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**STORMWATER MANAGEMENT REPORT  
FOR THE  
BUCKDALE PRELIMINARY AND FINAL  
MAJOR SUBDIVISION  
BLOCK 355, LOTS 6, 7, 8 & 11  
TOWNSHIP OF MARLBORO  
MONMOUTH COUNTY, NEW JERSEY**

**MARCH 13, 2019  
Revised JUNE 19, 2019  
Revised AUGUST 9, 2019  
Revised SEPTEMBER 26, 2019  
Revised NOVEMBER 26, 2019  
Revised FEBRUARY 3, 2020**

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PREPARED BY:

DW SMITH ASSOCIATES, LLC

*Carolyn A. Feigin*

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CAROLYN A. FEIGIN, PE, PP  
NJ License No. 24GE04247200



DWSA Reference No. 18-191.01



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## I. INTRODUCTION

The subject property is known and designated as Block 355, Lots 6, 7, 8 & 11 as shown on Marlboro Township Tax Map Sheet No. 96. The property contains 11.33 acres. Existing conditions on the property consist of two vacant single family dwellings with multiple accessory structures including sheds and garages, and associated driveways. The majority of the site is cleared and grassed, including a portion of previously farmed land, with wooded areas spread throughout the property, roughly along the four existing lot lines. All remaining site improvements will be removed as part of this development proposal. The site is located along the west side of Buckley Road at the intersection with School Road East and to the east of New Jersey State Highway (NJSH) No. 79, just north of the clover leaf intersection with NJSH No. 18. Figures are located within Appendix A depicting the site and surrounding area.

At the northeasterly corner of the property, a hill/high point exists approximately 14 FT above the roadway elevation. The topography of the site generally flows away from that high point toward the south, toward the west, toward the north and a small section toward the east. Elevations range from a high of approximately 187 at the northeast corner of the property to approximate elevation 173 at the westerly property line and to approximate elevation 169 in the southerly portion of the property.

The applicant is proposing to develop this property for a 45 lot residential subdivision to be known as Buckdale, including 26 single family homes and four townhouse buildings consisting of 19 units. Three new 24 FT wide roadways of approximately 1,700 linear feet total are proposed to service the lots, including two cul-de-sacs. The stormwater management design for this development will include the construction of one stormwater management basin adjacent to Buckley Road, a subsurface recharge storage system and grassed swales throughout the rear and side yards to convey stormwater runoff. These design features will be implemented to mitigate the increase in stormwater runoff.

The site is located within the Sub-Watershed of the McGellairds Brook (above Taylors Mills), in the Matchaponix Brook Watershed within the Lower Raritan, South River and Lawrence Watershed Management Area of the Raritan Watershed Region.

This report addresses the stormwater management design, including the runoff water quantity assessment, runoff water quality assessment, groundwater recharge and soil erosion and sediment control measures.

## II. SOILS

Soils information was taken from the U.S. Department of Agriculture, Natural Resources Conservation Service Soil Survey Geographic (SSURGO) database for Monmouth County, New Jersey. A soils map is included in the figures of Appendix A in this report. A summary of the soils located with the tributary drainage area to the overall site are as follows:

Name	Description	Hydrologic Soil Group
ThgB	Tinton Loamy Sand, 0% to 5% slopes	A
ThgC	Tinton Loamy Sand, 5% to 10% slopes	A
EveC	Evesboro Sand	A

Soil test pits and permeability tests have been performed to confirm the design. The Subsoil Investigation Report and soil logs can be found in Appendix B of this report.

### III. METHODOLOGY

Site development can cause increases in stormwater runoff due to the introduction of additional impervious surfaces. The project meets the definition of "Major Development" per NJDEP and Township definitions. The net increase in impervious area will be more than ¼ acre and the overall disturbance will exceed one (1) acre. Due to these facts, the project must comply with the Township's Land Use Ordinance, specifically §220-147 thru 157, Stormwater Management and therefore the post development stormwater flows must be 50%, 75% and 80% of the 2, 10 and 100 year storm events respectively, as compared to predevelopment stormwater flows.

The methodology utilized for the stormwater management for this site meets the Standard Engineering Practices for site development and is in conformance with the New Jersey Department of Environmental Protection's Best Management Practices Manual for Stormwater, Marlboro Township Land Use and Development Ordinance, NJAC 7:8 Stormwater Management and the Standards for Soil Erosion & Sediment Control in New Jersey.

The design of the stormwater piping system for this project was accomplished through the combined use of the Rational Method and Manning's Equation. The 25-year rainfall intensity storm was utilized for the design of the stormwater piping system. The Manning's roughness coefficient "n" for the reinforced concrete pipe is 0.013 and for HDPE is 0.010. In conjunction with using the Rational Method, a weighted "C" coefficient was utilized. The value for this coefficient was calculated based upon the area and type of ground cover located within each drainage area.

The times of concentration utilized in determining stormwater runoff were established using the procedures of TR-55. A maximum length of 150 feet was used in calculating the initial sheet flow in the upper reaches of the drainage areas for pre and post development. For small times of concentration, a minimum time of ten (10) minutes was used in accordance with standard engineering practice. Calculations for the stormwater piping design and pipe capacity calculations can be found in Appendix C.

NJAC 7:8-5.6 states that stormwater runoff may be calculated by using the USDA Natural Resources Conservation Service (NRCS) methodology, described in Technical Release 55 (TR-55), Urban Hydrology for Small Watersheds. NJAC also states "for the purposes of computing runoff, all lands in the site shall be assumed prior to development to be in



good condition with good cover, regardless of conditions existing at the time of computation.” Actual hydrograph calculations and flood routings were performed utilizing the “HydroCAD 10.0” computer program as published by Applied Microcomputer Systems. Weighted CN numbers were determined for the land covers. For the pre-development CN number calculation, the existing land cover has been established for a period of at least five years prior, including open space and wooded areas.

Five (5) storm events have been examined: Water Quality, 2, 10, 25 and 100-year frequencies, based upon the National Oceanic and Atmospheric Administration Point Precipitation Frequency Estimates for Monmouth County. The rainfall amounts for the respective storm frequencies for a 24 hour storm are as follows:

Storm Frequency (Years)	24 Hour Rainfall Amount
1 Year Water Quality storm	1.25 inches/2 hours
2	3.38
10	5.23
25	6.53
100	8.94

#### IV. **PRE-DEVELOPMENT ANALYSIS**

The pre-development analysis indicates seven (7) individual drainage areas. Area 1 contributes the largest run-off component and contains 4.03 acres. This area currently drains towards the south and ultimately discharges toward the Route 18 ramp right of way. Area 2 contains 2.88 acres and drains westerly toward the Route 18 ramp right of way, Route 79 and the westerly property line. Area 3 contains 0.76 acres and flows toward Route 79, generally along the existing gravel driveway toward the northwest. Area 4 contains 1.72 acres and flows northerly toward the adjacent residential properties. Area 5 contains 1.06 acres and flows northerly toward the rear of the adjacent school property. Area 6 contains 1.12 acres and flows toward an existing inlet located on Buckley Road near the intersection with School Road East. Area 7 consists of off-site runoff that is located upstream of the project site. This area consists of 3.767 acres and the runoff follows existing conditions and drains under Buckley Road via a pipe and through Area 1, and discharges toward the Route 18 ramp right of way, at the same location as Area 1. The pre-development drainage areas flow in different directions with no clear combined point of analysis; however, all are contributory to the same watershed and have therefore been combined below for purposes of this analysis. There are a series of stormwater inlets and conveyance pipes located within Buckley Road, that direct Area 7 under Buckley road and onto the project site. The on-site flows were utilized to develop the reductions required by the regulations, as summarized in the tables below:

PRE-DEVELOPMENT RUNOFF SUMMARY								
STORM EVENT	DRAINAGE AREAS							COMBINED TOTAL SITE (cfs)
	DA #1 (cfs)	DA #2 (cfs)	DA #3 (cfs)	DA #4 (cfs)	DA #5 (cfs)	DA #6 (cfs)	DA OFFSITE (cfs)	
2 year	0.53	0.07	0.53	0.15	0.00	0.26	2.54	3.83
10 year	1.82	0.12	0.83	0.25	0.02	0.40	4.92	7.86
25 year	3.25	0.45	1.04	0.53	0.09	0.54	6.85	11.69
100 year	7.26	1.73	1.49	1.58	0.46	1.23	11.23	23.08

RUNOFF REDUCTION REQUIREMENTS					
STORM EVENT	TOTAL ON-SITE RUNOFF REQUIRING REDUCTION (cfs)	REQUIRED REDUCTION (%)	ALLOWABLE POST-DEVELOPMENT RUNOFF FOR ON-SITE RUNOFF (cfs)	OFFSITE RUNOFF (NO REDUCTION REQUIRED) (cfs)	TOTAL ALLOWABLE POST-DEVELOPMENT RUNOFF (cfs)
2 year	1.28	50	0.64	2.54	3.18
10 year	2.94	75	2.21	4.92	7.13
25 year	4.97	N/A (use 75%)	3.73 (using 75%)	6.85	10.58
100 year	12.43	80	9.94	11.23	21.17

Pre-development hydrographs can be found within Appendix D.

#### V. **POST-DEVELOPMENT ANALYSIS**

The proposed development was divided into nine (9) overall subcatchment areas. Similar to pre-development conditions, the post-development drainage areas flow in various directions: Systems "A" and "B" collect overland runoff through conveyance pipes and route it toward the stormwater management facilities (these are further broken down on the drainage area maps into contributory areas to individual inlets). One drainage area encompasses overland runoff which is routed directly into the stormwater management basin. The drainage area "Off-Site" collects the stormwater runoff from a portion of Buckley Road and the area that is upstream of the project site. This drainage area will remain in existing conditions and will continue to follow the pre-development drainage pattern to the existing 12" diameter storm pipe that crosses Buckley Road. Once the runoff reaches the project site, it will be routed into the proposed infiltration basin. This runoff is not required to be reduced before it is released downstream. The remaining drainage areas are not collected onsite; however, they are directed offsite and represent perimeter areas that cannot be conveyed into the proposed system. The following table represents the post-development runoff calculations and a comparison of the flows to the total allowable runoff rate for post-development, as calculated above.

POST-DEVELOPMENT SUMMARY				
STORM EVENT	OUTFLOW RECHARGE BASIN TO INFILTRATION BASIN (cfs)	OUTFLOW FROM BASIN TO OFFSITE (cfs)	OFFSITE (NON-CAPTURED) (cfs)	TOTAL POST-DEVELOPMENT RUNOFF (cfs)
2 year	0.00	0.73	0.39	0.75
10 year	0.04	2.65	0.60	2.79
25 year	0.25	6.82	1.12	7.27
100 year	2.17	18.97	3.21	20.49

RUNOFF REDUCTION COMPARISON SUMMARY			
STORM EVENT	ALLOWABLE POST-DEVELOPMENT FLOW (cfs)	ACTUAL POST-DEVELOPMENT FLOW (cfs)	RUNOFF REDUCTION REQUIREMENT MET?
2 year	3.18	0.75	Yes
10 year	7.13	2.79	Yes
25 year	10.58	7.27	Yes (no reduction requirement)
100 year	21.17	20.49	Yes

As noted in the chart above, all flows leaving the site from the designated areas have been reduced as required. Post-Development hydrographs and drain down times can be found within Appendix E.

**VI. STORMWATER RUNOFF QUALITY AND GROUNDWATER RECHARGE**

As described in the Township's ordinance, a reduction in the total suspended solids (TSS) from stormwater runoff is required if a net increase in impervious area of 1/4-acre or more is proposed. The basis behind this requirement is that the potential exists for high pollutant runoff such as vehicle oils, contaminants, emissions, etc. This project is proposing more than 1/4-acre of net new impervious area. Therefore, compliance with the water quality reduction standard is required.

The water quality of the runoff flowing through the infiltration basin is expected to provide 80% Total Suspended Solids (TSS) removal as described in the NJDEP's Stormwater Best Management Practices Manual. The infiltration basin will provide 80% TSS Removal. This TSS Removal rate is based on the NJDEP Stormwater BMP Manual.

In order to ensure that the State's aquifers are properly recharged, and to protect the water resources in the State and allow clean drinking water to be available, it is necessary to meet the Groundwater Recharge Standards. Groundwater recharge requirements are met by recharging the difference between the site's 2-year pre- and post-development runoff volumes, in accordance with NJBMP requirements.

<b>GROUNDWATER RECHARGE REQUIREMENTS</b>	
Field Tested Permeability Rate at Infiltration Basin	20 in/hr
Permeability Rate used in design of Infiltration Basin	10 in/hr*
Field Tested Permeability Rate at Underground Recharge Basin	12 in/hr
Permeability Rate used in design of Underground Recharge Basin	6 in/hr**

\* design utilizes one-half of the field tested permeability rate of 20 inches/hour

\*\*design utilizes one-half of the field tested permeability rate of 12 inches/hour

Subsoil investigation of the site has established that the permeability rate (K) in the infiltration basin area is 20 inches per hour. The area where the Underground Recharge Basin will be located has a permeability rate of 12 inches per hour. Based on the BMP Manual, Chapter 9.5 – Design Criteria, a factor of safety of 2 must be applied to the tested permeability rate to determine the design permeability rate. Based on the criteria, a permeability rate of 10 inches per hour and 6 inches per hour may be used for the design of the infiltration basin and recharge basin. This is a conservative approach.

<b>RECHARGE CALCULATIONS FOR THE STORMWATER SYSTEM</b>	
2-YEAR PRE-DEVELOPMENT RUNOFF VOLUME	0.186 ac-ft
2-YEAR POST-DEVELOPMENT RUNOFF VOLUME	0.993 ac-ft
VOLUME OF RUNOFF THAT IS REQUIRED TO BE RECHARGED	0.807 ac-ft
ACTUAL VOLUME OF RUNOFF THAT WILL BE RECHARGED	0.807 ac-ft

<b>GROUNDWATER RECHARGE VOLUME (BOTTOM 2 FT. OF BASIN)</b>	
<b>Basin Number</b>	<b>Storage Available (CF)</b>
BASIN 1	32,285
RECHARGE	2,879
<b>TOTAL</b>	<b>35,164 (0.807 ac-ft)</b>

Water quality routings and groundwater recharge calculations for the site can be found in Appendix F of this report. It can be concluded that the overall system design meets the recharge requirements per the New Jersey Stormwater Best Management Practices Manual, as 0.807 ac-ft of storage is provided, and 0.807 ac-ft of storage is required.

## **VII. STORM WATER MANAGEMENT FACILITIES**

An infiltration basin and a subsurface recharge basin have been designed to mitigate the increased flow rates due to the increased impervious surfaces developed as a result of the site improvements. The stormwater runoff routed to the basins will be detained and infiltrated through the basin bottom. As runoff accumulates to a maximum depth of 2 feet

within the infiltration basin, the runoff will also be released through an outlet control structure consisting of weirs and a top grate. The runoff will be released to a stable outfall and scour hole offsite toward the Route 18 ramp right of way. This point of discharge is the same location as the largest pre-development runoff discharge area.

In accordance with the New Jersey Best Management Practices for an Infiltration Basin (Chapter 9.5), the infiltration basin has been designed with the following criteria:

- The basin has a six inch (6") layer of K5 sand at the bottom
- The lowest elevation of the infiltration basin (the bottom of the sand layer) is at least two feet (2') above the seasonal high water table
- Maximum standing water depth will be two feet (2')
- Outlet structure and emergency spillway are provided for safe conveyance of water
- The basin fully drains within 72 hours. (15.25 hours)
- Permeability Rate Factor of Safety is 2
- Subsoil Design Permeability Rate is between 0.5 and 10 inches per hour (10"/hr)
- The bottom of the basin is level and shall not be compacted

Similarly, in accordance with the New Jersey Best Management Practices for an Infiltration Basin (Chapter 9.5), the subsurface infiltration basin (underground recharge trenches) have been designed with the following criteria:

- Filter fabric is provided along the top and sides of the stone trench to prevent the migration of fine particles
- The aggregate used in the trench will be free from debris, silt and other materials that could contribute to clogging
- At least one inspection port per system has been provided to allow monitoring
- The lowest elevation of the infiltration basin (the bottom of the stone trench) is at least two feet (2') above the seasonal high water table
- The system fully drains within 72 hours (less than 19.45 hours)
- Permeability Rate Factor of Safety is 2
- Subsoil Design Permeability Rate is between 0.5 and 10 inches per hour (6"/hr)
- The bottom of the trench system is level and surrounding soil shall not be compacted

### **VIII. EROSION CONTROL AND STORMWATER/STABILITY CALCULATIONS**

The minimum design and performance standards for erosion control are those established under the Soil Erosion and Sediment Control Act (NJSA 4:24-39 et seq.) and implementing rules. The soil erosion and sediment control measures for this site have been graphically shown on the project drawings. Inlet protection has been added to prevent silt and fines entering into the drainage system. A silt fence has been added around the limit of

disturbance. A stone pad has been added at the construction entrance to prevent sediment tracking. Conduit outlet protection is proposed at all outfalls. All components of the erosion control protection have been designed in accordance with Section 4.12.1 of the “Standards for Soil Erosion and Sediment Control in New Jersey” (the “Standards”).

In accordance with the Standards, assuming failure of the primary outlet (infiltration), the 10 YR storm has been routed discounting all basin storage below the elevation of the first stage outlet (the orifice). The off-site discharge has been reviewed for stability for the area downstream of the basin outfall point. As all runoff is routed through the outlet control structure and discharged at the dual scour holes, the flow can be considered stable. After release from the outlet control structure, the basin discharges to the lowest elevation within the surrounding area, to the point of analysis where the pre-development runoff flows.

Per Chapter 21 of the Standards for Soil Erosion and Sediment Control in New Jersey, for the Off-Site Stability Analysis there is no well-defined waterway at or below the point of discharge. As stated in 1.a, stability can be achieved by retaining the pre-existing runoff characteristics, without accounting for infiltration. The pre-existing runoff rate to the point of analysis (outflow of proposed basin) has not been increased, as can be seen below:

<b>POINT DISCHARGE STABILITY ANALYSIS</b>			
<b>STORM EVENT</b>	<b>PRE-DEVELOPMENT RUNOFF DA A-1 &amp; OFFSITE (cfs)</b>	<b>POST-DEVELOPMENT DISCHARGE FROM BASIN (cfs)</b>	<b>POINT DISCHARGE STABILITY MET?</b>
2 year	2.98	2.54	Yes
10 year	6.62	6.15	Yes

To further analyze the area downstream of the point of discharge, method 2 was utilized. An infiltration/detention facility has been proposed to reduce the 2 year storm to less than 50% of the predevelopment peak flow and the 10 year storm to less than 75% of the predevelopment peak flow. As permitted, infiltration was included within this analysis.

<b>DOWNSTREAM STABILITY ANALYSIS</b>				
<b>STORM EVENT</b>	<b>PRE-DEVELOPMENT RUNOFF DA A-1 (cfs)</b>	<b>PERMITTED RELEASE (% / CFS)</b>	<b>POST-DEVELOPMENT DISCHARGE FROM BASIN (cfs)</b>	<b>DOWNSTREAM STABILITY MET?</b>
2 year	2.98	50 / 1.49	0.00	Yes
10 year	6.62	75 / 4.97	0.00	Yes

Although the analysis indicates that the post-development rate of runoff to the discharge location is less than pre-development, and the downstream stability analysis meets the Standards, the outfall has been split into two discharge pipes to provide a more conservative design. Each pipe end will outlet to a scour hole designed with oversized stone diameter, to further provide erosion control and additional safety factor. Based upon

existing topography, the slope of the path of runoff has been determined to be approximately 2.2% to a flat, stable area approximately 180 linear feet downstream from the outfall. Per a meeting with Mr. John Showler and Ms. Stacy Brady, of the Freehold Soil Conservation District, on January 30, 2020, this design will be considered acceptable. Calculations for Soil Erosion and Sediment Control can be found in Appendix G.

## IX. **CONCLUSION**

A review of the methodology and analysis used for this stormwater management study reveals that the components that comprise the proposed stormwater management system will provide water quality and runoff reductions well in excess of those required by New Jersey Administrative Code 7:8 and by the New Jersey Stormwater Best Management Practices Manual. In addition, groundwater recharge and soil erosion and sediment control requirements will be met on the site.

The proposed flows will follow the pre-development patterns, although their values have been reduced to meet current regulatory requirements. Proposed onsite flows that do not leave the site are conveyed to the infiltration basin, before being released. Based on the information provided there will be no negative impact due to stormwater runoff to areas downstream of the project. Therefore, the development can take place while meeting all the rules and regulations promulgated by the Local, County and State reviewing agencies.

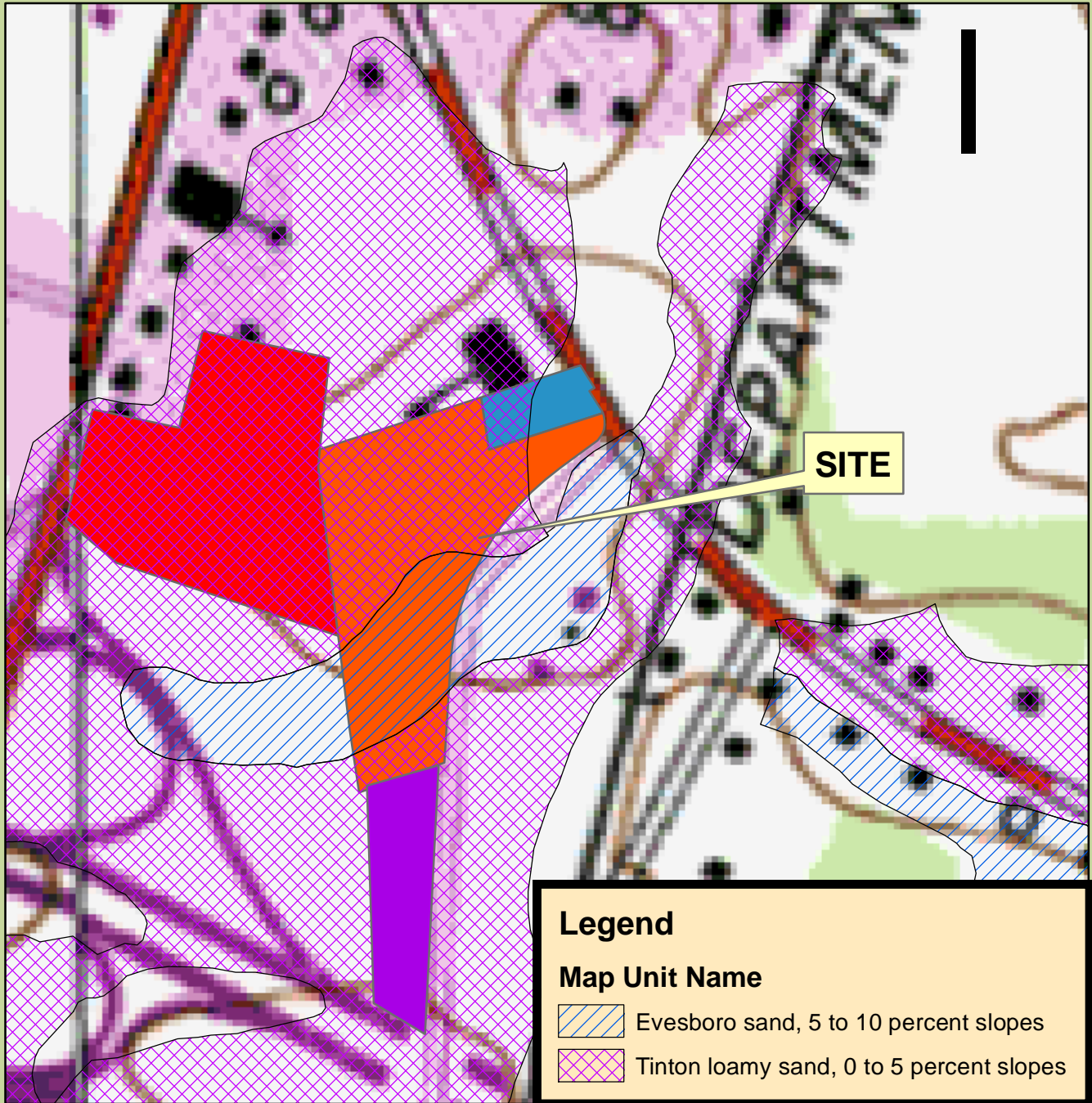




## **APPENDIX A: FIGURES**

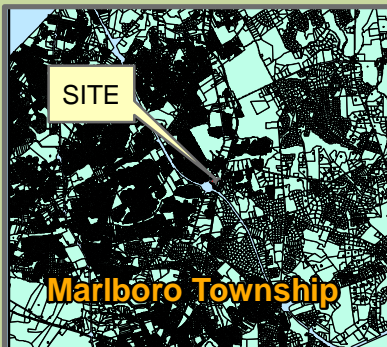


# SOIL (SSURGO) MAP



DW SMITH ASSOCIATES, LLC  
1450 State Highway 34  
Wall Township, NJ 07753  
P. 732-363-5850  
F. 732-905-8669  
pgriber@dwsmith.com

Date: November 19, 2018  
Job Number: 18-191.01

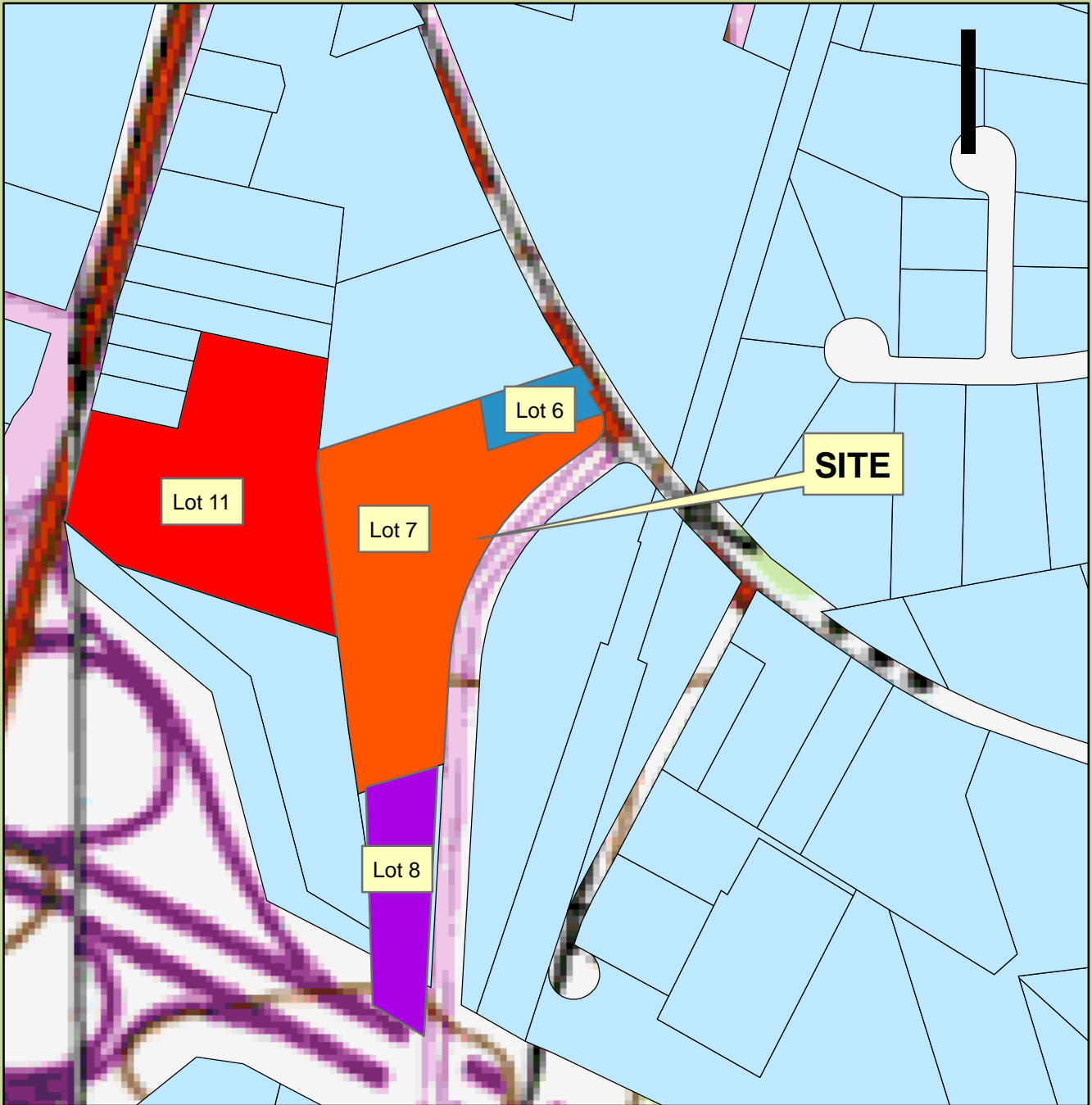


Block 355, Lots 6, 7, 8, 11  
Marlboro Township  
Monmouth County, NJ

Scale: 1" = 300'  
Northing: 538,332'  
Easting: 562,471'

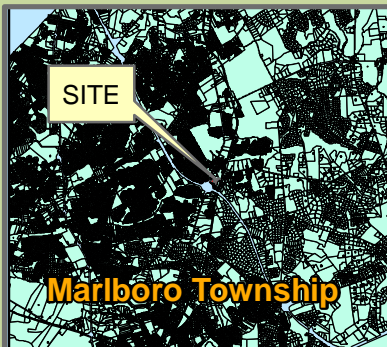


# DIGITAL TAX MAP



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1450 State Highway 34  
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Date: November 20, 2018  
Job Number: 18-191.01

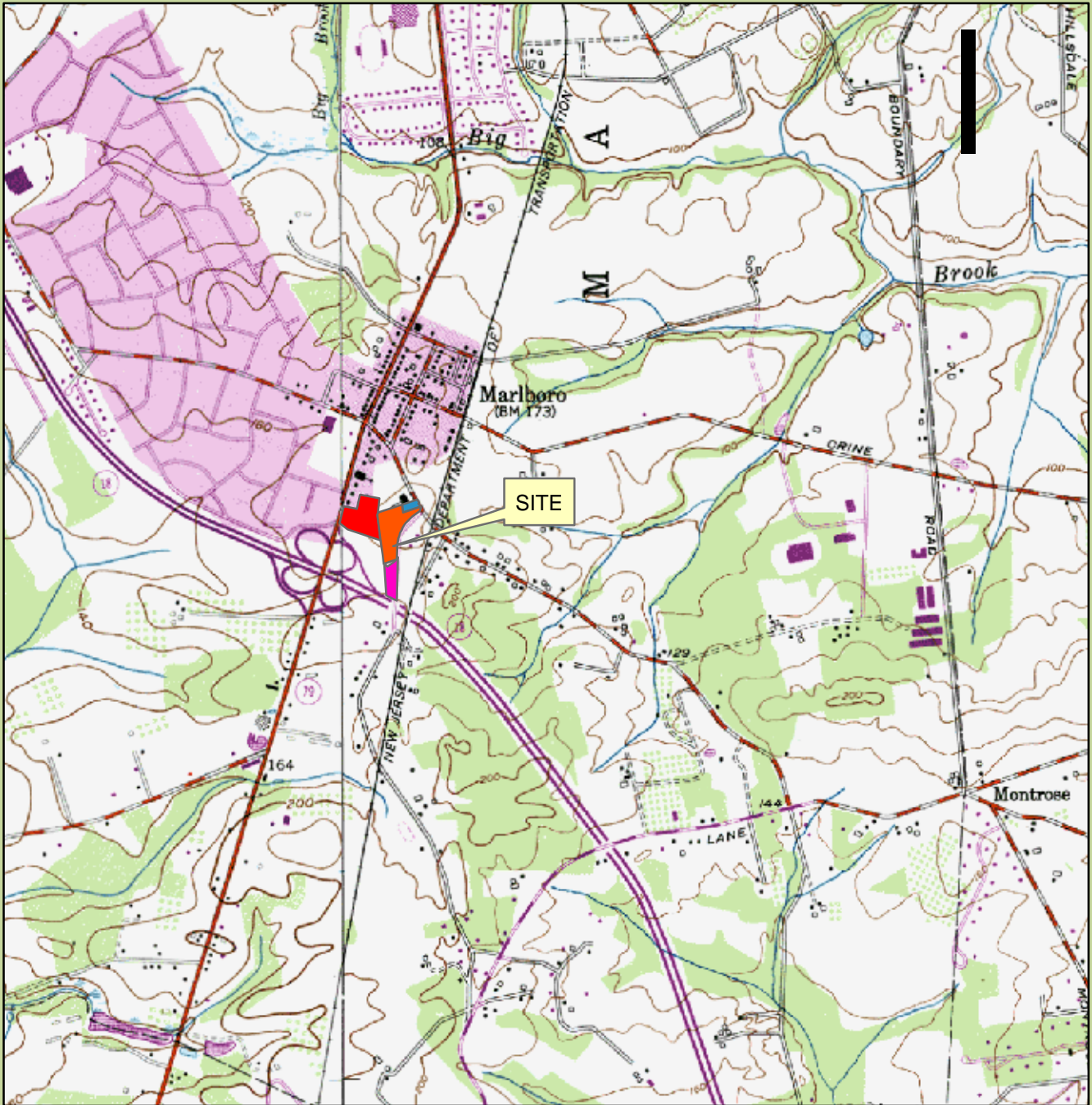


Block 355, Lots 6, 7, 8, 11  
Marlboro Township  
Monmouth County, NJ

Scale: 1" = 300'  
Northing: 538,332'  
Easting: 562,471'

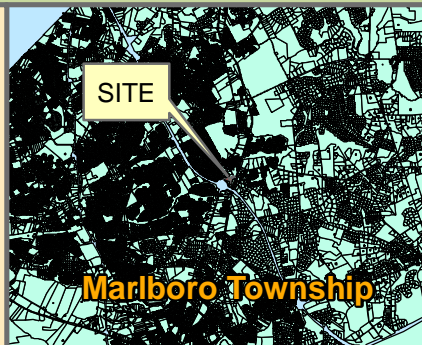


# USGS MARLBORO TOPO QUAD



DW SMITH ASSOCIATES, LLC  
1450 State Highway 34  
Wall Township, NJ 07753  
P. 732-363-5850  
F. 732-905-8669  
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Date: November 19, 2018  
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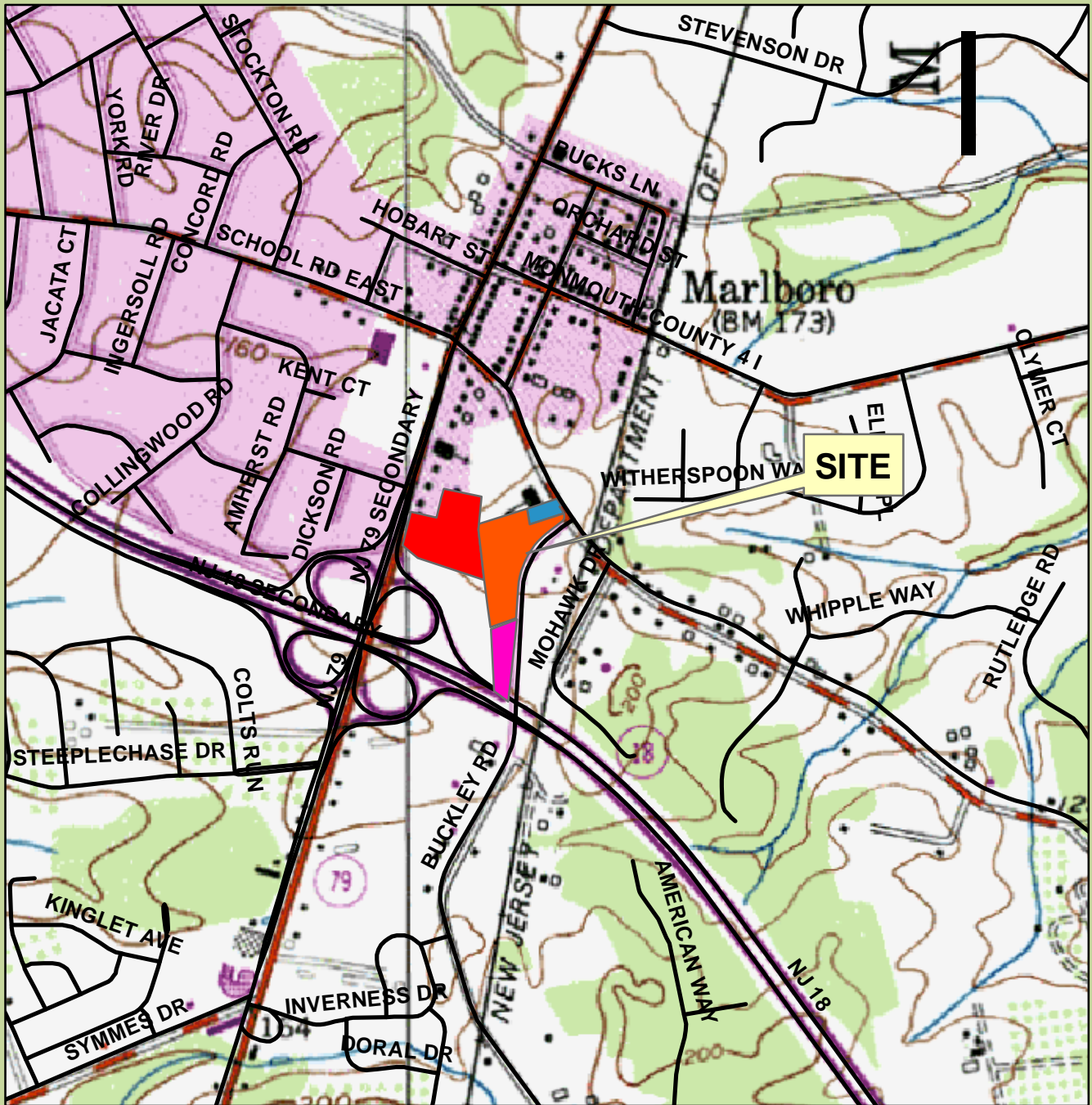
Block 355, Lots 6, 7, 8, 11  
Marlboro Township  
Monmouth County, NJ

Scale: 1" = 2000'  
Northing: 538,332'  
Easting: 562,471'



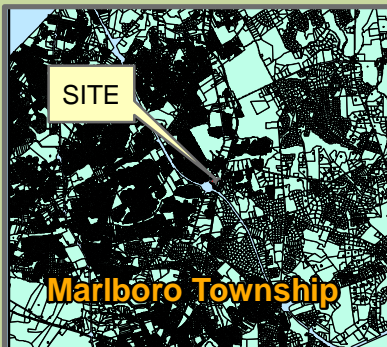


# NJDOT ROAD MAP



DW SMITH ASSOCIATES, LLC  
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 Wall Township, NJ 07753  
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 pgriber@dwsmith.com

Date: November 19, 2018  
 Job Number: 18-191.01



Block 355, Lots 6, 7, 8, 11  
 Marlboro Township  
 Monmouth County, NJ

Scale: 1" = 1,000'  
 Northing: 538,332'  
 Easting: 562,471'



## **APPENDIX B: SUBSOIL INVESTIGATION REPORT**





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**BUCKDALE – MARLBORO, NEW JERSEY  
ADDITIONAL SOIL TESTS**

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June 18, 2019

On May 24, 2019, 2 test pits and percolation tests were performed. The test pits were excavated with a rubber tire backhoe at locations shown on the attached survey, prepared by DW Smith.

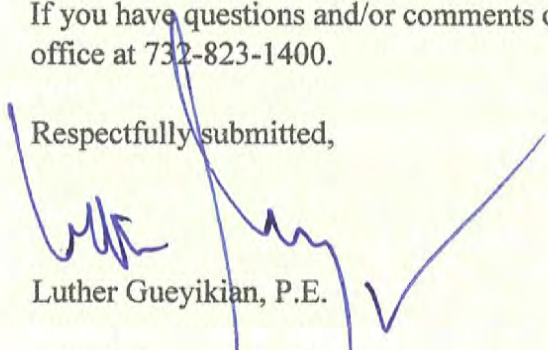
Grain size lab analysis was conducted in the laboratory of Gentech Engineering. The testing was done on the soil samples retrieved from the test pits. Based on the laboratory test results, the soils are designated as K-5 type soils below a depth of 2' of the existing surface. Based on published values, K-5 soils have a permeability of greater than 20 inches per hour. No ground water was encountered and no soil mottling was noted.

Summary of Test Results

Sample/TP Location	Soil Type (below 3.5+/-)	Groundwater Depth	Perc Rate (in/hr) Corresponding Depth
6 A	Loamy Sand K-5	Dry (moist at 10')	20 in/hr @ 6'+/-
6B	Loamy Sand K-5	Dry (moist at 10')	20 in/hr @ 2'+/-
7A	Loamy Sand K-5	Dry (moist @10')	20 in/hr @ 2' +/-
7B	Loamy Sand K-5	Dry (moist @10')	20 in/hr @ 8'+/-

If you have questions and/or comments or require additional information, please contact our office at 732-823-1400.

Respectfully submitted,



Luther Gueyikian, P.E.

Attached: Test Pit Logs  
Map  
Laboratory Test Results  
Appendix A from NJDEP Sewage Disposal Manual 9A

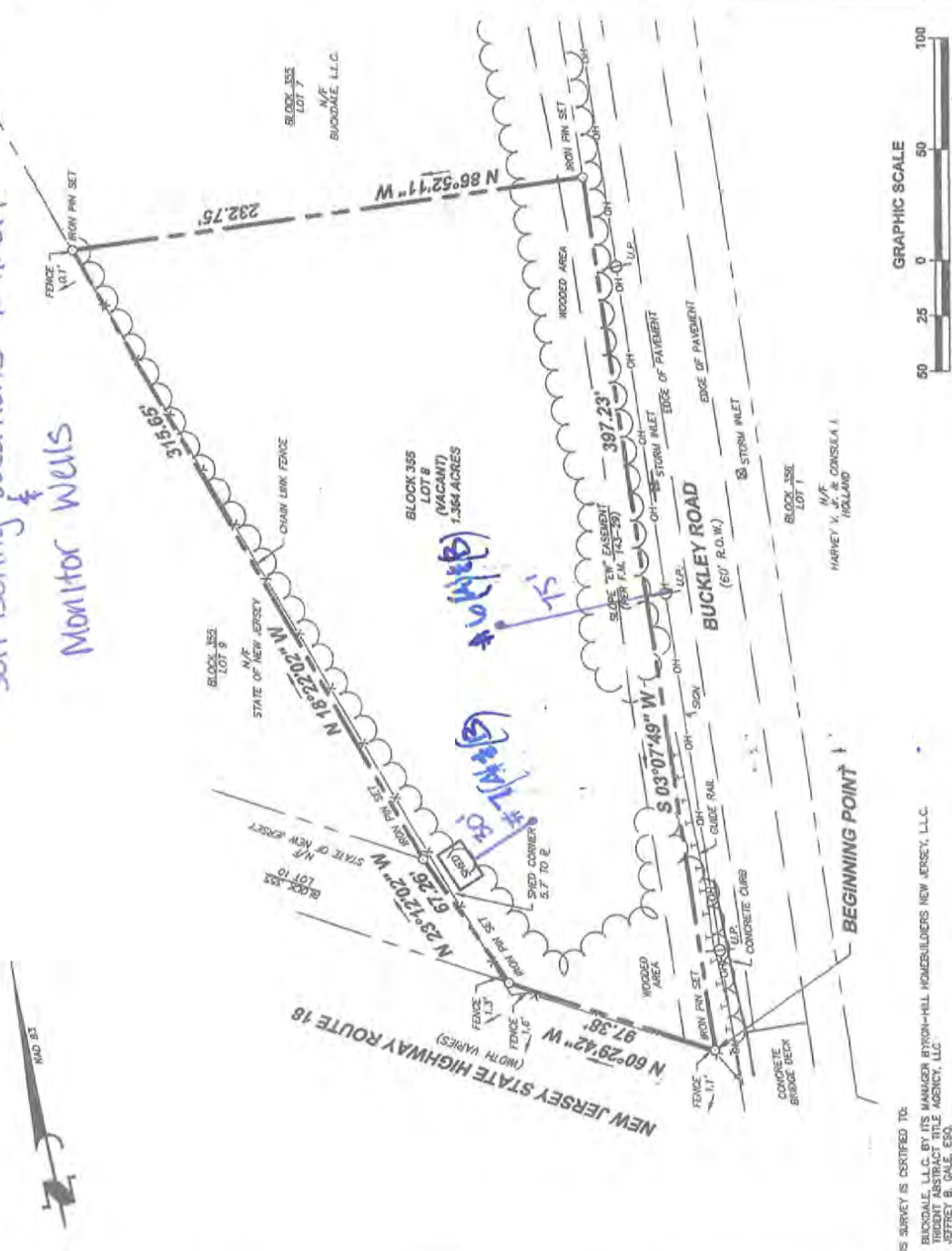
Soil Boring Locations 5/24/2019  
 Monitor Wells

**GENERAL NOTES:**

1. This plan was prepared in accordance with the following:
  - A. O.B. 8286, Page 9596 & D.B. 4010, Page 477.
  - B. Plan entitled "New Jersey State Highway Department GENERAL PROPERTY PARCEL MAP, ROUTE 18 FREEWAY SECTION 9, From Route 79 To Route 34, Showing Existing Right Of Way And Parcels To Be Acquired In The Townships Of Marlboro, Freehold And Colts Neck County Of Monmouth" prepared by N.J.D.O.I., dated March 1965 and filed in the Monmouth County Clerk's Office on March 8, 1977 as Case #143-29.
  - C. Title Commitment No. TA-137257 prepared by Trident Abstract Title Agency, LLC dated June 26, 2017.

**Schedule B-Part II:**

- 16 - Slope, drainage, and other possible rights of the Lots of New Jersey as set forth in Deed Book 3936 Page B61 (PLOTTED).
- 17 - Subject to Various Easements as set forth on Filed Map Case No. 143-29 (PLOTTED).
- 18 - Rights of Jersey Central Power & Light Company/GPU Energy Co. and Bell Atlantic/New Jersey Bell Telephone Company under Grant recorded in Deed Book 1385 Page 148 and Deed Book 3500 Page 347 (NOT-PLOTTED).
- D. Marlboro Township Tax Map Sheet 96.
- E. An actual field survey performed on the ground by DW Smith Associates, LLC personnel on October 4-11, 2018.
2. Subject to any easements and/or restrictions of record.
3. Underground improvements and/or underground encroachments, if any, are not shown hereon.
4. This plan was prepared without the benefit of a title report.
5. This property has not been reviewed for any State of New Jersey Tideland Claims that may encumber this property.
6. No attempt has been made to identify the presence/absence of freshwater wetlands claims.



No.	DATE	BY	DESCRIPTION
3	5/14/2018	A.S.C.	ADD CERTIFICATIONS, SURVEY NOT CONTINUED TO DATE
2	11/02/2018	A.S.C.	REVISED TO SHOW PROPERTY CORNER MARKERS SET, SURVEY NOT CONTINUED TO DATE
1	11/01/2018	A.S.C.	REVISED TO SHOW TITLE REPORT, SURVEY NOT CONTINUED TO DATE

THIS SURVEY IS CERTIFIED TO:  
 • BUCKDALE, L.L.C. BY ITS MANAGER BYRON-HILL HOMEBUILDERS NEW JERSEY, L.L.C.  
 • TRIDENT ABSTRACT TITLE AGENCY, LLC  
 • JEFFREY B. GALE, ESQ.

AND TO ALL CURRENT PARTIES INTERESTED IN TITLE TO PREMISES SURVEYED. THIS SURVEY WAS ACTUALLY MADE ON THE GROUND AND IS CORRECT. THAT THERE ARE NO ENCROACHMENTS EITHER WAY ACROSS PROPERTY LINES EXCEPT AS SHOWN.

KEVIN J. MURPHY  
 TOWNSHIP LAND SURVEYOR  
 No. 246303368-600

**BOUNDARY SURVEY**  
**TAX MAP SHEET 98**  
**LOT 8, BLOCK 355**

TOWNSHIP OF MARLBORO  
 MONMOUTH COUNTY, NEW JERSEY

JOB NO. 18181.01  
 DATE 10/11/2018  
 SCALE 1" = 50'  
 DESIGN J.A.H.  
 DRAWN J.A.H.  
 CHECKED J.A.H.  
 PAGE 1 OF 1

**DW Smith**  
 Associates, LLC  
**Engineering**

108 STATE ROUTE 34, WALL TOWNSHIP, NJ 07725  
 (908) 848-8888 • WWW.DWSMITH.COM

ENGINEERS • PLANNERS • SURVEYORS  
 ENVIRONMENTAL SERVICE • LANDSCAPE ARCHITECTS  
 COMMUNITY DEVELOPMENT

REGISTERED PROFESSIONAL ENGINEER  
 KEVIN J. MURPHY  
 N.J. P.E. & P.L.S. No. 34803368-600  
 N.Y. P.L.S. No. 009522-1 PA. P.L.S. No. 3098294

## TEST PIT LOG

PROJECT: <u>Buckdale</u>	CONTRACT No.: _____
LOCATION: <u>Buckley Rd, Marlboro, NJ</u>	TEST PIT No.: <u>6A &amp; B</u>
DATE: <u>5/24/2019</u>	TIME: <u>9:26am</u>
CLIENT: <u>Buckdale, LLC</u>	CONTRACTOR: <u>Ientile</u>
SURFACE ELEVATION: <u>168 +/-</u>	EQUIPMENT: <u>Rubber Tire Backhoe</u>
WATER ELEVATION: <u>Dry</u>	Rep: <u>Luther Gueyikian</u>

DEPTH (FEET)	DENS.	MOIST.	IDENTIFICATION	REMARKS
			<u>Topsail 12"</u>	<u>K-5</u>
<u>2</u>			<u>Red brown &amp; orange mf sand, little silt</u>	
<u>6</u>			<u>Loamy sand</u>	
<u>10</u>			<u>No Mottling</u>	
			<u>End of Test Pit @ 11'</u>	

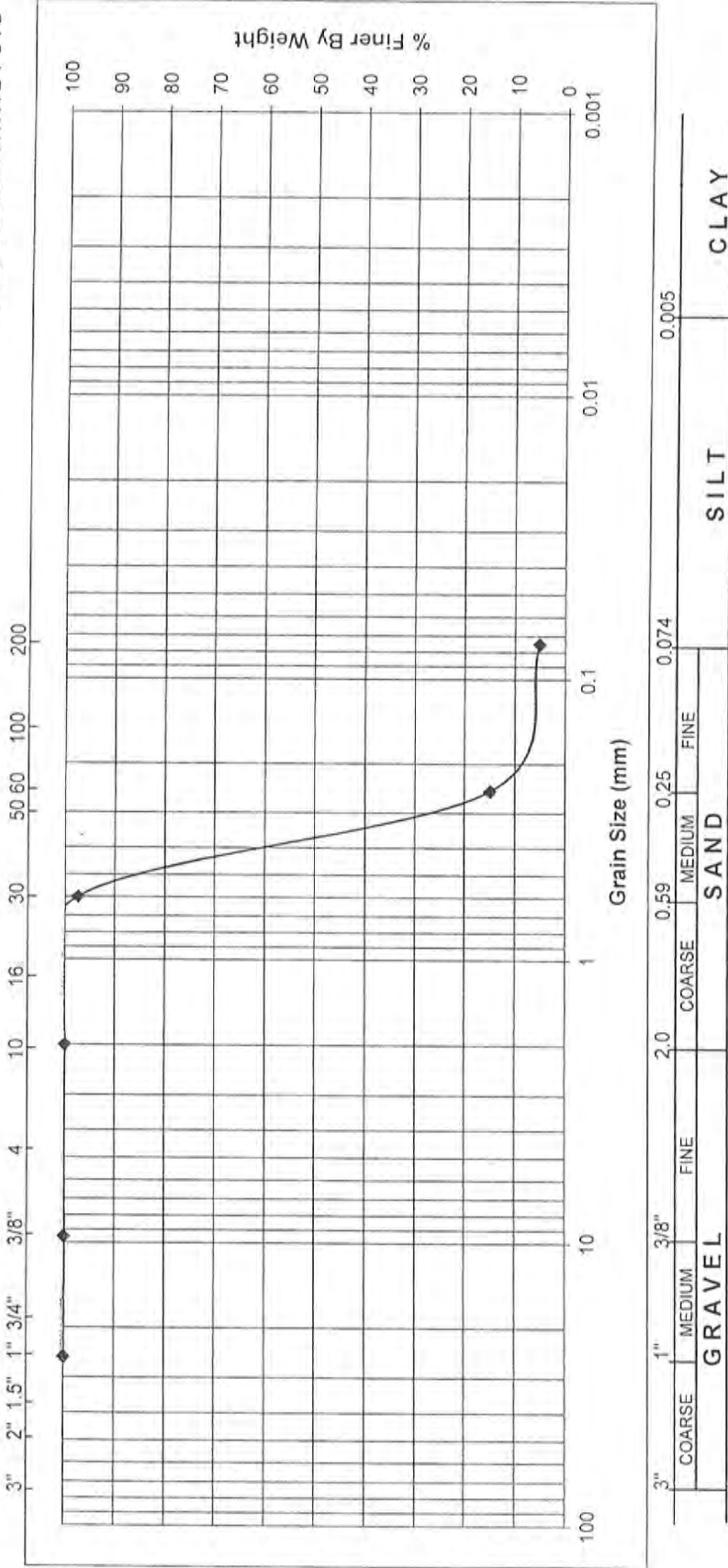




# U.S. STANDARD SIEVE ANALYSIS

SIEVE ANALYSIS

HYDROMETER ANALYSIS



## MECHANICAL ANALYSIS

Sample #	Depth	Sieve#	% Passing
6A	2'	1"	100.00
		3/8"	100.00
		No.10	99.91
		No.30	97.36
		No.60	14.93
		No.200	5.11

**GENTECH**

ENGINEERING ASSOCIATES, P.C.  
CONSULTING ENGINEERS

Tel No. 732-290-7113  
Fax No. 732-290-7115

CLIENT : Buckdale LLC

PROJECT : Buckdale

LOCATION : Marlboro, NJ

DATE : 6/13/19

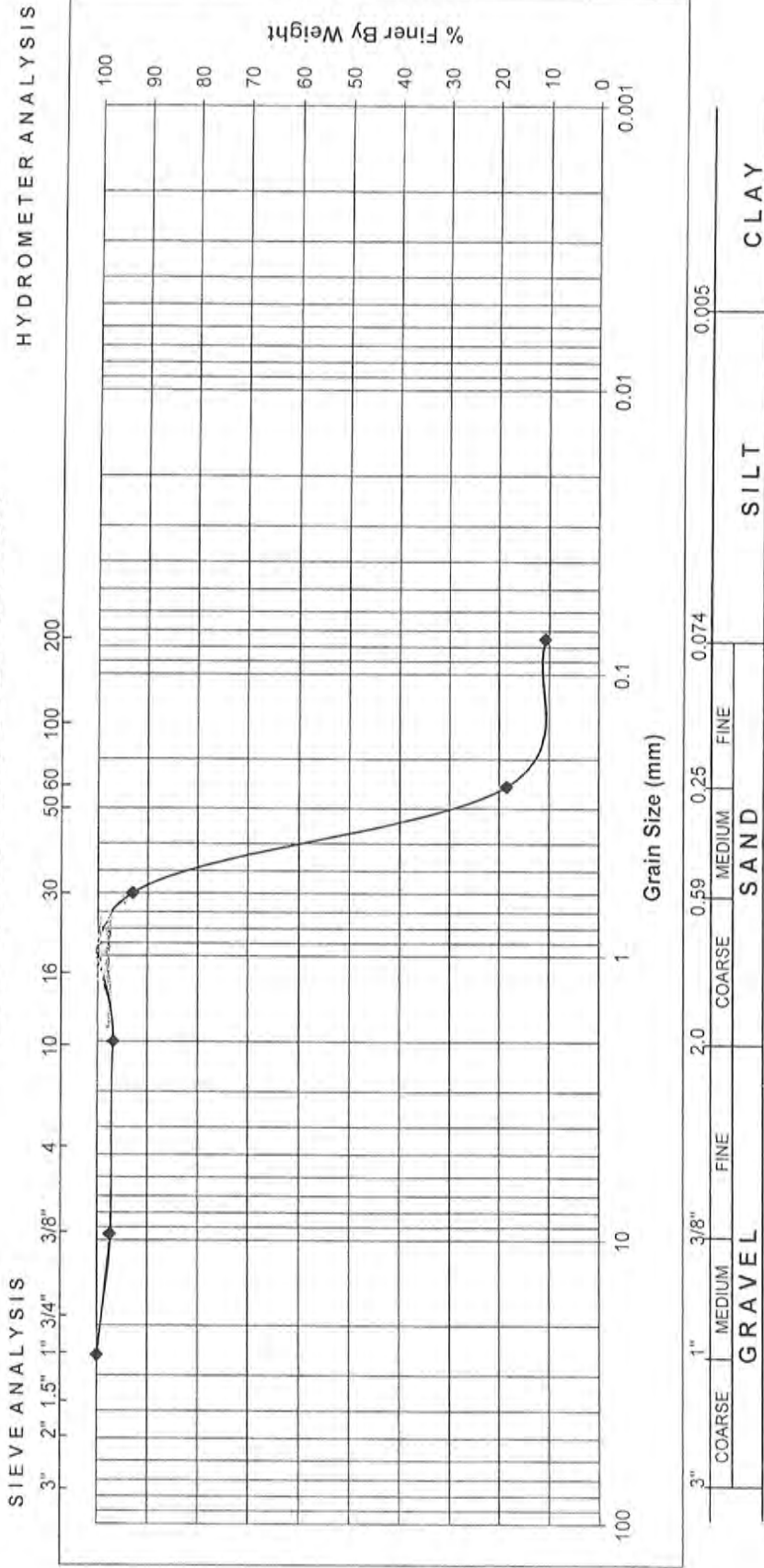
SOURCE : test pit 6A by client

SOIL TYPE: K5

FIGURE #: 1



# U.S. STANDARD SIEVE ANALYSIS



## MECHANICAL ANALYSIS

Sample #	Depth	Sieve#	% Passing
7A	2'	1"	100.00
		3/8"	97.45
		No.10	96.84
		No.30	92.97
		No.60	18.49
		No.200	10.75

GENTECH

ENGINEERING ASSOCIATES, P.C.  
CONSULTING ENGINEERS

Tel No. 732-290-7113  
Fax No. 732-290-7115

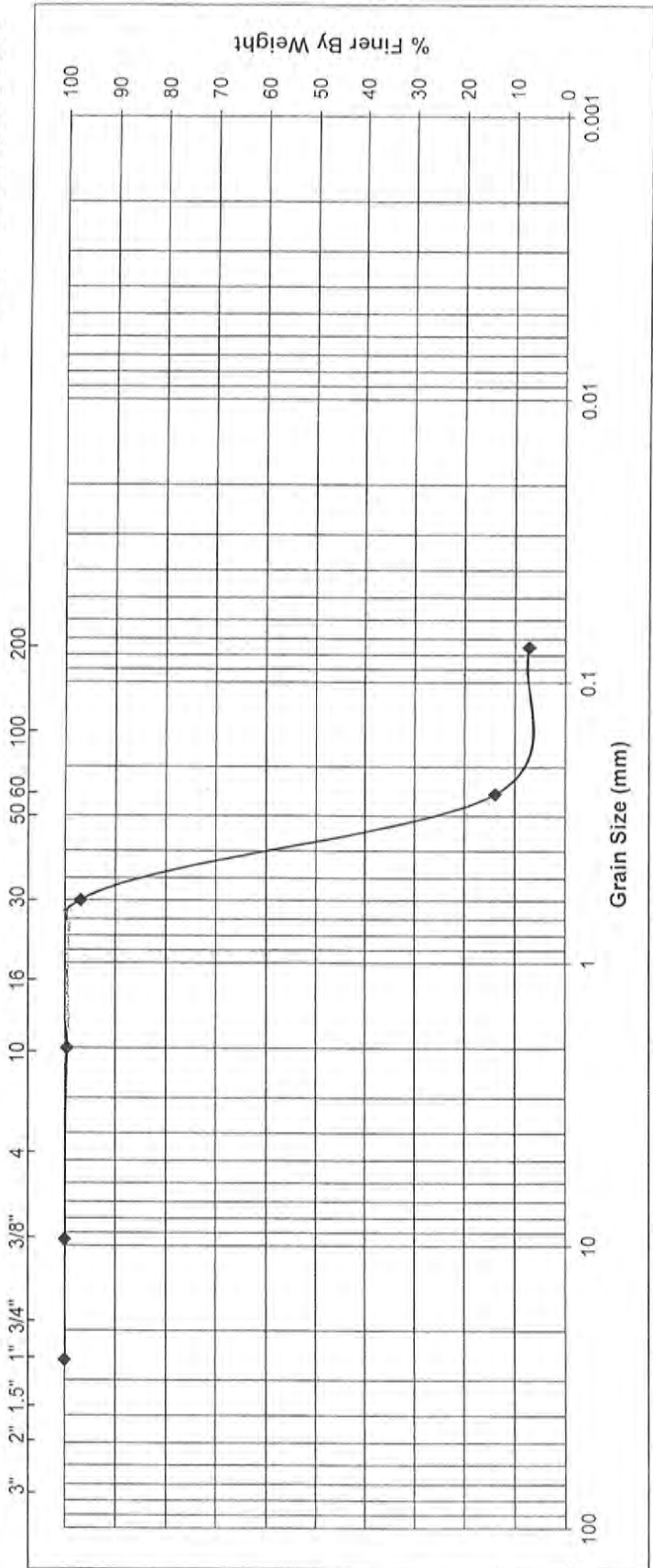
CLIENT : Buckdale LLC  
PROJECT : Buckdale  
LOCATION : Marlboro, NJ  
DATE : 6/13/19  
SOURCE : test pit 7A by client  
SOIL TYPE: K5

FIGURE #: 3

# U.S. STANDARD SIEVE ANALYSIS

## HYDROMETER ANALYSIS

## SIEVE ANALYSIS



### MECHANICAL ANALYSIS

Sample #	Depth	Sieve#	% Passing
7B	8'	1"	100.00
		3/8"	100.00
		No.10	99.55
		No.30	96.98
		No.60	13.95
		No.200	7.23

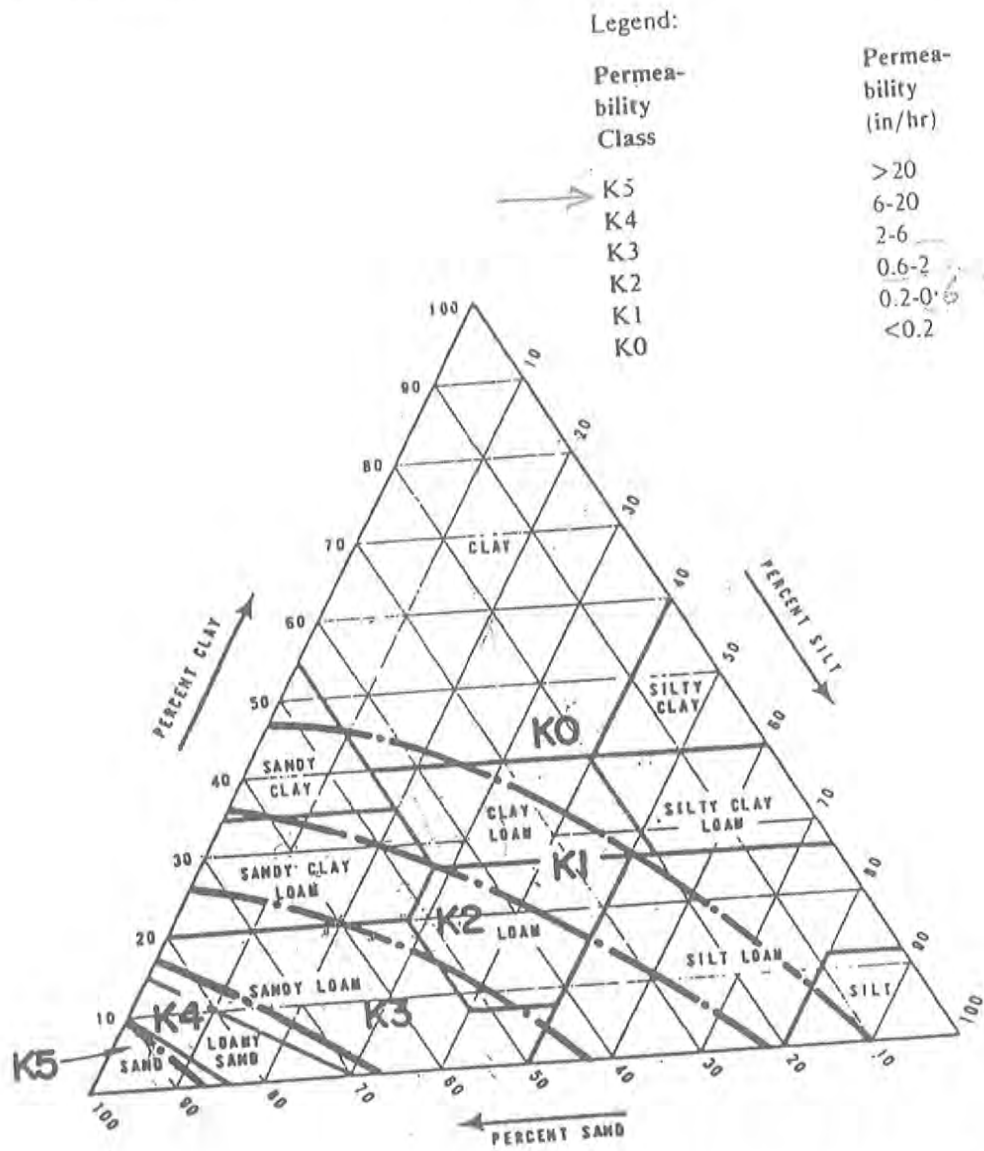
**GENTECH**

ENGINEERING ASSOCIATES, P.C.  
CONSULTING ENGINEERS  
Tel No. 732-290-7113  
Fax No. 732-290-7115

CLIENT : Buckdale LLC  
PROJECT : Buckdale  
LOCATION : Marlboro, NJ  
DATE : 6/13/19  
SOURCE : test pit 7B by client  
SOIL TYPE: K5

FIGURE # : 4

*J. Buckton*



Adapted from N.N. Hantzsche et al. (1982) Soil Textural Analysis for Onsite Sewage Disposal Evaluation, Proc. 3rd Nat. Symposium on Individual and Small Community Sewage Treatment, Am. Soc. Agric. Eng., St. Joseph, Michigan

Figure 6. Soil Permeability/Textural Triangle

**GENTECH**

**ENGINEERING ASSOCIATES, P.C.  
CONSULTING ENGINEERS**

April 7, 2003  
Report #03-76/R-1



Byron Hill, LLC  
42 Vanderburg Road  
Marlboro, NJ 07746

Attn: Mr. Shahen Gharibian

Re: Test Pit Logs, Groundwater Depths  
& Perc Rates  
The Palazzo – Marlboro, NJ

Gentlemen:

Pursuant to your request, we performed five test pits and percolation tests on March 31, 2003. The test pits were excavated with a rubber tire backhoe at locations shown on site plan by Sigma Engineering. A drawing is attached showing the locations of the test pits. The perc tests were performed in shallow pits excavated adjacent to the test pits mentioned above. The perc tests were performed at a depth of approximately 4 feet from the existing ground surface at each location.

In addition, we performed five grain size analysis in our laboratory. The testing was done on the soil samples retrieved from the test pits. The test pit logs, perc rates and laboratory test results are attached.

Based on the laboratory test results, the soils are designated as K-4 type soils below a depth of 5 feet from the surface. At Test Pits SL-1 and SL-5, these K-4 soils are present at 2 feet below the existing surface. Based on published values, K-4 soils have a permeability in the range of (6 to 20) inch/hour. The perc rates from field tests are between 6 to 20 in/hour (see data attached). No groundwater was encountered and no soil mottling was noted. We will monitor the groundwater depths in the p.v.c. pipes installed at each test pit location.

Thank you.

Very truly yours,  
Gentech Engineering Associates, P.C.

Tariq Bashir, P.E.  
Principal Engineer

**160 Route 35 North, Cliffwood Beach, NJ 07735 • (732) 290-7113 • Fax (732) 290-7115**

[www.gentecheng.com](http://www.gentecheng.com)

The Palazzo – Marlboro, NJ

Summary of Test Results

<u>Sample/T.P. Location</u>	<u>Soil Type (below 3.5'±)</u>	<u>Groundwater Depth</u>	<u>Perc Rate (in/hr) corresponding depth</u>
SL-1	Loamy Sand K-4	Dry (moist @ 10.5')	10in/hr @ 4.5'±
SL-2	"	"	"
SL-3	"	"	20in/hr @ 4.5'±
SL-4	*see note below	"	*6in/hr @ 6.5' or lower
SL-5	"	"	12in/hr @ 4.5'±

\*Based on published values. Upper 5 feet has excess Silt & Clay layers.

GENTECH

ENGINEERING ASSOCIATES, P.C.  
CONSULTING ENGINEERS

TEST PIT LOG

PROJECT:	<u>The Palazzo</u>	CONTRACT No.:	<u>03-76</u>
LOCATION:	<u>Marlboro, NJ</u>	TEST PIT No.:	<u>1</u>
DATE:	<u>3/31/03</u>	TIME:	
CLIENT:	<u>Byron Hill, LLC</u>	CONTRACTOR:	<u>Cifelli</u>
SURFACE ELEVATION:	<u>169'±</u>	EQUIPMENT:	<u>Rubber Tire Backhoe - John Deere 310SE</u>
WATER ELEVATION:	<u>Moist @ 10.5'</u>	GENTECH REP.:	<u>TB/TQ</u>

DEPTH (FEET)	DENS.	MOIST.	IDENTIFICATION	REMARKS
			TOPSOIL 8"	
5			Brown mf SAND, little Silt, trace mf gravel	K-4
			LOAMY SAND (10YR 6/6)	
10			No Mottling	
			End of Test Pit @ 11.5'	
15				
20				



GENTECH

ENGINEERING ASSOCIATES, P.C.  
CONSULTING ENGINEERS

TEST PIT LOG

PROJECT:	<u>The Palazzo</u>	CONTRACT No.:	<u>03-76</u>
LOCATION:	<u>Marlboro, NJ</u>	TEST PIT No.:	<u>2</u>
DATE:	<u>3/31/03</u>	TIME:	
CLIENT:	<u>Byron Hill, LLC</u>	CONTRACTOR:	<u>Cifelli</u>
SURFACE ELEVATION:	<u>175.5'±</u>	EQUIPMENT:	<u>Rubber Tire Backhoe - John Deere 310SE</u>
WATER ELEVATION:		GENTECH REP.:	<u>TB/TQ</u>

DEPTH (FEET)	DENS.	MOIST.	IDENTIFICATION	REMARKS
			TOPSOIL 8"	
			Brown f SAND, some+ Silt & Clay	Sample 2A @ 3'
			SANDY LOAM (10YR4/6)	K-3
5			Brown mf SAND, little Silt	K-4
			LOAMY SAND (10YR6/8)	Sample 2 @ 7'
10			No Mottling	
			End of Test Pit @ 11'	
15				
20				

GENTECH

ENGINEERING ASSOCIATES, P.C.  
CONSULTING ENGINEERS

TEST PIT LOG

PROJECT:	<u>The Palazzo</u>	CONTRACT No.:	<u>03-76</u>
LOCATION:	<u>Marlboro, NJ</u>	TEST PIT No.:	<u>3</u>
DATE:	<u>3/31/03</u>	TIME:	
CLIENT:	<u>Byron Hill, LLC</u>	CONTRACTOR:	<u>Cifelli</u>
SURFACE ELEVATION:	<u>176'±</u>	EQUIPMENT:	<u>Rubber Tire Backhoe - John Deere 310SE</u>
WATER ELEVATION:	<u>Dry</u>	GENTECH REP.:	<u>TB/TQ</u>

DEPTH (FEET)	DENS.	MOIST.	IDENTIFICATION	REMARKS
			TOPSOIL 6"	
	3.5'		Brown mf SAND, some Silt & Clay, trace f gravel SANDY LOAM (10YR4/6)	K-3
5			Brown cf SAND, some Silt, trace mf gravel LOAMY SAND (10YR6/6)	K-4
10			No Mottling	
			End of Test Pit @ 11.5'	
15				
20				

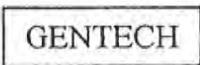
GENTECH

ENGINEERING ASSOCIATES, P.C.  
CONSULTING ENGINEERS

TEST PIT LOG

PROJECT:	<u>The Palazzo</u>	CONTRACT No.:	<u>03-76</u>
LOCATION:	<u>Marlboro, NJ</u>	TEST PIT No.:	<u>4</u>
DATE:	<u>3/31/03</u>	TIME:	
CLIENT:	<u>Byron Hill, LLC</u>	CONTRACTOR:	<u>Cifelli</u>
SURFACE ELEVATION:	<u>178.5'±</u>	EQUIPMENT:	<u>Rubber Tire Backhoe - John Deere 310SE</u>
WATER ELEVATION:		GENTECH REP.:	<u>TB/TQ</u>

DEPTH (FEET)	DENS.	MOIST.	IDENTIFICATION	REMARKS
			TOPSOIL 8"	
5		6'±	Brown CLAY & SILT, some mf Sand SANDY CLAY LOAM (10YR4/6)	K-2/K-3
10			Brown mc SAND, some Silt, trace mf gravel LOAMY SAND (10YR7/8) No Mottling	K-4 Sample @ 7'±
15			End of Test Pit @ 11.5'	
20				

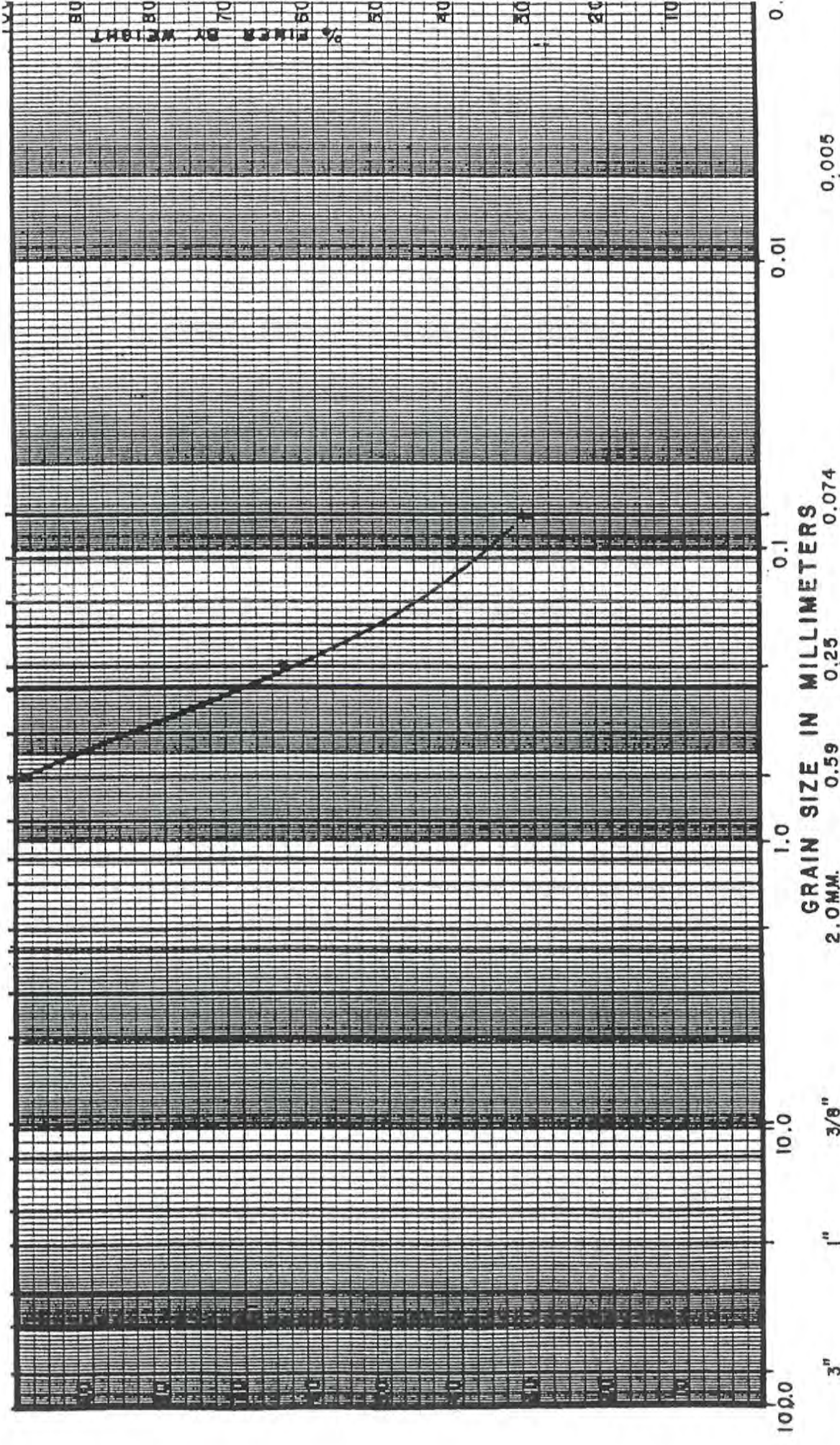


ENGINEERING ASSOCIATES, P.C.  
CONSULTING ENGINEERS

### TEST PIT LOG

PROJECT:	<u>The Palazzo</u>	CONTRACT No.:	<u>03-76</u>
LOCATION:	<u>Marlboro, NJ</u>	TEST PIT No.:	<u>5</u>
DATE:	<u>3/31/03</u>	TIME:	
CLIENT:	<u>Byron Hill, LLC</u>	CONTRACTOR:	<u>Cifelli</u>
SURFACE ELEVATION:	<u>179.5'±</u>	EQUIPMENT:	<u>Rubber Tire Backhoe - John Deere 310SE</u>
WATER ELEVATION:		GENTECH REP.:	<u>TB/TQ</u>

DEPTH (FEET)	DENS.	MOIST.	IDENTIFICATION	REMARKS
			TOPSOIL 12"	
			Red Brown & Orange mf SAND, little Silt	
5				
			LOAMY SAND (5YR5/8)	K-4
10				
			No Mottling	
			End of Test Pit @ 11'	
15				
20				



COBBLES 3" 1" 3/8" 10.0 1.0 0.1 0.01 0.005 0

GRAVEL SAND SILT CLAY

MECHANICAL ANALYSIS

SAMPLE NO.	ELEV.	IDENTIFICATION	% Pass.	MOIST. CONT.	L.L. %	P.L. %	P.I.
S-2A		SIENE 3/8"	100				
(TP-2)		N.O. 10	100				
		N.O. 30	99.6				
		N.O. 60	64.7				
		N.O. 200	31.3				

GENTECH ENGINEERING ASSOCIATES, I CONSULTING ENGINEERS

CLIENT: BYRON HILL LLC Tel: 732-290-7113

PROJECT: THE PALAZZO MARLBOROUGH

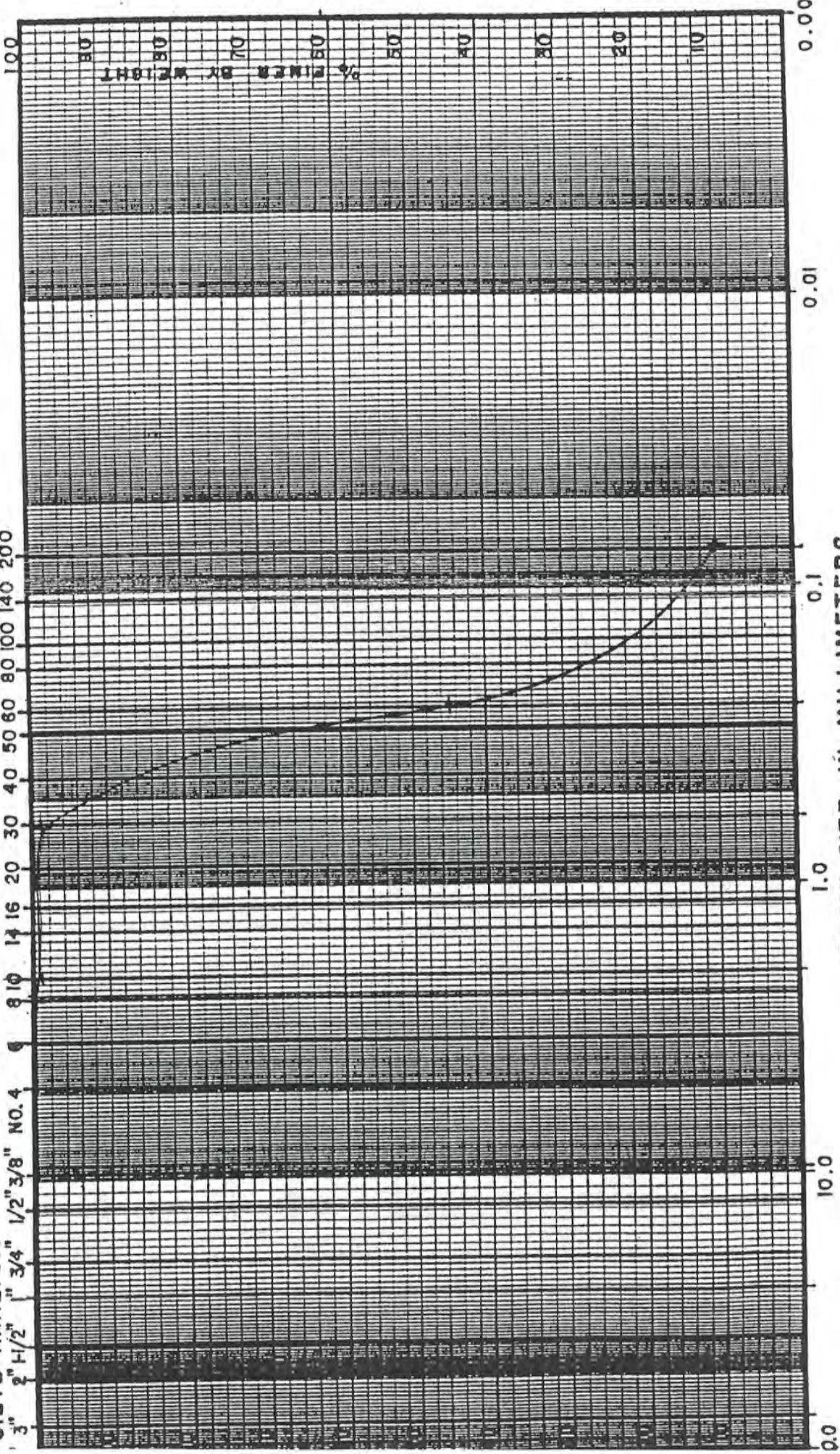
DATE: 4/7/03 FIGURE NO. 1

SOURCE: TEST PIT SAMPLE (TP-2)

**HYDROMETER ANALYSTS**

**U.S. STANDARD SIEVE SIZES**

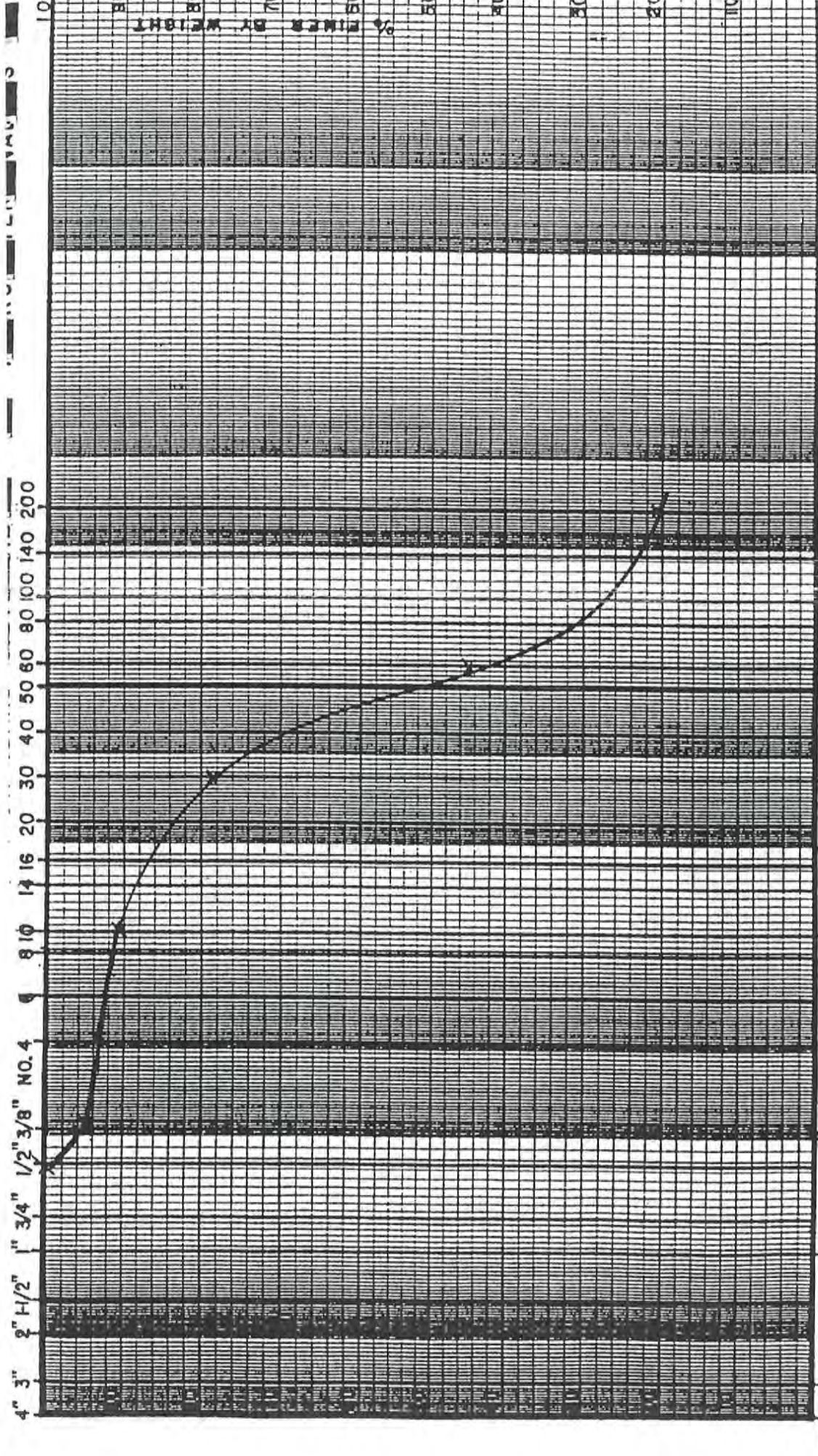
**SIEVE ANALYSIS**



GRAVEL		SAND		SILT		CLAY	
COARSE	MEDIUM	COARSE	MEDIUM	FINE			
3"	1"	2.0mm	0.59	0.25	0.075		

MECHANICAL ANALYSIS			
SAMPLE NO.	ELEV.	IDENTIFICATION	% PASS.
S-2		SIEVE 3/8"	100
(TP-2)		N.O. 10	99.7
		N.O. 30	99.4

**GENTECH**  
 ENGINEERING ASSOCIATES, P.C.  
 CONSULTING ENGINEERS  
 CLIENT: BYRON HILL  
 PROJECT: THE PALAZZO MARLBORN  
 DATE: 4/7/03 FIGURE NO. 2

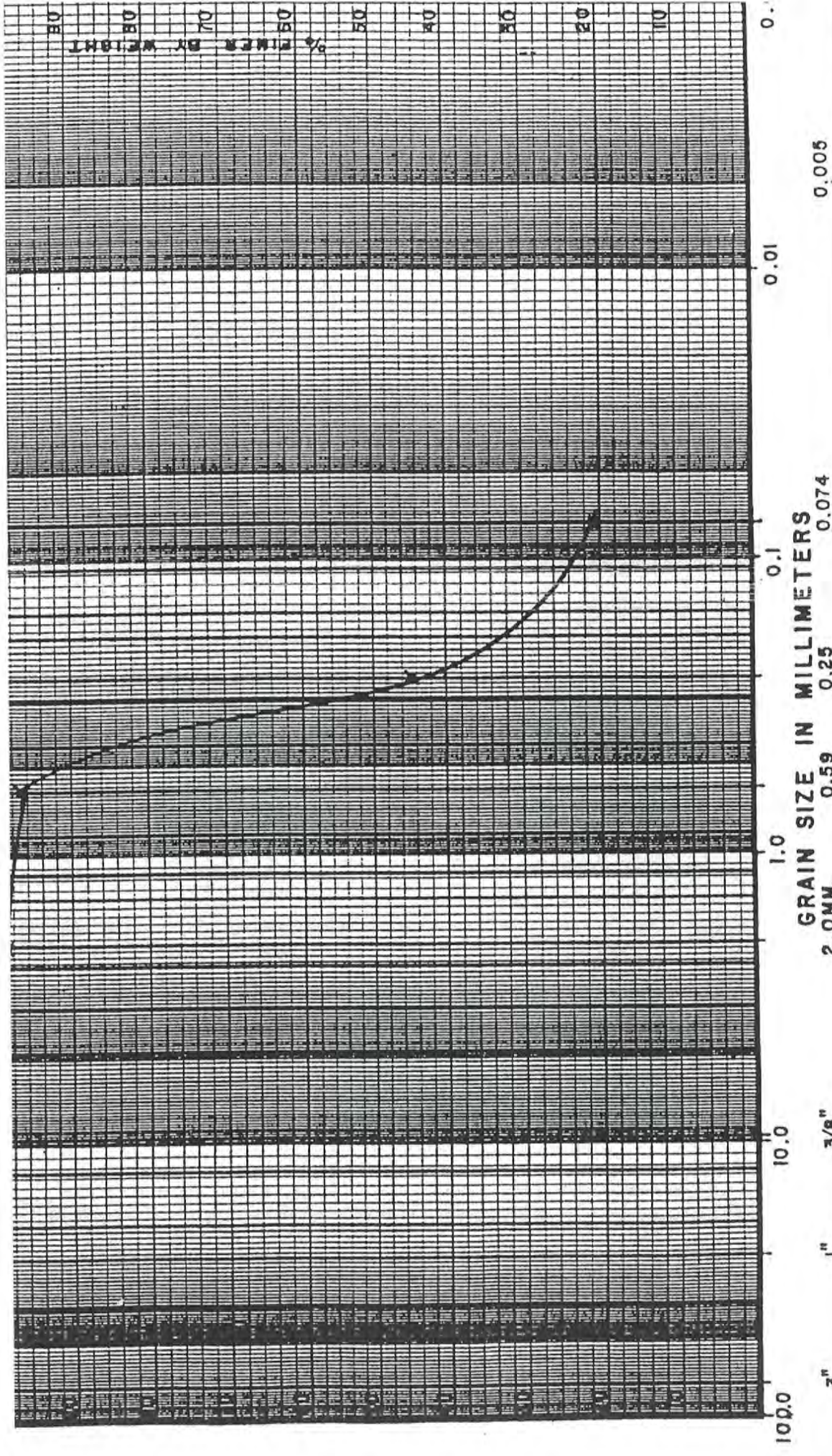


SOBBLES	GRAVEL			SAND			SILT	CLAY
	COARSE	MEDIUM	FINE	COARSE	MEDIUM	FINE		
3"	1"	3/8"	2.0MM.	1.0	0.59	0.25	0.074	0.005

MECHANICAL ANALYSIS						
SAMPLE NO.	ELEV.	IDENTIFICATION of Pass.	MOIST. CONT.	LL %	P.L. %	P.I.
S-3		Sieve 3/8" 95.9 / 98.8				
TP-3		N.O. 10 90.8				
		N.O. 30 85.2				
		N.O. 60 45.4				

GENTECH  
 ENGINEERING ASSOCIATES,  
 CONSULTING ENGINEERS

CLIENT: BYRON HILL, LLC  
 PROJECT: THE PALAZZO MARLBOROUGH  
 DATE: 4/7/03 FIGURE NO. 3



**GRAVEL**      **SAND**      **SILT**      **CLAY**

ENGINEERING ASSOCIATES, P  
CONSULTING ENGINEERS

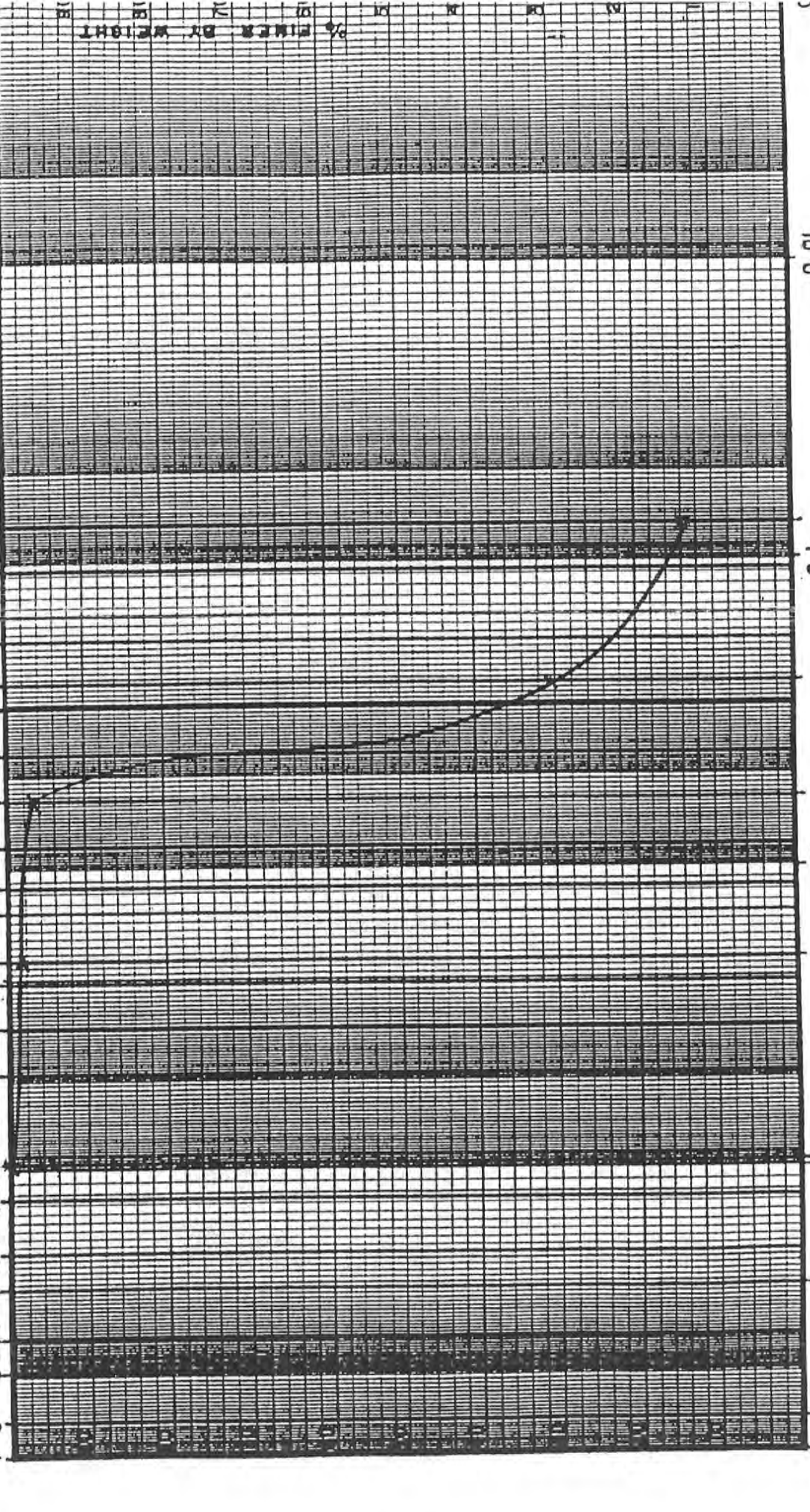
**GENTECH**

CLIENT: BYRON HILL, LLC      Tel: 732-290-7113  
PROJECT: THE PALAZZO, MARLBOROUGH  
DATE: 4/7/03      FIGURE NO. 4  
SOURCE: TEST PIT SAMPLE (TP-4)

**MECHANICAL ANALYSIS**

SAMPLE NO.	ELEV.	IDENTIFICATION	% Pass.	MOIST. CONT.	L.L. %	P.L. %	P.I.
S-4		SIEVE 3/8"	100				
TP-4		N.O. 10	99.2				
		N.O. 30	98.8				
		N.O. 60	45.9				
		N.O. 200	21.2				





GRAVEL				SAND				SILT		CLAY	
COARSE	MEDIUM	FINE	GRAIN SIZE IN MILLIMETERS	COARSE	MEDIUM	FINE	GRAIN SIZE IN MILLIMETERS	COARSE	MEDIUM	FINE	GRAIN SIZE IN MILLIMETERS
3"	1"	3/8"	2.0MM.	1.0	0.59	0.25	0.074	0.01	0.005		

MECHANICAL ANALYSIS							
SAMPLE NO.	ELEV.	IDENTIFICATION	% Pass.	MOIST. CONT.	L.L. %	P.L. %	P.I.
S-5		SIEVE 3/16"	100				
TP-5		NO. 10	98.7				
		NO. 30	97.0				

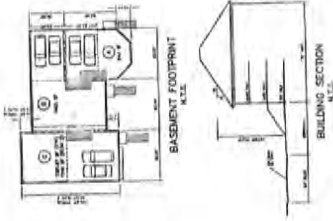
  

GENTECH ENGINEERING ASSOCIATES CONSULTING ENGINEER

CLIENT: BYRON HILL, LLC Tel: 732-290-7113

PROJECT: THE PALAZZO MARLBOROUGH

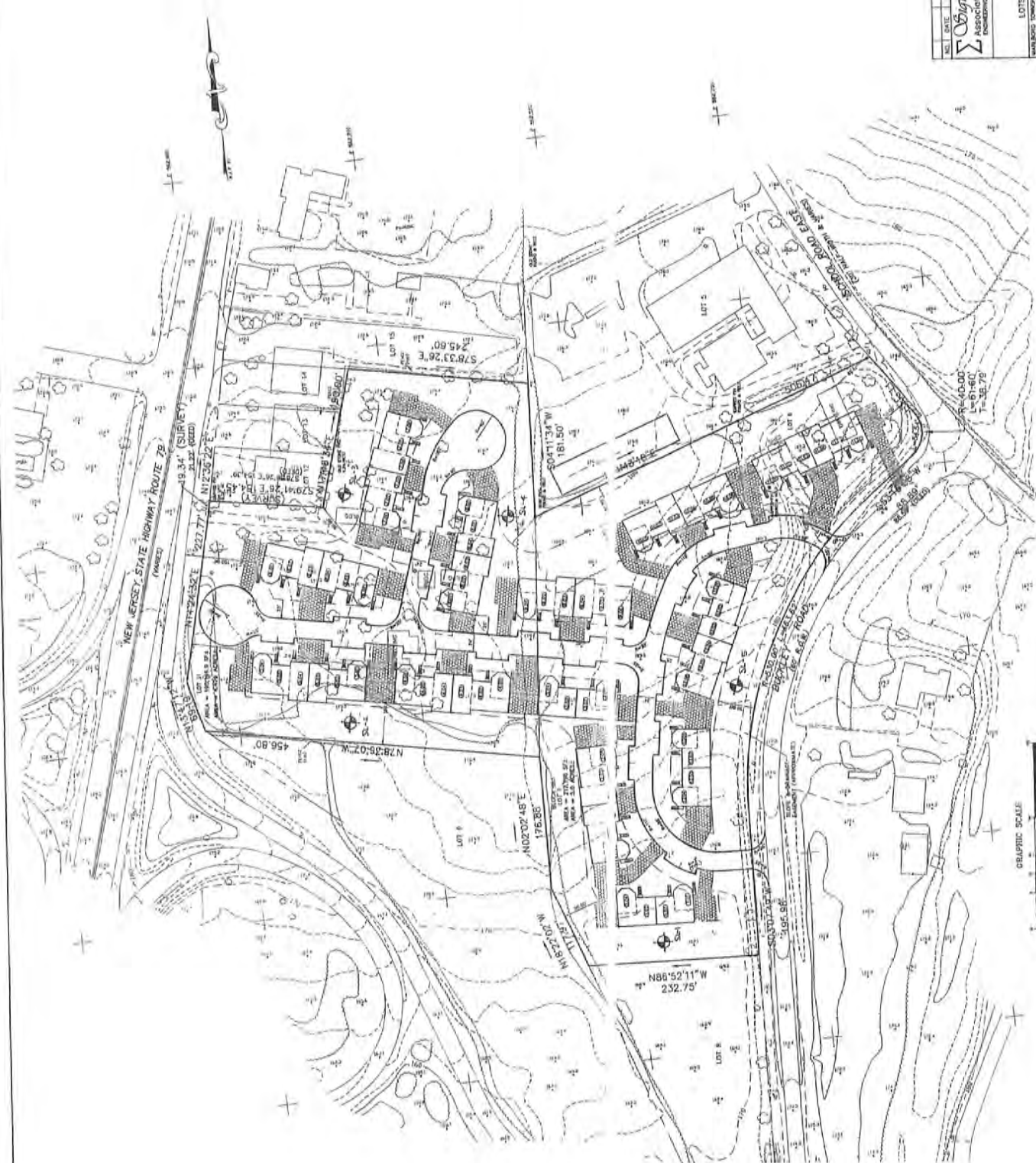
DATE: 4/7/03 FIGURE NO. 5



**TABLE OF MATERIALS - SEE SPEC**

**REMARKS:**  
 1. ALL DIMENSIONS ARE IN FEET AND INCHES.  
 2. ALL DIMENSIONS ARE TO FACE UNLESS OTHERWISE NOTED.  
 3. ALL DIMENSIONS ARE TO CENTERLINE UNLESS OTHERWISE NOTED.  
 4. ALL DIMENSIONS ARE TO CENTERLINE UNLESS OTHERWISE NOTED.  
 5. ALL DIMENSIONS ARE TO CENTERLINE UNLESS OTHERWISE NOTED.  
 6. ALL DIMENSIONS ARE TO CENTERLINE UNLESS OTHERWISE NOTED.  
 7. ALL DIMENSIONS ARE TO CENTERLINE UNLESS OTHERWISE NOTED.  
 8. ALL DIMENSIONS ARE TO CENTERLINE UNLESS OTHERWISE NOTED.  
 9. ALL DIMENSIONS ARE TO CENTERLINE UNLESS OTHERWISE NOTED.  
 10. ALL DIMENSIONS ARE TO CENTERLINE UNLESS OTHERWISE NOTED.

NO.	DATE	DESCRIPTION
1	08/15/11	CONCEPTUAL LAYOUT
2	08/15/11	CONCEPTUAL LAYOUT
3	08/15/11	CONCEPTUAL LAYOUT
4	08/15/11	CONCEPTUAL LAYOUT
5	08/15/11	CONCEPTUAL LAYOUT
6	08/15/11	CONCEPTUAL LAYOUT
7	08/15/11	CONCEPTUAL LAYOUT
8	08/15/11	CONCEPTUAL LAYOUT
9	08/15/11	CONCEPTUAL LAYOUT
10	08/15/11	CONCEPTUAL LAYOUT
11	08/15/11	CONCEPTUAL LAYOUT
12	08/15/11	CONCEPTUAL LAYOUT
13	08/15/11	CONCEPTUAL LAYOUT
14	08/15/11	CONCEPTUAL LAYOUT
15	08/15/11	CONCEPTUAL LAYOUT
16	08/15/11	CONCEPTUAL LAYOUT
17	08/15/11	CONCEPTUAL LAYOUT
18	08/15/11	CONCEPTUAL LAYOUT
19	08/15/11	CONCEPTUAL LAYOUT
20	08/15/11	CONCEPTUAL LAYOUT
21	08/15/11	CONCEPTUAL LAYOUT
22	08/15/11	CONCEPTUAL LAYOUT
23	08/15/11	CONCEPTUAL LAYOUT
24	08/15/11	CONCEPTUAL LAYOUT
25	08/15/11	CONCEPTUAL LAYOUT
26	08/15/11	CONCEPTUAL LAYOUT
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30	08/15/11	CONCEPTUAL LAYOUT
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40	08/15/11	CONCEPTUAL LAYOUT
41	08/15/11	CONCEPTUAL LAYOUT
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65	08/15/11	CONCEPTUAL LAYOUT
66	08/15/11	CONCEPTUAL LAYOUT
67	08/15/11	CONCEPTUAL LAYOUT
68	08/15/11	CONCEPTUAL LAYOUT
69	08/15/11	CONCEPTUAL LAYOUT
70	08/15/11	CONCEPTUAL LAYOUT
71	08/15/11	CONCEPTUAL LAYOUT
72	08/15/11	CONCEPTUAL LAYOUT
73	08/15/11	CONCEPTUAL LAYOUT
74	08/15/11	CONCEPTUAL LAYOUT
75	08/15/11	CONCEPTUAL LAYOUT
76	08/15/11	CONCEPTUAL LAYOUT
77	08/15/11	CONCEPTUAL LAYOUT
78	08/15/11	CONCEPTUAL LAYOUT
79	08/15/11	CONCEPTUAL LAYOUT
80	08/15/11	CONCEPTUAL LAYOUT
81	08/15/11	CONCEPTUAL LAYOUT
82	08/15/11	CONCEPTUAL LAYOUT
83	08/15/11	CONCEPTUAL LAYOUT
84	08/15/11	CONCEPTUAL LAYOUT
85	08/15/11	CONCEPTUAL LAYOUT
86	08/15/11	CONCEPTUAL LAYOUT
87	08/15/11	CONCEPTUAL LAYOUT
88	08/15/11	CONCEPTUAL LAYOUT
89	08/15/11	CONCEPTUAL LAYOUT
90	08/15/11	CONCEPTUAL LAYOUT
91	08/15/11	CONCEPTUAL LAYOUT
92	08/15/11	CONCEPTUAL LAYOUT
93	08/15/11	CONCEPTUAL LAYOUT
94	08/15/11	CONCEPTUAL LAYOUT
95	08/15/11	CONCEPTUAL LAYOUT
96	08/15/11	CONCEPTUAL LAYOUT
97	08/15/11	CONCEPTUAL LAYOUT
98	08/15/11	CONCEPTUAL LAYOUT
99	08/15/11	CONCEPTUAL LAYOUT
100	08/15/11	CONCEPTUAL LAYOUT



GRAPHIC SCALE  
1" = 50' (HORIZONTAL)  
1" = 10' (VERTICAL)

## **APPENDIX C: STORMWATER CONDUIT SYSTEM CALCULATIONS**



BY: RSE

**BUCKDALE SUBDIVISION**  
**MARLBORO TOWNSHIP, MONMOUTH COUNTY, NEW JERSEY**

JOB NO. 18-191.01  
 DATE: 11/26/2019

**RATIONAL "c" COMPUTATIONS**

AREA	WOODS								CULTIVATED		GRASS								IMPERVIOUS		AREA	WIEGHTED	
	HSG A		HSG B		HSG C		HSG D		HSG A		HSG A		HSG B		HSG C		HSG D		Area	Weighted	Acres	"C"	
	Area	Weighted (c=0.11)	Area	Weighted (c=0.14)	Area	Weighted (c=0.16)	Area	Weighted (c=0.20)	Area	Weighted (c=0.49)	Area	Weighted (c=0.29)	Area	Weighted (c=0.32)	Area	Weighted (c=0.35)	Area	Weighted (c=0.38)	Area	Weighted (c=0.98)			
Inlet A 13	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.512	0.148	0.000	0.000	0.000	0.000	0.000	0.000	0.574	0.563	1.09	0.65
Inlet A 12	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.916	0.266	0.000	0.000	0.000	0.000	0.000	0.000	0.468	0.459	1.38	0.52
Inlet A 11	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.069	0.020	0.000	0.000	0.000	0.000	0.000	0.000	0.092	0.090	0.16	0.68
Inlet A 10	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.147	0.043	0.000	0.000	0.000	0.000	0.000	0.000	0.233	0.228	0.38	0.71
Inlet A 9	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.859	0.249	0.000	0.000	0.000	0.000	0.000	0.000	0.757	0.742	1.62	0.61
Inlet A 8	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.194	0.056	0.000	0.000	0.000	0.000	0.000	0.000	0.126	0.123	0.32	0.56
Manhole A 7	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00	0.00
Inlet A 6	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.347	0.101	0.000	0.000	0.000	0.000	0.000	0.000	0.335	0.328	0.68	0.63
Inlet A 5	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.124	0.036	0.000	0.000	0.000	0.000	0.000	0.000	0.094	0.092	0.22	0.59
Inlet A 4	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.206	0.060	0.000	0.000	0.000	0.000	0.000	0.000	0.355	0.348	0.56	0.73
Manhole A 3	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00	0.00
Manhole A 2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00	0.00
Manhole A 1	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00	0.00
Inlet B 5	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.640	0.186	0.000	0.000	0.000	0.000	0.000	0.000	0.165	0.162	0.81	0.43
Inlet B 4	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.125	0.036	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.13	0.29
Inlet B 3	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.116	0.034	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.12	0.29
Inlet B 2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.088	0.086	0.09	0.98
Inlet B 1	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.082	0.024	0.000	0.000	0.000	0.000	0.000	0.000	0.102	0.100	0.18	0.67
Off-Site	0.115	0.013	0.000	0.000	0.000	0.000	0.000	0.000	1.470	0.720	1.308	0.379	0.000	0.000	0.000	0.000	0.000	0.000	0.874	0.857	3.77	0.52	

BY: RSE

**BUCKDALE SUBDIVISION  
MARLBORO TOWNSHIP, MONMOUTH COUNTY, NEW JERSEY**

JOB NO. 18-191.01  
DATE: 3/13/2019  
REV: 11/26/2019

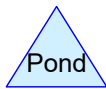
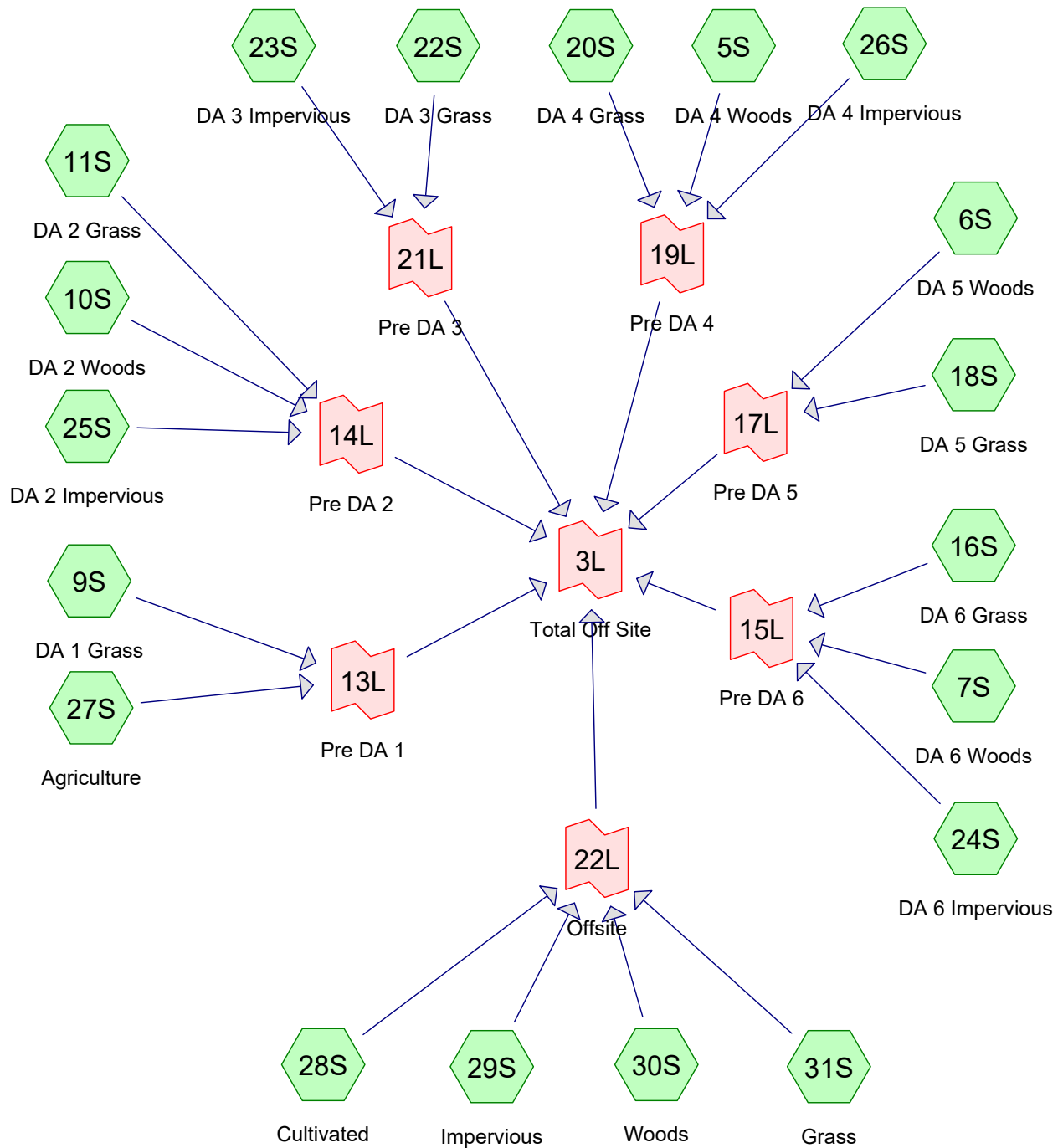
**STORM SEWER COMPUTATIONS - RATIONAL METHOD (Q=CIA)**

Inflow Point #	Inflow (Ac.)		"C"	"C" Avg.	Tc Minutes			"I"	RCP HDPE "Q" cfs	n = 0.013 n = 0.010 Pipe Size	Slope	Qf	Vf	Vact	L
	Sub-Total	Total			To Inlet	In Pipe	Total								
Inlet B 5	0.81	0.81	0.43	0.43	10.0	0.5	10.5	6.60	2.3	24 Dia. HDPE	0.13%	10.6	3.4	2.4	100
Inlet B 4	0.13	0.93	0.29	0.41	10.5	0.3	10.8	6.57	2.5	24 Dia. HDPE	0.13%	10.6	3.4	2.4	63
Inlet B 3	0.12	1.05	0.29	0.40	10.8	0.4	11.2	6.54	2.7	24 Dia. HDPE	0.13%	10.6	3.4	2.5	81
Inlet B 2	0.09	1.13	0.98	0.44	11.2	0.1	11.3	6.50	3.3	15 Dia. HDPE	0.30%	4.6	3.7	3.6	24
TO MANHOLE A 1															
Inlet B 1	0.18	0.18	0.67	0.67	10.0	0.1	10.1	6.60	0.8	15 Dia. HDPE	0.30%	4.6	3.7	2.6	23
TO MANHOLE A 1															
Inlet A 13	1.09	1.09	0.65	0.65	10.0	1.3	11.3	6.60	4.7	15 Dia. HDPE	0.35%	5.0	4.0	4.3	304
TO INLET 11															
Inlet A 12	1.38	1.38	0.52	0.52	10.0	0.9	10.9	6.60	4.8	15 Dia. HDPE	0.35%	5.0	4.0	4.4	222
Inlet A 11	0.16	2.63	0.68	0.59	11.3	0.5	11.7	6.50	10.0	24 Dia. HDPE	0.30%	16.1	5.1	4.7	152
Inlet A 10	0.38	3.01	0.71	0.60	11.7	0.2	11.9	6.46	11.7	24 Dia. HDPE	0.30%	16.1	5.1	4.9	52
TO INLET 8															
Inlet A 9	1.62	1.62	0.61	0.61	10.0	0.1	10.1	6.60	6.5	18 Dia. HDPE	0.30%	7.5	4.2	4.4	24
Inlet A 8	0.32	4.95	0.56	0.60	11.9	0.2	12.1	6.45	19.3	30 Dia. HDPE	0.30%	29.2	5.9	5.5	57
Manhole A 7	0.00	4.95	0.00	0.60	12.1	0.2	12.2	6.44	19.2	30 Dia. HDPE	0.30%	29.2	5.9	5.5	57
TO INLET 5															
Inlet A 6	0.68	0.68	0.63	0.63	10.0	0.1	10.1	6.60	2.8	15 Dia. HDPE	0.30%	4.6	3.7	3.4	24
Inlet A 5	0.22	5.85	0.59	0.61	12.2	0.2	12.4	6.42	22.8	30 Dia. HDPE	0.30%	29.2	5.9	5.9	73
Inlet A 4	0.56	6.41	0.73	0.62	12.4	0.6	13.0	6.41	25.3	30 Dia. HDPE	0.30%	29.2	5.9	6.2	213
Manhole A 3	0.00	6.41	0.62	0.62	13.0	0.5	13.6	6.36	25.1	30 Dia. HDPE	0.30%	29.2	5.9	6.1	191
Manhole A 2	0.00	6.41	0.62	0.62	13.6	0.1	13.7	6.32	25.0	30 Dia. HDPE	0.30%	29.2	5.9	6.1	31
Manhole A 1	0.00	7.73	0.62	0.59	13.7	0.1	13.8	6.31	28.9	30 Dia. HDPE	0.35%	31.5	6.4	6.8	54
TO F.E.S. A-16 DISCHARGING INTO STORMWATER MANAGEMENT BASIN 1															
Off-Site	3.77	3.77	0.52	0.52	17.9	0.0	17.9	5.33	10.5	12 Dia. HDPE	11.00%	15.4	19.6	18.4	42
TO F.E.S. O-1 DISCHARGING INTO STORMWATER MANAGEMENT BASIN 1															

## **APPENDIX D : PRE-DEVELOPMENT RUNOFF CALCULATIONS**







**Routing Diagram for Pre-Drainage - November 26**  
 Prepared by DW Smith Associates, Printed 11/27/2019  
 HydroCAD® 10.00-20 s/n 00811 © 2017 HydroCAD Software Solutions LLC



**PRE-DEVELOPMENT RUNOFF CALCULATIONS**  
**(2 YEAR STORM)**



**Pre-Drainage - November 26**

Prepared by DW Smith Associates

HydroCAD® 10.00-20 s/n 00811 © 2017 HydroCAD Software Solutions LLC

NOAA 24-hr D 2-Year Rainfall=3.38"

Printed 11/27/2019

Page 2

Time span=0.00-40.00 hrs, dt=0.05 hrs, 801 points  
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN  
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

<b>Subcatchment 5S: DA 4 Woods</b>	Runoff Area=0.237 ac 0.00% Impervious Runoff Depth=0.00" Flow Length=370' Tc=36.2 min CN=30 Runoff=0.00 cfs 0.000 af
<b>Subcatchment 6S: DA 5 Woods</b>	Runoff Area=0.601 ac 0.00% Impervious Runoff Depth=0.00" Flow Length=150' Tc=23.3 min CN=30 Runoff=0.00 cfs 0.000 af
<b>Subcatchment 7S: DA 6 Woods</b>	Runoff Area=0.201 ac 0.00% Impervious Runoff Depth=0.00" Flow Length=113' Tc=22.1 min CN=30 Runoff=0.00 cfs 0.000 af
<b>Subcatchment 9S: DA 1 Grass</b>	Runoff Area=2.520 ac 0.00% Impervious Runoff Depth=0.00" Flow Length=780' Tc=20.5 min CN=39 Runoff=0.00 cfs 0.001 af
<b>Subcatchment 10S: DA 2 Woods</b>	Runoff Area=0.755 ac 0.00% Impervious Runoff Depth=0.00" Flow Length=343' Tc=34.4 min CN=30 Runoff=0.00 cfs 0.000 af
<b>Subcatchment 11S: DA 2 Grass</b>	Runoff Area=2.086 ac 0.00% Impervious Runoff Depth=0.00" Flow Length=460' Tc=31.6 min CN=39 Runoff=0.00 cfs 0.001 af
<b>Subcatchment 16S: DA 6 Grass</b>	Runoff Area=0.825 ac 0.00% Impervious Runoff Depth=0.00" Flow Length=145' Tc=18.5 min CN=39 Runoff=0.00 cfs 0.000 af
<b>Subcatchment 18S: DA 5 Grass</b>	Runoff Area=0.462 ac 0.00% Impervious Runoff Depth=0.00" Flow Length=268' Tc=22.0 min CN=39 Runoff=0.00 cfs 0.000 af
<b>Subcatchment 20S: DA 4 Grass</b>	Runoff Area=1.402 ac 0.00% Impervious Runoff Depth=0.00" Flow Length=388' Tc=23.9 min CN=39 Runoff=0.00 cfs 0.000 af
<b>Subcatchment 22S: DA 3 Grass</b>	Runoff Area=0.567 ac 0.00% Impervious Runoff Depth=0.00" Flow Length=457' Tc=33.2 min CN=39 Runoff=0.00 cfs 0.000 af
<b>Subcatchment 23S: DA 3 Impervious</b>	Runoff Area=0.194 ac 100.00% Impervious Runoff Depth=3.15" Tc=10.0 min CN=98 Runoff=0.53 cfs 0.051 af
<b>Subcatchment 24S: DA 6 Impervious</b>	Runoff Area=0.094 ac 100.00% Impervious Runoff Depth=3.15" Tc=10.0 min CN=98 Runoff=0.26 cfs 0.025 af
<b>Subcatchment 25S: DA 2 Impervious</b>	Runoff Area=0.039 ac 100.00% Impervious Runoff Depth=3.15" Flow Length=460' Tc=31.6 min CN=98 Runoff=0.07 cfs 0.010 af
<b>Subcatchment 26S: DA 4 Impervious</b>	Runoff Area=0.083 ac 100.00% Impervious Runoff Depth=3.15" Flow Length=293' Tc=26.5 min CN=98 Runoff=0.15 cfs 0.022 af
<b>Subcatchment 27S: Agriculture</b>	Runoff Area=1.510 ac 0.00% Impervious Runoff Depth=0.60" Flow Length=272' Tc=19.4 min CN=63 Runoff=0.53 cfs 0.076 af
<b>Subcatchment 28S: Cultivated</b>	Runoff Area=1.470 ac 0.00% Impervious Runoff Depth=0.60" Flow Length=650' Tc=19.1 min CN=63 Runoff=0.52 cfs 0.074 af

<b>Subcatchment29S: Impervious</b>	Runoff Area=0.874 ac 100.00% Impervious Runoff Depth=3.15" Flow Length=750' Tc=13.8 min CN=98 Runoff=2.15 cfs 0.229 af
<b>Subcatchment30S: Woods</b>	Runoff Area=0.115 ac 0.00% Impervious Runoff Depth=0.00" Flow Length=580' Tc=28.3 min CN=30 Runoff=0.00 cfs 0.000 af
<b>Subcatchment31S: Grass</b>	Runoff Area=1.308 ac 0.00% Impervious Runoff Depth=0.00" Flow Length=820' Tc=22.1 min CN=39 Runoff=0.00 cfs 0.000 af
<b>Link 3L: Total Off Site</b>	Inflow=3.83 cfs 0.489 af Primary=3.83 cfs 0.489 af
<b>Link 13L: Pre DA 1</b>	Inflow=0.53 cfs 0.077 af Primary=0.53 cfs 0.077 af
<b>Link 14L: Pre DA 2</b>	Inflow=0.07 cfs 0.011 af Primary=0.07 cfs 0.011 af
<b>Link 15L: Pre DA 6</b>	Inflow=0.26 cfs 0.025 af Primary=0.26 cfs 0.025 af
<b>Link 17L: Pre DA 5</b>	Inflow=0.00 cfs 0.000 af Primary=0.00 cfs 0.000 af
<b>Link 19L: Pre DA 4</b>	Inflow=0.15 cfs 0.022 af Primary=0.15 cfs 0.022 af
<b>Link 21L: Pre DA 3</b>	Inflow=0.53 cfs 0.051 af Primary=0.53 cfs 0.051 af
<b>Link 22L: Offsite</b>	Inflow=2.54 cfs 0.303 af Primary=2.54 cfs 0.303 af

**Total Runoff Area = 15.343 ac Runoff Volume = 0.489 af Average Runoff Depth = 0.38"**  
**91.63% Pervious = 14.059 ac 8.37% Impervious = 1.284 ac**

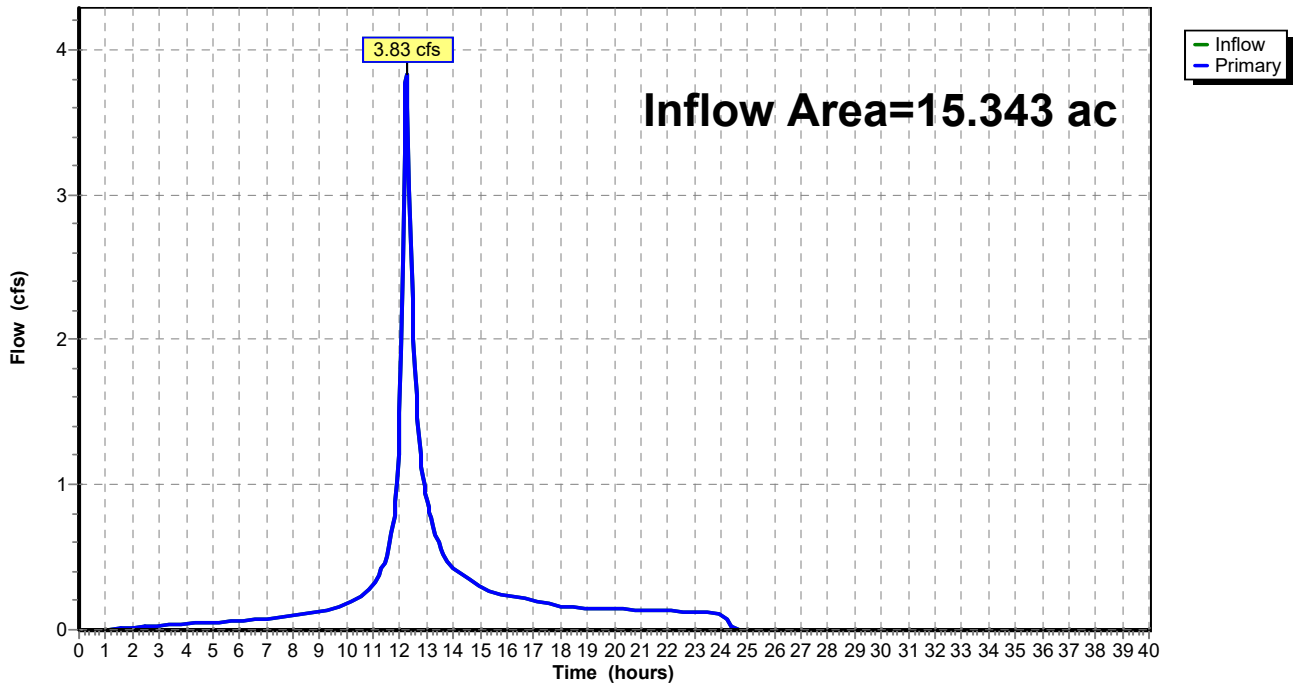
### Summary for Link 3L: Total Off Site

Inflow Area = 15.343 ac, 8.37% Impervious, Inflow Depth = 0.38" for 2-Year event  
Inflow = 3.83 cfs @ 12.22 hrs, Volume= 0.489 af  
Primary = 3.83 cfs @ 12.22 hrs, Volume= 0.489 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs

### Link 3L: Total Off Site

Hydrograph



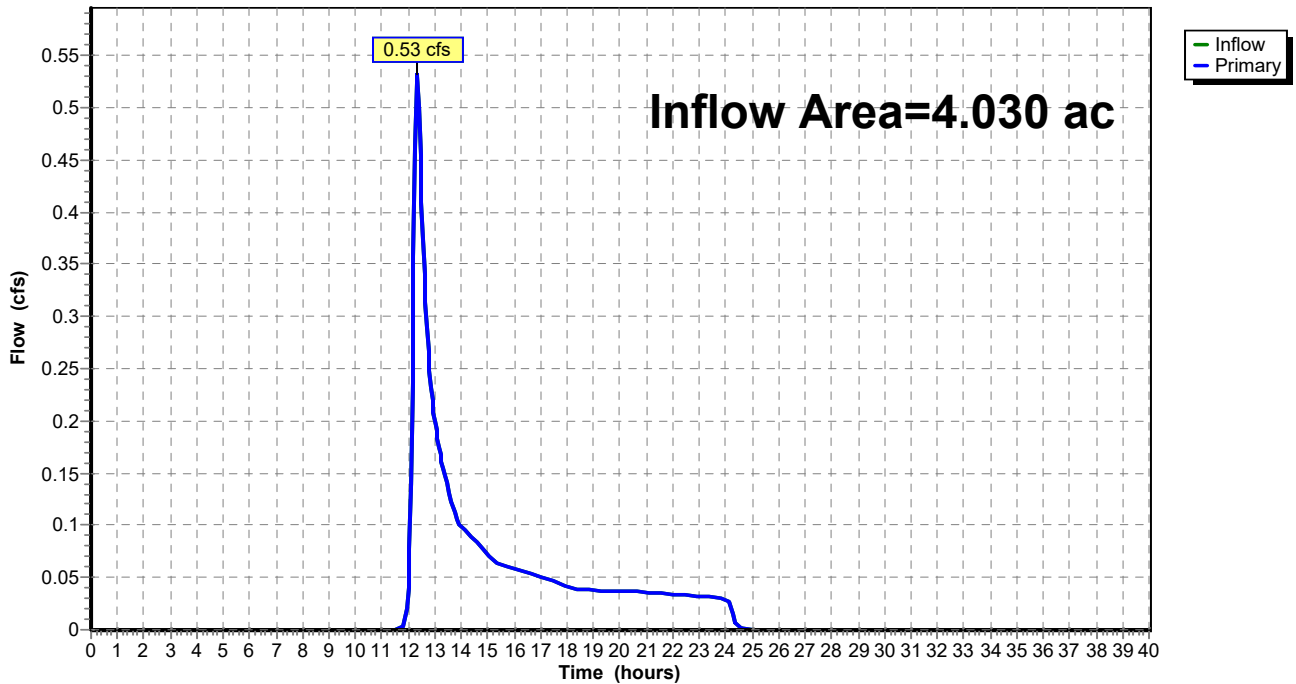
### Summary for Link 13L: Pre DA 1

Inflow Area = 4.030 ac, 0.00% Impervious, Inflow Depth = 0.23" for 2-Year event  
Inflow = 0.53 cfs @ 12.34 hrs, Volume= 0.077 af  
Primary = 0.53 cfs @ 12.34 hrs, Volume= 0.077 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs

### Link 13L: Pre DA 1

Hydrograph





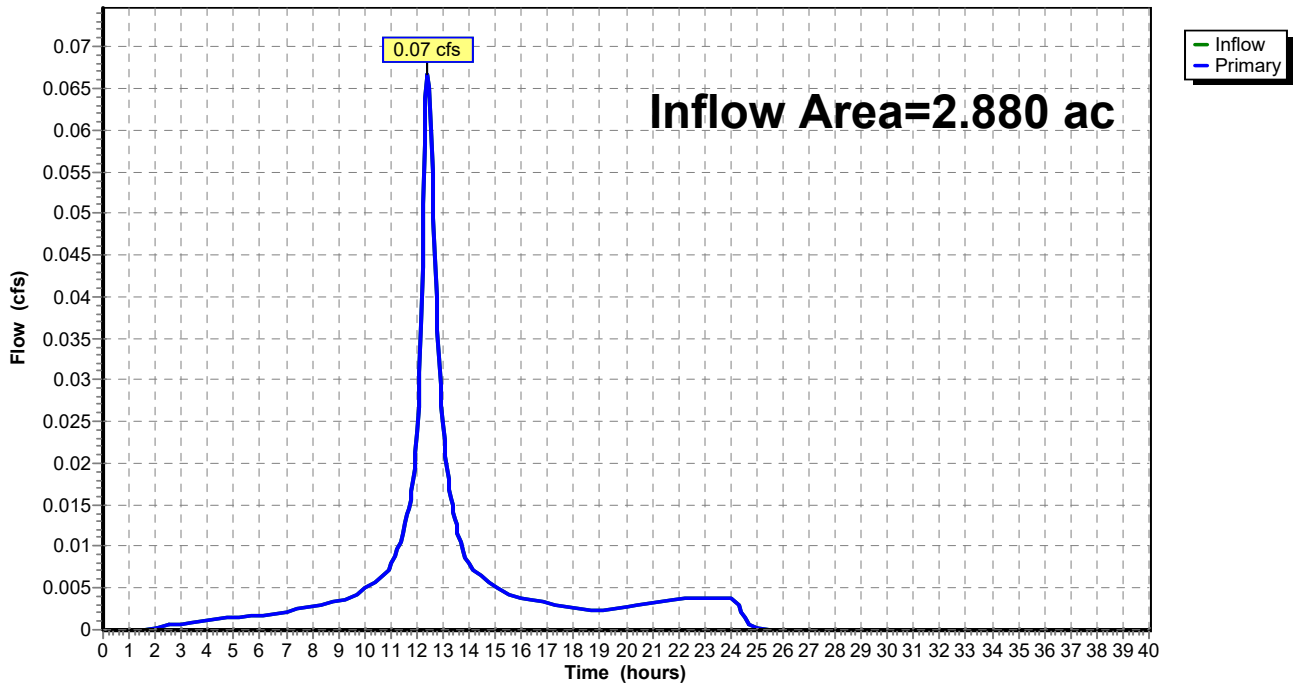
### Summary for Link 14L: Pre DA 2

Inflow Area = 2.880 ac, 1.35% Impervious, Inflow Depth = 0.05" for 2-Year event  
Inflow = 0.07 cfs @ 12.42 hrs, Volume= 0.011 af  
Primary = 0.07 cfs @ 12.42 hrs, Volume= 0.011 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs

### Link 14L: Pre DA 2

Hydrograph



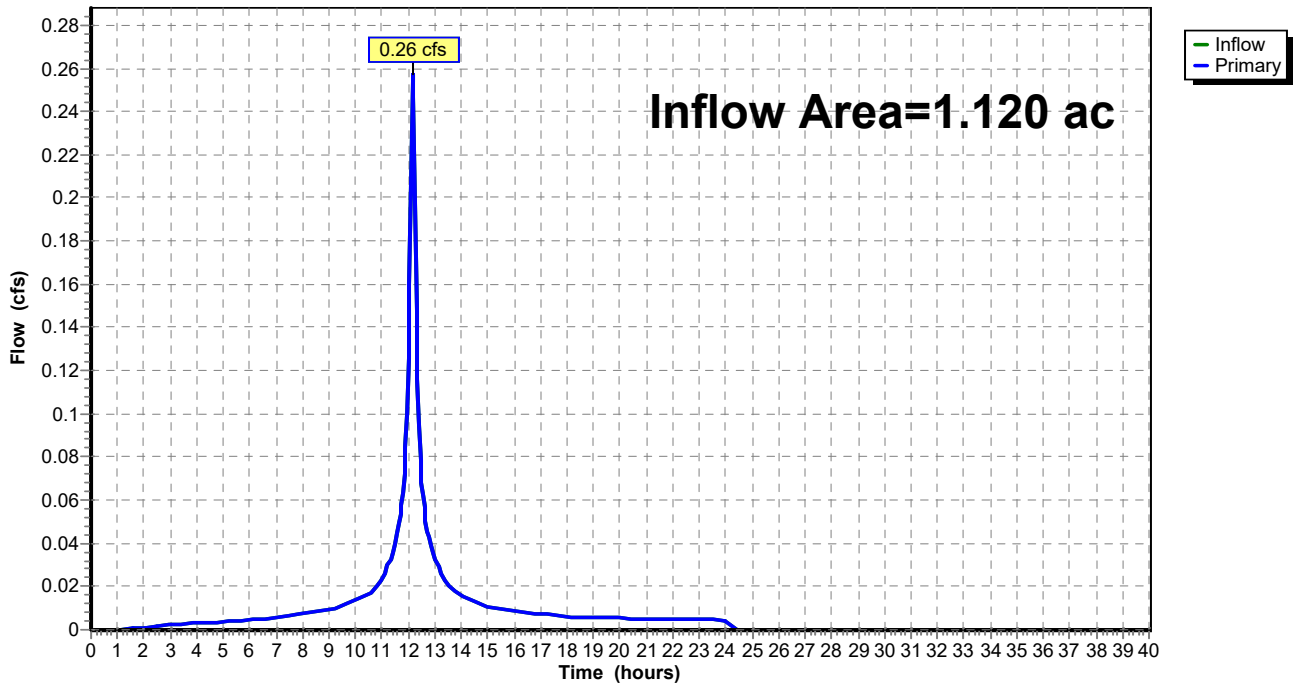
### Summary for Link 15L: Pre DA 6

Inflow Area = 1.120 ac, 8.39% Impervious, Inflow Depth = 0.27" for 2-Year event  
Inflow = 0.26 cfs @ 12.17 hrs, Volume= 0.025 af  
Primary = 0.26 cfs @ 12.17 hrs, Volume= 0.025 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs

### Link 15L: Pre DA 6

#### Hydrograph



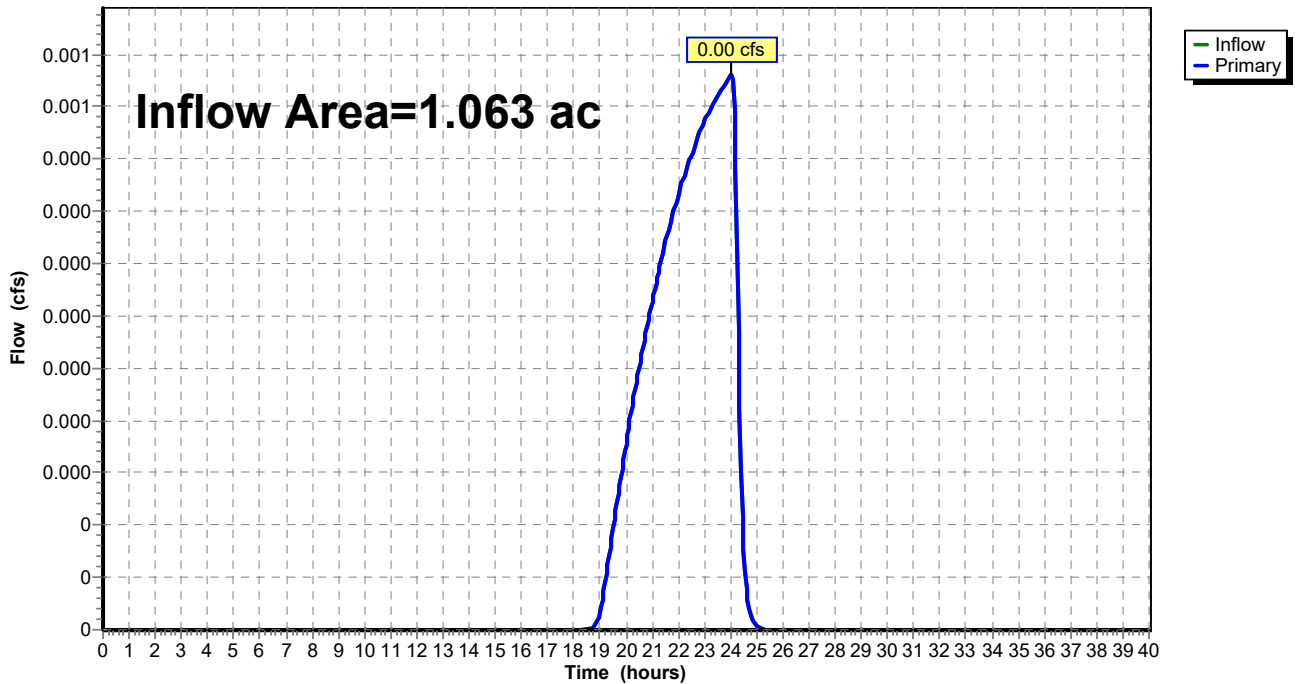
### Summary for Link 17L: Pre DA 5

Inflow Area = 1.063 ac, 0.00% Impervious, Inflow Depth = 0.00" for 2-Year event  
Inflow = 0.00 cfs @ 24.03 hrs, Volume= 0.000 af  
Primary = 0.00 cfs @ 24.03 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs

### Link 17L: Pre DA 5

Hydrograph



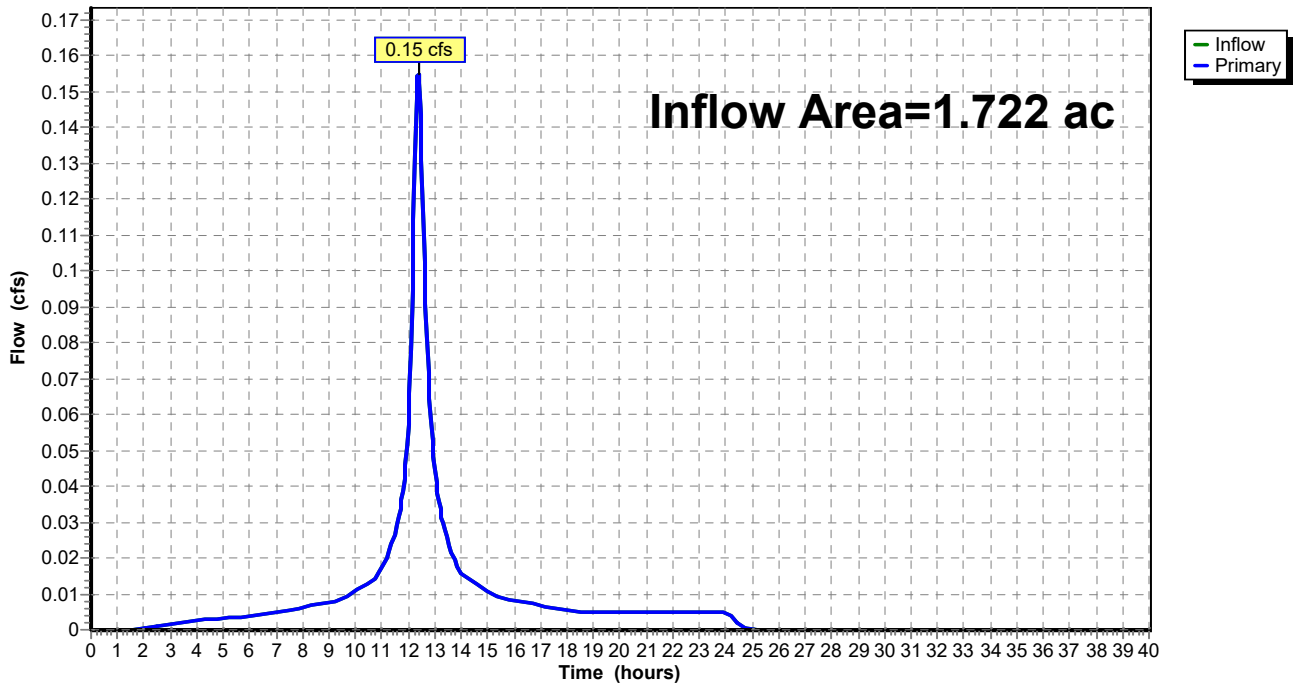
### Summary for Link 19L: Pre DA 4

Inflow Area = 1.722 ac, 4.82% Impervious, Inflow Depth = 0.15" for 2-Year event  
Inflow = 0.15 cfs @ 12.36 hrs, Volume= 0.022 af  
Primary = 0.15 cfs @ 12.36 hrs, Volume= 0.022 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs

### Link 19L: Pre DA 4

Hydrograph



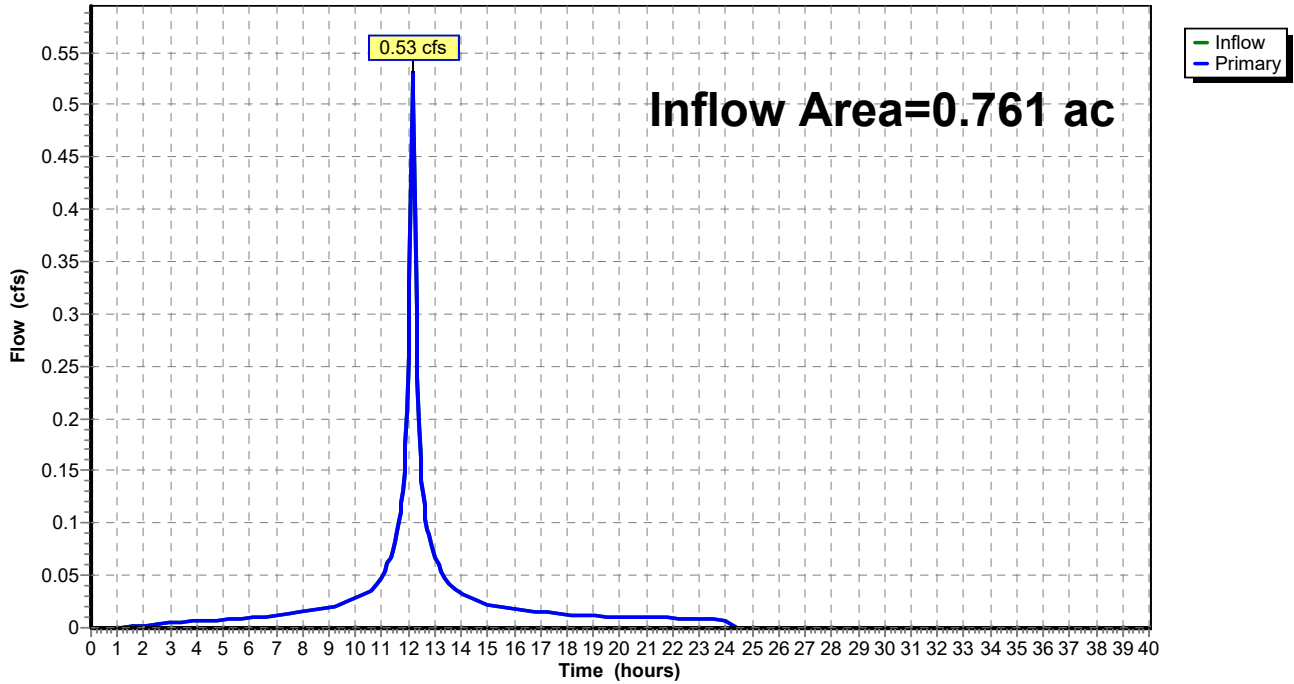
### Summary for Link 21L: Pre DA 3

Inflow Area = 0.761 ac, 25.49% Impervious, Inflow Depth = 0.81" for 2-Year event  
Inflow = 0.53 cfs @ 12.17 hrs, Volume= 0.051 af  
Primary = 0.53 cfs @ 12.17 hrs, Volume= 0.051 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs

### Link 21L: Pre DA 3

Hydrograph



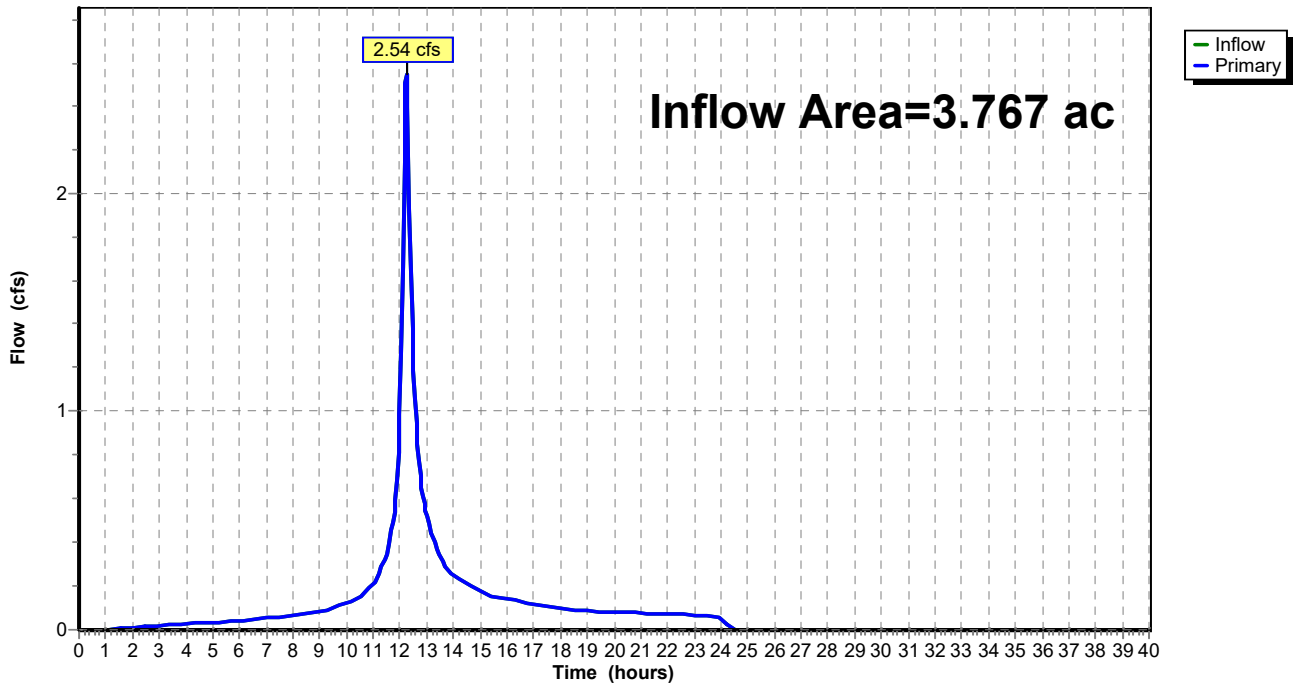
### Summary for Link 22L: Offsite

Inflow Area = 3.767 ac, 23.20% Impervious, Inflow Depth = 0.97" for 2-Year event  
Inflow = 2.54 cfs @ 12.23 hrs, Volume= 0.303 af  
Primary = 2.54 cfs @ 12.23 hrs, Volume= 0.303 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs

### Link 22L: Offsite

Hydrograph



**PRE-DEVELOPMENT RUNOFF CALCULATIONS**  
**(10 YEAR STORM)**





**Pre-Drainage - November 26**

Prepared by DW Smith Associates

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NOAA 24-hr D 10-Year Rainfall=5.23"

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Time span=0.00-40.00 hrs, dt=0.05 hrs, 801 points  
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN  
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

<b>Subcatchment 5S: DA 4 Woods</b>	Runoff Area=0.237 ac 0.00% Impervious Runoff Depth=0.01" Flow Length=370' Tc=36.2 min CN=30 Runoff=0.00 cfs 0.000 af
<b>Subcatchment 6S: DA 5 Woods</b>	Runoff Area=0.601 ac 0.00% Impervious Runoff Depth=0.01" Flow Length=150' Tc=23.3 min CN=30 Runoff=0.00 cfs 0.001 af
<b>Subcatchment 7S: DA 6 Woods</b>	Runoff Area=0.201 ac 0.00% Impervious Runoff Depth=0.01" Flow Length=113' Tc=22.1 min CN=30 Runoff=0.00 cfs 0.000 af
<b>Subcatchment 9S: DA 1 Grass</b>	Runoff Area=2.520 ac 0.00% Impervious Runoff Depth=0.25" Flow Length=780' Tc=20.5 min CN=39 Runoff=0.11 cfs 0.052 af
<b>Subcatchment 10S: DA 2 Woods</b>	Runoff Area=0.755 ac 0.00% Impervious Runoff Depth=0.01" Flow Length=343' Tc=34.4 min CN=30 Runoff=0.00 cfs 0.001 af
<b>Subcatchment 11S: DA 2 Grass</b>	Runoff Area=2.086 ac 0.00% Impervious Runoff Depth=0.25" Flow Length=460' Tc=31.6 min CN=39 Runoff=0.09 cfs 0.043 af
<b>Subcatchment 16S: DA 6 Grass</b>	Runoff Area=0.825 ac 0.00% Impervious Runoff Depth=0.25" Flow Length=145' Tc=18.5 min CN=39 Runoff=0.04 cfs 0.017 af
<b>Subcatchment 18S: DA 5 Grass</b>	Runoff Area=0.462 ac 0.00% Impervious Runoff Depth=0.25" Flow Length=268' Tc=22.0 min CN=39 Runoff=0.02 cfs 0.010 af
<b>Subcatchment 20S: DA 4 Grass</b>	Runoff Area=1.402 ac 0.00% Impervious Runoff Depth=0.25" Flow Length=388' Tc=23.9 min CN=39 Runoff=0.06 cfs 0.029 af
<b>Subcatchment 22S: DA 3 Grass</b>	Runoff Area=0.567 ac 0.00% Impervious Runoff Depth=0.25" Flow Length=457' Tc=33.2 min CN=39 Runoff=0.02 cfs 0.012 af
<b>Subcatchment 23S: DA 3 Impervious</b>	Runoff Area=0.194 ac 100.00% Impervious Runoff Depth=4.99" Tc=10.0 min CN=98 Runoff=0.83 cfs 0.081 af
<b>Subcatchment 24S: DA 6 Impervious</b>	Runoff Area=0.094 ac 100.00% Impervious Runoff Depth=4.99" Tc=10.0 min CN=98 Runoff=0.40 cfs 0.039 af
<b>Subcatchment 25S: DA 2 Impervious</b>	Runoff Area=0.039 ac 100.00% Impervious Runoff Depth=4.99" Flow Length=460' Tc=31.6 min CN=98 Runoff=0.10 cfs 0.016 af
<b>Subcatchment 26S: DA 4 Impervious</b>	Runoff Area=0.083 ac 100.00% Impervious Runoff Depth=4.99" Flow Length=293' Tc=26.5 min CN=98 Runoff=0.24 cfs 0.035 af
<b>Subcatchment 27S: Agriculture</b>	Runoff Area=1.510 ac 0.00% Impervious Runoff Depth=1.66" Flow Length=272' Tc=19.4 min CN=63 Runoff=1.81 cfs 0.208 af
<b>Subcatchment 28S: Cultivated</b>	Runoff Area=1.470 ac 0.00% Impervious Runoff Depth=1.66" Flow Length=650' Tc=19.1 min CN=63 Runoff=1.77 cfs 0.203 af

<b>Subcatchment29S: Impervious</b>	Runoff Area=0.874 ac 100.00% Impervious Runoff Depth=4.99" Flow Length=750' Tc=13.8 min CN=98 Runoff=3.35 cfs 0.364 af
<b>Subcatchment30S: Woods</b>	Runoff Area=0.115 ac 0.00% Impervious Runoff Depth=0.01" Flow Length=580' Tc=28.3 min CN=30 Runoff=0.00 cfs 0.000 af
<b>Subcatchment31S: Grass</b>	Runoff Area=1.308 ac 0.00% Impervious Runoff Depth=0.25" Flow Length=820' Tc=22.1 min CN=39 Runoff=0.06 cfs 0.027 af
<b>Link 3L: Total Off Site</b>	Inflow=7.86 cfs 1.138 af Primary=7.86 cfs 1.138 af
<b>Link 13L: Pre DA 1</b>	Inflow=1.82 cfs 0.261 af Primary=1.82 cfs 0.261 af
<b>Link 14L: Pre DA 2</b>	Inflow=0.12 cfs 0.060 af Primary=0.12 cfs 0.060 af
<b>Link 15L: Pre DA 6</b>	Inflow=0.40 cfs 0.056 af Primary=0.40 cfs 0.056 af
<b>Link 17L: Pre DA 5</b>	Inflow=0.02 cfs 0.010 af Primary=0.02 cfs 0.010 af
<b>Link 19L: Pre DA 4</b>	Inflow=0.25 cfs 0.064 af Primary=0.25 cfs 0.064 af
<b>Link 21L: Pre DA 3</b>	Inflow=0.83 cfs 0.092 af Primary=0.83 cfs 0.092 af
<b>Link 22L: Offsite</b>	Inflow=4.92 cfs 0.594 af Primary=4.92 cfs 0.594 af

**Total Runoff Area = 15.343 ac Runoff Volume = 1.138 af Average Runoff Depth = 0.89"**  
**91.63% Pervious = 14.059 ac 8.37% Impervious = 1.284 ac**

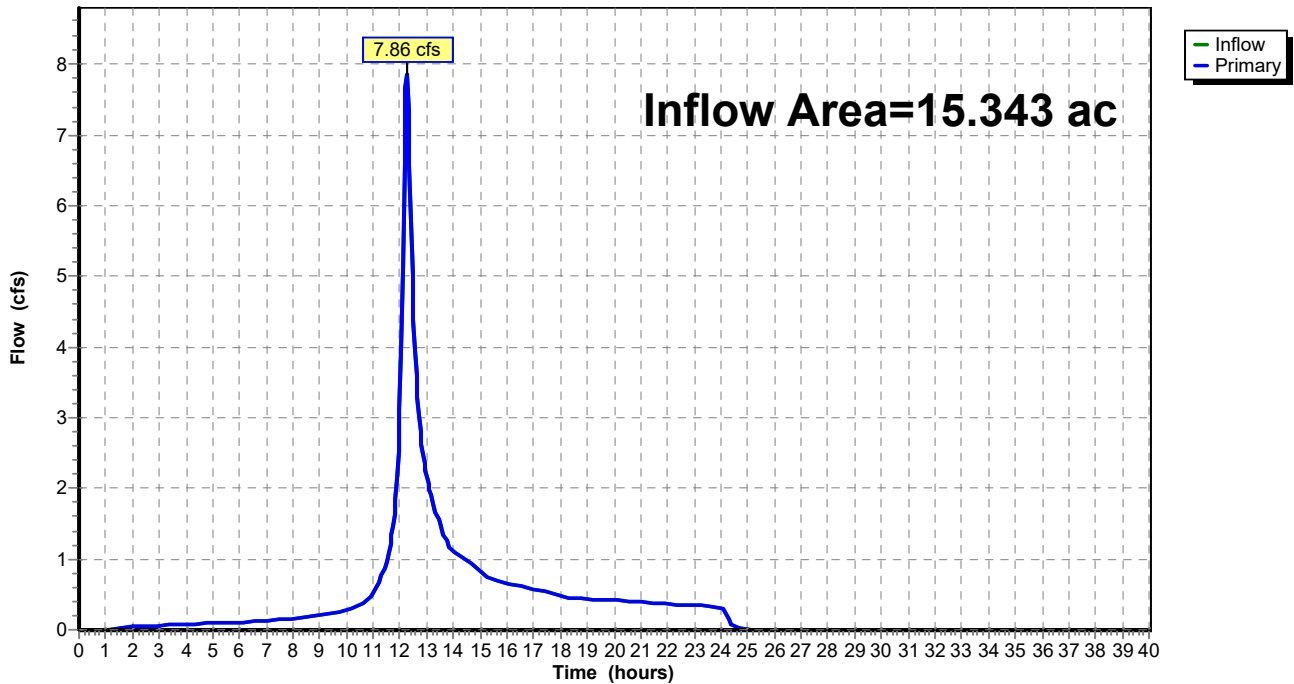
### Summary for Link 3L: Total Off Site

Inflow Area = 15.343 ac, 8.37% Impervious, Inflow Depth = 0.89" for 10-Year event  
Inflow = 7.86 cfs @ 12.24 hrs, Volume= 1.138 af  
Primary = 7.86 cfs @ 12.24 hrs, Volume= 1.138 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs

### Link 3L: Total Off Site

Hydrograph



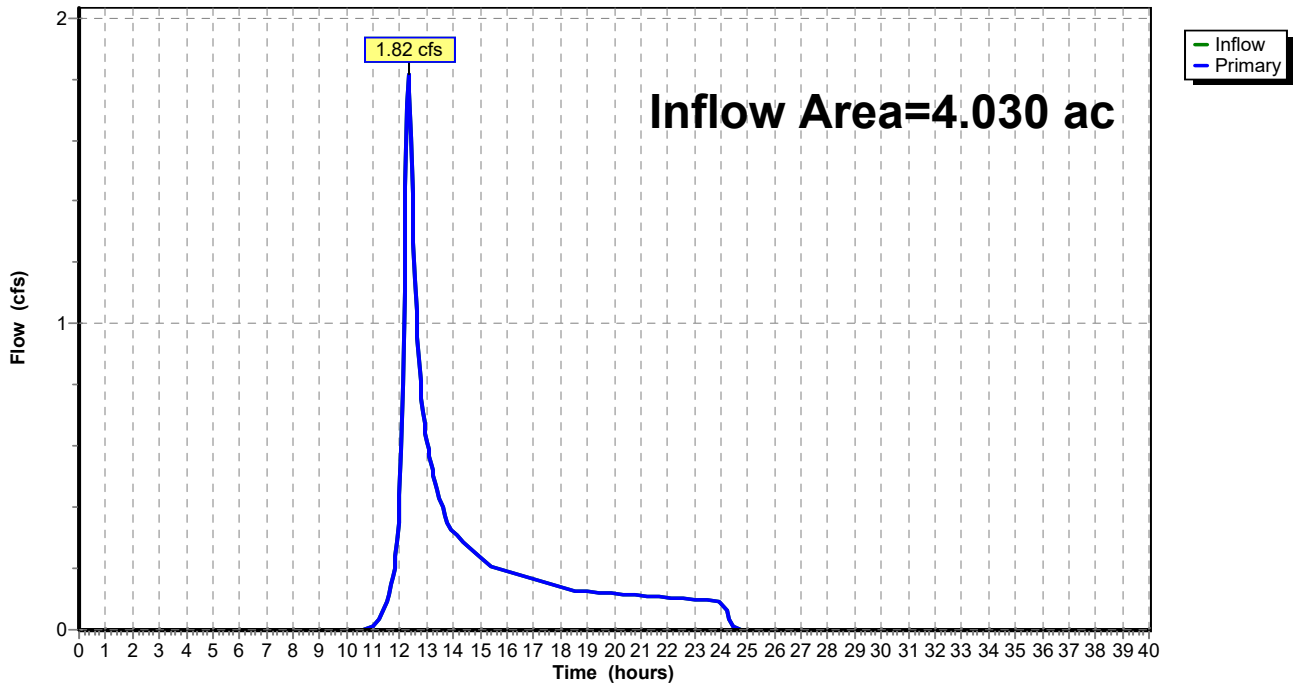
### Summary for Link 13L: Pre DA 1

Inflow Area = 4.030 ac, 0.00% Impervious, Inflow Depth = 0.78" for 10-Year event  
Inflow = 1.82 cfs @ 12.31 hrs, Volume= 0.261 af  
Primary = 1.82 cfs @ 12.31 hrs, Volume= 0.261 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs

### Link 13L: Pre DA 1

Hydrograph



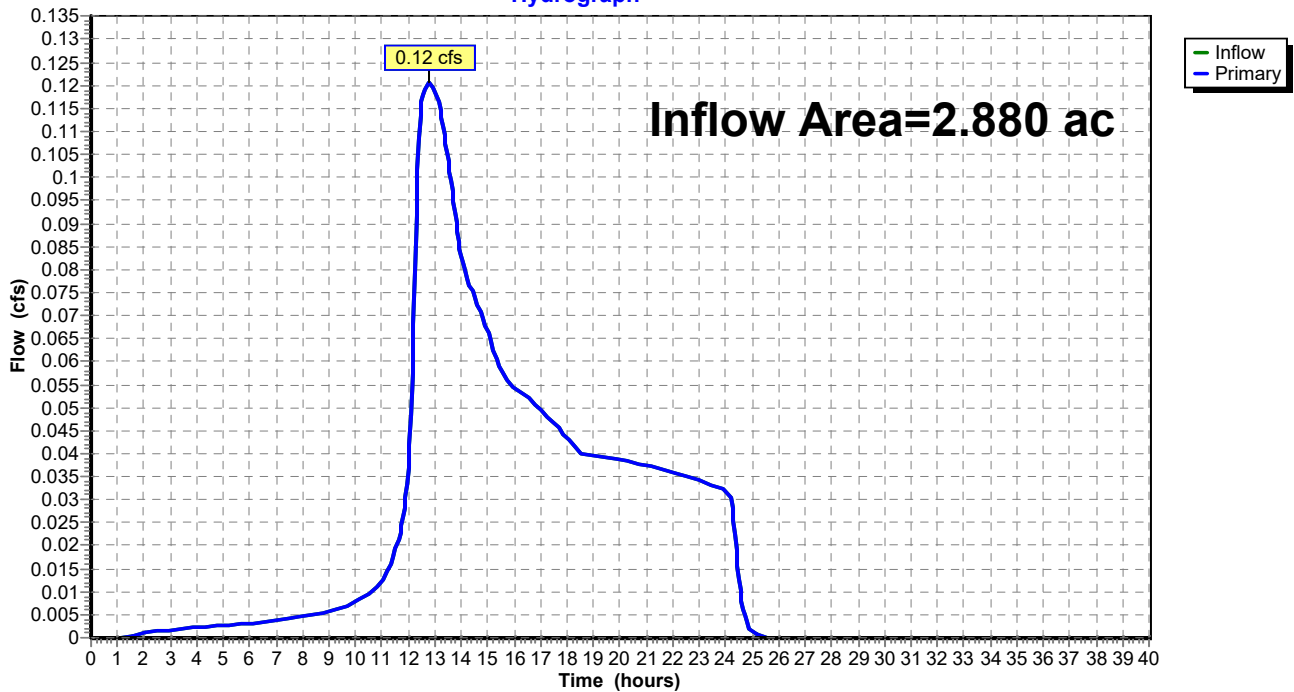
### Summary for Link 14L: Pre DA 2

Inflow Area = 2.880 ac, 1.35% Impervious, Inflow Depth = 0.25" for 10-Year event  
Inflow = 0.12 cfs @ 12.81 hrs, Volume= 0.060 af  
Primary = 0.12 cfs @ 12.81 hrs, Volume= 0.060 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs

### Link 14L: Pre DA 2

Hydrograph



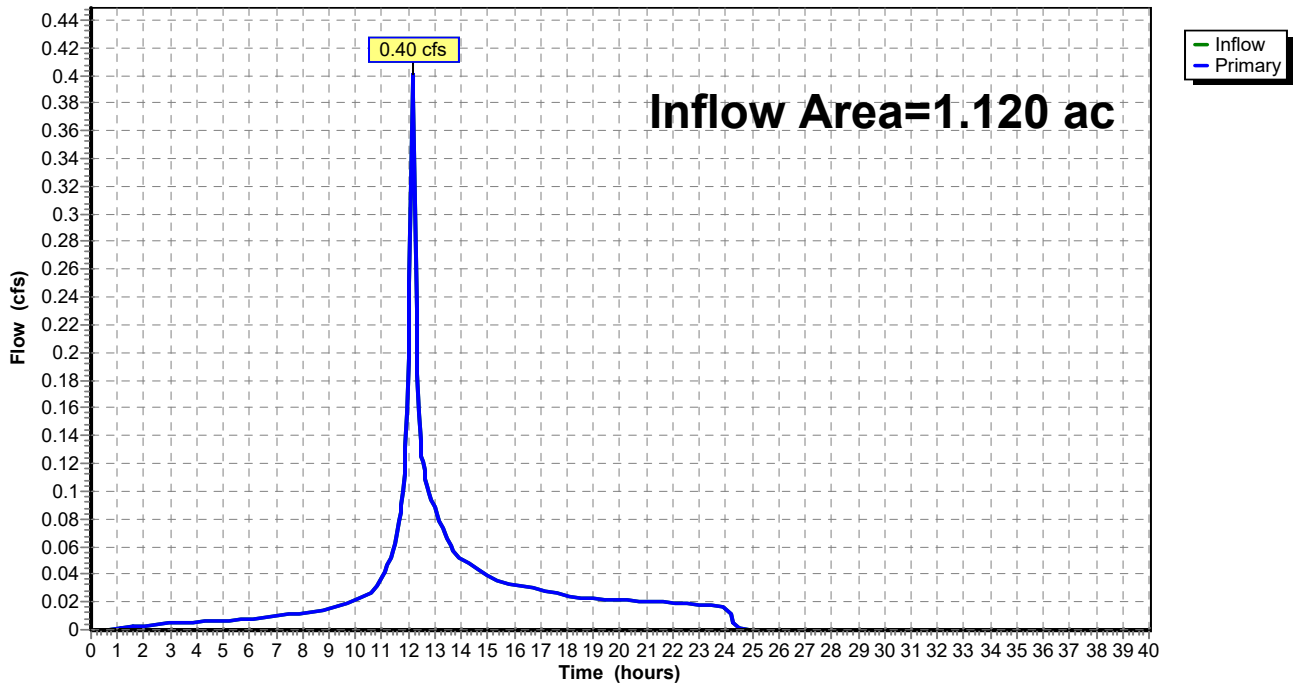
### Summary for Link 15L: Pre DA 6

Inflow Area = 1.120 ac, 8.39% Impervious, Inflow Depth = 0.60" for 10-Year event  
Inflow = 0.40 cfs @ 12.17 hrs, Volume= 0.056 af  
Primary = 0.40 cfs @ 12.17 hrs, Volume= 0.056 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs

### Link 15L: Pre DA 6

#### Hydrograph



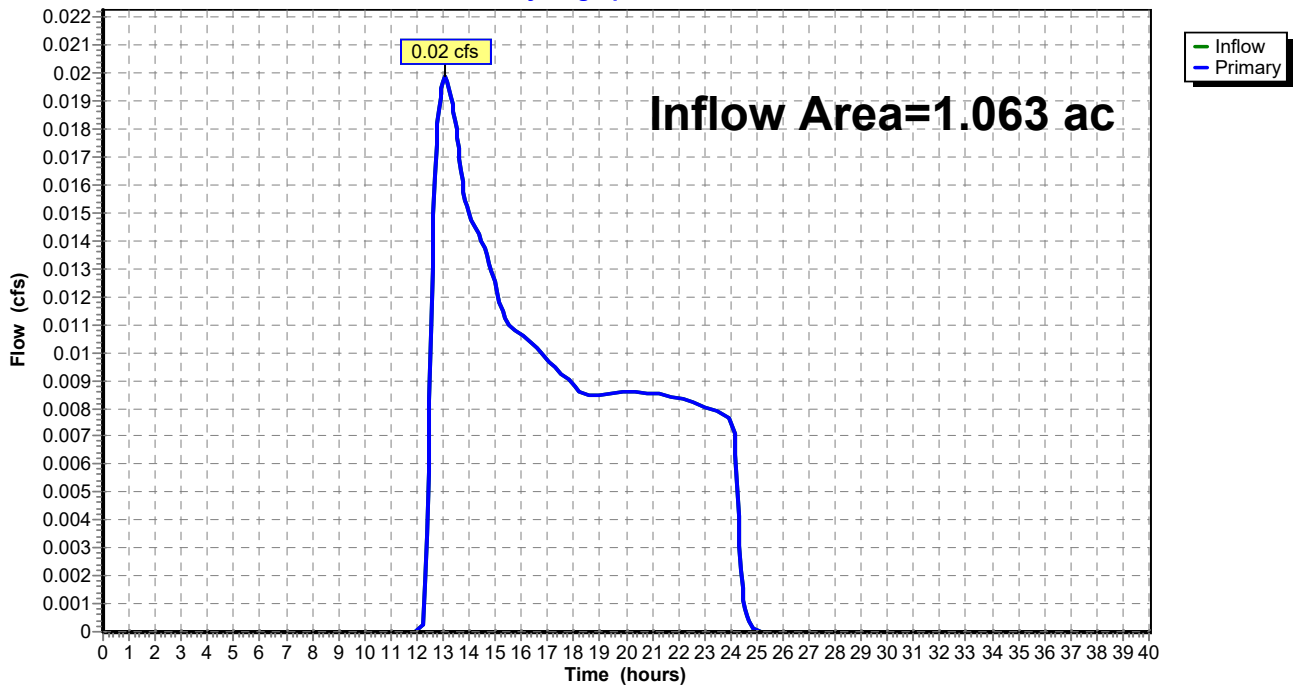
### Summary for Link 17L: Pre DA 5

Inflow Area = 1.063 ac, 0.00% Impervious, Inflow Depth = 0.12" for 10-Year event  
Inflow = 0.02 cfs @ 13.09 hrs, Volume= 0.010 af  
Primary = 0.02 cfs @ 13.09 hrs, Volume= 0.010 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs

### Link 17L: Pre DA 5

Hydrograph



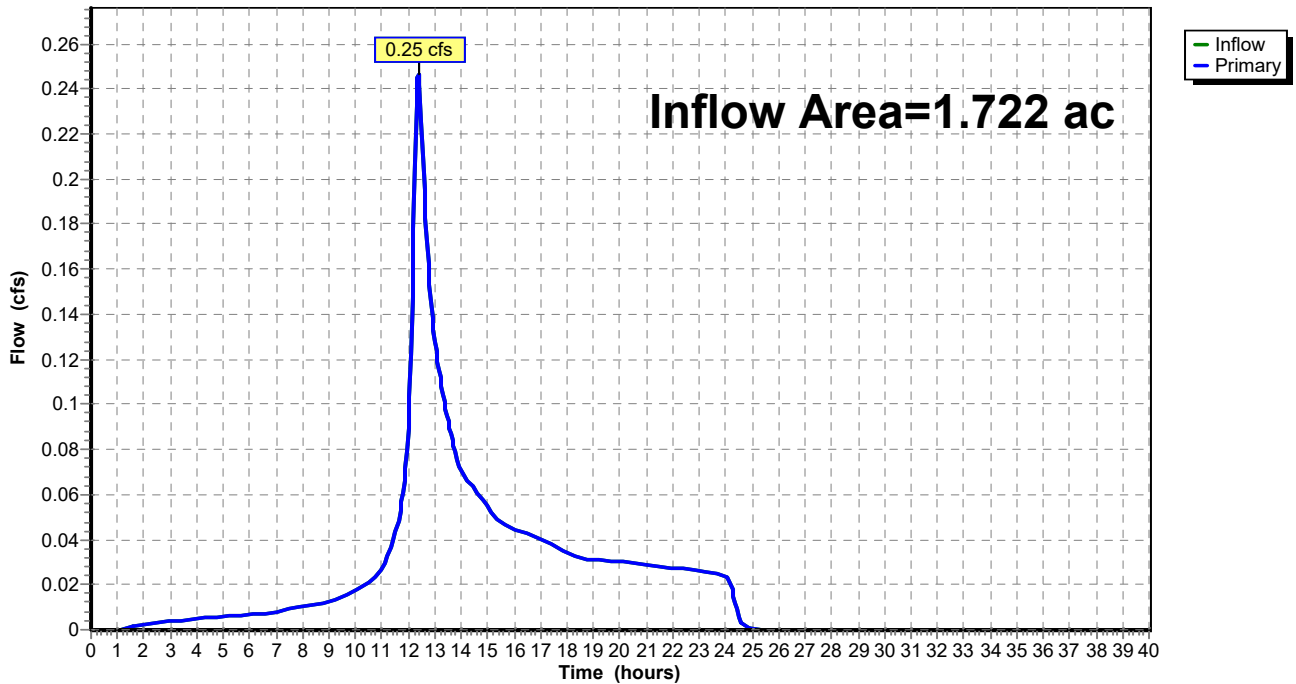
### Summary for Link 19L: Pre DA 4

Inflow Area = 1.722 ac, 4.82% Impervious, Inflow Depth = 0.45" for 10-Year event  
Inflow = 0.25 cfs @ 12.38 hrs, Volume= 0.064 af  
Primary = 0.25 cfs @ 12.38 hrs, Volume= 0.064 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs

### Link 19L: Pre DA 4

Hydrograph





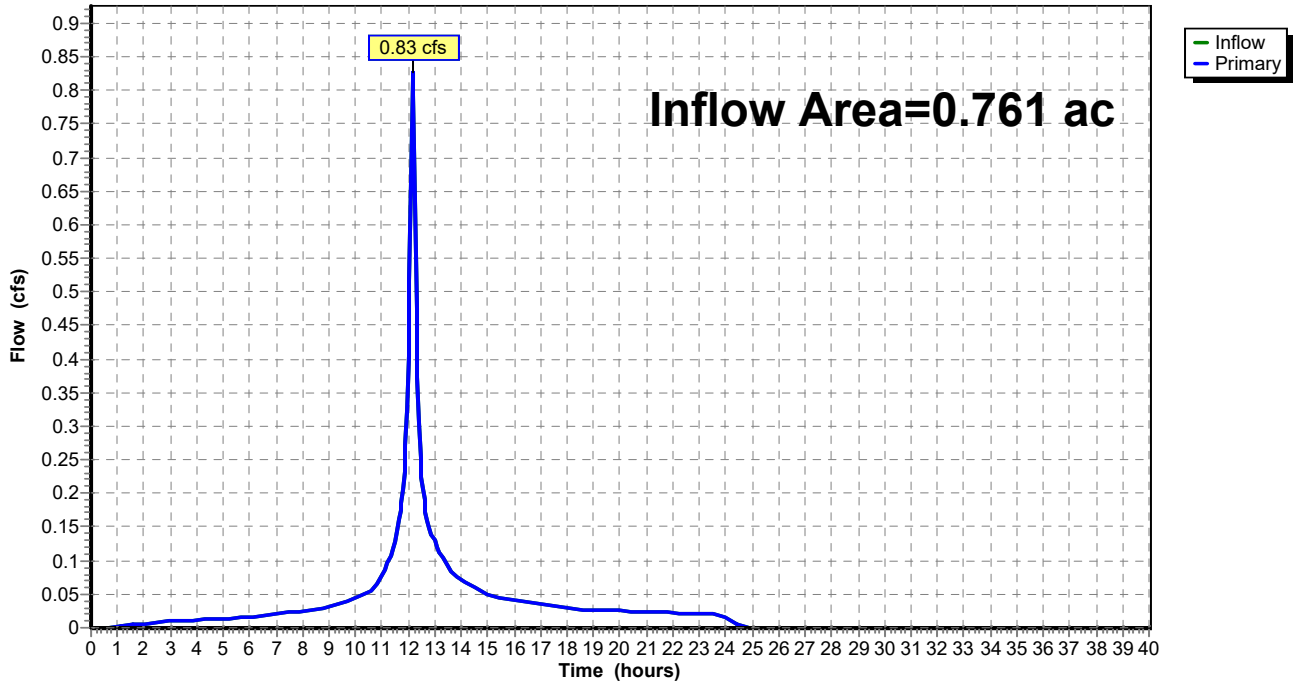
### Summary for Link 21L: Pre DA 3

Inflow Area = 0.761 ac, 25.49% Impervious, Inflow Depth = 1.46" for 10-Year event  
Inflow = 0.83 cfs @ 12.17 hrs, Volume= 0.092 af  
Primary = 0.83 cfs @ 12.17 hrs, Volume= 0.092 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs

### Link 21L: Pre DA 3

Hydrograph



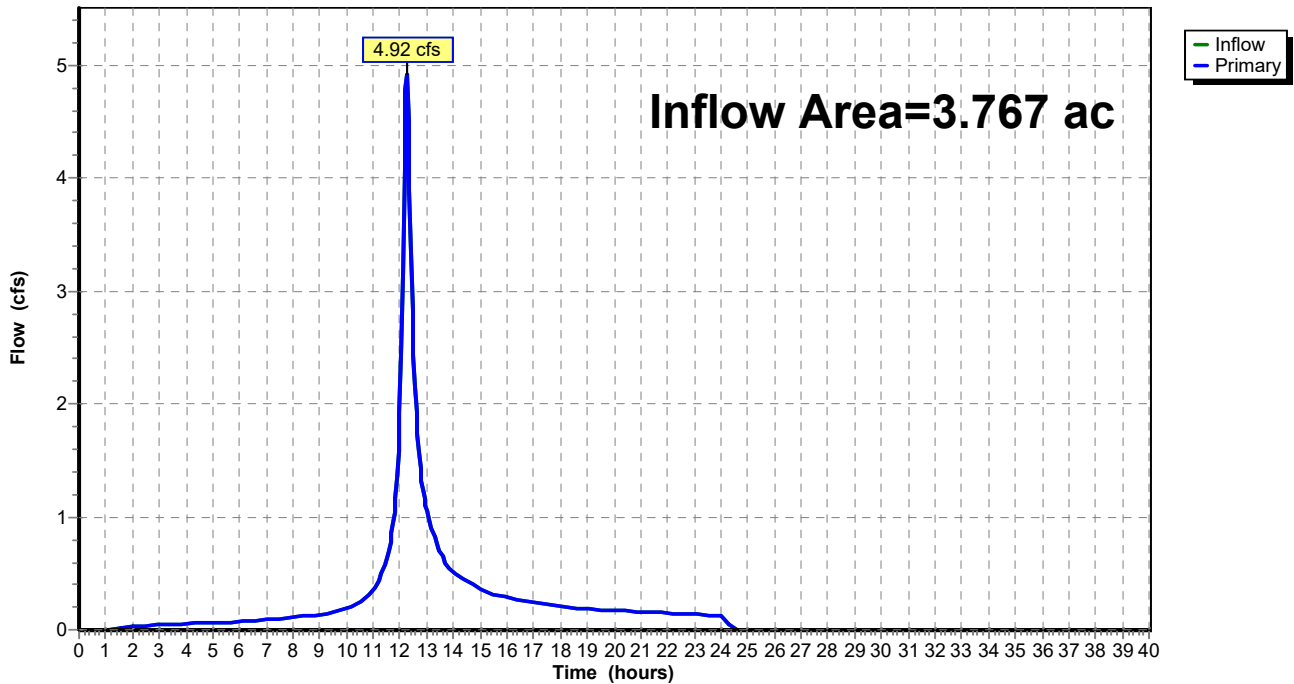
### Summary for Link 22L: Offsite

Inflow Area = 3.767 ac, 23.20% Impervious, Inflow Depth = 1.89" for 10-Year event  
Inflow = 4.92 cfs @ 12.24 hrs, Volume= 0.594 af  
Primary = 4.92 cfs @ 12.24 hrs, Volume= 0.594 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs

### Link 22L: Offsite

#### Hydrograph



**PRE-DEVELOPMENT RUNOFF CALCULATIONS**  
**(25 YEAR STORM)**



**Pre-Drainage - November 26**

Prepared by DW Smith Associates

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NOAA 24-hr D 25-Year Rainfall=6.53"

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Time span=0.00-40.00 hrs, dt=0.05 hrs, 801 points  
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN  
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

<b>Subcatchment 5S: DA 4 Woods</b>	Runoff Area=0.237 ac 0.00% Impervious Runoff Depth=0.14" Flow Length=370' Tc=36.2 min CN=30 Runoff=0.00 cfs 0.003 af
<b>Subcatchment 6S: DA 5 Woods</b>	Runoff Area=0.601 ac 0.00% Impervious Runoff Depth=0.14" Flow Length=150' Tc=23.3 min CN=30 Runoff=0.01 cfs 0.007 af
<b>Subcatchment 7S: DA 6 Woods</b>	Runoff Area=0.201 ac 0.00% Impervious Runoff Depth=0.14" Flow Length=113' Tc=22.1 min CN=30 Runoff=0.00 cfs 0.002 af
<b>Subcatchment 9S: DA 1 Grass</b>	Runoff Area=2.520 ac 0.00% Impervious Runoff Depth=0.61" Flow Length=780' Tc=20.5 min CN=39 Runoff=0.49 cfs 0.128 af
<b>Subcatchment 10S: DA 2 Woods</b>	Runoff Area=0.755 ac 0.00% Impervious Runoff Depth=0.14" Flow Length=343' Tc=34.4 min CN=30 Runoff=0.01 cfs 0.009 af
<b>Subcatchment 11S: DA 2 Grass</b>	Runoff Area=2.086 ac 0.00% Impervious Runoff Depth=0.61" Flow Length=460' Tc=31.6 min CN=39 Runoff=0.35 cfs 0.106 af
<b>Subcatchment 16S: DA 6 Grass</b>	Runoff Area=0.825 ac 0.00% Impervious Runoff Depth=0.61" Flow Length=145' Tc=18.5 min CN=39 Runoff=0.17 cfs 0.042 af
<b>Subcatchment 18S: DA 5 Grass</b>	Runoff Area=0.462 ac 0.00% Impervious Runoff Depth=0.61" Flow Length=268' Tc=22.0 min CN=39 Runoff=0.09 cfs 0.023 af
<b>Subcatchment 20S: DA 4 Grass</b>	Runoff Area=1.402 ac 0.00% Impervious Runoff Depth=0.61" Flow Length=388' Tc=23.9 min CN=39 Runoff=0.26 cfs 0.071 af
<b>Subcatchment 22S: DA 3 Grass</b>	Runoff Area=0.567 ac 0.00% Impervious Runoff Depth=0.61" Flow Length=457' Tc=33.2 min CN=39 Runoff=0.09 cfs 0.029 af
<b>Subcatchment 23S: DA 3 Impervious</b>	Runoff Area=0.194 ac 100.00% Impervious Runoff Depth=6.29" Tc=10.0 min CN=98 Runoff=1.03 cfs 0.102 af
<b>Subcatchment 24S: DA 6 Impervious</b>	Runoff Area=0.094 ac 100.00% Impervious Runoff Depth=6.29" Tc=10.0 min CN=98 Runoff=0.50 cfs 0.049 af
<b>Subcatchment 25S: DA 2 Impervious</b>	Runoff Area=0.039 ac 100.00% Impervious Runoff Depth=6.29" Flow Length=460' Tc=31.6 min CN=98 Runoff=0.13 cfs 0.020 af
<b>Subcatchment 26S: DA 4 Impervious</b>	Runoff Area=0.083 ac 100.00% Impervious Runoff Depth=6.29" Flow Length=293' Tc=26.5 min CN=98 Runoff=0.30 cfs 0.044 af
<b>Subcatchment 27S: Agriculture</b>	Runoff Area=1.510 ac 0.00% Impervious Runoff Depth=2.55" Flow Length=272' Tc=19.4 min CN=63 Runoff=2.89 cfs 0.321 af
<b>Subcatchment 28S: Cultivated</b>	Runoff Area=1.470 ac 0.00% Impervious Runoff Depth=2.55" Flow Length=650' Tc=19.1 min CN=63 Runoff=2.83 cfs 0.313 af

**Pre-Drainage - November 26**

Prepared by DW Smith Associates

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NOAA 24-hr D 25-Year Rainfall=6.53"

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**Subcatchment29S: Impervious**

Runoff Area=0.874 ac 100.00% Impervious Runoff Depth=6.29"  
Flow Length=750' Tc=13.8 min CN=98 Runoff=4.19 cfs 0.458 af

**Subcatchment30S: Woods**

Runoff Area=0.115 ac 0.00% Impervious Runoff Depth=0.14"  
Flow Length=580' Tc=28.3 min CN=30 Runoff=0.00 cfs 0.001 af

**Subcatchment31S: Grass**

Runoff Area=1.308 ac 0.00% Impervious Runoff Depth=0.61"  
Flow Length=820' Tc=22.1 min CN=39 Runoff=0.25 cfs 0.066 af

**Link 3L: Total Off Site**

Inflow=11.69 cfs 1.794 af  
Primary=11.69 cfs 1.794 af

**Link 13L: Pre DA 1**

Inflow=3.25 cfs 0.449 af  
Primary=3.25 cfs 0.449 af

**Link 14L: Pre DA 2**

Inflow=0.45 cfs 0.135 af  
Primary=0.45 cfs 0.135 af

**Link 15L: Pre DA 6**

Inflow=0.54 cfs 0.093 af  
Primary=0.54 cfs 0.093 af

**Link 17L: Pre DA 5**

Inflow=0.09 cfs 0.030 af  
Primary=0.09 cfs 0.030 af

**Link 19L: Pre DA 4**

Inflow=0.53 cfs 0.117 af  
Primary=0.53 cfs 0.117 af

**Link 21L: Pre DA 3**

Inflow=1.04 cfs 0.130 af  
Primary=1.04 cfs 0.130 af

**Link 22L: Offsite**

Inflow=6.85 cfs 0.839 af  
Primary=6.85 cfs 0.839 af

**Total Runoff Area = 15.343 ac Runoff Volume = 1.794 af Average Runoff Depth = 1.40"**  
**91.63% Pervious = 14.059 ac 8.37% Impervious = 1.284 ac**

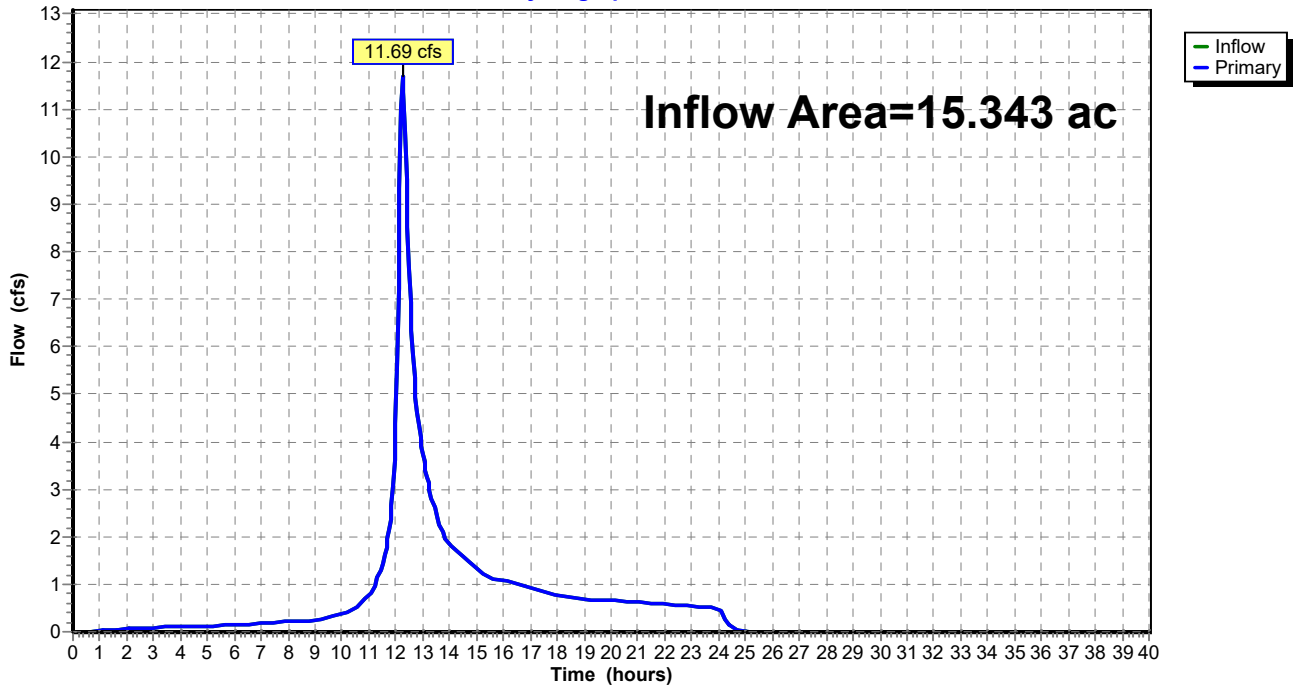
### Summary for Link 3L: Total Off Site

Inflow Area = 15.343 ac, 8.37% Impervious, Inflow Depth = 1.40" for 25-Year event  
Inflow = 11.69 cfs @ 12.26 hrs, Volume= 1.794 af  
Primary = 11.69 cfs @ 12.26 hrs, Volume= 1.794 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs

### Link 3L: Total Off Site

Hydrograph



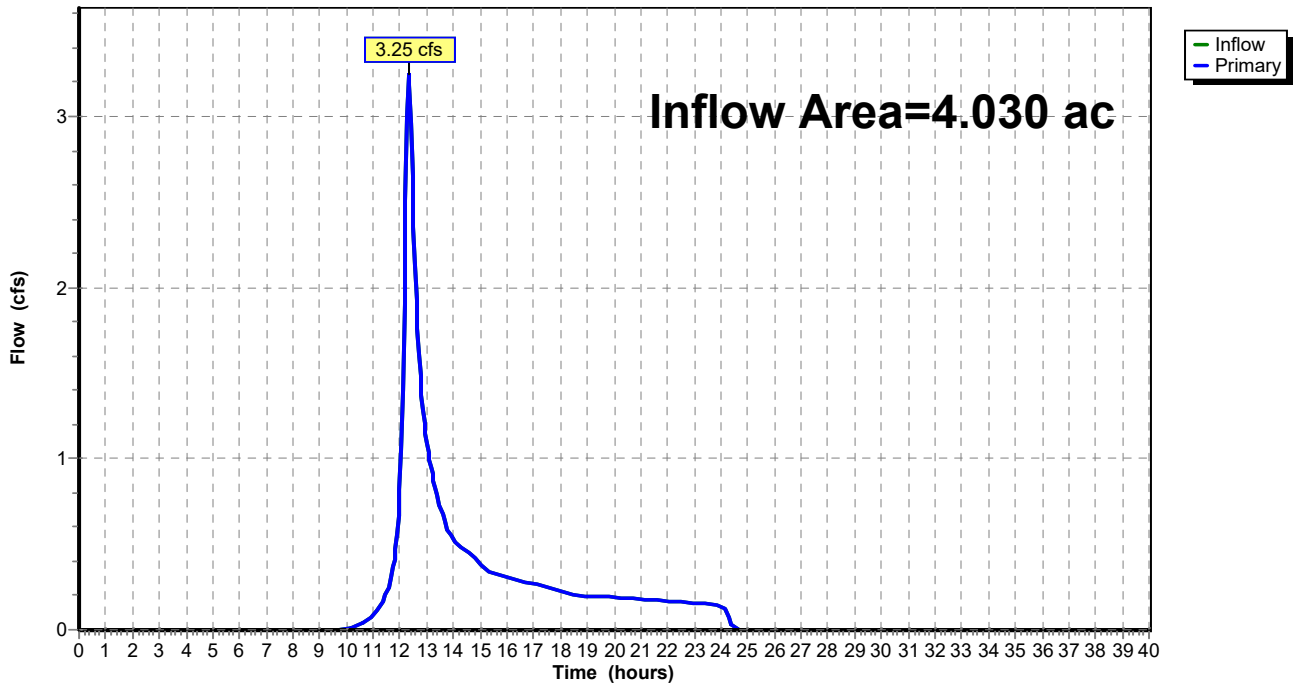
### Summary for Link 13L: Pre DA 1

Inflow Area = 4.030 ac, 0.00% Impervious, Inflow Depth = 1.34" for 25-Year event  
Inflow = 3.25 cfs @ 12.32 hrs, Volume= 0.449 af  
Primary = 3.25 cfs @ 12.32 hrs, Volume= 0.449 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs

### Link 13L: Pre DA 1

Hydrograph





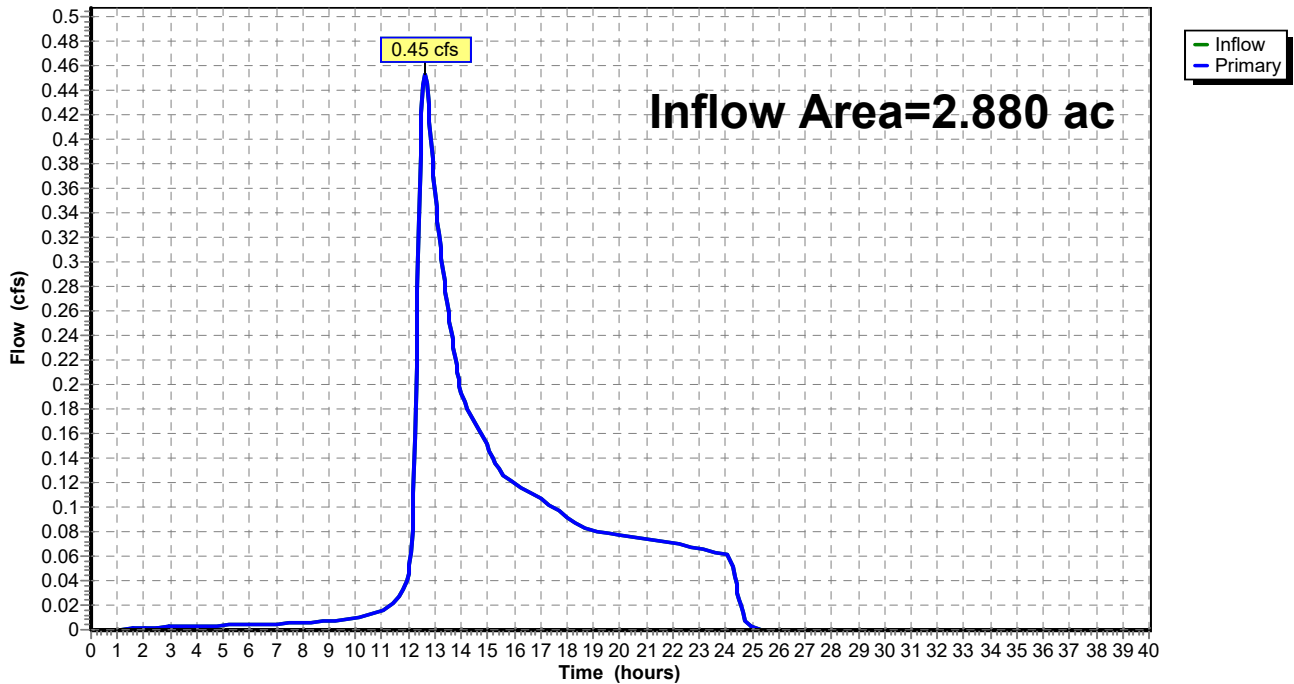
### Summary for Link 14L: Pre DA 2

Inflow Area = 2.880 ac, 1.35% Impervious, Inflow Depth = 0.56" for 25-Year event  
Inflow = 0.45 cfs @ 12.61 hrs, Volume= 0.135 af  
Primary = 0.45 cfs @ 12.61 hrs, Volume= 0.135 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs

### Link 14L: Pre DA 2

#### Hydrograph



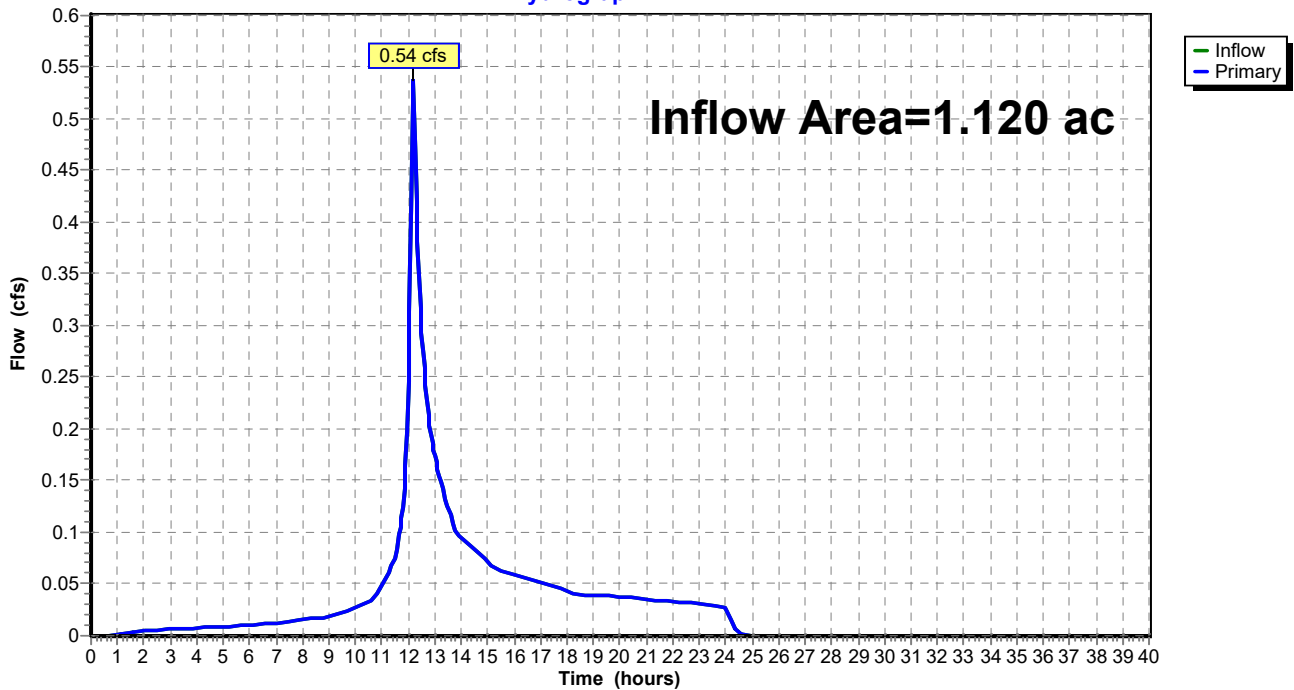
### Summary for Link 15L: Pre DA 6

Inflow Area = 1.120 ac, 8.39% Impervious, Inflow Depth = 1.00" for 25-Year event  
Inflow = 0.54 cfs @ 12.19 hrs, Volume= 0.093 af  
Primary = 0.54 cfs @ 12.19 hrs, Volume= 0.093 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs

### Link 15L: Pre DA 6

Hydrograph



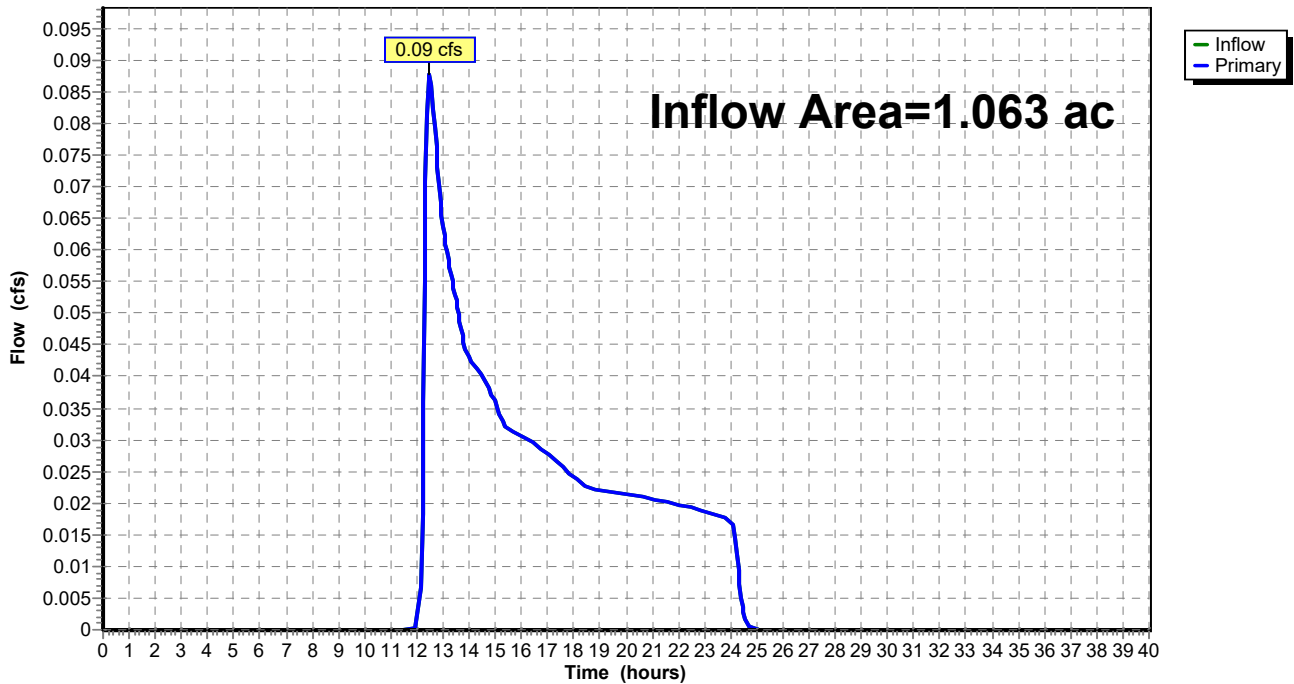
### Summary for Link 17L: Pre DA 5

Inflow Area = 1.063 ac, 0.00% Impervious, Inflow Depth = 0.34" for 25-Year event  
Inflow = 0.09 cfs @ 12.49 hrs, Volume= 0.030 af  
Primary = 0.09 cfs @ 12.49 hrs, Volume= 0.030 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs

### Link 17L: Pre DA 5

Hydrograph



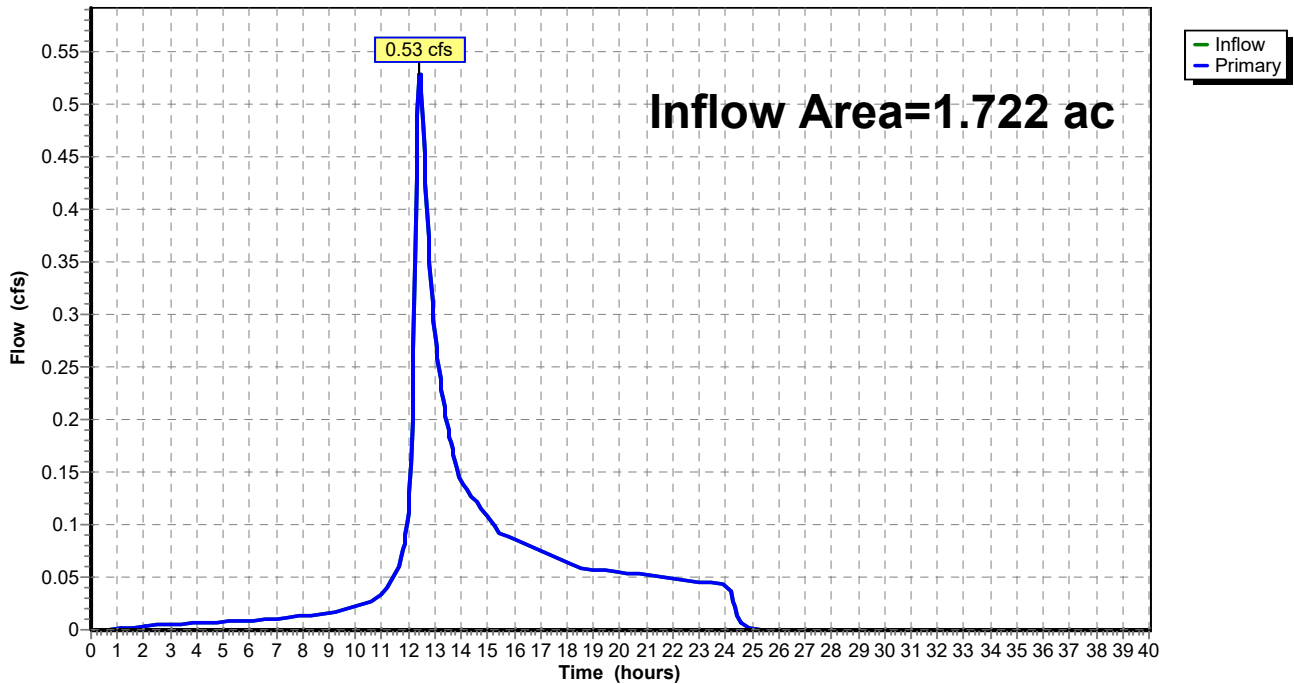
### Summary for Link 19L: Pre DA 4

Inflow Area = 1.722 ac, 4.82% Impervious, Inflow Depth = 0.82" for 25-Year event  
Inflow = 0.53 cfs @ 12.44 hrs, Volume= 0.117 af  
Primary = 0.53 cfs @ 12.44 hrs, Volume= 0.117 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs

### Link 19L: Pre DA 4

Hydrograph



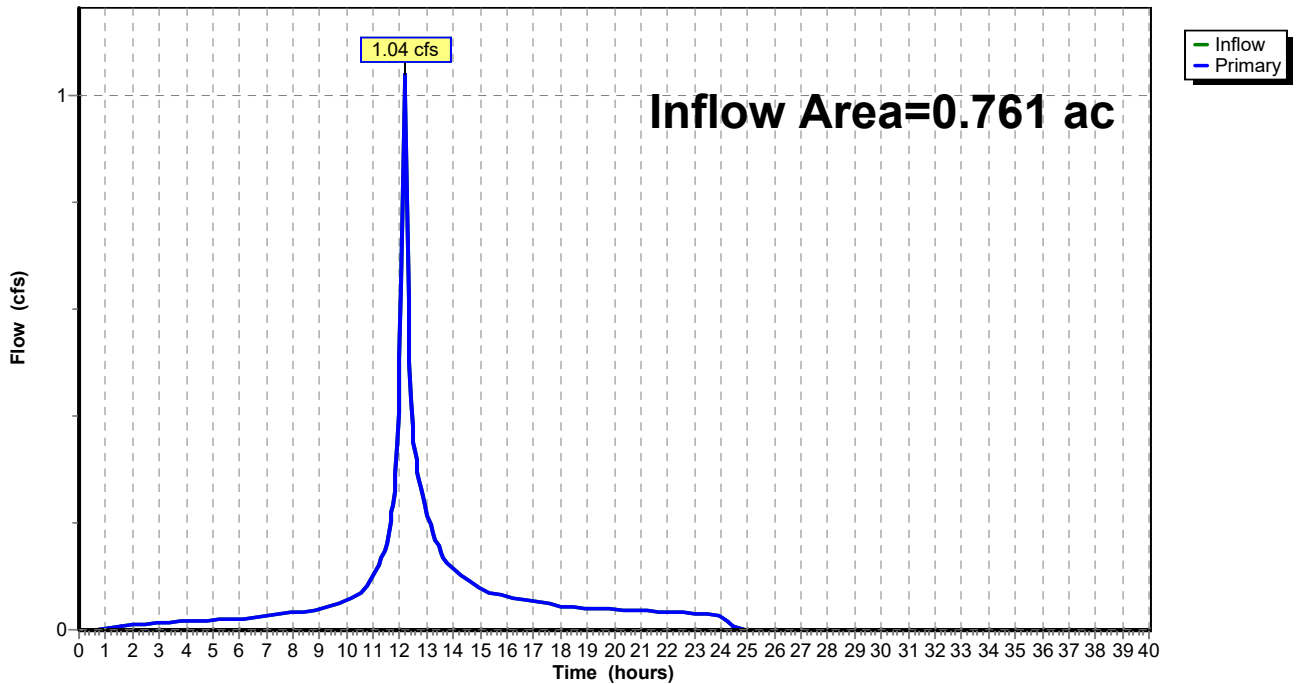
### Summary for Link 21L: Pre DA 3

Inflow Area = 0.761 ac, 25.49% Impervious, Inflow Depth = 2.06" for 25-Year event  
Inflow = 1.04 cfs @ 12.17 hrs, Volume= 0.130 af  
Primary = 1.04 cfs @ 12.17 hrs, Volume= 0.130 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs

### Link 21L: Pre DA 3

#### Hydrograph



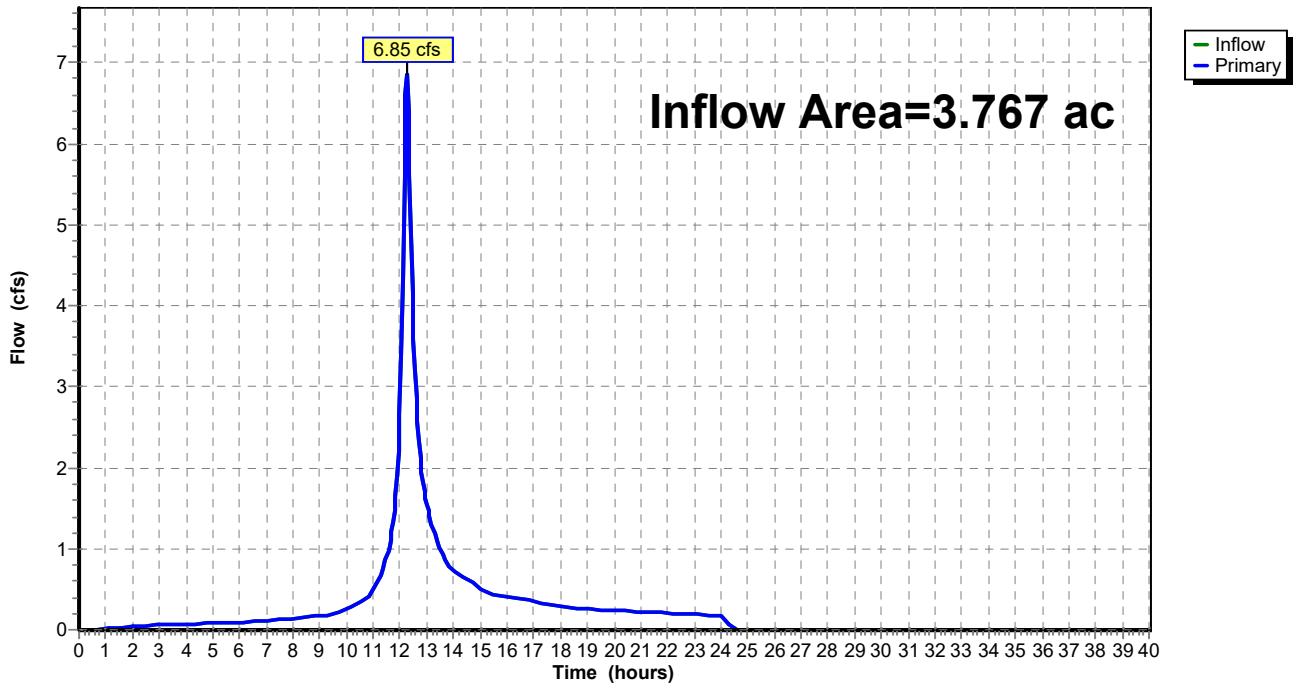
### Summary for Link 22L: Offsite

Inflow Area = 3.767 ac, 23.20% Impervious, Inflow Depth = 2.67" for 25-Year event  
Inflow = 6.85 cfs @ 12.24 hrs, Volume= 0.839 af  
Primary = 6.85 cfs @ 12.24 hrs, Volume= 0.839 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs

### Link 22L: Offsite

#### Hydrograph



**PRE-DEVELOPMENT RUNOFF CALCULATIONS**  
**(100 YEAR STORM)**





**Pre-Drainage - November 26**

Prepared by DW Smith Associates

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NOAA 24-hr D 100-Year Rainfall=8.94"

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Time span=0.00-40.00 hrs, dt=0.05 hrs, 801 points  
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN  
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

<b>Subcatchment 5S: DA 4 Woods</b>	Runoff Area=0.237 ac 0.00% Impervious Runoff Depth=0.66" Flow Length=370' Tc=36.2 min CN=30 Runoff=0.03 cfs 0.013 af
<b>Subcatchment 6S: DA 5 Woods</b>	Runoff Area=0.601 ac 0.00% Impervious Runoff Depth=0.66" Flow Length=150' Tc=23.3 min CN=30 Runoff=0.10 cfs 0.033 af
<b>Subcatchment 7S: DA 6 Woods</b>	Runoff Area=0.201 ac 0.00% Impervious Runoff Depth=0.66" Flow Length=113' Tc=22.1 min CN=30 Runoff=0.03 cfs 0.011 af
<b>Subcatchment 9S: DA 1 Grass</b>	Runoff Area=2.520 ac 0.00% Impervious Runoff Depth=1.57" Flow Length=780' Tc=20.5 min CN=39 Runoff=2.25 cfs 0.331 af
<b>Subcatchment 10S: DA 2 Woods</b>	Runoff Area=0.755 ac 0.00% Impervious Runoff Depth=0.66" Flow Length=343' Tc=34.4 min CN=30 Runoff=0.11 cfs 0.042 af
<b>Subcatchment 11S: DA 2 Grass</b>	Runoff Area=2.086 ac 0.00% Impervious Runoff Depth=1.57" Flow Length=460' Tc=31.6 min CN=39 Runoff=1.50 cfs 0.274 af
<b>Subcatchment 16S: DA 6 Grass</b>	Runoff Area=0.825 ac 0.00% Impervious Runoff Depth=1.57" Flow Length=145' Tc=18.5 min CN=39 Runoff=0.77 cfs 0.108 af
<b>Subcatchment 18S: DA 5 Grass</b>	Runoff Area=0.462 ac 0.00% Impervious Runoff Depth=1.57" Flow Length=268' Tc=22.0 min CN=39 Runoff=0.40 cfs 0.061 af
<b>Subcatchment 20S: DA 4 Grass</b>	Runoff Area=1.402 ac 0.00% Impervious Runoff Depth=1.57" Flow Length=388' Tc=23.9 min CN=39 Runoff=1.16 cfs 0.184 af
<b>Subcatchment 22S: DA 3 Grass</b>	Runoff Area=0.567 ac 0.00% Impervious Runoff Depth=1.57" Flow Length=457' Tc=33.2 min CN=39 Runoff=0.39 cfs 0.074 af
<b>Subcatchment 23S: DA 3 Impervious</b>	Runoff Area=0.194 ac 100.00% Impervious Runoff Depth=8.70" Tc=10.0 min CN=98 Runoff=1.42 cfs 0.141 af
<b>Subcatchment 24S: DA 6 Impervious</b>	Runoff Area=0.094 ac 100.00% Impervious Runoff Depth=8.70" Tc=10.0 min CN=98 Runoff=0.69 cfs 0.068 af
<b>Subcatchment 25S: DA 2 Impervious</b>	Runoff Area=0.039 ac 100.00% Impervious Runoff Depth=8.70" Flow Length=460' Tc=31.6 min CN=98 Runoff=0.18 cfs 0.028 af
<b>Subcatchment 26S: DA 4 Impervious</b>	Runoff Area=0.083 ac 100.00% Impervious Runoff Depth=8.70" Flow Length=293' Tc=26.5 min CN=98 Runoff=0.41 cfs 0.060 af
<b>Subcatchment 27S: Agriculture</b>	Runoff Area=1.510 ac 0.00% Impervious Runoff Depth=4.42" Flow Length=272' Tc=19.4 min CN=63 Runoff=5.10 cfs 0.556 af
<b>Subcatchment 28S: Cultivated</b>	Runoff Area=1.470 ac 0.00% Impervious Runoff Depth=4.42" Flow Length=650' Tc=19.1 min CN=63 Runoff=5.00 cfs 0.542 af

<b>Subcatchment29S: Impervious</b>	Runoff Area=0.874 ac 100.00% Impervious Runoff Depth=8.70" Flow Length=750' Tc=13.8 min CN=98 Runoff=5.75 cfs 0.634 af
<b>Subcatchment30S: Woods</b>	Runoff Area=0.115 ac 0.00% Impervious Runoff Depth=0.66" Flow Length=580' Tc=28.3 min CN=30 Runoff=0.02 cfs 0.006 af
<b>Subcatchment31S: Grass</b>	Runoff Area=1.308 ac 0.00% Impervious Runoff Depth=1.57" Flow Length=820' Tc=22.1 min CN=39 Runoff=1.12 cfs 0.172 af
<b>Link 3L: Total Off Site</b>	Inflow=23.08 cfs 3.337 af Primary=23.08 cfs 3.337 af
<b>Link 13L: Pre DA 1</b>	Inflow=7.26 cfs 0.887 af Primary=7.26 cfs 0.887 af
<b>Link 14L: Pre DA 2</b>	Inflow=1.73 cfs 0.344 af Primary=1.73 cfs 0.344 af
<b>Link 15L: Pre DA 6</b>	Inflow=1.23 cfs 0.187 af Primary=1.23 cfs 0.187 af
<b>Link 17L: Pre DA 5</b>	Inflow=0.46 cfs 0.094 af Primary=0.46 cfs 0.094 af
<b>Link 19L: Pre DA 4</b>	Inflow=1.58 cfs 0.257 af Primary=1.58 cfs 0.257 af
<b>Link 21L: Pre DA 3</b>	Inflow=1.49 cfs 0.215 af Primary=1.49 cfs 0.215 af
<b>Link 22L: Offsite</b>	Inflow=11.23 cfs 1.353 af Primary=11.23 cfs 1.353 af

**Total Runoff Area = 15.343 ac Runoff Volume = 3.337 af Average Runoff Depth = 2.61"**  
**91.63% Pervious = 14.059 ac 8.37% Impervious = 1.284 ac**

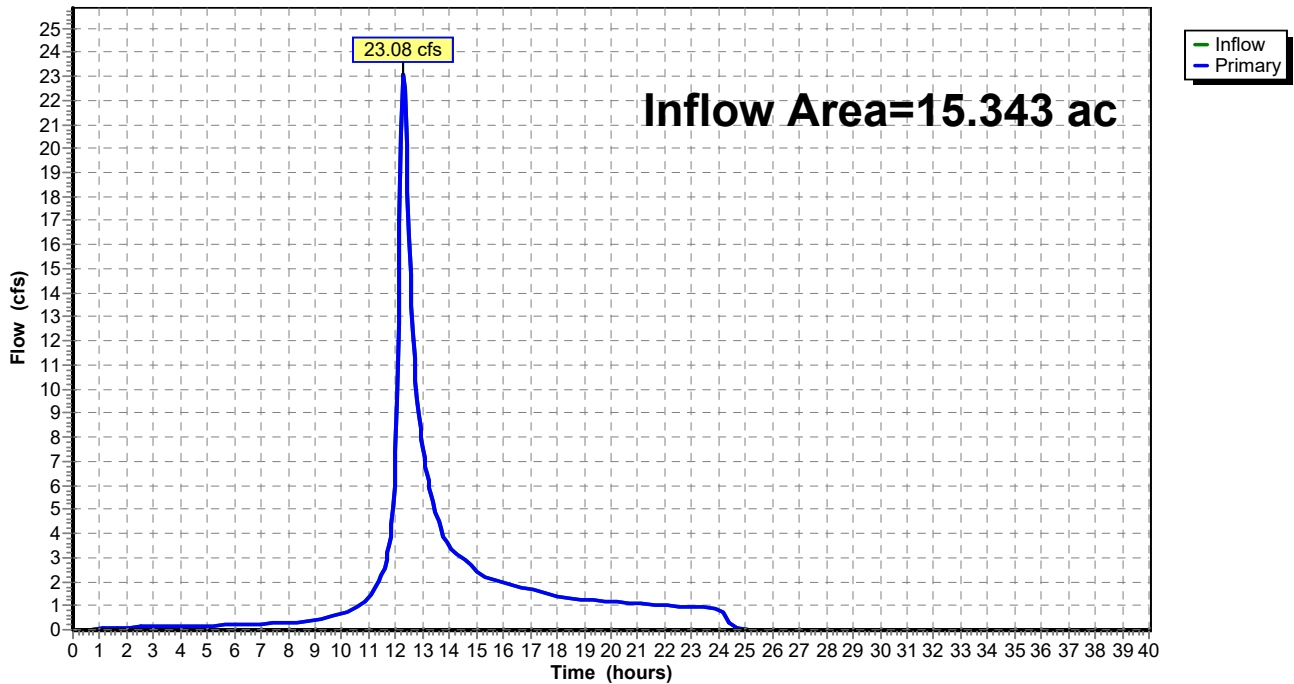
### Summary for Link 3L: Total Off Site

Inflow Area = 15.343 ac, 8.37% Impervious, Inflow Depth = 2.61" for 100-Year event  
Inflow = 23.08 cfs @ 12.28 hrs, Volume= 3.337 af  
Primary = 23.08 cfs @ 12.28 hrs, Volume= 3.337 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs

### Link 3L: Total Off Site

Hydrograph



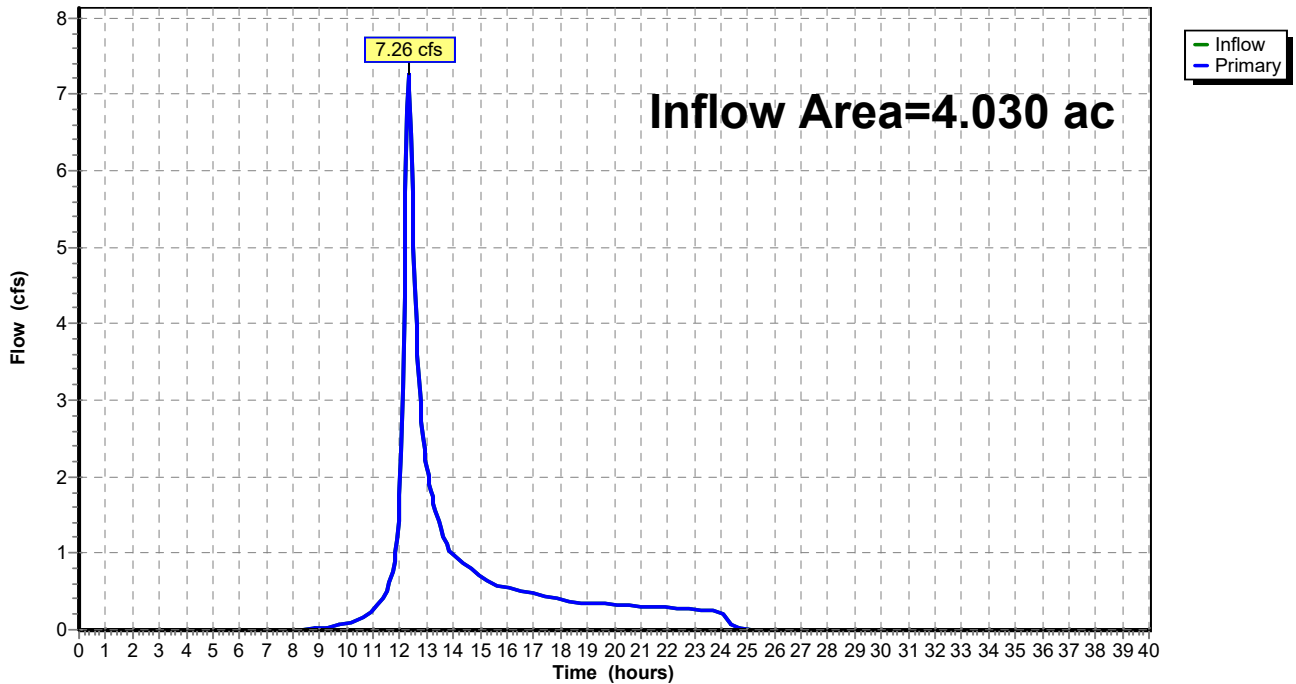
### Summary for Link 13L: Pre DA 1

Inflow Area = 4.030 ac, 0.00% Impervious, Inflow Depth = 2.64" for 100-Year event  
Inflow = 7.26 cfs @ 12.31 hrs, Volume= 0.887 af  
Primary = 7.26 cfs @ 12.31 hrs, Volume= 0.887 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs

### Link 13L: Pre DA 1

Hydrograph



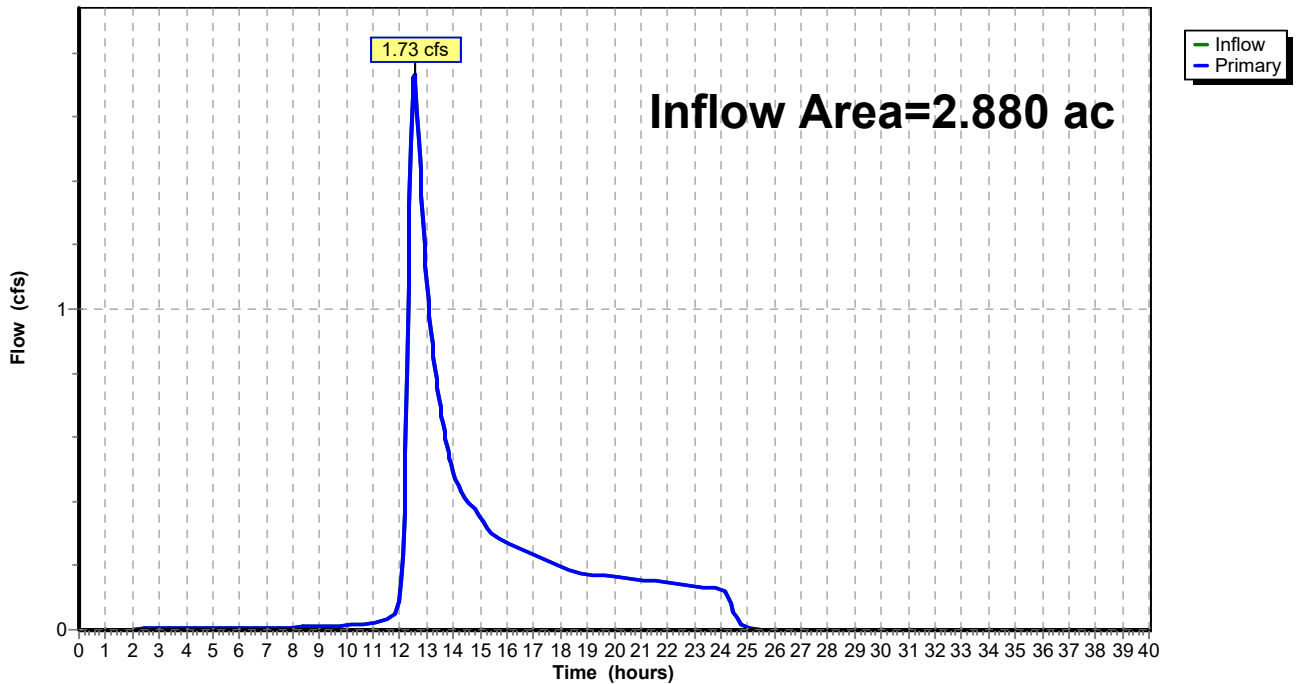
### Summary for Link 14L: Pre DA 2

Inflow Area = 2.880 ac, 1.35% Impervious, Inflow Depth = 1.43" for 100-Year event  
Inflow = 1.73 cfs @ 12.53 hrs, Volume= 0.344 af  
Primary = 1.73 cfs @ 12.53 hrs, Volume= 0.344 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs

### Link 14L: Pre DA 2

Hydrograph



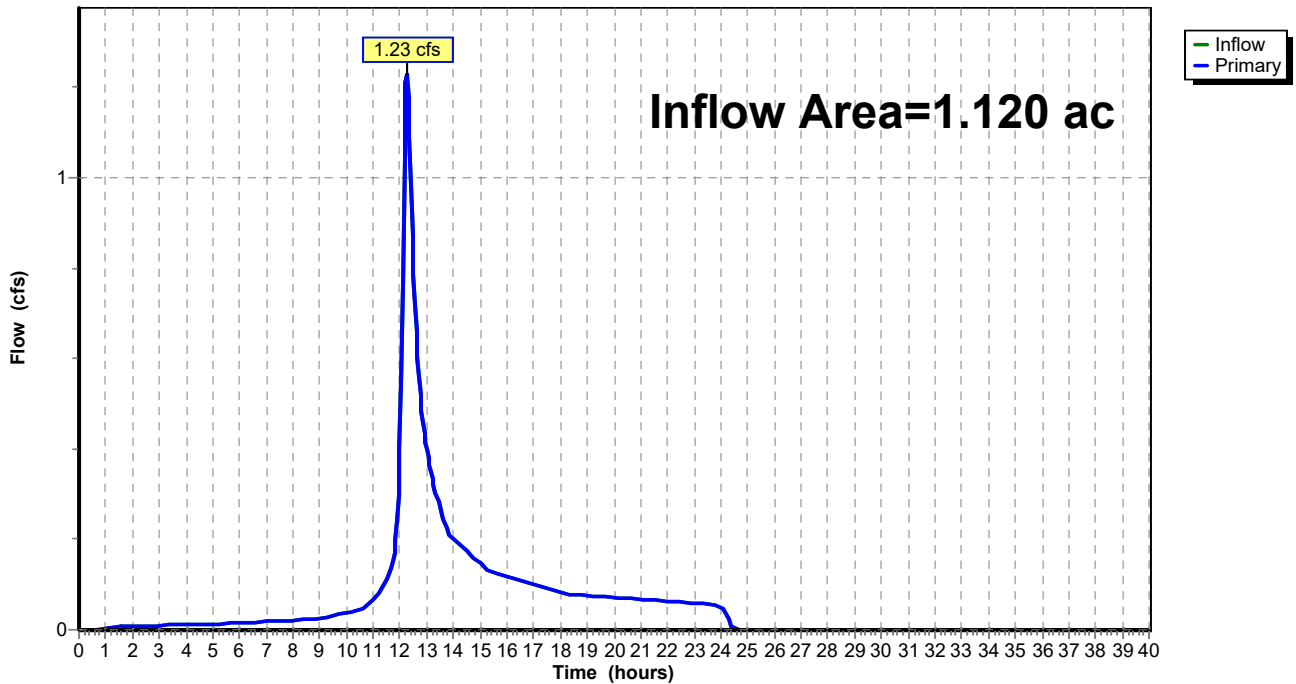
### Summary for Link 15L: Pre DA 6

Inflow Area = 1.120 ac, 8.39% Impervious, Inflow Depth = 2.01" for 100-Year event  
Inflow = 1.23 cfs @ 12.24 hrs, Volume= 0.187 af  
Primary = 1.23 cfs @ 12.24 hrs, Volume= 0.187 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs

### Link 15L: Pre DA 6

Hydrograph



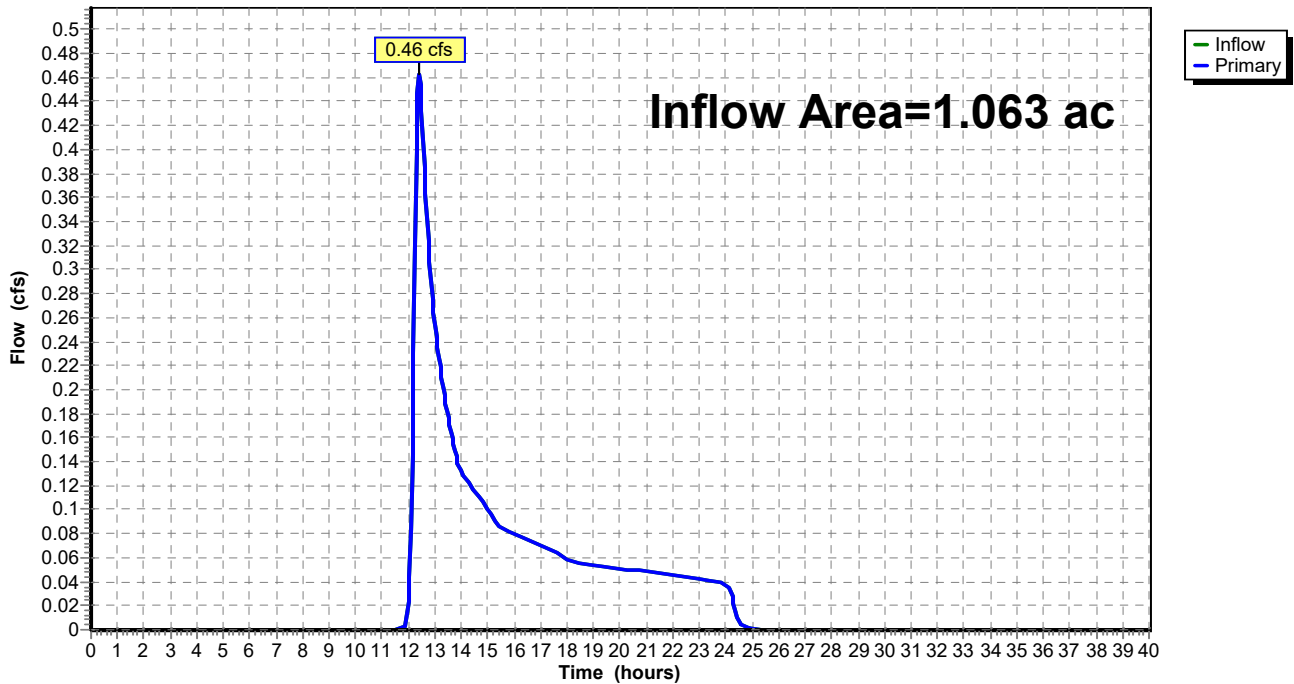
### Summary for Link 17L: Pre DA 5

Inflow Area = 1.063 ac, 0.00% Impervious, Inflow Depth = 1.06" for 100-Year event  
Inflow = 0.46 cfs @ 12.41 hrs, Volume= 0.094 af  
Primary = 0.46 cfs @ 12.41 hrs, Volume= 0.094 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs

### Link 17L: Pre DA 5

Hydrograph



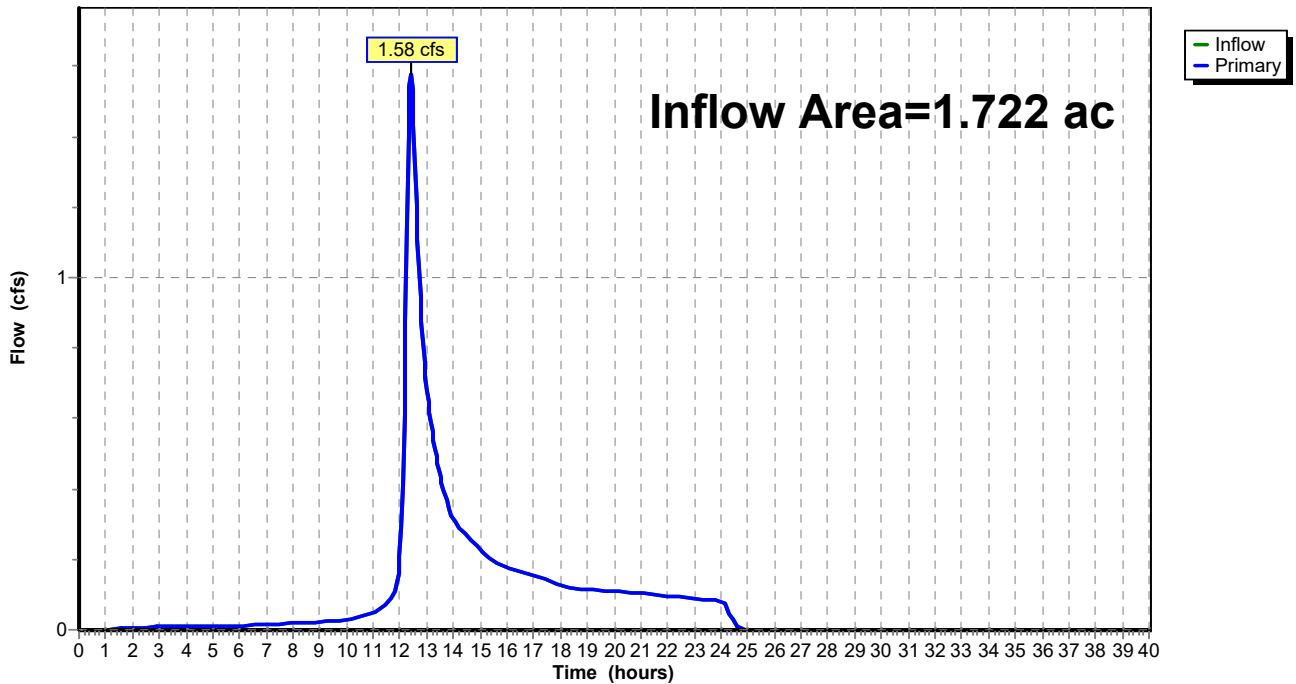
### Summary for Link 19L: Pre DA 4

Inflow Area = 1.722 ac, 4.82% Impervious, Inflow Depth = 1.79" for 100-Year event  
Inflow = 1.58 cfs @ 12.40 hrs, Volume= 0.257 af  
Primary = 1.58 cfs @ 12.40 hrs, Volume= 0.257 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs

### Link 19L: Pre DA 4

Hydrograph





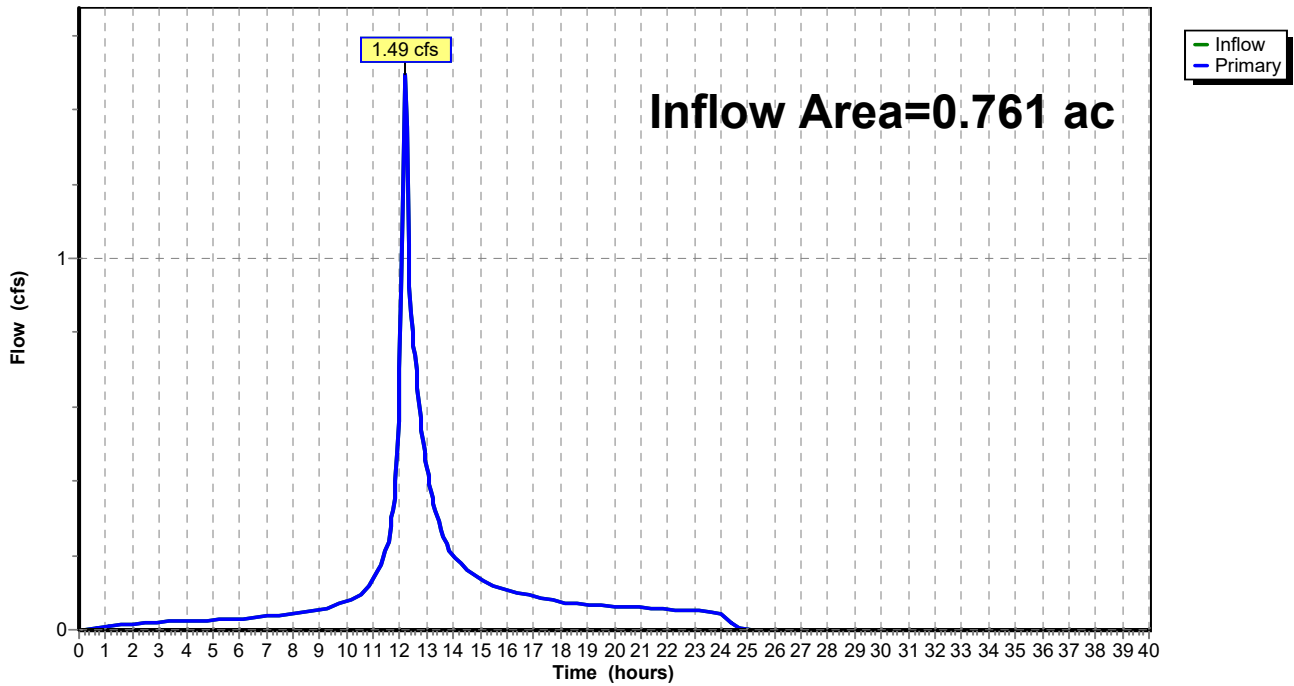
### Summary for Link 21L: Pre DA 3

Inflow Area = 0.761 ac, 25.49% Impervious, Inflow Depth = 3.39" for 100-Year event  
Inflow = 1.49 cfs @ 12.18 hrs, Volume= 0.215 af  
Primary = 1.49 cfs @ 12.18 hrs, Volume= 0.215 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs

### Link 21L: Pre DA 3

Hydrograph



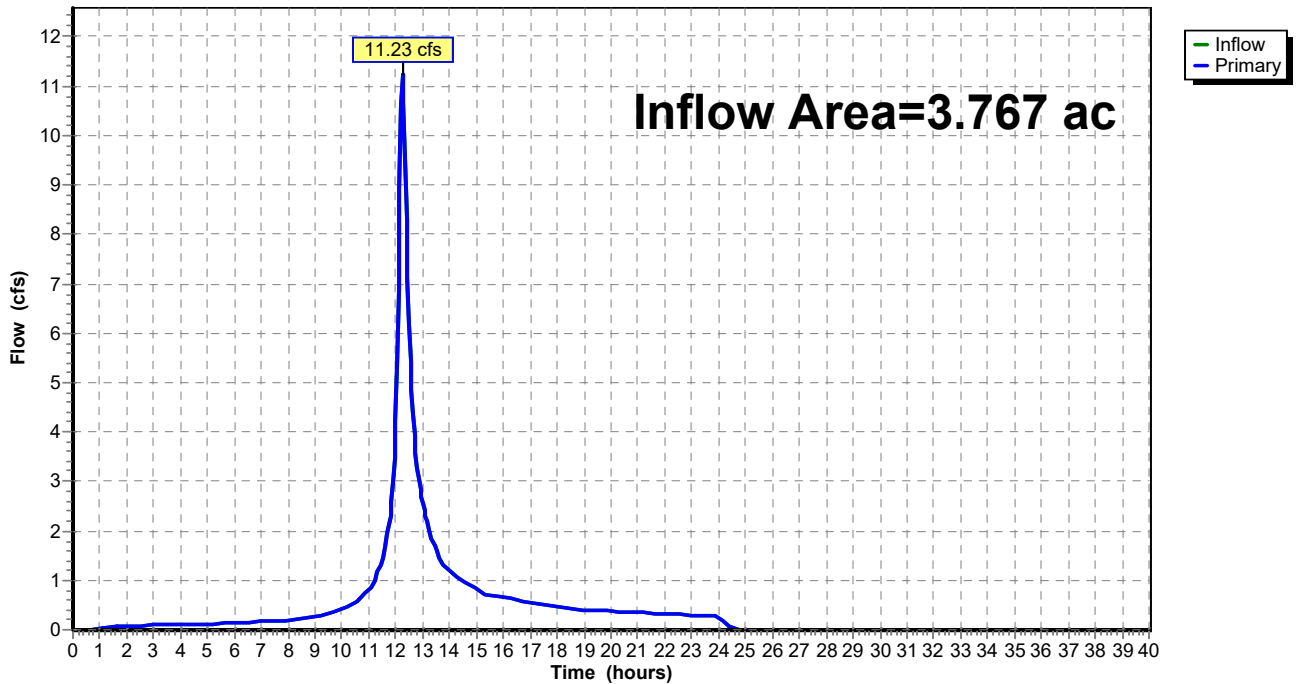
### Summary for Link 22L: Offsite

Inflow Area = 3.767 ac, 23.20% Impervious, Inflow Depth = 4.31" for 100-Year event  
Inflow = 11.23 cfs @ 12.25 hrs, Volume= 1.353 af  
Primary = 11.23 cfs @ 12.25 hrs, Volume= 1.353 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs

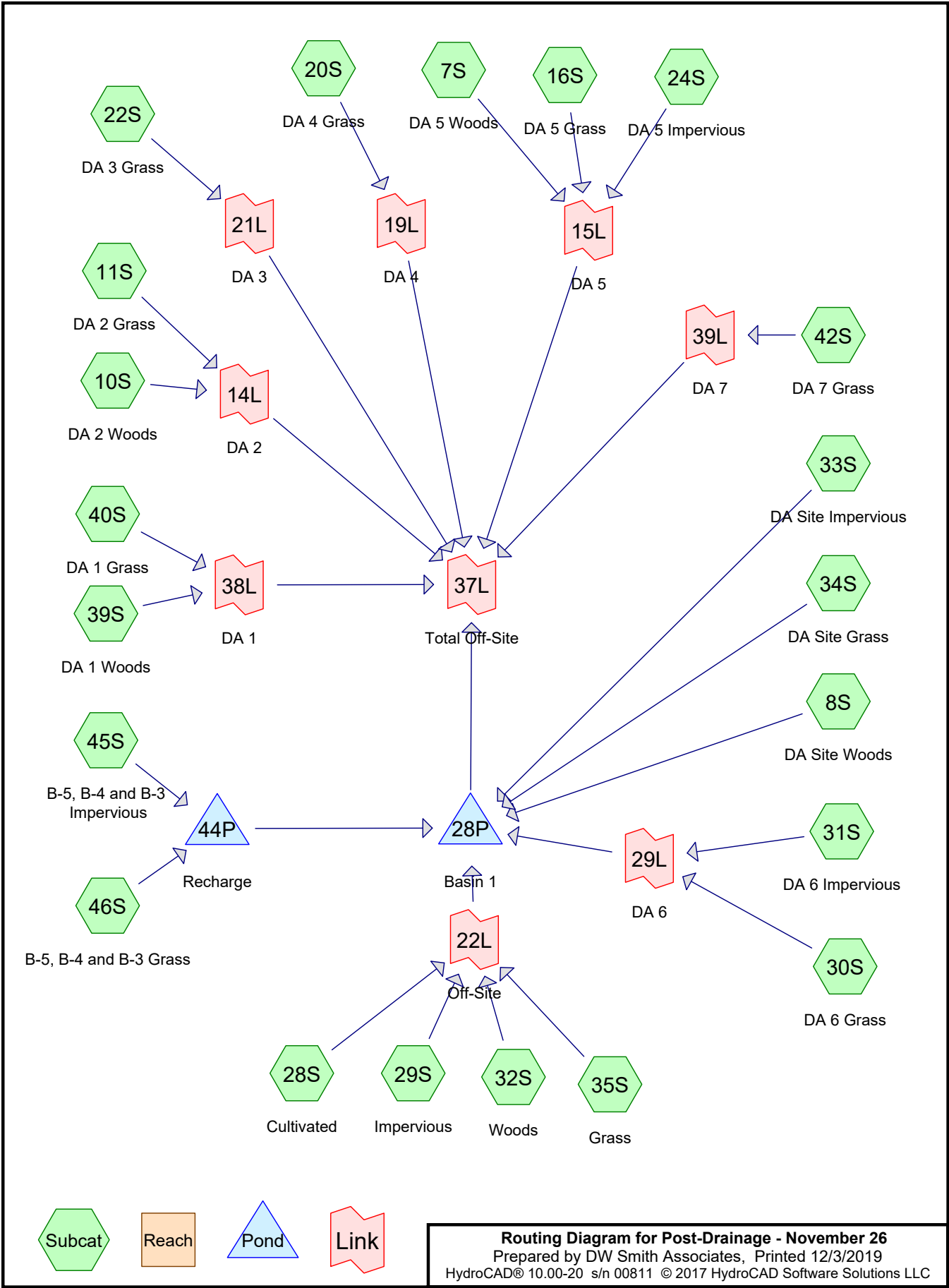
### Link 22L: Offsite

#### Hydrograph



## **APPENDIX E: POST-DEVELOPMENT RUNOFF CALCULATIONS**







**POST-DEVELOPMENT RUNOFF CALCULATIONS**  
**(2 YEAR STORM)**





**Post-Drainage - November 26**

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Time span=0.00-50.00 hrs, dt=0.05 hrs, 1001 points  
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN  
 Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

<b>Subcatchment 7S: DA 5 Woods</b>	Runoff Area=0.014 ac 0.00% Impervious Runoff Depth=0.00" Tc=10.0 min CN=30 Runoff=0.00 cfs 0.000 af
<b>Subcatchment 8S: DA Site Woods</b>	Runoff Area=0.116 ac 0.00% Impervious Runoff Depth=0.00" Flow Length=110' Tc=25.8 min CN=30 Runoff=0.00 cfs 0.000 af
<b>Subcatchment 10S: DA 2 Woods</b>	Runoff Area=0.338 ac 0.00% Impervious Runoff Depth=0.00" Flow Length=120' Slope=0.0147 '/' Tc=27.3 min CN=30 Runoff=0.00 cfs 0.000 af
<b>Subcatchment 11S: DA 2 Grass</b>	Runoff Area=0.292 ac 0.00% Impervious Runoff Depth=0.00" Tc=10.0 min CN=39 Runoff=0.00 cfs 0.000 af
<b>Subcatchment 16S: DA 5 Grass</b>	Runoff Area=0.363 ac 0.00% Impervious Runoff Depth=0.00" Tc=10.0 min CN=39 Runoff=0.00 cfs 0.000 af
<b>Subcatchment 20S: DA 4 Grass</b>	Runoff Area=0.467 ac 0.00% Impervious Runoff Depth=0.00" Tc=10.0 min CN=39 Runoff=0.00 cfs 0.000 af
<b>Subcatchment 22S: DA 3 Grass</b>	Runoff Area=0.078 ac 0.00% Impervious Runoff Depth=0.00" Tc=10.0 min CN=39 Runoff=0.00 cfs 0.000 af
<b>Subcatchment 24S: DA 5 Impervious</b>	Runoff Area=0.141 ac 100.00% Impervious Runoff Depth=3.15" Tc=10.0 min CN=98 Runoff=0.39 cfs 0.037 af
<b>Subcatchment 28S: Cultivated</b>	Runoff Area=1.470 ac 0.00% Impervious Runoff Depth=0.60" Flow Length=415' Tc=14.9 min CN=63 Runoff=0.59 cfs 0.074 af
<b>Subcatchment 29S: Impervious</b>	Runoff Area=0.874 ac 100.00% Impervious Runoff Depth=3.15" Tc=10.0 min CN=98 Runoff=2.39 cfs 0.229 af
<b>Subcatchment 30S: DA 6 Grass</b>	Runoff Area=0.013 ac 0.00% Impervious Runoff Depth=0.00" Tc=10.0 min CN=39 Runoff=0.00 cfs 0.000 af
<b>Subcatchment 31S: DA 6 Impervious</b>	Runoff Area=0.027 ac 100.00% Impervious Runoff Depth=3.15" Tc=10.0 min CN=98 Runoff=0.07 cfs 0.007 af
<b>Subcatchment 32S: Woods</b>	Runoff Area=0.115 ac 0.00% Impervious Runoff Depth=0.00" Flow Length=345' Tc=24.1 min CN=30 Runoff=0.00 cfs 0.000 af
<b>Subcatchment 33S: DA Site Impervious</b>	Runoff Area=3.441 ac 100.00% Impervious Runoff Depth=3.15" Tc=10.0 min CN=98 Runoff=9.41 cfs 0.902 af
<b>Subcatchment 34S: DA Site Grass</b>	Runoff Area=4.629 ac 0.00% Impervious Runoff Depth=0.00" Tc=10.0 min CN=39 Runoff=0.01 cfs 0.002 af
<b>Subcatchment 35S: Grass</b>	Runoff Area=1.308 ac 0.00% Impervious Runoff Depth=0.00" Flow Length=585' Tc=17.9 min CN=39 Runoff=0.00 cfs 0.000 af

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<b>Subcatchment39S: DA 1 Woods</b>	Runoff Area=0.018 ac 0.00% Impervious Runoff Depth=0.00" Tc=10.0 min CN=30 Runoff=0.00 cfs 0.000 af
<b>Subcatchment40S: DA 1 Grass</b>	Runoff Area=0.202 ac 0.00% Impervious Runoff Depth=0.00" Tc=10.0 min CN=39 Runoff=0.00 cfs 0.000 af
<b>Subcatchment42S: DA 7 Grass</b>	Runoff Area=0.391 ac 0.00% Impervious Runoff Depth=0.00" Tc=10.0 min CN=39 Runoff=0.00 cfs 0.000 af
<b>Subcatchment45S: B-5, B-4 and B-3</b>	Runoff Area=0.165 ac 100.00% Impervious Runoff Depth=3.15" Tc=10.0 min CN=98 Runoff=0.45 cfs 0.043 af
<b>Subcatchment46S: B-5, B-4 and B-3 Grass</b>	Runoff Area=0.881 ac 0.00% Impervious Runoff Depth=0.00" Tc=10.0 min CN=39 Runoff=0.00 cfs 0.000 af
<b>Pond 28P: Basin 1</b>	Peak Elev=168.46' Storage=37,995 cf Inflow=12.31 cfs 1.214 af Outflow=0.73 cfs 0.467 af
<b>Pond 44P: Recharge</b>	Peak Elev=170.18' Storage=1,898 cf Inflow=0.45 cfs 0.044 af Outflow=0.00 cfs 0.000 af
<b>Link 14L: DA 2</b>	Inflow=0.00 cfs 0.000 af Primary=0.00 cfs 0.000 af
<b>Link 15L: DA 5</b>	Inflow=0.39 cfs 0.037 af Primary=0.39 cfs 0.037 af
<b>Link 19L: DA 4</b>	Inflow=0.00 cfs 0.000 af Primary=0.00 cfs 0.000 af
<b>Link 21L: DA 3</b>	Inflow=0.00 cfs 0.000 af Primary=0.00 cfs 0.000 af
<b>Link 22L: Off-Site</b>	Inflow=2.83 cfs 0.303 af Primary=2.83 cfs 0.303 af
<b>Link 29L: DA 6</b>	Inflow=0.07 cfs 0.007 af Primary=0.07 cfs 0.007 af
<b>Link 37L: Total Off-Site</b>	Inflow=0.75 cfs 0.505 af Primary=0.75 cfs 0.505 af
<b>Link 38L: DA 1</b>	Inflow=0.00 cfs 0.000 af Primary=0.00 cfs 0.000 af
<b>Link 39L: DA 7</b>	Inflow=0.00 cfs 0.000 af Primary=0.00 cfs 0.000 af

**Total Runoff Area = 15.343 ac Runoff Volume = 1.296 af Average Runoff Depth = 1.01"**  
**69.71% Pervious = 10.695 ac 30.29% Impervious = 4.648 ac**

**Post-Drainage - November 26**

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**Summary for Pond 28P: Basin 1**

Inflow Area = 13.039 ac, 34.57% Impervious, Inflow Depth = 1.12" for 2-Year event  
 Inflow = 12.31 cfs @ 12.17 hrs, Volume= 1.214 af  
 Outflow = 0.73 cfs @ 14.38 hrs, Volume= 0.467 af, Atten= 94%, Lag= 132.6 min  
 Primary = 0.73 cfs @ 14.38 hrs, Volume= 0.467 af

Routing by Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs  
 Peak Elev= 168.46' @ 14.38 hrs Surf.Area= 18,714 sf Storage= 37,995 cf

Plug-Flow detention time= 533.4 min calculated for 0.467 af (38% of inflow)  
 Center-of-Mass det. time= 362.0 min ( 1,133.7 - 771.6 )

Volume	Invert	Avail.Storage	Storage Description
#1	166.15'	114,130 cf	<b>Basin (Prismatic)</b> Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
166.15	14,300	0	0
167.00	15,820	12,801	12,801
168.00	17,770	16,795	29,596
169.00	19,820	18,795	48,391
170.00	21,979	20,900	69,290
171.90	25,220	44,839	114,130

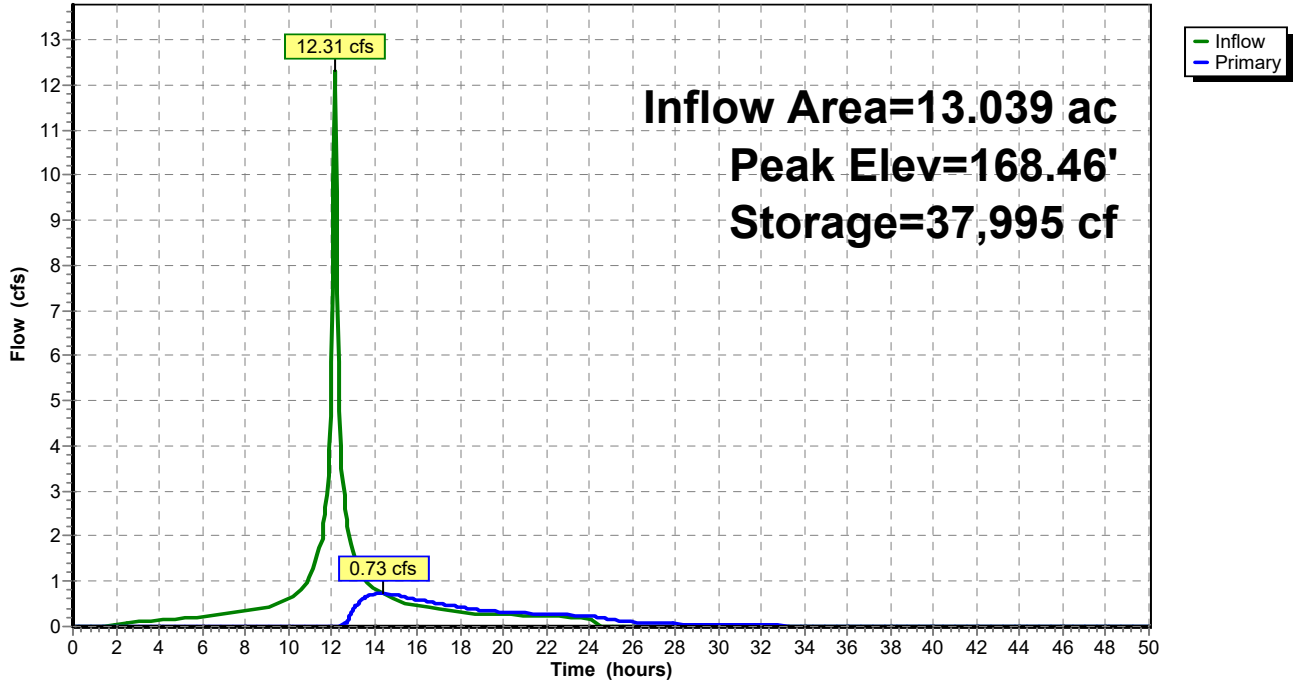
Device	Routing	Invert	Outlet Devices
#1	Primary	168.15'	<b>6.0" Vert. Orifice/Grate X 3.00</b> C= 0.600
#2	Primary	170.60'	<b>48.0" W x 48.0" H Vert. Orifice/Grate</b> C= 0.600
#3	Primary	169.30'	<b>1.8' long Sharp-Crested Rectangular Weir X 2.00</b> 2 End Contraction(s)

**Primary OutFlow** Max=0.73 cfs @ 14.38 hrs HW=168.46' (Free Discharge)

- 1=Orifice/Grate (Orifice Controls 0.73 cfs @ 1.90 fps)
- 2=Orifice/Grate ( Controls 0.00 cfs)
- 3=Sharp-Crested Rectangular Weir ( Controls 0.00 cfs)

Pond 28P: Basin 1

Hydrograph



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**Summary for Pond 44P: Recharge**

Inflow Area = 1.046 ac, 15.77% Impervious, Inflow Depth = 0.50" for 2-Year event  
 Inflow = 0.45 cfs @ 12.17 hrs, Volume= 0.044 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= 0.00-50.00 hrs, dt= 0.05 hrs  
 Peak Elev= 170.18' @ 24.60 hrs Surf.Area= 1,300 sf Storage= 1,898 cf

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

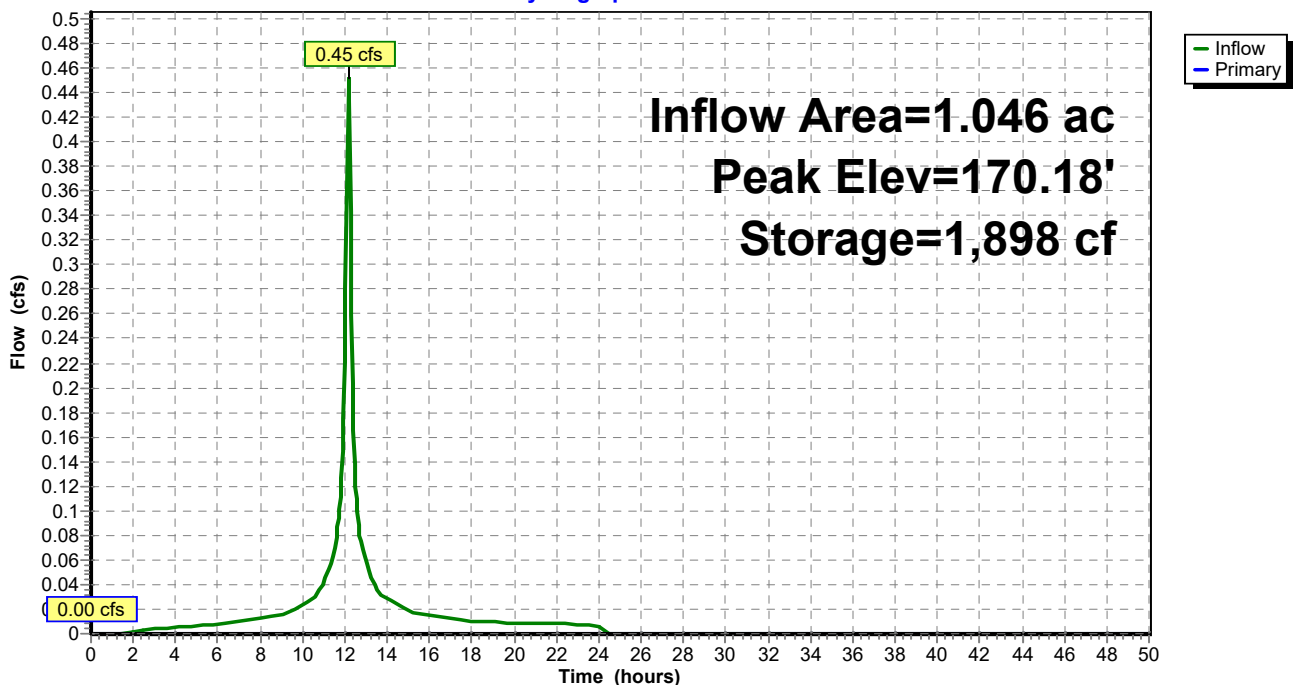
Volume	Invert	Avail.Storage	Storage Description
#1	167.75'	1,605 cf	<b>5.00'W x 260.00'L x 4.50'H Prismatic</b> 5,850 cf Overall - 1,838 cf Embedded = 4,012 cf x 40.0% Voids
#2	168.50'	1,838 cf	<b>36.0" Round Pipe Storage</b> Inside #1 L= 260.0'
		3,443 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	171.25'	<b>4.0' long Sharp-Crested Rectangular Weir</b> 2 End Contraction(s)

**Primary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=167.75' (Free Discharge)  
 ↳1=Sharp-Crested Rectangular Weir ( Controls 0.00 cfs)

**Pond 44P: Recharge**

Hydrograph



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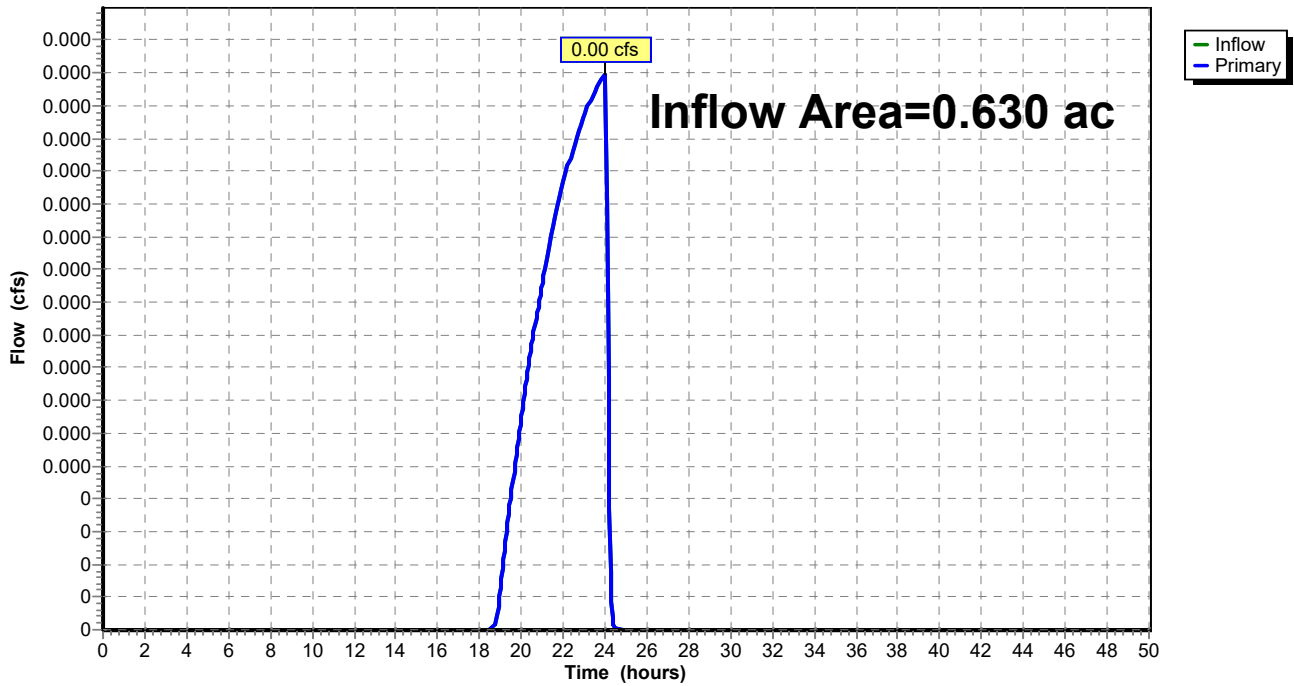
**Summary for Link 14L: DA 2**

Inflow Area = 0.630 ac, 0.00% Impervious, Inflow Depth = 0.00" for 2-Year event  
Inflow = 0.00 cfs @ 24.00 hrs, Volume= 0.000 af  
Primary = 0.00 cfs @ 24.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs

**Link 14L: DA 2**

Hydrograph



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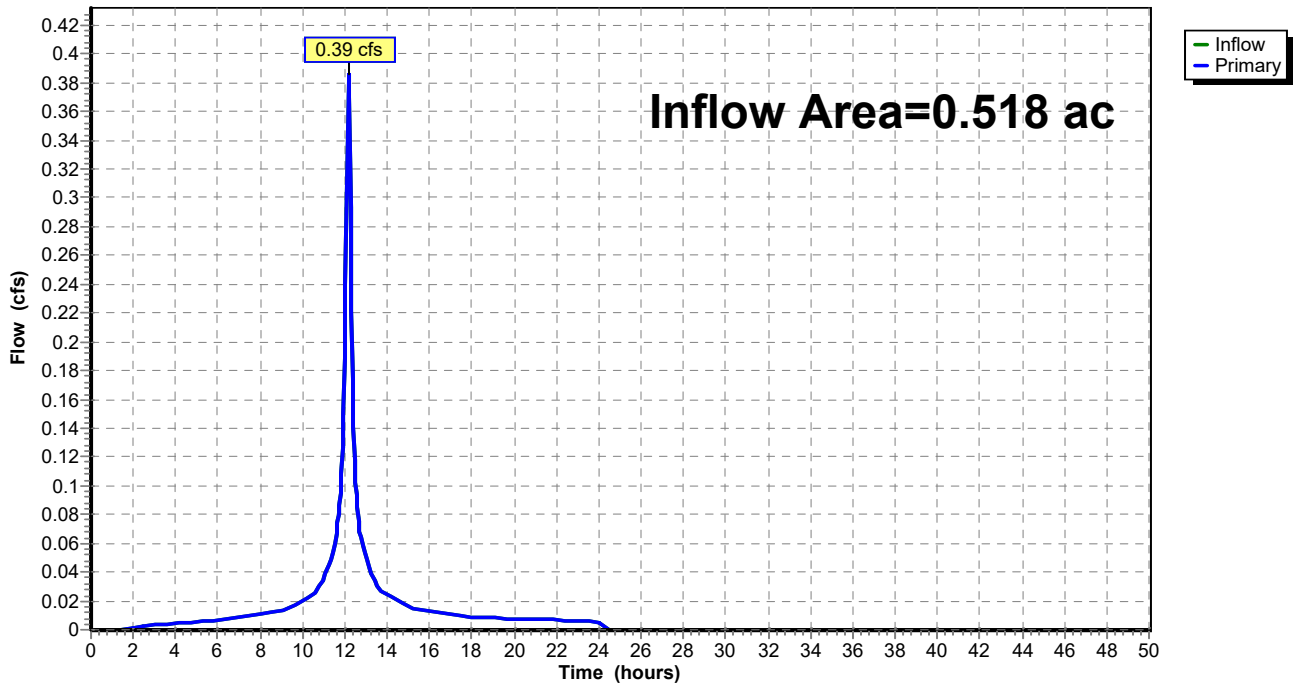
**Summary for Link 15L: DA 5**

Inflow Area = 0.518 ac, 27.22% Impervious, Inflow Depth = 0.86" for 2-Year event  
Inflow = 0.39 cfs @ 12.17 hrs, Volume= 0.037 af  
Primary = 0.39 cfs @ 12.17 hrs, Volume= 0.037 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs

**Link 15L: DA 5**

Hydrograph



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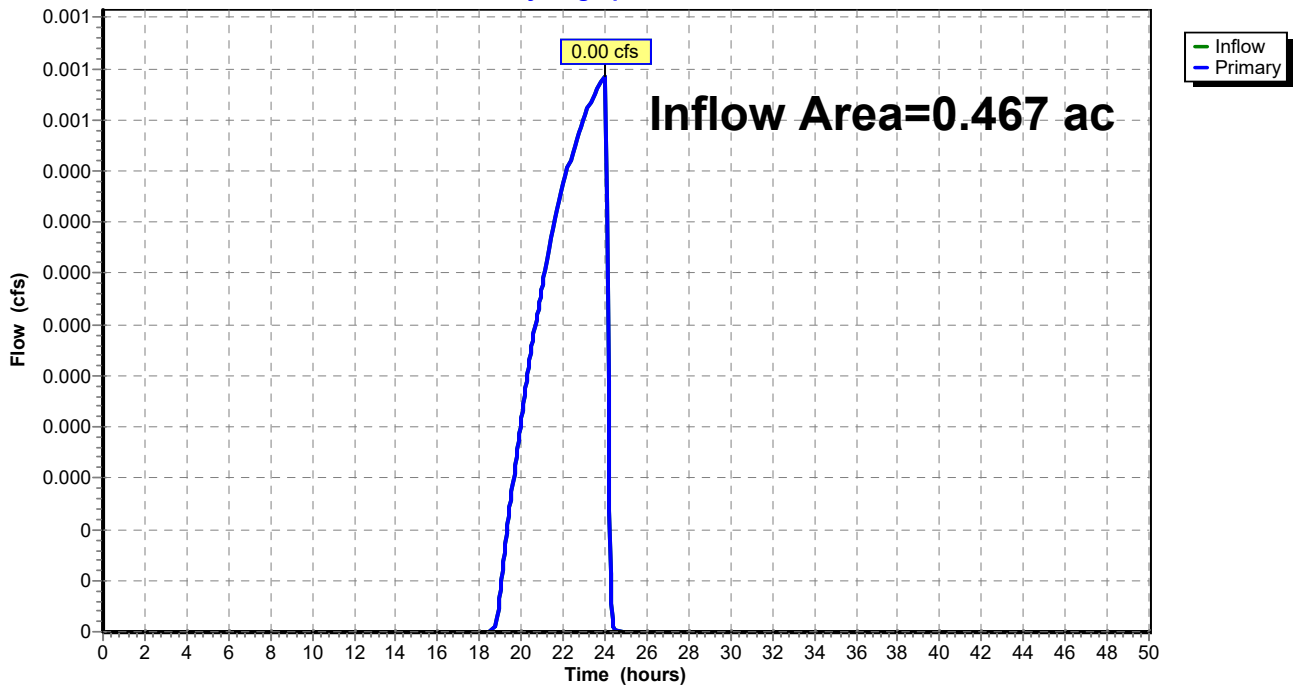
**Summary for Link 19L: DA 4**

Inflow Area = 0.467 ac, 0.00% Impervious, Inflow Depth = 0.00" for 2-Year event  
Inflow = 0.00 cfs @ 24.00 hrs, Volume= 0.000 af  
Primary = 0.00 cfs @ 24.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs

**Link 19L: DA 4**

Hydrograph





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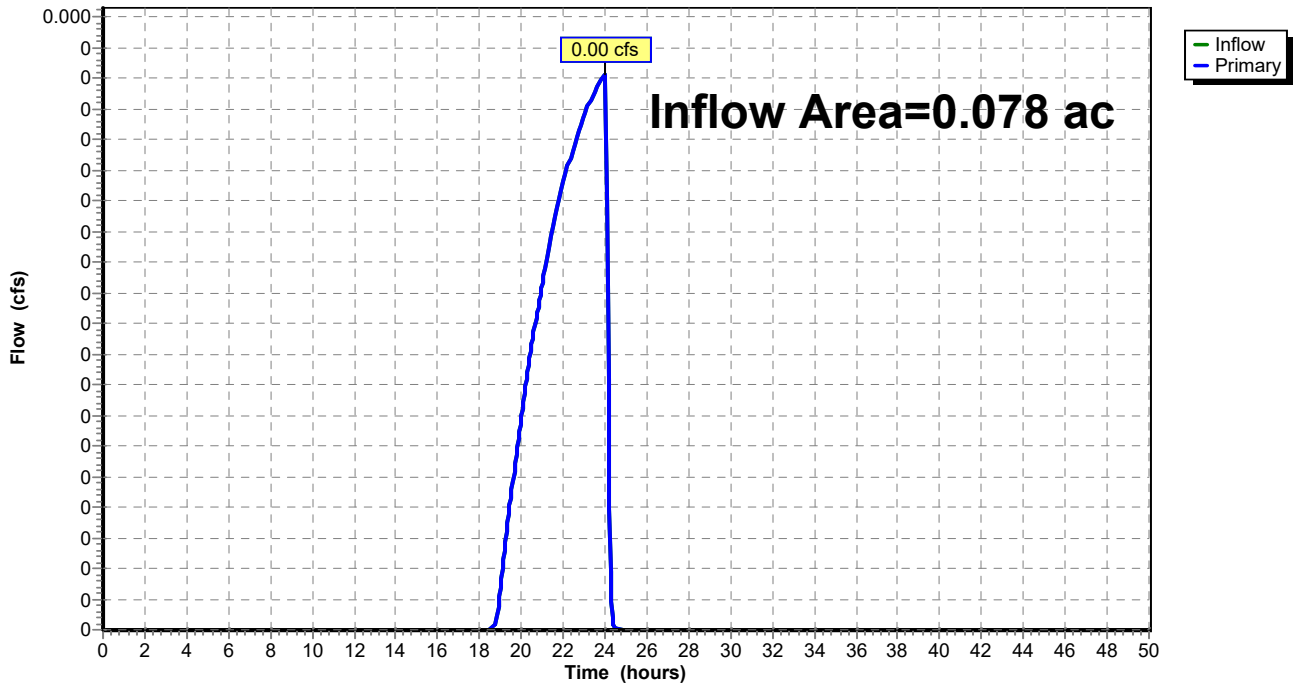
**Summary for Link 21L: DA 3**

Inflow Area = 0.078 ac, 0.00% Impervious, Inflow Depth = 0.00" for 2-Year event  
Inflow = 0.00 cfs @ 24.00 hrs, Volume= 0.000 af  
Primary = 0.00 cfs @ 24.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs

**Link 21L: DA 3**

Hydrograph



**Post-Drainage - November 26**

Prepared by DW Smith Associates

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NOAA 24-hr D 2-Year Rainfall=3.38"

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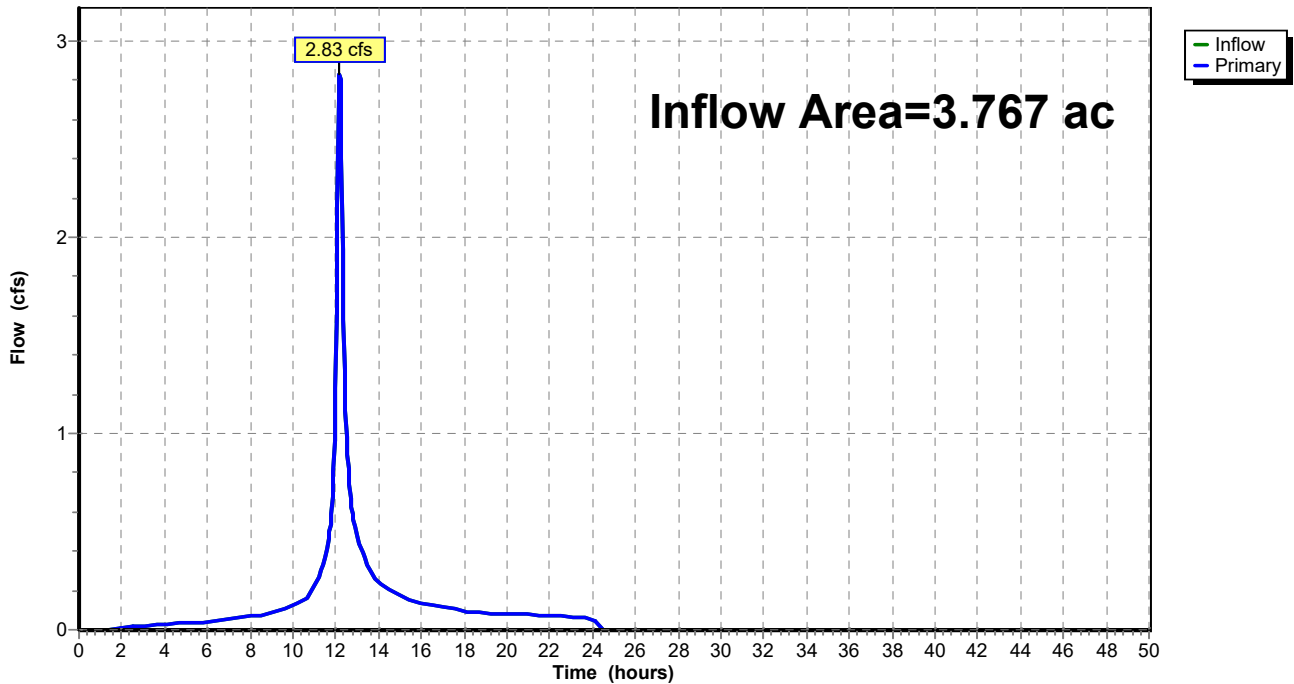
**Summary for Link 22L: Off-Site**

Inflow Area = 3.767 ac, 23.20% Impervious, Inflow Depth = 0.97" for 2-Year event  
Inflow = 2.83 cfs @ 12.18 hrs, Volume= 0.303 af  
Primary = 2.83 cfs @ 12.18 hrs, Volume= 0.303 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs

**Link 22L: Off-Site**

Hydrograph



**Post-Drainage - November 26**

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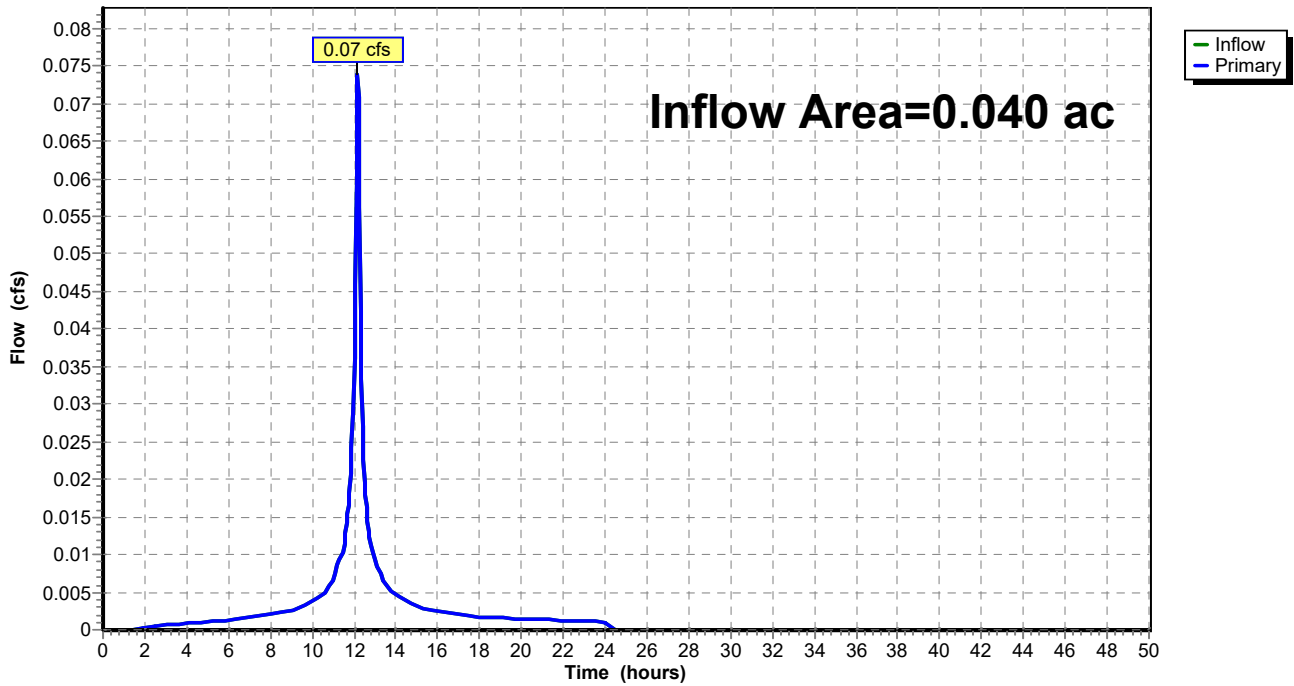
**Summary for Link 29L: DA 6**

Inflow Area = 0.040 ac, 67.50% Impervious, Inflow Depth = 2.13" for 2-Year event  
Inflow = 0.07 cfs @ 12.17 hrs, Volume= 0.007 af  
Primary = 0.07 cfs @ 12.17 hrs, Volume= 0.007 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs

**Link 29L: DA 6**

Hydrograph



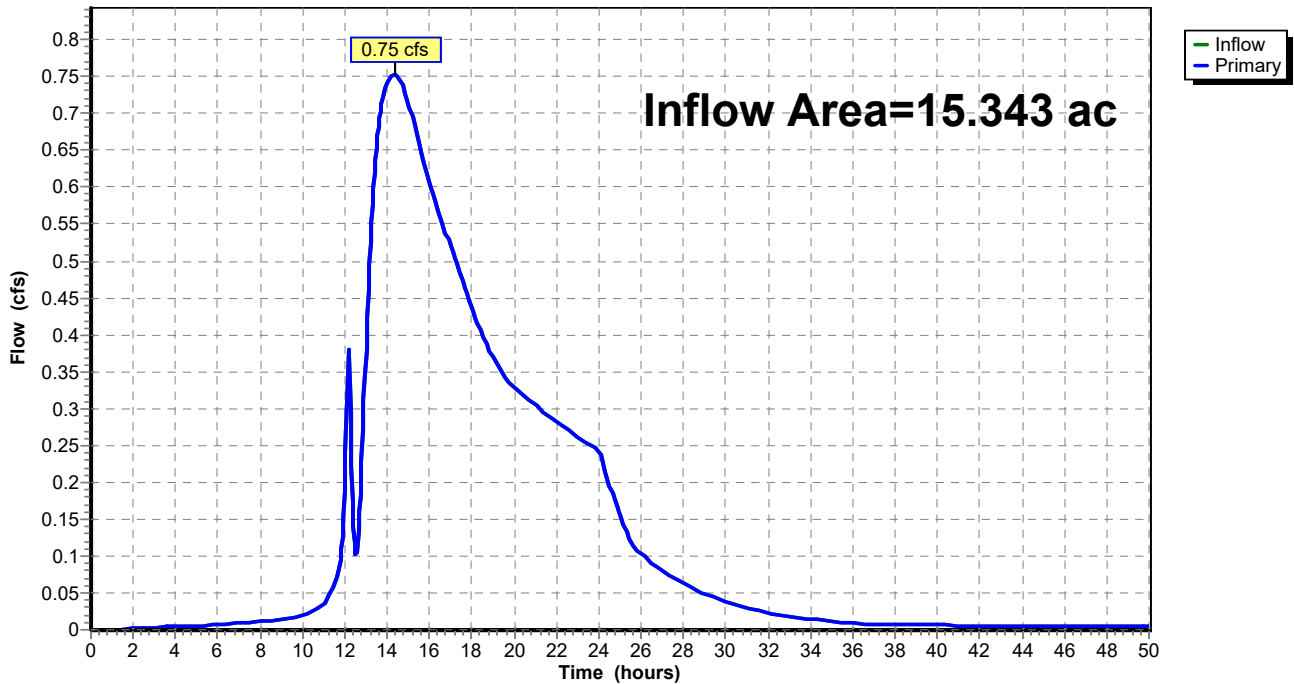
### Summary for Link 37L: Total Off-Site

Inflow Area = 15.343 ac, 30.29% Impervious, Inflow Depth > 0.40" for 2-Year event  
Inflow = 0.75 cfs @ 14.34 hrs, Volume= 0.505 af  
Primary = 0.75 cfs @ 14.34 hrs, Volume= 0.505 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs

### Link 37L: Total Off-Site

Hydrograph



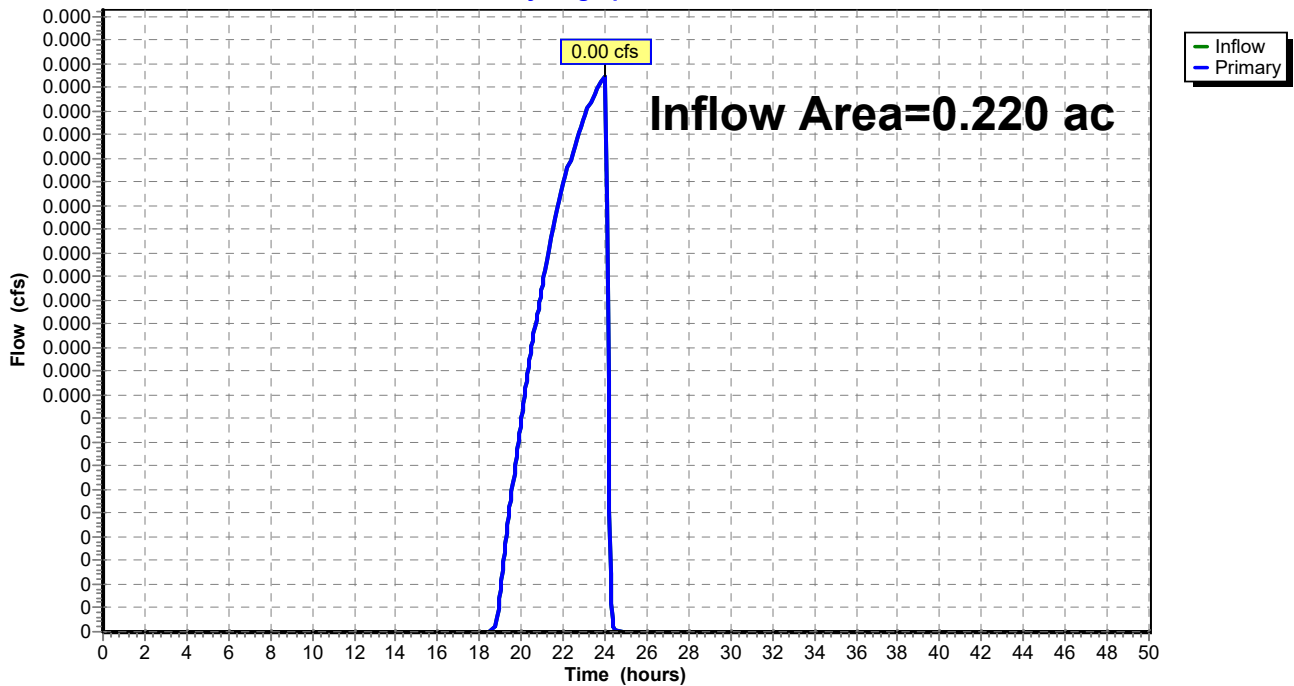
### Summary for Link 38L: DA 1

Inflow Area = 0.220 ac, 0.00% Impervious, Inflow Depth = 0.00" for 2-Year event  
Inflow = 0.00 cfs @ 24.00 hrs, Volume= 0.000 af  
Primary = 0.00 cfs @ 24.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs

### Link 38L: DA 1

Hydrograph



**Post-Drainage - November 26**

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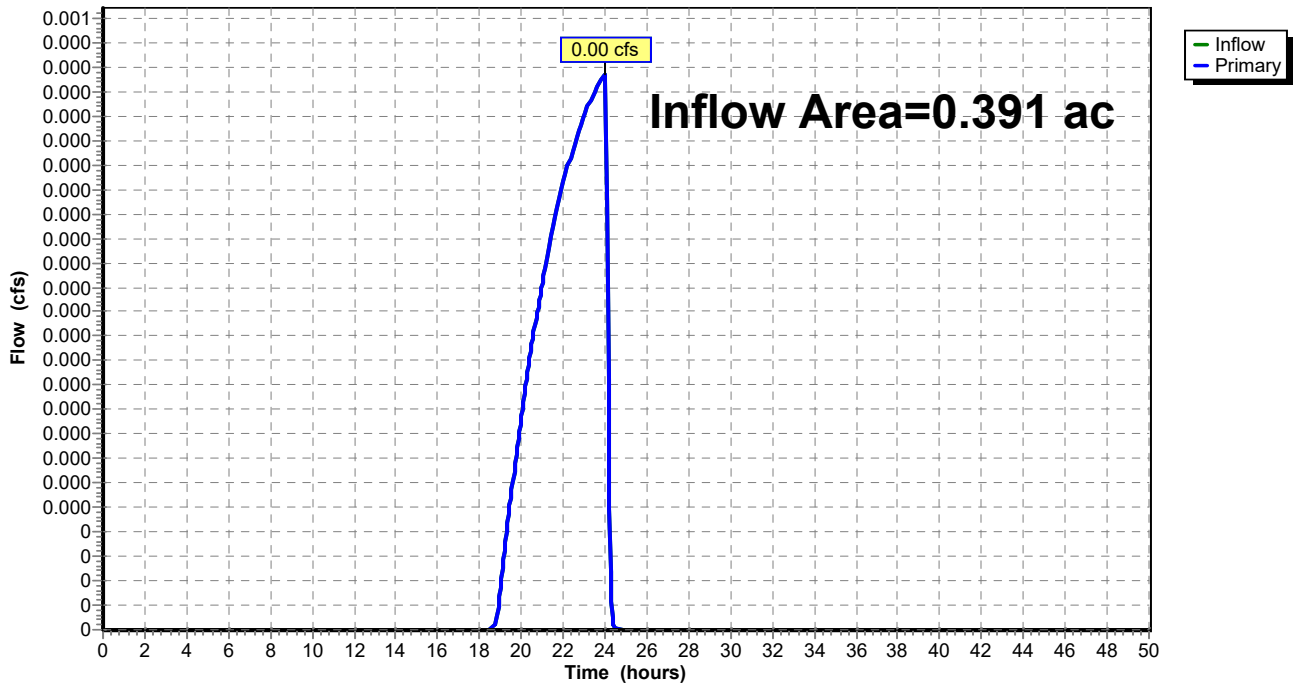
**Summary for Link 39L: DA 7**

Inflow Area = 0.391 ac, 0.00% Impervious, Inflow Depth = 0.00" for 2-Year event  
Inflow = 0.00 cfs @ 24.00 hrs, Volume= 0.000 af  
Primary = 0.00 cfs @ 24.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs

**Link 39L: DA 7**

Hydrograph



**POST-DEVELOPMENT RUNOFF CALCULATIONS**  
**(10 YEAR STORM)**





**Post-Drainage - November 26**

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Time span=0.00-50.00 hrs, dt=0.05 hrs, 1001 points  
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN  
 Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

<b>Subcatchment 7S: DA 5 Woods</b>	Runoff Area=0.014 ac 0.00% Impervious Runoff Depth=0.01" Tc=10.0 min CN=30 Runoff=0.00 cfs 0.000 af
<b>Subcatchment 8S: DA Site Woods</b>	Runoff Area=0.116 ac 0.00% Impervious Runoff Depth=0.01" Flow Length=110' Tc=25.8 min CN=30 Runoff=0.00 cfs 0.000 af
<b>Subcatchment 10S: DA 2 Woods</b>	Runoff Area=0.338 ac 0.00% Impervious Runoff Depth=0.01" Flow Length=120' Slope=0.0147 '/' Tc=27.3 min CN=30 Runoff=0.00 cfs 0.000 af
<b>Subcatchment 11S: DA 2 Grass</b>	Runoff Area=0.292 ac 0.00% Impervious Runoff Depth=0.25" Tc=10.0 min CN=39 Runoff=0.01 cfs 0.006 af
<b>Subcatchment 16S: DA 5 Grass</b>	Runoff Area=0.363 ac 0.00% Impervious Runoff Depth=0.25" Tc=10.0 min CN=39 Runoff=0.02 cfs 0.008 af
<b>Subcatchment 20S: DA 4 Grass</b>	Runoff Area=0.467 ac 0.00% Impervious Runoff Depth=0.25" Tc=10.0 min CN=39 Runoff=0.02 cfs 0.010 af
<b>Subcatchment 22S: DA 3 Grass</b>	Runoff Area=0.078 ac 0.00% Impervious Runoff Depth=0.25" Tc=10.0 min CN=39 Runoff=0.00 cfs 0.002 af
<b>Subcatchment 24S: DA 5 Impervious</b>	Runoff Area=0.141 ac 100.00% Impervious Runoff Depth=4.99" Tc=10.0 min CN=98 Runoff=0.60 cfs 0.059 af
<b>Subcatchment 28S: Cultivated</b>	Runoff Area=1.470 ac 0.00% Impervious Runoff Depth=1.66" Flow Length=415' Tc=14.9 min CN=63 Runoff=1.98 cfs 0.203 af
<b>Subcatchment 29S: Impervious</b>	Runoff Area=0.874 ac 100.00% Impervious Runoff Depth=4.99" Tc=10.0 min CN=98 Runoff=3.72 cfs 0.364 af
<b>Subcatchment 30S: DA 6 Grass</b>	Runoff Area=0.013 ac 0.00% Impervious Runoff Depth=0.25" Tc=10.0 min CN=39 Runoff=0.00 cfs 0.000 af
<b>Subcatchment 31S: DA 6 Impervious</b>	Runoff Area=0.027 ac 100.00% Impervious Runoff Depth=4.99" Tc=10.0 min CN=98 Runoff=0.12 cfs 0.011 af
<b>Subcatchment 32S: Woods</b>	Runoff Area=0.115 ac 0.00% Impervious Runoff Depth=0.01" Flow Length=345' Tc=24.1 min CN=30 Runoff=0.00 cfs 0.000 af
<b>Subcatchment 33S: DA Site Impervious</b>	Runoff Area=3.441 ac 100.00% Impervious Runoff Depth=4.99" Tc=10.0 min CN=98 Runoff=14.66 cfs 1.432 af
<b>Subcatchment 34S: DA Site Grass</b>	Runoff Area=4.629 ac 0.00% Impervious Runoff Depth=0.25" Tc=10.0 min CN=39 Runoff=0.20 cfs 0.096 af
<b>Subcatchment 35S: Grass</b>	Runoff Area=1.308 ac 0.00% Impervious Runoff Depth=0.25" Flow Length=585' Tc=17.9 min CN=39 Runoff=0.06 cfs 0.027 af

**Post-Drainage - November 26**

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<b>Subcatchment39S: DA 1 Woods</b>	Runoff Area=0.018 ac 0.00% Impervious Runoff Depth=0.01" Tc=10.0 min CN=30 Runoff=0.00 cfs 0.000 af
<b>Subcatchment40S: DA 1 Grass</b>	Runoff Area=0.202 ac 0.00% Impervious Runoff Depth=0.25" Tc=10.0 min CN=39 Runoff=0.01 cfs 0.004 af
<b>Subcatchment42S: DA 7 Grass</b>	Runoff Area=0.391 ac 0.00% Impervious Runoff Depth=0.25" Tc=10.0 min CN=39 Runoff=0.02 cfs 0.008 af
<b>Subcatchment45S: B-5, B-4 and B-3</b>	Runoff Area=0.165 ac 100.00% Impervious Runoff Depth=4.99" Tc=10.0 min CN=98 Runoff=0.70 cfs 0.069 af
<b>Subcatchment46S: B-5, B-4 and B-3 Grass</b>	Runoff Area=0.881 ac 0.00% Impervious Runoff Depth=0.25" Tc=10.0 min CN=39 Runoff=0.04 cfs 0.018 af
<b>Pond 28P: Basin 1</b>	Peak Elev=169.27' Storage=53,830 cf Inflow=20.17 cfs 2.154 af Outflow=2.65 cfs 1.407 af
<b>Pond 44P: Recharge</b>	Peak Elev=171.27' Storage=2,893 cf Inflow=0.70 cfs 0.087 af Outflow=0.04 cfs 0.021 af
<b>Link 14L: DA 2</b>	Inflow=0.01 cfs 0.006 af Primary=0.01 cfs 0.006 af
<b>Link 15L: DA 5</b>	Inflow=0.60 cfs 0.066 af Primary=0.60 cfs 0.066 af
<b>Link 19L: DA 4</b>	Inflow=0.02 cfs 0.010 af Primary=0.02 cfs 0.010 af
<b>Link 21L: DA 3</b>	Inflow=0.00 cfs 0.002 af Primary=0.00 cfs 0.002 af
<b>Link 22L: Off-Site</b>	Inflow=5.46 cfs 0.594 af Primary=5.46 cfs 0.594 af
<b>Link 29L: DA 6</b>	Inflow=0.12 cfs 0.012 af Primary=0.12 cfs 0.012 af
<b>Link 37L: Total Off-Site</b>	Inflow=2.79 cfs 1.503 af Primary=2.79 cfs 1.503 af
<b>Link 38L: DA 1</b>	Inflow=0.01 cfs 0.004 af Primary=0.01 cfs 0.004 af
<b>Link 39L: DA 7</b>	Inflow=0.02 cfs 0.008 af Primary=0.02 cfs 0.008 af

**Total Runoff Area = 15.343 ac Runoff Volume = 2.316 af Average Runoff Depth = 1.81"**  
**69.71% Pervious = 10.695 ac 30.29% Impervious = 4.648 ac**

**Post-Drainage - November 26**

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**Summary for Pond 28P: Basin 1**

Inflow Area = 13.039 ac, 34.57% Impervious, Inflow Depth = 1.98" for 10-Year event  
 Inflow = 20.17 cfs @ 12.17 hrs, Volume= 2.154 af  
 Outflow = 2.65 cfs @ 13.17 hrs, Volume= 1.407 af, Atten= 87%, Lag= 59.5 min  
 Primary = 2.65 cfs @ 13.17 hrs, Volume= 1.407 af

Routing by Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs  
 Peak Elev= 169.27' @ 13.17 hrs Surf.Area= 20,404 sf Storage= 53,830 cf

Plug-Flow detention time= 362.2 min calculated for 1.405 af (65% of inflow)  
 Center-of-Mass det. time= 237.6 min ( 1,022.1 - 784.4 )

Volume	Invert	Avail.Storage	Storage Description
#1	166.15'	114,130 cf	<b>Basin (Prismatic)</b> Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
166.15	14,300	0	0
167.00	15,820	12,801	12,801
168.00	17,770	16,795	29,596
169.00	19,820	18,795	48,391
170.00	21,979	20,900	69,290
171.90	25,220	44,839	114,130

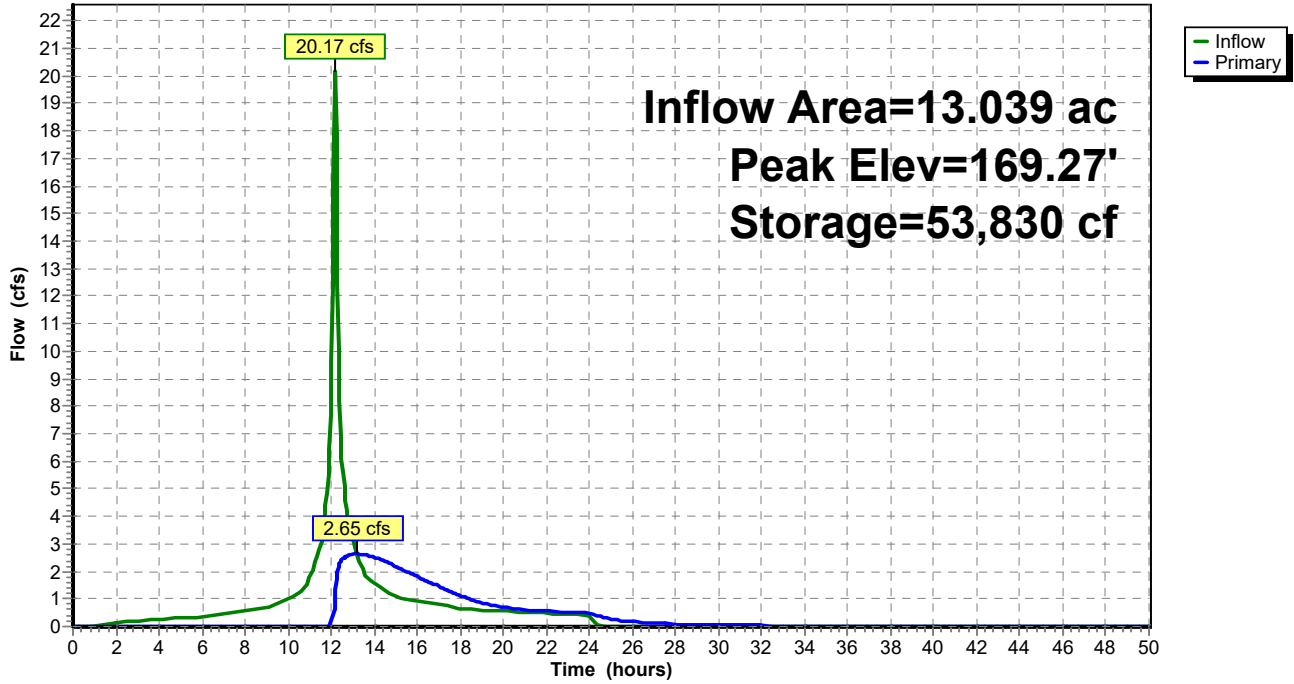
Device	Routing	Invert	Outlet Devices
#1	Primary	168.15'	<b>6.0" Vert. Orifice/Grate X 3.00</b> C= 0.600
#2	Primary	170.60'	<b>48.0" W x 48.0" H Vert. Orifice/Grate</b> C= 0.600
#3	Primary	169.30'	<b>1.8' long Sharp-Crested Rectangular Weir X 2.00</b> 2 End Contraction(s)

**Primary OutFlow** Max=2.65 cfs @ 13.17 hrs HW=169.27' (Free Discharge)

- 1=Orifice/Grate (Orifice Controls 2.65 cfs @ 4.49 fps)
- 2=Orifice/Grate ( Controls 0.00 cfs)
- 3=Sharp-Crested Rectangular Weir ( Controls 0.00 cfs)

Pond 28P: Basin 1

Hydrograph



**Post-Drainage - November 26**

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**Summary for Pond 44P: Recharge**

Inflow Area = 1.046 ac, 15.77% Impervious, Inflow Depth = 1.00" for 10-Year event  
 Inflow = 0.70 cfs @ 12.17 hrs, Volume= 0.087 af  
 Outflow = 0.04 cfs @ 15.96 hrs, Volume= 0.021 af, Atten= 94%, Lag= 227.3 min  
 Primary = 0.04 cfs @ 15.96 hrs, Volume= 0.021 af

Routing by Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs  
 Peak Elev= 171.27' @ 15.96 hrs Surf.Area= 1,300 sf Storage= 2,893 cf

Plug-Flow detention time= 633.4 min calculated for 0.021 af (24% of inflow)  
 Center-of-Mass det. time= 358.9 min ( 1,168.1 - 809.2 )

Volume	Invert	Avail.Storage	Storage Description
#1	167.75'	1,605 cf	<b>5.00'W x 260.00'L x 4.50'H Prismatic</b> 5,850 cf Overall - 1,838 cf Embedded = 4,012 cf x 40.0% Voids
#2	168.50'	1,838 cf	<b>36.0" Round Pipe Storage</b> Inside #1 L= 260.0'
		3,443 cf	Total Available Storage

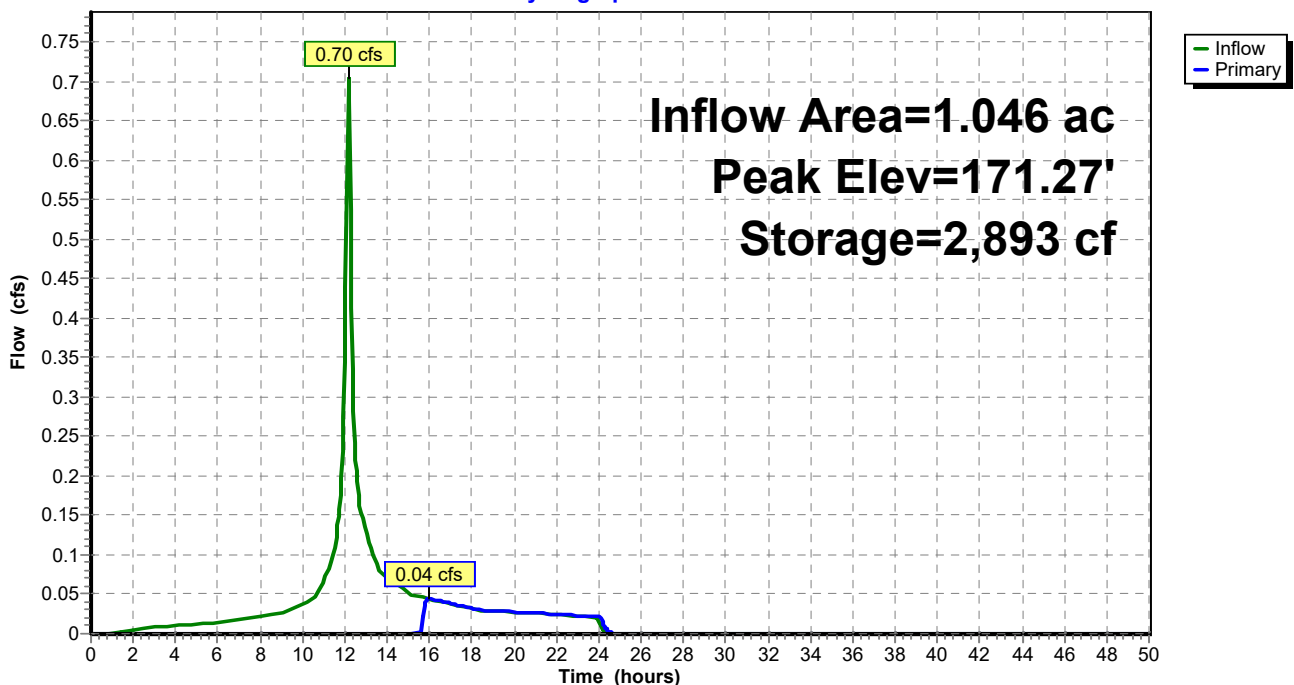
Device	Routing	Invert	Outlet Devices
#1	Primary	171.25'	<b>4.0' long Sharp-Crested Rectangular Weir</b> 2 End Contraction(s)

**Primary OutFlow** Max=0.03 cfs @ 15.96 hrs HW=171.27' (Free Discharge)

↳ **1=Sharp-Crested Rectangular Weir** (Weir Controls 0.03 cfs @ 0.45 fps)

**Pond 44P: Recharge**

Hydrograph



**Post-Drainage - November 26**

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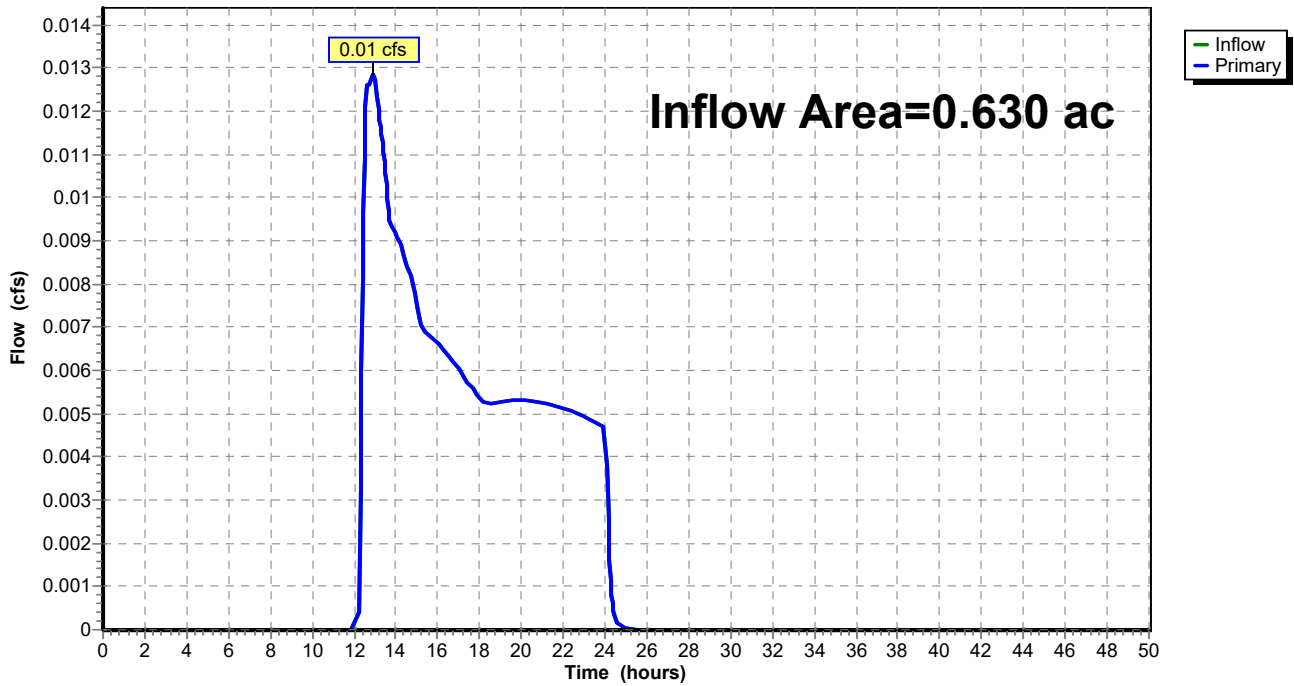
**Summary for Link 14L: DA 2**

Inflow Area = 0.630 ac, 0.00% Impervious, Inflow Depth = 0.12" for 10-Year event  
Inflow = 0.01 cfs @ 12.91 hrs, Volume= 0.006 af  
Primary = 0.01 cfs @ 12.91 hrs, Volume= 0.006 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs

**Link 14L: DA 2**

Hydrograph



**Post-Drainage - November 26**

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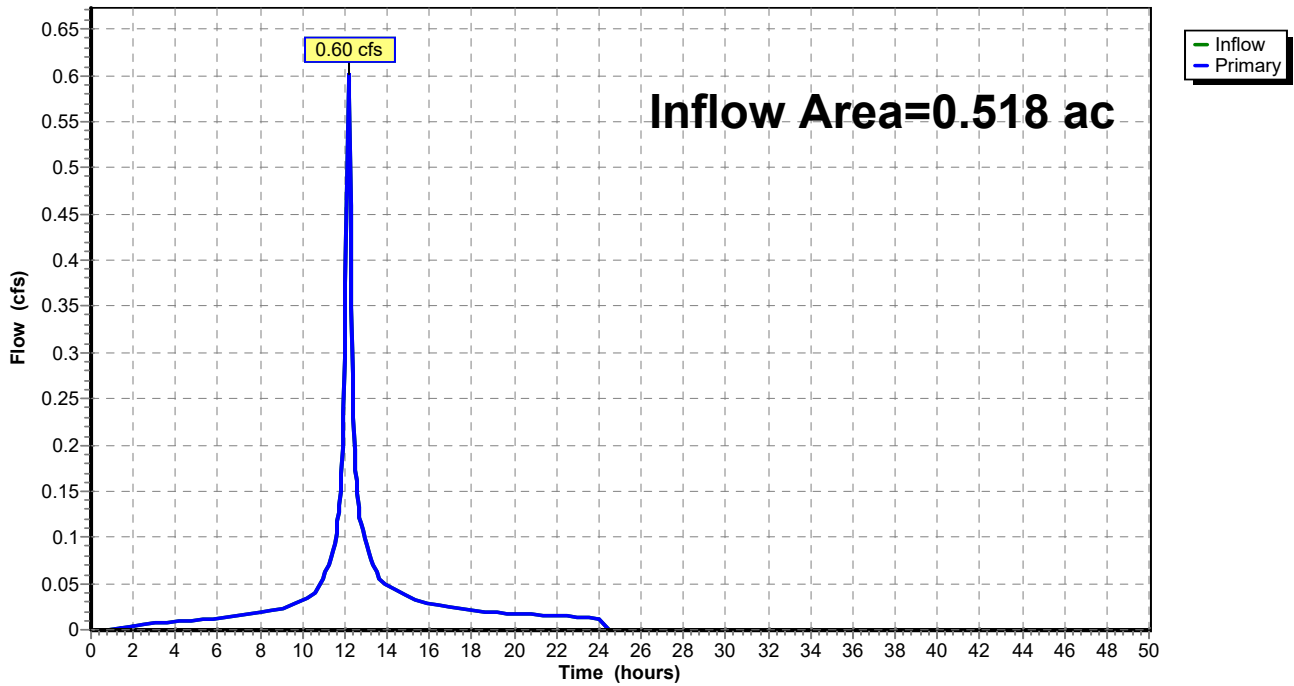
**Summary for Link 15L: DA 5**

Inflow Area = 0.518 ac, 27.22% Impervious, Inflow Depth = 1.53" for 10-Year event  
Inflow = 0.60 cfs @ 12.17 hrs, Volume= 0.066 af  
Primary = 0.60 cfs @ 12.17 hrs, Volume= 0.066 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs

**Link 15L: DA 5**

Hydrograph



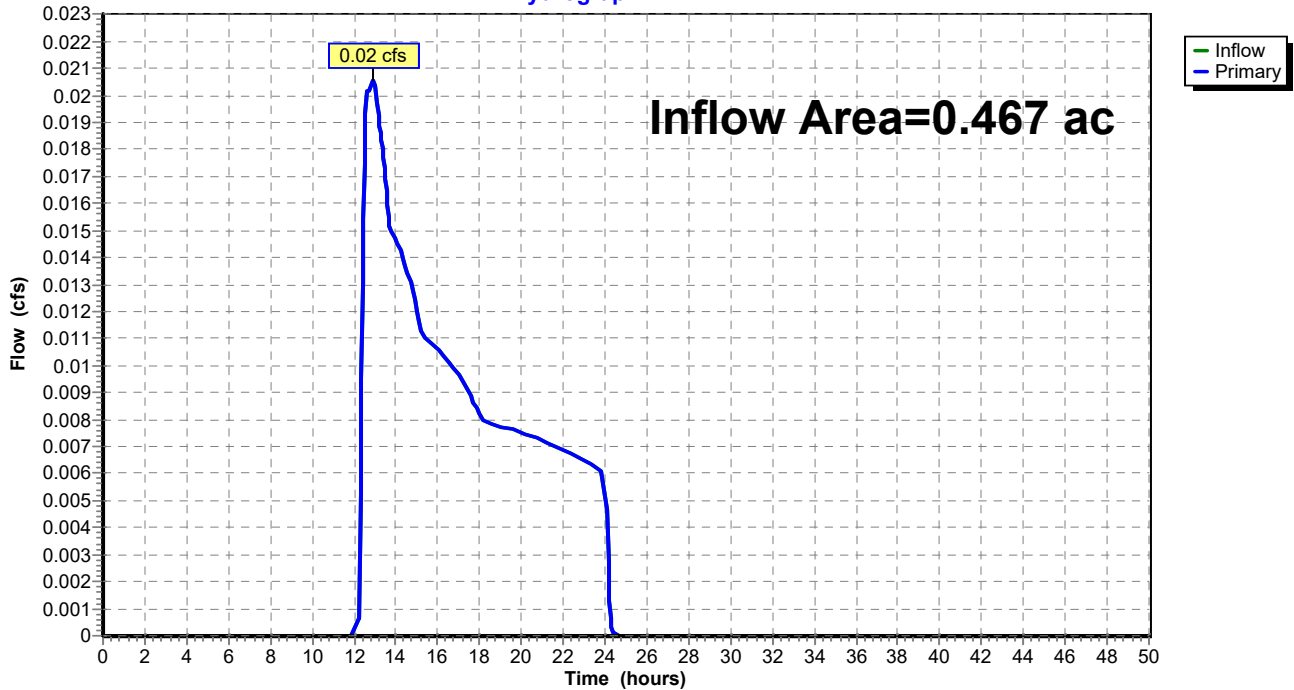
### Summary for Link 19L: DA 4

Inflow Area = 0.467 ac, 0.00% Impervious, Inflow Depth = 0.25" for 10-Year event  
Inflow = 0.02 cfs @ 12.91 hrs, Volume= 0.010 af  
Primary = 0.02 cfs @ 12.91 hrs, Volume= 0.010 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs

### Link 19L: DA 4

Hydrograph





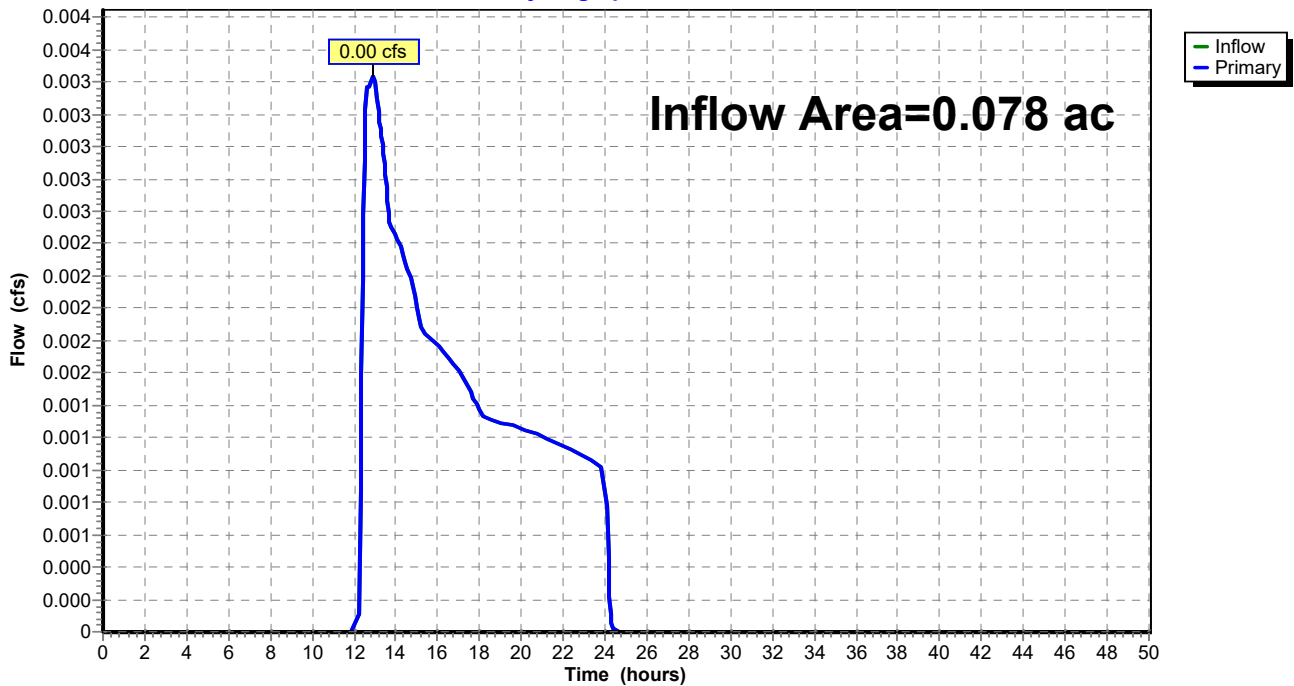
### Summary for Link 21L: DA 3

Inflow Area = 0.078 ac, 0.00% Impervious, Inflow Depth = 0.25" for 10-Year event  
Inflow = 0.00 cfs @ 12.91 hrs, Volume= 0.002 af  
Primary = 0.00 cfs @ 12.91 hrs, Volume= 0.002 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs

### Link 21L: DA 3

Hydrograph



**Post-Drainage - November 26**

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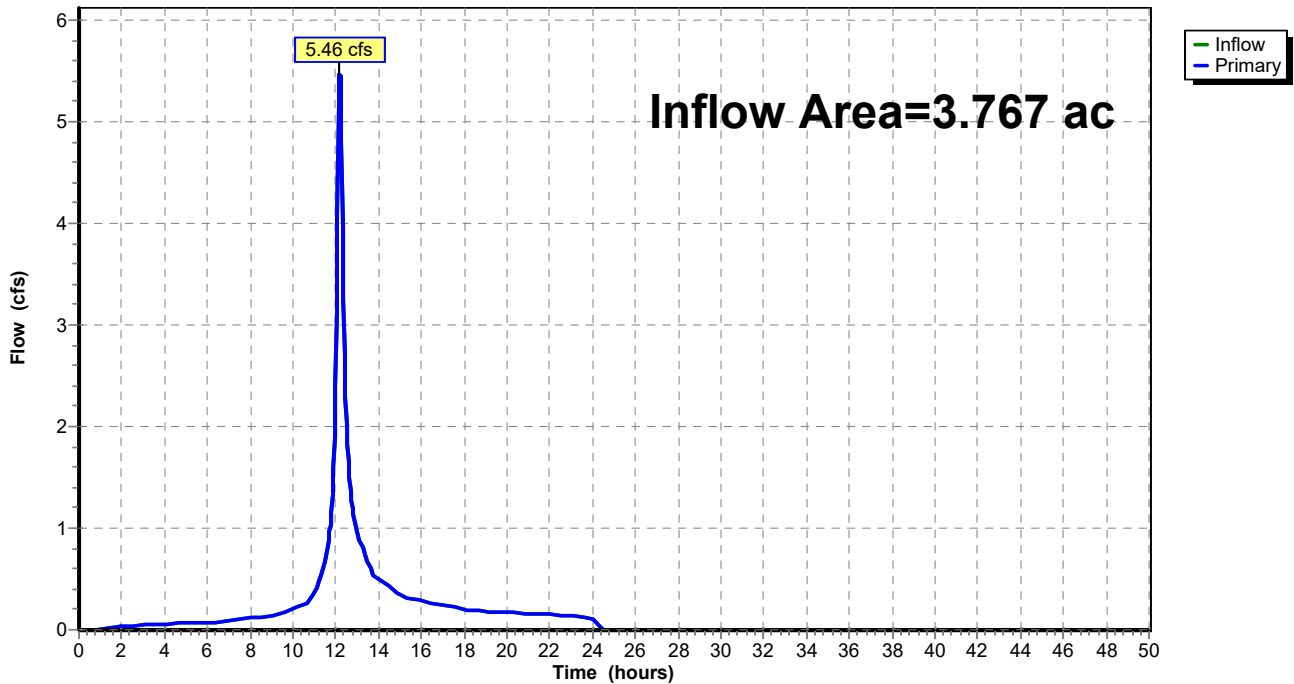
**Summary for Link 22L: Off-Site**

Inflow Area = 3.767 ac, 23.20% Impervious, Inflow Depth = 1.89" for 10-Year event  
Inflow = 5.46 cfs @ 12.19 hrs, Volume= 0.594 af  
Primary = 5.46 cfs @ 12.19 hrs, Volume= 0.594 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs

**Link 22L: Off-Site**

Hydrograph



**Post-Drainage - November 26**

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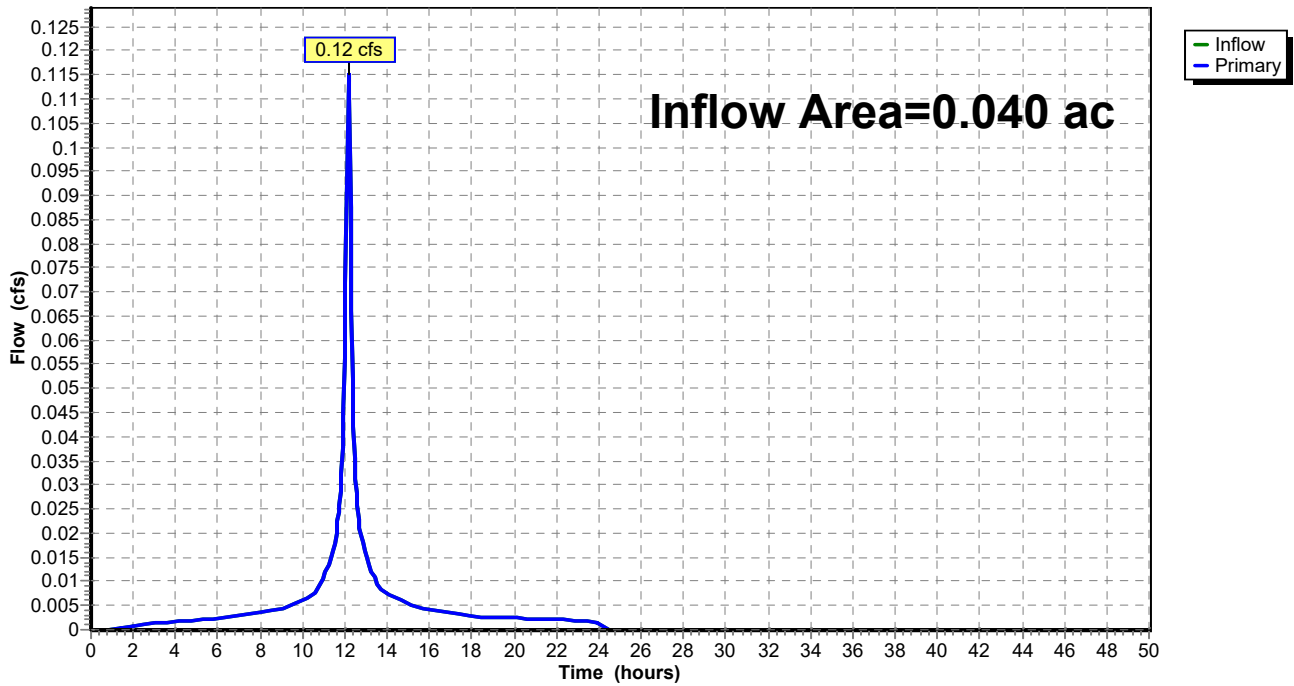
**Summary for Link 29L: DA 6**

Inflow Area = 0.040 ac, 67.50% Impervious, Inflow Depth = 3.45" for 10-Year event  
Inflow = 0.12 cfs @ 12.17 hrs, Volume= 0.012 af  
Primary = 0.12 cfs @ 12.17 hrs, Volume= 0.012 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs

**Link 29L: DA 6**

Hydrograph



**Post-Drainage - November 26**

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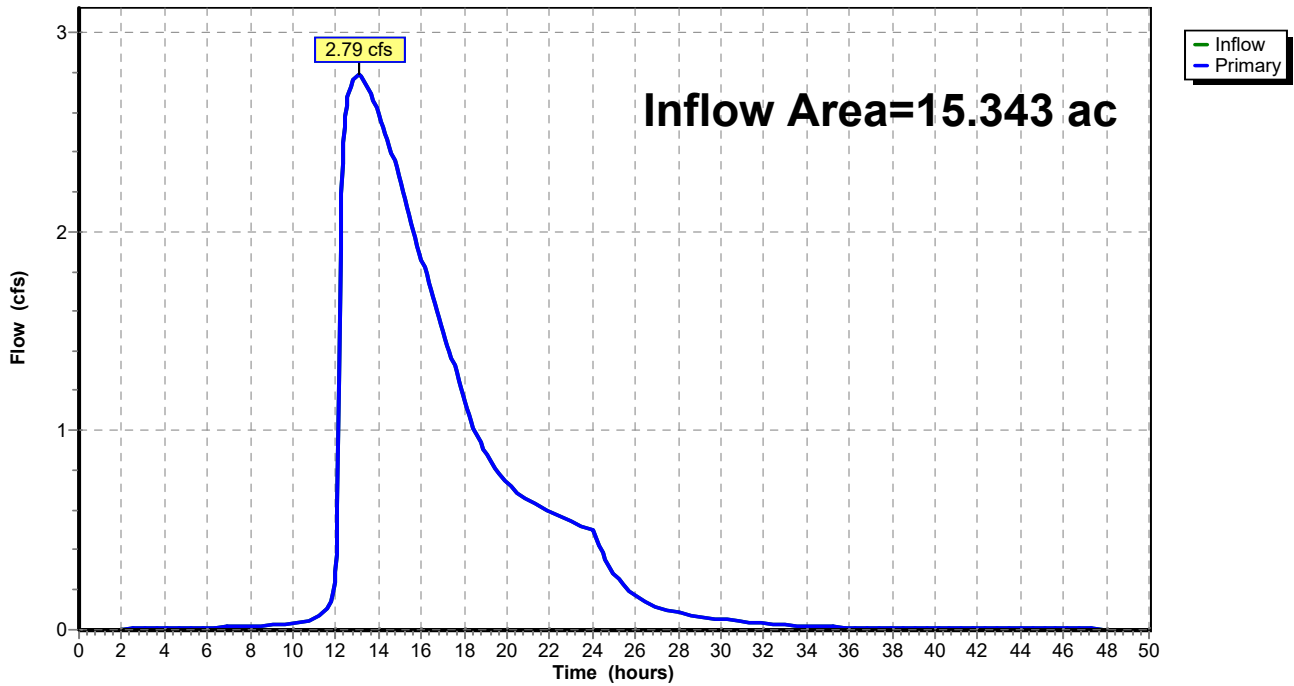
**Summary for Link 37L: Total Off-Site**

Inflow Area = 15.343 ac, 30.29% Impervious, Inflow Depth > 1.18" for 10-Year event  
Inflow = 2.79 cfs @ 13.04 hrs, Volume= 1.503 af  
Primary = 2.79 cfs @ 13.04 hrs, Volume= 1.503 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs

**Link 37L: Total Off-Site**

Hydrograph



**Post-Drainage - November 26**

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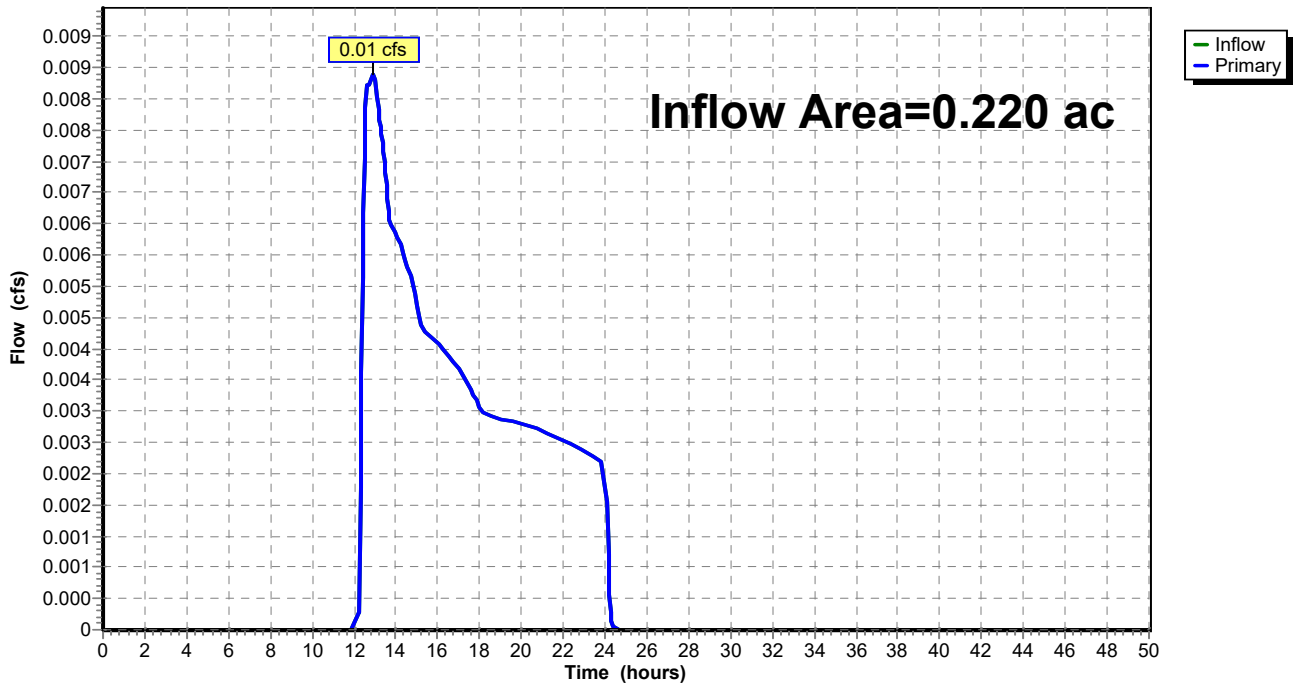
**Summary for Link 38L: DA 1**

Inflow Area = 0.220 ac, 0.00% Impervious, Inflow Depth = 0.23" for 10-Year event  
Inflow = 0.01 cfs @ 12.91 hrs, Volume= 0.004 af  
Primary = 0.01 cfs @ 12.91 hrs, Volume= 0.004 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs

**Link 38L: DA 1**

Hydrograph



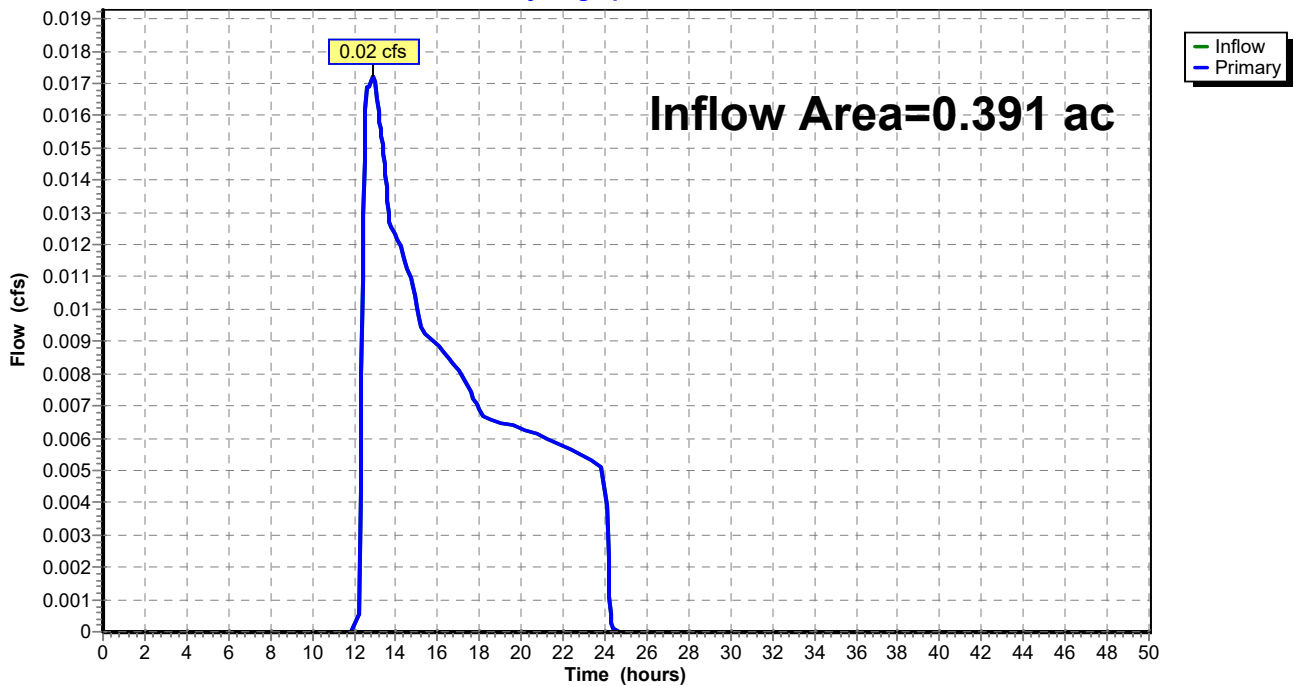
### Summary for Link 39L: DA 7

Inflow Area = 0.391 ac, 0.00% Impervious, Inflow Depth = 0.25" for 10-Year event  
Inflow = 0.02 cfs @ 12.91 hrs, Volume= 0.008 af  
Primary = 0.02 cfs @ 12.91 hrs, Volume= 0.008 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs

### Link 39L: DA 7

Hydrograph



**POST-DEVELOPMENT RUNOFF CALCULATIONS**  
**(25 YEAR STORM)**





**Post-Drainage - November 26**

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Time span=0.00-50.00 hrs, dt=0.05 hrs, 1001 points  
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN  
 Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

<b>Subcatchment 7S: DA 5 Woods</b>	Runoff Area=0.014 ac 0.00% Impervious Runoff Depth=0.14" Tc=10.0 min CN=30 Runoff=0.00 cfs 0.000 af
<b>Subcatchment 8S: DA Site Woods</b>	Runoff Area=0.116 ac 0.00% Impervious Runoff Depth=0.14" Flow Length=110' Tc=25.8 min CN=30 Runoff=0.00 cfs 0.001 af
<b>Subcatchment 10S: DA 2 Woods</b>	Runoff Area=0.338 ac 0.00% Impervious Runoff Depth=0.14" Flow Length=120' Slope=0.0147 '/' Tc=27.3 min CN=30 Runoff=0.01 cfs 0.004 af
<b>Subcatchment 11S: DA 2 Grass</b>	Runoff Area=0.292 ac 0.00% Impervious Runoff Depth=0.61" Tc=10.0 min CN=39 Runoff=0.07 cfs 0.015 af
<b>Subcatchment 16S: DA 5 Grass</b>	Runoff Area=0.363 ac 0.00% Impervious Runoff Depth=0.61" Tc=10.0 min CN=39 Runoff=0.09 cfs 0.018 af
<b>Subcatchment 20S: DA 4 Grass</b>	Runoff Area=0.467 ac 0.00% Impervious Runoff Depth=0.61" Tc=10.0 min CN=39 Runoff=0.11 cfs 0.024 af
<b>Subcatchment 22S: DA 3 Grass</b>	Runoff Area=0.078 ac 0.00% Impervious Runoff Depth=0.61" Tc=10.0 min CN=39 Runoff=0.02 cfs 0.004 af
<b>Subcatchment 24S: DA 5 Impervious</b>	Runoff Area=0.141 ac 100.00% Impervious Runoff Depth=6.29" Tc=10.0 min CN=98 Runoff=0.75 cfs 0.074 af
<b>Subcatchment 28S: Cultivated</b>	Runoff Area=1.470 ac 0.00% Impervious Runoff Depth=2.55" Flow Length=415' Tc=14.9 min CN=63 Runoff=3.15 cfs 0.313 af
<b>Subcatchment 29S: Impervious</b>	Runoff Area=0.874 ac 100.00% Impervious Runoff Depth=6.29" Tc=10.0 min CN=98 Runoff=4.66 cfs 0.458 af
<b>Subcatchment 30S: DA 6 Grass</b>	Runoff Area=0.013 ac 0.00% Impervious Runoff Depth=0.61" Tc=10.0 min CN=39 Runoff=0.00 cfs 0.001 af
<b>Subcatchment 31S: DA 6 Impervious</b>	Runoff Area=0.027 ac 100.00% Impervious Runoff Depth=6.29" Tc=10.0 min CN=98 Runoff=0.14 cfs 0.014 af
<b>Subcatchment 32S: Woods</b>	Runoff Area=0.115 ac 0.00% Impervious Runoff Depth=0.14" Flow Length=345' Tc=24.1 min CN=30 Runoff=0.00 cfs 0.001 af
<b>Subcatchment 33S: DA Site Impervious</b>	Runoff Area=3.441 ac 100.00% Impervious Runoff Depth=6.29" Tc=10.0 min CN=98 Runoff=18.34 cfs 1.804 af
<b>Subcatchment 34S: DA Site Grass</b>	Runoff Area=4.629 ac 0.00% Impervious Runoff Depth=0.61" Tc=10.0 min CN=39 Runoff=1.13 cfs 0.234 af
<b>Subcatchment 35S: Grass</b>	Runoff Area=1.308 ac 0.00% Impervious Runoff Depth=0.61" Flow Length=585' Tc=17.9 min CN=39 Runoff=0.27 cfs 0.066 af

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<b>Subcatchment39S: DA 1 Woods</b>	Runoff Area=0.018 ac 0.00% Impervious Runoff Depth=0.14" Tc=10.0 min CN=30 Runoff=0.00 cfs 0.000 af
<b>Subcatchment40S: DA 1 Grass</b>	Runoff Area=0.202 ac 0.00% Impervious Runoff Depth=0.61" Tc=10.0 min CN=39 Runoff=0.05 cfs 0.010 af
<b>Subcatchment42S: DA 7 Grass</b>	Runoff Area=0.391 ac 0.00% Impervious Runoff Depth=0.61" Tc=10.0 min CN=39 Runoff=0.10 cfs 0.020 af
<b>Subcatchment45S: B-5, B-4 and B-3</b>	Runoff Area=0.165 ac 100.00% Impervious Runoff Depth=6.29" Tc=10.0 min CN=98 Runoff=0.88 cfs 0.087 af
<b>Subcatchment46S: B-5, B-4 and B-3 Grass</b>	Runoff Area=0.881 ac 0.00% Impervious Runoff Depth=0.61" Tc=10.0 min CN=39 Runoff=0.21 cfs 0.045 af
<b>Pond 28P: Basin 1</b>	Peak Elev=169.76' Storage=64,110 cf Inflow=26.75 cfs 2.958 af Outflow=6.82 cfs 2.211 af
<b>Pond 44P: Recharge</b>	Peak Elev=171.32' Storage=2,932 cf Inflow=1.05 cfs 0.131 af Outflow=0.25 cfs 0.065 af
<b>Link 14L: DA 2</b>	Inflow=0.07 cfs 0.019 af Primary=0.07 cfs 0.019 af
<b>Link 15L: DA 5</b>	Inflow=0.82 cfs 0.092 af Primary=0.82 cfs 0.092 af
<b>Link 19L: DA 4</b>	Inflow=0.11 cfs 0.024 af Primary=0.11 cfs 0.024 af
<b>Link 21L: DA 3</b>	Inflow=0.02 cfs 0.004 af Primary=0.02 cfs 0.004 af
<b>Link 22L: Off-Site</b>	Inflow=7.59 cfs 0.839 af Primary=7.59 cfs 0.839 af
<b>Link 29L: DA 6</b>	Inflow=0.15 cfs 0.015 af Primary=0.15 cfs 0.015 af
<b>Link 37L: Total Off-Site</b>	Inflow=7.27 cfs 2.380 af Primary=7.27 cfs 2.380 af
<b>Link 38L: DA 1</b>	Inflow=0.05 cfs 0.010 af Primary=0.05 cfs 0.010 af
<b>Link 39L: DA 7</b>	Inflow=0.10 cfs 0.020 af Primary=0.10 cfs 0.020 af

**Total Runoff Area = 15.343 ac Runoff Volume = 3.193 af Average Runoff Depth = 2.50"**  
**69.71% Pervious = 10.695 ac 30.29% Impervious = 4.648 ac**

**Post-Drainage - November 26**

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**Summary for Pond 28P: Basin 1**

Inflow Area = 13.039 ac, 34.57% Impervious, Inflow Depth = 2.72" for 25-Year event  
 Inflow = 26.75 cfs @ 12.18 hrs, Volume= 2.958 af  
 Outflow = 6.82 cfs @ 12.63 hrs, Volume= 2.211 af, Atten= 75%, Lag= 27.2 min  
 Primary = 6.82 cfs @ 12.63 hrs, Volume= 2.211 af

Routing by Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs  
 Peak Elev= 169.76' @ 12.63 hrs Surf.Area= 21,464 sf Storage= 64,110 cf

Plug-Flow detention time= 304.3 min calculated for 2.209 af (75% of inflow)  
 Center-of-Mass det. time= 199.5 min ( 989.3 - 789.7 )

Volume	Invert	Avail.Storage	Storage Description
#1	166.15'	114,130 cf	<b>Basin (Prismatic)</b> Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
166.15	14,300	0	0
167.00	15,820	12,801	12,801
168.00	17,770	16,795	29,596
169.00	19,820	18,795	48,391
170.00	21,979	20,900	69,290
171.90	25,220	44,839	114,130

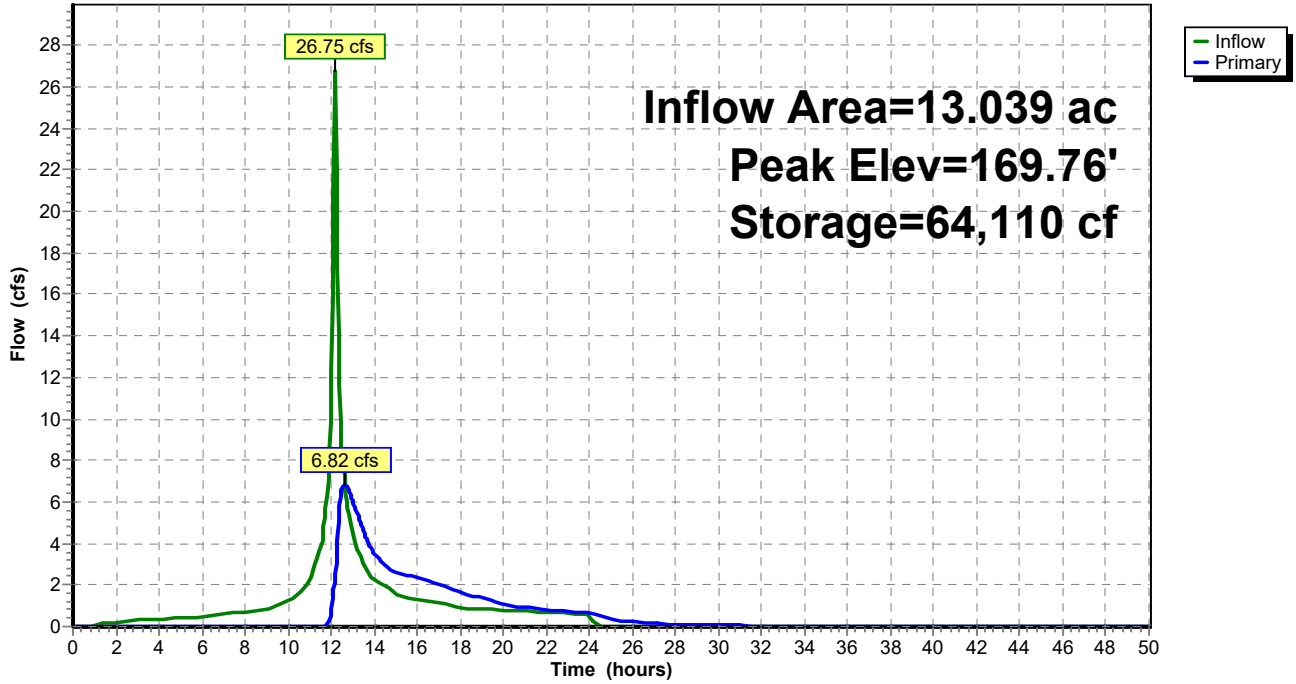
Device	Routing	Invert	Outlet Devices
#1	Primary	168.15'	<b>6.0" Vert. Orifice/Grate X 3.00</b> C= 0.600
#2	Primary	170.60'	<b>48.0" W x 48.0" H Vert. Orifice/Grate</b> C= 0.600
#3	Primary	169.30'	<b>1.8' long Sharp-Crested Rectangular Weir X 2.00</b> 2 End Contraction(s)

**Primary OutFlow** Max=6.80 cfs @ 12.63 hrs HW=169.76' (Free Discharge)

- 1=Orifice/Grate (Orifice Controls 3.31 cfs @ 5.62 fps)
- 2=Orifice/Grate ( Controls 0.00 cfs)
- 3=Sharp-Crested Rectangular Weir (Weir Controls 3.50 cfs @ 2.22 fps)

**Pond 28P: Basin 1**

Hydrograph



**Post-Drainage - November 26**

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**Summary for Pond 44P: Recharge**

Inflow Area = 1.046 ac, 15.77% Impervious, Inflow Depth = 1.50" for 25-Year event  
 Inflow = 1.05 cfs @ 12.19 hrs, Volume= 0.131 af  
 Outflow = 0.25 cfs @ 12.84 hrs, Volume= 0.065 af, Atten= 76%, Lag= 39.3 min  
 Primary = 0.25 cfs @ 12.84 hrs, Volume= 0.065 af

Routing by Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs  
 Peak Elev= 171.32' @ 12.84 hrs Surf.Area= 1,300 sf Storage= 2,932 cf

Plug-Flow detention time= 353.6 min calculated for 0.065 af (50% of inflow)  
 Center-of-Mass det. time= 179.7 min ( 1,002.4 - 822.7 )

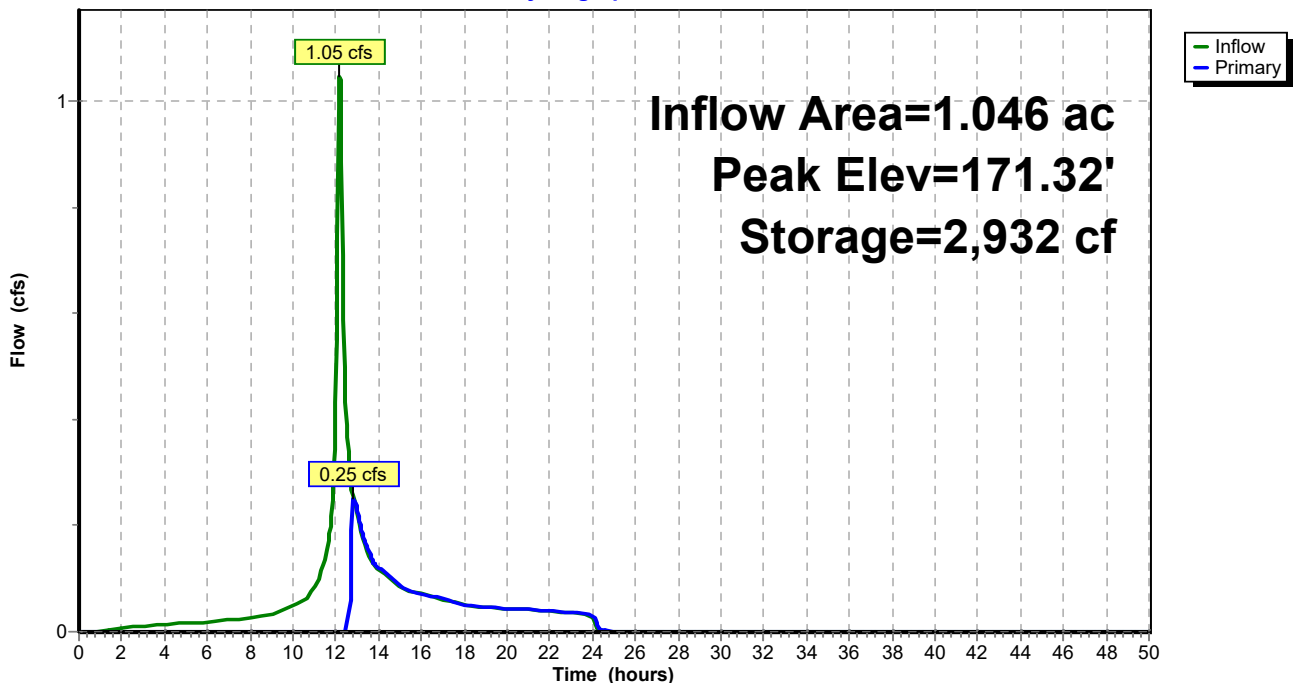
Volume	Invert	Avail.Storage	Storage Description
#1	167.75'	1,605 cf	<b>5.00'W x 260.00'L x 4.50'H Prismatic</b> 5,850 cf Overall - 1,838 cf Embedded = 4,012 cf x 40.0% Voids
#2	168.50'	1,838 cf	<b>36.0" Round Pipe Storage</b> Inside #1 L= 260.0'
		3,443 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	171.25'	<b>4.0' long Sharp-Crested Rectangular Weir</b> 2 End Contraction(s)

**Primary OutFlow** Max=0.24 cfs @ 12.84 hrs HW=171.32' (Free Discharge)  
 ↳1=Sharp-Crested Rectangular Weir (Weir Controls 0.24 cfs @ 0.87 fps)

**Pond 44P: Recharge**

Hydrograph



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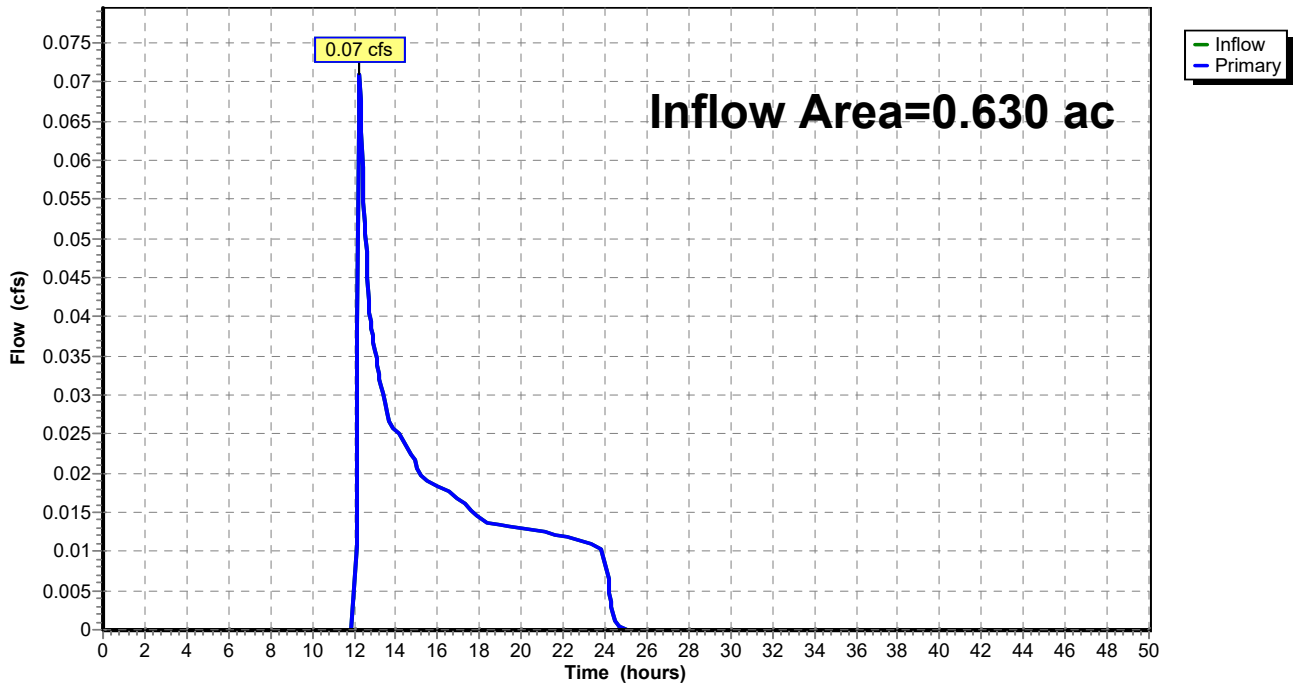
**Summary for Link 14L: DA 2**

Inflow Area = 0.630 ac, 0.00% Impervious, Inflow Depth = 0.36" for 25-Year event  
Inflow = 0.07 cfs @ 12.26 hrs, Volume= 0.019 af  
Primary = 0.07 cfs @ 12.26 hrs, Volume= 0.019 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs

**Link 14L: DA 2**

Hydrograph



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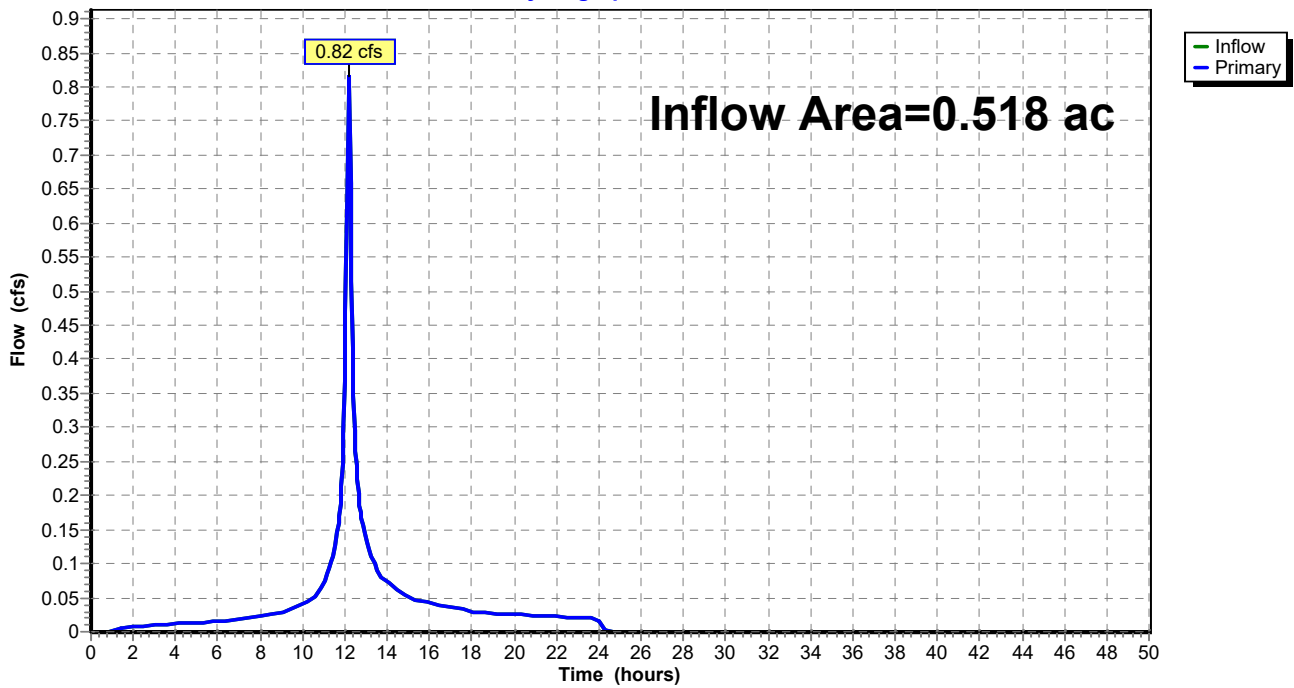
**Summary for Link 15L: DA 5**

Inflow Area = 0.518 ac, 27.22% Impervious, Inflow Depth = 2.14" for 25-Year event  
Inflow = 0.82 cfs @ 12.18 hrs, Volume= 0.092 af  
Primary = 0.82 cfs @ 12.18 hrs, Volume= 0.092 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs

**Link 15L: DA 5**

Hydrograph



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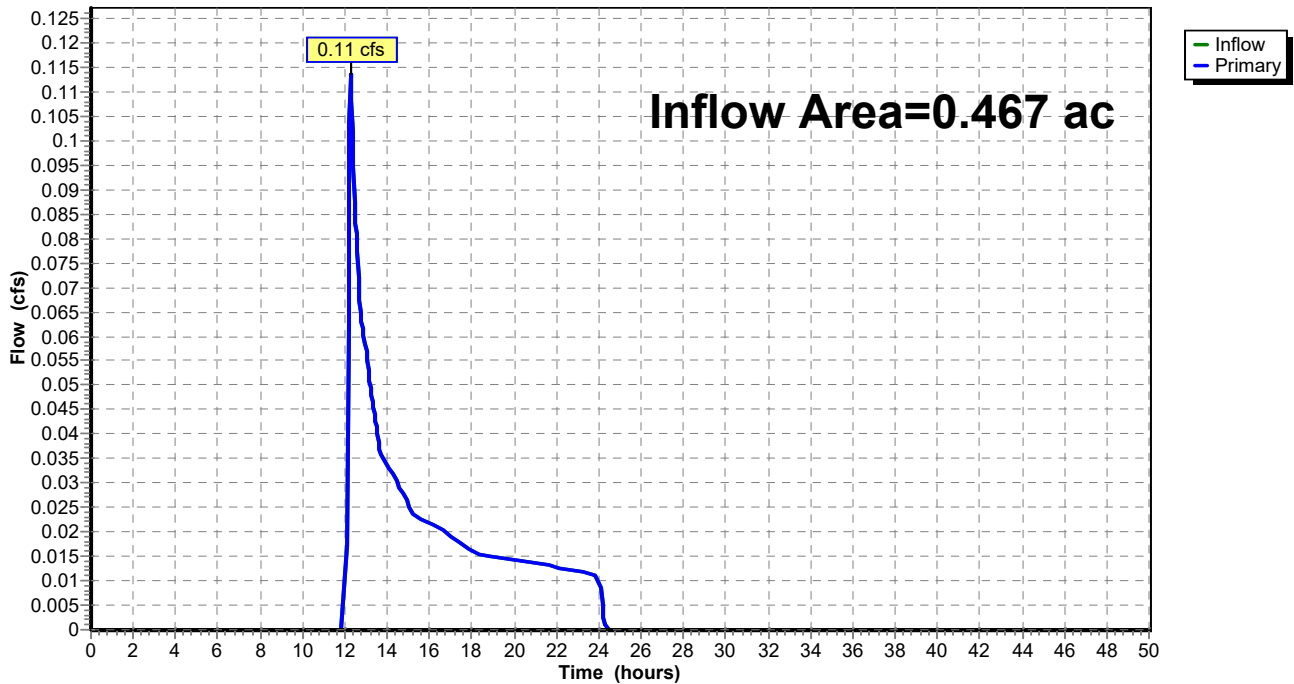
**Summary for Link 19L: DA 4**

Inflow Area = 0.467 ac, 0.00% Impervious, Inflow Depth = 0.61" for 25-Year event  
Inflow = 0.11 cfs @ 12.26 hrs, Volume= 0.024 af  
Primary = 0.11 cfs @ 12.26 hrs, Volume= 0.024 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs

**Link 19L: DA 4**

Hydrograph





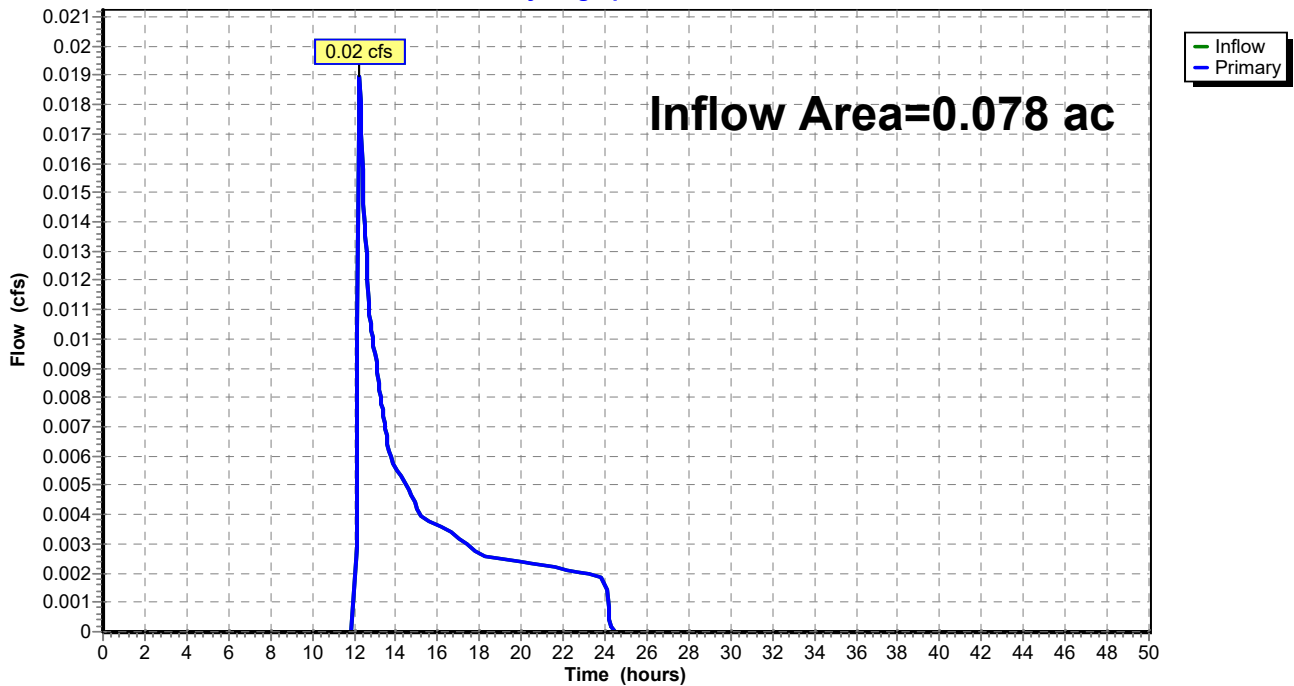
### Summary for Link 21L: DA 3

Inflow Area = 0.078 ac, 0.00% Impervious, Inflow Depth = 0.61" for 25-Year event  
Inflow = 0.02 cfs @ 12.26 hrs, Volume= 0.004 af  
Primary = 0.02 cfs @ 12.26 hrs, Volume= 0.004 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs

### Link 21L: DA 3

Hydrograph



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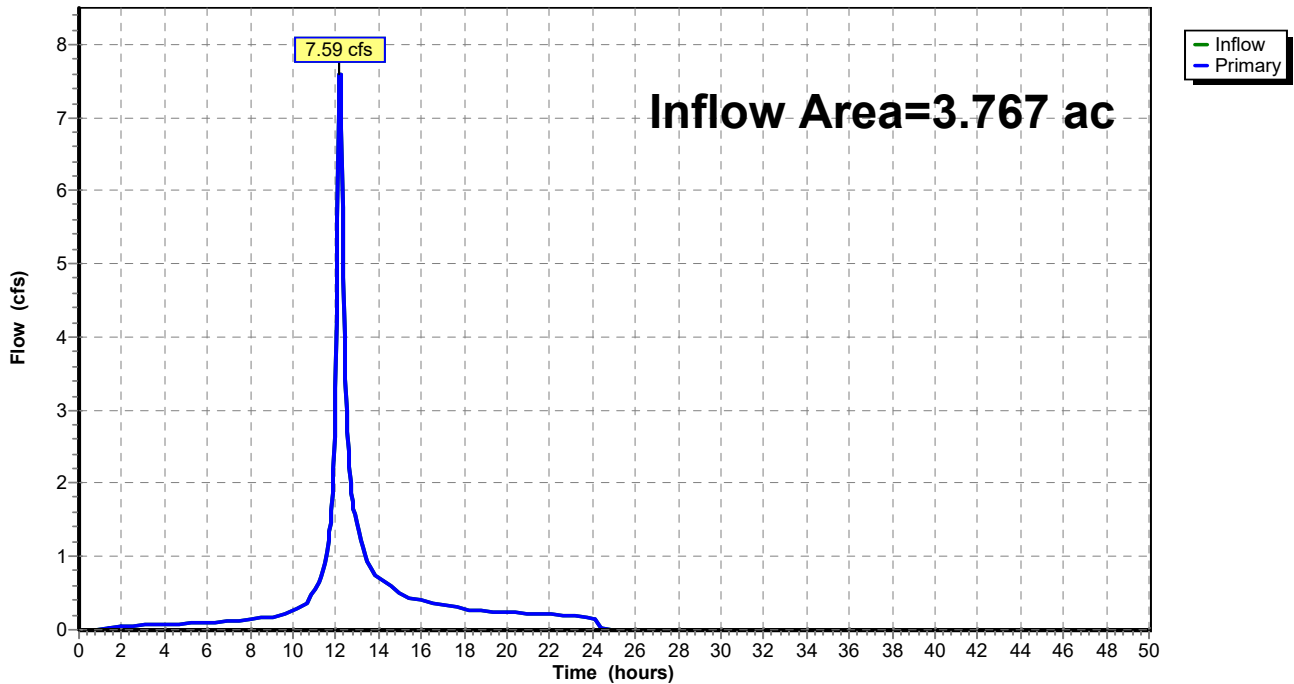
**Summary for Link 22L: Off-Site**

Inflow Area = 3.767 ac, 23.20% Impervious, Inflow Depth = 2.67" for 25-Year event  
Inflow = 7.59 cfs @ 12.19 hrs, Volume= 0.839 af  
Primary = 7.59 cfs @ 12.19 hrs, Volume= 0.839 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs

**Link 22L: Off-Site**

**Hydrograph**



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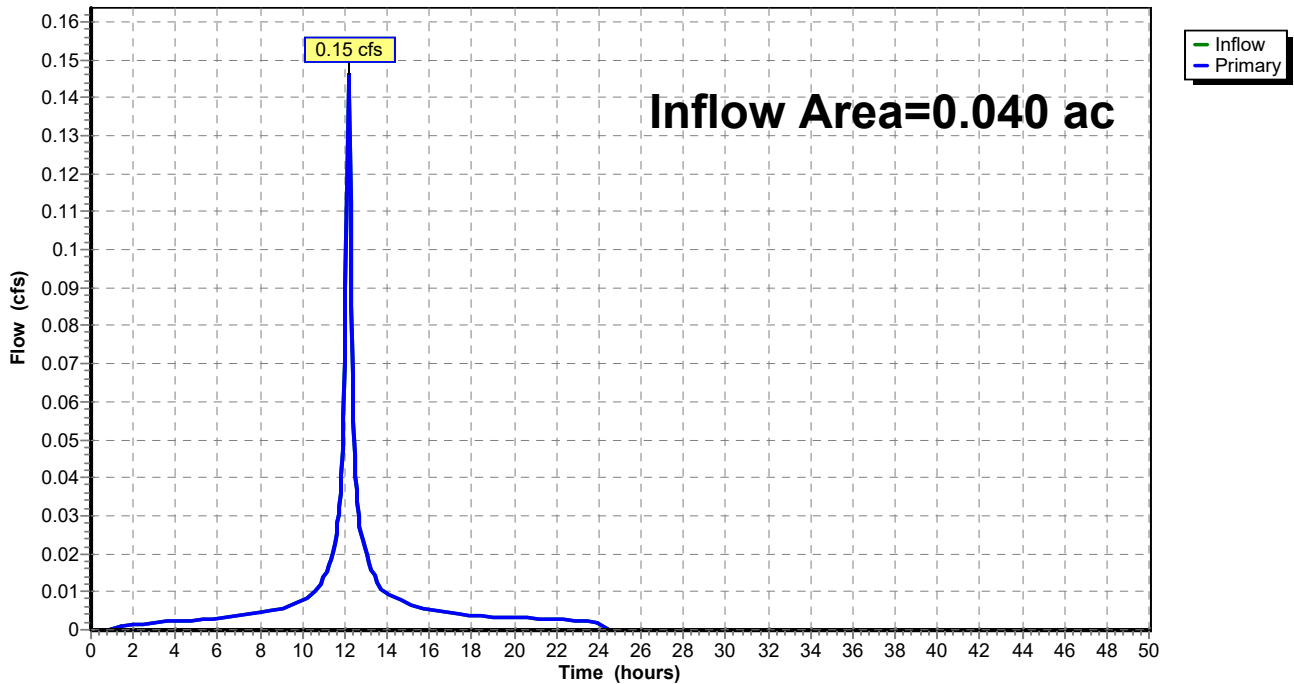
**Summary for Link 29L: DA 6**

Inflow Area = 0.040 ac, 67.50% Impervious, Inflow Depth = 4.44" for 25-Year event  
Inflow = 0.15 cfs @ 12.17 hrs, Volume= 0.015 af  
Primary = 0.15 cfs @ 12.17 hrs, Volume= 0.015 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs

**Link 29L: DA 6**

Hydrograph



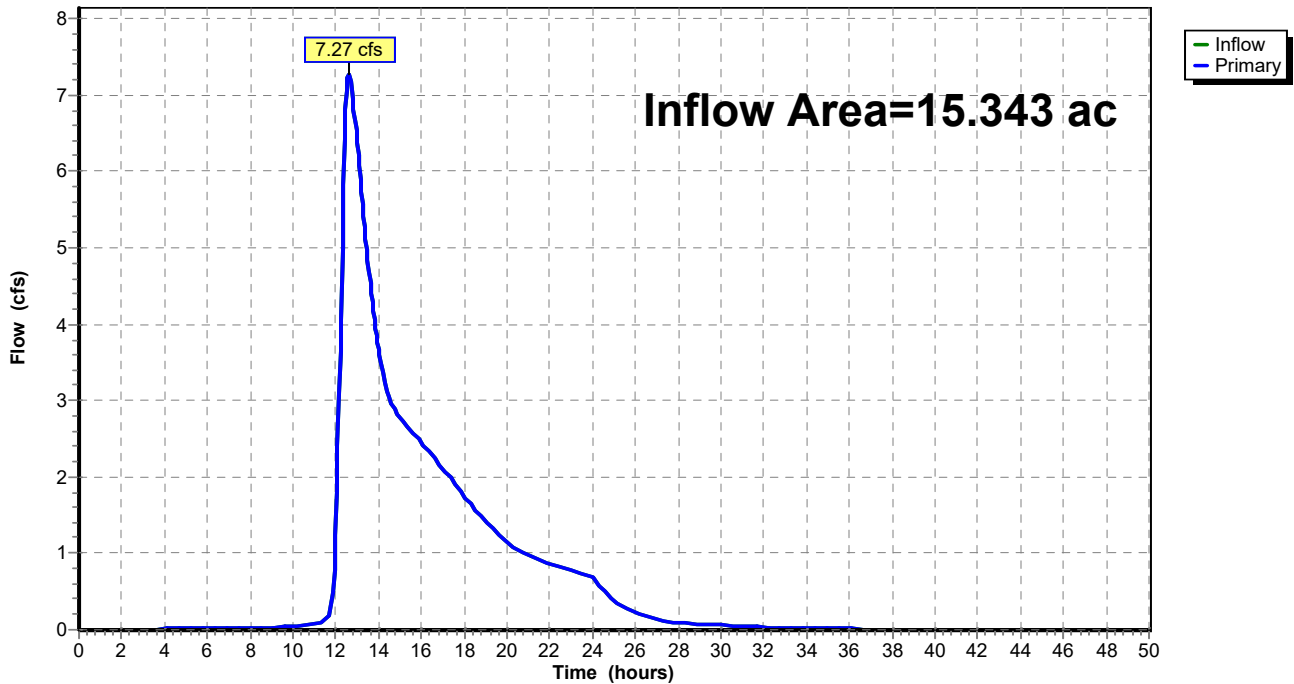
### Summary for Link 37L: Total Off-Site

Inflow Area = 15.343 ac, 30.29% Impervious, Inflow Depth > 1.86" for 25-Year event  
Inflow = 7.27 cfs @ 12.61 hrs, Volume= 2.380 af  
Primary = 7.27 cfs @ 12.61 hrs, Volume= 2.380 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs

### Link 37L: Total Off-Site

Hydrograph



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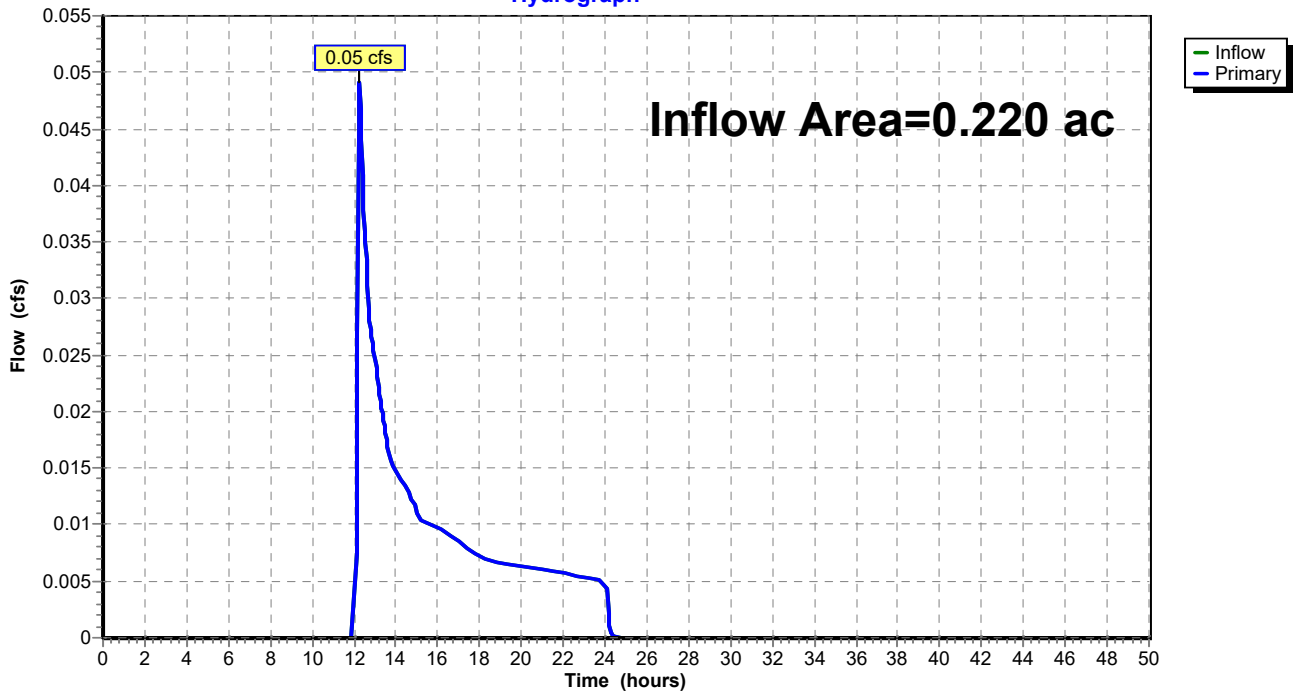
**Summary for Link 38L: DA 1**

Inflow Area = 0.220 ac, 0.00% Impervious, Inflow Depth = 0.57" for 25-Year event  
Inflow = 0.05 cfs @ 12.26 hrs, Volume= 0.010 af  
Primary = 0.05 cfs @ 12.26 hrs, Volume= 0.010 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs

**Link 38L: DA 1**

Hydrograph



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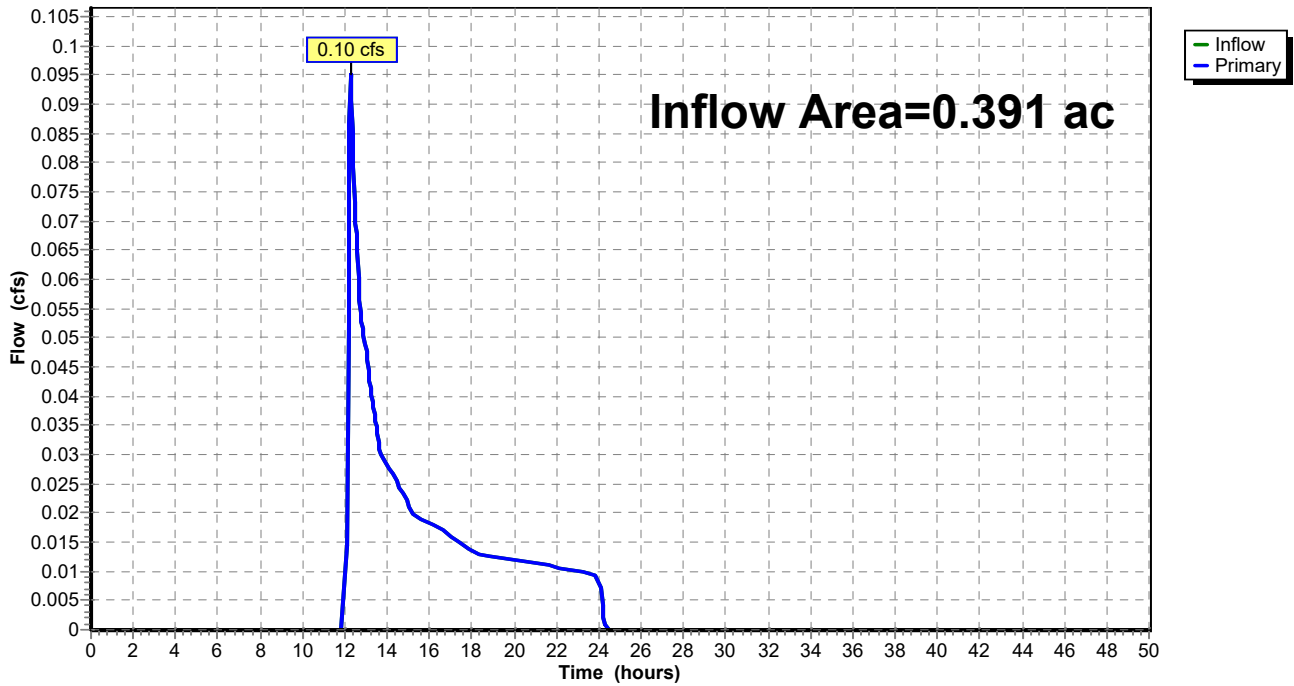
**Summary for Link 39L: DA 7**

Inflow Area = 0.391 ac, 0.00% Impervious, Inflow Depth = 0.61" for 25-Year event  
Inflow = 0.10 cfs @ 12.26 hrs, Volume= 0.020 af  
Primary = 0.10 cfs @ 12.26 hrs, Volume= 0.020 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs

**Link 39L: DA 7**

Hydrograph



**POST-DEVELOPMENT RUNOFF CALCULATIONS**  
**(100 YEAR STORM)**





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Time span=0.00-50.00 hrs, dt=0.05 hrs, 1001 points  
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN  
 Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

<b>Subcatchment 7S: DA 5 Woods</b>	Runoff Area=0.014 ac 0.00% Impervious Runoff Depth=0.66" Tc=10.0 min CN=30 Runoff=0.00 cfs 0.001 af
<b>Subcatchment 8S: DA Site Woods</b>	Runoff Area=0.116 ac 0.00% Impervious Runoff Depth=0.66" Flow Length=110' Tc=25.8 min CN=30 Runoff=0.02 cfs 0.006 af
<b>Subcatchment 10S: DA 2 Woods</b>	Runoff Area=0.338 ac 0.00% Impervious Runoff Depth=0.66" Flow Length=120' Slope=0.0147 '/' Tc=27.3 min CN=30 Runoff=0.05 cfs 0.019 af
<b>Subcatchment 11S: DA 2 Grass</b>	Runoff Area=0.292 ac 0.00% Impervious Runoff Depth=1.57" Tc=10.0 min CN=39 Runoff=0.36 cfs 0.038 af
<b>Subcatchment 16S: DA 5 Grass</b>	Runoff Area=0.363 ac 0.00% Impervious Runoff Depth=1.57" Tc=10.0 min CN=39 Runoff=0.45 cfs 0.048 af
<b>Subcatchment 20S: DA 4 Grass</b>	Runoff Area=0.467 ac 0.00% Impervious Runoff Depth=1.57" Tc=10.0 min CN=39 Runoff=0.57 cfs 0.061 af
<b>Subcatchment 22S: DA 3 Grass</b>	Runoff Area=0.078 ac 0.00% Impervious Runoff Depth=1.57" Tc=10.0 min CN=39 Runoff=0.10 cfs 0.010 af
<b>Subcatchment 24S: DA 5 Impervious</b>	Runoff Area=0.141 ac 100.00% Impervious Runoff Depth=8.70" Tc=10.0 min CN=98 Runoff=1.03 cfs 0.102 af
<b>Subcatchment 28S: Cultivated</b>	Runoff Area=1.470 ac 0.00% Impervious Runoff Depth=4.42" Flow Length=415' Tc=14.9 min CN=63 Runoff=5.54 cfs 0.542 af
<b>Subcatchment 29S: Impervious</b>	Runoff Area=0.874 ac 100.00% Impervious Runoff Depth=8.70" Tc=10.0 min CN=98 Runoff=6.39 cfs 0.634 af
<b>Subcatchment 30S: DA 6 Grass</b>	Runoff Area=0.013 ac 0.00% Impervious Runoff Depth=1.57" Tc=10.0 min CN=39 Runoff=0.02 cfs 0.002 af
<b>Subcatchment 31S: DA 6 Impervious</b>	Runoff Area=0.027 ac 100.00% Impervious Runoff Depth=8.70" Tc=10.0 min CN=98 Runoff=0.20 cfs 0.020 af
<b>Subcatchment 32S: Woods</b>	Runoff Area=0.115 ac 0.00% Impervious Runoff Depth=0.66" Flow Length=345' Tc=24.1 min CN=30 Runoff=0.02 cfs 0.006 af
<b>Subcatchment 33S: DA Site Impervious</b>	Runoff Area=3.441 ac 100.00% Impervious Runoff Depth=8.70" Tc=10.0 min CN=98 Runoff=25.15 cfs 2.495 af
<b>Subcatchment 34S: DA Site Grass</b>	Runoff Area=4.629 ac 0.00% Impervious Runoff Depth=1.57" Tc=10.0 min CN=39 Runoff=5.69 cfs 0.607 af
<b>Subcatchment 35S: Grass</b>	Runoff Area=1.308 ac 0.00% Impervious Runoff Depth=1.57" Flow Length=585' Tc=17.9 min CN=39 Runoff=1.24 cfs 0.172 af

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<b>Subcatchment39S: DA 1 Woods</b>	Runoff Area=0.018 ac 0.00% Impervious Runoff Depth=0.66" Tc=10.0 min CN=30 Runoff=0.00 cfs 0.001 af
<b>Subcatchment40S: DA 1 Grass</b>	Runoff Area=0.202 ac 0.00% Impervious Runoff Depth=1.57" Tc=10.0 min CN=39 Runoff=0.25 cfs 0.027 af
<b>Subcatchment42S: DA 7 Grass</b>	Runoff Area=0.391 ac 0.00% Impervious Runoff Depth=1.57" Tc=10.0 min CN=39 Runoff=0.48 cfs 0.051 af
<b>Subcatchment45S: B-5, B-4 and B-3</b>	Runoff Area=0.165 ac 100.00% Impervious Runoff Depth=8.70" Tc=10.0 min CN=98 Runoff=1.21 cfs 0.120 af
<b>Subcatchment46S: B-5, B-4 and B-3 Grass</b>	Runoff Area=0.881 ac 0.00% Impervious Runoff Depth=1.57" Tc=10.0 min CN=39 Runoff=1.08 cfs 0.116 af
<b>Pond 28P: Basin 1</b>	Peak Elev=170.59' Storage=82,545 cf Inflow=44.26 cfs 4.652 af Outflow=18.97 cfs 3.904 af
<b>Pond 44P: Recharge</b>	Peak Elev=171.55' Storage=3,081 cf Inflow=2.26 cfs 0.235 af Outflow=2.17 cfs 0.169 af
<b>Link 14L: DA 2</b>	Inflow=0.36 cfs 0.057 af Primary=0.36 cfs 0.057 af
<b>Link 15L: DA 5</b>	Inflow=1.46 cfs 0.151 af Primary=1.46 cfs 0.151 af
<b>Link 19L: DA 4</b>	Inflow=0.57 cfs 0.061 af Primary=0.57 cfs 0.061 af
<b>Link 21L: DA 3</b>	Inflow=0.10 cfs 0.010 af Primary=0.10 cfs 0.010 af
<b>Link 22L: Off-Site</b>	Inflow=12.41 cfs 1.353 af Primary=12.41 cfs 1.353 af
<b>Link 29L: DA 6</b>	Inflow=0.21 cfs 0.021 af Primary=0.21 cfs 0.021 af
<b>Link 37L: Total Off-Site</b>	Inflow=20.49 cfs 4.262 af Primary=20.49 cfs 4.262 af
<b>Link 38L: DA 1</b>	Inflow=0.25 cfs 0.027 af Primary=0.25 cfs 0.027 af
<b>Link 39L: DA 7</b>	Inflow=0.48 cfs 0.051 af Primary=0.48 cfs 0.051 af

**Total Runoff Area = 15.343 ac Runoff Volume = 5.076 af Average Runoff Depth = 3.97"**  
**69.71% Pervious = 10.695 ac 30.29% Impervious = 4.648 ac**

**Post-Drainage - November 26**

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**Summary for Pond 28P: Basin 1**

Inflow Area = 13.039 ac, 34.57% Impervious, Inflow Depth = 4.28" for 100-Year event  
 Inflow = 44.26 cfs @ 12.19 hrs, Volume= 4.652 af  
 Outflow = 18.97 cfs @ 12.42 hrs, Volume= 3.904 af, Atten= 57%, Lag= 14.0 min  
 Primary = 18.97 cfs @ 12.42 hrs, Volume= 3.904 af

Routing by Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs  
 Peak Elev= 170.59' @ 12.42 hrs Surf.Area= 22,985 sf Storage= 82,545 cf

Plug-Flow detention time= 232.6 min calculated for 3.904 af (84% of inflow)  
 Center-of-Mass det. time= 154.1 min ( 947.8 - 793.7 )

Volume	Invert	Avail.Storage	Storage Description
#1	166.15'	114,130 cf	<b>Basin (Prismatic)</b> Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
166.15	14,300	0	0
167.00	15,820	12,801	12,801
168.00	17,770	16,795	29,596
169.00	19,820	18,795	48,391
170.00	21,979	20,900	69,290
171.90	25,220	44,839	114,130

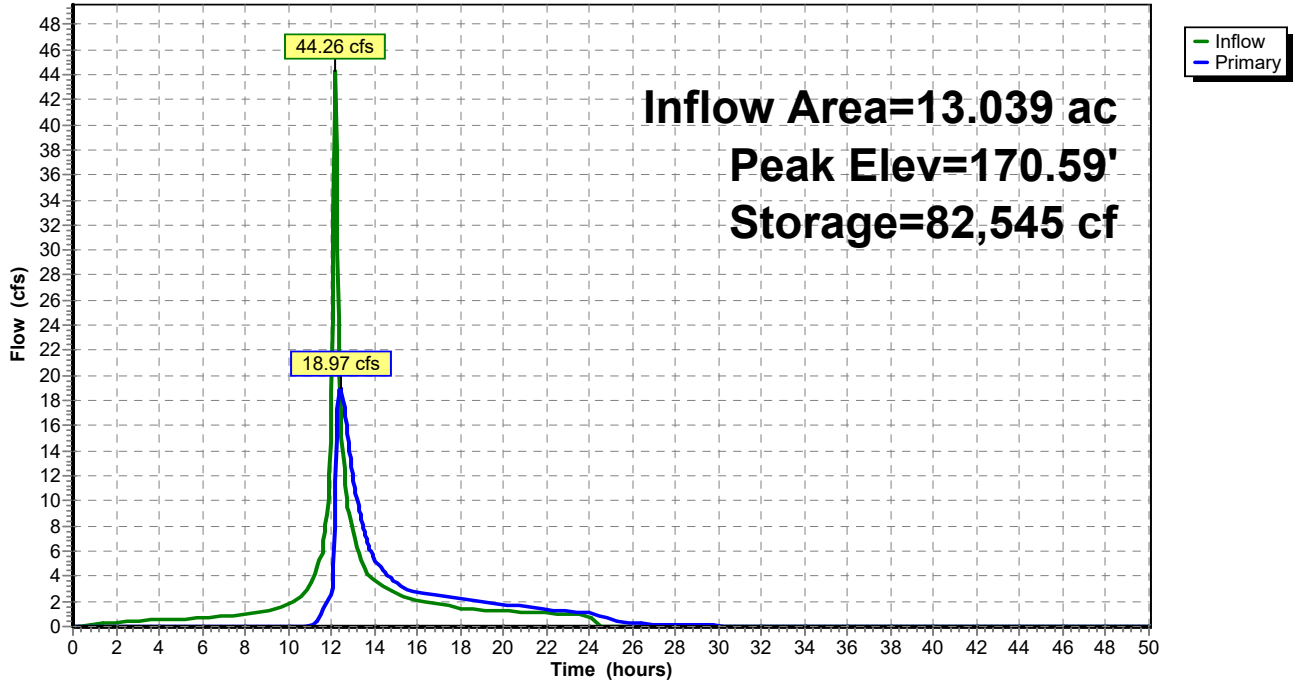
Device	Routing	Invert	Outlet Devices
#1	Primary	168.15'	<b>6.0" Vert. Orifice/Grate X 3.00</b> C= 0.600
#2	Primary	170.60'	<b>48.0" W x 48.0" H Vert. Orifice/Grate</b> C= 0.600
#3	Primary	169.30'	<b>1.8' long Sharp-Crested Rectangular Weir X 2.00</b> 2 End Contraction(s)

**Primary OutFlow** Max=18.90 cfs @ 12.42 hrs HW=170.59' (Free Discharge)

- 1=Orifice/Grate (Orifice Controls 4.19 cfs @ 7.12 fps)
- 2=Orifice/Grate ( Controls 0.00 cfs)
- 3=Sharp-Crested Rectangular Weir (Weir Controls 14.71 cfs @ 3.71 fps)

### Pond 28P: Basin 1

#### Hydrograph



**Post-Drainage - November 26**

NOAA 24-hr D 100-Year Rainfall=8.94"

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**Summary for Pond 44P: Recharge**

Inflow Area = 1.046 ac, 15.77% Impervious, Inflow Depth = 2.70" for 100-Year event  
 Inflow = 2.26 cfs @ 12.18 hrs, Volume= 0.235 af  
 Outflow = 2.17 cfs @ 12.25 hrs, Volume= 0.169 af, Atten= 4%, Lag= 3.8 min  
 Primary = 2.17 cfs @ 12.25 hrs, Volume= 0.169 af

Routing by Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs  
 Peak Elev= 171.55' @ 12.25 hrs Surf.Area= 1,300 sf Storage= 3,081 cf

Plug-Flow detention time= 208.0 min calculated for 0.169 af (72% of inflow)  
 Center-of-Mass det. time= 90.6 min ( 921.0 - 830.4 )

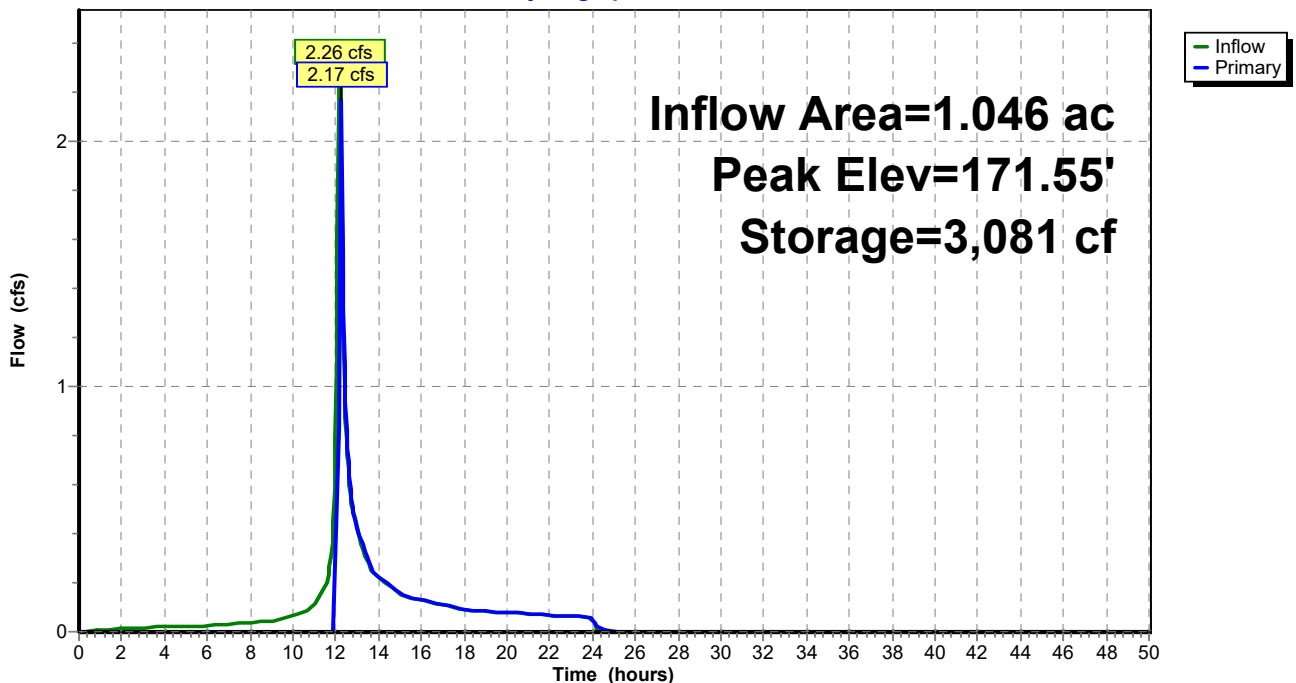
Volume	Invert	Avail.Storage	Storage Description
#1	167.75'	1,605 cf	<b>5.00'W x 260.00'L x 4.50'H Prismatic</b> 5,850 cf Overall - 1,838 cf Embedded = 4,012 cf x 40.0% Voids
#2	168.50'	1,838 cf	<b>36.0" Round Pipe Storage</b> Inside #1 L= 260.0'
		3,443 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	171.25'	<b>4.0' long Sharp-Crested Rectangular Weir</b> 2 End Contraction(s)

**Primary OutFlow** Max=2.14 cfs @ 12.25 hrs HW=171.55' (Free Discharge)  
 ↳1=Sharp-Crested Rectangular Weir (Weir Controls 2.14 cfs @ 1.80 fps)

**Pond 44P: Recharge**

Hydrograph



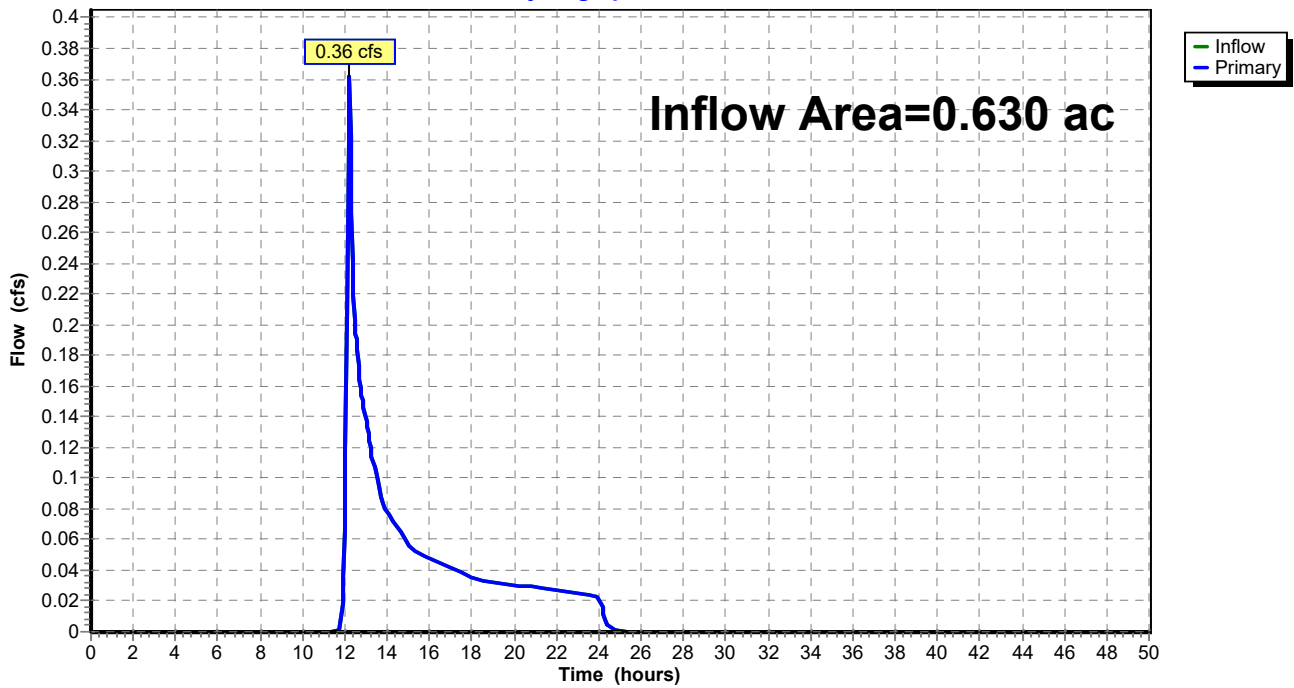
### Summary for Link 14L: DA 2

Inflow Area = 0.630 ac, 0.00% Impervious, Inflow Depth = 1.08" for 100-Year event  
Inflow = 0.36 cfs @ 12.20 hrs, Volume= 0.057 af  
Primary = 0.36 cfs @ 12.20 hrs, Volume= 0.057 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs

### Link 14L: DA 2

Hydrograph



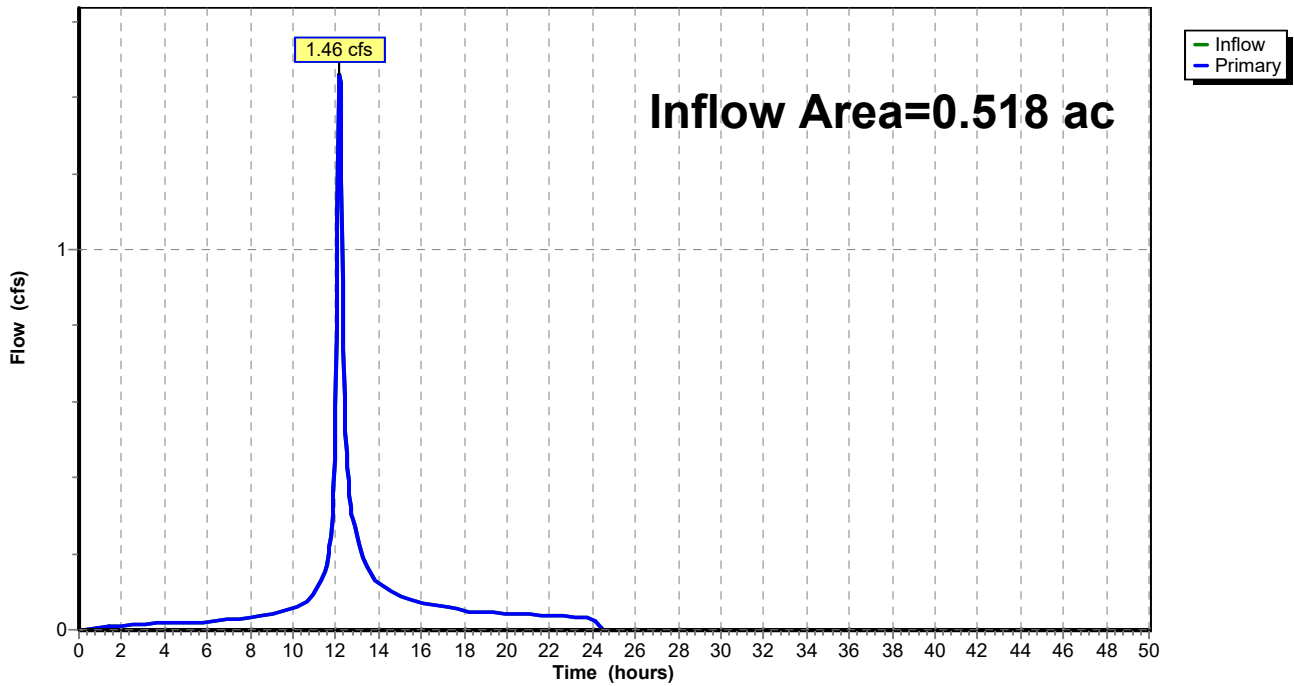
### Summary for Link 15L: DA 5

Inflow Area = 0.518 ac, 27.22% Impervious, Inflow Depth = 3.49" for 100-Year event  
Inflow = 1.46 cfs @ 12.18 hrs, Volume= 0.151 af  
Primary = 1.46 cfs @ 12.18 hrs, Volume= 0.151 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs

### Link 15L: DA 5

Hydrograph



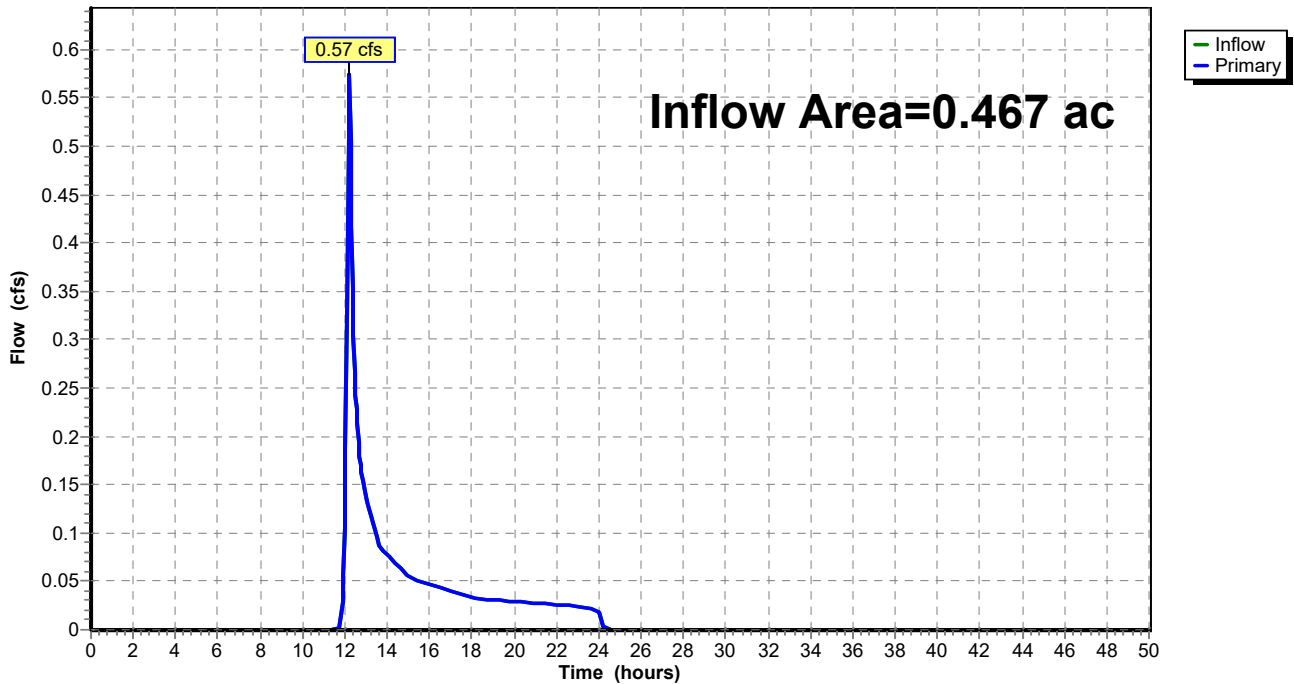
### Summary for Link 19L: DA 4

Inflow Area = 0.467 ac, 0.00% Impervious, Inflow Depth = 1.57" for 100-Year event  
Inflow = 0.57 cfs @ 12.20 hrs, Volume= 0.061 af  
Primary = 0.57 cfs @ 12.20 hrs, Volume= 0.061 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs

### Link 19L: DA 4

Hydrograph





**Post-Drainage - November 26**

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NOAA 24-hr D 100-Year Rainfall=8.94"

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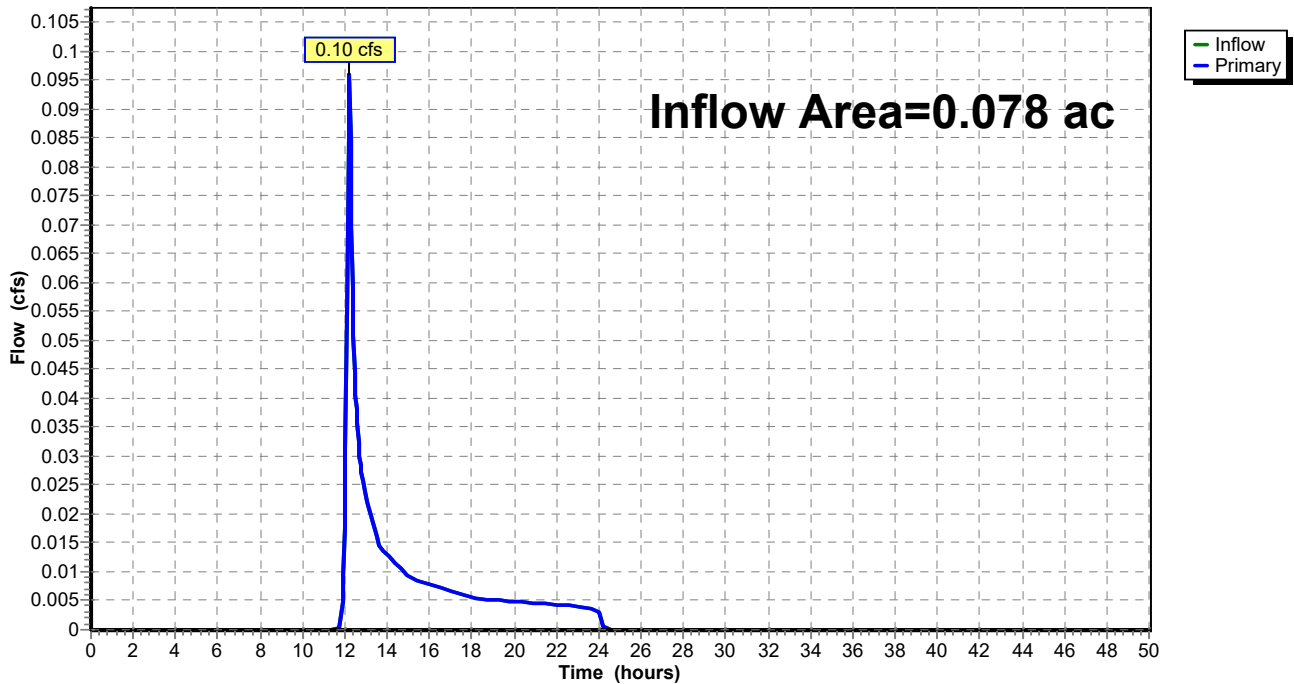
**Summary for Link 21L: DA 3**

Inflow Area = 0.078 ac, 0.00% Impervious, Inflow Depth = 1.57" for 100-Year event  
Inflow = 0.10 cfs @ 12.20 hrs, Volume= 0.010 af  
Primary = 0.10 cfs @ 12.20 hrs, Volume= 0.010 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs

**Link 21L: DA 3**

Hydrograph



**Post-Drainage - November 26**

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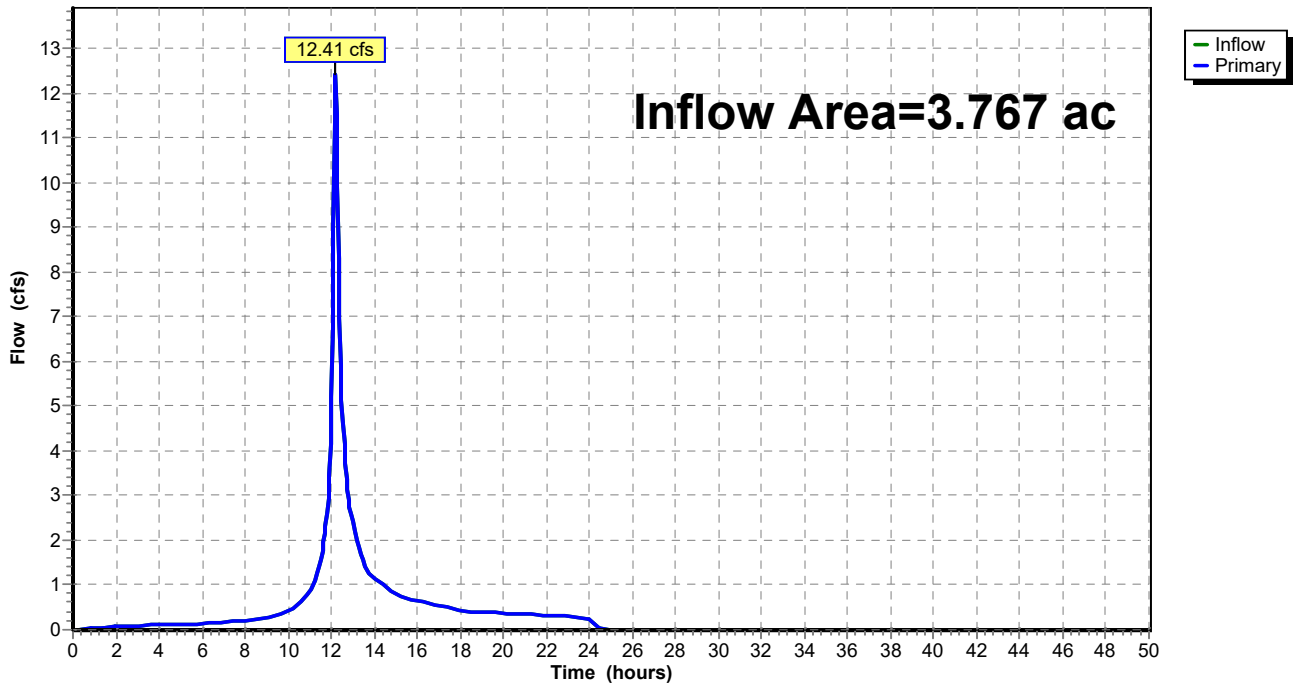
**Summary for Link 22L: Off-Site**

Inflow Area = 3.767 ac, 23.20% Impervious, Inflow Depth = 4.31" for 100-Year event  
Inflow = 12.41 cfs @ 12.20 hrs, Volume= 1.353 af  
Primary = 12.41 cfs @ 12.20 hrs, Volume= 1.353 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs

**Link 22L: Off-Site**

Hydrograph



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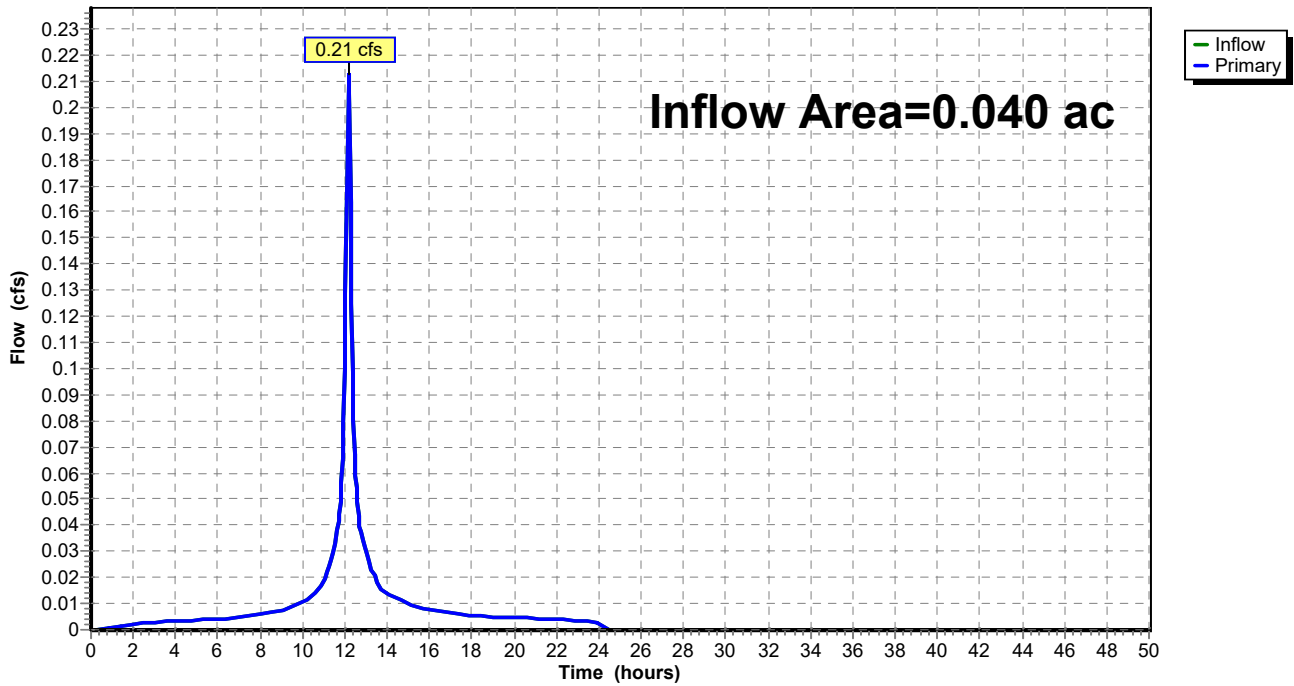
**Summary for Link 29L: DA 6**

Inflow Area = 0.040 ac, 67.50% Impervious, Inflow Depth = 6.38" for 100-Year event  
Inflow = 0.21 cfs @ 12.17 hrs, Volume= 0.021 af  
Primary = 0.21 cfs @ 12.17 hrs, Volume= 0.021 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs

**Link 29L: DA 6**

Hydrograph



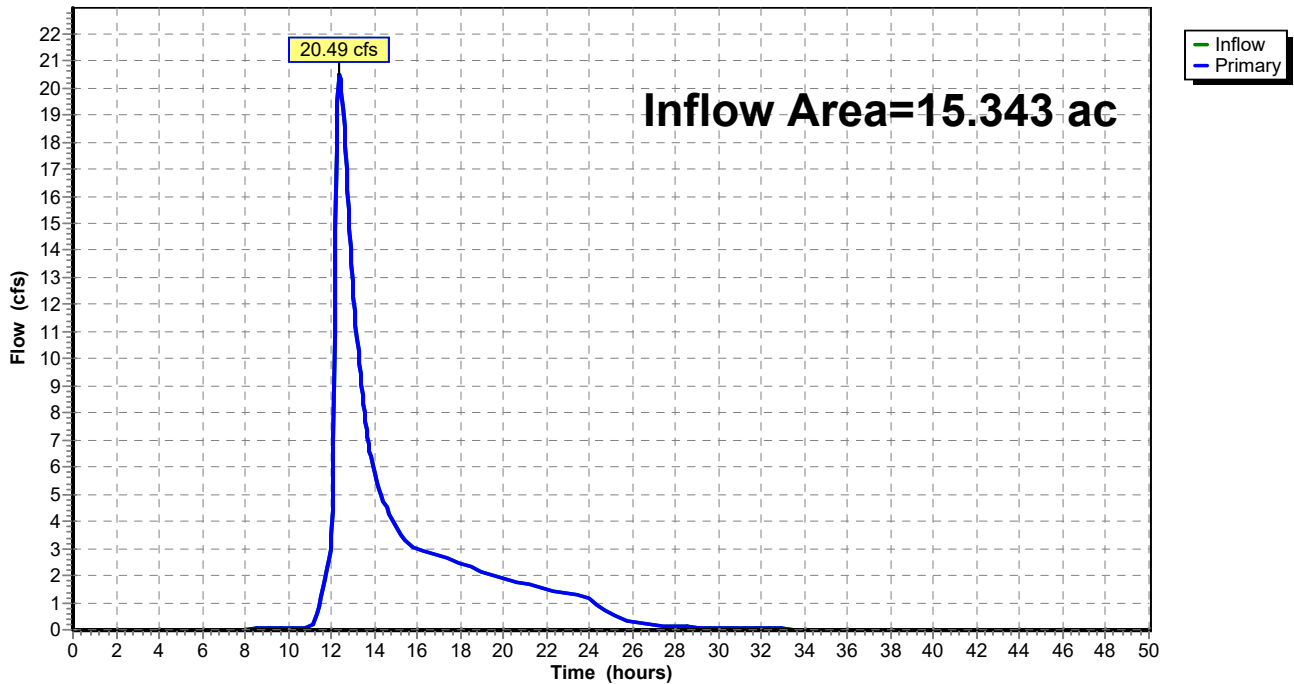
### Summary for Link 37L: Total Off-Site

Inflow Area = 15.343 ac, 30.29% Impervious, Inflow Depth > 3.33" for 100-Year event  
Inflow = 20.49 cfs @ 12.40 hrs, Volume= 4.262 af  
Primary = 20.49 cfs @ 12.40 hrs, Volume= 4.262 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs

### Link 37L: Total Off-Site

Hydrograph



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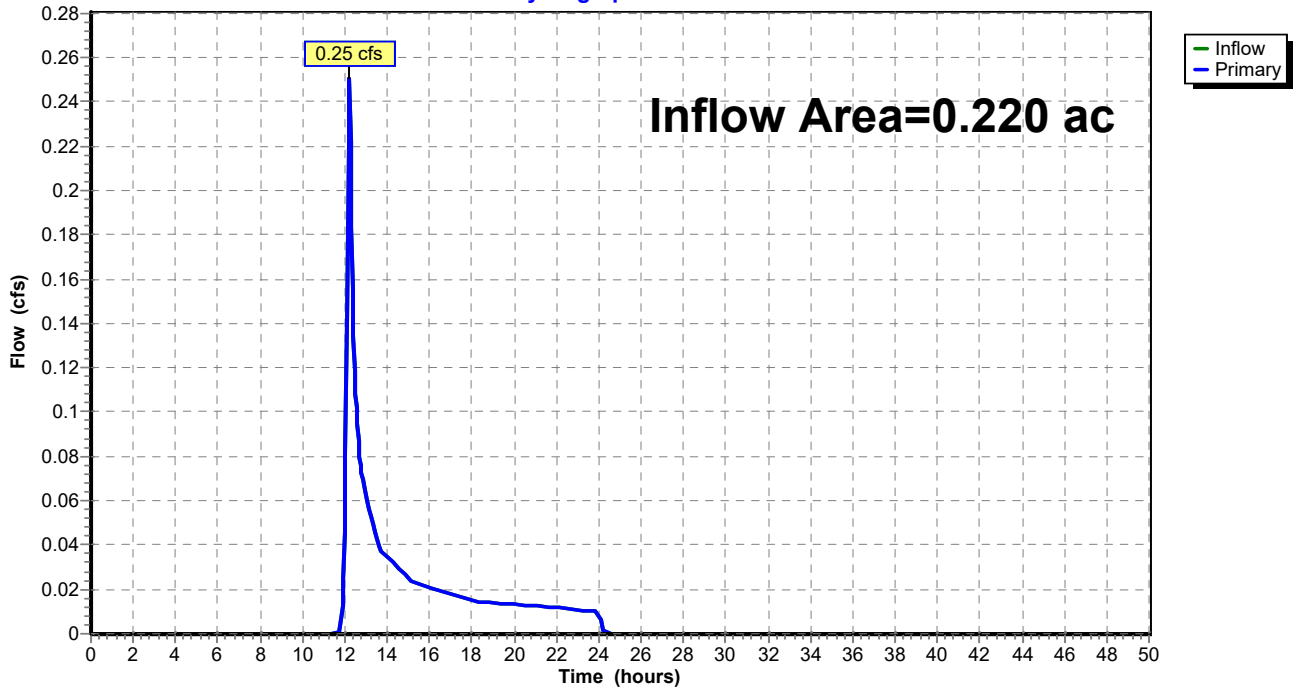
**Summary for Link 38L: DA 1**

Inflow Area = 0.220 ac, 0.00% Impervious, Inflow Depth = 1.50" for 100-Year event  
Inflow = 0.25 cfs @ 12.20 hrs, Volume= 0.027 af  
Primary = 0.25 cfs @ 12.20 hrs, Volume= 0.027 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs

**Link 38L: DA 1**

Hydrograph



**Post-Drainage - November 26**

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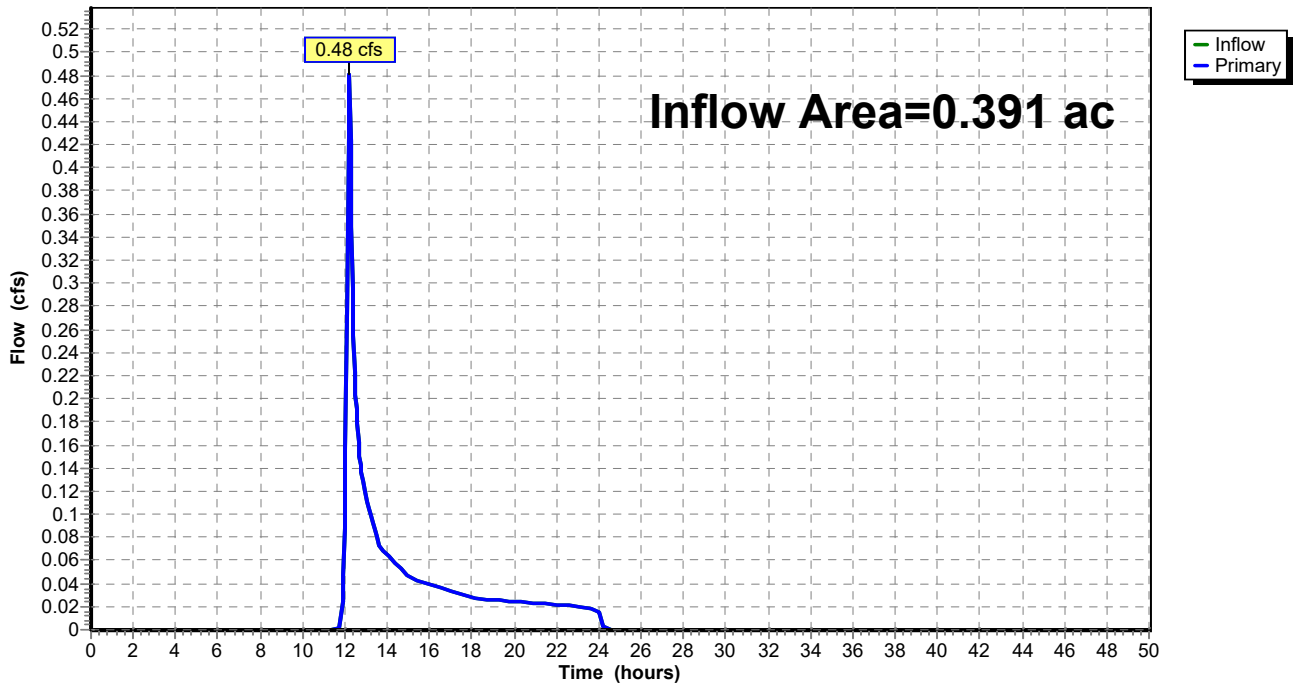
**Summary for Link 39L: DA 7**

Inflow Area = 0.391 ac, 0.00% Impervious, Inflow Depth = 1.57" for 100-Year event  
Inflow = 0.48 cfs @ 12.20 hrs, Volume= 0.051 af  
Primary = 0.48 cfs @ 12.20 hrs, Volume= 0.051 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs

**Link 39L: DA 7**

Hydrograph



## **APPENDIX F: WATER QUALITY ROUTINGS AND GROUNDWATER RECHARGE CALCULATIONS**





**Post-Drainage - November 26**

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NJ DEP 2-hr WQ Rainfall=1.25"

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Time span=0.00-50.00 hrs, dt=0.05 hrs, 1001 points  
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN  
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

<b>Subcatchment7S: DA 5 Woods</b>	Runoff Area=0.014 ac 0.00% Impervious Runoff Depth=0.00" Tc=10.0 min CN=30 Runoff=0.00 cfs 0.000 af
<b>Subcatchment8S: DA Site Woods</b>	Runoff Area=0.116 ac 0.00% Impervious Runoff Depth=0.00" Flow Length=110' Tc=25.8 min CN=30 Runoff=0.00 cfs 0.000 af
<b>Subcatchment10S: DA 2 Woods</b>	Runoff Area=0.338 ac 0.00% Impervious Runoff Depth=0.00" Flow Length=120' Slope=0.0147 '/' Tc=27.3 min CN=30 Runoff=0.00 cfs 0.000 af
<b>Subcatchment11S: DA 2 Grass</b>	Runoff Area=0.292 ac 0.00% Impervious Runoff Depth=0.00" Tc=10.0 min CN=39 Runoff=0.00 cfs 0.000 af
<b>Subcatchment16S: DA 5 Grass</b>	Runoff Area=0.363 ac 0.00% Impervious Runoff Depth=0.00" Tc=10.0 min CN=39 Runoff=0.00 cfs 0.000 af
<b>Subcatchment20S: DA 4 Grass</b>	Runoff Area=0.467 ac 0.00% Impervious Runoff Depth=0.00" Tc=10.0 min CN=39 Runoff=0.00 cfs 0.000 af
<b>Subcatchment22S: DA 3 Grass</b>	Runoff Area=0.078 ac 0.00% Impervious Runoff Depth=0.00" Tc=10.0 min CN=39 Runoff=0.00 cfs 0.000 af
<b>Subcatchment24S: DA 5 Impervious</b>	Runoff Area=0.141 ac 100.00% Impervious Runoff Depth=1.03" Tc=10.0 min CN=98 Runoff=0.36 cfs 0.012 af
<b>Subcatchment28S: Cultivated</b>	Runoff Area=1.470 ac 0.00% Impervious Runoff Depth=0.00" Flow Length=415' Tc=14.9 min CN=63 Runoff=0.00 cfs 0.000 af
<b>Subcatchment29S: Impervious</b>	Runoff Area=0.874 ac 100.00% Impervious Runoff Depth=1.03" Tc=10.0 min CN=98 Runoff=2.25 cfs 0.075 af
<b>Subcatchment30S: DA 6 Grass</b>	Runoff Area=0.013 ac 0.00% Impervious Runoff Depth=0.00" Tc=10.0 min CN=39 Runoff=0.00 cfs 0.000 af
<b>Subcatchment31S: DA 6 Impervious</b>	Runoff Area=0.027 ac 100.00% Impervious Runoff Depth=1.03" Tc=10.0 min CN=98 Runoff=0.07 cfs 0.002 af
<b>Subcatchment32S: Woods</b>	Runoff Area=0.115 ac 0.00% Impervious Runoff Depth=0.00" Flow Length=345' Tc=24.1 min CN=30 Runoff=0.00 cfs 0.000 af
<b>Subcatchment33S: DA Site Impervious</b>	Runoff Area=3.441 ac 100.00% Impervious Runoff Depth=1.03" Tc=10.0 min CN=98 Runoff=8.87 cfs 0.297 af
<b>Subcatchment34S: DA Site Grass</b>	Runoff Area=4.629 ac 0.00% Impervious Runoff Depth=0.00" Tc=10.0 min CN=39 Runoff=0.00 cfs 0.000 af
<b>Subcatchment35S: Grass</b>	Runoff Area=1.308 ac 0.00% Impervious Runoff Depth=0.00" Flow Length=585' Tc=17.9 min CN=39 Runoff=0.00 cfs 0.000 af

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NJ DEP 2-hr WQ Rainfall=1.25"

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<b>Subcatchment39S: DA 1 Woods</b>	Runoff Area=0.018 ac 0.00% Impervious Runoff Depth=0.00" Tc=10.0 min CN=30 Runoff=0.00 cfs 0.000 af
<b>Subcatchment40S: DA 1 Grass</b>	Runoff Area=0.202 ac 0.00% Impervious Runoff Depth=0.00" Tc=10.0 min CN=39 Runoff=0.00 cfs 0.000 af
<b>Subcatchment42S: DA 7 Grass</b>	Runoff Area=0.391 ac 0.00% Impervious Runoff Depth=0.00" Tc=10.0 min CN=39 Runoff=0.00 cfs 0.000 af
<b>Subcatchment45S: B-5, B-4 and B-3</b>	Runoff Area=0.165 ac 100.00% Impervious Runoff Depth=1.03" Tc=10.0 min CN=98 Runoff=0.43 cfs 0.014 af
<b>Subcatchment46S: B-5, B-4 and B-3 Grass</b>	Runoff Area=0.881 ac 0.00% Impervious Runoff Depth=0.00" Tc=10.0 min CN=39 Runoff=0.00 cfs 0.000 af
<b>Pond 28P: Basin 1</b>	Peak Elev=167.22' Storage=16,310 cf Inflow=11.19 cfs 0.374 af Outflow=0.00 cfs 0.000 af
<b>Pond 44P: Recharge</b>	Peak Elev=168.82' Storage=620 cf Inflow=0.43 cfs 0.014 af Outflow=0.00 cfs 0.000 af
<b>Link 14L: DA 2</b>	Inflow=0.00 cfs 0.000 af Primary=0.00 cfs 0.000 af
<b>Link 15L: DA 5</b>	Inflow=0.36 cfs 0.012 af Primary=0.36 cfs 0.012 af
<b>Link 19L: DA 4</b>	Inflow=0.00 cfs 0.000 af Primary=0.00 cfs 0.000 af
<b>Link 21L: DA 3</b>	Inflow=0.00 cfs 0.000 af Primary=0.00 cfs 0.000 af
<b>Link 22L: Off-Site</b>	Inflow=2.25 cfs 0.075 af Primary=2.25 cfs 0.075 af
<b>Link 29L: DA 6</b>	Inflow=0.07 cfs 0.002 af Primary=0.07 cfs 0.002 af
<b>Link 37L: Total Off-Site</b>	Inflow=0.36 cfs 0.012 af Primary=0.36 cfs 0.012 af
<b>Link 38L: DA 1</b>	Inflow=0.00 cfs 0.000 af Primary=0.00 cfs 0.000 af
<b>Link 39L: DA 7</b>	Inflow=0.00 cfs 0.000 af Primary=0.00 cfs 0.000 af

**Total Runoff Area = 15.343 ac Runoff Volume = 0.401 af Average Runoff Depth = 0.31"**  
**69.71% Pervious = 10.695 ac 30.29% Impervious = 4.648 ac**

**Post-Drainage - November 26**

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NJ DEP 2-hr WQ Rainfall=1.25"

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**Summary for Pond 28P: Basin 1**

Inflow Area = 13.039 ac, 34.57% Impervious, Inflow Depth = 0.34" for WQ event  
 Inflow = 11.19 cfs @ 1.15 hrs, Volume= 0.374 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= 0.00-50.00 hrs, dt= 0.05 hrs  
 Peak Elev= 167.22' @ 2.90 hrs Surf.Area= 16,247 sf Storage= 16,310 cf

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

Volume	Invert	Avail.Storage	Storage Description
#1	166.15'	114,130 cf	<b>Basin (Prismatic)</b> Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
166.15	14,300	0	0
167.00	15,820	12,801	12,801
168.00	17,770	16,795	29,596
169.00	19,820	18,795	48,391
170.00	21,979	20,900	69,290
171.90	25,220	44,839	114,130

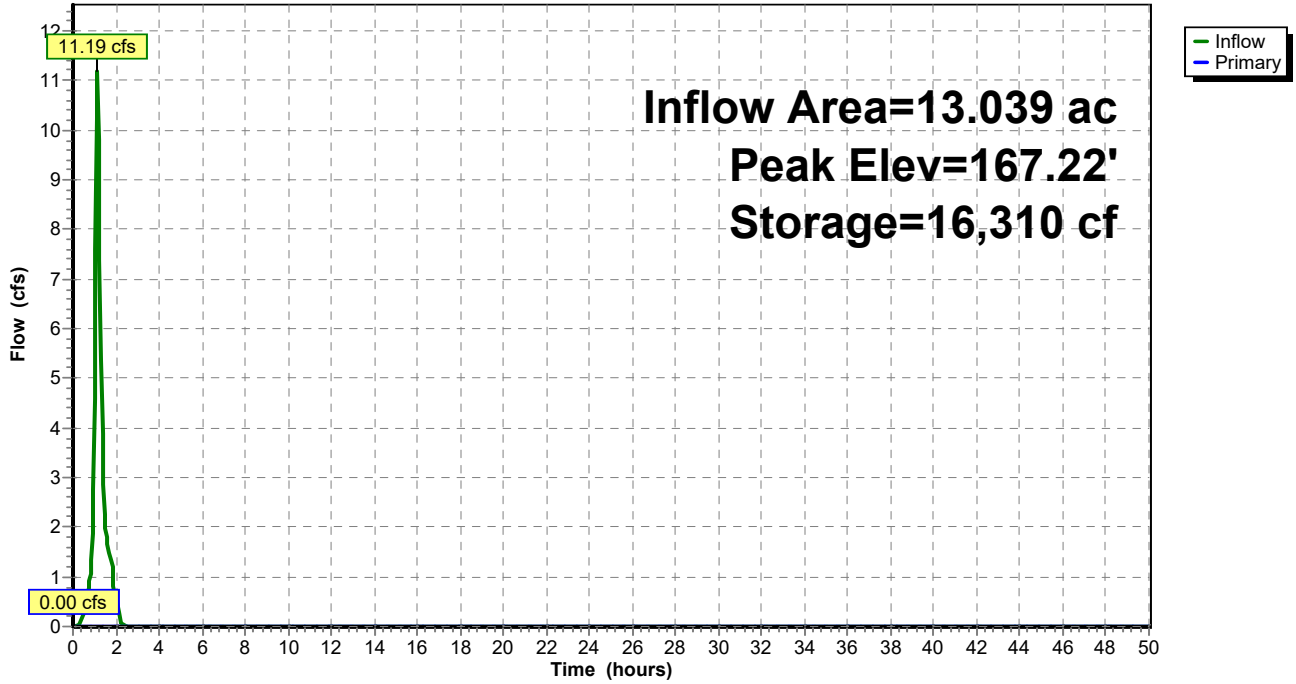
Device	Routing	Invert	Outlet Devices
#1	Primary	168.15'	<b>6.0" Vert. Orifice/Grate X 3.00</b> C= 0.600
#2	Primary	170.60'	<b>48.0" W x 48.0" H Vert. Orifice/Grate</b> C= 0.600
#3	Primary	169.30'	<b>1.8' long Sharp-Crested Rectangular Weir X 2.00</b> 2 End Contraction(s)

**Primary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=166.15' (Free Discharge)

- 1=Orifice/Grate ( Controls 0.00 cfs)
- 2=Orifice/Grate ( Controls 0.00 cfs)
- 3=Sharp-Crested Rectangular Weir ( Controls 0.00 cfs)

Pond 28P: Basin 1

Hydrograph



**Post-Drainage - November 26**

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NJ DEP 2-hr WQ Rainfall=1.25"

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**Summary for Pond 44P: Recharge**

Inflow Area = 1.046 ac, 15.77% Impervious, Inflow Depth = 0.16" for WQ event  
 Inflow = 0.43 cfs @ 1.15 hrs, Volume= 0.014 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= 0.00-50.00 hrs, dt= 0.05 hrs  
 Peak Elev= 168.82' @ 2.60 hrs Surf.Area= 1,300 sf Storage= 620 cf

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

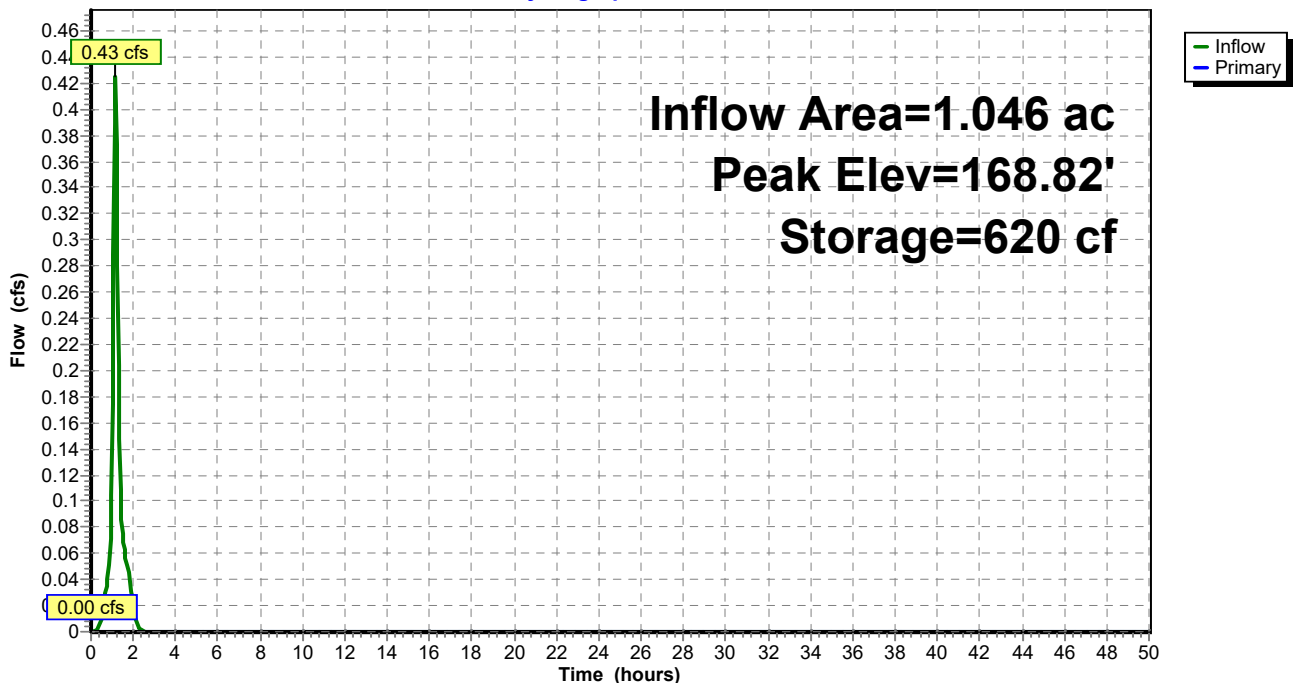
Volume	Invert	Avail.Storage	Storage Description
#1	167.75'	1,605 cf	<b>5.00'W x 260.00'L x 4.50'H Prismatoid</b> 5,850 cf Overall - 1,838 cf Embedded = 4,012 cf x 40.0% Voids
#2	168.50'	1,838 cf	<b>36.0" Round Pipe Storage</b> Inside #1 L= 260.0'
		3,443 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	171.25'	<b>4.0' long Sharp-Crested Rectangular Weir</b> 2 End Contraction(s)

**Primary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=167.75' (Free Discharge)  
 ↳1=Sharp-Crested Rectangular Weir ( Controls 0.00 cfs)

**Pond 44P: Recharge**

Hydrograph



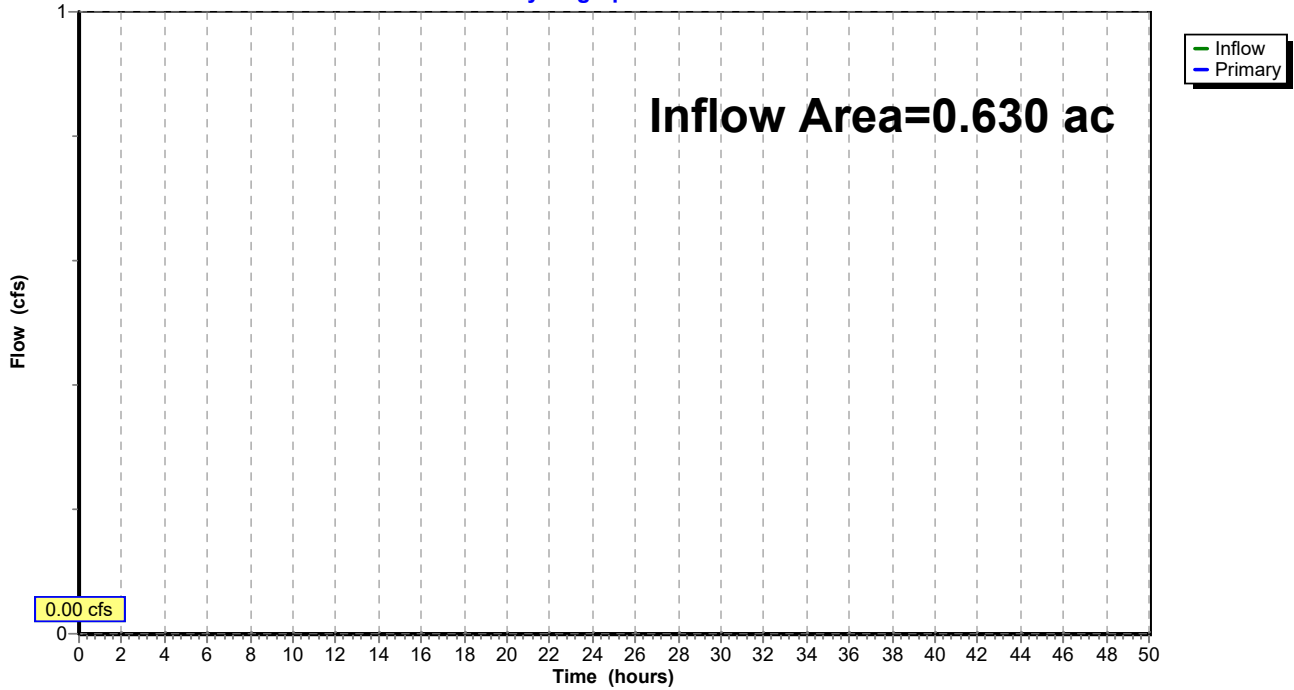
Summary for Link 14L: DA 2

Inflow Area = 0.630 ac, 0.00% Impervious, Inflow Depth = 0.00" for WQ event  
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af  
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs

Link 14L: DA 2

Hydrograph



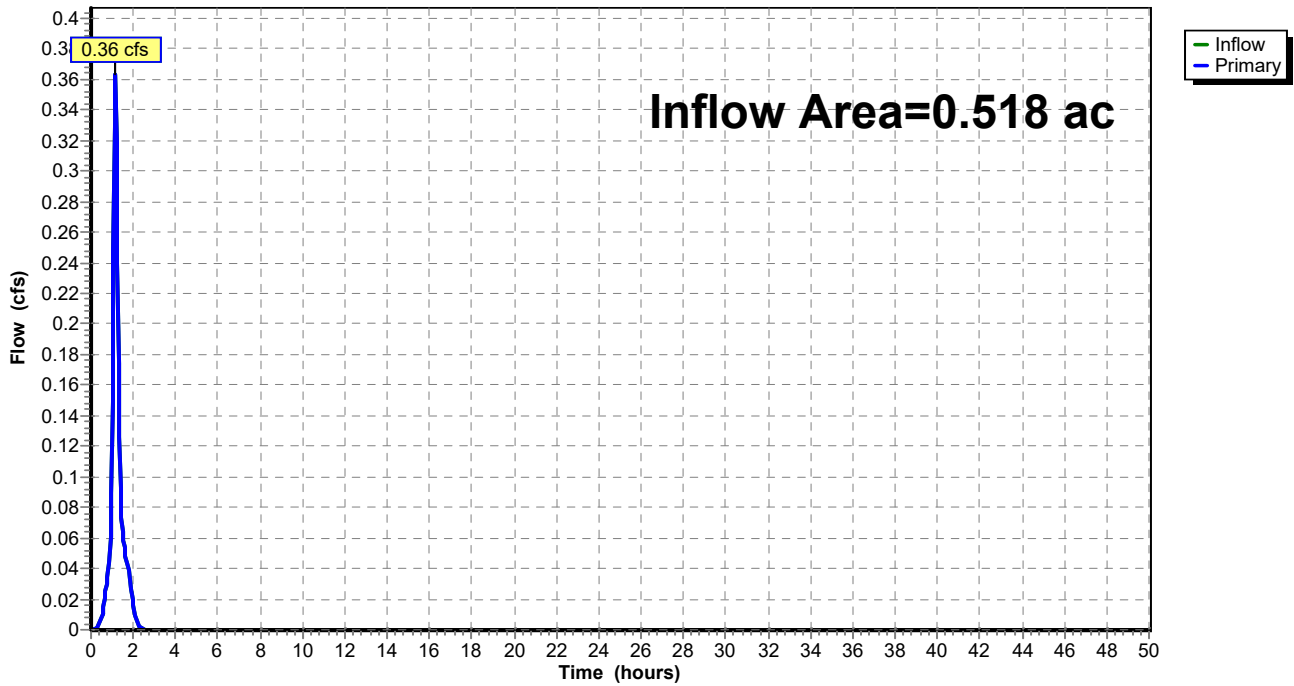
### Summary for Link 15L: DA 5

Inflow Area = 0.518 ac, 27.22% Impervious, Inflow Depth = 0.28" for WQ event  
Inflow = 0.36 cfs @ 1.15 hrs, Volume= 0.012 af  
Primary = 0.36 cfs @ 1.15 hrs, Volume= 0.012 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs

### Link 15L: DA 5

Hydrograph



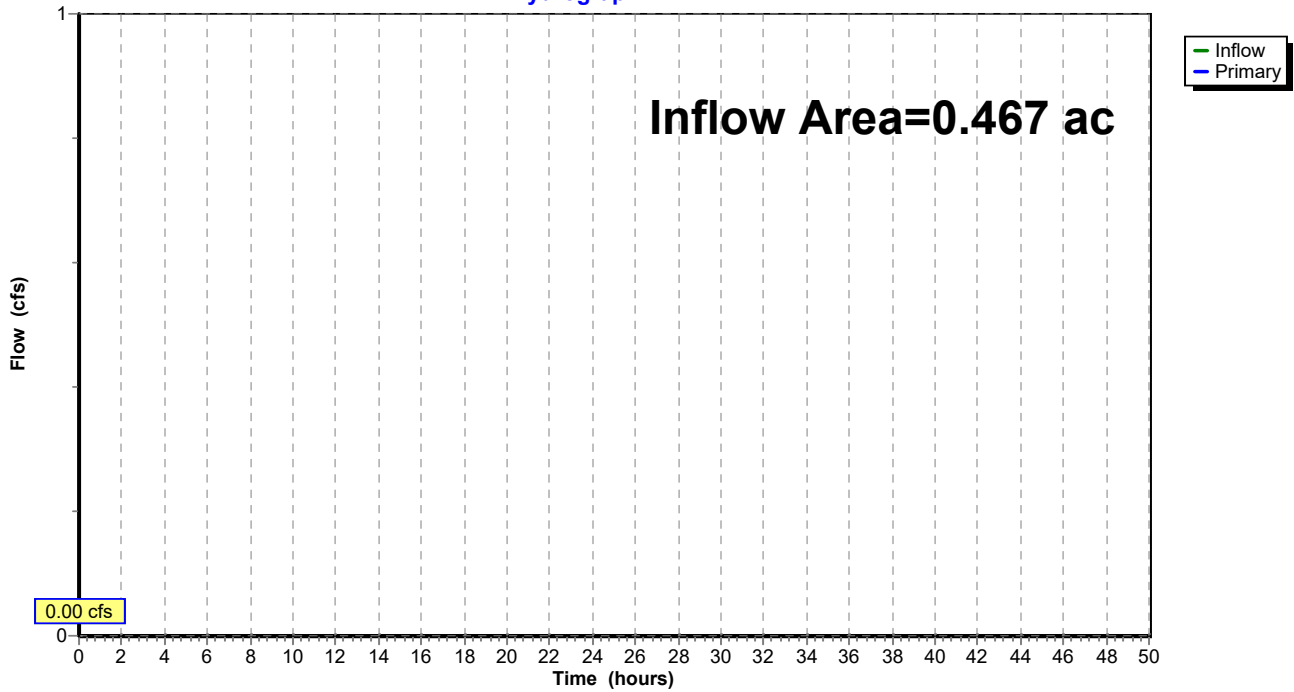
### Summary for Link 19L: DA 4

Inflow Area = 0.467 ac, 0.00% Impervious, Inflow Depth = 0.00" for WQ event  
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af  
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs

### Link 19L: DA 4

Hydrograph





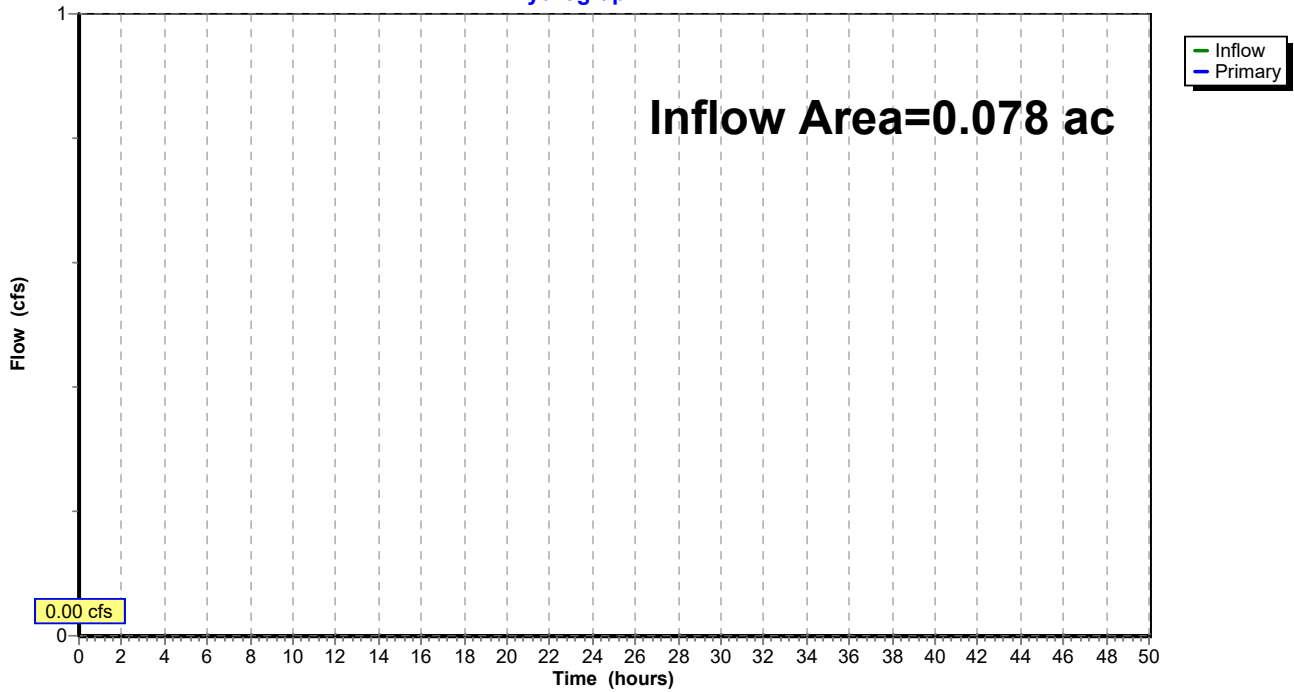
### Summary for Link 21L: DA 3

Inflow Area = 0.078 ac, 0.00% Impervious, Inflow Depth = 0.00" for WQ event  
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af  
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs

### Link 21L: DA 3

Hydrograph



**Post-Drainage - November 26**

Prepared by DW Smith Associates

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NJ DEP 2-hr WQ Rainfall=1.25"

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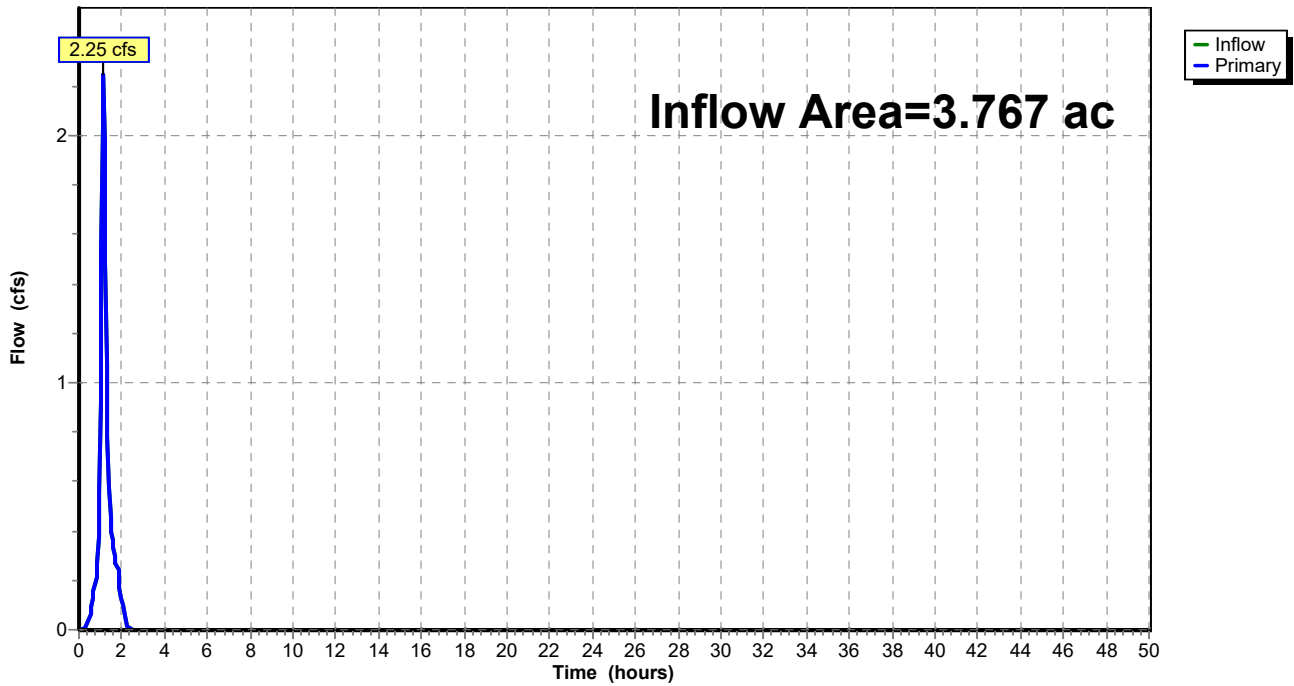
**Summary for Link 22L: Off-Site**

Inflow Area = 3.767 ac, 23.20% Impervious, Inflow Depth = 0.24" for WQ event  
Inflow = 2.25 cfs @ 1.15 hrs, Volume= 0.075 af  
Primary = 2.25 cfs @ 1.15 hrs, Volume= 0.075 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs

**Link 22L: Off-Site**

Hydrograph



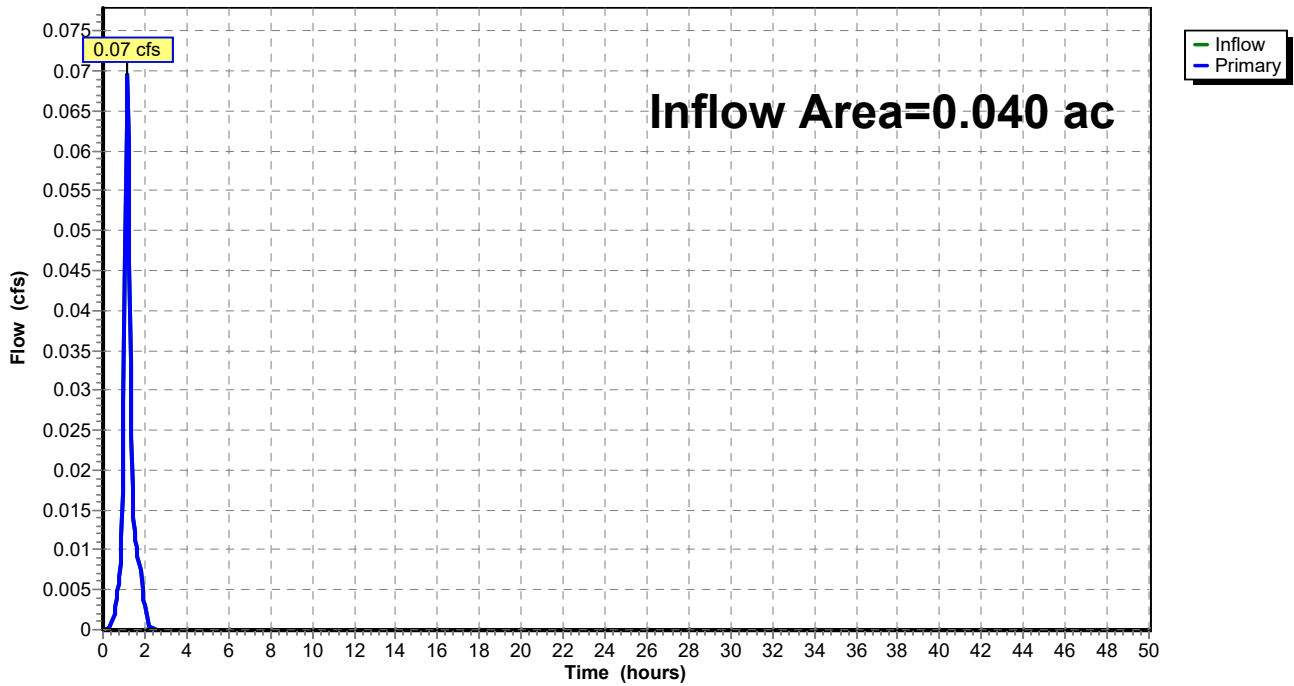
### Summary for Link 29L: DA 6

Inflow Area = 0.040 ac, 67.50% Impervious, Inflow Depth = 0.70" for WQ event  
Inflow = 0.07 cfs @ 1.15 hrs, Volume= 0.002 af  
Primary = 0.07 cfs @ 1.15 hrs, Volume= 0.002 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs

### Link 29L: DA 6

Hydrograph



**Post-Drainage - November 26**

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NJ DEP 2-hr WQ Rainfall=1.25"

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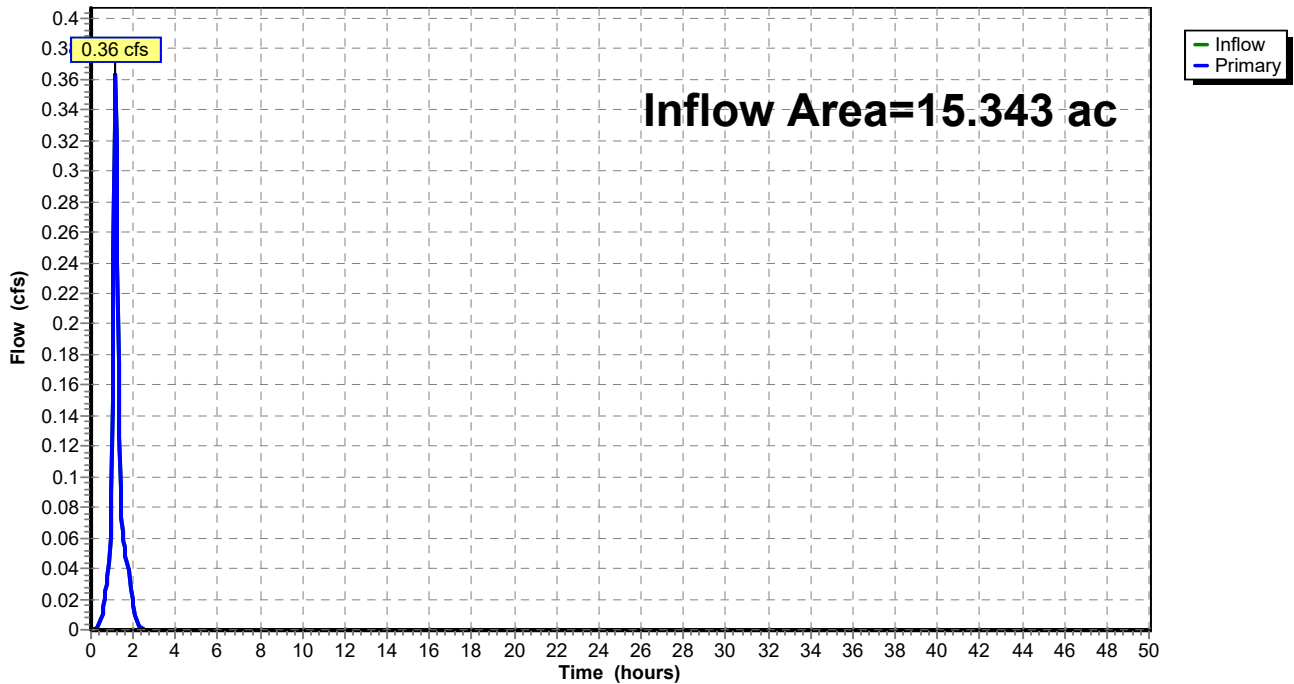
**Summary for Link 37L: Total Off-Site**

Inflow Area = 15.343 ac, 30.29% Impervious, Inflow Depth = 0.01" for WQ event  
Inflow = 0.36 cfs @ 1.15 hrs, Volume= 0.012 af  
Primary = 0.36 cfs @ 1.15 hrs, Volume= 0.012 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs

**Link 37L: Total Off-Site**

Hydrograph



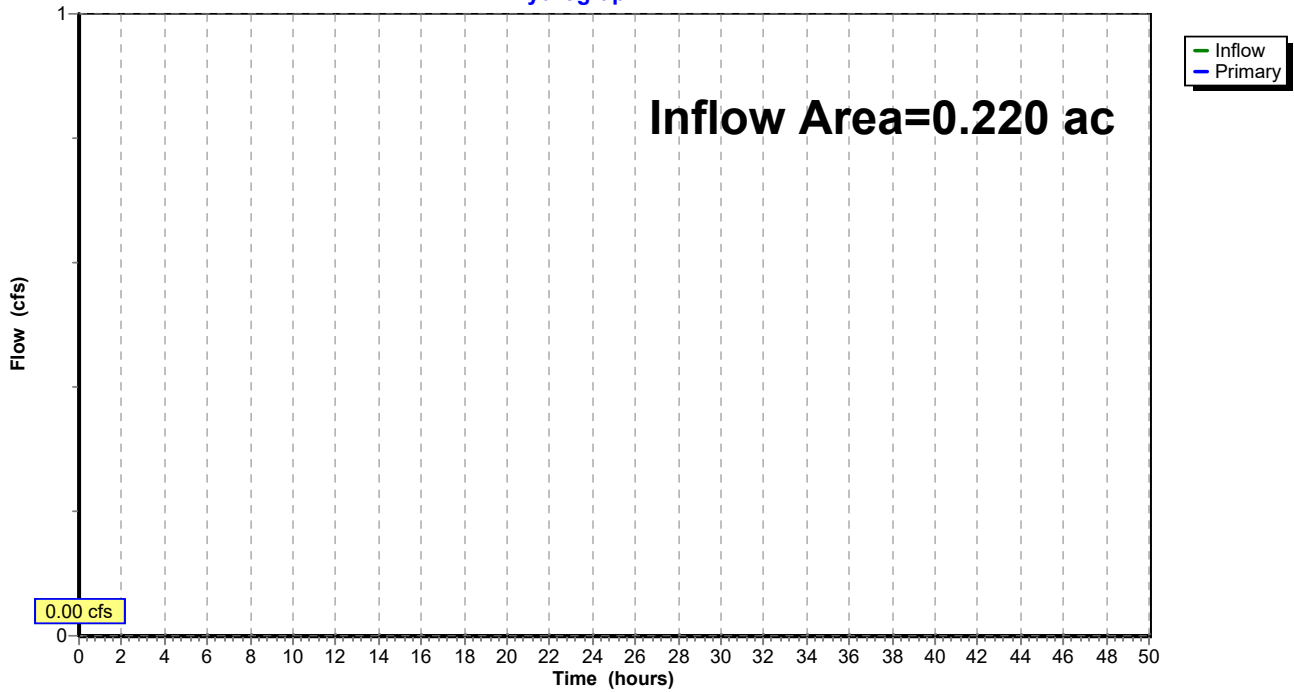
### Summary for Link 38L: DA 1

Inflow Area = 0.220 ac, 0.00% Impervious, Inflow Depth = 0.00" for WQ event  
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af  
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs

### Link 38L: DA 1

Hydrograph



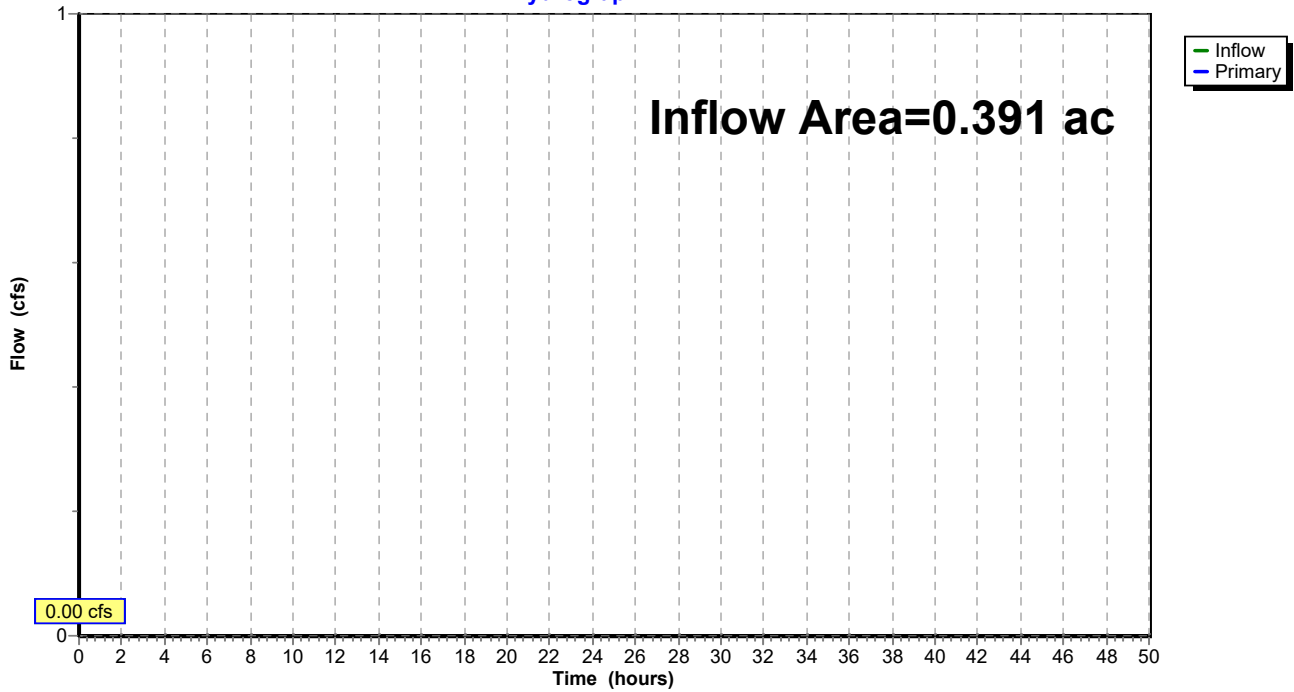
### Summary for Link 39L: DA 7

Inflow Area = 0.391 ac, 0.00% Impervious, Inflow Depth = 0.00" for WQ event  
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af  
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs

### Link 39L: DA 7

Hydrograph



**Post-Drainage - November 26**

NOAA 24-hr D 100-Year Rainfall=8.94"

Prepared by DW Smith Associates

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**Hydrograph for Pond 28P: Basin 1 (continued)**

Infiltration Basin Drain Down

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)
10.60	2.29	2,001	166.29	1.68	1.68	0.00
10.70	2.50	2,256	166.31	1.69	1.69	0.00
10.80	2.75	2,592	166.33	1.69	1.69	0.00
10.90	3.00	3,015	166.36	1.70	1.70	0.00
11.00	3.25	3,527	166.39	1.71	1.71	0.00
11.10	3.55	4,134	166.43	1.71	1.71	0.00
11.20	3.96	4,867	166.48	1.72	1.72	0.00
11.30	4.40	5,748	166.54	1.74	1.74	0.00
11.40	4.86	6,789	166.61	1.75	1.75	0.00
11.50	5.33	7,990	166.69	1.77	1.77	0.00
11.60	6.15	9,395	166.78	1.79	1.79	0.00
11.70	7.47	11,208	166.90	1.81	1.81	0.00
11.80	8.88	13,464	167.04	1.84	1.84	0.00
11.90	12.03	16,509	167.23	1.88	1.88	0.00
12.00	18.59	21,196	167.51	1.95	1.95	0.00
12.10	32.63	29,464	167.99	2.06	2.06	0.00
12.20	<b>43.88</b>	42,810	168.71	3.81	2.23	1.59
12.30	29.97	54,633	169.31	5.10	2.37	2.73
12.40	20.22	61,239	169.63	7.72	2.45	5.27
12.50	15.04	64,378	169.77	9.45	2.49	6.97
12.60	12.47	65,753	169.84	10.27	2.50	7.77
<b>12.70</b>	<b>10.21</b>	<b>66,068</b>	<b>169.85</b>	<b>10.46</b>	<b>2.51</b>	<b>7.96</b>
12.80	8.97	65,766	169.84	10.28	2.50	7.78
12.90	8.15	65,201	169.81	9.94	2.50	7.45
13.00	7.44	64,502	169.78	9.52	2.49	7.04
13.10	6.77	63,711	169.74	9.07	2.48	6.59
13.20	6.14	62,852	169.70	8.58	2.47	6.11
13.30	5.67	61,973	169.66	8.11	2.46	5.65
13.40	5.26	61,104	169.62	7.64	2.45	5.20
13.50	4.86	60,249	169.58	7.22	2.44	4.78
13.60	4.45	59,401	169.54	6.81	2.43	4.38
13.70	4.11	58,558	169.50	6.43	2.42	4.01
13.80	3.92	57,748	169.46	6.08	2.41	3.67
13.90	3.79	56,999	169.42	5.80	2.40	3.40
14.00	3.67	56,298	169.39	5.55	2.39	3.16
14.10	3.56	55,643	169.36	5.33	2.38	2.95
14.20	3.46	55,013	169.33	5.19	2.38	2.81
14.30	3.35	54,394	169.30	5.06	2.37	2.69
14.40	3.24	53,770	169.27	5.00	2.36	2.64
14.50	3.13	53,127	169.24	4.95	2.35	2.59
14.60	3.02	52,465	169.20	4.89	2.34	2.54
14.70	2.91	51,785	169.17	4.82	2.34	2.49
14.80	2.80	51,089	169.14	4.76	2.33	2.43
14.90	2.69	50,376	169.10	4.69	2.32	2.37
15.00	2.58	49,648	169.06	4.62	2.31	2.31
15.10	2.46	48,906	169.03	4.54	2.30	2.24
15.20	2.36	48,152	168.99	4.47	2.29	2.17
15.30	2.31	47,399	168.95	4.38	2.28	2.10
15.40	2.27	46,659	168.91	4.30	2.27	2.03
15.50	2.24	45,937	168.88	4.22	2.26	1.95
15.60	2.21	45,233	168.84	4.13	2.26	1.88
15.70	2.17	44,549	168.80	4.05	2.25	1.80
15.80	2.15	43,884	168.77	3.96	2.24	1.72

**Post-Drainage - November 26**

NOAA 24-hr D 100-Year Rainfall=8.94"

Prepared by DW Smith Associates

Printed 11/27/2019

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**Hydrograph for Pond 28P: Basin 1 (continued)**

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)
15.90	2.11	43,240	168.74	3.87	2.23	1.64
16.00	2.08	42,616	168.70	3.79	2.22	1.56
16.10	2.05	42,013	168.67	3.70	2.22	1.48
16.20	2.02	41,433	168.64	3.60	2.21	1.39
16.30	1.99	40,874	168.61	3.51	2.20	1.31
16.40	1.96	40,336	168.58	3.41	2.20	1.22
16.50	1.93	39,828	168.56	3.30	2.19	1.11
16.60	1.89	39,345	168.53	3.20	2.18	1.01
16.70	1.86	38,888	168.51	3.10	2.18	0.92
16.80	1.83	38,456	168.48	3.00	2.17	0.83
16.90	1.80	38,046	168.46	2.91	2.17	0.74
17.00	1.77	37,656	168.44	2.82	2.16	0.66
17.10	1.73	37,285	168.42	2.74	2.16	0.59
17.20	1.70	36,929	168.40	2.67	2.15	0.52
17.30	1.67	36,586	168.38	2.60	2.15	0.46
17.40	1.64	36,255	168.37	2.54	2.14	0.39
17.50	1.60	35,936	168.35	2.47	2.14	0.34
17.60	1.57	35,625	168.33	2.43	2.14	0.29
17.70	1.54	35,319	168.32	2.38	2.13	0.25
17.80	1.50	35,017	168.30	2.33	2.13	0.21
17.90	1.47	34,720	168.28	2.29	2.12	0.17
18.00	1.44	34,428	168.27	2.25	2.12	0.13
18.10	1.41	34,137	168.25	2.22	2.12	0.10
18.20	1.38	33,843	168.24	2.19	2.11	0.08
18.30	1.36	33,551	168.22	2.17	2.11	0.06
18.40	1.35	33,262	168.20	2.14	2.11	0.04
18.50	1.34	32,978	168.19	2.12	2.10	0.02
18.60	1.33	32,699	168.17	2.10	2.10	0.01
18.70	1.33	32,421	168.16	2.10	2.09	0.00
18.80	1.32	32,143	168.14	2.09	2.09	0.00
18.90	1.31	31,865	168.13	2.09	2.09	0.00
19.00	1.30	31,585	168.11	2.08	2.08	0.00
19.10	1.29	31,303	168.10	2.08	2.08	0.00
19.20	1.29	31,019	168.08	2.08	2.08	0.00
19.30	1.28	30,734	168.06	2.07	2.07	0.00
19.40	1.27	30,448	168.05	2.07	2.07	0.00
19.50	1.26	30,160	168.03	2.06	2.06	0.00
19.60	1.26	29,871	168.02	2.06	2.06	0.00
19.70	1.25	29,580	168.00	2.06	2.06	0.00
19.80	1.24	29,289	167.98	2.05	2.05	0.00
19.90	1.23	28,995	167.97	2.05	2.05	0.00
20.00	1.22	28,700	167.95	2.05	2.05	0.00
20.10	1.22	28,403	167.93	2.04	2.04	0.00
20.20	1.21	28,106	167.92	2.04	2.04	0.00
20.30	1.20	27,806	167.90	2.03	2.03	0.00
20.40	1.19	27,505	167.88	2.03	2.03	0.00
20.50	1.18	27,202	167.86	2.03	2.03	0.00
20.60	1.18	26,898	167.85	2.02	2.02	0.00
20.70	1.17	26,593	167.83	2.02	2.02	0.00
20.80	1.16	26,286	167.81	2.01	2.01	0.00
20.90	1.15	25,978	167.79	2.01	2.01	0.00
21.00	1.14	25,668	167.78	2.01	2.01	0.00
21.10	1.13	25,357	167.76	2.00	2.00	0.00



**Post-Drainage - November 26**

Prepared by DW Smith Associates

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**Hydrograph for Pond 28P: Basin 1 (continued)**

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)
21.20	1.12	25,043	167.74	2.00	2.00	0.00
21.30	1.12	24,728	167.72	1.99	1.99	0.00
21.40	1.11	24,412	167.70	1.99	1.99	0.00
21.50	1.10	24,095	167.68	1.99	1.99	0.00
21.60	1.09	23,777	167.67	1.98	1.98	0.00
21.70	1.08	23,456	167.65	1.98	1.98	0.00
21.80	1.08	23,134	167.63	1.97	1.97	0.00
21.90	1.07	22,811	167.61	1.97	1.97	0.00
22.00	1.06	22,487	167.59	1.96	1.96	0.00
22.10	1.05	22,162	167.57	1.96	1.96	0.00
22.20	1.04	21,834	167.55	1.96	1.96	0.00
22.30	1.04	21,505	167.53	1.95	1.95	0.00
22.40	1.03	21,175	167.51	1.95	1.95	0.00
22.50	1.02	20,843	167.49	1.94	1.94	0.00
22.60	1.01	20,509	167.47	1.94	1.94	0.00
22.70	1.00	20,175	167.45	1.93	1.93	0.00
22.80	0.99	19,839	167.43	1.93	1.93	0.00
22.90	0.99	19,502	167.41	1.92	1.92	0.00
23.00	0.98	19,164	167.39	1.92	1.92	0.00
23.10	0.97	18,824	167.37	1.91	1.91	0.00
23.20	0.96	18,483	167.35	1.91	1.91	0.00
23.30	0.95	18,140	167.33	1.91	1.91	0.00
23.40	0.94	17,796	167.31	1.90	1.90	0.00
23.50	0.93	17,450	167.29	1.90	1.90	0.00
23.60	0.93	17,103	167.27	1.89	1.89	0.00
23.70	0.92	16,755	167.25	1.89	1.89	0.00
23.80	0.91	16,406	167.22	1.88	1.88	0.00
23.90	0.90	16,054	167.20	1.88	1.88	0.00
24.00	0.89	15,702	167.18	1.87	1.87	0.00
24.10	0.72	15,331	167.16	1.87	1.87	0.00
24.20	0.28	14,838	167.13	1.86	1.86	0.00
24.30	0.09	14,232	167.09	1.85	1.85	0.00
24.40	0.03	13,589	167.05	1.84	1.84	0.00
24.50	0.01	12,936	167.01	1.83	1.83	0.00
24.60	0.01	12,281	166.97	1.82	1.82	0.00
24.70	0.00	11,627	166.93	1.82	1.82	0.00
24.80	0.00	10,976	166.88	1.81	1.81	0.00
24.90	0.00	10,327	166.84	1.80	1.80	0.00
25.00	0.00	9,682	166.80	1.79	1.79	0.00
25.10	0.00	9,039	166.76	1.78	1.78	0.00
25.20	0.00	8,399	166.72	1.77	1.77	0.00
25.30	0.00	7,763	166.68	1.76	1.76	0.00
25.40	0.00	7,129	166.63	1.76	1.76	0.00
25.50	0.00	6,499	166.59	1.75	1.75	0.00
25.60	0.00	5,872	166.55	1.74	1.74	0.00
25.70	0.00	5,248	166.51	1.73	1.73	0.00
25.80	0.00	4,627	166.47	1.72	1.72	0.00
25.90	0.00	4,009	166.43	1.71	1.71	0.00
26.00	0.00	3,394	166.38	1.70	1.70	0.00
26.10	0.00	2,782	166.34	1.69	1.69	0.00
26.20	0.00	2,174	166.30	1.69	1.69	0.00
26.30	0.00	1,568	166.26	1.68	1.68	0.00
26.40	0.00	993	166.22	1.37	1.37	0.00

**Post-Drainage - November 26**

NOAA 24-hr D 100-Year Rainfall=8.94"

Prepared by DW Smith Associates

Printed 11/27/2019

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**Hydrograph for Pond 28P: Basin 1 (continued)**

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)
26.50	0.00	603	166.19	0.83	0.83	0.00
26.60	0.00	367	166.18	0.50	0.50	0.00
26.70	0.00	223	166.17	0.31	0.31	0.00
26.80	0.00	135	166.16	0.19	0.19	0.00
26.90	0.00	82	166.16	0.11	0.11	0.00
27.00	0.00	50	166.15	0.07	0.07	0.00
27.10	0.00	30	166.15	0.04	0.04	0.00
27.20	0.00	18	166.15	0.03	0.03	0.00
27.30	0.00	11	166.15	0.02	0.02	0.00
27.40	0.00	7	166.15	0.01	0.01	0.00
27.50	0.00	4	166.15	0.01	0.01	0.00
27.60	0.00	3	166.15	0.00	0.00	0.00
27.70	0.00	2	166.15	0.00	0.00	0.00
27.80	0.00	1	166.15	0.00	0.00	0.00
27.90	0.00	1	166.15	0.00	0.00	0.00
28.00	0.00	0	166.15	0.00	0.00	0.00
28.10	0.00	0	166.15	0.00	0.00	0.00
28.20	0.00	0	166.15	0.00	0.00	0.00
28.30	0.00	0	166.15	0.00	0.00	0.00
28.40	0.00	0	166.15	0.00	0.00	0.00
28.50	0.00	0	166.15	0.00	0.00	0.00
28.60	0.00	0	166.15	0.00	0.00	0.00
28.70	0.00	0	166.15	0.00	0.00	0.00
28.80	0.00	0	166.15	0.00	0.00	0.00
28.90	0.00	0	166.15	0.00	0.00	0.00
29.00	0.00	0	166.15	0.00	0.00	0.00
29.10	0.00	0	166.15	0.00	0.00	0.00
29.20	0.00	0	166.15	0.00	0.00	0.00
29.30	0.00	0	166.15	0.00	0.00	0.00
29.40	0.00	0	166.15	0.00	0.00	0.00
29.50	0.00	0	166.15	0.00	0.00	0.00
29.60	0.00	0	166.15	0.00	0.00	0.00
29.70	0.00	0	166.15	0.00	0.00	0.00
29.80	0.00	0	166.15	0.00	0.00	0.00
29.90	0.00	0	166.15	0.00	0.00	0.00
30.00	0.00	0	166.15	0.00	0.00	0.00
30.10	0.00	0	166.15	0.00	0.00	0.00
30.20	0.00	0	166.15	0.00	0.00	0.00
30.30	0.00	0	166.15	0.00	0.00	0.00
30.40	0.00	0	166.15	0.00	0.00	0.00
30.50	0.00	0	166.15	0.00	0.00	0.00
30.60	0.00	0	166.15	0.00	0.00	0.00
30.70	0.00	0	166.15	0.00	0.00	0.00
30.80	0.00	0	166.15	0.00	0.00	0.00
30.90	0.00	0	166.15	0.00	0.00	0.00
31.00	0.00	0	166.15	0.00	0.00	0.00
31.10	0.00	0	166.15	0.00	0.00	0.00
31.20	0.00	0	166.15	0.00	0.00	0.00
31.30	0.00	0	166.15	0.00	0.00	0.00
31.40	0.00	0	166.15	0.00	0.00	0.00
31.50	0.00	0	166.15	0.00	0.00	0.00
31.60	0.00	0	166.15	0.00	0.00	0.00
31.70	0.00	0	166.15	0.00	0.00	0.00

The infiltration basin reaches a peak elevation of 169.85 at 12.70 hours. At 27.95 hours the basin no longer stores any storm water.

**Drainage Time: 15.25 Hours**

**Post-Drainage - November 26**

Prepared by DW Smith Associates

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NOAA 24-hr D 100-Year Rainfall=8.94"

Printed 11/27/2019

**Hydrograph for Pond 44P: Recharge (continued)**

**Recharge Basin Drain Down**

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)
10.60	0.08	21	167.79	0.08	0.08	0.00
10.70	0.09	22	167.79	0.08	0.08	0.00
10.80	0.10	24	167.80	0.09	<b>0.09</b>	0.00
10.90	0.11	28	167.80	0.09	0.09	0.00
11.00	0.11	35	167.82	0.09	0.09	0.00
11.10	0.12	46	167.84	0.09	0.09	0.00
11.20	0.14	60	167.87	0.09	0.09	0.00
11.30	0.15	80	167.90	0.09	0.09	0.00
11.40	0.17	106	167.95	0.09	0.09	0.00
11.50	0.18	136	168.01	0.09	0.09	0.00
11.60	0.21	174	168.08	0.09	0.09	0.00
11.70	0.26	226	168.18	0.09	0.09	0.00
11.80	0.31	293	168.31	0.09	0.09	0.00
11.90	0.45	394	168.51	0.09	0.09	0.00
12.00	0.79	578	168.77	0.09	0.09	0.00
12.10	1.60	960	169.21	0.09	0.09	0.00
12.20	<b>2.24</b>	1,660	169.94	0.09	0.09	0.00
12.30	1.48	2,299	170.59	0.09	0.09	0.00
12.40	1.01	2,707	171.04	0.09	0.09	0.00
<b>12.50</b>	<b>0.78</b>	<b>2,955</b>	<b>171.35</b>	<b>0.51</b>	<b>0.09</b>	<b>0.42</b>
<b>12.60</b>	<b>0.67</b>	<b>2,974</b>	<b>171.38</b>	<b>0.70</b>	<b>0.09</b>	<b>0.61</b>
12.70	0.55	2,962	171.36	0.58	0.09	0.49
12.80	0.50	2,955	171.35	0.51	0.09	0.42
12.90	0.46	2,950	171.34	0.47	0.09	0.38
13.00	0.42	2,945	171.34	0.44	0.09	0.34
13.10	0.39	2,940	171.33	0.40	0.09	0.31
13.20	0.35	2,935	171.32	0.36	0.09	0.27
13.30	0.33	2,931	171.32	0.34	0.09	0.25
13.40	0.30	2,928	171.32	0.31	0.09	0.22
13.50	0.28	2,925	171.31	0.29	0.09	0.20
13.60	0.26	2,922	171.31	0.27	0.09	0.18
13.70	0.24	2,919	171.30	0.25	0.09	0.16
13.80	0.23	2,916	171.30	0.24	0.09	0.15
13.90	0.22	2,914	171.30	0.23	0.09	0.14
14.00	0.22	2,913	171.29	0.22	0.09	0.13
14.10	0.21	2,912	171.29	0.22	0.09	0.13
14.20	0.21	2,910	171.29	0.21	0.09	0.12
14.30	0.20	2,909	171.29	0.20	0.09	0.11
14.40	0.19	2,908	171.29	0.20	0.09	0.11
14.50	0.19	2,906	171.29	0.19	0.09	0.10
14.60	0.18	2,905	171.28	0.19	0.09	0.10
14.70	0.18	2,903	171.28	0.18	0.09	0.09
14.80	0.17	2,902	171.28	0.17	0.09	0.08
14.90	0.16	2,901	171.28	0.17	0.09	0.08
15.00	0.16	2,899	171.28	0.16	0.09	0.07
15.10	0.15	2,898	171.27	0.15	0.09	0.06
15.20	0.14	2,896	171.27	0.15	0.09	0.06
15.30	0.14	2,895	171.27	0.14	0.09	0.05
15.40	0.14	2,895	171.27	0.14	0.09	0.05
15.50	0.14	2,894	171.27	0.14	0.09	0.05
15.60	0.14	2,894	171.27	0.14	0.09	0.05
15.70	0.13	2,893	171.27	0.13	0.09	0.04
15.80	0.13	2,893	171.27	0.13	0.09	0.04

**Post-Drainage - November 26**

NOAA 24-hr D 100-Year Rainfall=8.94"

Prepared by DW Smith Associates

Printed 11/27/2019

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**Hydrograph for Pond 44P: Recharge (continued)**

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)
15.90	0.13	2,893	171.27	0.13	0.09	0.04
16.00	0.13	2,892	171.27	0.13	0.09	0.04
16.10	0.13	2,892	171.27	0.13	0.09	0.04
16.20	0.12	2,892	171.27	0.13	0.09	0.04
16.30	0.12	2,891	171.27	0.12	0.09	0.03
16.40	0.12	2,891	171.27	0.12	0.09	0.03
16.50	0.12	2,890	171.26	0.12	0.09	0.03
16.60	0.12	2,890	171.26	0.12	0.09	0.03
16.70	0.12	2,889	171.26	0.12	0.09	0.03
16.80	0.11	2,889	171.26	0.11	0.09	0.02
16.90	0.11	2,889	171.26	0.11	0.09	0.02
17.00	0.11	2,888	171.26	0.11	0.09	0.02
17.10	0.11	2,888	171.26	0.11	0.09	0.02
17.20	0.11	2,887	171.26	0.11	0.09	0.02
17.30	0.10	2,887	171.26	0.11	0.09	0.01
17.40	0.10	2,887	171.26	0.10	0.09	0.01
17.50	0.10	2,886	171.26	0.10	0.09	0.01
17.60	0.10	2,885	171.26	0.10	0.09	0.01
17.70	0.10	2,884	171.26	0.10	0.09	0.01
17.80	0.09	2,883	171.26	0.10	0.09	0.01
17.90	0.09	2,882	171.25	0.10	0.09	0.00
18.00	0.09	2,881	171.25	0.09	0.09	0.00
18.10	0.09	2,879	171.25	0.09	0.09	0.00
18.20	0.09	2,878	171.25	0.09	0.09	0.00
18.30	0.09	2,876	171.25	0.09	0.09	0.00
18.40	0.08	2,875	171.24	0.09	0.09	0.00
18.50	0.08	2,873	171.24	0.09	0.09	0.00
18.60	0.08	2,870	171.24	0.09	0.09	0.00
18.70	0.08	2,868	171.24	0.09	0.09	0.00
18.80	0.08	2,866	171.23	0.09	0.09	0.00
18.90	0.08	2,863	171.23	0.09	0.09	0.00
19.00	0.08	2,860	171.23	0.09	0.09	0.00
19.10	0.08	2,857	171.22	0.09	0.09	0.00
19.20	0.08	2,854	171.22	0.09	0.09	0.00
19.30	0.08	2,851	171.21	0.09	0.09	0.00
19.40	0.08	2,847	171.21	0.09	0.09	0.00
19.50	0.08	2,844	171.21	0.09	0.09	0.00
19.60	0.08	2,840	171.20	0.09	0.09	0.00
19.70	0.08	2,836	171.20	0.09	0.09	0.00
19.80	0.08	2,832	171.19	0.09	0.09	0.00
19.90	0.08	2,827	171.19	0.09	0.09	0.00
20.00	0.08	2,823	171.18	0.09	0.09	0.00
20.10	0.08	2,818	171.17	0.09	0.09	0.00
20.20	0.08	2,814	171.17	0.09	0.09	0.00
20.30	0.08	2,809	171.16	0.09	0.09	0.00
20.40	0.08	2,804	171.16	0.09	0.09	0.00
20.50	0.08	2,798	171.15	0.09	0.09	0.00
20.60	0.07	2,793	171.14	0.09	0.09	0.00
20.70	0.07	2,787	171.14	0.09	0.09	0.00
20.80	0.07	2,781	171.13	0.09	0.09	0.00
20.90	0.07	2,775	171.12	0.09	0.09	0.00
21.00	0.07	2,769	171.11	0.09	0.09	0.00
21.10	0.07	2,763	171.11	0.09	0.09	0.00

**Post-Drainage - November 26**

NOAA 24-hr D 100-Year Rainfall=8.94"

Prepared by DW Smith Associates

Printed 11/27/2019

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**Hydrograph for Pond 44P: Recharge (continued)**

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)
21.20	0.07	2,756	171.10	0.09	0.09	0.00
21.30	0.07	2,750	171.09	0.09	0.09	0.00
21.40	0.07	2,743	171.08	0.09	0.09	0.00
21.50	0.07	2,736	171.07	0.09	0.09	0.00
21.60	0.07	2,728	171.07	0.09	0.09	0.00
21.70	0.07	2,721	171.06	0.09	0.09	0.00
21.80	0.07	2,713	171.05	0.09	0.09	0.00
21.90	0.07	2,706	171.04	0.09	0.09	0.00
22.00	0.07	2,698	171.03	0.09	0.09	0.00
22.10	0.07	2,690	171.02	0.09	0.09	0.00
22.20	0.07	2,681	171.01	0.09	0.09	0.00
22.30	0.07	2,673	171.00	0.09	0.09	0.00
22.40	0.07	2,664	170.99	0.09	0.09	0.00
22.50	0.07	2,655	170.98	0.09	0.09	0.00
22.60	0.06	2,646	170.97	0.09	0.09	0.00
22.70	0.06	2,637	170.96	0.09	0.09	0.00
22.80	0.06	2,627	170.95	0.09	0.09	0.00
22.90	0.06	2,618	170.94	0.09	0.09	0.00
23.00	0.06	2,608	170.93	0.09	0.09	0.00
23.10	0.06	2,598	170.92	0.09	0.09	0.00
23.20	0.06	2,588	170.90	0.09	0.09	0.00
23.30	0.06	2,578	170.89	0.09	0.09	0.00
23.40	0.06	2,567	170.88	0.09	0.09	0.00
23.50	0.06	2,556	170.87	0.09	0.09	0.00
23.60	0.06	2,545	170.86	0.09	0.09	0.00
23.70	0.06	2,534	170.85	0.09	0.09	0.00
23.80	0.06	2,523	170.83	0.09	0.09	0.00
23.90	0.06	2,511	170.82	0.09	0.09	0.00
24.00	0.06	2,500	170.81	0.09	0.09	0.00
24.10	0.04	2,486	170.79	0.09	0.09	0.00
24.20	0.01	2,464	170.77	0.09	0.09	0.00
24.30	0.00	2,433	170.74	0.09	0.09	0.00
24.40	0.00	2,401	170.70	0.09	0.09	0.00
24.50	0.00	2,369	170.67	0.09	0.09	0.00
24.60	0.00	2,337	170.63	0.09	0.09	0.00
24.70	0.00	2,304	170.60	0.09	0.09	0.00
24.80	0.00	2,272	170.56	0.09	0.09	0.00
24.90	0.00	2,239	170.53	0.09	0.09	0.00
25.00	0.00	2,207	170.50	0.09	0.09	0.00
25.10	0.00	2,174	170.46	0.09	0.09	0.00
25.20	0.00	2,142	170.43	0.09	0.09	0.00
25.30	0.00	2,109	170.39	0.09	0.09	0.00
25.40	0.00	2,077	170.36	0.09	0.09	0.00
25.50	0.00	2,044	170.33	0.09	0.09	0.00
25.60	0.00	2,012	170.29	0.09	0.09	0.00
25.70	0.00	1,979	170.26	0.09	0.09	0.00
25.80	0.00	1,947	170.23	0.09	0.09	0.00
25.90	0.00	1,914	170.20	0.09	0.09	0.00
26.00	0.00	1,882	170.16	0.09	0.09	0.00
26.10	0.00	1,849	170.13	0.09	0.09	0.00
26.20	0.00	1,817	170.10	0.09	0.09	0.00
26.30	0.00	1,784	170.06	0.09	0.09	0.00
26.40	0.00	1,752	170.03	0.09	0.09	0.00

**Post-Drainage - November 26**

NOAA 24-hr D 100-Year Rainfall=8.94"

Prepared by DW Smith Associates

Printed 11/27/2019

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**Hydrograph for Pond 44P: Recharge (continued)**

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)
26.50	0.00	1,719	170.00	0.09	0.09	0.00
26.60	0.00	1,687	169.96	0.09	0.09	0.00
26.70	0.00	1,654	169.93	0.09	0.09	0.00
26.80	0.00	1,622	169.90	0.09	0.09	0.00
26.90	0.00	1,589	169.87	0.09	0.09	0.00
27.00	0.00	1,557	169.83	0.09	0.09	0.00
27.10	0.00	1,524	169.80	0.09	0.09	0.00
27.20	0.00	1,492	169.77	0.09	0.09	0.00
27.30	0.00	1,459	169.73	0.09	0.09	0.00
27.40	0.00	1,427	169.70	0.09	0.09	0.00
27.50	0.00	1,394	169.67	0.09	0.09	0.00
27.60	0.00	1,362	169.63	0.09	0.09	0.00
27.70	0.00	1,329	169.60	0.09	0.09	0.00
27.80	0.00	1,297	169.57	0.09	0.09	0.00
27.90	0.00	1,264	169.53	0.09	0.09	0.00
28.00	0.00	1,232	169.50	0.09	0.09	0.00
28.10	0.00	1,199	169.47	0.09	0.09	0.00
28.20	0.00	1,167	169.43	0.09	0.09	0.00
28.30	0.00	1,134	169.40	0.09	0.09	0.00
28.40	0.00	1,102	169.36	0.09	0.09	0.00
28.50	0.00	1,069	169.33	0.09	0.09	0.00
28.60	0.00	1,037	169.29	0.09	0.09	0.00
28.70	0.00	1,004	169.26	0.09	0.09	0.00
28.80	0.00	972	169.22	0.09	0.09	0.00
28.90	0.00	939	169.19	0.09	0.09	0.00
29.00	0.00	907	169.15	0.09	0.09	0.00
29.10	0.00	874	169.12	0.09	0.09	0.00
29.20	0.00	842	169.08	0.09	0.09	0.00
29.30	0.00	809	169.04	0.09	0.09	0.00
29.40	0.00	777	169.01	0.09	0.09	0.00
29.50	0.00	744	168.97	0.09	0.09	0.00
29.60	0.00	712	168.93	0.09	0.09	0.00
29.70	0.00	679	168.89	0.09	0.09	0.00
29.80	0.00	647	168.85	0.09	0.09	0.00
29.90	0.00	614	168.81	0.09	0.09	0.00
30.00	0.00	582	168.77	0.09	0.09	0.00
30.10	0.00	549	168.73	0.09	0.09	0.00
30.20	0.00	517	168.69	0.09	0.09	0.00
30.30	0.00	484	168.64	0.09	0.09	0.00
30.40	0.00	452	168.60	0.09	0.09	0.00
30.50	0.00	419	168.55	0.09	0.09	0.00
30.60	0.00	387	168.49	0.09	0.09	0.00
30.70	0.00	354	168.43	0.09	0.09	0.00
30.80	0.00	322	168.37	0.09	0.09	0.00
30.90	0.00	289	168.31	0.09	0.09	0.00
31.00	0.00	257	168.24	0.09	0.09	0.00
31.10	0.00	224	168.18	0.09	0.09	0.00
31.20	0.00	192	168.12	0.09	0.09	0.00
31.30	0.00	159	168.06	0.09	0.09	0.00
31.40	0.00	127	167.99	0.09	0.09	0.00
31.50	0.00	94	167.93	0.09	0.09	0.00
31.60	0.00	62	167.87	0.09	0.09	0.00
31.70	0.00	29	167.81	0.09	0.09	0.00

**Post-Drainage - November 26**

NOAA 24-hr D 100-Year Rainfall=8.94"

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**Hydrograph for Pond 44P: Recharge (continued)**

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)
31.80	0.00	8	167.76	0.03	0.03	0.00
31.90	0.00	2	167.75	0.01	0.01	0.00
32.00	0.00	0	167.75	0.00	0.00	0.00
32.10	0.00	0	167.75	0.00	0.00	0.00
32.20	0.00	0	167.75	0.00	0.00	0.00
32.30	0.00	0	167.75	0.00	0.00	0.00
32.40	0.00	0	167.75	0.00	0.00	0.00
32.50	0.00	0	167.75	0.00	0.00	0.00
32.60	0.00	0	167.75	0.00	0.00	0.00
32.70	0.00	0	167.75	0.00	0.00	0.00
32.80	0.00	0	167.75	0.00	0.00	0.00
32.90	0.00	0	167.75	0.00	0.00	0.00
33.00	0.00	0	167.75	0.00	0.00	0.00
33.10	0.00	0	167.75	0.00	0.00	0.00
33.20	0.00	0	167.75	0.00	0.00	0.00
33.30	0.00	0	167.75	0.00	0.00	0.00
33.40	0.00	0	167.75	0.00	0.00	0.00
33.50	0.00	0	167.75	0.00	0.00	0.00
33.60	0.00	0	167.75	0.00	0.00	0.00
33.70	0.00	0	167.75	0.00	0.00	0.00
33.80	0.00	0	167.75	0.00	0.00	0.00
33.90	0.00	0	167.75	0.00	0.00	0.00
34.00	0.00	0	167.75	0.00	0.00	0.00
34.10	0.00	0	167.75	0.00	0.00	0.00
34.20	0.00	0	167.75	0.00	0.00	0.00
34.30	0.00	0	167.75	0.00	0.00	0.00
34.40	0.00	0	167.75	0.00	0.00	0.00
34.50	0.00	0	167.75	0.00	0.00	0.00
34.60	0.00	0	167.75	0.00	0.00	0.00
34.70	0.00	0	167.75	0.00	0.00	0.00
34.80	0.00	0	167.75	0.00	0.00	0.00
34.90	0.00	0	167.75	0.00	0.00	0.00
35.00	0.00	0	167.75	0.00	0.00	0.00
35.10	0.00	0	167.75	0.00	0.00	0.00
35.20	0.00	0	167.75	0.00	0.00	0.00
35.30	0.00	0	167.75	0.00	0.00	0.00
35.40	0.00	0	167.75	0.00	0.00	0.00
35.50	0.00	0	167.75	0.00	0.00	0.00
35.60	0.00	0	167.75	0.00	0.00	0.00
35.70	0.00	0	167.75	0.00	0.00	0.00
35.80	0.00	0	167.75	0.00	0.00	0.00
35.90	0.00	0	167.75	0.00	0.00	0.00
36.00	0.00	0	167.75	0.00	0.00	0.00
36.10	0.00	0	167.75	0.00	0.00	0.00
36.20	0.00	0	167.75	0.00	0.00	0.00
36.30	0.00	0	167.75	0.00	0.00	0.00
36.40	0.00	0	167.75	0.00	0.00	0.00
36.50	0.00	0	167.75	0.00	0.00	0.00
36.60	0.00	0	167.75	0.00	0.00	0.00
36.70	0.00	0	167.75	0.00	0.00	0.00
36.80	0.00	0	167.75	0.00	0.00	0.00
36.90	0.00	0	167.75	0.00	0.00	0.00
37.00	0.00	0	167.75	0.00	0.00	0.00

The recharge basin reaches a peak elevation of 171.38 at 12.55 hours. At 32.00 hours the basin no longer stores any storm water.

Drainage Time: 19.45 Hours





**Post-Drainage - November 26**

Prepared by DW Smith Associates

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NOAA 24-hr D 100-Year Rainfall=8.94"

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**Stage-Area-Storage for Pond 28P: Basin 1**

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
166.15	14,300	0	171.45	24,452	102,953
166.25	14,479	1,439	171.55	24,623	105,407
166.35	14,658	2,896	171.65	24,794	107,878
166.45	14,836	4,370	171.75	24,964	110,366
166.55	15,015	5,863	171.85	<b>25,135</b>	<b>112,871</b>
166.65	15,194	7,374	171.95	<b>25,220</b>	<b>114,130</b>
166.75	15,373	8,902	172.05	25,220	114,130
166.85	15,552	10,448	172.15	25,220	114,130
166.95	15,731	12,012	172.25	25,220	114,130
167.05	15,918	13,594	172.35	25,220	114,130
167.15	16,113	15,196	172.45	25,220	114,130
167.25	16,308	16,817	172.55	25,220	114,130
167.35	16,502	18,457	172.65	25,220	114,130
167.45	16,698	20,117	172.75	25,220	114,130
167.55	16,893	21,797	172.85	25,220	114,130
167.65	17,088	23,496	172.95	25,220	114,130
167.75	17,283	25,214	173.05	25,220	114,130
167.85	17,477	26,952	173.15	25,220	114,130
167.95	17,673	28,710	173.25	25,220	114,130
168.05	17,873	30,487	173.35	25,220	114,130
<b>168.15</b>	<b>18,078</b>	<b>32,285</b>	173.45	25,220	114,130
168.25	18,283	34,103	173.55	25,220	114,130
168.35	18,487	35,941	173.65	25,220	114,130
168.45	18,693	37,800	173.75	25,220	114,130
168.55	18,898	39,680	173.85	25,220	114,130
168.65	19,103	41,580	173.95	25,220	114,130
168.75	19,308	43,500	174.05	25,220	114,130
168.85	19,512	45,441	174.15	25,220	114,130
168.95	19,718	47,403	174.25	25,220	114,130
169.05	19,928	49,385	174.35	25,220	114,130
169.15	20,144	51,388	174.45	25,220	114,130
169.25	20,360	53,413	174.55	25,220	114,130
169.35	20,576	55,460			
169.45	20,792	57,529			
169.55	21,007	59,619			
169.65	21,223	61,730			
169.75	21,439	63,863			
169.85	21,655	66,018			
169.95	21,871	68,194			
170.05	22,064	70,392			
170.15	22,235	72,607			
170.25	22,405	74,839			
170.35	22,576	77,088			
170.45	22,747	79,354			
170.55	22,917	81,637			
170.65	23,088	83,937			
170.75	23,258	86,255			
170.85	23,429	88,589			
170.95	23,600	90,940			
171.05	23,770	93,309			
171.15	23,941	95,694			
171.25	24,111	98,097			
171.35	24,282	100,517			

**Post-Drainage - November 26**

Prepared by DW Smith Associates

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NOAA 24-hr D 100-Year Rainfall=8.94"

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**Stage-Area-Storage for Pond 44P: Recharge**

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
167.75	1,300	0	170.40	1,300	2,114
167.80	1,300	26	170.45	1,300	2,163
167.85	1,300	52	170.50	1,300	2,211
167.90	1,300	78	170.55	1,300	2,259
167.95	1,300	104	170.60	1,300	2,306
168.00	1,300	130	170.65	1,300	2,354
168.05	1,300	156	170.70	1,300	2,401
168.10	1,300	182	170.75	1,300	2,447
168.15	1,300	208	170.80	1,300	2,493
168.20	1,300	234	170.85	1,300	2,539
168.25	1,300	260	170.90	1,300	2,584
168.30	1,300	286	170.95	1,300	2,628
168.35	1,300	312	171.00	1,300	2,672
168.40	1,300	338	171.05	1,300	2,715
168.45	1,300	364	171.10	1,300	2,757
168.50	1,300	390	171.15	1,300	2,799
168.55	1,300	420	171.20	1,300	2,839
168.60	1,300	453	171.25	1,300	2,879
168.65	1,300	489	171.30	1,300	2,917
168.70	1,300	526	171.35	1,300	2,954
168.75	1,300	564	171.40	1,300	2,989
168.80	1,300	603	171.45	1,300	3,023
168.85	1,300	644	171.50	1,300	3,053
168.90	1,300	685	171.55	1,300	3,079
168.95	1,300	728	171.60	1,300	3,105
169.00	1,300	771	171.65	1,300	3,131
169.05	1,300	815	171.70	1,300	3,157
169.10	1,300	859	171.75	1,300	3,183
169.15	1,300	904	171.80	1,300	3,209
169.20	1,300	950	171.85	1,300	3,235
169.25	1,300	996	171.90	1,300	3,261
169.30	1,300	1,042	171.95	1,300	3,287
169.35	1,300	1,089	172.00	1,300	3,313
169.40	1,300	1,136	172.05	1,300	3,339
169.45	1,300	1,184	172.10	1,300	3,365
169.50	1,300	1,232	172.15	1,300	3,391
169.55	1,300	1,280	172.20	1,300	3,417
169.60	1,300	1,328	172.25	1,300	3,443
169.65	1,300	1,377			
169.70	1,300	1,426			
169.75	1,300	1,475			
169.80	1,300	1,524			
169.85	1,300	1,573			
169.90	1,300	1,623			
169.95	1,300	1,672			
170.00	1,300	1,721			
170.05	1,300	1,771			
170.10	1,300	1,820			
170.15	1,300	1,869			
170.20	1,300	1,919			
170.25	1,300	1,968			
170.30	1,300	2,017			
170.35	1,300	2,066			

**TOTAL STORAGE FOR RECHARGE:**  
 32,285 + 2,879 = 35,164 CUBIC FEET

## **APPENDIX G: SOIL EROSION AND SEDIMENT CONTROL CALCULATIONS**



DATE:	<u>8/9/2019</u>
JOB NO.:	<u>18-191.01</u>
PROJECT:	<u>BUCKDALE SUBDIVISION</u>
RIP RAP APRON:	<u>A</u>
BY:	<u>CAF</u>

Maximum Inside Culvert Width	30 inches
Maximum Inside Vertical Culvert Dimension	30 inches
Equivalent Pipe Diameter	30 inches
Slope	0.0035 feet/foot
Manning's Number	0.010
25 Year Flow Rate From Culvert	28.90 cfs
Depth of Tailwater	2.13 feet
Allowable Velocity	1.8 fps

Full Pipe Flow	31.5 cfs
Full Pipe Velocity	6.4 fps
Actual Pipe Velocity	6.8 fps
Length of Apron (La)	21.9 feet
Width of Apron near Pipe (3Do)	7.5 feet
Width of Apron at Outfall (W)	16.3 feet
Median Stone Diameter for Rip Rap (d50)	3.0 inches
Stone Thickness	6.0 inches

Round to 23 FT

Round to 17 FT

DATE:	<u>2/3/2020</u>
JOB NO.:	<u>18-191.01</u>
PROJECT:	<u>BUCKDALE SUBDIVISION</u>
SCOUR HOLE:	<u>Scour Hole 1</u>
BY:	<u>RSE</u>

Maximum Inside Culvert Width	24 inches
Maximum Inside Vertical Culvert Dimension	24 inches
Equivalent Pipe Diameter	24 inches
Slope	0.0036 feet/feet
Manning's Number	0.01
25 Year Flow Rate From Culvert (Half of 6.82 CFS)	3.41 cfs
Depth of Tailwater	0.40 feet
Allowable Velocity	1.8 fps

Full Pipe Flow	17.7 cfs
Full Pipe Velocity	5.6 fps
Q/Qfull	0.2
d/d	0.4
Actual Pipe Velocity	3.9 fps
Depth of Scour Hole (Do)	1.5 feet
Length of Scour Hole (L) (oversized)	15.0 feet
Width of Scour Hole (W) (oversized)	13.0 feet
Median Stone Diameter for Scour Hole	0.8 inches
Bottom Stones, Width (W1)	4.0 feet
Bottom Stones, Length (L1)	6.0 feet
Stone Thickness	1.5 inches
Depth	1.50 feet
Volume of Stone	0.92 cy

Round to 4 inches

(oversized)

Round to 8 inches

(oversized)

DATE:	<u>2/3/2020</u>
JOB NO.:	<u>18-191.01</u>
PROJECT:	<u>BUCKDALE SUBDIVISION</u>
SCOUR HOLE:	<u>Scour Hole 2</u>
BY:	<u>RSE</u>

Maximum Inside Culvert Width	24 inches
Maximum Inside Vertical Culvert Dimension	24 inches
Equivalent Pipe Diameter	24 inches
Slope	0.0036 feet/feet
Manning's Number	0.01
25 Year Flow Rate From Culvert (Half of 6.82 CFS)	3.41 cfs
Depth of Tailwater	0.40 feet
Allowable Velocity	1.8 fps

Full Pipe Flow	17.7 cfs
Full Pipe Velocity	5.6 fps
Q/Qfull	0.2
d/d	0.4
Actual Pipe Velocity	3.9 fps
Depth of Scour Hole (Do)	1.5 feet
Length of Scour Hole (L) (oversized)	15.0 feet
Width of Scour Hole (W) (oversized)	13.0 feet
Median Stone Diameter for Scour Hole	0.8 inches
Bottom Stones, Width (W1)	4.0 feet
Bottom Stones, Length (L1)	6.0 feet
Stone Thickness	1.5 inches
Depth	1.50 feet
Volume of Stone	0.92 cy

Round to 4 inches  
(oversized)  
Round to 8 inches  
(oversized)

DATE:	<u>11/26/2019</u>
JOB NO.:	<u>18-191.01</u>
PROJECT:	<u>BUCKDALE SUBDIVISION</u>
RIP RAP APRON:	<u>O-1</u>
BY:	<u>RSE</u>

Maximum Inside Culvert Width	12 inches
Maximum Inside Vertical Culvert Dimension	12 inches
Equivalent Pipe Diameter	12 inches
Slope	0.11 feet/foot
Manning's Number	0.01
25 Year Flow Rate From Culvert	10.50 cfs
Depth of Tailwater	3.04 feet
Allowable Velocity	1.8 fps

Full Pipe Flow	15.4 cfs	
Full Pipe Velocity	19.6 fps	
Actual Pipe Velocity	18.5 fps	
Length of Apron (La)	31.5 feet	round to 32 feet
Width of Apron near Pipe (3Do)	3.0 feet	use 3 feet
Width of Apron at Outfall (W)	15.6 feet	round to 16 feet
Median Stone Diameter for Rip Rap (d50)	3.0 inches	use 3 inches
Stone Thickness	6.0 inches	unse 6 inches





RIP-RAP CHANNEL SIZING

PER SESC STANDARDS, CHAPTER 25  
"SLOPE PROTECTION STRUCTURES"

TOTAL DRAINAGE AREA TO CHANNEL = 0.642 AC.

0.477 AC = GRASS, C = 0.3

0.165 AC = ROOF, C = 0.95

WEIGHTED C = 0.467 (USE 0.47)

t = 10 MIN

i = 5.47 - 10 YEAR STORM

$$Q = ciA$$

$$Q_{10} = (0.47)(5.47)(0.642)$$

$$Q_{10} = 1.65 \text{ CFS}$$

FOR RIP-RAP LINED CHUTES, CHANNEL SLOPES 10% - 40%:

$$D_{50} = \left[ \frac{q \times S^{0.58}}{3.93(10)^{-2}} \right]^{1.89}$$

$$q = \frac{Q}{\text{WIDTH}}$$

$$q = \frac{1.65 \text{ CFS}}{6 \text{ FT}}$$

$$D_{50} = \left[ \frac{0.275 \times 3^{0.58}}{0.0393} \right]^{0.5291}$$

$$q = 0.275$$

$$S = 3 \quad (3:1 \text{ FT/FT})$$

$$D_{50} = 3.92''$$

**USE 6" D50**



$$z = \left[ \frac{n \times q}{1.486 \times S^{0.5}} \right]^{3/5}$$

$$z = \left[ \frac{0.072 \times 0.275}{1.486 \times 3^{0.5}} \right]^{0.6}$$

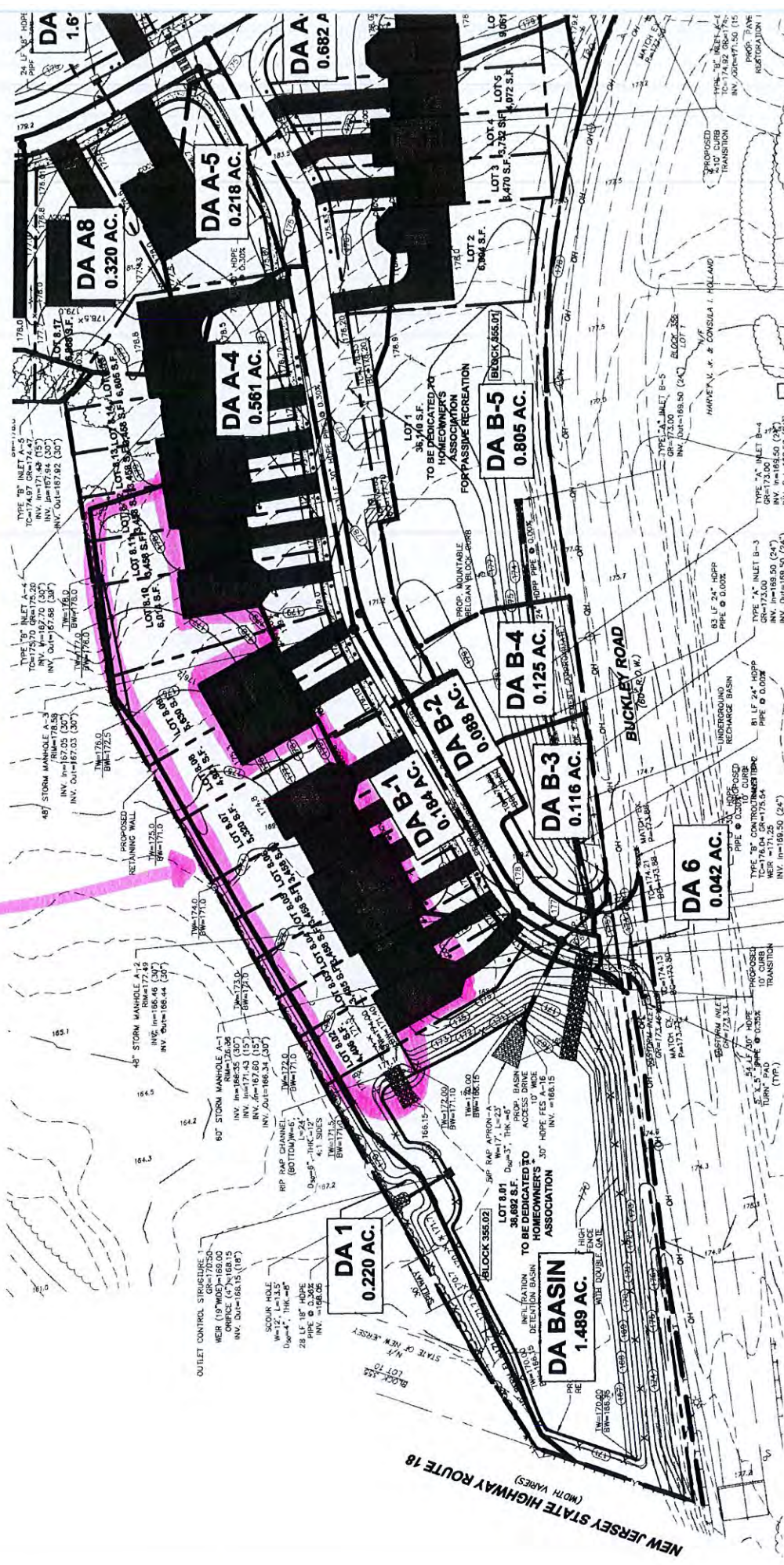
$$z = 0.054' = 0.65'' \text{ FLOW DEPTH}$$

$$n = 0.047 (D_{50} S)^{0.147}$$

$$n = 0.047 (6'' \times 3)^{0.147}$$

$$n = 0.072$$

**DRAINAGE AREA TO RIP-RAP CHANNEL**  
**= 0.642 AC**  
**0.477 AC GRASS + 0.165 AC ROOF**



## Worksheet for Trapezoidal Channel - 1

### Project Description

Friction Method	Manning Formula	
Solve For	Normal Depth	RIP RAP CHANNEL

### Input Data

Roughness Coefficient	0.069	(for 6" D50)
Channel Slope	3.00000	ft/ft
Left Side Slope	4.00	ft/ft (H:V)
Right Side Slope	4.00	ft/ft (H:V)
Bottom Width	6.00	ft
Discharge	1.65	ft <sup>3</sup> /s     10 YEAR

### Results

Normal Depth	0.05	ft
Flow Area	0.32	ft <sup>2</sup>
Wetted Perimeter	6.43	ft
Hydraulic Radius	0.05	ft
Top Width	6.42	ft
Critical Depth	0.13	ft
Critical Slope	0.14165	ft/ft
Velocity	5.09	ft/s
Velocity Head	0.40	ft
Specific Energy	0.45	ft
Froude Number	3.99	
Flow Type	Supercritical	

### GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

### GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.05	ft
Critical Depth	0.13	ft
Channel Slope	3.00000	ft/ft

---

## Worksheet for Trapezoidal Channel - 1

---

### GVF Output Data

Critical Slope 0.14165 ft/ft

**SESC - November 26**

Prepared by DW Smith Associates

Printed 12/3/2019

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**Summary for Pond 28P: Basin 1**

Inflow Area = 13.039 ac, 34.57% Impervious, Inflow Depth = 1.96" for 10-Year event  
 Inflow = 20.17 cfs @ 12.17 hrs, Volume= 2.133 af  
 Outflow = 6.15 cfs @ 12.50 hrs, Volume= 2.127 af, Atten= 69%, Lag= 19.8 min  
 Primary = 6.15 cfs @ 12.50 hrs, Volume= 2.127 af

Routing by Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs

**Starting Elev= 168.15'** Surf.Area= 18,078 sf Storage= 32,285 cf **Starting Elevation = Orifice Invert**

**Peak Elev= 169.71'** @ 12.50 hrs Surf.Area= 21,345 sf Storage= 62,927 cf (30,642 cf above start)

**Basin does not overtop Spillway (elevation 170.8)**

Plug-Flow detention time= 376.6 min calculated for 1.386 af (65% of inflow)

Center-of-Mass det. time= 125.2 min ( 905.9 - 780.7 )

Volume	Invert	Avail.Storage	Storage Description
#1	166.15'	114,130 cf	<b>Basin (Prismatic)</b> Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
166.15	14,300	0	0
167.00	15,820	12,801	12,801
168.00	17,770	16,795	29,596
169.00	19,820	18,795	48,391
170.00	21,979	20,900	69,290
171.90	25,220	44,839	114,130

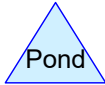
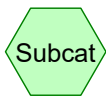
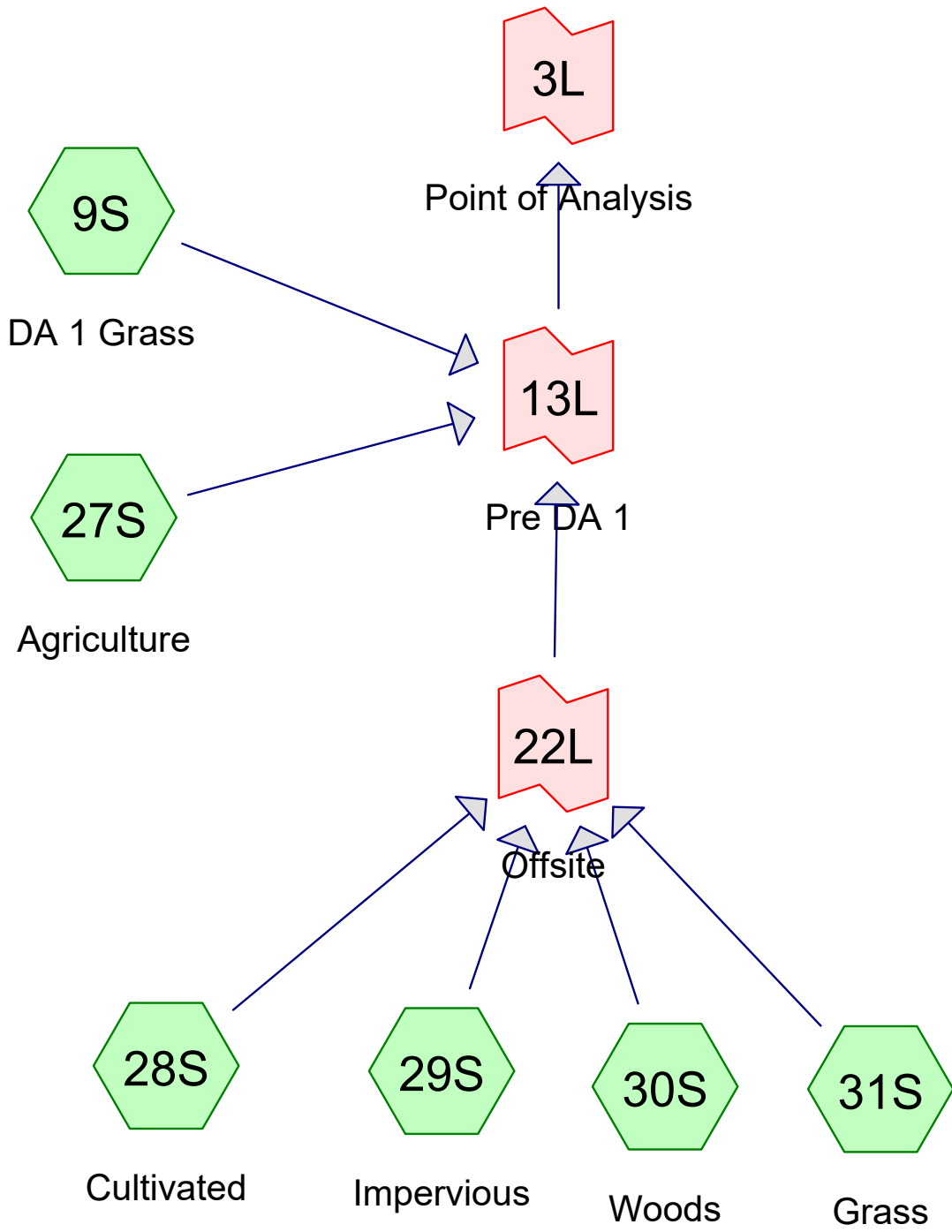
Device	Routing	Invert	Outlet Devices
#1	Primary	168.15'	<b>6.0" Vert. Orifice/Grate X 3.00</b> C= 0.600
#2	Primary	170.60'	<b>48.0" W x 48.0" H Vert. Orifice/Grate</b> C= 0.600
#3	Primary	169.30'	<b>1.8' long Sharp-Crested Rectangular Weir X 2.00</b> 2 End Contraction(s)

**Primary OutFlow** Max=6.15 cfs @ 12.50 hrs HW=169.71' (Free Discharge)

1=Orifice/Grate (Orifice Controls 3.24 cfs @ 5.50 fps)

2=Orifice/Grate ( Controls 0.00 cfs)

3=Sharp-Crested Rectangular Weir (Weir Controls 2.91 cfs @ 2.08 fps)



**Routing Diagram for Off-Site Stability - November 26**  
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**Off-Site Stability - November 26**

Prepared by DW Smith Associates

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Pre-Drainage  
NOAA 24-hr D 2-Year Rainfall=3.38"

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Time span=0.00-40.00 hrs, dt=0.05 hrs, 801 points  
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN  
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

<b>Subcatchment9S: DA 1 Grass</b>	Runoff Area=2.520 ac 0.00% Impervious Runoff Depth=0.00" Flow Length=780' Tc=20.5 min CN=39 Runoff=0.00 cfs 0.001 af
<b>Subcatchment27S: Agriculture</b>	Runoff Area=1.510 ac 0.00% Impervious Runoff Depth=0.60" Flow Length=272' Tc=19.4 min CN=63 Runoff=0.53 cfs 0.076 af
<b>Subcatchment28S: Cultivated</b>	Runoff Area=1.470 ac 0.00% Impervious Runoff Depth=0.60" Flow Length=650' Tc=19.1 min CN=63 Runoff=0.52 cfs 0.074 af
<b>Subcatchment29S: Impervious</b>	Runoff Area=0.874 ac 100.00% Impervious Runoff Depth=3.15" Flow Length=750' Tc=13.8 min CN=98 Runoff=2.15 cfs 0.229 af
<b>Subcatchment30S: Woods</b>	Runoff Area=0.115 ac 0.00% Impervious Runoff Depth=0.00" Flow Length=580' Tc=28.3 min CN=30 Runoff=0.00 cfs 0.000 af
<b>Subcatchment31S: Grass</b>	Runoff Area=1.308 ac 0.00% Impervious Runoff Depth=0.00" Flow Length=820' Tc=22.1 min CN=39 Runoff=0.00 cfs 0.000 af
<b>Link 3L: Point of Analysis</b>	Inflow=2.98 cfs 0.380 af Primary=2.98 cfs 0.380 af
<b>Link 13L: Pre DA 1</b>	Inflow=2.98 cfs 0.380 af Primary=2.98 cfs 0.380 af
<b>Link 22L: Offsite</b>	Inflow=2.54 cfs 0.303 af Primary=2.54 cfs 0.303 af

**Total Runoff Area = 7.797 ac Runoff Volume = 0.380 af Average Runoff Depth = 0.58"**  
**88.79% Pervious = 6.923 ac 11.21% Impervious = 0.874 ac**



# Off-Site Stability - November 26

Prepared by DW Smith Associates

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Pre-Drainage  
NOAA 24-hr D 2-Year Rainfall=3.38"

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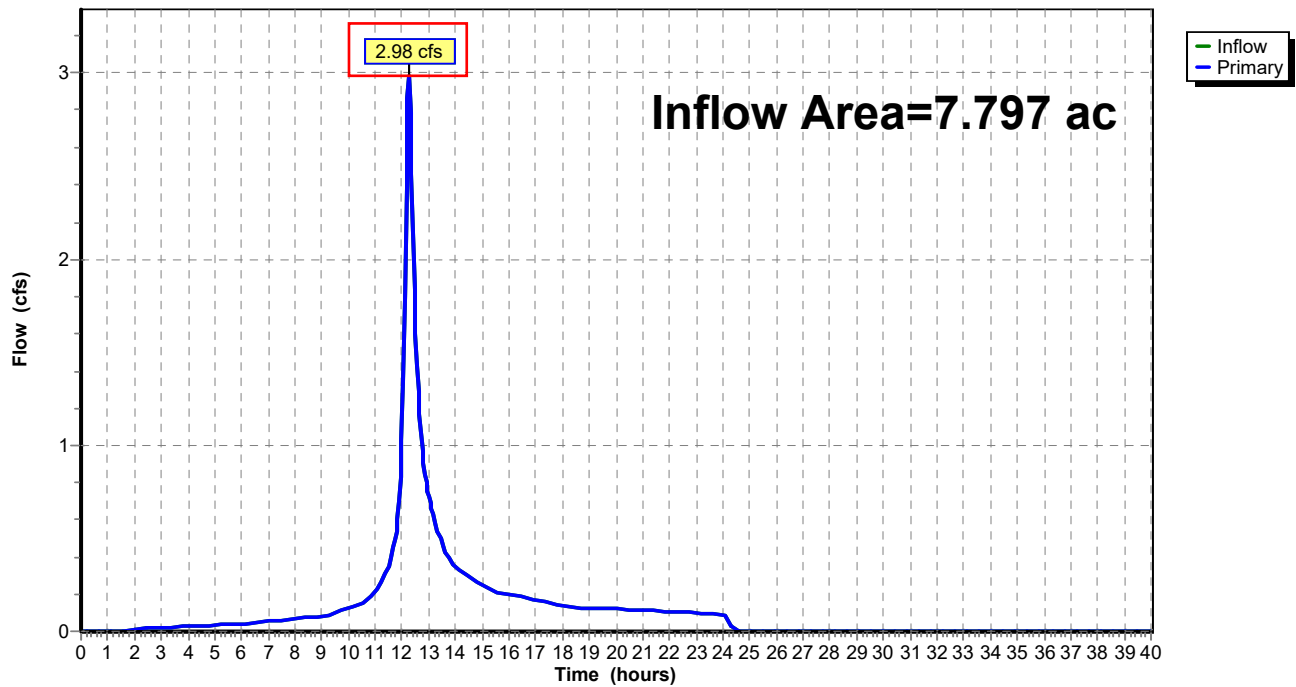
## Summary for Link 3L: Point of Analysis

Inflow Area = 7.797 ac, 11.21% Impervious, Inflow Depth = 0.58" for 2-Year event  
Inflow = 2.98 cfs @ 12.24 hrs, Volume= 0.380 af  
Primary = 2.98 cfs @ 12.24 hrs, Volume= 0.380 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs

## Link 3L: Point of Analysis

Hydrograph



# Off-Site Stability - November 26

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Pre-Drainage  
NOAA 24-hr D 2-Year Rainfall=3.38"

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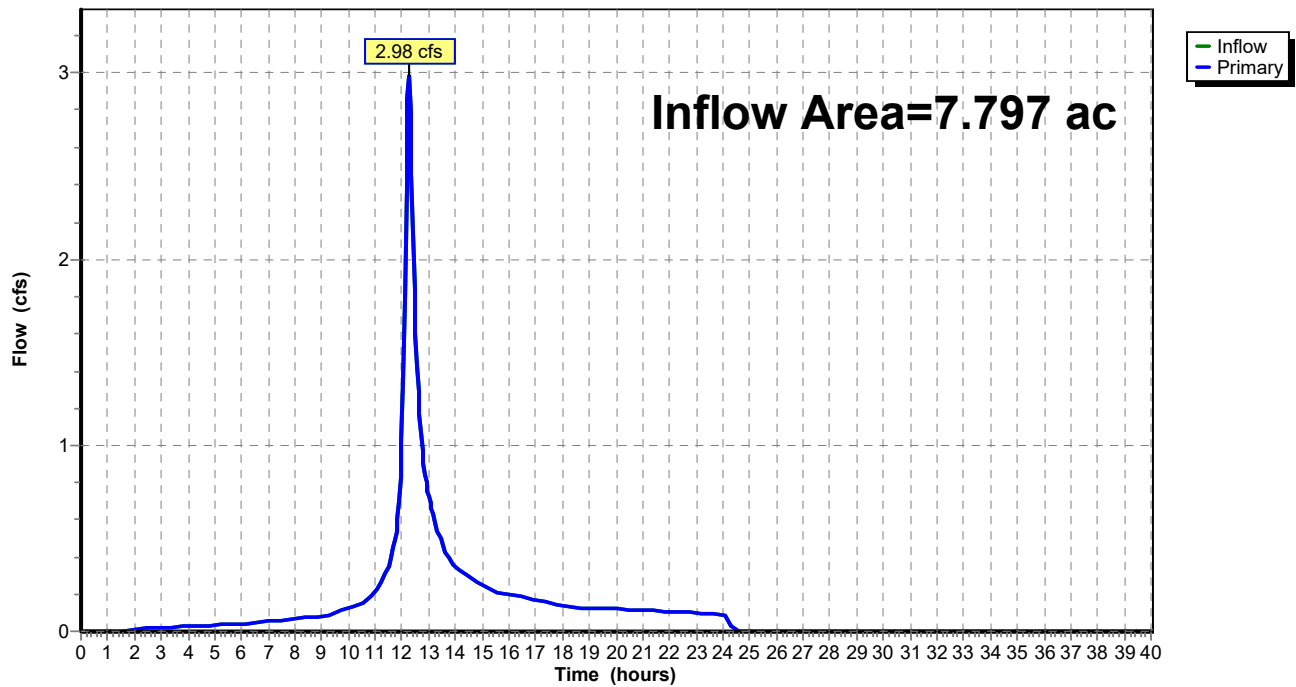
## Summary for Link 13L: Pre DA 1

Inflow Area = 7.797 ac, 11.21% Impervious, Inflow Depth = 0.58" for 2-Year event  
Inflow = 2.98 cfs @ 12.24 hrs, Volume= 0.380 af  
Primary = 2.98 cfs @ 12.24 hrs, Volume= 0.380 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs

### Link 13L: Pre DA 1

#### Hydrograph



# Off-Site Stability - November 26

Prepared by DW Smith Associates

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Pre-Drainage  
NOAA 24-hr D 2-Year Rainfall=3.38"

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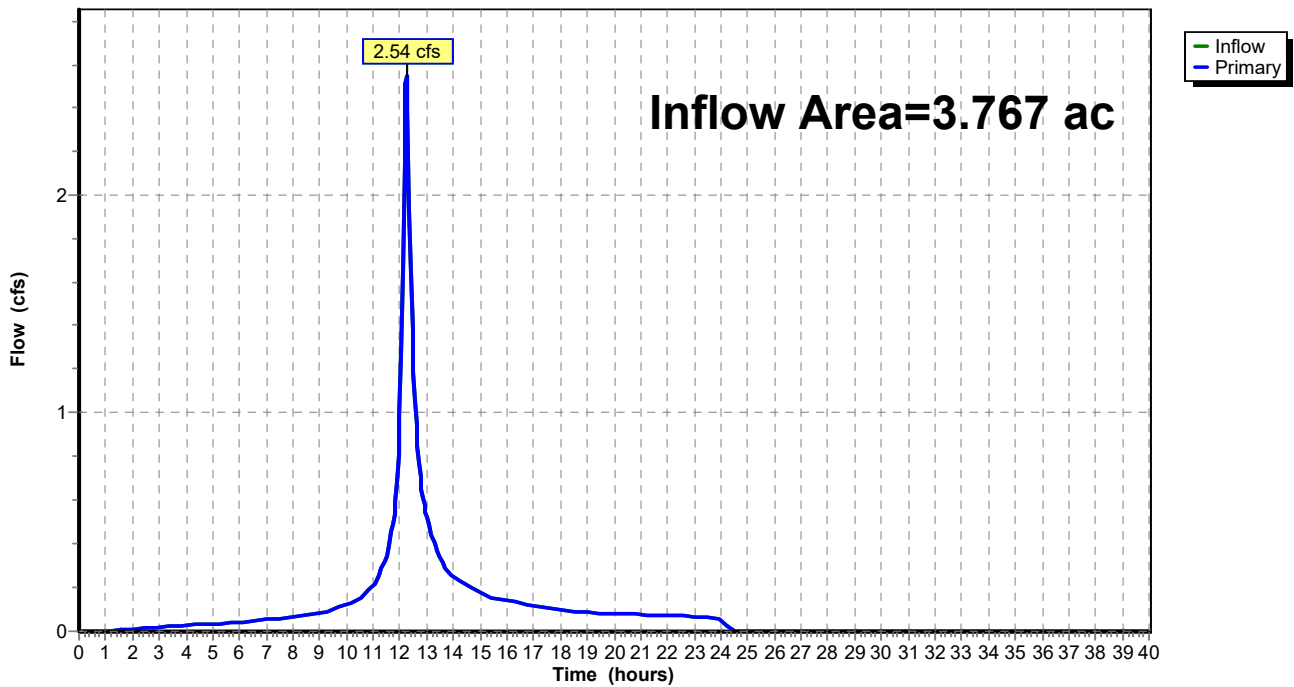
## Summary for Link 22L: Offsite

Inflow Area = 3.767 ac, 23.20% Impervious, Inflow Depth = 0.97" for 2-Year event  
Inflow = 2.54 cfs @ 12.23 hrs, Volume= 0.303 af  
Primary = 2.54 cfs @ 12.23 hrs, Volume= 0.303 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs

### Link 22L: Offsite

#### Hydrograph



**Off-Site Stability - November 26**

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Pre-Drainage  
NOAA 24-hr D 10-Year Rainfall=5.23"

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Time span=0.00-40.00 hrs, dt=0.05 hrs, 801 points  
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN  
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

**Subcatchment9S: DA 1 Grass**

Runoff Area=2.520 ac 0.00% Impervious Runoff Depth=0.25"  
Flow Length=780' Tc=20.5 min CN=39 Runoff=0.11 cfs 0.052 af

**Subcatchment27S: Agriculture**

Runoff Area=1.510 ac 0.00% Impervious Runoff Depth=1.66"  
Flow Length=272' Tc=19.4 min CN=63 Runoff=1.81 cfs 0.208 af

**Subcatchment28S: Cultivated**

Runoff Area=1.470 ac 0.00% Impervious Runoff Depth=1.66"  
Flow Length=650' Tc=19.1 min CN=63 Runoff=1.77 cfs 0.203 af

**Subcatchment29S: Impervious**

Runoff Area=0.874 ac 100.00% Impervious Runoff Depth=4.99"  
Flow Length=750' Tc=13.8 min CN=98 Runoff=3.35 cfs 0.364 af

**Subcatchment30S: Woods**

Runoff Area=0.115 ac 0.00% Impervious Runoff Depth=0.01"  
Flow Length=580' Tc=28.3 min CN=30 Runoff=0.00 cfs 0.000 af

**Subcatchment31S: Grass**

Runoff Area=1.308 ac 0.00% Impervious Runoff Depth=0.25"  
Flow Length=820' Tc=22.1 min CN=39 Runoff=0.06 cfs 0.027 af

**Link 3L: Point of Analysis**

Inflow=6.62 cfs 0.855 af  
Primary=6.62 cfs 0.855 af

**Link 13L: Pre DA 1**

Inflow=6.62 cfs 0.855 af  
Primary=6.62 cfs 0.855 af

**Link 22L: Offsite**

Inflow=4.92 cfs 0.594 af  
Primary=4.92 cfs 0.594 af

**Total Runoff Area = 7.797 ac Runoff Volume = 0.855 af Average Runoff Depth = 1.32"**  
**88.79% Pervious = 6.923 ac 11.21% Impervious = 0.874 ac**

# Off-Site Stability - November 26

Prepared by DW Smith Associates

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Pre-Drainage  
NOAA 24-hr D 10-Year Rainfall=5.23"

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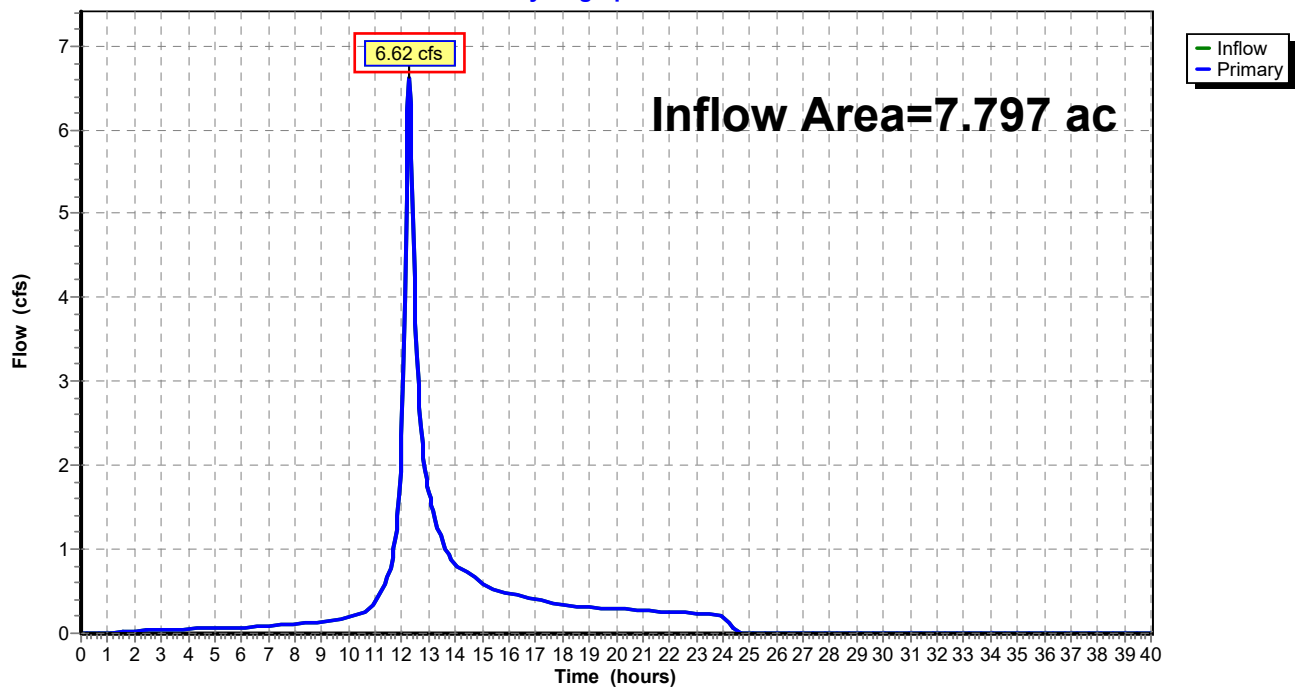
## Summary for Link 3L: Point of Analysis

Inflow Area = 7.797 ac, 11.21% Impervious, Inflow Depth = 1.32" for 10-Year event  
Inflow = 6.62 cfs @ 12.25 hrs, Volume= 0.855 af  
Primary = 6.62 cfs @ 12.25 hrs, Volume= 0.855 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs

## Link 3L: Point of Analysis

Hydrograph



# Off-Site Stability - November 26

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Pre-Drainage  
NOAA 24-hr D 10-Year Rainfall=5.23"

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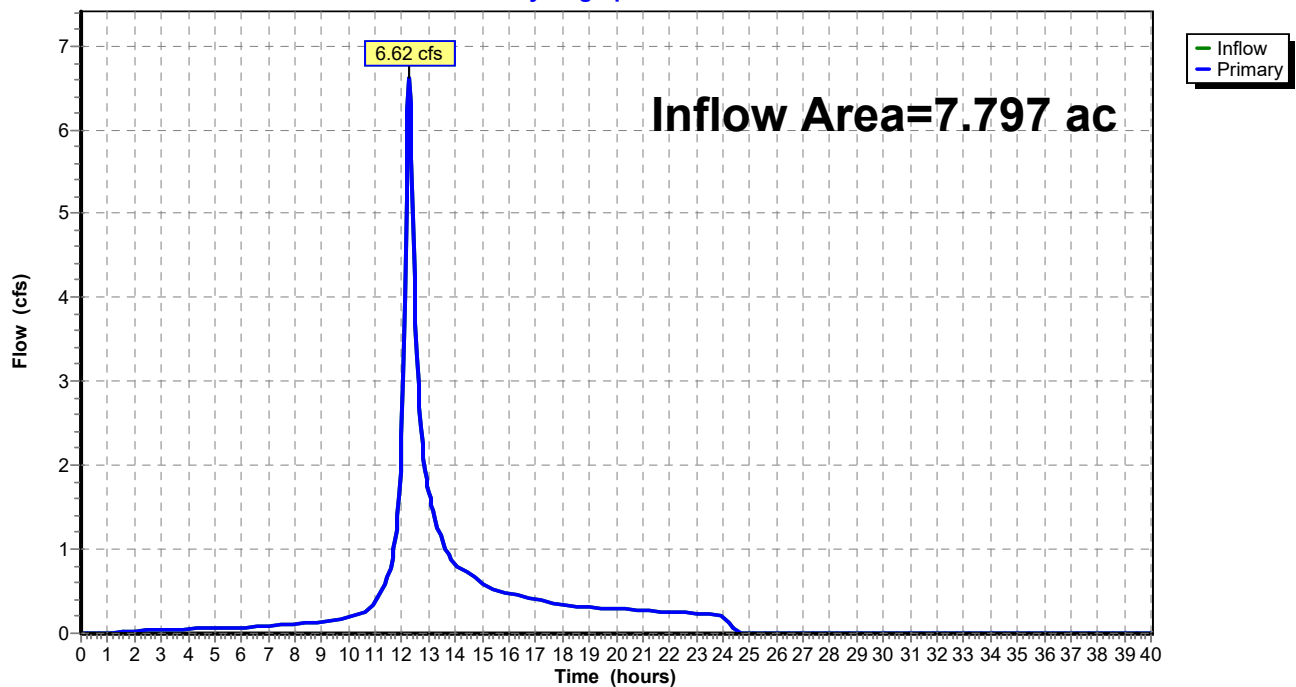
## Summary for Link 13L: Pre DA 1

Inflow Area = 7.797 ac, 11.21% Impervious, Inflow Depth = 1.32" for 10-Year event  
Inflow = 6.62 cfs @ 12.25 hrs, Volume= 0.855 af  
Primary = 6.62 cfs @ 12.25 hrs, Volume= 0.855 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs

### Link 13L: Pre DA 1

#### Hydrograph



# Off-Site Stability - November 26

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Pre-Drainage  
NOAA 24-hr D 10-Year Rainfall=5.23"

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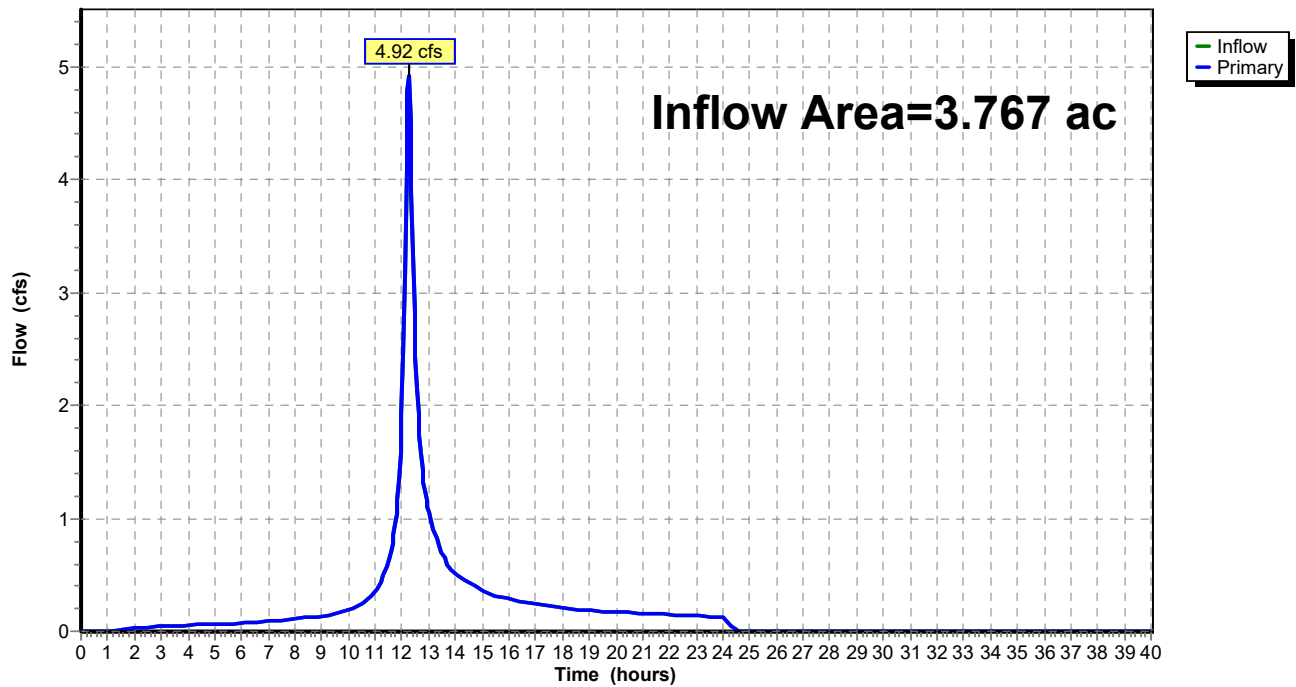
## Summary for Link 22L: Offsite

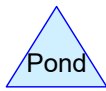
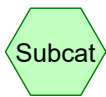
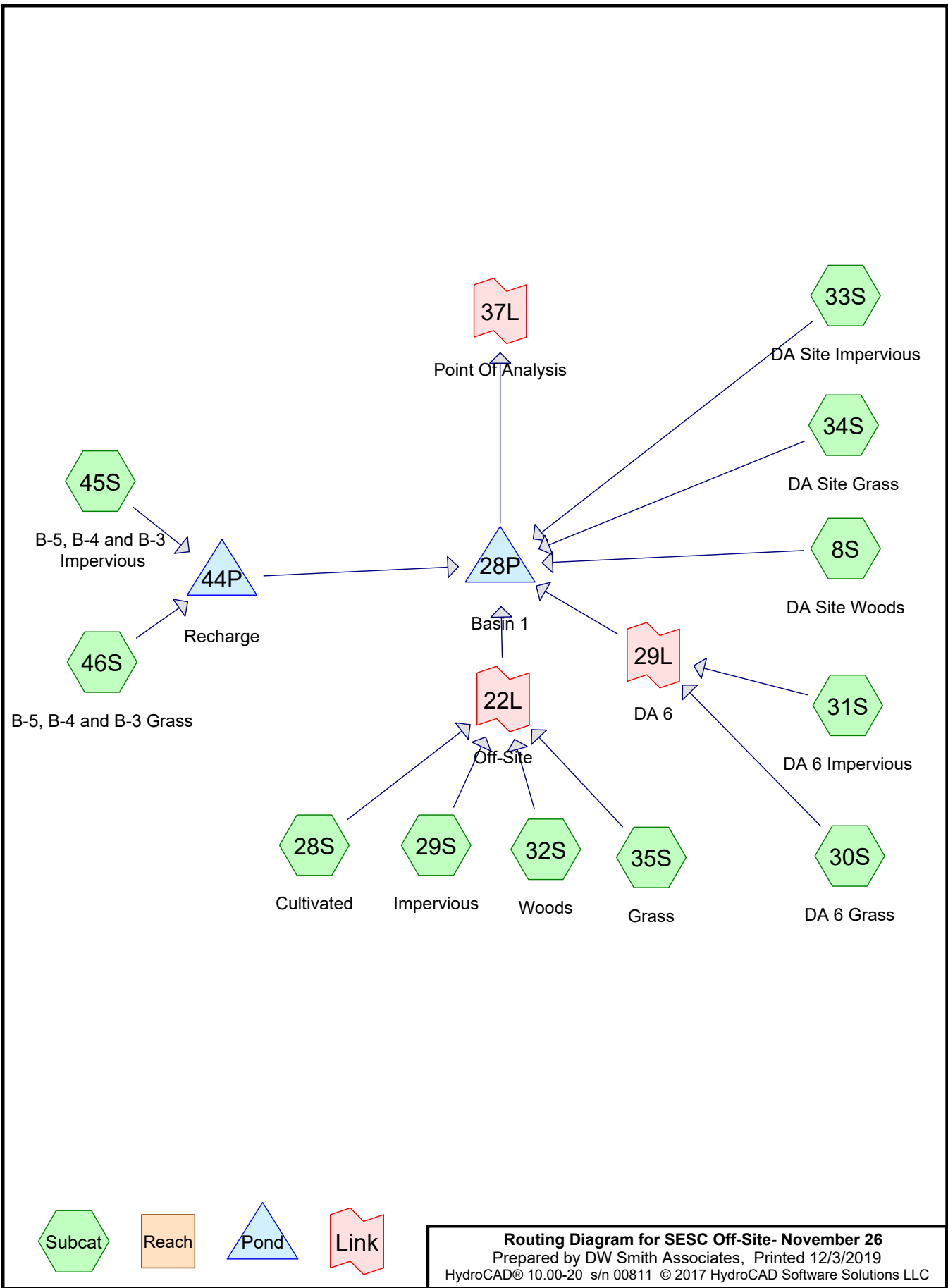
Inflow Area = 3.767 ac, 23.20% Impervious, Inflow Depth = 1.89" for 10-Year event  
Inflow = 4.92 cfs @ 12.24 hrs, Volume= 0.594 af  
Primary = 4.92 cfs @ 12.24 hrs, Volume= 0.594 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs

### Link 22L: Offsite

#### Hydrograph





**Routing Diagram for SESC Off-Site- November 26**  
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**SESC Off-Site- November 26**

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Time span=0.00-50.00 hrs, dt=0.05 hrs, 1001 points  
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN  
 Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

<b>Subcatchment 8S: DA Site Woods</b>	Runoff Area=0.116 ac 0.00% Impervious Runoff Depth=0.00" Flow Length=110' Tc=25.8 min CN=30 Runoff=0.00 cfs 0.000 af
<b>Subcatchment 28S: Cultivated</b>	Runoff Area=1.470 ac 0.00% Impervious Runoff Depth=0.60" Flow Length=415' Tc=14.9 min CN=63 Runoff=0.59 cfs 0.074 af
<b>Subcatchment 29S: Impervious</b>	Runoff Area=0.874 ac 100.00% Impervious Runoff Depth=3.15" Tc=10.0 min CN=98 Runoff=2.39 cfs 0.229 af
<b>Subcatchment 30S: DA 6 Grass</b>	Runoff Area=0.013 ac 0.00% Impervious Runoff Depth=0.00" Tc=10.0 min CN=39 Runoff=0.00 cfs 0.000 af
<b>Subcatchment 31S: DA 6 Impervious</b>	Runoff Area=0.027 ac 100.00% Impervious Runoff Depth=3.15" Tc=10.0 min CN=98 Runoff=0.07 cfs 0.007 af
<b>Subcatchment 32S: Woods</b>	Runoff Area=0.115 ac 0.00% Impervious Runoff Depth=0.00" Flow Length=345' Tc=24.1 min CN=30 Runoff=0.00 cfs 0.000 af
<b>Subcatchment 33S: DA Site Impervious</b>	Runoff Area=3.441 ac 100.00% Impervious Runoff Depth=3.15" Tc=10.0 min CN=98 Runoff=9.41 cfs 0.902 af
<b>Subcatchment 34S: DA Site Grass</b>	Runoff Area=4.629 ac 0.00% Impervious Runoff Depth=0.00" Tc=10.0 min CN=39 Runoff=0.01 cfs 0.002 af
<b>Subcatchment 35S: Grass</b>	Runoff Area=1.308 ac 0.00% Impervious Runoff Depth=0.00" Flow Length=585' Tc=17.9 min CN=39 Runoff=0.00 cfs 0.000 af
<b>Subcatchment 45S: B-5, B-4 and B-3</b>	Runoff Area=0.165 ac 100.00% Impervious Runoff Depth=3.15" Tc=10.0 min CN=98 Runoff=0.45 cfs 0.043 af
<b>Subcatchment 46S: B-5, B-4 and B-3 Grass</b>	Runoff Area=0.881 ac 0.00% Impervious Runoff Depth=0.00" Tc=10.0 min CN=39 Runoff=0.00 cfs 0.000 af
<b>Pond 28P: Basin 1</b>	Peak Elev=169.20' Storage=52,396 cf Inflow=12.31 cfs 1.214 af Outflow=2.54 cfs 1.209 af
<b>Pond 44P: Recharge</b>	Peak Elev=168.55' Storage=422 cf Inflow=0.45 cfs 0.044 af Discarded=0.09 cfs 0.044 af Primary=0.00 cfs 0.000 af Outflow=0.09 cfs 0.044 af
<b>Link 22L: Off-Site</b>	Inflow=2.83 cfs 0.303 af Primary=2.83 cfs 0.303 af
<b>Link 29L: DA 6</b>	Inflow=0.07 cfs 0.007 af Primary=0.07 cfs 0.007 af
<b>Link 37L: Point Of Analysis</b>	Inflow=2.54 cfs 1.209 af Primary=2.54 cfs 1.209 af

**SESC Off-Site- November 26**

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NOAA 24-hr D 2-Year Rainfall=3.38"

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**Total Runoff Area = 13.039 ac   Runoff Volume = 1.258 af   Average Runoff Depth = 1.16"**  
**65.43% Pervious = 8.532 ac   34.57% Impervious = 4.507 ac**

**Summary for Pond 28P: Basin 1**

**Failure to first outlet, no dead storage.**

Inflow Area = 13.039 ac, 34.57% Impervious, Inflow Depth = 1.12" for 2-Year event  
 Inflow = 12.31 cfs @ 12.17 hrs, Volume= 1.214 af  
 Outflow = 2.54 cfs @ 12.66 hrs, Volume= 1.209 af, Atten= 79%, Lag= 29.6 min  
 Primary = 2.54 cfs @ 12.66 hrs, Volume= 1.209 af

Routing by Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs  
 Starting Elev= 168.15' Surf.Area= 18,078 sf Storage= 32,285 cf  
 Peak Elev= 169.20' @ 12.66 hrs Surf.Area= 20,252 sf Storage= 52,396 cf (20,111 cf above start)

Plug-Flow detention time= 573.2 min calculated for 0.467 af (38% of inflow)  
 Center-of-Mass det. time= 143.9 min ( 915.5 - 771.6 )

Volume	Invert	Avail.Storage	Storage Description
#1	166.15'	114,130 cf	<b>Basin (Prismatic)</b> Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
166.15	14,300	0	0
167.00	15,820	12,801	12,801
168.00	17,770	16,795	29,596
169.00	19,820	18,795	48,391
170.00	21,979	20,900	69,290
171.90	25,220	44,839	114,130

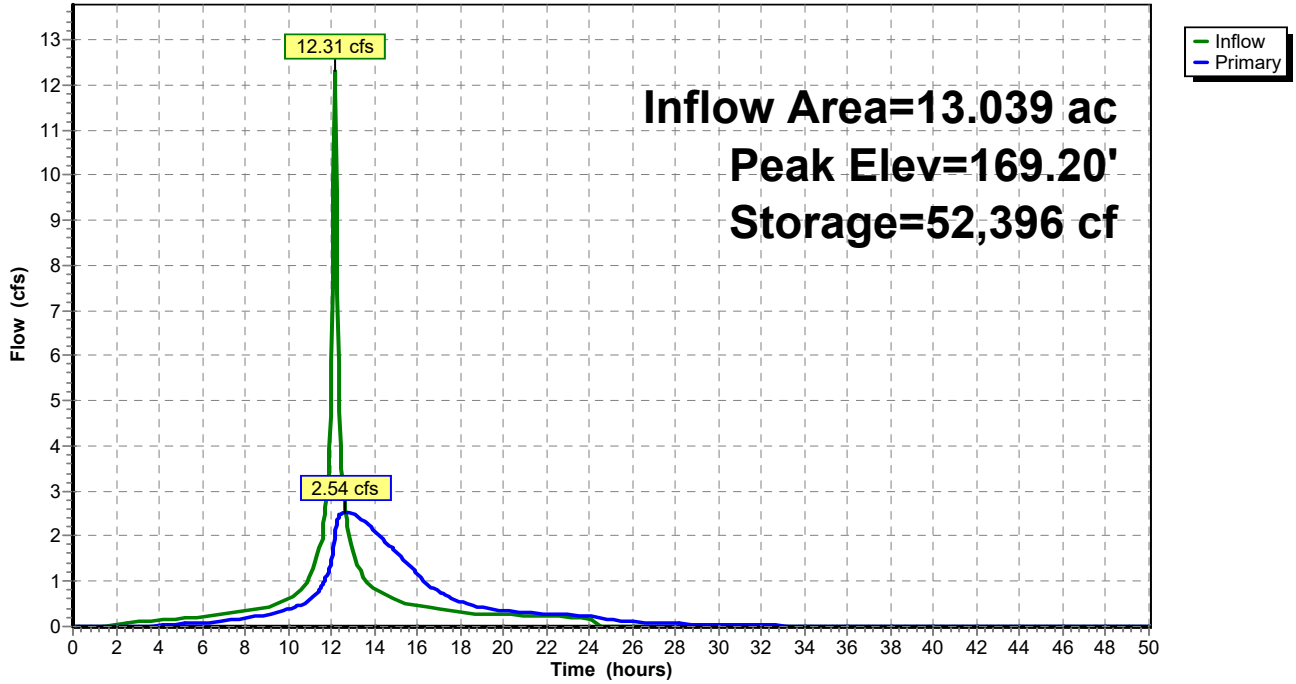
Device	Routing	Invert	Outlet Devices
#1	Primary	168.15'	<b>6.0" Vert. Orifice/Grate X 3.00</b> C= 0.600
#2	Primary	170.60'	<b>48.0" W x 48.0" H Vert. Orifice/Grate</b> C= 0.600
#3	Primary	169.30'	<b>1.8' long Sharp-Crested Rectangular Weir X 2.00</b> 2 End Contraction(s)

**Primary OutFlow** Max=2.54 cfs @ 12.66 hrs HW=169.20' (Free Discharge)

- 1=Orifice/Grate (Orifice Controls 2.54 cfs @ 4.31 fps)
- 2=Orifice/Grate ( Controls 0.00 cfs)
- 3=Sharp-Crested Rectangular Weir ( Controls 0.00 cfs)

**Pond 28P: Basin 1**

Hydrograph



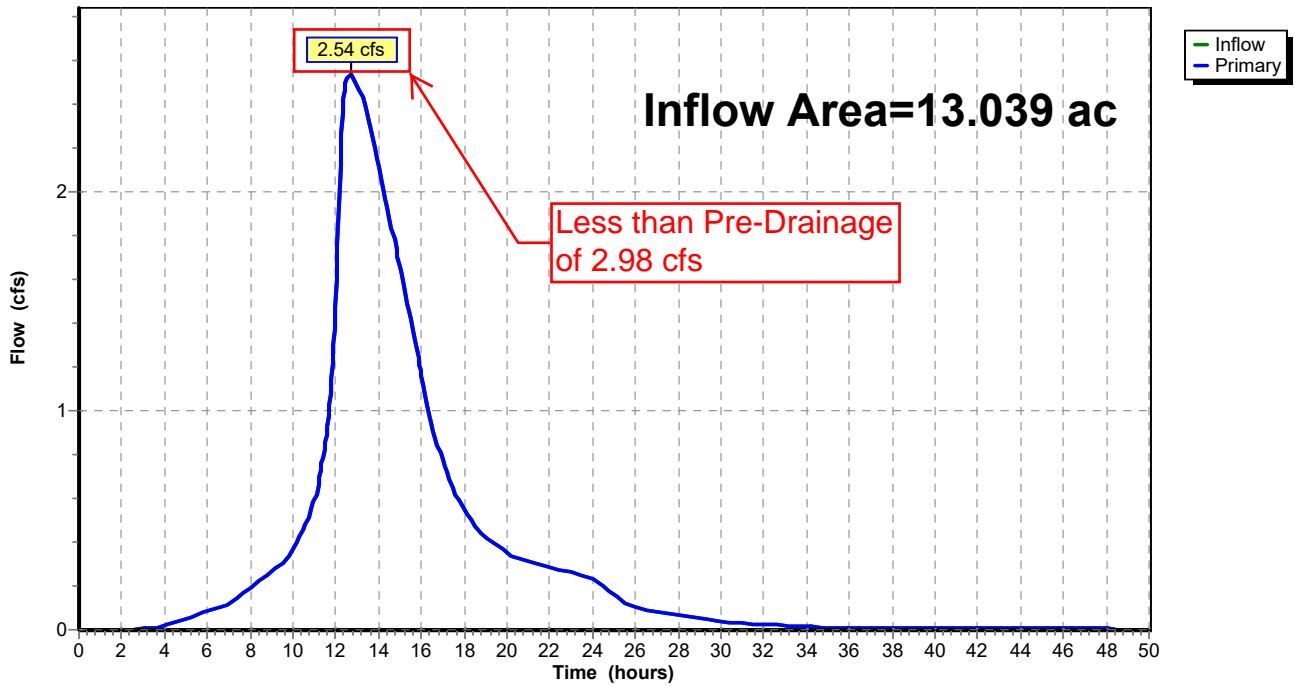
### Summary for Link 37L: Point Of Analysis

Inflow Area = 13.039 ac, 34.57% Impervious, Inflow Depth > 1.11" for 2-Year event  
Inflow = 2.54 cfs @ 12.66 hrs, Volume= 1.209 af  
Primary = 2.54 cfs @ 12.66 hrs, Volume= 1.209 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs

### Link 37L: Point Of Analysis

Hydrograph



**SESC Off-Site- November 26**

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Time span=0.00-50.00 hrs, dt=0.05 hrs, 1001 points  
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN  
 Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

<b>Subcatchment 8S: DA Site Woods</b>	Runoff Area=0.116 ac 0.00% Impervious Runoff Depth=0.01" Flow Length=110' Tc=25.8 min CN=30 Runoff=0.00 cfs 0.000 af
<b>Subcatchment 28S: Cultivated</b>	Runoff Area=1.470 ac 0.00% Impervious Runoff Depth=1.66" Flow Length=415' Tc=14.9 min CN=63 Runoff=1.98 cfs 0.203 af
<b>Subcatchment 29S: Impervious</b>	Runoff Area=0.874 ac 100.00% Impervious Runoff Depth=4.99" Tc=10.0 min CN=98 Runoff=3.72 cfs 0.364 af
<b>Subcatchment 30S: DA 6 Grass</b>	Runoff Area=0.013 ac 0.00% Impervious Runoff Depth=0.25" Tc=10.0 min CN=39 Runoff=0.00 cfs 0.000 af
<b>Subcatchment 31S: DA 6 Impervious</b>	Runoff Area=0.027 ac 100.00% Impervious Runoff Depth=4.99" Tc=10.0 min CN=98 Runoff=0.12 cfs 0.011 af
<b>Subcatchment 32S: Woods</b>	Runoff Area=0.115 ac 0.00% Impervious Runoff Depth=0.01" Flow Length=345' Tc=24.1 min CN=30 Runoff=0.00 cfs 0.000 af
<b>Subcatchment 33S: DA Site Impervious</b>	Runoff Area=3.441 ac 100.00% Impervious Runoff Depth=4.99" Tc=10.0 min CN=98 Runoff=14.66 cfs 1.432 af
<b>Subcatchment 34S: DA Site Grass</b>	Runoff Area=4.629 ac 0.00% Impervious Runoff Depth=0.25" Tc=10.0 min CN=39 Runoff=0.20 cfs 0.096 af
<b>Subcatchment 35S: Grass</b>	Runoff Area=1.308 ac 0.00% Impervious Runoff Depth=0.25" Flow Length=585' Tc=17.9 min CN=39 Runoff=0.06 cfs 0.027 af
<b>Subcatchment 45S: B-5, B-4 and B-3</b>	Runoff Area=0.165 ac 100.00% Impervious Runoff Depth=4.99" Tc=10.0 min CN=98 Runoff=0.70 cfs 0.069 af
<b>Subcatchment 46S: B-5, B-4 and B-3 Grass</b>	Runoff Area=0.881 ac 0.00% Impervious Runoff Depth=0.25" Tc=10.0 min CN=39 Runoff=0.04 cfs 0.018 af
<b>Pond 28P: Basin 1</b>	Peak Elev=169.71' Storage=62,927 cf Inflow=20.17 cfs 2.133 af Outflow=6.15 cfs 2.127 af
<b>Pond 44P: Recharge</b>	Peak Elev=169.24' Storage=989 cf Inflow=0.70 cfs 0.087 af Discarded=0.09 cfs 0.087 af Primary=0.00 cfs 0.000 af Outflow=0.09 cfs 0.087 af
<b>Link 22L: Off-Site</b>	Inflow=5.46 cfs 0.594 af Primary=5.46 cfs 0.594 af
<b>Link 29L: DA 6</b>	Inflow=0.12 cfs 0.012 af Primary=0.12 cfs 0.012 af
<b>Link 37L: Point Of Analysis</b>	Inflow=6.15 cfs 2.127 af Primary=6.15 cfs 2.127 af

**SESC Off-Site- November 26**

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NOAA 24-hr D 10-Year Rainfall=5.23"

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**Total Runoff Area = 13.039 ac   Runoff Volume = 2.220 af   Average Runoff Depth = 2.04"**  
**65.43% Pervious = 8.532 ac   34.57% Impervious = 4.507 ac**

**Summary for Pond 28P: Basin 1**

**Failure to first outlet, no dead storage.**

Inflow Area = 13.039 ac, 34.57% Impervious, Inflow Depth = 1.96" for 10-Year event  
 Inflow = 20.17 cfs @ 12.17 hrs, Volume= 2.133 af  
 Outflow = 6.15 cfs @ 12.50 hrs, Volume= 2.127 af, Atten= 69%, Lag= 19.8 min  
 Primary = 6.15 cfs @ 12.50 hrs, Volume= 2.127 af

Routing by Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs  
 Starting Elev= 168.15' Surf.Area= 18,078 sf Storage= 32,285 cf  
 Peak Elev= 169.71' @ 12.50 hrs Surf.Area= 21,345 sf Storage= 62,927 cf (30,642 cf above start)

Plug-Flow detention time= 376.6 min calculated for 1.386 af (65% of inflow)  
 Center-of-Mass det. time= 125.2 min ( 905.9 - 780.7 )

Volume	Invert	Avail.Storage	Storage Description
#1	166.15'	114,130 cf	<b>Basin (Prismatic)</b> Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
166.15	14,300	0	0
167.00	15,820	12,801	12,801
168.00	17,770	16,795	29,596
169.00	19,820	18,795	48,391
170.00	21,979	20,900	69,290
171.90	25,220	44,839	114,130

Device	Routing	Invert	Outlet Devices
#1	Primary	168.15'	<b>6.0" Vert. Orifice/Grate X 3.00</b> C= 0.600
#2	Primary	170.60'	<b>48.0" W x 48.0" H Vert. Orifice/Grate</b> C= 0.600
#3	Primary	169.30'	<b>1.8' long Sharp-Crested Rectangular Weir X 2.00</b> 2 End Contraction(s)

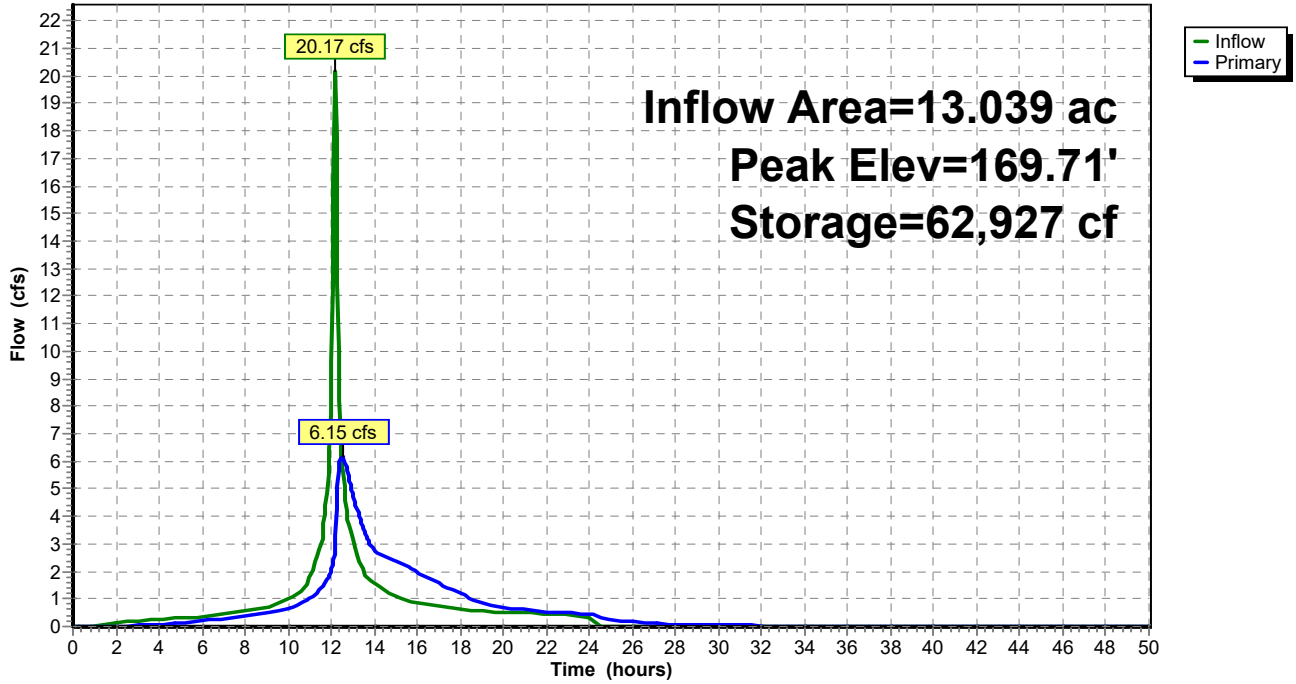
**Primary OutFlow** Max=6.15 cfs @ 12.50 hrs HW=169.71' (Free Discharge)

- 1=Orifice/Grate (Orifice Controls 3.24 cfs @ 5.50 fps)
- 2=Orifice/Grate ( Controls 0.00 cfs)
- 3=Sharp-Crested Rectangular Weir (Weir Controls 2.91 cfs @ 2.08 fps)



**Pond 28P: Basin 1**

Hydrograph



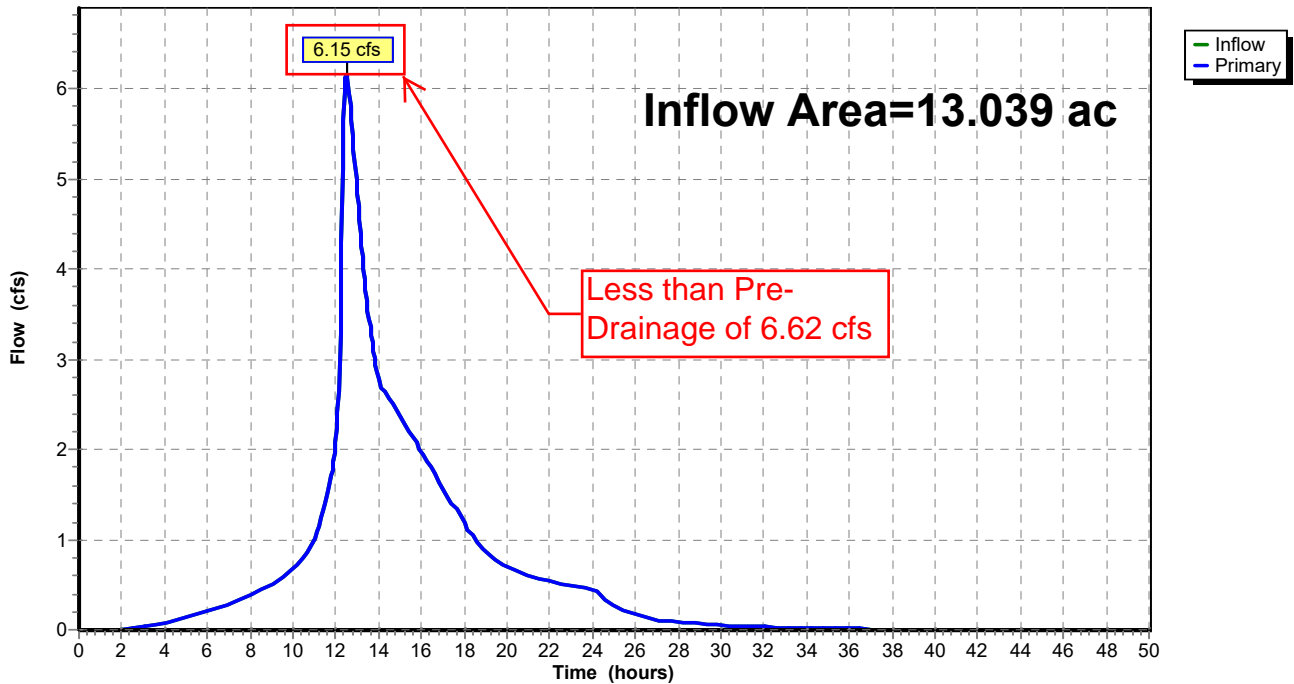
### Summary for Link 37L: Point Of Analysis

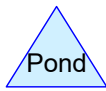
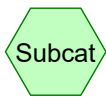
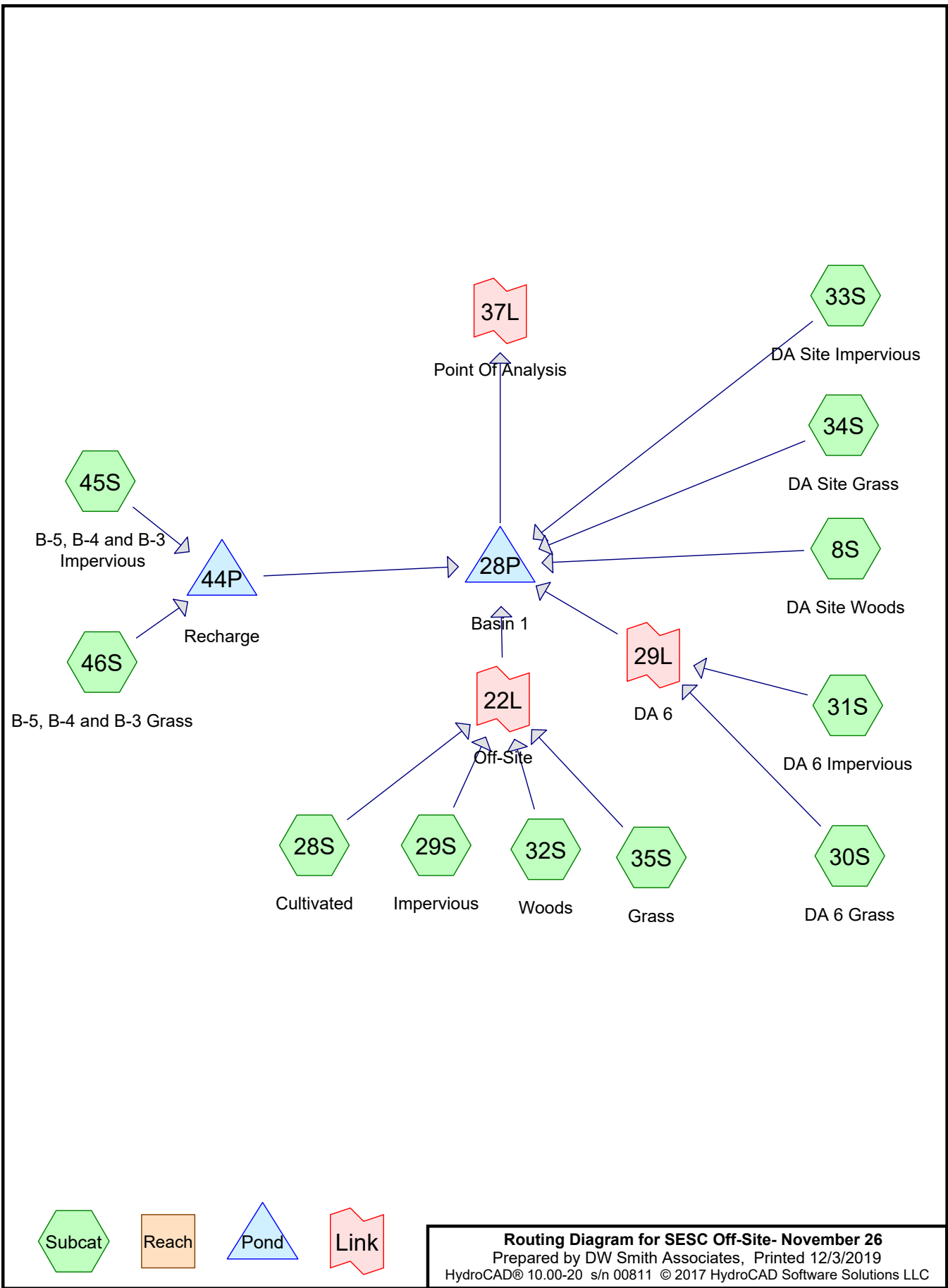
Inflow Area = 13.039 ac, 34.57% Impervious, Inflow Depth > 1.96" for 10-Year event  
Inflow = 6.15 cfs @ 12.50 hrs, Volume= 2.127 af  
Primary = 6.15 cfs @ 12.50 hrs, Volume= 2.127 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs

### Link 37L: Point Of Analysis

Hydrograph





**Routing Diagram for SESC Off-Site- November 26**  
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**SESC Off-Site- November 26**

Prepared by DW Smith Associates

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SESC With Infiltration &amp; Storage

NOAA 24-hr D 2-Year Rainfall=3.38"

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Time span=0.00-50.00 hrs, dt=0.05 hrs, 1001 points  
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN  
 Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

<b>Subcatchment 8S: DA Site Woods</b>	Runoff Area=0.116 ac 0.00% Impervious Runoff Depth=0.00" Flow Length=110' Tc=25.8 min CN=30 Runoff=0.00 cfs 0.000 af
<b>Subcatchment 28S: Cultivated</b>	Runoff Area=1.470 ac 0.00% Impervious Runoff Depth=0.60" Flow Length=415' Tc=14.9 min CN=63 Runoff=0.59 cfs 0.074 af
<b>Subcatchment 29S: Impervious</b>	Runoff Area=0.874 ac 100.00% Impervious Runoff Depth=3.15" Tc=10.0 min CN=98 Runoff=2.39 cfs 0.229 af
<b>Subcatchment 30S: DA 6 Grass</b>	Runoff Area=0.013 ac 0.00% Impervious Runoff Depth=0.00" Tc=10.0 min CN=39 Runoff=0.00 cfs 0.000 af
<b>Subcatchment 31S: DA 6 Impervious</b>	Runoff Area=0.027 ac 100.00% Impervious Runoff Depth=3.15" Tc=10.0 min CN=98 Runoff=0.07 cfs 0.007 af
<b>Subcatchment 32S: Woods</b>	Runoff Area=0.115 ac 0.00% Impervious Runoff Depth=0.00" Flow Length=345' Tc=24.1 min CN=30 Runoff=0.00 cfs 0.000 af
<b>Subcatchment 33S: DA Site Impervious</b>	Runoff Area=3.441 ac 100.00% Impervious Runoff Depth=3.15" Tc=10.0 min CN=98 Runoff=9.41 cfs 0.902 af
<b>Subcatchment 34S: DA Site Grass</b>	Runoff Area=4.629 ac 0.00% Impervious Runoff Depth=0.00" Tc=10.0 min CN=39 Runoff=0.01 cfs 0.002 af
<b>Subcatchment 35S: Grass</b>	Runoff Area=1.308 ac 0.00% Impervious Runoff Depth=0.00" Flow Length=585' Tc=17.9 min CN=39 Runoff=0.00 cfs 0.000 af
<b>Subcatchment 45S: B-5, B-4 and B-3</b>	Runoff Area=0.165 ac 100.00% Impervious Runoff Depth=3.15" Tc=10.0 min CN=98 Runoff=0.45 cfs 0.043 af
<b>Subcatchment 46S: B-5, B-4 and B-3 Grass</b>	Runoff Area=0.881 ac 0.00% Impervious Runoff Depth=0.00" Tc=10.0 min CN=39 Runoff=0.00 cfs 0.000 af
<b>Pond 28P: Basin 1</b>	Peak Elev=167.15' Storage=15,183 cf Inflow=12.31 cfs 1.214 af Discarded=1.86 cfs 1.214 af Primary=0.00 cfs 0.000 af Outflow=1.86 cfs 1.214 af
<b>Pond 44P: Recharge</b>	Peak Elev=168.55' Storage=422 cf Inflow=0.45 cfs 0.044 af Discarded=0.09 cfs 0.044 af Primary=0.00 cfs 0.000 af Outflow=0.09 cfs 0.044 af
<b>Link 22L: Off-Site</b>	Inflow=2.83 cfs 0.303 af Primary=2.83 cfs 0.303 af
<b>Link 29L: DA 6</b>	Inflow=0.07 cfs 0.007 af Primary=0.07 cfs 0.007 af
<b>Link 37L: Point Of Analysis</b>	Inflow=0.00 cfs 0.000 af Primary=0.00 cfs 0.000 af

**SESC Off-Site- November 26**

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SESC With Infiltration & Storage  
NOAA 24-hr D 2-Year Rainfall=3.38"

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**Total Runoff Area = 13.039 ac   Runoff Volume = 1.258 af   Average Runoff Depth = 1.16"**  
**65.43% Pervious = 8.532 ac   34.57% Impervious = 4.507 ac**

**SESC Off-Site- November 26**

Prepared by DW Smith Associates

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SESC With Infiltration & Storage  
NOAA 24-hr D 2-Year Rainfall=3.38"

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**Summary for Pond 28P: Basin 1**

Inflow Area = 13.039 ac, 34.57% Impervious, Inflow Depth = 1.12" for 2-Year event  
 Inflow = 12.31 cfs @ 12.17 hrs, Volume= 1.214 af  
 Outflow = 1.86 cfs @ 12.91 hrs, Volume= 1.214 af, Atten= 85%, Lag= 44.5 min  
 Discarded = 1.86 cfs @ 12.91 hrs, Volume= 1.214 af  
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs  
 Peak Elev= 167.15' @ 12.91 hrs Surf.Area= 16,111 sf Storage= 15,183 cf

Plug-Flow detention time= 57.2 min calculated for 1.213 af (100% of inflow)  
 Center-of-Mass det. time= 57.1 min ( 828.8 - 771.6 )

Volume	Invert	Avail.Storage	Storage Description
#1	166.15'	114,130 cf	<b>Basin (Prismatic)</b> Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
166.15	14,300	0	0
167.00	15,820	12,801	12,801
168.00	17,770	16,795	29,596
169.00	19,820	18,795	48,391
170.00	21,979	20,900	69,290
171.90	25,220	44,839	114,130

Device	Routing	Invert	Outlet Devices
#1	Primary	168.15'	<b>6.0" Vert. Orifice/Grate X 3.00</b> C= 0.600
#2	Primary	170.60'	<b>48.0" W x 48.0" H Vert. Orifice/Grate</b> C= 0.600
#3	Primary	169.30'	<b>1.8' long Sharp-Crested Rectangular Weir X 2.00</b> 2 End Contraction(s)
#4	Discarded	166.15'	<b>5.000 in/hr Exfiltration over Surface area</b>

**Discarded OutFlow** Max=1.86 cfs @ 12.91 hrs HW=167.15' (Free Discharge)  
 ↳4=Exfiltration (Exfiltration Controls 1.86 cfs)

**Primary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=166.15' (Free Discharge)  
 ↳1=Orifice/Grate ( Controls 0.00 cfs)  
 ↳2=Orifice/Grate ( Controls 0.00 cfs)  
 ↳3=Sharp-Crested Rectangular Weir ( Controls 0.00 cfs)

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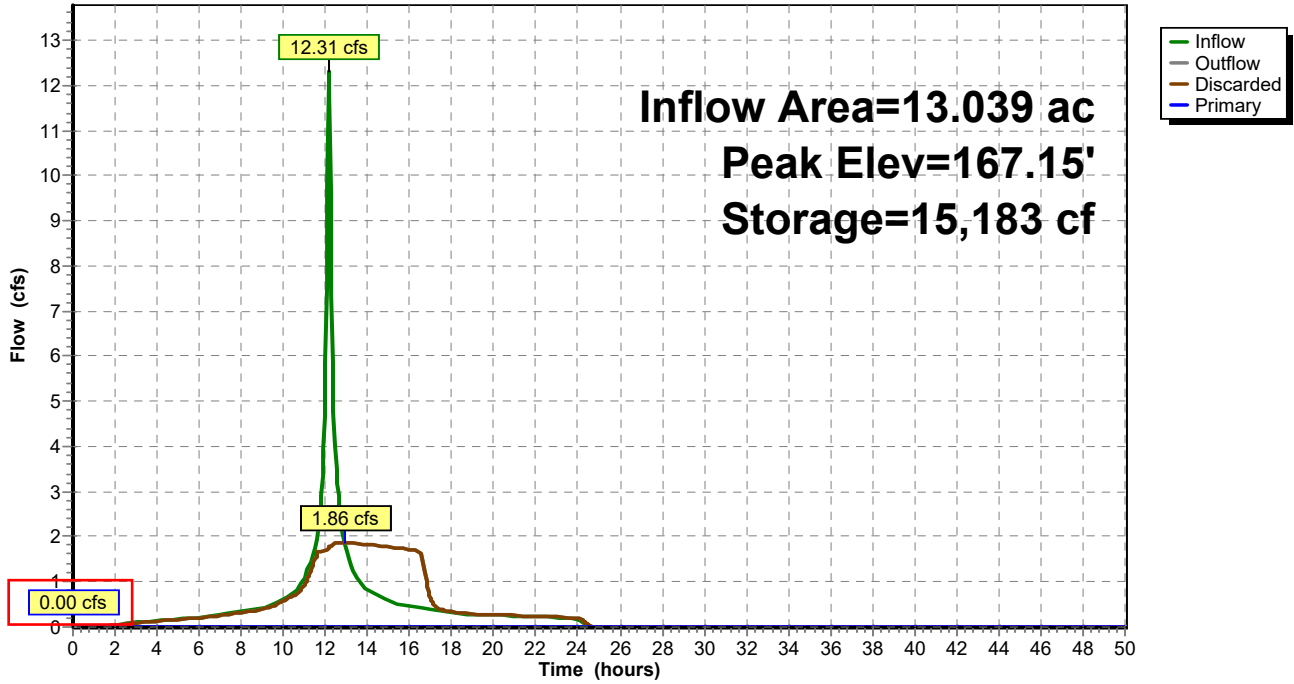
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**Pond 28P: Basin 1**

Hydrograph



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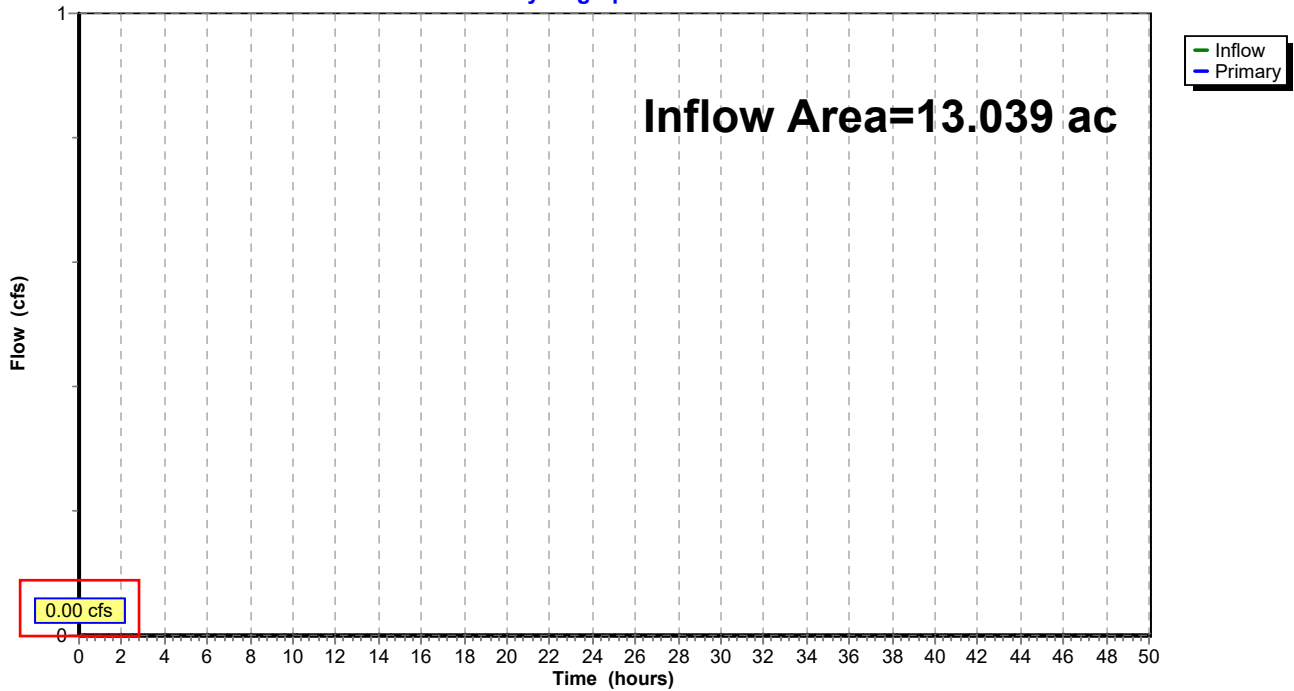
**Summary for Link 37L: Point Of Analysis**

Inflow Area = 13.039 ac, 34.57% Impervious, Inflow Depth = 0.00" for 2-Year event  
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af  
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs

**Link 37L: Point Of Analysis**

Hydrograph





**SESC Off-Site- November 26**

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Time span=0.00-50.00 hrs, dt=0.05 hrs, 1001 points  
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN  
 Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

<b>Subcatchment 8S: DA Site Woods</b>	Runoff Area=0.116 ac 0.00% Impervious Runoff Depth=0.01" Flow Length=110' Tc=25.8 min CN=30 Runoff=0.00 cfs 0.000 af
<b>Subcatchment 28S: Cultivated</b>	Runoff Area=1.470 ac 0.00% Impervious Runoff Depth=1.66" Flow Length=415' Tc=14.9 min CN=63 Runoff=1.98 cfs 0.203 af
<b>Subcatchment 29S: Impervious</b>	Runoff Area=0.874 ac 100.00% Impervious Runoff Depth=4.99" Tc=10.0 min CN=98 Runoff=3.72 cfs 0.364 af
<b>Subcatchment 30S: DA 6 Grass</b>	Runoff Area=0.013 ac 0.00% Impervious Runoff Depth=0.25" Tc=10.0 min CN=39 Runoff=0.00 cfs 0.000 af
<b>Subcatchment 31S: DA 6 Impervious</b>	Runoff Area=0.027 ac 100.00% Impervious Runoff Depth=4.99" Tc=10.0 min CN=98 Runoff=0.12 cfs 0.011 af
<b>Subcatchment 32S: Woods</b>	Runoff Area=0.115 ac 0.00% Impervious Runoff Depth=0.01" Flow Length=345' Tc=24.1 min CN=30 Runoff=0.00 cfs 0.000 af
<b>Subcatchment 33S: DA Site Impervious</b>	Runoff Area=3.441 ac 100.00% Impervious Runoff Depth=4.99" Tc=10.0 min CN=98 Runoff=14.66 cfs 1.432 af
<b>Subcatchment 34S: DA Site Grass</b>	Runoff Area=4.629 ac 0.00% Impervious Runoff Depth=0.25" Tc=10.0 min CN=39 Runoff=0.20 cfs 0.096 af
<b>Subcatchment 35S: Grass</b>	Runoff Area=1.308 ac 0.00% Impervious Runoff Depth=0.25" Flow Length=585' Tc=17.9 min CN=39 Runoff=0.06 cfs 0.027 af
<b>Subcatchment 45S: B-5, B-4 and B-3</b>	Runoff Area=0.165 ac 100.00% Impervious Runoff Depth=4.99" Tc=10.0 min CN=98 Runoff=0.70 cfs 0.069 af
<b>Subcatchment 46S: B-5, B-4 and B-3 Grass</b>	Runoff Area=0.881 ac 0.00% Impervious Runoff Depth=0.25" Tc=10.0 min CN=39 Runoff=0.04 cfs 0.018 af
<b>Pond 28P: Basin 1</b>	Peak Elev=168.16' Storage=32,379 cf Inflow=20.17 cfs 2.133 af Discarded=2.09 cfs 2.133 af Primary=0.00 cfs 0.000 af Outflow=2.09 cfs 2.133 af
<b>Pond 44P: Recharge</b>	Peak Elev=169.24' Storage=989 cf Inflow=0.70 cfs 0.087 af Discarded=0.09 cfs 0.087 af Primary=0.00 cfs 0.000 af Outflow=0.09 cfs 0.087 af
<b>Link 22L: Off-Site</b>	Inflow=5.46 cfs 0.594 af Primary=5.46 cfs 0.594 af
<b>Link 29L: DA 6</b>	Inflow=0.12 cfs 0.012 af Primary=0.12 cfs 0.012 af
<b>Link 37L: Point Of Analysis</b>	Inflow=0.00 cfs 0.000 af Primary=0.00 cfs 0.000 af

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**Total Runoff Area = 13.039 ac   Runoff Volume = 2.220 af   Average Runoff Depth = 2.04"**  
**65.43% Pervious = 8.532 ac   34.57% Impervious = 4.507 ac**

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**Summary for Pond 28P: Basin 1**

Inflow Area = 13.039 ac, 34.57% Impervious, Inflow Depth = 1.96" for 10-Year event  
 Inflow = 20.17 cfs @ 12.17 hrs, Volume= 2.133 af  
 Outflow = 2.09 cfs @ 13.46 hrs, Volume= 2.133 af, Atten= 90%, Lag= 77.5 min  
 Discarded = 2.09 cfs @ 13.46 hrs, Volume= 2.133 af  
 Primary = 0.00 cfs @ 13.46 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs  
 Peak Elev= 168.16' @ 13.46 hrs Surf.Area= 18,088 sf Storage= 32,379 cf

Plug-Flow detention time= 125.5 min calculated for 2.131 af (100% of inflow)  
 Center-of-Mass det. time= 125.4 min ( 906.1 - 780.7 )

Volume	Invert	Avail.Storage	Storage Description
#1	166.15'	114,130 cf	<b>Basin (Prismatic)</b> Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
166.15	14,300	0	0
167.00	15,820	12,801	12,801
168.00	17,770	16,795	29,596
169.00	19,820	18,795	48,391
170.00	21,979	20,900	69,290
171.90	25,220	44,839	114,130

Device	Routing	Invert	Outlet Devices
#1	Primary	168.15'	<b>6.0" Vert. Orifice/Grate X 3.00</b> C= 0.600
#2	Primary	170.60'	<b>48.0" W x 48.0" H Vert. Orifice/Grate</b> C= 0.600
#3	Primary	169.30'	<b>1.8' long Sharp-Crested Rectangular Weir X 2.00</b> 2 End Contraction(s)
#4	Discarded	166.15'	<b>5.000 in/hr Exfiltration over Surface area</b>

**Discarded OutFlow** Max=2.09 cfs @ 13.46 hrs HW=168.16' (Free Discharge)  
 ↳4=Exfiltration (Exfiltration Controls 2.09 cfs)

**Primary OutFlow** Max=0.00 cfs @ 13.46 hrs HW=168.16' (Free Discharge)  
 ↳1=Orifice/Grate (Orifice Controls 0.00 cfs @ 0.24 fps)  
 ↳2=Orifice/Grate ( Controls 0.00 cfs)  
 ↳3=Sharp-Crested Rectangular Weir ( Controls 0.00 cfs)

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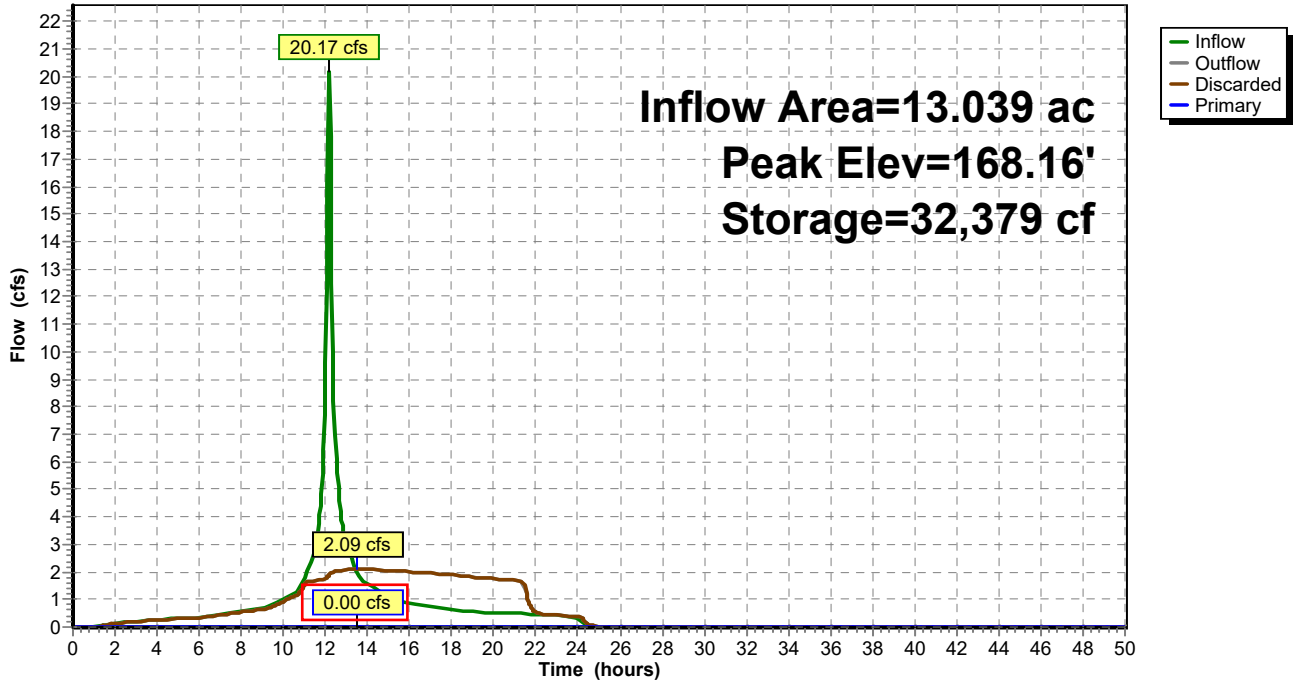
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**Pond 28P: Basin 1**

Hydrograph



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**Summary for Link 37L: Point Of Analysis**

Inflow Area = 13.039 ac, 34.57% Impervious, Inflow Depth = 0.00" for 10-Year event  
Inflow = 0.00 cfs @ 13.46 hrs, Volume= 0.000 af  
Primary = 0.00 cfs @ 13.46 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs

**Link 37L: Point Of Analysis**

Hydrograph

