MILLENNIUM ENGINEERING, INC.

Land Surveyors and Civil Engineers

MEI

STORMWATER MANAGEMENT REPORT

FOR THE

SITE PLAN

AT

2 NORINO WAY
GEORGETOWN, MA

PREPARED FOR:

HUMBOLDT EAST, LLC

395B IPSWICH ROAD
BOXFORD, MA 01921

COMMONWEALTH OF MASSACHUSETTS
JAMES T MELVIN
CIVIL
No. 52965
REGISTERED PROFESSIONAL ENGINEER

3-14-22

DATE: MAY 24, 2021
REVISED: JUNE 22, 2021
REVISED: OCTOBER 4, 2021
REVISED: JANUARY 11, 2022
REVISED: MARCH 14, 2022

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Stormwater Management Report
2 Norino Way, Boxford, MA

I. Introduction

Introduction

The subject parcel is described as Tax Map 15, Lot 0-50H on the Town of Georgetown, MA Assessor's Map. The project parcel is 4.81 acres in size. Elevations on the site range from 178.00' on the east property line to 120.00' at the southwest corner of the site. These elevations are based upon 1988 NAVD datum.

The Site Plan at 2 Norino Way proposes to construct a 27,000 s.f. two-story building located on approximately 4.81 acres in Georgetown, Massachusetts. The project will consist of the construction of a new access drive, commercial building, and associated stormwater management system. The proposed stormwater management system for the project includes catch basins, proprietary separators, infiltration basins, and subsurface infiltration structures. The catch basins and Contech CDS units will remove suspended solids prior to discharging to the infiltration areas. The infiltration areas will provide stormwater recharge to the groundwater and mitigate peak runoff rates so the post-development runoff rates will be less than or equal to the pre-development rates.

II. Stormwater Management Checklist

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands Program

Checklist for Stormwater Report

A. Introduction

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.

A Stormwater Report must be submitted with the Notice of Intent permit application to document compliance with the Stormwater Management Standards. The following checklist is NOT a substitute for the Stormwater Report (which should provide more substantive and detailed information) but is offered here as a tool to help the applicant organize their Stormwater Management documentation for their Report and for the reviewer to assess this information in a consistent format. As noted in the Checklist, the Stormwater Report must contain the engineering computations and supporting information set forth in Volume 3 of the Massachusetts Stormwater Handbook. The Stormwater Report must be prepared and certified by a Registered Professional Engineer (RPE) licensed in the Commonwealth.

The Stormwater Report must include:

- The Stormwater Checklist completed and stamped by a Registered Professional Engineer (see page 2) that certifies that the Stormwater Report contains all required submittals.[1] This Checklist is to be used as the cover for the completed Stormwater Report.
- Applicant/Project Name
- Project Address
- Name of Firm and Registered Professional Engineer that prepared the Report
- Long-Term Pollution Prevention Plan required by Standards 4-6
- Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan required by Standard 8[2]
- Operation and Maintenance Plan required by Standard 9

In addition to all plans and supporting information, the Stormwater Report must include a brief narrative describing stormwater management practices, including environmentally sensitive site design and LID techniques, along with a diagram depicting runoff through the proposed BMP treatment train. Plans are required to show existing and proposed conditions, identify all wetland resource areas, NRCS soil types, critical areas, Land Uses with Higher Potential Pollutant Loads (LUHPPL), and any areas on the site where infiltration rate is greater than 2.4 inches per hour. The Plans shall identify the drainage areas for both existing and proposed conditions at a scale that enables verification of supporting calculations.

As noted in the Checklist, the Stormwater Management Report shall document compliance with each of the Stormwater Management Standards as provided in the Massachusetts Stormwater Handbook. The soils evaluation and calculations shall be done using the methodologies set forth in Volume 3 of the Massachusetts Stormwater Handbook.

To ensure that the Stormwater Report is complete, applicants are required to fill in the Stormwater Report Checklist by checking the box to indicate that the specified information has been included in the Stormwater Report. If any of the information specified in the checklist has not been submitted, the applicant must provide an explanation. The completed Stormwater Report Checklist and Certification

[1] The Stormwater Report may also include the Illicit Discharge Compliance Statement required by Standard 10. If not included in the Stormwater Report, the Illicit Discharge Compliance Statement must be submitted prior to the discharge of stormwater runoff to the post-construction best management practices.

[2] For some complex projects, it may not be possible to include the Construction Period Erosion and Sedimentation Control Plan in the Stormwater Report. In that event, the issuing authority has the discretion to issue an Order of Conditions that approves the project and includes a condition requiring the proponent to submit the Construction Period Erosion and Sedimentation Control Plan before commencing any land disturbance activity on the site.

B. Stormwater Checklist and Certification

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands Program

Checklist for Stormwater Report

The following checklist is intended to serve as a guide for applicants as to the elements that ordinarily need to be addressed in a complete Stormwater Report. The checklist is also intended to provide conservation commissions and other reviewing authorities with a summary of the components necessary for a comprehensive Stormwater Report that addresses the ten Stormwater Standards.

Note: Because stormwater requirements vary from project to project, it is possible that a complete Stormwater Report may not include information on some of the subjects specified in the Checklist. If it is determined that a specific item does not apply to the project under review, please note that the item is not applicable (N.A.) and provide the reasons for that determination.

A complete checklist must include the Certification set forth below signed by the Registered Professional Engineer who prepared the Stormwater Report.

Registered Professional Engineer's Certification

I have reviewed the Stormwater Report, including the soil evaluation, computations, Long-term Pollution Prevention Plan, the Construction Period Erosion and Sedimentation Control Plan (if included), the Long-term Post-Construction Operation and Maintenance Plan, the Illicit Discharge Compliance Statement (if included) and the plans showing the stormwater management system, and have determined that they have been prepared in accordance with the requirements of the Stormwater Management Standards as further elaborated by the Massachusetts Stormwater Handbook. I have also determined that the information presented in the Stormwater Checklist is accurate and that the information presented in the Stormwater Report accurately reflects conditions at the site as of the date of this permit application.

Registered Professional Engineer Block and Signature

COMMONWEALTH OF MASSACHUSETTS
JAMES T. MELVIN
CIVIL
No. 52965
REGISTERED PROFESSIONAL ENGINEER

3-14-22

Signature and Date

Checklist

Project Type: Is the application for new development, redevelopment, or a mix of new and redevelopment?

- ☒ New development
- ☐ Redevelopment
- ☐ Mix of New Development and Redevelopment

Checklist (continued)

Checklist for Stormwater Report

LID Measures: Stormwater Standards require LID measures to be considered. Document what environmentally sensitive design and LID Techniques were considered during the planning and design of the project:

- ☒ No disturbance to any Wetland Resource Areas
- ☐ Site Design Practices (e.g. clustered development, reduced frontage setbacks)
- ☐ Reduced Impervious Area (Redevelopment Only)
- ☒ Minimizing disturbance to existing trees and shrubs
- ☐ LID Site Design Credit Requested:
  - ☐ Credit 1
  - ☐ Credit 2
  - ☐ Credit 3
- ☐ Use of "country drainage" versus curb and gutter conveyance and pipe
- ☐ Bioretention Cells (includes Rain Gardens)
- ☐ Constructed Stormwater Wetlands (includes Gravel Wetlands designs)
- ☐ Treebox Filter
- ☐ Water Quality Swale
- ☐ Grass Channel
- ☐ Green Roof
- ☒ Other (describe): Contech CDS, Subsurface infiltration Structures

Standard 1: No New Untreated Discharges

- ☒ No new untreated discharges
- ☒ Outlets have been designed so there is no erosion or scour to wetlands and waters of the Commonwealth
- ☒ Supporting calculations specified in Volume 3 of the Massachusetts Stormwater Handbook included.

Checklist (continued)

Standard 2: Peak Rate Attenuation

☐ Standard 2 waiver requested because the project is located in land subject to coastal storm flowage and stormwater discharge is to a wetland subject to coastal flooding.

☐ Evaluation provided to determine whether off-site flooding increases during the 100-year 24-hour storm.

☒ Calculations provided to show that post-development peak discharge rates do not exceed pre-development rates for the 2-year and 10-year 24-hour storms. If evaluation shows that off-site flooding increases during the 100-year 24-hour storm, calculations are also provided to show that post-development peak discharge rates do not exceed pre-development rates for the 100-year 24-hour storm.

Standard 3: Recharge

☒ Soil Analysis provided.

☒ Required Recharge Volume calculation provided.

☐ Required Recharge volume reduced through use of the LID site Design Credits.

☒ Sizing the infiltration, BMPs is based on the following method: Check the method used.

☒ Static ☐ Simple Dynamic ☐ Dynamic Field[1]

☐ Runoff from all impervious areas at the site discharging to the infiltration BMP.

☒ Runoff from all impervious areas at the site is *not* discharging to the infiltration BMP and calculations are provided showing that the drainage area contributing runoff to the infiltration BMPs is sufficient to generate the required recharge volume.

☒ Recharge BMPs have been sized to infiltrate the Required Recharge Volume.

☐ Recharge BMPs have been sized to infiltrate the Required Recharge Volume *only* to the maximum extent practicable for the following reason:

- ☐ Site is comprised solely of C and D soils and/or bedrock at the land surface
- ☐ M.G.L. c. 21E sites pursuant to 310 CMR 40.0000
- ☐ Solid Waste Landfill pursuant to 310 CMR 19.000
- ☐ Project is otherwise subject to Stormwater Management Standards only to the maximum extent practicable.

☒ Calculations showing that the infiltration BMPs will drain in 72 hours are provided.

☐ Property includes a M.G.L. c. 21E site or a solid waste landfill and a mounding analysis is included.

[1] 80% TSS removal is required prior to discharge to infiltration BMP if Dynamic Field method is used.

Standard 3: Recharge (continued)

☒ The infiltration BMP is used to attenuate peak flows during storms greater than or equal to the 10-year 24-hour storm and separation to seasonal high groundwater is less than 4 feet and a mounding analysis is provided.

☐ Documentation is provided showing that infiltration BMPs do not adversely impact nearby wetland resource areas.

Standard 4: Water Quality

The Long-Term Pollution Prevention Plan typically includes the following:

- Good housekeeping practices;
- Provisions for storing materials and waste products inside or under cover;
- Vehicle washing controls;
- Requirements for routine inspections and maintenance of stormwater BMPs;
- Spill prevention and response plans;
- Provisions for maintenance of lawns, gardens, and other landscaped areas;
- Requirements for storage and use of fertilizers, herbicides, and pesticides;
- Pet waste management provisions;
- Provisions for operation and management of septic systems;
- Provisions for solid waste management;
- Snow disposal and plowing plans relative to Wetland Resource Areas;
- Winter Road Salt and/or Sand Use and Storage restrictions;
- Street sweeping schedules;
- Provisions for prevention of illicit discharges to the stormwater management system;
- Documentation that Stormwater BMPs are designed to provide for shutdown and containment in the event of a spill or discharges to or near critical areas or from LUHPPL;
- Training for staff or personnel involved with implementing Long-Term Pollution Prevention Plan;
- List of Emergency contacts for implementing Long-Term Pollution Prevention Plan.

☒ A Long-Term Pollution Prevention Plan is attached to Stormwater Report and is included as an attachment to the Wetlands Notice of Intent.

☐ Treatment BMPs subject to the 44% TSS removal pretreatment requirement and the one inch rule for calculating the water quality volume are included, and discharge:

- ☐ is within the Zone II or Interim Wellhead Protection Area
- ☐ is near or to other critical areas
- ☐ is within soils with a rapid infiltration rate (greater than 2.4 inches per hour)
- ☐ involves runoff from land uses with higher potential pollutant loads.

☐ The Required Water Quality Volume is reduced through use of the LID site Design Credits.

☒ Calculations documenting that the treatment train meets the 80% TSS removal requirement and, if applicable, the 44% TSS removal pretreatment requirement, are provided.

Checklist (continued)

Standard 4: Water Quality (continued)

☒ The BMP is sized (and calculations provided) based on:

- ☒ The ½" or 1" Water Quality Volume or
- ☐ The equivalent flow rate associated with the Water Quality Volume and documentation is provided showing that the BMP treats the required water quality volume.

☐ The applicant proposes to use proprietary BMPs, and documentation supporting use of proprietary BMP and proposed TSS removal rate is provided. This documentation may be in the form of the propriety BMP checklist found in Volume 2, Chapter 4 of the Massachusetts Stormwater Handbook and submitting copies of the TARP Report, STEP Report, and/or other third party studies verifying performance of the proprietary BMPs.

☐ A TMDL exists that indicates a need to reduce pollutants other than TSS and documentation showing that the BMPs selected are consistent with the TMDL is provided.

Standard 5: Land Uses With Higher Potential Pollutant Loads (LUHPPLs)

☐ The NPDES Multi-Sector General Permit covers the land use and the Stormwater Pollution Prevention Plan (SWPPP) has been included with the Stormwater Report.

☐ The NPDES Multi-Sector General Permit covers the land use and the SWPPP will be submitted ***prior to*** the discharge of stormwater to the post-construction stormwater BMPs.

☒ The NPDES Multi-Sector General Permit does ***not*** cover the land use.

☐ LUHPPLs are located at the site and industry specific source control and pollution prevention measures have been proposed to reduce or eliminate the exposure of LUHPPLs to rain, snow, snow melt and runoff, and been included in the long term Pollution Prevention Plan.

☐ All exposure has been eliminated.

☐ All exposure has ***not*** been eliminated and all BMPs selected are on MassDEP LUHPPL list.

☐ The LUHPPL has the potential to generate runoff with moderate to higher concentrations of oil and grease (e.g. all parking lots with >1000 vehicle trips per day) and the treatment train includes an oil grit separator, a filtering bioretention area, a sand filter or equivalent.

Standard 6: Critical Areas

☐ The discharge is near or to a critical area and the treatment train includes only BMPs that MassDEP has approved for stormwater discharges to or near that particular class of critical area.

☐ Critical areas and BMPs are identified in the Stormwater Report.

Standard 7: Redevelopments and Other Projects Subject to the Standards only to the maximum extent practicable

☐ The project is subject to the Stormwater Management Standards only to the maximum Extent Practicable as a:

- ☐ Limited Project
- ☐ Small Residential Projects: 5-9 single family houses or 5-9 units in a multi-family development provided there is no discharge that may potentially affect a critical area.
- ☐ Small Residential Projects: 2-4 single family houses or 2-4 units in a multi-family development with a discharge to a critical area
- ☐ Marina and/or boatyard provided the hull painting, service and maintenance areas are protected from exposure to rain, snow, snow melt and runoff
- ☐ Bike Path and/or Foot Path
- ☐ Redevelopment Project
- ☐ Redevelopment portion of mix of new and redevelopment.

☐ Certain standards are not fully met (Standard No. 1, 8, 9, and 10 must always be fully met) and an explanation of why these standards are not met is contained in the Stormwater Report.

☐ The project involves redevelopment and a description of all measures that have been taken to improve existing conditions is provided in the Stormwater Report. The redevelopment checklist found in Volume 2 Chapter 3 of the Massachusetts Stormwater Handbook may be used to document that the proposed stormwater management system (a) complies with Standards 2, 3 and the pretreatment and structural BMP requirements of Standards 4-6 to the maximum extent practicable and (b) improves existing conditions.

Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control

A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan must include the following information:

- Narrative;
- Construction Period Operation and Maintenance Plan;
- Names of Persons or Entity Responsible for Plan Compliance;
- Construction Period Pollution Prevention Measures;
- Erosion and Sedimentation Control Plan Drawings;
- Detail drawings and specifications for erosion control BMPs, including sizing calculations;
- Vegetation Planning;
- Site Development Plan;
- Construction Sequencing Plan;
- Sequencing of Erosion and Sedimentation Controls;
- Operation and Maintenance of Erosion and Sedimentation Controls;
- Inspection Schedule;
- Maintenance Schedule;
- Inspection and Maintenance Log Form.

☒ A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan containing the information set forth above has been included in the Stormwater Report.

Checklist (continued)

Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control (continued)

☐ The project is highly complex and information is included in the Stormwater Report that explains why it is not possible to submit the Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan with the application. A Construction Period Pollution Prevention and Erosion and Sedimentation Control has ***not*** been included in the Stormwater Report but will be submitted ***before*** land disturbance begins.

☐ The project is ***not*** covered by a NPDES Construction General Permit.

☐ The project is covered by a NPDES Construction General Permit and a copy of the SWPPP is in the Stormwater Report.

☒ The project is covered by a NPDES Construction General Permit but no SWPPP been submitted. The SWPPP will be submitted BEFORE land disturbance begins.

Standard 9: Operation and Maintenance Plan

☒ The Post Construction Operation and Maintenance Plan is included in the Stormwater Report and includes the following information:

- ☒ Name of the stormwater management system owners;
- ☒ Party responsible for operation and maintenance;
- ☒ Schedule for implementation of routine and non-routine maintenance tasks;
- ☒ Plan showing the location of all stormwater BMPs maintenance access areas;
- ☐ Description and delineation of public safety features;
- ☐ Estimated operation and maintenance budget; and
- ☒ Operation and Maintenance Log Form.

☐ The responsible party is ***not*** the owner of the parcel where the BMP is located and the Stormwater Report includes the following submissions:

- ☐ A copy of the legal instrument (deed, homeowner's association, utility trust or other legal entity) that establishes the terms of and legal responsibility for the operation and maintenance of the project site stormwater BMPs;
- ☐ A plan and easement deed that allows site access for the legal entity to operate and maintain BMP functions.

Standard 10: Prohibition of Illicit Discharges

☒ The Long-Term Pollution Prevention Plan includes measures to prevent illicit discharges;

☒ An Illicit Discharge Compliance Statement is attached;

☐ NO Illicit Discharge Compliance Statement is attached but will be submitted ***prior to*** the discharge of any stormwater to post-construction BMPs.

III. Hydrologic Analysis

Existing Site Characteristics

In general, the property is irregular in shape and fronts Norino Way. A small wetland resource area is present at the southeastern property line. The vast majority of the property is upland. The site is primarily wooded with some grass areas along the right-of-way of Norino Way. See the accompanying plan for a more detailed description of the existing site conditions and topography.

The lot consists of three soil groups: Montauk Fine Sandy Loam, 301C (Hydrologic Soil Group C); Paxton Fine Sandy Loam, 306C and 306D (Hydrologic Soil Group C); and Canton Fine Sandy Loam, 421B (Hydrologic Soil Group B). Test pits were performed onsite in July and November 2020. The test pits indicated sandy loam soils throughout the site, more indicative of B soils being present throughout the site. See Appendix E for the NRCS soil map.

Proposed Site Features

The Applicant proposes to construct a 27,000 s.f. two-story commercial building, an access drive, and stormwater management system. Access to the property will be via Norino Way. Underground electrical and telecommunications service will also be provided. Water services are proposed to be connected to the Town of Georgetown's water main located in the Norino Way Right of Way. A septic system is proposed to handle the wastewater requirements for the facility.

In order to address stormwater management regulations, catch basins, Cotech Water Quality Units, subsurface infiltration areas, and infiltration basins are proposed to treat, store, and infiltrate runoff.

WATERSHED ANALYSIS AND METHODOLOGY

The stormwater runoff management system was analyzed using the storm events of the 2-year, 10-year, 25-year and 100-year frequency. The analysis was performed using HydroCAD, version 10.00. Using USDA NRCS TR-20 and TR-55 methods of estimating runoff, the program uses the measured characteristics of the site and computes runoff produced by simulated rainfall events. The results are then used to design runoff control structures.

Existing drainage area boundaries were developed using an onsite topographic survey performed by Millennium Engineering, Inc. Proposed site development boundaries were developed from proposed grades and ground cover designed to minimize site storm water management structure requirements.

Hydrologic soil groups and curve numbers were estimated for existing and proposed developed conditions using available NRCS Soil Maps, current vegetation, and terrain.

DRAINAGE ANALYSIS

The purpose of the drainage analysis is two-fold. The first is to analyze and quantify the pre-development runoff flows through the site. The second purpose is to evaluate the impact of the proposed development on drainage patterns and flows, both within and outside the site, and to design a stormwater management system to adequately convey post-development runoff.

The design of the stormwater management system has the following goals:

1.) Minimize or eliminate erosion and sedimentation during construction as well as after development.

2.) To ensure that post-development flows do not have an adverse effect on downstream drainage structures and landowners.

3.) To design a stormwater and treatment system which will carry the surface runoff and satisfy goals one and two.

To determine the hydrological effect of the proposed development on the watershed, the existing conditions must first be analyzed.

WATERSHED DESCRIPTION: EXISTING CONDITIONS

Depending on the soil classification, type of ground cover present and the direction of the flow of runoff, the existing site is divided into watershed areas. Watershed area E1 consists of the southern portion of the site and it flows towards the southwest corner of the site and ultimately to Norino Way. Area E2 consists of the central portion of the site and flows from east to west ultimately to Norino Way. Area E3 consists of the northern portion of the site and flows to the drainage system in Norino Way. See the attached plans (Watersheds and HydroCad Data, sheet 1 of 2) for the watershed area boundaries and the pre-development time of concentration flow paths.

WATERSHED ANALYSIS: EXISTING CONDITIONS

The existing conditions were modeled using the tabular hydrograph method with a Type III synthetic storm distribution for the 2, 10, 25 and 100-year storm recurrence intervals. Runoff hydrographs were produced to estimate existing peak discharge.

Flows for the four storm simulations are as follows:

Existing (Pre-development) Peak Runoff Rates (c.f.s.)

Subcatchment	Size (Acres)	2 Yr Storm	10 Yr Storm	25 Yr Storm	100 Yr Storm
E1	2.28	0.17	1.53	3.07	6.90
E2	2.57	0.23	2.15	4.26	9.47
E3	6.09	0.55	5.34	10.51	23.27

The pre-development drainage calculations can be found in Appendix A.

WATERSHED DESCRIPTION: POST-DEVELOPMENT CONDITIONS

To determine the post development runoff, new watersheds, runoff curve numbers and times of concentration were generated reflecting the changes in the topography and surface cover. The post-development watersheds are shown on the attached plans (Watersheds and HydroCad Data, sheet 2 of 2). Watershed area P1A consists of the undisturbed southern portion of the site that flows overland to the southwest corner of the site and ultimately to Norino Way. Areas P1B and P1C contain portions of the access drive. The runoff from these areas is collected by catch basins, sent into a Contech Pre-treatment unit, directed into an infiltration and detention area. Area P2A contains portions of woods, lawn and a small portion of the access drive that flow overland towards Norino Way. Area P2B and P2C contain portions of the access drive that flow into a catch basin with a Contech CDS pretreatment unit and into a subsurface detention area. Area P2D contains a portion of the lot that will be disturbed for grading and ultimately returned to an area that will not be landscaped or maintained. The flow is collected by a collection trench and discharged on the opposite side of the retaining wall. Area P3A contains mostly lawn and landscaped areas that flow overland towards Norino Way. Areas P3B-P3C and P3P3f-P3J contains portions of the access drive and parking area. These areas flow into catch basins, into Contech CDS pretreatment units and are discharged into Infiltration Basin 2. Areas P3D and P3E contain portions of the access driveway and flow into catch basins, a Contech CDS pretreatment unit, and into Infiltration Basin 1. Area P3K contains roof runoff that is directed into a subsurface infiltration area.

WATERSHED ANALYSIS: POST-DEVELOPMENT CONDITIONS

The proposed developed conditions were modeled using the tabular hydrograph method with a Type III synthetic storm distribution for the 2, 10, 25 and 100-year storm recurrence intervals. Runoff hydrographs were produced to estimate the post-development peak discharge.

Flows for the four storm simulations are as follows:

Post-Developed Peak Runoff Rates (c.f.s.)

Subcatchment	Size	2 Yr	10 Yr	25 Yr	100 Yr
	(Acres)	Storm	Storm	Storm	Storm
Total P1	2.45	0.12	1.38	2.89	6.63
Total P2	1.56	0.13	1.23	2.45	5.76
Total P3	6.93	0.15	2.07	7.86	20.69

The post-development drainage calculations can be found in Appendix B.

IV. Stormwater Recharge Calculations

Stormwater Recharge Calculations

Calculations were performed to ensure that the proposed project will comply with the groundwater recharge requirements of the Mass **DEP** Stormwater Management Standards. The required recharge volume was calculated as follows:

The Required Recharge Volume equals a depth of runoff corresponding to the soil type times the impervious areas located on site.

Rv = Fx Impervious area Where:

Rv = Required Recharge Volume, expressed in cubic feet

F = Target Depth Factor associated with each Hydrologic Soil

Group Impervious Area = pavement and rooftop area on site

For the proposed project:

Required Recharge volume, Rv (B soil) = F * impervious area
= 0.35 in * 62,901 s.f.
= 1,835 c.f.

Total Required Recharge Volume = 1,835 c.f.

Total Recharge provided = 10,551 c.f.
Inf. Basin 1= 2,929 c.f.
Inf. Basin 2= 2,788 c.f.
Subsurface Inf. Area 1 =653 c.f.
Roof Drywell 1= 4,181 c.f.

Adjusted Required Recharge Volume

Since only a portion of the new impervious areas are to be directed into the infiltration BMP, it is necessary to calculate an Adjusted Required Recharge Volume:

1. The Required Recharge Volume = 1,835 cubic feet

2. The total proposed impervious area is 62,902 s.f.
3. The proposed impervious area draining to all infiltration areas is 58,628 s.f.
4. The ratio of total site impervious area to impervious are draining to the infiltration BMP is 62,902 / 58,628= 1.07
5. The Adjusted Required Recharge Volume = 1.07 x 1,835 cubic feet = 1,964 cubic feet.

Stormwater recharge will be accomplished on the site through the infiltration areas to be constructed.

Adjust Recharge Required=1,964 c.f.
Total Recharge provided = 10,551 c.f.

2" RETENTION LOCAL REQUIREMENT

Total impervious area = 62,901 s.f.
2in x 1ft/12in x 62,901 s.f. = 10,484 c.f.
10,551 c.f. recharged > 10,484 c.f. required

Drawdown Calculation

Infiltration Basin 1

$$\text{Drawdown Time} = \frac{\text{Rv}}{\text{(K) (Bottom Area)}}$$

Rv=Storage Volume= 2,929 c.f.
K=Saturated Hydraulic Conductivity=1.02 in./hr
Bottom Area=5 s.f.

$$\text{Drawdown Time} = \frac{\text{2,929 c.f.}}{\text{(1.02 in/hr)(1ft/12in)(996 s.f.)}}$$

Drawdown Time = 34.6 hours

Infiltration Basin 2

Drawdown Time = $\dfrac{Rv}{(K)\ (\text{Bottom Area})}$

Rv=Storage Volume= 2,788 c.f.
K=Saturated Hydraulic Conductivity=1.02 in./hr
Bottom Area=1,410 s.f.

Drawdown Time = $\dfrac{2{,}788\ \text{c.f.}}{(1.02\ \text{in/hr})(1\text{ft}/12\text{in})(1{,}410\ \text{s.f.})}$

Drawdown Time = 23.3 hours

Subsurface Infiltration Area 1

Drawdown Time = $\dfrac{Rv}{(K)\ (\text{Bottom Area})}$

Rv=Storage Volume= 653 c.f.
K=Saturated Hydraulic Conductivity=1.02 in./hr
Bottom Area=475 s.f.

Drawdown Time = $\dfrac{653\ \text{c.f.}}{(1.02\ \text{in/hr})(1\text{ft}/12\text{in})(475\ \text{s.f.})}$

Drawdown Time = 16.2 hours

Roof Drywell 1

Drawdown Time = $\dfrac{Rv}{}$

(K) (Bottom Area)

Rv=Storage Volume= 4,181 c.f.
K=Saturated Hydraulic Conductivity=1.02 in./hr
Bottom Area=2,410 s.f.

$$\text{Drawdown Time} = \frac{4{,}181 \text{ c.f.}}{(1.02 \text{ in/hr})(1\text{ft}/12\text{in})(2410 \text{ s.f.})}$$

Drawdown Time = 20.4 hours

V. TSS Removal Calculations

INSTRUCTIONS:

Non-automated: Mar. 4, 2008

1. Sheet is nonautomated. Print sheet and complete using hand calculations. Column A and B: See MassDEP Structural BMP Table
2. The calculations must be completed using the Column Headings specified in Chart and Not the Excel Column Headings
3. To complete Chart Column D, multiple Column B value within Row x Column C value within Row
4. To complete Chart Column E value, subtract Column D value within Row from Column C within Row
5. Total TSS Removal = Sum All Values in Column D

Location: Infiltration Area 1

TSS Removal Calculation Worksheet

A BMP[1]	B TSS Remova Rate[1]	C Starting TSS Load*	D Amount Removed (B*C)	E Remaining Load (C-D)
Contech CDS	**0.95**	**1.00**	**0.95**	**0.05**
Subsurface Infiltration Area	**0.80**	**0.05**	**0.04**	**0.01**

Total TSS Removal = **99%**

Separate Form Needs to be Completed for Each Outlet or BMP Train

Project: **M193651**

Prepared By: **JTM**

Date: **3/7/2022**

*Equals remaining load from previous BMP (E) which enters the BMP

INSTRUCTIONS:

Non-automated: Mar. 4, 2008

1. Sheet is nonautomated. Print sheet and complete using hand calculations. Column A and B: See MassDEP Structural BMP Table
2. The calculations must be completed using the Column Headings specified in Chart and Not the Excel Column Headings
3. To complete Chart Column D, multiple Column B value within Row x Column C value within Row
4. To complete Chart Column E value, subtract Column D value within Row from Column C within Row
5. Total TSS Removal = Sum All Values in Column D

Location: Infiltration Basin 1

TSS Removal Calculation Worksheet

A BMP[1]	B TSS Remova Rate[1]	C Starting TSS Load*	D Amount Removed (B*C)	E Remaining Load (C-D)
Contech CDS	**0.94**	**1.00**	**0.94**	**0.06**
Infiltration Baisn	**0.80**	**0.06**	**0.04**	**0.02**

Total TSS Removal = **98%**

Separate Form Needs to be Completed for Each Outlet or BMP Train

Project: **M193651**

Prepared By: **JTM**

Date: **3/7/2022**

*Equals remaining load from previous BMP (E) which enters the BMP

INSTRUCTIONS: *Non-automated: Mar. 4, 2008*

1. Sheet is nonautomated. Print sheet and complete using hand calculations. Column A and B: See MassDEP Structural BMP Table
2. The calculations must be completed using the Column Headings specified in Chart and Not the Excel Column Headings
3. To complete Chart Column D, multiple Column B value within Row x Column C value within Row
4. To complete Chart Column E value, subtract Column D value within Row from Column C within Row
5. Total TSS Removal = Sum All Values in Column D

Location: Infiltration Basin 2

TSS Removal Calculation Worksheet

A BMP[1]	B TSS Remova Rate[1]	C Starting TSS Load*	D Amount Removed (B*C)	E Remaining Load (C-D)
Contech CDS	0.95	1.00	0.95	0.05
Infiltration Baisn	0.80	0.05	0.04	0.01

Total TSS Removal = **99%**

Separate Form Needs to be Completed for Each Outlet or BMP Train

Project: M193651
Prepared By: JTM
Date: 3/7/2022

*Equals remaining load from previous BMP (E) which enters the BMP

CDS ESTIMATED NET ANNUAL SOLIDS LOAD REDUCTION
BASED ON THE RATIONAL RAINFALL METHOD

2 NORINO WAY
GEORGETOWN, MA

Area	**0.12 ac**	Unit Site Designation	**WQU 1**
Weighted C	**0.9**	Rainfall Station #	**67**
t_c	**6 min**		
CDS Model	**1515-3**	CDS Treatment Capacity	**1.0 cfs**

Rainfall Intensity[1] (in/hr)	Percent Rainfall Volume[1]	Cumulative Rainfall Volume	Total Flowrate (cfs)	Treated Flowrate (cfs)	Incremental Removal (%)
0.08	41.0%	41.0%	0.01	0.01	39.7
0.16	23.9%	64.9%	0.02	0.02	22.9
0.24	11.5%	76.5%	0.03	0.03	11.0
0.32	7.4%	83.9%	0.03	0.03	7.0
0.40	4.4%	88.3%	0.04	0.04	4.2
0.48	2.9%	91.2%	0.05	0.05	2.7
0.56	1.8%	93.0%	0.06	0.06	1.7
0.64	1.2%	94.2%	0.07	0.07	1.1
0.72	1.6%	95.8%	0.08	0.08	1.5
0.80	0.8%	96.6%	0.09	0.09	0.7
1.00	0.6%	97.1%	0.11	0.11	0.5
1.40	1.4%	98.6%	0.15	0.15	1.3
1.80	0.9%	99.5%	0.19	0.19	0.8
2.20	0.5%	100.0%	0.24	0.24	0.4
0.00	0.0%	100.0%	0.00	0.00	0.0
0.00	0.0%	100.0%	0.00	0.00	0.0
0.00	0.0%	100.0%	0.00	0.00	0.0
0.00	0.0%	100.0%	0.00	0.00	0.0
0.00	0.0%	100.0%	0.00	0.00	0.0
0.00	0.0%	100.0%	0.00	0.00	0.0
0.00	0.0%	100.0%	0.00	0.00	0.0
					95.4

Removal Efficiency Adjustment[2] =	0.0%
Predicted % Annual Rainfall Treated =	100.0%
Predicted Net Annual Load Removal Efficiency =	**95.4%**

1 - Based on 7 years of data from NCDC station #3276, Groveland, Essex County, MA
2 - Reduction due to use of 60-minute data for a site that has a time of concentration less than 30-minutes.

CDS ESTIMATED NET ANNUAL SOLIDS LOAD REDUCTION
BASED ON THE RATIONAL RAINFALL METHOD

2 NORINO WAY
GEORGETOWN, MA

Area	0.32 ac	Unit Site Designation	WQU 2
Weighted C	0.9	Rainfall Station #	67
t_c	6 min		
CDS Model	1515-3	CDS Treatment Capacity	1.0 cfs

Rainfall Intensity[1] (in/hr)	Percent Rainfall Volume[1]	Cumulative Rainfall Volume	Total Flowrate (cfs)	Treated Flowrate (cfs)	Incremental Removal (%)
0.08	41.0%	41.0%	0.02	0.02	39.3
0.16	23.9%	64.9%	0.05	0.05	22.5
0.24	11.5%	76.5%	0.07	0.07	10.7
0.32	7.4%	83.9%	0.09	0.09	6.7
0.40	4.4%	88.3%	0.12	0.12	4.0
0.48	2.9%	91.2%	0.14	0.14	2.5
0.56	1.8%	93.0%	0.16	0.16	1.5
0.64	1.2%	94.2%	0.19	0.19	1.0
0.72	1.6%	95.8%	0.21	0.21	1.3
0.80	0.8%	96.6%	0.23	0.23	0.6
1.00	0.6%	97.1%	0.29	0.29	0.4
1.40	1.4%	98.6%	0.41	0.41	1.0
1.80	0.9%	99.5%	0.52	0.52	0.6
2.20	0.5%	100.0%	0.64	0.64	0.3
0.00	0.0%	100.0%	0.00	0.00	0.0
0.00	0.0%	100.0%	0.00	0.00	0.0
0.00	0.0%	100.0%	0.00	0.00	0.0
0.00	0.0%	100.0%	0.00	0.00	0.0
0.00	0.0%	100.0%	0.00	0.00	0.0
0.00	0.0%	100.0%	0.00	0.00	0.0
0.00	0.0%	100.0%	0.00	0.00	0.0
					92.4
				Removal Efficiency Adjustment[2] =	0.0%
				Predicted % Annual Rainfall Treated =	100.0%
				Predicted Net Annual Load Removal Efficiency =	**92.4%**

1 - Based on 7 years of data from NCDC station #3276, Groveland, Essex County, MA
2 - Reduction due to use of 60-minute data for a site that has a time of concentration less than 30-minutes.

CDS ESTIMATED NET ANNUAL SOLIDS LOAD REDUCTION BASED ON THE RATIONAL RAINFALL METHOD

2 NORINO WAY
GEORGETOWN, MA

Area	0.11 ac	Unit Site Designation	WQU 3
Weighted C	0.9	Rainfall Station #	67
t_c	6 min		
CDS Model	1515-3	CDS Treatment Capacity	1.0 cfs

Rainfall Intensity[1] (in/hr)	Percent Rainfall Volume[1]	Cumulative Rainfall Volume	Total Flowrate (cfs)	Treated Flowrate (cfs)	Incremental Removal (%)
0.08	41.0%	41.0%	0.01	0.01	39.7
0.16	23.9%	64.9%	0.02	0.02	23.0
0.24	11.5%	76.5%	0.02	0.02	11.0
0.32	7.4%	83.9%	0.03	0.03	7.1
0.40	4.4%	88.3%	0.04	0.04	4.2
0.48	2.9%	91.2%	0.05	0.05	2.7
0.56	1.8%	93.0%	0.06	0.06	1.7
0.64	1.2%	94.2%	0.06	0.06	1.1
0.72	1.6%	95.8%	0.07	0.07	1.5
0.80	0.8%	96.6%	0.08	0.08	0.7
1.00	0.6%	97.1%	0.10	0.10	0.5
1.40	1.4%	98.6%	0.14	0.14	1.3
1.80	0.9%	99.5%	0.18	0.18	0.8
2.20	0.5%	100.0%	0.22	0.22	0.4
0.00	0.0%	100.0%	0.00	0.00	0.0
0.00	0.0%	100.0%	0.00	0.00	0.0
0.00	0.0%	100.0%	0.00	0.00	0.0
0.00	0.0%	100.0%	0.00	0.00	0.0
0.00	0.0%	100.0%	0.00	0.00	0.0
0.00	0.0%	100.0%	0.00	0.00	0.0
0.00	0.0%	100.0%	0.00	0.00	0.0
					95.6
				Removal Efficiency Adjustment[2] =	0.0%
				Predicted % Annual Rainfall Treated =	100.0%
				Predicted Net Annual Load Removal Efficiency =	**95.6%**

1 - Based on 7 years of data from NCDC station #3276, Groveland, Essex County, MA
2 - Reduction due to use of 60-minute data for a site that has a time of concentration less than 30-minutes.

CDS ESTIMATED NET ANNUAL SOLIDS LOAD REDUCTION
BASED ON THE RATIONAL RAINFALL METHOD

2 NORINO WAY
GEORGETOWN, MA

Area	**0.16 ac**	Unit Site Designation	**WQU 4**
Weighted C	**0.9**	Rainfall Station #	**67**
t_c	**6 min**		
CDS Model	**1515-3**	CDS Treatment Capacity	**1.0 cfs**

Rainfall Intensity[1] (in/hr)	Percent Rainfall Volume[1]	Cumulative Rainfall Volume	Total Flowrate (cfs)	Treated Flowrate (cfs)	Incremental Removal (%)
0.08	41.0%	41.0%	0.01	0.01	39.6
0.16	23.9%	64.9%	0.02	0.02	22.8
0.24	11.5%	76.5%	0.04	0.04	10.9
0.32	7.4%	83.9%	0.05	0.05	7.0
0.40	4.4%	88.3%	0.06	0.06	4.1
0.48	2.9%	91.2%	0.07	0.07	2.7
0.56	1.8%	93.0%	0.08	0.08	1.6
0.64	1.2%	94.2%	0.09	0.09	1.1
0.72	1.6%	95.8%	0.11	0.11	1.4
0.80	0.8%	96.6%	0.12	0.12	0.7
1.00	0.6%	97.1%	0.15	0.15	0.5
1.40	1.4%	98.6%	0.21	0.21	1.2
1.80	0.9%	99.5%	0.27	0.27	0.7
2.20	0.5%	100.0%	0.32	0.32	0.4
0.00	0.0%	100.0%	0.00	0.00	0.0
0.00	0.0%	100.0%	0.00	0.00	0.0
0.00	0.0%	100.0%	0.00	0.00	0.0
0.00	0.0%	100.0%	0.00	0.00	0.0
0.00	0.0%	100.0%	0.00	0.00	0.0
0.00	0.0%	100.0%	0.00	0.00	0.0
0.00	0.0%	100.0%	0.00	0.00	0.0
					94.8

Removal Efficiency Adjustment[2] = 0.0%

Predicted % Annual Rainfall Treated = 100.0%

Predicted Net Annual Load Removal Efficiency = 94.8%

1 - Based on 7 years of data from NCDC station #3276, Groveland, Essex County, MA

2 - Reduction due to use of 60-minute data for a site that has a time of concentration less than 30-minutes.

VI. Water Quality Calculations

Water Quality Calculations

The Massachusetts DEP requires water quality calculations based on 1/2 inch of runoff for the total impervious area associated with the proposed development. The following calculation identifies the water quality volume required.

Infiltration Area 1

Total Impervious Area = 35,501 s.f.
35,501 s.f. * 1/2" / 12 (to convert to ft) = 1,480 c.f. of runoff to be treated for water quality.

Volume of infiltration area 1 below the lowest outlet = 2,929 c.f.

Volume of infiltration area 2 below the lowest outlet = 2,788 c.f.

Volume of Subsurface Infiltration Area 1 below the lowest outlet = 653 c.f.
Total Volume below outlets = 6,370 c.f.

Project: 2 Norino Way
Location: Georgetown, MA
Prepared For: Millennium Engineering

CONTECH ENGINEERED SOLUTIONS

Purpose: To calculate the water quality flow rate (WQF) over a given site area. In this situation the WQF is derived from the first 1/2" of runoff from the contributing impervious surface.

Reference: Massachusetts Dept. of Environmental Protection Wetlands Program / United States Department of Agriculture Natural Resources Conservation Service TR-55 Manual

Procedure: Determine unit peak discharge using Figure 1 or 2. Figure 2 is in tabular form so is preferred. Using the tc, read the unit peak discharge (qu) from Figure 1 or Table in Figure 2. qu is expressed in the following units: cfs/mi^2/watershed inches (csm/in).

Compute Q Rate using the following equation:

Q = (qu) (A) (WQV)

where:

Q = flow rate associated with first 1/2" of runoff
qu = the unit peak discharge, in csm/in.
A = impervious surface drainage area (in square miles)
WQV = water quality volume in watershed inches (1/2" in this case)

Structure Name	Impv. (acres)	A (miles^2)	t_c (min)	t_c (hr)	WQV (in)	qu (csm/in.)	Q (cfs)
WQU 1	0.12	0.0001857	6.0	0.100	0.50	752.00	0.07
WQU 2	0.32	0.0005046	6.0	0.100	0.50	752.00	0.19
WQU 3	0.11	0.0001739	6.0	0.100	0.50	752.00	0.07
WQU 4	0.16	0.0002563	6.0	0.100	0.50	752.00	0.10

The WQf sizing calculation selects the minimum size CDS/Cascade/StormCeptor model capable of operating at the computed WQf peak flowrate prior to bypassing. It assumes free discharge of the WQf through the unit and ignores the routing effect of any upstream storm drain piping. As with all hydrodynamic separators, there will be some impact to the Hydraulic Gradient of the corresponding drainage system, and evaluation of this impact should be considered in the design.

Determining Number of Cartridges for Systems Downstream of Detention

CONTECH Stormwater Solutions Inc. Engineer:	DRA	
Date	3/9/2022	
Site Information		
Project Name	2 Norino Way	
Project State	MA	
Project Location	Georgetown	
Drainage Area, Ad	0.10	ac
Impervious Area, Ai	0.10	ac
Pervious Area, Ap	0.00	
% Impervious	100	%
Runoff Coefficient, Rc	0.95	
Upstream Detention System		
Detention pretreatment credit (from removal efficiency calcs)	25%	
Mass loading calculations		
Mean Annual Rainfall, P	50.5	in
Agency required % removal	80%	
Percent Runoff Capture	90%	
Mean Annual Runoff, V_t	15,281	ft^3
Event Mean Concentration of Pollutant, EMC	75	mg/l
Annual Mass Load, M_{total}	72	lbs
Water Quality Volume		
90% Rainfall Depth	1.00	in
Volume to be treated	0.008	ac-ft
Volume to be treated by filters	336	ft^3
Filter System		
Filtration brand	StormFilter	
Cartridge height	18	in
Specific Flow Rate	1.00	gpm/ft^2
Number of cartridges - mass loading		
Mass removed by pretreatment system, M_{pre}	18	lbs
Mass load to filters after pretreatment, M_{pass1}	54	lbs
Mass to be captured by filters, M_{filter}	43	lbs
Allowable Cartridge Flow rate, Q_{cart}	7.50	
Mass load per cartridge, M_{cart} (lbs)	36	lbs
Number of Cartridges required, N_{mass}	2	
Treatment Capacity	0.03	cfs
Determine Critical Sizing Value		
Method to Use:	MASS-LOADING	

SUMMARY

Treatment Flow Rate	0.03	cfs
Cartridge Flow Rate	7.5	gpm
Number of Cartridges	2	ea
Model	SFMH48	

VII. Soils Analysis

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for

Essex County, Massachusetts, Northern Part

December 16, 2020

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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Contents

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Soil Map

N

Map Scale: 1:1,750 if printed on A portrait (8.5" x 11") sheet.

Meters: 0, 25, 50, 100, 150

Feet: 0, 50, 100, 200, 300

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 19N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

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

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

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

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Essex County, Massachusetts, Northern Part
Survey Area Data: Version 16, Jun 9, 2020

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

Date(s) aerial images were photographed: Aug 28, 2019—Sep 20, 2019

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

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
306C	Paxton fine sandy loam, 8 to 15 percent slopes, very stony	1.2	19.9%
306D	Paxton fine sandy loam, 15 to 25 percent slopes, very stony	4.7	74.9%
421B	Canton fine sandy loam, 0 to 8 percent slopes, very stony	0.3	5.2%
Totals for Area of Interest		**6.2**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Essex County, Massachusetts, Northern Part

306C—Paxton fine sandy loam, 8 to 15 percent slopes, very stony

Map Unit Setting

National map unit symbol: 2w677
Elevation: 0 to 1,330 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Paxton, very stony, and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Paxton, Very Stony

Setting

Landform: Drumlins, hills, ground moraines
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear, convex
Across-slope shape: Convex, linear
Parent material: Coarse-loamy lodgment till derived from gneiss, granite, and/or schist

Typical profile

Oe - 0 to 2 inches: moderately decomposed plant material
A - 2 to 10 inches: fine sandy loam
Bw1 - 10 to 17 inches: fine sandy loam
Bw2 - 17 to 28 inches: fine sandy loam
Cd - 28 to 67 inches: gravelly fine sandy loam

Properties and qualities

Slope: 8 to 15 percent
Surface area covered with cobbles, stones or boulders: 1.6 percent
Depth to restrictive feature: 20 to 43 inches to densic material
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.14 in/hr)
Depth to water table: About 18 to 37 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water capacity: Low (about 4.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: C
Ecological site: F144AY007CT - Well Drained Dense Till Uplands
Hydric soil rating: No

Minor Components

Woodbridge, very stony

Percent of map unit: 8 percent
Landform: Ground moraines, drumlins, hills
Landform position (two-dimensional): Backslope, footslope
Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Charlton, very stony

Percent of map unit: 5 percent
Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Ridgebury, very stony

Percent of map unit: 2 percent
Landform: Drainageways, hills, ground moraines, depressions, drumlins
Landform position (two-dimensional): Toeslope, footslope
Landform position (three-dimensional): Base slope, head slope
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

306D—Paxton fine sandy loam, 15 to 25 percent slopes, very stony

Map Unit Setting

National map unit symbol: 2w67h
Elevation: 0 to 1,400 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Paxton, very stony, and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Paxton, Very Stony

Setting

Landform: Drumlins, hills, ground moraines
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope

Down-slope shape: Linear, convex
Across-slope shape: Convex, linear
Parent material: Coarse-loamy lodgment till derived from gneiss, granite, and/or schist

Typical profile

Oe - 0 to 2 inches: moderately decomposed plant material
A - 2 to 10 inches: fine sandy loam
Bw1 - 10 to 17 inches: fine sandy loam
Bw2 - 17 to 28 inches: fine sandy loam
Cd - 28 to 67 inches: gravelly fine sandy loam

Properties and qualities

Slope: 15 to 25 percent
Surface area covered with cobbles, stones or boulders: 1.6 percent
Depth to restrictive feature: 20 to 43 inches to densic material
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.14 in/hr)
Depth to water table: About 18 to 37 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water capacity: Low (about 4.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: C
Ecological site: F144AY007CT - Well Drained Dense Till Uplands
Hydric soil rating: No

Minor Components

Woodbridge, very stony

Percent of map unit: 5 percent
Landform: Ground moraines, drumlins, hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Charlton, very stony

Percent of map unit: 4 percent
Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Ridgebury, very stony

Percent of map unit: 1 percent
Landform: Depressions, drumlins, drainageways, hills, ground moraines
Landform position (two-dimensional): Toeslope, footslope

Landform position (three-dimensional): Base slope, head slope
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

421B—Canton fine sandy loam, 0 to 8 percent slopes, very stony

Map Unit Setting

National map unit symbol: 2w81l
Elevation: 0 to 1,180 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Canton, very stony, and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Canton, Very Stony

Setting

Landform: Ridges, hills, moraines
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Side slope, crest, nose slope
Down-slope shape: Convex, linear
Across-slope shape: Convex
Parent material: Coarse-loamy over sandy melt-out till derived from gneiss, granite, and/or schist

Typical profile

Oi - 0 to 2 inches: slightly decomposed plant material
A - 2 to 5 inches: fine sandy loam
Bw1 - 5 to 16 inches: fine sandy loam
Bw2 - 16 to 22 inches: gravelly fine sandy loam
2C - 22 to 67 inches: gravelly loamy sand

Properties and qualities

Slope: 0 to 8 percent
Surface area covered with cobbles, stones or boulders: 1.6 percent
Depth to restrictive feature: 19 to 39 inches to strongly contrasting textural stratification
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.14 to 14.17 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None

Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water capacity: Low (about 3.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: B
Ecological site: F144AY034CT - Well Drained Till Uplands
Hydric soil rating: No

Minor Components

Scituate, very stony

Percent of map unit: 9 percent
Landform: Ground moraines, drumlins, hills
Landform position (two-dimensional): Footslope, backslope, summit
Landform position (three-dimensional): Side slope, crest
Down-slope shape: Linear, convex
Across-slope shape: Convex
Hydric soil rating: No

Montauk, very stony

Percent of map unit: 5 percent
Landform: Hills, ground moraines, recessionial moraines, drumlins
Landform position (two-dimensional): Backslope, shoulder, summit
Landform position (three-dimensional): Side slope, crest
Down-slope shape: Linear, convex
Across-slope shape: Convex
Hydric soil rating: No

Gloucester, very stony

Percent of map unit: 4 percent
Landform: Ridges, hills, moraines
Landform position (two-dimensional): Summit, backslope, shoulder
Landform position (three-dimensional): Side slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Convex
Hydric soil rating: No

Swansea

Percent of map unit: 2 percent
Landform: Kettles, swamps, bogs, depressions, marshes
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

References

American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.

American Society for Testing and Materials (ASTM). 2005. Standard classification of soils for engineering purposes. ASTM Standard D2487-00.

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deep-water habitats of the United States. U.S. Fish and Wildlife Service FWS/OBS-79/31.

Federal Register. July 13, 1994. Changes in hydric soils of the United States.

Federal Register. September 18, 2002. Hydric soils of the United States.

Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.

National Research Council. 1995. Wetlands: Characteristics and boundaries.

Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_054262

Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service, U.S. Department of Agriculture Handbook 436. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053577

Soil Survey Staff. 2010. Keys to soil taxonomy. 11th edition. U.S. Department of Agriculture, Natural Resources Conservation Service. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053580

Tiner, R.W., Jr. 1985. Wetlands of Delaware. U.S. Fish and Wildlife Service and Delaware Department of Natural Resources and Environmental Control, Wetlands Section.

United States Army Corps of Engineers, Environmental Laboratory. 1987. Corps of Engineers wetlands delineation manual. Waterways Experiment Station Technical Report Y-87-1.

United States Department of Agriculture, Natural Resources Conservation Service. National forestry manual. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/home/?cid=nrcs142p2_053374

United States Department of Agriculture, Natural Resources Conservation Service. National range and pasture handbook. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/landuse/rangepasture/?cid=stelprdb1043084

United States Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/scientists/?cid=nrcs142p2_054242

United States Department of Agriculture, Natural Resources Conservation Service. 2006. Land resource regions and major land resource areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053624

United States Department of Agriculture, Soil Conservation Service. 1961. Land capability classification. U.S. Department of Agriculture Handbook 210. http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_052290.pdf

SOIL SUITABILITY ASSESSMENT REPORT
COMMONWEALTH OF MASSACHUSETTS
GEORGETOWN, MASSACHUSETTS

SOIL EVALUATION FOR NEW CONSTRUCTION OF ON-SITE SUBSURFACE SEWAGE DISPOSAL SYSTEM

SITE INFORMATION

Street Address: 2 Norino Way Town: Georgetown State: Massachusetts Zip Code: 01833 County: Essex

Land Use: Undeveloped commercial Latitude: ~42º 43' 05.35" N Longitude: ~70º 57' 21.41" W Elevation: ~ 148 - 170'

PUBLISHED SOIL DATA AND MAP UNIT DESCRIPTION

Physiographic Division: Appalachian Highlands Physio. Province: New England Physio. Section: Seaboard lowland section

Soil survey area: Essex County, Massachusetts, Northern Part Series name: 306D – Paxton fine sandy loam, 15-25% slopes

Order: Inceptisol Suborder: Ochrepts Family: Coarse-loamy, mixed, mesic Typic Dystrochrepts

Soil moisture regime: Udic Soil temperature regime: Mesic Depth to restrictive feature: Variable to densic material

Soil hydric or upland: Upland Average depth to water table: 32" to 45" Runoff class: High

Frequency of flooding: None Frequency of ponding: None Available water capacity: Low (~4.7")

Drainage Class: Well drained Hydrologic Soil Group: C Ksat: Low to moderately high (0.0 – 0.14 in/hr)

WETLAND AREA & USGS WELL MEASUREMENTS

National Wetland Inventory Map: NA Wetlands Conservancy Program: NA Bordering vegetative wetland: NA

Current Water Resource Condition (USGS): Well Site # 424520070562401- MA-NIW 27 Newbury, MA

Well depth: 19.8 feet Land altitude: 55.00 feet above NGVD29 Latitude: ~42º45'19.3" N Longitude: ~70º56'22.1"

Most recent data value: 8.29' on 7/09/20 (depth to water level in feet below land surface) Range: Normal

SURFICIAL GEOLOGY:

Surficial Geology: Qgm: Ground moraine Ecological site: Well drained dense till uplands

Parent material: Glacial lodgment till deposits Geomorphic component: ground moraine Runoff class: High

Slope aspect: Westerly Landform position (2D): Backslope Landform position (3D): Side slope

Slope gradient: ~3-5% Down slope shape: Linear Across slope shape: Convex Slope complexity: Simple

Bedrock outcropping in vicinity: None Glacial erratics in vicinity: None Surface fragments: None

Bedrock Type: Nashoba Formation – Boxford Member: Thin bedded to massive amphibolite & minor biotite gneiss

TP20-1 DEEP OBSERVATION HOLE

2 Norino Way, Georgetown, Massachusetts

Date: July 08, 2020   Time: 08:30   Weather: Partly cloudy, calm, 70-75ºF, dry

Landscape: Upland   Landform: Ground moraine   Position on landscape: Side slope

Slope aspect: Westerly   Slope (%): 02- 03%   Slope complexity: Simple   Land Cover: Hard and softwoods and brush

Property line: 10^+ feet   Drainage way: 50^+ feet   Drinking water well: 100^+ feet   Abutting septic system: 50^+ feet

Wetlands: 100^+ feet   Public water supply reservoir: 400^+ feet   Tributary to reservoir: 200^+ feet

SOIL PROFILE ► TP20-1

Depth below land surface (inches)	Soil Horizon/ Layer	Soil Texture (USDA/ NRCS)	Soil Color (Munsell)	Redoxomorphic Features/ ESHGWT	Consistence, grade, size, structure, grain size, soil moisture state, roots, horizon boundary, clasts, stratification, artifacts, restrictive features, etc.
00” → 05”	A_P	Sandy Loam	10YR 3/2 very dark grayish brown	none observed	Very friable; moderate-grade; fine-to-medium granular structure; somewhat cohesive; fine grained mineral content; slightly damp; non-sticky; non-plastic; many fine-to-medium tree and brush roots; free of clasts; clear wavy boundary.
05” → 20”	B_w	Sandy Loam	10YR 5/3 brown	none observed	Very friable; weak-grade, medium sub-angular blocky structure; somewhat cohesive; mixed medium to mostly fine-grained mineral content; damp matrix; non-sticky; non-plastic; common fine and medium roots; ~05% rounded to sub-rounded gravel content of mixed lithology; clear wavy boundary.
20” → 100”	$2C_d$	Sandy Loam	2.5Y 5/6 light olive brown	43” (c,1-2,p) 10YR 7/1 5YR 5/8	Friable to firm; dense compact matrix; massive to subangular platy structure of moderate grade; mixed fine-to-medium grained mineral content; crudely stratified; damp matrix; non-sticky; non-plastic; well graded; approximately 15-20% sub-angular to sub-rounded gravel and 10-15% subrounded to angular cobble content of mixed lithology; redoximorphic features observed at 43”; no apparent water observed; no bedrock refusal at test hole depth.

Depth to bedrock: > 100”   Seasonal High Groundwater Table: 43”   Apparent water table: ____

TP20-1 DEEP OBSERVATION HOLE

2 Norino Way, Georgetown, Massachusetts

DEPTH TO APPARENT/ PHREATIC GROUNDWATER TABLE: *NONE OBSERVED*

Apparent water seeping from pit face:___ (below land surface) Depth to stabilized apparent water: ___ (below land surface)

Soil moisture state: Damp

ESTIMATED SEASONAL HIGH GROUNDWATER TABLE:

Depth of Estimated Seasonal High Groundwater Table: 43" (below land surface)

Kind: Iron concentrations; noncemented iron masses and reduction spots – iron coatings on sand grains

Location: In 2C matrix surrounding redox depletions Shape: Irregular/ spherical

Hardness: Soft Boundary: Clear Abundance: Common Size: Fine to medium Contrast: Prominent

Concentration color: 5YR 5/8 yellowish red Reduction color: 10YR 7/1 light gray Moisture state: Damp

DETERMINATION OF HIGH GROUNDWATER ELEVATION

Observed depth to redoximorphic features: 43" inches below grade

Observed depth to stabilized phreatic water: ___ inches below grade

Observed water weeping from side of deep hole: ___ inches below grade

DEPTH OF NATURALLY OCCURRING PERVIOUS MATERIAL: ► 7.92'

Depth of naturally occurring pervious material in TP20-1 Upper boundary: 05"
Lower boundary: 100"

Certification

I certify that I am currently approved by the Department of Environmental Protection pursuant to 310 CMR 15.017 to conduct evaluations and that the above analysis has been performed by me consistent with the required training, expertise and experience described in 310 CMR 15.017. I further certify that the results of my soil evaluation, as indicated in the attached Soil Evaluation Form, are accurate and in accordance with 310 CMR 15.017.

Alexander F. Parker *#1848*	June 1998
Massachusetts Soil Evaluator & Certification number	Date of Soil Evaluator Certification
Mr. Joe Serwatka, Georgetown Board of Health Representative	07/08/2020
Town of Georgetown Health Department	Date of soil testing

TP20-2 DEEP OBSERVATION HOLE

2 Norino Way, Georgetown, Massachusetts

Date: July 08, 2020 Time: 08:43 Weather: Partly cloudy, calm, 70-75ºF, dry

Landscape: Upland Landform: Ground moraine Position on landscape: Side slope

Slope aspect: Westerly Slope (%): 02- 03% Slope complexity: Simple Land Cover: Hard and softwoods and brush

Property line: 10^{+} feet Drainage way: 50^{+} feet Drinking water well: 100^{+} feet Abutting septic system: 50^{+} feet

Wetlands: 100^{+} feet Public water supply reservoir: 400^{+} feet Tributary to reservoir: 200^{+} feet

SOIL PROFILE ► TP20-2

Depth below land surface (inches)	Soil Horizon/ Layer	Soil Texture (USDA/ NRCS)	Soil Color (Munsell)	Redoxomorphic Features/ ESHGWT	Consistence, grade, size, structure, grain size, soil moisture state, roots, horizon boundary, clasts, stratification, artifacts, restrictive features, etc.
00” → 06”	A_P	Sandy Loam	10YR 3/2 very dark grayish brown	none observed	Very friable; moderate-grade; fine-to-medium granular structure; somewhat cohesive; fine grained mineral content; slightly damp; non-sticky; non-plastic; many fine-to-medium tree and brush roots; free of clasts; clear wavy boundary.
06” → 17”	B_w	Sandy Loam	10YR 5/3 brown	none observed	Very friable; weak-grade, medium sub-angular blocky structure; somewhat cohesive; mixed medium to mostly fine-grained mineral content; damp matrix; non-sticky; non-plastic; common fine and medium roots; ~05% rounded to sub-rounded gravel content of mixed lithology; clear wavy boundary.
17” → 95”	$2C_d$	Sandy Loam	2.5Y 5/6 light olive brown	32” (c,1-2,p) 10YR 7/1 5YR 5/8	Friable to firm; dense compact matrix; massive to subangular platy structure of moderate grade; mixed fine-to-medium grained mineral content; crudely stratified; damp matrix; non-sticky; non-plastic; well graded; approximately 15-20% sub-angular to sub-rounded gravel and 10-15% subrounded to angular cobble content of mixed lithology; redoximorphic features observed at 32”; no apparent water observed; no bedrock refusal at test hole depth.

Depth to bedrock: > 95” Seasonal High Groundwater Table: 32” Apparent water table: ____

TP20-2 DEEP OBSERVATION HOLE

2 Norino Way, Georgetown, Massachusetts

DEPTH TO APPARENT/ PHREATIC GROUNDWATER TABLE: *NONE OBSERVED*

Apparent water seeping from pit face:___ (below land surface) Depth to stabilized apparent water: ___ (below land surface)

Soil moisture state: Damp

ESTIMATED SEASONAL HIGH GROUNDWATER TABLE:

Depth of Estimated Seasonal High Groundwater Table: 32" (below land surface)

Kind: Iron concentrations; noncemented iron masses and reduction spots – iron coatings on sand grains

Location: In 2C matrix surrounding redox depletions Shape: Irregular/ spherical

Hardness: Soft Boundary: Clear Abundance: Common Size: Fine to medium Contrast: Prominent

Concentration color: 5YR 5/8 yellowish red Reduction color: 10YR 7/1 light gray Moisture state: Damp

DETERMINATION OF HIGH GROUNDWATER ELEVATION

Observed depth to redoximorphic features: 32" inches below grade

Observed depth to stabilized phreatic water: ___ inches below grade

Observed water weeping from side of deep hole: ___ inches below grade

DEPTH OF NATURALLY OCCURRING PERVIOUS MATERIAL: ► 7.42'

Depth of naturally occurring pervious material in TP20-2 Upper boundary: 06"
Lower boundary: 95"

Certification

I certify that I am currently approved by the Department of Environmental Protection pursuant to 310 CMR 15.017 to conduct evaluations and that the above analysis has been performed by me consistent with the required training, expertise and experience described in 310 CMR 15.017. I further certify that the results of my soil evaluation, as indicated in the attached Soil Evaluation Form, are accurate and in accordance with 310 CMR 15.017.

Alexander F. Parker *#1848* — June 1998

Massachusetts Soil Evaluator & Certification number — Date of Soil Evaluator Certification

Mr. Joe Serwatka, Georgetown Board of Health Representative — 07/08/2020

Town of Georgetown Health Department — Date of soil testing

TP20-3 DEEP OBSERVATION HOLE

2 Norino Way, Georgetown, Massachusetts

Date: July 08, 2020 Time: 08:59 Weather: Partly cloudy, calm, 70-75ºF, dry

Landscape: Upland Landform: Ground moraine Position on landscape: Side slope

Slope aspect: Westerly Slope (%): 02- 03% Slope complexity: Simple Land Cover: Hard and softwoods and brush

Property line: 10^+ feet Drainage way: 50^+ feet Drinking water well: 100^+ feet Abutting septic system: 50^+ feet

Wetlands: 100^+ feet Public water supply reservoir: 400^+ feet Tributary to reservoir: 200^+ feet

SOIL PROFILE ► TP20-3

Depth below land surface (inches)	Soil Horizon/ Layer	Soil Texture (USDA/ NRCS)	Soil Color (Munsell)	Redoxomorphic Features/ ESHGWT	Consistence, grade, size, structure, grain size, soil moisture state, roots, horizon boundary, clasts, stratification, artifacts, restrictive features, etc.
00” → 08”	A_P	Sandy Loam	10YR 3/2 very dark grayish brown	none observed	Very friable; moderate-grade; fine-to-medium granular structure; somewhat cohesive; fine grained mineral content; slightly damp; non-sticky; non-plastic; many fine-to-medium tree and brush roots; free of clasts; clear wavy boundary.
08” → 21”	B_w	Sandy Loam	10YR 5/3 brown	none observed	Very friable; weak-grade, medium sub-angular blocky structure; somewhat cohesive; mixed medium to mostly fine-grained mineral content; damp matrix; non-sticky; non-plastic; common fine and medium roots; ~05% rounded to sub-rounded gravel content of mixed lithology; clear wavy boundary.
21” → 90”	$2C_d$	Sandy Loam	2.5Y 5/6 light olive brown	43” (c,1-2,p) 10YR 7/1 5YR 5/8	Friable to firm; dense compact matrix; massive to subangular platy structure of moderate grade; mixed fine-to-medium grained mineral content; crudely stratified; damp matrix; non-sticky; non-plastic; well graded; approximately 15-20% sub-angular to sub-rounded gravel and 10-15% subrounded to angular cobble content of mixed lithology; redoximorphic features observed at 43”; no apparent water observed; no bedrock refusal at test hole depth.

Depth to bedrock: > 95” Seasonal High Groundwater Table: 43” Apparent water table: ____

TP20-3 DEEP OBSERVATION HOLE

2 Norino Way, Georgetown, Massachusetts

DEPTH TO APPARENT/ PHREATIC GROUNDWATER TABLE: *NONE OBSERVED*

Apparent water seeping from pit face:___ (below land surface)   Depth to stabilized apparent water: ___ (below land surface)

Soil moisture state: Damp

ESTIMATED SEASONAL HIGH GROUNDWATER TABLE:

Depth of Estimated Seasonal High Groundwater Table: 43" (below land surface)

Kind: Iron concentrations; noncemented iron masses and reduction spots – iron coatings on sand grains

Location: In 2C matrix surrounding redox depletions   Shape: Irregular/ spherical

Hardness: Soft   Boundary: Clear   Abundance: Common   Size: Fine to medium   Contrast: Prominent

Concentration color: 5YR 5/8 yellowish red   Reduction color: 10YR 7/1 light gray   Moisture state: Damp

DETERMINATION OF HIGH GROUNDWATER ELEVATION

Observed depth to redoximorphic features: 43" inches below grade

Observed depth to stabilized phreatic water: ___ inches below grade

Observed water weeping from side of deep hole: ___ inches below grade

DEPTH OF NATURALLY OCCURRING PERVIOUS MATERIAL: ► 6.00'

Depth of naturally occurring pervious material in TP20-3   Upper boundary: 08"
Lower boundary: 90"

Certification

I certify that I am currently approved by the Department of Environmental Protection pursuant to 310 CMR 15.017 to conduct evaluations and that the above analysis has been performed by me consistent with the required training, expertise and experience described in 310 CMR 15.017. I further certify that the results of my soil evaluation, as indicated in the attached Soil Evaluation Form, are accurate and in accordance with 310 CMR 15.017.

Alexander F. Parker *#1848*   June 1998

Massachusetts Soil Evaluator & Certification number   Date of Soil Evaluator Certification

Mr. Joe Serwatka, Georgetown Board of Health Representative   07/08/2020

Town of Georgetown Health Department   Date of soil testing

TP20-4 DEEP OBSERVATION HOLE

2 Norino Way, Georgetown, Massachusetts

Date: July 08, 2020 Time: 09:22 Weather: Partly cloudy, calm, 70-75ºF, dry

Landscape: Upland Landform: Ground moraine Position on landscape: Side slope

Slope aspect: Westerly Slope (%): 02- 03% Slope complexity: Simple Land Cover: Hard and softwoods and brush

Property line: 10^+ feet Drainage way: 50^+ feet Drinking water well: 100^+ feet Abutting septic system: 50^+ feet

Wetlands: 100^+ feet Public water supply reservoir: 400^+ feet Tributary to reservoir: 200^+ feet

SOIL PROFILE ► TP20-4

Depth below land surface (inches)	Soil Horizon/ Layer	Soil Texture (USDA/ NRCS)	Soil Color (Munsell)	Redoxomorphic Features/ ESHGWT	Consistence, grade, size, structure, grain size, soil moisture state, roots, horizon boundary, clasts, stratification, artifacts, restrictive features, etc.
00” → 09”	A_P	Sandy Loam	10YR 3/2 very dark grayish brown	none observed	Very friable; moderate-grade; fine-to-medium granular structure; somewhat cohesive; fine grained mineral content; slightly damp; non-sticky; non-plastic; many fine-to-medium tree and brush roots; free of clasts; clear wavy boundary.
09” → 31”	B_w	Sandy Loam	10YR 5/3 brown	none observed	Very friable; weak-grade, medium sub-angular blocky structure; somewhat cohesive; mixed medium to mostly fine-grained mineral content; damp matrix; non-sticky; non-plastic; common fine and medium roots; ~05% rounded to sub-rounded gravel content of mixed lithology; clear wavy boundary.
31” → 92”	$2C_d$	Sandy Loam	2.5Y 5/6 light olive brown	45” (c,1-2,p) 10YR 7/1 5YR 5/8	Friable to firm; dense compact matrix; massive to subangular platy structure of moderate grade; mixed fine-to-medium grained mineral content; crudely stratified; damp matrix; non-sticky; non-plastic; well graded; approximately 15-20% sub-angular to sub-rounded gravel and 10-15% subrounded to angular cobble content of mixed lithology; redoximorphic features observed at 45”; no apparent water observed; no bedrock refusal at test hole depth.

Depth to bedrock: > 92” Seasonal High Groundwater Table: 45” Apparent water table: ____

TP20-4 DEEP OBSERVATION HOLE

2 Norino Way, Georgetown, Massachusetts

DEPTH TO APPARENT/ PHREATIC GROUNDWATER TABLE: *NONE OBSERVED*

Apparent water seeping from pit face:___ (below land surface) Depth to stabilized apparent water: ___ (below land surface)

Soil moisture state: Damp

ESTIMATED SEASONAL HIGH GROUNDWATER TABLE:

Depth of Estimated Seasonal High Groundwater Table: 45" (below land surface)

Kind: Iron concentrations; noncemented iron masses and reduction spots – iron coatings on sand grains

Location: In 2C matrix surrounding redox depletions Shape: Irregular/ spherical

Hardness: Soft Boundary: Clear Abundance: Common Size: Fine to medium Contrast: Prominent

Concentration color: 5YR 5/8 yellowish red Reduction color: 10YR 7/1 light gray Moisture state: Damp

DETERMINATION OF HIGH GROUNDWATER ELEVATION

Observed depth to redoximorphic features: 45" inches below grade

Observed depth to stabilized phreatic water: ___ inches below grade

Observed water weeping from side of deep hole: ___ inches below grade

DEPTH OF NATURALLY OCCURRING PERVIOUS MATERIAL: ► 6.92'

Depth of naturally occurring pervious material in TP20-4 Upper boundary: 09"
Lower boundary: 92"

Certification

I certify that I am currently approved by the Department of Environmental Protection pursuant to 310 CMR 15.017 to conduct evaluations and that the above analysis has been performed by me consistent with the required training, expertise and experience described in 310 CMR 15.017. I further certify that the results of my soil evaluation, as indicated in the attached Soil Evaluation Form, are accurate and in accordance with 310 CMR 15.017.

Alexander F. Parker *#1848* — June 1998

Massachusetts Soil Evaluator & Certification number — Date of Soil Evaluator Certification

Mr. Joe Serwatka, Georgetown Board of Health Representative — 07/08/2020

Town of Georgetown Health Department — Date of soil testing

TPD-1 DEEP OBSERVATION HOLE

2 Norino Way, Georgetown, Massachusetts

Date: July 08, 2020 Time: 10:09 Weather: Partly cloudy, calm, 70-75ºF, dry

Landscape: Upland Landform: Ground moraine Position on landscape: Side slope

Slope aspect: Westerly Slope (%): 02- 03% Slope complexity: Simple Land Cover: Hard and softwoods and brush

Property line: 10^+ feet Drainage way: 50^+ feet Drinking water well: 100^+ feet Abutting septic system: 50^+ feet

Wetlands: 100^+ feet Public water supply reservoir: 400^+ feet Tributary to reservoir: 200^+ feet

SOIL PROFILE ► TPD-1

Depth below land surface (inches)	Soil Horizon/ Layer	Soil Texture (USDA/ NRCS)	Soil Color (Munsell)	Redoxomorphic Features/ ESHGWT	Consistence, grade, size, structure, grain size, soil moisture state, roots, horizon boundary, clasts, stratification, artifacts, restrictive features, etc.
00” → 08”	A_P	Sandy Loam	10YR 3/2 very dark grayish brown	none observed	Very friable; moderate-grade; fine-to-medium granular structure; somewhat cohesive; fine grained mineral content; slightly damp; non-sticky; non-plastic; many fine-to-medium tree and brush roots; free of clasts; clear wavy boundary.
08” → 22”	B_w	Sandy Loam	10YR 5/3 brown	none observed	Very friable; weak-grade, medium sub-angular blocky structure; somewhat cohesive; mixed medium to mostly fine-grained mineral content; damp matrix; non-sticky; non-plastic; common fine and medium roots; ~05% rounded to sub-rounded gravel content of mixed lithology; clear wavy boundary.
22” → 100”	$2C_d$	Sandy Loam	2.5Y 5/6 light olive brown	56” (c,1-2,p) 10YR 7/1 5YR 5/8	Friable to firm; dense compact matrix; massive to subangular platy structure of moderate grade; mixed fine-to-medium grained mineral content; crudely stratified; damp matrix; non-sticky; non-plastic; well graded; approximately 15-20% sub-angular to sub-rounded gravel and 10-15% subrounded to angular cobble content of mixed lithology; redoximorphic features observed at 45”; no apparent water observed; no bedrock refusal at test hole depth.

Depth to bedrock: > 100” Seasonal High Groundwater Table: 56” Apparent water table: ____

TPD-1 DEEP OBSERVATION HOLE

2 Norino Way, Georgetown, Massachusetts

DEPTH TO APPARENT/ PHREATIC GROUNDWATER TABLE: *NONE OBSERVED*

Apparent water seeping from pit face:___ (below land surface) Depth to stabilized apparent water: ___ (below land surface)

Soil moisture state: Damp

ESTIMATED SEASONAL HIGH GROUNDWATER TABLE:

Depth of Estimated Seasonal High Groundwater Table: 56" (below land surface)

Kind: Iron concentrations; noncemented iron masses and reduction spots – iron coatings on sand grains

Location: In 2C matrix surrounding redox depletions Shape: Irregular/ spherical

Hardness: Soft Boundary: Clear Abundance: Common Size: Fine to medium Contrast: Prominent

Concentration color: 5YR 5/8 yellowish red Reduction color: 10YR 7/1 light gray Moisture state: Damp

DETERMINATION OF HIGH GROUNDWATER ELEVATION

Observed depth to redoximorphic features: 56" inches below grade

Observed depth to stabilized phreatic water: ___ inches below grade

Observed water weeping from side of deep hole: ___ inches below grade

DEPTH OF NATURALLY OCCURRING PERVIOUS MATERIAL: ► 7.66'

Depth of naturally occurring pervious material in TPD-1 Upper boundary: 08"
Lower boundary: 100"

Certification

I certify that I am currently approved by the Department of Environmental Protection pursuant to 310 CMR 15.017 to conduct evaluations and that the above analysis has been performed by me consistent with the required training, expertise and experience described in 310 CMR 15.017. I further certify that the results of my soil evaluation, as indicated in the attached Soil Evaluation Form, are accurate and in accordance with 310 CMR 15.017.

Alexander F. Parker *#1848* June 1998

Massachusetts Soil Evaluator & Certification number Date of Soil Evaluator Certification

Mr. Joe Serwatka, Georgetown Board of Health Representative 07/08/2020

Town of Georgetown Health Department Date of soil testing

TPD-2 DEEP OBSERVATION HOLE

2 Norino Way, Georgetown, Massachusetts

Date: July 08, 2020 Time: 10:58 Weather: Partly cloudy, calm, 70-75°F, dry

Landscape: Upland Landform: Ground moraine Position on landscape: Side slope

Slope aspect: Westerly Slope (%): 02- 03% Slope complexity: Simple Land Cover: Hard and softwoods and brush

Property line: 10^+ feet Drainage way: 50^+ feet Drinking water well: 100^+ feet Abutting septic system: 50^+ feet

Wetlands: 100^+ feet Public water supply reservoir: 400^+ feet Tributary to reservoir: 200^+ feet

SOIL PROFILE ► TPD-2

Depth below land surface (inches)	Soil Horizon/ Layer	Soil Texture (USDA/ NRCS)	Soil Color (Munsell)	Redoxomorphic Features/ ESHGWT	Consistence, grade, size, structure, grain size, soil moisture state, roots, horizon boundary, clasts, stratification, artifacts, restrictive features, etc.
00” → 08”	A_P	Sandy Loam	10YR 3/2 very dark grayish brown	none observed	Very friable; moderate-grade; fine-to-medium granular structure; somewhat cohesive; fine grained mineral content; slightly damp; non-sticky; non-plastic; many fine-to-medium tree and brush roots; free of clasts; clear wavy boundary.
08” → 11”	B_w	Sandy Loam	10YR 5/3 brown	none observed	Very friable; weak-grade, medium sub-angular blocky structure; somewhat cohesive; mixed medium to mostly fine-grained mineral content; damp matrix; non-sticky; non-plastic; common fine and medium roots; ~05% rounded to sub-rounded gravel content of mixed lithology; clear wavy boundary.
11” → 100”	$2C_d$	Sandy Loam	2.5Y 5/6 light olive brown	32” (c,1-2,p) 10YR 7/1 5YR 5/8	Friable to firm; dense compact matrix; massive to subangular platy structure of moderate grade; mixed fine-to-medium grained mineral content; crudely stratified; damp matrix; non-sticky; non-plastic; well graded; approximately 15-20% sub-angular to sub-rounded gravel and 10-15% subrounded to angular cobble content of mixed lithology; redoximorphic features observed at 32”; no apparent water observed; no bedrock refusal at test hole depth.

Depth to bedrock: > 100” Seasonal High Groundwater Table: 32” Apparent water table: ____

TPD-2 DEEP OBSERVATION HOLE

2 Norino Way, Georgetown, Massachusetts

DEPTH TO APPARENT/ PHREATIC GROUNDWATER TABLE: *NONE OBSERVED*

Apparent water seeping from pit face:___ (below land surface)   Depth to stabilized apparent water: ___ (below land surface)

Soil moisture state: Damp

ESTIMATED SEASONAL HIGH GROUNDWATER TABLE:

Depth of Estimated Seasonal High Groundwater Table: 32” (below land surface)

Kind: Iron concentrations; noncemented iron masses and reduction spots – iron coatings on sand grains

Location: In 2C matrix surrounding redox depletions   Shape: Irregular/ spherical

Hardness: Soft   Boundary: Clear   Abundance: Common   Size: Fine to medium   Contrast: Prominent

Concentration color: 5YR 5/8 yellowish red   Reduction color: 10YR 7/1 light gray   Moisture state: Damp

DETERMINATION OF HIGH GROUNDWATER ELEVATION

Observed depth to redoximorphic features: 32” inches below grade

Observed depth to stabilized phreatic water: ___ inches below grade

Observed water weeping from side of deep hole: ___ inches below grade

DEPTH OF NATURALLY OCCURRING PERVIOUS MATERIAL: ► 7.66’

Depth of naturally occurring pervious material in TPD-2   Upper boundary: 08”
Lower boundary: 100”

Certification

I certify that I am currently approved by the Department of Environmental Protection pursuant to 310 CMR 15.017 to conduct evaluations and that the above analysis has been performed by me consistent with the required training, expertise and experience described in 310 CMR 15.017. I further certify that the results of my soil evaluation, as indicated in the attached Soil Evaluation Form, are accurate and in accordance with 310 CMR 15.017.

Alexander F. Parker *#1848*   June 1998

Massachusetts Soil Evaluator & Certification number   Date of Soil Evaluator Certification

Mr. Joe Serwatka, Georgetown Board of Health Representative   07/08/2020

Town of Georgetown Health Department   Date of soil testing

SOIL SUITABILITY PERCOLATION TEST

COMMONWEALTH OF MASSACHUSETTS

GEORGETOWN, MASSACHUSETTS

2 Norino Way, Georgetown, Massachusetts

Percolation Test	Percolation Test-1 (TP20-1)	Percolation Test-2 (TP20-4)
Depth of test:	Depth to shelf: 20” 38” Depth of hole: 18”	Depth to shelf: 23” 41” Depth of hole: 18”
Start presoak:	08:50	09:18
End presoak:	09:05	09:33
Time at 12”→	09:05	09:33
Time at 9”→	09:10	09:54
Time at 6”→	09:19	10:29
Total time 9” to 6”→	9 minutes	35 minutes
Rate (minutes per inch)	3 MPI CLASS II SOIL LTAR 0.60	11.6 MPI CLASS II SOIL LTAR 0.56

Alexander F. Parker *#1848*

Massachusetts Soil Evaluator & Certification number

Mr. Joe Serwatka, Newbury Board of Health Representative 07/08/2020

Town of Newbury Health Department Date of soil testing

SOIL SUITABILITY ASSESSMENT REPORT

COMMONWEALTH OF MASSACHUSETTS

GEORGETOWN, MASSACHUSETTS

SOIL EVALUATION FOR NEW CONSTRUCTION OF ON-SITE SUBSURFACE SEWAGE DISPOSAL SYSTEM

SITE INFORMATION

Street Address: 2 Norino Way Town: Georgetown State: Massachusetts Zip Code: 01833 County: Essex

Land Use: Undeveloped commercial Latitude: ~42º 43' 05.35" N Longitude: ~70º 57' 21.41" W Elevation: ~ 148 - 170'

PUBLISHED SOIL DATA AND MAP UNIT DESCRIPTION

Physiographic Division: Appalachian Highlands Physio. Province: New England Physio. Section: Seaboard lowland section

Soil survey area: Essex County, Massachusetts, Northern Part Series name: 306D – Paxton fine sandy loam, 15-25% slopes

Order: Inceptisol Suborder: Ochrepts Family: Coarse-loamy, mixed, mesic Typic Dystrochrepts

Soil moisture regime: Udic Soil temperature regime: Mesic Depth to restrictive feature: Variable to densic material

Soil hydric or upland: Upland Average depth to water table: 32" to 45" Runoff class: High

Available water capacity: Low (~4.7") Ksat: Low to moderately high (0.0 – 0.14 in/hr)

Drainage Class: Well drained Hydrologic Soil Group: C Ecological site: Well drained dense till uplands

Frequency of flooding: None Frequency of ponding: None

WETLAND AREA & USGS WELL MEASUREMENTS

National Wetland Inventory Map: NA Wetlands Conservancy Program: NA Bordering vegetative wetland: NA

Current Water Resource Condition (USGS): Well Site # 424520070562401- MA-NIW 27 Newbury, MA

Well depth: 19.8 feet Land altitude: 55.00 feet above NGVD29 Latitude: ~42º45'19.3" N Longitude: ~70º56'22.1"

Most recent data value: 9.00' on11/30/20 (depth to water level in feet below land surface) Range: Normal

SURFICIAL GEOLOGY:

Surficial Geology: Qgm: Ground moraine

Parent material: Glacial lodgment till deposits Geomorphic component: ground moraine Runoff class: High

Slope aspect: Westerly Landform position (2D): Backslope Landform position (3D): Side slope

Slope gradient: ~3-5% Down slope shape: Linear Across slope shape: Convex Slope complexity: Simple

Bedrock outcropping in vicinity: None Glacial erratics in vicinity: None Surface fragments: None

Bedrock Type: Nashoba Formation – Boxford Member: Thin bedded to massive amphibolite & minor biotite gneiss

TP20-15 DEEP OBSERVATION HOLE

2 Norino Way, Georgetown, Massachusetts

FOR SEPTIC DESIGN

Date: November 30, 2020 Time: 09:30 Weather: Overcast, heavy rain, 50-55ºF, SW wind

Landscape: Upland Landform: Ground moraine Position on landscape: Side slope

Slope aspect: Westerly Slope (%): 02- 03% Slope complexity: Simple Land Cover: Hard and softwoods and brush

Property line: 10+ feet Drainage way: 50+ feet Drinking water well: 100+ feet Abutting septic system: 50+ feet

Wetlands: 100+ feet Public water supply reservoir: 400+ feet Tributary to reservoir: 200+ feet

SOIL PROFILE ► TP20-15

Depth below land surface (inches)	Soil Horizon/ Layer	Soil Texture (USDA/ NRCS)	Soil Color (Munsell)	Redoxomorphic Features/ ESHGWT	Consistence, grade, size, structure, grain size, soil moisture state, roots, horizon boundary, clasts, stratification, artifacts, restrictive features, etc.
00” → 07”	A_P	Sandy Loam	10YR 3/2 very dark grayish brown	none observed	Very friable; moderate-grade; fine-to-medium granular structure; somewhat cohesive; fine grained mineral content; slightly damp; non-sticky; non-plastic; many fine-to-medium tree and brush roots; free of clasts; clear wavy boundary.
07” → 20”	B_w	Sandy Loam	10YR 4/6 dark yellowish brown	none observed	Very friable; weak-grade, medium sub-angular blocky structure; somewhat cohesive; mixed medium to mostly fine-grained mineral content; damp matrix; non-sticky; non-plastic; common fine and medium roots; ~05% rounded to sub-rounded gravel content of mixed lithology; clear wavy boundary.
20” → 115”	$2C_d$	Sandy Loam	2.5Y 5/4 light olive brown	34” (c,1-2,p) 10YR 7/1 5YR 5/8	Friable to firm; dense compact matrix; massive to subangular platy structure of moderate grade; mixed fine-to-medium grained mineral content; crudely stratified; damp matrix; non-sticky; non-plastic; well graded; approximately 15-20% sub-angular to sub-rounded gravel and 10-15% subrounded to angular cobble content of mixed lithology; redoximorphic features observed at 34”; no apparent water observed; no bedrock refusal at test hole depth.

Depth to bedrock: > 115” Seasonal High Groundwater Table: 34” Apparent water table: ____

TP20-15 DEEP OBSERVATION HOLE

2 Norino Way, Georgetown, Massachusetts

FOR SEPTIC DESIGN

DEPTH TO APPARENT/ PHREATIC GROUNDWATER TABLE: *NONE OBSERVED*

Apparent water seeping from pit face:___ (below land surface) Depth to stabilized apparent water: ___ (below land surface)

Soil moisture state: Damp

ESTIMATED SEASONAL HIGH GROUNDWATER TABLE:

Depth of Estimated Seasonal High Groundwater Table: 34” (below land surface)

Kind: Iron concentrations; noncemented iron masses and reduction spots – iron coatings on sand grains

Location: In $2C_d$ matrix surrounding redox depletions Shape: Irregular/ spherical

Hardness: Soft Boundary: Clear Abundance: Common Size: Fine to medium Contrast: Prominent

Concentration color: 5YR 5/8 yellowish red Reduction color: 10YR 7/1 light gray Moisture state: Damp

DETERMINATION OF HIGH GROUNDWATER ELEVATION

Observed depth to redoximorphic features: 34” inches below grade

Observed depth to stabilized phreatic water: ___ inches below grade

Observed water weeping from side of deep hole: ___ inches below grade

DEPTH OF NATURALLY OCCURRING PERVIOUS MATERIAL: ► 9.00’

Depth of naturally occurring pervious material in TP20-15 Upper boundary: 07”
Lower boundary: 115”

Certification

I certify that I am currently approved by the Department of Environmental Protection pursuant to 310 CMR 15.017 to conduct evaluations and that the above analysis has been performed by me consistent with the required training, expertise and experience described in 310 CMR 15.017. I further certify that the results of my soil evaluation, as indicated in the attached Soil Evaluation Form, are accurate and in accordance with 310 CMR 15.017.

Alexander F. Parker *#1848*	June 1998
Massachusetts Soil Evaluator & Certification number	Date of Soil Evaluator Certification
Mr. Joe Serwatka, Georgetown Board of Health Representative	11/30/2020
Town of Georgetown Health Department	Date of soil testing

TP20-16 DEEP OBSERVATION HOLE

2 Norino Way, Georgetown, Massachusetts

FOR SEPTIC DESIGN

Date: November 30, 2020 Time: 09:59 Weather: Overcast, heavy rain, 50-55ºF, SW wind

Landscape: Upland Landform: Ground moraine Position on landscape: Side slope

Slope aspect: Westerly Slope (%): 02- 03% Slope complexity: Simple Land Cover: Hard and softwoods and brush

Property line: 10+ feet Drainage way: 50+ feet Drinking water well: 100+ feet Abutting septic system: 50+ feet

Wetlands: 100+ feet Public water supply reservoir: 400+ feet Tributary to reservoir: 200+ feet

SOIL PROFILE ► TP20-16

Depth below land surface (inches)	Soil Horizon/ Layer	Soil Texture (USDA/ NRCS)	Soil Color (Munsell)	Redoxomorphic Features/ ESHGWT	Consistence, grade, size, structure, grain size, soil moisture state, roots, horizon boundary, clasts, stratification, artifacts, restrictive features, etc.
00” → 06”	A_P	Sandy Loam	10YR 3/2 very dark grayish brown	none observed	Very friable; moderate-grade; fine-to-medium granular structure; somewhat cohesive; fine grained mineral content; slightly damp; non-sticky; non-plastic; many fine-to-medium tree and brush roots; free of clasts; clear wavy boundary.
06” → 17”	B_w	Sandy Loam	10YR 4/6 dark yellowish brown	none observed	Very friable; weak-grade, medium sub-angular blocky structure; somewhat cohesive; mixed medium to mostly fine-grained mineral content; damp matrix; non-sticky; non-plastic; common fine and medium roots; ~05% rounded to sub-rounded gravel content of mixed lithology; clear wavy boundary.
17” → 115”	$2C_d$	Sandy Loam	2.5Y 5/4 light olive brown	28” (c,1-2,p) 10YR 7/1 5YR 5/8	Friable to firm; dense compact matrix; massive to subangular platy structure of moderate grade; mixed fine-to-medium grained mineral content; crudely stratified; damp matrix; non-sticky; non-plastic; well graded; approximately 15-20% sub-angular to sub-rounded gravel and 10-15% subrounded to angular cobble content of mixed lithology; redoximorphic features observed at 28”; no apparent water observed; no bedrock refusal at test hole depth.

Depth to bedrock: $>$ 115” Seasonal High Groundwater Table: 28” Apparent water table: ____

TP20-16 DEEP OBSERVATION HOLE

2 Norino Way, Georgetown, Massachusetts

FOR SEPTIC DESIGN

DEPTH TO APPARENT/ PHREATIC GROUNDWATER TABLE: *NONE OBSERVED*

Apparent water seeping from pit face:___ (below land surface) Depth to stabilized apparent water: ___ (below land surface)

Soil moisture state: Damp

ESTIMATED SEASONAL HIGH GROUNDWATER TABLE:

Depth of Estimated Seasonal High Groundwater Table: 28" (below land surface)

Kind: Iron concentrations; noncemented iron masses and reduction spots – iron coatings on sand grains

Location: In $2C_d$ matrix surrounding redox depletions Shape: Irregular/ spherical

Hardness: Soft Boundary: Clear Abundance: Common Size: Fine to medium Contrast: Prominent

Concentration color: 5YR 5/8 yellowish red Reduction color: 10YR 7/1 light gray Moisture state: Damp

DETERMINATION OF HIGH GROUNDWATER ELEVATION

Observed depth to redoximorphic features: 28" inches below grade

Observed depth to stabilized phreatic water: ___ inches below grade

Observed water weeping from side of deep hole: ___ inches below grade

DEPTH OF NATURALLY OCCURRING PERVIOUS MATERIAL: ► 9.08'

Depth of naturally occurring pervious material in TP20-16 Upper boundary: 06"
Lower boundary: 115"

Certification

I certify that I am currently approved by the Department of Environmental Protection pursuant to 310 CMR 15.017 to conduct evaluations and that the above analysis has been performed by me consistent with the required training, expertise and experience described in 310 CMR 15.017. I further certify that the results of my soil evaluation, as indicated in the attached Soil Evaluation Form, are accurate and in accordance with 310 CMR 15.017.

Alexander F. Parker *#1848* — June 1998

Massachusetts Soil Evaluator & Certification number — Date of Soil Evaluator Certification

Mr. Joe Serwatka, Georgetown Board of Health Representative — 11/30/2020

Town of Georgetown Health Department — Date of soil testing

TP20-17 DEEP OBSERVATION HOLE

2 Norino Way, Georgetown, Massachusetts

Date: November 30, 2020 Time: 10:18 Weather: Overcast, heavy rain, 50-55ºF, SW wind

Landscape: Upland Landform: Ground moraine Position on landscape: Side slope

Slope aspect: Westerly Slope (%): 02- 03% Slope complexity: Simple Land Cover: Hard and softwoods and brush

Property line: 10^+ feet Drainage way: 50^+ feet Drinking water well: 100^+ feet Abutting septic system: 50^+ feet

Wetlands: 100^+ feet Public water supply reservoir: 400^+ feet Tributary to reservoir: 200^+ feet

SOIL PROFILE ► TP20-17

Depth below land surface (inches)	Soil Horizon/ Layer	Soil Texture (USDA/ NRCS)	Soil Color (Munsell)	Redoxomorphic Features/ ESHGWT	Consistence, grade, size, structure, grain size, soil moisture state, roots, horizon boundary, clasts, stratification, artifacts, restrictive features, etc.
00” → 06”	A_P	Sandy Loam	10YR 3/2 very dark grayish brown	none observed	Very friable; moderate-grade; fine-to-medium granular structure; somewhat cohesive; fine grained mineral content; slightly damp; non-sticky; non-plastic; many fine-to-medium tree and brush roots; free of clasts; clear wavy boundary.
06” → 20”	B_w	Sandy Loam	10YR 4/6 dark yellowish brown	none observed	Very friable; weak-grade, medium sub-angular blocky structure; somewhat cohesive; mixed medium to mostly fine-grained mineral content; damp matrix; non-sticky; non-plastic; common fine and medium roots; ~05% rounded to sub-rounded gravel content of mixed lithology; clear wavy boundary.
20” → 100”	$2C_d$	Sandy Loam	2.5Y 5/4 light olive brown	36” (c,1-2,p) 10YR 7/1 5YR 5/8	Friable to firm; dense compact matrix; massive to subangular platy structure of moderate grade; mixed fine-to-medium grained mineral content; crudely stratified; damp matrix; non-sticky; non-plastic; well graded; approximately 15-20% sub-angular to sub-rounded gravel and 10-15% subrounded to angular cobble content of mixed lithology; redoximorphic features observed at 36”; no apparent water observed; no bedrock refusal at test hole depth.

Depth to bedrock: $\geq$ 100” Seasonal High Groundwater Table: 36” Apparent water table: ____

TP20-17 DEEP OBSERVATION HOLE

2 Norino Way, Georgetown, Massachusetts

DEPTH TO APPARENT/ PHREATIC GROUNDWATER TABLE: *NONE OBSERVED*

Apparent water seeping from pit face:___ (below land surface)   Depth to stabilized apparent water: ___ (below land surface)

Soil moisture state: Damp

ESTIMATED SEASONAL HIGH GROUNDWATER TABLE:

Depth of Estimated Seasonal High Groundwater Table: 36” (below land surface)

Kind: Iron concentrations; noncemented iron masses and reduction spots – iron coatings on sand grains

Location: In $2C_d$ matrix surrounding redox depletions   Shape: Irregular/ spherical

Hardness: Soft   Boundary: Clear   Abundance: Common   Size: Fine to medium   Contrast: Prominent

Concentration color: 5YR 5/8 yellowish red   Reduction color: 10YR 7/1 light gray   Moisture state: Damp

DETERMINATION OF HIGH GROUNDWATER ELEVATION

Observed depth to redoximorphic features: 36” inches below grade

Observed depth to stabilized phreatic water: ___ inches below grade

Observed water weeping from side of deep hole: ___ inches below grade

DEPTH OF NATURALLY OCCURRING PERVIOUS MATERIAL: ► 7.83’

Depth of naturally occurring pervious material in TP20-17   Upper boundary: 06”
Lower boundary: 100”

Certification

I certify that I am currently approved by the Department of Environmental Protection pursuant to 310 CMR 15.017 to conduct evaluations and that the above analysis has been performed by me consistent with the required training, expertise and experience described in 310 CMR 15.017. I further certify that the results of my soil evaluation, as indicated in the attached Soil Evaluation Form, are accurate and in accordance with 310 CMR 15.017.

Alexander F. Parker *#1848*   June 1998

Massachusetts Soil Evaluator & Certification number   Date of Soil Evaluator Certification

Unofficial soil test pits   11/30/2020

Town of Georgetown Health Department   Date of soil testing

TP20-18 DEEP OBSERVATION HOLE

2 Norino Way, Georgetown, Massachusetts

Date: November 30, 2020 Time: 10:39 Weather: Overcast, heavy rain, 50-55°F, SW wind

Landscape: Upland Landform: Ground moraine Position on landscape: Side slope

Slope aspect: Westerly Slope (%): 02- 03% Slope complexity: Simple Land Cover: Hard and softwoods and brush

Property line: 10^+ feet Drainage way: 50^+ feet Drinking water well: 100^+ feet Abutting septic system: 50^+ feet

Wetlands: 100^+ feet Public water supply reservoir: 400^+ feet Tributary to reservoir: 200^+ feet

SOIL PROFILE ► TP20-18

Depth below land surface (inches)	Soil Horizon/ Layer	Soil Texture (USDA/ NRCS)	Soil Color (Munsell)	Redoxomorphic Features/ ESHGWT	Consistence, grade, size, structure, grain size, soil moisture state, roots, horizon boundary, clasts, stratification, artifacts, restrictive features, etc.
00” → 07”	A_P	Sandy Loam	10YR 3/2 very dark grayish brown	none observed	Very friable; moderate-grade; fine-to-medium granular structure; somewhat cohesive; fine grained mineral content; slightly damp; non-sticky; non-plastic; many fine-to-medium tree and brush roots; free of clasts; clear wavy boundary.
07” → 20”	B_w	Sandy Loam	10YR 4/6 dark yellowish brown	none observed	Very friable; weak-grade, medium sub-angular blocky structure; somewhat cohesive; mixed medium to mostly fine-grained mineral content; damp matrix; non-sticky; non-plastic; common fine and medium roots; ~05% rounded to sub-rounded gravel content of mixed lithology; clear wavy boundary.
20” → 100”	$2C_d$	Sandy Loam	2.5Y 5/4 light olive brown	42” (c,1-2,p) 10YR 7/1 5YR 5/8	Friable to firm; dense compact matrix; massive to subangular platy structure of moderate grade; mixed fine-to-medium grained mineral content; crudely stratified; damp matrix; non-sticky; non-plastic; well graded; approximately 15-20% sub-angular to sub-rounded gravel and 10-15% subrounded to angular cobble content of mixed lithology; redoximorphic features observed at 42”; no apparent water observed; no bedrock refusal at test hole depth.

Depth to bedrock: $\geq$ 100” Seasonal High Groundwater Table: 42” Apparent water table: ____

TP20-18 DEEP OBSERVATION HOLE

2 Norino Way, Georgetown, Massachusetts

DEPTH TO APPARENT/ PHREATIC GROUNDWATER TABLE: *NONE OBSERVED*

Apparent water seeping from pit face:___ (below land surface) Depth to stabilized apparent water: ___ (below land surface)

Soil moisture state: Damp

ESTIMATED SEASONAL HIGH GROUNDWATER TABLE:

Depth of Estimated Seasonal High Groundwater Table: 42” (below land surface)

Kind: Iron concentrations; noncemented iron masses and reduction spots – iron coatings on sand grains

Location: In $2C_d$ matrix surrounding redox depletions Shape: Irregular/ spherical

Hardness: Soft Boundary: Clear Abundance: Common Size: Fine to medium Contrast: Prominent

Concentration color: 5YR 5/8 yellowish red Reduction color: 10YR 7/1 light gray Moisture state: Damp

DETERMINATION OF HIGH GROUNDWATER ELEVATION

Observed depth to redoximorphic features: 42” inches below grade

Observed depth to stabilized phreatic water: ___ inches below grade

Observed water weeping from side of deep hole: ___ inches below grade

DEPTH OF NATURALLY OCCURRING PERVIOUS MATERIAL: ► 7.75’

Depth of naturally occurring pervious material in TP20-18 Upper boundary: 07”
Lower boundary: 100”

Certification

I certify that I am currently approved by the Department of Environmental Protection pursuant to 310 CMR 15.017 to conduct evaluations and that the above analysis has been performed by me consistent with the required training, expertise and experience described in 310 CMR 15.017. I further certify that the results of my soil evaluation, as indicated in the attached Soil Evaluation Form, are accurate and in accordance with 310 CMR 15.017.

Alexander F. Parker *#1848*
Massachusetts Soil Evaluator & Certification number

June 1998
Date of Soil Evaluator Certification

Unofficial soil test pits
Town of Georgetown Health Department

11/30/2020
Date of soil testing

TP20-19 DEEP OBSERVATION HOLE

2 Norino Way, Georgetown, Massachusetts

Date: November 30, 2020 Time: 10:58 Weather: Overcast, heavy rain, 50-55ºF, SW wind

Landscape: Upland Landform: Ground moraine Position on landscape: Side slope

Slope aspect: Westerly Slope (%): 02- 03% Slope complexity: Simple Land Cover: Hard and softwoods and brush

Property line: 10^+ feet Drainage way: 50^+ feet Drinking water well: 100^+ feet Abutting septic system: 50^+ feet

Wetlands: 100^+ feet Public water supply reservoir: 400^+ feet Tributary to reservoir: 200^+ feet

SOIL PROFILE ► TP20-19

Depth below land surface (inches)	Soil Horizon/ Layer	Soil Texture (USDA/ NRCS)	Soil Color (Munsell)	Redoxomorphic Features/ ESHGWT	Consistence, grade, size, structure, grain size, soil moisture state, roots, horizon boundary, clasts, stratification, artifacts, restrictive features, etc.
00” → 08”	A_P	Sandy Loam	10YR 3/2 very dark grayish brown	none observed	Very friable; moderate-grade; fine-to-medium granular structure; somewhat cohesive; fine grained mineral content; slightly damp; non-sticky; non-plastic; many fine-to-medium tree and brush roots; free of clasts; clear wavy boundary.
08” → 21”	B_w	Sandy Loam	10YR 4/6 dark yellowish brown	none observed	Very friable; weak-grade, medium sub-angular blocky structure; somewhat cohesive; mixed medium to mostly fine-grained mineral content; damp matrix; non-sticky; non-plastic; common fine and medium roots; ~05% rounded to sub-rounded gravel content of mixed lithology; clear wavy boundary.
21” → 100”	$2C_d$	Sandy Loam	2.5Y 5/4 light olive brown	40” (c,1-2,p) 10YR 7/1 5YR 5/8	Friable to firm; dense compact matrix; massive to subangular platy structure of moderate grade; mixed fine-to-medium grained mineral content; crudely stratified; damp matrix; non-sticky; non-plastic; well graded; approximately 15-20% sub-angular to sub-rounded gravel and 10-15% subrounded to angular cobble content of mixed lithology; redoximorphic features observed at 40”; no apparent water observed; no bedrock refusal at test hole depth.

Depth to bedrock: $\geq$ 100” Seasonal High Groundwater Table: 40” Apparent water table: ____

TP20-19 DEEP OBSERVATION HOLE

2 Norino Way, Georgetown, Massachusetts

DEPTH TO APPARENT/ PHREATIC GROUNDWATER TABLE: *NONE OBSERVED*

Apparent water seeping from pit face:___ (below land surface) Depth to stabilized apparent water: ___ (below land surface)

Soil moisture state: Damp

ESTIMATED SEASONAL HIGH GROUNDWATER TABLE:

Depth of Estimated Seasonal High Groundwater Table: 40” (below land surface)

Kind: Iron concentrations; noncemented iron masses and reduction spots – iron coatings on sand grains

Location: In $2C_d$ matrix surrounding redox depletions Shape: Irregular/ spherical

Hardness: Soft Boundary: Clear Abundance: Common Size: Fine to medium Contrast: Prominent

Concentration color: 5YR 5/8 yellowish red Reduction color: 10YR 7/1 light gray Moisture state: Damp

DETERMINATION OF HIGH GROUNDWATER ELEVATION

Observed depth to redoximorphic features: 40” inches below grade

Observed depth to stabilized phreatic water: ___ inches below grade

Observed water weeping from side of deep hole: ___ inches below grade

DEPTH OF NATURALLY OCCURRING PERVIOUS MATERIAL: ► 7.66’

Depth of naturally occurring pervious material in TP20-19 Upper boundary: 08”
Lower boundary: 100”

Certification

I certify that I am currently approved by the Department of Environmental Protection pursuant to 310 CMR 15.017 to conduct evaluations and that the above analysis has been performed by me consistent with the required training, expertise and experience described in 310 CMR 15.017. I further certify that the results of my soil evaluation, as indicated in the attached Soil Evaluation Form, are accurate and in accordance with 310 CMR 15.017.

Alexander F. Parker *#1848*
Massachusetts Soil Evaluator & Certification number

June 1998
Date of Soil Evaluator Certification

Unofficial soil test pits
Town of Georgetown Health Department

11/30/2020
Date of soil testing

TP20-20 DEEP OBSERVATION HOLE

2 Norino Way, Georgetown, Massachusetts

Date: November 30, 2020 Time: 11:10 Weather: Overcast, heavy rain, 50-55ºF, SW wind

Landscape: Upland Landform: Ground moraine Position on landscape: Side slope

Slope aspect: Westerly Slope (%): 02- 03% Slope complexity: Simple Land Cover: Hard and softwoods and brush

Property line: 10^+ feet Drainage way: 50^+ feet Drinking water well: 100^+ feet Abutting septic system: 50^+ feet

Wetlands: 100^+ feet Public water supply reservoir: 400^+ feet Tributary to reservoir: 200^+ feet

SOIL PROFILE ► TP20-20

Depth below land surface (inches)	Soil Horizon/ Layer	Soil Texture (USDA/ NRCS)	Soil Color (Munsell)	Redoxomorphic Features/ ESHGWT	Consistence, grade, size, structure, grain size, soil moisture state, roots, horizon boundary, clasts, stratification, artifacts, restrictive features, etc.
00” → 08”	A_P	Sandy Loam	10YR 3/2 very dark grayish brown	none observed	Very friable; moderate-grade; fine-to-medium granular structure; somewhat cohesive; fine grained mineral content; slightly damp; non-sticky; non-plastic; many fine-to-medium tree and brush roots; free of clasts; clear wavy boundary.
08” → 20”	B_w	Sandy Loam	10YR 4/6 dark yellowish brown	none observed	Very friable; weak-grade, medium sub-angular blocky structure; somewhat cohesive; mixed medium to mostly fine-grained mineral content; damp matrix; non-sticky; non-plastic; common fine and medium roots; ~05% rounded to sub-rounded gravel content of mixed lithology; clear wavy boundary.
20” → 101”	$2C_d$	Sandy Loam	2.5Y 5/4 light olive brown	42” (c,1-2,p) 10YR 7/1 5YR 5/8	Friable to firm; dense compact matrix; massive to subangular platy structure of moderate grade; mixed fine-to-medium grained mineral content; crudely stratified; damp matrix; non-sticky; non-plastic; well graded; approximately 15-20% sub-angular to sub-rounded gravel and 10-15% subrounded to angular cobble content of mixed lithology; redoximorphic features observed at 42”; no apparent water observed; no bedrock refusal at test hole depth.

Depth to bedrock: $\geq$ 101” Seasonal High Groundwater Table: 42” Apparent water table: ____

TP20-20 DEEP OBSERVATION HOLE

2 Norino Way, Georgetown, Massachusetts

DEPTH TO APPARENT/ PHREATIC GROUNDWATER TABLE: *NONE OBSERVED*

Apparent water seeping from pit face:___ (below land surface) Depth to stabilized apparent water: ___ (below land surface)

Soil moisture state: Damp

ESTIMATED SEASONAL HIGH GROUNDWATER TABLE:

Depth of Estimated Seasonal High Groundwater Table: 42” (below land surface)

Kind: Iron concentrations; noncemented iron masses and reduction spots – iron coatings on sand grains

Location: In $2C_d$ matrix surrounding redox depletions Shape: Irregular/ spherical

Hardness: Soft Boundary: Clear Abundance: Common Size: Fine to medium Contrast: Prominent

Concentration color: 5YR 5/8 yellowish red Reduction color: 10YR 7/1 light gray Moisture state: Damp

DETERMINATION OF HIGH GROUNDWATER ELEVATION

Observed depth to redoximorphic features: 42” inches below grade

Observed depth to stabilized phreatic water: ___ inches below grade

Observed water weeping from side of deep hole: ___ inches below grade

DEPTH OF NATURALLY OCCURRING PERVIOUS MATERIAL: ► 7.75’

Depth of naturally occurring pervious material in TP20-20 Upper boundary: 08”
Lower boundary: 101”

Certification

I certify that I am currently approved by the Department of Environmental Protection pursuant to 310 CMR 15.017 to conduct evaluations and that the above analysis has been performed by me consistent with the required training, expertise and experience described in 310 CMR 15.017. I further certify that the results of my soil evaluation, as indicated in the attached Soil Evaluation Form, are accurate and in accordance with 310 CMR 15.017.

Alexander F. Parker *#1848*
Massachusetts Soil Evaluator & Certification number

June 1998
Date of Soil Evaluator Certification

Unofficial soil test pits
Town of Georgetown Health Department

11/30/2020
Date of soil testing

TP20-21 DEEP OBSERVATION HOLE

2 Norino Way, Georgetown, Massachusetts

Date: November 30, 2020 Time: 11:28 Weather: Overcast, heavy rain, 50-55°F, SW wind

Landscape: Upland Landform: Ground moraine Position on landscape: Side slope

Slope aspect: Westerly Slope (%): 02- 03% Slope complexity: Simple Land Cover: Hard and softwoods and brush

Property line: 10^+ feet Drainage way: 50^+ feet Drinking water well: 100^+ feet Abutting septic system: 50^+ feet

Wetlands: 100^+ feet Public water supply reservoir: 400^+ feet Tributary to reservoir: 200^+ feet

SOIL PROFILE ► TP20-21

Depth below land surface (inches)	Soil Horizon/ Layer	Soil Texture (USDA/ NRCS)	Soil Color (Munsell)	Redoxomorphic Features/ ESHGWT	Consistence, grade, size, structure, grain size, soil moisture state, roots, horizon boundary, clasts, stratification, artifacts, restrictive features, etc.
00” → 10”	A_P	Sandy Loam	10YR 3/2 very dark grayish brown	none observed	Very friable; moderate-grade; fine-to-medium granular structure; somewhat cohesive; fine grained mineral content; slightly damp; non-sticky; non-plastic; many fine-to-medium tree and brush roots; free of clasts; clear wavy boundary.
10” → 19”	B_w	Sandy Loam	10YR 4/6 dark yellowish brown	none observed	Very friable; weak-grade, medium sub-angular blocky structure; somewhat cohesive; mixed medium to mostly fine-grained mineral content; damp matrix; non-sticky; non-plastic; common fine and medium roots; ~05% rounded to sub-rounded gravel content of mixed lithology; clear wavy boundary.
19” → 100”	$2C_d$	Sandy Loam	2.5Y 5/4 light olive brown	39” (c,1-2,p) 10YR 7/1 5YR 5/8	Friable to firm; dense compact matrix; massive to subangular platy structure of moderate grade; mixed fine-to-medium grained mineral content; crudely stratified; damp matrix; non-sticky; non-plastic; well graded; approximately 15-20% sub-angular to sub-rounded gravel and 10-15% subrounded to angular cobble content of mixed lithology; redoximorphic features observed at 39”; no apparent water observed; no bedrock refusal at test hole depth.

Depth to bedrock: $\geq$ 100” Seasonal High Groundwater Table: 39” Apparent water table: ____

TP20-21 DEEP OBSERVATION HOLE

2 Norino Way, Georgetown, Massachusetts

DEPTH TO APPARENT/ PHREATIC GROUNDWATER TABLE: *NONE OBSERVED*

Apparent water seeping from pit face:___ (below land surface) Depth to stabilized apparent water: ___ (below land surface)

Soil moisture state: Damp

ESTIMATED SEASONAL HIGH GROUNDWATER TABLE:

Depth of Estimated Seasonal High Groundwater Table: 39” (below land surface)

Kind: Iron concentrations; noncemented iron masses and reduction spots – iron coatings on sand grains

Location: In $2C_d$ matrix surrounding redox depletions Shape: Irregular/ spherical

Hardness: Soft Boundary: Clear Abundance: Common Size: Fine to medium Contrast: Prominent

Concentration color: 5YR 5/8 yellowish red Reduction color: 10YR 7/1 light gray Moisture state: Damp

DETERMINATION OF HIGH GROUNDWATER ELEVATION

Observed depth to redoximorphic features: 39” inches below grade

Observed depth to stabilized phreatic water: ___ inches below grade

Observed water weeping from side of deep hole: ___ inches below grade

DEPTH OF NATURALLY OCCURRING PERVIOUS MATERIAL: ► 7.50’

Depth of naturally occurring pervious material in TP20-21 Upper boundary: 10”
Lower boundary: 100”

Certification

I certify that I am currently approved by the Department of Environmental Protection pursuant to 310 CMR 15.017 to conduct evaluations and that the above analysis has been performed by me consistent with the required training, expertise and experience described in 310 CMR 15.017. I further certify that the results of my soil evaluation, as indicated in the attached Soil Evaluation Form, are accurate and in accordance with 310 CMR 15.017.

Alexander F. Parker *#1848*
Massachusetts Soil Evaluator & Certification number

June 1998
Date of Soil Evaluator Certification

Unofficial soil test pits
Town of Georgetown Health Department

11/30/2020
Date of soil testing

TP20-22 DEEP OBSERVATION HOLE

2 Norino Way, Georgetown, Massachusetts

Date: November 30, 2020 Time: 11:44 Weather: Overcast, heavy rain, 50-55ºF, SW wind

Landscape: Upland Landform: Ground moraine Position on landscape: Side slope

Slope aspect: Westerly Slope (%): 02- 03% Slope complexity: Simple Land Cover: Hard and softwoods and brush

Property line: 10^+ feet Drainage way: 50^+ feet Drinking water well: 100^+ feet Abutting septic system: 50^+ feet

Wetlands: 100^+ feet Public water supply reservoir: 400^+ feet Tributary to reservoir: 200^+ feet

SOIL PROFILE ► TP20-22

Depth below land surface (inches)	Soil Horizon/ Layer	Soil Texture (USDA/ NRCS)	Soil Color (Munsell)	Redoxomorphic Features/ ESHGWT	Consistence, grade, size, structure, grain size, soil moisture state, roots, horizon boundary, clasts, stratification, artifacts, restrictive features, etc.
00” → 08”	A_P	Sandy Loam	10YR 3/2 very dark grayish brown	none observed	Very friable; moderate-grade; fine-to-medium granular structure; somewhat cohesive; fine grained mineral content; slightly damp; non-sticky; non-plastic; many fine-to-medium tree and brush roots; free of clasts; clear wavy boundary.
08” → 22”	B_w	Sandy Loam	10YR 4/6 dark yellowish brown	none observed	Very friable; weak-grade, medium sub-angular blocky structure; somewhat cohesive; mixed medium to mostly fine-grained mineral content; damp matrix; non-sticky; non-plastic; common fine and medium roots; ~05% rounded to sub-rounded gravel content of mixed lithology; clear wavy boundary.
22” → 100”	$2C_d$	Sandy Loam	2.5Y 5/4 light olive brown	44” (c,1-2,p) 10YR 7/1 5YR 5/8	Friable to firm; dense compact matrix; massive to subangular platy structure of moderate grade; mixed fine-to-medium grained mineral content; crudely stratified; damp matrix; non-sticky; non-plastic; well graded; approximately 15-20% sub-angular to sub-rounded gravel and 10-15% subrounded to angular cobble content of mixed lithology; redoximorphic features observed at 44”; no apparent water observed; no bedrock refusal at test hole depth.

Depth to bedrock: $\geq$ 100” Seasonal High Groundwater Table: 44” Apparent water table: ____

TP20-22 DEEP OBSERVATION HOLE

2 Norino Way, Georgetown, Massachusetts

DEPTH TO APPARENT/ PHREATIC GROUNDWATER TABLE: *NONE OBSERVED*

Apparent water seeping from pit face:___ (below land surface) Depth to stabilized apparent water: ___ (below land surface)

Soil moisture state: Damp

ESTIMATED SEASONAL HIGH GROUNDWATER TABLE:

Depth of Estimated Seasonal High Groundwater Table: 44” (below land surface)

Kind: Iron concentrations; noncemented iron masses and reduction spots – iron coatings on sand grains

Location: In $2C_d$ matrix surrounding redox depletions Shape: Irregular/ spherical

Hardness: Soft Boundary: Clear Abundance: Common Size: Fine to medium Contrast: Prominent

Concentration color: 5YR 5/8 yellowish red Reduction color: 10YR 7/1 light gray Moisture state: Damp

DETERMINATION OF HIGH GROUNDWATER ELEVATION

Observed depth to redoximorphic features: 44” inches below grade

Observed depth to stabilized phreatic water: ___ inches below grade

Observed water weeping from side of deep hole: ___ inches below grade

DEPTH OF NATURALLY OCCURRING PERVIOUS MATERIAL: ► 7.66’

Depth of naturally occurring pervious material in TP20-22 Upper boundary: 08”
Lower boundary: 100”

Certification

I certify that I am currently approved by the Department of Environmental Protection pursuant to 310 CMR 15.017 to conduct evaluations and that the above analysis has been performed by me consistent with the required training, expertise and experience described in 310 CMR 15.017. I further certify that the results of my soil evaluation, as indicated in the attached Soil Evaluation Form, are accurate and in accordance with 310 CMR 15.017.

Alexander F. Parker *#1848*
Massachusetts Soil Evaluator & Certification number

June 1998
Date of Soil Evaluator Certification

Unofficial soil test pits
Town of Georgetown Health Department

11/30/2020
Date of soil testing

TP20-23 DEEP OBSERVATION HOLE

2 Norino Way, Georgetown, Massachusetts

Date: November 30, 2020 Time: 11:59 Weather: Overcast, heavy rain, 50-55ºF, SW wind

Landscape: Upland Landform: Ground moraine Position on landscape: Side slope

Slope aspect: Westerly Slope (%): 02- 03% Slope complexity: Simple Land Cover: Hard and softwoods and brush

Property line: 10+ feet Drainage way: 50+ feet Drinking water well: 100+ feet Abutting septic system: 50+ feet

Wetlands: 100+ feet Public water supply reservoir: 400+ feet Tributary to reservoir: 200+ feet

SOIL PROFILE ► TP20-23

Depth below land surface (inches)	Soil Horizon/ Layer	Soil Texture (USDA/ NRCS)	Soil Color (Munsell)	Redoxomorphic Features/ ESHGWT	Consistence, grade, size, structure, grain size, soil moisture state, roots, horizon boundary, clasts, stratification, artifacts, restrictive features, etc.
00” → 08”	A_P	Sandy Loam	10YR 3/2 very dark grayish brown	none observed	Very friable; moderate-grade; fine-to-medium granular structure; somewhat cohesive; fine grained mineral content; slightly damp; non-sticky; non-plastic; many fine-to-medium tree and brush roots; free of clasts; clear wavy boundary.
08” → 19”	B_w	Sandy Loam	10YR 4/6 dark yellowish brown	none observed	Very friable; weak-grade, medium sub-angular blocky structure; somewhat cohesive; mixed medium to mostly fine-grained mineral content; damp matrix; non-sticky; non-plastic; common fine and medium roots; ~05% rounded to sub-rounded gravel content of mixed lithology; clear wavy boundary.
19” → 101”	$2C_d$	Sandy Loam	2.5Y 5/4 light olive brown	38” (c,1-2,p) 10YR 7/1 5YR 5/8	Friable to firm; dense compact matrix; massive to subangular platy structure of moderate grade; mixed fine-to-medium grained mineral content; crudely stratified; damp matrix; non-sticky; non-plastic; well graded; approximately 15-20% sub-angular to sub-rounded gravel and 10-15% subrounded to angular cobble content of mixed lithology; redoximorphic features observed at 38”; no apparent water observed; no bedrock refusal at test hole depth.

Depth to bedrock: > 101” Seasonal High Groundwater Table: 38” Apparent water table: ____

TP20-23 DEEP OBSERVATION HOLE

2 Norino Way, Georgetown, Massachusetts

DEPTH TO APPARENT/ PHREATIC GROUNDWATER TABLE: *NONE OBSERVED*

Apparent water seeping from pit face:___ (below land surface) Depth to stabilized apparent water: ___ (below land surface)

Soil moisture state: Damp

ESTIMATED SEASONAL HIGH GROUNDWATER TABLE:

Depth of Estimated Seasonal High Groundwater Table: 38” (below land surface)

Kind: Iron concentrations; noncemented iron masses and reduction spots – iron coatings on sand grains

Location: In $2C_d$ matrix surrounding redox depletions Shape: Irregular/ spherical

Hardness: Soft Boundary: Clear Abundance: Common Size: Fine to medium Contrast: Prominent

Concentration color: 5YR 5/8 yellowish red Reduction color: 10YR 7/1 light gray Moisture state: Damp

DETERMINATION OF HIGH GROUNDWATER ELEVATION

Observed depth to redoximorphic features: 38” inches below grade

Observed depth to stabilized phreatic water: ___ inches below grade

Observed water weeping from side of deep hole: ___ inches below grade

DEPTH OF NATURALLY OCCURRING PERVIOUS MATERIAL: ► 7.75’

Depth of naturally occurring pervious material in TP20-23 Upper boundary: 08”
Lower boundary: 101”

Certification

I certify that I am currently approved by the Department of Environmental Protection pursuant to 310 CMR 15.017 to conduct evaluations and that the above analysis has been performed by me consistent with the required training, expertise and experience described in 310 CMR 15.017. I further certify that the results of my soil evaluation, as indicated in the attached Soil Evaluation Form, are accurate and in accordance with 310 CMR 15.017.

Alexander F. Parker *#1848* — June 1998

Massachusetts Soil Evaluator & Certification number — Date of Soil Evaluator Certification

Unofficial soil test pits — 11/30/2020

Town of Georgetown Health Department — Date of soil testing

TP20-24 DEEP OBSERVATION HOLE

2 Norino Way, Georgetown, Massachusetts

Date: November 30, 2020 Time: 12:22 Weather: Overcast, heavy rain, 50-55ºF, SW wind

Landscape: Upland Landform: Ground moraine Position on landscape: Side slope

Slope aspect: Westerly Slope (%): 02- 03% Slope complexity: Simple Land Cover: Hard and softwoods and brush

Property line: 10^{+} feet Drainage way: 50^{+} feet Drinking water well: 100^{+} feet Abutting septic system: 50^{+} feet

Wetlands: 100^{+} feet Public water supply reservoir: 400^{+} feet Tributary to reservoir: 200^{+} feet

SOIL PROFILE ► TP20-24

Depth below land surface (inches)	Soil Horizon/ Layer	Soil Texture (USDA/ NRCS)	Soil Color (Munsell)	Redoxomorphic Features/ ESHGWT	Consistence, grade, size, structure, grain size, soil moisture state, roots, horizon boundary, clasts, stratification, artifacts, restrictive features, etc.
00” → 11”	A_P	Sandy Loam	10YR 3/2 very dark grayish brown	none observed	Very friable; moderate-grade; fine-to-medium granular structure; somewhat cohesive; fine grained mineral content; slightly damp; non-sticky; non-plastic; many fine-to-medium tree and brush roots; free of clasts; clear wavy boundary.
11” → 25”	B_w	Sandy Loam	10YR 4/6 dark yellowish brown	none observed	Very friable; weak-grade, medium sub-angular blocky structure; somewhat cohesive; mixed medium to mostly fine-grained mineral content; damp matrix; non-sticky; non-plastic; common fine and medium roots; ~05% rounded to sub-rounded gravel content of mixed lithology; clear wavy boundary.
25” → 102”	$2C_d$	Sandy Loam	2.5Y 5/4 light olive brown	39” (c,1-2,p) 10YR 7/1 5YR 5/8	Friable to firm; dense compact matrix; massive to subangular platy structure of moderate grade; mixed fine-to-medium grained mineral content; crudely stratified; damp matrix; non-sticky; non-plastic; well graded; approximately 15-20% sub-angular to sub-rounded gravel and 10-15% subrounded to angular cobble content of mixed lithology; redoximorphic features observed at 39”; no apparent water observed; no bedrock refusal at test hole depth.

Depth to bedrock: $\geq$ 102” Seasonal High Groundwater Table: 39” Apparent water table: ____

TP20-24 DEEP OBSERVATION HOLE

2 Norino Way, Georgetown, Massachusetts

DEPTH TO APPARENT/ PHREATIC GROUNDWATER TABLE: *NONE OBSERVED*

Apparent water seeping from pit face:___ (below land surface) Depth to stabilized apparent water: ___ (below land surface)

Soil moisture state: Damp

ESTIMATED SEASONAL HIGH GROUNDWATER TABLE:

Depth of Estimated Seasonal High Groundwater Table: 39” (below land surface)

Kind: Iron concentrations; noncemented iron masses and reduction spots – iron coatings on sand grains

Location: In $2C_d$ matrix surrounding redox depletions Shape: Irregular/ spherical

Hardness: Soft Boundary: Clear Abundance: Common Size: Fine to medium Contrast: Prominent

Concentration color: 5YR 5/8 yellowish red Reduction color: 10YR 7/1 light gray Moisture state: Damp

DETERMINATION OF HIGH GROUNDWATER ELEVATION

Observed depth to redoximorphic features: 39” inches below grade

Observed depth to stabilized phreatic water: ___ inches below grade

Observed water weeping from side of deep hole: ___ inches below grade

DEPTH OF NATURALLY OCCURRING PERVIOUS MATERIAL: ► 7.58’

Depth of naturally occurring pervious material in TP20-24 Upper boundary: 11”
Lower boundary: 102”

Certification

I certify that I am currently approved by the Department of Environmental Protection pursuant to 310 CMR 15.017 to conduct evaluations and that the above analysis has been performed by me consistent with the required training, expertise and experience described in 310 CMR 15.017. I further certify that the results of my soil evaluation, as indicated in the attached Soil Evaluation Form, are accurate and in accordance with 310 CMR 15.017.

Alexander F. Parker *#1848*
Massachusetts Soil Evaluator & Certification number

June 1998
Date of Soil Evaluator Certification

Unofficial soil test pits
Town of Georgetown Health Department

11/30/2020
Date of soil testing

TP20-25 DEEP OBSERVATION HOLE

2 Norino Way, Georgetown, Massachusetts

Date: November 30, 2020 Time: 12:43 Weather: Overcast, heavy rain, 50-55ºF, SW wind

Landscape: Upland Landform: Ground moraine Position on landscape: Side slope

Slope aspect: Westerly Slope (%): 02- 03% Slope complexity: Simple Land Cover: Hard and softwoods and brush

Property line: 10+ feet Drainage way: 50+ feet Drinking water well: 100+ feet Abutting septic system: 50+ feet

Wetlands: 100+ feet Public water supply reservoir: 400+ feet Tributary to reservoir: 200+ feet

SOIL PROFILE ► TP20-25

Depth below land surface (inches)	Soil Horizon/ Layer	Soil Texture (USDA/ NRCS)	Soil Color (Munsell)	Redoxomorphic Features/ ESHGWT	Consistence, grade, size, structure, grain size, soil moisture state, roots, horizon boundary, clasts, stratification, artifacts, restrictive features, etc.
00” → 06”	A_P	Sandy Loam	10YR 3/2 very dark grayish brown	none observed	Very friable; moderate-grade; fine-to-medium granular structure; somewhat cohesive; fine grained mineral content; slightly damp; non-sticky; non-plastic; many fine-to-medium tree and brush roots; free of clasts; clear wavy boundary.
06” → 23”	B_w	Sandy Loam	10YR 4/6 dark yellowish brown	none observed	Very friable; weak-grade, medium sub-angular blocky structure; somewhat cohesive; mixed medium to mostly fine-grained mineral content; damp matrix; non-sticky; non-plastic; common fine and medium roots; ~05% rounded to sub-rounded gravel content of mixed lithology; clear wavy boundary.
23” → 102”	$2C_d$	Sandy Loam	2.5Y 5/4 light olive brown	40” (c,1-2,p) 10YR 7/1 5YR 5/8	Friable to firm; dense compact matrix; massive to subangular platy structure of moderate grade; mixed fine-to-medium grained mineral content; crudely stratified; damp matrix; non-sticky; non-plastic; well graded; approximately 15-20% sub-angular to sub-rounded gravel and 10-15% subrounded to angular cobble content of mixed lithology; redoximorphic features observed at 40”; no apparent water observed; no bedrock refusal at test hole depth.

Depth to bedrock: > 102” Seasonal High Groundwater Table: 40” Apparent water table: ____

TP20-25 DEEP OBSERVATION HOLE

2 Norino Way, Georgetown, Massachusetts

DEPTH TO APPARENT/ PHREATIC GROUNDWATER TABLE: *NONE OBSERVED*

Apparent water seeping from pit face:___ (below land surface) Depth to stabilized apparent water: ___ (below land surface)

Soil moisture state: Damp

ESTIMATED SEASONAL HIGH GROUNDWATER TABLE:

Depth of Estimated Seasonal High Groundwater Table: 40" (below land surface)

Kind: Iron concentrations; noncemented iron masses and reduction spots – iron coatings on sand grains

Location: In $2C_d$ matrix surrounding redox depletions Shape: Irregular/ spherical

Hardness: Soft Boundary: Clear Abundance: Common Size: Fine to medium Contrast: Prominent

Concentration color: 5YR 5/8 yellowish red Reduction color: 10YR 7/1 light gray Moisture state: Damp

DETERMINATION OF HIGH GROUNDWATER ELEVATION

Observed depth to redoximorphic features: 40" inches below grade

Observed depth to stabilized phreatic water: ___ inches below grade

Observed water weeping from side of deep hole: ___ inches below grade

DEPTH OF NATURALLY OCCURRING PERVIOUS MATERIAL: ► 8.00'

Depth of naturally occurring pervious material in TP20-25 Upper boundary: 06"
Lower boundary: 102"

Certification

I certify that I am currently approved by the Department of Environmental Protection pursuant to 310 CMR 15.017 to conduct evaluations and that the above analysis has been performed by me consistent with the required training, expertise and experience described in 310 CMR 15.017. I further certify that the results of my soil evaluation, as indicated in the attached Soil Evaluation Form, are accurate and in accordance with 310 CMR 15.017.

Alexander F. Parker *#1848*	June 1998
Massachusetts Soil Evaluator & Certification number	Date of Soil Evaluator Certification
Unofficial soil test pits	11/30/2020
Town of Georgetown Health Department	Date of soil testing

TP20-26 DEEP OBSERVATION HOLE

2 Norino Way, Georgetown, Massachusetts

Date: November 30, 2020 Time: 13:02 Weather: Overcast, heavy rain, 50-55°F, SW wind

Landscape: Upland Landform: Ground moraine Position on landscape: Side slope

Slope aspect: Westerly Slope (%): 02- 03% Slope complexity: Simple Land Cover: Hard and softwoods and brush

Property line: 10^+ feet Drainage way: 50^+ feet Drinking water well: 100^+ feet Abutting septic system: 50^+ feet

Wetlands: 100^+ feet Public water supply reservoir: 400^+ feet Tributary to reservoir: 200^+ feet

SOIL PROFILE ► TP20-26

Depth below land surface (inches)	Soil Horizon/ Layer	Soil Texture (USDA/ NRCS)	Soil Color (Munsell)	Redoxomorphic Features/ ESHGWT	Consistence, grade, size, structure, grain size, soil moisture state, roots, horizon boundary, clasts, stratification, artifacts, restrictive features, etc.
00” → 08”	A_P	Sandy Loam	10YR 3/2 very dark grayish brown	none observed	Very friable; moderate-grade; fine-to-medium granular structure; somewhat cohesive; fine grained mineral content; slightly damp; non-sticky; non-plastic; many fine-to-medium tree and brush roots; free of clasts; clear wavy boundary.
08” → 18”	B_w	Sandy Loam	10YR 4/6 dark yellowish brown	none observed	Very friable; weak-grade, medium sub-angular blocky structure; somewhat cohesive; mixed medium to mostly fine-grained mineral content; damp matrix; non-sticky; non-plastic; common fine and medium roots; ~05% rounded to sub-rounded gravel content of mixed lithology; clear wavy boundary.
18” → 101”	$2C_d$	Sandy Loam	2.5Y 5/4 light olive brown	43” (c,1-2,p) 10YR 7/1 5YR 5/8	Friable to firm; dense compact matrix; massive to subangular platy structure of moderate grade; mixed fine-to-medium grained mineral content; crudely stratified; damp matrix; non-sticky; non-plastic; well graded; approximately 15-20% sub-angular to sub-rounded gravel and 10-15% subrounded to angular cobble content of mixed lithology; redoximorphic features observed at 43”; no apparent water observed; no bedrock refusal at test hole depth.

Depth to bedrock: > 101” Seasonal High Groundwater Table: 43” Apparent water table: ____

TP20-26 DEEP OBSERVATION HOLE

2 Norino Way, Georgetown, Massachusetts

DEPTH TO APPARENT/ PHREATIC GROUNDWATER TABLE: *NONE OBSERVED*

Apparent water seeping from pit face:___ (below land surface) Depth to stabilized apparent water: ___ (below land surface)

Soil moisture state: Damp

ESTIMATED SEASONAL HIGH GROUNDWATER TABLE:

Depth of Estimated Seasonal High Groundwater Table: 43” (below land surface)

Kind: Iron concentrations; noncemented iron masses and reduction spots – iron coatings on sand grains

Location: In $2C_d$ matrix surrounding redox depletions Shape: Irregular/ spherical

Hardness: Soft Boundary: Clear Abundance: Common Size: Fine to medium Contrast: Prominent

Concentration color: 5YR 5/8 yellowish red Reduction color: 10YR 7/1 light gray Moisture state: Damp

DETERMINATION OF HIGH GROUNDWATER ELEVATION

Observed depth to redoximorphic features: 43” inches below grade

Observed depth to stabilized phreatic water: ___ inches below grade

Observed water weeping from side of deep hole: ___ inches below grade

DEPTH OF NATURALLY OCCURRING PERVIOUS MATERIAL: ► 7.75’

Depth of naturally occurring pervious material in TP20-26 Upper boundary: 08”
Lower boundary: 101”

Certification

I certify that I am currently approved by the Department of Environmental Protection pursuant to 310 CMR 15.017 to conduct evaluations and that the above analysis has been performed by me consistent with the required training, expertise and experience described in 310 CMR 15.017. I further certify that the results of my soil evaluation, as indicated in the attached Soil Evaluation Form, are accurate and in accordance with 310 CMR 15.017.

Alexander F. Parker *#1848*
Massachusetts Soil Evaluator & Certification number

June 1998
Date of Soil Evaluator Certification

Unofficial soil test pits
Town of Georgetown Health Department

11/30/2020
Date of soil testing

TP20-27 DEEP OBSERVATION HOLE

2 Norino Way, Georgetown, Massachusetts

Date: November 30, 2020 Time: 13:27 Weather: Overcast, heavy rain, 50-55ºF, SW wind

Landscape: Upland Landform: Ground moraine Position on landscape: Side slope

Slope aspect: Westerly Slope (%): 02- 03% Slope complexity: Simple Land Cover: Hard and softwoods and brush

Property line: 10^+ feet Drainage way: 50^+ feet Drinking water well: 100^+ feet Abutting septic system: 50^+ feet

Wetlands: 100^+ feet Public water supply reservoir: 400^+ feet Tributary to reservoir: 200^+ feet

SOIL PROFILE ► TP20-27

Depth below land surface (inches)	Soil Horizon/ Layer	Soil Texture (USDA/ NRCS)	Soil Color (Munsell)	Redoxomorphic Features/ ESHGWT	Consistence, grade, size, structure, grain size, soil moisture state, roots, horizon boundary, clasts, stratification, artifacts, restrictive features, etc.
00” → 08”	A_P	Sandy Loam	10YR 3/2 very dark grayish brown	none observed	Very friable; moderate-grade; fine-to-medium granular structure; somewhat cohesive; fine grained mineral content; slightly damp; non-sticky; non-plastic; many fine-to-medium tree and brush roots; free of clasts; clear wavy boundary.
08” → 21”	B_w	Sandy Loam	10YR 4/6 dark yellowish brown	none observed	Very friable; weak-grade, medium sub-angular blocky structure; somewhat cohesive; mixed medium to mostly fine-grained mineral content; damp matrix; non-sticky; non-plastic; common fine and medium roots; ~05% rounded to sub-rounded gravel content of mixed lithology; clear wavy boundary.
21” → 101”	$2C_d$	Sandy Loam	2.5Y 5/4 light olive brown	44” (c,1-2,p) 10YR 7/1 5YR 5/8	Friable to firm; dense compact matrix; massive to subangular platy structure of moderate grade; mixed fine-to-medium grained mineral content; crudely stratified; damp matrix; non-sticky; non-plastic; well graded; approximately 15-20% sub-angular to sub-rounded gravel and 10-15% subrounded to angular cobble content of mixed lithology; redoximorphic features observed at 44”; no apparent water observed; no bedrock refusal at test hole depth.

Depth to bedrock: > 101” Seasonal High Groundwater Table: 44” Apparent water table: ____

TP20-27 DEEP OBSERVATION HOLE

2 Norino Way, Georgetown, Massachusetts

DEPTH TO APPARENT/ PHREATIC GROUNDWATER TABLE: *NONE OBSERVED*

Apparent water seeping from pit face:___ (below land surface) Depth to stabilized apparent water: ___ (below land surface)

Soil moisture state: Damp

ESTIMATED SEASONAL HIGH GROUNDWATER TABLE:

Depth of Estimated Seasonal High Groundwater Table: 44" (below land surface)

Kind: Iron concentrations; noncemented iron masses and reduction spots – iron coatings on sand grains

Location: In $2C_d$ matrix surrounding redox depletions Shape: Irregular/ spherical

Hardness: Soft Boundary: Clear Abundance: Common Size: Fine to medium Contrast: Prominent

Concentration color: 5YR 5/8 yellowish red Reduction color: 10YR 7/1 light gray Moisture state: Damp

DETERMINATION OF HIGH GROUNDWATER ELEVATION

Observed depth to redoximorphic features: 44" inches below grade

Observed depth to stabilized phreatic water: ___ inches below grade

Observed water weeping from side of deep hole: ___ inches below grade

DEPTH OF NATURALLY OCCURRING PERVIOUS MATERIAL: ► 7.75'

Depth of naturally occurring pervious material in TP20-27 Upper boundary: 08"
Lower boundary: 101"

Certification

I certify that I am currently approved by the Department of Environmental Protection pursuant to 310 CMR 15.017 to conduct evaluations and that the above analysis has been performed by me consistent with the required training, expertise and experience described in 310 CMR 15.017. I further certify that the results of my soil evaluation, as indicated in the attached Soil Evaluation Form, are accurate and in accordance with 310 CMR 15.017.

Alexander F. Parker *#1848* — June 1998

Massachusetts Soil Evaluator & Certification number — Date of Soil Evaluator Certification

Unofficial soil test pits — 11/30/2020

Town of Georgetown Health Department — Date of soil testing

TP20-28 DEEP OBSERVATION HOLE

2 Norino Way, Georgetown, Massachusetts

Date: November 30, 2020   Time: 13:51   Weather: Overcast, heavy rain, 50-55°F, SW wind

Landscape: Upland   Landform: Ground moraine   Position on landscape: Side slope

Slope aspect: Westerly   Slope (%): 02- 03%   Slope complexity: Simple   Land Cover: Hard and softwoods and brush

Property line: 10^+ feet   Drainage way: 50^+ feet   Drinking water well: 100^+ feet   Abutting septic system: 50^+ feet

Wetlands: 100^+ feet   Public water supply reservoir: 400^+ feet   Tributary to reservoir: 200^+ feet

SOIL PROFILE ► TP20-28

Depth below land surface (inches)	Soil Horizon/ Layer	Soil Texture (USDA/ NRCS)	Soil Color (Munsell)	Redoxomorphic Features/ ESHGWT	Consistence, grade, size, structure, grain size, soil moisture state, roots, horizon boundary, clasts, stratification, artifacts, restrictive features, etc.
00” → 10”	A_P	Sandy Loam	10YR 3/2 very dark grayish brown	none observed	Very friable; moderate-grade; fine-to-medium granular structure; somewhat cohesive; fine grained mineral content; slightly damp; non-sticky; non-plastic; many fine-to-medium tree and brush roots; free of clasts; clear wavy boundary.
10” → 23”	B_w	Sandy Loam	10YR 4/6 dark yellowish brown	none observed	Very friable; weak-grade, medium sub-angular blocky structure; somewhat cohesive; mixed medium to mostly fine-grained mineral content; damp matrix; non-sticky; non-plastic; common fine and medium roots; ~05% rounded to sub-rounded gravel content of mixed lithology; clear wavy boundary.
23” → 100”	$2C_d$	Sandy Loam	2.5Y 5/4 light olive brown	36” (c,1-2,p) 10YR 7/1 5YR 5/8	Friable to firm; dense compact matrix; massive to subangular platy structure of moderate grade; mixed fine-to-medium grained mineral content; crudely stratified; damp matrix; non-sticky; non-plastic; well graded; approximately 15-20% sub-angular to sub-rounded gravel and 10-15% subrounded to angular cobble content of mixed lithology; redoximorphic features observed at 36”; no apparent water observed; no bedrock refusal at test hole depth.

Depth to bedrock: $\geq$ 100”   Seasonal High Groundwater Table: 36”   Apparent water table: ____

TP20-28 DEEP OBSERVATION HOLE

2 Norino Way, Georgetown, Massachusetts

DEPTH TO APPARENT/ PHREATIC GROUNDWATER TABLE: *NONE OBSERVED*

Apparent water seeping from pit face:___ (below land surface) Depth to stabilized apparent water: ___ (below land surface)

Soil moisture state: Damp

ESTIMATED SEASONAL HIGH GROUNDWATER TABLE:

Depth of Estimated Seasonal High Groundwater Table: 36” (below land surface)

Kind: Iron concentrations; noncemented iron masses and reduction spots – iron coatings on sand grains

Location: In $2C_d$ matrix surrounding redox depletions Shape: Irregular/ spherical

Hardness: Soft Boundary: Clear Abundance: Common Size: Fine to medium Contrast: Prominent

Concentration color: 5YR 5/8 yellowish red Reduction color: 10YR 7/1 light gray Moisture state: Damp

DETERMINATION OF HIGH GROUNDWATER ELEVATION

Observed depth to redoximorphic features: 36” inches below grade

Observed depth to stabilized phreatic water: ___ inches below grade

Observed water weeping from side of deep hole: ___ inches below grade

DEPTH OF NATURALLY OCCURRING PERVIOUS MATERIAL: ► 7.50’

Depth of naturally occurring pervious material in TP20-28 Upper boundary: 10”
Lower boundary: 100”

Certification

I certify that I am currently approved by the Department of Environmental Protection pursuant to 310 CMR 15.017 to conduct evaluations and that the above analysis has been performed by me consistent with the required training, expertise and experience described in 310 CMR 15.017. I further certify that the results of my soil evaluation, as indicated in the attached Soil Evaluation Form, are accurate and in accordance with 310 CMR 15.017.

Alexander F. Parker *#1848*
Massachusetts Soil Evaluator & Certification number

June 1998
Date of Soil Evaluator Certification

Unofficial soil test pits
Town of Georgetown Health Department

11/30/2020
Date of soil testing

TP20-29 DEEP OBSERVATION HOLE

2 Norino Way, Georgetown, Massachusetts

Date: November 30, 2020 Time: 14:12 Weather: Overcast, heavy rain, 50-55ºF, SW wind

Landscape: Upland Landform: Ground moraine Position on landscape: Side slope

Slope aspect: Westerly Slope (%): 02- 03% Slope complexity: Simple Land Cover: Hard and softwoods and brush

Property line: 10^+ feet Drainage way: 50^+ feet Drinking water well: 100^+ feet Abutting septic system: 50^+ feet

Wetlands: 100^+ feet Public water supply reservoir: 400^+ feet Tributary to reservoir: 200^+ feet

SOIL PROFILE ► TP20-29

Depth below land surface (inches)	Soil Horizon/ Layer	Soil Texture (USDA/ NRCS)	Soil Color (Munsell)	Redoxomorphic Features/ ESHGWT	Consistence, grade, size, structure, grain size, soil moisture state, roots, horizon boundary, clasts, stratification, artifacts, restrictive features, etc.
00” → 09”	A_P	Sandy Loam	10YR 3/2 very dark grayish brown	none observed	Very friable; moderate-grade; fine-to-medium granular structure; somewhat cohesive; fine grained mineral content; slightly damp; non-sticky; non-plastic; many fine-to-medium tree and brush roots; free of clasts; clear wavy boundary.
09” → 18”	B_w	Sandy Loam	10YR 4/6 dark yellowish brown	none observed	Very friable; weak-grade, medium sub-angular blocky structure; somewhat cohesive; mixed medium to mostly fine-grained mineral content; damp matrix; non-sticky; non-plastic; common fine and medium roots; ~05% rounded to sub-rounded gravel content of mixed lithology; clear wavy boundary.
18” → 100”	$2C_d$	Sandy Loam	2.5Y 5/4 light olive brown	33” (c,1-2,p) 10YR 7/1 5YR 5/8	Friable to firm; dense compact matrix; massive to subangular platy structure of moderate grade; mixed fine-to-medium grained mineral content; crudely stratified; damp matrix; non-sticky; non-plastic; well graded; approximately 15-20% sub-angular to sub-rounded gravel and 10-15% subrounded to angular cobble content of mixed lithology; redoximorphic features observed at 33”; no apparent water observed; no bedrock refusal at test hole depth.

Depth to bedrock: $\geq$ 100” Seasonal High Groundwater Table: 33” Apparent water table: ____

TP20-29 DEEP OBSERVATION HOLE

2 Norino Way, Georgetown, Massachusetts

DEPTH TO APPARENT/ PHREATIC GROUNDWATER TABLE: *NONE OBSERVED*

Apparent water seeping from pit face:___ (below land surface)   Depth to stabilized apparent water: ___ (below land surface)

Soil moisture state: Damp

ESTIMATED SEASONAL HIGH GROUNDWATER TABLE:

Depth of Estimated Seasonal High Groundwater Table: 33" (below land surface)

Kind: Iron concentrations; noncemented iron masses and reduction spots – iron coatings on sand grains

Location: In $2C_d$ matrix surrounding redox depletions   Shape: Irregular/ spherical

Hardness: Soft   Boundary: Clear   Abundance: Common   Size: Fine to medium   Contrast: Prominent

Concentration color: 5YR 5/8 yellowish red   Reduction color: 10YR 7/1 light gray   Moisture state: Damp

DETERMINATION OF HIGH GROUNDWATER ELEVATION

Observed depth to redoximorphic features: 33" inches below grade

Observed depth to stabilized phreatic water: ___ inches below grade

Observed water weeping from side of deep hole: ___ inches below grade

DEPTH OF NATURALLY OCCURRING PERVIOUS MATERIAL: ► 7.58'

Depth of naturally occurring pervious material in TP20-29   Upper boundary: 09"
Lower boundary: 100"

Certification

I certify that I am currently approved by the Department of Environmental Protection pursuant to 310 CMR 15.017 to conduct evaluations and that the above analysis has been performed by me consistent with the required training, expertise and experience described in 310 CMR 15.017. I further certify that the results of my soil evaluation, as indicated in the attached Soil Evaluation Form, are accurate and in accordance with 310 CMR 15.017.

Alexander F. Parker *#1848*
Massachusetts Soil Evaluator & Certification number

June 1998
Date of Soil Evaluator Certification

Unofficial soil test pits
Town of Georgetown Health Department

11/30/2020
Date of soil testing

TP20-30 DEEP OBSERVATION HOLE

2 Norino Way, Georgetown, Massachusetts

Date: November 30, 2020 Time: 14:31 Weather: Overcast, heavy rain, 50-55ºF, SW wind

Landscape: Upland Landform: Ground moraine Position on landscape: Side slope

Slope aspect: Westerly Slope (%): 02- 03% Slope complexity: Simple Land Cover: Hard and softwoods and brush

Property line: 10+ feet Drainage way: 50+ feet Drinking water well: 100+ feet Abutting septic system: 50+ feet

Wetlands: 100+ feet Public water supply reservoir: 400+ feet Tributary to reservoir: 200+ feet

SOIL PROFILE ► TP20-30

Depth below land surface (inches)	Soil Horizon/ Layer	Soil Texture (USDA/ NRCS)	Soil Color (Munsell)	Redoxomorphic Features/ ESHGWT	Consistence, grade, size, structure, grain size, soil moisture state, roots, horizon boundary, clasts, stratification, artifacts, restrictive features, etc.
00” → 06”	A_P	Sandy Loam	10YR 3/2 very dark grayish brown	none observed	Very friable; moderate-grade; fine-to-medium granular structure; somewhat cohesive; fine grained mineral content; slightly damp; non-sticky; non-plastic; many fine-to-medium tree and brush roots; free of clasts; clear wavy boundary.
06” → 14”	B_w	Sandy Loam	10YR 4/6 dark yellowish brown	none observed	Very friable; weak-grade, medium sub-angular blocky structure; somewhat cohesive; mixed medium to mostly fine-grained mineral content; damp matrix; non-sticky; non-plastic; common fine and medium roots; ~05% rounded to sub-rounded gravel content of mixed lithology; clear wavy boundary.
14” → 100”	$2C_d$	Sandy Loam	2.5Y 5/4 light olive brown	40” (c,1-2,p) 10YR 7/1 5YR 5/8	Friable to firm; dense compact matrix; massive to subangular platy structure of moderate grade; mixed fine-to-medium grained mineral content; crudely stratified; damp matrix; non-sticky; non-plastic; well graded; approximately 15-20% sub-angular to sub-rounded gravel and 10-15% subrounded to angular cobble content of mixed lithology; redoximorphic features observed at 40”; no apparent water observed; no bedrock refusal at test hole depth.

Depth to bedrock: > 100” Seasonal High Groundwater Table: 40” Apparent water table: ____

TP20-30 DEEP OBSERVATION HOLE

2 Norino Way, Georgetown, Massachusetts

DEPTH TO APPARENT/ PHREATIC GROUNDWATER TABLE: *NONE OBSERVED*

Apparent water seeping from pit face:___ (below land surface) Depth to stabilized apparent water: ___ (below land surface)

Soil moisture state: Damp

ESTIMATED SEASONAL HIGH GROUNDWATER TABLE:

Depth of Estimated Seasonal High Groundwater Table: 40” (below land surface)

Kind: Iron concentrations; noncemented iron masses and reduction spots – iron coatings on sand grains

Location: In $2C_d$ matrix surrounding redox depletions Shape: Irregular/ spherical

Hardness: Soft Boundary: Clear Abundance: Common Size: Fine to medium Contrast: Prominent

Concentration color: 5YR 5/8 yellowish red Reduction color: 10YR 7/1 light gray Moisture state: Damp

DETERMINATION OF HIGH GROUNDWATER ELEVATION

Observed depth to redoximorphic features: 40” inches below grade

Observed depth to stabilized phreatic water: ___ inches below grade

Observed water weeping from side of deep hole: ___ inches below grade

DEPTH OF NATURALLY OCCURRING PERVIOUS MATERIAL: ► 7.83’

Depth of naturally occurring pervious material in TP20-30 Upper boundary: 06”
Lower boundary: 100”

Certification

I certify that I am currently approved by the Department of Environmental Protection pursuant to 310 CMR 15.017 to conduct evaluations and that the above analysis has been performed by me consistent with the required training, expertise and experience described in 310 CMR 15.017. I further certify that the results of my soil evaluation, as indicated in the attached Soil Evaluation Form, are accurate and in accordance with 310 CMR 15.017.

Alexander F. Parker *#1848* June 1998

Massachusetts Soil Evaluator & Certification number Date of Soil Evaluator Certification

Unofficial soil test pits 11/30/2020

Town of Georgetown Health Department Date of soil testing

TP20-31 DEEP OBSERVATION HOLE

2 Norino Way, Georgetown, Massachusetts

Date: November 30, 2020 Time: 14:55 Weather: Overcast, heavy rain, 50-55ºF, SW wind

Landscape: Upland Landform: Ground moraine Position on landscape: Side slope

Slope aspect: Westerly Slope (%): 02- 03% Slope complexity: Simple Land Cover: Hard and softwoods and brush

Property line: 10^+ feet Drainage way: 50^+ feet Drinking water well: 100^+ feet Abutting septic system: 50^+ feet

Wetlands: 100^+ feet Public water supply reservoir: 400^+ feet Tributary to reservoir: 200^+ feet

SOIL PROFILE ► TP20-31

Depth below land surface (inches)	Soil Horizon/ Layer	Soil Texture (USDA/ NRCS)	Soil Color (Munsell)	Redoxomorphic Features/ ESHGWT	Consistence, grade, size, structure, grain size, soil moisture state, roots, horizon boundary, clasts, stratification, artifacts, restrictive features, etc.
00” → 07”	A_P	Sandy Loam	10YR 3/2 very dark grayish brown	none observed	Very friable; moderate-grade; fine-to-medium granular structure; somewhat cohesive; fine grained mineral content; slightly damp; non-sticky; non-plastic; many fine-to-medium tree and brush roots; free of clasts; clear wavy boundary.
07” → 11”	B_w	Sandy Loam	10YR 4/6 dark yellowish brown	none observed	Very friable; weak-grade, medium sub-angular blocky structure; somewhat cohesive; mixed medium to mostly fine-grained mineral content; damp matrix; non-sticky; non-plastic; common fine and medium roots; ~05% rounded to sub-rounded gravel content of mixed lithology; clear wavy boundary.
11” → 100”	$2C_d$	Sandy Loam	2.5Y 5/4 light olive brown	40” (c,1-2,p) 10YR 7/1 5YR 5/8	Friable to firm; dense compact matrix; massive to subangular platy structure of moderate grade; mixed fine-to-medium grained mineral content; crudely stratified; damp matrix; non-sticky; non-plastic; well graded; approximately 15-20% sub-angular to sub-rounded gravel and 10-15% subrounded to angular cobble content of mixed lithology; redoximorphic features observed at 40”; no apparent water observed; no bedrock refusal at test hole depth.

Depth to bedrock: ≥ 100” Seasonal High Groundwater Table: 40” Apparent water table: ____

TP20-31 DEEP OBSERVATION HOLE

2 Norino Way, Georgetown, Massachusetts

DEPTH TO APPARENT/ PHREATIC GROUNDWATER TABLE: *NONE OBSERVED*

Apparent water seeping from pit face:___ (below land surface) Depth to stabilized apparent water: ___ (below land surface)

Soil moisture state: Damp

ESTIMATED SEASONAL HIGH GROUNDWATER TABLE:

Depth of Estimated Seasonal High Groundwater Table: 40” (below land surface)

Kind: Iron concentrations; noncemented iron masses and reduction spots – iron coatings on sand grains

Location: In $2C_d$ matrix surrounding redox depletions Shape: Irregular/ spherical

Hardness: Soft Boundary: Clear Abundance: Common Size: Fine to medium Contrast: Prominent

Concentration color: 5YR 5/8 yellowish red Reduction color: 10YR 7/1 light gray Moisture state: Damp

DETERMINATION OF HIGH GROUNDWATER ELEVATION

Observed depth to redoximorphic features: 40” inches below grade

Observed depth to stabilized phreatic water: ___ inches below grade

Observed water weeping from side of deep hole: ___ inches below grade

DEPTH OF NATURALLY OCCURRING PERVIOUS MATERIAL: ► 7.75’

Depth of naturally occurring pervious material in TP20-31 Upper boundary: 07”
Lower boundary: 100”

Certification

I certify that I am currently approved by the Department of Environmental Protection pursuant to 310 CMR 15.017 to conduct evaluations and that the above analysis has been performed by me consistent with the required training, expertise and experience described in 310 CMR 15.017. I further certify that the results of my soil evaluation, as indicated in the attached Soil Evaluation Form, are accurate and in accordance with 310 CMR 15.017.

Alexander F. Parker *#1848*
Massachusetts Soil Evaluator & Certification number

June 1998
Date of Soil Evaluator Certification

Unofficial soil test pits
Town of Georgetown Health Department

11/30/2020
Date of soil testing

SOIL SUITABILITY PERCOLATION TEST

COMMONWEALTH OF MASSACHUSETTS

GEORGETOWN, MASSACHUSETTS

2 Norino Way, Georgetown, Massachusetts

Percolation Test	Percolation Test-15 (TP20-15)	Percolation Test
Depth of test:	Depth to shelf: 29” 47” Depth of hole: 18”	
Start presoak:	10:01	
End presoak:	10:16	
Time at 12”→	10:16	
Time at 9”→	10:50	
Time at 6”→	11:37	
Total time 9” to 6”→	47 minutes	
Rate (minutes per inch)	15.6 MPI CLASS II SOIL LTAR 0.53	

Alexander F. Parker *#1848*

Massachusetts Soil Evaluator & Certification number

Mr. Joe Serwatka, Newbury Board of Health Representative — 11/30/2020

Town of Newbury Health Department — Date of soil testing

SOIL SUITABILITY ASSESSMENT REPORT
COMMONWEALTH OF MASSACHUSETTS
GEORGETOWN, MASSACHUSETTS

SOIL EVALUATION FOR NEW CONSTRUCTION OF ON-SITE SUBSURFACE SEWAGE DISPOSAL SYSTEM

SITE INFORMATION

February 10, 2022

Street Address: 2 Norino Way   Town: Georgetown   State: Massachusetts   Zip Code: 01833   County: Essex

Land Use: Undeveloped commercial   Latitude: ~42º 43' 05.35" N   Longitude: ~70º 57' 21.41" W   Elevation: ~ 148 - 170'

PUBLISHED SOIL DATA AND MAP UNIT DESCRIPTION

Physiographic Division: Appalachian Highlands   Physio. Province: New England   Physio. Section: Seaboard lowland section

Soil survey area: Essex County, Massachusetts, Northern Part   Series name: 306D – Paxton fine sandy loam, 15-25% slopes

Order: Inceptisol   Suborder: Ochrepts   Family: Coarse-loamy, mixed, mesic Typic Dystrochrepts

Soil moisture regime: Udic   Soil temperature regime: Mesic   Depth to restrictive feature: Variable to densic material

Soil hydric or upland: Upland   Average depth to water table: 32" to 45"   Runoff class: High

Available water capacity: Low (~4.7")   Ksat: Low to moderately high (0.0 – 0.14 in/hr)

Drainage Class: Well drained   Hydrologic Soil Group: C   Ecological site: Well drained dense till uplands

Frequency of flooding: None   Frequency of ponding: None

WETLAND AREA & USGS WELL MEASUREMENTS

National Wetland Inventory Map: NA   Wetlands Conservancy Program: NA   Bordering vegetative wetland: NA

Current Water Resource Condition (USGS): Well Site # 424520070562401- MA-NIW 27 Newbury, MA

Well depth: 19.8 feet   Land altitude: 55.00 feet above NGVD29   Latitude: ~42º45'19.3" N   Longitude: ~70º56'22.1"

Most recent data value: 10.96' on 02/09/22 (depth to water level in feet below land surface)   Range: Above normal

SURFICIAL GEOLOGY:

Surficial Geology: Qgm: Ground moraine

Parent material: Glacial lodgment till deposits   Geomorphic component: ground moraine   Runoff class: High

Slope aspect: Westerly   Landform position (2D): Backslope   Landform position (3D): Side slope

Slope gradient: ~3-5%   Down slope shape: Linear   Across slope shape: Convex   Slope complexity: Simple

Bedrock outcropping in vicinity: None   Glacial erratics in vicinity: None   Surface fragments: None

Bedrock Type: Nashoba Formation – Boxford Member: Thin bedded to massive amphibolite & minor biotite gneiss

TP22-1 DEEP OBSERVATION HOLE

2 Norino Way, Georgetown, Massachusetts

FOR DRAINAGE DESIGN

Date: February 10, 2022 Time: 08:30 Weather: Partly cloudy, 35-40°F, still

Landscape: Upland Landform: Ground moraine Position on landscape: Side slope

Slope aspect: Westerly Slope (%): 02- 03% Slope complexity: Simple Land Cover: Hard and softwoods and brush

Property line: 10^{+} feet Drainage way: 50^{+} feet Drinking water well: 100^{+} feet Abutting septic system: 50^{+} feet

Wetlands: 100^{+} feet Public water supply reservoir: 400^{+} feet Tributary to reservoir: 200^{+} feet

SOIL PROFILE ► TP22-1

Depth below land surface (inches)	Soil Horizon/ Layer	Soil Texture (USDA/ NRCS)	Soil Color (Munsell)	Redoxomorphic Features/ ESHGWT	Consistence, grade, size, structure, grain size, soil moisture state, roots, horizon boundary, clasts, stratification, artifacts, restrictive features, etc.
00” → 10”	A_P	Sandy Loam	10YR 3/2 very dark grayish brown	none observed	Very friable; moderate-grade; fine-to-medium granular structure; somewhat cohesive; fine grained mineral content; slightly damp; non-sticky; non-plastic; many fine-to-medium tree and brush roots; free of clasts; clear wavy boundary.
10” → 77”	$2C_d$	Sandy Loam	2.5Y 5/4 light olive brown	39” (c,1-2,p) 10YR 7/1 5YR 5/8	Friable to firm; dense compact matrix; massive to subangular platy structure of moderate grade; mixed fine-to-medium grained mineral content; crudely stratified; damp matrix; non-sticky; non-plastic; well graded; approximately 15-20% sub-angular to sub-rounded gravel and 10-15% sub-rounded to angular cobble content of mixed lithology; redoximorphic features observed at 39”; apparent water observed at 46”; no bedrock refusal at test hole depth.

Depth to bedrock: > 77” Seasonal High Groundwater Table: 39” Apparent water table: 46”

TP21-1 DEEP OBSERVATION HOLE

2 Norino Way, Georgetown, Massachusetts

FOR DRAINAGE DESIGN

DEPTH TO APPARENT/ PHREATIC GROUNDWATER TABLE:

Apparent water seeping from pit face: 46" (below land surface) Depth to stabilized apparent water: ___ (below land surface)

Soil moisture state: Damp to wet

ESTIMATED SEASONAL HIGH GROUNDWATER TABLE:

Depth of Estimated Seasonal High Groundwater Table: 39" (below land surface)

Kind: Iron concentrations; noncemented iron masses and reduction spots – iron coatings on sand grains

Location: In $2C_d$ matrix surrounding redox depletions Shape: Irregular/ spherical

Hardness: Soft Boundary: Clear Abundance: Common Size: Fine to medium Contrast: Prominent

Concentration color: 5YR 5/8 yellowish red Reduction color: 10YR 7/1 light gray Moisture state: Damp

DETERMINATION OF HIGH GROUNDWATER ELEVATION

Observed depth to redoximorphic features: 39" inches below grade

Observed depth to stabilized phreatic water: 46" inches below grade

Observed water weeping from side of deep hole: ___ inches below grade

DEPTH OF NATURALLY OCCURRING PERVIOUS MATERIAL: ► 5.58'

Depth of naturally occurring pervious material in TP22-1 Upper boundary: 10"
Lower boundary: 77"

Certification

I certify that I am currently approved by the Department of Environmental Protection pursuant to 310 CMR 15.017 to conduct evaluations and that the above analysis has been performed by me consistent with the required training, expertise and experience described in 310 CMR 15.017. I further certify that the results of my soil evaluation, as indicated in the attached Soil Evaluation Form, are accurate and in accordance with 310 CMR 15.017.

Alexander F. Parker *#1848*

Massachusetts Soil Evaluator & Certification number

June 1998

Date of Soil Evaluator Certification

02/10/2022

Date of soil testing

TP22-2 DEEP OBSERVATION HOLE

2 Norino Way, Georgetown, Massachusetts

FOR DRAINAGE DESIGN

Date: February 10, 2022 Time: 09:02 Weather: Partly cloudy, 35-40°F, still

Landscape: Upland Landform: Ground moraine Position on landscape: Side slope

Slope aspect: Westerly Slope (%): 02- 03% Slope complexity: Simple Land Cover: Hard and softwoods and brush

Property line: 10^+ feet Drainage way: 50^+ feet Drinking water well: 100^+ feet Abutting septic system: 50^+ feet

Wetlands: 100^+ feet Public water supply reservoir: 400^+ feet Tributary to reservoir: 200^+ feet

SOIL PROFILE ► TP22-2

Depth below land surface (inches)	Soil Horizon/ Layer	Soil Texture (USDA/ NRCS)	Soil Color (Munsell)	Redoxomorphic Features/ ESHGWT	Consistence, grade, size, structure, grain size, soil moisture state, roots, horizon boundary, clasts, stratification, artifacts, restrictive features, etc.
00” → 08”	A_P	Sandy Loam	10YR 3/2 very dark grayish brown	none observed	Very friable; moderate-grade; fine-to-medium granular structure; somewhat cohesive; fine grained mineral content; slightly damp; non-sticky; non-plastic; many fine-to-medium tree and brush roots; free of clasts; clear wavy boundary.
08” → 79”	$2C_d$	Sandy Loam	2.5Y 5/4 light olive brown	36” (c,1-2,p) 10YR 7/1 5YR 5/8	Friable to firm; dense compact matrix; massive to subangular platy structure of moderate grade; mixed fine-to-medium grained mineral content; crudely stratified; damp matrix; non-sticky; non-plastic; well graded; approximately 15-20% sub-angular to sub-rounded gravel and 10-15% sub-rounded to angular cobble content of mixed lithology; redoximorphic features observed at 36”; apparent water observed at 44”; no bedrock refusal at test hole depth.

Depth to bedrock: $\geq$ 79” Seasonal High Groundwater Table: 36” Apparent water table: 44”

TP21-2 DEEP OBSERVATION HOLE

2 Norino Way, Georgetown, Massachusetts

FOR DRAINAGE DESIGN

DEPTH TO APPARENT/ PHREATIC GROUNDWATER TABLE:

Apparent water seeping from pit face: 44" (below land surface) Depth to stabilized apparent water: ___ (below land surface)

Soil moisture state: Damp to wet

ESTIMATED SEASONAL HIGH GROUNDWATER TABLE:

Depth of Estimated Seasonal High Groundwater Table: 36" (below land surface)

Kind: Iron concentrations; noncemented iron masses and reduction spots – iron coatings on sand grains

Location: In $2C_d$ matrix surrounding redox depletions Shape: Irregular/ spherical

Hardness: Soft Boundary: Clear Abundance: Common Size: Fine to medium Contrast: Prominent

Concentration color: 5YR 5/8 yellowish red Reduction color: 10YR 7/1 light gray Moisture state: Damp

DETERMINATION OF HIGH GROUNDWATER ELEVATION

Observed depth to redoximorphic features: 36" inches below grade

Observed depth to stabilized phreatic water: 44" inches below grade

Observed water weeping from side of deep hole: ___ inches below grade

DEPTH OF NATURALLY OCCURRING PERVIOUS MATERIAL: ► 5.92'

Depth of naturally occurring pervious material in TP22-2 Upper boundary: 08"
Lower boundary: 79"

Certification

I certify that I am currently approved by the Department of Environmental Protection pursuant to 310 CMR 15.017 to conduct evaluations and that the above analysis has been performed by me consistent with the required training, expertise and experience described in 310 CMR 15.017. I further certify that the results of my soil evaluation, as indicated in the attached Soil Evaluation Form, are accurate and in accordance with 310 CMR 15.017.

Alexander F. Parker *#1848*

Massachusetts Soil Evaluator & Certification number

June 1998

Date of Soil Evaluator Certification

02/10/2022

Date of soil testing

TP22-3 DEEP OBSERVATION HOLE

2 Norino Way, Georgetown, Massachusetts

FOR DRAINAGE DESIGN

Date: February 10, 2022 Time: 09:41 Weather: Partly cloudy, 35-40^{o}F, still

Landscape: Upland Landform: Ground moraine Position on landscape: Side slope

Slope aspect: Westerly Slope (%): 02- 03% Slope complexity: Simple Land Cover: Hard and softwoods and brush

Property line: 10^{+} feet Drainage way: 50^{+} feet Drinking water well: 100^{+} feet Abutting septic system: 50^{+} feet

Wetlands: 100^{+} feet Public water supply reservoir: 400^{+} feet Tributary to reservoir: 200^{+} feet

SOIL PROFILE ► TP22-3

Depth below land surface (inches)	Soil Horizon/ Layer	Soil Texture (USDA/ NRCS)	Soil Color (Munsell)	Redoxomorphic Features/ ESHGWT	Consistence, grade, size, structure, grain size, soil moisture state, roots, horizon boundary, clasts, stratification, artifacts, restrictive features, etc.
00” → 09”	A_P	Sandy Loam	10YR 3/2 very dark grayish brown	none observed	Very friable; moderate-grade; fine-to-medium granular structure; somewhat cohesive; fine grained mineral content; slightly damp; non-sticky; non-plastic; many fine-to-medium tree and brush roots; free of clasts; clear wavy boundary.
09” → 18”	B_w	Sandy Loam	10YR 5/6 yellowish brown	none observed	Very friable; medium sub-angular blocky structure; non-cohesive; mixed medium to mostly fine-grained mineral content; damp matrix; non-sticky; non-plastic; common fine and medium roots present; ~05% rounded to sub-rounded gravel content of mixed lithology; gradual wavy boundary.
18” → 79”	$2C_d$	Sandy Loam	2.5Y 5/4 light olive brown	38” (c,1-2,p) 10YR 7/1 5YR 5/8	Friable to firm; dense compact matrix; massive to subangular platy structure of moderate grade; mixed fine-to-medium grained mineral content; crudely stratified; damp matrix; non-sticky; non-plastic; well graded; approximately 15-20% sub-angular to sub-rounded gravel and 10-15% sub-rounded to angular cobble content of mixed lithology; redoximorphic features observed at 38”; apparent water observed at 44”; no bedrock refusal at test hole depth.

Depth to bedrock: > 79” Seasonal High Groundwater Table: 38” Apparent water table: 44”

TP21-3 DEEP OBSERVATION HOLE

2 Norino Way, Georgetown, Massachusetts

FOR DRAINAGE DESIGN

DEPTH TO APPARENT/ PHREATIC GROUNDWATER TABLE:

Apparent water seeping from pit face: 44" (below land surface) Depth to stabilized apparent water: ___ (below land surface)

Soil moisture state: Damp to wet

ESTIMATED SEASONAL HIGH GROUNDWATER TABLE:

Depth of Estimated Seasonal High Groundwater Table: 38" (below land surface)

Kind: Iron concentrations; noncemented iron masses and reduction spots – iron coatings on sand grains

Location: In $2C_d$ matrix surrounding redox depletions Shape: Irregular/ spherical

Hardness: Soft Boundary: Clear Abundance: Common Size: Fine to medium Contrast: Prominent

Concentration color: 5YR 5/8 yellowish red Reduction color: 10YR 7/1 light gray Moisture state: Damp

DETERMINATION OF HIGH GROUNDWATER ELEVATION

Observed depth to redoximorphic features: 38" inches below grade

Observed depth to stabilized phreatic water: 44" inches below grade

Observed water weeping from side of deep hole: ___ inches below grade

DEPTH OF NATURALLY OCCURRING PERVIOUS MATERIAL: ► 5.92'

Depth of naturally occurring pervious material in TP22-3 Upper boundary: 09"
Lower boundary: 79"

Certification

I certify that I am currently approved by the Department of Environmental Protection pursuant to 310 CMR 15.017 to conduct evaluations and that the above analysis has been performed by me consistent with the required training, expertise and experience described in 310 CMR 15.017. I further certify that the results of my soil evaluation, as indicated in the attached Soil Evaluation Form, are accurate and in accordance with 310 CMR 15.017.

Alexander F. Parker *#1848*
Massachusetts Soil Evaluator & Certification number

June 1998
Date of Soil Evaluator Certification

02/10/2022
Date of soil testing

VIII. Long Term Pollution Prevention and Operations and Maintenance Plan

This long-term Stormwater Management System Operations and Maintenance (O&M) Plan, filed with the Town of Georgetown, shall be implemented for the proposed development at 2 Norino Way to ensure that the stormwater management system functions as designed. The Owner holds the primary responsibility for overseeing and implementing the O&M Plan and assigning a Property Manager who will be responsible for the proper operation and maintenance of the stormwater structures. In case of transfer of property ownership, future property owners shall be notified of the presence of the stormwater management system and the requirements for proper implementation of the O&M Plan. Included in the manual is a Stormwater Management O&M Plan identifying the key components of the stormwater system and a log for tracking inspections and maintenance.

The stormwater management system protects and enhances the stormwater runoff water quality through the removal of sediment and pollutants, and source control significantly reduces the amount of pollutants entering the system. Preventive maintenance of the system will include a comprehensive source reduction program of regular vacuuming and litter removal, and prohibitions on the use of pesticides.

The purpose of the Stormwater Operations and Maintenance (O&M) plan is to ensure inspection of the system, removal of accumulated sediments, oils, and debris, and implementation of corrective action and record keeping activities.

The ongoing responsibility is the Owner, its successors and assigns. Adequate maintenance is defined in this document as good working condition.

Contact information is provided below:

Responsibility for Operations and Maintenance
Humboldt East, LLC
395 Ipswich Road
Boxford, MA

Illicit Discharge Compliance Statement

I, Jayme Fishman ____________________, verify that all illicit discharges to the stormwater management system are prohibited and no illicit discharges exist on the site.

EROSION AND SEDIMENT CONTROL BMPs

Minimize Disturbed Area and Protect Natural Features and Soil

Topsoil

Topsoil stripped from the immediate construction area can be temporarily stockpiled on site providing that the perimeter of the stockpiles is properly staked with silt fence at the toe of slope. The stockpiles shall be in areas that will not interfere with construction and at least 15 feet away from areas of concentrated flows or pavement. The area shall be inspected weekly for erosion and immediately after storm events. Areas on or around the stockpile that have eroded shall be stabilized immediately with erosion controls.

Stabilize Soils

Temporary Stabilization

- All vegetated areas which do not exhibit a minimum of 85% vegetative growth by Oct. 15th, or which are disturbed after Oct. 15th, shall be stabilized by seeding and installing erosion control blankets on slopes greater than 3:1, and seeding and placing 3 to 4 tons of mulch per acre, secured with anchored netting, elsewhere. The placement of erosion control blankets or mulch and netting shall not occur over accumulated snow or on frozen ground and shall be completed in advance of thaw or spring melt events.
- All ditches or swales which do not exhibit a minimum of 85% vegetative growth by Oct. 15th, or which are disturbed after Oct. 15th, shall be stabilized with stone or erosion control blankets appropriate for the design flow conditions.
- After November 15th, incomplete road surfaces, where work has stopped for the winter season, shall be protected with a minimum of 3 inches of crushed gravel.

Protect Slopes

Geotextile erosion control blankets shall be used to provide stabilization for slopes exceeding 3:1. Prepare soil before installing erosion control blanket, including any necessary application of lime, fertilizer, and seed. Begin at the top of the slope by anchoring the blanket in a 6" deep x 6" wide trench with approximately 12" extended beyond the upslope portion of the trench. Anchor the blanket with a row of staples/stakes approximately 12" apart in the bottom of the trench. Backfill and compact the trench after stapling. Apply seed to compacted soil and fold remaining 12" portion of back over seed and compacted soil. Secure over compacted soil with a row of staples/stakes spaced approximately 12" apart across the width of the blanket. Roll erosion control blanket either down or horizontally across the slope. Blanket will unroll with appropriate side against the soil surface. All blankets must be securely fastened to soil surface by placing staples/stakes in appropriate locations as shown in the staple pattern guide. When using the dot system, staples/stakes should be placed through each of the colored dots corresponding to the appropriate staple pattern. The edges of parallel blankets must be stapled with approximately 2"-5" overlap. Consecutive blankets spliced down the slope must be placed end over end (shingle style) with an approximate 3" overlap. Staple through overlapped area, approximately 12" apart across entire blanket's width. In loose soil conditions, the use of staple or stake lengths greater than 6" may be necessary to properly anchor the blanket.

Establish Perimeter Controls and Sediment Barriers

Silt fence shall be installed along the edge of wetlands. A double-row of erosion control barriers should be installed along the limit of work. The silt fence shall be installed before construction begins. Wooden posts shall be doubled and coupled at filter cloth seams. Filter cloth shall be fastened securely to support netting with ties spaced every 24" at top, midsection, and bottom. When two sections of filter cloth adjoin each other, they shall be overlapped by 6 inches, folded and stapled. Silt fence shall be removed upon completion of the project and stabilization of all soil.

Maintenance:
1. Silt fence shall be inspected immediately after each rainfall and at least daily during prolonged rainfall. Any repairs that are required shall be made immediately.
2. If the fabric on the silt fence shall decompose or become ineffective during the expected life of the fence, the fabric shall be replaced promptly.
3. Sediment deposits shall be inspected after every storm event. The deposits shall be removed when they reach approximately one-half the height of the barrier.
4. Sediment deposits that are removed or left in place after the fabric has been removed shall be graded to conform with the existing topography and vegetated.

Establish Stabilized Construction Entrance

A stabilized construction entrance shall be installed before construction begins on the site. The stone anti-tracking pad shall remain in place until the subgrade of pavement is installed.

1. Stone shall be 1-2" stone, reclaimed stone, or recycled concrete equivalent.
2. The length of the stabilized entrance shall not be less than 50'.
3. The thickness of the stone for the stabilized entrance shall not be less than 6".
4. Geotextile filter cloth shall be placed over the entire area prior to placing the stone.
5. All surface water that is flowing to or diverted toward the construction entrance shall be piped beneath the entrance. If piping is impractical, a berm with 5:1 slope that can be crossed by vehicles may be substituted for the pipe.
6. The entrance shall be maintained in a condition that will prevent tracking or flowing of sediment onto public rights-of-way. This may require periodic top-dressing with additional stone as conditions demand and repair and/or cleanout of any measures used to trap sediment. All sediment spilled, washed, or tracked onto public rights-of-way must be removed promptly.

7. Wheels shall be cleaned to remove mud prior to entrance onto public rights-of way. When washing is required, it shall be done on an area stabilized with stone which drains into an approved sediment trapping device.

Catch Basin Inlet Protection

Inlet protection devices intercept and/or filter sediment before it can be transported from a site into the storm drain system and discharged into a lake, river, stream, wetland, or other waterbody. These devices also keep sediment from filling or clogging storm drain pipes, ditches, and downgradient sediment traps or ponds. A siltsack or approved equal shall be used for catch basin inlet protection. It should be inspected weekly. When the restraint cord is no longer visible, siltsack is full and shall be emptied.

POST-CONSTRUCTION BMPs

Snow and Snow Melt Management

Proper management of snow and snow melt, snow removal and storage, use of deicing compounds, and other practices can minimize major runoff and pollutant loading impacts. Snow will be stored in areas adjacent to the edge of the access drive. Use of alternative deicing compounds, such as calcium chloride and calcium magnesium acetate, will be investigated for use. Professional services will be used for snow management.

Deep Sump/Hooded Catch Basins

Deep sump/hooded catch basins are incorporated in the proposed development's stormwater management plan as pre-treatment for the proposed drainage system. The sump provides for settlement of suspended solids and a hood is provided to remove floatables and trapped hydrocarbons. It is not anticipated that the proposed access drive will become an area of high sediment loading. The sump should be inspected and cleaned at least four times per year; the more frequent the cleaning, the less likely sediment will be resuspended and subsequently discharged. Catch basin sediments and debris shall be disposed of at an approved DEP landfill. The owner shall be responsible for the catch basin cleaning operations.

Infiltration Basin

Infiltration basins are included in the stormwater management plan design for the proposed development. The applicant of the project, through his contractor, will incorporate this sediment control feature into the project during construction activities. The infiltration basins shall not be used for sedimentation control and shall be protected and shall not be used for sedimentation during construction. The basins shall be inspected monthly during construction and cleaned upon completion of the project. Upon completion of the development, the Owner will be responsible for proper maintenance of the basins. Infiltration basins are prone to clogging and failure, so to ensure proper performance and system longevity, it is imperative the following maintenance schedule is recommended:

a. Mowing: Basin should be mowed periodically; at least once per month in the spring, summer and fall. The vegetation must not be cut shorter than four inches. All grass clippings should be removed and properly disposed of.
b. Sediment and debris removal: Once the basin is in use, it shall be inspected for the first few months after every rainfall event exceeding 2.5 inches over a 24-hour period to endure it is stabilized and functioning properly. If water remains standing in the basin 48-72 hours after the storm, check for clogging. Reasons for clogging include upland sediment erosion, excessive compaction of soils or low spots. Basin should be inspected at least four times per year and after every time drainage flows through the high outlet orifice. Any sediment and debris should be removed manually before the vegetation is adversely impacted. At a minimum, accumulated debris should be removed at least once per year to ensure sediments are not re-suspended. Use deep tilling to break up any clogged surfaces and revegetate immediately. Items to look for during inspection include signs of settlement, crackling, erosion, leakage in the embankments, tree growth in the embankments, condition of riprap, sediment accumulation and the health of the turf.
c. Basin protection: Efforts should be made, through snow and snow melt management, local bylaws, and public education, to protect the basin from damages of snow removal and off-street parking.

Infiltration Chamber

Infiltration chambers are incorporated into the site design for infiltration. The chambers shall be inspected after every major storm event in the first 4 months after construction to ensure proper function. Inspection ports shall be utilized for access and assessment. After the four-month period, the chambers shall be inspected a minimum of twice per year. Any grit or sediment found within the chambers impacting infiltration shall be removed by manual or mechanical methods, such as a vacuum truck. The owner will be responsible for proper maintenance of the subsurface systems.

ADS Underground Detention System

A high-density polyethylene pipe (HDPE) underground detention system is incorporated into the site design for runoff storage. The system should be inspected quarterly for accumulated sediment. The system should be cleaned when inspection reveals that accumulated sediment or trash is clogging the discharge orifice. Accumulated sediment and trash can typically be removed through the riser over the outlet orifice. Sediments and debris shall be disposed of at an approved DEP landfill. The Owner shall be responsible for the underground system cleaning operations.

CDS System

A CDS1515-3 is incorporated into the site design for treatment for the proposed underground infiltration system. At a minimum, the unit shall be inspected twice per year (spring and fall). The CDS unit should be vacuum cleaned when the level of sediment has reached 75% of capacity in the isolated sump. Sediments and debris shall be disposed of at an approved DEP landfill. The owner shall be responsible for the CDS cleaning operations.

StormFilter System

A StormFilter is incorporated into the site design for treatment for the proposed underground infiltration system. At a minimum, the unit shall be inspected twice per year (spring and fall). The StormFilter unit should be vacuum cleaned when the level of sediment has reached a depth of 4" in the vault. When sediment is greater than ¼" on top of the cartridge, maintenance will be required. When there is more than 4" of statis water above the cartridge bottom for 24 hours, the cartridge requires maintenance. Sediments and debris shall be disposed of at an approved DEP landfill. The owner shall be responsible for the StormFilter cleaning operations.

Rip Rap

Inspect the rip rap outlets regularly, especially after major storm events. Notation of any low spots or erosion should be made. Any debris or trash should be removed. If scouring or channeling occurs, the riprap should be repaired.

<u>FINAL STABILIZATION</u>

<u>Permanent Seeding</u>

Loam and hydroseed any disturbed surfaces after the final design grades have been achieved. A minimum of 6" of loam shall be installed. Seed mix shall be a maximum of 10% rye grass and a minimum of 90% permanent bluegrass and/or fescue. Lime shall be applied at a rate of 2 tons/acre.

Construction debris, trash and temporary BMPs (including silt fences, material storage areas, and inlet protection) will also be removed and any areas disturbed during removal will be seeded immediately.

Inspection and Maintenance Report Form

To be completed every 7 days and within 24 hours of a rainfall event of 0.5 inches or more.

Inspector: ______________________________ Date: _____________________

Inspector's Qualifications: ____

____

____

Days since last rainfall: _________ days Amount of last rainfall: _____ in.

Stabilization Measures

Drainage Area	**Date Since Last Disturbance**	**Date of Next Disturbance**	**Stabilized (Yes/No)**	**Stabilized With**	**Condition**

Stabilization required:

____

____

To be performed by: ________________________ On or before: __________________

Inspection and Maintenance Report Form

Sediment Forebay/Basin

Depth of Sediment in forebay (inches)	Condition of Swale Side Sloped	Any Evidence of Overtopping of the Embankment (Yes/No)	Condition of Outfall from Swales

Maintenance required for sediment forebay/basin:

____

____

____

____

To be performed by: __________________________On or before: _________________

Stabilized Construction Entrance (Area __________):

Does Much Sediment Get Tracked on to Road?	Is Gravel Clean or Full of Sediment?	Does all Traffic use the Stabilized Entrance to Leave the Site?	Is the Culvert Beneath the Entrance Working?

Maintenance required for stabilized construction entrance (Area ___________):

____

____

____

To be performed by: __________________________On or before: _________________

Inspection and Maintenance Report Form

Perimeter Controls:

Date: _________________________

Silt sock

Drainage Area	Has Silt Reached 1/3 of Fence Height? (Yes/No)	Depth of Silt?	Is Fence Properly Secured?	Is There Evidence of Overtopping?	If a Problem is Found, List Nearest Flag No.

Maintenance required for silt fence and hay bales:

____

____

____

To be performed by: __________________________On or before: _________________

IIX. **Appendix**

a. Rip Rap Sizing Calculations

PIPE OUTLET PROTECTION APRON DESIGN
And
d_{50} RIPRAP SIZING

PROJECT NAME :	2 Norino Way		
PROJECT # :	Infiltration Basin 2 Outlet		
BY :	JTM	CHECKED BY :	
DATE :	5/24/2021 STORM: 10-Yr	DATE :	

DOWNSTREAM PIPE HYDRAULICS

Peak Discharge Required = 0.47 cfs
Depth of Flow* = 0.20 Feet

La AND W CALCULATIONS:

Culvert Diameter (Do) =	12.0	Inches
Tail Water Depth (TW)* =	0.20	Feet
Width of Apron @ U.S End (W) =	3.0	Feet
Length of Apron (La) =	8	Feet
Width of Apron @ D.S End (W) =	11	Feet

***If outletting to Flat Area use TW depth = 0.2 x Do**

ROCK RIPRAP SIZE

d_{50} = 0.04 Feet or 0.44 Inches

$d_{50} = (0.02 \times Q^{4/3})/(Tw \times Do)$

ROCK RIPRAP GRADATION (TABLE 7-24 OF NHDES HANDBOOK)

% of Weight Smaller Than The Given Size	Size of Stone in Inches		
100	0.7	to	0.9
85	0.6	to	0.8
50	0.4	to	0.7
15	0.1	to	0.2

Minimum Rock Riprap Blanket Thickness = 6.0 Inches
Minimum Six inch Sand/Gravel Bedding or Geotextile Fabric Required Under All Rock Riprap

FORMULAS USED (Reference NHDES HANDBOOK, Pages 7-114, 7-115)

Manning's Uniform Channel Flow -	Q = (A x 1.486 x R^(2/3) x S^(1/2))/"n"
Length of Apron (La) TW< Do/2 -	La = (1.8 x Q/Do^1.5) + 7 x Do
Length of Apron (La) TW>= Do/2 -	La = 3.0 x Q/Do^1.5 + 7 x Do
Width of Apron @ D.S End TW < Do/2 -	W = 3 x Do + La
Width of Apron @ D.S End TW >= Do/2 -	W = 3 x Do + 0.4 x La
Width of D.S. Apron if in Channel -	Ch. BW +Sum of Side Slopes x Flow Depth
Width of Apron @ Culvert -	Wc = 3 x Do

PIPE OUTLET PROTECTION APRON DESIGN
And
d_{50} RIPRAP SIZING

PROJECT NAME :	2 Norino Way		
PROJECT # :	Subsurface Infiltration Area Outlet		
BY :	JTM	CHECKED BY :	
DATE :	5/24/2021 STORM: 10-Yr	DATE :	

DOWNSTREAM PIPE HYDRAULICS

Peak Discharge Required = 2.45 cfs
Depth of Flow* = 0.20 Feet

La AND W CALCULATIONS:

Culvert Diameter (Do) =	12.0	Inches
Tail Water Depth (TW)* =	0.20	Feet
Width of Apron @ U.S End (W) =	3.0	Feet
Length of Apron (La) =	11	Feet
Width of Apron @ D.S End (W) =	14	Feet

***If outletting to Flat Area use TW depth = 0.2 x Do**

ROCK RIPRAP SIZE

d_{50} = 0.33 Feet or 3.96 Inches

$d_{50} = (0.02 \times Q^{4/3})/(Tw \times Do)$

ROCK RIPRAP GRADATION (TABLE 7-24 OF NHDES HANDBOOK)

% of Weight Smaller Than The Given Size	Size of Stone in Inches		
100	5.9	to	7.9
85	5.2	to	7.1
50	4.0	to	5.9
15	1.2	to	2.0

Minimum Rock Riprap Blanket Thickness = 11.9 Inches
Minimum Six inch Sand/Gravel Bedding or Geotextile Fabric Required Under All Rock Riprap

FORMULAS USED (Reference NHDES HANDBOOK, Pages 7-114, 7-115)

Manning's Uniform Channel Flow -	Q = (A x 1.486 x R^(2/3) x S^(1/2))/"n"
Length of Apron (La) TW< Do/2 -	La = (1.8 x Q/Do^1.5) + 7 x Do
Length of Apron (La) TW>= Do/2 -	La = 3.0 x Q/Do^1.5 + 7 x Do
Width of Apron @ D.S End TW < Do/2 -	W = 3 x Do + La
Width of Apron @ D.S End TW >= Do/2 -	W = 3 x Do + 0.4 x La
Width of D.S. Apron if in Channel -	Ch. BW +Sum of Side Slopes x Flow Depth
Width of Apron @ Culvert -	Wc = 3 x Do

PIPE OUTLET PROTECTION APRON DESIGN
And
d_{50} RIPRAP SIZING

PROJECT NAME :	2 Norino Way		
PROJECT # :	Detention Area Outlet		
BY :	JTM	CHECKED BY :	
DATE :	5/24/2021	STORM: 10-Yr	DATE :

DOWNSTREAM PIPE HYDRAULICS

Peak Discharge Required =	0.83	cfs
Depth of Flow* =	0.20	Feet

La AND W CALCULATIONS:

Culvert Diameter (Do) =	12.0	Inches
Tail Water Depth (TW)* =	0.20	Feet
Width of Apron @ U.S End (W) =	3.0	Feet
Length of Apron (La) =	8	Feet
Width of Apron @ D.S End (W) =	11	Feet

***If outletting to Flat Area use TW depth = 0.2 x Do**

ROCK RIPRAP SIZE

d_{50} = 0.08 Feet or 0.94 Inches

$d_{50} = (0.02 \times Q^{4/3})/(Tw \times Do)$

ROCK RIPRAP GRADATION (TABLE 7-24 OF NHDES HANDBOOK)

% of Weight Smaller Than The Given Size	Size of Stone in Inches		
100	1.4	to	1.9
85	1.2	to	1.7
50	0.9	to	1.4
15	0.3	to	0.5

Minimum Rock Riprap Blanket Thickness = 6.0 Inches

Minimum Six inch Sand/Gravel Bedding or Geotextile Fabric Required Under All Rock Riprap

FORMULAS USED (Reference NHDES HANDBOOK, Pages 7-114, 7-115)

Manning's Uniform Channel Flow -	Q = (A x 1.486 x R^(2/3) x S^(1/2))/"n"
Length of Apron (La) TW< Do/2 -	La = (1.8 x Q/Do^1.5) + 7 x Do
Length of Apron (La) TW>= Do/2 -	La = 3.0 x Q/Do^1.5 + 7 x Do
Width of Apron @ D.S End TW < Do/2 -	W = 3 x Do + La
Width of Apron @ D.S End TW >= Do/2 -	W = 3 x Do + 0.4 x La
Width of D.S. Apron if in Channel -	Ch. BW +Sum of Side Slopes x Flow Depth
Width of Apron @ Culvert -	Wc = 3 x Do

b. Mounding Analysis

This spreadsheet will calculate the height of a groundwater mound beneath a stormwater infiltration basin. More information can be found in the U.S. Geological Survey Scientific Investigations Report 2010-5102 "Simulation of groundwater mounding beneath hypothetical stormwater infiltration basins".

The user must specify infiltration rate (R), specific yield (Sy), horizontal hydraulic conductivity (Kh), basin dimensions (x, y), duration of infiltration period (t), and the initial thickness of the saturated zone (hi(0), height of the water table if the bottom of the aquifer is the datum). For a square basin the half width equals the half length (x = y). For a rectangular basin, if the user wants the water-table changes perpendicular to the long side, specify x as the short dimension and y as the long dimension. Conversely, if the user wants the values perpendicular to the short side, specify y as the short dimension, x as the long dimension. All distances are from the center of the basin. Users can change the distances from the center of the basin at which water-table aquifer thickness are calculated.
Cells highlighted in yellow are values that can be changed by the user. Cells highlighted in red are output values based on user-specified inputs. The user MUST click the blue "Re-Calculate Now" button each time ANY of the user-specified inputs are changed otherwise necessary iterations to converge on the correct solution will not be done and values shown will be incorrect. Use consistent units for all input values (for example, feet and days)

Input Values		use consistent units (e.g. feet & days **or** inches & hours)
2.0400	***R***	**Recharge (infiltration) rate (feet/day)**
0.230	**Sy**	**Specific yield, Sy (dimensionless, between 0 and 1)**
60.00	**K**	**Horizontal hydraulic conductivity, Kh (feet/day)***
57.000	**x**	**1/2 length of basin (x direction, in feet)**
22.000	**y**	**1/2 width of basin (y direction, in feet)**
0.650	**t**	**duration of infiltration period (days)**
30.000	**hi(0)**	**initial thickness of saturated zone (feet)**

Conversion Table

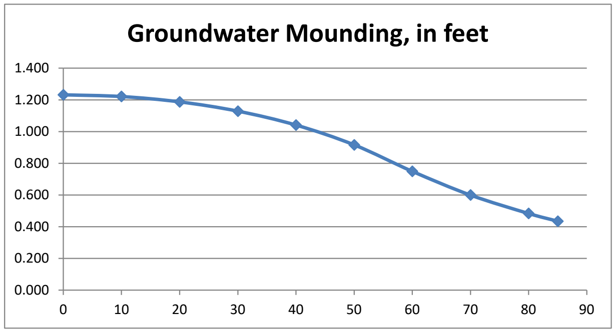
inch/hour	**feet/day**
0.67	1.33
2.00	4.00
hours	**days**
36	1.50

In the report accompanying this spreadsheet (USGS SIR 2010-5102), vertical soil permeability (ft/d) is assumed to be one-tenth horizontal hydraulic conductivity (ft/d).

31.232	**h(max)**	**maximum thickness of saturated zone (beneath center of basin at end of infiltration period)**
1.232	**Δh(max)**	**maximum groundwater mounding (beneath center of basin at end of infiltration period)**

Ground-water Mounding, in feet	**Distance from center of basin in x direction, in feet**
1.232	**0**
1.221	**10**
1.187	**20**
1.129	**30**
1.041	**40**
0.916	**50**
0.749	**60**
0.599	**70**
0.483	**80**
0.435	**85**

Re-Calculate Now



Disclaimer

This spreadsheet solving the Hantush (1967) equation for ground-water mounding beneath an infiltration basin is made available to the general public as a convenience for those wishing to replicate values documented in the USGS Scientific Investigations Report 2010-5102 "Groundwater mounding beneath hypothetical stormwater infiltration basins" or to calculate values based on user-specified site conditions. Any changes made to the spreadsheet (other than values identified as user-specified) after transmission from the USGS could have unintended, undesirable consequences. These consequences could include, but may not be limited to: erroneous output, numerical instabilities, and violations of underlying assumptions that are inherent in results presented in the accompanying USGS published report. The USGS assumes no responsibility for the consequences of any changes made to the spreadsheet. If changes are made to the spreadsheet, the user is responsible for documenting the changes and justifying the results and conclusions.

This spreadsheet will calculate the height of a groundwater mound beneath a stormwater infiltration basin. More information can be found in the U.S. Geological Survey Scientific Investigations Report 2010-5102 "Simulation of groundwater mounding beneath hypothetical stormwater infiltration basins".

The user must specify infiltration rate (R), specific yield (Sy), horizontal hydraulic conductivity (Kh), basin dimensions (x, y), duration of infiltration period (t), and the initial thickness of the saturated zone (hi(0), height of the water table if the bottom of the aquifer is the datum). For a square basin the half width equals the half length (x = y). For a rectangular basin, if the user wants the water-table changes perpendicular to the long side, specify x as the short dimension and y as the long dimension. Conversely, if the user wants the values perpendicular to the short side, specify y as the short dimension, x as the long dimension. All distances are from the center of the basin. Users can change the distances from the center of the basin at which water-table aquifer thickness are calculated.
Cells highlighted in yellow are values that can be changed by the user. Cells highlighted in red are output values based on user-specified inputs. The user MUST click the blue "Re-Calculate Now" button each time ANY of the user-specified inputs are changed otherwise necessary iterations to converge on the correct solution will not be done and values shown will be incorrect. Use consistent units for all input values (for example, feet and days)

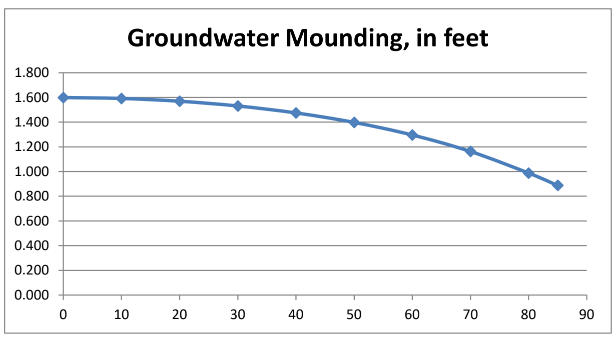
Input Values		use consistent units (e.g. feet & days **or** inches & hours)	Conversion Table	
			inch/hour	**feet/day**
2.0400	***R***	**Recharge (infiltration) rate (feet/day)**	0.67	1.33
0.230	**Sy**	**Specific yield, Sy (dimensionless, between 0 and 1)**		
60.00	**K**	**Horizontal hydraulic conductivity, Kh (feet/day)***	2.00	4.00
82.000	**x**	**1/2 length of basin (x direction, in feet)**		
25.000	**y**	**1/2 width of basin (y direction, in feet)**	**hours**	**days**
0.650	**t**	**duration of infiltration period (days)**	36	1.50
30.000	**hi(0)**	**initial thickness of saturated zone (feet)**		

In the report accompanying this spreadsheet (USGS SIR 2010-5102), vertical soil permeability (ft/d) is assumed to be one-tenth horizontal hydraulic conductivity (ft/d).

31.599	**h(max)**	**maximum thickness of saturated zone (beneath center of basin at end of infiltration period)**
1.599	**Δh(max)**	**maximum groundwater mounding (beneath center of basin at end of infiltration period)**

Ground-water Mounding, in feet	**Distance from center of basin in x direction, in feet**
1.599	**0**
1.592	**10**
1.569	**20**
1.531	**30**
1.475	**40**
1.398	**50**
1.296	**60**
1.163	**70**
0.987	**80**
0.887	**85**

Re-Calculate Now



Disclaimer

This spreadsheet solving the Hantush (1967) equation for ground-water mounding beneath an infiltration basin is made available to the general public as a convenience for those wishing to replicate values documented in the USGS Scientific Investigations Report 2010-5102 "Groundwater mounding beneath hypothetical stormwater infiltration basins" or to calculate values based on user-specified site conditions. Any changes made to the spreadsheet (other than values identified as user-specified) after transmission from the USGS could have unintended, undesirable consequences. These consequences could include, but may not be limited to: erroneous output, numerical instabilities, and violations of underlying assumptions that are inherent in results presented in the accompanying USGS published report. The USGS assumes no responsibility for the consequences of any changes made to the spreadsheet. If changes are made to the spreadsheet, the user is responsible for documenting the changes and justifying the results and conclusions.

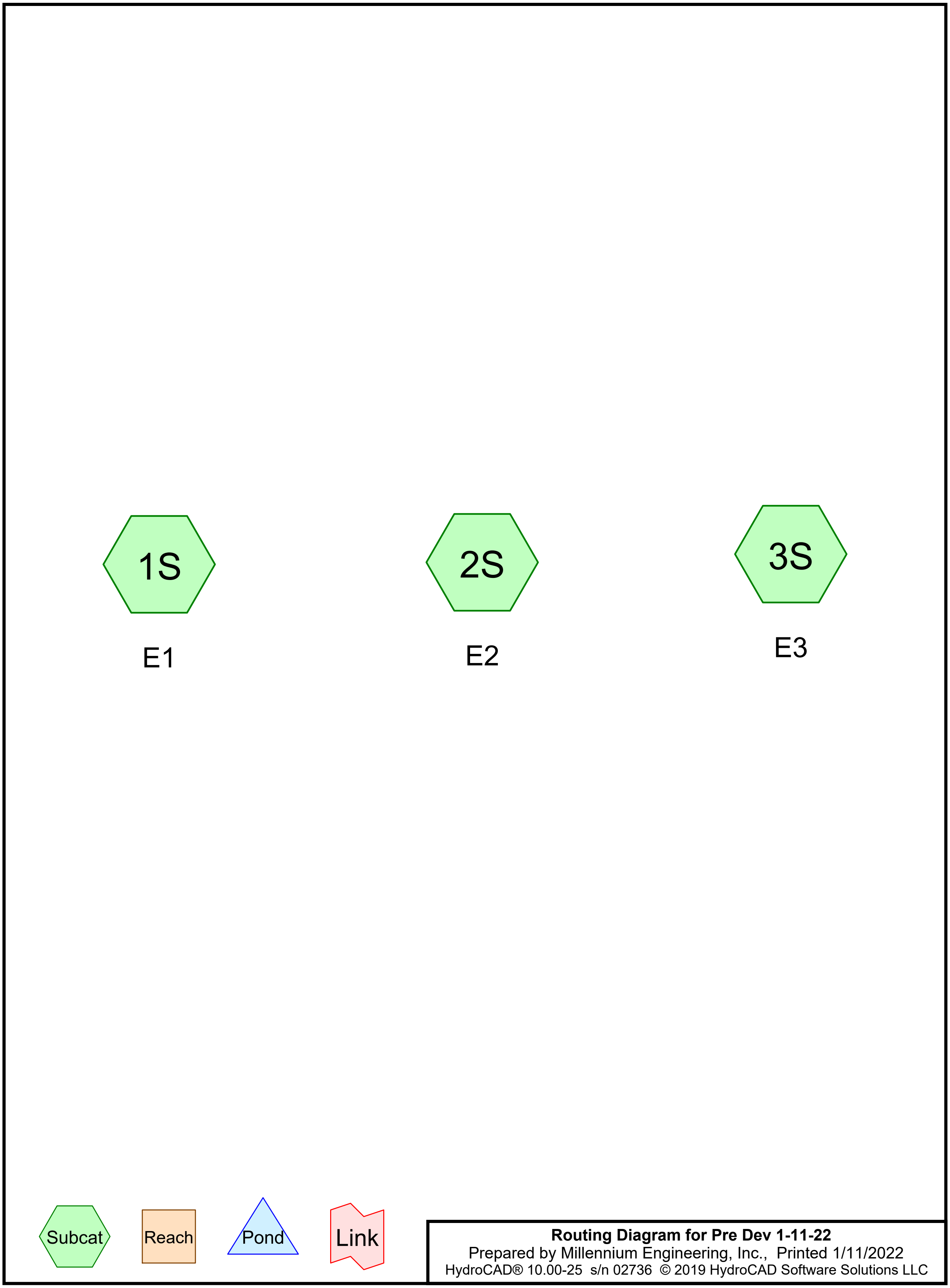
c. Phosphorus Removal Calculations

Phosphorus Removal Calculations

Infiltration Basin 1 Removal = 70% of 7,139 s.f. of impervious = 4,997 s.f. treated.
Infiltration Basin 2 Removal = 70% of 18,926 s.f. of impervious = 13,248 s.f. treated.
Subsurface Detention Area 2 = 75% of 4,266 s.f. of impervious = 3,199 s,f, treated.

Total Impervious Area = 35,501 s.f.
60 % of Impervious area required phosphorus removal = 21,300 s.f.
Total Impervious area treated = 21,444 s.f. = 60.4%

d. Existing Conditions HydroCAD Report



Routing Diagram for Pre Dev 1-11-22
Prepared by Millennium Engineering, Inc., Printed 1/11/2022
HydroCAD® 10.00-25 s/n 02736 © 2019 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.127	98	Unconnected pavement, HSG B (2S, 3S)
0.161	98	Unconnected roofs, HSG B (1S, 2S, 3S)
9.377	55	Woods, Good, HSG B (1S, 2S, 3S)
1.268	58	Woods/grass comb., Good, HSG B (1S, 2S, 3S)
10.932	**56**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
10.932	HSG B	1S, 2S, 3S
0.000	HSG C	
0.000	HSG D	
0.000	Other	
10.932		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.127	0.000	0.000	0.000	0.127	Unconnected pavement	2S, 3S
0.000	0.161	0.000	0.000	0.000	0.161	Unconnected roofs	1S, 2S, 3S
0.000	9.377	0.000	0.000	0.000	9.377	Woods, Good	1S, 2S, 3S
0.000	1.268	0.000	0.000	0.000	1.268	Woods/grass comb., Good	1S, 2S, 3S
0.000	**10.932**	**0.000**	**0.000**	**0.000**	**10.932**	**TOTAL AREA**	

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

Subcatchment 1S: E1 Runoff Area=99,332 sf 2.45% Impervious Runoff Depth>0.21"
Flow Length=598' Tc=13.3 min CN=56 Runoff=0.17 cfs 0.039 af

Subcatchment 2S: E2 Runoff Area=111,802 sf 3.60% Impervious Runoff Depth>0.21"
Flow Length=165' Tc=7.8 min UI Adjusted CN=56 Runoff=0.23 cfs 0.045 af

Subcatchment 3S: E3 Runoff Area=265,075 sf 2.29% Impervious Runoff Depth>0.21"
Flow Length=287' Tc=6.8 min CN=56 Runoff=0.55 cfs 0.106 af

Total Runoff Area = 10.932 ac Runoff Volume = 0.190 af Average Runoff Depth = 0.21"
97.37% Pervious = 10.645 ac 2.63% Impervious = 0.288 ac

Summary for Subcatchment 1S: E1

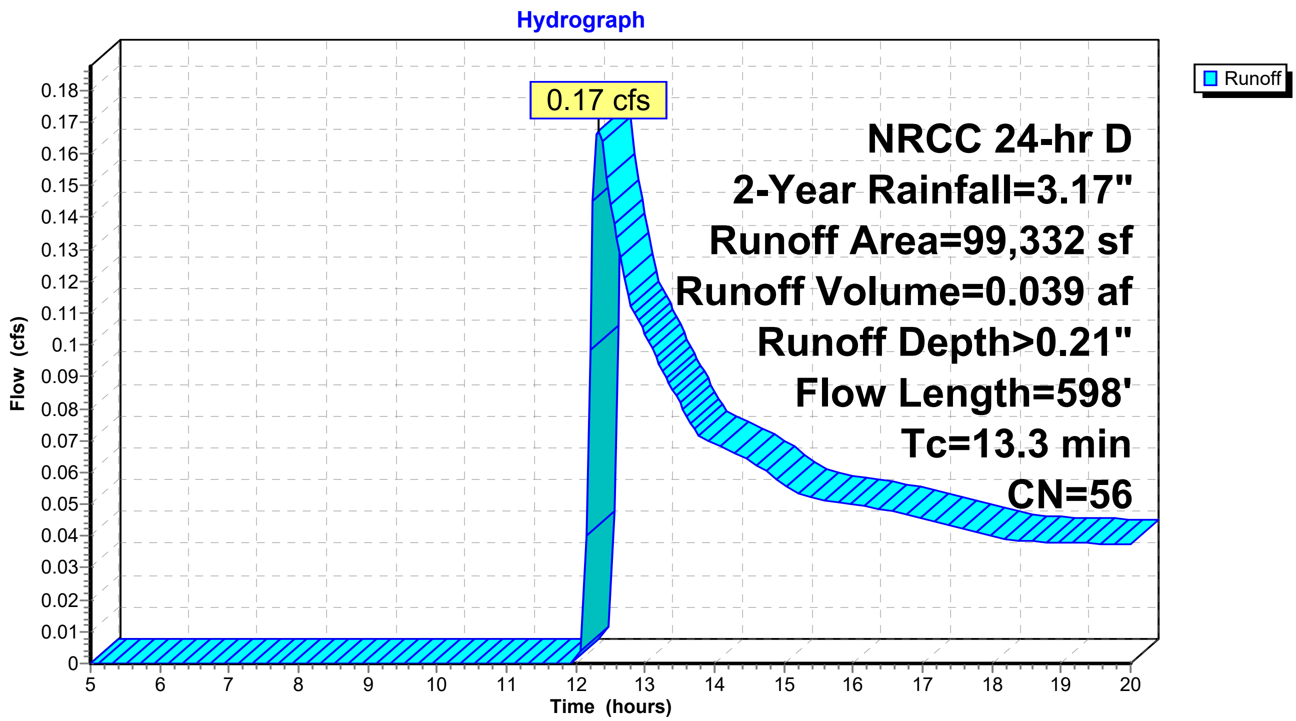
Runoff = 0.17 cfs @ 12.33 hrs, Volume= 0.039 af, Depth> 0.21"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 2-Year Rainfall=3.17"

Area (sf)	CN	Description
8,434	58	Woods/grass comb., Good, HSG B
88,466	55	Woods, Good, HSG B
2,432	98	Unconnected roofs, HSG B
99,332	56	Weighted Average
96,900		97.55% Pervious Area
2,432		2.45% Impervious Area
2,432		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.3	50	0.0200	0.10		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.10"
5.0	548	0.1350	1.84		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
13.3	598	Total			

Subcatchment 1S: E1



Summary for Subcatchment 2S: E2

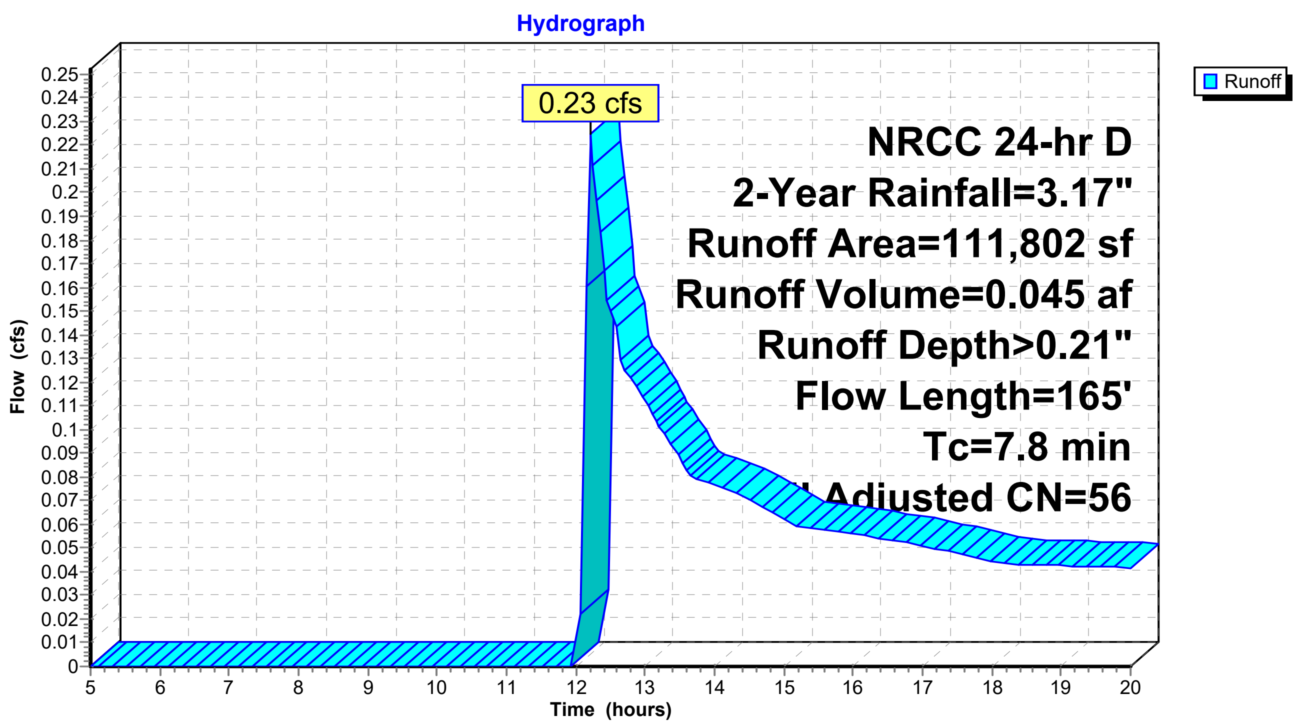
Runoff = 0.23 cfs @ 12.22 hrs, Volume= 0.045 af, Depth> 0.21"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 2-Year Rainfall=3.17"

Area (sf)	CN	Adj	Description
17,143	58		Woods/grass comb., Good, HSG B
90,630	55		Woods, Good, HSG B
2,740	98		Unconnected roofs, HSG B
1,289	98		Unconnected pavement, HSG B
111,802	57	56	Weighted Average, UI Adjusted
107,773			96.40% Pervious Area
4,029			3.60% Impervious Area
4,029			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.6	50	0.0700	0.11		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.10"
0.2	115	0.2500	8.05		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
7.8	165	Total			

Subcatchment 2S: E2



Summary for Subcatchment 3S: E3

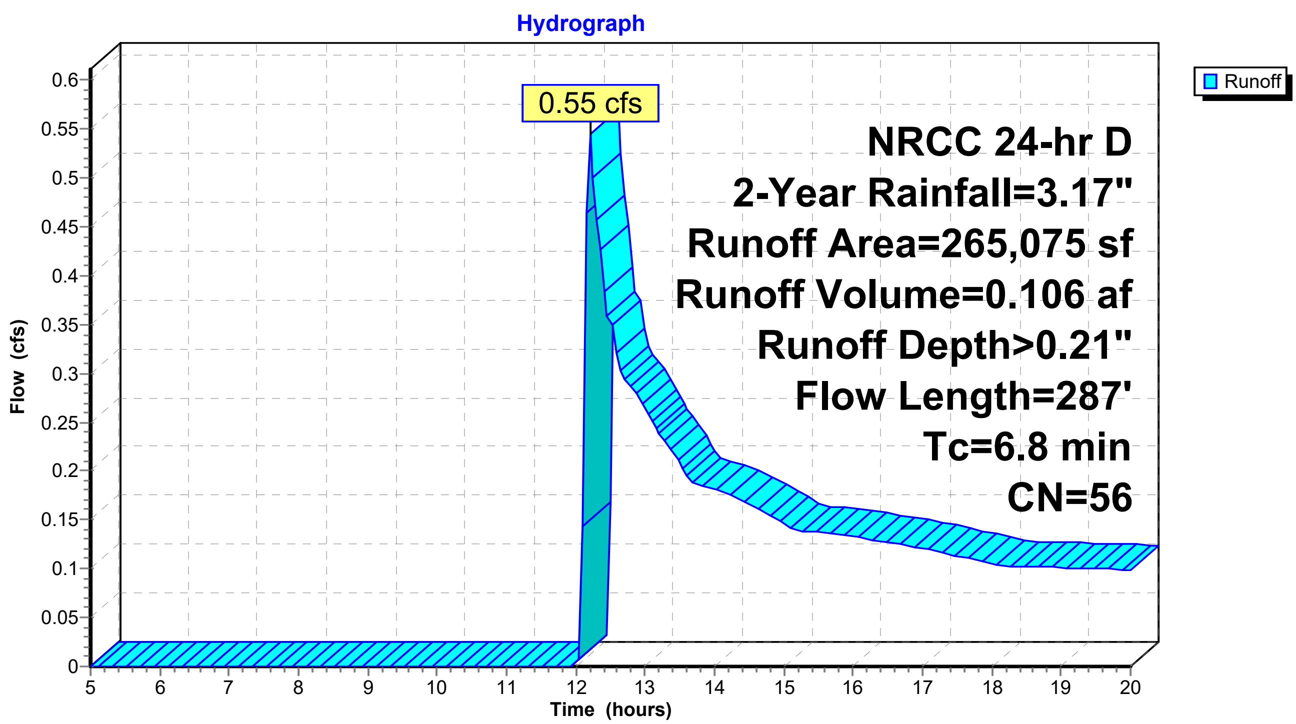
Runoff = 0.55 cfs @ 12.21 hrs, Volume= 0.106 af, Depth> 0.21"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 2-Year Rainfall=3.17"

Area (sf)	CN	Description
29,652	58	Woods/grass comb., Good, HSG B
229,355	55	Woods, Good, HSG B
1,840	98	Unconnected roofs, HSG B
4,228	98	Unconnected pavement, HSG B
265,075	56	Weighted Average
259,007		97.71% Pervious Area
6,068		2.29% Impervious Area
6,068		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.1	50	0.1200	0.14		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.10"
0.7	237	0.1300	5.80		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
6.8	287	Total			

Subcatchment 3S: E3



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

Subcatchment 1S: E1 Runoff Area=99,332 sf 2.45% Impervious Runoff Depth>0.81"
Flow Length=598' Tc=13.3 min CN=56 Runoff=1.53 cfs 0.155 af

Subcatchment 2S: E2 Runoff Area=111,802 sf 3.60% Impervious Runoff Depth>0.82"
Flow Length=165' Tc=7.8 min UI Adjusted CN=56 Runoff=2.15 cfs 0.175 af

Subcatchment 3S: E3 Runoff Area=265,075 sf 2.29% Impervious Runoff Depth>0.82"
Flow Length=287' Tc=6.8 min CN=56 Runoff=5.34 cfs 0.415 af

Total Runoff Area = 10.932 ac Runoff Volume = 0.745 af Average Runoff Depth = 0.82"
97.37% Pervious = 10.645 ac 2.63% Impervious = 0.288 ac

Summary for Subcatchment 1S: E1

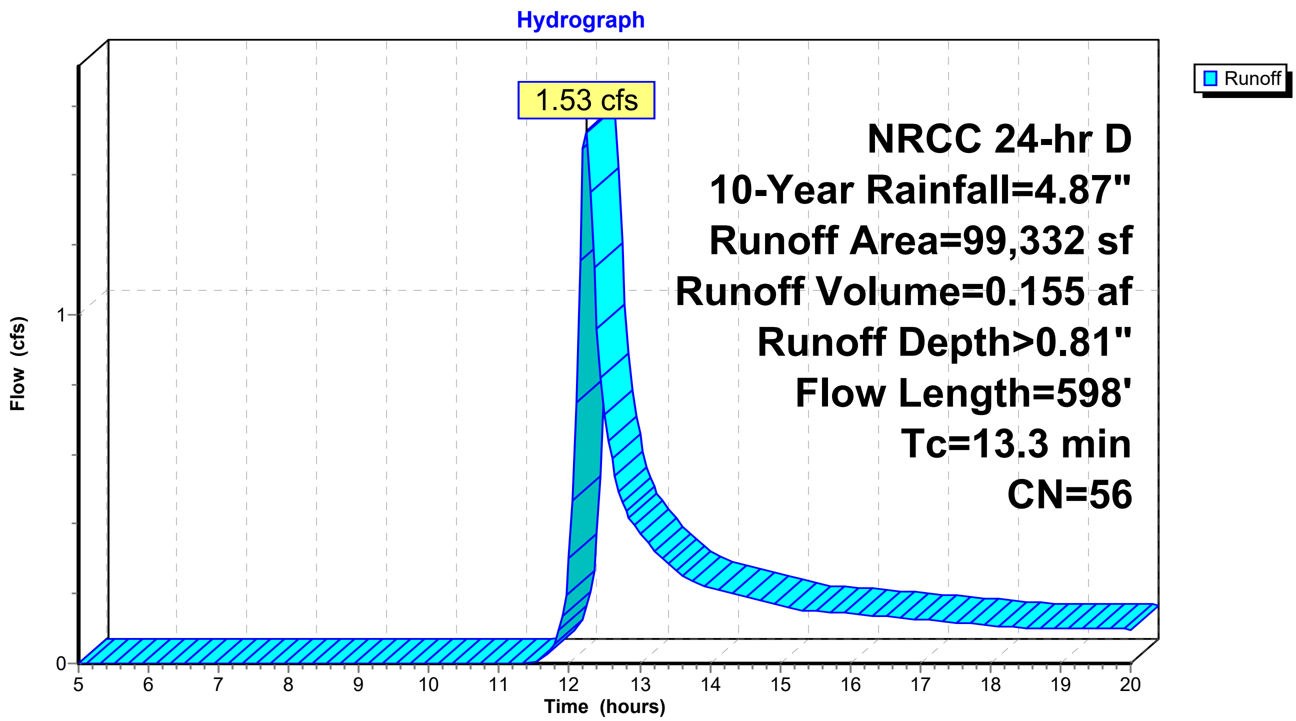
Runoff = 1.53 cfs @ 12.24 hrs, Volume= 0.155 af, Depth> 0.81"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 10-Year Rainfall=4.87"

Area (sf)	CN	Description
8,434	58	Woods/grass comb., Good, HSG B
88,466	55	Woods, Good, HSG B
2,432	98	Unconnected roofs, HSG B
99,332	56	Weighted Average
96,900		97.55% Pervious Area
2,432		2.45% Impervious Area
2,432		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.3	50	0.0200	0.10		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.10"
5.0	548	0.1350	1.84		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
13.3	598	Total			

Subcatchment 1S: E1



Summary for Subcatchment 2S: E2

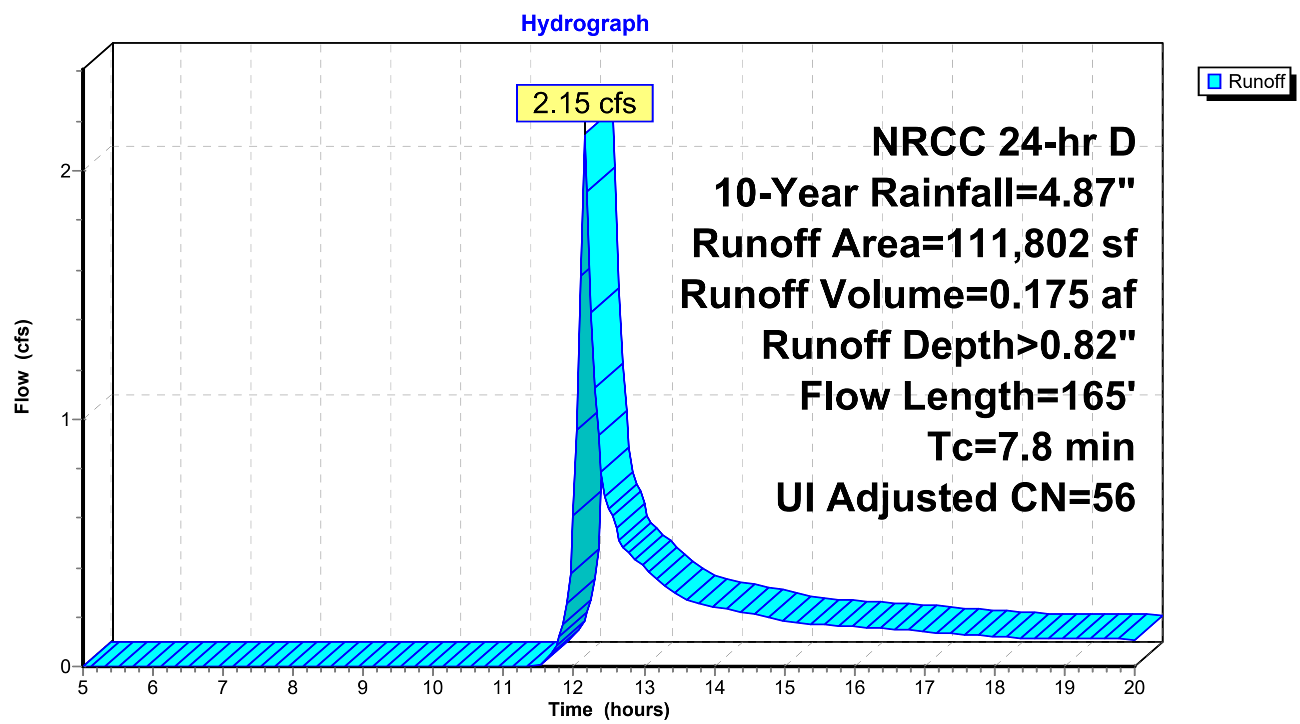
Runoff = 2.15 cfs @ 12.16 hrs, Volume= 0.175 af, Depth> 0.82"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 10-Year Rainfall=4.87"

Area (sf)	CN	Adj	Description
17,143	58		Woods/grass comb., Good, HSG B
90,630	55		Woods, Good, HSG B
2,740	98		Unconnected roofs, HSG B
1,289	98		Unconnected pavement, HSG B
111,802	57	56	Weighted Average, UI Adjusted
107,773			96.40% Pervious Area
4,029			3.60% Impervious Area
4,029			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.6	50	0.0700	0.11		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.10"
0.2	115	0.2500	8.05		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
7.8	165	Total			

Subcatchment 2S: E2



Summary for Subcatchment 3S: E3

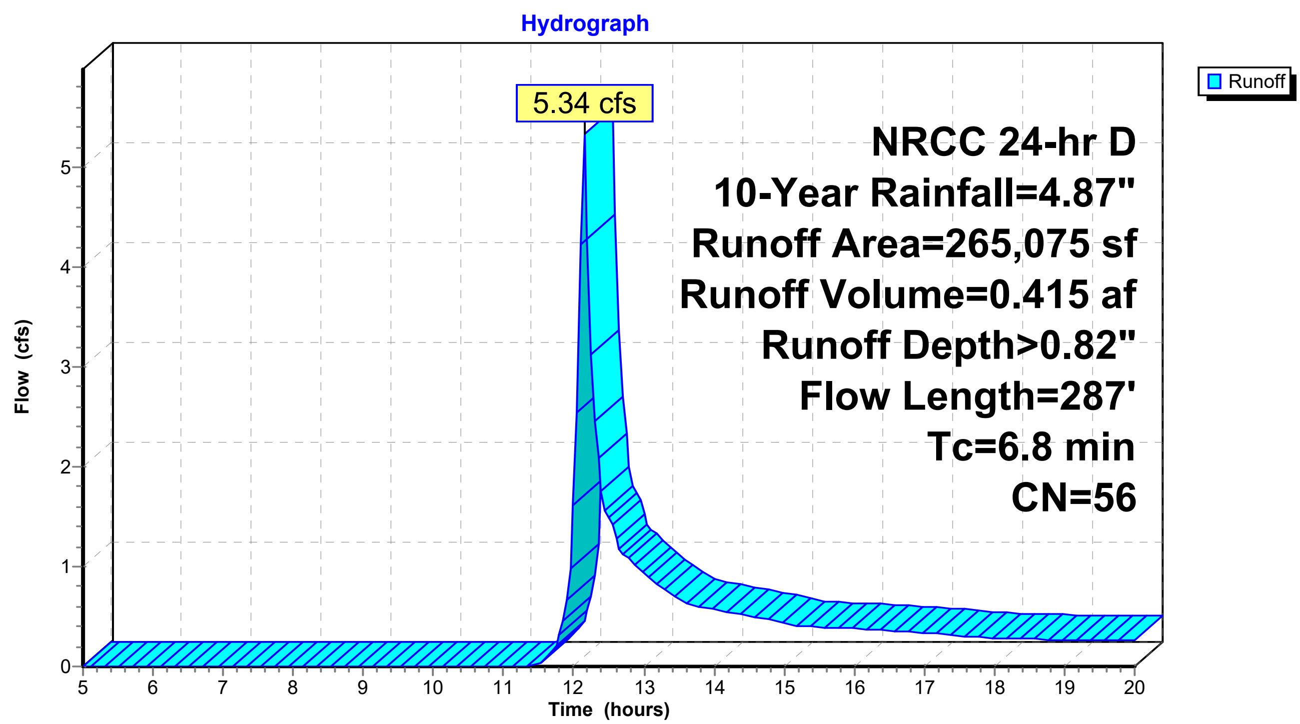
Runoff = 5.34 cfs @ 12.15 hrs, Volume= 0.415 af, Depth> 0.82"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 10-Year Rainfall=4.87"

Area (sf)	CN	Description
29,652	58	Woods/grass comb., Good, HSG B
229,355	55	Woods, Good, HSG B
1,840	98	Unconnected roofs, HSG B
4,228	98	Unconnected pavement, HSG B
265,075	56	Weighted Average
259,007		97.71% Pervious Area
6,068		2.29% Impervious Area
6,068		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.1	50	0.1200	0.14		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.10"
0.7	237	0.1300	5.80		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
6.8	287	Total			

Subcatchment 3S: E3



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

Subcatchment 1S: E1 Runoff Area=99,332 sf 2.45% Impervious Runoff Depth>1.48"
Flow Length=598' Tc=13.3 min CN=56 Runoff=3.07 cfs 0.282 af

Subcatchment 2S: E2 Runoff Area=111,802 sf 3.60% Impervious Runoff Depth>1.49"
Flow Length=165' Tc=7.8 min UI Adjusted CN=56 Runoff=4.26 cfs 0.319 af

Subcatchment 3S: E3 Runoff Area=265,075 sf 2.29% Impervious Runoff Depth>1.49"
Flow Length=287' Tc=6.8 min CN=56 Runoff=10.51 cfs 0.756 af

Total Runoff Area = 10.932 ac Runoff Volume = 1.357 af Average Runoff Depth = 1.49"
97.37% Pervious = 10.645 ac 2.63% Impervious = 0.288 ac

Summary for Subcatchment 1S: E1

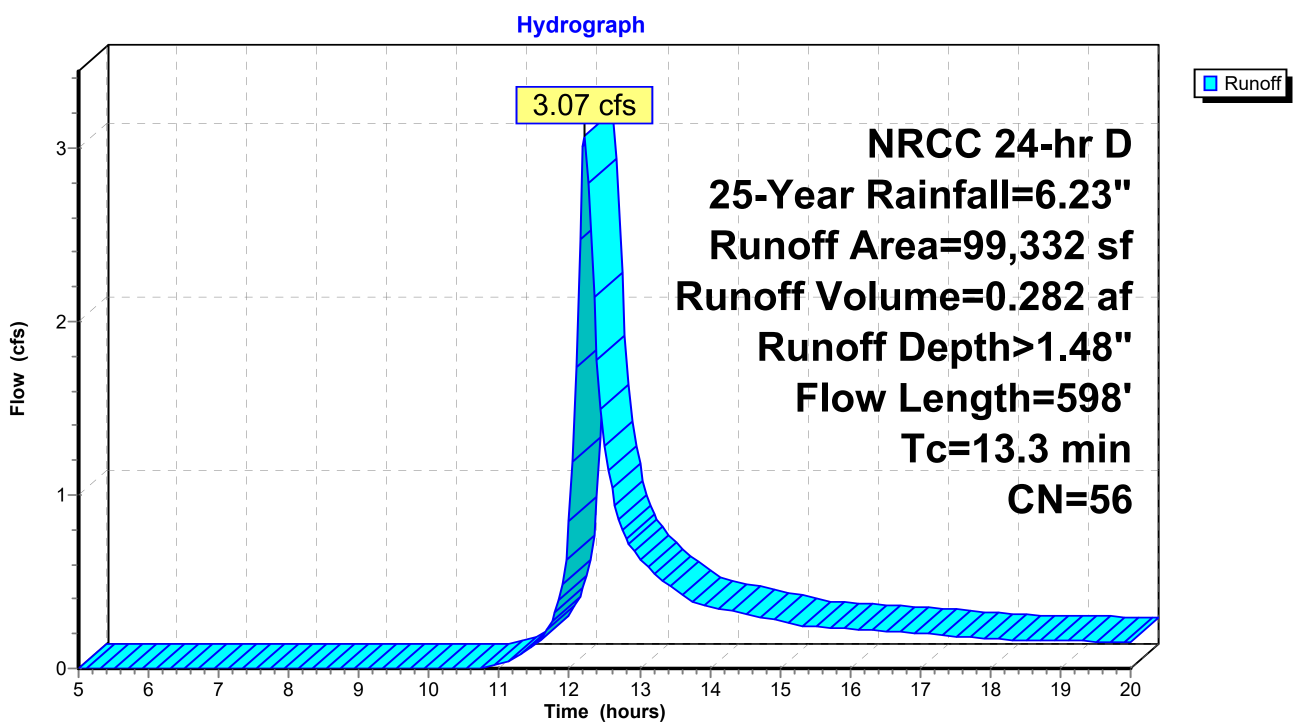
Runoff = 3.07 cfs @ 12.22 hrs, Volume= 0.282 af, Depth> 1.48"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 25-Year Rainfall=6.23"

Area (sf)	CN	Description
8,434	58	Woods/grass comb., Good, HSG B
88,466	55	Woods, Good, HSG B
2,432	98	Unconnected roofs, HSG B
99,332	56	Weighted Average
96,900		97.55% Pervious Area
2,432		2.45% Impervious Area
2,432		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.3	50	0.0200	0.10		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.10"
5.0	548	0.1350	1.84		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
13.3	598	Total			

Subcatchment 1S: E1



Summary for Subcatchment 2S: E2

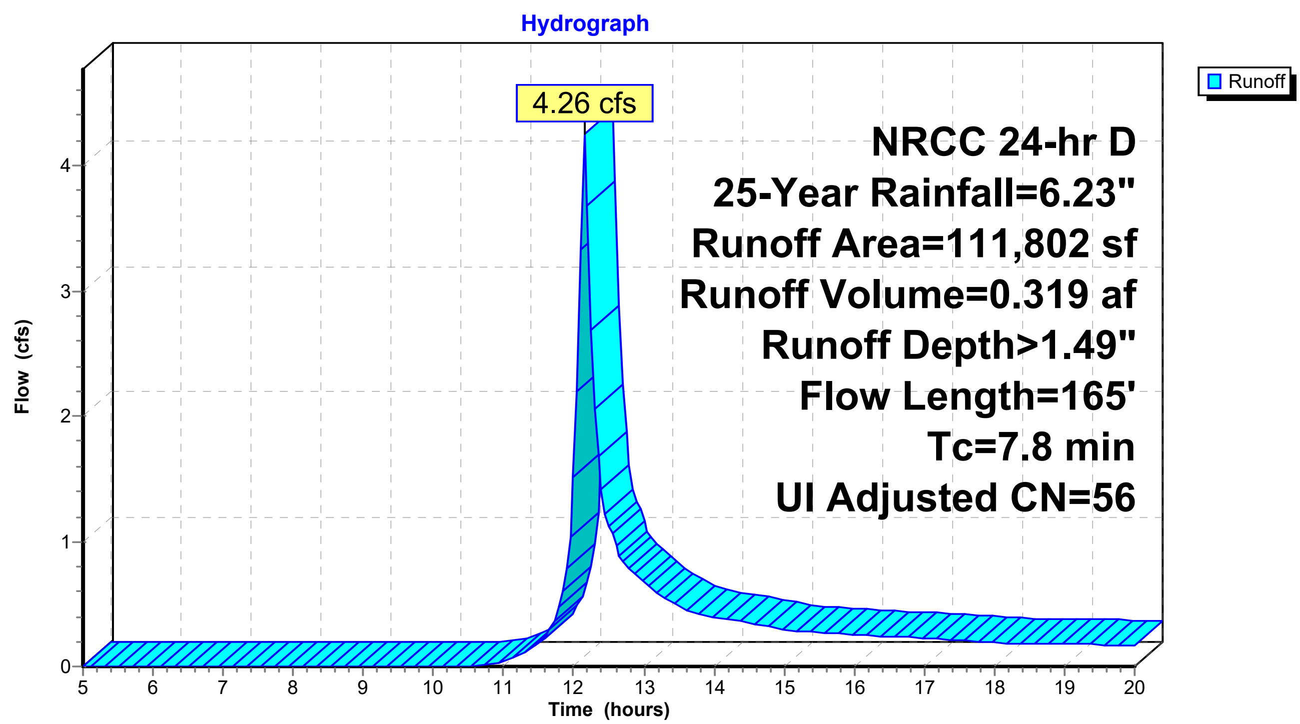
Runoff = 4.26 cfs @ 12.16 hrs, Volume= 0.319 af, Depth> 1.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 25-Year Rainfall=6.23"

Area (sf)	CN	Adj	Description
17,143	58		Woods/grass comb., Good, HSG B
90,630	55		Woods, Good, HSG B
2,740	98		Unconnected roofs, HSG B
1,289	98		Unconnected pavement, HSG B
111,802	57	56	Weighted Average, UI Adjusted
107,773			96.40% Pervious Area
4,029			3.60% Impervious Area
4,029			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.6	50	0.0700	0.11		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.10"
0.2	115	0.2500	8.05		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
7.8	165	Total			

Subcatchment 2S: E2



Summary for Subcatchment 3S: E3

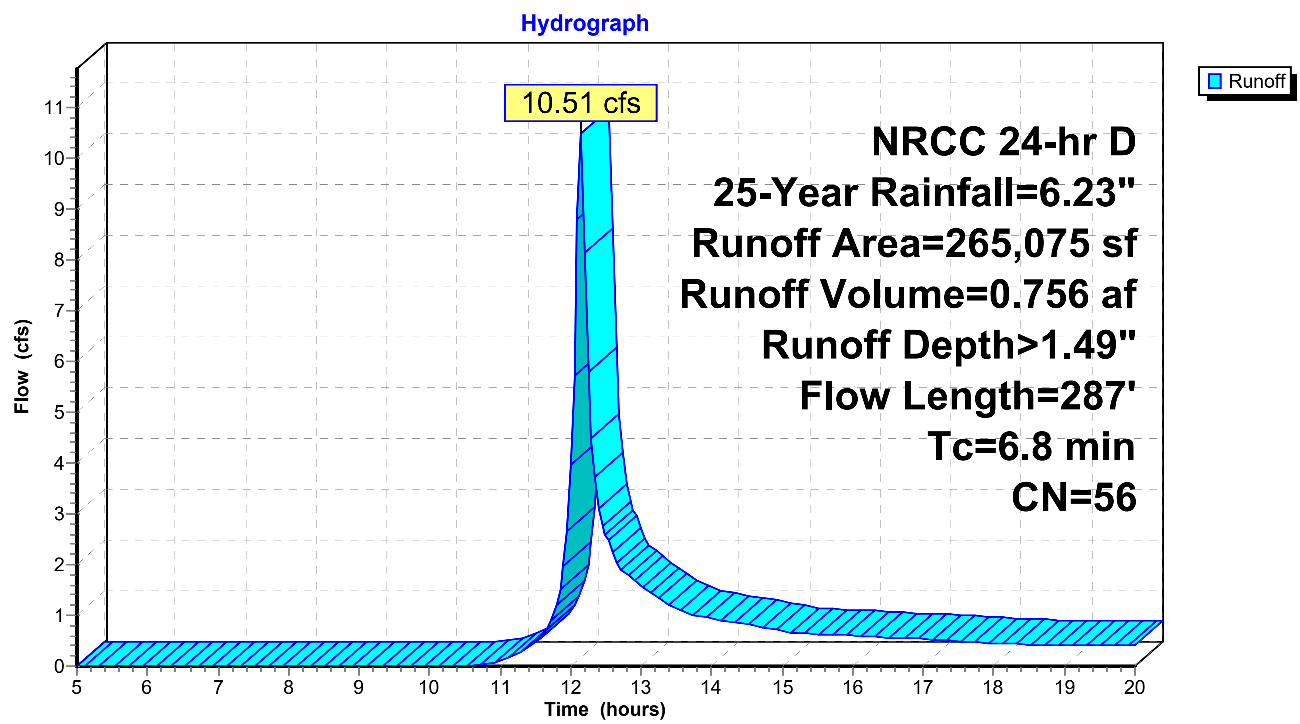
Runoff = 10.51 cfs @ 12.15 hrs, Volume= 0.756 af, Depth> 1.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 25-Year Rainfall=6.23"

Area (sf)	CN	Description
29,652	58	Woods/grass comb., Good, HSG B
229,355	55	Woods, Good, HSG B
1,840	98	Unconnected roofs, HSG B
4,228	98	Unconnected pavement, HSG B
265,075	56	Weighted Average
259,007		97.71% Pervious Area
6,068		2.29% Impervious Area
6,068		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.1	50	0.1200	0.14		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.10"
0.7	237	0.1300	5.80		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
6.8	287	Total			

Subcatchment 3S: E3



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

Subcatchment 1S: E1 Runoff Area=99,332 sf 2.45% Impervious Runoff Depth>3.20"
Flow Length=598' Tc=13.3 min CN=56 Runoff=6.90 cfs 0.608 af

Subcatchment 2S: E2 Runoff Area=111,802 sf 3.60% Impervious Runoff Depth>3.21"
Flow Length=165' Tc=7.8 min UI Adjusted CN=56 Runoff=9.47 cfs 0.687 af

Subcatchment 3S: E3 Runoff Area=265,075 sf 2.29% Impervious Runoff Depth>3.21"
Flow Length=287' Tc=6.8 min CN=56 Runoff=23.27 cfs 1.630 af

Total Runoff Area = 10.932 ac Runoff Volume = 2.925 af Average Runoff Depth = 3.21"
97.37% Pervious = 10.645 ac 2.63% Impervious = 0.288 ac

Summary for Subcatchment 1S: E1

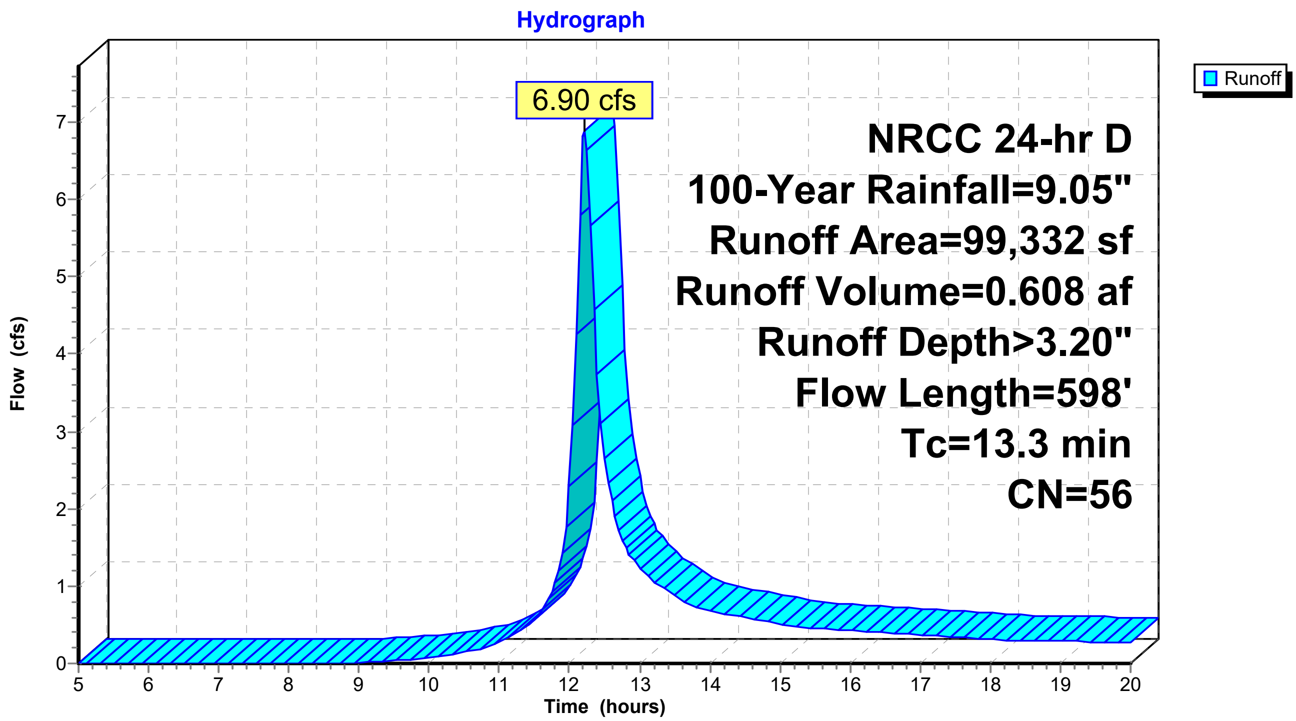
Runoff = 6.90 cfs @ 12.22 hrs, Volume= 0.608 af, Depth> 3.20"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 100-Year Rainfall=9.05"

Area (sf)	CN	Description
8,434	58	Woods/grass comb., Good, HSG B
88,466	55	Woods, Good, HSG B
2,432	98	Unconnected roofs, HSG B
99,332	56	Weighted Average
96,900		97.55% Pervious Area
2,432		2.45% Impervious Area
2,432		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.3	50	0.0200	0.10		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.10"
5.0	548	0.1350	1.84		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
13.3	598	Total			

Subcatchment 1S: E1



Summary for Subcatchment 2S: E2

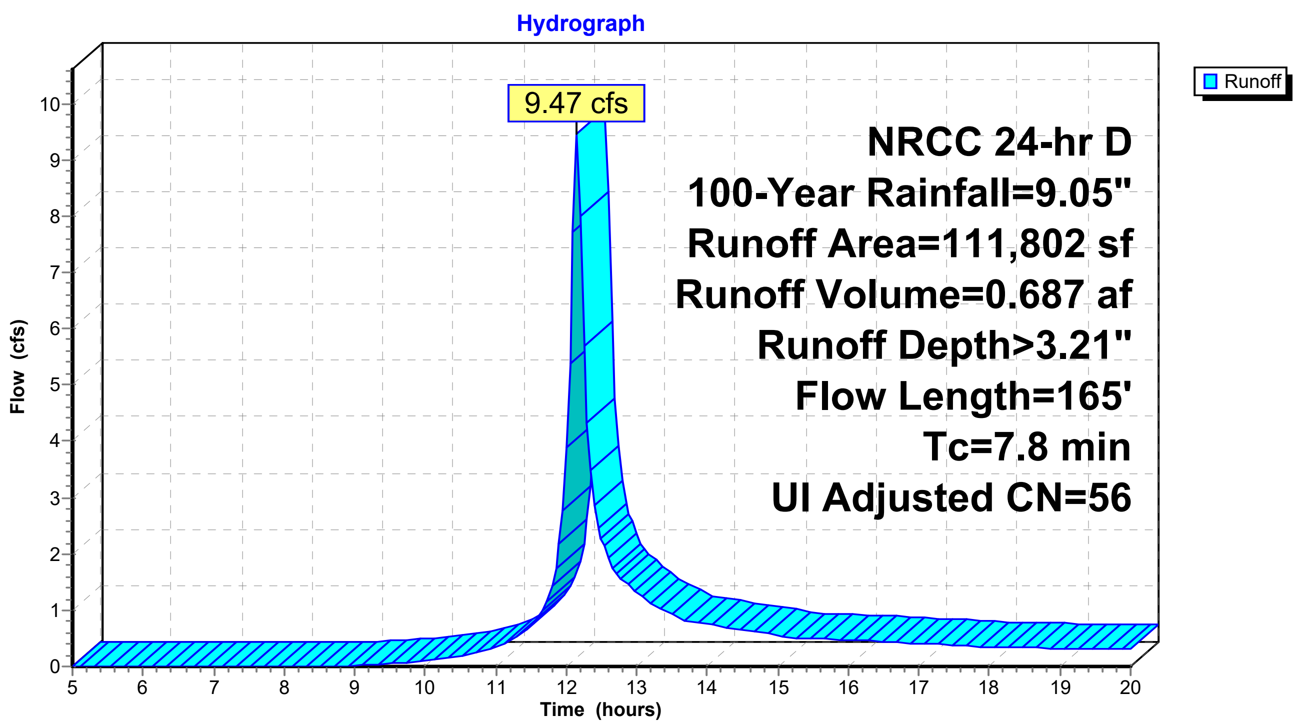
Runoff = 9.47 cfs @ 12.15 hrs, Volume= 0.687 af, Depth> 3.21"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 100-Year Rainfall=9.05"

Area (sf)	CN	Adj	Description
17,143	58		Woods/grass comb., Good, HSG B
90,630	55		Woods, Good, HSG B
2,740	98		Unconnected roofs, HSG B
1,289	98		Unconnected pavement, HSG B
111,802	57	56	Weighted Average, UI Adjusted
107,773			96.40% Pervious Area
4,029			3.60% Impervious Area
4,029			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.6	50	0.0700	0.11		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.10"
0.2	115	0.2500	8.05		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
7.8	165	Total			

Subcatchment 2S: E2



Summary for Subcatchment 3S: E3

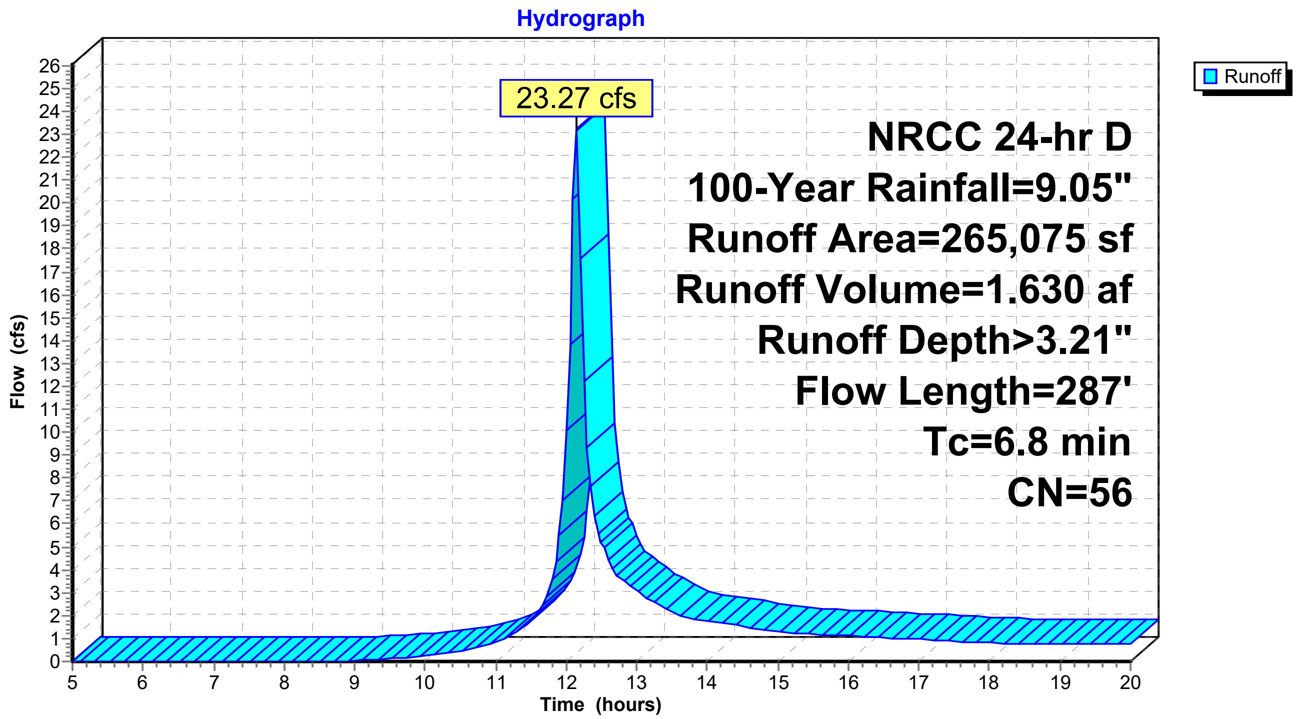
Runoff = 23.27 cfs @ 12.14 hrs, Volume= 1.630 af, Depth> 3.21"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 100-Year Rainfall=9.05"

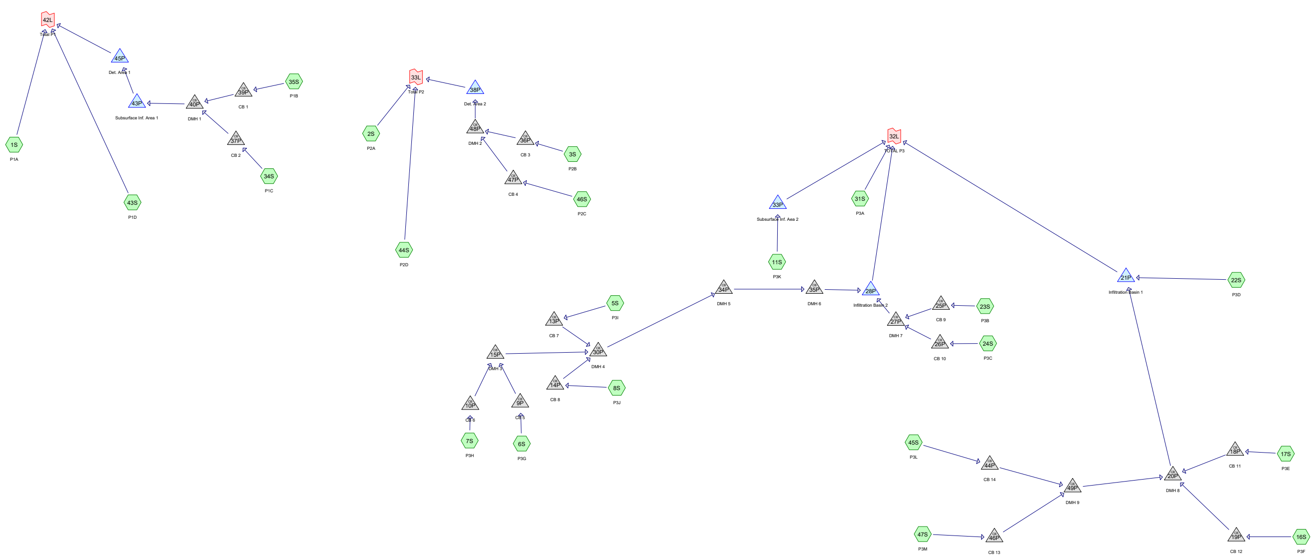
Area (sf)	CN	Description
29,652	58	Woods/grass comb., Good, HSG B
229,355	55	Woods, Good, HSG B
1,840	98	Unconnected roofs, HSG B
4,228	98	Unconnected pavement, HSG B
265,075	56	Weighted Average
259,007		97.71% Pervious Area
6,068		2.29% Impervious Area
6,068		100.00% Unconnected

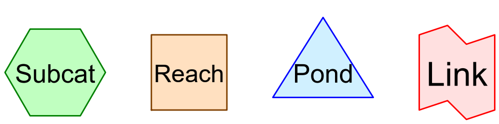
Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.1	50	0.1200	0.14		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.10"
0.7	237	0.1300	5.80		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
6.8	287	Total			

Subcatchment 3S: E3



e. Proposed Conditions HydroCAD Report





Routing Diagram for Post De 3-9-22
Prepared by Millennium Engineering, Inc., Printed 3/15/2022
HydroCAD® 10.00-25 s/n 02736 © 2019 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
1.752	61	>75% Grass cover, Good, HSG B (2S, 6S, 7S, 16S, 22S, 24S, 31S, 35S, 46S)
0.575	48	Brush, Good, HSG B (1S, 43S, 44S)
0.815	98	Paved parking, HSG B (3S, 5S, 6S, 7S, 8S, 16S, 17S, 23S, 24S, 34S, 35S, 45S, 46S, 47S)
0.127	98	Unconnected pavement, HSG B (7S, 16S, 44S)
0.790	98	Unconnected roofs, HSG B (1S, 7S, 11S, 16S, 44S)
6.060	55	Woods, Good, HSG B (1S, 7S, 16S, 22S, 31S, 43S, 44S)
0.837	58	Woods/grass comb., Good, HSG B (7S, 16S, 44S)
10.955	**63**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
10.955	HSG B	1S, 2S, 3S, 5S, 6S, 7S, 8S, 11S, 16S, 17S, 22S, 23S, 24S, 31S, 34S, 35S, 43S, 44S, 45S, 46S, 47S
0.000	HSG C	
0.000	HSG D	
0.000	Other	
10.955		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	1.752	0.000	0.000	0.000	1.752	>75% Grass cover, Good	2S, 6S, 7S, 16S, 22S, 24S, 31S, 35S, 46S
0.000	0.575	0.000	0.000	0.000	0.575	Brush, Good	1S, 43S, 44S
0.000	0.815	0.000	0.000	0.000	0.815	Paved parking	3S, 5S, 6S, 7S, 8S, 16S, 17S, 23S, 24S, 34S, 35S, 45S, 46S, 47S
0.000	0.127	0.000	0.000	0.000	0.127	Unconnected pavement	7S, 16S, 44S
0.000	0.790	0.000	0.000	0.000	0.790	Unconnected roofs	1S, 7S, 11S, 16S, 44S
0.000	6.060	0.000	0.000	0.000	6.060	Woods, Good	1S, 7S, 16S, 22S, 31S, 43S, 44S
0.000	0.837	0.000	0.000	0.000	0.837	Woods/grass comb., Good	7S, 16S, 44S
0.000	**10.955**	**0.000**	**0.000**	**0.000**	**10.955**	**TOTAL AREA**	

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

Subcatchment 1S: P1A Runoff Area=94,172 sf 2.58% Impervious Runoff Depth>0.18"
Flow Length=598' Tc=13.3 min UI Adjusted CN=55 Runoff=0.12 cfs 0.033 af

Subcatchment 2S: P2A Runoff Area=12,266 sf 0.00% Impervious Runoff Depth>0.35"
Tc=6.0 min CN=61 Runoff=0.09 cfs 0.008 af

Subcatchment 3S: P2B Runoff Area=2,156 sf 100.00% Impervious Runoff Depth>2.62"
Tc=6.0 min CN=98 Runoff=0.14 cfs 0.011 af

Subcatchment 5S: P3I Runoff Area=1,563 sf 100.00% Impervious Runoff Depth>2.62"
Tc=6.0 min CN=98 Runoff=0.10 cfs 0.008 af

Subcatchment 6S: P3G Runoff Area=7,278 sf 68.97% Impervious Runoff Depth>1.71"
Tc=6.0 min CN=87 Runoff=0.34 cfs 0.024 af

Subcatchment 7S: P3H Runoff Area=70,167 sf 8.32% Impervious Runoff Depth>0.29"
Flow Length=620' Tc=14.3 min UI Adjusted CN=59 Runoff=0.24 cfs 0.039 af

Subcatchment 8S: P3J Runoff Area=2,216 sf 100.00% Impervious Runoff Depth>2.62"
Tc=6.0 min CN=98 Runoff=0.14 cfs 0.011 af

Subcatchment 11S: P3K Runoff Area=27,385 sf 100.00% Impervious Runoff Depth>2.62"
Tc=6.0 min CN=98 Runoff=1.73 cfs 0.137 af

Subcatchment 16S: P3F Runoff Area=131,453 sf 5.15% Impervious Runoff Depth>0.23"
Flow Length=664' Slope=0.0600 '/' Tc=16.5 min UI Adjusted CN=57 Runoff=0.27 cfs 0.058 af

Subcatchment 17S: P3E Runoff Area=3,344 sf 100.00% Impervious Runoff Depth>2.62"
Tc=6.0 min CN=98 Runoff=0.21 cfs 0.017 af

Subcatchment 22S: P3D Runoff Area=19,733 sf 0.00% Impervious Runoff Depth>0.26"
Tc=6.0 min CN=58 Runoff=0.08 cfs 0.010 af

Subcatchment 23S: P3B Runoff Area=2,425 sf 100.00% Impervious Runoff Depth>2.62"
Tc=6.0 min CN=98 Runoff=0.15 cfs 0.012 af

Subcatchment 24S: P3C Runoff Area=8,435 sf 28.74% Impervious Runoff Depth>0.79"
Tc=6.0 min CN=72 Runoff=0.18 cfs 0.013 af

Subcatchment 31S: P3A Runoff Area=24,420 sf 0.00% Impervious Runoff Depth>0.32"
Tc=6.0 min CN=60 Runoff=0.15 cfs 0.015 af

Subcatchment 34S: P1C Runoff Area=3,042 sf 100.00% Impervious Runoff Depth>2.62"
Tc=6.0 min CN=98 Runoff=0.19 cfs 0.015 af

Subcatchment 35S: P1B Runoff Area=5,798 sf 36.82% Impervious Runoff Depth>0.94"
Tc=6.0 min CN=75 Runoff=0.15 cfs 0.010 af

Subcatchment 43S: P1D
Runoff Area=4,007 sf 0.00% Impervious Runoff Depth>0.07"
Flow Length=186' Tc=7.0 min CN=49 Runoff=0.00 cfs 0.001 af

Subcatchment 44S: P2D
Runoff Area=51,183 sf 5.43% Impervious Runoff Depth>0.16"
Flow Length=186' Tc=7.0 min UI Adjusted CN=54 Runoff=0.05 cfs 0.016 af

Subcatchment 45S: P3L
Runoff Area=2,730 sf 100.00% Impervious Runoff Depth>2.62"
Tc=6.0 min CN=98 Runoff=0.17 cfs 0.014 af

Subcatchment 46S: P2C
Runoff Area=2,354 sf 88.83% Impervious Runoff Depth>2.29"
Tc=6.0 min CN=94 Runoff=0.14 cfs 0.010 af

Subcatchment 47S: P3M
Runoff Area=1,052 sf 100.00% Impervious Runoff Depth>2.62"
Tc=6.0 min CN=98 Runoff=0.07 cfs 0.005 af

Pond 9P: CB 5
Peak Elev=151.82' Inflow=0.34 cfs 0.024 af
12.0" Round Culvert n=0.013 L=23.0' S=0.0113 '/' Outflow=0.34 cfs 0.024 af

Pond 10P: CB 6
Peak Elev=151.77' Inflow=0.24 cfs 0.039 af
12.0" Round Culvert n=0.013 L=27.0' S=0.0104 '/' Outflow=0.24 cfs 0.039 af

Pond 13P: CB 7
Peak Elev=152.20' Inflow=0.10 cfs 0.008 af
12.0" Round Culvert n=0.013 L=11.0' S=0.0127 '/' Outflow=0.10 cfs 0.008 af

Pond 14P: CB 8
Peak Elev=152.23' Inflow=0.14 cfs 0.011 af
12.0" Round Culvert n=0.013 L=8.0' S=0.0138 '/' Outflow=0.14 cfs 0.011 af

Pond 15P: DMH 3
Peak Elev=151.49' Inflow=0.44 cfs 0.062 af
12.0" Round Culvert n=0.013 L=30.0' S=0.0117 '/' Outflow=0.44 cfs 0.062 af

Pond 18P: CB 11
Peak Elev=164.79' Inflow=0.21 cfs 0.017 af
12.0" Round Culvert n=0.013 L=7.0' S=0.0143 '/' Outflow=0.21 cfs 0.017 af

Pond 19P: CB 12
Peak Elev=164.85' Inflow=0.27 cfs 0.058 af
12.0" Round Culvert n=0.013 L=14.0' S=0.0071 '/' Outflow=0.27 cfs 0.058 af

Pond 20P: DMH 8
Peak Elev=164.74' Inflow=0.49 cfs 0.094 af
12.0" Round Culvert n=0.013 L=94.0' S=0.1313 '/' Outflow=0.49 cfs 0.094 af

Pond 21P: Infiltration Basin 1
Peak Elev=153.26' Storage=2,121 cf Inflow=0.57 cfs 0.104 af
Discarded=0.08 cfs 0.056 af Primary=0.00 cfs 0.000 af Outflow=0.08 cfs 0.056 af

Pond 25P: CB 9
Peak Elev=145.21' Inflow=0.15 cfs 0.012 af
12.0" Round Culvert n=0.013 L=12.0' S=0.0917 '/' Outflow=0.15 cfs 0.012 af

Pond 26P: CB 10
Peak Elev=145.23' Inflow=0.18 cfs 0.013 af
12.0" Round Culvert n=0.013 L=10.0' S=0.1100 '/' Outflow=0.18 cfs 0.013 af

Pond 27P: DMH 7
Peak Elev=144.12' Inflow=0.33 cfs 0.025 af
12.0" Round Culvert n=0.013 L=50.0' S=0.0760 '/' Outflow=0.33 cfs 0.025 af

Pond 28P: Infiltration Basin 2
Peak Elev=141.25' Storage=2,229 cf Inflow=0.99 cfs 0.106 af
Discarded=0.08 cfs 0.059 af Primary=0.00 cfs 0.000 af Outflow=0.08 cfs 0.059 af

Pond 30P: DMH 4 Peak Elev=148.52' Inflow=0.66 cfs 0.081 af
12.0" Round Culvert n=0.013 L=84.0' S=0.0700 '/' Outflow=0.66 cfs 0.081 af

Pond 33P: Subsurface Inf. Aea 2 Peak Elev=151.72' Storage=0.064 af Inflow=1.73 cfs 0.137 af
Discarded=0.11 cfs 0.096 af Primary=0.00 cfs 0.000 af Outflow=0.11 cfs 0.096 af

Pond 34P: DMH 5 Peak Elev=142.54' Inflow=0.66 cfs 0.081 af
12.0" Round Culvert n=0.013 L=190.0' S=0.0095 '/' Outflow=0.66 cfs 0.081 af

Pond 35P: DMH 6 Peak Elev=140.67' Inflow=0.66 cfs 0.081 af
12.0" Round Culvert n=0.013 L=32.0' S=0.0053 '/' Outflow=0.66 cfs 0.081 af

Pond 36P: CB 3 Peak Elev=141.30' Inflow=0.14 cfs 0.011 af
12.0" Round Culvert n=0.013 L=9.0' S=0.0111 '/' Outflow=0.14 cfs 0.011 af

Pond 37P: CB 2 Peak Elev=126.74' Inflow=0.19 cfs 0.015 af
12.0" Round Culvert n=0.013 L=8.0' S=0.0125 '/' Outflow=0.19 cfs 0.015 af

Pond 38P: Det. Area 2 Peak Elev=141.36' Storage=0.013 af Inflow=0.27 cfs 0.021 af
Outflow=0.02 cfs 0.013 af

Pond 39P: CB 1 Peak Elev=126.73' Inflow=0.15 cfs 0.010 af
12.0" Round Culvert n=0.013 L=20.0' S=0.0050 '/' Outflow=0.15 cfs 0.010 af

Pond 40P: DMH 1 Peak Elev=126.65' Inflow=0.34 cfs 0.026 af
12.0" Round Culvert n=0.013 L=60.0' S=0.0050 '/' Outflow=0.34 cfs 0.026 af

Pond 43P: Subsurface Inf. Area 1 Peak Elev=127.61' Storage=0.006 af Inflow=0.34 cfs 0.026 af
Discarded=0.01 cfs 0.011 af Primary=0.37 cfs 0.009 af Outflow=0.38 cfs 0.020 af

Pond 44P: CB 14 Peak Elev=166.03' Inflow=0.17 cfs 0.014 af
12.0" Round Culvert n=0.013 L=9.0' S=0.0100 '/' Outflow=0.17 cfs 0.014 af

Pond 45P: Det. Area 1 Peak Elev=124.85' Storage=0.009 af Inflow=0.37 cfs 0.009 af
Outflow=0.00 cfs 0.000 af

Pond 46P: CB 13 Peak Elev=165.95' Inflow=0.07 cfs 0.005 af
12.0" Round Culvert n=0.013 L=17.0' S=0.0053 '/' Outflow=0.07 cfs 0.005 af

Pond 47P: CB 4 Peak Elev=141.32' Inflow=0.14 cfs 0.010 af
12.0" Round Culvert n=0.013 L=18.0' S=0.0056 '/' Outflow=0.14 cfs 0.010 af

Pond 48P: DMH 2 Peak Elev=141.19' Inflow=0.27 cfs 0.021 af
12.0" Round Culvert n=0.013 L=40.0' S=0.0075 '/' Outflow=0.27 cfs 0.021 af

Pond 49P: DMH 9 Peak Elev=165.88' Inflow=0.24 cfs 0.019 af
12.0" Round Culvert n=0.013 L=107.0' S=0.0109 '/' Outflow=0.24 cfs 0.019 af

Link 32L: TOTAL P3 Inflow=0.15 cfs 0.015 af
Primary=0.15 cfs 0.015 af

Link 33L: Total P2

Inflow=0.13 cfs 0.038 af
Primary=0.13 cfs 0.038 af

Link 42L: Total P1

Inflow=0.12 cfs 0.034 af
Primary=0.12 cfs 0.034 af

Total Runoff Area = 10.955 ac Runoff Volume = 0.466 af Average Runoff Depth = 0.51"
84.20% Pervious = 9.224 ac 15.80% Impervious = 1.731 ac

Summary for Subcatchment 1S: P1A

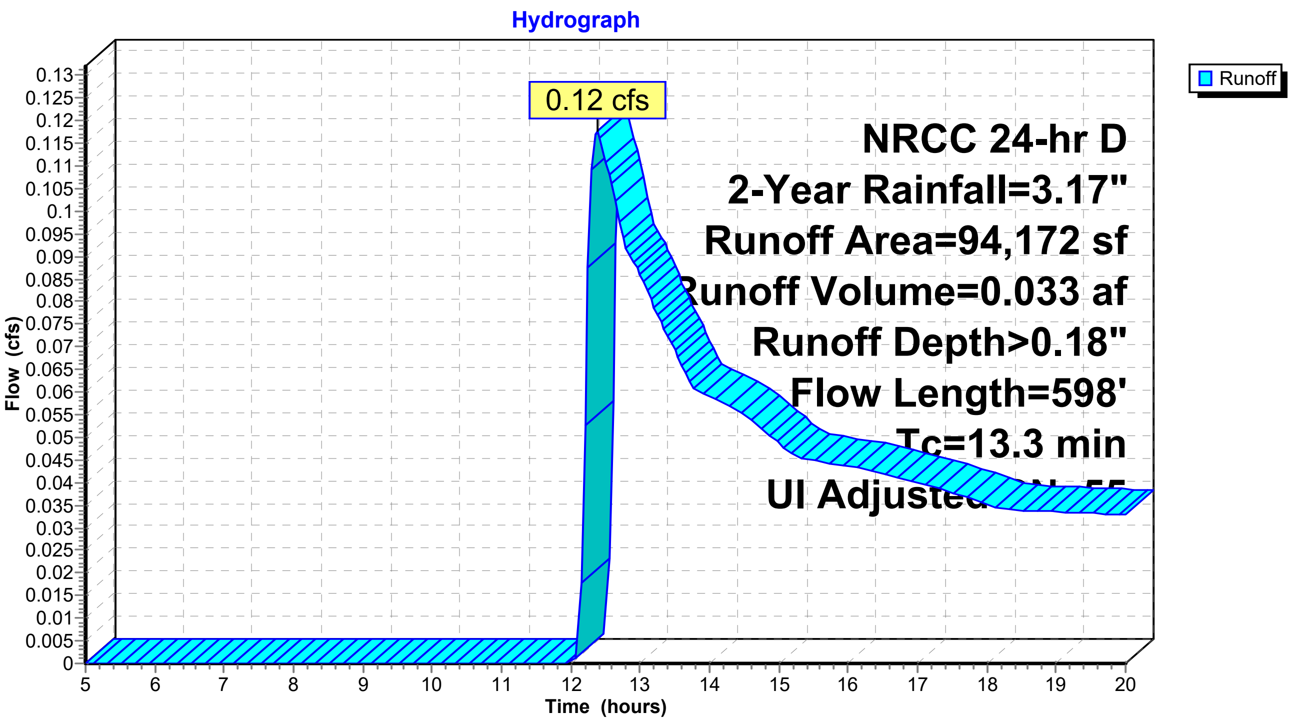
Runoff = 0.12 cfs @ 12.39 hrs, Volume= 0.033 af, Depth> 0.18"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 2-Year Rainfall=3.17"

Area (sf)	CN	Adj	Description
7,397	48		Brush, Good, HSG B
84,343	55		Woods, Good, HSG B
2,432	98		Unconnected roofs, HSG B
94,172	56	55	Weighted Average, UI Adjusted
91,740			97.42% Pervious Area
2,432			2.58% Impervious Area
2,432			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.3	50	0.0200	0.10		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.10"
5.0	548	0.1350	1.84		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
13.3	598	Total			

Subcatchment 1S: P1A



Summary for Subcatchment 2S: P2A

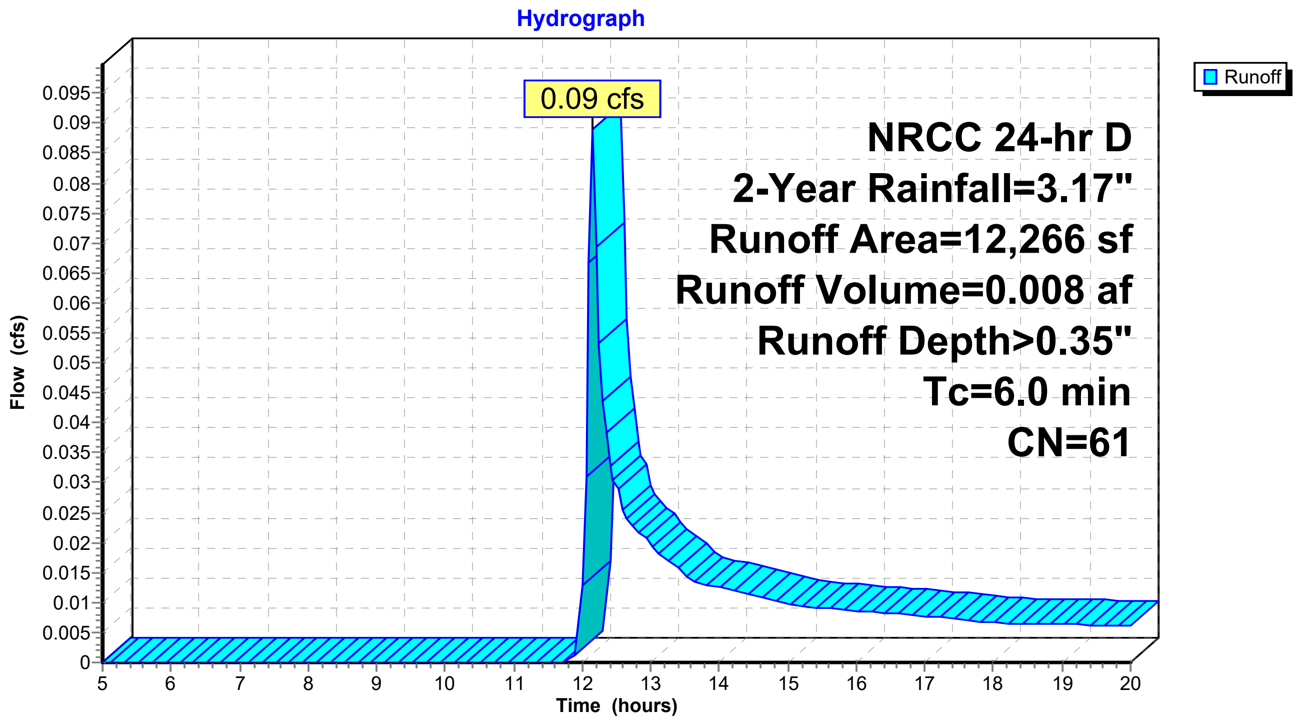
Runoff = 0.09 cfs @ 12.15 hrs, Volume= 0.008 af, Depth> 0.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 2-Year Rainfall=3.17"

Area (sf)	CN	Description
12,266	61	>75% Grass cover, Good, HSG B
12,266		100.00% Pervious Area

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

Subcatchment 2S: P2A



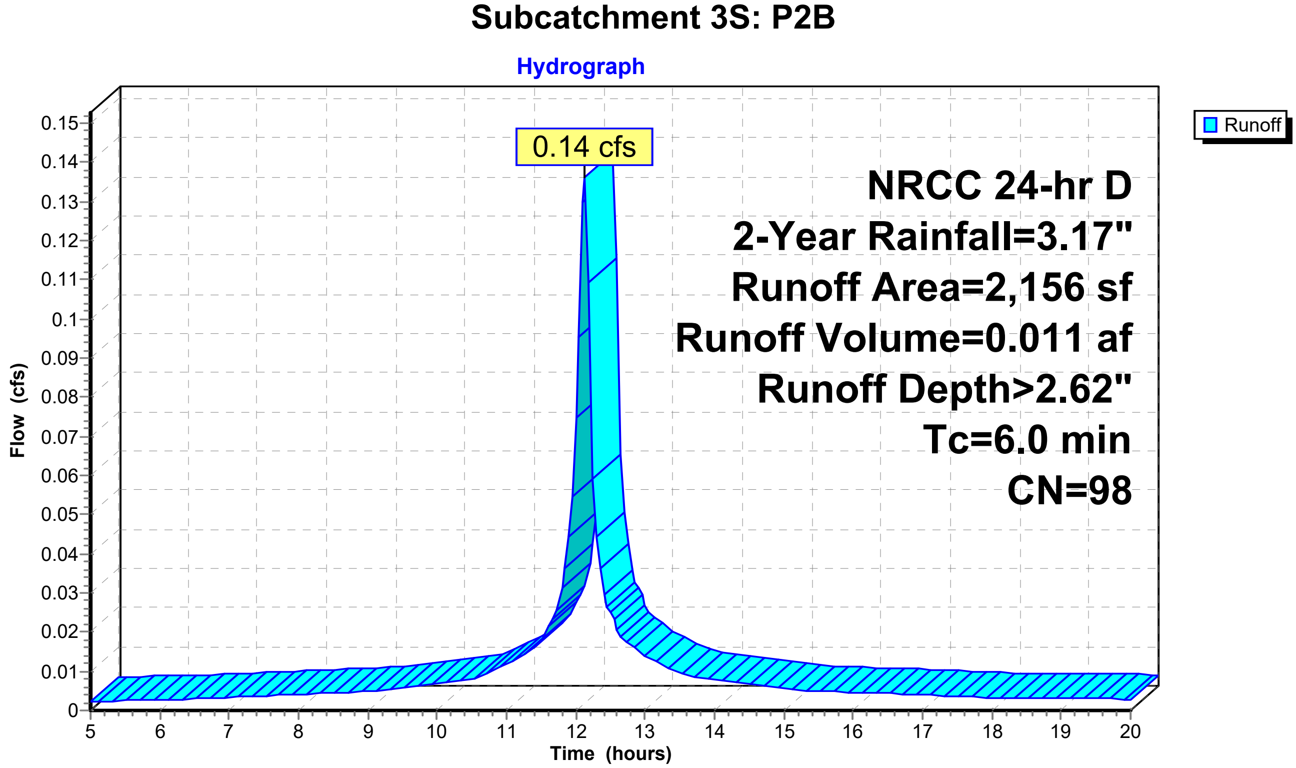
Summary for Subcatchment 3S: P2B

Runoff = 0.14 cfs @ 12.13 hrs, Volume= 0.011 af, Depth> 2.62"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 2-Year Rainfall=3.17"

Area (sf)	CN	Description
2,156	98	Paved parking, HSG B
2,156		100.00% Impervious Area

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



Summary for Subcatchment 5S: P3I

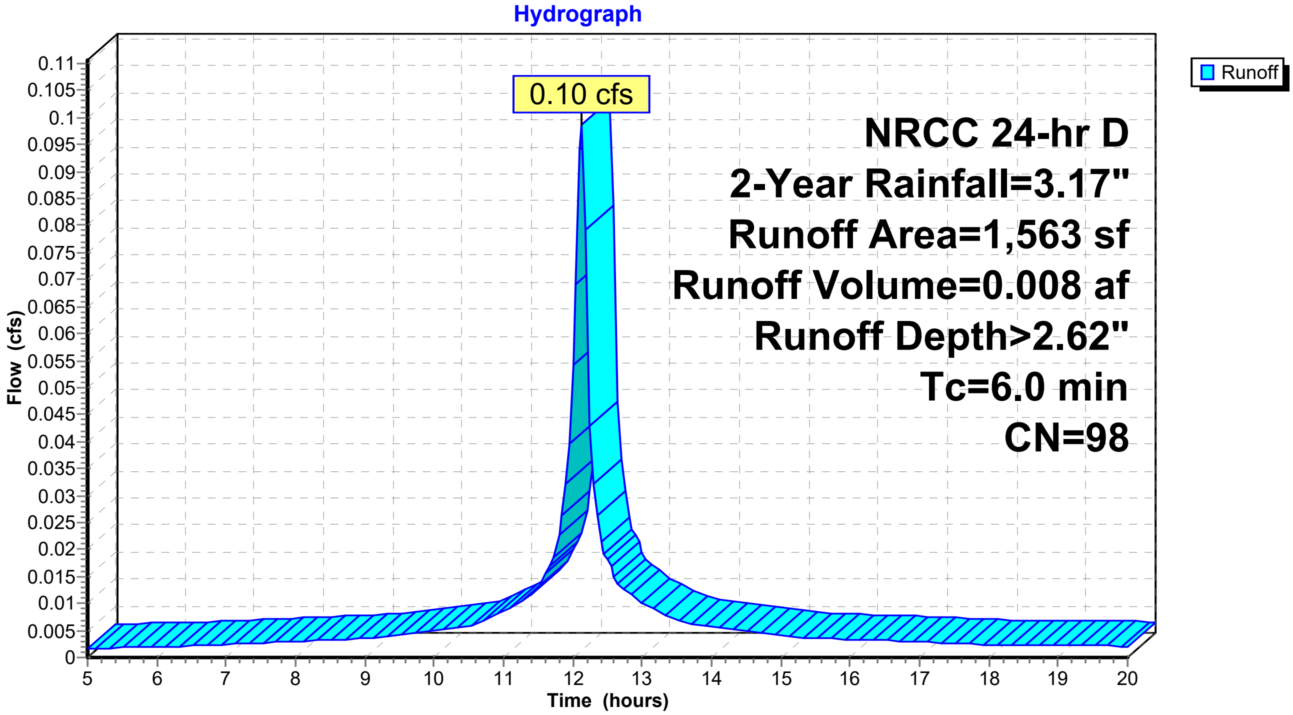
Runoff = 0.10 cfs @ 12.13 hrs, Volume= 0.008 af, Depth> 2.62"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 2-Year Rainfall=3.17"

Area (sf)	CN	Description
1,563	98	Paved parking, HSG B
1,563		100.00% Impervious Area

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

Subcatchment 5S: P3I



Summary for Subcatchment 6S: P3G

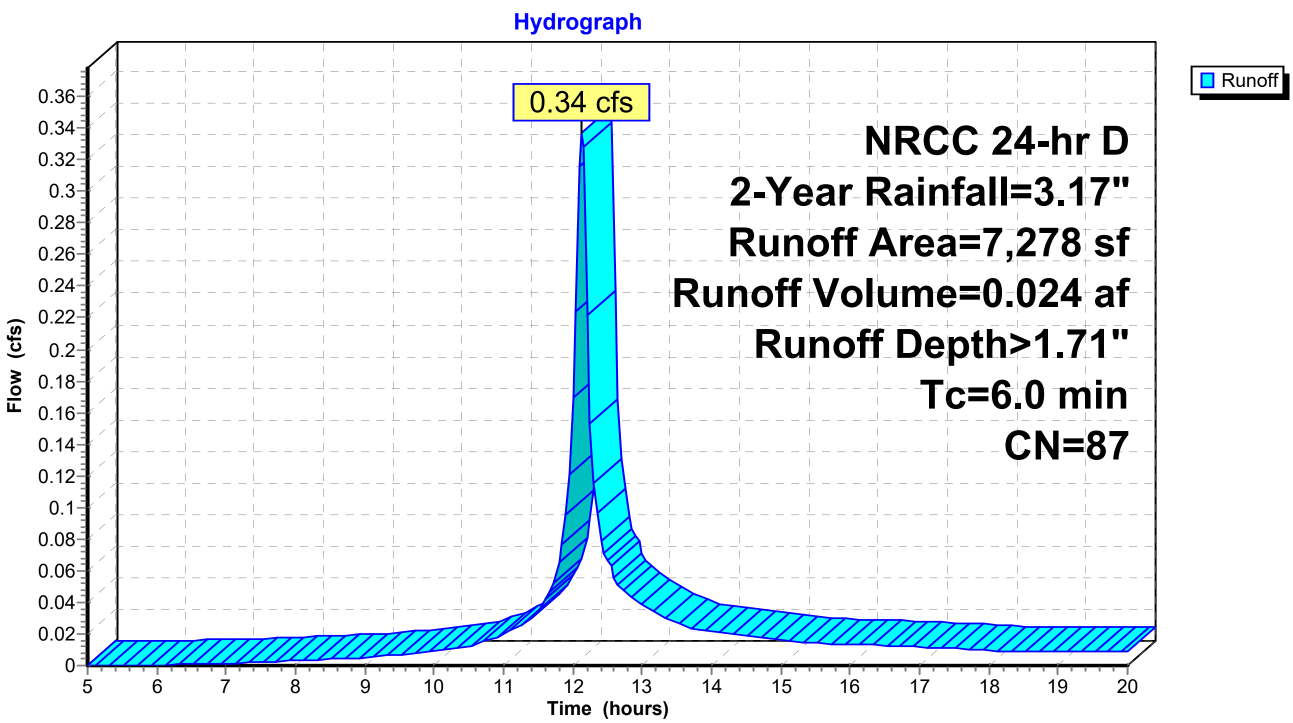
Runoff = 0.34 cfs @ 12.13 hrs, Volume= 0.024 af, Depth> 1.71"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 2-Year Rainfall=3.17"

Area (sf)	CN	Description
2,258	61	>75% Grass cover, Good, HSG B
5,020	98	Paved parking, HSG B
7,278	87	Weighted Average
2,258		31.03% Pervious Area
5,020		68.97% Impervious Area

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

Subcatchment 6S: P3G



Summary for Subcatchment 7S: P3H

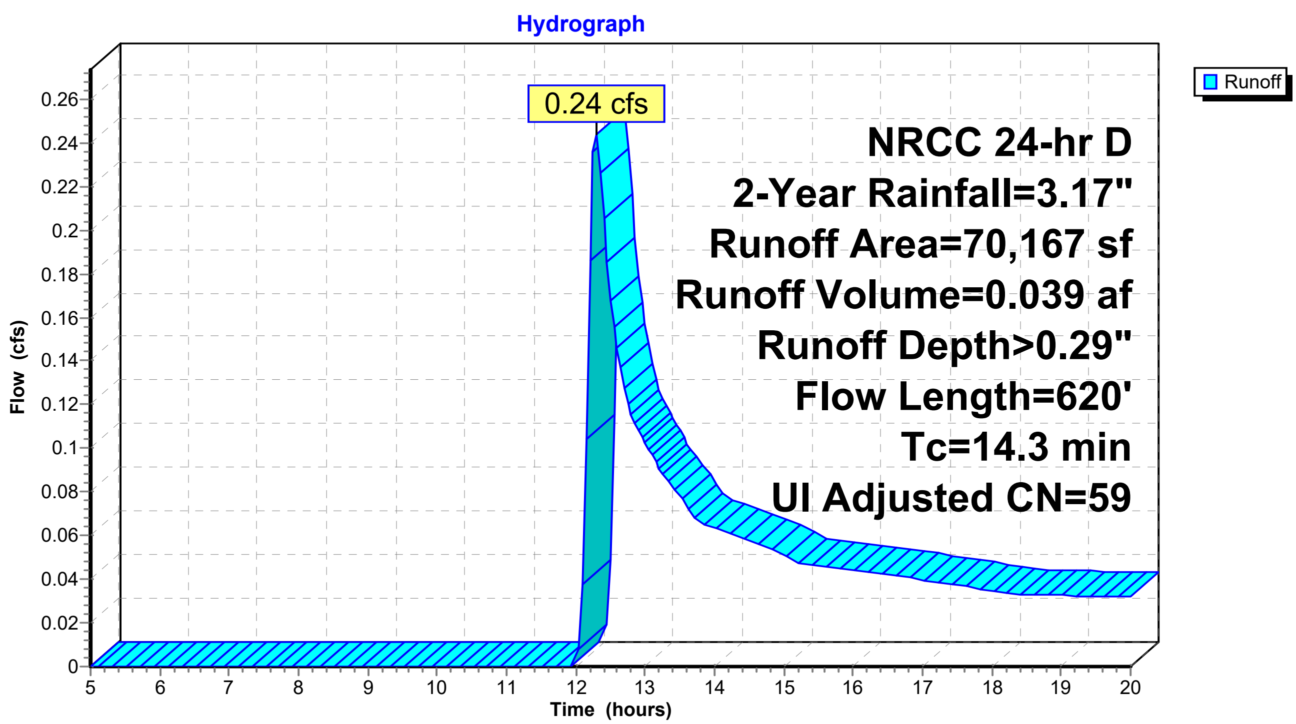
Runoff = 0.24 cfs @ 12.29 hrs, Volume= 0.039 af, Depth> 0.29"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 2-Year Rainfall=3.17"

Area (sf)	CN	Adj	Description
9,561	61		>75% Grass cover, Good, HSG B
3,870	98		Paved parking, HSG B
424	98		Unconnected roofs, HSG B
1,543	98		Unconnected pavement, HSG B
10,060	58		Woods/grass comb., Good, HSG B
44,709	55		Woods, Good, HSG B
70,167	60	59	Weighted Average, UI Adjusted
64,330			91.68% Pervious Area
5,837			8.32% Impervious Area
1,967			33.70% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.3	50	0.0200	0.10		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.10"
6.0	570	0.1000	1.58		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
14.3	620	Total			

Subcatchment 7S: P3H



Summary for Subcatchment 8S: P3J

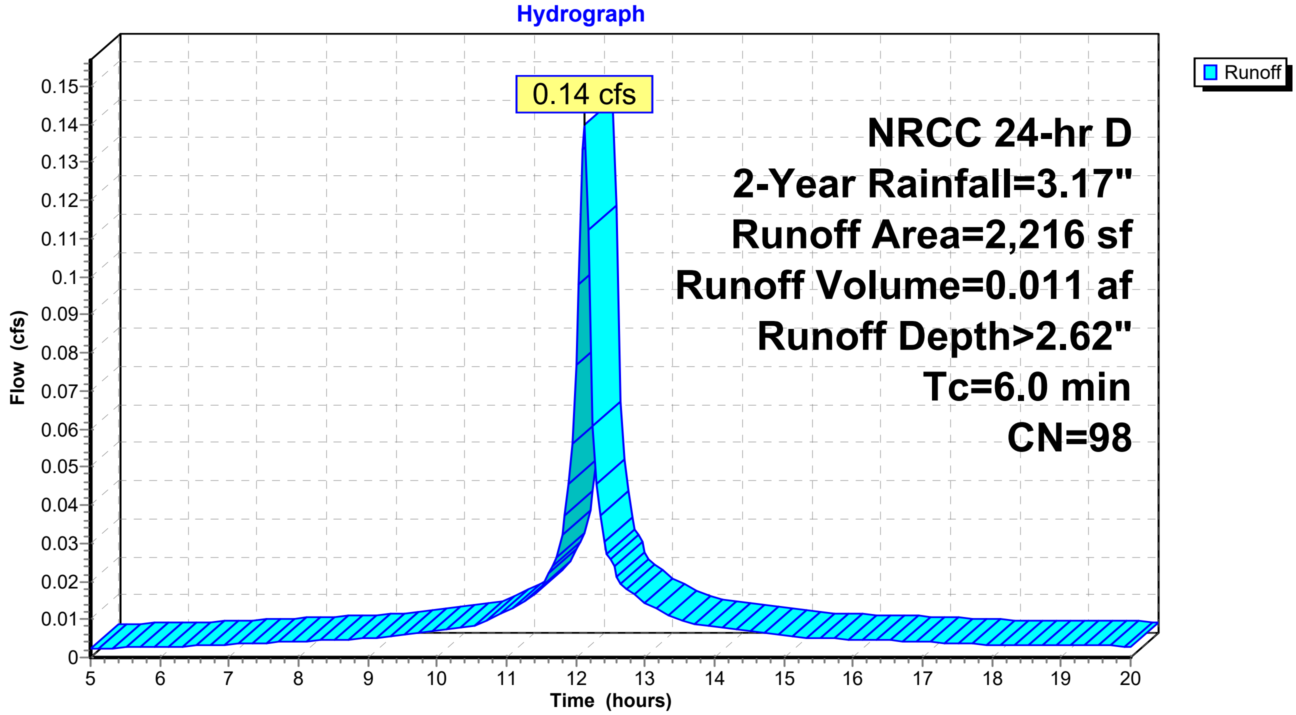
Runoff = 0.14 cfs @ 12.13 hrs, Volume= 0.011 af, Depth> 2.62"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 2-Year Rainfall=3.17"

Area (sf)	CN	Description
2,216	98	Paved parking, HSG B
2,216		100.00% Impervious Area

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

Subcatchment 8S: P3J



Summary for Subcatchment 11S: P3K

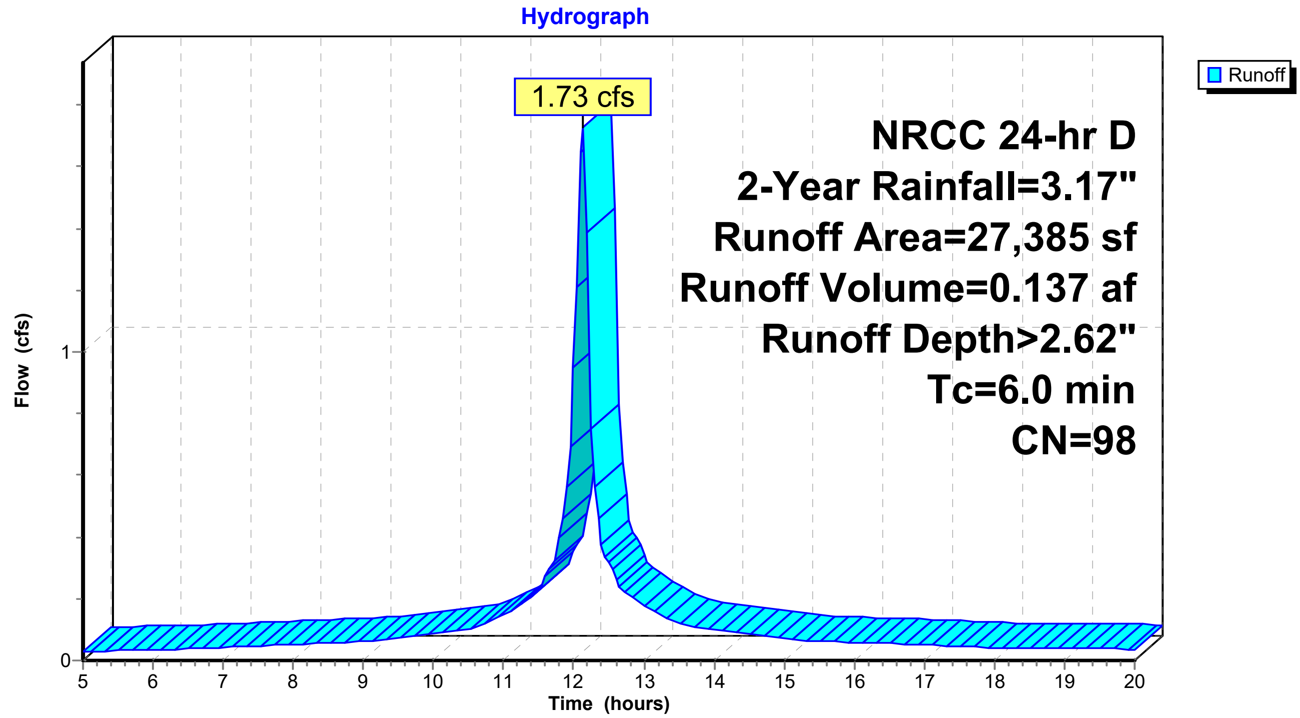
Runoff = 1.73 cfs @ 12.13 hrs, Volume= 0.137 af, Depth> 2.62"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 2-Year Rainfall=3.17"

Area (sf)	CN	Description
27,385	98	Unconnected roofs, HSG B
27,385		100.00% Impervious Area
27,385		100.00% Unconnected

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

Subcatchment 11S: P3K



Summary for Subcatchment 16S: P3F

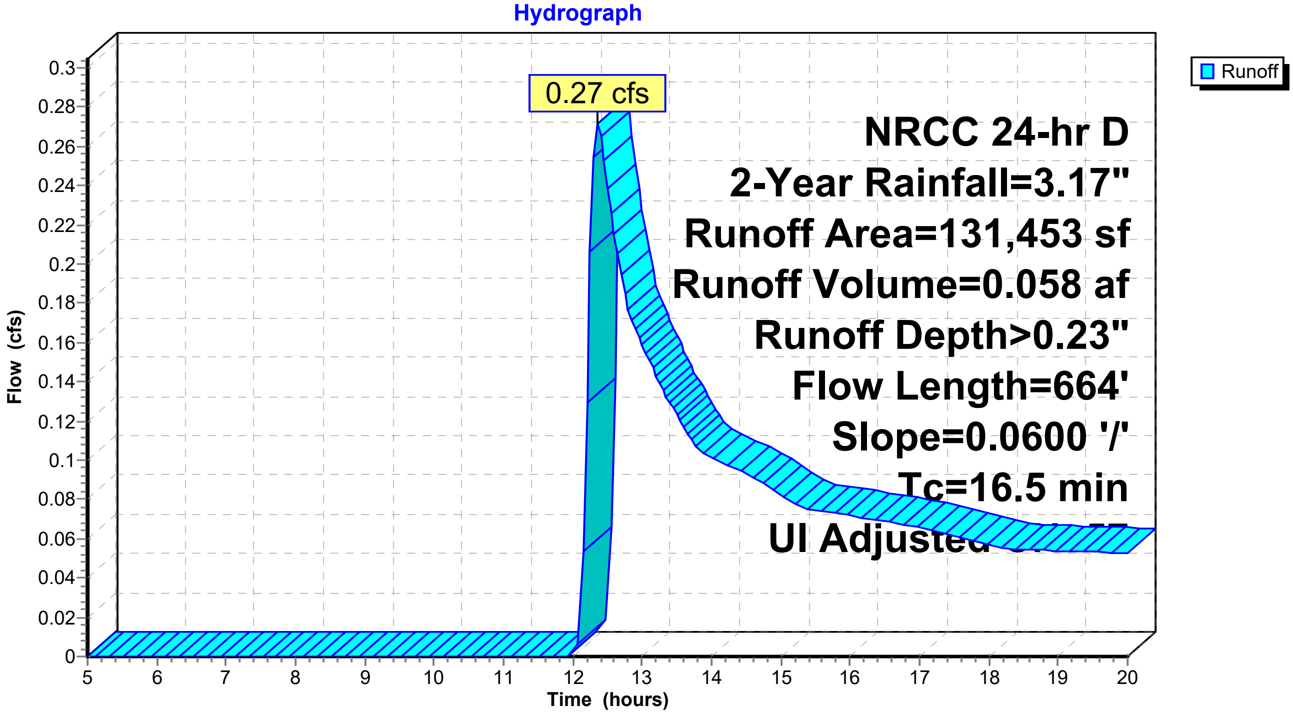
Runoff = 0.27 cfs @ 12.36 hrs, Volume= 0.058 af, Depth> 0.23"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 2-Year Rainfall=3.17"

Area (sf)	CN	Adj	Description
1,418	98		Paved parking, HSG B
2,247	61		>75% Grass cover, Good, HSG B
1,840	98		Unconnected roofs, HSG B
3,512	98		Unconnected pavement, HSG B
25,035	58		Woods/grass comb., Good, HSG B
88,304	55		Woods, Good, HSG B
9,097	61		>75% Grass cover, Good, HSG B
131,453	58	57	Weighted Average, UI Adjusted
124,683			94.85% Pervious Area
6,770			5.15% Impervious Area
5,352			79.05% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.1	50	0.0600	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.10"
8.4	614	0.0600	1.22		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
16.5	664	Total			

Subcatchment 16S: P3F



Summary for Subcatchment 17S: P3E

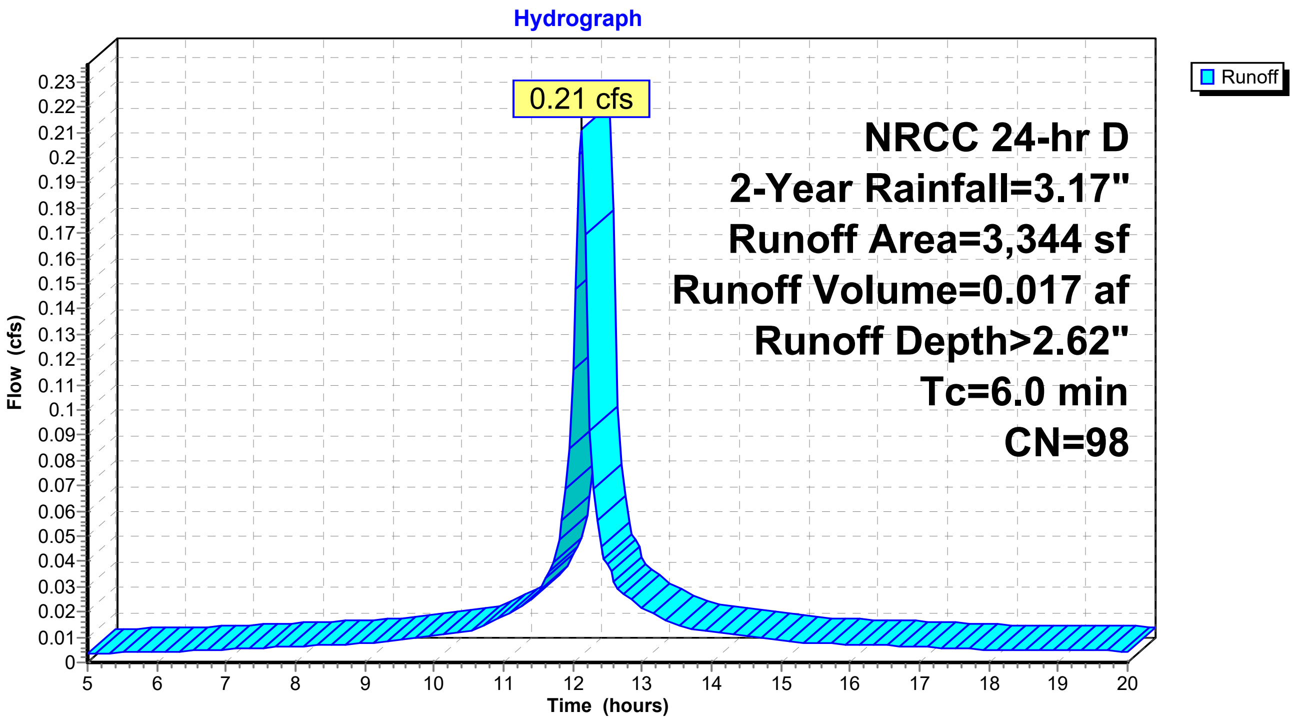
Runoff = 0.21 cfs @ 12.13 hrs, Volume= 0.017 af, Depth> 2.62"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 2-Year Rainfall=3.17"

Area (sf)	CN	Description
3,344	98	Paved parking, HSG B
3,344		100.00% Impervious Area

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

Subcatchment 17S: P3E



Summary for Subcatchment 22S: P3D

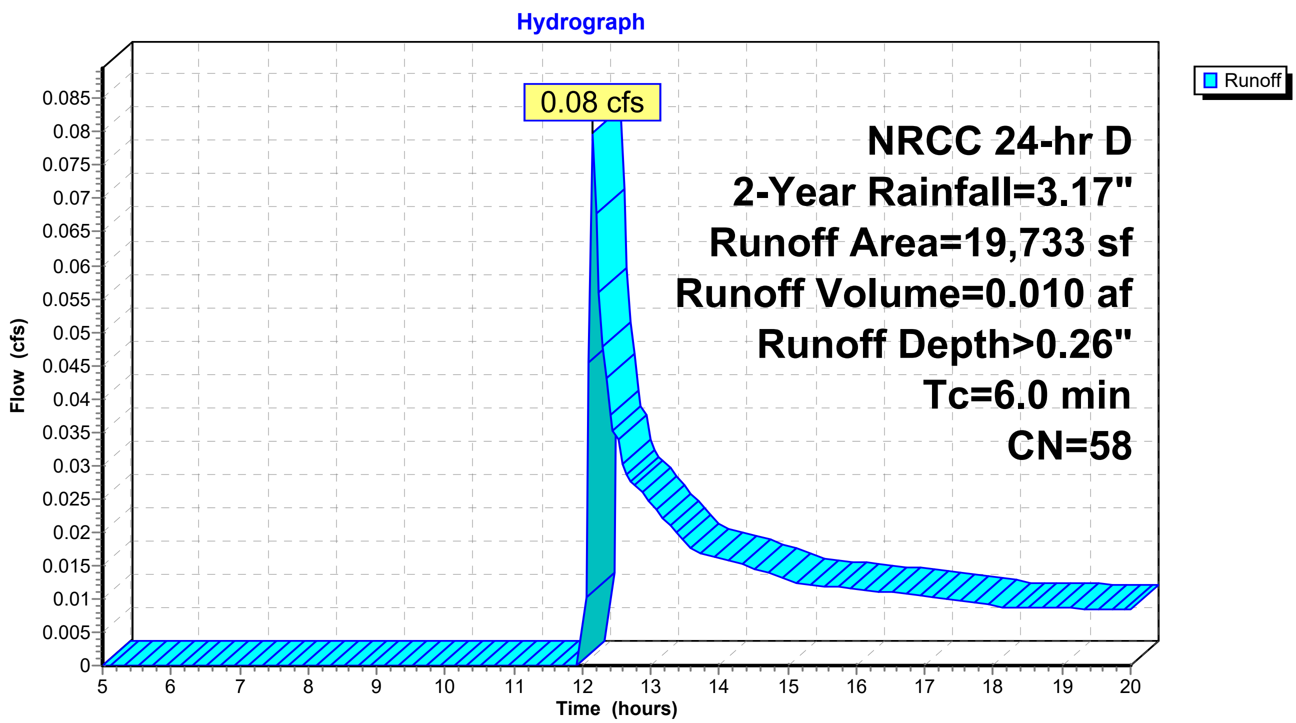
Runoff = 0.08 cfs @ 12.16 hrs, Volume= 0.010 af, Depth> 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 2-Year Rainfall=3.17"

Area (sf)	CN	Description
10,830	61	>75% Grass cover, Good, HSG B
4,323	55	Woods, Good, HSG B
4,580	55	Woods, Good, HSG B
19,733	58	Weighted Average
19,733		100.00% Pervious Area

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

Subcatchment 22S: P3D



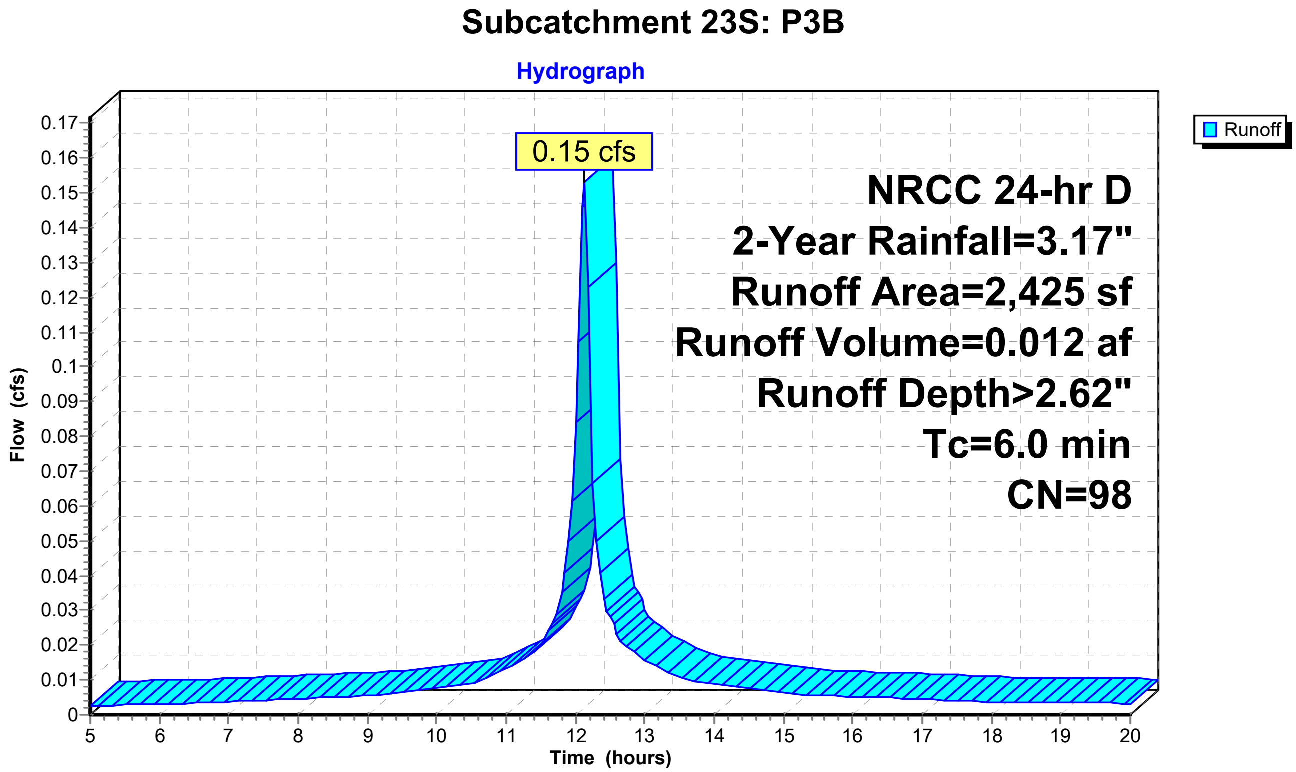
Summary for Subcatchment 23S: P3B

Runoff = 0.15 cfs @ 12.13 hrs, Volume= 0.012 af, Depth> 2.62"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 2-Year Rainfall=3.17"

Area (sf)	CN	Description
2,425	98	Paved parking, HSG B
2,425		100.00% Impervious Area

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



Summary for Subcatchment 24S: P3C

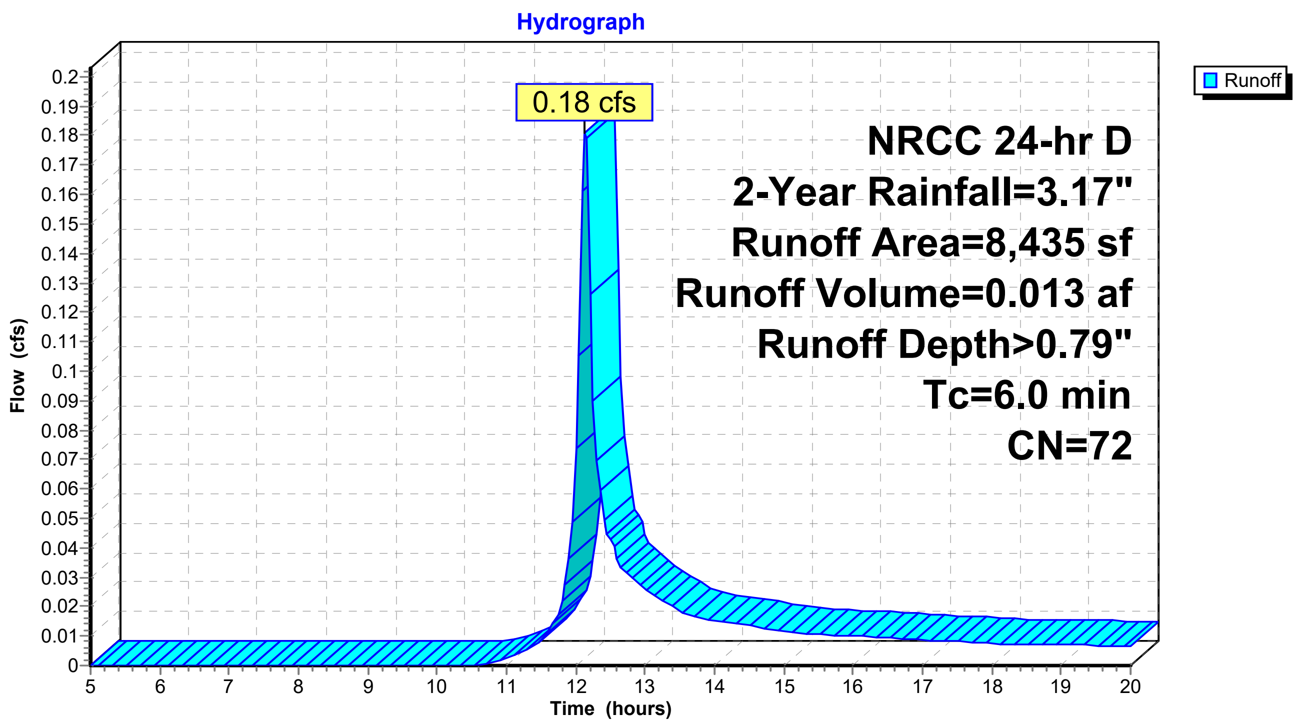
Runoff = 0.18 cfs @ 12.14 hrs, Volume= 0.013 af, Depth> 0.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 2-Year Rainfall=3.17"

Area (sf)	CN	Description
6,011	61	>75% Grass cover, Good, HSG B
2,424	98	Paved parking, HSG B
8,435	72	Weighted Average
6,011		71.26% Pervious Area
2,424		28.74% Impervious Area

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

Subcatchment 24S: P3C



Summary for Subcatchment 31S: P3A

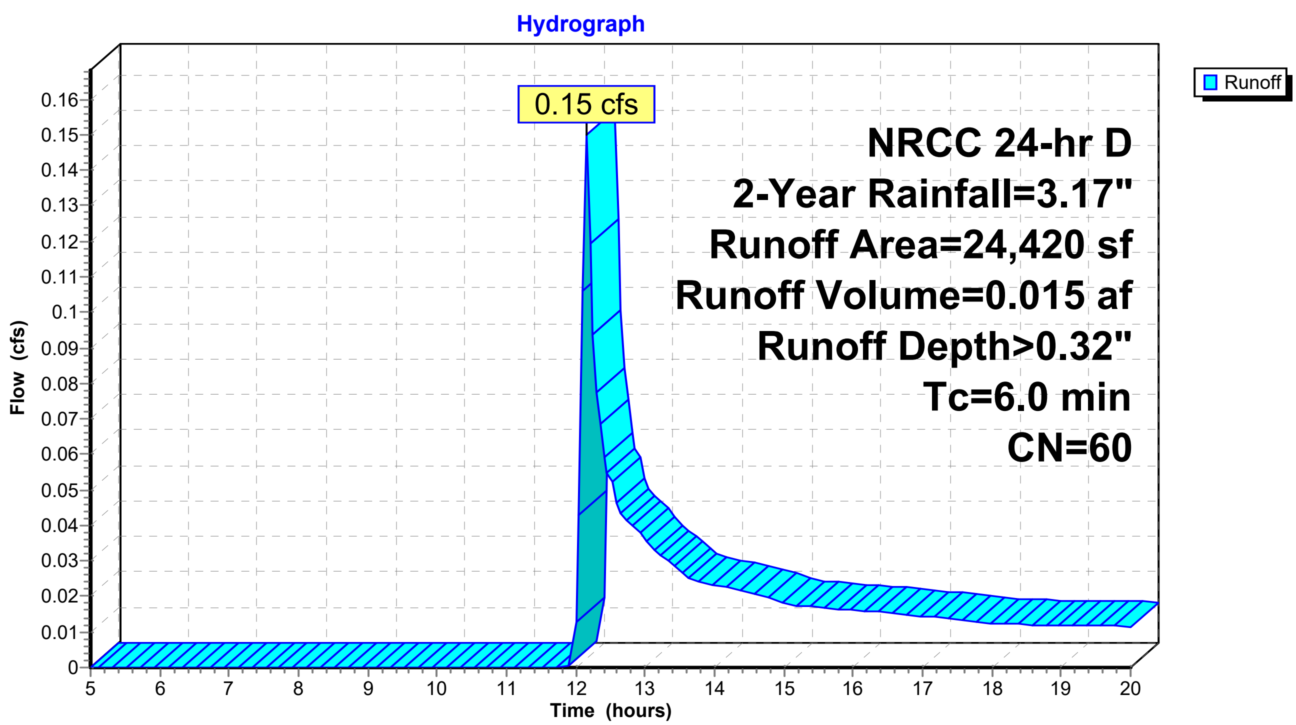
Runoff = 0.15 cfs @ 12.15 hrs, Volume= 0.015 af, Depth> 0.32"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 2-Year Rainfall=3.17"

Area (sf)	CN	Description
4,295	55	Woods, Good, HSG B
20,125	61	>75% Grass cover, Good, HSG B
24,420	60	Weighted Average
24,420		100.00% Pervious Area

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

Subcatchment 31S: P3A



Summary for Subcatchment 34S: P1C

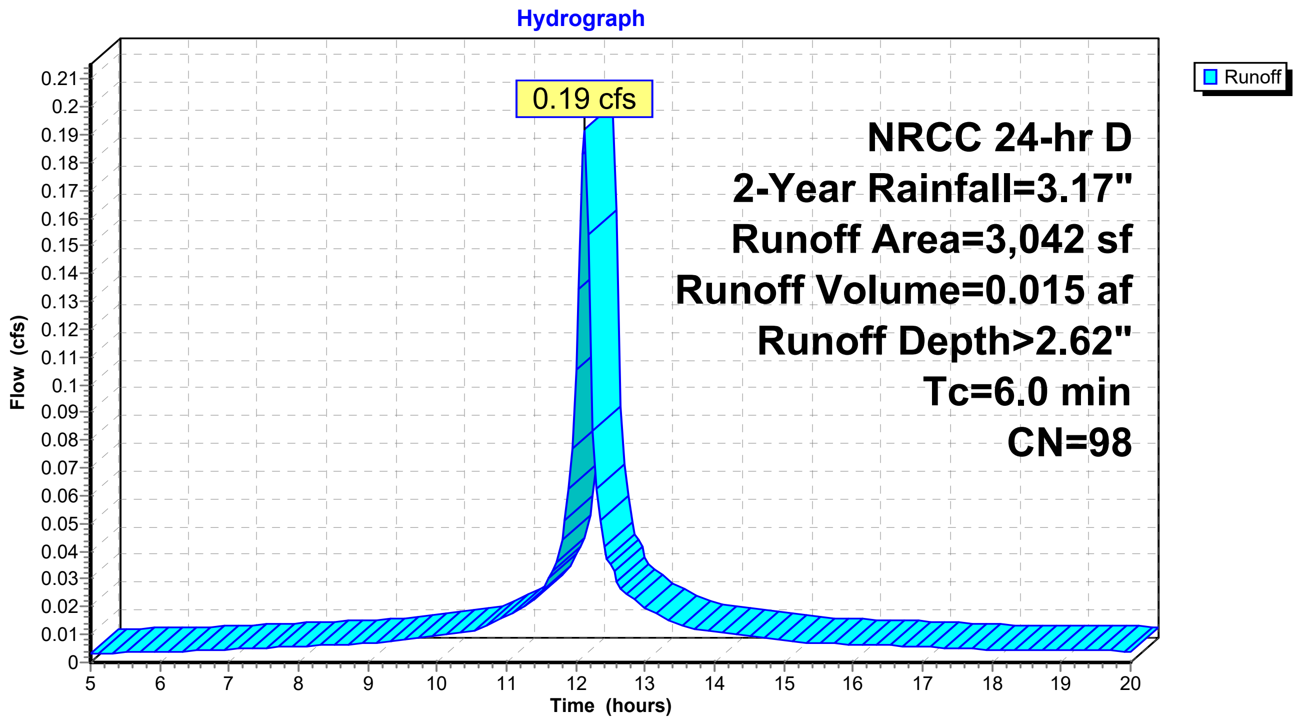
Runoff = 0.19 cfs @ 12.13 hrs, Volume= 0.015 af, Depth> 2.62"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 2-Year Rainfall=3.17"

Area (sf)	CN	Description
3,042	98	Paved parking, HSG B
3,042		100.00% Impervious Area

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

Subcatchment 34S: P1C



Summary for Subcatchment 35S: P1B

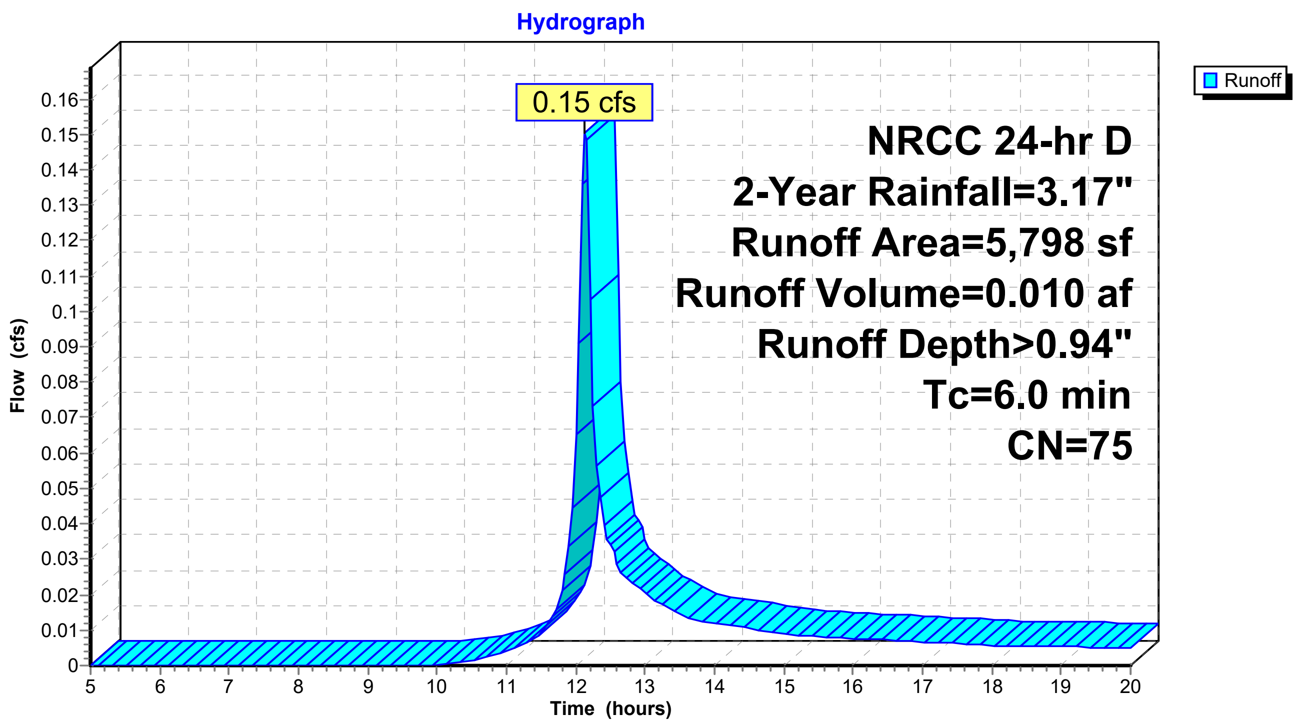
Runoff = 0.15 cfs @ 12.14 hrs, Volume= 0.010 af, Depth> 0.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 2-Year Rainfall=3.17"

Area (sf)	CN	Description
2,135	98	Paved parking, HSG B
3,663	61	>75% Grass cover, Good, HSG B
5,798	75	Weighted Average
3,663		63.18% Pervious Area
2,135		36.82% Impervious Area

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

Subcatchment 35S: P1B



Summary for Subcatchment 43S: P1D

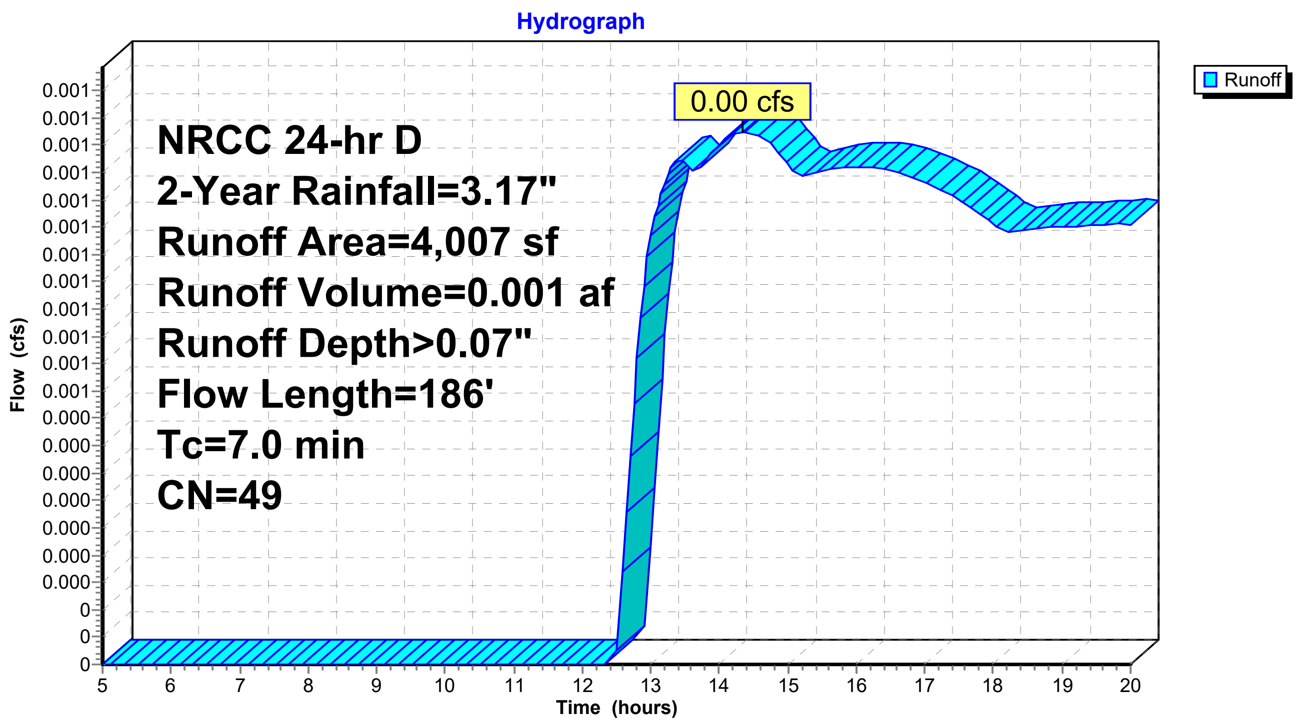
Runoff = 0.00 cfs @ 14.35 hrs, Volume= 0.001 af, Depth> 0.07"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 2-Year Rainfall=3.17"

Area (sf)	CN	Description
316	55	Woods, Good, HSG B
3,691	48	Brush, Good, HSG B
4,007	49	Weighted Average
4,007		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.6	50	0.1000	0.13		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.10"
0.4	136	0.1300	5.80		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
7.0	186	Total			

Subcatchment 43S: P1D



Summary for Subcatchment 44S: P2D

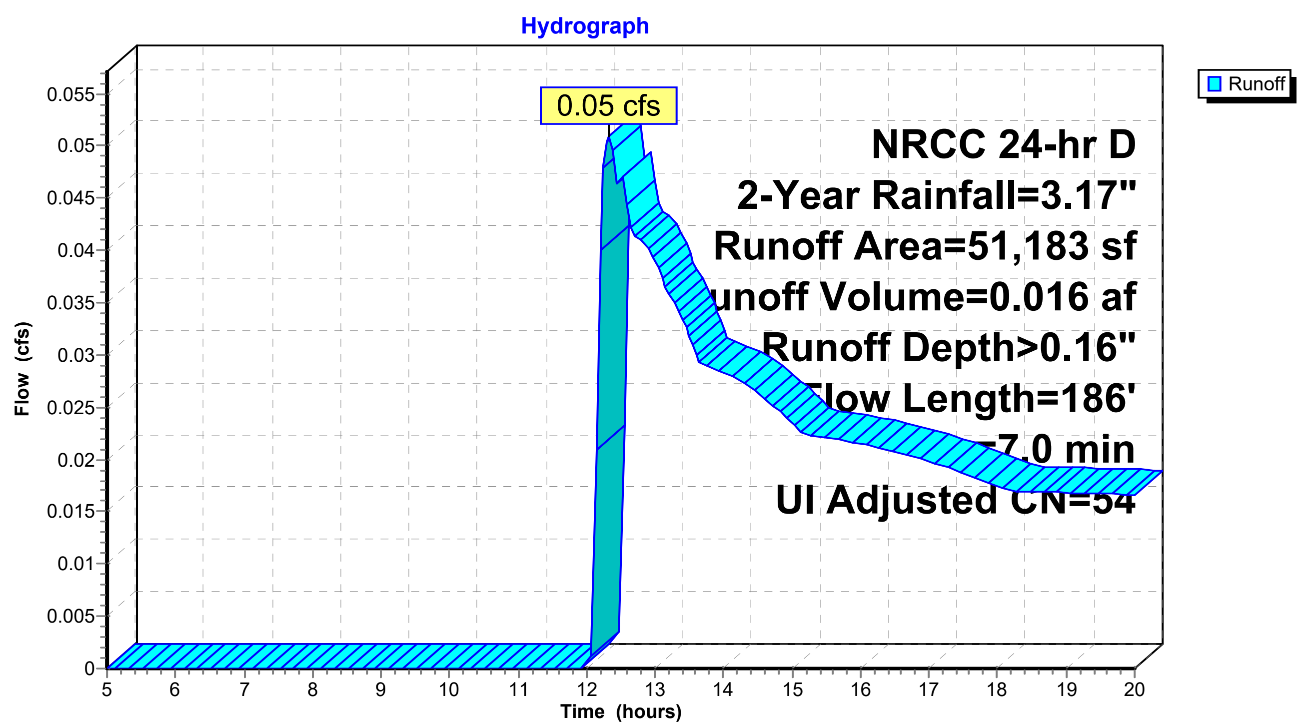
Runoff = 0.05 cfs @ 12.33 hrs, Volume= 0.016 af, Depth> 0.16"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 2-Year Rainfall=3.17"

Area (sf)	CN	Adj	Description
33,103	55		Woods, Good, HSG B
13,939	48		Brush, Good, HSG B
2,316	98		Unconnected roofs, HSG B
461	98		Unconnected pavement, HSG B
1,364	58		Woods/grass comb., Good, HSG B
51,183	56	54	Weighted Average, UI Adjusted
48,406			94.57% Pervious Area
2,777			5.43% Impervious Area
2,777			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.6	50	0.1000	0.13		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.10"
0.4	136	0.1300	5.80		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
7.0	186	Total			

Subcatchment 44S: P2D



Summary for Subcatchment 45S: P3L

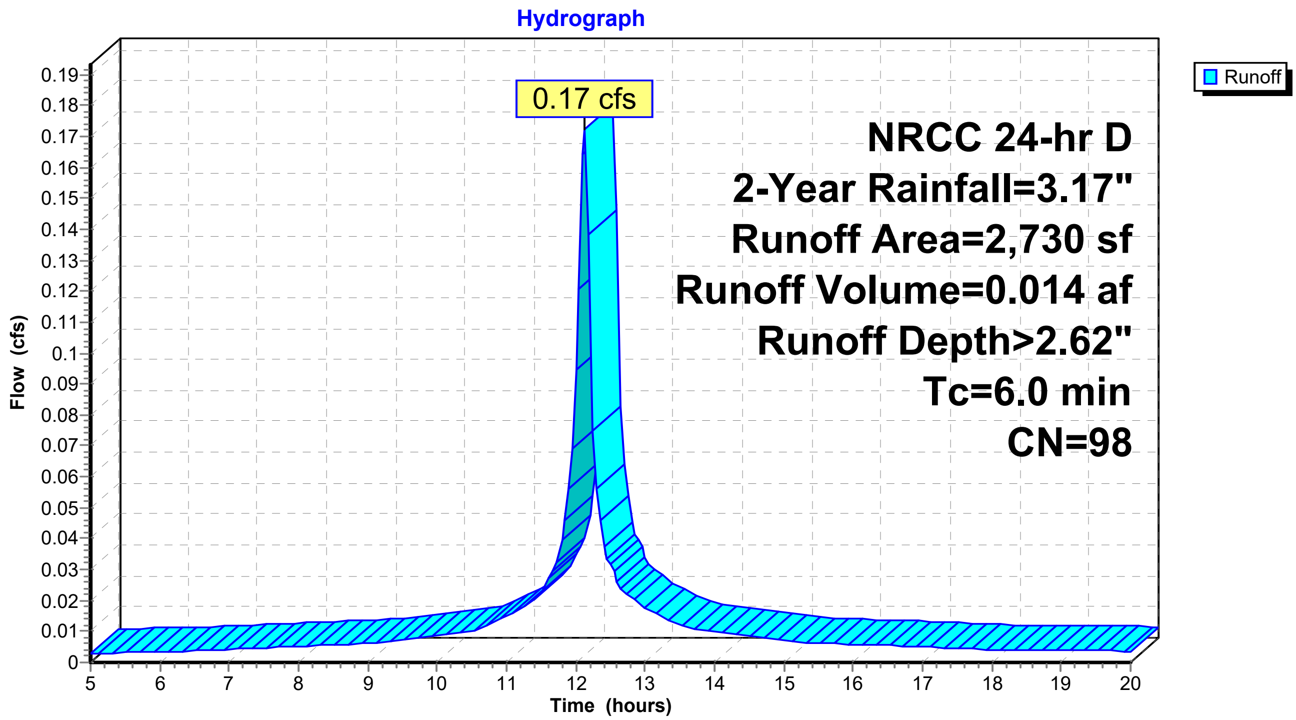
Runoff = 0.17 cfs @ 12.13 hrs, Volume= 0.014 af, Depth> 2.62"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 2-Year Rainfall=3.17"

Area (sf)	CN	Description
2,730	98	Paved parking, HSG B
2,730		100.00% Impervious Area

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

Subcatchment 45S: P3L



Summary for Subcatchment 46S: P2C

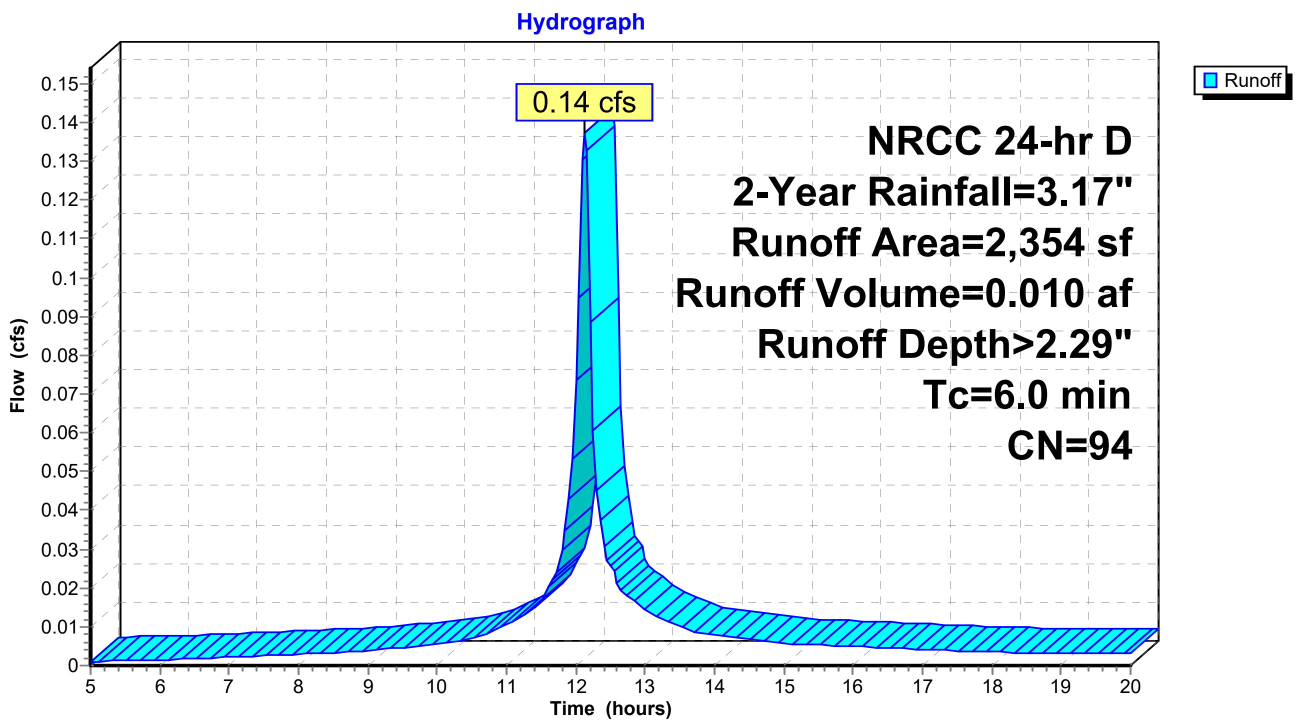
Runoff = 0.14 cfs @ 12.13 hrs, Volume= 0.010 af, Depth> 2.29"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 2-Year Rainfall=3.17"

Area (sf)	CN	Description
263	61	>75% Grass cover, Good, HSG B
2,091	98	Paved parking, HSG B
2,354	94	Weighted Average
263		11.17% Pervious Area
2,091		88.83% Impervious Area

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

Subcatchment 46S: P2C



Summary for Subcatchment 47S: P3M

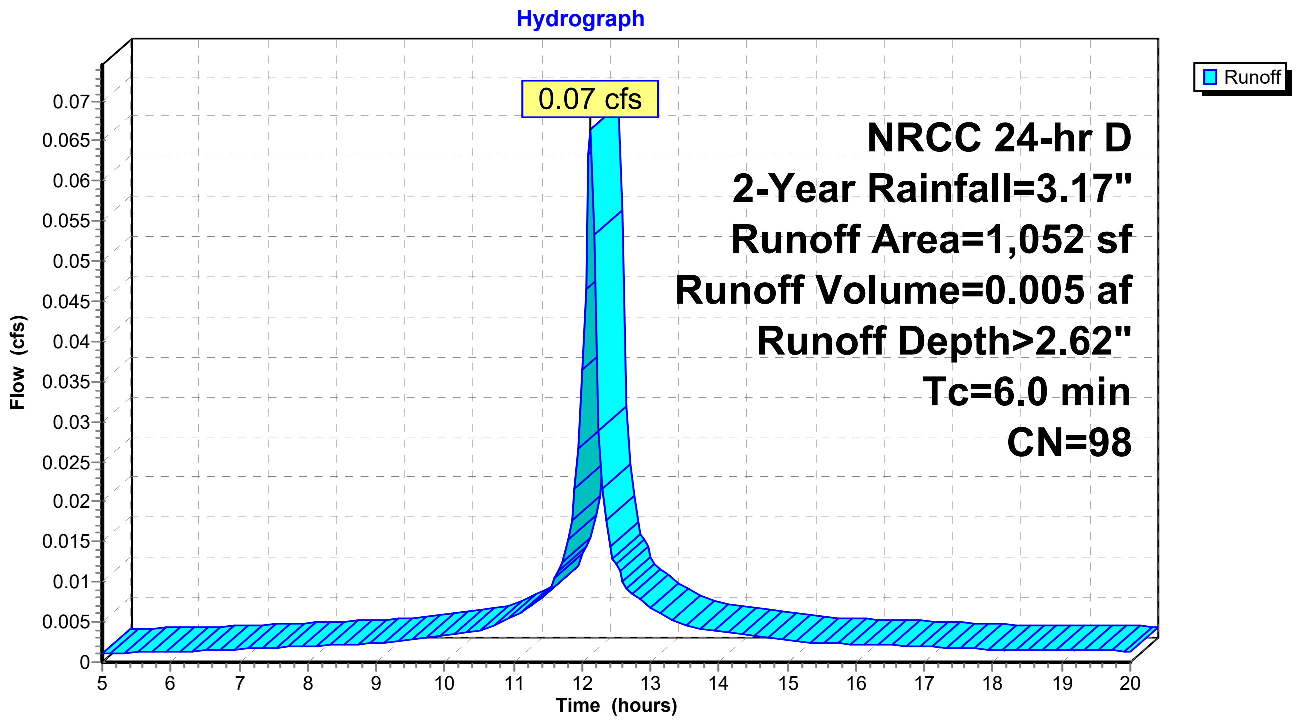
Runoff = 0.07 cfs @ 12.13 hrs, Volume= 0.005 af, Depth> 2.62"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 2-Year Rainfall=3.17"

Area (sf)	CN	Description
1,052	98	Paved parking, HSG B
1,052		100.00% Impervious Area

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

Subcatchment 47S: P3M



Summary for Pond 9P: CB 5

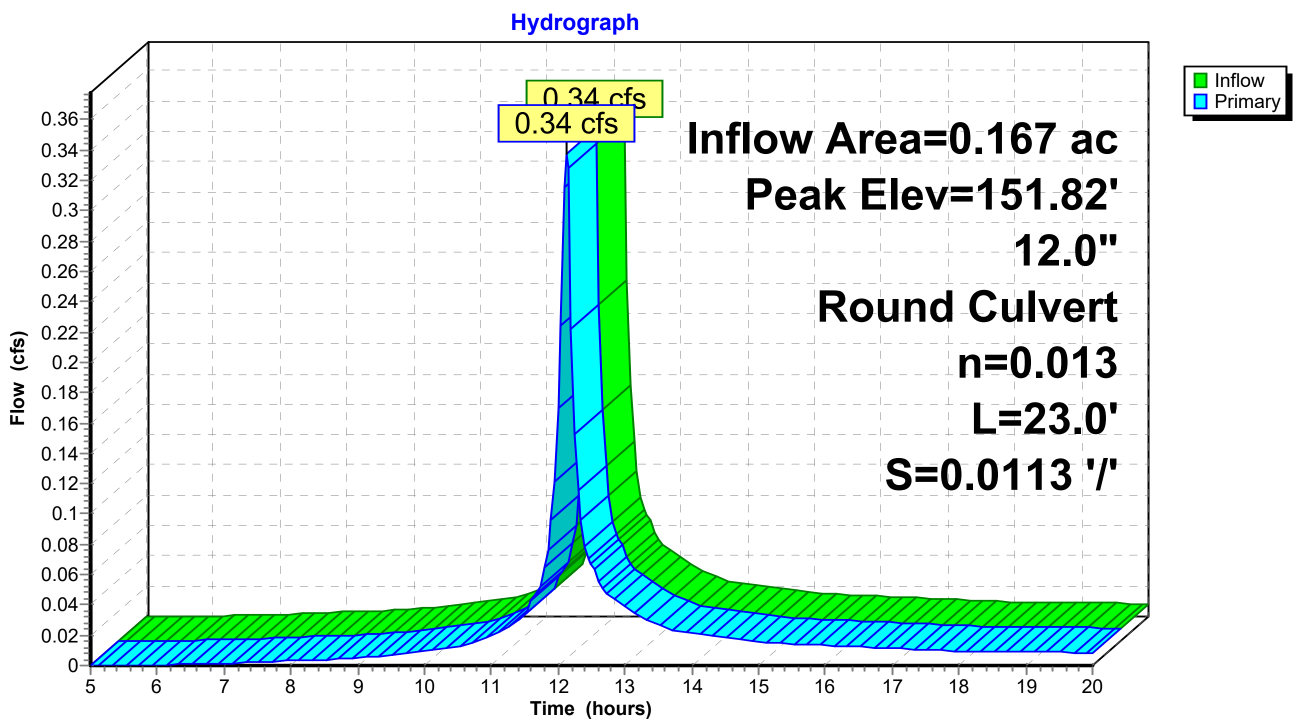
Inflow Area =	0.167 ac,	68.97% Impervious,	Inflow Depth > 1.71"	for 2-Year event
Inflow =	0.34 cfs @	12.13 hrs, Volume=	0.024 af	
Outflow =	0.34 cfs @	12.13 hrs, Volume=	0.024 af, Atten= 0%, Lag= 0.0 min	
Primary =	0.34 cfs @	12.13 hrs, Volume=	0.024 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 151.82' @ 12.13 hrs
Flood Elev= 156.25'

Device	Routing	Invert	Outlet Devices
#1	Primary	151.50'	**12.0" Round Culvert** L= 23.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 151.50' / 151.24' S= 0.0113 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.32 cfs @ 12.13 hrs HW=151.82' (Free Discharge)
└─**1=Culvert** (Inlet Controls 0.32 cfs @ 1.51 fps)

Pond 9P: CB 5



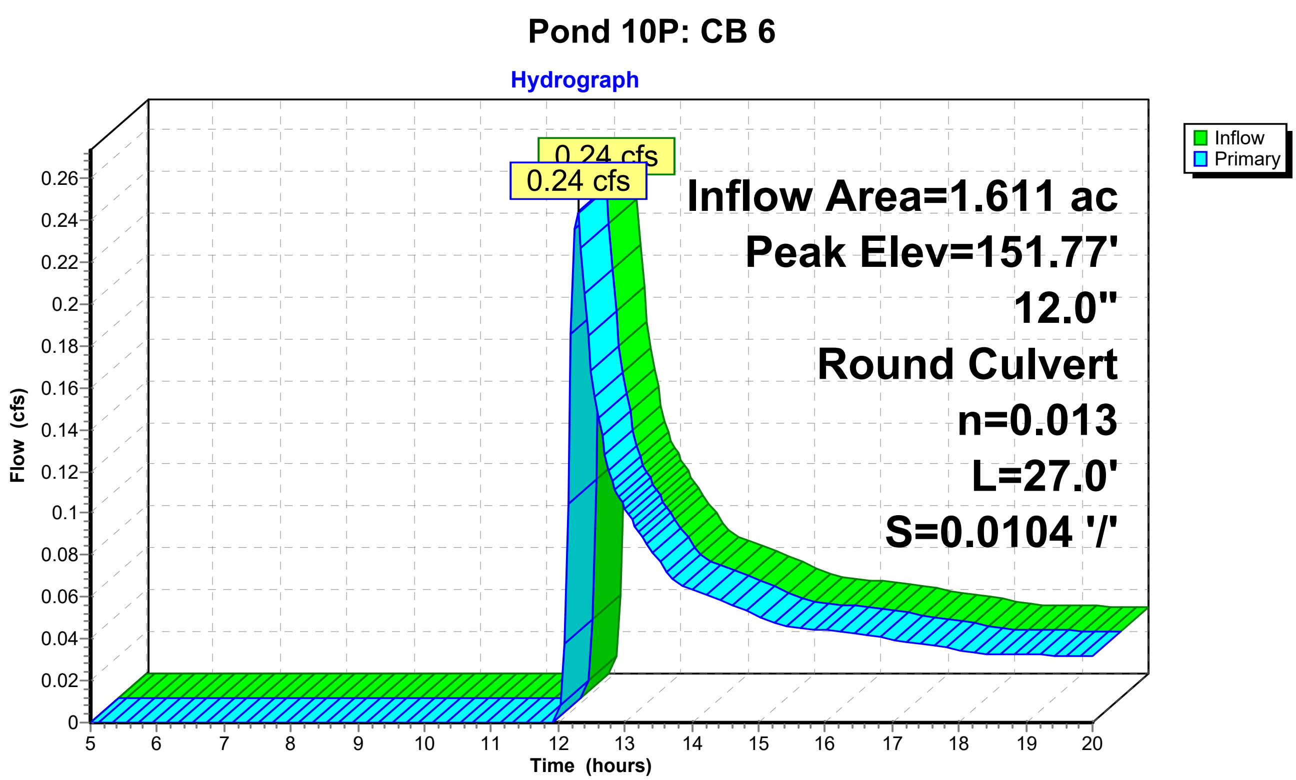
Summary for Pond 10P: CB 6

Inflow Area =	1.611 ac,	8.32% Impervious,	Inflow Depth > 0.29"	for 2-Year event	
Inflow =	0.24 cfs @	12.29 hrs,	Volume=	0.039 af	
Outflow =	0.24 cfs @	12.29 hrs,	Volume=	0.039 af,	Atten= 0%, Lag= 0.0 min
Primary =	0.24 cfs @	12.29 hrs,	Volume=	0.039 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 151.77' @ 12.29 hrs
Flood Elev= 156.25'

Device	Routing	Invert	Outlet Devices
#1	Primary	151.50'	**12.0" Round Culvert** L= 27.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 151.50' / 151.22' S= 0.0104 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.24 cfs @ 12.29 hrs HW=151.77' (Free Discharge)
↑**1=Culvert** (Inlet Controls 0.24 cfs @ 1.40 fps)



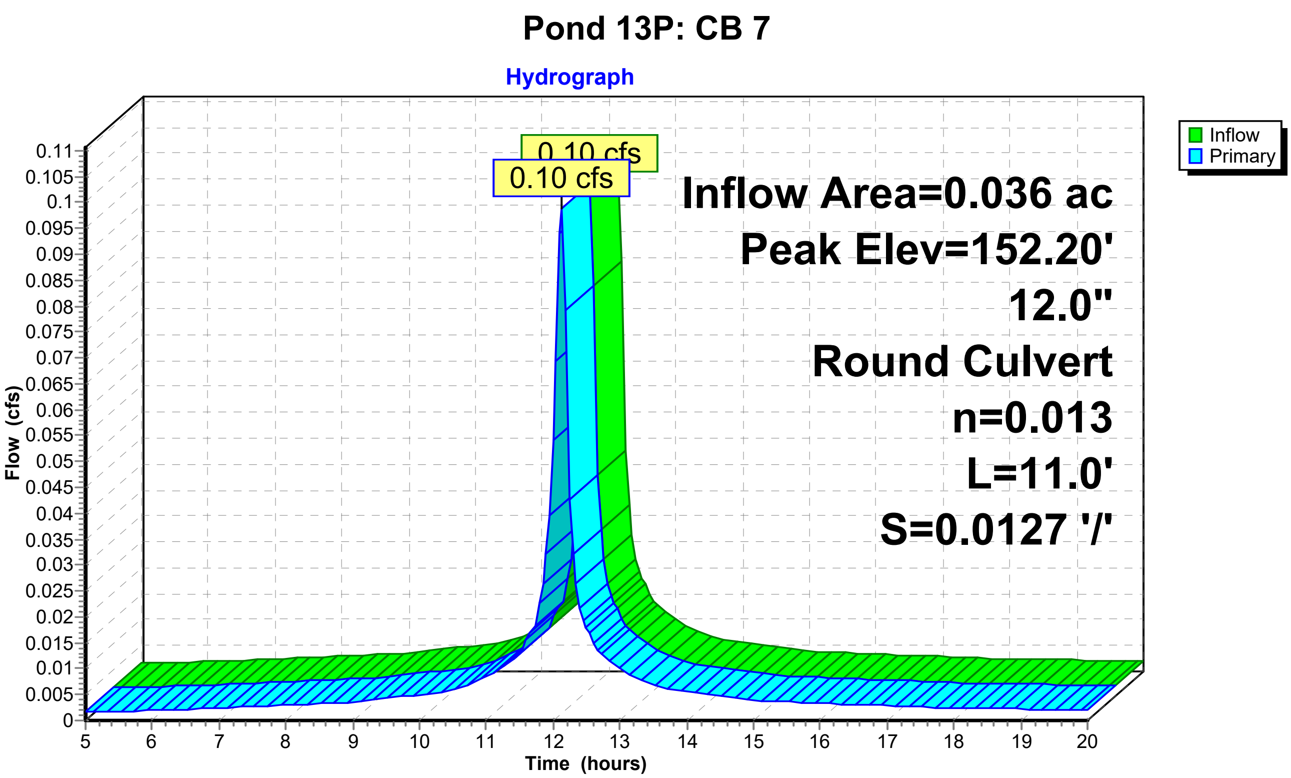
Summary for Pond 13P: CB 7

Inflow Area = 0.036 ac,100.00% Impervious, Inflow Depth > 2.62" for 2-Year event
Inflow = 0.10 cfs @ 12.13 hrs, Volume= 0.008 af
Outflow = 0.10 cfs @ 12.13 hrs, Volume= 0.008 af, Atten= 0%, Lag= 0.0 min
Primary = 0.10 cfs @ 12.13 hrs, Volume= 0.008 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 152.20' @ 12.13 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	152.03'	**12.0" Round Culvert** L= 11.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 152.03' / 151.89' S= 0.0127 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.09 cfs @ 12.13 hrs HW=152.20' (Free Discharge)
└─**1=Culvert** (Inlet Controls 0.09 cfs @ 1.10 fps)



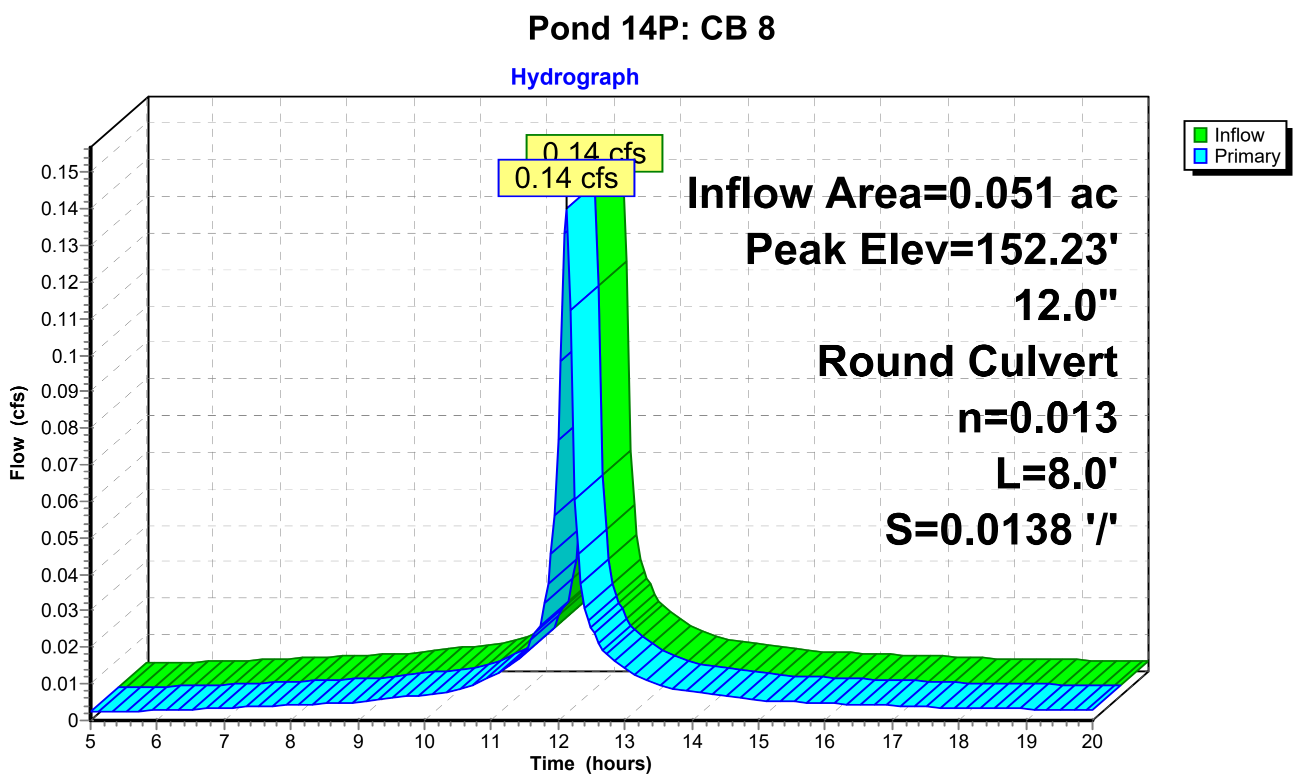
Summary for Pond 14P: CB 8

Inflow Area = 0.051 ac,100.00% Impervious, Inflow Depth > 2.62" for 2-Year event
Inflow = 0.14 cfs @ 12.13 hrs, Volume= 0.011 af
Outflow = 0.14 cfs @ 12.13 hrs, Volume= 0.011 af, Atten= 0%, Lag= 0.0 min
Primary = 0.14 cfs @ 12.13 hrs, Volume= 0.011 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 152.23' @ 12.13 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	152.03'	**12.0" Round Culvert** L= 8.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 152.03' / 151.92' S= 0.0138 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.13 cfs @ 12.13 hrs HW=152.23' (Free Discharge)
└─**1=Culvert** (Inlet Controls 0.13 cfs @ 1.20 fps)



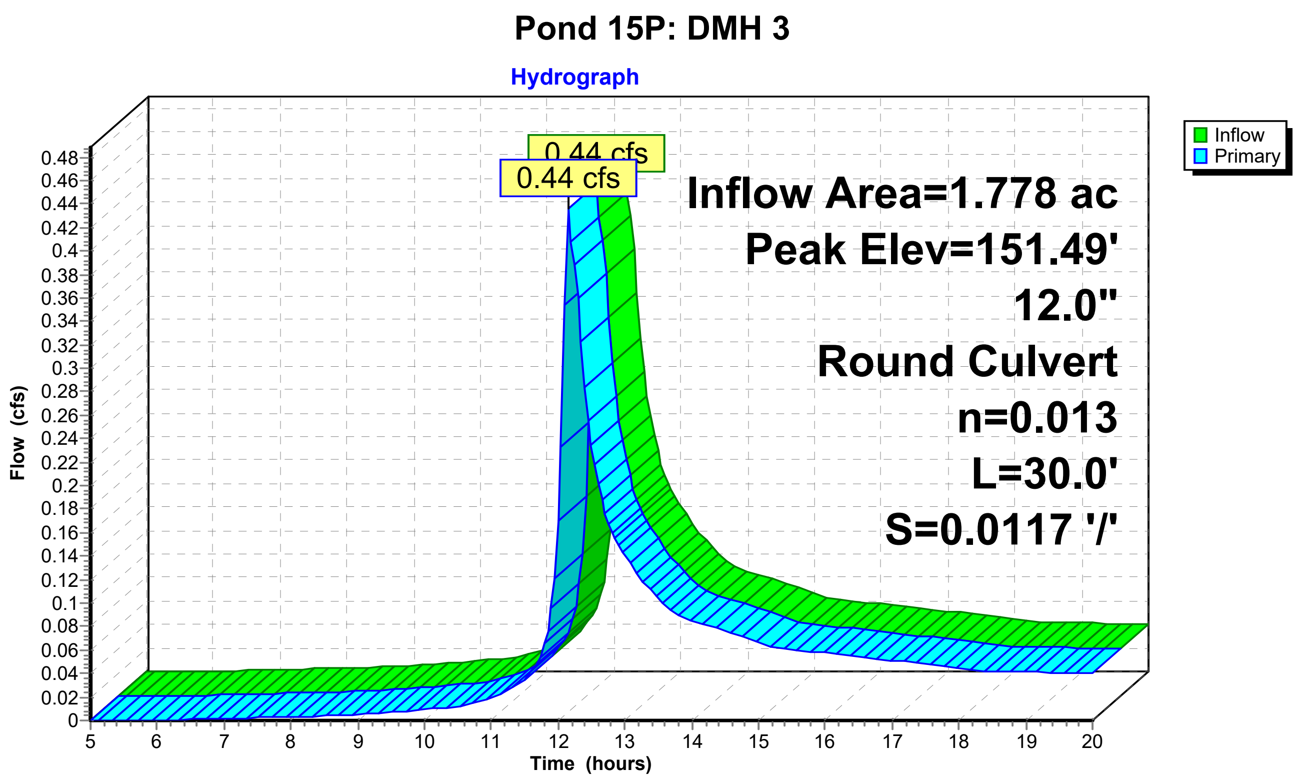
Summary for Pond 15P: DMH 3

Inflow Area =	1.778 ac,	14.02% Impervious,	Inflow Depth > 0.42"	for 2-Year event	
Inflow =	0.44 cfs @	12.16 hrs,	Volume=	0.062 af	
Outflow =	0.44 cfs @	12.16 hrs,	Volume=	0.062 af,	Atten= 0%, Lag= 0.0 min
Primary =	0.44 cfs @	12.16 hrs,	Volume=	0.062 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 151.49' @ 12.16 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	151.12'	**12.0" Round Culvert** L= 30.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 151.12' / 150.77' S= 0.0117 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.43 cfs @ 12.16 hrs HW=151.49' (Free Discharge)
└**1=Culvert** (Inlet Controls 0.43 cfs @ 1.63 fps)



Summary for Pond 18P: CB 11

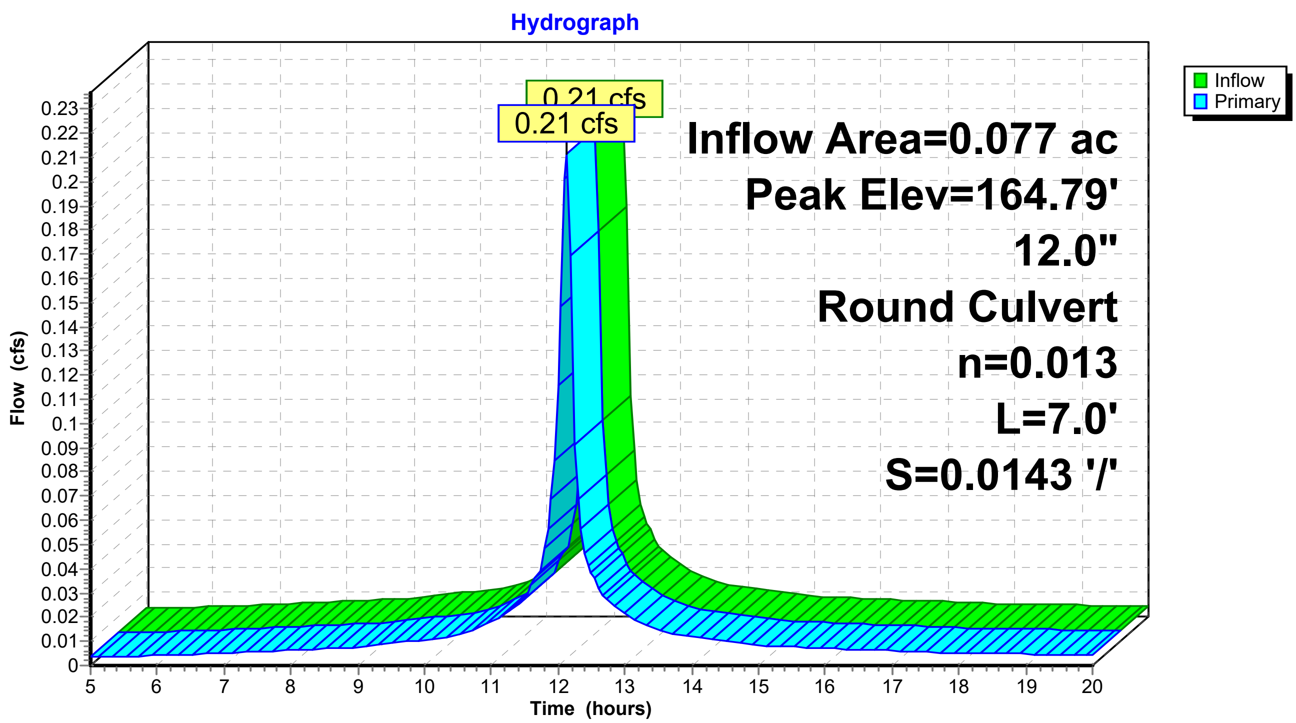
Inflow Area =	0.077 ac,100.00% Impervious,	Inflow Depth >	2.62"	for 2-Year event		
Inflow =	0.21 cfs @	12.13 hrs,	Volume=	0.017 af		
Outflow =	0.21 cfs @	12.13 hrs,	Volume=	0.017 af,	Atten= 0%,	Lag= 0.0 min
Primary =	0.21 cfs @	12.13 hrs,	Volume=	0.017 af		

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 164.79' @ 12.13 hrs
Flood Elev= 168.07'

Device	Routing	Invert	Outlet Devices
#1	Primary	164.54'	**12.0" Round Culvert** L= 7.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 164.54' / 164.44' S= 0.0143 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.20 cfs @ 12.13 hrs HW=164.79' (Free Discharge)
└─**1=Culvert** (Inlet Controls 0.20 cfs @ 1.34 fps)

Pond 18P: CB 11



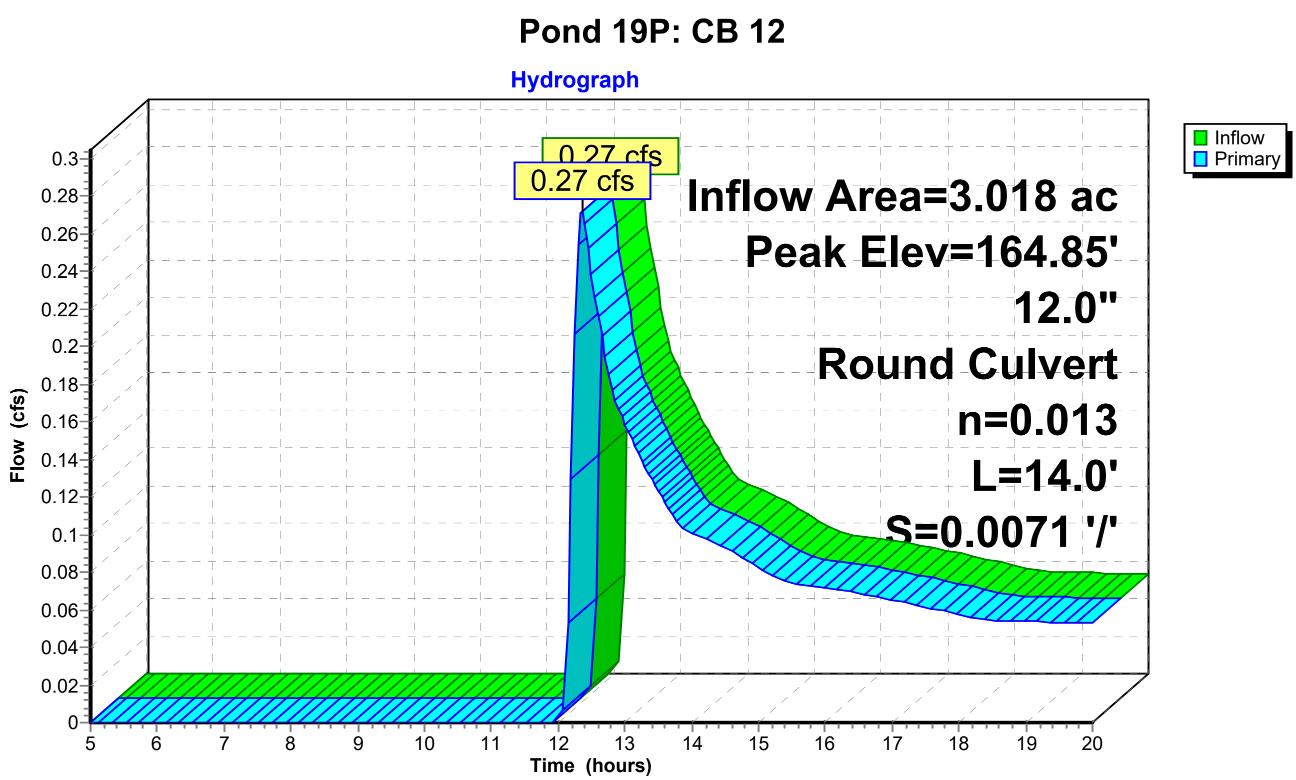
Summary for Pond 19P: CB 12

Inflow Area = 3.018 ac, 5.15% Impervious, Inflow Depth > 0.23" for 2-Year event
Inflow = 0.27 cfs @ 12.36 hrs, Volume= 0.058 af
Outflow = 0.27 cfs @ 12.36 hrs, Volume= 0.058 af, Atten= 0%, Lag= 0.0 min
Primary = 0.27 cfs @ 12.36 hrs, Volume= 0.058 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 164.85' @ 12.36 hrs
Flood Elev= 168.07'

Device	Routing	Invert	Outlet Devices
#1	Primary	164.54'	**12.0" Round Culvert** L= 14.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 164.54' / 164.44' S= 0.0071 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.27 cfs @ 12.36 hrs HW=164.85' (Free Discharge)
└─**1=Culvert** (Barrel Controls 0.27 cfs @ 1.98 fps)



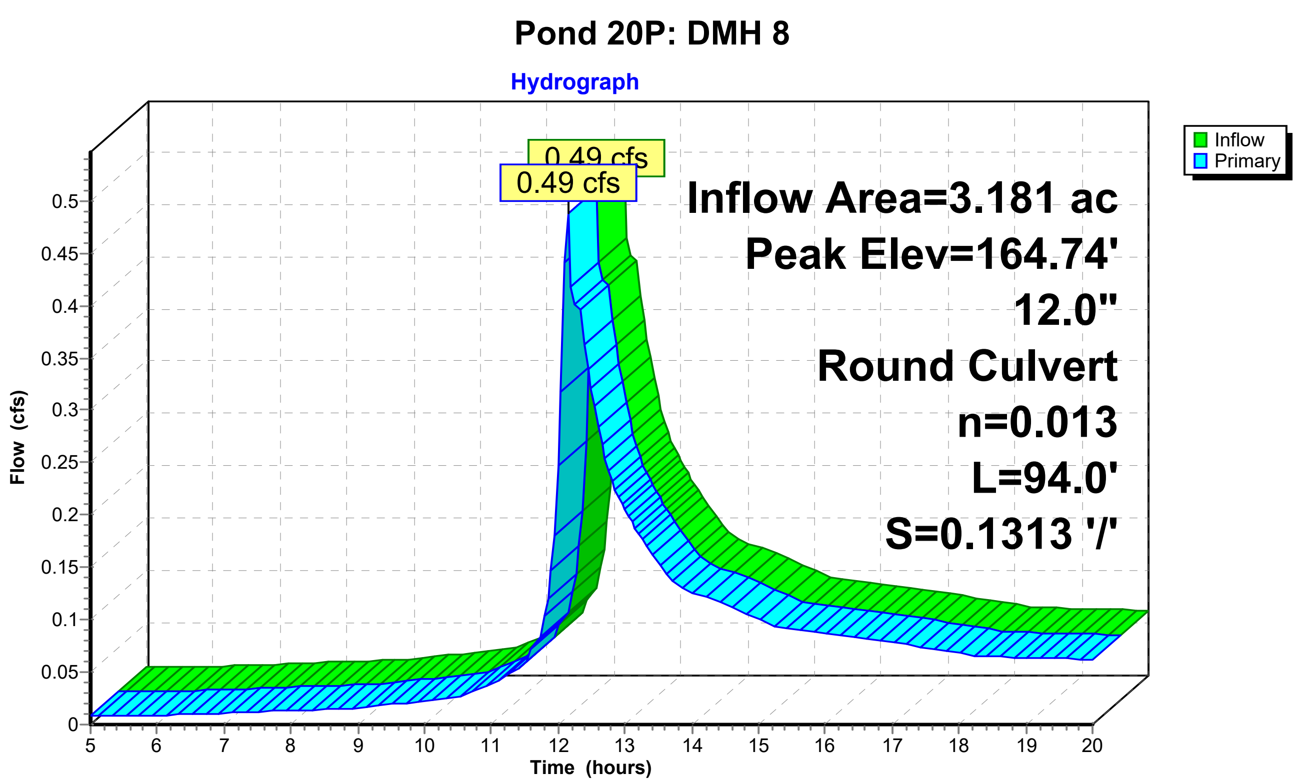
Summary for Pond 20P: DMH 8

Inflow Area =	3.181 ac,	10.03% Impervious,	Inflow Depth > 0.35"	for 2-Year event	
Inflow =	0.49 cfs @	12.14 hrs,	Volume=	0.094 af	
Outflow =	0.49 cfs @	12.14 hrs,	Volume=	0.094 af,	Atten= 0%, Lag= 0.0 min
Primary =	0.49 cfs @	12.14 hrs,	Volume=	0.094 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 164.74' @ 12.14 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	164.34'	**12.0" Round Culvert** L= 94.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 164.34' / 152.00' S= 0.1313 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.48 cfs @ 12.14 hrs HW=164.73' (Free Discharge)
└**1=Culvert** (Inlet Controls 0.48 cfs @ 1.68 fps)



Summary for Pond 21P: Infiltration Basin 1

Inflow Area = 3.634 ac, 8.78% Impervious, Inflow Depth > 0.34" for 2-Year event
Inflow = 0.57 cfs @ 12.15 hrs, Volume= 0.104 af
Outflow = 0.08 cfs @ 18.04 hrs, Volume= 0.056 af, Atten= 86%, Lag= 353.1 min
Discarded = 0.08 cfs @ 18.04 hrs, Volume= 0.056 af
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 153.26' @ 18.04 hrs Surf.Area= 2,267 sf Storage= 2,121 cf

Plug-Flow detention time= 188.1 min calculated for 0.056 af (54% of inflow)
Center-of-Mass det. time= 63.4 min (910.9 - 847.5)

Volume	Invert	Avail.Storage	Storage Description
#1	152.00'	11,781 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

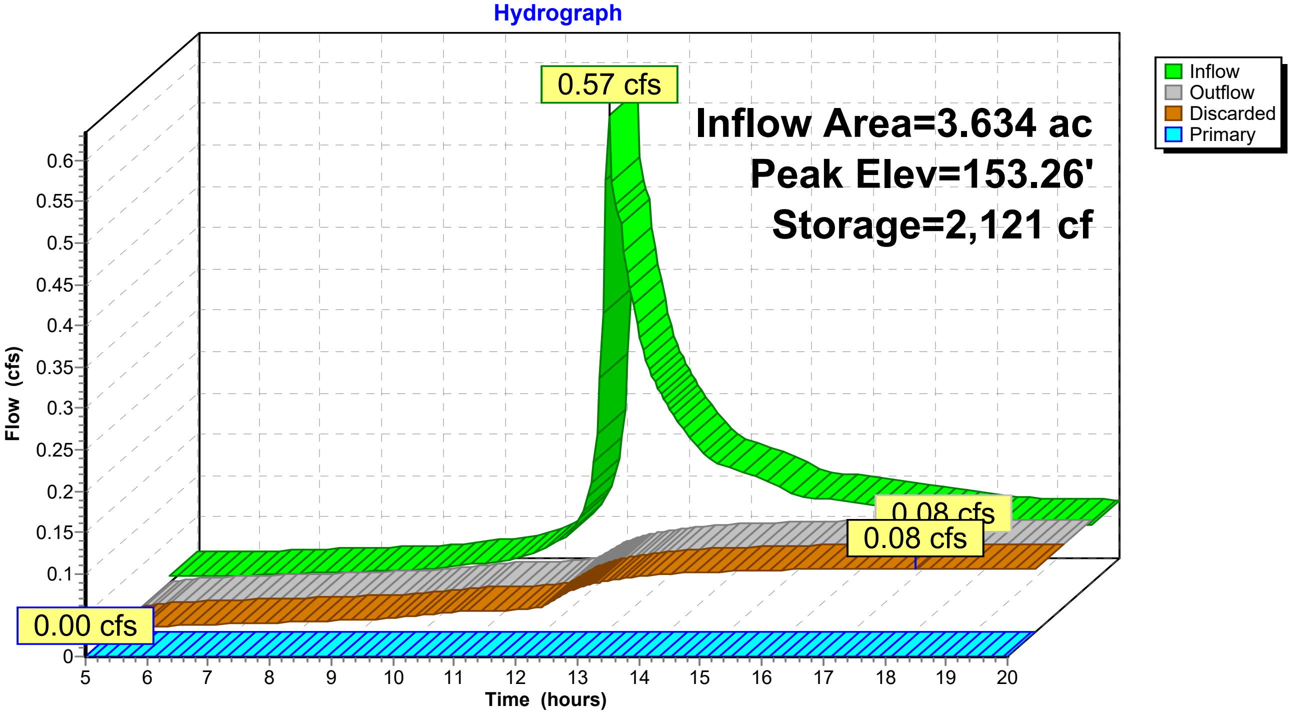
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
152.00	996	0	0
153.00	2,112	1,554	1,554
154.00	2,709	2,411	3,965
155.00	4,044	3,377	7,341
156.00	4,836	4,440	11,781

Device	Routing	Invert	Outlet Devices
#1	Discarded	152.00'	**1.020 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 150.00'
#2	Primary	152.00'	**18.0" Round Culvert** L= 121.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 152.00' / 139.00' S= 0.1074 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf
#3	Device 2	154.00'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 2	153.60'	**2.0' long x 0.40' rise Sharp-Crested Vee/Trap Weir** Cv= 2.62 (C= 3.28)

Discarded OutFlow Max=0.08 cfs @ 18.04 hrs HW=153.26' (Free Discharge)
└─**1=Exfiltration** (Controls 0.08 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=152.00' (Free Discharge)
└─**2=Culvert** (Passes 0.00 cfs of 0.00 cfs potential flow)
  ├─**3=Orifice/Grate** (Controls 0.00 cfs)
  └─**4=Sharp-Crested Vee/Trap Weir** (Controls 0.00 cfs)

Pond 21P: Infiltration Basin 1



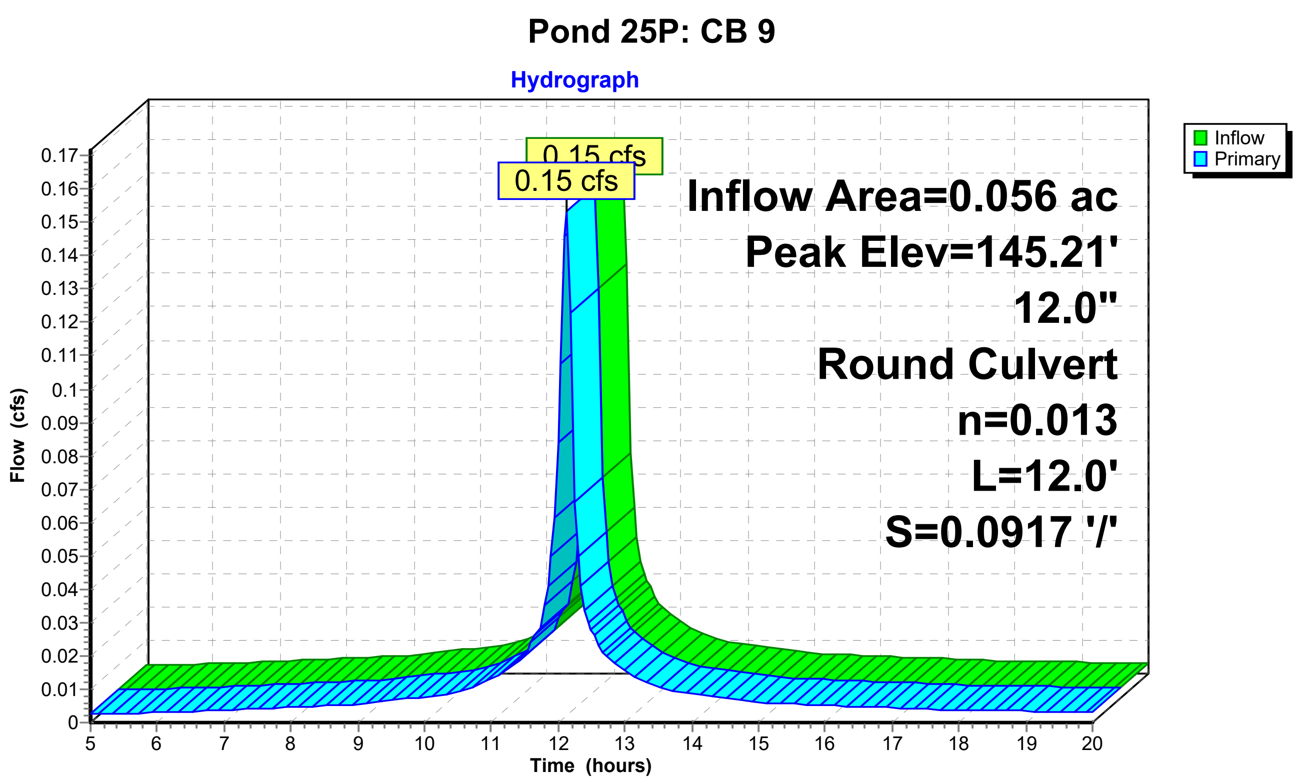
Summary for Pond 25P: CB 9

Inflow Area = 0.056 ac,100.00% Impervious, Inflow Depth > 2.62" for 2-Year event
Inflow = 0.15 cfs @ 12.13 hrs, Volume= 0.012 af
Outflow = 0.15 cfs @ 12.13 hrs, Volume= 0.012 af, Atten= 0%, Lag= 0.0 min
Primary = 0.15 cfs @ 12.13 hrs, Volume= 0.012 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 145.21' @ 12.13 hrs
Flood Elev= 152.72'

Device	Routing	Invert	Outlet Devices
#1	Primary	145.00'	**12.0" Round Culvert** L= 12.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 145.00' / 143.90' S= 0.0917 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.14 cfs @ 12.13 hrs HW=145.21' (Free Discharge)
└**1=Culvert** (Inlet Controls 0.14 cfs @ 1.22 fps)



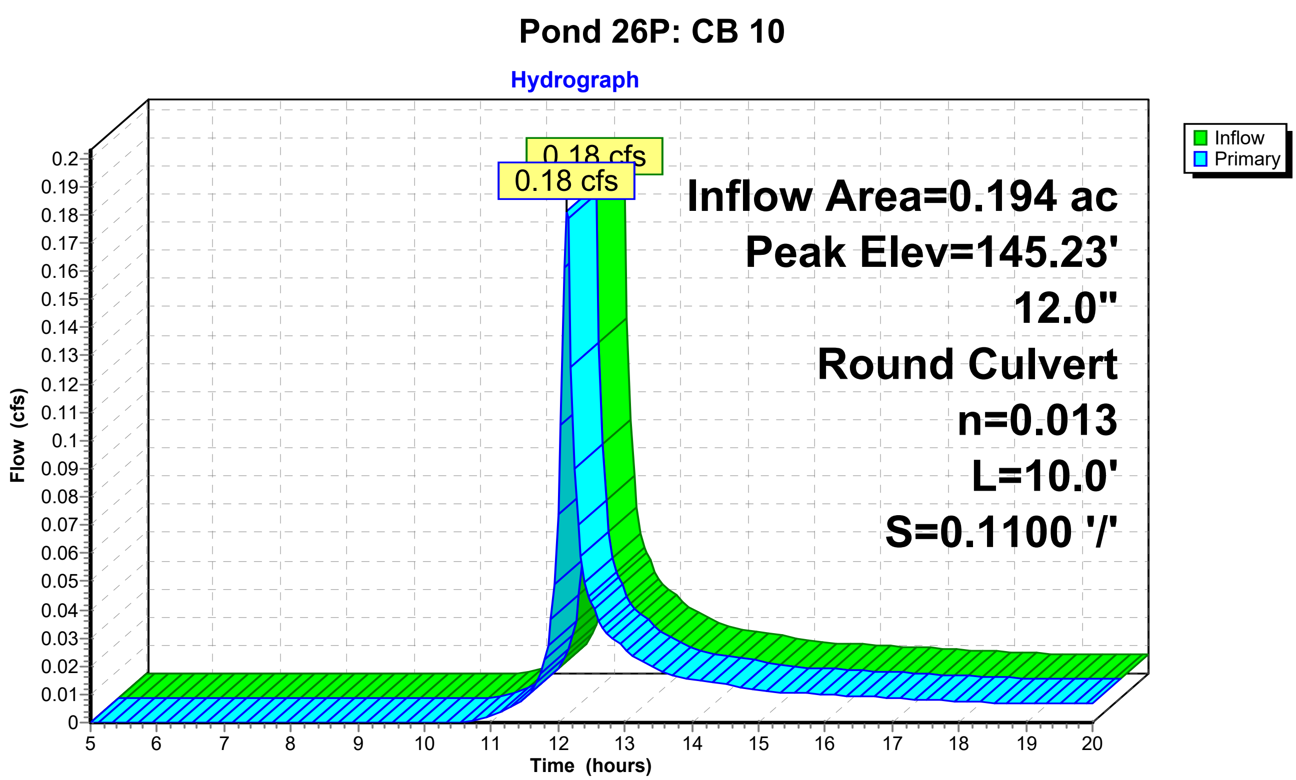
Summary for Pond 26P: CB 10

Inflow Area = 0.194 ac, 28.74% Impervious, Inflow Depth > 0.79" for 2-Year event
Inflow = 0.18 cfs @ 12.14 hrs, Volume= 0.013 af
Outflow = 0.18 cfs @ 12.14 hrs, Volume= 0.013 af, Atten= 0%, Lag= 0.0 min
Primary = 0.18 cfs @ 12.14 hrs, Volume= 0.013 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 145.23' @ 12.14 hrs
Flood Elev= 152.72'

Device	Routing	Invert	Outlet Devices
#1	Primary	145.00'	**12.0" Round Culvert** L= 10.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 145.00' / 143.90' S= 0.1100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.17 cfs @ 12.14 hrs HW=145.23' (Free Discharge)
↑—**1=Culvert** (Inlet Controls 0.17 cfs @ 1.28 fps)



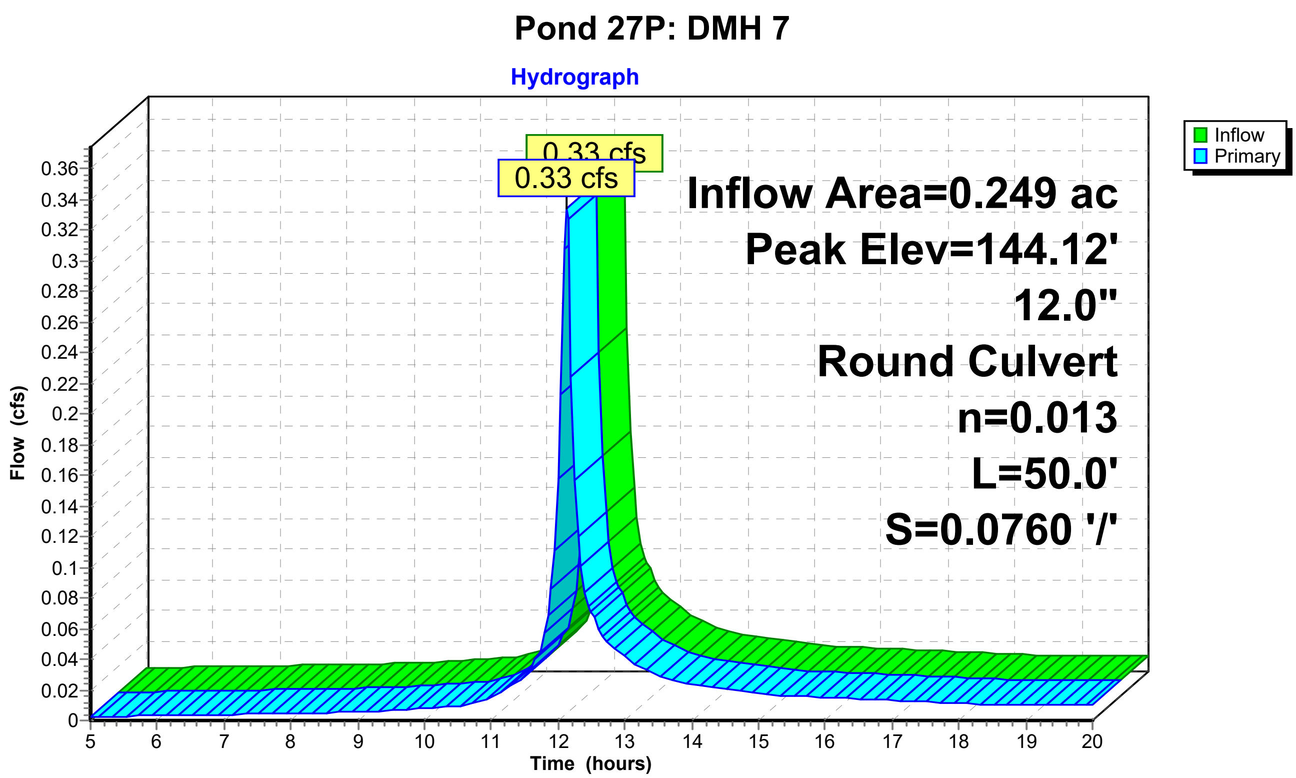
Summary for Pond 27P: DMH 7

Inflow Area =	0.249 ac, 44.65% Impervious, Inflow Depth > 1.19" for 2-Year event			
Inflow =	0.33 cfs @	12.13 hrs, Volume=	0.025 af	
Outflow =	0.33 cfs @	12.13 hrs, Volume=	0.025 af,	Atten= 0%, Lag= 0.0 min
Primary =	0.33 cfs @	12.13 hrs, Volume=	0.025 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 144.12' @ 12.13 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	143.80'	**12.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 143.80' / 140.00' S= 0.0760 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.32 cfs @ 12.13 hrs HW=144.12' (Free Discharge)
└**1=Culvert** (Inlet Controls 0.32 cfs @ 1.51 fps)



Summary for Pond 28P: Infiltration Basin 2

Inflow Area = 2.114 ac, 21.16% Impervious, Inflow Depth > 0.60" for 2-Year event
Inflow = 0.99 cfs @ 12.14 hrs, Volume= 0.106 af
Outflow = 0.08 cfs @ 16.49 hrs, Volume= 0.059 af, Atten= 92%, Lag= 260.8 min
Discarded = 0.08 cfs @ 16.49 hrs, Volume= 0.059 af
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 141.25' @ 16.49 hrs Surf.Area= 2,164 sf Storage= 2,229 cf

Plug-Flow detention time= 193.6 min calculated for 0.059 af (55% of inflow)
Center-of-Mass det. time= 81.3 min (899.5 - 818.2)

Volume	Invert	Avail.Storage	Storage Description
#1	140.00'	10,768 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

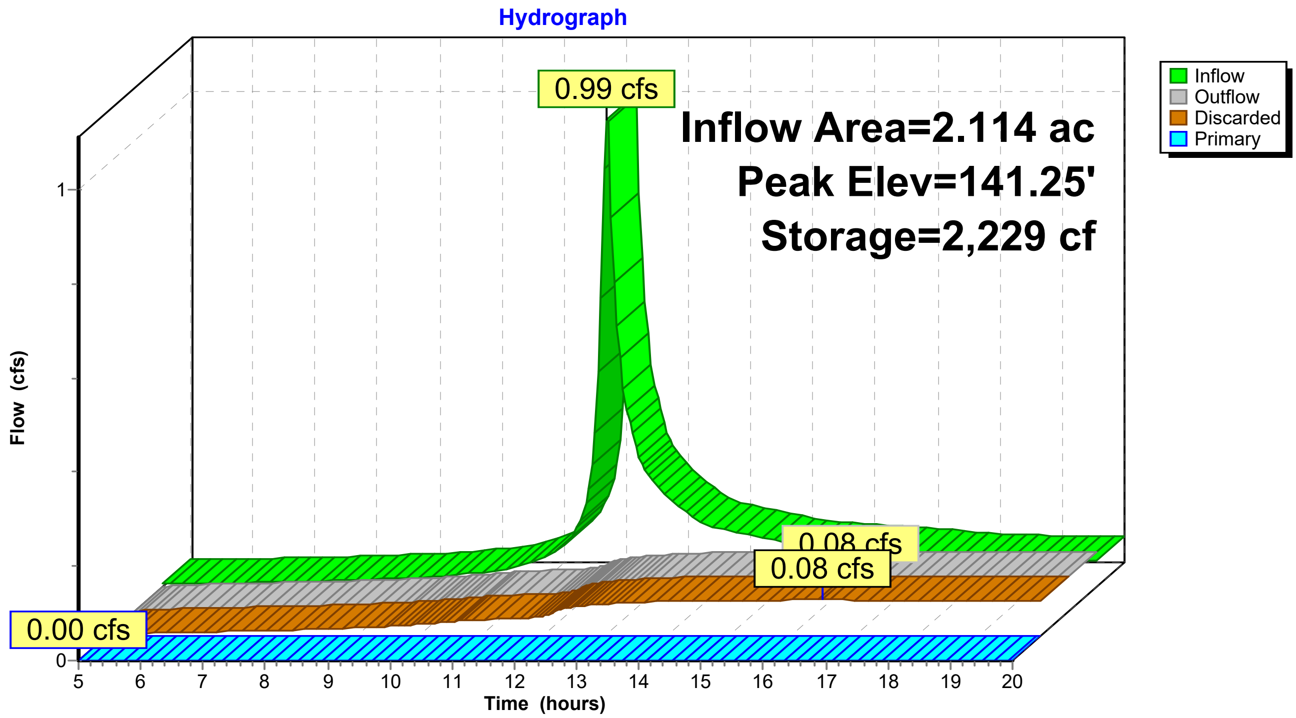
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
140.00	1,410	0	0
141.00	2,002	1,706	1,706
142.00	2,649	2,326	4,032
143.00	3,354	3,002	7,033
144.00	4,115	3,735	10,768

Device	Routing	Invert	Outlet Devices
#1	Discarded	140.00'	**1.020 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 138.00'
#2	Primary	139.00'	**12.0" Round Culvert** L= 65.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 139.00' / 134.50' S= 0.0692 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#3	Device 2	141.50'	**6.0" Vert. Orifice/Grate** C= 0.600
#4	Device 2	142.35'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.08 cfs @ 16.49 hrs HW=141.25' (Free Discharge)
└─**1=Exfiltration** (Controls 0.08 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=140.00' (Free Discharge)
└─**2=Culvert** (Passes 0.00 cfs of 2.11 cfs potential flow)
  ├─**3=Orifice/Grate** (Controls 0.00 cfs)
  └─**4=Orifice/Grate** (Controls 0.00 cfs)

Pond 28P: Infiltration Basin 2



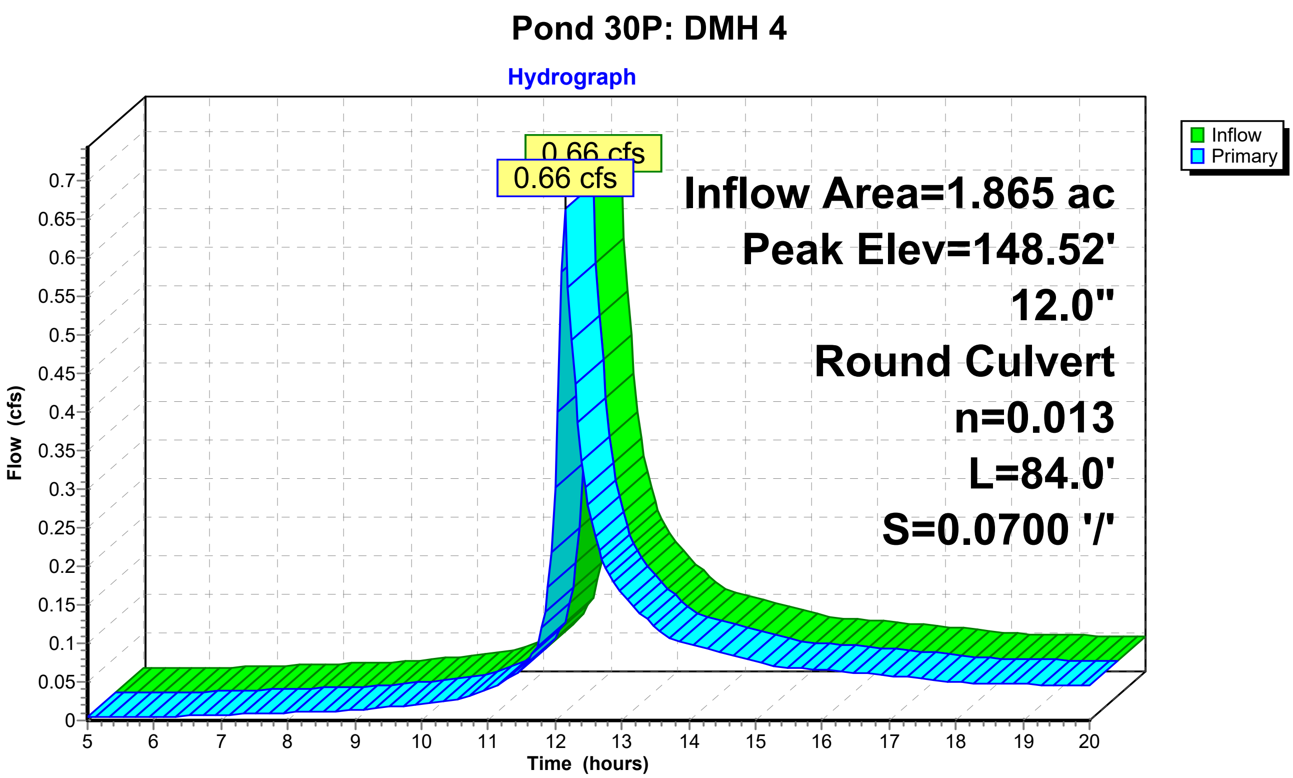
Summary for Pond 30P: DMH 4

Inflow Area =	1.865 ac,	18.02% Impervious,	Inflow Depth >	0.52"	for 2-Year event
Inflow =	0.66 cfs @	12.15 hrs,	Volume=	0.081 af	
Outflow =	0.66 cfs @	12.15 hrs,	Volume=	0.081 af,	Atten= 0%, Lag= 0.0 min
Primary =	0.66 cfs @	12.15 hrs,	Volume=	0.081 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 148.52' @ 12.15 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	148.05'	**12.0" Round Culvert** L= 84.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 148.05' / 142.17' S= 0.0700 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.66 cfs @ 12.15 hrs HW=148.52' (Free Discharge)
└─**1=Culvert** (Inlet Controls 0.66 cfs @ 1.83 fps)



Summary for Pond 33P: Subsurface Inf. Aea 2

Inflow Area = 0.629 ac,100.00% Impervious, Inflow Depth > 2.62" for 2-Year event
Inflow = 1.73 cfs @ 12.13 hrs, Volume= 0.137 af
Outflow = 0.11 cfs @ 13.72 hrs, Volume= 0.096 af, Atten= 94%, Lag= 95.5 min
Discarded = 0.11 cfs @ 13.72 hrs, Volume= 0.096 af
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 151.72' @ 13.72 hrs Surf.Area= 0.055 ac Storage= 0.064 af

Plug-Flow detention time= 169.2 min calculated for 0.095 af (69% of inflow)
Center-of-Mass det. time= 90.1 min (829.9 - 739.8)

Volume	Invert	Avail.Storage	Storage Description
#1A	150.00'	0.050 af	**20.50'W x 117.54'L x 3.50'H Field A** 0.194 af Overall - 0.067 af Embedded = 0.126 af x 40.0% Voids
#2A	150.50'	0.067 af	**ADS_StormTech SC-740 +Cap** x 64 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 64 Chambers in 4 Rows
		0.118 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	150.00'	**1.020 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 148.00'
#2	Primary	150.00'	**12.0" Round Culvert** L= 70.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 150.00' / 138.00' S= 0.1714 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#3	Device 2	152.60'	**4.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.11 cfs @ 13.72 hrs HW=151.72' (Free Discharge)
└─**1=Exfiltration** (Controls 0.11 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=150.00' (Free Discharge)
└─**2=Culvert** (Passes 0.00 cfs of 0.00 cfs potential flow)
  └─**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 33P: Subsurface Inf. Aea 2 - Chamber Wizard Field A

Chamber Model = ADS_StormTech SC-740 +Cap (ADS StormTech® SC-740 with cap length)
Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf
Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

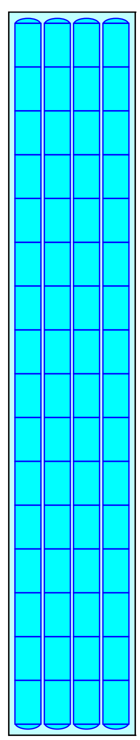
16 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 115.54' Row Length +12.0" End Stone x 2 = 117.54' Base Length
4 Rows x 51.0" Wide + 6.0" Spacing x 3 + 12.0" Side Stone x 2 = 20.50' Base Width
6.0" Base + 30.0" Chamber Height + 6.0" Cover = 3.50' Field Height

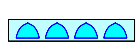
64 Chambers x 45.9 cf = 2,940.2 cf Chamber Storage

8,433.3 cf Field - 2,940.2 cf Chambers = 5,493.1 cf Stone x 40.0% Voids = 2,197.2 cf Stone Storage

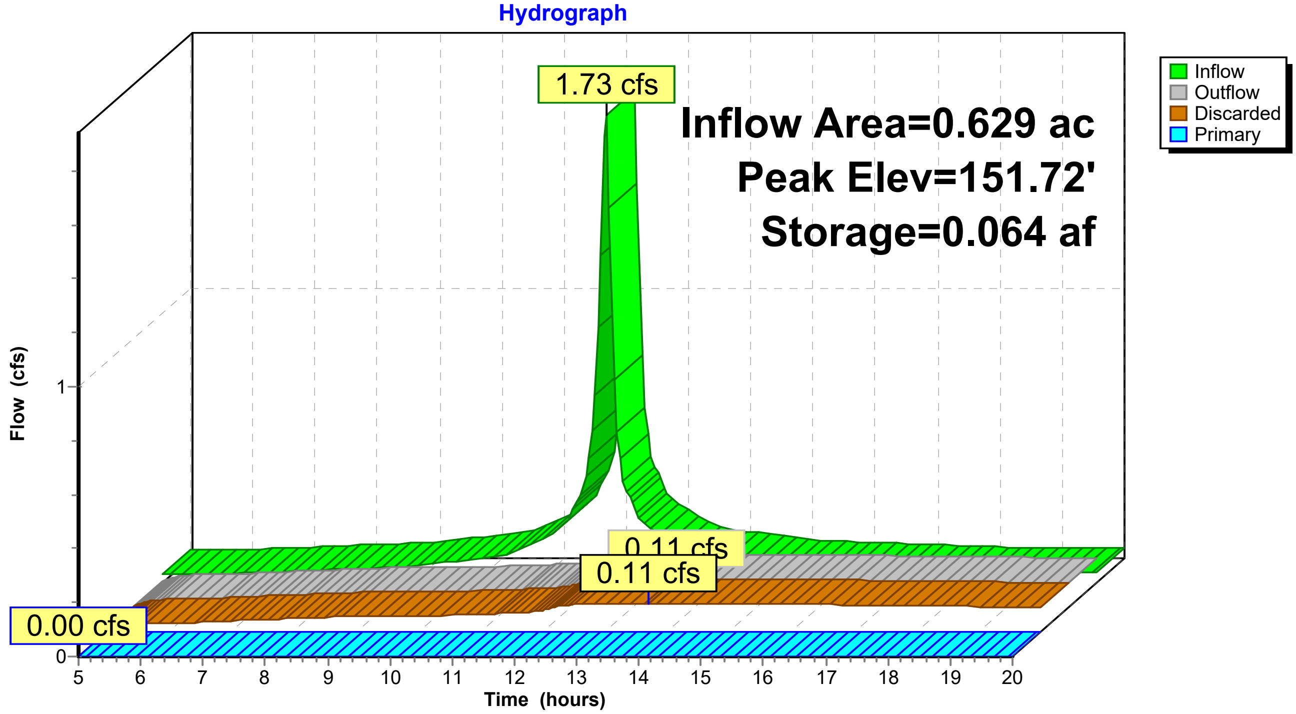
Chamber Storage + Stone Storage = 5,137.4 cf = 0.118 af
Overall Storage Efficiency = 60.9%
Overall System Size = 117.54' x 20.50' x 3.50'

64 Chambers
312.3 cy Field
203.4 cy Stone





Pond 33P: Subsurface Inf. Aea 2



Summary for Pond 34P: DMH 5

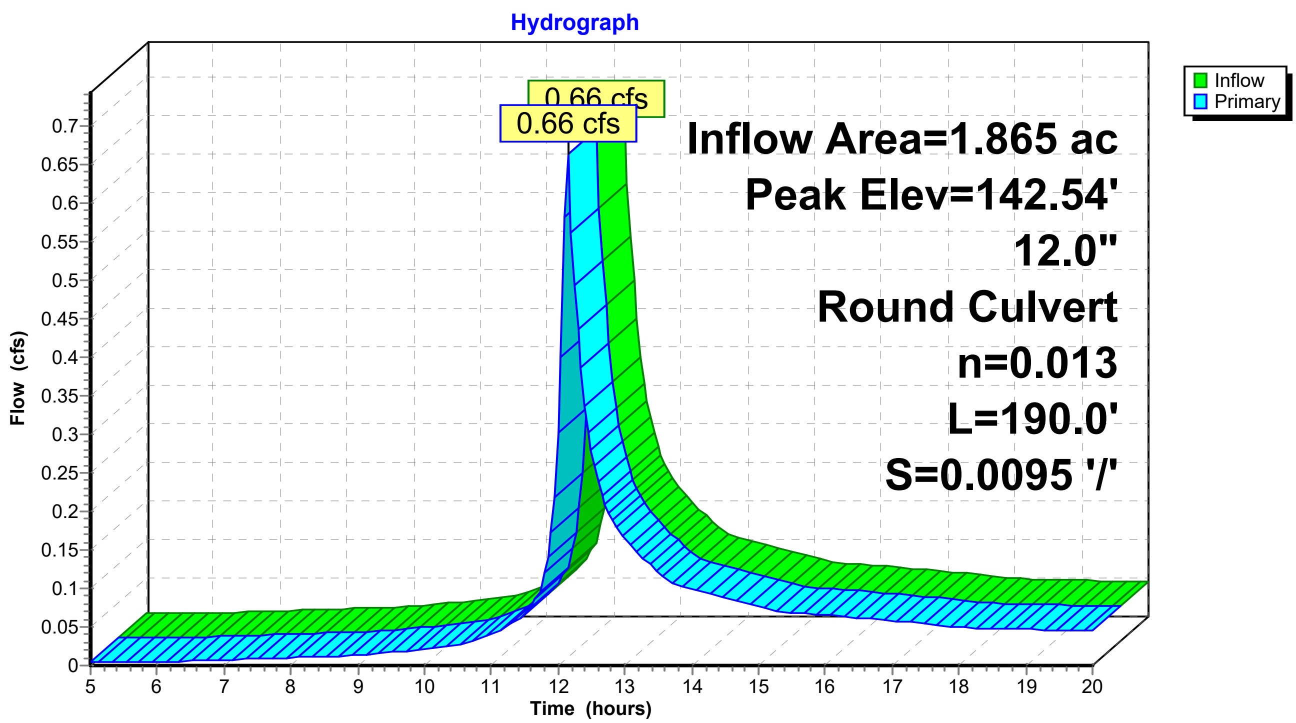
Inflow Area = 1.865 ac, 18.02% Impervious, Inflow Depth > 0.52" for 2-Year event
Inflow = 0.66 cfs @ 12.15 hrs, Volume= 0.081 af
Outflow = 0.66 cfs @ 12.15 hrs, Volume= 0.081 af, Atten= 0%, Lag= 0.0 min
Primary = 0.66 cfs @ 12.15 hrs, Volume= 0.081 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 142.54' @ 12.15 hrs
Flood Elev= 145.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	142.07'	**12.0" Round Culvert** L= 190.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 142.07' / 140.27' S= 0.0095 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.66 cfs @ 12.15 hrs HW=142.54' (Free Discharge)
└─**1=Culvert** (Inlet Controls 0.66 cfs @ 1.83 fps)

Pond 34P: DMH 5



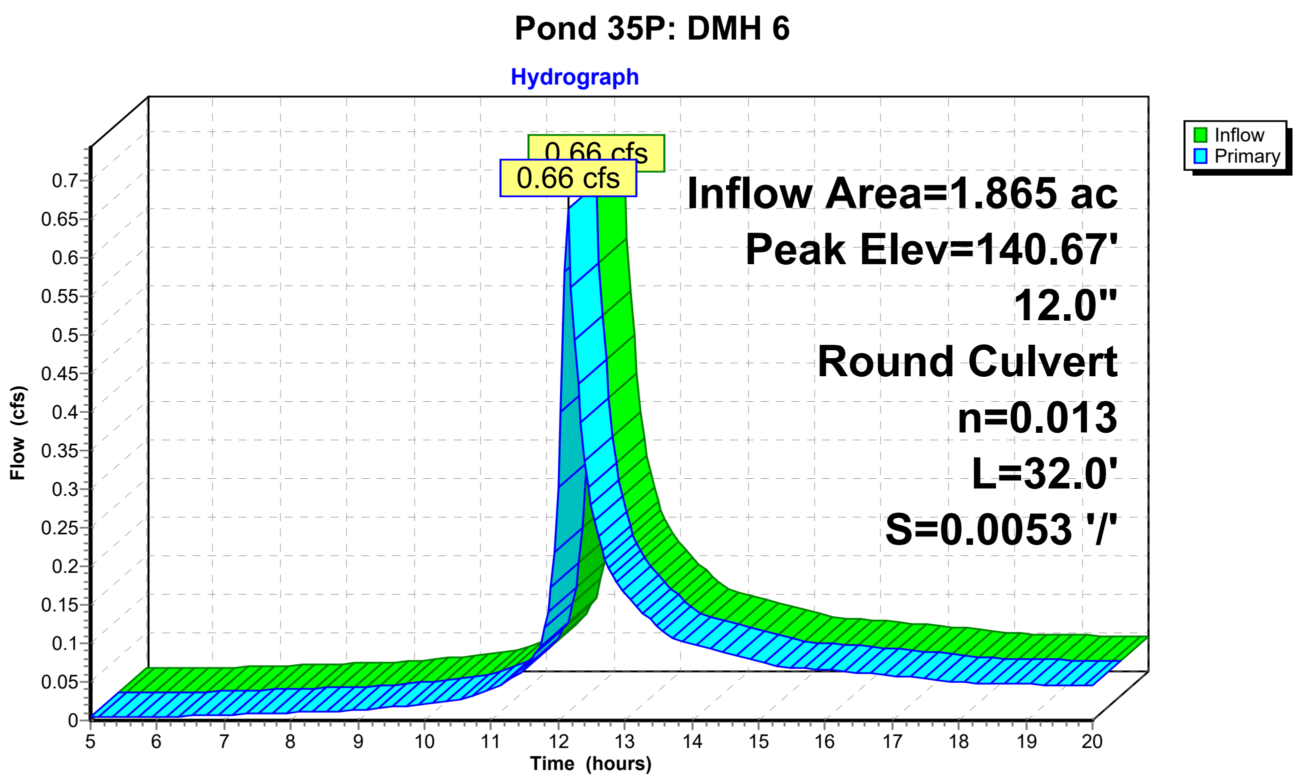
Summary for Pond 35P: DMH 6

Inflow Area =	1.865 ac,	18.02% Impervious,	Inflow Depth > 0.52"	for 2-Year event	
Inflow =	0.66 cfs @	12.15 hrs,	Volume=	0.081 af	
Outflow =	0.66 cfs @	12.15 hrs,	Volume=	0.081 af,	Atten= 0%, Lag= 0.0 min
Primary =	0.66 cfs @	12.15 hrs,	Volume=	0.081 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 140.67' @ 12.15 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	140.17'	**12.0" Round Culvert** L= 32.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 140.17' / 140.00' S= 0.0053 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.66 cfs @ 12.15 hrs HW=140.67' (Free Discharge)
└─**1=Culvert** (Barrel Controls 0.66 cfs @ 2.43 fps)



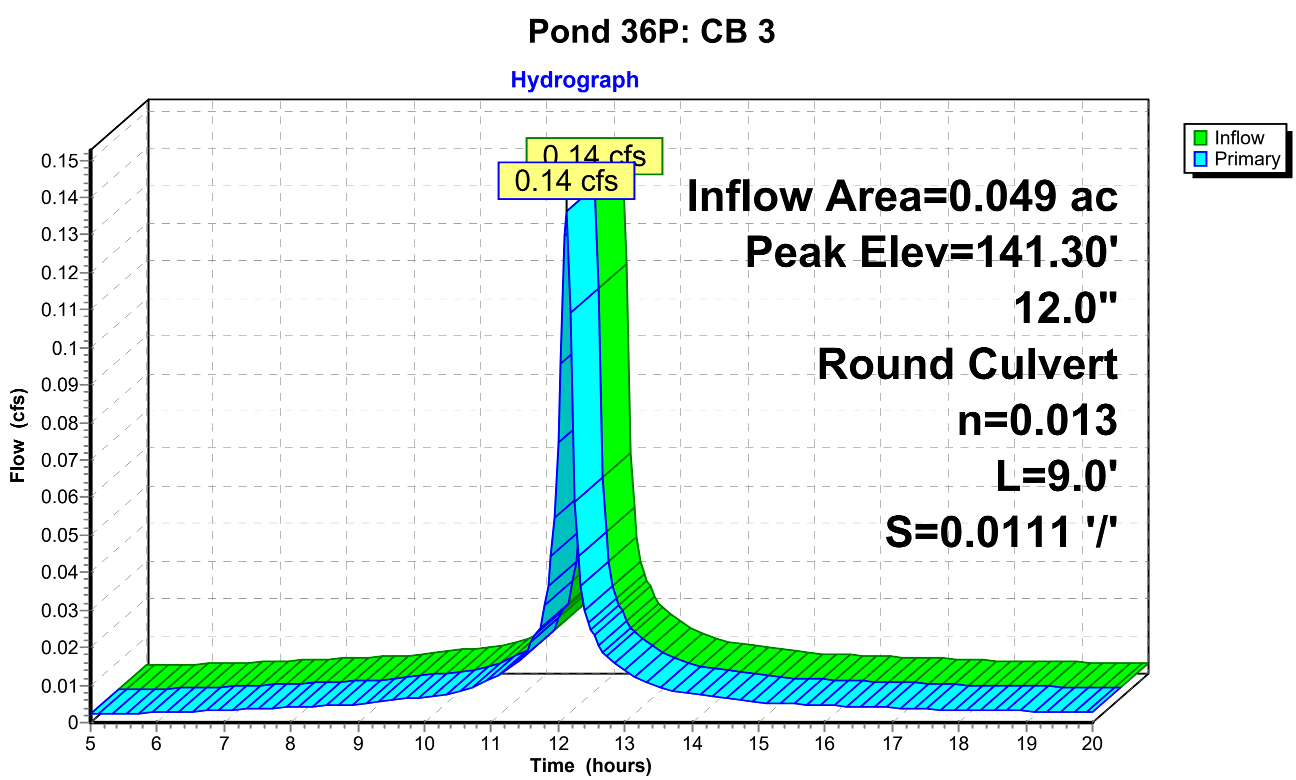
Summary for Pond 36P: CB 3

Inflow Area =	0.049 ac,100.00% Impervious,	Inflow Depth > 2.62"	for 2-Year event		
Inflow =	0.14 cfs @	12.13 hrs,	Volume=	0.011 af	
Outflow =	0.14 cfs @	12.13 hrs,	Volume=	0.011 af,	Atten= 0%, Lag= 0.0 min
Primary =	0.14 cfs @	12.13 hrs,	Volume=	0.011 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 141.30' @ 12.13 hrs
Flood Elev= 144.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	141.10'	**12.0" Round Culvert** L= 9.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 141.10' / 141.00' S= 0.0111 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.13 cfs @ 12.13 hrs HW=141.30' (Free Discharge)
└─**1=Culvert** (Barrel Controls 0.13 cfs @ 1.80 fps)



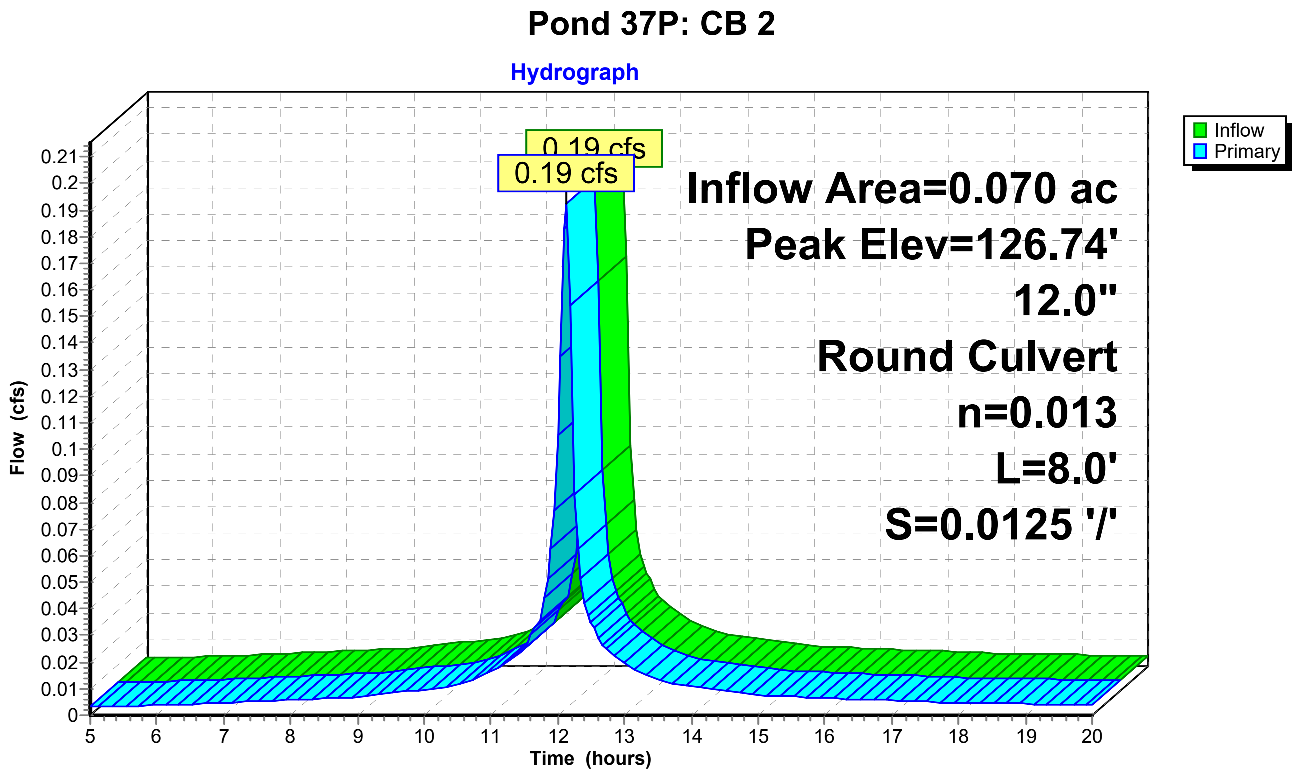
Summary for Pond 37P: CB 2

Inflow Area = 0.070 ac,100.00% Impervious, Inflow Depth > 2.62" for 2-Year event
Inflow = 0.19 cfs @ 12.13 hrs, Volume= 0.015 af
Outflow = 0.19 cfs @ 12.13 hrs, Volume= 0.015 af, Atten= 0%, Lag= 0.0 min
Primary = 0.19 cfs @ 12.13 hrs, Volume= 0.015 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 126.74' @ 12.13 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	126.50'	**12.0" Round Culvert** L= 8.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 126.50' / 126.40' S= 0.0125 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.18 cfs @ 12.13 hrs HW=126.74' (Free Discharge)
↑—**1=Culvert** (Barrel Controls 0.18 cfs @ 1.96 fps)



Summary for Pond 38P: Det. Area 2

Inflow Area = 0.104 ac, 94.17% Impervious, Inflow Depth > 2.45" for 2-Year event
Inflow = 0.27 cfs @ 12.13 hrs, Volume= 0.021 af
Outflow = 0.02 cfs @ 13.33 hrs, Volume= 0.013 af, Atten= 92%, Lag= 71.9 min
Primary = 0.02 cfs @ 13.33 hrs, Volume= 0.013 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 141.36' @ 13.33 hrs Surf.Area= 0.022 ac Storage= 0.013 af

Plug-Flow detention time= 276.0 min calculated for 0.013 af (64% of inflow)
Center-of-Mass det. time= 189.2 min (938.2 - 749.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	140.10'	0.020 af	**11.00'W x 86.67'L x 3.33'H Field A** 0.073 af Overall - 0.023 af Embedded = 0.050 af x 40.0% Voids
#2A	140.60'	0.018 af	**ADS N-12 24"** x 12 Inside #1 Inside= 23.8"W x 23.8"H => 3.10 sf x 20.00'L = 62.0 cf Outside= 28.0"W x 28.0"H => 3.92 sf x 20.00'L = 78.4 cf 12 Chambers in 3 Rows 9.00' Header x 3.10 sf x 2 = 55.8 cf Inside
		0.038 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	140.60'	**12.0" Round Culvert** L= 10.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 140.60' / 140.00' S= 0.0600 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	142.00'	**8.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	142.70'	**4.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#4	Device 1	140.60'	**1.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=0.02 cfs @ 13.33 hrs HW=141.36' (Free Discharge)
└─**1=Culvert** (Passes 0.02 cfs of 1.50 cfs potential flow)
  ├─**2=Orifice/Grate** (Controls 0.00 cfs)
  ├─**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)
  └─**4=Orifice/Grate** (Orifice Controls 0.02 cfs @ 4.08 fps)

Pond 38P: Det. Area 2 - Chamber Wizard Field A

Chamber Model = ADS N-12 24" (ADS N-12® Pipe)
Inside= 23.8"W x 23.8"H => 3.10 sf x 20.00'L = 62.0 cf
Outside= 28.0"W x 28.0"H => 3.92 sf x 20.00'L = 78.4 cf

28.0" Wide + 12.0" Spacing = 40.0" C-C Row Spacing

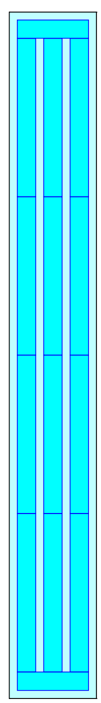
4 Chambers/Row x 20.00' Long +2.33' Header x 2 = 84.67' Row Length +12.0" End Stone x 2 = 86.67' Base Length
3 Rows x 28.0" Wide + 12.0" Spacing x 2 + 12.0" Side Stone x 2 = 11.00' Base Width
6.0" Base + 28.0" Chamber Height + 6.0" Cover = 3.33' Field Height

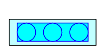
12 Chambers x 62.0 cf + 9.00' Header x 3.10 sf x 2 = 799.8 cf Chamber Storage
12 Chambers x 78.4 cf + 9.00' Header x 3.92 sf x 2 = 1,011.3 cf Displacement

3,177.9 cf Field - 1,011.3 cf Chambers = 2,166.6 cf Stone x 40.0% Voids = 866.6 cf Stone Storage

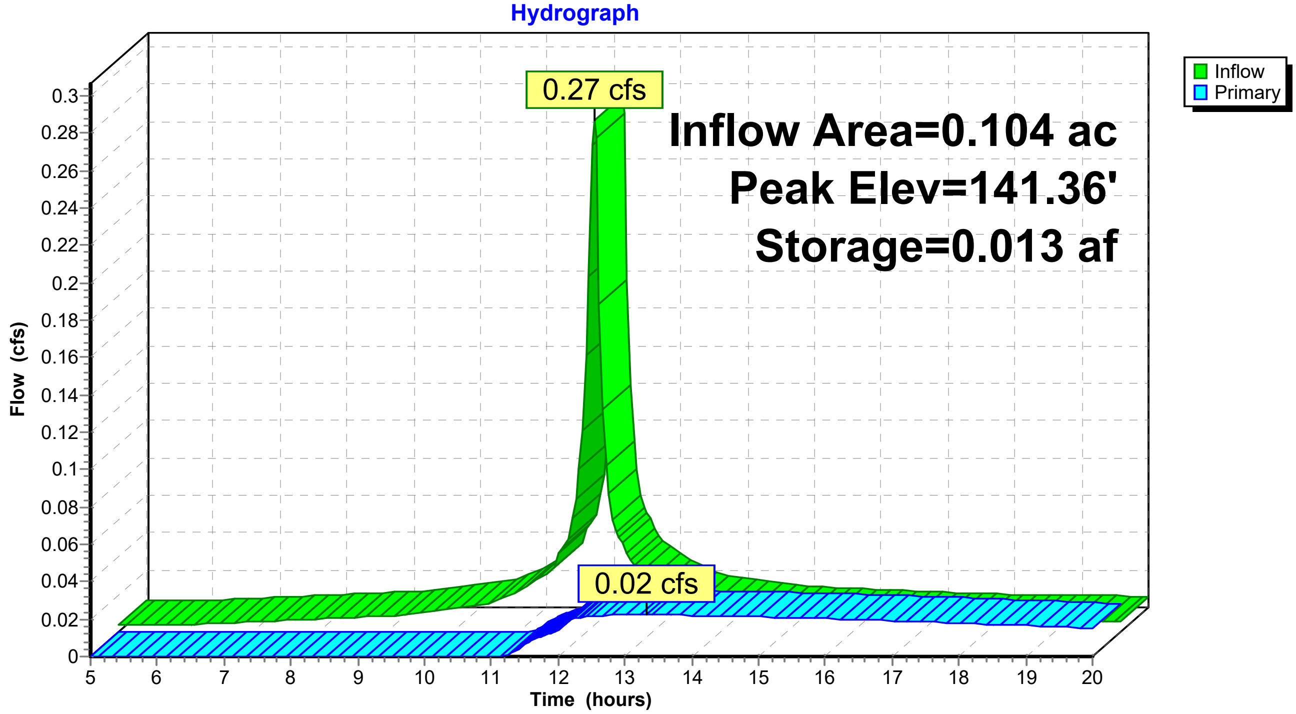
Chamber Storage + Stone Storage = 1,666.4 cf = 0.038 af
Overall Storage Efficiency = 52.4%
Overall System Size = 86.67' x 11.00' x 3.33'

12 Chambers
117.7 cy Field
80.2 cy Stone





Pond 38P: Det. Area 2



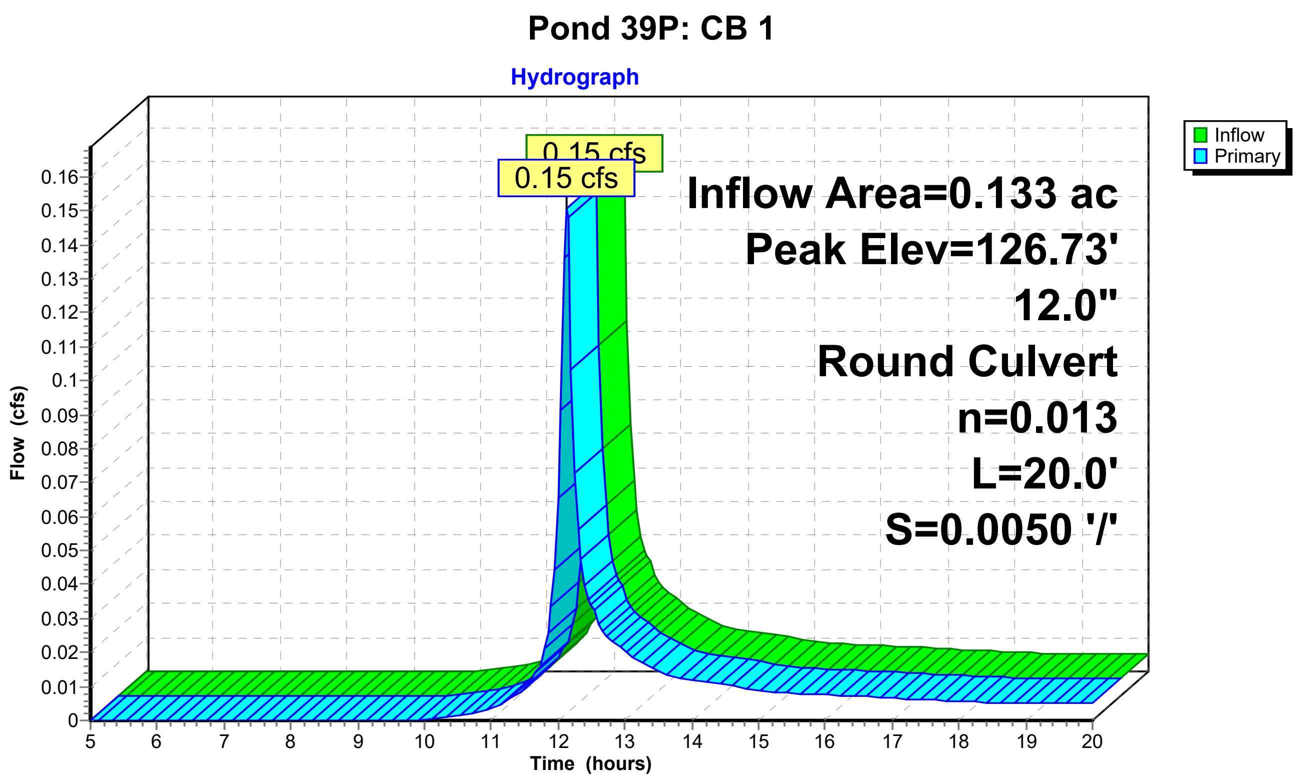
Summary for Pond 39P: CB 1

Inflow Area = 0.133 ac, 36.82% Impervious, Inflow Depth > 0.94" for 2-Year event
Inflow = 0.15 cfs @ 12.14 hrs, Volume= 0.010 af
Outflow = 0.15 cfs @ 12.14 hrs, Volume= 0.010 af, Atten= 0%, Lag= 0.0 min
Primary = 0.15 cfs @ 12.14 hrs, Volume= 0.010 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 126.73' @ 12.14 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	126.50'	**12.0" Round Culvert** L= 20.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 126.50' / 126.40' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.14 cfs @ 12.14 hrs HW=126.73' (Free Discharge)
└─**1=Culvert** (Barrel Controls 0.14 cfs @ 1.61 fps)



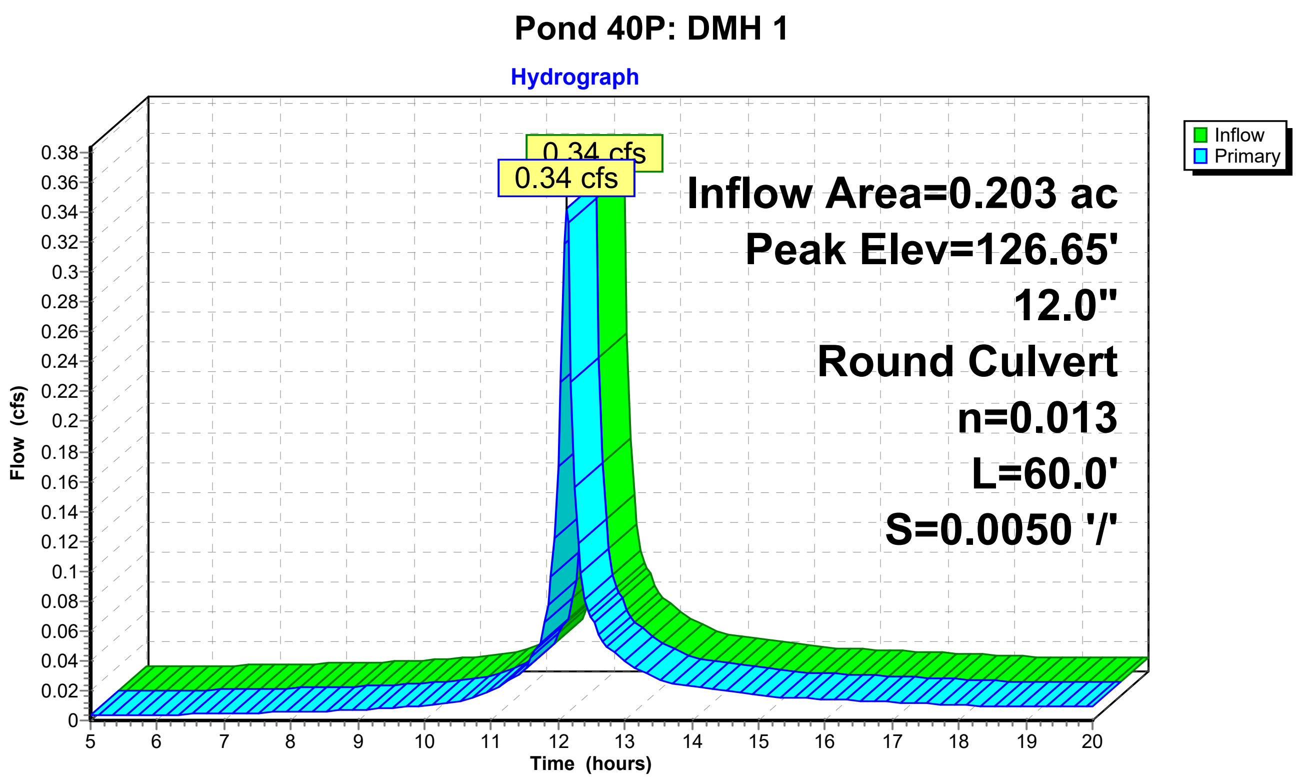
Summary for Pond 40P: DMH 1

Inflow Area =	0.203 ac,	58.56% Impervious,	Inflow Depth > 1.52"	for 2-Year event
Inflow =	0.34 cfs @	12.13 hrs, Volume=	0.026 af	
Outflow =	0.34 cfs @	12.13 hrs, Volume=	0.026 af,	Atten= 0%, Lag= 0.0 min
Primary =	0.34 cfs @	12.13 hrs, Volume=	0.026 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 126.65' @ 12.13 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	126.30'	**12.0" Round Culvert** L= 60.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 126.30' / 126.00' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.33 cfs @ 12.13 hrs HW=126.64' (Free Discharge)
1=Culvert (Barrel Controls 0.33 cfs @ 2.09 fps)



Summary for Pond 43P: Subsurface Inf. Area 1

Inflow Area = 0.203 ac, 58.56% Impervious, Inflow Depth > 1.52" for 2-Year event
Inflow = 0.34 cfs @ 12.13 hrs, Volume= 0.026 af
Outflow = 0.38 cfs @ 12.16 hrs, Volume= 0.020 af, Atten= 0%, Lag= 1.8 min
Discarded = 0.01 cfs @ 12.17 hrs, Volume= 0.011 af
Primary = 0.37 cfs @ 12.16 hrs, Volume= 0.009 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 127.61' @ 12.17 hrs Surf.Area= 0.008 ac Storage= 0.006 af

Plug-Flow detention time= 93.6 min calculated for 0.020 af (78% of inflow)
Center-of-Mass det. time= 27.1 min (802.9 - 775.8)

Volume	Invert	Avail.Storage	Storage Description
#1A	126.00'	0.006 af	**7.63'W x 44.42'L x 2.21'H Field A** 0.017 af Overall - 0.003 af Embedded = 0.014 af x 40.0% Voids
#2A	126.50'	0.002 af	**ADS N-12 12"** x 6 Inside #1 Inside= 12.2"W x 12.2"H => 0.81 sf x 20.00'L = 16.2 cf Outside= 14.5"W x 14.5"H => 1.05 sf x 20.00'L = 20.9 cf 6 Chambers in 3 Rows 5.63' Header x 0.81 sf x 2 = 9.1 cf Inside
		0.008 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	126.00'	**1.020 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 122.00'
#2	Primary	126.00'	**12.0" Round Culvert** L= 10.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 126.00' / 125.90' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#3	Device 2	127.50'	**4.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.01 cfs @ 12.17 hrs HW=127.59' (Free Discharge)
└─**1=Exfiltration** (Controls 0.01 cfs)

Primary OutFlow Max=0.33 cfs @ 12.16 hrs HW=127.59' (Free Discharge)
└─**2=Culvert** (Passes 0.33 cfs of 3.12 cfs potential flow)
  └─**3=Broad-Crested Rectangular Weir** (Weir Controls 0.33 cfs @ 0.86 fps)

Pond 43P: Subsurface Inf. Area 1 - Chamber Wizard Field A

Chamber Model = ADS N-12 12" (ADS N-12® Pipe)
Inside= 12.2"W x 12.2"H => 0.81 sf x 20.00'L = 16.2 cf
Outside= 14.5"W x 14.5"H => 1.05 sf x 20.00'L = 20.9 cf

14.5" Wide + 12.0" Spacing = 26.5" C-C Row Spacing

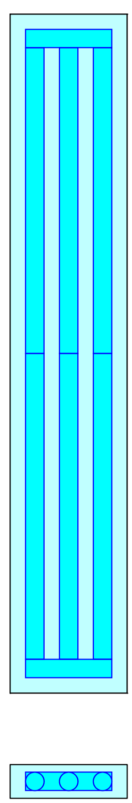
2 Chambers/Row x 20.00' Long +1.21' Header x 2 = 42.42' Row Length +12.0" End Stone x 2 = 44.42' Base Length
3 Rows x 14.5" Wide + 12.0" Spacing x 2 + 12.0" Side Stone x 2 = 7.63' Base Width
6.0" Base + 14.5" Chamber Height + 6.0" Cover = 2.21' Field Height

6 Chambers x 16.2 cf + 5.63' Header x 0.81 sf x 2 = 106.3 cf Chamber Storage
6 Chambers x 20.9 cf + 5.63' Header x 1.05 sf x 2 = 137.4 cf Displacement

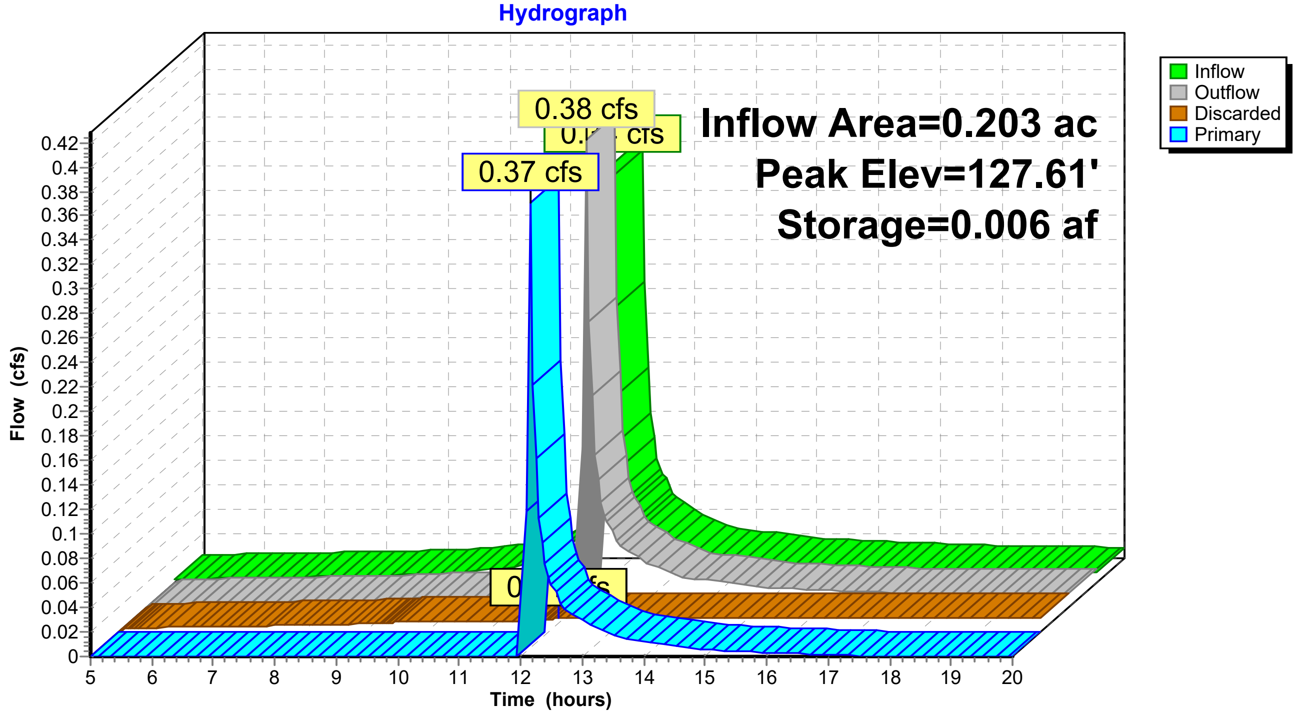
748.3 cf Field - 137.4 cf Chambers = 610.9 cf Stone x 40.0% Voids = 244.4 cf Stone Storage

Chamber Storage + Stone Storage = 350.7 cf = 0.008 af
Overall Storage Efficiency = 46.9%
Overall System Size = 44.42' x 7.63' x 2.21'

6 Chambers
27.7 cy Field
22.6 cy Stone



Pond 43P: Subsurface Inf. Area 1



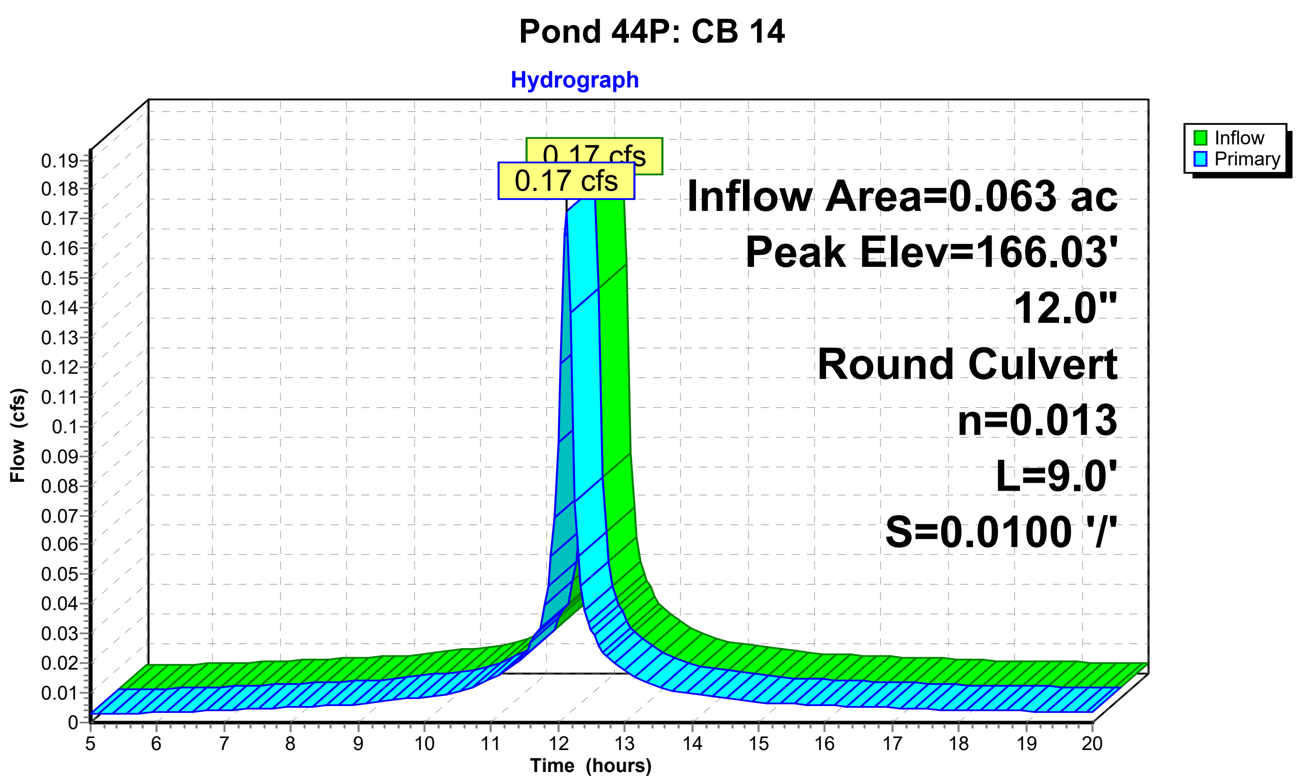
Summary for Pond 44P: CB 14

Inflow Area =	0.063 ac,100.00% Impervious,	Inflow Depth > 2.62"	for 2-Year event		
Inflow =	0.17 cfs @	12.13 hrs,	Volume=	0.014 af	
Outflow =	0.17 cfs @	12.13 hrs,	Volume=	0.014 af,	Atten= 0%, Lag= 0.0 min
Primary =	0.17 cfs @	12.13 hrs,	Volume=	0.014 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 166.03' @ 12.13 hrs
Flood Elev= 170.24'

Device	Routing	Invert	Outlet Devices
#1	Primary	165.80'	**12.0" Round Culvert** L= 9.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 165.80' / 165.71' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.16 cfs @ 12.13 hrs HW=166.03' (Free Discharge)
↑**1=Culvert** (Barrel Controls 0.16 cfs @ 1.84 fps)



Summary for Pond 45P: Det. Area 1

Inflow Area = 0.203 ac, 58.56% Impervious, Inflow Depth = 0.54" for 2-Year event
Inflow = 0.37 cfs @ 12.16 hrs, Volume= 0.009 af
Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 124.85' @ 17.75 hrs Surf.Area= 0.027 ac Storage= 0.009 af

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
#1A	124.00'	0.030 af	**14.33'W x 82.00'L x 3.83'H Field A** 0.103 af Overall - 0.029 af Embedded = 0.075 af x 40.0% Voids
#2A	125.00'	0.023 af	**ADS N-12 24"** x 16 Inside #1 Inside= 23.8"W x 23.8"H => 3.10 sf x 20.00'L = 62.0 cf Outside= 28.0"W x 28.0"H => 3.92 sf x 20.00'L = 78.4 cf 16 Chambers in 4 Rows
		0.053 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	125.00'	**12.0" Round Culvert** L= 10.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 125.00' / 122.00' S= 0.3000 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	126.75'	**4.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#3	Device 1	125.00'	**2.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=124.00' (Free Discharge)
└─**1=Culvert** (Controls 0.00 cfs)
  ├─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)
  └─**3=Orifice/Grate** (Controls 0.00 cfs)

Pond 45P: Det. Area 1 - Chamber Wizard Field A

Chamber Model = ADS N-12 24" (ADS N-12® Pipe)
Inside= 23.8"W x 23.8"H => 3.10 sf x 20.00'L = 62.0 cf
Outside= 28.0"W x 28.0"H => 3.92 sf x 20.00'L = 78.4 cf

28.0" Wide + 12.0" Spacing = 40.0" C-C Row Spacing

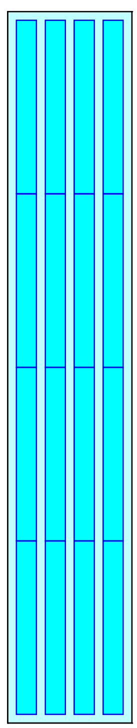
4 Chambers/Row x 20.00' Long = 80.00' Row Length +12.0" End Stone x 2 = 82.00' Base Length
4 Rows x 28.0" Wide + 12.0" Spacing x 3 + 12.0" Side Stone x 2 = 14.33' Base Width
12.0" Base + 28.0" Chamber Height + 6.0" Cover = 3.83' Field Height

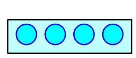
16 Chambers x 62.0 cf = 992.0 cf Chamber Storage
16 Chambers x 78.4 cf = 1,254.3 cf Displacement

4,505.6 cf Field - 1,254.3 cf Chambers = 3,251.3 cf Stone x 40.0% Voids = 1,300.5 cf Stone Storage

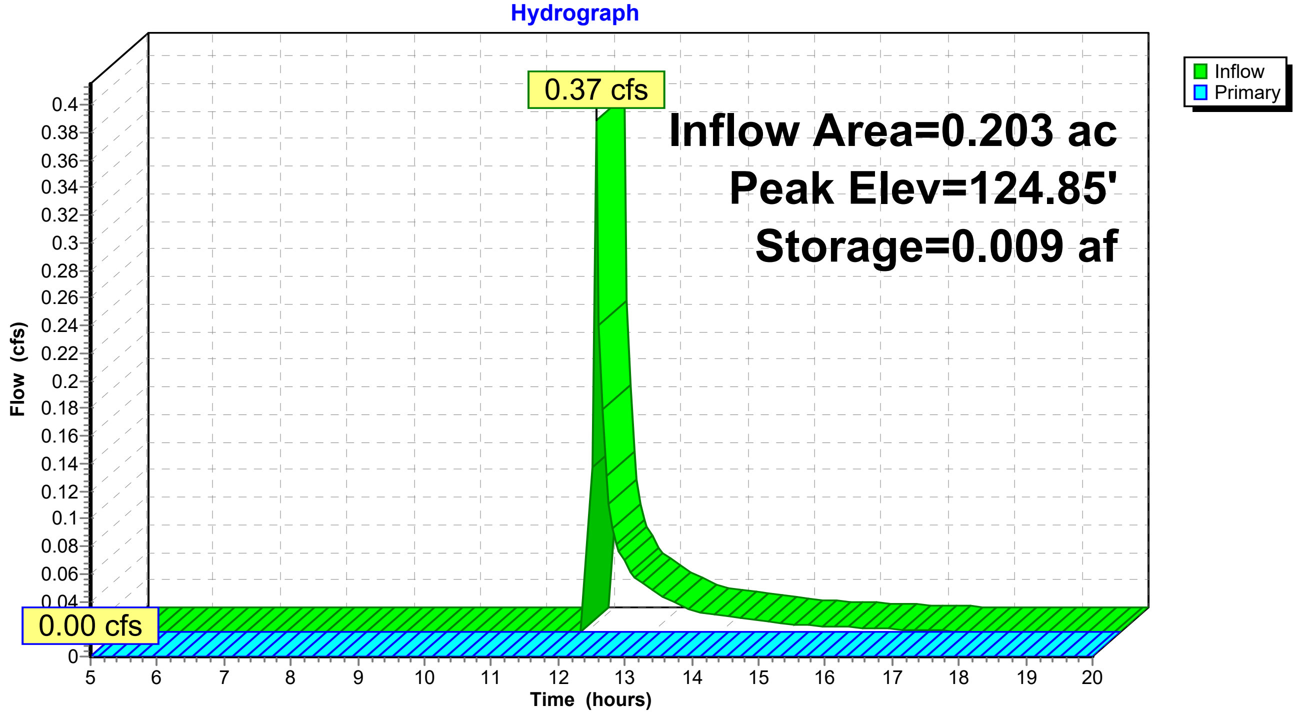
Chamber Storage + Stone Storage = 2,292.5 cf = 0.053 af
Overall Storage Efficiency = 50.9%
Overall System Size = 82.00' x 14.33' x 3.83'

16 Chambers
166.9 cy Field
120.4 cy Stone





Pond 45P: Det. Area 1



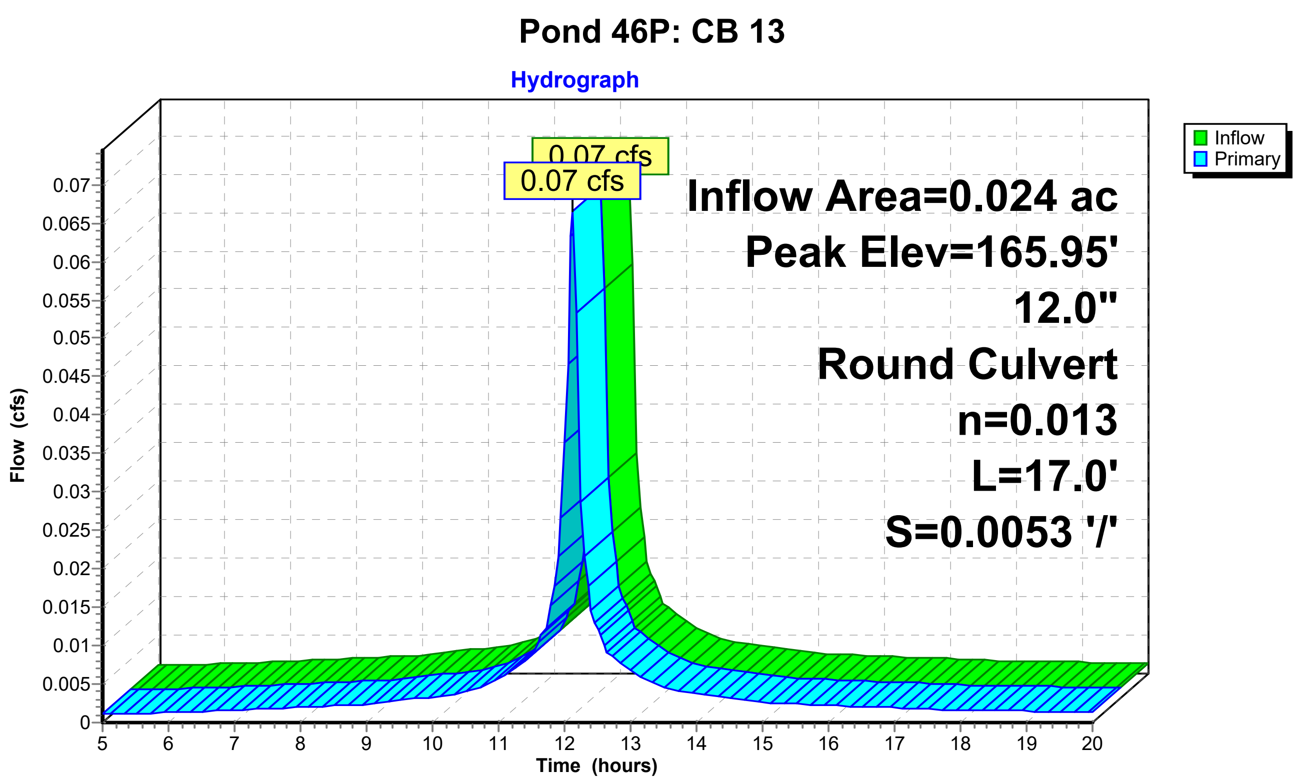
Summary for Pond 46P: CB 13

Inflow Area = 0.024 ac,100.00% Impervious, Inflow Depth > 2.62" for 2-Year event
Inflow = 0.07 cfs @ 12.13 hrs, Volume= 0.005 af
Outflow = 0.07 cfs @ 12.13 hrs, Volume= 0.005 af, Atten= 0%, Lag= 0.0 min
Primary = 0.07 cfs @ 12.13 hrs, Volume= 0.005 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 165.95' @ 12.13 hrs
Flood Elev= 170.24'

Device	Routing	Invert	Outlet Devices
#1	Primary	165.80'	**12.0" Round Culvert** L= 17.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 165.80' / 165.71' S= 0.0053 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.06 cfs @ 12.13 hrs HW=165.95' (Free Discharge)
└─**1=Culvert** (Barrel Controls 0.06 cfs @ 1.31 fps)



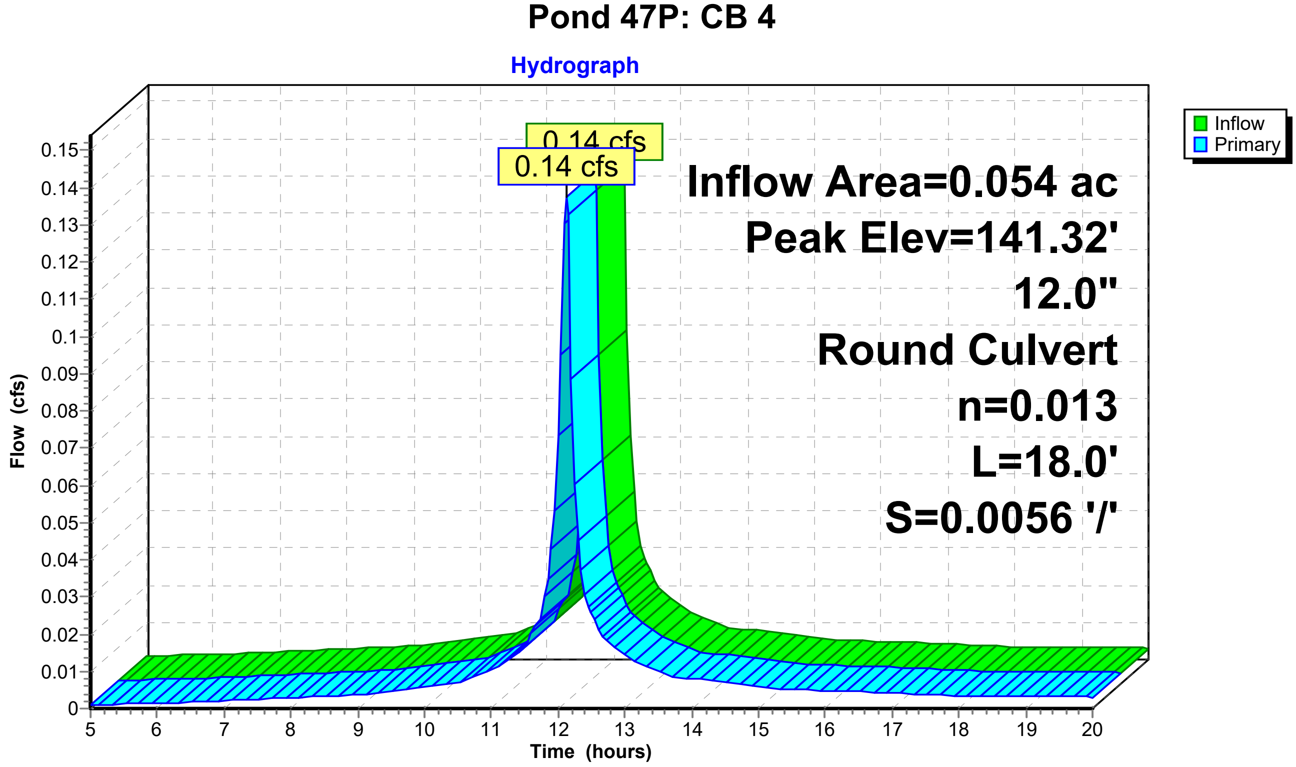
Summary for Pond 47P: CB 4

Inflow Area =	0.054 ac,	88.83% Impervious,	Inflow Depth > 2.29"	for 2-Year event
Inflow =	0.14 cfs @	12.13 hrs, Volume=	0.010 af	
Outflow =	0.14 cfs @	12.13 hrs, Volume=	0.010 af,	Atten= 0%, Lag= 0.0 min
Primary =	0.14 cfs @	12.13 hrs, Volume=	0.010 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 141.32' @ 12.13 hrs
Flood Elev= 144.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	141.10'	**12.0" Round Culvert** L= 18.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 141.10' / 141.00' S= 0.0056 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.13 cfs @ 12.13 hrs HW=141.31' (Free Discharge)
└─**1=Culvert** (Barrel Controls 0.13 cfs @ 1.61 fps)



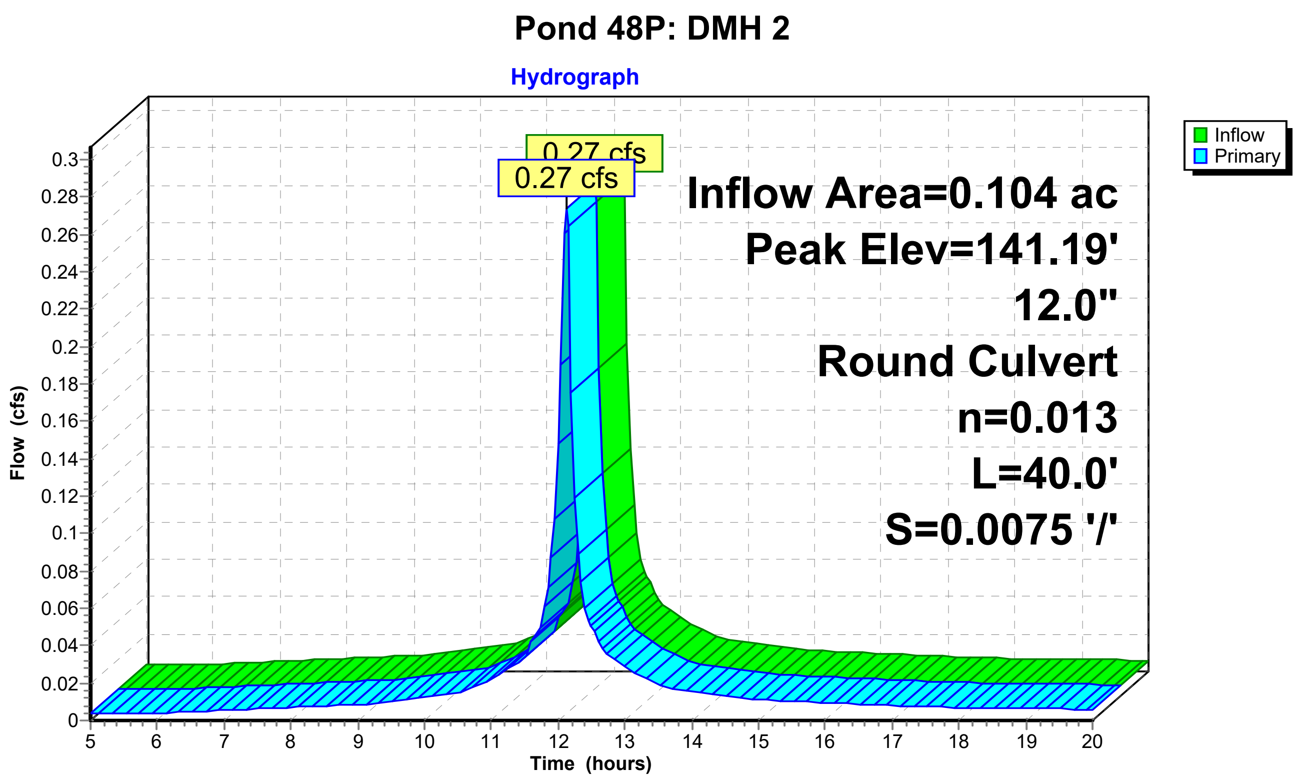
Summary for Pond 48P: DMH 2

Inflow Area = 0.104 ac, 94.17% Impervious, Inflow Depth > 2.45" for 2-Year event
Inflow = 0.27 cfs @ 12.13 hrs, Volume= 0.021 af
Outflow = 0.27 cfs @ 12.13 hrs, Volume= 0.021 af, Atten= 0%, Lag= 0.0 min
Primary = 0.27 cfs @ 12.13 hrs, Volume= 0.021 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 141.19' @ 12.13 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	140.90'	**12.0" Round Culvert** L= 40.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 140.90' / 140.60' S= 0.0075 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.26 cfs @ 12.13 hrs HW=141.18' (Free Discharge)
└**1=Culvert** (Inlet Controls 0.26 cfs @ 1.43 fps)



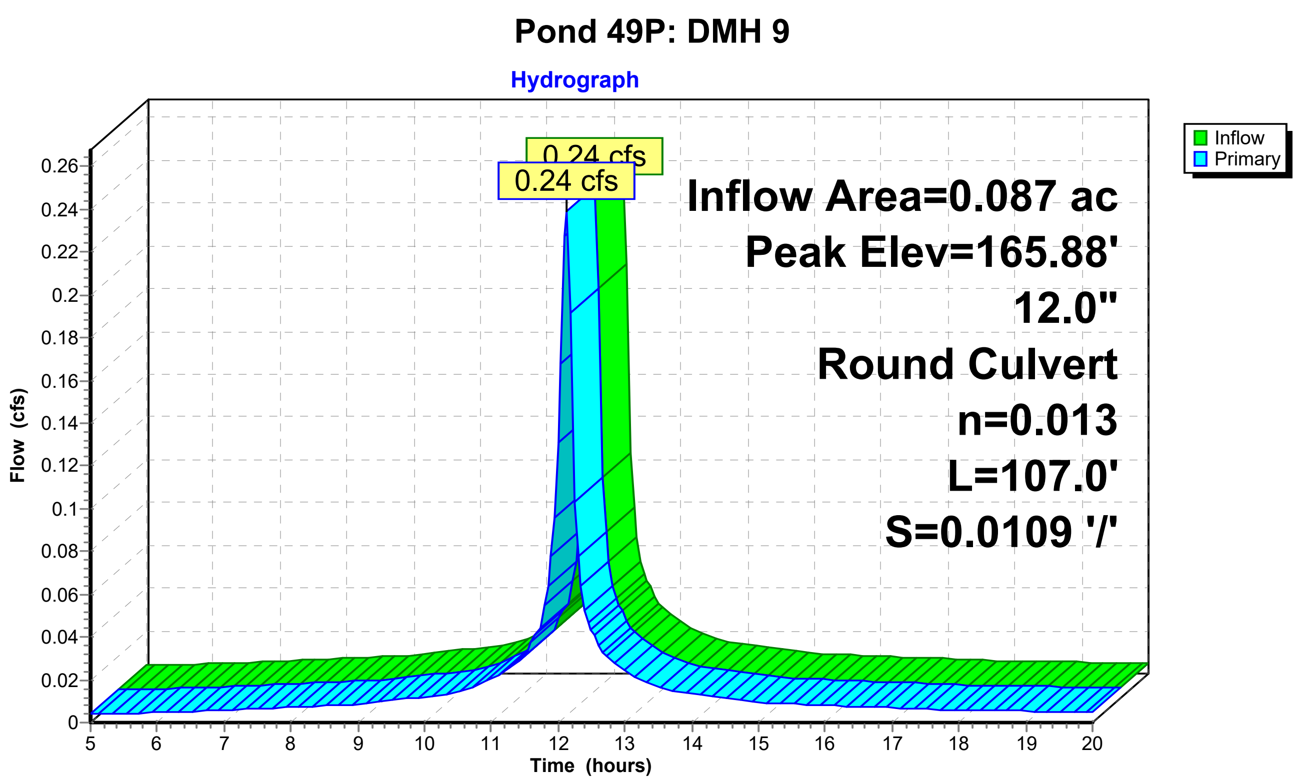
Summary for Pond 49P: DMH 9

Inflow Area = 0.087 ac,100.00% Impervious, Inflow Depth > 2.62" for 2-Year event
Inflow = 0.24 cfs @ 12.13 hrs, Volume= 0.019 af
Outflow = 0.24 cfs @ 12.13 hrs, Volume= 0.019 af, Atten= 0%, Lag= 0.0 min
Primary = 0.24 cfs @ 12.13 hrs, Volume= 0.019 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 165.88' @ 12.13 hrs
Flood Elev= 170.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	165.61'	**12.0" Round Culvert** L= 107.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 165.61' / 164.44' S= 0.0109 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

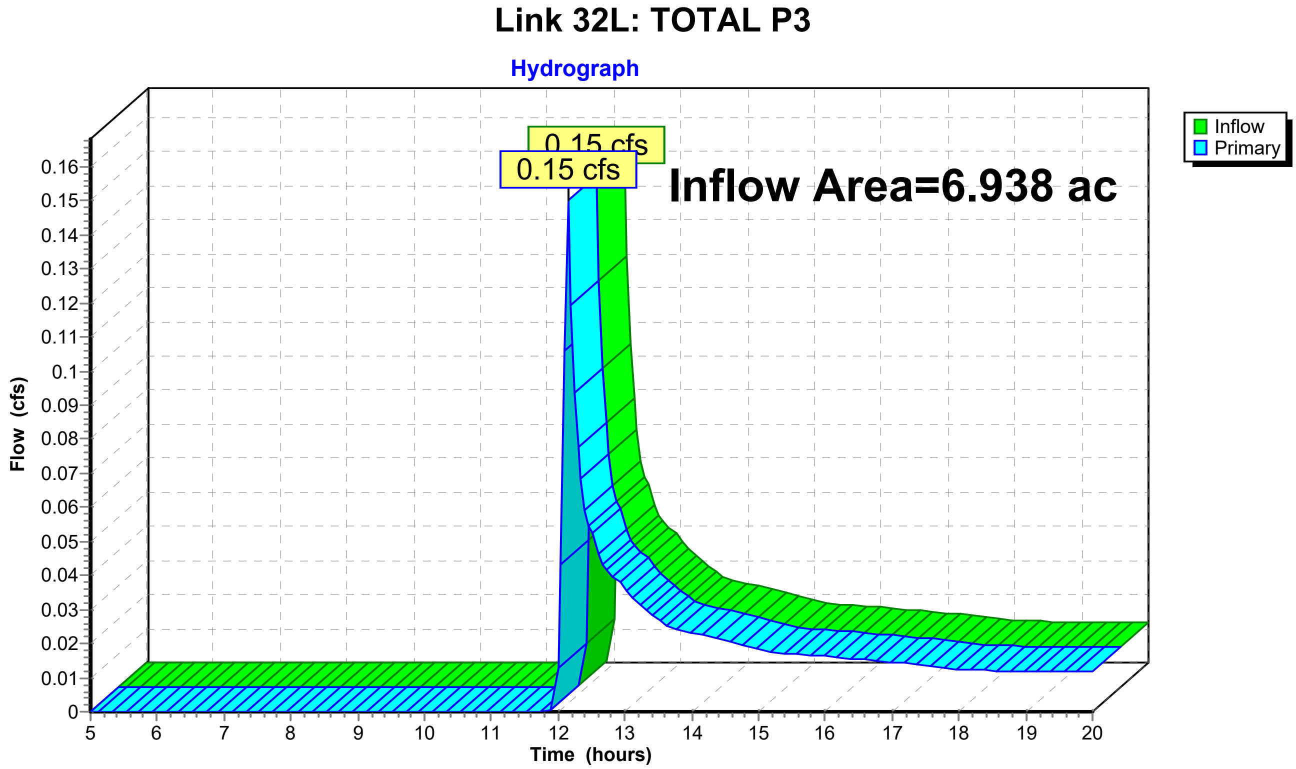
Primary OutFlow Max=0.23 cfs @ 12.13 hrs HW=165.87' (Free Discharge)
└**1=Culvert** (Inlet Controls 0.23 cfs @ 1.38 fps)



Summary for Link 32L: TOTAL P3

Inflow Area = 6.938 ac, 20.11% Impervious, Inflow Depth > 0.03" for 2-Year event
Inflow = 0.15 cfs @ 12.15 hrs, Volume= 0.015 af
Primary = 0.15 cfs @ 12.15 hrs, Volume= 0.015 af, Atten= 0%, Lag= 0.0 min

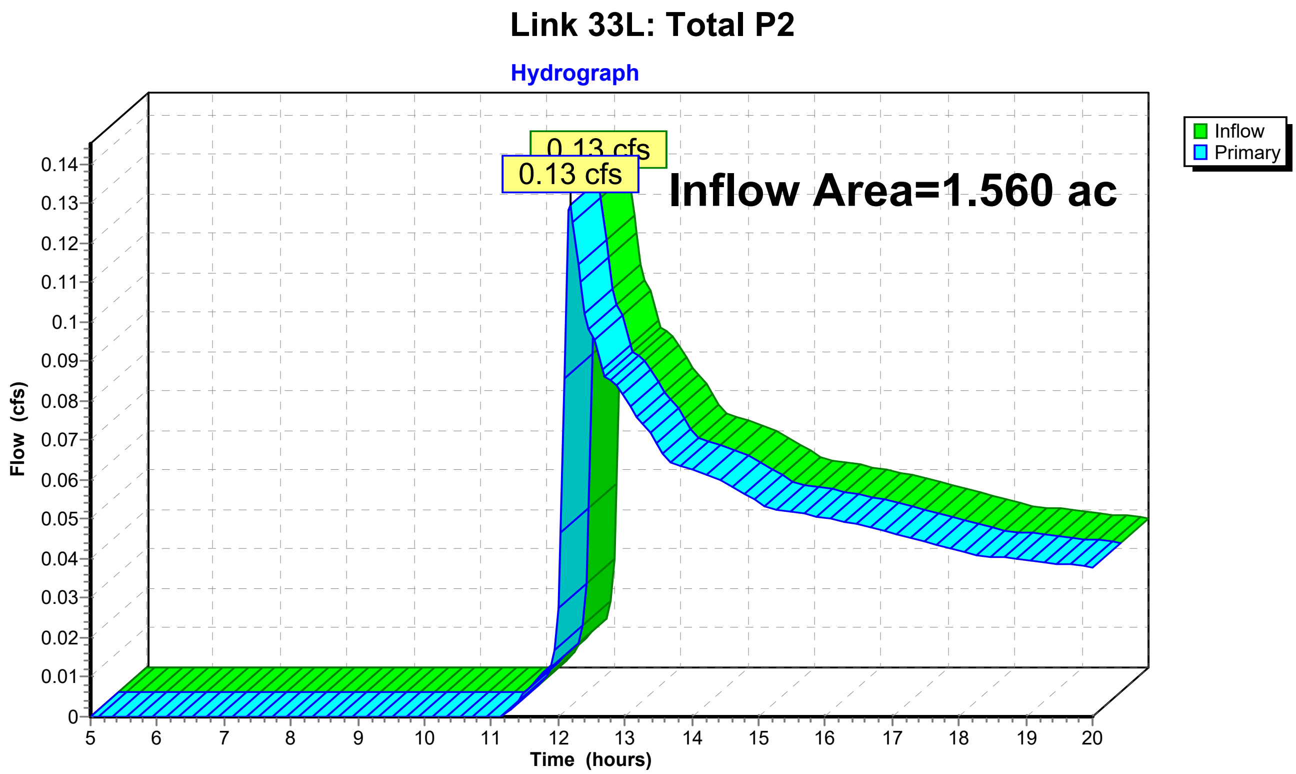
Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs



Summary for Link 33L: Total P2

Inflow Area = 1.560 ac, 10.34% Impervious, Inflow Depth > 0.29" for 2-Year event
Inflow = 0.13 cfs @ 12.18 hrs, Volume= 0.038 af
Primary = 0.13 cfs @ 12.18 hrs, Volume= 0.038 af, Atten= 0%, Lag= 0.0 min

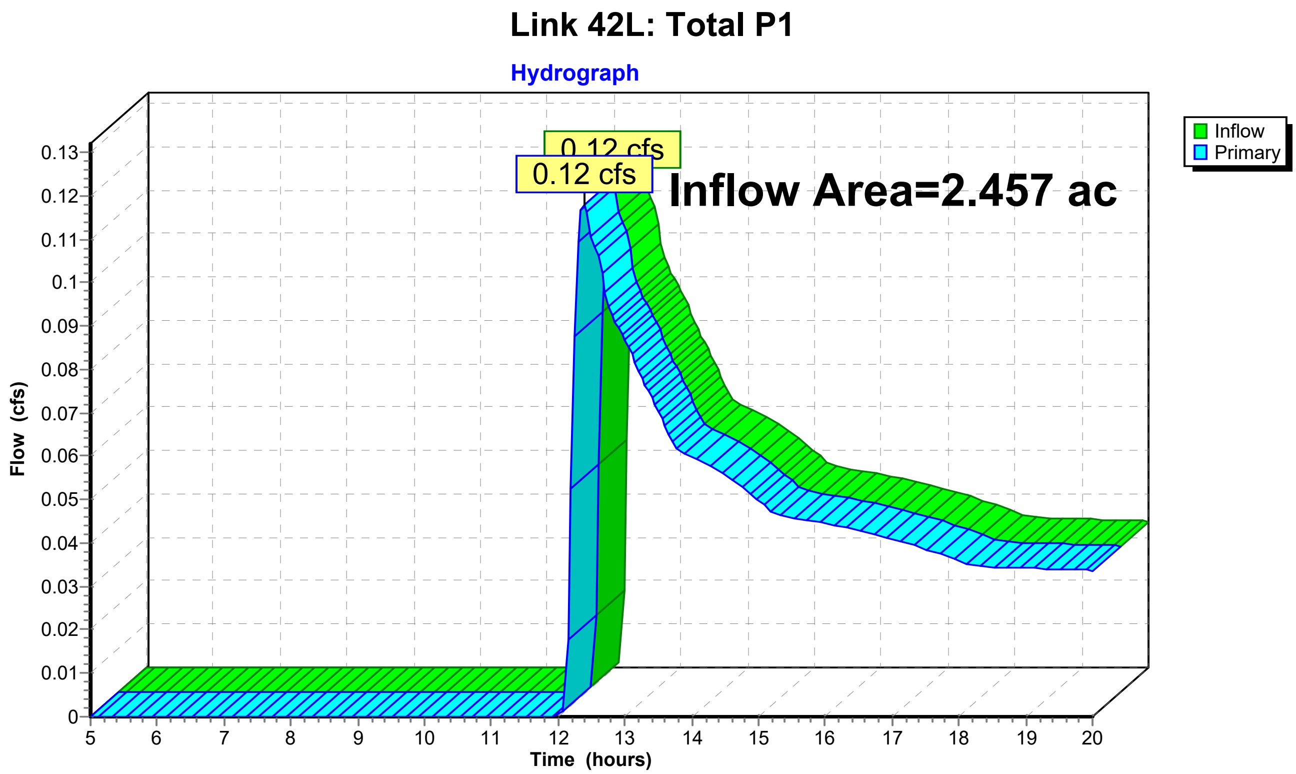
Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs



Summary for Link 42L: Total P1

Inflow Area =	2.457 ac,	7.11% Impervious,	Inflow Depth > 0.16"	for 2-Year event	
Inflow =	0.12 cfs @	12.39 hrs,	Volume=	0.034 af	
Primary =	0.12 cfs @	12.39 hrs,	Volume=	0.034 af,	Atten= 0%, Lag= 0.0 min

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



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

Subcatchment 1S: P1A Runoff Area=94,172 sf 2.58% Impervious Runoff Depth>0.76"
Flow Length=598' Tc=13.3 min UI Adjusted CN=55 Runoff=1.32 cfs 0.137 af

Subcatchment 2S: P2A Runoff Area=12,266 sf 0.00% Impervious Runoff Depth>1.11"
Tc=6.0 min CN=61 Runoff=0.37 cfs 0.026 af

Subcatchment 3S: P2B Runoff Area=2,156 sf 100.00% Impervious Runoff Depth>4.09"
Tc=6.0 min CN=98 Runoff=0.21 cfs 0.017 af

Subcatchment 5S: P3I Runoff Area=1,563 sf 100.00% Impervious Runoff Depth>4.09"
Tc=6.0 min CN=98 Runoff=0.15 cfs 0.012 af

Subcatchment 6S: P3G Runoff Area=7,278 sf 68.97% Impervious Runoff Depth>3.14"
Tc=6.0 min CN=87 Runoff=0.60 cfs 0.044 af

Subcatchment 7S: P3H Runoff Area=70,167 sf 8.32% Impervious Runoff Depth>0.98"
Flow Length=620' Tc=14.3 min UI Adjusted CN=59 Runoff=1.34 cfs 0.132 af

Subcatchment 8S: P3J Runoff Area=2,216 sf 100.00% Impervious Runoff Depth>4.09"
Tc=6.0 min CN=98 Runoff=0.22 cfs 0.017 af

Subcatchment 11S: P3K Runoff Area=27,385 sf 100.00% Impervious Runoff Depth>4.09"
Tc=6.0 min CN=98 Runoff=2.68 cfs 0.214 af

Subcatchment 16S: P3F Runoff Area=131,453 sf 5.15% Impervious Runoff Depth>0.87"
Flow Length=664' Slope=0.0600 '/' Tc=16.5 min UI Adjusted CN=57 Runoff=2.02 cfs 0.218 af

Subcatchment 17S: P3E Runoff Area=3,344 sf 100.00% Impervious Runoff Depth>4.09"
Tc=6.0 min CN=98 Runoff=0.33 cfs 0.026 af

Subcatchment 22S: P3D Runoff Area=19,733 sf 0.00% Impervious Runoff Depth>0.93"
Tc=6.0 min CN=58 Runoff=0.48 cfs 0.035 af

Subcatchment 23S: P3B Runoff Area=2,425 sf 100.00% Impervious Runoff Depth>4.09"
Tc=6.0 min CN=98 Runoff=0.24 cfs 0.019 af

Subcatchment 24S: P3C Runoff Area=8,435 sf 28.74% Impervious Runoff Depth>1.86"
Tc=6.0 min CN=72 Runoff=0.44 cfs 0.030 af

Subcatchment 31S: P3A Runoff Area=24,420 sf 0.00% Impervious Runoff Depth>1.05"
Tc=6.0 min CN=60 Runoff=0.69 cfs 0.049 af

Subcatchment 34S: P1C Runoff Area=3,042 sf 100.00% Impervious Runoff Depth>4.09"
Tc=6.0 min CN=98 Runoff=0.30 cfs 0.024 af

Subcatchment 35S: P1B Runoff Area=5,798 sf 36.82% Impervious Runoff Depth>2.09"
Tc=6.0 min CN=75 Runoff=0.34 cfs 0.023 af

Subcatchment 43S: P1D Runoff Area=4,007 sf 0.00% Impervious Runoff Depth>0.47"
Flow Length=186' Tc=7.0 min CN=49 Runoff=0.03 cfs 0.004 af

Subcatchment 44S: P2D Runoff Area=51,183 sf 5.43% Impervious Runoff Depth>0.71"
Flow Length=186' Tc=7.0 min UI Adjusted CN=54 Runoff=0.85 cfs 0.070 af

Subcatchment 45S: P3L Runoff Area=2,730 sf 100.00% Impervious Runoff Depth>4.09"
Tc=6.0 min CN=98 Runoff=0.27 cfs 0.021 af

Subcatchment 46S: P2C Runoff Area=2,354 sf 88.83% Impervious Runoff Depth>3.79"
Tc=6.0 min CN=94 Runoff=0.22 cfs 0.017 af

Subcatchment 47S: P3M Runoff Area=1,052 sf 100.00% Impervious Runoff Depth>4.09"
Tc=6.0 min CN=98 Runoff=0.10 cfs 0.008 af

Pond 9P: CB 5 Peak Elev=151.94' Inflow=0.60 cfs 0.044 af
12.0" Round Culvert n=0.013 L=23.0' S=0.0113 '/' Outflow=0.60 cfs 0.044 af

Pond 10P: CB 6 Peak Elev=152.21' Inflow=1.34 cfs 0.132 af
12.0" Round Culvert n=0.013 L=27.0' S=0.0104 '/' Outflow=1.34 cfs 0.132 af

Pond 13P: CB 7 Peak Elev=152.24' Inflow=0.15 cfs 0.012 af
12.0" Round Culvert n=0.013 L=11.0' S=0.0127 '/' Outflow=0.15 cfs 0.012 af

Pond 14P: CB 8 Peak Elev=152.29' Inflow=0.22 cfs 0.017 af
12.0" Round Culvert n=0.013 L=8.0' S=0.0138 '/' Outflow=0.22 cfs 0.017 af

Pond 15P: DMH 3 Peak Elev=151.93' Inflow=1.66 cfs 0.176 af
12.0" Round Culvert n=0.013 L=30.0' S=0.0117 '/' Outflow=1.66 cfs 0.176 af

Pond 18P: CB 11 Peak Elev=164.86' Inflow=0.33 cfs 0.026 af
12.0" Round Culvert n=0.013 L=7.0' S=0.0143 '/' Outflow=0.33 cfs 0.026 af

Pond 19P: CB 12 Peak Elev=165.54' Inflow=2.02 cfs 0.218 af
12.0" Round Culvert n=0.013 L=14.0' S=0.0071 '/' Outflow=2.02 cfs 0.218 af

Pond 20P: DMH 8 Peak Elev=165.43' Inflow=2.29 cfs 0.274 af
12.0" Round Culvert n=0.013 L=94.0' S=0.1313 '/' Outflow=2.29 cfs 0.274 af

Pond 21P: Infiltration Basin 1 Peak Elev=153.91' Storage=3,725 cf Inflow=2.55 cfs 0.309 af
Discarded=0.10 cfs 0.074 af Primary=1.14 cfs 0.165 af Outflow=1.24 cfs 0.239 af

Pond 25P: CB 9 Peak Elev=145.27' Inflow=0.24 cfs 0.019 af
12.0" Round Culvert n=0.013 L=12.0' S=0.0917 '/' Outflow=0.24 cfs 0.019 af

Pond 26P: CB 10 Peak Elev=145.37' Inflow=0.44 cfs 0.030 af
12.0" Round Culvert n=0.013 L=10.0' S=0.1100 '/' Outflow=0.44 cfs 0.030 af

Pond 27P: DMH 7 Peak Elev=144.27' Inflow=0.67 cfs 0.049 af
12.0" Round Culvert n=0.013 L=50.0' S=0.0760 '/' Outflow=0.67 cfs 0.049 af

Pond 28P: Infiltration Basin 2 Peak Elev=142.02' Storage=4,095 cf Inflow=2.59 cfs 0.254 af
Discarded=0.11 cfs 0.079 af Primary=0.49 cfs 0.106 af Outflow=0.60 cfs 0.184 af

Pond 30P: DMH 4 Peak Elev=148.97' Inflow=1.96 cfs 0.205 af
12.0" Round Culvert n=0.013 L=84.0' S=0.0700 '/' Outflow=1.96 cfs 0.205 af

Pond 33P: Subsurface Inf. Aea 2 Peak Elev=152.69' Storage=0.099 af Inflow=2.68 cfs 0.214 af
Discarded=0.13 cfs 0.120 af Primary=0.31 cfs 0.019 af Outflow=0.44 cfs 0.138 af

Pond 34P: DMH 5 Peak Elev=143.00' Inflow=1.96 cfs 0.205 af
12.0" Round Culvert n=0.013 L=190.0' S=0.0095 '/' Outflow=1.96 cfs 0.205 af

Pond 35P: DMH 6 Peak Elev=141.15' Inflow=1.96 cfs 0.205 af
12.0" Round Culvert n=0.013 L=32.0' S=0.0053 '/' Outflow=1.96 cfs 0.205 af

Pond 36P: CB 3 Peak Elev=141.36' Inflow=0.21 cfs 0.017 af
12.0" Round Culvert n=0.013 L=9.0' S=0.0111 '/' Outflow=0.21 cfs 0.017 af

Pond 37P: CB 2 Peak Elev=126.81' Inflow=0.30 cfs 0.024 af
12.0" Round Culvert n=0.013 L=8.0' S=0.0125 '/' Outflow=0.30 cfs 0.024 af

Pond 38P: Det. Area 2 Peak Elev=141.86' Storage=0.021 af Inflow=0.43 cfs 0.034 af
Outflow=0.03 cfs 0.020 af

Pond 39P: CB 1 Peak Elev=126.86' Inflow=0.34 cfs 0.023 af
12.0" Round Culvert n=0.013 L=20.0' S=0.0050 '/' Outflow=0.34 cfs 0.023 af

Pond 40P: DMH 1 Peak Elev=126.78' Inflow=0.63 cfs 0.047 af
12.0" Round Culvert n=0.013 L=60.0' S=0.0050 '/' Outflow=0.63 cfs 0.047 af

Pond 43P: Subsurface Inf. Area 1 Peak Elev=127.65' Storage=0.006 af Inflow=0.63 cfs 0.047 af
Discarded=0.01 cfs 0.012 af Primary=0.62 cfs 0.029 af Outflow=0.64 cfs 0.041 af

Pond 44P: CB 14 Peak Elev=166.10' Inflow=0.27 cfs 0.021 af
12.0" Round Culvert n=0.013 L=9.0' S=0.0100 '/' Outflow=0.27 cfs 0.021 af

Pond 45P: Det. Area 1 Peak Elev=125.45' Storage=0.016 af Inflow=0.62 cfs 0.029 af
Outflow=0.06 cfs 0.018 af

Pond 46P: CB 13 Peak Elev=165.99' Inflow=0.10 cfs 0.008 af
12.0" Round Culvert n=0.013 L=17.0' S=0.0053 '/' Outflow=0.10 cfs 0.008 af

Pond 47P: CB 4 Peak Elev=141.38' Inflow=0.22 cfs 0.017 af
12.0" Round Culvert n=0.013 L=18.0' S=0.0056 '/' Outflow=0.22 cfs 0.017 af

Pond 48P: DMH 2 Peak Elev=141.27' Inflow=0.43 cfs 0.034 af
12.0" Round Culvert n=0.013 L=40.0' S=0.0075 '/' Outflow=0.43 cfs 0.034 af

Pond 49P: DMH 9 Peak Elev=165.95' Inflow=0.37 cfs 0.030 af
12.0" Round Culvert n=0.013 L=107.0' S=0.0109 '/' Outflow=0.37 cfs 0.030 af

Link 32L: TOTAL P3 Inflow=2.07 cfs 0.338 af
Primary=2.07 cfs 0.338 af

Link 33L: Total P2
Inflow=1.23 cfs 0.116 af
Primary=1.23 cfs 0.116 af

Link 42L: Total P1
Inflow=1.38 cfs 0.158 af
Primary=1.38 cfs 0.158 af

Total Runoff Area = 10.955 ac Runoff Volume = 1.143 af Average Runoff Depth = 1.25"
84.20% Pervious = 9.224 ac 15.80% Impervious = 1.731 ac

Summary for Subcatchment 1S: P1A

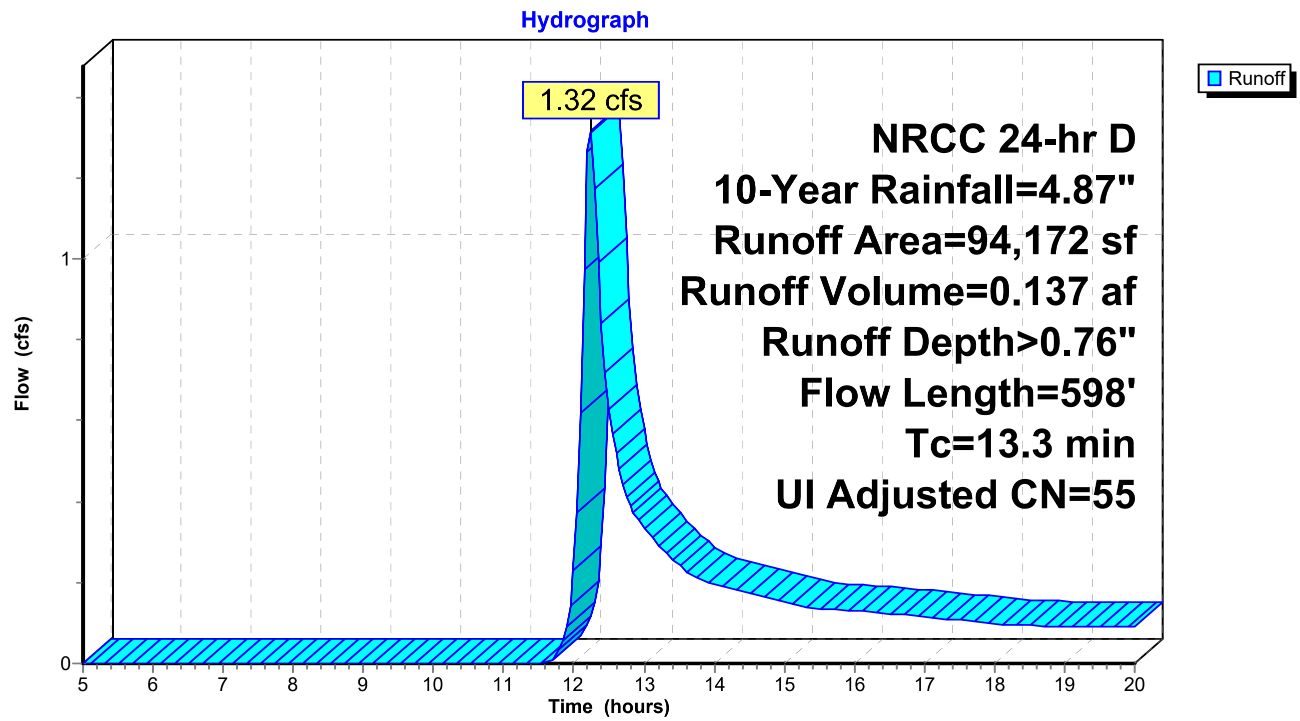
Runoff = 1.32 cfs @ 12.24 hrs, Volume= 0.137 af, Depth> 0.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 10-Year Rainfall=4.87"

Area (sf)	CN	Adj	Description
7,397	48		Brush, Good, HSG B
84,343	55		Woods, Good, HSG B
2,432	98		Unconnected roofs, HSG B
94,172	56	55	Weighted Average, UI Adjusted
91,740			97.42% Pervious Area
2,432			2.58% Impervious Area
2,432			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.3	50	0.0200	0.10		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.10"
5.0	548	0.1350	1.84		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
13.3	598	Total			

Subcatchment 1S: P1A



Summary for Subcatchment 2S: P2A

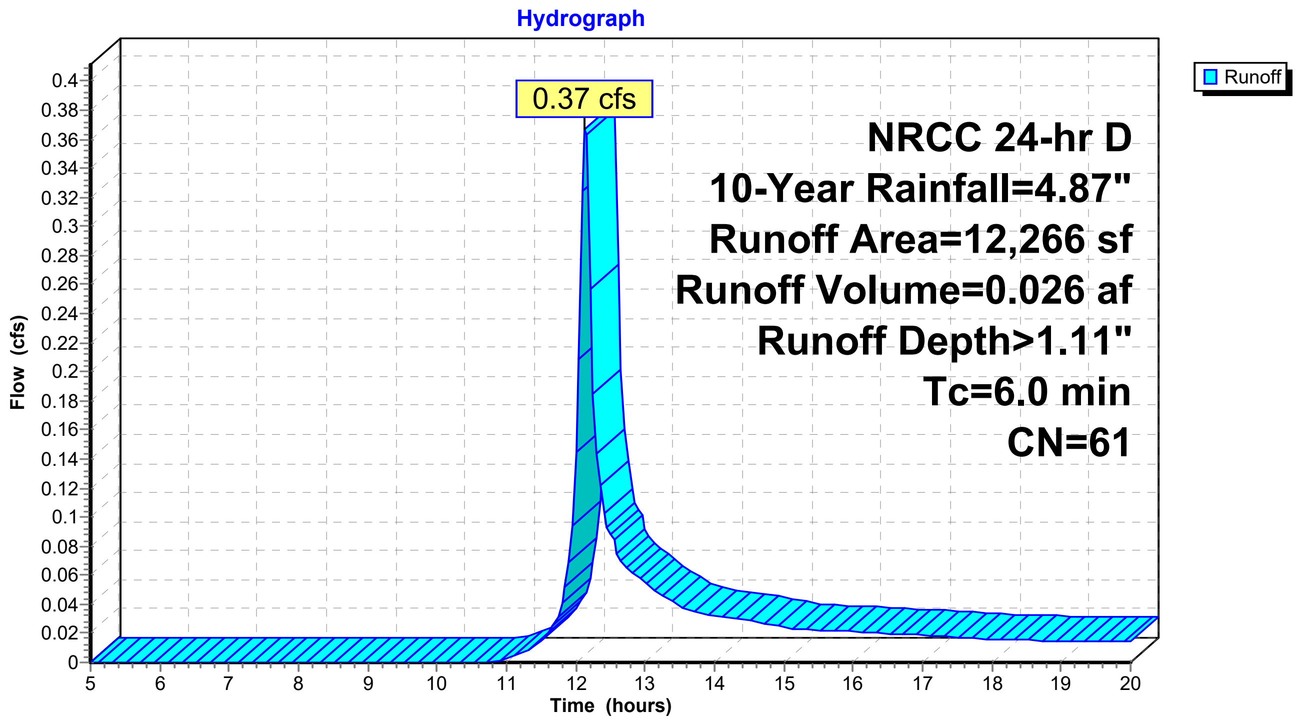
Runoff = 0.37 cfs @ 12.14 hrs, Volume= 0.026 af, Depth> 1.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 10-Year Rainfall=4.87"

Area (sf)	CN	Description
12,266	61	>75% Grass cover, Good, HSG B
12,266		100.00% Pervious Area

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

Subcatchment 2S: P2A



Summary for Subcatchment 3S: P2B

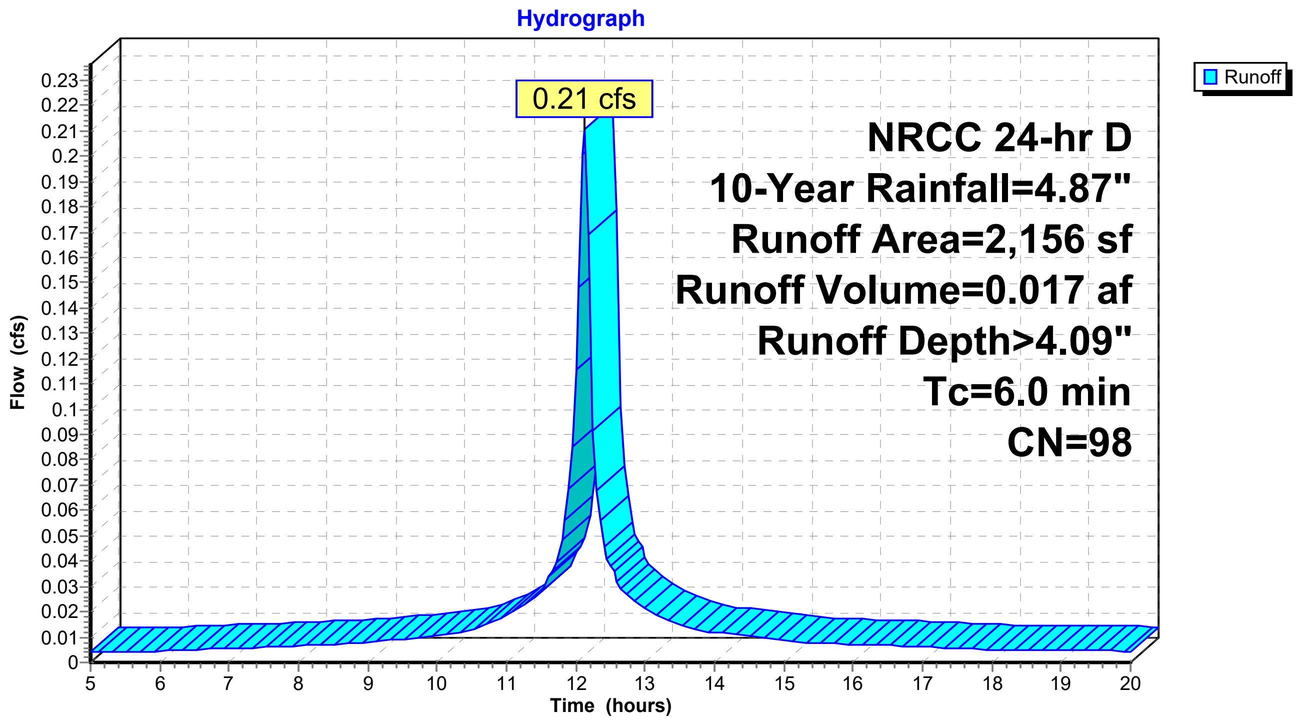
Runoff = 0.21 cfs @ 12.13 hrs, Volume= 0.017 af, Depth> 4.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 10-Year Rainfall=4.87"

Area (sf)	CN	Description
2,156	98	Paved parking, HSG B
2,156		100.00% Impervious Area

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

Subcatchment 3S: P2B



Summary for Subcatchment 5S: P3I

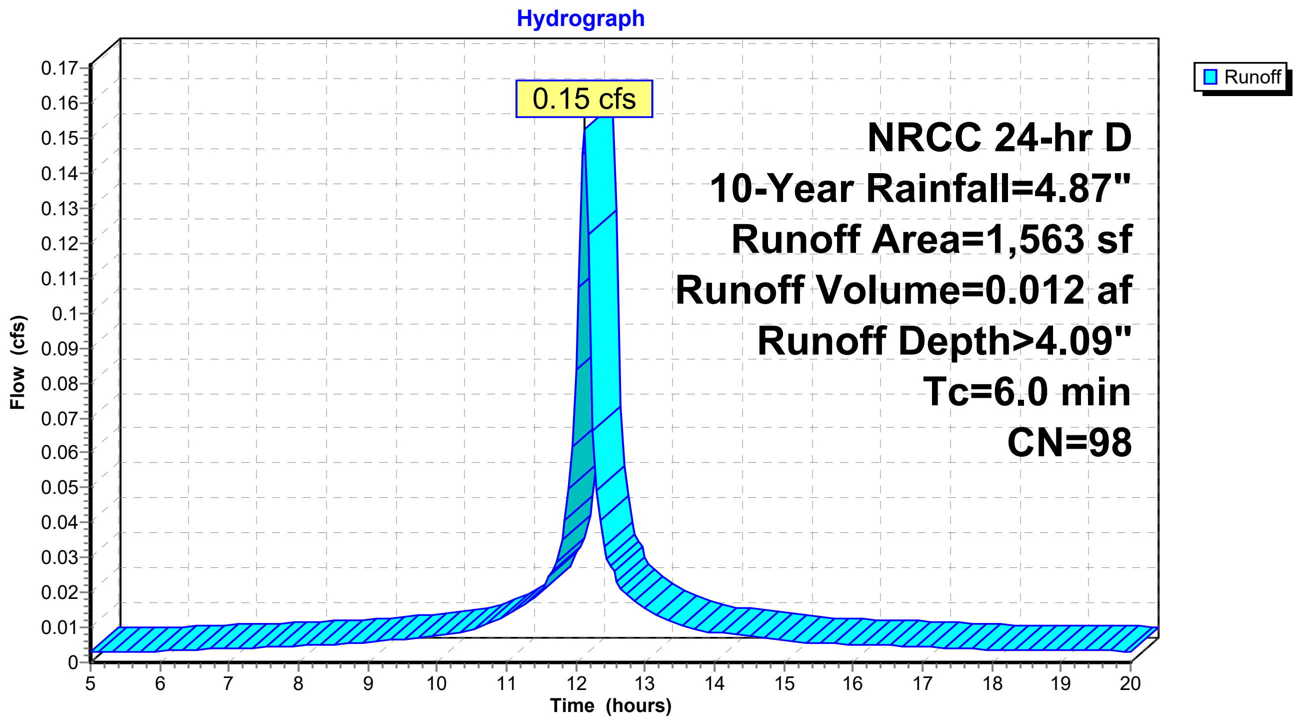
Runoff = 0.15 cfs @ 12.13 hrs, Volume= 0.012 af, Depth> 4.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 10-Year Rainfall=4.87"

Area (sf)	CN	Description
1,563	98	Paved parking, HSG B
1,563		100.00% Impervious Area

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

Subcatchment 5S: P3I



Summary for Subcatchment 6S: P3G

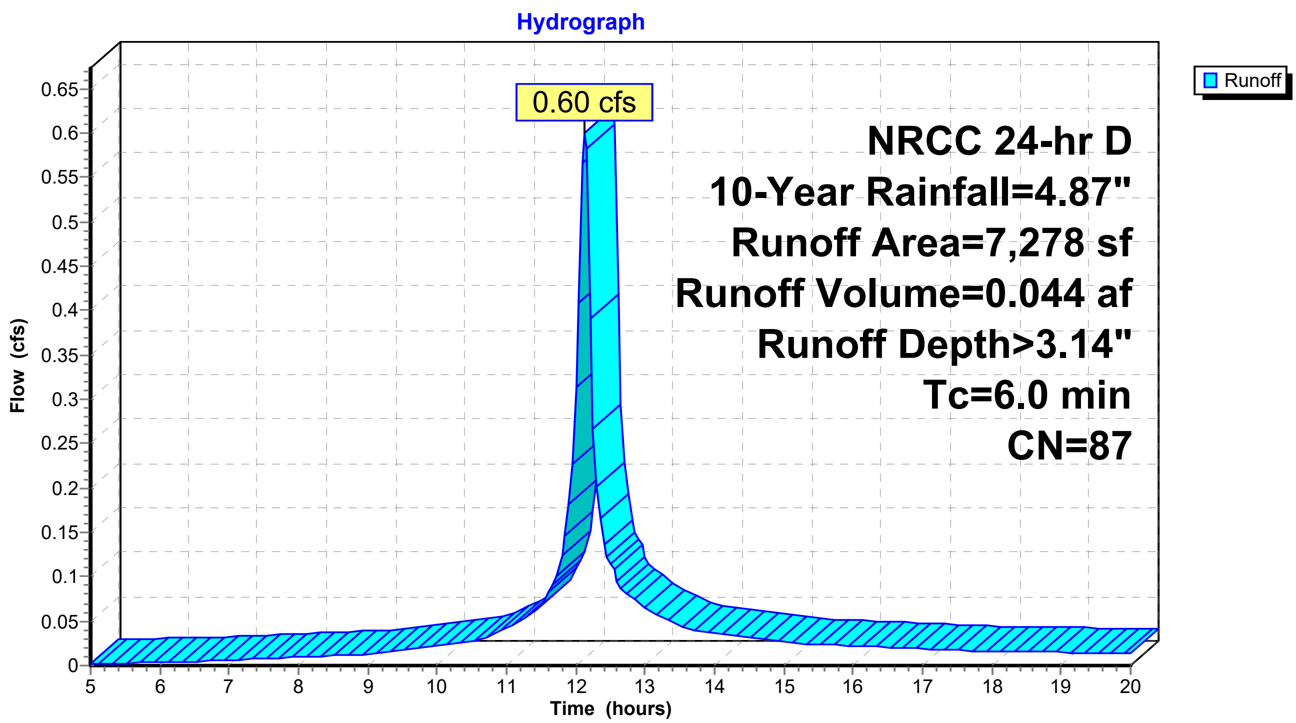
Runoff = 0.60 cfs @ 12.13 hrs, Volume= 0.044 af, Depth> 3.14"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 10-Year Rainfall=4.87"

Area (sf)	CN	Description
2,258	61	>75% Grass cover, Good, HSG B
5,020	98	Paved parking, HSG B
7,278	87	Weighted Average
2,258		31.03% Pervious Area
5,020		68.97% Impervious Area

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

Subcatchment 6S: P3G



Summary for Subcatchment 7S: P3H

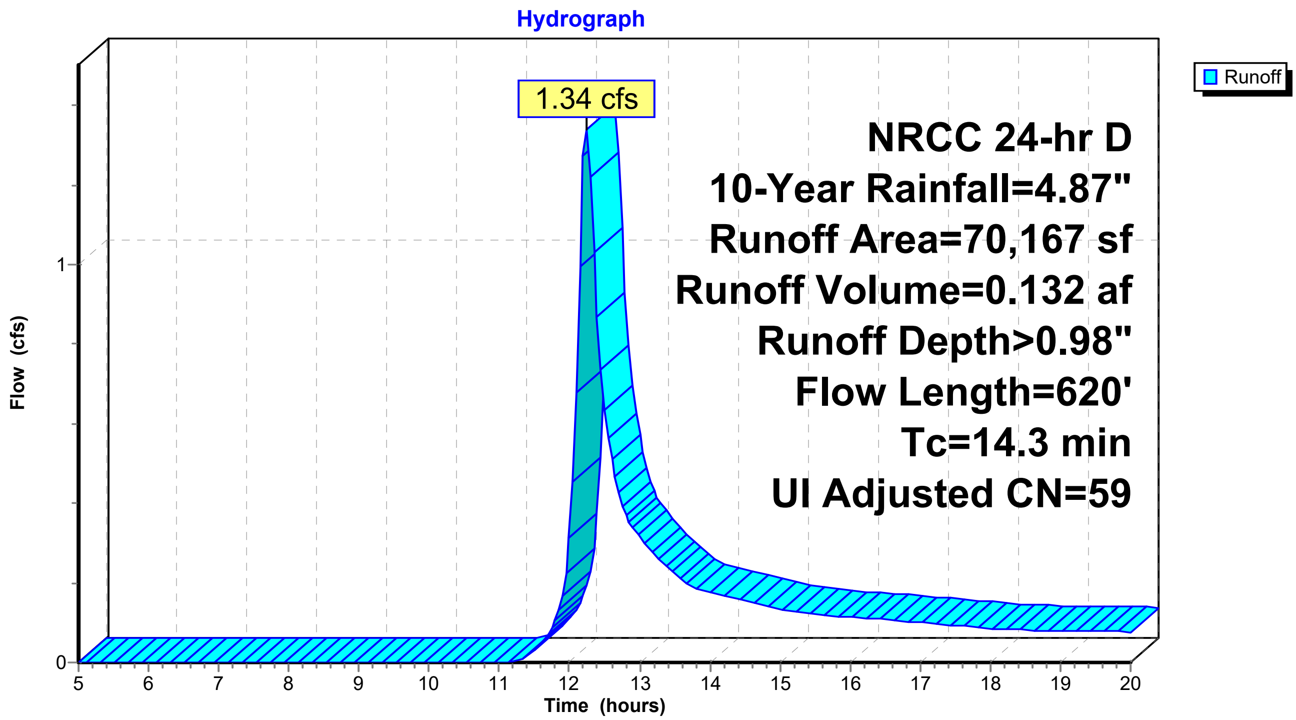
Runoff = 1.34 cfs @ 12.24 hrs, Volume= 0.132 af, Depth> 0.98"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 10-Year Rainfall=4.87"

Area (sf)	CN	Adj	Description
9,561	61		>75% Grass cover, Good, HSG B
3,870	98		Paved parking, HSG B
424	98		Unconnected roofs, HSG B
1,543	98		Unconnected pavement, HSG B
10,060	58		Woods/grass comb., Good, HSG B
44,709	55		Woods, Good, HSG B
70,167	60	59	Weighted Average, UI Adjusted
64,330			91.68% Pervious Area
5,837			8.32% Impervious Area
1,967			33.70% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.3	50	0.0200	0.10		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.10"
6.0	570	0.1000	1.58		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
14.3	620	Total			

Subcatchment 7S: P3H



Summary for Subcatchment 8S: P3J

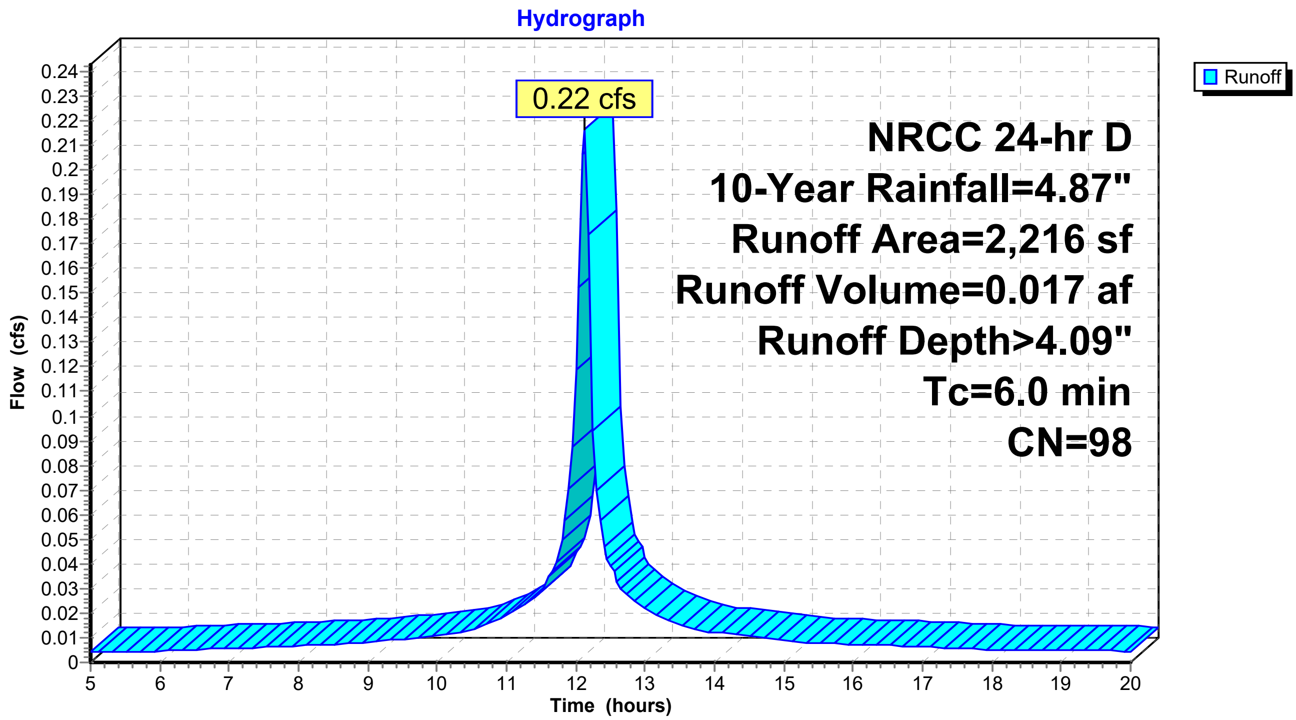
Runoff = 0.22 cfs @ 12.13 hrs, Volume= 0.017 af, Depth> 4.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 10-Year Rainfall=4.87"

Area (sf)	CN	Description
2,216	98	Paved parking, HSG B
2,216		100.00% Impervious Area

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

Subcatchment 8S: P3J



Summary for Subcatchment 11S: P3K

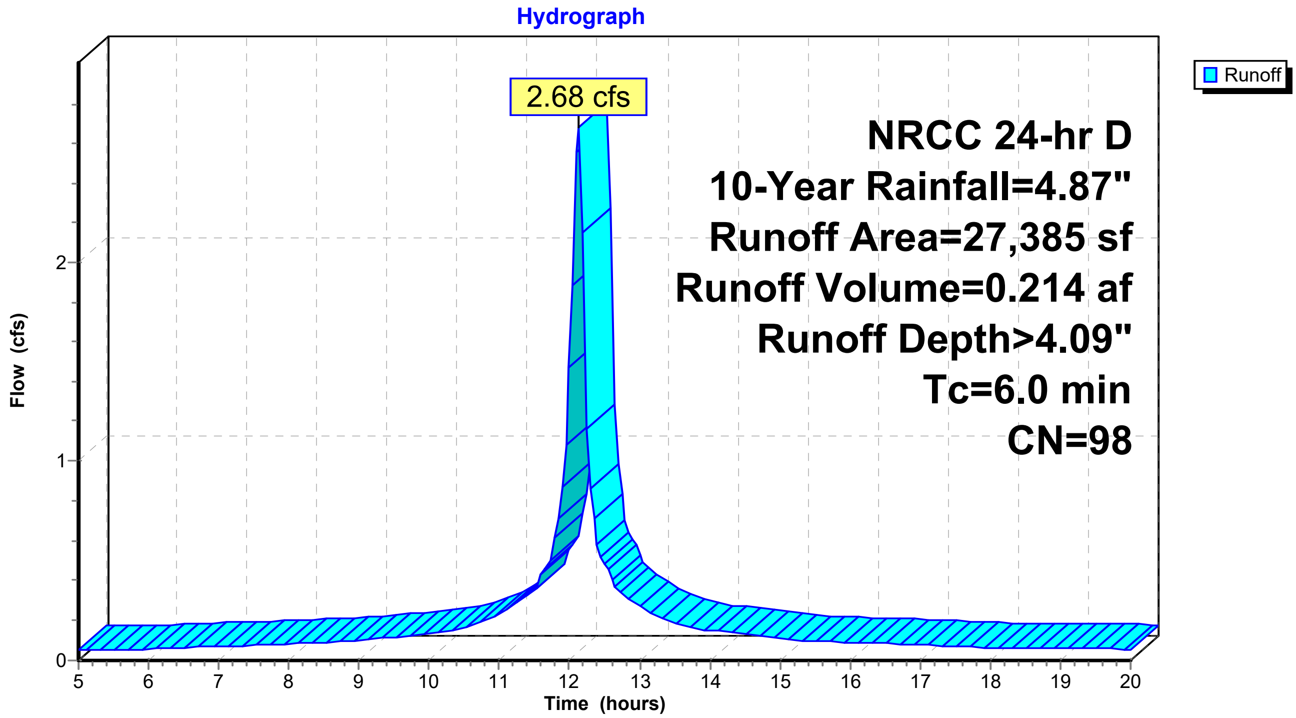
Runoff = 2.68 cfs @ 12.13 hrs, Volume= 0.214 af, Depth> 4.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 10-Year Rainfall=4.87"

Area (sf)	CN	Description
27,385	98	Unconnected roofs, HSG B
27,385		100.00% Impervious Area
27,385		100.00% Unconnected

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

Subcatchment 11S: P3K



Summary for Subcatchment 16S: P3F

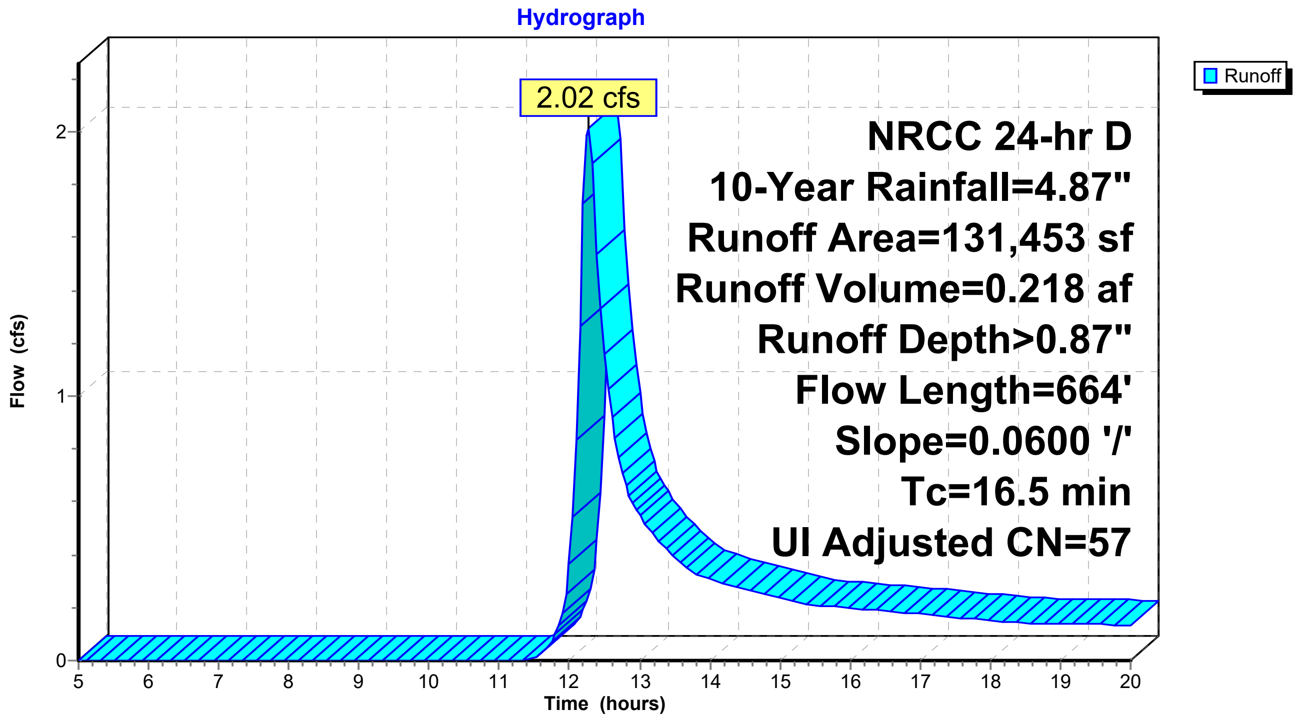
Runoff = 2.02 cfs @ 12.27 hrs, Volume= 0.218 af, Depth> 0.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 10-Year Rainfall=4.87"

Area (sf)	CN	Adj	Description
1,418	98		Paved parking, HSG B
2,247	61		>75% Grass cover, Good, HSG B
1,840	98		Unconnected roofs, HSG B
3,512	98		Unconnected pavement, HSG B
25,035	58		Woods/grass comb., Good, HSG B
88,304	55		Woods, Good, HSG B
9,097	61		>75% Grass cover, Good, HSG B
131,453	58	57	Weighted Average, UI Adjusted
124,683			94.85% Pervious Area
6,770			5.15% Impervious Area
5,352			79.05% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.1	50	0.0600	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.10"
8.4	614	0.0600	1.22		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
16.5	664	Total			

Subcatchment 16S: P3F



Summary for Subcatchment 17S: P3E

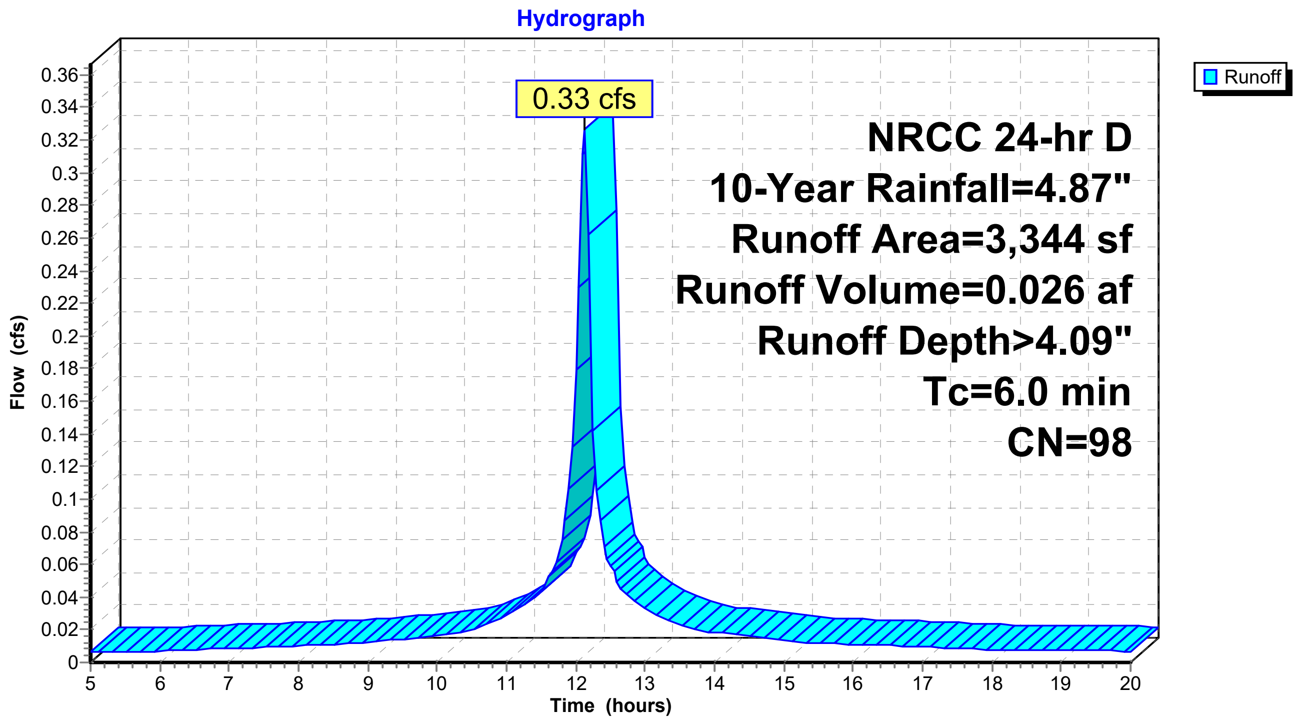
Runoff = 0.33 cfs @ 12.13 hrs, Volume= 0.026 af, Depth> 4.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 10-Year Rainfall=4.87"

Area (sf)	CN	Description
3,344	98	Paved parking, HSG B
3,344		100.00% Impervious Area

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

Subcatchment 17S: P3E



Summary for Subcatchment 22S: P3D

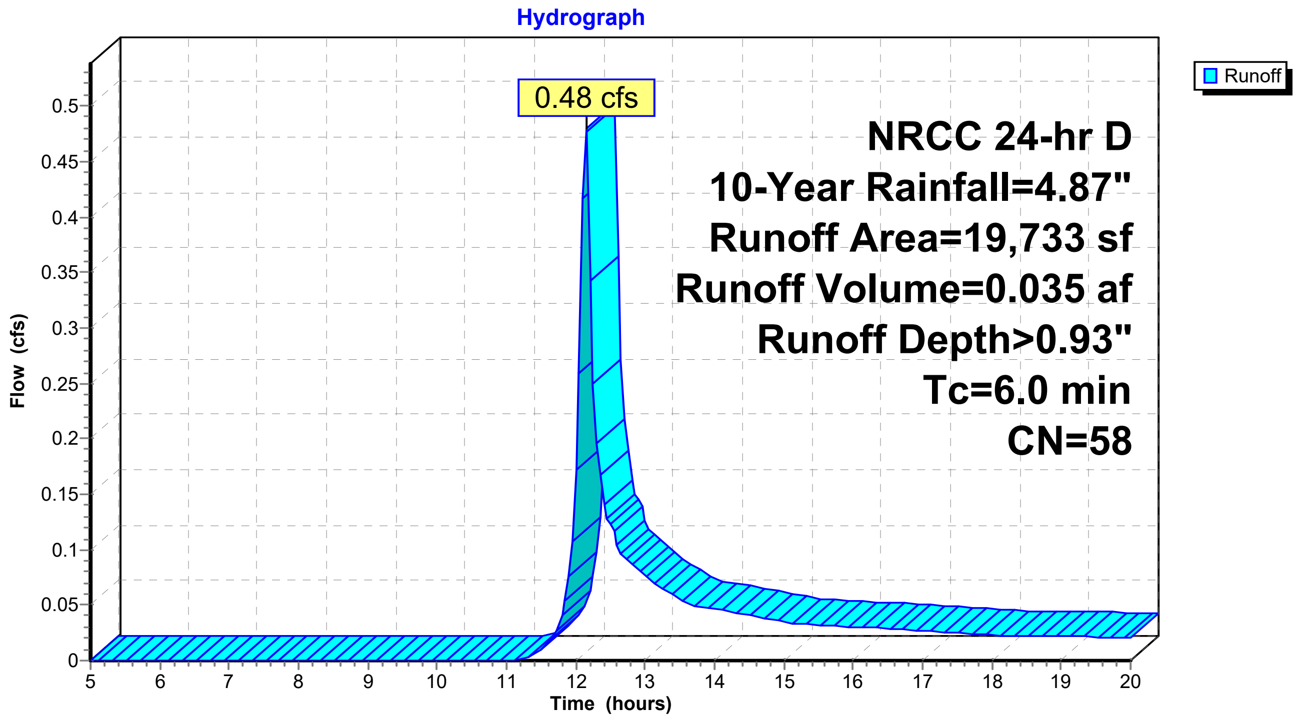
Runoff = 0.48 cfs @ 12.14 hrs, Volume= 0.035 af, Depth> 0.93"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 10-Year Rainfall=4.87"

Area (sf)	CN	Description
10,830	61	>75% Grass cover, Good, HSG B
4,323	55	Woods, Good, HSG B
4,580	55	Woods, Good, HSG B
19,733	58	Weighted Average
19,733		100.00% Pervious Area

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

Subcatchment 22S: P3D



Summary for Subcatchment 23S: P3B

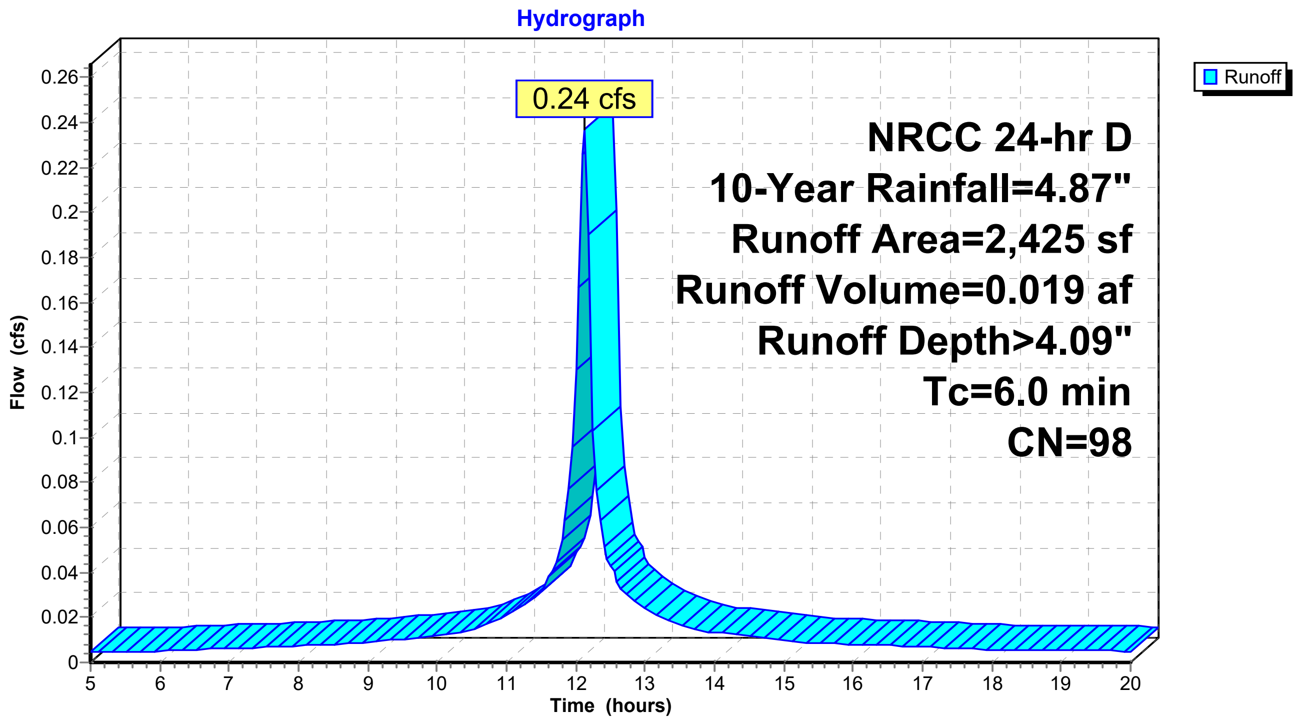
Runoff = 0.24 cfs @ 12.13 hrs, Volume= 0.019 af, Depth> 4.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 10-Year Rainfall=4.87"

Area (sf)	CN	Description
2,425	98	Paved parking, HSG B
2,425		100.00% Impervious Area

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

Subcatchment 23S: P3B



Summary for Subcatchment 24S: P3C

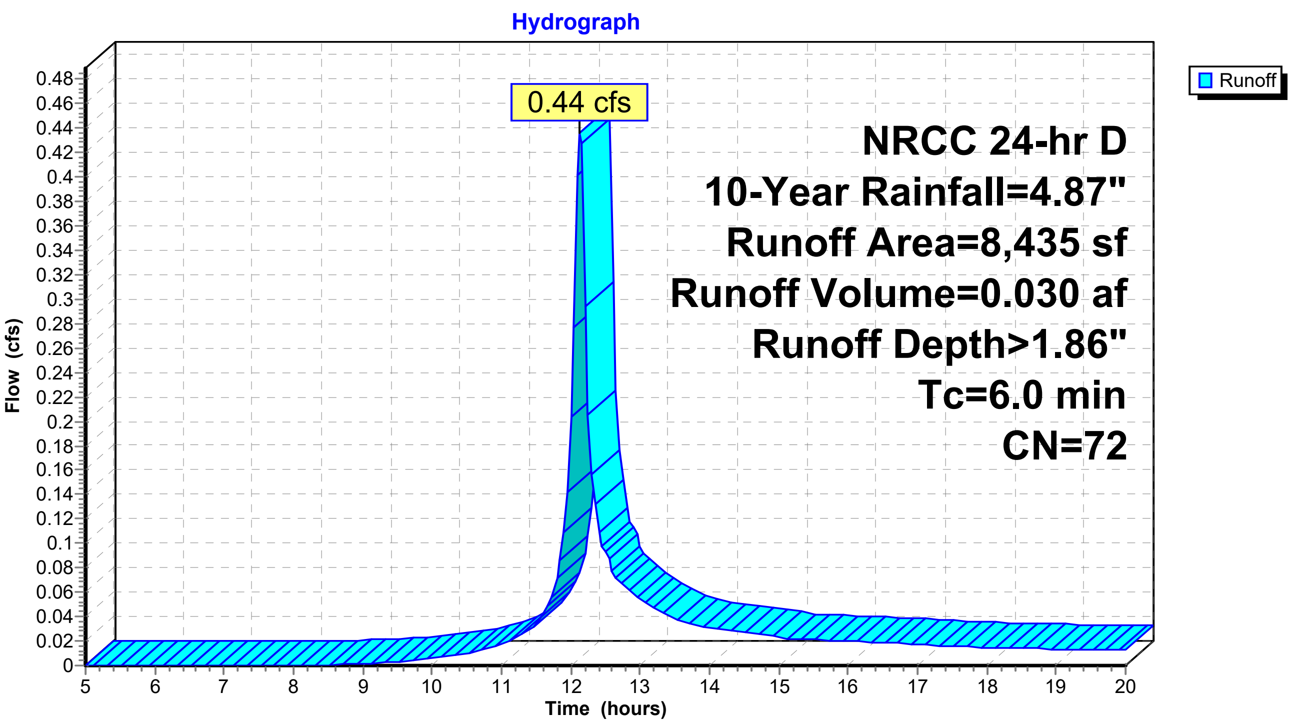
Runoff = 0.44 cfs @ 12.13 hrs, Volume= 0.030 af, Depth> 1.86"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 10-Year Rainfall=4.87"

Area (sf)	CN	Description
6,011	61	>75% Grass cover, Good, HSG B
2,424	98	Paved parking, HSG B
8,435	72	Weighted Average
6,011		71.26% Pervious Area
2,424		28.74% Impervious Area

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

Subcatchment 24S: P3C



Summary for Subcatchment 31S: P3A

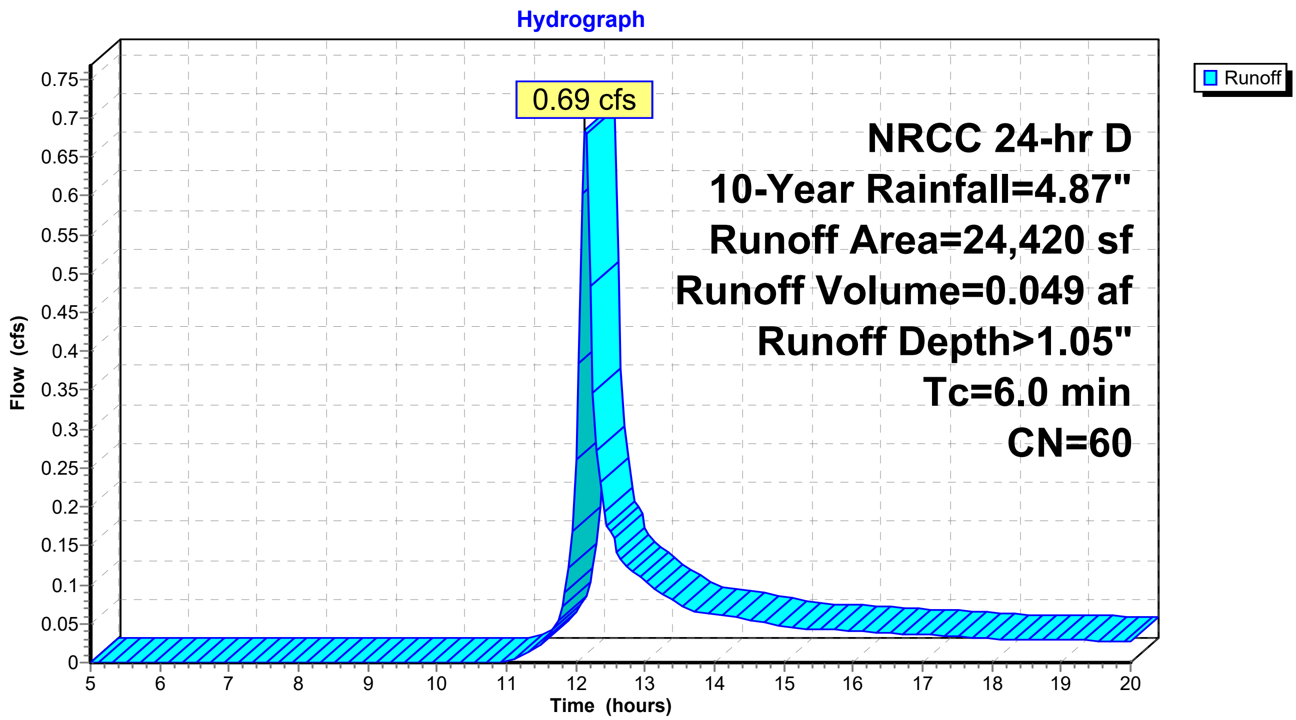
Runoff = 0.69 cfs @ 12.14 hrs, Volume= 0.049 af, Depth> 1.05"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 10-Year Rainfall=4.87"

Area (sf)	CN	Description
4,295	55	Woods, Good, HSG B
20,125	61	>75% Grass cover, Good, HSG B
24,420	60	Weighted Average
24,420		100.00% Pervious Area

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

Subcatchment 31S: P3A



Summary for Subcatchment 34S: P1C

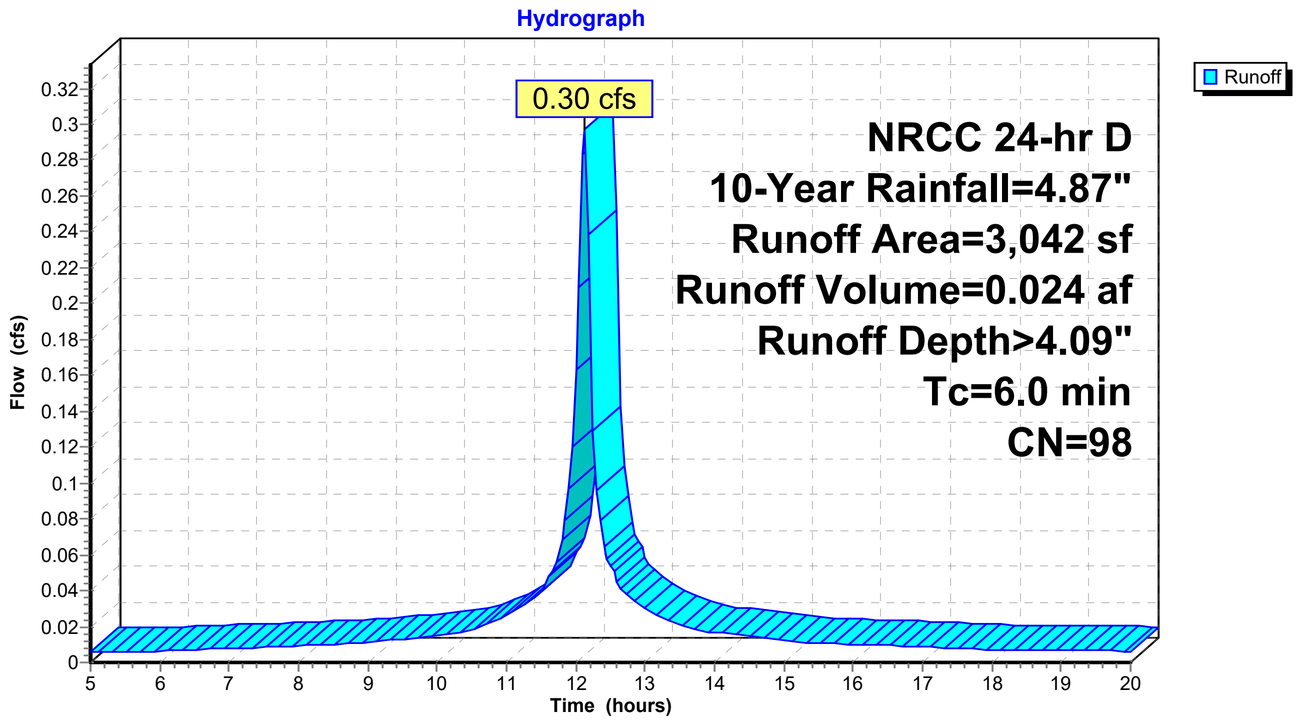
Runoff = 0.30 cfs @ 12.13 hrs, Volume= 0.024 af, Depth> 4.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 10-Year Rainfall=4.87"

Area (sf)	CN	Description
3,042	98	Paved parking, HSG B
3,042		100.00% Impervious Area

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

Subcatchment 34S: P1C



Summary for Subcatchment 35S: P1B

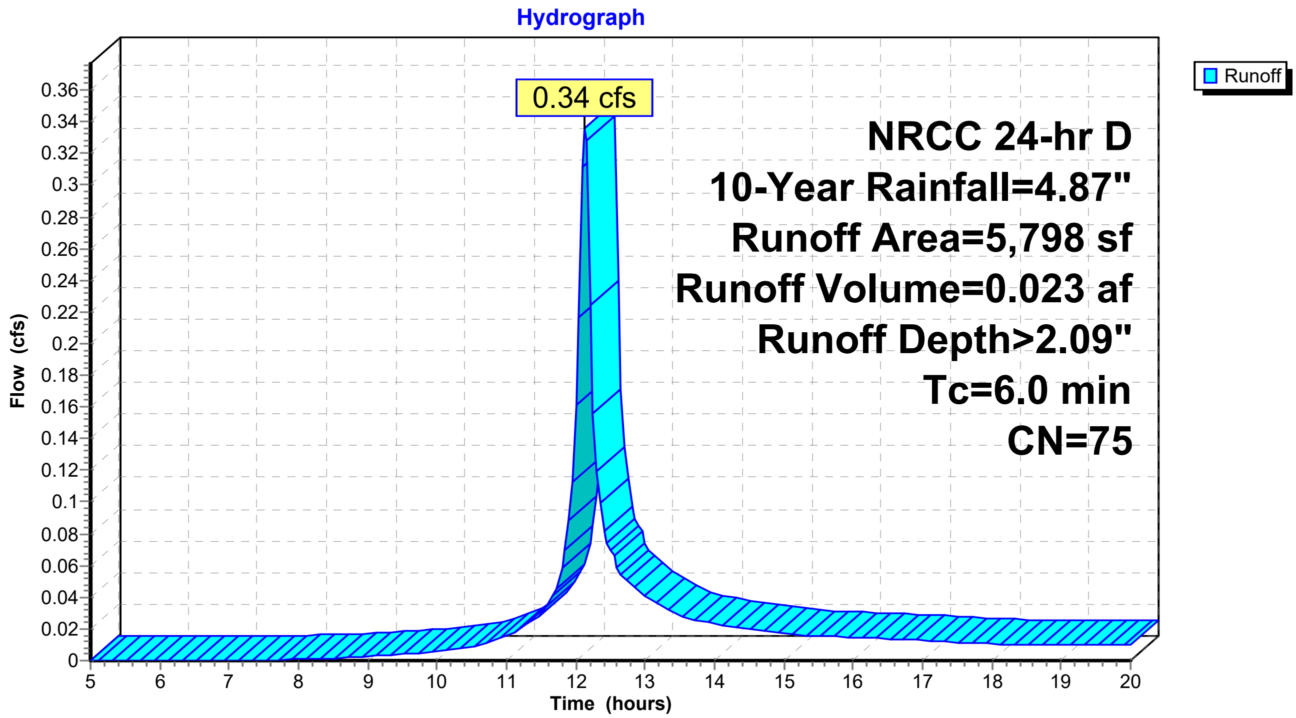
Runoff = 0.34 cfs @ 12.13 hrs, Volume= 0.023 af, Depth> 2.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 10-Year Rainfall=4.87"

Area (sf)	CN	Description
2,135	98	Paved parking, HSG B
3,663	61	>75% Grass cover, Good, HSG B
5,798	75	Weighted Average
3,663		63.18% Pervious Area
2,135		36.82% Impervious Area

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

Subcatchment 35S: P1B



Summary for Subcatchment 43S: P1D

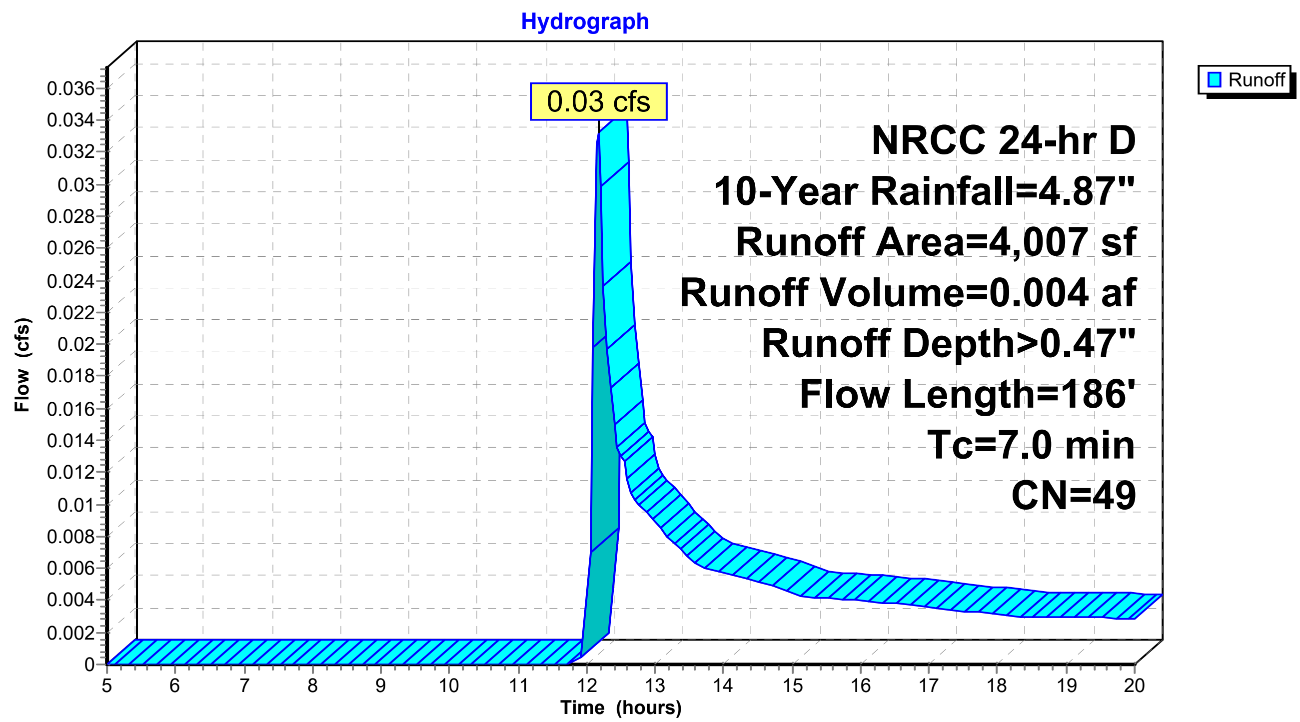
Runoff = 0.03 cfs @ 12.17 hrs, Volume= 0.004 af, Depth> 0.47"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 10-Year Rainfall=4.87"

Area (sf)	CN	Description
316	55	Woods, Good, HSG B
3,691	48	Brush, Good, HSG B
4,007	49	Weighted Average
4,007		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.6	50	0.1000	0.13		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.10"
0.4	136	0.1300	5.80		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
7.0	186	Total			

Subcatchment 43S: P1D



Summary for Subcatchment 44S: P2D

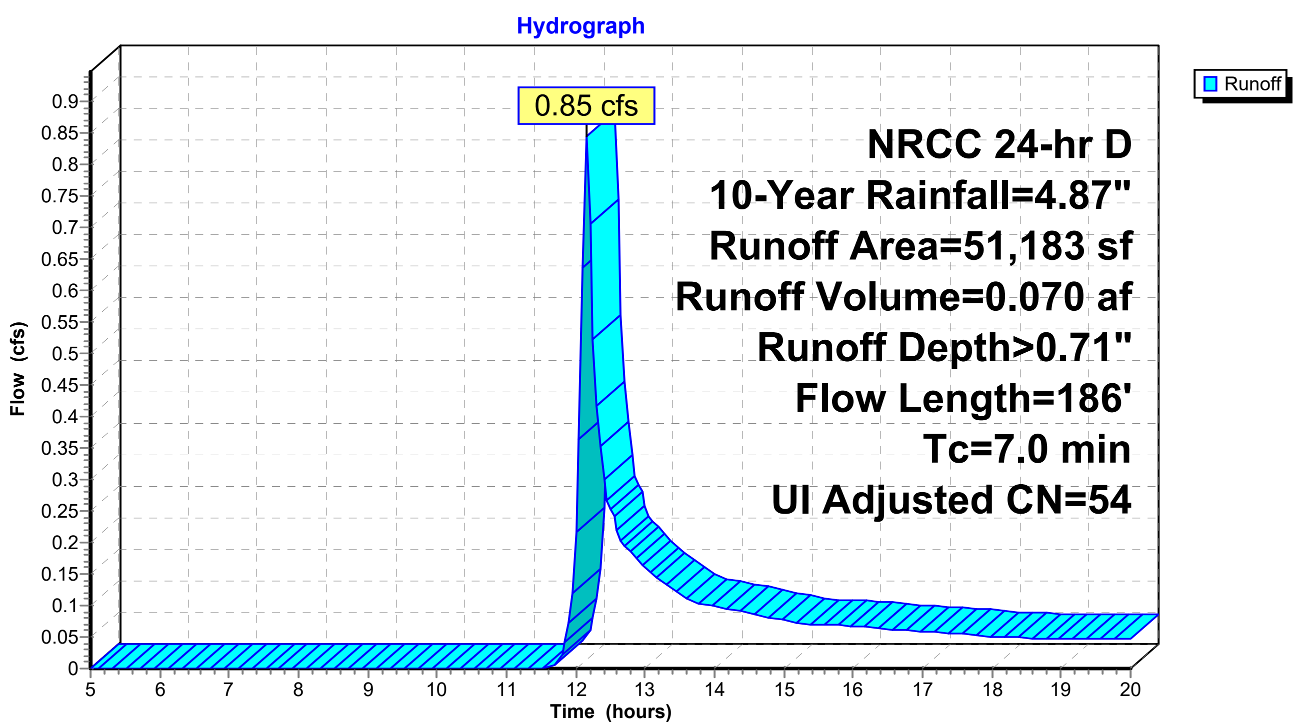
Runoff = 0.85 cfs @ 12.15 hrs, Volume= 0.070 af, Depth> 0.71"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 10-Year Rainfall=4.87"

Area (sf)	CN	Adj	Description
33,103	55		Woods, Good, HSG B
13,939	48		Brush, Good, HSG B
2,316	98		Unconnected roofs, HSG B
461	98		Unconnected pavement, HSG B
1,364	58		Woods/grass comb., Good, HSG B
51,183	56	54	Weighted Average, UI Adjusted
48,406			94.57% Pervious Area
2,777			5.43% Impervious Area
2,777			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.6	50	0.1000	0.13		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.10"
0.4	136	0.1300	5.80		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
7.0	186	Total			

Subcatchment 44S: P2D



Summary for Subcatchment 45S: P3L

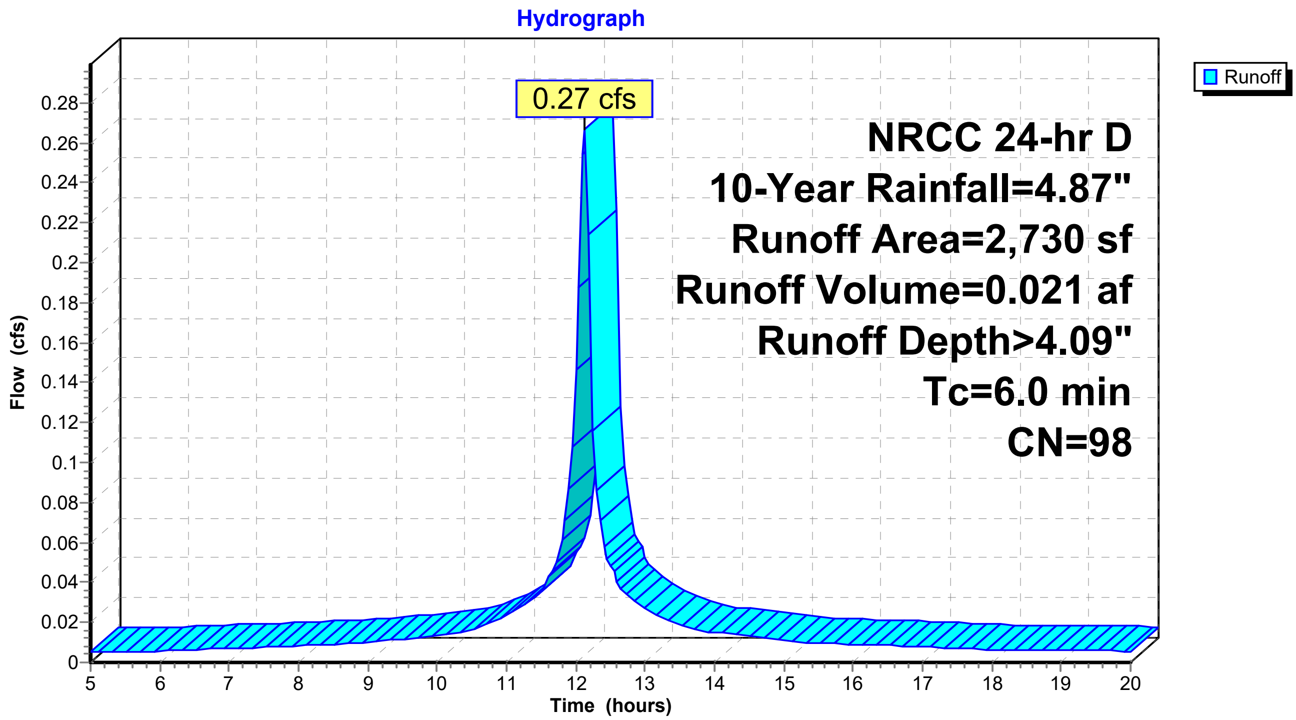
Runoff = 0.27 cfs @ 12.13 hrs, Volume= 0.021 af, Depth> 4.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 10-Year Rainfall=4.87"

Area (sf)	CN	Description
2,730	98	Paved parking, HSG B
2,730		100.00% Impervious Area

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

Subcatchment 45S: P3L



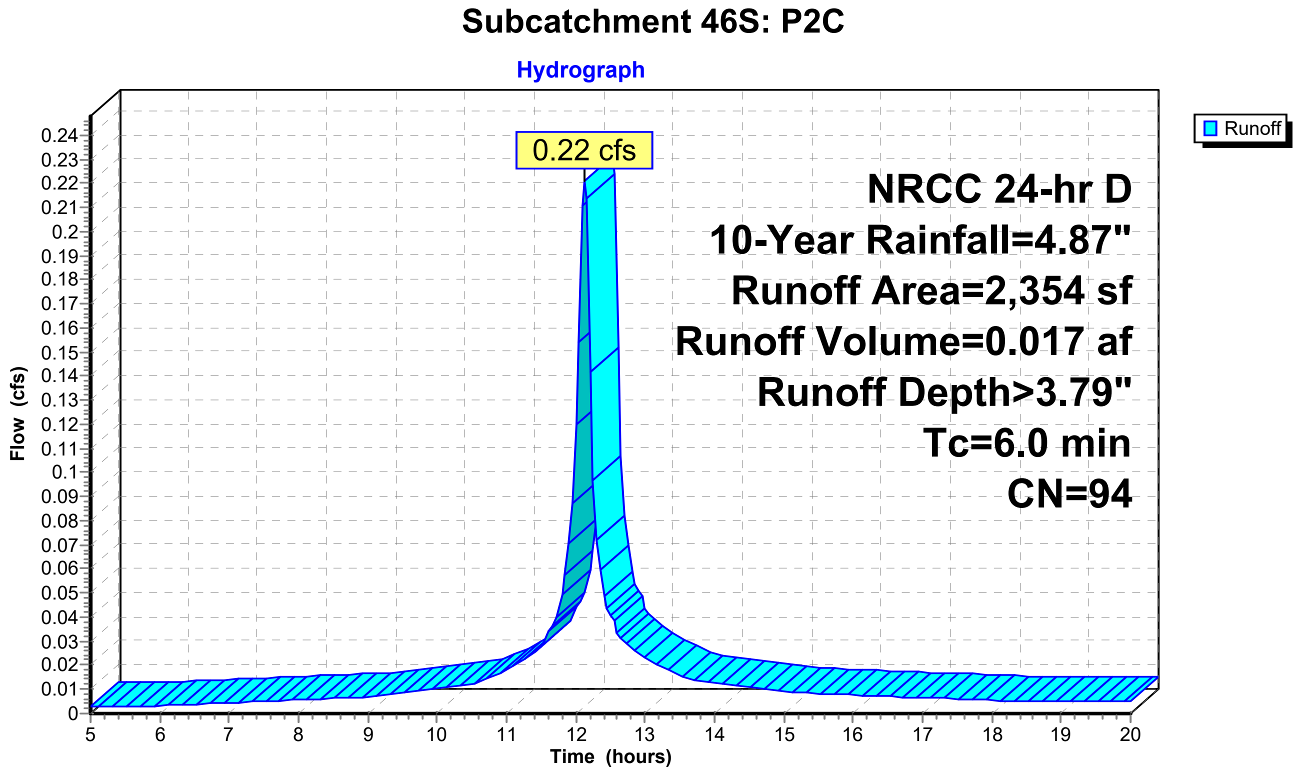
Summary for Subcatchment 46S: P2C

Runoff = 0.22 cfs @ 12.13 hrs, Volume= 0.017 af, Depth> 3.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 10-Year Rainfall=4.87"

Area (sf)	CN	Description
263	61	>75% Grass cover, Good, HSG B
2,091	98	Paved parking, HSG B
2,354	94	Weighted Average
263		11.17% Pervious Area
2,091		88.83% Impervious Area

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



Summary for Subcatchment 47S: P3M

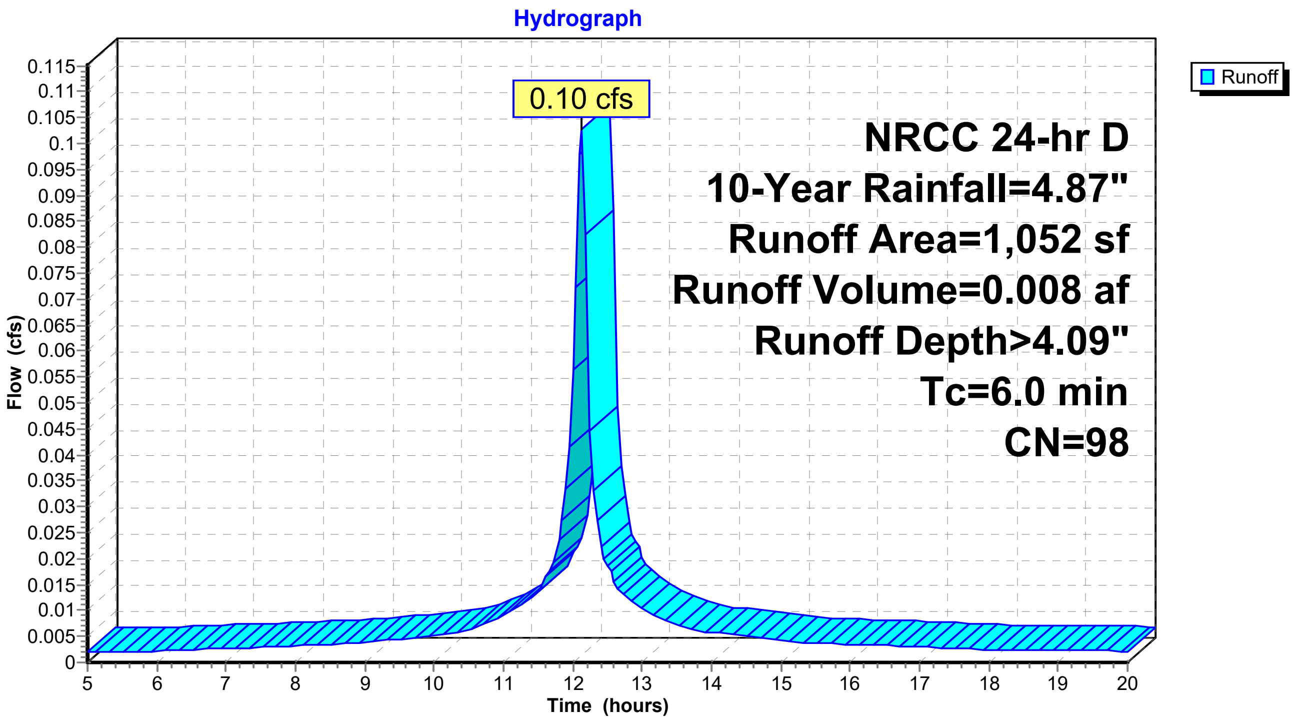
Runoff = 0.10 cfs @ 12.13 hrs, Volume= 0.008 af, Depth> 4.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 10-Year Rainfall=4.87"

Area (sf)	CN	Description
1,052	98	Paved parking, HSG B
1,052		100.00% Impervious Area

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

Subcatchment 47S: P3M



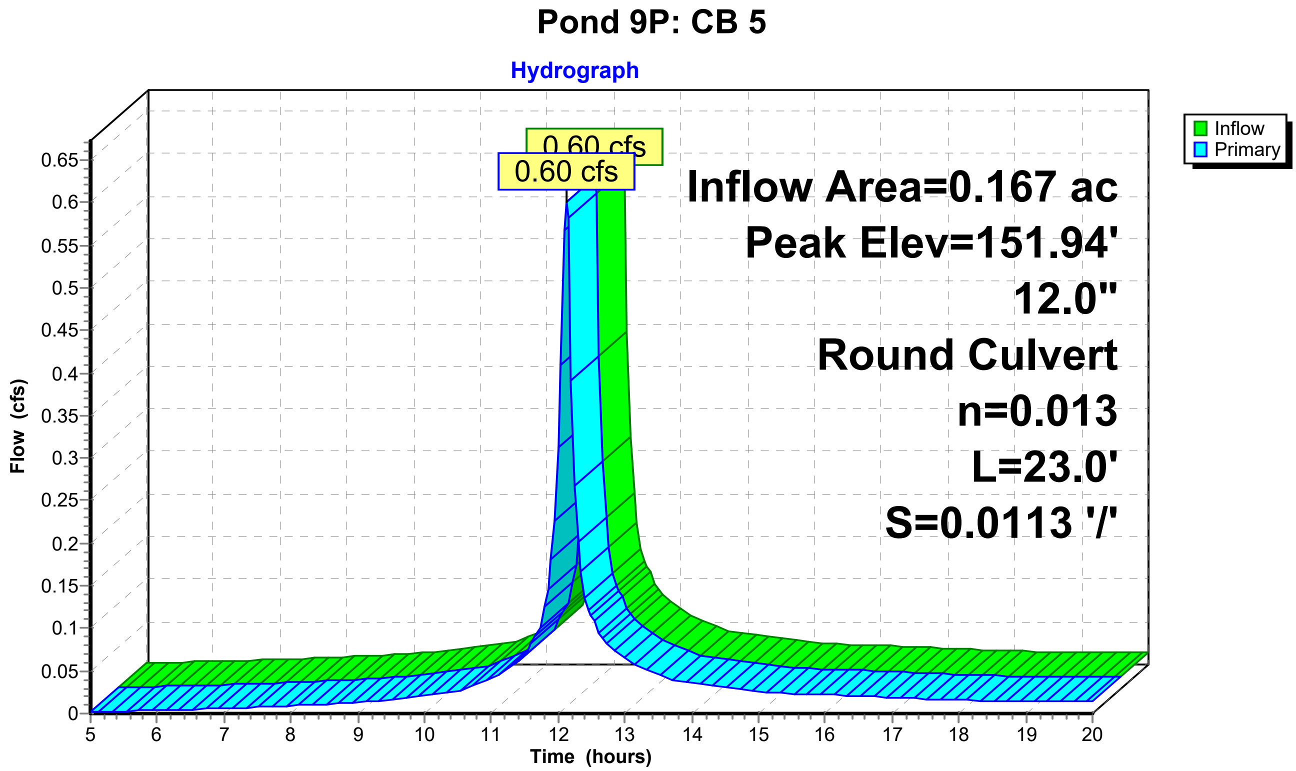
Summary for Pond 9P: CB 5

Inflow Area =	0.167 ac,	68.97% Impervious,	Inflow Depth > 3.14"	for 10-Year event
Inflow =	0.60 cfs @	12.13 hrs, Volume=	0.044 af	
Outflow =	0.60 cfs @	12.13 hrs, Volume=	0.044 af,	Atten= 0%, Lag= 0.0 min
Primary =	0.60 cfs @	12.13 hrs, Volume=	0.044 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 151.94' @ 12.13 hrs
Flood Elev= 156.25'

Device	Routing	Invert	Outlet Devices
#1	Primary	151.50'	**12.0" Round Culvert** L= 23.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 151.50' / 151.24' S= 0.0113 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.58 cfs @ 12.13 hrs HW=151.93' (Free Discharge)
└─**1=Culvert** (Inlet Controls 0.58 cfs @ 1.77 fps)



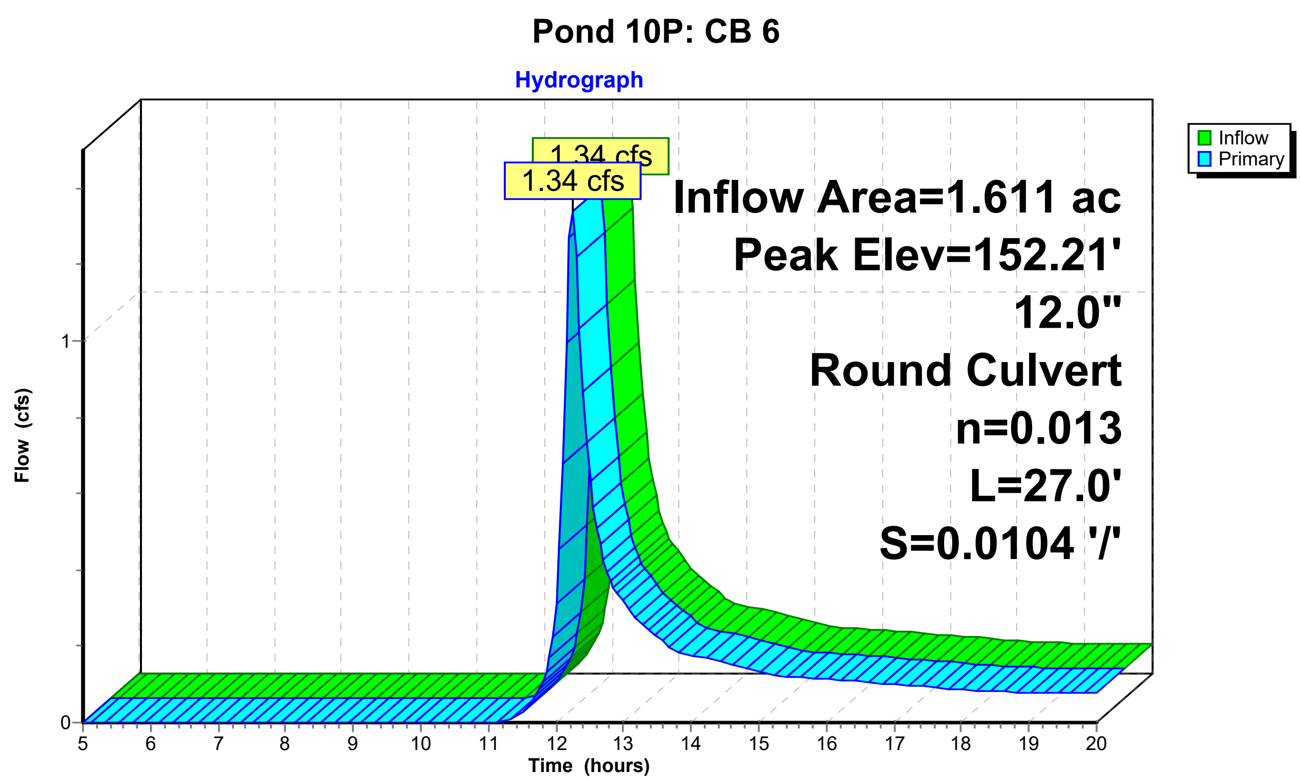
Summary for Pond 10P: CB 6

Inflow Area = 1.611 ac, 8.32% Impervious, Inflow Depth > 0.98" for 10-Year event
Inflow = 1.34 cfs @ 12.24 hrs, Volume= 0.132 af
Outflow = 1.34 cfs @ 12.24 hrs, Volume= 0.132 af, Atten= 0%, Lag= 0.0 min
Primary = 1.34 cfs @ 12.24 hrs, Volume= 0.132 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 152.21' @ 12.24 hrs
Flood Elev= 156.25'

Device	Routing	Invert	Outlet Devices
#1	Primary	151.50'	**12.0" Round Culvert** L= 27.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 151.50' / 151.22' S= 0.0104 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.33 cfs @ 12.24 hrs HW=152.20' (Free Discharge)
1=Culvert (Inlet Controls 1.33 cfs @ 2.25 fps)



Summary for Pond 13P: CB 7

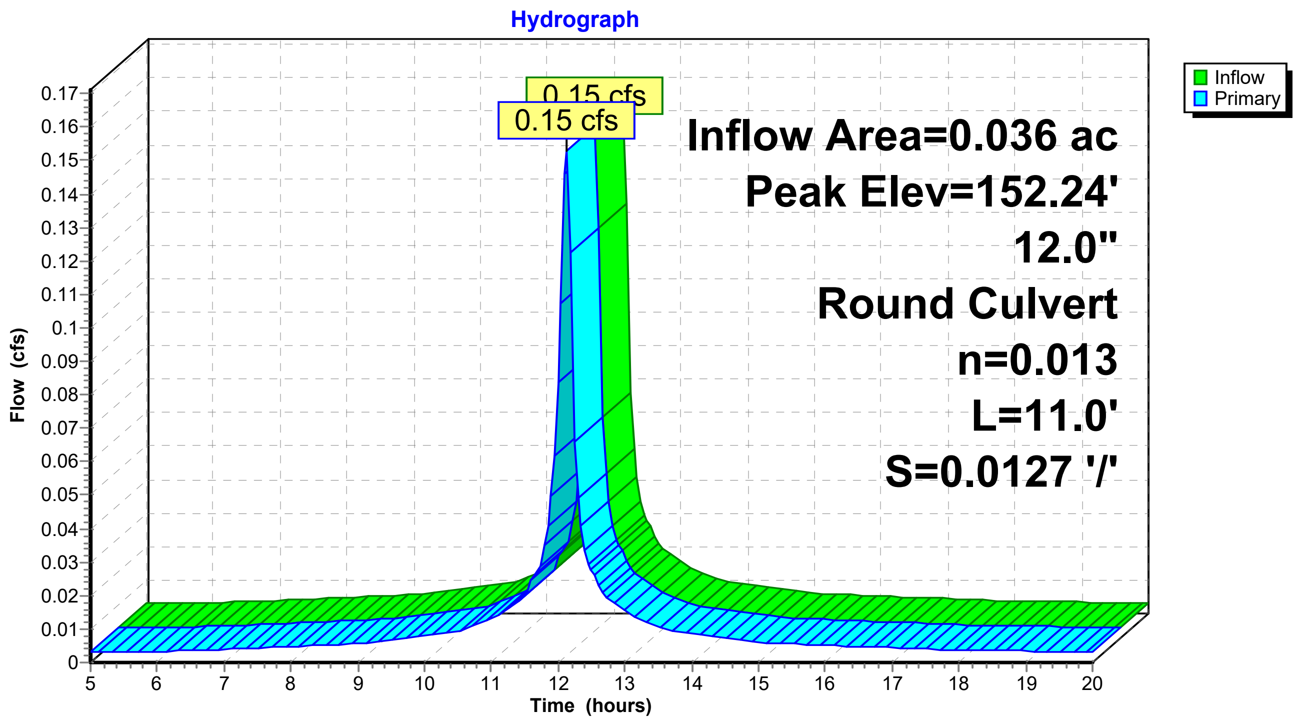
Inflow Area = 0.036 ac,100.00% Impervious, Inflow Depth > 4.09" for 10-Year event
Inflow = 0.15 cfs @ 12.13 hrs, Volume= 0.012 af
Outflow = 0.15 cfs @ 12.13 hrs, Volume= 0.012 af, Atten= 0%, Lag= 0.0 min
Primary = 0.15 cfs @ 12.13 hrs, Volume= 0.012 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 152.24' @ 12.13 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	152.03'	**12.0" Round Culvert** L= 11.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 152.03' / 151.89' S= 0.0127 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.15 cfs @ 12.13 hrs HW=152.24' (Free Discharge)
└─**1=Culvert** (Inlet Controls 0.15 cfs @ 1.23 fps)

Pond 13P: CB 7



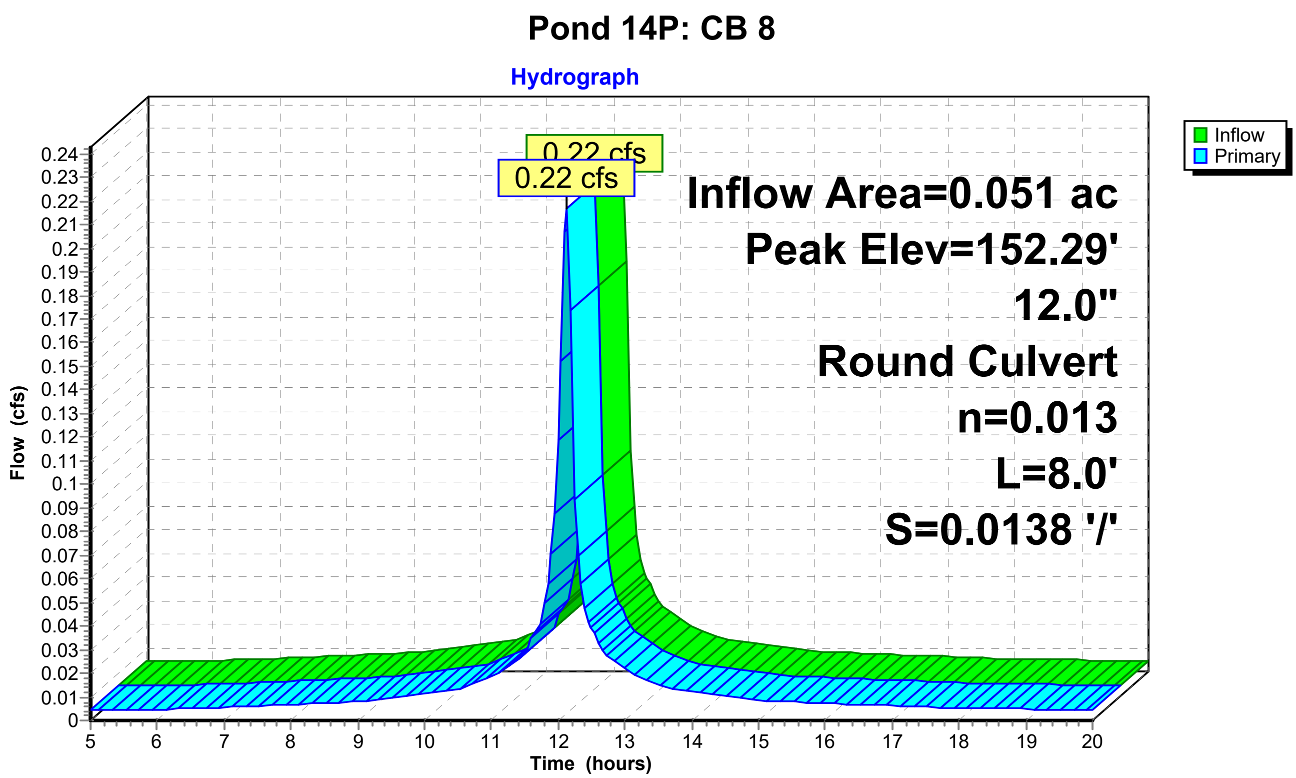
Summary for Pond 14P: CB 8

Inflow Area = 0.051 ac,100.00% Impervious, Inflow Depth > 4.09" for 10-Year event
Inflow = 0.22 cfs @ 12.13 hrs, Volume= 0.017 af
Outflow = 0.22 cfs @ 12.13 hrs, Volume= 0.017 af, Atten= 0%, Lag= 0.0 min
Primary = 0.22 cfs @ 12.13 hrs, Volume= 0.017 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 152.29' @ 12.13 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	152.03'	**12.0" Round Culvert** L= 8.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 152.03' / 151.92' S= 0.0138 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.21 cfs @ 12.13 hrs HW=152.28' (Free Discharge)
└**1=Culvert** (Inlet Controls 0.21 cfs @ 1.35 fps)



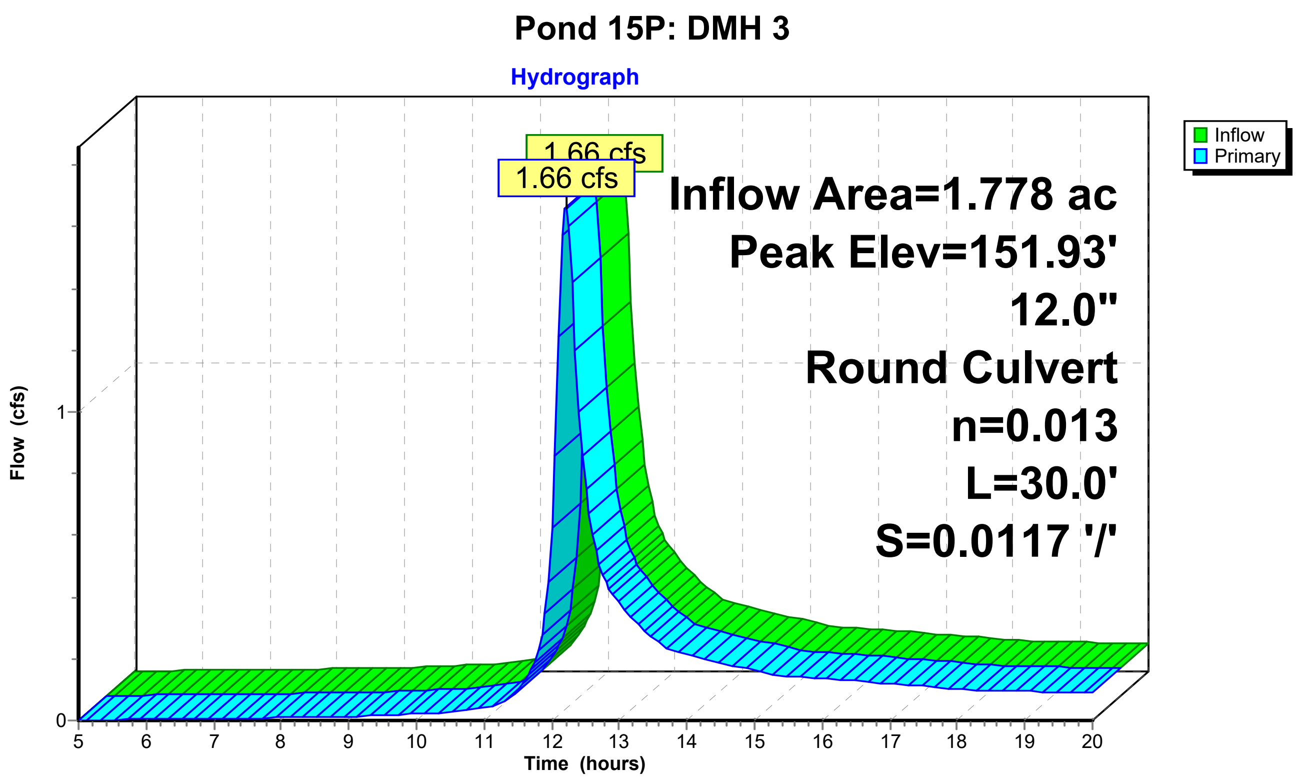
Summary for Pond 15P: DMH 3

Inflow Area = 1.778 ac, 14.02% Impervious, Inflow Depth > 1.18" for 10-Year event
Inflow = 1.66 cfs @ 12.20 hrs, Volume= 0.176 af
Outflow = 1.66 cfs @ 12.20 hrs, Volume= 0.176 af, Atten= 0%, Lag= 0.0 min
Primary = 1.66 cfs @ 12.20 hrs, Volume= 0.176 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 151.93' @ 12.20 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	151.12'	**12.0" Round Culvert** L= 30.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 151.12' / 150.77' S= 0.0117 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.66 cfs @ 12.20 hrs HW=151.93' (Free Discharge)
└─**1=Culvert** (Inlet Controls 1.66 cfs @ 2.42 fps)



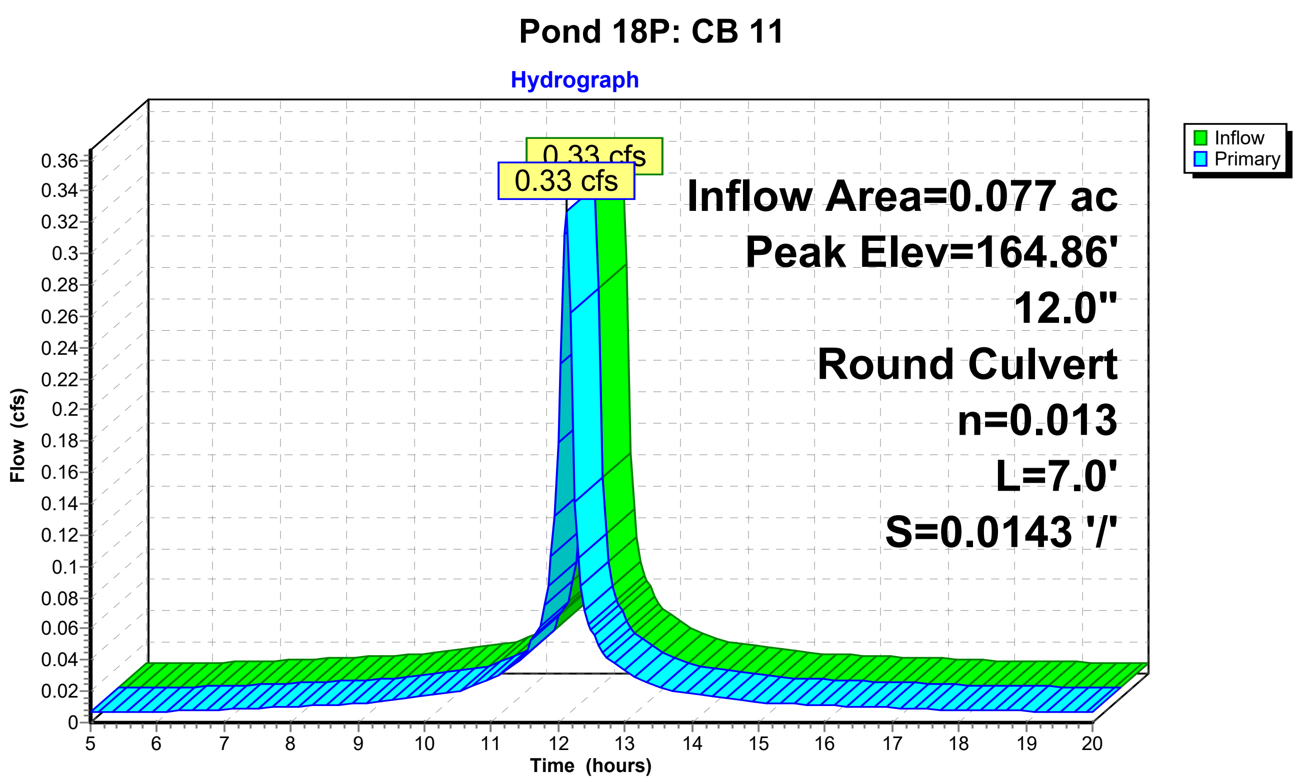
Summary for Pond 18P: CB 11

Inflow Area =	0.077 ac,100.00% Impervious,	Inflow Depth >	4.09"	for 10-Year event	
Inflow =	0.33 cfs @	12.13 hrs,	Volume=	0.026 af	
Outflow =	0.33 cfs @	12.13 hrs,	Volume=	0.026 af,	Atten= 0%, Lag= 0.0 min
Primary =	0.33 cfs @	12.13 hrs,	Volume=	0.026 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 164.86' @ 12.13 hrs
Flood Elev= 168.07'

Device	Routing	Invert	Outlet Devices
#1	Primary	164.54'	**12.0" Round Culvert** L= 7.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 164.54' / 164.44' S= 0.0143 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.31 cfs @ 12.13 hrs HW=164.86' (Free Discharge)
1=Culvert (Barrel Controls 0.31 cfs @ 2.20 fps)



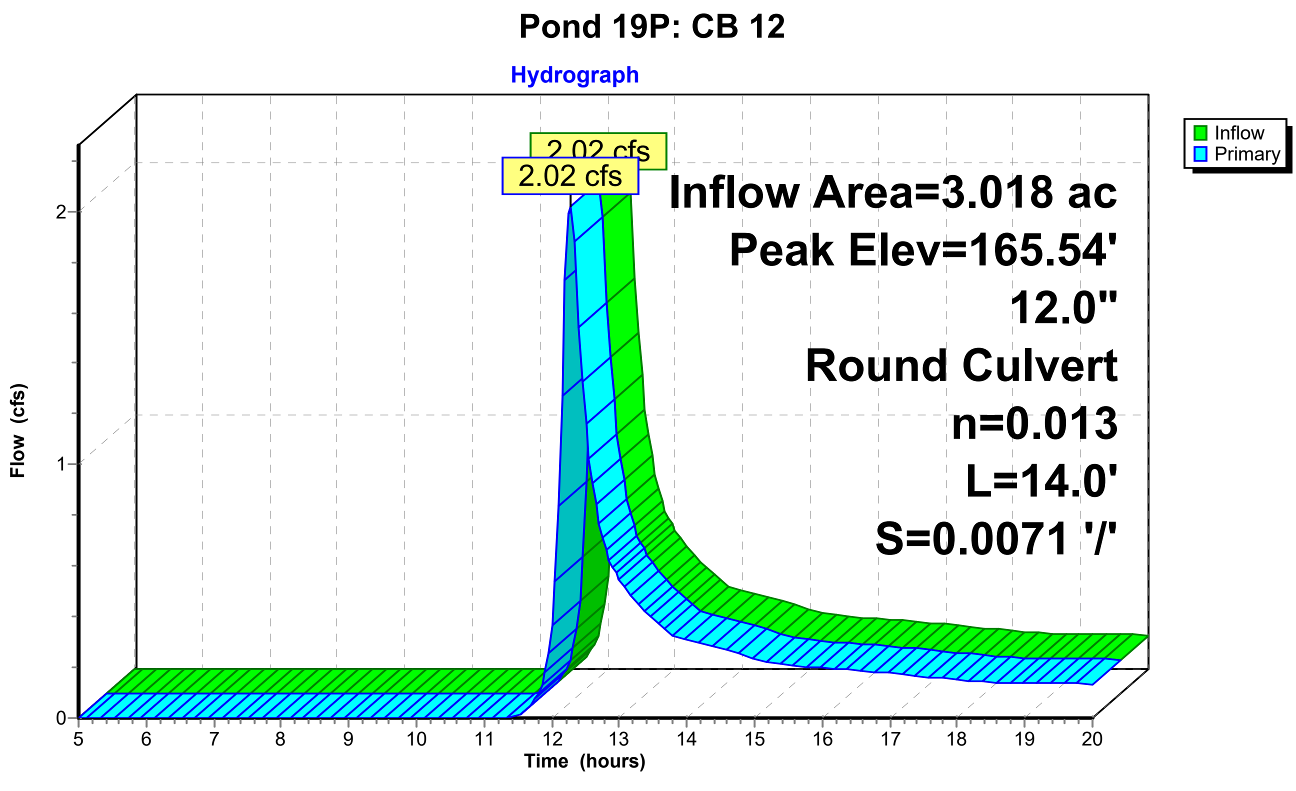
Summary for Pond 19P: CB 12

Inflow Area = 3.018 ac, 5.15% Impervious, Inflow Depth > 0.87" for 10-Year event
Inflow = 2.02 cfs @ 12.27 hrs, Volume= 0.218 af
Outflow = 2.02 cfs @ 12.27 hrs, Volume= 0.218 af, Atten= 0%, Lag= 0.0 min
Primary = 2.02 cfs @ 12.27 hrs, Volume= 0.218 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 165.54' @ 12.27 hrs
Flood Elev= 168.07'

Device	Routing	Invert	Outlet Devices
#1	Primary	164.54'	**12.0" Round Culvert** L= 14.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 164.54' / 164.44' S= 0.0071 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.98 cfs @ 12.27 hrs HW=165.53' (Free Discharge)
└─**1=Culvert** (Barrel Controls 1.98 cfs @ 3.16 fps)



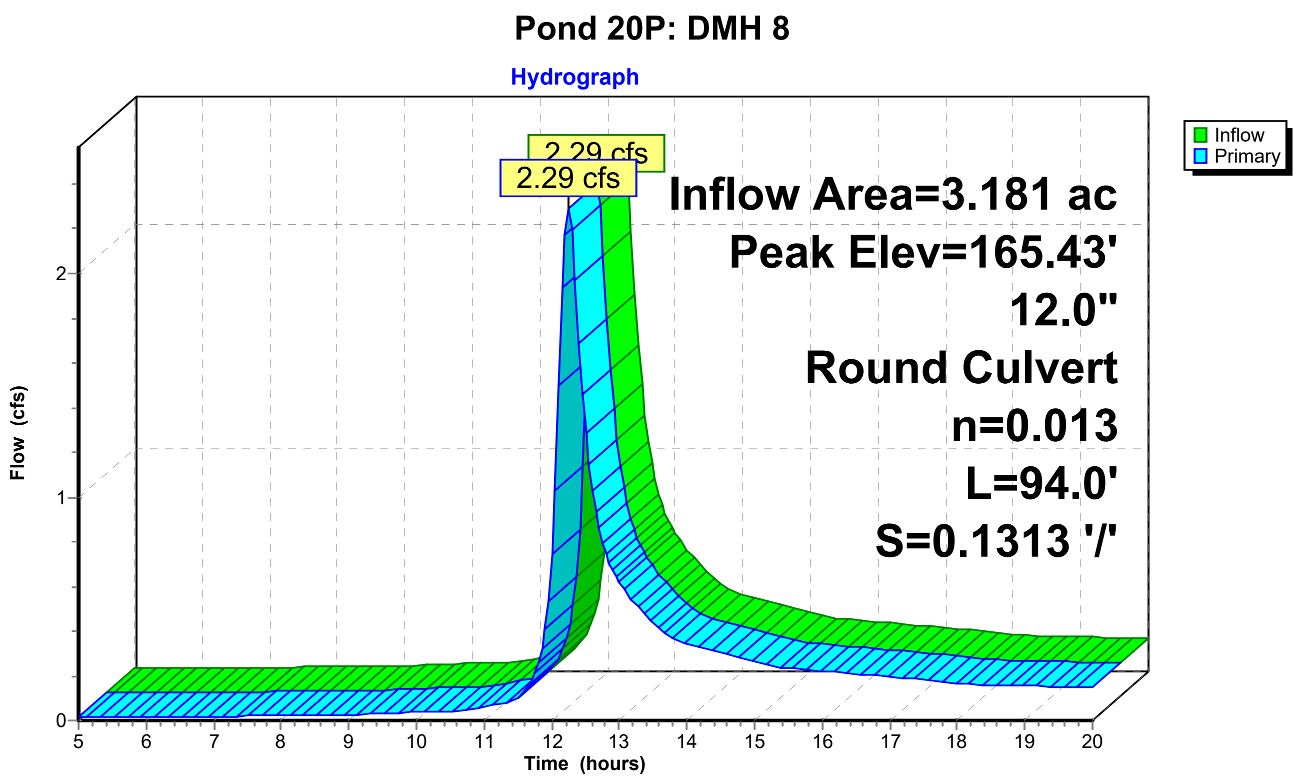
Summary for Pond 20P: DMH 8

Inflow Area =	3.181 ac,	10.03% Impervious,	Inflow Depth > 1.03"	for 10-Year event
Inflow =	2.29 cfs @	12.25 hrs, Volume=	0.274 af	
Outflow =	2.29 cfs @	12.25 hrs, Volume=	0.274 af,	Atten= 0%, Lag= 0.0 min
Primary =	2.29 cfs @	12.25 hrs, Volume=	0.274 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 165.43' @ 12.25 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	164.34'	**12.0" Round Culvert** L= 94.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 164.34' / 152.00' S= 0.1313 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=2.29 cfs @ 12.25 hrs HW=165.43' (Free Discharge)
└─**1=Culvert** (Inlet Controls 2.29 cfs @ 2.91 fps)



Summary for Pond 21P: Infiltration Basin 1

Inflow Area = 3.634 ac, 8.78% Impervious, Inflow Depth > 1.02" for 10-Year event
Inflow = 2.55 cfs @ 12.23 hrs, Volume= 0.309 af
Outflow = 1.24 cfs @ 12.56 hrs, Volume= 0.239 af, Atten= 51%, Lag= 20.0 min
Discarded = 0.10 cfs @ 12.56 hrs, Volume= 0.074 af
Primary = 1.14 cfs @ 12.56 hrs, Volume= 0.165 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 153.91' @ 12.56 hrs Surf.Area= 2,656 sf Storage= 3,725 cf

Plug-Flow detention time= 108.4 min calculated for 0.239 af (77% of inflow)
Center-of-Mass det. time= 41.1 min (878.0 - 836.9)

Volume	Invert	Avail.Storage	Storage Description
#1	152.00'	11,781 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

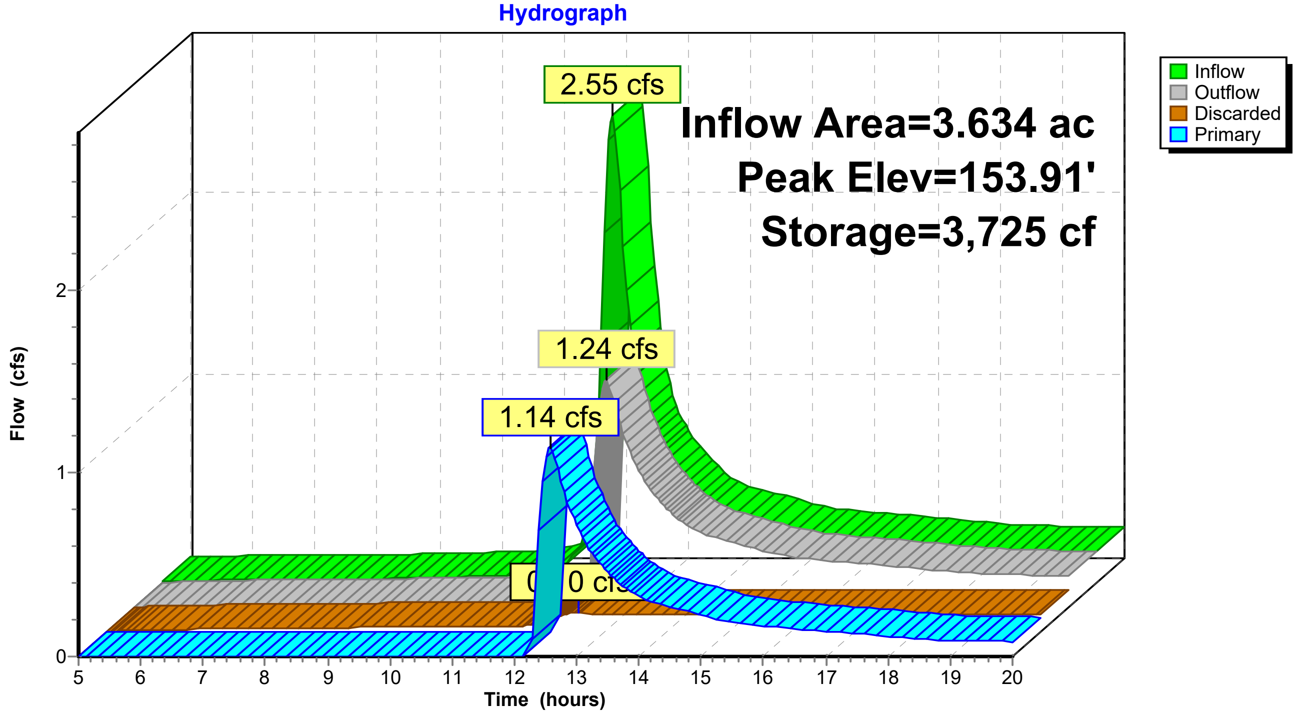
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
152.00	996	0	0
153.00	2,112	1,554	1,554
154.00	2,709	2,411	3,965
155.00	4,044	3,377	7,341
156.00	4,836	4,440	11,781

Device	Routing	Invert	Outlet Devices
#1	Discarded	152.00'	**1.020 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 150.00'
#2	Primary	152.00'	**18.0" Round Culvert** L= 121.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 152.00' / 139.00' S= 0.1074 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf
#3	Device 2	154.00'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 2	153.60'	**2.0' long x 0.40' rise Sharp-Crested Vee/Trap Weir** Cv= 2.62 (C= 3.28)

Discarded OutFlow Max=0.10 cfs @ 12.56 hrs HW=153.91' (Free Discharge)
└─**1=Exfiltration** (Controls 0.10 cfs)

Primary OutFlow Max=1.13 cfs @ 12.56 hrs HW=153.91' (Free Discharge)
└─**2=Culvert** (Passes 1.13 cfs of 7.23 cfs potential flow)
  ├─**3=Orifice/Grate** (Controls 0.00 cfs)
  └─**4=Sharp-Crested Vee/Trap Weir** (Weir Controls 1.13 cfs @ 1.82 fps)

Pond 21P: Infiltration Basin 1



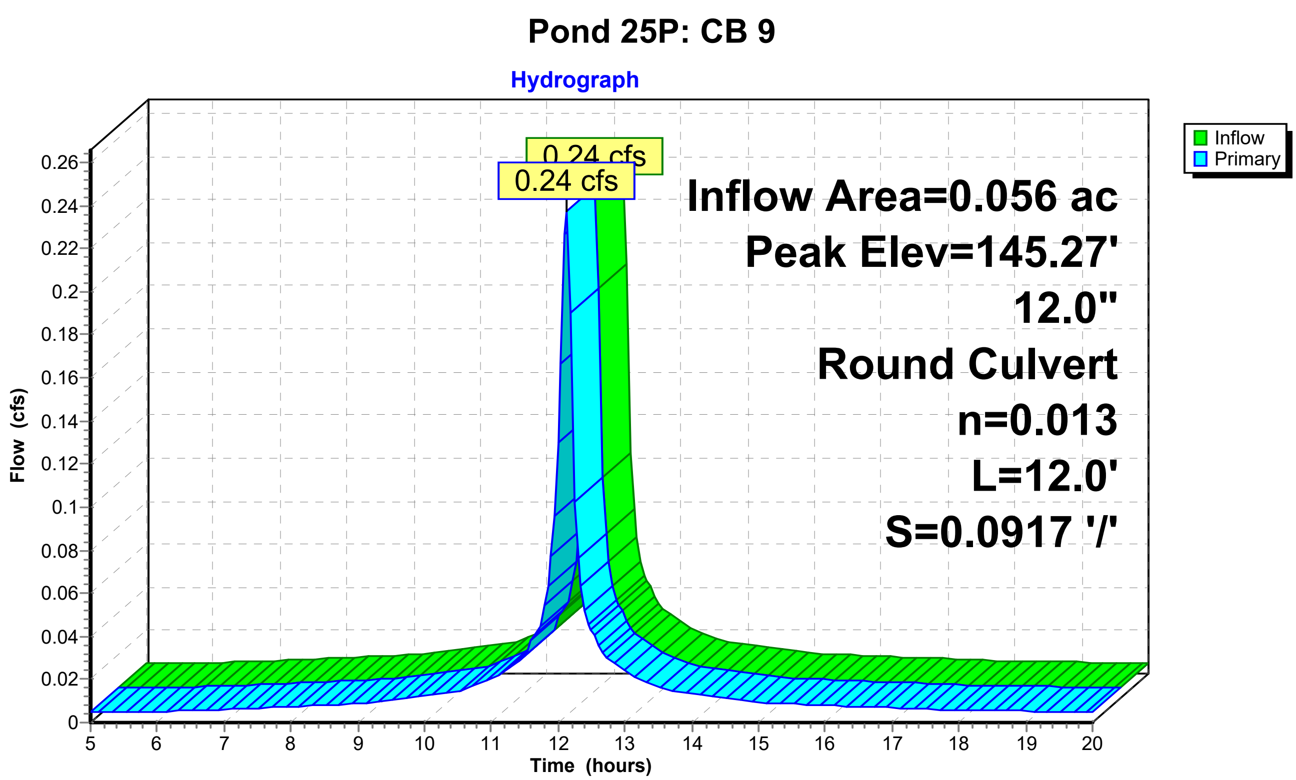
Summary for Pond 25P: CB 9

Inflow Area = 0.056 ac,100.00% Impervious, Inflow Depth > 4.09" for 10-Year event
Inflow = 0.24 cfs @ 12.13 hrs, Volume= 0.019 af
Outflow = 0.24 cfs @ 12.13 hrs, Volume= 0.019 af, Atten= 0%, Lag= 0.0 min
Primary = 0.24 cfs @ 12.13 hrs, Volume= 0.019 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 145.27' @ 12.13 hrs
Flood Elev= 152.72'

Device	Routing	Invert	Outlet Devices
#1	Primary	145.00'	**12.0" Round Culvert** L= 12.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 145.00' / 143.90' S= 0.0917 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.22 cfs @ 12.13 hrs HW=145.26' (Free Discharge)
1=Culvert (Inlet Controls 0.22 cfs @ 1.37 fps)



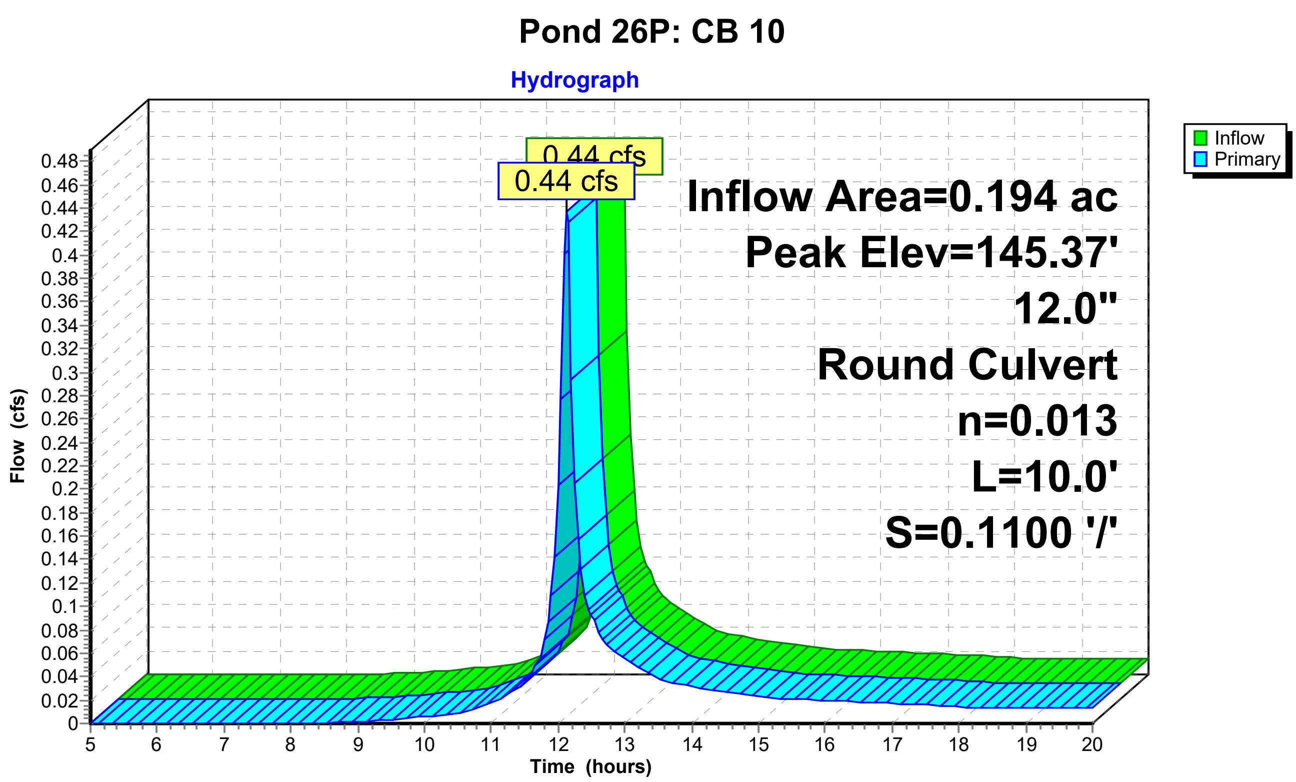
Summary for Pond 26P: CB 10

Inflow Area = 0.194 ac, 28.74% Impervious, Inflow Depth > 1.86" for 10-Year event
Inflow = 0.44 cfs @ 12.13 hrs, Volume= 0.030 af
Outflow = 0.44 cfs @ 12.13 hrs, Volume= 0.030 af, Atten= 0%, Lag= 0.0 min
Primary = 0.44 cfs @ 12.13 hrs, Volume= 0.030 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 145.37' @ 12.13 hrs
Flood Elev= 152.72'

Device	Routing	Invert	Outlet Devices
#1	Primary	145.00'	**12.0" Round Culvert** L= 10.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 145.00' / 143.90' S= 0.1100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.42 cfs @ 12.13 hrs HW=145.36' (Free Discharge)
└**1=Culvert** (Inlet Controls 0.42 cfs @ 1.62 fps)



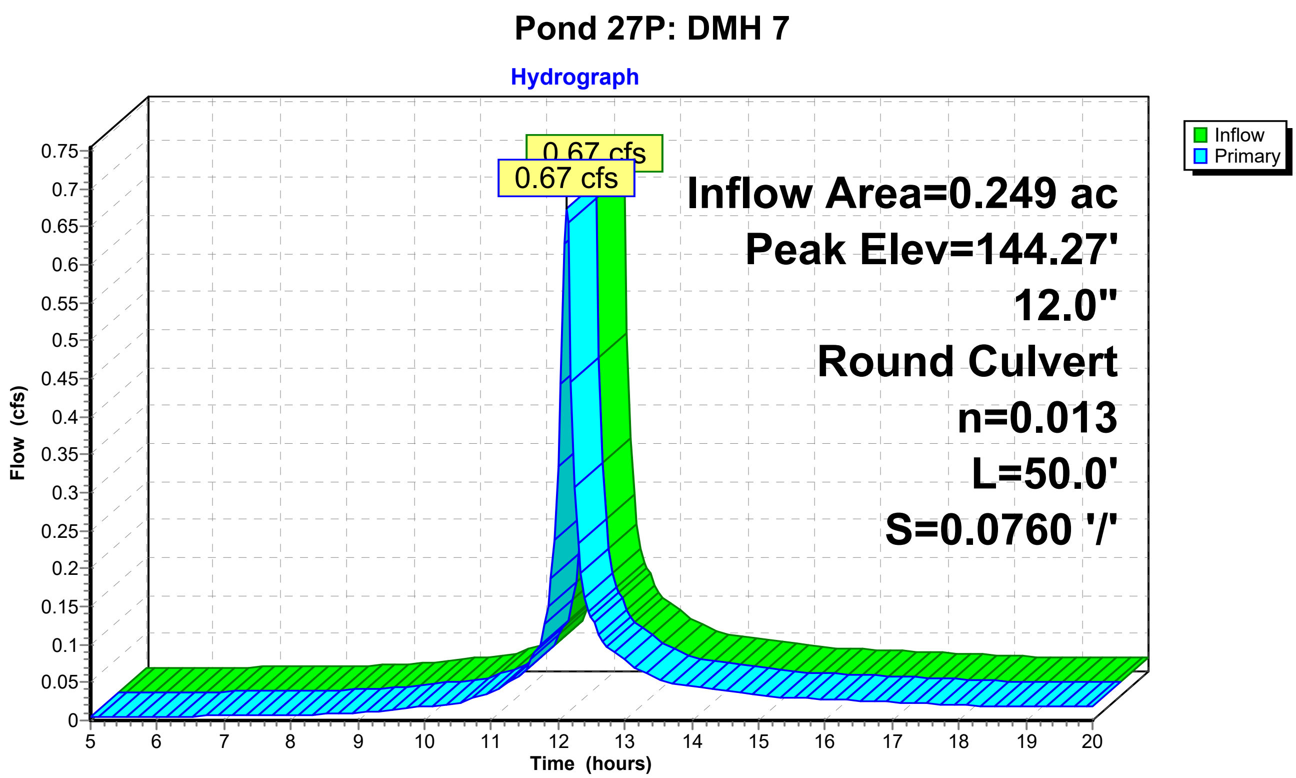
Summary for Pond 27P: DMH 7

Inflow Area =	0.249 ac, 44.65% Impervious, Inflow Depth > 2.36" for 10-Year event			
Inflow =	0.67 cfs @	12.13 hrs, Volume=	0.049 af	
Outflow =	0.67 cfs @	12.13 hrs, Volume=	0.049 af,	Atten= 0%, Lag= 0.0 min
Primary =	0.67 cfs @	12.13 hrs, Volume=	0.049 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 144.27' @ 12.13 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	143.80'	**12.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 143.80' / 140.00' S= 0.0760 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.65 cfs @ 12.13 hrs HW=144.26' (Free Discharge)
└─**1=Culvert** (Inlet Controls 0.65 cfs @ 1.82 fps)



Summary for Pond 28P: Infiltration Basin 2

Inflow Area = 2.114 ac, 21.16% Impervious, Inflow Depth > 1.44" for 10-Year event
Inflow = 2.59 cfs @ 12.15 hrs, Volume= 0.254 af
Outflow = 0.60 cfs @ 12.77 hrs, Volume= 0.184 af, Atten= 77%, Lag= 37.1 min
Discarded = 0.11 cfs @ 12.77 hrs, Volume= 0.079 af
Primary = 0.49 cfs @ 12.77 hrs, Volume= 0.106 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 142.02' @ 12.77 hrs Surf.Area= 2,666 sf Storage= 4,095 cf

Plug-Flow detention time= 136.1 min calculated for 0.184 af (73% of inflow)
Center-of-Mass det. time= 58.3 min (870.5 - 812.2)

Volume	Invert	Avail.Storage	Storage Description
#1	140.00'	10,768 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

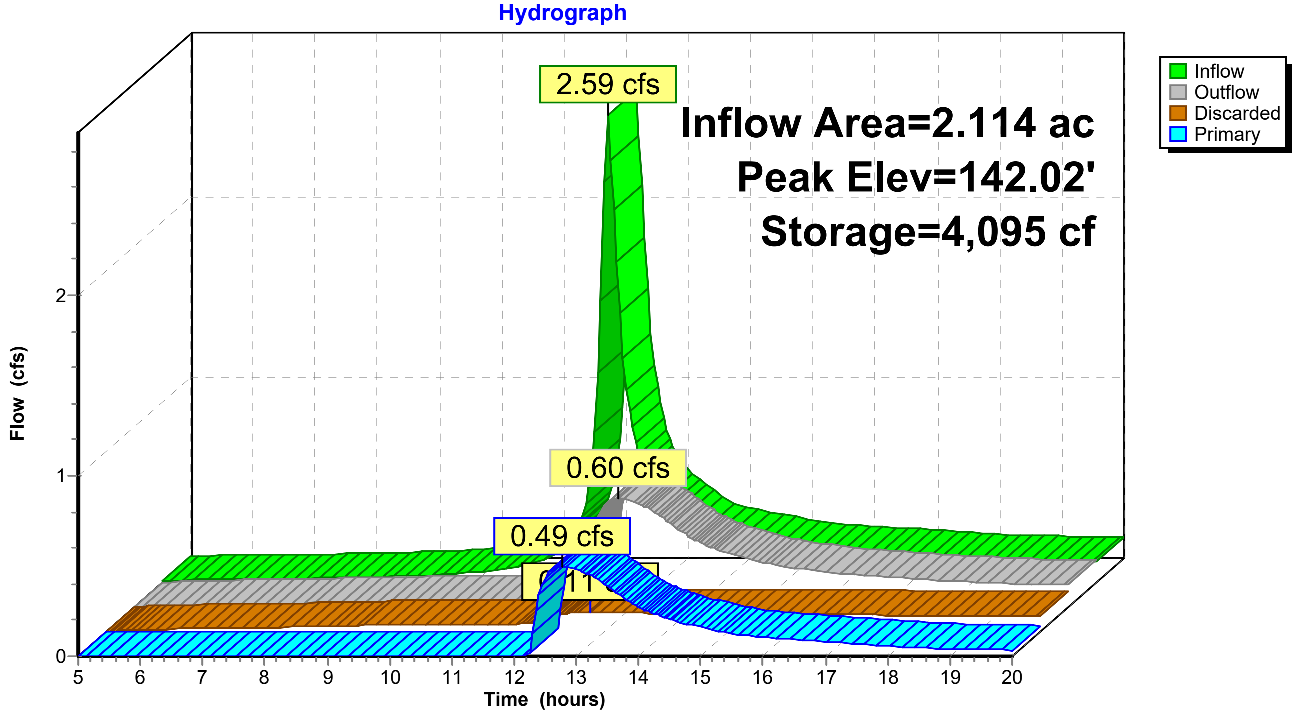
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
140.00	1,410	0	0
141.00	2,002	1,706	1,706
142.00	2,649	2,326	4,032
143.00	3,354	3,002	7,033
144.00	4,115	3,735	10,768

Device	Routing	Invert	Outlet Devices
#1	Discarded	140.00'	**1.020 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 138.00'
#2	Primary	139.00'	**12.0" Round Culvert** L= 65.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 139.00' / 134.50' S= 0.0692 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#3	Device 2	141.50'	**6.0" Vert. Orifice/Grate** C= 0.600
#4	Device 2	142.35'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.11 cfs @ 12.77 hrs HW=142.02' (Free Discharge)
└─**1=Exfiltration** (Controls 0.11 cfs)

Primary OutFlow Max=0.49 cfs @ 12.77 hrs HW=142.02' (Free Discharge)
└─**2=Culvert** (Passes 0.49 cfs of 4.74 cfs potential flow)
  ├─**3=Orifice/Grate** (Orifice Controls 0.49 cfs @ 2.52 fps)
  └─**4=Orifice/Grate** (Controls 0.00 cfs)

Pond 28P: Infiltration Basin 2



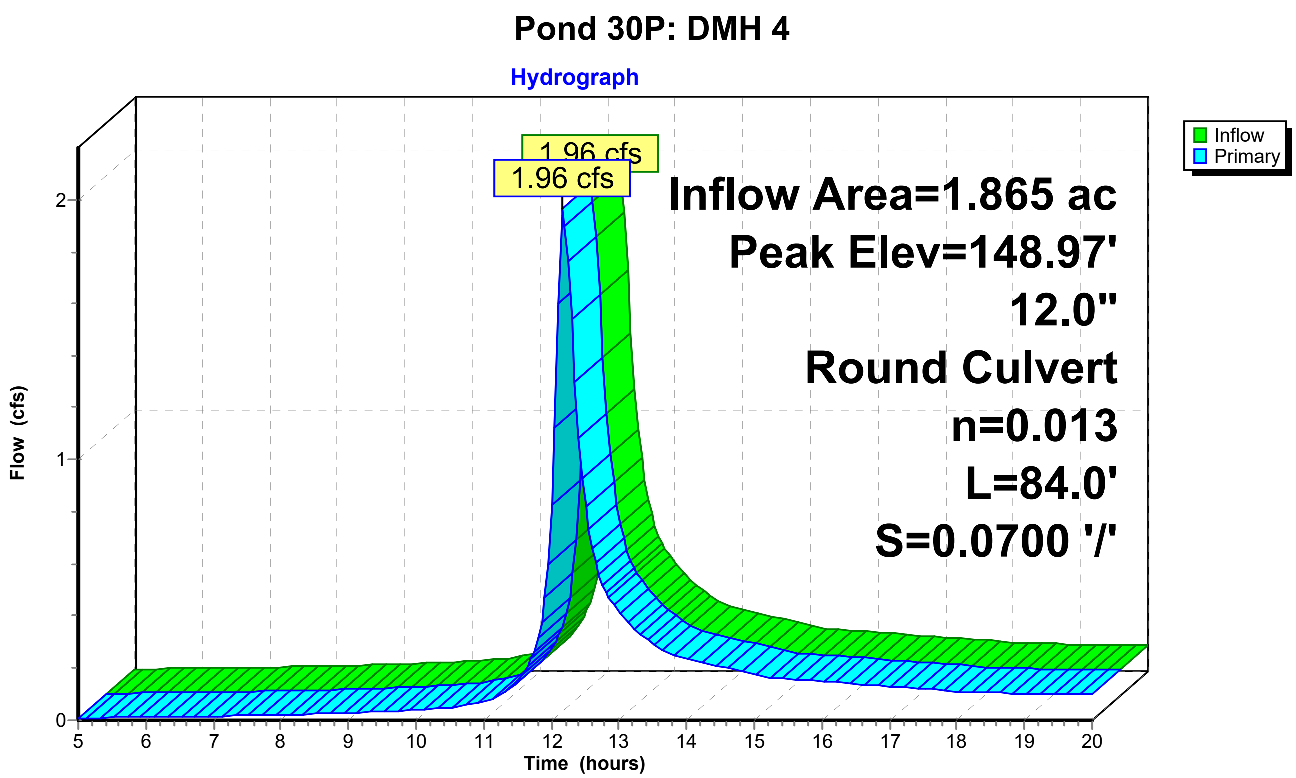
Summary for Pond 30P: DMH 4

Inflow Area =	1.865 ac, 18.02% Impervious, Inflow Depth > 1.32"	for 10-Year event	
Inflow =	1.96 cfs @ 12.17 hrs, Volume=	0.205 af	
Outflow =	1.96 cfs @ 12.17 hrs, Volume=	0.205 af, Atten= 0%, Lag= 0.0 min	
Primary =	1.96 cfs @ 12.17 hrs, Volume=	0.205 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 148.97' @ 12.17 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	148.05'	**12.0" Round Culvert** L= 84.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 148.05' / 142.17' S= 0.0700 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.92 cfs @ 12.17 hrs HW=148.96' (Free Discharge)
└─**1=Culvert** (Inlet Controls 1.92 cfs @ 2.56 fps)



Summary for Pond 33P: Subsurface Inf. Aea 2

Inflow Area = 0.629 ac,100.00% Impervious, Inflow Depth > 4.09" for 10-Year event
Inflow = 2.68 cfs @ 12.13 hrs, Volume= 0.214 af
Outflow = 0.44 cfs @ 12.57 hrs, Volume= 0.138 af, Atten= 83%, Lag= 26.6 min
Discarded = 0.13 cfs @ 12.57 hrs, Volume= 0.120 af
Primary = 0.31 cfs @ 12.57 hrs, Volume= 0.019 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 152.69' @ 12.57 hrs Surf.Area= 0.055 ac Storage= 0.099 af

Plug-Flow detention time= 170.3 min calculated for 0.138 af (65% of inflow)
Center-of-Mass det. time= 82.5 min (819.4 - 736.9)

Volume	Invert	Avail.Storage	Storage Description
#1A	150.00'	0.050 af	**20.50'W x 117.54'L x 3.50'H Field A** 0.194 af Overall - 0.067 af Embedded = 0.126 af x 40.0% Voids
#2A	150.50'	0.067 af	**ADS_StormTech SC-740 +Cap** x 64 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 64 Chambers in 4 Rows
		0.118 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	150.00'	**1.020 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 148.00'
#2	Primary	150.00'	**12.0" Round Culvert** L= 70.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 150.00' / 138.00' S= 0.1714 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#3	Device 2	152.60'	**4.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.13 cfs @ 12.57 hrs HW=152.69' (Free Discharge)
└─**1=Exfiltration** (Controls 0.13 cfs)

Primary OutFlow Max=0.30 cfs @ 12.57 hrs HW=152.69' (Free Discharge)
└─**2=Culvert** (Passes 0.30 cfs of 4.42 cfs potential flow)
  └─**3=Broad-Crested Rectangular Weir** (Weir Controls 0.30 cfs @ 0.84 fps)

Pond 33P: Subsurface Inf. Aea 2 - Chamber Wizard Field A

Chamber Model = ADS_StormTech SC-740 +Cap (ADS StormTech® SC-740 with cap length)
Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf
Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

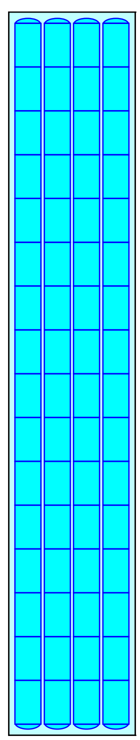
16 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 115.54' Row Length +12.0" End Stone x 2 = 117.54' Base Length
4 Rows x 51.0" Wide + 6.0" Spacing x 3 + 12.0" Side Stone x 2 = 20.50' Base Width
6.0" Base + 30.0" Chamber Height + 6.0" Cover = 3.50' Field Height

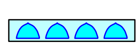
64 Chambers x 45.9 cf = 2,940.2 cf Chamber Storage

8,433.3 cf Field - 2,940.2 cf Chambers = 5,493.1 cf Stone x 40.0% Voids = 2,197.2 cf Stone Storage

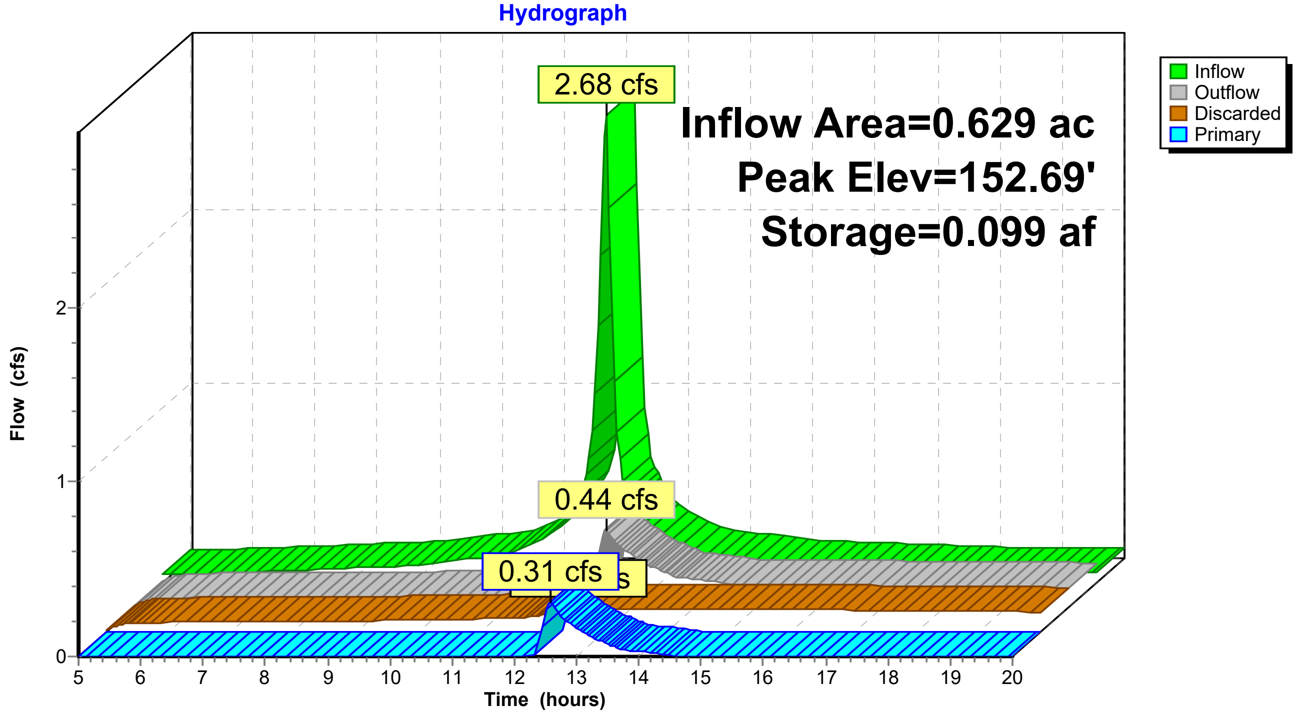
Chamber Storage + Stone Storage = 5,137.4 cf = 0.118 af
Overall Storage Efficiency = 60.9%
Overall System Size = 117.54' x 20.50' x 3.50'

64 Chambers
312.3 cy Field
203.4 cy Stone





Pond 33P: Subsurface Inf. Aea 2



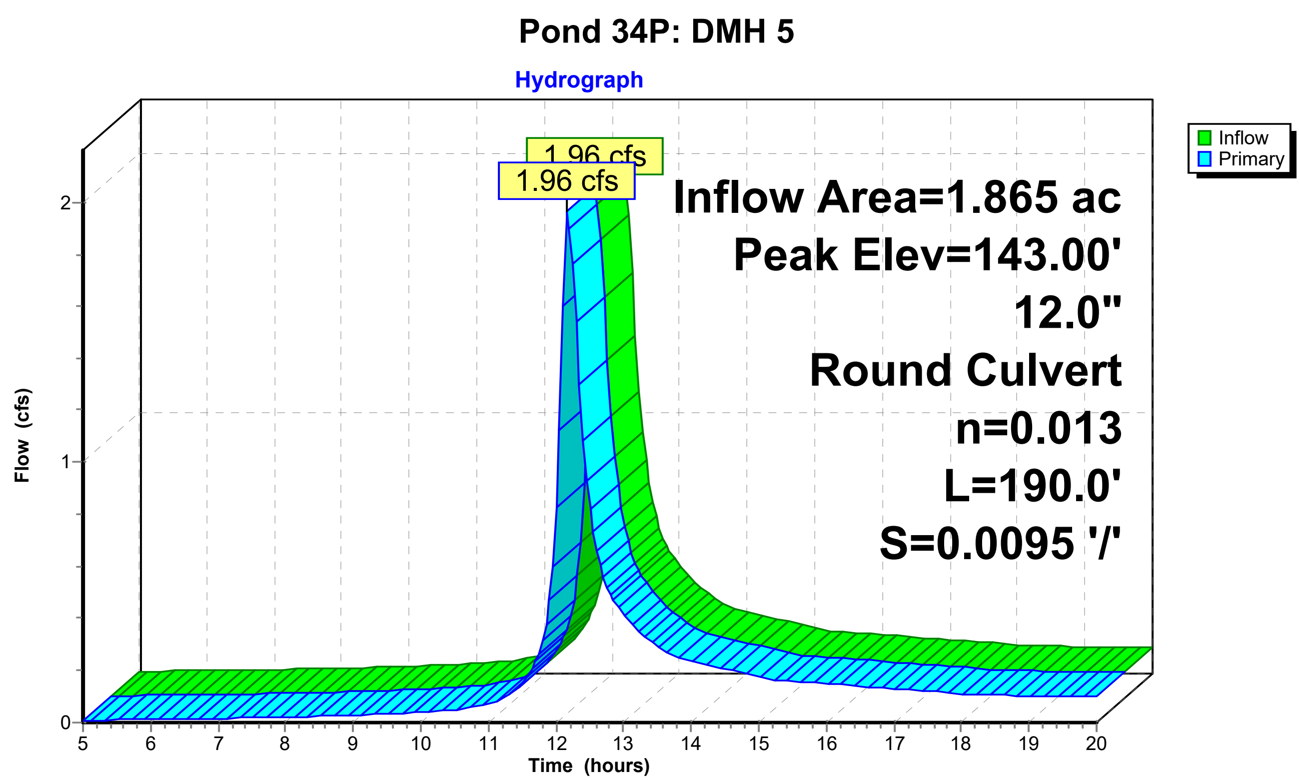
Summary for Pond 34P: DMH 5

Inflow Area =	1.865 ac,	18.02% Impervious,	Inflow Depth > 1.32"	for 10-Year event
Inflow =	1.96 cfs @	12.17 hrs, Volume=	0.205 af	
Outflow =	1.96 cfs @	12.17 hrs, Volume=	0.205 af, Atten= 0%, Lag= 0.0 min	
Primary =	1.96 cfs @	12.17 hrs, Volume=	0.205 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 143.00' @ 12.17 hrs
Flood Elev= 145.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	142.07'	**12.0" Round Culvert** L= 190.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 142.07' / 140.27' S= 0.0095 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.92 cfs @ 12.17 hrs HW=142.98' (Free Discharge)
↑**1=Culvert** (Inlet Controls 1.92 cfs @ 2.56 fps)



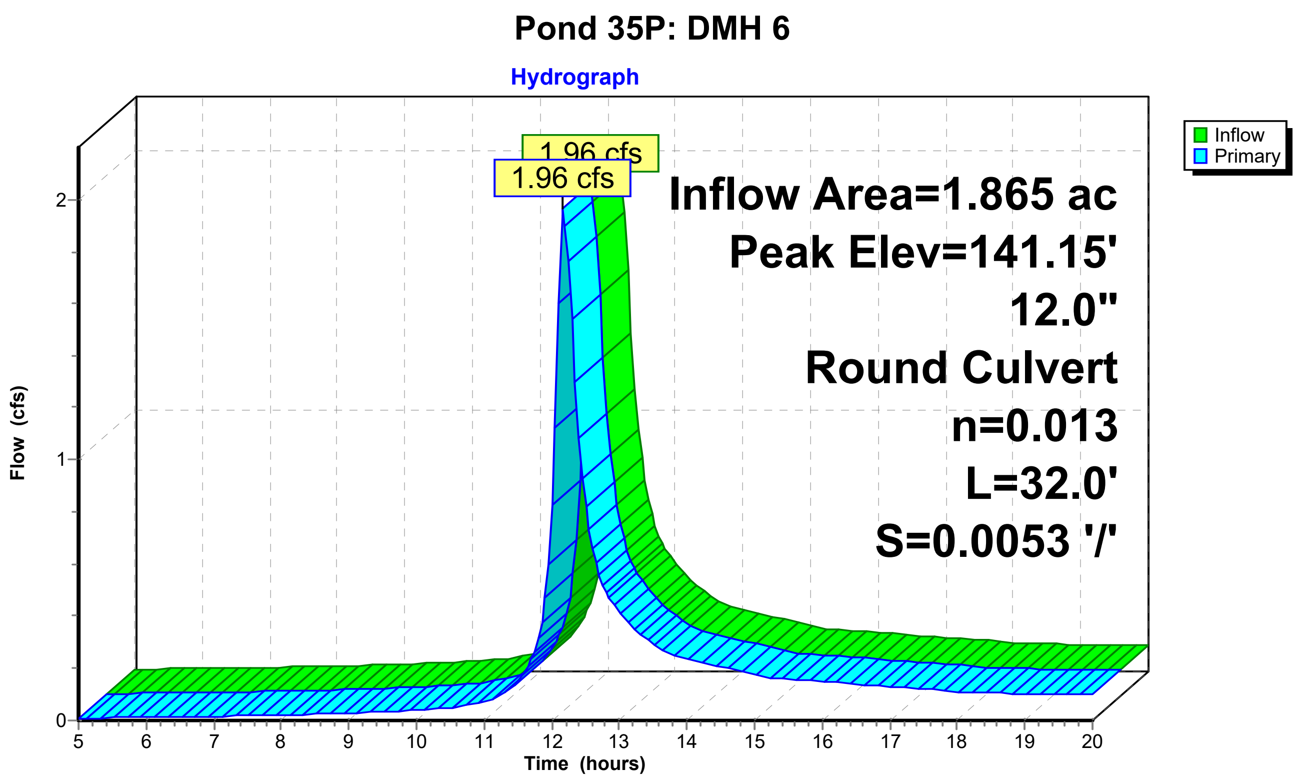
Summary for Pond 35P: DMH 6

Inflow Area = 1.865 ac, 18.02% Impervious, Inflow Depth > 1.32" for 10-Year event
Inflow = 1.96 cfs @ 12.17 hrs, Volume= 0.205 af
Outflow = 1.96 cfs @ 12.17 hrs, Volume= 0.205 af, Atten= 0%, Lag= 0.0 min
Primary = 1.96 cfs @ 12.17 hrs, Volume= 0.205 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 141.15' @ 12.17 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	140.17'	**12.0" Round Culvert** L= 32.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 140.17' / 140.00' S= 0.0053 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.92 cfs @ 12.17 hrs HW=141.14' (Free Discharge)
↑—**1=Culvert** (Barrel Controls 1.92 cfs @ 3.14 fps)



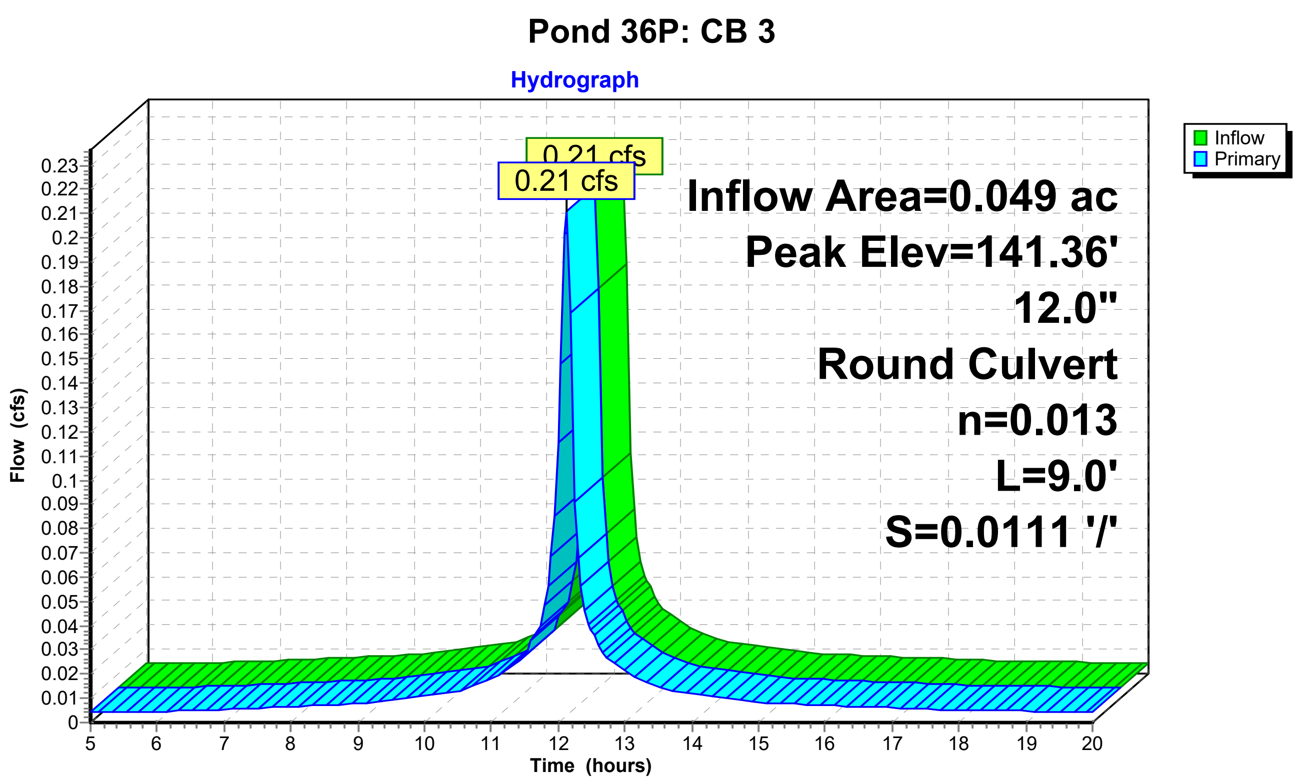
Summary for Pond 36P: CB 3

Inflow Area =	0.049 ac,100.00% Impervious,	Inflow Depth > 4.09"	for 10-Year event	
Inflow =	0.21 cfs @	12.13 hrs, Volume=	0.017 af	
Outflow =	0.21 cfs @	12.13 hrs, Volume=	0.017 af,	Atten= 0%, Lag= 0.0 min
Primary =	0.21 cfs @	12.13 hrs, Volume=	0.017 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 141.36' @ 12.13 hrs
Flood Elev= 144.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	141.10'	**12.0" Round Culvert** L= 9.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 141.10' / 141.00' S= 0.0111 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.20 cfs @ 12.13 hrs HW=141.35' (Free Discharge)
└─**1=Culvert** (Barrel Controls 0.20 cfs @ 1.97 fps)



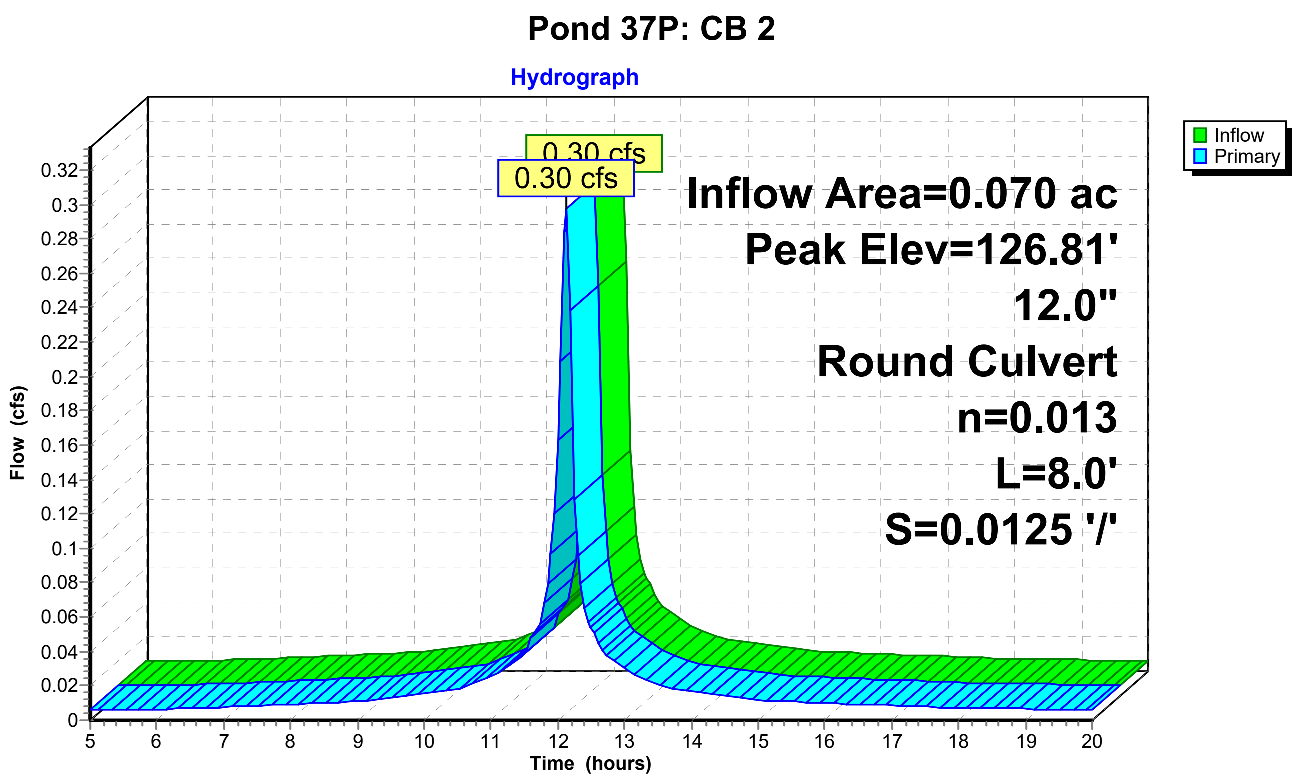
Summary for Pond 37P: CB 2

Inflow Area = 0.070 ac,100.00% Impervious, Inflow Depth > 4.09" for 10-Year event
Inflow = 0.30 cfs @ 12.13 hrs, Volume= 0.024 af
Outflow = 0.30 cfs @ 12.13 hrs, Volume= 0.024 af, Atten= 0%, Lag= 0.0 min
Primary = 0.30 cfs @ 12.13 hrs, Volume= 0.024 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 126.81' @ 12.13 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	126.50'	**12.0" Round Culvert** L= 8.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 126.50' / 126.40' S= 0.0125 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.29 cfs @ 12.13 hrs HW=126.80' (Free Discharge)
└─**1=Culvert** (Barrel Controls 0.29 cfs @ 2.14 fps)



Summary for Pond 38P: Det. Area 2

Inflow Area = 0.104 ac, 94.17% Impervious, Inflow Depth > 3.93" for 10-Year event
Inflow = 0.43 cfs @ 12.13 hrs, Volume= 0.034 af
Outflow = 0.03 cfs @ 13.56 hrs, Volume= 0.020 af, Atten= 93%, Lag= 86.0 min
Primary = 0.03 cfs @ 13.56 hrs, Volume= 0.020 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 141.86' @ 13.56 hrs Surf.Area= 0.022 ac Storage= 0.021 af

Plug-Flow detention time= 277.9 min calculated for 0.020 af (58% of inflow)
Center-of-Mass det. time= 182.7 min (925.8 - 743.1)

Volume	Invert	Avail.Storage	Storage Description
#1A	140.10'	0.020 af	**11.00'W x 86.67'L x 3.33'H Field A**
			0.073 af Overall - 0.023 af Embedded = 0.050 af x 40.0% Voids
#2A	140.60'	0.018 af	**ADS N-12 24"** x 12 Inside #1
			Inside= 23.8"W x 23.8"H => 3.10 sf x 20.00'L = 62.0 cf
			Outside= 28.0"W x 28.0"H => 3.92 sf x 20.00'L = 78.4 cf
			12 Chambers in 3 Rows
			9.00' Header x 3.10 sf x 2 = 55.8 cf Inside
		0.038 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	140.60'	**12.0" Round Culvert**
			L= 10.0' CPP, projecting, no headwall, Ke= 0.900
			Inlet / Outlet Invert= 140.60' / 140.00' S= 0.0600 '/' Cc= 0.900
			n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	142.00'	**8.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	142.70'	**4.0' long x 0.5' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00
			Coef. (English) 2.80 2.92 3.08 3.30 3.32
#4	Device 1	140.60'	**1.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=0.03 cfs @ 13.56 hrs HW=141.86' (Free Discharge)
└─**1=Culvert** (Passes 0.03 cfs of 2.61 cfs potential flow)
  ├─**2=Orifice/Grate** (Controls 0.00 cfs)
  ├─**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)
  └─**4=Orifice/Grate** (Orifice Controls 0.03 cfs @ 5.33 fps)

Pond 38P: Det. Area 2 - Chamber Wizard Field A

Chamber Model = ADS N-12 24" (ADS N-12® Pipe)
Inside= 23.8"W x 23.8"H => 3.10 sf x 20.00'L = 62.0 cf
Outside= 28.0"W x 28.0"H => 3.92 sf x 20.00'L = 78.4 cf

28.0" Wide + 12.0" Spacing = 40.0" C-C Row Spacing

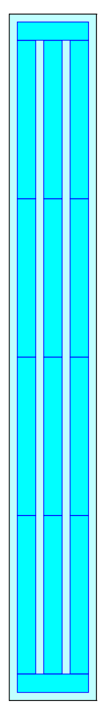
4 Chambers/Row x 20.00' Long +2.33' Header x 2 = 84.67' Row Length +12.0" End Stone x 2 = 86.67' Base Length
3 Rows x 28.0" Wide + 12.0" Spacing x 2 + 12.0" Side Stone x 2 = 11.00' Base Width
6.0" Base + 28.0" Chamber Height + 6.0" Cover = 3.33' Field Height

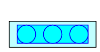
12 Chambers x 62.0 cf + 9.00' Header x 3.10 sf x 2 = 799.8 cf Chamber Storage
12 Chambers x 78.4 cf + 9.00' Header x 3.92 sf x 2 = 1,011.3 cf Displacement

3,177.9 cf Field - 1,011.3 cf Chambers = 2,166.6 cf Stone x 40.0% Voids = 866.6 cf Stone Storage

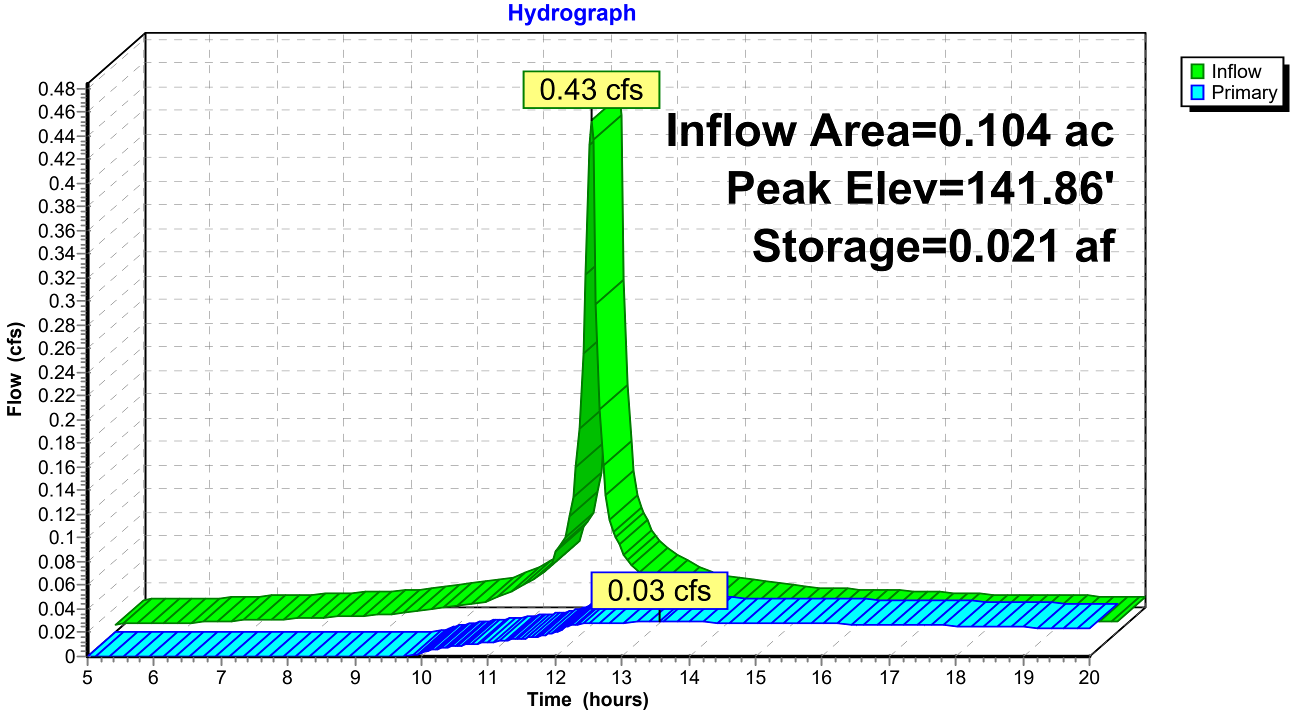
Chamber Storage + Stone Storage = 1,666.4 cf = 0.038 af
Overall Storage Efficiency = 52.4%
Overall System Size = 86.67' x 11.00' x 3.33'

12 Chambers
117.7 cy Field
80.2 cy Stone





Pond 38P: Det. Area 2



Summary for Pond 39P: CB 1

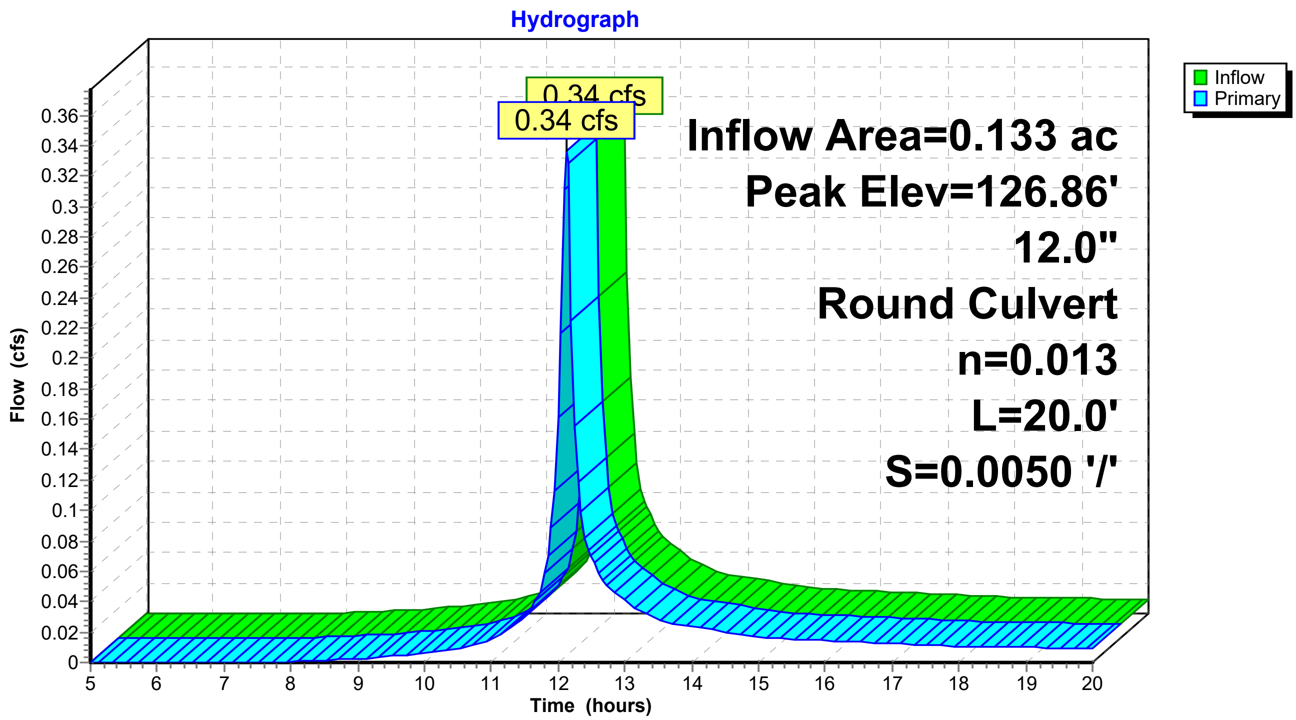
Inflow Area = 0.133 ac, 36.82% Impervious, Inflow Depth > 2.09" for 10-Year event
Inflow = 0.34 cfs @ 12.13 hrs, Volume= 0.023 af
Outflow = 0.34 cfs @ 12.13 hrs, Volume= 0.023 af, Atten= 0%, Lag= 0.0 min
Primary = 0.34 cfs @ 12.13 hrs, Volume= 0.023 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 126.86' @ 12.13 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	126.50'	**12.0" Round Culvert** L= 20.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 126.50' / 126.40' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.32 cfs @ 12.13 hrs HW=126.85' (Free Discharge)
1=Culvert (Barrel Controls 0.32 cfs @ 1.97 fps)

Pond 39P: CB 1



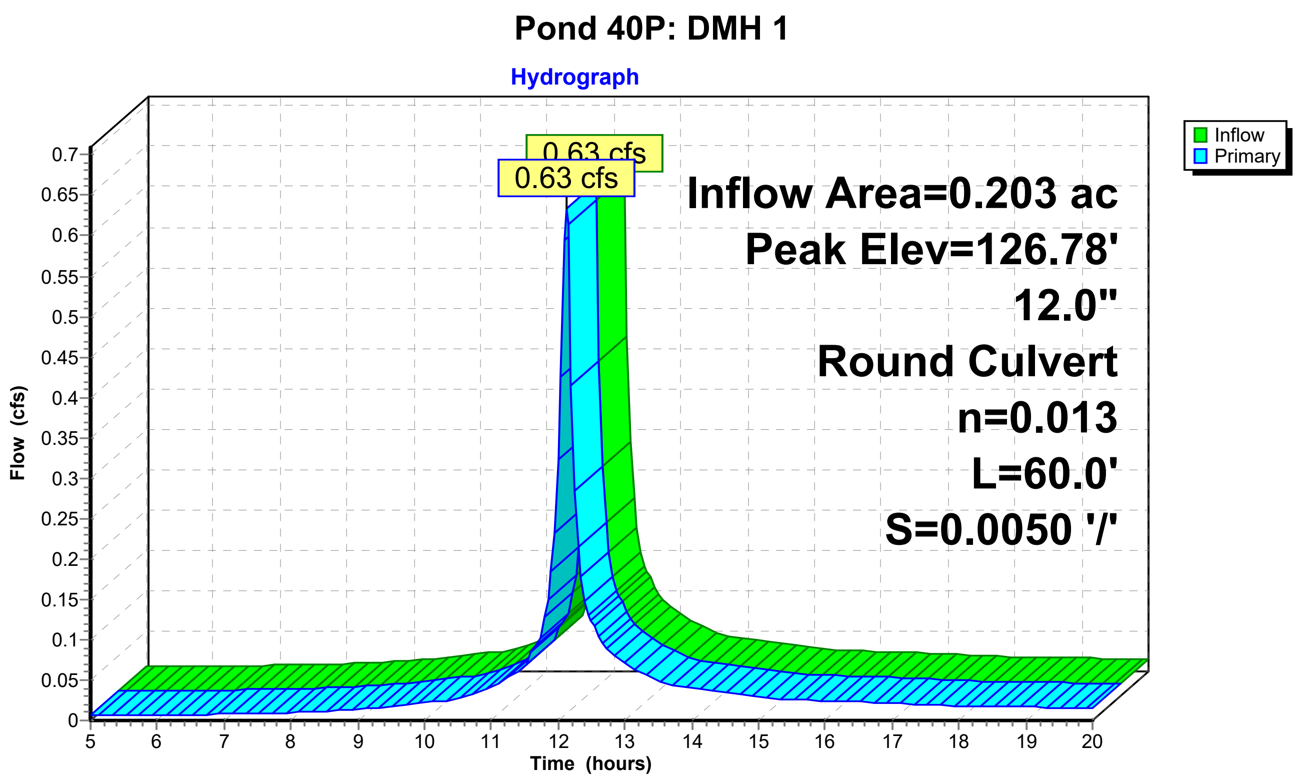
Summary for Pond 40P: DMH 1

Inflow Area =	0.203 ac,	58.56% Impervious,	Inflow Depth > 2.78"	for 10-Year event
Inflow =	0.63 cfs @	12.13 hrs, Volume=	0.047 af	
Outflow =	0.63 cfs @	12.13 hrs, Volume=	0.047 af,	Atten= 0%, Lag= 0.0 min
Primary =	0.63 cfs @	12.13 hrs, Volume=	0.047 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 126.78' @ 12.13 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	126.30'	**12.0" Round Culvert** L= 60.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 126.30' / 126.00' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.61 cfs @ 12.13 hrs HW=126.77' (Free Discharge)
└—**1=Culvert** (Barrel Controls 0.61 cfs @ 2.44 fps)



Summary for Pond 43P: Subsurface Inf. Area 1

Inflow Area = 0.203 ac, 58.56% Impervious, Inflow Depth > 2.78" for 10-Year event
Inflow = 0.63 cfs @ 12.13 hrs, Volume= 0.047 af
Outflow = 0.64 cfs @ 12.14 hrs, Volume= 0.041 af, Atten= 0%, Lag= 0.4 min
Discarded = 0.01 cfs @ 12.14 hrs, Volume= 0.012 af
Primary = 0.62 cfs @ 12.14 hrs, Volume= 0.029 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 127.65' @ 12.14 hrs Surf.Area= 0.008 ac Storage= 0.006 af

Plug-Flow detention time= 62.9 min calculated for 0.041 af (87% of inflow)
Center-of-Mass det. time= 18.9 min (790.2 - 771.2)

Volume	Invert	Avail.Storage	Storage Description
#1A	126.00'	0.006 af	**7.63'W x 44.42'L x 2.21'H Field A** 0.017 af Overall - 0.003 af Embedded = 0.014 af x 40.0% Voids
#2A	126.50'	0.002 af	**ADS N-12 12"** x 6 Inside #1 Inside= 12.2"W x 12.2"H => 0.81 sf x 20.00'L = 16.2 cf Outside= 14.5"W x 14.5"H => 1.05 sf x 20.00'L = 20.9 cf 6 Chambers in 3 Rows 5.63' Header x 0.81 sf x 2 = 9.1 cf Inside
		0.008 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	126.00'	**1.020 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 122.00'
#2	Primary	126.00'	**12.0" Round Culvert** L= 10.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 126.00' / 125.90' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#3	Device 2	127.50'	**4.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.01 cfs @ 12.14 hrs HW=127.64' (Free Discharge)
└─**1=Exfiltration** (Controls 0.01 cfs)

Primary OutFlow Max=0.60 cfs @ 12.14 hrs HW=127.64' (Free Discharge)
└─**2=Culvert** (Passes 0.60 cfs of 3.19 cfs potential flow)
  └─**3=Broad-Crested Rectangular Weir** (Weir Controls 0.60 cfs @ 1.06 fps)

Pond 43P: Subsurface Inf. Area 1 - Chamber Wizard Field A

Chamber Model = ADS N-12 12" (ADS N-12® Pipe)
Inside= 12.2"W x 12.2"H => 0.81 sf x 20.00'L = 16.2 cf
Outside= 14.5"W x 14.5"H => 1.05 sf x 20.00'L = 20.9 cf

14.5" Wide + 12.0" Spacing = 26.5" C-C Row Spacing

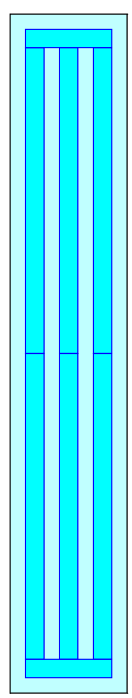
2 Chambers/Row x 20.00' Long +1.21' Header x 2 = 42.42' Row Length +12.0" End Stone x 2 = 44.42' Base Length
3 Rows x 14.5" Wide + 12.0" Spacing x 2 + 12.0" Side Stone x 2 = 7.63' Base Width
6.0" Base + 14.5" Chamber Height + 6.0" Cover = 2.21' Field Height

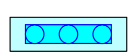
6 Chambers x 16.2 cf + 5.63' Header x 0.81 sf x 2 = 106.3 cf Chamber Storage
6 Chambers x 20.9 cf + 5.63' Header x 1.05 sf x 2 = 137.4 cf Displacement

748.3 cf Field - 137.4 cf Chambers = 610.9 cf Stone x 40.0% Voids = 244.4 cf Stone Storage

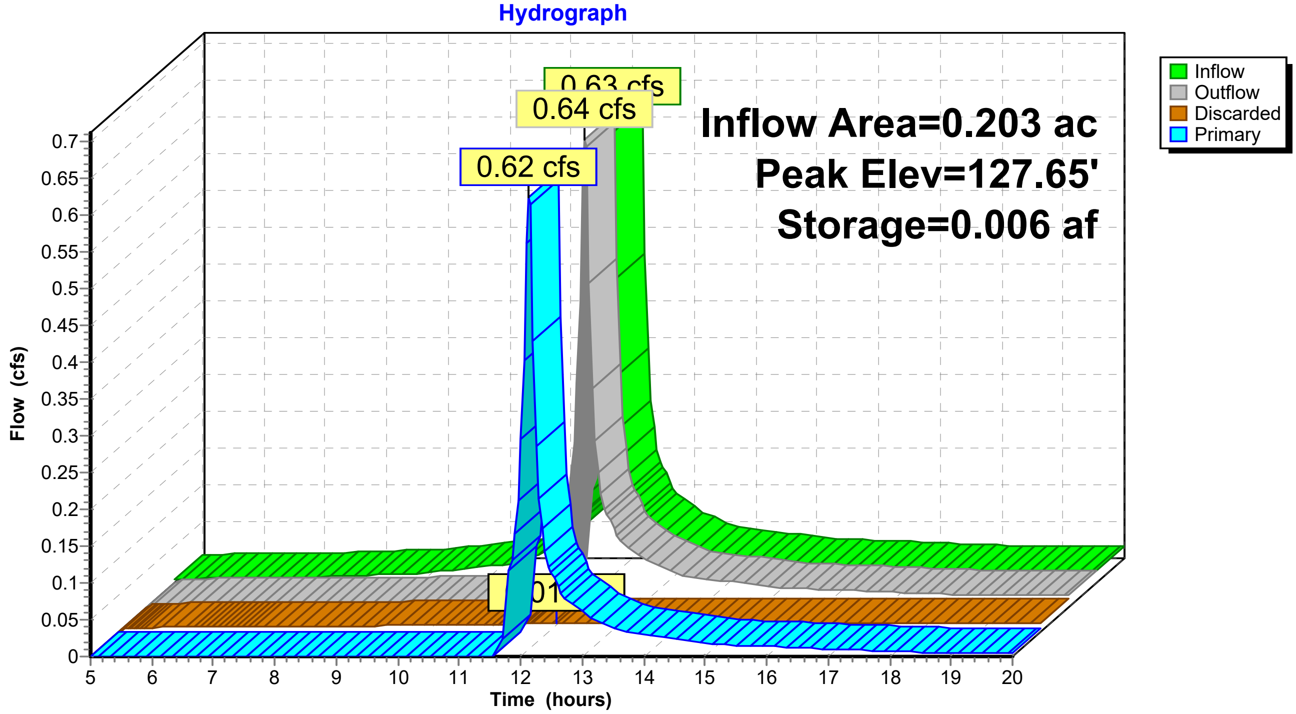
Chamber Storage + Stone Storage = 350.7 cf = 0.008 af
Overall Storage Efficiency = 46.9%
Overall System Size = 44.42' x 7.63' x 2.21'

6 Chambers
27.7 cy Field
22.6 cy Stone





Pond 43P: Subsurface Inf. Area 1



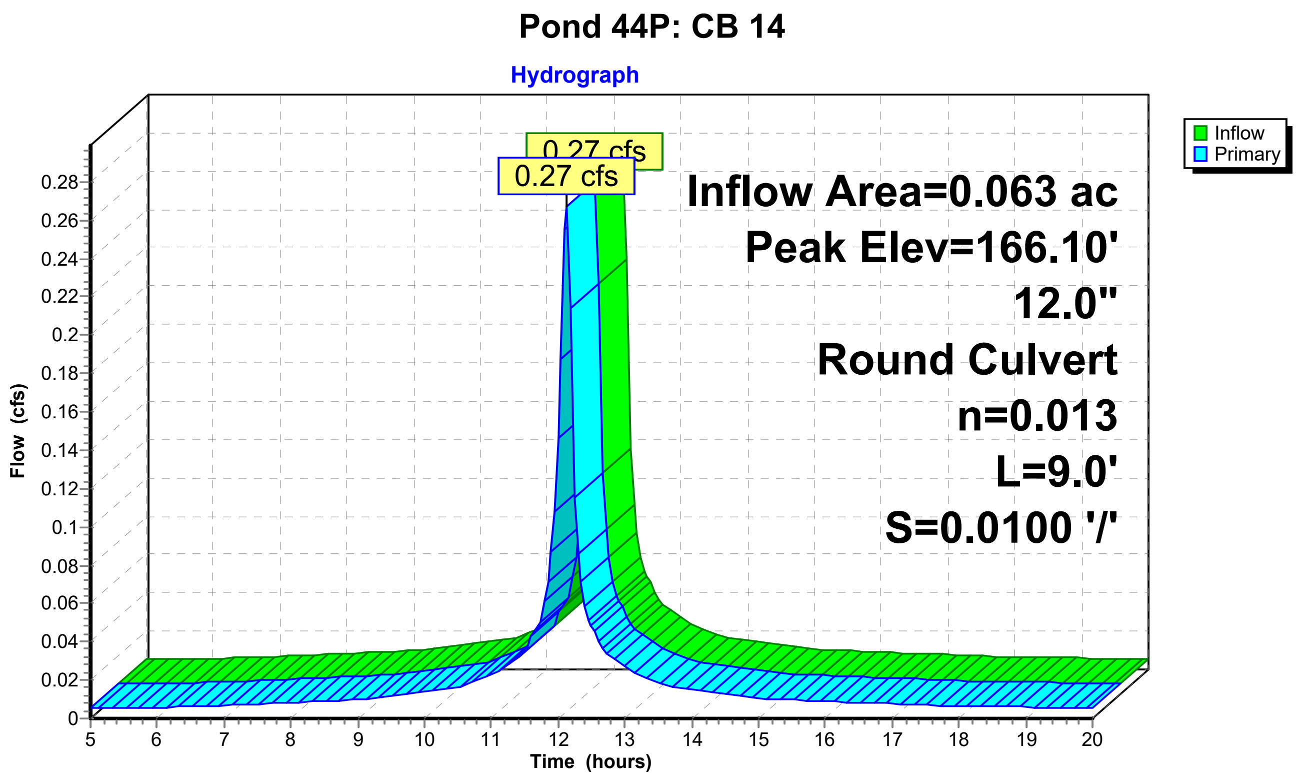
Summary for Pond 44P: CB 14

Inflow Area =	0.063 ac,100.00% Impervious,	Inflow Depth > 4.09"	for 10-Year event		
Inflow =	0.27 cfs @	12.13 hrs,	Volume=	0.021 af	
Outflow =	0.27 cfs @	12.13 hrs,	Volume=	0.021 af,	Atten= 0%, Lag= 0.0 min
Primary =	0.27 cfs @	12.13 hrs,	Volume=	0.021 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 166.10' @ 12.13 hrs
Flood Elev= 170.24'

Device	Routing	Invert	Outlet Devices
#1	Primary	165.80'	**12.0" Round Culvert** L= 9.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 165.80' / 165.71' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.25 cfs @ 12.13 hrs HW=166.09' (Free Discharge)
└─**1=Culvert** (Barrel Controls 0.25 cfs @ 2.02 fps)



Summary for Pond 45P: Det. Area 1

Inflow Area = 0.203 ac, 58.56% Impervious, Inflow Depth > 1.72" for 10-Year event
Inflow = 0.62 cfs @ 12.14 hrs, Volume= 0.029 af
Outflow = 0.06 cfs @ 12.96 hrs, Volume= 0.018 af, Atten= 90%, Lag= 49.6 min
Primary = 0.06 cfs @ 12.96 hrs, Volume= 0.018 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 125.45' @ 12.96 hrs Surf.Area= 0.027 ac Storage= 0.016 af

Plug-Flow detention time= 138.0 min calculated for 0.018 af (61% of inflow)
Center-of-Mass det. time= 78.7 min (867.6 - 788.9)

Volume	Invert	Avail.Storage	Storage Description
#1A	124.00'	0.030 af	**14.33'W x 82.00'L x 3.83'H Field A** 0.103 af Overall - 0.029 af Embedded = 0.075 af x 40.0% Voids
#2A	125.00'	0.023 af	**ADS N-12 24"** x 16 Inside #1 Inside= 23.8"W x 23.8"H => 3.10 sf x 20.00'L = 62.0 cf Outside= 28.0"W x 28.0"H => 3.92 sf x 20.00'L = 78.4 cf 16 Chambers in 4 Rows
		0.053 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	125.00'	**12.0" Round Culvert** L= 10.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 125.00' / 122.00' S= 0.3000 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	126.75'	**4.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#3	Device 1	125.00'	**2.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=0.06 cfs @ 12.96 hrs HW=125.45' (Free Discharge)
1=Culvert (Passes 0.06 cfs of 0.62 cfs potential flow)
2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)
3=Orifice/Grate (Orifice Controls 0.06 cfs @ 2.93 fps)

Pond 45P: Det. Area 1 - Chamber Wizard Field A

Chamber Model = ADS N-12 24" (ADS N-12® Pipe)
Inside= 23.8"W x 23.8"H => 3.10 sf x 20.00'L = 62.0 cf
Outside= 28.0"W x 28.0"H => 3.92 sf x 20.00'L = 78.4 cf

28.0" Wide + 12.0" Spacing = 40.0" C-C Row Spacing

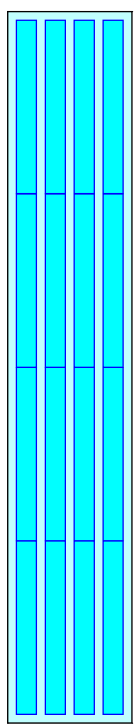
4 Chambers/Row x 20.00' Long = 80.00' Row Length +12.0" End Stone x 2 = 82.00' Base Length
4 Rows x 28.0" Wide + 12.0" Spacing x 3 + 12.0" Side Stone x 2 = 14.33' Base Width
12.0" Base + 28.0" Chamber Height + 6.0" Cover = 3.83' Field Height

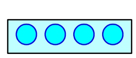
16 Chambers x 62.0 cf = 992.0 cf Chamber Storage
16 Chambers x 78.4 cf = 1,254.3 cf Displacement

4,505.6 cf Field - 1,254.3 cf Chambers = 3,251.3 cf Stone x 40.0% Voids = 1,300.5 cf Stone Storage

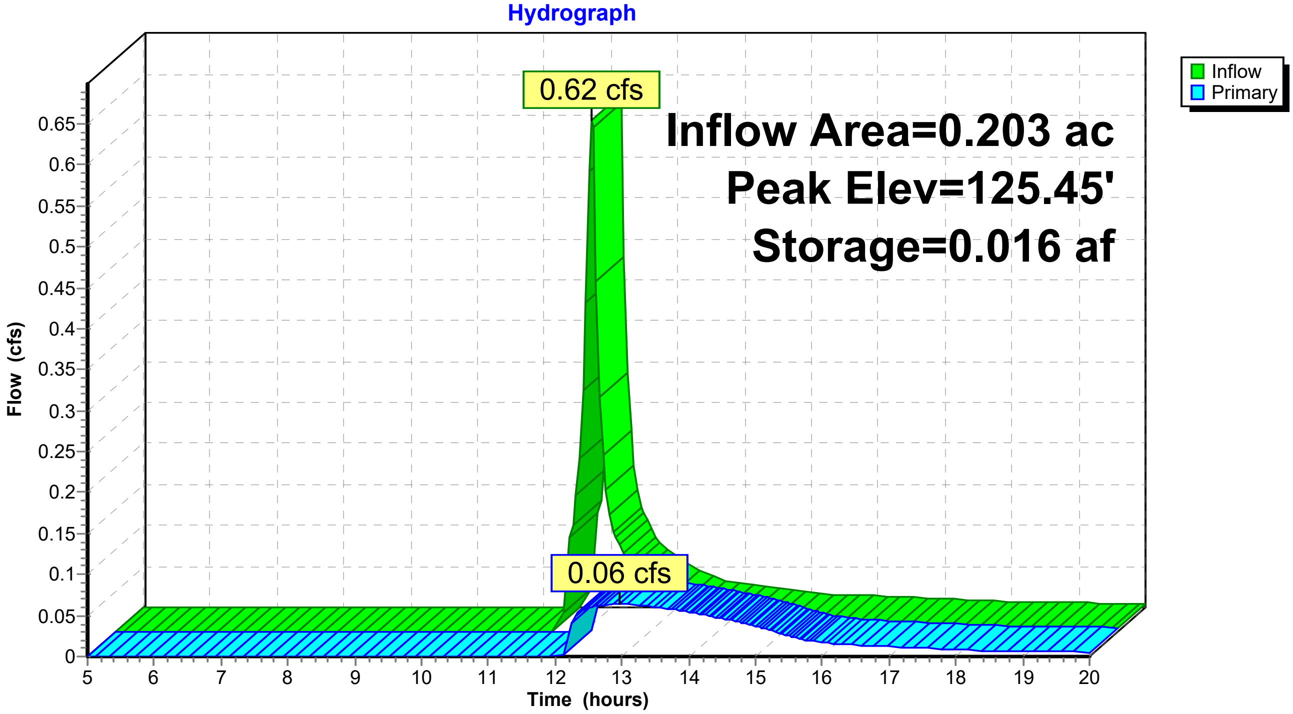
Chamber Storage + Stone Storage = 2,292.5 cf = 0.053 af
Overall Storage Efficiency = 50.9%
Overall System Size = 82.00' x 14.33' x 3.83'

16 Chambers
166.9 cy Field
120.4 cy Stone





Pond 45P: Det. Area 1



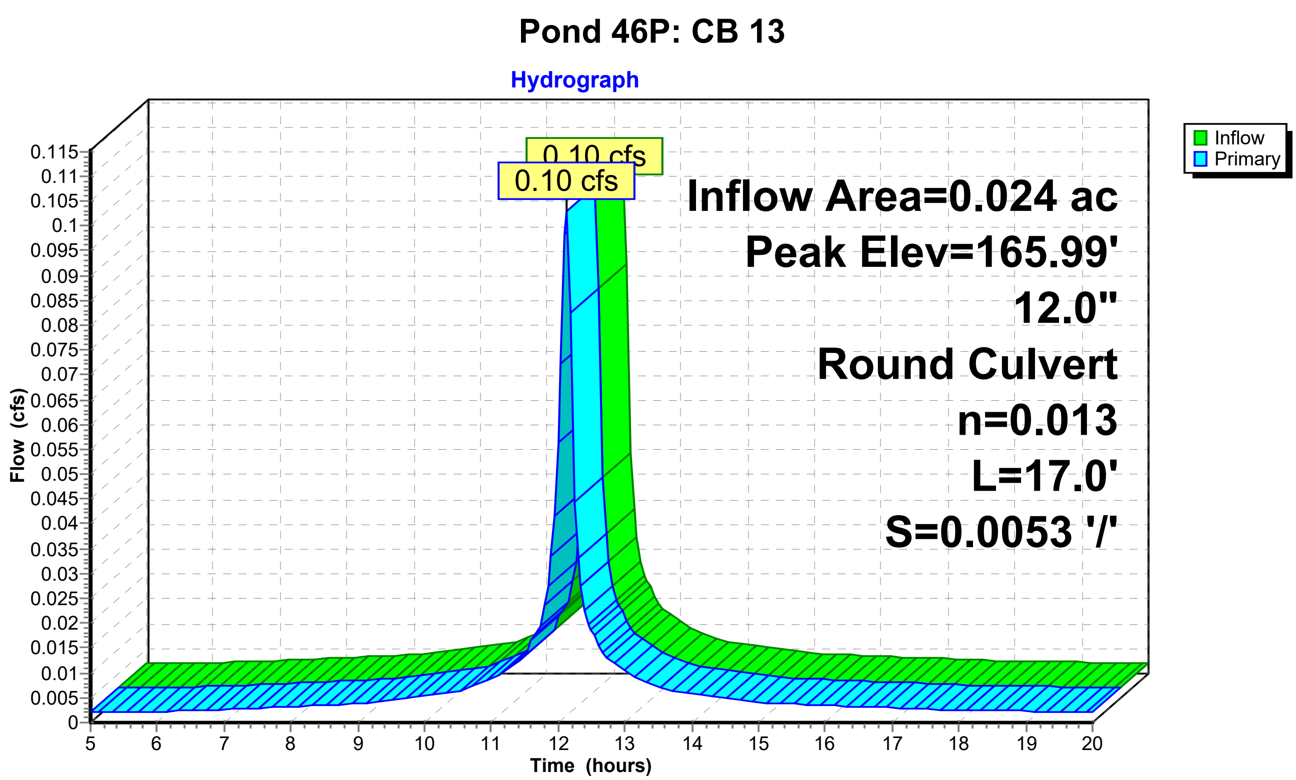
Summary for Pond 46P: CB 13

Inflow Area = 0.024 ac,100.00% Impervious, Inflow Depth > 4.09" for 10-Year event
Inflow = 0.10 cfs @ 12.13 hrs, Volume= 0.008 af
Outflow = 0.10 cfs @ 12.13 hrs, Volume= 0.008 af, Atten= 0%, Lag= 0.0 min
Primary = 0.10 cfs @ 12.13 hrs, Volume= 0.008 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 165.99' @ 12.13 hrs
Flood Elev= 170.24'

Device	Routing	Invert	Outlet Devices
#1	Primary	165.80'	**12.0" Round Culvert** L= 17.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 165.80' / 165.71' S= 0.0053 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.10 cfs @ 12.13 hrs HW=165.99' (Free Discharge)
└─**1=Culvert** (Barrel Controls 0.10 cfs @ 1.47 fps)



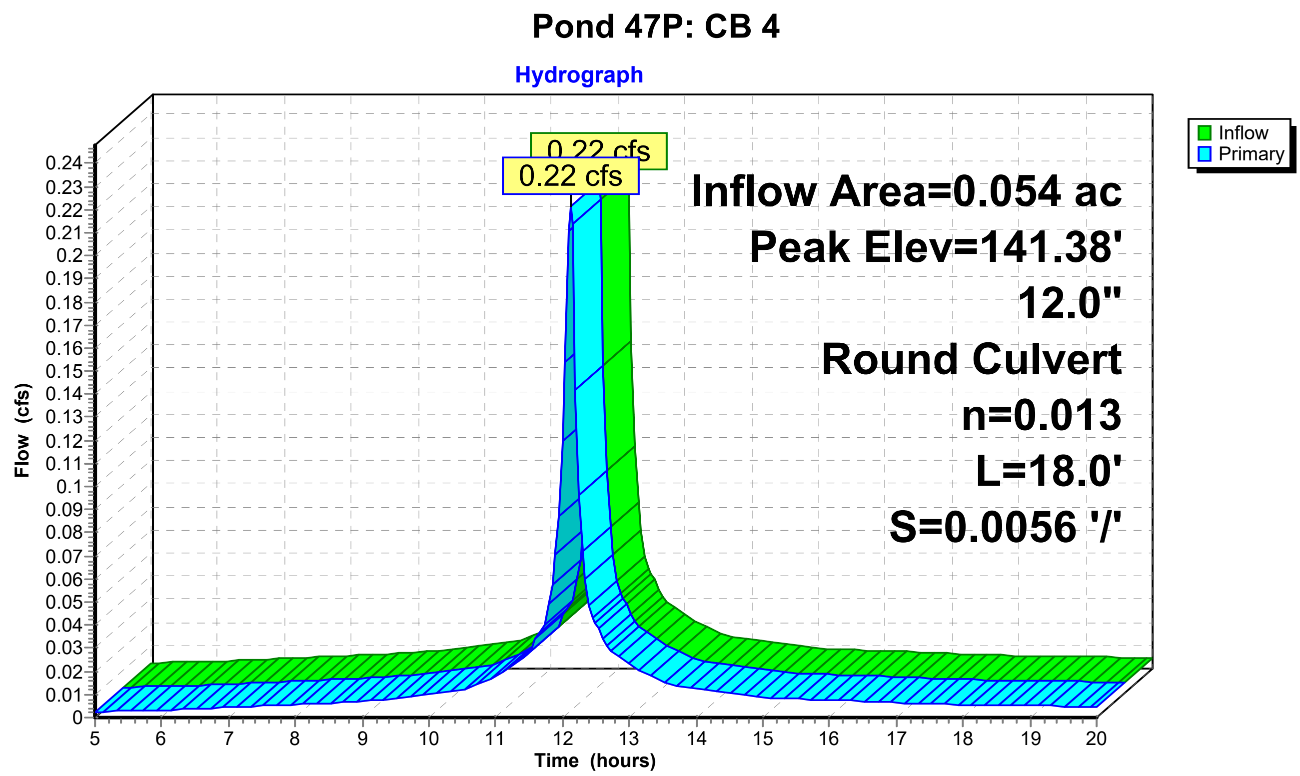
Summary for Pond 47P: CB 4

Inflow Area =	0.054 ac, 88.83% Impervious, Inflow Depth > 3.79" for 10-Year event			
Inflow =	0.22 cfs @	12.13 hrs, Volume=	0.017 af	
Outflow =	0.22 cfs @	12.13 hrs, Volume=	0.017 af,	Atten= 0%, Lag= 0.0 min
Primary =	0.22 cfs @	12.13 hrs, Volume=	0.017 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 141.38' @ 12.13 hrs
Flood Elev= 144.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	141.10'	**12.0" Round Culvert** L= 18.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 141.10' / 141.00' S= 0.0056 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.21 cfs @ 12.13 hrs HW=141.38' (Free Discharge)
└─**1=Culvert** (Barrel Controls 0.21 cfs @ 1.81 fps)



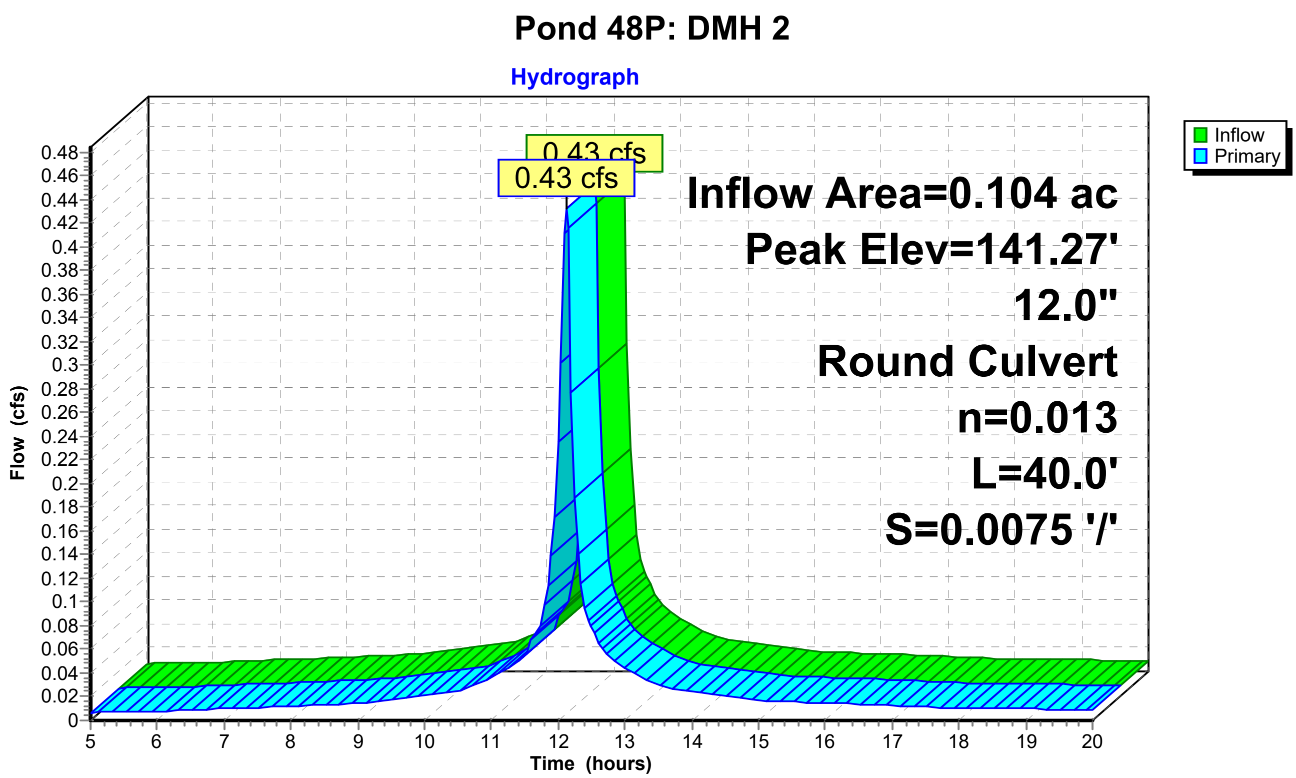
Summary for Pond 48P: DMH 2

Inflow Area = 0.104 ac, 94.17% Impervious, Inflow Depth > 3.93" for 10-Year event
Inflow = 0.43 cfs @ 12.13 hrs, Volume= 0.034 af
Outflow = 0.43 cfs @ 12.13 hrs, Volume= 0.034 af, Atten= 0%, Lag= 0.0 min
Primary = 0.43 cfs @ 12.13 hrs, Volume= 0.034 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 141.27' @ 12.13 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	140.90'	**12.0" Round Culvert** L= 40.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 140.90' / 140.60' S= 0.0075 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.41 cfs @ 12.13 hrs HW=141.26' (Free Discharge)
└**1=Culvert** (Inlet Controls 0.41 cfs @ 1.62 fps)



Summary for Pond 49P: DMH 9

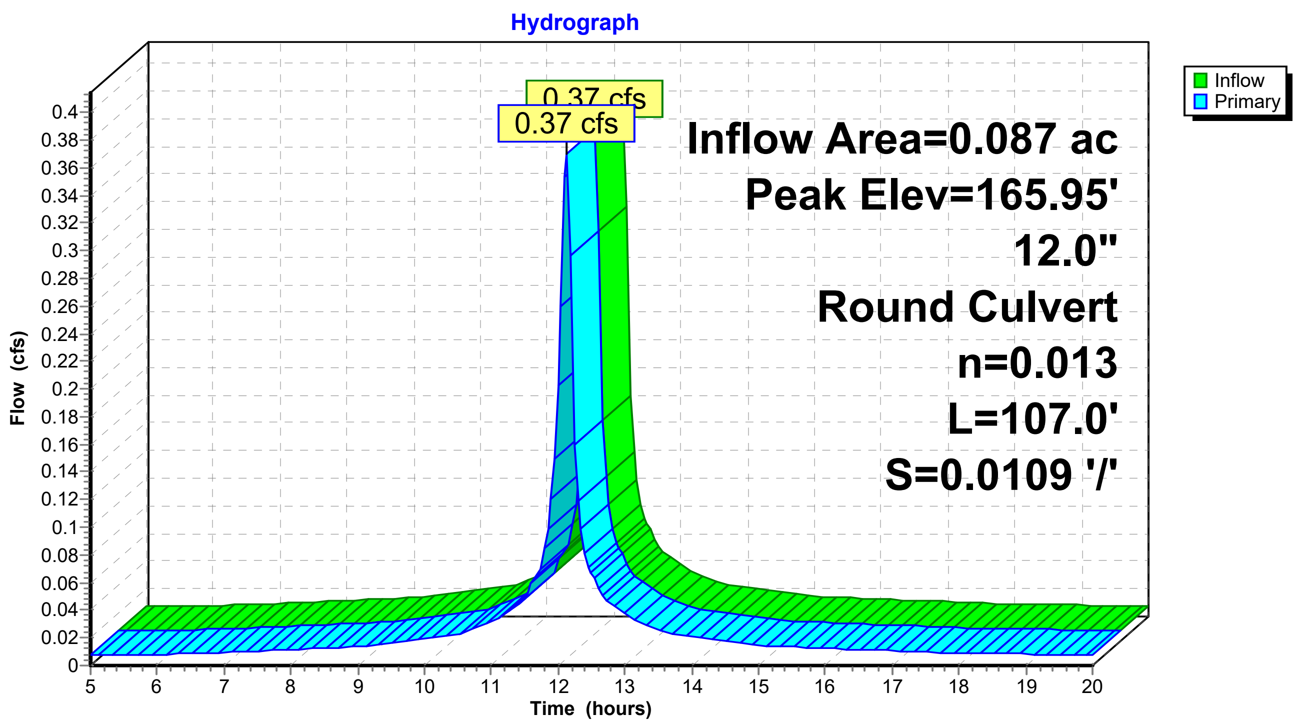
Inflow Area = 0.087 ac,100.00% Impervious, Inflow Depth > 4.09" for 10-Year event
Inflow = 0.37 cfs @ 12.13 hrs, Volume= 0.030 af
Outflow = 0.37 cfs @ 12.13 hrs, Volume= 0.030 af, Atten= 0%, Lag= 0.0 min
Primary = 0.37 cfs @ 12.13 hrs, Volume= 0.030 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 165.95' @ 12.13 hrs
Flood Elev= 170.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	165.61'	**12.0" Round Culvert** L= 107.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 165.61' / 164.44' S= 0.0109 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.35 cfs @ 12.13 hrs HW=165.94' (Free Discharge)
└─**1=Culvert** (Inlet Controls 0.35 cfs @ 1.55 fps)

Pond 49P: DMH 9

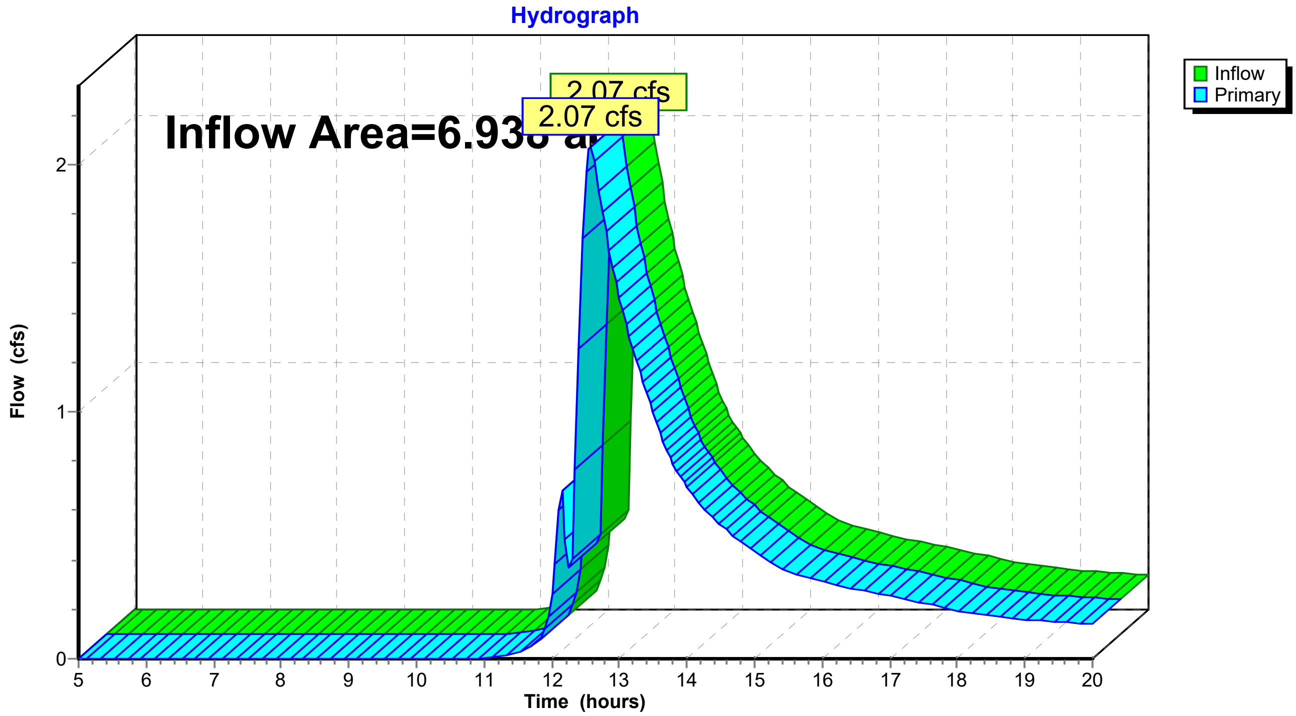


Summary for Link 32L: TOTAL P3

Inflow Area = 6.938 ac, 20.11% Impervious, Inflow Depth > 0.58" for 10-Year event
Inflow = 2.07 cfs @ 12.57 hrs, Volume= 0.338 af
Primary = 2.07 cfs @ 12.57 hrs, Volume= 0.338 af, Atten= 0%, Lag= 0.0 min

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

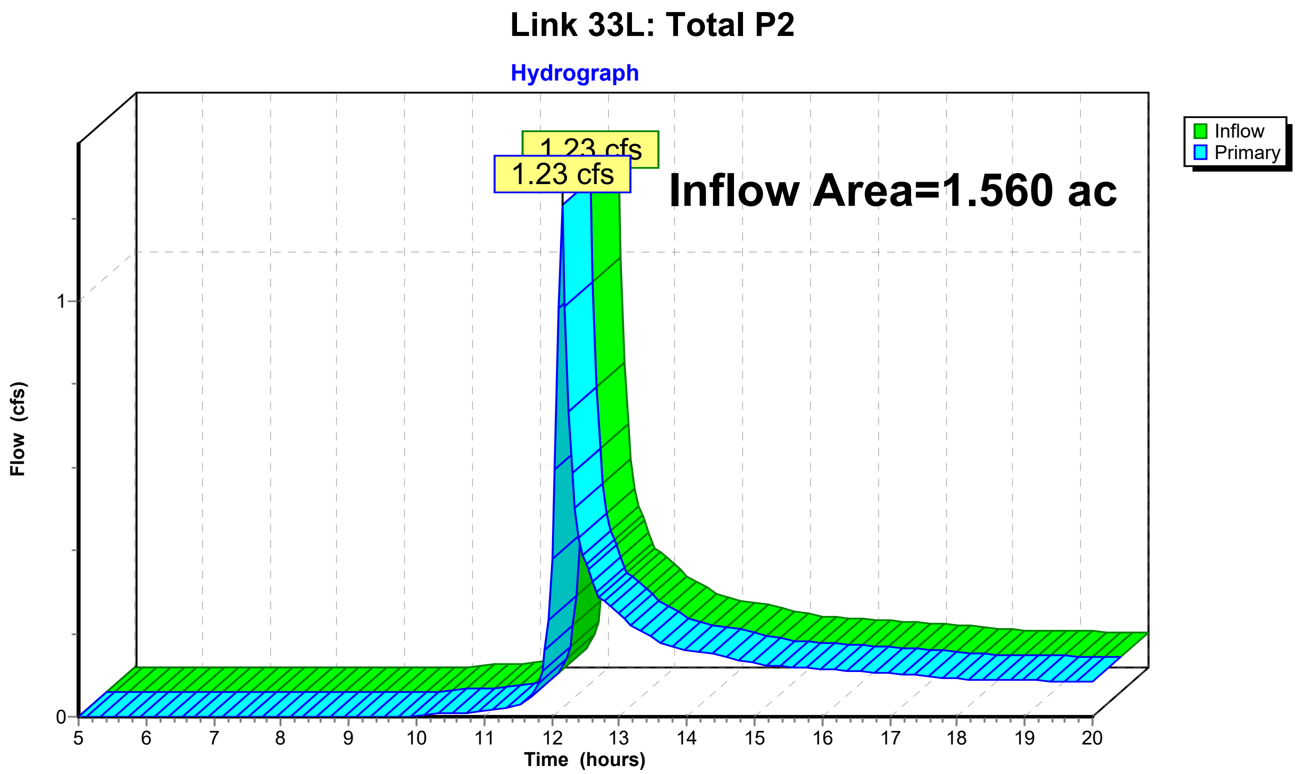
Link 32L: TOTAL P3



Summary for Link 33L: Total P2

Inflow Area = 1.560 ac, 10.34% Impervious, Inflow Depth > 0.89" for 10-Year event
Inflow = 1.23 cfs @ 12.15 hrs, Volume= 0.116 af
Primary = 1.23 cfs @ 12.15 hrs, Volume= 0.116 af, Atten= 0%, Lag= 0.0 min

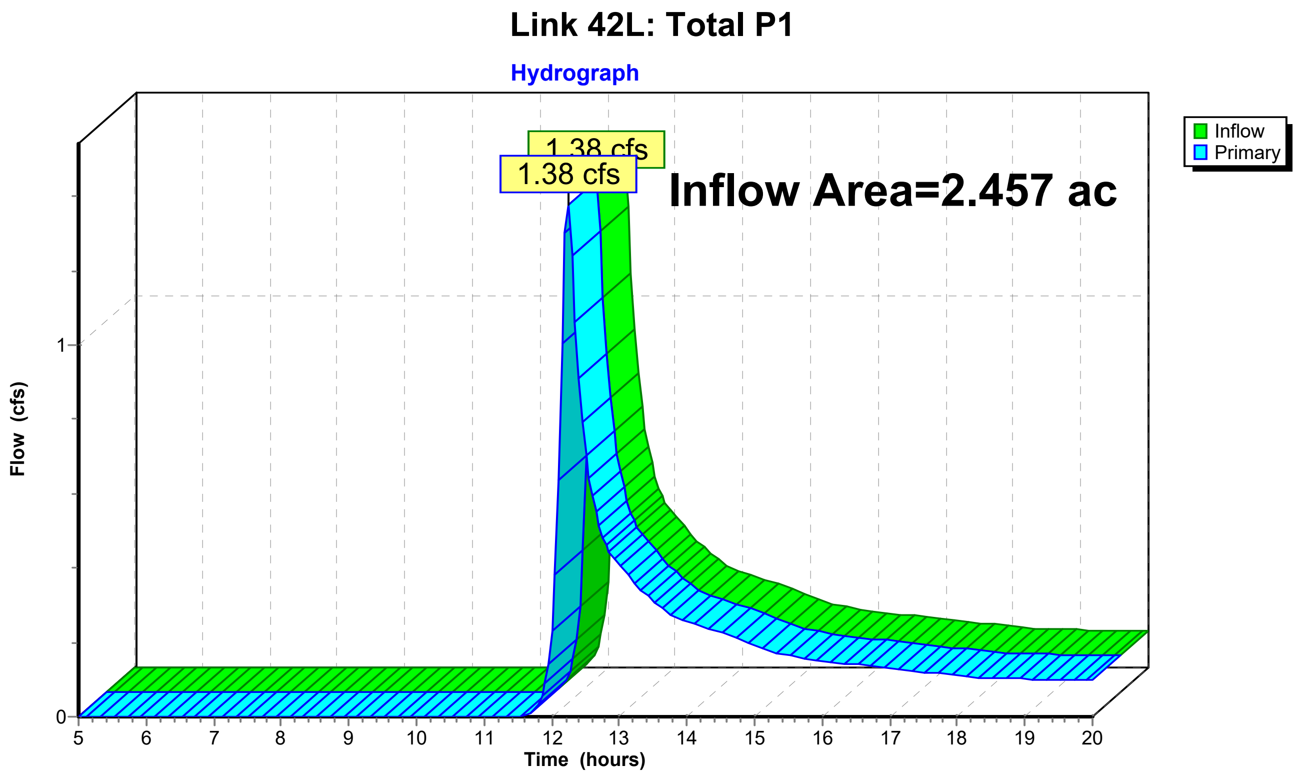
Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs



Summary for Link 42L: Total P1

Inflow Area = 2.457 ac, 7.11% Impervious, Inflow Depth > 0.77" for 10-Year event
Inflow = 1.38 cfs @ 12.24 hrs, Volume= 0.158 af
Primary = 1.38 cfs @ 12.24 hrs, Volume= 0.158 af, Atten= 0%, Lag= 0.0 min

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



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

Subcatchment 1S: P1A Runoff Area=94,172 sf 2.58% Impervious Runoff Depth>1.41"
Flow Length=598' Tc=13.3 min UI Adjusted CN=55 Runoff=2.72 cfs 0.254 af

Subcatchment 2S: P2A Runoff Area=12,266 sf 0.00% Impervious Runoff Depth>1.89"
Tc=6.0 min CN=61 Runoff=0.64 cfs 0.044 af

Subcatchment 3S: P2B Runoff Area=2,156 sf 100.00% Impervious Runoff Depth>5.26"
Tc=6.0 min CN=98 Runoff=0.27 cfs 0.022 af

Subcatchment 5S: P3I Runoff Area=1,563 sf 100.00% Impervious Runoff Depth>5.26"
Tc=6.0 min CN=98 Runoff=0.20 cfs 0.016 af

Subcatchment 6S: P3G Runoff Area=7,278 sf 68.97% Impervious Runoff Depth>4.32"
Tc=6.0 min CN=87 Runoff=0.81 cfs 0.060 af

Subcatchment 7S: P3H Runoff Area=70,167 sf 8.32% Impervious Runoff Depth>1.72"
Flow Length=620' Tc=14.3 min UI Adjusted CN=59 Runoff=2.48 cfs 0.230 af

Subcatchment 8S: P3J Runoff Area=2,216 sf 100.00% Impervious Runoff Depth>5.26"
Tc=6.0 min CN=98 Runoff=0.28 cfs 0.022 af

Subcatchment 11S: P3K Runoff Area=27,385 sf 100.00% Impervious Runoff Depth>5.26"
Tc=6.0 min CN=98 Runoff=3.43 cfs 0.276 af

Subcatchment 16S: P3F Runoff Area=131,453 sf 5.15% Impervious Runoff Depth>1.56"
Flow Length=664' Slope=0.0600 '/' Tc=16.5 min UI Adjusted CN=57 Runoff=3.93 cfs 0.392 af

Subcatchment 17S: P3E Runoff Area=3,344 sf 100.00% Impervious Runoff Depth>5.26"
Tc=6.0 min CN=98 Runoff=0.42 cfs 0.034 af

Subcatchment 22S: P3D Runoff Area=19,733 sf 0.00% Impervious Runoff Depth>1.65"
Tc=6.0 min CN=58 Runoff=0.89 cfs 0.062 af

Subcatchment 23S: P3B Runoff Area=2,425 sf 100.00% Impervious Runoff Depth>5.26"
Tc=6.0 min CN=98 Runoff=0.30 cfs 0.024 af

Subcatchment 24S: P3C Runoff Area=8,435 sf 28.74% Impervious Runoff Depth>2.85"
Tc=6.0 min CN=72 Runoff=0.66 cfs 0.046 af

Subcatchment 31S: P3A Runoff Area=24,420 sf 0.00% Impervious Runoff Depth>1.81"
Tc=6.0 min CN=60 Runoff=1.22 cfs 0.084 af

Subcatchment 34S: P1C Runoff Area=3,042 sf 100.00% Impervious Runoff Depth>5.26"
Tc=6.0 min CN=98 Runoff=0.38 cfs 0.031 af

Subcatchment 35S: P1B Runoff Area=5,798 sf 36.82% Impervious Runoff Depth>3.13"
Tc=6.0 min CN=75 Runoff=0.50 cfs 0.035 af

Subcatchment 43S: P1D Runoff Area=4,007 sf 0.00% Impervious Runoff Depth>0.99"
Flow Length=186' Tc=7.0 min CN=49 Runoff=0.09 cfs 0.008 af

Subcatchment 44S: P2D Runoff Area=51,183 sf 5.43% Impervious Runoff Depth>1.34"
Flow Length=186' Tc=7.0 min UI Adjusted CN=54 Runoff=1.78 cfs 0.131 af

Subcatchment 45S: P3L Runoff Area=2,730 sf 100.00% Impervious Runoff Depth>5.26"
Tc=6.0 min CN=98 Runoff=0.34 cfs 0.027 af

Subcatchment 46S: P2C Runoff Area=2,354 sf 88.83% Impervious Runoff Depth>4.98"
Tc=6.0 min CN=94 Runoff=0.29 cfs 0.022 af

Subcatchment 47S: P3M Runoff Area=1,052 sf 100.00% Impervious Runoff Depth>5.26"
Tc=6.0 min CN=98 Runoff=0.13 cfs 0.011 af

Pond 9P: CB 5 Peak Elev=152.02' Inflow=0.81 cfs 0.060 af
12.0" Round Culvert n=0.013 L=23.0' S=0.0113 '/' Outflow=0.81 cfs 0.060 af

Pond 10P: CB 6 Peak Elev=152.69' Inflow=2.48 cfs 0.230 af
12.0" Round Culvert n=0.013 L=27.0' S=0.0104 '/' Outflow=2.48 cfs 0.230 af

Pond 13P: CB 7 Peak Elev=152.27' Inflow=0.20 cfs 0.016 af
12.0" Round Culvert n=0.013 L=11.0' S=0.0127 '/' Outflow=0.20 cfs 0.016 af

Pond 14P: CB 8 Peak Elev=152.32' Inflow=0.28 cfs 0.022 af
12.0" Round Culvert n=0.013 L=8.0' S=0.0138 '/' Outflow=0.28 cfs 0.022 af

Pond 15P: DMH 3 Peak Elev=152.58' Inflow=2.92 cfs 0.291 af
12.0" Round Culvert n=0.013 L=30.0' S=0.0117 '/' Outflow=2.92 cfs 0.291 af

Pond 18P: CB 11 Peak Elev=164.91' Inflow=0.42 cfs 0.034 af
12.0" Round Culvert n=0.013 L=7.0' S=0.0143 '/' Outflow=0.42 cfs 0.034 af

Pond 19P: CB 12 Peak Elev=166.77' Inflow=3.93 cfs 0.392 af
12.0" Round Culvert n=0.013 L=14.0' S=0.0071 '/' Outflow=3.93 cfs 0.392 af

Pond 20P: DMH 8 Peak Elev=166.92' Inflow=4.30 cfs 0.463 af
12.0" Round Culvert n=0.013 L=94.0' S=0.1313 '/' Outflow=4.30 cfs 0.463 af

Pond 21P: Infiltration Basin 1 Peak Elev=154.17' Storage=4,458 cf Inflow=4.77 cfs 0.525 af
Discarded=0.12 cfs 0.079 af Primary=4.29 cfs 0.374 af Outflow=4.41 cfs 0.453 af

Pond 25P: CB 9 Peak Elev=145.31' Inflow=0.30 cfs 0.024 af
12.0" Round Culvert n=0.013 L=12.0' S=0.0917 '/' Outflow=0.30 cfs 0.024 af

Pond 26P: CB 10 Peak Elev=145.47' Inflow=0.66 cfs 0.046 af
12.0" Round Culvert n=0.013 L=10.0' S=0.1100 '/' Outflow=0.66 cfs 0.046 af

Pond 27P: DMH 7 Peak Elev=144.38' Inflow=0.97 cfs 0.070 af
12.0" Round Culvert n=0.013 L=50.0' S=0.0760 '/' Outflow=0.97 cfs 0.070 af

Pond 28P: Infiltration Basin 2 Peak Elev=142.50' Storage=5,436 cf Inflow=4.14 cfs 0.399 af
Discarded=0.13 cfs 0.087 af Primary=2.30 cfs 0.238 af Outflow=2.43 cfs 0.326 af

Pond 30P: DMH 4 Peak Elev=149.72' Inflow=3.24 cfs 0.329 af
12.0" Round Culvert n=0.013 L=84.0' S=0.0700 '/' Outflow=3.24 cfs 0.329 af

Pond 33P: Subsurface Inf. Aea 2 Peak Elev=152.96' Storage=0.106 af Inflow=3.43 cfs 0.276 af
Discarded=0.14 cfs 0.126 af Primary=2.45 cfs 0.067 af Outflow=2.59 cfs 0.192 af

Pond 34P: DMH 5 Peak Elev=143.74' Inflow=3.24 cfs 0.329 af
12.0" Round Culvert n=0.013 L=190.0' S=0.0095 '/' Outflow=3.24 cfs 0.329 af

Pond 35P: DMH 6 Peak Elev=141.84' Inflow=3.24 cfs 0.329 af
12.0" Round Culvert n=0.013 L=32.0' S=0.0053 '/' Outflow=3.24 cfs 0.329 af

Pond 36P: CB 3 Peak Elev=141.40' Inflow=0.27 cfs 0.022 af
12.0" Round Culvert n=0.013 L=9.0' S=0.0111 '/' Outflow=0.27 cfs 0.022 af

Pond 37P: CB 2 Peak Elev=126.86' Inflow=0.38 cfs 0.031 af
12.0" Round Culvert n=0.013 L=8.0' S=0.0125 '/' Outflow=0.38 cfs 0.031 af

Pond 38P: Det. Area 2 Peak Elev=142.12' Storage=0.024 af Inflow=0.56 cfs 0.044 af
Outflow=0.08 cfs 0.027 af

Pond 39P: CB 1 Peak Elev=126.94' Inflow=0.50 cfs 0.035 af
12.0" Round Culvert n=0.013 L=20.0' S=0.0050 '/' Outflow=0.50 cfs 0.035 af

Pond 40P: DMH 1 Peak Elev=126.88' Inflow=0.88 cfs 0.065 af
12.0" Round Culvert n=0.013 L=60.0' S=0.0050 '/' Outflow=0.88 cfs 0.065 af

Pond 43P: Subsurface Inf. Area 1 Peak Elev=127.68' Storage=0.006 af Inflow=0.88 cfs 0.065 af
Discarded=0.01 cfs 0.013 af Primary=0.87 cfs 0.047 af Outflow=0.88 cfs 0.059 af

Pond 44P: CB 14 Peak Elev=166.14' Inflow=0.34 cfs 0.027 af
12.0" Round Culvert n=0.013 L=9.0' S=0.0100 '/' Outflow=0.34 cfs 0.027 af

Pond 45P: Det. Area 1 Peak Elev=125.97' Storage=0.025 af Inflow=0.87 cfs 0.047 af
Outflow=0.10 cfs 0.035 af

Pond 46P: CB 13 Peak Elev=166.02' Inflow=0.13 cfs 0.011 af
12.0" Round Culvert n=0.013 L=17.0' S=0.0053 '/' Outflow=0.13 cfs 0.011 af

Pond 47P: CB 4 Peak Elev=141.43' Inflow=0.29 cfs 0.022 af
12.0" Round Culvert n=0.013 L=18.0' S=0.0056 '/' Outflow=0.29 cfs 0.022 af

Pond 48P: DMH 2 Peak Elev=141.33' Inflow=0.56 cfs 0.044 af
12.0" Round Culvert n=0.013 L=40.0' S=0.0075 '/' Outflow=0.56 cfs 0.044 af

Pond 49P: DMH 9 Peak Elev=166.00' Inflow=0.47 cfs 0.038 af
12.0" Round Culvert n=0.013 L=107.0' S=0.0109 '/' Outflow=0.47 cfs 0.038 af

Link 32L: TOTAL P3 Inflow=7.86 cfs 0.763 af
Primary=7.86 cfs 0.763 af

Link 33L: Total P2

Inflow=2.45 cfs 0.202 af
Primary=2.45 cfs 0.202 af

Link 42L: Total P1

Inflow=2.89 cfs 0.297 af
Primary=2.89 cfs 0.297 af

Total Runoff Area = 10.955 ac Runoff Volume = 1.831 af Average Runoff Depth = 2.01"
84.20% Pervious = 9.224 ac 15.80% Impervious = 1.731 ac

Summary for Subcatchment 1S: P1A

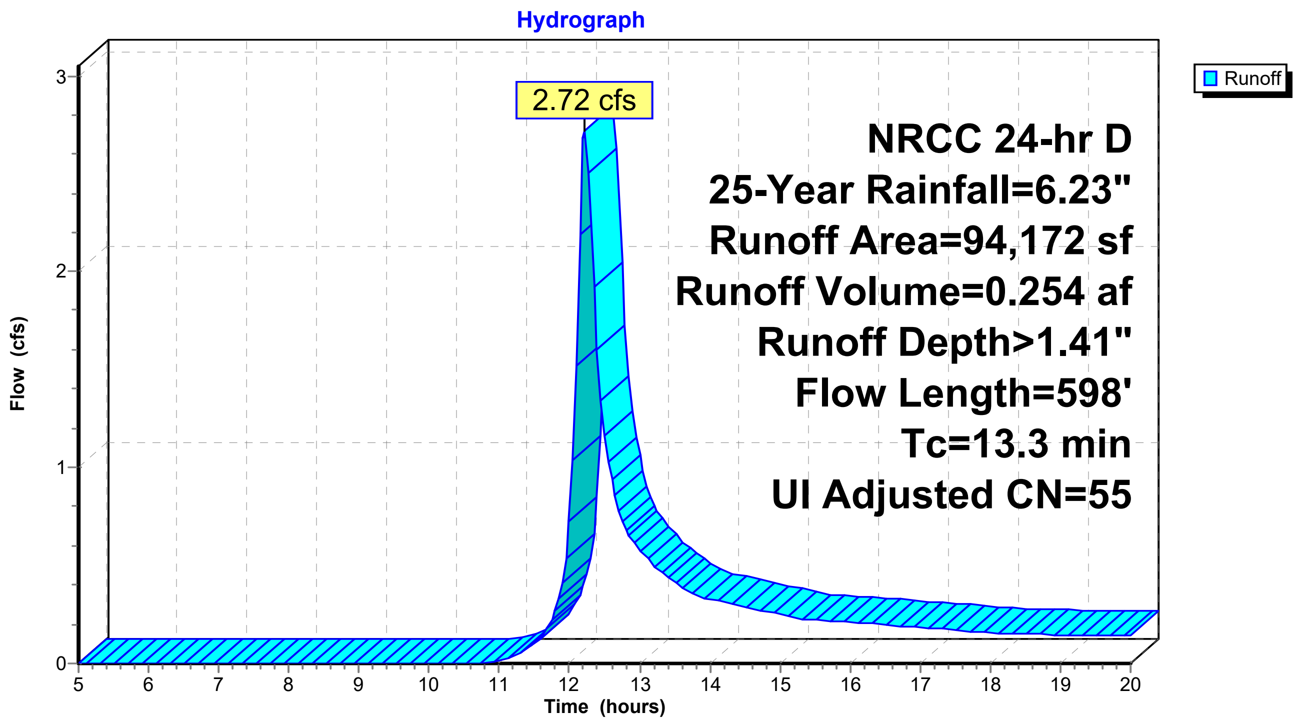
Runoff = 2.72 cfs @ 12.23 hrs, Volume= 0.254 af, Depth> 1.41"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 25-Year Rainfall=6.23"

Area (sf)	CN	Adj	Description
7,397	48		Brush, Good, HSG B
84,343	55		Woods, Good, HSG B
2,432	98		Unconnected roofs, HSG B
94,172	56	55	Weighted Average, UI Adjusted
91,740			97.42% Pervious Area
2,432			2.58% Impervious Area
2,432			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.3	50	0.0200	0.10		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.10"
5.0	548	0.1350	1.84		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
13.3	598	Total			

Subcatchment 1S: P1A



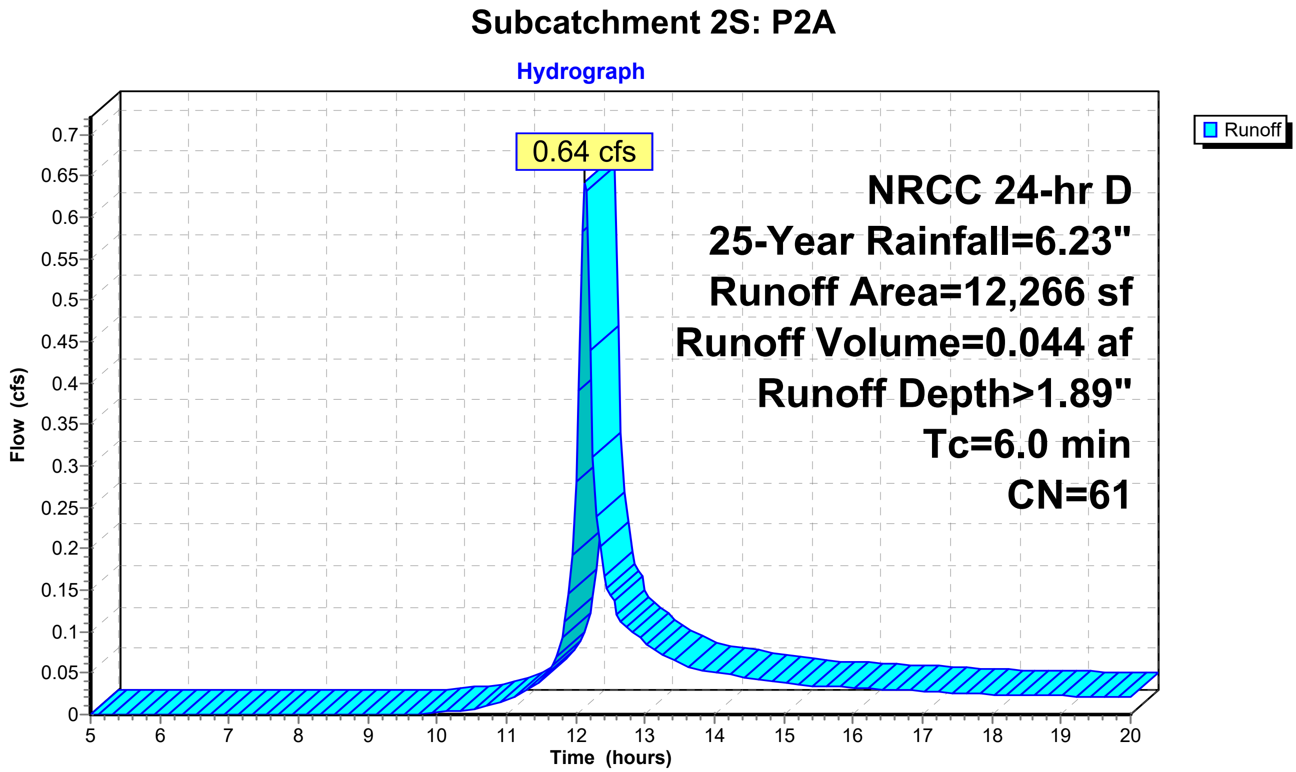
Summary for Subcatchment 2S: P2A

Runoff = 0.64 cfs @ 12.14 hrs, Volume= 0.044 af, Depth> 1.89"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 25-Year Rainfall=6.23"

Area (sf)	CN	Description
12,266	61	>75% Grass cover, Good, HSG B
12,266		100.00% Pervious Area

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



Summary for Subcatchment 3S: P2B

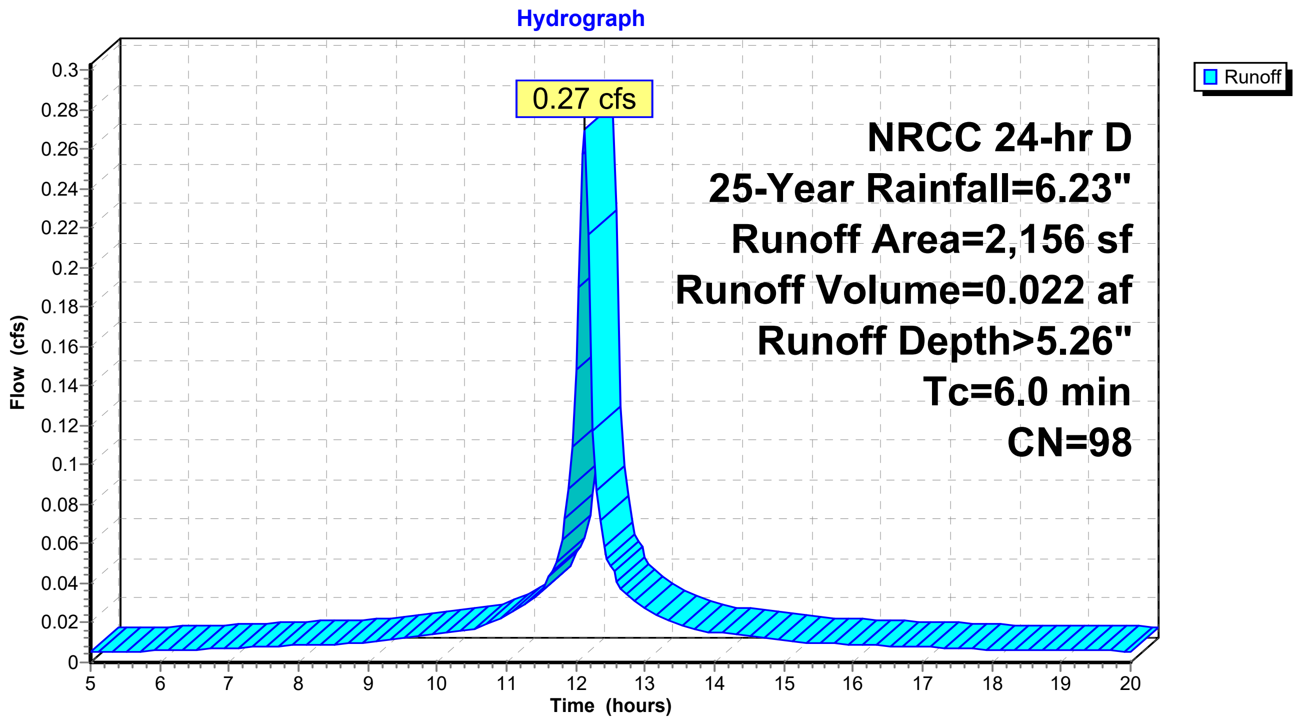
Runoff = 0.27 cfs @ 12.13 hrs, Volume= 0.022 af, Depth> 5.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 25-Year Rainfall=6.23"

Area (sf)	CN	Description
2,156	98	Paved parking, HSG B
2,156		100.00% Impervious Area

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

Subcatchment 3S: P2B



Summary for Subcatchment 5S: P3I

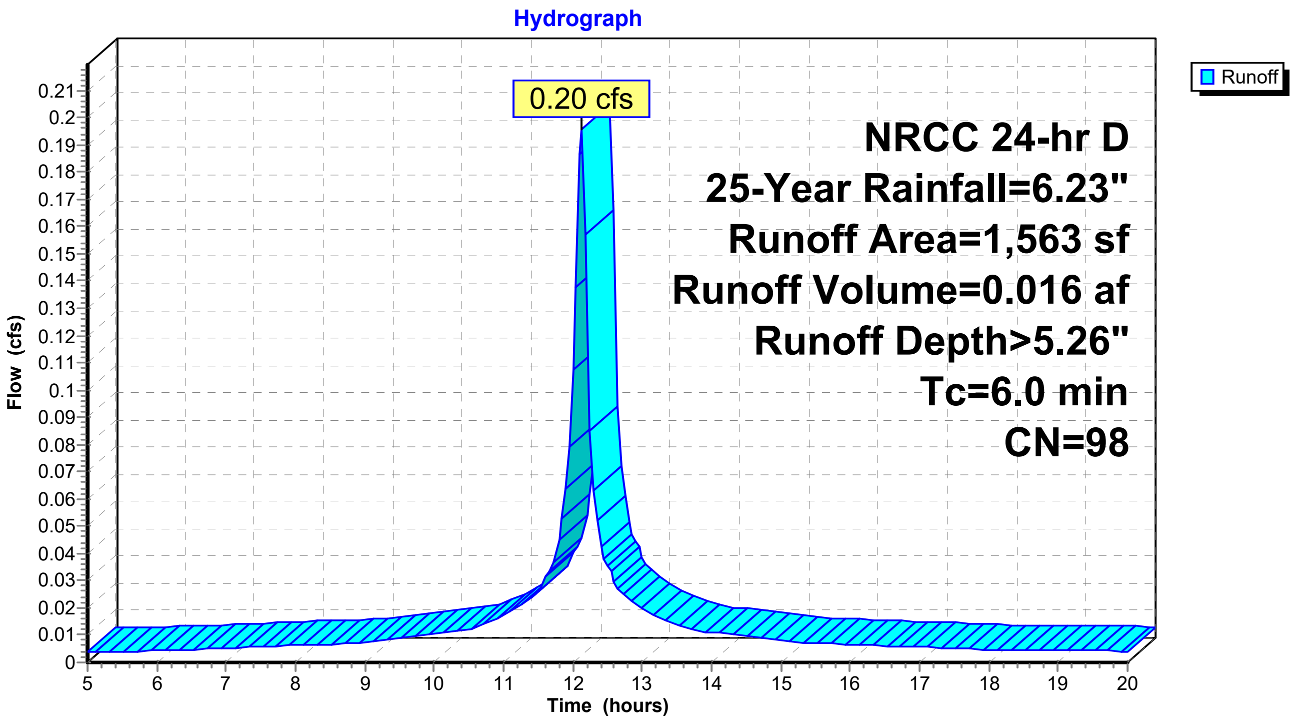
Runoff = 0.20 cfs @ 12.13 hrs, Volume= 0.016 af, Depth> 5.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 25-Year Rainfall=6.23"

Area (sf)	CN	Description
1,563	98	Paved parking, HSG B
1,563		100.00% Impervious Area

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

Subcatchment 5S: P3I



Summary for Subcatchment 6S: P3G

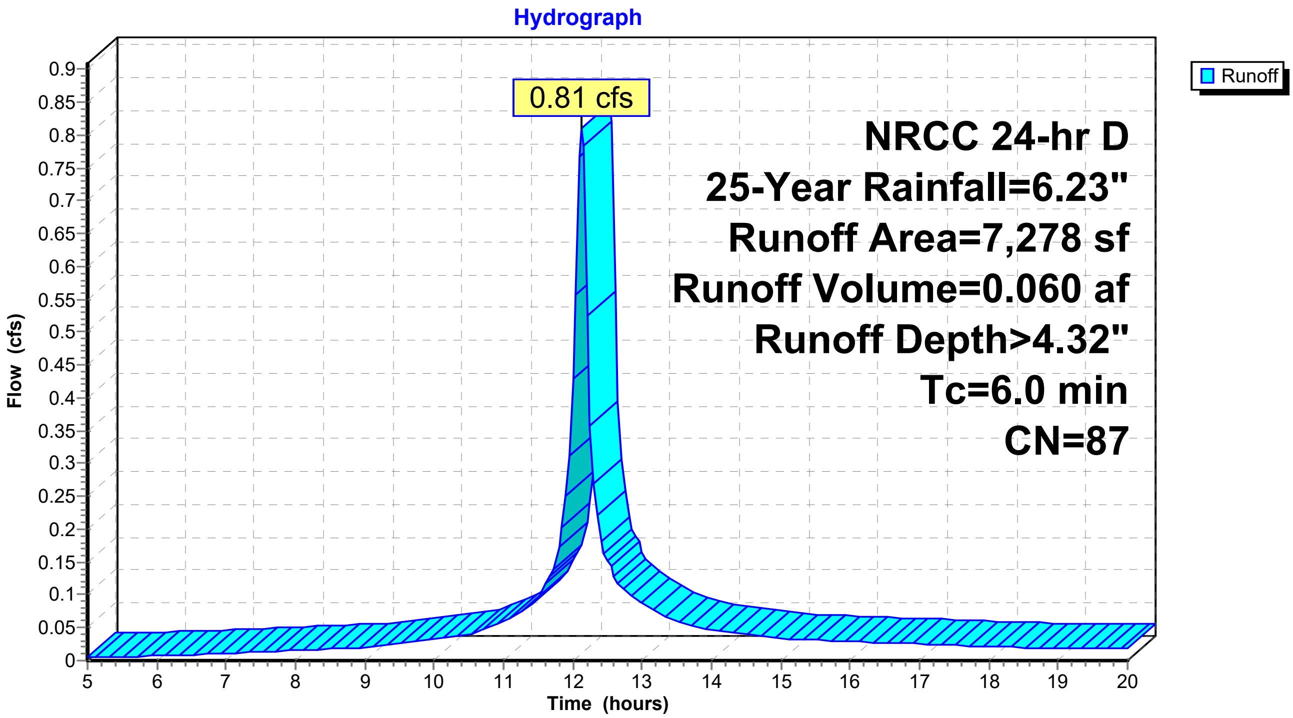
Runoff = 0.81 cfs @ 12.13 hrs, Volume= 0.060 af, Depth> 4.32"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 25-Year Rainfall=6.23"

Area (sf)	CN	Description
2,258	61	>75% Grass cover, Good, HSG B
5,020	98	Paved parking, HSG B
7,278	87	Weighted Average
2,258		31.03% Pervious Area
5,020		68.97% Impervious Area

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

Subcatchment 6S: P3G



Summary for Subcatchment 7S: P3H

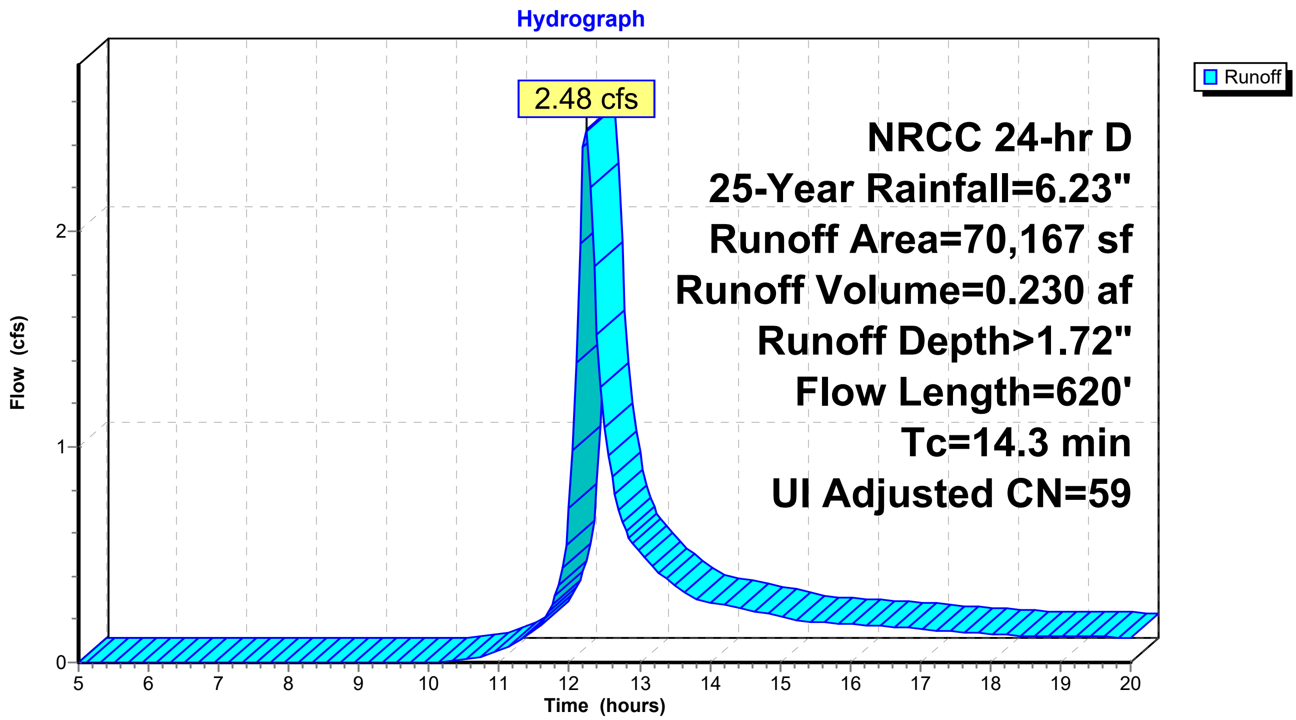
Runoff = 2.48 cfs @ 12.24 hrs, Volume= 0.230 af, Depth> 1.72"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 25-Year Rainfall=6.23"

Area (sf)	CN	Adj	Description
9,561	61		>75% Grass cover, Good, HSG B
3,870	98		Paved parking, HSG B
424	98		Unconnected roofs, HSG B
1,543	98		Unconnected pavement, HSG B
10,060	58		Woods/grass comb., Good, HSG B
44,709	55		Woods, Good, HSG B
70,167	60	59	Weighted Average, UI Adjusted
64,330			91.68% Pervious Area
5,837			8.32% Impervious Area
1,967			33.70% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.3	50	0.0200	0.10		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.10"
6.0	570	0.1000	1.58		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
14.3	620	Total			

Subcatchment 7S: P3H



Summary for Subcatchment 8S: P3J

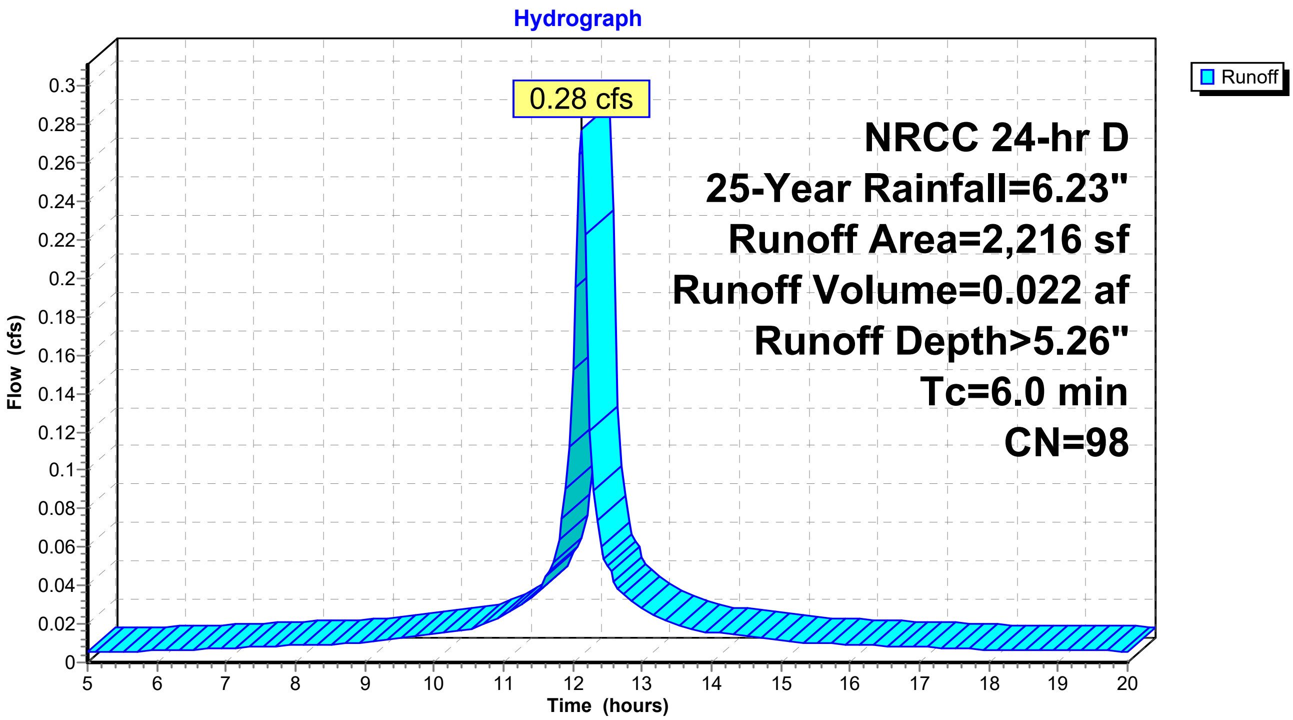
Runoff = 0.28 cfs @ 12.13 hrs, Volume= 0.022 af, Depth> 5.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 25-Year Rainfall=6.23"

Area (sf)	CN	Description
2,216	98	Paved parking, HSG B
2,216		100.00% Impervious Area

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

Subcatchment 8S: P3J



Summary for Subcatchment 11S: P3K

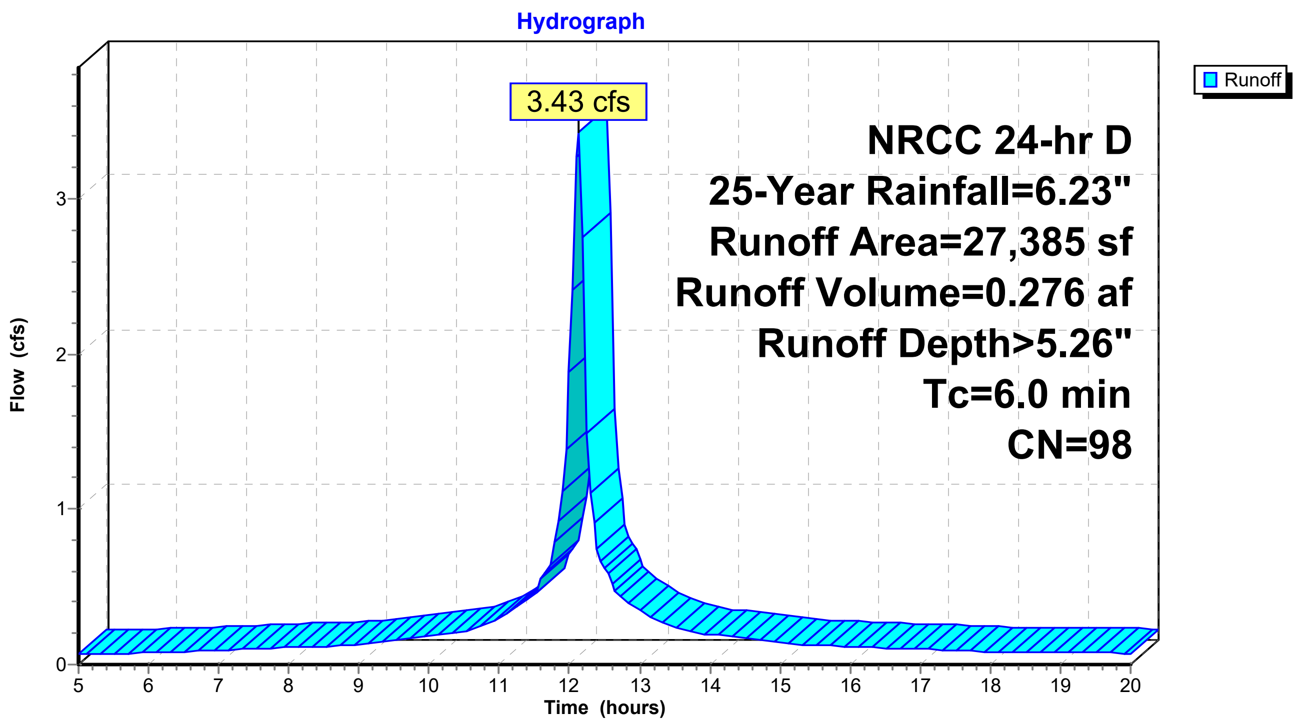
Runoff = 3.43 cfs @ 12.13 hrs, Volume= 0.276 af, Depth> 5.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 25-Year Rainfall=6.23"

Area (sf)	CN	Description
27,385	98	Unconnected roofs, HSG B
27,385		100.00% Impervious Area
27,385		100.00% Unconnected

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

Subcatchment 11S: P3K



Summary for Subcatchment 16S: P3F

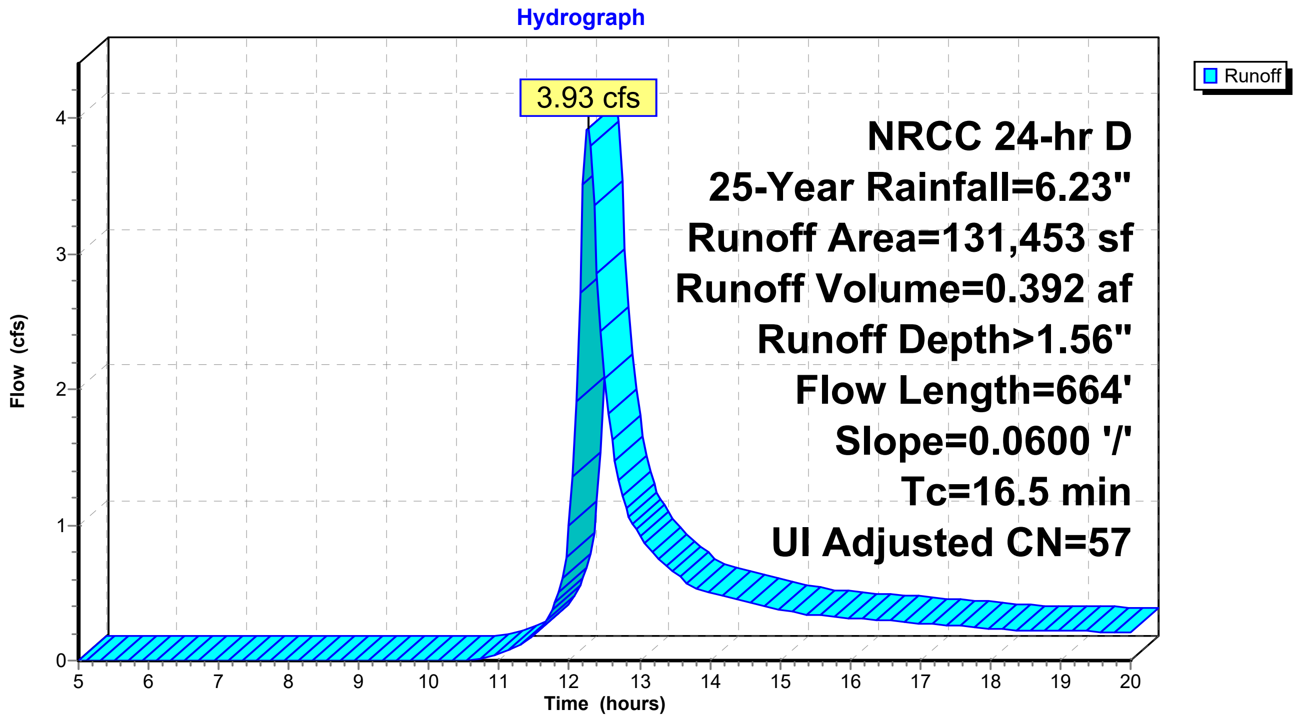
Runoff = 3.93 cfs @ 12.26 hrs, Volume= 0.392 af, Depth> 1.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 25-Year Rainfall=6.23"

Area (sf)	CN	Adj	Description
1,418	98		Paved parking, HSG B
2,247	61		>75% Grass cover, Good, HSG B
1,840	98		Unconnected roofs, HSG B
3,512	98		Unconnected pavement, HSG B
25,035	58		Woods/grass comb., Good, HSG B
88,304	55		Woods, Good, HSG B
9,097	61		>75% Grass cover, Good, HSG B
131,453	58	57	Weighted Average, UI Adjusted
124,683			94.85% Pervious Area
6,770			5.15% Impervious Area
5,352			79.05% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.1	50	0.0600	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.10"
8.4	614	0.0600	1.22		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
16.5	664	Total			

Subcatchment 16S: P3F



Summary for Subcatchment 17S: P3E

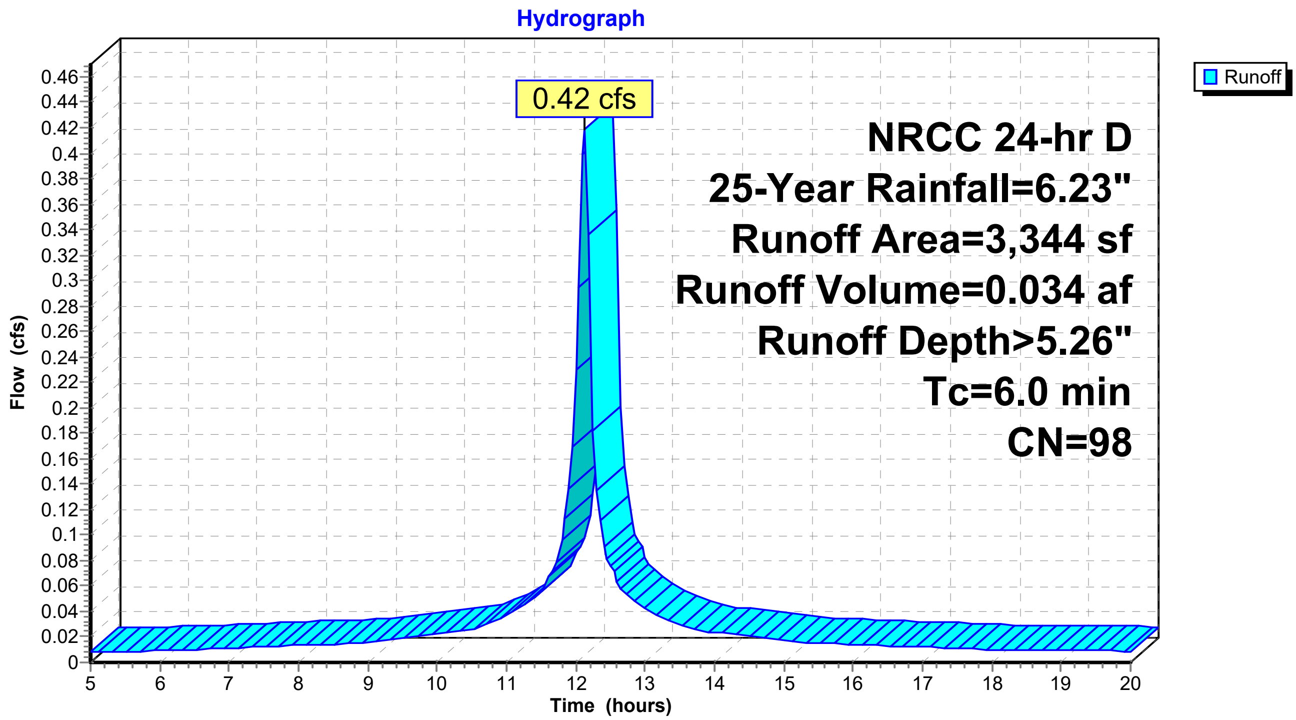
Runoff = 0.42 cfs @ 12.13 hrs, Volume= 0.034 af, Depth> 5.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 25-Year Rainfall=6.23"

Area (sf)	CN	Description
3,344	98	Paved parking, HSG B
3,344		100.00% Impervious Area

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

Subcatchment 17S: P3E



Summary for Subcatchment 22S: P3D

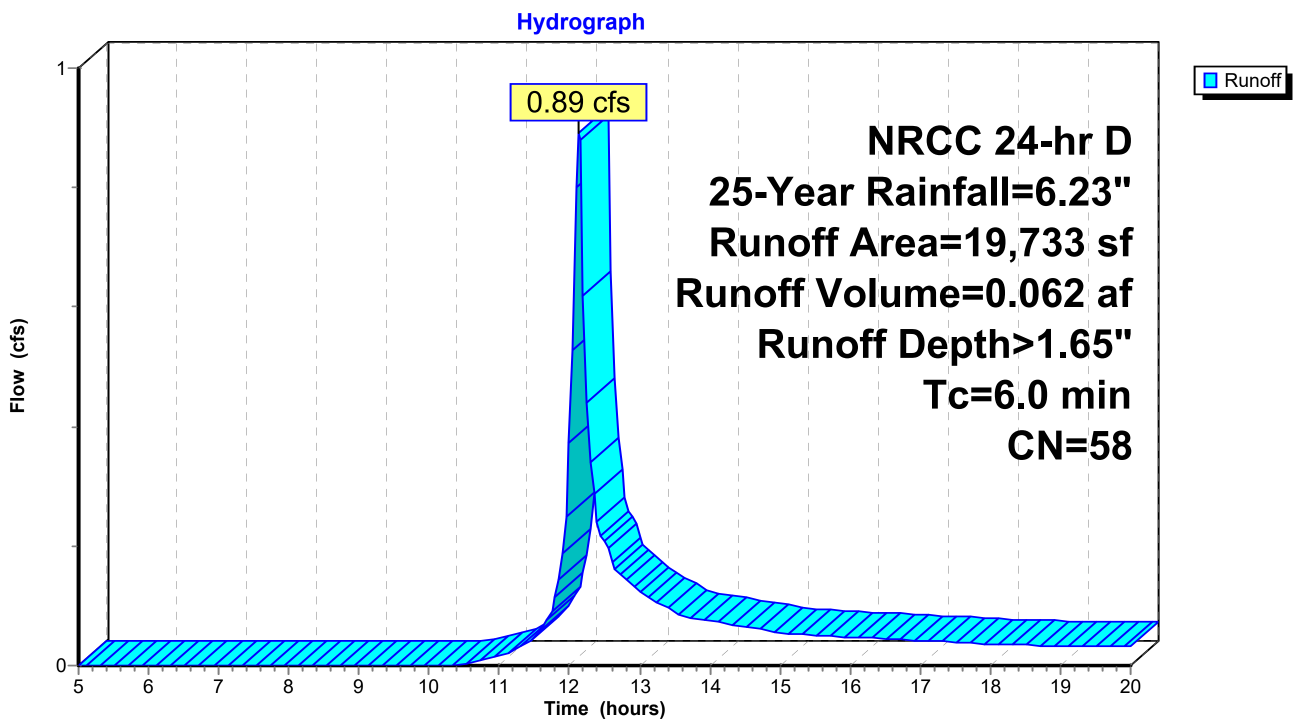
Runoff = 0.89 cfs @ 12.14 hrs, Volume= 0.062 af, Depth> 1.65"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 25-Year Rainfall=6.23"

Area (sf)	CN	Description
10,830	61	>75% Grass cover, Good, HSG B
4,323	55	Woods, Good, HSG B
4,580	55	Woods, Good, HSG B
19,733	58	Weighted Average
19,733		100.00% Pervious Area

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

Subcatchment 22S: P3D



Summary for Subcatchment 23S: P3B

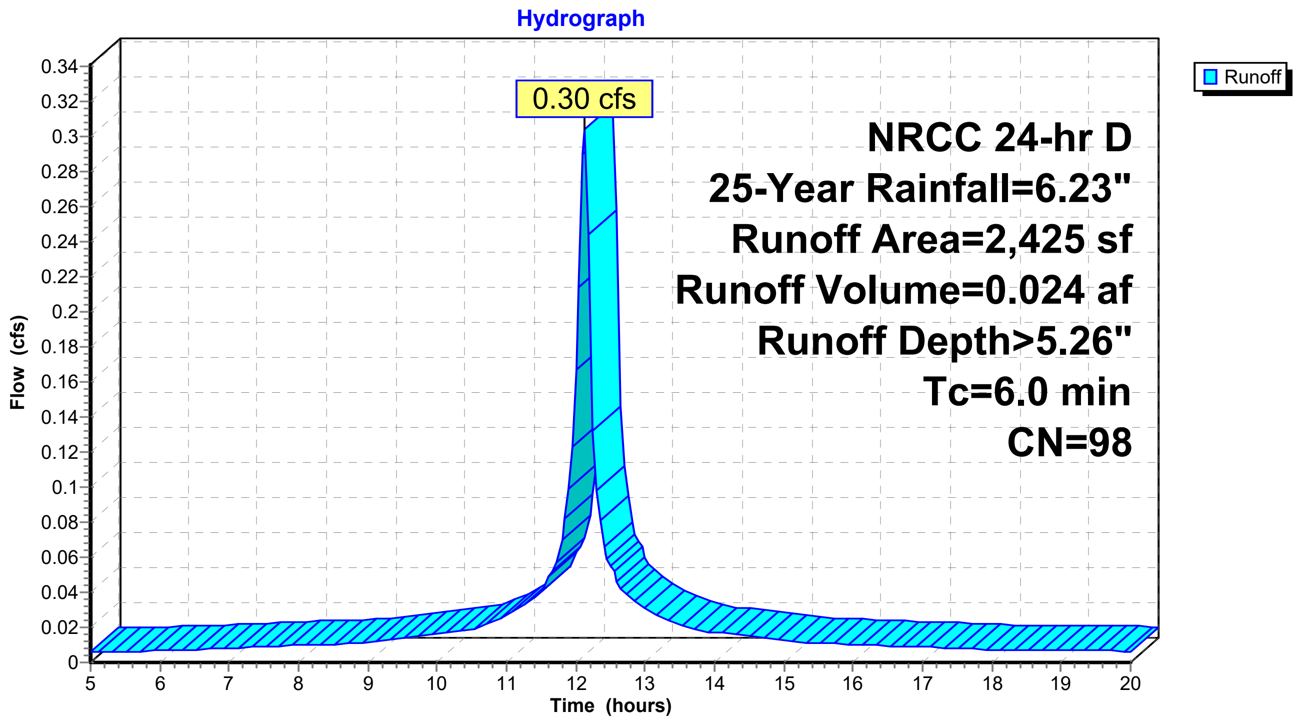
Runoff = 0.30 cfs @ 12.13 hrs, Volume= 0.024 af, Depth> 5.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 25-Year Rainfall=6.23"

Area (sf)	CN	Description
2,425	98	Paved parking, HSG B
2,425		100.00% Impervious Area

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

Subcatchment 23S: P3B



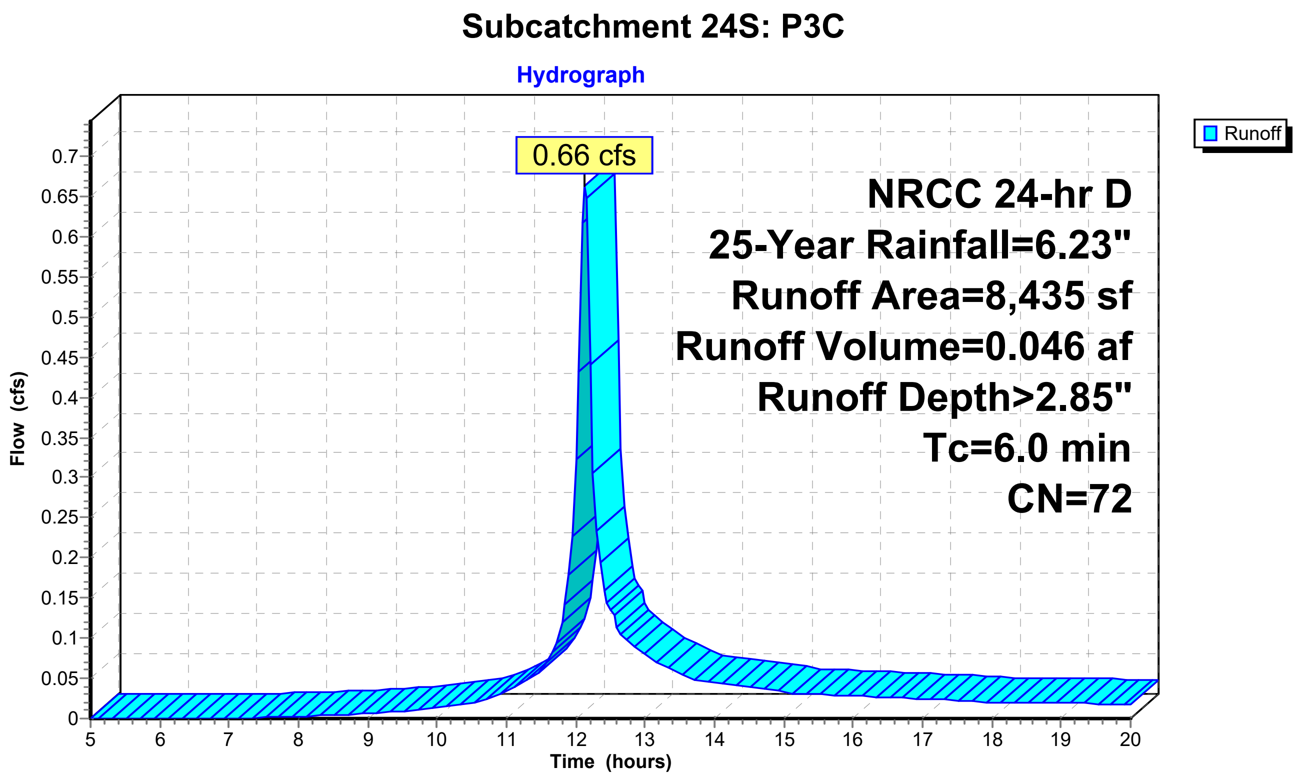
Summary for Subcatchment 24S: P3C

Runoff = 0.66 cfs @ 12.13 hrs, Volume= 0.046 af, Depth> 2.85"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 25-Year Rainfall=6.23"

Area (sf)	CN	Description
6,011	61	>75% Grass cover, Good, HSG B
2,424	98	Paved parking, HSG B
8,435	72	Weighted Average
6,011		71.26% Pervious Area
2,424		28.74% Impervious Area

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



Summary for Subcatchment 31S: P3A

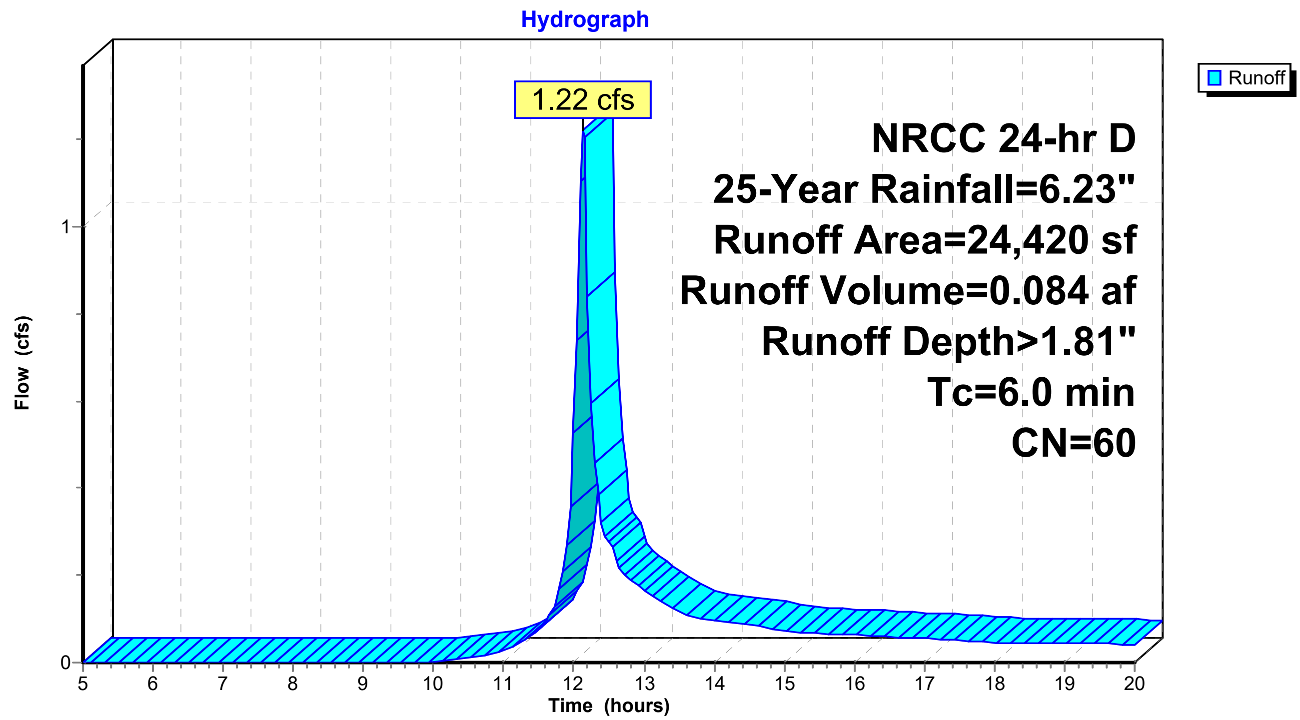
Runoff = 1.22 cfs @ 12.14 hrs, Volume= 0.084 af, Depth> 1.81"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 25-Year Rainfall=6.23"

Area (sf)	CN	Description
4,295	55	Woods, Good, HSG B
20,125	61	>75% Grass cover, Good, HSG B
24,420	60	Weighted Average
24,420		100.00% Pervious Area

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

Subcatchment 31S: P3A



Summary for Subcatchment 34S: P1C

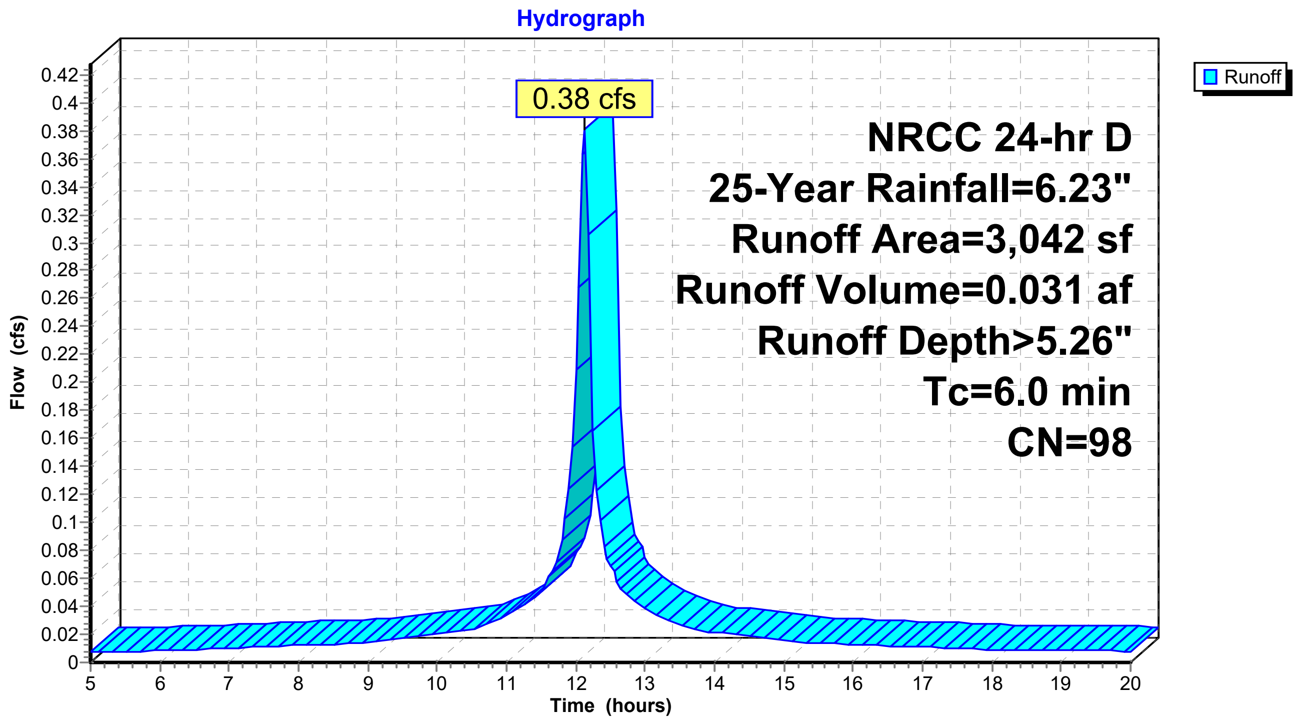
Runoff = 0.38 cfs @ 12.13 hrs, Volume= 0.031 af, Depth> 5.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 25-Year Rainfall=6.23"

Area (sf)	CN	Description
3,042	98	Paved parking, HSG B
3,042		100.00% Impervious Area

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

Subcatchment 34S: P1C



Summary for Subcatchment 35S: P1B

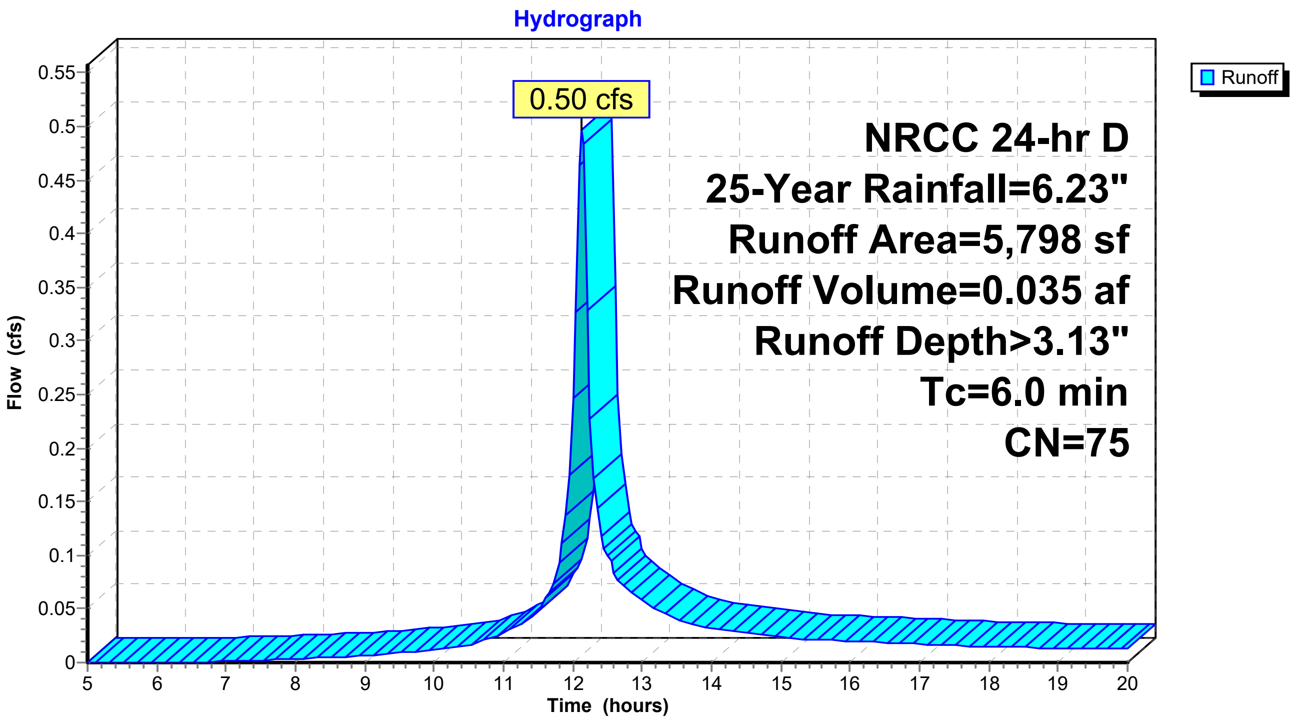
Runoff = 0.50 cfs @ 12.13 hrs, Volume= 0.035 af, Depth> 3.13"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 25-Year Rainfall=6.23"

Area (sf)	CN	Description
2,135	98	Paved parking, HSG B
3,663	61	>75% Grass cover, Good, HSG B
5,798	75	Weighted Average
3,663		63.18% Pervious Area
2,135		36.82% Impervious Area

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

Subcatchment 35S: P1B



Summary for Subcatchment 43S: P1D

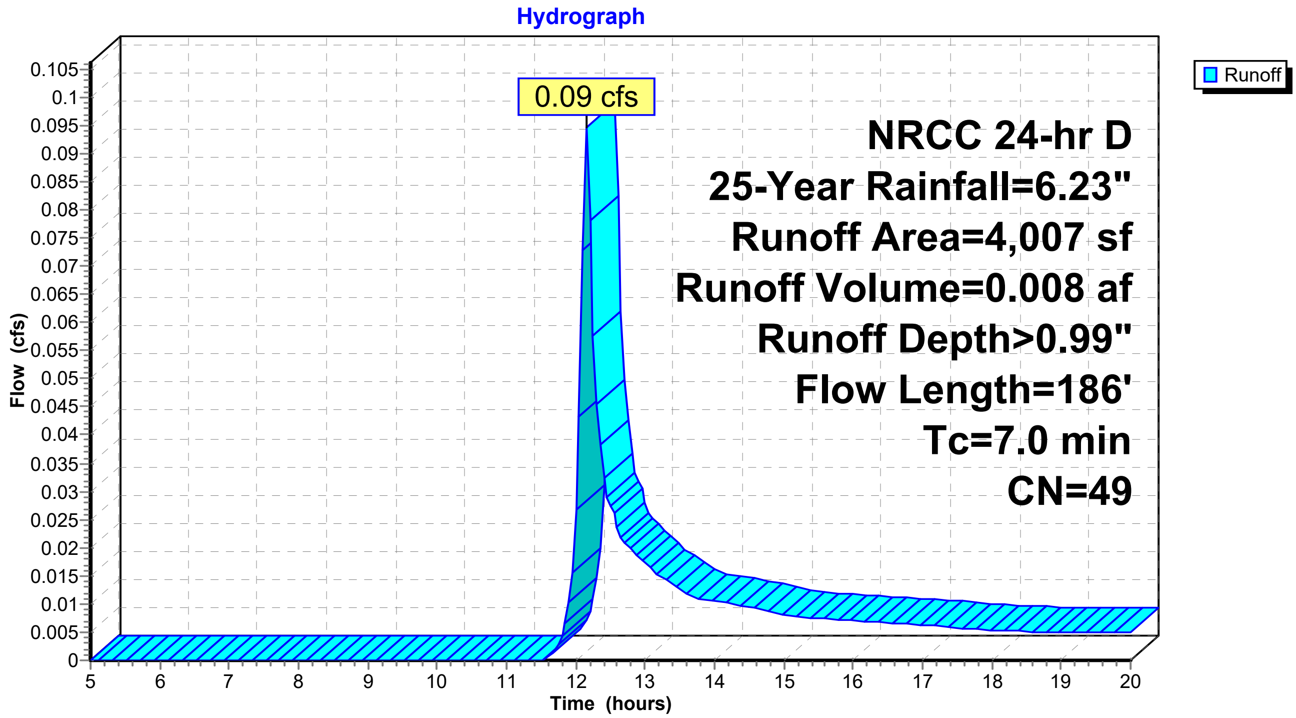
Runoff = 0.09 cfs @ 12.15 hrs, Volume= 0.008 af, Depth> 0.99"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 25-Year Rainfall=6.23"

Area (sf)	CN	Description
316	55	Woods, Good, HSG B
3,691	48	Brush, Good, HSG B
4,007	49	Weighted Average
4,007		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.6	50	0.1000	0.13		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.10"
0.4	136	0.1300	5.80		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
7.0	186	Total			

Subcatchment 43S: P1D



Summary for Subcatchment 44S: P2D

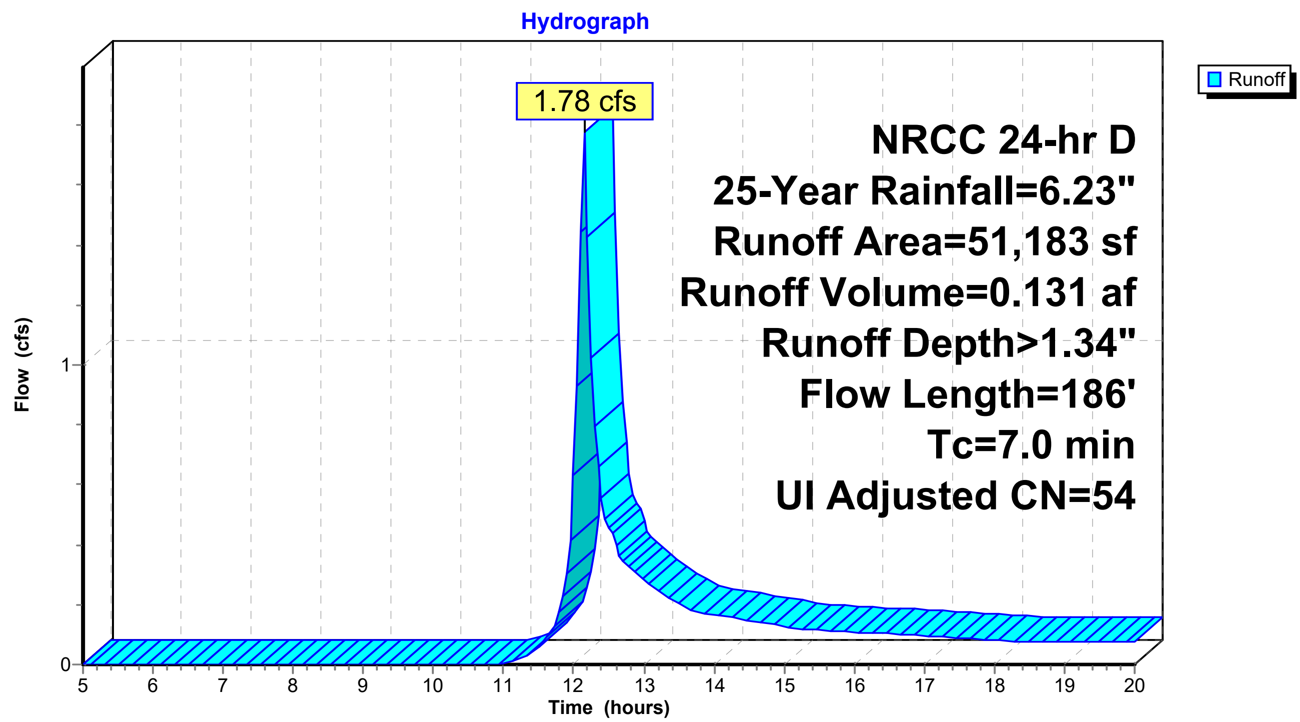
Runoff = 1.78 cfs @ 12.15 hrs, Volume= 0.131 af, Depth> 1.34"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 25-Year Rainfall=6.23"

Area (sf)	CN	Adj	Description
33,103	55		Woods, Good, HSG B
13,939	48		Brush, Good, HSG B
2,316	98		Unconnected roofs, HSG B
461	98		Unconnected pavement, HSG B
1,364	58		Woods/grass comb., Good, HSG B
51,183	56	54	Weighted Average, UI Adjusted
48,406			94.57% Pervious Area
2,777			5.43% Impervious Area
2,777			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.6	50	0.1000	0.13		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.10"
0.4	136	0.1300	5.80		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
7.0	186	Total			

Subcatchment 44S: P2D



Summary for Subcatchment 45S: P3L

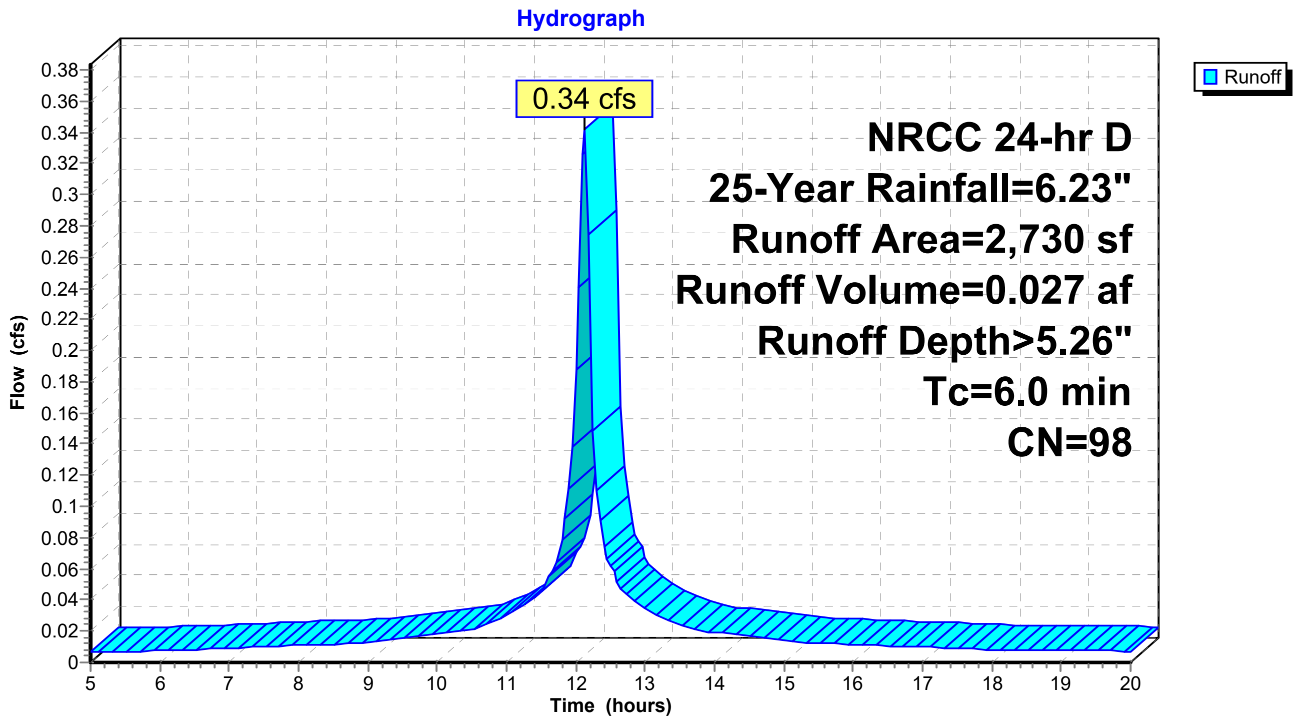
Runoff = 0.34 cfs @ 12.13 hrs, Volume= 0.027 af, Depth> 5.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 25-Year Rainfall=6.23"

Area (sf)	CN	Description
2,730	98	Paved parking, HSG B
2,730		100.00% Impervious Area

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

Subcatchment 45S: P3L



Summary for Subcatchment 46S: P2C

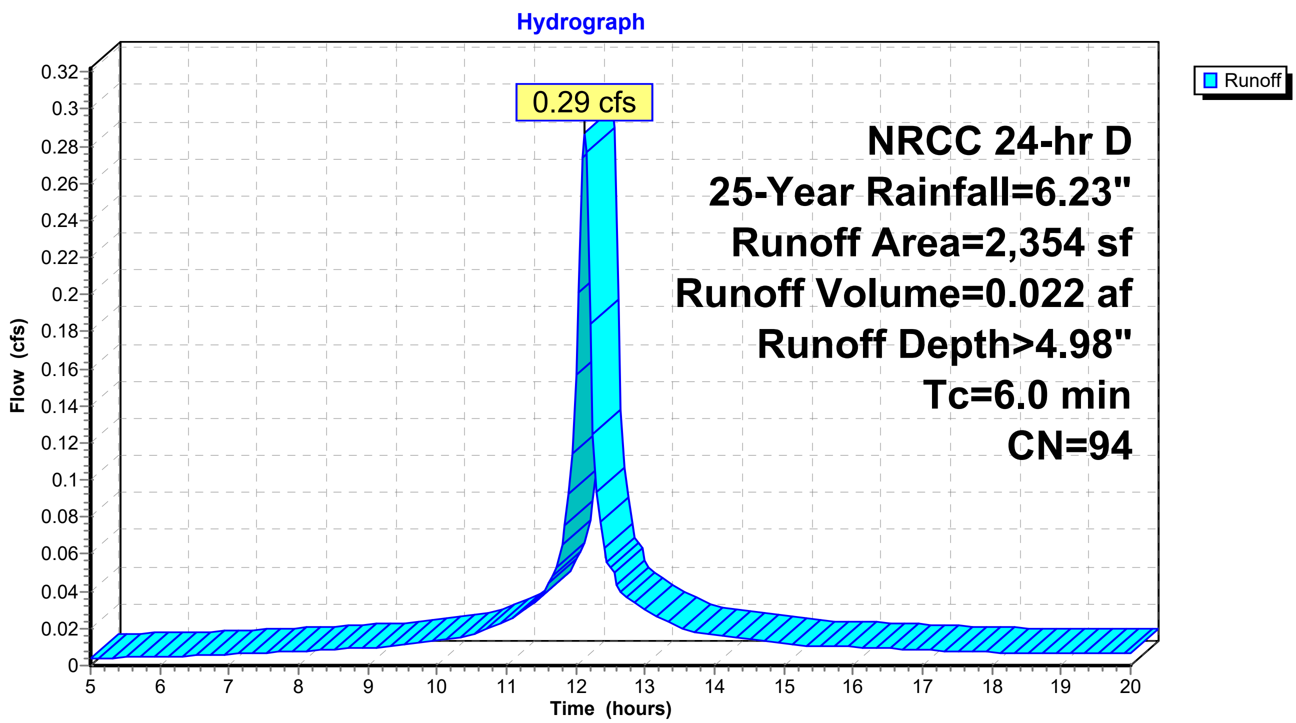
Runoff = 0.29 cfs @ 12.13 hrs, Volume= 0.022 af, Depth> 4.98"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 25-Year Rainfall=6.23"

Area (sf)	CN	Description
263	61	>75% Grass cover, Good, HSG B
2,091	98	Paved parking, HSG B
2,354	94	Weighted Average
263		11.17% Pervious Area
2,091		88.83% Impervious Area

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

Subcatchment 46S: P2C



Summary for Subcatchment 47S: P3M

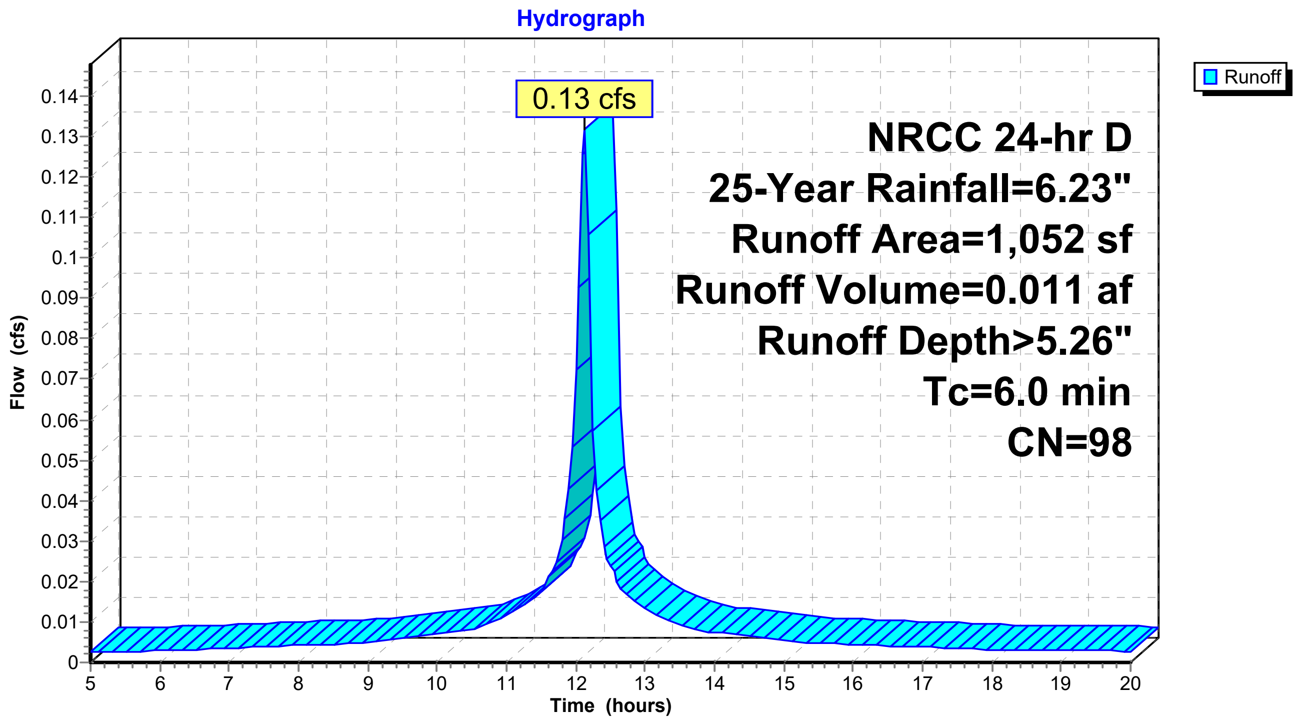
Runoff = 0.13 cfs @ 12.13 hrs, Volume= 0.011 af, Depth> 5.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 25-Year Rainfall=6.23"

Area (sf)	CN	Description
1,052	98	Paved parking, HSG B
1,052		100.00% Impervious Area

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

Subcatchment 47S: P3M



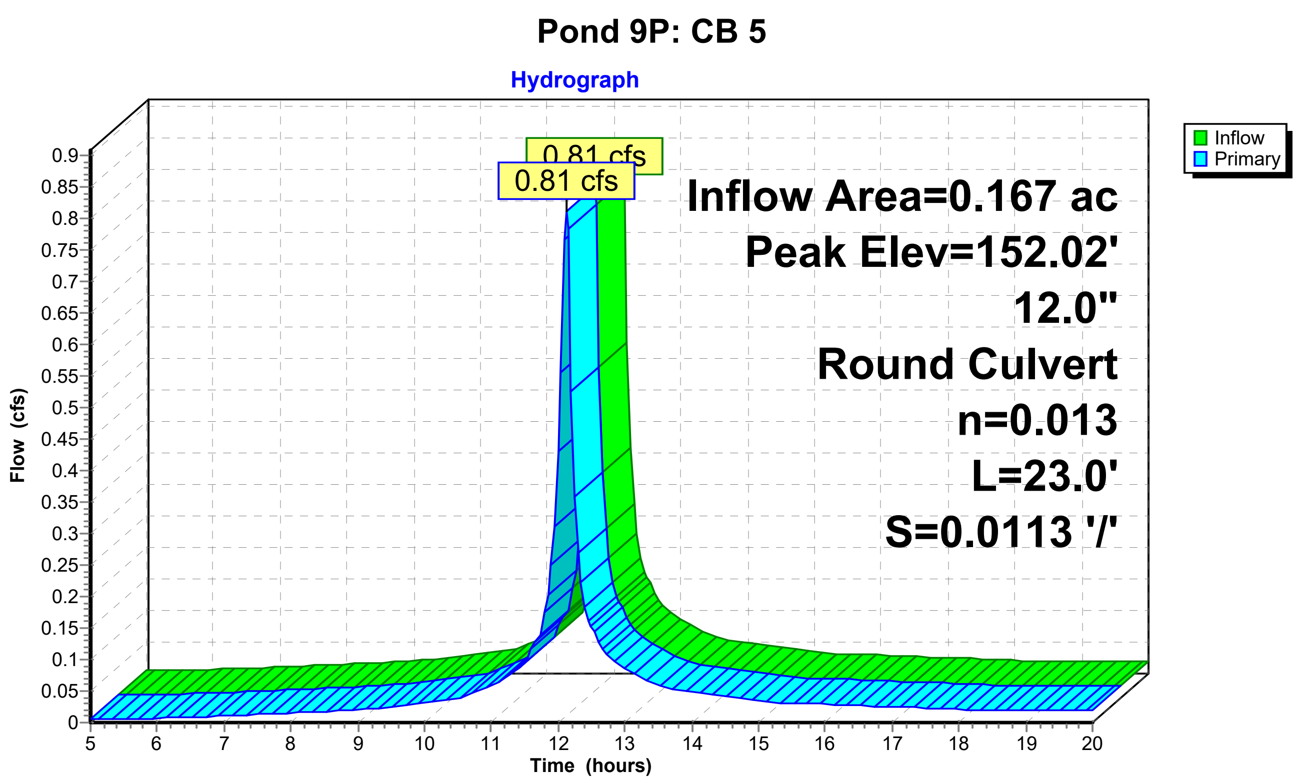
Summary for Pond 9P: CB 5

Inflow Area =	0.167 ac,	68.97% Impervious,	Inflow Depth > 4.32"	for 25-Year event	
Inflow =	0.81 cfs @	12.13 hrs,	Volume=	0.060 af	
Outflow =	0.81 cfs @	12.13 hrs,	Volume=	0.060 af,	Atten= 0%, Lag= 0.0 min
Primary =	0.81 cfs @	12.13 hrs,	Volume=	0.060 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 152.02' @ 12.13 hrs
Flood Elev= 156.25'

Device	Routing	Invert	Outlet Devices
#1	Primary	151.50'	**12.0" Round Culvert** L= 23.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 151.50' / 151.24' S= 0.0113 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.78 cfs @ 12.13 hrs HW=152.01' (Free Discharge)
└─**1=Culvert** (Inlet Controls 0.78 cfs @ 1.92 fps)



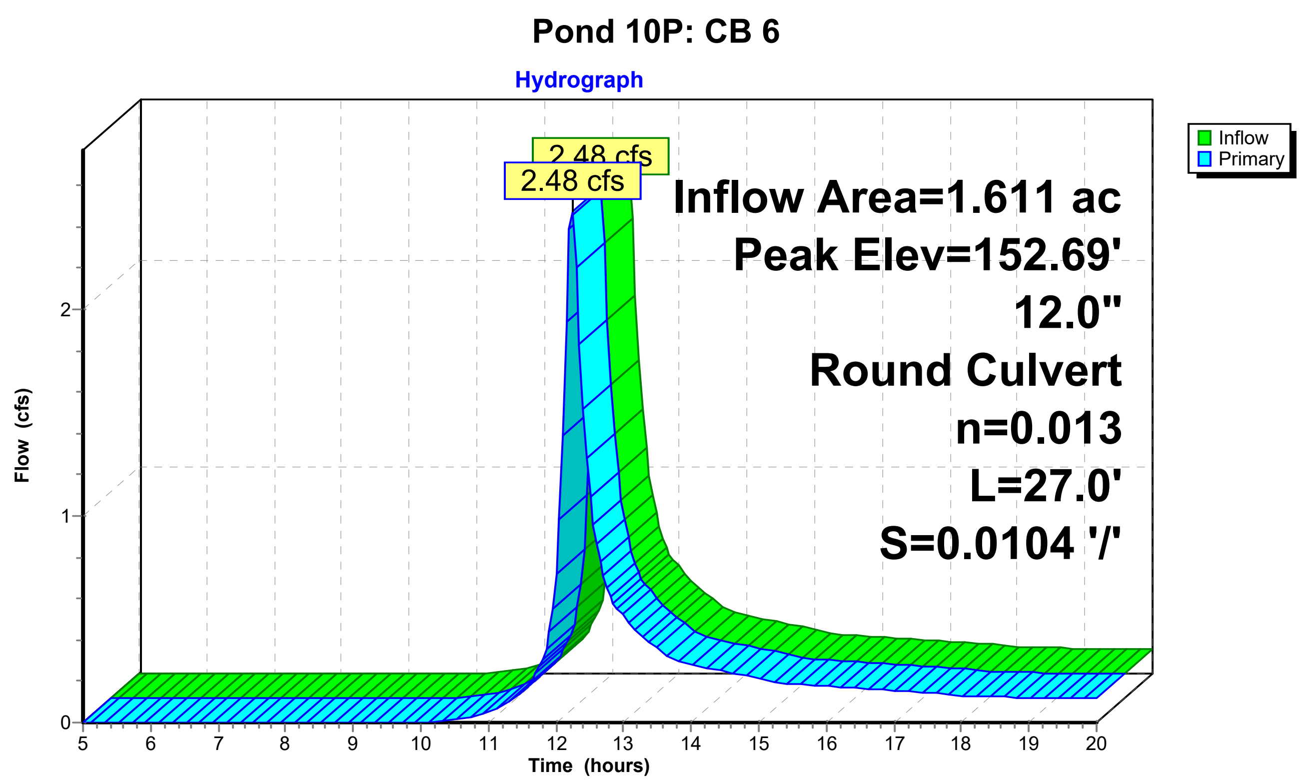
Summary for Pond 10P: CB 6

Inflow Area =	1.611 ac,	8.32% Impervious, Inflow Depth > 1.72"	for 25-Year event	
Inflow =	2.48 cfs @	12.24 hrs, Volume=	0.230 af	
Outflow =	2.48 cfs @	12.24 hrs, Volume=	0.230 af,	Atten= 0%, Lag= 0.0 min
Primary =	2.48 cfs @	12.24 hrs, Volume=	0.230 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 152.69' @ 12.24 hrs
Flood Elev= 156.25'

Device	Routing	Invert	Outlet Devices
#1	Primary	151.50'	**12.0" Round Culvert** L= 27.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 151.50' / 151.22' S= 0.0104 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=2.44 cfs @ 12.24 hrs HW=152.67' (Free Discharge)
↑**1=Culvert** (Inlet Controls 2.44 cfs @ 3.11 fps)



Summary for Pond 13P: CB 7

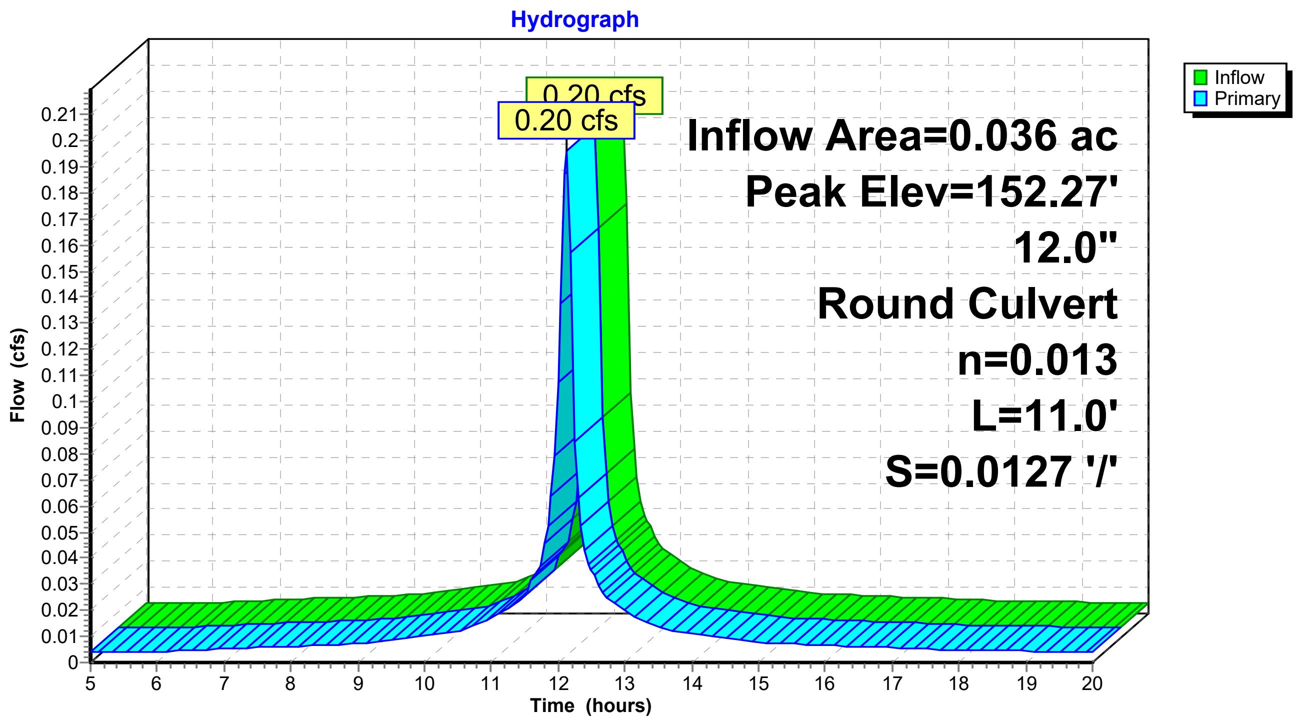
Inflow Area = 0.036 ac,100.00% Impervious, Inflow Depth > 5.26" for 25-Year event
Inflow = 0.20 cfs @ 12.13 hrs, Volume= 0.016 af
Outflow = 0.20 cfs @ 12.13 hrs, Volume= 0.016 af, Atten= 0%, Lag= 0.0 min
Primary = 0.20 cfs @ 12.13 hrs, Volume= 0.016 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 152.27' @ 12.13 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	152.03'	**12.0" Round Culvert** L= 11.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 152.03' / 151.89' S= 0.0127 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.19 cfs @ 12.13 hrs HW=152.27' (Free Discharge)
└─**1=Culvert** (Inlet Controls 0.19 cfs @ 1.31 fps)

Pond 13P: CB 7



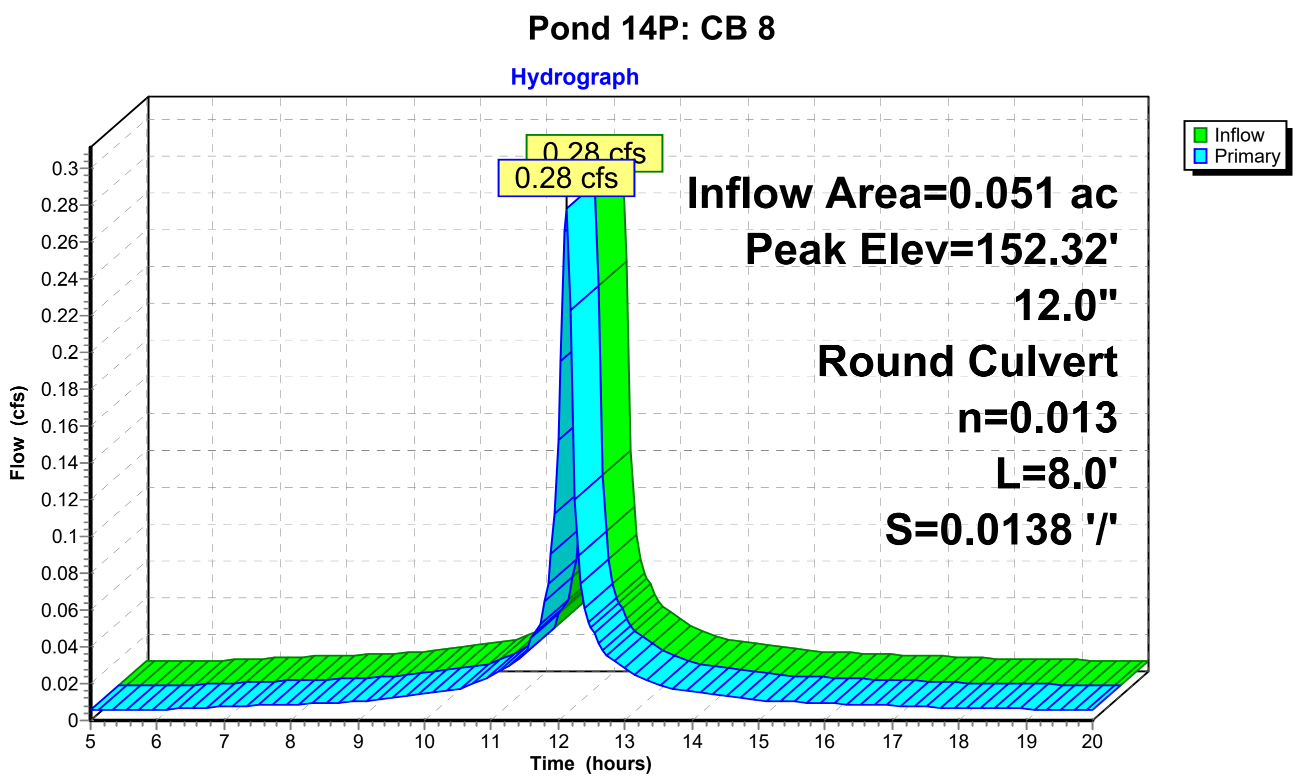
Summary for Pond 14P: CB 8

Inflow Area = 0.051 ac,100.00% Impervious, Inflow Depth > 5.26" for 25-Year event
Inflow = 0.28 cfs @ 12.13 hrs, Volume= 0.022 af
Outflow = 0.28 cfs @ 12.13 hrs, Volume= 0.022 af, Atten= 0%, Lag= 0.0 min
Primary = 0.28 cfs @ 12.13 hrs, Volume= 0.022 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 152.32' @ 12.13 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	152.03'	**12.0" Round Culvert** L= 8.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 152.03' / 151.92' S= 0.0138 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.27 cfs @ 12.13 hrs HW=152.32' (Free Discharge)
└─**1=Culvert** (Inlet Controls 0.27 cfs @ 1.44 fps)



Summary for Pond 15P: DMH 3

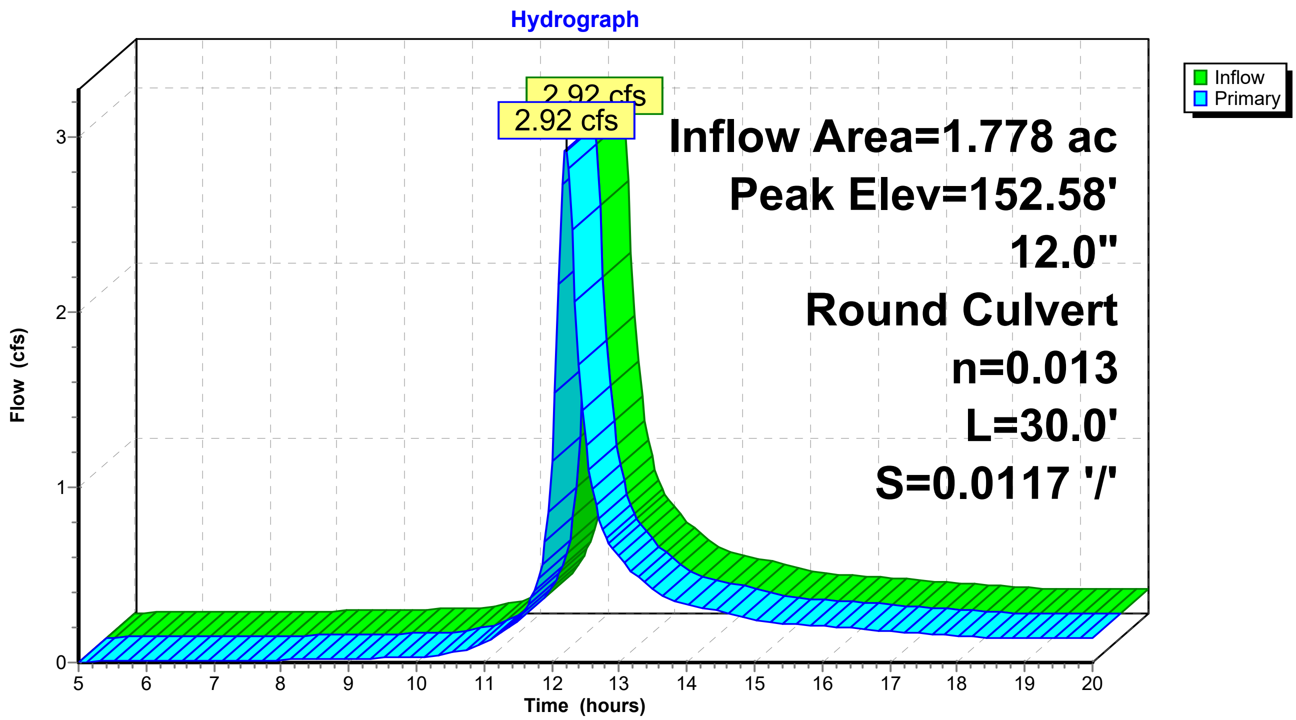
Inflow Area =	1.778 ac,	14.02% Impervious,	Inflow Depth > 1.96"	for 25-Year event	
Inflow =	2.92 cfs @	12.21 hrs,	Volume=	0.291 af	
Outflow =	2.92 cfs @	12.21 hrs,	Volume=	0.291 af,	Atten= 0%, Lag= 0.0 min
Primary =	2.92 cfs @	12.21 hrs,	Volume=	0.291 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 152.58' @ 12.21 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	151.12'	**12.0" Round Culvert** L= 30.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 151.12' / 150.77' S= 0.0117 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=2.90 cfs @ 12.21 hrs HW=152.57' (Free Discharge)
└─**1=Culvert** (Inlet Controls 2.90 cfs @ 3.70 fps)

Pond 15P: DMH 3



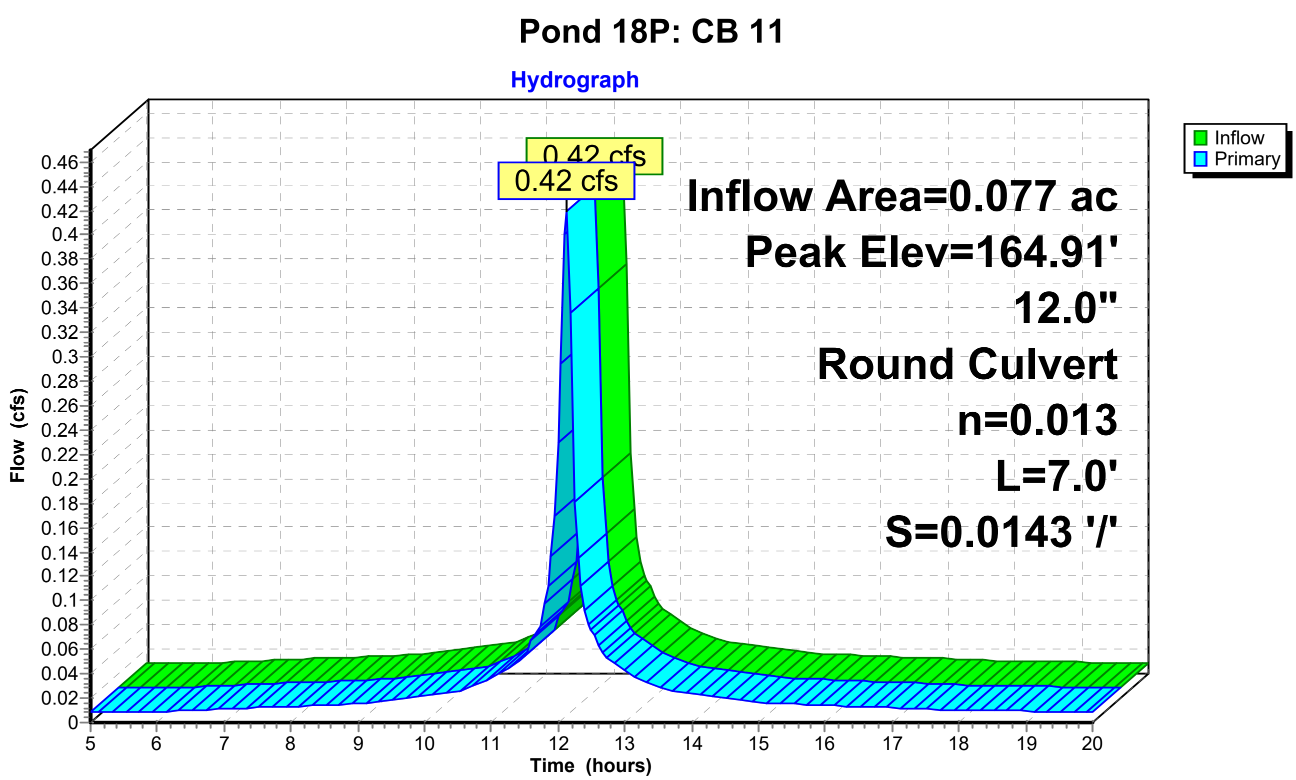
Summary for Pond 18P: CB 11

Inflow Area = 0.077 ac,100.00% Impervious, Inflow Depth > 5.26" for 25-Year event
Inflow = 0.42 cfs @ 12.13 hrs, Volume= 0.034 af
Outflow = 0.42 cfs @ 12.13 hrs, Volume= 0.034 af, Atten= 0%, Lag= 0.0 min
Primary = 0.42 cfs @ 12.13 hrs, Volume= 0.034 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 164.91' @ 12.13 hrs
Flood Elev= 168.07'

Device	Routing	Invert	Outlet Devices
#1	Primary	164.54'	**12.0" Round Culvert** L= 7.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 164.54' / 164.44' S= 0.0143 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.40 cfs @ 12.13 hrs HW=164.90' (Free Discharge)
↑**1=Culvert** (Barrel Controls 0.40 cfs @ 2.31 fps)



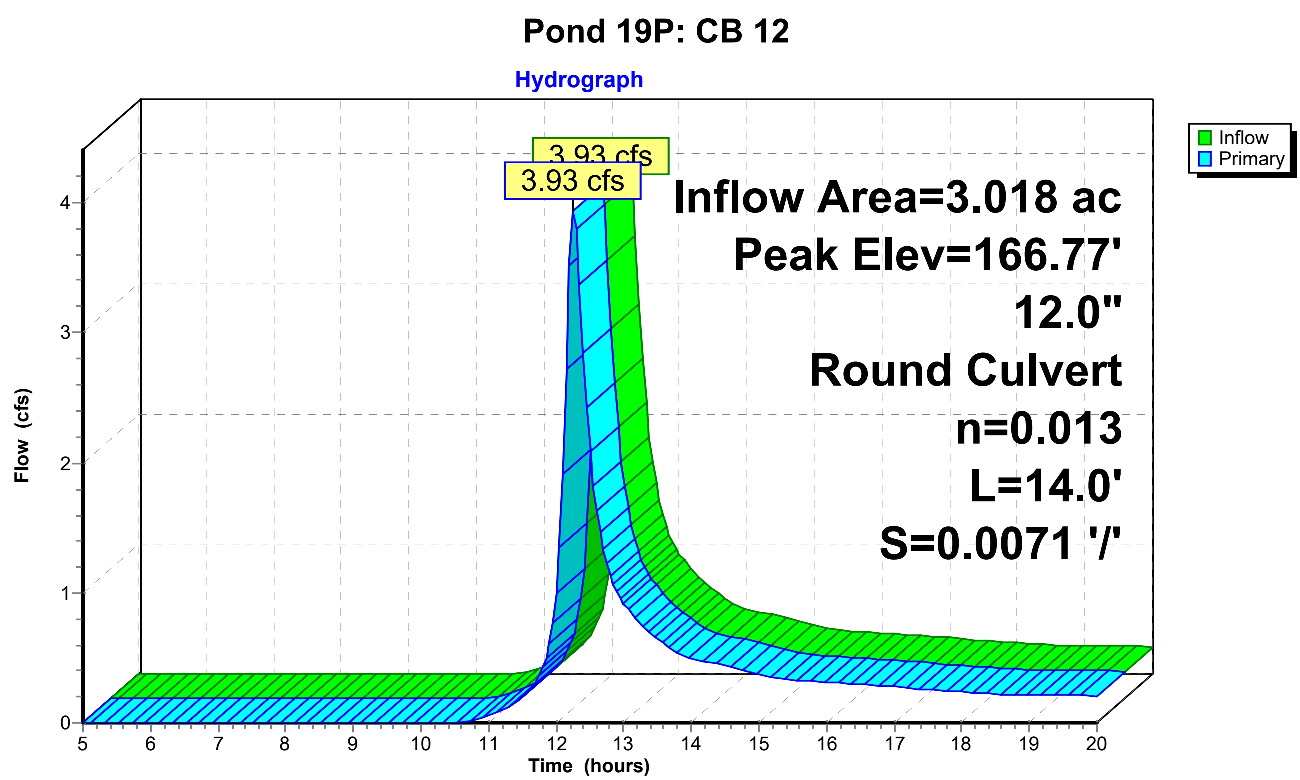
Summary for Pond 19P: CB 12

Inflow Area = 3.018 ac, 5.15% Impervious, Inflow Depth > 1.56" for 25-Year event
Inflow = 3.93 cfs @ 12.26 hrs, Volume= 0.392 af
Outflow = 3.93 cfs @ 12.26 hrs, Volume= 0.392 af, Atten= 0%, Lag= 0.0 min
Primary = 3.93 cfs @ 12.26 hrs, Volume= 0.392 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 166.77' @ 12.26 hrs
Flood Elev= 168.07'

Device	Routing	Invert	Outlet Devices
#1	Primary	164.54'	**12.0" Round Culvert** L= 14.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 164.54' / 164.44' S= 0.0071 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=3.88 cfs @ 12.26 hrs HW=166.73' (Free Discharge)
↑**1=Culvert** (Inlet Controls 3.88 cfs @ 4.94 fps)



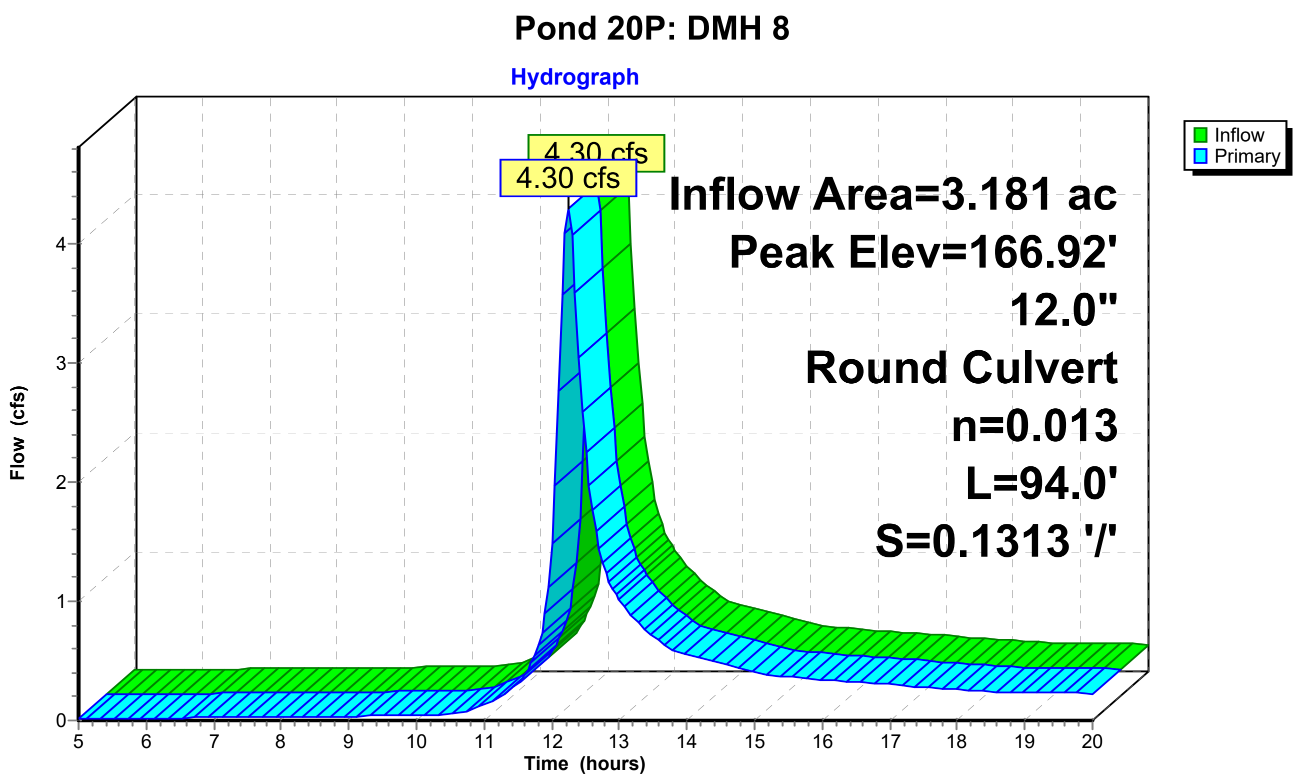
Summary for Pond 20P: DMH 8

Inflow Area = 3.181 ac, 10.03% Impervious, Inflow Depth > 1.75" for 25-Year event
Inflow = 4.30 cfs @ 12.25 hrs, Volume= 0.463 af
Outflow = 4.30 cfs @ 12.25 hrs, Volume= 0.463 af, Atten= 0%, Lag= 0.0 min
Primary = 4.30 cfs @ 12.25 hrs, Volume= 0.463 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 166.92' @ 12.25 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	164.34'	**12.0" Round Culvert** L= 94.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 164.34' / 152.00' S= 0.1313 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=4.30 cfs @ 12.25 hrs HW=166.91' (Free Discharge)
└─**1=Culvert** (Inlet Controls 4.30 cfs @ 5.47 fps)



Summary for Pond 21P: Infiltration Basin 1

Inflow Area = 3.634 ac, 8.78% Impervious, Inflow Depth > 1.74" for 25-Year event
Inflow = 4.77 cfs @ 12.23 hrs, Volume= 0.525 af
Outflow = 4.41 cfs @ 12.31 hrs, Volume= 0.453 af, Atten= 8%, Lag= 5.0 min
Discarded = 0.12 cfs @ 12.31 hrs, Volume= 0.079 af
Primary = 4.29 cfs @ 12.31 hrs, Volume= 0.374 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 154.17' @ 12.31 hrs Surf.Area= 2,942 sf Storage= 4,458 cf

Plug-Flow detention time= 69.6 min calculated for 0.452 af (86% of inflow)
Center-of-Mass det. time= 25.7 min (853.8 - 828.1)

Volume	Invert	Avail.Storage	Storage Description
#1	152.00'	11,781 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

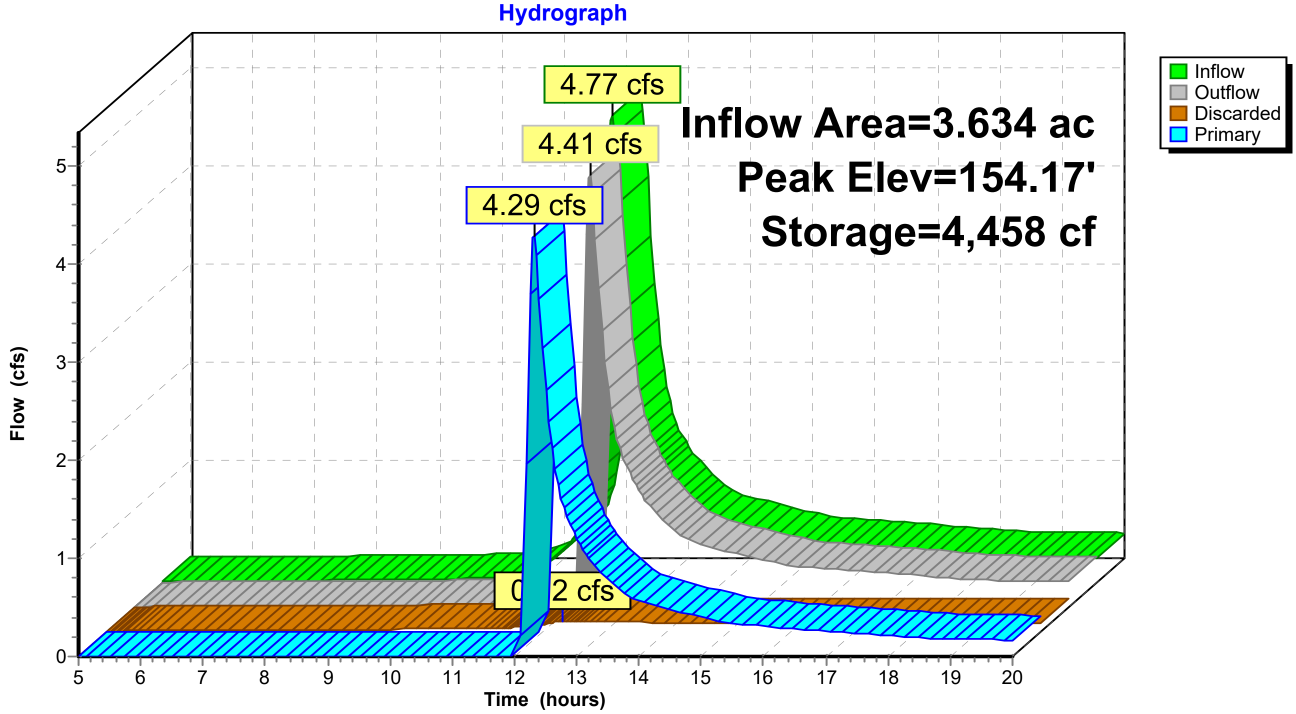
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
152.00	996	0	0
153.00	2,112	1,554	1,554
154.00	2,709	2,411	3,965
155.00	4,044	3,377	7,341
156.00	4,836	4,440	11,781

Device	Routing	Invert	Outlet Devices
#1	Discarded	152.00'	**1.020 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 150.00'
#2	Primary	152.00'	**18.0" Round Culvert** L= 121.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 152.00' / 139.00' S= 0.1074 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf
#3	Device 2	154.00'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 2	153.60'	**2.0' long x 0.40' rise Sharp-Crested Vee/Trap Weir** Cv= 2.62 (C= 3.28)

Discarded OutFlow Max=0.12 cfs @ 12.31 hrs HW=154.17' (Free Discharge)
└─**1=Exfiltration** (Controls 0.12 cfs)

Primary OutFlow Max=4.21 cfs @ 12.31 hrs HW=154.17' (Free Discharge)
└─**2=Culvert** (Passes 4.21 cfs of 8.01 cfs potential flow)
  ├─**3=Orifice/Grate** (Weir Controls 1.85 cfs @ 1.35 fps)
  └─**4=Sharp-Crested Vee/Trap Weir** (Orifice Controls 2.36 cfs @ 2.95 fps)

Pond 21P: Infiltration Basin 1



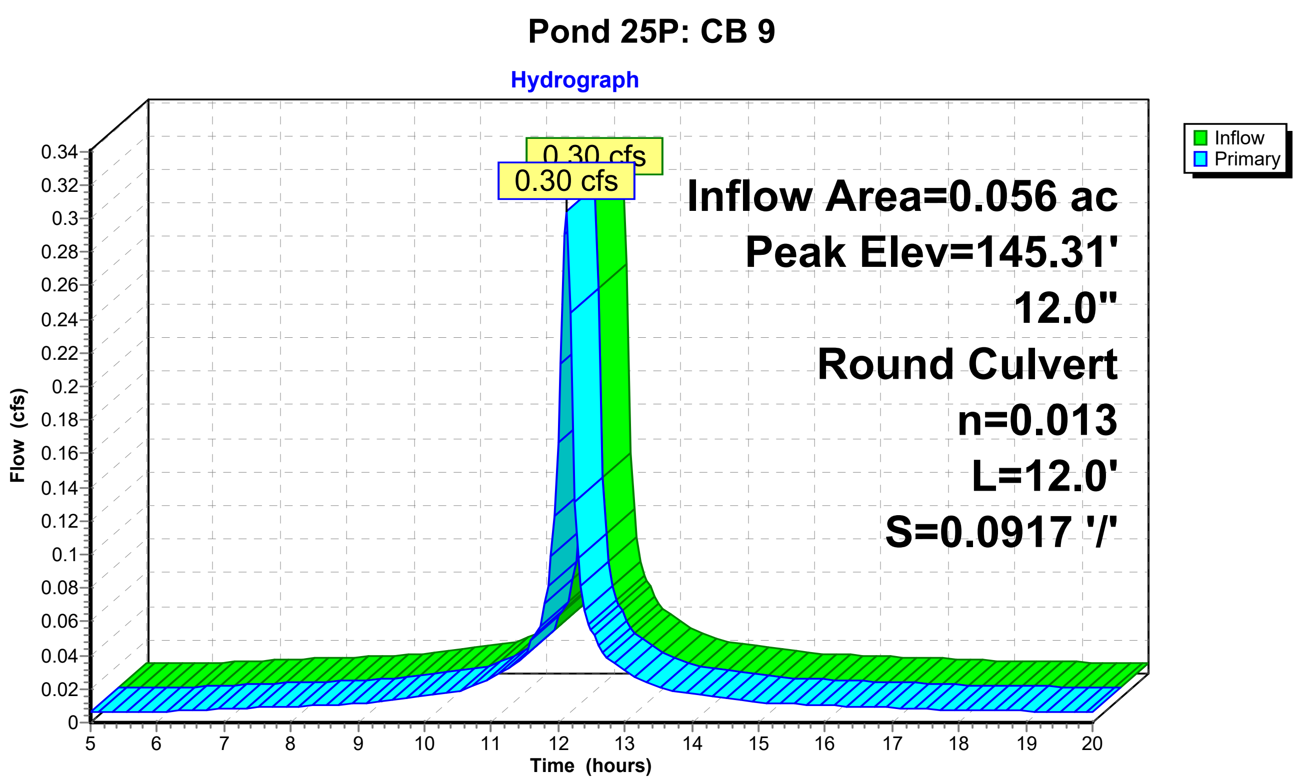
Summary for Pond 25P: CB 9

Inflow Area = 0.056 ac,100.00% Impervious, Inflow Depth > 5.26" for 25-Year event
Inflow = 0.30 cfs @ 12.13 hrs, Volume= 0.024 af
Outflow = 0.30 cfs @ 12.13 hrs, Volume= 0.024 af, Atten= 0%, Lag= 0.0 min
Primary = 0.30 cfs @ 12.13 hrs, Volume= 0.024 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 145.31' @ 12.13 hrs
Flood Elev= 152.72'

Device	Routing	Invert	Outlet Devices
#1	Primary	145.00'	**12.0" Round Culvert** L= 12.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 145.00' / 143.90' S= 0.0917 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.29 cfs @ 12.13 hrs HW=145.30' (Free Discharge)
↑—**1=Culvert** (Inlet Controls 0.29 cfs @ 1.47 fps)



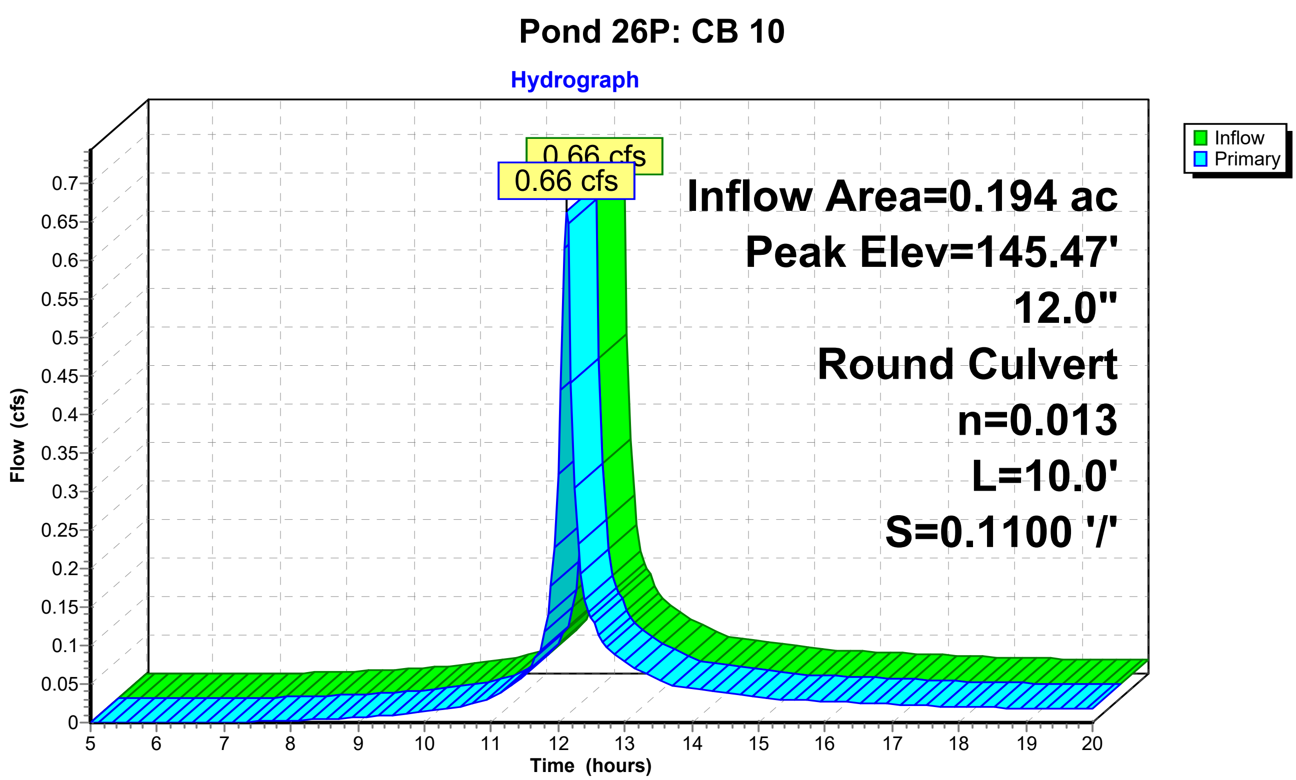
Summary for Pond 26P: CB 10

Inflow Area =	0.194 ac,	28.74% Impervious,	Inflow Depth > 2.85"	for 25-Year event
Inflow =	0.66 cfs @	12.13 hrs, Volume=	0.046 af	
Outflow =	0.66 cfs @	12.13 hrs, Volume=	0.046 af,	Atten= 0%, Lag= 0.0 min
Primary =	0.66 cfs @	12.13 hrs, Volume=	0.046 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 145.47' @ 12.13 hrs
Flood Elev= 152.72'

Device	Routing	Invert	Outlet Devices
#1	Primary	145.00'	**12.0" Round Culvert** L= 10.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 145.00' / 143.90' S= 0.1100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.64 cfs @ 12.13 hrs HW=145.46' (Free Discharge)
└**1=Culvert** (Inlet Controls 0.64 cfs @ 1.82 fps)



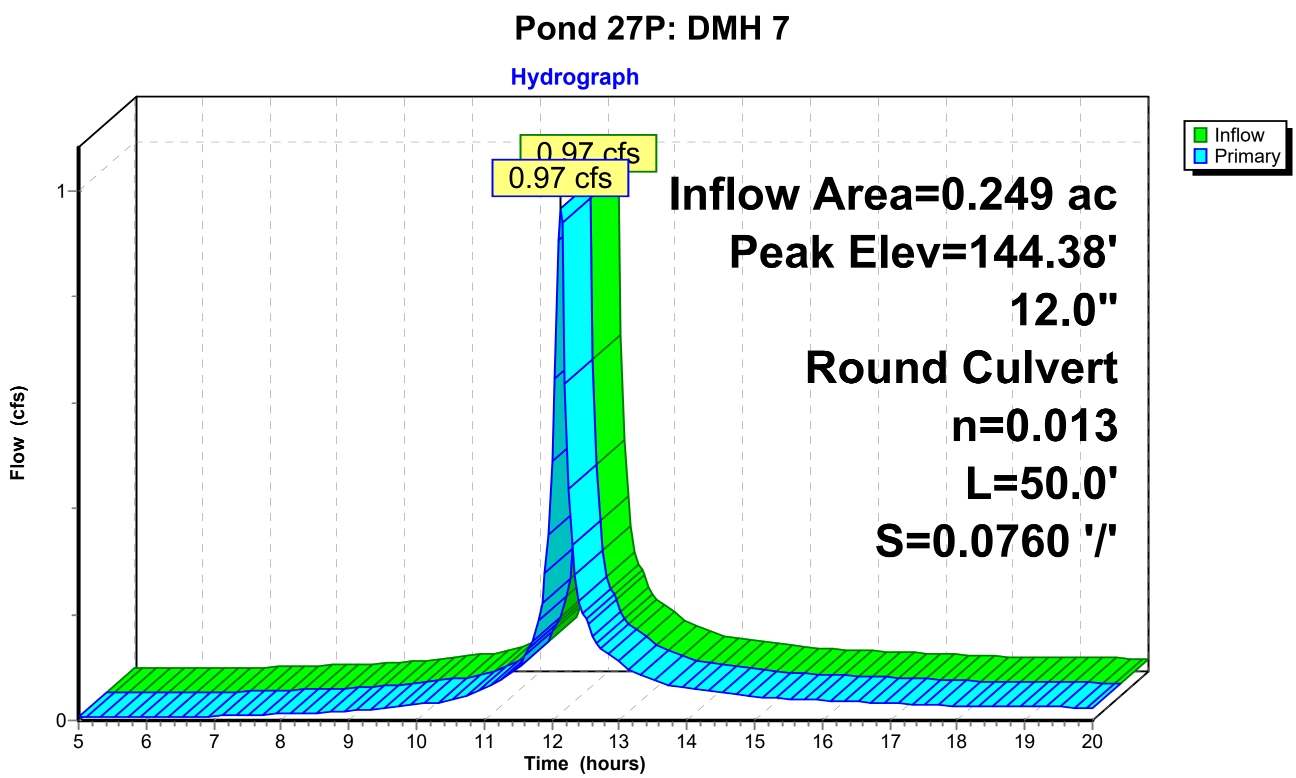
Summary for Pond 27P: DMH 7

Inflow Area =	0.249 ac, 44.65% Impervious, Inflow Depth > 3.39" for 25-Year event			
Inflow =	0.97 cfs @	12.13 hrs, Volume=	0.070 af	
Outflow =	0.97 cfs @	12.13 hrs, Volume=	0.070 af,	Atten= 0%, Lag= 0.0 min
Primary =	0.97 cfs @	12.13 hrs, Volume=	0.070 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 144.38' @ 12.13 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	143.80'	**12.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 143.80' / 140.00' S= 0.0760 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.93 cfs @ 12.13 hrs HW=144.37' (Free Discharge)
1=Culvert (Inlet Controls 0.93 cfs @ 2.02 fps)



Summary for Pond 28P: Infiltration Basin 2

Inflow Area = 2.114 ac, 21.16% Impervious, Inflow Depth > 2.26" for 25-Year event
Inflow = 4.14 cfs @ 12.16 hrs, Volume= 0.399 af
Outflow = 2.43 cfs @ 12.37 hrs, Volume= 0.326 af, Atten= 41%, Lag= 12.4 min
Discarded = 0.13 cfs @ 12.37 hrs, Volume= 0.087 af
Primary = 2.30 cfs @ 12.37 hrs, Volume= 0.238 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 142.50' @ 12.37 hrs Surf.Area= 3,000 sf Storage= 5,436 cf

Plug-Flow detention time= 103.4 min calculated for 0.324 af (81% of inflow)
Center-of-Mass det. time= 46.4 min (852.9 - 806.4)

Volume	Invert	Avail.Storage	Storage Description
#1	140.00'	10,768 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

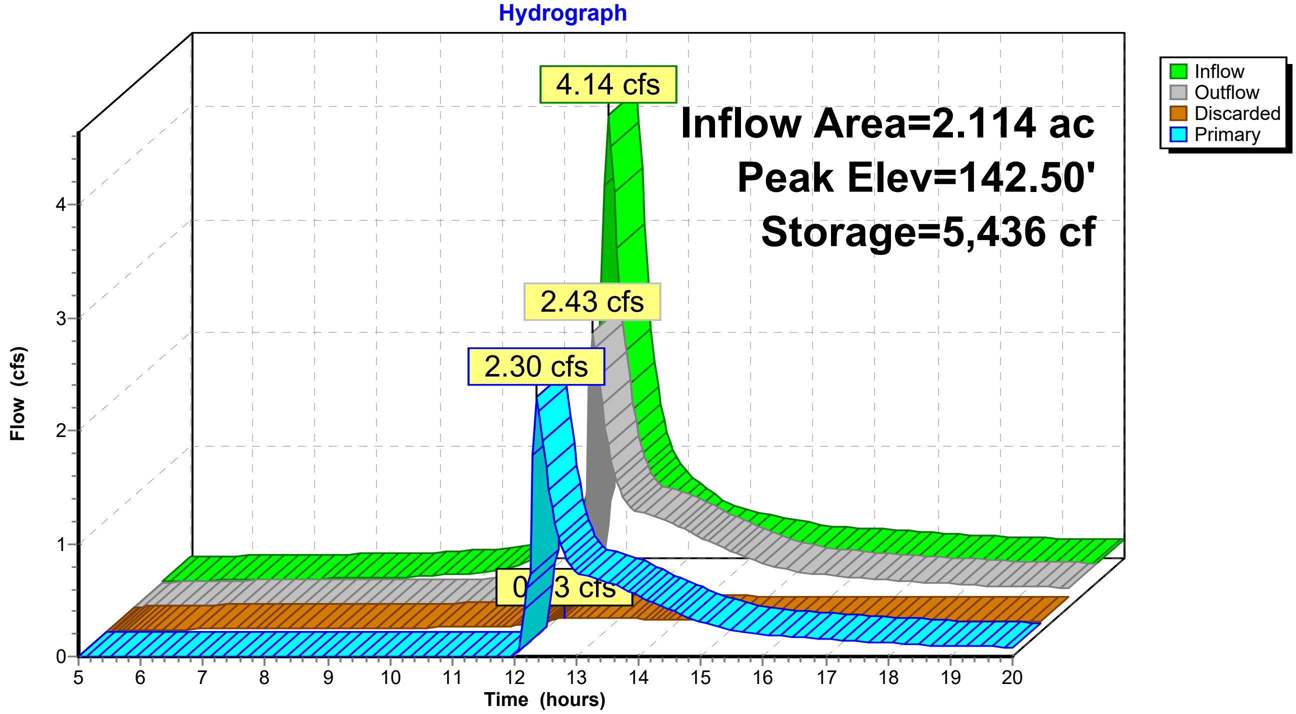
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
140.00	1,410	0	0
141.00	2,002	1,706	1,706
142.00	2,649	2,326	4,032
143.00	3,354	3,002	7,033
144.00	4,115	3,735	10,768

Device	Routing	Invert	Outlet Devices
#1	Discarded	140.00'	**1.020 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 138.00'
#2	Primary	139.00'	**12.0" Round Culvert** L= 65.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 139.00' / 134.50' S= 0.0692 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#3	Device 2	141.50'	**6.0" Vert. Orifice/Grate** C= 0.600
#4	Device 2	142.35'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.13 cfs @ 12.37 hrs HW=142.49' (Free Discharge)
└─**1=Exfiltration** (Controls 0.13 cfs)

Primary OutFlow Max=2.23 cfs @ 12.37 hrs HW=142.49' (Free Discharge)
└─**2=Culvert** (Passes 2.23 cfs of 5.17 cfs potential flow)
  ├─**3=Orifice/Grate** (Orifice Controls 0.81 cfs @ 4.15 fps)
  └─**4=Orifice/Grate** (Weir Controls 1.42 cfs @ 1.24 fps)

Pond 28P: Infiltration Basin 2



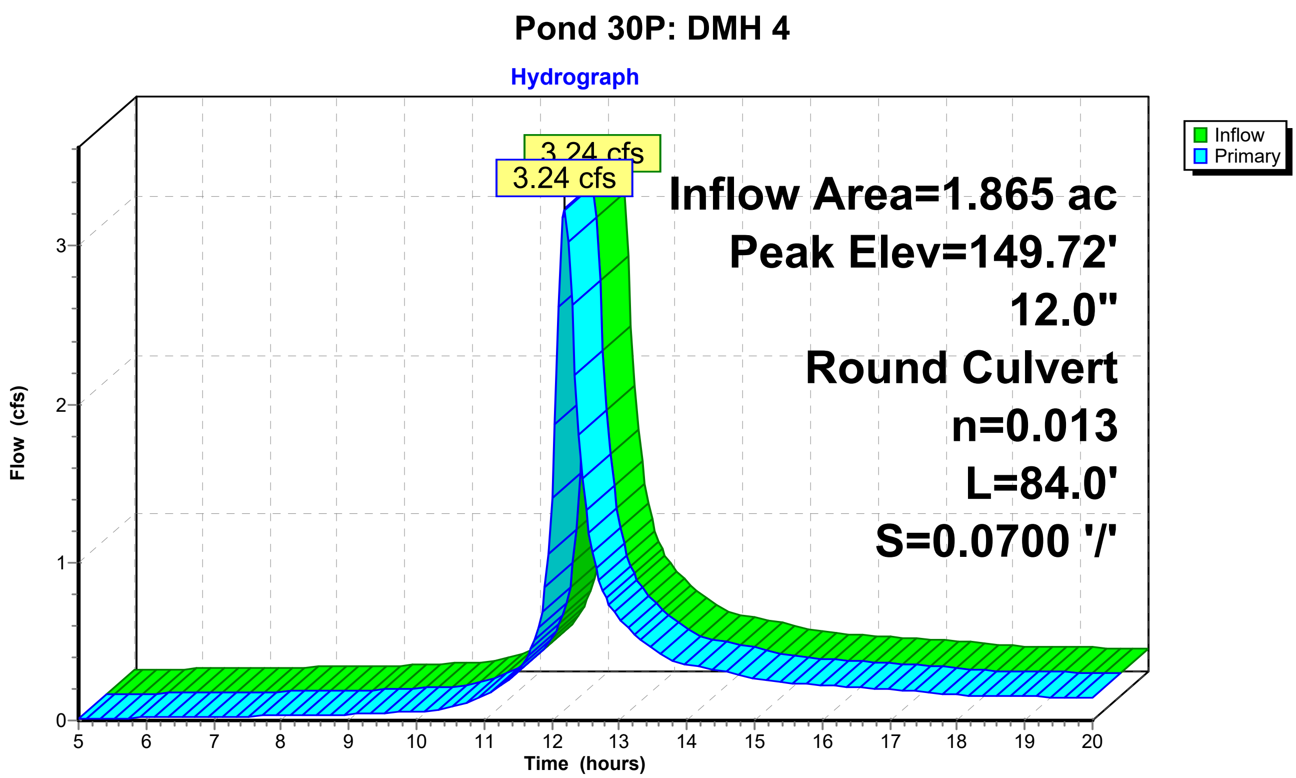
Summary for Pond 30P: DMH 4

Inflow Area =	1.865 ac,	18.02% Impervious, Inflow Depth > 2.11"	for 25-Year event	
Inflow =	3.24 cfs @	12.18 hrs, Volume=	0.329 af	
Outflow =	3.24 cfs @	12.18 hrs, Volume=	0.329 af,	Atten= 0%, Lag= 0.0 min
Primary =	3.24 cfs @	12.18 hrs, Volume=	0.329 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 149.72' @ 12.18 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	148.05'	**12.0" Round Culvert** L= 84.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 148.05' / 142.17' S= 0.0700 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=3.21 cfs @ 12.18 hrs HW=149.71' (Free Discharge)
↑**1=Culvert** (Inlet Controls 3.21 cfs @ 4.09 fps)



Summary for Pond 33P: Subsurface Inf. Aea 2

Inflow Area = 0.629 ac,100.00% Impervious, Inflow Depth > 5.26" for 25-Year event
Inflow = 3.43 cfs @ 12.13 hrs, Volume= 0.276 af
Outflow = 2.59 cfs @ 12.21 hrs, Volume= 0.192 af, Atten= 25%, Lag= 5.0 min
Discarded = 0.14 cfs @ 12.21 hrs, Volume= 0.126 af
Primary = 2.45 cfs @ 12.21 hrs, Volume= 0.067 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 152.96' @ 12.21 hrs Surf.Area= 0.055 ac Storage= 0.106 af

Plug-Flow detention time= 144.1 min calculated for 0.192 af (70% of inflow)
Center-of-Mass det. time= 63.8 min (799.7 - 735.9)

Volume	Invert	Avail.Storage	Storage Description
#1A	150.00'	0.050 af	**20.50'W x 117.54'L x 3.50'H Field A** 0.194 af Overall - 0.067 af Embedded = 0.126 af x 40.0% Voids
#2A	150.50'	0.067 af	**ADS_StormTech SC-740 +Cap** x 64 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 64 Chambers in 4 Rows
		0.118 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	150.00'	**1.020 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 148.00'
#2	Primary	150.00'	**12.0" Round Culvert** L= 70.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 150.00' / 138.00' S= 0.1714 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#3	Device 2	152.60'	**4.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.14 cfs @ 12.21 hrs HW=152.94' (Free Discharge)
└─**1=Exfiltration** (Controls 0.14 cfs)

Primary OutFlow Max=2.28 cfs @ 12.21 hrs HW=152.94' (Free Discharge)
└─**2=Culvert** (Passes 2.28 cfs of 4.66 cfs potential flow)
  └─**3=Broad-Crested Rectangular Weir** (Weir Controls 2.28 cfs @ 1.68 fps)

Pond 33P: Subsurface Inf. Aea 2 - Chamber Wizard Field A

Chamber Model = ADS_StormTech SC-740 +Cap (ADS StormTech® SC-740 with cap length)
Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf
Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

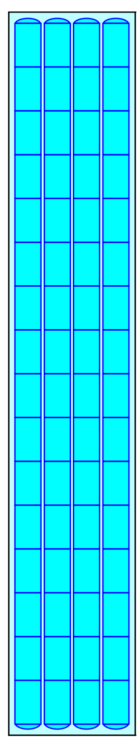
16 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 115.54' Row Length +12.0" End Stone x 2 = 117.54' Base Length
4 Rows x 51.0" Wide + 6.0" Spacing x 3 + 12.0" Side Stone x 2 = 20.50' Base Width
6.0" Base + 30.0" Chamber Height + 6.0" Cover = 3.50' Field Height

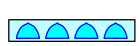
64 Chambers x 45.9 cf = 2,940.2 cf Chamber Storage

8,433.3 cf Field - 2,940.2 cf Chambers = 5,493.1 cf Stone x 40.0% Voids = 2,197.2 cf Stone Storage

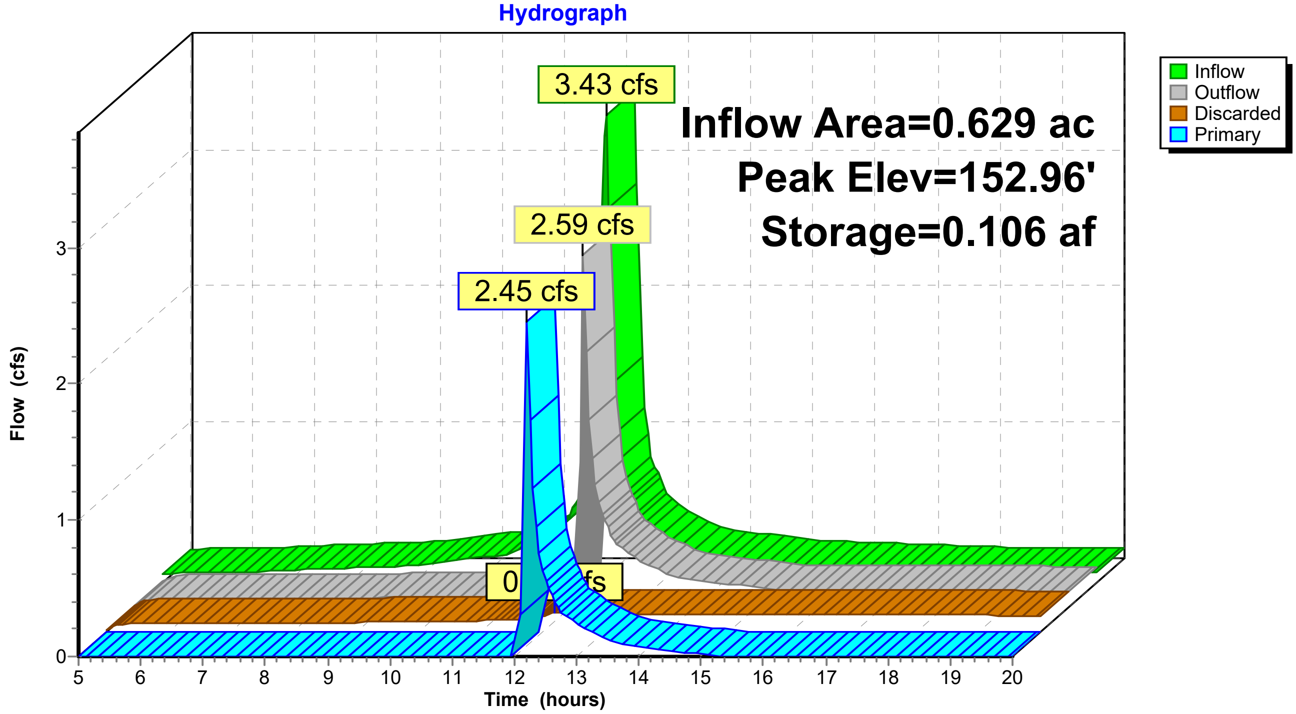
Chamber Storage + Stone Storage = 5,137.4 cf = 0.118 af
Overall Storage Efficiency = 60.9%
Overall System Size = 117.54' x 20.50' x 3.50'

64 Chambers
312.3 cy Field
203.4 cy Stone





Pond 33P: Subsurface Inf. Aea 2



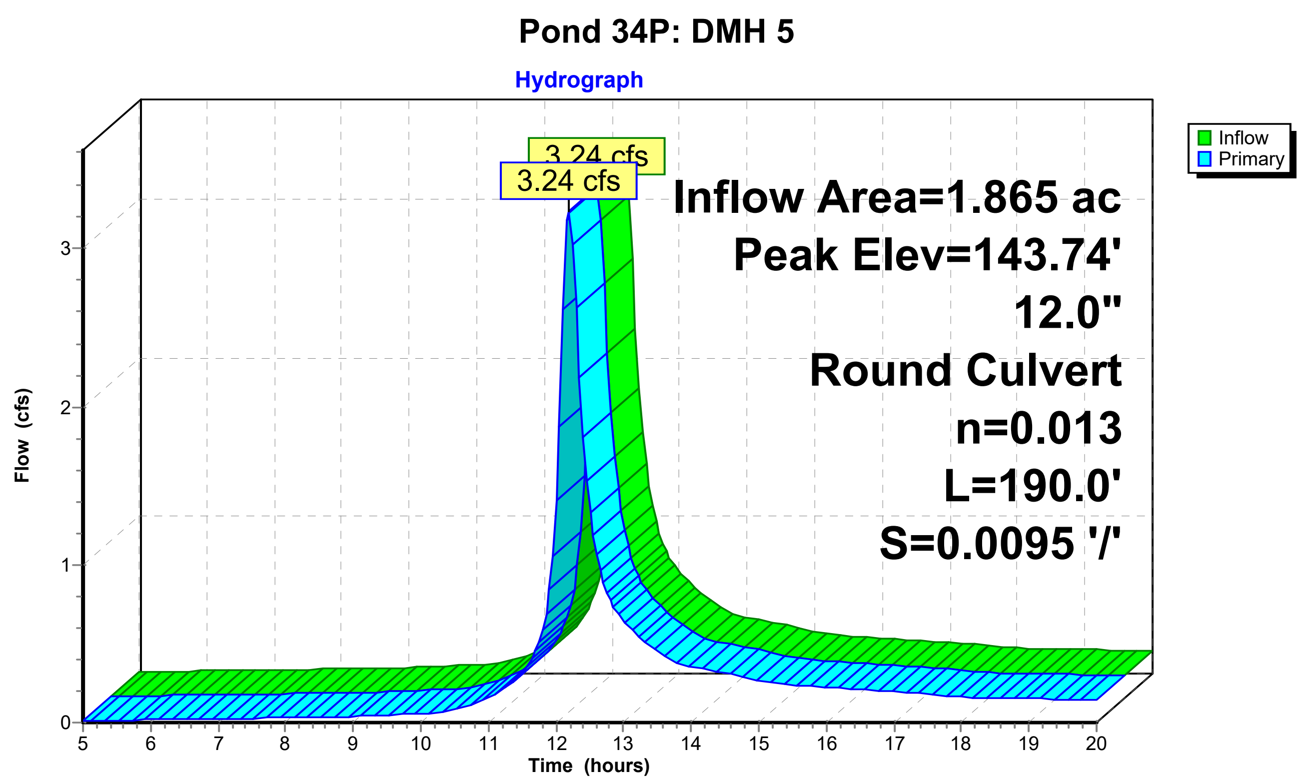
Summary for Pond 34P: DMH 5

Inflow Area =	1.865 ac,	18.02% Impervious,	Inflow Depth > 2.11"	for 25-Year event	
Inflow =	3.24 cfs @	12.18 hrs,	Volume=	0.329 af	
Outflow =	3.24 cfs @	12.18 hrs,	Volume=	0.329 af,	Atten= 0%, Lag= 0.0 min
Primary =	3.24 cfs @	12.18 hrs,	Volume=	0.329 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 143.74' @ 12.18 hrs
Flood Elev= 145.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	142.07'	**12.0" Round Culvert** L= 190.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 142.07' / 140.27' S= 0.0095 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=3.21 cfs @ 12.18 hrs HW=143.73' (Free Discharge)
1=Culvert (Inlet Controls 3.21 cfs @ 4.09 fps)



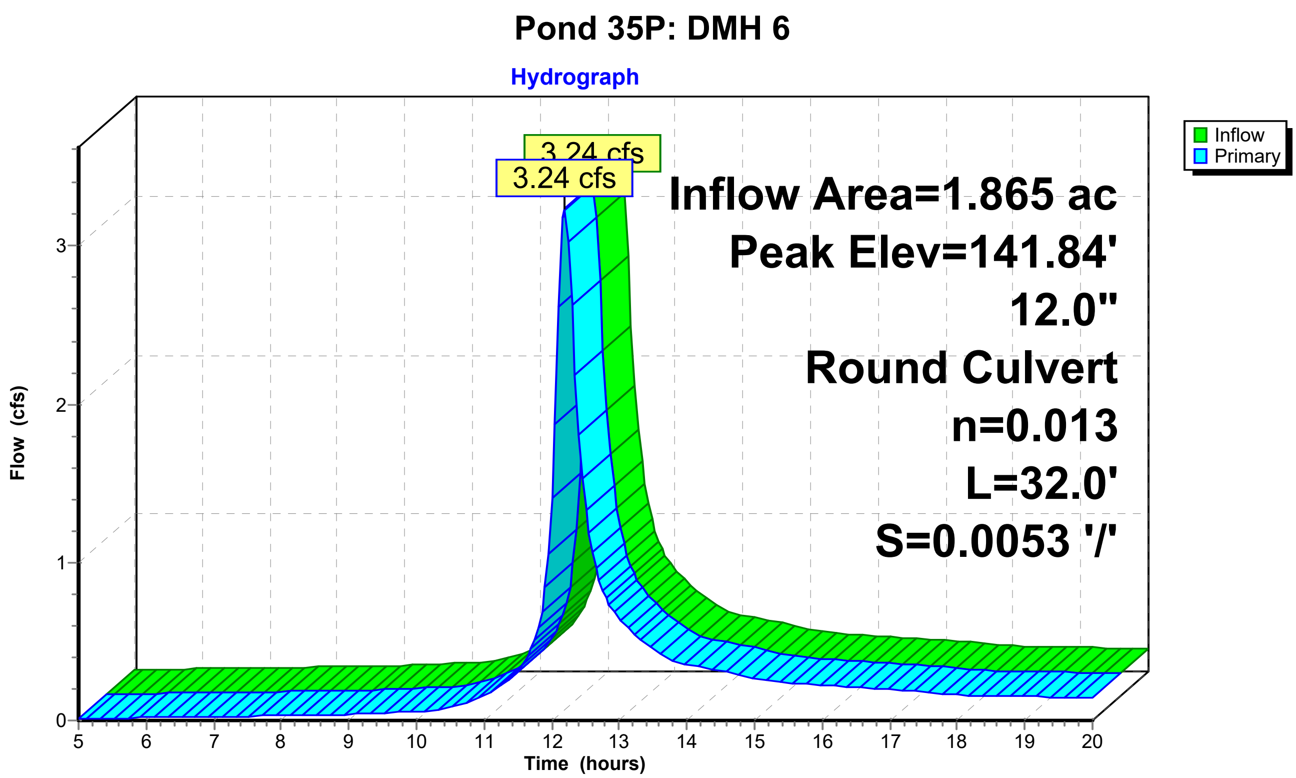
Summary for Pond 35P: DMH 6

Inflow Area =	1.865 ac,	18.02% Impervious,	Inflow Depth > 2.11"	for 25-Year event
Inflow =	3.24 cfs @	12.18 hrs, Volume=	0.329 af	
Outflow =	3.24 cfs @	12.18 hrs, Volume=	0.329 af,	Atten= 0%, Lag= 0.0 min
Primary =	3.24 cfs @	12.18 hrs, Volume=	0.329 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 141.84' @ 12.18 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	140.17'	**12.0" Round Culvert** L= 32.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 140.17' / 140.00' S= 0.0053 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=3.21 cfs @ 12.18 hrs HW=141.83' (Free Discharge)
└─**1=Culvert** (Inlet Controls 3.21 cfs @ 4.09 fps)



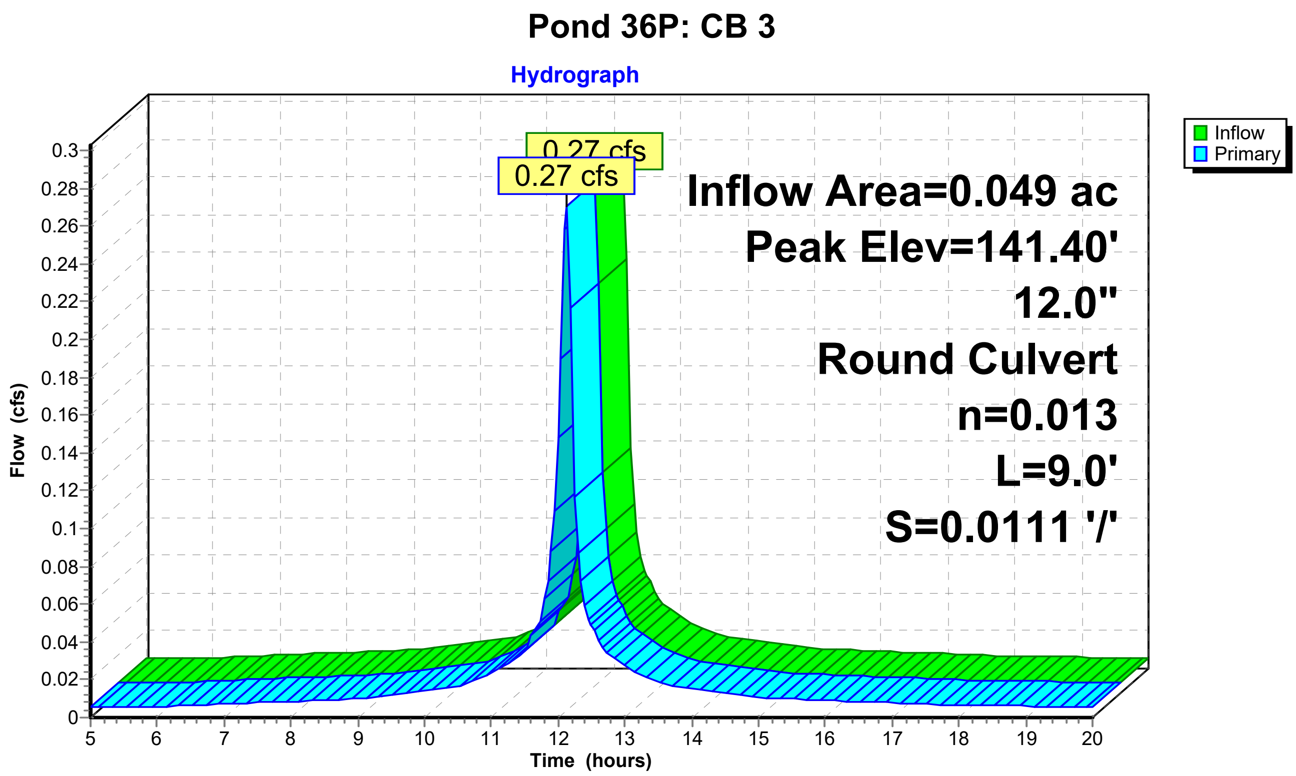
Summary for Pond 36P: CB 3

Inflow Area =	0.049 ac,100.00% Impervious,	Inflow Depth > 5.26"	for 25-Year event	
Inflow =	0.27 cfs @	12.13 hrs, Volume=	0.022 af	
Outflow =	0.27 cfs @	12.13 hrs, Volume=	0.022 af,	Atten= 0%, Lag= 0.0 min
Primary =	0.27 cfs @	12.13 hrs, Volume=	0.022 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 141.40' @ 12.13 hrs
Flood Elev= 144.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	141.10'	**12.0" Round Culvert** L= 9.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 141.10' / 141.00' S= 0.0111 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.26 cfs @ 12.13 hrs HW=141.39' (Free Discharge)
1=Culvert (Barrel Controls 0.26 cfs @ 2.07 fps)



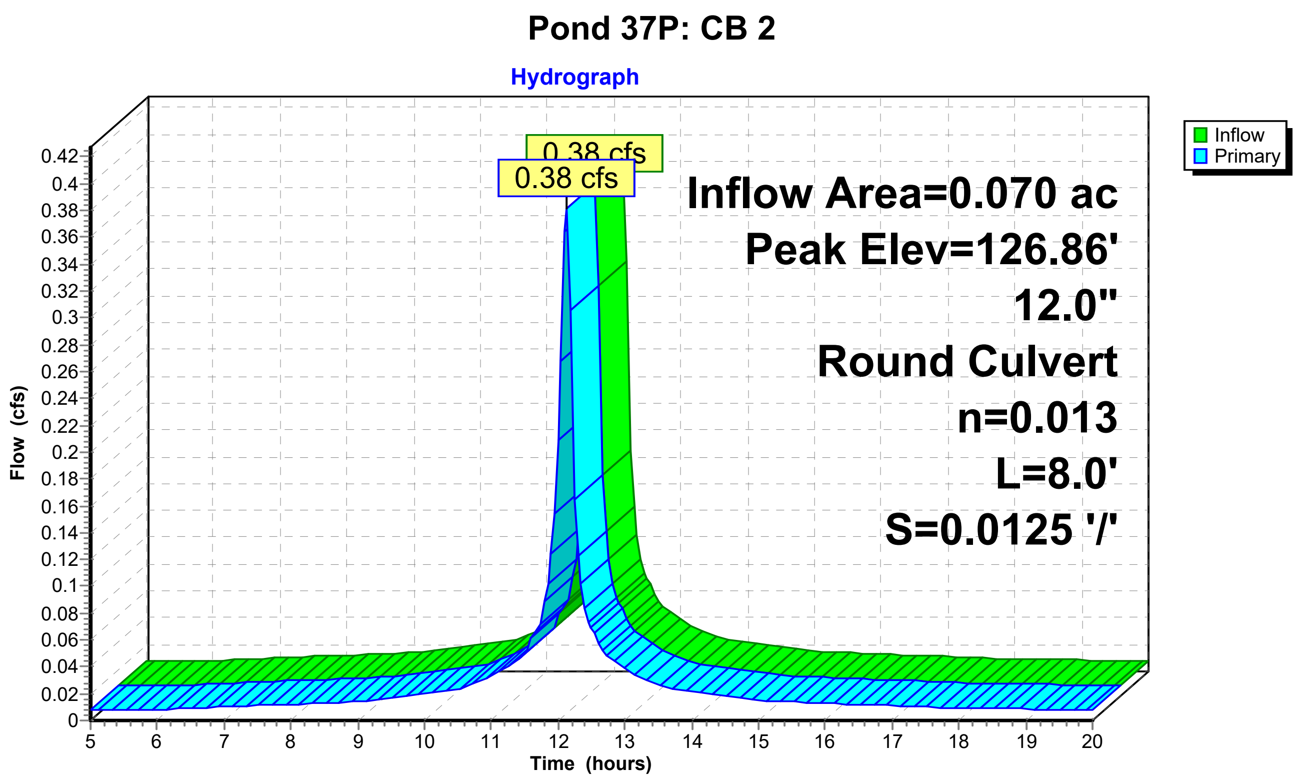
Summary for Pond 37P: CB 2

Inflow Area = 0.070 ac,100.00% Impervious, Inflow Depth > 5.26" for 25-Year event
Inflow = 0.38 cfs @ 12.13 hrs, Volume= 0.031 af
Outflow = 0.38 cfs @ 12.13 hrs, Volume= 0.031 af, Atten= 0%, Lag= 0.0 min
Primary = 0.38 cfs @ 12.13 hrs, Volume= 0.031 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 126.86' @ 12.13 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	126.50'	**12.0" Round Culvert** L= 8.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 126.50' / 126.40' S= 0.0125 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.37 cfs @ 12.13 hrs HW=126.85' (Free Discharge)
└─**1=Culvert** (Barrel Controls 0.37 cfs @ 2.25 fps)



Summary for Pond 38P: Det. Area 2

Inflow Area = 0.104 ac, 94.17% Impervious, Inflow Depth > 5.11" for 25-Year event
Inflow = 0.56 cfs @ 12.13 hrs, Volume= 0.044 af
Outflow = 0.08 cfs @ 12.65 hrs, Volume= 0.027 af, Atten= 86%, Lag= 31.3 min
Primary = 0.08 cfs @ 12.65 hrs, Volume= 0.027 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 142.12' @ 12.65 hrs Surf.Area= 0.022 ac Storage= 0.024 af

Plug-Flow detention time= 245.6 min calculated for 0.027 af (61% of inflow)
Center-of-Mass det. time= 152.6 min (893.2 - 740.6)

Volume	Invert	Avail.Storage	Storage Description
#1A	140.10'	0.020 af	**11.00'W x 86.67'L x 3.33'H Field A** 0.073 af Overall - 0.023 af Embedded = 0.050 af x 40.0% Voids
#2A	140.60'	0.018 af	**ADS N-12 24"** x 12 Inside #1 Inside= 23.8"W x 23.8"H => 3.10 sf x 20.00'L = 62.0 cf Outside= 28.0"W x 28.0"H => 3.92 sf x 20.00'L = 78.4 cf 12 Chambers in 3 Rows 9.00' Header x 3.10 sf x 2 = 55.8 cf Inside
		0.038 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	140.60'	**12.0" Round Culvert** L= 10.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 140.60' / 140.00' S= 0.0600 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	142.00'	**8.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	142.70'	**4.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#4	Device 1	140.60'	**1.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=0.08 cfs @ 12.65 hrs HW=142.12' (Free Discharge)
└─**1=Culvert** (Passes 0.08 cfs of 3.01 cfs potential flow)
  ├─**2=Orifice/Grate** (Orifice Controls 0.05 cfs @ 1.16 fps)
  ├─**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)
  └─**4=Orifice/Grate** (Orifice Controls 0.03 cfs @ 5.85 fps)

Pond 38P: Det. Area 2 - Chamber Wizard Field A

Chamber Model = ADS N-12 24" (ADS N-12® Pipe)
Inside= 23.8"W x 23.8"H => 3.10 sf x 20.00'L = 62.0 cf
Outside= 28.0"W x 28.0"H => 3.92 sf x 20.00'L = 78.4 cf

28.0" Wide + 12.0" Spacing = 40.0" C-C Row Spacing

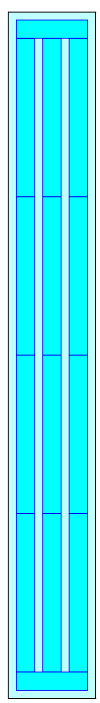
4 Chambers/Row x 20.00' Long +2.33' Header x 2 = 84.67' Row Length +12.0" End Stone x 2 = 86.67' Base Length
3 Rows x 28.0" Wide + 12.0" Spacing x 2 + 12.0" Side Stone x 2 = 11.00' Base Width
6.0" Base + 28.0" Chamber Height + 6.0" Cover = 3.33' Field Height

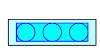
12 Chambers x 62.0 cf + 9.00' Header x 3.10 sf x 2 = 799.8 cf Chamber Storage
12 Chambers x 78.4 cf + 9.00' Header x 3.92 sf x 2 = 1,011.3 cf Displacement

3,177.9 cf Field - 1,011.3 cf Chambers = 2,166.6 cf Stone x 40.0% Voids = 866.6 cf Stone Storage

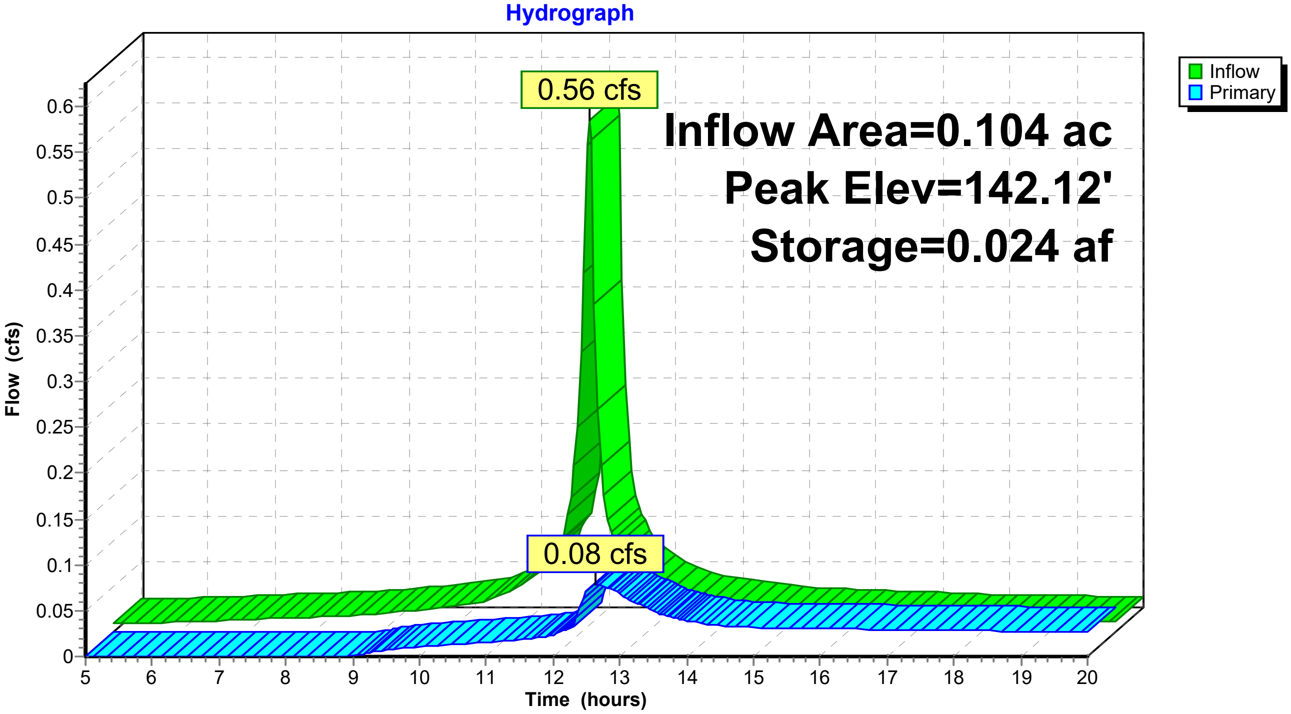
Chamber Storage + Stone Storage = 1,666.4 cf = 0.038 af
Overall Storage Efficiency = 52.4%
Overall System Size = 86.67' x 11.00' x 3.33'

12 Chambers
117.7 cy Field
80.2 cy Stone





Pond 38P: Det. Area 2



Summary for Pond 39P: CB 1

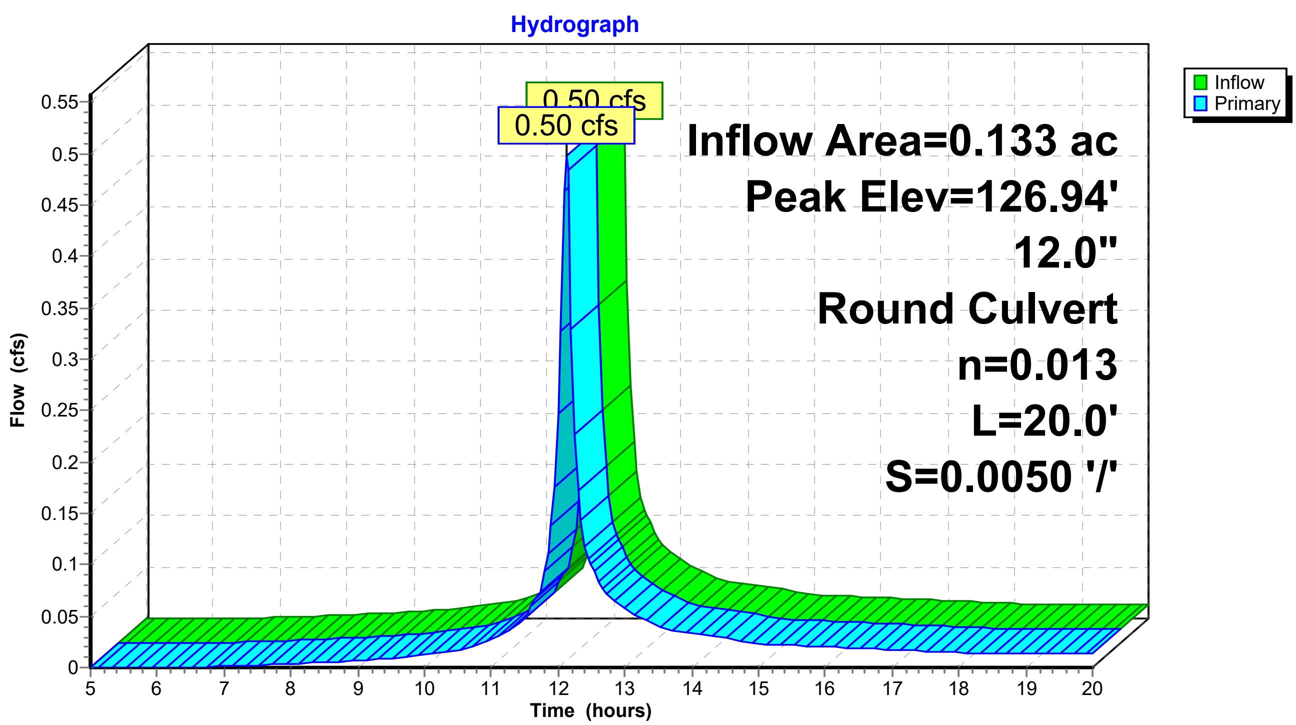
Inflow Area =	0.133 ac, 36.82% Impervious,	Inflow Depth > 3.13"	for 25-Year event
Inflow =	0.50 cfs @ 12.13 hrs,	Volume=	0.035 af
Outflow =	0.50 cfs @ 12.13 hrs,	Volume=	0.035 af, Atten= 0%, Lag= 0.0 min
Primary =	0.50 cfs @ 12.13 hrs,	Volume=	0.035 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 126.94' @ 12.13 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	126.50'	**12.0" Round Culvert** L= 20.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 126.50' / 126.40' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.48 cfs @ 12.13 hrs HW=126.93' (Free Discharge)
└─**1=Culvert** (Barrel Controls 0.48 cfs @ 2.16 fps)

Pond 39P: CB 1



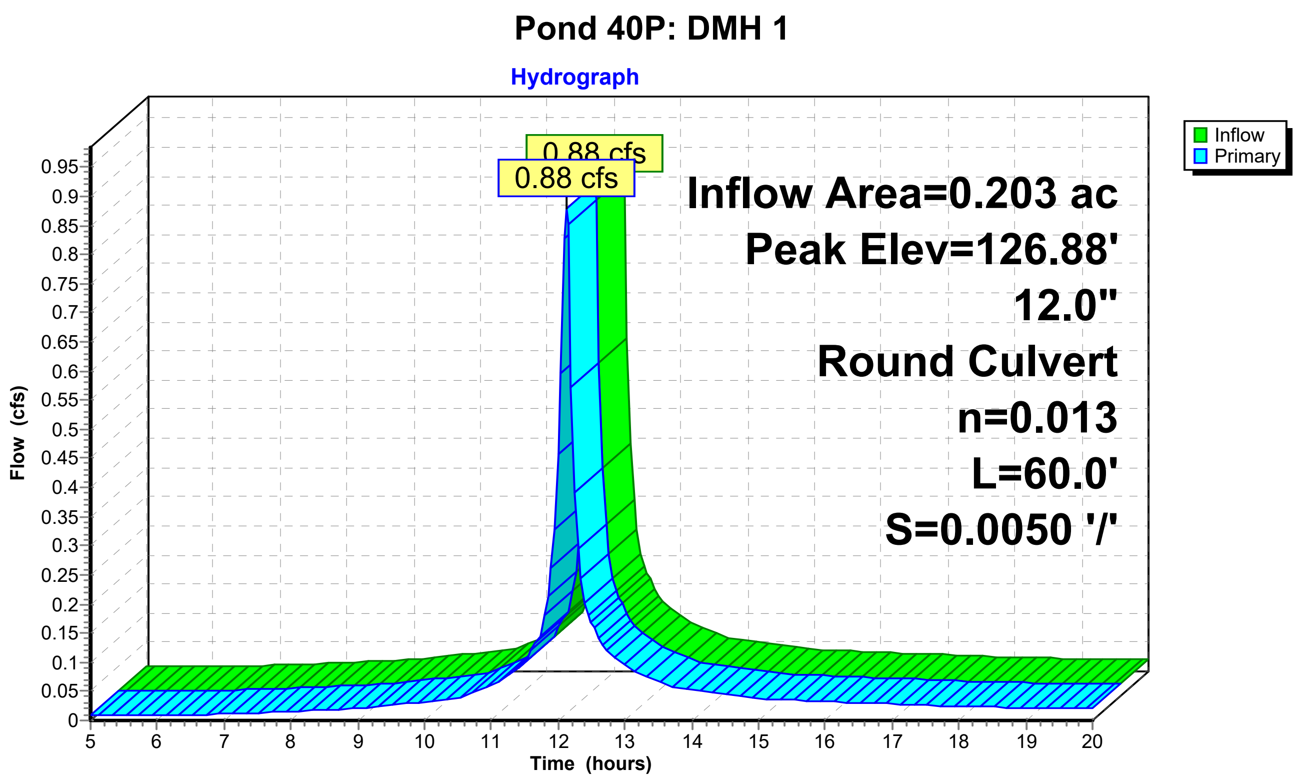
Summary for Pond 40P: DMH 1

Inflow Area =	0.203 ac,	58.56% Impervious,	Inflow Depth > 3.86"	for 25-Year event
Inflow =	0.88 cfs @	12.13 hrs, Volume=	0.065 af	
Outflow =	0.88 cfs @	12.13 hrs, Volume=	0.065 af,	Atten= 0%, Lag= 0.0 min
Primary =	0.88 cfs @	12.13 hrs, Volume=	0.065 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 126.88' @ 12.13 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	126.30'	**12.0" Round Culvert** L= 60.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 126.30' / 126.00' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.84 cfs @ 12.13 hrs HW=126.87' (Free Discharge)
└─**1=Culvert** (Barrel Controls 0.84 cfs @ 2.64 fps)



Summary for Pond 43P: Subsurface Inf. Area 1

Inflow Area = 0.203 ac, 58.56% Impervious, Inflow Depth > 3.86" for 25-Year event
Inflow = 0.88 cfs @ 12.13 hrs, Volume= 0.065 af
Outflow = 0.88 cfs @ 12.14 hrs, Volume= 0.059 af, Atten= 0%, Lag= 0.4 min
Discarded = 0.01 cfs @ 12.14 hrs, Volume= 0.013 af
Primary = 0.87 cfs @ 12.14 hrs, Volume= 0.047 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 127.68' @ 12.14 hrs Surf.Area= 0.008 ac Storage= 0.006 af

Plug-Flow detention time= 51.9 min calculated for 0.059 af (91% of inflow)
Center-of-Mass det. time= 18.7 min (785.9 - 767.2)

Volume	Invert	Avail.Storage	Storage Description
#1A	126.00'	0.006 af	**7.63'W x 44.42'L x 2.21'H Field A** 0.017 af Overall - 0.003 af Embedded = 0.014 af x 40.0% Voids
#2A	126.50'	0.002 af	**ADS N-12 12"** x 6 Inside #1 Inside= 12.2"W x 12.2"H => 0.81 sf x 20.00'L = 16.2 cf Outside= 14.5"W x 14.5"H => 1.05 sf x 20.00'L = 20.9 cf 6 Chambers in 3 Rows 5.63' Header x 0.81 sf x 2 = 9.1 cf Inside
		0.008 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	126.00'	**1.020 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 122.00'
#2	Primary	126.00'	**12.0" Round Culvert** L= 10.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 126.00' / 125.90' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#3	Device 2	127.50'	**4.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.01 cfs @ 12.14 hrs HW=127.68' (Free Discharge)
└—**1=Exfiltration** (Controls 0.01 cfs)

Primary OutFlow Max=0.84 cfs @ 12.14 hrs HW=127.68' (Free Discharge)
└—**2=Culvert** (Passes 0.84 cfs of 3.24 cfs potential flow)
  └—**3=Broad-Crested Rectangular Weir** (Weir Controls 0.84 cfs @ 1.18 fps)

Pond 43P: Subsurface Inf. Area 1 - Chamber Wizard Field A

Chamber Model = ADS N-12 12" (ADS N-12® Pipe)
Inside= 12.2"W x 12.2"H => 0.81 sf x 20.00'L = 16.2 cf
Outside= 14.5"W x 14.5"H => 1.05 sf x 20.00'L = 20.9 cf

14.5" Wide + 12.0" Spacing = 26.5" C-C Row Spacing

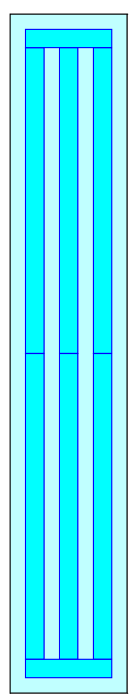
2 Chambers/Row x 20.00' Long +1.21' Header x 2 = 42.42' Row Length +12.0" End Stone x 2 = 44.42' Base Length
3 Rows x 14.5" Wide + 12.0" Spacing x 2 + 12.0" Side Stone x 2 = 7.63' Base Width
6.0" Base + 14.5" Chamber Height + 6.0" Cover = 2.21' Field Height

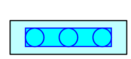
6 Chambers x 16.2 cf + 5.63' Header x 0.81 sf x 2 = 106.3 cf Chamber Storage
6 Chambers x 20.9 cf + 5.63' Header x 1.05 sf x 2 = 137.4 cf Displacement

748.3 cf Field - 137.4 cf Chambers = 610.9 cf Stone x 40.0% Voids = 244.4 cf Stone Storage

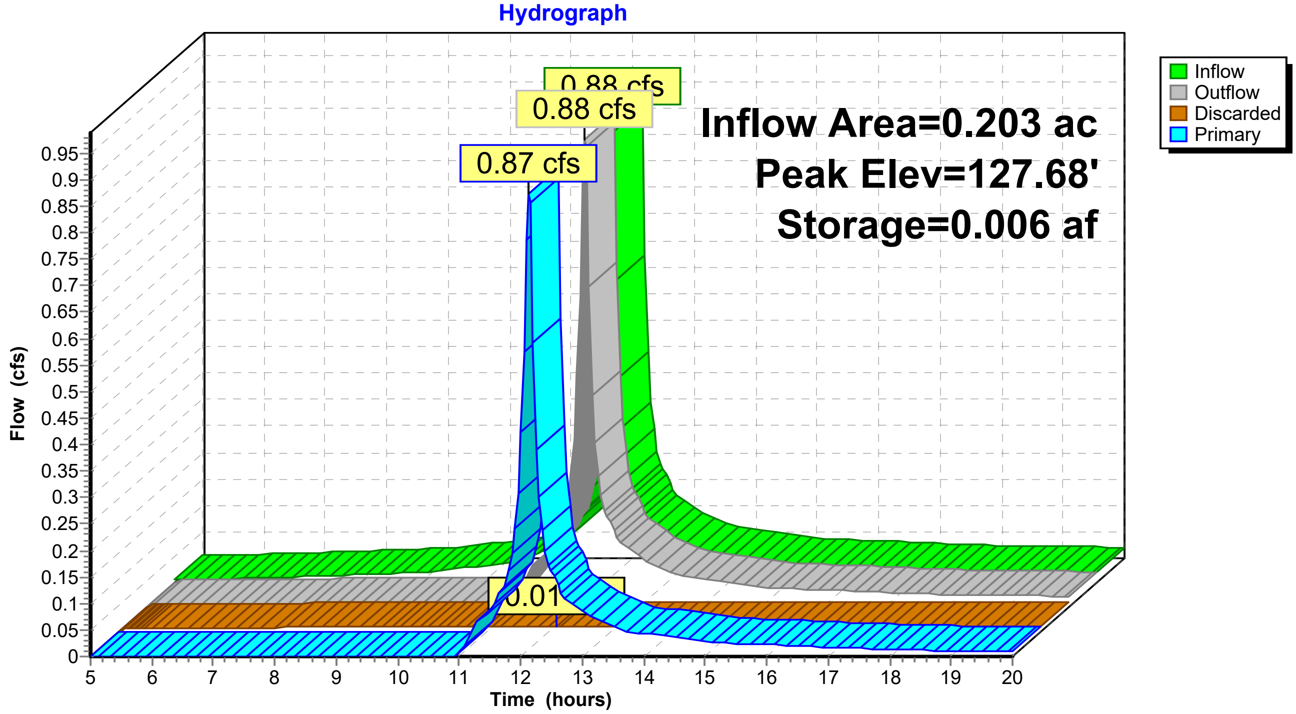
Chamber Storage + Stone Storage = 350.7 cf = 0.008 af
Overall Storage Efficiency = 46.9%
Overall System Size = 44.42' x 7.63' x 2.21'

6 Chambers
27.7 cy Field
22.6 cy Stone





Pond 43P: Subsurface Inf. Area 1



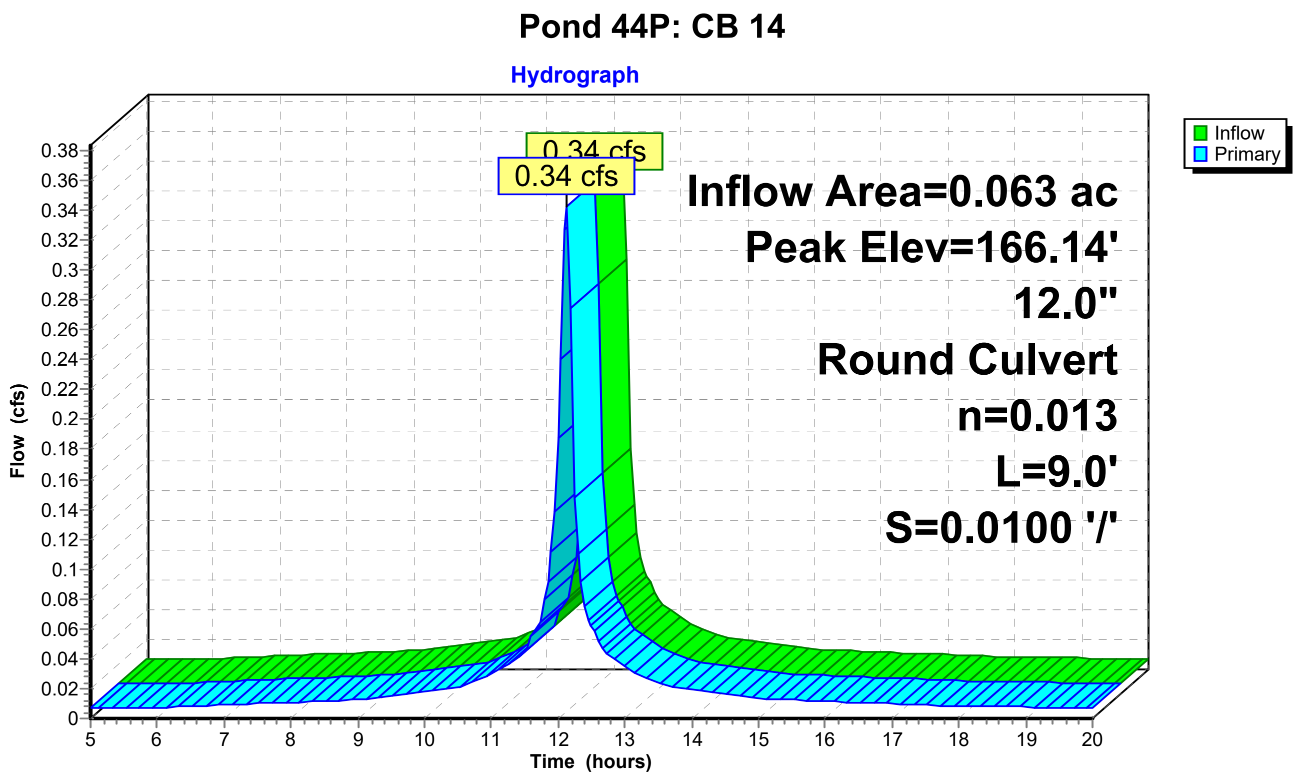
Summary for Pond 44P: CB 14

Inflow Area =	0.063 ac,100.00% Impervious,	Inflow Depth > 5.26"	for 25-Year event	
Inflow =	0.34 cfs @	12.13 hrs, Volume=	0.027 af	
Outflow =	0.34 cfs @	12.13 hrs, Volume=	0.027 af,	Atten= 0%, Lag= 0.0 min
Primary =	0.34 cfs @	12.13 hrs, Volume=	0.027 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 166.14' @ 12.13 hrs
Flood Elev= 170.24'

Device	Routing	Invert	Outlet Devices
#1	Primary	165.80'	**12.0" Round Culvert** L= 9.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 165.80' / 165.71' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.33 cfs @ 12.13 hrs HW=166.13' (Free Discharge)
└─**1=Culvert** (Barrel Controls 0.33 cfs @ 2.13 fps)



Summary for Pond 45P: Det. Area 1

Inflow Area = 0.203 ac, 58.56% Impervious, Inflow Depth > 2.78" for 25-Year event
Inflow = 0.87 cfs @ 12.14 hrs, Volume= 0.047 af
Outflow = 0.10 cfs @ 12.86 hrs, Volume= 0.035 af, Atten= 89%, Lag= 43.5 min
Primary = 0.10 cfs @ 12.86 hrs, Volume= 0.035 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 125.97' @ 12.86 hrs Surf.Area= 0.027 ac Storage= 0.025 af

Plug-Flow detention time= 148.3 min calculated for 0.035 af (75% of inflow)
Center-of-Mass det. time= 94.5 min (881.9 - 787.4)

Volume	Invert	Avail.Storage	Storage Description
#1A	124.00'	0.030 af	**14.33'W x 82.00'L x 3.83'H Field A** 0.103 af Overall - 0.029 af Embedded = 0.075 af x 40.0% Voids
#2A	125.00'	0.023 af	**ADS N-12 24"** x 16 Inside #1 Inside= 23.8"W x 23.8"H => 3.10 sf x 20.00'L = 62.0 cf Outside= 28.0"W x 28.0"H => 3.92 sf x 20.00'L = 78.4 cf 16 Chambers in 4 Rows
		0.053 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	125.00'	**12.0" Round Culvert** L= 10.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 125.00' / 122.00' S= 0.3000 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	126.75'	**4.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#3	Device 1	125.00'	**2.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=0.10 cfs @ 12.86 hrs HW=125.97' (Free Discharge)
└─**1=Culvert** (Passes 0.10 cfs of 2.06 cfs potential flow)
  ├─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)
  └─**3=Orifice/Grate** (Orifice Controls 0.10 cfs @ 4.54 fps)

Pond 45P: Det. Area 1 - Chamber Wizard Field A

Chamber Model = ADS N-12 24" (ADS N-12® Pipe)
Inside= 23.8"W x 23.8"H => 3.10 sf x 20.00'L = 62.0 cf
Outside= 28.0"W x 28.0"H => 3.92 sf x 20.00'L = 78.4 cf

28.0" Wide + 12.0" Spacing = 40.0" C-C Row Spacing

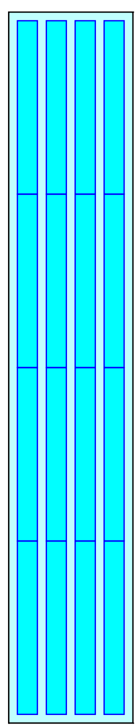
4 Chambers/Row x 20.00' Long = 80.00' Row Length +12.0" End Stone x 2 = 82.00' Base Length
4 Rows x 28.0" Wide + 12.0" Spacing x 3 + 12.0" Side Stone x 2 = 14.33' Base Width
12.0" Base + 28.0" Chamber Height + 6.0" Cover = 3.83' Field Height

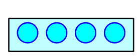
16 Chambers x 62.0 cf = 992.0 cf Chamber Storage
16 Chambers x 78.4 cf = 1,254.3 cf Displacement

4,505.6 cf Field - 1,254.3 cf Chambers = 3,251.3 cf Stone x 40.0% Voids = 1,300.5 cf Stone Storage

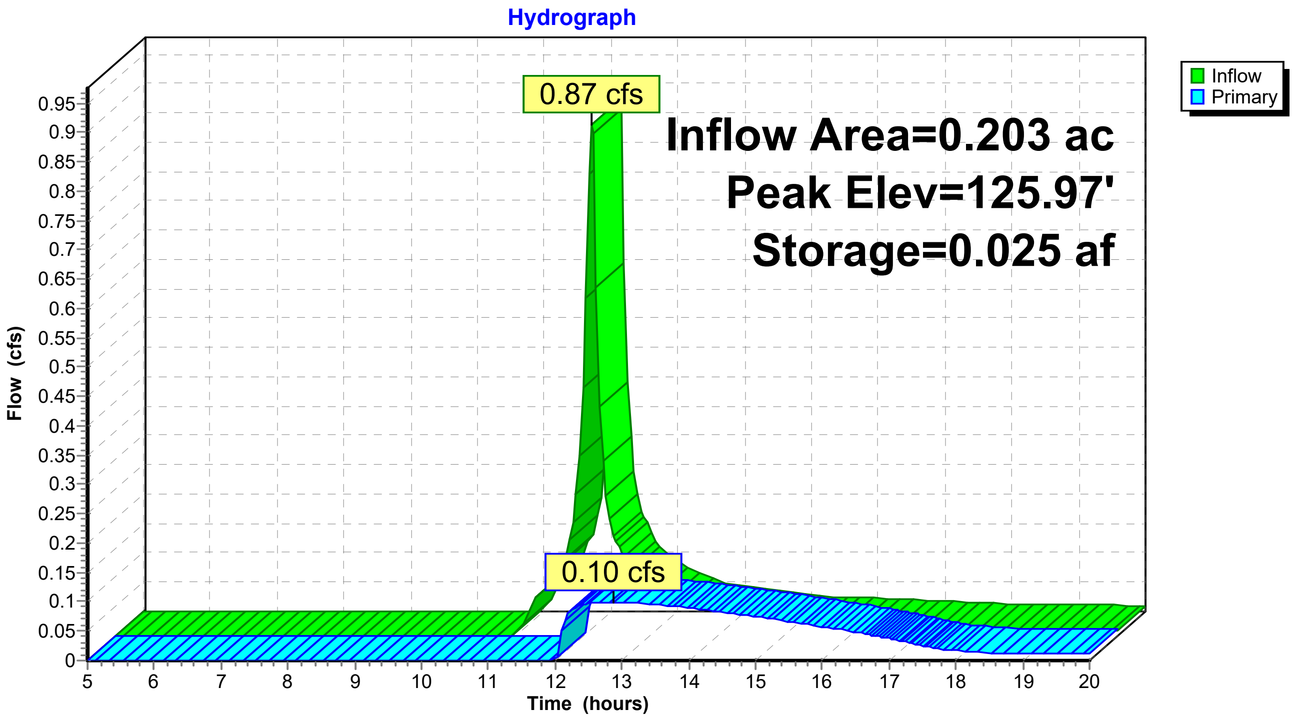
Chamber Storage + Stone Storage = 2,292.5 cf = 0.053 af
Overall Storage Efficiency = 50.9%
Overall System Size = 82.00' x 14.33' x 3.83'

16 Chambers
166.9 cy Field
120.4 cy Stone





Pond 45P: Det. Area 1



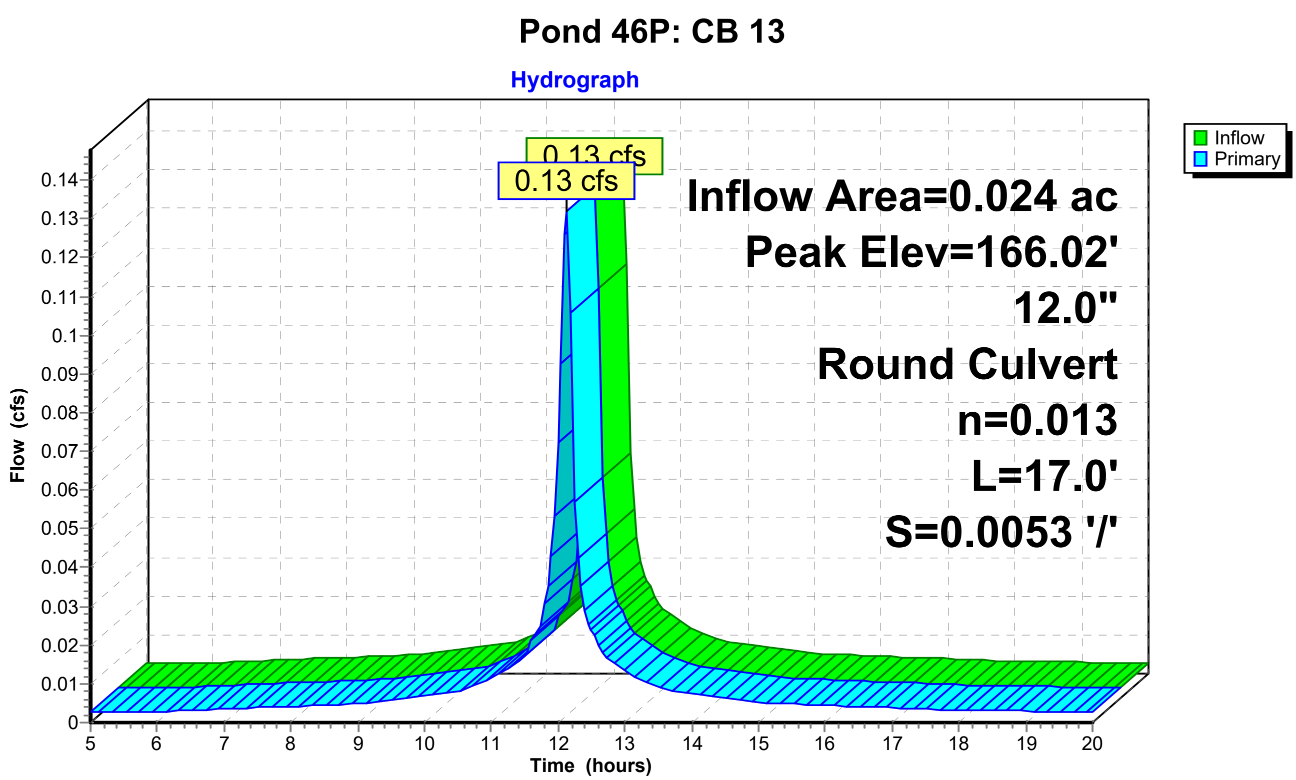
Summary for Pond 46P: CB 13

Inflow Area =	0.024 ac,100.00% Impervious,	Inflow Depth >	5.26"	for 25-Year event	
Inflow =	0.13 cfs @	12.13 hrs,	Volume=	0.011 af	
Outflow =	0.13 cfs @	12.13 hrs,	Volume=	0.011 af,	Atten= 0%, Lag= 0.0 min
Primary =	0.13 cfs @	12.13 hrs,	Volume=	0.011 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 166.02' @ 12.13 hrs
Flood Elev= 170.24'

Device	Routing	Invert	Outlet Devices
#1	Primary	165.80'	**12.0" Round Culvert** L= 17.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 165.80' / 165.71' S= 0.0053 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.13 cfs @ 12.13 hrs HW=166.01' (Free Discharge)
└─**1=Culvert** (Barrel Controls 0.13 cfs @ 1.56 fps)



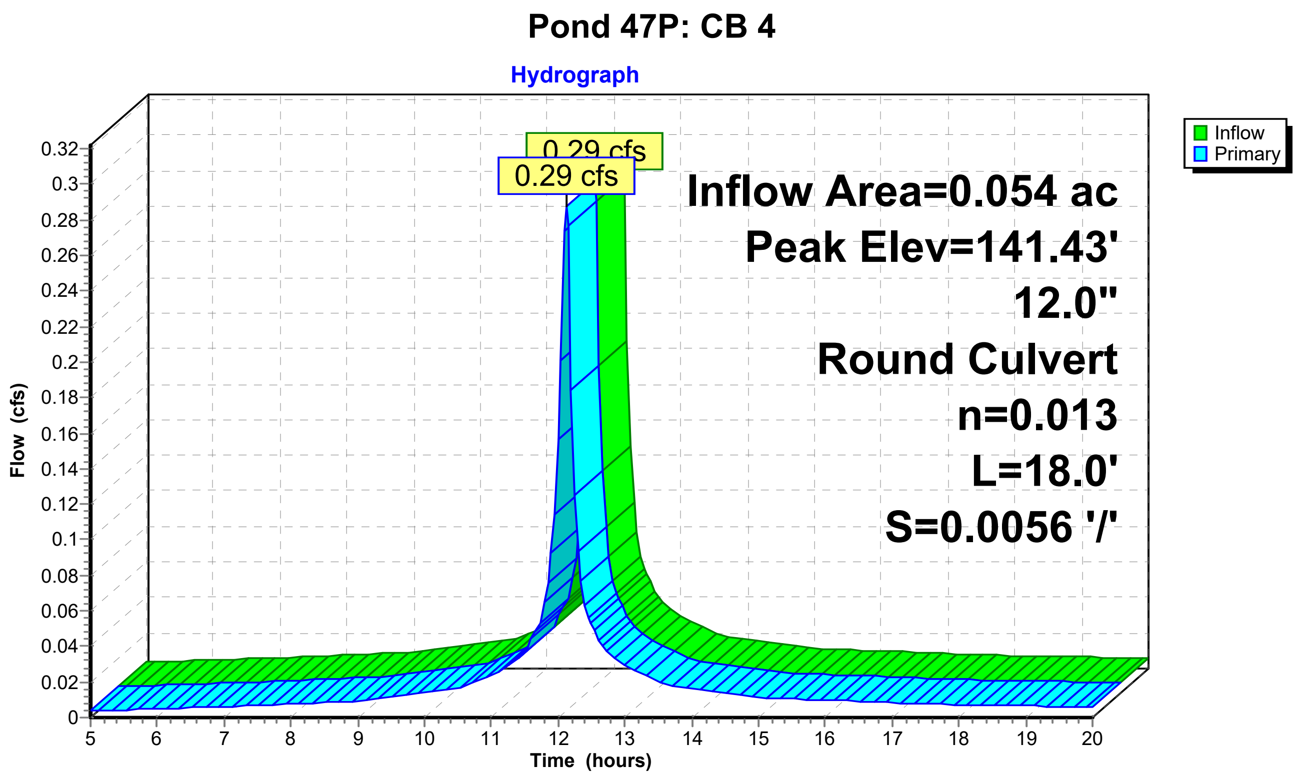
Summary for Pond 47P: CB 4

Inflow Area =	0.054 ac,	88.83% Impervious,	Inflow Depth > 4.98"	for 25-Year event	
Inflow =	0.29 cfs @	12.13 hrs,	Volume=	0.022 af	
Outflow =	0.29 cfs @	12.13 hrs,	Volume=	0.022 af,	Atten= 0%, Lag= 0.0 min
Primary =	0.29 cfs @	12.13 hrs,	Volume=	0.022 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 141.43' @ 12.13 hrs
Flood Elev= 144.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	141.10'	**12.0" Round Culvert** L= 18.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 141.10' / 141.00' S= 0.0056 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.28 cfs @ 12.13 hrs HW=141.42' (Free Discharge)
└**1=Culvert** (Barrel Controls 0.28 cfs @ 1.92 fps)



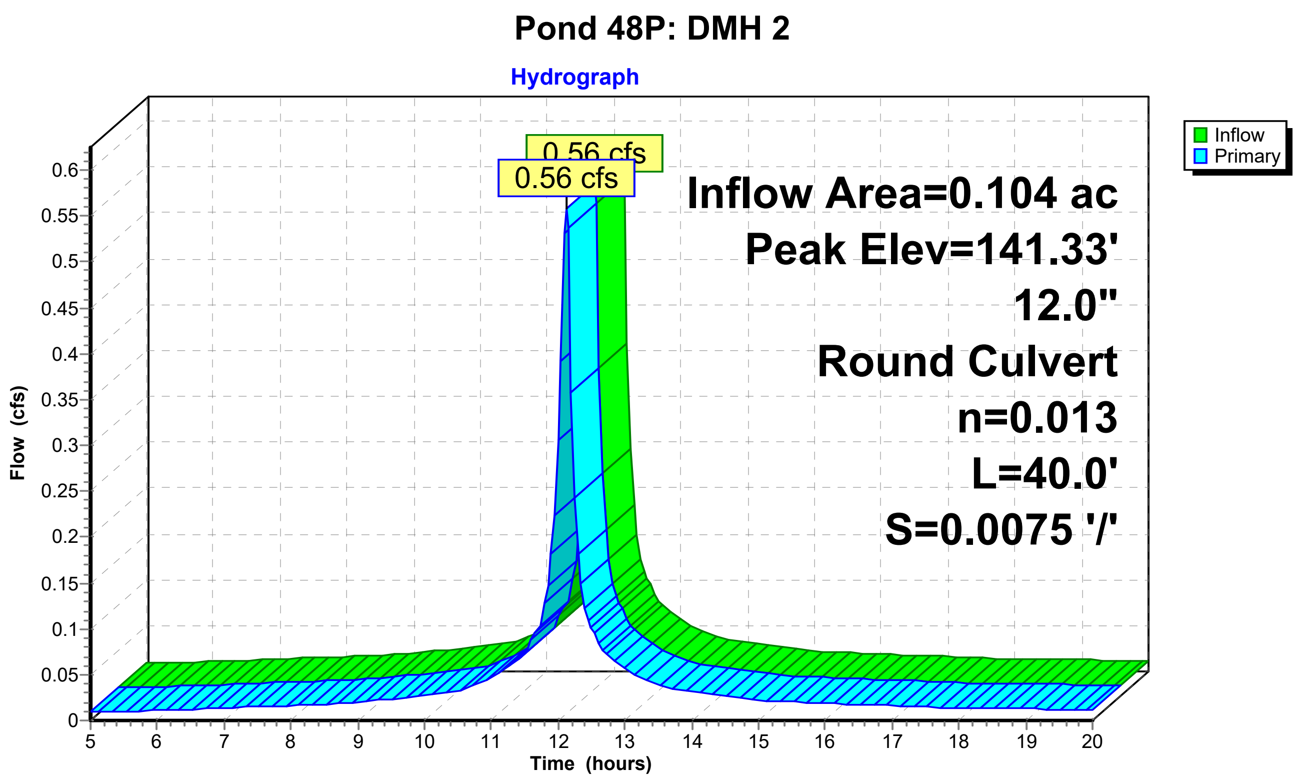
Summary for Pond 48P: DMH 2

Inflow Area =	0.104 ac, 94.17% Impervious, Inflow Depth > 5.11" for 25-Year event			
Inflow =	0.56 cfs @	12.13 hrs, Volume=	0.044 af	
Outflow =	0.56 cfs @	12.13 hrs, Volume=	0.044 af,	Atten= 0%, Lag= 0.0 min
Primary =	0.56 cfs @	12.13 hrs, Volume=	0.044 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 141.33' @ 12.13 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	140.90'	**12.0" Round Culvert** L= 40.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 140.90' / 140.60' S= 0.0075 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.53 cfs @ 12.13 hrs HW=141.32' (Free Discharge)
└─**1=Culvert** (Inlet Controls 0.53 cfs @ 1.73 fps)



Summary for Pond 49P: DMH 9

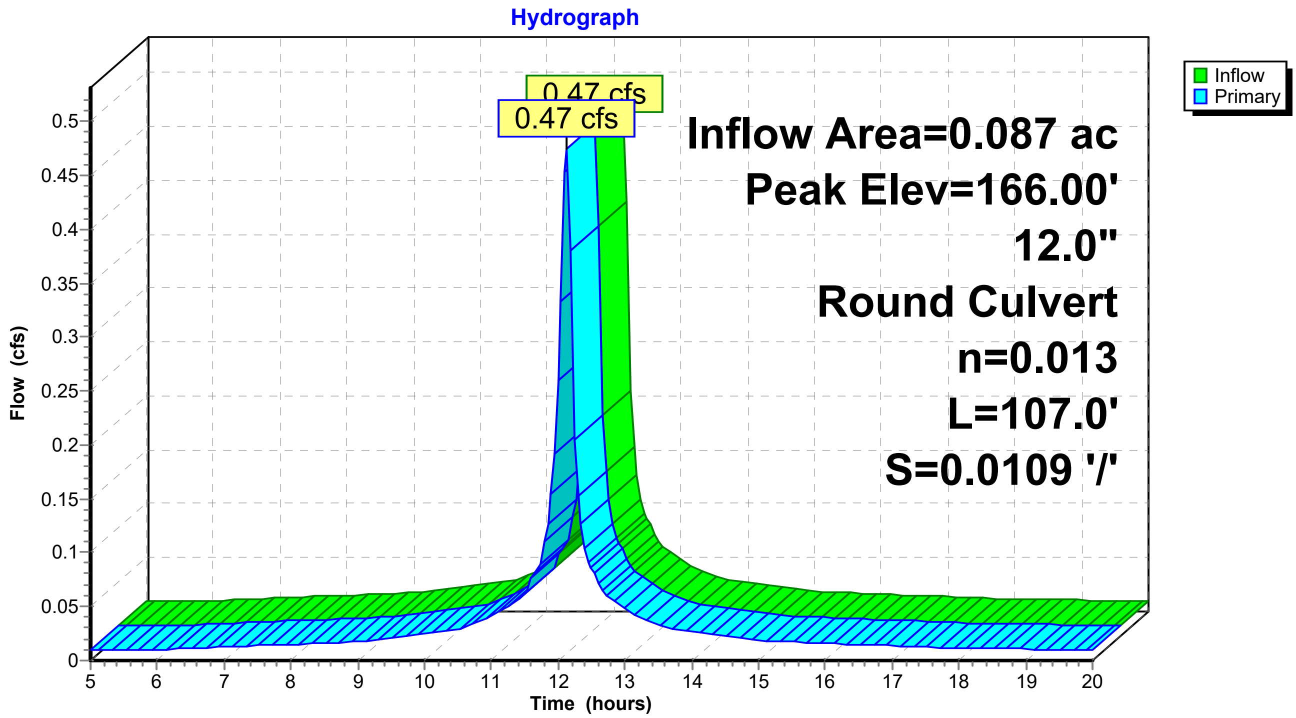
Inflow Area = 0.087 ac,100.00% Impervious, Inflow Depth > 5.26" for 25-Year event
Inflow = 0.47 cfs @ 12.13 hrs, Volume= 0.038 af
Outflow = 0.47 cfs @ 12.13 hrs, Volume= 0.038 af, Atten= 0%, Lag= 0.0 min
Primary = 0.47 cfs @ 12.13 hrs, Volume= 0.038 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 166.00' @ 12.13 hrs
Flood Elev= 170.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	165.61'	**12.0" Round Culvert** L= 107.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 165.61' / 164.44' S= 0.0109 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.45 cfs @ 12.13 hrs HW=165.99' (Free Discharge)
1=Culvert (Inlet Controls 0.45 cfs @ 1.66 fps)

Pond 49P: DMH 9

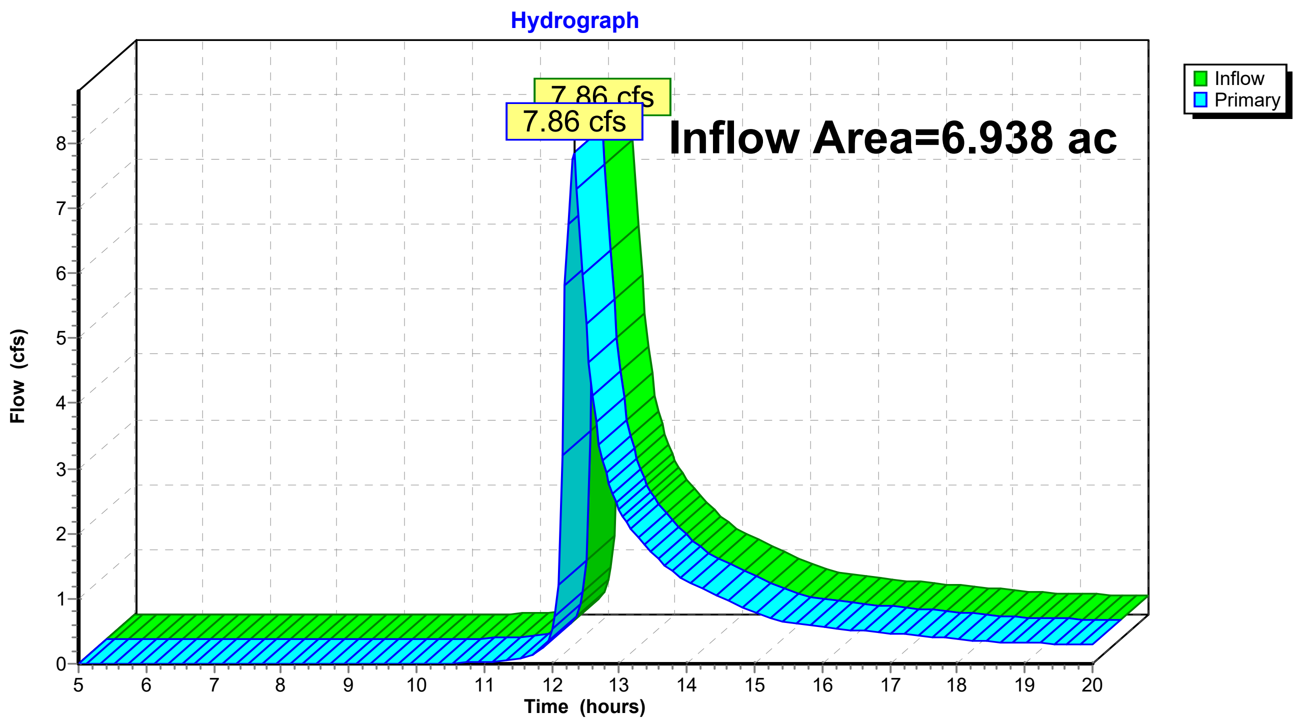


Summary for Link 32L: TOTAL P3

Inflow Area = 6.938 ac, 20.11% Impervious, Inflow Depth > 1.32" for 25-Year event
Inflow = 7.86 cfs @ 12.32 hrs, Volume= 0.763 af
Primary = 7.86 cfs @ 12.32 hrs, Volume= 0.763 af, Atten= 0%, Lag= 0.0 min

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

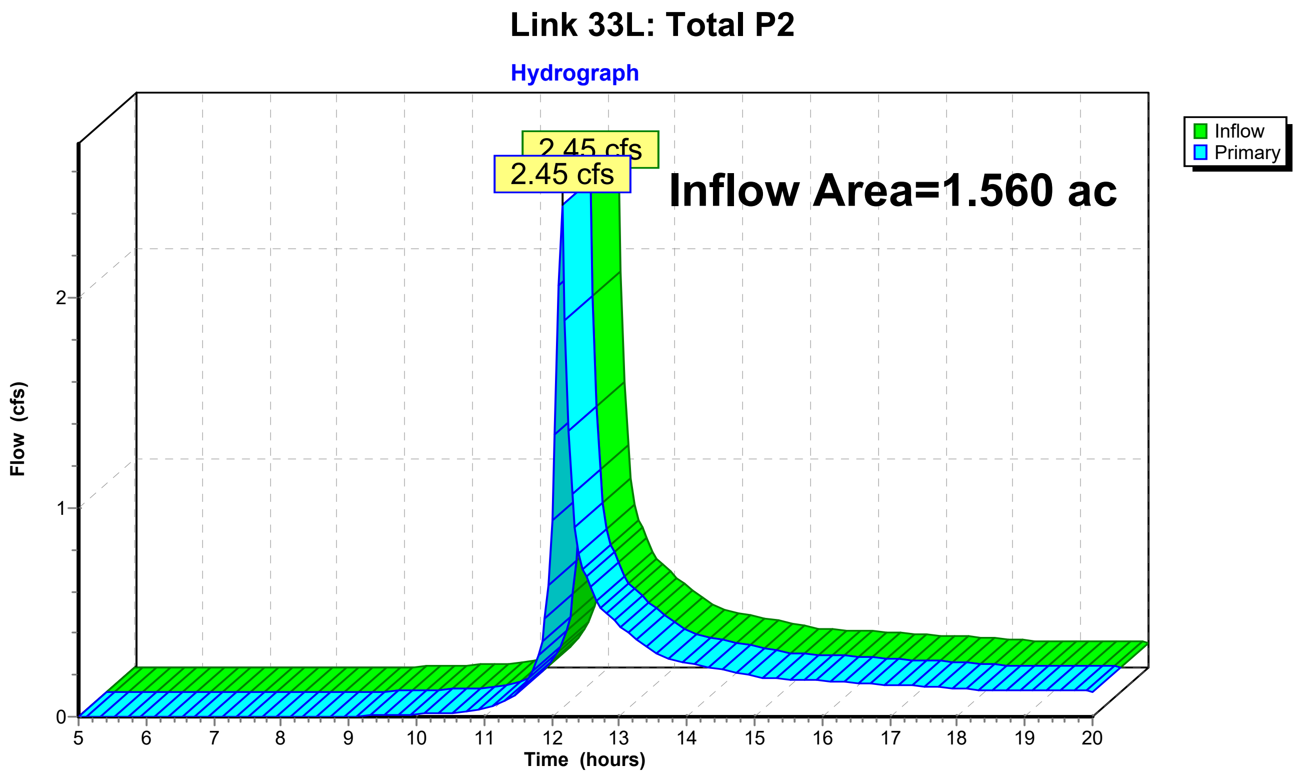
Link 32L: TOTAL P3



Summary for Link 33L: Total P2

Inflow Area =	1.560 ac,	10.34% Impervious,	Inflow Depth > 1.56"	for 25-Year event
Inflow =	2.45 cfs @	12.15 hrs, Volume=	0.202 af	
Primary =	2.45 cfs @	12.15 hrs, Volume=	0.202 af,	Atten= 0%, Lag= 0.0 min

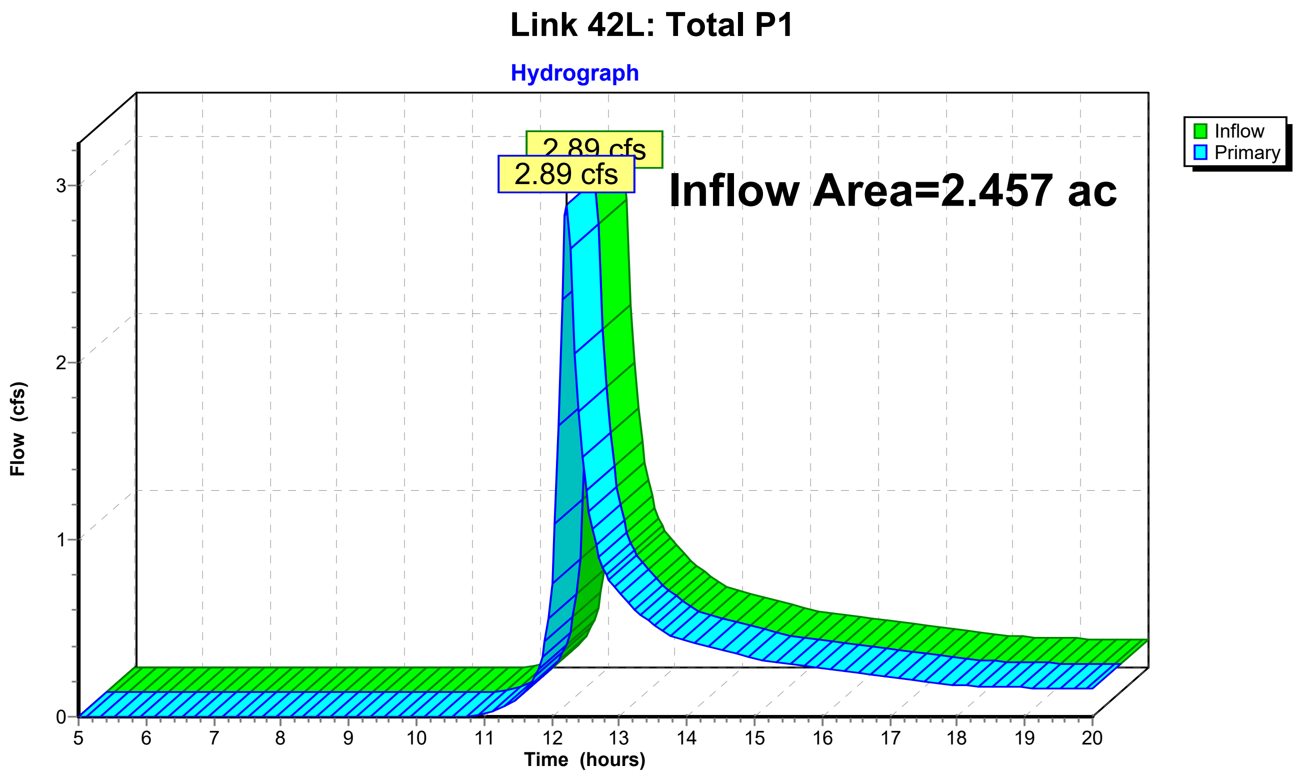
Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs



Summary for Link 42L: Total P1

Inflow Area =	2.457 ac,	7.11% Impervious,	Inflow Depth > 1.45"	for 25-Year event	
Inflow =	2.89 cfs @	12.22 hrs,	Volume=	0.297 af	
Primary =	2.89 cfs @	12.22 hrs,	Volume=	0.297 af,	Atten= 0%, Lag= 0.0 min

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



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

Subcatchment 1S: P1A Runoff Area=94,172 sf 2.58% Impervious Runoff Depth>3.09"
Flow Length=598' Tc=13.3 min UI Adjusted CN=55 Runoff=6.30 cfs 0.556 af

Subcatchment 2S: P2A Runoff Area=12,266 sf 0.00% Impervious Runoff Depth>3.80"
Tc=6.0 min CN=61 Runoff=1.29 cfs 0.089 af

Subcatchment 3S: P2B Runoff Area=2,156 sf 100.00% Impervious Runoff Depth>7.68"
Tc=6.0 min CN=98 Runoff=0.39 cfs 0.032 af

Subcatchment 5S: P3I Runoff Area=1,563 sf 100.00% Impervious Runoff Depth>7.68"
Tc=6.0 min CN=98 Runoff=0.29 cfs 0.023 af

Subcatchment 6S: P3G Runoff Area=7,278 sf 68.97% Impervious Runoff Depth>6.80"
Tc=6.0 min CN=87 Runoff=1.24 cfs 0.095 af

Subcatchment 7S: P3H Runoff Area=70,167 sf 8.32% Impervious Runoff Depth>3.55"
Flow Length=620' Tc=14.3 min UI Adjusted CN=59 Runoff=5.22 cfs 0.476 af

Subcatchment 8S: P3J Runoff Area=2,216 sf 100.00% Impervious Runoff Depth>7.68"
Tc=6.0 min CN=98 Runoff=0.40 cfs 0.033 af

Subcatchment 11S: P3K Runoff Area=27,385 sf 100.00% Impervious Runoff Depth>7.68"
Tc=6.0 min CN=98 Runoff=5.00 cfs 0.402 af

Subcatchment 16S: P3F Runoff Area=131,453 sf 5.15% Impervious Runoff Depth>3.31"
Flow Length=664' Slope=0.0600 '/' Tc=16.5 min UI Adjusted CN=57 Runoff=8.66 cfs 0.833 af

Subcatchment 17S: P3E Runoff Area=3,344 sf 100.00% Impervious Runoff Depth>7.68"
Tc=6.0 min CN=98 Runoff=0.61 cfs 0.049 af

Subcatchment 22S: P3D Runoff Area=19,733 sf 0.00% Impervious Runoff Depth>3.45"
Tc=6.0 min CN=58 Runoff=1.90 cfs 0.130 af

Subcatchment 23S: P3B Runoff Area=2,425 sf 100.00% Impervious Runoff Depth>7.68"
Tc=6.0 min CN=98 Runoff=0.44 cfs 0.036 af

Subcatchment 24S: P3C Runoff Area=8,435 sf 28.74% Impervious Runoff Depth>5.10"
Tc=6.0 min CN=72 Runoff=1.16 cfs 0.082 af

Subcatchment 31S: P3A Runoff Area=24,420 sf 0.00% Impervious Runoff Depth>3.68"
Tc=6.0 min CN=60 Runoff=2.50 cfs 0.172 af

Subcatchment 34S: P1C Runoff Area=3,042 sf 100.00% Impervious Runoff Depth>7.68"
Tc=6.0 min CN=98 Runoff=0.56 cfs 0.045 af

Subcatchment 35S: P1B Runoff Area=5,798 sf 36.82% Impervious Runoff Depth>5.45"
Tc=6.0 min CN=75 Runoff=0.84 cfs 0.060 af

Subcatchment 43S: P1D Runoff Area=4,007 sf 0.00% Impervious Runoff Depth>2.42"
Flow Length=186' Tc=7.0 min CN=49 Runoff=0.26 cfs 0.019 af

Subcatchment 44S: P2D Runoff Area=51,183 sf 5.43% Impervious Runoff Depth>2.98"
Flow Length=186' Tc=7.0 min UI Adjusted CN=54 Runoff=4.14 cfs 0.292 af

Subcatchment 45S: P3L Runoff Area=2,730 sf 100.00% Impervious Runoff Depth>7.68"
Tc=6.0 min CN=98 Runoff=0.50 cfs 0.040 af

Subcatchment 46S: P2C Runoff Area=2,354 sf 88.83% Impervious Runoff Depth>7.44"
Tc=6.0 min CN=94 Runoff=0.42 cfs 0.034 af

Subcatchment 47S: P3M Runoff Area=1,052 sf 100.00% Impervious Runoff Depth>7.68"
Tc=6.0 min CN=98 Runoff=0.19 cfs 0.015 af

Pond 9P: CB 5 Peak Elev=152.18' Inflow=1.24 cfs 0.095 af
12.0" Round Culvert n=0.013 L=23.0' S=0.0113 '/' Outflow=1.24 cfs 0.095 af

Pond 10P: CB 6 Peak Elev=155.06' Inflow=5.22 cfs 0.476 af
12.0" Round Culvert n=0.013 L=27.0' S=0.0104 '/' Outflow=5.22 cfs 0.476 af

Pond 13P: CB 7 Peak Elev=152.33' Inflow=0.29 cfs 0.023 af
12.0" Round Culvert n=0.013 L=11.0' S=0.0127 '/' Outflow=0.29 cfs 0.023 af

Pond 14P: CB 8 Peak Elev=152.39' Inflow=0.40 cfs 0.033 af
12.0" Round Culvert n=0.013 L=8.0' S=0.0138 '/' Outflow=0.40 cfs 0.033 af

Pond 15P: DMH 3 Peak Elev=155.56' Inflow=5.93 cfs 0.571 af
12.0" Round Culvert n=0.013 L=30.0' S=0.0117 '/' Outflow=5.93 cfs 0.571 af

Pond 18P: CB 11 Peak Elev=165.01' Inflow=0.61 cfs 0.049 af
12.0" Round Culvert n=0.013 L=7.0' S=0.0143 '/' Outflow=0.61 cfs 0.049 af

Pond 19P: CB 12 Peak Elev=173.45' Inflow=8.66 cfs 0.833 af
12.0" Round Culvert n=0.013 L=14.0' S=0.0071 '/' Outflow=8.66 cfs 0.833 af

Pond 20P: DMH 8 Peak Elev=174.36' Inflow=9.21 cfs 0.937 af
12.0" Round Culvert n=0.013 L=94.0' S=0.1313 '/' Outflow=9.21 cfs 0.937 af

Pond 21P: Infiltration Basin 1 Peak Elev=154.52' Storage=5,542 cf Inflow=10.19 cfs 1.067 af
Discarded=0.14 cfs 0.090 af Primary=8.93 cfs 0.902 af Outflow=9.06 cfs 0.992 af

Pond 25P: CB 9 Peak Elev=145.37' Inflow=0.44 cfs 0.036 af
12.0" Round Culvert n=0.013 L=12.0' S=0.0917 '/' Outflow=0.44 cfs 0.036 af

Pond 26P: CB 10 Peak Elev=145.65' Inflow=1.16 cfs 0.082 af
12.0" Round Culvert n=0.013 L=10.0' S=0.1100 '/' Outflow=1.16 cfs 0.082 af

Pond 27P: DMH 7 Peak Elev=144.59' Inflow=1.60 cfs 0.118 af
12.0" Round Culvert n=0.013 L=50.0' S=0.0760 '/' Outflow=1.60 cfs 0.118 af

Pond 28P: Infiltration Basin 2 Peak Elev=142.96' Storage=6,890 cf Inflow=7.76 cfs 0.744 af
Discarded=0.15 cfs 0.101 af Primary=5.55 cfs 0.564 af Outflow=5.70 cfs 0.665 af

Pond 30P: DMH 4 Peak Elev=153.09' Inflow=6.36 cfs 0.626 af
12.0" Round Culvert n=0.013 L=84.0' S=0.0700 '/' Outflow=6.36 cfs 0.626 af

Pond 33P: Subsurface Inf. Aea 2 Peak Elev=153.14' Storage=0.110 af Inflow=5.00 cfs 0.402 af
Discarded=0.15 cfs 0.134 af Primary=4.70 cfs 0.175 af Outflow=4.85 cfs 0.309 af

Pond 34P: DMH 5 Peak Elev=149.29' Inflow=6.36 cfs 0.626 af
12.0" Round Culvert n=0.013 L=190.0' S=0.0095 '/' Outflow=6.36 cfs 0.626 af

Pond 35P: DMH 6 Peak Elev=145.21' Inflow=6.36 cfs 0.626 af
12.0" Round Culvert n=0.013 L=32.0' S=0.0053 '/' Outflow=6.36 cfs 0.626 af

Pond 36P: CB 3 Peak Elev=141.47' Inflow=0.39 cfs 0.032 af
12.0" Round Culvert n=0.013 L=9.0' S=0.0111 '/' Outflow=0.39 cfs 0.032 af

Pond 37P: CB 2 Peak Elev=126.94' Inflow=0.56 cfs 0.045 af
12.0" Round Culvert n=0.013 L=8.0' S=0.0125 '/' Outflow=0.56 cfs 0.045 af

Pond 38P: Det. Area 2 Peak Elev=142.40' Storage=0.028 af Inflow=0.82 cfs 0.065 af
Outflow=0.50 cfs 0.045 af

Pond 39P: CB 1 Peak Elev=127.10' Inflow=0.84 cfs 0.060 af
12.0" Round Culvert n=0.013 L=20.0' S=0.0050 '/' Outflow=0.84 cfs 0.060 af

Pond 40P: DMH 1 Peak Elev=127.07' Inflow=1.40 cfs 0.105 af
12.0" Round Culvert n=0.013 L=60.0' S=0.0050 '/' Outflow=1.40 cfs 0.105 af

Pond 43P: Subsurface Inf. Area 1 Peak Elev=127.75' Storage=0.007 af Inflow=1.40 cfs 0.105 af
Discarded=0.01 cfs 0.013 af Primary=1.39 cfs 0.086 af Outflow=1.40 cfs 0.099 af

Pond 44P: CB 14 Peak Elev=166.22' Inflow=0.50 cfs 0.040 af
12.0" Round Culvert n=0.013 L=9.0' S=0.0100 '/' Outflow=0.50 cfs 0.040 af

Pond 45P: Det. Area 1 Peak Elev=126.84' Storage=0.041 af Inflow=1.39 cfs 0.086 af
Outflow=0.46 cfs 0.074 af

Pond 46P: CB 13 Peak Elev=166.06' Inflow=0.19 cfs 0.015 af
12.0" Round Culvert n=0.013 L=17.0' S=0.0053 '/' Outflow=0.19 cfs 0.015 af

Pond 47P: CB 4 Peak Elev=141.50' Inflow=0.42 cfs 0.034 af
12.0" Round Culvert n=0.013 L=18.0' S=0.0056 '/' Outflow=0.42 cfs 0.034 af

Pond 48P: DMH 2 Peak Elev=141.43' Inflow=0.82 cfs 0.065 af
12.0" Round Culvert n=0.013 L=40.0' S=0.0075 '/' Outflow=0.82 cfs 0.065 af

Pond 49P: DMH 9 Peak Elev=166.09' Inflow=0.69 cfs 0.056 af
12.0" Round Culvert n=0.013 L=107.0' S=0.0109 '/' Outflow=0.69 cfs 0.056 af

Link 32L: TOTAL P3 Inflow=20.69 cfs 1.814 af
Primary=20.69 cfs 1.814 af

Link 33L: Total P2

Inflow=5.76 cfs 0.426 af
Primary=5.76 cfs 0.426 af

Link 42L: Total P1

Inflow=6.63 cfs 0.648 af
Primary=6.63 cfs 0.648 af

Total Runoff Area = 10.955 ac Runoff Volume = 3.512 af Average Runoff Depth = 3.85"
84.20% Pervious = 9.224 ac 15.80% Impervious = 1.731 ac

Summary for Subcatchment 1S: P1A

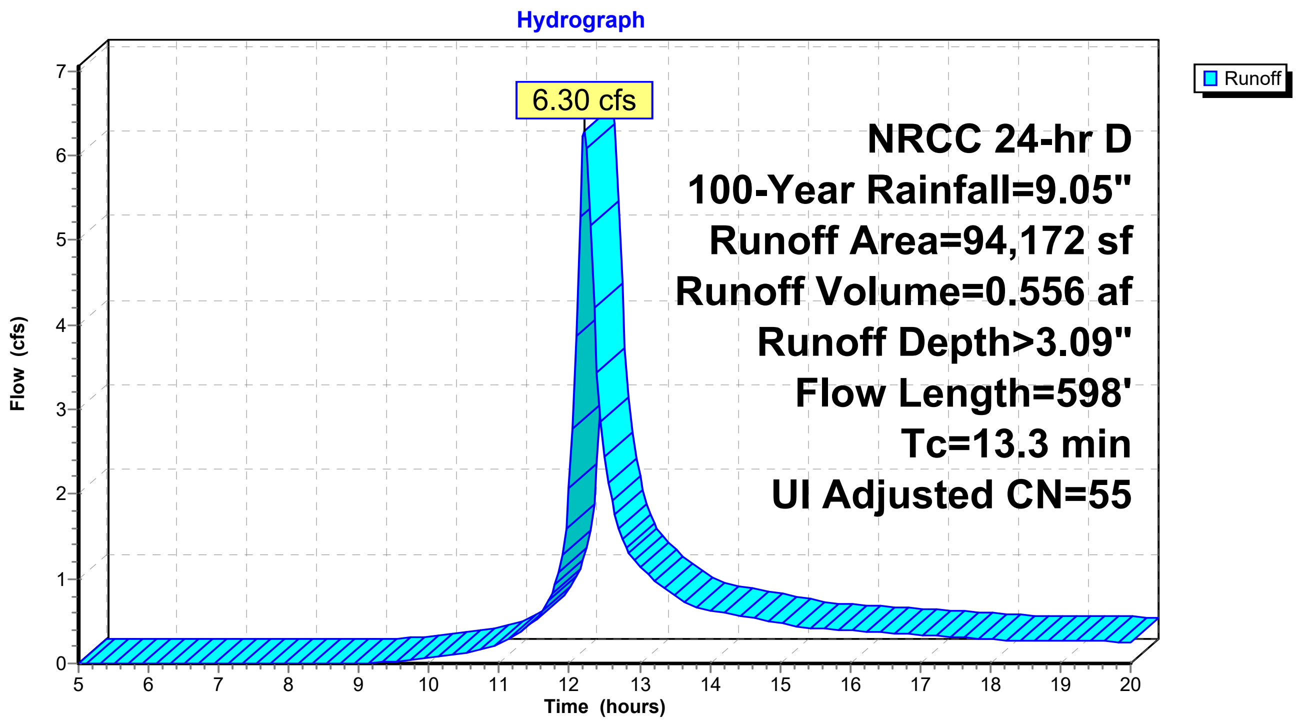
Runoff = 6.30 cfs @ 12.22 hrs, Volume= 0.556 af, Depth> 3.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 100-Year Rainfall=9.05"

Area (sf)	CN	Adj	Description
7,397	48		Brush, Good, HSG B
84,343	55		Woods, Good, HSG B
2,432	98		Unconnected roofs, HSG B
94,172	56	55	Weighted Average, UI Adjusted
91,740			97.42% Pervious Area
2,432			2.58% Impervious Area
2,432			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.3	50	0.0200	0.10		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.10"
5.0	548	0.1350	1.84		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
13.3	598	Total			

Subcatchment 1S: P1A



Summary for Subcatchment 2S: P2A

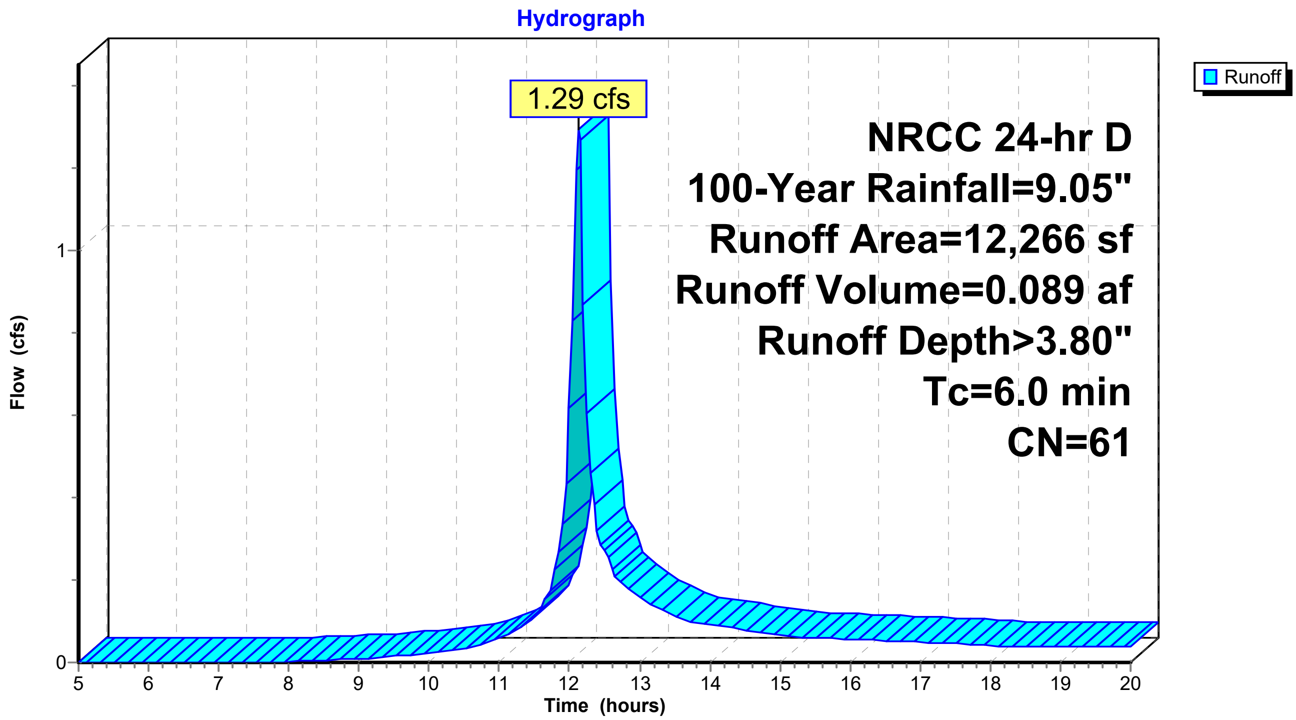
Runoff = 1.29 cfs @ 12.13 hrs, Volume= 0.089 af, Depth> 3.80"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 100-Year Rainfall=9.05"

Area (sf)	CN	Description
12,266	61	>75% Grass cover, Good, HSG B
12,266		100.00% Pervious Area

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

Subcatchment 2S: P2A



Summary for Subcatchment 3S: P2B

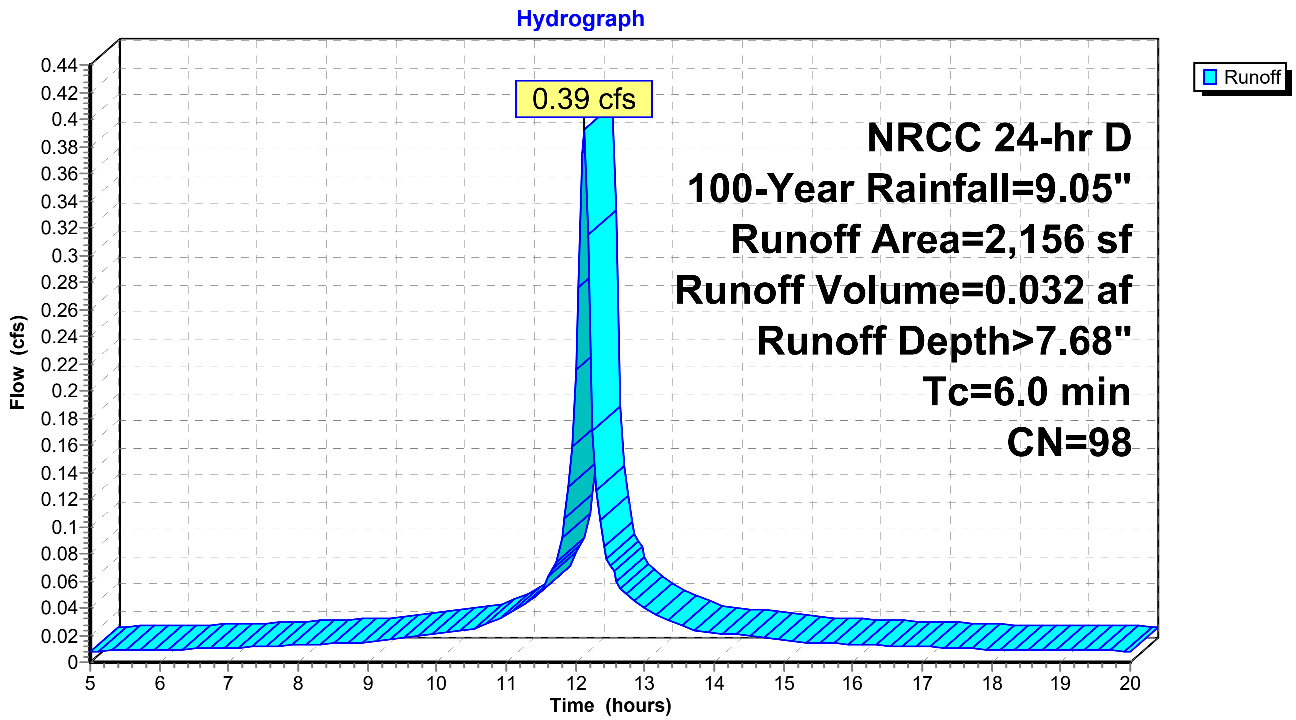
Runoff = 0.39 cfs @ 12.13 hrs, Volume= 0.032 af, Depth> 7.68"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 100-Year Rainfall=9.05"

Area (sf)	CN	Description
2,156	98	Paved parking, HSG B
2,156		100.00% Impervious Area

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

Subcatchment 3S: P2B



Summary for Subcatchment 5S: P3I

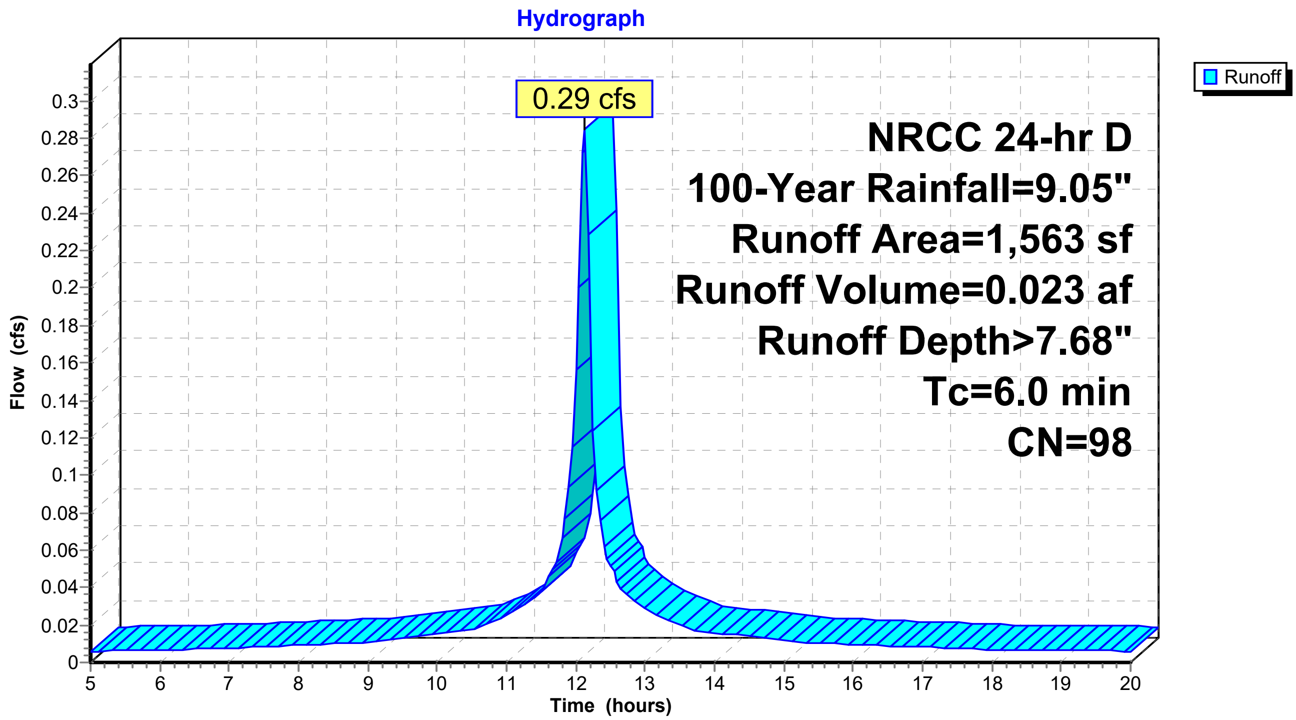
Runoff = 0.29 cfs @ 12.13 hrs, Volume= 0.023 af, Depth> 7.68"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 100-Year Rainfall=9.05"

Area (sf)	CN	Description
1,563	98	Paved parking, HSG B
1,563		100.00% Impervious Area

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

Subcatchment 5S: P3I



Summary for Subcatchment 6S: P3G

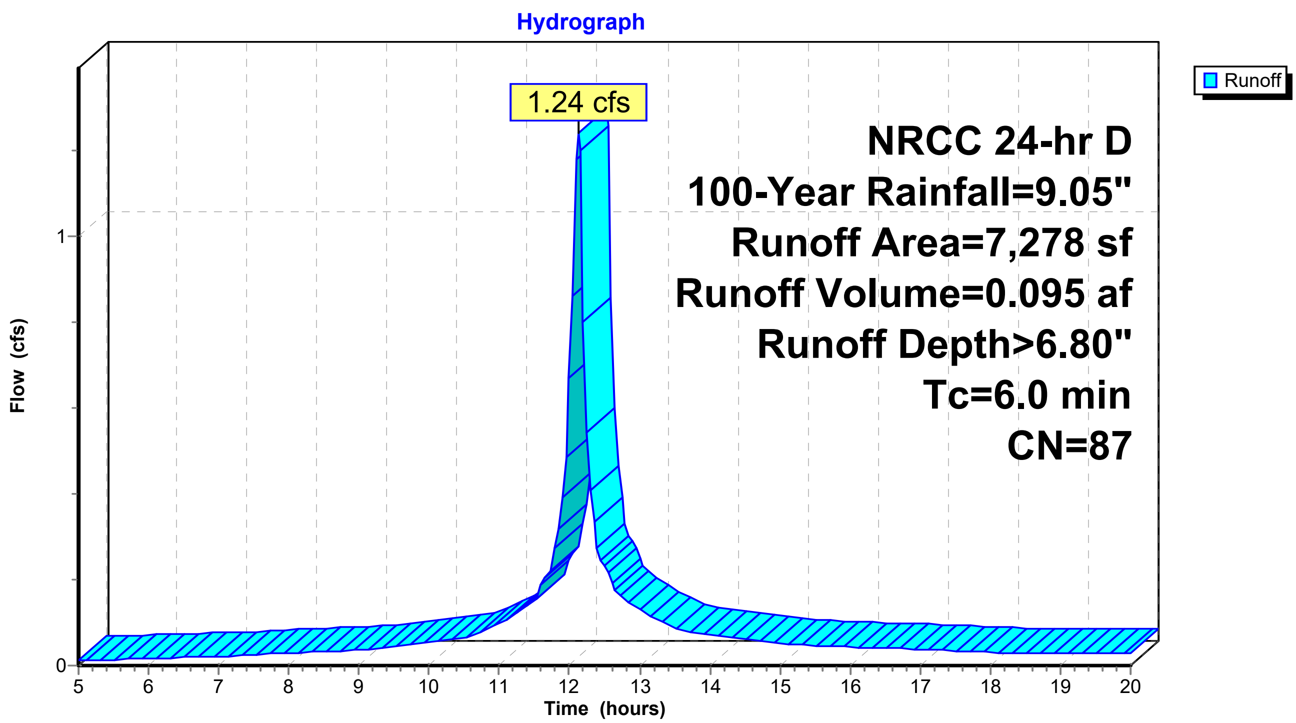
Runoff = 1.24 cfs @ 12.13 hrs, Volume= 0.095 af, Depth> 6.80"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 100-Year Rainfall=9.05"

Area (sf)	CN	Description
2,258	61	>75% Grass cover, Good, HSG B
5,020	98	Paved parking, HSG B
7,278	87	Weighted Average
2,258		31.03% Pervious Area
5,020		68.97% Impervious Area

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

Subcatchment 6S: P3G



Summary for Subcatchment 7S: P3H

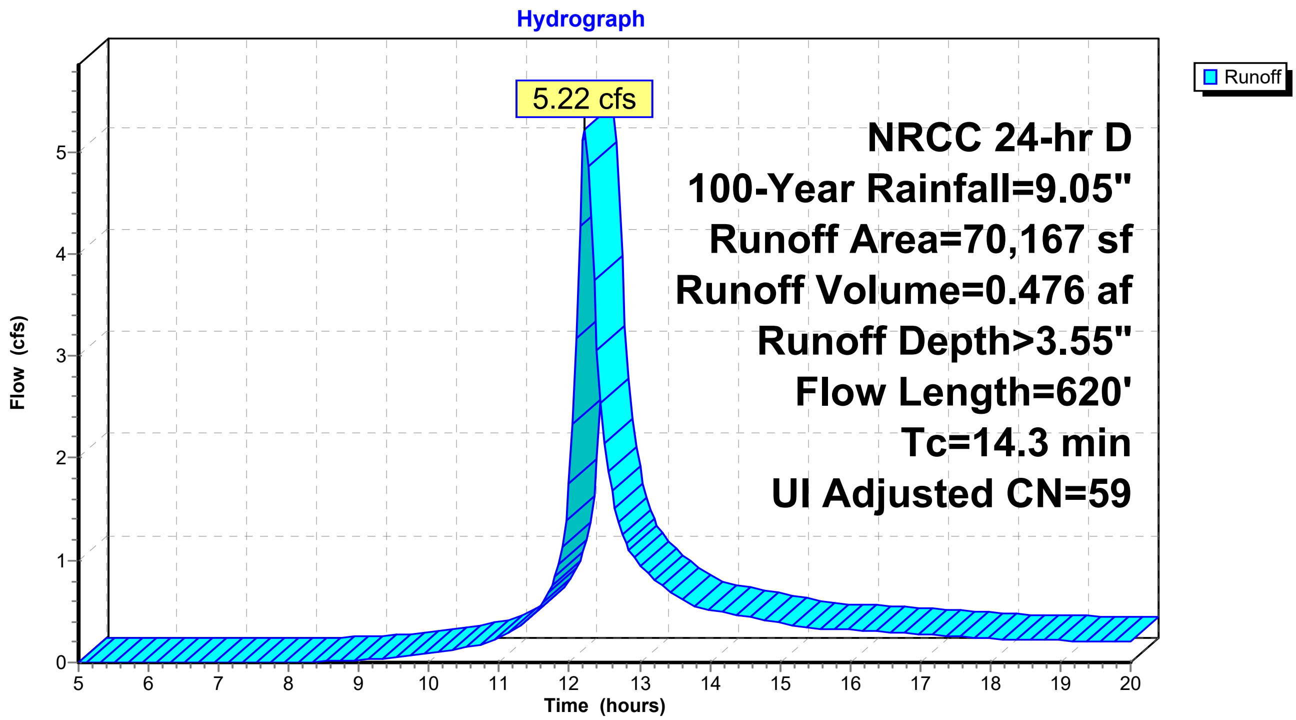
Runoff = 5.22 cfs @ 12.23 hrs, Volume= 0.476 af, Depth> 3.55"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 100-Year Rainfall=9.05"

Area (sf)	CN	Adj	Description
9,561	61		>75% Grass cover, Good, HSG B
3,870	98		Paved parking, HSG B
424	98		Unconnected roofs, HSG B
1,543	98		Unconnected pavement, HSG B
10,060	58		Woods/grass comb., Good, HSG B
44,709	55		Woods, Good, HSG B
70,167	60	59	Weighted Average, UI Adjusted
64,330			91.68% Pervious Area
5,837			8.32% Impervious Area
1,967			33.70% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.3	50	0.0200	0.10		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.10"
6.0	570	0.1000	1.58		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
14.3	620	Total			

Subcatchment 7S: P3H



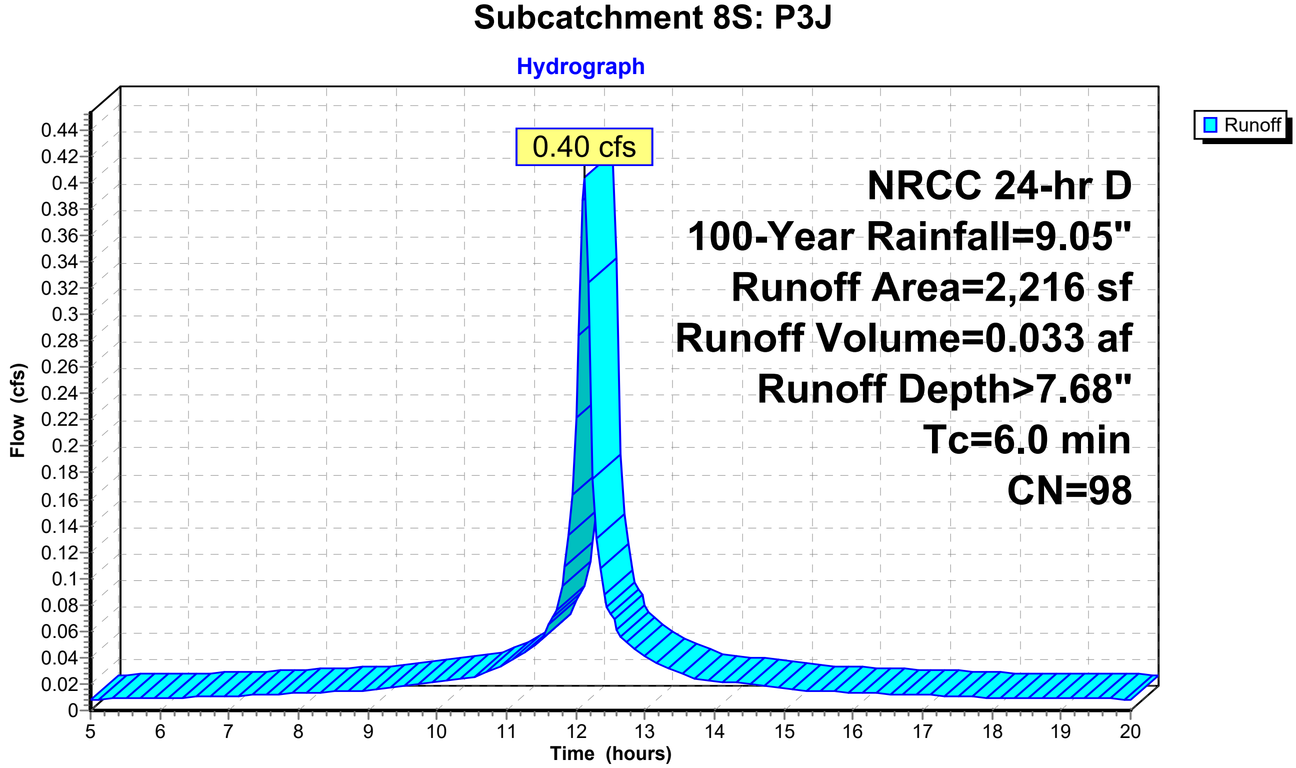
Summary for Subcatchment 8S: P3J

Runoff = 0.40 cfs @ 12.13 hrs, Volume= 0.033 af, Depth> 7.68"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 100-Year Rainfall=9.05"

Area (sf)	CN	Description
2,216	98	Paved parking, HSG B
2,216		100.00% Impervious Area

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



Summary for Subcatchment 11S: P3K

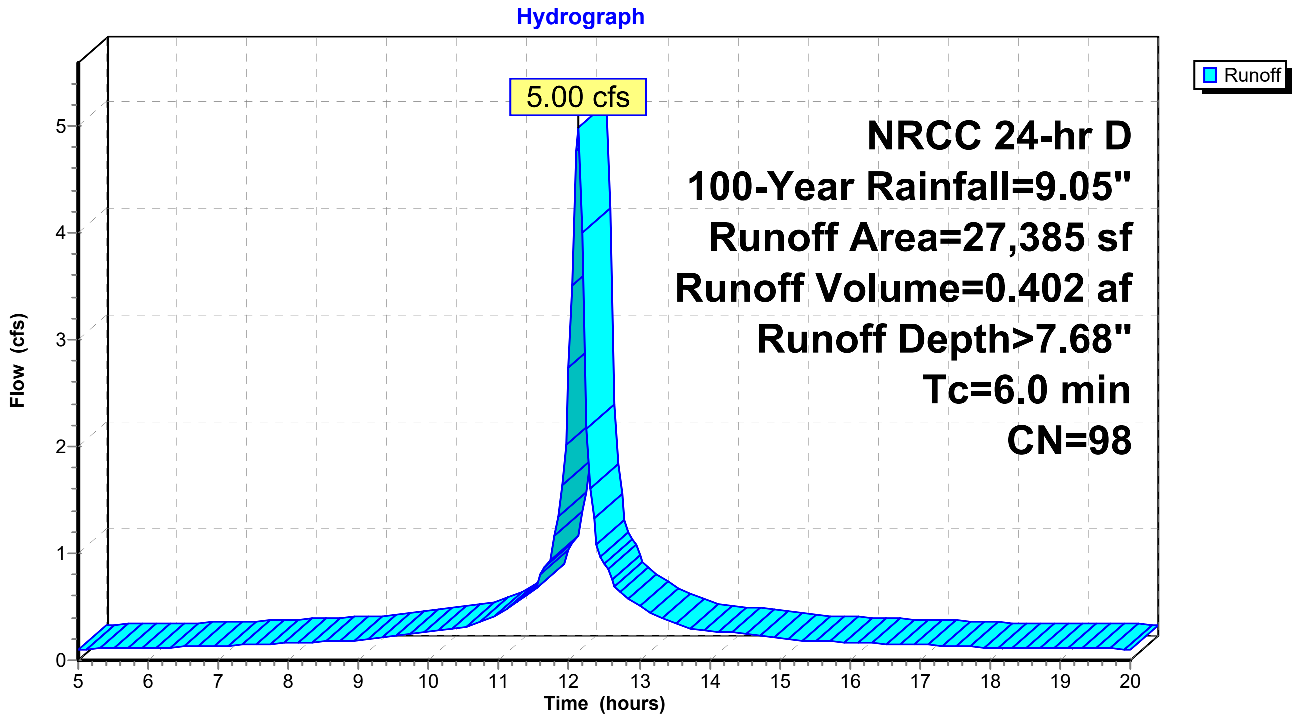
Runoff = 5.00 cfs @ 12.13 hrs, Volume= 0.402 af, Depth> 7.68"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 100-Year Rainfall=9.05"

Area (sf)	CN	Description
27,385	98	Unconnected roofs, HSG B
27,385		100.00% Impervious Area
27,385		100.00% Unconnected

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

Subcatchment 11S: P3K



Summary for Subcatchment 16S: P3F

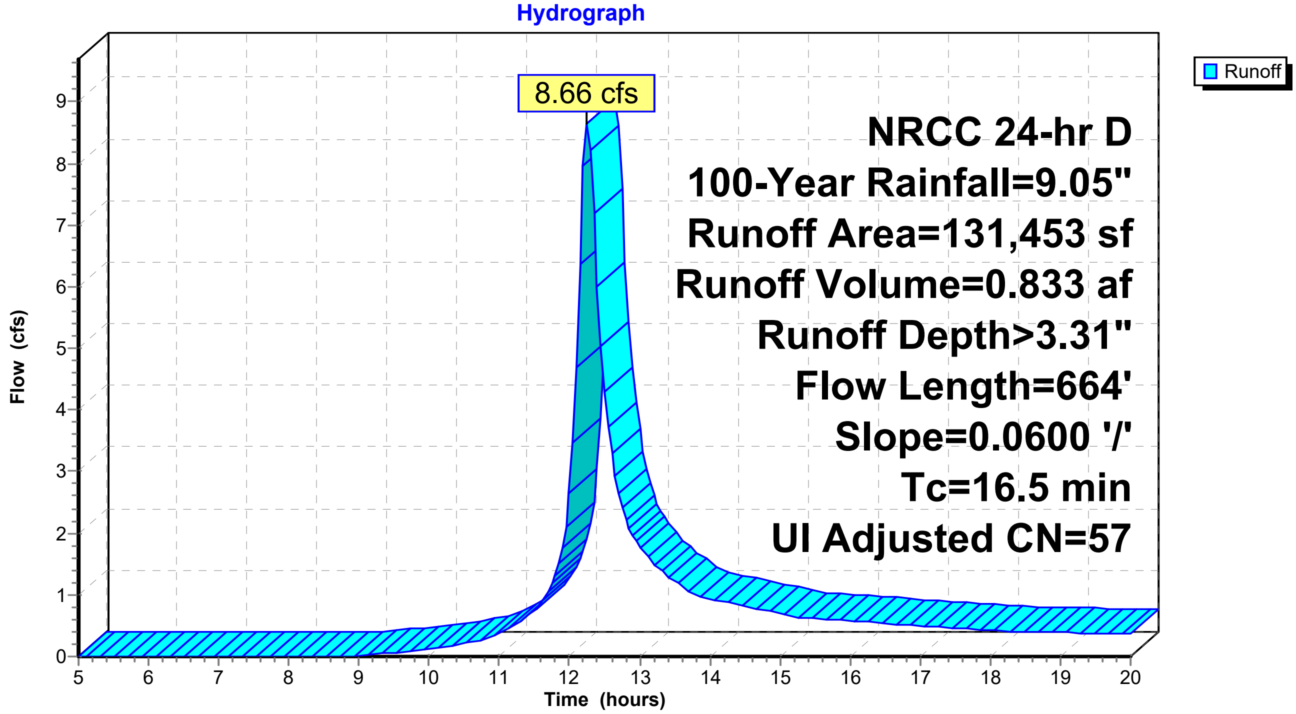
Runoff = 8.66 cfs @ 12.26 hrs, Volume= 0.833 af, Depth> 3.31"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 100-Year Rainfall=9.05"

Area (sf)	CN	Adj	Description
1,418	98		Paved parking, HSG B
2,247	61		>75% Grass cover, Good, HSG B
1,840	98		Unconnected roofs, HSG B
3,512	98		Unconnected pavement, HSG B
25,035	58		Woods/grass comb., Good, HSG B
88,304	55		Woods, Good, HSG B
9,097	61		>75% Grass cover, Good, HSG B
131,453	58	57	Weighted Average, UI Adjusted
124,683			94.85% Pervious Area
6,770			5.15% Impervious Area
5,352			79.05% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.1	50	0.0600	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.10"
8.4	614	0.0600	1.22		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
16.5	664	Total			

Subcatchment 16S: P3F



Summary for Subcatchment 17S: P3E

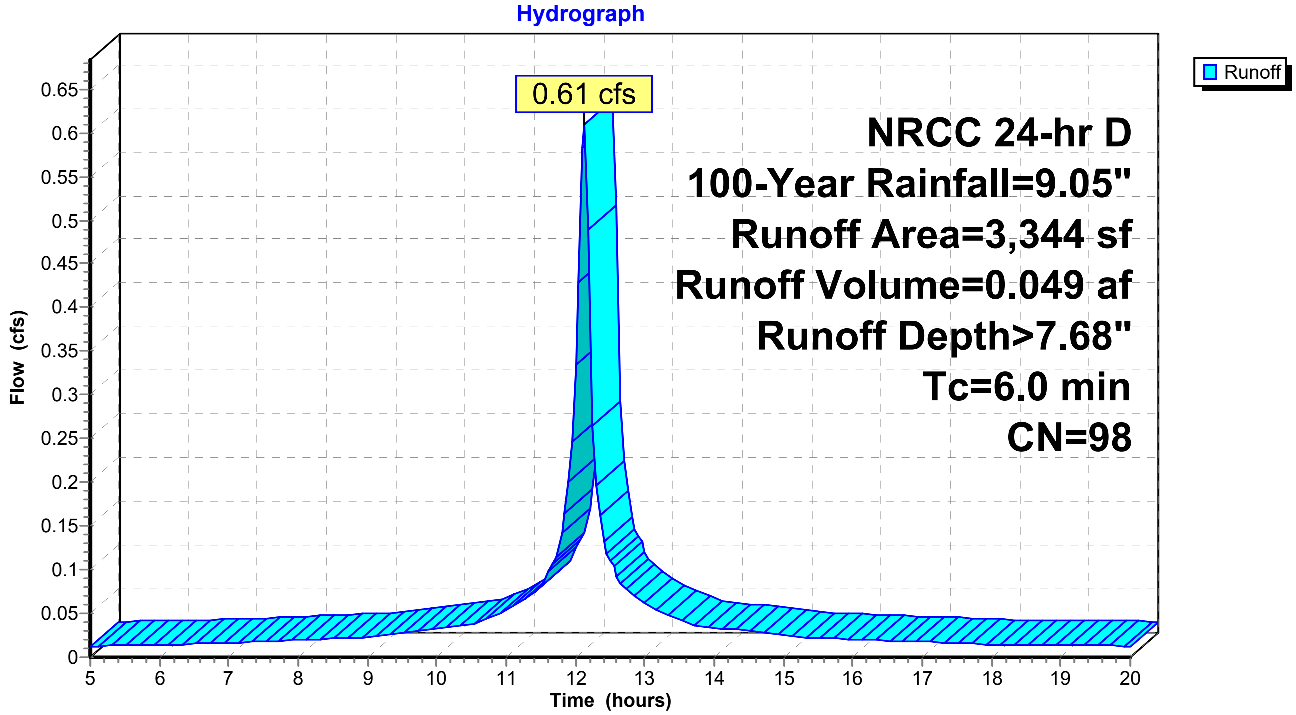
Runoff = 0.61 cfs @ 12.13 hrs, Volume= 0.049 af, Depth> 7.68"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 100-Year Rainfall=9.05"

Area (sf)	CN	Description
3,344	98	Paved parking, HSG B
3,344		100.00% Impervious Area

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

Subcatchment 17S: P3E



Summary for Subcatchment 22S: P3D

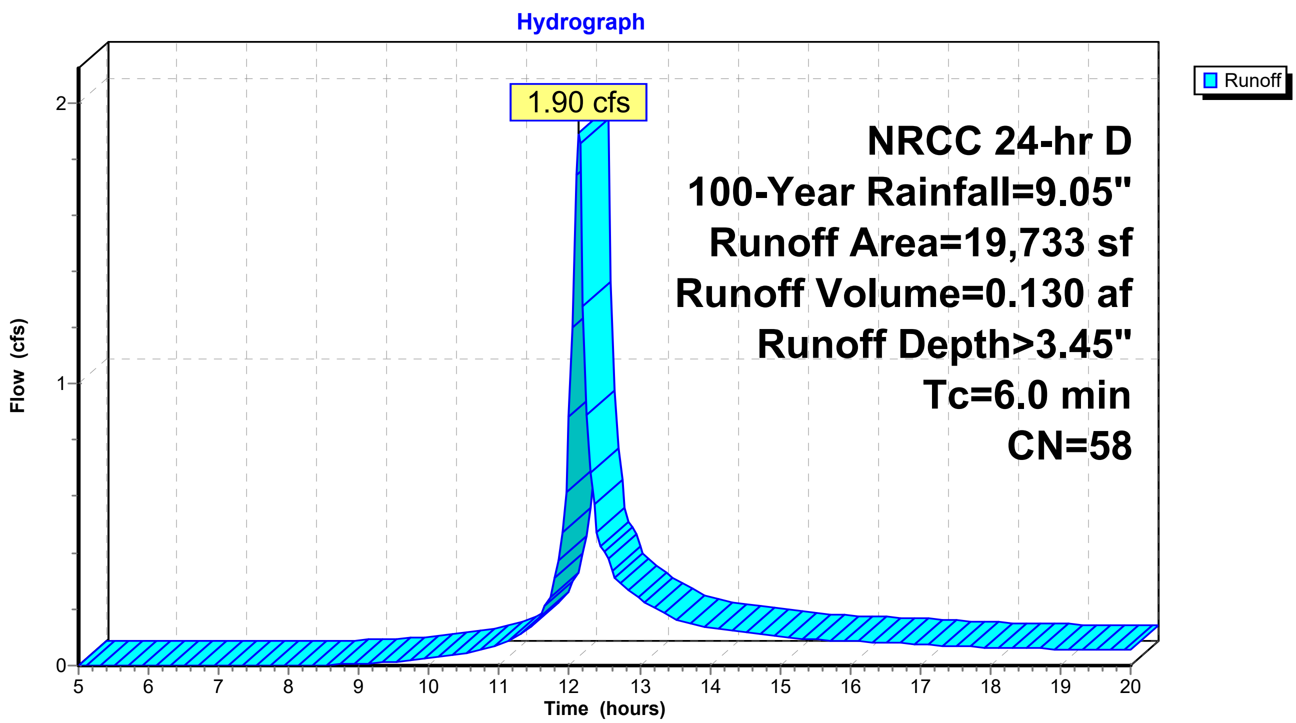
Runoff = 1.90 cfs @ 12.13 hrs, Volume= 0.130 af, Depth> 3.45"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 100-Year Rainfall=9.05"

Area (sf)	CN	Description
10,830	61	>75% Grass cover, Good, HSG B
4,323	55	Woods, Good, HSG B
4,580	55	Woods, Good, HSG B
19,733	58	Weighted Average
19,733		100.00% Pervious Area

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

Subcatchment 22S: P3D



Summary for Subcatchment 23S: P3B

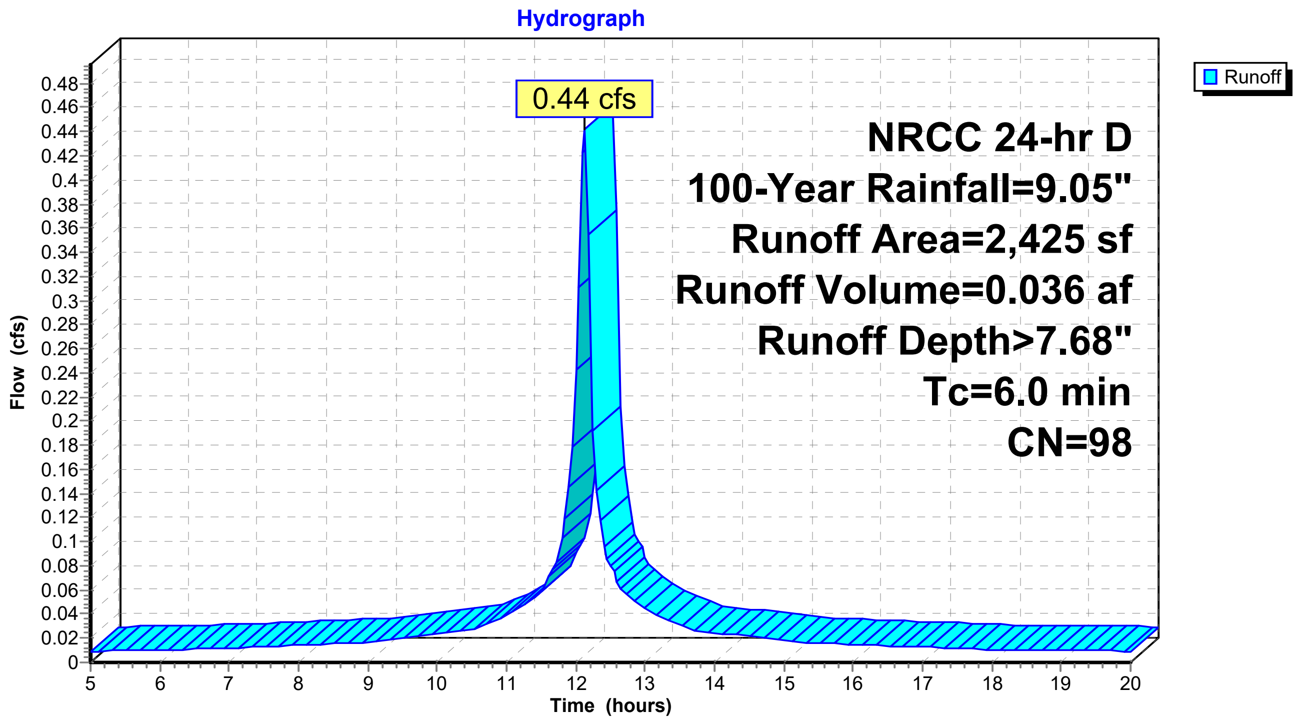
Runoff = 0.44 cfs @ 12.13 hrs, Volume= 0.036 af, Depth> 7.68"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 100-Year Rainfall=9.05"

Area (sf)	CN	Description
2,425	98	Paved parking, HSG B
2,425		100.00% Impervious Area

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

Subcatchment 23S: P3B



Summary for Subcatchment 24S: P3C

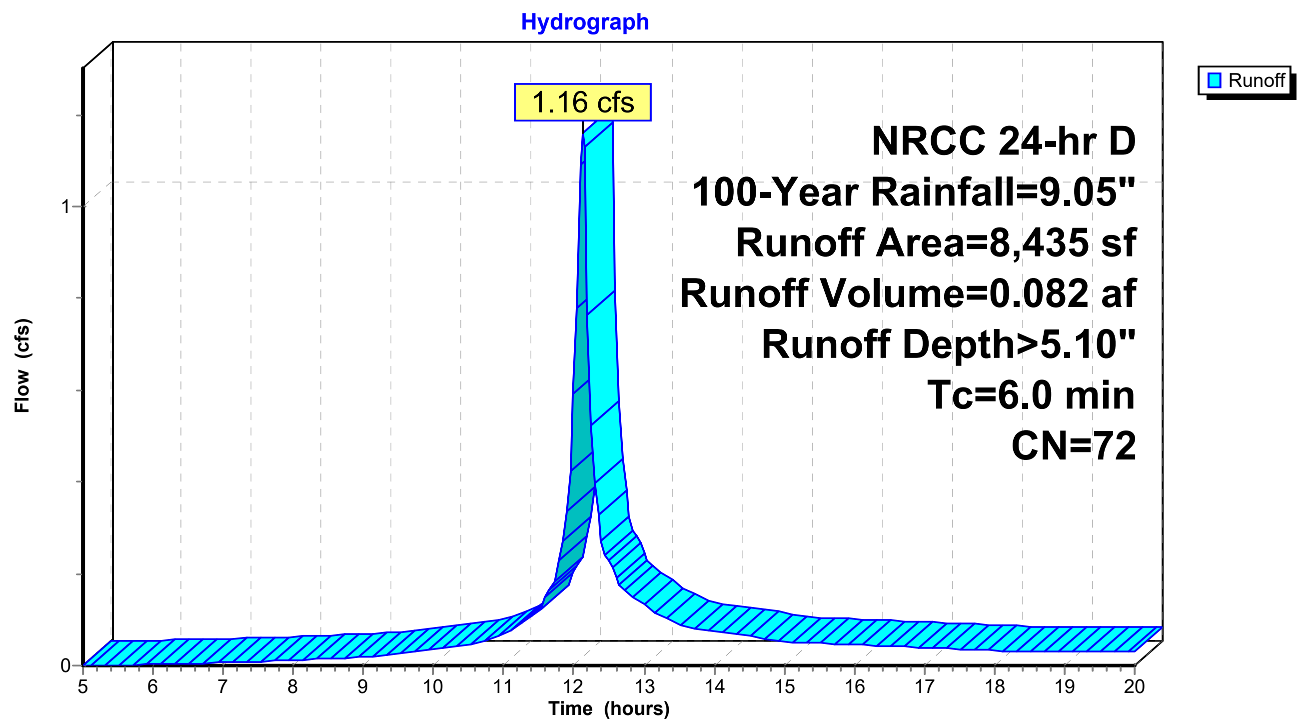
Runoff = 1.16 cfs @ 12.13 hrs, Volume= 0.082 af, Depth> 5.10"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 100-Year Rainfall=9.05"

Area (sf)	CN	Description
6,011	61	>75% Grass cover, Good, HSG B
2,424	98	Paved parking, HSG B
8,435	72	Weighted Average
6,011		71.26% Pervious Area
2,424		28.74% Impervious Area

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

Subcatchment 24S: P3C



Summary for Subcatchment 31S: P3A

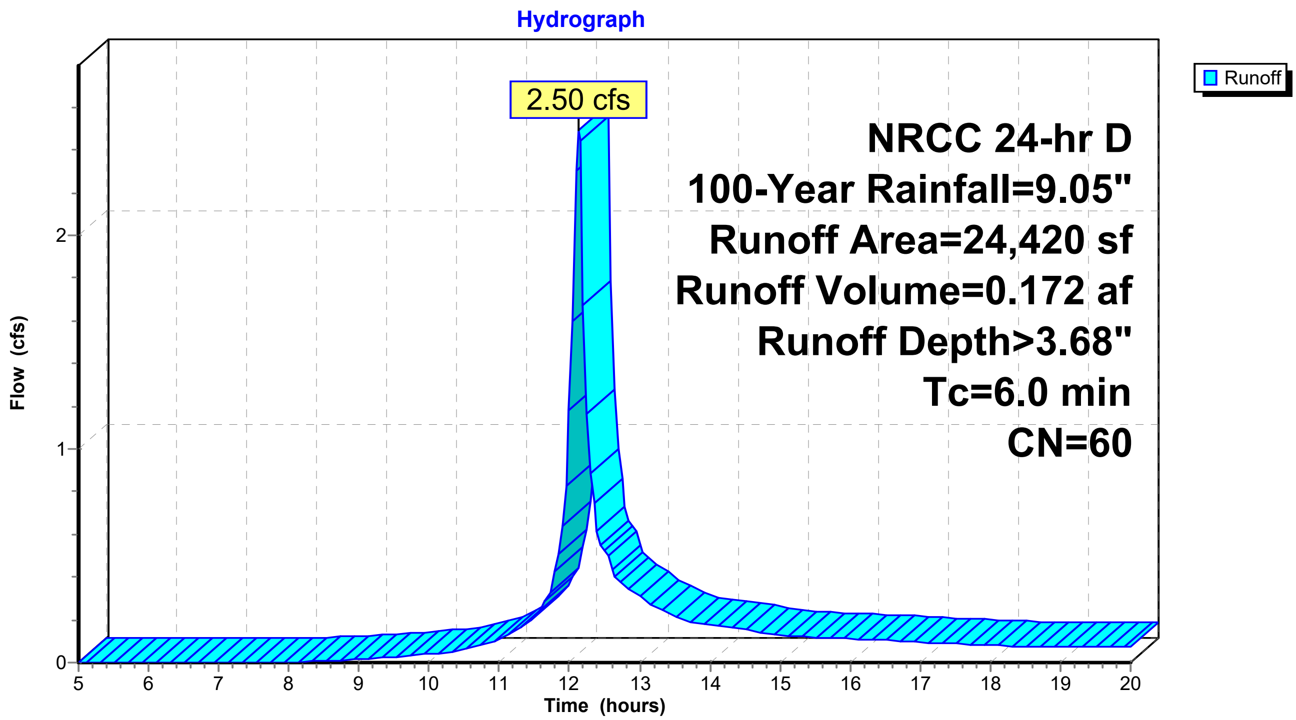
Runoff = 2.50 cfs @ 12.13 hrs, Volume= 0.172 af, Depth> 3.68"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 100-Year Rainfall=9.05"

Area (sf)	CN	Description
4,295	55	Woods, Good, HSG B
20,125	61	>75% Grass cover, Good, HSG B
24,420	60	Weighted Average
24,420		100.00% Pervious Area

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

Subcatchment 31S: P3A



Summary for Subcatchment 34S: P1C

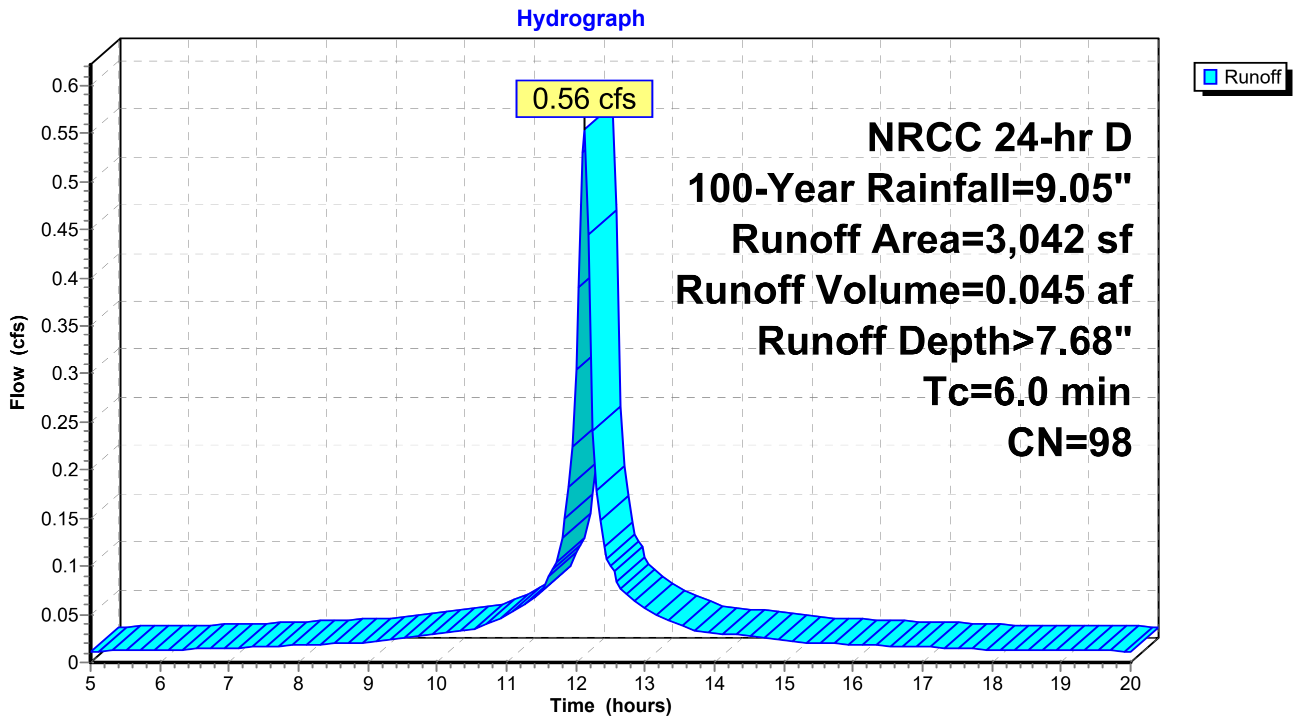
Runoff = 0.56 cfs @ 12.13 hrs, Volume= 0.045 af, Depth> 7.68"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 100-Year Rainfall=9.05"

Area (sf)	CN	Description
3,042	98	Paved parking, HSG B
3,042		100.00% Impervious Area

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

Subcatchment 34S: P1C



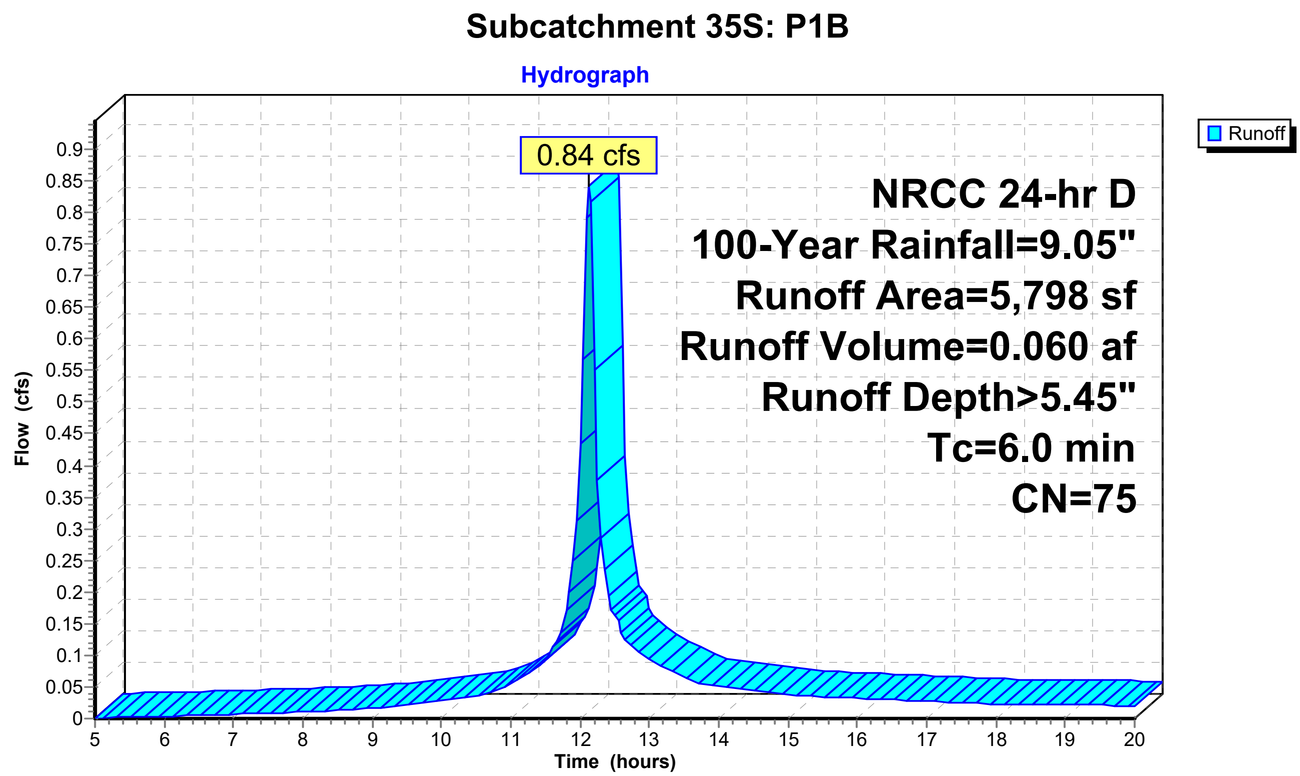
Summary for Subcatchment 35S: P1B

Runoff = 0.84 cfs @ 12.13 hrs, Volume= 0.060 af, Depth> 5.45"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 100-Year Rainfall=9.05"

Area (sf)	CN	Description
2,135	98	Paved parking, HSG B
3,663	61	>75% Grass cover, Good, HSG B
5,798	75	Weighted Average
3,663		63.18% Pervious Area
2,135		36.82% Impervious Area

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



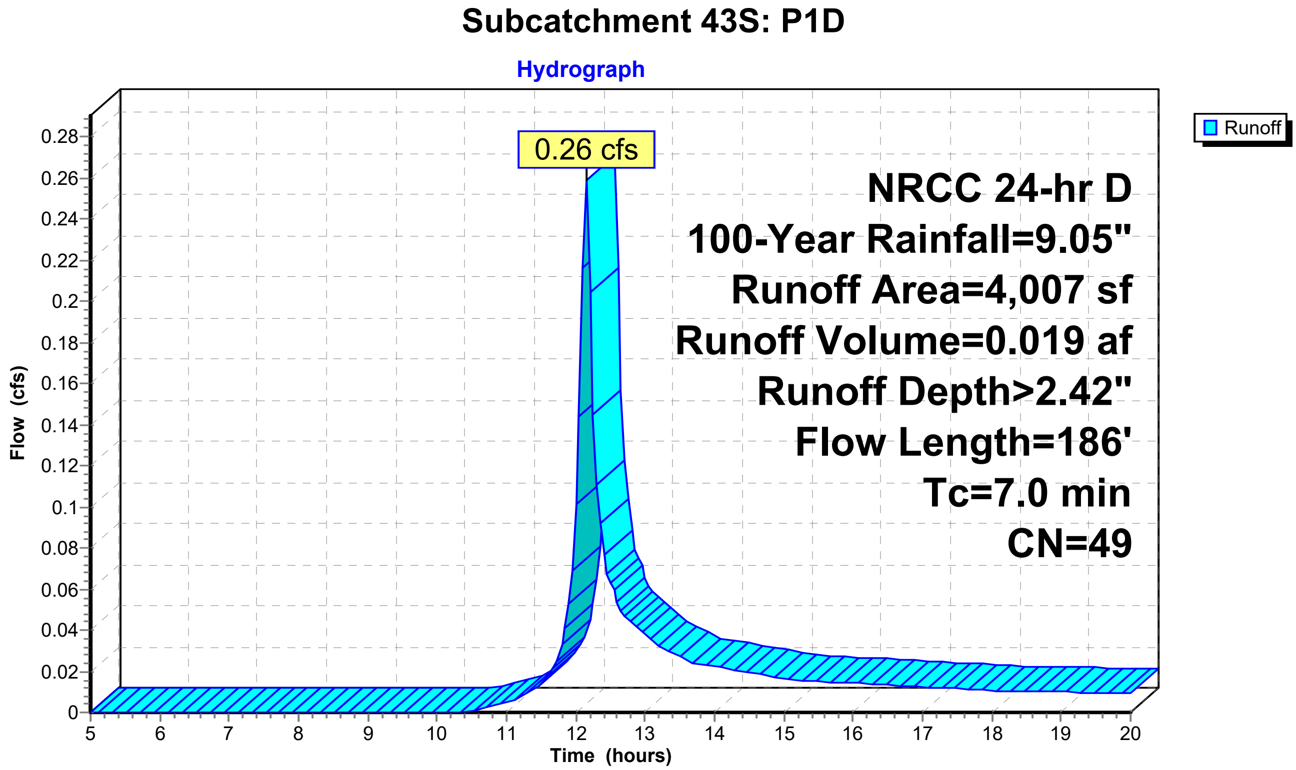
Summary for Subcatchment 43S: P1D

Runoff = 0.26 cfs @ 12.15 hrs, Volume= 0.019 af, Depth> 2.42"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 100-Year Rainfall=9.05"

Area (sf)	CN	Description
316	55	Woods, Good, HSG B
3,691	48	Brush, Good, HSG B
4,007	49	Weighted Average
4,007		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.6	50	0.1000	0.13		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.10"
0.4	136	0.1300	5.80		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
7.0	186	Total			



Summary for Subcatchment 44S: P2D

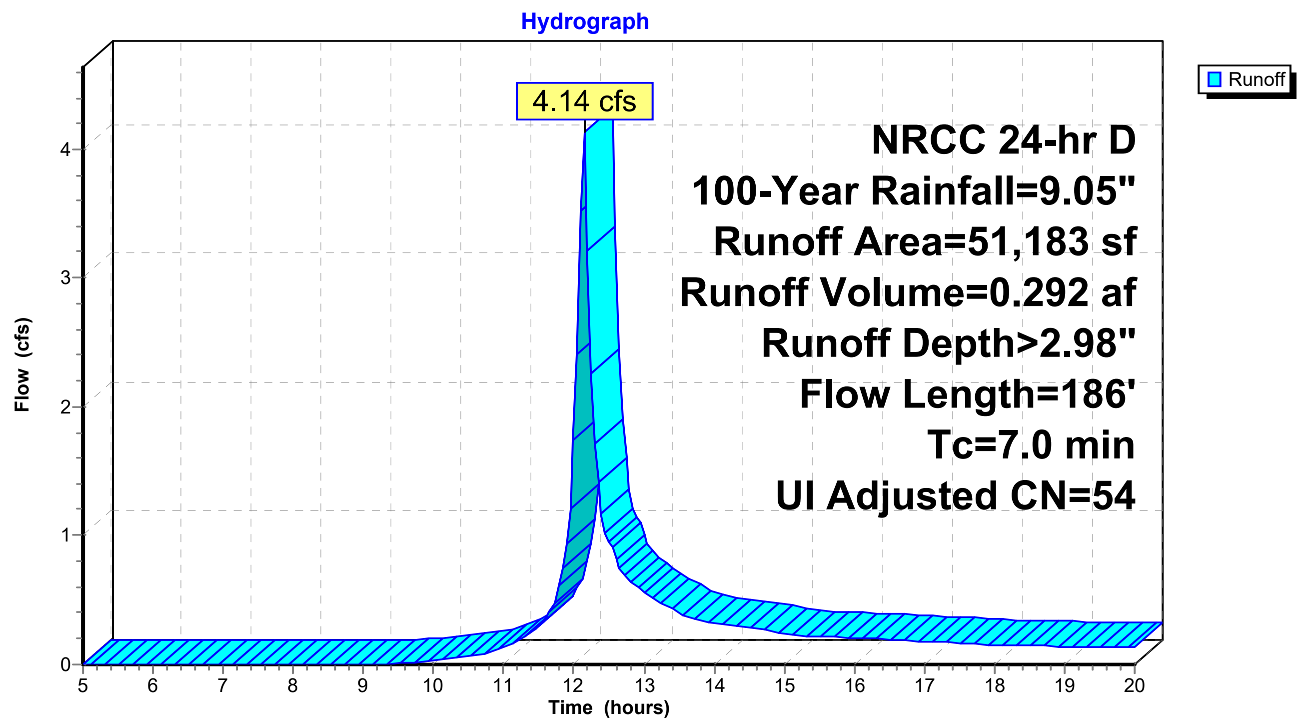
Runoff = 4.14 cfs @ 12.15 hrs, Volume= 0.292 af, Depth> 2.98"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 100-Year Rainfall=9.05"

Area (sf)	CN	Adj	Description
33,103	55		Woods, Good, HSG B
13,939	48		Brush, Good, HSG B
2,316	98		Unconnected roofs, HSG B
461	98		Unconnected pavement, HSG B
1,364	58		Woods/grass comb., Good, HSG B
51,183	56	54	Weighted Average, UI Adjusted
48,406			94.57% Pervious Area
2,777			5.43% Impervious Area
2,777			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.6	50	0.1000	0.13		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.10"
0.4	136	0.1300	5.80		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
7.0	186	Total			

Subcatchment 44S: P2D



Summary for Subcatchment 45S: P3L

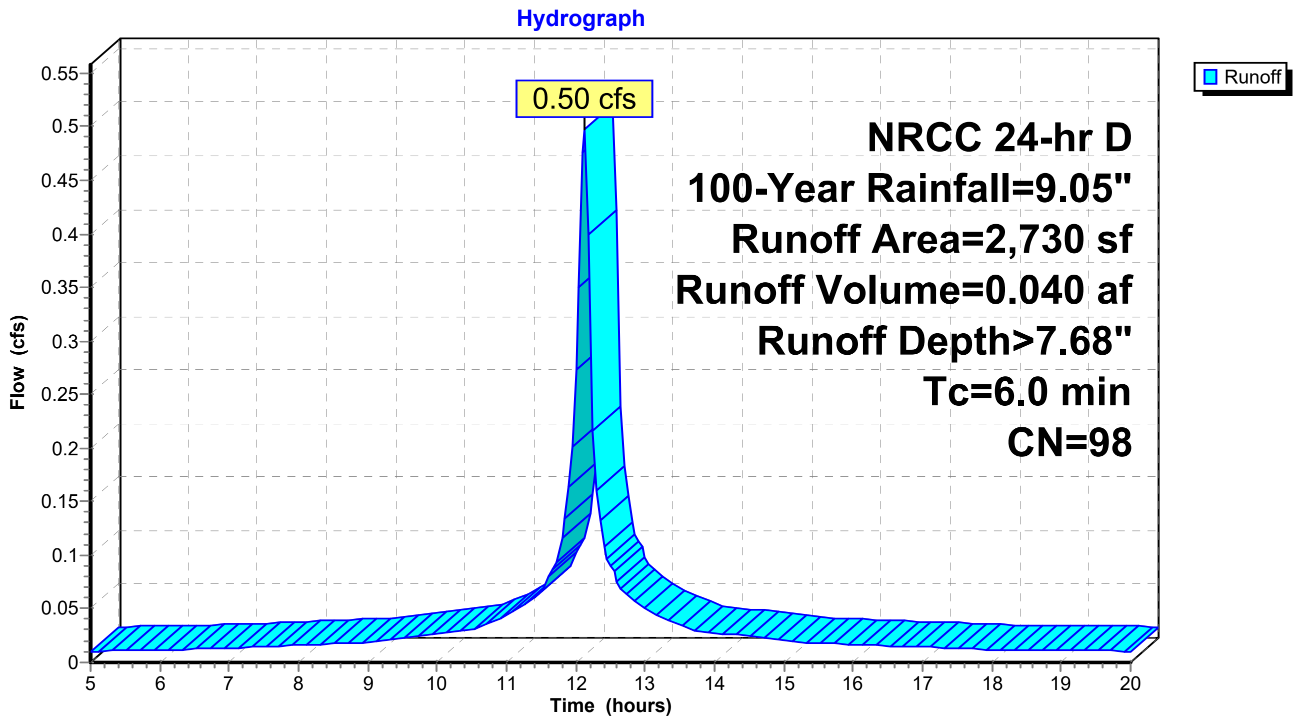
Runoff = 0.50 cfs @ 12.13 hrs, Volume= 0.040 af, Depth> 7.68"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 100-Year Rainfall=9.05"

Area (sf)	CN	Description
2,730	98	Paved parking, HSG B
2,730		100.00% Impervious Area

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

Subcatchment 45S: P3L



Summary for Subcatchment 46S: P2C

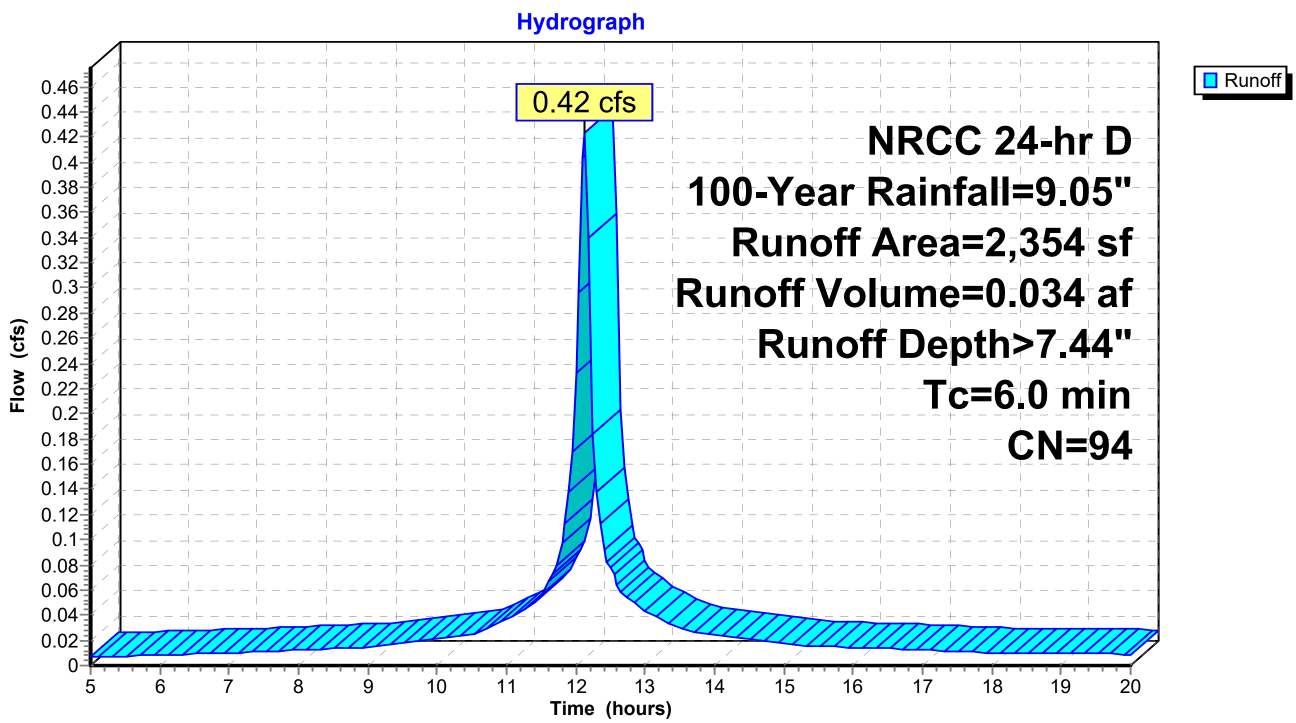
Runoff = 0.42 cfs @ 12.13 hrs, Volume= 0.034 af, Depth> 7.44"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 100-Year Rainfall=9.05"

Area (sf)	CN	Description
263	61	>75% Grass cover, Good, HSG B
2,091	98	Paved parking, HSG B
2,354	94	Weighted Average
263		11.17% Pervious Area
2,091		88.83% Impervious Area

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

Subcatchment 46S: P2C



Summary for Subcatchment 47S: P3M

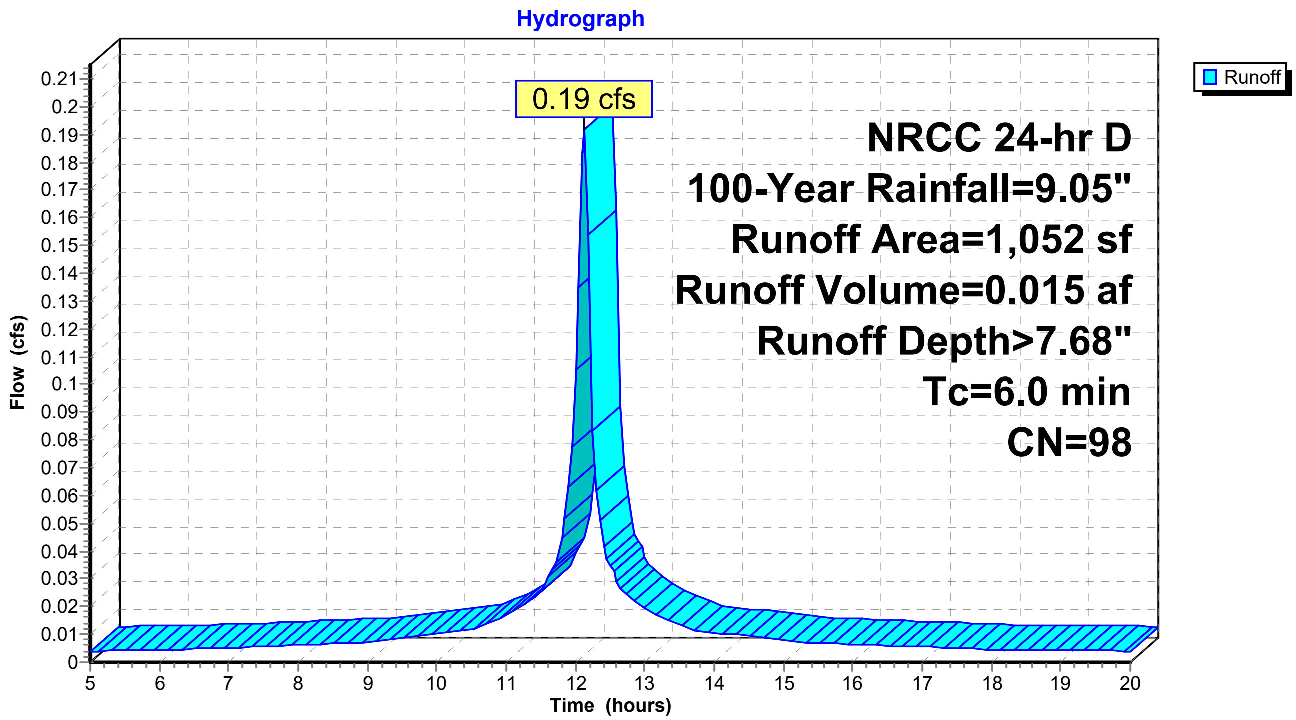
Runoff = 0.19 cfs @ 12.13 hrs, Volume= 0.015 af, Depth> 7.68"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 100-Year Rainfall=9.05"

Area (sf)	CN	Description
1,052	98	Paved parking, HSG B
1,052		100.00% Impervious Area

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

Subcatchment 47S: P3M



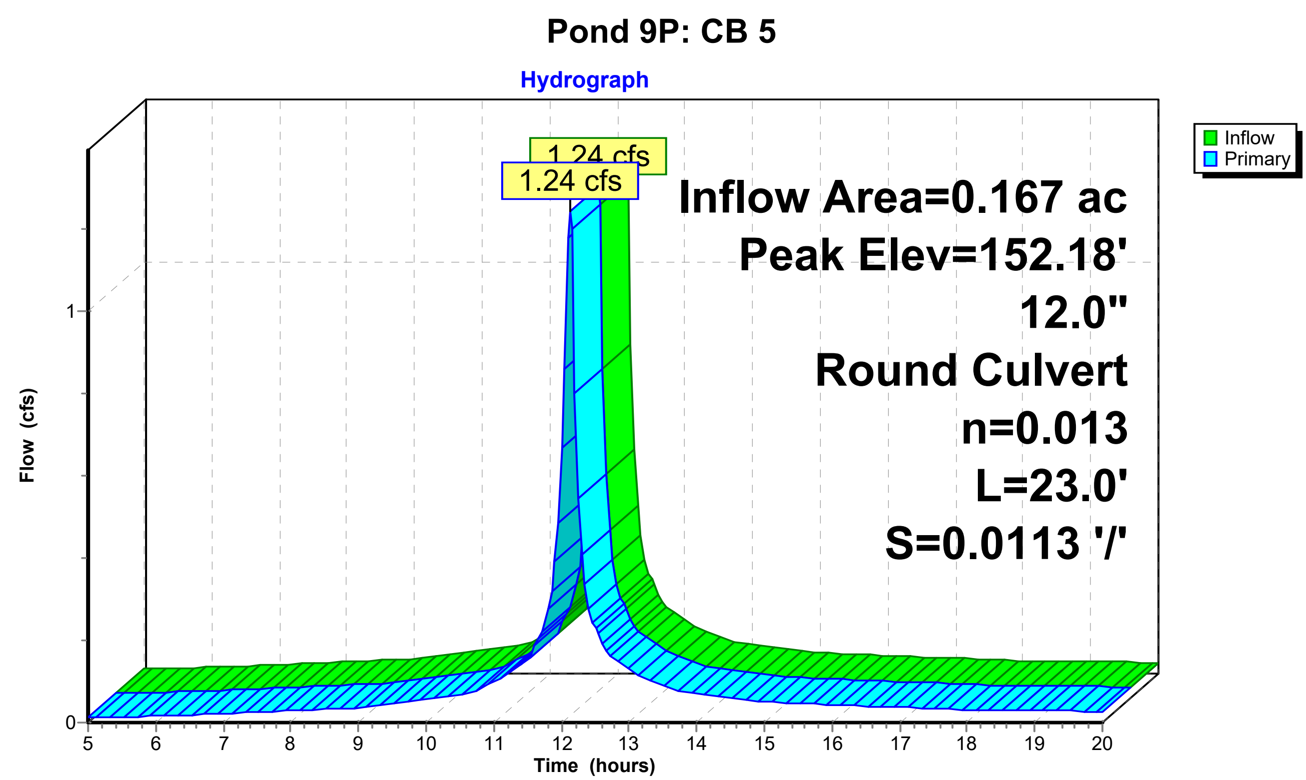
Summary for Pond 9P: CB 5

Inflow Area =	0.167 ac,	68.97% Impervious,	Inflow Depth >	6.80"	for 100-Year event
Inflow =	1.24 cfs @	12.13 hrs,	Volume=	0.095 af	
Outflow =	1.24 cfs @	12.13 hrs,	Volume=	0.095 af,	Atten= 0%, Lag= 0.0 min
Primary =	1.24 cfs @	12.13 hrs,	Volume=	0.095 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 152.18' @ 12.13 hrs
Flood Elev= 156.25'

Device	Routing	Invert	Outlet Devices
#1	Primary	151.50'	**12.0" Round Culvert** L= 23.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 151.50' / 151.24' S= 0.0113 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.19 cfs @ 12.13 hrs HW=152.16' (Free Discharge)
└─**1=Culvert** (Inlet Controls 1.19 cfs @ 2.18 fps)



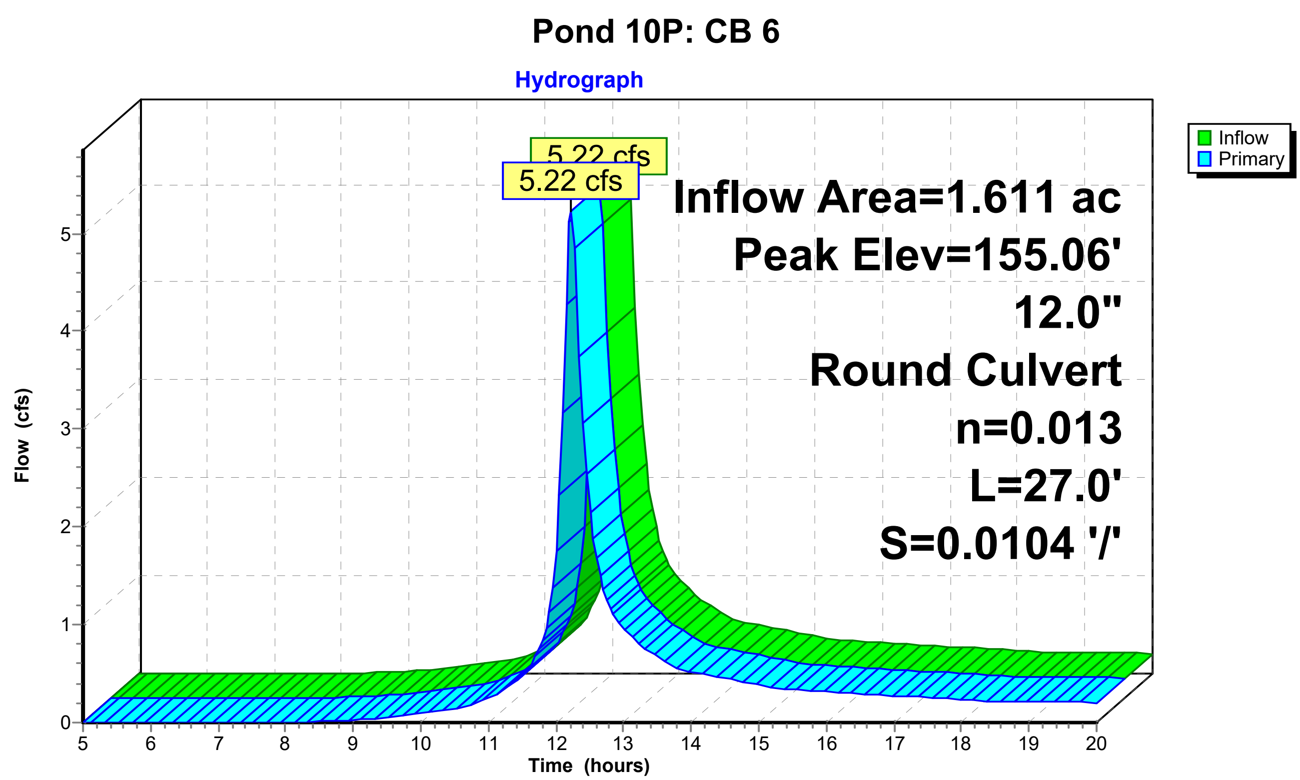
Summary for Pond 10P: CB 6

Inflow Area =	1.611 ac,	8.32% Impervious,	Inflow Depth > 3.55"	for 100-Year event	
Inflow =	5.22 cfs @	12.23 hrs,	Volume=	0.476 af	
Outflow =	5.22 cfs @	12.23 hrs,	Volume=	0.476 af,	Atten= 0%, Lag= 0.0 min
Primary =	5.22 cfs @	12.23 hrs,	Volume=	0.476 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 155.06' @ 12.23 hrs
Flood Elev= 156.25'

Device	Routing	Invert	Outlet Devices
#1	Primary	151.50'	**12.0" Round Culvert** L= 27.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 151.50' / 151.22' S= 0.0104 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=5.14 cfs @ 12.23 hrs HW=154.97' (Free Discharge)
└**1=Culvert** (Inlet Controls 5.14 cfs @ 6.55 fps)



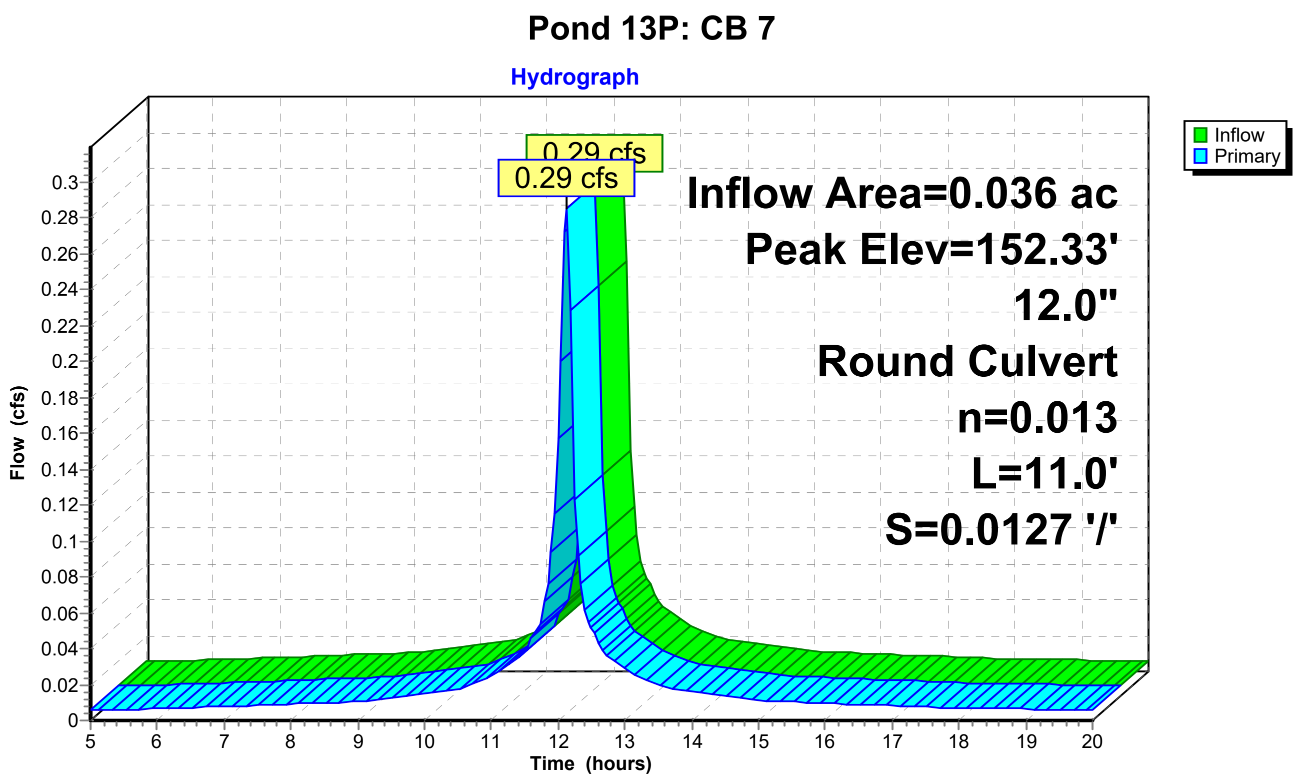
Summary for Pond 13P: CB 7

Inflow Area =	0.036 ac,100.00% Impervious,	Inflow Depth > 7.68"	for 100-Year event		
Inflow =	0.29 cfs @	12.13 hrs,	Volume=	0.023 af	
Outflow =	0.29 cfs @	12.13 hrs,	Volume=	0.023 af,	Atten= 0%, Lag= 0.0 min
Primary =	0.29 cfs @	12.13 hrs,	Volume=	0.023 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 152.33' @ 12.13 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	152.03'	**12.0" Round Culvert** L= 11.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 152.03' / 151.89' S= 0.0127 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.27 cfs @ 12.13 hrs HW=152.32' (Free Discharge)
└─**1=Culvert** (Inlet Controls 0.27 cfs @ 1.45 fps)



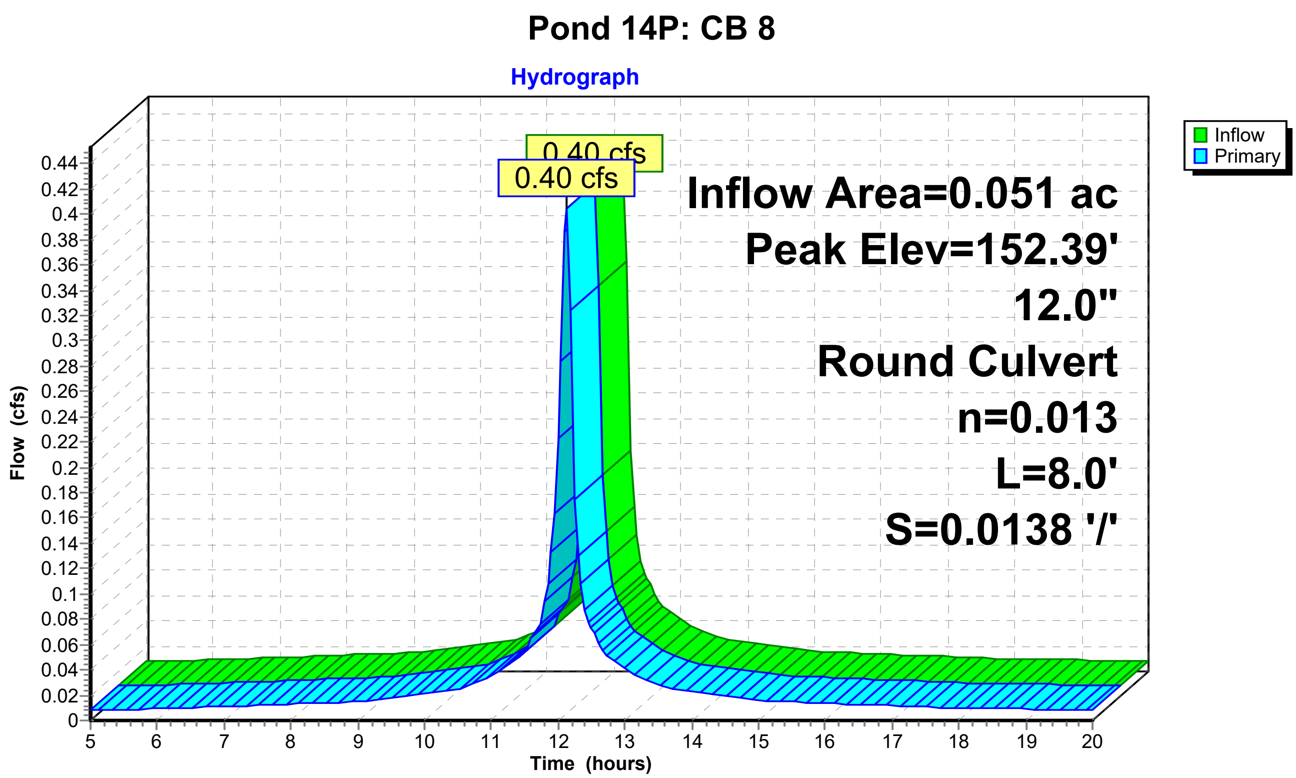
Summary for Pond 14P: CB 8

Inflow Area = 0.051 ac,100.00% Impervious, Inflow Depth > 7.68" for 100-Year event
Inflow = 0.40 cfs @ 12.13 hrs, Volume= 0.033 af
Outflow = 0.40 cfs @ 12.13 hrs, Volume= 0.033 af, Atten= 0%, Lag= 0.0 min
Primary = 0.40 cfs @ 12.13 hrs, Volume= 0.033 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 152.39' @ 12.13 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	152.03'	**12.0" Round Culvert** L= 8.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 152.03' / 151.92' S= 0.0138 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.39 cfs @ 12.13 hrs HW=152.38' (Free Discharge)
↑**1=Culvert** (Barrel Controls 0.39 cfs @ 2.32 fps)



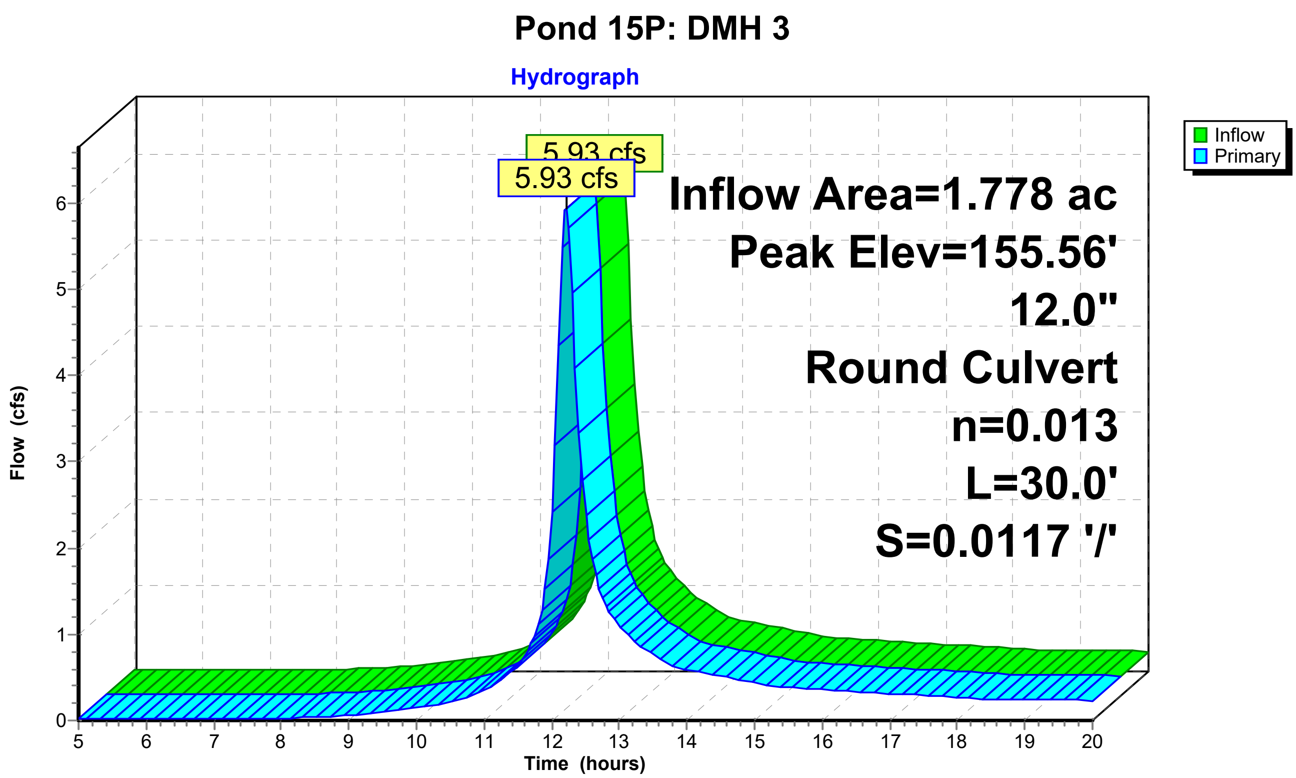
Summary for Pond 15P: DMH 3

Inflow Area =	1.778 ac,	14.02% Impervious,	Inflow Depth > 3.85"	for 100-Year event
Inflow =	5.93 cfs @	12.21 hrs, Volume=	0.571 af	
Outflow =	5.93 cfs @	12.21 hrs, Volume=	0.571 af, Atten= 0%, Lag= 0.0 min	
Primary =	5.93 cfs @	12.21 hrs, Volume=	0.571 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 155.56' @ 12.21 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	151.12'	**12.0" Round Culvert** L= 30.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 151.12' / 150.77' S= 0.0117 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=5.88 cfs @ 12.21 hrs HW=155.50' (Free Discharge)
└─**1=Culvert** (Inlet Controls 5.88 cfs @ 7.49 fps)



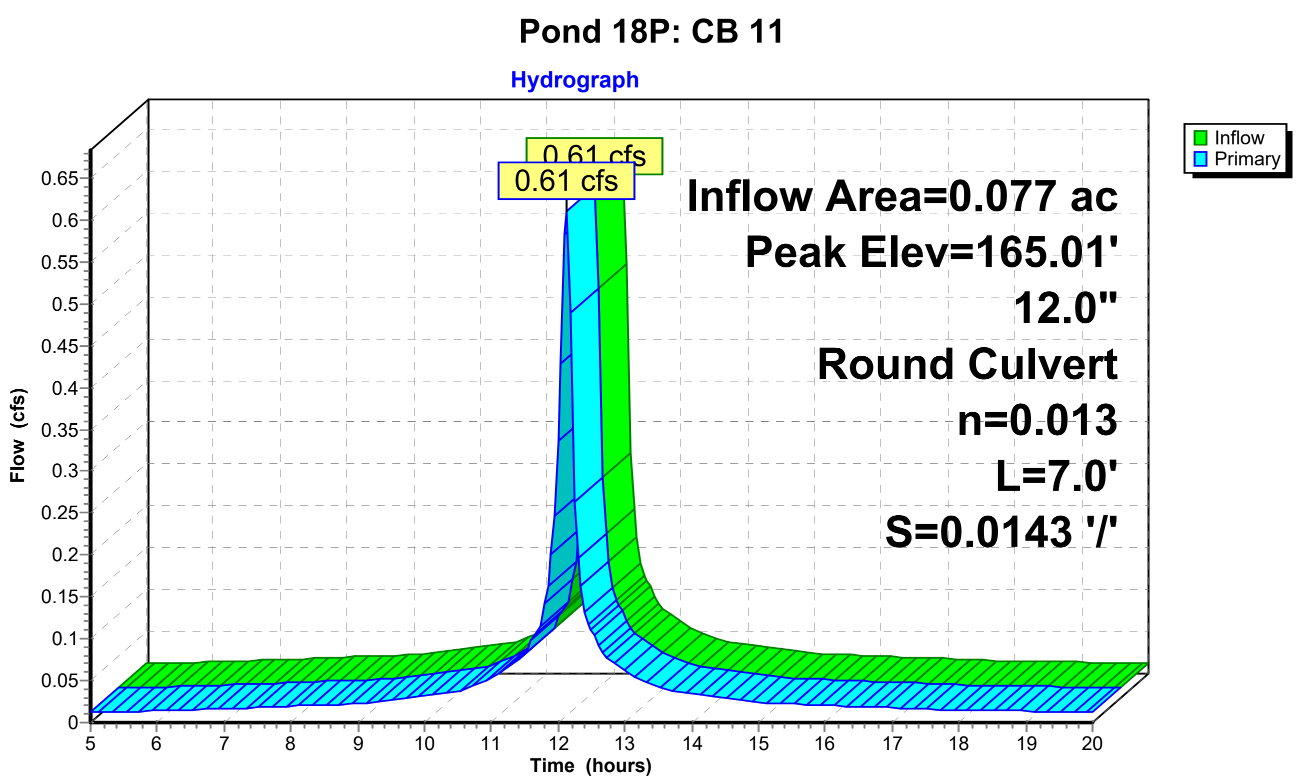
Summary for Pond 18P: CB 11

Inflow Area = 0.077 ac,100.00% Impervious, Inflow Depth > 7.68" for 100-Year event
Inflow = 0.61 cfs @ 12.13 hrs, Volume= 0.049 af
Outflow = 0.61 cfs @ 12.13 hrs, Volume= 0.049 af, Atten= 0%, Lag= 0.0 min
Primary = 0.61 cfs @ 12.13 hrs, Volume= 0.049 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 165.01' @ 12.13 hrs
Flood Elev= 168.07'

Device	Routing	Invert	Outlet Devices
#1	Primary	164.54'	**12.0" Round Culvert** L= 7.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 164.54' / 164.44' S= 0.0143 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.58 cfs @ 12.13 hrs HW=164.99' (Free Discharge)
└─**1=Culvert** (Barrel Controls 0.58 cfs @ 2.49 fps)



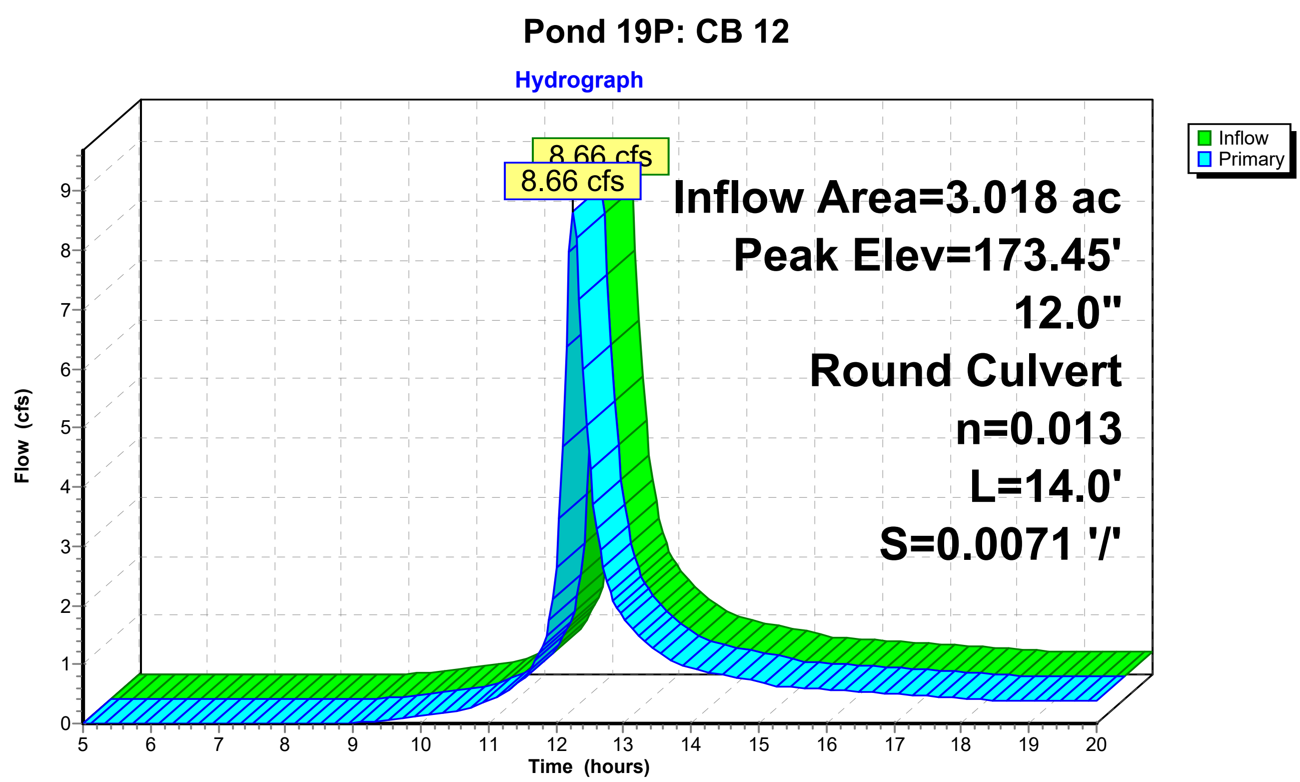
Summary for Pond 19P: CB 12

Inflow Area = 3.018 ac, 5.15% Impervious, Inflow Depth > 3.31" for 100-Year event
Inflow = 8.66 cfs @ 12.26 hrs, Volume= 0.833 af
Outflow = 8.66 cfs @ 12.26 hrs, Volume= 0.833 af, Atten= 0%, Lag= 0.0 min
Primary = 8.66 cfs @ 12.26 hrs, Volume= 0.833 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 173.45' @ 12.26 hrs
Flood Elev= 168.07'

Device	Routing	Invert	Outlet Devices
#1	Primary	164.54'	**12.0" Round Culvert** L= 14.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 164.54' / 164.44' S= 0.0071 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=8.60 cfs @ 12.26 hrs HW=173.34' (Free Discharge)
└─**1=Culvert** (Inlet Controls 8.60 cfs @ 10.95 fps)



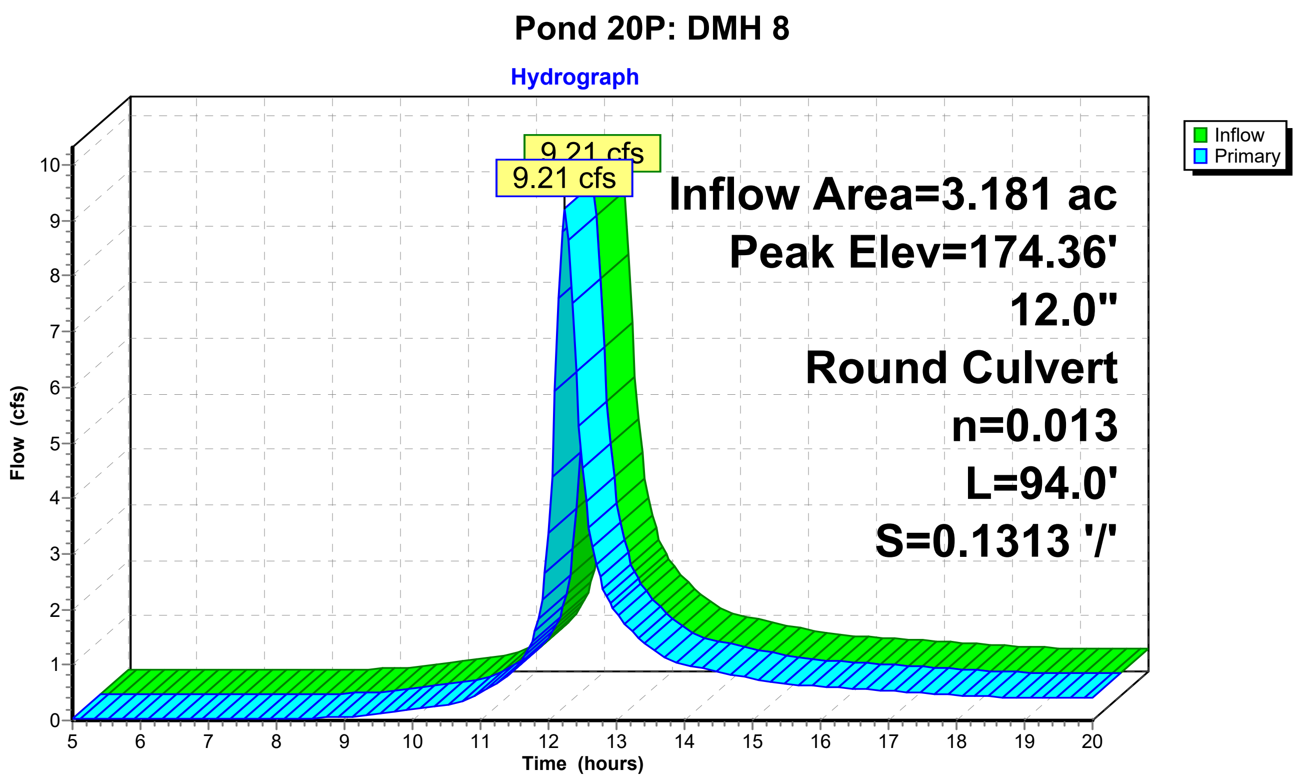
Summary for Pond 20P: DMH 8

Inflow Area =	3.181 ac,	10.03% Impervious,	Inflow Depth >	3.54"	for 100-Year event	
Inflow =	9.21 cfs @	12.25 hrs,	Volume=	0.937 af		
Outflow =	9.21 cfs @	12.25 hrs,	Volume=	0.937 af,	Atten= 0%,	Lag= 0.0 min
Primary =	9.21 cfs @	12.25 hrs,	Volume=	0.937 af		

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 174.36' @ 12.25 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	164.34'	**12.0" Round Culvert** L= 94.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 164.34' / 152.00' S= 0.1313 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=9.18 cfs @ 12.25 hrs HW=174.29' (Free Discharge)
└─**1=Culvert** (Inlet Controls 9.18 cfs @ 11.69 fps)



Summary for Pond 21P: Infiltration Basin 1

Inflow Area = 3.634 ac, 8.78% Impervious, Inflow Depth > 3.52" for 100-Year event
Inflow = 10.19 cfs @ 12.23 hrs, Volume= 1.067 af
Outflow = 9.06 cfs @ 12.31 hrs, Volume= 0.992 af, Atten= 11%, Lag= 4.9 min
Discarded = 0.14 cfs @ 12.31 hrs, Volume= 0.090 af
Primary = 8.93 cfs @ 12.31 hrs, Volume= 0.902 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 154.52' @ 12.31 hrs Surf.Area= 3,398 sf Storage= 5,542 cf

Plug-Flow detention time= 42.2 min calculated for 0.988 af (93% of inflow)
Center-of-Mass det. time= 17.3 min (831.1 - 813.8)

Volume	Invert	Avail.Storage	Storage Description
#1	152.00'	11,781 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

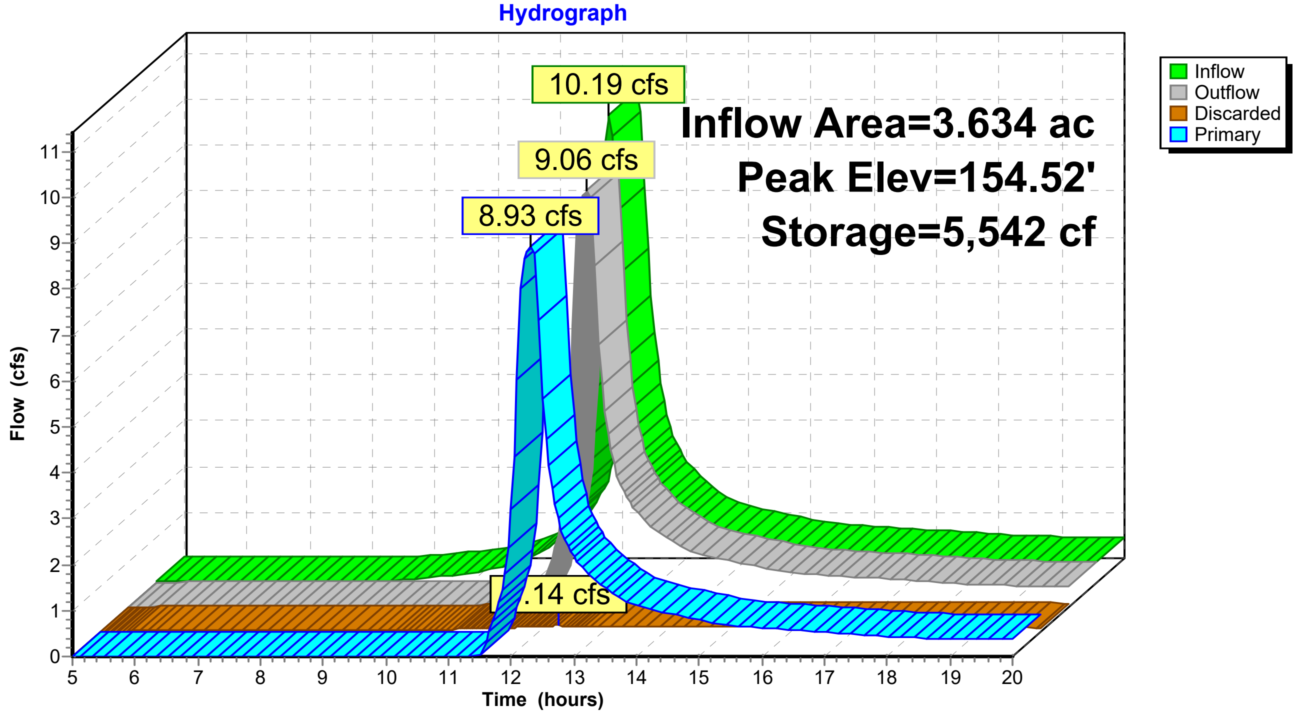
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
152.00	996	0	0
153.00	2,112	1,554	1,554
154.00	2,709	2,411	3,965
155.00	4,044	3,377	7,341
156.00	4,836	4,440	11,781

Device	Routing	Invert	Outlet Devices
#1	Discarded	152.00'	**1.020 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 150.00'
#2	Primary	152.00'	**18.0" Round Culvert** L= 121.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 152.00' / 139.00' S= 0.1074 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf
#3	Device 2	154.00'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 2	153.60'	**2.0' long x 0.40' rise Sharp-Crested Vee/Trap Weir** Cv= 2.62 (C= 3.28)

Discarded OutFlow Max=0.14 cfs @ 12.31 hrs HW=154.51' (Free Discharge)
└─**1=Exfiltration** (Controls 0.14 cfs)

Primary OutFlow Max=8.92 cfs @ 12.31 hrs HW=154.51' (Free Discharge)
└─**2=Culvert** (Inlet Controls 8.92 cfs @ 5.05 fps)
  ├─**3=Orifice/Grate** (Passes < 9.59 cfs potential flow)
  └─**4=Sharp-Crested Vee/Trap Weir** (Passes < 3.31 cfs potential flow)

Pond 21P: Infiltration Basin 1



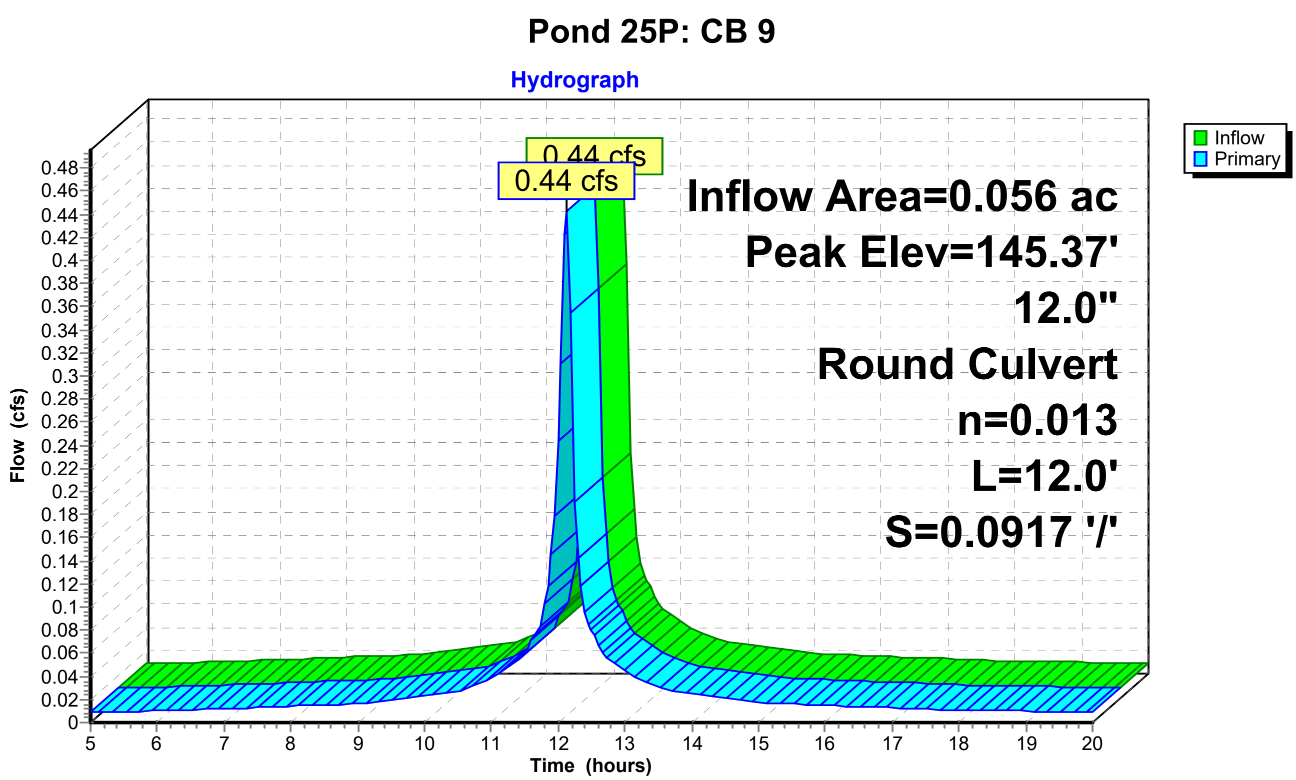
Summary for Pond 25P: CB 9

Inflow Area = 0.056 ac,100.00% Impervious, Inflow Depth > 7.68" for 100-Year event
Inflow = 0.44 cfs @ 12.13 hrs, Volume= 0.036 af
Outflow = 0.44 cfs @ 12.13 hrs, Volume= 0.036 af, Atten= 0%, Lag= 0.0 min
Primary = 0.44 cfs @ 12.13 hrs, Volume= 0.036 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 145.37' @ 12.13 hrs
Flood Elev= 152.72'

Device	Routing	Invert	Outlet Devices
#1	Primary	145.00'	**12.0" Round Culvert** L= 12.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 145.00' / 143.90' S= 0.0917 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.42 cfs @ 12.13 hrs HW=145.37' (Free Discharge)
└─**1=Culvert** (Inlet Controls 0.42 cfs @ 1.62 fps)



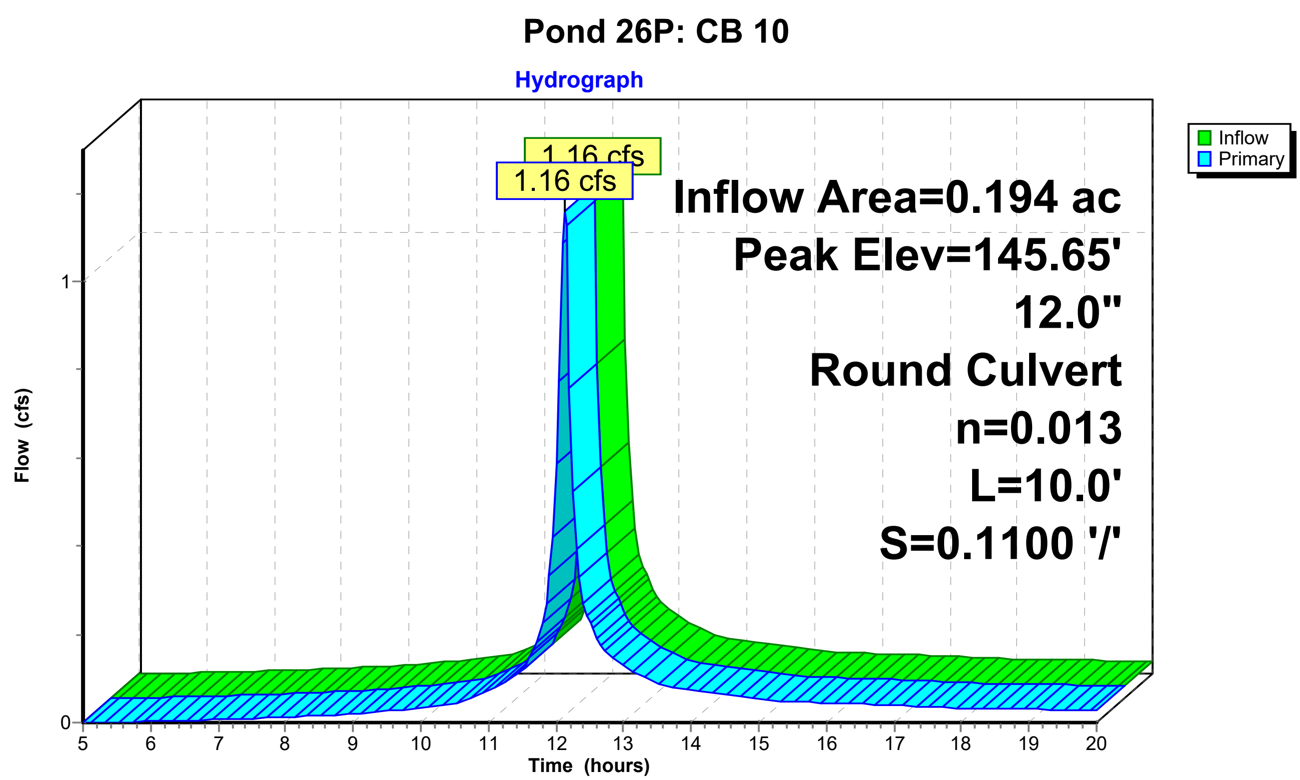
Summary for Pond 26P: CB 10

Inflow Area =	0.194 ac, 28.74% Impervious, Inflow Depth > 5.10" for 100-Year event	
Inflow =	1.16 cfs @ 12.13 hrs, Volume=	0.082 af
Outflow =	1.16 cfs @ 12.13 hrs, Volume=	0.082 af, Atten= 0%, Lag= 0.0 min
Primary =	1.16 cfs @ 12.13 hrs, Volume=	0.082 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 145.65' @ 12.13 hrs
Flood Elev= 152.72'

Device	Routing	Invert	Outlet Devices
#1	Primary	145.00'	**12.0" Round Culvert** L= 10.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 145.00' / 143.90' S= 0.1100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.11 cfs @ 12.13 hrs HW=145.63' (Free Discharge)
└─**1=Culvert** (Inlet Controls 1.11 cfs @ 2.13 fps)



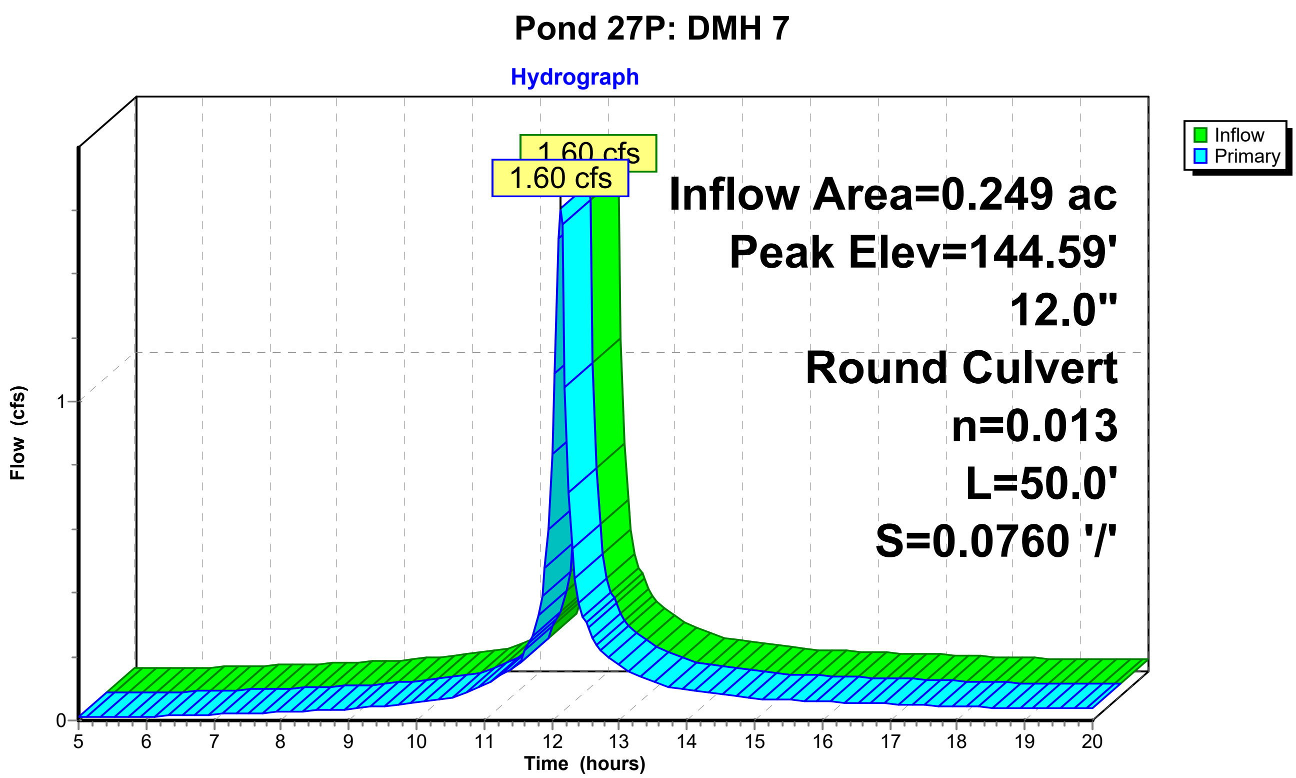
Summary for Pond 27P: DMH 7

Inflow Area =	0.249 ac, 44.65% Impervious,	Inflow Depth > 5.67"	for 100-Year event
Inflow =	1.60 cfs @ 12.13 hrs,	Volume=	0.118 af
Outflow =	1.60 cfs @ 12.13 hrs,	Volume=	0.118 af, Atten= 0%, Lag= 0.0 min
Primary =	1.60 cfs @ 12.13 hrs,	Volume=	0.118 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 144.59' @ 12.13 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	143.80'	**12.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 143.80' / 140.00' S= 0.0760 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.54 cfs @ 12.13 hrs HW=144.57' (Free Discharge)
↑—**1=Culvert** (Inlet Controls 1.54 cfs @ 2.36 fps)



Summary for Pond 28P: Infiltration Basin 2

Inflow Area = 2.114 ac, 21.16% Impervious, Inflow Depth > 4.22" for 100-Year event
Inflow = 7.76 cfs @ 12.17 hrs, Volume= 0.744 af
Outflow = 5.70 cfs @ 12.30 hrs, Volume= 0.665 af, Atten= 27%, Lag= 8.2 min
Discarded = 0.15 cfs @ 12.30 hrs, Volume= 0.101 af
Primary = 5.55 cfs @ 12.30 hrs, Volume= 0.564 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 142.96' @ 12.30 hrs Surf.Area= 3,324 sf Storage= 6,890 cf

Plug-Flow detention time= 71.5 min calculated for 0.665 af (89% of inflow)
Center-of-Mass det. time= 34.5 min (830.5 - 796.0)

Volume	Invert	Avail.Storage	Storage Description
#1	140.00'	10,768 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

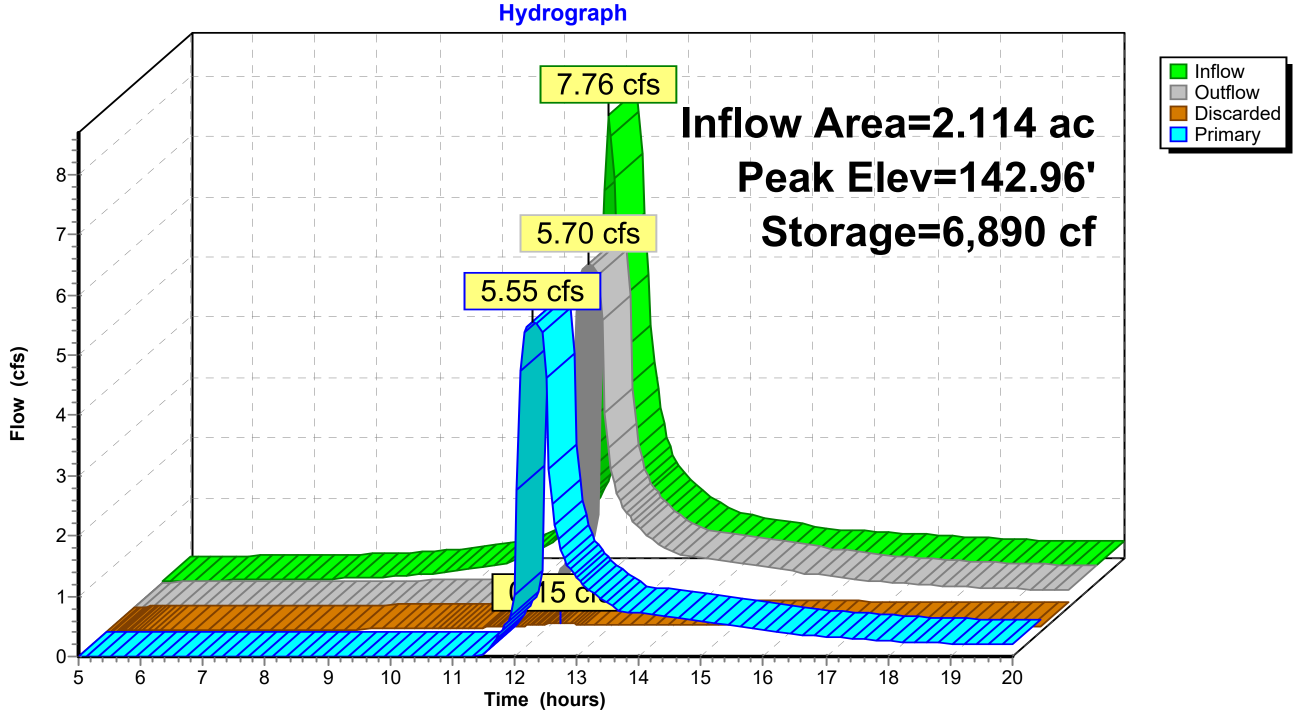
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
140.00	1,410	0	0
141.00	2,002	1,706	1,706
142.00	2,649	2,326	4,032
143.00	3,354	3,002	7,033
144.00	4,115	3,735	10,768

Device	Routing	Invert	Outlet Devices
#1	Discarded	140.00'	**1.020 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 138.00'
#2	Primary	139.00'	**12.0" Round Culvert** L= 65.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 139.00' / 134.50' S= 0.0692 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#3	Device 2	141.50'	**6.0" Vert. Orifice/Grate** C= 0.600
#4	Device 2	142.35'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.15 cfs @ 12.30 hrs HW=142.96' (Free Discharge)
└─**1=Exfiltration** (Controls 0.15 cfs)

Primary OutFlow Max=5.55 cfs @ 12.30 hrs HW=142.96' (Free Discharge)
└─**2=Culvert** (Inlet Controls 5.55 cfs @ 7.07 fps)
  ├─**3=Orifice/Grate** (Passes < 1.04 cfs potential flow)
  └─**4=Orifice/Grate** (Passes < 12.36 cfs potential flow)

Pond 28P: Infiltration Basin 2



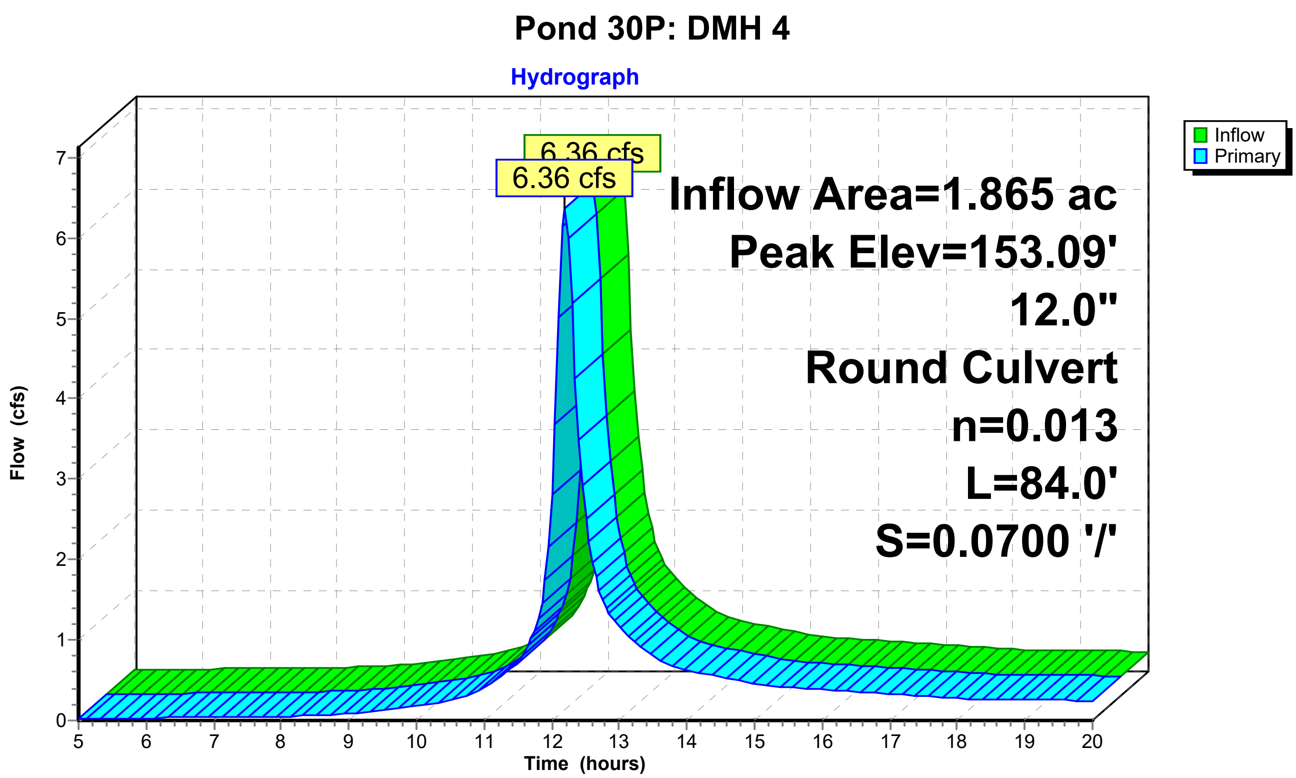
Summary for Pond 30P: DMH 4

Inflow Area =	1.865 ac,	18.02% Impervious,	Inflow Depth > 4.03"	for 100-Year event
Inflow =	6.36 cfs @	12.19 hrs, Volume=	0.626 af	
Outflow =	6.36 cfs @	12.19 hrs, Volume=	0.626 af,	Atten= 0%, Lag= 0.0 min
Primary =	6.36 cfs @	12.19 hrs, Volume=	0.626 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 153.09' @ 12.19 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	148.05'	**12.0" Round Culvert** L= 84.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 148.05' / 142.17' S= 0.0700 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=6.33 cfs @ 12.19 hrs HW=153.05' (Free Discharge)
└─**1=Culvert** (Inlet Controls 6.33 cfs @ 8.07 fps)



Summary for Pond 33P: Subsurface Inf. Aea 2

Inflow Area = 0.629 ac,100.00% Impervious, Inflow Depth > 7.68" for 100-Year event
Inflow = 5.00 cfs @ 12.13 hrs, Volume= 0.402 af
Outflow = 4.85 cfs @ 12.14 hrs, Volume= 0.309 af, Atten= 3%, Lag= 1.1 min
Discarded = 0.15 cfs @ 12.15 hrs, Volume= 0.134 af
Primary = 4.70 cfs @ 12.14 hrs, Volume= 0.175 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 153.14' @ 12.15 hrs Surf.Area= 0.055 ac Storage= 0.110 af

Plug-Flow detention time= 115.7 min calculated for 0.308 af (77% of inflow)
Center-of-Mass det. time= 47.8 min (782.7 - 734.9)

Volume	Invert	Avail.Storage	Storage Description
#1A	150.00'	0.050 af	**20.50'W x 117.54'L x 3.50'H Field A** 0.194 af Overall - 0.067 af Embedded = 0.126 af x 40.0% Voids
#2A	150.50'	0.067 af	**ADS_StormTech SC-740 +Cap** x 64 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 64 Chambers in 4 Rows
		0.118 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	150.00'	**1.020 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 148.00'
#2	Primary	150.00'	**12.0" Round Culvert** L= 70.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 150.00' / 138.00' S= 0.1714 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#3	Device 2	152.60'	**4.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.15 cfs @ 12.15 hrs HW=153.13' (Free Discharge)
└─**1=Exfiltration** (Controls 0.15 cfs)

Primary OutFlow Max=4.68 cfs @ 12.14 hrs HW=153.13' (Free Discharge)
└─**2=Culvert** (Passes 4.68 cfs of 4.84 cfs potential flow)
  └─**3=Broad-Crested Rectangular Weir** (Weir Controls 4.68 cfs @ 2.20 fps)

Pond 33P: Subsurface Inf. Aea 2 - Chamber Wizard Field A

Chamber Model = ADS_StormTech SC-740 +Cap (ADS StormTech® SC-740 with cap length)
Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf
Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

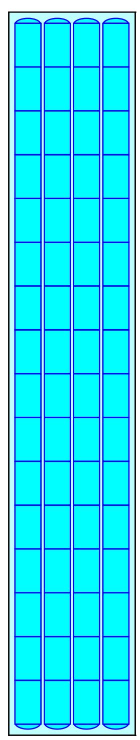
16 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 115.54' Row Length +12.0" End Stone x 2 = 117.54' Base Length
4 Rows x 51.0" Wide + 6.0" Spacing x 3 + 12.0" Side Stone x 2 = 20.50' Base Width
6.0" Base + 30.0" Chamber Height + 6.0" Cover = 3.50' Field Height

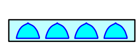
64 Chambers x 45.9 cf = 2,940.2 cf Chamber Storage

8,433.3 cf Field - 2,940.2 cf Chambers = 5,493.1 cf Stone x 40.0% Voids = 2,197.2 cf Stone Storage

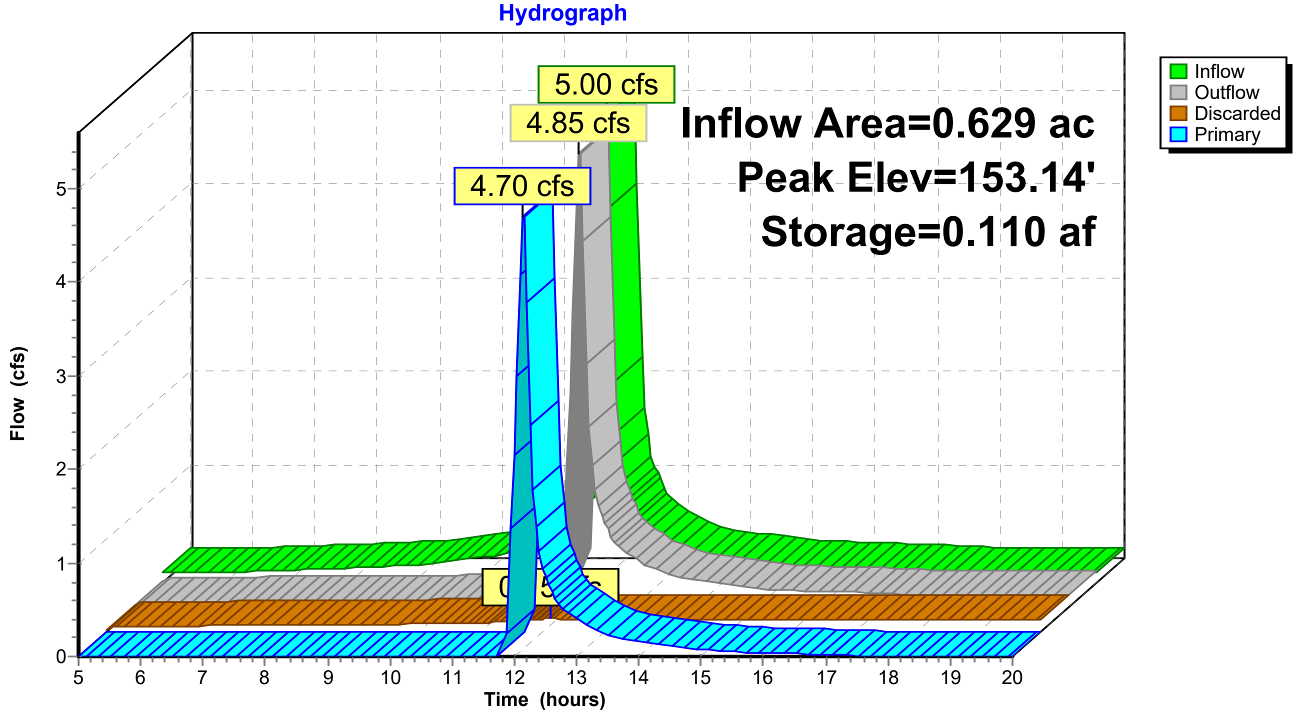
Chamber Storage + Stone Storage = 5,137.4 cf = 0.118 af
Overall Storage Efficiency = 60.9%
Overall System Size = 117.54' x 20.50' x 3.50'

64 Chambers
312.3 cy Field
203.4 cy Stone





Pond 33P: Subsurface Inf. Aea 2



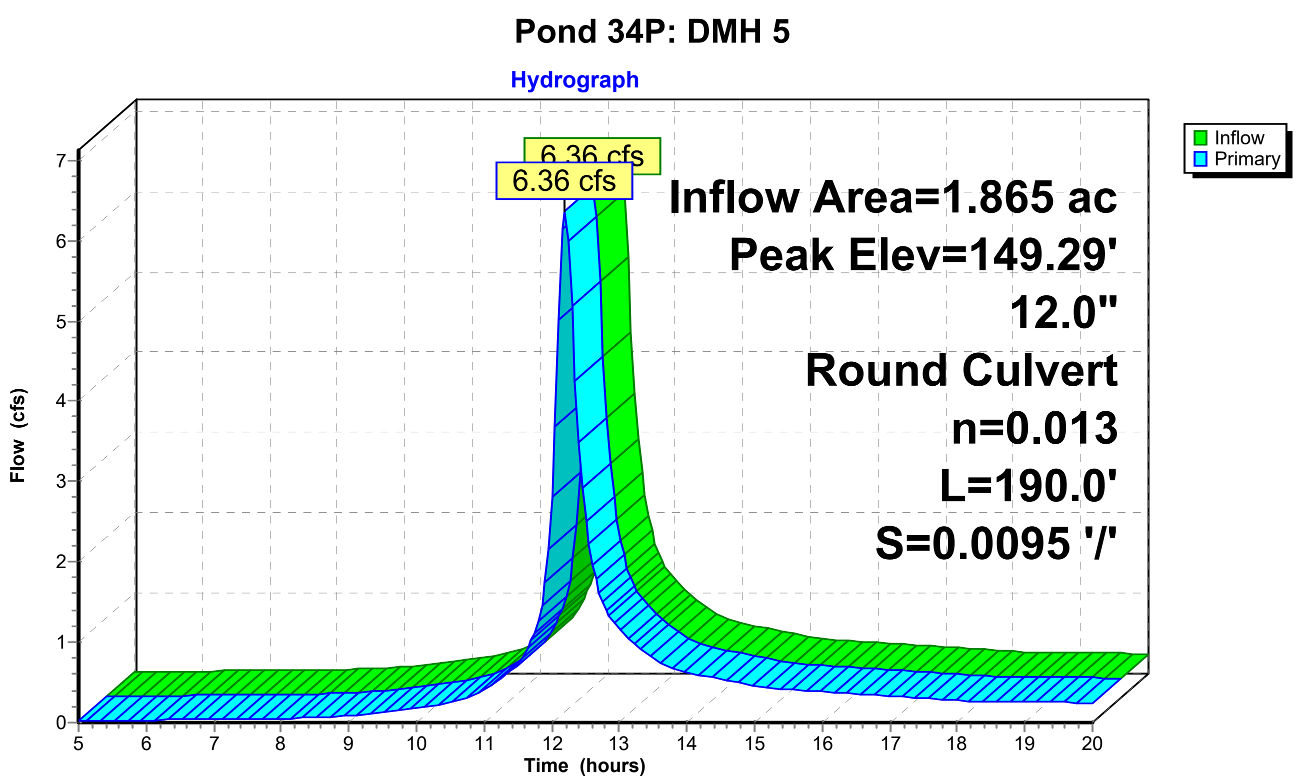
Summary for Pond 34P: DMH 5

Inflow Area = 1.865 ac, 18.02% Impervious, Inflow Depth > 4.03" for 100-Year event
Inflow = 6.36 cfs @ 12.19 hrs, Volume= 0.626 af
Outflow = 6.36 cfs @ 12.19 hrs, Volume= 0.626 af, Atten= 0%, Lag= 0.0 min
Primary = 6.36 cfs @ 12.19 hrs, Volume= 0.626 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 149.29' @ 12.19 hrs
Flood Elev= 145.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	142.07'	**12.0" Round Culvert** L= 190.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 142.07' / 140.27' S= 0.0095 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=6.33 cfs @ 12.19 hrs HW=149.22' (Free Discharge)
↑—**1=Culvert** (Barrel Controls 6.33 cfs @ 8.07 fps)



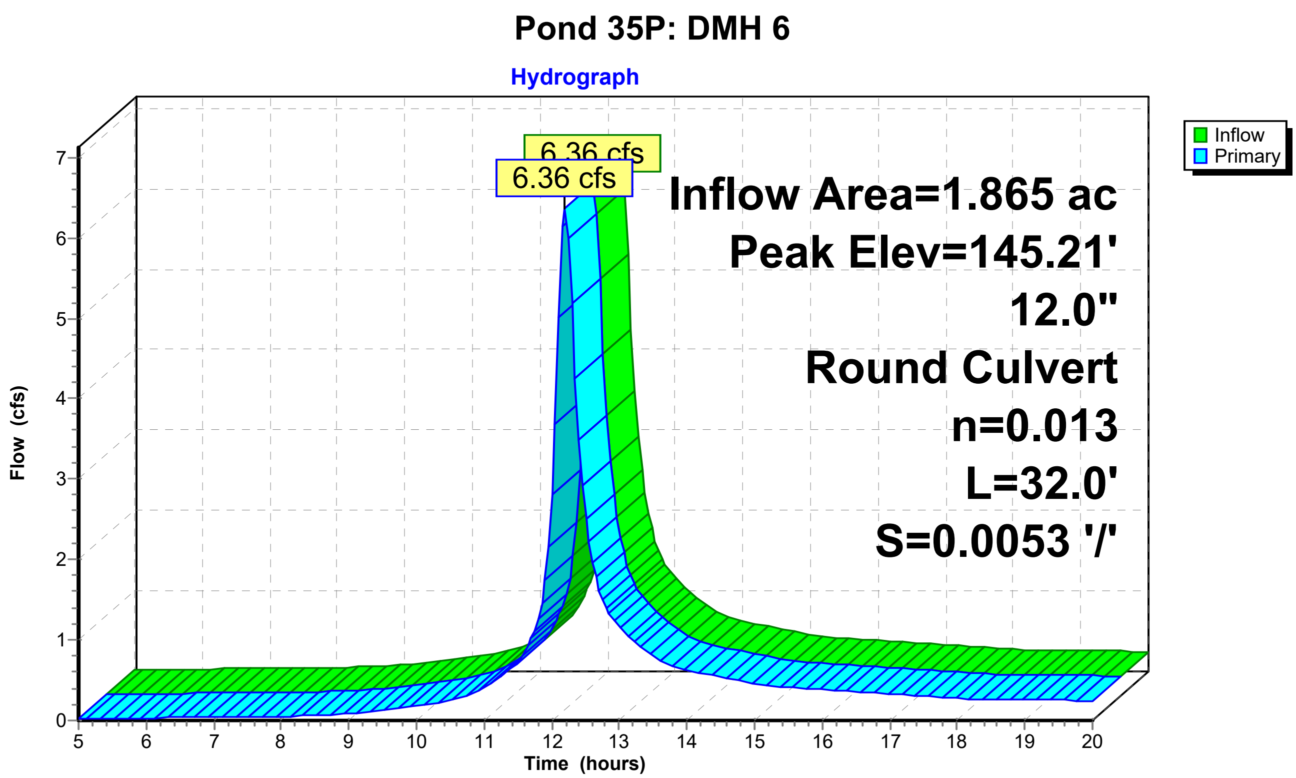
Summary for Pond 35P: DMH 6

Inflow Area =	1.865 ac,	18.02% Impervious,	Inflow Depth > 4.03"	for 100-Year event
Inflow =	6.36 cfs @	12.19 hrs, Volume=	0.626 af	
Outflow =	6.36 cfs @	12.19 hrs, Volume=	0.626 af,	Atten= 0%, Lag= 0.0 min
Primary =	6.36 cfs @	12.19 hrs, Volume=	0.626 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 145.21' @ 12.19 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	140.17'	**12.0" Round Culvert** L= 32.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 140.17' / 140.00' S= 0.0053 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=6.33 cfs @ 12.19 hrs HW=145.17' (Free Discharge)
└─**1=Culvert** (Inlet Controls 6.33 cfs @ 8.07 fps)



Summary for Pond 36P: CB 3

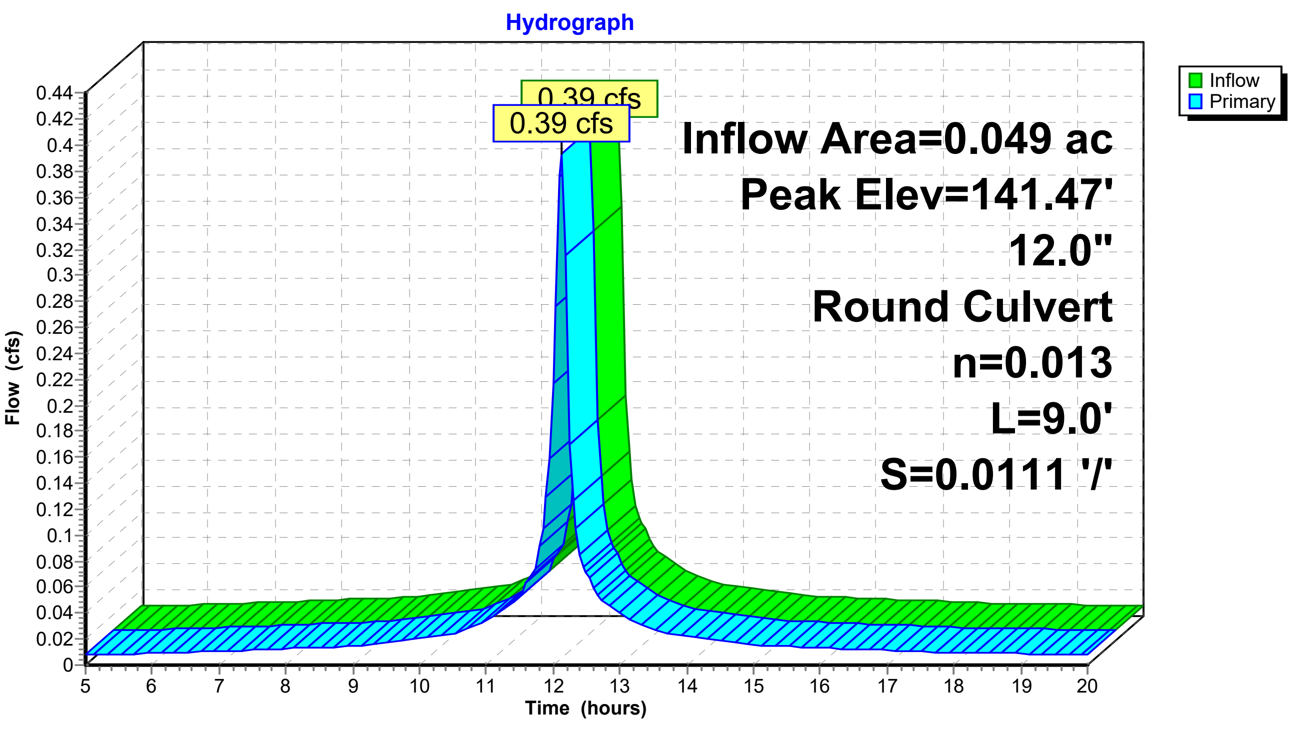
Inflow Area = 0.049 ac,100.00% Impervious, Inflow Depth > 7.68" for 100-Year event
Inflow = 0.39 cfs @ 12.13 hrs, Volume= 0.032 af
Outflow = 0.39 cfs @ 12.13 hrs, Volume= 0.032 af, Atten= 0%, Lag= 0.0 min
Primary = 0.39 cfs @ 12.13 hrs, Volume= 0.032 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 141.47' @ 12.13 hrs
Flood Elev= 144.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	141.10'	**12.0" Round Culvert** L= 9.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 141.10' / 141.00' S= 0.0111 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.38 cfs @ 12.13 hrs HW=141.46' (Free Discharge)
1=Culvert (Barrel Controls 0.38 cfs @ 2.24 fps)

Pond 36P: CB 3



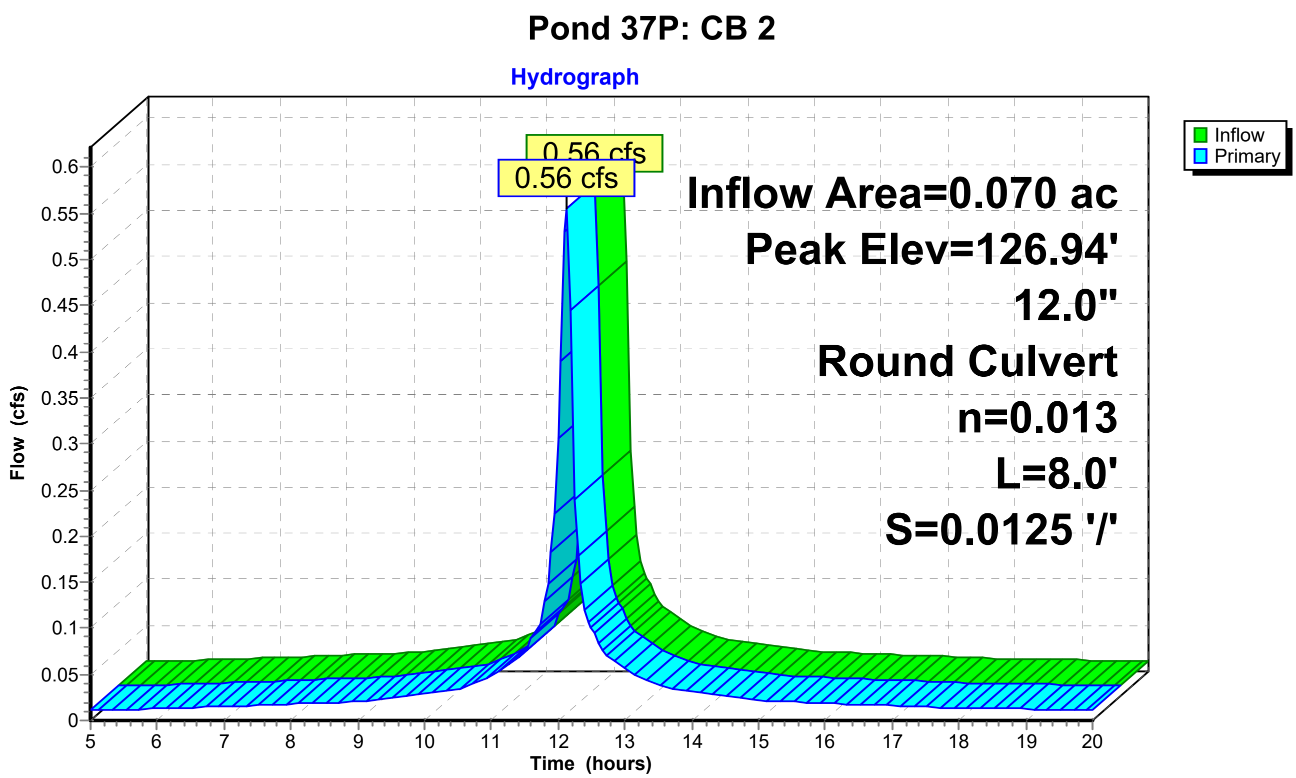
Summary for Pond 37P: CB 2

Inflow Area =	0.070 ac,100.00% Impervious,	Inflow Depth > 7.68"	for 100-Year event		
Inflow =	0.56 cfs @	12.13 hrs,	Volume=	0.045 af	
Outflow =	0.56 cfs @	12.13 hrs,	Volume=	0.045 af,	Atten= 0%, Lag= 0.0 min
Primary =	0.56 cfs @	12.13 hrs,	Volume=	0.045 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 126.94' @ 12.13 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	126.50'	**12.0" Round Culvert** L= 8.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 126.50' / 126.40' S= 0.0125 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.53 cfs @ 12.13 hrs HW=126.93' (Free Discharge)
↑**1=Culvert** (Barrel Controls 0.53 cfs @ 2.42 fps)



Summary for Pond 38P: Det. Area 2

Inflow Area = 0.104 ac, 94.17% Impervious, Inflow Depth > 7.56" for 100-Year event
Inflow = 0.82 cfs @ 12.13 hrs, Volume= 0.065 af
Outflow = 0.50 cfs @ 12.22 hrs, Volume= 0.045 af, Atten= 39%, Lag= 5.5 min
Primary = 0.50 cfs @ 12.22 hrs, Volume= 0.045 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 142.40' @ 12.22 hrs Surf.Area= 0.022 ac Storage= 0.028 af

Plug-Flow detention time= 176.3 min calculated for 0.045 af (69% of inflow)
Center-of-Mass det. time= 96.6 min (834.4 - 737.9)

Volume	Invert	Avail.Storage	Storage Description
#1A	140.10'	0.020 af	**11.00'W x 86.67'L x 3.33'H Field A** 0.073 af Overall - 0.023 af Embedded = 0.050 af x 40.0% Voids
#2A	140.60'	0.018 af	**ADS N-12 24"** x 12 Inside #1 Inside= 23.8"W x 23.8"H => 3.10 sf x 20.00'L = 62.0 cf Outside= 28.0"W x 28.0"H => 3.92 sf x 20.00'L = 78.4 cf 12 Chambers in 3 Rows 9.00' Header x 3.10 sf x 2 = 55.8 cf Inside
		0.038 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	140.60'	**12.0" Round Culvert** L= 10.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 140.60' / 140.00' S= 0.0600 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	142.00'	**8.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	142.70'	**4.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#4	Device 1	140.60'	**1.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=0.48 cfs @ 12.22 hrs HW=142.39' (Free Discharge)
└─**1=Culvert** (Passes 0.48 cfs of 3.39 cfs potential flow)
  ├─**2=Orifice/Grate** (Orifice Controls 0.44 cfs @ 2.12 fps)
  ├─**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)
  └─**4=Orifice/Grate** (Orifice Controls 0.03 cfs @ 6.36 fps)

Pond 38P: Det. Area 2 - Chamber Wizard Field A

Chamber Model = ADS N-12 24" (ADS N-12® Pipe)
Inside= 23.8"W x 23.8"H => 3.10 sf x 20.00'L = 62.0 cf
Outside= 28.0"W x 28.0"H => 3.92 sf x 20.00'L = 78.4 cf

28.0" Wide + 12.0" Spacing = 40.0" C-C Row Spacing

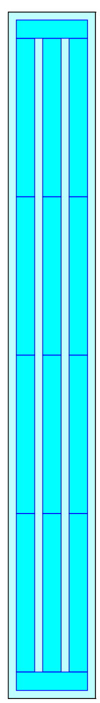
4 Chambers/Row x 20.00' Long +2.33' Header x 2 = 84.67' Row Length +12.0" End Stone x 2 = 86.67' Base Length
3 Rows x 28.0" Wide + 12.0" Spacing x 2 + 12.0" Side Stone x 2 = 11.00' Base Width
6.0" Base + 28.0" Chamber Height + 6.0" Cover = 3.33' Field Height

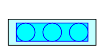
12 Chambers x 62.0 cf + 9.00' Header x 3.10 sf x 2 = 799.8 cf Chamber Storage
12 Chambers x 78.4 cf + 9.00' Header x 3.92 sf x 2 = 1,011.3 cf Displacement

3,177.9 cf Field - 1,011.3 cf Chambers = 2,166.6 cf Stone x 40.0% Voids = 866.6 cf Stone Storage

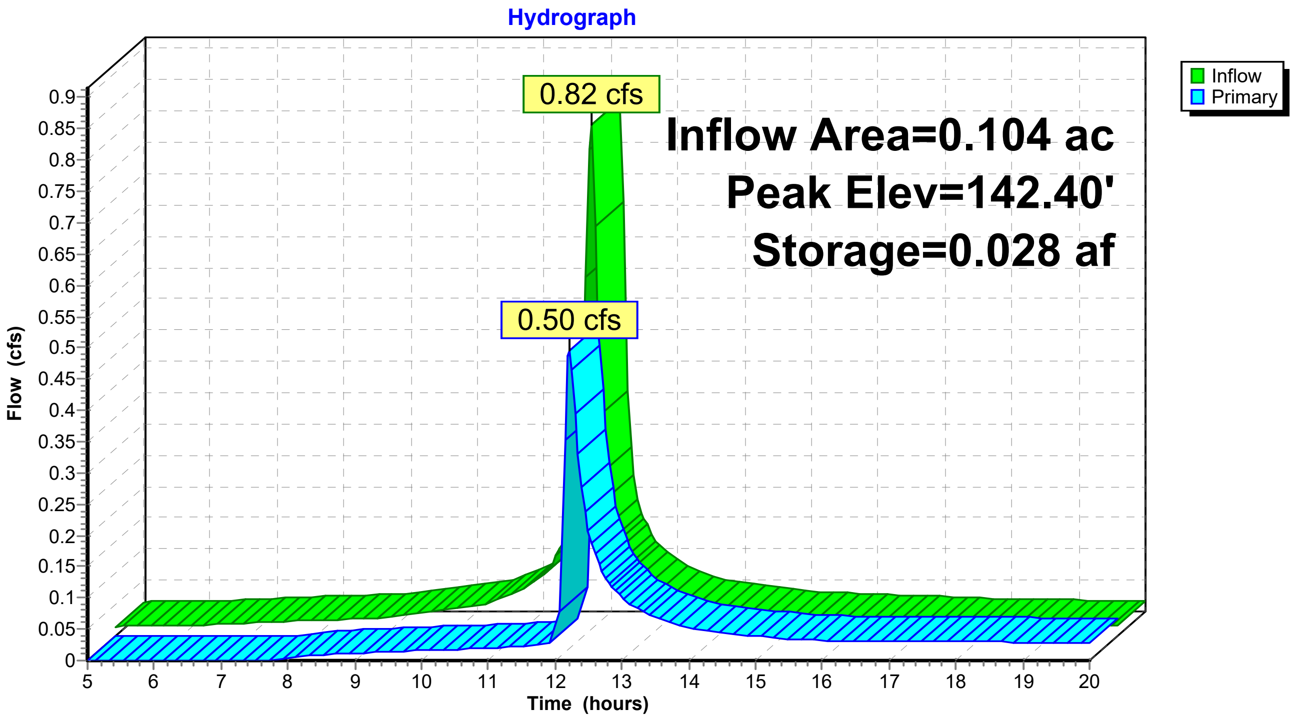
Chamber Storage + Stone Storage = 1,666.4 cf = 0.038 af
Overall Storage Efficiency = 52.4%
Overall System Size = 86.67' x 11.00' x 3.33'

12 Chambers
117.7 cy Field
80.2 cy Stone





Pond 38P: Det. Area 2



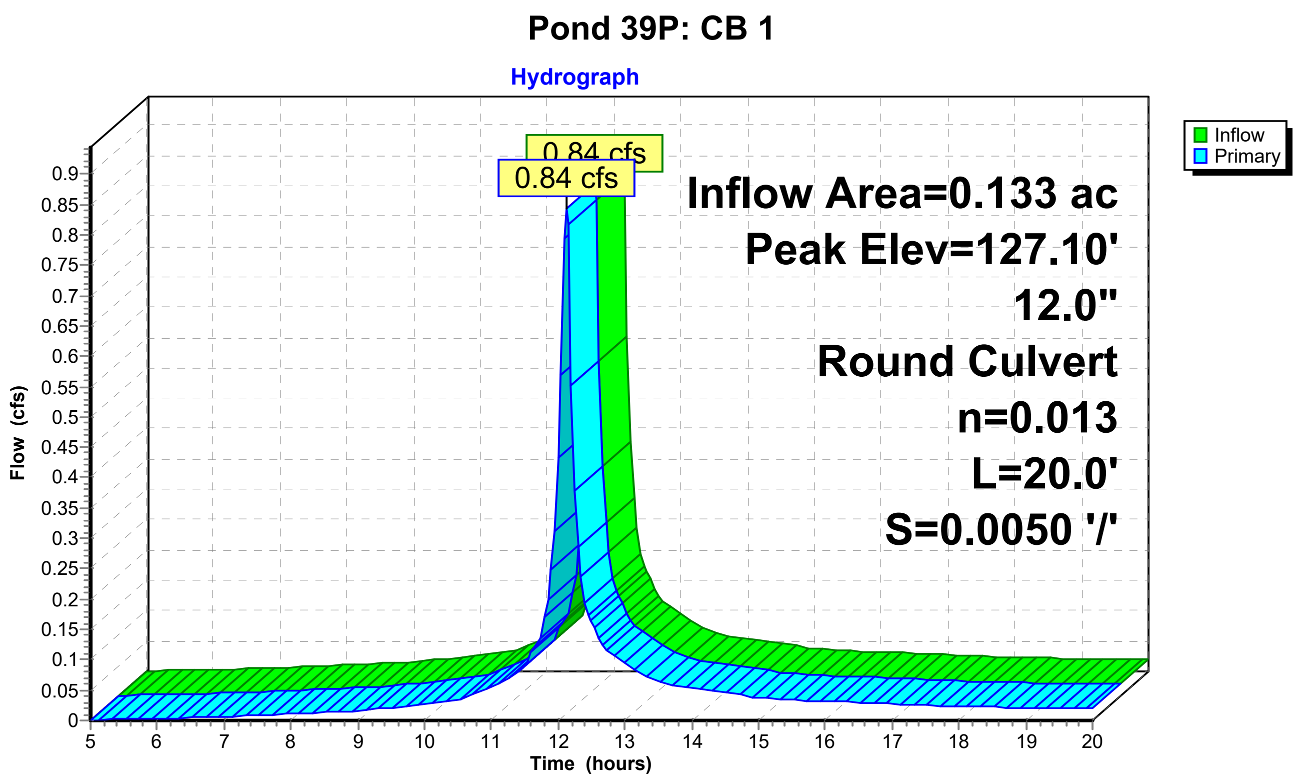
Summary for Pond 39P: CB 1

Inflow Area =	0.133 ac,	36.82% Impervious,	Inflow Depth > 5.45"	for 100-Year event
Inflow =	0.84 cfs @	12.13 hrs, Volume=	0.060 af	
Outflow =	0.84 cfs @	12.13 hrs, Volume=	0.060 af,	Atten= 0%, Lag= 0.0 min
Primary =	0.84 cfs @	12.13 hrs, Volume=	0.060 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 127.10' @ 12.13 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	126.50'	**12.0" Round Culvert** L= 20.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 126.50' / 126.40' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.81 cfs @ 12.13 hrs HW=127.08' (Free Discharge)
└─**1=Culvert** (Barrel Controls 0.81 cfs @ 2.46 fps)



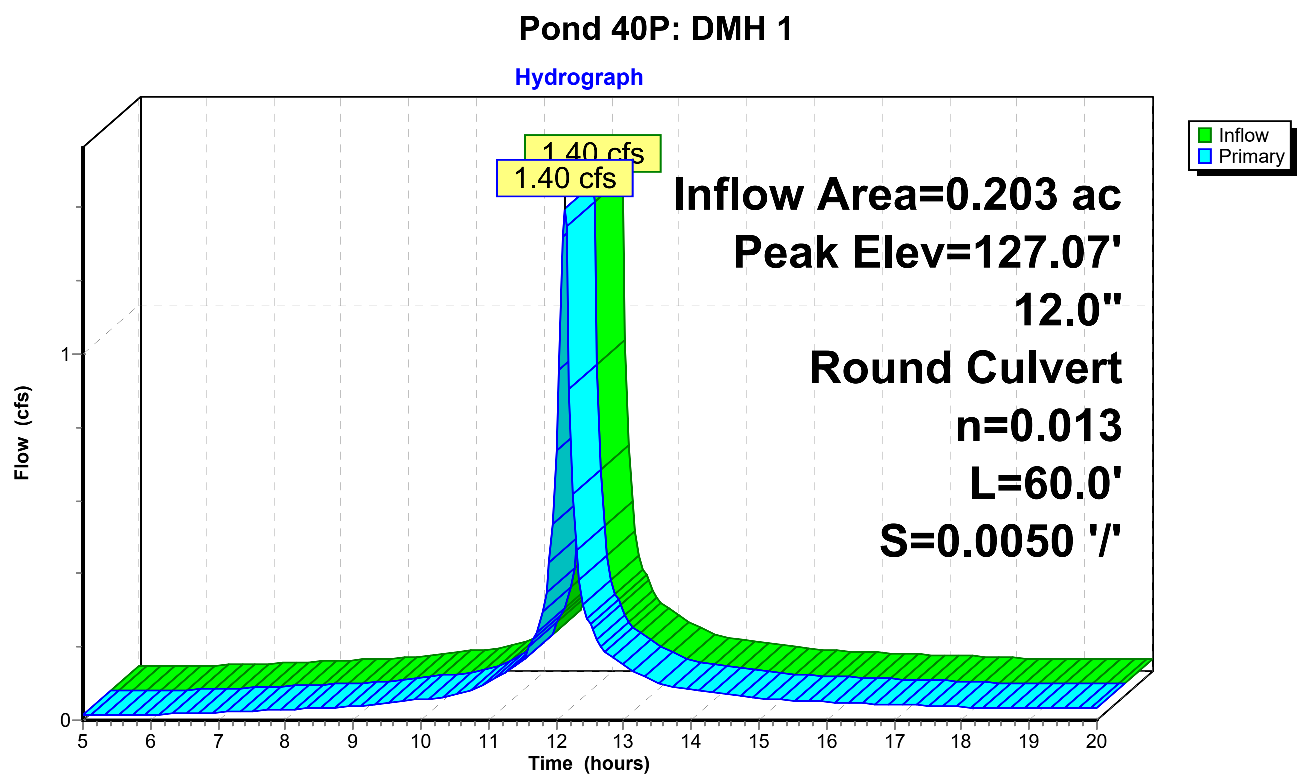
Summary for Pond 40P: DMH 1

Inflow Area =	0.203 ac,	58.56% Impervious,	Inflow Depth > 6.22"	for 100-Year event
Inflow =	1.40 cfs @	12.13 hrs, Volume=	0.105 af	
Outflow =	1.40 cfs @	12.13 hrs, Volume=	0.105 af, Atten= 0%, Lag= 0.0 min	
Primary =	1.40 cfs @	12.13 hrs, Volume=	0.105 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 127.07' @ 12.13 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	126.30'	**12.0" Round Culvert** L= 60.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 126.30' / 126.00' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.34 cfs @ 12.13 hrs HW=127.05' (Free Discharge)
└**1=Culvert** (Barrel Controls 1.34 cfs @ 2.95 fps)



Summary for Pond 43P: Subsurface Inf. Area 1

Inflow Area =	0.203 ac, 58.56% Impervious,	Inflow Depth > 6.22"	for 100-Year event	
Inflow =	1.40 cfs @	12.13 hrs, Volume=	0.105 af	
Outflow =	1.40 cfs @	12.13 hrs, Volume=	0.099 af,	Atten= 0%, Lag= 0.4 min
Discarded =	0.01 cfs @	12.13 hrs, Volume=	0.013 af	
Primary =	1.39 cfs @	12.13 hrs, Volume=	0.086 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 127.75' @ 12.13 hrs Surf.Area= 0.008 ac Storage= 0.007 af

Plug-Flow detention time= 40.0 min calculated for 0.099 af (94% of inflow)
Center-of-Mass det. time= 17.4 min (777.3 - 759.9)

Volume	Invert	Avail.Storage	Storage Description
#1A	126.00'	0.006 af	**7.63'W x 44.42'L x 2.21'H Field A**
			0.017 af Overall - 0.003 af Embedded = 0.014 af x 40.0% Voids
#2A	126.50'	0.002 af	**ADS N-12 12"** x 6 Inside #1
			Inside= 12.2"W x 12.2"H => 0.81 sf x 20.00'L = 16.2 cf
			Outside= 14.5"W x 14.5"H => 1.05 sf x 20.00'L = 20.9 cf
			6 Chambers in 3 Rows
			5.63' Header x 0.81 sf x 2 = 9.1 cf Inside
		0.008 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	126.00'	**1.020 in/hr Exfiltration over Surface area**
			Conductivity to Groundwater Elevation = 122.00'
#2	Primary	126.00'	**12.0" Round Culvert**
			L= 10.0' CPP, projecting, no headwall, Ke= 0.900
			Inlet / Outlet Invert= 126.00' / 125.90' S= 0.0100 '/' Cc= 0.900
			n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#3	Device 2	127.50'	**4.0' long x 0.5' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00
			Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.01 cfs @ 12.13 hrs HW=127.74' (Free Discharge)
└─**1=Exfiltration** (Controls 0.01 cfs)

Primary OutFlow Max=1.34 cfs @ 12.13 hrs HW=127.74' (Free Discharge)
└─**2=Culvert** (Passes 1.34 cfs of 3.33 cfs potential flow)
  └─**3=Broad-Crested Rectangular Weir** (Weir Controls 1.34 cfs @ 1.39 fps)

Pond 43P: Subsurface Inf. Area 1 - Chamber Wizard Field A

Chamber Model = ADS N-12 12" (ADS N-12® Pipe)
Inside= 12.2"W x 12.2"H => 0.81 sf x 20.00'L = 16.2 cf
Outside= 14.5"W x 14.5"H => 1.05 sf x 20.00'L = 20.9 cf

14.5" Wide + 12.0" Spacing = 26.5" C-C Row Spacing

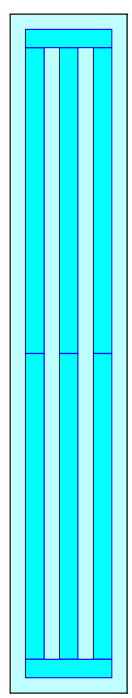
2 Chambers/Row x 20.00' Long +1.21' Header x 2 = 42.42' Row Length +12.0" End Stone x 2 = 44.42' Base Length
3 Rows x 14.5" Wide + 12.0" Spacing x 2 + 12.0" Side Stone x 2 = 7.63' Base Width
6.0" Base + 14.5" Chamber Height + 6.0" Cover = 2.21' Field Height

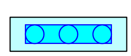
6 Chambers x 16.2 cf + 5.63' Header x 0.81 sf x 2 = 106.3 cf Chamber Storage
6 Chambers x 20.9 cf + 5.63' Header x 1.05 sf x 2 = 137.4 cf Displacement

748.3 cf Field - 137.4 cf Chambers = 610.9 cf Stone x 40.0% Voids = 244.4 cf Stone Storage

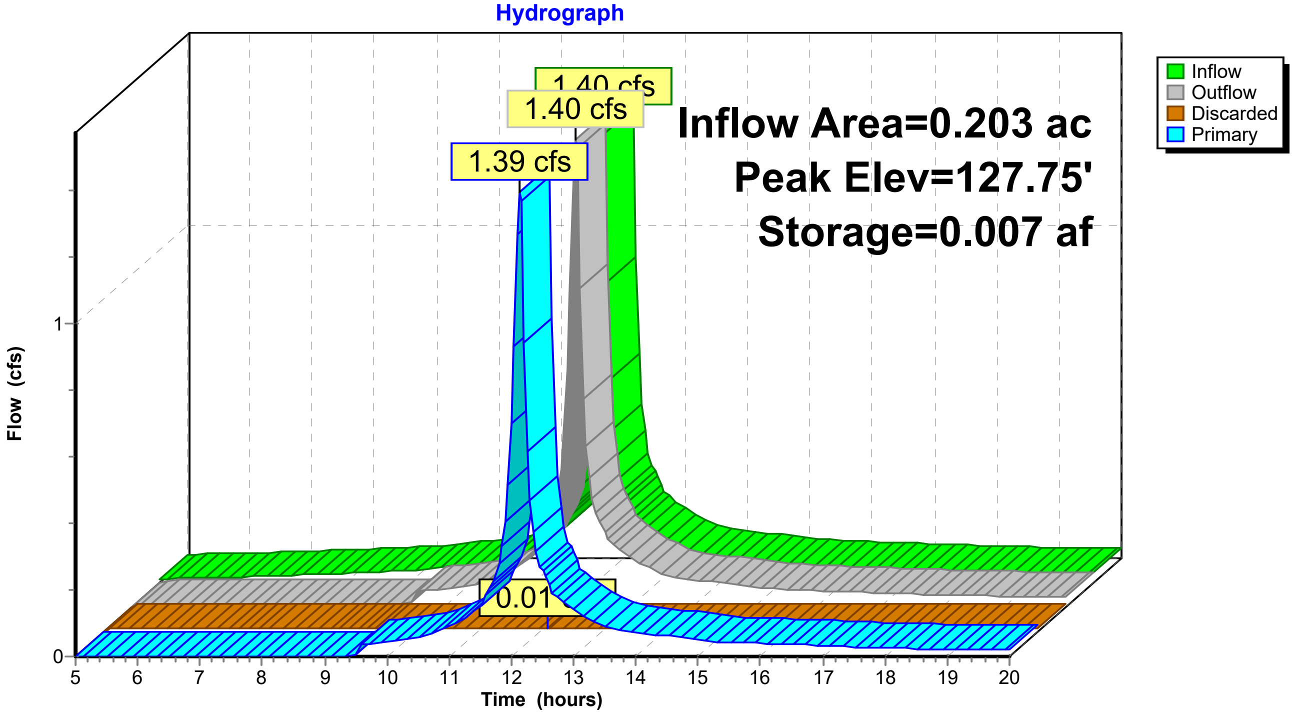
Chamber Storage + Stone Storage = 350.7 cf = 0.008 af
Overall Storage Efficiency = 46.9%
Overall System Size = 44.42' x 7.63' x 2.21'

6 Chambers
27.7 cy Field
22.6 cy Stone





Pond 43P: Subsurface Inf. Area 1



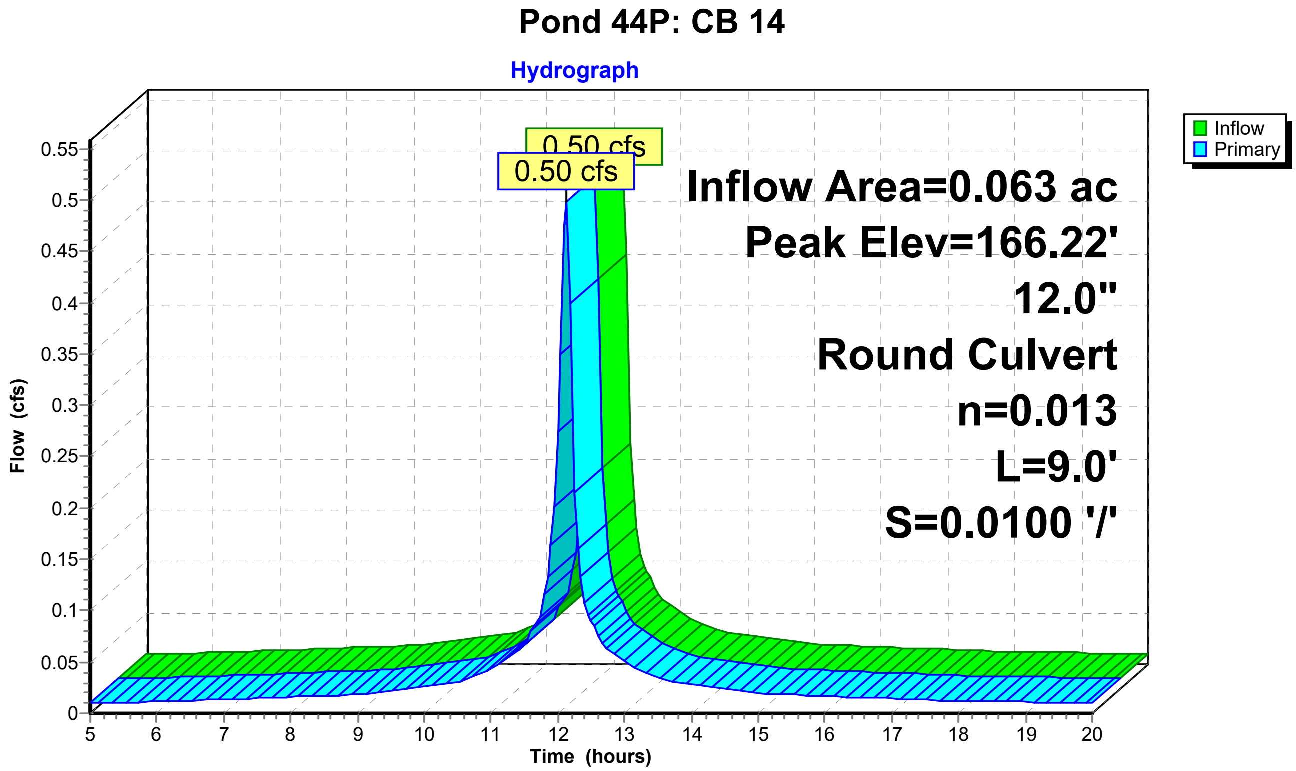
Summary for Pond 44P: CB 14

Inflow Area = 0.063 ac,100.00% Impervious, Inflow Depth > 7.68" for 100-Year event
Inflow = 0.50 cfs @ 12.13 hrs, Volume= 0.040 af
Outflow = 0.50 cfs @ 12.13 hrs, Volume= 0.040 af, Atten= 0%, Lag= 0.0 min
Primary = 0.50 cfs @ 12.13 hrs, Volume= 0.040 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 166.22' @ 12.13 hrs
Flood Elev= 170.24'

Device	Routing	Invert	Outlet Devices
#1	Primary	165.80'	**12.0" Round Culvert** L= 9.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 165.80' / 165.71' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.48 cfs @ 12.13 hrs HW=166.21' (Free Discharge)
1=Culvert (Barrel Controls 0.48 cfs @ 2.30 fps)



Summary for Pond 45P: Det. Area 1

Inflow Area =	0.203 ac, 58.56% Impervious, Inflow Depth > 5.10" for 100-Year event			
Inflow =	1.39 cfs @	12.13 hrs, Volume=	0.086 af	
Outflow =	0.46 cfs @	12.32 hrs, Volume=	0.074 af,	Atten= 67%, Lag= 11.3 min
Primary =	0.46 cfs @	12.32 hrs, Volume=	0.074 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 126.84' @ 12.32 hrs Surf.Area= 0.027 ac Storage= 0.041 af

Plug-Flow detention time= 157.0 min calculated for 0.074 af (85% of inflow)
Center-of-Mass det. time= 115.1 min (893.5 - 778.5)

Volume	Invert	Avail.Storage	Storage Description
#1A	124.00'	0.030 af	**14.33'W x 82.00'L x 3.83'H Field A** 0.103 af Overall - 0.029 af Embedded = 0.075 af x 40.0% Voids
#2A	125.00'	0.023 af	**ADS N-12 24"** x 16 Inside #1 Inside= 23.8"W x 23.8"H => 3.10 sf x 20.00'L = 62.0 cf Outside= 28.0"W x 28.0"H => 3.92 sf x 20.00'L = 78.4 cf 16 Chambers in 4 Rows
		0.053 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	125.00'	**12.0" Round Culvert** L= 10.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 125.00' / 122.00' S= 0.3000 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	126.75'	**4.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#3	Device 1	125.00'	**2.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=0.43 cfs @ 12.32 hrs HW=126.84' (Free Discharge)
└─**1=Culvert** (Passes 0.43 cfs of 3.45 cfs potential flow)
  ├─**2=Broad-Crested Rectangular Weir** (Weir Controls 0.29 cfs @ 0.83 fps)
  └─**3=Orifice/Grate** (Orifice Controls 0.14 cfs @ 6.38 fps)

Pond 45P: Det. Area 1 - Chamber Wizard Field A

Chamber Model = ADS N-12 24" (ADS N-12® Pipe)
Inside= 23.8"W x 23.8"H => 3.10 sf x 20.00'L = 62.0 cf
Outside= 28.0"W x 28.0"H => 3.92 sf x 20.00'L = 78.4 cf

28.0" Wide + 12.0" Spacing = 40.0" C-C Row Spacing

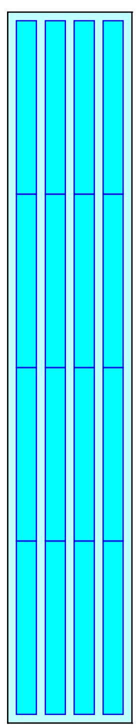
4 Chambers/Row x 20.00' Long = 80.00' Row Length +12.0" End Stone x 2 = 82.00' Base Length
4 Rows x 28.0" Wide + 12.0" Spacing x 3 + 12.0" Side Stone x 2 = 14.33' Base Width
12.0" Base + 28.0" Chamber Height + 6.0" Cover = 3.83' Field Height

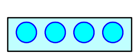
16 Chambers x 62.0 cf = 992.0 cf Chamber Storage
16 Chambers x 78.4 cf = 1,254.3 cf Displacement

4,505.6 cf Field - 1,254.3 cf Chambers = 3,251.3 cf Stone x 40.0% Voids = 1,300.5 cf Stone Storage

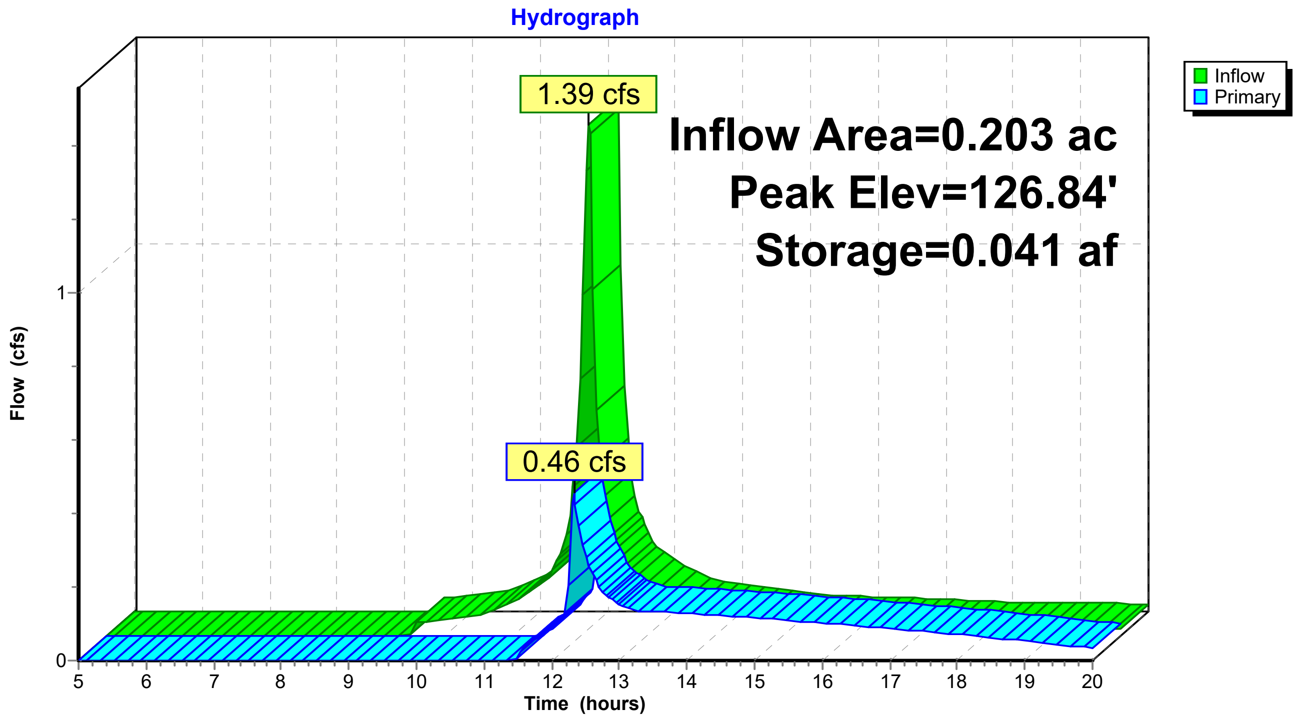
Chamber Storage + Stone Storage = 2,292.5 cf = 0.053 af
Overall Storage Efficiency = 50.9%
Overall System Size = 82.00' x 14.33' x 3.83'

16 Chambers
166.9 cy Field
120.4 cy Stone





Pond 45P: Det. Area 1



Summary for Pond 46P: CB 13

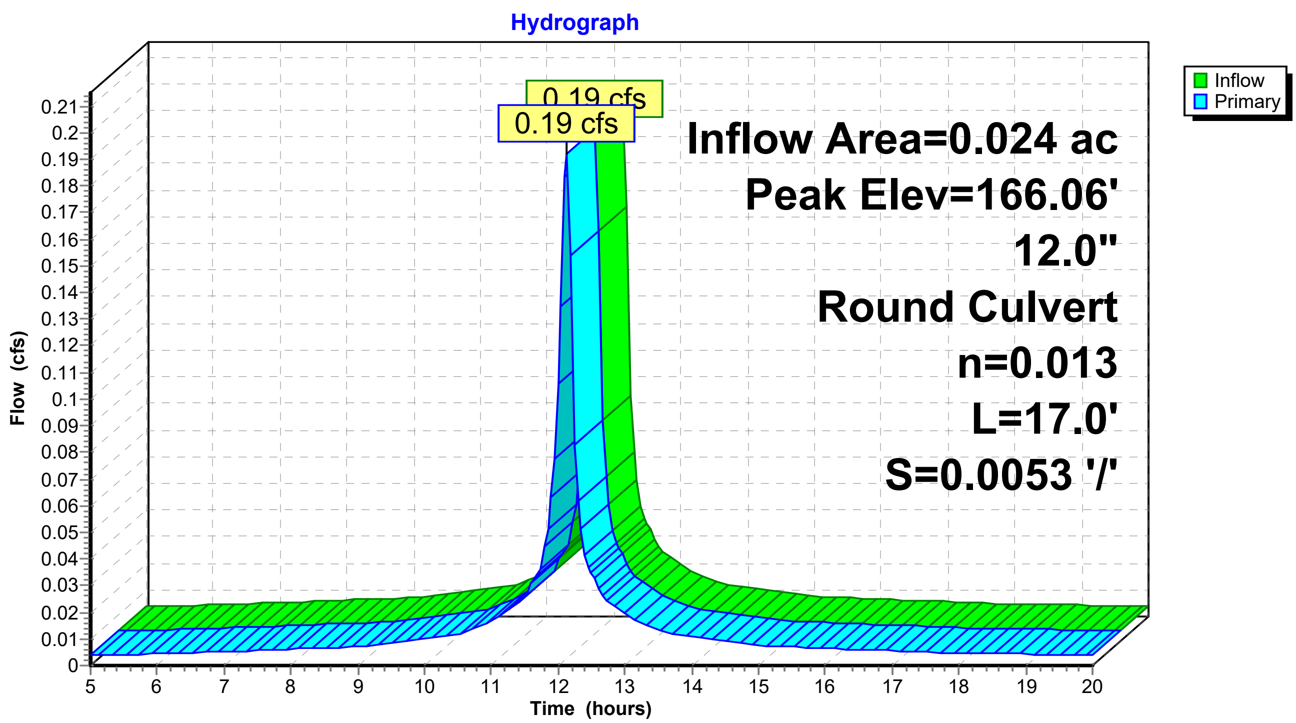
Inflow Area = 0.024 ac,100.00% Impervious, Inflow Depth > 7.68" for 100-Year event
Inflow = 0.19 cfs @ 12.13 hrs, Volume= 0.015 af
Outflow = 0.19 cfs @ 12.13 hrs, Volume= 0.015 af, Atten= 0%, Lag= 0.0 min
Primary = 0.19 cfs @ 12.13 hrs, Volume= 0.015 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 166.06' @ 12.13 hrs
Flood Elev= 170.24'

Device	Routing	Invert	Outlet Devices
#1	Primary	165.80'	**12.0" Round Culvert** L= 17.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 165.80' / 165.71' S= 0.0053 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.18 cfs @ 12.13 hrs HW=166.06' (Free Discharge)
└**1=Culvert** (Barrel Controls 0.18 cfs @ 1.72 fps)

Pond 46P: CB 13



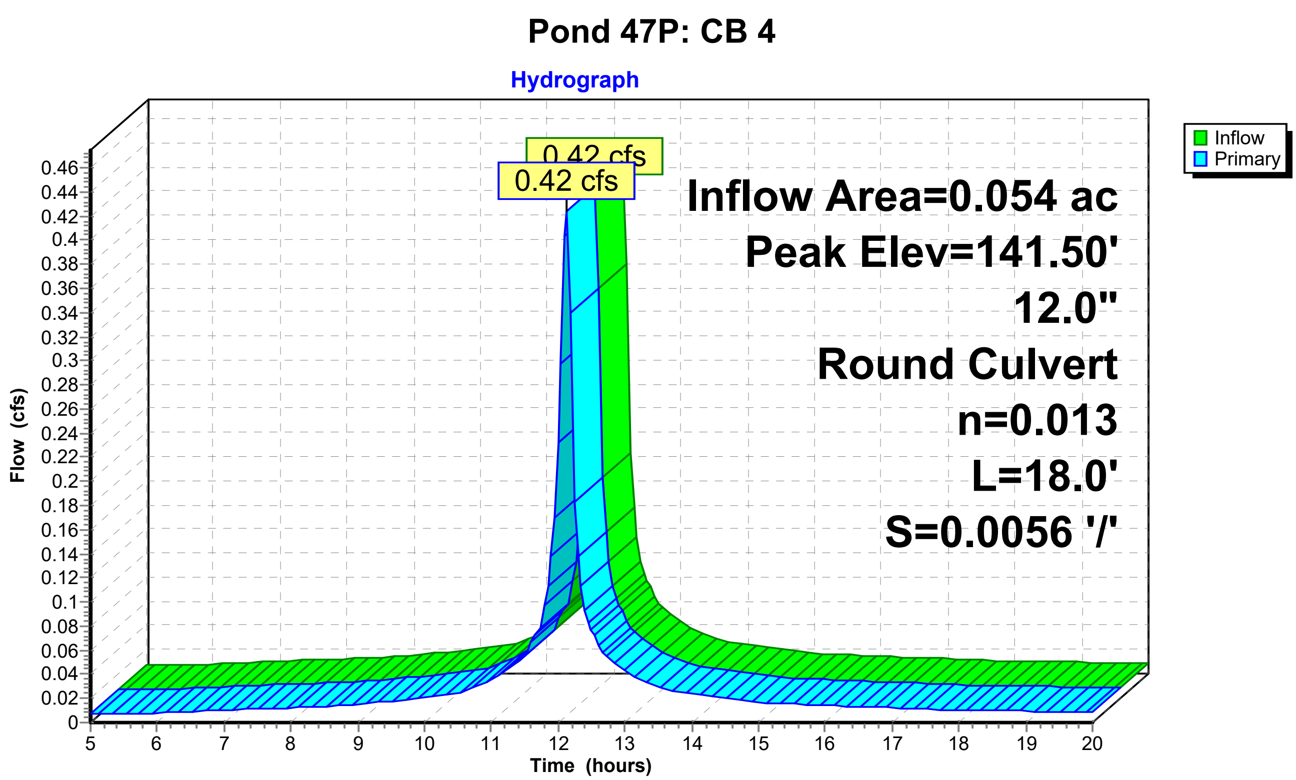
Summary for Pond 47P: CB 4

Inflow Area = 0.054 ac, 88.83% Impervious, Inflow Depth > 7.44" for 100-Year event
Inflow = 0.42 cfs @ 12.13 hrs, Volume= 0.034 af
Outflow = 0.42 cfs @ 12.13 hrs, Volume= 0.034 af, Atten= 0%, Lag= 0.0 min
Primary = 0.42 cfs @ 12.13 hrs, Volume= 0.034 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 141.50' @ 12.13 hrs
Flood Elev= 144.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	141.10'	**12.0" Round Culvert** L= 18.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 141.10' / 141.00' S= 0.0056 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.41 cfs @ 12.13 hrs HW=141.49' (Free Discharge)
└─**1=Culvert** (Barrel Controls 0.41 cfs @ 2.11 fps)



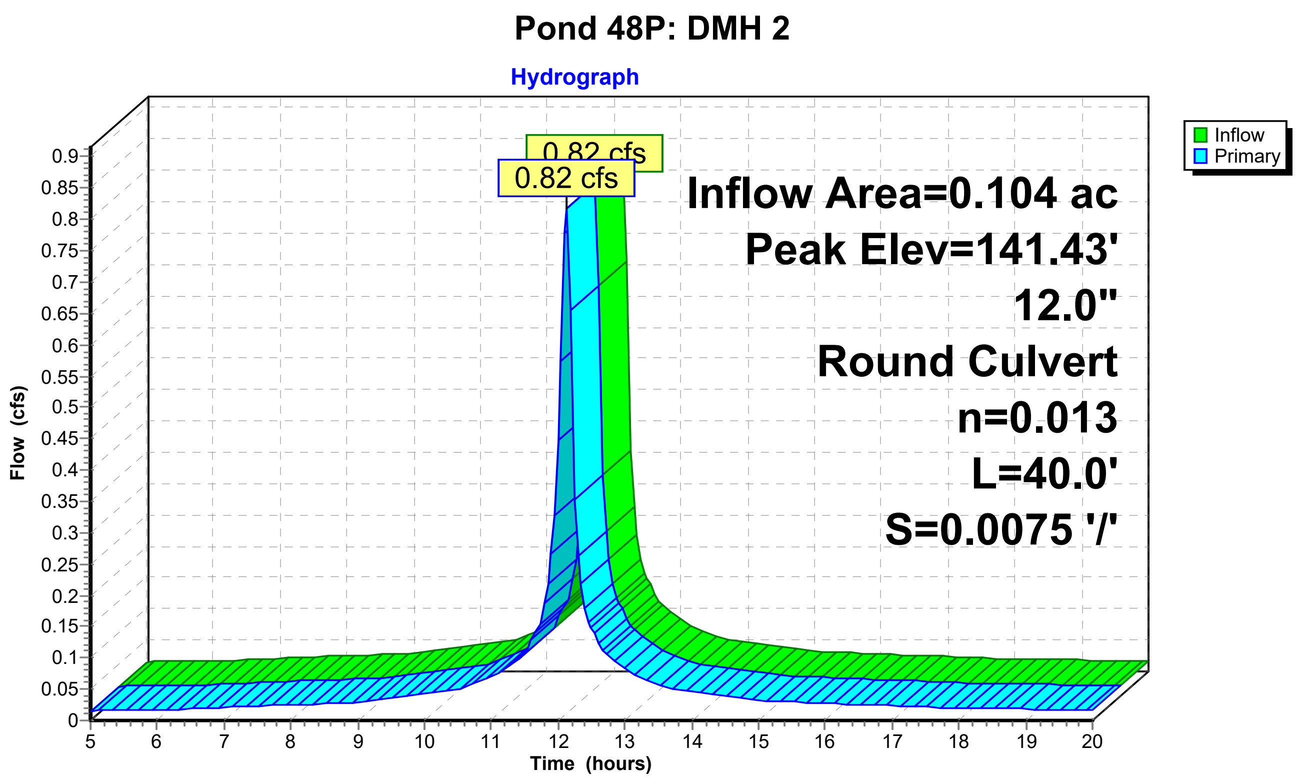
Summary for Pond 48P: DMH 2

Inflow Area = 0.104 ac, 94.17% Impervious, Inflow Depth > 7.56" for 100-Year event
Inflow = 0.82 cfs @ 12.13 hrs, Volume= 0.065 af
Outflow = 0.82 cfs @ 12.13 hrs, Volume= 0.065 af, Atten= 0%, Lag= 0.0 min
Primary = 0.82 cfs @ 12.13 hrs, Volume= 0.065 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 141.43' @ 12.13 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	140.90'	**12.0" Round Culvert** L= 40.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 140.90' / 140.60' S= 0.0075 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.78 cfs @ 12.13 hrs HW=141.41' (Free Discharge)
└─**1=Culvert** (Inlet Controls 0.78 cfs @ 1.93 fps)



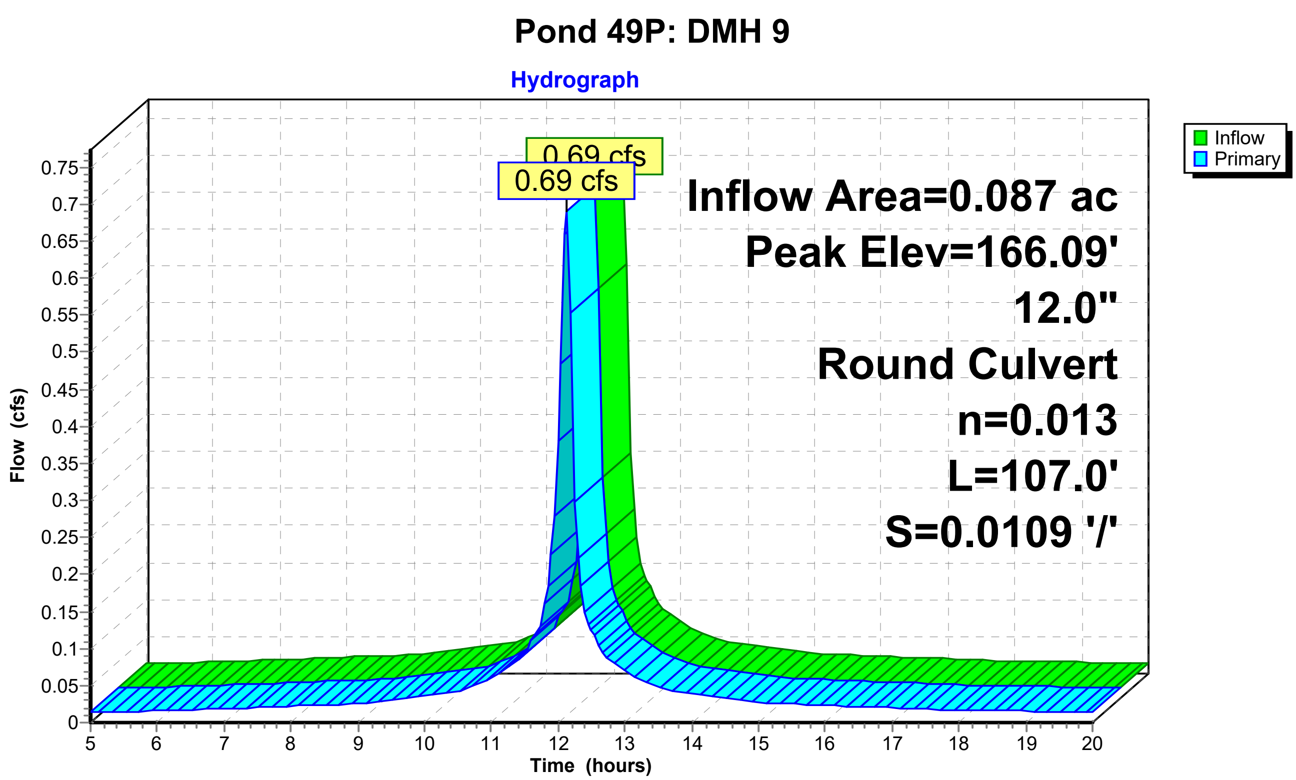
Summary for Pond 49P: DMH 9

Inflow Area = 0.087 ac,100.00% Impervious, Inflow Depth > 7.68" for 100-Year event
Inflow = 0.69 cfs @ 12.13 hrs, Volume= 0.056 af
Outflow = 0.69 cfs @ 12.13 hrs, Volume= 0.056 af, Atten= 0%, Lag= 0.0 min
Primary = 0.69 cfs @ 12.13 hrs, Volume= 0.056 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 166.09' @ 12.13 hrs
Flood Elev= 170.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	165.61'	**12.0" Round Culvert** L= 107.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 165.61' / 164.44' S= 0.0109 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

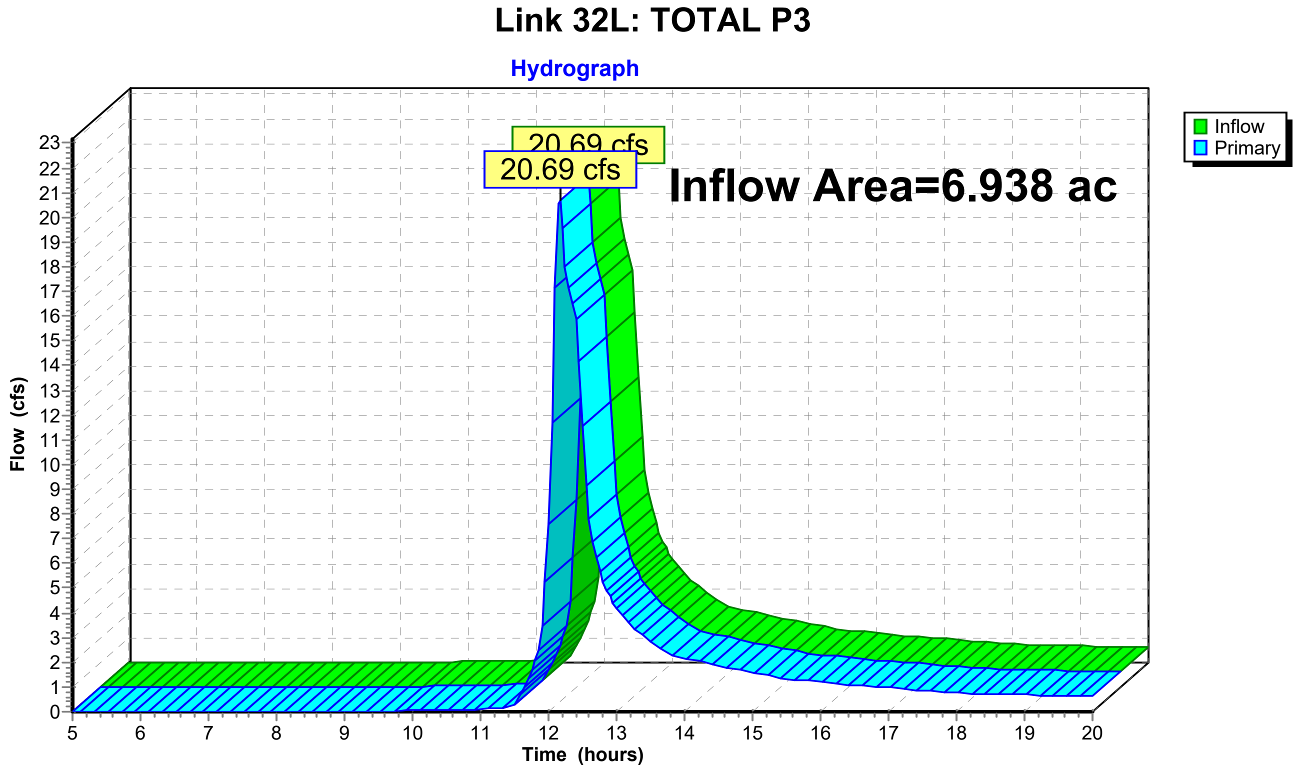
Primary OutFlow Max=0.66 cfs @ 12.13 hrs HW=166.08' (Free Discharge)
└1=Culvert (Inlet Controls 0.66 cfs @ 1.84 fps)



Summary for Link 32L: TOTAL P3

Inflow Area =	6.938 ac,	20.11% Impervious,	Inflow Depth > 3.14"	for 100-Year event
Inflow =	20.69 cfs @	12.16 hrs, Volume=	1.814 af	
Primary =	20.69 cfs @	12.16 hrs, Volume=	1.814 af,	Atten= 0%, Lag= 0.0 min

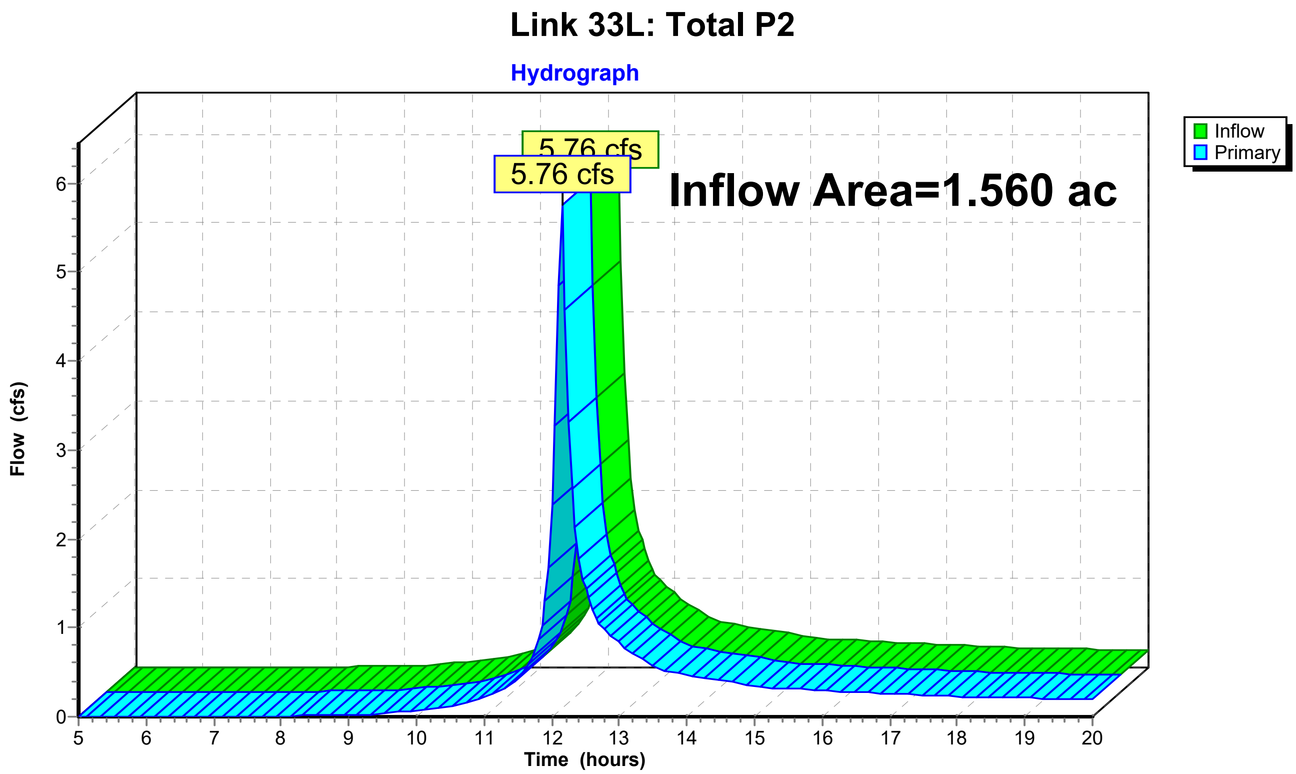
Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs



Summary for Link 33L: Total P2

Inflow Area =	1.560 ac,	10.34% Impervious,	Inflow Depth > 3.28"	for 100-Year event
Inflow =	5.76 cfs @	12.15 hrs, Volume=	0.426 af	
Primary =	5.76 cfs @	12.15 hrs, Volume=	0.426 af,	Atten= 0%, Lag= 0.0 min

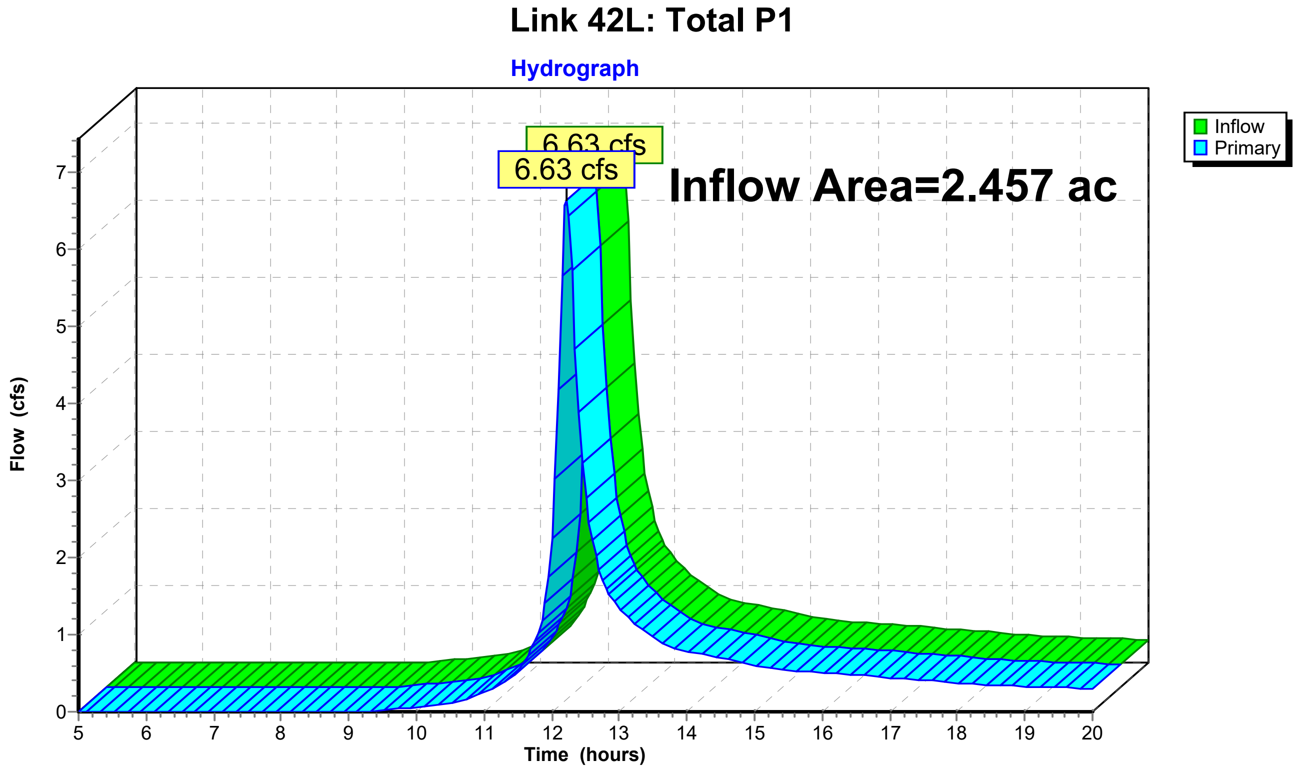
Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs



Summary for Link 42L: Total P1

Inflow Area = 2.457 ac, 7.11% Impervious, Inflow Depth > 3.17" for 100-Year event
Inflow = 6.63 cfs @ 12.22 hrs, Volume= 0.648 af
Primary = 6.63 cfs @ 12.22 hrs, Volume= 0.648 af, Atten= 0%, Lag= 0.0 min

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



f. Watershed Maps