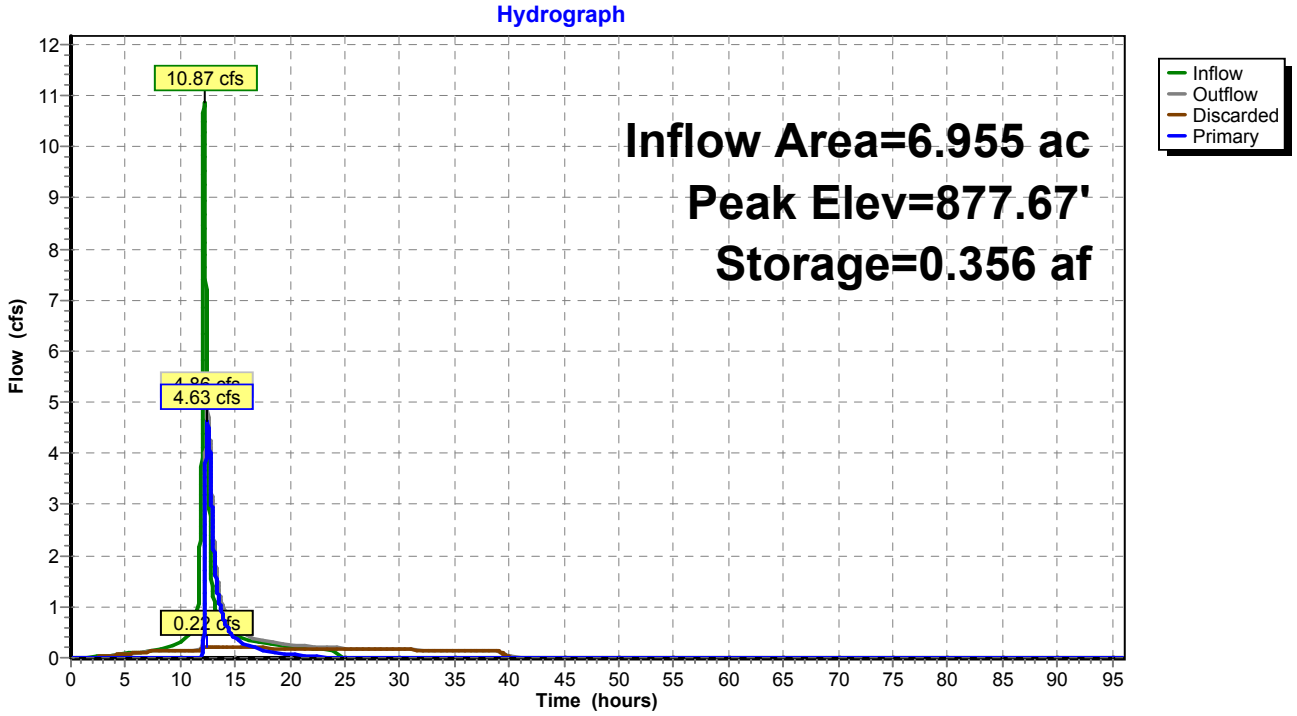
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
876.00	0.150	0.000	0.000
878.00	0.300	0.450	0.450
879.00	0.500	0.400	0.850

Device	Routing	Invert	Outlet Devices
#1	Discarded	876.00'	**0.800 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 0.00'
#2	Primary	877.00'	**24.0" Round Culvert** L= 155.0' Ke= 0.500 Inlet / Outlet Invert= 877.00' / 876.00' S= 0.0065 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#3	Primary	877.00'	**24.0" Round Culvert** L= 155.0' Ke= 0.500 Inlet / Outlet Invert= 877.00' / 876.00' S= 0.0065 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf

Discarded OutFlow Max=0.22 cfs @ 12.47 hrs HW=877.67' (Free Discharge)
└**1=Exfiltration** (Controls 0.22 cfs)

Primary OutFlow Max=4.63 cfs @ 12.47 hrs HW=877.67' (Free Discharge)
├**2=Culvert** (Barrel Controls 2.32 cfs @ 3.73 fps)
└**3=Culvert** (Barrel Controls 2.32 cfs @ 3.73 fps)

Pond CRH-1: CRH-1



Summary for Pond CRH-2: CRH-2

Inflow Area = 10.214 ac, 37.73% Impervious, Inflow Depth = 1.47" for 2-Year event
Inflow = 12.67 cfs @ 12.22 hrs, Volume= 1.253 af
Outflow = 2.69 cfs @ 12.87 hrs, Volume= 1.253 af, Atten= 79%, Lag= 38.9 min
Discarded = 0.33 cfs @ 12.87 hrs, Volume= 0.826 af
Primary = 2.36 cfs @ 12.87 hrs, Volume= 0.427 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Peak Elev= 882.05' @ 12.87 hrs Surf.Area= 0.405 ac Storage= 0.620 af

Plug-Flow detention time= 502.7 min calculated for 1.253 af (100% of inflow)
Center-of-Mass det. time= 502.8 min (1,310.0 - 807.2)

Volume	Invert	Avail.Storage	Storage Description
#1	880.00'	1.600 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

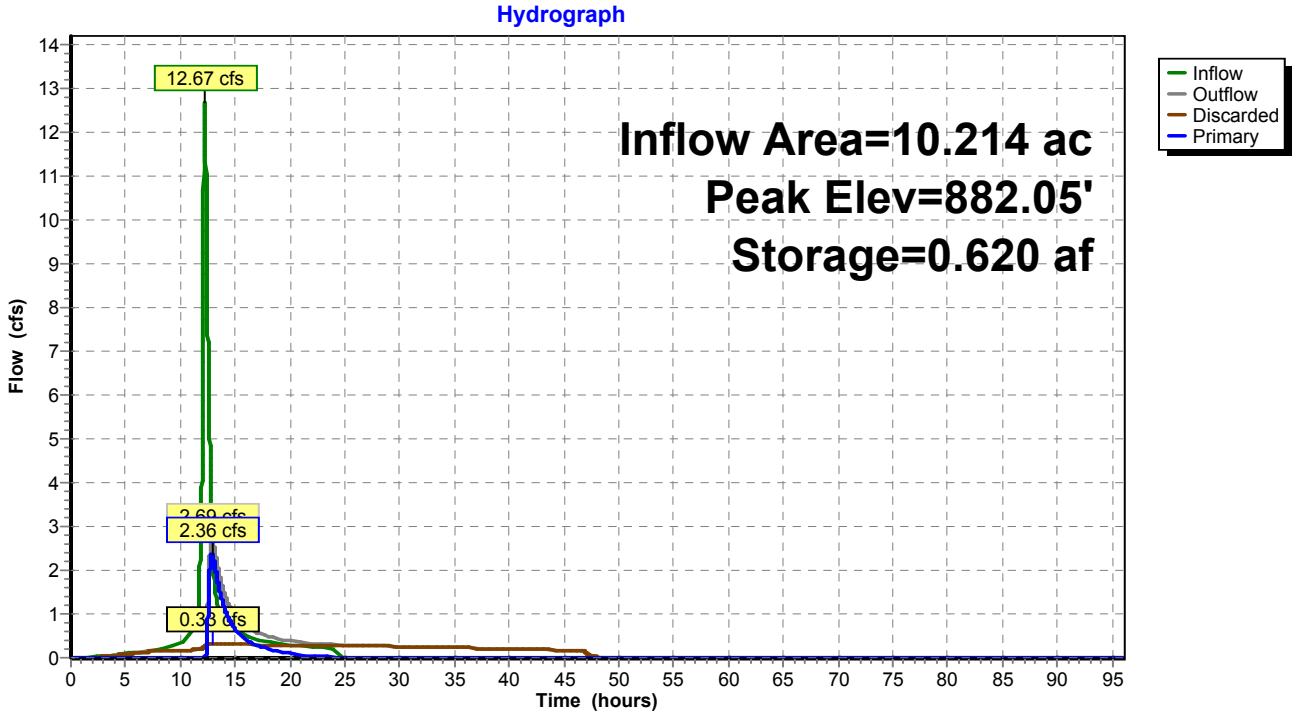
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
880.00	0.200	0.000	0.000
882.00	0.400	0.600	0.600
884.00	0.600	1.000	1.600

Device	Routing	Invert	Outlet Devices
#1	Discarded	880.00'	**0.800 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 0.00'
#2	Primary	881.50'	**24.0" Round Culvert** L= 155.0' Ke= 0.500 Inlet / Outlet Invert= 881.50' / 881.00' S= 0.0032 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#3	Primary	881.50'	**24.0" Round Culvert** L= 155.0' Ke= 0.500 Inlet / Outlet Invert= 881.50' / 881.00' S= 0.0032 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf

Discarded OutFlow Max=0.33 cfs @ 12.87 hrs HW=882.05' (Free Discharge)
└**1=Exfiltration** (Controls 0.33 cfs)

Primary OutFlow Max=2.36 cfs @ 12.87 hrs HW=882.05' (Free Discharge)
├**2=Culvert** (Barrel Controls 1.18 cfs @ 2.53 fps)
└**3=Culvert** (Barrel Controls 1.18 cfs @ 2.53 fps)

Pond CRH-2: CRH-2



Summary for Pond CRH-3: CRH-3

Inflow Area = 11.815 ac, 36.95% Impervious, Inflow Depth = 0.62" for 2-Year event
Inflow = 2.97 cfs @ 12.04 hrs, Volume= 0.610 af
Outflow = 1.22 cfs @ 14.06 hrs, Volume= 0.610 af, Atten= 59%, Lag= 121.2 min
Discarded = 0.20 cfs @ 14.06 hrs, Volume= 0.378 af
Primary = 1.02 cfs @ 14.06 hrs, Volume= 0.232 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Peak Elev= 878.31' @ 14.06 hrs Surf.Area= 0.248 ac Storage= 0.262 af

Plug-Flow detention time= 350.0 min calculated for 0.610 af (100% of inflow)
Center-of-Mass det. time= 350.0 min (1,206.9 - 856.9)

Volume	Invert	Avail.Storage	Storage Description
#1	877.00'	0.850 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

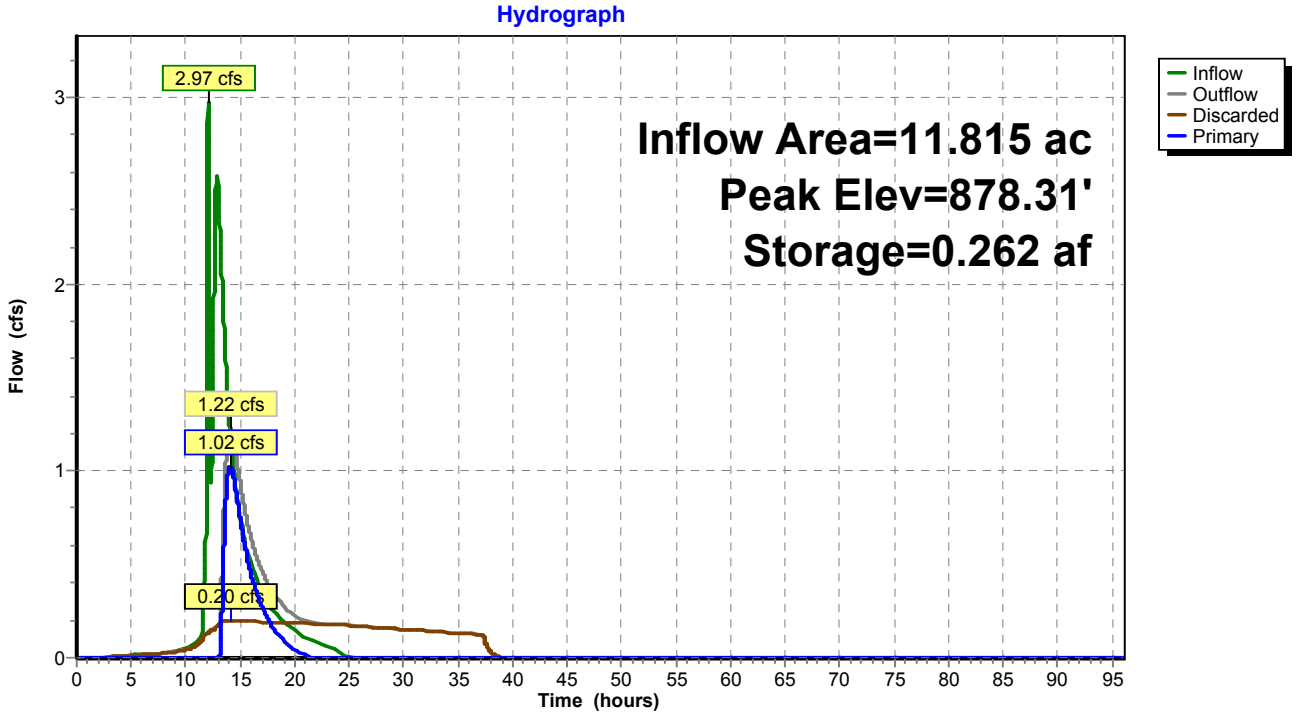
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
877.00	0.150	0.000	0.000
879.00	0.300	0.450	0.450
880.00	0.500	0.400	0.850

Device	Routing	Invert	Outlet Devices
#1	Discarded	877.00'	**0.800 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 0.00'
#2	Primary	878.00'	**24.0" Round Culvert** L= 155.0' Ke= 0.500 Inlet / Outlet Invert= 878.00' / 877.00' S= 0.0065 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#3	Primary	878.00'	**24.0" Round Culvert** L= 155.0' Ke= 0.500 Inlet / Outlet Invert= 878.00' / 877.00' S= 0.0065 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf

Discarded OutFlow Max=0.20 cfs @ 14.06 hrs HW=878.31' (Free Discharge)
└**1=Exfiltration** (Controls 0.20 cfs)

Primary OutFlow Max=1.02 cfs @ 14.06 hrs HW=878.31' (Free Discharge)
├**2=Culvert** (Barrel Controls 0.51 cfs @ 2.48 fps)
└**3=Culvert** (Barrel Controls 0.51 cfs @ 2.48 fps)

Pond CRH-3: CRH-3



Summary for Pond P1/P2: P-1/P-2

Inflow Area = 68.531 ac, 57.92% Impervious, Inflow Depth = 1.83" for 2-Year event
Inflow = 54.34 cfs @ 12.57 hrs, Volume= 10.477 af
Outflow = 52.67 cfs @ 12.67 hrs, Volume= 10.473 af, Atten= 3%, Lag= 6.1 min
Primary = 52.67 cfs @ 12.67 hrs, Volume= 10.473 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Starting Elev= 924.00' Surf.Area= 1.270 ac Storage= 3.500 af
Peak Elev= 924.94' @ 12.67 hrs Surf.Area= 1.411 ac Storage= 4.759 af (1.259 af above start)

Plug-Flow detention time= 303.1 min calculated for 6.973 af (67% of inflow)
Center-of-Mass det. time= 97.0 min (907.7 - 810.7)

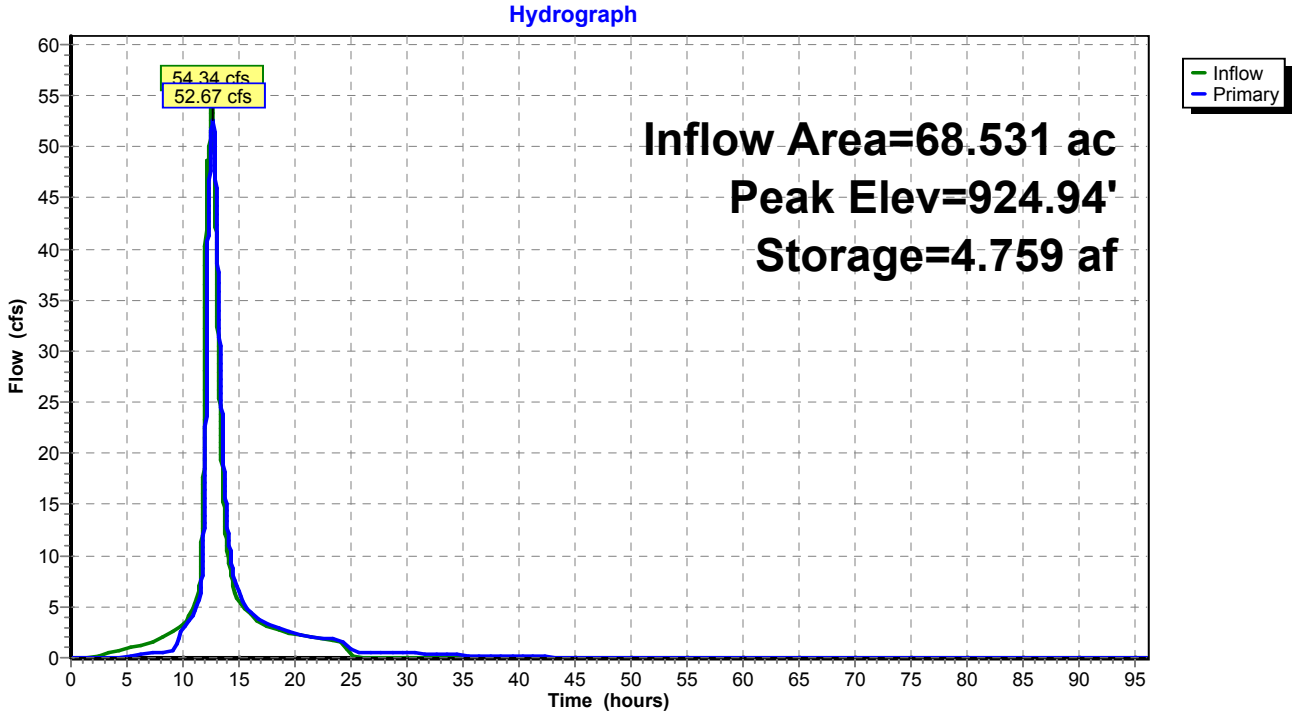
Volume	Invert	Avail.Storage	Storage Description
#1	920.00'	6.340 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
920.00	0.650	0.000	0.000
922.00	0.790	1.440	1.440
924.00	1.270	2.060	3.500
926.00	1.570	2.840	6.340

Device	Routing	Invert	Outlet Devices
#1	Primary	924.40'	**40.0' long x 1.00' rise Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#2	Primary	924.00'	**6.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=52.62 cfs @ 12.67 hrs HW=924.94' (Free Discharge)
└**1=Sharp-Crested Rectangular Weir** (Weir Controls 51.70 cfs @ 2.40 fps)
└**2=Orifice/Grate** (Orifice Controls 0.92 cfs @ 4.67 fps)

Pond P1/P2: P-1/P-2



Summary for Pond P5/P6: P-5/P-6

Inflow Area = 43.279 ac, 47.44% Impervious, Inflow Depth = 1.65" for 2-Year event
Inflow = 66.74 cfs @ 12.15 hrs, Volume= 5.941 af
Outflow = 6.87 cfs @ 13.07 hrs, Volume= 3.834 af, Atten= 90%, Lag= 55.3 min
Primary = 5.61 cfs @ 13.07 hrs, Volume= 3.148 af
Secondary = 1.26 cfs @ 13.07 hrs, Volume= 0.685 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Starting Elev= 929.00' Surf.Area= 1.975 ac Storage= 5.062 af
Peak Elev= 930.72' @ 13.07 hrs Surf.Area= 2.356 ac Storage= 8.829 af (3.766 af above start)

Plug-Flow detention time= (not calculated: initial storage excedes outflow)
Center-of-Mass det. time= 333.1 min (1,126.8 - 793.7)

Volume	Invert	Avail.Storage	Storage Description
#1	926.00'	14.650 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

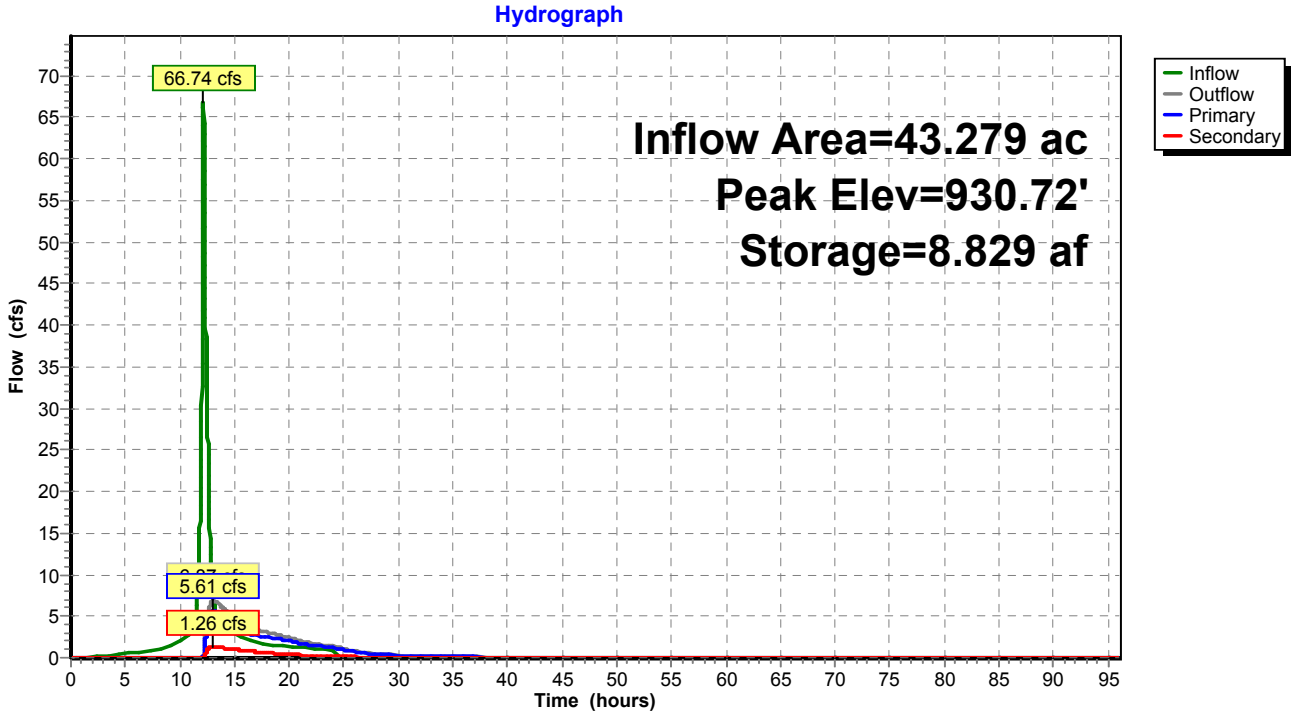
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
926.00	1.510	0.000	0.000
928.00	1.710	3.220	3.220
930.00	2.240	3.950	7.170
931.00	2.400	2.320	9.490
933.00	2.760	5.160	14.650

Device	Routing	Invert	Outlet Devices
#1	Primary	930.00'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	930.50'	**7.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#3	Primary	931.50'	**14.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#4	Secondary	930.00'	**9.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=5.59 cfs @ 13.07 hrs HW=930.72' (Free Discharge)
- **1=Orifice/Grate** (Orifice Controls 3.21 cfs @ 4.09 fps)
- **2=Sharp-Crested Rectangular Weir** (Weir Controls 2.38 cfs @ 1.54 fps)
- **3=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Secondary OutFlow Max=1.26 cfs @ 13.07 hrs HW=930.72' (Free Discharge)
- **4=Orifice/Grate** (Orifice Controls 1.26 cfs @ 2.89 fps)

Pond P5/P6: P-5/P-6



Summary for Pond P8: P-8

Inflow Area = 6.389 ac, 7.62% Impervious, Inflow Depth = 0.93" for 2-Year event
Inflow = 7.36 cfs @ 12.06 hrs, Volume= 0.497 af
Outflow = 1.39 cfs @ 12.63 hrs, Volume= 0.495 af, Atten= 81%, Lag= 34.0 min
Primary = 1.39 cfs @ 12.63 hrs, Volume= 0.495 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Starting Elev= 897.00' Surf.Area= 0.300 ac Storage= 0.495 af
Peak Elev= 897.61' @ 12.63 hrs Surf.Area= 0.391 ac Storage= 0.706 af (0.211 af above start)

Plug-Flow detention time= 5,368.4 min calculated for 0.000 af (0% of inflow)
Center-of-Mass det. time= 246.5 min (1,091.8 - 845.3)

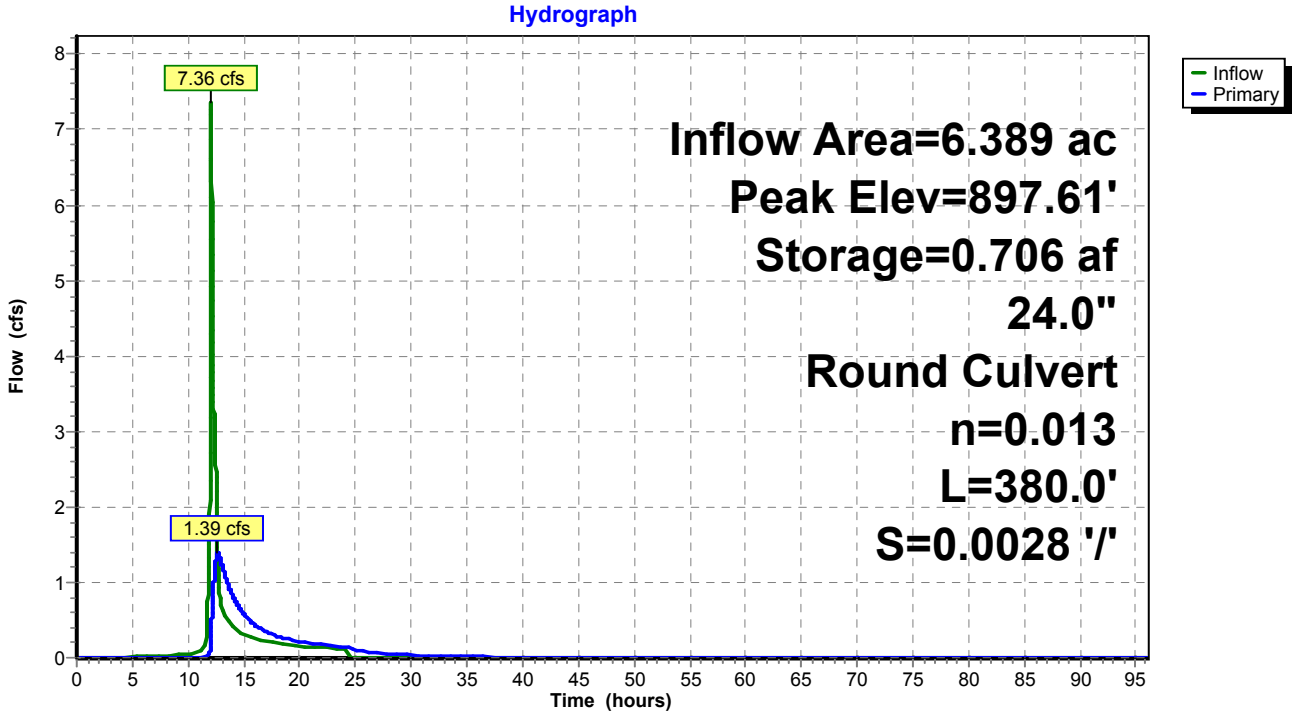
Volume	Invert	Avail.Storage	Storage Description
#1	893.00'	1.850 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
893.00	0.030	0.000	0.000
894.00	0.070	0.050	0.050
896.00	0.150	0.220	0.270
897.00	0.300	0.225	0.495
898.00	0.450	0.375	0.870
900.00	0.530	0.980	1.850

Device	Routing	Invert	Outlet Devices
#1	Primary	897.00'	**24.0" Round RCP_Round 24"** L= 380.0' RCP, groove end w/headwall, Ke= 0.200 Inlet / Outlet Invert= 897.00' / 895.94' S= 0.0028 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf

Primary OutFlow Max=1.39 cfs @ 12.63 hrs HW=897.61' (Free Discharge)
1=RCP_Round 24" (Barrel Controls 1.39 cfs @ 2.56 fps)

Pond P8: P-8


Hydrograph
7.36 cfs
1.39 cfs
Inflow Area=6.389 ac
Peak Elev=897.61'
Storage=0.706 af
24.0"
Round Culvert
n=0.013
L=380.0'
S=0.0028 '/'
Inflow
Primary
Flow (cfs)
Time (hours)
0
1
2
3
4
5
6
7
8
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95

Summary for Pond W-1: W-1

[79] Warning: Submerged Pond 4P Secondary device # 2 by 0.09'

Inflow Area = 0.997 ac, 24.47% Impervious, Inflow Depth = 11.75" for 2-Year event
Inflow = 2.47 cfs @ 13.33 hrs, Volume= 0.976 af
Outflow = 2.05 cfs @ 14.46 hrs, Volume= 0.976 af, Atten= 17%, Lag= 68.0 min
Primary = 2.05 cfs @ 14.46 hrs, Volume= 0.976 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Peak Elev= 915.09' @ 14.46 hrs Surf.Area= 0.715 ac Storage= 0.235 af

Plug-Flow detention time= 119.0 min calculated for 0.976 af (100% of inflow)
Center-of-Mass det. time= 119.0 min (987.3 - 868.3)

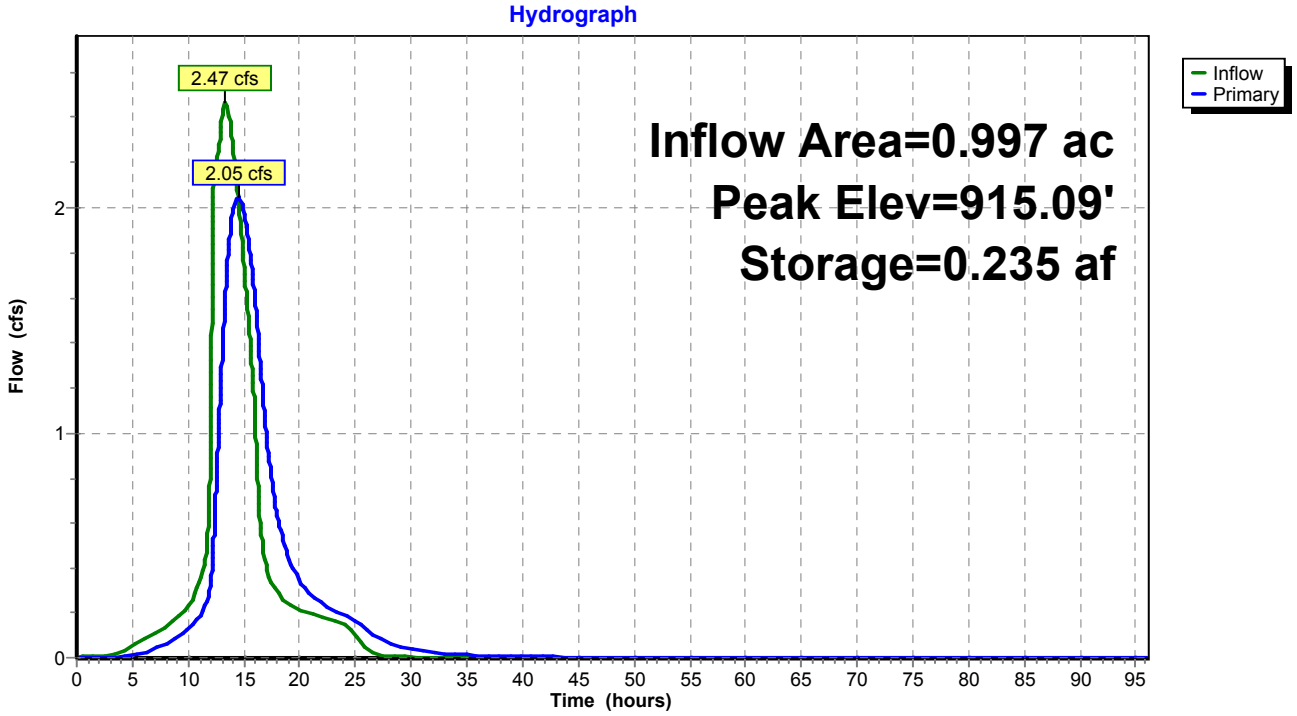
Volume	Invert	Avail.Storage	Storage Description
#1	914.75'	0.950 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
914.75	0.660	0.000	0.000
916.00	0.860	0.950	0.950

Device	Routing	Invert	Outlet Devices
#1	Primary	914.75'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=2.05 cfs @ 14.46 hrs HW=915.09' (Free Discharge)
↑**1=Orifice/Grate** (Weir Controls 2.05 cfs @ 1.91 fps)

Pond W-1: W-1


Hydrograph
2.47 cfs
2.05 cfs
Inflow Area=0.997 ac
Peak Elev=915.09'
Storage=0.235 af
Inflow
Primary
Flow (cfs)
Time (hours)
0
1
2
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95

Summary for Pond W-2: W-2

Inflow	=	1.26 cfs @	13.07 hrs, Volume=	0.685 af
Outflow	=	0.37 cfs @	20.25 hrs, Volume=	0.540 af, Atten= 70%, Lag= 430.6 min
Primary	=	0.37 cfs @	20.25 hrs, Volume=	0.540 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Peak Elev= 929.37' @ 20.25 hrs Surf.Area= 1.153 ac Storage= 0.413 af

Plug-Flow detention time= 886.6 min calculated for 0.540 af (79% of inflow)
Center-of-Mass det. time= 761.7 min (1,821.3 - 1,059.7)

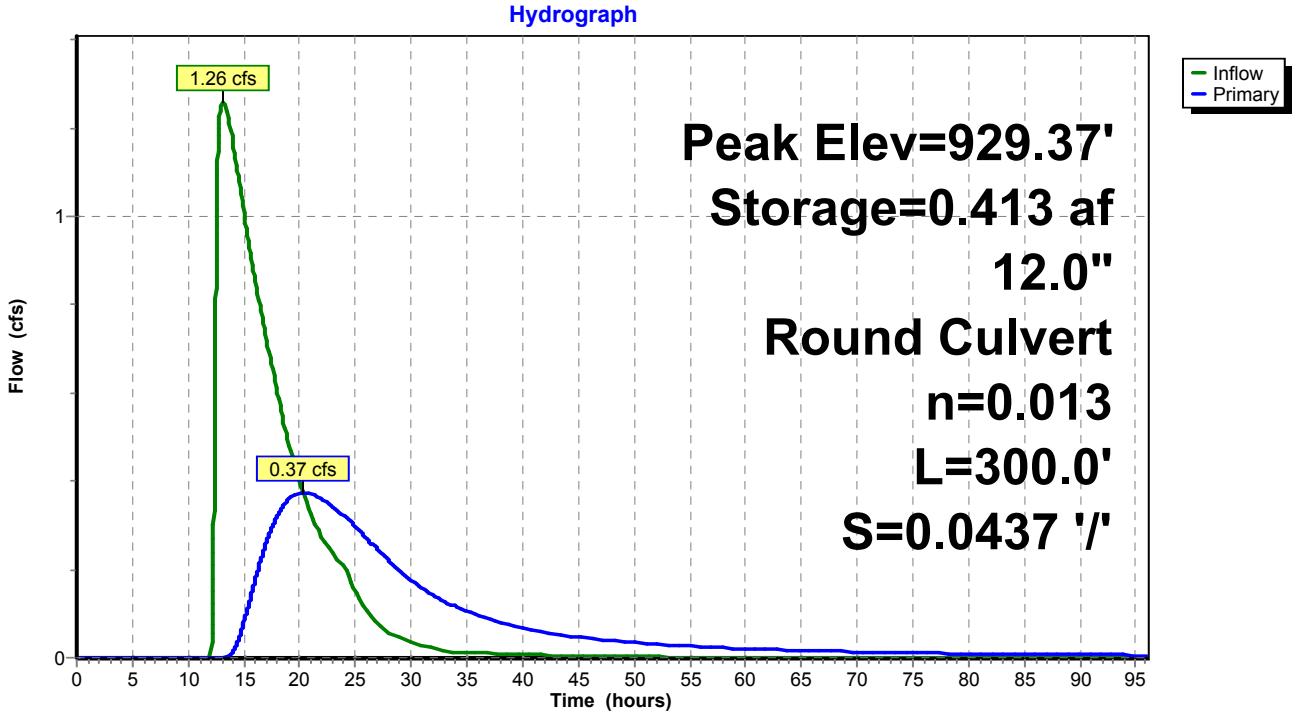
Volume	Invert	Avail.Storage	Storage Description
#1	929.00'	1.175 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
929.00	1.090	0.000	0.000
930.00	1.260	1.175	1.175

Device	Routing	Invert	Outlet Devices
#1	Primary	929.10'	**12.0" Round RCP_Round 12"** L= 300.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 929.10' / 916.00' S= 0.0437 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=0.37 cfs @ 20.25 hrs HW=929.37' (Free Discharge)
↑—**1=RCP_Round 12"** (Inlet Controls 0.37 cfs @ 2.20 fps)

Pond W-2: W-2


Hydrograph
1.26 cfs
0.37 cfs
Peak Elev=929.37'
Storage=0.413 af
12.0"
Round Culvert
n=0.013
L=300.0'
S=0.0437 '/'
Inflow
Primary
Flow (cfs)
Time (hours)
0
1
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95

Summary for Pond W-3: W-3

[79] Warning: Submerged Pond 7P Secondary device # 2 OUTLET by 0.23'

Inflow	=	0.58 cfs @	20.25 hrs, Volume=	1.078 af
Outflow	=	0.29 cfs @	31.09 hrs, Volume=	0.901 af, Atten= 50%, Lag= 650.6 min
Primary	=	0.29 cfs @	31.09 hrs, Volume=	0.901 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Peak Elev= 914.98' @ 31.09 hrs Surf.Area= 2.078 ac Storage= 0.483 af

Plug-Flow detention time= 1,283.5 min calculated for 0.901 af (84% of inflow)
Center-of-Mass det. time= 911.0 min (2,777.8 - 1,866.8)

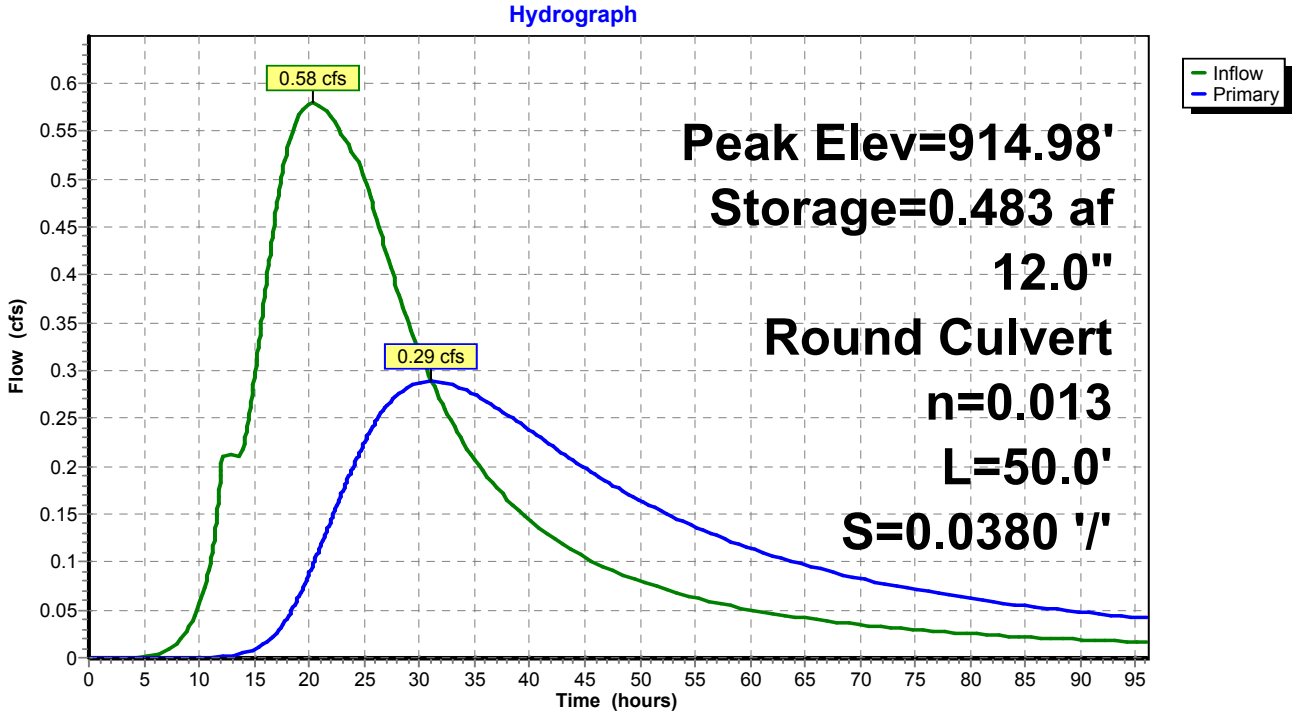
Volume	Invert	Avail.Storage	Storage Description
#1	914.75'	2.680 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
914.75	2.040	0.000	0.000
915.00	2.080	0.515	0.515
916.00	2.250	2.165	2.680

Device	Routing	Invert	Outlet Devices
#1	Primary	914.75'	**12.0" Round RCP_Round 12"** L= 50.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 914.75' / 912.85' S= 0.0380 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=0.29 cfs @ 31.09 hrs HW=914.98' (Free Discharge)
↑—**1=RCP_Round 12"** (Inlet Controls 0.29 cfs @ 2.06 fps)

Pond W-3: W-3


Hydrograph
0.58 cfs
0.29 cfs
Peak Elev=914.98'
Storage=0.483 af
12.0"
Round Culvert
n=0.013
L=50.0'
S=0.0380 '/'
Inflow
Primary
Flow (cfs)
Time (hours)
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
0.45
0.5
0.55
0.6
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95

Summary for Pond W-4: W-4

[79] Warning: Submerged Pond 11P Secondary device # 5 OUTLET by 0.81'

Inflow Area = 2.985 ac, 30.99% Impervious, Inflow Depth > 8.39" for 2-Year event
Inflow = 5.02 cfs @ 12.09 hrs, Volume= 2.088 af
Outflow = 2.62 cfs @ 16.41 hrs, Volume= 2.058 af, Atten= 48%, Lag= 259.3 min
Primary = 2.62 cfs @ 16.41 hrs, Volume= 2.058 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Peak Elev= 908.81' @ 16.41 hrs Surf.Area= 1.072 ac Storage= 0.752 af

Plug-Flow detention time= 324.0 min calculated for 2.058 af (99% of inflow)
Center-of-Mass det. time= 279.4 min (1,273.8 - 994.4)

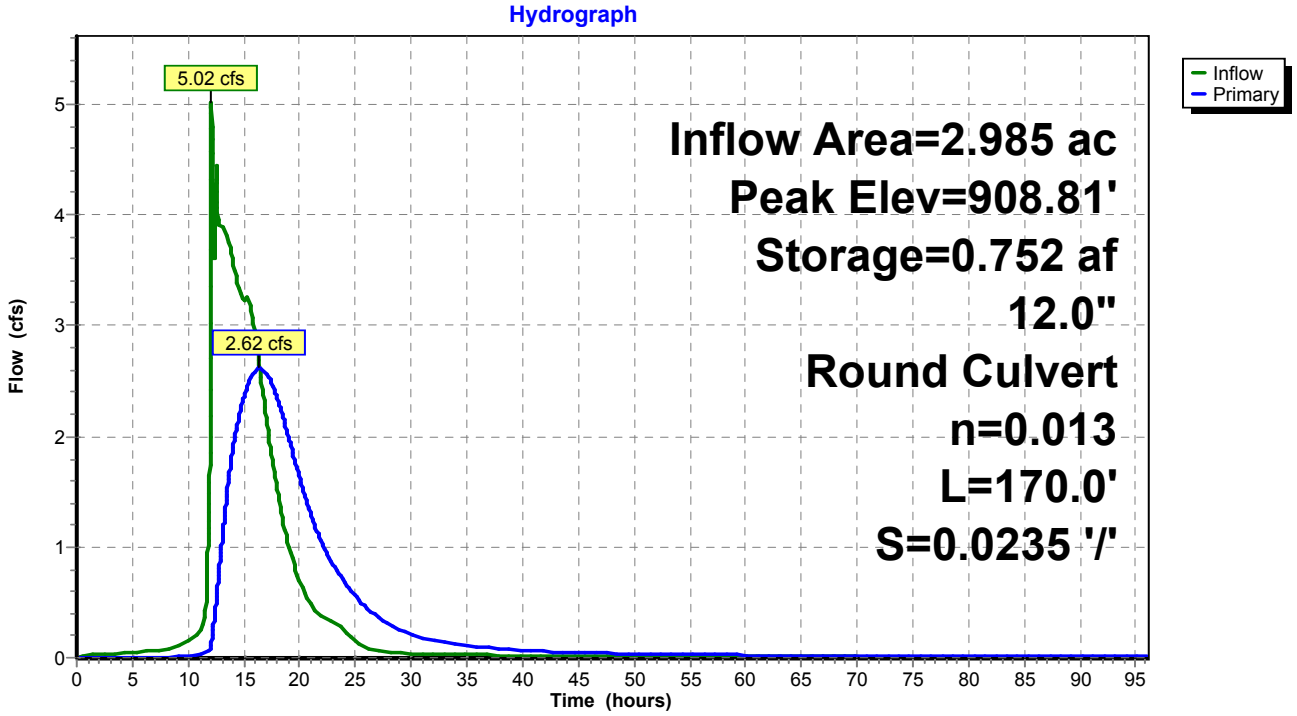
Volume	Invert	Avail.Storage	Storage Description
#1	908.00'	2.280 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
908.00	0.780	0.000	0.000
910.00	1.500	2.280	2.280

Device	Routing	Invert	Outlet Devices
#1	Primary	908.00'	**12.0" Round RCP_Round 12"** L= 170.0' RCP, groove end w/headwall, Ke= 0.200 Inlet / Outlet Invert= 908.00' / 904.00' S= 0.0235 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=2.62 cfs @ 16.41 hrs HW=908.81' (Free Discharge)
↑—**1=RCP_Round 12"** (Inlet Controls 2.62 cfs @ 3.84 fps)

Pond W-4: W-4


Hydrograph
5.02 cfs
2.62 cfs
Inflow Area=2.985 ac
Peak Elev=908.81'
Storage=0.752 af
12.0"
Round Culvert
n=0.013
L=170.0'
S=0.0235 '/'
Inflow
Primary
Flow (cfs)
Time (hours)
0
1
2
3
4
5
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95

Summary for Pond W-5: W-5

[79] Warning: Submerged Pond 13P Secondary device # 2 OUTLET by 0.23'
[79] Warning: Submerged Pond 13P Secondary device # 3 OUTLET by 0.23'
[79] Warning: Submerged Pond 13P Secondary device # 4 OUTLET by 0.23'
[79] Warning: Submerged Pond 13P Secondary device # 5 OUTLET by 0.23'
[79] Warning: Submerged Pond 13P Secondary device # 6 OUTLET by 0.23'

Inflow Area = 7.608 ac, 48.41% Impervious, Inflow Depth = 4.01" for 2-Year event
Inflow = 20.49 cfs @ 12.02 hrs, Volume= 2.545 af
Outflow = 4.35 cfs @ 13.19 hrs, Volume= 2.544 af, Atten= 79%, Lag= 69.8 min
Primary = 4.35 cfs @ 13.19 hrs, Volume= 2.544 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Starting Elev= 882.75' Surf.Area= 4.887 ac Storage= 7.134 af
Peak Elev= 882.98' @ 13.19 hrs Surf.Area= 5.103 ac Storage= 8.292 af (1.158 af above start)

Plug-Flow detention time= (not calculated: initial storage excedes outflow)
Center-of-Mass det. time= 286.8 min (1,125.8 - 839.1)

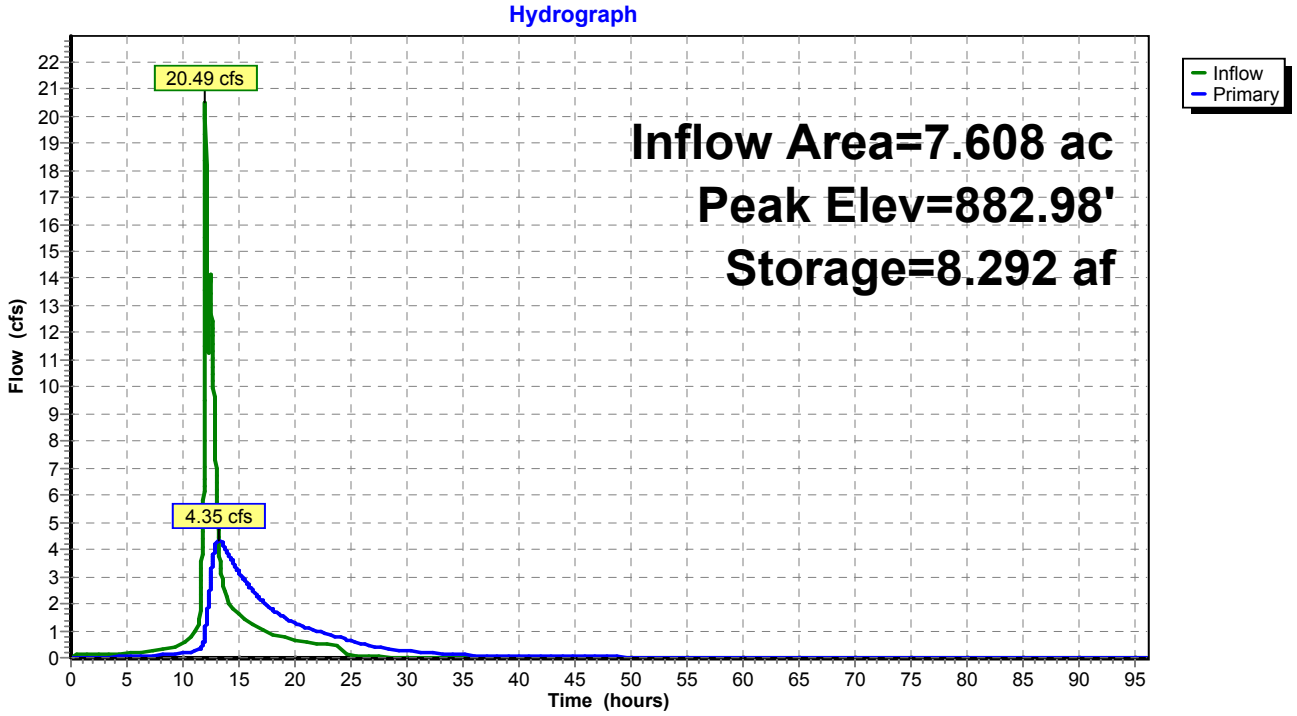
Volume	Invert	Avail.Storage	Storage Description
#1	881.00'	11.097 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
881.00	3.270	0.000	0.000
882.00	4.190	3.730	3.730
883.00	5.120	4.655	8.385
883.49	5.950	2.712	11.097

Device	Routing	Invert	Outlet Devices
#1	Primary	882.75'	**6.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#2	Primary	882.75'	**6.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=4.34 cfs @ 13.19 hrs HW=882.98' (Free Discharge)
↑—**1=Sharp-Crested Rectangular Weir** (Weir Controls 2.17 cfs @ 1.57 fps)
└—**2=Sharp-Crested Rectangular Weir** (Weir Controls 2.17 cfs @ 1.57 fps)

Pond W-5: W-5


Hydrograph
20.49 cfs
4.35 cfs
Inflow Area=7.608 ac
Peak Elev=882.98'
Storage=8.292 af
Inflow
Primary
Flow (cfs)
Time (hours)
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95

Time span=0.00-96.00 hrs, dt=0.01 hrs, 9601 points
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious
Reach routing by Muskingum-Cunge method - Pond routing by Stor-Ind method

Subcatchment1S: To Rice Creek Runoff Area=1.601 ac 31.98% Impervious Runoff Depth=2.47"
Tc=5.7 min CN=74/98 Runoff=5.55 cfs 0.330 af

SubcatchmentSB 1: SB 1 Runoff Area=52.192 ac 48.35% Impervious Runoff Depth=2.83"
Tc=53.1 min CN=74/98 Runoff=76.21 cfs 12.329 af

SubcatchmentSB 10: SB 10 Runoff Area=6.389 ac 7.62% Impervious Runoff Depth=1.93"
Tc=7.3 min CN=74/98 Runoff=16.44 cfs 1.027 af

SubcatchmentSB 11: SB 11 Runoff Area=3.293 ac 32.16% Impervious Runoff Depth=2.55"
Tc=11.7 min CN=74/100 Runoff=8.82 cfs 0.700 af

SubcatchmentSB 12: SB 12 Runoff Area=1.382 ac 38.71% Impervious Runoff Depth=2.62"
Tc=9.5 min CN=74/98 Runoff=4.23 cfs 0.302 af

SubcatchmentSB 13: SB 13 Runoff Area=2.985 ac 30.99% Impervious Runoff Depth=2.52"
Tc=9.4 min CN=74/100 Runoff=8.67 cfs 0.627 af

SubcatchmentSB 14: SB 14 Runoff Area=10.225 ac 42.62% Impervious Runoff Depth=2.71"
Tc=4.3 min CN=74/98 Runoff=41.19 cfs 2.307 af

SubcatchmentSB 15: SB 15 Runoff Area=58.564 ac 48.22% Impervious Runoff Depth=2.83"
Tc=31.3 min CN=74/98 Runoff=112.62 cfs 13.820 af

SubcatchmentSB 16: SB 16 Runoff Area=32.428 ac 33.53% Impervious Runoff Depth=2.50"
Tc=12.1 min CN=74/98 Runoff=86.24 cfs 6.769 af

SubcatchmentSB 17: SB 17 Runoff Area=7.608 ac 48.41% Impervious Runoff Depth=2.95"
Tc=4.3 min CN=74/100 Runoff=32.13 cfs 1.870 af

SubcatchmentSB 18: SB 18 Runoff Area=52.908 ac 84.55% Impervious Runoff Depth=3.64"
Tc=33.5 min CN=74/98 Runoff=124.38 cfs 16.050 af

SubcatchmentSB 19: SB 19 Runoff Area=21.198 ac 39.93% Impervious Runoff Depth=2.65"
Tc=24.7 min CN=74/98 Runoff=42.96 cfs 4.676 af

SubcatchmentSB 2: SB 2 Runoff Area=11.400 ac 84.29% Impervious Runoff Depth=3.63"
Tc=16.6 min CN=74/98 Runoff=37.33 cfs 3.453 af

SubcatchmentSB 22: SB 22 Runoff Area=41.911 ac 82.19% Impervious Runoff Depth=3.34"
Tc=41.0 min CN=49/98 Runoff=79.81 cfs 11.662 af

SubcatchmentSB 24: SB 24 Runoff Area=4.939 ac 98.22% Impervious Runoff Depth=3.94"
Tc=7.5 min CN=74/98 Runoff=24.36 cfs 1.623 af

SubcatchmentSB 25: SB 25 Runoff Area=5.012 ac 95.71% Impervious Runoff Depth=3.89"
Tc=10.7 min CN=74/98 Runoff=21.17 cfs 1.624 af

Subcatchment SB 26: SB 26 Runoff Area=14.335 ac 98.27% Impervious Runoff Depth=3.95"
Tc=25.4 min CN=74/98 Runoff=41.75 cfs 4.713 af

Subcatchment SB 27: SB 27 (Thumb Road) Runoff Area=6.629 ac 97.12% Impervious Runoff Depth=3.88"
Tc=27.6 min CN=49/98 Runoff=18.18 cfs 2.143 af

Subcatchment SB 28: SB 28 Runoff Area=6.955 ac 46.76% Impervious Runoff Depth=2.80"
Tc=14.6 min CN=74/98 Runoff=18.97 cfs 1.622 af

Subcatchment SB 29: SB 29 Runoff Area=10.214 ac 37.73% Impervious Runoff Depth=2.60"
Tc=19.1 min CN=74/98 Runoff=23.01 cfs 2.212 af

Subcatchment SB 3: SB 3 Runoff Area=37.668 ac 41.46% Impervious Runoff Depth=2.68"
Tc=15.3 min CN=74/98 Runoff=96.96 cfs 8.417 af

Subcatchment SB 4: SB 4 Runoff Area=0.599 ac 19.70% Impervious Runoff Depth=2.24"
Tc=5.9 min CN=74/100 Runoff=1.86 cfs 0.112 af

Subcatchment SB 5: SB 5 Runoff Area=7.853 ac 70.37% Impervious Runoff Depth=3.32"
Tc=59.3 min CN=74/98 Runoff=12.43 cfs 2.176 af

Subcatchment SB 51: Offsite Subbasin 51 Runoff Area=25.238 ac 19.96% Impervious Runoff Depth=1.72"
Tc=17.7 min CN=65/98 Runoff=37.07 cfs 3.622 af

Subcatchment SB 6: SB 6 Runoff Area=0.997 ac 24.47% Impervious Runoff Depth=2.36"
Tc=20.3 min CN=74/100 Runoff=1.96 cfs 0.196 af

Subcatchment SB 7: SB 7 Runoff Area=21.555 ac 84.83% Impervious Runoff Depth=3.65"
Tc=5.7 min CN=74/98 Runoff=106.75 cfs 6.550 af

Subcatchment SB 8: SB 8 Runoff Area=29.595 ac 30.01% Impervious Runoff Depth=2.43"
Tc=47.1 min CN=74/98 Runoff=39.95 cfs 5.985 af

Subcatchment SB 9: SB 9 Runoff Area=25.789 ac 33.17% Impervious Runoff Depth=2.50"
Tc=30.0 min CN=74/98 Runoff=45.10 cfs 5.366 af

Reach 30R: 60" RCP to existing 60" Avg. Flow Depth=1.83' Max Vel=15.13 fps Inflow=98.36 cfs 30.860 af
60.0" Round Pipe n=0.013 L=400.0' S=0.0085 '/' Capacity=240.12 cfs Outflow=98.35 cfs 30.860 af

Reach 34R: 60" RCP connecting Avg. Flow Depth=2.01' Max Vel=12.47 fps Inflow=89.60 cfs 17.400 af
60.0" Round Pipe n=0.013 L=2,150.0' S=0.0050 '/' Capacity=184.16 cfs Outflow=89.55 cfs 17.400 af

Reach 37R: 48" RCP Avg. Flow Depth=1.09' Max Vel=9.48 fps Inflow=26.37 cfs 6.915 af
48.0" Round Pipe n=0.013 L=240.0' S=0.0060 '/' Capacity=111.27 cfs Outflow=26.37 cfs 6.915 af

Reach 39R: 24" RCP Avg. Flow Depth=0.74' Max Vel=6.34 fps Inflow=6.75 cfs 2.372 af
24.0" Round Pipe n=0.013 L=90.0' S=0.0050 '/' Capacity=16.00 cfs Outflow=6.75 cfs 2.372 af

Reach 43R: 30" RCP connecting P-10 Avg. Flow Depth=1.03' Max Vel=6.63 fps Inflow=12.56 cfs 8.488 af
30.0" Round Pipe n=0.013 L=750.0' S=0.0037 '/' Capacity=24.93 cfs Outflow=12.56 cfs 8.488 af

Reach 51R: 40' x 4.5 ft parabolic Avg. Flow Depth=2.47' Max Vel=6.16 fps Inflow=300.84 cfs 56.849 af
n=0.035 L=300.0' S=0.0050 '/' Capacity=733.43 cfs Outflow=300.59 cfs 56.848 af

Pond 3P: P-3 Peak Elev=917.65' Storage=13.731 af Inflow=138.44 cfs 30.865 af
Outflow=98.36 cfs 30.860 af

Pond 4P: P-4 Peak Elev=916.82' Storage=1.238 af Inflow=12.43 cfs 2.176 af
Primary=4.43 cfs 0.931 af Secondary=2.87 cfs 1.244 af Outflow=7.30 cfs 2.176 af

Pond 7P: P-7 Peak Elev=915.79' Storage=1.447 af Inflow=39.95 cfs 5.985 af
Primary=39.71 cfs 5.333 af Secondary=0.22 cfs 0.571 af Outflow=39.93 cfs 5.904 af

Pond 9P: P-9 Peak Elev=915.52' Storage=0.488 af Inflow=78.39 cfs 12.071 af
Outflow=78.30 cfs 12.071 af

Pond 10P: P-10 Peak Elev=897.76' Storage=1.273 af Inflow=39.11 cfs 11.416 af
Primary=12.56 cfs 8.488 af Secondary=26.44 cfs 2.920 af Outflow=39.01 cfs 11.409 af

Pond 11P: P-11 Peak Elev=912.02' Storage=7.822 af Inflow=81.57 cfs 12.771 af
Primary=35.70 cfs 10.088 af Secondary=4.51 cfs 2.663 af Outflow=40.20 cfs 12.752 af

Pond 12P: P-12 Peak Elev=894.35' Storage=7.414 af Inflow=44.58 cfs 16.975 af
Outflow=37.39 cfs 16.953 af

Pond 13P: P-13 Peak Elev=884.60' Storage=7.706 af Inflow=325.70 cfs 54.985 af
Primary=294.72 cfs 52.396 af Secondary=13.93 cfs 2.584 af Outflow=308.65 cfs 54.980 af

Pond 14P: P-14 Peak Elev=893.66' Storage=6.908 af Inflow=42.96 cfs 4.676 af
Outflow=6.52 cfs 4.676 af

Pond 23P: Thumb Infiltration (Thumb TP Peak Elev=903.83' Storage=3.833 af Inflow=95.01 cfs 13.805 af
Outflow=94.93 cfs 10.065 af

Pond 31P: SB 18 Infiltration Peak Elev=903.43' Storage=3.430 af Inflow=124.38 cfs 16.050 af
Outflow=124.26 cfs 12.730 af

Pond 36P: Culverts passing flow Peak Elev=887.49' Storage=0.000 af Inflow=124.26 cfs 12.730 af
Primary=124.27 cfs 12.730 af Secondary=0.00 cfs 0.000 af Outflow=124.27 cfs 12.730 af

Pond CRH-1: CRH-1 Peak Elev=878.13' Storage=0.489 af Inflow=18.97 cfs 1.622 af
Discarded=0.26 cfs 0.509 af Primary=11.83 cfs 1.114 af Outflow=12.10 cfs 1.622 af

Pond CRH-2: CRH-2 Peak Elev=882.67' Storage=0.890 af Inflow=23.01 cfs 2.212 af
Discarded=0.38 cfs 0.898 af Primary=9.88 cfs 1.314 af Outflow=10.26 cfs 2.212 af

Pond CRH-3: CRH-3 Peak Elev=878.91' Storage=0.422 af Inflow=10.91 cfs 1.644 af
Discarded=0.24 cfs 0.445 af Primary=8.07 cfs 1.198 af Outflow=8.31 cfs 1.644 af

Pond P1/P2: P-1/P-2 Peak Elev=925.17' Storage=5.093 af Inflow=92.00 cfs 17.405 af
Outflow=89.60 cfs 17.400 af

Pond P5/P6: P-5/P-6 Peak Elev=931.49' Storage=10.676 af Inflow=116.17 cfs 10.153 af
Primary=26.37 cfs 6.915 af Secondary=2.24 cfs 1.130 af Outflow=28.61 cfs 8.045 af

Pond P8: P-8 Peak Elev=898.07' Storage=0.903 af Inflow=16.44 cfs 1.027 af
24.0" Round Culvert n=0.013 L=380.0' S=0.0028 '/' Outflow=4.14 cfs 1.026 af

Pond W-1: W-1 Peak Elev=915.18' Storage=0.298 af Inflow=3.34 cfs 1.440 af
Outflow=2.48 cfs 1.440 af

Pond W-2: W-2 Peak Elev=929.49' Storage=0.558 af Inflow=2.24 cfs 1.130 af
12.0" Round Culvert n=0.013 L=300.0' S=0.0437 '/' Outflow=0.76 cfs 0.984 af

Pond W-3: W-3 Peak Elev=915.08' Storage=0.673 af Inflow=0.97 cfs 1.555 af
12.0" Round Culvert n=0.013 L=50.0' S=0.0380 '/' Outflow=0.54 cfs 1.372 af

Pond W-4: W-4 Peak Elev=908.98' Storage=0.934 af Inflow=10.40 cfs 3.291 af
12.0" Round Culvert n=0.013 L=170.0' S=0.0235 '/' Outflow=3.28 cfs 3.259 af

Pond W-5: W-5 Peak Elev=883.11' Storage=8.970 af Inflow=37.74 cfs 4.455 af
Outflow=8.45 cfs 4.453 af

Total Runoff Area = 501.462 ac Runoff Volume = 122.282 af Average Runoff Depth = 2.93"
45.62% Pervious = 228.758 ac 54.38% Impervious = 272.704 ac

Summary for Subcatchment 1S: To Rice Creek

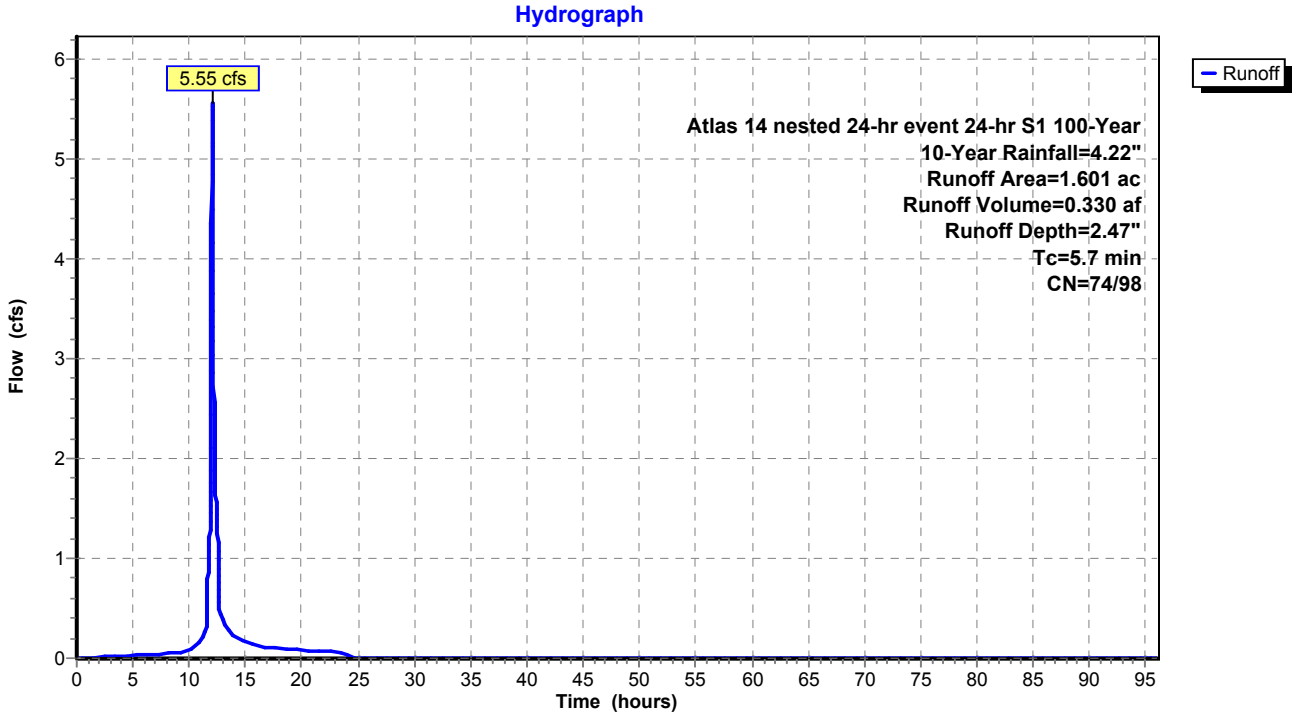
Runoff = 5.55 cfs @ 12.04 hrs, Volume= 0.330 af, Depth= 2.47"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 10-Year Rainfall=4.22"

	Area (ac)	CN	Description
*	0.512	98	impervious
*	1.089	74	pervious
	1.601	82	Weighted Average
	1.089	74	68.02% Pervious Area
	0.512	98	31.98% Impervious Area

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

Subcatchment 1S: To Rice Creek



Summary for Subcatchment SB 1: SB 1

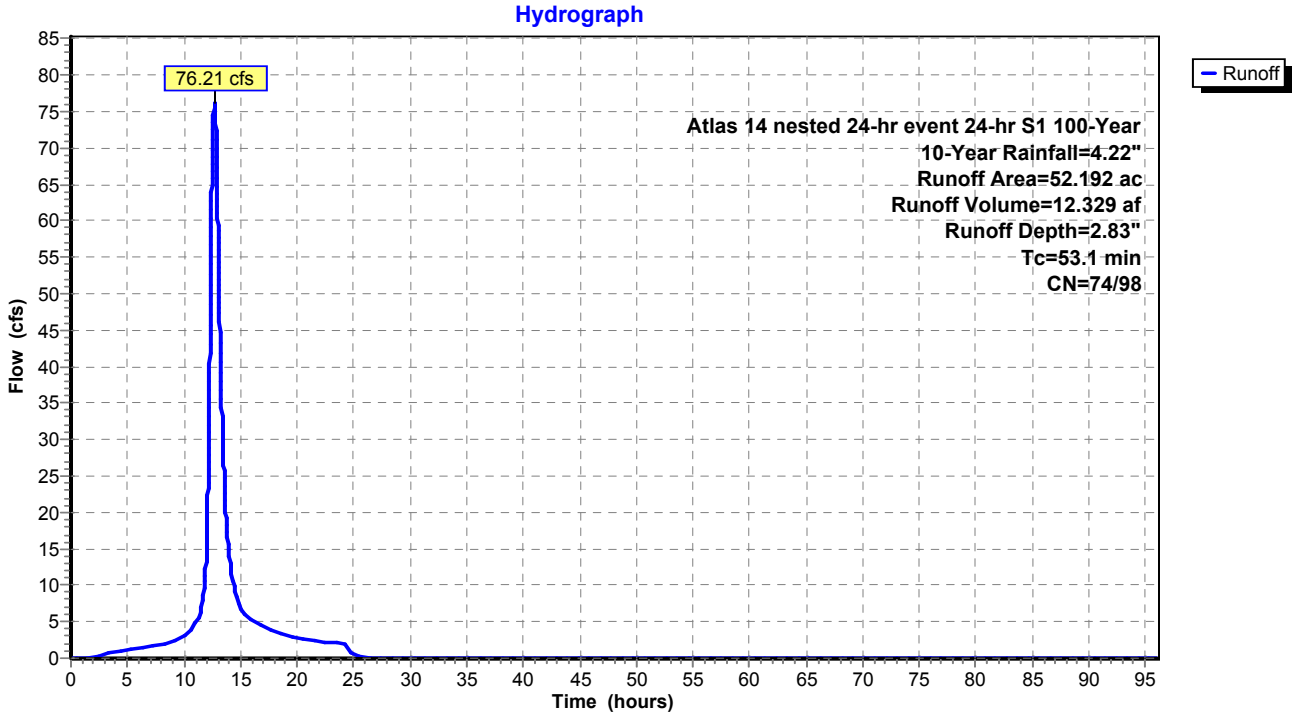
Runoff = 76.21 cfs @ 12.69 hrs, Volume= 12.329 af, Depth= 2.83"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 10-Year Rainfall=4.22"

	Area (ac)	CN	Description
*	26.958	74	pervious
*	25.234	98	impervious
	52.192	86	Weighted Average
	26.958	74	51.65% Pervious Area
	25.234	98	48.35% Impervious Area

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

Subcatchment SB 1: SB 1



Summary for Subcatchment SB 10: SB 10

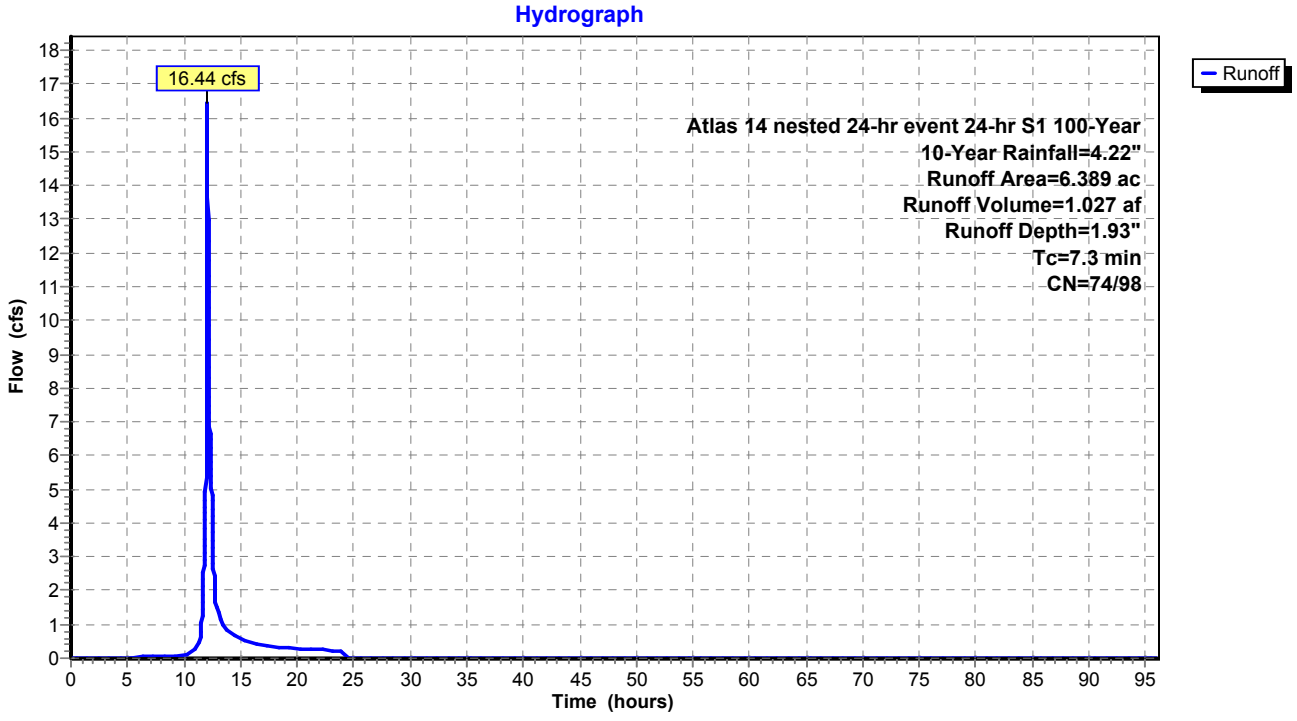
Runoff = 16.44 cfs @ 12.06 hrs, Volume= 1.027 af, Depth= 1.93"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 10-Year Rainfall=4.22"

	Area (ac)	CN	Description
*	5.902	74	pervious
*	0.487	98	impervious
	6.389	76	Weighted Average
	5.902	74	92.38% Pervious Area
	0.487	98	7.62% Impervious Area

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

Subcatchment SB 10: SB 10



Summary for Subcatchment SB 11: SB 11

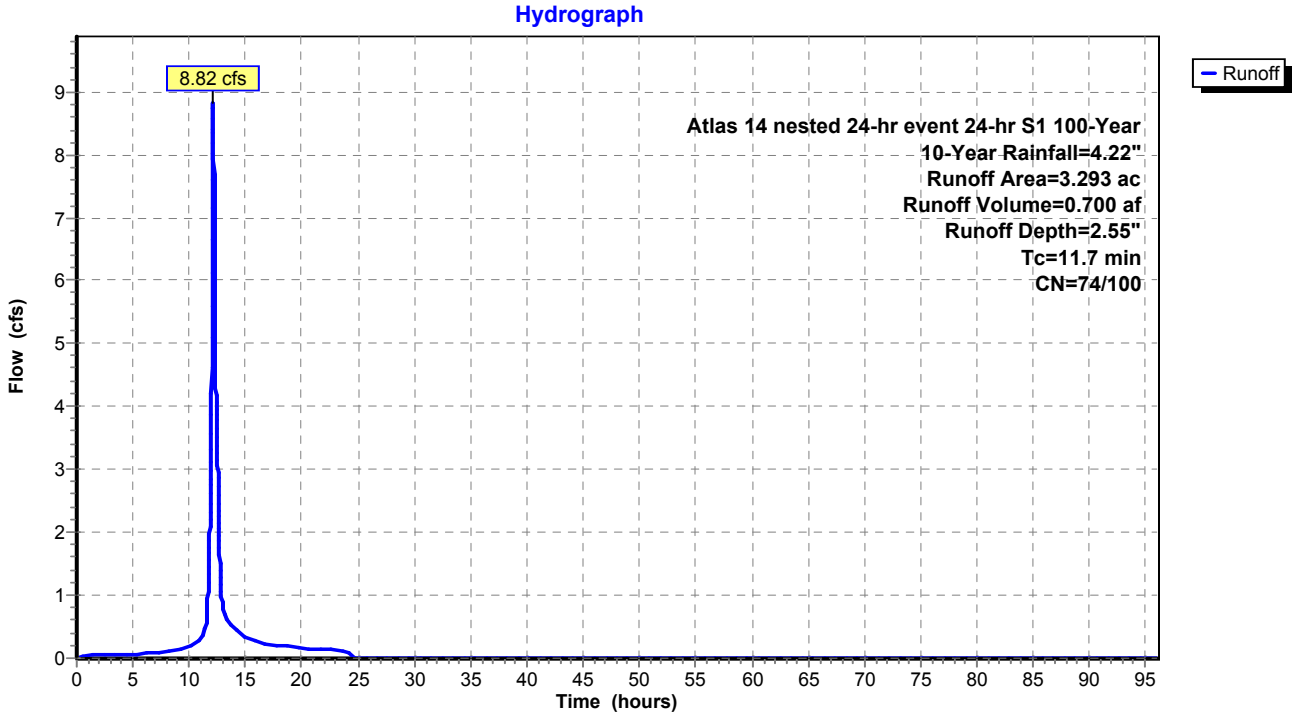
Runoff = 8.82 cfs @ 12.11 hrs, Volume= 0.700 af, Depth= 2.55"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 10-Year Rainfall=4.22"

	Area (ac)	CN	Description
*	2.234	74	pervious
*	1.059	100	impervious
	3.293	82	Weighted Average
	2.234	74	67.84% Pervious Area
	1.059	100	32.16% Impervious Area

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

Subcatchment SB 11: SB 11



Summary for Subcatchment SB 12: SB 12

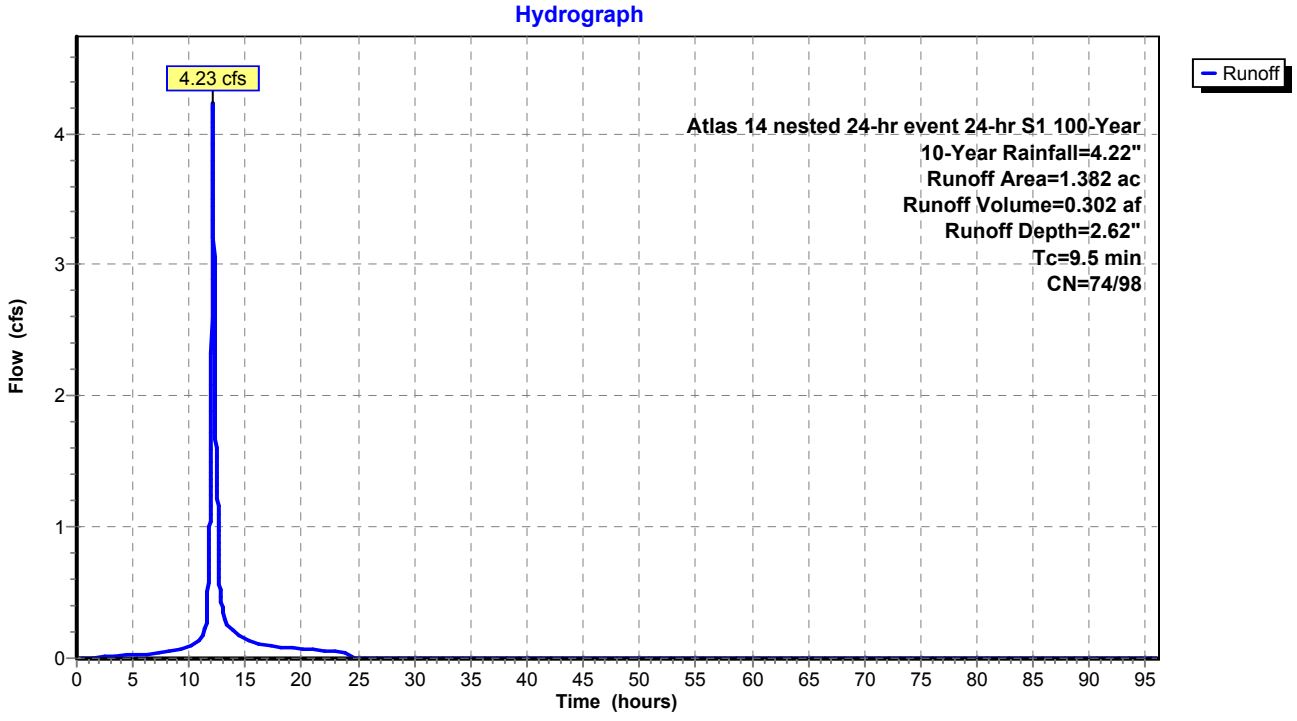
Runoff = 4.23 cfs @ 12.08 hrs, Volume= 0.302 af, Depth= 2.62"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 10-Year Rainfall=4.22"

	Area (ac)	CN	Description
*	0.847	74	pervious
*	0.535	98	impervious
	1.382	83	Weighted Average
	0.847	74	61.29% Pervious Area
	0.535	98	38.71% Impervious Area

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

Subcatchment SB 12: SB 12



Summary for Subcatchment SB 13: SB 13

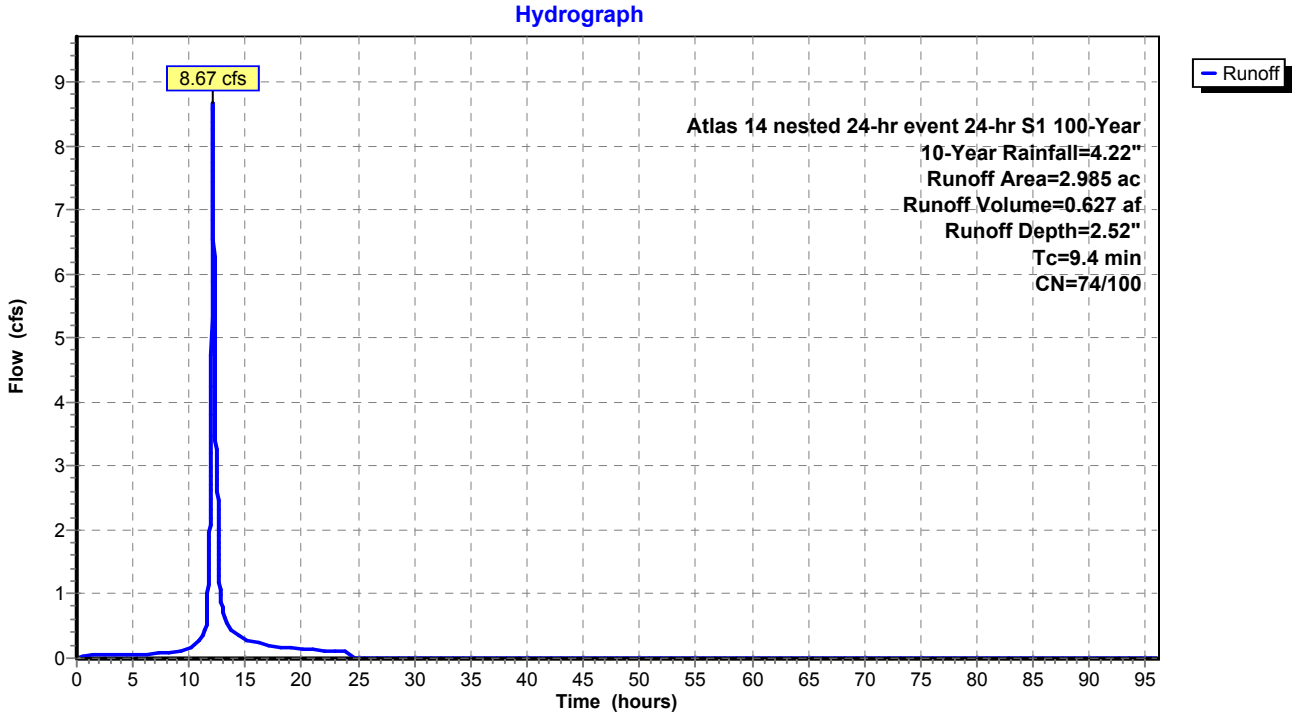
Runoff = 8.67 cfs @ 12.08 hrs, Volume= 0.627 af, Depth= 2.52"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 10-Year Rainfall=4.22"

	Area (ac)	CN	Description
*	2.060	74	pervious
*	0.925	100	impervious
	2.985	82	Weighted Average
	2.060	74	69.01% Pervious Area
	0.925	100	30.99% Impervious Area

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

Subcatchment SB 13: SB 13



Summary for Subcatchment SB 14: SB 14

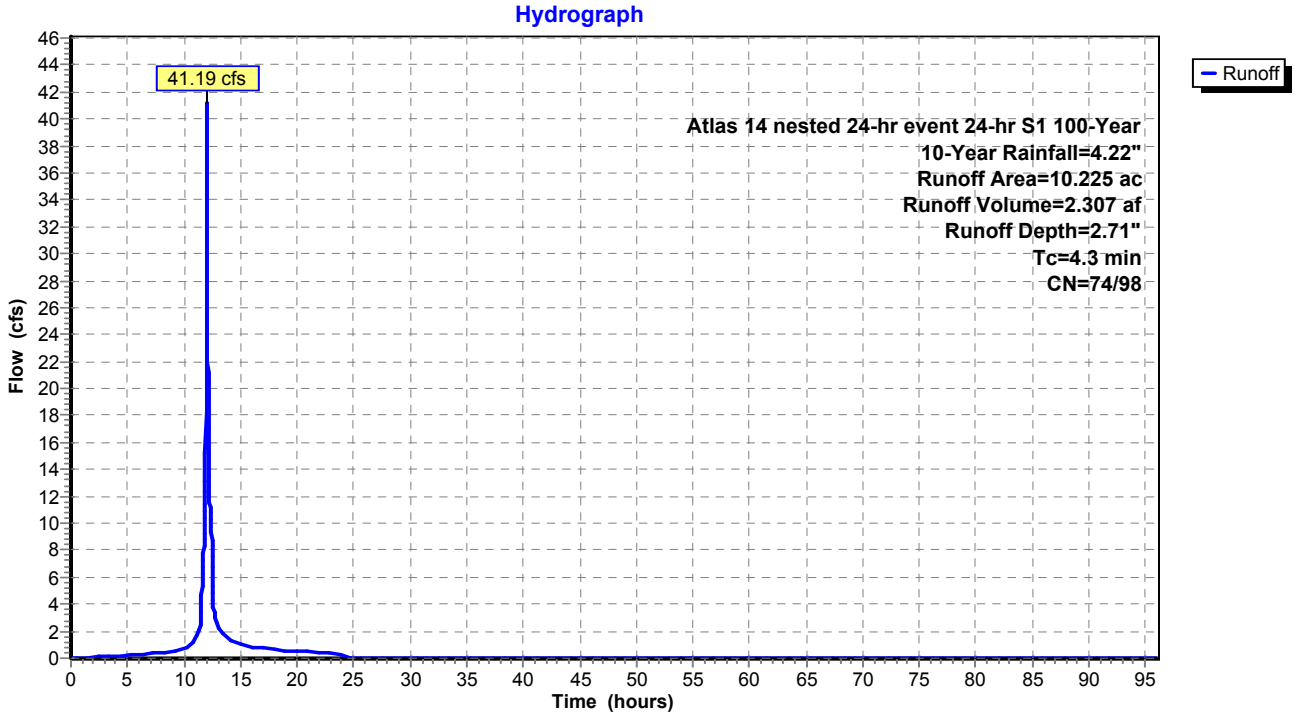
Runoff = 41.19 cfs @ 12.02 hrs, Volume= 2.307 af, Depth= 2.71"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 10-Year Rainfall=4.22"

	Area (ac)	CN	Description
*	5.867	74	pervious
*	4.358	98	impervious
	10.225	84	Weighted Average
	5.867	74	57.38% Pervious Area
	4.358	98	42.62% Impervious Area

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

Subcatchment SB 14: SB 14



Summary for Subcatchment SB 15: SB 15

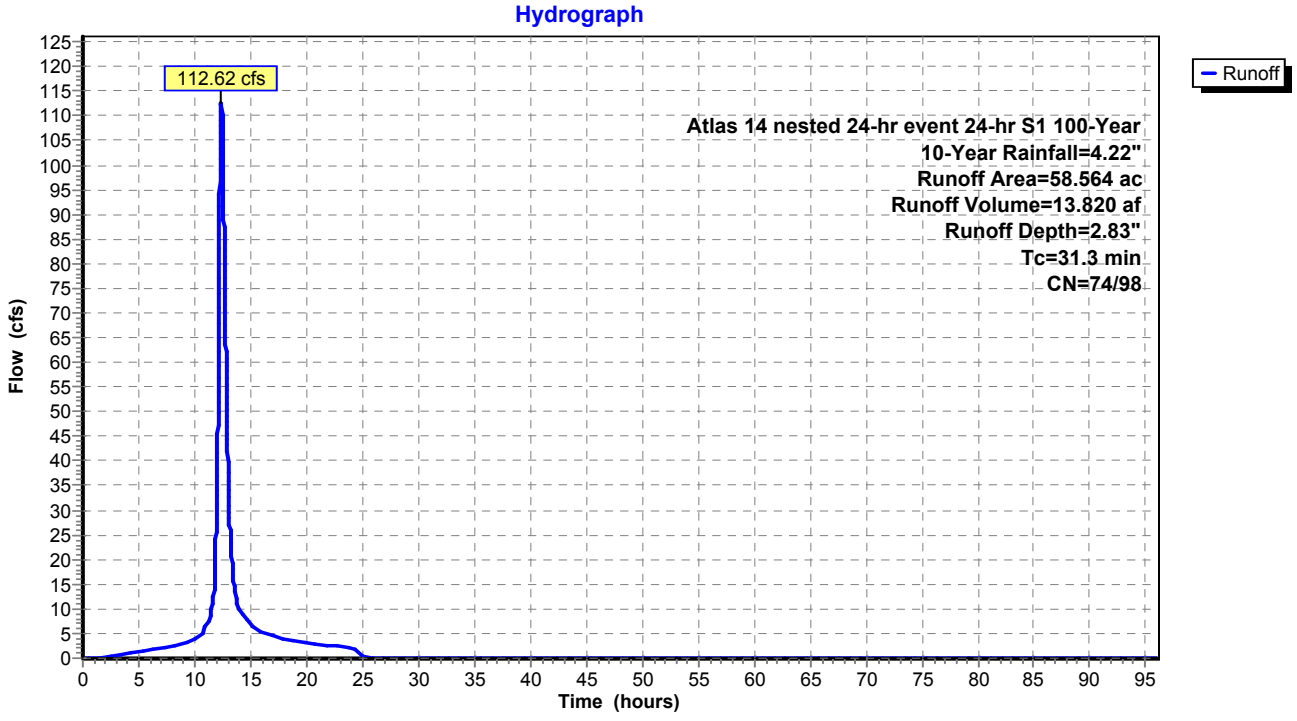
Runoff = 112.62 cfs @ 12.38 hrs, Volume= 13.820 af, Depth= 2.83"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 10-Year Rainfall=4.22"

	Area (ac)	CN	Description
*	30.326	74	pervious
*	28.238	98	impervious
	58.564	86	Weighted Average
	30.326	74	51.78% Pervious Area
	28.238	98	48.22% Impervious Area

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

Subcatchment SB 15: SB 15



Summary for Subcatchment SB 16: SB 16

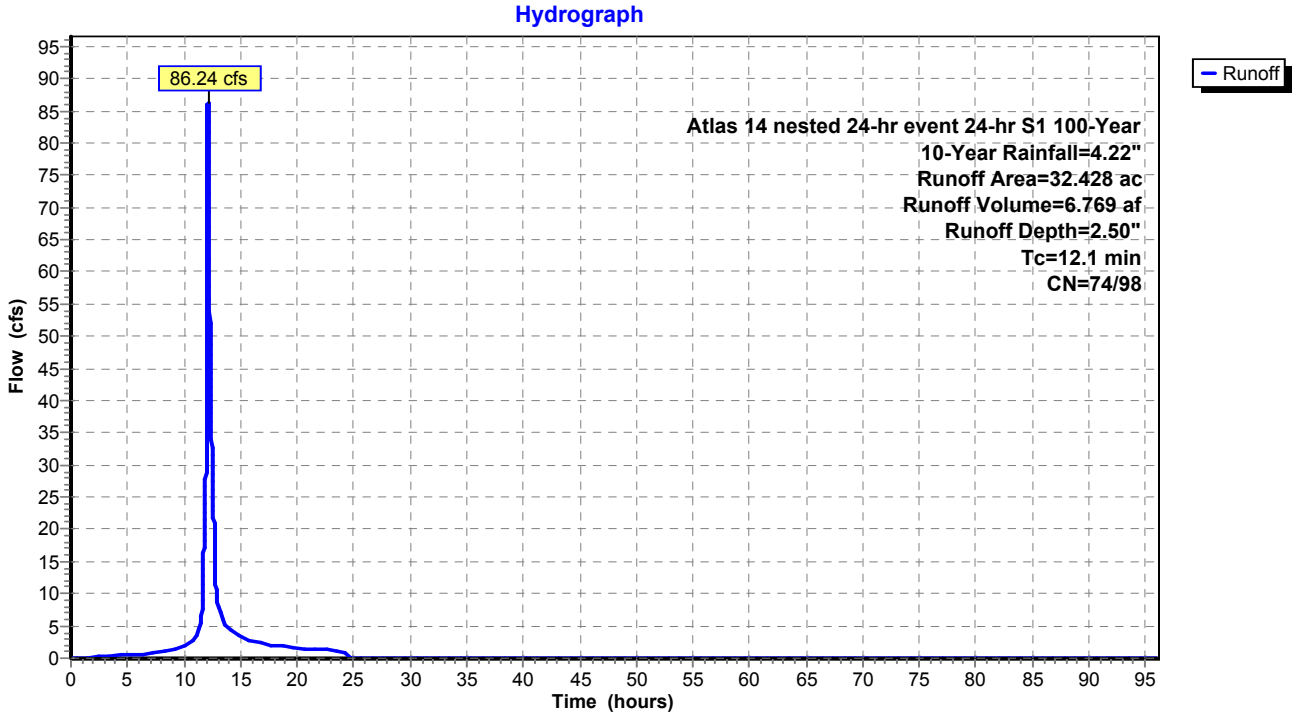
Runoff = 86.24 cfs @ 12.12 hrs, Volume= 6.769 af, Depth= 2.50"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 10-Year Rainfall=4.22"

	Area (ac)	CN	Description
*	21.555	74	pervious
*	10.873	98	impervious
	32.428	82	Weighted Average
	21.555	74	66.47% Pervious Area
	10.873	98	33.53% Impervious Area

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

Subcatchment SB 16: SB 16



Summary for Subcatchment SB 17: SB 17

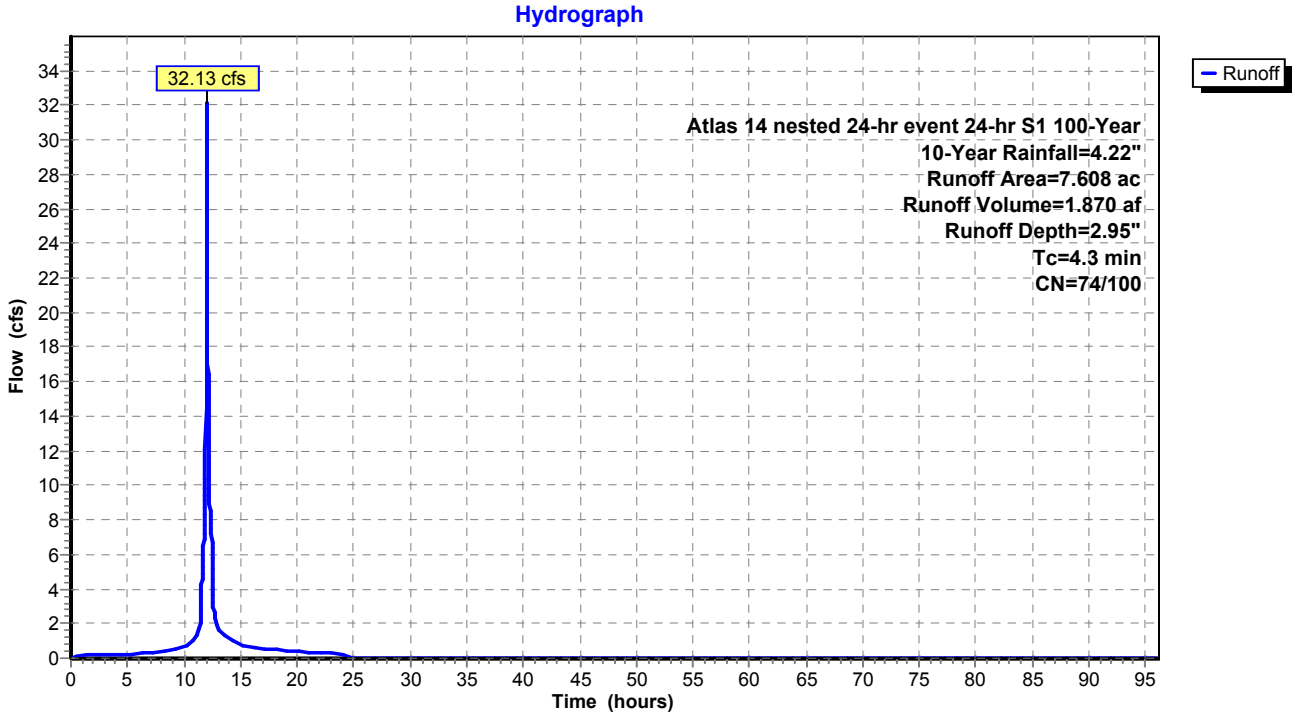
Runoff = 32.13 cfs @ 12.02 hrs, Volume= 1.870 af, Depth= 2.95"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 10-Year Rainfall=4.22"

	Area (ac)	CN	Description
*	3.925	74	pervious
*	3.683	100	impervious
	7.608	87	Weighted Average
	3.925	74	51.59% Pervious Area
	3.683	100	48.41% Impervious Area

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

Subcatchment SB 17: SB 17



Summary for Subcatchment SB 18: SB 18

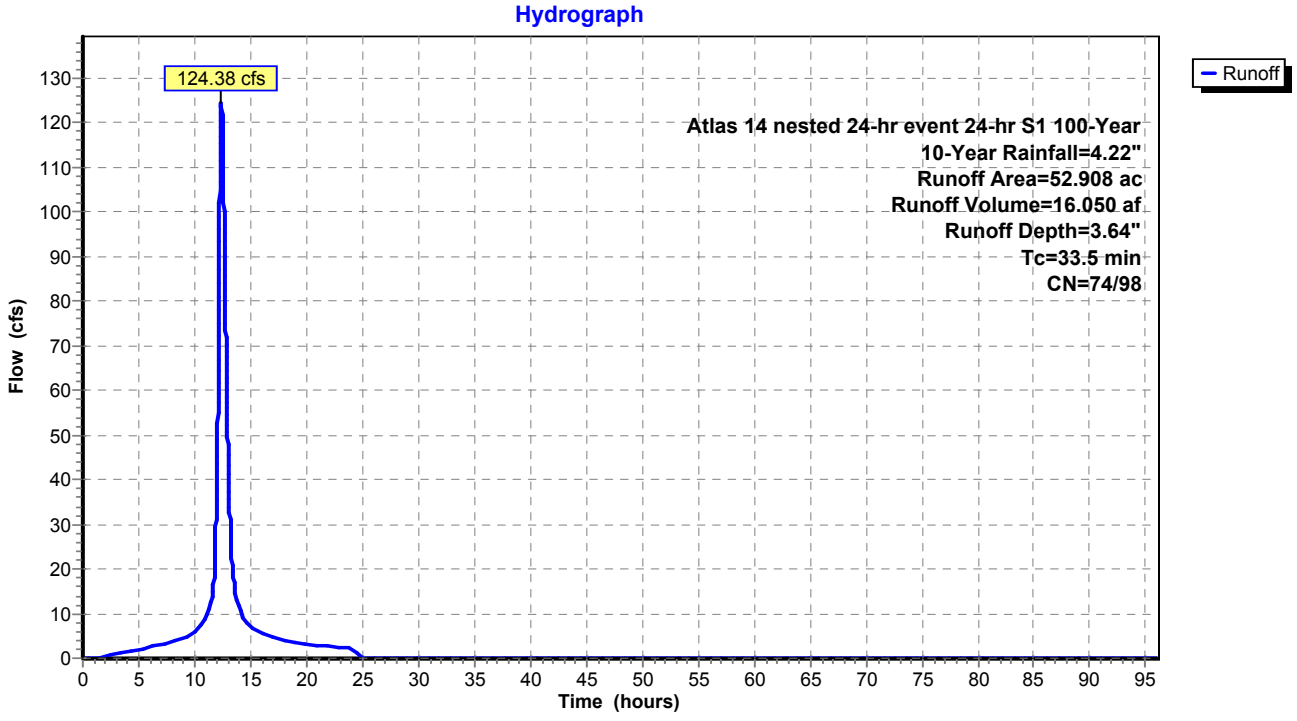
Runoff = 124.38 cfs @ 12.40 hrs, Volume= 16.050 af, Depth= 3.64"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 10-Year Rainfall=4.22"

	Area (ac)	CN	Description
*	8.172	74	pervious
*	44.736	98	impervious
	52.908	94	Weighted Average
	8.172	74	15.45% Pervious Area
	44.736	98	84.55% Impervious Area

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

Subcatchment SB 18: SB 18



Summary for Subcatchment SB 19: SB 19

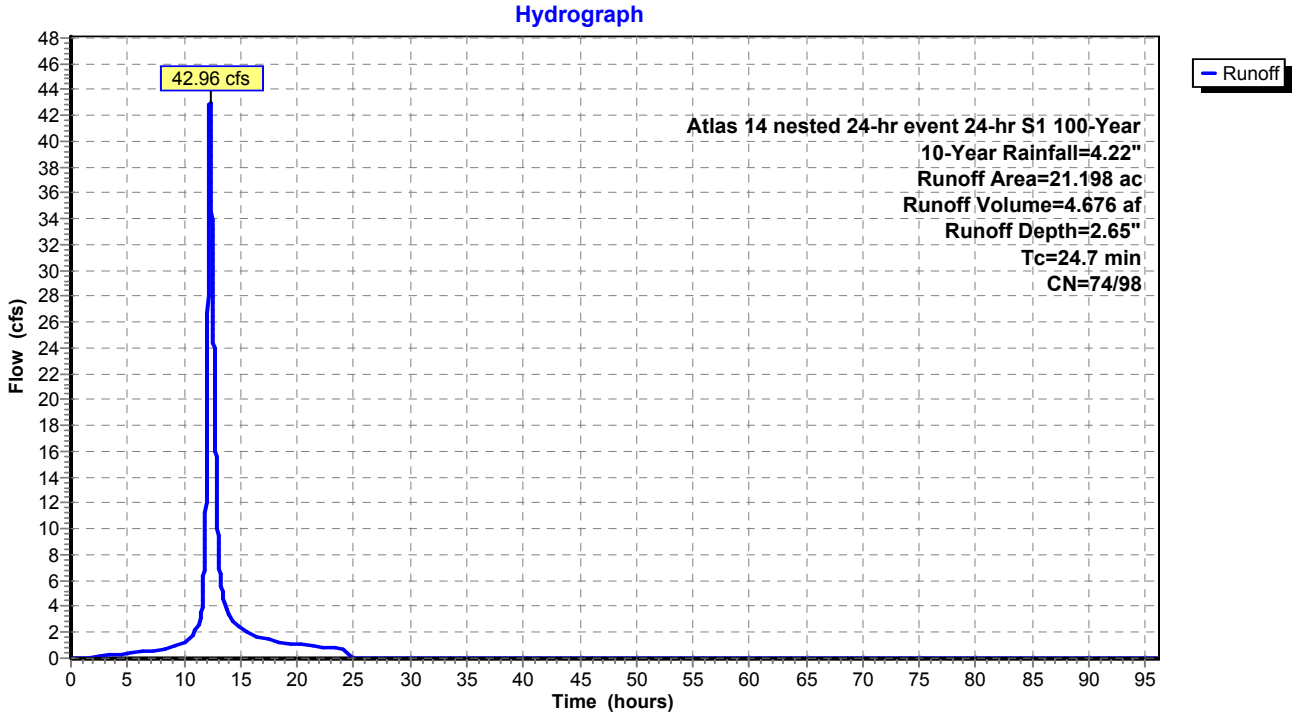
Runoff = 42.96 cfs @ 12.30 hrs, Volume= 4.676 af, Depth= 2.65"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 10-Year Rainfall=4.22"

	Area (ac)	CN	Description
*	12.734	74	pervious
*	8.464	98	impervious
	21.198	84	Weighted Average
	12.734	74	60.07% Pervious Area
	8.464	98	39.93% Impervious Area

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

Subcatchment SB 19: SB 19



Summary for Subcatchment SB 2: SB 2

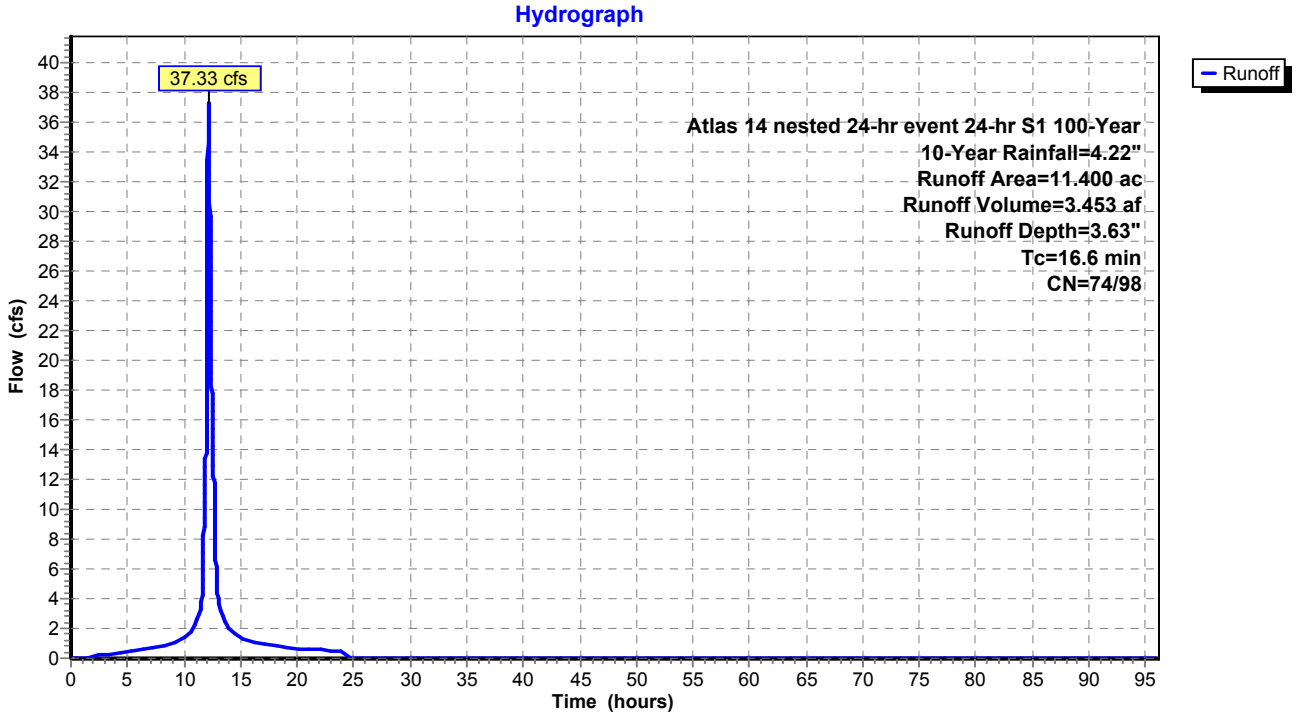
Runoff = 37.33 cfs @ 12.17 hrs, Volume= 3.453 af, Depth= 3.63"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 10-Year Rainfall=4.22"

	Area (ac)	CN	Description
*	1.791	74	pervious
*	9.609	98	impervious
	11.400	94	Weighted Average
	1.791	74	15.71% Pervious Area
	9.609	98	84.29% Impervious Area

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

Subcatchment SB 2: SB 2



Summary for Subcatchment SB 22: SB 22

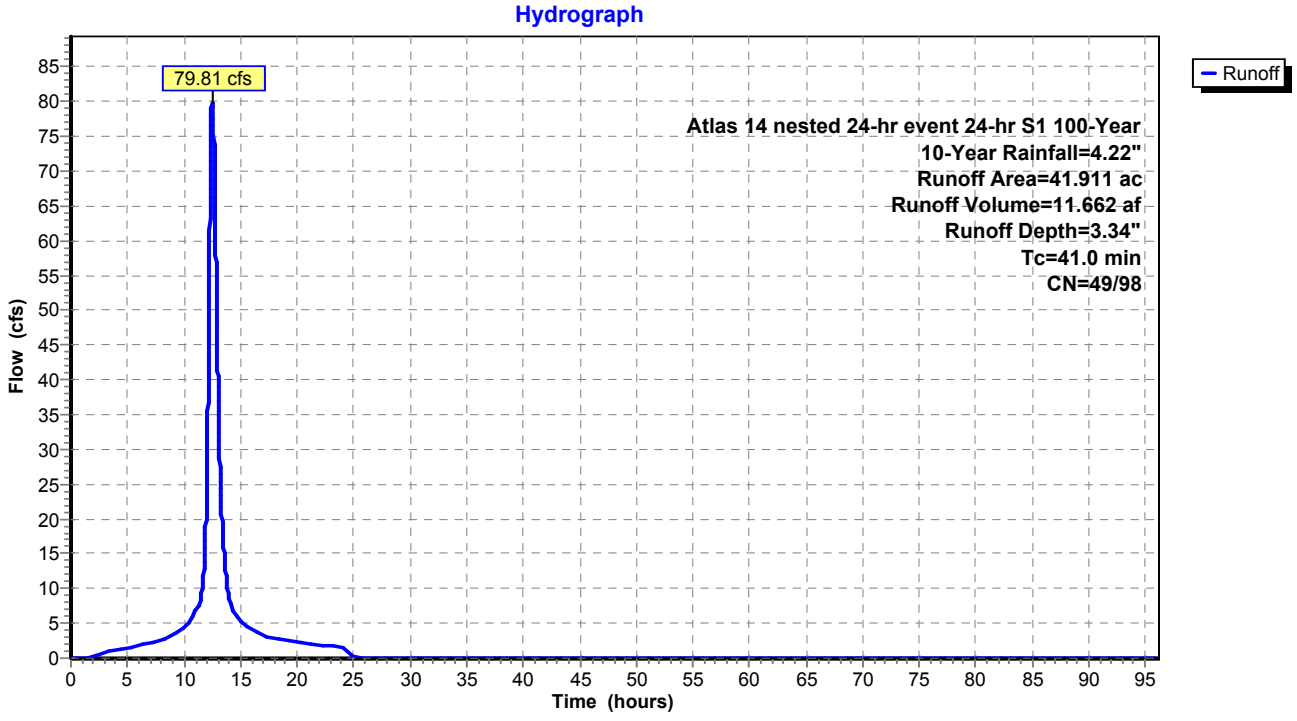
Runoff = 79.81 cfs @ 12.52 hrs, Volume= 11.662 af, Depth= 3.34"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 10-Year Rainfall=4.22"

	Area (ac)	CN	Description
*	7.465	49	Pervious
*	34.446	98	Impervious
	41.911	89	Weighted Average
	7.465	49	17.81% Pervious Area
	34.446	98	82.19% Impervious Area

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

Subcatchment SB 22: SB 22



Summary for Subcatchment SB 24: SB 24

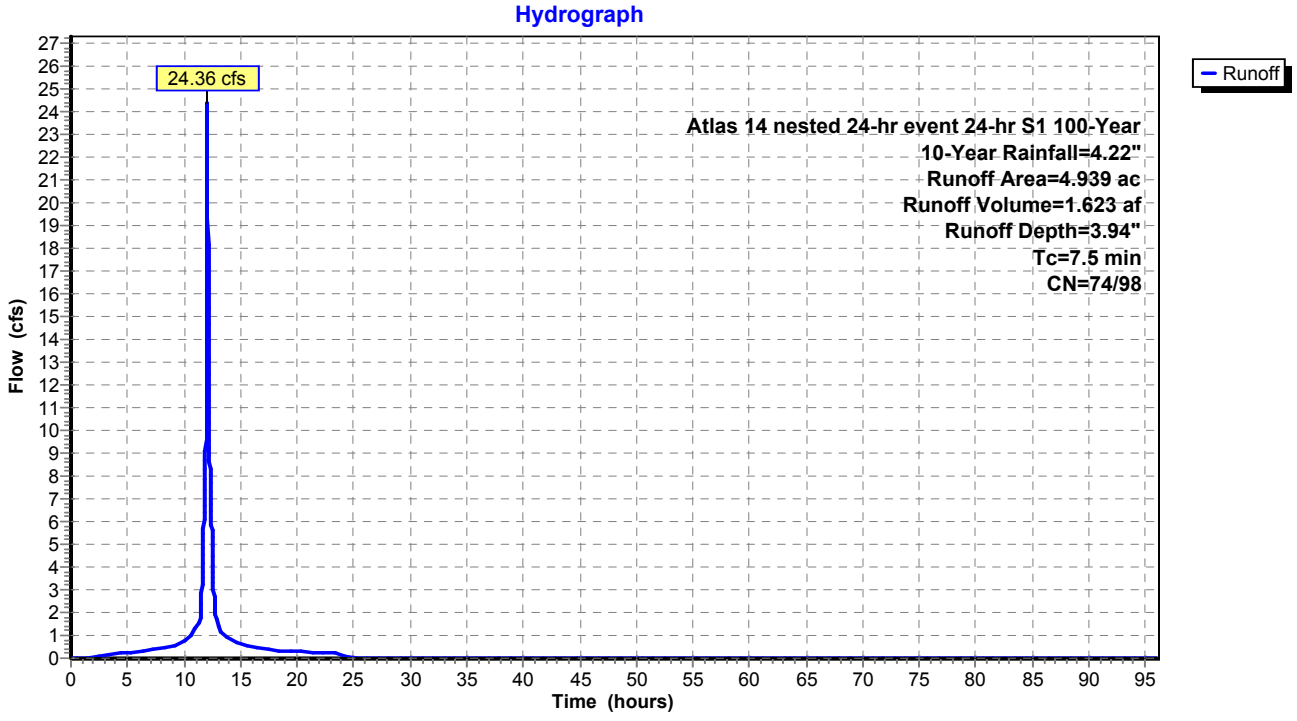
Runoff = 24.36 cfs @ 12.05 hrs, Volume= 1.623 af, Depth= 3.94"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 10-Year Rainfall=4.22"

	Area (ac)	CN	Description
*	0.088	74	permiable
*	4.851	98	impermiable
	4.939	98	Weighted Average
	0.088	74	1.78% Pervious Area
	4.851	98	98.22% Impervious Area

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

Subcatchment SB 24: SB 24



Summary for Subcatchment SB 25: SB 25

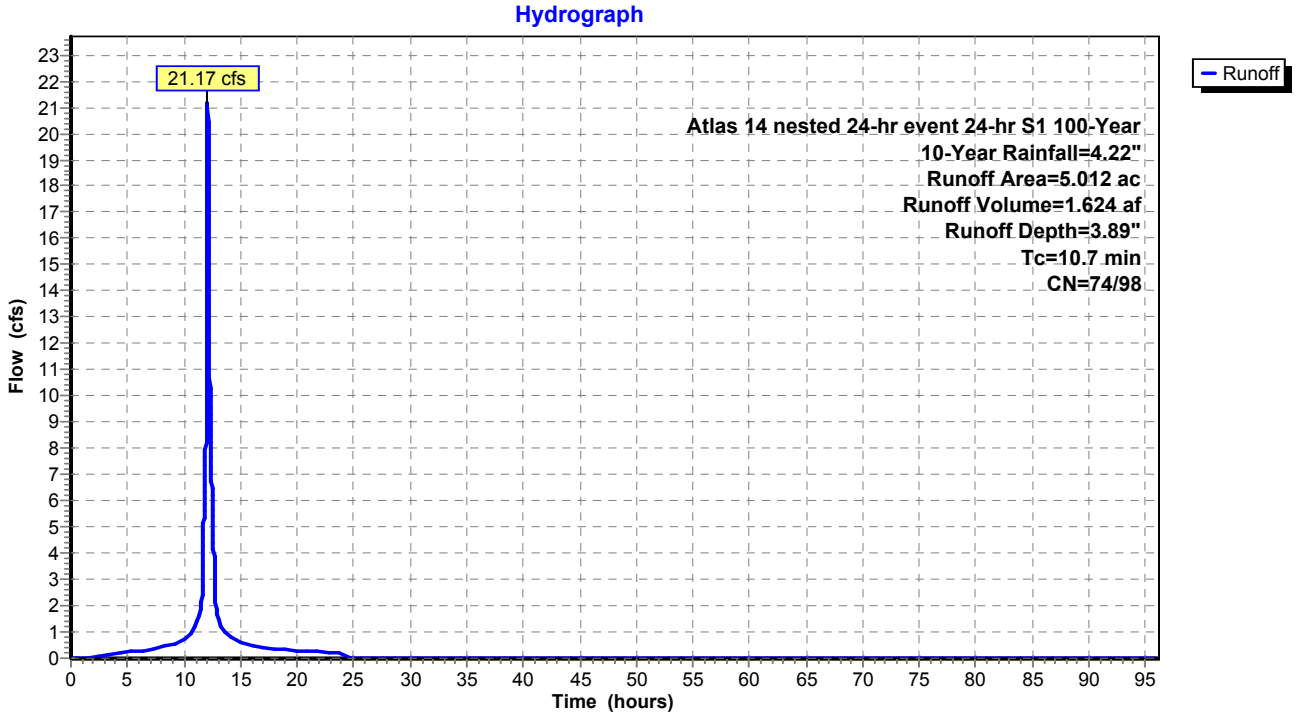
Runoff = 21.17 cfs @ 12.09 hrs, Volume= 1.624 af, Depth= 3.89"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 10-Year Rainfall=4.22"

	Area (ac)	CN	Description
*	0.215	74	pervious
*	4.797	98	impervious
	5.012	97	Weighted Average
	0.215	74	4.29% Pervious Area
	4.797	98	95.71% Impervious Area

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

Subcatchment SB 25: SB 25



Summary for Subcatchment SB 26: SB 26

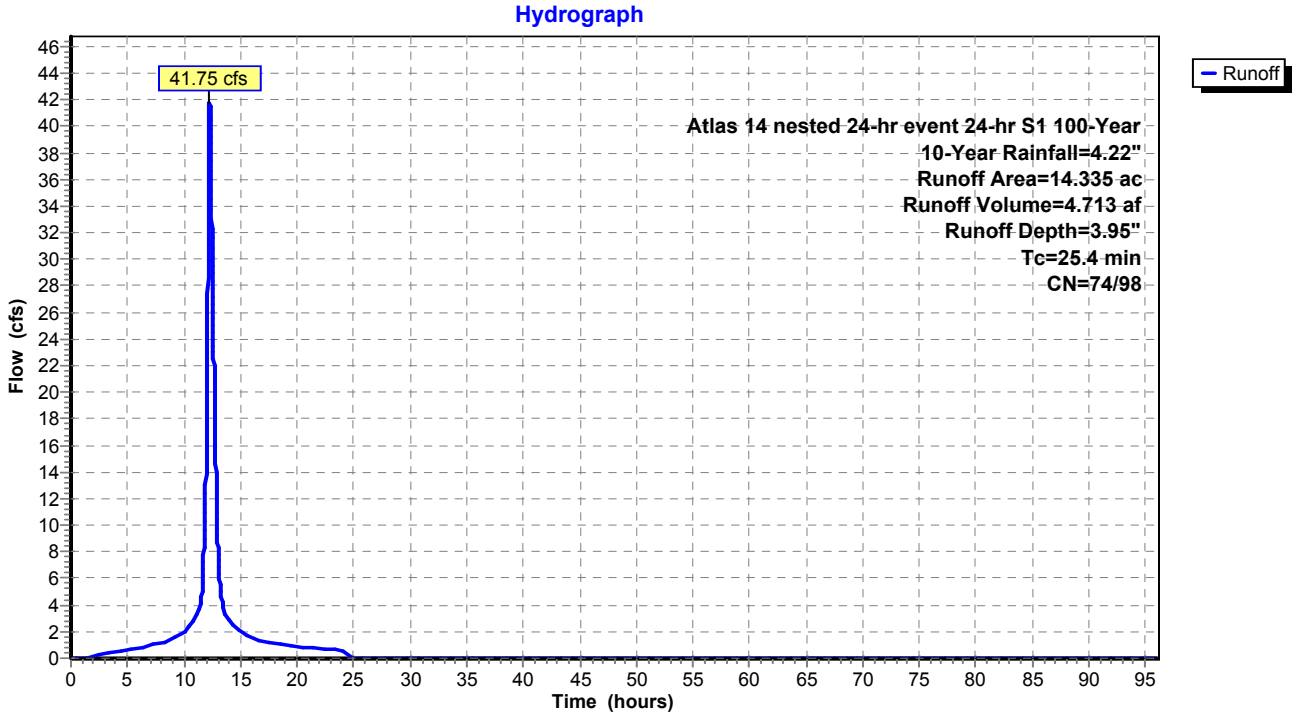
Runoff = 41.75 cfs @ 12.28 hrs, Volume= 4.713 af, Depth= 3.95"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 10-Year Rainfall=4.22"

	Area (ac)	CN	Description
*	0.248	74	pervious
*	14.087	98	impervious
	14.335	98	Weighted Average
	0.248	74	1.73% Pervious Area
	14.087	98	98.27% Impervious Area

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

Subcatchment SB 26: SB 26



Summary for Subcatchment SB 27: SB 27 (Thumb Road)

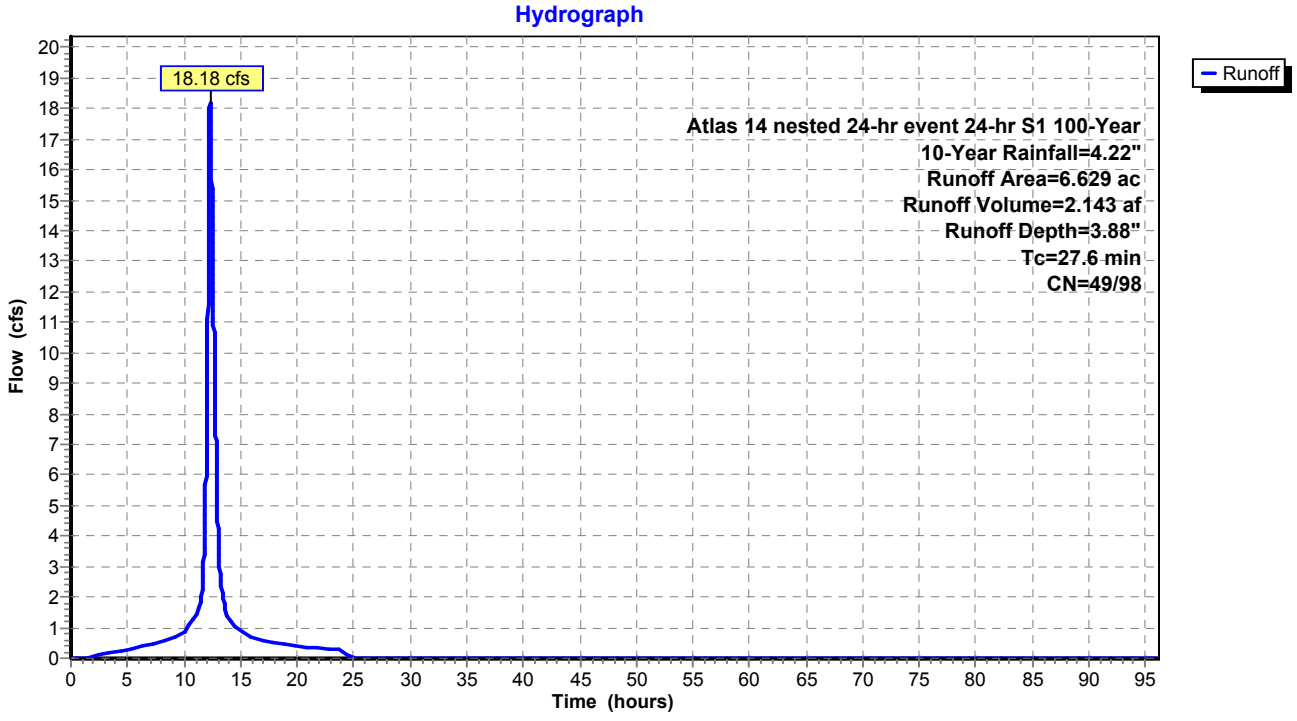
Runoff = 18.18 cfs @ 12.31 hrs, Volume= 2.143 af, Depth= 3.88"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 10-Year Rainfall=4.22"

	Area (ac)	CN	Description
*	0.191	49	Pervious
*	6.438	98	Impervious
	6.629	97	Weighted Average
	0.191	49	2.88% Pervious Area
	6.438	98	97.12% Impervious Area

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

Subcatchment SB 27: SB 27 (Thumb Road)



Summary for Subcatchment SB 28: SB 28

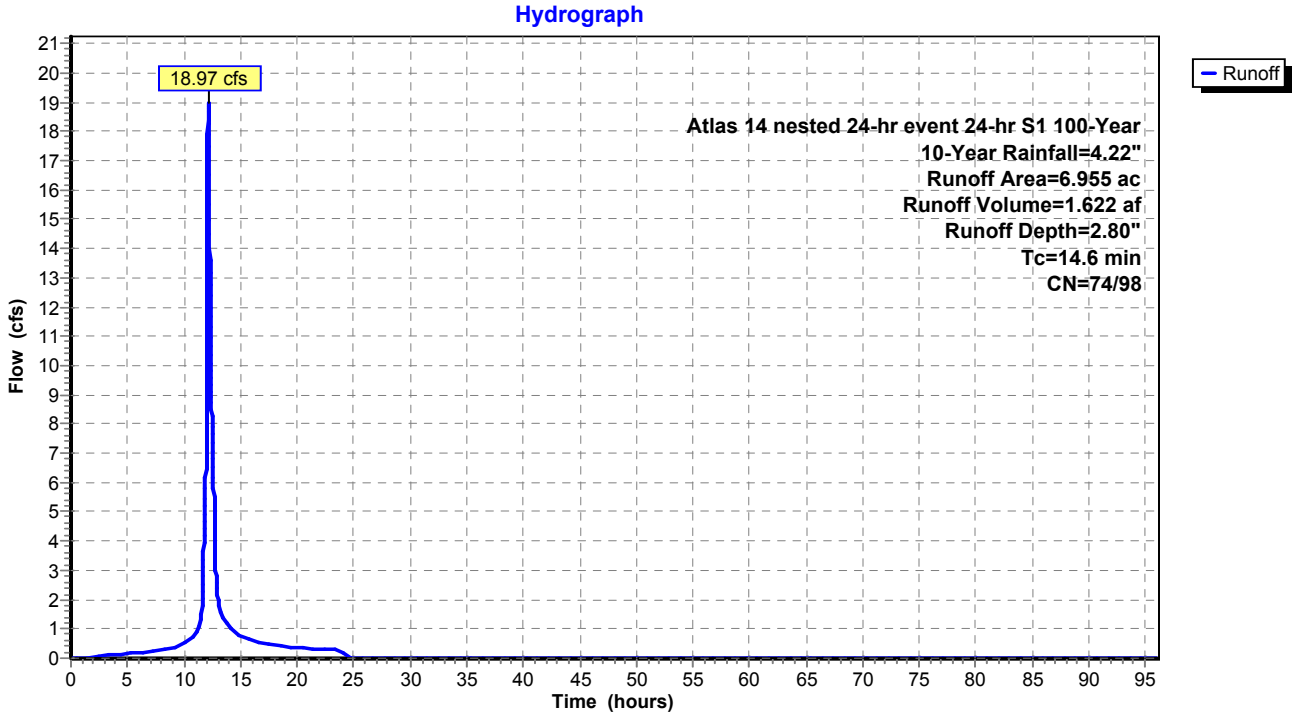
Runoff = 18.97 cfs @ 12.15 hrs, Volume= 1.622 af, Depth= 2.80"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 10-Year Rainfall=4.22"

	Area (ac)	CN	Description
*	3.703	74	pervious
*	3.252	98	impervious
	6.955	85	Weighted Average
	3.703	74	53.24% Pervious Area
	3.252	98	46.76% Impervious Area

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

Subcatchment SB 28: SB 28



Summary for Subcatchment SB 29: SB 29

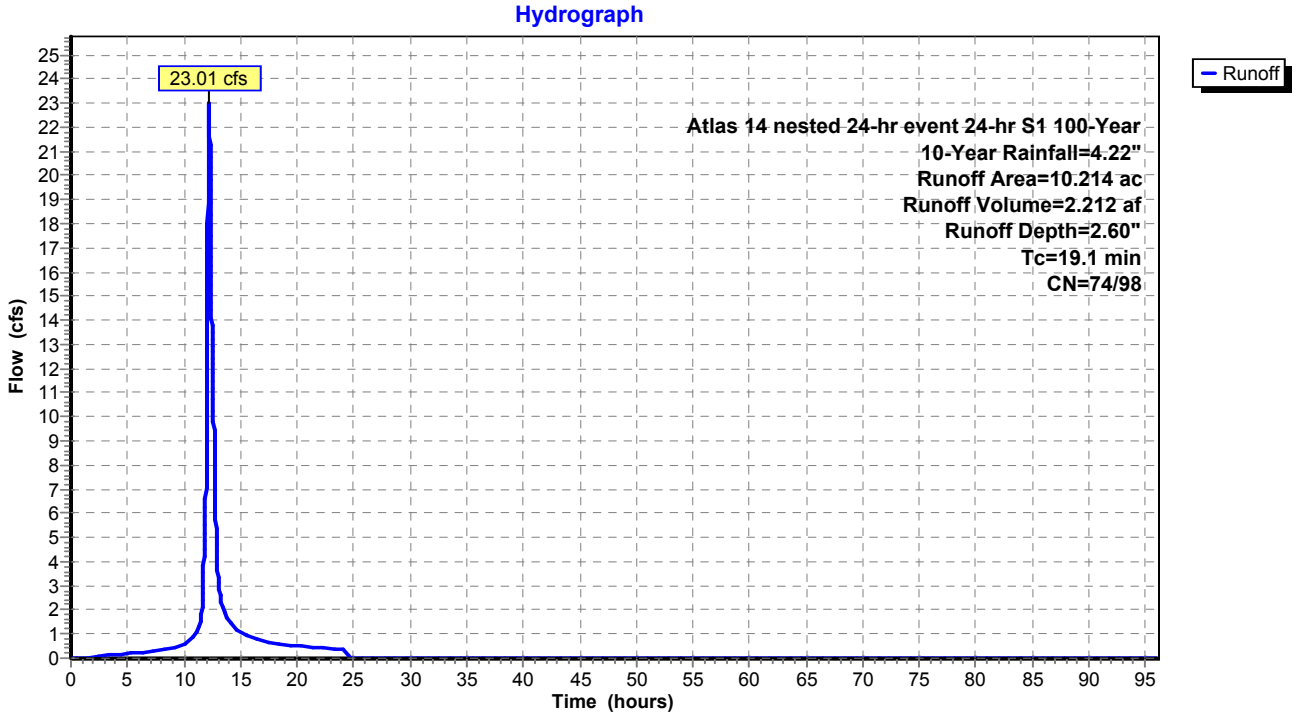
Runoff = 23.01 cfs @ 12.22 hrs, Volume= 2.212 af, Depth= 2.60"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 10-Year Rainfall=4.22"

	Area (ac)	CN	Description
*	6.360	74	pervious
*	3.854	98	impervious
	10.214	83	Weighted Average
	6.360	74	62.27% Pervious Area
	3.854	98	37.73% Impervious Area

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

Subcatchment SB 29: SB 29



Summary for Subcatchment SB 3: SB 3

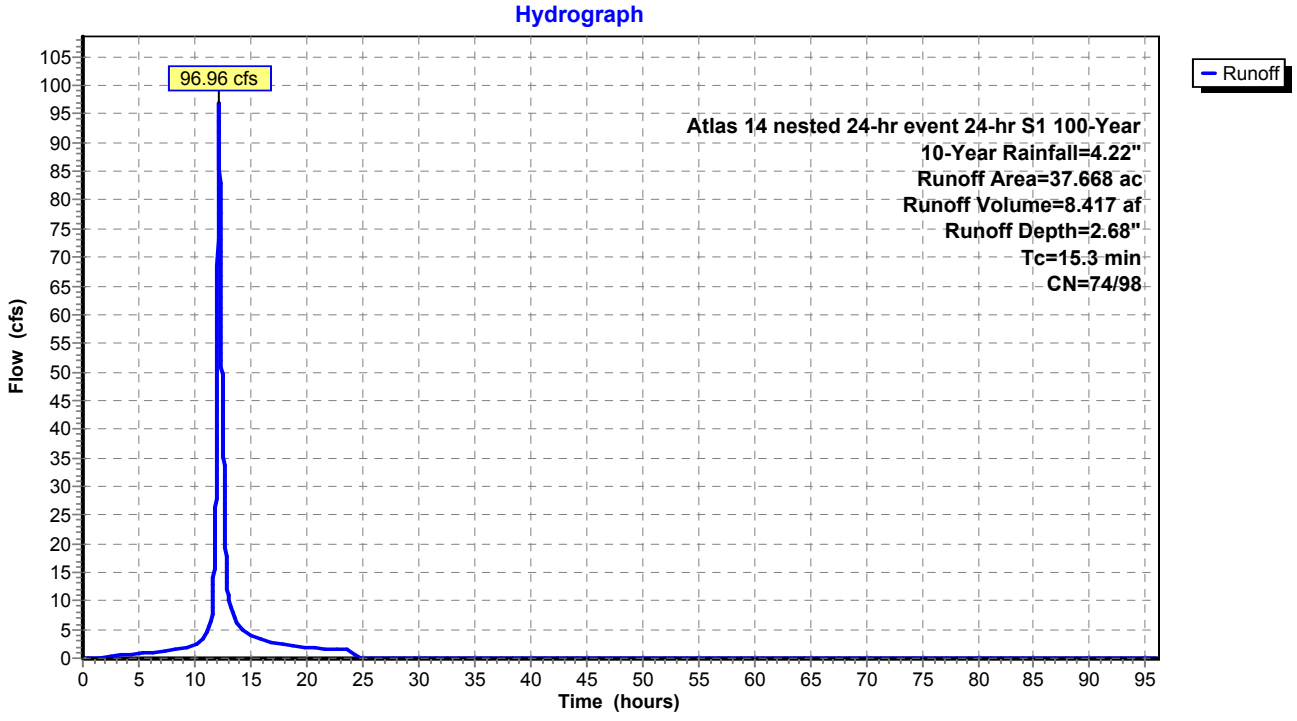
Runoff = 96.96 cfs @ 12.16 hrs, Volume= 8.417 af, Depth= 2.68"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 10-Year Rainfall=4.22"

	Area (ac)	CN	Description
*	22.050	74	Pervious
*	15.618	98	Impervious
	37.668	84	Weighted Average
	22.050	74	58.54% Pervious Area
	15.618	98	41.46% Impervious Area

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

Subcatchment SB 3: SB 3



Summary for Subcatchment SB 4: SB 4

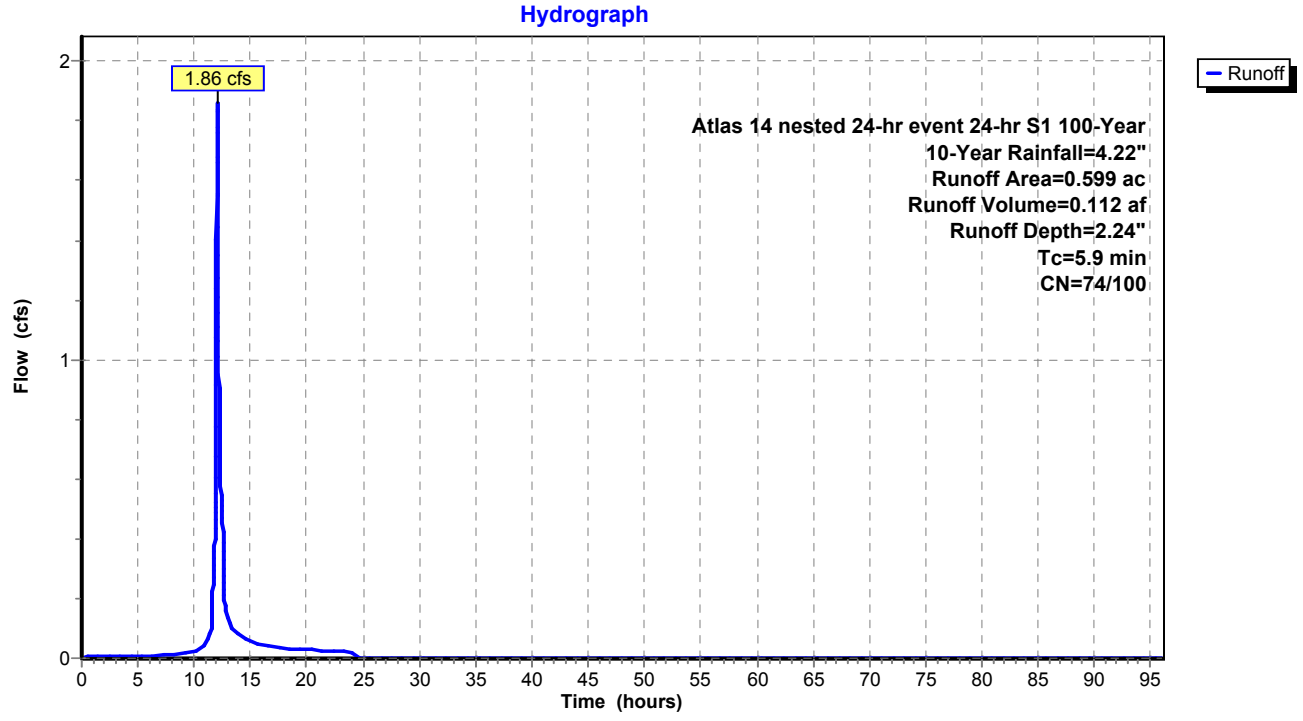
Runoff = 1.86 cfs @ 12.04 hrs, Volume= 0.112 af, Depth= 2.24"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 10-Year Rainfall=4.22"

	Area (ac)	CN	Description
*	0.481	74	pervious
*	0.118	100	impervious
	0.599	79	Weighted Average
	0.481	74	80.30% Pervious Area
	0.118	100	19.70% Impervious Area

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

Subcatchment SB 4: SB 4



Summary for Subcatchment SB 5: SB 5

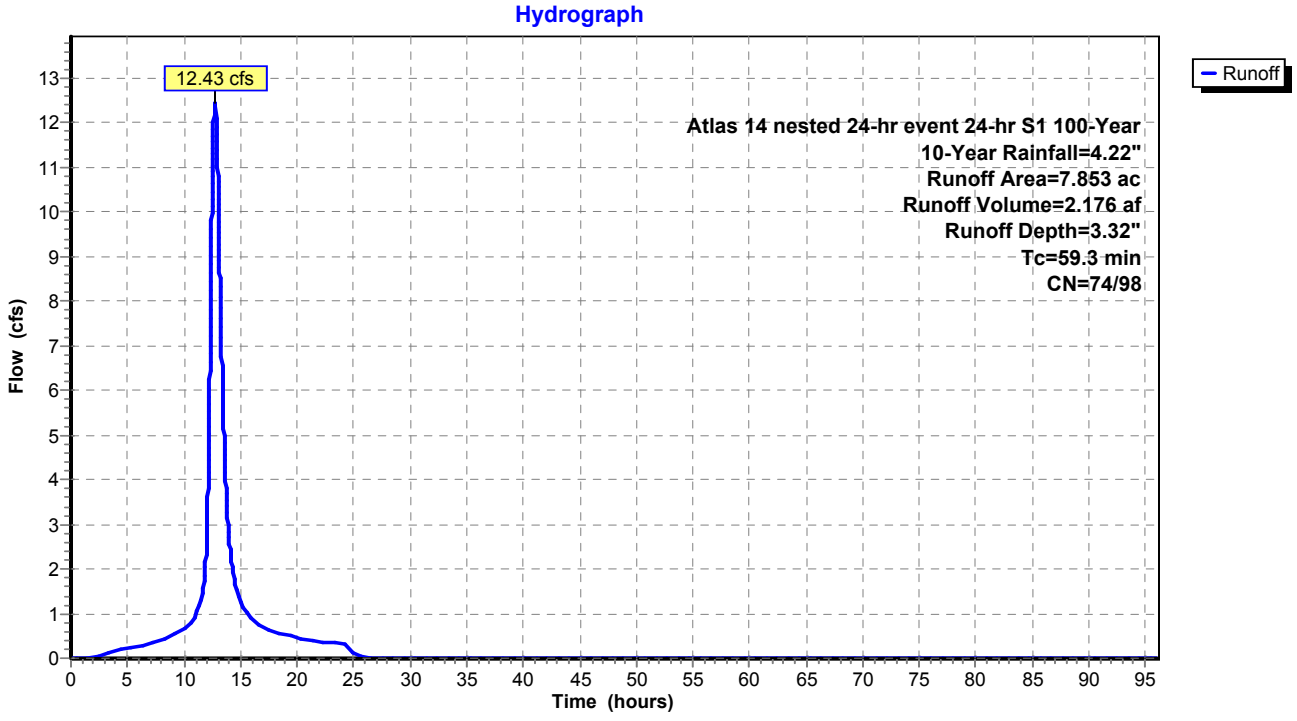
Runoff = 12.43 cfs @ 12.72 hrs, Volume= 2.176 af, Depth= 3.32"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 10-Year Rainfall=4.22"

	Area (ac)	CN	Description
*	2.327	74	pervious
*	5.526	98	impervious
	7.853	91	Weighted Average
	2.327	74	29.63% Pervious Area
	5.526	98	70.37% Impervious Area

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

Subcatchment SB 5: SB 5



Summary for Subcatchment SB 51: Offsite Subbasin 51

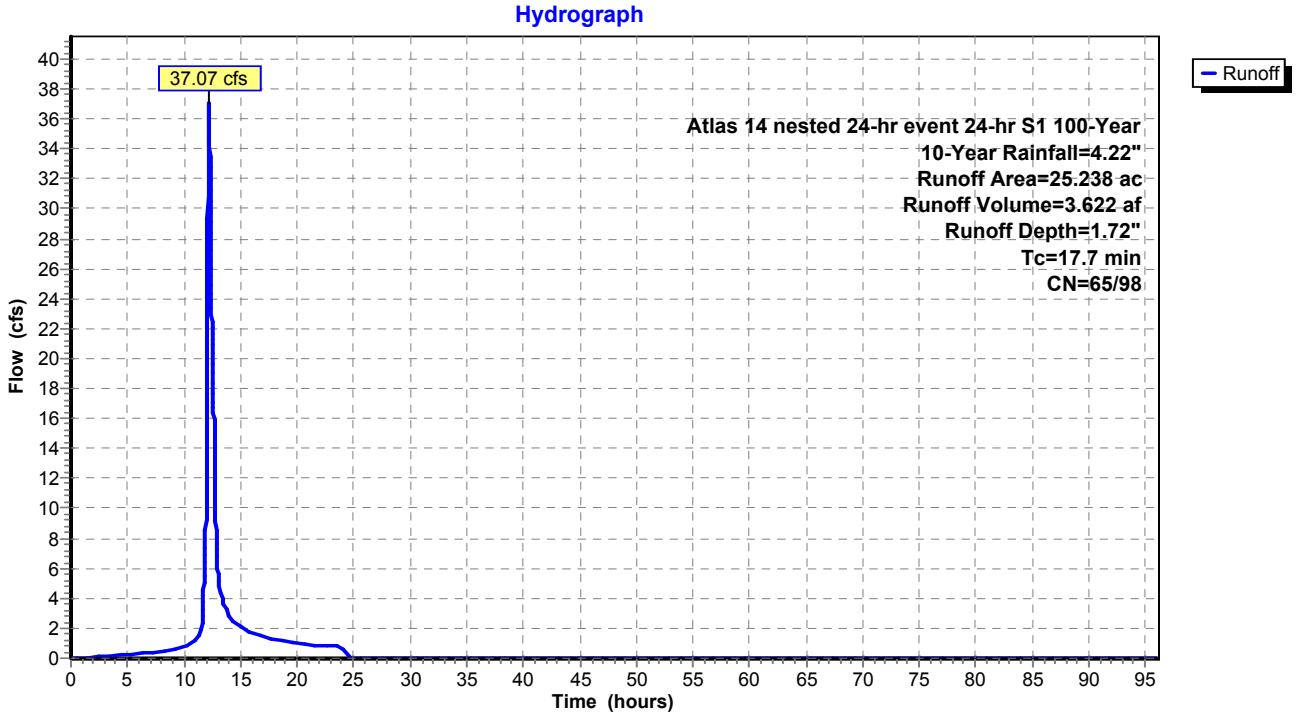
Runoff = 37.07 cfs @ 12.21 hrs, Volume= 3.622 af, Depth= 1.72"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 10-Year Rainfall=4.22"

	Area (ac)	CN	Description
*	20.200	65	Offsite subbasin 51
*	5.038	98	
	25.238	72	Weighted Average
	20.200	65	80.04% Pervious Area
	5.038	98	19.96% Impervious Area

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

Subcatchment SB 51: Offsite Subbasin 51



Summary for Subcatchment SB 6: SB 6

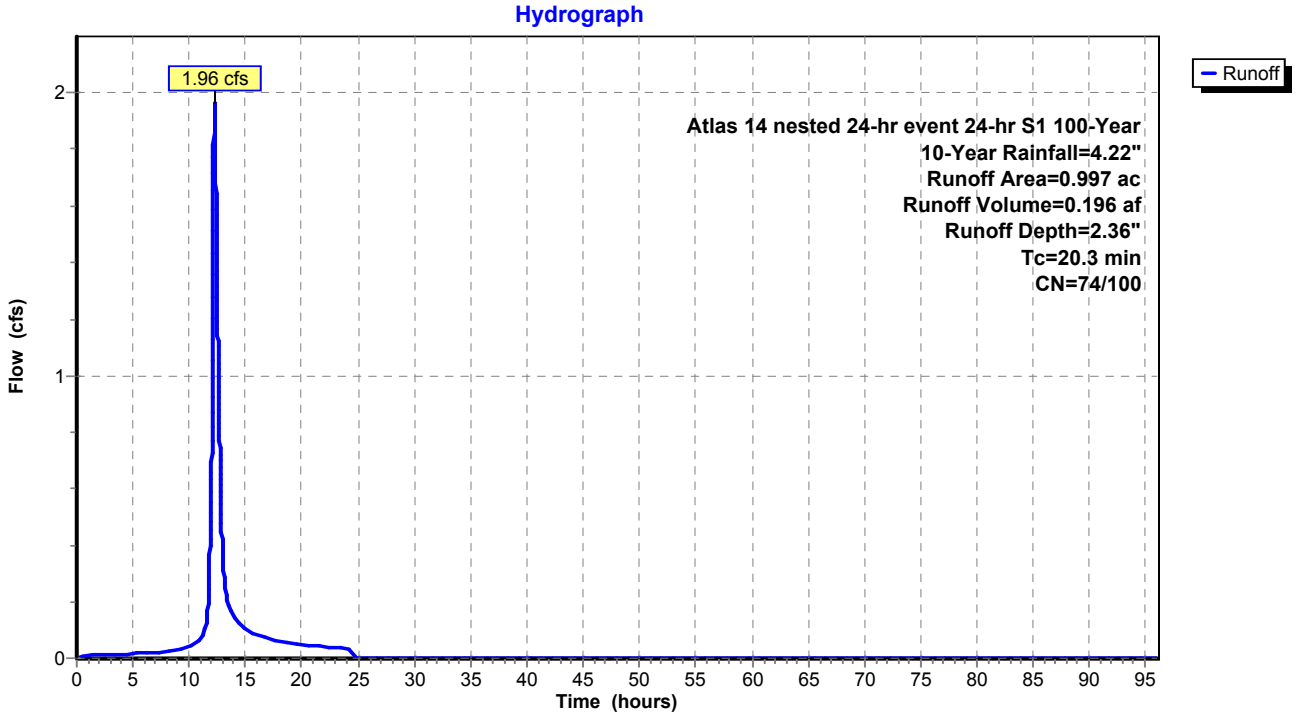
Runoff = 1.96 cfs @ 12.24 hrs, Volume= 0.196 af, Depth= 2.36"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 10-Year Rainfall=4.22"

	Area (ac)	CN	Description
*	0.753	74	pervious
*	0.244	100	impervious
	0.997	80	Weighted Average
	0.753	74	75.53% Pervious Area
	0.244	100	24.47% Impervious Area

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

Subcatchment SB 6: SB 6



Summary for Subcatchment SB 7: SB 7

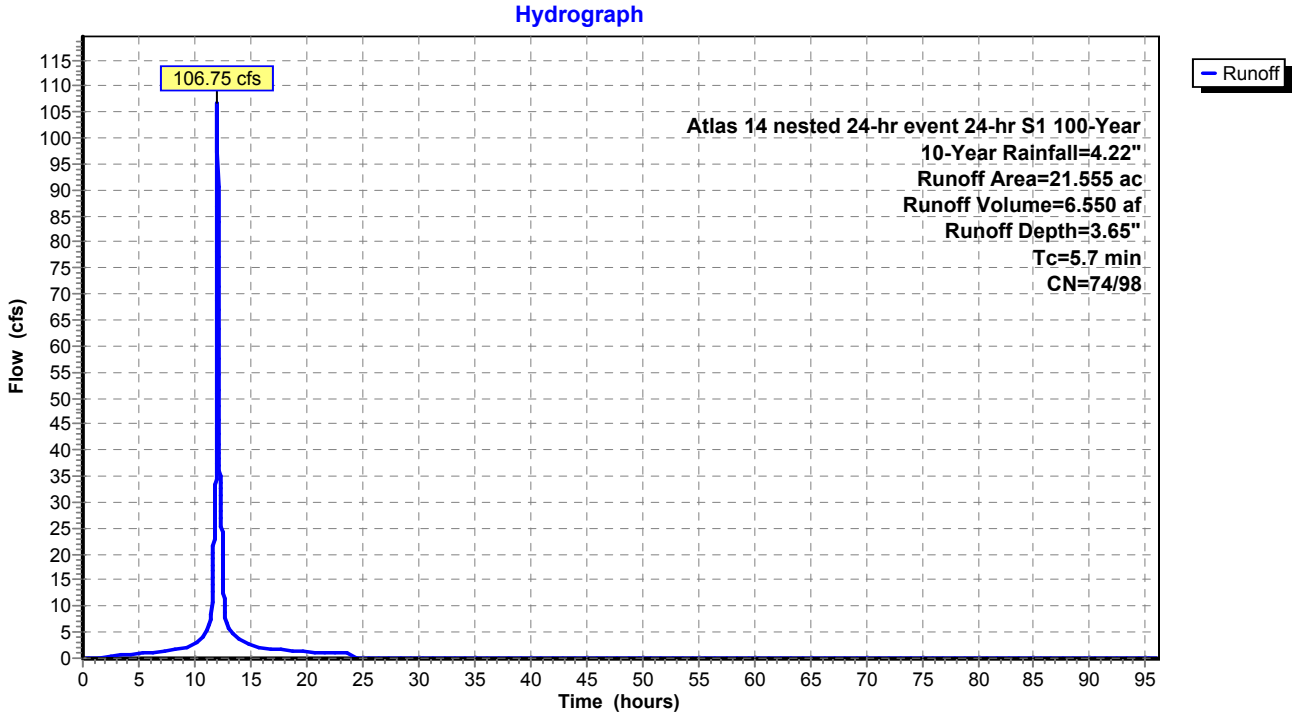
Runoff = 106.75 cfs @ 12.03 hrs, Volume= 6.550 af, Depth= 3.65"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 10-Year Rainfall=4.22"

	Area (ac)	CN	Description
*	3.269	74	pervious
*	18.286	98	impervious
	21.555	94	Weighted Average
	3.269	74	15.17% Pervious Area
	18.286	98	84.83% Impervious Area

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

Subcatchment SB 7: SB 7



Summary for Subcatchment SB 8: SB 8

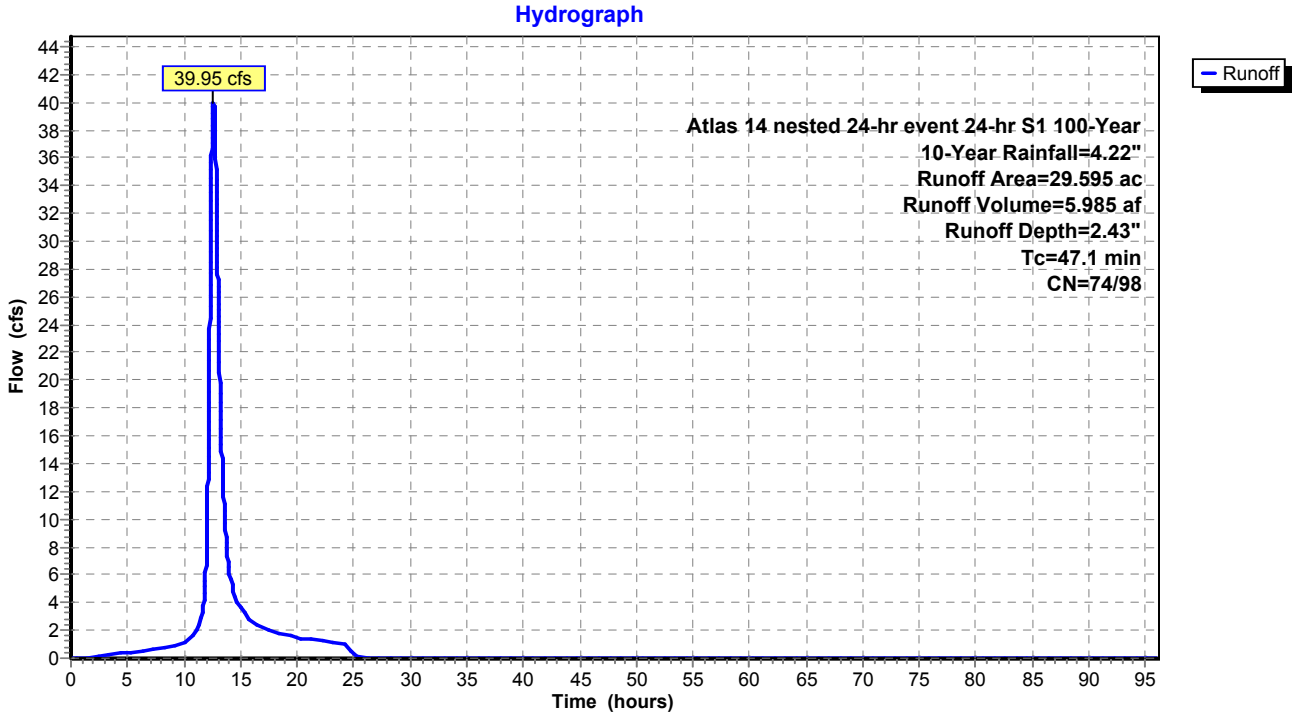
Runoff = 39.95 cfs @ 12.61 hrs, Volume= 5.985 af, Depth= 2.43"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 10-Year Rainfall=4.22"

	Area (ac)	CN	Description
*	20.714	74	pervious
*	8.881	98	impervious
	29.595	81	Weighted Average
	20.714	74	69.99% Pervious Area
	8.881	98	30.01% Impervious Area

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

Subcatchment SB 8: SB 8



Summary for Subcatchment SB 9: SB 9

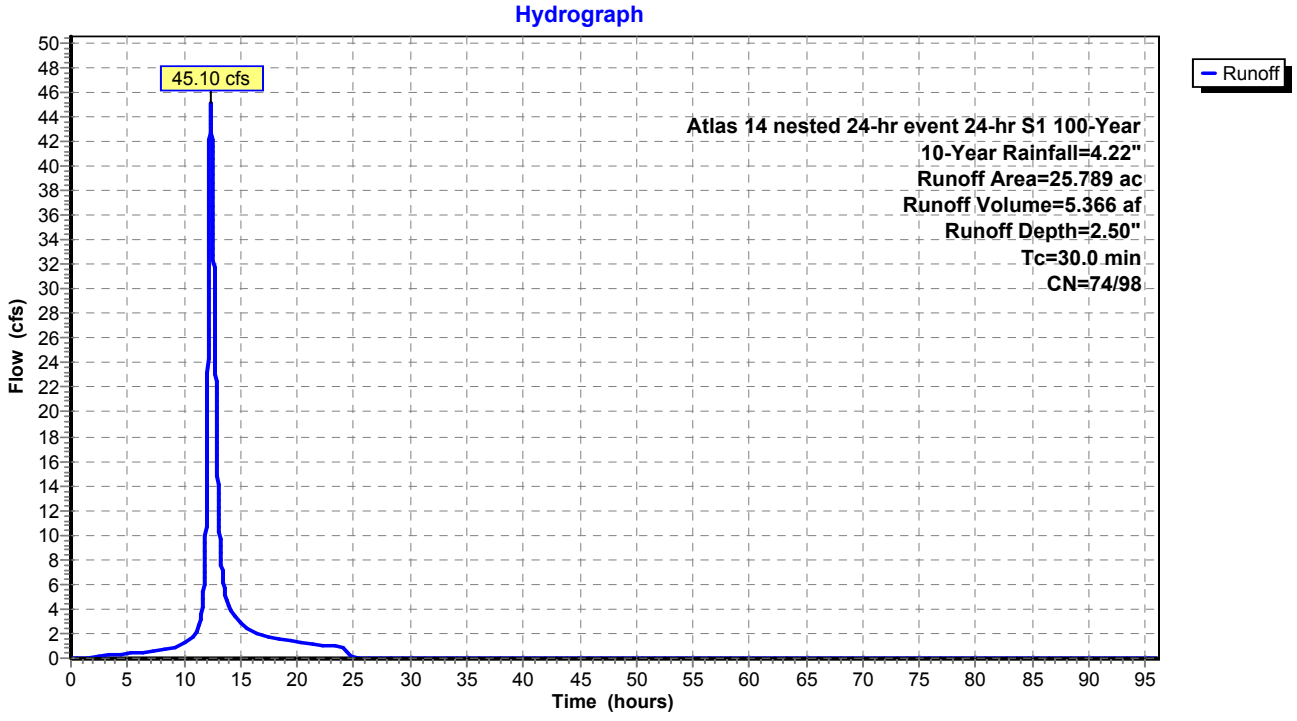
Runoff = 45.10 cfs @ 12.37 hrs, Volume= 5.366 af, Depth= 2.50"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 10-Year Rainfall=4.22"

	Area (ac)	CN	Description
*	17.234	74	permiable
*	8.555	98	impermiable
	25.789	82	Weighted Average
	17.234	74	66.83% Pervious Area
	8.555	98	33.17% Impervious Area

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

Subcatchment SB 9: SB 9



Summary for Reach 30R: 60" RCP to existing 60" storm sewer

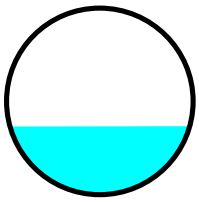
[52] Hint: Inlet/Outlet conditions not evaluated
[65] Warning: Inlet elevation not specified

Inflow Area = 133.365 ac, 58.87% Impervious, Inflow Depth = 2.78" for 10-Year event
Inflow = 98.36 cfs @ 13.09 hrs, Volume= 30.860 af
Outflow = 98.35 cfs @ 13.09 hrs, Volume= 30.860 af, Atten= 0%, Lag= 0.4 min

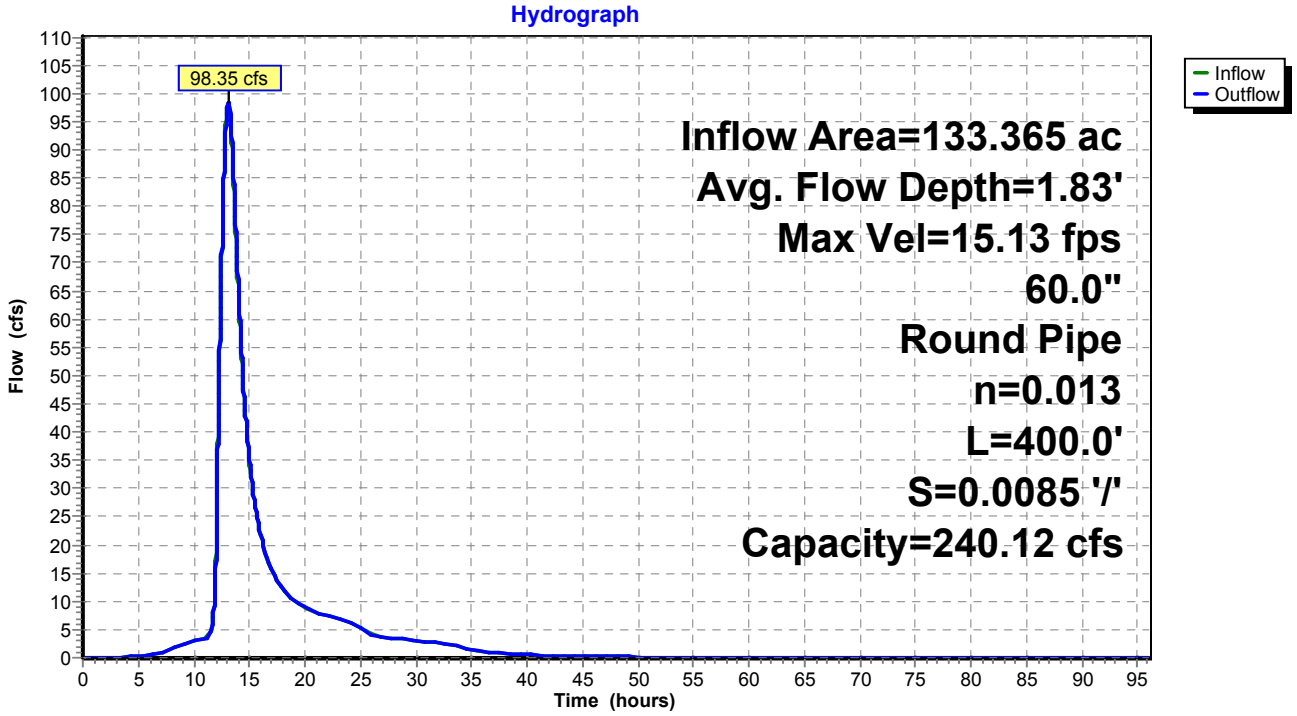
Routing by Muskingum-Cunge method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Reference Flow= 73.77 cfs Estimated Depth= 1.90' Velocity= 10.76 fps
m= 1.404, c= 15.10 fps, dt= 0.6 min, dx= 400.0' / 1 = 400.0', K= 0.4 min, X= 0.301
Max. Velocity= 15.13 fps, Min. Travel Time= 0.4 min
Avg. Velocity = 15.10 fps, Avg. Travel Time= 0.4 min

Peak Storage= 2,605 cf @ 13.09 hrs
Average Depth at Peak Storage= 1.83'
Bank-Full Depth= 5.00' Flow Area= 19.6 sf, Capacity= 240.12 cfs

60.0" Round Pipe
n= 0.013
Length= 400.0' Slope= 0.0085 '/'
Inlet Invert= 0.00', Outlet Invert= -3.40'



Reach 30R: 60" RCP to existing 60" storm sewer



Summary for Reach 34R: 60" RCP connecting P-1/P-2 with P-3

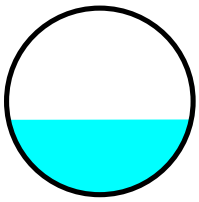
[52] Hint: Inlet/Outlet conditions not evaluated
[65] Warning: Inlet elevation not specified

Inflow Area = 68.531 ac, 57.92% Impervious, Inflow Depth = 3.05" for 10-Year event
Inflow = 89.60 cfs @ 12.67 hrs, Volume= 17.400 af
Outflow = 89.55 cfs @ 12.72 hrs, Volume= 17.400 af, Atten= 0%, Lag= 3.0 min

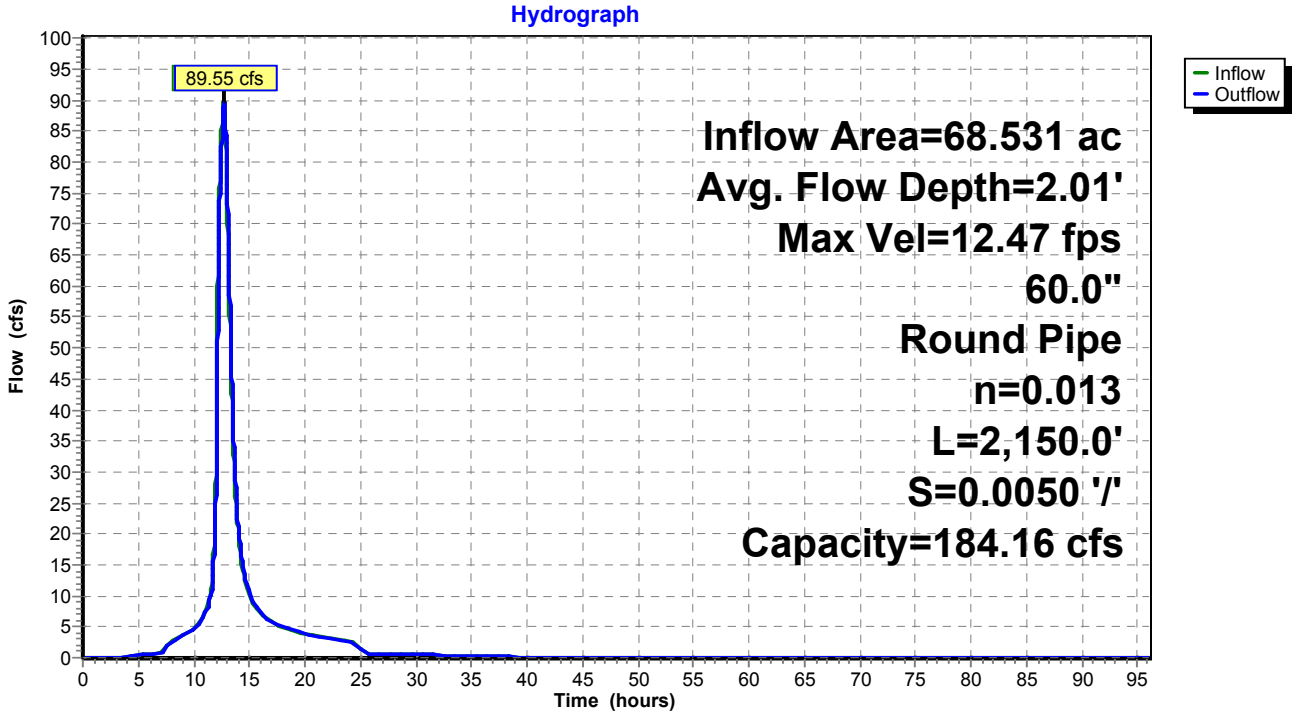
Routing by Muskingum-Cunge method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Reference Flow= 67.20 cfs Estimated Depth= 2.09' Velocity= 8.64 fps
m= 1.398, c= 12.09 fps, dt= 0.6 min, dx= 2,150.0' / 5 = 430.0', K= 0.6 min, X= 0.153
Max. Velocity= 12.47 fps, Min. Travel Time= 2.9 min
Avg. Velocity = 12.09 fps, Avg. Travel Time= 3.0 min

Peak Storage= 15,926 cf @ 12.69 hrs
Average Depth at Peak Storage= 2.01'
Bank-Full Depth= 5.00' Flow Area= 19.6 sf, Capacity= 184.16 cfs

60.0" Round Pipe
n= 0.013
Length= 2,150.0' Slope= 0.0050 '/'
Inlet Invert= 0.00', Outlet Invert= -10.75'



Reach 34R: 60" RCP connecting P-1/P-2 with P-3



Summary for Reach 37R: 48" RCP

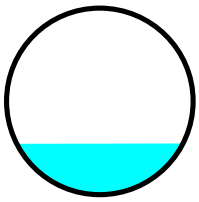
[52] Hint: Inlet/Outlet conditions not evaluated
[65] Warning: Inlet elevation not specified

Inflow Area = 43.279 ac, 47.44% Impervious, Inflow Depth = 1.92" for 10-Year event
Inflow = 26.37 cfs @ 12.70 hrs, Volume= 6.915 af
Outflow = 26.37 cfs @ 12.70 hrs, Volume= 6.915 af, Atten= 0%, Lag= 0.4 min

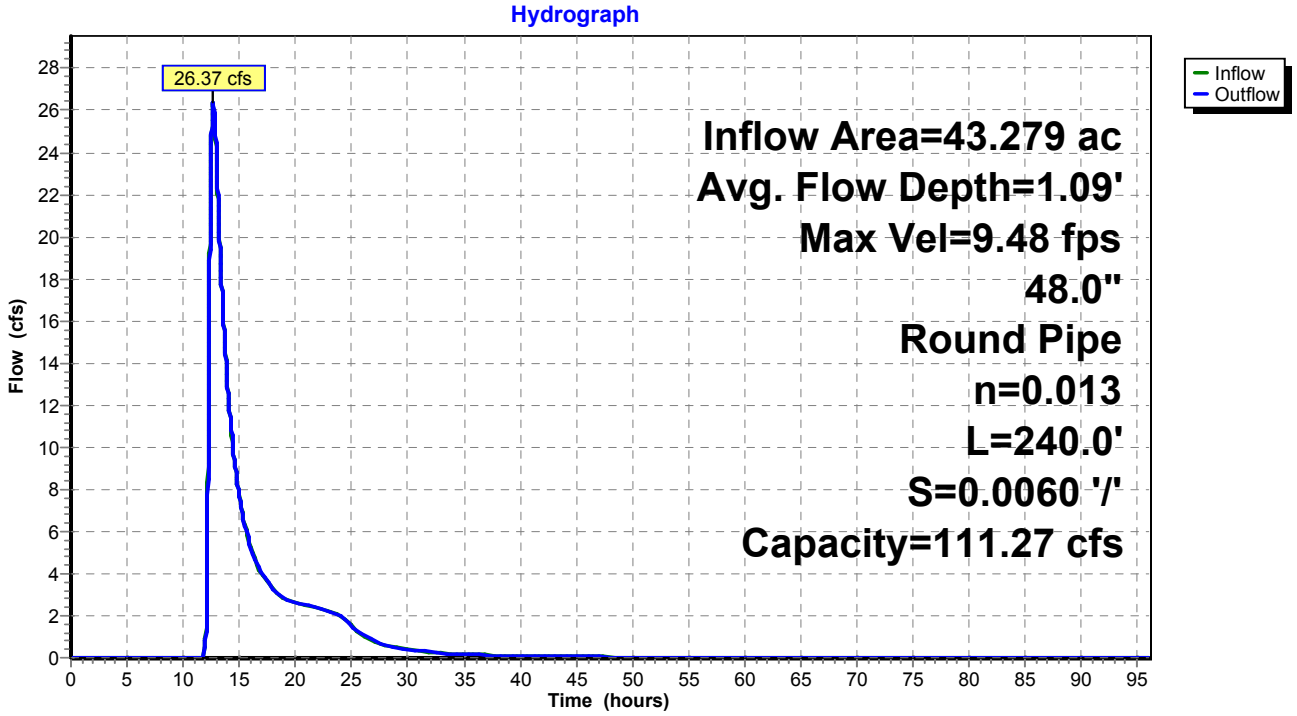
Routing by Muskingum-Cunge method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Reference Flow= 19.78 cfs Estimated Depth= 1.14' Velocity= 6.68 fps
m= 1.416, c= 9.47 fps, dt= 0.6 min, dx= 240.0' / 1 = 240.0', K= 0.4 min, X= 0.220
Max. Velocity= 9.48 fps, Min. Travel Time= 0.4 min
Avg. Velocity = 9.47 fps, Avg. Travel Time= 0.4 min

Peak Storage= 668 cf @ 12.70 hrs
Average Depth at Peak Storage= 1.09'
Bank-Full Depth= 4.00' Flow Area= 12.6 sf, Capacity= 111.27 cfs

48.0" Round Pipe
n= 0.013
Length= 240.0' Slope= 0.0060 '/'
Inlet Invert= 0.00', Outlet Invert= -1.44'



Reach 37R: 48" RCP



Summary for Reach 39R: 24" RCP

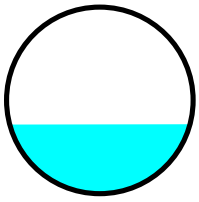
[52] Hint: Inlet/Outlet conditions not evaluated
[65] Warning: Inlet elevation not specified
[97] Warning: Factor X out of range

Inflow Area = 8.850 ac, 65.20% Impervious, Inflow Depth = 3.22" for 10-Year event
Inflow = 6.75 cfs @ 13.30 hrs, Volume= 2.372 af
Outflow = 6.75 cfs @ 13.31 hrs, Volume= 2.372 af, Atten= 0%, Lag= 0.2 min

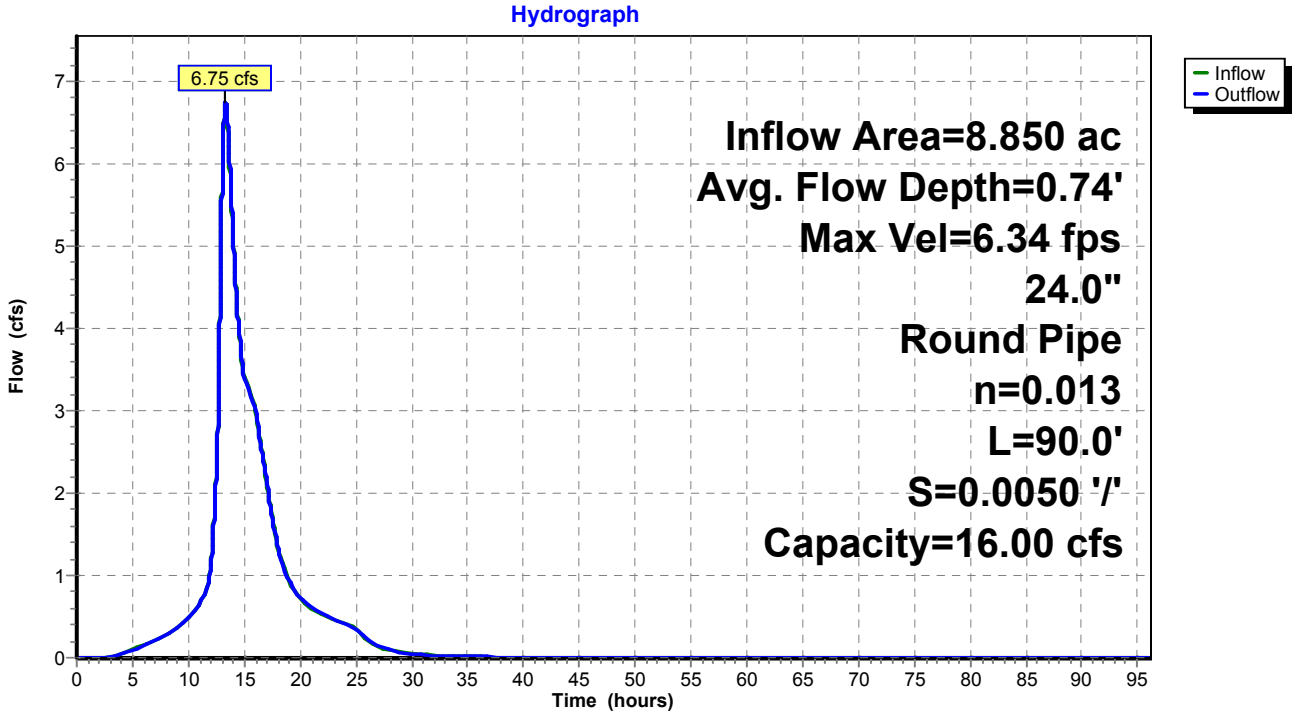
Routing by Muskingum-Cunge method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Reference Flow= 5.06 cfs Estimated Depth= 0.77' Velocity= 4.52 fps
m= 1.403, c= 6.34 fps, dt= 0.6 min, dx= 90.0' / 1 = 90.0', K= 0.2 min, X= 0.000
Max. Velocity= 6.34 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 6.34 fps, Avg. Travel Time= 0.2 min

Peak Storage= 96 cf @ 13.31 hrs
Average Depth at Peak Storage= 0.74'
Bank-Full Depth= 2.00' Flow Area= 3.1 sf, Capacity= 16.00 cfs

24.0" Round Pipe
n= 0.013
Length= 90.0' Slope= 0.0050 '/'
Inlet Invert= 0.00', Outlet Invert= -0.45'



Reach 39R: 24" RCP



Summary for Reach 43R: 30" RCP connecting P-10 with P-12

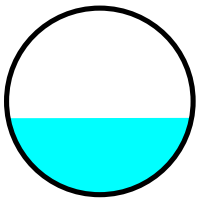
[52] Hint: Inlet/Outlet conditions not evaluated
[79] Warning: Submerged Pond 10P Primary device # 1 by 1.03'

Inflow Area = 66.448 ac, 29.37% Impervious, Inflow Depth > 1.53" for 10-Year event
Inflow = 12.56 cfs @ 13.07 hrs, Volume= 8.488 af
Outflow = 12.56 cfs @ 13.10 hrs, Volume= 8.488 af, Atten= 0%, Lag= 1.9 min

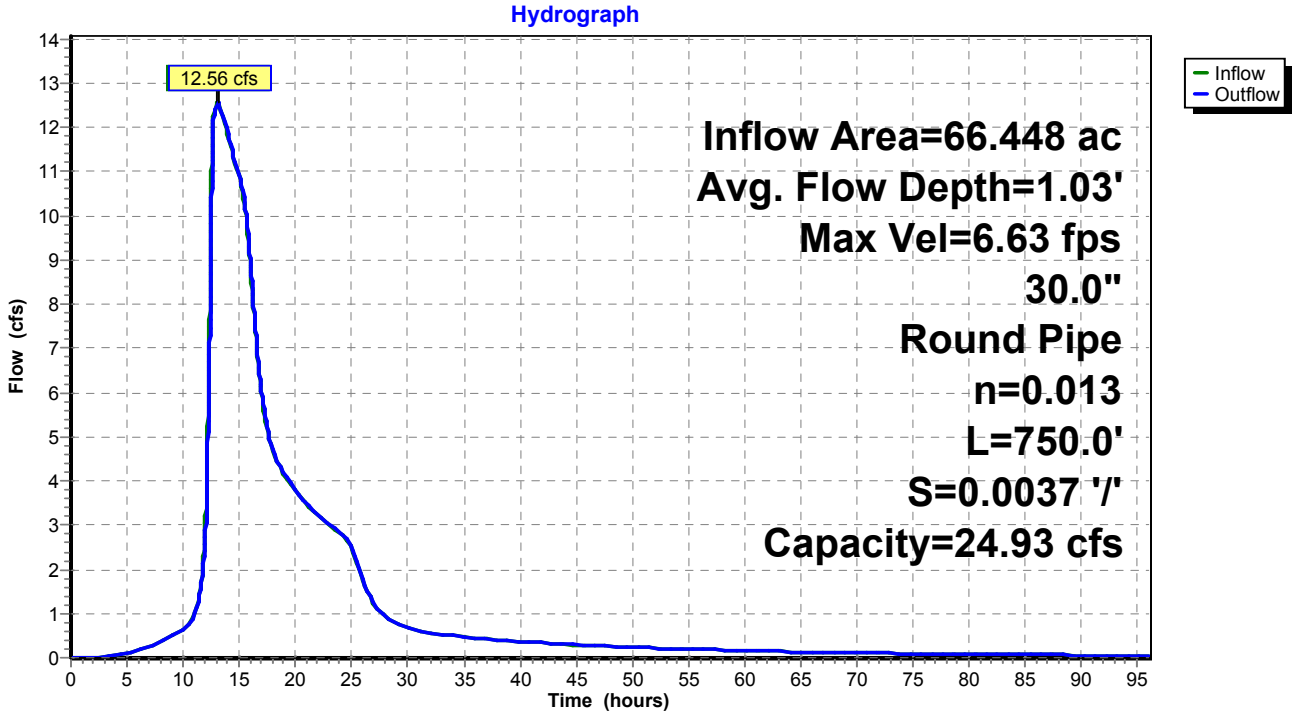
Routing by Muskingum-Cunge method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Reference Flow= 9.42 cfs Estimated Depth= 1.07' Velocity= 4.72 fps
m= 1.397, c= 6.60 fps, dt= 0.6 min, dx= 750.0' / 3 = 250.0', K= 0.6 min, X= 0.087
Max. Velocity= 6.63 fps, Min. Travel Time= 1.9 min
Avg. Velocity = 6.60 fps, Avg. Travel Time= 1.9 min

Peak Storage= 1,427 cf @ 13.09 hrs
Average Depth at Peak Storage= 1.03'
Bank-Full Depth= 2.50' Flow Area= 4.9 sf, Capacity= 24.93 cfs

30.0" Round Pipe
n= 0.013
Length= 750.0' Slope= 0.0037 '/'
Inlet Invert= 896.00', Outlet Invert= 893.23'



Reach 43R: 30" RCP connecting P-10 with P-12



Summary for Reach 51R: 40' x 4.5 ft parabolic hannel from P-13 to Rice Creek

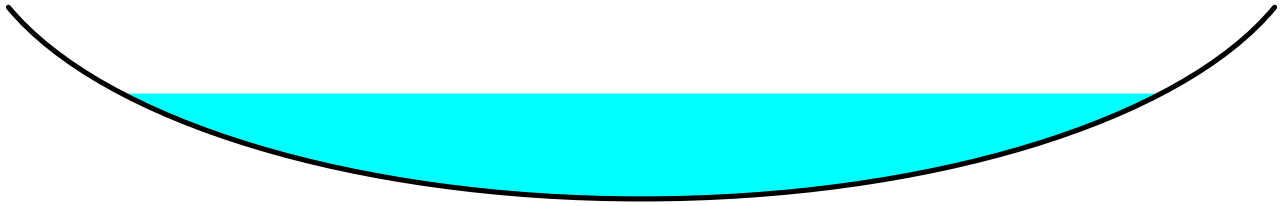
[65] Warning: Inlet elevation not specified
[97] Warning: Factor X out of range

Inflow Area = 245.501 ac, 51.49% Impervious, Inflow Depth > 2.78" for 10-Year event
Inflow = 300.84 cfs @ 12.46 hrs, Volume= 56.849 af
Outflow = 300.59 cfs @ 12.47 hrs, Volume= 56.848 af, Atten= 0%, Lag= 0.8 min

Routing by Muskingum-Cunge method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Reference Flow= 225.63 cfs Estimated Depth= 2.60' Velocity= 4.28 fps
m= 1.439, c= 6.16 fps, dt= 0.6 min, dx= 300.0' / 1 = 300.0', K= 0.8 min, X= 0.000
Max. Velocity= 6.16 fps, Min. Travel Time= 0.8 min
Avg. Velocity = 6.16 fps, Avg. Travel Time= 0.8 min

Peak Storage= 14,649 cf @ 12.47 hrs
Average Depth at Peak Storage= 2.47'
Bank-Full Depth= 4.50' Flow Area= 120.0 sf, Capacity= 733.43 cfs

40.00' x 4.50' deep Parabolic Channel, n= 0.035
Length= 300.0' Slope= 0.0050 '/'
Inlet Invert= 0.00', Outlet Invert= -1.50'



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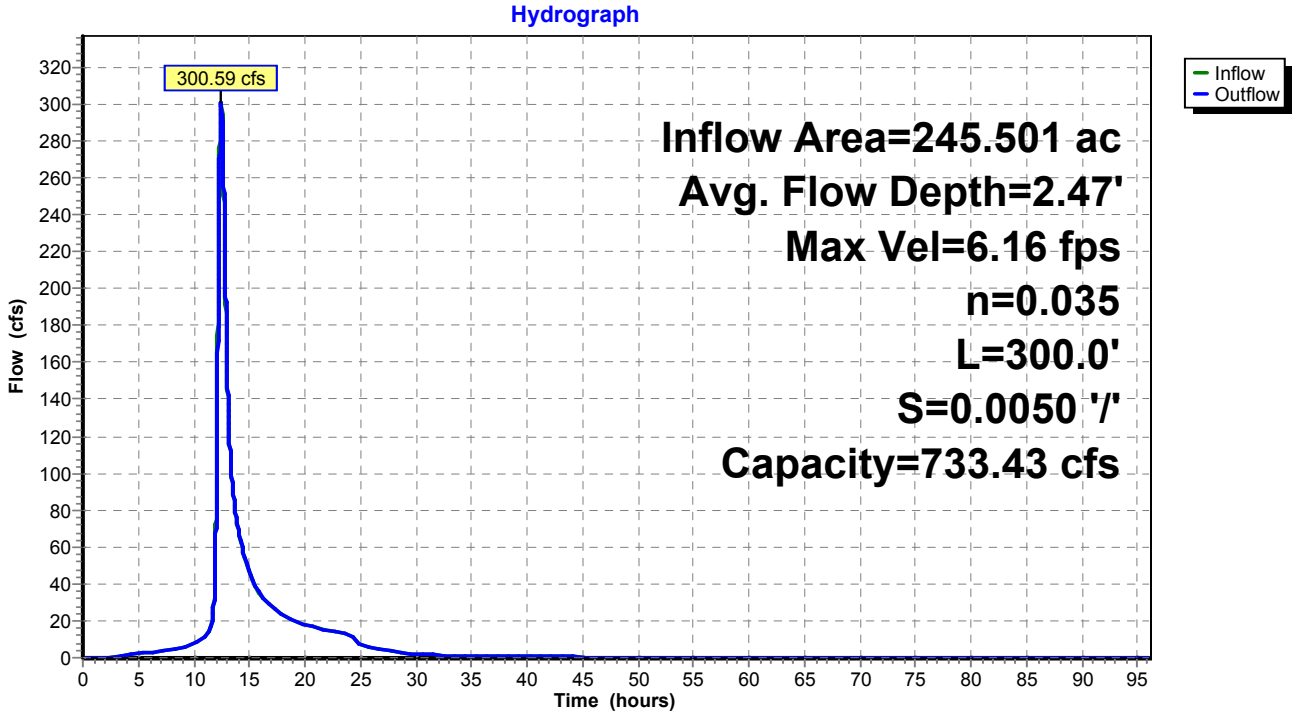
Reach 51R: 40' x 4.5 ft parabolic hannel from P-13 to Rice Creek



Summary for Pond 3P: P-3

Inflow Area = 133.365 ac, 58.87% Impervious, Inflow Depth = 2.78" for 10-Year event
Inflow = 138.44 cfs @ 12.04 hrs, Volume= 30.865 af
Outflow = 98.36 cfs @ 13.09 hrs, Volume= 30.860 af, Atten= 29%, Lag= 62.9 min
Primary = 98.36 cfs @ 13.09 hrs, Volume= 30.860 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Starting Elev= 914.00' Surf.Area= 1.790 ac Storage= 5.827 af
Peak Elev= 917.65' @ 13.09 hrs Surf.Area= 2.508 ac Storage= 13.731 af (7.904 af above start)

Plug-Flow detention time= 320.0 min calculated for 25.031 af (81% of inflow)
Center-of-Mass det. time= 135.4 min (1,016.6 - 881.2)

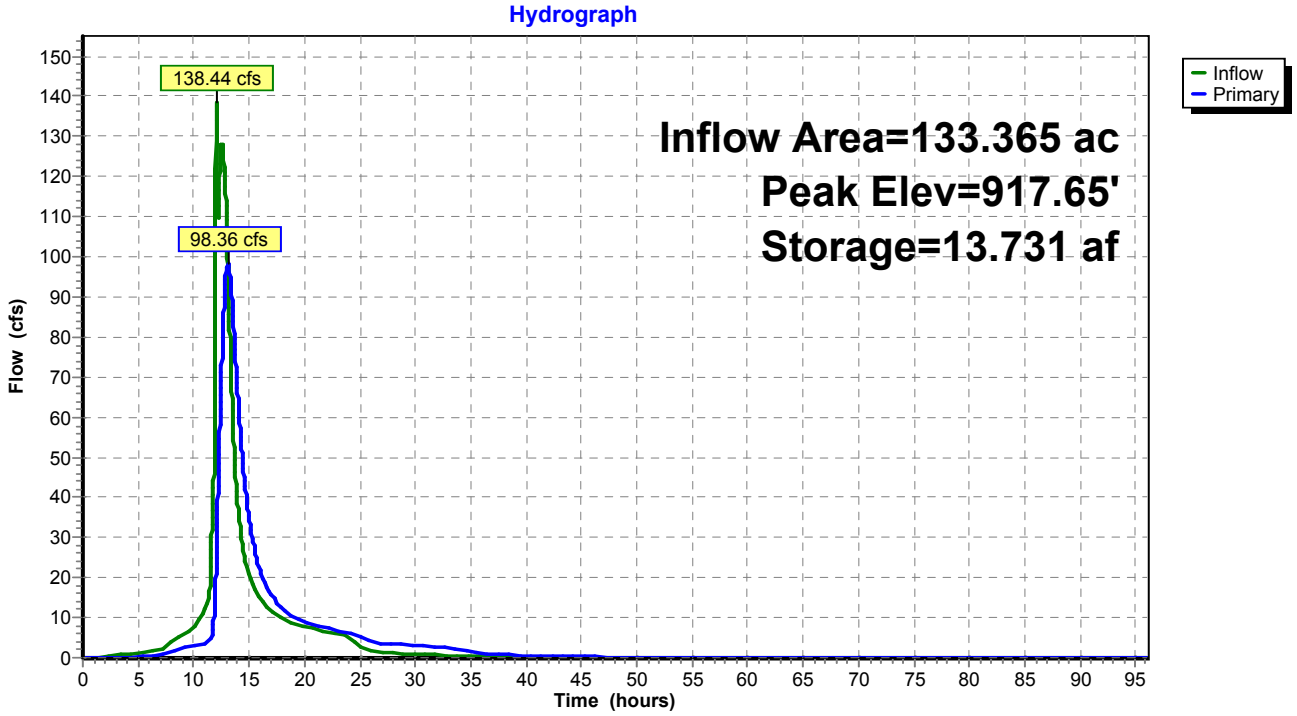
Volume	Invert	Avail.Storage	Storage Description
#1	909.85'	20.423 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
909.85	1.130	0.000	0.000
912.00	1.360	2.677	2.677
916.00	2.220	7.160	9.837
918.00	2.570	4.790	14.627
920.10	2.950	5.796	20.423

Device	Routing	Invert	Outlet Devices
#1	Primary	914.00'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	918.25'	**10.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#3	Primary	915.00'	**7.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=98.35 cfs @ 13.09 hrs HW=917.65' (Free Discharge)
- **1=Orifice/Grate** (Orifice Controls 7.22 cfs @ 9.20 fps)
- **2=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)
- **3=Sharp-Crested Rectangular Weir** (Weir Controls 91.13 cfs @ 5.32 fps)

Pond 3P: P-3


Hydrograph
138.44 cfs
98.36 cfs
Inflow Area=133.365 ac
Peak Elev=917.65'
Storage=13.731 af
Inflow
Primary
Flow (cfs)
Time (hours)
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
75
80
85
90
95

Summary for Pond 4P: P-4

Inflow Area = 7.853 ac, 70.37% Impervious, Inflow Depth = 3.32" for 10-Year event
Inflow = 12.43 cfs @ 12.72 hrs, Volume= 2.176 af
Outflow = 7.30 cfs @ 13.28 hrs, Volume= 2.176 af, Atten= 41%, Lag= 33.7 min
Primary = 4.43 cfs @ 13.28 hrs, Volume= 0.931 af
Secondary = 2.87 cfs @ 13.28 hrs, Volume= 1.244 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Starting Elev= 915.00' Surf.Area= 0.275 ac Storage= 0.646 af
Peak Elev= 916.82' @ 13.28 hrs Surf.Area= 0.379 ac Storage= 1.238 af (0.592 af above start)

Plug-Flow detention time= 240.9 min calculated for 1.530 af (70% of inflow)
Center-of-Mass det. time= 56.8 min (871.0 - 814.3)

Volume	Invert	Avail.Storage	Storage Description
#1	910.90'	1.728 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

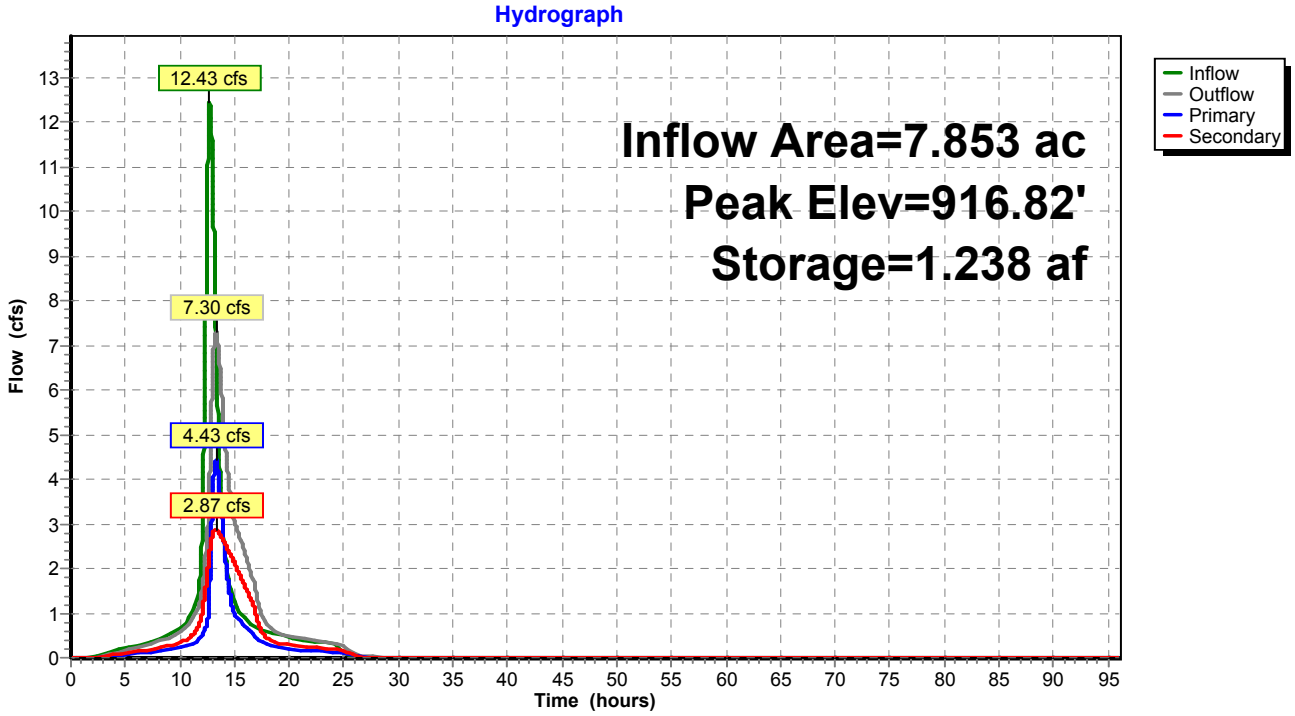
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
910.90	0.070	0.000	0.000
912.00	0.090	0.088	0.088
914.00	0.220	0.310	0.398
916.00	0.330	0.550	0.948
918.00	0.450	0.780	1.728

Device	Routing	Invert	Outlet Devices
#1	Primary	915.00'	**6.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Secondary	915.00'	**9.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Primary	915.95'	**24.0" Round RCP_Round 24"** L= 50.0' RCP, groove end w/headwall, Ke= 0.200 Inlet / Outlet Invert= 915.80' / 915.95' S= -0.0030 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf

Primary OutFlow Max=4.43 cfs @ 13.28 hrs HW=916.82' (Free Discharge)
└**1=Orifice/Grate** (Orifice Controls 1.27 cfs @ 6.49 fps)
└**3=RCP_Round 24"** (Barrel Controls 3.15 cfs @ 2.86 fps)

Secondary OutFlow Max=2.87 cfs @ 13.28 hrs HW=916.82' (Free Discharge)
└**2=Orifice/Grate** (Orifice Controls 2.87 cfs @ 6.49 fps)

Pond 4P: P-4


Hydrograph
Inflow Area=7.853 ac
Peak Elev=916.82'
Storage=1.238 af
12.43 cfs
7.30 cfs
4.43 cfs
2.87 cfs
Inflow
Outflow
Primary
Secondary
Flow (cfs)
Time (hours)
0 1 2 3 4 5 6 7 8 9 10 11 12 13
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95

Summary for Pond 7P: P-7

Inflow Area = 29.595 ac, 30.01% Impervious, Inflow Depth = 2.43" for 10-Year event
Inflow = 39.95 cfs @ 12.61 hrs, Volume= 5.985 af
Outflow = 39.93 cfs @ 12.62 hrs, Volume= 5.904 af, Atten= 0%, Lag= 0.4 min
Primary = 39.71 cfs @ 12.62 hrs, Volume= 5.333 af
Secondary = 0.22 cfs @ 12.62 hrs, Volume= 0.571 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Starting Elev= 915.00' Surf.Area= 0.440 ac Storage= 1.062 af
Peak Elev= 915.79' @ 12.62 hrs Surf.Area= 0.535 ac Storage= 1.447 af (0.385 af above start)

Plug-Flow detention time= 243.7 min calculated for 4.842 af (81% of inflow)
Center-of-Mass det. time= 112.5 min (948.2 - 835.7)

Volume	Invert	Avail.Storage	Storage Description
#1	910.95'	1.562 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

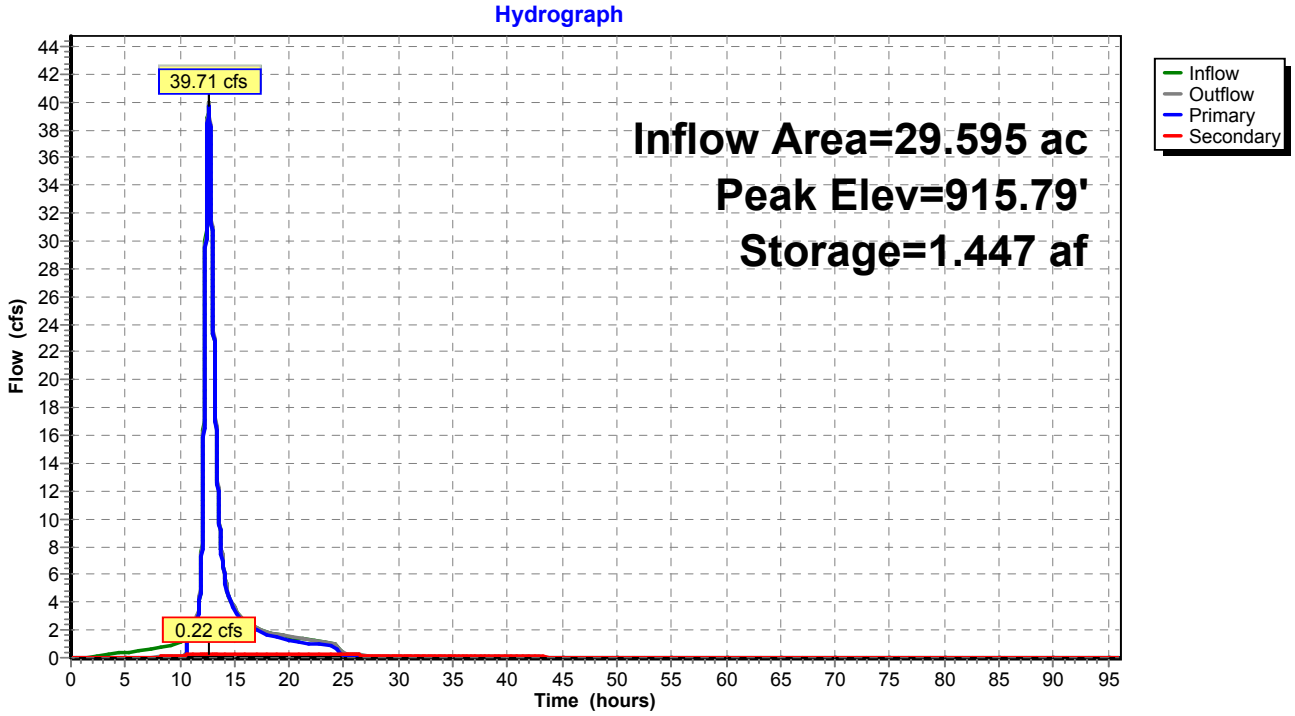
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
910.95	0.110	0.000	0.000
912.00	0.180	0.152	0.152
914.00	0.340	0.520	0.672
915.00	0.440	0.390	1.062
916.00	0.560	0.500	1.562

Device	Routing	Invert	Outlet Devices
#1	Primary	915.00'	**75.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88
#2	Secondary	915.00'	**12.0" Round RCP_Round 12"** L= 50.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 915.00' / 914.75' S= 0.0050 '/' Cc= 0.900 n= 0.130, Flow Area= 0.79 sf

Primary OutFlow Max=46.16 cfs @ 12.62 hrs HW=915.79' TW=915.76' (Fixed TW Elev= 915.76')
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 46.16 cfs @ 0.78 fps)

Secondary OutFlow Max=0.22 cfs @ 12.62 hrs HW=915.79' (Free Discharge)
↑—**2=RCP_Round 12"** (Barrel Controls 0.22 cfs @ 0.46 fps)

Pond 7P: P-7


Hydrograph
39.71 cfs
0.22 cfs
Inflow Area=29.595 ac
Peak Elev=915.79'
Storage=1.447 af
Inflow
Outflow
Primary
Secondary
Flow (cfs)
Time (hours)
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95

Summary for Pond 9P: P-9

[81] Warning: Exceeded Pond W-3 by 0.74' @ 12.47 hrs

Inflow Area = 55.384 ac, 31.48% Impervious, Inflow Depth > 2.62" for 10-Year event
Inflow = 78.39 cfs @ 12.46 hrs, Volume= 12.071 af
Outflow = 78.30 cfs @ 12.48 hrs, Volume= 12.071 af, Atten= 0%, Lag= 0.9 min
Primary = 78.30 cfs @ 12.48 hrs, Volume= 12.071 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Starting Elev= 915.00' Surf.Area= 0.210 ac Storage= 0.353 af
Peak Elev= 915.52' @ 12.48 hrs Surf.Area= 0.314 ac Storage= 0.488 af (0.136 af above start)

Plug-Flow detention time= 111.5 min calculated for 11.719 af (97% of inflow)
Center-of-Mass det. time= 2.0 min (1,026.8 - 1,024.8)

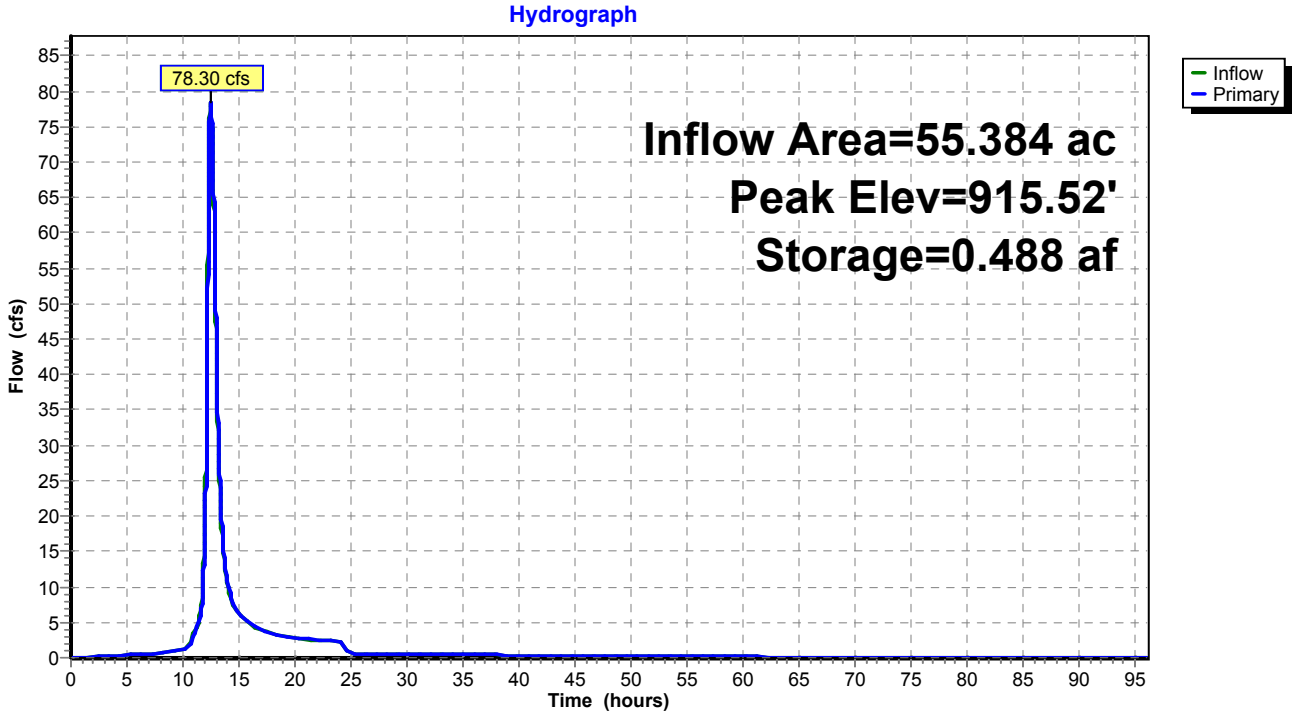
Volume	Invert	Avail.Storage	Storage Description
#1	910.50'	1.673 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
910.50	0.020	0.000	0.000
912.00	0.050	0.052	0.052
913.00	0.070	0.060	0.112
914.00	0.100	0.085	0.198
915.00	0.210	0.155	0.353
916.00	0.410	0.310	0.662
918.00	0.600	1.010	1.673

Device	Routing	Invert	Outlet Devices
#1	Primary	915.00'	**80.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=78.20 cfs @ 12.48 hrs HW=915.52' (Free Discharge)
1=Broad-Crested Rectangular Weir (Weir Controls 78.20 cfs @ 1.89 fps)

Pond 9P: P-9


Hydrograph
78.30 cfs
Inflow Area=55.384 ac
Peak Elev=915.52'
Storage=0.488 af
Inflow
Primary
Flow (cfs)
Time (hours)
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
75
80
85
90
95

Summary for Pond 10P: P-10

[95] Warning: Outlet Device #1 rise exceeded
[79] Warning: Submerged Pond P8 Primary device # 1 INLET by 0.76'

Inflow Area = 66.448 ac, 29.37% Impervious, Inflow Depth > 2.06" for 10-Year event
Inflow = 39.11 cfs @ 13.03 hrs, Volume= 11.416 af
Outflow = 39.01 cfs @ 13.07 hrs, Volume= 11.409 af, Atten= 0%, Lag= 2.0 min
Primary = 12.56 cfs @ 13.07 hrs, Volume= 8.488 af
Secondary = 26.44 cfs @ 13.07 hrs, Volume= 2.920 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Starting Elev= 896.00' Surf.Area= 0.290 ac Storage= 0.700 af
Peak Elev= 897.76' @ 13.07 hrs Surf.Area= 0.364 ac Storage= 1.273 af (0.573 af above start)

Plug-Flow detention time= 212.2 min calculated for 10.709 af (94% of inflow)
Center-of-Mass det. time= 27.9 min (1,153.7 - 1,125.8)

Volume	Invert	Avail.Storage	Storage Description
#1	892.00'	1.760 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

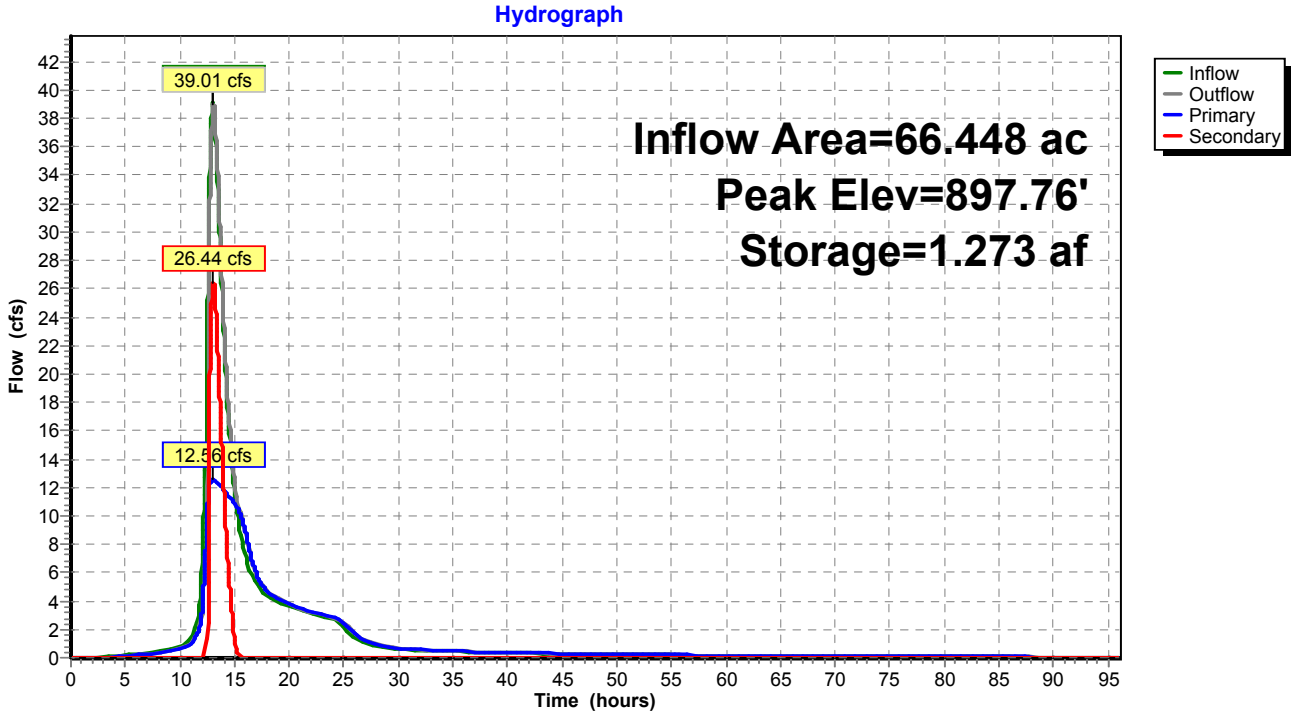
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
892.00	0.120	0.000	0.000
893.00	0.140	0.130	0.130
895.00	0.190	0.330	0.460
896.00	0.290	0.240	0.700
897.00	0.330	0.310	1.010
899.00	0.420	0.750	1.760

Device	Routing	Invert	Outlet Devices
#1	Primary	896.00'	**2.5' long x 1.00' rise Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#2	Secondary	897.40'	**50.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=12.56 cfs @ 13.07 hrs HW=897.76' (Free Discharge)
↑—**1=Sharp-Crested Rectangular Weir** (Orifice Controls 12.56 cfs @ 5.46 fps)

Secondary OutFlow Max=26.33 cfs @ 13.07 hrs HW=897.76' (Free Discharge)
↑—**2=Broad-Crested Rectangular Weir** (Weir Controls 26.33 cfs @ 1.47 fps)

Pond 10P: P-10


Hydrograph
Inflow Area=66.448 ac
Peak Elev=897.76'
Storage=1.273 af
39.01 cfs
26.44 cfs
12.56 cfs
Inflow
Outflow
Primary
Secondary
Flow (cfs)
Time (hours)
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95

Summary for Pond 11P: P-11

Inflow Area = 58.677 ac, 31.52% Impervious, Inflow Depth > 2.61" for 10-Year event
Inflow = 81.57 cfs @ 12.47 hrs, Volume= 12.771 af
Outflow = 40.20 cfs @ 13.05 hrs, Volume= 12.752 af, Atten= 51%, Lag= 34.6 min
Primary = 35.70 cfs @ 13.05 hrs, Volume= 10.088 af
Secondary = 4.51 cfs @ 13.05 hrs, Volume= 2.663 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Starting Elev= 909.00' Surf.Area= 1.210 ac Storage= 3.640 af
Peak Elev= 912.02' @ 13.05 hrs Surf.Area= 1.563 ac Storage= 7.822 af (4.182 af above start)

Plug-Flow detention time= 531.4 min calculated for 9.111 af (71% of inflow)
Center-of-Mass det. time= 118.9 min (1,132.5 - 1,013.6)

Volume	Invert	Avail.Storage	Storage Description
#1	905.00'	9.405 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

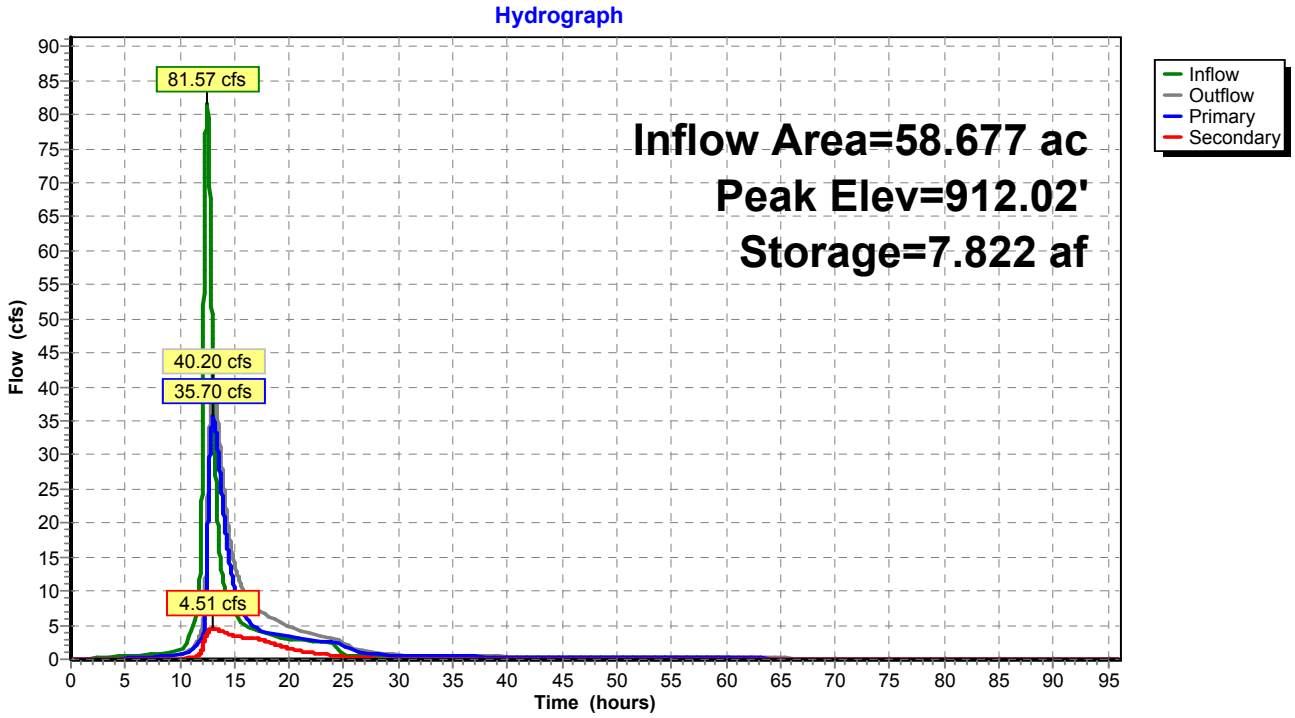
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
905.00	0.760	0.000	0.000
906.00	0.820	0.790	0.790
908.00	0.950	1.770	2.560
909.00	1.210	1.080	3.640
910.00	1.320	1.265	4.905
912.00	1.560	2.880	7.785
913.00	1.680	1.620	9.405

Device	Routing	Invert	Outlet Devices
#1	Primary	909.00'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	910.00'	**24.0" Round RCP_Round 24"** L= 200.0' RCP, groove end w/headwall, Ke= 0.200 Inlet / Outlet Invert= 910.00' / 909.00' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#3	Primary	910.00'	**24.0" Round RCP_Round 24"** L= 200.0' RCP, groove end w/headwall, Ke= 0.200 Inlet / Outlet Invert= 910.00' / 909.00' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#4	Primary	912.00'	**60.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88
#5	Secondary	909.00'	**12.0" Round RCP_Round 12"** L= 150.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 909.00' / 908.00' S= 0.0067 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=35.54 cfs @ 13.05 hrs HW=912.02' (Free Discharge)
- **1=Orifice/Grate** (Orifice Controls 6.58 cfs @ 8.37 fps)
- **2=RCP_Round 24"** (Barrel Controls 14.23 cfs @ 5.56 fps)
- **3=RCP_Round 24"** (Barrel Controls 14.23 cfs @ 5.56 fps)
- **4=Broad-Crested Rectangular Weir** (Weir Controls 0.51 cfs @ 0.36 fps)

Secondary OutFlow Max=4.51 cfs @ 13.05 hrs HW=912.02' (Free Discharge)
- **5=RCP_Round 12"** (Barrel Controls 4.51 cfs @ 5.74 fps)

Pond 11P: P-11



Summary for Pond 12P: P-12

[62] Hint: Exceeded Reach 43R OUTLET depth by 0.11' @ 13.59 hrs

Inflow Area = 79.658 ac, 31.13% Impervious, Inflow Depth > 2.56" for 10-Year event
Inflow = 44.58 cfs @ 12.02 hrs, Volume= 16.975 af
Outflow = 37.39 cfs @ 13.52 hrs, Volume= 16.953 af, Atten= 16%, Lag= 90.0 min
Primary = 37.39 cfs @ 13.52 hrs, Volume= 16.953 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Starting Elev= 893.00' Surf.Area= 1.640 ac Storage= 5.075 af
Peak Elev= 894.35' @ 13.52 hrs Surf.Area= 1.818 ac Storage= 7.414 af (2.339 af above start)

Plug-Flow detention time= 552.4 min calculated for 11.878 af (70% of inflow)
Center-of-Mass det. time= 87.8 min (1,213.4 - 1,125.6)

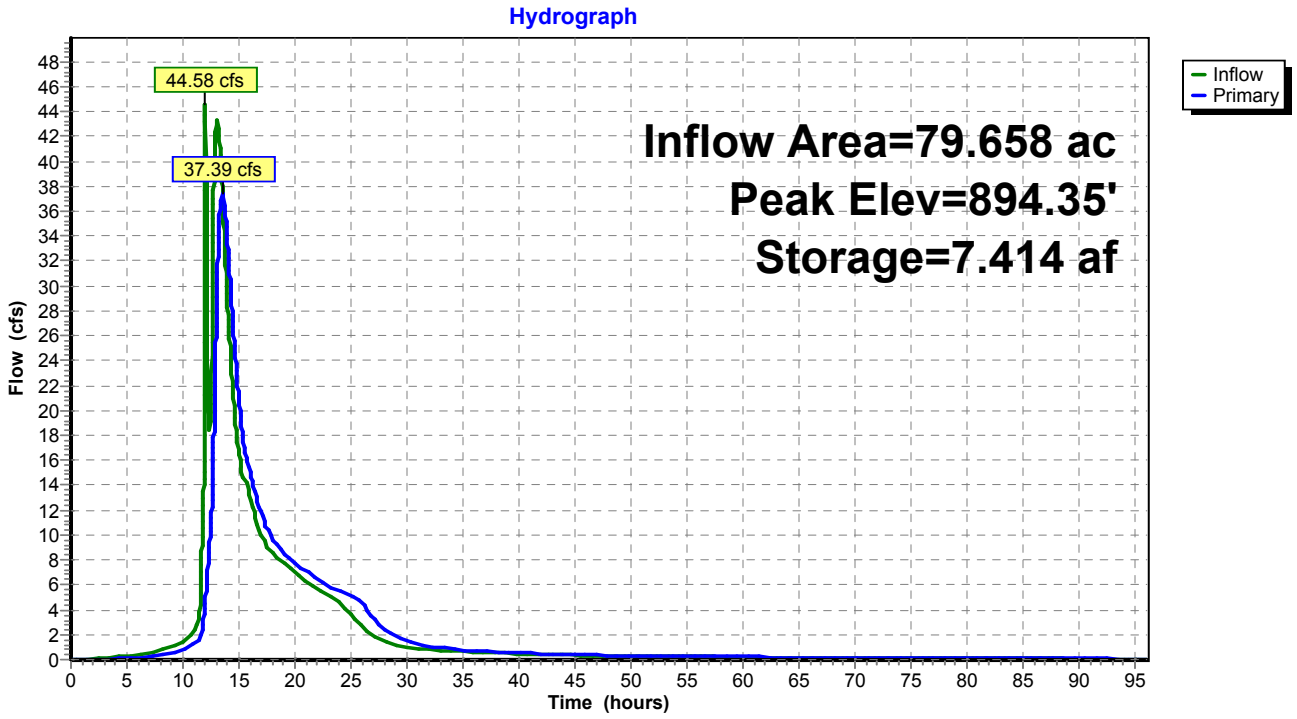
Volume	Invert	Avail.Storage	Storage Description
#1	889.00'	10.590 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
889.00	1.070	0.000	0.000
890.00	1.150	1.110	1.110
892.00	1.330	2.480	3.590
893.00	1.640	1.485	5.075
894.00	1.770	1.705	6.780
896.00	2.040	3.810	10.590

Device	Routing	Invert	Outlet Devices
#1	Primary	893.00'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	893.00'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Primary	893.50'	**43.8" W x 26.6" H, R=22.5"/62.0" Arch RCP_Arch 44x27** L= 30.0' Box, 30-75° wingwalls, rounded crown, Ke= 0.200 Inlet / Outlet Invert= 893.50' / 893.35' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 6.29 sf
#4	Primary	893.50'	**43.8" W x 26.6" H, R=22.5"/62.0" Arch RCP_Arch 44x27** L= 30.0' Box, 30-75° wingwalls, rounded crown, Ke= 0.200 Inlet / Outlet Invert= 893.50' / 893.35' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 6.29 sf
#5	Primary	893.50'	**43.8" W x 26.6" H, R=22.5"/62.0" Arch RCP_Arch 44x27** L= 30.0' Box, 30-75° wingwalls, rounded crown, Ke= 0.200 Inlet / Outlet Invert= 893.50' / 893.35' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 6.29 sf
#6	Primary	893.50'	**43.8" W x 26.6" H, R=22.5"/62.0" Arch RCP_Arch 44x27** L= 30.0' Box, 30-75° wingwalls, rounded crown, Ke= 0.200 Inlet / Outlet Invert= 893.50' / 893.35' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 6.29 sf

Primary OutFlow Max=37.37 cfs @ 13.52 hrs HW=894.35' (Free Discharge)
- **1=Orifice/Grate** (Orifice Controls 4.40 cfs @ 5.60 fps)
- **2=Orifice/Grate** (Orifice Controls 4.40 cfs @ 5.60 fps)
- **3=RCP_Arch 44x27** (Barrel Controls 7.14 cfs @ 3.79 fps)
- **4=RCP_Arch 44x27** (Barrel Controls 7.14 cfs @ 3.79 fps)
- **5=RCP_Arch 44x27** (Barrel Controls 7.14 cfs @ 3.79 fps)
- **6=RCP_Arch 44x27** (Barrel Controls 7.14 cfs @ 3.79 fps)

Pond 12P: P-12



Summary for Pond 13P: P-13

Inflow Area = 237.893 ac, 51.59% Impervious, Inflow Depth > 2.77" for 10-Year event
Inflow = 325.70 cfs @ 12.35 hrs, Volume= 54.985 af
Outflow = 308.65 cfs @ 12.46 hrs, Volume= 54.980 af, Atten= 5%, Lag= 6.5 min
Primary = 294.72 cfs @ 12.46 hrs, Volume= 52.396 af
Secondary = 13.93 cfs @ 12.46 hrs, Volume= 2.584 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Starting Elev= 883.00' Surf.Area= 1.870 ac Storage= 4.265 af
Peak Elev= 884.60' @ 12.46 hrs Surf.Area= 2.442 ac Storage= 7.706 af (3.441 af above start)

Plug-Flow detention time= 141.4 min calculated for 50.710 af (92% of inflow)
Center-of-Mass det. time= 15.3 min (951.7 - 936.4)

Volume	Invert	Avail.Storage	Storage Description
#1	878.00'	11.490 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
878.00	0.000	0.000	0.000
879.00	0.630	0.315	0.315
880.00	0.730	0.680	0.995
882.00	1.070	1.800	2.795
883.00	1.870	1.470	4.265
884.00	2.220	2.045	6.310
886.00	2.960	5.180	11.490

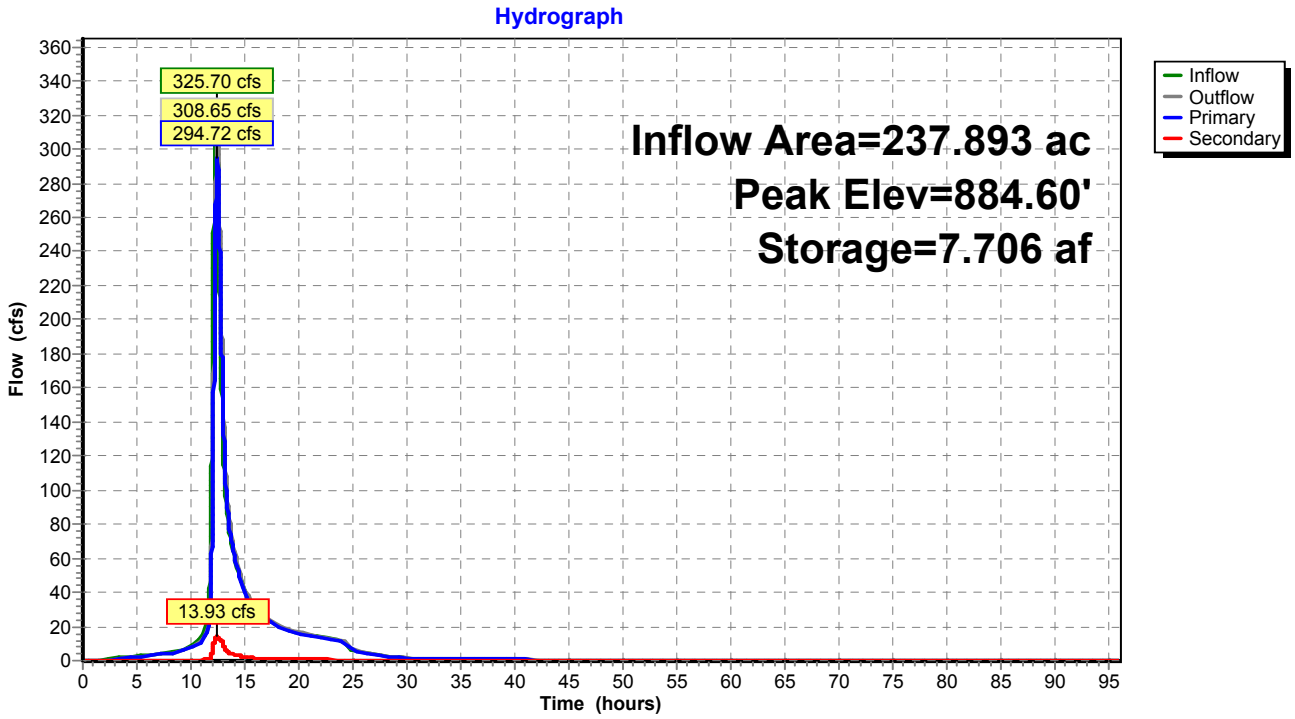
Device	Routing	Invert	Outlet Devices
#1	Primary	883.00'	**55.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88
#2	Secondary	883.00'	**12.0" Round RCP_Round 12"** L= 100.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 883.00' / 882.75' S= 0.0025 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#3	Secondary	883.00'	**12.0" Round RCP_Round 12"** L= 100.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 883.00' / 882.75' S= 0.0025 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#4	Secondary	883.00'	**12.0" Round RCP_Round 12"** L= 100.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 883.00' / 882.75' S= 0.0025 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#5	Secondary	883.00'	**12.0" Round RCP_Round 12"** L= 100.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 883.00' / 882.75' S= 0.0025 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

#6 Secondary 883.00' **12.0" Round RCP_Round 12"**
L= 100.0' RCP, groove end projecting, Ke= 0.200
Inlet / Outlet Invert= 883.00' / 882.75' S= 0.0025 '/' Cc= 0.900
n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=294.62 cfs @ 12.46 hrs HW=884.60' (Free Discharge)
└─**1=Broad-Crested Rectangular Weir** (Weir Controls 294.62 cfs @ 3.35 fps)

Secondary OutFlow Max=13.94 cfs @ 12.46 hrs HW=884.60' (Free Discharge)
├─**2=RCP_Round 12"** (Barrel Controls 2.79 cfs @ 3.55 fps)
├─**3=RCP_Round 12"** (Barrel Controls 2.79 cfs @ 3.55 fps)
├─**4=RCP_Round 12"** (Barrel Controls 2.79 cfs @ 3.55 fps)
├─**5=RCP_Round 12"** (Barrel Controls 2.79 cfs @ 3.55 fps)
└─**6=RCP_Round 12"** (Barrel Controls 2.79 cfs @ 3.55 fps)

Pond 13P: P-13



Summary for Pond 14P: P-14

Inflow Area = 21.198 ac, 39.93% Impervious, Inflow Depth = 2.65" for 10-Year event
Inflow = 42.96 cfs @ 12.30 hrs, Volume= 4.676 af
Outflow = 6.52 cfs @ 13.19 hrs, Volume= 4.676 af, Atten= 85%, Lag= 53.4 min
Primary = 6.52 cfs @ 13.19 hrs, Volume= 4.676 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Starting Elev= 892.00' Surf.Area= 1.380 ac Storage= 4.490 af
Peak Elev= 893.66' @ 13.19 hrs Surf.Area= 1.536 ac Storage= 6.908 af (2.418 af above start)

Plug-Flow detention time= 1,667.8 min calculated for 0.186 af (4% of inflow)
Center-of-Mass det. time= 257.1 min (1,062.0 - 804.9)

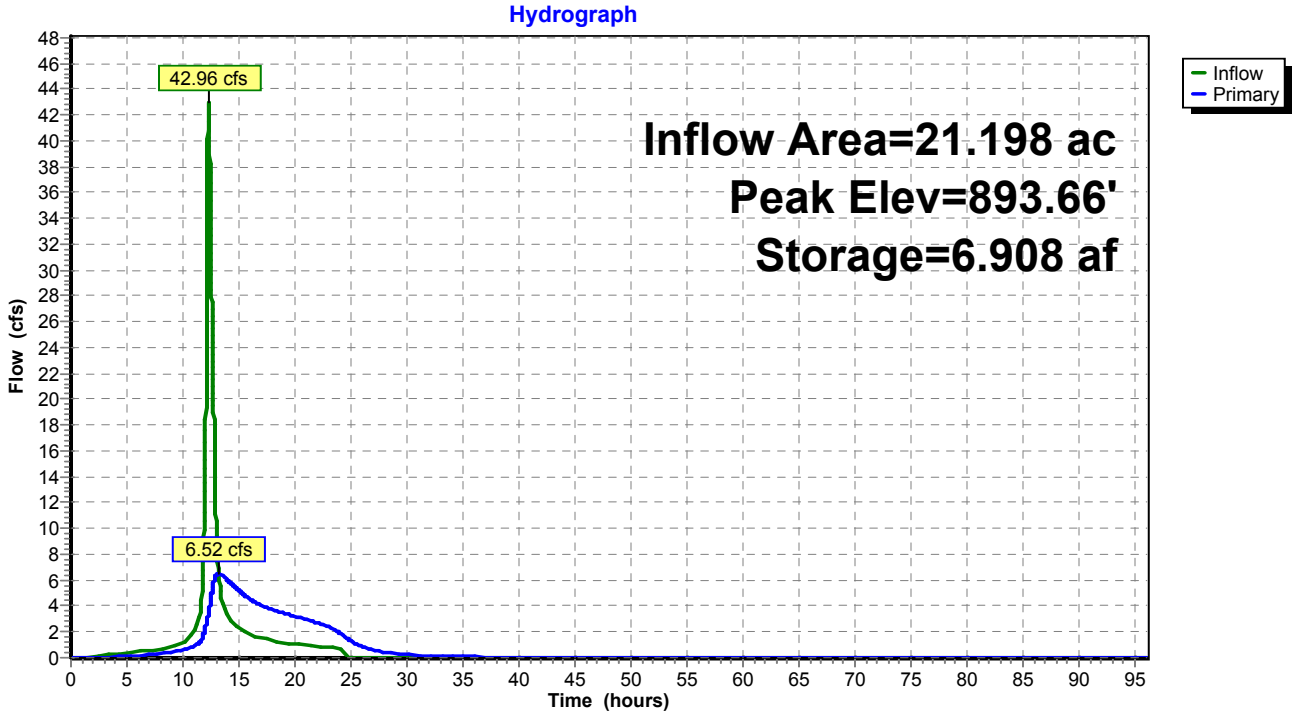
Volume	Invert	Avail.Storage	Storage Description
#1	888.00'	9.910 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
888.00	0.950	0.000	0.000
890.00	1.080	2.030	2.030
892.00	1.380	2.460	4.490
893.00	1.470	1.425	5.915
894.00	1.570	1.520	7.435
895.50	1.730	2.475	9.910

Device	Routing	Invert	Outlet Devices
#1	Primary	892.00'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	893.00'	**18.0" Round RCP_Round 18"** L= 50.0' RCP, groove end w/headwall, Ke= 0.200 Inlet / Outlet Invert= 893.00' / 892.75' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf

Primary OutFlow Max=6.52 cfs @ 13.19 hrs HW=893.66' (Free Discharge)
↑—**1=Orifice/Grate** (Orifice Controls 4.87 cfs @ 6.21 fps)
└—**2=RCP_Round 18"** (Barrel Controls 1.64 cfs @ 3.23 fps)

Pond 14P: P-14


Hydrograph
Inflow Area=21.198 ac
Peak Elev=893.66'
Storage=6.908 af
42.96 cfs
6.52 cfs
Inflow
Primary
Flow (cfs)
Time (hours)

Summary for Pond 23P: Thumb Infiltration (Thumb TP load only)

Inflow Area = 48.540 ac, 84.23% Impervious, Inflow Depth = 3.41" for 10-Year event
Inflow = 95.01 cfs @ 12.44 hrs, Volume= 13.805 af
Outflow = 94.93 cfs @ 12.45 hrs, Volume= 10.065 af, Atten= 0%, Lag= 0.7 min
Primary = 94.93 cfs @ 12.45 hrs, Volume= 10.065 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Peak Elev= 903.83' @ 12.45 hrs Surf.Area= 1.000 ac Storage= 3.833 af

Plug-Flow detention time= 168.2 min calculated for 10.065 af (73% of inflow)
Center-of-Mass det. time= 76.9 min (860.9 - 784.1)

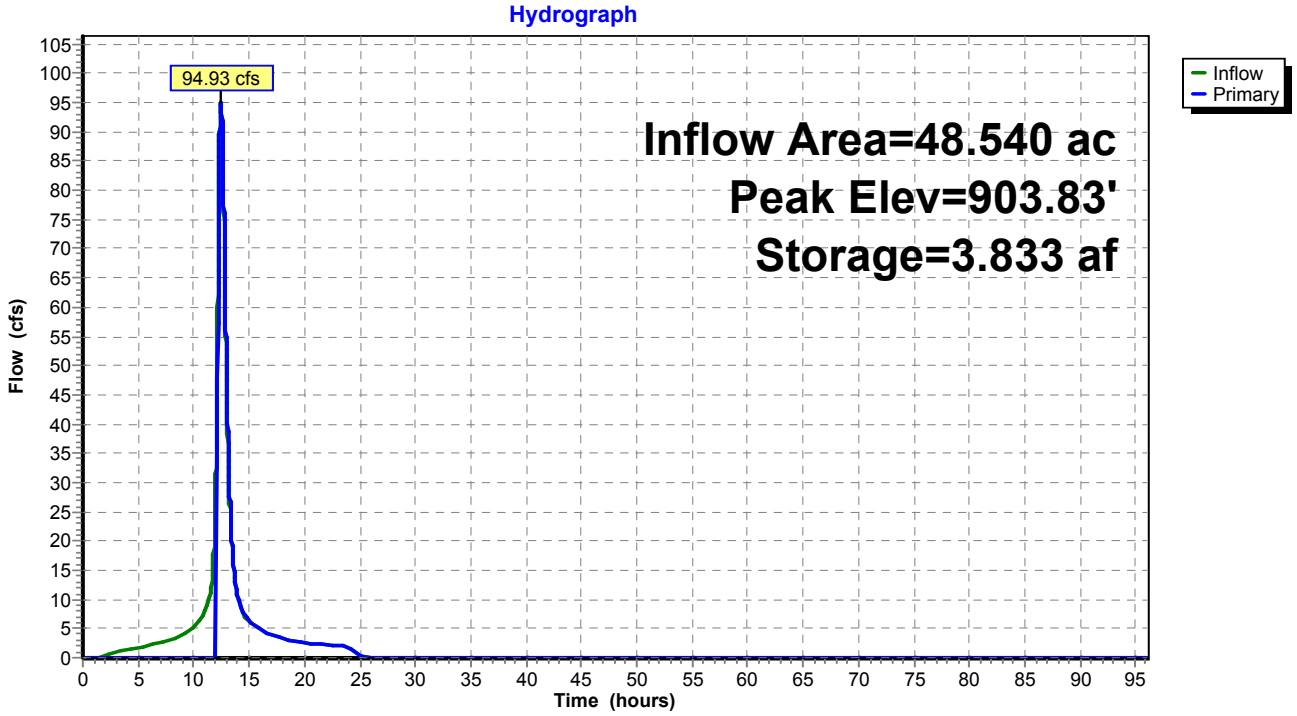
Volume	Invert	Avail.Storage	Storage Description
#1	900.00'	5.000 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
900.00	1.000	0.000	0.000
901.00	1.000	1.000	1.000
902.00	1.000	1.000	2.000
903.00	1.000	1.000	3.000
904.00	1.000	1.000	4.000
905.00	1.000	1.000	5.000

Device	Routing	Invert	Outlet Devices
#1	Primary	903.74'	**1,000.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s) 5.0' Crest Height

Primary OutFlow Max=92.53 cfs @ 12.45 hrs HW=903.83' (Free Discharge)
↑—**1=Sharp-Crested Rectangular Weir** (Weir Controls 92.53 cfs @ 1.00 fps)

Pond 23P: Thumb Infiltration (Thumb TP load only)



Summary for Pond 31P: SB 18 Infiltration

Inflow Area = 52.908 ac, 84.55% Impervious, Inflow Depth = 3.64" for 10-Year event
Inflow = 124.38 cfs @ 12.40 hrs, Volume= 16.050 af
Outflow = 124.26 cfs @ 12.40 hrs, Volume= 12.730 af, Atten= 0%, Lag= 0.4 min
Primary = 124.26 cfs @ 12.40 hrs, Volume= 12.730 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Peak Elev= 903.43' @ 12.40 hrs Surf.Area= 1.000 ac Storage= 3.430 af

Plug-Flow detention time= 144.0 min calculated for 12.730 af (79% of inflow)
Center-of-Mass det. time= 63.6 min (846.4 - 782.8)

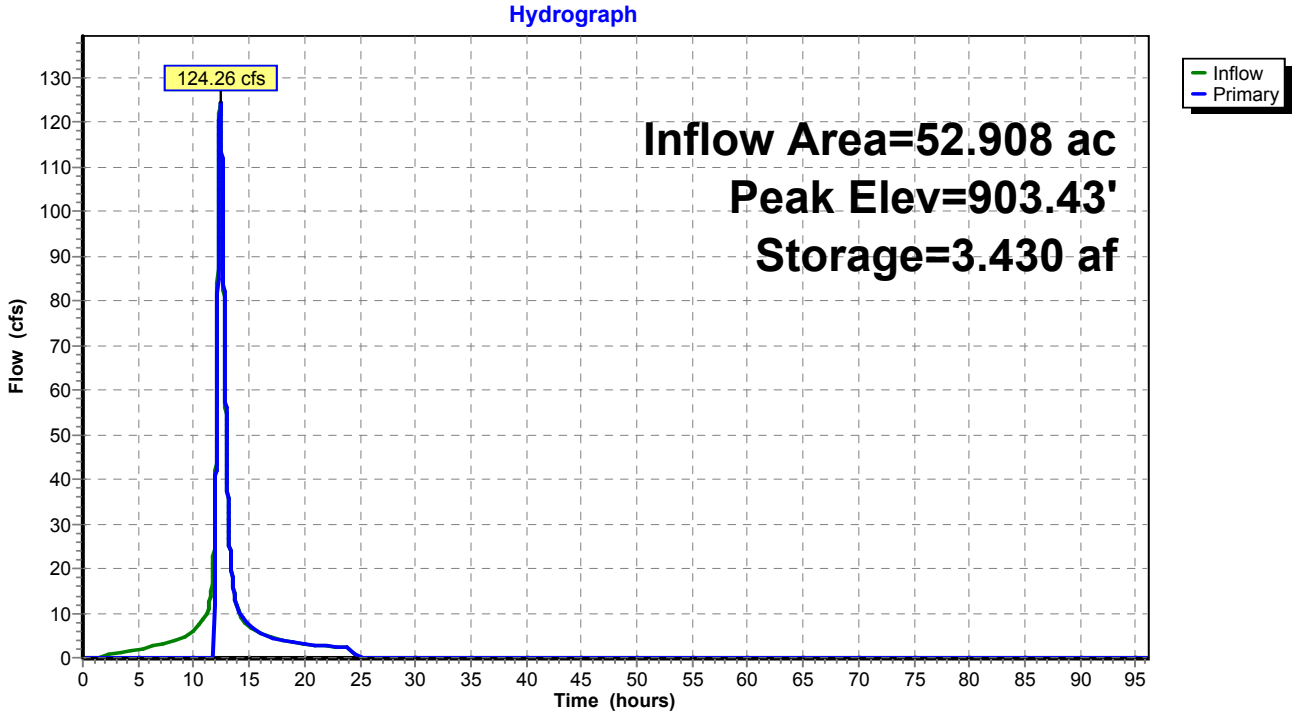
Volume	Invert	Avail.Storage	Storage Description
#1	900.00'	5.000 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
900.00	1.000	0.000	0.000
901.00	1.000	1.000	1.000
902.00	1.000	1.000	2.000
903.00	1.000	1.000	3.000
904.00	1.000	1.000	4.000
905.00	1.000	1.000	5.000

Device	Routing	Invert	Outlet Devices
#1	Primary	903.32'	**1,000.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s) 0.8' Crest Height

Primary OutFlow Max=121.79 cfs @ 12.40 hrs HW=903.43' (Free Discharge)
↑—**1=Sharp-Crested Rectangular Weir** (Weir Controls 121.79 cfs @ 1.10 fps)

Pond 31P: SB 18 Infiltration



Summary for Pond 36P: Culverts passing flow beneath Spine Road

[88] Warning: Qout>Qin may require Finer Routing>1

Inflow Area = 52.908 ac, 84.55% Impervious, Inflow Depth = 2.89" for 10-Year event
Inflow = 124.26 cfs @ 12.40 hrs, Volume= 12.730 af
Outflow = 124.27 cfs @ 12.40 hrs, Volume= 12.730 af, Atten= 0%, Lag= 0.0 min
Primary = 124.27 cfs @ 12.40 hrs, Volume= 12.730 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Peak Elev= 887.49' @ 12.40 hrs Surf.Area= 0.002 ac Storage= 0.000 af

Plug-Flow detention time= 0.0 min calculated for 12.728 af (100% of inflow)
Center-of-Mass det. time= 0.0 min (846.4 - 846.4)

Volume	Invert	Avail.Storage	Storage Description
#1	887.00'	0.026 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
887.00	0.000	0.000	0.000
887.50	0.002	0.001	0.001
890.50	0.007	0.014	0.014
892.00	0.009	0.012	0.026

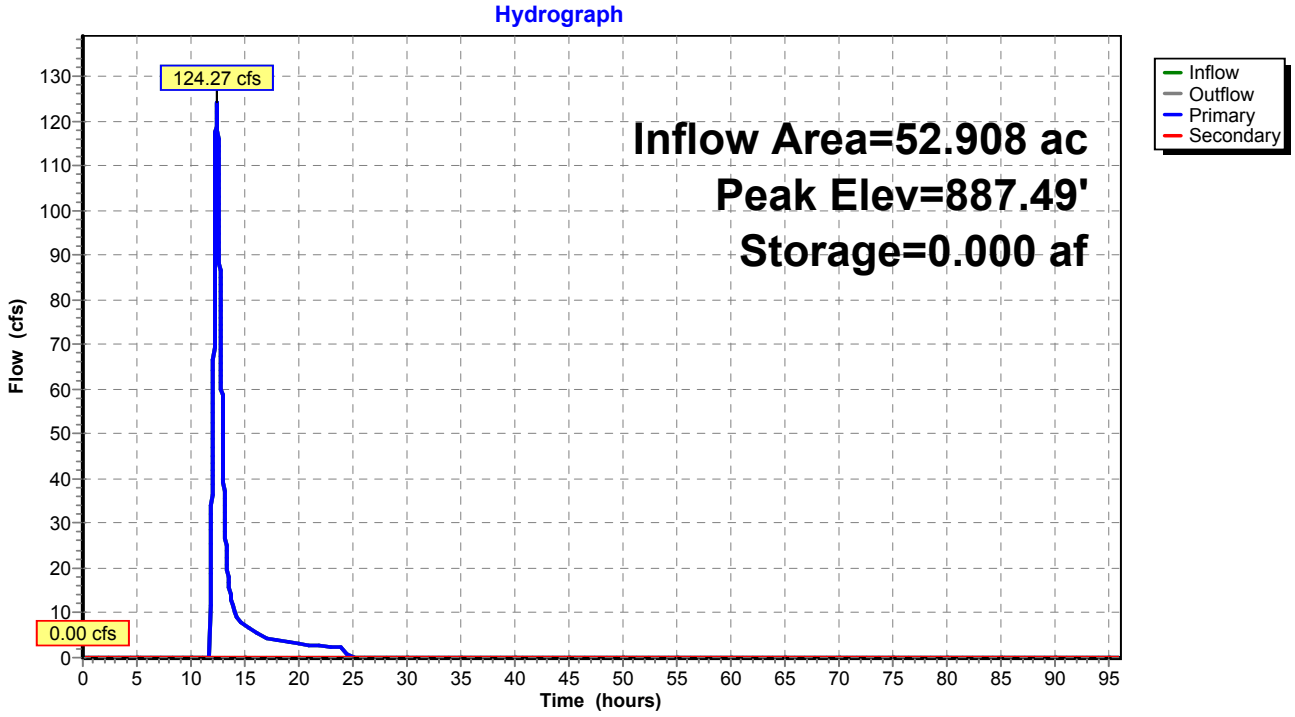
Device	Routing	Invert	Outlet Devices
#1	Primary	887.00'	**Special & User-Defined** Head (feet) 0.00 0.10 0.20 0.30 0.40 0.50 Disch. (cfs) 0.000 25.000 50.000 75.000 100.000 127.000
#2	Secondary	887.50'	**18.0" Round RCP_Round 18"** L= 100.0' RCP, groove end w/headwall, Ke= 0.200 Inlet / Outlet Invert= 887.50' / 886.50' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#3	Secondary	887.50'	**18.0" Round RCP_Round 18"** L= 100.0' RCP, groove end w/headwall, Ke= 0.200 Inlet / Outlet Invert= 887.50' / 886.50' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#4	Secondary	887.50'	**18.0" Round RCP_Round 18"** L= 100.0' RCP, groove end w/headwall, Ke= 0.200 Inlet / Outlet Invert= 887.50' / 886.50' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#5	Secondary	887.50'	**18.0" Round RCP_Round 18"** L= 100.0' RCP, groove end w/headwall, Ke= 0.200 Inlet / Outlet Invert= 887.50' / 886.50' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#6	Secondary	887.50'	**18.0" Round RCP_Round 18"** L= 100.0' RCP, groove end w/headwall, Ke= 0.200 Inlet / Outlet Invert= 887.50' / 886.50' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf

#7	Secondary	887.50'	**18.0" Round RCP_Round 18"** L= 100.0' RCP, groove end w/headwall, Ke= 0.200 Inlet / Outlet Invert= 887.50' / 886.50' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#8	Secondary	887.50'	**18.0" Round RCP_Round 18"** L= 100.0' RCP, groove end w/headwall, Ke= 0.200 Inlet / Outlet Invert= 887.50' / 886.50' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#9	Secondary	887.50'	**18.0" Round RCP_Round 18"** L= 100.0' RCP, groove end w/headwall, Ke= 0.200 Inlet / Outlet Invert= 887.50' / 886.50' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf

Primary OutFlow Max=124.22 cfs @ 12.40 hrs HW=887.49' (Free Discharge)
└─**1=Special & User-Defined** (Custom Controls 124.22 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=887.00' (Free Discharge)
- **2=RCP_Round 18"** (Controls 0.00 cfs)
- **3=RCP_Round 18"** (Controls 0.00 cfs)
- **4=RCP_Round 18"** (Controls 0.00 cfs)
- **5=RCP_Round 18"** (Controls 0.00 cfs)
- **6=RCP_Round 18"** (Controls 0.00 cfs)
- **7=RCP_Round 18"** (Controls 0.00 cfs)
- **8=RCP_Round 18"** (Controls 0.00 cfs)
- **9=RCP_Round 18"** (Controls 0.00 cfs)

Pond 36P: Culverts passing flow beneath Spine Road



Summary for Pond CRH-1: CRH-1

Inflow Area = 6.955 ac, 46.76% Impervious, Inflow Depth = 2.80" for 10-Year event
Inflow = 18.97 cfs @ 12.15 hrs, Volume= 1.622 af
Outflow = 12.10 cfs @ 12.33 hrs, Volume= 1.622 af, Atten= 36%, Lag= 10.6 min
Discarded = 0.26 cfs @ 12.33 hrs, Volume= 0.509 af
Primary = 11.83 cfs @ 12.33 hrs, Volume= 1.114 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Peak Elev= 878.13' @ 12.33 hrs Surf.Area= 0.325 ac Storage= 0.489 af

Plug-Flow detention time= 183.6 min calculated for 1.622 af (100% of inflow)
Center-of-Mass det. time= 183.7 min (973.1 - 789.5)

Volume	Invert	Avail.Storage	Storage Description
#1	876.00'	0.850 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

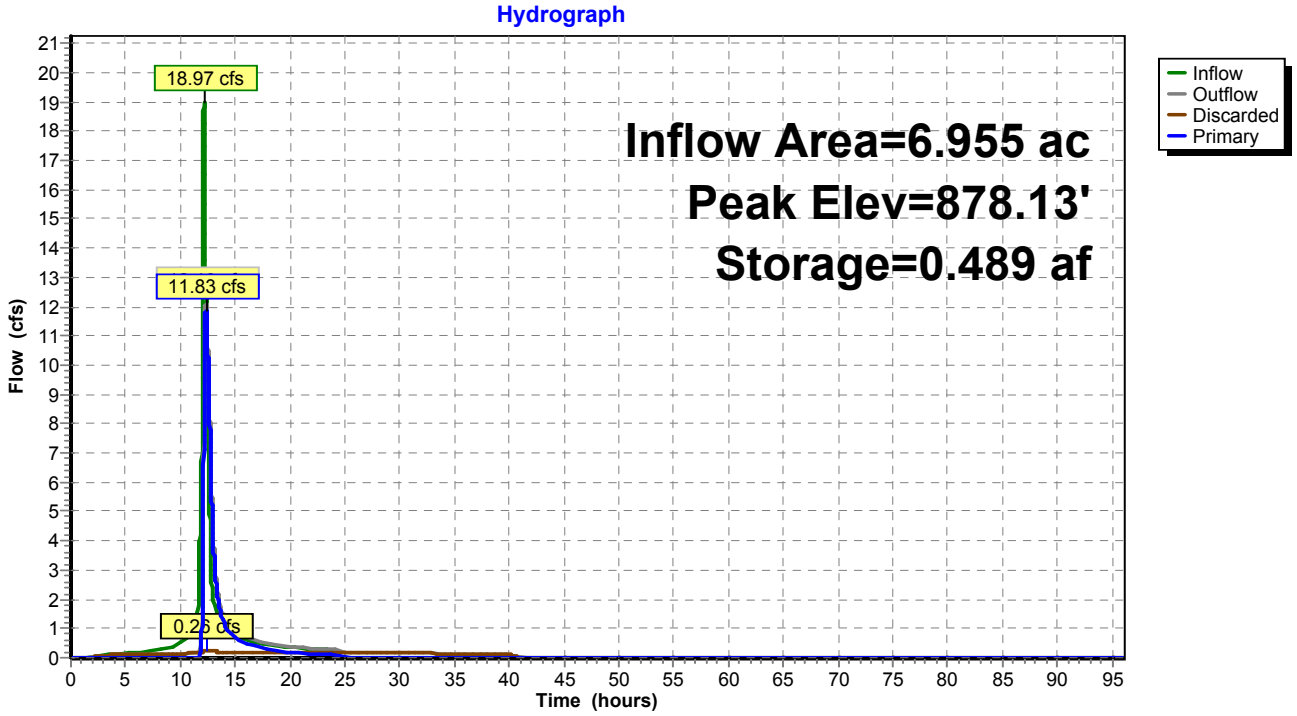
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
876.00	0.150	0.000	0.000
878.00	0.300	0.450	0.450
879.00	0.500	0.400	0.850

Device	Routing	Invert	Outlet Devices
#1	Discarded	876.00'	**0.800 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 0.00'
#2	Primary	877.00'	**24.0" Round Culvert** L= 155.0' Ke= 0.500 Inlet / Outlet Invert= 877.00' / 876.00' S= 0.0065 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#3	Primary	877.00'	**24.0" Round Culvert** L= 155.0' Ke= 0.500 Inlet / Outlet Invert= 877.00' / 876.00' S= 0.0065 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf

Discarded OutFlow Max=0.26 cfs @ 12.33 hrs HW=878.13' (Free Discharge)
└**1=Exfiltration** (Controls 0.26 cfs)

Primary OutFlow Max=11.83 cfs @ 12.33 hrs HW=878.13' (Free Discharge)
├**2=Culvert** (Barrel Controls 5.92 cfs @ 4.69 fps)
└**3=Culvert** (Barrel Controls 5.92 cfs @ 4.69 fps)

Pond CRH-1: CRH-1



Summary for Pond CRH-2: CRH-2

Inflow Area = 10.214 ac, 37.73% Impervious, Inflow Depth = 2.60" for 10-Year event
Inflow = 23.01 cfs @ 12.22 hrs, Volume= 2.212 af
Outflow = 10.26 cfs @ 12.62 hrs, Volume= 2.212 af, Atten= 55%, Lag= 24.0 min
Discarded = 0.38 cfs @ 12.62 hrs, Volume= 0.898 af
Primary = 9.88 cfs @ 12.62 hrs, Volume= 1.314 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Peak Elev= 882.67' @ 12.62 hrs Surf.Area= 0.467 ac Storage= 0.890 af

Plug-Flow detention time= 325.2 min calculated for 2.212 af (100% of inflow)
Center-of-Mass det. time= 325.3 min (1,127.1 - 801.7)

Volume	Invert	Avail.Storage	Storage Description
#1	880.00'	1.600 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

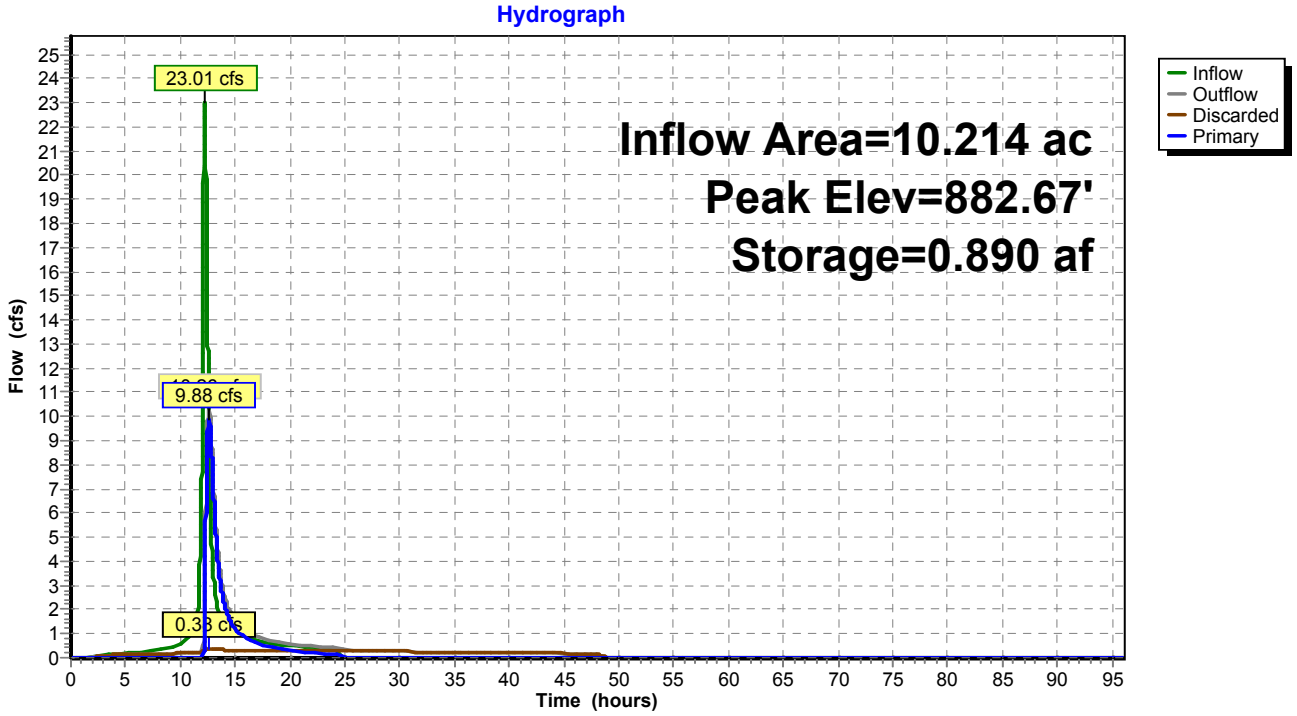
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
880.00	0.200	0.000	0.000
882.00	0.400	0.600	0.600
884.00	0.600	1.000	1.600

Device	Routing	Invert	Outlet Devices
#1	Discarded	880.00'	**0.800 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 0.00'
#2	Primary	881.50'	**24.0" Round Culvert** L= 155.0' Ke= 0.500 Inlet / Outlet Invert= 881.50' / 881.00' S= 0.0032 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#3	Primary	881.50'	**24.0" Round Culvert** L= 155.0' Ke= 0.500 Inlet / Outlet Invert= 881.50' / 881.00' S= 0.0032 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf

Discarded OutFlow Max=0.38 cfs @ 12.62 hrs HW=882.67' (Free Discharge)
└**1=Exfiltration** (Controls 0.38 cfs)

Primary OutFlow Max=9.88 cfs @ 12.62 hrs HW=882.67' (Free Discharge)
├**2=Culvert** (Barrel Controls 4.94 cfs @ 3.73 fps)
└**3=Culvert** (Barrel Controls 4.94 cfs @ 3.73 fps)

Pond CRH-2: CRH-2



Summary for Pond CRH-3: CRH-3

Inflow Area = 11.815 ac, 36.95% Impervious, Inflow Depth = 1.67" for 10-Year event
Inflow = 10.91 cfs @ 12.54 hrs, Volume= 1.644 af
Outflow = 8.31 cfs @ 12.90 hrs, Volume= 1.644 af, Atten= 24%, Lag= 21.8 min
Discarded = 0.24 cfs @ 12.90 hrs, Volume= 0.445 af
Primary = 8.07 cfs @ 12.90 hrs, Volume= 1.198 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Peak Elev= 878.91' @ 12.90 hrs Surf.Area= 0.293 ac Storage= 0.422 af

Plug-Flow detention time= 170.1 min calculated for 1.643 af (100% of inflow)
Center-of-Mass det. time= 170.2 min (1,017.9 - 847.7)

Volume	Invert	Avail.Storage	Storage Description
#1	877.00'	0.850 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

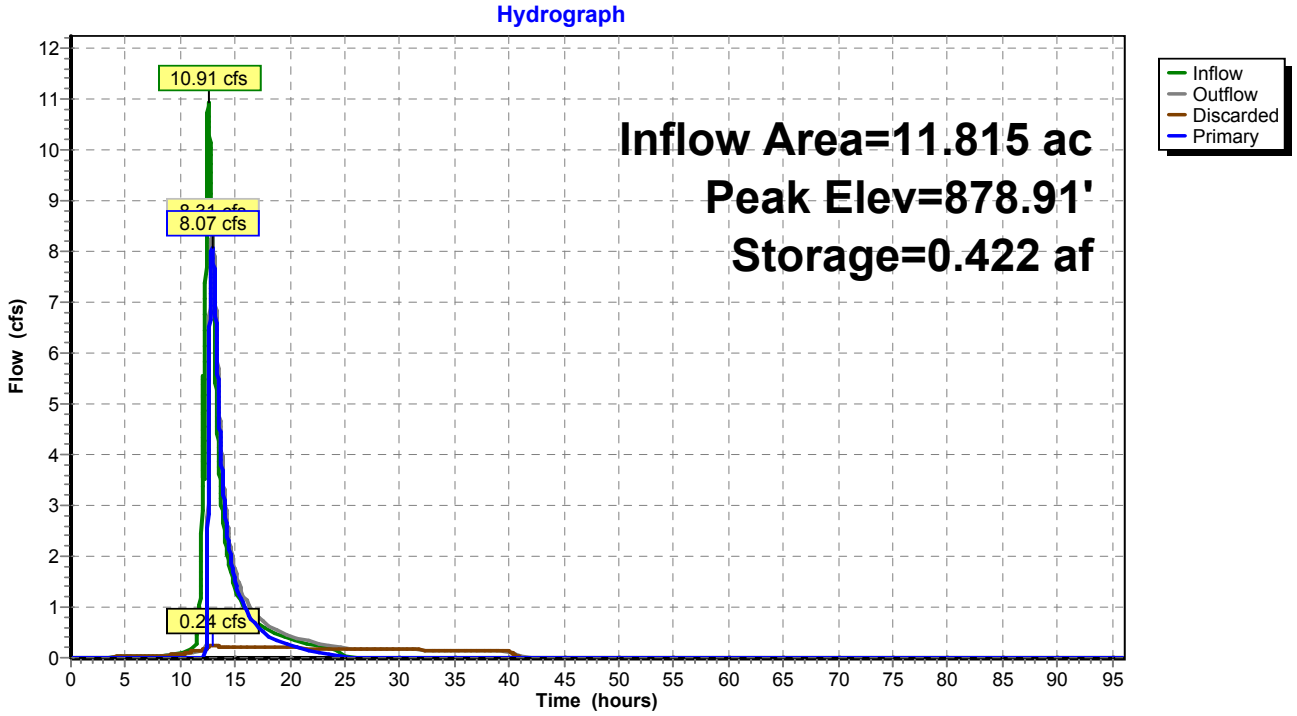
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
877.00	0.150	0.000	0.000
879.00	0.300	0.450	0.450
880.00	0.500	0.400	0.850

Device	Routing	Invert	Outlet Devices
#1	Discarded	877.00'	**0.800 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 0.00'
#2	Primary	878.00'	**24.0" Round Culvert** L= 155.0' Ke= 0.500 Inlet / Outlet Invert= 878.00' / 877.00' S= 0.0065 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#3	Primary	878.00'	**24.0" Round Culvert** L= 155.0' Ke= 0.500 Inlet / Outlet Invert= 878.00' / 877.00' S= 0.0065 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf

Discarded OutFlow Max=0.24 cfs @ 12.90 hrs HW=878.91' (Free Discharge)
└**1=Exfiltration** (Controls 0.24 cfs)

Primary OutFlow Max=8.07 cfs @ 12.90 hrs HW=878.91' (Free Discharge)
├**2=Culvert** (Barrel Controls 4.04 cfs @ 4.29 fps)
└**3=Culvert** (Barrel Controls 4.04 cfs @ 4.29 fps)

Pond CRH-3: CRH-3



Summary for Pond P1/P2: P-1/P-2

Inflow Area = 68.531 ac, 57.92% Impervious, Inflow Depth = 3.05" for 10-Year event
Inflow = 92.00 cfs @ 12.57 hrs, Volume= 17.405 af
Outflow = 89.60 cfs @ 12.67 hrs, Volume= 17.400 af, Atten= 3%, Lag= 5.9 min
Primary = 89.60 cfs @ 12.67 hrs, Volume= 17.400 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Starting Elev= 924.00' Surf.Area= 1.270 ac Storage= 3.500 af
Peak Elev= 925.17' @ 12.67 hrs Surf.Area= 1.446 ac Storage= 5.093 af (1.593 af above start)

Plug-Flow detention time= 204.4 min calculated for 13.900 af (80% of inflow)
Center-of-Mass det. time= 66.3 min (872.3 - 806.0)

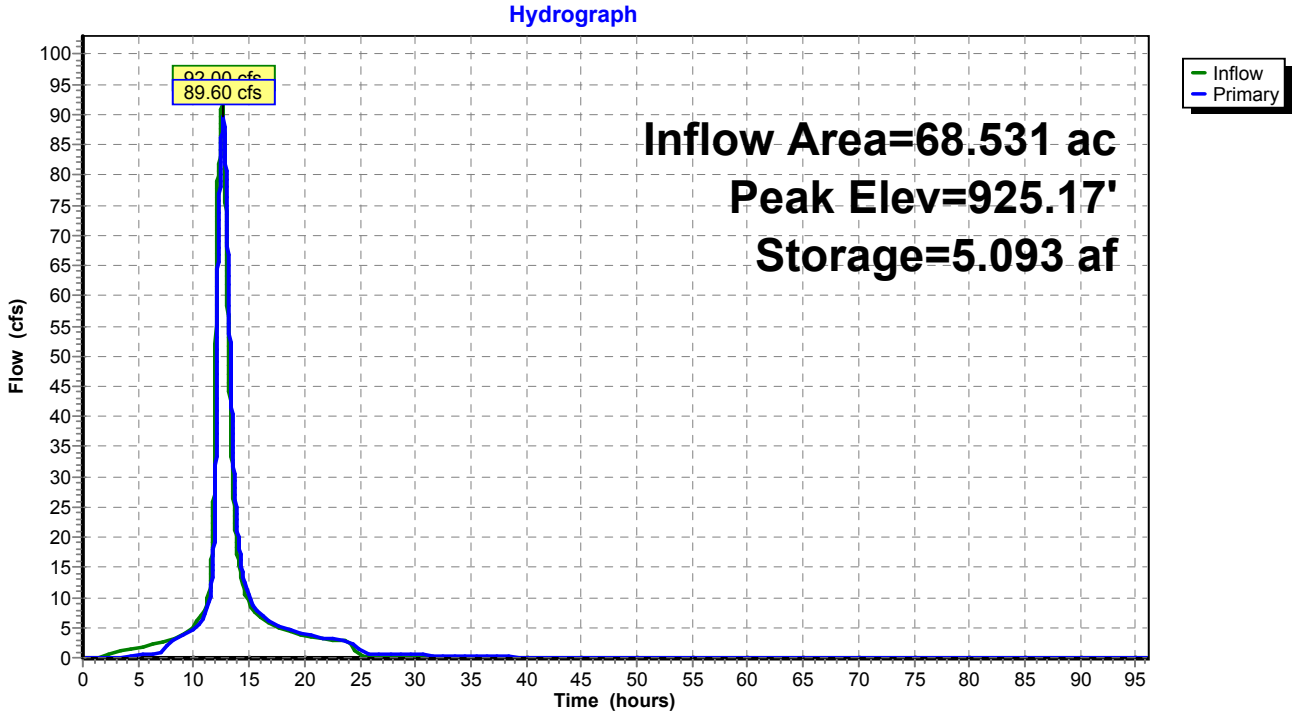
Volume	Invert	Avail.Storage	Storage Description
#1	920.00'	6.340 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
920.00	0.650	0.000	0.000
922.00	0.790	1.440	1.440
924.00	1.270	2.060	3.500
926.00	1.570	2.840	6.340

Device	Routing	Invert	Outlet Devices
#1	Primary	924.40'	**40.0' long x 1.00' rise Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#2	Primary	924.00'	**6.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=89.57 cfs @ 12.67 hrs HW=925.17' (Free Discharge)
└**1=Sharp-Crested Rectangular Weir** (Weir Controls 88.54 cfs @ 2.87 fps)
└**2=Orifice/Grate** (Orifice Controls 1.02 cfs @ 5.21 fps)

Pond P1/P2: P-1/P-2



Summary for Pond P5/P6: P-5/P-6

Inflow Area = 43.279 ac, 47.44% Impervious, Inflow Depth = 2.82" for 10-Year event
Inflow = 116.17 cfs @ 12.15 hrs, Volume= 10.153 af
Outflow = 28.61 cfs @ 12.70 hrs, Volume= 8.045 af, Atten= 75%, Lag= 32.8 min
Primary = 26.37 cfs @ 12.70 hrs, Volume= 6.915 af
Secondary = 2.24 cfs @ 12.70 hrs, Volume= 1.130 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Starting Elev= 929.00' Surf.Area= 1.975 ac Storage= 5.062 af
Peak Elev= 931.49' @ 12.70 hrs Surf.Area= 2.487 ac Storage= 10.676 af (5.614 af above start)

Plug-Flow detention time= 731.8 min calculated for 2.983 af (29% of inflow)
Center-of-Mass det. time= 229.8 min (1,018.4 - 788.7)

Volume	Invert	Avail.Storage	Storage Description
#1	926.00'	14.650 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

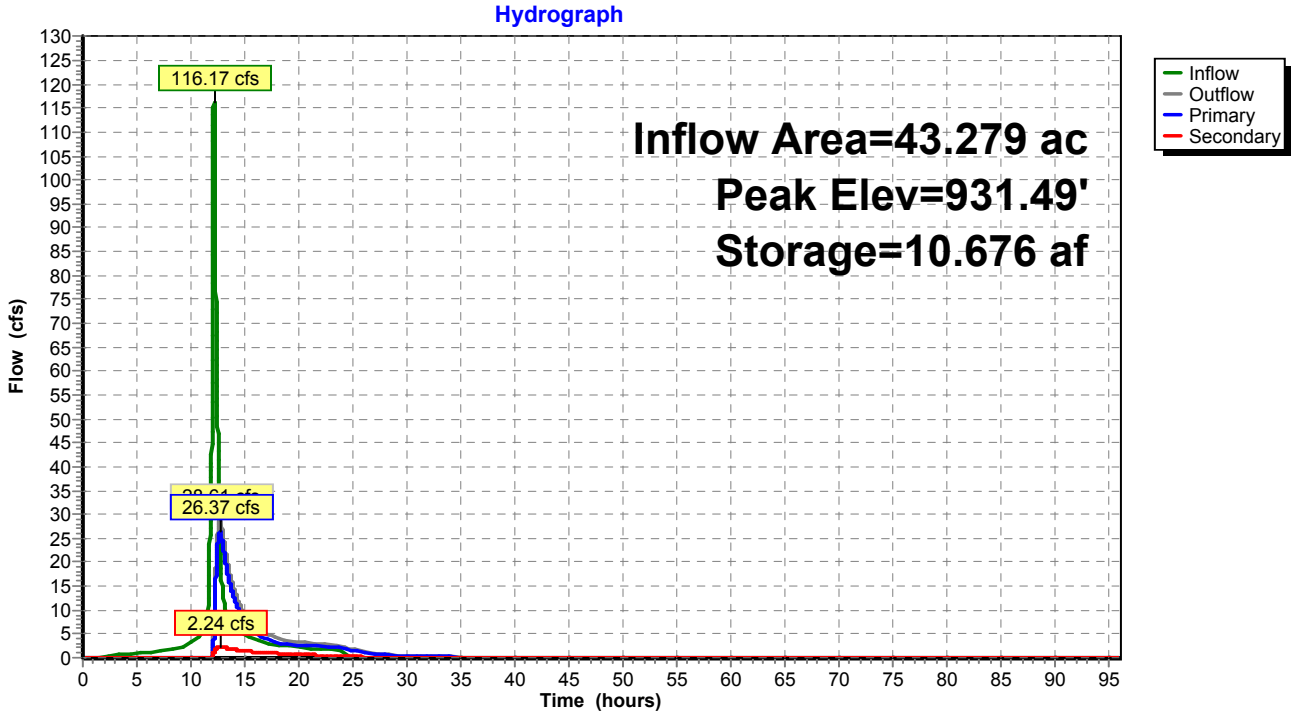
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
926.00	1.510	0.000	0.000
928.00	1.710	3.220	3.220
930.00	2.240	3.950	7.170
931.00	2.400	2.320	9.490
933.00	2.760	5.160	14.650

Device	Routing	Invert	Outlet Devices
#1	Primary	930.00'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	930.50'	**7.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#3	Primary	931.50'	**14.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#4	Secondary	930.00'	**9.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=26.37 cfs @ 12.70 hrs HW=931.49' (Free Discharge)
- **1=Orifice/Grate** (Orifice Controls 4.61 cfs @ 5.87 fps)
- **2=Sharp-Crested Rectangular Weir** (Weir Controls 21.76 cfs @ 3.25 fps)
- **3=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Secondary OutFlow Max=2.24 cfs @ 12.70 hrs HW=931.49' (Free Discharge)
- **4=Orifice/Grate** (Orifice Controls 2.24 cfs @ 5.07 fps)

Pond P5/P6: P-5/P-6



Summary for Pond P8: P-8

Inflow Area = 6.389 ac, 7.62% Impervious, Inflow Depth = 1.93" for 10-Year event
Inflow = 16.44 cfs @ 12.06 hrs, Volume= 1.027 af
Outflow = 4.14 cfs @ 12.56 hrs, Volume= 1.026 af, Atten= 75%, Lag= 30.3 min
Primary = 4.14 cfs @ 12.56 hrs, Volume= 1.026 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Starting Elev= 897.00' Surf.Area= 0.300 ac Storage= 0.495 af
Peak Elev= 898.07' @ 12.56 hrs Surf.Area= 0.453 ac Storage= 0.903 af (0.408 af above start)

Plug-Flow detention time= 492.2 min calculated for 0.531 af (52% of inflow)
Center-of-Mass det. time= 163.3 min (993.3 - 830.1)

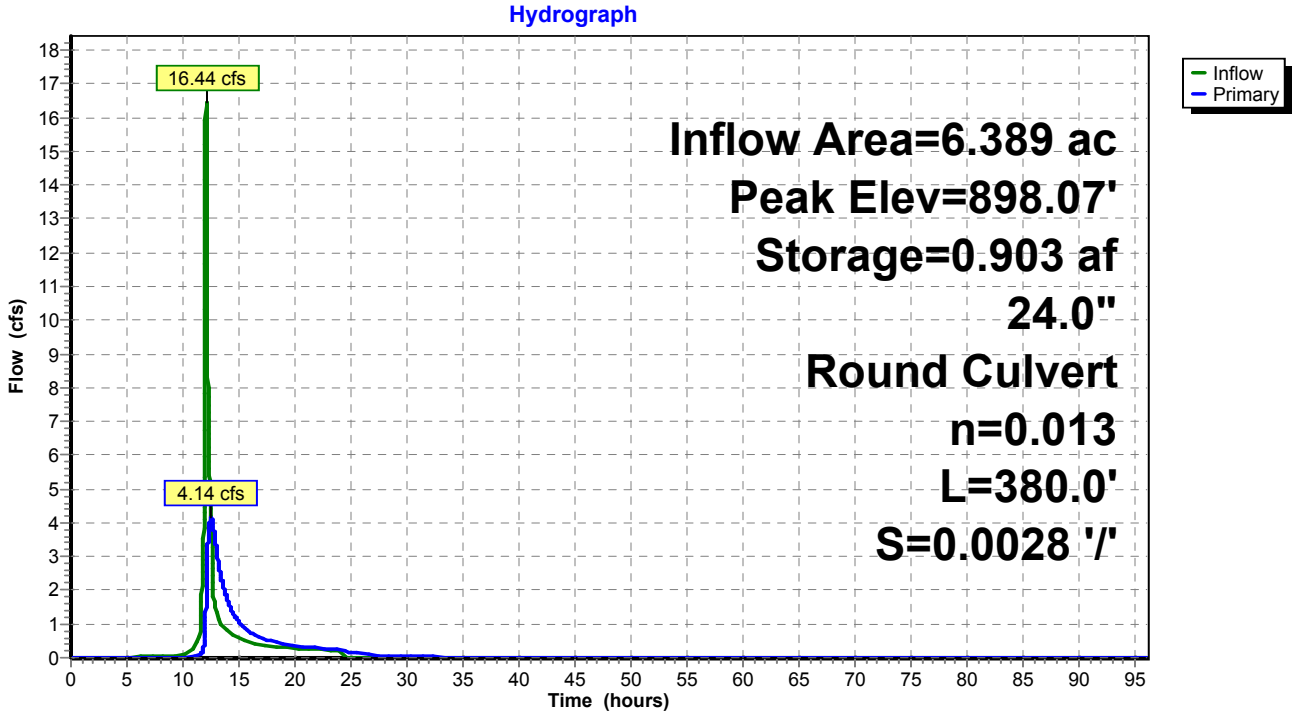
Volume	Invert	Avail.Storage	Storage Description
#1	893.00'	1.850 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
893.00	0.030	0.000	0.000
894.00	0.070	0.050	0.050
896.00	0.150	0.220	0.270
897.00	0.300	0.225	0.495
898.00	0.450	0.375	0.870
900.00	0.530	0.980	1.850

Device	Routing	Invert	Outlet Devices
#1	Primary	897.00'	**24.0" Round RCP_Round 24"** L= 380.0' RCP, groove end w/headwall, Ke= 0.200 Inlet / Outlet Invert= 897.00' / 895.94' S= 0.0028 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf

Primary OutFlow Max=4.14 cfs @ 12.56 hrs HW=898.07' (Free Discharge)
1=RCP_Round 24" (Barrel Controls 4.14 cfs @ 3.50 fps)

Pond P8: P-8


Hydrograph
16.44 cfs
4.14 cfs
Inflow Area=6.389 ac
Peak Elev=898.07'
Storage=0.903 af
24.0"
Round Culvert
n=0.013
L=380.0'
S=0.0028 '/'
Inflow
Primary
Flow (cfs)
Time (hours)
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95

Summary for Pond W-1: W-1

[79] Warning: Submerged Pond 4P Secondary device # 2 by 0.18'

Inflow Area = 0.997 ac, 24.47% Impervious, Inflow Depth = 17.34" for 10-Year event
Inflow = 3.34 cfs @ 12.27 hrs, Volume= 1.440 af
Outflow = 2.48 cfs @ 14.50 hrs, Volume= 1.440 af, Atten= 26%, Lag= 133.9 min
Primary = 2.48 cfs @ 14.50 hrs, Volume= 1.440 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Peak Elev= 915.18' @ 14.50 hrs Surf.Area= 0.729 ac Storage= 0.298 af

Plug-Flow detention time= 109.1 min calculated for 1.440 af (100% of inflow)
Center-of-Mass det. time= 109.3 min (977.6 - 868.3)

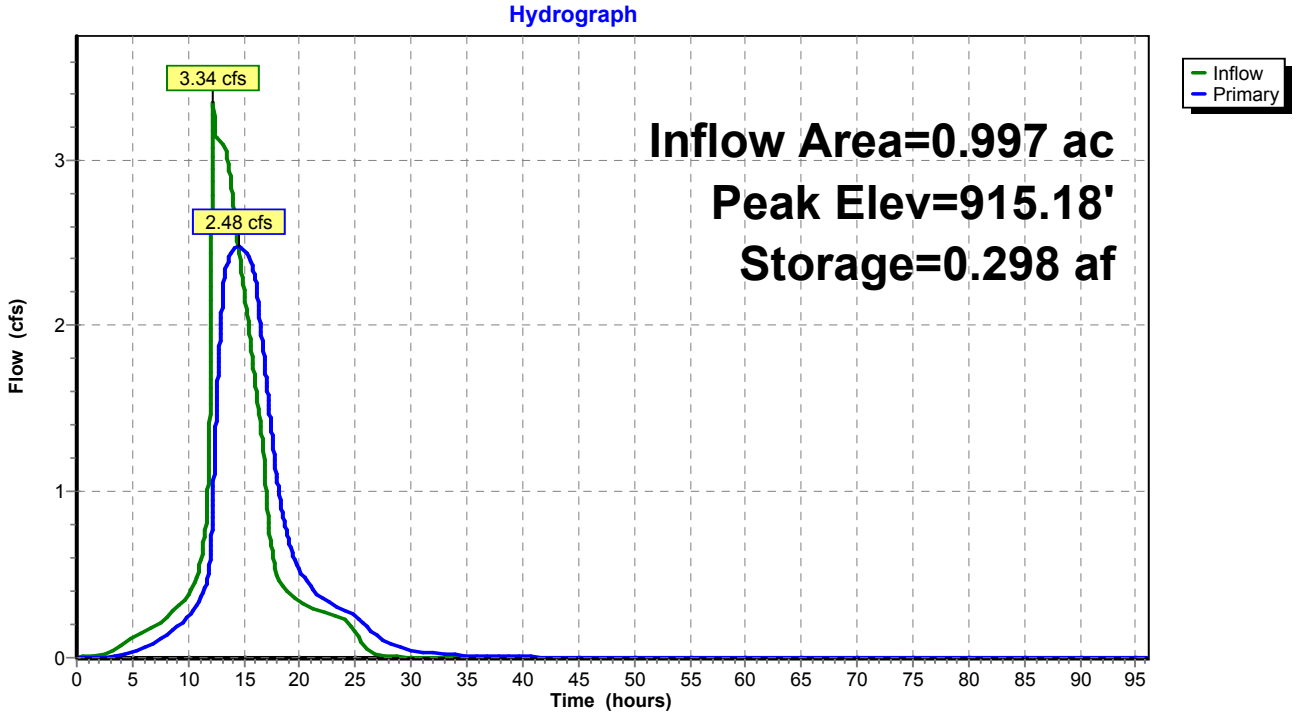
Volume	Invert	Avail.Storage	Storage Description
#1	914.75'	0.950 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
914.75	0.660	0.000	0.000
916.00	0.860	0.950	0.950

Device	Routing	Invert	Outlet Devices
#1	Primary	914.75'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=2.48 cfs @ 14.50 hrs HW=915.18' (Free Discharge)
↑—**1=Orifice/Grate** (Orifice Controls 2.48 cfs @ 3.15 fps)

Pond W-1: W-1


Hydrograph
3.34 cfs
2.48 cfs
Inflow Area=0.997 ac
Peak Elev=915.18'
Storage=0.298 af
Inflow
Primary
Flow (cfs)
Time (hours)
0
1
2
3
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95

Summary for Pond W-2: W-2

Inflow	=	2.24 cfs @	12.70 hrs,	Volume=	1.130 af
Outflow	=	0.76 cfs @	19.36 hrs,	Volume=	0.984 af, Atten= 66%, Lag= 400.0 min
Primary	=	0.76 cfs @	19.36 hrs,	Volume=	0.984 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Peak Elev= 929.49' @ 19.36 hrs Surf.Area= 1.174 ac Storage= 0.558 af

Plug-Flow detention time= 662.2 min calculated for 0.984 af (87% of inflow)
Center-of-Mass det. time= 577.1 min (1,625.6 - 1,048.6)

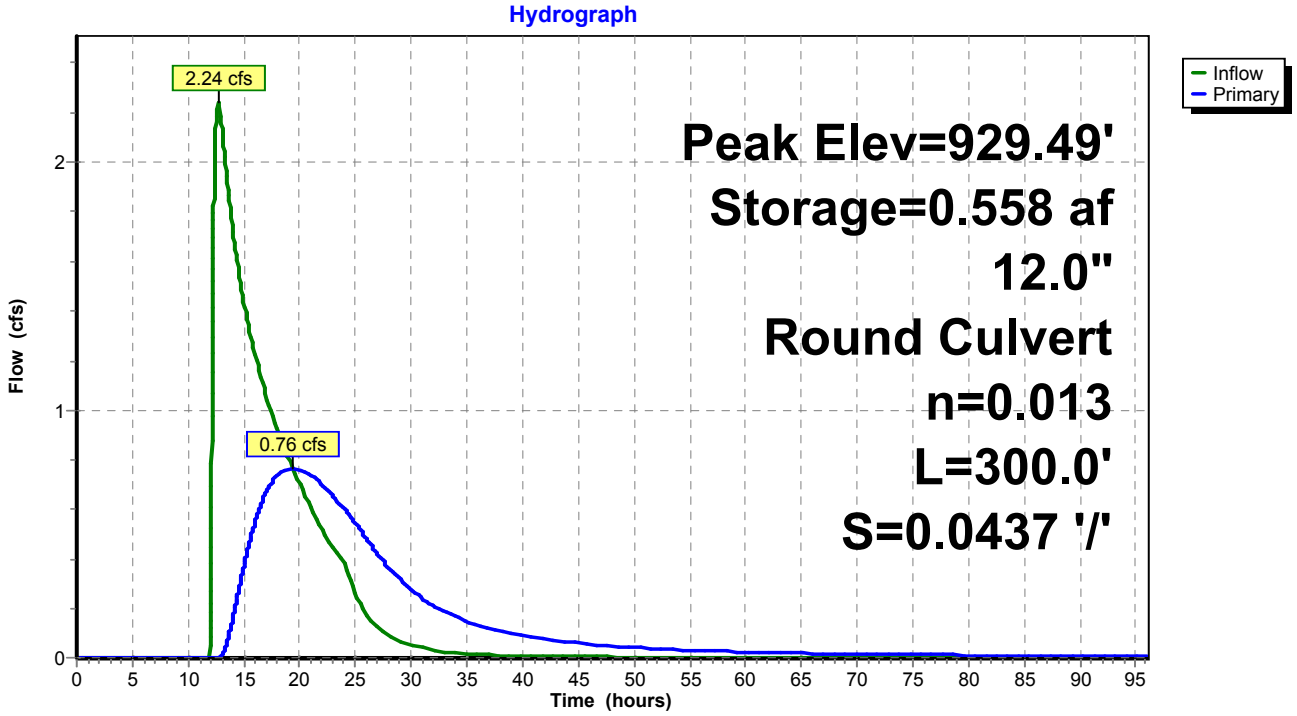
Volume	Invert	Avail.Storage	Storage Description
#1	929.00'	1.175 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
929.00	1.090	0.000	0.000
930.00	1.260	1.175	1.175

Device	Routing	Invert	Outlet Devices
#1	Primary	929.10'	**12.0" Round RCP_Round 12"** L= 300.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 929.10' / 916.00' S= 0.0437 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=0.76 cfs @ 19.36 hrs HW=929.49' (Free Discharge)
↑—**1=RCP_Round 12"** (Inlet Controls 0.76 cfs @ 2.67 fps)

Pond W-2: W-2


Hydrograph
2.24 cfs
0.76 cfs
Peak Elev=929.49'
Storage=0.558 af
12.0"
Round Culvert
n=0.013
L=300.0'
S=0.0437 '/'
Inflow
Primary
Flow (cfs)
Time (hours)
0
1
2
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95

Summary for Pond W-3: W-3

[79] Warning: Submerged Pond 7P Secondary device # 2 INLET by 0.08'

Inflow	=	0.97 cfs @	19.36 hrs, Volume=	1.555 af
Outflow	=	0.54 cfs @	27.88 hrs, Volume=	1.372 af, Atten= 45%, Lag= 511.2 min
Primary	=	0.54 cfs @	27.88 hrs, Volume=	1.372 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Peak Elev= 915.08' @ 27.88 hrs Surf.Area= 2.093 ac Storage= 0.673 af

Plug-Flow detention time= 1,080.4 min calculated for 1.372 af (88% of inflow)
Center-of-Mass det. time= 804.2 min (2,509.4 - 1,705.3)

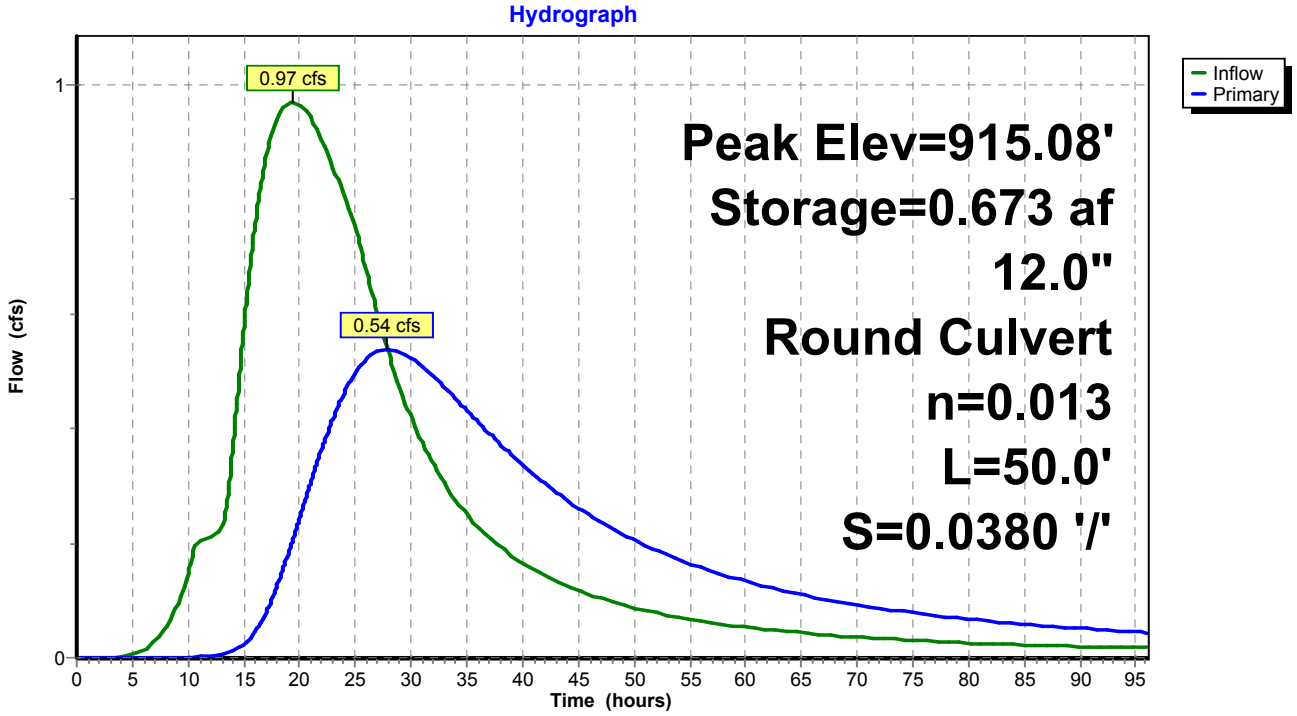
Volume	Invert	Avail.Storage	Storage Description
#1	914.75'	2.680 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
914.75	2.040	0.000	0.000
915.00	2.080	0.515	0.515
916.00	2.250	2.165	2.680

Device	Routing	Invert	Outlet Devices
#1	Primary	914.75'	**12.0" Round RCP_Round 12"** L= 50.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 914.75' / 912.85' S= 0.0380 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=0.54 cfs @ 27.88 hrs HW=915.08' (Free Discharge)
↑—**1=RCP_Round 12"** (Inlet Controls 0.54 cfs @ 2.43 fps)

Pond W-3: W-3


Hydrograph
0.97 cfs
0.54 cfs
Peak Elev=915.08'
Storage=0.673 af
12.0"
Round Culvert
n=0.013
L=50.0'
S=0.0380 '/'
Inflow
Primary
Flow (cfs)
Time (hours)
0
1
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95

Summary for Pond W-4: W-4

[79] Warning: Submerged Pond 11P Secondary device # 5 OUTLET by 0.98'

Inflow Area = 2.985 ac, 30.99% Impervious, Inflow Depth > 13.23" for 10-Year event
Inflow = 10.40 cfs @ 12.09 hrs, Volume= 3.291 af
Outflow = 3.28 cfs @ 16.93 hrs, Volume= 3.259 af, Atten= 68%, Lag= 290.3 min
Primary = 3.28 cfs @ 16.93 hrs, Volume= 3.259 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Peak Elev= 908.98' @ 16.93 hrs Surf.Area= 1.132 ac Storage= 0.934 af

Plug-Flow detention time= 279.8 min calculated for 3.259 af (99% of inflow)
Center-of-Mass det. time= 249.7 min (1,264.6 - 1,014.9)

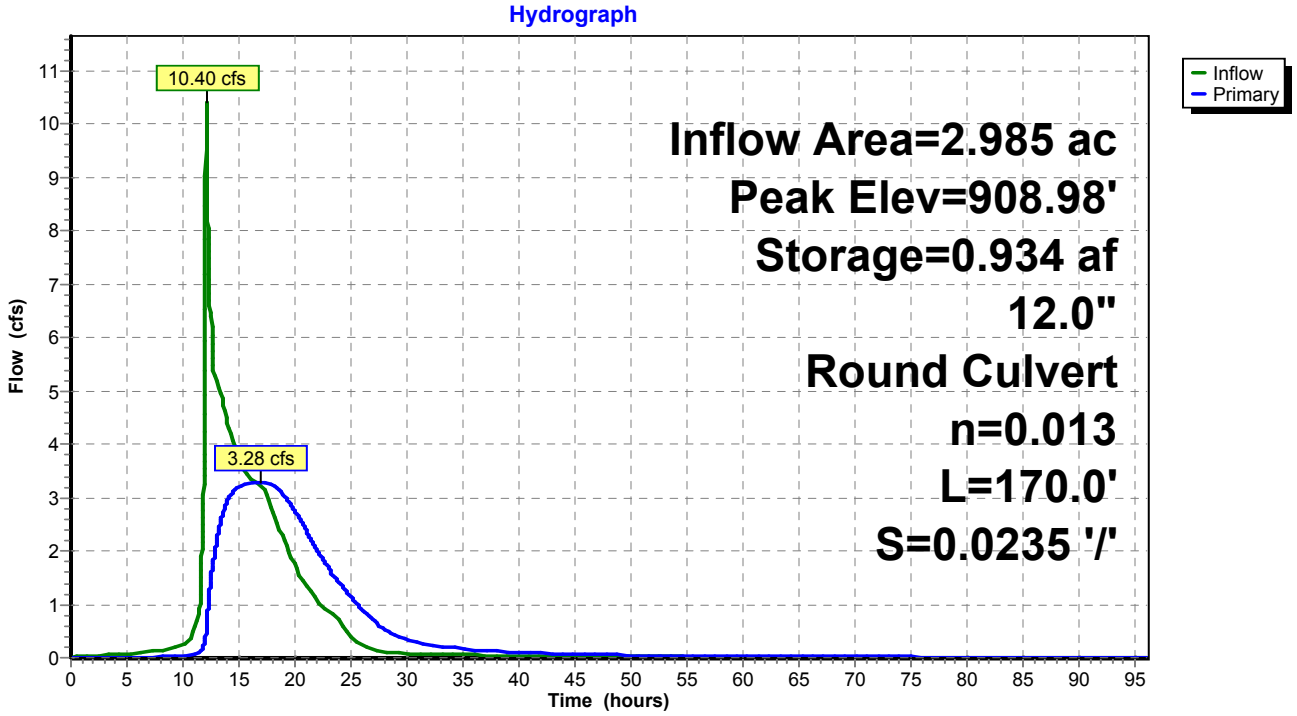
Volume	Invert	Avail.Storage	Storage Description
#1	908.00'	2.280 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
908.00	0.780	0.000	0.000
910.00	1.500	2.280	2.280

Device	Routing	Invert	Outlet Devices
#1	Primary	908.00'	**12.0" Round RCP_Round 12"** L= 170.0' RCP, groove end w/headwall, Ke= 0.200 Inlet / Outlet Invert= 908.00' / 904.00' S= 0.0235 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=3.28 cfs @ 16.93 hrs HW=908.98' (Free Discharge)
↑—**1=RCP_Round 12"** (Inlet Controls 3.28 cfs @ 4.21 fps)

Pond W-4: W-4


Hydrograph
10.40 cfs
3.28 cfs
Inflow Area=2.985 ac
Peak Elev=908.98'
Storage=0.934 af
12.0"
Round Culvert
n=0.013
L=170.0'
S=0.0235 '/'
Inflow
Primary
Flow (cfs)
Time (hours)
0
1
2
3
4
5
6
7
8
9
10
11
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
75
80
85
90
95

Summary for Pond W-5: W-5

[79] Warning: Submerged Pond 13P Secondary device # 2 INLET by 0.11'
[79] Warning: Submerged Pond 13P Secondary device # 3 INLET by 0.11'
[79] Warning: Submerged Pond 13P Secondary device # 4 INLET by 0.11'
[79] Warning: Submerged Pond 13P Secondary device # 5 INLET by 0.11'
[79] Warning: Submerged Pond 13P Secondary device # 6 INLET by 0.11'

Inflow Area = 7.608 ac, 48.41% Impervious, Inflow Depth = 7.03" for 10-Year event
Inflow = 37.74 cfs @ 12.02 hrs, Volume= 4.455 af
Outflow = 8.45 cfs @ 13.21 hrs, Volume= 4.453 af, Atten= 78%, Lag= 71.3 min
Primary = 8.45 cfs @ 13.21 hrs, Volume= 4.453 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Starting Elev= 882.75' Surf.Area= 4.887 ac Storage= 7.134 af
Peak Elev= 883.11' @ 13.21 hrs Surf.Area= 5.310 ac Storage= 8.970 af (1.836 af above start)

Plug-Flow detention time= (not calculated: initial storage excedes outflow)
Center-of-Mass det. time= 234.9 min (1,071.9 - 837.0)

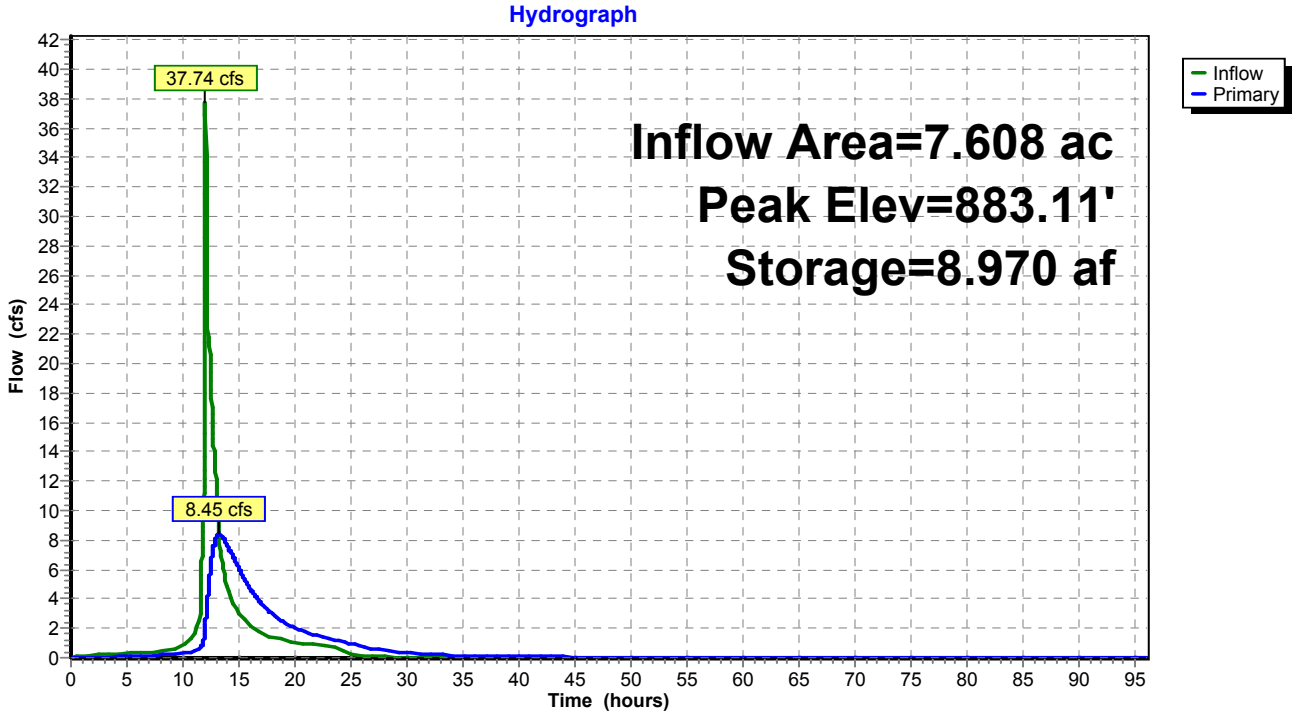
Volume	Invert	Avail.Storage	Storage Description
#1	881.00'	11.097 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
881.00	3.270	0.000	0.000
882.00	4.190	3.730	3.730
883.00	5.120	4.655	8.385
883.49	5.950	2.712	11.097

Device	Routing	Invert	Outlet Devices
#1	Primary	882.75'	**6.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#2	Primary	882.75'	**6.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=8.45 cfs @ 13.21 hrs HW=883.11' (Free Discharge)
1=Sharp-Crested Rectangular Weir (Weir Controls 4.22 cfs @ 1.97 fps)
2=Sharp-Crested Rectangular Weir (Weir Controls 4.22 cfs @ 1.97 fps)

Pond W-5: W-5


Hydrograph
Inflow Area=7.608 ac
Peak Elev=883.11'
Storage=8.970 af
37.74 cfs
8.45 cfs
Inflow
Primary
Flow (cfs)
Time (hours)
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95

Time span=0.00-96.00 hrs, dt=0.01 hrs, 9601 points
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious
Reach routing by Muskingum-Cunge method - Pond routing by Stor-Ind method

Subcatchment1S: To Rice Creek Runoff Area=1.601 ac 31.98% Impervious Runoff Depth=5.20"
Tc=5.7 min CN=74/98 Runoff=11.87 cfs 0.693 af

SubcatchmentSB 1: SB 1 Runoff Area=52.192 ac 48.35% Impervious Runoff Depth=5.65"
Tc=53.1 min CN=74/98 Runoff=152.90 cfs 24.560 af

SubcatchmentSB 10: SB 10 Runoff Area=6.389 ac 7.62% Impervious Runoff Depth=4.52"
Tc=7.3 min CN=74/98 Runoff=39.72 cfs 2.409 af

SubcatchmentSB 11: SB 11 Runoff Area=3.293 ac 32.16% Impervious Runoff Depth=5.28"
Tc=11.7 min CN=74/100 Runoff=18.83 cfs 1.448 af

SubcatchmentSB 12: SB 12 Runoff Area=1.382 ac 38.71% Impervious Runoff Depth=5.38"
Tc=9.5 min CN=74/98 Runoff=8.83 cfs 0.620 af

SubcatchmentSB 13: SB 13 Runoff Area=2.985 ac 30.99% Impervious Runoff Depth=5.24"
Tc=9.4 min CN=74/100 Runoff=18.60 cfs 1.304 af

SubcatchmentSB 14: SB 14 Runoff Area=10.225 ac 42.62% Impervious Runoff Depth=5.49"
Tc=4.3 min CN=74/98 Runoff=84.34 cfs 4.677 af

SubcatchmentSB 15: SB 15 Runoff Area=58.564 ac 48.22% Impervious Runoff Depth=5.64"
Tc=31.3 min CN=74/98 Runoff=226.38 cfs 27.541 af

SubcatchmentSB 16: SB 16 Runoff Area=32.428 ac 33.53% Impervious Runoff Depth=5.24"
Tc=12.1 min CN=74/98 Runoff=183.61 cfs 14.156 af

SubcatchmentSB 17: SB 17 Runoff Area=7.608 ac 48.41% Impervious Runoff Depth=5.76"
Tc=4.3 min CN=74/100 Runoff=64.20 cfs 3.655 af

SubcatchmentSB 18: SB 18 Runoff Area=52.908 ac 84.55% Impervious Runoff Depth=6.65"
Tc=33.5 min CN=74/98 Runoff=224.72 cfs 29.299 af

SubcatchmentSB 19: SB 19 Runoff Area=21.198 ac 39.93% Impervious Runoff Depth=5.41"
Tc=24.7 min CN=74/98 Runoff=89.07 cfs 9.565 af

SubcatchmentSB 2: SB 2 Runoff Area=11.400 ac 84.29% Impervious Runoff Depth=6.64"
Tc=16.6 min CN=74/98 Runoff=67.49 cfs 6.306 af

SubcatchmentSB 22: SB 22 Runoff Area=41.911 ac 82.19% Impervious Runoff Depth=6.12"
Tc=41.0 min CN=49/98 Runoff=144.97 cfs 21.385 af

SubcatchmentSB 24: SB 24 Runoff Area=4.939 ac 98.22% Impervious Runoff Depth=7.02"
Tc=7.5 min CN=74/98 Runoff=42.62 cfs 2.890 af

SubcatchmentSB 25: SB 25 Runoff Area=5.012 ac 95.71% Impervious Runoff Depth=6.95"
Tc=10.7 min CN=74/98 Runoff=37.25 cfs 2.904 af

Subcatchment SB 26: SB 26 Runoff Area=14.335 ac 98.27% Impervious Runoff Depth=7.02"
Tc=25.4 min CN=74/98 Runoff=73.07 cfs 8.390 af

Subcatchment SB 27: SB 27 (Thumb Road) Runoff Area=6.629 ac 97.12% Impervious Runoff Depth=6.92"
Tc=27.6 min CN=49/98 Runoff=31.89 cfs 3.821 af

Subcatchment SB 28: SB 28 Runoff Area=6.955 ac 46.76% Impervious Runoff Depth=5.60"
Tc=14.6 min CN=74/98 Runoff=38.37 cfs 3.247 af

Subcatchment SB 29: SB 29 Runoff Area=10.214 ac 37.73% Impervious Runoff Depth=5.35"
Tc=19.1 min CN=74/98 Runoff=48.13 cfs 4.557 af

Subcatchment SB 3: SB 3 Runoff Area=37.668 ac 41.46% Impervious Runoff Depth=5.46"
Tc=15.3 min CN=74/98 Runoff=199.96 cfs 17.130 af

Subcatchment SB 4: SB 4 Runoff Area=0.599 ac 19.70% Impervious Runoff Depth=4.90"
Tc=5.9 min CN=74/100 Runoff=4.20 cfs 0.245 af

Subcatchment SB 5: SB 5 Runoff Area=7.853 ac 70.37% Impervious Runoff Depth=6.25"
Tc=59.3 min CN=74/98 Runoff=23.32 cfs 4.093 af

Subcatchment SB 51: Offsite Subbasin 51 Runoff Area=25.238 ac 19.96% Impervious Runoff Depth=4.09"
Tc=17.7 min CN=65/98 Runoff=94.36 cfs 8.599 af

Subcatchment SB 6: SB 6 Runoff Area=0.997 ac 24.47% Impervious Runoff Depth=5.05"
Tc=20.3 min CN=74/100 Runoff=4.33 cfs 0.419 af

Subcatchment SB 7: SB 7 Runoff Area=21.555 ac 84.83% Impervious Runoff Depth=6.65"
Tc=5.7 min CN=74/98 Runoff=192.64 cfs 11.950 af

Subcatchment SB 8: SB 8 Runoff Area=29.595 ac 30.01% Impervious Runoff Depth=5.14"
Tc=47.1 min CN=74/98 Runoff=86.02 cfs 12.680 af

Subcatchment SB 9: SB 9 Runoff Area=25.789 ac 33.17% Impervious Runoff Depth=5.23"
Tc=30.0 min CN=74/98 Runoff=96.02 cfs 11.237 af

Reach 30R: 60" RCP to existing 60" Avg. Flow Depth=3.41' Max Vel=18.35 fps Inflow=261.46 cfs 62.165 af
60.0" Round Pipe n=0.013 L=400.0' S=0.0085 '/' Capacity=240.12 cfs Outflow=261.45 cfs 62.165 af

Reach 34R: 60" RCP connecting Avg. Flow Depth=3.05' Max Vel=14.30 fps Inflow=174.02 cfs 33.752 af
60.0" Round Pipe n=0.013 L=2,150.0' S=0.0050 '/' Capacity=184.16 cfs Outflow=173.89 cfs 33.752 af

Reach 37R: 48" RCP Avg. Flow Depth=2.69' Max Vel=13.26 fps Inflow=119.35 cfs 16.468 af
48.0" Round Pipe n=0.013 L=240.0' S=0.0060 '/' Capacity=111.27 cfs Outflow=119.34 cfs 16.468 af

Reach 39R: 24" RCP Avg. Flow Depth=1.24' Max Vel=7.54 fps Inflow=15.41 cfs 4.512 af
24.0" Round Pipe n=0.013 L=90.0' S=0.0050 '/' Capacity=16.00 cfs Outflow=15.41 cfs 4.512 af

Reach 43R: 30" RCP connecting P-10 Avg. Flow Depth=1.18' Max Vel=6.99 fps Inflow=15.89 cfs 12.301 af
30.0" Round Pipe n=0.013 L=750.0' S=0.0037 '/' Capacity=24.93 cfs Outflow=15.89 cfs 12.301 af

Reach 51R: 40' x 4.5 ft parabolic Avg. Flow Depth=3.48' Max Vel=7.67 fps Inflow=625.92 cfs 115.289 af
n=0.035 L=300.0' S=0.0050 '/' Capacity=733.43 cfs Outflow=625.70 cfs 115.289 af

Pond 3P: P-3 Peak Elev=919.66' Storage=19.133 af Inflow=314.07 cfs 62.170 af
Outflow=261.46 cfs 62.165 af

Pond 4P: P-4 Peak Elev=917.79' Storage=1.633 af Inflow=23.32 cfs 4.093 af
Primary=12.51 cfs 2.196 af Secondary=3.55 cfs 1.897 af Outflow=16.06 cfs 4.093 af

Pond 7P: P-7 Peak Elev=915.87' Storage=1.492 af Inflow=86.02 cfs 12.680 af
Primary=85.58 cfs 11.978 af Secondary=0.26 cfs 0.621 af Outflow=85.84 cfs 12.599 af

Pond 9P: P-9 Peak Elev=915.85' Storage=0.602 af Inflow=167.38 cfs 25.203 af
Outflow=167.16 cfs 25.203 af

Pond 10P: P-10 Peak Elev=898.50' Storage=1.554 af Inflow=169.45 cfs 25.409 af
Primary=15.89 cfs 12.301 af Secondary=153.06 cfs 13.101 af Outflow=168.95 cfs 25.402 af

Pond 11P: P-11 Peak Elev=912.79' Storage=9.060 af Inflow=173.92 cfs 26.651 af
Primary=156.28 cfs 22.382 af Secondary=5.05 cfs 4.248 af Outflow=161.33 cfs 26.631 af

Pond 12P: P-12 Peak Elev=895.84' Storage=10.273 af Inflow=180.07 cfs 35.599 af
Outflow=141.34 cfs 35.576 af

Pond 13P: P-13 Peak Elev=885.59' Storage=10.299 af Inflow=652.92 cfs 111.642 af
Primary=610.72 cfs 106.706 af Secondary=20.50 cfs 4.930 af Outflow=631.22 cfs 111.636 af

Pond 14P: P-14 Peak Elev=895.17' Storage=9.341 af Inflow=89.07 cfs 9.565 af
Outflow=16.07 cfs 9.565 af

Pond 23P: Thumb Infiltration (Thumb TP Peak Elev=903.88' Storage=3.878 af Inflow=171.27 cfs 25.207 af
Outflow=171.19 cfs 21.467 af

Pond 31P: SB 18 Infiltration Peak Elev=903.48' Storage=3.484 af Inflow=224.72 cfs 29.299 af
Outflow=224.58 cfs 25.979 af

Pond 36P: Culverts passing flow Peak Elev=890.24' Storage=0.012 af Inflow=224.58 cfs 25.979 af
Primary=127.00 cfs 22.800 af Secondary=97.52 cfs 3.178 af Outflow=224.52 cfs 25.979 af

Pond CRH-1: CRH-1 Peak Elev=878.81' Storage=0.760 af Inflow=38.37 cfs 3.247 af
Discarded=0.37 cfs 0.560 af Primary=25.15 cfs 2.688 af Outflow=25.53 cfs 3.247 af

Pond CRH-2: CRH-2 Peak Elev=883.78' Storage=1.468 af Inflow=48.13 cfs 4.557 af
Discarded=0.47 cfs 0.981 af Primary=27.39 cfs 3.577 af Outflow=27.86 cfs 4.557 af

Pond CRH-3: CRH-3 Peak Elev=879.83' Storage=0.770 af Inflow=30.16 cfs 4.270 af
Discarded=0.38 cfs 0.516 af Primary=25.55 cfs 3.754 af Outflow=25.93 cfs 4.270 af

Pond P1/P2: P-1/P-2 Peak Elev=925.71' Storage=5.893 af Inflow=181.28 cfs 33.757 af
Outflow=174.02 cfs 33.752 af

Pond P5/P6: P-5/P-6 Peak Elev=932.56' Storage=13.462 af Inflow=234.37 cfs 20.279 af
Primary=119.35 cfs 16.468 af Secondary=3.15 cfs 1.703 af Outflow=122.50 cfs 18.171 af

Pond P8: P-8 Peak Elev=899.05' Storage=1.367 af Inflow=39.72 cfs 2.409 af
24.0" Round Culvert n=0.013 L=380.0' S=0.0028 '/' Outflow=11.85 cfs 2.407 af

Pond W-1: W-1 Peak Elev=915.41' Storage=0.472 af Inflow=6.30 cfs 2.316 af
Outflow=3.08 cfs 2.316 af

Pond W-2: W-2 Peak Elev=929.60' Storage=0.680 af Inflow=3.15 cfs 1.703 af
12.0" Round Culvert n=0.013 L=300.0' S=0.0437 '/' Outflow=1.17 cfs 1.555 af

Pond W-3: W-3 Peak Elev=915.18' Storage=0.894 af Inflow=1.37 cfs 2.176 af
12.0" Round Culvert n=0.013 L=50.0' S=0.0380 '/' Outflow=0.90 cfs 1.988 af

Pond W-4: W-4 Peak Elev=909.37' Storage=1.401 af Inflow=22.15 cfs 5.553 af
12.0" Round Culvert n=0.013 L=170.0' S=0.0235 '/' Outflow=4.40 cfs 5.520 af

Pond W-5: W-5 Peak Elev=883.35' Storage=10.265 af Inflow=76.01 cfs 8.585 af
Outflow=17.76 cfs 8.583 af

Total Runoff Area = 501.462 ac Runoff Volume = 239.780 af Average Runoff Depth = 5.74"
45.62% Pervious = 228.758 ac 54.38% Impervious = 272.704 ac

Summary for Subcatchment 1S: To Rice Creek

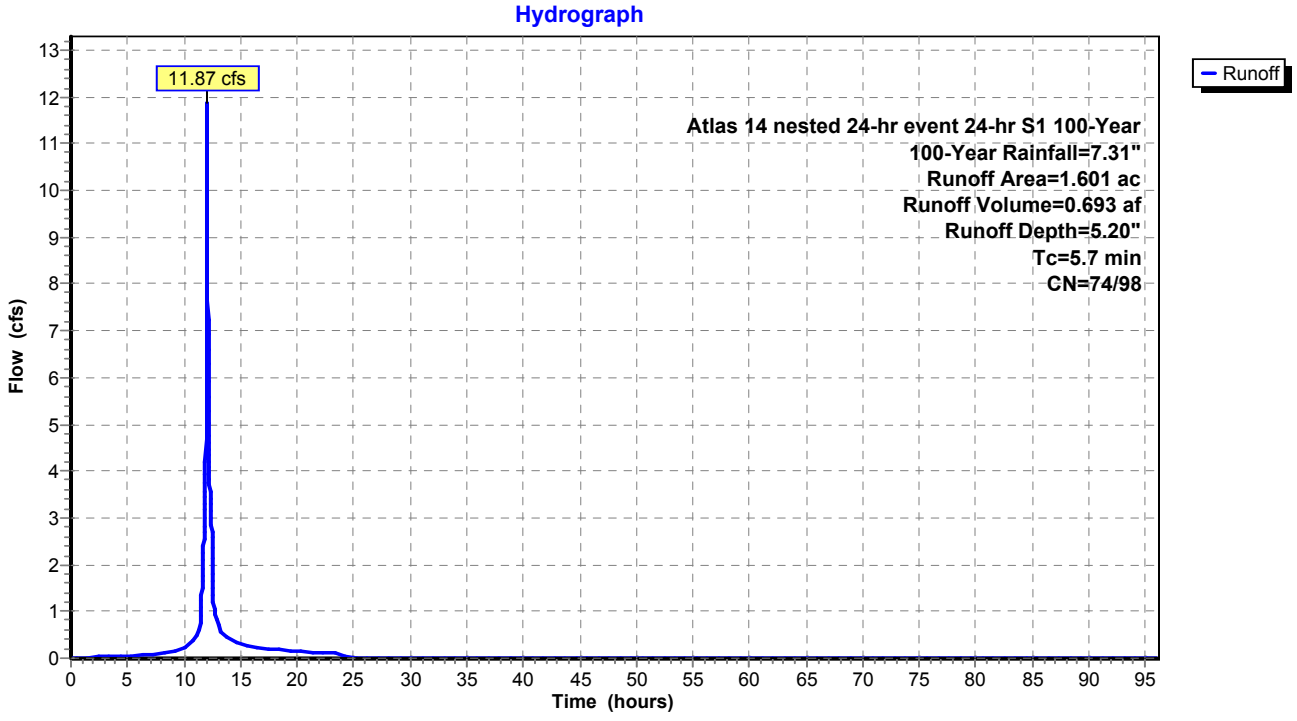
Runoff = 11.87 cfs @ 12.03 hrs, Volume= 0.693 af, Depth= 5.20"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 100-Year Rainfall=7.31"

	Area (ac)	CN	Description
*	0.512	98	impervious
*	1.089	74	pervious
	1.601	82	Weighted Average
	1.089	74	68.02% Pervious Area
	0.512	98	31.98% Impervious Area

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

Subcatchment 1S: To Rice Creek



Summary for Subcatchment SB 1: SB 1

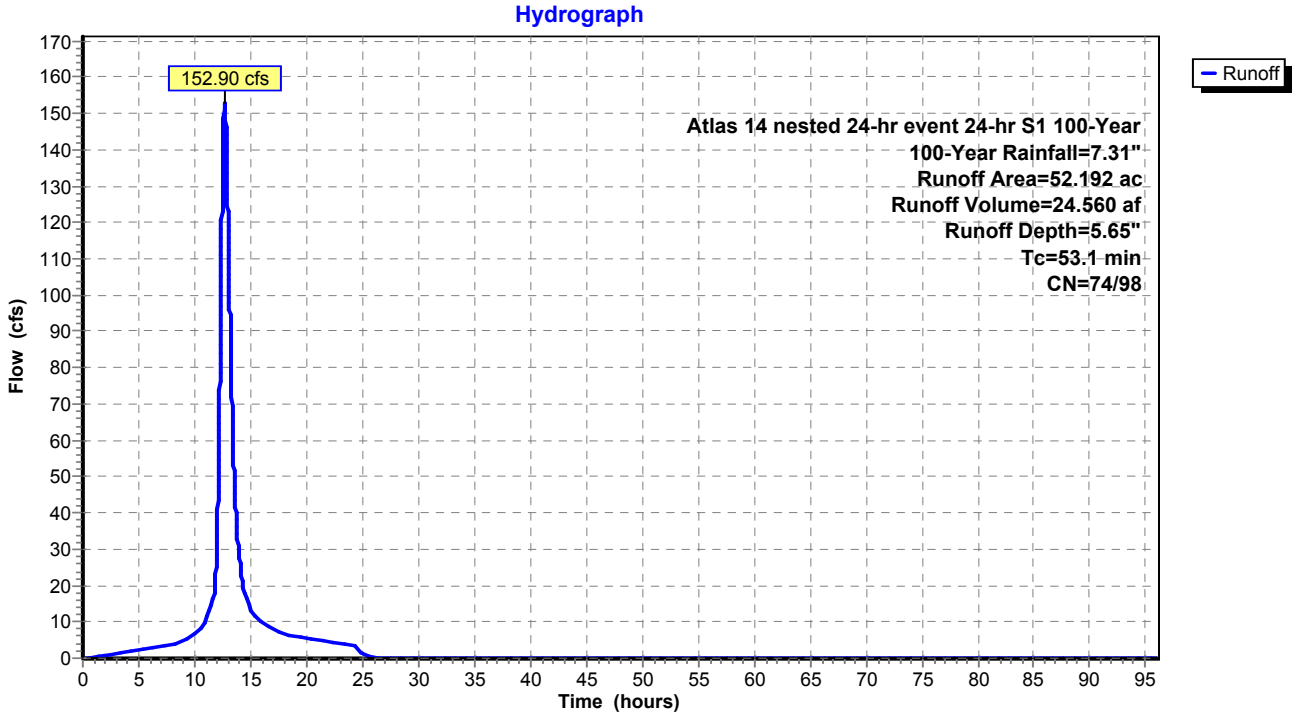
Runoff = 152.90 cfs @ 12.68 hrs, Volume= 24.560 af, Depth= 5.65"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 100-Year Rainfall=7.31"

	Area (ac)	CN	Description
*	26.958	74	pervious
*	25.234	98	impervious
	52.192	86	Weighted Average
	26.958	74	51.65% Pervious Area
	25.234	98	48.35% Impervious Area

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

Subcatchment SB 1: SB 1



Summary for Subcatchment SB 10: SB 10

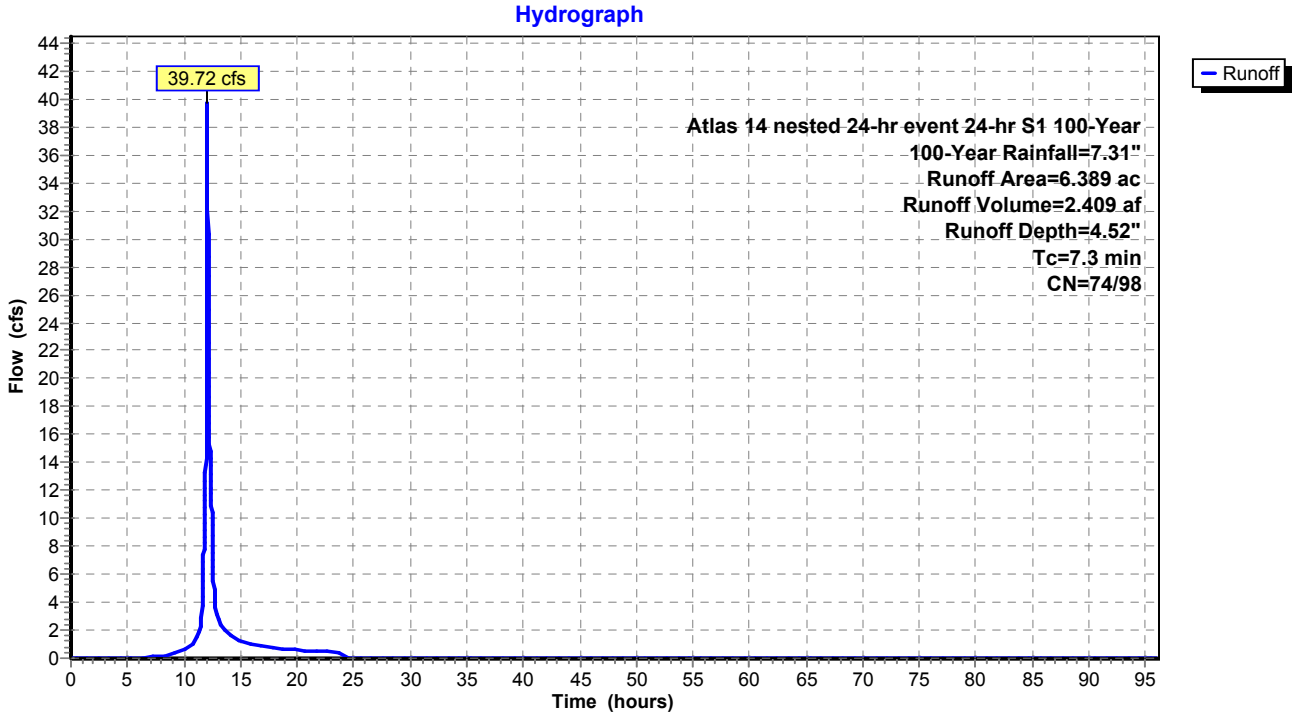
Runoff = 39.72 cfs @ 12.05 hrs, Volume= 2.409 af, Depth= 4.52"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 100-Year Rainfall=7.31"

	Area (ac)	CN	Description
*	5.902	74	pervious
*	0.487	98	impervious
	6.389	76	Weighted Average
	5.902	74	92.38% Pervious Area
	0.487	98	7.62% Impervious Area

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

Subcatchment SB 10: SB 10



Summary for Subcatchment SB 11: SB 11

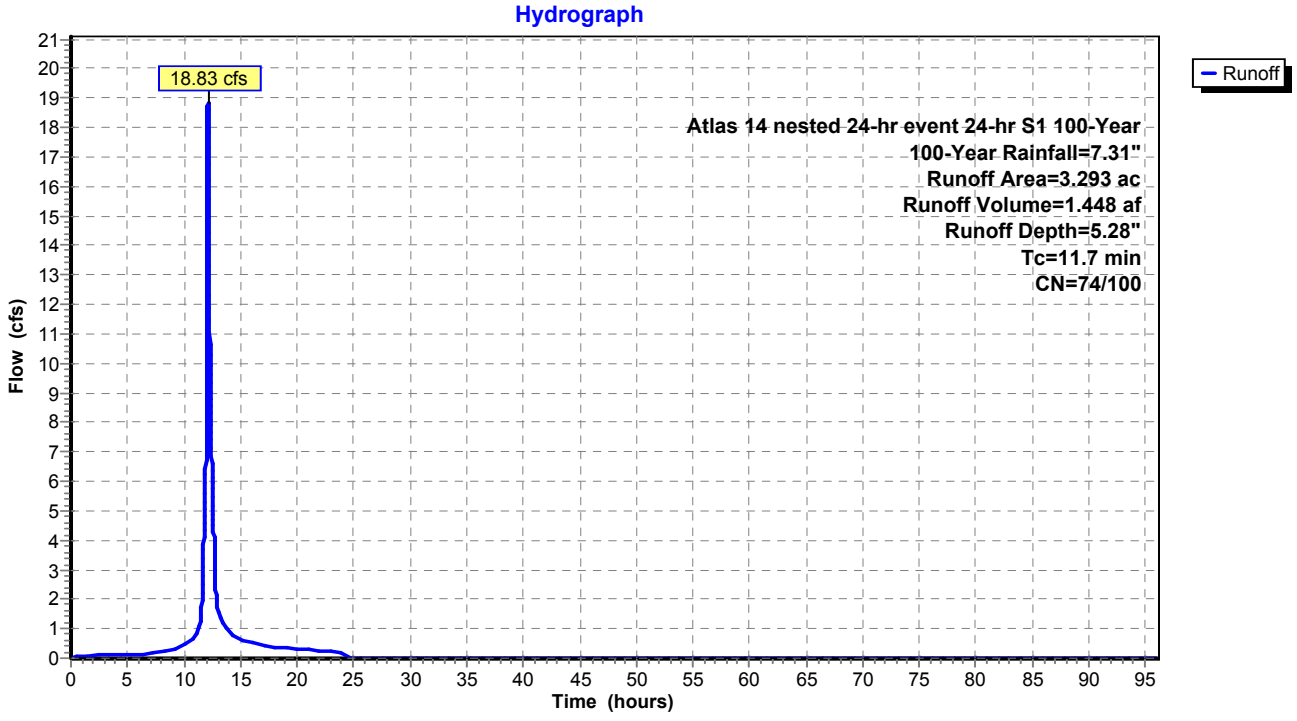
Runoff = 18.83 cfs @ 12.11 hrs, Volume= 1.448 af, Depth= 5.28"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 100-Year Rainfall=7.31"

	Area (ac)	CN	Description
*	2.234	74	pervious
*	1.059	100	impervious
	3.293	82	Weighted Average
	2.234	74	67.84% Pervious Area
	1.059	100	32.16% Impervious Area

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

Subcatchment SB 11: SB 11



Summary for Subcatchment SB 12: SB 12

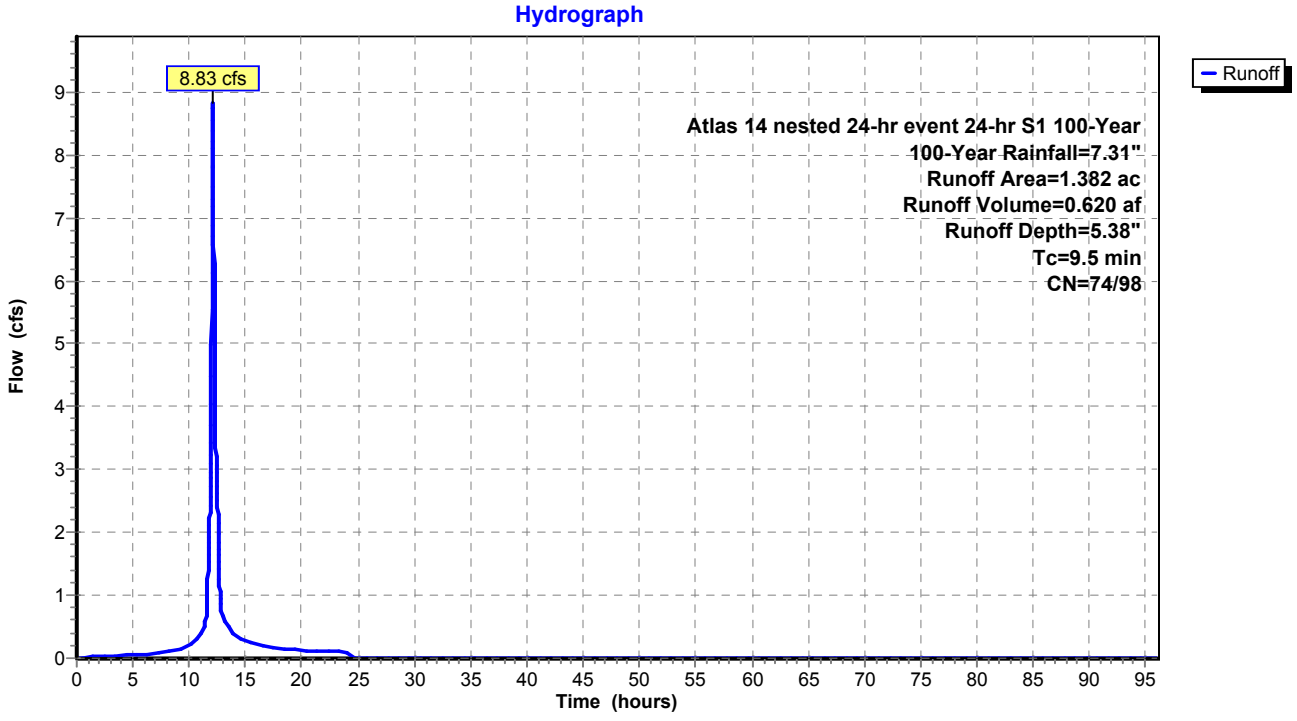
Runoff = 8.83 cfs @ 12.08 hrs, Volume= 0.620 af, Depth= 5.38"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 100-Year Rainfall=7.31"

	Area (ac)	CN	Description
*	0.847	74	pervious
*	0.535	98	impervious
	1.382	83	Weighted Average
	0.847	74	61.29% Pervious Area
	0.535	98	38.71% Impervious Area

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

Subcatchment SB 12: SB 12



Summary for Subcatchment SB 13: SB 13

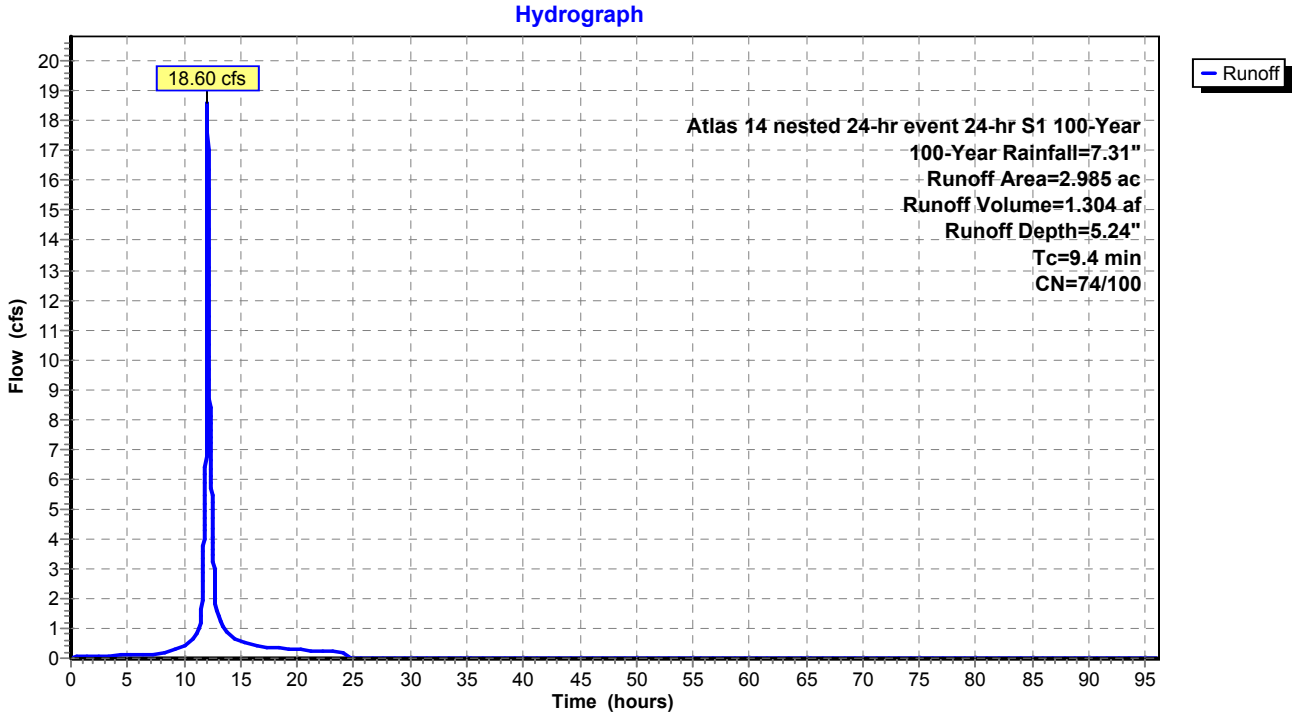
Runoff = 18.60 cfs @ 12.08 hrs, Volume= 1.304 af, Depth= 5.24"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 100-Year Rainfall=7.31"

	Area (ac)	CN	Description
*	2.060	74	pervious
*	0.925	100	impervious
	2.985	82	Weighted Average
	2.060	74	69.01% Pervious Area
	0.925	100	30.99% Impervious Area

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

Subcatchment SB 13: SB 13



Summary for Subcatchment SB 14: SB 14

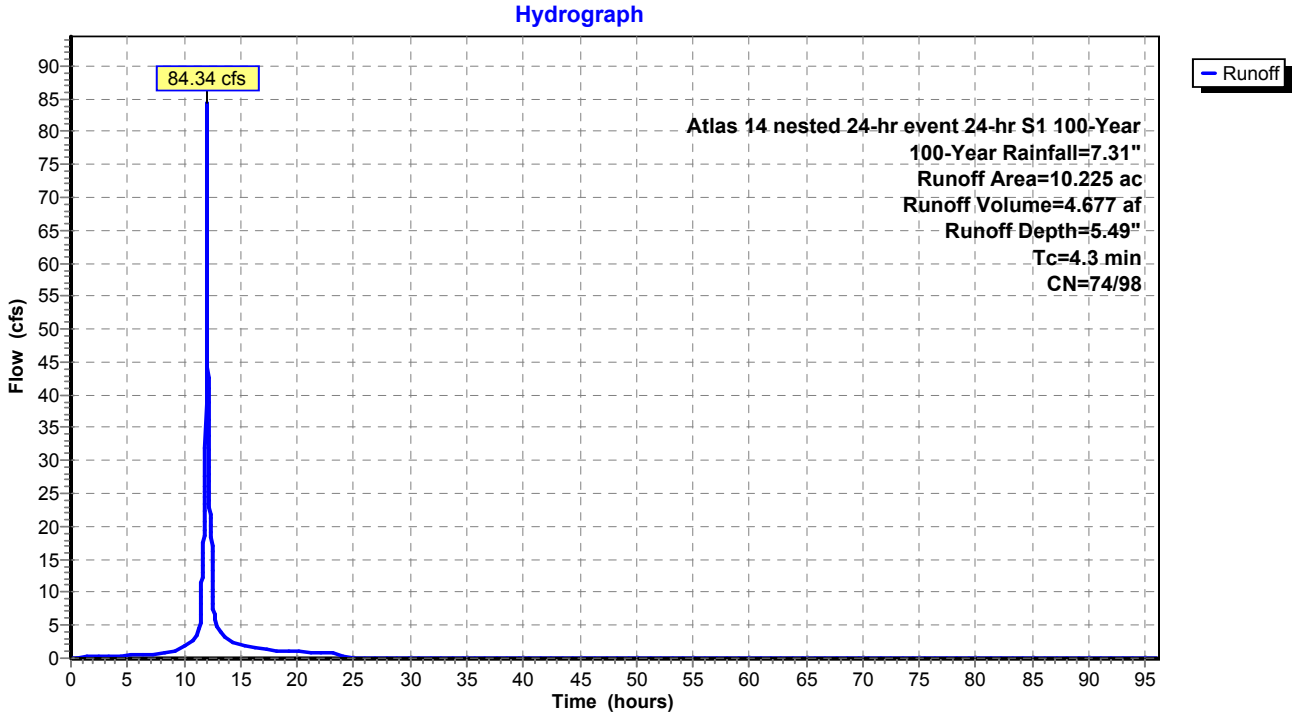
Runoff = 84.34 cfs @ 12.02 hrs, Volume= 4.677 af, Depth= 5.49"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 100-Year Rainfall=7.31"

	Area (ac)	CN	Description
*	5.867	74	pervious
*	4.358	98	impervious
	10.225	84	Weighted Average
	5.867	74	57.38% Pervious Area
	4.358	98	42.62% Impervious Area

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

Subcatchment SB 14: SB 14



Summary for Subcatchment SB 15: SB 15

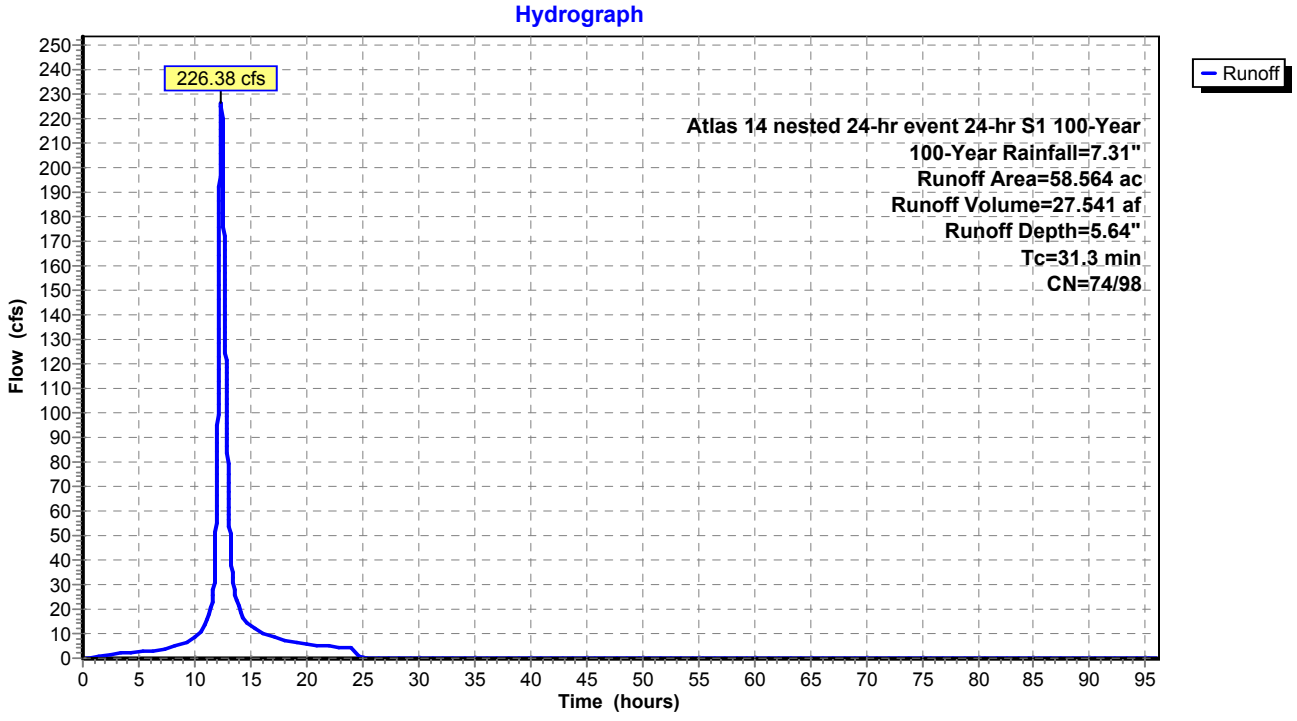
Runoff = 226.38 cfs @ 12.38 hrs, Volume= 27.541 af, Depth= 5.64"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 100-Year Rainfall=7.31"

	Area (ac)	CN	Description
*	30.326	74	pervious
*	28.238	98	impervious
	58.564	86	Weighted Average
	30.326	74	51.78% Pervious Area
	28.238	98	48.22% Impervious Area

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

Subcatchment SB 15: SB 15



Summary for Subcatchment SB 16: SB 16

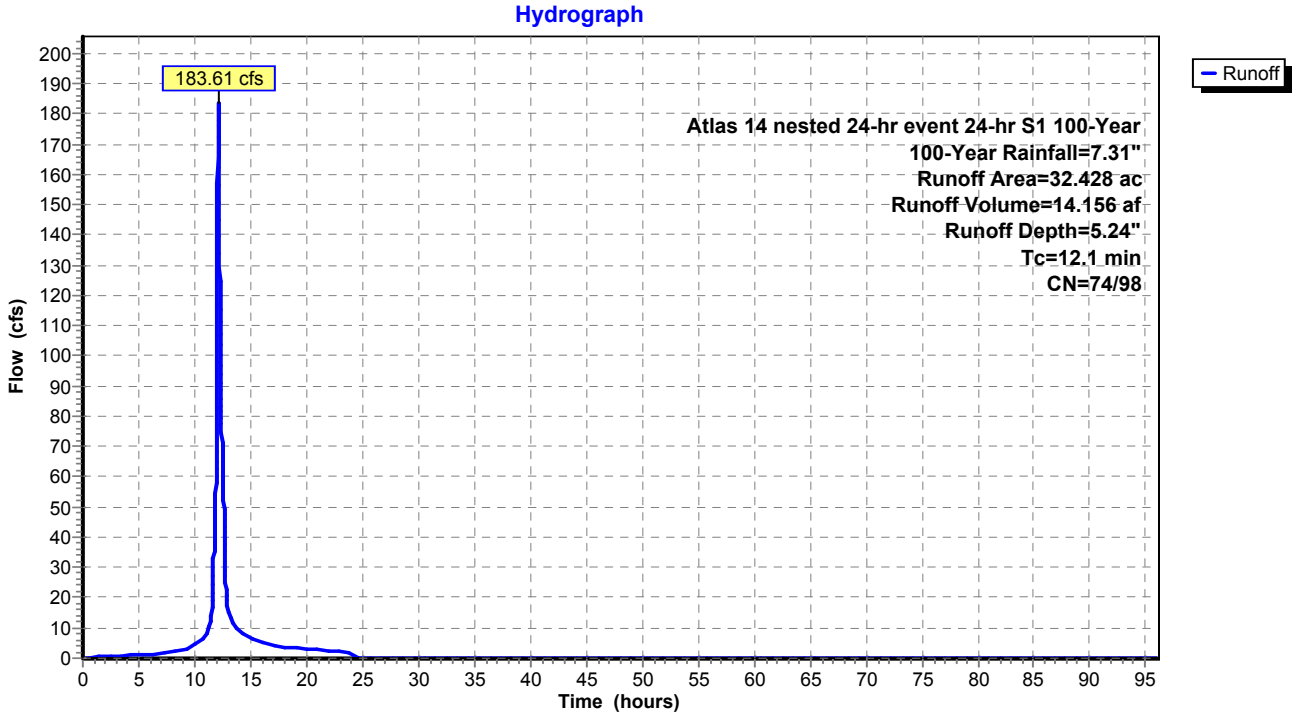
Runoff = 183.61 cfs @ 12.12 hrs, Volume= 14.156 af, Depth= 5.24"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 100-Year Rainfall=7.31"

	Area (ac)	CN	Description
*	21.555	74	pervious
*	10.873	98	impervious
	32.428	82	Weighted Average
	21.555	74	66.47% Pervious Area
	10.873	98	33.53% Impervious Area

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

Subcatchment SB 16: SB 16



Summary for Subcatchment SB 17: SB 17

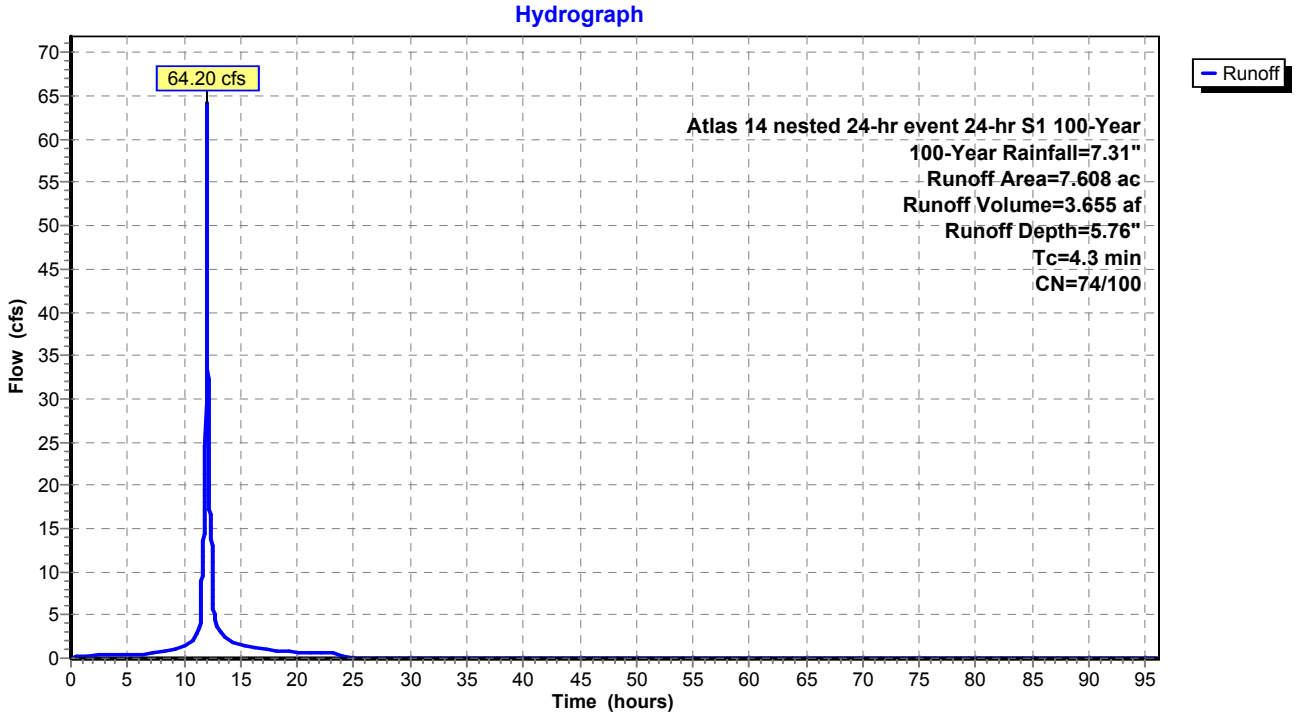
Runoff = 64.20 cfs @ 12.02 hrs, Volume= 3.655 af, Depth= 5.76"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 100-Year Rainfall=7.31"

	Area (ac)	CN	Description
*	3.925	74	pervious
*	3.683	100	impervious
	7.608	87	Weighted Average
	3.925	74	51.59% Pervious Area
	3.683	100	48.41% Impervious Area

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

Subcatchment SB 17: SB 17



Summary for Subcatchment SB 18: SB 18

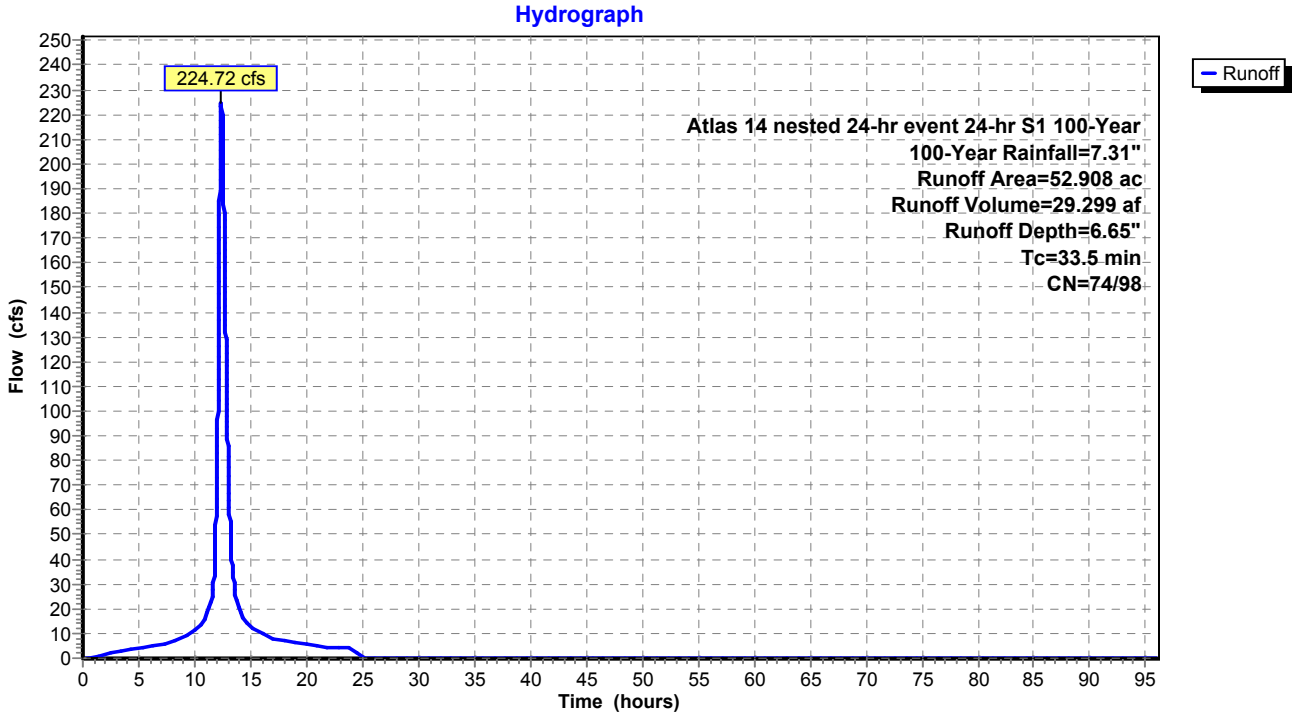
Runoff = 224.72 cfs @ 12.40 hrs, Volume= 29.299 af, Depth= 6.65"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 100-Year Rainfall=7.31"

	Area (ac)	CN	Description
*	8.172	74	pervious
*	44.736	98	impervious
	52.908	94	Weighted Average
	8.172	74	15.45% Pervious Area
	44.736	98	84.55% Impervious Area

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

Subcatchment SB 18: SB 18



Summary for Subcatchment SB 19: SB 19

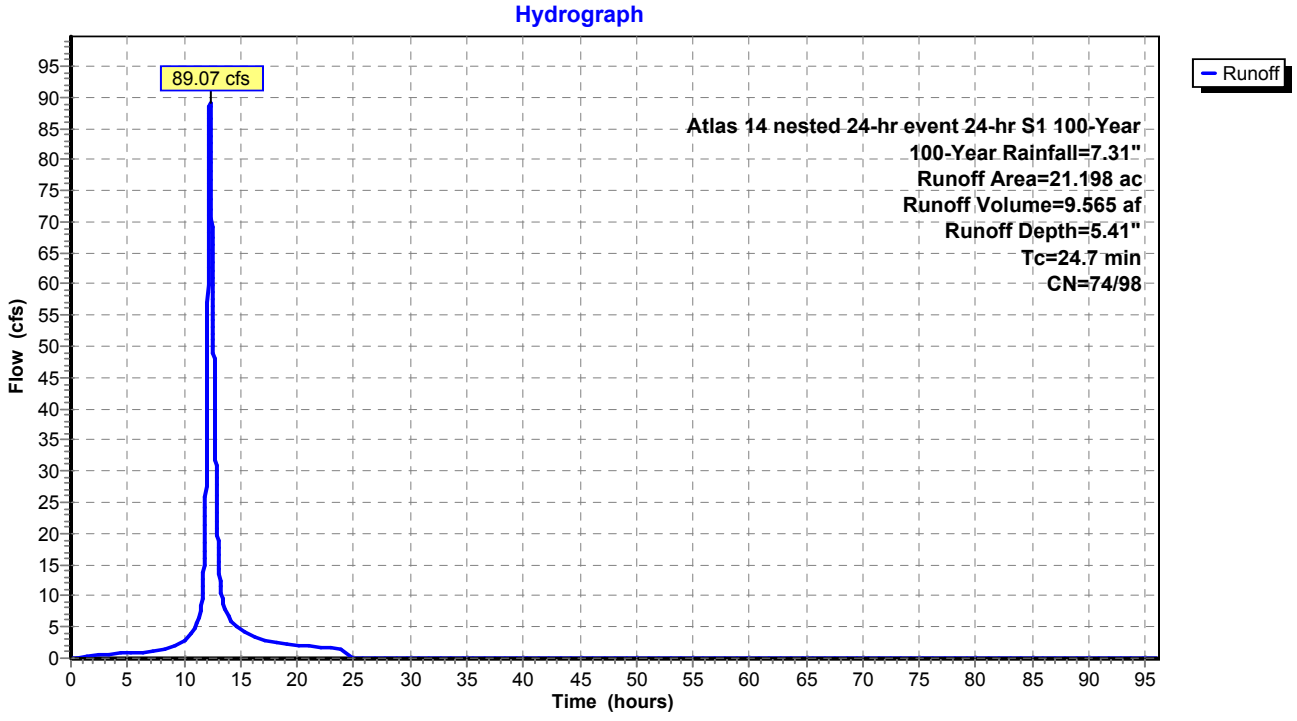
Runoff = 89.07 cfs @ 12.29 hrs, Volume= 9.565 af, Depth= 5.41"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 100-Year Rainfall=7.31"

	Area (ac)	CN	Description
*	12.734	74	pervious
*	8.464	98	impervious
	21.198	84	Weighted Average
	12.734	74	60.07% Pervious Area
	8.464	98	39.93% Impervious Area

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

Subcatchment SB 19: SB 19



Summary for Subcatchment SB 2: SB 2

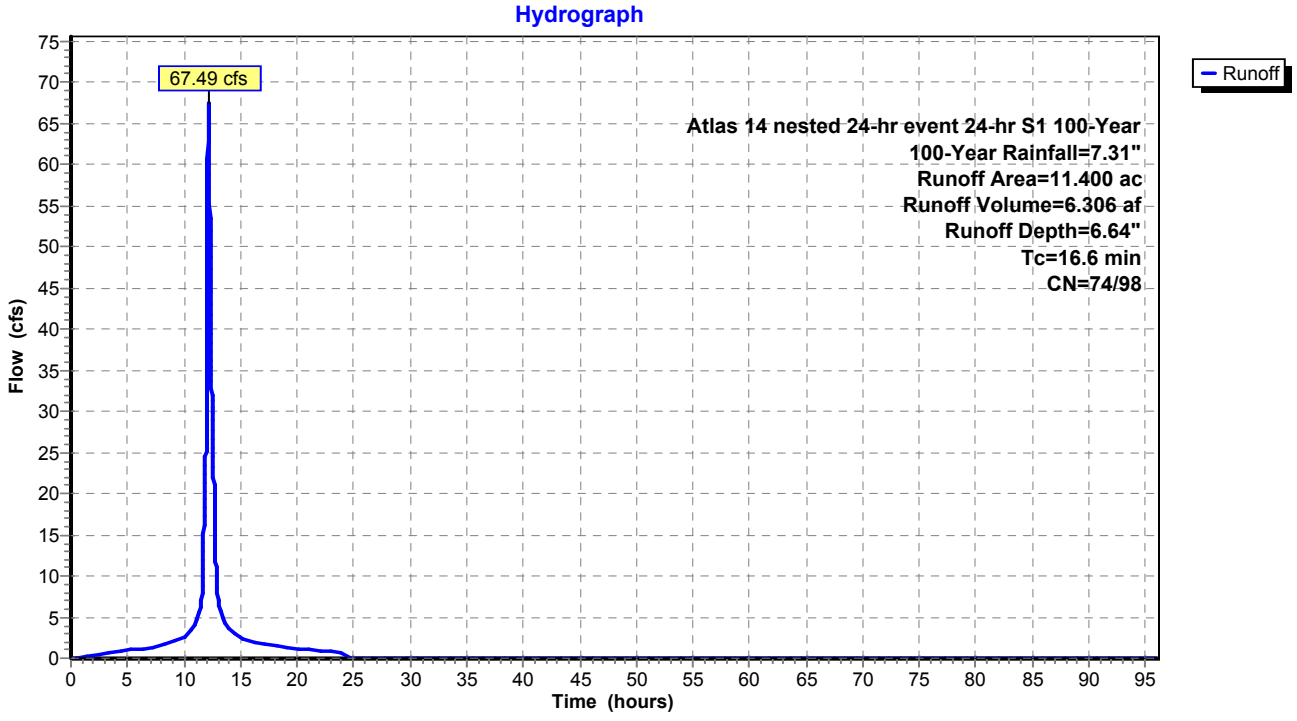
Runoff = 67.49 cfs @ 12.17 hrs, Volume= 6.306 af, Depth= 6.64"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 100-Year Rainfall=7.31"

	Area (ac)	CN	Description
*	1.791	74	pervious
*	9.609	98	impervious
	11.400	94	Weighted Average
	1.791	74	15.71% Pervious Area
	9.609	98	84.29% Impervious Area

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

Subcatchment SB 2: SB 2



Summary for Subcatchment SB 22: SB 22

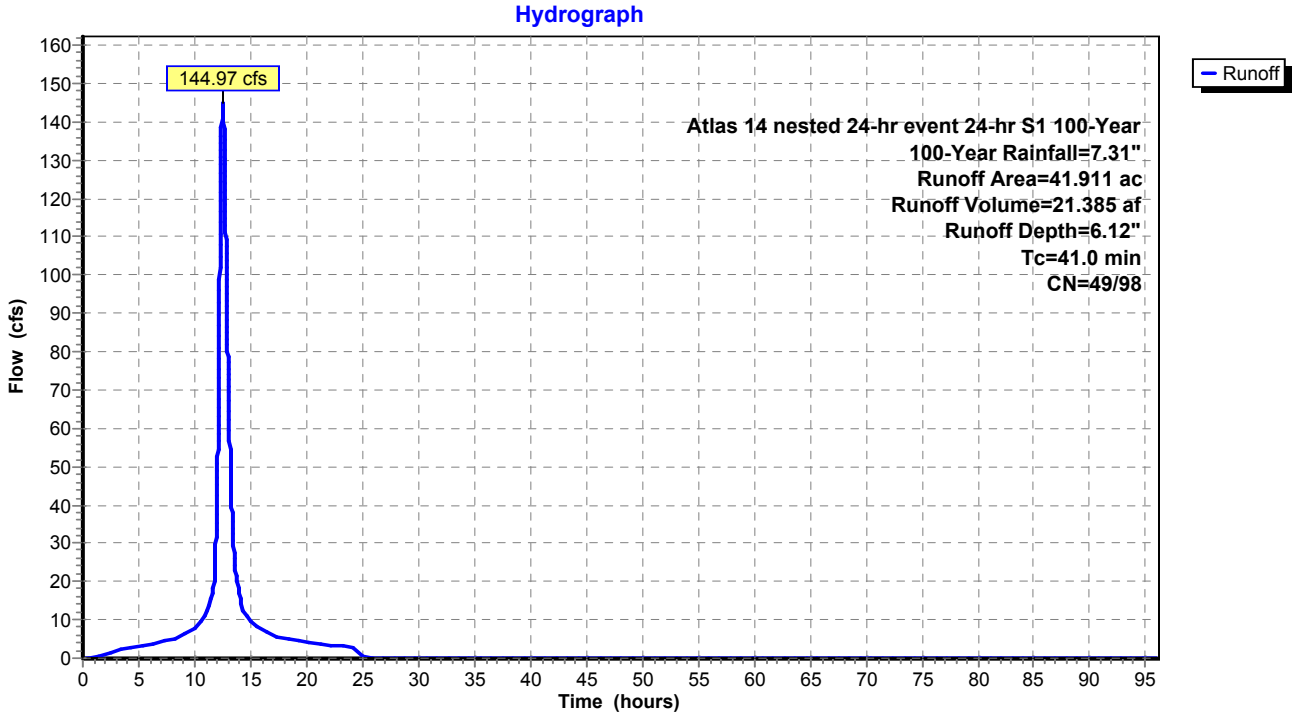
Runoff = 144.97 cfs @ 12.52 hrs, Volume= 21.385 af, Depth= 6.12"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 100-Year Rainfall=7.31"

	Area (ac)	CN	Description
*	7.465	49	Pervious
*	34.446	98	Impervious
	41.911	89	Weighted Average
	7.465	49	17.81% Pervious Area
	34.446	98	82.19% Impervious Area

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

Subcatchment SB 22: SB 22



Summary for Subcatchment SB 24: SB 24

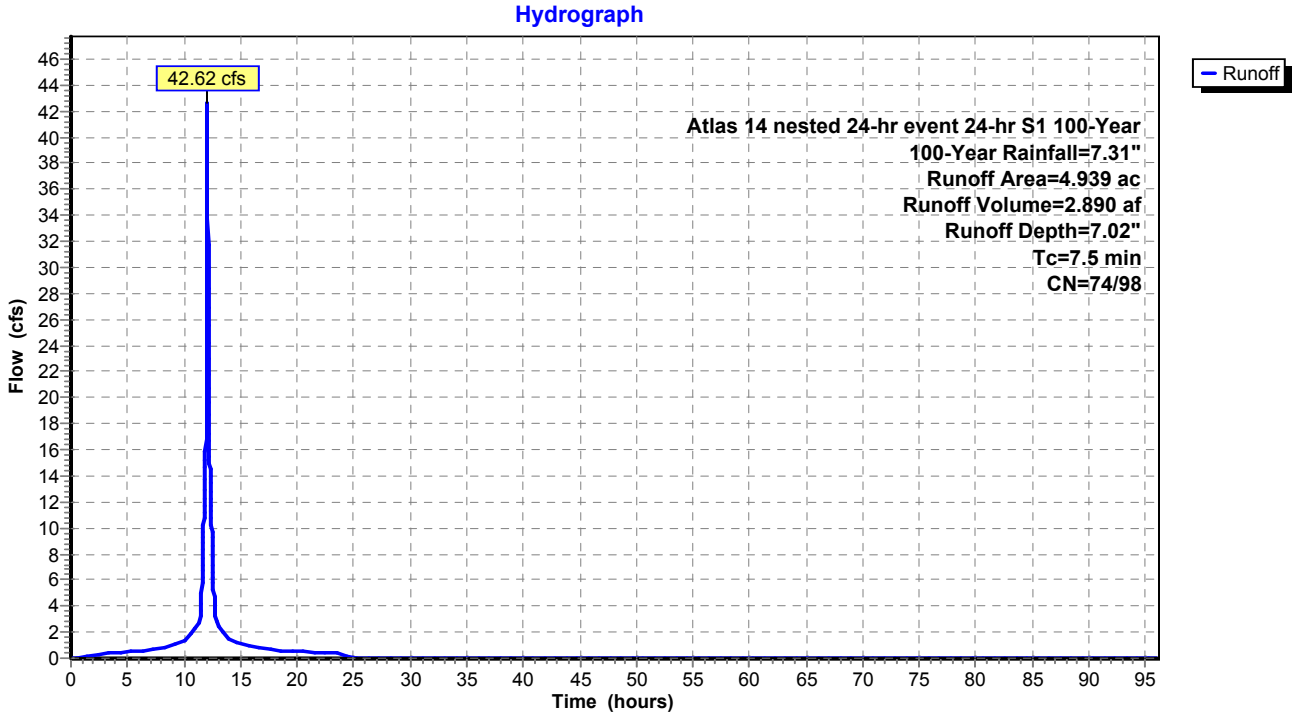
Runoff = 42.62 cfs @ 12.05 hrs, Volume= 2.890 af, Depth= 7.02"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 100-Year Rainfall=7.31"

	Area (ac)	CN	Description
*	0.088	74	permiable
*	4.851	98	impermiable
	4.939	98	Weighted Average
	0.088	74	1.78% Pervious Area
	4.851	98	98.22% Impervious Area

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

Subcatchment SB 24: SB 24



Summary for Subcatchment SB 25: SB 25

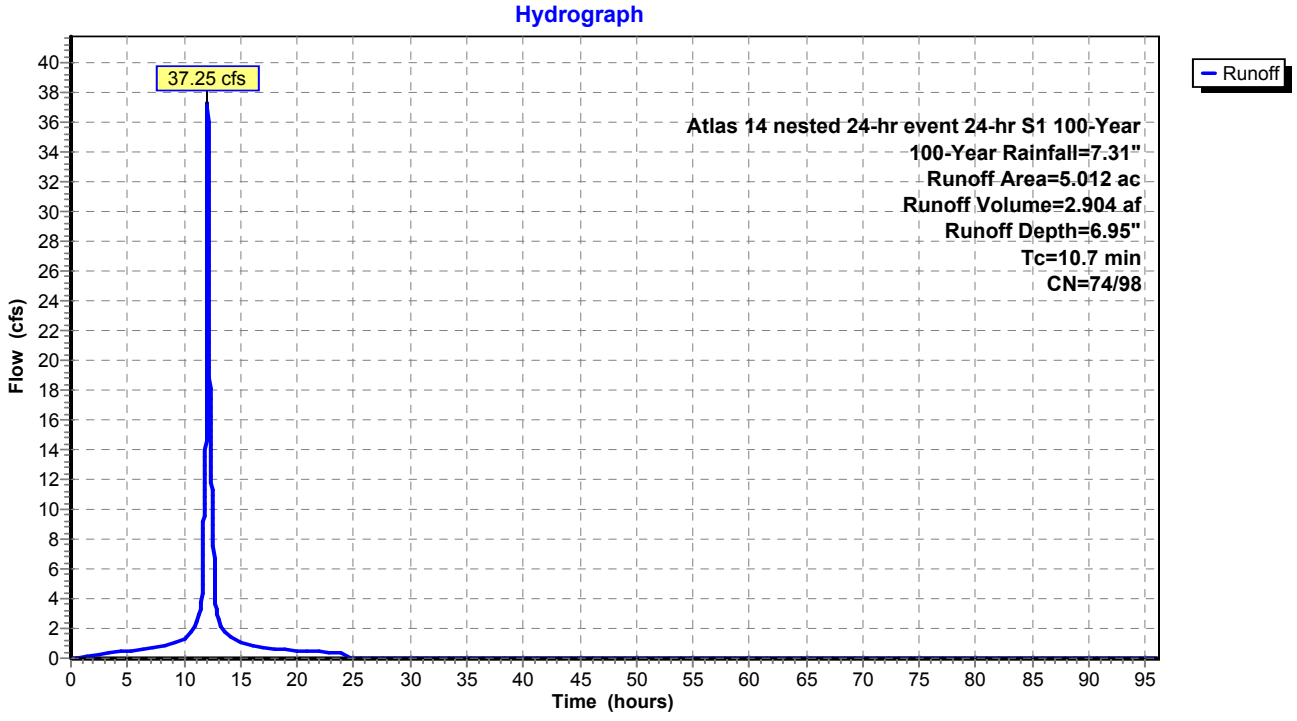
Runoff = 37.25 cfs @ 12.09 hrs, Volume= 2.904 af, Depth= 6.95"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 100-Year Rainfall=7.31"

	Area (ac)	CN	Description
*	0.215	74	pervious
*	4.797	98	impervious
	5.012	97	Weighted Average
	0.215	74	4.29% Pervious Area
	4.797	98	95.71% Impervious Area

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

Subcatchment SB 25: SB 25



Summary for Subcatchment SB 26: SB 26

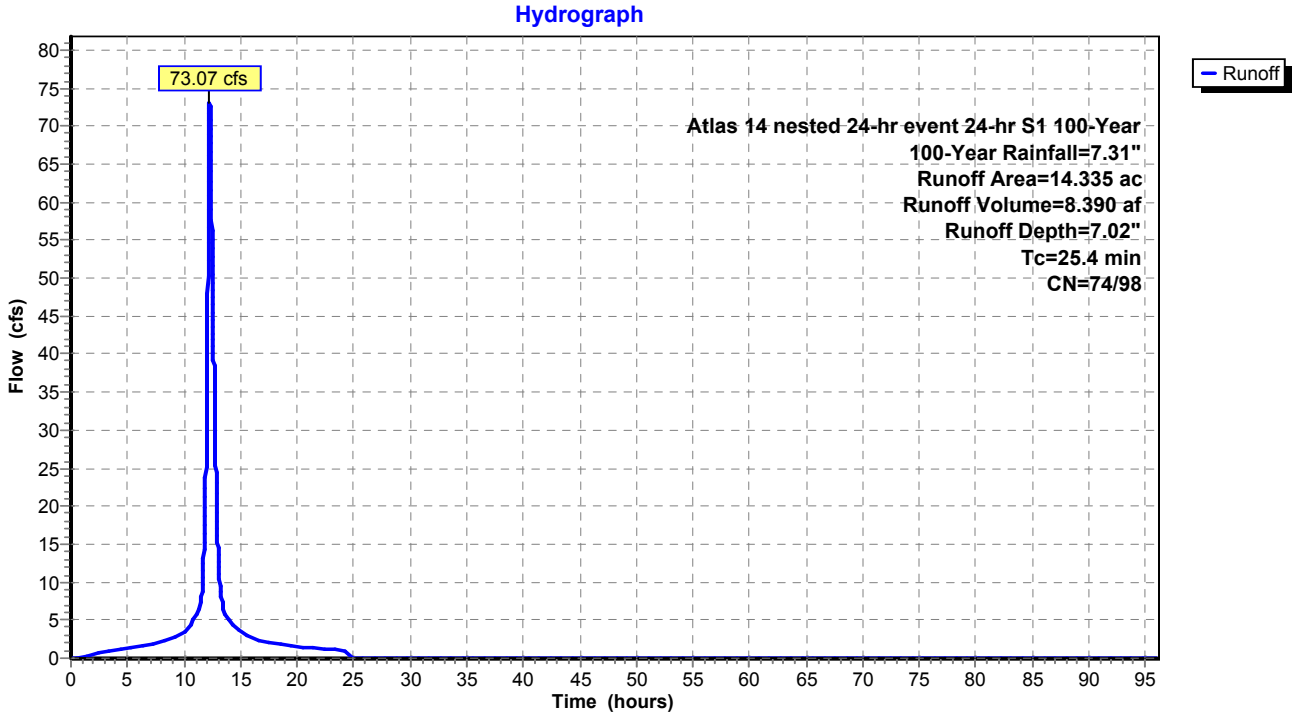
Runoff = 73.07 cfs @ 12.28 hrs, Volume= 8.390 af, Depth= 7.02"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 100-Year Rainfall=7.31"

	Area (ac)	CN	Description
*	0.248	74	pervious
*	14.087	98	impervious
	14.335	98	Weighted Average
	0.248	74	1.73% Pervious Area
	14.087	98	98.27% Impervious Area

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

Subcatchment SB 26: SB 26



Summary for Subcatchment SB 27: SB 27 (Thumb Road)

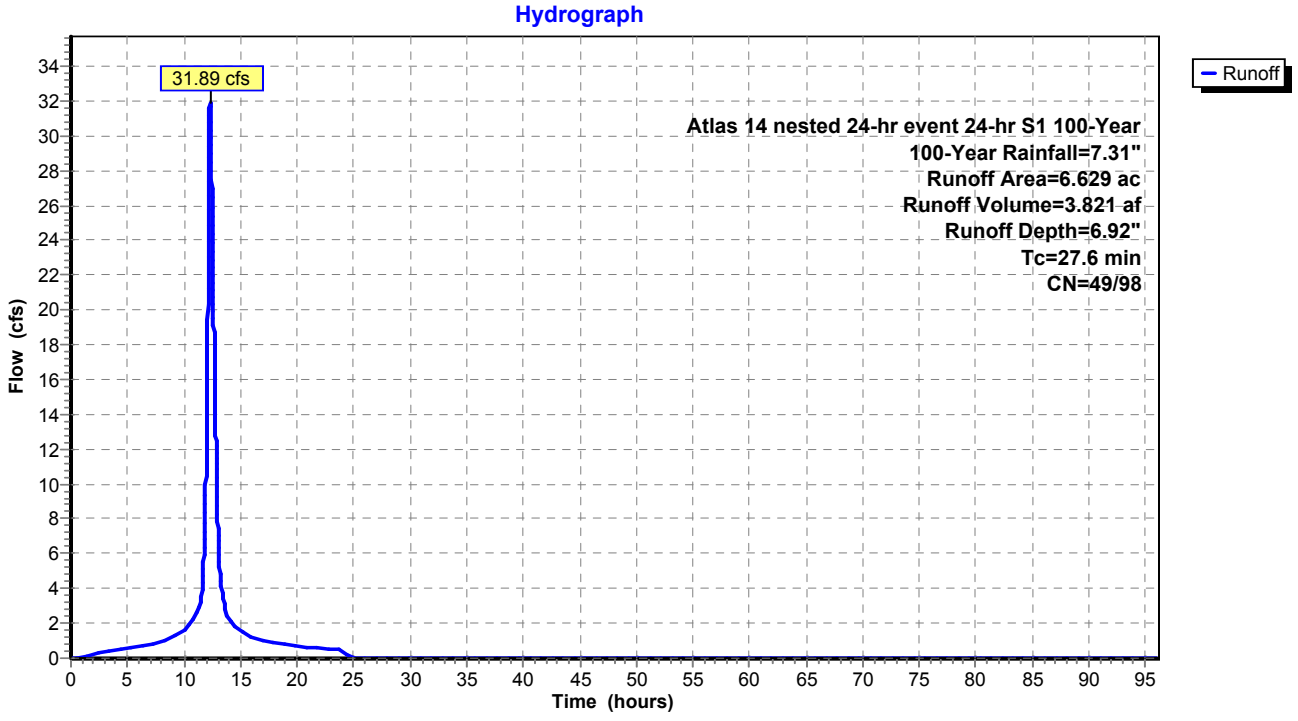
Runoff = 31.89 cfs @ 12.31 hrs, Volume= 3.821 af, Depth= 6.92"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 100-Year Rainfall=7.31"

	Area (ac)	CN	Description
*	0.191	49	Pervious
*	6.438	98	Impervious
	6.629	97	Weighted Average
	0.191	49	2.88% Pervious Area
	6.438	98	97.12% Impervious Area

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

Subcatchment SB 27: SB 27 (Thumb Road)



Summary for Subcatchment SB 28: SB 28

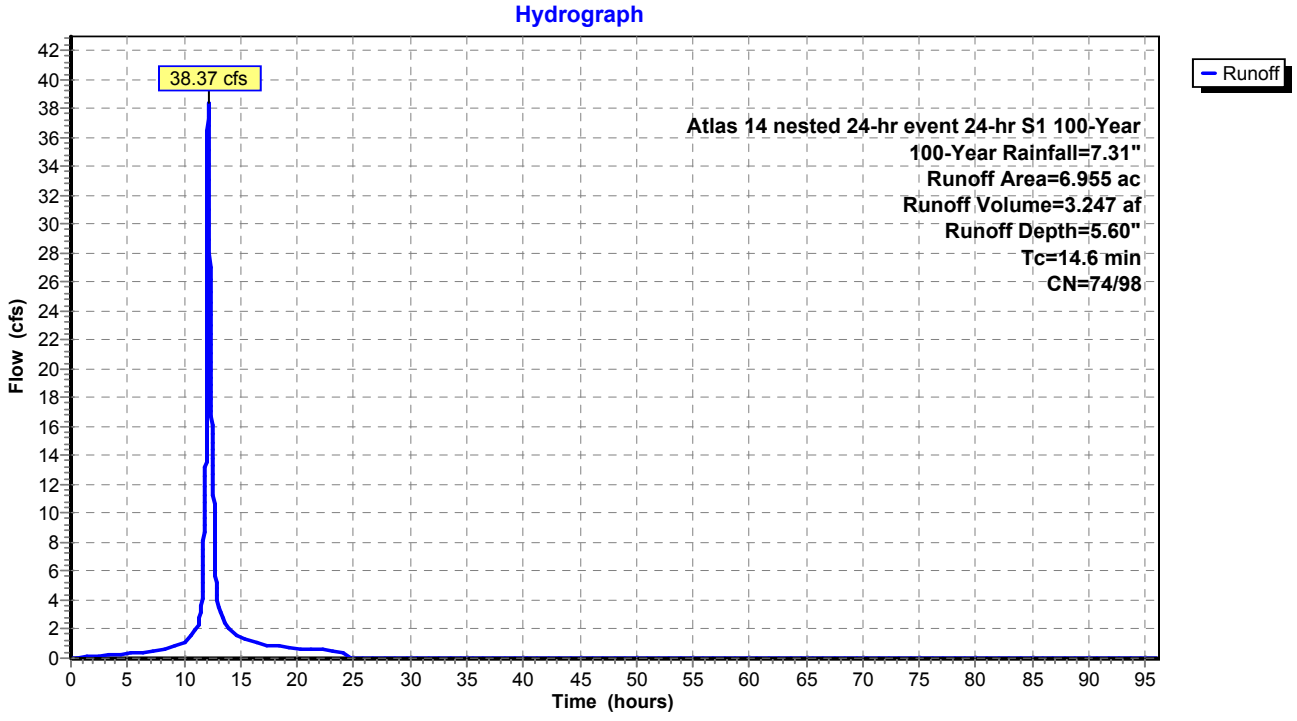
Runoff = 38.37 cfs @ 12.15 hrs, Volume= 3.247 af, Depth= 5.60"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 100-Year Rainfall=7.31"

	Area (ac)	CN	Description
*	3.703	74	pervious
*	3.252	98	impervious
	6.955	85	Weighted Average
	3.703	74	53.24% Pervious Area
	3.252	98	46.76% Impervious Area

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

Subcatchment SB 28: SB 28



Summary for Subcatchment SB 29: SB 29

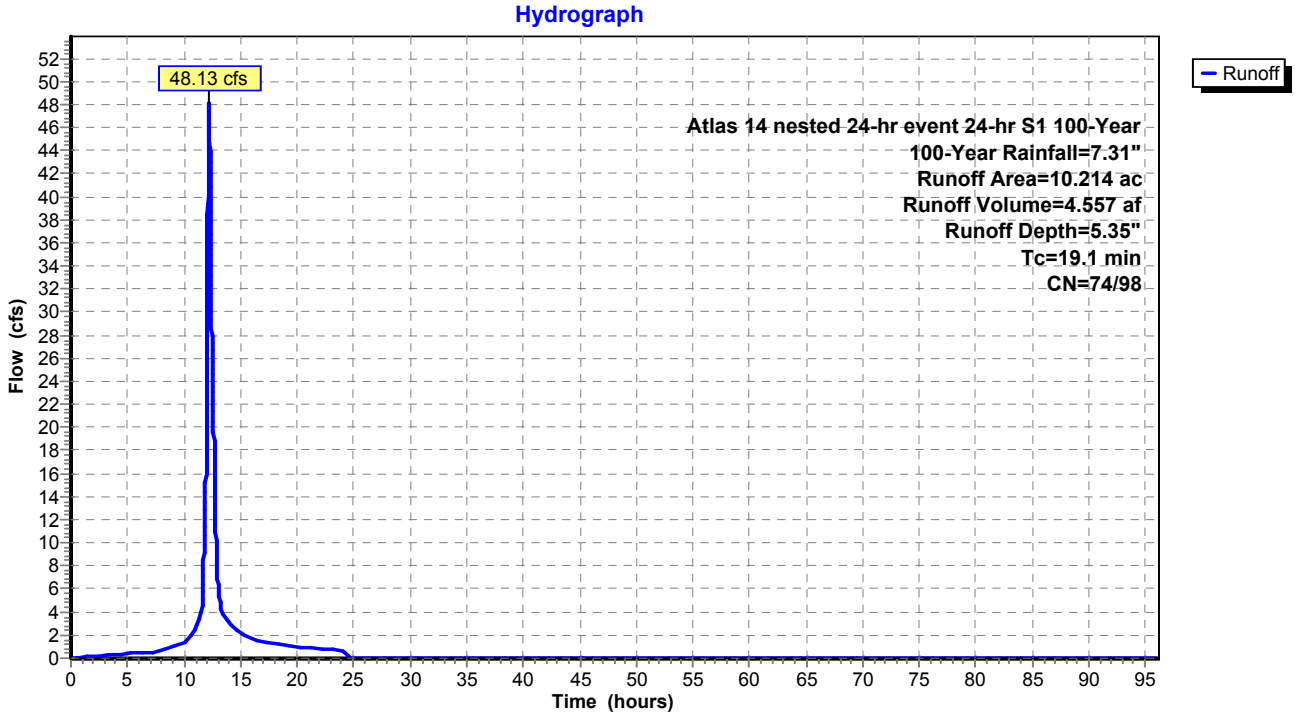
Runoff = 48.13 cfs @ 12.21 hrs, Volume= 4.557 af, Depth= 5.35"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 100-Year Rainfall=7.31"

	Area (ac)	CN	Description
*	6.360	74	pervious
*	3.854	98	impervious
	10.214	83	Weighted Average
	6.360	74	62.27% Pervious Area
	3.854	98	37.73% Impervious Area

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

Subcatchment SB 29: SB 29



Summary for Subcatchment SB 3: SB 3

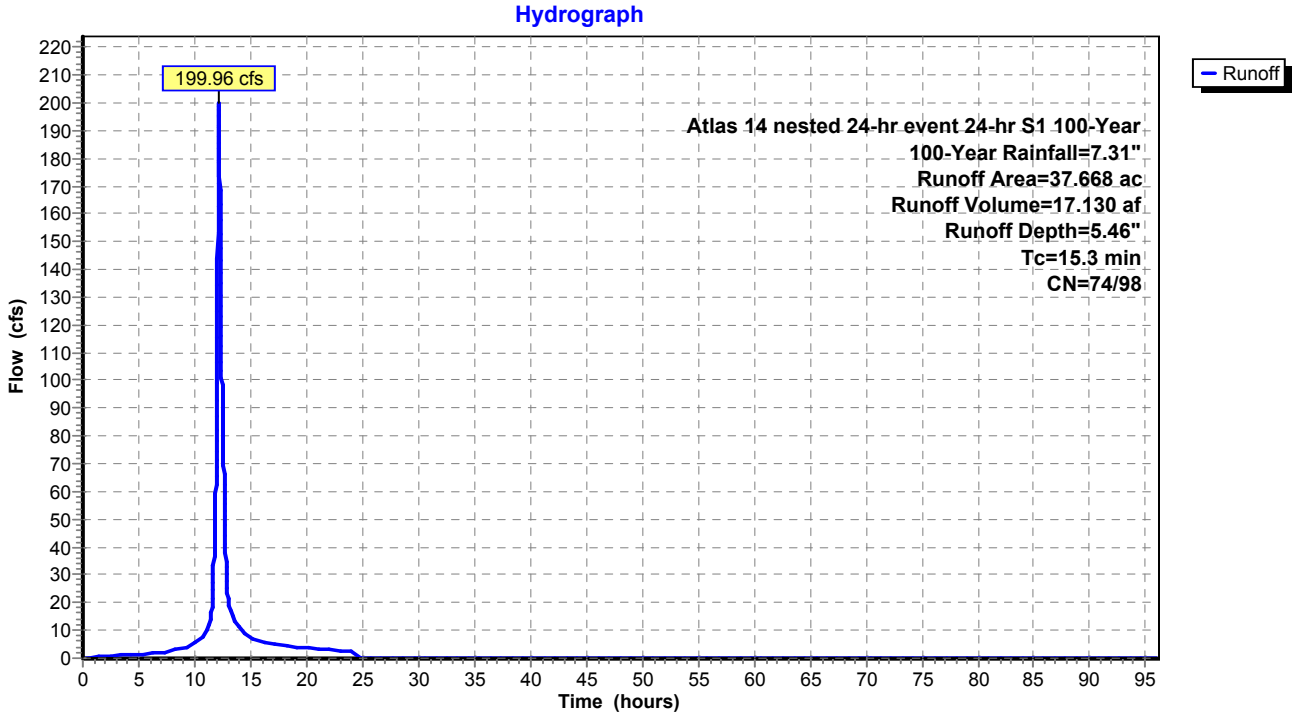
Runoff = 199.96 cfs @ 12.16 hrs, Volume= 17.130 af, Depth= 5.46"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 100-Year Rainfall=7.31"

	Area (ac)	CN	Description
*	22.050	74	Pervious
*	15.618	98	Impervious
	37.668	84	Weighted Average
	22.050	74	58.54% Pervious Area
	15.618	98	41.46% Impervious Area

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

Subcatchment SB 3: SB 3



Summary for Subcatchment SB 4: SB 4

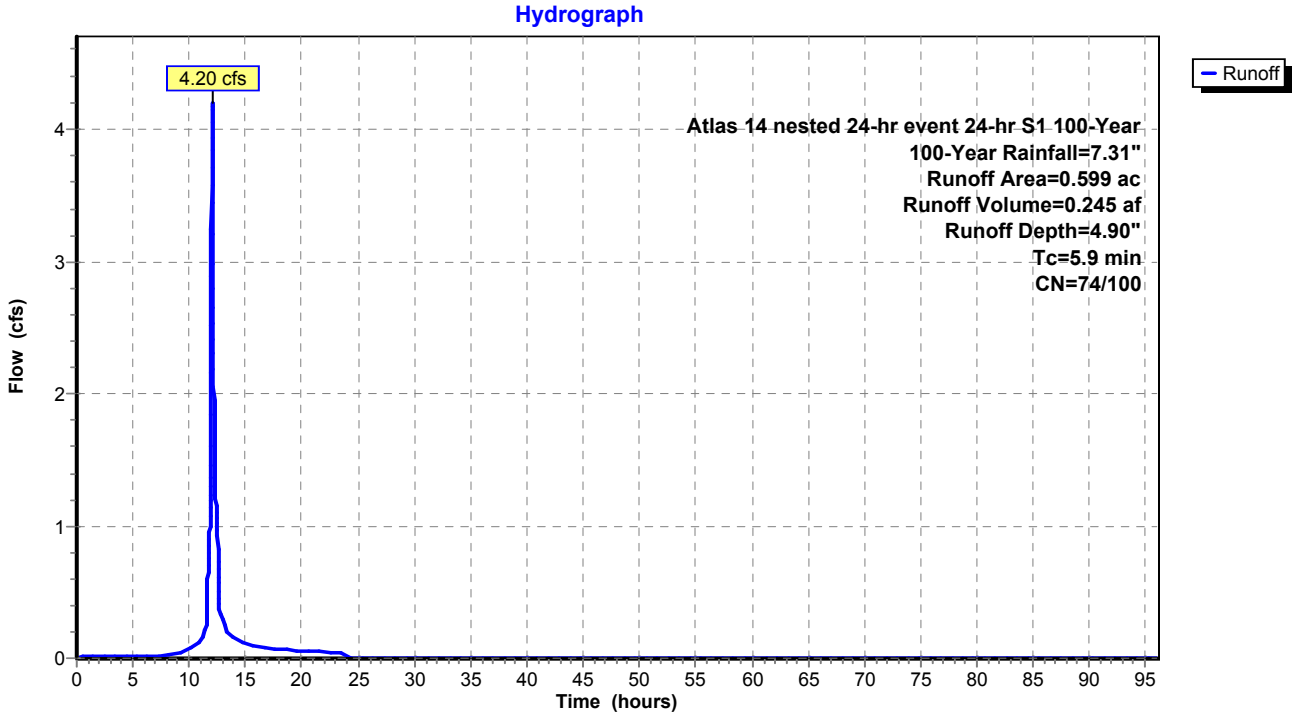
Runoff = 4.20 cfs @ 12.04 hrs, Volume= 0.245 af, Depth= 4.90"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 100-Year Rainfall=7.31"

	Area (ac)	CN	Description
*	0.481	74	pervious
*	0.118	100	impervious
	0.599	79	Weighted Average
	0.481	74	80.30% Pervious Area
	0.118	100	19.70% Impervious Area

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

Subcatchment SB 4: SB 4



Summary for Subcatchment SB 5: SB 5

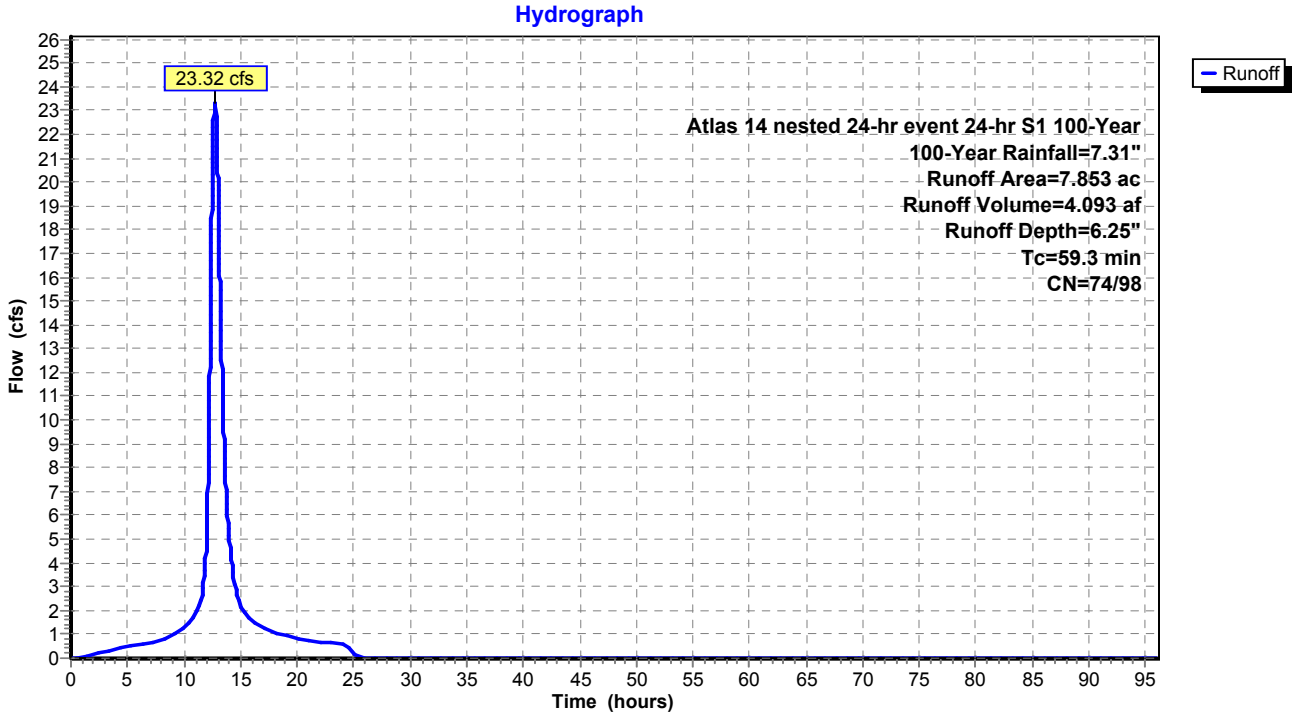
Runoff = 23.32 cfs @ 12.72 hrs, Volume= 4.093 af, Depth= 6.25"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 100-Year Rainfall=7.31"

	Area (ac)	CN	Description
*	2.327	74	pervious
*	5.526	98	impervious
	7.853	91	Weighted Average
	2.327	74	29.63% Pervious Area
	5.526	98	70.37% Impervious Area

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

Subcatchment SB 5: SB 5



Summary for Subcatchment SB 51: Offsite Subbasin 51

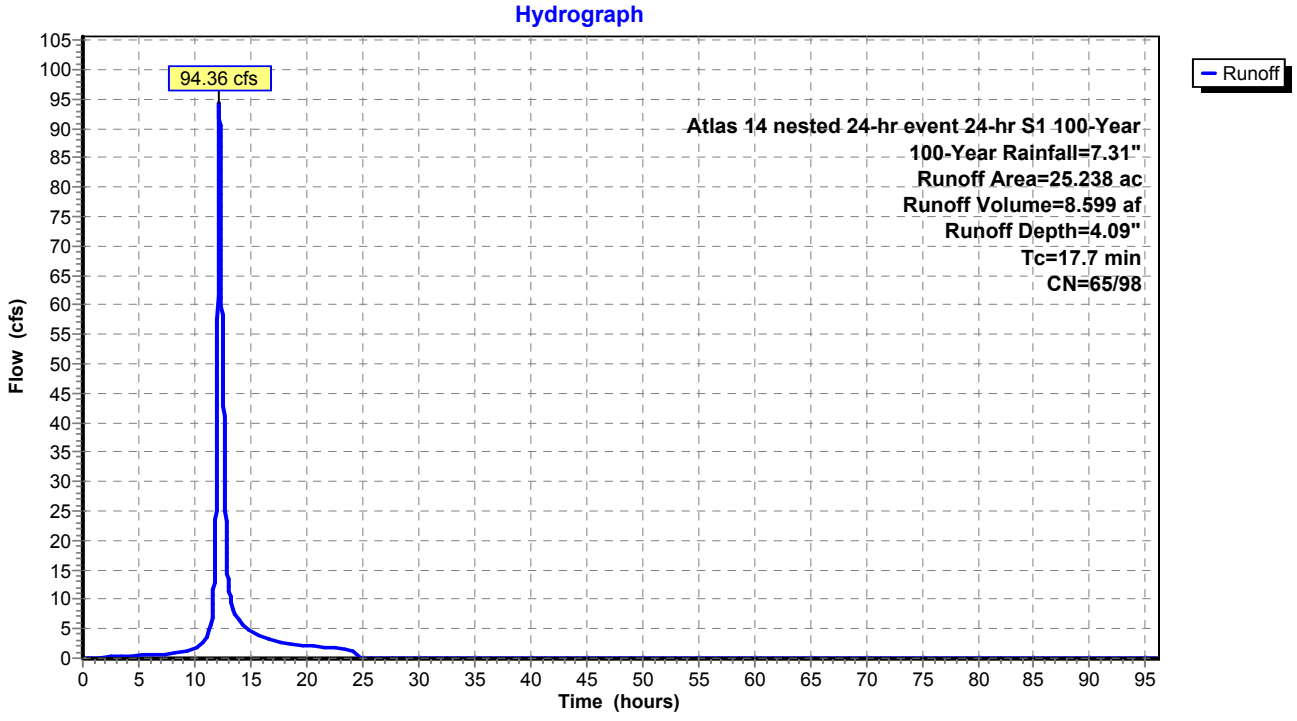
Runoff = 94.36 cfs @ 12.21 hrs, Volume= 8.599 af, Depth= 4.09"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 100-Year Rainfall=7.31"

	Area (ac)	CN	Description
*	20.200	65	Offsite subbasin 51
*	5.038	98	
	25.238	72	Weighted Average
	20.200	65	80.04% Pervious Area
	5.038	98	19.96% Impervious Area

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

Subcatchment SB 51: Offsite Subbasin 51



Summary for Subcatchment SB 6: SB 6

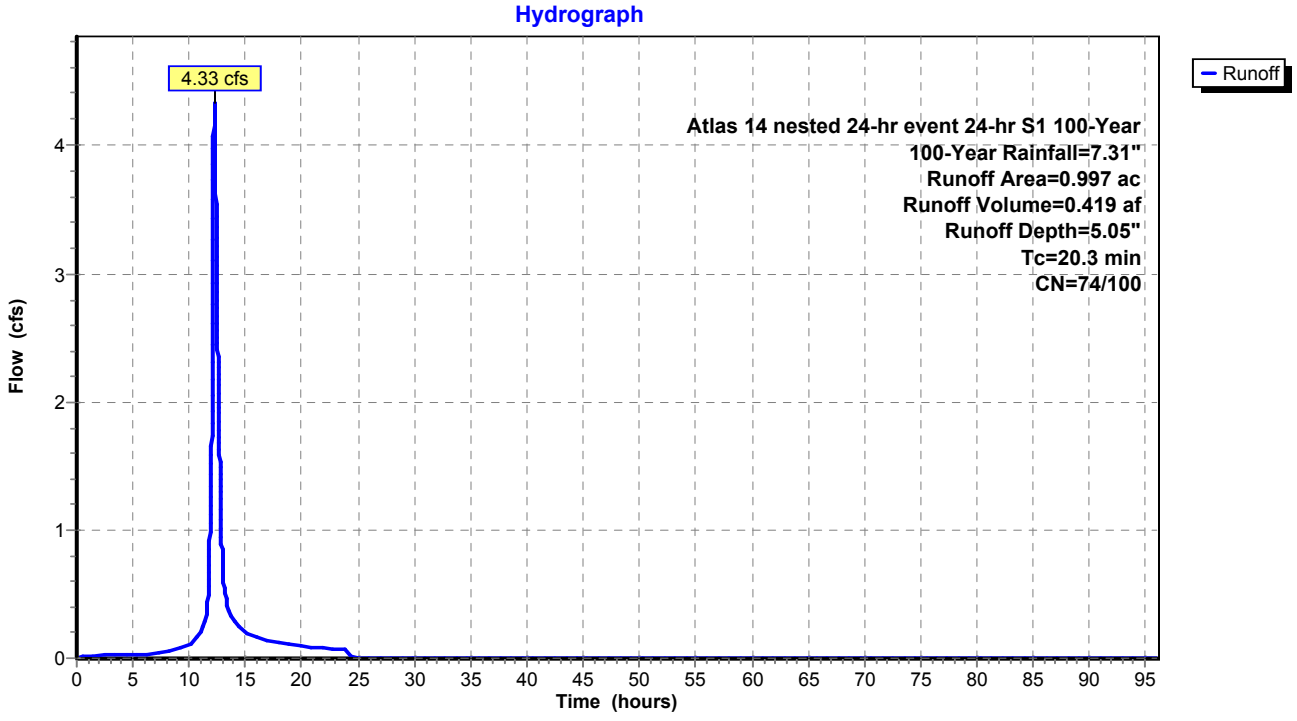
Runoff = 4.33 cfs @ 12.23 hrs, Volume= 0.419 af, Depth= 5.05"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 100-Year Rainfall=7.31"

	Area (ac)	CN	Description
*	0.753	74	pervious
*	0.244	100	impervious
	0.997	80	Weighted Average
	0.753	74	75.53% Pervious Area
	0.244	100	24.47% Impervious Area

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

Subcatchment SB 6: SB 6



Summary for Subcatchment SB 7: SB 7

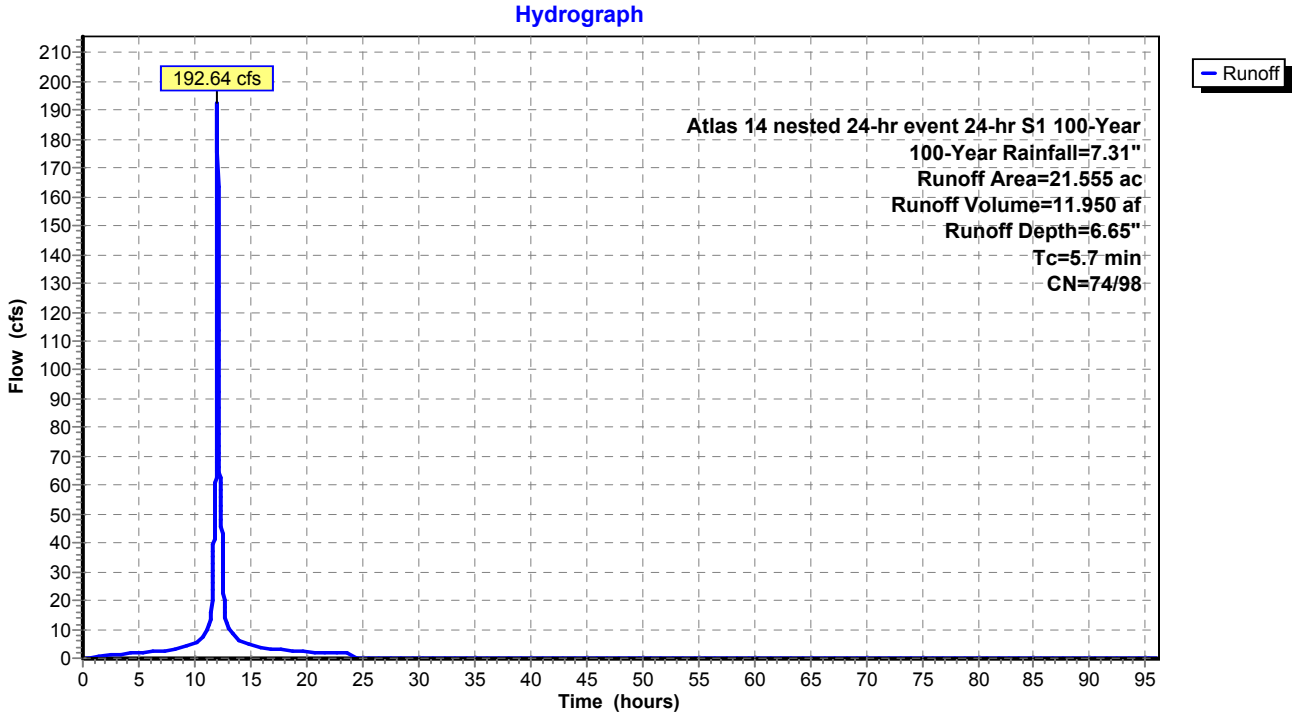
Runoff = 192.64 cfs @ 12.03 hrs, Volume= 11.950 af, Depth= 6.65"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 100-Year Rainfall=7.31"

	Area (ac)	CN	Description
*	3.269	74	pervious
*	18.286	98	impervious
	21.555	94	Weighted Average
	3.269	74	15.17% Pervious Area
	18.286	98	84.83% Impervious Area

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

Subcatchment SB 7: SB 7



Summary for Subcatchment SB 8: SB 8

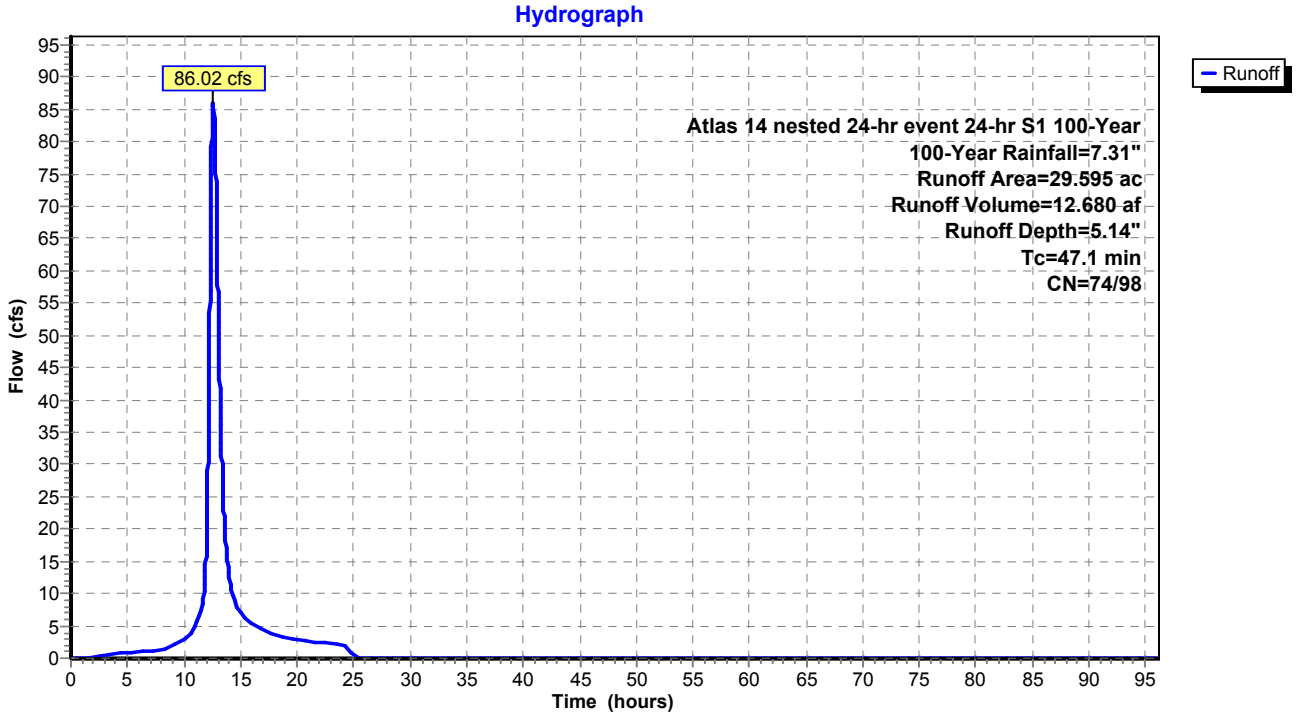
Runoff = 86.02 cfs @ 12.61 hrs, Volume= 12.680 af, Depth= 5.14"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 100-Year Rainfall=7.31"

	Area (ac)	CN	Description
*	20.714	74	pervious
*	8.881	98	impervious
	29.595	81	Weighted Average
	20.714	74	69.99% Pervious Area
	8.881	98	30.01% Impervious Area

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

Subcatchment SB 8: SB 8



Summary for Subcatchment SB 9: SB 9

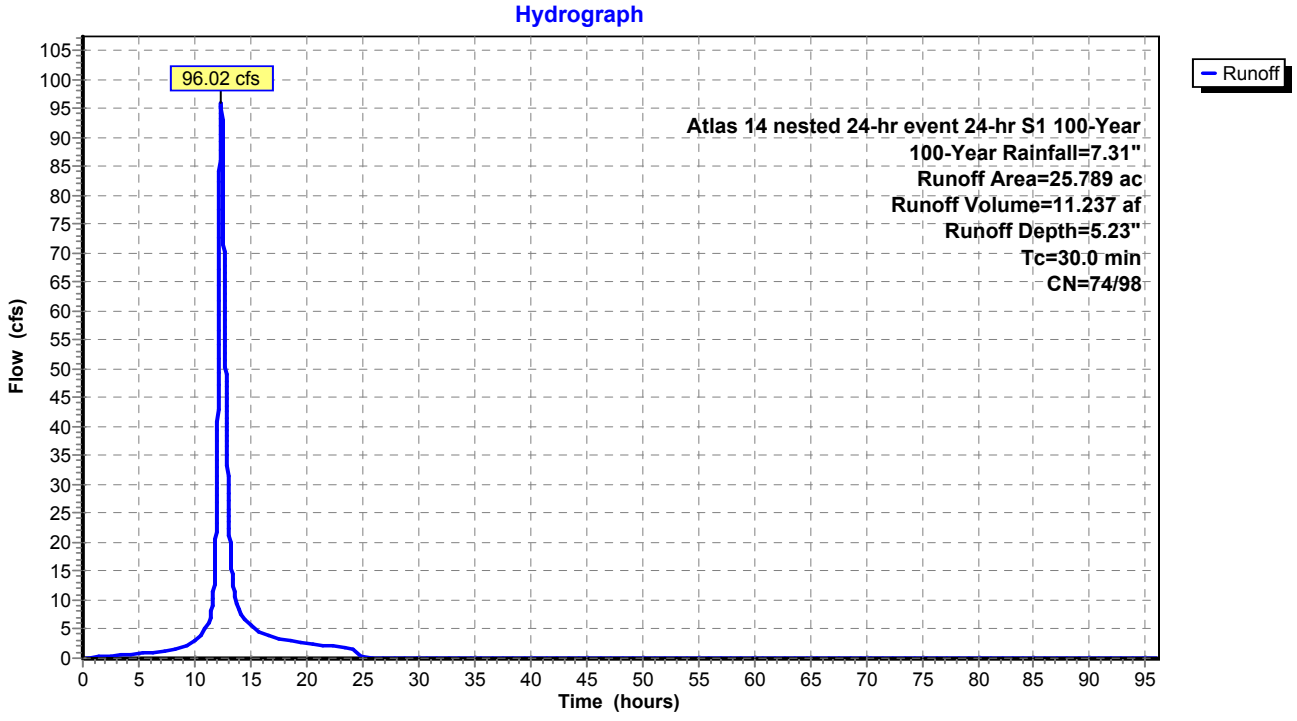
Runoff = 96.02 cfs @ 12.37 hrs, Volume= 11.237 af, Depth= 5.23"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-96.00 hrs, dt= 0.01
Atlas 14 nested 24-hr event 24-hr S1 100-Year 100-Year Rainfall=7.31"

	Area (ac)	CN	Description
*	17.234	74	permiable
*	8.555	98	impermiable
	25.789	82	Weighted Average
	17.234	74	66.83% Pervious Area
	8.555	98	33.17% Impervious Area

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

Subcatchment SB 9: SB 9



Summary for Reach 30R: 60" RCP to existing 60" storm sewer

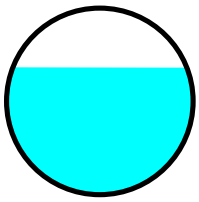
[52] Hint: Inlet/Outlet conditions not evaluated
[65] Warning: Inlet elevation not specified
[55] Hint: Peak inflow is 109% of Manning's capacity

Inflow Area = 133.365 ac, 58.87% Impervious, Inflow Depth = 5.59" for 100-Year event
Inflow = 261.46 cfs @ 12.82 hrs, Volume= 62.165 af
Outflow = 261.45 cfs @ 12.83 hrs, Volume= 62.165 af, Atten= 0%, Lag= 0.4 min

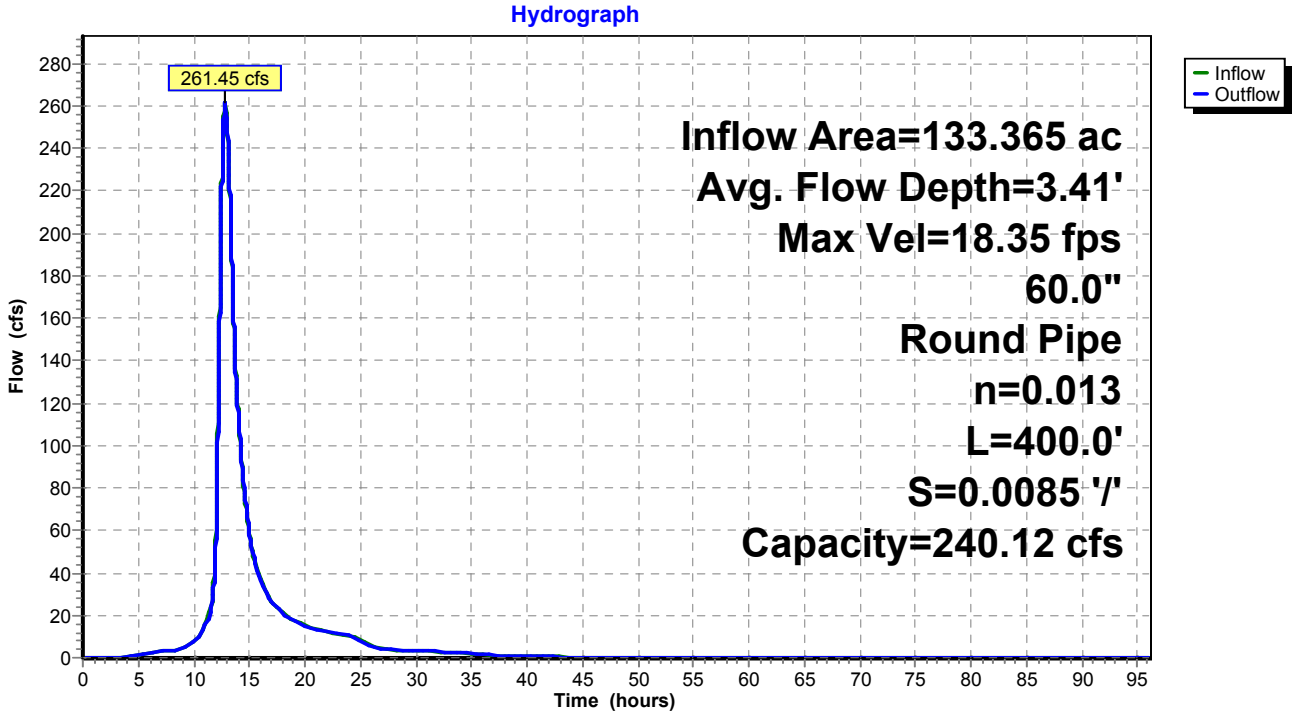
Routing by Muskingum-Cunge method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Reference Flow= 196.09 cfs Estimated Depth= 3.43' Velocity= 13.64 fps
m= 1.345, c= 18.34 fps, dt= 0.6 min, dx= 400.0' / 1 = 400.0', K= 0.4 min, X= 0.124
Max. Velocity= 18.35 fps, Min. Travel Time= 0.4 min
Avg. Velocity = 18.34 fps, Avg. Travel Time= 0.4 min

Peak Storage= 5,703 cf @ 12.83 hrs
Average Depth at Peak Storage= 3.41'
Bank-Full Depth= 5.00' Flow Area= 19.6 sf, Capacity= 240.12 cfs

60.0" Round Pipe
n= 0.013
Length= 400.0' Slope= 0.0085 '/'
Inlet Invert= 0.00', Outlet Invert= -3.40'



Reach 30R: 60" RCP to existing 60" storm sewer



Summary for Reach 34R: 60" RCP connecting P-1/P-2 with P-3

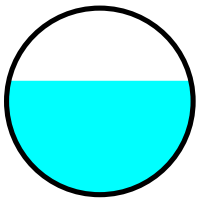
[52] Hint: Inlet/Outlet conditions not evaluated
[65] Warning: Inlet elevation not specified

Inflow Area = 68.531 ac, 57.92% Impervious, Inflow Depth = 5.91" for 100-Year event
Inflow = 174.02 cfs @ 12.70 hrs, Volume= 33.752 af
Outflow = 173.89 cfs @ 12.74 hrs, Volume= 33.752 af, Atten= 0%, Lag= 2.6 min

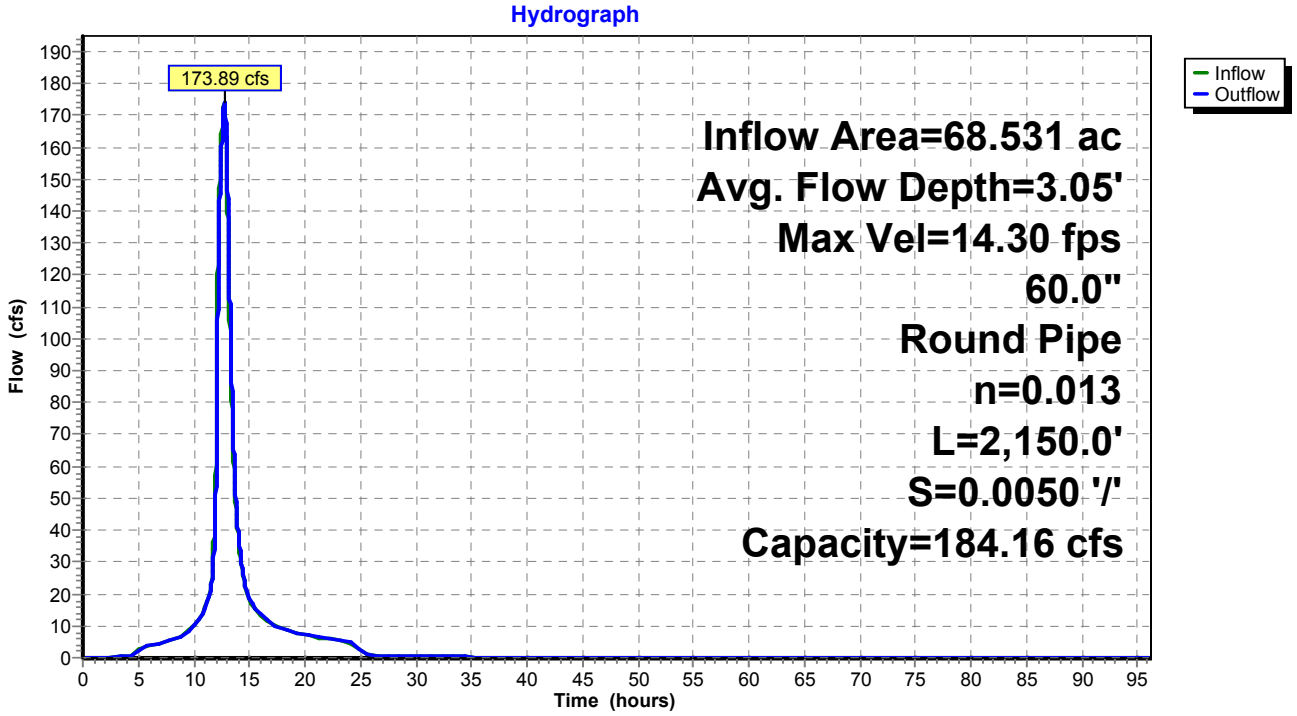
Routing by Muskingum-Cunge method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Reference Flow= 130.51 cfs Estimated Depth= 3.11' Velocity= 10.17 fps
m= 1.361, c= 13.85 fps, dt= 0.6 min, dx= 2,150.0' / 4 = 537.5', K= 0.6 min, X= 0.075
Max. Velocity= 14.30 fps, Min. Travel Time= 2.5 min
Avg. Velocity = 13.84 fps, Avg. Travel Time= 2.6 min

Peak Storage= 27,002 cf @ 12.72 hrs
Average Depth at Peak Storage= 3.05'
Bank-Full Depth= 5.00' Flow Area= 19.6 sf, Capacity= 184.16 cfs

60.0" Round Pipe
n= 0.013
Length= 2,150.0' Slope= 0.0050 '/'
Inlet Invert= 0.00', Outlet Invert= -10.75'



Reach 34R: 60" RCP connecting P-1/P-2 with P-3



Summary for Reach 37R: 48" RCP

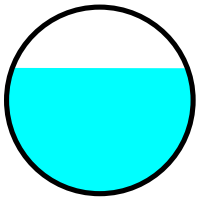
[52] Hint: Inlet/Outlet conditions not evaluated
[65] Warning: Inlet elevation not specified
[97] Warning: Factor X out of range
[55] Hint: Peak inflow is 107% of Manning's capacity

Inflow Area = 43.279 ac, 47.44% Impervious, Inflow Depth = 4.57" for 100-Year event
Inflow = 119.35 cfs @ 12.39 hrs, Volume= 16.468 af
Outflow = 119.34 cfs @ 12.40 hrs, Volume= 16.468 af, Atten= 0%, Lag= 0.3 min

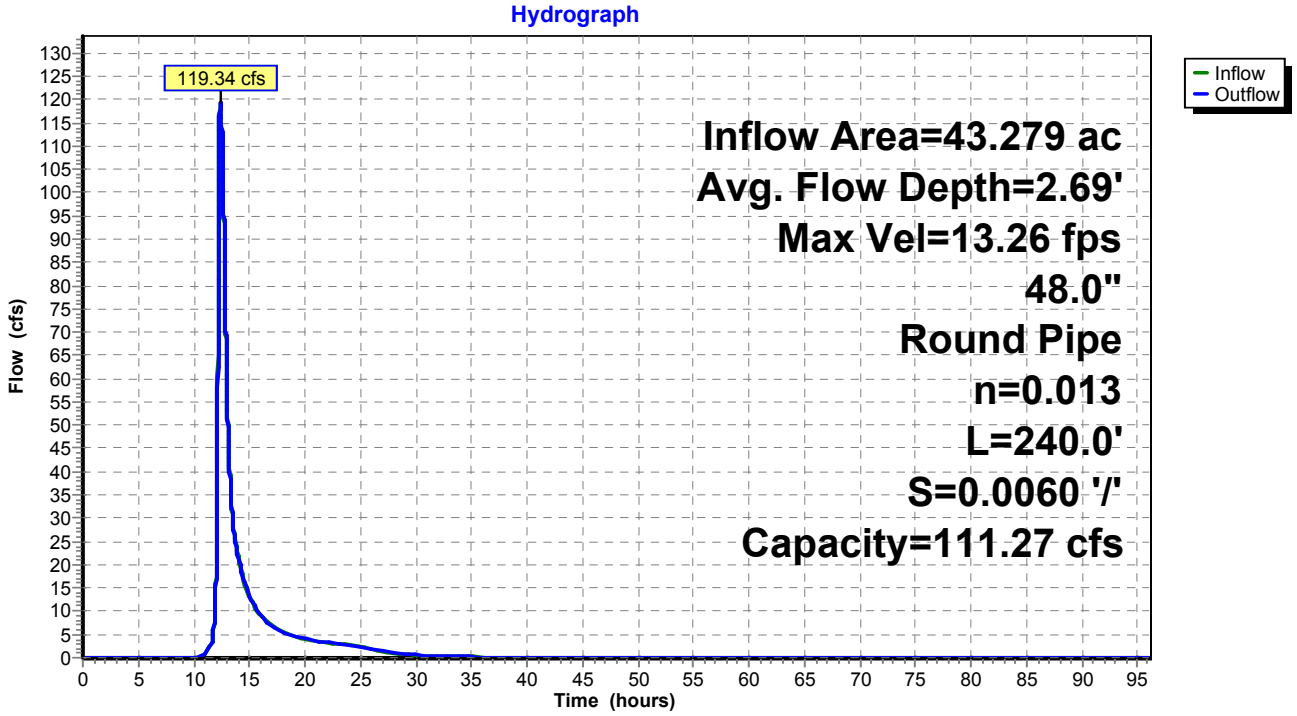
Routing by Muskingum-Cunge method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Reference Flow= 89.51 cfs Estimated Depth= 2.72' Velocity= 9.85 fps
m= 1.347, c= 13.26 fps, dt= 0.6 min, dx= 240.0' / 1 = 240.0', K= 0.3 min, X= 0.000
Max. Velocity= 13.26 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 13.26 fps, Avg. Travel Time= 0.3 min

Peak Storage= 2,160 cf @ 12.40 hrs
Average Depth at Peak Storage= 2.69'
Bank-Full Depth= 4.00' Flow Area= 12.6 sf, Capacity= 111.27 cfs

48.0" Round Pipe
n= 0.013
Length= 240.0' Slope= 0.0060 '/'
Inlet Invert= 0.00', Outlet Invert= -1.44'



Reach 37R: 48" RCP



Summary for Reach 39R: 24" RCP

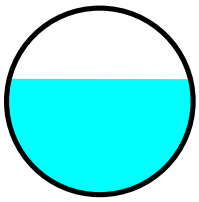
[52] Hint: Inlet/Outlet conditions not evaluated
[65] Warning: Inlet elevation not specified
[97] Warning: Factor X out of range

Inflow Area = 8.850 ac, 65.20% Impervious, Inflow Depth = 6.12" for 100-Year event
Inflow = 15.41 cfs @ 13.18 hrs, Volume= 4.512 af
Outflow = 15.41 cfs @ 13.18 hrs, Volume= 4.512 af, Atten= 0%, Lag= 0.2 min

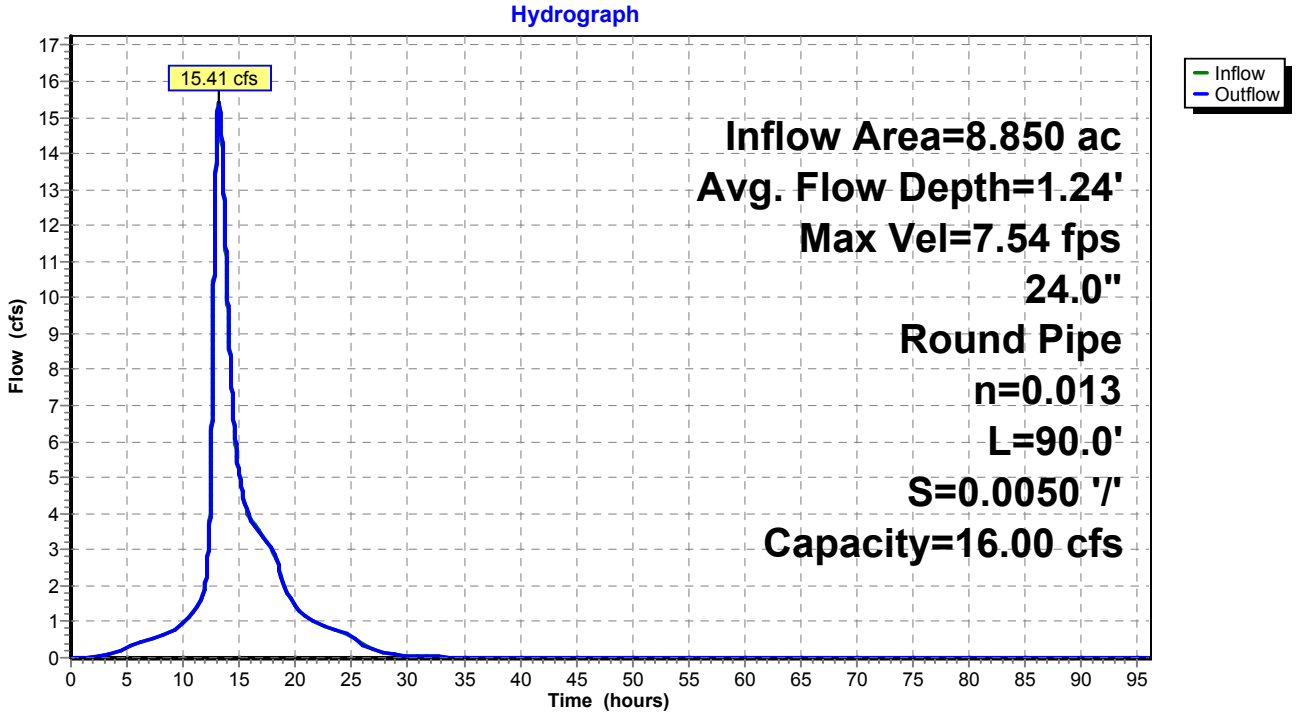
Routing by Muskingum-Cunge method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Reference Flow= 11.56 cfs Estimated Depth= 1.26' Velocity= 5.55 fps
m= 1.359, c= 7.54 fps, dt= 0.6 min, dx= 90.0' / 1 = 90.0', K= 0.2 min, X= 0.000
Max. Velocity= 7.54 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 7.54 fps, Avg. Travel Time= 0.2 min

Peak Storage= 184 cf @ 13.18 hrs
Average Depth at Peak Storage= 1.24'
Bank-Full Depth= 2.00' Flow Area= 3.1 sf, Capacity= 16.00 cfs

24.0" Round Pipe
n= 0.013
Length= 90.0' Slope= 0.0050 '/'
Inlet Invert= 0.00', Outlet Invert= -0.45'



Reach 39R: 24" RCP



Summary for Reach 43R: 30" RCP connecting P-10 with P-12

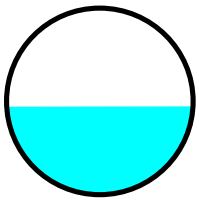
[52] Hint: Inlet/Outlet conditions not evaluated
[79] Warning: Submerged Pond 10P Primary device # 1 by 1.18'

Inflow Area = 66.448 ac, 29.37% Impervious, Inflow Depth > 2.22" for 100-Year event
Inflow = 15.89 cfs @ 12.63 hrs, Volume= 12.301 af
Outflow = 15.89 cfs @ 12.66 hrs, Volume= 12.301 af, Atten= 0%, Lag= 1.9 min

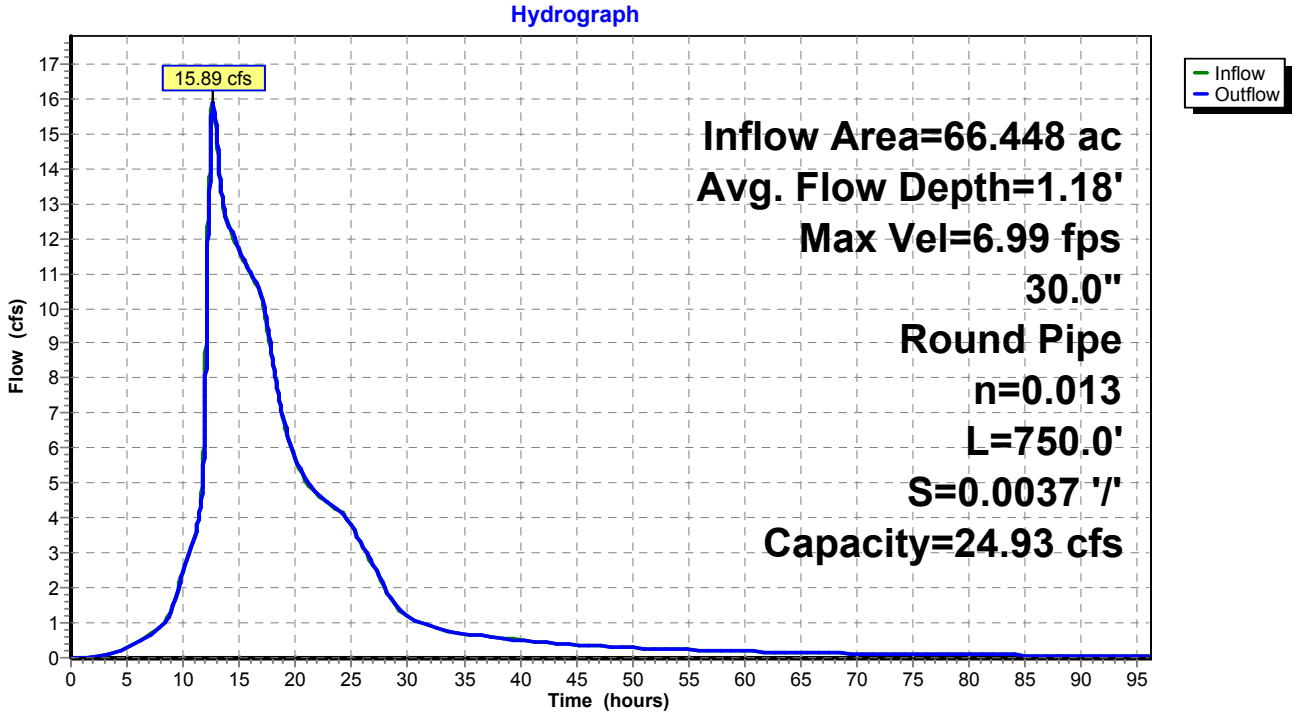
Routing by Muskingum-Cunge method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Reference Flow= 11.92 cfs Estimated Depth= 1.22' Velocity= 5.02 fps
m= 1.387, c= 6.97 fps, dt= 0.6 min, dx= 750.0' / 3 = 250.0', K= 0.6 min, X= 0.025
Max. Velocity= 6.99 fps, Min. Travel Time= 1.8 min
Avg. Velocity = 6.96 fps, Avg. Travel Time= 1.8 min

Peak Storage= 1,711 cf @ 12.65 hrs
Average Depth at Peak Storage= 1.18'
Bank-Full Depth= 2.50' Flow Area= 4.9 sf, Capacity= 24.93 cfs

30.0" Round Pipe
n= 0.013
Length= 750.0' Slope= 0.0037 '/'
Inlet Invert= 896.00', Outlet Invert= 893.23'



Reach 43R: 30" RCP connecting P-10 with P-12



Summary for Reach 51R: 40' x 4.5 ft parabolic hannel from P-13 to Rice Creek

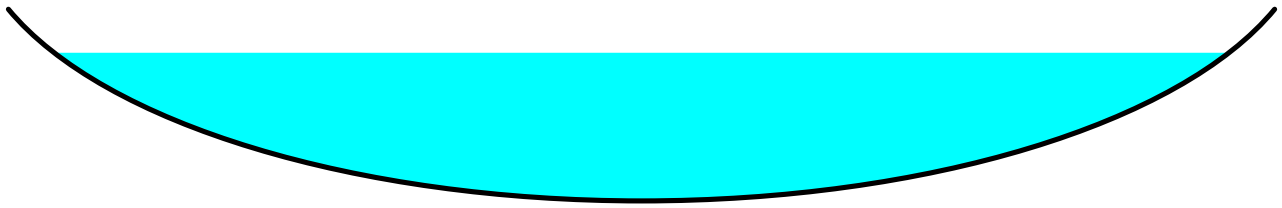
[65] Warning: Inlet elevation not specified
[97] Warning: Factor X out of range

Inflow Area = 245.501 ac, 51.49% Impervious, Inflow Depth > 5.64" for 100-Year event
Inflow = 625.92 cfs @ 12.47 hrs, Volume= 115.289 af
Outflow = 625.70 cfs @ 12.48 hrs, Volume= 115.289 af, Atten= 0%, Lag= 0.7 min

Routing by Muskingum-Cunge method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Reference Flow= 469.44 cfs Estimated Depth= 3.66' Velocity= 5.34 fps
m= 1.437, c= 7.67 fps, dt= 0.6 min, dx= 300.0' / 1 = 300.0', K= 0.7 min, X= 0.000
Max. Velocity= 7.67 fps, Min. Travel Time= 0.7 min
Avg. Velocity = 7.67 fps, Avg. Travel Time= 0.7 min

Peak Storage= 24,460 cf @ 12.48 hrs
Average Depth at Peak Storage= 3.48'
Bank-Full Depth= 4.50' Flow Area= 120.0 sf, Capacity= 733.43 cfs

40.00' x 4.50' deep Parabolic Channel, n= 0.035
Length= 300.0' Slope= 0.0050 '/'
Inlet Invert= 0.00', Outlet Invert= -1.50'



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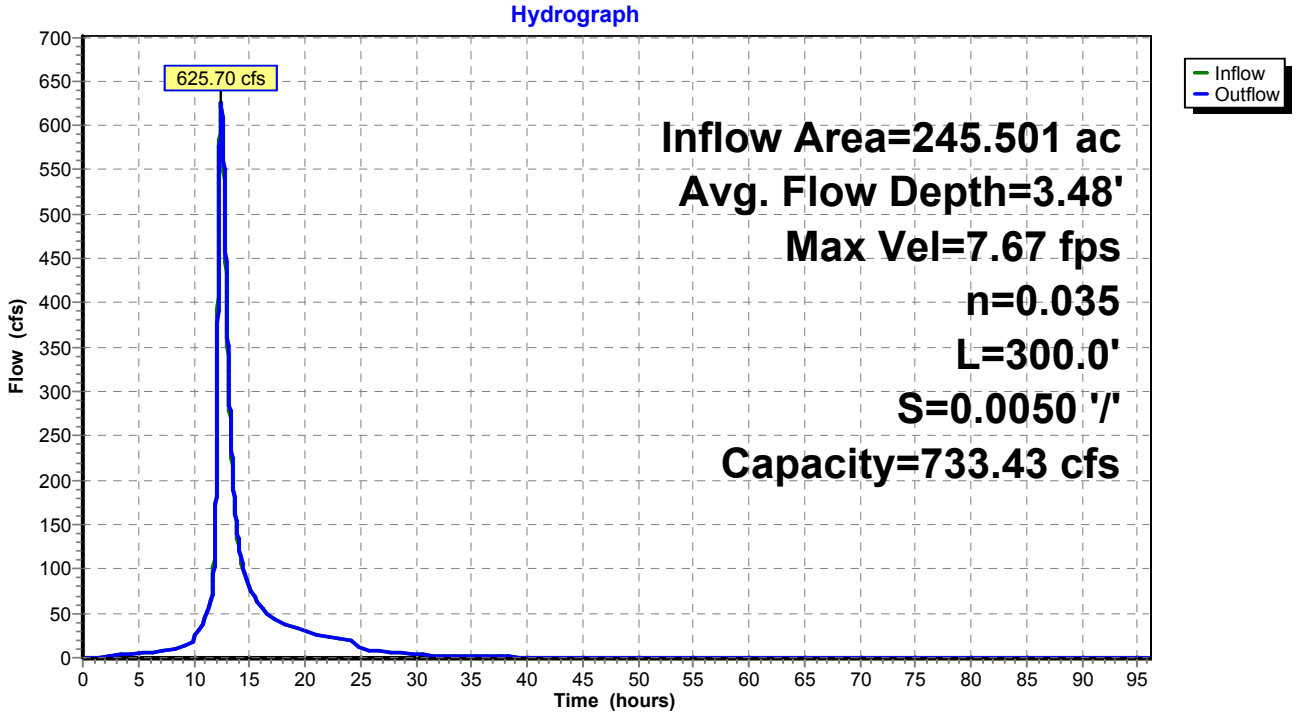
Reach 51R: 40' x 4.5 ft parabolic hannel from P-13 to Rice Creek



Summary for Pond 3P: P-3

Inflow Area = 133.365 ac, 58.87% Impervious, Inflow Depth = 5.59" for 100-Year event
Inflow = 314.07 cfs @ 12.44 hrs, Volume= 62.170 af
Outflow = 261.46 cfs @ 12.82 hrs, Volume= 62.165 af, Atten= 17%, Lag= 22.9 min
Primary = 261.46 cfs @ 12.82 hrs, Volume= 62.165 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Starting Elev= 914.00' Surf.Area= 1.790 ac Storage= 5.827 af
Peak Elev= 919.66' @ 12.82 hrs Surf.Area= 2.870 ac Storage= 19.133 af (13.306 af above start)

Plug-Flow detention time= 190.1 min calculated for 56.332 af (91% of inflow)
Center-of-Mass det. time= 93.5 min (938.2 - 844.7)

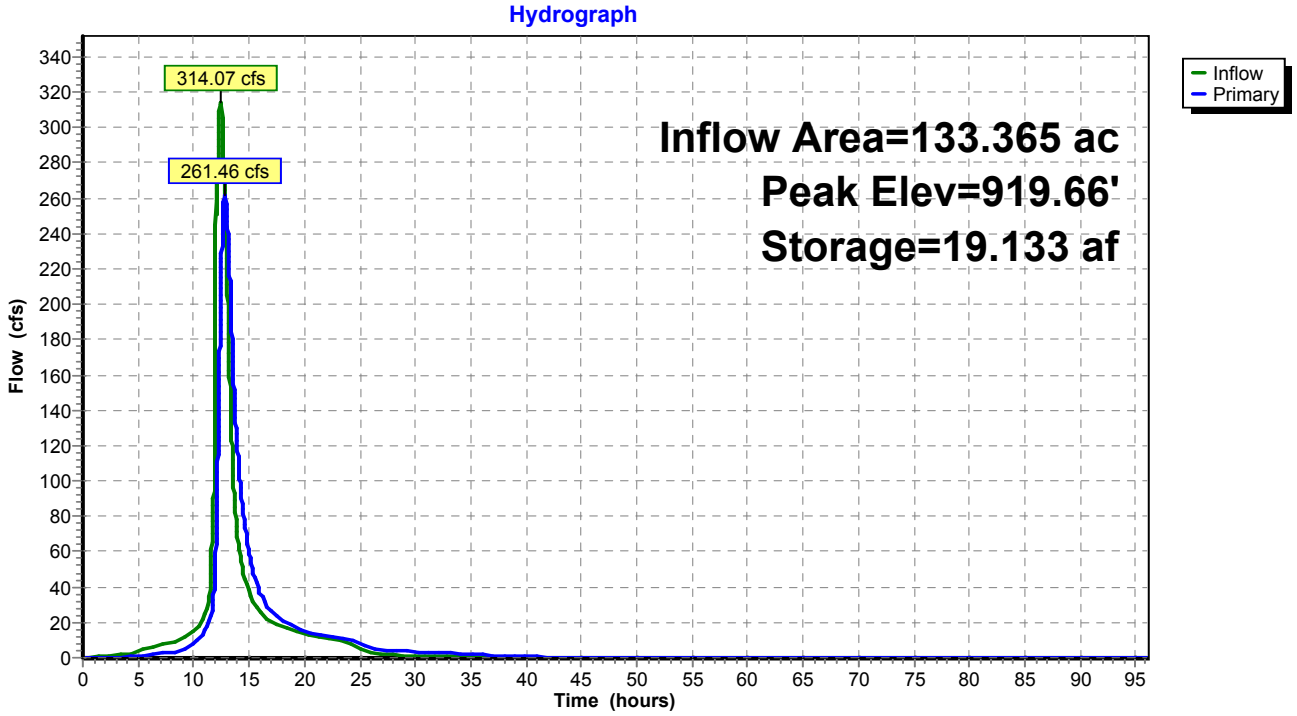
Volume	Invert	Avail.Storage	Storage Description
#1	909.85'	20.423 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
909.85	1.130	0.000	0.000
912.00	1.360	2.677	2.677
916.00	2.220	7.160	9.837
918.00	2.570	4.790	14.627
920.10	2.950	5.796	20.423

Device	Routing	Invert	Outlet Devices
#1	Primary	914.00'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	918.25'	**10.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#3	Primary	915.00'	**7.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=261.43 cfs @ 12.82 hrs HW=919.66' (Free Discharge)
- **1=Orifice/Grate** (Orifice Controls 8.99 cfs @ 11.45 fps)
- **2=Sharp-Crested Rectangular Weir** (Weir Controls 53.02 cfs @ 3.88 fps)
- **3=Sharp-Crested Rectangular Weir** (Weir Controls 199.42 cfs @ 7.06 fps)

Pond 3P: P-3


Hydrograph
314.07 cfs
261.46 cfs
Inflow Area=133.365 ac
Peak Elev=919.66'
Storage=19.133 af
Inflow
Primary
Flow (cfs)
Time (hours)
0
20
40
60
80
100
120
140
160
180
200
220
240
260
280
300
320
340
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
75
80
85
90
95

Summary for Pond 4P: P-4

Inflow Area = 7.853 ac, 70.37% Impervious, Inflow Depth = 6.25" for 100-Year event
Inflow = 23.32 cfs @ 12.72 hrs, Volume= 4.093 af
Outflow = 16.06 cfs @ 13.17 hrs, Volume= 4.093 af, Atten= 31%, Lag= 26.9 min
Primary = 12.51 cfs @ 13.17 hrs, Volume= 2.196 af
Secondary = 3.55 cfs @ 13.17 hrs, Volume= 1.897 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Starting Elev= 915.00' Surf.Area= 0.275 ac Storage= 0.646 af
Peak Elev= 917.79' @ 13.17 hrs Surf.Area= 0.437 ac Storage= 1.633 af (0.988 af above start)

Plug-Flow detention time= 179.1 min calculated for 3.447 af (84% of inflow)
Center-of-Mass det. time= 50.7 min (857.4 - 806.7)

Volume	Invert	Avail.Storage	Storage Description
#1	910.90'	1.728 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

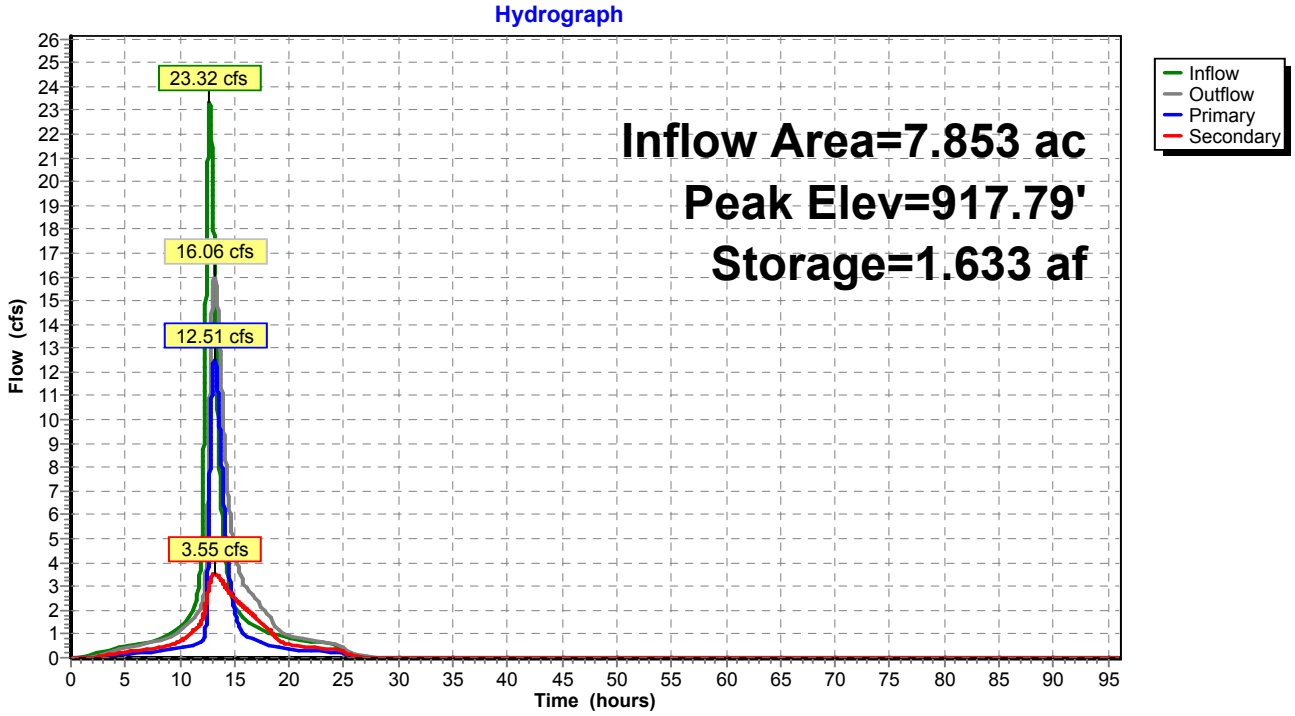
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
910.90	0.070	0.000	0.000
912.00	0.090	0.088	0.088
914.00	0.220	0.310	0.398
916.00	0.330	0.550	0.948
918.00	0.450	0.780	1.728

Device	Routing	Invert	Outlet Devices
#1	Primary	915.00'	**6.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Secondary	915.00'	**9.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Primary	915.95'	**24.0" Round RCP_Round 24"** L= 50.0' RCP, groove end w/headwall, Ke= 0.200 Inlet / Outlet Invert= 915.80' / 915.95' S= -0.0030 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf

Primary OutFlow Max=12.51 cfs @ 13.17 hrs HW=917.79' (Free Discharge)
└**1=Orifice/Grate** (Orifice Controls 1.58 cfs @ 8.04 fps)
└**3=RCP_Round 24"** (Barrel Controls 10.93 cfs @ 4.36 fps)

Secondary OutFlow Max=3.55 cfs @ 13.17 hrs HW=917.79' (Free Discharge)
└**2=Orifice/Grate** (Orifice Controls 3.55 cfs @ 8.04 fps)

Pond 4P: P-4


Hydrograph
Inflow Area=7.853 ac
Peak Elev=917.79'
Storage=1.633 af
23.32 cfs
16.06 cfs
12.51 cfs
3.55 cfs
Inflow
Outflow
Primary
Secondary
Flow (cfs)
Time (hours)

Summary for Pond 7P: P-7

Inflow Area = 29.595 ac, 30.01% Impervious, Inflow Depth = 5.14" for 100-Year event
Inflow = 86.02 cfs @ 12.61 hrs, Volume= 12.680 af
Outflow = 85.84 cfs @ 12.62 hrs, Volume= 12.599 af, Atten= 0%, Lag= 0.7 min
Primary = 85.58 cfs @ 12.62 hrs, Volume= 11.978 af
Secondary = 0.26 cfs @ 12.62 hrs, Volume= 0.621 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Starting Elev= 915.00' Surf.Area= 0.440 ac Storage= 1.062 af
Peak Elev= 915.87' @ 12.62 hrs Surf.Area= 0.545 ac Storage= 1.492 af (0.430 af above start)

Plug-Flow detention time= 128.3 min calculated for 11.536 af (91% of inflow)
Center-of-Mass det. time= 57.0 min (882.0 - 825.0)

Volume	Invert	Avail.Storage	Storage Description
#1	910.95'	1.562 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

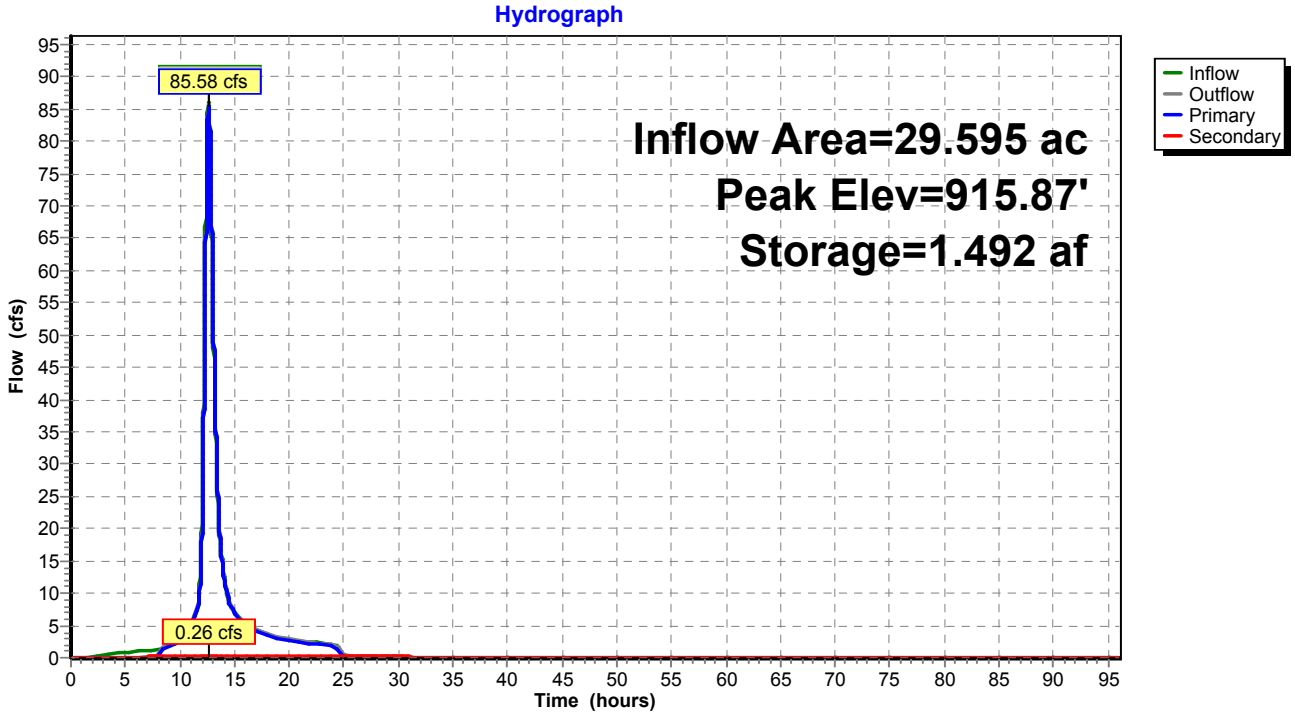
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
910.95	0.110	0.000	0.000
912.00	0.180	0.152	0.152
914.00	0.340	0.520	0.672
915.00	0.440	0.390	1.062
916.00	0.560	0.500	1.562

Device	Routing	Invert	Outlet Devices
#1	Primary	915.00'	**75.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88
#2	Secondary	915.00'	**12.0" Round RCP_Round 12"** L= 50.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 915.00' / 914.75' S= 0.0050 '/' Cc= 0.900 n= 0.130, Flow Area= 0.79 sf

Primary OutFlow Max=85.86 cfs @ 12.62 hrs HW=915.87' TW=915.76' (Fixed TW Elev= 915.76')
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 85.86 cfs @ 1.31 fps)

Secondary OutFlow Max=0.26 cfs @ 12.62 hrs HW=915.87' (Free Discharge)
↑—**2=RCP_Round 12"** (Barrel Controls 0.26 cfs @ 0.48 fps)

Pond 7P: P-7


Hydrograph
85.58 cfs
0.26 cfs
Inflow Area=29.595 ac
Peak Elev=915.87'
Storage=1.492 af
Inflow
Outflow
Primary
Secondary
Flow (cfs)
Time (hours)
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95

Summary for Pond 9P: P-9

[79] Warning: Submerged Pond 7P Primary device # 1 by 0.85'
[81] Warning: Exceeded Pond W-3 by 1.05' @ 12.46 hrs

Inflow Area = 55.384 ac, 31.48% Impervious, Inflow Depth > 5.46" for 100-Year event
Inflow = 167.38 cfs @ 12.44 hrs, Volume= 25.203 af
Outflow = 167.16 cfs @ 12.46 hrs, Volume= 25.203 af, Atten= 0%, Lag= 1.2 min
Primary = 167.16 cfs @ 12.46 hrs, Volume= 25.203 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Starting Elev= 915.00' Surf.Area= 0.210 ac Storage= 0.353 af
Peak Elev= 915.85' @ 12.46 hrs Surf.Area= 0.379 ac Storage= 0.602 af (0.250 af above start)

Plug-Flow detention time= 56.5 min calculated for 24.850 af (99% of inflow)
Center-of-Mass det. time= 1.8 min (941.6 - 939.8)

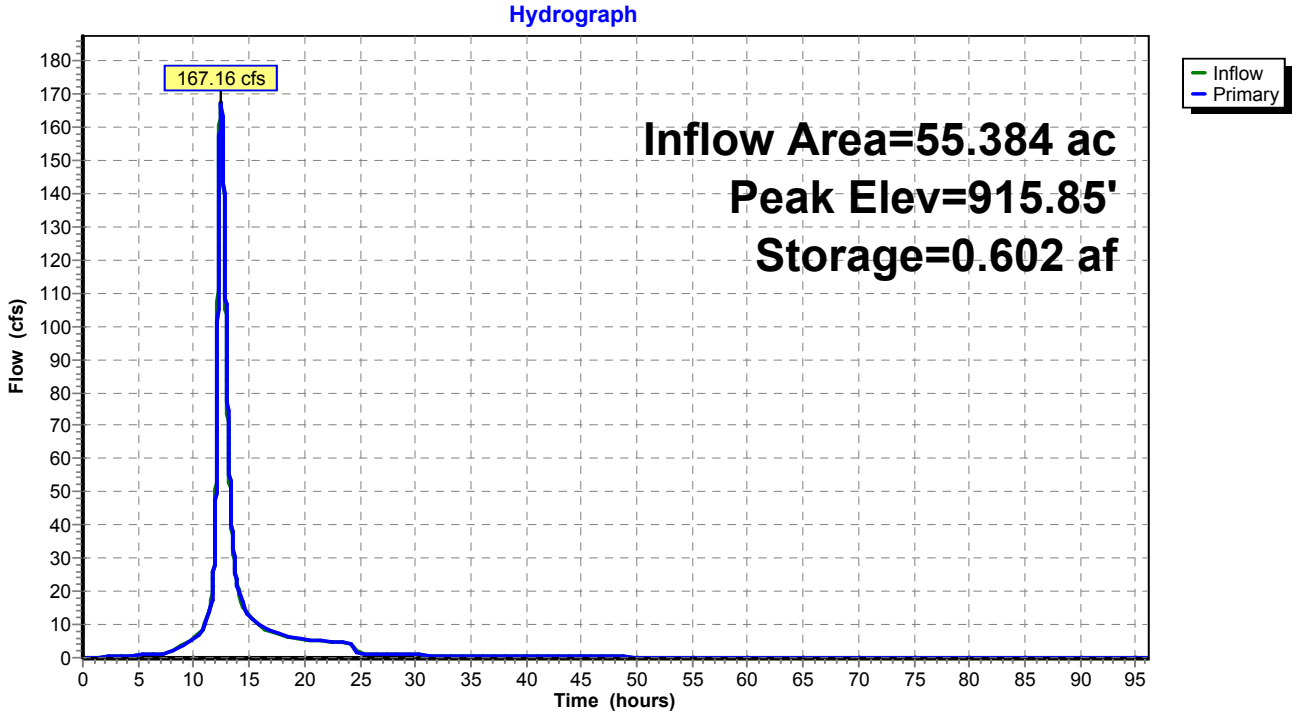
Volume	Invert	Avail.Storage	Storage Description
#1	910.50'	1.673 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
910.50	0.020	0.000	0.000
912.00	0.050	0.052	0.052
913.00	0.070	0.060	0.112
914.00	0.100	0.085	0.198
915.00	0.210	0.155	0.353
916.00	0.410	0.310	0.662
918.00	0.600	1.010	1.673

Device	Routing	Invert	Outlet Devices
#1	Primary	915.00'	**80.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=167.04 cfs @ 12.46 hrs HW=915.85' (Free Discharge)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 167.04 cfs @ 2.47 fps)

Pond 9P: P-9


Hydrograph
167.16 cfs
Inflow Area=55.384 ac
Peak Elev=915.85'
Storage=0.602 af
Inflow
Primary
Flow (cfs)
Time (hours)
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
160
170
180
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
75
80
85
90
95

Summary for Pond 10P: P-10

[95] Warning: Outlet Device #1 rise exceeded
[79] Warning: Submerged Pond P8 Primary device # 1 INLET by 1.50'

Inflow Area = 66.448 ac, 29.37% Impervious, Inflow Depth > 4.59" for 100-Year event
Inflow = 169.45 cfs @ 12.61 hrs, Volume= 25.409 af
Outflow = 168.95 cfs @ 12.63 hrs, Volume= 25.402 af, Atten= 0%, Lag= 1.6 min
Primary = 15.89 cfs @ 12.63 hrs, Volume= 12.301 af
Secondary = 153.06 cfs @ 12.63 hrs, Volume= 13.101 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Starting Elev= 896.00' Surf.Area= 0.290 ac Storage= 0.700 af
Peak Elev= 898.50' @ 12.63 hrs Surf.Area= 0.397 ac Storage= 1.554 af (0.854 af above start)

Plug-Flow detention time= 104.4 min calculated for 24.702 af (97% of inflow)
Center-of-Mass det. time= 17.5 min (1,007.2 - 989.7)

Volume	Invert	Avail.Storage	Storage Description
#1	892.00'	1.760 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

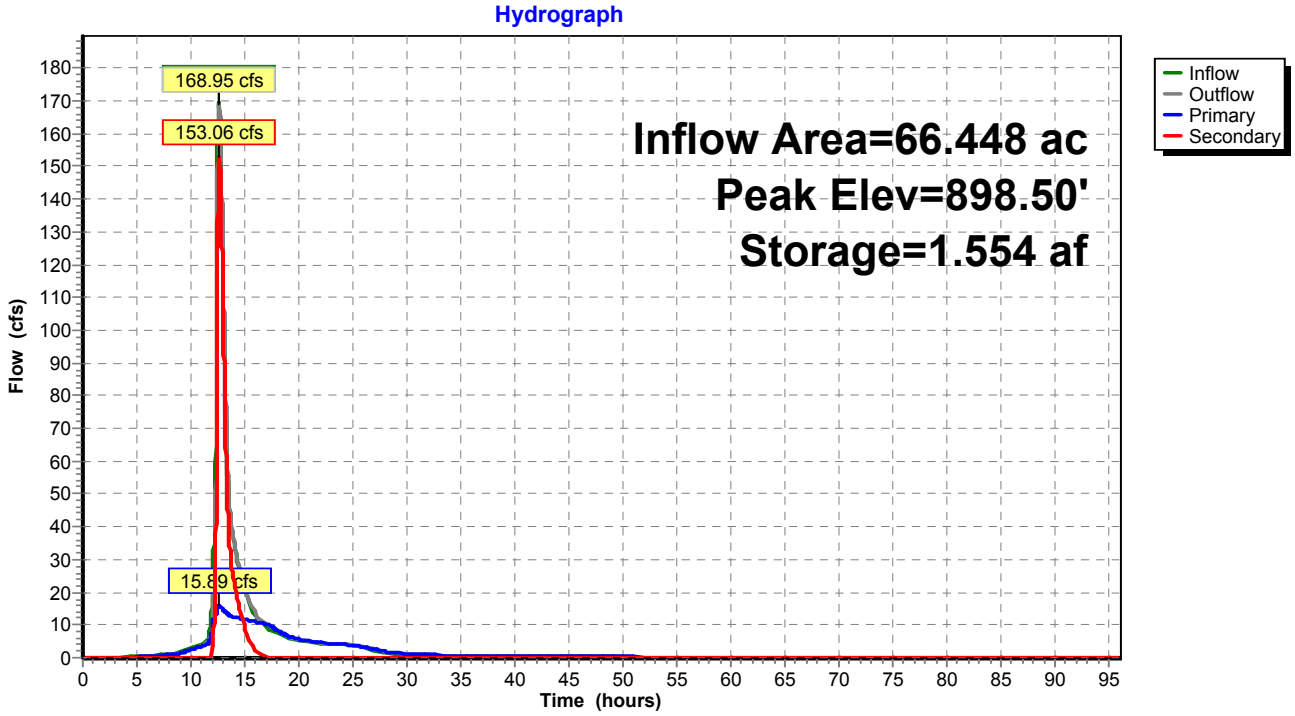
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
892.00	0.120	0.000	0.000
893.00	0.140	0.130	0.130
895.00	0.190	0.330	0.460
896.00	0.290	0.240	0.700
897.00	0.330	0.310	1.010
899.00	0.420	0.750	1.760

Device	Routing	Invert	Outlet Devices
#1	Primary	896.00'	**2.5' long x 1.00' rise Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#2	Secondary	897.40'	**50.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=15.89 cfs @ 12.63 hrs HW=898.50' (Free Discharge)
└**1=Sharp-Crested Rectangular Weir** (Orifice Controls 15.89 cfs @ 6.91 fps)

Secondary OutFlow Max=153.01 cfs @ 12.63 hrs HW=898.50' (Free Discharge)
└**2=Broad-Crested Rectangular Weir** (Weir Controls 153.01 cfs @ 2.79 fps)

Pond 10P: P-10


Hydrograph
168.95 cfs
153.06 cfs
15.89 cfs
Inflow Area=66.448 ac
Peak Elev=898.50'
Storage=1.554 af
Inflow
Outflow
Primary
Secondary
Flow (cfs)
Time (hours)
0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95

Summary for Pond 11P: P-11

Inflow Area = 58.677 ac, 31.52% Impervious, Inflow Depth > 5.45" for 100-Year event
Inflow = 173.92 cfs @ 12.46 hrs, Volume= 26.651 af
Outflow = 161.33 cfs @ 12.62 hrs, Volume= 26.631 af, Atten= 7%, Lag= 9.7 min
Primary = 156.28 cfs @ 12.62 hrs, Volume= 22.382 af
Secondary = 5.05 cfs @ 12.62 hrs, Volume= 4.248 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Starting Elev= 909.00' Surf.Area= 1.210 ac Storage= 3.640 af
Peak Elev= 912.79' @ 12.62 hrs Surf.Area= 1.655 ac Storage= 9.060 af (5.420 af above start)

Plug-Flow detention time= 289.4 min calculated for 22.991 af (86% of inflow)
Center-of-Mass det. time= 86.7 min (1,019.6 - 932.9)

Volume	Invert	Avail.Storage	Storage Description
#1	905.00'	9.405 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

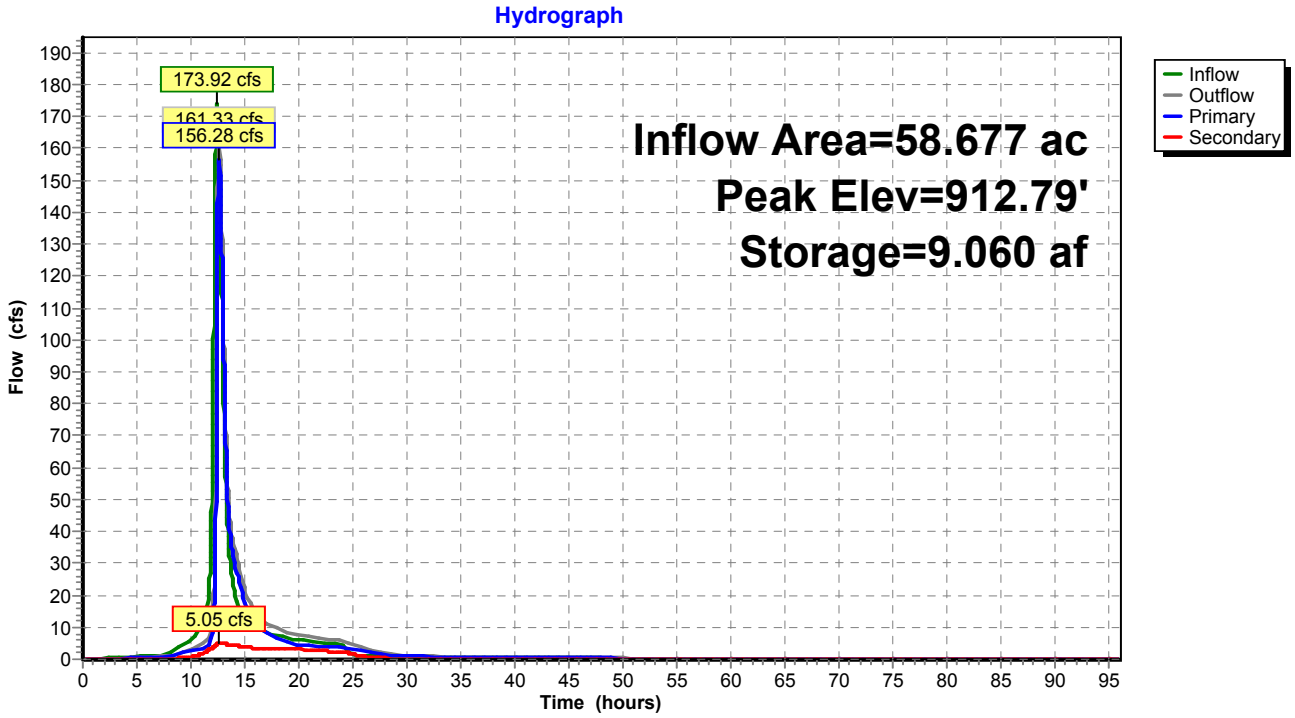
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
905.00	0.760	0.000	0.000
906.00	0.820	0.790	0.790
908.00	0.950	1.770	2.560
909.00	1.210	1.080	3.640
910.00	1.320	1.265	4.905
912.00	1.560	2.880	7.785
913.00	1.680	1.620	9.405

Device	Routing	Invert	Outlet Devices
#1	Primary	909.00'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	910.00'	**24.0" Round RCP_Round 24"** L= 200.0' RCP, groove end w/headwall, Ke= 0.200 Inlet / Outlet Invert= 910.00' / 909.00' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#3	Primary	910.00'	**24.0" Round RCP_Round 24"** L= 200.0' RCP, groove end w/headwall, Ke= 0.200 Inlet / Outlet Invert= 910.00' / 909.00' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#4	Primary	912.00'	**60.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88
#5	Secondary	909.00'	**12.0" Round RCP_Round 12"** L= 150.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 909.00' / 908.00' S= 0.0067 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=156.10 cfs @ 12.62 hrs HW=912.79' (Free Discharge)
- **1=Orifice/Grate** (Orifice Controls 7.37 cfs @ 9.38 fps)
- **2=RCP_Round 24"** (Barrel Controls 17.57 cfs @ 5.59 fps)
- **3=RCP_Round 24"** (Barrel Controls 17.57 cfs @ 5.59 fps)
- **4=Broad-Crested Rectangular Weir** (Weir Controls 113.60 cfs @ 2.39 fps)

Secondary OutFlow Max=5.05 cfs @ 12.62 hrs HW=912.79' (Free Discharge)
- **5=RCP_Round 12"** (Barrel Controls 5.05 cfs @ 6.43 fps)

Pond 11P: P-11



Summary for Pond 12P: P-12

[62] Hint: Exceeded Reach 43R OUTLET depth by 1.47' @ 12.96 hrs

Inflow Area = 79.658 ac, 31.13% Impervious, Inflow Depth > 5.36" for 100-Year event
Inflow = 180.07 cfs @ 12.62 hrs, Volume= 35.599 af
Outflow = 141.34 cfs @ 12.93 hrs, Volume= 35.576 af, Atten= 22%, Lag= 18.7 min
Primary = 141.34 cfs @ 12.93 hrs, Volume= 35.576 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Starting Elev= 893.00' Surf.Area= 1.640 ac Storage= 5.075 af
Peak Elev= 895.84' @ 12.93 hrs Surf.Area= 2.019 ac Storage= 10.273 af (5.198 af above start)

Plug-Flow detention time= 284.9 min calculated for 30.498 af (86% of inflow)
Center-of-Mass det. time= 61.8 min (1,080.0 - 1,018.2)

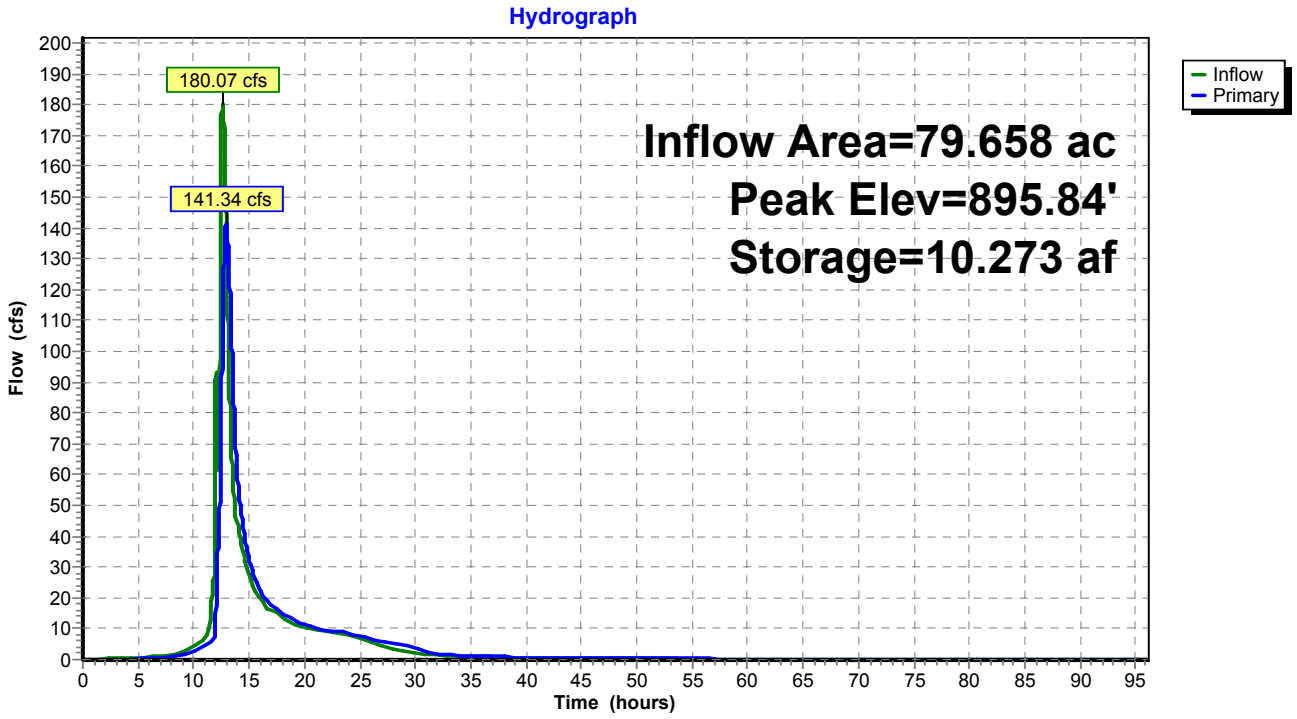
Volume	Invert	Avail.Storage	Storage Description
#1	889.00'	10.590 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
889.00	1.070	0.000	0.000
890.00	1.150	1.110	1.110
892.00	1.330	2.480	3.590
893.00	1.640	1.485	5.075
894.00	1.770	1.705	6.780
896.00	2.040	3.810	10.590

Device	Routing	Invert	Outlet Devices
#1	Primary	893.00'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	893.00'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Primary	893.50'	**43.8" W x 26.6" H, R=22.5"/62.0" Arch RCP_Arch 44x27** L= 30.0' Box, 30-75° wingwalls, rounded crown, Ke= 0.200 Inlet / Outlet Invert= 893.50' / 893.35' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 6.29 sf
#4	Primary	893.50'	**43.8" W x 26.6" H, R=22.5"/62.0" Arch RCP_Arch 44x27** L= 30.0' Box, 30-75° wingwalls, rounded crown, Ke= 0.200 Inlet / Outlet Invert= 893.50' / 893.35' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 6.29 sf
#5	Primary	893.50'	**43.8" W x 26.6" H, R=22.5"/62.0" Arch RCP_Arch 44x27** L= 30.0' Box, 30-75° wingwalls, rounded crown, Ke= 0.200 Inlet / Outlet Invert= 893.50' / 893.35' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 6.29 sf
#6	Primary	893.50'	**43.8" W x 26.6" H, R=22.5"/62.0" Arch RCP_Arch 44x27** L= 30.0' Box, 30-75° wingwalls, rounded crown, Ke= 0.200 Inlet / Outlet Invert= 893.50' / 893.35' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 6.29 sf

Primary OutFlow Max=141.35 cfs @ 12.93 hrs HW=895.84' (Free Discharge)
- **1=Orifice/Grate** (Orifice Controls 6.38 cfs @ 8.12 fps)
- **2=Orifice/Grate** (Orifice Controls 6.38 cfs @ 8.12 fps)
- **3=RCP_Arch 44x27** (Barrel Controls 32.15 cfs @ 5.83 fps)
- **4=RCP_Arch 44x27** (Barrel Controls 32.15 cfs @ 5.83 fps)
- **5=RCP_Arch 44x27** (Barrel Controls 32.15 cfs @ 5.83 fps)
- **6=RCP_Arch 44x27** (Barrel Controls 32.15 cfs @ 5.83 fps)

Pond 12P: P-12



Summary for Pond 13P: P-13

Inflow Area = 237.893 ac, 51.59% Impervious, Inflow Depth > 5.63" for 100-Year event
Inflow = 652.92 cfs @ 12.35 hrs, Volume= 111.642 af
Outflow = 631.22 cfs @ 12.47 hrs, Volume= 111.636 af, Atten= 3%, Lag= 6.8 min
Primary = 610.72 cfs @ 12.47 hrs, Volume= 106.706 af
Secondary = 20.50 cfs @ 12.47 hrs, Volume= 4.930 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Starting Elev= 883.00' Surf.Area= 1.870 ac Storage= 4.265 af
Peak Elev= 885.59' @ 12.47 hrs Surf.Area= 2.807 ac Storage= 10.299 af (6.034 af above start)

Plug-Flow detention time= 85.0 min calculated for 107.371 af (96% of inflow)
Center-of-Mass det. time= 12.1 min (901.4 - 889.3)

Volume	Invert	Avail.Storage	Storage Description
#1	878.00'	11.490 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
878.00	0.000	0.000	0.000
879.00	0.630	0.315	0.315
880.00	0.730	0.680	0.995
882.00	1.070	1.800	2.795
883.00	1.870	1.470	4.265
884.00	2.220	2.045	6.310
886.00	2.960	5.180	11.490

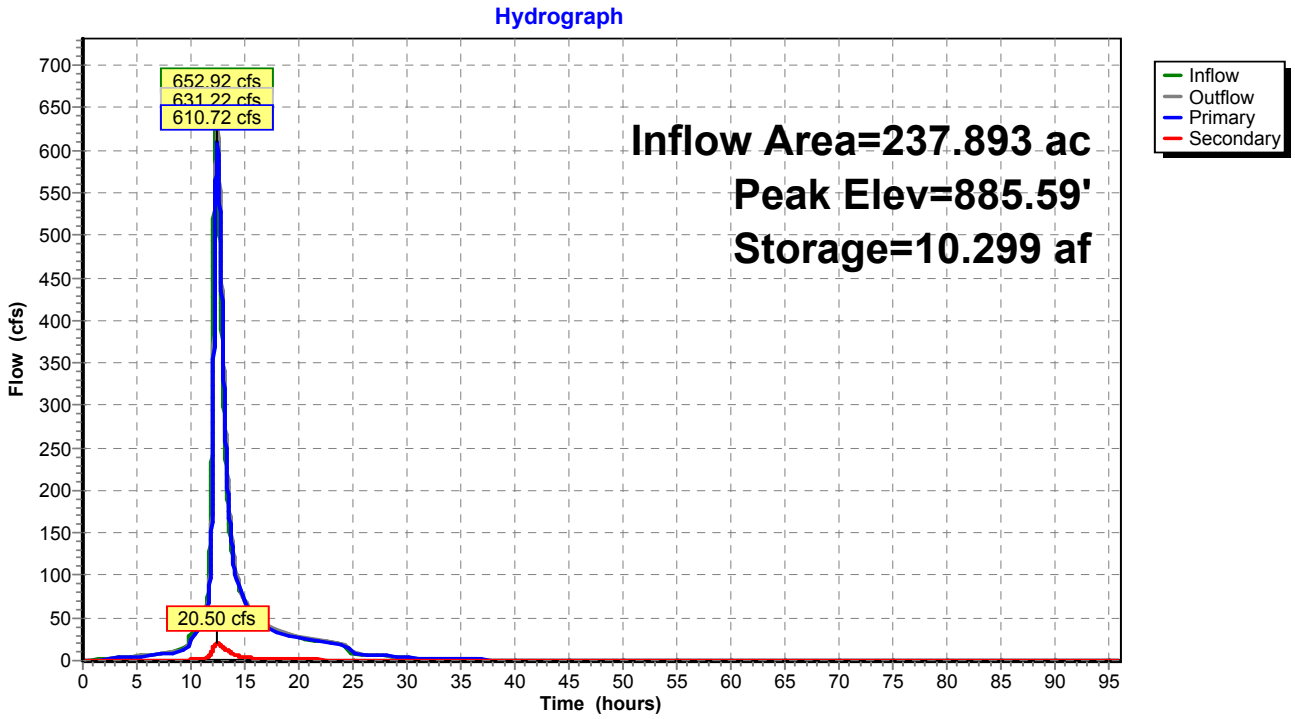
Device	Routing	Invert	Outlet Devices
#1	Primary	883.00'	**55.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88
#2	Secondary	883.00'	**12.0" Round RCP_Round 12"** L= 100.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 883.00' / 882.75' S= 0.0025 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#3	Secondary	883.00'	**12.0" Round RCP_Round 12"** L= 100.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 883.00' / 882.75' S= 0.0025 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#4	Secondary	883.00'	**12.0" Round RCP_Round 12"** L= 100.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 883.00' / 882.75' S= 0.0025 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#5	Secondary	883.00'	**12.0" Round RCP_Round 12"** L= 100.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 883.00' / 882.75' S= 0.0025 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

#6 Secondary 883.00' **12.0" Round RCP_Round 12"**
L= 100.0' RCP, groove end projecting, Ke= 0.200
Inlet / Outlet Invert= 883.00' / 882.75' S= 0.0025 '/' Cc= 0.900
n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=610.65 cfs @ 12.47 hrs HW=885.59' (Free Discharge)
└─**1=Broad-Crested Rectangular Weir** (Weir Controls 610.65 cfs @ 4.29 fps)

Secondary OutFlow Max=20.50 cfs @ 12.47 hrs HW=885.59' (Free Discharge)
├─**2=RCP_Round 12"** (Barrel Controls 4.10 cfs @ 5.22 fps)
├─**3=RCP_Round 12"** (Barrel Controls 4.10 cfs @ 5.22 fps)
├─**4=RCP_Round 12"** (Barrel Controls 4.10 cfs @ 5.22 fps)
├─**5=RCP_Round 12"** (Barrel Controls 4.10 cfs @ 5.22 fps)
└─**6=RCP_Round 12"** (Barrel Controls 4.10 cfs @ 5.22 fps)

Pond 13P: P-13



Summary for Pond 14P: P-14

Inflow Area = 21.198 ac, 39.93% Impervious, Inflow Depth = 5.41" for 100-Year event
Inflow = 89.07 cfs @ 12.29 hrs, Volume= 9.565 af
Outflow = 16.07 cfs @ 13.06 hrs, Volume= 9.565 af, Atten= 82%, Lag= 46.4 min
Primary = 16.07 cfs @ 13.06 hrs, Volume= 9.565 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Starting Elev= 892.00' Surf.Area= 1.380 ac Storage= 4.490 af
Peak Elev= 895.17' @ 13.06 hrs Surf.Area= 1.695 ac Storage= 9.341 af (4.851 af above start)

Plug-Flow detention time= 578.4 min calculated for 5.075 af (53% of inflow)
Center-of-Mass det. time= 238.8 min (1,034.6 - 795.8)

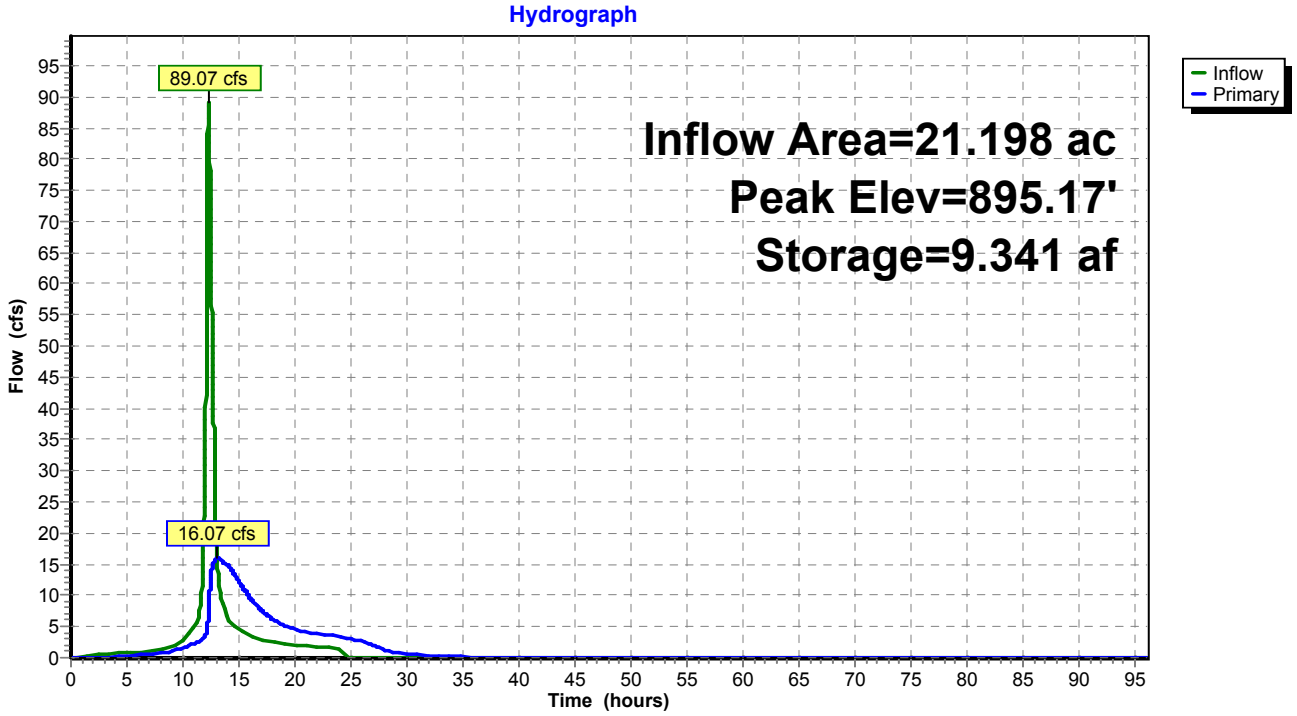
Volume	Invert	Avail.Storage	Storage Description
#1	888.00'	9.910 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
888.00	0.950	0.000	0.000
890.00	1.080	2.030	2.030
892.00	1.380	2.460	4.490
893.00	1.470	1.425	5.915
894.00	1.570	1.520	7.435
895.50	1.730	2.475	9.910

Device	Routing	Invert	Outlet Devices
#1	Primary	892.00'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	893.00'	**18.0" Round RCP_Round 18"** L= 50.0' RCP, groove end w/headwall, Ke= 0.200 Inlet / Outlet Invert= 893.00' / 892.75' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf

Primary OutFlow Max=16.07 cfs @ 13.06 hrs HW=895.17' (Free Discharge)
1=Orifice/Grate (Orifice Controls 6.73 cfs @ 8.57 fps)
2=RCP_Round 18" (Barrel Controls 9.34 cfs @ 5.29 fps)

Pond 14P: P-14


Hydrograph
89.07 cfs
16.07 cfs
Inflow Area=21.198 ac
Peak Elev=895.17'
Storage=9.341 af
Inflow
Primary
Flow (cfs)
Time (hours)
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95

Summary for Pond 23P: Thumb Infiltration (Thumb TP load only)

Inflow Area = 48.540 ac, 84.23% Impervious, Inflow Depth = 6.23" for 100-Year event
Inflow = 171.27 cfs @ 12.44 hrs, Volume= 25.207 af
Outflow = 171.19 cfs @ 12.45 hrs, Volume= 21.467 af, Atten= 0%, Lag= 0.6 min
Primary = 171.19 cfs @ 12.45 hrs, Volume= 21.467 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Peak Elev= 903.88' @ 12.45 hrs Surf.Area= 1.000 ac Storage= 3.878 af

Plug-Flow detention time= 126.7 min calculated for 21.467 af (85% of inflow)
Center-of-Mass det. time= 58.7 min (836.8 - 778.1)

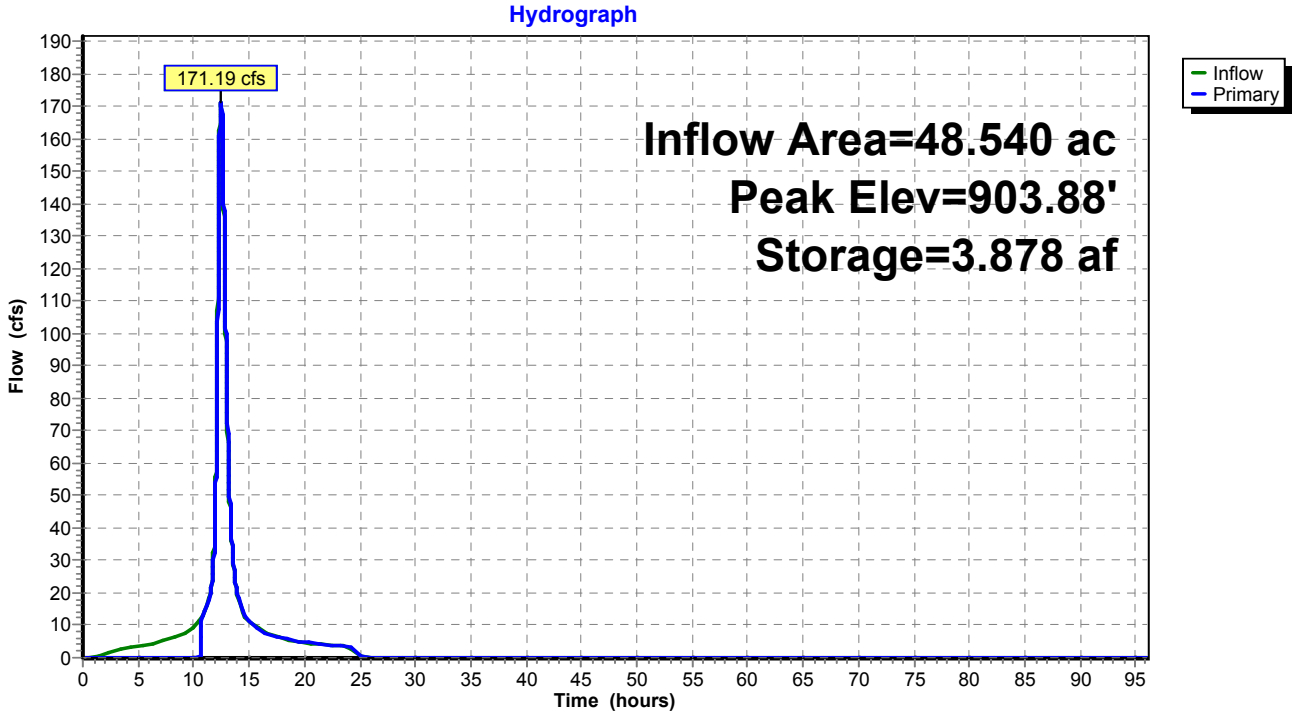
Volume	Invert	Avail.Storage	Storage Description
#1	900.00'	5.000 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
900.00	1.000	0.000	0.000
901.00	1.000	1.000	1.000
902.00	1.000	1.000	2.000
903.00	1.000	1.000	3.000
904.00	1.000	1.000	4.000
905.00	1.000	1.000	5.000

Device	Routing	Invert	Outlet Devices
#1	Primary	903.74'	**1,000.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s) 5.0' Crest Height

Primary OutFlow Max=169.08 cfs @ 12.45 hrs HW=903.88' (Free Discharge)
↑—**1=Sharp-Crested Rectangular Weir** (Weir Controls 169.08 cfs @ 1.22 fps)

Pond 23P: Thumb Infiltration (Thumb TP load only)



Summary for Pond 31P: SB 18 Infiltration

Inflow Area = 52.908 ac, 84.55% Impervious, Inflow Depth = 6.65" for 100-Year event
Inflow = 224.72 cfs @ 12.40 hrs, Volume= 29.299 af
Outflow = 224.58 cfs @ 12.40 hrs, Volume= 25.979 af, Atten= 0%, Lag= 0.4 min
Primary = 224.58 cfs @ 12.40 hrs, Volume= 25.979 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Peak Elev= 903.48' @ 12.40 hrs Surf.Area= 1.000 ac Storage= 3.484 af

Plug-Flow detention time= 105.1 min calculated for 25.976 af (89% of inflow)
Center-of-Mass det. time= 48.5 min (823.3 - 774.8)

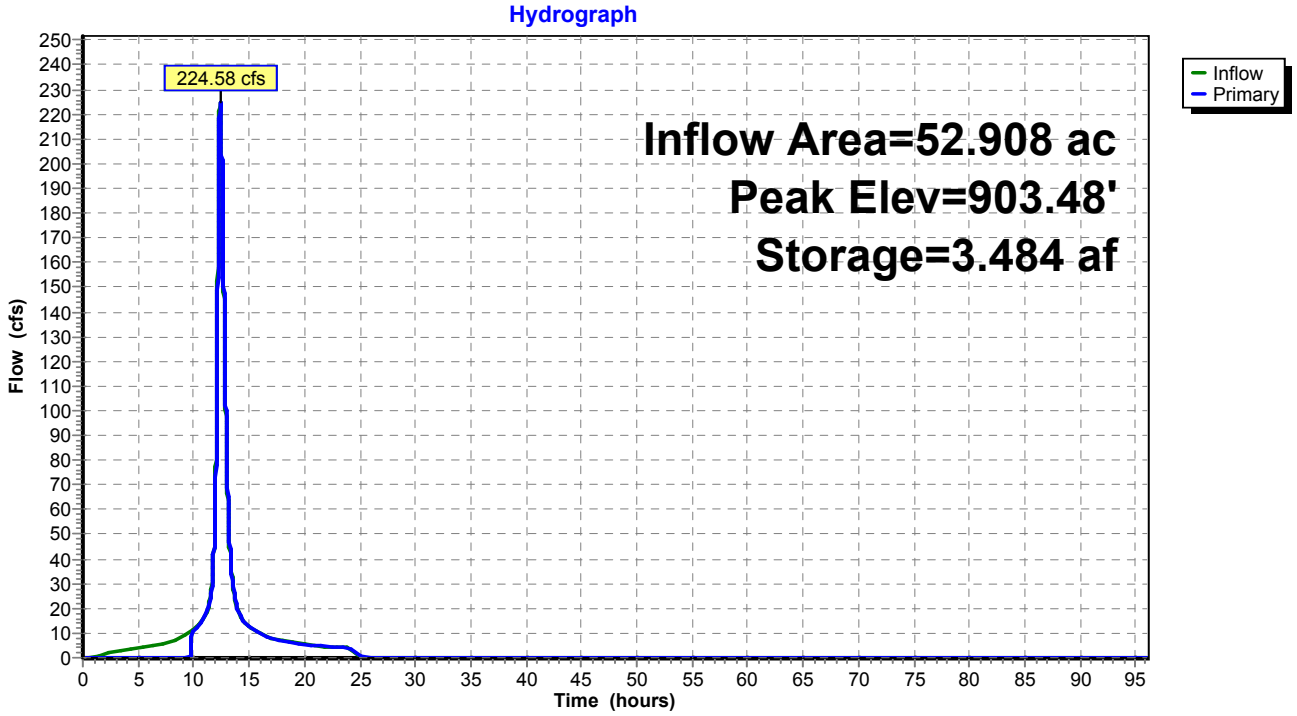
Volume	Invert	Avail.Storage	Storage Description
#1	900.00'	5.000 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
900.00	1.000	0.000	0.000
901.00	1.000	1.000	1.000
902.00	1.000	1.000	2.000
903.00	1.000	1.000	3.000
904.00	1.000	1.000	4.000
905.00	1.000	1.000	5.000

Device	Routing	Invert	Outlet Devices
#1	Primary	903.32'	**1,000.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s) 0.8' Crest Height

Primary OutFlow Max=222.63 cfs @ 12.40 hrs HW=903.48' (Free Discharge)
↑—**1=Sharp-Crested Rectangular Weir** (Weir Controls 222.63 cfs @ 1.36 fps)

Pond 31P: SB 18 Infiltration



Summary for Pond 36P: Culverts passing flow beneath Spine Road

[95] Warning: Outlet Device #1 rise exceeded

Inflow Area = 52.908 ac, 84.55% Impervious, Inflow Depth = 5.89" for 100-Year event
Inflow = 224.58 cfs @ 12.40 hrs, Volume= 25.979 af
Outflow = 224.52 cfs @ 12.41 hrs, Volume= 25.979 af, Atten= 0%, Lag= 0.3 min
Primary = 127.00 cfs @ 12.14 hrs, Volume= 22.800 af
Secondary = 97.52 cfs @ 12.41 hrs, Volume= 3.178 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Peak Elev= 890.24' @ 12.41 hrs Surf.Area= 0.007 ac Storage= 0.012 af

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 0.0 min (823.4 - 823.3)

Volume	Invert	Avail.Storage	Storage Description
#1	887.00'	0.026 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
887.00	0.000	0.000	0.000
887.50	0.002	0.001	0.001
890.50	0.007	0.014	0.014
892.00	0.009	0.012	0.026

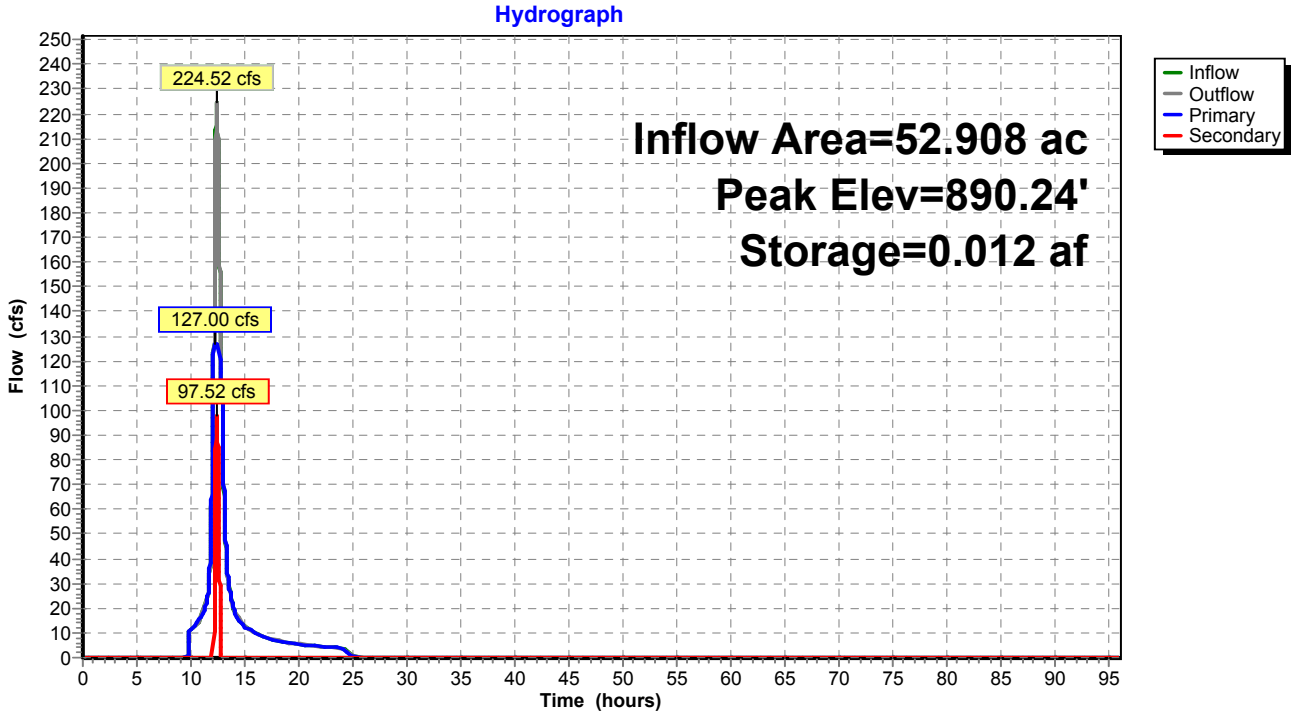
Device	Routing	Invert	Outlet Devices
#1	Primary	887.00'	**Special & User-Defined** Head (feet) 0.00 0.10 0.20 0.30 0.40 0.50 Disch. (cfs) 0.000 25.000 50.000 75.000 100.000 127.000
#2	Secondary	887.50'	**18.0" Round RCP_Round 18"** L= 100.0' RCP, groove end w/headwall, Ke= 0.200 Inlet / Outlet Invert= 887.50' / 886.50' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#3	Secondary	887.50'	**18.0" Round RCP_Round 18"** L= 100.0' RCP, groove end w/headwall, Ke= 0.200 Inlet / Outlet Invert= 887.50' / 886.50' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#4	Secondary	887.50'	**18.0" Round RCP_Round 18"** L= 100.0' RCP, groove end w/headwall, Ke= 0.200 Inlet / Outlet Invert= 887.50' / 886.50' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#5	Secondary	887.50'	**18.0" Round RCP_Round 18"** L= 100.0' RCP, groove end w/headwall, Ke= 0.200 Inlet / Outlet Invert= 887.50' / 886.50' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#6	Secondary	887.50'	**18.0" Round RCP_Round 18"** L= 100.0' RCP, groove end w/headwall, Ke= 0.200 Inlet / Outlet Invert= 887.50' / 886.50' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf

#7	Secondary	887.50'	**18.0" Round RCP_Round 18"** L= 100.0' RCP, groove end w/headwall, Ke= 0.200 Inlet / Outlet Invert= 887.50' / 886.50' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#8	Secondary	887.50'	**18.0" Round RCP_Round 18"** L= 100.0' RCP, groove end w/headwall, Ke= 0.200 Inlet / Outlet Invert= 887.50' / 886.50' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#9	Secondary	887.50'	**18.0" Round RCP_Round 18"** L= 100.0' RCP, groove end w/headwall, Ke= 0.200 Inlet / Outlet Invert= 887.50' / 886.50' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf

Primary OutFlow Max=127.00 cfs @ 12.14 hrs HW=887.58' (Free Discharge)
└─**1=Special & User-Defined** (Custom Controls 127.00 cfs)

Secondary OutFlow Max=97.46 cfs @ 12.41 hrs HW=890.24' (Free Discharge)
- **2=RCP_Round 18"** (Barrel Controls 12.18 cfs @ 6.89 fps)
- **3=RCP_Round 18"** (Barrel Controls 12.18 cfs @ 6.89 fps)
- **4=RCP_Round 18"** (Barrel Controls 12.18 cfs @ 6.89 fps)
- **5=RCP_Round 18"** (Barrel Controls 12.18 cfs @ 6.89 fps)
- **6=RCP_Round 18"** (Barrel Controls 12.18 cfs @ 6.89 fps)
- **7=RCP_Round 18"** (Barrel Controls 12.18 cfs @ 6.89 fps)
- **8=RCP_Round 18"** (Barrel Controls 12.18 cfs @ 6.89 fps)
- **9=RCP_Round 18"** (Barrel Controls 12.18 cfs @ 6.89 fps)

Pond 36P: Culverts passing flow beneath Spine Road



Summary for Pond CRH-1: CRH-1

Inflow Area = 6.955 ac, 46.76% Impervious, Inflow Depth = 5.60" for 100-Year event
Inflow = 38.37 cfs @ 12.15 hrs, Volume= 3.247 af
Outflow = 25.53 cfs @ 12.31 hrs, Volume= 3.247 af, Atten= 33%, Lag= 9.5 min
Discarded = 0.37 cfs @ 12.31 hrs, Volume= 0.560 af
Primary = 25.15 cfs @ 12.31 hrs, Volume= 2.688 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Peak Elev= 878.81' @ 12.31 hrs Surf.Area= 0.463 ac Storage= 0.760 af

Plug-Flow detention time= 114.7 min calculated for 3.247 af (100% of inflow)
Center-of-Mass det. time= 114.8 min (896.0 - 781.2)

Volume	Invert	Avail.Storage	Storage Description
#1	876.00'	0.850 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

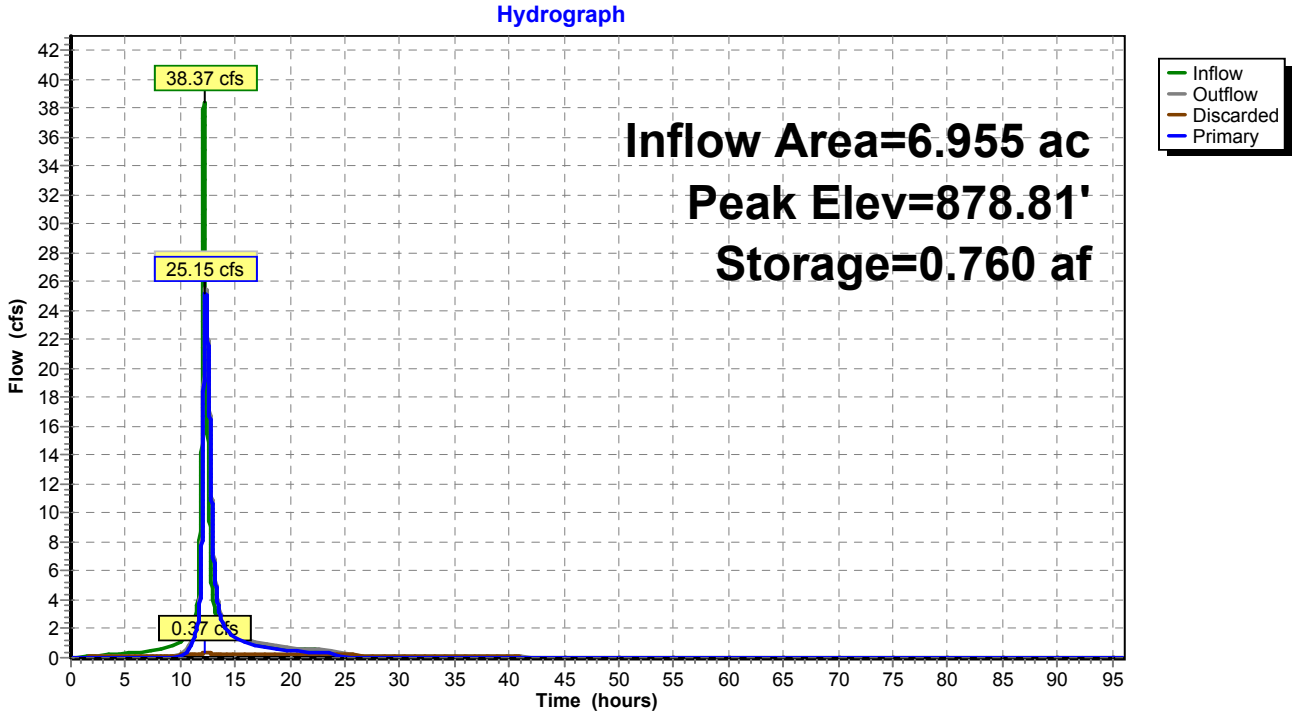
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
876.00	0.150	0.000	0.000
878.00	0.300	0.450	0.450
879.00	0.500	0.400	0.850

Device	Routing	Invert	Outlet Devices
#1	Discarded	876.00'	**0.800 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 0.00'
#2	Primary	877.00'	**24.0" Round Culvert** L= 155.0' Ke= 0.500 Inlet / Outlet Invert= 877.00' / 876.00' S= 0.0065 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#3	Primary	877.00'	**24.0" Round Culvert** L= 155.0' Ke= 0.500 Inlet / Outlet Invert= 877.00' / 876.00' S= 0.0065 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf

Discarded OutFlow Max=0.37 cfs @ 12.31 hrs HW=878.81' (Free Discharge)
└**1=Exfiltration** (Controls 0.37 cfs)

Primary OutFlow Max=25.15 cfs @ 12.31 hrs HW=878.81' (Free Discharge)
├**2=Culvert** (Barrel Controls 12.58 cfs @ 5.53 fps)
└**3=Culvert** (Barrel Controls 12.58 cfs @ 5.53 fps)

Pond CRH-1: CRH-1



Summary for Pond CRH-2: CRH-2

Inflow Area = 10.214 ac, 37.73% Impervious, Inflow Depth = 5.35" for 100-Year event
Inflow = 48.13 cfs @ 12.21 hrs, Volume= 4.557 af
Outflow = 27.86 cfs @ 12.47 hrs, Volume= 4.557 af, Atten= 42%, Lag= 15.6 min
Discarded = 0.47 cfs @ 12.47 hrs, Volume= 0.981 af
Primary = 27.39 cfs @ 12.47 hrs, Volume= 3.577 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Peak Elev= 883.78' @ 12.47 hrs Surf.Area= 0.578 ac Storage= 1.468 af

Plug-Flow detention time= 191.1 min calculated for 4.557 af (100% of inflow)
Center-of-Mass det. time= 191.0 min (983.5 - 792.4)

Volume	Invert	Avail.Storage	Storage Description
#1	880.00'	1.600 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

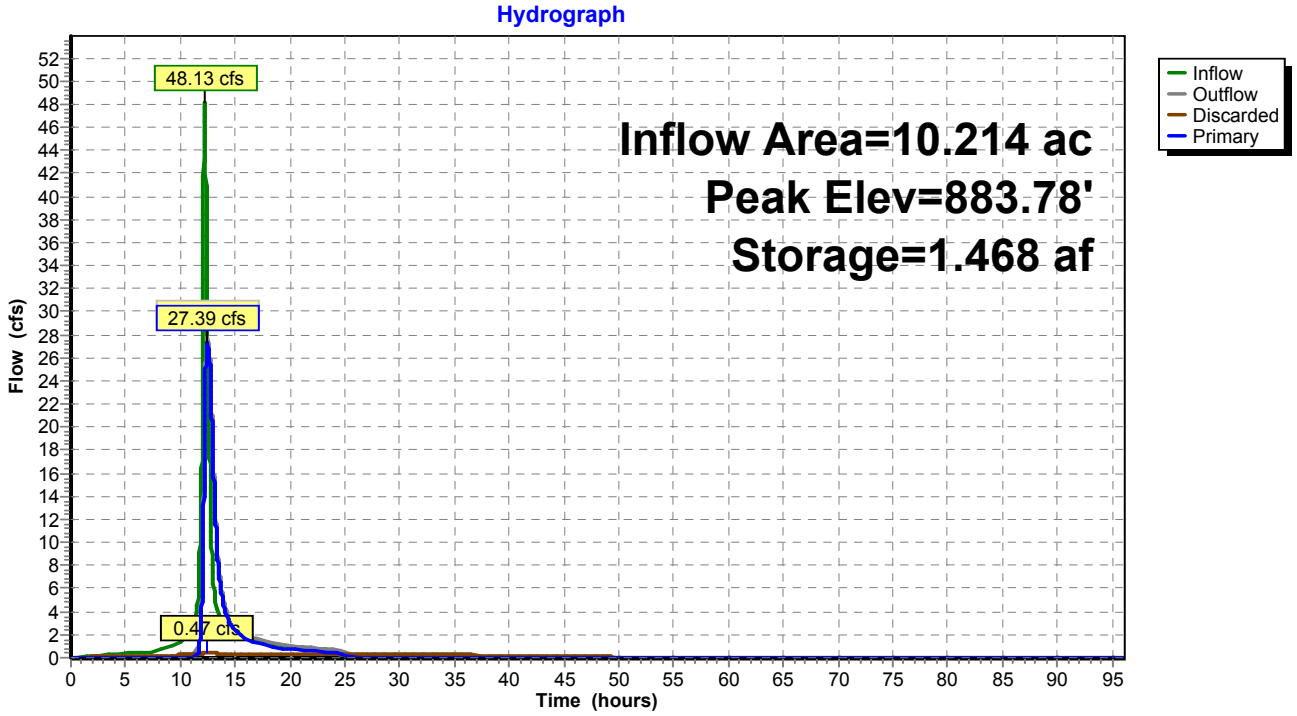
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
880.00	0.200	0.000	0.000
882.00	0.400	0.600	0.600
884.00	0.600	1.000	1.600

Device	Routing	Invert	Outlet Devices
#1	Discarded	880.00'	**0.800 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 0.00'
#2	Primary	881.50'	**24.0" Round Culvert** L= 155.0' Ke= 0.500 Inlet / Outlet Invert= 881.50' / 881.00' S= 0.0032 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#3	Primary	881.50'	**24.0" Round Culvert** L= 155.0' Ke= 0.500 Inlet / Outlet Invert= 881.50' / 881.00' S= 0.0032 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf

Discarded OutFlow Max=0.47 cfs @ 12.47 hrs HW=883.78' (Free Discharge)
└**1=Exfiltration** (Controls 0.47 cfs)

Primary OutFlow Max=27.40 cfs @ 12.47 hrs HW=883.78' (Free Discharge)
├**2=Culvert** (Barrel Controls 13.70 cfs @ 4.79 fps)
└**3=Culvert** (Barrel Controls 13.70 cfs @ 4.79 fps)

Pond CRH-2: CRH-2



Summary for Pond CRH-3: CRH-3

Inflow Area = 11.815 ac, 36.95% Impervious, Inflow Depth = 4.34" for 100-Year event
Inflow = 30.16 cfs @ 12.44 hrs, Volume= 4.270 af
Outflow = 25.93 cfs @ 12.70 hrs, Volume= 4.270 af, Atten= 14%, Lag= 15.7 min
Discarded = 0.38 cfs @ 12.70 hrs, Volume= 0.516 af
Primary = 25.55 cfs @ 12.70 hrs, Volume= 3.754 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Peak Elev= 879.83' @ 12.70 hrs Surf.Area= 0.467 ac Storage= 0.770 af

Plug-Flow detention time= 82.3 min calculated for 4.270 af (100% of inflow)
Center-of-Mass det. time= 82.4 min (919.5 - 837.0)

Volume	Invert	Avail.Storage	Storage Description
#1	877.00'	0.850 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

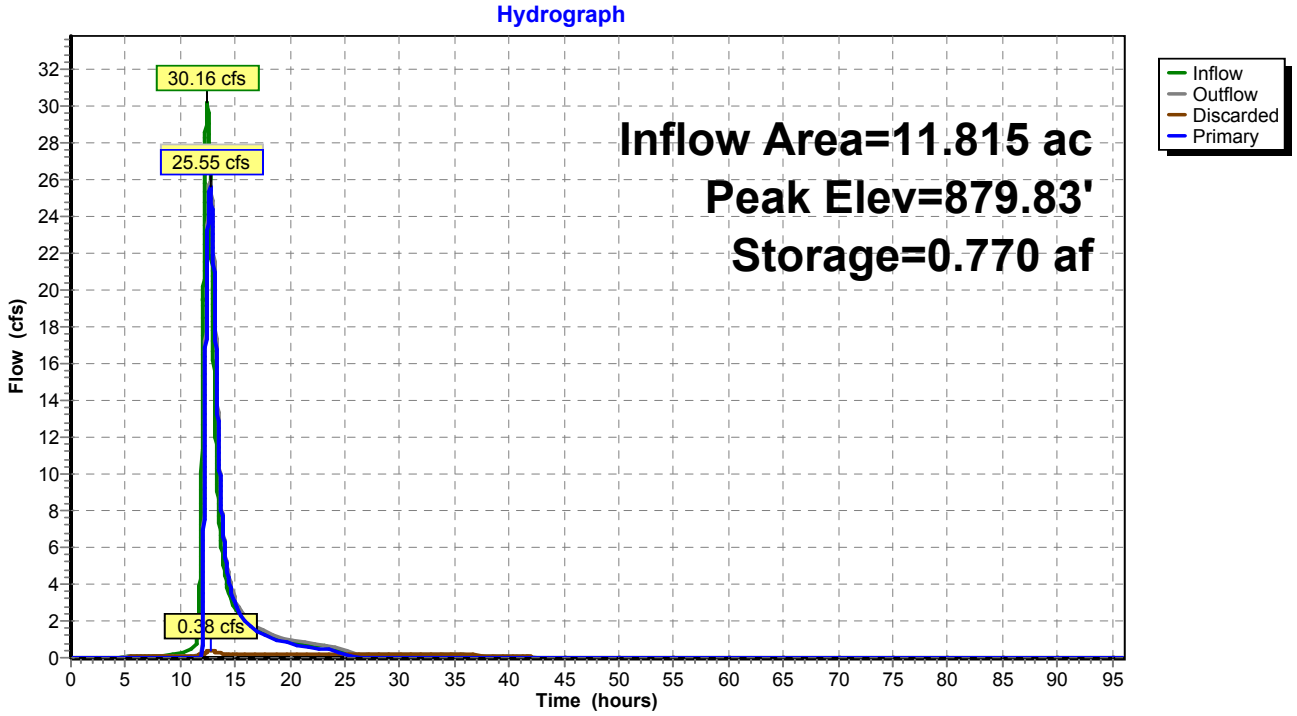
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
877.00	0.150	0.000	0.000
879.00	0.300	0.450	0.450
880.00	0.500	0.400	0.850

Device	Routing	Invert	Outlet Devices
#1	Discarded	877.00'	**0.800 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 0.00'
#2	Primary	878.00'	**24.0" Round Culvert** L= 155.0' Ke= 0.500 Inlet / Outlet Invert= 878.00' / 877.00' S= 0.0065 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#3	Primary	878.00'	**24.0" Round Culvert** L= 155.0' Ke= 0.500 Inlet / Outlet Invert= 878.00' / 877.00' S= 0.0065 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf

Discarded OutFlow Max=0.38 cfs @ 12.70 hrs HW=879.83' (Free Discharge)
└**1=Exfiltration** (Controls 0.38 cfs)

Primary OutFlow Max=25.55 cfs @ 12.70 hrs HW=879.83' (Free Discharge)
├**2=Culvert** (Barrel Controls 12.78 cfs @ 5.55 fps)
└**3=Culvert** (Barrel Controls 12.78 cfs @ 5.55 fps)

Pond CRH-3: CRH-3



Summary for Pond P1/P2: P-1/P-2

[95] Warning: Outlet Device #1 rise exceeded

Inflow Area = 68.531 ac, 57.92% Impervious, Inflow Depth = 5.91" for 100-Year event
Inflow = 181.28 cfs @ 12.57 hrs, Volume= 33.757 af
Outflow = 174.02 cfs @ 12.70 hrs, Volume= 33.752 af, Atten= 4%, Lag= 7.9 min
Primary = 174.02 cfs @ 12.70 hrs, Volume= 33.752 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Starting Elev= 924.00' Surf.Area= 1.270 ac Storage= 3.500 af
Peak Elev= 925.71' @ 12.70 hrs Surf.Area= 1.527 ac Storage= 5.893 af (2.393 af above start)

Plug-Flow detention time= 131.3 min calculated for 30.252 af (90% of inflow)
Center-of-Mass det. time= 40.8 min (839.8 - 799.0)

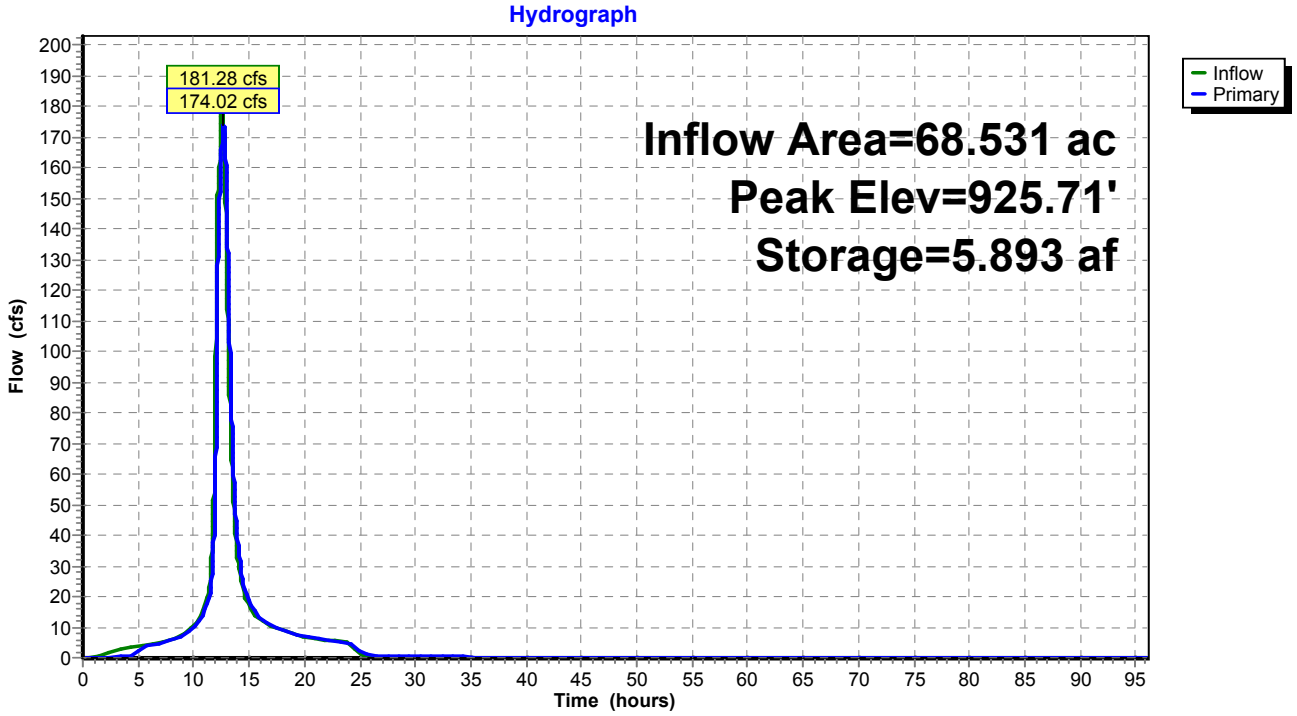
Volume	Invert	Avail.Storage	Storage Description
#1	920.00'	6.340 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
920.00	0.650	0.000	0.000
922.00	0.790	1.440	1.440
924.00	1.270	2.060	3.500
926.00	1.570	2.840	6.340

Device	Routing	Invert	Outlet Devices
#1	Primary	924.40'	**40.0' long x 1.00' rise Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#2	Primary	924.00'	**6.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=174.04 cfs @ 12.70 hrs HW=925.71' (Free Discharge)
1=Sharp-Crested Rectangular Weir (Orifice Controls 172.80 cfs @ 4.34 fps)
2=Orifice/Grate (Orifice Controls 1.24 cfs @ 6.30 fps)

Pond P1/P2: P-1/P-2



Summary for Pond P5/P6: P-5/P-6

Inflow Area = 43.279 ac, 47.44% Impervious, Inflow Depth = 5.62" for 100-Year event
Inflow = 234.37 cfs @ 12.15 hrs, Volume= 20.279 af
Outflow = 122.50 cfs @ 12.39 hrs, Volume= 18.171 af, Atten= 48%, Lag= 14.7 min
Primary = 119.35 cfs @ 12.39 hrs, Volume= 16.468 af
Secondary = 3.15 cfs @ 12.39 hrs, Volume= 1.703 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Starting Elev= 929.00' Surf.Area= 1.975 ac Storage= 5.062 af
Peak Elev= 932.56' @ 12.39 hrs Surf.Area= 2.681 ac Storage= 13.462 af (8.400 af above start)

Plug-Flow detention time= 329.7 min calculated for 13.108 af (65% of inflow)
Center-of-Mass det. time= 151.8 min (932.3 - 780.5)

Volume	Invert	Avail.Storage	Storage Description
#1	926.00'	14.650 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
926.00	1.510	0.000	0.000
928.00	1.710	3.220	3.220
930.00	2.240	3.950	7.170
931.00	2.400	2.320	9.490
933.00	2.760	5.160	14.650

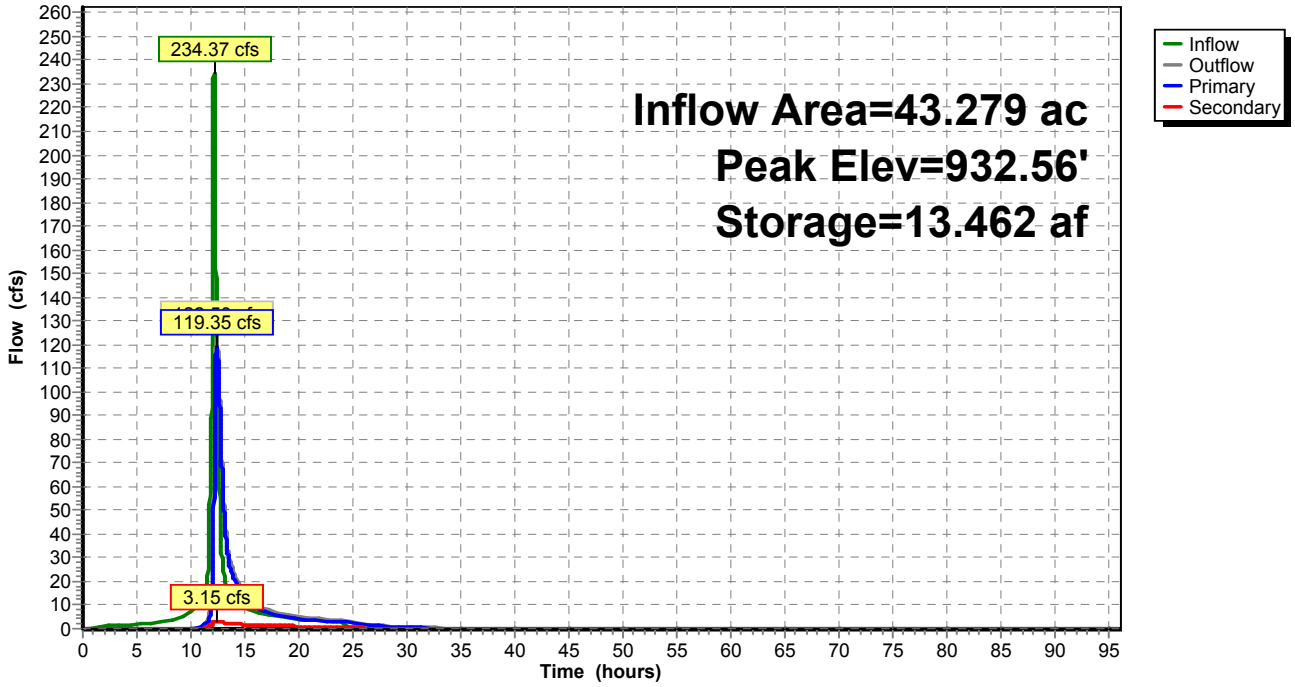
Device	Routing	Invert	Outlet Devices
#1	Primary	930.00'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	930.50'	**7.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#3	Primary	931.50'	**14.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#4	Secondary	930.00'	**9.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=119.32 cfs @ 12.39 hrs HW=932.56' (Free Discharge)
- **1=Orifice/Grate** (Orifice Controls 6.05 cfs @ 7.71 fps)
- **2=Sharp-Crested Rectangular Weir** (Weir Controls 63.84 cfs @ 4.70 fps)
- **3=Sharp-Crested Rectangular Weir** (Weir Controls 49.43 cfs @ 3.37 fps)

Secondary OutFlow Max=3.15 cfs @ 12.39 hrs HW=932.56' (Free Discharge)
- **4=Orifice/Grate** (Orifice Controls 3.15 cfs @ 7.12 fps)

Pond P5/P6: P-5/P-6

Hydrograph



Summary for Pond P8: P-8

Inflow Area = 6.389 ac, 7.62% Impervious, Inflow Depth = 4.52" for 100-Year event
Inflow = 39.72 cfs @ 12.05 hrs, Volume= 2.409 af
Outflow = 11.85 cfs @ 12.39 hrs, Volume= 2.407 af, Atten= 70%, Lag= 20.2 min
Primary = 11.85 cfs @ 12.39 hrs, Volume= 2.407 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Starting Elev= 897.00' Surf.Area= 0.300 ac Storage= 0.495 af
Peak Elev= 899.05' @ 12.39 hrs Surf.Area= 0.492 ac Storage= 1.367 af (0.872 af above start)

Plug-Flow detention time= 240.5 min calculated for 1.912 af (79% of inflow)
Center-of-Mass det. time= 107.3 min (918.0 - 810.7)

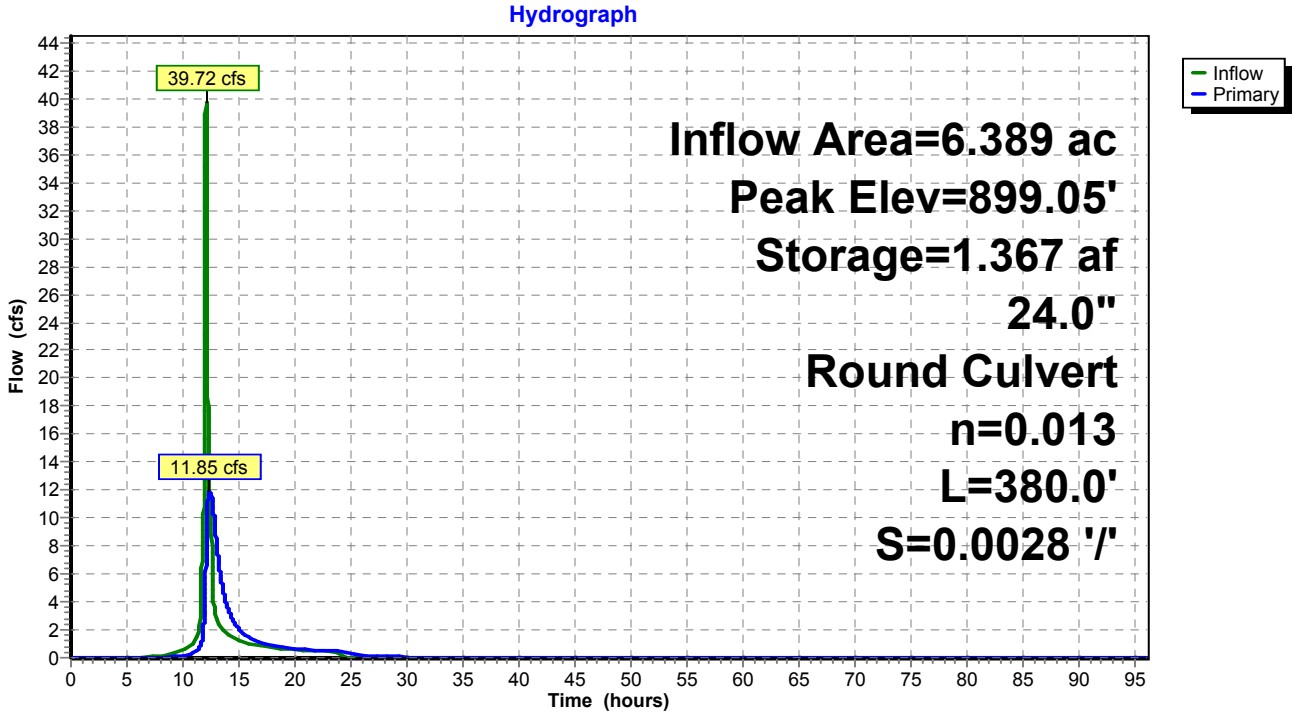
Volume	Invert	Avail.Storage	Storage Description
#1	893.00'	1.850 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
893.00	0.030	0.000	0.000
894.00	0.070	0.050	0.050
896.00	0.150	0.220	0.270
897.00	0.300	0.225	0.495
898.00	0.450	0.375	0.870
900.00	0.530	0.980	1.850

Device	Routing	Invert	Outlet Devices
#1	Primary	897.00'	**24.0" Round RCP_Round 24"** L= 380.0' RCP, groove end w/headwall, Ke= 0.200 Inlet / Outlet Invert= 897.00' / 895.94' S= 0.0028 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf

Primary OutFlow Max=11.86 cfs @ 12.39 hrs HW=899.05' (Free Discharge)
1=RCP_Round 24" (Barrel Controls 11.86 cfs @ 4.56 fps)

Pond P8: P-8


Hydrograph
39.72 cfs
11.85 cfs
Inflow Area=6.389 ac
Peak Elev=899.05'
Storage=1.367 af
24.0"
Round Culvert
n=0.013
L=380.0'
S=0.0028 '/'
Inflow
Primary
Flow (cfs)
Time (hours)
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95

Summary for Pond W-1: W-1

[79] Warning: Submerged Pond 4P Secondary device # 2 by 0.41'

Inflow Area = 0.997 ac, 24.47% Impervious, Inflow Depth = 27.88" for 100-Year event
Inflow = 6.30 cfs @ 12.25 hrs, Volume= 2.316 af
Outflow = 3.08 cfs @ 14.38 hrs, Volume= 2.316 af, Atten= 51%, Lag= 127.9 min
Primary = 3.08 cfs @ 14.38 hrs, Volume= 2.316 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Peak Elev= 915.41' @ 14.38 hrs Surf.Area= 0.766 ac Storage= 0.472 af

Plug-Flow detention time= 110.7 min calculated for 2.316 af (100% of inflow)
Center-of-Mass det. time= 110.8 min (973.9 - 863.1)

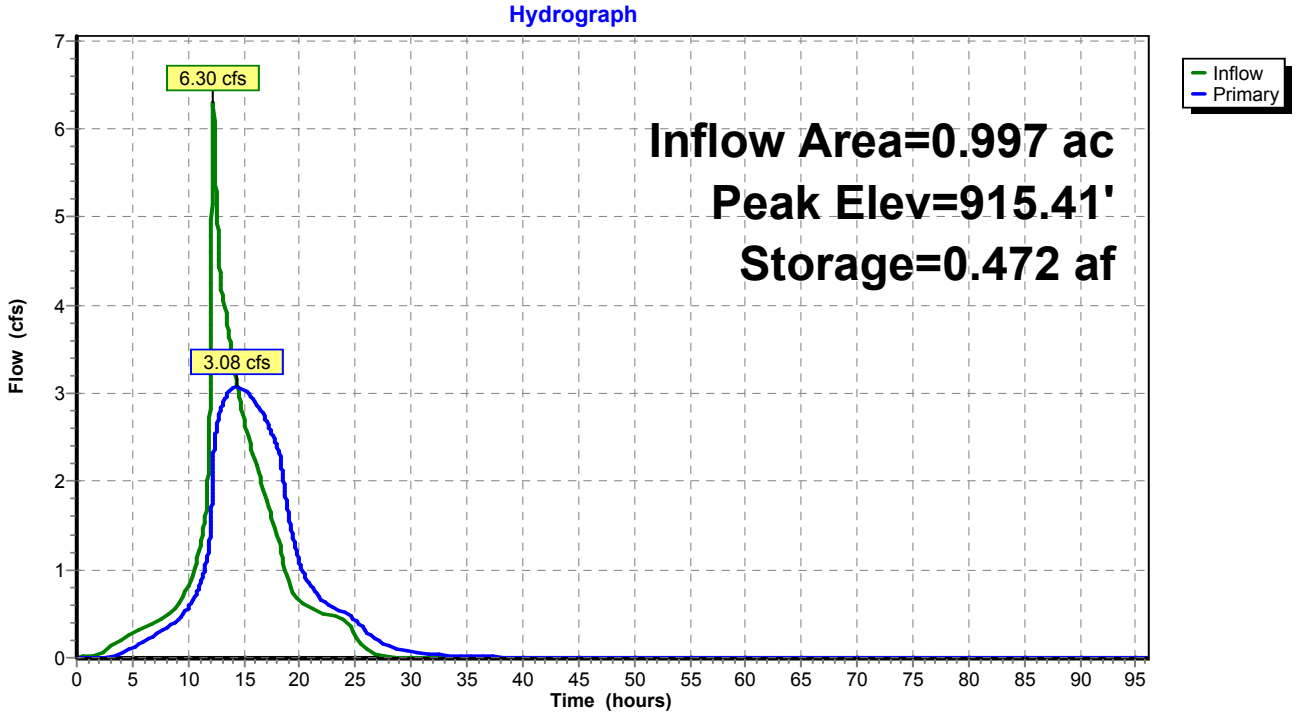
Volume	Invert	Avail.Storage	Storage Description
#1	914.75'	0.950 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
914.75	0.660	0.000	0.000
916.00	0.860	0.950	0.950

Device	Routing	Invert	Outlet Devices
#1	Primary	914.75'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=3.08 cfs @ 14.38 hrs HW=915.41' (Free Discharge)
↑—**1=Orifice/Grate** (Orifice Controls 3.08 cfs @ 3.92 fps)

Pond W-1: W-1


Hydrograph
6.30 cfs
3.08 cfs
Inflow Area=0.997 ac
Peak Elev=915.41'
Storage=0.472 af
Inflow
Primary
Flow (cfs)
Time (hours)
0
1
2
3
4
5
6
7
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95

Summary for Pond W-2: W-2

Inflow	=	3.15 cfs @	12.39 hrs,	Volume=	1.703 af
Outflow	=	1.17 cfs @	18.90 hrs,	Volume=	1.555 af, Atten= 63%, Lag= 390.6 min
Primary	=	1.17 cfs @	18.90 hrs,	Volume=	1.555 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Peak Elev= 929.60' @ 18.90 hrs Surf.Area= 1.191 ac Storage= 0.680 af

Plug-Flow detention time= 537.3 min calculated for 1.555 af (91% of inflow)
Center-of-Mass det. time= 474.1 min (1,537.1 - 1,063.1)

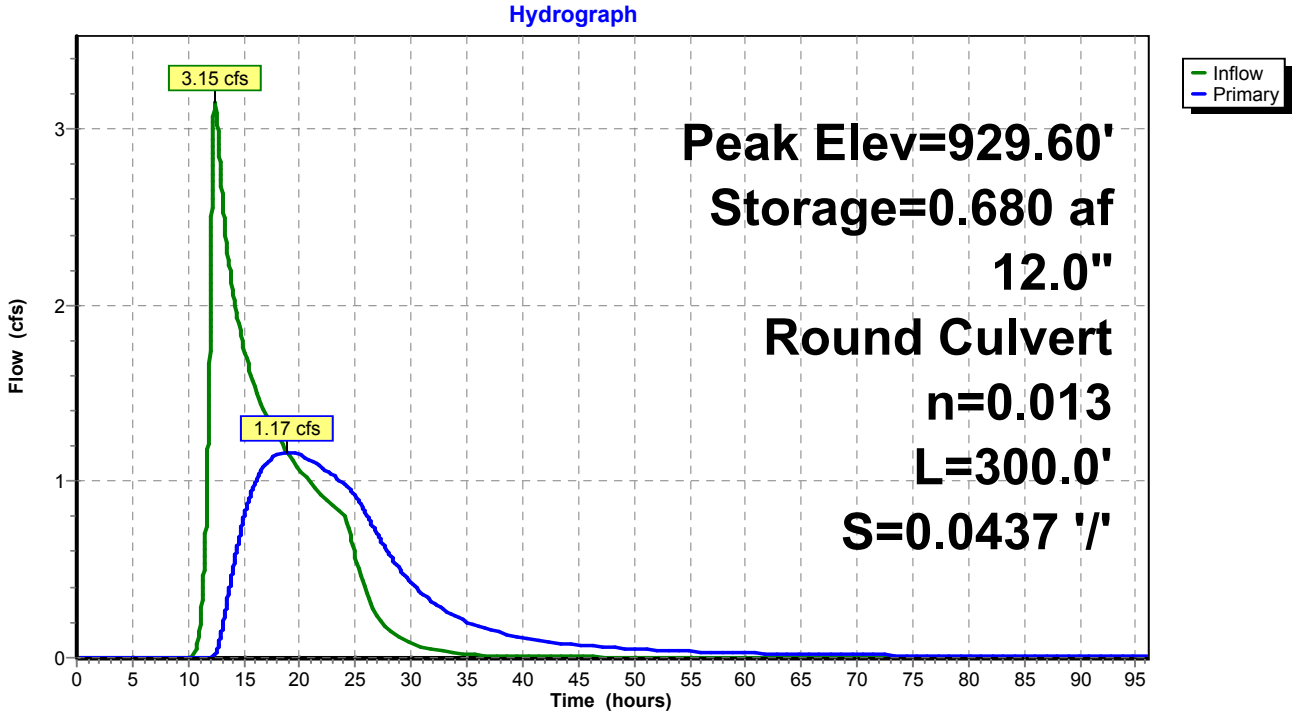
Volume	Invert	Avail.Storage	Storage Description
#1	929.00'	1.175 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
929.00	1.090	0.000	0.000
930.00	1.260	1.175	1.175

Device	Routing	Invert	Outlet Devices
#1	Primary	929.10'	**12.0" Round RCP_Round 12"** L= 300.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 929.10' / 916.00' S= 0.0437 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=1.17 cfs @ 18.90 hrs HW=929.60' (Free Discharge)
↑—**1=RCP_Round 12"** (Inlet Controls 1.17 cfs @ 3.00 fps)

Pond W-2: W-2


Hydrograph
3.15 cfs
1.17 cfs
Peak Elev=929.60'
Storage=0.680 af
12.0"
Round Culvert
n=0.013
L=300.0'
S=0.0437 '/'
Inflow
Primary
Flow (cfs)
Time (hours)
0
1
2
3
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95

Summary for Pond W-3: W-3

[79] Warning: Submerged Pond 7P Secondary device # 2 INLET by 0.18'

Inflow	=	1.37 cfs @	18.90 hrs, Volume=	2.176 af
Outflow	=	0.90 cfs @	26.81 hrs, Volume=	1.988 af, Atten= 34%, Lag= 474.5 min
Primary	=	0.90 cfs @	26.81 hrs, Volume=	1.988 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Peak Elev= 915.18' @ 26.81 hrs Surf.Area= 2.111 ac Storage= 0.894 af

Plug-Flow detention time= 923.1 min calculated for 1.988 af (91% of inflow)
Center-of-Mass det. time= 715.0 min (2,311.0 - 1,596.0)

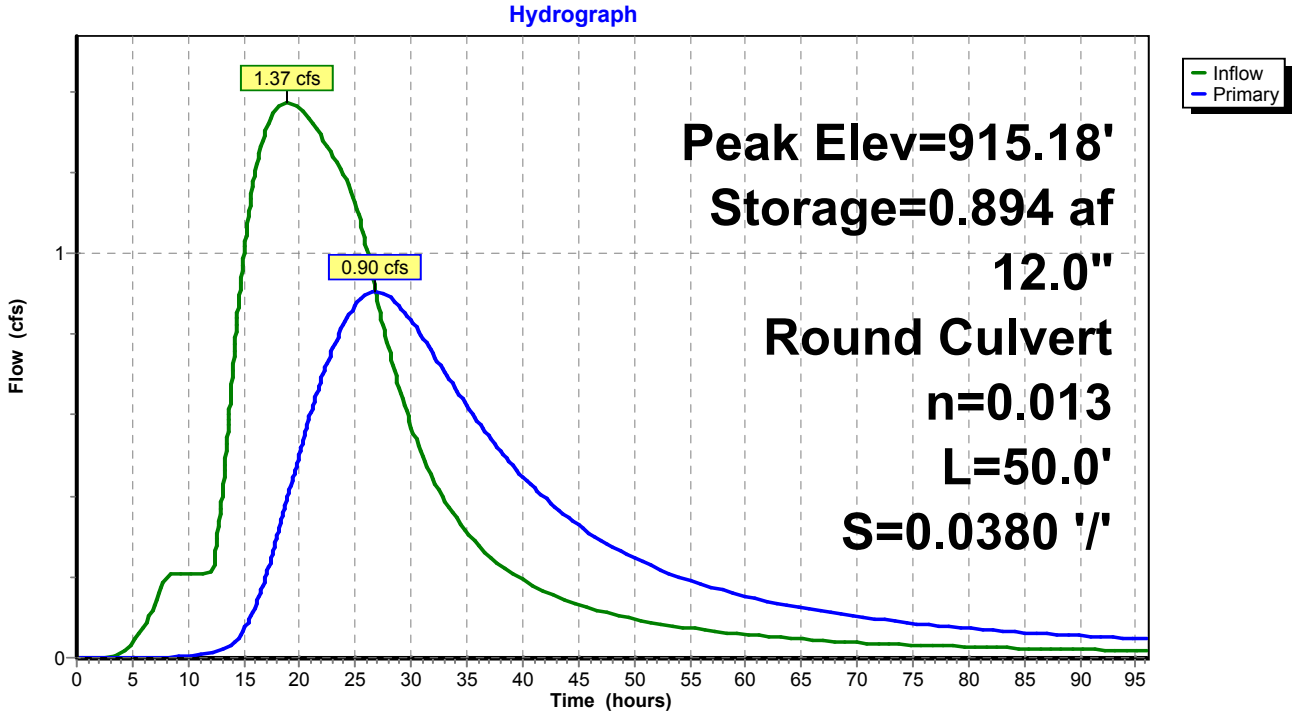
Volume	Invert	Avail.Storage	Storage Description
#1	914.75'	2.680 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
914.75	2.040	0.000	0.000
915.00	2.080	0.515	0.515
916.00	2.250	2.165	2.680

Device	Routing	Invert	Outlet Devices
#1	Primary	914.75'	**12.0" Round RCP_Round 12"** L= 50.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 914.75' / 912.85' S= 0.0380 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=0.90 cfs @ 26.81 hrs HW=915.18' (Free Discharge)
↑—**1=RCP_Round 12"** (Inlet Controls 0.90 cfs @ 2.79 fps)

Pond W-3: W-3


Hydrograph
1.37 cfs
0.90 cfs
Peak Elev=915.18'
Storage=0.894 af
12.0"
Round Culvert
n=0.013
L=50.0'
S=0.0380 '/'
Inflow
Primary
Flow (cfs)
Time (hours)
0
1
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95

Summary for Pond W-4: W-4

[79] Warning: Submerged Pond 11P Secondary device # 5 INLET by 0.37'

Inflow Area = 2.985 ac, 30.99% Impervious, Inflow Depth > 22.32" for 100-Year event
Inflow = 22.15 cfs @ 12.08 hrs, Volume= 5.553 af
Outflow = 4.40 cfs @ 15.04 hrs, Volume= 5.520 af, Atten= 80%, Lag= 177.4 min
Primary = 4.40 cfs @ 15.04 hrs, Volume= 5.520 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Peak Elev= 909.37' @ 15.04 hrs Surf.Area= 1.272 ac Storage= 1.401 af

Plug-Flow detention time= 260.2 min calculated for 5.519 af (99% of inflow)
Center-of-Mass det. time= 241.8 min (1,271.5 - 1,029.7)

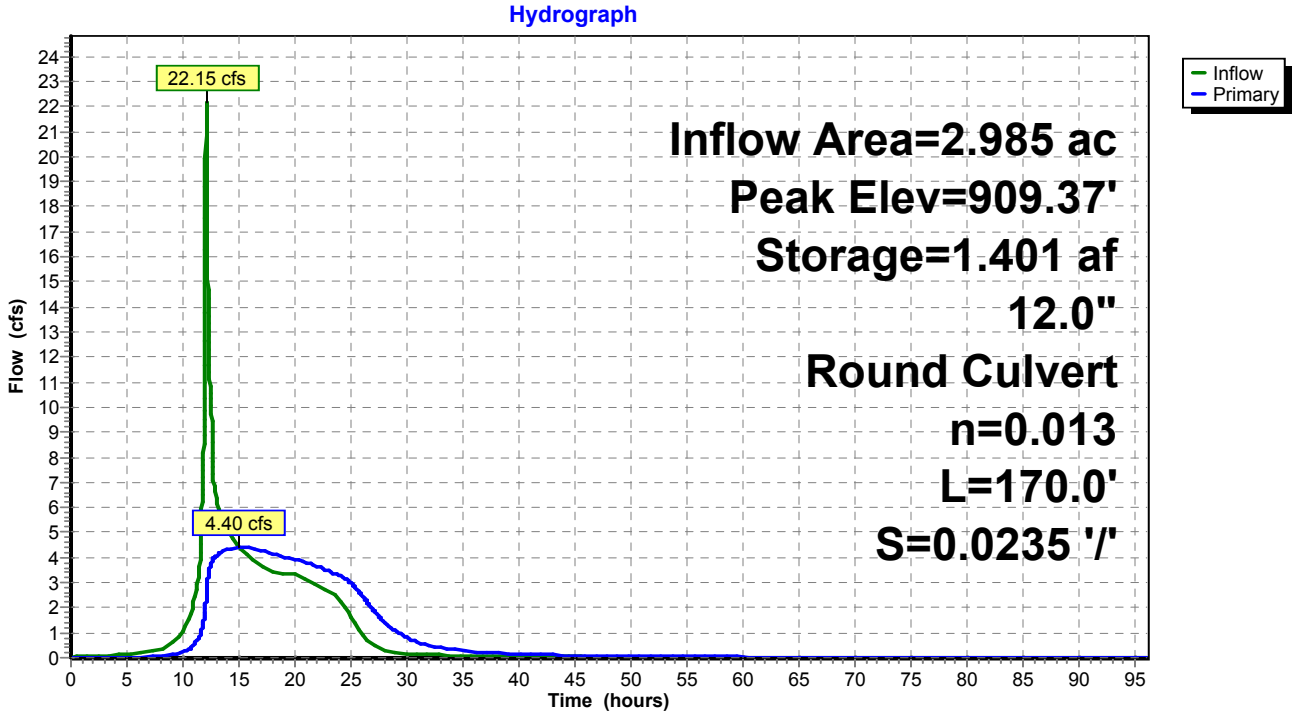
Volume	Invert	Avail.Storage	Storage Description
#1	908.00'	2.280 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
908.00	0.780	0.000	0.000
910.00	1.500	2.280	2.280

Device	Routing	Invert	Outlet Devices
#1	Primary	908.00'	**12.0" Round RCP_Round 12"** L= 170.0' RCP, groove end w/headwall, Ke= 0.200 Inlet / Outlet Invert= 908.00' / 904.00' S= 0.0235 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=4.40 cfs @ 15.04 hrs HW=909.37' (Free Discharge)
↑—**1=RCP_Round 12"** (Inlet Controls 4.40 cfs @ 5.60 fps)

Pond W-4: W-4


Hydrograph
22.15 cfs
4.40 cfs
Inflow Area=2.985 ac
Peak Elev=909.37'
Storage=1.401 af
12.0"
Round Culvert
n=0.013
L=170.0'
S=0.0235 '/'
Inflow
Primary
Flow (cfs)
Time (hours)

Summary for Pond W-5: W-5

[79] Warning: Submerged Pond 13P Secondary device # 2 INLET by 0.35'
[79] Warning: Submerged Pond 13P Secondary device # 3 INLET by 0.35'
[79] Warning: Submerged Pond 13P Secondary device # 4 INLET by 0.35'
[79] Warning: Submerged Pond 13P Secondary device # 5 INLET by 0.35'
[79] Warning: Submerged Pond 13P Secondary device # 6 INLET by 0.35'

Inflow Area = 7.608 ac, 48.41% Impervious, Inflow Depth = 13.54" for 100-Year event
Inflow = 76.01 cfs @ 12.02 hrs, Volume= 8.585 af
Outflow = 17.76 cfs @ 13.10 hrs, Volume= 8.583 af, Atten= 77%, Lag= 64.6 min
Primary = 17.76 cfs @ 13.10 hrs, Volume= 8.583 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Starting Elev= 882.75' Surf.Area= 4.887 ac Storage= 7.134 af
Peak Elev= 883.35' @ 13.10 hrs Surf.Area= 5.708 ac Storage= 10.265 af (3.131 af above start)

Plug-Flow detention time= 1,101.1 min calculated for 1.448 af (17% of inflow)
Center-of-Mass det. time= 188.8 min (1,018.1 - 829.3)

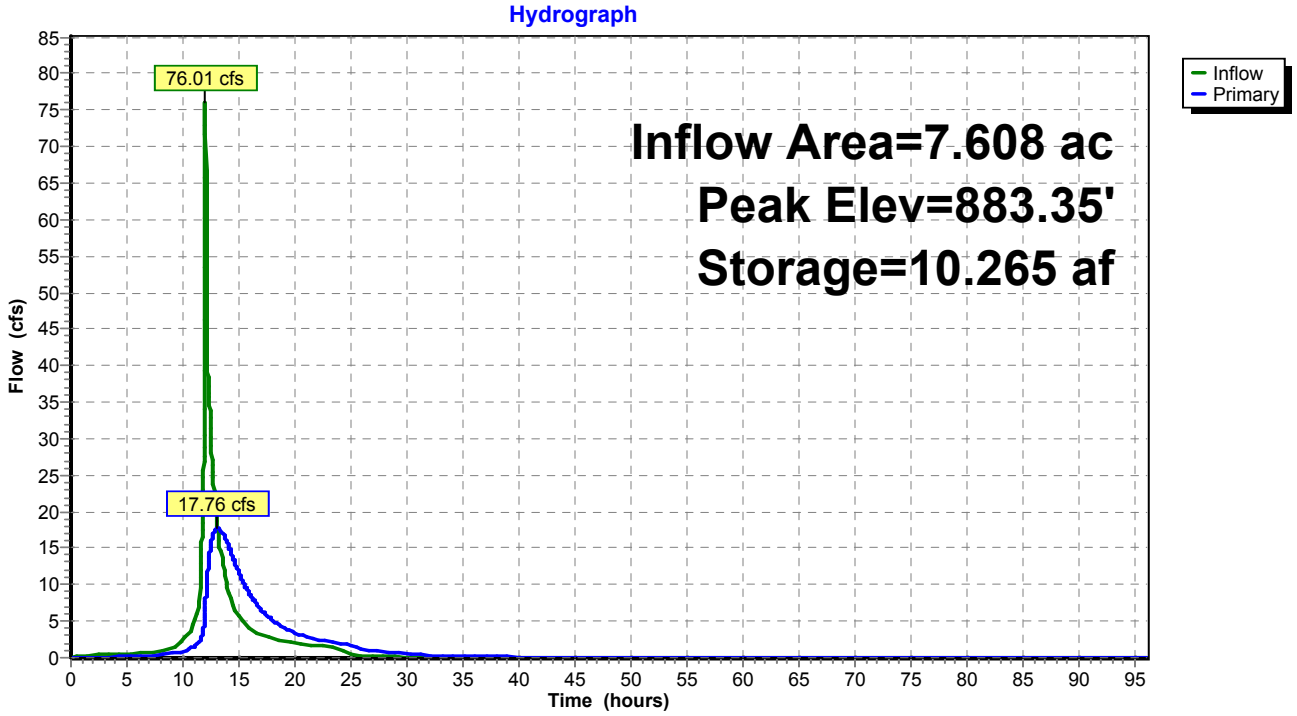
Volume	Invert	Avail.Storage	Storage Description
#1	881.00'	11.097 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
881.00	3.270	0.000	0.000
882.00	4.190	3.730	3.730
883.00	5.120	4.655	8.385
883.49	5.950	2.712	11.097

Device	Routing	Invert	Outlet Devices
#1	Primary	882.75'	**6.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#2	Primary	882.75'	**6.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=17.75 cfs @ 13.10 hrs HW=883.35' (Free Discharge)
↑—**1=Sharp-Crested Rectangular Weir** (Weir Controls 8.88 cfs @ 2.53 fps)
└—**2=Sharp-Crested Rectangular Weir** (Weir Controls 8.88 cfs @ 2.53 fps)

Pond W-5: W-5


Hydrograph
76.01 cfs
17.76 cfs
Inflow Area=7.608 ac
Peak Elev=883.35'
Storage=10.265 af
Inflow
Primary
Flow (cfs)
Time (hours)
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
75
80
85
90
95

Technical Memo

WENCK ASSOCIATES

Responsive partner.
Exceptional outcomes.

To: Beth Kunkel, Kimley-Horn

From: Pamela Massaro, PE, Wenck Associates, Inc.
Mary Pate-Holt, EIT, Wenck Associates, Inc.
Adam Marsh, EIT, Wenck Associates, Inc.

Date: July 30, 2015

Subject: P8 Water Quality Modeling

1.1 Introduction

The purpose of this technical memorandum is to summarize the stormwater water quality modeling completed using the P8 model as presented in the Comprehensive Stormwater Management Plan (CSMP) submitted to the Rice Creek Watershed District (RCWD) for the portion of the former Twin Cities Army Ammunition Plant (TCAAP) Site being redeveloped by Ramsey County (County), the City of Arden Hills (City), the County's consultants (Kimley Horn, Wenck Associates Inc.), and future Developers. The Site, under 2012 existing conditions, provides few stormwater control structures to reduce discharge rate and just grassy swales as best management practices (BMPs) to improve water quality treatment before stormwater leaves the Site.

1.2 Project Location

The 427-acre site is located in the Ramsey County, Minnesota in the cities of Arden Hills and New Brighton, the Twin Cities Army Ammunitions Plant (TCAAP) is bounded by U.S. Interstate Highway 35 on the west, Minnesota Highway 96 to the south and US Highway 10 to the Southwest (**CSMP Figure 2-1**).

Rice Creek divides the Site into two sections: the portion south of Rice Creek, and the portion north of Rice Creek. The Site drains to both Rice Creek and Round Lake (**CSMP Figure 2-2**). The portion north of Rice Creek is north of County Road H and drains to Rice Creek, the northern two-thirds of the Site south of Rice Creek drains to Rice Creek, and the southern third of the Site south of Rice Creek drains south to Round Lake.

1.3 Water Quality Modeling Scenarios

The Site, under proposed fully developed conditions, will meet RCWD's water quality treatment requirements through a combination of onsite infiltration and wet detention ponds. Hydrology and Hydraulics results are summarized in a separate HydroCAD Modeling technical memorandum. This technical memorandum summarizes the evaluation of phosphorous removal using the P8 water quality model for interim and fully developed conditions at the Site. Wet detention ponds (stand alone and connected in series) hydraulically connected to wetlands (both mitigation and existing), a vegetated swale, and

"to be designed" infiltration practices are planned to provide the water quality treatment to reduce the total phosphorous (TP) load from stormwater before discharging to the Resource of Concern (ROC). Dead storage volume, of the wet detention pond, is the most important design parameter influencing the pollutant removal efficiency as it provides runoff storage and water quality treatment between storms. Phosphorous removals were evaluated for several stages of development and various treatment trains by discharge point; Table 1 describes the different model scenarios evaluated by ROC.

Table 1: P8 Modeling Scenarios

Resource of Concern	Development Stage
Round Lake	
Interim Scenario 1	Construction of Spine Road, mitigation wetlands (W-1, W-2), stormwater ponds (P-2, P-4, P-5, P-6), 60" RCP and 36" RCP to Outfall #2 (60" under Hwy 10), and connections to Outfall #1 (24" under Hwy 10) (as shown in CSMP Figure 4-5) The Site's open space is undeveloped and vegetated (CN 74).
Scenario 2	Fully Developed Conditions (CSMP Figure 4-5 with landuse per CSMP Figure 3-1)
Rice Creek	
Interim Scenario 1	Construction of Spine Road, County Road H/I-35W Interchange, remeander of Rice Creek, Old Highway 8 extension Road, mitigation wetlands (W-3, W-4, W-5), stormwater ponds (P-7, P-8, P-9, P-10, P-11, P-12, and P-13), MnDOT ponds (CRH-1, CRH-2, and CRH-3), and vegetated swale (SB-18) connected to P-13 under Spine Road. The Site's open space is undeveloped and vegetated (CN 74).
Interim Scenario 2	Interim Scenario 1 plus stormwater pond (P-14), development east of Spine Road (landuse per CSMP Figure 3-1). Assume there is no development or infiltration device in SB-18 (CSMP Figure 4-7).
Scenario 3	Fully Developed Conditions (CSMP Figure 4-5 with landuse per CSMP Figure 3-1)

Many figures referenced in this technical memorandum are from the CSMP document and referenced as "CSMP Figure X-X".

2.1 P8 Computer Model

P8 (Program for Predicting Polluting Particle Passage through Pits, Puddles and Ponds, IEP, Inc., 1990) is a computer model used for predicting the generation and transport of stormwater runoff pollutants in urban watersheds. P8 is a useful diagnostic tool for evaluating and designing watershed improvements like green infrastructure. The model requires user input on watershed characteristics, green infrastructure dimensions, local precipitation and temperature, and water quality parameters.

P8 calculates runoff separately from pervious and impervious areas. Calculations for pervious areas use the Soil Conservation Service (SCS) Curve Number (CN) method. The

CN for pervious areas was 74 and the impervious area CNs was assigned 98 for all scenarios tested. To represent changes in development, the percent impervious was adjusted for the modeling scenarios presented in Table 1.

The percent impervious of scenario 1 (for both resources of concern) was calculated using Table 2 of the HydroCAD Technical Memorandum. In the fully developed conditions (for both resources of concern), the percent impervious was calculated using Table 3 of the HydroCAD Technical Memorandum. The Rice Creek interim scenario 2 model uses the interim percent impervious for subwatershed 18 (Table 2 of the HydroCAD Technical Memorandum) and the full development percent impervious for the rest of the site (Table 3 of the HydroCAD Technical Memorandum). The surface areas of the ponds and wetlands were included in the tributary area directly contributing runoff into each pond (see the Stormwater Pond Data Summary Tables included in the Appendix of the HydroCAD Technical Memorandum). This provides a conservative estimate for the amount of TP removed. Runoff from impervious areas begins once the cumulative storm rainfall exceeds the specified depression storage, with the runoff rate equal to the rainfall intensity.

The ponds in P8 were built using area, volume, and outlet information from HydroCAD. Surface areas were inputted for each pond's bottom, permanent pool, and flood pool. The permanent pool was calculated as the surface area at the primary outlet. The flood pool surface area was calculated at the top contour of the pond. Permanent and flood pool storage for each pond are shown in the Stormwater Pond Data Summary Tables included in the Appendix of the HydroCAD Technical Memorandum. Outlet devices are shown in the Stormwater Pond Data Summary Tables included in the Appendix of the HydroCAD Technical Memorandum

The P8 model uses an hourly precipitation record (rain and snowfall) and daily temperature record. Precipitation and temperature data were obtained from the Minneapolis-St. Paul International Airport. Records from 2001 to 2010 were used for this study. Model results summarized herein are annual averages reported by weight (pounds of TP per year).

Wenck selected the $NURP_{50}$ particle file for the TCAAP study. The component concentrations in the $NURP_{50}$ file represent the 50^{th} percentile (median) values compiled in the US EPA's Nationwide Urban Runoff Program (NURP).

2.2 Proposed Stormwater Treatment

Wenck evaluated the proposed TP loads, by weight, for runoff into Round Lake and Rice Creek/Long Lake at each discharge point were evaluated individually (**CSMP Figures 4-6 and 4-7**). P8, under fully developed conditions, predicts runoff loading from subwatersheds that are directed to stormwater BMPs (e.g., ponds) for treatment. The proposed ponds P-1, P-2, P-3, P-4, P-5, P-6, and wetlands W-1 and W-2 discharge to Round Lake. While proposed ponds P-7, P-8, P-9, P-10, P-11, P-12, P-13, P-14, CRH-1, CHR-2, CHR-3, and wetlands Wi, W-3, W-4, and W-5 discharge to Rice Creek/Long Lake.

2.2.1 Infiltration BMPs

Runoff from the west side of the site (subwatershed 18) and the thumb will be treated by infiltration once the site is fully developed (**CSMP Figure 5-1***, Areas 3 and 4*). This was modeled in P8, under fully developed conditions, by creating an infiltration basin sized to infiltrate the runoff from the proposed impervious surfaces. For Area 3 on **CSMP Figure 5-1**, the infiltration basin was sized to infiltrate 3.32 acre-ft (1.1 inches) of runoff. For Area 4 on **CSMP Figure 5-1**, the infiltration basin was sized to infiltrate 3.74 acre-ft (1.1 inches) of runoff. The modeled removal efficiency for the proposed ponds reflect the least effective BMP that will be installed. Under interim scenarios 1 and 2, a grassy swale was used as an infiltration treatment device in subwatershed 18. The grassy swale provides 6.15 acre-feet of infiltration volume. The P8 input details for the swale are shown in Table 2.

Table 2: Swale Details

Parameter	Measurement
Flow Path Length	3,400 feet
Flow Path Slope	1%
Bottom Width	4 feet
Side Slope	0.33 ft/ft
Maximum Depth	4.5 feet
Infiltration Rate	0.45 in/hour
Manning's n	0.15
Infiltration Volume	6.15 acre-feet

2.3 Pollutant Reduction

The Rice Creek Watershed District (RCWD) recommended TP loads (lbs/year) are reduced by at least 50%.

2.3.1 ROC: Rice Creek TP Reductions

The proposed ponding systems will reduce the annual TP load to Rice Creek by 65% under the public infrastructure improvement conditions, aka interim scenario 1 (**Table 3**, total), 55% in worst case, aka interim scenario 2 (**Table 4**, total), and 64% in fully developed conditions, aka scenario 3 (**Table 5**, total). TP load reductions at each discharge point are shown in **Tables 3-5**. The outfall locations and tributary areas are shown in **CSMP Figure 6-5**. Ponds CRH-1 and CRH-3 are not meeting the 50% reduction in annual TP load because they are only 30% designed; these ponds are required to have infiltration if the soil borings indicate infiltration is possible. Results from P8 are provided in **Appendix A**.

Table 3: TP Load Reductions to Rice Creek (Interim Scenario 1: Public Infrastructure Improvements)

Discharge Point	Total TP Inflow Load* (lbs./year)	Total Outflow Load (lbs./year)	% Reduction
Outfall #5 (Pond P-13)	75.3	28.9	62%
Outfall #4 (CRH-1)**	7.1	3.8	46%
Outfall #8 (CRH-3)**	5.4	4.2	22%
Outfall #9 (Thumb with Infiltration BMP)	19.0	1.0	95%
Total	106.8	37.9	**65%**

*The total TP inflow load for each discharge point was calculated by summing the TP loads from each contributing watershed (i.e. total TP inflow load for CRH-3 = TP load from CRH-2 + TP load from CRH-3).
** Ponds CRH-1 and CHR-3 are 30% designed.

Table 4: TP Load Reductions to Rice Creek (Interim Scenario 2: Worst Case)

Discharge Point	Total TP Inflow Load* (lbs./year)	Total Outflow Load (lbs./year)	% Reduction
Outfall #5 (Pond P-13)	189.6	91	52%
Outfall #10 (Pond P-14)	18.8	7.1	62%
Outfall #4 (CRH-1)**	8.6	4.9	43%
Outfall #8 (CRH-3)**	4.5	3.4	24%
Outfall #9 (Thumb with Infiltration BMP)	16.8	0.8	95%
Total	238.3	107.2	**55%**

*The total TP inflow load for each discharge point was calculated by summing the TP loads from each contributing watershed (i.e. total TP inflow load for CRH-3 = TP load from CRH-2 + TP load from CRH-3).
** Ponds CRH-1 and CHR-3 are 30% designed.

Table 5: TP Load Reductions to Rice Creek (Scenario 3: Fully Developed Conditions)

Discharge Point	Watershed Inflow (lbs./year)	Total Outflow (lbs./year)	% Reduction
Outfall #5 (Pond P-13)	279	99.9	64%
Outfall #10 (Pond P-14)	18.8	7.1	62%
Outfall #4 (CRH-1)**	7.1	3.8	46%
Outfall #8 (CRH-3)**	5.4	4.2	22%
Outfall #9 (Thumb with Infiltration BMP)	13.6	0.4	97%
Total	323.9	115.4	**64%**

*The total TP inflow load for each discharge point was calculated by summing the TP loads from each contributing watershed (i.e. total TP inflow load for CRH-3 = TP load from CRH-2 + TP load from CRH-3).
** Ponds CRH-1 and CHR-3 are 30% designed, see text above.

2.3.1 ROC: Round Lake TP Reductions

The proposed ponding systems will reduce the annual TP load to Round Lake by 53% in under the public infrastructure improvement conditions, aka interim scenario 1 (**Table 6**, total) and 60% in fully developed conditions, aka scenario 2 (**Tables 7**, total). TP load reductions at each discharge point are shown in **Tables 6-7**. The outfall locations and tributary areas are shown in **CSMP Figure 6-5**. Results from P8 are provided in **Appendix A**.

Table 6: TP Load Reductions to Round Lake (Interim Scenario 1: Public Infrastructure Improvements)

Discharge Point	Total TP Inflow Load* (lbs./year)	Total Outflow Load (lbs./year)	% Reduction
Outfall #2 (Pond P-3)	36.2	17	53%
Outfall #1 (Pond P-4)	1.7	0.8	53%
Total	37.9	17.8	**53%**

*The total TP inflow load for each discharge point was calculated by summing the TP loads from each contributing watershed (i.e. total TP inflow load for Outfall #1 = TP load from Pond 4 + TP load from Wetland 1).

Table 7: TP Load Reductions to Round Lake (Scenario 2: Fully Developed Conditions)

Discharge Point	Total TP Inflow Load* (lbs./year)	Total Outflow Load (lbs./year)	% Reduction
Outfall #2 (Pond P-3)	168.8	66.3	61%
Outfall #1 (Pond P-4)	12.4	6.1	51%
Total	181.2	72.4	**60%**

*The total TP inflow load for each discharge point was calculated by summing the TP loads from each contributing watershed (i.e. total TP inflow load for Outfall #1 = TP load from Pond 4 + TP load from Wetland 1)

3.1 Conclusion

The proposed ponding systems will reduce TP loads from the proposed site conditions by more than 50%, meeting RCWD standards. For runoff into Rice Creek, the TP load is 65% in interim scenario 1, 55% in interim scenario 2, and 64% in scenario 3. The proposed ponding systems will reduce the annual TP load to Round Lake by 53% in interim scenario 1 and 60% in scenario 2.

Appendix A

Round Lake P8 Results
Rice Creek/Long Lake P8 Results

Round Lake P8 Results
Interim Scenario 1

P8 Urban Catchment Model, Version 3.5 Run Date 06/08/15

Case	Round Lake - Spine Road Only.p	FirstDate	01/01/01	Precip(in)	296.7
Title	Round Lake	LastDate	12/31/10	Rain(in)	273.57
PrecFile	precip1970-2010.pcp	Events	598	Snow(in)	23.12
PartFile	nurp50.p8p	TotalHrs	87576	TotalYrs	9.99

File Directory	T:\1382 KimleyHorn\01 TCAAP\TASK 03 Stormwater Prelim Design\Models\P8\
Case Title	Round Lake
Case File	Round Lake - Spine Road Only.p8c
Particle File	nurp50.p8p
Temperature File	temp1970-2011.tmp
Storm File	precip1970-2010.pcp
Precip Scale Factor	1
Watersheds	5
Devices	6
Particles	5
WQ Components	7
Start Date	06/01/00
Keep Date	01/01/01
Stop Date	12/31/10
Storm Count	598
Total Hours	87576
Wet Hours	9265
Precip (in)	297
Rain (in)	274
Snowfall (in)	23
Snowmelt (in)	22
EvapoTran(in)	303
Overall TSS Removal(%)	1
Water Balance Error(%)	0
TSS Mass Balance Error	0

P8 Urban Catchment Model, Version 3.5 Run Date 06/08/15

Case	Round Lake - Spine Road Only.p	FirstDate	01/01/01	Precip(in)	296.7
Title	Round Lake	LastDate	12/31/10	Rain(in)	273.57
PrecFile	precip1970-2010.pcp	Events	598	Snow(in)	23.12
PartFile	nurp50.p8p	TotalHrs	87576	TotalYrs	9.99

Case Title	Round Lake
Case Data File	Round Lake - Spine Road Only.p8c
Path	T:\1382 KimleyHorn\01 TCAAP\TASK 03 Stormwater Prelim Design\Models\P8\
Case Notes:	Round Lake Ponds 1/2, 5/6, and 3
Storm Data File	precip1970-2010.pcp
Particle File	nurp50.p8p
Air Temp File File	temp1970-2011.tmp

Time Steps Per Hour	8
Minimum Inter-Event Time (hrs)	10
Maximum Continuity Error %	2
Rainfall Breakpoint (inches)	0.8
Precipitation Scale Factor	1
Air Temp Offset (deg-F)	0
Loops Thru Storm File	1
Simulation Dates	
Start	6/1/2000
Keep	1/1/2001
Stop	12/31/2010

Max Snowfall Temperature (deg-f)	32.0
SnowMelt Temperature (deg-f)	32.0
Snowmelt Coef (in/degF-Day)	0.06
Soil Freeze Temp (deg-F)	32.0
Snowmelt Abstraction Factor	1.00
Evapo-Trans. Calibration Factor	1.00
Growing Season Start Month	5
Growing Season End Month	10

5-Day Antecedent Rainfall + Runoff (inches)

CN Antecedent Moisture Condition	AMC-II	AMC-III
Growing Season	1.40	2.10
NonGrowing Season	0.50	1.10

Watershed Data

Watershed Name	Subbasins Pond 2	Subbasins Outfall #2	Subbasins 3 Pond 5/6	Subbasin 6 Wetland 1	Subbasin 5 Pond 4
Runoff to Device					
Infiltration to Device					
Watershed Area	68.5	21.55	43.27	0.1	7.86
SCS Curve Number (Pervious)	74	74	74	74	74
Scale Factor for Pervious Runoff	1	1	1	1	1
Indirectly Connected Imperv Frac	0	0	0	0	0
UnSwept Impervious Fraction	0.07	0	0.19	0.1	0.06
UnSwept Depression Storage (inch	0.02	0.02	0.02	0.02	0.02
UnSwept Imperv. Runoff Coefficie	1	1	1	1	1
UnSwept Scale Factor for Particl	1	1	1	1	1
Swept Impervious Fraction	0	0	0	0	0
Swept Depression Storage (inches	0.02	0	0.02	0	0
Swept Imperv. Runoff Coefficient	1	1	1	1	1

Swept Scale Factor for Particle	1	1	1	1	1
Sweeping Frequency	0	0	0	0.5	0.5
Sweeping Efficiency	1	1	1	1	1
Sweeping Start Date (MMDD)	101	101	101	101	101
Sweeping Stop Date (MMDD)	1231	1231	1231	1231	1231

Device Data

Device Name	Pond 2	Pond 5/6	Pond 4	Wetland 1	Outfall #1Outfall #2
Device Type	POND	POND	POND	POND	PIPE PIPE
Infiltration Outlet					
Normal Outlet	Outfall #2	Outfall #2	Outfall #1	Outfall #1	
Spillway Outlet	Outfall #2	Outfall #2	Outfall #1	Outfall #1	
Particle Removal Scale Factor	1	1	1	1	
Bottom Elevation (ft)	0	0	0	0	
Bottom Area (acres)	0.095	2.151	0	0.129	
Permanent Pool Area (acres)	0.368	2.729	0.266	0.241	
Permanent Pool Volume (ac-ft)	0.897	6.8	0.5	0	
Perm Pool Infilt Rate (in/hr)	0	0	0	0	
Flood Pool Area (acres)	0.637	3.737	0.593	0.38	
Flood Pool Volume (ac-ft)	1.005	6.1	0.9	0.2	
Flood Pool Infilt Rate (in/hr)	0	0	0	0	
Infilt Basin Void Fraction (%)					
Detention Pond Outlet Parameters					
Outlet Type	ORIFICE	ORIFICE	ORIFICE	ORIFICE	
Outlet Orifice Diameter (in)	6	12	12	6	
Orifice Discharge Coef	1	1	0.6	0.6	
Outlet Weir Length (ft)					
Weir Discharge Coef					
Perforated Riser Height (ft)					
Number of Holes in Riser					
Holes Diameter					
Flood Pool Drain Time (hrs)					
Swale Parameters					
Length of Flow Path (ft)					
Slope of Flow Path %					
Bottom Width (ft)					
Side Slope (ft-v/ft-h)					
Maximum Depth of Flow (ft)					
Mannings n Constant					
Hydraulic Model					
Pipe, Splitter, Aquifer Parameter					
Hydraulic Res. Time (hrs)					0 0

Particle Data

Particle File	nurp50.p8p				
Particle Class	P0%	P10%	P30%	P50%	P80%
Filtration Efficiency	90	100	100	100	100
Settling Velocity (ft/	0	0.03	0.3	1.5	15
First Order Decay Rate	0	0	0	0	0
2nd Order Decay (1/day	0	0	0	0	0
Impervious Runoff Conc	1	0	0	0	0
Pervious Runoff Conc (	1	100	100	100	200
Pervious Conc Exponent	0	1	1	1	1
Accum. Rate (lbs-ac-da	0	1.75	1.75	1.75	3.5
Particle Removal Rate	0	0.25	0.25	0.25	0.25
Washoff Coefficient	0	20	20	20	20
Washoff Exponent	0	2	2	2	2
Sweeper Efficiency	0	0	0	5	15

Water Quality Component Data

Component Name	TSS	TP	TKN	CU	PB	ZN	HC
Water Quality Criteria (ppm)							
Level 1	5	0.025	2	2	0.02	5	0.1
Level 2	10	0.05	1	0.0048	0.014	0.0362	0.5
Level 3	20	0.1	0.5	0.02	0.15	0.38	1
Content Scale Factor	1	1	1	1	1	1	1
Particle Composition (mg/kg)							
P0%	0	99000	600000	13600	2000	640000	250000
P10%	1000000	3850	15000	340	180	1600	22500
P30%	1000000	3850	15000	340	180	1600	22500
P50%	1000000	3850	15000	340	180	1600	22500
P80%	1000000	0	0	340	180	0	22500

P8 Urban Catchment Model, Version 3.5 Run Date 06/08/15

Case	Round Lake - Spine Road Only.p	FirstDate	01/01/01	Precip(in)	296.7
Title	Round Lake	LastDate	12/31/10	Rain(in)	273.57
PrecFile	precip1970-2010.pcp	Events	598	Snow(in)	23.12
PartFile	nurp50.p8p	TotalHrs	87576	TotalYrs	9.99

Devices Listed in Downstream Order

Device:	Pond 2	Type:	POND
	Discharges normal outlet to		Outfall #2
	Discharges spillway to		Outfall #2
	Runoff from watershed		Subbasins 1, 2, 24
Device:	Pond 5/6	Type:	POND
	Discharges normal outlet to		Outfall #2
	Discharges spillway to		Outfall #2
	Runoff from watershed		Subbasins 3, 4, 25
Device:	Pond 4	Type:	POND
	Discharges normal outlet to		Outfall #1
	Discharges spillway to		Outfall #1
	Runoff from watershed		Subbasin 5
Device:	Wetland 1	Type:	POND
	Discharges normal outlet to		Outfall #1
	Discharges spillway to		Outfall #1
	Runoff from watershed		Subbasin 6
Device:	Outfall #1	Type:	PIPE
Device:	Outfall #2	Type:	PIPE
	Runoff from watershed		Subbasins 7

P8-V3.X Round Lake - Spine Road Only.p8c

Watershed Label	Total Imperv Area acres	Outflow Device	Depress Storage inches	Imperv Runoff Coef	Percol Load Factor	Directly Connected UnSwept Areas--Street Sweeping Parameters: Curve Number	Imperv Load Fraction	Directly Connected Swept Areas--Street Sweeping Parameters: Pervious Start Date MMDD	Indirect Imperv Stop Date MMDD	Pervious Sweep Effic	Depress Storage inches	Imperv Runoff Coef	Percol Load Factor	Curve Number	Imperv Load Fraction	Pervious Start Date MMDD	Stop Date MMDD	Sweep Effic	Sweep Freq 1/week
Subbasins 1,	68.5	Pond 2				74	0.000	1		0.07									
			0.02	1	1				101	1231		1	0	0.02	1	1			
Subbasins 7	21.55	Outfall #2				74	0.000	1		0									
			0.02	1	1				101	1231		1	0	0	1	1			
Subbasins 3,	43.27	Pond 5/6				74	0.000	1		0.19									
			0.02	1	1				101	1231		1	0	0.02	1	1			
Subbasin 6	0.1	Wetland 1				74	0.000	1		0.1									
			0.02	1	1				101	1231		1	0.5	0	1	1			
Subbasin 5	7.86	Pond 4				74	0.000	1		0.06									
			0.02	1	1				101	1231		1	0.5	0	1	1			

P8 Urban Catchment Model, Version 3.5

Run Date	06/08/15		
Case	Round Lake - Spine Road Only.p8c	FirstDate	01/01/01
Precip(in)	296.7		
Title	Round Lake	LastDate	12/31/10
Rain(in)	273.57		
PrecFile	precip1970-2010.pcp	Events	598
Snow(in)	23.12		
PartFile	nurp50.p8p	TotalHrs	87576
TotalYrs	9.99		

Mass Balances by Device and Variable

Device: OVERALL Type: NONE Variable: TSS

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	524.83	0.07	111293.3	11140.0	78.02
06 normal outlet	524.83	0.07	17335.7	1735.2	12.15
08 sedimen + decay	0.00	0.00	93957.1	9404.7	
09 total inflow	524.83	0.07	111293.3	11140.0	78.02
10 surface outflow	524.83	0.07	17335.7	1735.2	12.15
12 total outflow	524.83	0.07	17335.7	1735.2	12.15
13 total trapped	0.00	0.00	93957.1	9404.7	
14 storage increase	0.00	0.00	0.4	0.0	
15 mass balance chec	0.00	0.00	0.0	0.0	
Reduction (%)	0.00	0.00	84.4	84.4	

Device: OVERALL Type: NONE Variable: TP

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	524.83	0.07	398.3	39.9	0.28
06 normal outlet	524.83	0.07	197.6	19.8	0.14
08 sedimen + decay	0.00	0.00	200.4	20.1	
09 total inflow	524.83	0.07	398.3	39.9	0.28
10 surface outflow	524.83	0.07	197.6	19.8	0.14
12 total outflow	524.83	0.07	197.6	19.8	0.14
13 total trapped	0.00	0.00	200.4	20.1	
14 storage increase	0.00	0.00	0.3	0.0	
15 mass balance chec	0.00	0.00	0.0	0.0	
Reduction (%)	0.00	0.00	50.3	50.3	

Device: Pond 2 Type: POND Variable: TSS

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	215.76	0.03	43357.2	4339.9	73.93
06 normal outlet	192.85	0.03	5629.3	563.5	10.74
07 spillway outlet	22.92	0.00	4146.3	415.0	66.56
08 sedimen + decay	0.00	0.00	33581.5	3361.4	
09 total inflow	215.76	0.03	43357.2	4339.9	73.93
10 surface outflow	215.76	0.03	9775.5	978.5	16.67
12 total outflow	215.76	0.03	9775.5	978.5	16.67
13 total trapped	0.00	0.00	33581.5	3361.4	
14 storage increase	0.00	0.00	0.2	0.0	
15 mass balance chec	0.00	0.00	0.0	0.0	
Reduction (%)	0.00	0.00	77.5	77.5	

Device: Pond 2 Type: POND Variable: TP

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	215.76	0.03	158.2	15.8	0.27
06 normal outlet	192.85	0.03	73.1	7.3	0.14
07 spillway outlet	22.92	0.00	19.6	2.0	0.32

08 sedimen + decay	0.00	0.00	65.5	6.6	
09 total inflow	215.76	0.03	158.2	15.8	0.27
10 surface outflow	215.76	0.03	92.7	9.3	0.16
12 total outflow	215.76	0.03	92.7	9.3	0.16
13 total trapped	0.00	0.00	65.5	6.6	
14 storage increase	0.00	0.00	0.0	0.0	
15 mass balance chec	0.00	0.00	0.0	0.0	
Reduction (%)	0.00	0.00	41.4	41.4	

Device: Pond 5/6 Type: POND Variable: TSS

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	251.16	0.03	58858.8	5891.5	86.22
06 normal outlet	251.16	0.03	2603.8	260.6	3.81
08 sedimen + decay	0.00	0.00	56254.7	5630.9	
09 total inflow	251.16	0.03	58858.8	5891.5	86.22
10 surface outflow	251.16	0.03	2603.8	260.6	3.81
12 total outflow	251.16	0.03	2603.8	260.6	3.81
13 total trapped	0.00	0.00	56254.7	5630.9	
14 storage increase	0.00	0.00	0.3	0.0	
15 mass balance chec	0.00	0.00	0.0	0.0	
Reduction (%)	0.00	0.00	95.6	95.6	

Device: Pond 5/6 Type: POND Variable: TP

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	251.16	0.03	203.5	20.4	0.30
06 normal outlet	251.16	0.03	77.2	7.7	0.11
08 sedimen + decay	0.00	0.00	126.0	12.6	
09 total inflow	251.16	0.03	203.5	20.4	0.30
10 surface outflow	251.16	0.03	77.2	7.7	0.11
12 total outflow	251.16	0.03	77.2	7.7	0.11
13 total trapped	0.00	0.00	126.0	12.6	
14 storage increase	0.00	0.00	0.3	0.0	
15 mass balance chec	0.00	0.00	0.0	0.0	
Reduction (%)	0.00	0.00	61.9	61.9	

Device: Pond 4 Type: POND Variable: TSS

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	23.02	0.00	4498.6	450.3	71.90
06 normal outlet	23.02	0.00	457.3	45.8	7.31
08 sedimen + decay	0.00	0.00	4041.3	404.5	
09 total inflow	23.02	0.00	4498.6	450.3	71.90
10 surface outflow	23.02	0.00	457.3	45.8	7.31
12 total outflow	23.02	0.00	457.3	45.8	7.31
13 total trapped	0.00	0.00	4041.3	404.5	
14 storage increase	0.00	0.00	0.0	0.0	
15 mass balance chec	0.00	0.00	0.0	0.0	
Reduction (%)	0.00	0.00	89.8	89.8	

Device: Pond 4 Type: POND Variable: TP

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	23.02	0.00	16.6	1.7	0.27
06 normal outlet	23.02	0.00	7.9	0.8	0.13
08 sedimen + decay	0.00	0.00	8.7	0.9	
09 total inflow	23.02	0.00	16.6	1.7	0.27
10 surface outflow	23.02	0.00	7.9	0.8	0.13
12 total outflow	23.02	0.00	7.9	0.8	0.13
13 total trapped	0.00	0.00	8.7	0.9	
14 storage increase	0.00	0.00	0.0	0.0	
15 mass balance chec	0.00	0.00	0.0	0.0	

Reduction (%)	0.00	0.00	52.3	52.3	

Device: Wetland 1 Type: POND Variable: TSS

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	0.38	0.00	81.5	8.2	78.61
06 normal outlet	0.38	0.00	1.9	0.2	1.87
08 sedimen + decay	0.00	0.00	79.5	8.0	
09 total inflow	0.38	0.00	81.5	8.2	78.61
10 surface outflow	0.38	0.00	1.9	0.2	1.87
12 total outflow	0.38	0.00	1.9	0.2	1.87
13 total trapped	0.00	0.00	79.5	8.0	
14 storage increase	0.00	0.00	0.0	0.0	
15 mass balance chec	0.00	0.00	0.0	0.0	
Reduction (%)	0.00	0.00	97.6	97.6	

Device: Wetland 1 Type: POND Variable: TP

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	0.38	0.00	0.3	0.0	0.28
06 normal outlet	0.38	0.00	0.1	0.0	0.11
08 sedimen + decay	0.00	0.00	0.2	0.0	
09 total inflow	0.38	0.00	0.3	0.0	0.28
10 surface outflow	0.38	0.00	0.1	0.0	0.11
12 total outflow	0.38	0.00	0.1	0.0	0.11
13 total trapped	0.00	0.00	0.2	0.0	
14 storage increase	0.00	0.00	0.0	0.0	
15 mass balance chec	0.00	0.00	0.0	0.0	
Reduction (%)	0.00	0.00	62.1	62.1	

Device: Outfall #1 Type: PIPE Variable: TSS

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
02 upstream device	23.40	0.00	459.2	46.0	7.22
06 normal outlet	23.40	0.00	459.2	46.0	7.22
09 total inflow	23.40	0.00	459.2	46.0	7.22
10 surface outflow	23.40	0.00	459.2	46.0	7.22
12 total outflow	23.40	0.00	459.2	46.0	7.22
Reduction (%)	0.00	0.00	0.0	0.0	

Device: Outfall #1 Type: PIPE Variable: TP

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
02 upstream device	23.40	0.00	8.0	0.8	0.13
06 normal outlet	23.40	0.00	8.0	0.8	0.13
09 total inflow	23.40	0.00	8.0	0.8	0.13
10 surface outflow	23.40	0.00	8.0	0.8	0.13
12 total outflow	23.40	0.00	8.0	0.8	0.13
Reduction (%)	0.00	0.00	0.0	0.0	

Device: Outfall #2 Type: PIPE Variable: TSS

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	34.51	0.00	4497.2	450.1	47.95
02 upstream device	466.92	0.06	12379.3	1239.1	9.75
06 normal outlet	501.43	0.07	16876.5	1689.3	12.38
09 total inflow	501.43	0.07	16876.5	1689.3	12.38
10 surface outflow	501.43	0.07	16876.5	1689.3	12.38
12 total outflow	501.43	0.07	16876.5	1689.3	12.38
15 mass balance chec	0.00	0.00	0.0	0.0	
Reduction (%)	0.00	0.00	0.0	0.0	

Device: Outfall #2 Type: PIPE Variable: TP

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	34.51	0.00	19.7	2.0	0.21
02 upstream device	466.92	0.06	169.9	17.0	0.13
06 normal outlet	501.43	0.07	189.6	19.0	0.14
09 total inflow	501.43	0.07	189.6	19.0	0.14
10 surface outflow	501.43	0.07	189.6	19.0	0.14
12 total outflow	501.43	0.07	189.6	19.0	0.14
15 mass balance chec	0.00	0.00	0.0	0.0	
Reduction (%)	0.00	0.00	0.0	0.0	

Round Lake P8 Results
Scenario 2: Fully Developed Conditions

P8 Urban Catchment Model, Version 3.5 Run Date 06/08/15

Case	Round Lake.p8c	FirstDate	01/01/01	Precip(in)	296.7
Title	Round Lake	LastDate	12/31/10	Rain(in)	273.57
PrecFile	precip1970-2010.pcp	Events	598	Snow(in)	23.12
PartFile	nurp50.p8p	TotalHrs	87576	TotalYrs	9.99

File Directory	T:\1382 KimleyHorn\01 TCAAP\TASK 03 Stormwater Prelim Design\Models\P8\
Case Title	Round Lake
Case File	Round Lake.p8c
Particle File	nurp50.p8p
Temperature File	temp1970-2011.tmp
Storm File	precip1970-2010.pcp
Precip Scale Factor	1
Watersheds	5
Devices	7
Particles	5
WQ Components	7
Start Date	06/01/00
Keep Date	01/01/01
Stop Date	12/31/10
Storm Count	598
Total Hours	87576
Wet Hours	9265
Precip (in)	297
Rain (in)	274
Snowfall (in)	23
Snowmelt (in)	22
EvapoTran(in)	303
Overall TSS Removal(%)	1
Water Balance Error(%)	0
TSS Mass Balance Error	0

P8 Urban Catchment Model, Version 3.5 Run Date 06/08/15

Case	Round Lake.p8c	FirstDate	01/01/01	Precip(in)	296.7
Title	Round Lake	LastDate	12/31/10	Rain(in)	273.57
PrecFile	precip1970-2010.pcp	Events	598	Snow(in)	23.12
PartFile	nurp50.p8p	TotalHrs	87576	TotalYrs	9.99

Case Title	Round Lake
Case Data File	Round Lake.p8c
Path	T:\1382 KimleyHorn\01 TCAAP\TASK 03 Stormwater Prelim Design\Models\P8\
Case Notes:	Round Lake Ponds 1/2, 5/6, and 3
Storm Data File	precip1970-2010.pcp
Particle File	nurp50.p8p
Air Temp File File	temp1970-2011.tmp

Time Steps Per Hour	8
Minimum Inter-Event Time (hrs)	10
Maximum Continuity Error %	2
Rainfall Breakpoint (inches)	0.8
Precipitation Scale Factor	1
Air Temp Offset (deg-F)	0
Loops Thru Storm File	1
Simulation Dates	
Start	6/1/2000
Keep	1/1/2001
Stop	12/31/2010

Max Snowfall Temperature (deg-f)	32.0
SnowMelt Temperature (deg-f)	32.0
Snowmelt Coef (in/degF-Day)	0.06
Soil Freeze Temp (deg-F)	32.0
Snowmelt Abstraction Factor	1.00
Evapo-Trans. Calibration Factor	1.00
Growing Season Start Month	5
Growing Season End Month	10

5-Day Antecedent Rainfall + Runoff (inches)

CN Antecedent Moisture Condition	AMC-II	AMC-III
Growing Season	1.40	2.10
NonGrowing Season	0.50	1.10

Watershed Data

Watershed Name	Watershed Pond 1/2	Watershed Pond 3	Watershed Pond 5/6	Subbasin 6 Wetland 1	Subbasin 5 Pond 4
Runoff to Device					
Infiltration to Device					
Watershed Area	68.5	21.55	43.27	0.997	7.853
SCS Curve Number (Pervious)	74	74	74	74	74
Scale Factor for Pervious Runoff	1	1	1	1	1
Indirectly Connected Imperv Frac	0	0	0	0	0
UnSwept Impervious Fraction	0.58	0.85	0.47	0.2447	0.7037
UnSwept Depression Storage (inch	0.02	0.02	0.02	0.02	0.02
UnSwept Imperv. Runoff Coefficie	1	1	1	1	1
UnSwept Scale Factor for Particl	1	1	1	1	1
Swept Impervious Fraction	0	0	0	0	0
Swept Depression Storage (inches	0.02	0.02	0.02	0	0
Swept Imperv. Runoff Coefficient	1	1	1	1	1

Swept Scale Factor for Particle	1	1	1	1	1
Sweeping Frequency	0	0	0	0.5	0.5
Sweeping Efficiency	1	1	1	1	1
Sweeping Start Date (MMDD)	101	101	101	101	101
Sweeping Stop Date (MMDD)	1231	1231	1231	1231	1231

Device Data

Device Name	Pond 1/2	Pond 3	Pond 5/6	Pond 4	Wetland 1
Outfall #1Outfall #2					
Device Type	POND	POND	POND	POND	POND
PIPE PIPE					
Infiltration Outlet					
Normal Outlet	Pond 3	Outfall #2	Pond 3	Outfall #1Outfall #1	
Spillway Outlet	Pond 3	Outfall #2	Pond 3	Outfall #1Outfall #1	
Particle Removal Scale Factor	1	1	1	1	1
Bottom Elevation (ft)	0	0	0	0	0
Bottom Area (acres)	0.865	1.401	2.151	0	0.129
Permanent Pool Area (acres)	1.295	2.27	2.729	0.266	0.241
Permanent Pool Volume (ac-ft)	4.3	7.4	6.8	0.5	0
Perm Pool Infilt Rate (in/hr)	0	0	0	0	0
Flood Pool Area (acres)	1.539	3.678	3.737	0.593	0.38
Flood Pool Volume (ac-ft)	2.4	16.3	6.1	0.9	0.3
Flood Pool Infilt Rate (in/hr)	0	0	0	0	0
Infilt Basin Void Fraction (%)					
Detention Pond Outlet Parameters					
Outlet Type	ORIFICE	ORIFICE	ORIFICE	ORIFICE	ORIFICE
Outlet Orifice Diameter (in)	6	12	12	12	6
Orifice Discharge Coef	1	1	1	0.6	0.6
Outlet Weir Length (ft)					
Weir Discharge Coef					
Perforated Riser Height (ft)					
Number of Holes in Riser					
Holes Diameter					
Flood Pool Drain Time (hrs)					
Swale Parameters					
Length of Flow Path (ft)					
Slope of Flow Path %					
Bottom Width (ft)					
Side Slope (ft-v/ft-h)					
Maximum Depth of Flow (ft)					
Mannings n Constant					
Hydraulic Model					
Pipe, Splitter, Aquifer Parameter					
Hydraulic Res. Time (hrs)					
0 0					

Particle Data

Particle File	nurp50.p8p				
Particle Class	P0%	P10%	P30%	P50%	P80%
Filtration Efficiency	90	100	100	100	100
Settling Velocity (ft/	0	0.03	0.3	1.5	15
First Order Decay Rate	0	0	0	0	0
2nd Order Decay (1/day	0	0	0	0	0
Impervious Runoff Conc	1	0	0	0	0
Pervious Runoff Conc (	1	100	100	100	200
Pervious Conc Exponent	0	1	1	1	1
Accum. Rate (lbs-ac-da	0	1.75	1.75	1.75	3.5
Particle Removal Rate	0	0.25	0.25	0.25	0.25
Washoff Coefficient	0	20	20	20	20
Washoff Exponent	0	2	2	2	2
Sweeper Efficiency	0	0	0	5	15

Water Quality Component Data

Component Name	TSS	TP	TKN	CU	PB	ZN	HC
Water Quality Criteria (ppm)							
Level 1	5	0.025	2	2	0.02	5	0.1
Level 2	10	0.05	1	0.0048	0.014	0.0362	0.5
Level 3	20	0.1	0.5	0.02	0.15	0.38	1
Content Scale Factor	1	1	1	1	1	1	1
Particle Composition (mg/kg)							
P0%	0	99000	600000	13600	2000	640000	250000
P10%	1000000	3850	15000	340	180	1600	22500
P30%	1000000	3850	15000	340	180	1600	22500
P50%	1000000	3850	15000	340	180	1600	22500
P80%	1000000	0	0	340	180	0	22500

P8 Urban Catchment Model, Version 3.5 Run Date 06/08/15

Case	Round Lake.p8c	FirstDate	01/01/01	Precip(in)	296.7
Title	Round Lake	LastDate	12/31/10	Rain(in)	273.57
PrecFile	precip1970-2010.pcp	Events	598	Snow(in)	23.12
PartFile	nurp50.p8p	TotalHrs	87576	TotalYrs	9.99

Devices Listed in Downstream Order

Device:	Pond 1/2	Type:	POND
	Discharges normal outlet to		Pond 3
	Discharges spillway to		Pond 3
	Runoff from watershed		Watershed 1/2
Device:	Pond 5/6	Type:	POND
	Discharges normal outlet to		Pond 3
	Discharges spillway to		Pond 3
	Runoff from watershed		Watershed 5/6
Device:	Pond 3	Type:	POND
	Discharges normal outlet to		Outfall #2
	Discharges spillway to		Outfall #2
	Runoff from watershed		Watershed 3
Device:	Pond 4	Type:	POND
	Discharges normal outlet to		Outfall #1
	Discharges spillway to		Outfall #1
	Runoff from watershed		Subbasin 5
Device:	Wetland 1	Type:	POND
	Discharges normal outlet to		Outfall #1
	Discharges spillway to		Outfall #1
	Runoff from watershed		Subbasin 6
Device:	Outfall #1	Type:	PIPE
Device:	Outfall #2	Type:	PIPE

P8-V3.X Round Lake.p8c

Watershed Label	Area acres	Outflow Device	Directly Connected UnSwept Areas Depress Storage inches	Runoff Coef	Load Factor	Imperv Fraction	Directly Connected Swept Areas--Street Sweeping Parameters Total Imperv Depress Storage inches	Runoff Coef	Load Factor	Pervious Imperv Fraction	Indirect Start MMDD	Pervious Stop MMDD	Sweep Effic	Sweep Freq 1/week
Watershed 1/2	68.5	Pond 1/2	0.02	1	1	0	0.02	1	1	0	74 101	0.000 1231	1	0.58
Watershed 3	21.55	Pond 3	0.02	1	1	0	0.02	1	1	0	74 101	0.000 1231	1	0.85
Watershed 5/6	43.27	Pond 5/6	0.02	1	1	0	0.02	1	1	0	74 101	0.000 1231	1	0.47
Subbasin 6	0.997	Wetland 1	0.02	1	1	0	0	1	1	0	74 101	0.000 1231	1	0.2447
Subbasin 5	7.853	Pond 4	0.02	1	1	0	0	1	1	0	74 101	0.000 1231	1	0.7037
														0.5

P8 Urban Catchment Model, Version 3.5

Run Date	06/08/15		
Case	Round Lake.p8c	FirstDate	01/01/01
Precip(in)	296.7		
Title	Round Lake	LastDate	12/31/10
Rain(in)	273.57		
PrecFile	precip1970-2010.pcp	Events	598
Snow(in)	23.12		
PartFile	nurp50.p8p	TotalHrs	87576
TotalYrs	9.99		

Mass Balances by Device and Variable

Device: OVERALL Type: NONE Variable: TSS

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	2089.33	0.29	539726.0	54024.4	95.04
06 normal outlet	2089.33	0.29	42179.9	4222.0	7.43
08 sedimen + decay	0.00	0.00	497542.0	49801.9	
09 total inflow	2089.33	0.29	539726.0	54024.4	95.04
10 surface outflow	2089.33	0.29	42179.9	4222.0	7.43
12 total outflow	2089.33	0.29	42179.9	4222.0	7.43
13 total trapped	0.00	0.00	497542.0	49801.9	
14 storage increase	0.00	0.00	3.7	0.4	
15 mass balance chec	0.00	0.00	0.3	0.0	
Reduction (%)	0.00	0.00	92.2	92.2	

Device: OVERALL Type: NONE Variable: TP

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	2089.33	0.29	1809.0	181.1	0.32
06 normal outlet	2089.33	0.29	723.4	72.4	0.13
08 sedimen + decay	0.00	0.00	1085.5	108.7	
09 total inflow	2089.33	0.29	1809.0	181.1	0.32
10 surface outflow	2089.33	0.29	723.4	72.4	0.13
12 total outflow	2089.33	0.29	723.4	72.4	0.13
13 total trapped	0.00	0.00	1085.5	108.7	
14 storage increase	0.00	0.00	0.1	0.0	
15 mass balance chec	0.00	0.00	0.0	0.0	
Reduction (%)	0.00	0.00	60.0	60.0	

Device: Pond 1/2 Type: POND Variable: TSS

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	988.60	0.14	255096.9	25534.2	94.94
06 normal outlet	815.77	0.11	28710.8	2873.8	12.95
07 spillway outlet	172.83	0.02	11334.5	1134.5	24.13
08 sedimen + decay	0.00	0.00	215049.7	21525.6	
09 total inflow	988.60	0.14	255096.9	25534.2	94.94
10 surface outflow	988.60	0.14	40045.3	4008.4	14.90
12 total outflow	988.60	0.14	40045.3	4008.4	14.90
13 total trapped	0.00	0.00	215049.7	21525.6	
14 storage increase	0.00	0.00	1.9	0.2	
15 mass balance chec	0.00	0.00	0.0	0.0	
Reduction (%)	0.00	0.00	84.3	84.3	

Device: Pond 1/2 Type: POND Variable: TP

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	988.60	0.14	855.3	85.6	0.32
06 normal outlet	815.77	0.11	328.6	32.9	0.15
07 spillway outlet	172.83	0.02	87.6	8.8	0.19

08 sedimen + decay	0.00	0.00	439.1	43.9	
09 total inflow	988.60	0.14	855.3	85.6	0.32
10 surface outflow	988.60	0.14	416.2	41.7	0.15
12 total outflow	988.60	0.14	416.2	41.7	0.15
13 total trapped	0.00	0.00	439.1	43.9	
14 storage increase	0.00	0.00	0.0	0.0	
15 mass balance chec	0.00	0.00	0.0	0.0	
Reduction (%)	0.00	0.00	51.3	51.3	

Device: Pond 5/6 Type: POND Variable: TSS

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	519.18	0.07	132290.9	13241.8	93.75
06 normal outlet	519.18	0.07	8669.8	867.8	6.14
08 sedimen + decay	0.00	0.00	123620.4	12373.9	
09 total inflow	519.18	0.07	132290.9	13241.8	93.75
10 surface outflow	519.18	0.07	8669.8	867.8	6.14
12 total outflow	519.18	0.07	8669.8	867.8	6.14
13 total trapped	0.00	0.00	123620.4	12373.9	
14 storage increase	0.00	0.00	0.7	0.1	
15 mass balance chec	0.00	0.00	0.0	0.0	
Reduction (%)	0.00	0.00	93.4	93.4	

Device: Pond 5/6 Type: POND Variable: TP

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	519.18	0.07	445.3	44.6	0.32
06 normal outlet	519.18	0.07	172.7	17.3	0.12
08 sedimen + decay	0.00	0.00	272.5	27.3	
09 total inflow	519.18	0.07	445.3	44.6	0.32
10 surface outflow	519.18	0.07	172.7	17.3	0.12
12 total outflow	519.18	0.07	172.7	17.3	0.12
13 total trapped	0.00	0.00	272.5	27.3	
14 storage increase	0.00	0.00	0.0	0.0	
15 mass balance chec	0.00	0.00	0.0	0.0	
Reduction (%)	0.00	0.00	61.2	61.2	

Device: Pond 3 Type: POND Variable: TSS

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	439.73	0.06	115518.8	11563.0	96.65
02 upstream device	1507.78	0.21	48715.1	4876.2	11.89
06 normal outlet	1947.51	0.27	36008.9	3604.3	6.80
08 sedimen + decay	0.00	0.00	128224.0	12834.7	
09 total inflow	1947.51	0.27	164233.9	16439.1	31.03
10 surface outflow	1947.51	0.27	36008.9	3604.3	6.80
12 total outflow	1947.51	0.27	36008.9	3604.3	6.80
13 total trapped	0.00	0.00	128224.0	12834.7	
14 storage increase	0.00	0.00	1.0	0.1	
15 mass balance chec	0.00	0.00	0.0	0.0	
Reduction (%)	0.00	0.00	78.1	78.1	

Device: Pond 3 Type: POND Variable: TP

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	439.73	0.06	385.2	38.6	0.32
02 upstream device	1507.78	0.21	588.9	58.9	0.14
06 normal outlet	1947.51	0.27	662.0	66.3	0.13
08 sedimen + decay	0.00	0.00	312.1	31.2	
09 total inflow	1947.51	0.27	974.1	97.5	0.18
10 surface outflow	1947.51	0.27	662.0	66.3	0.13
12 total outflow	1947.51	0.27	662.0	66.3	0.13
13 total trapped	0.00	0.00	312.1	31.2	

14 storage increase	0.00	0.00	0.0	0.0
15 mass balance chec	0.00	0.00	0.0	0.0
Reduction (%)	0.00	0.00	32.0	32.0

Device: Pond 4 Type: POND Variable: TSS

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	134.82	0.02	35132.6	3516.6	95.87
06 normal outlet	134.82	0.02	6022.7	602.8	16.44
08 sedimen + decay	0.00	0.00	29109.8	2913.8	
09 total inflow	134.82	0.02	35132.6	3516.6	95.87
10 surface outflow	134.82	0.02	6022.7	602.8	16.44
12 total outflow	134.82	0.02	6022.7	602.8	16.44
13 total trapped	0.00	0.00	29109.8	2913.8	
14 storage increase	0.00	0.00	0.1	0.0	
15 mass balance chec	0.00	0.00	0.0	0.0	
Reduction (%)	0.00	0.00	82.9	82.9	

Device: Pond 4 Type: POND Variable: TP

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	134.82	0.02	117.4	11.8	0.32
06 normal outlet	134.82	0.02	58.9	5.9	0.16
08 sedimen + decay	0.00	0.00	58.5	5.9	
09 total inflow	134.82	0.02	117.4	11.8	0.32
10 surface outflow	134.82	0.02	58.9	5.9	0.16
12 total outflow	134.82	0.02	58.9	5.9	0.16
13 total trapped	0.00	0.00	58.5	5.9	
14 storage increase	0.00	0.00	0.0	0.0	
15 mass balance chec	0.00	0.00	0.0	0.0	
Reduction (%)	0.00	0.00	49.8	49.8	

Device: Wetland 1 Type: POND Variable: TSS

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	6.99	0.00	1686.7	168.8	88.74
06 normal outlet	6.99	0.00	148.3	14.8	7.80
08 sedimen + decay	0.00	0.00	1538.2	154.0	
09 total inflow	6.99	0.00	1686.7	168.8	88.74
10 surface outflow	6.99	0.00	148.3	14.8	7.80
12 total outflow	6.99	0.00	148.3	14.8	7.80
13 total trapped	0.00	0.00	1538.2	154.0	
14 storage increase	0.00	0.00	0.0	0.0	
15 mass balance chec	0.00	0.00	0.3	0.0	
Reduction (%)	0.00	0.00	91.2	91.2	

Device: Wetland 1 Type: POND Variable: TP

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	6.99	0.00	5.8	0.6	0.30
06 normal outlet	6.99	0.00	2.4	0.2	0.13
08 sedimen + decay	0.00	0.00	3.3	0.3	
09 total inflow	6.99	0.00	5.8	0.6	0.30
10 surface outflow	6.99	0.00	2.4	0.2	0.13
12 total outflow	6.99	0.00	2.4	0.2	0.13
13 total trapped	0.00	0.00	3.3	0.3	
14 storage increase	0.00	0.00	0.0	0.0	
15 mass balance chec	0.00	0.00	0.0	0.0	
Reduction (%)	0.00	0.00	57.6	57.6	

Device: Outfall #1 Type: PIPE Variable: TSS

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm

02 upstream device	141.82	0.02	6171.0	617.7	16.01
06 normal outlet	141.82	0.02	6171.0	617.7	16.01
09 total inflow	141.82	0.02	6171.0	617.7	16.01
10 surface outflow	141.82	0.02	6171.0	617.7	16.01
12 total outflow	141.82	0.02	6171.0	617.7	16.01
Reduction (%)	0.00	0.00	0.0	0.0	

Device: Outfall #1 Type: PIPE Variable: TP

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
02 upstream device	141.82	0.02	61.4	6.1	0.16
06 normal outlet	141.82	0.02	61.4	6.1	0.16
09 total inflow	141.82	0.02	61.4	6.1	0.16
10 surface outflow	141.82	0.02	61.4	6.1	0.16
12 total outflow	141.82	0.02	61.4	6.1	0.16
Reduction (%)	0.00	0.00	0.0	0.0	

Device: Outfall #2 Type: PIPE Variable: TSS

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
02 upstream device	1947.51	0.27	36008.9	3604.3	6.80
06 normal outlet	1947.51	0.27	36008.9	3604.3	6.80
09 total inflow	1947.51	0.27	36008.9	3604.3	6.80
10 surface outflow	1947.51	0.27	36008.9	3604.3	6.80
12 total outflow	1947.51	0.27	36008.9	3604.3	6.80
Reduction (%)	0.00	0.00	0.0	0.0	

Device: Outfall #2 Type: PIPE Variable: TP

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
02 upstream device	1947.51	0.27	662.0	66.3	0.13
06 normal outlet	1947.51	0.27	662.0	66.3	0.13
09 total inflow	1947.51	0.27	662.0	66.3	0.13
10 surface outflow	1947.51	0.27	662.0	66.3	0.13
12 total outflow	1947.51	0.27	662.0	66.3	0.13
Reduction (%)	0.00	0.00	0.0	0.0	

Rice Creek P8 Results
Interim Scenario 1

P8 Urban Catchment Model, Version 3.5 Run Date 07/30/15

Case	Rice Creek Spine Road.p8c	FirstDate	01/01/01	Precip(in)	296.7
Title	Rice Creek	LastDate	12/31/10	Rain(in)	273.57
PrecFile	precip1970-2010.pcp	Events	598	Snow(in)	23.12
PartFile	nurp50.p8p	TotalHrs	87576	TotalYrs	9.99

File Directory	T:\1382 KimleyHorn\01 TCAAP\TASK 03 Stormwater Prelim Design\CSMP_Final\Appendix A P8\P8\
Case Title	Rice Creek
Case File	Rice Creek Spine Road.p8c
Particle File	nurp50.p8p
Temperature File	temp1970-2011.tmp
Storm File	precip1970-2010.pcp
Precip Scale Factor	1
Watersheds	16
Devices	19
Particles	5
WQ Components	7
Start Date	06/01/00
Keep Date	01/01/01
Stop Date	12/31/10
Storm Count	598
Total Hours	87576
Wet Hours	9265
Precip (in)	297
Rain (in)	274
Snowfall (in)	23
Snowmelt (in)	22
EvapoTran(in)	303
Overall TSS Removal(%)	1
Water Balance Error(%)	0
TSS Mass Balance Error	0

P8 Urban Catchment Model, Version 3.5 Run Date 07/30/15

Case	Rice Creek Spine Road.p8c	FirstDate	01/01/01	Precip(in)	296.7
Title	Rice Creek	LastDate	12/31/10	Rain(in)	273.57
PrecFile	precip1970-2010.pcp	Events	598	Snow(in)	23.12
PartFile	nurp50.p8p	TotalHrs	87576	TotalYrs	9.99

Case Title	Rice Creek
Case Data File	Rice Creek Spine Road.p8c
Path	T:\1382 KimleyHorn\01 TCAAP\TASK 03 Stormwater Prelim Design\CSMP_Final\Appendix A P8\P8\
Case Notes:	Spine Road Only
Storm Data File	precip1970-2010.pcp
Particle File	nurp50.p8p
Air Temp File File	temp1970-2011.tmp

Time Steps Per Hour	4
Minimum Inter-Event Time (hrs)	10
Maximum Continuity Error %	2
Rainfall Breakpoint (inches)	0.8
Precipitation Scale Factor	1
Air Temp Offset (deg-F)	0
Loops Thru Storm File	1
Simulation Dates	
Start	6/1/2000
Keep	1/1/2001
Stop	12/31/2010

Max Snowfall Temperature (deg-f)	32.0
SnowMelt Temperature (deg-f)	32.0
Snowmelt Coef (in/degF-Day)	0.06
Soil Freeze Temp (deg-F)	32.0
Snowmelt Abstraction Factor	1.00
Evapo-Trans. Calibration Factor	1.00
Growing Season Start Month	5
Growing Season End Month	10

5-Day Antecedent Rainfall + Runoff (inches)

CN Antecedent Moisture Condition	AMC-II	AMC-III
Growing Season	1.40	2.10
NonGrowing Season	0.50	1.10

Watershed Data

Watershed Name	SB 8	SB 10	SB 9	SB 12	SB 11	SB 14	SB 13	SB 18	SB 15, 16, 29	SB 17	Inflow fro 1S	SB 19	SB 28	SB 22 and 27
Runoff to Device	Pond 7	Pond 8	Pond 9	Pond 10	Pond 11	Pond 12	Wetland 4	SB 18 Swal	Pond 13	Wetland 5	Wetland 3	Outfall #4	CHR-1	CRH-2
CRH-3	Thumb Infiltration													
Infiltration to Device														
Watershed Area	29.69	6.39	25.78	1.39	3.29	10.23	2.98	52.79	105.345	7.608	4.311	21.19	6.955	10.214
1.601	48.539													
SCS Curve Number (Pervious)	74	74	74	74	74	74	74	74	74	74	74	74	74	74
74	74	74	74	74	74	74	74	74	74	74	74	74	74	74
74	80													
Scale Factor for Pervious Runoff	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1	1													

```
       1         1
Indirectly Connected Imperv Frac    0         0         0         0         0
  0         0         0         0         0         0         0         0         0
       0         0
UnSwept Impervious Fraction       0.0551     0.05     0.0012     0.2098    0.3678
 0.16     0.2617      0       0.1517    0.4841    0.1861      0       0.4676
0.3773    0.3198    0.1138
UnSwept Depression Storage (inch   0.02      0.02      0.02      0.02      0.02
 0.02      0.02      0.02      0.02      0.02      0.02      0.02      0.02
0.02      0.02      0.02
UnSwept Imperv. Runoff Coefficie    1         1         1         1         1
  1         1         1         1         1         1         1         1         1
       1         1
UnSwept Scale Factor for Particl    1         1         1         1         1
  1         1         1         1         1         1         1         1         1
       1         1
Swept Impervious Fraction           0         0         0         0         0
  0         0         0         0         0         0         0         0         0
       0         0
Swept Depression Storage (inches   0.02      0.02      0.02      0.02      0.02
 0.02      0.02       0        0.02      0.02       0        0.02       0         0
       0        0.02
Swept Imperv. Runoff Coefficient    1         1         1         1         1
  1         1         1         1         1         1         1         1         0
       1         1
Swept Scale Factor for Particle     1         1         1         1         1
  1         1         1         1         1         1         1         1         1
       1         1
Sweeping Frequency                   0.5       0.5       0.5       0.5       0.5
 0.5       0.5       0.5       0.5       0.5       0.5       0.5       0.5       0.5
      0.5       0.5
Sweeping Efficiency                  1         1         1         1         1
  1         1         1         1         1         1         1         1         1
       1         1
Sweeping Start Date (MMDD)          101       101       101       101       101
 101       101       101       101       101       101       101       101       101
      101       101
Sweeping Stop Date (MMDD)          1231      1231      1231      1231      1231
 1231      1231      1231      1231      1231      1231      1231      1231
1231      1231      1231

Device Data
Device Name                         Pond 7    Pond 8    Pond 9    Pond 10   Pond 11
Pond 12   Pond 13  Outfall #4Wetland 4 Wetland 5 Outfall #5Wetland 3 Wetland 2
CHR-1     CRH-2   To Rice Cr  CRH-3   SB 18 SwalThumb Infiltration
Device Type                          POND      POND      POND      POND      POND
 POND      POND      PIPE      POND      POND      PIPE      POND      POND
POND      POND      PIPE      POND   INF_BASIN INF_BASIN
Infiltration Outlet
Normal Outlet                       Pond 9   Pond 10    Pond 11   Pond 12   Pond 10
Pond 13  Outfall #5To Rice Cr Pond 12            To Rice Cr  Pond 9  Wetland 3 To
Rice Cr  CRH-3             To Rice Creek
Spillway Outlet                     Pond 9   Pond 10    Pond 11   Pond 12   Pond 10
Pond 13  Outfall #5           Pond 12                          Pond 9  Wetland 3 To
Rice Cr  CRH-3             To Rice Cr Pond 13  To Rice Creek
Particle Removal Scale Factor       1         1         1         1         1
  1         1                     1         1                     1         1         1
       1                   1         1         1
Bottom Elevation (ft)               0         0         0         0         0
  0         0                     0         0                     0         0         0
       0                   0         0         0
Bottom Area (acres)               0.143     0.057     0.024     0.13      0.97
 1.2       0.02                   0         0                 2.157     2.157
```

0.15 0.2 0.15 0 0
Permanent Pool Area (acres) 0.548 0.26 0.41 0.288 1.32
1.64 1.988 0 0 2.355 2.18
0.225 0.35 0.225
Permanent Pool Volume (ac-ft) 1 0.6 0.5 0.8 4.5
5.7 6.2 0 0 0 0
0.187 0.412 0.187
Perm Pool Infilt Rate (in/hr) 0 0 0 0 0
0 0 0 0 0 0 0
0 0
Flood Pool Area (acres) 0.723 0.669 0.75 0.61 2.11
2.38 4.03 1.891 1.891 2.653 2.591 0.5
0.6 0.5 0.31 3.74
Flood Pool Volume (ac-ft) 0.5 0.9 0.4 1.1 6.6
5.3 8.1 2.5 5.8 2.6 1.2
0.663 1.188 0.663 6.15 3.74
Flood Pool Infilt Rate (in/hr) 0 0 0 0 0
0 0 0 0 0 0 0
0 0 0.45 0.45
Infilt Basin Void Fraction (%)

100 100
Detention Pond Outlet Parameters
Outlet Type WEIR ORIFICE WEIR WEIR ORIFICE
ORIFICE WEIR ORIFICE ORIFICE ORIFICE ORIFICE
ORIFICE ORIFICE ORIFICE
Outlet Orifice Diameter (in) 24 12
12 12 6 12 12 24
24 24
Orifice Discharge Coef 1 0.6
0.6 0.6 0.6 0.6 0.6 0.6
0.6 0.6
Outlet Weir Length (ft) 75 80 50
55
Weir Discharge Coef 3.3 3.3 3.3
3.3
Perforated Riser Height (ft)
Number of Holes in Riser
Holes Diameter
Flood Pool Drain Time (hrs)
Swale Parameters
Length of Flow Path (ft)
Slope of Flow Path %
Bottom Width (ft)
Side Slope (ft-v/ft-h)
Maximum Depth of Flow (ft)
Mannings n Constant
Hydraulic Model
Pipe, Splitter, Aquifer Parameter
Hydraulic Res. Time (hrs)
0 0
0

Particle Data
Particle File nurp50.p8p
Particle Class P0% P10% P30% P50% P80%
Filtration Efficiency 90 100 100 100 100
Settling Velocity (ft/ 0 0.03 0.3 1.5 15
First Order Decay Rate 0 0 0 0 0
2nd Order Decay (1/day 0 0 0 0 0
Impervious Runoff Conc 1 0 0 0 0
Pervious Runoff Conc (1 100 100 100 200
Pervious Conc Exponent 0 1 1 1 1

Accum. Rate (lbs-ac-da	0	1.75	1.75	1.75	3.5	
Particle Removal Rate	0	0.25	0.25	0.25	0.25	
Washoff Coefficient	0	20	20	20	20	
Washoff Exponent	0	2	2	2	2	
Sweeper Efficiency	0	0	0	5	15	

Water Quality Component Data

Component Name	TSS	TP	TKN	CU	PB	ZN	HC
Water Quality Criteria (ppm)							
Level 1	5	0.025	2	2	0.02	5	0.1
Level 2	10	0.05	1	0.0048	0.014	0.0362	0.5
Level 3	20	0.1	0.5	0.02	0.15	0.38	1
Content Scale Factor	1	1	1	1	1	1	1
Particle Composition (mg/kg)							
P0%	0	99000	600000	13600	2000	640000	250000
P10%	1000000	3850	15000	340	180	1600	22500
P30%	1000000	3850	15000	340	180	1600	22500
P50%	1000000	3850	15000	340	180	1600	22500
P80%	1000000	0	0	340	180	0	22500

P8 Urban Catchment Model, Version 3.5 Run Date 07/30/15

Case	Rice Creek Spine Road.p8c	FirstDate	01/01/01	Precip(in)	296.7
Title	Rice Creek	LastDate	12/31/10	Rain(in)	273.57
PrecFile	precip1970-2010.pcp	Events	598	Snow(in)	23.12
PartFile	nurp50.p8p	TotalHrs	87576	TotalYrs	9.99

Devices Listed in Downstream Order

Device:	Pond 7	Type:	POND
	Discharges normal outlet to		Pond 9
	Discharges spillway to		Pond 9
	Runoff from watershed		SB 8
Device:	Pond 8	Type:	POND
	Discharges normal outlet to		Pond 10
	Discharges spillway to		Pond 10
	Runoff from watershed		SB 10
Device:	Outfall #4	Type:	PIPE
	Discharges normal outlet to		To Rice Creek
	Runoff from watershed		SB 19
Device:	Wetland 4	Type:	POND
	Discharges normal outlet to		Pond 12
	Discharges spillway to		Pond 12
	Runoff from watershed		SB 13
Device:	Wetland 5	Type:	POND
	Runoff from watershed		SB 17
Device:	Wetland 2	Type:	POND
	Discharges normal outlet to		Wetland 3
	Discharges spillway to		Wetland 3
Device:	Wetland 3	Type:	POND
	Discharges normal outlet to		Pond 9
	Discharges spillway to		Pond 9
	Runoff from watershed		Inflow from Ponds 4/5
Device:	Pond 9	Type:	POND
	Discharges normal outlet to		Pond 11
	Discharges spillway to		Pond 11
	Runoff from watershed		SB 9
Device:	Pond 11	Type:	POND
	Discharges normal outlet to		Pond 10
	Discharges spillway to		Pond 10
	Runoff from watershed		SB 11
Device:	Pond 10	Type:	POND
	Discharges normal outlet to		Pond 12
	Discharges spillway to		Pond 12
	Runoff from watershed		SB 12
Device:	Pond 12	Type:	POND
	Discharges normal outlet to		Pond 13
	Discharges spillway to		Pond 13

	Runoff from watershed		SB 14
Device:	CHR-1	Type:	POND
	Discharges normal outlet to		To Rice Creek
	Discharges spillway to		To Rice Creek
	Runoff from watershed		SB 28
Device:	CRH-2	Type:	POND
	Discharges normal outlet to		CRH-3
	Discharges spillway to		CRH-3
	Runoff from watershed		SB 29
Device:	CRH-3	Type:	POND
	Discharges normal outlet to		To Rice Creek
	Discharges spillway to		To Rice Creek
	Runoff from watershed		1S
Device:	SB 18 Swale	Type:	INF_BASIN
	Discharges spillway to		Pond 13
	Runoff from watershed		SB 18
Device:	Pond 13	Type:	POND
	Discharges normal outlet to		Outfall #5
	Discharges spillway to		Outfall #5
	Runoff from watershed		SB 15, 16, 26
Device:	Outfall #5	Type:	PIPE
	Discharges normal outlet to		To Rice Creek
Device:	Thumb Infiltration	Type:	INF_BASIN
	Discharges spillway to		To Rice Creek
	Runoff from watershed		SB 22 and 27
Device:	To Rice Creek	Type:	PIPE

P8-V3.X Rice Creek Spine Road.p8c

Watershed Label	Total Imperv Area acres	Outflow Device	Depress Storage Device inches	Imperv Runoff Coef	Imperv Load Factor	Directly Connected UnSwept Areas Curve Number	Directly Connected Swept Areas--Street Sweeping Parameters Pervious Load Date MMDD	Indirect Pervious Load Date MMDD	Imperv Sweep Effic	Sweep Freq 1/week
SB 8	29.69	Pond 7	0.02	1	1	74	0.000	1	0.0551	0.5
SB 10	6.39	Pond 8	0.02	1	1	74	0.000	1	0.05	0.5
SB 9	25.78	Pond 9	0.02	1	1	74	0.000	1	0.0012	0.5
SB 12	1.39	Pond 10	0.02	1	1	74	0.000	1	0.2098	0.5
SB 11	3.29	Pond 11	0.02	1	1	74	0.000	1	0.3678	0.5
SB 14	10.23	Pond 12	0.02	1	1	74	0.000	1	0.16	0.5
SB 13	2.98	Wetland 4	0.02	1	1	74	0.000	1	0.2617	0.5
SB 18	52.79	SB 18 Swale	0	1	1	74	0.000	1	0	0.5
SB 15, 16, 26	105.345	Pond 13	0.02	1	1	74	0.000	1	0.1517	0.5
SB 17	7.608	Wetland 5	0.02	1	1	74	0.000	1	0.4841	0.5
Inflow from P	4.311	Wetland 3	0	1	1	74	0.000	1	0.1861	0.5
SB 19	21.19	Outfall #4	0.02	1	1	74	0.000	1	0	0.5
SB 28	6.955	CHR-1	0	1	1	74	0.000	1	0.4676	0.5
SB 29	10.214	CRH-2	0	1	1	74	0.000	1	0.3773	0.5
1S	1.601	CRH-3	0	1	1	74	0.000	1	0.3198	0.5
SB 22 and 27	48.539	Thumb Infiltration	0.02	1	1	80	0.000	1	0.1138	0.5

P8 Urban Catchment Model, Version 3.5

Run Date	07/30/15		
Case	Rice Creek Spine Road.p8c	FirstDate	01/01/01
Precip(in)	296.7		
Title	Rice Creek	LastDate	12/31/10
Rain(in)	273.57		
PrecFile	precip1970-2010.pcp	Events	598
Snow(in)	23.12		
PartFile	nurp50.p8p	TotalHrs	87576
TotalYrs	9.99		

Mass Balances by Device and Variable

Device: OVERALL Type: NONE Variable: TSS

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	1462.01	0.20	319623.0	31993.0	80.43
03 infiltrate	321.31	0.04	8515.7	852.4	9.75
04 exfiltrate	321.31	0.04	0.0	0.0	0.00
05 filtered	0.00	0.00	8515.7	852.4	
06 normal outlet	1140.94	0.16	39272.9	3931.1	12.66
08 sedimen + decay	0.00	0.00	271832.0	27209.3	
09 total inflow	1462.01	0.20	319623.0	31993.0	80.43
10 surface outflow	1140.94	0.16	39272.9	3931.1	12.66
11 groundw outflow	321.31	0.04	0.0	0.0	0.00
12 total outflow	1462.25	0.20	39272.9	3931.1	9.88
13 total trapped	0.00	0.00	280347.7	28061.7	
14 storage increase	0.00	0.00	1.0	0.1	
15 mass balance chec	-0.24	0.00	1.3	0.1	
Reduction (%)	0.00	0.00	87.7	87.7	

Device: OVERALL Type: NONE Variable: TP

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	1462.01	0.20	1131.7	113.3	0.28
03 infiltrate	321.31	0.04	119.0	11.9	0.14
04 exfiltrate	321.31	0.04	8.6	0.9	0.01
05 filtered	0.00	0.00	110.4	11.0	
06 normal outlet	1140.94	0.16	444.5	44.5	0.14
08 sedimen + decay	0.00	0.00	566.9	56.7	
09 total inflow	1462.01	0.20	1131.7	113.3	0.28
10 surface outflow	1140.94	0.16	444.5	44.5	0.14
11 groundw outflow	321.31	0.04	8.6	0.9	0.01
12 total outflow	1462.25	0.20	453.2	45.4	0.11
13 total trapped	0.00	0.00	677.2	67.8	
14 storage increase	0.00	0.00	1.3	0.1	
15 mass balance chec	-0.24	0.00	0.0	0.0	
Reduction (%)	0.00	0.00	59.8	59.8	

Device: Pond 7 Type: POND Variable: TSS

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	83.73	0.01	16079.2	1609.5	70.65
06 normal outlet	83.76	0.01	2768.9	277.2	12.16
08 sedimen + decay	0.00	0.00	13310.3	1332.3	
09 total inflow	83.73	0.01	16079.2	1609.5	70.65
10 surface outflow	83.76	0.01	2768.9	277.2	12.16
12 total outflow	83.76	0.01	2768.9	277.2	12.16
13 total trapped	0.00	0.00	13310.3	1332.3	
14 storage increase	0.00	0.00	0.0	0.0	
15 mass balance chec	-0.03	0.00	0.0	0.0	
Reduction (%)	0.00	0.00	82.8	82.8	

Device: Pond 7 Type: POND Variable: TP

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	83.73	0.01	59.7	6.0	0.26
06 normal outlet	83.76	0.01	32.4	3.2	0.14
08 sedimen + decay	0.00	0.00	27.3	2.7	
09 total inflow	83.73	0.01	59.7	6.0	0.26
10 surface outflow	83.76	0.01	32.4	3.2	0.14
12 total outflow	83.76	0.01	32.4	3.2	0.14
13 total trapped	0.00	0.00	27.3	2.7	
14 storage increase	0.00	0.00	0.0	0.0	
15 mass balance chec	-0.03	0.00	0.0	0.0	
Reduction (%)	0.00	0.00	45.8	45.8	

Device: Pond 8 Type: POND Variable: TSS

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	17.30	0.00	3263.1	326.6	69.40
06 normal outlet	17.30	0.00	314.5	31.5	6.69
08 sedimen + decay	0.00	0.00	2948.6	295.1	
09 total inflow	17.30	0.00	3263.1	326.6	69.40
10 surface outflow	17.30	0.00	314.5	31.5	6.69
12 total outflow	17.30	0.00	314.5	31.5	6.69
13 total trapped	0.00	0.00	2948.6	295.1	
14 storage increase	0.00	0.00	0.0	0.0	
15 mass balance chec	0.00	0.00	0.0	0.0	
Reduction (%)	0.00	0.00	90.4	90.4	

Device: Pond 8 Type: POND Variable: TP

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	17.30	0.00	12.2	1.2	0.26
06 normal outlet	17.30	0.00	5.8	0.6	0.12
08 sedimen + decay	0.00	0.00	6.4	0.6	
09 total inflow	17.30	0.00	12.2	1.2	0.26
10 surface outflow	17.30	0.00	5.8	0.6	0.12
12 total outflow	17.30	0.00	5.8	0.6	0.12
13 total trapped	0.00	0.00	6.4	0.6	
14 storage increase	0.00	0.00	0.0	0.0	
15 mass balance chec	0.00	0.00	0.0	0.0	
Reduction (%)	0.00	0.00	52.5	52.5	

Device: Outfall #4 Type: PIPE Variable: TSS

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	33.93	0.00	4400.1	440.4	47.71
06 normal outlet	33.93	0.00	4400.1	440.4	47.71
09 total inflow	33.93	0.00	4400.1	440.4	47.71
10 surface outflow	33.93	0.00	4400.1	440.4	47.71
12 total outflow	33.93	0.00	4400.1	440.4	47.71
Reduction (%)	0.00	0.00	0.0	0.0	

Device: Outfall #4 Type: PIPE Variable: TP

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	33.93	0.00	19.3	1.9	0.21
06 normal outlet	33.93	0.00	19.3	1.9	0.21
09 total inflow	33.93	0.00	19.3	1.9	0.21
10 surface outflow	33.93	0.00	19.3	1.9	0.21
12 total outflow	33.93	0.00	19.3	1.9	0.21
Reduction (%)	0.00	0.00	0.0	0.0	

Device: Wetland 4 Type: POND Variable: TSS

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	22.02	0.00	5345.0	535.0	89.29
06 normal outlet	22.03	0.00	1710.1	171.2	28.56
08 sedimen + decay	0.00	0.00	3634.6	363.8	
09 total inflow	22.02	0.00	5345.0	535.0	89.29
10 surface outflow	22.03	0.00	1710.1	171.2	28.56
12 total outflow	22.03	0.00	1710.1	171.2	28.56
13 total trapped	0.00	0.00	3634.6	363.8	
14 storage increase	0.00	0.00	0.0	0.0	
15 mass balance chec	-0.01	0.00	0.3	0.0	
Reduction (%)	0.00	0.00	68.0	68.0	

Device: Wetland 4 Type: POND Variable: TP

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	22.02	0.00	18.3	1.8	0.31
06 normal outlet	22.03	0.00	12.4	1.2	0.21
08 sedimen + decay	0.00	0.00	5.9	0.6	
09 total inflow	22.02	0.00	18.3	1.8	0.31
10 surface outflow	22.03	0.00	12.4	1.2	0.21
12 total outflow	22.03	0.00	12.4	1.2	0.21
13 total trapped	0.00	0.00	5.9	0.6	
14 storage increase	0.00	0.00	0.0	0.0	
15 mass balance chec	-0.01	0.00	0.0	0.0	
Reduction (%)	0.00	0.00	32.4	32.4	

Device: Wetland 5 Type: POND Variable: TSS

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	93.66	0.01	23900.0	2392.3	93.89
06 normal outlet	93.66	0.01	7194.2	720.1	28.26
08 sedimen + decay	0.00	0.00	16705.6	1672.2	
09 total inflow	93.66	0.01	23900.0	2392.3	93.89
10 surface outflow	93.66	0.01	7194.2	720.1	28.26
12 total outflow	93.66	0.01	7194.2	720.1	28.26
13 total trapped	0.00	0.00	16705.6	1672.2	
14 storage increase	0.00	0.00	0.0	0.0	
15 mass balance chec	0.00	0.00	0.2	0.0	
Reduction (%)	0.00	0.00	69.9	69.9	

Device: Wetland 5 Type: POND Variable: TP

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	93.66	0.01	80.4	8.0	0.32
06 normal outlet	93.66	0.01	52.3	5.2	0.21
08 sedimen + decay	0.00	0.00	28.1	2.8	
09 total inflow	93.66	0.01	80.4	8.0	0.32
10 surface outflow	93.66	0.01	52.3	5.2	0.21
12 total outflow	93.66	0.01	52.3	5.2	0.21
13 total trapped	0.00	0.00	28.1	2.8	
14 storage increase	0.00	0.00	0.0	0.0	
15 mass balance chec	0.00	0.00	0.0	0.0	
Reduction (%)	0.00	0.00	35.0	35.0	

Device: Wetland 2 Type: POND Variable: TSS

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
Reduction (%)	0.00	0.00	0.0	0.0	

Device: Wetland 2 Type: POND Variable: TP

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
Reduction (%)	0.00	0.00	0.0	0.0	

Device: Wetland 3 Type: POND Variable: TSS

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	24.65	0.00	5757.2	576.3	85.93
06 normal outlet	24.65	0.00	101.8	10.2	1.52
08 sedimen + decay	0.00	0.00	5654.6	566.0	
09 total inflow	24.65	0.00	5757.2	576.3	85.93
10 surface outflow	24.65	0.00	101.8	10.2	1.52
12 total outflow	24.65	0.00	101.8	10.2	1.52
13 total trapped	0.00	0.00	5654.6	566.0	
14 storage increase	0.00	0.00	0.0	0.0	
15 mass balance chec	0.00	0.00	0.8	0.1	
Reduction (%)	0.00	0.00	98.2	98.2	

Device: Wetland 3 Type: POND Variable: TP

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	24.65	0.00	19.9	2.0	0.30
06 normal outlet	24.65	0.00	7.0	0.7	0.10
08 sedimen + decay	0.00	0.00	12.9	1.3	
09 total inflow	24.65	0.00	19.9	2.0	0.30
10 surface outflow	24.65	0.00	7.0	0.7	0.10
12 total outflow	24.65	0.00	7.0	0.7	0.10
13 total trapped	0.00	0.00	12.9	1.3	
14 storage increase	0.00	0.00	0.0	0.0	
15 mass balance chec	0.00	0.00	0.0	0.0	
Reduction (%)	0.00	0.00	64.7	64.7	

Device: Pond 9 Type: POND Variable: TSS

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	41.97	0.01	5540.6	554.6	48.58
02 upstream device	108.41	0.01	2870.7	287.3	9.74
06 normal outlet	150.44	0.02	4727.1	473.2	11.56
08 sedimen + decay	0.00	0.00	3684.2	368.8	
09 total inflow	150.38	0.02	8411.3	841.9	20.58
10 surface outflow	150.44	0.02	4727.1	473.2	11.56
12 total outflow	150.44	0.02	4727.1	473.2	11.56
13 total trapped	0.00	0.00	3684.2	368.8	
14 storage increase	0.00	0.00	0.0	0.0	
15 mass balance chec	-0.06	0.00	0.0	0.0	
Reduction (%)	0.00	0.00	43.8	43.8	

Device: Pond 9 Type: POND Variable: TP

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	41.97	0.01	24.1	2.4	0.21
02 upstream device	108.41	0.01	39.4	3.9	0.13
06 normal outlet	150.44	0.02	57.2	5.7	0.14
08 sedimen + decay	0.00	0.00	6.2	0.6	
09 total inflow	150.38	0.02	63.5	6.4	0.16
10 surface outflow	150.44	0.02	57.2	5.7	0.14
12 total outflow	150.44	0.02	57.2	5.7	0.14
13 total trapped	0.00	0.00	6.2	0.6	
14 storage increase	0.00	0.00	0.0	0.0	
15 mass balance chec	-0.06	0.00	0.0	0.0	
Reduction (%)	0.00	0.00	9.8	9.8	

Device: Pond 11 Type: POND Variable: TSS

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	32.04	0.00	8016.5	802.4	92.06
02 upstream device	150.44	0.02	4727.1	473.2	11.56
06 normal outlet	182.48	0.03	1996.6	199.9	4.03
08 sedimen + decay	0.00	0.00	10746.8	1075.7	
09 total inflow	182.48	0.03	12743.5	1275.6	25.69
10 surface outflow	182.48	0.03	1996.6	199.9	4.03
12 total outflow	182.48	0.03	1996.6	199.9	4.03
13 total trapped	0.00	0.00	10746.8	1075.7	
14 storage increase	0.00	0.00	0.1	0.0	
15 mass balance chec	0.00	0.00	0.0	0.0	
Reduction (%)	0.00	0.00	84.3	84.3	

Device: Pond 11 Type: POND Variable: TP

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	32.04	0.00	27.1	2.7	0.31
02 upstream device	150.44	0.02	57.2	5.7	0.14
06 normal outlet	182.48	0.03	56.5	5.7	0.11
08 sedimen + decay	0.00	0.00	27.7	2.8	
09 total inflow	182.48	0.03	84.4	8.4	0.17
10 surface outflow	182.48	0.03	56.5	5.7	0.11
12 total outflow	182.48	0.03	56.5	5.7	0.11
13 total trapped	0.00	0.00	27.7	2.8	
14 storage increase	0.00	0.00	0.3	0.0	
15 mass balance chec	0.00	0.00	0.0	0.0	
Reduction (%)	0.00	0.00	32.8	32.8	

Device: Pond 10 Type: POND Variable: TSS

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	8.68	0.00	2055.9	205.8	87.17
02 upstream device	199.78	0.03	2311.2	231.3	4.26
06 normal outlet	208.55	0.03	2076.5	207.9	3.66
08 sedimen + decay	0.00	0.00	2290.5	229.3	
09 total inflow	208.45	0.03	4367.1	437.1	7.71
10 surface outflow	208.55	0.03	2076.5	207.9	3.66
12 total outflow	208.55	0.03	2076.5	207.9	3.66
13 total trapped	0.00	0.00	2290.5	229.3	
14 storage increase	0.00	0.00	0.0	0.0	
15 mass balance chec	-0.10	0.00	0.0	0.0	
Reduction (%)	0.00	0.00	52.5	52.5	

Device: Pond 10 Type: POND Variable: TP

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	8.68	0.00	7.1	0.7	0.30
02 upstream device	199.78	0.03	62.2	6.2	0.11
06 normal outlet	208.55	0.03	63.7	6.4	0.11
08 sedimen + decay	0.00	0.00	5.6	0.6	
09 total inflow	208.45	0.03	69.3	6.9	0.12
10 surface outflow	208.55	0.03	63.7	6.4	0.11
12 total outflow	208.55	0.03	63.7	6.4	0.11
13 total trapped	0.00	0.00	5.6	0.6	
14 storage increase	0.00	0.00	0.0	0.0	
15 mass balance chec	-0.10	0.00	0.0	0.0	
Reduction (%)	0.00	0.00	8.1	8.1	

Device: Pond 12 Type: POND Variable: TSS

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	52.59	0.01	12043.7	1205.5	84.26
02 upstream device	230.58	0.03	3786.7	379.0	6.04

06 normal outlet	283.17	0.04	1795.0	179.7	2.33
08 sedimen + decay	0.00	0.00	14035.3	1404.9	
09 total inflow	283.17	0.04	15830.4	1584.6	20.57
10 surface outflow	283.17	0.04	1795.0	179.7	2.33
12 total outflow	283.17	0.04	1795.0	179.7	2.33
13 total trapped	0.00	0.00	14035.3	1404.9	
14 storage increase	0.00	0.00	0.1	0.0	
15 mass balance chec	0.00	0.00	0.0	0.0	
Reduction (%)	0.00	0.00	88.7	88.7	

Device: Pond 12 Type: POND Variable: TP

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	52.59	0.01	42.0	4.2	0.29
02 upstream device	230.58	0.03	76.0	7.6	0.12
06 normal outlet	283.17	0.04	82.1	8.2	0.11
08 sedimen + decay	0.00	0.00	35.3	3.5	
09 total inflow	283.17	0.04	118.0	11.8	0.15
10 surface outflow	283.17	0.04	82.1	8.2	0.11
12 total outflow	283.17	0.04	82.1	8.2	0.11
13 total trapped	0.00	0.00	35.3	3.5	
14 storage increase	0.00	0.00	0.6	0.1	
15 mass balance chec	0.00	0.00	0.0	0.0	
Reduction (%)	0.00	0.00	29.9	29.9	

Device: CHR-1 Type: POND Variable: TSS

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	83.08	0.01	21153.2	2117.3	93.67
06 normal outlet	83.08	0.01	4281.6	428.6	18.96
08 sedimen + decay	0.00	0.00	16871.6	1688.8	
09 total inflow	83.08	0.01	21153.2	2117.3	93.67
10 surface outflow	83.08	0.01	4281.6	428.6	18.96
12 total outflow	83.08	0.01	4281.6	428.6	18.96
13 total trapped	0.00	0.00	16871.6	1688.8	
14 storage increase	0.00	0.00	0.0	0.0	
15 mass balance chec	0.00	0.00	0.0	0.0	
Reduction (%)	0.00	0.00	79.8	79.8	

Device: CHR-1 Type: POND Variable: TP

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	83.08	0.01	71.2	7.1	0.32
06 normal outlet	83.08	0.01	38.4	3.8	0.17
08 sedimen + decay	0.00	0.00	32.8	3.3	
09 total inflow	83.08	0.01	71.2	7.1	0.32
10 surface outflow	83.08	0.01	38.4	3.8	0.17
12 total outflow	83.08	0.01	38.4	3.8	0.17
13 total trapped	0.00	0.00	32.8	3.3	
14 storage increase	0.00	0.00	0.0	0.0	
15 mass balance chec	0.00	0.00	0.0	0.0	
Reduction (%)	0.00	0.00	46.1	46.1	

Device: CRH-2 Type: POND Variable: TSS

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	101.61	0.01	25475.6	2550.0	92.25
06 normal outlet	101.61	0.01	4019.6	402.3	14.55
08 sedimen + decay	0.00	0.00	21456.1	2147.7	
09 total inflow	101.61	0.01	25475.6	2550.0	92.25
10 surface outflow	101.61	0.01	4019.6	402.3	14.55
12 total outflow	101.61	0.01	4019.6	402.3	14.55
13 total trapped	0.00	0.00	21456.1	2147.7	

14 storage increase	0.00	0.00	0.0	0.0
15 mass balance chec	0.00	0.00	0.0	0.0
Reduction (%)	0.00	0.00	84.2	84.2

Device: CRH-2 Type: POND Variable: TP

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	101.61	0.01	86.2	8.6	0.31
06 normal outlet	101.61	0.01	42.4	4.2	0.15
08 sedimen + decay	0.00	0.00	43.8	4.4	
09 total inflow	101.61	0.01	86.2	8.6	0.31
10 surface outflow	101.61	0.01	42.4	4.2	0.15
12 total outflow	101.61	0.01	42.4	4.2	0.15
13 total trapped	0.00	0.00	43.8	4.4	
14 storage increase	0.00	0.00	0.0	0.0	
15 mass balance chec	0.00	0.00	0.0	0.0	
Reduction (%)	0.00	0.00	50.8	50.8	

Device: CRH-3 Type: POND Variable: TSS

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	13.89	0.00	3435.3	343.9	90.99
02 upstream device	101.61	0.01	4019.6	402.3	14.55
06 normal outlet	115.50	0.02	2778.6	278.1	8.85
08 sedimen + decay	0.00	0.00	4676.3	468.1	
09 total inflow	115.50	0.02	7454.9	746.2	23.75
10 surface outflow	115.50	0.02	2778.6	278.1	8.85
12 total outflow	115.50	0.02	2778.6	278.1	8.85
13 total trapped	0.00	0.00	4676.3	468.1	
14 storage increase	0.00	0.00	0.0	0.0	
15 mass balance chec	0.00	0.00	0.0	0.0	
Reduction (%)	0.00	0.00	62.7	62.7	

Device: CRH-3 Type: POND Variable: TP

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	13.89	0.00	11.7	1.2	0.31
02 upstream device	101.61	0.01	42.4	4.2	0.15
06 normal outlet	115.50	0.02	41.7	4.2	0.13
08 sedimen + decay	0.00	0.00	12.4	1.2	
09 total inflow	115.50	0.02	54.1	5.4	0.17
10 surface outflow	115.50	0.02	41.7	4.2	0.13
12 total outflow	115.50	0.02	41.7	4.2	0.13
13 total trapped	0.00	0.00	12.4	1.2	
14 storage increase	0.00	0.00	0.0	0.0	
15 mass balance chec	0.00	0.00	0.0	0.0	
Reduction (%)	0.00	0.00	22.9	22.9	

Device: SB 18 Swale Type: INF_BASIN Variable: TSS

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	84.53	0.01	10961.7	1097.2	47.71
03 infiltrate	79.77	0.01	1287.0	128.8	5.94
04 exfiltrate	79.77	0.01	0.0	0.0	0.00
05 filtered	0.00	0.00	1287.0	128.8	
07 spillway outlet	4.76	0.00	1041.3	104.2	80.49
08 sedimen + decay	0.00	0.00	8633.4	864.2	
09 total inflow	84.53	0.01	10961.7	1097.2	47.71
10 surface outflow	4.76	0.00	1041.3	104.2	80.49
11 groundw outflow	79.77	0.01	0.0	0.0	0.00
12 total outflow	84.53	0.01	1041.3	104.2	4.53
13 total trapped	0.00	0.00	9920.4	993.0	
14 storage increase	0.00	0.00	0.0	0.0	

15 mass balance chec	0.00	0.00	0.0	0.0
Reduction (%)	0.00	0.00	90.5	90.5

Device: SB 18 Swale Type: INF_BASIN Variable: TP

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	84.53	0.01	48.1	4.8	0.21
03 infiltrate	79.77	0.01	26.4	2.6	0.12
04 exfiltrate	79.77	0.01	2.1	0.2	0.01
05 filtered	0.00	0.00	24.2	2.4	
07 spillway outlet	4.76	0.00	4.6	0.5	0.35
08 sedimen + decay	0.00	0.00	17.1	1.7	
09 total inflow	84.53	0.01	48.1	4.8	0.21
10 surface outflow	4.76	0.00	4.6	0.5	0.35
11 groundw outflow	79.77	0.01	2.1	0.2	0.01
12 total outflow	84.53	0.01	6.7	0.7	0.03
13 total trapped	0.00	0.00	41.3	4.1	
14 storage increase	0.00	0.00	0.0	0.0	
15 mass balance chec	0.00	0.00	0.0	0.0	
Reduction (%)	0.00	0.00	86.0	86.0	

Device: Pond 13 Type: POND Variable: TSS

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	522.22	0.07	118722.9	11883.7	83.64
02 upstream device	287.93	0.04	2836.2	283.9	3.62
06 normal outlet	810.20	0.11	19922.0	1994.1	9.05
08 sedimen + decay	0.00	0.00	101636.4	10173.4	
09 total inflow	810.15	0.11	121559.1	12167.6	55.20
10 surface outflow	810.20	0.11	19922.0	1994.1	9.05
12 total outflow	810.20	0.11	19922.0	1994.1	9.05
13 total trapped	0.00	0.00	101636.4	10173.4	
14 storage increase	0.00	0.00	0.7	0.1	
15 mass balance chec	-0.05	0.00	0.0	0.0	
Reduction (%)	0.00	0.00	83.6	83.6	

Device: Pond 13 Type: POND Variable: TP

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	522.22	0.07	414.8	41.5	0.29
02 upstream device	287.93	0.04	86.7	8.7	0.11
06 normal outlet	810.20	0.11	289.1	28.9	0.13
08 sedimen + decay	0.00	0.00	212.0	21.2	
09 total inflow	810.15	0.11	501.4	50.2	0.23
10 surface outflow	810.20	0.11	289.1	28.9	0.13
12 total outflow	810.20	0.11	289.1	28.9	0.13
13 total trapped	0.00	0.00	212.0	21.2	
14 storage increase	0.00	0.00	0.4	0.0	
15 mass balance chec	-0.05	0.00	0.0	0.0	
Reduction (%)	0.00	0.00	42.3	42.3	

Device: Outfall #5 Type: PIPE Variable: TSS

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
02 upstream device	810.20	0.11	19922.0	1994.1	9.05
06 normal outlet	810.20	0.11	19922.0	1994.1	9.05
09 total inflow	810.20	0.11	19922.0	1994.1	9.05
10 surface outflow	810.20	0.11	19922.0	1994.1	9.05
12 total outflow	810.20	0.11	19922.0	1994.1	9.05
Reduction (%)	0.00	0.00	0.0	0.0	

Device: Outfall #5 Type: PIPE Variable: TP

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
02 upstream device	810.20	0.11	289.1	28.9	0.13
06 normal outlet	810.20	0.11	289.1	28.9	0.13
09 total inflow	810.20	0.11	289.1	28.9	0.13
10 surface outflow	810.20	0.11	289.1	28.9	0.13
12 total outflow	810.20	0.11	289.1	28.9	0.13
Reduction (%)	0.00	0.00	0.0	0.0	

Device: Thumb Infiltration Type: INF_BASIN Variable: TSS

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	246.11	0.03	53473.0	5352.4	79.94
03 infiltrate	241.54	0.03	7228.7	723.6	11.01
04 exfiltrate	241.54	0.03	0.0	0.0	0.00
05 filtered	0.00	0.00	7228.7	723.6	
07 spillway outlet	4.57	0.00	696.4	69.7	56.03
08 sedimen + decay	0.00	0.00	45547.9	4559.2	
09 total inflow	246.11	0.03	53473.0	5352.4	79.94
10 surface outflow	4.57	0.00	696.4	69.7	56.03
11 groundw outflow	241.54	0.03	0.0	0.0	0.00
12 total outflow	246.11	0.03	696.4	69.7	1.04
13 total trapped	0.00	0.00	52776.5	5282.7	
14 storage increase	0.00	0.00	0.0	0.0	
15 mass balance chec	0.00	0.00	0.0	0.0	
Reduction (%)	0.00	0.00	98.7	98.7	

Device: Thumb Infiltration Type: INF_BASIN Variable: TP

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	246.11	0.03	189.7	19.0	0.28
03 infiltrate	241.54	0.03	92.6	9.3	0.14
04 exfiltrate	241.54	0.03	6.5	0.7	0.01
05 filtered	0.00	0.00	86.1	8.6	
07 spillway outlet	4.57	0.00	3.8	0.4	0.30
08 sedimen + decay	0.00	0.00	93.4	9.3	
09 total inflow	246.11	0.03	189.7	19.0	0.28
10 surface outflow	4.57	0.00	3.8	0.4	0.30
11 groundw outflow	241.54	0.03	6.5	0.7	0.01
12 total outflow	246.11	0.03	10.3	1.0	0.02
13 total trapped	0.00	0.00	179.5	18.0	
14 storage increase	0.00	0.00	0.0	0.0	
15 mass balance chec	0.00	0.00	0.0	0.0	
Reduction (%)	0.00	0.00	94.6	94.6	

Device: To Rice Creek Type: PIPE Variable: TSS

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
02 upstream device	1047.28	0.14	32078.7	3210.9	11.27
06 normal outlet	1047.28	0.14	32078.7	3210.9	11.27
09 total inflow	1047.28	0.14	32078.7	3210.9	11.27
10 surface outflow	1047.28	0.14	32078.7	3210.9	11.27
12 total outflow	1047.28	0.14	32078.7	3210.9	11.27
Reduction (%)	0.00	0.00	0.0	0.0	

Device: To Rice Creek Type: PIPE Variable: TP

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
02 upstream device	1047.28	0.14	392.2	39.3	0.14
06 normal outlet	1047.28	0.14	392.2	39.3	0.14
09 total inflow	1047.28	0.14	392.2	39.3	0.14
10 surface outflow	1047.28	0.14	392.2	39.3	0.14
12 total outflow	1047.28	0.14	392.2	39.3	0.14
Reduction (%)	0.00	0.00	0.0	0.0	

Rice Creek P8 Results
Interim Scenario 2

P8 Urban Catchment Model, Version 3.5 Run Date 07/30/15

Case	Rice Creek Full Build without	FirstDate	01/01/01	Precip(in)	296.7
Title	Rice Creek	LastDate	12/31/10	Rain(in)	273.57
PrecFile	precip1970-2010.pcp	Events	598	Snow(in)	23.12
PartFile	nurp50.p8p	TotalHrs	87576	TotalYrs	9.99

File Directory	C:\Users\patmf0648\Desktop\P8\
Case Title	Rice Creek
Case File	Rice Creek Full Build without Infiltration Dev.p8c
Particle File	nurp50.p8p
Temperature File	temp1970-2011.tmp
Storm File	precip1970-2010.pcp
Precip Scale Factor	1
Watersheds	16
Devices	19
Particles	5
WQ Components	7
Start Date	06/01/00
Keep Date	01/01/01
Stop Date	12/31/10
Storm Count	598
Total Hours	87576
Wet Hours	9265
Precip (in)	297
Rain (in)	274
Snowfall (in)	23
Snowmelt (in)	22
EvapoTran(in)	303
Overall TSS Removal(%)	1
Water Balance Error(%)	0
TSS Mass Balance Error	0

P8 Urban Catchment Model, Version 3.5 Run Date 07/30/15

Case	Rice Creek Full Build without	FirstDate	01/01/01	Precip(in)	296.7
Title	Rice Creek	LastDate	12/31/10	Rain(in)	273.57
PrecFile	precip1970-2010.pcp	Events	598	Snow(in)	23.12
PartFile	nurp50.p8p	TotalHrs	87576	TotalYrs	9.99

Case Title	Rice Creek
Case Data File	Rice Creek Full Build without Infiltration Dev.p8c
Path	C:\Users\patmf0648\Desktop\P8\
Case Notes:	No Development in SB 18 (no infiltration)
Storm Data File	precip1970-2010.pcp
Particle File	nurp50.p8p
Air Temp File File	temp1970-2011.tmp
Time Steps Per Hour	4
Minimum Inter-Event Time (hrs)	10
Maximum Continuity Error %	2
Rainfall Breakpoint (inches)	0.8
Precipitation Scale Factor	1
Air Temp Offset (deg-F)	0
Loops Thru Storm File	1
Simulation Dates	
Start	6/1/2000
Keep	1/1/2001
Stop	12/31/2010
Max Snowfall Temperature (deg-f)	32.0
SnowMelt Temperature (deg-f)	32.0
Snowmelt Coef (in/degF-Day)	0.06
Soil Freeze Temp (deg-F)	32.0
Snowmelt Abstraction Factor	1.00
Evapo-Trans. Calibration Factor	1.00
Growing Season Start Month	5
Growing Season End Month	10

5-Day Antecedent Rainfall + Runoff (inches)

CN Antecedent Moisture Condition	AMC-II	AMC-III
Growing Season	1.40	2.10
NonGrowing Season	0.50	1.10

Watershed Data

Watershed Name	SB 8	SB 10	SB 9	SB 12	SB 11
SB 14	SB 13	SB 18	SB 15, 16,	SB 17	SB 19
Inflow fro	SB 28	SB 29	SB 1	SB 22 and 27	
Runoff to Device	Pond 7	Pond 8	Pond 9	Pond 10	Pond 11
Pond 12	Wetland 4 SB 18 Swal	Pond 13	Wetland 5 Pond 14 (OWetland 3	CRH-2	
CRH-1	CRH-3	Thumb Infiltration			
Infiltration to Device					
Watershed Area	29.6	6.39	25.79	1.38	3.29
10.23	2.985	52.79	105.327	7.608	21.198
4.16	6.955	10.214	1.601	43.013	
SCS Curve Number (Pervious)	74	74	74	74	74
74	74	74	74	74	74
74	74	74	74	74	74
74	74	80			
Scale Factor for Pervious Runoff	1	1	1	1	1
1	1	1	1	1	1
1	1	1	1	1	1
1	1	1			

```
      1         1
Indirectly Connected Imperv Frac    0         0         0         0         0
  0         0         0         0         0         0         0         0         0
      0         0
UnSwept Impervious Fraction       0.3001    0.076     0.3317     0.3871    0.3216
0.4262    0.3099      0       0.505     0.4841    0.3993     0.47     0.4676
0.3773    0.3198    0.1138
UnSwept Depression Storage (inch   0.02      0.02      0.02       0.02      0.02
 0.02      0.02      0.02      0.02      0.02      0.02      0.02      0.02
0.02      0.02      0.02
UnSwept Imperv. Runoff Coefficie    1         1         1         1         1
  1         1         1         1         1         1         1         1         1
      1         1
UnSwept Scale Factor for Particl    1         1         1         1         1
  1         1         1         1         1         1         1         1         1
      1         1
Swept Impervious Fraction           0         0         0         0         0
  0         0         0         0         0         0         0         0         0
      0         0
Swept Depression Storage (inches   0.02      0.02      0.02       0.02      0.02
 0.02      0.02      0.02      0.02      0.02      0.02       0         0         0
      0        0.02
Swept Imperv. Runoff Coefficient    1         1         1         1         1
  1         1         1         1         1         1         1         1         1
      1         1
Swept Scale Factor for Particle     1         1         1         1         1
  1         1         1         1         1         1         1         1         1
      1         1
Sweeping Frequency                    0.5       0.5       0.5       0.5       0.5
 0.5       0.5       0.5       0.5       0.5       0.5       0.5       0.5       0.5
     0.5       0.5
Sweeping Efficiency                   1         1         1         1         1
  1         1         1         1         1         1         1         1         1
      1         1
Sweeping Start Date (MMDD)          101       101       101       101       101
 101       101       101       101       101       101       101       101       101
     101       101
Sweeping Stop Date (MMDD)          1231      1231      1231      1231      1231
 1231      1231      1231      1231      1231      1231      1231      1231      1231
1231      1231      1231

Device Data
Device Name                         Pond 7    Pond 8    Pond 9    Pond 10   Pond 11
Pond 12   Pond 13  Pond 14 (OWetland 4 Wetland 5 Outfall #5Wetland 3 Wetland 2
CRH-1     CRH-2   To Rice Cr  CRH-3   SB 18 SwalThumb Infiltration
Device Type                          POND      POND      POND       POND      POND
 POND      POND      POND      POND      POND      PIPE      POND      POND
POND      POND      PIPE      POND   INF_BASIN INF_BASIN
Infiltration Outlet
Normal Outlet                       Pond 9   Pond 10    Pond 11   Pond 12   Pond 10
Pond 13  Outfall #5           Pond 12            To Rice Cr  Pond 9  Wetland 3 To
Rice Cr  CRH-3             To Rice Creek
Spillway Outlet                     Pond 9   Pond 10    Pond 11   Pond 12   Pond 10
Pond 13  Outfall #5           Pond 12  Outfall #5           Pond 9  Wetland 3 To
Rice Cr  CRH-3             To Rice Cr Pond 13  To Rice Creek
Particle Removal Scale Factor       1         1         1         1         1
  1         1         1         1         1                   1         1         1
      1                   1         1         1
Bottom Elevation (ft)               0         0         0         0         0
  0         0         0         0         0                   0         0         0
      0                   0         0         0
Bottom Area (acres)                0.11      0.03      0.03       0.12      0.76
 1.2        0        0.95       0         0                 2.157     2.157
```

0.15 0.2 0.15 0 0

Permanent Pool Area (acres) 0.44 0.3 0.21 0.29 1.21 1.64 1.87 1.38 0 0 2.355 2.18 0.225 0.35 0.225

Permanent Pool Volume (ac-ft) 1.1 0.5 0.4 0.7 3.6 5.1 4.3 4.5 0 0 0 0 0.187 0.412 0.187

Perm Pool Infilt Rate (in/hr) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0

Flood Pool Area (acres) 0.5 0.53 0.6 0.42 1.68 2.04 2.96 1.73 1.891 1.891 2.653 2.591 0.5 0.65 0.5 0.31 3.74

Flood Pool Volume (ac-ft) 0.4 0.9 0.3 0.9 5.4 5.1 6.3 4.9 2.5 5.8 2.6 1.2 0.663 1.18 0.663 6.15 3.74

Flood Pool Infilt Rate (in/hr) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0

Infilt Basin Void Fraction (%) 100 100

Detention Pond Outlet Parameters

Outlet Type WEIR ORIFICE WEIR WEIR ORIFICE ORIFICE WEIR ORIFICE ORIFICE ORIFICE ORIFICE ORIFICE ORIFICE

Outlet Orifice Diameter (in) 24 12 12 12 12 6 12 12 24 24 24

Orifice Discharge Coef 1 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.6

Outlet Weir Length (ft) 75 80 50 55

Weir Discharge Coef 3.3 3.3 3.3 3.3

Perforated Riser Height (ft)

Number of Holes in Riser

Holes Diameter

Flood Pool Drain Time (hrs)

Swale Parameters

Length of Flow Path (ft)

Slope of Flow Path %

Bottom Width (ft)

Side Slope (ft-v/ft-h)

Maximum Depth of Flow (ft)

Mannings n Constant

Hydraulic Model

Pipe, Splitter, Aquifer Parameter

Hydraulic Res. Time (hrs) 0 0

Particle Data

Particle File nurp50.p8p

Particle Class	P0%	P10%	P30%	P50%	P80%
Filtration Efficiency	90	100	100	100	100
Settling Velocity (ft/	0	0.03	0.3	1.5	15
First Order Decay Rate	0	0	0	0	0
2nd Order Decay (1/day	0	0	0	0	0
Impervious Runoff Conc	1	0	0	0	0
Pervious Runoff Conc (	1	100	100	100	200
Pervious Conc Exponent	0	1	1	1	1

Accum. Rate (lbs-ac-da	0	1.75	1.75	1.75	3.5	
Particle Removal Rate	0	0.25	0.25	0.25	0.25	
Washoff Coefficient	0	20	20	20	20	
Washoff Exponent	0	2	2	2	2	
Sweeper Efficiency	0	0	0	5	15	

Water Quality Component Data

Component Name	TSS	TP	TKN	CU	PB	ZN	HC
Water Quality Criteria (ppm)							
Level 1	5	0.025	2	2	0.02	5	0.1
Level 2	10	0.05	1	0.0048	0.014	0.0362	0.5
Level 3	20	0.1	0.5	0.02	0.15	0.38	1
Content Scale Factor	1	1	1	1	1	1	1
Particle Composition (mg/kg)							
P0%	0	99000	600000	13600	2000	640000	250000
P10%	1000000	3850	15000	340	180	1600	22500
P30%	1000000	3850	15000	340	180	1600	22500
P50%	1000000	3850	15000	340	180	1600	22500
P80%	1000000	0	0	340	180	0	22500

P8 Urban Catchment Model, Version 3.5 Run Date 07/30/15

Case	Rice Creek Full Build without	FirstDate	01/01/01	Precip(in)	296.7
Title	Rice Creek	LastDate	12/31/10	Rain(in)	273.57
PrecFile	precip1970-2010.pcp	Events	598	Snow(in)	23.12
PartFile	nurp50.p8p	TotalHrs	87576	TotalYrs	9.99

Devices Listed in Downstream Order

Device:	Pond 7	Type:	POND
	Discharges normal outlet to		Pond 9
	Discharges spillway to		Pond 9
	Runoff from watershed		SB 8
Device:	Pond 8	Type:	POND
	Discharges normal outlet to		Pond 10
	Discharges spillway to		Pond 10
	Runoff from watershed		SB 10
Device:	Pond 14 (Outfall #10	Type:	POND
	Runoff from watershed		SB 19
Device:	Wetland 4	Type:	POND
	Discharges normal outlet to		Pond 12
	Discharges spillway to		Pond 12
	Runoff from watershed		SB 13
Device:	Wetland 5	Type:	POND
	Discharges spillway to		Outfall #5
	Runoff from watershed		SB 17
Device:	Wetland 2	Type:	POND
	Discharges normal outlet to		Wetland 3
	Discharges spillway to		Wetland 3
Device:	Wetland 3	Type:	POND
	Discharges normal outlet to		Pond 9
	Discharges spillway to		Pond 9
	Runoff from watershed		Inflow from Ponds 4/5
Device:	Pond 9	Type:	POND
	Discharges normal outlet to		Pond 11
	Discharges spillway to		Pond 11
	Runoff from watershed		SB 9
Device:	Pond 11	Type:	POND
	Discharges normal outlet to		Pond 10
	Discharges spillway to		Pond 10
	Runoff from watershed		SB 11
Device:	Pond 10	Type:	POND
	Discharges normal outlet to		Pond 12
	Discharges spillway to		Pond 12
	Runoff from watershed		SB 12
Device:	Pond 12	Type:	POND
	Discharges normal outlet to		Pond 13
	Discharges spillway to		Pond 13

	Runoff from watershed		SB 14
Device:	CRH-1	Type:	POND
	Discharges normal outlet to		To Rice Creek
	Discharges spillway to		To Rice Creek
	Runoff from watershed		SB 29
Device:	CRH-2	Type:	POND
	Discharges normal outlet to		CRH-3
	Discharges spillway to		CRH-3
	Runoff from watershed		SB 28
Device:	CRH-3	Type:	POND
	Discharges normal outlet to		To Rice Creek
	Discharges spillway to		To Rice Creek
	Runoff from watershed		SB 1
Device:	SB 18 Swale	Type:	INF_BASIN
	Discharges spillway to		Pond 13
	Runoff from watershed		SB 18
Device:	Pond 13	Type:	POND
	Discharges normal outlet to		Outfall #5
	Discharges spillway to		Outfall #5
	Runoff from watershed		SB 15, 16, 26
Device:	Outfall #5	Type:	PIPE
	Discharges normal outlet to		To Rice Creek
Device:	Thumb Infiltration	Type:	INF_BASIN
	Discharges spillway to		To Rice Creek
	Runoff from watershed		SB 22 and 27
Device:	To Rice Creek	Type:	PIPE

Watershed Label	Total Imperv Area acres	Outflow Device	Depress Storage inches	Imperv Runoff Coef	Imperv Load Factor	Directly Connected UnSwept Areas Imperv Fraction	Directly Connected Swept Areas--Street Sweeping Parameters Depress Storage inches	Imperv Runoff Coef	Imperv Load Factor	Pervious Percol Curve Number	Indirect Start Date MMDD	Pervious Stop Date MMDD	Sweep Effic	Sweep Freq 1/week
SB 8	29.6	Pond 7	0.02	1	1	0	0.02	1	1	74	0.000	1	0.3001	0.5
SB 10	6.39	Pond 8	0.02	1	1	0	0.02	1	1	74	0.000	1	0.076	0.5
SB 9	25.79	Pond 9	0.02	1	1	0	0.02	1	1	74	0.000	1	0.3317	0.5
SB 12	1.38	Pond 10	0.02	1	1	0	0.02	1	1	74	0.000	1	0.3871	0.5
SB 11	3.29	Pond 11	0.02	1	1	0	0.02	1	1	74	0.000	1	0.3216	0.5
SB 14	10.23	Pond 12	0.02	1	1	0	0.02	1	1	74	0.000	1	0.4262	0.5
SB 13	2.985	Wetland 4	0.02	1	1	0	0.02	1	1	74	0.000	1	0.3099	0.5
SB 18	52.79	SB 18 Swale	0.02	1	1	0	0.02	1	1	74	0.000	1	0	0.5
SB 15, 16, 2	105.327	Pond 13	0.02	1	1	0	0.02	1	1	74	0.000	1	0.505	0.5
SB 17	7.608	Wetland 5	0.02	1	1	0	0.02	1	1	74	0.000	1	0.4841	0.5
SB 19	21.198	Pond 14 (Outfall #10)	0.02	1	1	0	0.02	1	1	74	0.000	1	0.3993	0.5
Inflow from P	4.16	Wetland 3	0.02	1	1	0	0	1	1	74	0.000	1	0.47	0.5
SB 28	6.955	CRH-2	0.02	1	1	0	0	1	1	74	0.000	1	0.4676	0.5
SB 29	10.214	CRH-1	0.02	1	1	0	0	1	1	74	0.000	1	0.3773	0.5
SB 1	1.601	CRH-3	0.02	1	1	0	0	1	1	74	0.000	1	0.3198	0.5
SB 22 and 27	43.013	Thumb Infiltration	0.02	1	1	0	0.02	1	1	80	0.000	1	0.1138	0.5

P8 Urban Catchment Model, Version 3.5

Run Date	07/30/15		
Case	Rice Creek Full Build without Inf	FirstDate	01/01/01
Precip(in)	296.7		
Title	Rice Creek	LastDate	12/31/10
Rain(in)	273.57		
PrecFile	precip1970-2010.pcp	Events	598
Snow(in)	23.12		
PartFile	nurp50.p8p	TotalHrs	87576
TotalYrs	9.99		

Mass Balances by Device and Variable

Device: OVERALL Type: NONE Variable: TSS

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	2887.51	0.40	711779.7	71246.2	90.69
03 infiltrate	295.35	0.04	7763.6	777.1	9.67
04 exfiltrate	295.35	0.04	0.0	0.0	0.00
05 filtered	0.00	0.00	7763.6	777.1	
06 normal outlet	2593.69	0.36	114410.0	11452.0	16.23
08 sedimen + decay	0.00	0.00	589602.3	59016.8	
09 total inflow	2887.51	0.40	711779.7	71246.2	90.69
10 surface outflow	2593.69	0.36	114410.0	11452.0	16.23
11 groundw outflow	295.35	0.04	0.0	0.0	0.00
12 total outflow	2889.04	0.40	114410.0	11452.0	14.57
13 total trapped	0.00	0.00	597365.9	59793.9	
14 storage increase	0.00	0.00	2.7	0.3	
15 mass balance chec	-1.53	0.00	1.0	0.1	
Reduction (%)	0.00	0.00	83.9	83.9	

Device: OVERALL Type: NONE Variable: TP

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	2887.51	0.40	2421.2	242.4	0.31
03 infiltrate	295.35	0.04	109.1	10.9	0.14
04 exfiltrate	295.35	0.04	7.9	0.8	0.01
05 filtered	0.00	0.00	101.2	10.1	
06 normal outlet	2593.69	0.36	1117.2	111.8	0.16
08 sedimen + decay	0.00	0.00	1194.6	119.6	
09 total inflow	2887.51	0.40	2421.2	242.4	0.31
10 surface outflow	2593.69	0.36	1117.2	111.8	0.16
11 groundw outflow	295.35	0.04	7.9	0.8	0.01
12 total outflow	2889.04	0.40	1125.2	112.6	0.14
13 total trapped	0.00	0.00	1295.8	129.7	
14 storage increase	0.00	0.00	0.2	0.0	
15 mass balance chec	-1.53	0.00	0.0	0.0	
Reduction (%)	0.00	0.00	53.5	53.5	

Device: Pond 7 Type: POND Variable: TSS

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	243.91	0.03	59979.5	6003.7	90.47
06 normal outlet	244.52	0.03	12052.6	1206.4	18.13
08 sedimen + decay	0.00	0.00	47926.6	4797.3	
09 total inflow	243.91	0.03	59979.5	6003.7	90.47
10 surface outflow	244.52	0.03	12052.6	1206.4	18.13
12 total outflow	244.52	0.03	12052.6	1206.4	18.13
13 total trapped	0.00	0.00	47926.6	4797.3	
14 storage increase	0.00	0.00	0.3	0.0	
15 mass balance chec	-0.62	0.00	0.0	0.0	
Reduction (%)	0.00	0.00	79.9	79.9	

Device: Pond 7 Type: POND Variable: TP

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	243.91	0.03	204.2	20.4	0.31
06 normal outlet	244.52	0.03	108.8	10.9	0.16
08 sedimen + decay	0.00	0.00	95.4	9.5	
09 total inflow	243.91	0.03	204.2	20.4	0.31
10 surface outflow	244.52	0.03	108.8	10.9	0.16
12 total outflow	244.52	0.03	108.8	10.9	0.16
13 total trapped	0.00	0.00	95.4	9.5	
14 storage increase	0.00	0.00	0.0	0.0	
15 mass balance chec	-0.62	0.00	0.0	0.0	
Reduction (%)	0.00	0.00	46.7	46.7	

Device: Pond 8 Type: POND Variable: TSS

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	20.98	0.00	4270.0	427.4	74.90
06 normal outlet	20.98	0.00	379.7	38.0	6.66
08 sedimen + decay	0.00	0.00	3890.3	389.4	
09 total inflow	20.98	0.00	4270.0	427.4	74.90
10 surface outflow	20.98	0.00	379.7	38.0	6.66
12 total outflow	20.98	0.00	379.7	38.0	6.66
13 total trapped	0.00	0.00	3890.3	389.4	
14 storage increase	0.00	0.00	0.0	0.0	
15 mass balance chec	0.00	0.00	0.0	0.0	
Reduction (%)	0.00	0.00	91.1	91.1	

Device: Pond 8 Type: POND Variable: TP

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	20.98	0.00	15.5	1.6	0.27
06 normal outlet	20.98	0.00	7.0	0.7	0.12
08 sedimen + decay	0.00	0.00	8.5	0.8	
09 total inflow	20.98	0.00	15.5	1.6	0.27
10 surface outflow	20.98	0.00	7.0	0.7	0.12
12 total outflow	20.98	0.00	7.0	0.7	0.12
13 total trapped	0.00	0.00	8.5	0.8	
14 storage increase	0.00	0.00	0.0	0.0	
15 mass balance chec	0.00	0.00	0.0	0.0	
Reduction (%)	0.00	0.00	54.6	54.6	

Device: Pond 14 (Outfall #10) Type: POND Variable: TSS

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	221.19	0.03	55698.1	5575.1	92.64
06 normal outlet	221.19	0.03	3087.4	309.0	5.14
08 sedimen + decay	0.00	0.00	52610.2	5266.1	
09 total inflow	221.19	0.03	55698.1	5575.1	92.64
10 surface outflow	221.19	0.03	3087.4	309.0	5.14
12 total outflow	221.19	0.03	3087.4	309.0	5.14
13 total trapped	0.00	0.00	52610.2	5266.1	
14 storage increase	0.00	0.00	0.4	0.0	
15 mass balance chec	0.00	0.00	0.0	0.0	
Reduction (%)	0.00	0.00	94.5	94.5	

Device: Pond 14 (Outfall #10) Type: POND Variable: TP

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	221.19	0.03	188.2	18.8	0.31
06 normal outlet	221.19	0.03	71.1	7.1	0.12
08 sedimen + decay	0.00	0.00	116.9	11.7	

09 total inflow	221.19	0.03	188.2	18.8	0.31
10 surface outflow	221.19	0.03	71.1	7.1	0.12
12 total outflow	221.19	0.03	71.1	7.1	0.12
13 total trapped	0.00	0.00	116.9	11.7	
14 storage increase	0.00	0.00	0.1	0.0	
15 mass balance chec	0.00	0.00	0.0	0.0	
Reduction (%)	0.00	0.00	62.1	62.1	

Device: Wetland 4 Type: POND Variable: TSS

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	25.24	0.00	6225.9	623.2	90.74
06 normal outlet	25.26	0.00	2001.2	200.3	29.15
08 sedimen + decay	0.00	0.00	4224.3	422.8	
09 total inflow	25.24	0.00	6225.9	623.2	90.74
10 surface outflow	25.26	0.00	2001.2	200.3	29.15
12 total outflow	25.26	0.00	2001.2	200.3	29.15
13 total trapped	0.00	0.00	4224.3	422.8	
14 storage increase	0.00	0.00	0.0	0.0	
15 mass balance chec	-0.01	0.00	0.4	0.0	
Reduction (%)	0.00	0.00	67.9	67.9	

Device: Wetland 4 Type: POND Variable: TP

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	25.24	0.00	21.2	2.1	0.31
06 normal outlet	25.26	0.00	14.3	1.4	0.21
08 sedimen + decay	0.00	0.00	6.9	0.7	
09 total inflow	25.24	0.00	21.2	2.1	0.31
10 surface outflow	25.26	0.00	14.3	1.4	0.21
12 total outflow	25.26	0.00	14.3	1.4	0.21
13 total trapped	0.00	0.00	6.9	0.7	
14 storage increase	0.00	0.00	0.0	0.0	
15 mass balance chec	-0.01	0.00	0.0	0.0	
Reduction (%)	0.00	0.00	32.4	32.4	

Device: Wetland 5 Type: POND Variable: TSS

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	93.66	0.01	23900.0	2392.3	93.89
06 normal outlet	93.66	0.01	7194.2	720.1	28.26
08 sedimen + decay	0.00	0.00	16705.6	1672.2	
09 total inflow	93.66	0.01	23900.0	2392.3	93.89
10 surface outflow	93.66	0.01	7194.2	720.1	28.26
12 total outflow	93.66	0.01	7194.2	720.1	28.26
13 total trapped	0.00	0.00	16705.6	1672.2	
14 storage increase	0.00	0.00	0.0	0.0	
15 mass balance chec	0.00	0.00	0.2	0.0	
Reduction (%)	0.00	0.00	69.9	69.9	

Device: Wetland 5 Type: POND Variable: TP

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	93.66	0.01	80.4	8.0	0.32
06 normal outlet	93.66	0.01	52.3	5.2	0.21
08 sedimen + decay	0.00	0.00	28.1	2.8	
09 total inflow	93.66	0.01	80.4	8.0	0.32
10 surface outflow	93.66	0.01	52.3	5.2	0.21
12 total outflow	93.66	0.01	52.3	5.2	0.21
13 total trapped	0.00	0.00	28.1	2.8	
14 storage increase	0.00	0.00	0.0	0.0	
15 mass balance chec	0.00	0.00	0.0	0.0	
Reduction (%)	0.00	0.00	35.0	35.0	

Device: Wetland 2 Type: POND Variable: TSS

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
Reduction (%)	0.00	0.00	0.0	0.0	

Device: Wetland 2 Type: POND Variable: TP

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
Reduction (%)	0.00	0.00	0.0	0.0	

Device: Wetland 3 Type: POND Variable: TSS

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	49.91	0.01	12712.9	1272.5	93.71
06 normal outlet	49.91	0.01	297.6	29.8	2.19
08 sedimen + decay	0.00	0.00	12414.8	1242.7	
09 total inflow	49.91	0.01	12712.9	1272.5	93.71
10 surface outflow	49.91	0.01	297.6	29.8	2.19
12 total outflow	49.91	0.01	297.6	29.8	2.19
13 total trapped	0.00	0.00	12414.8	1242.7	
14 storage increase	0.00	0.00	0.0	0.0	
15 mass balance chec	0.00	0.00	0.5	0.0	
Reduction (%)	0.00	0.00	97.7	97.7	

Device: Wetland 3 Type: POND Variable: TP

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	49.91	0.01	42.8	4.3	0.32
06 normal outlet	49.91	0.01	14.6	1.5	0.11
08 sedimen + decay	0.00	0.00	28.2	2.8	
09 total inflow	49.91	0.01	42.8	4.3	0.32
10 surface outflow	49.91	0.01	14.6	1.5	0.11
12 total outflow	49.91	0.01	14.6	1.5	0.11
13 total trapped	0.00	0.00	28.2	2.8	
14 storage increase	0.00	0.00	0.0	0.0	
15 mass balance chec	0.00	0.00	0.0	0.0	
Reduction (%)	0.00	0.00	65.9	65.9	

Device: Pond 9 Type: POND Variable: TSS

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	230.54	0.03	57198.1	5725.3	91.28
02 upstream device	294.44	0.04	12350.2	1236.2	15.43
06 normal outlet	525.76	0.07	32794.1	3282.6	22.95
08 sedimen + decay	0.00	0.00	36754.1	3678.9	
09 total inflow	524.98	0.07	69548.3	6961.5	48.74
10 surface outflow	525.76	0.07	32794.1	3282.6	22.95
12 total outflow	525.76	0.07	32794.1	3282.6	22.95
13 total trapped	0.00	0.00	36754.1	3678.9	
14 storage increase	0.00	0.00	0.1	0.0	
15 mass balance chec	-0.78	0.00	0.0	0.0	
Reduction (%)	0.00	0.00	52.8	52.8	

Device: Pond 9 Type: POND Variable: TP

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	230.54	0.03	194.2	19.4	0.31
02 upstream device	294.44	0.04	123.4	12.4	0.15
06 normal outlet	525.76	0.07	258.8	25.9	0.18
08 sedimen + decay	0.00	0.00	58.8	5.9	
09 total inflow	524.98	0.07	317.5	31.8	0.22
10 surface outflow	525.76	0.07	258.8	25.9	0.18

12 total outflow	525.76	0.07	258.8	25.9	0.18
13 total trapped	0.00	0.00	58.8	5.9	
14 storage increase	0.00	0.00	0.0	0.0	
15 mass balance chec	-0.78	0.00	0.0	0.0	
Reduction (%)	0.00	0.00	18.5	18.5	

Device: Pond 11 Type: POND Variable: TSS

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	28.67	0.00	7095.3	710.2	91.04
02 upstream device	525.76	0.07	32794.1	3282.6	22.95
06 normal outlet	554.44	0.08	9575.7	958.5	6.35
08 sedimen + decay	0.00	0.00	30313.5	3034.3	
09 total inflow	554.44	0.08	39889.4	3992.8	26.47
10 surface outflow	554.44	0.08	9575.7	958.5	6.35
12 total outflow	554.44	0.08	9575.7	958.5	6.35
13 total trapped	0.00	0.00	30313.5	3034.3	
14 storage increase	0.00	0.00	0.1	0.0	
15 mass balance chec	0.00	0.00	0.0	0.0	
Reduction (%)	0.00	0.00	76.0	76.0	

Device: Pond 11 Type: POND Variable: TP

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	28.67	0.00	24.1	2.4	0.31
02 upstream device	525.76	0.07	258.8	25.9	0.18
06 normal outlet	554.44	0.08	185.6	18.6	0.12
08 sedimen + decay	0.00	0.00	97.3	9.7	
09 total inflow	554.44	0.08	282.9	28.3	0.19
10 surface outflow	554.44	0.08	185.6	18.6	0.12
12 total outflow	554.44	0.08	185.6	18.6	0.12
13 total trapped	0.00	0.00	97.3	9.7	
14 storage increase	0.00	0.00	0.0	0.0	
15 mass balance chec	0.00	0.00	0.0	0.0	
Reduction (%)	0.00	0.00	34.4	34.4	

Device: Pond 10 Type: POND Variable: TSS

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	14.03	0.00	3523.9	352.7	92.43
02 upstream device	575.41	0.08	9955.4	996.5	6.37
06 normal outlet	589.57	0.08	8048.1	805.6	5.02
08 sedimen + decay	0.00	0.00	5431.2	543.6	
09 total inflow	589.44	0.08	13479.4	1349.2	8.41
10 surface outflow	589.57	0.08	8048.1	805.6	5.02
12 total outflow	589.57	0.08	8048.1	805.6	5.02
13 total trapped	0.00	0.00	5431.2	543.6	
14 storage increase	0.00	0.00	0.0	0.0	
15 mass balance chec	-0.14	0.00	0.0	0.0	
Reduction (%)	0.00	0.00	40.3	40.3	

Device: Pond 10 Type: POND Variable: TP

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	14.03	0.00	11.9	1.2	0.31
02 upstream device	575.41	0.08	192.6	19.3	0.12
06 normal outlet	589.57	0.08	189.1	18.9	0.12
08 sedimen + decay	0.00	0.00	15.4	1.5	
09 total inflow	589.44	0.08	204.5	20.5	0.13
10 surface outflow	589.57	0.08	189.1	18.9	0.12
12 total outflow	589.57	0.08	189.1	18.9	0.12
13 total trapped	0.00	0.00	15.4	1.5	
14 storage increase	0.00	0.00	0.0	0.0	

15 mass balance chec	-0.14	0.00	0.0	0.0	
Reduction (%)	0.00	0.00	7.5	7.5	

Device: Pond 12 Type: POND Variable: TSS

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	112.83	0.02	28547.2	2857.5	93.08
02 upstream device	614.83	0.08	10049.3	1005.9	6.01
06 normal outlet	727.67	0.10	6421.4	642.8	3.25
08 sedimen + decay	0.00	0.00	32174.9	3220.6	
09 total inflow	727.67	0.10	38596.5	3863.4	19.51
10 surface outflow	727.67	0.10	6421.4	642.8	3.25
12 total outflow	727.67	0.10	6421.4	642.8	3.25
13 total trapped	0.00	0.00	32174.9	3220.6	
14 storage increase	0.00	0.00	0.2	0.0	
15 mass balance chec	0.00	0.00	0.0	0.0	
Reduction (%)	0.00	0.00	83.4	83.4	

Device: Pond 12 Type: POND Variable: TP

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	112.83	0.02	96.3	9.6	0.31
02 upstream device	614.83	0.08	203.4	20.4	0.12
06 normal outlet	727.67	0.10	220.0	22.0	0.11
08 sedimen + decay	0.00	0.00	79.7	8.0	
09 total inflow	727.67	0.10	299.7	30.0	0.15
10 surface outflow	727.67	0.10	220.0	22.0	0.11
12 total outflow	727.67	0.10	220.0	22.0	0.11
13 total trapped	0.00	0.00	79.7	8.0	
14 storage increase	0.00	0.00	0.0	0.0	
15 mass balance chec	0.00	0.00	0.0	0.0	
Reduction (%)	0.00	0.00	26.6	26.6	

Device: CRH-1 Type: POND Variable: TSS

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	101.61	0.01	25475.6	2550.0	92.25
06 normal outlet	101.61	0.01	5758.7	576.4	20.85
08 sedimen + decay	0.00	0.00	19716.9	1973.6	
09 total inflow	101.61	0.01	25475.6	2550.0	92.25
10 surface outflow	101.61	0.01	5758.7	576.4	20.85
12 total outflow	101.61	0.01	5758.7	576.4	20.85
13 total trapped	0.00	0.00	19716.9	1973.6	
14 storage increase	0.00	0.00	0.0	0.0	
15 mass balance chec	0.00	0.00	0.0	0.0	
Reduction (%)	0.00	0.00	77.4	77.4	

Device: CRH-1 Type: POND Variable: TP

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	101.61	0.01	86.2	8.6	0.31
06 normal outlet	101.61	0.01	48.9	4.9	0.18
08 sedimen + decay	0.00	0.00	37.3	3.7	
09 total inflow	101.61	0.01	86.2	8.6	0.31
10 surface outflow	101.61	0.01	48.9	4.9	0.18
12 total outflow	101.61	0.01	48.9	4.9	0.18
13 total trapped	0.00	0.00	37.3	3.7	
14 storage increase	0.00	0.00	0.0	0.0	
15 mass balance chec	0.00	0.00	0.0	0.0	
Reduction (%)	0.00	0.00	43.3	43.3	

Device: CRH-2 Type: POND Variable: TSS

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	83.08	0.01	21153.2	2117.3	93.67
06 normal outlet	83.08	0.01	2881.7	288.4	12.76
08 sedimen + decay	0.00	0.00	18271.5	1828.9	
09 total inflow	83.08	0.01	21153.2	2117.3	93.67
10 surface outflow	83.08	0.01	2881.7	288.4	12.76
12 total outflow	83.08	0.01	2881.7	288.4	12.76
13 total trapped	0.00	0.00	18271.5	1828.9	
14 storage increase	0.00	0.00	0.0	0.0	
15 mass balance chec	0.00	0.00	0.0	0.0	
Reduction (%)	0.00	0.00	86.4	86.4	

Device: CRH-2 Type: POND Variable: TP

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	83.08	0.01	71.2	7.1	0.32
06 normal outlet	83.08	0.01	33.2	3.3	0.15
08 sedimen + decay	0.00	0.00	38.0	3.8	
09 total inflow	83.08	0.01	71.2	7.1	0.32
10 surface outflow	83.08	0.01	33.2	3.3	0.15
12 total outflow	83.08	0.01	33.2	3.3	0.15
13 total trapped	0.00	0.00	38.0	3.8	
14 storage increase	0.00	0.00	0.0	0.0	
15 mass balance chec	0.00	0.00	0.0	0.0	
Reduction (%)	0.00	0.00	53.4	53.4	

Device: CRH-3 Type: POND Variable: TSS

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	13.89	0.00	3435.3	343.9	90.99
02 upstream device	83.08	0.01	2881.7	288.4	12.76
06 normal outlet	96.97	0.01	2052.2	205.4	7.79
08 sedimen + decay	0.00	0.00	4264.8	426.9	
09 total inflow	96.97	0.01	6317.0	632.3	23.97
10 surface outflow	96.97	0.01	2052.2	205.4	7.79
12 total outflow	96.97	0.01	2052.2	205.4	7.79
13 total trapped	0.00	0.00	4264.8	426.9	
14 storage increase	0.00	0.00	0.0	0.0	
15 mass balance chec	0.00	0.00	0.0	0.0	
Reduction (%)	0.00	0.00	67.5	67.5	

Device: CRH-3 Type: POND Variable: TP

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	13.89	0.00	11.7	1.2	0.31
02 upstream device	83.08	0.01	33.2	3.3	0.15
06 normal outlet	96.97	0.01	33.9	3.4	0.13
08 sedimen + decay	0.00	0.00	10.9	1.1	
09 total inflow	96.97	0.01	44.9	4.5	0.17
10 surface outflow	96.97	0.01	33.9	3.4	0.13
12 total outflow	96.97	0.01	33.9	3.4	0.13
13 total trapped	0.00	0.00	10.9	1.1	
14 storage increase	0.00	0.00	0.0	0.0	
15 mass balance chec	0.00	0.00	0.0	0.0	
Reduction (%)	0.00	0.00	24.4	24.4	

Device: SB 18 Swale Type: INF_BASIN Variable: TSS

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	84.53	0.01	10961.7	1097.2	47.71
03 infiltrate	79.77	0.01	1287.0	128.8	5.94
04 exfiltrate	79.77	0.01	0.0	0.0	0.00
05 filtered	0.00	0.00	1287.0	128.8	

07 spillway outlet	4.76	0.00	1041.3	104.2	80.49
08 sedimen + decay	0.00	0.00	8633.4	864.2	
09 total inflow	84.53	0.01	10961.7	1097.2	47.71
10 surface outflow	4.76	0.00	1041.3	104.2	80.49
11 groundw outflow	79.77	0.01	0.0	0.0	0.00
12 total outflow	84.53	0.01	1041.3	104.2	4.53
13 total trapped	0.00	0.00	9920.4	993.0	
14 storage increase	0.00	0.00	0.0	0.0	
15 mass balance chec	0.00	0.00	0.0	0.0	
Reduction (%)	0.00	0.00	90.5	90.5	

Device: SB 18 Swale Type: INF_BASIN Variable: TP

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	84.53	0.01	48.1	4.8	0.21
03 infiltrate	79.77	0.01	26.4	2.6	0.12
04 exfiltrate	79.77	0.01	2.1	0.2	0.01
05 filtered	0.00	0.00	24.2	2.4	
07 spillway outlet	4.76	0.00	4.6	0.5	0.35
08 sedimen + decay	0.00	0.00	17.1	1.7	
09 total inflow	84.53	0.01	48.1	4.8	0.21
10 surface outflow	4.76	0.00	4.6	0.5	0.35
11 groundw outflow	79.77	0.01	2.1	0.2	0.01
12 total outflow	84.53	0.01	6.7	0.7	0.03
13 total trapped	0.00	0.00	41.3	4.1	
14 storage increase	0.00	0.00	0.0	0.0	
15 mass balance chec	0.00	0.00	0.0	0.0	
Reduction (%)	0.00	0.00	86.0	86.0	

Device: Pond 13 Type: POND Variable: TSS

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	1345.33	0.19	344217.7	34454.8	94.14
02 upstream device	732.43	0.10	7462.6	747.0	3.75
06 normal outlet	2077.74	0.29	95897.0	9598.9	16.98
08 sedimen + decay	0.00	0.00	255781.9	25602.7	
09 total inflow	2077.76	0.29	351680.3	35201.8	62.27
10 surface outflow	2077.74	0.29	95897.0	9598.9	16.98
12 total outflow	2077.74	0.29	95897.0	9598.9	16.98
13 total trapped	0.00	0.00	255781.9	25602.7	
14 storage increase	0.00	0.00	1.4	0.1	
15 mass balance chec	0.02	0.00	0.0	0.0	
Reduction (%)	0.00	0.00	72.7	72.7	

Device: Pond 13 Type: POND Variable: TP

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	1345.33	0.19	1157.1	115.8	0.32
02 upstream device	732.43	0.10	224.5	22.5	0.11
06 normal outlet	2077.74	0.29	908.8	91.0	0.16
08 sedimen + decay	0.00	0.00	472.9	47.3	
09 total inflow	2077.76	0.29	1381.7	138.3	0.24
10 surface outflow	2077.74	0.29	908.8	91.0	0.16
12 total outflow	2077.74	0.29	908.8	91.0	0.16
13 total trapped	0.00	0.00	472.9	47.3	
14 storage increase	0.00	0.00	0.0	0.0	
15 mass balance chec	0.02	0.00	0.0	0.0	
Reduction (%)	0.00	0.00	34.2	34.2	

Device: Outfall #5 Type: PIPE Variable: TSS

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
02 upstream device	2077.74	0.29	95897.0	9598.9	16.98

06 normal outlet	2077.74	0.29	95897.0	9598.9	16.98
09 total inflow	2077.74	0.29	95897.0	9598.9	16.98
10 surface outflow	2077.74	0.29	95897.0	9598.9	16.98
12 total outflow	2077.74	0.29	95897.0	9598.9	16.98
Reduction (%)	0.00	0.00	0.0	0.0	

Device: Outfall #5 Type: PIPE Variable: TP

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
02 upstream device	2077.74	0.29	908.8	91.0	0.16
06 normal outlet	2077.74	0.29	908.8	91.0	0.16
09 total inflow	2077.74	0.29	908.8	91.0	0.16
10 surface outflow	2077.74	0.29	908.8	91.0	0.16
12 total outflow	2077.74	0.29	908.8	91.0	0.16
Reduction (%)	0.00	0.00	0.0	0.0	

Device: Thumb Infiltration Type: INF_BASIN Variable: TSS

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	218.09	0.03	47385.3	4743.1	79.94
03 infiltrate	215.58	0.03	6476.5	648.3	11.05
04 exfiltrate	215.58	0.03	0.0	0.0	0.00
05 filtered	0.00	0.00	6476.5	648.3	
07 spillway outlet	2.51	0.00	420.4	42.1	61.54
08 sedimen + decay	0.00	0.00	40488.3	4052.7	
09 total inflow	218.09	0.03	47385.3	4743.1	79.94
10 surface outflow	2.51	0.00	420.4	42.1	61.54
11 groundw outflow	215.58	0.03	0.0	0.0	0.00
12 total outflow	218.09	0.03	420.4	42.1	0.71
13 total trapped	0.00	0.00	46964.9	4701.0	
14 storage increase	0.00	0.00	0.0	0.0	
15 mass balance chec	0.00	0.00	0.0	0.0	
Reduction (%)	0.00	0.00	99.1	99.1	

Device: Thumb Infiltration Type: INF_BASIN Variable: TP

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	218.09	0.03	168.1	16.8	0.28
03 infiltrate	215.58	0.03	82.8	8.3	0.14
04 exfiltrate	215.58	0.03	5.8	0.6	0.01
05 filtered	0.00	0.00	77.0	7.7	
07 spillway outlet	2.51	0.00	2.2	0.2	0.32
08 sedimen + decay	0.00	0.00	83.2	8.3	
09 total inflow	218.09	0.03	168.1	16.8	0.28
10 surface outflow	2.51	0.00	2.2	0.2	0.32
11 groundw outflow	215.58	0.03	5.8	0.6	0.01
12 total outflow	218.09	0.03	8.0	0.8	0.01
13 total trapped	0.00	0.00	160.1	16.0	
14 storage increase	0.00	0.00	0.0	0.0	
15 mass balance chec	0.00	0.00	0.0	0.0	
Reduction (%)	0.00	0.00	95.2	95.2	

Device: To Rice Creek Type: PIPE Variable: TSS

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
02 upstream device	2278.84	0.31	104128.4	10422.8	16.81
06 normal outlet	2278.84	0.31	104128.4	10422.8	16.81
09 total inflow	2278.84	0.31	104128.4	10422.8	16.81
10 surface outflow	2278.84	0.31	104128.4	10422.8	16.81
12 total outflow	2278.84	0.31	104128.4	10422.8	16.81
Reduction (%)	0.00	0.00	0.0	0.0	

Device: To Rice Creek Type: PIPE Variable: TP

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
02 upstream device	2278.84	0.31	993.8	99.5	0.16
06 normal outlet	2278.84	0.31	993.8	99.5	0.16
09 total inflow	2278.84	0.31	993.8	99.5	0.16
10 surface outflow	2278.84	0.31	993.8	99.5	0.16
12 total outflow	2278.84	0.31	993.8	99.5	0.16
Reduction (%)	0.00	0.00	0.0	0.0	

Rice Creek P8 Results
Scenario 3: Fully Developed Conditions

P8 Urban Catchment Model, Version 3.5 Run Date 06/10/15

Case	Rice Creek Full Build.p8c	FirstDate	01/01/01	Precip(in)	296.7
Title	Rice Creek	LastDate	12/31/10	Rain(in)	273.57
PrecFile	precip1970-2010.pcp	Events	598	Snow(in)	23.12
PartFile	nurp50.p8p	TotalHrs	87576	TotalYrs	9.99

File Directory	T:\1382 KimleyHorn\01 TCAAP\TASK 03 Stormwater Prelim Design\Models\P8\
Case Title	Rice Creek
Case File	Rice Creek Full Build.p8c
Particle File	nurp50.p8p
Temperature File	temp1970-2011.tmp
Storm File	precip1970-2010.pcp
Precip Scale Factor	1
Watersheds	16
Devices	19
Particles	5
WQ Components	7
Start Date	06/01/00
Keep Date	01/01/01
Stop Date	12/31/10
Storm Count	598
Total Hours	87576
Wet Hours	9265
Precip (in)	297
Rain (in)	274
Snowfall (in)	23
Snowmelt (in)	22
EvapoTran(in)	303
Overall TSS Removal(%)	1
Water Balance Error(%)	0
TSS Mass Balance Error	0

P8 Urban Catchment Model, Version 3.5 Run Date 06/10/15

Case	Rice Creek Full Build.p8c	FirstDate	01/01/01	Precip(in)	296.7
Title	Rice Creek	LastDate	12/31/10	Rain(in)	273.57
PrecFile	precip1970-2010.pcp	Events	598	Snow(in)	23.12
PartFile	nurp50.p8p	TotalHrs	87576	TotalYrs	9.99

Case Title	Rice Creek
Case Data File	Rice Creek Full Build.p8c
Path	T:\1382 KimleyHorn\01 TCAAP\TASK 03 Stormwater Prelim Design\Models\P8\
Case Notes:	Full Build
Storm Data File	precip1970-2010.pcp
Particle File	nurp50.p8p
Air Temp File File	temp1970-2011.tmp

Time Steps Per Hour	4
Minimum Inter-Event Time (hrs)	10
Maximum Continuity Error %	2
Rainfall Breakpoint (inches)	0.8
Precipitation Scale Factor	1
Air Temp Offset (deg-F)	0
Loops Thru Storm File	1
Simulation Dates	
Start	6/1/2000
Keep	1/1/2001
Stop	12/31/2010

Max Snowfall Temperature (deg-f)	32.0
SnowMelt Temperature (deg-f)	32.0
Snowmelt Coef (in/degF-Day)	0.06
Soil Freeze Temp (deg-F)	32.0
Snowmelt Abstraction Factor	1.00
Evapo-Trans. Calibration Factor	1.00
Growing Season Start Month	5
Growing Season End Month	10

5-Day Antecedent Rainfall + Runoff (inches)

CN Antecedent Moisture Condition	AMC-II	AMC-III
Growing Season	1.40	2.10
NonGrowing Season	0.50	1.10

Watershed Data

Watershed Name	SB 8	SB 10	SB 9	SB 12	SB 11	SB 14	SB 13	SB 18	SB 15, 16, 22 and 27	SB 17	SB 19	Inflow fro	SB 28	SB 29	SB 1
Runoff to Device	Pond 7	Pond 8	Pond 9	Pond 10	Pond 11	Pond 12	Wetland 4 Infiltrati	Pond 13	Wetland 5 Pond 14 (O	Wetland 3	CRH-1	CRH-2	CRH-3	Thumb Infiltration	
Infiltration to Device															
Watershed Area	29.6	6.39	25.79	1.38	3.29	10.23	2.985	52.908	105.327	7.608	21.198	4.16	6.955	10.214	1.601	7.656
SCS Curve Number (Pervious)	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74
Scale Factor for Pervious Runoff	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

```
       1         1
Indirectly Connected Imperv Frac    0         0         0         0         0
  0         0         0         0         0         0         0         0         0
       0         0
UnSwept Impervious Fraction         0.3      0.076     0.3317     0.3871    0.3216
0.4262    0.3099    0.8455    0.505     0.4841    0.3993     0.47     0.4676
0.3773    0.3198    0.8423
UnSwept Depression Storage (inch   0.02      0.02      0.02       0.02      0.02
 0.02      0.02      0.02      0.02      0.02      0.02      0.02      0.02
0.02      0.02      0.02
UnSwept Imperv. Runoff Coefficie    1         1         1         1         1
  1         1         1         1         1         1         1         1         1
       1         1
UnSwept Scale Factor for Particl    1         1         1         1         1
  1         1         1         1         1         1         1         1         1
       1         1
Swept Impervious Fraction           0         0         0         0         0
  0         0         0         0         0         0         0         0         0
       0         0
Swept Depression Storage (inches   0.02      0.02      0.02       0.02      0.02
 0.02      0.02      0.02      0.02      0.02      0.02       0         0         0
       0        0.02
Swept Imperv. Runoff Coefficient    1         1         1         1         1
  1         1         1         1         1         1         1         1         1
       1         1
Swept Scale Factor for Particle     1         1         1         1         1
  1         1         1         1         1         1         1         1         1
       1         1
Sweeping Frequency                 0.5       0.5       0.5       0.5       0.5
 0.5       0.5       0.5       0.5       0.5       0.5       0.5       0.5       0.5
      0.5       0.5
Sweeping Efficiency                 1         1         1         1         1
  1         1         1         1         1         1         1         1         1
       1         1
Sweeping Start Date (MMDD)         101       101       101       101       101
 101       101       101       101       101       101       101       101       101
      101       101
Sweeping Stop Date (MMDD)          1231      1231      1231      1231      1231
 1231      1231      1231      1231      1231      1231      1231      1231      1231
1231      1231      1231

Device Data
Device Name                        Pond 7    Pond 8    Pond 9    Pond 10   Pond 11
Pond 12   Pond 13  InfiltratiPond 14 (OWetland 4 Wetland 5 Outfall #5Wetland 3
Wetland 2   CRH-1     CRH-2   To Rice Cr  CRH-3   Thumb Infiltration
Device Type                         POND      POND      POND      POND      POND
 POND      POND   INF_BASIN    POND      POND      POND      PIPE      POND
POND      POND      POND      PIPE      POND   INF_BASIN
Infiltration Outlet
Normal Outlet                      Pond 9   Pond 10    Pond 11   Pond 12   Pond 10
Pond 13  Outfall #5          To Rice Cr Pond 12  Outfall #5To Rice Cr  Pond 9
Wetland 3 To Rice Cr  CRH-3             To Rice Creek
Spillway Outlet                    Pond 9   Pond 10    Pond 11   Pond 12   Pond 10
Pond 13  Outfall #5 Pond 13  To Rice Cr Pond 12  Outfall #5            Pond 9
Wetland 3 To Rice Cr  CRH-3             To Rice CrTo Rice Creek
Particle Removal Scale Factor       1         1         1         1         1
  1         1         1         1         1         1                   1         1
       1         1                   1         1
Bottom Elevation (ft)               0         0         0         0         0
  0         0         0         0         0         0                   0         0
       0         0                   0         0
Bottom Area (acres)               0.143     0.057     0.024     0.13      0.97
 1.2       0.02       0        1.22       0         0                  2.157
```

2.157 0.15 0.2 0.15 0
Permanent Pool Area (acres) 0.548 0.26 0.41 0.288 1.32
1.64 1.988 1.557 0 0 2.355
2.18 0.225 0.35 0.225
Permanent Pool Volume (ac-ft) 1 0.6 0.5 0.8 4.5
5.7 6.2 2.3 0 0 0 0
0.187 0.412 0.187
Perm Pool Infilt Rate (in/hr) 0 0 0 0 0
0 0 0 0 0 0 0
0 0 0
Flood Pool Area (acres) 0.723 0.669 0.75 0.61 2.11
2.38 4.03 3.32 2.179 1.891 1.891 2.653
2.591 0.5 0.6 0.5 3.74
Flood Pool Volume (ac-ft) 0.5 0.9 0.4 1.1 6.6
5.3 8.1 3.32 5.1 2.5 5.8 2.6 1.2
0.663 1.18 0.663 3.74
Flood Pool Infilt Rate (in/hr) 0 0 0 0 0
0 0 0.45 0 0 0 0 0
0 0 0 0.45
Infilt Basin Void Fraction (%)
100
100
Detention Pond Outlet Parameters
Outlet Type WEIR ORIFICE WEIR WEIR ORIFICE
ORIFICE WEIR ORIFICE ORIFICE ORIFICE ORIFICE
ORIFICE ORIFICE ORIFICE ORIFICE
Outlet Orifice Diameter (in) 24 12
12 12 12 6 12 12
24 24 24
Orifice Discharge Coef 1 0.6
0.6 0.6 0.6 0.6 0.6 0.6
0.6 0.6 0.6
Outlet Weir Length (ft) 75 80 50
55
Weir Discharge Coef 3.3 3.3 3.3
3.3
Perforated Riser Height (ft)
Number of Holes in Riser
Holes Diameter
Flood Pool Drain Time (hrs)
Swale Parameters
Length of Flow Path (ft)
Slope of Flow Path %
Bottom Width (ft)
Side Slope (ft-v/ft-h)
Maximum Depth of Flow (ft)
Mannings n Constant
Hydraulic Model
Pipe, Splitter, Aquifer Parameter
Hydraulic Res. Time (hrs)
0
0

Particle Data
Particle File nurp50.p8p

Particle Class	P0%	P10%	P30%	P50%	P80%
Filtration Efficiency	90	100	100	100	100
Settling Velocity (ft/	0	0.03	0.3	1.5	15
First Order Decay Rate	0	0	0	0	0
2nd Order Decay (1/day	0	0	0	0	0
Impervious Runoff Conc	1	0	0	0	0
Pervious Runoff Conc (	1	100	100	100	200
Pervious Conc Exponent	0	1	1	1	1

Accum. Rate (lbs-ac-da	0	1.75	1.75	1.75	3.5	
Particle Removal Rate	0	0.25	0.25	0.25	0.25	
Washoff Coefficient	0	20	20	20	20	
Washoff Exponent	0	2	2	2	2	
Sweeper Efficiency	0	0	0	5	15	

Water Quality Component Data

Component Name	TSS	TP	TKN	CU	PB	ZN	HC
Water Quality Criteria (ppm)							
Level 1	5	0.025	2	2	0.02	5	0.1
Level 2	10	0.05	1	0.0048	0.014	0.0362	0.5
Level 3	20	0.1	0.5	0.02	0.15	0.38	1
Content Scale Factor	1	1	1	1	1	1	1
Particle Composition (mg/kg)							
P0%	0	99000	600000	13600	2000	640000	250000
P10%	1000000	3850	15000	340	180	1600	22500
P30%	1000000	3850	15000	340	180	1600	22500
P50%	1000000	3850	15000	340	180	1600	22500
P80%	1000000	0	0	340	180	0	22500

P8 Urban Catchment Model, Version 3.5 Run Date 06/10/15

Case	Rice Creek Full Build.p8c	FirstDate	01/01/01	Precip(in)	296.7
Title	Rice Creek	LastDate	12/31/10	Rain(in)	273.57
PrecFile	precip1970-2010.pcp	Events	598	Snow(in)	23.12
PartFile	nurp50.p8p	TotalHrs	87576	TotalYrs	9.99

Devices Listed in Downstream Order

Device:	Pond 7	Type:	POND
	Discharges normal outlet to		Pond 9
	Discharges spillway to		Pond 9
	Runoff from watershed		SB 8
Device:	Pond 8	Type:	POND
	Discharges normal outlet to		Pond 10
	Discharges spillway to		Pond 10
	Runoff from watershed		SB 10
Device:	Infiltration BMP	Type:	INF_BASIN
	Discharges spillway to		Pond 13
	Runoff from watershed		SB 18
Device:	Pond 14 (Outfall #10	Type:	POND
	Discharges normal outlet to		To Rice Creek
	Discharges spillway to		To Rice Creek
	Runoff from watershed		SB 19
Device:	Wetland 4	Type:	POND
	Discharges normal outlet to		Pond 12
	Discharges spillway to		Pond 12
	Runoff from watershed		SB 13
Device:	Wetland 5	Type:	POND
	Discharges normal outlet to		Outfall #5
	Discharges spillway to		Outfall #5
	Runoff from watershed		SB 17
Device:	Wetland 2	Type:	POND
	Discharges normal outlet to		Wetland 3
	Discharges spillway to		Wetland 3
Device:	Wetland 3	Type:	POND
	Discharges normal outlet to		Pond 9
	Discharges spillway to		Pond 9
	Runoff from watershed		Inflow from Ponds 4/5
Device:	Pond 9	Type:	POND
	Discharges normal outlet to		Pond 11
	Discharges spillway to		Pond 11
	Runoff from watershed		SB 9
Device:	Pond 11	Type:	POND
	Discharges normal outlet to		Pond 10
	Discharges spillway to		Pond 10
	Runoff from watershed		SB 11
Device:	Pond 10	Type:	POND

	Discharges normal outlet to		Pond 12
	Discharges spillway to		Pond 12
	Runoff from watershed		SB 12
Device:	Pond 12	Type:	POND
	Discharges normal outlet to		Pond 13
	Discharges spillway to		Pond 13
	Runoff from watershed		SB 14
Device:	Pond 13	Type:	POND
	Discharges normal outlet to		Outfall #5
	Discharges spillway to		Outfall #5
	Runoff from watershed		SB 15, 16, 26
Device:	Outfall #5	Type:	PIPE
	Discharges normal outlet to		To Rice Creek
Device:	CRH-1	Type:	POND
	Discharges normal outlet to		To Rice Creek
	Discharges spillway to		To Rice Creek
	Runoff from watershed		SB 28
Device:	CRH-2	Type:	POND
	Discharges normal outlet to		CRH-3
	Discharges spillway to		CRH-3
	Runoff from watershed		SB 29
Device:	CRH-3	Type:	POND
	Discharges normal outlet to		To Rice Creek
	Discharges spillway to		To Rice Creek
	Runoff from watershed		SB 1
Device:	Thumb Infiltration	Type:	INF_BASIN
	Discharges spillway to		To Rice Creek
	Runoff from watershed		SB 22 and 27
Device:	To Rice Creek	Type:	PIPE

P8-V3.X Rice Creek Full Build.p8c

Watershed Label	Total Imperv Area acres	Outflow Device	Depress Storage inches	Imperv Runoff Coef	Imperv Load Factor	Directly Connected UnSwept Areas Fraction	Directly Connected Swept Areas--Street Sweeping Parameters Depress Storage inches	Imperv Runoff Coef	Imperv Load Factor	Pervious Percol Curve Number	Indirect Load Date MMDD	Pervious Start Date MMDD	Stop Sweep Effic	Sweep Freq 1/week
SB 8	29.6	Pond 7	0.02	1	1	0	0.02	1	1	74	0.000	1	0.3	0.5
SB 10	6.39	Pond 8	0.02	1	1	0	0.02	1	1	74	0.000	1	0.076	0.5
SB 9	25.79	Pond 9	0.02	1	1	0	0.02	1	1	74	0.000	1	0.3317	0.5
SB 12	1.38	Pond 10	0.02	1	1	0	0.02	1	1	74	0.000	1	0.3871	0.5
SB 11	3.29	Pond 11	0.02	1	1	0	0.02	1	1	74	0.000	1	0.3216	0.5
SB 14	10.23	Pond 12	0.02	1	1	0	0.02	1	1	74	0.000	1	0.4262	0.5
SB 13	2.985	Wetland 4	0.02	1	1	0	0.02	1	1	74	0.000	1	0.3099	0.5
SB 18	52.908	Infiltration BMP	0.02	1	1	0	0.02	1	1	74	0.000	1	0.8455	0.5
SB 15, 16, 26	105.327	Pond 13	0.02	1	1	0	0.02	1	1	74	0.000	1	0.505	0.5
SB 17	7.608	Wetland 5	0.02	1	1	0	0.02	1	1	74	0.000	1	0.4841	0.5
SB 19	21.198	Pond 14 (Outfall #10)	0.02	1	1	0	0.02	1	1	74	0.000	1	0.3993	0.5
Inflow from P	4.16	Wetland 3	0.02	1	1	0	0	1	1	74	0.000	1	0.47	0.5
SB 28	6.955	CRH-1	0.02	1	1	0	0	1	1	74	0.000	1	0.4676	0.5
SB 29	10.214	CRH-2	0.02	1	1	0	0	1	1	74	0.000	1	0.3773	0.5
SB 1	1.601	CRH-3	0.02	1	1	0	0	1	1	74	0.000	1	0.3198	0.5
SB 22 and 27	7.656	Thumb Infiltration	0.02	1	1	0	0.02	1	1	74	0.000	1	0.8423	0.5

P8 Urban Catchment Model, Version 3.5

Run Date	06/10/15		
Case	Rice Creek Full Build.p8c	FirstDate	01/01/01
Precip(in)	296.7		
Title	Rice Creek	LastDate	12/31/10
Rain(in)	273.57		
PrecFile	precip1970-2010.pcp	Events	598
Snow(in)	23.12		
PartFile	nurp50.p8p	TotalHrs	87576
TotalYrs	9.99		

Mass Balances by Device and Variable

Device: OVERALL Type: NONE Variable: TSS

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	3814.06	0.53	976169.8	97710.6	94.16
03 infiltrate	1065.79	0.15	41546.7	4158.7	14.34
04 exfiltrate	1065.79	0.15	0.0	0.0	0.00
05 filtered	0.00	0.00	41546.7	4158.7	
06 normal outlet	2749.56	0.38	112085.8	11219.3	15.00
08 sedimen + decay	0.00	0.00	822533.1	82332.2	
09 total inflow	3814.06	0.53	976169.8	97710.6	94.16
10 surface outflow	2749.56	0.38	112085.8	11219.3	15.00
11 groundw outflow	1065.79	0.15	0.0	0.0	0.00
12 total outflow	3815.34	0.53	112085.8	11219.3	10.81
13 total trapped	0.00	0.00	864079.9	86490.9	
14 storage increase	0.00	0.00	3.1	0.3	
15 mass balance chec	-1.29	0.00	1.0	0.1	
Reduction (%)	0.00	0.00	88.5	88.5	

Device: OVERALL Type: NONE Variable: TP

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	3814.06	0.53	3281.2	328.4	0.32
03 infiltrate	1065.79	0.15	445.5	44.6	0.15
04 exfiltrate	1065.79	0.15	28.7	2.9	0.01
05 filtered	0.00	0.00	416.8	41.7	
06 normal outlet	2749.56	0.38	1151.2	115.2	0.15
08 sedimen + decay	0.00	0.00	1684.4	168.6	
09 total inflow	3814.06	0.53	3281.2	328.4	0.32
10 surface outflow	2749.56	0.38	1151.2	115.2	0.15
11 groundw outflow	1065.79	0.15	28.7	2.9	0.01
12 total outflow	3815.34	0.53	1179.9	118.1	0.11
13 total trapped	0.00	0.00	2101.2	210.3	
14 storage increase	0.00	0.00	0.1	0.0	
15 mass balance chec	-1.29	0.00	0.0	0.0	
Reduction (%)	0.00	0.00	64.0	64.0	

Device: Pond 7 Type: POND Variable: TSS

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	243.84	0.03	59961.6	6001.9	90.47
06 normal outlet	244.26	0.03	11590.2	1160.1	17.46
08 sedimen + decay	0.00	0.00	48371.2	4841.8	
09 total inflow	243.84	0.03	59961.6	6001.9	90.47
10 surface outflow	244.26	0.03	11590.2	1160.1	17.46
12 total outflow	244.26	0.03	11590.2	1160.1	17.46
13 total trapped	0.00	0.00	48371.2	4841.8	
14 storage increase	0.00	0.00	0.2	0.0	
15 mass balance chec	-0.42	0.00	0.0	0.0	
Reduction (%)	0.00	0.00	80.7	80.7	

Device: Pond 7 Type: POND Variable: TP

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	243.84	0.03	204.1	20.4	0.31
06 normal outlet	244.26	0.03	107.7	10.8	0.16
08 sedimen + decay	0.00	0.00	96.4	9.7	
09 total inflow	243.84	0.03	204.1	20.4	0.31
10 surface outflow	244.26	0.03	107.7	10.8	0.16
12 total outflow	244.26	0.03	107.7	10.8	0.16
13 total trapped	0.00	0.00	96.4	9.7	
14 storage increase	0.00	0.00	0.0	0.0	
15 mass balance chec	-0.42	0.00	0.0	0.0	
Reduction (%)	0.00	0.00	47.2	47.2	

Device: Pond 8 Type: POND Variable: TSS

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	20.98	0.00	4270.0	427.4	74.90
06 normal outlet	20.98	0.00	363.5	36.4	6.38
08 sedimen + decay	0.00	0.00	3906.5	391.0	
09 total inflow	20.98	0.00	4270.0	427.4	74.90
10 surface outflow	20.98	0.00	363.5	36.4	6.38
12 total outflow	20.98	0.00	363.5	36.4	6.38
13 total trapped	0.00	0.00	3906.5	391.0	
14 storage increase	0.00	0.00	0.0	0.0	
15 mass balance chec	0.00	0.00	0.0	0.0	
Reduction (%)	0.00	0.00	91.5	91.5	

Device: Pond 8 Type: POND Variable: TP

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	20.98	0.00	15.5	1.6	0.27
06 normal outlet	20.98	0.00	6.9	0.7	0.12
08 sedimen + decay	0.00	0.00	8.5	0.9	
09 total inflow	20.98	0.00	15.5	1.6	0.27
10 surface outflow	20.98	0.00	6.9	0.7	0.12
12 total outflow	20.98	0.00	6.9	0.7	0.12
13 total trapped	0.00	0.00	8.5	0.9	
14 storage increase	0.00	0.00	0.0	0.0	
15 mass balance chec	0.00	0.00	0.0	0.0	
Reduction (%)	0.00	0.00	55.1	55.1	

Device: Infiltration BMP Type: INF_BASIN Variable: TSS

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	1074.32	0.15	282084.8	28235.5	96.60
03 infiltrate	910.87	0.13	35885.1	3592.0	14.49
04 exfiltrate	910.87	0.13	0.0	0.0	0.00
05 filtered	0.00	0.00	35885.1	3592.0	
07 spillway outlet	163.45	0.02	9649.1	965.8	21.72
08 sedimen + decay	0.00	0.00	236550.6	23677.7	
09 total inflow	1074.32	0.15	282084.8	28235.5	96.60
10 surface outflow	163.45	0.02	9649.1	965.8	21.72
11 groundw outflow	910.87	0.13	0.0	0.0	0.00
12 total outflow	1074.32	0.15	9649.1	965.8	3.30
13 total trapped	0.00	0.00	272435.7	27269.7	
14 storage increase	0.00	0.00	0.0	0.0	
15 mass balance chec	0.00	0.00	0.0	0.0	
Reduction (%)	0.00	0.00	96.6	96.6	

Device: Infiltration BMP Type: INF_BASIN Variable: TP

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	1074.32	0.15	940.7	94.2	0.32
03 infiltrate	910.87	0.13	382.2	38.3	0.15
04 exfiltrate	910.87	0.13	24.5	2.5	0.01
05 filtered	0.00	0.00	357.7	35.8	
07 spillway outlet	163.45	0.02	80.7	8.1	0.18
08 sedimen + decay	0.00	0.00	477.8	47.8	
09 total inflow	1074.32	0.15	940.7	94.2	0.32
10 surface outflow	163.45	0.02	80.7	8.1	0.18
11 groundw outflow	910.87	0.13	24.5	2.5	0.01
12 total outflow	1074.32	0.15	105.2	10.5	0.04
13 total trapped	0.00	0.00	835.5	83.6	
14 storage increase	0.00	0.00	0.0	0.0	
15 mass balance chec	0.00	0.00	0.0	0.0	
Reduction (%)	0.00	0.00	88.8	88.8	

Device: Pond 14 (Outfall #10) Type: POND Variable: TSS

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	221.19	0.03	55698.1	5575.1	92.64
06 normal outlet	221.19	0.03	3588.4	359.2	5.97
08 sedimen + decay	0.00	0.00	52109.6	5216.0	
09 total inflow	221.19	0.03	55698.1	5575.1	92.64
10 surface outflow	221.19	0.03	3588.4	359.2	5.97
12 total outflow	221.19	0.03	3588.4	359.2	5.97
13 total trapped	0.00	0.00	52109.6	5216.0	
14 storage increase	0.00	0.00	0.1	0.0	
15 mass balance chec	0.00	0.00	0.0	0.0	
Reduction (%)	0.00	0.00	93.6	93.6	

Device: Pond 14 (Outfall #10) Type: POND Variable: TP

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	221.19	0.03	188.2	18.8	0.31
06 normal outlet	221.19	0.03	73.2	7.3	0.12
08 sedimen + decay	0.00	0.00	115.0	11.5	
09 total inflow	221.19	0.03	188.2	18.8	0.31
10 surface outflow	221.19	0.03	73.2	7.3	0.12
12 total outflow	221.19	0.03	73.2	7.3	0.12
13 total trapped	0.00	0.00	115.0	11.5	
14 storage increase	0.00	0.00	0.0	0.0	
15 mass balance chec	0.00	0.00	0.0	0.0	
Reduction (%)	0.00	0.00	61.1	61.1	

Device: Wetland 4 Type: POND Variable: TSS

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	25.24	0.00	6225.9	623.2	90.74
06 normal outlet	25.26	0.00	2001.2	200.3	29.15
08 sedimen + decay	0.00	0.00	4224.3	422.8	
09 total inflow	25.24	0.00	6225.9	623.2	90.74
10 surface outflow	25.26	0.00	2001.2	200.3	29.15
12 total outflow	25.26	0.00	2001.2	200.3	29.15
13 total trapped	0.00	0.00	4224.3	422.8	
14 storage increase	0.00	0.00	0.0	0.0	
15 mass balance chec	-0.01	0.00	0.4	0.0	
Reduction (%)	0.00	0.00	67.9	67.9	

Device: Wetland 4 Type: POND Variable: TP

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	25.24	0.00	21.2	2.1	0.31
06 normal outlet	25.26	0.00	14.3	1.4	0.21

08 sedimen + decay	0.00	0.00	6.9	0.7	
09 total inflow	25.24	0.00	21.2	2.1	0.31
10 surface outflow	25.26	0.00	14.3	1.4	0.21
12 total outflow	25.26	0.00	14.3	1.4	0.21
13 total trapped	0.00	0.00	6.9	0.7	
14 storage increase	0.00	0.00	0.0	0.0	
15 mass balance chec	-0.01	0.00	0.0	0.0	
Reduction (%)	0.00	0.00	32.4	32.4	

Device: Wetland 5 Type: POND Variable: TSS

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	93.66	0.01	23900.0	2392.3	93.89
06 normal outlet	93.66	0.01	7194.2	720.1	28.26
08 sedimen + decay	0.00	0.00	16705.6	1672.2	
09 total inflow	93.66	0.01	23900.0	2392.3	93.89
10 surface outflow	93.66	0.01	7194.2	720.1	28.26
12 total outflow	93.66	0.01	7194.2	720.1	28.26
13 total trapped	0.00	0.00	16705.6	1672.2	
14 storage increase	0.00	0.00	0.0	0.0	
15 mass balance chec	0.00	0.00	0.2	0.0	
Reduction (%)	0.00	0.00	69.9	69.9	

Device: Wetland 5 Type: POND Variable: TP

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	93.66	0.01	80.4	8.0	0.32
06 normal outlet	93.66	0.01	52.3	5.2	0.21
08 sedimen + decay	0.00	0.00	28.1	2.8	
09 total inflow	93.66	0.01	80.4	8.0	0.32
10 surface outflow	93.66	0.01	52.3	5.2	0.21
12 total outflow	93.66	0.01	52.3	5.2	0.21
13 total trapped	0.00	0.00	28.1	2.8	
14 storage increase	0.00	0.00	0.0	0.0	
15 mass balance chec	0.00	0.00	0.0	0.0	
Reduction (%)	0.00	0.00	35.0	35.0	

Device: Wetland 2 Type: POND Variable: TSS

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
Reduction (%)	0.00	0.00	0.0	0.0	

Device: Wetland 2 Type: POND Variable: TP

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
Reduction (%)	0.00	0.00	0.0	0.0	

Device: Wetland 3 Type: POND Variable: TSS

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	49.91	0.01	12712.9	1272.5	93.71
06 normal outlet	49.91	0.01	297.6	29.8	2.19
08 sedimen + decay	0.00	0.00	12414.8	1242.7	
09 total inflow	49.91	0.01	12712.9	1272.5	93.71
10 surface outflow	49.91	0.01	297.6	29.8	2.19
12 total outflow	49.91	0.01	297.6	29.8	2.19
13 total trapped	0.00	0.00	12414.8	1242.7	
14 storage increase	0.00	0.00	0.0	0.0	
15 mass balance chec	0.00	0.00	0.5	0.0	
Reduction (%)	0.00	0.00	97.7	97.7	

Device: Wetland 3 Type: POND Variable: TP

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	49.91	0.01	42.8	4.3	0.32
06 normal outlet	49.91	0.01	14.6	1.5	0.11
08 sedimen + decay	0.00	0.00	28.2	2.8	
09 total inflow	49.91	0.01	42.8	4.3	0.32
10 surface outflow	49.91	0.01	14.6	1.5	0.11
12 total outflow	49.91	0.01	14.6	1.5	0.11
13 total trapped	0.00	0.00	28.2	2.8	
14 storage increase	0.00	0.00	0.0	0.0	
15 mass balance chec	0.00	0.00	0.0	0.0	
Reduction (%)	0.00	0.00	65.9	65.9	

Device: Pond 9 Type: POND Variable: TSS

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	230.54	0.03	57198.1	5725.3	91.28
02 upstream device	294.18	0.04	11887.9	1189.9	14.87
06 normal outlet	525.31	0.07	27696.0	2772.3	19.40
08 sedimen + decay	0.00	0.00	41389.9	4143.0	
09 total inflow	524.72	0.07	69086.0	6915.2	48.44
10 surface outflow	525.31	0.07	27696.0	2772.3	19.40
12 total outflow	525.31	0.07	27696.0	2772.3	19.40
13 total trapped	0.00	0.00	41389.9	4143.0	
14 storage increase	0.00	0.00	0.0	0.0	
15 mass balance chec	-0.59	0.00	0.0	0.0	
Reduction (%)	0.00	0.00	59.9	59.9	

Device: Pond 9 Type: POND Variable: TP

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	230.54	0.03	194.2	19.4	0.31
02 upstream device	294.18	0.04	122.3	12.2	0.15
06 normal outlet	525.31	0.07	242.7	24.3	0.17
08 sedimen + decay	0.00	0.00	73.8	7.4	
09 total inflow	524.72	0.07	316.4	31.7	0.22
10 surface outflow	525.31	0.07	242.7	24.3	0.17
12 total outflow	525.31	0.07	242.7	24.3	0.17
13 total trapped	0.00	0.00	73.8	7.4	
14 storage increase	0.00	0.00	0.0	0.0	
15 mass balance chec	-0.59	0.00	0.0	0.0	
Reduction (%)	0.00	0.00	23.3	23.3	

Device: Pond 11 Type: POND Variable: TSS

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	28.67	0.00	7095.3	710.2	91.04
02 upstream device	525.31	0.07	27696.0	2772.3	19.40
06 normal outlet	553.99	0.08	7896.3	790.4	5.24
08 sedimen + decay	0.00	0.00	26894.9	2692.1	
09 total inflow	553.99	0.08	34791.4	3482.5	23.11
10 surface outflow	553.99	0.08	7896.3	790.4	5.24
12 total outflow	553.99	0.08	7896.3	790.4	5.24
13 total trapped	0.00	0.00	26894.9	2692.1	
14 storage increase	0.00	0.00	0.1	0.0	
15 mass balance chec	0.00	0.00	0.0	0.0	
Reduction (%)	0.00	0.00	77.3	77.3	

Device: Pond 11 Type: POND Variable: TP

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	28.67	0.00	24.1	2.4	0.31
02 upstream device	525.31	0.07	242.7	24.3	0.17
06 normal outlet	553.99	0.08	179.1	17.9	0.12

08 sedimen + decay	0.00	0.00	87.7	8.8	
09 total inflow	553.99	0.08	266.8	26.7	0.18
10 surface outflow	553.99	0.08	179.1	17.9	0.12
12 total outflow	553.99	0.08	179.1	17.9	0.12
13 total trapped	0.00	0.00	87.7	8.8	
14 storage increase	0.00	0.00	0.0	0.0	
15 mass balance chec	0.00	0.00	0.0	0.0	
Reduction (%)	0.00	0.00	32.9	32.9	

Device: Pond 10 Type: POND Variable: TSS

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	14.03	0.00	3523.9	352.7	92.43
02 upstream device	574.96	0.08	8259.8	826.8	5.29
06 normal outlet	589.11	0.08	6817.9	682.4	4.26
08 sedimen + decay	0.00	0.00	4965.9	497.1	
09 total inflow	588.99	0.08	11783.8	1179.5	7.36
10 surface outflow	589.11	0.08	6817.9	682.4	4.26
12 total outflow	589.11	0.08	6817.9	682.4	4.26
13 total trapped	0.00	0.00	4965.9	497.1	
14 storage increase	0.00	0.00	0.0	0.0	
15 mass balance chec	-0.12	0.00	0.0	0.0	
Reduction (%)	0.00	0.00	42.1	42.1	

Device: Pond 10 Type: POND Variable: TP

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	14.03	0.00	11.9	1.2	0.31
02 upstream device	574.96	0.08	186.1	18.6	0.12
06 normal outlet	589.11	0.08	184.3	18.4	0.12
08 sedimen + decay	0.00	0.00	13.7	1.4	
09 total inflow	588.99	0.08	198.0	19.8	0.12
10 surface outflow	589.11	0.08	184.3	18.4	0.12
12 total outflow	589.11	0.08	184.3	18.4	0.12
13 total trapped	0.00	0.00	13.7	1.4	
14 storage increase	0.00	0.00	0.0	0.0	
15 mass balance chec	-0.12	0.00	0.0	0.0	
Reduction (%)	0.00	0.00	6.9	6.9	

Device: Pond 12 Type: POND Variable: TSS

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	112.83	0.02	28547.2	2857.5	93.08
02 upstream device	614.37	0.08	8819.0	882.8	5.28
06 normal outlet	727.20	0.10	5725.6	573.1	2.90
08 sedimen + decay	0.00	0.00	31640.4	3167.1	
09 total inflow	727.20	0.10	37366.2	3740.2	18.90
10 surface outflow	727.20	0.10	5725.6	573.1	2.90
12 total outflow	727.20	0.10	5725.6	573.1	2.90
13 total trapped	0.00	0.00	31640.4	3167.1	
14 storage increase	0.00	0.00	0.3	0.0	
15 mass balance chec	0.00	0.00	0.0	0.0	
Reduction (%)	0.00	0.00	84.7	84.7	

Device: Pond 12 Type: POND Variable: TP

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	112.83	0.02	96.3	9.6	0.31
02 upstream device	614.37	0.08	198.6	19.9	0.12
06 normal outlet	727.20	0.10	217.2	21.7	0.11
08 sedimen + decay	0.00	0.00	77.6	7.8	
09 total inflow	727.20	0.10	294.9	29.5	0.15
10 surface outflow	727.20	0.10	217.2	21.7	0.11

12 total outflow	727.20	0.10	217.2	21.7	0.11
13 total trapped	0.00	0.00	77.6	7.8	
14 storage increase	0.00	0.00	0.1	0.0	
15 mass balance chec	0.00	0.00	0.0	0.0	
Reduction (%)	0.00	0.00	26.3	26.3	

Device: Pond 13 Type: POND Variable: TSS

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	1345.33	0.19	344217.7	34454.8	94.14
02 upstream device	890.65	0.12	15374.7	1538.9	6.35
06 normal outlet	2236.13	0.31	94243.1	9433.4	15.51
08 sedimen + decay	0.00	0.00	265346.9	26560.1	
09 total inflow	2235.99	0.31	359592.4	35993.7	59.17
10 surface outflow	2236.13	0.31	94243.1	9433.4	15.51
12 total outflow	2236.13	0.31	94243.1	9433.4	15.51
13 total trapped	0.00	0.00	265346.9	26560.1	
14 storage increase	0.00	0.00	2.3	0.2	
15 mass balance chec	-0.14	0.00	0.0	0.0	
Reduction (%)	0.00	0.00	73.8	73.8	

Device: Pond 13 Type: POND Variable: TP

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	1345.33	0.19	1157.1	115.8	0.32
02 upstream device	890.65	0.12	297.9	29.8	0.12
06 normal outlet	2236.13	0.31	945.6	94.7	0.16
08 sedimen + decay	0.00	0.00	509.4	51.0	
09 total inflow	2235.99	0.31	1455.1	145.6	0.24
10 surface outflow	2236.13	0.31	945.6	94.7	0.16
12 total outflow	2236.13	0.31	945.6	94.7	0.16
13 total trapped	0.00	0.00	509.4	51.0	
14 storage increase	0.00	0.00	0.0	0.0	
15 mass balance chec	-0.14	0.00	0.0	0.0	
Reduction (%)	0.00	0.00	35.0	35.0	

Device: Outfall #5 Type: PIPE Variable: TSS

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
02 upstream device	2329.79	0.32	101437.4	10153.5	16.02
06 normal outlet	2329.79	0.32	101437.4	10153.5	16.02
09 total inflow	2329.79	0.32	101437.4	10153.5	16.02
10 surface outflow	2329.79	0.32	101437.4	10153.5	16.02
12 total outflow	2329.79	0.32	101437.4	10153.5	16.02
Reduction (%)	0.00	0.00	0.0	0.0	

Device: Outfall #5 Type: PIPE Variable: TP

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
02 upstream device	2329.79	0.32	997.9	99.9	0.16
06 normal outlet	2329.79	0.32	997.9	99.9	0.16
09 total inflow	2329.79	0.32	997.9	99.9	0.16
10 surface outflow	2329.79	0.32	997.9	99.9	0.16
12 total outflow	2329.79	0.32	997.9	99.9	0.16
Reduction (%)	0.00	0.00	0.0	0.0	

Device: CRH-1 Type: POND Variable: TSS

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	83.08	0.01	21153.2	2117.3	93.67
06 normal outlet	83.08	0.01	4281.6	428.6	18.96
08 sedimen + decay	0.00	0.00	16871.6	1688.8	
09 total inflow	83.08	0.01	21153.2	2117.3	93.67

10 surface outflow	83.08	0.01	4281.6	428.6	18.96
12 total outflow	83.08	0.01	4281.6	428.6	18.96
13 total trapped	0.00	0.00	16871.6	1688.8	
14 storage increase	0.00	0.00	0.0	0.0	
15 mass balance chec	0.00	0.00	0.0	0.0	
Reduction (%)	0.00	0.00	79.8	79.8	

Device: CRH-1 Type: POND Variable: TP

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	83.08	0.01	71.2	7.1	0.32
06 normal outlet	83.08	0.01	38.4	3.8	0.17
08 sedimen + decay	0.00	0.00	32.8	3.3	
09 total inflow	83.08	0.01	71.2	7.1	0.32
10 surface outflow	83.08	0.01	38.4	3.8	0.17
12 total outflow	83.08	0.01	38.4	3.8	0.17
13 total trapped	0.00	0.00	32.8	3.3	
14 storage increase	0.00	0.00	0.0	0.0	
15 mass balance chec	0.00	0.00	0.0	0.0	
Reduction (%)	0.00	0.00	46.1	46.1	

Device: CRH-2 Type: POND Variable: TSS

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	101.61	0.01	25475.6	2550.0	92.25
06 normal outlet	101.61	0.01	4019.2	402.3	14.55
08 sedimen + decay	0.00	0.00	21456.4	2147.7	
09 total inflow	101.61	0.01	25475.6	2550.0	92.25
10 surface outflow	101.61	0.01	4019.2	402.3	14.55
12 total outflow	101.61	0.01	4019.2	402.3	14.55
13 total trapped	0.00	0.00	21456.4	2147.7	
14 storage increase	0.00	0.00	0.0	0.0	
15 mass balance chec	0.00	0.00	0.0	0.0	
Reduction (%)	0.00	0.00	84.2	84.2	

Device: CRH-2 Type: POND Variable: TP

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	101.61	0.01	86.2	8.6	0.31
06 normal outlet	101.61	0.01	42.4	4.2	0.15
08 sedimen + decay	0.00	0.00	43.8	4.4	
09 total inflow	101.61	0.01	86.2	8.6	0.31
10 surface outflow	101.61	0.01	42.4	4.2	0.15
12 total outflow	101.61	0.01	42.4	4.2	0.15
13 total trapped	0.00	0.00	43.8	4.4	
14 storage increase	0.00	0.00	0.0	0.0	
15 mass balance chec	0.00	0.00	0.0	0.0	
Reduction (%)	0.00	0.00	50.8	50.8	

Device: CRH-3 Type: POND Variable: TSS

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	13.89	0.00	3435.3	343.9	90.99
02 upstream device	101.61	0.01	4019.2	402.3	14.55
06 normal outlet	115.50	0.02	2778.5	278.1	8.85
08 sedimen + decay	0.00	0.00	4676.1	468.1	
09 total inflow	115.50	0.02	7454.5	746.2	23.75
10 surface outflow	115.50	0.02	2778.5	278.1	8.85
12 total outflow	115.50	0.02	2778.5	278.1	8.85
13 total trapped	0.00	0.00	4676.1	468.1	
14 storage increase	0.00	0.00	0.0	0.0	
15 mass balance chec	0.00	0.00	0.0	0.0	
Reduction (%)	0.00	0.00	62.7	62.7	

Device: CRH-3 Type: POND Variable: TP

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	13.89	0.00	11.7	1.2	0.31
02 upstream device	101.61	0.01	42.4	4.2	0.15
06 normal outlet	115.50	0.02	41.7	4.2	0.13
08 sedimen + decay	0.00	0.00	12.4	1.2	
09 total inflow	115.50	0.02	54.1	5.4	0.17
10 surface outflow	115.50	0.02	41.7	4.2	0.13
12 total outflow	115.50	0.02	41.7	4.2	0.13
13 total trapped	0.00	0.00	12.4	1.2	
14 storage increase	0.00	0.00	0.0	0.0	
15 mass balance chec	0.00	0.00	0.0	0.0	
Reduction (%)	0.00	0.00	22.9	22.9	

Device: Thumb Infiltration Type: INF_BASIN Variable: TSS

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	154.92	0.02	40670.3	4070.9	96.59
03 infiltrate	154.92	0.02	5661.6	566.7	13.45
04 exfiltrate	154.92	0.02	0.0	0.0	0.00
05 filtered	0.00	0.00	5661.6	566.7	
08 sedimen + decay	0.00	0.00	35008.7	3504.2	
09 total inflow	154.92	0.02	40670.3	4070.9	96.59
11 groundw outflow	154.92	0.02	0.0	0.0	0.00
12 total outflow	154.92	0.02	0.0	0.0	0.00
13 total trapped	0.00	0.00	40670.3	4070.9	
14 storage increase	0.00	0.00	0.0	0.0	
15 mass balance chec	0.00	0.00	0.0	0.0	
Reduction (%)	0.00	0.00	100.0	100.0	

Device: Thumb Infiltration Type: INF_BASIN Variable: TP

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	154.92	0.02	135.6	13.6	0.32
03 infiltrate	154.92	0.02	63.3	6.3	0.15
04 exfiltrate	154.92	0.02	4.2	0.4	0.01
05 filtered	0.00	0.00	59.2	5.9	
08 sedimen + decay	0.00	0.00	72.3	7.2	
09 total inflow	154.92	0.02	135.6	13.6	0.32
11 groundw outflow	154.92	0.02	4.2	0.4	0.01
12 total outflow	154.92	0.02	4.2	0.4	0.01
13 total trapped	0.00	0.00	131.5	13.2	
14 storage increase	0.00	0.00	0.0	0.0	
15 mass balance chec	0.00	0.00	0.0	0.0	
Reduction (%)	0.00	0.00	96.9	96.9	

Device: To Rice Creek Type: PIPE Variable: TSS

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
02 upstream device	2749.56	0.38	112085.8	11219.3	15.00
06 normal outlet	2749.56	0.38	112085.8	11219.3	15.00
09 total inflow	2749.56	0.38	112085.8	11219.3	15.00
10 surface outflow	2749.56	0.38	112085.8	11219.3	15.00
12 total outflow	2749.56	0.38	112085.8	11219.3	15.00
Reduction (%)	0.00	0.00	0.0	0.0	

Device: To Rice Creek Type: PIPE Variable: TP

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
02 upstream device	2749.56	0.38	1151.2	115.2	0.15
06 normal outlet	2749.56	0.38	1151.2	115.2	0.15

09 total inflow	2749.56	0.38	1151.2	115.2	0.15
10 surface outflow	2749.56	0.38	1151.2	115.2	0.15
12 total outflow	2749.56	0.38	1151.2	115.2	0.15
Reduction (%)	0.00	0.00	0.0	0.0	