Attachment 13

Final Stormwater Pollution Prevention Plan

STORMWATER POLLUTION PREVENTION PLAN (SWPPP)

RHUDES CREEK SOLAR PROJECT

TOWN OF CECILIA
HARDIN COUNTY, KENTUCKY

IN COMPLIANCE WITH THE

KENTUCKY POLLUTANT DISCHARGE ELIMINATION SYSTEM (KPDES) CONSTRUCTION GENERAL PERMIT (KYR10)
FOR
STORMWATER DISCHARGES FROM CONSTRUCTION ACTIVITIES

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1.0 Introduction

This Stormwater Pollution Prevention Plan (SWPPP) has been prepared by TRC for ibV Energy Partners (the Client) to address stormwater from construction activities associated with Rhudes Creek Solar (the Project). The project includes the installation of an approximately 100 MW AC solar generation field on a site with a potential development area of 698 +/- acres.

The purpose of this SWPPP is to establish requirements and instructions for the management of construction-related stormwater discharges from Project Sites located in the Commonwealth of Kentucky and discharging to the Mississippi and Ohio River basins and sub-basins. Erosion and sediment controls have been designed and shall be installed and maintained to minimize the discharge of pollutants and prevent a violation of the water quality standards.

2.0 Regulatory Requirements

This SWPPP has been prepared in accordance with the Kentucky Department for Environmental Protection (KDEP) KPDES Construction General Permit (KYR10) which requires coverage for any “construction activities disturbing individually one (1) acre or more, including, in the case of a common plan of development, contiguous construction activities that cumulatively equal one (1) acre or more of disturbance.”.

Erosion and sedimentation control measures were designed in accordance with current versions of the University of Kentucky, Kentucky Transportation Center “Best Management Practices (BMPs) for Controlling Erosion, Sediment, and Pollutant Runoff from Construction Sites” and the University of Kentucky “Kentucky Erosion Prevention and Sediment Control Field Guide”

Stormwater design has been completed in accordance with the Engineering Department of Hardin County, “Kentucky Stormwater Manual”, dated 2005 and the Hardin County Post-Construction Runoff Control Ordinance.

A Notice of Intent (NOI) will be submitted to Kentucky Division of Water (KDOW) for approval prior to the start of construction.

3.0 Permit Coverage Information

This SWPPP serves as the minimum requirements necessary to address soil exposure and stormwater management during construction activities. This SWPPP is a living document that may be amended for unforeseen circumstances. If unanticipated site conditions warrant changes or additions to existing practices, the Owner/Operator and the Contractor(s), in consultation with the Qualified Inspector or Project Engineer, will be required to implement those measures.

The SWPPP and associated documentation must be kept current to ensure the erosion and sediment control practices are accurately documented.

Th SWPPP should continue to be implemented during construction activity, including inspections every 7 days or every 14 days. If on a 14-day cycle, inspections shall also occur within 24 hours after each rainfall of 0.5 inches or more.

4.0 Project Site Information

The Project Site is located along both sides of South Black Branch Road in the Town of Cecilia, Hardin County, Kentucky.

The Project proposes solar arrays, gravel access roads, utility pads, perimeter security fence, transmission line, substation and related stormwater features such as crossing culverts, swales, vegetative buffers etc.

The general scope of work for the Project which may result in soil disturbance includes, but is not limited to, limited site clearing, grading, gravel access road installation, equipment pad installation, solar panel and related electrical wire installation.

The Project Site consists of approximately 698 +/- acres enclosed within fence. The existing groundcover of the Project Site is composed mainly of agricultural land, wetlands, negligible wooded areas, some utility rights-of-way and a railway. Refer to the Construction Drawings for additional Project Site land cover, environmental resource, and topographic information.

Environmental features including streams and wetlands are present throughout this site. There are some geological features such as karst terrain that has the presence of sinkholes that are carefully evaluated and will not be disturbed.

4.1 Soils Classification

Review of the United States Department of Agriculture's (USDA) Natural Resources Conservation Service (NRCS) Web Soil Survey indicated the predominant soil series mapped within the Project Site are classified as Hydrologic Soil Group (HSG) rating B, C, and D soils. The Soil Conservation Service defines the HSGs as follows:

- Type A Soils: Soils having a high infiltration rate (low runoff potential).
- Type B Soils: Soils having a moderate infiltration rate.
- Type C Soils: Soils having a slow infiltration rate.
- Type D Soils: Soils having a very slow infiltration rate (high runoff potential).

For soils assigned to a dual hydrologic group, the first letter refers to drained areas and the second refers to undrained areas. In project areas of unknown soil type or areas not within agricultural land, the more conservative soil classification is assumed.

4.2 Rainfall Information

Rainfall data for the 10-year, 1 hour; 100-year, 1-hour; and 100-year, 6-hour rainfall events is used to evaluate the pre- and post-development stormwater hydraulic and hydrologic characteristics of the site. For rainfall distribution, Type II, 6 hr storm type has been used.

Table 1 – Rainfall Event Quantities

Rainfall Event	Rainfall Amount (inches)
10-Year; 1 hr	2.01
100-Year; 1 hr	2.87
100-Year; 6 hr	4.85

The rainfall depths are obtained from "1-Hour Rainfall Distribution" and "6-Hour Rainfall Distribution" tables from Engineering Department Hardin County, Kentucky's Stormwater Manual.

5.0 Personnel Contact List

A Construction Personnel Contact List for the Project will be provided. The listed personnel are responsible for ensuring compliance with the SWPPP and associated permit conditions. Personnel responsibilities include, but are not limited to, the following:

- Implement the SWPPP;
- Oversee maintenance practices identified in the SWPPP;
- Conduct or provide for inspection and monitoring activities;
- Identify potential erosion, sedimentation, and pollutant sources during construction and ensure issues are addressed appropriately and in a timely manner;
- Identify necessary amendments to the SWPPP and ensure proper implementation; and,
- Document activities associated with the implementation of this SWPPP and supporting documents.

6.0 SWPPP Construction Requirements and Sequencing

This section provides the Owner/Operator and the Contractor with a suggested order of construction that will minimize erosion and the transport of sediments. The individual objectives of the construction techniques described herein shall be considered an integral component of the Project design. The construction sequence is not intended to prescribe definitive construction methods and should not be interpreted as a construction specification document.

The Contractor shall follow the general principles outlined below throughout the construction phase:

- Protect and maintain existing vegetation wherever possible;
- Minimize the area of disturbance;
- To the extent possible, route unpolluted flows around disturbed areas;
- Install approved erosion and sediment control devices as early as possible;
- Minimize the time disturbed areas are left un-stabilized; and,
- Maintain erosion and sediment control devices in proper condition.

The Contractor should use the suggested construction sequence and techniques as a general guide and modify the suggested methods and procedures as required to best suit seasonal and site-specific physical constraints for the purpose of minimizing the environmental impact due to construction.

The Project is anticipated to involve multiple stages of work; site preparation, construction, and site restoration. Prior to the commencement of construction activities, temporary erosion and sediment control measures shall be installed per the Construction Drawings. The Project stages are detailed below.

Stage 1: Project Site Preparation

- Establish access to the Project Site including the stabilized construction entrances and access roads;
- Stake/flag construction limits, staging/storage areas, concrete washout locations, environmentally sensitive areas, and other associated work areas;
- Mark existing utilities and infrastructure;
- Conduct tree clearing and vegetation management, if necessary, and grading of work areas, as required; and,
- Install the erosion and sediment controls as detailed on the Erosion and Sediment Control Plans.

Stage 2: Construction

Construction projects typically requires the following general operations that have the potential for erosion and sedimentation due to stormwater flows.

- Tree Clearing – Removal of vegetation can expose soils to erosion. Ruts caused by equipment can create paths for concentrated water flows.
- Construction Site Entrance – Vehicles leaving the Project Site can track soil onto public roadways.
- Grading Operations – Exposed soils have the potential for erosion and discharge of sediment.
- Fugitive Dust – Dust generated by vehicles can be deposited in wetlands and waterways.
- Access Drive Preparation and Similar Grading Activities – Maintenance and heavy use of access roads can expose soils, creating erosion potential.
- Construct the Solar Generation Field.

Stage 3: Project Site Restoration

- Remove and dispose of Project related waste material at an approved disposal facility;
- Prepare soils as needed (restoration of original grade, de-compaction, soil amendments, etc.), and seed and mulching all disturbed areas. Stabilize disturbed soils with proper vegetation;

- Remove the temporary erosion and sediment controls when natural vegetative cover has been restored and erosion issues are no longer present;
- Submit the NOT to KDOW in accordance with the Construction General Permit.

This site is very large, and areas of development are spread out across the 698 +/- acres. Construction will be done in phases so that some areas of the site can be completed and stabilized before others are disturbed. This will keep the amount of disturbed area to a minimum at any one time.

The following Native/Naturalized Solar Farm Seed Mix or equivalent shall be used to vegetate the site.

NATIVE/NATURALIZED SOLAR FARM SEED MIX				
BOTANICAL NAME	**COMMON NAME**	**MIX CONCENTRATION**	**RATE (LBS/ACRE)**	**RATE (LBS/1000 FT^2)**
FESTUCA RUBRA	CREEPING RED FESCUE	34%	262	6
FESTUCA OVINA	SHEEP FESCUE	33%		
FESTUCA BREVIPILA 'BEACON'	HARD FESCUE 'BEACON'	10%		
FESTUCA OVINA VAR. DURIUSCULA 'RHINO'	HARD FESCUE 'RHINO'	5%		
FESTUCA OVINA VAR. GLAUCA (F. ARVERNENSIS) (F. GLAUCA), 'BLUE RAY'	BLUE FESCUE 'BLUE RAY'	5%		
POA PRATENSIS 'ARGYLE'	KENTUCKY BLUEGRASS 'ARGYLE'	5%		
POA PRATENSIS 'SHAMROCK'	KENTUCKY BLUEGRASS 'SHAMROCK'	5%		
AGROSTIS PERENNANS, ALBANY PINE BUSH-NY ECOTYPE	AUTUMN BENTGRASS, ALBANY PINE BUSH-NY ECOTYPE	3%		

7.0 Stormwater Management and Pollution Controls

Prior to the commencement of construction activities, temporary erosion and sediment controls shall be installed to prevent erosion of the soils and prevent water quality degradation in wetlands and waterbodies. Erosion and sediment controls will be utilized to limit, control, and mitigate construction related impacts. The stormwater management and pollution controls shall include practices that involve runoff control, soil stabilization practices, and sediment control.

The following sections detail potential stormwater contamination sources due to construction related activities and the temporary and permanent erosion and sediment controls to be utilized throughout the construction of the Project to mitigate impacts.

7.1 Potential Impacts for Stormwater Contamination

Construction activities and processes that result in either increased stormwater runoff or the potential to add pollutants to runoff are subject to the requirements of this SWPPP. These activities may include areas of land disturbed by grading, excavation, construction, or material storage. Water that comes in contact with the surface of the Project Site as a result of precipitation (snow, hail, rain, etc.) is classified as stormwater associated with the Project and is subject to the requirements of this SWPPP.

Construction activities that may negatively impact stormwater include, but are not limited to, the following:

- Tree Clearing and Vegetation Removal: Removal of vegetation can expose and weaken soils and may result in erosion.
- Construction Site Entrance: Vehicles leaving the Project Site can track soils onto public roadways.
- Grading Operations: Exposed soils have the potential for erosion and sedimentation when not stabilized.
- Fugitive Dust: Dust generated by vehicles or from strong winds during a drought period can be deposited in wetlands, waterways, and other environmentally sensitive areas, or may negatively impact the air quality.
- General Site Construction Activities: Maintenance and heavy use of access roads can expose soils, creating significant erosion potential. Soil stockpiling from site excavations and grading may promote erosion and sedimentation. Dewatering activities may result in concentrated flows and has the potential to increase erosion.
- Construction Vehicles and Equipment: Refueling of vehicles may result in spilling or dripping gasoline and diesel fuel onto the ground. On-site maintenance of excavating equipment may result in hydraulic oil, lubricants, or antifreeze dripping onto the ground. Sediment tracking and the spread of invasive species may occur if construction vehicles are improperly maintained. Ruts caused by equipment can create paths for concentrated water flows.
- Waste Management Practices: Typical construction projects often generate significant quantities of solid waste, such as wrappings, personnel-generated trash and waste, and construction debris.

Proper utilization of staging and storage areas, stockpiling areas, and erosion and sediment controls will mitigate potential impacts to the stormwater.

7.2 Protection of Existing Vegetation

Natural vegetation shall be preserved to the maximum extent practicable. Preserving natural vegetation will reduce soil erosion and maintain the inherent integrity of the Project Site. Protection practices may include barrier fencing to prevent equipment and vehicle traffic in vegetated and environmentally sensitive areas.

7.3 Temporary Erosion and Sediment Controls

Temporary erosion and sediment controls shall be utilized to reduce erosion, sedimentation, and pollutants in stormwater discharges, and to prevent impacts to undisturbed areas, natural resources, wetlands, waterbodies, and downstream areas. Both stabilization techniques and structural methods will be utilized, as needed, to meet these objectives.

Temporary erosion and sediment control measures shall be applied during construction to:

- Minimize soil erosion and sedimentation through the stabilization of disturbed areas and removal of sediment from construction site discharges.
- Preserve existing vegetation to the maximum extent practicable and establish permanent vegetation on exposed soils following the completion of soil disturbance activities.
- Minimize the area and duration of soil disturbance through site preparation activities and construction sequencing.

Table 2, below, lists the erosion and sediment controls anticipated to be utilized at the Project Site.

Table 2 - Proposed Erosion and Sediment Control Measures

Stabilized Construction Access	Construction Road Stabilization
Protecting Vegetation During Construction	Temporary Construction Area Seeding
Dust Control	Silt Fence
Compost Filter Sock	
Check Dam	
Rock Outlet Protection	Dewatering Sump Pit
Timber Matting	Buffer Filter Strip
Soil Stabilization	Topsoiling
Soil Restoration	Mulching
Seeding	Fertilizer Application
Horizontal Directional Drilling	

8.0 Post-Construction Stormwater Management

The pre-development and post-development conditions for the Project Site were divided into subcatchments, which depict the watershed conditions, methods of collection, conveyance, points of discharge and topography. In addition, the drainage pattern, drainage structures, soil types, and ground covers are utilized to analyze the rate of runoff in the existing and proposed conditions. The subcatchments include off-site contributing areas as determined by the site

topography and site features. The Project Site was divided into twenty-six (26) subcatchments. These subcatchments have been depicted on the pre and post development drainage area maps included in this report.

In order to compare the pre-development and post-development runoff conditions, study points were selected across the Project Site. The overall bounds of the study area and study points remain unchanged from the pre-development condition.

The stormwater analysis for this site includes:

1. Site planning to preserve natural site features and reduce impervious cover.
2. Detail the Water Quality Achievement for project.
3. Design for water quantity (flood control).
4. Design for peak runoff rates, where required.
5. Crossing of environmental features such as streams and wetlands. Permits will be obtained for any proposed crossings.
6. Consideration of sinkholes.

The proposed new development will mimic the existing runoff patterns to the maximum extent practicable.

These items will be addressed in the sections below.

8.1 Design Justification

The proposed Project will result in greater than one acre of soil disturbance and an increase in impervious surface, therefore post-construction stormwater management practices are required.

The Water Quality Volume (WQv) and rate of runoff requirements shall be met by projects requiring post-construction stormwater controls. The Hardin County Stormwater Manual details the stormwater management practices that may be implemented at the Project Site to aid in the reduction of stormwater effects to newly developed areas.

Most of the project will be developed in open, agricultural areas with minimal tree clearing; For conservative design, the agricultural areas are also considered as open space with fair grass cover conditions. Under proposed conditions, the grass cover within fenced area is considered as Meadow cover, and the gravel and equipment pad surfaces are considered as is. Therefore, the composite curve numbers (CN) has decreased in almost all the subcatchments. Few subcatchments maintain the same CN for both existing and proposed conditions. The Project proposes the creation of new impervious cover in the form of gravel access drives, equipment pads and substation.

The peak runoff rates for the pre-development and post-development conditions are analyzed to aid in maintaining the pre-development runoff rates. Regulating the runoff rate will minimize the impacts to adjacent and downstream properties and waterbodies and minimize impacts to the stormwater runoff quality.

8.2 Stormwater Quality Analysis

Kentucky stormwater management manual requires treatment of the WQv, which is intended to improve water quality by capturing and treating runoff from small, frequent storm events. The WQv to be treated shall be equal to ½" multiplied by the site area.

However, except for the gravel and equipment pad surfaces, the remaining portion of project area will be maintained as meadow cover. Therefore, the meadow cover will be considered as vegetated filter strip. An infiltration credit of 1" times the area of strip, as specified in the manual, will meet the required WQv for this project.

8.3 Stormwater Quantity Analysis

Stormwater runoff was estimated using HydroCAD, Version 10.0. HydroCAD software is based on methodologies developed by the USDA NRCS, namely "Urban Hydrology for Small Watersheds", Technical Release 55 and Technical Release 20 (TR-50 and TR-20, respectively), in conjunction with other hydrologic and hydraulic calculations. Based on site specific information, including land cover, slopes, soils, and rainfall data, the program calculates inflow and outflow hydrographs for subcatchments, reach routing, and pond routing.

For the HydroCAD analysis, the Project Site was divided by watershed and drainage systems, which contribute to the overall stormwater network. The watersheds and drainage systems were classified by the following components:

- Subcatchment: Utilized to model the runoff from a given area of land.
- Pond: Used to model a reservoir, dam, catch basin, manhole, drywell, storage chamber, vault, or other impoundment that fills with water. Ponds may empty through a weir, culvert, orifice, or other outlet device.
- Reach: Used to perform independent routing through an open channel or overland flows.
- Link: A multi-purpose node used to link a hydrograph to another system.

The pre-development and post-development conditions for the Project Site were divided into subcatchments, which depict the watershed conditions, methods of collection, conveyance, points of discharge and topography. In addition, the drainage pattern, drainage structures, soil types, and ground covers are utilized to analyze the rate of runoff in the existing and proposed conditions. The subcatchments include any off-site contributing areas as determined by the site topography and site features.

The pre-development Project Site was divided into twenty six (26) subcatchments and the post-development Project Site was divided into similar number pre-development subcatchments.

In order to compare the pre-development and post-development runoff conditions, study points were selected across the Project Site. The overall bounds of the study area and study points remain unchanged from the pre-development condition.

The Time of Concentration calculations were performed within the HydroCAD software using TR-55 methodology. The following assumptions were used to set the calculation parameters:

- For both pre and post developed conditions, first 50' of the flow is considered as Sheet flow (SF).
- After the first 50', flow is considered Shallow Concentrated Flow (SCF) until it reaches a water surface or channelized topography.
- For sheet flow, under existing conditions, a short grass manning's (n) value of 0.15 was taken, for open space and agricultural land covers. Similarly, an n value of 0.40 was used for woods. Under proposed conditions, a dense grass manning's value of 0.24 was used for meadow cover. For rest of site, n value was selected based on the cover conditions in both pre and post-development conditions.

8.4 Post-Construction Runoff Rates

Proposed construction on this site will significantly reduce the curve number (CN) of land in all areas except for subcatchment DA-8, 100-yr; 6-hr storm. Under post developed conditions, there is a 0.17 cfs (3.7%) increase from DA-8. However the remaining subcatchments (DA-7 and DA-9) that flow into the same neighboring pond has considerably reduced the post runoff flows. Similarly, subcatchment DA-23 has less than 2% increase in flow rates after the construction, with the bordering subcatchments (DA-22 and DA-20) showing a significant decrease in flow rates.

The pre- and post-development conditions were evaluated at each study point for the 10-, and 100-year storm events. Table 3, below, details the pre- and post-development peak discharge rates for each study point and storm event analyzed.

Table 3 - Peak Discharge Rate (cfs) Comparison

Study Point	10-Year; 1-Hour Rainfall Event		100-Year; 1-Hour Rainfall Event		100-Year; 6-Hour Rainfall Event	
	Pre-	Post-	Pre-	Post-	Pre-	Post-
1	8.01	4.70	19.73	14.33	72.89	60.67
2	0.57	0.12	2.59	1.31	13.67	9.95
3	13.61	5.40	37.11	21.55	145.92	108.91
4	6.54	3.21	20.05	13.05	84.79	65.51
5	25.66	8.65	65.78	35.73	250.85	180.48
6	104.08	61.28	246.43	175.80	882.40	715.41
7	1.66	0.61	5.79	3.41	26.60	20.50
8	0.00	0.00	0.16	0.14	4.59	4.76*
9	7.88	3.90	27.95	20.34	131.53	112.02
10	10.23	2.28	32.89	15.26	144.66	98.65
11	6.26	1.79	20.07	10.72	88.14	64.77
12	4.60	1.39	13.31	6.39	48.41	34.12
13	28.15	14.01	68.36	44.34	253.20	194.35
14	20.64	13.40	43.89	33.11	145.23	122.08
15	17.73	5.35	47.65	24.21	187.66	130.95
16	5.33	1.97	14.10	8.20	55.46	41.40
17	6.64	2.87	19.19	11.73	78.21	59.27
18	3.46	0.15	13.91	4.09	69.79	40.77
19	0.05	0.05	1.05	0.93	8.75	7.84
20	0.59	0.13	2.90	1.72	16.35	12.59
21	2.04	0.27	9.46	3.86	49.63	33.15

22	1.31	0.22	8.37	3.81	49.76	36.41
23	0.35	0.37**	3.36	3.47**	23.11	23.14**
24	1.55	0.41	7.64	4.54	43.14	38.16
25	6.24	0.31	32.12	7.00	179.91	101.95
26	2.14	1.73	9.78	8.76	54.63	51.88

*Study point 8 has negligible increase leaving the site border for the 100 yr, 6 hr storm however the adjacent study points has significant reductions. Therefore, the overall post runoffs will be significantly decreased by the time they reach any waterbodies.
**Study point 23 also has negligible increase leaving the site border for all three storm events, however the adjacent study points has significant reductions. Therefore, the overall post runoffs will be significantly decreased by the time they reach any waterbodies.

8.5 Environmental Crossings

Most of the construction will be outside wetlands and the floodplains of streams. Setbacks will be applied twenty-five (25) feet from the top of bank on each side of the streams. The construction of this site will require internal access drives to cross streams or wetlands to access some areas of proposed development. A total of 5 stream crossings are proposed for this project. The stream crossings and other additional culvert designs are documented in Appendix E-Stormwater Management Calculations.

Horizontal directional drilling (HDD) will be considered to minimize impacts where electric lines need to cross an environmental feature.

8.6 Sinkholes

Karst terrain has been identified within the project site. Karst terrain is susceptible to sinkhole activity. Development within identified sinkhole areas of the site will be avoided to the greatest degree possible. If excavation is required within these areas, exposed soils will be covered with clayey soils or bentonite will be mixed into the soils to create a low permeability soil cover. Basins in these areas should be impermeable.

8.7 Post-Construction Stormwater Control Practices Utilized

The project does not propose any structural BMPs since the post-development conditions vastly improve the ground cover compared to pre-development conditions.

The vegetation under solar panels and within fence will be considered as a vegetated filter strip to satisfy the Water Quality criteria.

The HydroCAD design of all proposed culverts at internal access drive low points is documented in Appendix E of this report. For Stream Crossings, a minimum of 20% of the culvert was proposed to be embedded. All culverts are designed for 100 year storm, and a min. size of 15” HDPE was used.

The swales proposed along access drives all have a 2’ wide bottom trapezoidal swales with a minimum of 1.5’ depth. The swales are sized for the biggest access drive culvert (30”) flow so that the proposed dimensions can be determined adequate for remaining locations. Please refer to Appendix E for swale calculations. North America Green’s Erosion Control Fabric, NAG P-200 (or equivalent) will be installed on all swales along the access drives.

9.0 Construction Pollution Prevention

Proper material storage, handling, and disposal practices shall be implemented during construction to reduce the risk of exposure of materials and hazardous substances to stormwater and environmental resources. The storage, handling, and disposal procedures to be enforced by the Owner/Operator, Contractor(s) and the Qualified Inspector are described below.

9.1 Management of Spills and Releases

The Owner/Operator must be notified in the event of a non-stormwater (fuel, oil, chemical, etc.) spill or release to ensure proper reporting and clean up. The Owner/Operator shall proceed as appropriate in accordance with the Owner/Operator's, local, state, and federal environmental policies and procedures.

The Contractor is responsible for retaining documentation containing the appropriate spill number and spill information to provide to the Owner/Operator and the Qualified Inspector. The Contractor is responsible for the cleanup and response actions, in accordance with the on-site spill prevention procedures manual. Contaminated soil shall be removed from the Project Site and disposed of in accordance with the product specific Safety Data Sheets (SDS) and environmental guidance.

Potential pollutant sources are likely to be stored on the construction site. Bulk petroleum storage (1,100 gallon above ground tank and/or 110 below ground tank) and chemical storage (185 gallon above ground tank and/or any below ground tank) shall not be present onsite. Construction materials typically present on construction sites, include, but are not limited to, the following:

- Building Products: Asphalt sealants, copper flashing, roofing materials, adhesives, concrete admixtures, and gravel and/or mulch stockpiles;
- Chemicals: Pesticides, herbicides, insecticides, fertilizers, and landscape materials;
- Petroleum Products: Diesel fuel, oil, hydraulic fluids, gasoline, etc.;
- Hazardous or Toxic Waste: Paints, caulks, sealants, fluorescent light ballasts, solvents, petroleum-based products, wood preservatives, additives, curing compounds, and acids;
- Sanitary Facilities: Portable toilets; and,
- Construction Debris: Fill, vegetative debris, stumps, and construction waste.

Specific quantities cannot be estimated until construction methodology and contractor(s) are secured for construction.

Spill cleanup and response guidance is provided in Appendix H of this SWPPP.

9.2 Construction Housekeeping

The Owner/Operator or the Contractor shall coordinate with local fire officials regarding on-site fire safety and emergency response. The Contractor shall keep the Construction Supervisor and the Qualified Inspector/Qualified Professional aware of chemicals and waste

present on site. The Contractor shall periodically conduct safety inspections at the Project Site to identify housekeeping issues and employ spill prevention procedures.

9.2.1 Material Stockpiling

Material resulting from clearing and grubbing, grading, and other construction activities, or new material delivered to the Project Site, shall be stockpiled upslope of disturbed areas. The stockpile areas shall have the proper erosion and sediment controls installed to prevent the migration of sediments and materials.

9.2.2 Staging, Storage, and Marshalling Areas

Construction materials and equipment should be stored in designated staging areas as indicated on the Construction Drawings or as directed by the Project Engineer (or Qualified Inspector). The staging, storage, and marshalling areas should be located in an area which minimizes impacts to stormwater quality.

Chemicals, solvents, fertilizers, and other toxic materials must be stored in waterproof containers and must be kept in the proper storage facilities, except during use or application. Runoff containing such materials must be collected and disposed of at an approved solid waste or chemical disposal facility.

Bulk storage of materials will be staged at the Project marshalling yard. Contractor marshalling yards may be associated with other projects not covered under this SWPPP and General Permit. If the marshalling area is associated with this SWPPP, the yard shall be inspected by the Qualified Inspector until Project related activities have ceased. A Qualified Inspector shall inspect the marshalling yard to assess for environmental impacts prior to and throughout its use. If additional marshalling yards are required, they must abide by this SWPPP. Amendments shall be made to the SWPPP, as necessary, for the additional marshalling areas.

9.2.3 Equipment Cleaning and Maintenance

All on-site construction vehicles, including employee vehicles, shall be monitored for leaks and shall receive regular preventative maintenance to reduce the risk of leakage. Any equipment leaking oil, fuel, or hydraulic fluid shall be repaired immediately or removed from the Project Site. Construction equipment and Contractor personal vehicles shall be parked, refueled and serviced at least 100 feet from a wetland, waterbody, or other ecologically sensitive area, at an upland location away from conveyance channels, unless approved by the Qualified Inspector/Qualified Professional.

Where there is no reasonable alternative, refueling may occur within these setbacks, but only under the observation of the Qualified Inspector or Trained Contractor and after proper precautions are taken to prevent an accidental spill. The Contractor shall take precautions to ensure that drips, spills, or seeps do not enter the ground. The use of absorbent towels and/or a portable basin beneath the fuel tank is recommended. Refueling activities shall be performed under continual surveillance with extreme care. In the event of a release, the spill shall be promptly cleaned up in accordance with the spill response and clean up procedures.

Petroleum products and hydraulic fluids that are not in vehicles shall be stored in tightly sealed containers that are clearly labeled. All gasoline and fuel storage vessels with greater than a 25-gallon capacity must have secondary containment constructed of an impervious material and be capable of holding 110% of the vessel capacity.

9.2.4 Concrete Washout Areas

Designated concrete washout areas should be provided as needed to allow concrete trucks to wash out or discharge surplus concrete and wash water on site. The concrete washout areas shall be a diked impervious area, located a minimum of 100 feet from a drainage way, waterbody, or wetland area. The concrete washout areas should be designed to prevent contact between the concrete wash and stormwater. The concrete washout areas shall have the proper signage to indicate the location of the facility. The Contractor is responsible for the maintenance of the concrete washout areas. Waste collected at the concrete washout areas shall be disposed of as non-hazardous construction waste material.

The washout facility should have sufficient volume to contain the concrete waste resulting from washout and a minimum freeboard of 12 inches. The washout areas should not be filled beyond 95% capacity and shall be cleaned out once 75% capacity has been met unless a new facility has been constructed.

9.3 Waste Management

The Contractor shall comply with all required regulations governing the on-site management and off-site disposal of solid and hazardous waste generated during construction of the Project. Substances and materials with the potential to pollute surface and groundwaters must be handled, controlled and contained as appropriate to ensure they do not discharge from the Project Site.

A solid waste management program will be implemented to support proper solid waste disposal and recycling practices. Solid waste and debris that cannot be recycled, reused, or salvaged shall be stored in on-site containers for off-site disposal. The containers shall be emptied periodically by a licensed waste transport service and hauled away from the site for proper disposal. No loose materials shall be allowed at the Project Site and all waste material shall be disposed of promptly and properly. The burning of crates, waste, and other refuse is not permitted.

If a hazardous material spill occurs, it must be contained and disposed of immediately.

10.0 Maintenance Inspections and Reporting Requirements

10.1 Pre-Construction Inspection

A site assessment shall be conducted by the Qualified Inspector prior to commencement of construction activities to ensure erosion and sediment controls have been adequately and appropriately installed. The Contractor is responsible for contacting the Qualified Inspector for the pre-construction inspection following the installation of the erosion and sediment control measures.

10.2 Construction Phase Inspections

A Qualified Inspector shall conduct regular site inspections for the implementation of this SWPPP through final stabilization of the Project Site. Inspections shall occur at an interval set forth in the Construction General Permit.

The Qualified Inspector shall conduct site inspections to assess the performance of the erosion and sediment controls and identify areas requiring modification or repair. The Qualified Inspector shall complete an inspection report following each inspection.

The Owner/Operator and the Contractor(s) must ensure the erosion and sediment control practices implemented at the Project Site have been maintained. The trained Contractor shall regularly inspect the erosion and sediment control practices and pollution prevention measures to ensure they are being maintained in effective operating condition at all times. Corrective actions to the identified deficiencies shall be made within a reasonable time frame.

The Qualified Inspector/Qualified Professional shall inspect the debris removal on a continual basis during construction to ensure proper management and disposal. When construction and restoration are complete, the Contractor is responsible for ensuring the Project Site is free of all construction debris and materials.

10.3 Temporary Construction Activity Suspension

The Contractor must temporarily stabilize all disturbed areas prior to temporary suspension of construction activities. For construction sites where soil disturbance activities have been temporarily suspended and the appropriate temporary stabilization measures have been installed and applied to all disturbed areas, the Qualified Inspector shall begin conducting site inspections. The trained Contractor may cease the regular maintenance inspections until soil disturbance activities resume.

10.4 Partial Project Completion

Construction sites where soil disturbance activities have been shut down with partial Project completion, the Qualified Inspector can stop conducting inspections once all disturbed areas have achieved final stabilization in conformance with this SWPPP.

The Owner/Operator must notify the County Authorities in writing prior to shut down. Correspondence with the State and County shall be included in Appendix D of this SWPPP.

If soil disturbance activities have ceased for two years from the date of shutdown, the Owner/Operator shall have the Qualified Inspector complete a final inspection to certify final stabilization has been achieved and all temporary erosion and sediment control measures have been removed. The Owner/Operator shall complete the NOT form and submit the form to the State. A copy of the completed NOT shall be included in Appendix A of this SWPPP.

10.5 Reporting Requirements

Inspection and maintenance reports shall be prepared in accordance with the Construction Plans from the commencement of construction activities until the NOT has been submitted to the State. The Qualified Inspector shall provide a copy of the completed inspection report to

the Owner/Operator and the Contractor(s) within one business day of inspection. A copy of the inspection report shall be included Appendix F of the on-site SWPPP. A blank inspection form is provided in Appendix F.

10.6 Post-Construction Operation and Maintenance Record Archiving

Post-construction operation and maintenance (O&M) activities shall be performed in accordance with the O&M Manual provided in Appendix D of this SWPPP. Post-construction operation and maintenance shall occur once stormwater management practices have been installed and are in operation, and the disturbed areas have achieved final stabilization.

10.7 Records Archiving

The Owner/Operator shall retain a copy of the SWPPP, permit coverage forms and associated documentation for a period of at least five years from the date that the state received the competed NOT.

Appendix A – SWPPP Permit Coverage Forms

- Notice of Intent (NOI) -

- SWPPP Preparer Certification Form -

- Owner/Operator Certification Form -

Appendix A – Blank Notice of Intent (NOI)

Appendix A – Blank SWPPP Preparer Certification Form

Appendix A – Owner/Operator Certification Form

Appendix B – Construction Personnel Contact List

- Blank Construction Contact List -

- Blank Contractor Certification Form -

Appendix B – Construction Contact List

Appendix B – Contractor Certification Form

Appendix C – Environmental Background Information

-Figure 1: Site Location Map

--USDA NRCS Soil Resource Report

Appendix C – Figure 1: Site Location Map

Appendix C – USDA NRCS Soils Resource Report

Appendix D – Post-Construction Operation and Maintenance (O&M) Manual

Appendix E – Stormwater Management Calculations

Appendix E – Pre Development Drainage Map

Appendix E – Pre Development Hydrocad Report

Appendix E – Post Development Drainage Map

Appendix E – Post Development Hydrocad Report

Appendix E – State Route Entrance Culvert Designs

Appendix E – Stream Crossing Culvert Designs

Appendix E – Internal Access Low Point Culvert Designs

Appendix E – Swale Design for the highest flow rate contributing area

(Note: Remaining all swales collect less flow rates but used the same dimensions for all)

Appendix F – SWPPP Amendments

The Owner/Operator shall have a Qualified Professional amend the SWPPP when one or more of the following occur:

- There is a significant change in design, construction, operation, or maintenance which may have a significant effect on the potential for the discharge of pollutants to the waters of the United States and which has not otherwise been addressed in the SWPPP; or
- The SWPPP proves to be ineffective in:
    - Eliminating or significantly minimizing pollutants from sources identified in the SWPPP and as required by this permit; or
    - Achieving the general objectives of controlling pollutants in stormwater discharges from permitted construction activity; and

Additionally, the SWPPP shall be amended to identify any new Contractor or Subcontractor that will implement any measure of the SWPPP.

The following information should be documented in this section:

- Dates when major grading activities occur;
- Dates when construction activities temporarily or permanently cease on a portion of the Project Site; and
- Dates when stabilization measures (temporary and permanent) are initiated.

Appendix G – SWPPP Inspection Reports

- Blank SWPPP Inspection Form -

- Completed SWPPP Inspection Reports -

Appendix G – Blank SWPPP Inspection Form

Appendix G – Completed SWPPP Inspection Reports

Appendix A – SWPPP Permit Coverage Forms

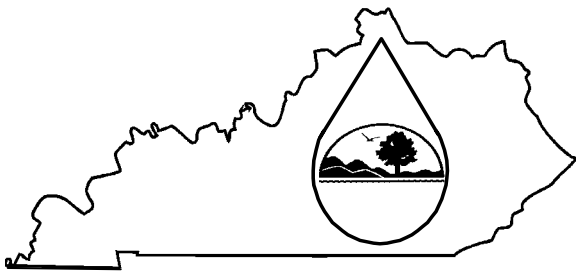
- Notice of Intent (NOI) -

- SWPPP Preparer Certification Form -

- Owner/Operator Certification Form -

Appendix A – Blank Notice of Intent (NOI)

FORM NOI-SWCA



KENTUCKY POLLUTION DISCHARGE ELIMINATION SYSTEM (KPDES)

Notice of Intent (NOI) for coverage of Storm Water Discharges Associated with Construction Activities Under the KPDES Storm Water General Permit KYR100000

This is an application for:

☐ New construction activity.
☐ Modification of coverage for additional area in same watershed.
☐ Modification of coverage for additional area in different watershed.

If Modification is checked, state reason for Modification:	

For Agency Use	Permit No. (Leave Blank)	**K**	**Y**	**R**	**1**	**0**				
For Agency Use	AI ID (Leave Blank)									

SECTION I – FACILITY OPERATOR INFORMATION

Operator Name(s)*:		Phone:*
Mailing Address:*		Status of Owner/Operator: ☐Private ☐State ☐Federal ☐Public(other than state or federal)
City:*:	State:*	Zip Code:*

SECTION II – FACILITY/SITE LOCATION INFORMATION

Name of Project:*	Physical Address:*	City:*
State:*	Zip Code:*	County:*
Latitude (decimal degrees):*	Longitude (decimal degrees):*	SIC Code:*

SECTION III – SITE ACTIVITY INFORMATION

For single projects provide the following information

Total Number of acres in project:*	Total Number of acres to be disturbed:*	Start date:	Completion date:

For common plans of development projects provide the following information

Total Number of acres in project:*	Number of individual lots in development:	Number of lots to be developed:
Total acreage intended to be disturbed:*	Number of acres intended to be disturbed at any one time:	
Start date:	Completion date:	List Contractors:

SECTION IV – DISCHARGE TO A WATER BODY

Name of Receiving Water:*	Anticipated number of discharge points:
Location of anticipated discharge points: Latitude (decimal degrees):*	Longitude (decimal degrees):*
Receiving Water Body Stream Use Designation	☐Cold Water Aquatic Habitat ☐Domestic Water Supply ☐Outstanding State Resource Water ☐Secondary Contact Recreation ☐Primary Contact Recreation ☐Warm Water Aquatic Habitat
Antidegradation Categorization	☐Outstanding National Resource Water ☐Exceptional Water ☐High Quality Water ☐Impaired Water
Name of Receiving Water:*	Anticipated number of discharge points:
Location of anticipated discharge points: Latitude (decimal degrees):*	Longitude (decimal degrees):*
Receiving Water Body Stream Use Designation	☐Cold Water Aquatic Habitat ☐Domestic Water Supply ☐Outstanding State Resource Water ☐Secondary Contact Recreation ☐Primary Contact Recreation ☐Warm Water Aquatic Habitat
Antidegradation Categorization	☐Outstanding National Resource Water ☐Exceptional Water ☐High Quality Water ☐Impaired Water

FORM NOI-SWCA

SECTION V – DISCHARGE TO AN MS4	
Name of MS4:	Date of application /notification to the MS4 for construction site coverage:
Number of discharge points**:**	Location of each discharge point: Latitude (decimal degrees):* Longitude (decimal degrees):*

SECTION VI – CONSTRUCTION ACTIVITIES IN OR ALONG A WATER BODY	
Will the project require construction activities in a water body or the riparian zone: ☐ Yes ☐ No	
If yes, describe scope of activity:	
Is a Clean Water Act 404 permit required: ☐ Yes ☐ No	Is a Clean Water Act 401 Water Quality Certification required: ☐ Yes ☐ No

SECTION VII – NOI PREPARER INFORMATION			
First Name:*	Last Name:*	Phone :*	eMail Address:*
Mailing Address:*	City:*	State:*	Zip Code:*

SECTION VIII – ATTACHMENTS
Attach a full size color USGS 7½-minute quadrangle map with the facility site clearly marked. USGS maps may be obtained from the University of Kentucky, Mines and Minerals Bldg. Room 106, Lexington, Kentucky 40506. Phone number (859) 257-3896**.**

SECTION IX – CERTIFICATION		
I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.		
Signature:*	First Name:*	Last Name:*
Phone:*	eMail Address:	Date:*

This completed application form and attachments should be sent to: SWP Branch, Division of Water, 200 Fair Oaks, Frankfort, Kentucky 40601. Questions should be directed to: SWP Branch, Operational Permits Section at (502) 564-3410.

KENTUCKY POLLUTANT DISCHARGE ELIMINATION SYSTEM
FORM NOI-SWCA – INSTRUCTIONS

WHO MUST FILE A NOTICE OF INTENT (NOI) FORM

Federal law at 40 CFR Part 122 prohibits point source discharges of stormwater associated with industrial activity to a water body of the Commonwealth of Kentucky without a Kentucky Pollutant Discharge Elimination System (KPDES) permit. The operator of an industrial activity that has such a storm water discharge must submit a NOI to obtain coverage under the KPDES Storm Water General Permit. If you have questions about whether you need a permit under the KPDES Storm Water program, or if you need information as to whether a particular program is administered by the state agency, call the **Storm Water Contact, Operational Permits Section, Kentucky Division of Water at (502) 564-3410.**

WHERE TO FILE NOI FORM

NOIs must be sent to the following address or submitted in on-line at https://dep.gateway.ky.gov/eForms/Default.aspx?FormID=3:

Operational Permits Section
SWP Branch, Division of Water
200 Fair Oaks Lane
Frankfort, KY 40601

Electronic NOI-SWCAs are to be submitted a minimum of seven (7) working days prior to commencement of construction related activities. Paper NOI-SWCAs are to be submitted a minimum of thirty (30) working days prior to commencement of construction related activities.

COMPLETING THE FORM

Enter information in the appropriate areas only. (*) denotes a required field. Enter N/A (Not Applicable) for fields that are required but do not apply to your submission. If you have any questions regarding the completion of this form call the **Storm Water Contact, Operational Permits Section, at (502) 564-3410.**

SECTION I – FACILITY OPERATOR INFORMATION

Operator Name(s): Enter the name or names of all operators applying for coverage under KYR10 using this NOI.
Mailing Address, City, State, and Zip Code: Provide the mailing address of the primary operator
Phone No.: Provide the telephone numbers of the person who is responsible for the operation.
Status of Owner/Operator: Select the appropriate legal status of the operator of the facility from the dropdown list.

Federal
Public (other than federal or state)
State
Private

SECTION II – FACILITY/SITE LOCATION INFORMATION

Name of Project: Provide the name of the project.
Physical Address, City, State, Zip Code and County: Provide the physical address of the project.
Latitude/Longitude: Provide the general site latitude and longitude of the operation.
SIC Code: Enter the Standard Industrial Code for the project

SECTION III –SITE ACTIVITY INFORMATION

For single projects provide the following information:

Total number of acres in project: Indicate the total acreage of the project including both disturbed and undisturbed areas.
Total number of acres to be disturbed: Indicate the total number of acres of the project to be disturbed.
Anticipated start date: Indicate the approximate date of when construction activities will begin.
Anticipated completion date: Indicated the approximate date of when final stabilization will be achieved.

For common plans of development provide the following information:

Total number of acres in project: Indicate the total acreage of the project including both disturbed and undisturbed areas.
Number of individual lots in development, if applicable: Indicate the number of individual lots or unit in the common plan of development
Number of lots to be developed: Indicate the number of lots that you intend to develop.
Total acreage of lots intended to develop: Indicate the total acreage of the lots you intend to develop
Total acreage intended to disturb: Indicate the total acreage of the lots you intend to disturb
Number of acres intended to disturb at any one time: Indicate the maximum number of acres to be disturbed at any one time.
Anticipated start date: Indicate the approximate date of when construction activities will begin.
Anticipated completion date: Indicated the approximate date of when final stabilization will be achieved.
List of contractors: Provide the names of all known contractors that will be working on site.

(Continued on Back Page)

KENTUCKY POLLUTANT DISCHARGE ELIMINATION SYSTEM
FORM NOI-SWCA – INSTRUCTIONS

SECTION IV – IF THE PERMITTED SITE DISCHARGES TO A WATER BODY THE FOLLOWING INFORMATION IS REQUIRED

Name of Receiving Water: Provide the names of the each water body receiving discharges from the site. Provide only official USGS names do not provide local names
Anticipated number of discharge points: Indicate the number of discharge points to each receiving water body.
Location of anticipated discharge points: Provide the latitude and longitude of each discharge point. Add points as necessary.
Receiving Water Body Stream Use Designation: Check all appropriate boxes
Antidegradation Categorization: Select from the drop down box one of the following:

Outstanding National Resource Water
Exceptional Water
High Quality Water
Impaired Water

SECTION V – IF THE PERMITTED SITE DISCHARGES TO A MS4 THE FOLLOWING INFORMATION IS REQUIRED

Name of MS4: Provide the name of the MS4 to which the activity will discharge
Number of discharge points to the MS4: Indicate the number of discharge points
Location of each discharge point: Provide the latitude and longitude of each discharge point. Add points as necessary
Date of application/notification to the MS4 for construction site permit coverage: Indicate the date the MS4 has or will be notified.

SECTION VI – CONSTRUCTION ACTIVITIES IN OR ALONG A WATER BODY

Will the project require construction activities in a water body or the riparian zone: Select Yes or No from the drop down box.
If Yes, describe scope of activity: Provide a brief description of the activity (ies) that will take place in the water body or the riparian zone.
Is a Clean Water Act 404 permit required: Select Yes or No from the drop down box.
Is a Clean Water Act 401 Water Quality Certification required: Select Yes or No from the drop down box.

SECTION VII – NOI PREPARER INFORMATION

Provide the name, mailing address, telephone number and eMail address of the person preparing the NOI.

SECTION VIII –Attachments

Attach a USGS topographic map indicating the location of the activity and the proposed discharge points.

SECTION IX – CERTIFICATION

Provide the name, mailing address, telephone number and eMail address of the person who is responsible for the activity

Signature: Provide full name of the responsibility party. This will constitute a signature.

The NOI must be signed as follows:

Corporation: by a principal executive officer of at least the level of vice president
Partnership or sole proprietorship: by a general partner or the proprietor respectively

Appendix A – Blank SWPPP Preparer Certification Form

SWPPP Preparer Certification Form

Project Site Information

Project/Site Name

Owner/Operator Information

Owner/Operator (Company Name/Private Owner/Municipality Name)

Certification Statement – SWPPP Preparer

I hereby certify that the Stormwater Pollution Prevention Plan (SWPPP) for this project has been prepared in accordance with the terms and conditions of the GP-0-20-001. Furthermore, I understand that certifying false, incorrect or inaccurate information is a violation of this permit and the laws of the State of New York and could subject me to criminal, civil and/or administrative proceedings.

First name MI Last Name

Signature Date

Appendix A – Owner/Operator Certification Form

Owner/Operator Certification Form

Project/Site Name: _____

eNOI Submission Number: _____

eNOI Submitted by: ☐ **Owner/Operator** ☐ **SWPPP Preparer** ☐ **Other**

Certification Statement - Owner/Operator

I have read or been advised of the permit conditions and believe that I understand them. I also understand that, under the terms of the permit, there may be reporting requirements. I hereby certify that this document and the corresponding documents were prepared under my direction or supervision. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations. I further understand that coverage under the general permit will be identified in the acknowledgment that I will receive as a result of submitting this NOI and can be as long as sixty (60) business days as provided for in the general permit. I also understand that, by submitting this NOI, I am acknowledging that the SWPPP has been developed and will be implemented as the first element of construction, and agreeing to comply with all the terms and conditions of the general permit for which this NOI is being submitted.

Owner/Operator First Name M.I. Last Name

_____

Signature

_____

Date

Appendix B – Construction Personnel Contact List

- Blank Construction Contact List -

- Blank Contractor Certification Form -

Appendix B – Construction Contact List

SWPPP Construction Contact List

Name	Title/Role	Company	Phone Number
	Project Engineer		
	Project Field Construction Coordinator		
	Project Environmental Engineer		
	Division Environmental Engineer (Spill Reporting)		
	SWPPP Preparer		
	Qualified Inspector		

Appendix B – Contractor Certification Form

Contractor Certification Form

Stormwater Pollution Prevention Plan (SWPPP)

Project Name: _____

Location: _____

All Contractors and Subcontractors performing construction activities shall sing the flowing certification before they commence construction activities. A copy of the certification shall be included in Appendix A of the on-site SWPPP. All Contractors and Subcontractors must identify at least one trained person from their company, who has met the requirements of a *Trained Contractor* that will be responsible for the implementation of the SWPPP.

> "I hereby certify under penalty of the law that I understand and agree to comply with the terms and conditions of the SWPPP and agree to implement any corrective actions identified by the Qualified Inspector during a site inspection. I also understand that the Owner or Operator must comply with the terms and conditions of the Construction Permit and that is unlawful for any person to cause or contribute to a violation of water quality standards. Furthermore, I am aware that there are significant penalties for submitting false information that I do not believe to be true, including the possibility of fine and imprisonment for knowing violations."

Name of Construction Company	
Address of Construction Company	Telephone Number
Printed Name of Authorized Representative	Title
Signature of Authorized Representative	Date
Printed Name of Trained Contractor(s)	Title(s)

Type of construction services to be provided:

Appendix C – Environmental Background Information

-Figure 1: Site Location Map

--USDA NRCS Soil Resource Report

Appendix C – Figure 1: Site Location Map

Appendix C – USDA NRCS Soils Resource Report

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 Hardin and Larue Counties, Kentucky

April 14, 2021

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.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require

alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410 or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

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.

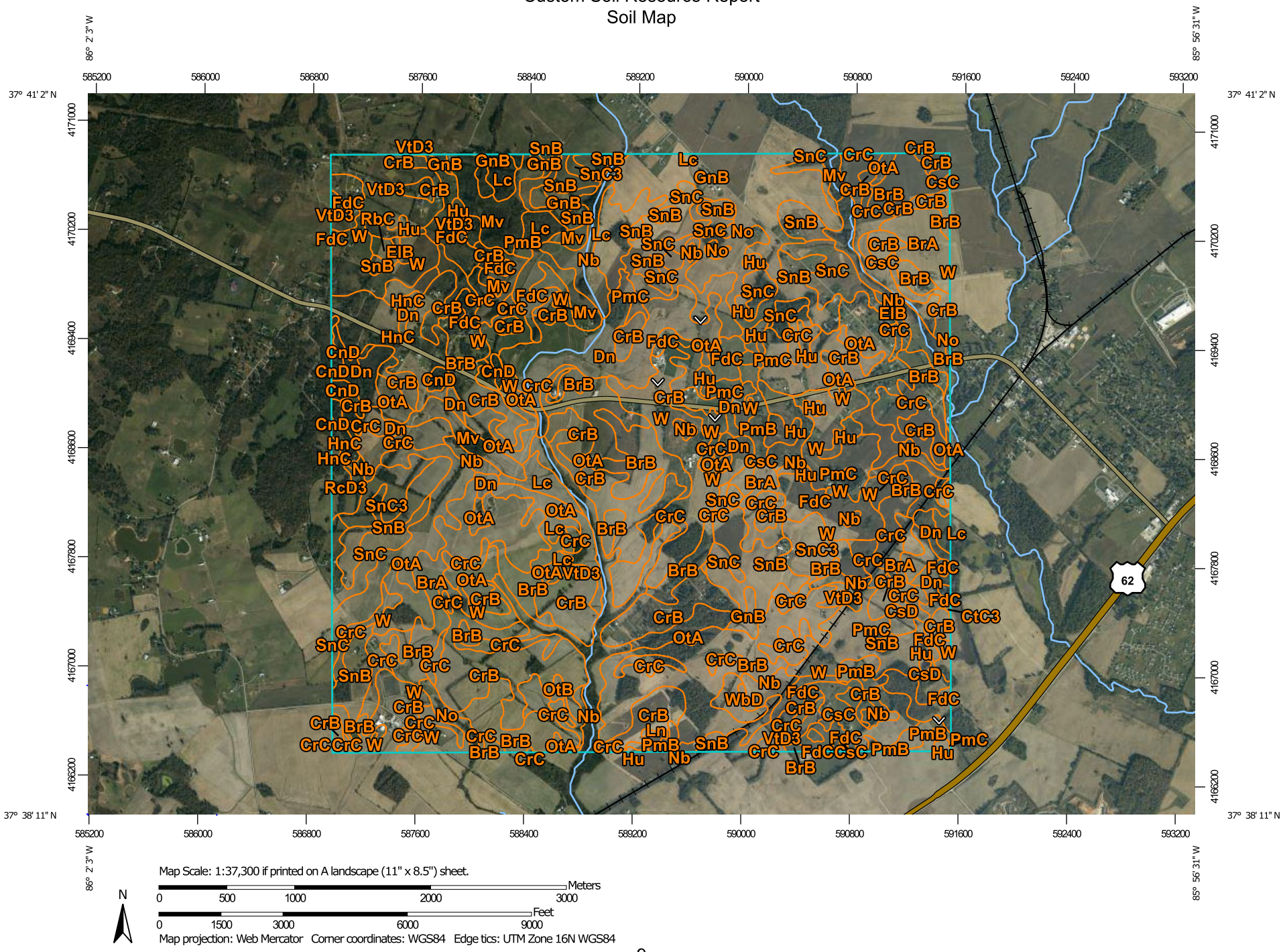
After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

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.

Custom Soil Resource Report
Soil Map



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 1:20,000.

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

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
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: Hardin and Larue Counties, Kentucky
Survey Area Data: Version 18, May 28, 2020

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

Date(s) aerial images were photographed: Oct 23, 2019—Nov 8, 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
BrA	Bedford silt loam, 0 to 2 percent slopes	68.9	1.4%
BrB	Bedford silt loam, 2 to 6 percent slopes	554.2	11.2%
CnD	Caneyville-Rock outcrop complex, 6 to 20 percent slopes	22.1	0.4%
CrB	Crider silt loam, 2 to 6 percent slopes	965.7	19.5%
CrC	Crider silt loam, 6 to 12 percent slopes	362.4	7.3%
CsC	Cumberland silt loam, 6 to 12 percent slopes	70.5	1.4%
CsD	Cumberland silt loam, 12 to 20 percent slopes	11.3	0.2%
CtC3	Cumberland silty clay loam, 6 to 12 percent slopes, severely eroded	12.4	0.3%
Dn	Dunning silty clay loam, 0 to 2 percent slopes, frequently flooded	261.9	5.3%
ElB	Elk silt loam, 2 to 6 percent slopes	10.8	0.2%
FdC	Fredonia-Rock outcrop complex, 6 to 20 percent slopes	275.6	5.6%
GnB	Gatton silt loam, 2 to 6 percent slopes	265.4	5.4%
HnC	Hagerstown silt loam, 6 to 12 percent slopes	109.0	2.2%
Hu	Huntington silt loam	98.5	2.0%
Lc	Lawrence silt loam, 0 to 2 percent slopes, rarely flooded	99.5	2.0%
Ln	Lindside silt loam, 0 to 2 percent slopes, frequently flooded	2.5	0.1%
Mv	Melvin silt loam	110.8	2.2%
Nb	Newark silt loam, 0 to 2 percent slopes, frequently flooded	260.4	5.3%
No	Nolin silt loam, 0 to 2 percent slopes, frequently flooded	20.4	0.4%
OtA	Otwood silt loam, 0 to 2 percent slopes, rarely flooded	368.4	7.4%
OtB	Otwood silt loam, 2 to 6 percent slopes, occasionally flooded	3.8	0.1%

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
PmB	Pembroke silt loam, 2 to 6 percent slopes	53.1	1.1%
PmC	Pembroke silt loam, 6 to 12 percent slopes	200.0	4.0%
RbC	Riney loam, 6 to 12 percent slopes	7.1	0.1%
RcD3	Riney sandy clay loam, 6 to 20 percent slopes, severely eroded	19.5	0.4%
SnB	Sonora silt loam, 2 to 6 percent slopes	292.3	5.9%
SnC	Sonora silt loam, 6 to 12 percent slopes	181.7	3.7%
SnC3	Sonora silt loam, 6 to 12 percent slopes, severely eroded	81.5	1.6%
VtD3	Vertrees silty clay loam, 6 to 20 percent slopes, severely eroded	144.8	2.9%
W	Water	19.0	0.4%
WbD	Waynesboro loam, 12 to 20 percent slopes	2.8	0.1%
Totals for Area of Interest		**4,956.7**	**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.

Hardin and Larue Counties, Kentucky

BrA—Bedford silt loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2wh4f
Elevation: 420 to 1,020 feet
Mean annual precipitation: 39 to 66 inches
Mean annual air temperature: 41 to 68 degrees F
Frost-free period: 139 to 205 days
Farmland classification: All areas are prime farmland

Map Unit Composition

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

Description of Bedford

Setting

Landform: Ridges
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Fine-silty noncalcareous loess over clayey residuum weathered from limestone

Typical profile

Ap - 0 to 9 inches: silt loam
Bt - 9 to 24 inches: silty clay loam
2Btx - 24 to 58 inches: silty clay loam
2Bt - 58 to 80 inches: clay

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: 23 to 35 inches to fragipan
Drainage class: Moderately well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.20 in/hr)
Depth to water table: About 20 to 33 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Low (about 4.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Other vegetative classification: Trees/Timber (Woody Vegetation)
Hydric soil rating: No

Minor Components

Crider

Percent of map unit: 10 percent
Landform: Ridges
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Trees/Timber (Woody Vegetation)
Hydric soil rating: No

Lawrence

Percent of map unit: 5 percent
Landform: Ridges
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest
Down-slope shape: Linear
Across-slope shape: Linear
Other vegetative classification: Trees/Timber (Woody Vegetation)
Hydric soil rating: No

BrB—Bedford silt loam, 2 to 6 percent slopes

Map Unit Setting

National map unit symbol: 2s2cy
Elevation: 420 to 1,210 feet
Mean annual precipitation: 40 to 66 inches
Mean annual air temperature: 41 to 68 degrees F
Frost-free period: 139 to 205 days
Farmland classification: All areas are prime farmland

Map Unit Composition

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

Description of Bedford

Setting

Landform: Hills
Landform position (two-dimensional): Shoulder, summit
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Noncalcareous loess over loamy noncalcareous loess over clayey residuum weathered from limestone

Typical profile

Ap - 0 to 9 inches: silt loam

Bt - 9 to 24 inches: silty clay loam
2Btx - 24 to 51 inches: silty clay loam
3Bt - 51 to 80 inches: clay

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: 21 to 35 inches to fragipan
Drainage class: Moderately well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.20 in/hr)
Depth to water table: About 18 to 33 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Low (about 4.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C/D
Other vegetative classification: Trees/Timber (Woody Vegetation)
Hydric soil rating: No

Minor Components

Crider

Percent of map unit: 10 percent
Landform: Hills
Landform position (two-dimensional): Shoulder, summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Convex
Other vegetative classification: Trees/Timber (Woody Vegetation)
Hydric soil rating: No

Lawrence

Percent of map unit: 5 percent
Landform: Ridges
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Linear
Other vegetative classification: Trees/Timber (Woody Vegetation)
Hydric soil rating: No

CnD—Caneyville-Rock outcrop complex, 6 to 20 percent slopes

Map Unit Setting

National map unit symbol: lhd0
Elevation: 380 to 1,060 feet
Mean annual precipitation: 44 to 58 inches

Mean annual air temperature: 46 to 68 degrees F
Frost-free period: 165 to 205 days
Farmland classification: Not prime farmland

Map Unit Composition

Caneyville and similar soils: 65 percent
Rock outcrop: 20 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Caneyville

Setting

Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Clayey residuum weathered from limestone

Typical profile

H1 - 0 to 5 inches: silt loam
H2 - 5 to 34 inches: clay
R - 34 to 44 inches: unweathered bedrock

Properties and qualities

Slope: 6 to 20 percent
Depth to restrictive feature: 20 to 40 inches to lithic bedrock
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Low (about 5.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: C
Hydric soil rating: No

Description of Rock Outcrop

Setting

Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Free face
Parent material: Limestone

Typical profile

R - 0 to 60 inches: unweathered bedrock

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8
Hydric soil rating: No

Minor Components

Other soils

Percent of map unit: 15 percent
Hydric soil rating: No

CrB—Crider silt loam, 2 to 6 percent slopes

Map Unit Setting

National map unit symbol: 2vp3p
Elevation: 350 to 1,120 feet
Mean annual precipitation: 37 to 62 inches
Mean annual air temperature: 41 to 68 degrees F
Frost-free period: 145 to 212 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Crider and similar soils: 75 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Crider

Setting

Landform: Hills
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Crest
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Fine-silty noncalcareous loess over clayey residuum weathered from limestone

Typical profile

Ap - 0 to 7 inches: silt loam
Bt1 - 7 to 32 inches: silty clay loam
2Bt2 - 32 to 80 inches: clay

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Moderate (about 7.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B
Other vegetative classification: Trees/Timber (Woody Vegetation)
Hydric soil rating: No

Minor Components

Nolin, ponded

Percent of map unit: 10 percent
Landform: Sinkholes
Landform position (three-dimensional): Talf
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: No

Bedford

Percent of map unit: 10 percent
Landform: Hills
Landform position (two-dimensional): Shoulder, summit
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Trees/Timber (Woody Vegetation)
Hydric soil rating: No

Caneyville

Percent of map unit: 5 percent
Landform: Hills
Landform position (two-dimensional): Shoulder, summit
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Trees/Timber (Woody Vegetation)
Hydric soil rating: No

CrC—Crider silt loam, 6 to 12 percent slopes

Map Unit Setting

National map unit symbol: 2vp3r
Elevation: 440 to 990 feet
Mean annual precipitation: 37 to 58 inches
Mean annual air temperature: 43 to 68 degrees F
Frost-free period: 150 to 212 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Crider and similar soils: 80 percent
Minor components: 20 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Crider

Setting

Landform: Hills
Landform position (two-dimensional): Shoulder, summit
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Fine-silty noncalcareous loess over clayey residuum weathered from limestone

Typical profile

Ap - 0 to 7 inches: silt loam
Bt1 - 7 to 36 inches: silty clay loam
2Bt2 - 36 to 80 inches: clay

Properties and qualities

Slope: 6 to 12 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Moderate (about 8.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Other vegetative classification: Trees/Timber (Woody Vegetation)
Hydric soil rating: No

Minor Components

Caneyville

Percent of map unit: 10 percent
Landform: Hills
Landform position (two-dimensional): Shoulder, summit
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Trees/Timber (Woody Vegetation)
Hydric soil rating: No

Bedford

Percent of map unit: 7 percent
Landform: Hills
Landform position (two-dimensional): Shoulder, summit
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Trees/Timber (Woody Vegetation)

Hydric soil rating: No

Nolin, ponded

Percent of map unit: 3 percent
Landform: Sinkholes
Landform position (three-dimensional): Talf
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: No

CsC—Cumberland silt loam, 6 to 12 percent slopes

Map Unit Setting

National map unit symbol: lhd5
Elevation: 380 to 1,060 feet
Mean annual precipitation: 44 to 58 inches
Mean annual air temperature: 46 to 68 degrees F
Frost-free period: 165 to 205 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

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

Description of Cumberland

Setting

Landform: Ridges
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Clayey residuum weathered from limestone

Typical profile

H1 - 0 to 5 inches: silt loam
H2 - 5 to 11 inches: silty clay loam
H3 - 11 to 65 inches: clay

Properties and qualities

Slope: 6 to 12 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: High (about 9.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Hydric soil rating: No

Minor Components

Other soils

Percent of map unit: 4 percent
Hydric soil rating: No

Newark

Percent of map unit: 3 percent
Hydric soil rating: No

Huntington

Percent of map unit: 3 percent
Hydric soil rating: No

CsD—Cumberland silt loam, 12 to 20 percent slopes

Map Unit Setting

National map unit symbol: lhd6
Elevation: 380 to 1,060 feet
Mean annual precipitation: 44 to 58 inches
Mean annual air temperature: 46 to 68 degrees F
Frost-free period: 165 to 205 days
Farmland classification: Not prime farmland

Map Unit Composition

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

Description of Cumberland

Setting

Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Clayey residuum weathered from limestone

Typical profile

H1 - 0 to 5 inches: silt loam
H2 - 5 to 11 inches: silty clay loam
H3 - 11 to 65 inches: clay

Properties and qualities

Slope: 12 to 20 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: High (about 9.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: B
Hydric soil rating: No

Minor Components

Other soils

Percent of map unit: 3 percent
Hydric soil rating: No

Fredonia

Percent of map unit: 3 percent
Hydric soil rating: No

Newark

Percent of map unit: 2 percent
Hydric soil rating: No

Huntington

Percent of map unit: 2 percent
Hydric soil rating: No

CtC3—Cumberland silty clay loam, 6 to 12 percent slopes, severely eroded

Map Unit Setting

National map unit symbol: lhd7
Elevation: 380 to 1,060 feet
Mean annual precipitation: 44 to 58 inches
Mean annual air temperature: 46 to 68 degrees F
Frost-free period: 165 to 205 days
Farmland classification: Not prime farmland

Map Unit Composition

Cumberland, severely eroded, and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Cumberland, Severely Eroded

Setting

Landform: Ridges
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Clayey residuum weathered from limestone

Typical profile

H1 - 0 to 6 inches: silty clay loam
H2 - 6 to 66 inches: clay

Properties and qualities

Slope: 6 to 12 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: High (about 9.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: B
Hydric soil rating: No

Minor Components

Other soils

Percent of map unit: 4 percent
Hydric soil rating: No

Newark

Percent of map unit: 3 percent
Hydric soil rating: No

Huntington

Percent of map unit: 3 percent
Hydric soil rating: No

Dn—Dunning silty clay loam, 0 to 2 percent slopes, frequently flooded

Map Unit Setting

National map unit symbol: 2wltd
Elevation: 440 to 850 feet

Mean annual precipitation: 44 to 58 inches
Mean annual air temperature: 45 to 68 degrees F
Frost-free period: 150 to 205 days
Farmland classification: Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season

Map Unit Composition

Dunning, frequently flooded, and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Dunning, Frequently Flooded

Setting

Landform: Flood plains
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Concave
Parent material: Clayey alluvium derived from limestone

Typical profile

Ap - 0 to 7 inches: silty clay loam
A - 7 to 16 inches: silty clay
Bg - 16 to 32 inches: silty clay
Cg - 32 to 96 inches: silty clay

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 to 6 inches
Frequency of flooding: FrequentNone
Frequency of ponding: None
Available water capacity: Moderate (about 6.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: C/D
Hydric soil rating: Yes

Minor Components

Melvin, frequently flooded

Percent of map unit: 5 percent
Landform: Flood plains
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: Yes

Newark, frequently flooded

Percent of map unit: 3 percent
Landform: Flood plains

Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Other vegetative classification: Trees/Timber (Woody Vegetation)
Hydric soil rating: No

Nolin, frequently flooded

Percent of map unit: 2 percent
Landform: Flood plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

ElB—Elk silt loam, 2 to 6 percent slopes

Map Unit Setting

National map unit symbol: lhdb
Elevation: 380 to 1,060 feet
Mean annual precipitation: 44 to 58 inches
Mean annual air temperature: 46 to 68 degrees F
Frost-free period: 165 to 205 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Elk, occasionally flooded, and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Elk, Occasionally Flooded

Setting

Landform: Stream terraces
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Mixed fine-silty alluvium

Typical profile

H1 - 0 to 9 inches: silt loam
H2 - 9 to 26 inches: silt loam
H3 - 26 to 65 inches: silty clay loam

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches

Frequency of flooding: OccasionalNone
Frequency of ponding: None
Available water capacity: High (about 11.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B
Hydric soil rating: No

Minor Components

Nolin

Percent of map unit: 5 percent
Hydric soil rating: No

Other soils

Percent of map unit: 5 percent
Hydric soil rating: No

FdC—Fredonia-Rock outcrop complex, 6 to 20 percent slopes

Map Unit Setting

National map unit symbol: lhdd
Elevation: 380 to 1,060 feet
Mean annual precipitation: 44 to 58 inches
Mean annual air temperature: 46 to 68 degrees F
Frost-free period: 165 to 205 days
Farmland classification: Not prime farmland

Map Unit Composition

Fredonia and similar soils: 65 percent
Rock outcrop: 20 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Fredonia

Setting

Landform: Ridges
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Clayey residuum weathered from limestone

Typical profile

H1 - 0 to 10 inches: silt loam
H2 - 10 to 28 inches: clay
R - 28 to 38 inches: unweathered bedrock

Properties and qualities

Slope: 6 to 20 percent
Depth to restrictive feature: 20 to 40 inches to lithic bedrock
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Low (about 4.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C
Hydric soil rating: No

Description of Rock Outcrop

Setting

Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Free face
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Limestone

Typical profile

R - 0 to 60 inches: unweathered bedrock

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8
Hydric soil rating: No

Minor Components

Cumberland

Percent of map unit: 8 percent
Hydric soil rating: No

Other soils

Percent of map unit: 7 percent
Hydric soil rating: No

GnB—Gatton silt loam, 2 to 6 percent slopes

Map Unit Setting

National map unit symbol: lhdj

Elevation: 380 to 1,060 feet
Mean annual precipitation: 44 to 58 inches
Mean annual air temperature: 46 to 68 degrees F
Frost-free period: 165 to 205 days
Farmland classification: All areas are prime farmland

Map Unit Composition

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

Description of Gatton

Setting

Landform: Ridges
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Thin fine-loamy loess over clayey residuum weathered from sandstone and shale

Typical profile

H1 - 0 to 6 inches: silt loam
H2 - 6 to 22 inches: silt loam
H3 - 22 to 42 inches: fine sandy loam
H4 - 42 to 65 inches: sandy clay

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: 18 to 30 inches to fragipan
Drainage class: Moderately well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 19 to 29 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Low (about 4.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: D
Hydric soil rating: No

Minor Components

Other soils

Percent of map unit: 9 percent
Hydric soil rating: No

Robertsville, occasionally flooded

Percent of map unit: 1 percent
Landform: Stream terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear

Across-slope shape: Linear
Hydric soil rating: Yes

HnC—Hagerstown silt loam, 6 to 12 percent slopes

Map Unit Setting

National map unit symbol: 2z8yt
Elevation: 380 to 1,060 feet
Mean annual precipitation: 44 to 58 inches
Mean annual air temperature: 46 to 68 degrees F
Frost-free period: 165 to 205 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

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

Description of Hagerstown

Setting

Landform: Ridges
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Clayey residuum weathered from limestone

Typical profile

Ap - 0 to 6 inches: silt loam
Bt1 - 6 to 13 inches: silty clay loam
Bt2 - 13 to 48 inches: clay
R - 48 to 58 inches: bedrock

Properties and qualities

Slope: 6 to 12 percent
Depth to restrictive feature: 40 to 62 inches to lithic bedrock
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 2 percent
Available water capacity: Moderate (about 7.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C

Ecological site: F122XY002KY - Deep Well Drained Limestone Uplands
Other vegetative classification: Trees/Timber (Woody Vegetation)
Hydric soil rating: No

Minor Components

Caneyville
Percent of map unit: 5 percent
Landform: Ridges
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F122XY002KY - Deep Well Drained Limestone Uplands
Other vegetative classification: Trees/Timber (Woody Vegetation)
Hydric soil rating: No

Crider
Percent of map unit: 5 percent
Landform: Ridges
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: F122XY004KY - Loess Veneered Uplands
Other vegetative classification: Trees/Timber (Woody Vegetation)
Hydric soil rating: No

Wilbur, frequently ponded, depression
Percent of map unit: 5 percent
Landform: Sinkholes
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: F122XY017KY - Moist Alluvium
Other vegetative classification: Trees/Timber (Woody Vegetation)
Hydric soil rating: No

Hu—Huntington silt loam

Map Unit Setting
National map unit symbol: lhdp
Elevation: 380 to 1,060 feet
Mean annual precipitation: 44 to 58 inches
Mean annual air temperature: 46 to 68 degrees F
Frost-free period: 165 to 205 days
Farmland classification: Prime farmland if protected from flooding or not frequently flooded during the growing season

Map Unit Composition

Huntington, frequently flooded, and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Huntington, Frequently Flooded

Setting

Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Fine-silty alluvium

Typical profile

H1 - 0 to 6 inches: silt loam
H2 - 6 to 65 inches: silt loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: About 48 to 72 inches
Frequency of flooding: FrequentNone
Frequency of ponding: None
Available water capacity: Moderate (about 8.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B
Hydric soil rating: No

Minor Components

Newark

Percent of map unit: 6 percent
Hydric soil rating: No

Other soils

Percent of map unit: 4 percent
Hydric soil rating: No

Lc—Lawrence silt loam, 0 to 2 percent slopes, rarely flooded

Map Unit Setting

National map unit symbol: 2wlvk
Elevation: 380 to 1,070 feet
Mean annual precipitation: 42 to 66 inches

Mean annual air temperature: 42 to 68 degrees F
Frost-free period: 139 to 210 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Lawrence, rarely flooded, and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Lawrence, Rarely Flooded

Setting

Landform: Stream terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Fine-silty loess over clayey residuum weathered from limestone and dolomite

Typical profile

Ap - 0 to 8 inches: silt loam
Bt - 8 to 20 inches: silt loam
Btx - 20 to 48 inches: silt loam
2Bt - 48 to 54 inches: silty clay loam
2C - 54 to 80 inches: silty clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: 18 to 32 inches to fragipan
Drainage class: Somewhat poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.03 to 0.20 in/hr)
Depth to water table: About 12 to 18 inches
Frequency of flooding: RareNone
Frequency of ponding: None
Available water capacity: Low (about 4.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: D
Hydric soil rating: No

Minor Components

Robertsville, rarely flooded

Percent of map unit: 4 percent
Landform: Stream terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Concave
Hydric soil rating: Yes

Newark, rarely flooded

Percent of map unit: 2 percent
Landform: Flood plains

Landform position (three-dimensional): Talf
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Otwood

Percent of map unit: 2 percent
Landform: Stream terraces
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Linear
Hydric soil rating: No

Mcgary, rarely flooded

Percent of map unit: 2 percent
Landform: Stream terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Ln—Lindside silt loam, 0 to 2 percent slopes, frequently flooded

Map Unit Setting

National map unit symbol: 2wh4d
Elevation: 400 to 940 feet
Mean annual precipitation: 42 to 58 inches
Mean annual air temperature: 45 to 68 degrees F
Frost-free period: 150 to 205 days
Farmland classification: Prime farmland if protected from flooding or not frequently flooded during the growing season

Map Unit Composition

Lindside, frequently flooded, and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Lindside, Frequently Flooded

Setting

Landform: Flood plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Non-acid fine-silty alluvium

Typical profile

Ap - 0 to 7 inches: silt loam
Bw - 7 to 27 inches: silt loam
C - 27 to 80 inches: silty clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.02 to 1.98 in/hr)
Depth to water table: About 20 to 36 inches
Frequency of flooding: NoneFrequent
Frequency of ponding: None
Available water capacity: Very high (about 12.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C
Hydric soil rating: No

Minor Components

Nolin, frequently flooded

Percent of map unit: 10 percent
Landform: Flood plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Huntington, frequently flooded

Percent of map unit: 5 percent
Landform: Flood plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Newark, frequently flooded

Percent of map unit: 3 percent
Landform: Flood plains
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Melvin, frequently flooded

Percent of map unit: 2 percent
Landform: Flood plains
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: Yes

Mv—Melvin silt loam

Map Unit Setting

National map unit symbol: lhdw
Elevation: 380 to 1,060 feet
Mean annual precipitation: 44 to 58 inches
Mean annual air temperature: 46 to 68 degrees F
Frost-free period: 165 to 205 days
Farmland classification: Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season

Map Unit Composition

Melvin, frequently flooded, and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Melvin, Frequently Flooded

Setting

Landform: Flood plains
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Mixed fine-silty alluvium

Typical profile

H1 - 0 to 8 inches: silt loam
H2 - 8 to 66 inches: silt loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: FrequentNone
Frequency of ponding: None
Available water capacity: Very high (about 12.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: B/D
Hydric soil rating: Yes

Minor Components

Other soils

Percent of map unit: 10 percent

Hydric soil rating: No

Nb—Newark silt loam, 0 to 2 percent slopes, frequently flooded

Map Unit Setting

National map unit symbol: 2s2cf
Elevation: 390 to 960 feet
Mean annual precipitation: 40 to 66 inches
Mean annual air temperature: 42 to 68 degrees F
Frost-free period: 139 to 205 days
Farmland classification: Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season

Map Unit Composition

Newark, frequently flooded, and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Newark, Frequently Flooded

Setting

Landform: Flood plains
Landform position (three-dimensional): Talf
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Mixed fine-silty alluvium

Typical profile

Ap - 0 to 8 inches: silt loam
Bg - 8 to 55 inches: silty clay loam
Cg - 55 to 80 inches: silt loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: About 6 to 20 inches
Frequency of flooding: NoneFrequent
Frequency of ponding: None
Available water capacity: High (about 10.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: B/D
Hydric soil rating: No

Minor Components

Nolin, frequently flooded
Percent of map unit: 5 percent
Landform: Flood plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Lindside, frequently flooded
Percent of map unit: 3 percent
Landform: Flood plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Melvin, frequently flooded
Percent of map unit: 2 percent
Landform: Flood plains
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: Yes

No—Nolin silt loam, 0 to 2 percent slopes, frequently flooded

Map Unit Setting
National map unit symbol: 2s2cx
Elevation: 380 to 970 feet
Mean annual precipitation: 43 to 62 inches
Mean annual air temperature: 42 to 68 degrees F
Frost-free period: 145 to 205 days
Farmland classification: Prime farmland if protected from flooding or not frequently flooded during the growing season

Map Unit Composition
Nolin, frequently flooded, and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Nolin, Frequently Flooded

Setting
Landform: Flood plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Mixed fine-silty alluvium

Typical profile

Ap - 0 to 8 inches: silt loam
Bw - 8 to 72 inches: silt loam
C - 72 to 85 inches: loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: NoneFrequent
Frequency of ponding: None
Available water capacity: High (about 10.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B
Hydric soil rating: No

Minor Components

Newark, frequently flooded

Percent of map unit: 5 percent
Landform: Flood plains
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Sensabaugh, frequently flooded

Percent of map unit: 3 percent
Landform: Flood plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Melvin, frequently flooded

Percent of map unit: 2 percent
Landform: Flood plains
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: Yes

OtA—Otwood silt loam, 0 to 2 percent slopes, rarely flooded

Map Unit Setting

National map unit symbol: 2wltw
Elevation: 420 to 890 feet
Mean annual precipitation: 42 to 60 inches
Mean annual air temperature: 44 to 68 degrees F
Frost-free period: 155 to 207 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Otwood, rarely flooded, and similar soils: 83 percent
Minor components: 17 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Otwood, Rarely Flooded

Setting

Landform: Stream terraces
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Mixed fine-silty alluvium over old loamy alluvium

Typical profile

Ap - 0 to 8 inches: silt loam
Bt - 8 to 26 inches: silty clay loam
Btx - 26 to 42 inches: silty clay loam
2BC - 42 to 80 inches: silty clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: 23 to 35 inches to fragipan
Drainage class: Moderately well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: About 20 to 32 inches
Frequency of flooding: RareNone
Frequency of ponding: None
Available water capacity: Low (about 5.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Hydric soil rating: No

Minor Components

Lawrence, rarely flooded
Percent of map unit: 4 percent
Landform: Stream terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Other vegetative classification: Trees/Timber (Woody Vegetation)
Hydric soil rating: No

Elk, rarely flooded
Percent of map unit: 4 percent
Landform: Stream terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Nolin, occasionally flooded
Percent of map unit: 4 percent
Landform: Flood plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Newark, occasionally flooded
Percent of map unit: 3 percent
Landform: Flood plains
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear
Other vegetative classification: Trees/Timber (Woody Vegetation)
Hydric soil rating: No

Otwood, occasionally flooded
Percent of map unit: 2 percent
Landform: Stream terraces
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Linear
Hydric soil rating: No

OtB—Otwood silt loam, 2 to 6 percent slopes, occasionally flooded

Map Unit Setting
National map unit symbol: 2wv50
Elevation: 400 to 950 feet
Mean annual precipitation: 40 to 66 inches

Mean annual air temperature: 44 to 68 degrees F
Frost-free period: 139 to 205 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Otwood, occasionally flooded, and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Otwood, Occasionally Flooded

Setting

Landform: Stream terraces
Landform position (three-dimensional): Riser
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Mixed fine-silty alluvium

Typical profile

Ap - 0 to 10 inches: silt loam
Bt - 10 to 27 inches: silt loam
Btx - 27 to 46 inches: silt loam
B't - 46 to 83 inches: silt loam
C - 83 to 91 inches: loam

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: 23 to 31 inches to fragipan
Drainage class: Moderately well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: About 20 to 28 inches
Frequency of flooding: NoneOccasional
Frequency of ponding: None
Available water capacity: Moderate (about 6.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C
Hydric soil rating: No

Minor Components

Elk, rarely flooded

Percent of map unit: 4 percent
Landform: Stream terraces
Landform position (three-dimensional): Riser
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Lawrence, rarely flooded

Percent of map unit: 4 percent
Landform: Stream terraces
Landform position (three-dimensional): Tread

Down-slope shape: Linear
Across-slope shape: Linear
Other vegetative classification: Trees/Timber (Woody Vegetation)
Hydric soil rating: No

Nolin, occasionally flooded
Percent of map unit: 4 percent
Landform: Flood plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Newark, occasionally flooded
Percent of map unit: 3 percent
Landform: Flood plains
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear
Other vegetative classification: Trees/Timber (Woody Vegetation)
Hydric soil rating: No

PmB—Pembroke silt loam, 2 to 6 percent slopes

Map Unit Setting
National map unit symbol: lhf4
Elevation: 380 to 1,060 feet
Mean annual precipitation: 44 to 58 inches
Mean annual air temperature: 46 to 68 degrees F
Frost-free period: 165 to 205 days
Farmland classification: All areas are prime farmland

Map Unit Composition
Pembroke and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Pembroke

Setting
Landform: Ridges
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Thin fine-silty noncalcareous loess over clayey residuum weathered from limestone

Typical profile
H1 - 0 to 7 inches: silt loam
H2 - 7 to 40 inches: silty clay loam

H3 - 40 to 66 inches: silty clay

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: High (about 11.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B
Hydric soil rating: No

Minor Components

Huntington

Percent of map unit: 4 percent
Hydric soil rating: No

Newark

Percent of map unit: 4 percent
Hydric soil rating: No

Other soils

Percent of map unit: 2 percent
Hydric soil rating: No

PmC—Pembroke silt loam, 6 to 12 percent slopes

Map Unit Setting

National map unit symbol: lhf5
Elevation: 380 to 1,060 feet
Mean annual precipitation: 44 to 58 inches
Mean annual air temperature: 46 to 68 degrees F
Frost-free period: 165 to 205 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

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

Description of Pembroke

Setting

Landform: Ridges
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Thin fine-silty noncalcareous loess over clayey residuum weathered from limestone

Typical profile

H1 - 0 to 7 inches: silt loam
H2 - 7 to 40 inches: silty clay loam
H3 - 40 to 66 inches: silty clay

Properties and qualities

Slope: 6 to 12 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: High (about 11.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Hydric soil rating: No

Minor Components

Newark

Percent of map unit: 3 percent
Hydric soil rating: No

Fredonia

Percent of map unit: 3 percent
Hydric soil rating: No

Huntington

Percent of map unit: 3 percent
Hydric soil rating: No

Other soils

Percent of map unit: 1 percent
Hydric soil rating: No

RbC—Riney loam, 6 to 12 percent slopes

Map Unit Setting

National map unit symbol: lhf7
Elevation: 380 to 1,060 feet
Mean annual precipitation: 44 to 58 inches
Mean annual air temperature: 46 to 68 degrees F
Frost-free period: 165 to 205 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

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

Description of Riney

Setting

Landform: Ridges
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Fine-loamy residuum weathered from sandstone and shale

Typical profile

H1 - 0 to 8 inches: loam
H2 - 8 to 54 inches: sandy clay loam
H3 - 54 to 65 inches: sandy loam

Properties and qualities

Slope: 6 to 12 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Moderate (about 8.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: A
Hydric soil rating: No

Minor Components

Sonora
Percent of map unit: 6 percent
Hydric soil rating: No

Other soils
Percent of map unit: 4 percent
Hydric soil rating: No

RcD3—Riney sandy clay loam, 6 to 20 percent slopes, severely eroded

Map Unit Setting
National map unit symbol: lhfb
Elevation: 380 to 1,060 feet
Mean annual precipitation: 44 to 58 inches
Mean annual air temperature: 46 to 68 degrees F
Frost-free period: 165 to 205 days
Farmland classification: Not prime farmland

Map Unit Composition
Riney, severely eroded, and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Riney, Severely Eroded

Setting
Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Fine-loamy residuum weathered from sandstone and shale

Typical profile
H1 - 0 to 6 inches: sandy clay loam
H2 - 6 to 50 inches: sandy clay loam
H3 - 50 to 64 inches: sandy loam

Properties and qualities
Slope: 6 to 20 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None

Available water capacity: Moderate (about 8.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: A
Hydric soil rating: No

Minor Components

Waynesboro

Percent of map unit: 10 percent
Hydric soil rating: No

Other soils

Percent of map unit: 5 percent
Hydric soil rating: No

SnB—Sonora silt loam, 2 to 6 percent slopes

Map Unit Setting

National map unit symbol: lhfk
Elevation: 380 to 1,060 feet
Mean annual precipitation: 44 to 58 inches
Mean annual air temperature: 46 to 68 degrees F
Frost-free period: 165 to 205 days
Farmland classification: All areas are prime farmland

Map Unit Composition

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

Description of Sonora

Setting

Landform: Ridges
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Fine-loamy noncalcareous loess over clayey residuum weathered from sandstone and shale

Typical profile

H1 - 0 to 9 inches: silt loam
H2 - 9 to 25 inches: silt loam
H3 - 25 to 39 inches: loam
H4 - 39 to 71 inches: sandy clay

Properties and qualities

Slope: 2 to 6 percent

Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: High (about 10.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B
Hydric soil rating: No

Minor Components

Gatton

Percent of map unit: 6 percent
Hydric soil rating: No

Other soils

Percent of map unit: 4 percent
Hydric soil rating: No

SnC—Sonora silt loam, 6 to 12 percent slopes

Map Unit Setting

National map unit symbol: lhfl
Elevation: 380 to 1,060 feet
Mean annual precipitation: 44 to 58 inches
Mean annual air temperature: 46 to 68 degrees F
Frost-free period: 165 to 205 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

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

Description of Sonora

Setting

Landform: Ridges
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Fine-loamy noncalcareous loess over clayey residuum weathered from sandstone and shale

Typical profile

H1 - 0 to 9 inches: silt loam
H2 - 9 to 25 inches: silt loam
H3 - 25 to 39 inches: loam
H4 - 39 to 71 inches: sandy clay

Properties and qualities

Slope: 6 to 12 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: High (about 10.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Hydric soil rating: No

Minor Components

Gatton

Percent of map unit: 6 percent
Hydric soil rating: No

Other soils

Percent of map unit: 4 percent
Hydric soil rating: No

SnC3—Sonora silt loam, 6 to 12 percent slopes, severely eroded

Map Unit Setting

National map unit symbol: lhfm
Elevation: 380 to 1,060 feet
Mean annual precipitation: 44 to 58 inches
Mean annual air temperature: 46 to 68 degrees F
Frost-free period: 165 to 205 days
Farmland classification: Not prime farmland

Map Unit Composition

Sonora, severely eroded, and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Sonora, Severely Eroded

Setting

Landform: Ridges
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Fine-loamy noncalcareous loess over clayey residuum weathered from sandstone and shale

Typical profile

H1 - 0 to 7 inches: silt loam
H2 - 7 to 23 inches: silt loam
H3 - 23 to 37 inches: loam
H4 - 37 to 69 inches: sandy clay

Properties and qualities

Slope: 6 to 12 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: High (about 10.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: B
Hydric soil rating: No

Minor Components

Other soils

Percent of map unit: 10 percent
Hydric soil rating: No

Gatton

Percent of map unit: 5 percent
Hydric soil rating: No

VtD3—Vertrees silty clay loam, 6 to 20 percent slopes, severely eroded

Map Unit Setting

National map unit symbol: lhfr
Elevation: 380 to 1,060 feet
Mean annual precipitation: 44 to 58 inches

Mean annual air temperature: 46 to 68 degrees F
Frost-free period: 165 to 205 days
Farmland classification: Not prime farmland

Map Unit Composition

Vertrees, severely eroded, and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Vertrees, Severely Eroded

Setting

Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Clayey residuum weathered from limestone and/or interbedded shale and siltstone

Typical profile

H1 - 0 to 6 inches: silty clay loam
H2 - 6 to 51 inches: clay
H3 - 51 to 70 inches: clay

Properties and qualities

Slope: 6 to 20 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: High (about 9.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: C
Hydric soil rating: No

Minor Components

Newark

Percent of map unit: 4 percent
Hydric soil rating: No

Nolin

Percent of map unit: 4 percent
Hydric soil rating: No

Crider

Percent of map unit: 4 percent
Hydric soil rating: No

Other soils

Percent of map unit: 3 percent
Hydric soil rating: No

W—Water

Map Unit Setting

National map unit symbol: lhfs
Elevation: 380 to 1,060 feet
Mean annual precipitation: 44 to 58 inches
Mean annual air temperature: 46 to 68 degrees F
Frost-free period: 165 to 205 days
Farmland classification: Not prime farmland

Map Unit Composition

Water: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

WbD—Waynesboro loam, 12 to 20 percent slopes

Map Unit Setting

National map unit symbol: lhfv
Elevation: 380 to 1,060 feet
Mean annual precipitation: 44 to 58 inches
Mean annual air temperature: 46 to 68 degrees F
Frost-free period: 165 to 205 days
Farmland classification: Not prime farmland

Map Unit Composition

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

Description of Waynesboro

Setting

Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Clayey residuum weathered from sandstone and shale

Typical profile

H1 - 0 to 12 inches: loam
H2 - 12 to 30 inches: clay loam
H3 - 30 to 60 inches: clay

Properties and qualities

Slope: 12 to 20 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: High (about 9.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: B
Hydric soil rating: No

Minor Components

Nolin

Percent of map unit: 5 percent
Hydric soil rating: No

Other soils

Percent of map unit: 5 percent
Hydric soil rating: No

Newark

Percent of map unit: 5 percent
Hydric soil rating: No

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

Appendix D – Post-Construction Operation and Maintenance (O&M) Manual

Post-Construction Operation and Maintenance (O&M) Manual for Stormwater Management Facilities

for

Rhudes Creek Solar Project

TOWN OF CECILIA
HARDIN COUNTY, KENTUCKY

KPDES Permit #: _____

Prepared for:
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An ib vogt GmbH company
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Prepared by:
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4900 Ritter Road, Suite 240
Mechanicsburg, PA 17055

May 2021

Table of Contents:

Appendices:

1.0 Introduction

The stormwater management system for the Rhudes Creek Solar Project (Project) consists of vegetated filter buffer, stream crossing, access drive culverts, and swales. The following O&M Manual outlines the minimum requirements for maintaining the stormwater management facilities.

1.1 Purpose of the Manual

This manual is intended to outline the requirements for proper maintenance and operation of the stormwater management facilities associated with the Project. Proper maintenance ensures the following:

- Stormwater facilities operate as they were designed;
- Stormwater facilities remain free of sediment, debris, and potential pollutants; and
- Stormwater facilities do not result in adverse downstream impacts to environmentally sensitive areas.

The Project will be solely-owned, operated, and maintained by ibV Energy Partners. (the Owner). The Owner is responsible for ensuring that the stormwater management facilities installed on the Project Site are properly maintained and that they function as designed. In some cases, the maintenance responsibility may be assigned to others through special maintenance agreements. Stormwater management practice schematics for the Project Site are provided in Appendix A. Maintenance agreements associated with this Project shall be included in Appendix D of this Manual.

This Manual details the various stormwater facility components and the general operation and maintenance activities required for each component.

2.0 Inspection and Maintenance Schedule

The stormwater management systems shall be inspected and maintained regularly to ensure proper site function. Inspection frequency may depend on the stormwater management systems and facilities present at the Project Site.

A Maintenance Inspection Form shall be completed during each inspection to document the Site conditions and required maintenance activities. Maintenance activities may include, but are not limited to, removal of sediment, trash, or debris; vegetation management; erosion repair; and revegetation of exposed soils. A blank sample Maintenance Inspection Form has been included in Appendix B. Completed Maintenance Inspection Forms shall be incorporated into Appendix C.

3.0 First Year Maintenance

The following maintenance activities are required during the first year following Project completion:

- Water vegetation once every three days for the first month, then provide a half inch of water per week during the first year.
- Fertilization may be needed in the fall after the first growing season to increase plant vigor. Fertilizer application and use should be in accordance with local, state, and federal laws and regulations.

- Keep the site free of vehicular and foot traffic and other weight loads.

4.0 General Site Maintenance

Site cover and associated structures should be inspected periodically for the first few months following construction and then on a bi-annual basis. Site inspections should also be performed following major weather events such as, but not limited to, major storm events.

Items to inspect for include, but are not limited to:

- Differential settlement of embankments, cracking, or erosion.
- Lack of vegetative cover density.
- Sediment accumulation on the ground surface or within stormwater management practices or conveyance systems.
- Accumulation of debris, litter, or pollutants such as oil or grease on the ground surface or within stormwater management practices or conveyance systems.
- Damage to or weakness of stormwater management practices or conveyance systems.

4.1 Site Restoration

Areas within a Project Site that have undergone site restoration should be inspected periodically for the first six months and once after each storm event greater than a half-inch.

Items to inspect for include, but are not limited to:

- Checking embankments for subsidence, erosion, cracking, undesirable tree and shrub growth, and the presence of burrowing animals.
- Health and vigor of vegetation such as trees, shrubs, grass, and flowers.
- Accumulation of sediment or vegetative debris such as leaves and branches.

4.2 Tree Planting/Preservation

During the first three years, mulching, watering and protection of young trees is necessary. Inspection of trees should be performed every three months and within the one week of ice storms and high wind events, reaching speeds of 20 mph, until trees have reached maturity. As a minimum, inspection should include assessment of tree health, inspection for evidence of damage or disease, and determining the survival rate of damage and diseased trees. Trees shall be pruned and treated as necessary, and dead trees shall be replaced.

5.0 Winter Maintenance

To prevent impacts to stormwater management facilities, the following winter maintenance limitations, restrictions, and/or requirements are recommended:

- Remove snow and ice from catch basins, inlet and outlet structures, and away from culvert end sections.
- Snow plowed or removed should not be piled at inlets/outlets of stormwater management practices or structures.
- De-icing materials should be limited to sand and “environmentally friendly” chemical products.

- The use of salt mixtures should be kept to a minimum.
- Sand used for de-icing should be clean, coarse material free of fines, silt and clay.

- De-icing materials should be removed during the early spring by sweeping and/or vacuuming.

6.0 Operation and Maintenance Procedures: Stormwater Management Facilities

6.1 Vegetated Filter Strips (Meadow Cover within site)

Vegetated filter strips are vegetated surfaces designed to treat sheet flow from adjacent areas and removed pollutants through filtration and infiltration.

General Inspection Requirements

The filter strips shall be inspected annually for damage and debris. Damage may include, but is not limited to, exposed soils, erosion or channelization.

Erosion and Sedimentation

If sedimentation occurs, the sediment shall be removed with a hand shovel when greater than two inches of sediment is present. If erosion or channelization is experienced, upstream maintenance may be required to repair an underlying problem contributing to the damages.

Vegetation Management

Vegetation within filter strips shall be mowed to a minimum height of six inches with a maximum of two cuttings per year. Exposed soils within filter strips shall be reseeded and mulch, as needed.

7.0 Operation and Maintenance Procedures: Stormwater Structures and Features

7.1 Storm Culverts and Drainage Pipes

Storm culverts and drainage pipes convey stormwater throughout the Project Site. The storm culverts and drainage pipes shall be inspected annually and after major storm events to assess for damage and obstructions. Storm culverts and drainage pipes may experience damage such as cracking, warping due to compaction, or corrosion. The culverts and piping shall be repaired or replaced when 25% or more of the structure has been compromised.

Sediment build-up and debris/trash shall be removed and disposed of at an approved soil waste disposal facility. Improper removal of sediment and debris/trash may result in flooding and adverse impacts to upstream areas. Use of a hand shovel is recommended for sediment removal.

Riprap outlet protection and stone aprons at the outlets of storm culverts and drainage pipes shall be inspected. The inlets and outlets shall be assessed for erosive conditions. Repair to erosion shall be completed as needed.

Vegetation shall be maintained to prevent excess vegetative growth at the inlets and outlets of the culverts and piping.

8.0 Operation and Maintenance Procedures: Miscellaneous Items

8.1 End Sections

End sections are found at the end of pipes and typically include rock outlet protection such as riprap stone aprons. The purpose of riprap aprons placed at the end of pipes is to reduce the velocity, depth, and energy of stormwater, such that the flow will not erode downstream areas.

The end section(s) of pipes, including stone aprons, should be visually inspected for trash and sediment at least twice per year and after major storm events. If trash is observed, it should be removed and disposed of properly. If excess sediment deposition is observed on the stone apron, measures should be taken to remove the sediment. Excessive sedimentation occurs when the stones on the bottom of the apron are no longer visible due to sediment deposition. It is recommended that accumulated sediments be removed with a hand shovel and disposed of off-site at an approved or otherwise authorized solid waste disposal facility.

8.2 Fences, Gates, and Signage

Fences have been installed around the perimeter of the facilities in order to restrict entry to the facility, and to protecting the public and wildlife. Gates have been installed at various locations along the perimeter fencing to allow for maintenance access. Gates are to be secured shut with a lock except when maintenance operations are actively occurring.

Signage shall be installed at the appropriate facilities. The Owner/Operator shall erect or post, in the immediate vicinity of project, a conspicuous and legible.

Inspect the fences, gates, and signage annually for areas needing repair or replacement. Repair or replace damaged or compromised components of the fences, gates, or signage as needed. Maintain the ground underneath the fences and gates as needed to allow safe entry and exit to the stormwater management facility and prevent further erosion impacts. Replace the signage if any information is missing or has been sun-bleached.

8.3 Access Roads, Gravel Parking Areas and Substation Yards

<u>Access Roads</u>

Access roads are to be installed per details. The access road will require little on-going maintenance. The road areas shall be inspected annually and after major storm events to access for trash/debris, erosion, rilling, sedimentation, or gravel migration. Trash/debris shall be removed as needed and disposed of at an approved solid waste facility. Erosion, sedimentation, rilling, or gravel migration shall be repaired. Vegetation along the road areas shall be maintained as needed to allow for safe access to the Project Site.

9.0 Operation and Maintenance Procedures: Repair/Replacement Activities

Damage to on-site stormwater facilities and infrastructure may occur and repair or replacement may be necessary to ensure proper function. Components of the stormwater management practices, conveyance systems, or on-site structures which require repair or replacement should be addressed immediately following identification of deficiencies.

Repair of stormwater management facilities shall be completed as outlined in this Manual. Replacement of stormwater facilities or components of a facility may require assessment and design by a licensed engineer. The Owner/Operator shall read local, state, and federal regulations prior to replacement activities to ensure compliance.

10.0 Contact Information

Questions about the stormwater management systems and operation and maintenance procedures should be directed to ibV Enerty Partners.

Appendix A - Stormwater Management Practice Schematics

Post-Construction O&M Manual: Stormwater Management Practice Schematics

Project Name:	
Owner/Operator:	

1		**2**	

3		**4**	

5		**6**	

7		**8**	

9		**10**	

11		**12**	

Appendix B – Blank Maintenance Inspection Form

Post-Construction Operation and Maintenance Manual: Maintenance Inspection Form

Project Name:	
Inspection Date:	
Inspection Time:	
Inspector's Name:	

Inspection Item	Inspection Frequency	Maintenance Required?	Comments
Swale(s)			
Free of trash, debris, and pollutants?	Monthly		
Erosion and/or sedimentation observed?	Annually		
Channel dewaters between storm events?	Monthly		
Blockage of flow present in the swale, culverts or underdrains?	Monthly		
Vegetation is healthy and sufficient ground cover is observed?	Monthly		
Vegetation is mowed to a minimum height of 8 inches?	Monthly		
Vegetation/Filter Strip Buffer			
Free of trash, debris, and pollutants?	Annually		
Erosion and/or sedimentation observed?	Annually		
Vegetation is healthy and sufficient ground cover is observed?	Annually		
Vegetation is mowed to a minimum height of 6 inches (maximum of 2 cuttings per year)?	Semi Annually		
Storm Culverts and Drainage Pipes			
Free of trash, debris, and pollutants?	Annually		
Culvert/pipe is free of obstructions and functioning properly?	Annually		
Vegetation at the inlet and outlet is properly maintained?	Annually		
Culvert/pipe is not damaged (cracked, warped, corroded, etc.)?	Annually		
25% or more of the culvert/pipe structure has been compromised?	Annually		
Fences, Gates, and Signage			
Fencing and gates are in working order and are not damaged?	Annually		
Signage is legible and displayed clearly?	Annually		
Vegetation is maintained to not impede gated access or block signage?	Annually		
Access Roads			
Road surface is free of riling?	Annually		

Inspection Item	Inspection Frequency	Maintenance Required?	Comments
Geo-web/grid is not exposed?	Annually		
Gravel cover is sufficient, and the road has maintained the proper grade?	Annually		
Erosion and/or sedimentation observed?	Annually		
Free of trash, debris, and pollutants?	Annually		
Vegetation is healthy and sufficient ground cover is observed?	Annually		
Vegetation is mowed to a minimum height of 4 inches?	Annually		

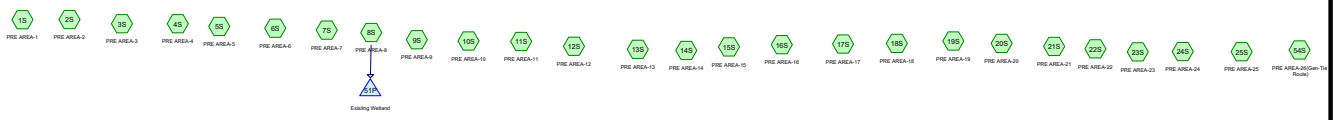
Appendix C – Completed Maintenance Inspection Forms

Appendix D – Maintenance Agreements

Appendix E – Stormwater Management Calculations

Appendix E – Pre Development Drainage Map

Appendix E – Pre Development Hydrocad Report



Subcat Reach Pond Link

Routing Diagram for PRE AND POST ANALYSIS
Prepared by TRC, Printed 5/12/2021
HydroCAD® 10.00-11 s/n 01402 © 2014 HydroCAD Software Solutions LLC

Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
4.830	68	1 acre lots, 20% imp, HSG B (3S, 5S, 6S)
10.200	84	1 acre lots, 20% imp, HSG D (3S, 15S, 16S, 17S)
621.320	69	50-75% Grass cover, Fair, HSG B (1S, 2S, 3S, 4S, 5S, 6S, 7S, 8S, 9S, 10S, 11S, 12S, 13S, 14S, 15S, 16S, 17S, 18S, 19S, 20S, 21S, 22S, 23S, 24S, 25S, 54S)
31.760	79	50-75% Grass cover, Fair, HSG C (10S, 11S, 16S, 17S, 18S, 24S)
388.030	84	50-75% Grass cover, Fair, HSG D (1S, 3S, 4S, 5S, 6S, 7S, 9S, 10S, 12S, 13S, 14S, 15S, 18S)
0.840	85	Gravel roads, HSG B (1S, 2S, 3S, 5S, 6S, 7S)
2.040	91	Gravel roads, HSG D (5S, 6S, 7S, 10S, 11S, 15S, 16S)
0.090	98	Water Surface, 0% imp, HSG B (8S)
11.290	98	Water Surface, 0% imp, HSG D (5S, 6S, 8S, 9S, 15S)
59.530	55	Woods, Good, HSG B (2S, 6S, 7S, 8S, 9S, 11S, 13S, 18S, 19S, 20S, 21S, 22S, 23S, 24S, 25S, 54S)
10.400	70	Woods, Good, HSG C (6S, 18S, 21S, 22S, 23S, 24S)
24.750	77	Woods, Good, HSG D (5S, 6S, 7S, 8S, 9S, 13S, 14S)
1,165.080	**74**	**TOTAL AREA**

Soil Listing (selected nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
686.610	HSG B	1S, 2S, 3S, 4S, 5S, 6S, 7S, 8S, 9S, 10S, 11S, 12S, 13S, 14S, 15S, 16S, 17S, 18S, 19S, 20S, 21S, 22S, 23S, 24S, 25S, 54S
42.160	HSG C	6S, 10S, 11S, 16S, 17S, 18S, 21S, 22S, 23S, 24S
436.310	HSG D	1S, 3S, 4S, 5S, 6S, 7S, 8S, 9S, 10S, 11S, 12S, 13S, 14S, 15S, 16S, 17S, 18S
0.000	Other	
1,165.080		**TOTAL AREA**

Ground Covers (selected nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	4.830	0.000	10.200	0.000	15.030	1 acre lots, 20% imp	3S, 5S, 6S, 15S, 16S, 17S
0.000	621.320	31.760	388.030	0.000	1,041.110	50-75% Grass cover, Fair	1S, 2S, 3S, 4S, 5S, 6S, 7S, 8S, 9S, 10S, 11S, 12S, 13S, 14S, 15S, 16S, 17S, 18S, 19S, 20S, 21S, 22S, 23S, 24S, 25S, 54S
0.000	0.840	0.000	2.040	0.000	2.880	Gravel roads	1S, 2S, 3S, 5S, 6S, 7S, 10S, 11S, 15S, 16S
0.000	0.090	0.000	11.290	0.000	11.380	Water Surface, 0% imp	5S, 6S, 8S, 9S, 15S
0.000	59.530	10.400	24.750	0.000	94.680	Woods, Good	2S, 5S, 6S, 7S, 8S, 9S, 11S, 13S, 14S, 18S, 19S, 20S, 21S, 22S, 23S, 24S, 25S, 54S

Ground Covers (selected nodes) (continued)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	**686.610**	**42.160**	**436.310**	**0.000**	**1,165.080**	**TOTAL AREA**	

Pipe Listing (selected nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Diam/Width (inches)	Height (inches)	Inside-Fill (inches)
1	51P	716.97	716.56	25.0	0.0164	0.011	12.0	0.0	0.0

Time span=0.00-120.00 hrs, dt=0.10 hrs, 1201 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: PRE AREA-1 Runoff Area=26.670 ac 0.00% Impervious Runoff Depth=0.45"
Flow Length=1,700' Tc=33.4 min CN=77 Runoff=8.01 cfs 1.008 af

Subcatchment 2S: PRE AREA-2 Runoff Area=5.380 ac 0.00% Impervious Runoff Depth=0.20"
Flow Length=924' Slope=0.0200 '/' Tc=20.2 min CN=68 Runoff=0.57 cfs 0.089 af

Subcatchment 3S: PRE AREA-3 Runoff Area=67.480 ac 0.40% Impervious Runoff Depth=0.39"
Flow Length=2,190' Tc=41.7 min CN=75 Runoff=13.61 cfs 2.170 af

Subcatchment 4S: PRE AREA-4 Runoff Area=24.880 ac 0.00% Impervious Runoff Depth=0.32"
Flow Length=1,062' Slope=0.0300 '/' Tc=18.5 min CN=73 Runoff=6.54 cfs 0.673 af

Subcatchment 5S: PRE AREA-5 Runoff Area=87.520 ac 0.16% Impervious Runoff Depth=0.42"
Flow Length=2,797' Tc=29.1 min CN=76 Runoff=25.66 cfs 3.055 af

Subcatchment 6S: PRE AREA-6 Runoff Area=346.820 ac 0.18% Impervious Runoff Depth=0.49"
Flow Length=3,249' Tc=38.8 min CN=78 Runoff=104.08 cfs 14.162 af

Subcatchment 7S: PRE AREA-7 Runoff Area=12.290 ac 0.00% Impervious Runoff Depth=0.27"
Flow Length=1,475' Tc=32.9 min CN=71 Runoff=1.66 cfs 0.276 af

Subcatchment 8S: PRE AREA-8 Runoff Area=7.840 ac 0.00% Impervious Runoff Depth=0.06"
Flow Length=1,010' Tc=19.9 min CN=60 Runoff=0.06 cfs 0.041 af

Subcatchment 9S: PRE AREA-9 Runoff Area=37.590 ac 0.00% Impervious Runoff Depth=0.24"
Flow Length=1,873' Tc=12.6 min CN=70 Runoff=7.88 cfs 0.766 af

Subcatchment 10S: PRE AREA-10 Runoff Area=60.170 ac 0.00% Impervious Runoff Depth=0.30"
Flow Length=2,383' Tc=29.8 min CN=72 Runoff=10.23 cfs 1.487 af

Subcatchment 11S: PRE AREA-11 Runoff Area=31.380 ac 0.00% Impervious Runoff Depth=0.30"
Flow Length=1,460' Tc=23.7 min CN=72 Runoff=6.26 cfs 0.775 af

Subcatchment 12S: PRE AREA-12 Runoff Area=15.490 ac 0.00% Impervious Runoff Depth=0.39"
Flow Length=1,523' Tc=24.3 min CN=75 Runoff=4.60 cfs 0.498 af

Subcatchment 13S: PRE AREA-13 Runoff Area=65.330 ac 0.00% Impervious Runoff Depth=0.45"
Flow Length=1,151' Tc=19.2 min CN=77 Runoff=28.15 cfs 2.469 af

Subcatchment 14S: PRE AREA-14 Runoff Area=51.210 ac 0.00% Impervious Runoff Depth=0.61"
Flow Length=2,097' Tc=38.6 min CN=81 Runoff=20.64 cfs 2.607 af

Subcatchment 15S: PRE AREA-15 Runoff Area=61.410 ac 2.64% Impervious Runoff Depth=0.39"
Flow Length=2,893' Tc=25.3 min CN=75 Runoff=17.73 cfs 1.975 af

Subcatchment 16S: PRE AREA-16 Runoff Area=14.540 ac 0.88% Impervious Runoff Depth=0.39"
Flow Length=1,042' Tc=17.4 min CN=75 Runoff=5.33 cfs 0.468 af

Subcatchment 17S: PRE AREA-17 Runoff Area=27.220 ac 0.76% Impervious Runoff Depth=0.35"
Flow Length=1,361' Tc=26.2 min CN=74 Runoff=6.64 cfs 0.804 af

Subcatchment 18S: PRE AREA-18 Runoff Area=19.240 ac 0.00% Impervious Runoff Depth=0.22"
Flow Length=1,364' Tc=10.7 min CN=69 Runoff=3.46 cfs 0.353 af

Subcatchment 19S: PRE AREA-19 Runoff Area=3.030 ac 0.00% Impervious Runoff Depth=0.09"
Flow Length=454' Tc=8.4 min CN=62 Runoff=0.05 cfs 0.022 af

Subcatchment 20S: PRE AREA-20 Runoff Area=5.100 ac 0.00% Impervious Runoff Depth=0.18"
Flow Length=537' Slope=0.0300 '/' Tc=11.3 min CN=67 Runoff=0.59 cfs 0.075 af

Subcatchment 21S: PRE AREA-21 Runoff Area=16.470 ac 0.00% Impervious Runoff Depth=0.20"
Flow Length=901' Tc=15.6 min CN=68 Runoff=2.04 cfs 0.272 af

Subcatchment 22S: PRE AREA-22 Runoff Area=18.460 ac 0.00% Impervious Runoff Depth=0.16"
Flow Length=1,173' Tc=16.1 min CN=66 Runoff=1.31 cfs 0.241 af

Subcatchment 23S: PRE AREA-23 Runoff Area=9.330 ac 0.00% Impervious Runoff Depth=0.12"
Flow Length=684' Tc=15.5 min CN=64 Runoff=0.35 cfs 0.094 af

Subcatchment 24S: PRE AREA-24 Runoff Area=26.870 ac 0.00% Impervious Runoff Depth=0.18"
Flow Length=1,715' Tc=38.0 min CN=67 Runoff=1.55 cfs 0.395 af

Subcatchment 25S: PRE AREA-25 Runoff Area=74.130 ac 0.00% Impervious Runoff Depth=0.18"
Flow Length=1,256' Tc=20.1 min CN=67 Runoff=6.24 cfs 1.091 af

Subcatchment 54S: PRE AREA-26(Gen-Tie Runoff Area=49.230 ac 0.00% Impervious Runoff Depth=0.18"
Flow Length=2,505' Tc=62.6 min CN=67 Runoff=2.14 cfs 0.724 af

Pond 51P: Exisitng Wetland Peak Elev=716.59' Storage=1,773 cf Inflow=0.06 cfs 0.041 af
12.0" Round Culvert n=0.011 L=25.0' S=0.0164 '/' Outflow=0.00 cfs 0.000 af

Total Runoff Area = 1,165.080 ac Runoff Volume = 36.589 af Average Runoff Depth = 0.38"
99.74% Pervious = 1,162.074 ac 0.26% Impervious = 3.006 ac

Summary for Subcatchment 1S: PRE AREA-1

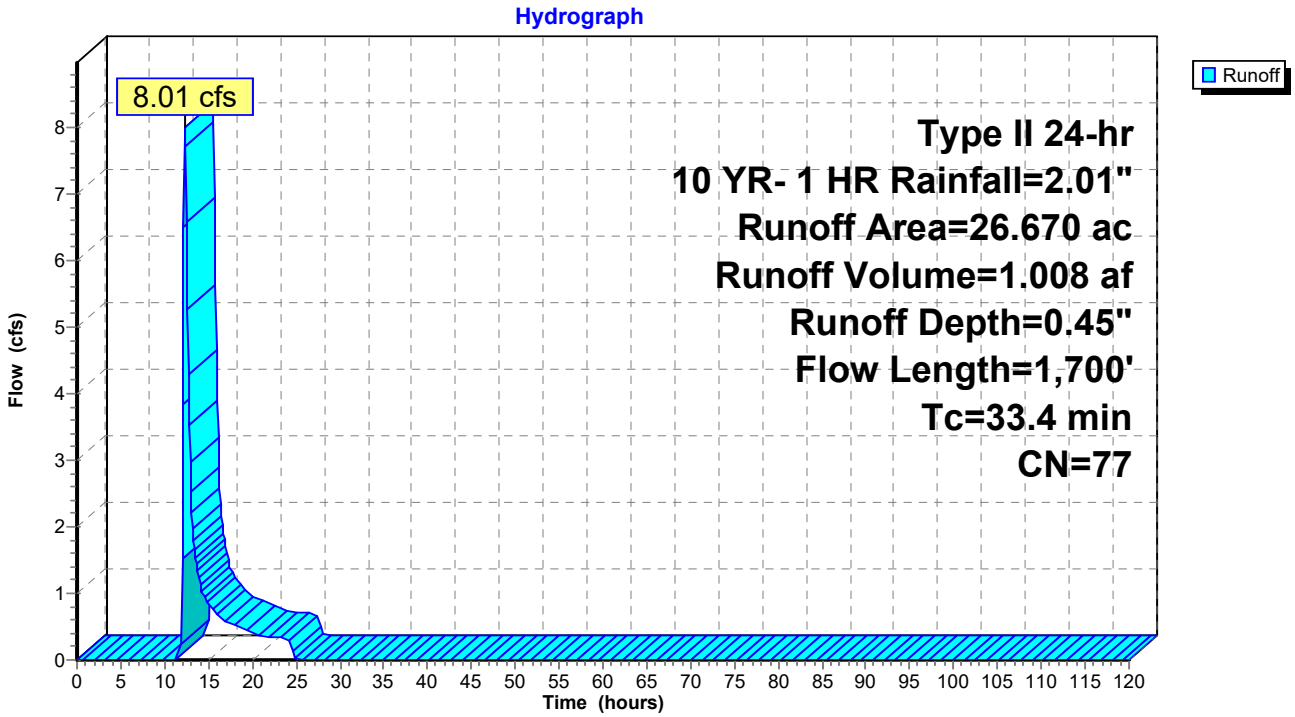
Runoff = 8.01 cfs @ 12.34 hrs, Volume= 1.008 af, Depth= 0.45"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 24-hr 10 YR- 1 HR Rainfall=2.01"

Area (ac)	CN	Description
12.830	69	50-75% Grass cover, Fair, HSG B
13.540	84	50-75% Grass cover, Fair, HSG D
0.300	85	Gravel roads, HSG B
26.670	77	Weighted Average
26.670		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.9	50	0.1000	0.29		**Sheet Flow, SF-1** Grass: Short n= 0.150 P2= 3.39"
6.0	620	0.0600	1.71		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
24.5	1,030	0.0100	0.70		**Shallow Concentrated Flow, SCF-2** Short Grass Pasture Kv= 7.0 fps
33.4	1,700	Total			

Subcatchment 1S: PRE AREA-1



Summary for Subcatchment 2S: PRE AREA-2

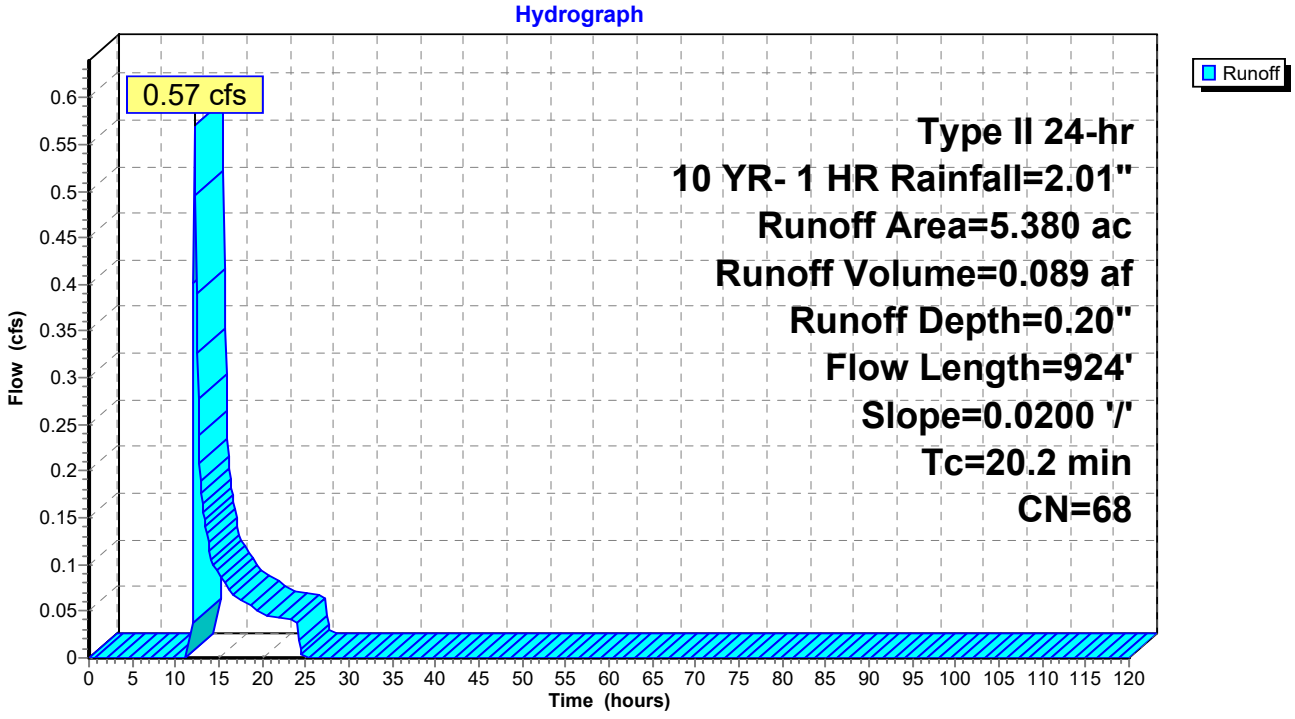
Runoff = 0.57 cfs @ 12.22 hrs, Volume= 0.089 af, Depth= 0.20"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 24-hr 10 YR- 1 HR Rainfall=2.01"

Area (ac)	CN	Description
4.790	69	50-75% Grass cover, Fair, HSG B
0.550	55	Woods, Good, HSG B
0.040	85	Gravel roads, HSG B
5.380	68	Weighted Average
5.380		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.5	50	0.0200	0.15		**Sheet Flow, SF-1** Grass: Short n= 0.150 P2= 3.39"
14.7	874	0.0200	0.99		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
20.2	924	Total			

Subcatchment 2S: PRE AREA-2



Summary for Subcatchment 3S: PRE AREA-3

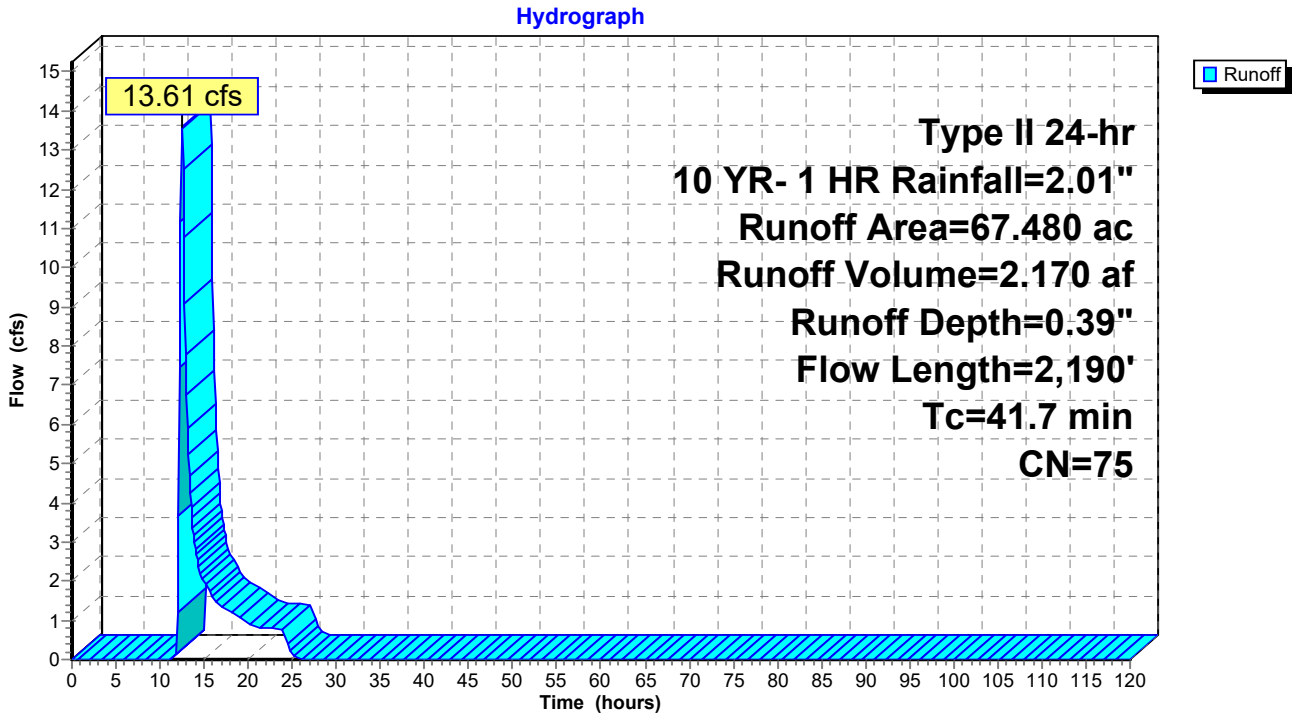
Runoff = 13.61 cfs @ 12.47 hrs, Volume= 2.170 af, Depth= 0.39"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 24-hr 10 YR- 1 HR Rainfall=2.01"

Area (ac)	CN	Description
40.400	69	50-75% Grass cover, Fair, HSG B
25.610	84	50-75% Grass cover, Fair, HSG D
0.120	85	Gravel roads, HSG B
0.930	68	1 acre lots, 20% imp, HSG B
0.420	84	1 acre lots, 20% imp, HSG D
67.480	75	Weighted Average
67.210		99.60% Pervious Area
0.270		0.40% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.1	50	0.0800	0.27		**Sheet Flow, SF-1** Grass: Short n= 0.150 P2= 3.39"
8.5	874	0.0600	1.71		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
30.1	1,266	0.0100	0.70		**Shallow Concentrated Flow, SCF-2** Short Grass Pasture Kv= 7.0 fps
41.7	2,190	Total			

Subcatchment 3S: PRE AREA-3



Summary for Subcatchment 4S: PRE AREA-4

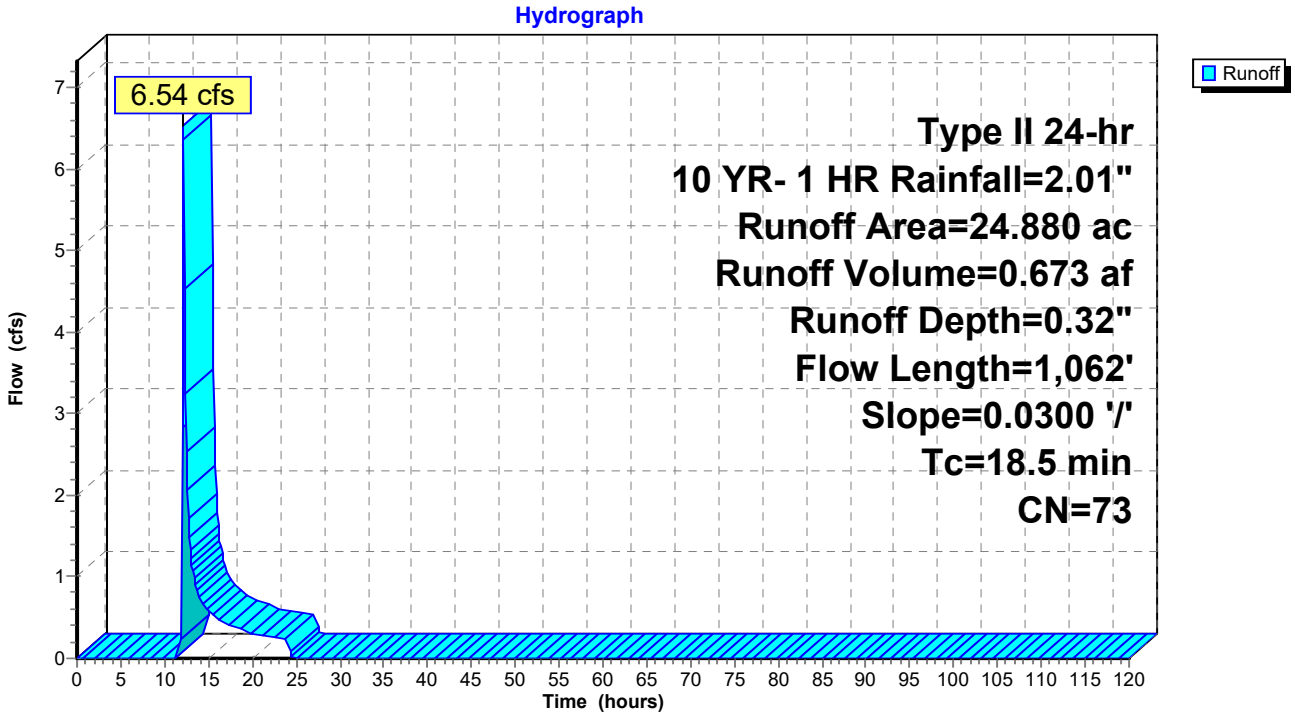
Runoff = 6.54 cfs @ 12.16 hrs, Volume= 0.673 af, Depth= 0.32"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 24-hr 10 YR- 1 HR Rainfall=2.01"

Area (ac)	CN	Description
18.430	69	50-75% Grass cover, Fair, HSG B
6.450	84	50-75% Grass cover, Fair, HSG D
24.880	73	Weighted Average
24.880		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.6	50	0.0300	0.18		**Sheet Flow, SF-1** Grass: Short n= 0.150 P2= 3.39"
13.9	1,012	0.0300	1.21		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
18.5	1,062	Total			

Subcatchment 4S: PRE AREA-4



Summary for Subcatchment 5S: PRE AREA-5

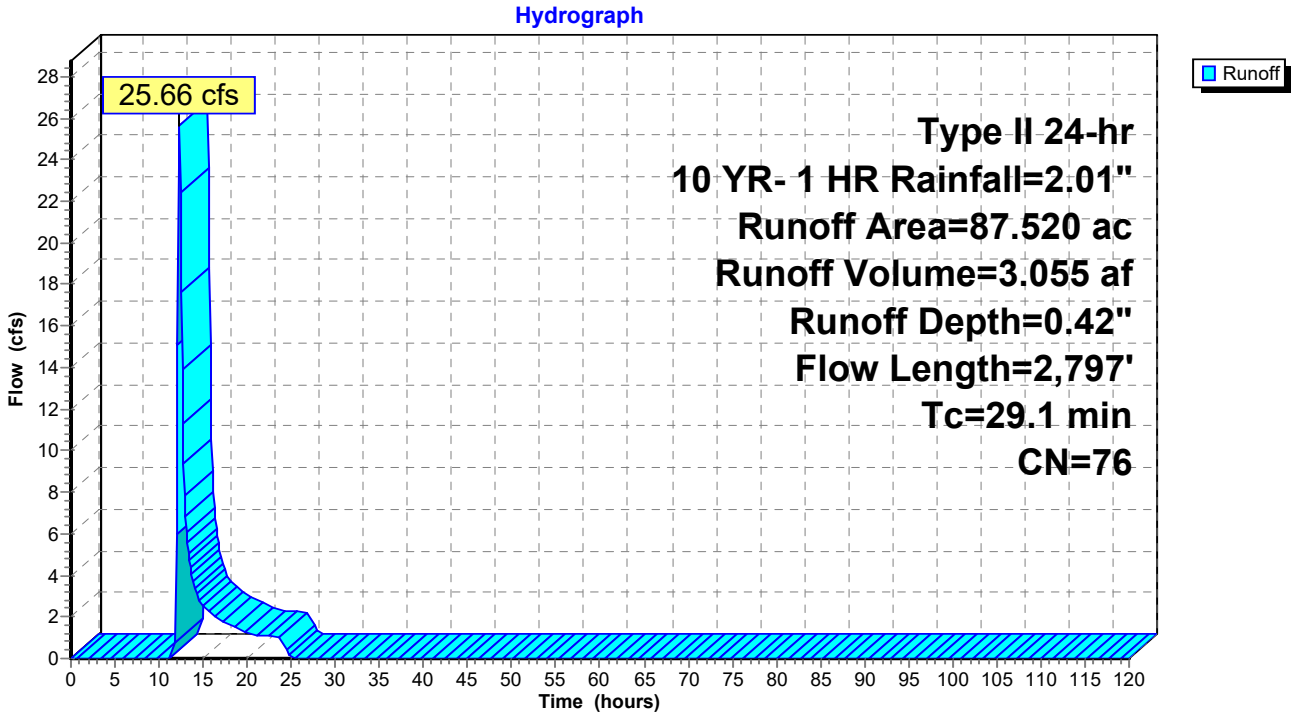
Runoff = 25.66 cfs @ 12.29 hrs, Volume= 3.055 af, Depth= 0.42"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 24-hr 10 YR- 1 HR Rainfall=2.01"

Area (ac)	CN	Description
45.210	69	50-75% Grass cover, Fair, HSG B
35.470	84	50-75% Grass cover, Fair, HSG D
2.950	98	Water Surface, 0% imp, HSG D
0.120	85	Gravel roads, HSG B
0.290	91	Gravel roads, HSG D
0.700	68	1 acre lots, 20% imp, HSG B
2.780	77	Woods, Good, HSG D
87.520	76	Weighted Average
87.380		99.84% Pervious Area
0.140		0.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.5	50	0.0600	0.24		**Sheet Flow, SF-1** Grass: Short n= 0.150 P2= 3.39"
13.3	968	0.0300	1.21		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
12.3	1,779	0.0060	2.42	8.46	**Channel Flow, CF-1** Area= 3.5 sf Perim= 7.0' r= 0.50' n= 0.030 Earth, grassed & winding
29.1	2,797	Total			

Subcatchment 5S: PRE AREA-5



Summary for Subcatchment 6S: PRE AREA-6

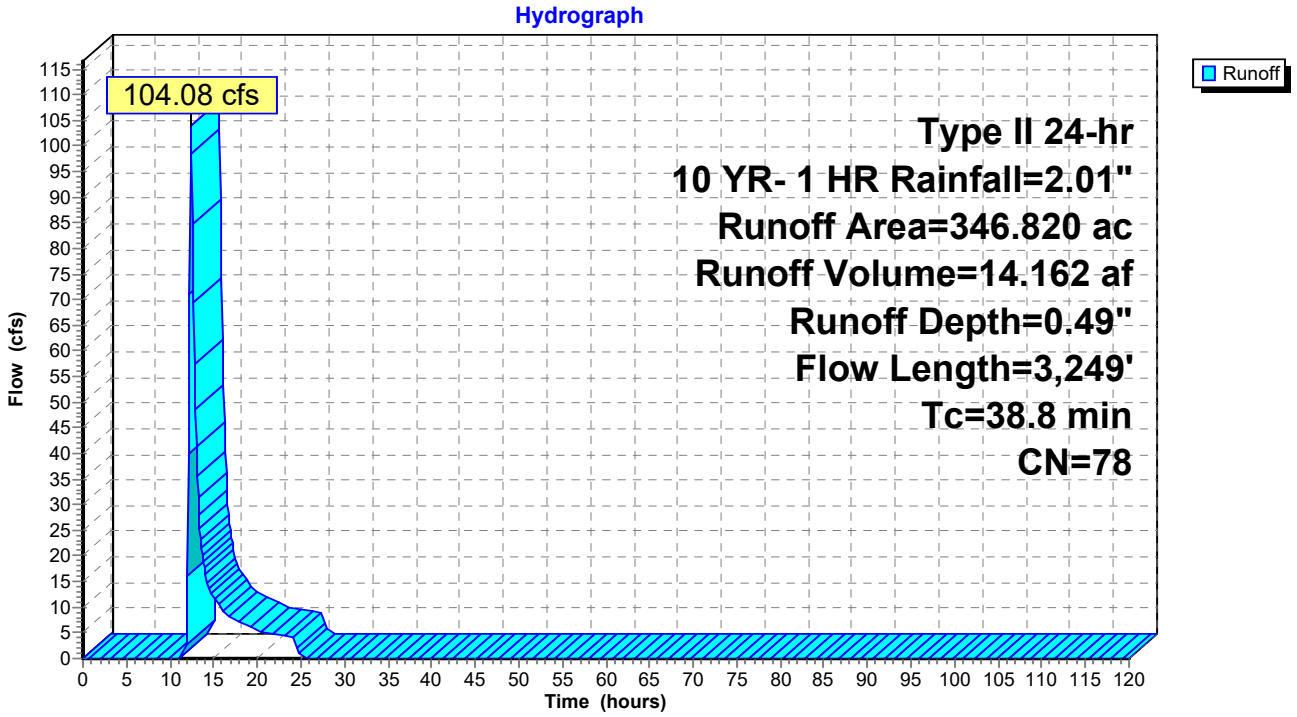
Runoff = 104.08 cfs @ 12.41 hrs, Volume= 14.162 af, Depth= 0.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 24-hr 10 YR- 1 HR Rainfall=2.01"

Area (ac)	CN	Description
120.060	69	50-75% Grass cover, Fair, HSG B
202.980	84	50-75% Grass cover, Fair, HSG D
6.950	98	Water Surface, 0% imp, HSG D
0.050	85	Gravel roads, HSG B
0.340	91	Gravel roads, HSG D
3.200	68	1 acre lots, 20% imp, HSG B
9.640	55	Woods, Good, HSG B
0.500	70	Woods, Good, HSG C
3.100	77	Woods, Good, HSG D
346.820	78	Weighted Average
346.180		99.82% Pervious Area
0.640		0.18% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.2	50	0.0100	0.12		**Sheet Flow, SF-1** Grass: Short n= 0.150 P2= 3.39"
25.2	1,499	0.0200	0.99		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
6.4	1,700	0.0200	4.41	15.45	**Channel Flow, CF-1** Area= 3.5 sf Perim= 7.0' r= 0.50' n= 0.030 Earth, grassed & winding
38.8	3,249	Total			

Subcatchment 6S: PRE AREA-6



Summary for Subcatchment 7S: PRE AREA-7

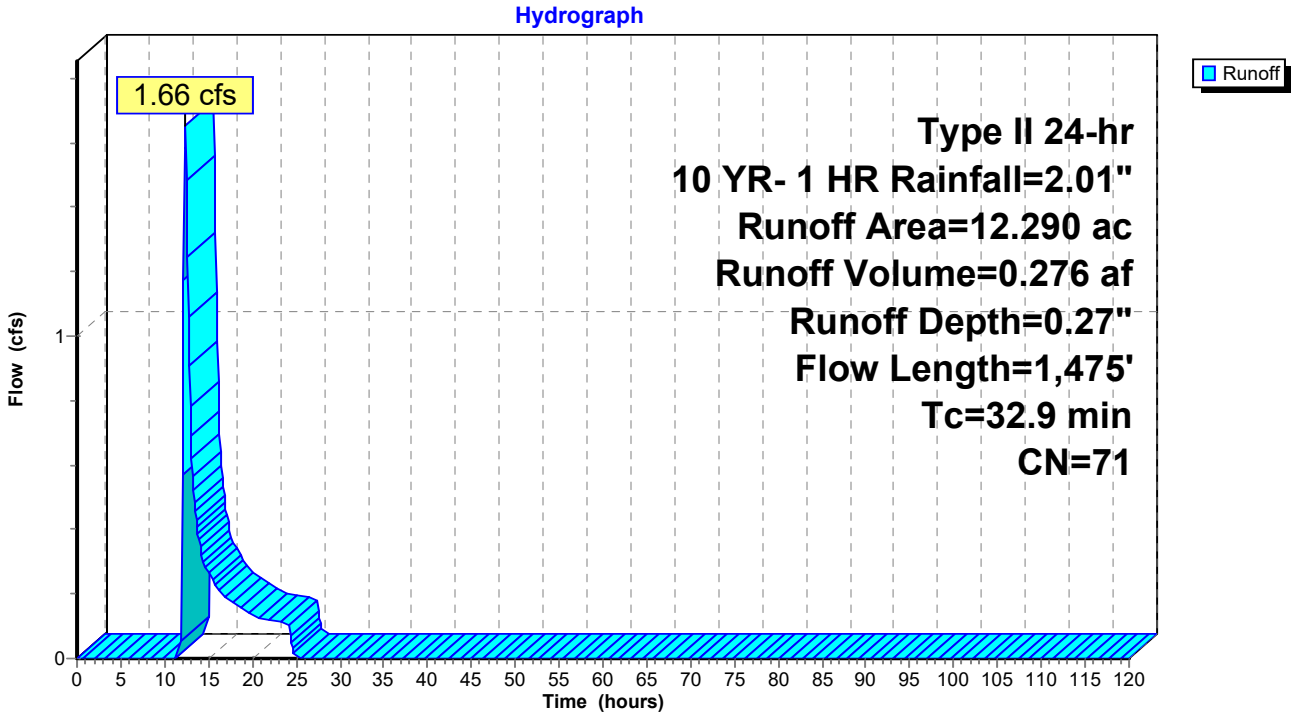
Runoff = 1.66 cfs @ 12.38 hrs, Volume= 0.276 af, Depth= 0.27"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 24-hr 10 YR- 1 HR Rainfall=2.01"

Area (ac)	CN	Description
5.940	69	50-75% Grass cover, Fair, HSG B
1.930	84	50-75% Grass cover, Fair, HSG D
0.210	85	Gravel roads, HSG B
0.270	91	Gravel roads, HSG D
1.940	55	Woods, Good, HSG B
2.000	77	Woods, Good, HSG D
12.290	71	Weighted Average
12.290		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.2	50	0.0100	0.12		**Sheet Flow, SF-1** Grass: Short n= 0.150 P2= 3.39"
2.0	86	0.0100	0.70		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
0.2	18	0.0100	1.61		**Shallow Concentrated Flow, SCF-2** Unpaved Kv= 16.1 fps
8.6	625	0.0300	1.21		**Shallow Concentrated Flow, SCF-3** Short Grass Pasture Kv= 7.0 fps
0.2	18	0.0100	1.61		**Shallow Concentrated Flow, SCF-4** Unpaved Kv= 16.1 fps
3.4	200	0.0200	0.99		**Shallow Concentrated Flow, SCF-5** Short Grass Pasture Kv= 7.0 fps
11.3	478	0.0200	0.71		**Shallow Concentrated Flow, SCF-5** Woodland Kv= 5.0 fps
32.9	1,475	Total			

Subcatchment 7S: PRE AREA-7



Summary for Subcatchment 8S: PRE AREA-8

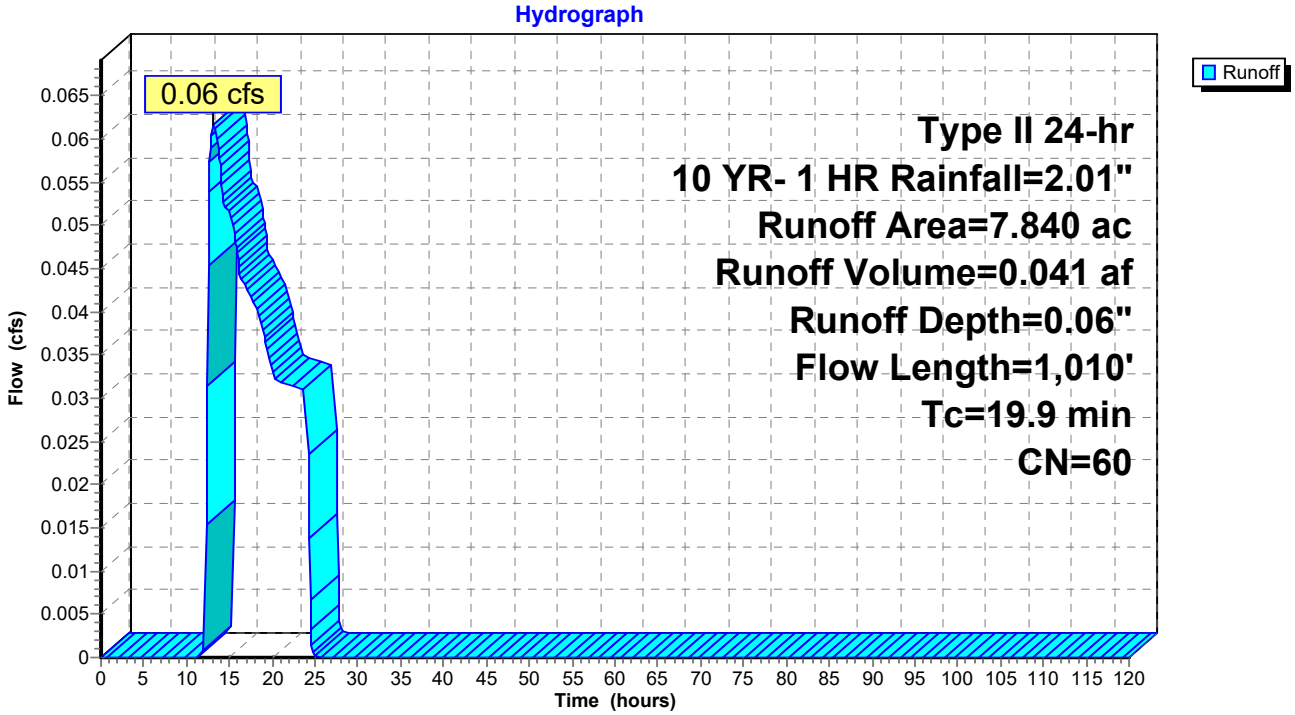
Runoff = 0.06 cfs @ 13.11 hrs, Volume= 0.041 af, Depth= 0.06"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 24-hr 10 YR- 1 HR Rainfall=2.01"

Area (ac)	CN	Description
0.100	69	50-75% Grass cover, Fair, HSG B
6.180	55	Woods, Good, HSG B
1.390	77	Woods, Good, HSG D
0.090	98	Water Surface, 0% imp, HSG B
0.080	98	Water Surface, 0% imp, HSG D
7.840	60	Weighted Average
7.840		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.5	50	0.0220	0.07		**Sheet Flow, SF-1** Woods: Light underbrush n= 0.400 P2= 3.39"
7.6	510	0.0500	1.12		**Shallow Concentrated Flow, SCF-1** Woodland Kv= 5.0 fps
0.8	450	0.0500	9.08	23.62	**Channel Flow, CF-1** Area= 2.6 sf Perim= 3.5' r= 0.74' n= 0.030 Earth, grassed & winding
19.9	1,010	Total			

Subcatchment 8S: PRE AREA-8



Summary for Subcatchment 9S: PRE AREA-9

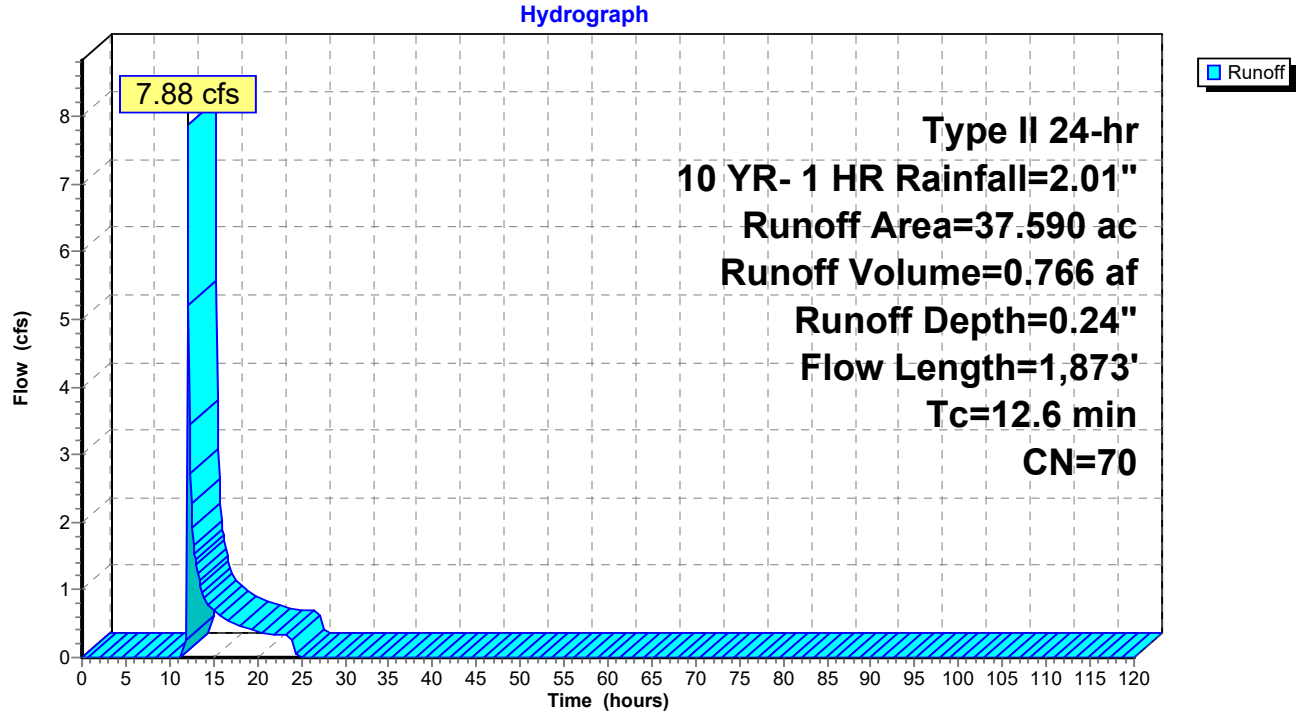
Runoff = 7.88 cfs @ 12.10 hrs, Volume= 0.766 af, Depth= 0.24"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 24-hr 10 YR- 1 HR Rainfall=2.01"

Area (ac)	CN	Description
33.190	69	50-75% Grass cover, Fair, HSG B
2.170	84	50-75% Grass cover, Fair, HSG D
0.910	55	Woods, Good, HSG B
0.610	77	Woods, Good, HSG D
0.710	98	Water Surface, 0% imp, HSG D
37.590	70	Weighted Average
37.590		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.5	50	0.0600	0.24		**Sheet Flow, SF-1** Grass: Short n= 0.150 P2= 3.39"
6.6	481	0.0300	1.21		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
2.5	1,342	0.0500	9.08	23.62	**Channel Flow, CF-1** Area= 2.6 sf Perim= 3.5' r= 0.74' n= 0.030 Earth, grassed & winding
12.6	1,873	Total			

Subcatchment 9S: PRE AREA-9



Summary for Subcatchment 10S: PRE AREA-10

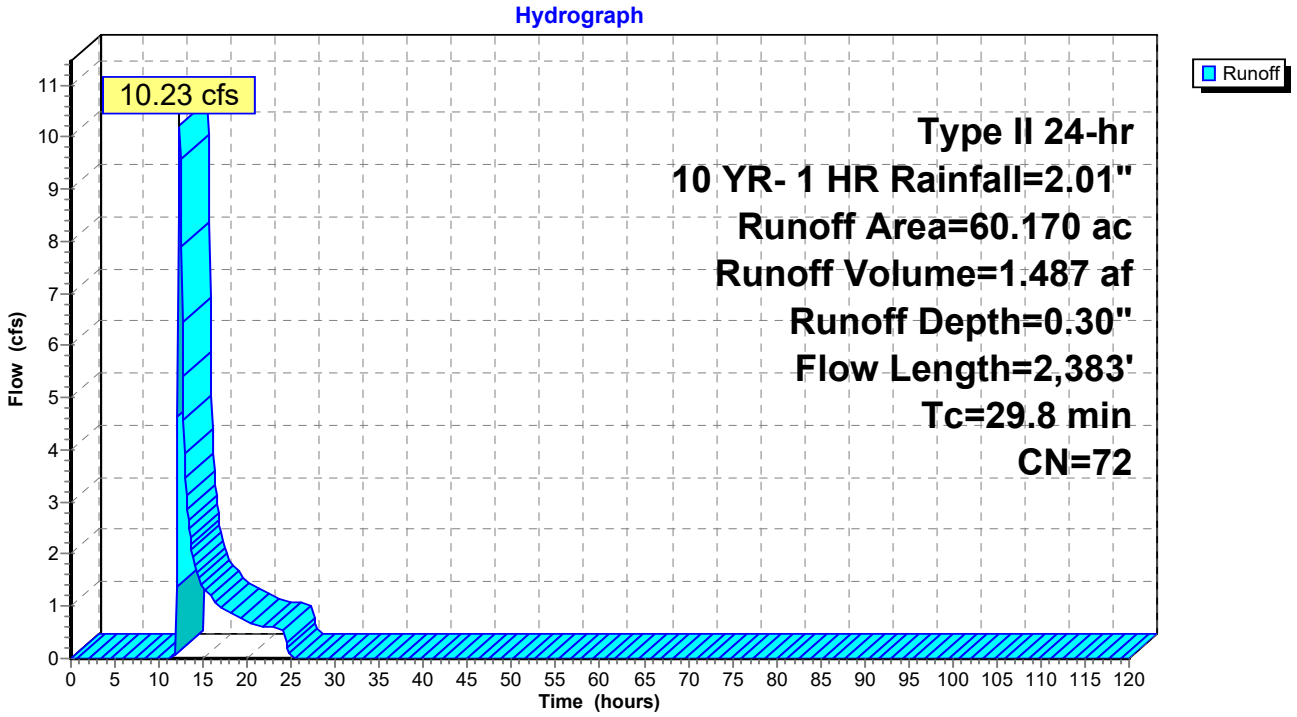
Runoff = 10.23 cfs @ 12.32 hrs, Volume= 1.487 af, Depth= 0.30"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 24-hr 10 YR- 1 HR Rainfall=2.01"

Area (ac)	CN	Description
49.000	69	50-75% Grass cover, Fair, HSG B
2.980	79	50-75% Grass cover, Fair, HSG C
7.920	84	50-75% Grass cover, Fair, HSG D
0.270	91	Gravel roads, HSG D
60.170	72	Weighted Average
60.170		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.6	50	0.0300	0.18		**Sheet Flow, SF-1** Grass: Short n= 0.150 P2= 3.39"
3.5	357	0.0600	1.71		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
19.8	1,178	0.0200	0.99		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
1.9	798	0.0300	7.17	46.63	**Channel Flow, CF-1** Area= 6.5 sf Perim= 8.5' r= 0.76' n= 0.030 Earth, grassed & winding
29.8	2,383	Total			

Subcatchment 10S: PRE AREA-10



Summary for Subcatchment 11S: PRE AREA-11

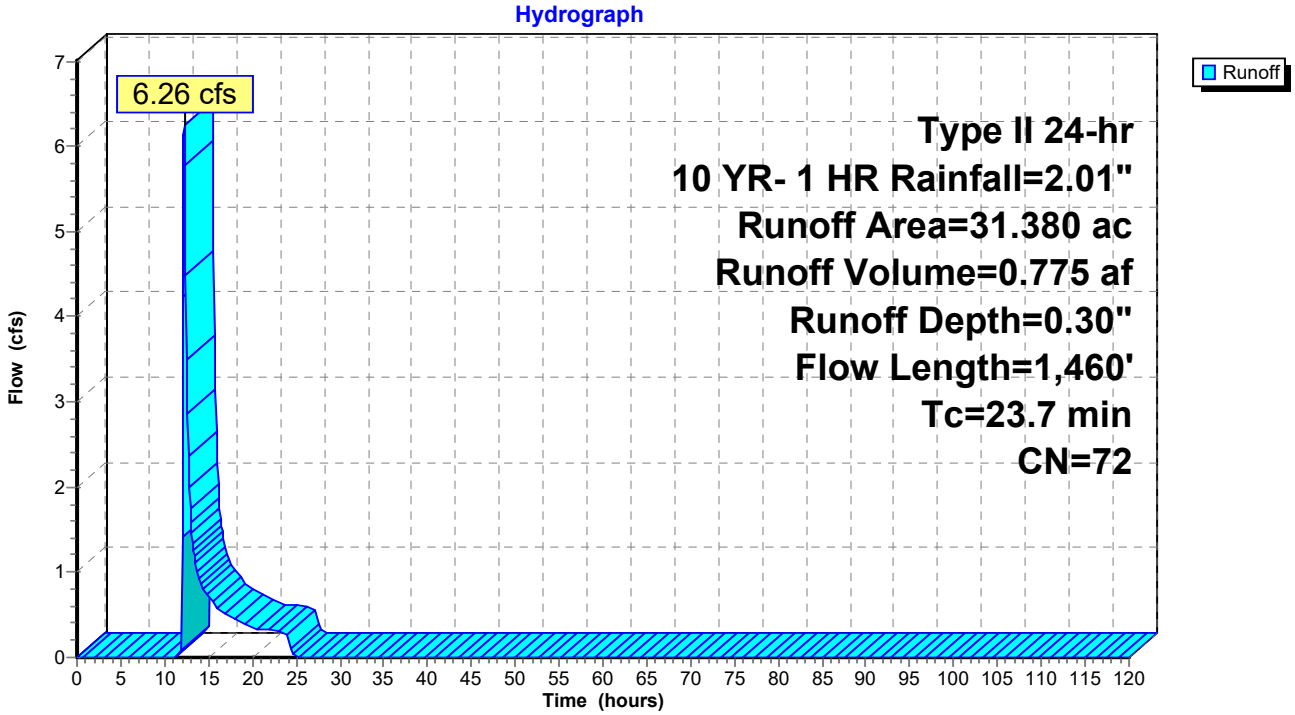
Runoff = 6.26 cfs @ 12.23 hrs, Volume= 0.775 af, Depth= 0.30"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 24-hr 10 YR- 1 HR Rainfall=2.01"

Area (ac)	CN	Description
21.950	69	50-75% Grass cover, Fair, HSG B
9.290	79	50-75% Grass cover, Fair, HSG C
0.110	55	Woods, Good, HSG B
0.030	91	Gravel roads, HSG D
31.380	72	Weighted Average
31.380		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.4	50	0.1500	0.34		**Sheet Flow, SF-1** Grass: Short n= 0.150 P2= 3.39"
2.5	292	0.0800	1.98		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
18.8	1,118	0.0200	0.99		**Shallow Concentrated Flow, SCF-2** Short Grass Pasture Kv= 7.0 fps
23.7	1,460	Total			

Subcatchment 11S: PRE AREA-11



Summary for Subcatchment 12S: PRE AREA-12

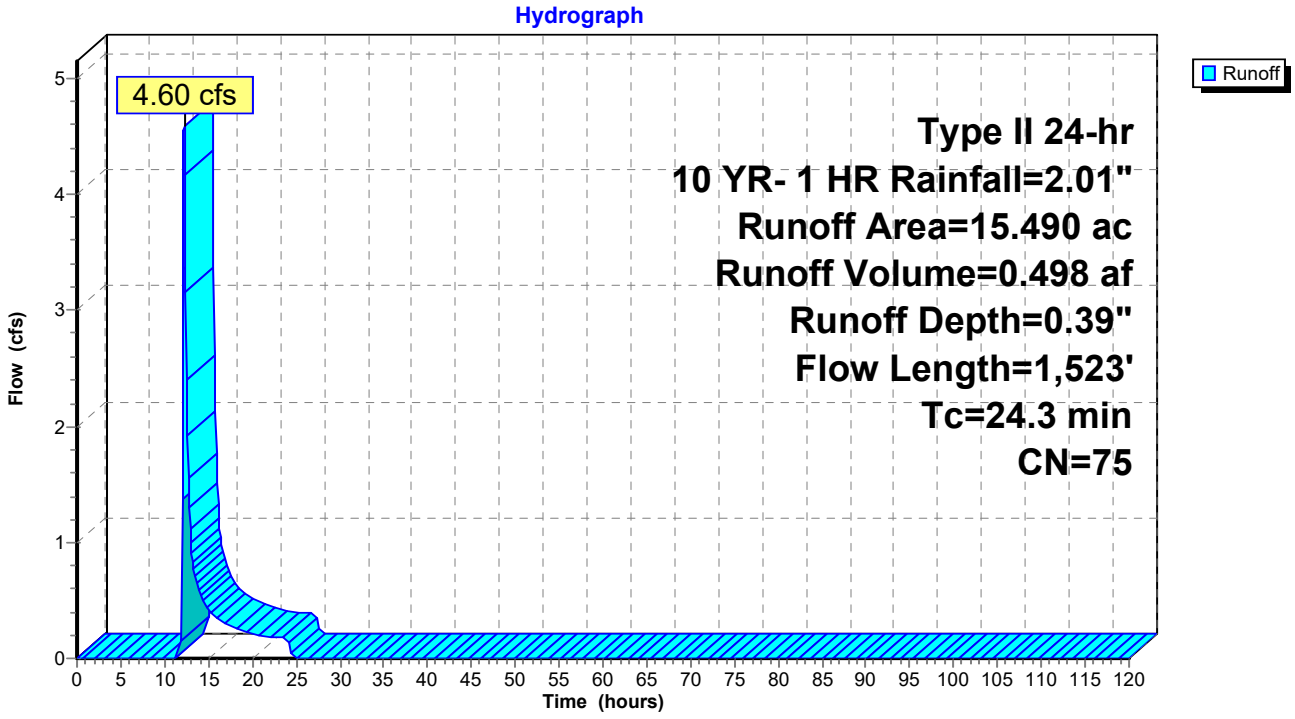
Runoff = 4.60 cfs @ 12.23 hrs, Volume= 0.498 af, Depth= 0.39"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 24-hr 10 YR- 1 HR Rainfall=2.01"

Area (ac)	CN	Description
9.730	69	50-75% Grass cover, Fair, HSG B
5.760	84	50-75% Grass cover, Fair, HSG D
15.490	75	Weighted Average
15.490		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.1	50	0.0400	0.20		**Sheet Flow, SF-1** Grass: Short n= 0.150 P2= 3.39"
20.2	1,473	0.0300	1.21		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
24.3	1,523	Total			

Subcatchment 12S: PRE AREA-12



Summary for Subcatchment 13S: PRE AREA-13

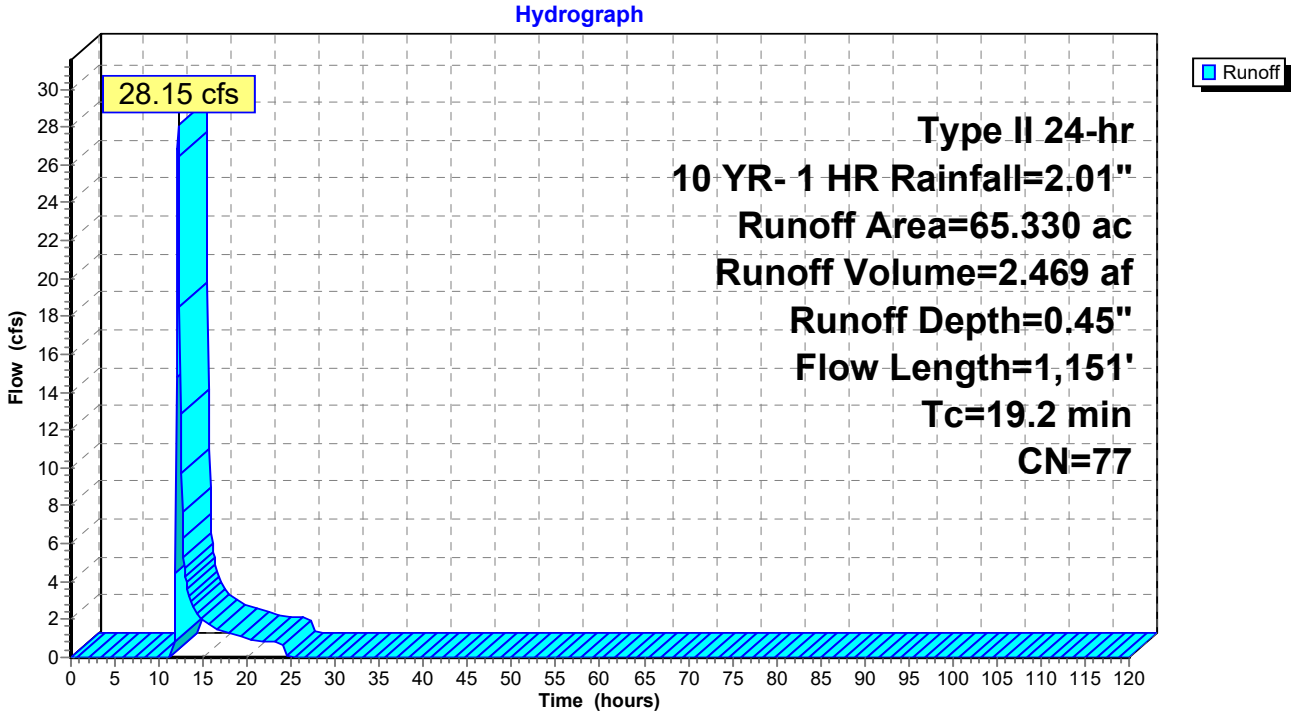
Runoff = 28.15 cfs @ 12.15 hrs, Volume= 2.469 af, Depth= 0.45"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 24-hr 10 YR- 1 HR Rainfall=2.01"

Area (ac)	CN	Description
17.980	69	50-75% Grass cover, Fair, HSG B
28.940	84	50-75% Grass cover, Fair, HSG D
3.610	55	Woods, Good, HSG B
14.800	77	Woods, Good, HSG D
65.330	77	Weighted Average
65.330		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.1	50	0.0400	0.20		**Sheet Flow, SF-1** Grass: Short n= 0.150 P2= 3.39"
15.1	1,101	0.0300	1.21		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
19.2	1,151	Total			

Subcatchment 13S: PRE AREA-13



Summary for Subcatchment 14S: PRE AREA-14

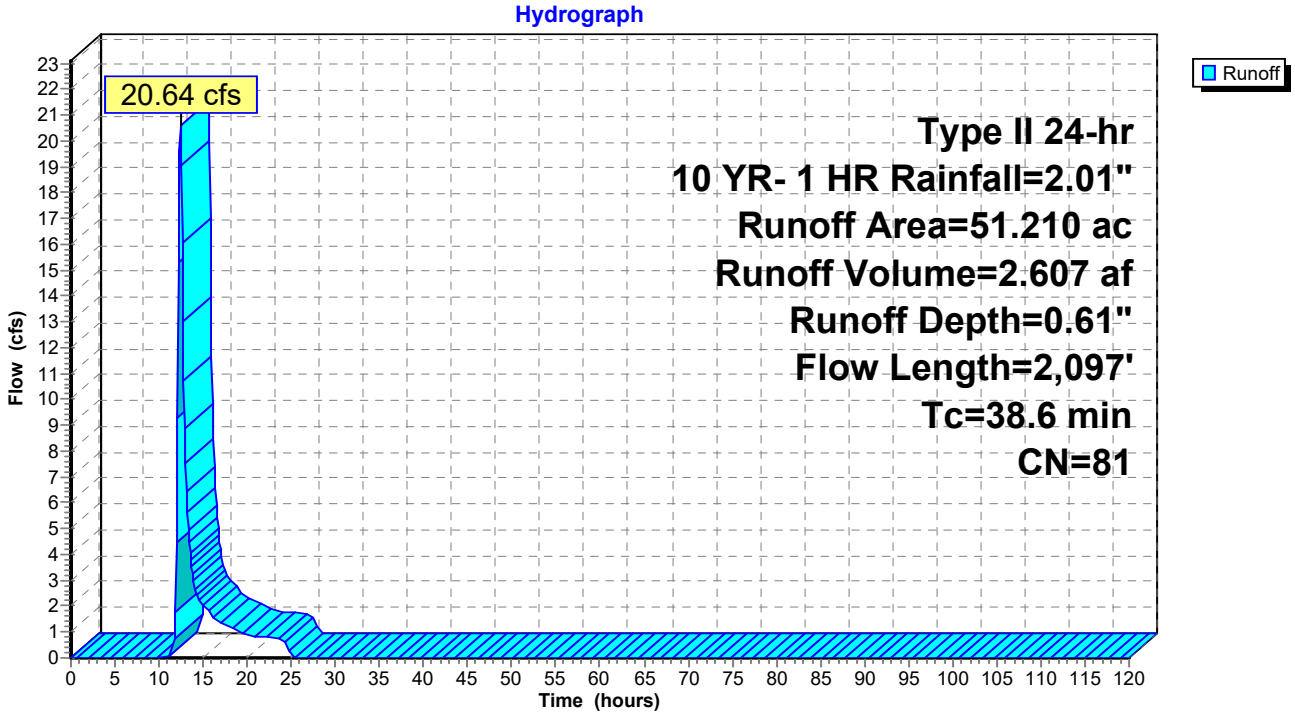
Runoff = 20.64 cfs @ 12.39 hrs, Volume= 2.607 af, Depth= 0.61"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 24-hr 10 YR- 1 HR Rainfall=2.01"

Area (ac)	CN	Description
10.700	69	50-75% Grass cover, Fair, HSG B
40.440	84	50-75% Grass cover, Fair, HSG D
0.070	77	Woods, Good, HSG D
51.210	81	Weighted Average
51.210		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.1	50	0.0400	0.20		**Sheet Flow, SF-1** Grass: Short n= 0.150 P2= 3.39"
34.5	2,047	0.0200	0.99		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
38.6	2,097	Total			

Subcatchment 14S: PRE AREA-14



Summary for Subcatchment 15S: PRE AREA-15

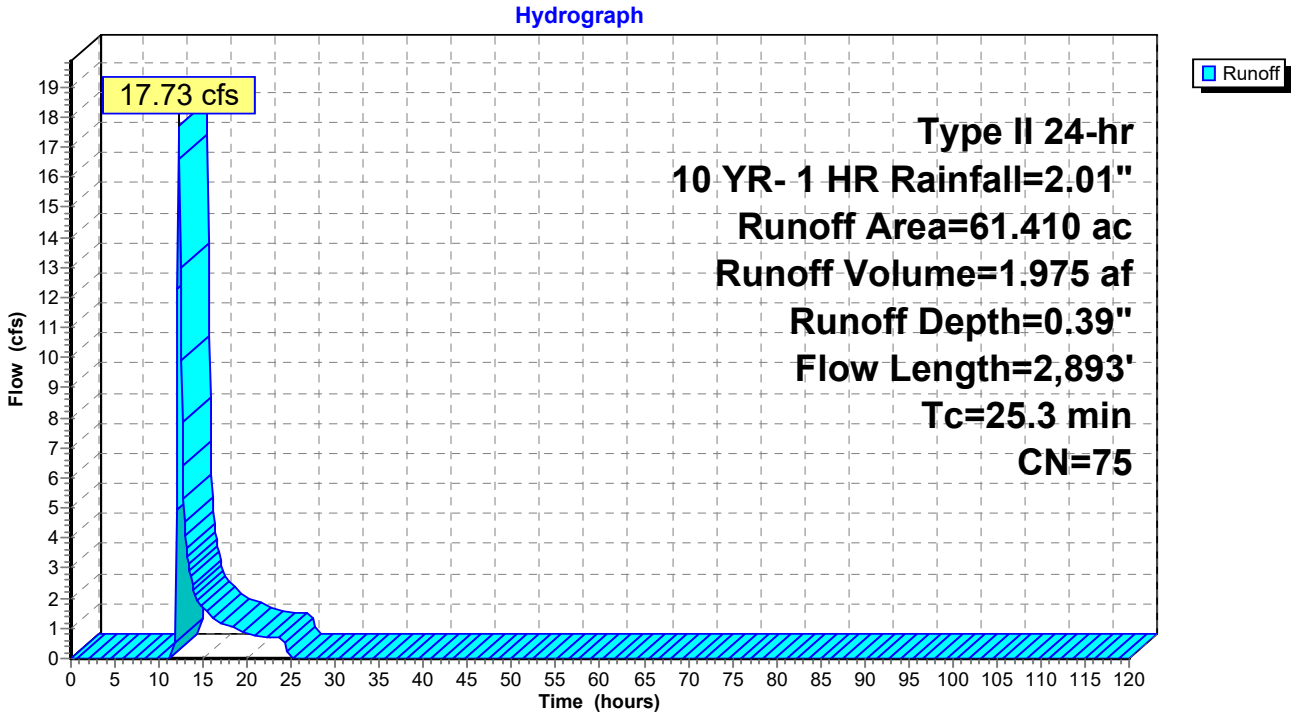
Runoff = 17.73 cfs @ 12.24 hrs, Volume= 1.975 af, Depth= 0.39"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 24-hr 10 YR- 1 HR Rainfall=2.01"

Area (ac)	CN	Description
36.590	69	50-75% Grass cover, Fair, HSG B
15.830	84	50-75% Grass cover, Fair, HSG D
8.110	84	1 acre lots, 20% imp, HSG D
0.280	91	Gravel roads, HSG D
0.600	98	Water Surface, 0% imp, HSG D
61.410	75	Weighted Average
59.788		97.36% Pervious Area
1.622		2.64% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.6	50	0.0300	0.18		**Sheet Flow, SF-1** Grass: Short n= 0.150 P2= 3.39"
16.5	1,201	0.0300	1.21		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
4.2	1,642	0.0400	6.58	42.79	**Channel Flow, CF-1** Area= 6.5 sf Perim= 12.0' r= 0.54' n= 0.030 Earth, grassed & winding
25.3	2,893	Total			

Subcatchment 15S: PRE AREA-15



Summary for Subcatchment 16S: PRE AREA-16

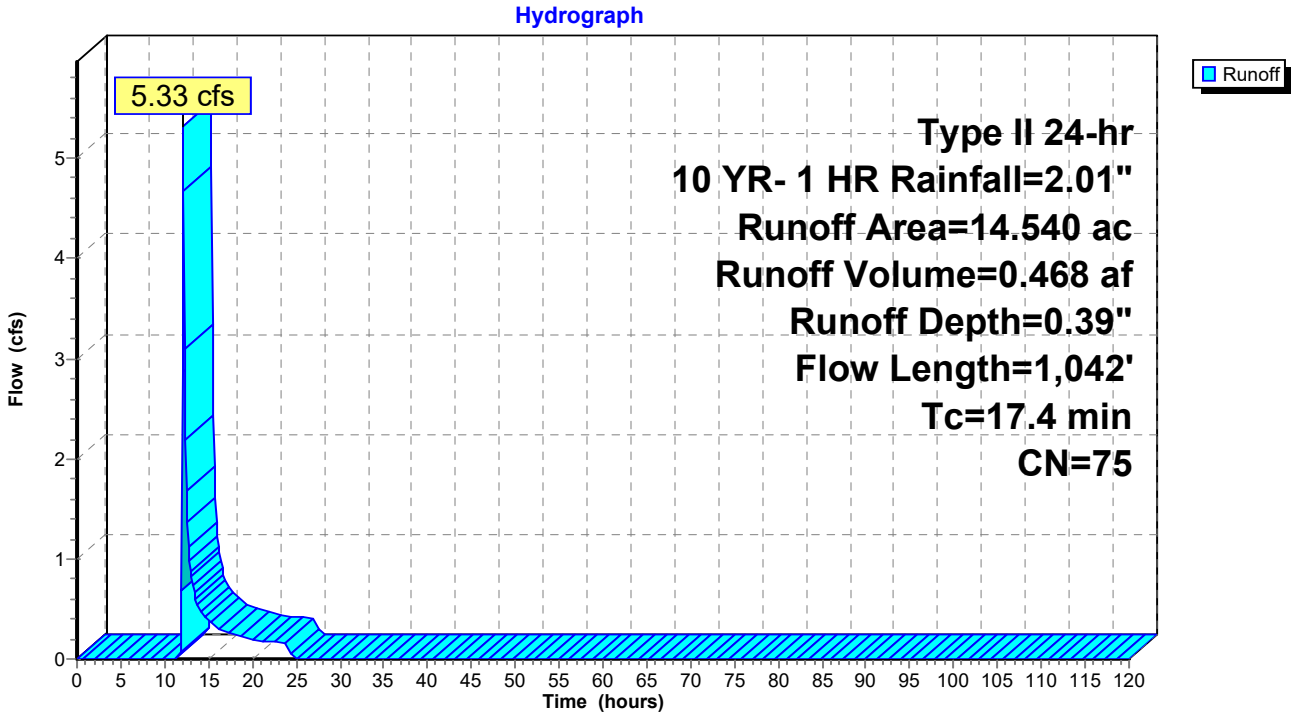
Runoff = 5.33 cfs @ 12.13 hrs, Volume= 0.468 af, Depth= 0.39"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 24-hr 10 YR- 1 HR Rainfall=2.01"

Area (ac)	CN	Description
7.140	69	50-75% Grass cover, Fair, HSG B
6.200	79	50-75% Grass cover, Fair, HSG C
0.640	84	1 acre lots, 20% imp, HSG D
0.560	91	Gravel roads, HSG D
14.540	75	Weighted Average
14.412		99.12% Pervious Area
0.128		0.88% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.9	50	0.1000	0.29		**Sheet Flow, SF-1** Grass: Short n= 0.150 P2= 3.39"
2.3	268	0.0800	1.98		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
12.2	724	0.0200	0.99		**Shallow Concentrated Flow, SCF-2** Short Grass Pasture Kv= 7.0 fps
17.4	1,042	Total			

Subcatchment 16S: PRE AREA-16



Summary for Subcatchment 17S: PRE AREA-17

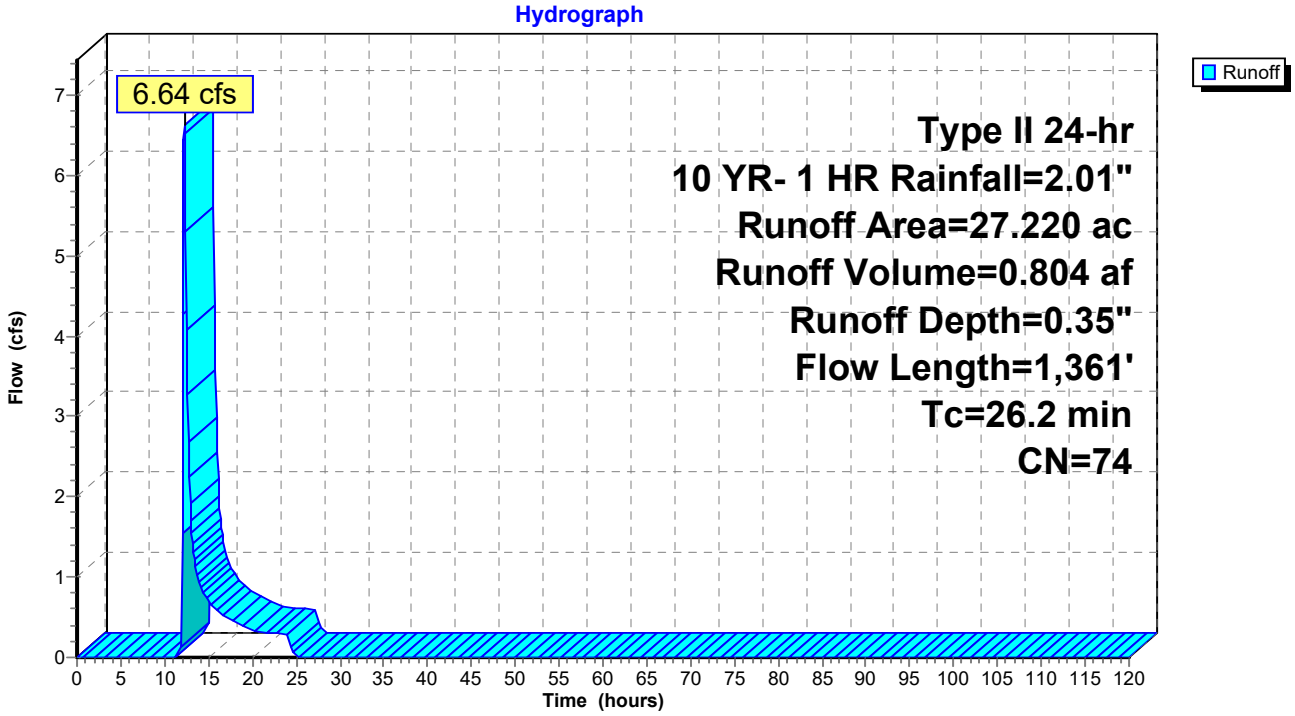
Runoff = 6.64 cfs @ 12.26 hrs, Volume= 0.804 af, Depth= 0.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 24-hr 10 YR- 1 HR Rainfall=2.01"

Area (ac)	CN	Description
14.120	69	50-75% Grass cover, Fair, HSG B
12.070	79	50-75% Grass cover, Fair, HSG C
1.030	84	1 acre lots, 20% imp, HSG D
27.220	74	Weighted Average
27.014		99.24% Pervious Area
0.206		0.76% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.1	50	0.0400	0.20		**Sheet Flow, SF-1** Grass: Short n= 0.150 P2= 3.39"
22.1	1,311	0.0200	0.99		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
26.2	1,361	Total			

Subcatchment 17S: PRE AREA-17



Summary for Subcatchment 18S: PRE AREA-18

[49] Hint: Tc<2dt may require smaller dt

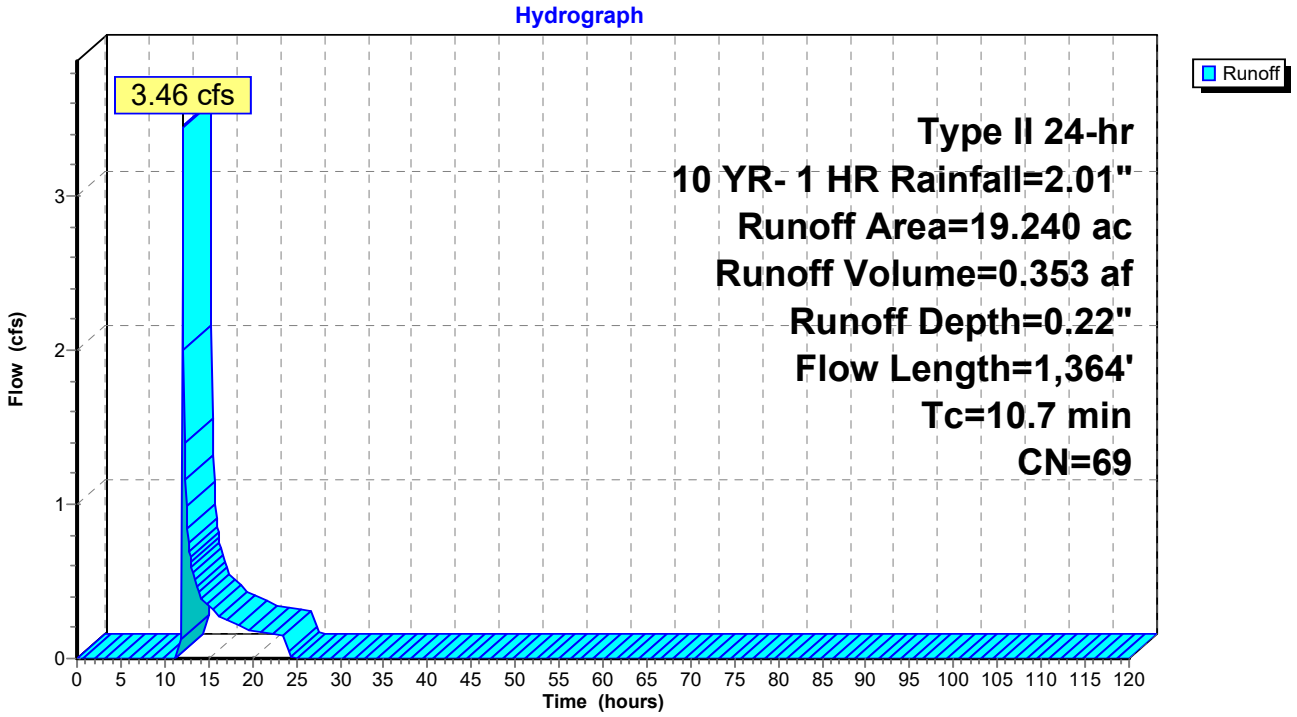
Runoff = 3.46 cfs @ 12.09 hrs, Volume= 0.353 af, Depth= 0.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 24-hr 10 YR- 1 HR Rainfall=2.01"

Area (ac)	CN	Description
0.710	55	Woods, Good, HSG B
0.320	70	Woods, Good, HSG C
17.060	69	50-75% Grass cover, Fair, HSG B
0.160	79	50-75% Grass cover, Fair, HSG C
0.990	84	50-75% Grass cover, Fair, HSG D
19.240	69	Weighted Average
19.240		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.1	50	0.0800	0.27		**Sheet Flow, SF-1** Grass: Short n= 0.150 P2= 3.39"
1.6	187	0.0800	1.98		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
6.0	1,127	0.0080	3.15	47.28	**Channel Flow,** Area= 15.0 sf Perim= 25.0' r= 0.60' n= 0.030
10.7	1,364	Total			

Subcatchment 18S: PRE AREA-18



Summary for Subcatchment 19S: PRE AREA-19

[49] Hint: Tc<2dt may require smaller dt

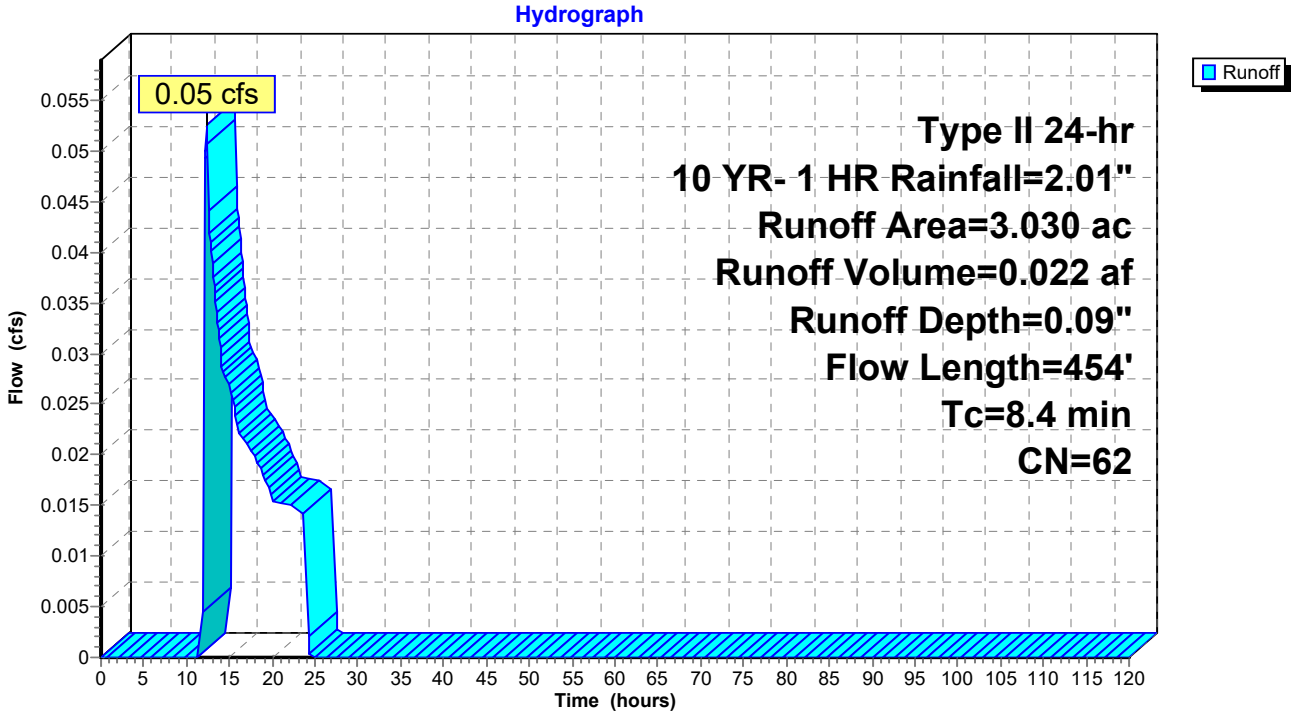
Runoff = 0.05 cfs @ 12.35 hrs, Volume= 0.022 af, Depth= 0.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 24-hr 10 YR- 1 HR Rainfall=2.01"

Area (ac)	CN	Description
1.570	55	Woods, Good, HSG B
1.460	69	50-75% Grass cover, Fair, HSG B
3.030	62	Weighted Average
3.030		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.1	50	0.0400	0.20		**Sheet Flow, SF-1** Grass: Short n= 0.150 P2= 3.39"
4.3	404	0.0500	1.57		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
8.4	454	Total			

Subcatchment 19S: PRE AREA-19



Summary for Subcatchment 20S: PRE AREA-20

[49] Hint: Tc<2dt may require smaller dt

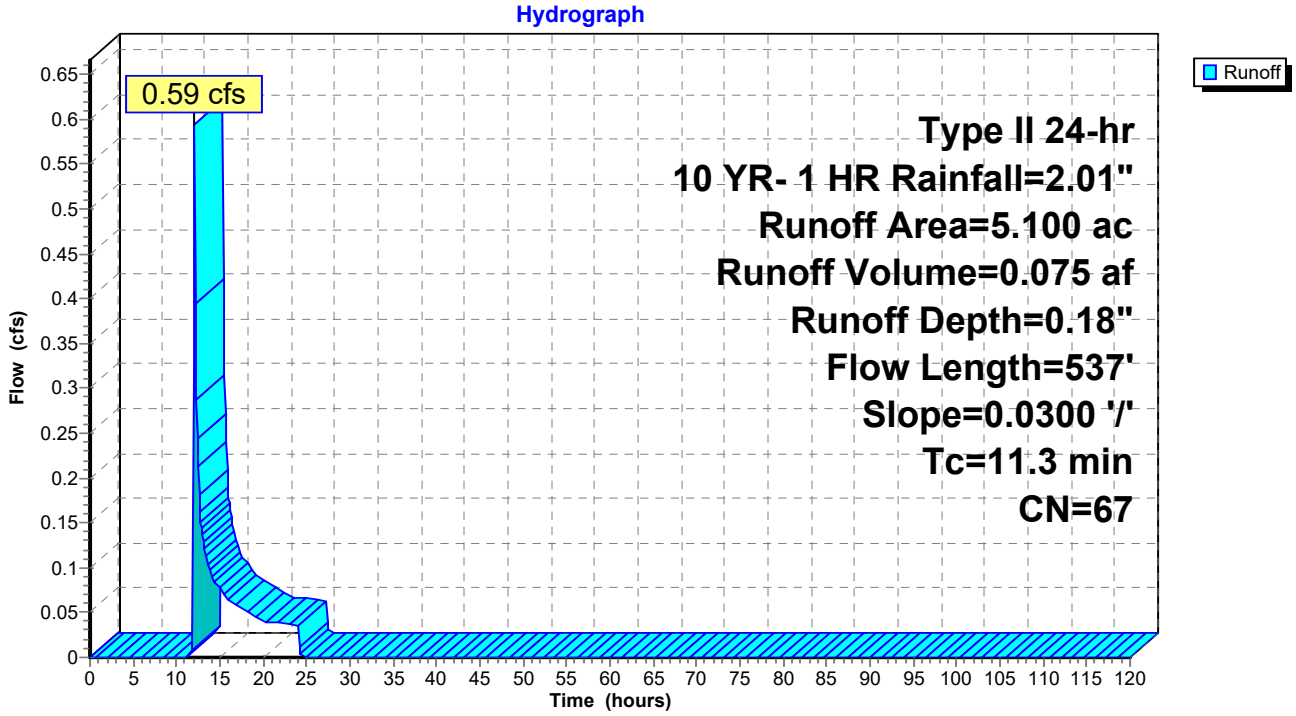
Runoff = 0.59 cfs @ 12.11 hrs, Volume= 0.075 af, Depth= 0.18"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 24-hr 10 YR- 1 HR Rainfall=2.01"

Area (ac)	CN	Description
0.640	55	Woods, Good, HSG B
4.460	69	50-75% Grass cover, Fair, HSG B
5.100	67	Weighted Average
5.100		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.6	50	0.0300	0.18		**Sheet Flow, SF-1** Grass: Short n= 0.150 P2= 3.39"
6.7	487	0.0300	1.21		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
11.3	537	Total			

Subcatchment 20S: PRE AREA-20



Summary for Subcatchment 21S: PRE AREA-21

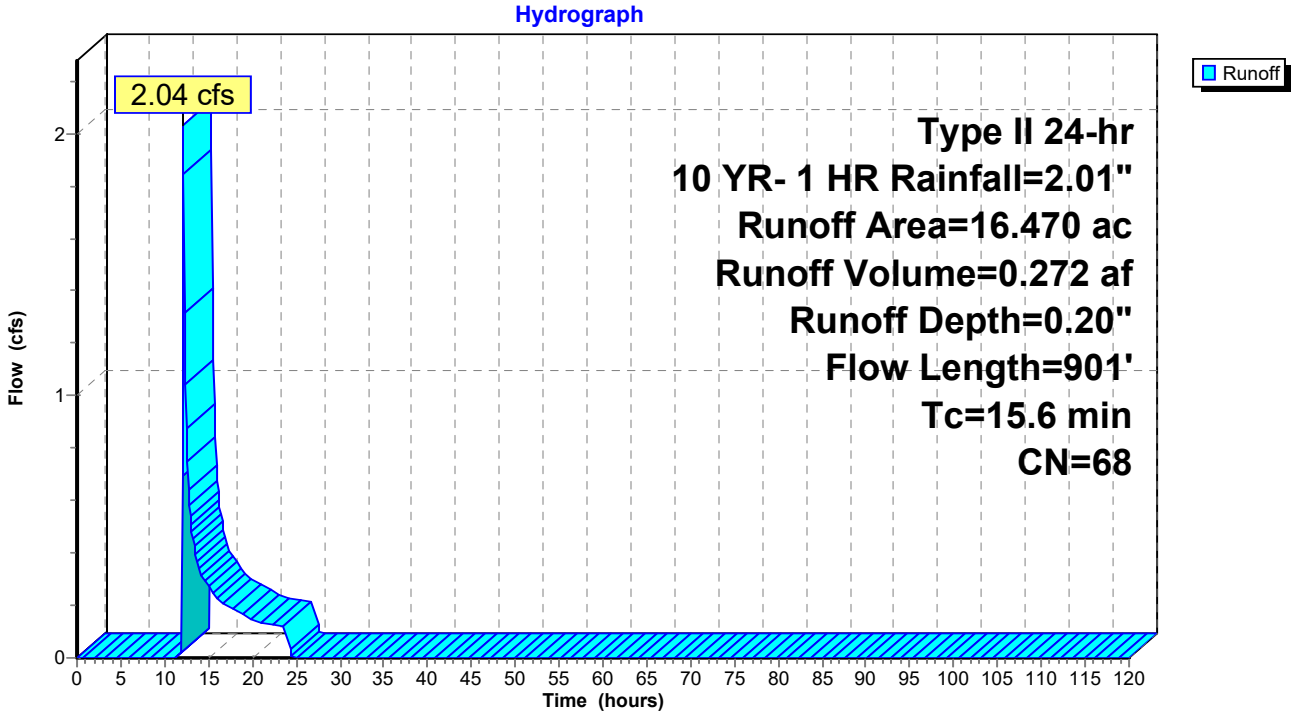
Runoff = 2.04 cfs @ 12.15 hrs, Volume= 0.272 af, Depth= 0.20"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 24-hr 10 YR- 1 HR Rainfall=2.01"

Area (ac)	CN	Description
0.870	55	Woods, Good, HSG B
0.390	70	Woods, Good, HSG C
15.210	69	50-75% Grass cover, Fair, HSG B
16.470	68	Weighted Average
16.470		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.5	50	0.0200	0.15		**Sheet Flow, SF-1** Grass: Short n= 0.150 P2= 3.39"
10.1	851	0.0400	1.40		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
15.6	901	Total			

Subcatchment 21S: PRE AREA-21



Summary for Subcatchment 22S: PRE AREA-22

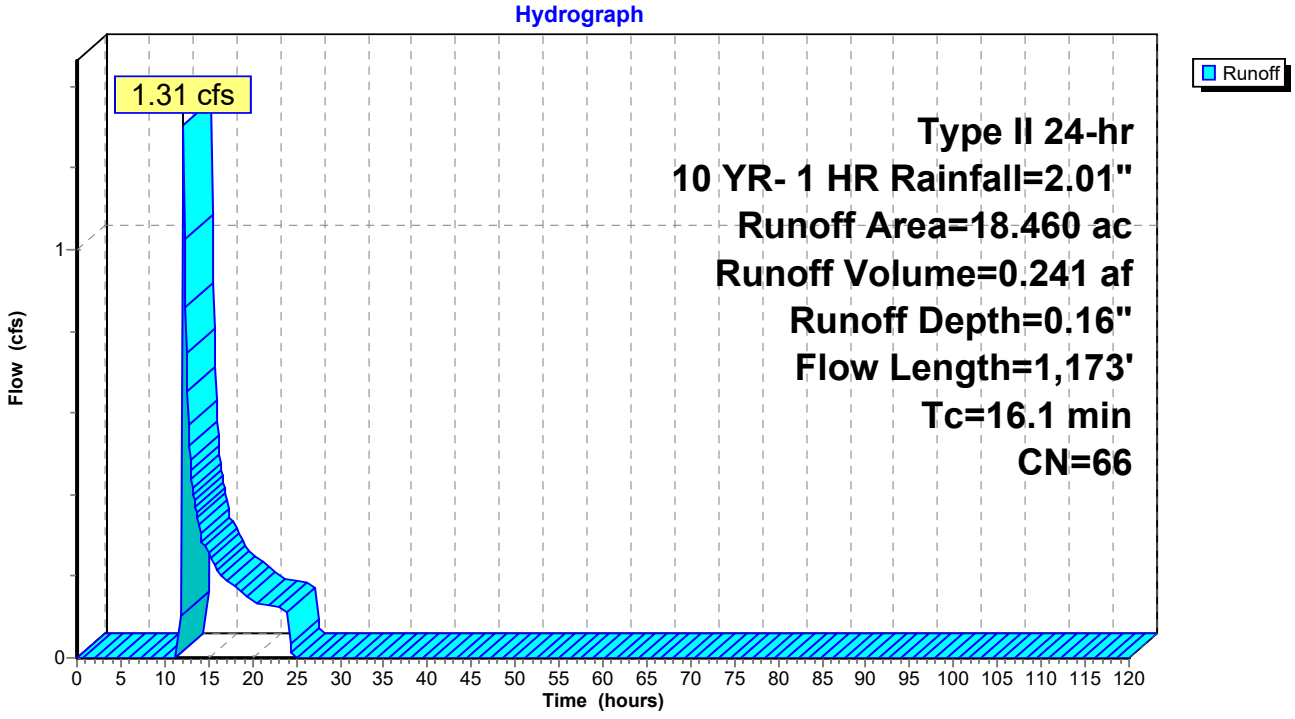
Runoff = 1.31 cfs @ 12.19 hrs, Volume= 0.241 af, Depth= 0.16"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 24-hr 10 YR- 1 HR Rainfall=2.01"

Area (ac)	CN	Description
3.800	55	Woods, Good, HSG B
1.800	70	Woods, Good, HSG C
12.860	69	50-75% Grass cover, Fair, HSG B
18.460	66	Weighted Average
18.460		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.1	50	0.0400	0.20		**Sheet Flow, SF-1** Grass: Short n= 0.150 P2= 3.39"
12.0	1,123	0.0500	1.57		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
16.1	1,173	Total			

Subcatchment 22S: PRE AREA-22



Summary for Subcatchment 23S: PRE AREA-23

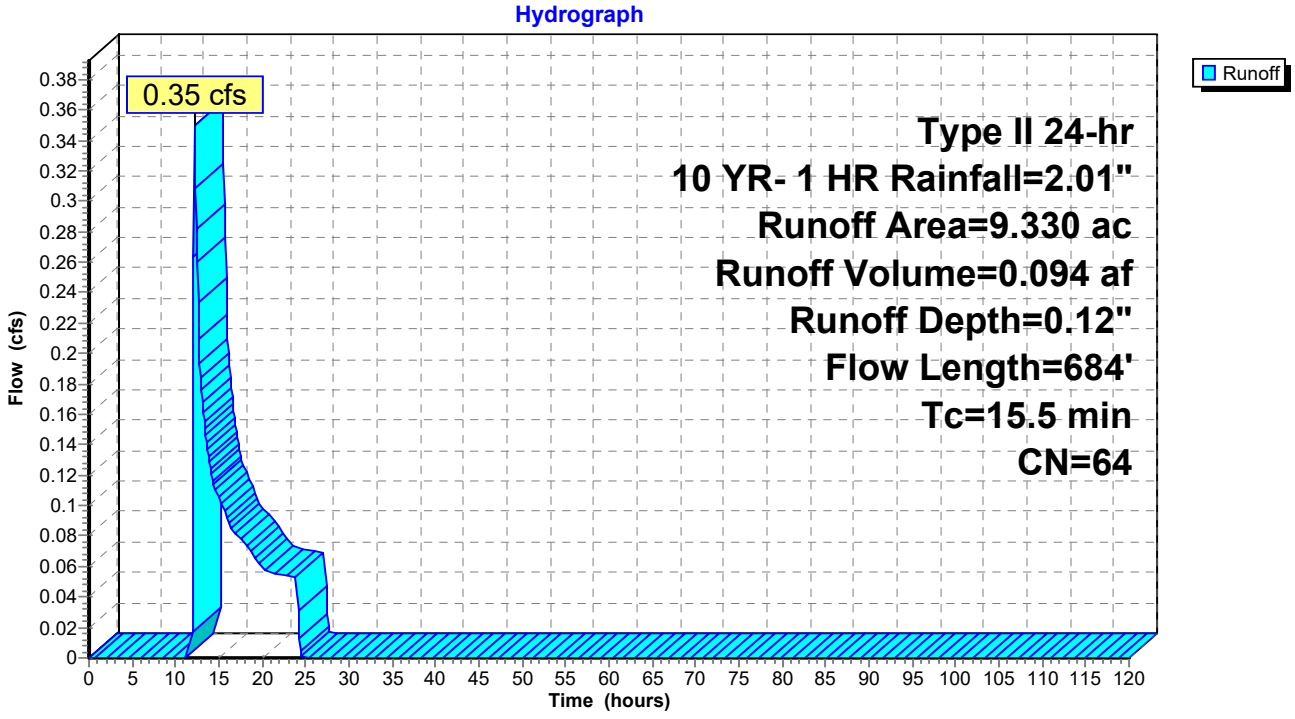
Runoff = 0.35 cfs @ 12.22 hrs, Volume= 0.094 af, Depth= 0.12"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 24-hr 10 YR- 1 HR Rainfall=2.01"

Area (ac)	CN	Description
3.620	55	Woods, Good, HSG B
5.310	70	Woods, Good, HSG C
0.400	69	50-75% Grass cover, Fair, HSG B
9.330	64	Weighted Average
9.330		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	50	0.0650	0.11		**Sheet Flow, SF-1** Woods: Light underbrush n= 0.400 P2= 3.39"
8.0	634	0.0700	1.32		**Shallow Concentrated Flow, SCF-1** Woodland Kv= 5.0 fps
15.5	684	Total			

Subcatchment 23S: PRE AREA-23



Summary for Subcatchment 24S: PRE AREA-24

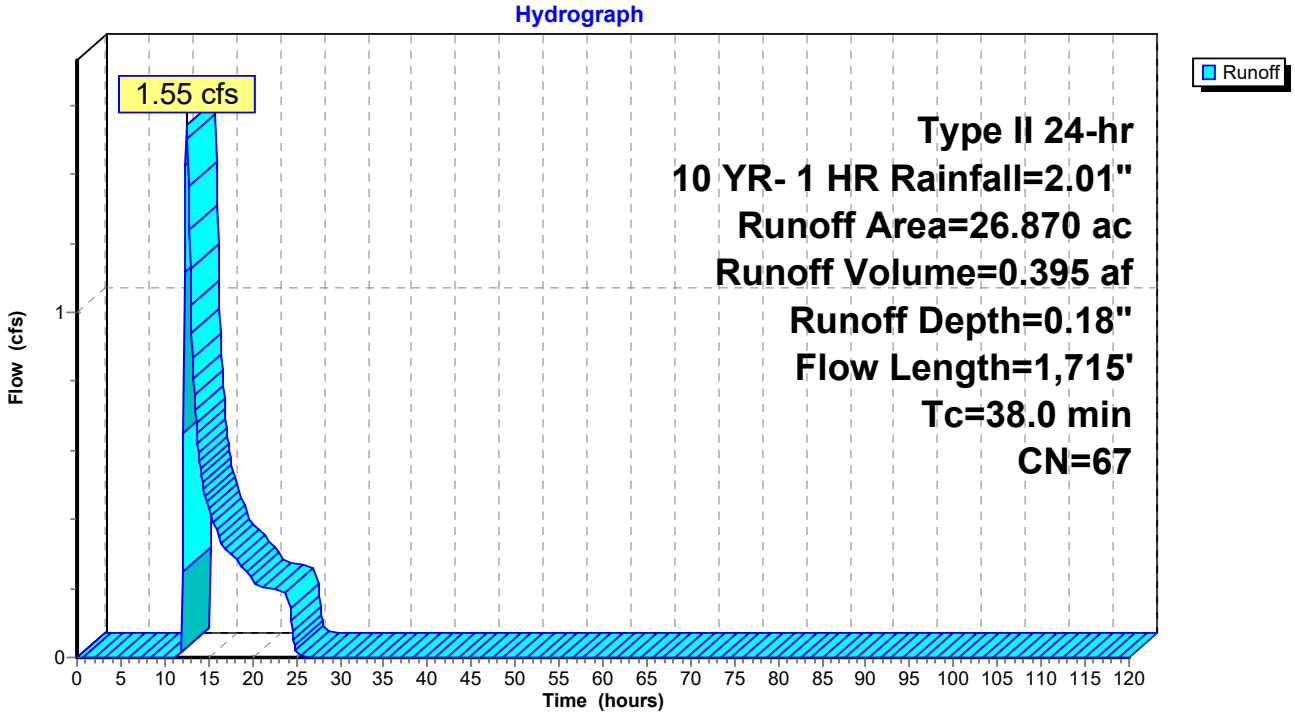
Runoff = 1.55 cfs @ 12.52 hrs, Volume= 0.395 af, Depth= 0.18"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 24-hr 10 YR- 1 HR Rainfall=2.01"

Area (ac)	CN	Description
5.180	55	Woods, Good, HSG B
2.080	70	Woods, Good, HSG C
18.550	69	50-75% Grass cover, Fair, HSG B
1.060	79	50-75% Grass cover, Fair, HSG C
26.870	67	Weighted Average
26.870		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.8	50	0.0100	0.05		**Sheet Flow, SF-1** Woods: Light underbrush n= 0.400 P2= 3.39"
7.4	586	0.0700	1.32		**Shallow Concentrated Flow, SCF-1** Woodland Kv= 5.0 fps
14.8	1,079	0.0300	1.21		**Shallow Concentrated Flow, SCF-2** Short Grass Pasture Kv= 7.0 fps
38.0	1,715	Total			

Subcatchment 24S: PRE AREA-24



Summary for Subcatchment 25S: PRE AREA-25

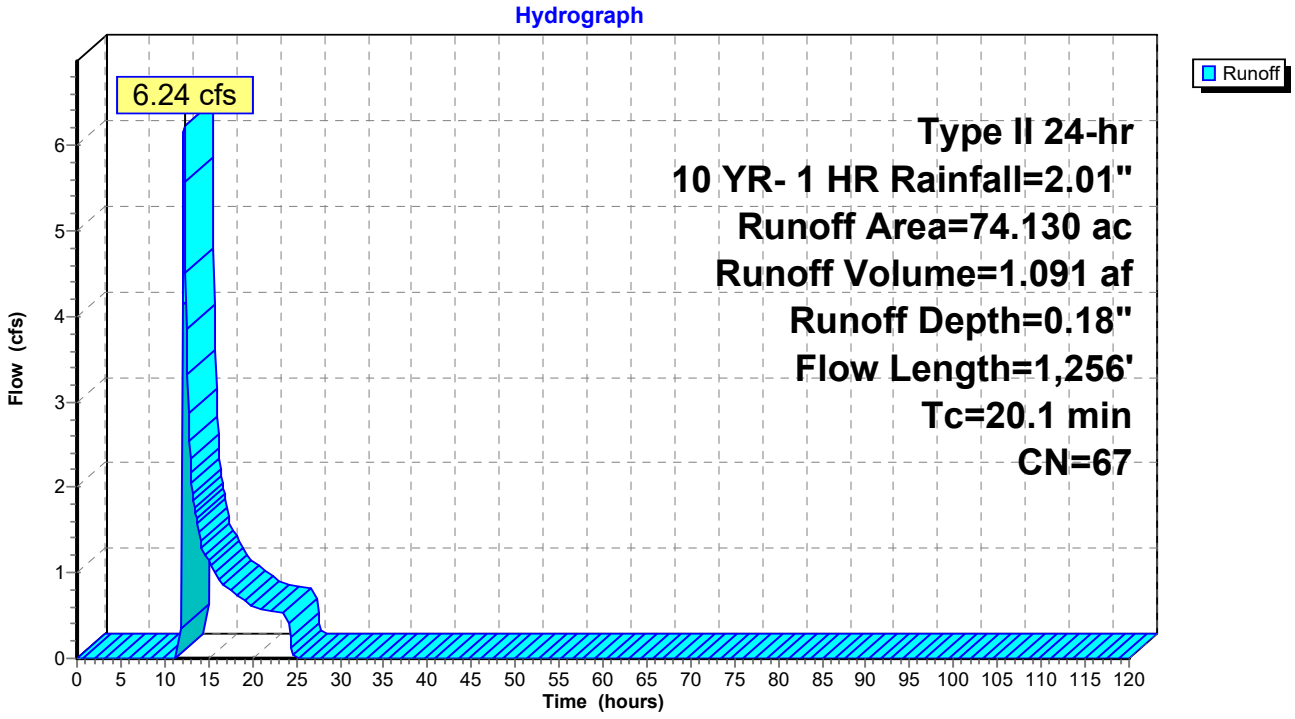
Runoff = 6.24 cfs @ 12.23 hrs, Volume= 1.091 af, Depth= 0.18"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 24-hr 10 YR- 1 HR Rainfall=2.01"

Area (ac)	CN	Description
62.530	69	50-75% Grass cover, Fair, HSG B
11.600	55	Woods, Good, HSG B
74.130	67	Weighted Average
74.130		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.5	50	0.0600	0.24		**Sheet Flow, SF-1** Grass: Short n= 0.150 P2= 3.39"
16.6	1,206	0.0300	1.21		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
20.1	1,256	Total			

Subcatchment 25S: PRE AREA-25



Summary for Subcatchment 54S: PRE AREA-26(Gen-Tie Route)

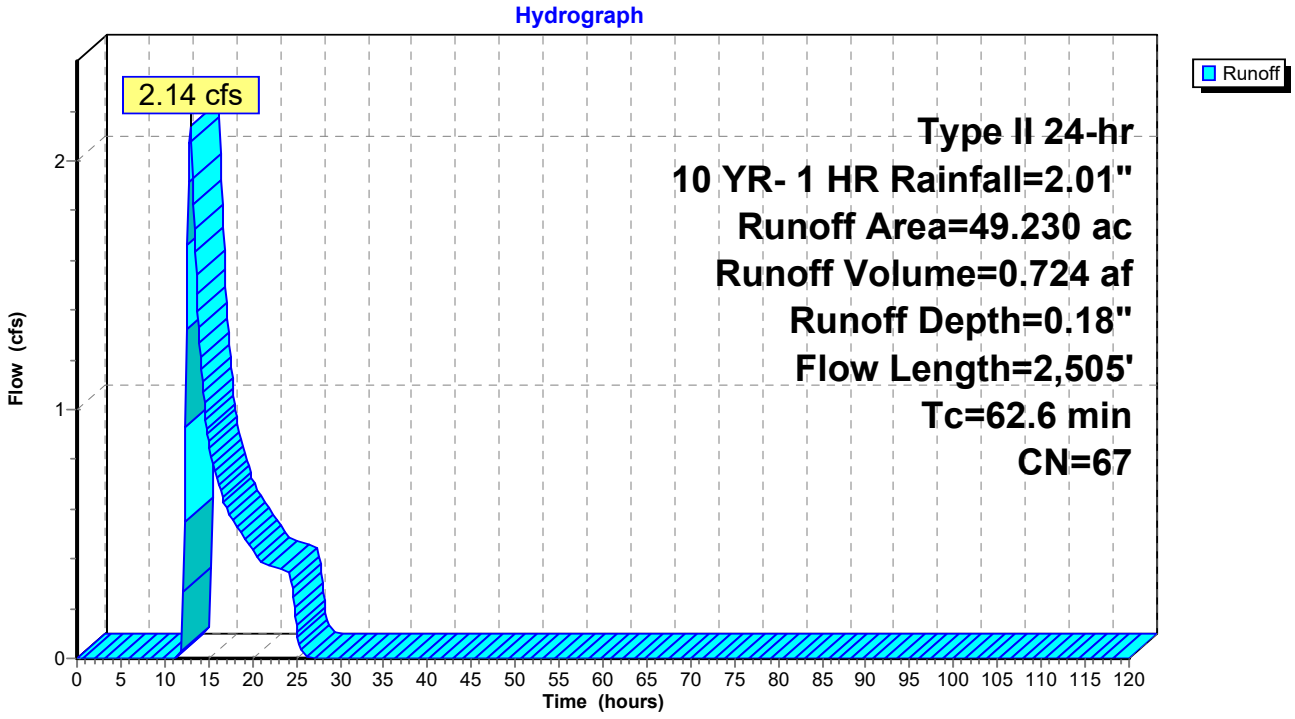
Runoff = 2.14 cfs @ 12.93 hrs, Volume= 0.724 af, Depth= 0.18"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 24-hr 10 YR- 1 HR Rainfall=2.01"

Area (ac)	CN	Description
40.630	69	50-75% Grass cover, Fair, HSG B
8.600	55	Woods, Good, HSG B
49.230	67	Weighted Average
49.230		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.1	50	0.0400	0.20		**Sheet Flow, SF-1** Grass: Short n= 0.150 P2= 3.39"
58.5	2,455	0.0100	0.70		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
62.6	2,505	Total			

Subcatchment 54S: PRE AREA-26(Gen-Tie Route)



Summary for Pond 51P: Exisitng Wetland

Inflow Area = 7.840 ac, 0.00% Impervious, Inflow Depth = 0.06" for 10 YR- 1 HR event
Inflow = 0.06 cfs @ 13.11 hrs, Volume= 0.041 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Peak Elev= 716.59' @ 25.20 hrs Surf.Area= 3,668 sf Storage= 1,773 cf

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

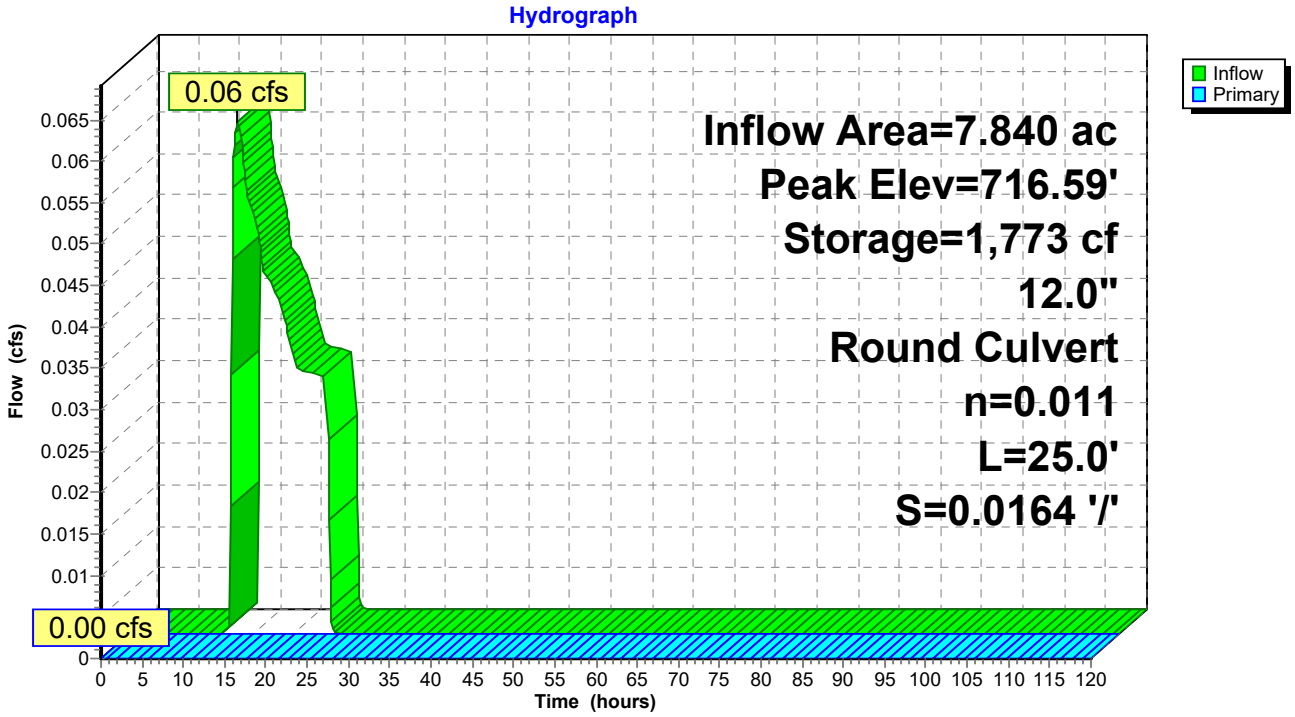
Volume	Invert	Avail.Storage	Storage Description
#1	716.00'	125,716 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
716.00	2,360	0	0
718.00	6,807	9,167	9,167
720.00	13,548	20,355	29,522
722.00	23,063	36,611	66,133
724.00	36,520	59,583	125,716

Device	Routing	Invert	Outlet Devices
#1	Primary	716.97'	**12.0" Round Culvert** L= 25.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 716.97' / 716.56' S= 0.0164 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.79 sf

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=716.00' (Free Discharge)
1=Culvert (Controls 0.00 cfs)

Pond 51P: Exisitng Wetland



Time span=0.00-120.00 hrs, dt=0.10 hrs, 1201 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: PRE AREA-1 Runoff Area=26.670 ac 0.00% Impervious Runoff Depth=0.98"
Flow Length=1,700' Tc=33.4 min CN=77 Runoff=19.73 cfs 2.182 af

Subcatchment 2S: PRE AREA-2 Runoff Area=5.380 ac 0.00% Impervious Runoff Depth=0.56"
Flow Length=924' Slope=0.0200 '/' Tc=20.2 min CN=68 Runoff=2.59 cfs 0.251 af

Subcatchment 3S: PRE AREA-3 Runoff Area=67.480 ac 0.40% Impervious Runoff Depth=0.88"
Flow Length=2,190' Tc=41.7 min CN=75 Runoff=37.11 cfs 4.931 af

Subcatchment 4S: PRE AREA-4 Runoff Area=24.880 ac 0.00% Impervious Runoff Depth=0.78"
Flow Length=1,062' Slope=0.0300 '/' Tc=18.5 min CN=73 Runoff=20.05 cfs 1.614 af

Subcatchment 5S: PRE AREA-5 Runoff Area=87.520 ac 0.16% Impervious Runoff Depth=0.93"
Flow Length=2,797' Tc=29.1 min CN=76 Runoff=65.78 cfs 6.772 af

Subcatchment 6S: PRE AREA-6 Runoff Area=346.820 ac 0.18% Impervious Runoff Depth=1.04"
Flow Length=3,249' Tc=38.8 min CN=78 Runoff=246.43 cfs 29.977 af

Subcatchment 7S: PRE AREA-7 Runoff Area=12.290 ac 0.00% Impervious Runoff Depth=0.69"
Flow Length=1,475' Tc=32.9 min CN=71 Runoff=5.79 cfs 0.703 af

Subcatchment 8S: PRE AREA-8 Runoff Area=7.840 ac 0.00% Impervious Runoff Depth=0.29"
Flow Length=1,010' Tc=19.9 min CN=60 Runoff=1.24 cfs 0.188 af

Subcatchment 9S: PRE AREA-9 Runoff Area=37.590 ac 0.00% Impervious Runoff Depth=0.64"
Flow Length=1,873' Tc=12.6 min CN=70 Runoff=27.95 cfs 2.015 af

Subcatchment 10S: PRE AREA-10 Runoff Area=60.170 ac 0.00% Impervious Runoff Depth=0.73"
Flow Length=2,383' Tc=29.8 min CN=72 Runoff=32.89 cfs 3.670 af

Subcatchment 11S: PRE AREA-11 Runoff Area=31.380 ac 0.00% Impervious Runoff Depth=0.73"
Flow Length=1,460' Tc=23.7 min CN=72 Runoff=20.07 cfs 1.914 af

Subcatchment 12S: PRE AREA-12 Runoff Area=15.490 ac 0.00% Impervious Runoff Depth=0.88"
Flow Length=1,523' Tc=24.3 min CN=75 Runoff=12.31 cfs 1.132 af

Subcatchment 13S: PRE AREA-13 Runoff Area=65.330 ac 0.00% Impervious Runoff Depth=0.98"
Flow Length=1,151' Tc=19.2 min CN=77 Runoff=68.36 cfs 5.346 af

Subcatchment 14S: PRE AREA-14 Runoff Area=51.210 ac 0.00% Impervious Runoff Depth=1.21"
Flow Length=2,097' Tc=38.6 min CN=81 Runoff=43.89 cfs 5.182 af

Subcatchment 15S: PRE AREA-15 Runoff Area=61.410 ac 2.64% Impervious Runoff Depth=0.88"
Flow Length=2,893' Tc=25.3 min CN=75 Runoff=47.65 cfs 4.487 af

Subcatchment 16S: PRE AREA-16 Runoff Area=14.540 ac 0.88% Impervious Runoff Depth=0.88"
Flow Length=1,042' Tc=17.4 min CN=75 Runoff=14.10 cfs 1.062 af

Subcatchment 17S: PRE AREA-17 Runoff Area=27.220 ac 0.76% Impervious Runoff Depth=0.83"
Flow Length=1,361' Tc=26.2 min CN=74 Runoff=19.19 cfs 1.876 af

Subcatchment 18S: PRE AREA-18 Runoff Area=19.240 ac 0.00% Impervious Runoff Depth=0.60"
Flow Length=1,364' Tc=10.7 min CN=69 Runoff=13.91 cfs 0.964 af

Subcatchment 19S: PRE AREA-19 Runoff Area=3.030 ac 0.00% Impervious Runoff Depth=0.35"
Flow Length=454' Tc=8.4 min CN=62 Runoff=1.05 cfs 0.088 af

Subcatchment 20S: PRE AREA-20 Runoff Area=5.100 ac 0.00% Impervious Runoff Depth=0.52"
Flow Length=537' Slope=0.0300 '/' Tc=11.3 min CN=67 Runoff=2.90 cfs 0.222 af

Subcatchment 21S: PRE AREA-21 Runoff Area=16.470 ac 0.00% Impervious Runoff Depth=0.56"
Flow Length=901' Tc=15.6 min CN=68 Runoff=9.46 cfs 0.770 af

Subcatchment 22S: PRE AREA-22 Runoff Area=18.460 ac 0.00% Impervious Runoff Depth=0.48"
Flow Length=1,173' Tc=16.1 min CN=66 Runoff=8.37 cfs 0.745 af

Subcatchment 23S: PRE AREA-23 Runoff Area=9.330 ac 0.00% Impervious Runoff Depth=0.41"
Flow Length=684' Tc=15.5 min CN=64 Runoff=3.36 cfs 0.321 af

Subcatchment 24S: PRE AREA-24 Runoff Area=26.870 ac 0.00% Impervious Runoff Depth=0.52"
Flow Length=1,715' Tc=38.0 min CN=67 Runoff=7.64 cfs 1.168 af

Subcatchment 25S: PRE AREA-25 Runoff Area=74.130 ac 0.00% Impervious Runoff Depth=0.52"
Flow Length=1,256' Tc=20.1 min CN=67 Runoff=32.12 cfs 3.223 af

Subcatchment 54S: PRE AREA-26(Gen-Tie Runoff Area=49.230 ac 0.00% Impervious Runoff Depth=0.52"
Flow Length=2,505' Tc=62.6 min CN=67 Runoff=9.78 cfs 2.140 af

Pond 51P: Exisitng Wetland Peak Elev=717.14' Storage=4,134 cf Inflow=1.24 cfs 0.188 af
12.0" Round Culvert n=0.011 L=25.0' S=0.0164 '/' Outflow=0.16 cfs 0.111 af

Total Runoff Area = 1,165.080 ac Runoff Volume = 82.943 af Average Runoff Depth = 0.85"
99.74% Pervious = 1,162.074 ac 0.26% Impervious = 3.006 ac

Summary for Subcatchment 1S: PRE AREA-1

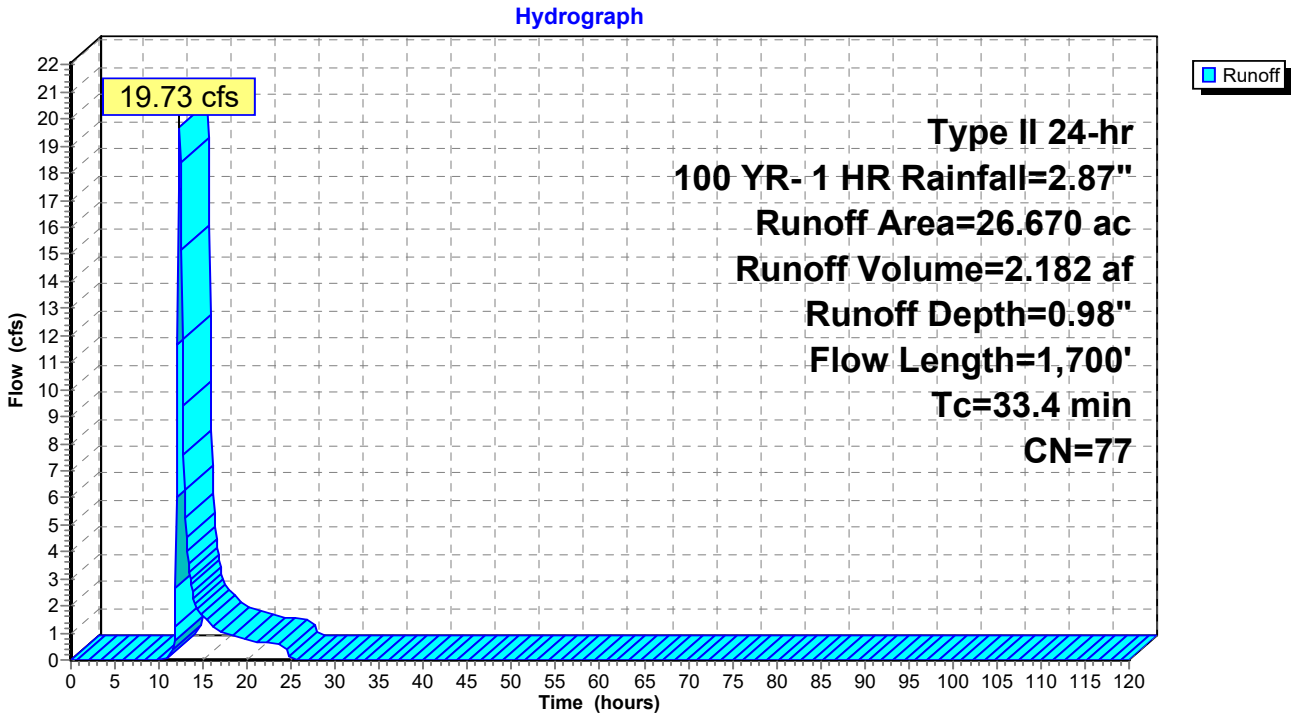
Runoff = 19.73 cfs @ 12.31 hrs, Volume= 2.182 af, Depth= 0.98"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 24-hr 100 YR- 1 HR Rainfall=2.87"

Area (ac)	CN	Description
12.830	69	50-75% Grass cover, Fair, HSG B
13.540	84	50-75% Grass cover, Fair, HSG D
0.300	85	Gravel roads, HSG B
26.670	77	Weighted Average
26.670		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.9	50	0.1000	0.29		**Sheet Flow, SF-1** Grass: Short n= 0.150 P2= 3.39"
6.0	620	0.0600	1.71		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
24.5	1,030	0.0100	0.70		**Shallow Concentrated Flow, SCF-2** Short Grass Pasture Kv= 7.0 fps
33.4	1,700	Total			

Subcatchment 1S: PRE AREA-1



Summary for Subcatchment 2S: PRE AREA-2

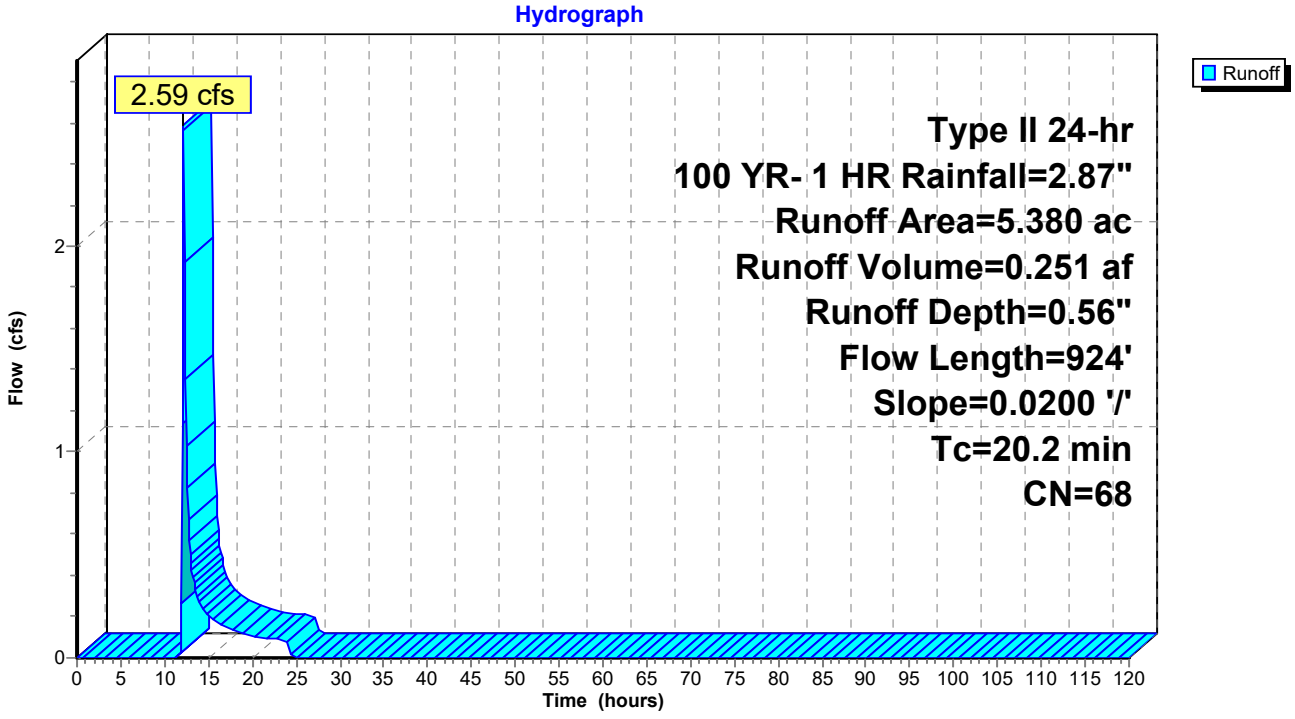
Runoff = 2.59 cfs @ 12.17 hrs, Volume= 0.251 af, Depth= 0.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 24-hr 100 YR- 1 HR Rainfall=2.87"

Area (ac)	CN	Description
4.790	69	50-75% Grass cover, Fair, HSG B
0.550	55	Woods, Good, HSG B
0.040	85	Gravel roads, HSG B
5.380	68	Weighted Average
5.380		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.5	50	0.0200	0.15		**Sheet Flow, SF-1** Grass: Short n= 0.150 P2= 3.39"
14.7	874	0.0200	0.99		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
20.2	924	Total			

Subcatchment 2S: PRE AREA-2



Summary for Subcatchment 3S: PRE AREA-3

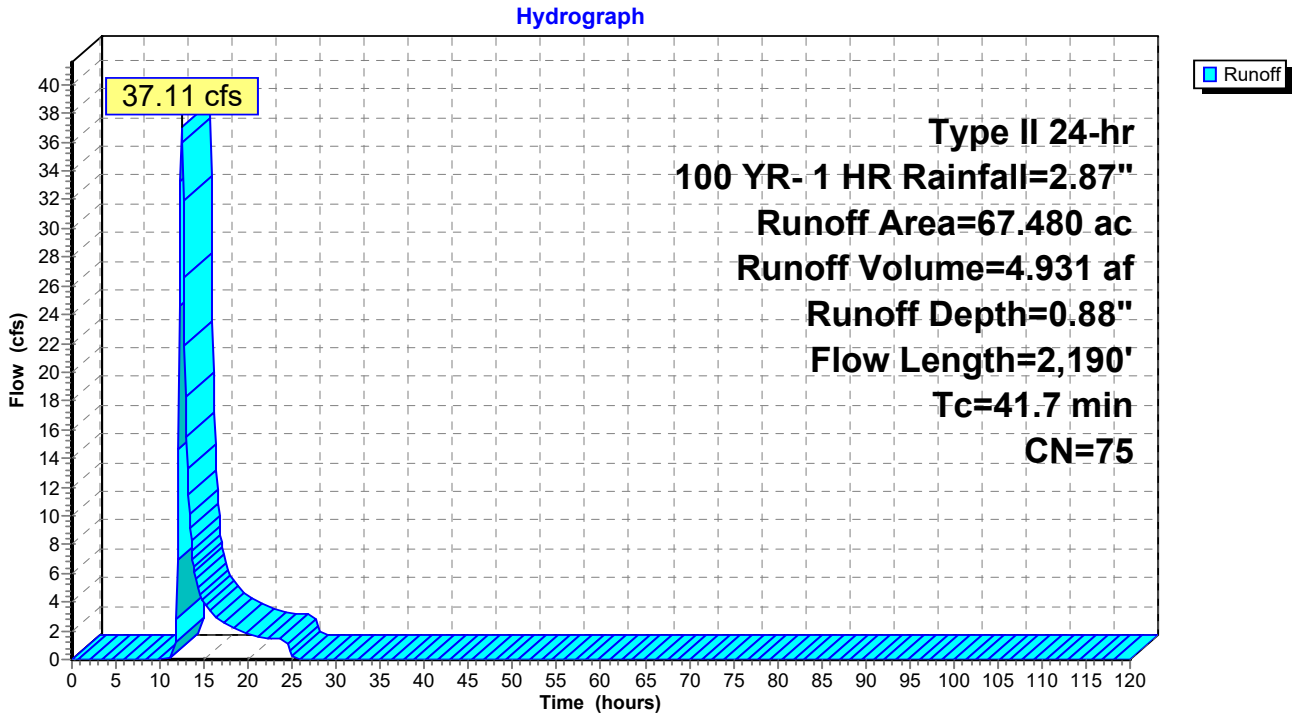
Runoff = 37.11 cfs @ 12.43 hrs, Volume= 4.931 af, Depth= 0.88"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 24-hr 100 YR- 1 HR Rainfall=2.87"

Area (ac)	CN	Description
40.400	69	50-75% Grass cover, Fair, HSG B
25.610	84	50-75% Grass cover, Fair, HSG D
0.120	85	Gravel roads, HSG B
0.930	68	1 acre lots, 20% imp, HSG B
0.420	84	1 acre lots, 20% imp, HSG D
67.480	75	Weighted Average
67.210		99.60% Pervious Area
0.270		0.40% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.1	50	0.0800	0.27		**Sheet Flow, SF-1** Grass: Short n= 0.150 P2= 3.39"
8.5	874	0.0600	1.71		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
30.1	1,266	0.0100	0.70		**Shallow Concentrated Flow, SCF-2** Short Grass Pasture Kv= 7.0 fps
41.7	2,190	Total			

Subcatchment 3S: PRE AREA-3



Summary for Subcatchment 4S: PRE AREA-4

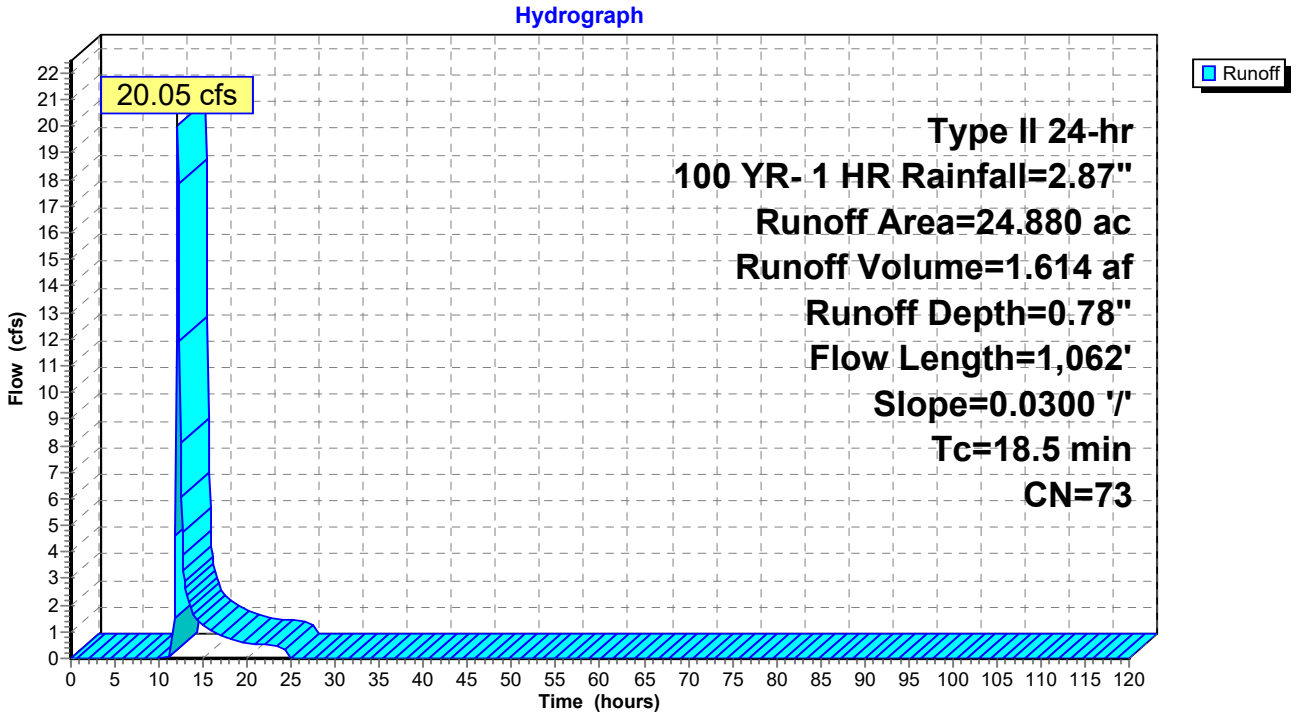
Runoff = 20.05 cfs @ 12.13 hrs, Volume= 1.614 af, Depth= 0.78"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 24-hr 100 YR- 1 HR Rainfall=2.87"

Area (ac)	CN	Description
18.430	69	50-75% Grass cover, Fair, HSG B
6.450	84	50-75% Grass cover, Fair, HSG D
24.880	73	Weighted Average
24.880		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.6	50	0.0300	0.18		**Sheet Flow, SF-1** Grass: Short n= 0.150 P2= 3.39"
13.9	1,012	0.0300	1.21		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
18.5	1,062	Total			

Subcatchment 4S: PRE AREA-4



Summary for Subcatchment 5S: PRE AREA-5

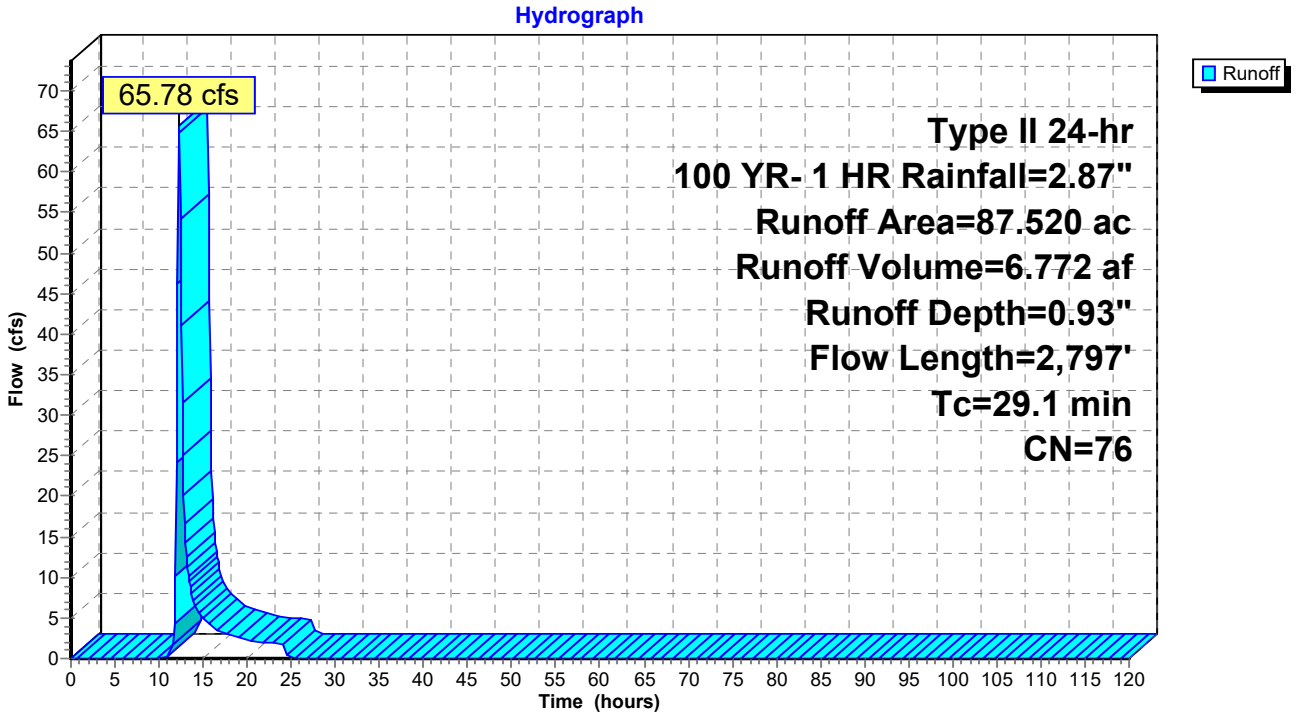
Runoff = 65.78 cfs @ 12.26 hrs, Volume= 6.772 af, Depth= 0.93"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 24-hr 100 YR- 1 HR Rainfall=2.87"

Area (ac)	CN	Description
45.210	69	50-75% Grass cover, Fair, HSG B
35.470	84	50-75% Grass cover, Fair, HSG D
2.950	98	Water Surface, 0% imp, HSG D
0.120	85	Gravel roads, HSG B
0.290	91	Gravel roads, HSG D
0.700	68	1 acre lots, 20% imp, HSG B
2.780	77	Woods, Good, HSG D
87.520	76	Weighted Average
87.380		99.84% Pervious Area
0.140		0.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.5	50	0.0600	0.24		**Sheet Flow, SF-1** Grass: Short n= 0.150 P2= 3.39"
13.3	968	0.0300	1.21		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
12.3	1,779	0.0060	2.42	8.46	**Channel Flow, CF-1** Area= 3.5 sf Perim= 7.0' r= 0.50' n= 0.030 Earth, grassed & winding
29.1	2,797	Total			

Subcatchment 5S: PRE AREA-5



Summary for Subcatchment 6S: PRE AREA-6

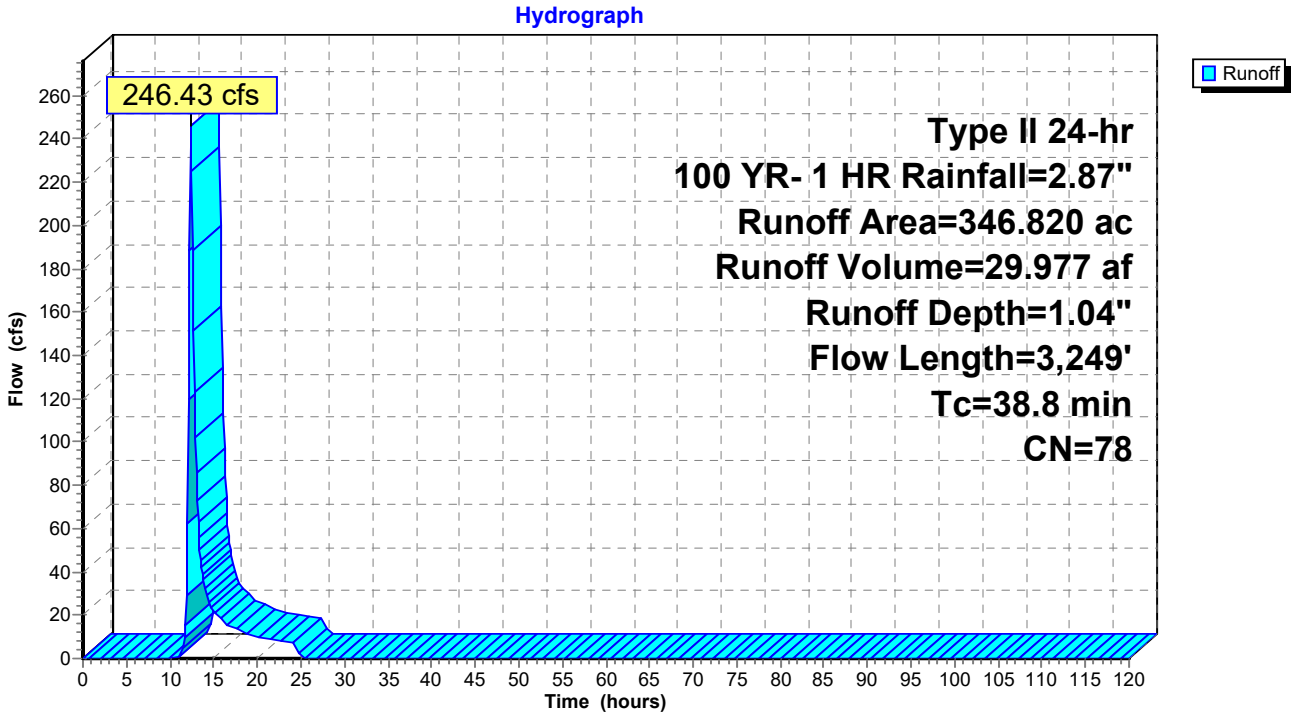
Runoff = 246.43 cfs @ 12.38 hrs, Volume= 29.977 af, Depth= 1.04"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 24-hr 100 YR- 1 HR Rainfall=2.87"

Area (ac)	CN	Description
120.060	69	50-75% Grass cover, Fair, HSG B
202.980	84	50-75% Grass cover, Fair, HSG D
6.950	98	Water Surface, 0% imp, HSG D
0.050	85	Gravel roads, HSG B
0.340	91	Gravel roads, HSG D
3.200	68	1 acre lots, 20% imp, HSG B
9.640	55	Woods, Good, HSG B
0.500	70	Woods, Good, HSG C
3.100	77	Woods, Good, HSG D
346.820	78	Weighted Average
346.180		99.82% Pervious Area
0.640		0.18% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.2	50	0.0100	0.12		**Sheet Flow, SF-1** Grass: Short n= 0.150 P2= 3.39"
25.2	1,499	0.0200	0.99		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
6.4	1,700	0.0200	4.41	15.45	**Channel Flow, CF-1** Area= 3.5 sf Perim= 7.0' r= 0.50' n= 0.030 Earth, grassed & winding
38.8	3,249	Total			

Subcatchment 6S: PRE AREA-6



Summary for Subcatchment 7S: PRE AREA-7

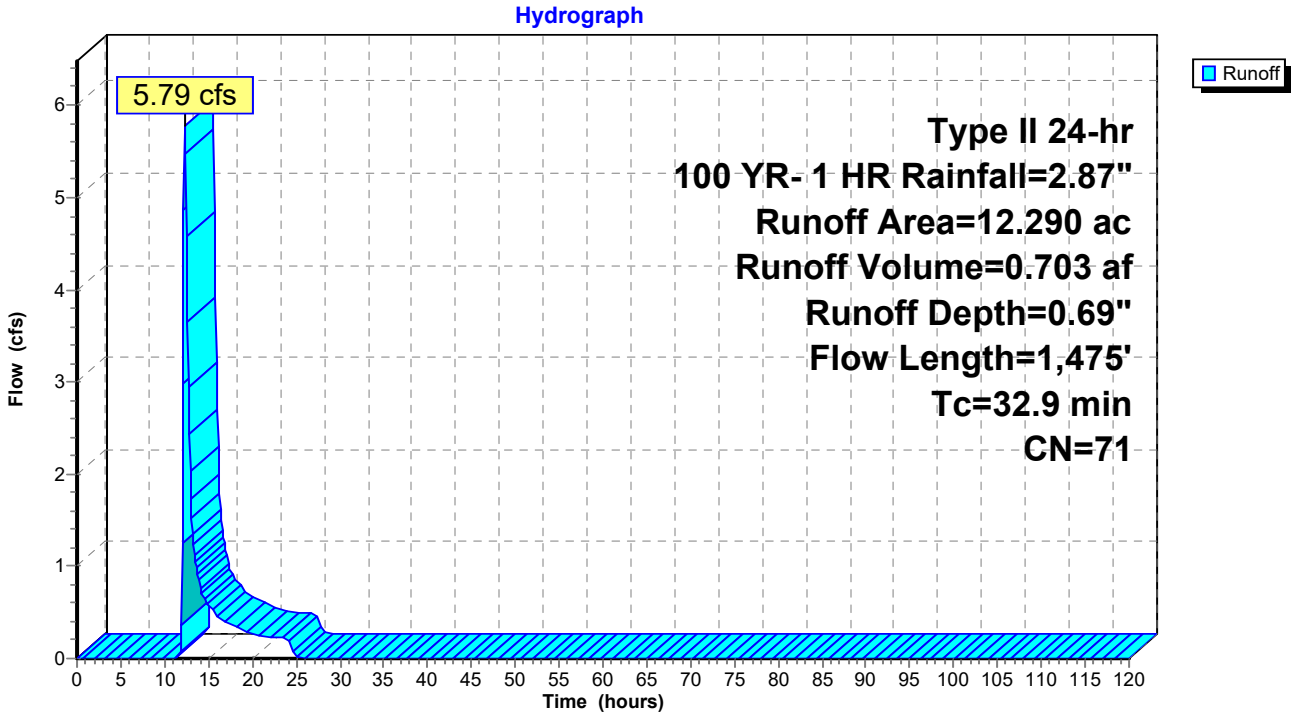
Runoff = 5.79 cfs @ 12.33 hrs, Volume= 0.703 af, Depth= 0.69"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 24-hr 100 YR- 1 HR Rainfall=2.87"

Area (ac)	CN	Description
5.940	69	50-75% Grass cover, Fair, HSG B
1.930	84	50-75% Grass cover, Fair, HSG D
0.210	85	Gravel roads, HSG B
0.270	91	Gravel roads, HSG D
1.940	55	Woods, Good, HSG B
2.000	77	Woods, Good, HSG D
12.290	71	Weighted Average
12.290		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.2	50	0.0100	0.12		**Sheet Flow, SF-1** Grass: Short n= 0.150 P2= 3.39"
2.0	86	0.0100	0.70		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
0.2	18	0.0100	1.61		**Shallow Concentrated Flow, SCF-2** Unpaved Kv= 16.1 fps
8.6	625	0.0300	1.21		**Shallow Concentrated Flow, SCF-3** Short Grass Pasture Kv= 7.0 fps
0.2	18	0.0100	1.61		**Shallow Concentrated Flow, SCF-4** Unpaved Kv= 16.1 fps
3.4	200	0.0200	0.99		**Shallow Concentrated Flow, SCF-5** Short Grass Pasture Kv= 7.0 fps
11.3	478	0.0200	0.71		**Shallow Concentrated Flow, SCF-5** Woodland Kv= 5.0 fps
32.9	1,475	Total			

Subcatchment 7S: PRE AREA-7



Summary for Subcatchment 8S: PRE AREA-8

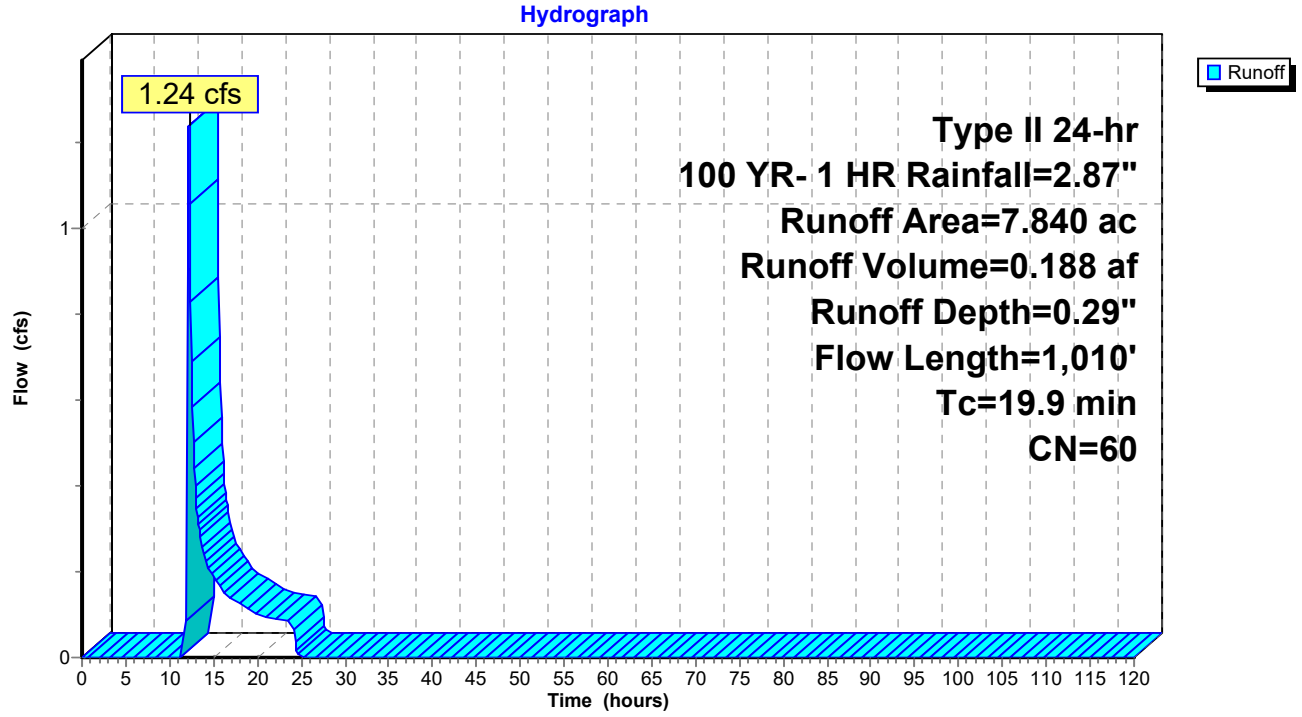
Runoff = 1.24 cfs @ 12.22 hrs, Volume= 0.188 af, Depth= 0.29"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 24-hr 100 YR- 1 HR Rainfall=2.87"

Area (ac)	CN	Description
0.100	69	50-75% Grass cover, Fair, HSG B
6.180	55	Woods, Good, HSG B
1.390	77	Woods, Good, HSG D
0.090	98	Water Surface, 0% imp, HSG B
0.080	98	Water Surface, 0% imp, HSG D
7.840	60	Weighted Average
7.840		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.5	50	0.0220	0.07		**Sheet Flow, SF-1** Woods: Light underbrush n= 0.400 P2= 3.39"
7.6	510	0.0500	1.12		**Shallow Concentrated Flow, SCF-1** Woodland Kv= 5.0 fps
0.8	450	0.0500	9.08	23.62	**Channel Flow, CF-1** Area= 2.6 sf Perim= 3.5' r= 0.74' n= 0.030 Earth, grassed & winding
19.9	1,010	Total			

Subcatchment 8S: PRE AREA-8



Summary for Subcatchment 9S: PRE AREA-9

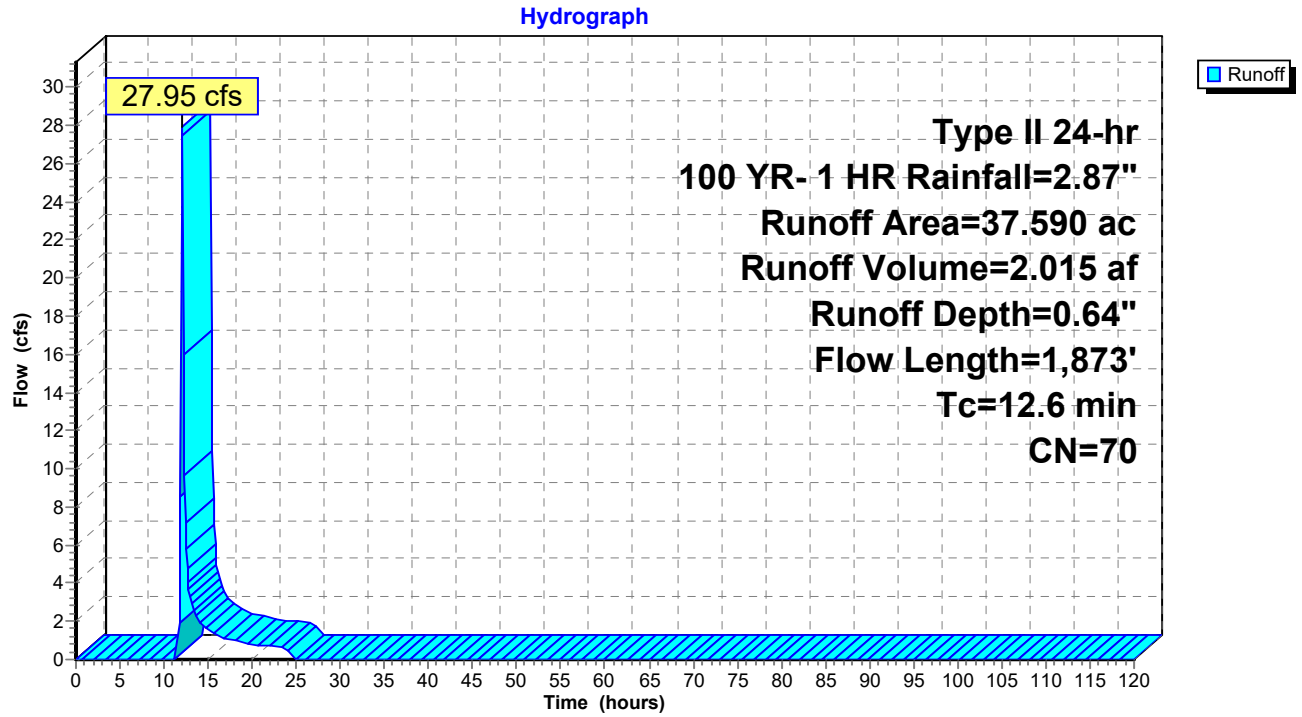
Runoff = 27.95 cfs @ 12.07 hrs, Volume= 2.015 af, Depth= 0.64"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 24-hr 100 YR- 1 HR Rainfall=2.87"

Area (ac)	CN	Description
33.190	69	50-75% Grass cover, Fair, HSG B
2.170	84	50-75% Grass cover, Fair, HSG D
0.910	55	Woods, Good, HSG B
0.610	77	Woods, Good, HSG D
0.710	98	Water Surface, 0% imp, HSG D
37.590	70	Weighted Average
37.590		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.5	50	0.0600	0.24		**Sheet Flow, SF-1** Grass: Short n= 0.150 P2= 3.39"
6.6	481	0.0300	1.21		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
2.5	1,342	0.0500	9.08	23.62	**Channel Flow, CF-1** Area= 2.6 sf Perim= 3.5' r= 0.74' n= 0.030 Earth, grassed & winding
12.6	1,873	Total			

Subcatchment 9S: PRE AREA-9



Summary for Subcatchment 10S: PRE AREA-10

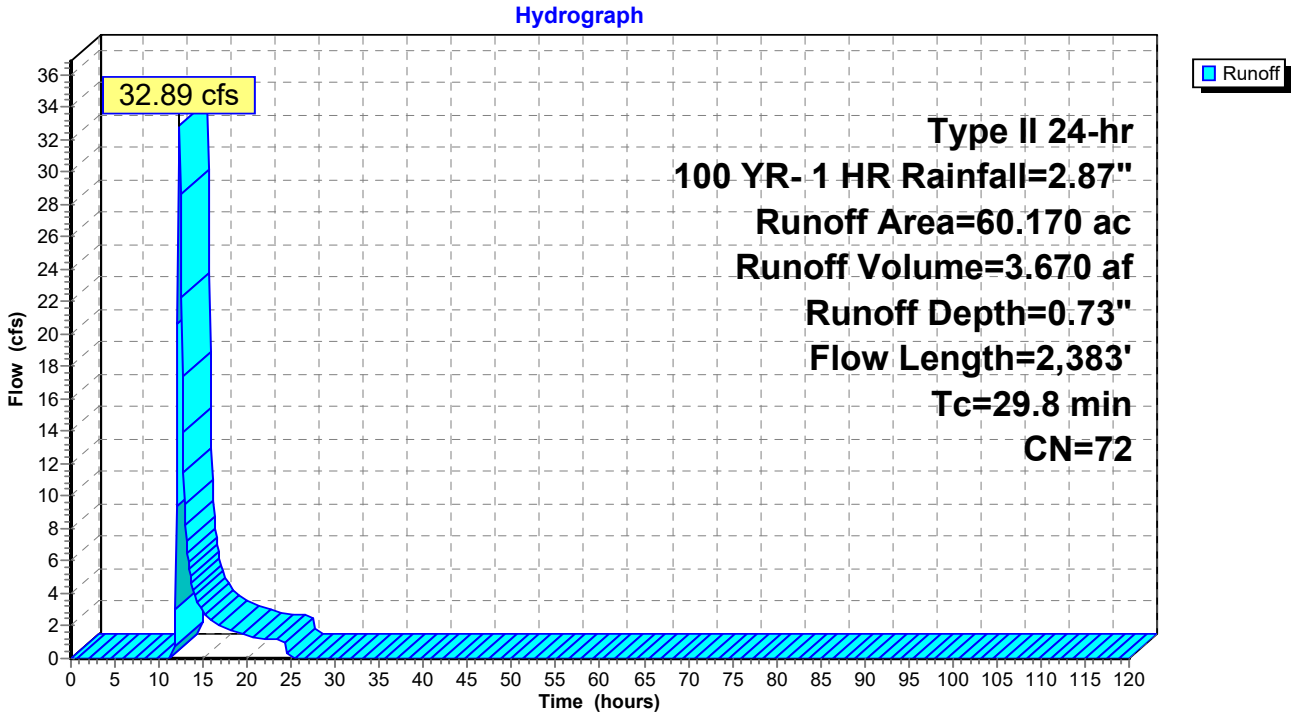
Runoff = 32.89 cfs @ 12.28 hrs, Volume= 3.670 af, Depth= 0.73"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 24-hr 100 YR- 1 HR Rainfall=2.87"

Area (ac)	CN	Description
49.000	69	50-75% Grass cover, Fair, HSG B
2.980	79	50-75% Grass cover, Fair, HSG C
7.920	84	50-75% Grass cover, Fair, HSG D
0.270	91	Gravel roads, HSG D
60.170	72	Weighted Average
60.170		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.6	50	0.0300	0.18		**Sheet Flow, SF-1** Grass: Short n= 0.150 P2= 3.39"
3.5	357	0.0600	1.71		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
19.8	1,178	0.0200	0.99		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
1.9	798	0.0300	7.17	46.63	**Channel Flow, CF-1** Area= 6.5 sf Perim= 8.5' r= 0.76' n= 0.030 Earth, grassed & winding
29.8	2,383	Total			

Subcatchment 10S: PRE AREA-10



Summary for Subcatchment 11S: PRE AREA-11

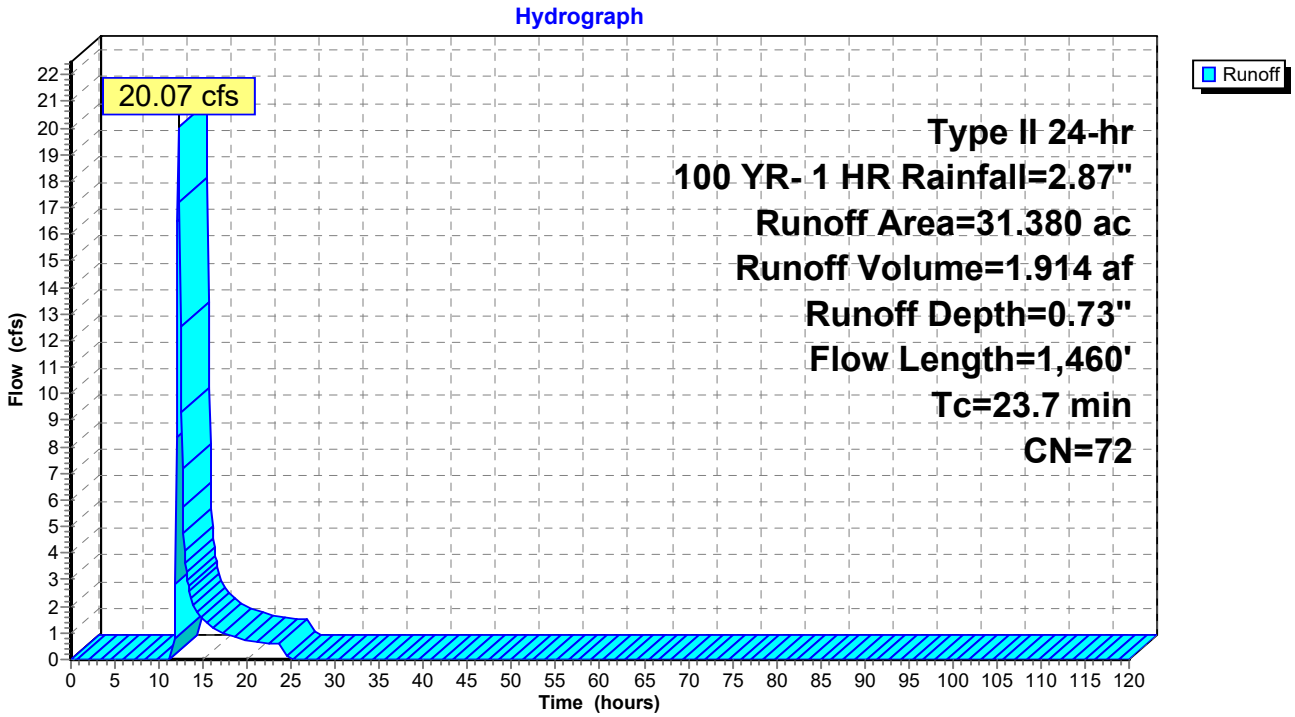
Runoff = 20.07 cfs @ 12.21 hrs, Volume= 1.914 af, Depth= 0.73"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 24-hr 100 YR- 1 HR Rainfall=2.87"

Area (ac)	CN	Description
21.950	69	50-75% Grass cover, Fair, HSG B
9.290	79	50-75% Grass cover, Fair, HSG C
0.110	55	Woods, Good, HSG B
0.030	91	Gravel roads, HSG D
31.380	72	Weighted Average
31.380		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.4	50	0.1500	0.34		**Sheet Flow, SF-1** Grass: Short n= 0.150 P2= 3.39"
2.5	292	0.0800	1.98		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
18.8	1,118	0.0200	0.99		**Shallow Concentrated Flow, SCF-2** Short Grass Pasture Kv= 7.0 fps
23.7	1,460	Total			

Subcatchment 11S: PRE AREA-11



Summary for Subcatchment 12S: PRE AREA-12

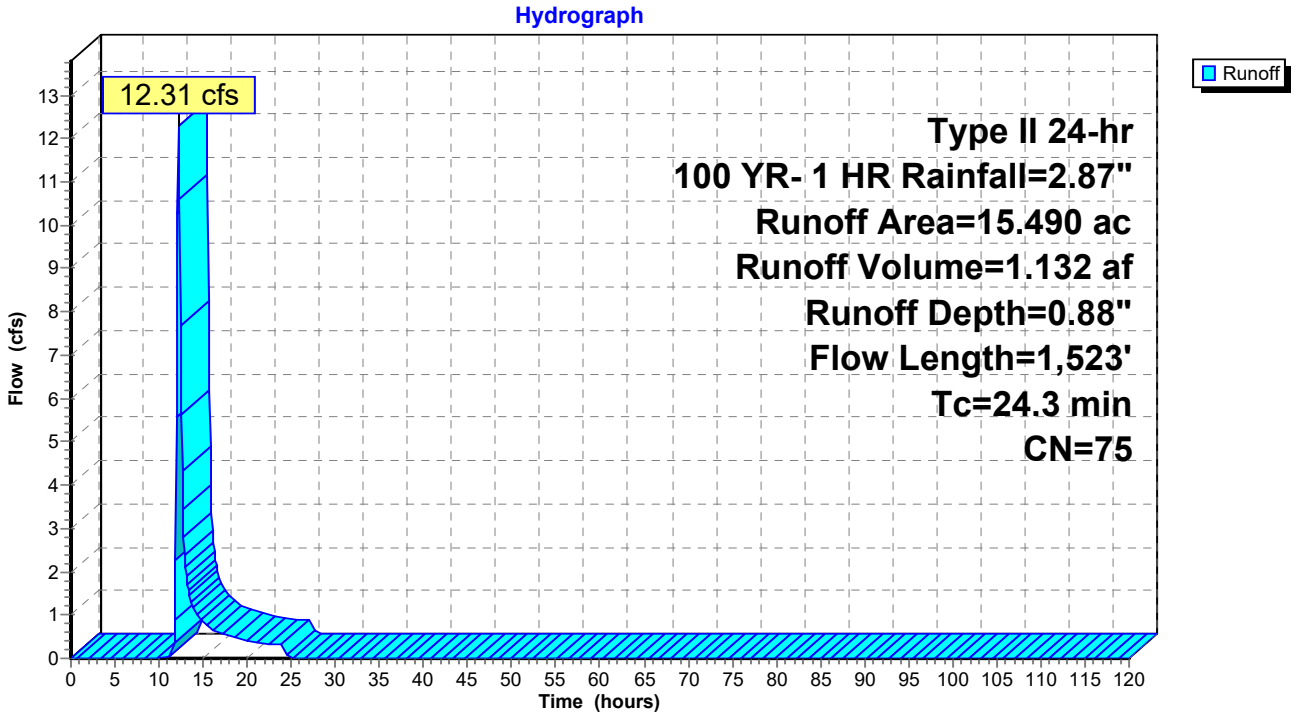
Runoff = 12.31 cfs @ 12.20 hrs, Volume= 1.132 af, Depth= 0.88"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 24-hr 100 YR- 1 HR Rainfall=2.87"

Area (ac)	CN	Description
9.730	69	50-75% Grass cover, Fair, HSG B
5.760	84	50-75% Grass cover, Fair, HSG D
15.490	75	Weighted Average
15.490		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.1	50	0.0400	0.20		**Sheet Flow, SF-1** Grass: Short n= 0.150 P2= 3.39"
20.2	1,473	0.0300	1.21		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
24.3	1,523	Total			

Subcatchment 12S: PRE AREA-12



Summary for Subcatchment 13S: PRE AREA-13

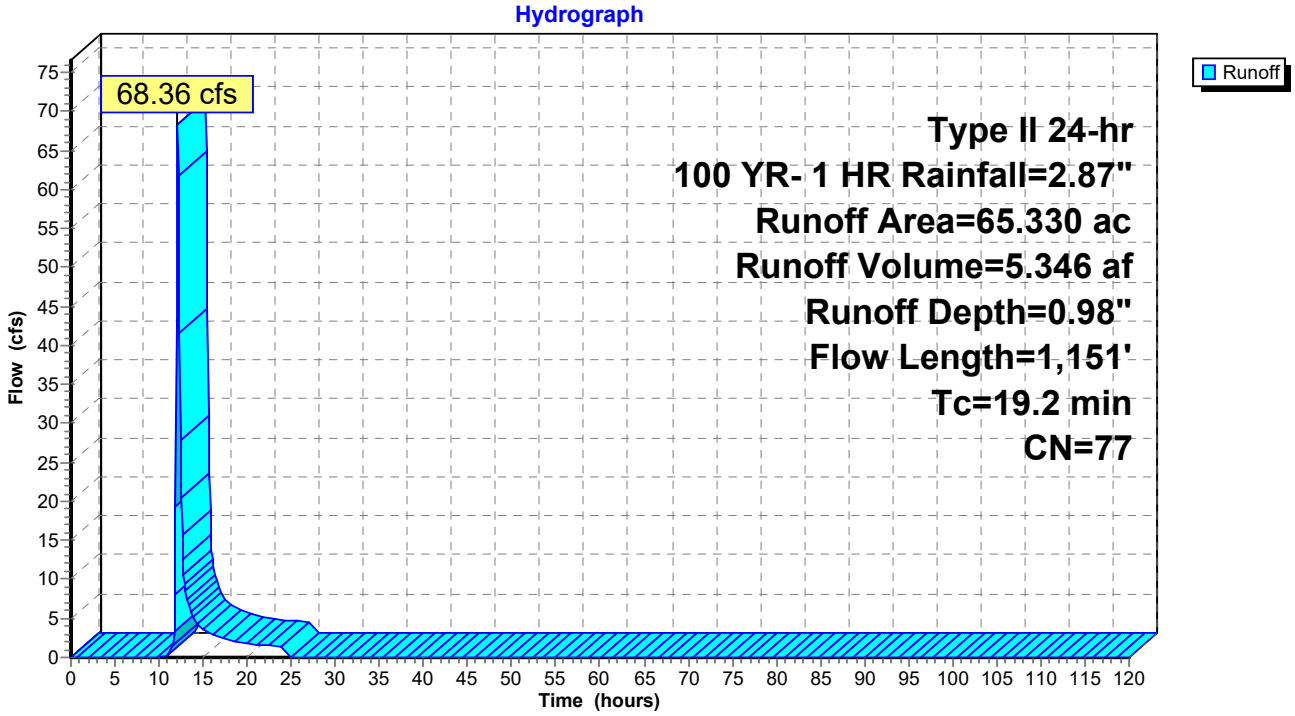
Runoff = 68.36 cfs @ 12.13 hrs, Volume= 5.346 af, Depth= 0.98"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 24-hr 100 YR- 1 HR Rainfall=2.87"

Area (ac)	CN	Description
17.980	69	50-75% Grass cover, Fair, HSG B
28.940	84	50-75% Grass cover, Fair, HSG D
3.610	55	Woods, Good, HSG B
14.800	77	Woods, Good, HSG D
65.330	77	Weighted Average
65.330		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.1	50	0.0400	0.20		**Sheet Flow, SF-1** Grass: Short n= 0.150 P2= 3.39"
15.1	1,101	0.0300	1.21		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
19.2	1,151	Total			

Subcatchment 13S: PRE AREA-13



Summary for Subcatchment 14S: PRE AREA-14

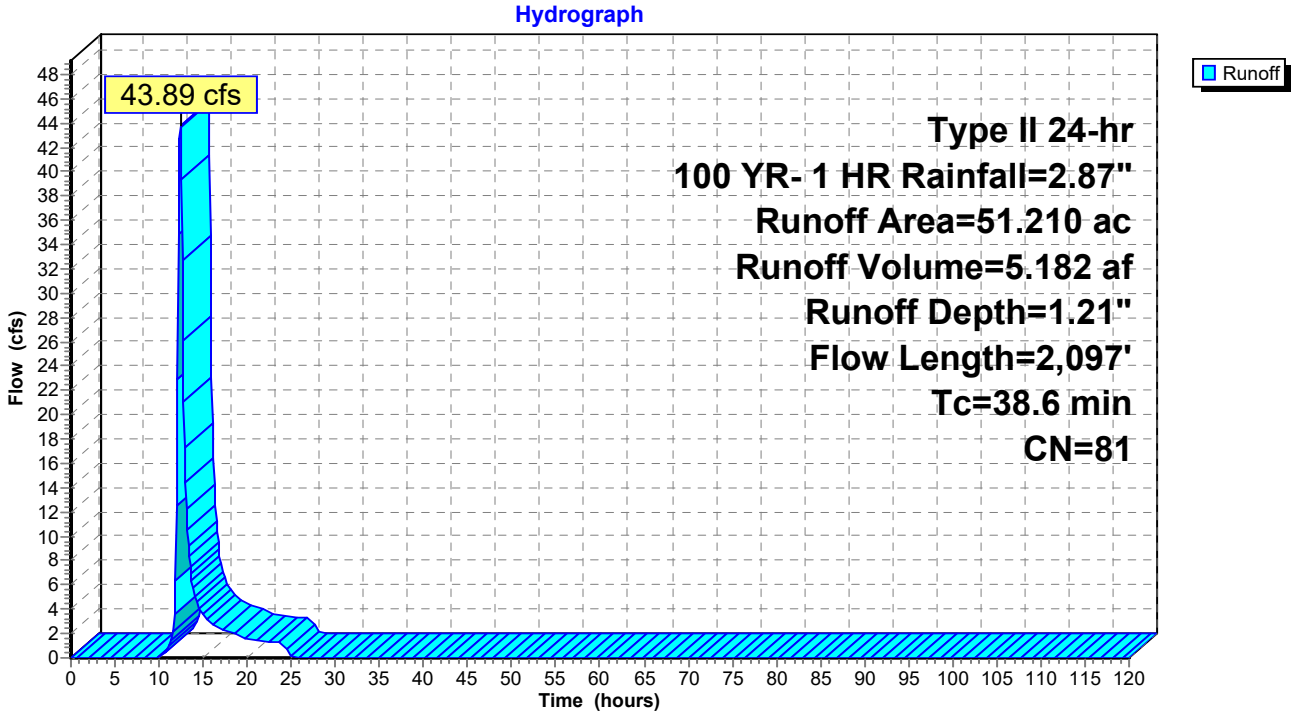
Runoff = 43.89 cfs @ 12.37 hrs, Volume= 5.182 af, Depth= 1.21"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 24-hr 100 YR- 1 HR Rainfall=2.87"

Area (ac)	CN	Description
10.700	69	50-75% Grass cover, Fair, HSG B
40.440	84	50-75% Grass cover, Fair, HSG D
0.070	77	Woods, Good, HSG D
51.210	81	Weighted Average
51.210		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.1	50	0.0400	0.20		**Sheet Flow, SF-1** Grass: Short n= 0.150 P2= 3.39"
34.5	2,047	0.0200	0.99		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
38.6	2,097	Total			

Subcatchment 14S: PRE AREA-14



Summary for Subcatchment 15S: PRE AREA-15

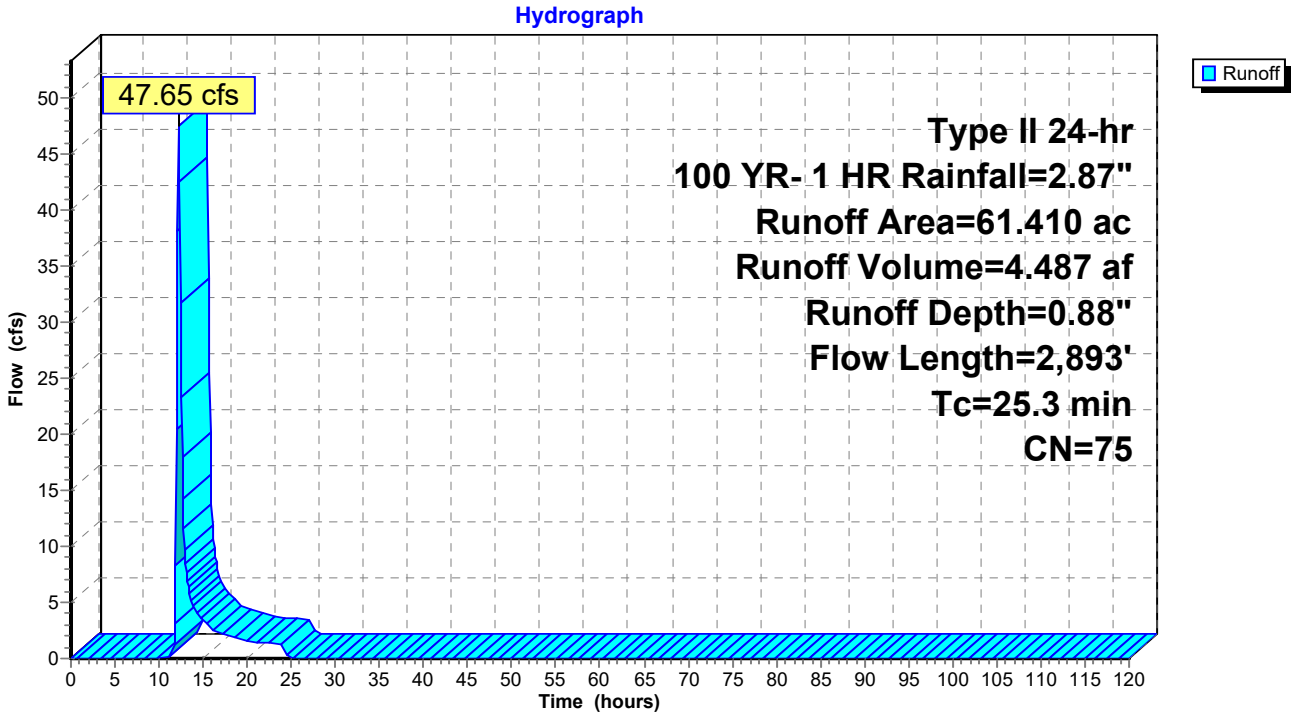
Runoff = 47.65 cfs @ 12.22 hrs, Volume= 4.487 af, Depth= 0.88"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 24-hr 100 YR- 1 HR Rainfall=2.87"

Area (ac)	CN	Description
36.590	69	50-75% Grass cover, Fair, HSG B
15.830	84	50-75% Grass cover, Fair, HSG D
8.110	84	1 acre lots, 20% imp, HSG D
0.280	91	Gravel roads, HSG D
0.600	98	Water Surface, 0% imp, HSG D
61.410	75	Weighted Average
59.788		97.36% Pervious Area
1.622		2.64% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.6	50	0.0300	0.18		**Sheet Flow, SF-1** Grass: Short n= 0.150 P2= 3.39"
16.5	1,201	0.0300	1.21		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
4.2	1,642	0.0400	6.58	42.79	**Channel Flow, CF-1** Area= 6.5 sf Perim= 12.0' r= 0.54' n= 0.030 Earth, grassed & winding
25.3	2,893	Total			

Subcatchment 15S: PRE AREA-15



Summary for Subcatchment 16S: PRE AREA-16

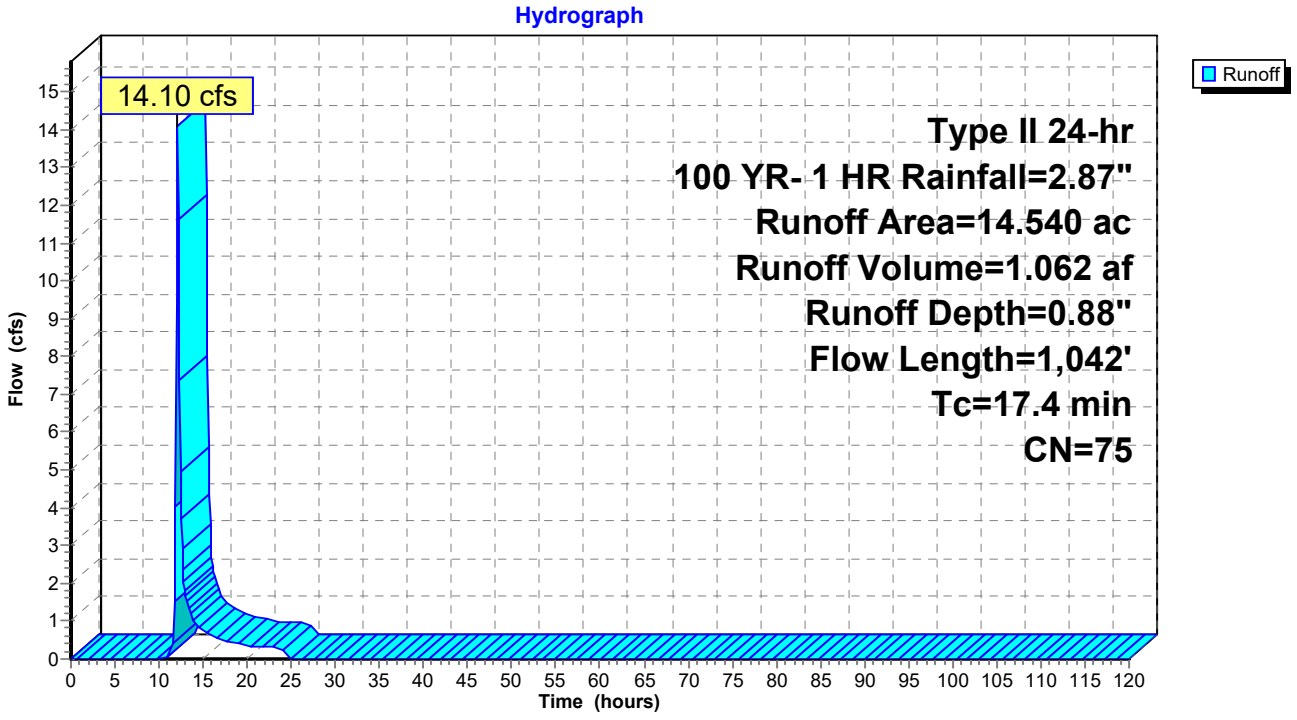
Runoff = 14.10 cfs @ 12.12 hrs, Volume= 1.062 af, Depth= 0.88"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 24-hr 100 YR- 1 HR Rainfall=2.87"

Area (ac)	CN	Description
7.140	69	50-75% Grass cover, Fair, HSG B
6.200	79	50-75% Grass cover, Fair, HSG C
0.640	84	1 acre lots, 20% imp, HSG D
0.560	91	Gravel roads, HSG D
14.540	75	Weighted Average
14.412		99.12% Pervious Area
0.128		0.88% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.9	50	0.1000	0.29		**Sheet Flow, SF-1** Grass: Short n= 0.150 P2= 3.39"
2.3	268	0.0800	1.98		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
12.2	724	0.0200	0.99		**Shallow Concentrated Flow, SCF-2** Short Grass Pasture Kv= 7.0 fps
17.4	1,042	Total			

Subcatchment 16S: PRE AREA-16



Summary for Subcatchment 17S: PRE AREA-17

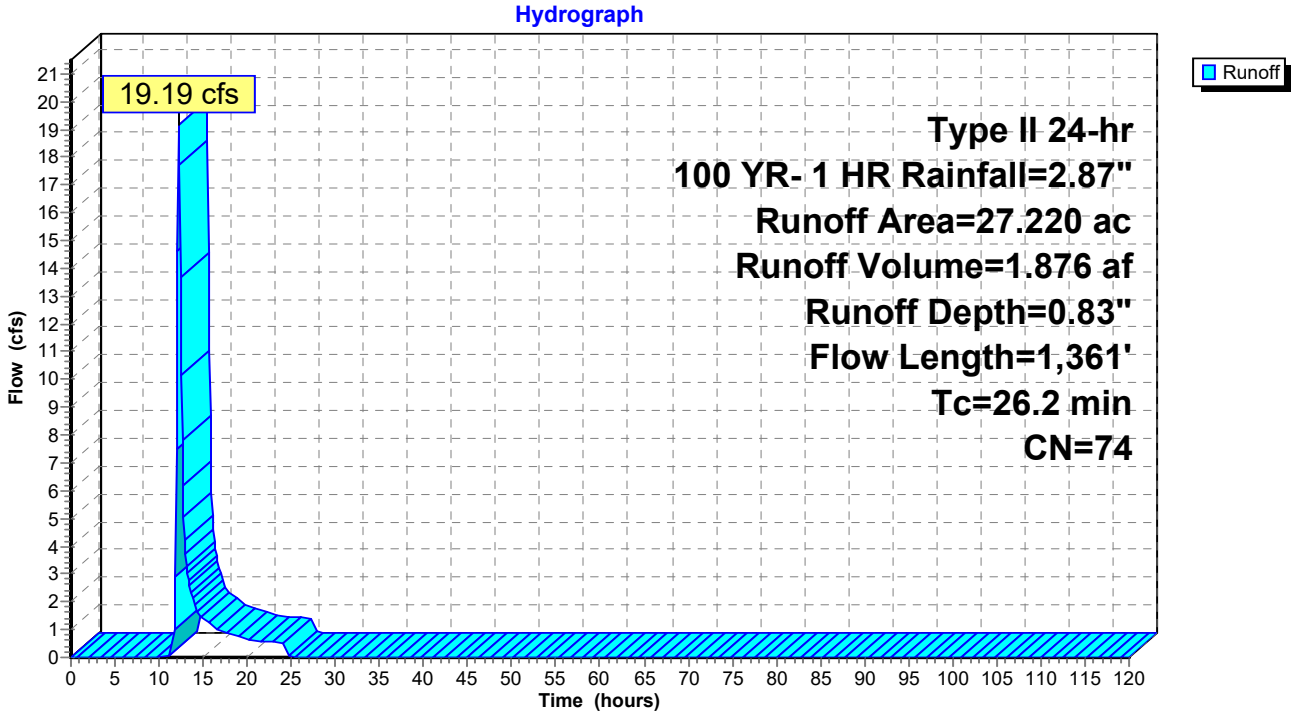
Runoff = 19.19 cfs @ 12.23 hrs, Volume= 1.876 af, Depth= 0.83"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 24-hr 100 YR- 1 HR Rainfall=2.87"

Area (ac)	CN	Description
14.120	69	50-75% Grass cover, Fair, HSG B
12.070	79	50-75% Grass cover, Fair, HSG C
1.030	84	1 acre lots, 20% imp, HSG D
27.220	74	Weighted Average
27.014		99.24% Pervious Area
0.206		0.76% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.1	50	0.0400	0.20		**Sheet Flow, SF-1** Grass: Short n= 0.150 P2= 3.39"
22.1	1,311	0.0200	0.99		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
26.2	1,361	Total			

Subcatchment 17S: PRE AREA-17



Summary for Subcatchment 18S: PRE AREA-18

[49] Hint: Tc<2dt may require smaller dt

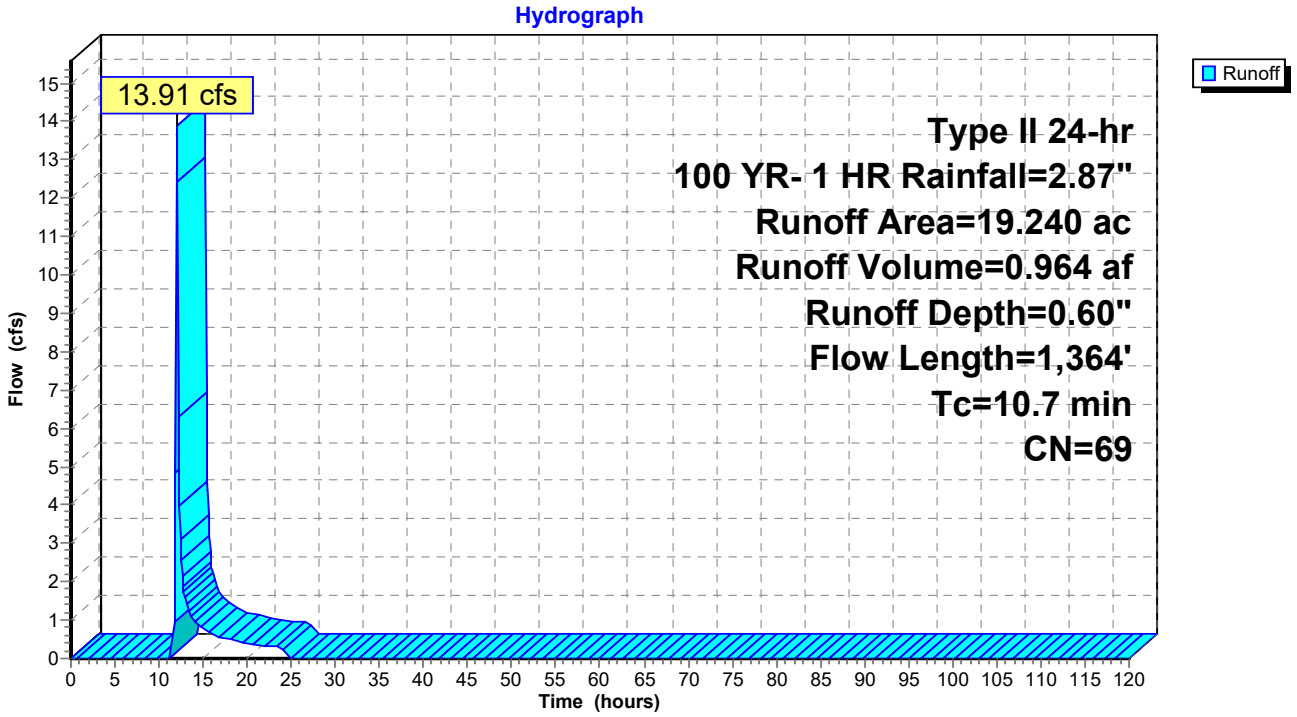
Runoff = 13.91 cfs @ 12.04 hrs, Volume= 0.964 af, Depth= 0.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 24-hr 100 YR- 1 HR Rainfall=2.87"

Area (ac)	CN	Description
0.710	55	Woods, Good, HSG B
0.320	70	Woods, Good, HSG C
17.060	69	50-75% Grass cover, Fair, HSG B
0.160	79	50-75% Grass cover, Fair, HSG C
0.990	84	50-75% Grass cover, Fair, HSG D
19.240	69	Weighted Average
19.240		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.1	50	0.0800	0.27		**Sheet Flow, SF-1** Grass: Short n= 0.150 P2= 3.39"
1.6	187	0.0800	1.98		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
6.0	1,127	0.0080	3.15	47.28	**Channel Flow,** Area= 15.0 sf Perim= 25.0' r= 0.60' n= 0.030
10.7	1,364	Total			

Subcatchment 18S: PRE AREA-18



Summary for Subcatchment 19S: PRE AREA-19

[49] Hint: Tc<2dt may require smaller dt

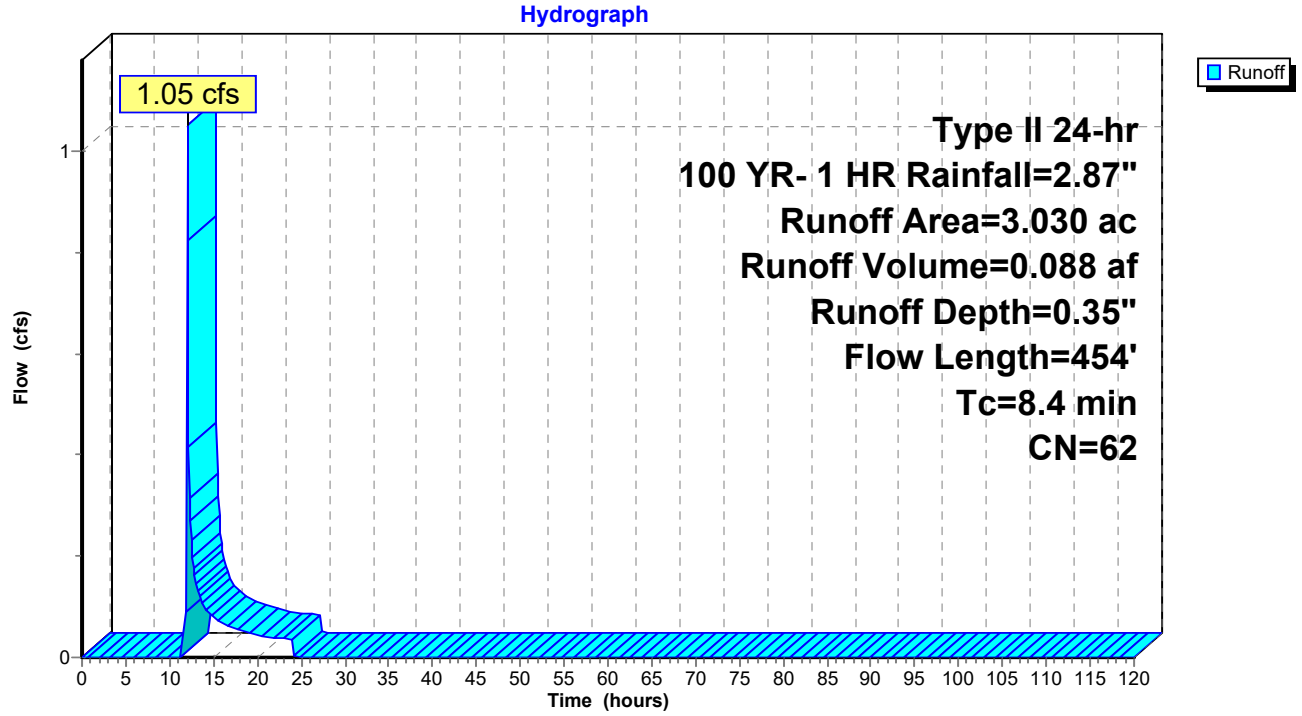
Runoff = 1.05 cfs @ 12.03 hrs, Volume= 0.088 af, Depth= 0.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 24-hr 100 YR- 1 HR Rainfall=2.87"

Area (ac)	CN	Description
1.570	55	Woods, Good, HSG B
1.460	69	50-75% Grass cover, Fair, HSG B
3.030	62	Weighted Average
3.030		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.1	50	0.0400	0.20		**Sheet Flow, SF-1** Grass: Short n= 0.150 P2= 3.39"
4.3	404	0.0500	1.57		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
8.4	454	Total			

Subcatchment 19S: PRE AREA-19



Summary for Subcatchment 20S: PRE AREA-20

[49] Hint: Tc<2dt may require smaller dt

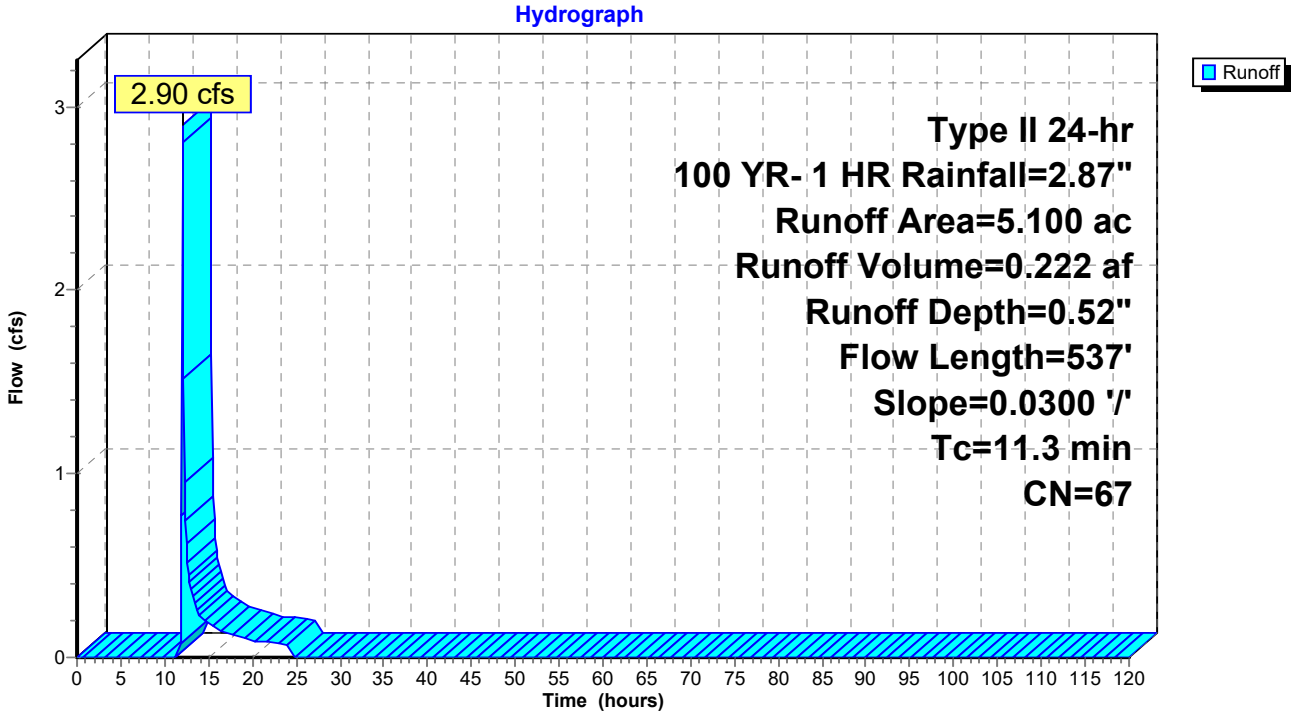
Runoff = 2.90 cfs @ 12.06 hrs, Volume= 0.222 af, Depth= 0.52"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 24-hr 100 YR- 1 HR Rainfall=2.87"

Area (ac)	CN	Description
0.640	55	Woods, Good, HSG B
4.460	69	50-75% Grass cover, Fair, HSG B
5.100	67	Weighted Average
5.100		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.6	50	0.0300	0.18		**Sheet Flow, SF-1** Grass: Short n= 0.150 P2= 3.39"
6.7	487	0.0300	1.21		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
11.3	537	Total			

Subcatchment 20S: PRE AREA-20



Summary for Subcatchment 21S: PRE AREA-21

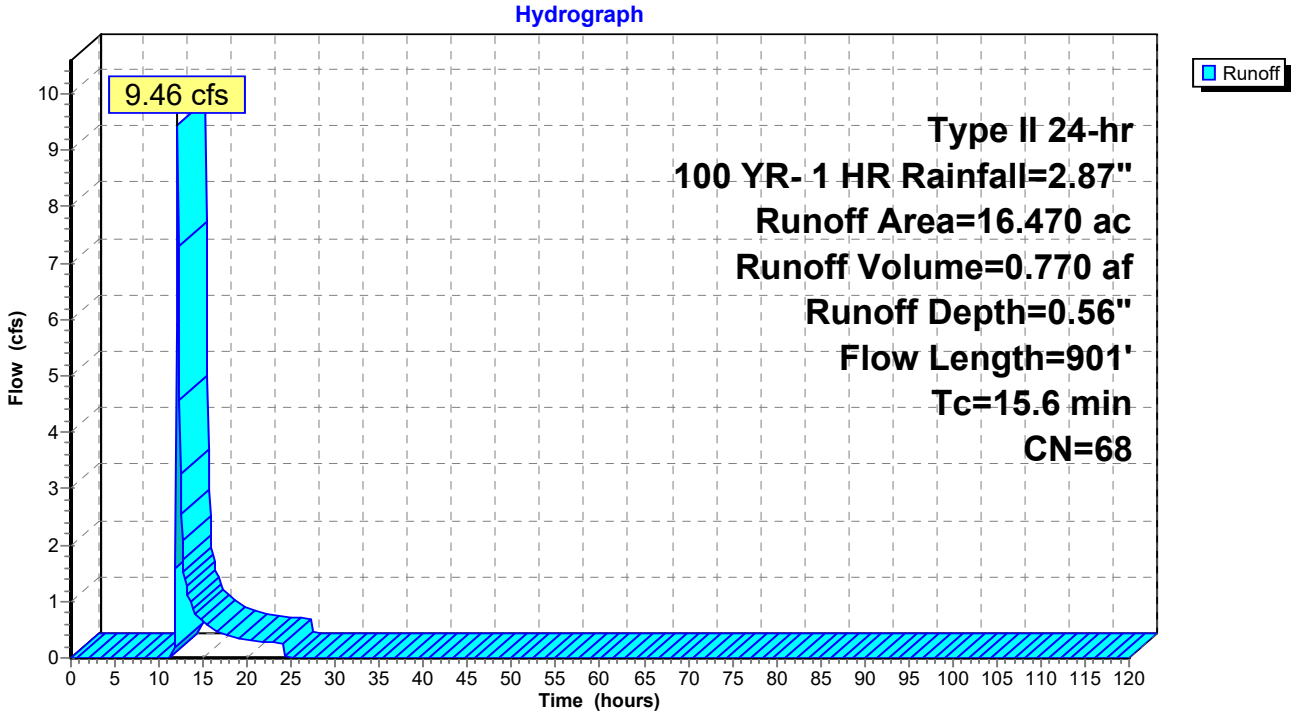
Runoff = 9.46 cfs @ 12.11 hrs, Volume= 0.770 af, Depth= 0.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 24-hr 100 YR- 1 HR Rainfall=2.87"

Area (ac)	CN	Description
0.870	55	Woods, Good, HSG B
0.390	70	Woods, Good, HSG C
15.210	69	50-75% Grass cover, Fair, HSG B
16.470	68	Weighted Average
16.470		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.5	50	0.0200	0.15		**Sheet Flow, SF-1** Grass: Short n= 0.150 P2= 3.39"
10.1	851	0.0400	1.40		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
15.6	901	Total			

Subcatchment 21S: PRE AREA-21



Summary for Subcatchment 22S: PRE AREA-22

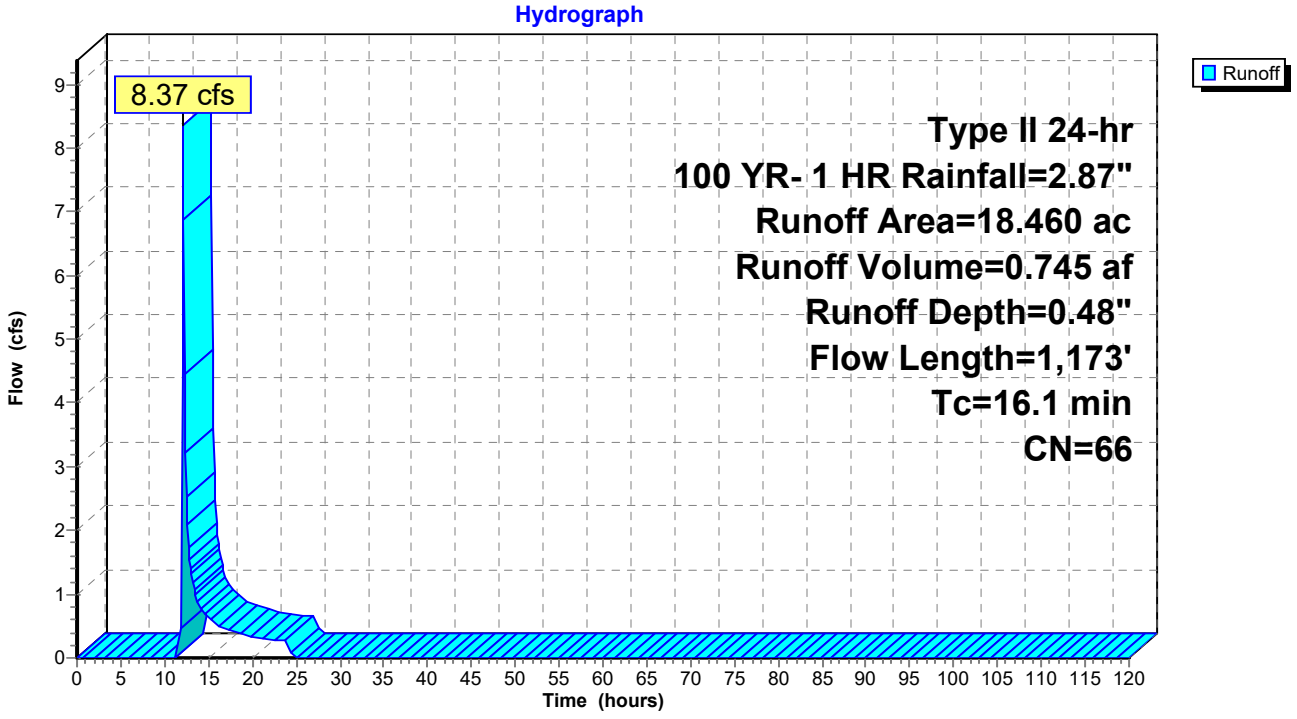
Runoff = 8.37 cfs @ 12.12 hrs, Volume= 0.745 af, Depth= 0.48"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 24-hr 100 YR- 1 HR Rainfall=2.87"

Area (ac)	CN	Description
3.800	55	Woods, Good, HSG B
1.800	70	Woods, Good, HSG C
12.860	69	50-75% Grass cover, Fair, HSG B
18.460	66	Weighted Average
18.460		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.1	50	0.0400	0.20		**Sheet Flow, SF-1** Grass: Short n= 0.150 P2= 3.39"
12.0	1,123	0.0500	1.57		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
16.1	1,173	Total			

Subcatchment 22S: PRE AREA-22



Summary for Subcatchment 23S: PRE AREA-23

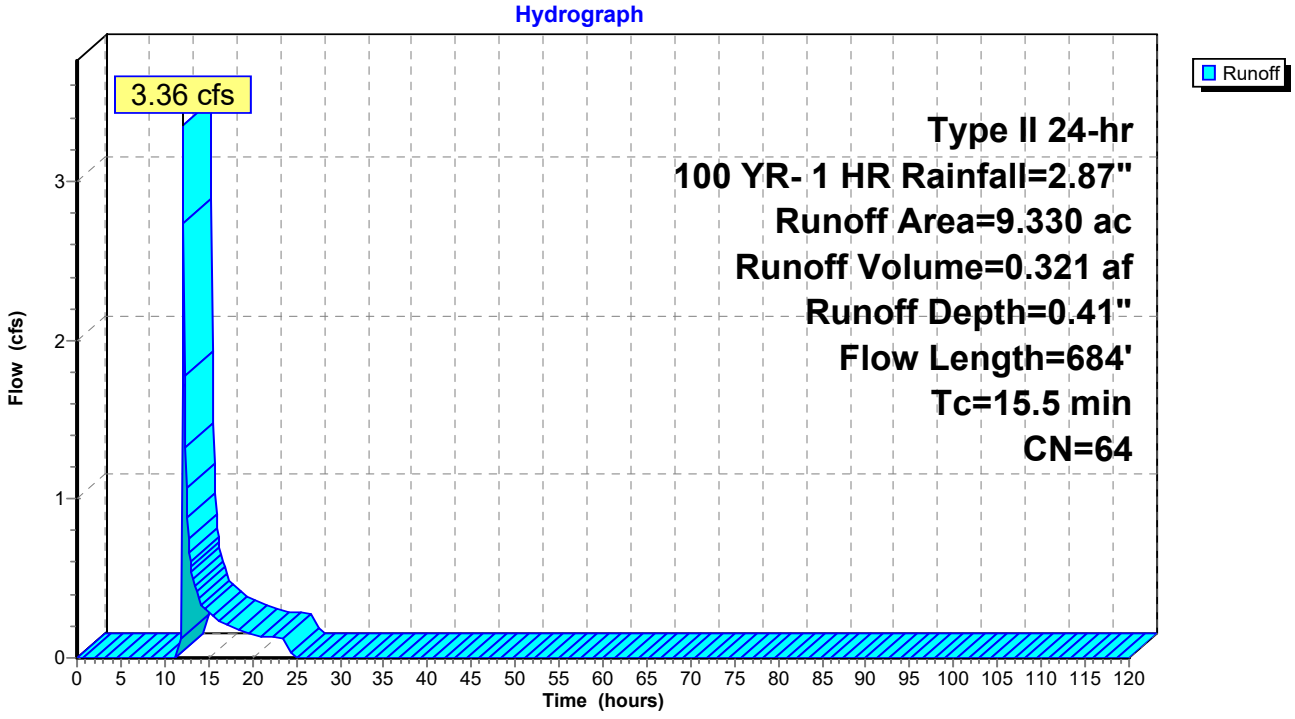
Runoff = 3.36 cfs @ 12.12 hrs, Volume= 0.321 af, Depth= 0.41"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 24-hr 100 YR- 1 HR Rainfall=2.87"

Area (ac)	CN	Description
3.620	55	Woods, Good, HSG B
5.310	70	Woods, Good, HSG C
0.400	69	50-75% Grass cover, Fair, HSG B
9.330	64	Weighted Average
9.330		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	50	0.0650	0.11		**Sheet Flow, SF-1** Woods: Light underbrush n= 0.400 P2= 3.39"
8.0	634	0.0700	1.32		**Shallow Concentrated Flow, SCF-1** Woodland Kv= 5.0 fps
15.5	684	Total			

Subcatchment 23S: PRE AREA-23



Summary for Subcatchment 24S: PRE AREA-24

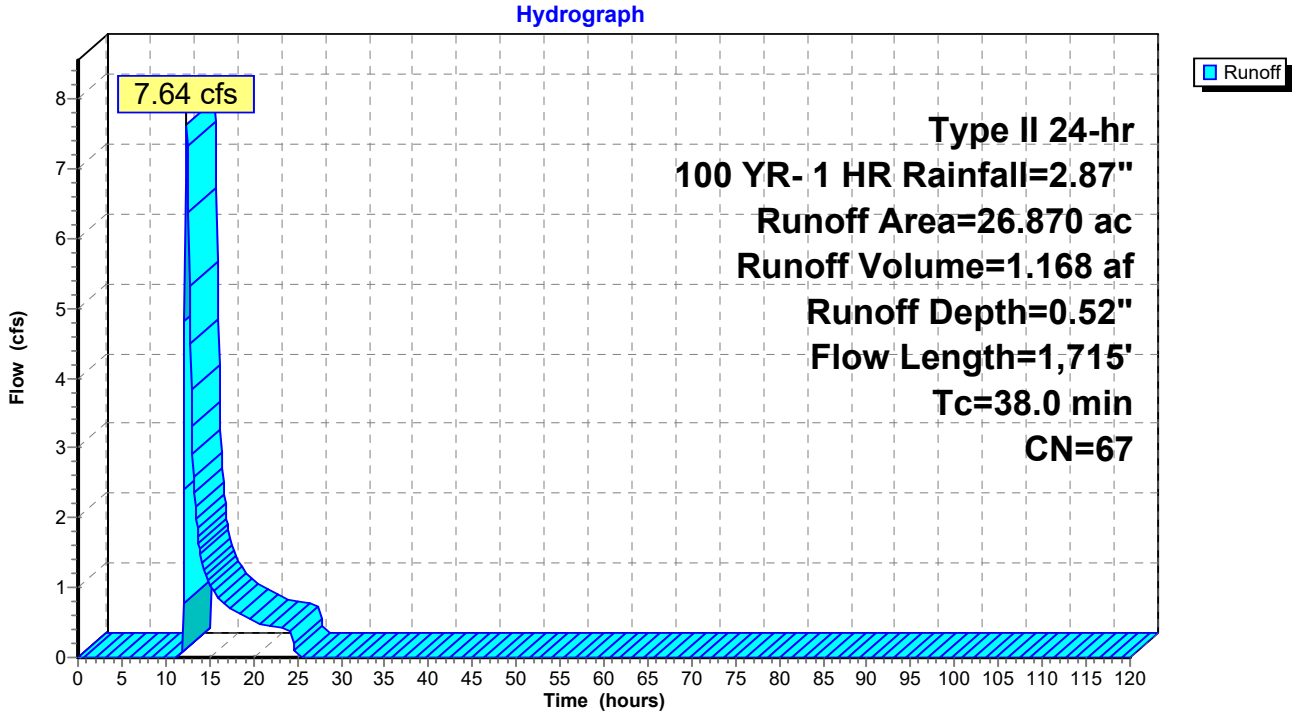
Runoff = 7.64 cfs @ 12.42 hrs, Volume= 1.168 af, Depth= 0.52"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 24-hr 100 YR- 1 HR Rainfall=2.87"

Area (ac)	CN	Description
5.180	55	Woods, Good, HSG B
2.080	70	Woods, Good, HSG C
18.550	69	50-75% Grass cover, Fair, HSG B
1.060	79	50-75% Grass cover, Fair, HSG C
26.870	67	Weighted Average
26.870		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.8	50	0.0100	0.05		**Sheet Flow, SF-1** Woods: Light underbrush n= 0.400 P2= 3.39"
7.4	586	0.0700	1.32		**Shallow Concentrated Flow, SCF-1** Woodland Kv= 5.0 fps
14.8	1,079	0.0300	1.21		**Shallow Concentrated Flow, SCF-2** Short Grass Pasture Kv= 7.0 fps
38.0	1,715	Total			

Subcatchment 24S: PRE AREA-24



Summary for Subcatchment 25S: PRE AREA-25

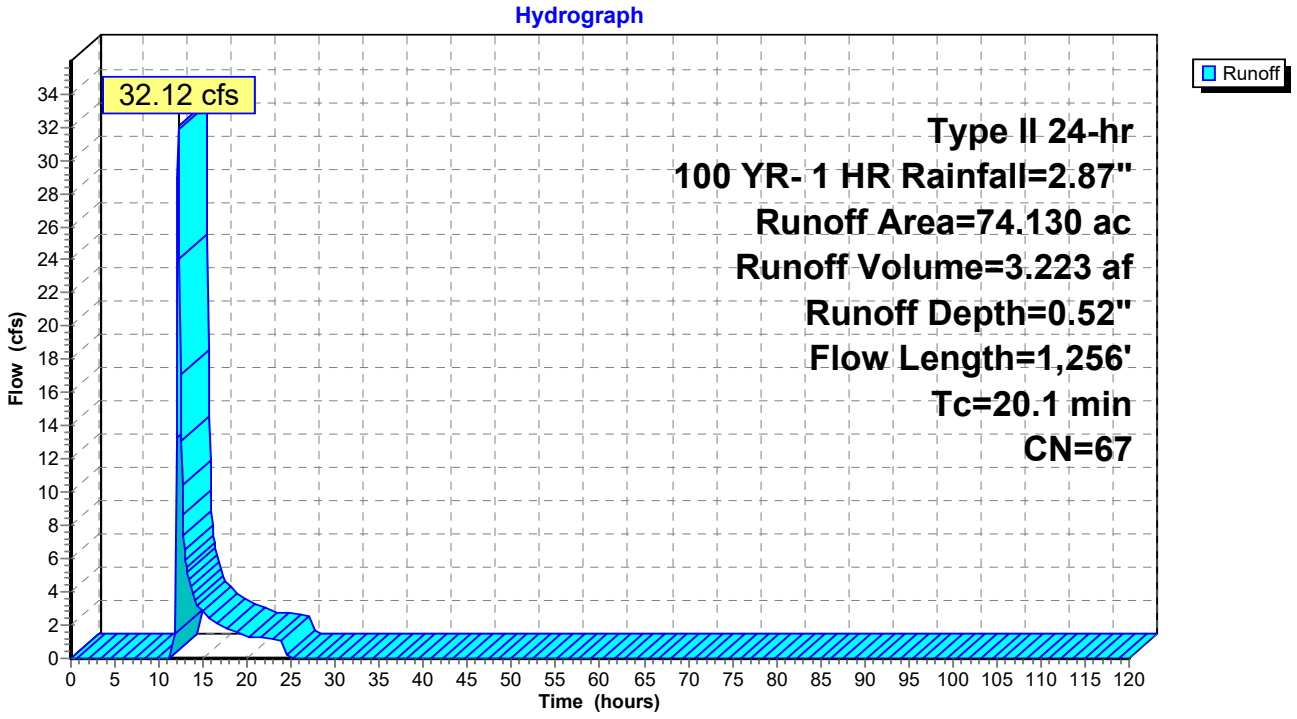
Runoff = 32.12 cfs @ 12.18 hrs, Volume= 3.223 af, Depth= 0.52"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 24-hr 100 YR- 1 HR Rainfall=2.87"

Area (ac)	CN	Description
62.530	69	50-75% Grass cover, Fair, HSG B
11.600	55	Woods, Good, HSG B
74.130	67	Weighted Average
74.130		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.5	50	0.0600	0.24		**Sheet Flow, SF-1** Grass: Short n= 0.150 P2= 3.39"
16.6	1,206	0.0300	1.21		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
20.1	1,256	Total			

Subcatchment 25S: PRE AREA-25



Summary for Subcatchment 54S: PRE AREA-26(Gen-Tie Route)

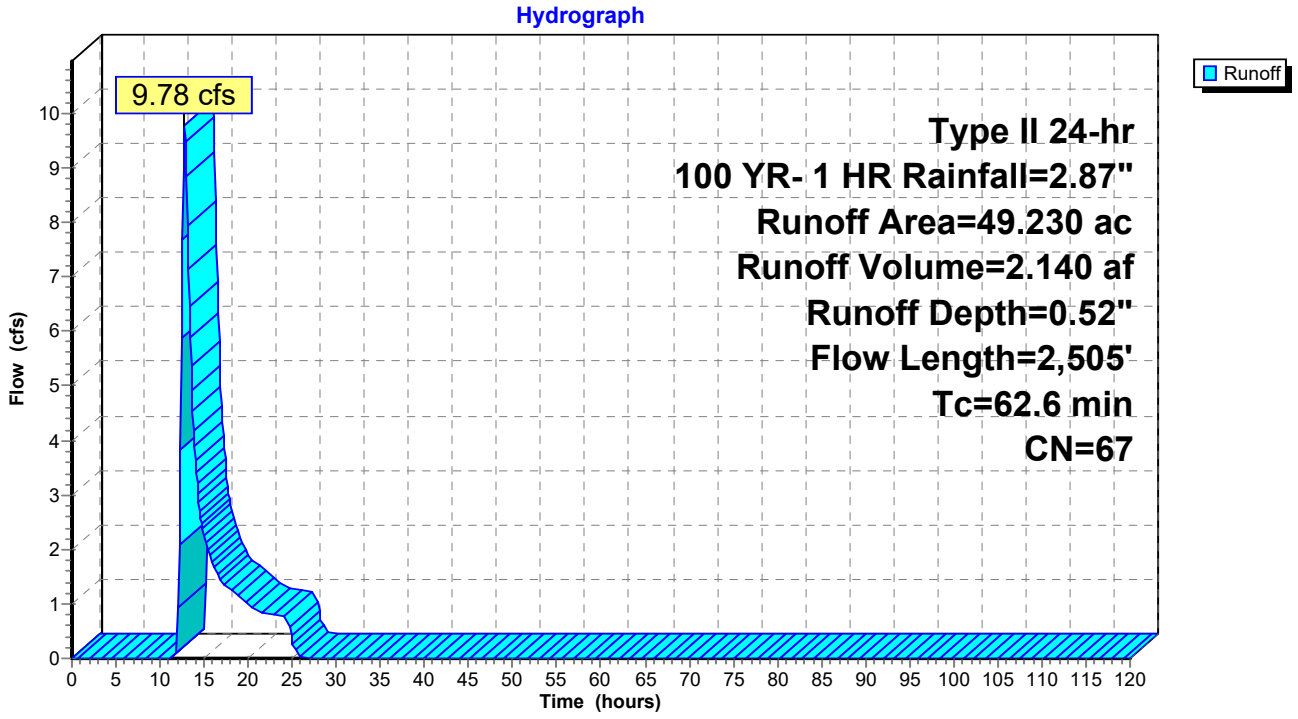
Runoff = 9.78 cfs @ 12.78 hrs, Volume= 2.140 af, Depth= 0.52"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 24-hr 100 YR- 1 HR Rainfall=2.87"

Area (ac)	CN	Description
40.630	69	50-75% Grass cover, Fair, HSG B
8.600	55	Woods, Good, HSG B
49.230	67	Weighted Average
49.230		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.1	50	0.0400	0.20		**Sheet Flow, SF-1** Grass: Short n= 0.150 P2= 3.39"
58.5	2,455	0.0100	0.70		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
62.6	2,505	Total			

Subcatchment 54S: PRE AREA-26(Gen-Tie Route)



Summary for Pond 51P: Exisitng Wetland

Inflow Area = 7.840 ac, 0.00% Impervious, Inflow Depth = 0.29" for 100 YR- 1 HR event
Inflow = 1.24 cfs @ 12.22 hrs, Volume= 0.188 af
Outflow = 0.16 cfs @ 15.93 hrs, Volume= 0.111 af, Atten= 87%, Lag= 222.6 min
Primary = 0.16 cfs @ 15.93 hrs, Volume= 0.111 af

Routing by Stor-Ind method, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Peak Elev= 717.14' @ 15.93 hrs Surf.Area= 4,894 sf Storage= 4,134 cf

Plug-Flow detention time= 389.6 min calculated for 0.111 af (59% of inflow)
Center-of-Mass det. time= 236.9 min (1,186.8 - 950.0)

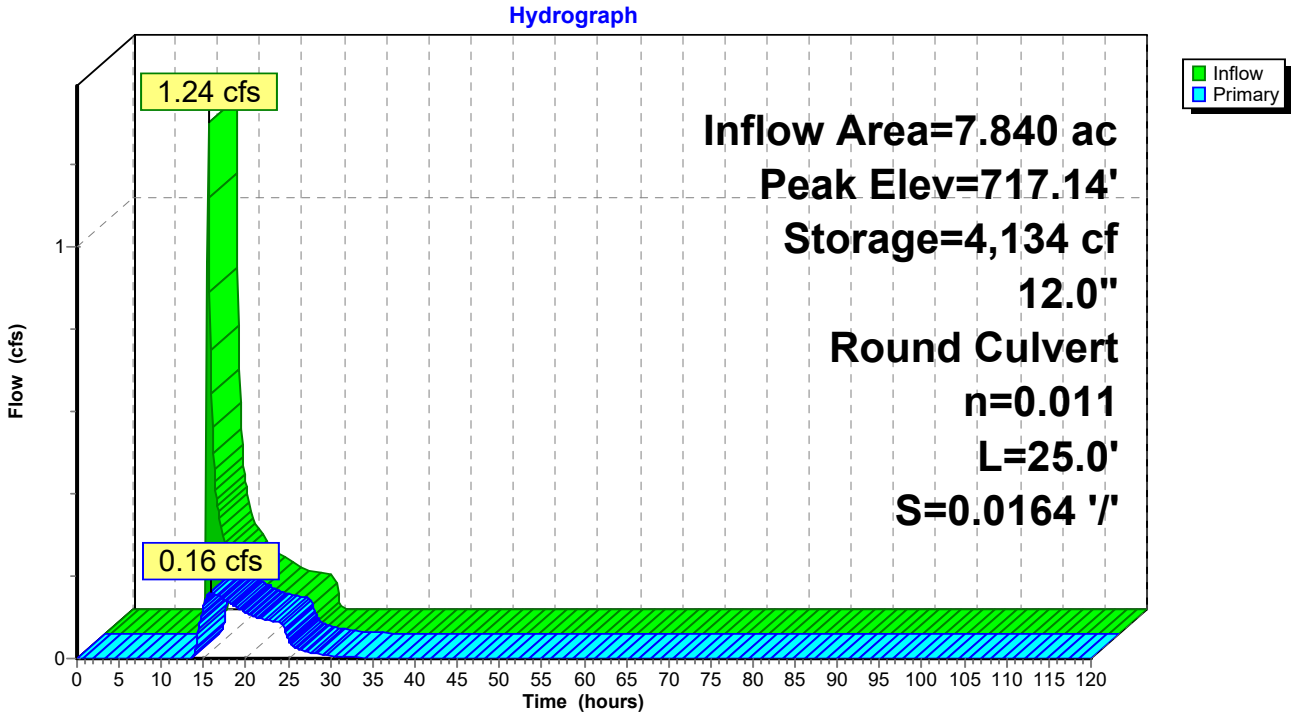
Volume	Invert	Avail.Storage	Storage Description
#1	716.00'	125,716 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
716.00	2,360	0	0
718.00	6,807	9,167	9,167
720.00	13,548	20,355	29,522
722.00	23,063	36,611	66,133
724.00	36,520	59,583	125,716

Device	Routing	Invert	Outlet Devices
#1	Primary	716.97'	**12.0" Round Culvert** L= 25.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 716.97' / 716.56' S= 0.0164 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.79 sf

Primary OutFlow Max=0.15 cfs @ 15.93 hrs HW=717.14' (Free Discharge)
1=Culvert (Inlet Controls 0.15 cfs @ 1.75 fps)

Pond 51P: Exisitng Wetland



Time span=0.00-120.00 hrs, dt=0.10 hrs, 1201 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: PRE AREA-1 Runoff Area=26.670 ac 0.00% Impervious Runoff Depth=2.50"
Flow Length=1,700' Tc=33.4 min CN=77 Runoff=72.89 cfs 5.552 af

Subcatchment 2S: PRE AREA-2 Runoff Area=5.380 ac 0.00% Impervious Runoff Depth=1.77"
Flow Length=924' Slope=0.0200 '/' Tc=20.2 min CN=68 Runoff=13.67 cfs 0.795 af

Subcatchment 3S: PRE AREA-3 Runoff Area=67.480 ac 0.40% Impervious Runoff Depth=2.33"
Flow Length=2,190' Tc=41.7 min CN=75 Runoff=145.92 cfs 13.092 af

Subcatchment 4S: PRE AREA-4 Runoff Area=24.880 ac 0.00% Impervious Runoff Depth=2.16"
Flow Length=1,062' Slope=0.0300 '/' Tc=18.5 min CN=73 Runoff=84.79 cfs 4.486 af

Subcatchment 5S: PRE AREA-5 Runoff Area=87.520 ac 0.16% Impervious Runoff Depth=2.41"
Flow Length=2,797' Tc=29.1 min CN=76 Runoff=250.85 cfs 17.595 af

Subcatchment 6S: PRE AREA-6 Runoff Area=346.820 ac 0.18% Impervious Runoff Depth=2.58"
Flow Length=3,249' Tc=38.8 min CN=78 Runoff=882.40 cfs 74.706 af

Subcatchment 7S: PRE AREA-7 Runoff Area=12.290 ac 0.00% Impervious Runoff Depth=2.00"
Flow Length=1,475' Tc=32.9 min CN=71 Runoff=26.60 cfs 2.052 af

Subcatchment 8S: PRE AREA-8 Runoff Area=7.840 ac 0.00% Impervious Runoff Depth=1.21"
Flow Length=1,010' Tc=19.9 min CN=60 Runoff=12.87 cfs 0.793 af

Subcatchment 9S: PRE AREA-9 Runoff Area=37.590 ac 0.00% Impervious Runoff Depth=1.93"
Flow Length=1,873' Tc=12.6 min CN=70 Runoff=131.53 cfs 6.033 af

Subcatchment 10S: PRE AREA-10 Runoff Area=60.170 ac 0.00% Impervious Runoff Depth=2.08"
Flow Length=2,383' Tc=29.8 min CN=72 Runoff=144.66 cfs 10.445 af

Subcatchment 11S: PRE AREA-11 Runoff Area=31.380 ac 0.00% Impervious Runoff Depth=2.08"
Flow Length=1,460' Tc=23.7 min CN=72 Runoff=88.14 cfs 5.447 af

Subcatchment 12S: PRE AREA-12 Runoff Area=15.490 ac 0.00% Impervious Runoff Depth=2.33"
Flow Length=1,523' Tc=24.3 min CN=75 Runoff=48.41 cfs 3.005 af

Subcatchment 13S: PRE AREA-13 Runoff Area=65.330 ac 0.00% Impervious Runoff Depth=2.50"
Flow Length=1,151' Tc=19.2 min CN=77 Runoff=253.20 cfs 13.600 af

Subcatchment 14S: PRE AREA-14 Runoff Area=51.210 ac 0.00% Impervious Runoff Depth=2.85"
Flow Length=2,097' Tc=38.6 min CN=81 Runoff=145.23 cfs 12.176 af

Subcatchment 15S: PRE AREA-15 Runoff Area=61.410 ac 2.64% Impervious Runoff Depth=2.33"
Flow Length=2,893' Tc=25.3 min CN=75 Runoff=187.66 cfs 11.915 af

Subcatchment 16S: PRE AREA-16 Runoff Area=14.540 ac 0.88% Impervious Runoff Depth=2.33"
Flow Length=1,042' Tc=17.4 min CN=75 Runoff=55.46 cfs 2.821 af

Subcatchment 17S: PRE AREA-17 Runoff Area=27.220 ac 0.76% Impervious Runoff Depth=2.25"
Flow Length=1,361' Tc=26.2 min CN=74 Runoff=78.21 cfs 5.093 af

Subcatchment 18S: PRE AREA-18 Runoff Area=19.240 ac 0.00% Impervious Runoff Depth=1.85"
Flow Length=1,364' Tc=10.7 min CN=69 Runoff=69.79 cfs 2.965 af

Subcatchment 19S: PRE AREA-19 Runoff Area=3.030 ac 0.00% Impervious Runoff Depth=1.35"
Flow Length=454' Tc=8.4 min CN=62 Runoff=8.75 cfs 0.340 af

Subcatchment 20S: PRE AREA-20 Runoff Area=5.100 ac 0.00% Impervious Runoff Depth=1.70"
Flow Length=537' Slope=0.0300 '/' Tc=11.3 min CN=67 Runoff=16.35 cfs 0.722 af

Subcatchment 21S: PRE AREA-21 Runoff Area=16.470 ac 0.00% Impervious Runoff Depth=1.77"
Flow Length=901' Tc=15.6 min CN=68 Runoff=49.63 cfs 2.434 af

Subcatchment 22S: PRE AREA-22 Runoff Area=18.460 ac 0.00% Impervious Runoff Depth=1.63"
Flow Length=1,173' Tc=16.1 min CN=66 Runoff=49.76 cfs 2.502 af

Subcatchment 23S: PRE AREA-23 Runoff Area=9.330 ac 0.00% Impervious Runoff Depth=1.48"
Flow Length=684' Tc=15.5 min CN=64 Runoff=23.11 cfs 1.154 af

Subcatchment 24S: PRE AREA-24 Runoff Area=26.870 ac 0.00% Impervious Runoff Depth=1.70"
Flow Length=1,715' Tc=38.0 min CN=67 Runoff=43.14 cfs 3.805 af

Subcatchment 25S: PRE AREA-25 Runoff Area=74.130 ac 0.00% Impervious Runoff Depth=1.70"
Flow Length=1,256' Tc=20.1 min CN=67 Runoff=179.91 cfs 10.498 af

Subcatchment 54S: PRE AREA-26(Gen-Tie Runoff Area=49.230 ac 0.00% Impervious Runoff Depth=1.70"
Flow Length=2,505' Tc=62.6 min CN=67 Runoff=54.63 cfs 6.972 af

Pond 51P: Exisitng Wetland Peak Elev=718.49' Storage=12,931 cf Inflow=12.87 cfs 0.793 af
12.0" Round Culvert n=0.011 L=25.0' S=0.0164 '/' Outflow=4.59 cfs 0.717 af

Total Runoff Area = 1,165.080 ac Runoff Volume = 220.996 af Average Runoff Depth = 2.28"
99.74% Pervious = 1,162.074 ac 0.26% Impervious = 3.006 ac

Summary for Subcatchment 1S: PRE AREA-1

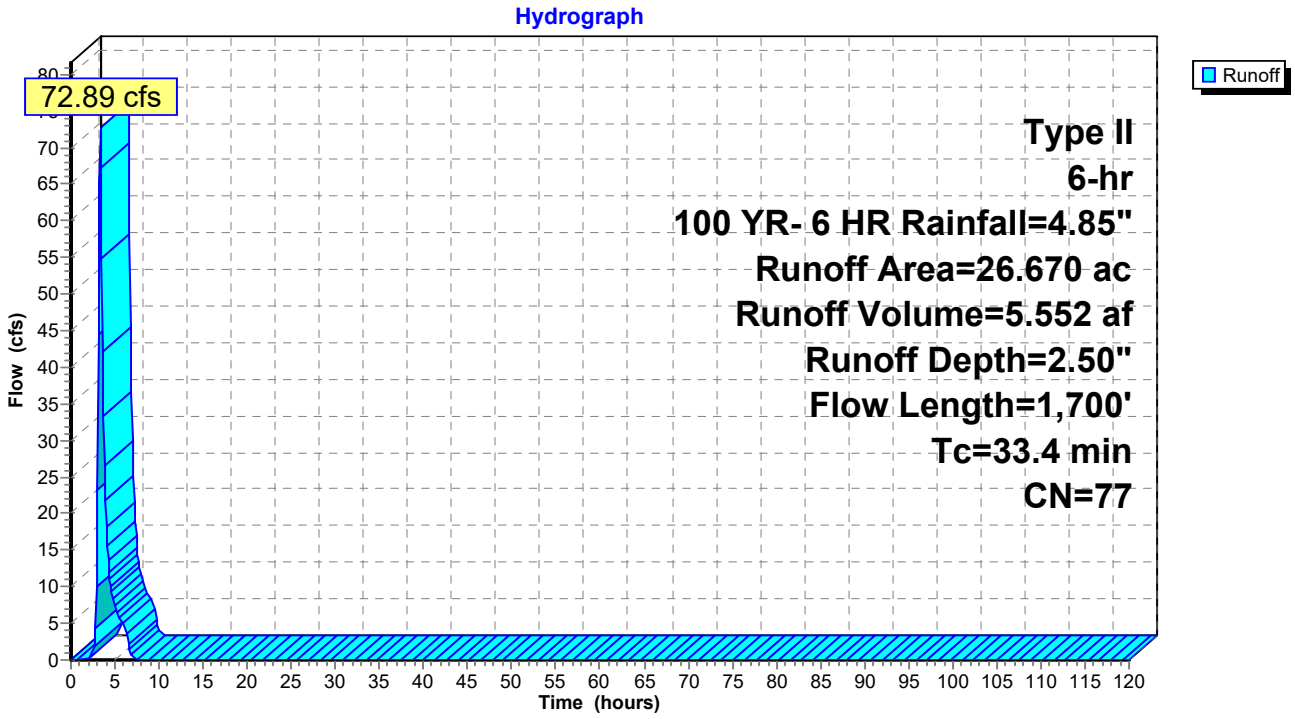
Runoff = 72.89 cfs @ 3.31 hrs, Volume= 5.552 af, Depth= 2.50"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 6-hr 100 YR- 6 HR Rainfall=4.85"

Area (ac)	CN	Description
12.830	69	50-75% Grass cover, Fair, HSG B
13.540	84	50-75% Grass cover, Fair, HSG D
0.300	85	Gravel roads, HSG B
26.670	77	Weighted Average
26.670		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.9	50	0.1000	0.29		**Sheet Flow, SF-1** Grass: Short n= 0.150 P2= 3.39"
6.0	620	0.0600	1.71		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
24.5	1,030	0.0100	0.70		**Shallow Concentrated Flow, SCF-2** Short Grass Pasture Kv= 7.0 fps
33.4	1,700	Total			

Subcatchment 1S: PRE AREA-1



Summary for Subcatchment 2S: PRE AREA-2

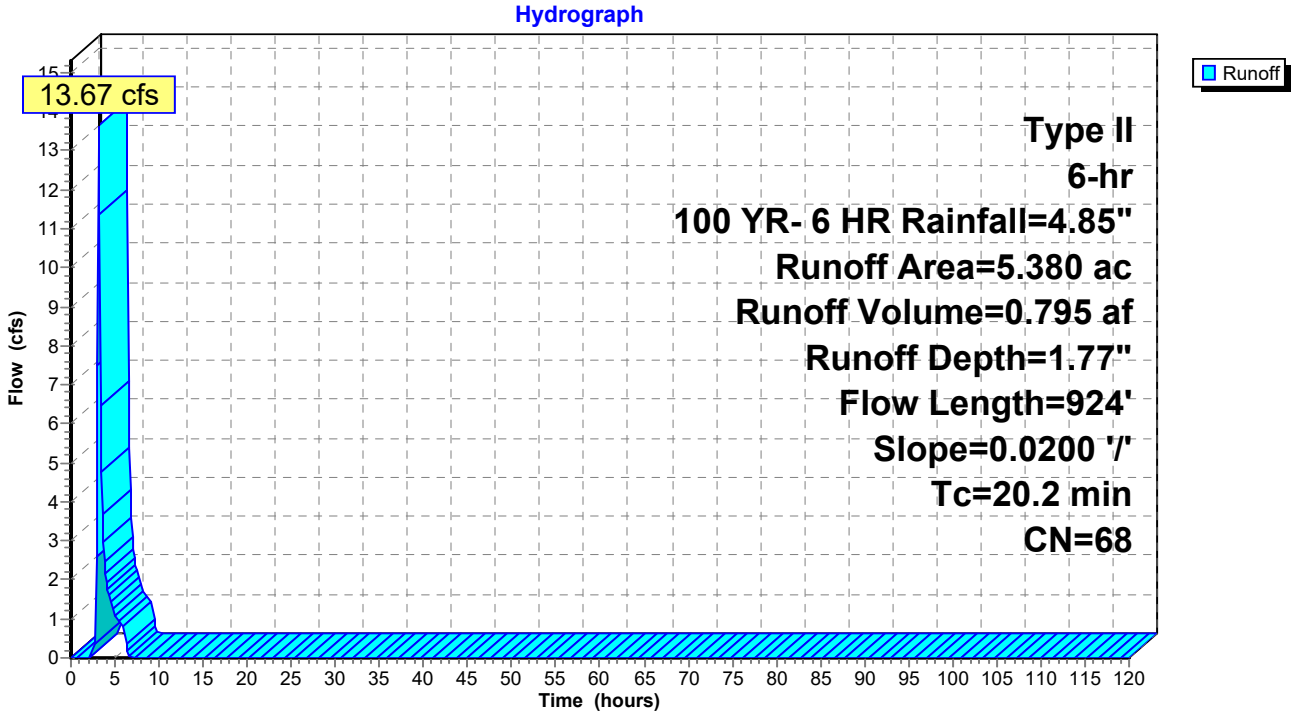
Runoff = 13.67 cfs @ 3.15 hrs, Volume= 0.795 af, Depth= 1.77"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 6-hr 100 YR- 6 HR Rainfall=4.85"

Area (ac)	CN	Description
4.790	69	50-75% Grass cover, Fair, HSG B
0.550	55	Woods, Good, HSG B
0.040	85	Gravel roads, HSG B
5.380	68	Weighted Average
5.380		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.5	50	0.0200	0.15		**Sheet Flow, SF-1** Grass: Short n= 0.150 P2= 3.39"
14.7	874	0.0200	0.99		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
20.2	924	Total			

Subcatchment 2S: PRE AREA-2



Summary for Subcatchment 3S: PRE AREA-3

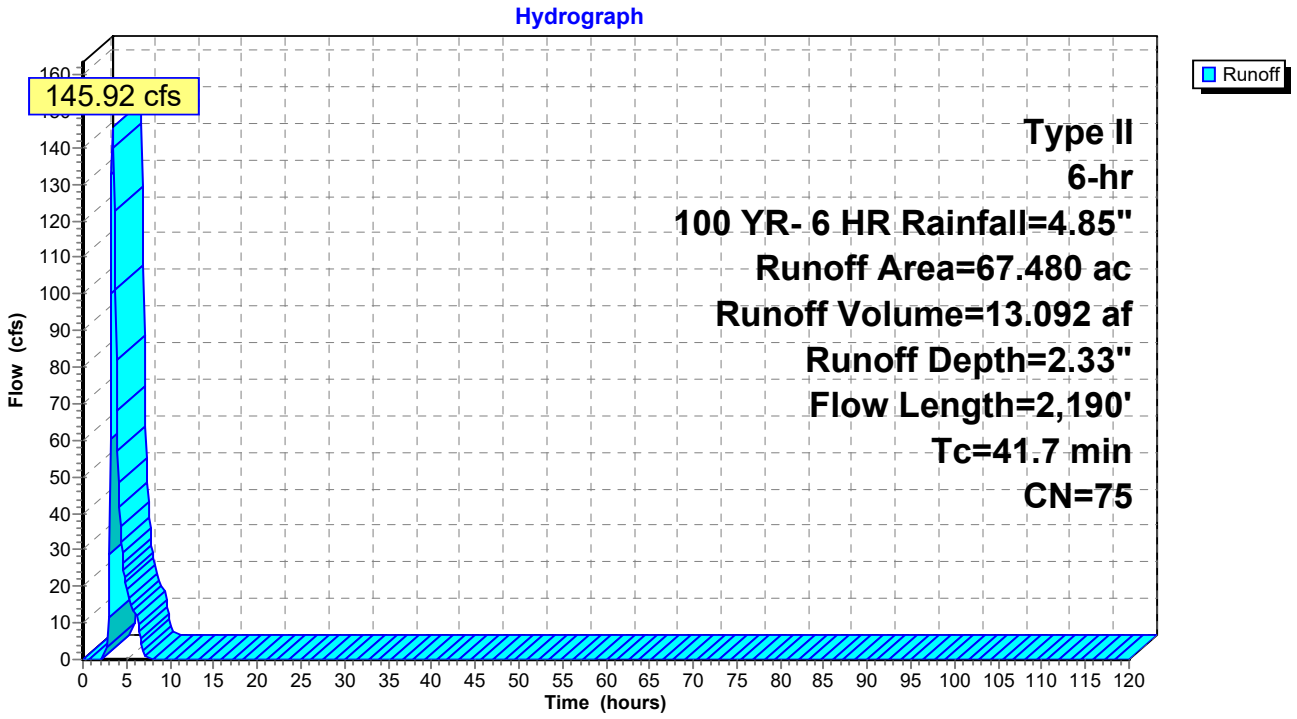
Runoff = 145.92 cfs @ 3.42 hrs, Volume= 13.092 af, Depth= 2.33"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 6-hr 100 YR- 6 HR Rainfall=4.85"

Area (ac)	CN	Description
40.400	69	50-75% Grass cover, Fair, HSG B
25.610	84	50-75% Grass cover, Fair, HSG D
0.120	85	Gravel roads, HSG B
0.930	68	1 acre lots, 20% imp, HSG B
0.420	84	1 acre lots, 20% imp, HSG D
67.480	75	Weighted Average
67.210		99.60% Pervious Area
0.270		0.40% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.1	50	0.0800	0.27		**Sheet Flow, SF-1** Grass: Short n= 0.150 P2= 3.39"
8.5	874	0.0600	1.71		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
30.1	1,266	0.0100	0.70		**Shallow Concentrated Flow, SCF-2** Short Grass Pasture Kv= 7.0 fps
41.7	2,190	Total			

Subcatchment 3S: PRE AREA-3



Summary for Subcatchment 4S: PRE AREA-4

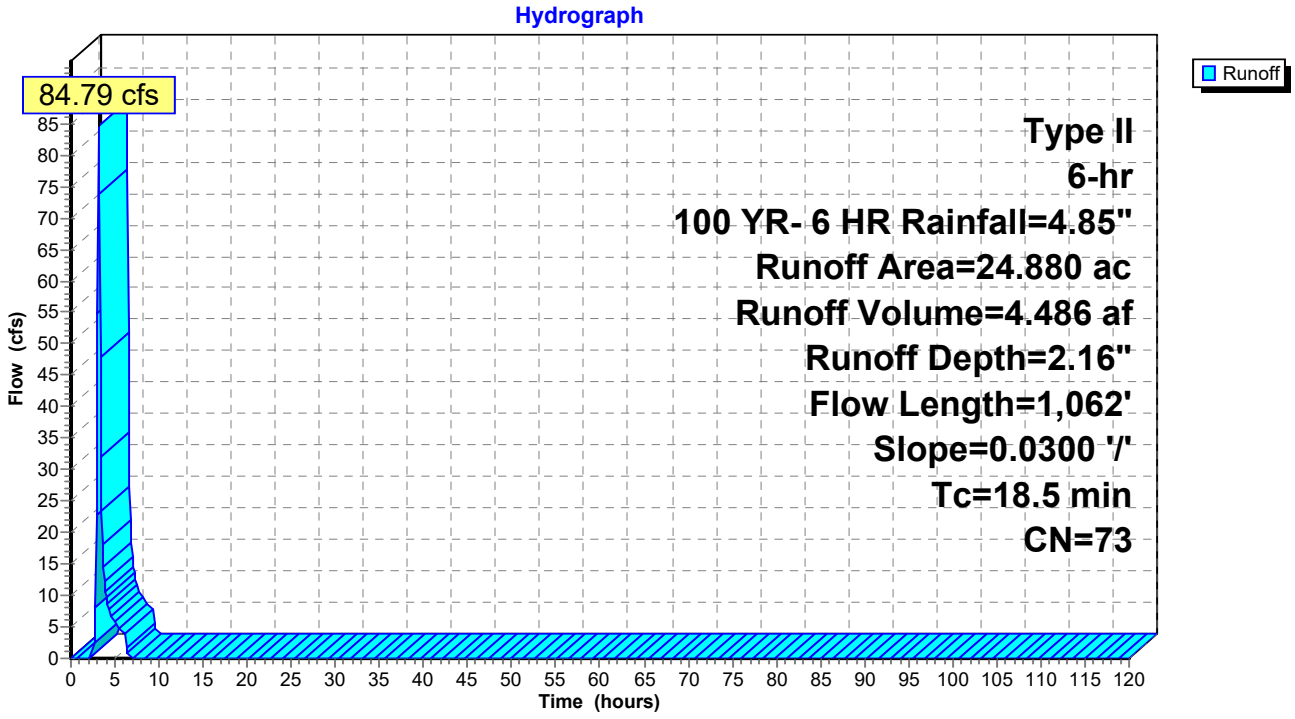
Runoff = 84.79 cfs @ 3.12 hrs, Volume= 4.486 af, Depth= 2.16"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 6-hr 100 YR- 6 HR Rainfall=4.85"

Area (ac)	CN	Description
18.430	69	50-75% Grass cover, Fair, HSG B
6.450	84	50-75% Grass cover, Fair, HSG D
24.880	73	Weighted Average
24.880		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.6	50	0.0300	0.18		**Sheet Flow, SF-1** Grass: Short n= 0.150 P2= 3.39"
13.9	1,012	0.0300	1.21		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
18.5	1,062	Total			

Subcatchment 4S: PRE AREA-4



Summary for Subcatchment 5S: PRE AREA-5

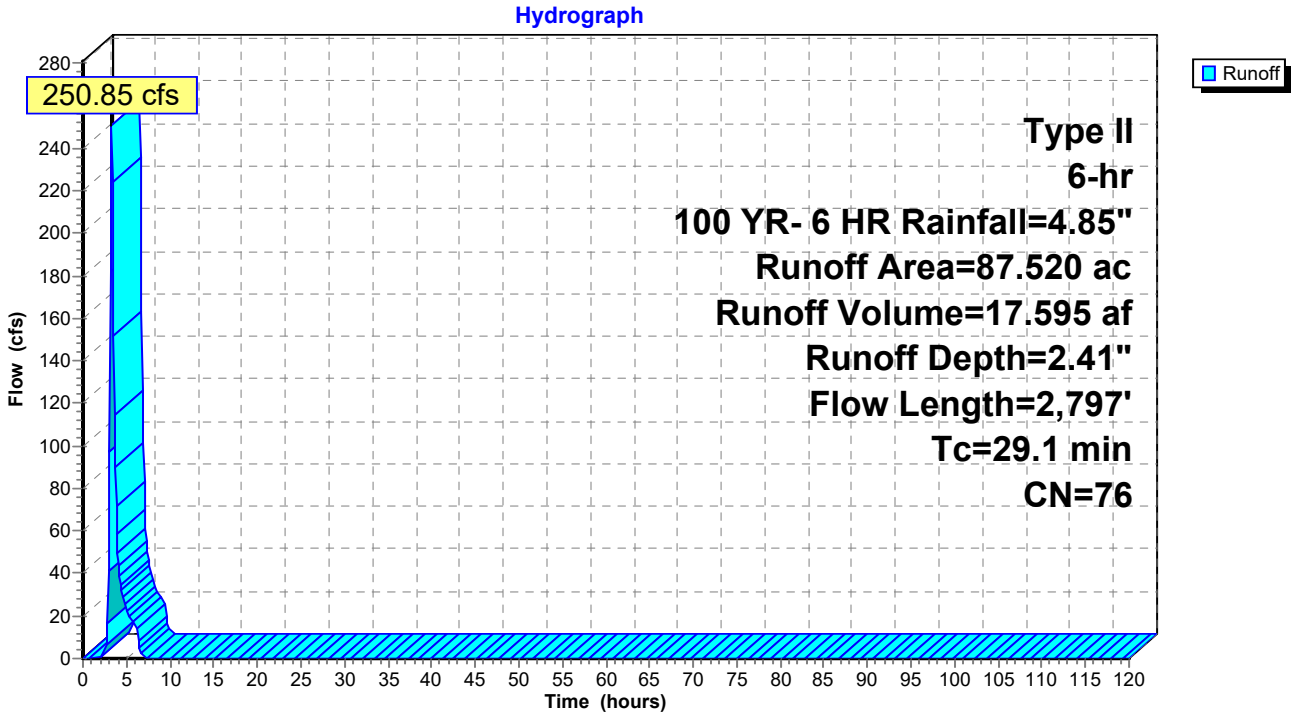
Runoff = 250.85 cfs @ 3.25 hrs, Volume= 17.595 af, Depth= 2.41"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 6-hr 100 YR- 6 HR Rainfall=4.85"

Area (ac)	CN	Description
45.210	69	50-75% Grass cover, Fair, HSG B
35.470	84	50-75% Grass cover, Fair, HSG D
2.950	98	Water Surface, 0% imp, HSG D
0.120	85	Gravel roads, HSG B
0.290	91	Gravel roads, HSG D
0.700	68	1 acre lots, 20% imp, HSG B
2.780	77	Woods, Good, HSG D
87.520	76	Weighted Average
87.380		99.84% Pervious Area
0.140		0.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.5	50	0.0600	0.24		**Sheet Flow, SF-1** Grass: Short n= 0.150 P2= 3.39"
13.3	968	0.0300	1.21		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
12.3	1,779	0.0060	2.42	8.46	**Channel Flow, CF-1** Area= 3.5 sf Perim= 7.0' r= 0.50' n= 0.030 Earth, grassed & winding
29.1	2,797	Total			

Subcatchment 5S: PRE AREA-5



Summary for Subcatchment 6S: PRE AREA-6

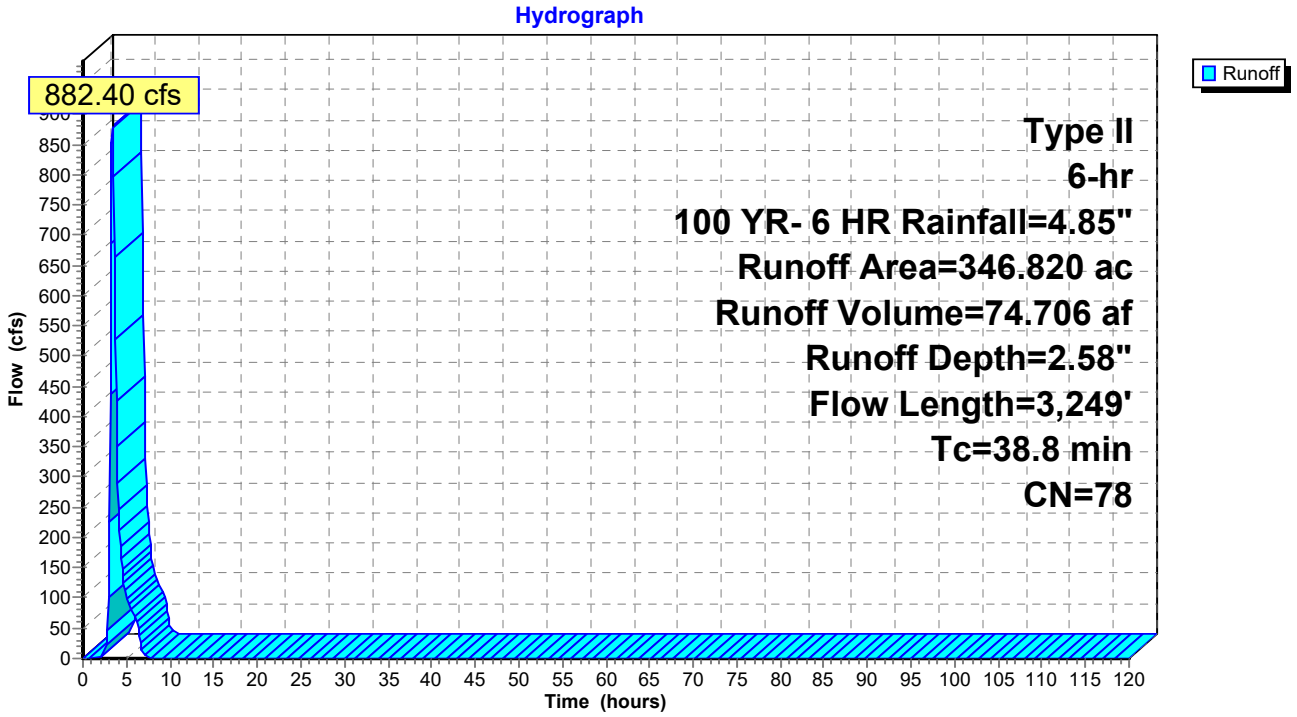
Runoff = 882.40 cfs @ 3.37 hrs, Volume= 74.706 af, Depth= 2.58"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 6-hr 100 YR- 6 HR Rainfall=4.85"

Area (ac)	CN	Description
120.060	69	50-75% Grass cover, Fair, HSG B
202.980	84	50-75% Grass cover, Fair, HSG D
6.950	98	Water Surface, 0% imp, HSG D
0.050	85	Gravel roads, HSG B
0.340	91	Gravel roads, HSG D
3.200	68	1 acre lots, 20% imp, HSG B
9.640	55	Woods, Good, HSG B
0.500	70	Woods, Good, HSG C
3.100	77	Woods, Good, HSG D
346.820	78	Weighted Average
346.180		99.82% Pervious Area
0.640		0.18% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.2	50	0.0100	0.12		**Sheet Flow, SF-1** Grass: Short n= 0.150 P2= 3.39"
25.2	1,499	0.0200	0.99		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
6.4	1,700	0.0200	4.41	15.45	**Channel Flow, CF-1** Area= 3.5 sf Perim= 7.0' r= 0.50' n= 0.030 Earth, grassed & winding
38.8	3,249	Total			

Subcatchment 6S: PRE AREA-6



Summary for Subcatchment 7S: PRE AREA-7

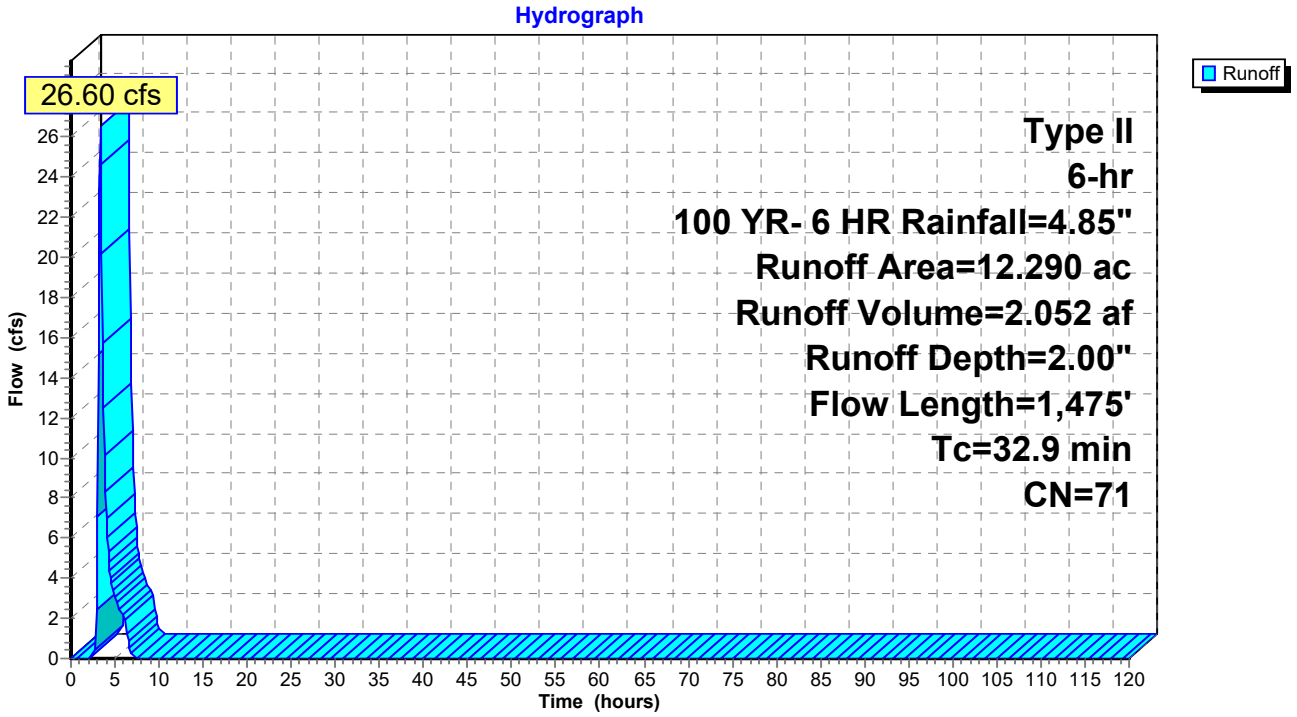
Runoff = 26.60 cfs @ 3.31 hrs, Volume= 2.052 af, Depth= 2.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 6-hr 100 YR- 6 HR Rainfall=4.85"

Area (ac)	CN	Description
5.940	69	50-75% Grass cover, Fair, HSG B
1.930	84	50-75% Grass cover, Fair, HSG D
0.210	85	Gravel roads, HSG B
0.270	91	Gravel roads, HSG D
1.940	55	Woods, Good, HSG B
2.000	77	Woods, Good, HSG D
12.290	71	Weighted Average
12.290		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.2	50	0.0100	0.12		**Sheet Flow, SF-1** Grass: Short n= 0.150 P2= 3.39"
2.0	86	0.0100	0.70		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
0.2	18	0.0100	1.61		**Shallow Concentrated Flow, SCF-2** Unpaved Kv= 16.1 fps
8.6	625	0.0300	1.21		**Shallow Concentrated Flow, SCF-3** Short Grass Pasture Kv= 7.0 fps
0.2	18	0.0100	1.61		**Shallow Concentrated Flow, SCF-4** Unpaved Kv= 16.1 fps
3.4	200	0.0200	0.99		**Shallow Concentrated Flow, SCF-5** Short Grass Pasture Kv= 7.0 fps
11.3	478	0.0200	0.71		**Shallow Concentrated Flow, SCF-5** Woodland Kv= 5.0 fps
32.9	1,475	Total			

Subcatchment 7S: PRE AREA-7



Summary for Subcatchment 8S: PRE AREA-8

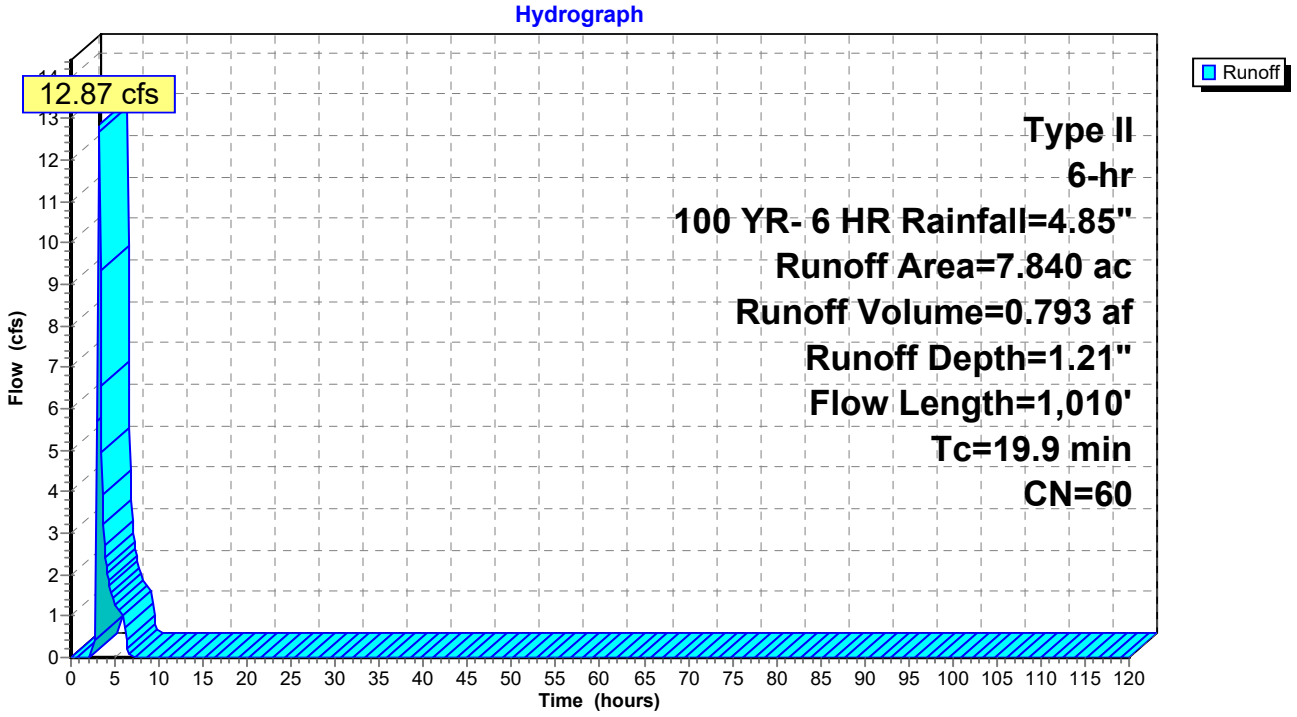
Runoff = 12.87 cfs @ 3.17 hrs, Volume= 0.793 af, Depth= 1.21"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 6-hr 100 YR- 6 HR Rainfall=4.85"

Area (ac)	CN	Description
0.100	69	50-75% Grass cover, Fair, HSG B
6.180	55	Woods, Good, HSG B
1.390	77	Woods, Good, HSG D
0.090	98	Water Surface, 0% imp, HSG B
0.080	98	Water Surface, 0% imp, HSG D
7.840	60	Weighted Average
7.840		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.5	50	0.0220	0.07		**Sheet Flow, SF-1** Woods: Light underbrush n= 0.400 P2= 3.39"
7.6	510	0.0500	1.12		**Shallow Concentrated Flow, SCF-1** Woodland Kv= 5.0 fps
0.8	450	0.0500	9.08	23.62	**Channel Flow, CF-1** Area= 2.6 sf Perim= 3.5' r= 0.74' n= 0.030 Earth, grassed & winding
19.9	1,010	Total			

Subcatchment 8S: PRE AREA-8



Summary for Subcatchment 9S: PRE AREA-9

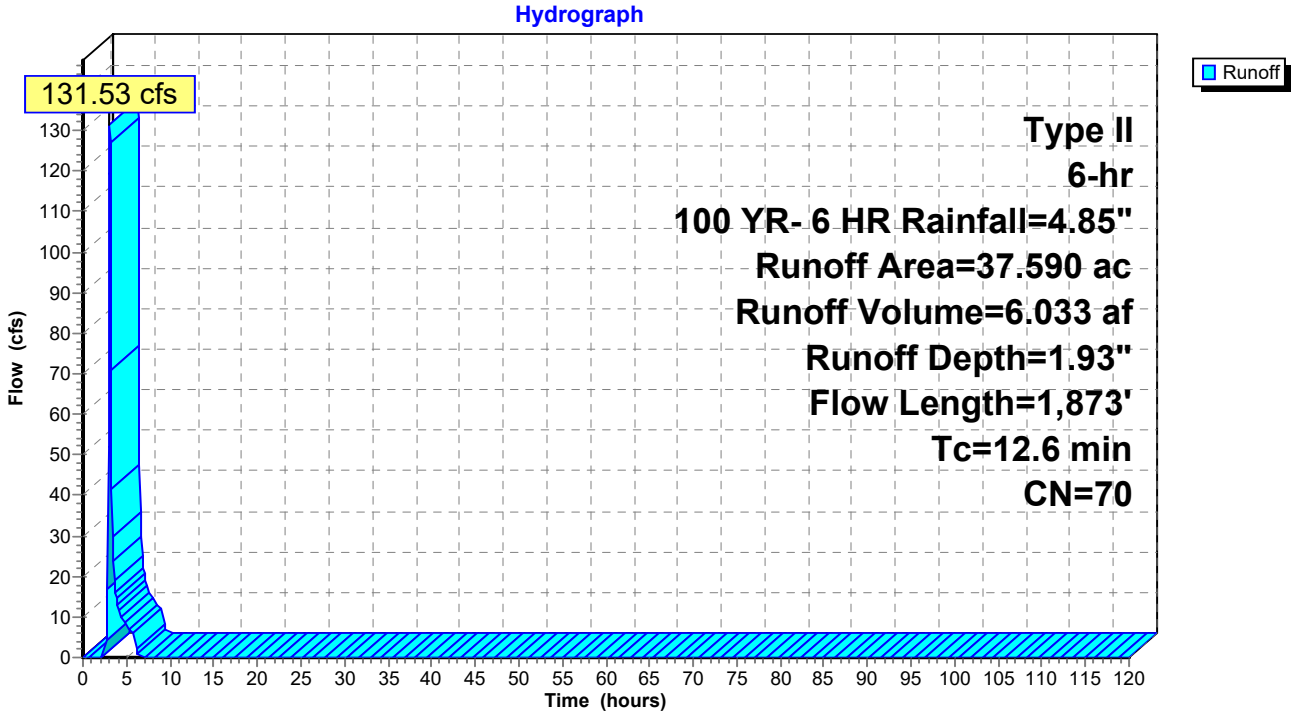
Runoff = 131.53 cfs @ 3.06 hrs, Volume= 6.033 af, Depth= 1.93"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 6-hr 100 YR- 6 HR Rainfall=4.85"

Area (ac)	CN	Description
33.190	69	50-75% Grass cover, Fair, HSG B
2.170	84	50-75% Grass cover, Fair, HSG D
0.910	55	Woods, Good, HSG B
0.610	77	Woods, Good, HSG D
0.710	98	Water Surface, 0% imp, HSG D
37.590	70	Weighted Average
37.590		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.5	50	0.0600	0.24		**Sheet Flow, SF-1** Grass: Short n= 0.150 P2= 3.39"
6.6	481	0.0300	1.21		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
2.5	1,342	0.0500	9.08	23.62	**Channel Flow, CF-1** Area= 2.6 sf Perim= 3.5' r= 0.74' n= 0.030 Earth, grassed & winding
12.6	1,873	Total			

Subcatchment 9S: PRE AREA-9



Summary for Subcatchment 10S: PRE AREA-10

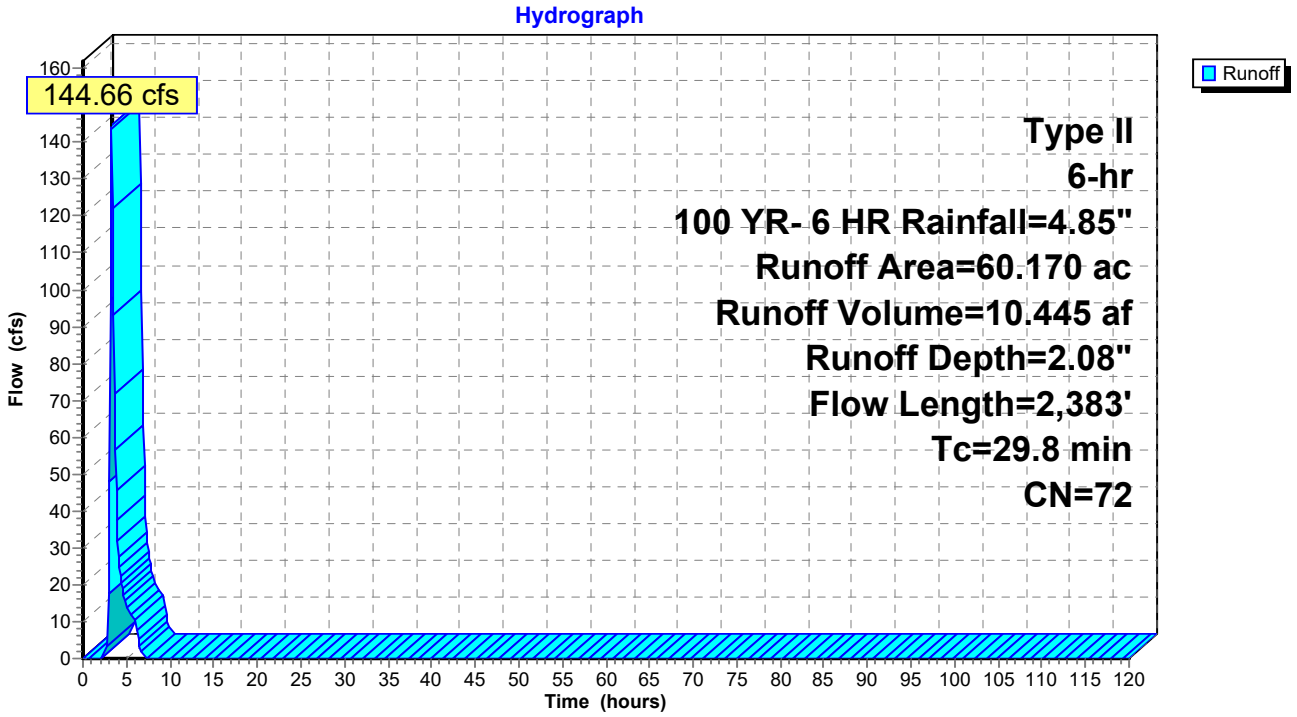
Runoff = 144.66 cfs @ 3.27 hrs, Volume= 10.445 af, Depth= 2.08"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 6-hr 100 YR- 6 HR Rainfall=4.85"

Area (ac)	CN	Description
49.000	69	50-75% Grass cover, Fair, HSG B
2.980	79	50-75% Grass cover, Fair, HSG C
7.920	84	50-75% Grass cover, Fair, HSG D
0.270	91	Gravel roads, HSG D
60.170	72	Weighted Average
60.170		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.6	50	0.0300	0.18		**Sheet Flow, SF-1** Grass: Short n= 0.150 P2= 3.39"
3.5	357	0.0600	1.71		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
19.8	1,178	0.0200	0.99		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
1.9	798	0.0300	7.17	46.63	**Channel Flow, CF-1** Area= 6.5 sf Perim= 8.5' r= 0.76' n= 0.030 Earth, grassed & winding
29.8	2,383	Total			

Subcatchment 10S: PRE AREA-10



Summary for Subcatchment 11S: PRE AREA-11

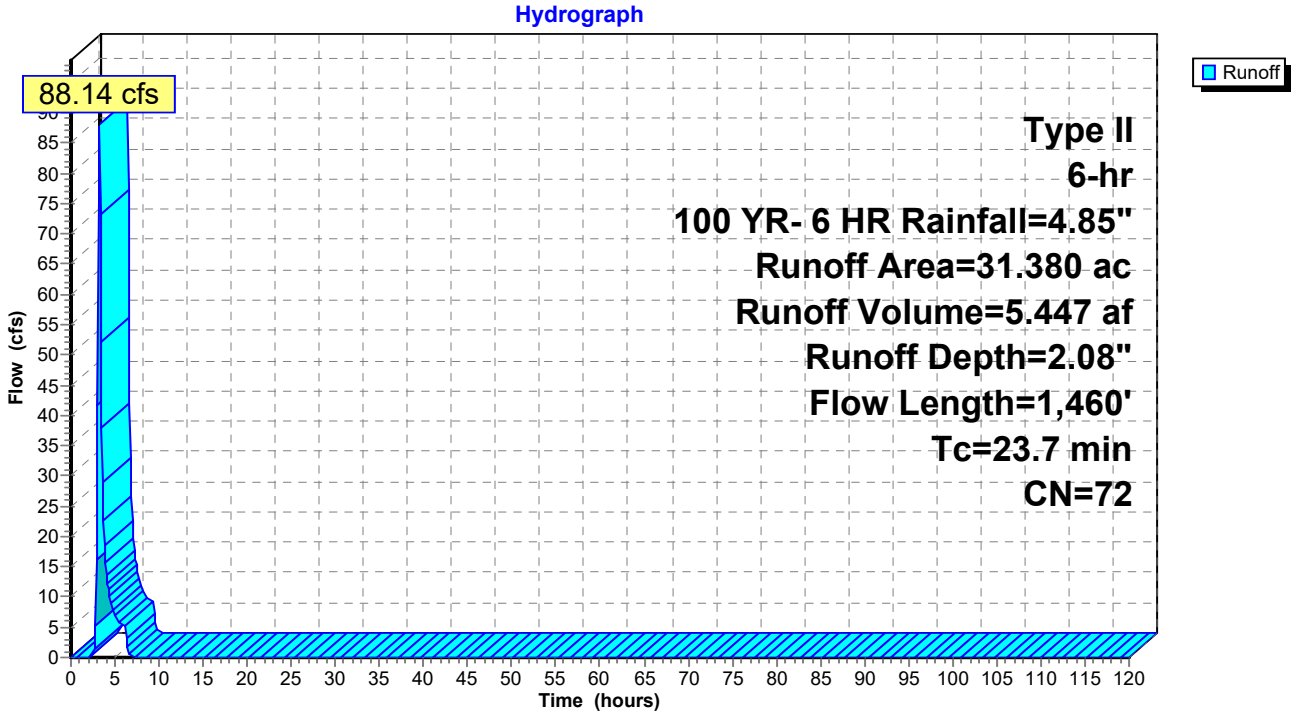
Runoff = 88.14 cfs @ 3.20 hrs, Volume= 5.447 af, Depth= 2.08"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 6-hr 100 YR- 6 HR Rainfall=4.85"

Area (ac)	CN	Description
21.950	69	50-75% Grass cover, Fair, HSG B
9.290	79	50-75% Grass cover, Fair, HSG C
0.110	55	Woods, Good, HSG B
0.030	91	Gravel roads, HSG D
31.380	72	Weighted Average
31.380		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.4	50	0.1500	0.34		**Sheet Flow, SF-1** Grass: Short n= 0.150 P2= 3.39"
2.5	292	0.0800	1.98		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
18.8	1,118	0.0200	0.99		**Shallow Concentrated Flow, SCF-2** Short Grass Pasture Kv= 7.0 fps
23.7	1,460	Total			

Subcatchment 11S: PRE AREA-11



Summary for Subcatchment 12S: PRE AREA-12

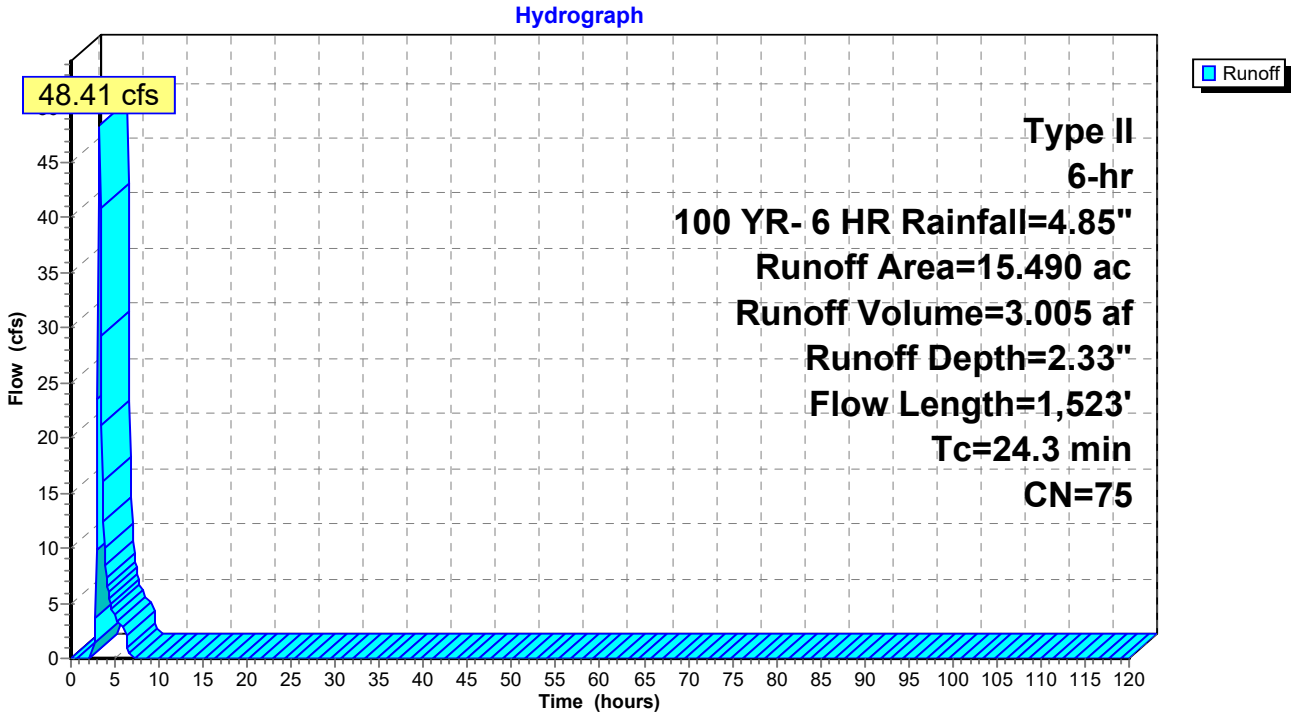
Runoff = 48.41 cfs @ 3.20 hrs, Volume= 3.005 af, Depth= 2.33"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 6-hr 100 YR- 6 HR Rainfall=4.85"

Area (ac)	CN	Description
9.730	69	50-75% Grass cover, Fair, HSG B
5.760	84	50-75% Grass cover, Fair, HSG D
15.490	75	Weighted Average
15.490		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.1	50	0.0400	0.20		**Sheet Flow, SF-1** Grass: Short n= 0.150 P2= 3.39"
20.2	1,473	0.0300	1.21		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
24.3	1,523	Total			

Subcatchment 12S: PRE AREA-12



Summary for Subcatchment 13S: PRE AREA-13

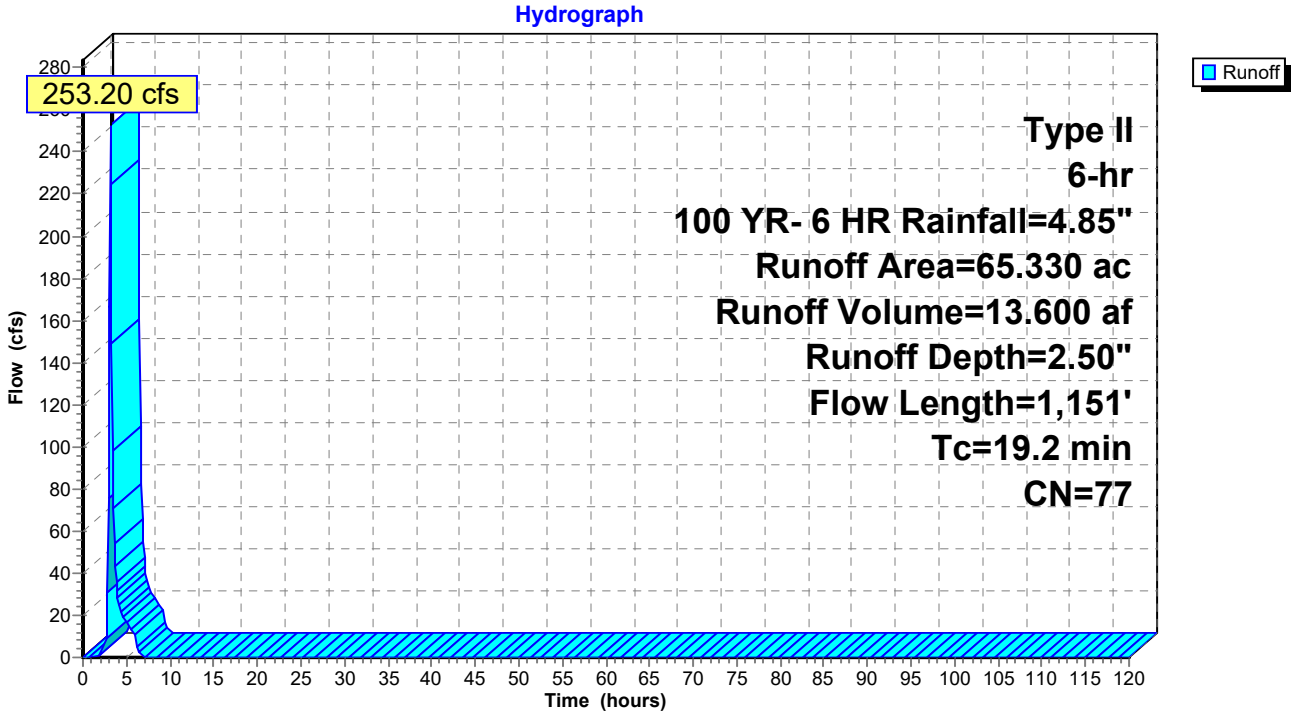
Runoff = 253.20 cfs @ 3.13 hrs, Volume= 13.600 af, Depth= 2.50"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 6-hr 100 YR- 6 HR Rainfall=4.85"

Area (ac)	CN	Description
17.980	69	50-75% Grass cover, Fair, HSG B
28.940	84	50-75% Grass cover, Fair, HSG D
3.610	55	Woods, Good, HSG B
14.800	77	Woods, Good, HSG D
65.330	77	Weighted Average
65.330		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.1	50	0.0400	0.20		**Sheet Flow, SF-1** Grass: Short n= 0.150 P2= 3.39"
15.1	1,101	0.0300	1.21		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
19.2	1,151	Total			

Subcatchment 13S: PRE AREA-13



Summary for Subcatchment 14S: PRE AREA-14

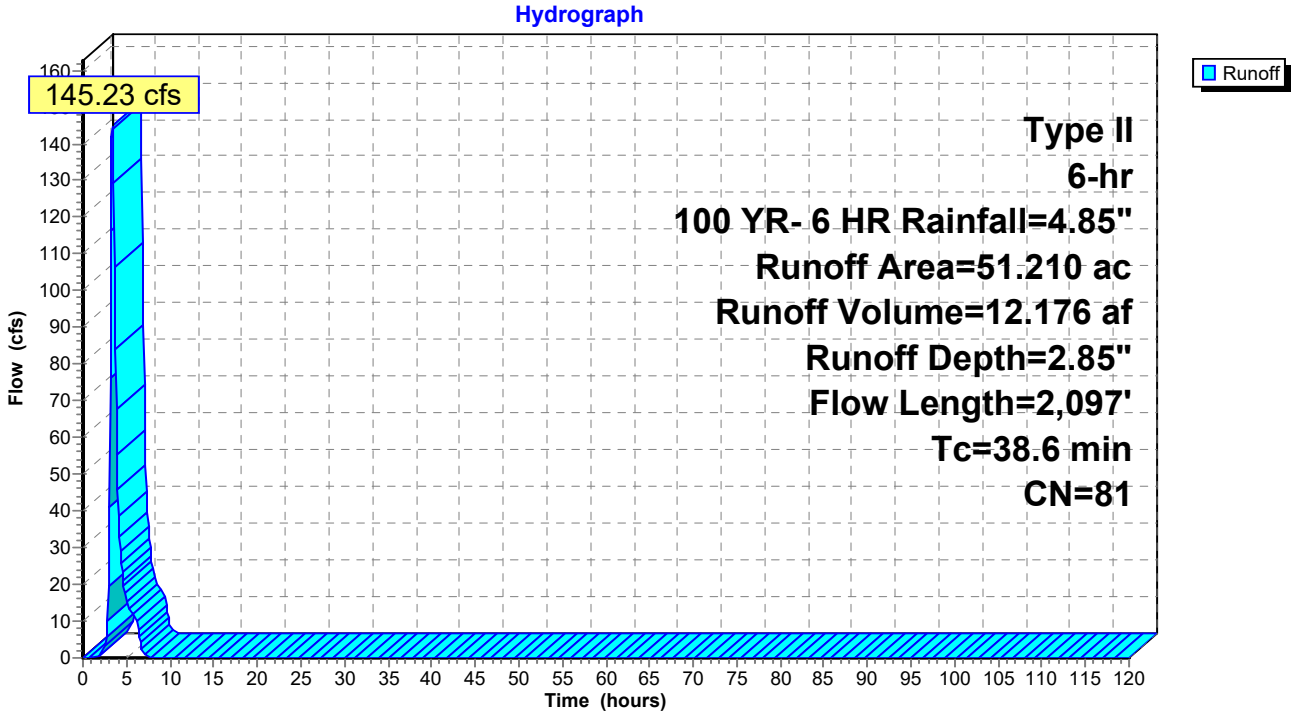
Runoff = 145.23 cfs @ 3.36 hrs, Volume= 12.176 af, Depth= 2.85"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 6-hr 100 YR- 6 HR Rainfall=4.85"

Area (ac)	CN	Description
10.700	69	50-75% Grass cover, Fair, HSG B
40.440	84	50-75% Grass cover, Fair, HSG D
0.070	77	Woods, Good, HSG D
51.210	81	Weighted Average
51.210		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.1	50	0.0400	0.20		**Sheet Flow, SF-1** Grass: Short n= 0.150 P2= 3.39"
34.5	2,047	0.0200	0.99		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
38.6	2,097	Total			

Subcatchment 14S: PRE AREA-14



Summary for Subcatchment 15S: PRE AREA-15

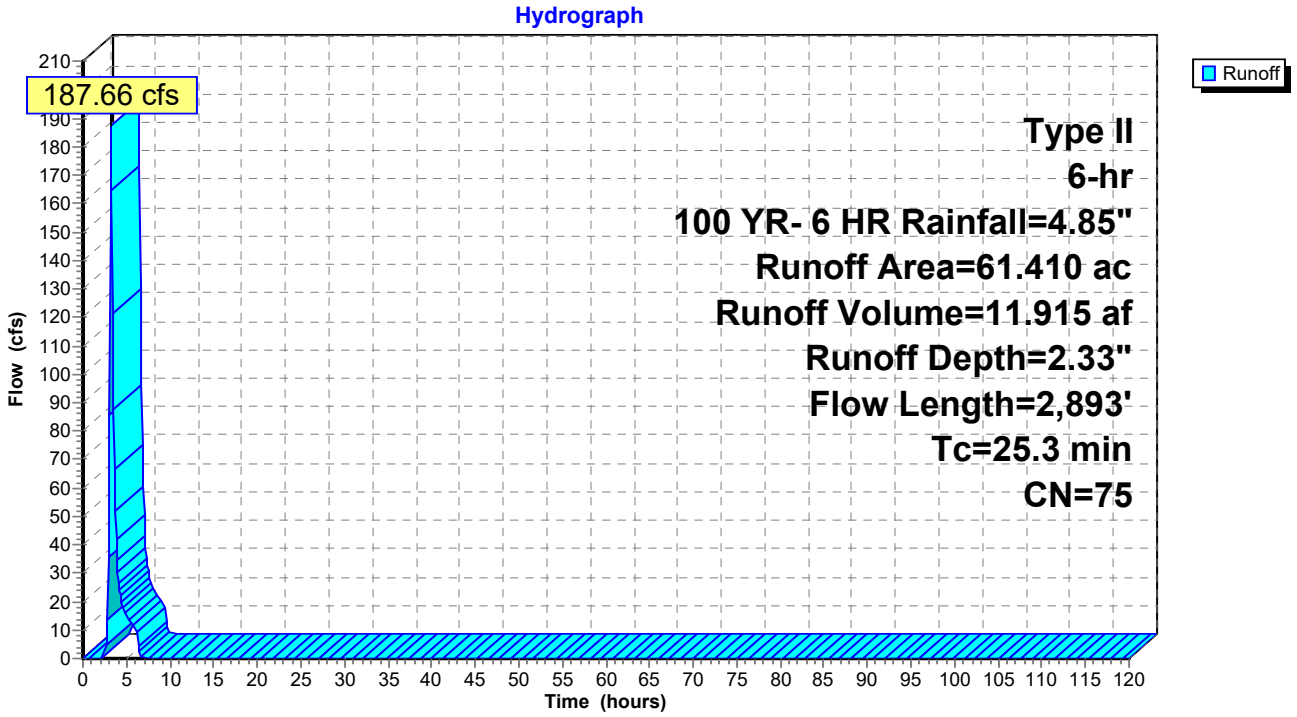
Runoff = 187.66 cfs @ 3.21 hrs, Volume= 11.915 af, Depth= 2.33"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 6-hr 100 YR- 6 HR Rainfall=4.85"

Area (ac)	CN	Description
36.590	69	50-75% Grass cover, Fair, HSG B
15.830	84	50-75% Grass cover, Fair, HSG D
8.110	84	1 acre lots, 20% imp, HSG D
0.280	91	Gravel roads, HSG D
0.600	98	Water Surface, 0% imp, HSG D
61.410	75	Weighted Average
59.788		97.36% Pervious Area
1.622		2.64% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.6	50	0.0300	0.18		**Sheet Flow, SF-1** Grass: Short n= 0.150 P2= 3.39"
16.5	1,201	0.0300	1.21		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
4.2	1,642	0.0400	6.58	42.79	**Channel Flow, CF-1** Area= 6.5 sf Perim= 12.0' r= 0.54' n= 0.030 Earth, grassed & winding
25.3	2,893	Total			

Subcatchment 15S: PRE AREA-15



Summary for Subcatchment 16S: PRE AREA-16

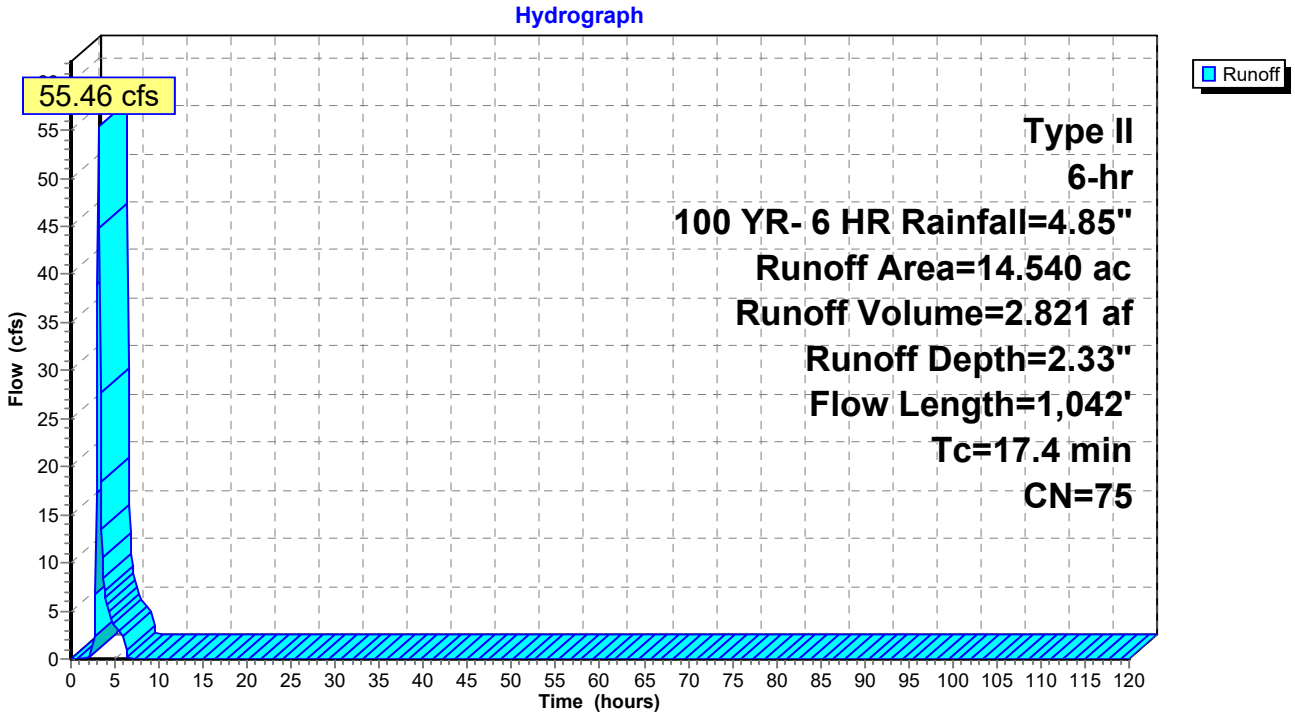
Runoff = 55.46 cfs @ 3.11 hrs, Volume= 2.821 af, Depth= 2.33"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 6-hr 100 YR- 6 HR Rainfall=4.85"

Area (ac)	CN	Description
7.140	69	50-75% Grass cover, Fair, HSG B
6.200	79	50-75% Grass cover, Fair, HSG C
0.640	84	1 acre lots, 20% imp, HSG D
0.560	91	Gravel roads, HSG D
14.540	75	Weighted Average
14.412		99.12% Pervious Area
0.128		0.88% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.9	50	0.1000	0.29		**Sheet Flow, SF-1** Grass: Short n= 0.150 P2= 3.39"
2.3	268	0.0800	1.98		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
12.2	724	0.0200	0.99		**Shallow Concentrated Flow, SCF-2** Short Grass Pasture Kv= 7.0 fps
17.4	1,042	Total			

Subcatchment 16S: PRE AREA-16



Summary for Subcatchment 17S: PRE AREA-17

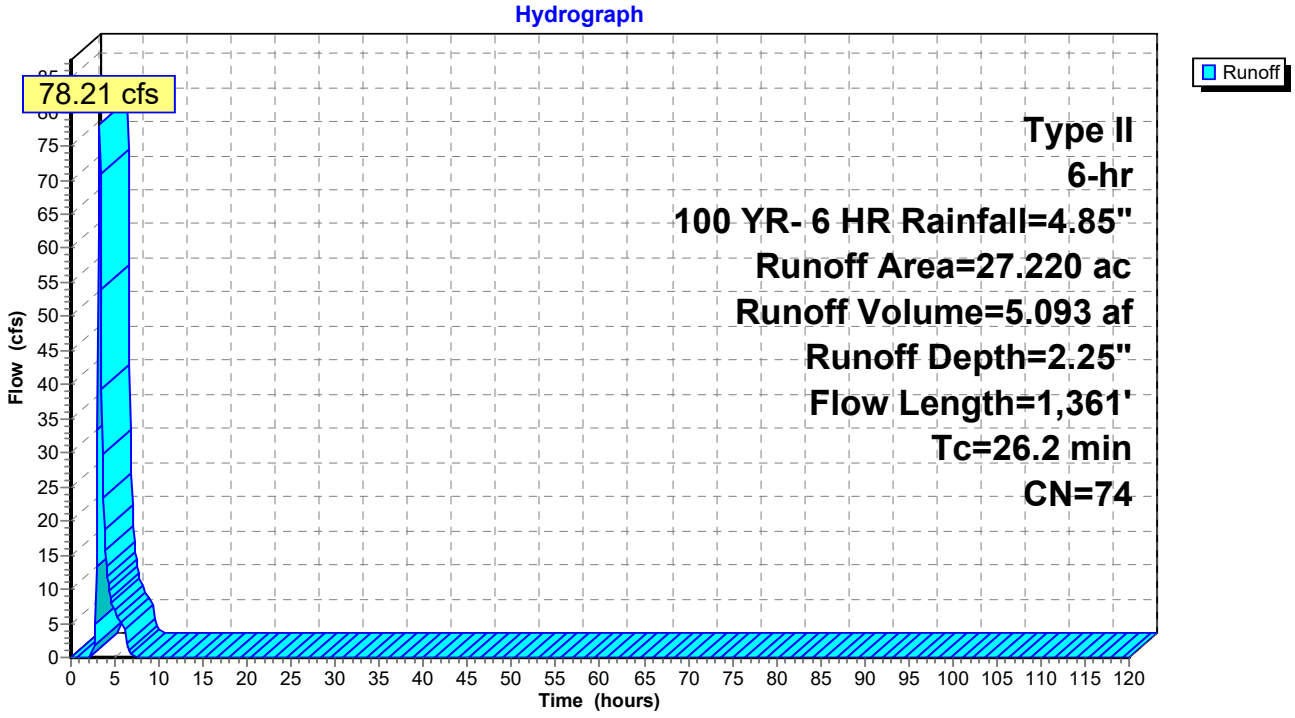
Runoff = 78.21 cfs @ 3.22 hrs, Volume= 5.093 af, Depth= 2.25"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 6-hr 100 YR- 6 HR Rainfall=4.85"

Area (ac)	CN	Description
14.120	69	50-75% Grass cover, Fair, HSG B
12.070	79	50-75% Grass cover, Fair, HSG C
1.030	84	1 acre lots, 20% imp, HSG D
27.220	74	Weighted Average
27.014		99.24% Pervious Area
0.206		0.76% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.1	50	0.0400	0.20		**Sheet Flow, SF-1** Grass: Short n= 0.150 P2= 3.39"
22.1	1,311	0.0200	0.99		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
26.2	1,361	Total			

Subcatchment 17S: PRE AREA-17



Summary for Subcatchment 18S: PRE AREA-18

[49] Hint: Tc<2dt may require smaller dt

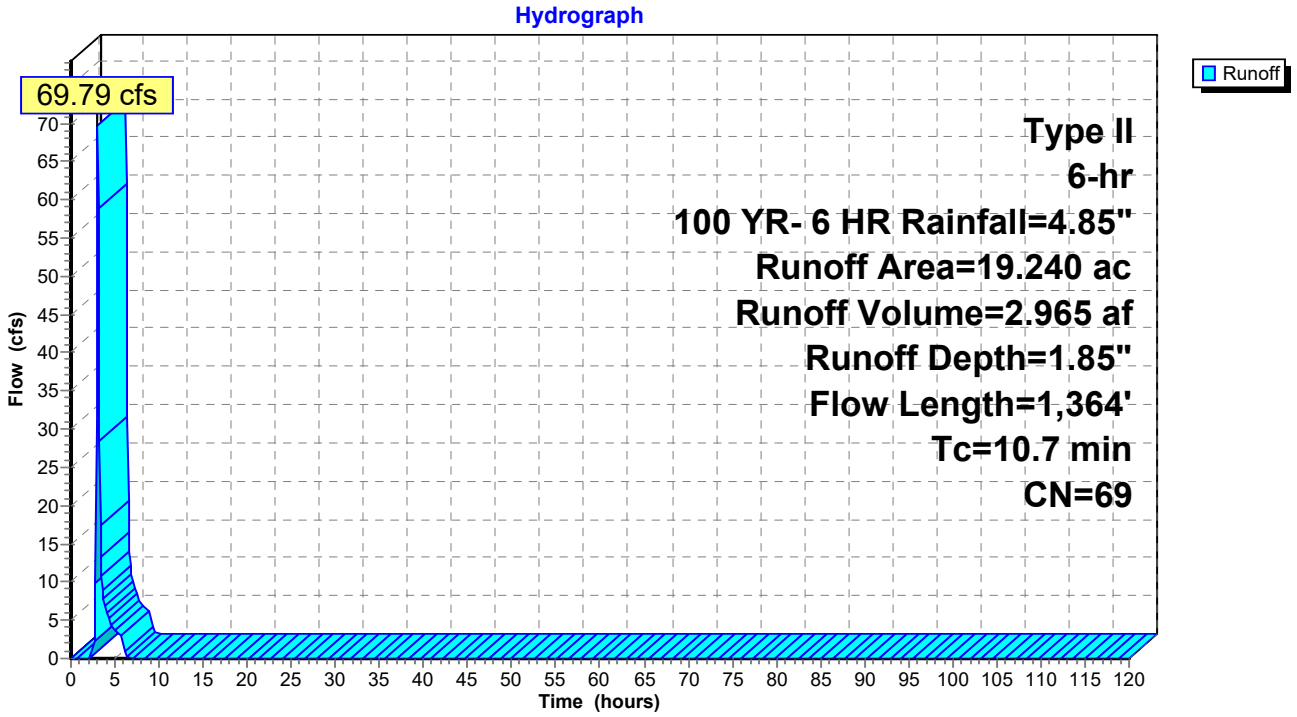
Runoff = 69.79 cfs @ 3.03 hrs, Volume= 2.965 af, Depth= 1.85"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 6-hr 100 YR- 6 HR Rainfall=4.85"

Area (ac)	CN	Description
0.710	55	Woods, Good, HSG B
0.320	70	Woods, Good, HSG C
17.060	69	50-75% Grass cover, Fair, HSG B
0.160	79	50-75% Grass cover, Fair, HSG C
0.990	84	50-75% Grass cover, Fair, HSG D
19.240	69	Weighted Average
19.240		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.1	50	0.0800	0.27		**Sheet Flow, SF-1** Grass: Short n= 0.150 P2= 3.39"
1.6	187	0.0800	1.98		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
6.0	1,127	0.0080	3.15	47.28	**Channel Flow,** Area= 15.0 sf Perim= 25.0' r= 0.60' n= 0.030
10.7	1,364	Total			

Subcatchment 18S: PRE AREA-18



Summary for Subcatchment 19S: PRE AREA-19

[49] Hint: Tc<2dt may require smaller dt

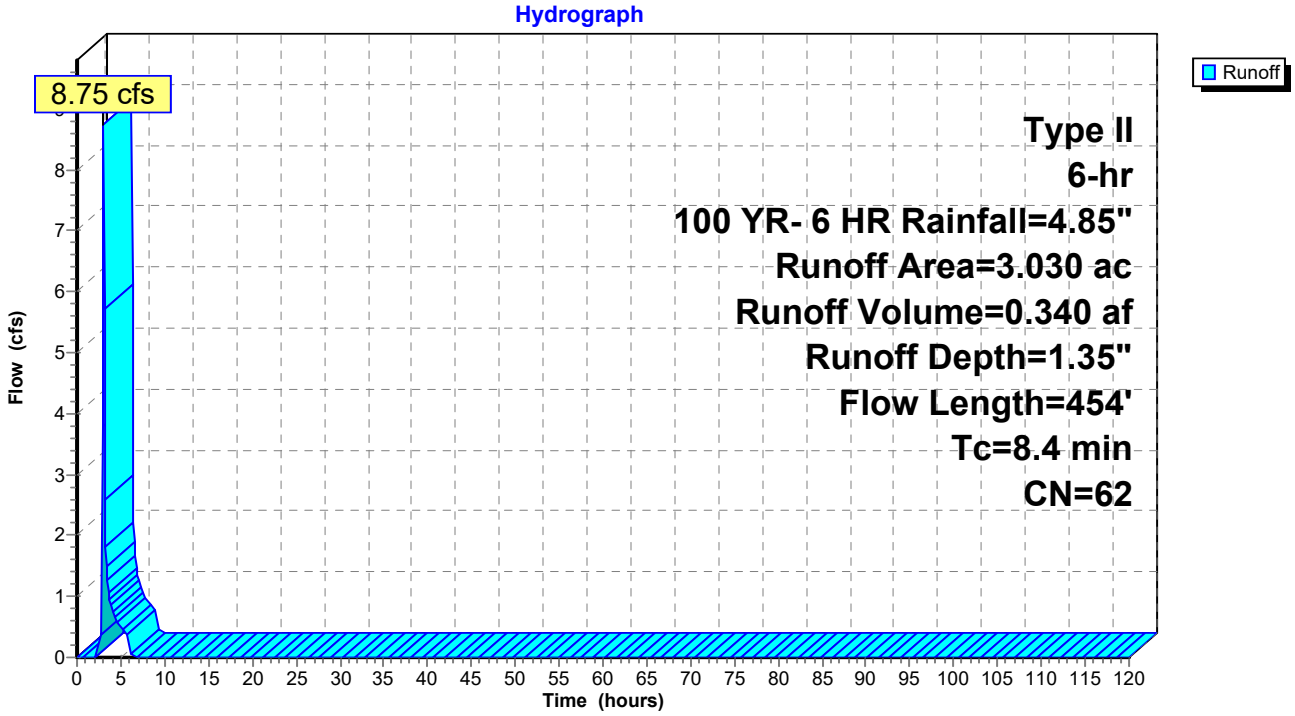
Runoff = 8.75 cfs @ 3.01 hrs, Volume= 0.340 af, Depth= 1.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 6-hr 100 YR- 6 HR Rainfall=4.85"

Area (ac)	CN	Description
1.570	55	Woods, Good, HSG B
1.460	69	50-75% Grass cover, Fair, HSG B
3.030	62	Weighted Average
3.030		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.1	50	0.0400	0.20		**Sheet Flow, SF-1** Grass: Short n= 0.150 P2= 3.39"
4.3	404	0.0500	1.57		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
8.4	454	Total			

Subcatchment 19S: PRE AREA-19



Summary for Subcatchment 20S: PRE AREA-20

[49] Hint: Tc<2dt may require smaller dt

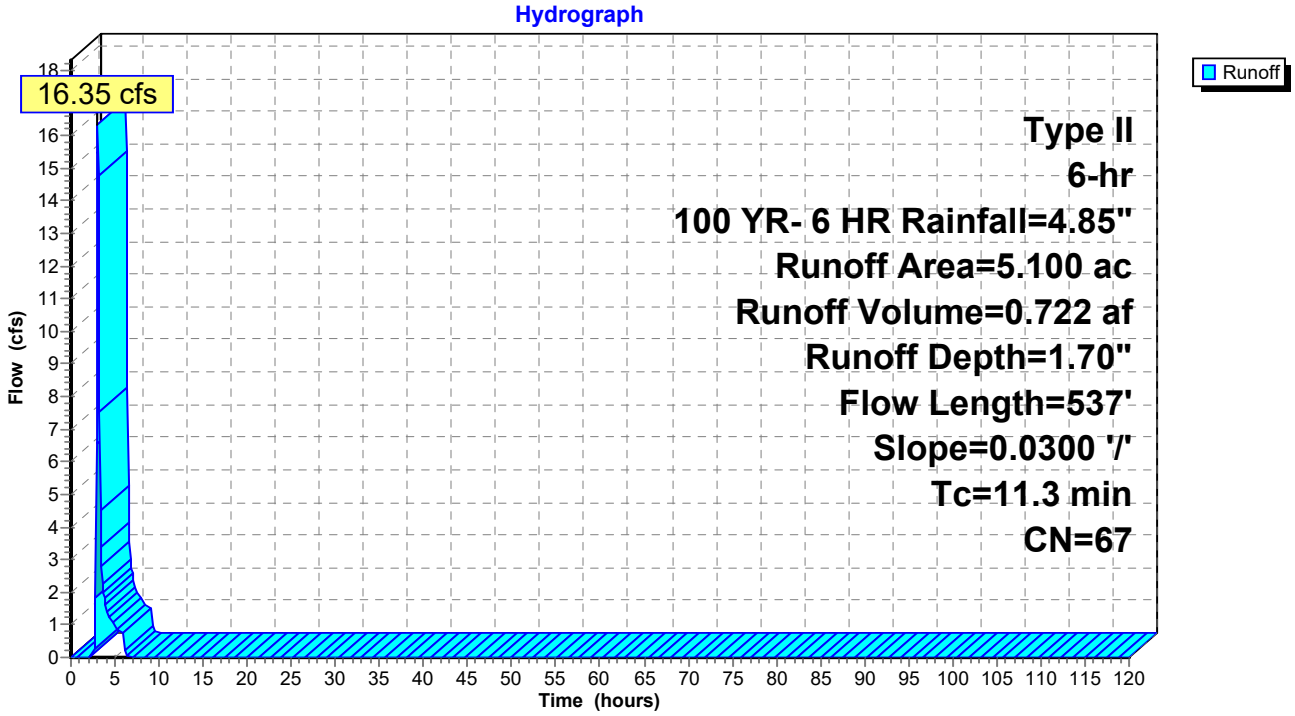
Runoff = 16.35 cfs @ 3.04 hrs, Volume= 0.722 af, Depth= 1.70"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 6-hr 100 YR- 6 HR Rainfall=4.85"

Area (ac)	CN	Description
0.640	55	Woods, Good, HSG B
4.460	69	50-75% Grass cover, Fair, HSG B
5.100	67	Weighted Average
5.100		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.6	50	0.0300	0.18		**Sheet Flow, SF-1** Grass: Short n= 0.150 P2= 3.39"
6.7	487	0.0300	1.21		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
11.3	537	Total			

Subcatchment 20S: PRE AREA-20



Summary for Subcatchment 21S: PRE AREA-21

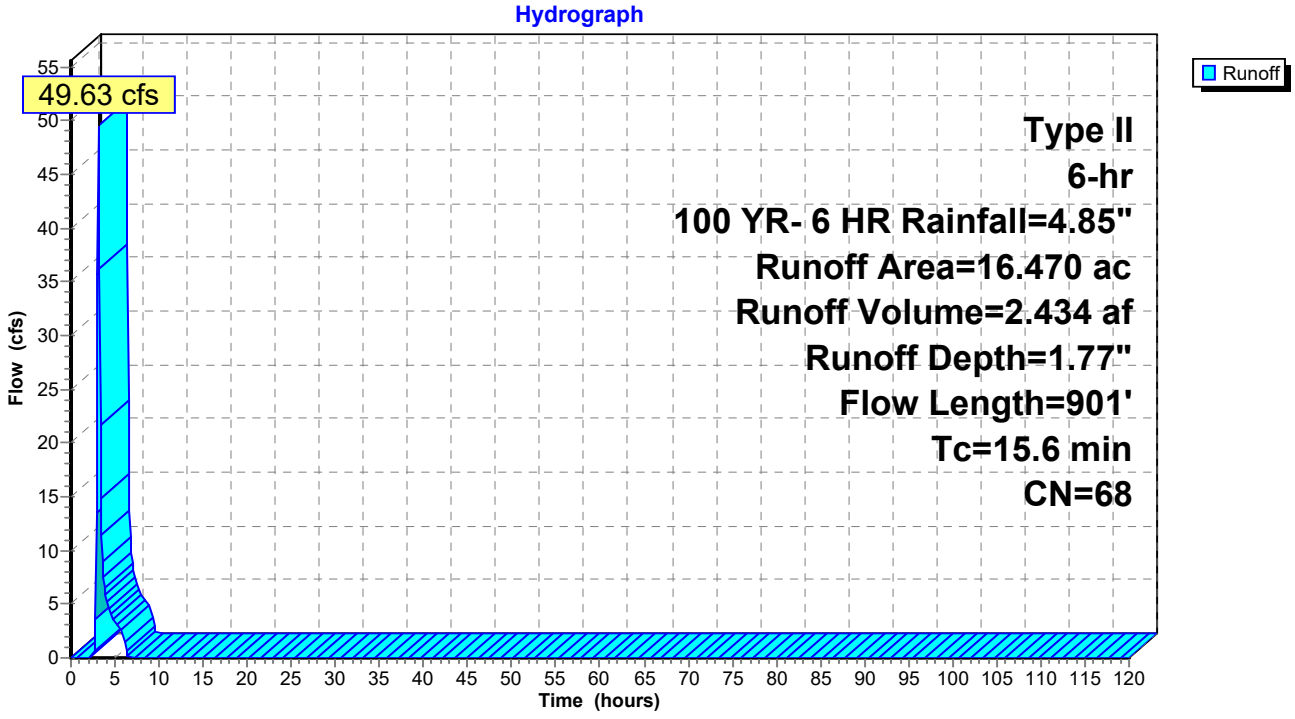
Runoff = 49.63 cfs @ 3.10 hrs, Volume= 2.434 af, Depth= 1.77"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 6-hr 100 YR- 6 HR Rainfall=4.85"

Area (ac)	CN	Description
0.870	55	Woods, Good, HSG B
0.390	70	Woods, Good, HSG C
15.210	69	50-75% Grass cover, Fair, HSG B
16.470	68	Weighted Average
16.470		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.5	50	0.0200	0.15		**Sheet Flow, SF-1** Grass: Short n= 0.150 P2= 3.39"
10.1	851	0.0400	1.40		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
15.6	901	Total			

Subcatchment 21S: PRE AREA-21



Summary for Subcatchment 22S: PRE AREA-22

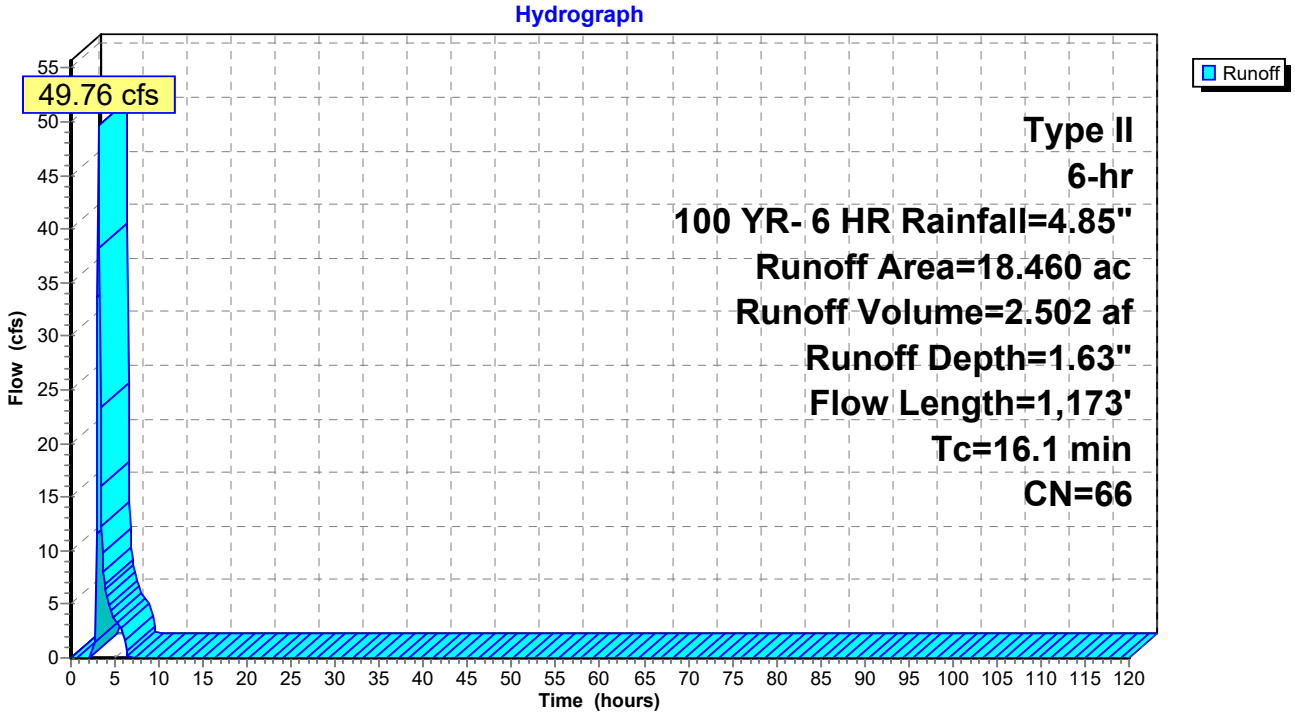
Runoff = 49.76 cfs @ 3.11 hrs, Volume= 2.502 af, Depth= 1.63"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 6-hr 100 YR- 6 HR Rainfall=4.85"

Area (ac)	CN	Description
3.800	55	Woods, Good, HSG B
1.800	70	Woods, Good, HSG C
12.860	69	50-75% Grass cover, Fair, HSG B
18.460	66	Weighted Average
18.460		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.1	50	0.0400	0.20		**Sheet Flow, SF-1** Grass: Short n= 0.150 P2= 3.39"
12.0	1,123	0.0500	1.57		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
16.1	1,173	Total			

Subcatchment 22S: PRE AREA-22



Summary for Subcatchment 23S: PRE AREA-23

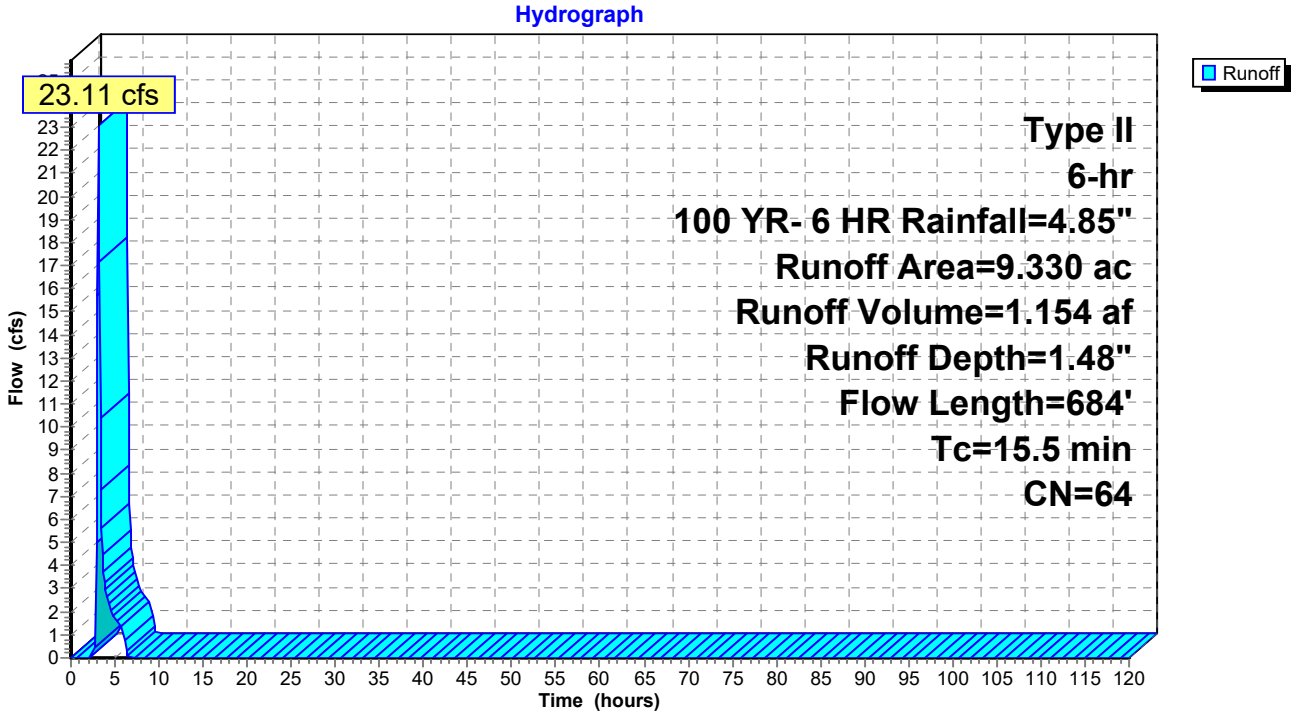
Runoff = 23.11 cfs @ 3.11 hrs, Volume= 1.154 af, Depth= 1.48"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 6-hr 100 YR- 6 HR Rainfall=4.85"

Area (ac)	CN	Description
3.620	55	Woods, Good, HSG B
5.310	70	Woods, Good, HSG C
0.400	69	50-75% Grass cover, Fair, HSG B
9.330	64	Weighted Average
9.330		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	50	0.0650	0.11		**Sheet Flow, SF-1** Woods: Light underbrush n= 0.400 P2= 3.39"
8.0	634	0.0700	1.32		**Shallow Concentrated Flow, SCF-1** Woodland Kv= 5.0 fps
15.5	684	Total			

Subcatchment 23S: PRE AREA-23



Summary for Subcatchment 24S: PRE AREA-24

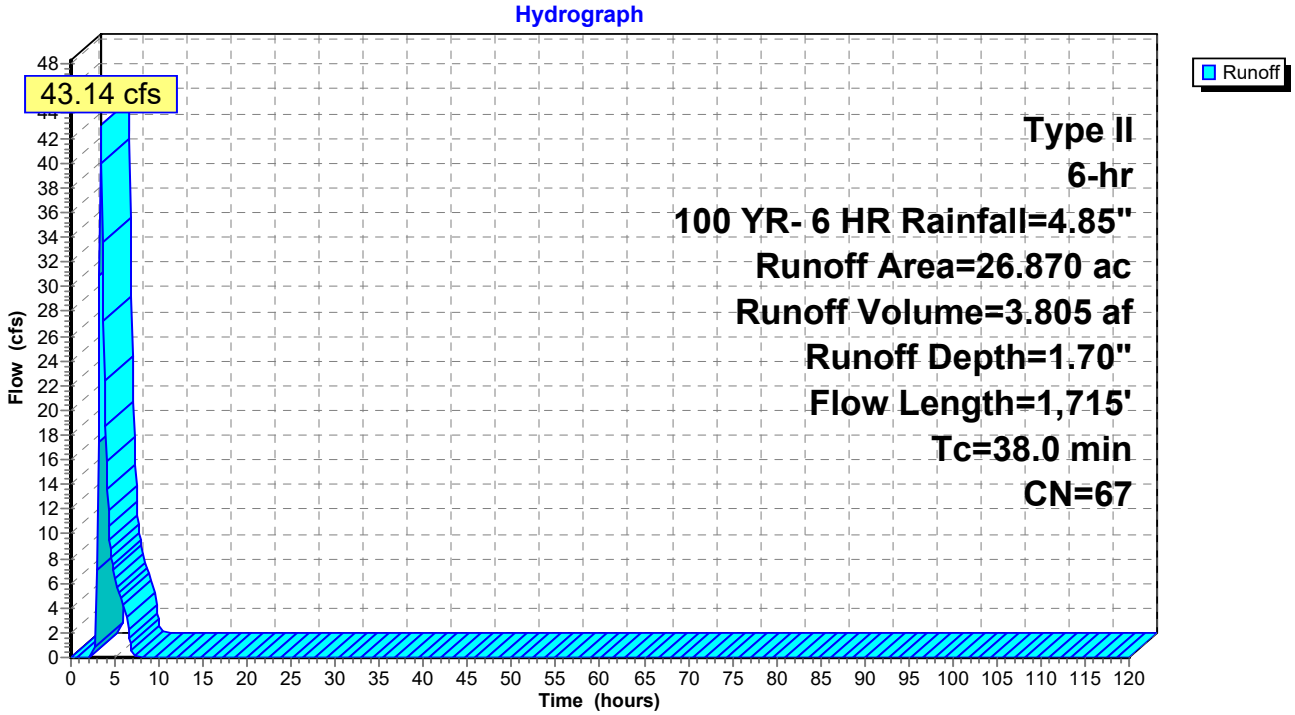
Runoff = 43.14 cfs @ 3.39 hrs, Volume= 3.805 af, Depth= 1.70"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 6-hr 100 YR- 6 HR Rainfall=4.85"

Area (ac)	CN	Description
5.180	55	Woods, Good, HSG B
2.080	70	Woods, Good, HSG C
18.550	69	50-75% Grass cover, Fair, HSG B
1.060	79	50-75% Grass cover, Fair, HSG C
26.870	67	Weighted Average
26.870		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.8	50	0.0100	0.05		**Sheet Flow, SF-1** Woods: Light underbrush n= 0.400 P2= 3.39"
7.4	586	0.0700	1.32		**Shallow Concentrated Flow, SCF-1** Woodland Kv= 5.0 fps
14.8	1,079	0.0300	1.21		**Shallow Concentrated Flow, SCF-2** Short Grass Pasture Kv= 7.0 fps
38.0	1,715	Total			

Subcatchment 24S: PRE AREA-24



Summary for Subcatchment 25S: PRE AREA-25

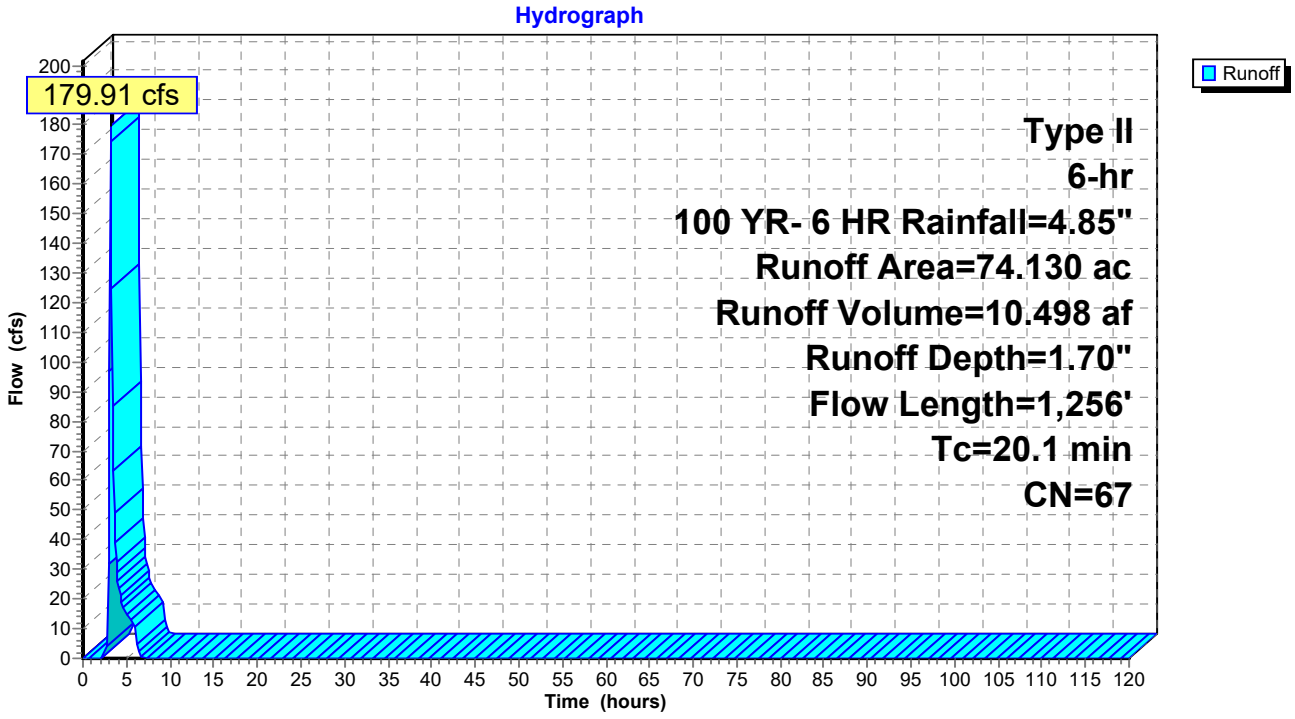
Runoff = 179.91 cfs @ 3.15 hrs, Volume= 10.498 af, Depth= 1.70"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 6-hr 100 YR- 6 HR Rainfall=4.85"

Area (ac)	CN	Description
62.530	69	50-75% Grass cover, Fair, HSG B
11.600	55	Woods, Good, HSG B
74.130	67	Weighted Average
74.130		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.5	50	0.0600	0.24		**Sheet Flow, SF-1** Grass: Short n= 0.150 P2= 3.39"
16.6	1,206	0.0300	1.21		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
20.1	1,256	Total			

Subcatchment 25S: PRE AREA-25



Summary for Subcatchment 54S: PRE AREA-26(Gen-Tie Route)

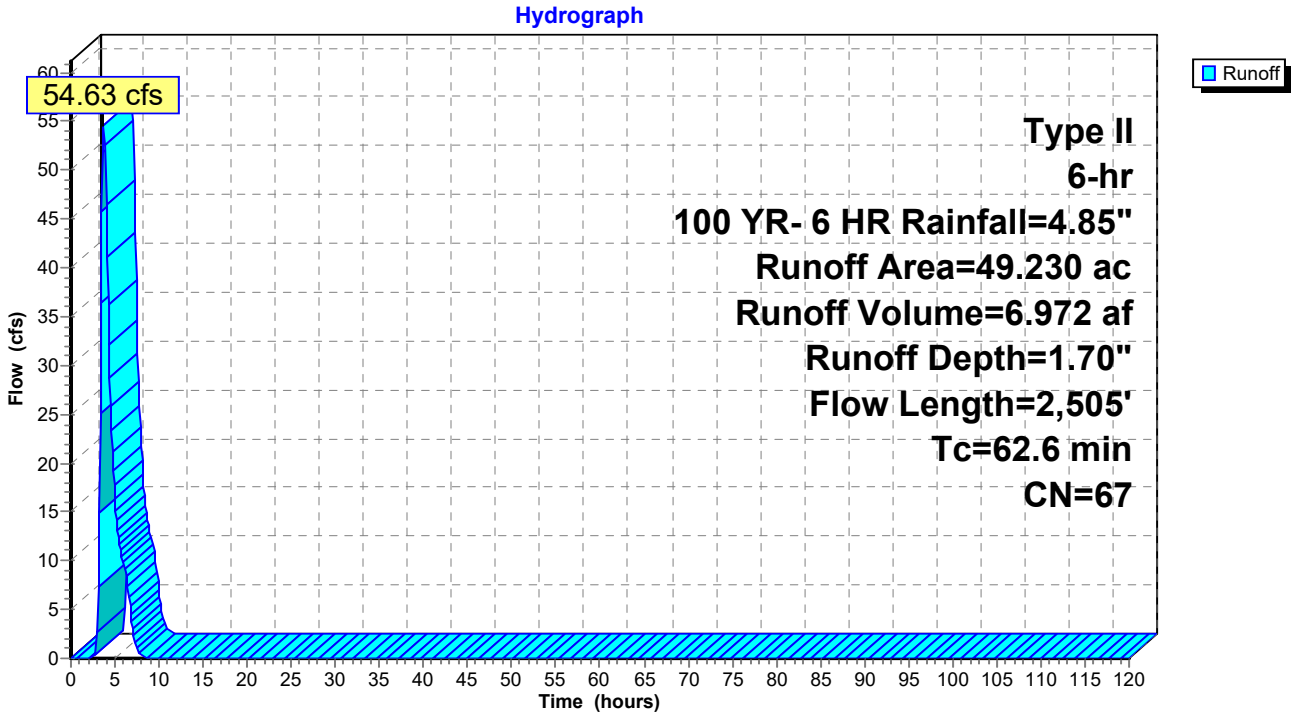
Runoff = 54.63 cfs @ 3.73 hrs, Volume= 6.972 af, Depth= 1.70"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 6-hr 100 YR- 6 HR Rainfall=4.85"

Area (ac)	CN	Description
40.630	69	50-75% Grass cover, Fair, HSG B
8.600	55	Woods, Good, HSG B
49.230	67	Weighted Average
49.230		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.1	50	0.0400	0.20		**Sheet Flow, SF-1** Grass: Short n= 0.150 P2= 3.39"
58.5	2,455	0.0100	0.70		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
62.6	2,505	Total			

Subcatchment 54S: PRE AREA-26(Gen-Tie Route)



Summary for Pond 51P: Exisitng Wetland

Inflow Area = 7.840 ac, 0.00% Impervious, Inflow Depth = 1.21" for 100 YR- 6 HR event
Inflow = 12.87 cfs @ 3.17 hrs, Volume= 0.793 af
Outflow = 4.59 cfs @ 3.54 hrs, Volume= 0.717 af, Atten= 64%, Lag= 22.3 min
Primary = 4.59 cfs @ 3.54 hrs, Volume= 0.717 af

Routing by Stor-Ind method, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Peak Elev= 718.49' @ 3.54 hrs Surf.Area= 8,468 sf Storage= 12,931 cf

Plug-Flow detention time= 54.4 min calculated for 0.716 af (90% of inflow)
Center-of-Mass det. time= 42.3 min (273.5 - 231.2)

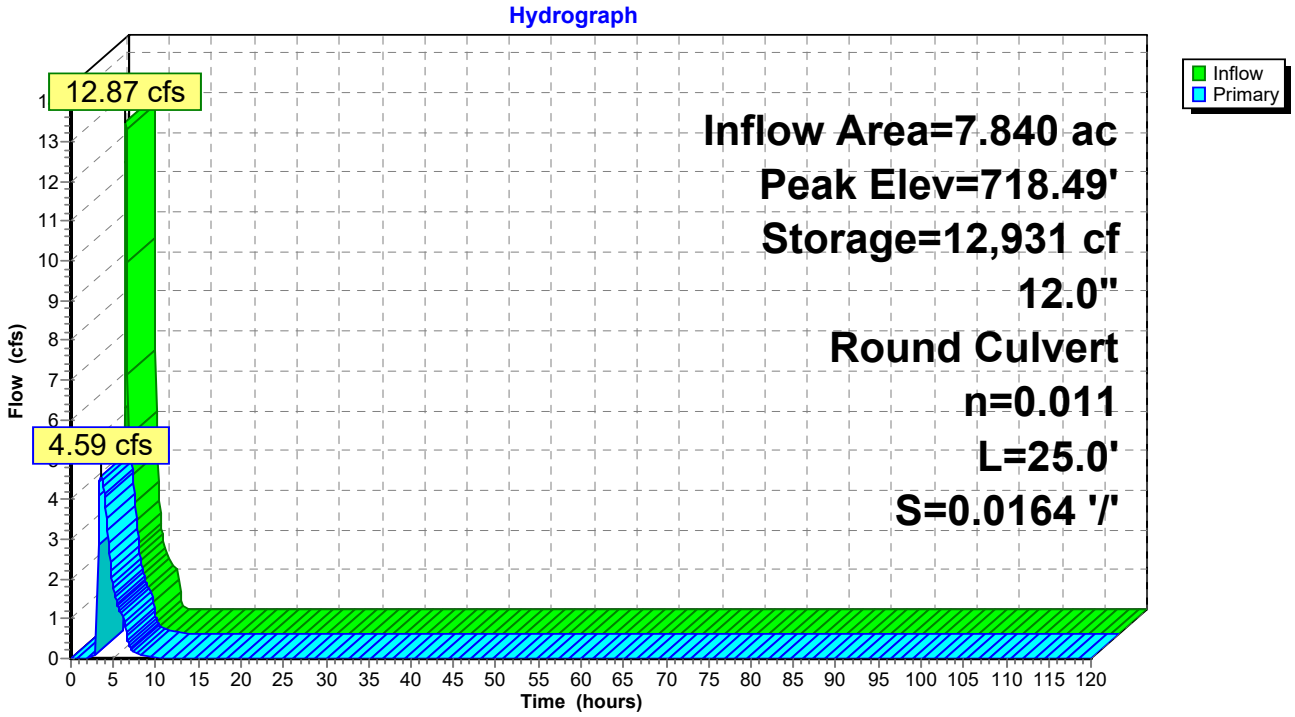
Volume	Invert	Avail.Storage	Storage Description
#1	716.00'	125,716 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
716.00	2,360	0	0
718.00	6,807	9,167	9,167
720.00	13,548	20,355	29,522
722.00	23,063	36,611	66,133
724.00	36,520	59,583	125,716

Device	Routing	Invert	Outlet Devices
#1	Primary	716.97'	**12.0" Round Culvert** L= 25.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 716.97' / 716.56' S= 0.0164 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.79 sf

Primary OutFlow Max=4.57 cfs @ 3.54 hrs HW=718.49' (Free Discharge)
1=Culvert (Barrel Controls 4.57 cfs @ 5.82 fps)

Pond 51P: Exisitng Wetland



Appendix E – Post Development Drainage Map

Appendix E – Post Development Hydrocad Report

Subcat Reach Pond Link

Routing Diagram for PRE AND POST ANALYSIS
Prepared by TRC, Printed 5/12/2021
HydroCAD® 10.00-11 s/n 01402 © 2014 HydroCAD Software Solutions LLC

Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
4.830	68	1 acre lots, 20% imp, HSG B (28S, 30S, 31S)
10.200	84	1 acre lots, 20% imp, HSG D (28S, 40S, 41S, 42S)
220.820	69	50-75% Grass cover, Fair, HSG B (26S, 27S, 28S, 29S, 31S, 32S, 34S, 35S, 36S, 37S, 38S, 39S, 41S, 42S, 43S, 44S, 45S, 46S, 47S, 49S, 50S, 55S)
12.170	79	50-75% Grass cover, Fair, HSG C (35S, 36S, 41S, 42S, 43S, 49S)
85.540	84	50-75% Grass cover, Fair, HSG D (26S, 28S, 29S, 31S, 32S, 34S, 37S, 38S, 39S, 40S)
9.050	85	Gravel roads, HSG B (26S, 27S, 28S, 30S, 31S, 32S, 34S, 36S, 37S, 46S, 47S, 50S, 55S)
6.350	91	Gravel roads, HSG D (30S, 31S, 32S, 35S, 36S, 38S, 39S, 40S, 41S)
428.460	58	Meadow, non-grazed, HSG B (26S, 27S, 28S, 29S, 30S, 31S, 32S, 33S, 34S, 35S, 36S, 37S, 38S, 39S, 40S, 41S, 42S, 43S, 44S, 45S, 46S, 47S, 49S, 50S, 55S)
9.600	71	Meadow, non-grazed, HSG C (41S, 47S, 48S)
320.990	78	Meadow, non-grazed, HSG D (26S, 28S, 29S, 30S, 31S, 32S, 35S, 36S, 37S, 38S, 39S, 40S, 42S, 43S, 49S)
0.010	98	Unconnected pavement, HSG D (30S)
0.090	98	Water Surface, 0% imp, HSG B (33S)
11.290	98	Water Surface, 0% imp, HSG D (30S, 31S, 33S, 34S, 40S)
34.290	55	Woods, Good, HSG B (27S, 31S, 32S, 33S, 34S, 36S, 38S, 43S, 44S, 45S, 46S, 47S, 48S, 49S, 55S)
2.220	70	Woods, Good, HSG C (31S, 43S, 46S, 48S)
9.990	77	Woods, Good, HSG D (31S, 32S, 33S, 34S, 38S, 39S)
1,165.900	**69**	**TOTAL AREA**

Soil Listing (selected nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
697.540	HSG B	26S, 27S, 28S, 29S, 30S, 31S, 32S, 33S, 34S, 35S, 36S, 37S, 38S, 39S, 40S, 41S, 42S, 43S, 44S, 45S, 46S, 47S, 48S, 49S, 50S, 55S
23.990	HSG C	31S, 35S, 36S, 41S, 42S, 43S, 46S, 47S, 48S, 49S
444.370	HSG D	26S, 28S, 29S, 30S, 31S, 32S, 33S, 34S, 35S, 36S, 37S, 38S, 39S, 40S, 41S, 42S, 43S, 49S
0.000	Other	
1,165.900		**TOTAL AREA**

Ground Covers (selected nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	4.830	0.000	10.200	0.000	15.030	1 acre lots, 20% imp	28S, 30S, 31S, 40S, 41S, 42S
0.000	220.820	12.170	85.540	0.000	318.530	50-75% Grass cover, Fair	26S, 27S, 28S, 29S, 31S, 32S, 34S, 35S, 36S, 37S, 38S, 39S, 40S, 41S, 42S, 43S, 44S, 45S, 46S, 47S, 49S, 50S, 55S
0.000	9.050	0.000	6.350	0.000	15.400	Gravel roads	26S, 27S, 28S, 30S, 31S, 32S, 34S, 35S, 36S, 37S, 38S, 39S, 40S, 41S, 46S, 47S, 50S, 55S

Ground Covers (selected nodes) (continued)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	428.460	9.600	320.990	0.000	759.050	Meadow, non-grazed	26S, 27S, 28S, 29S, 30S, 31S, 32S, 33S, 34S, 35S, 36S, 37S, 38S, 39S, 40S, 41S, 42S, 43S, 44S, 45S, 46S, 47S, 48S, 49S, 50S, 55S
0.000	0.000	0.000	0.010	0.000	0.010	Unconnected pavement	30S
0.000	0.090	0.000	11.290	0.000	11.380	Water Surface, 0% imp	30S, 31S, 33S, 34S, 40S
0.000	34.290	2.220	9.990	0.000	46.500	Woods, Good	27S, 31S, 32S, 33S, 34S, 36S, 38S, 39S, 43S, 44S, 45S, 46S, 47S, 48S, 49S, 55S

Ground Covers (selected nodes) (continued)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	**697.540**	**23.990**	**444.370**	**0.000**	**1,165.900**	**TOTAL AREA**	

Pipe Listing (selected nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Diam/Width (inches)	Height (inches)	Inside-Fill (inches)
1	53P	716.97	716.56	25.0	0.0164	0.011	12.0	0.0	0.0

Time span=0.00-120.00 hrs, dt=0.10 hrs, 1201 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 26S: POST AREA-1 Runoff Area=26.670 ac 0.00% Impervious Runoff Depth=0.32"
Flow Length=1,700' Tc=34.7 min CN=73 Runoff=4.70 cfs 0.722 af

Subcatchment 27S: POST AREA-2 Runoff Area=5.380 ac 0.00% Impervious Runoff Depth=0.10"
Flow Length=924' Slope=0.0200 '/' Tc=22.7 min CN=63 Runoff=0.12 cfs 0.047 af

Subcatchment 28S: POST AREA-3 Runoff Area=67.480 ac 0.40% Impervious Runoff Depth=0.22"
Flow Length=2,190' Tc=43.2 min CN=69 Runoff=5.40 cfs 1.240 af

Subcatchment 29S: POST AREA-4 Runoff Area=24.880 ac 0.00% Impervious Runoff Depth=0.22"
Flow Length=1,062' Slope=0.0300 '/' Tc=20.7 min CN=69 Runoff=3.21 cfs 0.457 af

Subcatchment 30S: POST AREA-5 Runoff Area=87.520 ac 0.17% Impervious Runoff Depth=0.22"
Flow Length=2,797' Tc=30.7 min CN=69 Runoff=8.65 cfs 1.608 af

Subcatchment 31S: POST AREA-6 Runoff Area=346.820 ac 0.18% Impervious Runoff Depth=0.35"
Flow Length=3,249' Tc=42.1 min CN=74 Runoff=61.28 cfs 10.246 af

Subcatchment 32S: POST AREA-7 Runoff Area=13.020 ac 0.00% Impervious Runoff Depth=0.16"
Flow Length=1,475' Tc=36.2 min CN=66 Runoff=0.61 cfs 0.170 af

Subcatchment 33S: POST AREA-8 Runoff Area=7.840 ac 0.00% Impervious Runoff Depth=0.09"
Flow Length=1,010' Tc=17.6 min CN=62 Runoff=0.13 cfs 0.058 af

Subcatchment 34S: POST AREA-9 Runoff Area=37.590 ac 0.00% Impervious Runoff Depth=0.18"
Flow Length=1,873' Tc=14.2 min CN=67 Runoff=3.90 cfs 0.553 af

Subcatchment 35S: POST AREA-10 Runoff Area=60.170 ac 0.00% Impervious Runoff Depth=0.14"
Flow Length=2,383' Tc=32.0 min CN=65 Runoff=2.28 cfs 0.691 af

Subcatchment 36S: POST AREA-11 Runoff Area=31.380 ac 0.00% Impervious Runoff Depth=0.16"
Flow Length=1,460' Tc=24.9 min CN=66 Runoff=1.79 cfs 0.409 af

Subcatchment 37S: POST AREA-12 Runoff Area=15.480 ac 0.00% Impervious Runoff Depth=0.20"
Flow Length=1,523' Tc=26.2 min CN=68 Runoff=1.39 cfs 0.255 af

Subcatchment 38S: POST AREA-13 Runoff Area=65.340 ac 0.00% Impervious Runoff Depth=0.30"
Flow Length=1,151' Tc=21.1 min CN=72 Runoff=14.01 cfs 1.614 af

Subcatchment 39S: POST AREA-14 Runoff Area=51.210 ac 0.00% Impervious Runoff Depth=0.45"
Flow Length=2,097' Tc=40.5 min CN=77 Runoff=13.40 cfs 1.936 af

Subcatchment 40S: POST AREA-15 Runoff Area=61.410 ac 2.64% Impervious Runoff Depth=0.20"
Flow Length=2,893' Tc=27.5 min CN=68 Runoff=5.35 cfs 1.012 af

Subcatchment 41S: POST AREA-16 Runoff Area=14.530 ac 0.88% Impervious Runoff Depth=0.22"
Flow Length=1,042' Tc=18.7 min CN=69 Runoff=1.97 cfs 0.267 af

Subcatchment 42S: POST AREA-17 Runoff Area=27.220 ac 0.76% Impervious Runoff Depth=0.22"
Flow Length=1,361' Tc=28.1 min CN=69 Runoff=2.87 cfs 0.500 af

Subcatchment 43S: POST AREA-18 Runoff Area=19.240 ac 0.00% Impervious Runoff Depth=0.06"
Flow Length=1,364' Tc=12.2 min CN=60 Runoff=0.15 cfs 0.100 af

Subcatchment 44S: POST AREA-19 Runoff Area=3.030 ac 0.00% Impervious Runoff Depth=0.09"
Flow Length=454' Tc=10.3 min CN=62 Runoff=0.05 cfs 0.022 af

Subcatchment 45S: POST AREA-20 Runoff Area=5.100 ac 0.00% Impervious Runoff Depth=0.10"
Flow Length=537' Slope=0.0300 '/' Tc=13.5 min CN=63 Runoff=0.13 cfs 0.044 af

Subcatchment 46S: POST AREA-21 Runoff Area=16.470 ac 0.00% Impervious Runoff Depth=0.09"
Flow Length=901' Tc=18.1 min CN=62 Runoff=0.27 cfs 0.122 af

Subcatchment 47S: POST AREA-22 Runoff Area=19.160 ac 0.00% Impervious Runoff Depth=0.08"
Flow Length=1,173' Tc=18.0 min CN=61 Runoff=0.22 cfs 0.120 af

Subcatchment 48S: POST AREA-23 Runoff Area=8.730 ac 0.00% Impervious Runoff Depth=0.12"
Flow Length=670' Tc=12.4 min CN=64 Runoff=0.37 cfs 0.088 af

Subcatchment 49S: POST AREA-24 Runoff Area=26.870 ac 0.00% Impervious Runoff Depth=0.09"
Flow Length=1,715' Tc=30.6 min CN=62 Runoff=0.41 cfs 0.199 af

Subcatchment 50S: POST AREA-25 Runoff Area=74.130 ac 0.00% Impervious Runoff Depth=0.04"
Flow Length=1,256' Tc=21.7 min CN=58 Runoff=0.31 cfs 0.250 af

Subcatchment 55S: POST Runoff Area=49.230 ac 0.00% Impervious Runoff Depth=0.16"
Flow Length=2,505' Tc=62.6 min CN=66 Runoff=1.73 cfs 0.642 af

Pond 53P: Exisitng Wetland Peak Elev=716.07' Storage=2,531 cf Inflow=0.13 cfs 0.058 af
12.0" Round Culvert n=0.011 L=25.0' S=0.0164 '/' Outflow=0.00 cfs 0.000 af

Total Runoff Area = 1,165.900 ac Runoff Volume = 23.372 af Average Runoff Depth = 0.24"
99.74% Pervious = 1,162.884 ac 0.26% Impervious = 3.016 ac

Summary for Subcatchment 26S: POST AREA-1

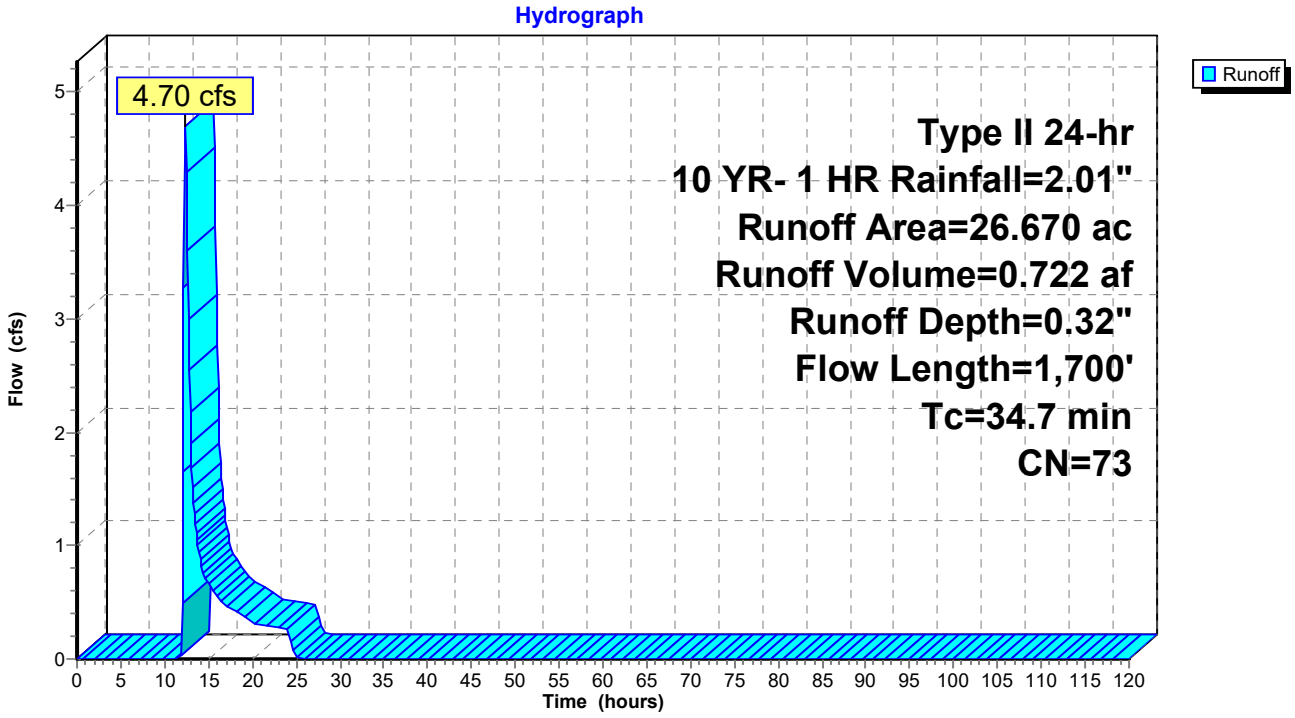
Runoff = 4.70 cfs @ 12.39 hrs, Volume= 0.722 af, Depth= 0.32"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 24-hr 10 YR- 1 HR Rainfall=2.01"

Area (ac)	CN	Description
7.780	69	50-75% Grass cover, Fair, HSG B
3.800	84	50-75% Grass cover, Fair, HSG D
0.300	85	Gravel roads, HSG B
5.050	58	Meadow, non-grazed, HSG B
9.740	78	Meadow, non-grazed, HSG D
26.670	73	Weighted Average
26.670		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.2	50	0.1000	0.20		**Sheet Flow, SF-1** Grass: Dense n= 0.240 P2= 3.39"
6.0	620	0.0600	1.71		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
24.5	1,030	0.0100	0.70		**Shallow Concentrated Flow, SCF-2** Short Grass Pasture Kv= 7.0 fps
34.7	1,700	Total			

Subcatchment 26S: POST AREA-1



Summary for Subcatchment 27S: POST AREA-2

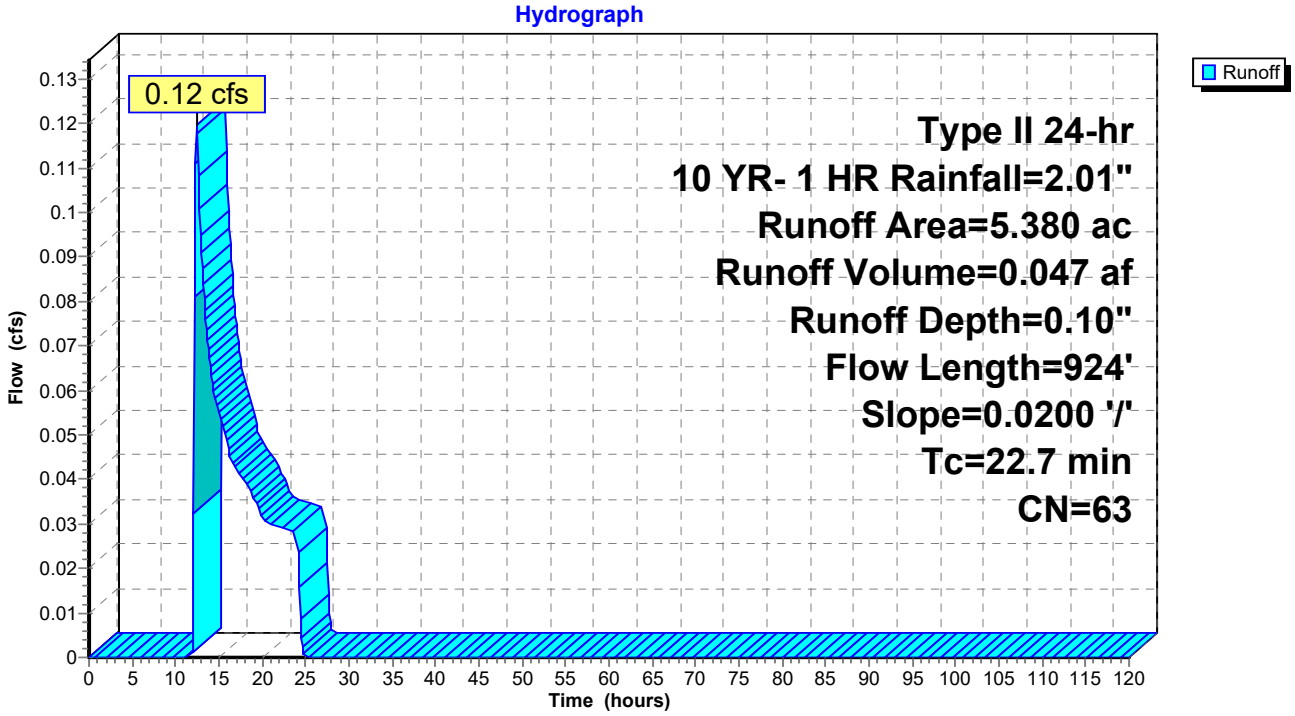
Runoff = 0.12 cfs @ 12.46 hrs, Volume= 0.047 af, Depth= 0.10"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 24-hr 10 YR- 1 HR Rainfall=2.01"

Area (ac)	CN	Description
2.660	69	50-75% Grass cover, Fair, HSG B
0.550	55	Woods, Good, HSG B
0.040	85	Gravel roads, HSG B
2.130	58	Meadow, non-grazed, HSG B
5.380	63	Weighted Average
5.380		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.0	50	0.0200	0.10		**Sheet Flow, SF-1** Grass: Dense n= 0.240 P2= 3.39"
14.7	874	0.0200	0.99		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
22.7	924	Total			

Subcatchment 27S: POST AREA-2



Summary for Subcatchment 28S: POST AREA-3

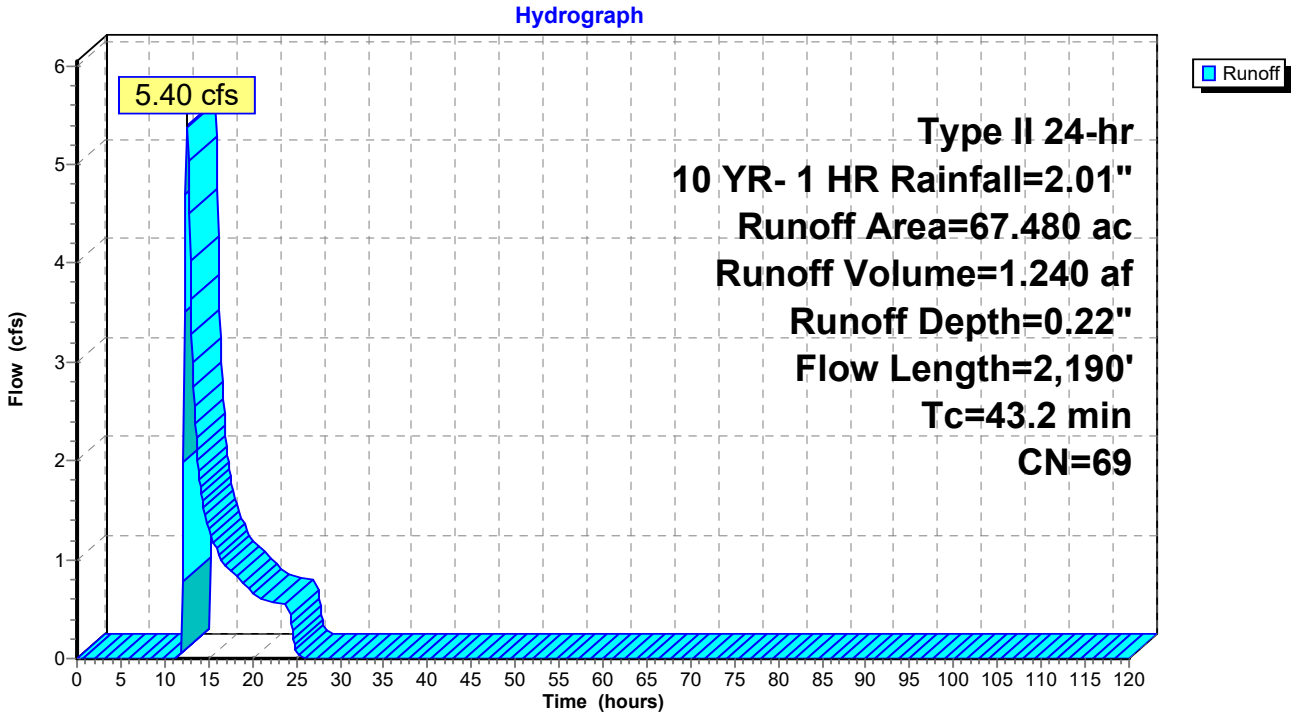
Runoff = 5.40 cfs @ 12.57 hrs, Volume= 1.240 af, Depth= 0.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 24-hr 10 YR- 1 HR Rainfall=2.01"

Area (ac)	CN	Description
15.050	69	50-75% Grass cover, Fair, HSG B
4.530	84	50-75% Grass cover, Fair, HSG D
1.170	85	Gravel roads, HSG B
0.930	68	1 acre lots, 20% imp, HSG B
0.420	84	1 acre lots, 20% imp, HSG D
24.300	58	Meadow, non-grazed, HSG B
21.080	78	Meadow, non-grazed, HSG D
67.480	69	Weighted Average
67.210		99.60% Pervious Area
0.270		0.40% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.6	50	0.0800	0.18		**Sheet Flow, SF-1** Grass: Dense n= 0.240 P2= 3.39"
8.5	874	0.0600	1.71		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
30.1	1,266	0.0100	0.70		**Shallow Concentrated Flow, SCF-2** Short Grass Pasture Kv= 7.0 fps
43.2	2,190	Total			

Subcatchment 28S: POST AREA-3



Summary for Subcatchment 29S: POST AREA-4

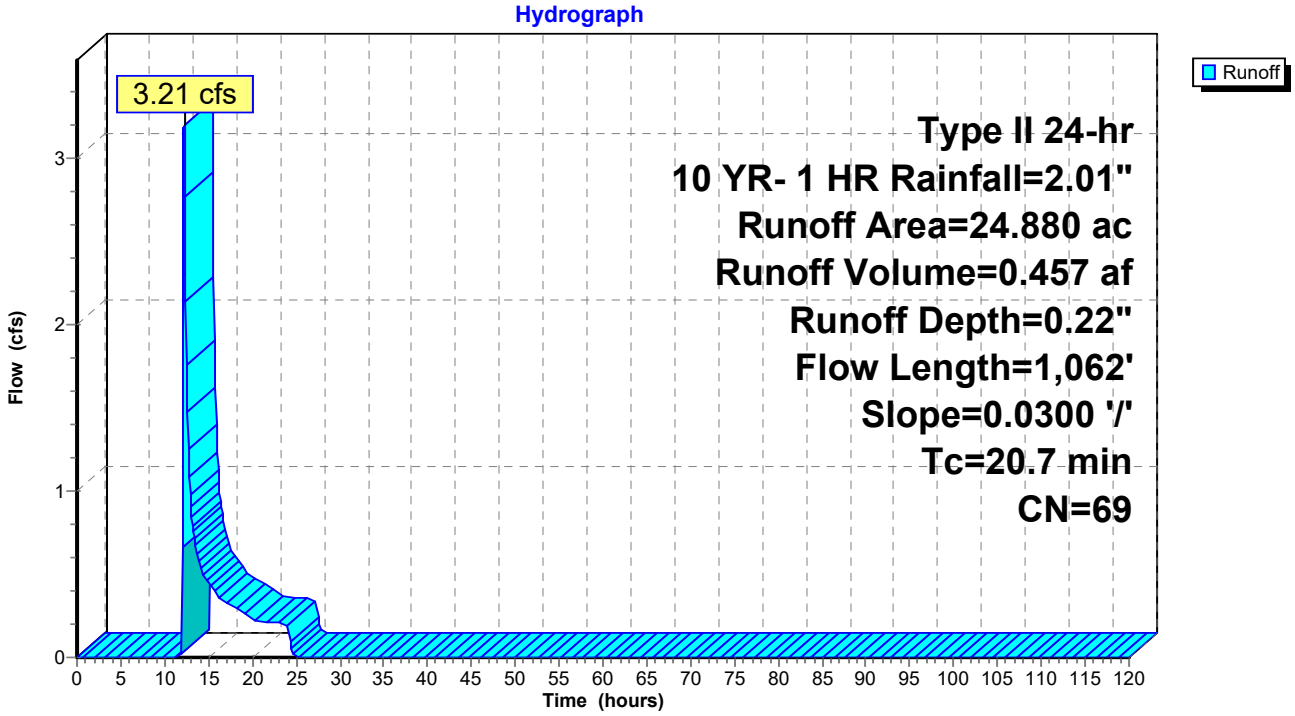
Runoff = 3.21 cfs @ 12.22 hrs, Volume= 0.457 af, Depth= 0.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 24-hr 10 YR- 1 HR Rainfall=2.01"

Area (ac)	CN	Description
9.120	69	50-75% Grass cover, Fair, HSG B
5.450	84	50-75% Grass cover, Fair, HSG D
9.310	58	Meadow, non-grazed, HSG B
1.000	78	Meadow, non-grazed, HSG D
24.880	69	Weighted Average
24.880		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.8	50	0.0300	0.12		**Sheet Flow, SF-1** Grass: Dense n= 0.240 P2= 3.39"
13.9	1,012	0.0300	1.21		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
20.7	1,062	Total			

Subcatchment 29S: POST AREA-4



Summary for Subcatchment 30S: POST AREA-5

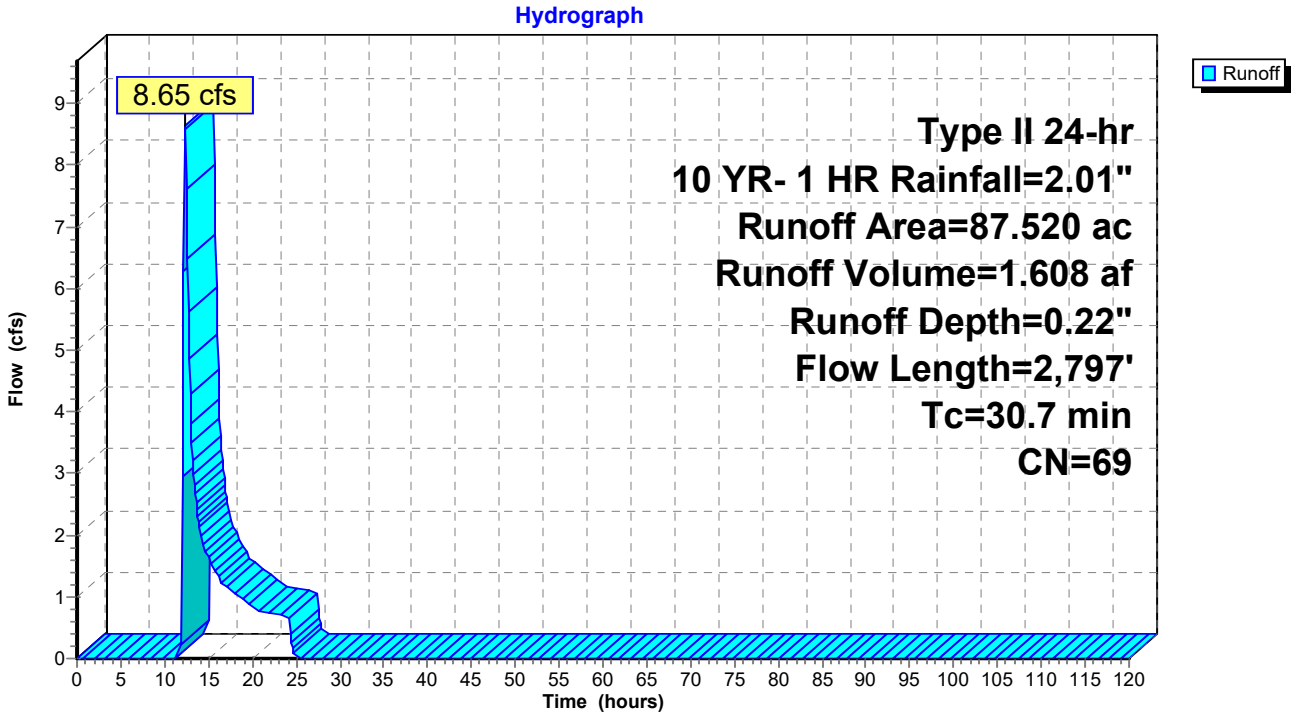
Runoff = 8.65 cfs @ 12.37 hrs, Volume= 1.608 af, Depth= 0.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 24-hr 10 YR- 1 HR Rainfall=2.01"

Area (ac)	CN	Description
44.510	58	Meadow, non-grazed, HSG B
37.550	78	Meadow, non-grazed, HSG D
2.950	98	Water Surface, 0% imp, HSG D
0.820	85	Gravel roads, HSG B
0.980	91	Gravel roads, HSG D
0.700	68	1 acre lots, 20% imp, HSG B
0.010	98	Unconnected pavement, HSG D
87.520	69	Weighted Average
87.370		99.83% Pervious Area
0.150		0.17% Impervious Area
0.010		6.67% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.1	50	0.0600	0.16		**Sheet Flow, SF-1** Grass: Dense n= 0.240 P2= 3.39"
13.3	968	0.0300	1.21		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
12.3	1,779	0.0060	2.42	8.46	**Channel Flow, CF-1** Area= 3.5 sf Perim= 7.0' r= 0.50' n= 0.030 Earth, grassed & winding
30.7	2,797	Total			

Subcatchment 30S: POST AREA-5



Summary for Subcatchment 31S: POST AREA-6

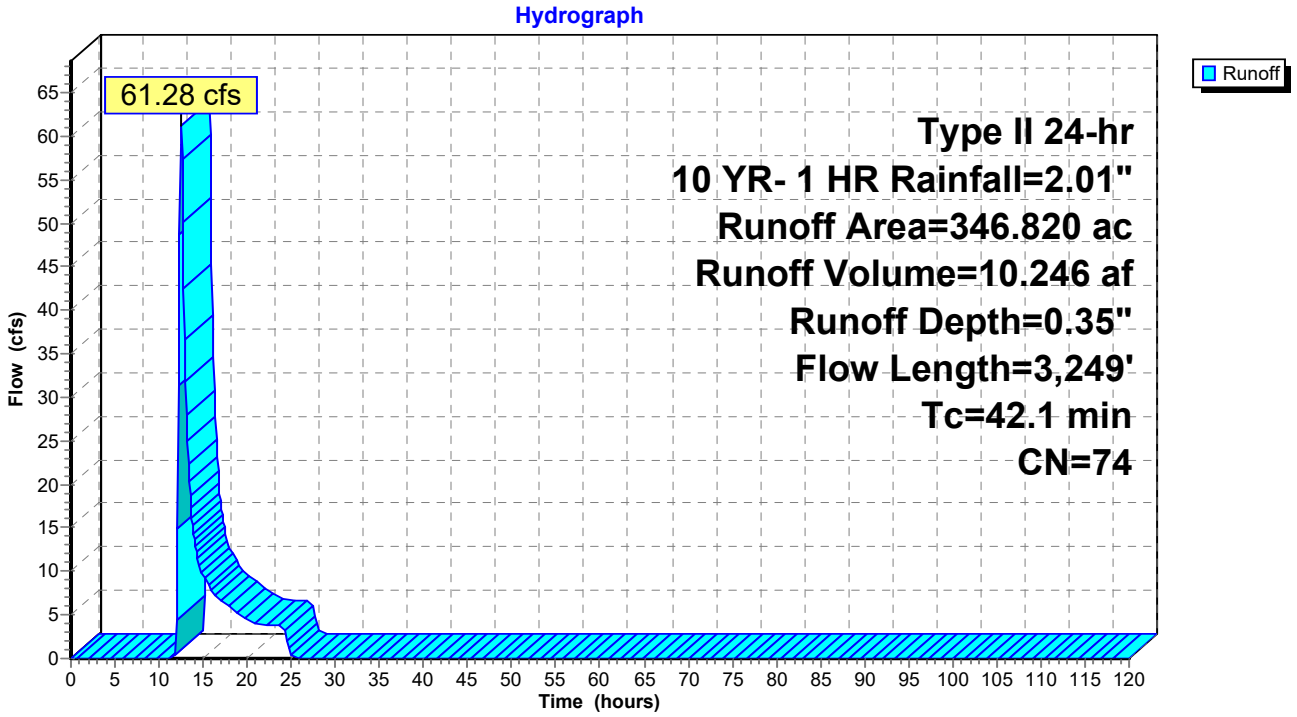
Runoff = 61.28 cfs @ 12.49 hrs, Volume= 10.246 af, Depth= 0.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 24-hr 10 YR- 1 HR Rainfall=2.01"

Area (ac)	CN	Description
64.810	69	50-75% Grass cover, Fair, HSG B
32.730	84	50-75% Grass cover, Fair, HSG D
56.200	58	Meadow, non-grazed, HSG B
168.280	78	Meadow, non-grazed, HSG D
6.950	98	Water Surface, 0% imp, HSG D
0.600	85	Gravel roads, HSG B
2.560	91	Gravel roads, HSG D
3.200	68	1 acre lots, 20% imp, HSG B
8.140	55	Woods, Good, HSG B
0.500	70	Woods, Good, HSG C
2.850	77	Woods, Good, HSG D
346.820	74	Weighted Average
346.180		99.82% Pervious Area
0.640		0.18% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.5	50	0.0100	0.08		**Sheet Flow, SF-1**
					Grass: Dense n= 0.240 P2= 3.39"
25.2	1,499	0.0200	0.99		**Shallow Concentrated Flow, SCF-1**
					Short Grass Pasture Kv= 7.0 fps
6.4	1,700	0.0200	4.41	15.45	**Channel Flow, CF-1**
					Area= 3.5 sf Perim= 7.0' r= 0.50'
					n= 0.030 Earth, grassed & winding
42.1	3,249	Total			

Subcatchment 31S: POST AREA-6



Summary for Subcatchment 32S: POST AREA-7

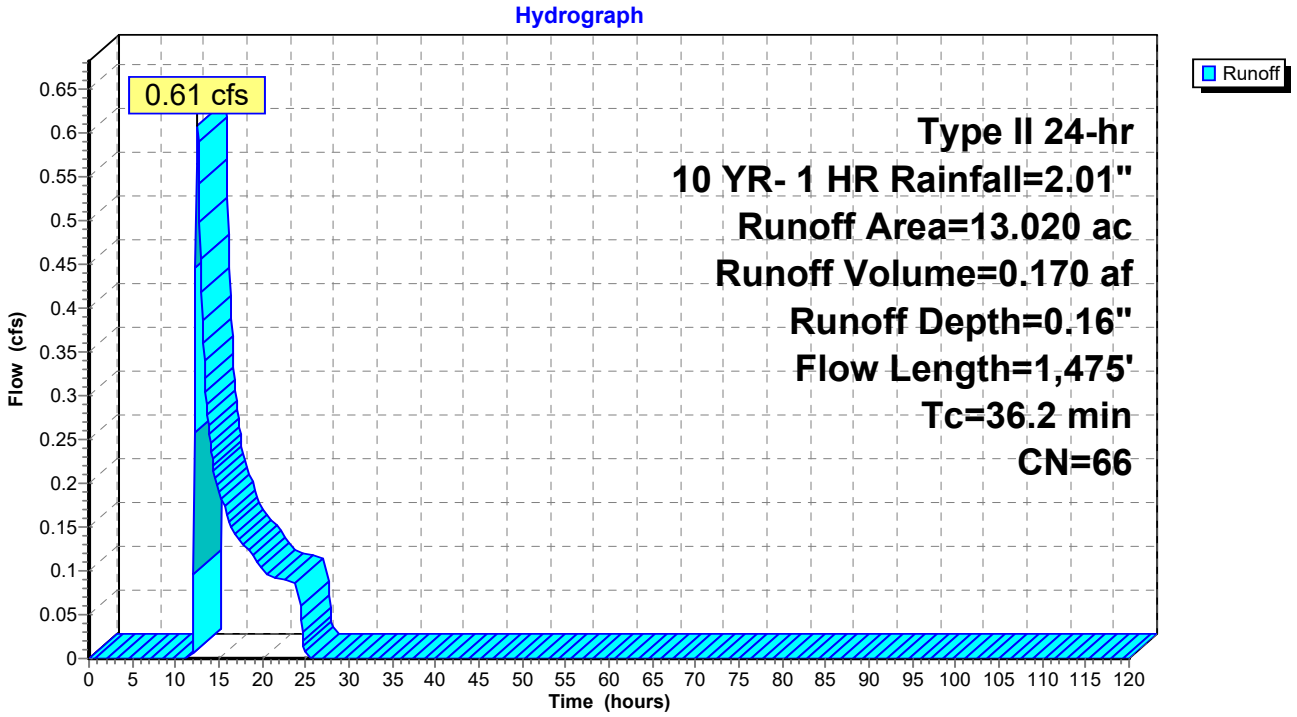
Runoff = 0.61 cfs @ 12.52 hrs, Volume= 0.170 af, Depth= 0.16"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 24-hr 10 YR- 1 HR Rainfall=2.01"

Area (ac)	CN	Description
0.730	69	50-75% Grass cover, Fair, HSG B
0.840	84	50-75% Grass cover, Fair, HSG D
0.550	85	Gravel roads, HSG B
0.270	91	Gravel roads, HSG D
1.140	55	Woods, Good, HSG B
0.730	77	Woods, Good, HSG D
6.810	58	Meadow, non-grazed, HSG B
1.950	78	Meadow, non-grazed, HSG D
13.020	66	Weighted Average
13.020		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.5	50	0.0100	0.08		**Sheet Flow, SF-1** Grass: Dense n= 0.240 P2= 3.39"
2.0	86	0.0100	0.70		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
0.2	18	0.0100	1.61		**Shallow Concentrated Flow, SCF-2** Unpaved Kv= 16.1 fps
8.6	625	0.0300	1.21		**Shallow Concentrated Flow, SCF-3** Short Grass Pasture Kv= 7.0 fps
0.2	18	0.0100	1.61		**Shallow Concentrated Flow, SCF-4** Unpaved Kv= 16.1 fps
3.4	200	0.0200	0.99		**Shallow Concentrated Flow, SCF-5** Short Grass Pasture Kv= 7.0 fps
11.3	478	0.0200	0.71		**Shallow Concentrated Flow, SCF-5** Woodland Kv= 5.0 fps
36.2	1,475	Total			

Subcatchment 32S: POST AREA-7



Summary for Subcatchment 33S: POST AREA-8

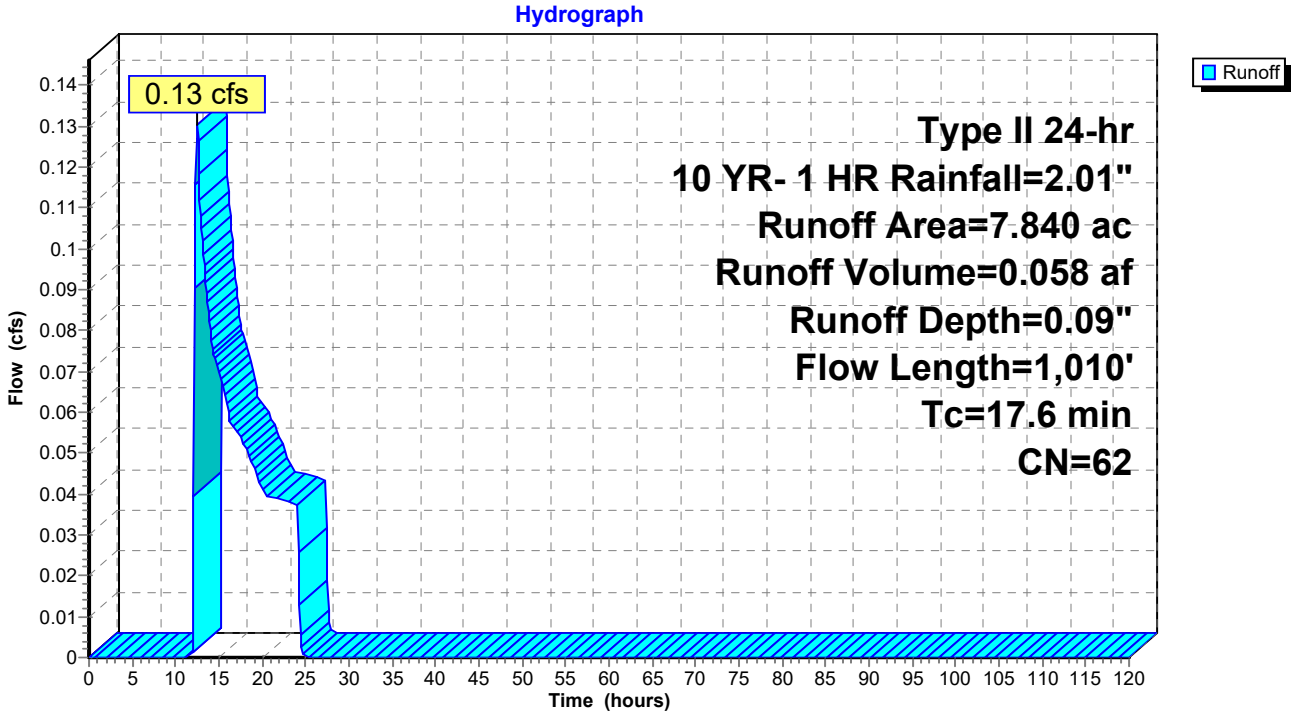
Runoff = 0.13 cfs @ 12.50 hrs, Volume= 0.058 af, Depth= 0.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 24-hr 10 YR- 1 HR Rainfall=2.01"

Area (ac)	CN	Description
1.690	55	Woods, Good, HSG B
1.390	77	Woods, Good, HSG D
0.090	98	Water Surface, 0% imp, HSG B
0.080	98	Water Surface, 0% imp, HSG D
4.590	58	Meadow, non-grazed, HSG B
7.840	62	Weighted Average
7.840		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.5	50	0.0100	0.08		**Sheet Flow, SF-1** Grass: Dense n= 0.240 P2= 3.39"
6.1	510	0.0400	1.40		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
1.0	450	0.0500	7.79	20.25	**Channel Flow, CF-1** Area= 2.6 sf Perim= 3.5' r= 0.74' n= 0.035 Earth, dense weeds
17.6	1,010	Total			

Subcatchment 33S: POST AREA-8



Summary for Subcatchment 34S: POST AREA-9

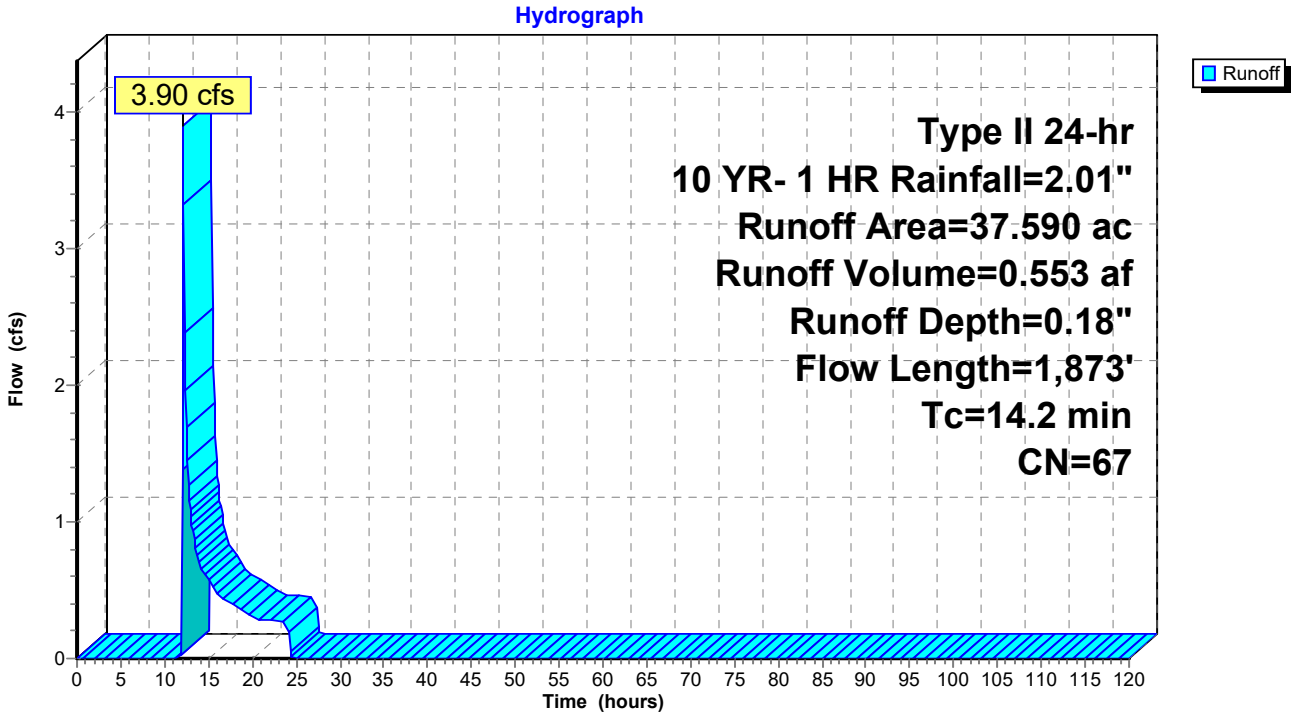
Runoff = 3.90 cfs @ 12.13 hrs, Volume= 0.553 af, Depth= 0.18"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 24-hr 10 YR- 1 HR Rainfall=2.01"

Area (ac)	CN	Description
19.780	69	50-75% Grass cover, Fair, HSG B
2.170	84	50-75% Grass cover, Fair, HSG D
0.910	55	Woods, Good, HSG B
0.610	77	Woods, Good, HSG D
0.710	98	Water Surface, 0% imp, HSG D
0.660	85	Gravel roads, HSG B
12.750	58	Meadow, non-grazed, HSG B
37.590	67	Weighted Average
37.590		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.1	50	0.0600	0.16		**Sheet Flow, SF-1** Grass: Dense n= 0.240 P2= 3.39"
6.6	481	0.0300	1.21		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
2.5	1,342	0.0500	9.08	23.62	**Channel Flow, CF-1** Area= 2.6 sf Perim= 3.5' r= 0.74' n= 0.030 Earth, grassed & winding
14.2	1,873	Total			

Subcatchment 34S: POST AREA-9



Summary for Subcatchment 35S: POST AREA-10

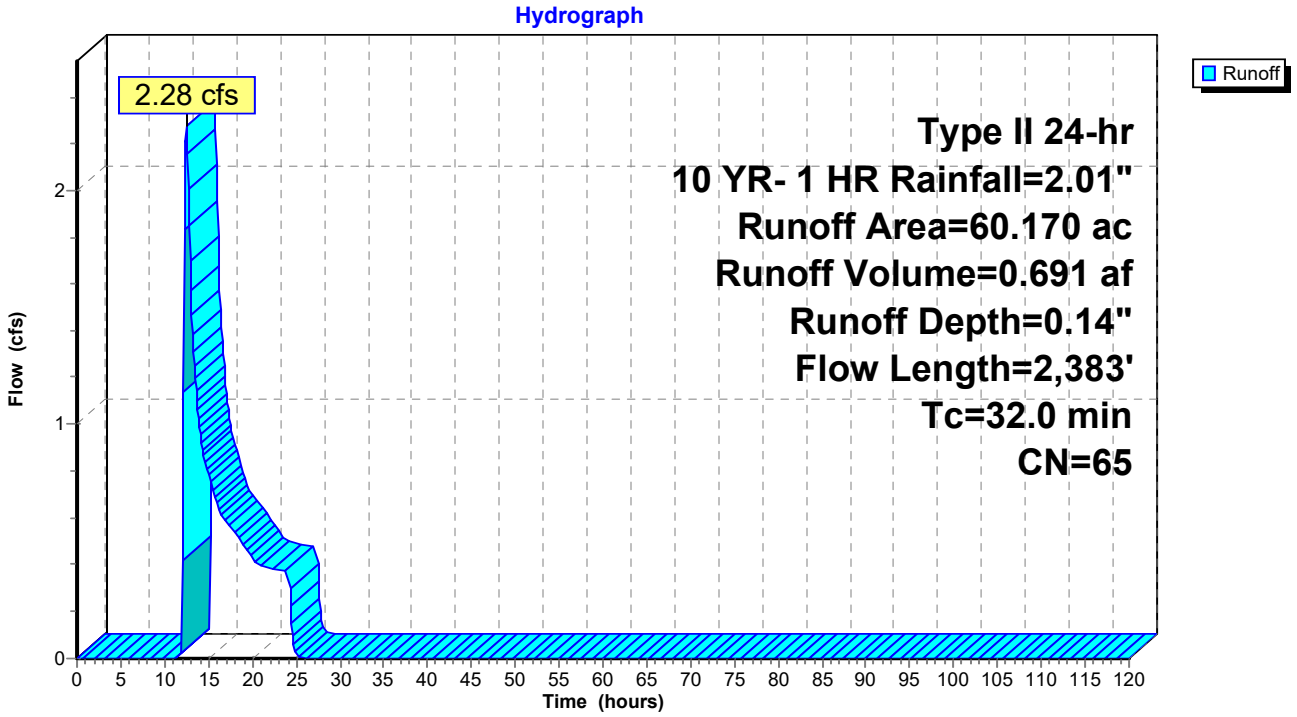
Runoff = 2.28 cfs @ 12.49 hrs, Volume= 0.691 af, Depth= 0.14"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 24-hr 10 YR- 1 HR Rainfall=2.01"

Area (ac)	CN	Description
14.950	69	50-75% Grass cover, Fair, HSG B
2.980	79	50-75% Grass cover, Fair, HSG C
0.610	91	Gravel roads, HSG D
34.050	58	Meadow, non-grazed, HSG B
7.580	78	Meadow, non-grazed, HSG D
60.170	65	Weighted Average
60.170		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.8	50	0.0300	0.12		**Sheet Flow, SF-1** Grass: Dense n= 0.240 P2= 3.39"
3.5	357	0.0600	1.71		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
19.8	1,178	0.0200	0.99		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
1.9	798	0.0300	7.17	46.63	**Channel Flow, CF-1** Area= 6.5 sf Perim= 8.5' r= 0.76' n= 0.030 Earth, grassed & winding
32.0	2,383	Total			

Subcatchment 35S: POST AREA-10



Summary for Subcatchment 36S: POST AREA-11

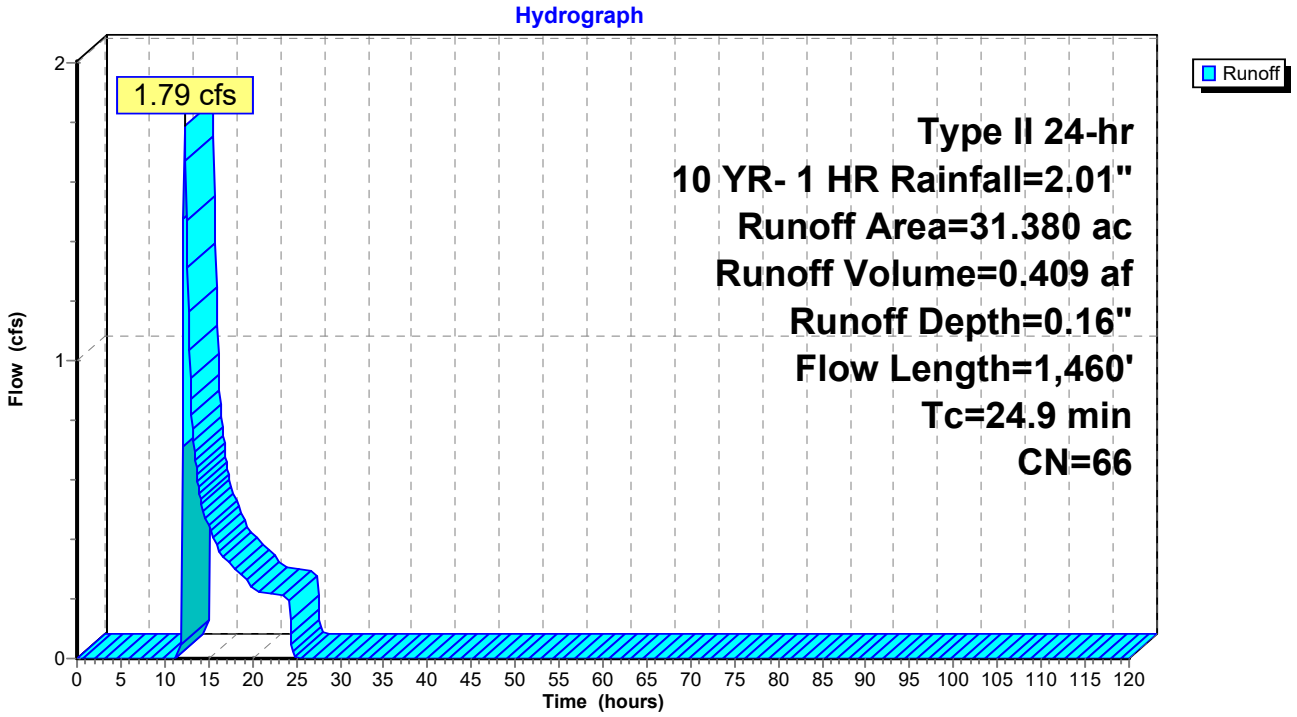
Runoff = 1.79 cfs @ 12.32 hrs, Volume= 0.409 af, Depth= 0.16"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 24-hr 10 YR- 1 HR Rainfall=2.01"

Area (ac)	CN	Description
4.120	69	50-75% Grass cover, Fair, HSG B
3.400	79	50-75% Grass cover, Fair, HSG C
0.110	55	Woods, Good, HSG B
0.400	85	Gravel roads, HSG B
0.030	91	Gravel roads, HSG D
17.430	58	Meadow, non-grazed, HSG B
5.890	78	Meadow, non-grazed, HSG D
31.380	66	Weighted Average
31.380		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.6	50	0.1500	0.23		**Sheet Flow, SF-1** Grass: Dense n= 0.240 P2= 3.39"
2.5	292	0.0800	1.98		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
18.8	1,118	0.0200	0.99		**Shallow Concentrated Flow, SCF-2** Short Grass Pasture Kv= 7.0 fps
24.9	1,460	Total			

Subcatchment 36S: POST AREA-11



Summary for Subcatchment 37S: POST AREA-12

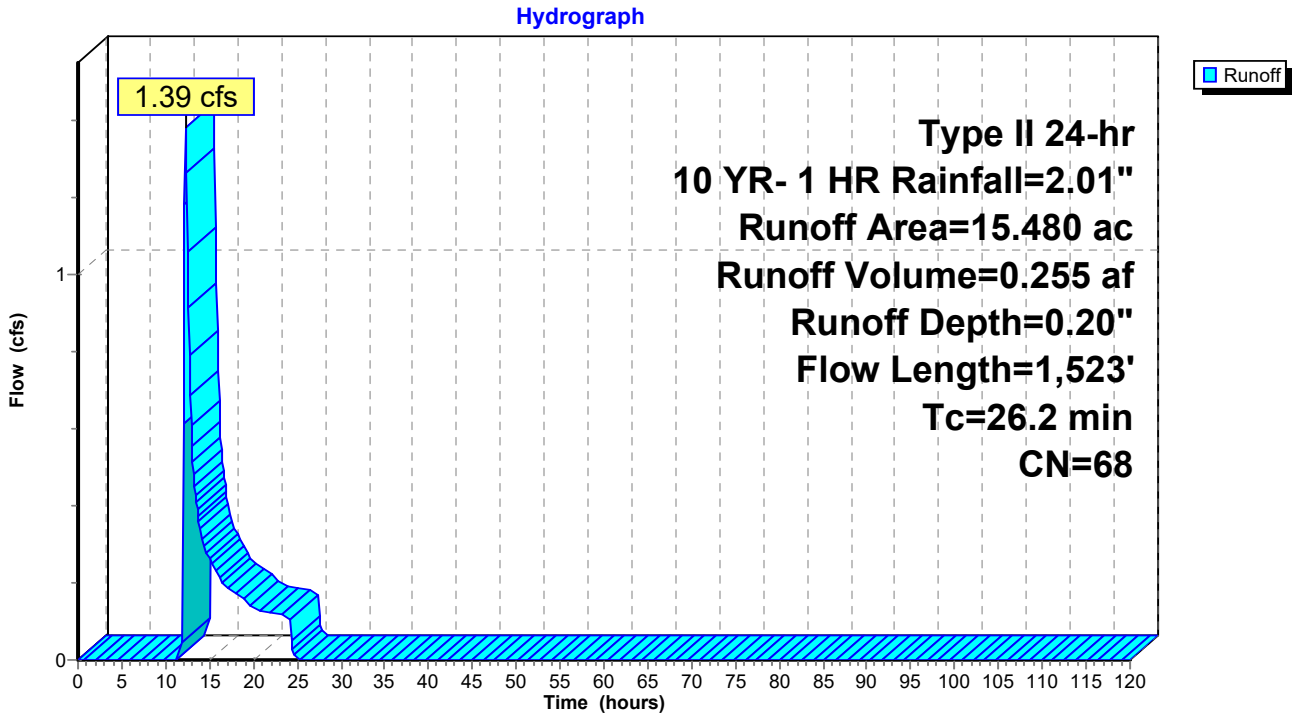
Runoff = 1.39 cfs @ 12.31 hrs, Volume= 0.255 af, Depth= 0.20"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 24-hr 10 YR- 1 HR Rainfall=2.01"

Area (ac)	CN	Description
1.470	69	50-75% Grass cover, Fair, HSG B
2.050	84	50-75% Grass cover, Fair, HSG D
7.570	58	Meadow, non-grazed, HSG B
3.700	78	Meadow, non-grazed, HSG D
0.690	85	Gravel roads, HSG B
15.480	68	Weighted Average
15.480		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	50	0.0400	0.14		**Sheet Flow, SF-1** Grass: Dense n= 0.240 P2= 3.39"
20.2	1,473	0.0300	1.21		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
26.2	1,523	Total			

Subcatchment 37S: POST AREA-12



Summary for Subcatchment 38S: POST AREA-13

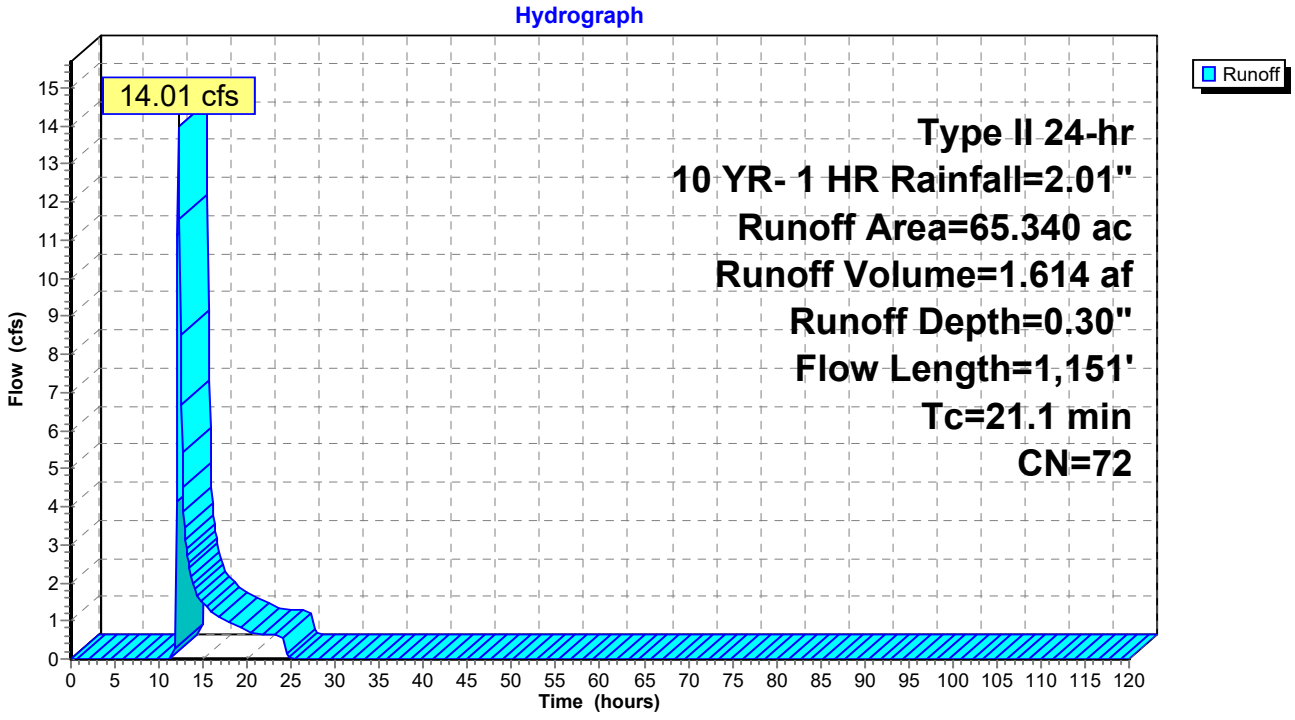
Runoff = 14.01 cfs @ 12.20 hrs, Volume= 1.614 af, Depth= 0.30"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 24-hr 10 YR- 1 HR Rainfall=2.01"

Area (ac)	CN	Description
17.980	69	50-75% Grass cover, Fair, HSG B
12.390	84	50-75% Grass cover, Fair, HSG D
3.610	55	Woods, Good, HSG B
4.340	77	Woods, Good, HSG D
9.800	58	Meadow, non-grazed, HSG B
16.960	78	Meadow, non-grazed, HSG D
0.260	91	Gravel roads, HSG D
65.340	72	Weighted Average
65.340		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	50	0.0400	0.14		**Sheet Flow, SF-1** Grass: Dense n= 0.240 P2= 3.39"
15.1	1,101	0.0300	1.21		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
21.1	1,151	Total			

Subcatchment 38S: POST AREA-13



Summary for Subcatchment 39S: POST AREA-14

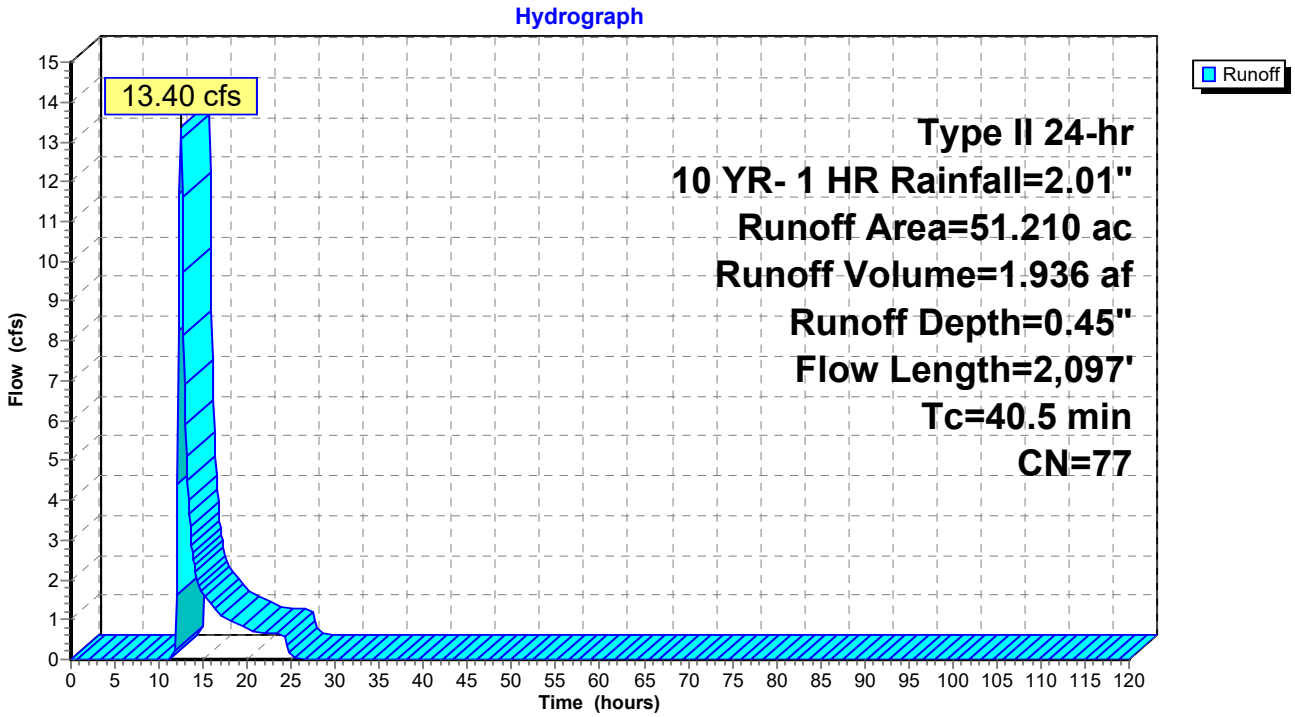
Runoff = 13.40 cfs @ 12.44 hrs, Volume= 1.936 af, Depth= 0.45"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 24-hr 10 YR- 1 HR Rainfall=2.01"

Area (ac)	CN	Description
5.440	69	50-75% Grass cover, Fair, HSG B
14.300	84	50-75% Grass cover, Fair, HSG D
0.070	77	Woods, Good, HSG D
5.260	58	Meadow, non-grazed, HSG B
25.740	78	Meadow, non-grazed, HSG D
0.400	91	Gravel roads, HSG D
51.210	77	Weighted Average
51.210		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	50	0.0400	0.14		**Sheet Flow, SF-1** Grass: Dense n= 0.240 P2= 3.39"
34.5	2,047	0.0200	0.99		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
40.5	2,097	Total			

Subcatchment 39S: POST AREA-14



Summary for Subcatchment 40S: POST AREA-15

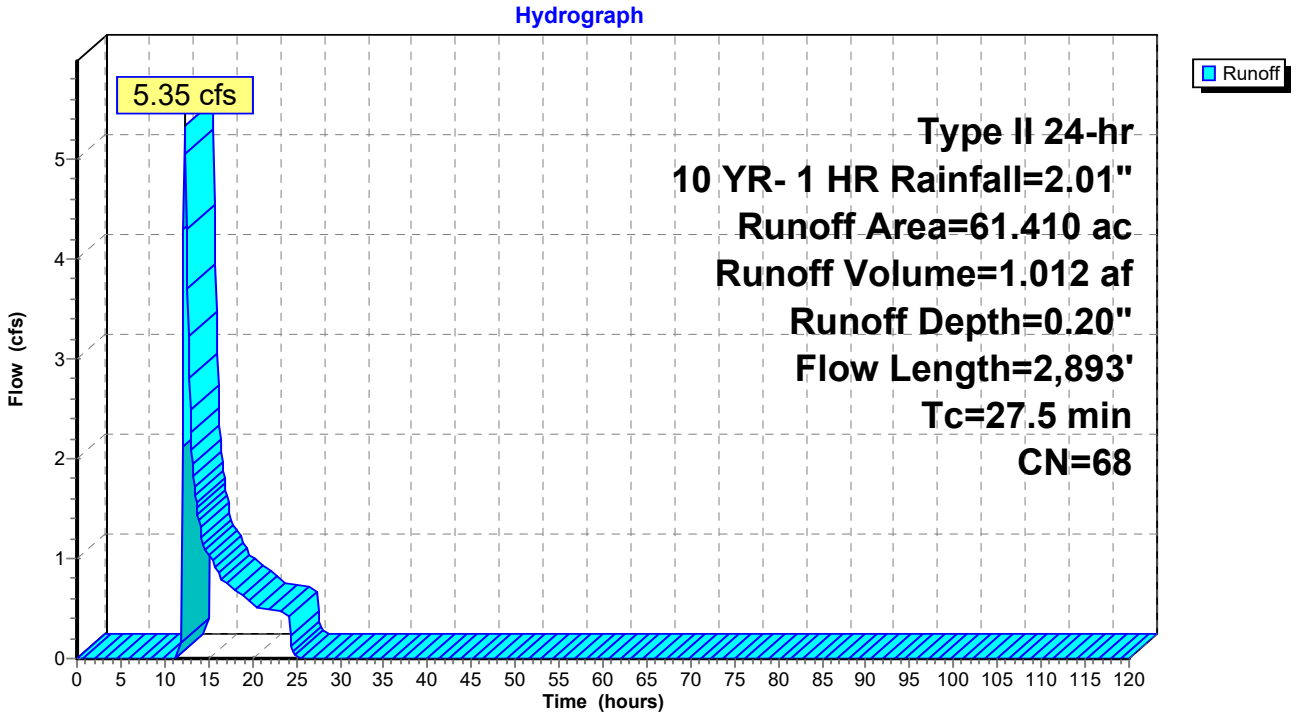
Runoff = 5.35 cfs @ 12.33 hrs, Volume= 1.012 af, Depth= 0.20"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 24-hr 10 YR- 1 HR Rainfall=2.01"

Area (ac)	CN	Description
7.280	84	50-75% Grass cover, Fair, HSG D
8.110	84	1 acre lots, 20% imp, HSG D
0.680	91	Gravel roads, HSG D
0.600	98	Water Surface, 0% imp, HSG D
36.590	58	Meadow, non-grazed, HSG B
8.150	78	Meadow, non-grazed, HSG D
61.410	68	Weighted Average
59.788		97.36% Pervious Area
1.622		2.64% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.8	50	0.0300	0.12		**Sheet Flow, SF-1** Grass: Dense n= 0.240 P2= 3.39"
16.5	1,201	0.0300	1.21		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
4.2	1,642	0.0400	6.58	42.79	**Channel Flow, CF-1** Area= 6.5 sf Perim= 12.0' r= 0.54' n= 0.030 Earth, grassed & winding
27.5	2,893	Total			

Subcatchment 40S: POST AREA-15



Summary for Subcatchment 41S: POST AREA-16

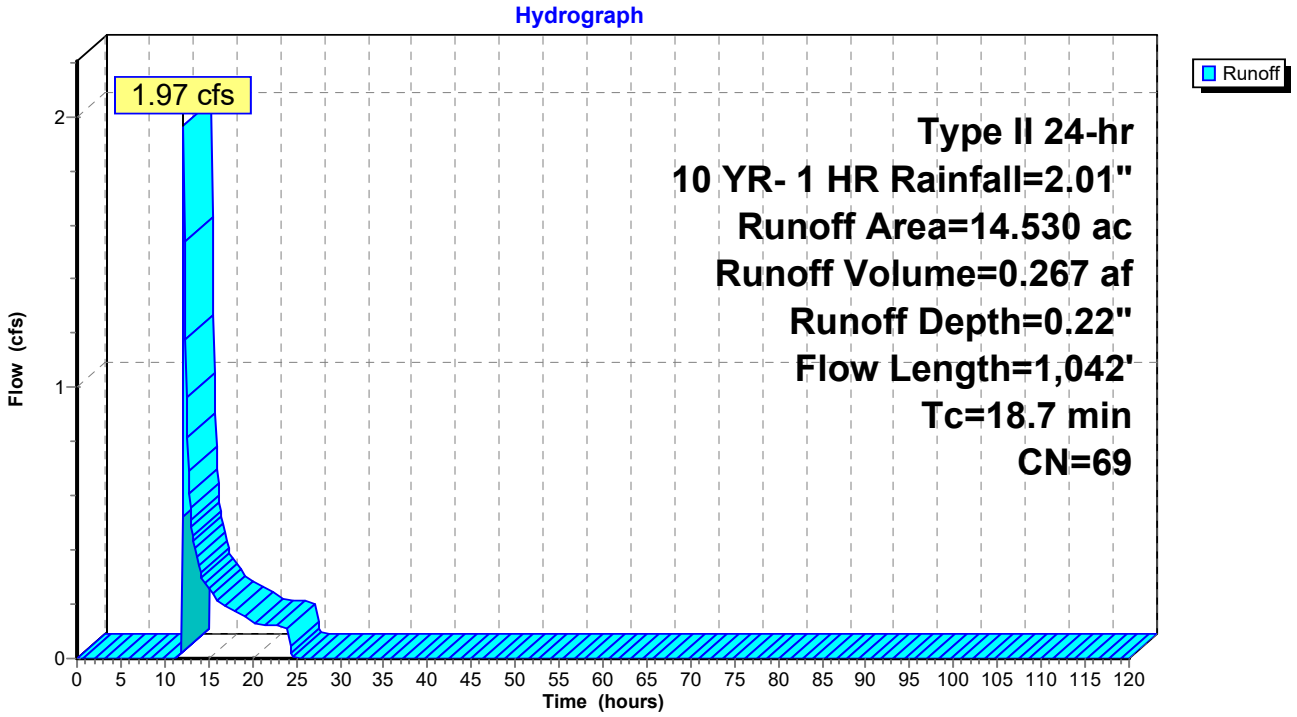
Runoff = 1.97 cfs @ 12.19 hrs, Volume= 0.267 af, Depth= 0.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 24-hr 10 YR- 1 HR Rainfall=2.01"

Area (ac)	CN	Description
2.540	69	50-75% Grass cover, Fair, HSG B
2.800	79	50-75% Grass cover, Fair, HSG C
0.640	84	1 acre lots, 20% imp, HSG D
0.560	91	Gravel roads, HSG D
4.590	58	Meadow, non-grazed, HSG B
3.400	71	Meadow, non-grazed, HSG C
14.530	69	Weighted Average
14.402		99.12% Pervious Area
0.128		0.88% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.2	50	0.1000	0.20		**Sheet Flow, SF-1** Grass: Dense n= 0.240 P2= 3.39"
2.3	268	0.0800	1.98		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
12.2	724	0.0200	0.99		**Shallow Concentrated Flow, SCF-2** Short Grass Pasture Kv= 7.0 fps
18.7	1,042	Total			

Subcatchment 41S: POST AREA-16



Summary for Subcatchment 42S: POST AREA-17

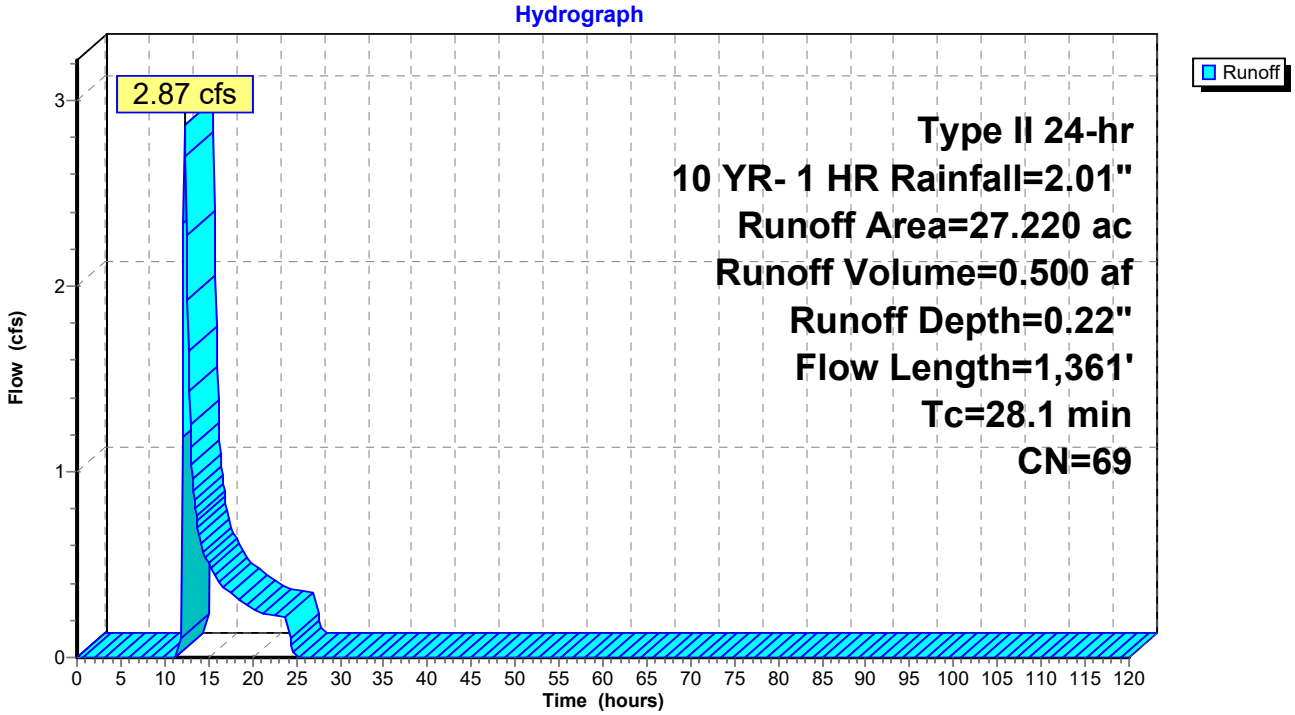
Runoff = 2.87 cfs @ 12.33 hrs, Volume= 0.500 af, Depth= 0.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 24-hr 10 YR- 1 HR Rainfall=2.01"

Area (ac)	CN	Description
3.080	69	50-75% Grass cover, Fair, HSG B
2.260	79	50-75% Grass cover, Fair, HSG C
1.030	84	1 acre lots, 20% imp, HSG D
11.040	58	Meadow, non-grazed, HSG B
9.810	78	Meadow, non-grazed, HSG D
27.220	69	Weighted Average
27.014		99.24% Pervious Area
0.206		0.76% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	50	0.0400	0.14		**Sheet Flow, SF-1** Grass: Dense n= 0.240 P2= 3.39"
22.1	1,311	0.0200	0.99		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
28.1	1,361	Total			

Subcatchment 42S: POST AREA-17



Summary for Subcatchment 43S: POST AREA-18

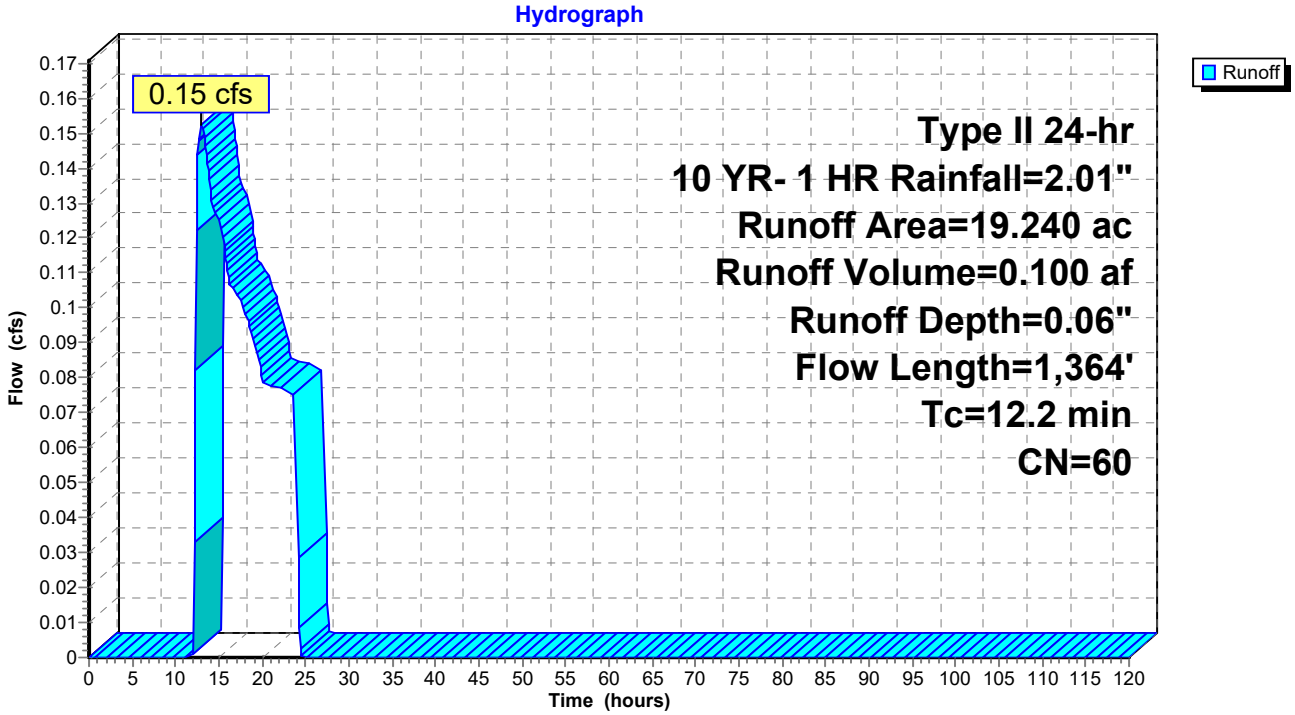
Runoff = 0.15 cfs @ 12.98 hrs, Volume= 0.100 af, Depth= 0.06"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 24-hr 10 YR- 1 HR Rainfall=2.01"

Area (ac)	CN	Description
0.710	55	Woods, Good, HSG B
0.320	70	Woods, Good, HSG C
1.690	69	50-75% Grass cover, Fair, HSG B
0.160	79	50-75% Grass cover, Fair, HSG C
15.370	58	Meadow, non-grazed, HSG B
0.990	78	Meadow, non-grazed, HSG D
19.240	60	Weighted Average
19.240		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.6	50	0.0800	0.18		**Sheet Flow, SF-1** Grass: Dense n= 0.240 P2= 3.39"
1.6	187	0.0800	1.98		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
6.0	1,127	0.0080	3.15	47.28	**Channel Flow,** Area= 15.0 sf Perim= 25.0' r= 0.60' n= 0.030
12.2	1,364	Total			

Subcatchment 43S: POST AREA-18



Summary for Subcatchment 44S: POST AREA-19

[49] Hint: Tc<2dt may require smaller dt

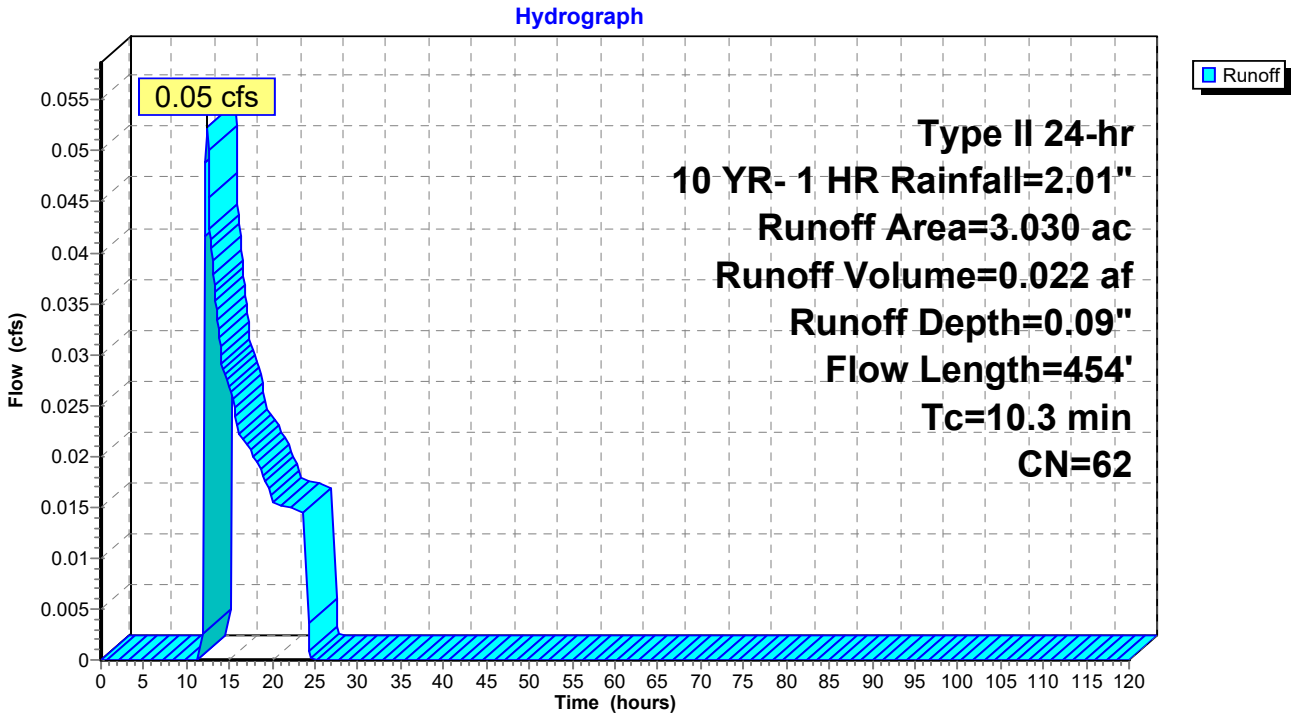
Runoff = 0.05 cfs @ 12.38 hrs, Volume= 0.022 af, Depth= 0.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 24-hr 10 YR- 1 HR Rainfall=2.01"

Area (ac)	CN	Description
1.260	55	Woods, Good, HSG B
1.360	69	50-75% Grass cover, Fair, HSG B
0.410	58	Meadow, non-grazed, HSG B
3.030	62	Weighted Average
3.030		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	50	0.0400	0.14		**Sheet Flow, SF-1** Grass: Dense n= 0.240 P2= 3.39"
4.3	404	0.0500	1.57		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
10.3	454	Total			

Subcatchment 44S: POST AREA-19



Summary for Subcatchment 45S: POST AREA-20

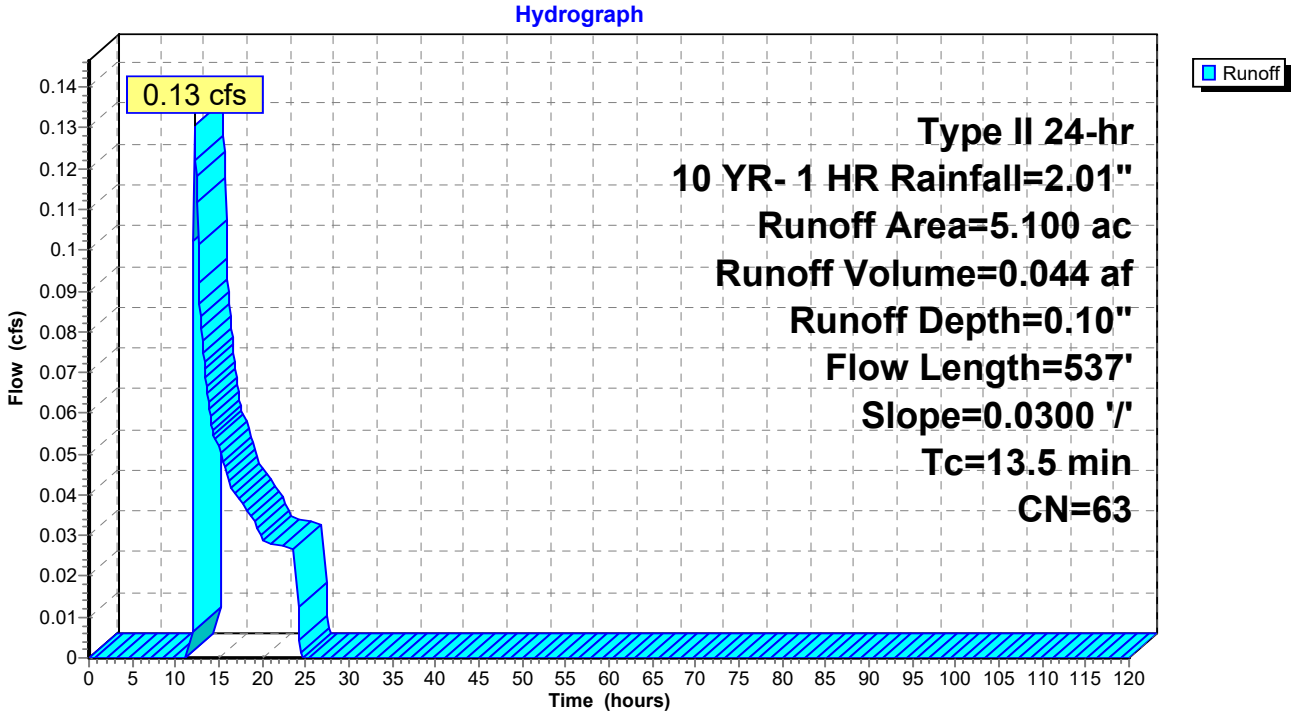
Runoff = 0.13 cfs @ 12.23 hrs, Volume= 0.044 af, Depth= 0.10"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 24-hr 10 YR- 1 HR Rainfall=2.01"

Area (ac)	CN	Description
0.640	55	Woods, Good, HSG B
2.530	69	50-75% Grass cover, Fair, HSG B
1.930	58	Meadow, non-grazed, HSG B
5.100	63	Weighted Average
5.100		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.8	50	0.0300	0.12		**Sheet Flow, SF-1** Grass: Dense n= 0.240 P2= 3.39"
6.7	487	0.0300	1.21		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
13.5	537	Total			

Subcatchment 45S: POST AREA-20



Summary for Subcatchment 46S: POST AREA-21

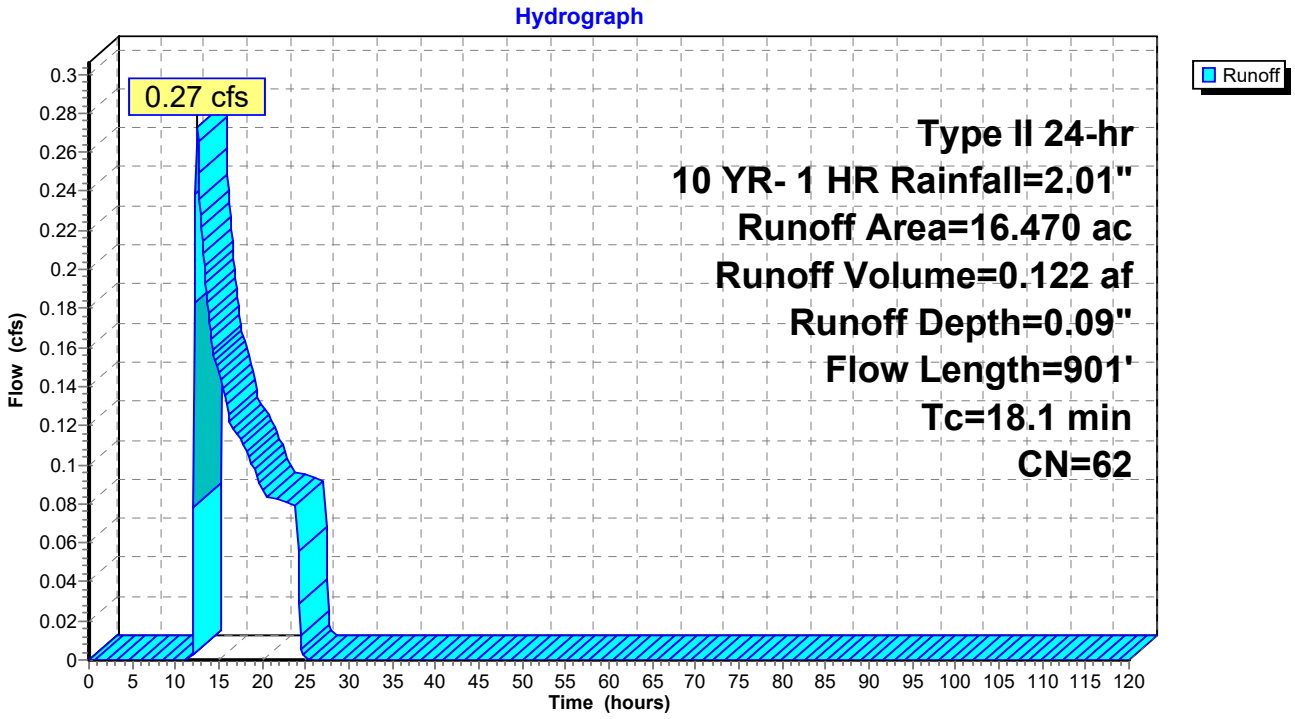
Runoff = 0.27 cfs @ 12.51 hrs, Volume= 0.122 af, Depth= 0.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 24-hr 10 YR- 1 HR Rainfall=2.01"

Area (ac)	CN	Description
0.870	55	Woods, Good, HSG B
0.390	70	Woods, Good, HSG C
4.430	69	50-75% Grass cover, Fair, HSG B
10.330	58	Meadow, non-grazed, HSG B
0.450	85	Gravel roads, HSG B
16.470	62	Weighted Average
16.470		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.0	50	0.0200	0.10		**Sheet Flow, SF-1** Grass: Dense n= 0.240 P2= 3.39"
10.1	851	0.0400	1.40		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
18.1	901	Total			

Subcatchment 46S: POST AREA-21



Summary for Subcatchment 47S: POST AREA-22

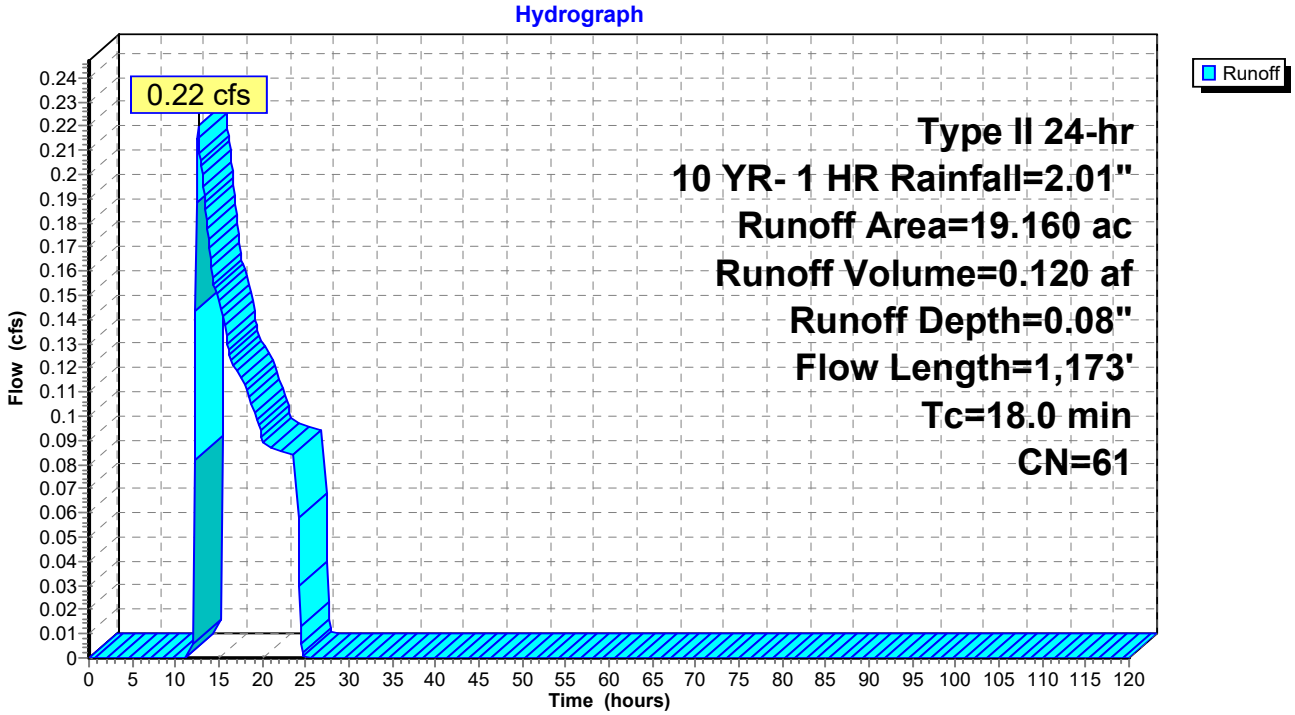
Runoff = 0.22 cfs @ 12.60 hrs, Volume= 0.120 af, Depth= 0.08"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 24-hr 10 YR- 1 HR Rainfall=2.01"

Area (ac)	CN	Description
0.530	55	Woods, Good, HSG B
2.570	69	50-75% Grass cover, Fair, HSG B
13.650	58	Meadow, non-grazed, HSG B
2.100	71	Meadow, non-grazed, HSG C
0.310	85	Gravel roads, HSG B
19.160	61	Weighted Average
19.160		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	50	0.0400	0.14		**Sheet Flow, SF-1** Grass: Dense n= 0.240 P2= 3.39"
12.0	1,123	0.0500	1.57		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
18.0	1,173	Total			

Subcatchment 47S: POST AREA-22



Summary for Subcatchment 48S: POST AREA-23

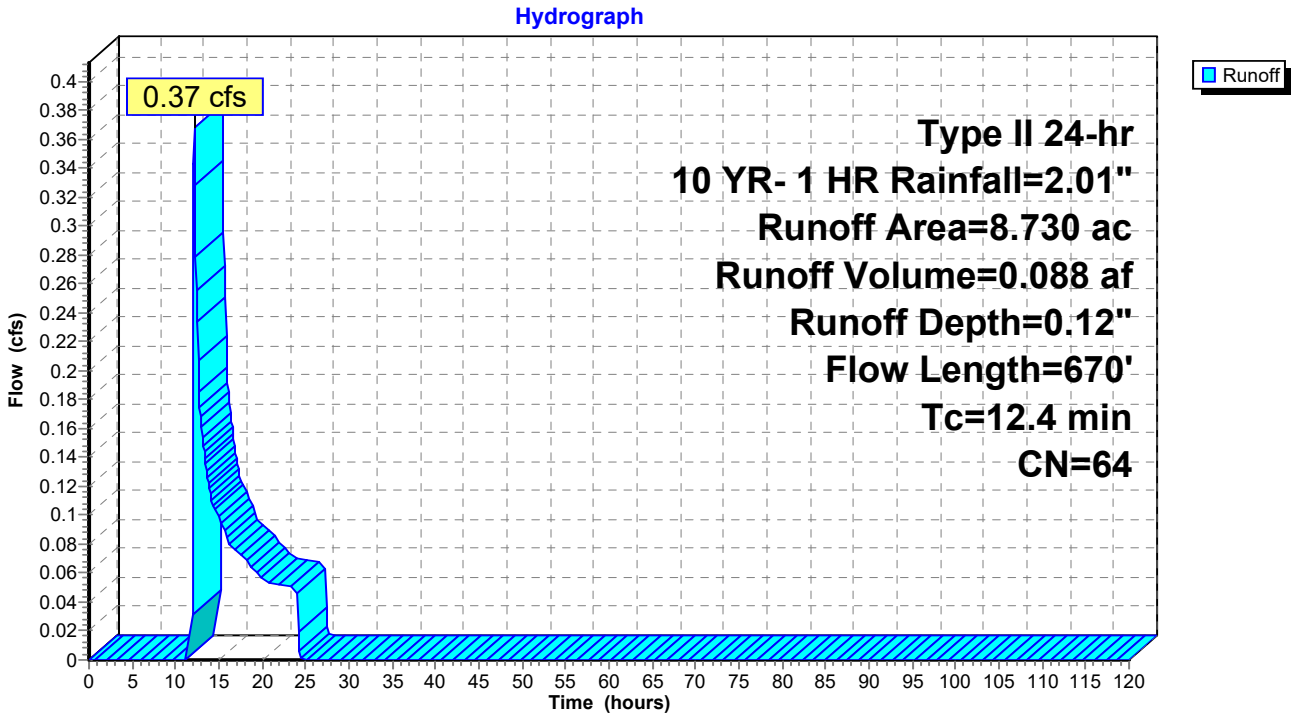
Runoff = 0.37 cfs @ 12.14 hrs, Volume= 0.088 af, Depth= 0.12"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 24-hr 10 YR- 1 HR Rainfall=2.01"

Area (ac)	CN	Description
3.620	55	Woods, Good, HSG B
1.010	70	Woods, Good, HSG C
4.100	71	Meadow, non-grazed, HSG C
8.730	64	Weighted Average
8.730		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	50	0.0400	0.14		**Sheet Flow, SF-1** Grass: Dense n= 0.240 P2= 3.39"
2.0	210	0.0600	1.71		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
4.4	410	0.0500	1.57		**Shallow Concentrated Flow, SCF-2** Short Grass Pasture Kv= 7.0 fps
12.4	670	Total			

Subcatchment 48S: POST AREA-23



Summary for Subcatchment 49S: POST AREA-24

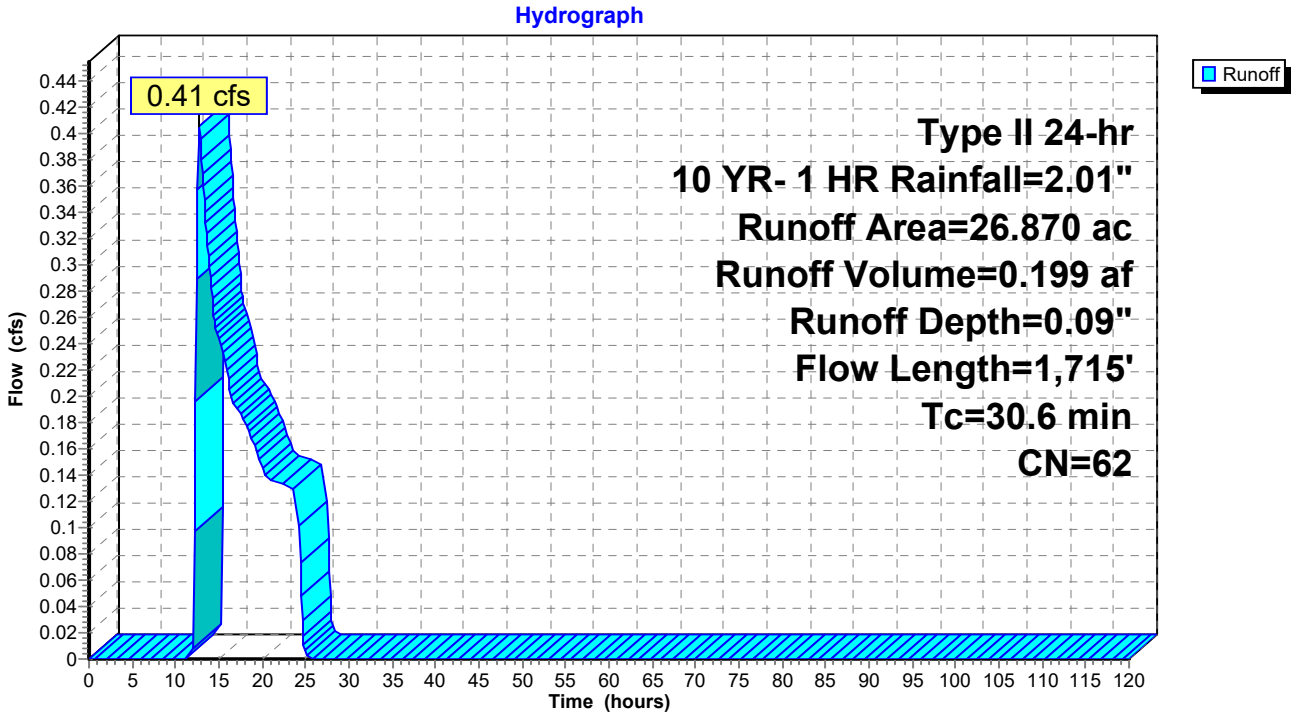
Runoff = 0.41 cfs @ 12.73 hrs, Volume= 0.199 af, Depth= 0.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 24-hr 10 YR- 1 HR Rainfall=2.01"

Area (ac)	CN	Description
2.610	55	Woods, Good, HSG B
4.460	69	50-75% Grass cover, Fair, HSG B
0.570	79	50-75% Grass cover, Fair, HSG C
16.660	58	Meadow, non-grazed, HSG B
2.570	78	Meadow, non-grazed, HSG D
26.870	62	Weighted Average
26.870		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.5	50	0.0100	0.08		**Sheet Flow, SF-1** Grass: Dense n= 0.240 P2= 3.39"
5.3	586	0.0700	1.85		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
14.8	1,079	0.0300	1.21		**Shallow Concentrated Flow, SCF-2** Short Grass Pasture Kv= 7.0 fps
30.6	1,715	Total			

Subcatchment 49S: POST AREA-24



Summary for Subcatchment 50S: POST AREA-25

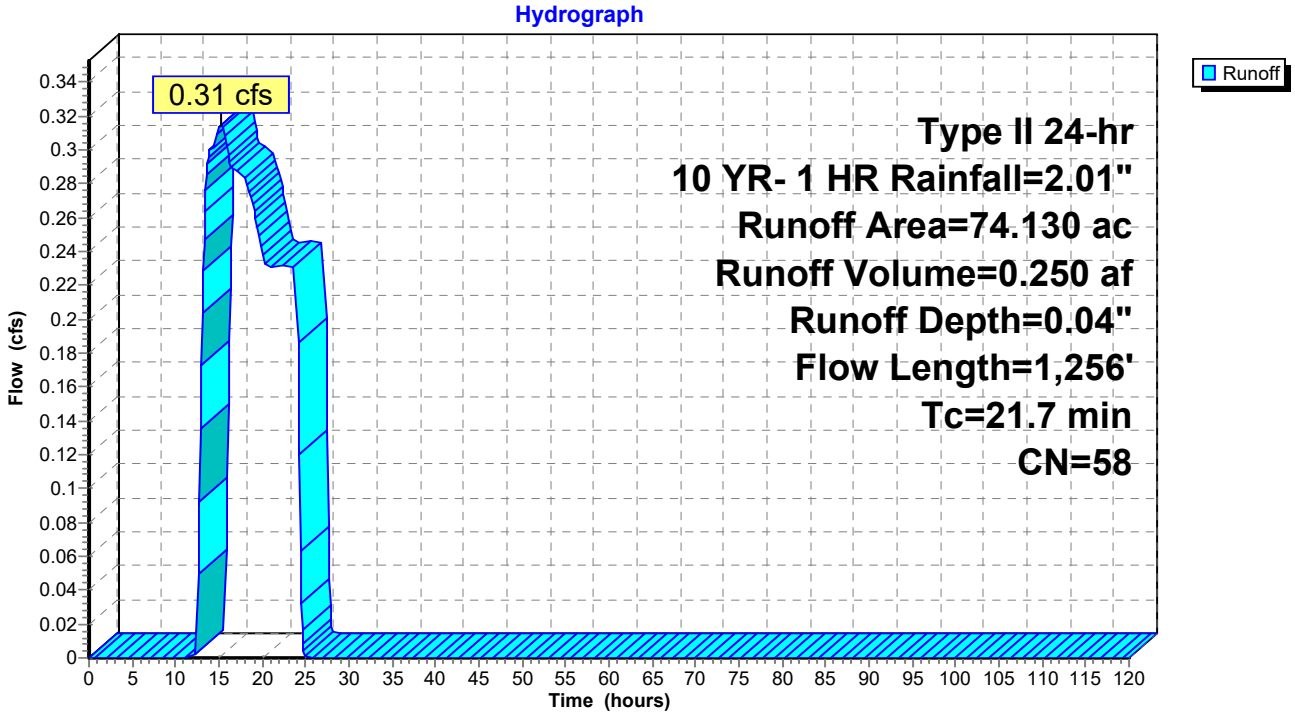
Runoff = 0.31 cfs @ 15.21 hrs, Volume= 0.250 af, Depth= 0.04"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 24-hr 10 YR- 1 HR Rainfall=2.01"

Area (ac)	CN	Description
1.200	69	50-75% Grass cover, Fair, HSG B
72.620	58	Meadow, non-grazed, HSG B
0.310	85	Gravel roads, HSG B
74.130	58	Weighted Average
74.130		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.1	50	0.0600	0.16		**Sheet Flow, SF-1** Grass: Dense n= 0.240 P2= 3.39"
16.6	1,206	0.0300	1.21		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
21.7	1,256	Total			

Subcatchment 50S: POST AREA-25



Summary for Subcatchment 55S: POST AREA-26(Gen-Tie Route)

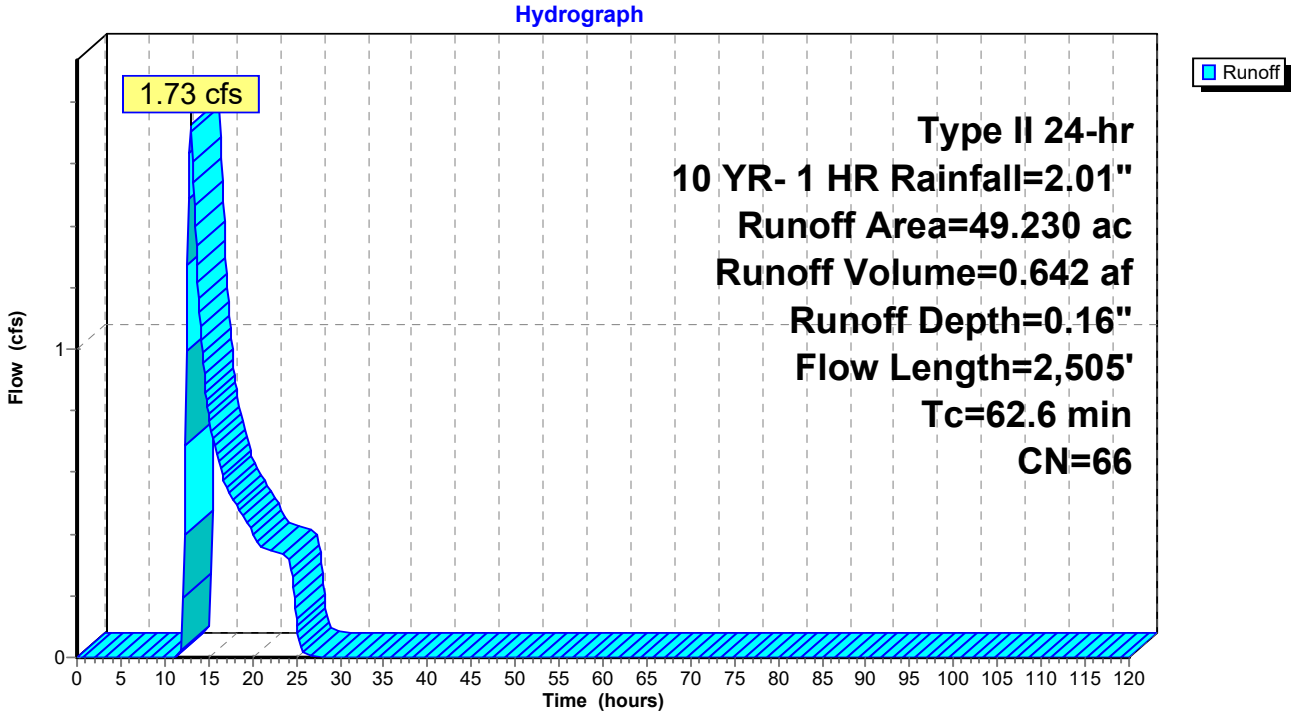
Runoff = 1.73 cfs @ 12.97 hrs, Volume= 0.642 af, Depth= 0.16"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 24-hr 10 YR- 1 HR Rainfall=2.01"

Area (ac)	CN	Description
33.070	69	50-75% Grass cover, Fair, HSG B
7.900	55	Woods, Good, HSG B
2.750	85	Gravel roads, HSG B
5.510	58	Meadow, non-grazed, HSG B
49.230	66	Weighted Average
49.230		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.1	50	0.0400	0.20		**Sheet Flow, SF-1** Grass: Short n= 0.150 P2= 3.39"
58.5	2,455	0.0100	0.70		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
62.6	2,505	Total			

Subcatchment 55S: POST AREA-26(Gen-Tie Route)



Summary for Pond 53P: Exisitng Wetland

Inflow Area = 7.840 ac, 0.00% Impervious, Inflow Depth = 0.09" for 10 YR- 1 HR event
Inflow = 0.13 cfs @ 12.50 hrs, Volume= 0.058 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Peak Elev= 716.07' @ 25.10 hrs Surf.Area= 2,516 sf Storage= 2,531 cf

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

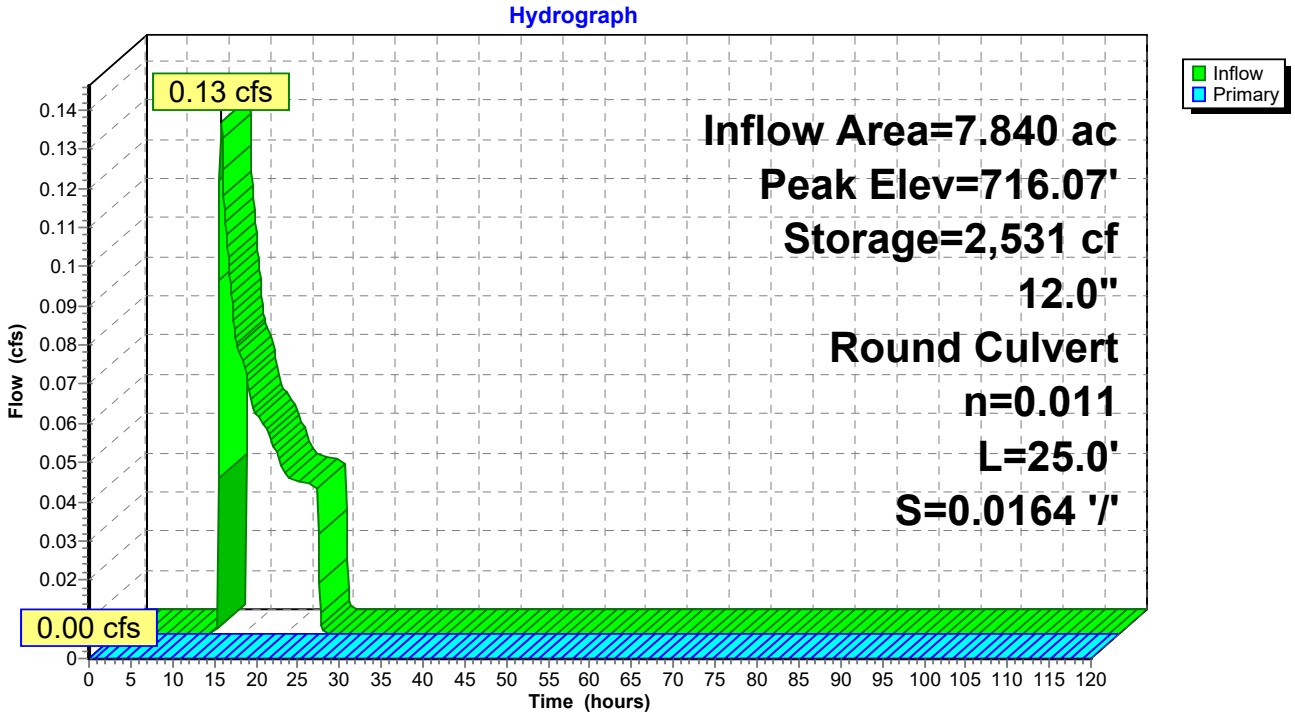
Volume	Invert	Avail.Storage	Storage Description
#1	715.00'	128,076 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
715.00	2,360	0	0
716.00	2,360	2,360	2,360
718.00	6,807	9,167	11,527
720.00	13,548	20,355	31,882
722.00	23,063	36,611	68,493
724.00	36,520	59,583	128,076

Device	Routing	Invert	Outlet Devices
#1	Primary	716.97'	**12.0" Round Culvert** L= 25.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 716.97' / 716.56' S= 0.0164 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.79 sf

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=715.00' (Free Discharge)
1=Culvert (Controls 0.00 cfs)

Pond 53P: Exisitng Wetland



Time span=0.00-120.00 hrs, dt=0.10 hrs, 1201 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 26S: POST AREA-1 Runoff Area=26.670 ac 0.00% Impervious Runoff Depth=0.78"
Flow Length=1,700' Tc=34.7 min CN=73 Runoff=14.33 cfs 1.730 af

Subcatchment 27S: POST AREA-2 Runoff Area=5.380 ac 0.00% Impervious Runoff Depth=0.38"
Flow Length=924' Slope=0.0200 '/' Tc=22.7 min CN=63 Runoff=1.31 cfs 0.170 af

Subcatchment 28S: POST AREA-3 Runoff Area=67.480 ac 0.40% Impervious Runoff Depth=0.60"
Flow Length=2,190' Tc=43.2 min CN=69 Runoff=21.55 cfs 3.381 af

Subcatchment 29S: POST AREA-4 Runoff Area=24.880 ac 0.00% Impervious Runoff Depth=0.60"
Flow Length=1,062' Slope=0.0300 '/' Tc=20.7 min CN=69 Runoff=13.05 cfs 1.247 af

Subcatchment 30S: POST AREA-5 Runoff Area=87.520 ac 0.17% Impervious Runoff Depth=0.60"
Flow Length=2,797' Tc=30.7 min CN=69 Runoff=35.73 cfs 4.385 af

Subcatchment 31S: POST AREA-6 Runoff Area=346.820 ac 0.18% Impervious Runoff Depth=0.83"
Flow Length=3,249' Tc=42.1 min CN=74 Runoff=175.80 cfs 23.897 af

Subcatchment 32S: POST AREA-7 Runoff Area=13.020 ac 0.00% Impervious Runoff Depth=0.48"
Flow Length=1,475' Tc=36.2 min CN=66 Runoff=3.41 cfs 0.525 af

Subcatchment 33S: POST AREA-8 Runoff Area=7.840 ac 0.00% Impervious Runoff Depth=0.35"
Flow Length=1,010' Tc=17.6 min CN=62 Runoff=1.86 cfs 0.227 af

Subcatchment 34S: POST AREA-9 Runoff Area=37.590 ac 0.00% Impervious Runoff Depth=0.52"
Flow Length=1,873' Tc=14.2 min CN=67 Runoff=20.34 cfs 1.634 af

Subcatchment 35S: POST AREA-10 Runoff Area=60.170 ac 0.00% Impervious Runoff Depth=0.45"
Flow Length=2,383' Tc=32.0 min CN=65 Runoff=15.26 cfs 2.246 af

Subcatchment 36S: POST AREA-11 Runoff Area=31.380 ac 0.00% Impervious Runoff Depth=0.48"
Flow Length=1,460' Tc=24.9 min CN=66 Runoff=10.72 cfs 1.266 af

Subcatchment 37S: POST AREA-12 Runoff Area=15.480 ac 0.00% Impervious Runoff Depth=0.56"
Flow Length=1,523' Tc=26.2 min CN=68 Runoff=6.39 cfs 0.723 af

Subcatchment 38S: POST AREA-13 Runoff Area=65.340 ac 0.00% Impervious Runoff Depth=0.73"
Flow Length=1,151' Tc=21.1 min CN=72 Runoff=44.34 cfs 3.985 af

Subcatchment 39S: POST AREA-14 Runoff Area=51.210 ac 0.00% Impervious Runoff Depth=0.98"
Flow Length=2,097' Tc=40.5 min CN=77 Runoff=33.11 cfs 4.190 af

Subcatchment 40S: POST AREA-15 Runoff Area=61.410 ac 2.64% Impervious Runoff Depth=0.56"
Flow Length=2,893' Tc=27.5 min CN=68 Runoff=24.21 cfs 2.870 af

Subcatchment 41S: POST AREA-16 Runoff Area=14.530 ac 0.88% Impervious Runoff Depth=0.60"
Flow Length=1,042' Tc=18.7 min CN=69 Runoff=8.20 cfs 0.728 af

Subcatchment 42S: POST AREA-17 Runoff Area=27.220 ac 0.76% Impervious Runoff Depth=0.60"
Flow Length=1,361' Tc=28.1 min CN=69 Runoff=11.73 cfs 1.364 af

Subcatchment 43S: POST AREA-18 Runoff Area=19.240 ac 0.00% Impervious Runoff Depth=0.29"
Flow Length=1,364' Tc=12.2 min CN=60 Runoff=4.09 cfs 0.462 af

Subcatchment 44S: POST AREA-19 Runoff Area=3.030 ac 0.00% Impervious Runoff Depth=0.35"
Flow Length=454' Tc=10.3 min CN=62 Runoff=0.93 cfs 0.088 af

Subcatchment 45S: POST AREA-20 Runoff Area=5.100 ac 0.00% Impervious Runoff Depth=0.38"
Flow Length=537' Slope=0.0300 '/' Tc=13.5 min CN=63 Runoff=1.72 cfs 0.161 af

Subcatchment 46S: POST AREA-21 Runoff Area=16.470 ac 0.00% Impervious Runoff Depth=0.35"
Flow Length=901' Tc=18.1 min CN=62 Runoff=3.86 cfs 0.477 af

Subcatchment 47S: POST AREA-22 Runoff Area=19.160 ac 0.00% Impervious Runoff Depth=0.32"
Flow Length=1,173' Tc=18.0 min CN=61 Runoff=3.81 cfs 0.506 af

Subcatchment 48S: POST AREA-23 Runoff Area=8.730 ac 0.00% Impervious Runoff Depth=0.41"
Flow Length=670' Tc=12.4 min CN=64 Runoff=3.47 cfs 0.301 af

Subcatchment 49S: POST AREA-24 Runoff Area=26.870 ac 0.00% Impervious Runoff Depth=0.35"
Flow Length=1,715' Tc=30.6 min CN=62 Runoff=4.54 cfs 0.779 af

Subcatchment 50S: POST AREA-25 Runoff Area=74.130 ac 0.00% Impervious Runoff Depth=0.23"
Flow Length=1,256' Tc=21.7 min CN=58 Runoff=7.00 cfs 1.441 af

Subcatchment 55S: POST Runoff Area=49.230 ac 0.00% Impervious Runoff Depth=0.48"
Flow Length=2,505' Tc=62.6 min CN=66 Runoff=8.76 cfs 1.986 af

Pond 53P: Exisitng Wetland Peak Elev=717.13' Storage=6,438 cf Inflow=1.86 cfs 0.227 af
12.0" Round Culvert n=0.011 L=25.0' S=0.0164 '/' Outflow=0.14 cfs 0.096 af

Total Runoff Area = 1,165.900 ac Runoff Volume = 60.771 af Average Runoff Depth = 0.63"
99.74% Pervious = 1,162.884 ac 0.26% Impervious = 3.016 ac

Summary for Subcatchment 26S: POST AREA-1

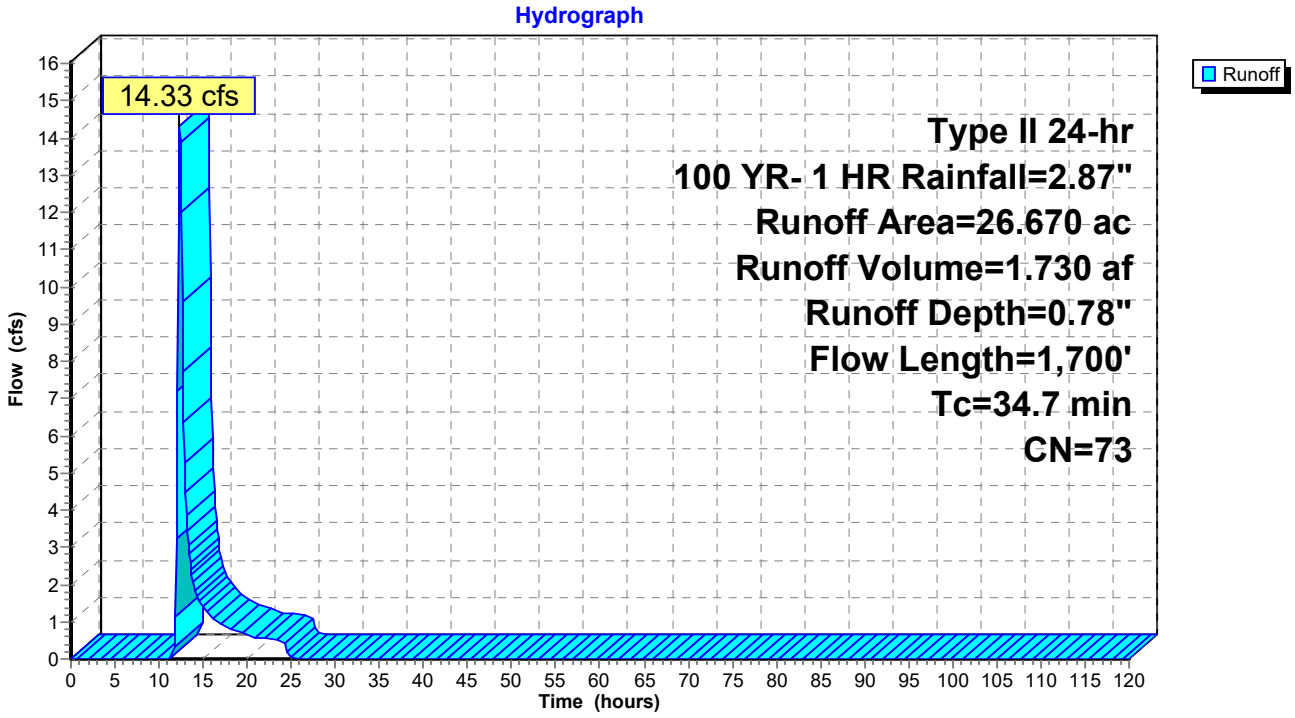
Runoff = 14.33 cfs @ 12.34 hrs, Volume= 1.730 af, Depth= 0.78"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 24-hr 100 YR- 1 HR Rainfall=2.87"

Area (ac)	CN	Description
7.780	69	50-75% Grass cover, Fair, HSG B
3.800	84	50-75% Grass cover, Fair, HSG D
0.300	85	Gravel roads, HSG B
5.050	58	Meadow, non-grazed, HSG B
9.740	78	Meadow, non-grazed, HSG D
26.670	73	Weighted Average
26.670		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.2	50	0.1000	0.20		**Sheet Flow, SF-1** Grass: Dense n= 0.240 P2= 3.39"
6.0	620	0.0600	1.71		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
24.5	1,030	0.0100	0.70		**Shallow Concentrated Flow, SCF-2** Short Grass Pasture Kv= 7.0 fps
34.7	1,700	Total			

Subcatchment 26S: POST AREA-1



Summary for Subcatchment 27S: POST AREA-2

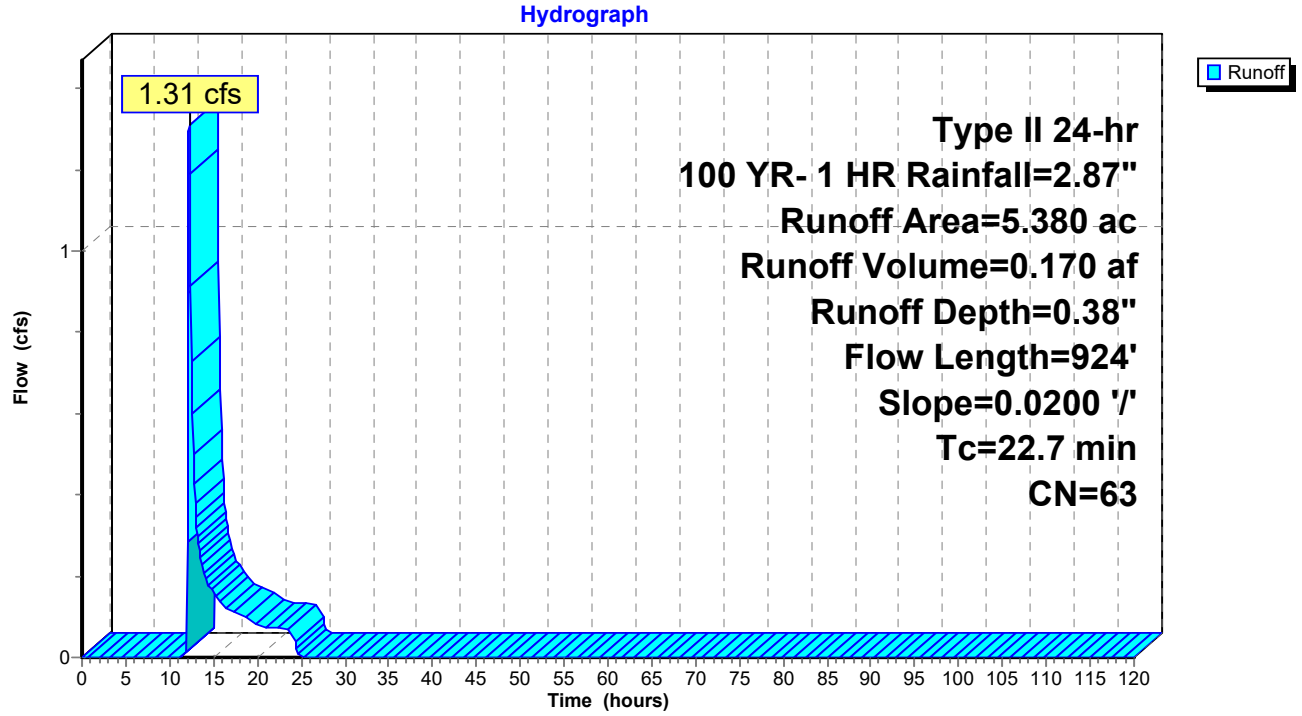
Runoff = 1.31 cfs @ 12.23 hrs, Volume= 0.170 af, Depth= 0.38"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 24-hr 100 YR- 1 HR Rainfall=2.87"

Area (ac)	CN	Description
2.660	69	50-75% Grass cover, Fair, HSG B
0.550	55	Woods, Good, HSG B
0.040	85	Gravel roads, HSG B
2.130	58	Meadow, non-grazed, HSG B
5.380	63	Weighted Average
5.380		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.0	50	0.0200	0.10		**Sheet Flow, SF-1** Grass: Dense n= 0.240 P2= 3.39"
14.7	874	0.0200	0.99		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
22.7	924	Total			

Subcatchment 27S: POST AREA-2



Summary for Subcatchment 28S: POST AREA-3

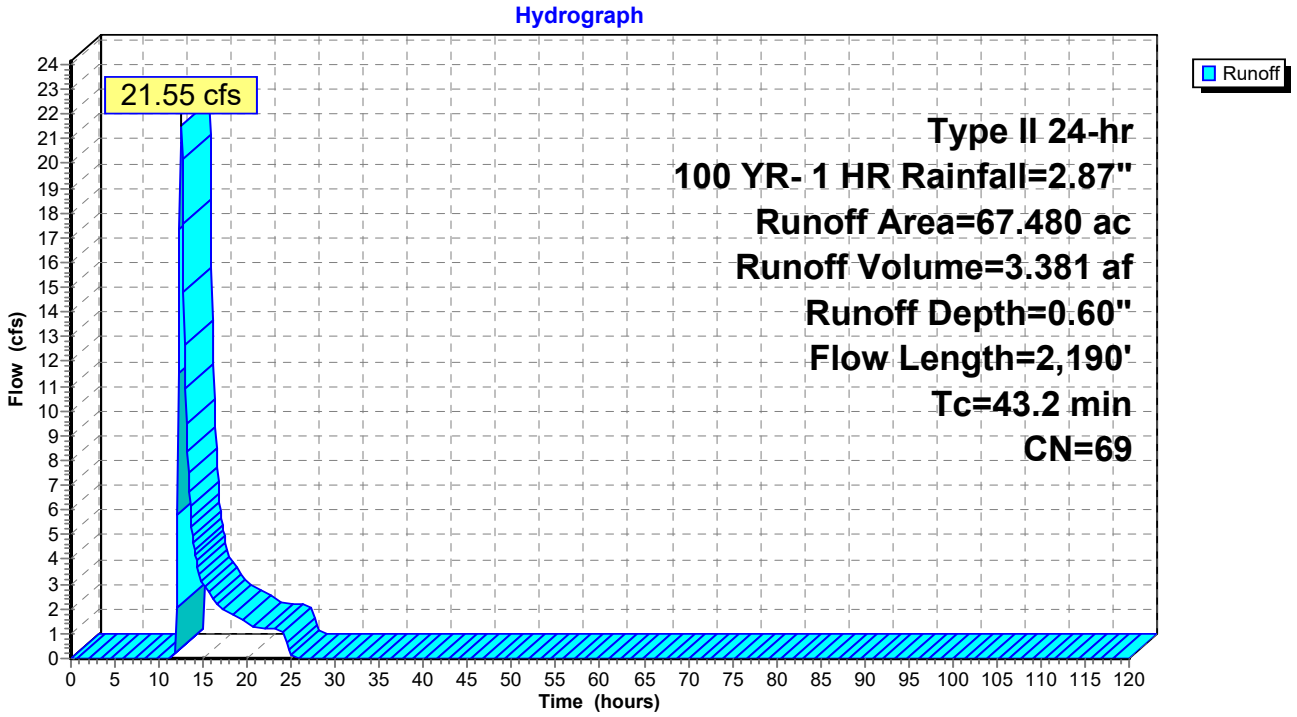
Runoff = 21.55 cfs @ 12.48 hrs, Volume= 3.381 af, Depth= 0.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 24-hr 100 YR- 1 HR Rainfall=2.87"

Area (ac)	CN	Description
15.050	69	50-75% Grass cover, Fair, HSG B
4.530	84	50-75% Grass cover, Fair, HSG D
1.170	85	Gravel roads, HSG B
0.930	68	1 acre lots, 20% imp, HSG B
0.420	84	1 acre lots, 20% imp, HSG D
24.300	58	Meadow, non-grazed, HSG B
21.080	78	Meadow, non-grazed, HSG D
67.480	69	Weighted Average
67.210		99.60% Pervious Area
0.270		0.40% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.6	50	0.0800	0.18		**Sheet Flow, SF-1** Grass: Dense n= 0.240 P2= 3.39"
8.5	874	0.0600	1.71		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
30.1	1,266	0.0100	0.70		**Shallow Concentrated Flow, SCF-2** Short Grass Pasture Kv= 7.0 fps
43.2	2,190	Total			

Subcatchment 28S: POST AREA-3



Summary for Subcatchment 29S: POST AREA-4

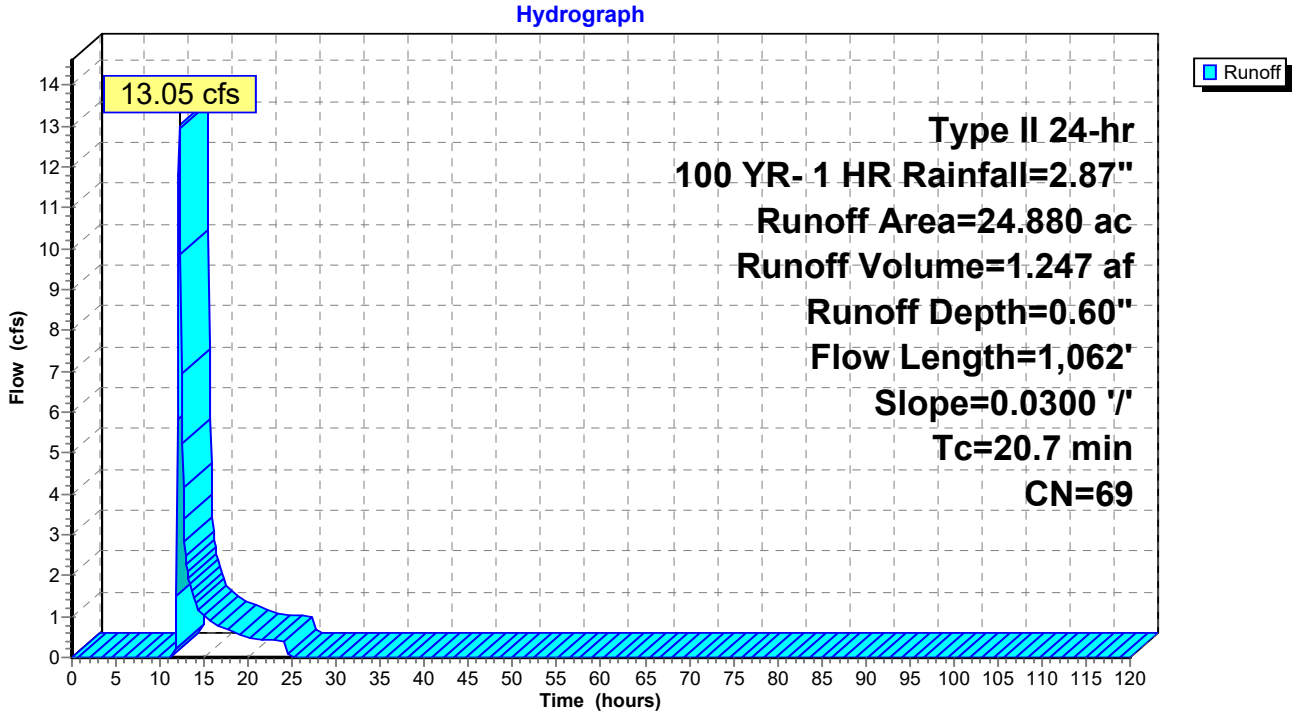
Runoff = 13.05 cfs @ 12.18 hrs, Volume= 1.247 af, Depth= 0.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 24-hr 100 YR- 1 HR Rainfall=2.87"

Area (ac)	CN	Description
9.120	69	50-75% Grass cover, Fair, HSG B
5.450	84	50-75% Grass cover, Fair, HSG D
9.310	58	Meadow, non-grazed, HSG B
1.000	78	Meadow, non-grazed, HSG D
24.880	69	Weighted Average
24.880		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.8	50	0.0300	0.12		**Sheet Flow, SF-1** Grass: Dense n= 0.240 P2= 3.39"
13.9	1,012	0.0300	1.21		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
20.7	1,062	Total			

Subcatchment 29S: POST AREA-4



Summary for Subcatchment 30S: POST AREA-5

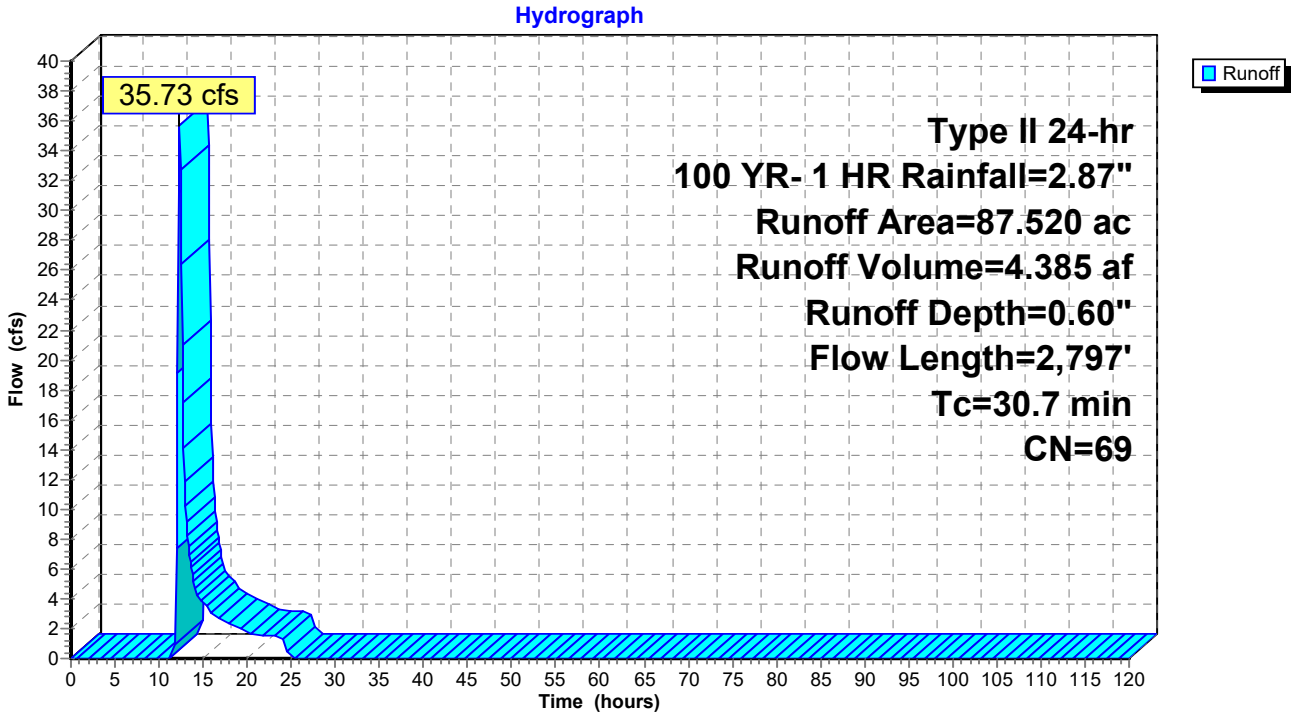
Runoff = 35.73 cfs @ 12.31 hrs, Volume= 4.385 af, Depth= 0.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 24-hr 100 YR- 1 HR Rainfall=2.87"

Area (ac)	CN	Description
44.510	58	Meadow, non-grazed, HSG B
37.550	78	Meadow, non-grazed, HSG D
2.950	98	Water Surface, 0% imp, HSG D
0.820	85	Gravel roads, HSG B
0.980	91	Gravel roads, HSG D
0.700	68	1 acre lots, 20% imp, HSG B
0.010	98	Unconnected pavement, HSG D
87.520	69	Weighted Average
87.370		99.83% Pervious Area
0.150		0.17% Impervious Area
0.010		6.67% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.1	50	0.0600	0.16		**Sheet Flow, SF-1** Grass: Dense n= 0.240 P2= 3.39"
13.3	968	0.0300	1.21		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
12.3	1,779	0.0060	2.42	8.46	**Channel Flow, CF-1** Area= 3.5 sf Perim= 7.0' r= 0.50' n= 0.030 Earth, grassed & winding
30.7	2,797	Total			

Subcatchment 30S: POST AREA-5



Summary for Subcatchment 31S: POST AREA-6

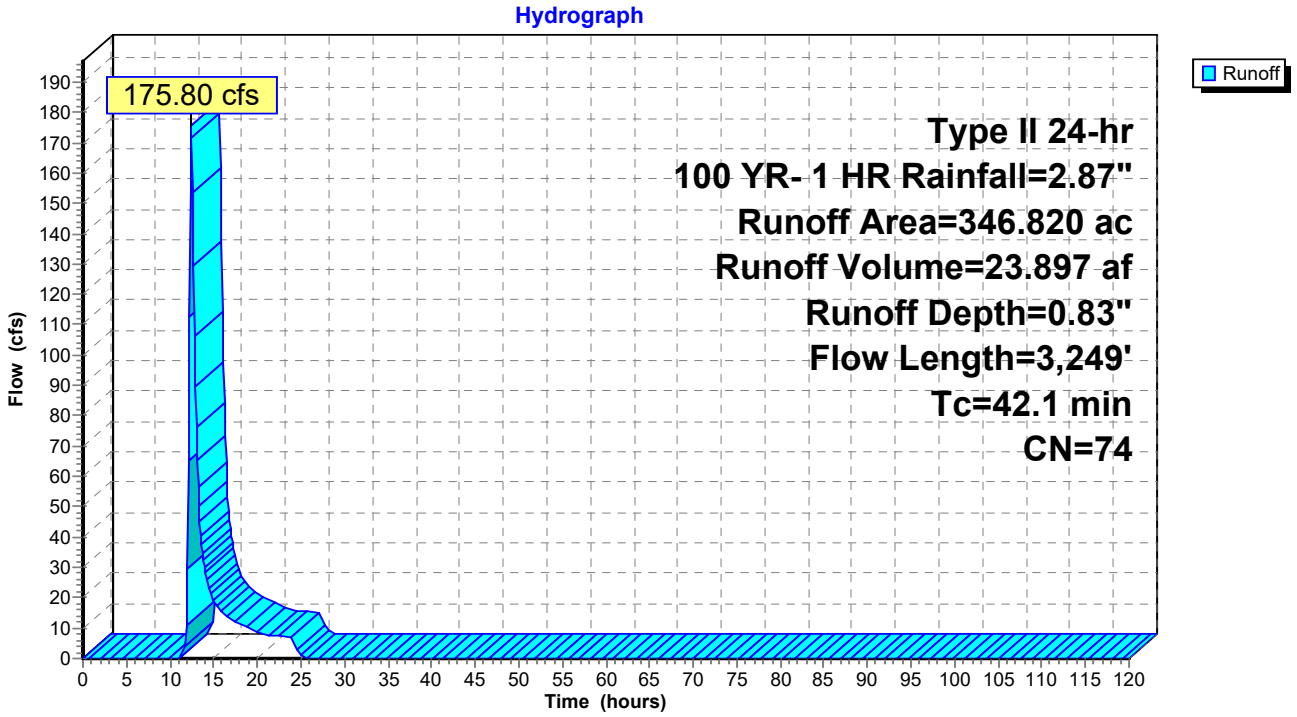
Runoff = 175.80 cfs @ 12.44 hrs, Volume= 23.897 af, Depth= 0.83"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 24-hr 100 YR- 1 HR Rainfall=2.87"

Area (ac)	CN	Description
64.810	69	50-75% Grass cover, Fair, HSG B
32.730	84	50-75% Grass cover, Fair, HSG D
56.200	58	Meadow, non-grazed, HSG B
168.280	78	Meadow, non-grazed, HSG D
6.950	98	Water Surface, 0% imp, HSG D
0.600	85	Gravel roads, HSG B
2.560	91	Gravel roads, HSG D
3.200	68	1 acre lots, 20% imp, HSG B
8.140	55	Woods, Good, HSG B
0.500	70	Woods, Good, HSG C
2.850	77	Woods, Good, HSG D
346.820	74	Weighted Average
346.180		99.82% Pervious Area
0.640		0.18% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.5	50	0.0100	0.08		**Sheet Flow, SF-1** Grass: Dense n= 0.240 P2= 3.39"
25.2	1,499	0.0200	0.99		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
6.4	1,700	0.0200	4.41	15.45	**Channel Flow, CF-1** Area= 3.5 sf Perim= 7.0' r= 0.50' n= 0.030 Earth, grassed & winding
42.1	3,249	Total			

Subcatchment 31S: POST AREA-6



Summary for Subcatchment 32S: POST AREA-7

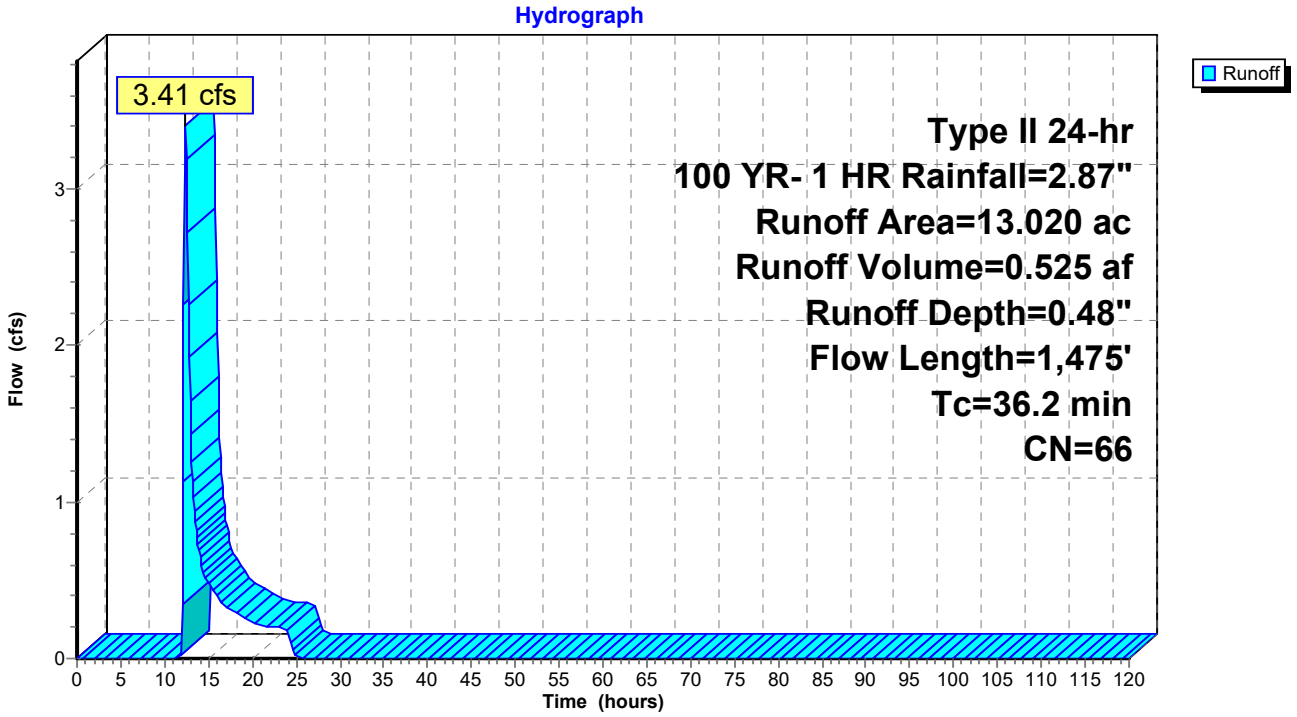
Runoff = 3.41 cfs @ 12.41 hrs, Volume= 0.525 af, Depth= 0.48"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 24-hr 100 YR- 1 HR Rainfall=2.87"

Area (ac)	CN	Description
0.730	69	50-75% Grass cover, Fair, HSG B
0.840	84	50-75% Grass cover, Fair, HSG D
0.550	85	Gravel roads, HSG B
0.270	91	Gravel roads, HSG D
1.140	55	Woods, Good, HSG B
0.730	77	Woods, Good, HSG D
6.810	58	Meadow, non-grazed, HSG B
1.950	78	Meadow, non-grazed, HSG D
13.020	66	Weighted Average
13.020		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.5	50	0.0100	0.08		**Sheet Flow, SF-1** Grass: Dense n= 0.240 P2= 3.39"
2.0	86	0.0100	0.70		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
0.2	18	0.0100	1.61		**Shallow Concentrated Flow, SCF-2** Unpaved Kv= 16.1 fps
8.6	625	0.0300	1.21		**Shallow Concentrated Flow, SCF-3** Short Grass Pasture Kv= 7.0 fps
0.2	18	0.0100	1.61		**Shallow Concentrated Flow, SCF-4** Unpaved Kv= 16.1 fps
3.4	200	0.0200	0.99		**Shallow Concentrated Flow, SCF-5** Short Grass Pasture Kv= 7.0 fps
11.3	478	0.0200	0.71		**Shallow Concentrated Flow, SCF-5** Woodland Kv= 5.0 fps
36.2	1,475	Total			

Subcatchment 32S: POST AREA-7



Summary for Subcatchment 33S: POST AREA-8

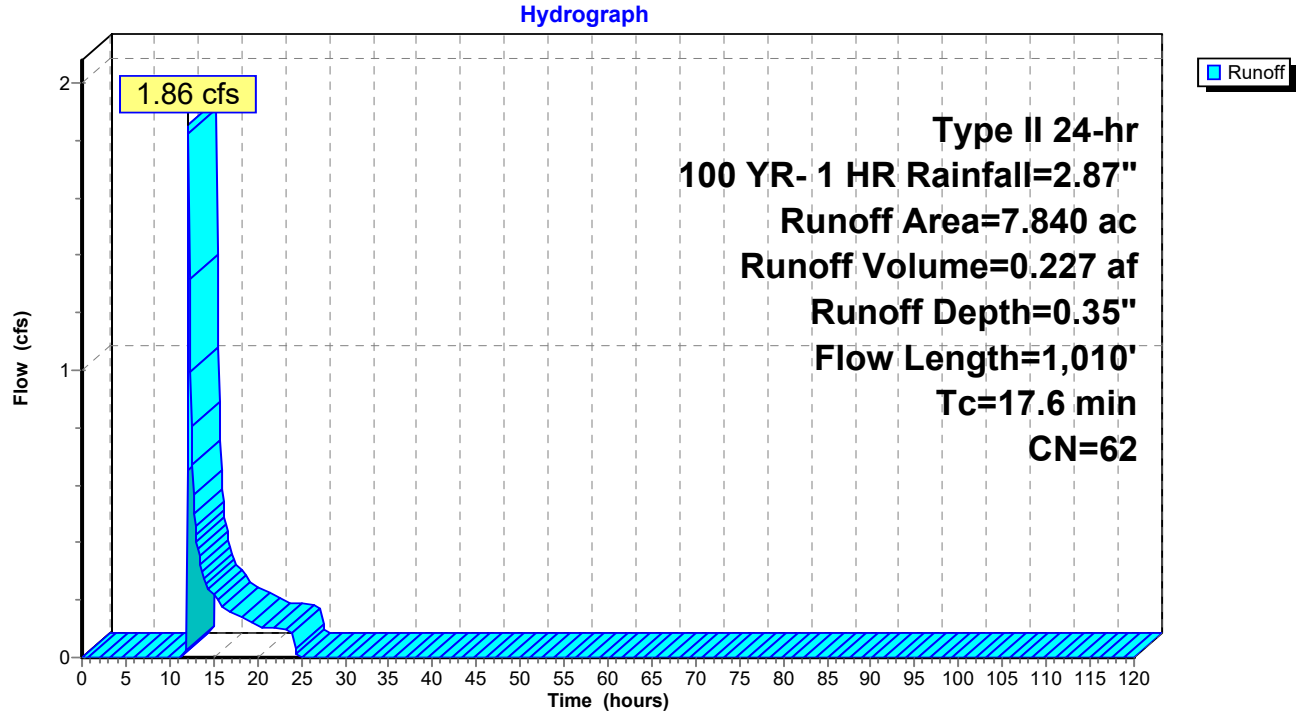
Runoff = 1.86 cfs @ 12.17 hrs, Volume= 0.227 af, Depth= 0.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 24-hr 100 YR- 1 HR Rainfall=2.87"

Area (ac)	CN	Description
1.690	55	Woods, Good, HSG B
1.390	77	Woods, Good, HSG D
0.090	98	Water Surface, 0% imp, HSG B
0.080	98	Water Surface, 0% imp, HSG D
4.590	58	Meadow, non-grazed, HSG B
7.840	62	Weighted Average
7.840		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.5	50	0.0100	0.08		**Sheet Flow, SF-1** Grass: Dense n= 0.240 P2= 3.39"
6.1	510	0.0400	1.40		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
1.0	450	0.0500	7.79	20.25	**Channel Flow, CF-1** Area= 2.6 sf Perim= 3.5' r= 0.74' n= 0.035 Earth, dense weeds
17.6	1,010	Total			

Subcatchment 33S: POST AREA-8



Summary for Subcatchment 34S: POST AREA-9

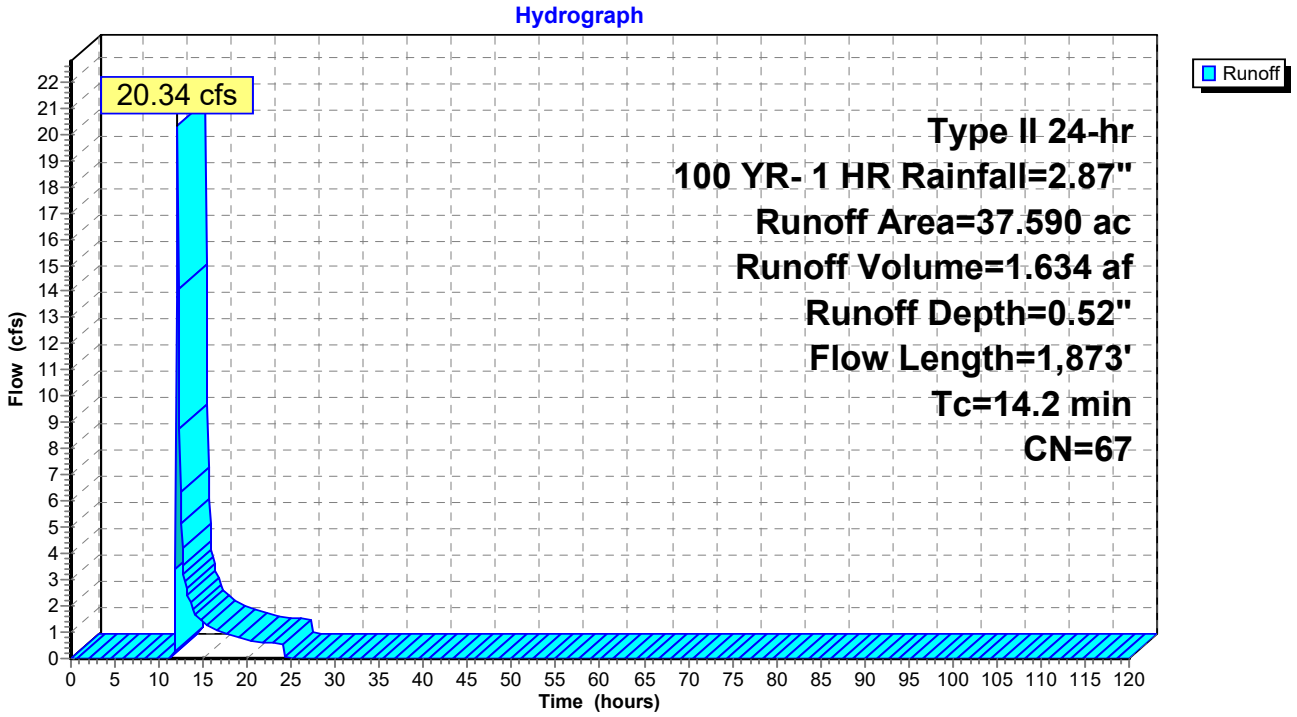
Runoff = 20.34 cfs @ 12.10 hrs, Volume= 1.634 af, Depth= 0.52"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 24-hr 100 YR- 1 HR Rainfall=2.87"

Area (ac)	CN	Description
19.780	69	50-75% Grass cover, Fair, HSG B
2.170	84	50-75% Grass cover, Fair, HSG D
0.910	55	Woods, Good, HSG B
0.610	77	Woods, Good, HSG D
0.710	98	Water Surface, 0% imp, HSG D
0.660	85	Gravel roads, HSG B
12.750	58	Meadow, non-grazed, HSG B
37.590	67	Weighted Average
37.590		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.1	50	0.0600	0.16		**Sheet Flow, SF-1** Grass: Dense n= 0.240 P2= 3.39"
6.6	481	0.0300	1.21		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
2.5	1,342	0.0500	9.08	23.62	**Channel Flow, CF-1** Area= 2.6 sf Perim= 3.5' r= 0.74' n= 0.030 Earth, grassed & winding
14.2	1,873	Total			

Subcatchment 34S: POST AREA-9



Summary for Subcatchment 35S: POST AREA-10

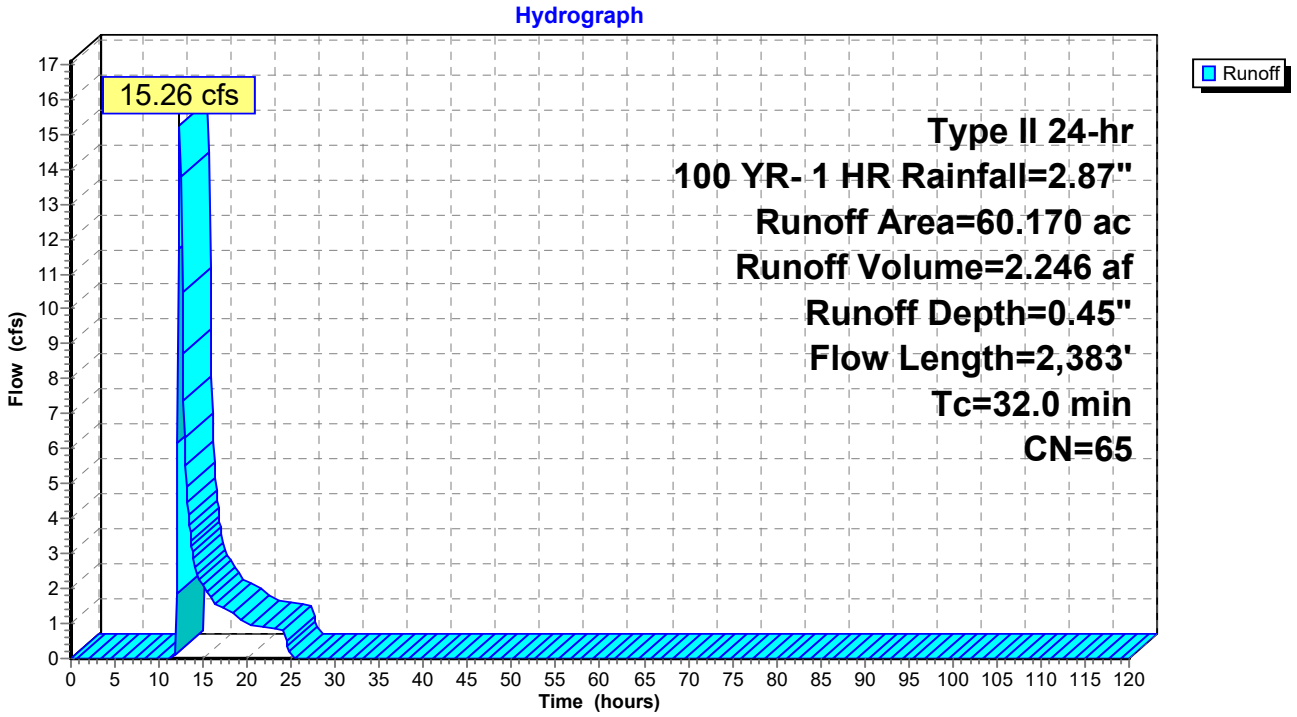
Runoff = 15.26 cfs @ 12.35 hrs, Volume= 2.246 af, Depth= 0.45"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 24-hr 100 YR- 1 HR Rainfall=2.87"

Area (ac)	CN	Description
14.950	69	50-75% Grass cover, Fair, HSG B
2.980	79	50-75% Grass cover, Fair, HSG C
0.610	91	Gravel roads, HSG D
34.050	58	Meadow, non-grazed, HSG B
7.580	78	Meadow, non-grazed, HSG D
60.170	65	Weighted Average
60.170		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.8	50	0.0300	0.12		**Sheet Flow, SF-1** Grass: Dense n= 0.240 P2= 3.39"
3.5	357	0.0600	1.71		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
19.8	1,178	0.0200	0.99		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
1.9	798	0.0300	7.17	46.63	**Channel Flow, CF-1** Area= 6.5 sf Perim= 8.5' r= 0.76' n= 0.030 Earth, grassed & winding
32.0	2,383	Total			

Subcatchment 35S: POST AREA-10



Summary for Subcatchment 36S: POST AREA-11

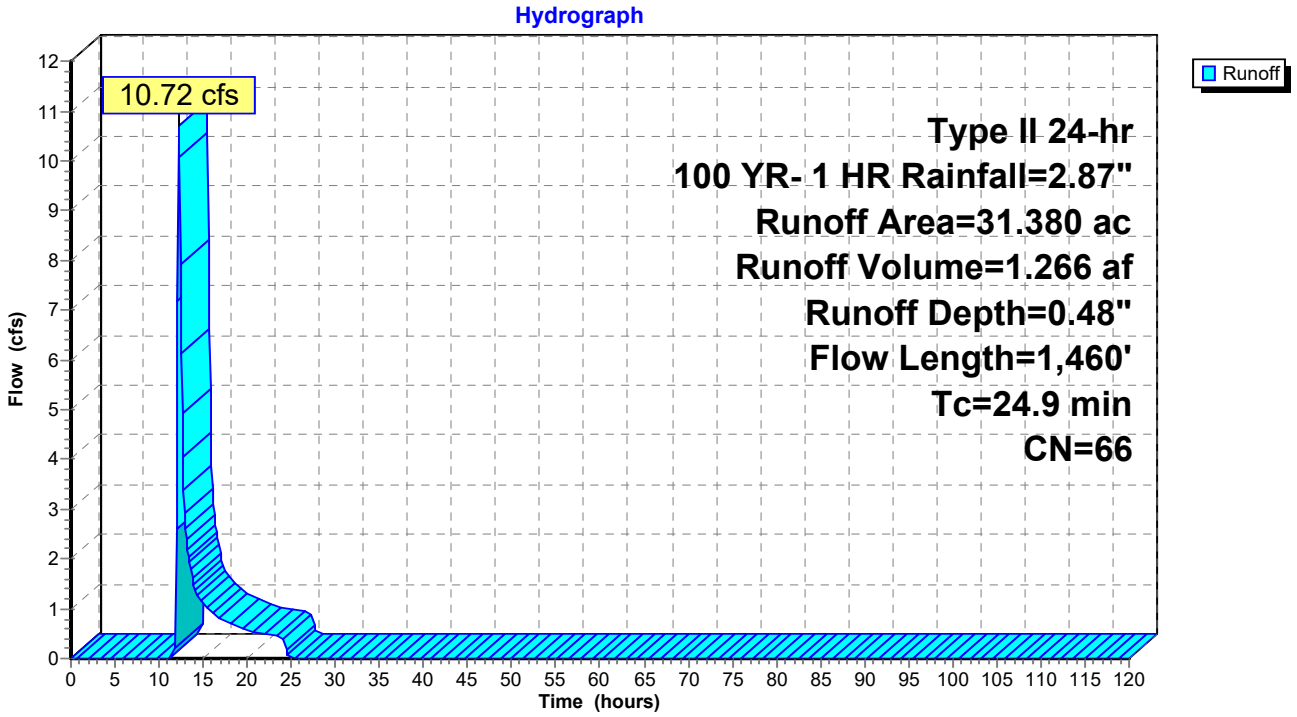
Runoff = 10.72 cfs @ 12.24 hrs, Volume= 1.266 af, Depth= 0.48"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 24-hr 100 YR- 1 HR Rainfall=2.87"

Area (ac)	CN	Description
4.120	69	50-75% Grass cover, Fair, HSG B
3.400	79	50-75% Grass cover, Fair, HSG C
0.110	55	Woods, Good, HSG B
0.400	85	Gravel roads, HSG B
0.030	91	Gravel roads, HSG D
17.430	58	Meadow, non-grazed, HSG B
5.890	78	Meadow, non-grazed, HSG D
31.380	66	Weighted Average
31.380		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.6	50	0.1500	0.23		**Sheet Flow, SF-1** Grass: Dense n= 0.240 P2= 3.39"
2.5	292	0.0800	1.98		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
18.8	1,118	0.0200	0.99		**Shallow Concentrated Flow, SCF-2** Short Grass Pasture Kv= 7.0 fps
24.9	1,460	Total			

Subcatchment 36S: POST AREA-11



Summary for Subcatchment 37S: POST AREA-12

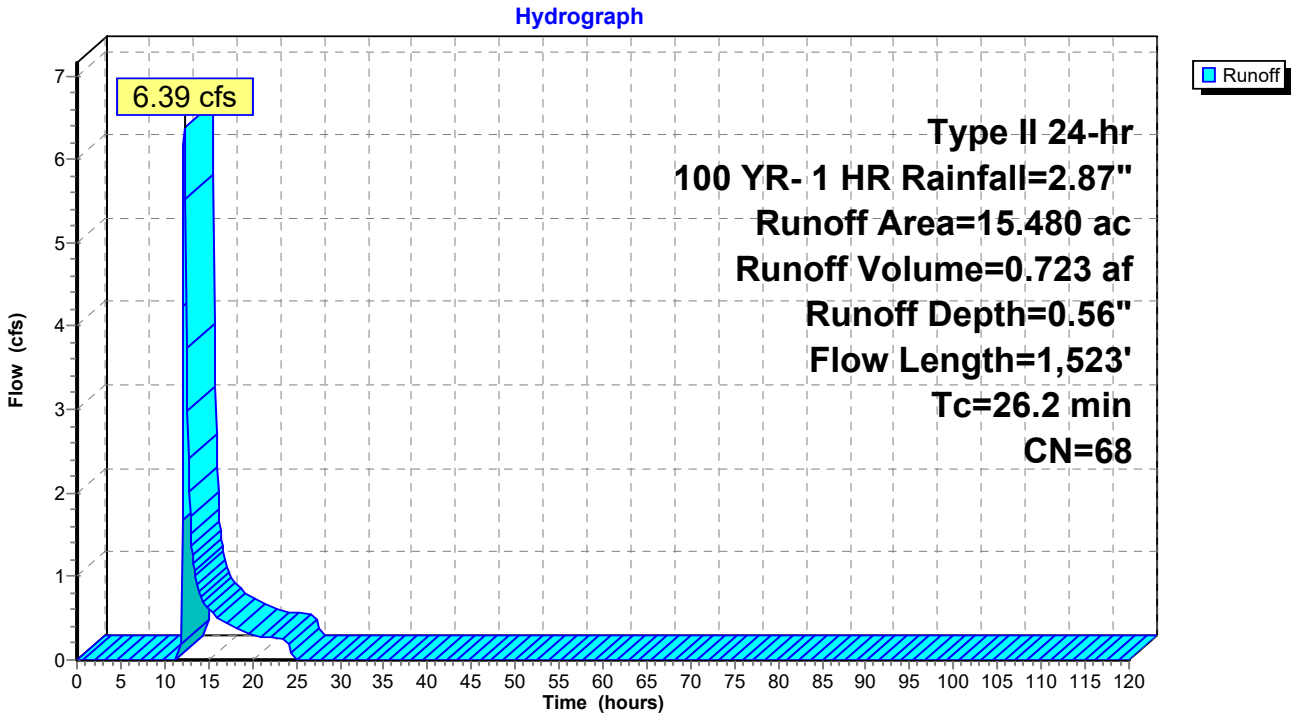
Runoff = 6.39 cfs @ 12.25 hrs, Volume= 0.723 af, Depth= 0.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 24-hr 100 YR- 1 HR Rainfall=2.87"

Area (ac)	CN	Description
1.470	69	50-75% Grass cover, Fair, HSG B
2.050	84	50-75% Grass cover, Fair, HSG D
7.570	58	Meadow, non-grazed, HSG B
3.700	78	Meadow, non-grazed, HSG D
0.690	85	Gravel roads, HSG B
15.480	68	Weighted Average
15.480		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	50	0.0400	0.14		**Sheet Flow, SF-1** Grass: Dense n= 0.240 P2= 3.39"
20.2	1,473	0.0300	1.21		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
26.2	1,523	Total			

Subcatchment 37S: POST AREA-12



Summary for Subcatchment 38S: POST AREA-13

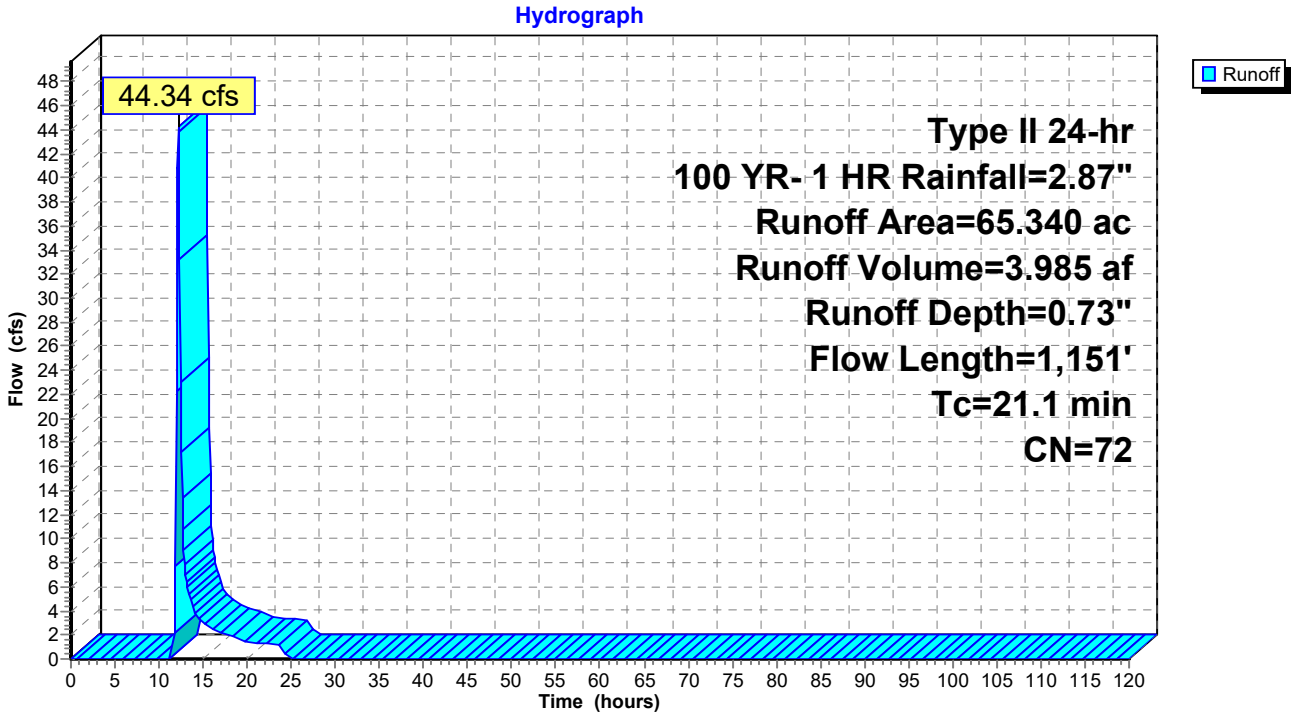
Runoff = 44.34 cfs @ 12.17 hrs, Volume= 3.985 af, Depth= 0.73"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 24-hr 100 YR- 1 HR Rainfall=2.87"

Area (ac)	CN	Description
17.980	69	50-75% Grass cover, Fair, HSG B
12.390	84	50-75% Grass cover, Fair, HSG D
3.610	55	Woods, Good, HSG B
4.340	77	Woods, Good, HSG D
9.800	58	Meadow, non-grazed, HSG B
16.960	78	Meadow, non-grazed, HSG D
0.260	91	Gravel roads, HSG D
65.340	72	Weighted Average
65.340		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	50	0.0400	0.14		**Sheet Flow, SF-1** Grass: Dense n= 0.240 P2= 3.39"
15.1	1,101	0.0300	1.21		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
21.1	1,151	Total			

Subcatchment 38S: POST AREA-13



Summary for Subcatchment 39S: POST AREA-14

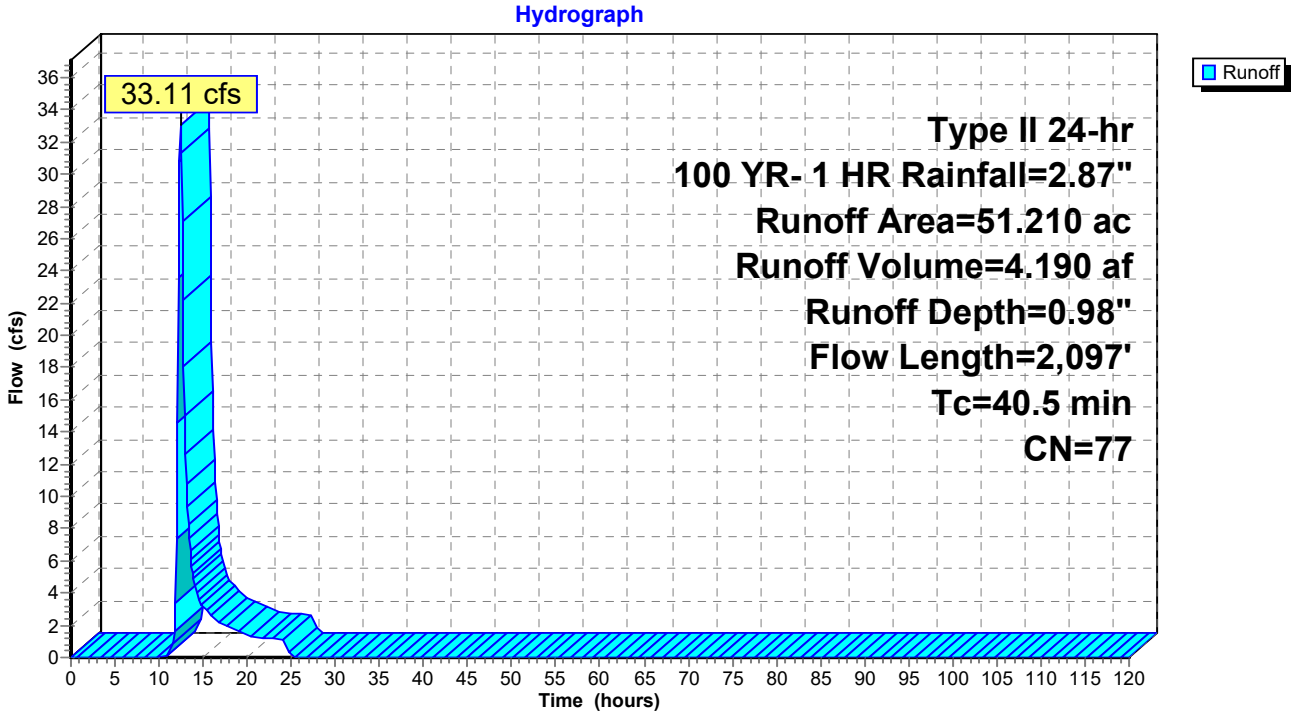
Runoff = 33.11 cfs @ 12.41 hrs, Volume= 4.190 af, Depth= 0.98"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 24-hr 100 YR- 1 HR Rainfall=2.87"

Area (ac)	CN	Description
5.440	69	50-75% Grass cover, Fair, HSG B
14.300	84	50-75% Grass cover, Fair, HSG D
0.070	77	Woods, Good, HSG D
5.260	58	Meadow, non-grazed, HSG B
25.740	78	Meadow, non-grazed, HSG D
0.400	91	Gravel roads, HSG D
51.210	77	Weighted Average
51.210		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	50	0.0400	0.14		**Sheet Flow, SF-1** Grass: Dense n= 0.240 P2= 3.39"
34.5	2,047	0.0200	0.99		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
40.5	2,097	Total			

Subcatchment 39S: POST AREA-14



Summary for Subcatchment 40S: POST AREA-15

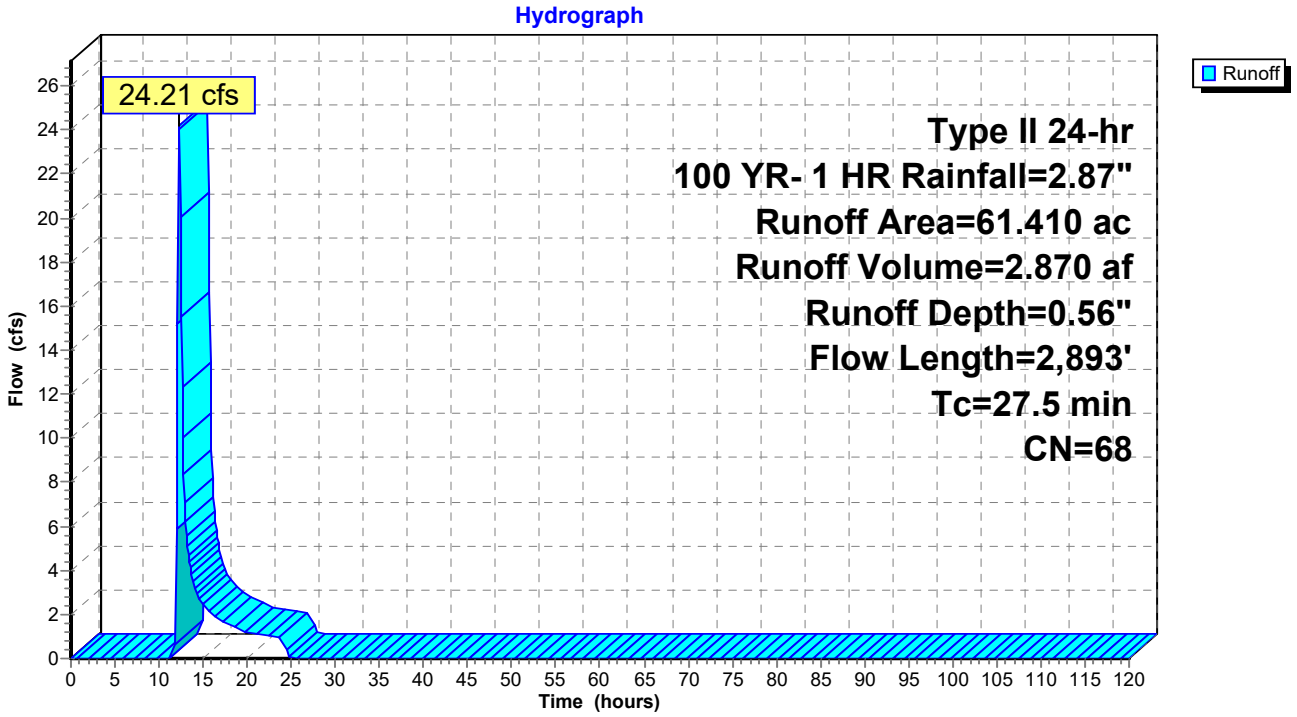
Runoff = 24.21 cfs @ 12.27 hrs, Volume= 2.870 af, Depth= 0.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 24-hr 100 YR- 1 HR Rainfall=2.87"

Area (ac)	CN	Description
7.280	84	50-75% Grass cover, Fair, HSG D
8.110	84	1 acre lots, 20% imp, HSG D
0.680	91	Gravel roads, HSG D
0.600	98	Water Surface, 0% imp, HSG D
36.590	58	Meadow, non-grazed, HSG B
8.150	78	Meadow, non-grazed, HSG D
61.410	68	Weighted Average
59.788		97.36% Pervious Area
1.622		2.64% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.8	50	0.0300	0.12		**Sheet Flow, SF-1** Grass: Dense n= 0.240 P2= 3.39"
16.5	1,201	0.0300	1.21		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
4.2	1,642	0.0400	6.58	42.79	**Channel Flow, CF-1** Area= 6.5 sf Perim= 12.0' r= 0.54' n= 0.030 Earth, grassed & winding
27.5	2,893	Total			

Subcatchment 40S: POST AREA-15



Summary for Subcatchment 41S: POST AREA-16

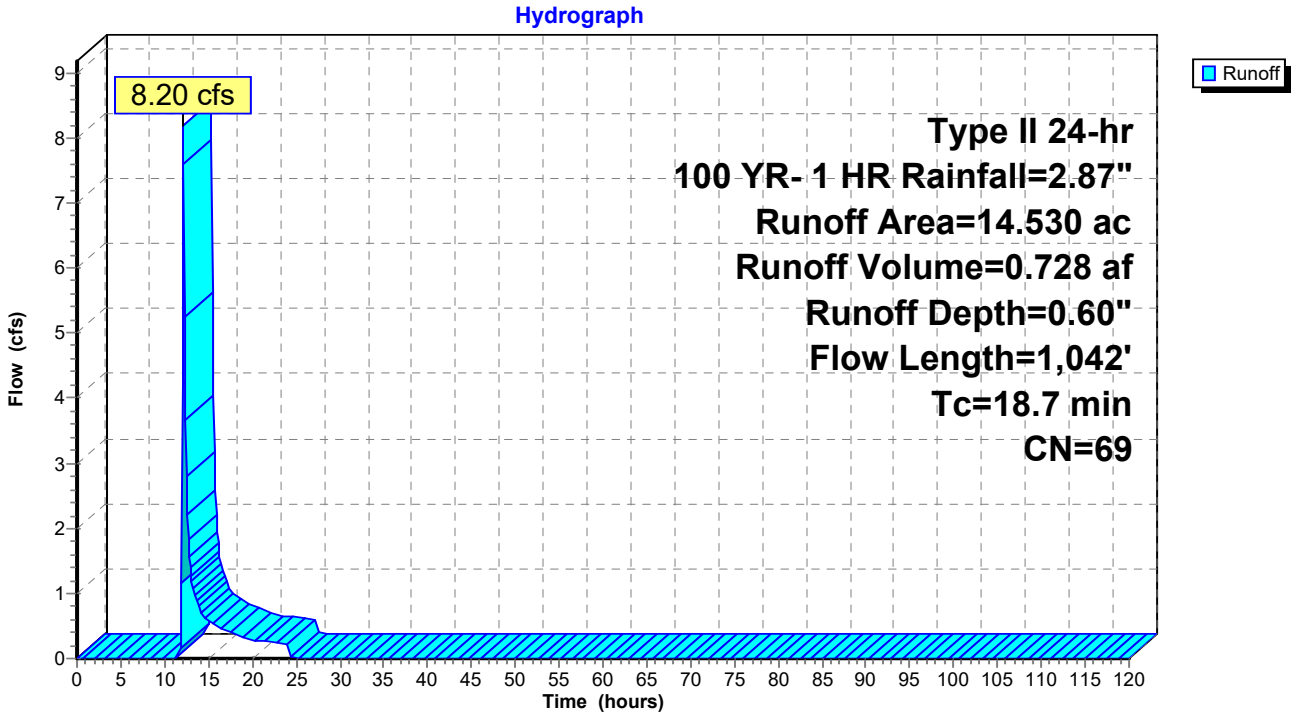
Runoff = 8.20 cfs @ 12.14 hrs, Volume= 0.728 af, Depth= 0.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 24-hr 100 YR- 1 HR Rainfall=2.87"

Area (ac)	CN	Description
2.540	69	50-75% Grass cover, Fair, HSG B
2.800	79	50-75% Grass cover, Fair, HSG C
0.640	84	1 acre lots, 20% imp, HSG D
0.560	91	Gravel roads, HSG D
4.590	58	Meadow, non-grazed, HSG B
3.400	71	Meadow, non-grazed, HSG C
14.530	69	Weighted Average
14.402		99.12% Pervious Area
0.128		0.88% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.2	50	0.1000	0.20		**Sheet Flow, SF-1** Grass: Dense n= 0.240 P2= 3.39"
2.3	268	0.0800	1.98		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
12.2	724	0.0200	0.99		**Shallow Concentrated Flow, SCF-2** Short Grass Pasture Kv= 7.0 fps
18.7	1,042	Total			

Subcatchment 41S: POST AREA-16



Summary for Subcatchment 42S: POST AREA-17

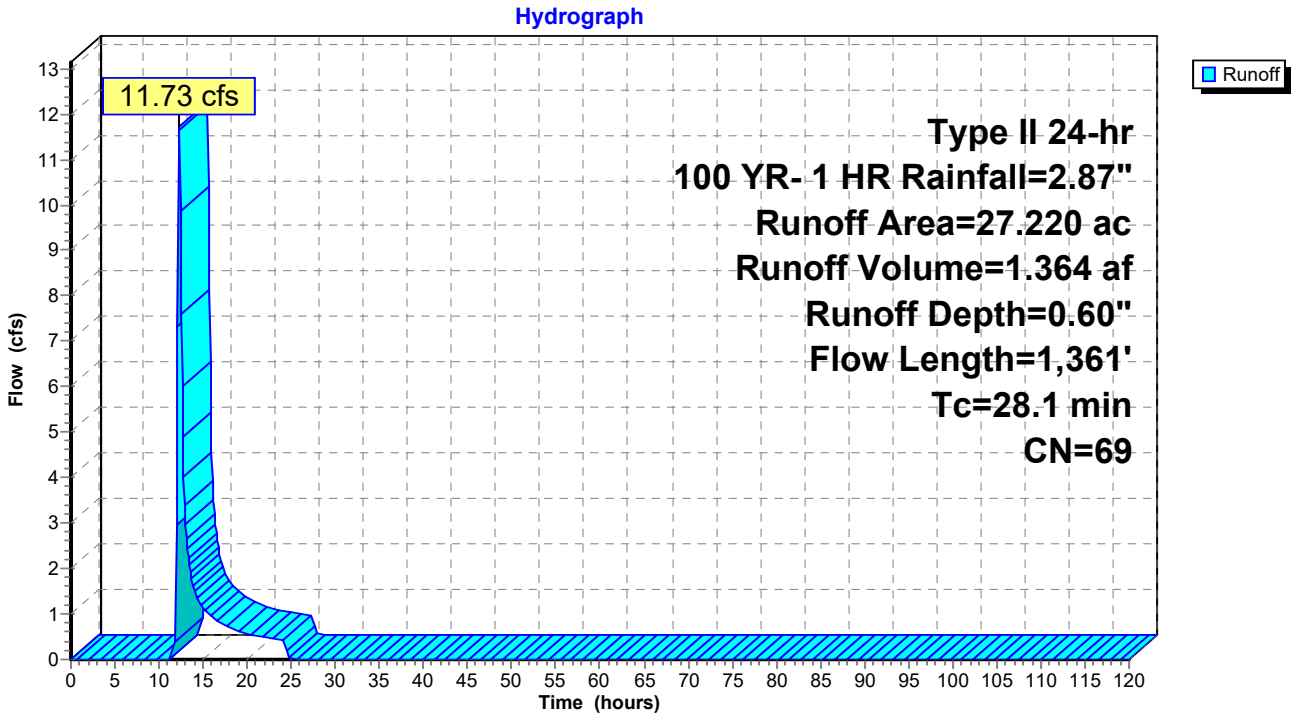
Runoff = 11.73 cfs @ 12.27 hrs, Volume= 1.364 af, Depth= 0.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 24-hr 100 YR- 1 HR Rainfall=2.87"

Area (ac)	CN	Description
3.080	69	50-75% Grass cover, Fair, HSG B
2.260	79	50-75% Grass cover, Fair, HSG C
1.030	84	1 acre lots, 20% imp, HSG D
11.040	58	Meadow, non-grazed, HSG B
9.810	78	Meadow, non-grazed, HSG D
27.220	69	Weighted Average
27.014		99.24% Pervious Area
0.206		0.76% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	50	0.0400	0.14		**Sheet Flow, SF-1** Grass: Dense n= 0.240 P2= 3.39"
22.1	1,311	0.0200	0.99		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
28.1	1,361	Total			

Subcatchment 42S: POST AREA-17



Summary for Subcatchment 43S: POST AREA-18

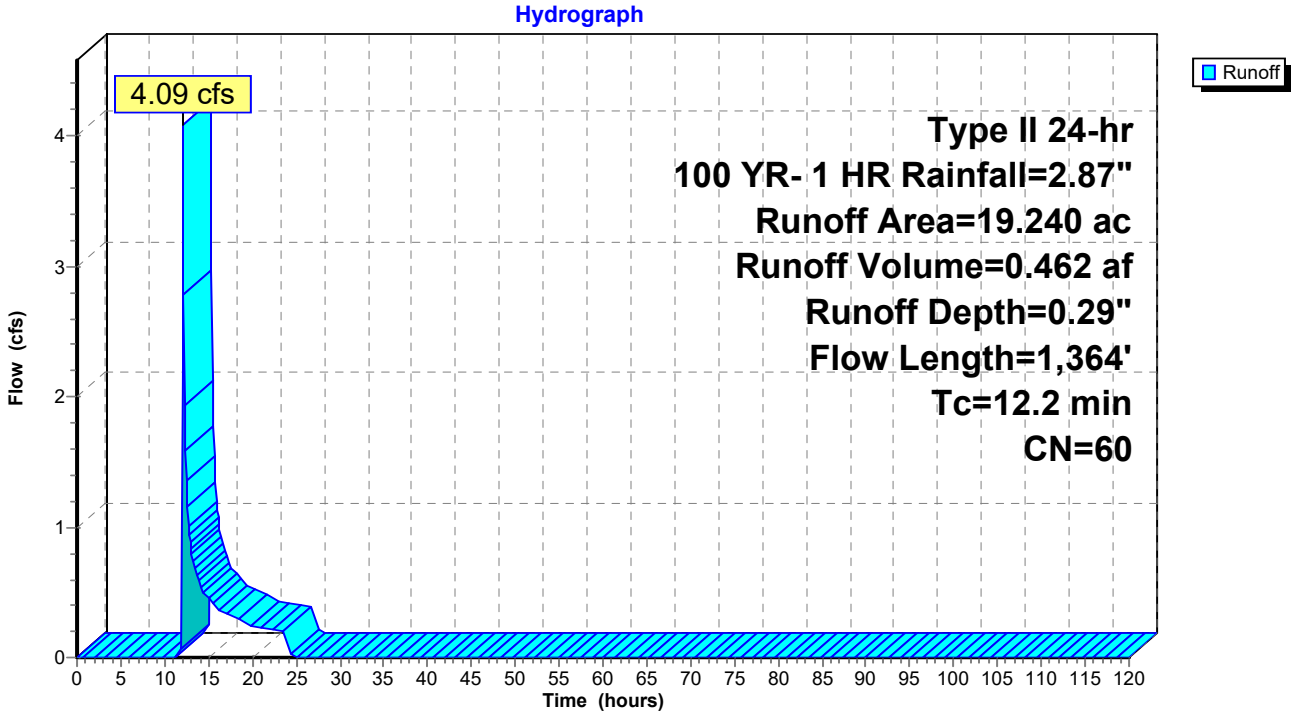
Runoff = 4.09 cfs @ 12.11 hrs, Volume= 0.462 af, Depth= 0.29"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 24-hr 100 YR- 1 HR Rainfall=2.87"

Area (ac)	CN	Description
0.710	55	Woods, Good, HSG B
0.320	70	Woods, Good, HSG C
1.690	69	50-75% Grass cover, Fair, HSG B
0.160	79	50-75% Grass cover, Fair, HSG C
15.370	58	Meadow, non-grazed, HSG B
0.990	78	Meadow, non-grazed, HSG D
19.240	60	Weighted Average
19.240		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.6	50	0.0800	0.18		**Sheet Flow, SF-1** Grass: Dense n= 0.240 P2= 3.39"
1.6	187	0.0800	1.98		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
6.0	1,127	0.0080	3.15	47.28	**Channel Flow,** Area= 15.0 sf Perim= 25.0' r= 0.60' n= 0.030
12.2	1,364	Total			

Subcatchment 43S: POST AREA-18



Summary for Subcatchment 44S: POST AREA-19

[49] Hint: Tc<2dt may require smaller dt

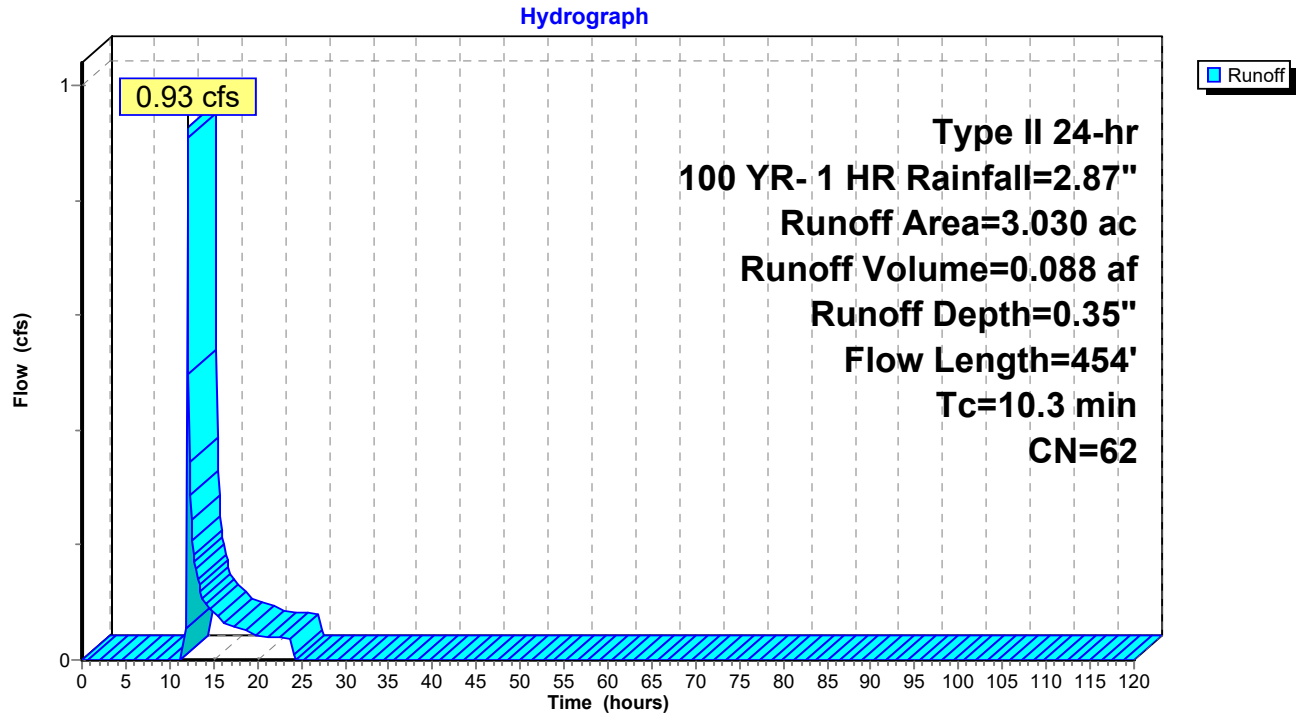
Runoff = 0.93 cfs @ 12.07 hrs, Volume= 0.088 af, Depth= 0.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 24-hr 100 YR- 1 HR Rainfall=2.87"

Area (ac)	CN	Description
1.260	55	Woods, Good, HSG B
1.360	69	50-75% Grass cover, Fair, HSG B
0.410	58	Meadow, non-grazed, HSG B
3.030	62	Weighted Average
3.030		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	50	0.0400	0.14		**Sheet Flow, SF-1** Grass: Dense n= 0.240 P2= 3.39"
4.3	404	0.0500	1.57		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
10.3	454	Total			

Subcatchment 44S: POST AREA-19



Summary for Subcatchment 45S: POST AREA-20

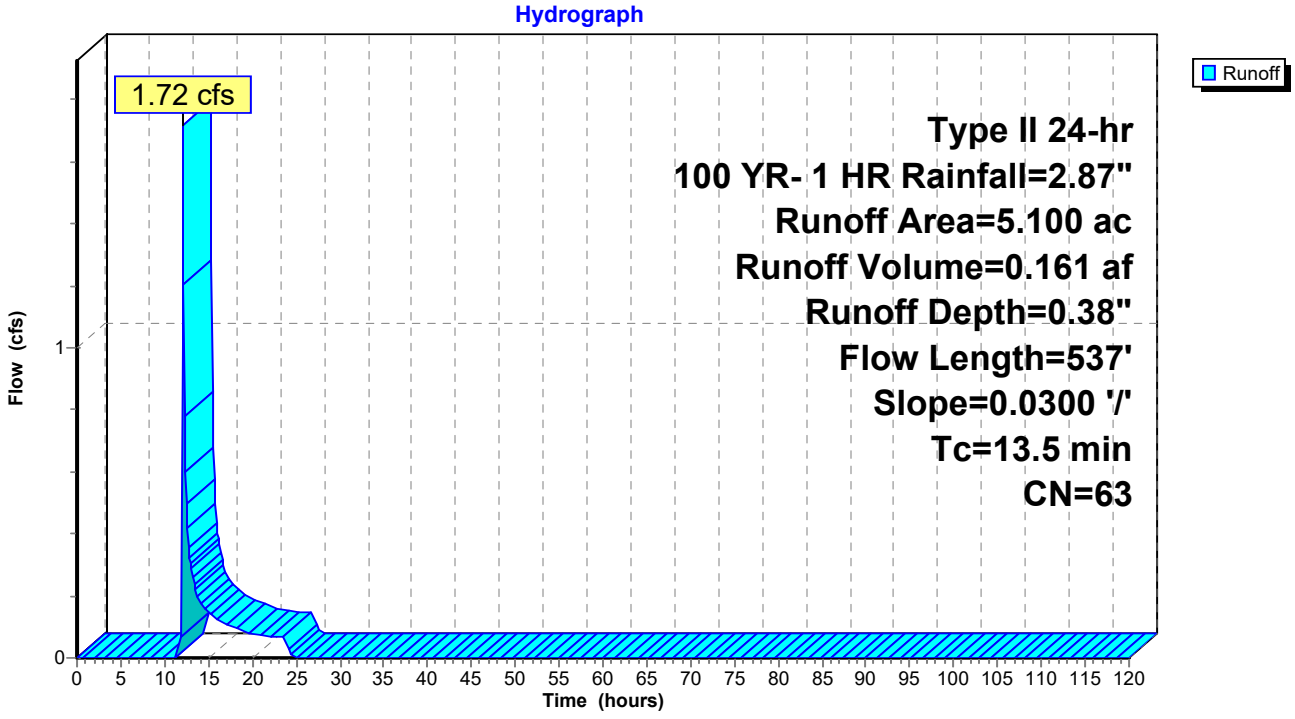
Runoff = 1.72 cfs @ 12.11 hrs, Volume= 0.161 af, Depth= 0.38"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 24-hr 100 YR- 1 HR Rainfall=2.87"

Area (ac)	CN	Description
0.640	55	Woods, Good, HSG B
2.530	69	50-75% Grass cover, Fair, HSG B
1.930	58	Meadow, non-grazed, HSG B
5.100	63	Weighted Average
5.100		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.8	50	0.0300	0.12		**Sheet Flow, SF-1** Grass: Dense n= 0.240 P2= 3.39"
6.7	487	0.0300	1.21		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
13.5	537	Total			

Subcatchment 45S: POST AREA-20



Summary for Subcatchment 46S: POST AREA-21

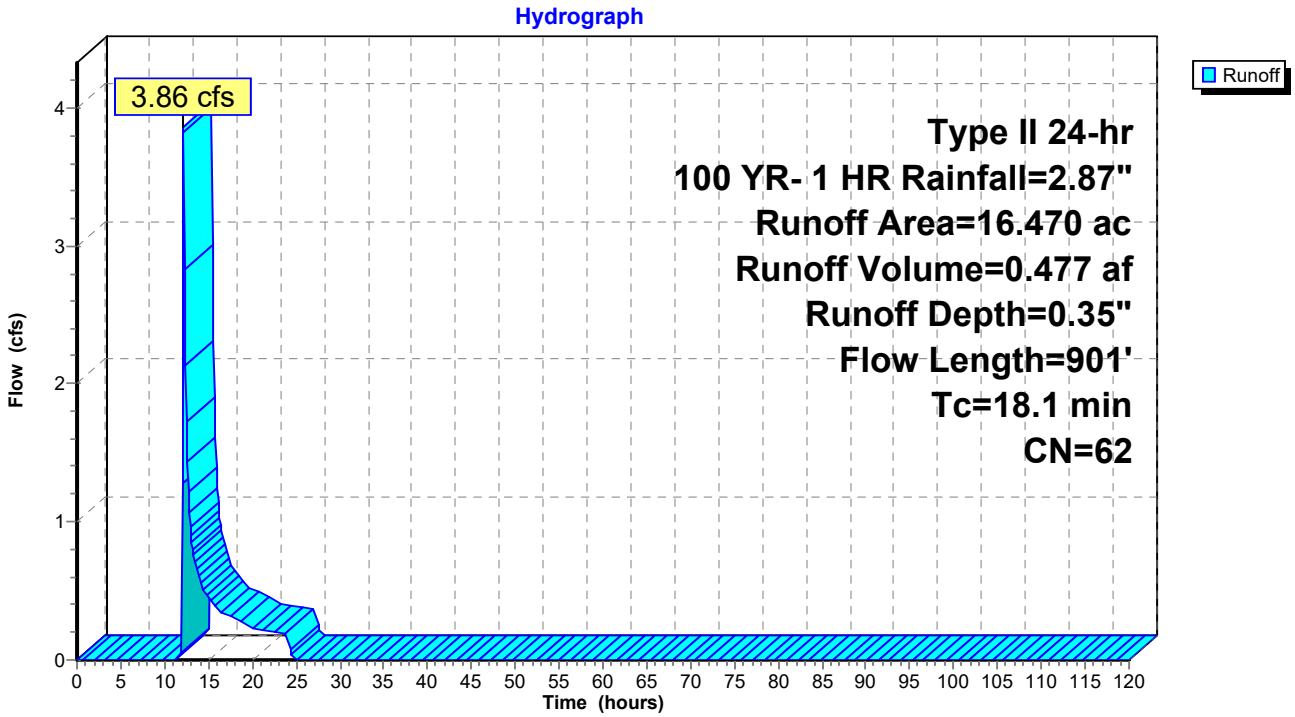
Runoff = 3.86 cfs @ 12.18 hrs, Volume= 0.477 af, Depth= 0.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 24-hr 100 YR- 1 HR Rainfall=2.87"

Area (ac)	CN	Description
0.870	55	Woods, Good, HSG B
0.390	70	Woods, Good, HSG C
4.430	69	50-75% Grass cover, Fair, HSG B
10.330	58	Meadow, non-grazed, HSG B
0.450	85	Gravel roads, HSG B
16.470	62	Weighted Average
16.470		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.0	50	0.0200	0.10		**Sheet Flow, SF-1** Grass: Dense n= 0.240 P2= 3.39"
10.1	851	0.0400	1.40		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
18.1	901	Total			

Subcatchment 46S: POST AREA-21



Summary for Subcatchment 47S: POST AREA-22

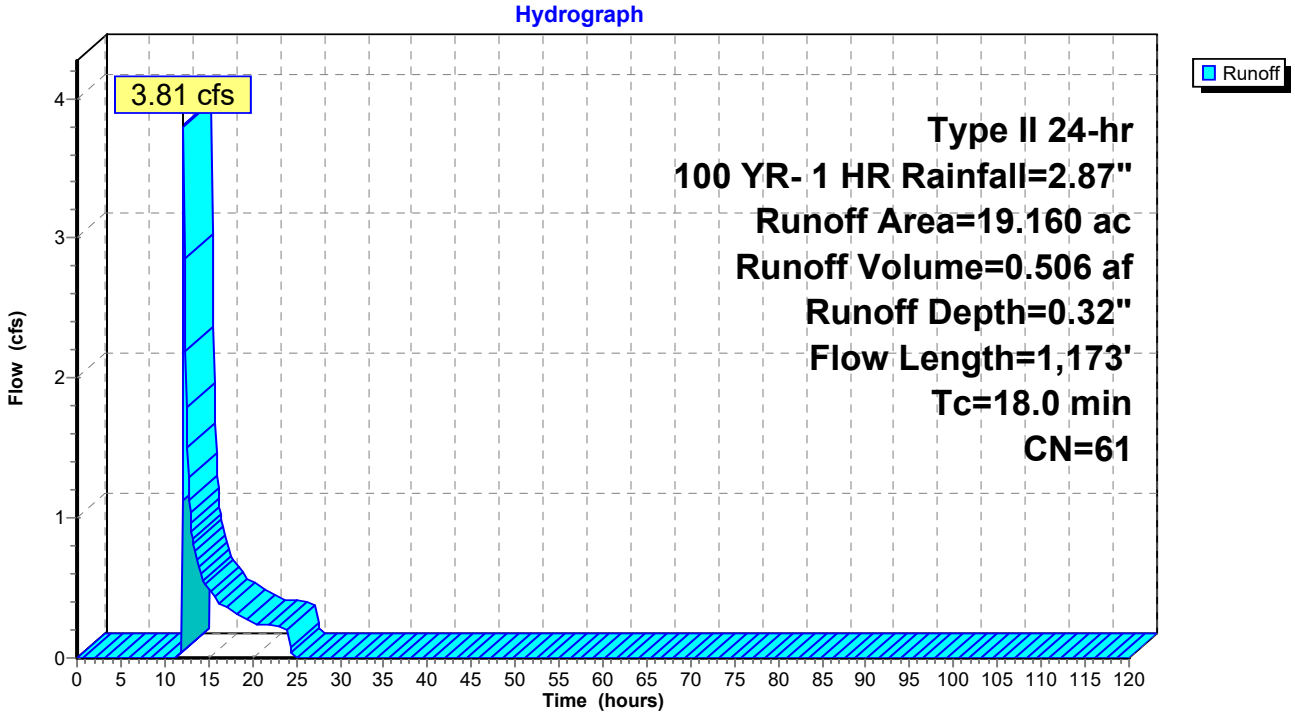
Runoff = 3.81 cfs @ 12.18 hrs, Volume= 0.506 af, Depth= 0.32"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 24-hr 100 YR- 1 HR Rainfall=2.87"

Area (ac)	CN	Description
0.530	55	Woods, Good, HSG B
2.570	69	50-75% Grass cover, Fair, HSG B
13.650	58	Meadow, non-grazed, HSG B
2.100	71	Meadow, non-grazed, HSG C
0.310	85	Gravel roads, HSG B
19.160	61	Weighted Average
19.160		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	50	0.0400	0.14		**Sheet Flow, SF-1** Grass: Dense n= 0.240 P2= 3.39"
12.0	1,123	0.0500	1.57		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
18.0	1,173	Total			

Subcatchment 47S: POST AREA-22



Summary for Subcatchment 48S: POST AREA-23

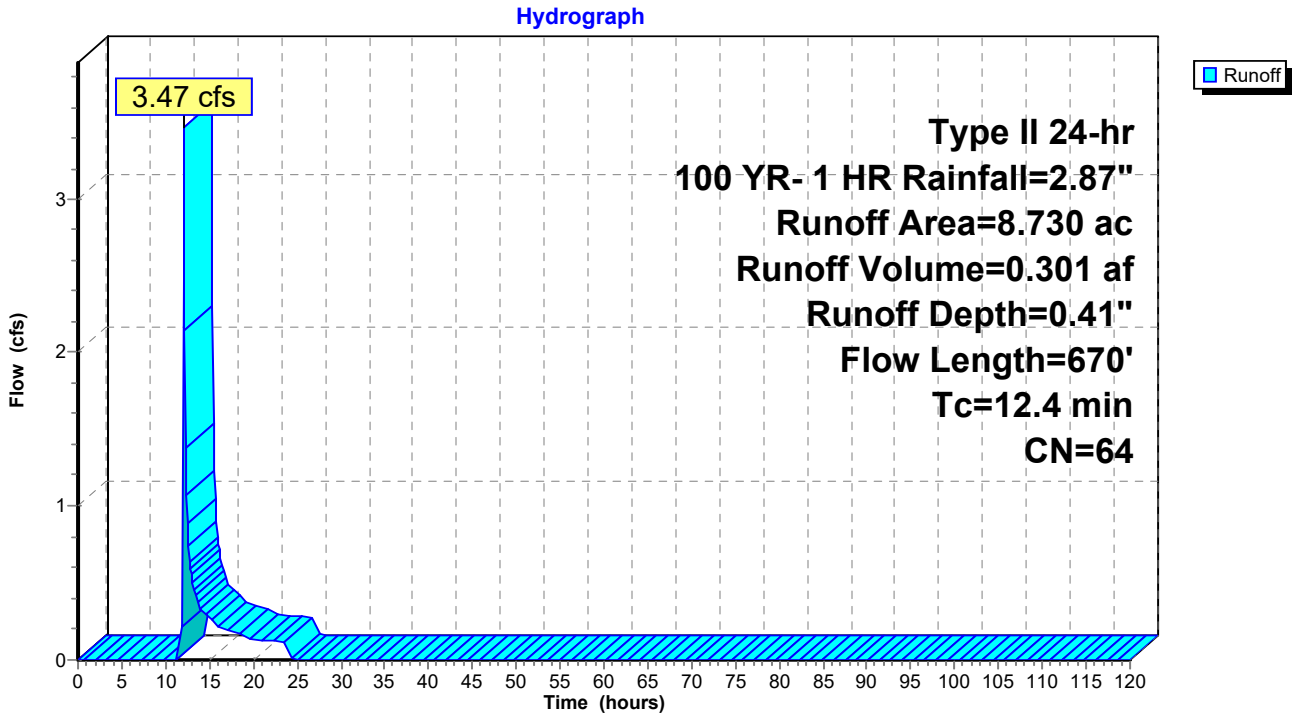
Runoff = 3.47 cfs @ 12.09 hrs, Volume= 0.301 af, Depth= 0.41"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 24-hr 100 YR- 1 HR Rainfall=2.87"

Area (ac)	CN	Description
3.620	55	Woods, Good, HSG B
1.010	70	Woods, Good, HSG C
4.100	71	Meadow, non-grazed, HSG C
8.730	64	Weighted Average
8.730		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	50	0.0400	0.14		**Sheet Flow, SF-1** Grass: Dense n= 0.240 P2= 3.39"
2.0	210	0.0600	1.71		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
4.4	410	0.0500	1.57		**Shallow Concentrated Flow, SCF-2** Short Grass Pasture Kv= 7.0 fps
12.4	670	Total			

Subcatchment 48S: POST AREA-23



Summary for Subcatchment 49S: POST AREA-24

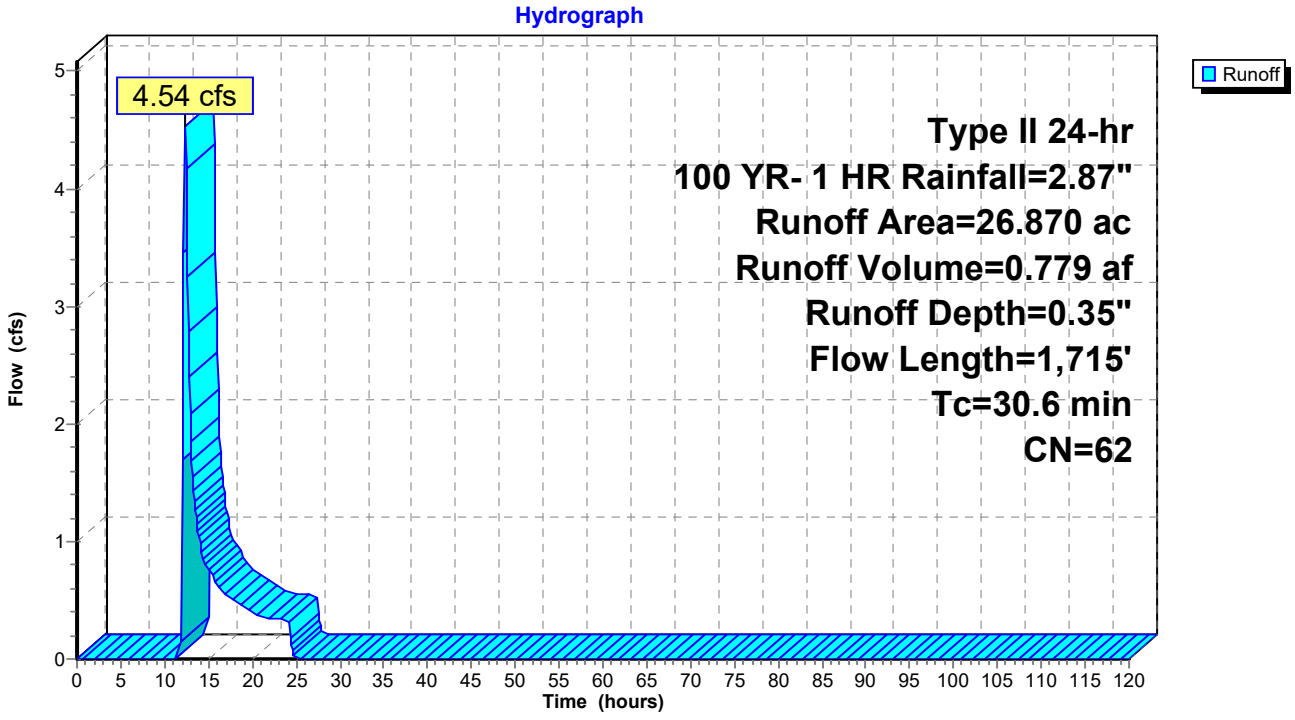
Runoff = 4.54 cfs @ 12.35 hrs, Volume= 0.779 af, Depth= 0.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 24-hr 100 YR- 1 HR Rainfall=2.87"

Area (ac)	CN	Description
2.610	55	Woods, Good, HSG B
4.460	69	50-75% Grass cover, Fair, HSG B
0.570	79	50-75% Grass cover, Fair, HSG C
16.660	58	Meadow, non-grazed, HSG B
2.570	78	Meadow, non-grazed, HSG D
26.870	62	Weighted Average
26.870		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.5	50	0.0100	0.08		**Sheet Flow, SF-1** Grass: Dense n= 0.240 P2= 3.39"
5.3	586	0.0700	1.85		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
14.8	1,079	0.0300	1.21		**Shallow Concentrated Flow, SCF-2** Short Grass Pasture Kv= 7.0 fps
30.6	1,715	Total			

Subcatchment 49S: POST AREA-24



Summary for Subcatchment 50S: POST AREA-25

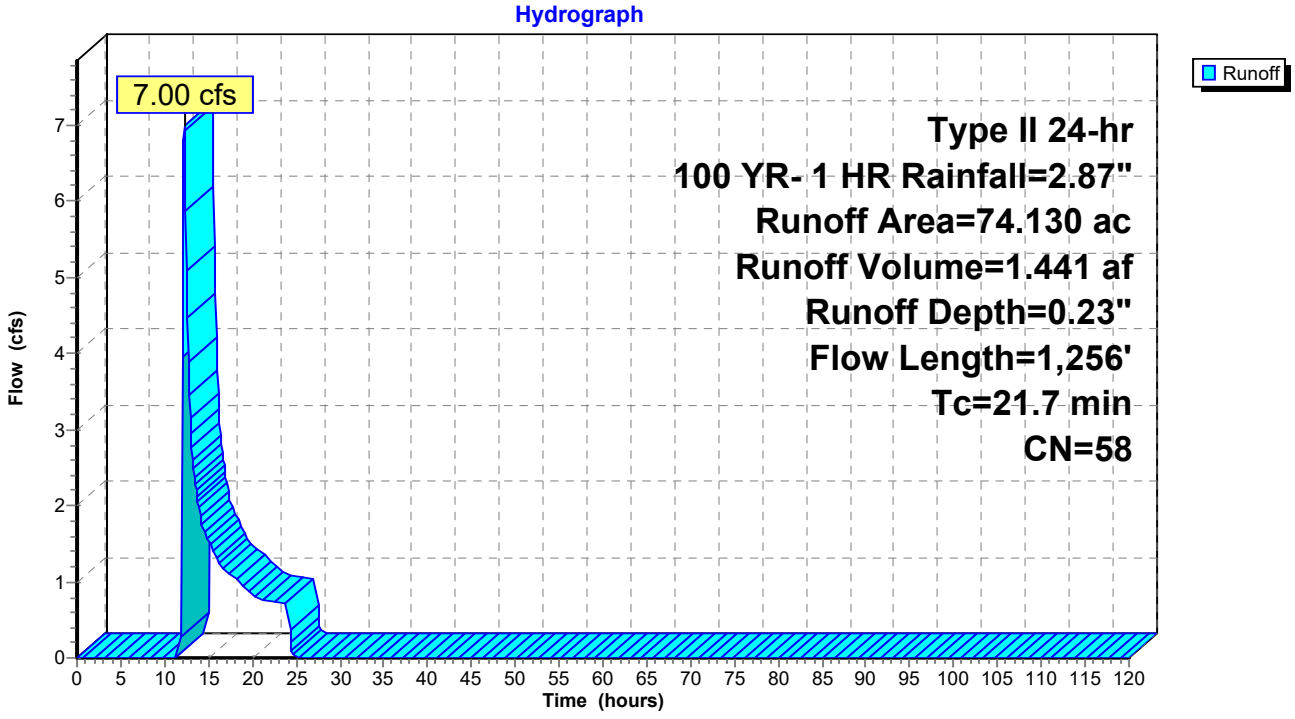
Runoff = 7.00 cfs @ 12.26 hrs, Volume= 1.441 af, Depth= 0.23"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 24-hr 100 YR- 1 HR Rainfall=2.87"

Area (ac)	CN	Description
1.200	69	50-75% Grass cover, Fair, HSG B
72.620	58	Meadow, non-grazed, HSG B
0.310	85	Gravel roads, HSG B
74.130	58	Weighted Average
74.130		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.1	50	0.0600	0.16		**Sheet Flow, SF-1** Grass: Dense n= 0.240 P2= 3.39"
16.6	1,206	0.0300	1.21		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
21.7	1,256	Total			

Subcatchment 50S: POST AREA-25



Summary for Subcatchment 55S: POST AREA-26(Gen-Tie Route)

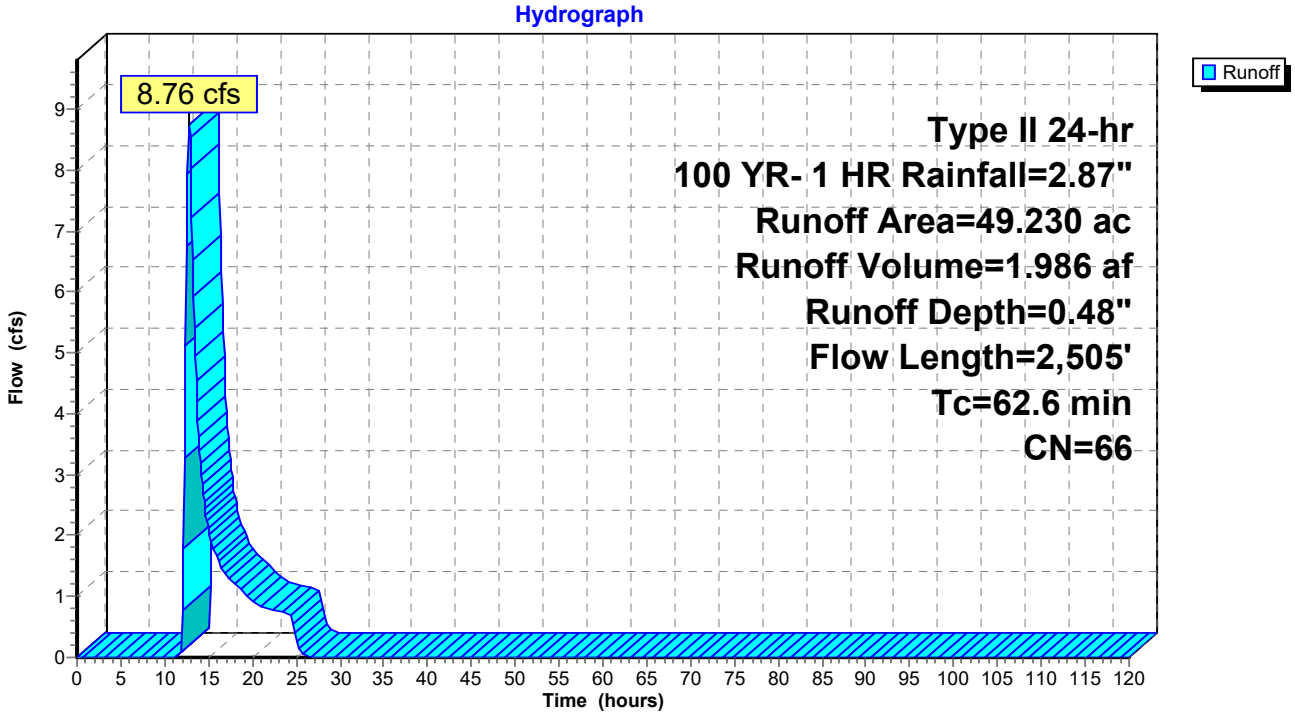
Runoff = 8.76 cfs @ 12.79 hrs, Volume= 1.986 af, Depth= 0.48"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 24-hr 100 YR- 1 HR Rainfall=2.87"

Area (ac)	CN	Description
33.070	69	50-75% Grass cover, Fair, HSG B
7.900	55	Woods, Good, HSG B
2.750	85	Gravel roads, HSG B
5.510	58	Meadow, non-grazed, HSG B
49.230	66	Weighted Average
49.230		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.1	50	0.0400	0.20		**Sheet Flow, SF-1** Grass: Short n= 0.150 P2= 3.39"
58.5	2,455	0.0100	0.70		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
62.6	2,505	Total			

Subcatchment 55S: POST AREA-26(Gen-Tie Route)



Summary for Pond 53P: Exisitng Wetland

Inflow Area = 7.840 ac, 0.00% Impervious, Inflow Depth = 0.35" for 100 YR- 1 HR event
Inflow = 1.86 cfs @ 12.17 hrs, Volume= 0.227 af
Outflow = 0.14 cfs @ 17.94 hrs, Volume= 0.096 af, Atten= 92%, Lag= 346.3 min
Primary = 0.14 cfs @ 17.94 hrs, Volume= 0.096 af

Routing by Stor-Ind method, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Peak Elev= 717.13' @ 17.94 hrs Surf.Area= 4,869 sf Storage= 6,438 cf

Plug-Flow detention time= 509.0 min calculated for 0.096 af (42% of inflow)
Center-of-Mass det. time= 329.6 min (1,263.4 - 933.8)

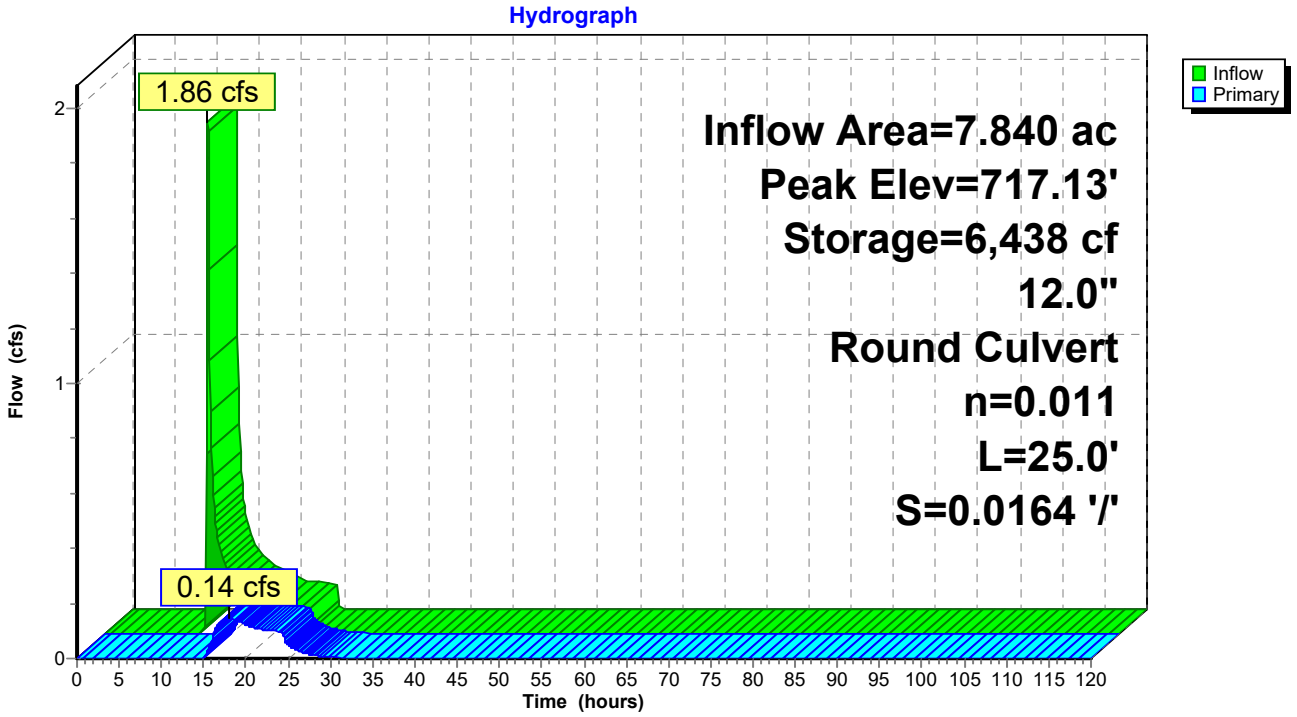
Volume	Invert	Avail.Storage	Storage Description
#1	715.00'	128,076 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
715.00	2,360	0	0
716.00	2,360	2,360	2,360
718.00	6,807	9,167	11,527
720.00	13,548	20,355	31,882
722.00	23,063	36,611	68,493
724.00	36,520	59,583	128,076

Device	Routing	Invert	Outlet Devices
#1	Primary	716.97'	**12.0" Round Culvert** L= 25.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 716.97' / 716.56' S= 0.0164 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.79 sf

Primary OutFlow Max=0.14 cfs @ 17.94 hrs HW=717.13' (Free Discharge)
1=Culvert (Inlet Controls 0.14 cfs @ 1.69 fps)

Pond 53P: Exisitng Wetland



Time span=0.00-120.00 hrs, dt=0.10 hrs, 1201 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 26S: POST AREA-1 Runoff Area=26.670 ac 0.00% Impervious Runoff Depth=2.16"
Flow Length=1,700' Tc=34.7 min CN=73 Runoff=60.67 cfs 4.808 af

Subcatchment 27S: POST AREA-2 Runoff Area=5.380 ac 0.00% Impervious Runoff Depth=1.41"
Flow Length=924' Slope=0.0200 '/' Tc=22.7 min CN=63 Runoff=9.95 cfs 0.634 af

Subcatchment 28S: POST AREA-3 Runoff Area=67.480 ac 0.40% Impervious Runoff Depth=1.85"
Flow Length=2,190' Tc=43.2 min CN=69 Runoff=108.91 cfs 10.398 af

Subcatchment 29S: POST AREA-4 Runoff Area=24.880 ac 0.00% Impervious Runoff Depth=1.85"
Flow Length=1,062' Slope=0.0300 '/' Tc=20.7 min CN=69 Runoff=65.51 cfs 3.834 af

Subcatchment 30S: POST AREA-5 Runoff Area=87.520 ac 0.17% Impervious Runoff Depth=1.85"
Flow Length=2,797' Tc=30.7 min CN=69 Runoff=180.48 cfs 13.486 af

Subcatchment 31S: POST AREA-6 Runoff Area=346.820 ac 0.18% Impervious Runoff Depth=2.25"
Flow Length=3,249' Tc=42.1 min CN=74 Runoff=715.41 cfs 64.890 af

Subcatchment 32S: POST AREA-7 Runoff Area=13.020 ac 0.00% Impervious Runoff Depth=1.63"
Flow Length=1,475' Tc=36.2 min CN=66 Runoff=20.50 cfs 1.765 af

Subcatchment 33S: POST AREA-8 Runoff Area=7.840 ac 0.00% Impervious Runoff Depth=1.35"
Flow Length=1,010' Tc=17.6 min CN=62 Runoff=16.09 cfs 0.880 af

Subcatchment 34S: POST AREA-9 Runoff Area=37.590 ac 0.00% Impervious Runoff Depth=1.70"
Flow Length=1,873' Tc=14.2 min CN=67 Runoff=112.02 cfs 5.323 af

Subcatchment 35S: POST AREA-10 Runoff Area=60.170 ac 0.00% Impervious Runoff Depth=1.55"
Flow Length=2,383' Tc=32.0 min CN=65 Runoff=98.65 cfs 7.795 af

Subcatchment 36S: POST AREA-11 Runoff Area=31.380 ac 0.00% Impervious Runoff Depth=1.63"
Flow Length=1,460' Tc=24.9 min CN=66 Runoff=64.77 cfs 4.253 af

Subcatchment 37S: POST AREA-12 Runoff Area=15.480 ac 0.00% Impervious Runoff Depth=1.77"
Flow Length=1,523' Tc=26.2 min CN=68 Runoff=34.12 cfs 2.288 af

Subcatchment 38S: POST AREA-13 Runoff Area=65.340 ac 0.00% Impervious Runoff Depth=2.08"
Flow Length=1,151' Tc=21.1 min CN=72 Runoff=194.35 cfs 11.342 af

Subcatchment 39S: POST AREA-14 Runoff Area=51.210 ac 0.00% Impervious Runoff Depth=2.50"
Flow Length=2,097' Tc=40.5 min CN=77 Runoff=122.08 cfs 10.660 af

Subcatchment 40S: POST AREA-15 Runoff Area=61.410 ac 2.64% Impervious Runoff Depth=1.77"
Flow Length=2,893' Tc=27.5 min CN=68 Runoff=130.95 cfs 9.076 af

Subcatchment 41S: POST AREA-16 Runoff Area=14.530 ac 0.88% Impervious Runoff Depth=1.85"
Flow Length=1,042' Tc=18.7 min CN=69 Runoff=41.40 cfs 2.239 af

Subcatchment 42S: POST AREA-17 Runoff Area=27.220 ac 0.76% Impervious Runoff Depth=1.85"
Flow Length=1,361' Tc=28.1 min CN=69 Runoff=59.27 cfs 4.194 af

Subcatchment 43S: POST AREA-18 Runoff Area=19.240 ac 0.00% Impervious Runoff Depth=1.21"
Flow Length=1,364' Tc=12.2 min CN=60 Runoff=40.77 cfs 1.947 af

Subcatchment 44S: POST AREA-19 Runoff Area=3.030 ac 0.00% Impervious Runoff Depth=1.35"
Flow Length=454' Tc=10.3 min CN=62 Runoff=7.84 cfs 0.340 af

Subcatchment 45S: POST AREA-20 Runoff Area=5.100 ac 0.00% Impervious Runoff Depth=1.41"
Flow Length=537' Slope=0.0300 '/' Tc=13.5 min CN=63 Runoff=12.59 cfs 0.601 af

Subcatchment 46S: POST AREA-21 Runoff Area=16.470 ac 0.00% Impervious Runoff Depth=1.35"
Flow Length=901' Tc=18.1 min CN=62 Runoff=33.15 cfs 1.848 af

Subcatchment 47S: POST AREA-22 Runoff Area=19.160 ac 0.00% Impervious Runoff Depth=1.28"
Flow Length=1,173' Tc=18.0 min CN=61 Runoff=36.41 cfs 2.044 af

Subcatchment 48S: POST AREA-23 Runoff Area=8.730 ac 0.00% Impervious Runoff Depth=1.48"
Flow Length=670' Tc=12.4 min CN=64 Runoff=23.14 cfs 1.080 af

Subcatchment 49S: POST AREA-24 Runoff Area=26.870 ac 0.00% Impervious Runoff Depth=1.35"
Flow Length=1,715' Tc=30.6 min CN=62 Runoff=38.16 cfs 3.016 af

Subcatchment 50S: POST AREA-25 Runoff Area=74.130 ac 0.00% Impervious Runoff Depth=1.09"
Flow Length=1,256' Tc=21.7 min CN=58 Runoff=101.95 cfs 6.716 af

Subcatchment 55S: POST Runoff Area=49.230 ac 0.00% Impervious Runoff Depth=1.63"
Flow Length=2,505' Tc=62.6 min CN=66 Runoff=51.88 cfs 6.672 af

Pond 53P: Exisitng Wetland Peak Elev=718.57' Storage=15,929 cf Inflow=16.09 cfs 0.880 af
12.0" Round Culvert n=0.011 L=25.0' S=0.0164 '/' Outflow=4.76 cfs 0.749 af

Total Runoff Area = 1,165.900 ac Runoff Volume = 182.129 af Average Runoff Depth = 1.87"
99.74% Pervious = 1,162.884 ac 0.26% Impervious = 3.016 ac

Summary for Subcatchment 26S: POST AREA-1

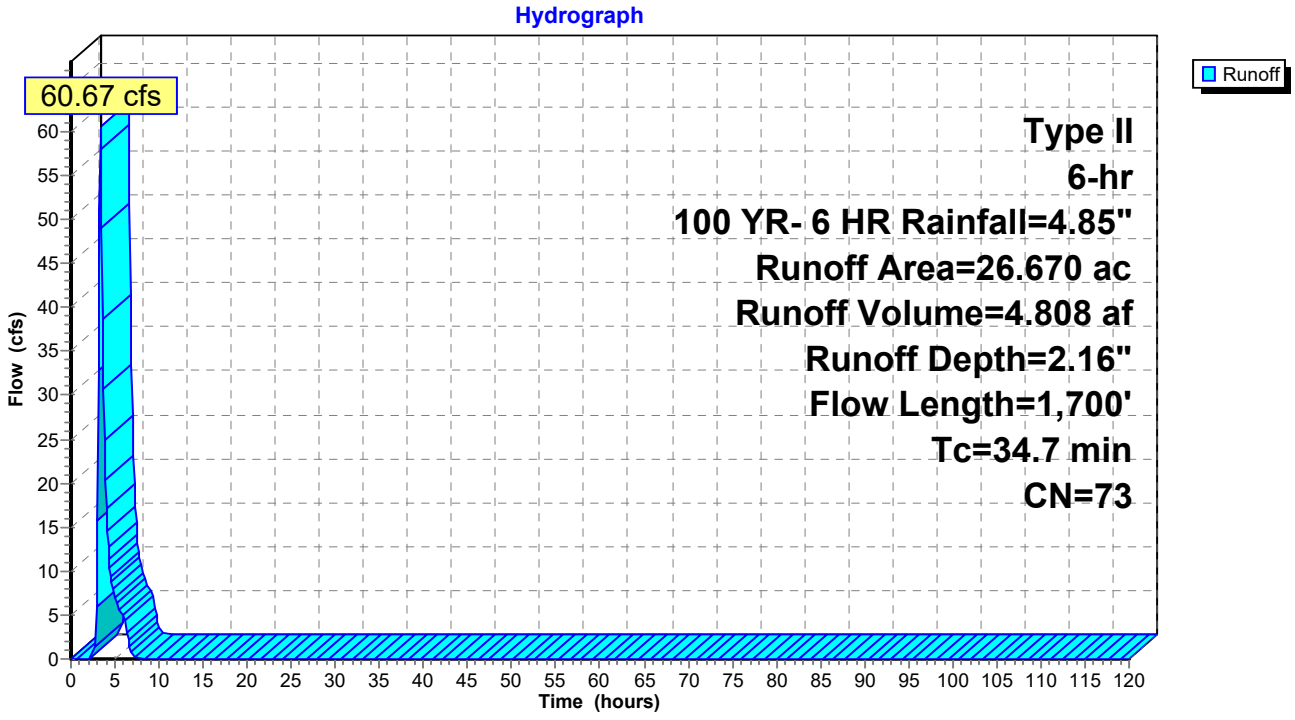
Runoff = 60.67 cfs @ 3.33 hrs, Volume= 4.808 af, Depth= 2.16"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 6-hr 100 YR- 6 HR Rainfall=4.85"

Area (ac)	CN	Description
7.780	69	50-75% Grass cover, Fair, HSG B
3.800	84	50-75% Grass cover, Fair, HSG D
0.300	85	Gravel roads, HSG B
5.050	58	Meadow, non-grazed, HSG B
9.740	78	Meadow, non-grazed, HSG D
26.670	73	Weighted Average
26.670		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.2	50	0.1000	0.20		**Sheet Flow, SF-1** Grass: Dense n= 0.240 P2= 3.39"
6.0	620	0.0600	1.71		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
24.5	1,030	0.0100	0.70		**Shallow Concentrated Flow, SCF-2** Short Grass Pasture Kv= 7.0 fps
34.7	1,700	Total			

Subcatchment 26S: POST AREA-1



Summary for Subcatchment 27S: POST AREA-2

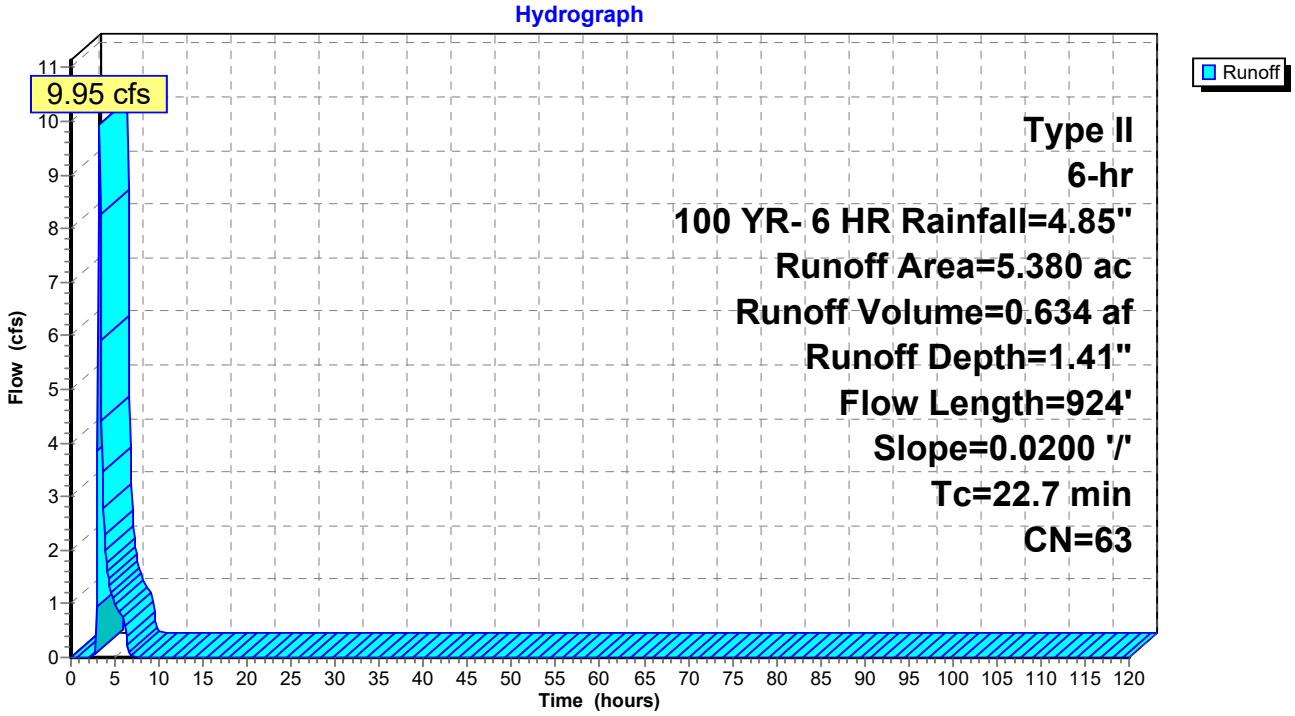
Runoff = 9.95 cfs @ 3.20 hrs, Volume= 0.634 af, Depth= 1.41"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 6-hr 100 YR- 6 HR Rainfall=4.85"

Area (ac)	CN	Description
2.660	69	50-75% Grass cover, Fair, HSG B
0.550	55	Woods, Good, HSG B
0.040	85	Gravel roads, HSG B
2.130	58	Meadow, non-grazed, HSG B
5.380	63	Weighted Average
5.380		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.0	50	0.0200	0.10		**Sheet Flow, SF-1** Grass: Dense n= 0.240 P2= 3.39"
14.7	874	0.0200	0.99		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
22.7	924	Total			

Subcatchment 27S: POST AREA-2



Summary for Subcatchment 28S: POST AREA-3

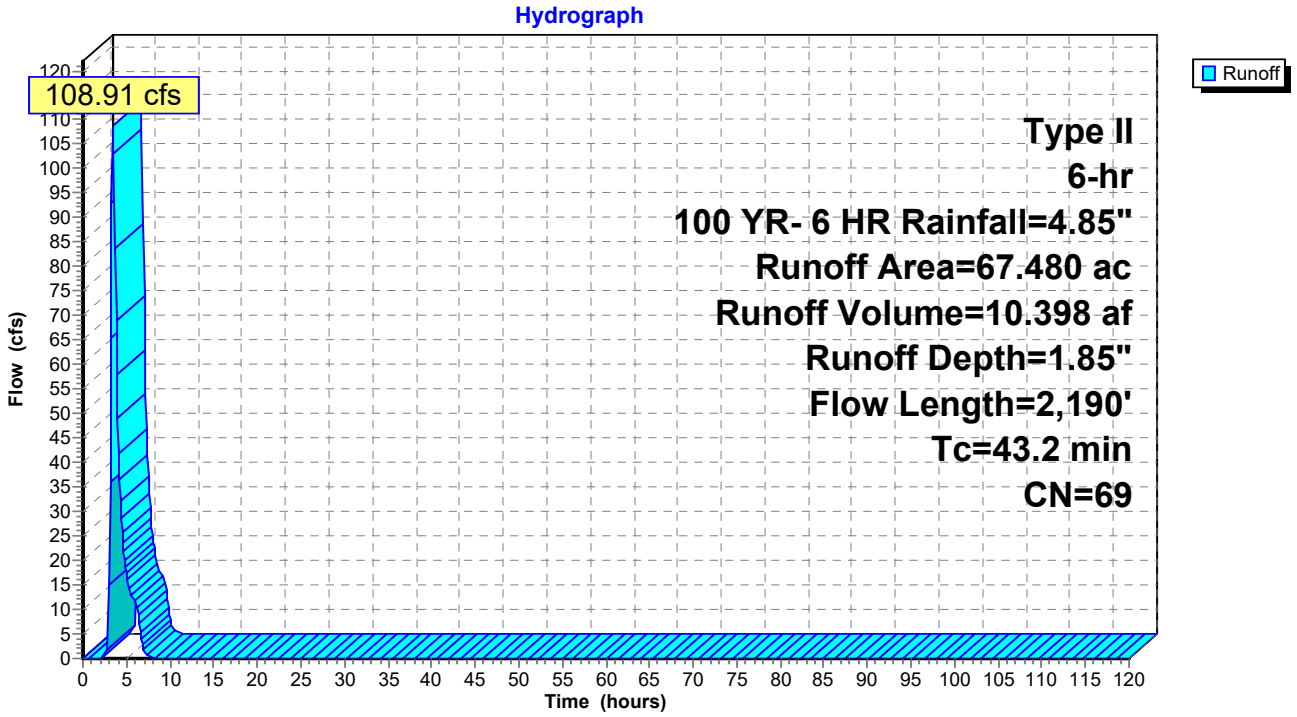
Runoff = 108.91 cfs @ 3.45 hrs, Volume= 10.398 af, Depth= 1.85"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 6-hr 100 YR- 6 HR Rainfall=4.85"

Area (ac)	CN	Description
15.050	69	50-75% Grass cover, Fair, HSG B
4.530	84	50-75% Grass cover, Fair, HSG D
1.170	85	Gravel roads, HSG B
0.930	68	1 acre lots, 20% imp, HSG B
0.420	84	1 acre lots, 20% imp, HSG D
24.300	58	Meadow, non-grazed, HSG B
21.080	78	Meadow, non-grazed, HSG D
67.480	69	Weighted Average
67.210		99.60% Pervious Area
0.270		0.40% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.6	50	0.0800	0.18		**Sheet Flow, SF-1** Grass: Dense n= 0.240 P2= 3.39"
8.5	874	0.0600	1.71		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
30.1	1,266	0.0100	0.70		**Shallow Concentrated Flow, SCF-2** Short Grass Pasture Kv= 7.0 fps
43.2	2,190	Total			

Subcatchment 28S: POST AREA-3



Summary for Subcatchment 29S: POST AREA-4

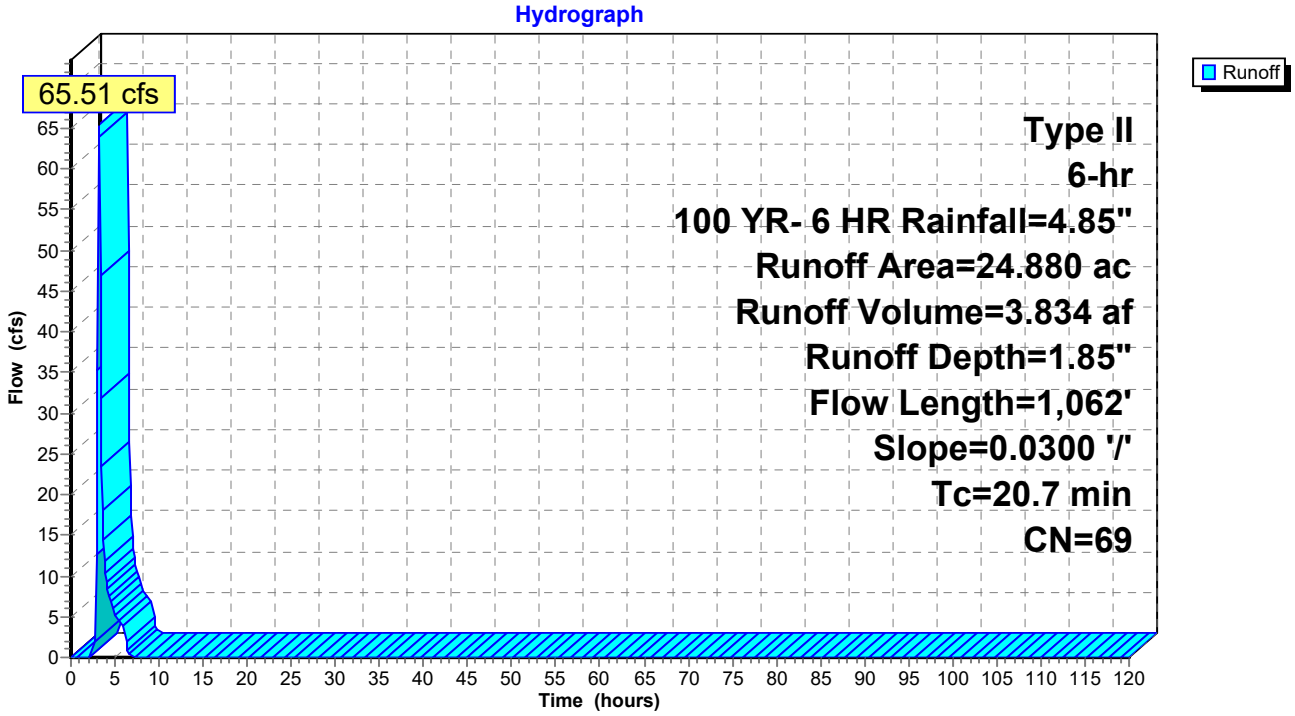
Runoff = 65.51 cfs @ 3.16 hrs, Volume= 3.834 af, Depth= 1.85"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 6-hr 100 YR- 6 HR Rainfall=4.85"

Area (ac)	CN	Description
9.120	69	50-75% Grass cover, Fair, HSG B
5.450	84	50-75% Grass cover, Fair, HSG D
9.310	58	Meadow, non-grazed, HSG B
1.000	78	Meadow, non-grazed, HSG D
24.880	69	Weighted Average
24.880		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.8	50	0.0300	0.12		**Sheet Flow, SF-1** Grass: Dense n= 0.240 P2= 3.39"
13.9	1,012	0.0300	1.21		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
20.7	1,062	Total			

Subcatchment 29S: POST AREA-4



Summary for Subcatchment 30S: POST AREA-5

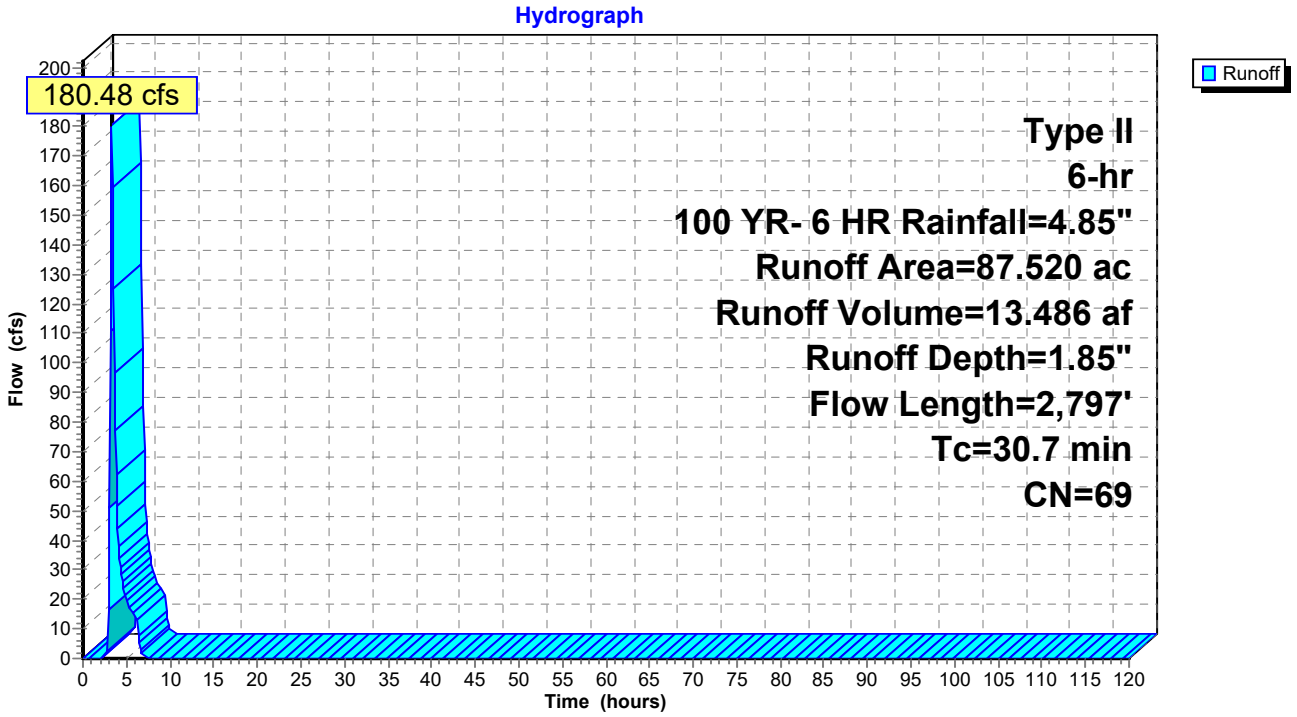
Runoff = 180.48 cfs @ 3.29 hrs, Volume= 13.486 af, Depth= 1.85"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 6-hr 100 YR- 6 HR Rainfall=4.85"

Area (ac)	CN	Description
44.510	58	Meadow, non-grazed, HSG B
37.550	78	Meadow, non-grazed, HSG D
2.950	98	Water Surface, 0% imp, HSG D
0.820	85	Gravel roads, HSG B
0.980	91	Gravel roads, HSG D
0.700	68	1 acre lots, 20% imp, HSG B
0.010	98	Unconnected pavement, HSG D
87.520	69	Weighted Average
87.370		99.83% Pervious Area
0.150		0.17% Impervious Area
0.010		6.67% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.1	50	0.0600	0.16		**Sheet Flow, SF-1** Grass: Dense n= 0.240 P2= 3.39"
13.3	968	0.0300	1.21		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
12.3	1,779	0.0060	2.42	8.46	**Channel Flow, CF-1** Area= 3.5 sf Perim= 7.0' r= 0.50' n= 0.030 Earth, grassed & winding
30.7	2,797	Total			

Subcatchment 30S: POST AREA-5



Summary for Subcatchment 31S: POST AREA-6

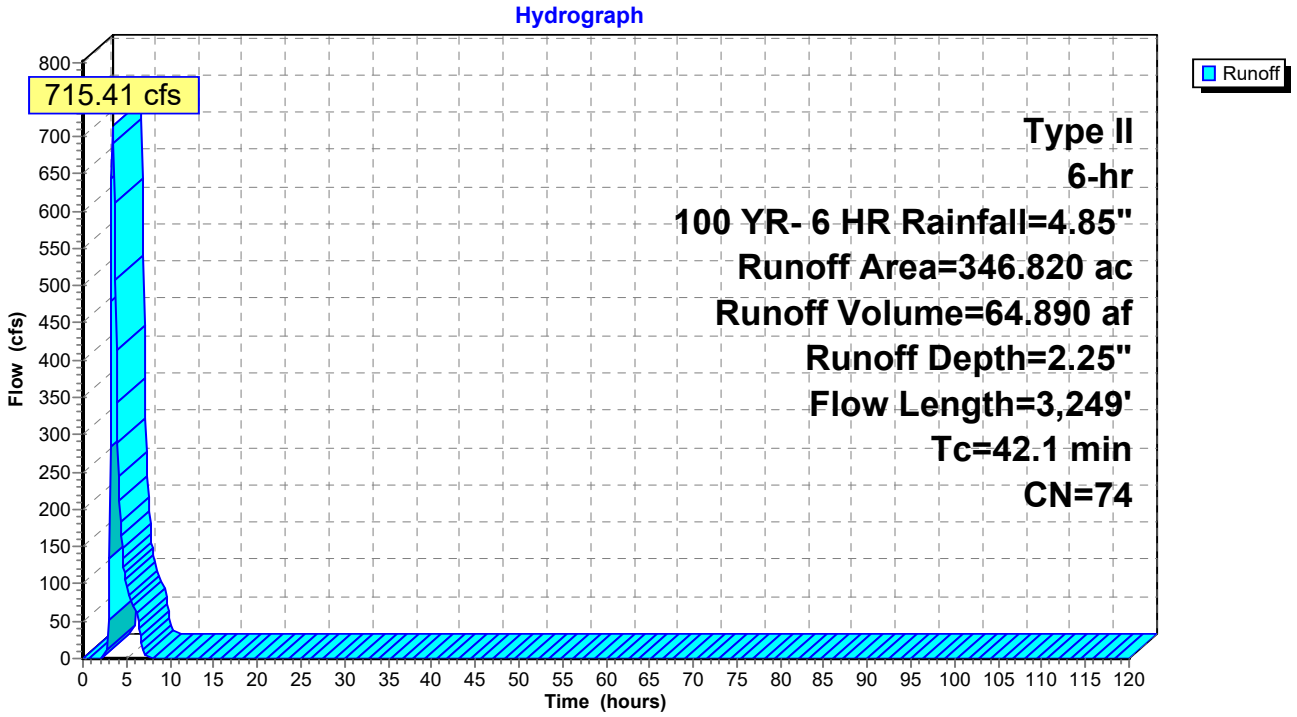
Runoff = 715.41 cfs @ 3.43 hrs, Volume= 64.890 af, Depth= 2.25"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 6-hr 100 YR- 6 HR Rainfall=4.85"

Area (ac)	CN	Description
64.810	69	50-75% Grass cover, Fair, HSG B
32.730	84	50-75% Grass cover, Fair, HSG D
56.200	58	Meadow, non-grazed, HSG B
168.280	78	Meadow, non-grazed, HSG D
6.950	98	Water Surface, 0% imp, HSG D
0.600	85	Gravel roads, HSG B
2.560	91	Gravel roads, HSG D
3.200	68	1 acre lots, 20% imp, HSG B
8.140	55	Woods, Good, HSG B
0.500	70	Woods, Good, HSG C
2.850	77	Woods, Good, HSG D
346.820	74	Weighted Average
346.180		99.82% Pervious Area
0.640		0.18% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.5	50	0.0100	0.08		**Sheet Flow, SF-1** Grass: Dense n= 0.240 P2= 3.39"
25.2	1,499	0.0200	0.99		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
6.4	1,700	0.0200	4.41	15.45	**Channel Flow, CF-1** Area= 3.5 sf Perim= 7.0' r= 0.50' n= 0.030 Earth, grassed & winding
42.1	3,249	Total			

Subcatchment 31S: POST AREA-6



Summary for Subcatchment 32S: POST AREA-7

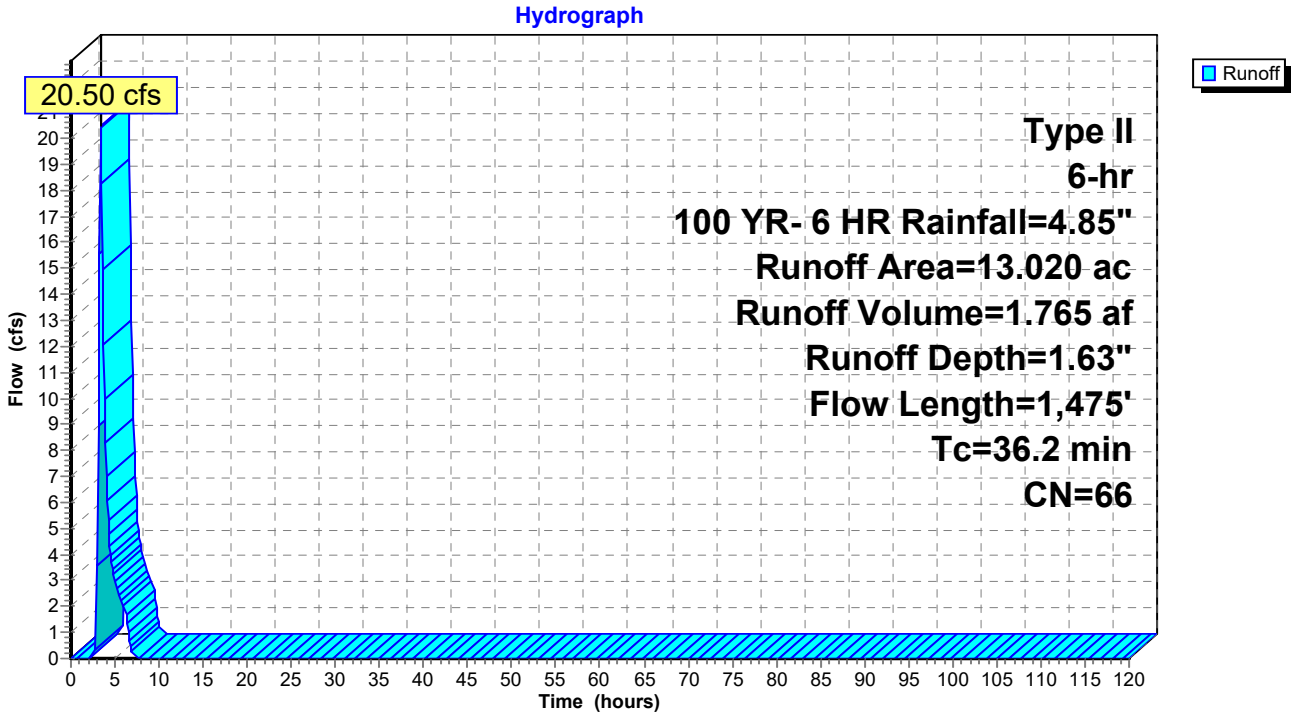
Runoff = 20.50 cfs @ 3.37 hrs, Volume= 1.765 af, Depth= 1.63"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 6-hr 100 YR- 6 HR Rainfall=4.85"

Area (ac)	CN	Description
0.730	69	50-75% Grass cover, Fair, HSG B
0.840	84	50-75% Grass cover, Fair, HSG D
0.550	85	Gravel roads, HSG B
0.270	91	Gravel roads, HSG D
1.140	55	Woods, Good, HSG B
0.730	77	Woods, Good, HSG D
6.810	58	Meadow, non-grazed, HSG B
1.950	78	Meadow, non-grazed, HSG D
13.020	66	Weighted Average
13.020		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.5	50	0.0100	0.08		**Sheet Flow, SF-1** Grass: Dense n= 0.240 P2= 3.39"
2.0	86	0.0100	0.70		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
0.2	18	0.0100	1.61		**Shallow Concentrated Flow, SCF-2** Unpaved Kv= 16.1 fps
8.6	625	0.0300	1.21		**Shallow Concentrated Flow, SCF-3** Short Grass Pasture Kv= 7.0 fps
0.2	18	0.0100	1.61		**Shallow Concentrated Flow, SCF-4** Unpaved Kv= 16.1 fps
3.4	200	0.0200	0.99		**Shallow Concentrated Flow, SCF-5** Short Grass Pasture Kv= 7.0 fps
11.3	478	0.0200	0.71		**Shallow Concentrated Flow, SCF-5** Woodland Kv= 5.0 fps
36.2	1,475	Total			

Subcatchment 32S: POST AREA-7



Summary for Subcatchment 33S: POST AREA-8

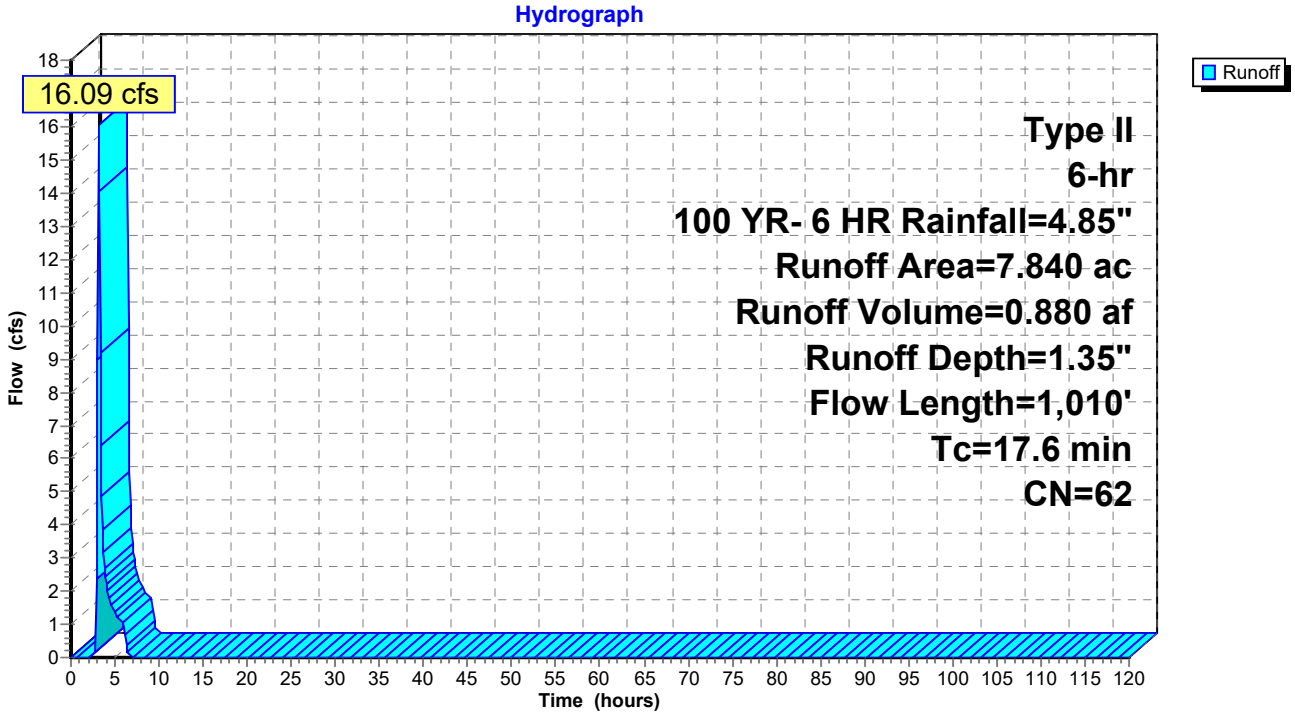
Runoff = 16.09 cfs @ 3.13 hrs, Volume= 0.880 af, Depth= 1.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 6-hr 100 YR- 6 HR Rainfall=4.85"

Area (ac)	CN	Description
1.690	55	Woods, Good, HSG B
1.390	77	Woods, Good, HSG D
0.090	98	Water Surface, 0% imp, HSG B
0.080	98	Water Surface, 0% imp, HSG D
4.590	58	Meadow, non-grazed, HSG B
7.840	62	Weighted Average
7.840		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.5	50	0.0100	0.08		**Sheet Flow, SF-1** Grass: Dense n= 0.240 P2= 3.39"
6.1	510	0.0400	1.40		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
1.0	450	0.0500	7.79	20.25	**Channel Flow, CF-1** Area= 2.6 sf Perim= 3.5' r= 0.74' n= 0.035 Earth, dense weeds
17.6	1,010	Total			

Subcatchment 33S: POST AREA-8



Summary for Subcatchment 34S: POST AREA-9

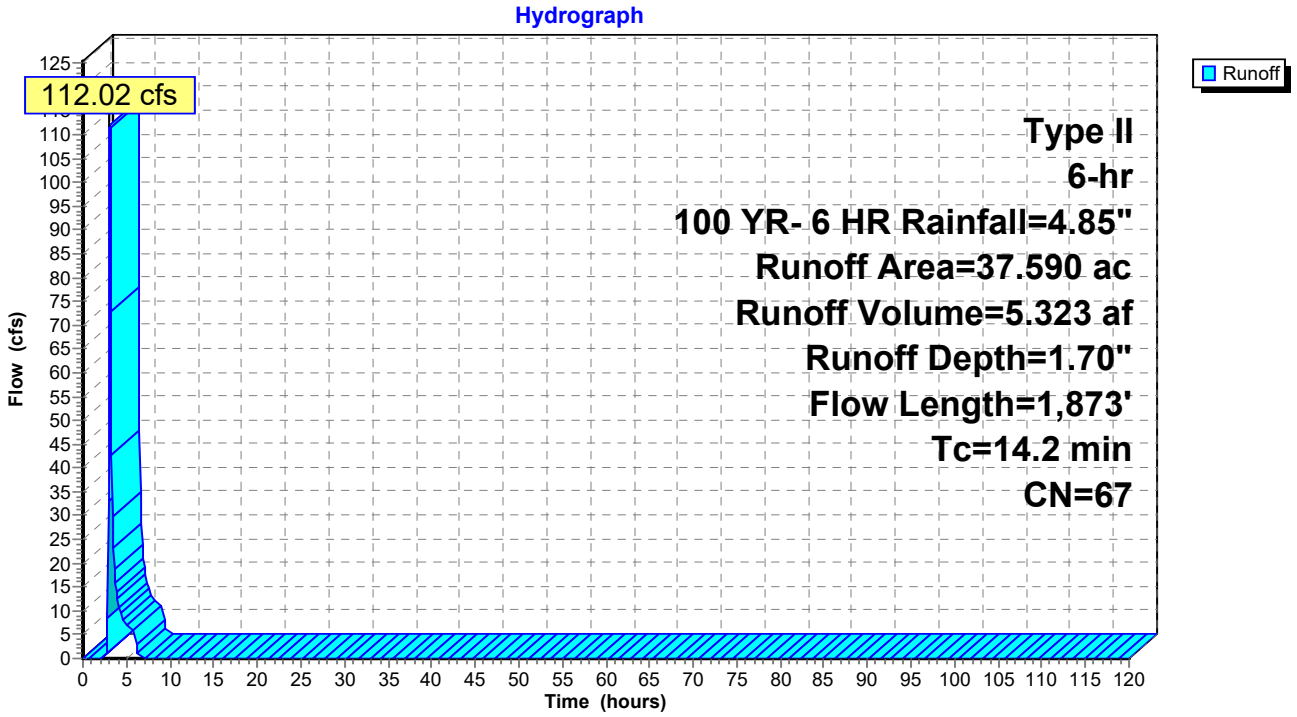
Runoff = 112.02 cfs @ 3.09 hrs, Volume= 5.323 af, Depth= 1.70"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 6-hr 100 YR- 6 HR Rainfall=4.85"

Area (ac)	CN	Description
19.780	69	50-75% Grass cover, Fair, HSG B
2.170	84	50-75% Grass cover, Fair, HSG D
0.910	55	Woods, Good, HSG B
0.610	77	Woods, Good, HSG D
0.710	98	Water Surface, 0% imp, HSG D
0.660	85	Gravel roads, HSG B
12.750	58	Meadow, non-grazed, HSG B
37.590	67	Weighted Average
37.590		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.1	50	0.0600	0.16		**Sheet Flow, SF-1** Grass: Dense n= 0.240 P2= 3.39"
6.6	481	0.0300	1.21		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
2.5	1,342	0.0500	9.08	23.62	**Channel Flow, CF-1** Area= 2.6 sf Perim= 3.5' r= 0.74' n= 0.030 Earth, grassed & winding
14.2	1,873	Total			

Subcatchment 34S: POST AREA-9



Summary for Subcatchment 35S: POST AREA-10

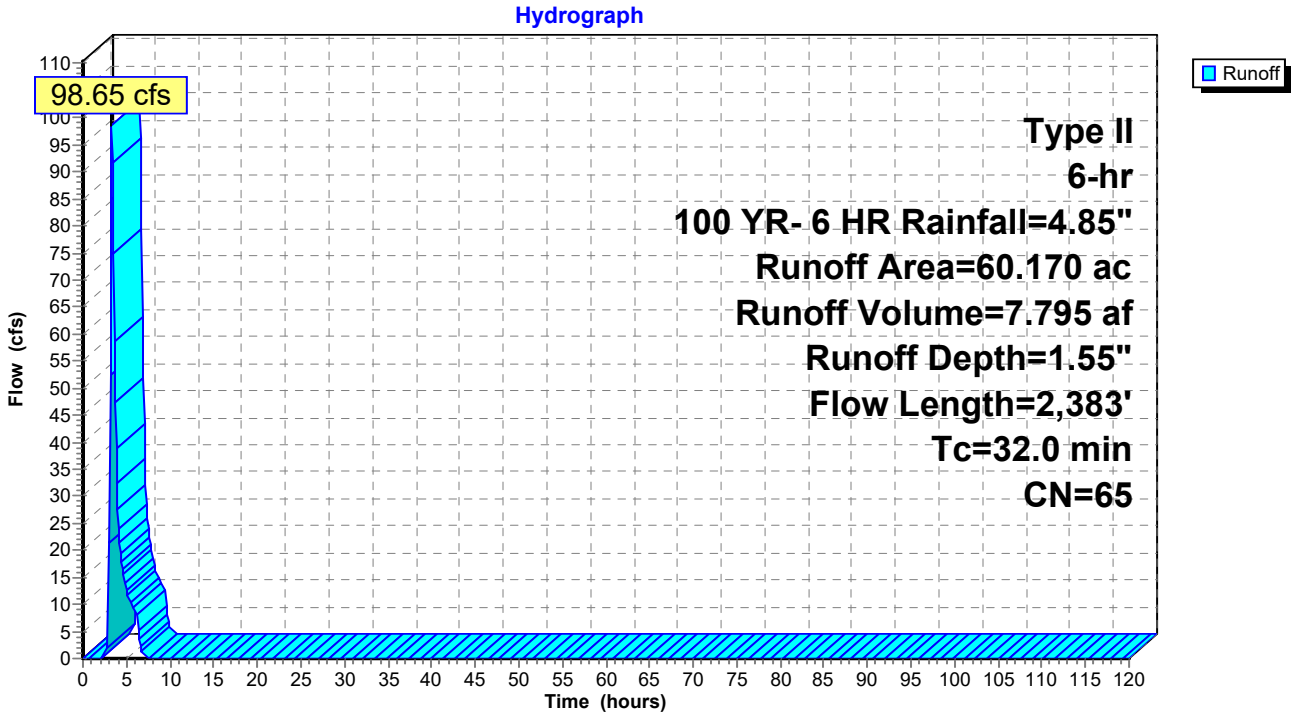
Runoff = 98.65 cfs @ 3.32 hrs, Volume= 7.795 af, Depth= 1.55"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 6-hr 100 YR- 6 HR Rainfall=4.85"

Area (ac)	CN	Description
14.950	69	50-75% Grass cover, Fair, HSG B
2.980	79	50-75% Grass cover, Fair, HSG C
0.610	91	Gravel roads, HSG D
34.050	58	Meadow, non-grazed, HSG B
7.580	78	Meadow, non-grazed, HSG D
60.170	65	Weighted Average
60.170		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.8	50	0.0300	0.12		**Sheet Flow, SF-1** Grass: Dense n= 0.240 P2= 3.39"
3.5	357	0.0600	1.71		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
19.8	1,178	0.0200	0.99		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
1.9	798	0.0300	7.17	46.63	**Channel Flow, CF-1** Area= 6.5 sf Perim= 8.5' r= 0.76' n= 0.030 Earth, grassed & winding
32.0	2,383	Total			

Subcatchment 35S: POST AREA-10



Summary for Subcatchment 36S: POST AREA-11

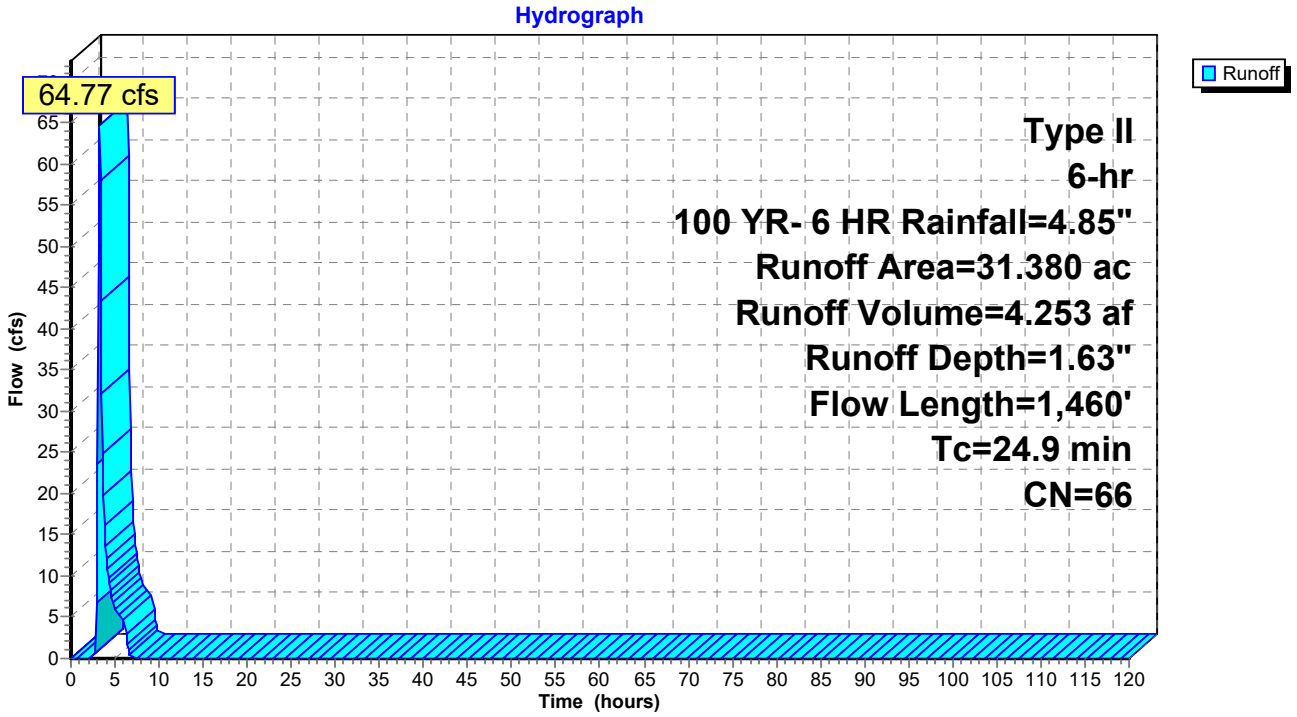
Runoff = 64.77 cfs @ 3.22 hrs, Volume= 4.253 af, Depth= 1.63"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 6-hr 100 YR- 6 HR Rainfall=4.85"

Area (ac)	CN	Description
4.120	69	50-75% Grass cover, Fair, HSG B
3.400	79	50-75% Grass cover, Fair, HSG C
0.110	55	Woods, Good, HSG B
0.400	85	Gravel roads, HSG B
0.030	91	Gravel roads, HSG D
17.430	58	Meadow, non-grazed, HSG B
5.890	78	Meadow, non-grazed, HSG D
31.380	66	Weighted Average
31.380		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.6	50	0.1500	0.23		**Sheet Flow, SF-1** Grass: Dense n= 0.240 P2= 3.39"
2.5	292	0.0800	1.98		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
18.8	1,118	0.0200	0.99		**Shallow Concentrated Flow, SCF-2** Short Grass Pasture Kv= 7.0 fps
24.9	1,460	Total			

Subcatchment 36S: POST AREA-11



Summary for Subcatchment 37S: POST AREA-12

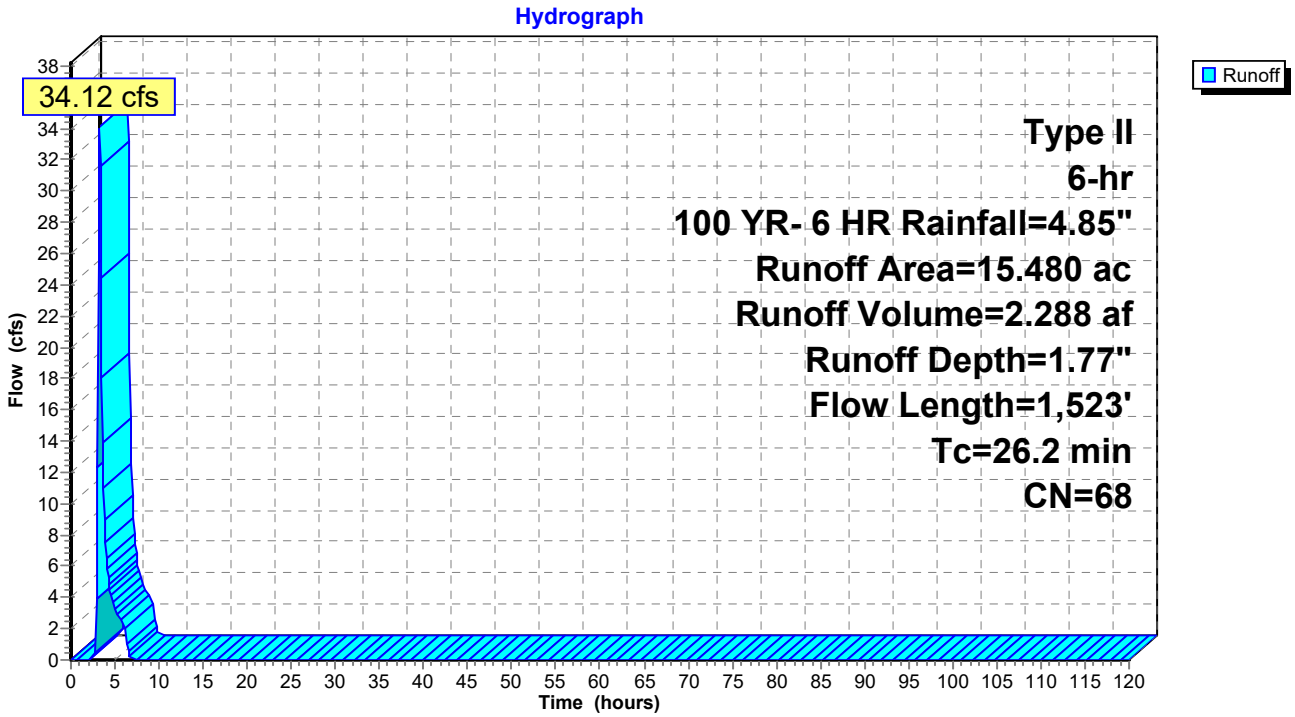
Runoff = 34.12 cfs @ 3.23 hrs, Volume= 2.288 af, Depth= 1.77"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 6-hr 100 YR- 6 HR Rainfall=4.85"

Area (ac)	CN	Description
1.470	69	50-75% Grass cover, Fair, HSG B
2.050	84	50-75% Grass cover, Fair, HSG D
7.570	58	Meadow, non-grazed, HSG B
3.700	78	Meadow, non-grazed, HSG D
0.690	85	Gravel roads, HSG B
15.480	68	Weighted Average
15.480		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	50	0.0400	0.14		**Sheet Flow, SF-1** Grass: Dense n= 0.240 P2= 3.39"
20.2	1,473	0.0300	1.21		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
26.2	1,523	Total			

Subcatchment 37S: POST AREA-12



Summary for Subcatchment 38S: POST AREA-13

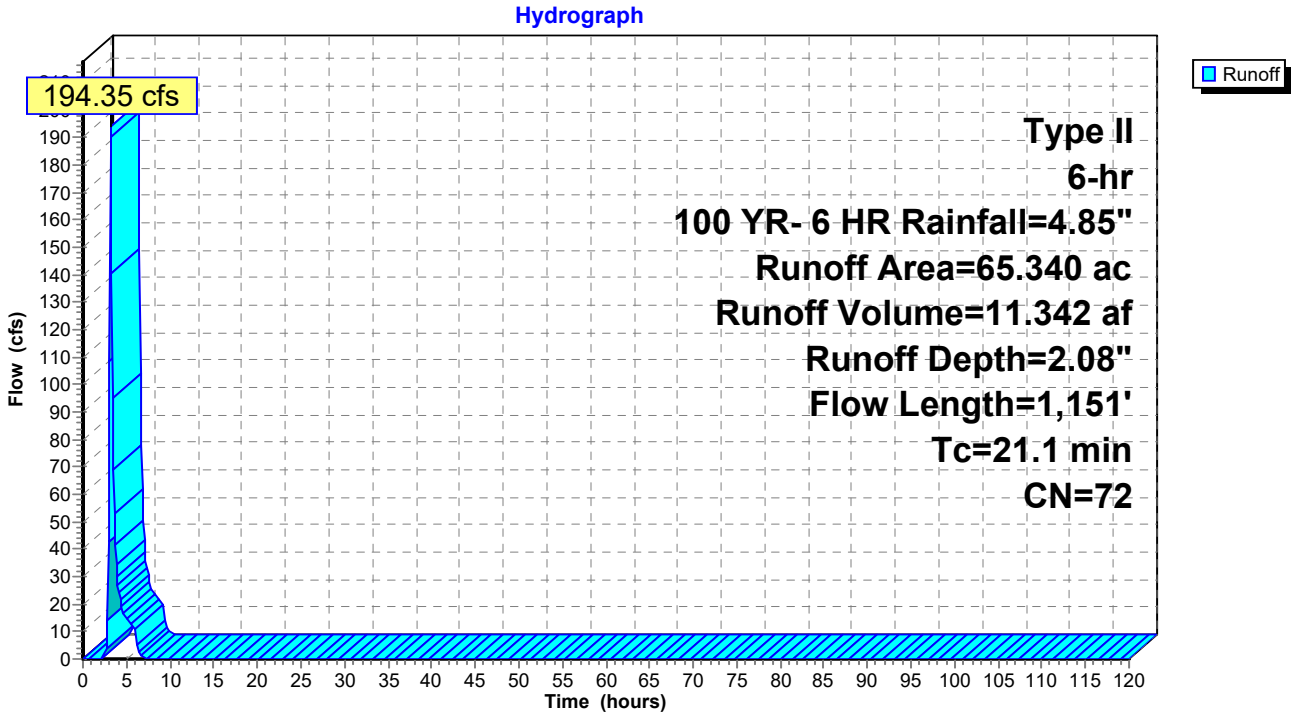
Runoff = 194.35 cfs @ 3.16 hrs, Volume= 11.342 af, Depth= 2.08"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 6-hr 100 YR- 6 HR Rainfall=4.85"

Area (ac)	CN	Description
17.980	69	50-75% Grass cover, Fair, HSG B
12.390	84	50-75% Grass cover, Fair, HSG D
3.610	55	Woods, Good, HSG B
4.340	77	Woods, Good, HSG D
9.800	58	Meadow, non-grazed, HSG B
16.960	78	Meadow, non-grazed, HSG D
0.260	91	Gravel roads, HSG D
65.340	72	Weighted Average
65.340		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	50	0.0400	0.14		**Sheet Flow, SF-1** Grass: Dense n= 0.240 P2= 3.39"
15.1	1,101	0.0300	1.21		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
21.1	1,151	Total			

Subcatchment 38S: POST AREA-13



Summary for Subcatchment 39S: POST AREA-14

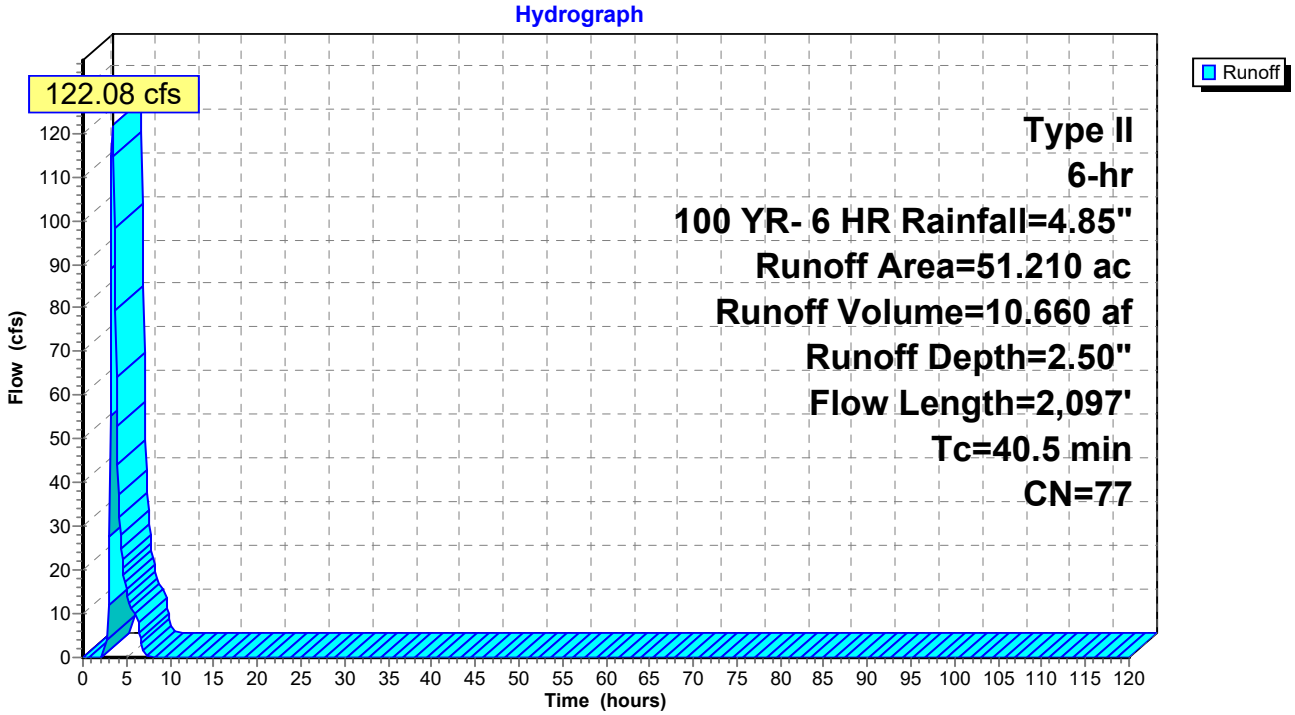
Runoff = 122.08 cfs @ 3.40 hrs, Volume= 10.660 af, Depth= 2.50"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 6-hr 100 YR- 6 HR Rainfall=4.85"

Area (ac)	CN	Description
5.440	69	50-75% Grass cover, Fair, HSG B
14.300	84	50-75% Grass cover, Fair, HSG D
0.070	77	Woods, Good, HSG D
5.260	58	Meadow, non-grazed, HSG B
25.740	78	Meadow, non-grazed, HSG D
0.400	91	Gravel roads, HSG D
51.210	77	Weighted Average
51.210		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	50	0.0400	0.14		**Sheet Flow, SF-1** Grass: Dense n= 0.240 P2= 3.39"
34.5	2,047	0.0200	0.99		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
40.5	2,097	Total			

Subcatchment 39S: POST AREA-14



Summary for Subcatchment 40S: POST AREA-15

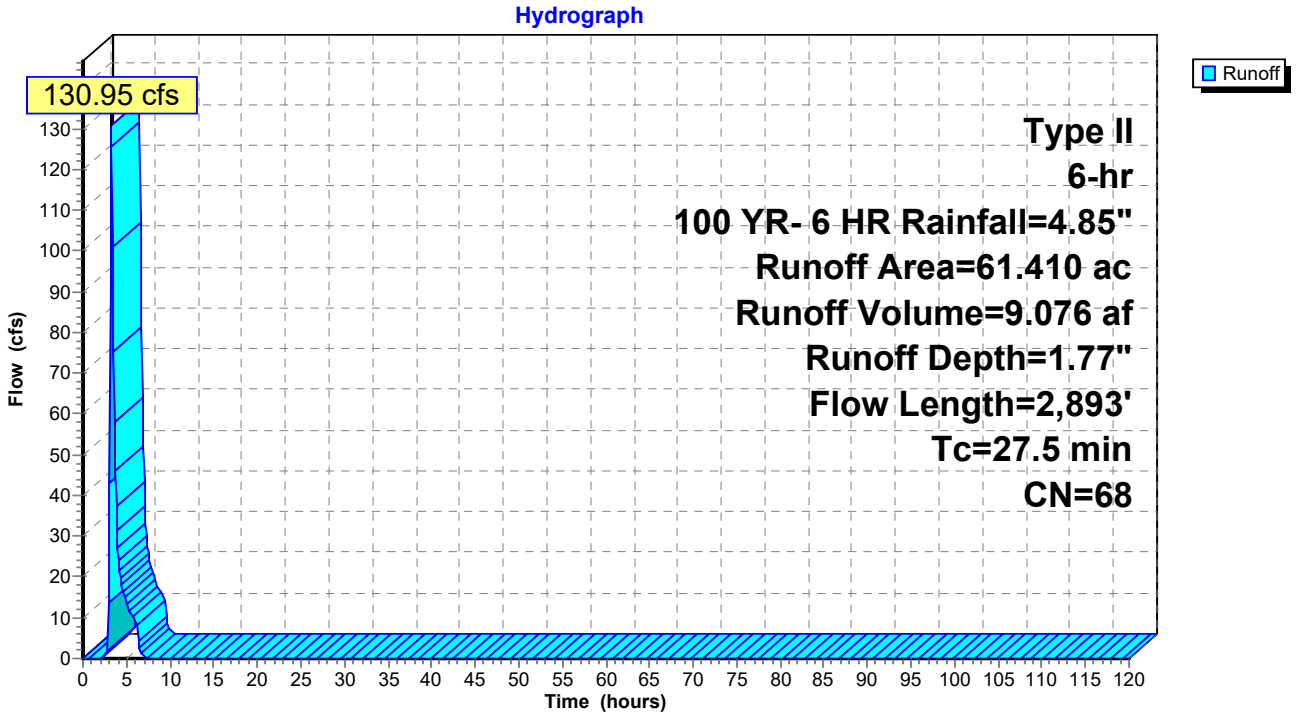
Runoff = 130.95 cfs @ 3.25 hrs, Volume= 9.076 af, Depth= 1.77"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 6-hr 100 YR- 6 HR Rainfall=4.85"

Area (ac)	CN	Description
7.280	84	50-75% Grass cover, Fair, HSG D
8.110	84	1 acre lots, 20% imp, HSG D
0.680	91	Gravel roads, HSG D
0.600	98	Water Surface, 0% imp, HSG D
36.590	58	Meadow, non-grazed, HSG B
8.150	78	Meadow, non-grazed, HSG D
61.410	68	Weighted Average
59.788		97.36% Pervious Area
1.622		2.64% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.8	50	0.0300	0.12		**Sheet Flow, SF-1** Grass: Dense n= 0.240 P2= 3.39"
16.5	1,201	0.0300	1.21		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
4.2	1,642	0.0400	6.58	42.79	**Channel Flow, CF-1** Area= 6.5 sf Perim= 12.0' r= 0.54' n= 0.030 Earth, grassed & winding
27.5	2,893	Total			

Subcatchment 40S: POST AREA-15



Summary for Subcatchment 41S: POST AREA-16

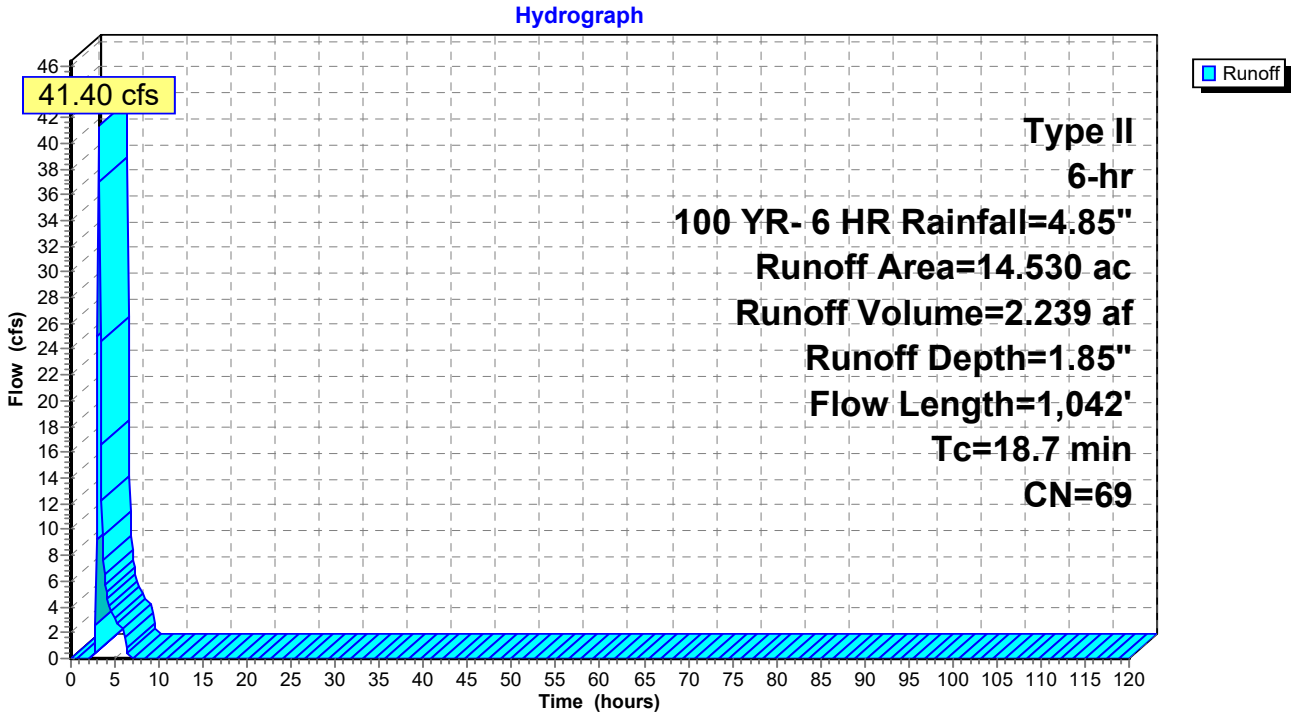
Runoff = 41.40 cfs @ 3.13 hrs, Volume= 2.239 af, Depth= 1.85"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 6-hr 100 YR- 6 HR Rainfall=4.85"

Area (ac)	CN	Description
2.540	69	50-75% Grass cover, Fair, HSG B
2.800	79	50-75% Grass cover, Fair, HSG C
0.640	84	1 acre lots, 20% imp, HSG D
0.560	91	Gravel roads, HSG D
4.590	58	Meadow, non-grazed, HSG B
3.400	71	Meadow, non-grazed, HSG C
14.530	69	Weighted Average
14.402		99.12% Pervious Area
0.128		0.88% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.2	50	0.1000	0.20		**Sheet Flow, SF-1** Grass: Dense n= 0.240 P2= 3.39"
2.3	268	0.0800	1.98		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
12.2	724	0.0200	0.99		**Shallow Concentrated Flow, SCF-2** Short Grass Pasture Kv= 7.0 fps
18.7	1,042	Total			

Subcatchment 41S: POST AREA-16



Summary for Subcatchment 42S: POST AREA-17

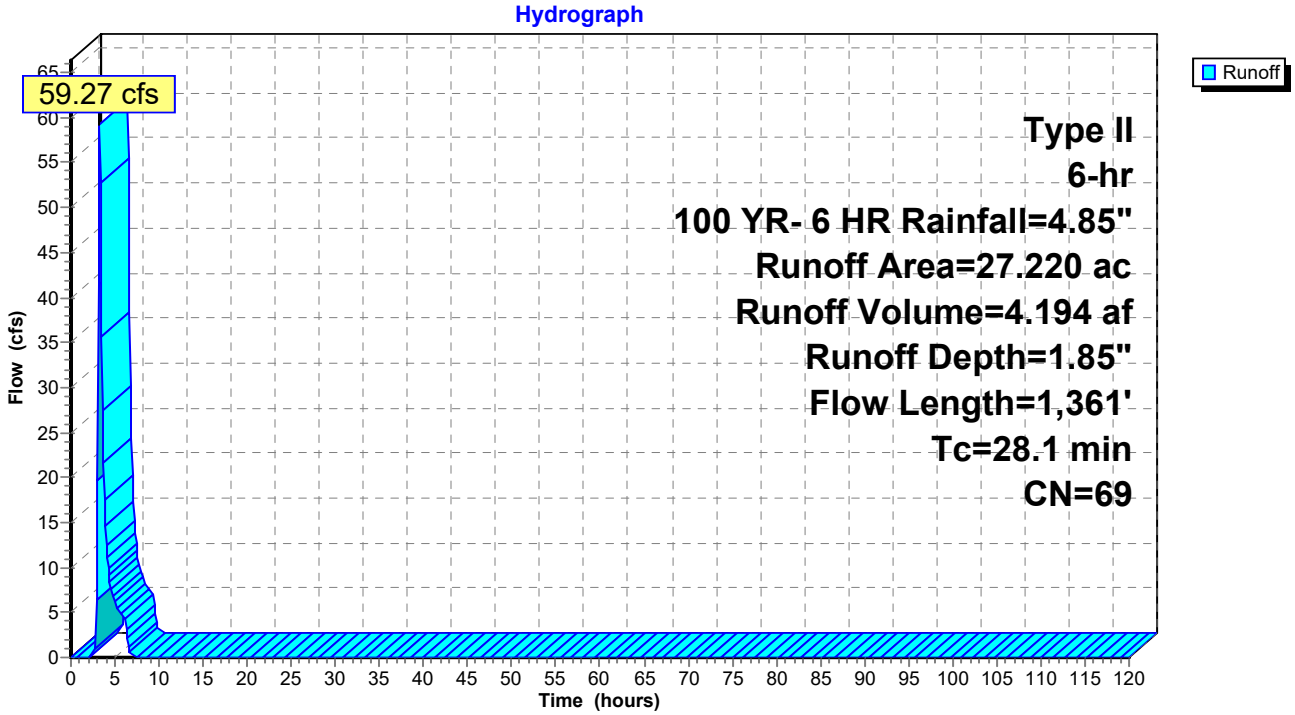
Runoff = 59.27 cfs @ 3.25 hrs, Volume= 4.194 af, Depth= 1.85"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 6-hr 100 YR- 6 HR Rainfall=4.85"

Area (ac)	CN	Description
3.080	69	50-75% Grass cover, Fair, HSG B
2.260	79	50-75% Grass cover, Fair, HSG C
1.030	84	1 acre lots, 20% imp, HSG D
11.040	58	Meadow, non-grazed, HSG B
9.810	78	Meadow, non-grazed, HSG D
27.220	69	Weighted Average
27.014		99.24% Pervious Area
0.206		0.76% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	50	0.0400	0.14		**Sheet Flow, SF-1** Grass: Dense n= 0.240 P2= 3.39"
22.1	1,311	0.0200	0.99		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
28.1	1,361	Total			

Subcatchment 42S: POST AREA-17



Summary for Subcatchment 43S: POST AREA-18

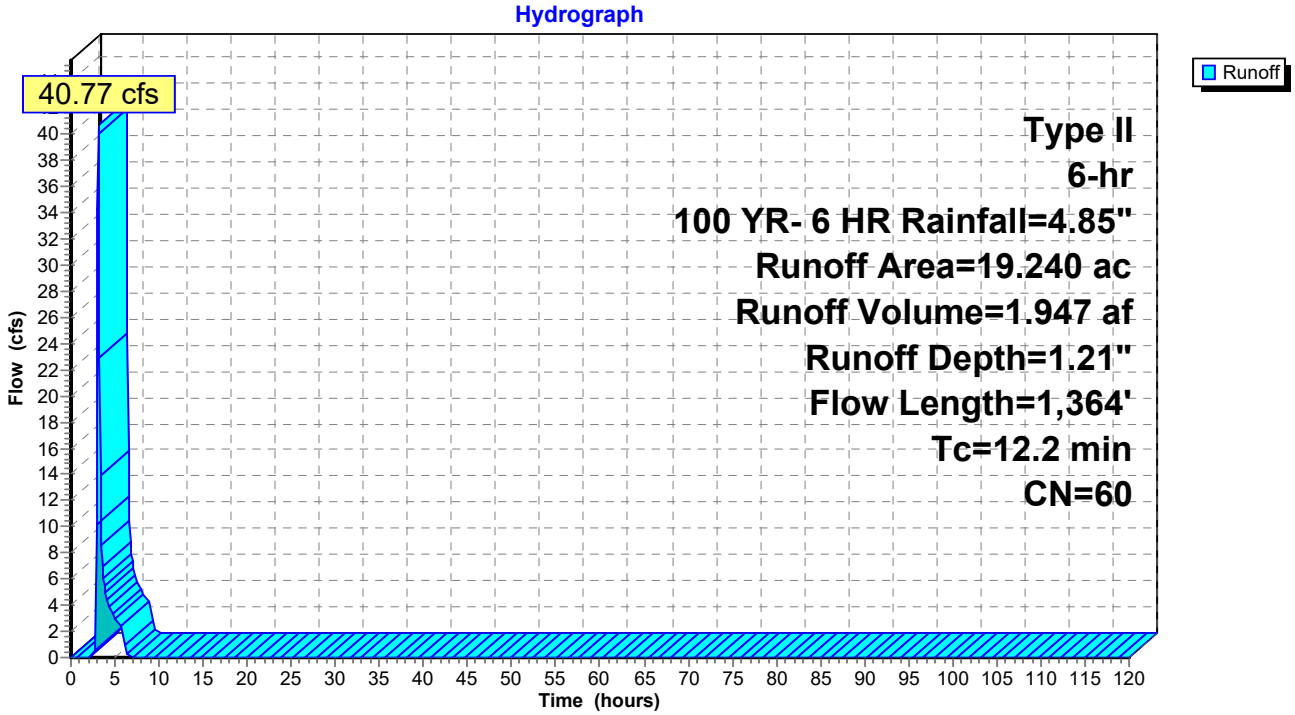
Runoff = 40.77 cfs @ 3.07 hrs, Volume= 1.947 af, Depth= 1.21"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 6-hr 100 YR- 6 HR Rainfall=4.85"

Area (ac)	CN	Description
0.710	55	Woods, Good, HSG B
0.320	70	Woods, Good, HSG C
1.690	69	50-75% Grass cover, Fair, HSG B
0.160	79	50-75% Grass cover, Fair, HSG C
15.370	58	Meadow, non-grazed, HSG B
0.990	78	Meadow, non-grazed, HSG D
19.240	60	Weighted Average
19.240		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.6	50	0.0800	0.18		**Sheet Flow, SF-1** Grass: Dense n= 0.240 P2= 3.39"
1.6	187	0.0800	1.98		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
6.0	1,127	0.0080	3.15	47.28	**Channel Flow,** Area= 15.0 sf Perim= 25.0' r= 0.60' n= 0.030
12.2	1,364	Total			

Subcatchment 43S: POST AREA-18



Summary for Subcatchment 44S: POST AREA-19

[49] Hint: Tc<2dt may require smaller dt

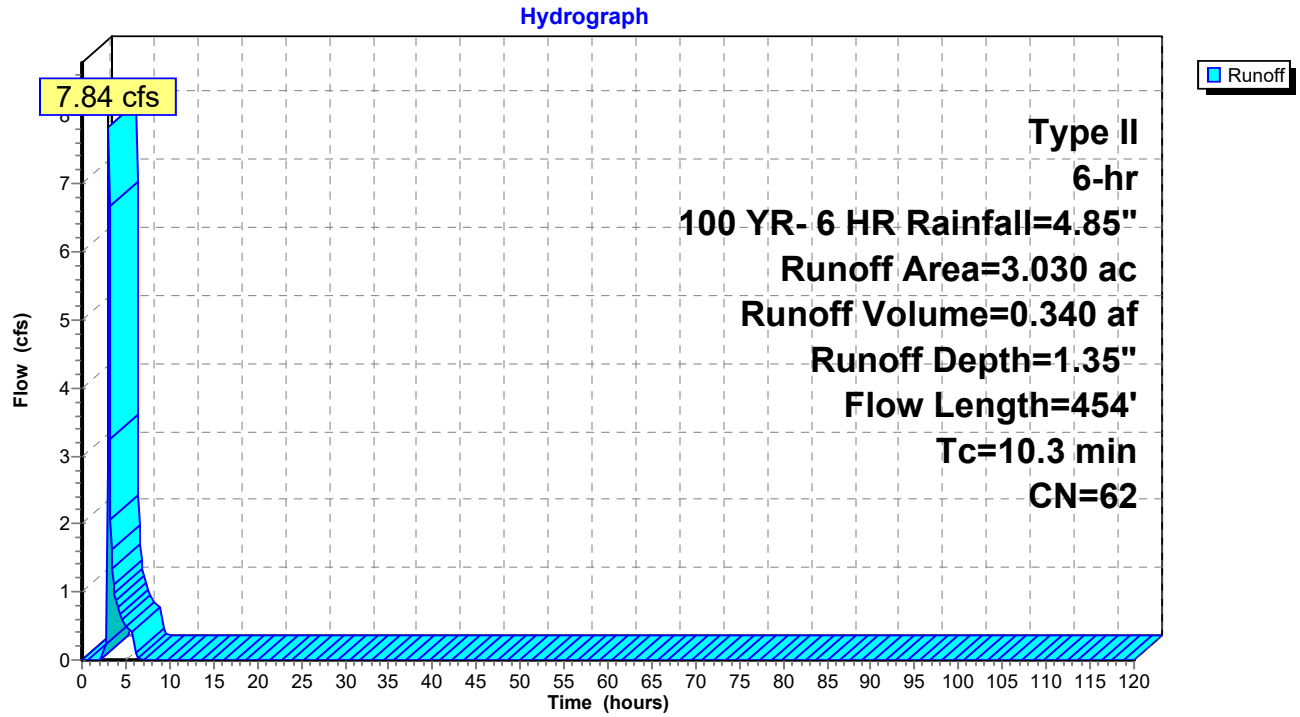
Runoff = 7.84 cfs @ 3.03 hrs, Volume= 0.340 af, Depth= 1.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 6-hr 100 YR- 6 HR Rainfall=4.85"

Area (ac)	CN	Description
1.260	55	Woods, Good, HSG B
1.360	69	50-75% Grass cover, Fair, HSG B
0.410	58	Meadow, non-grazed, HSG B
3.030	62	Weighted Average
3.030		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	50	0.0400	0.14		**Sheet Flow, SF-1** Grass: Dense n= 0.240 P2= 3.39"
4.3	404	0.0500	1.57		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
10.3	454	Total			

Subcatchment 44S: POST AREA-19



Summary for Subcatchment 45S: POST AREA-20

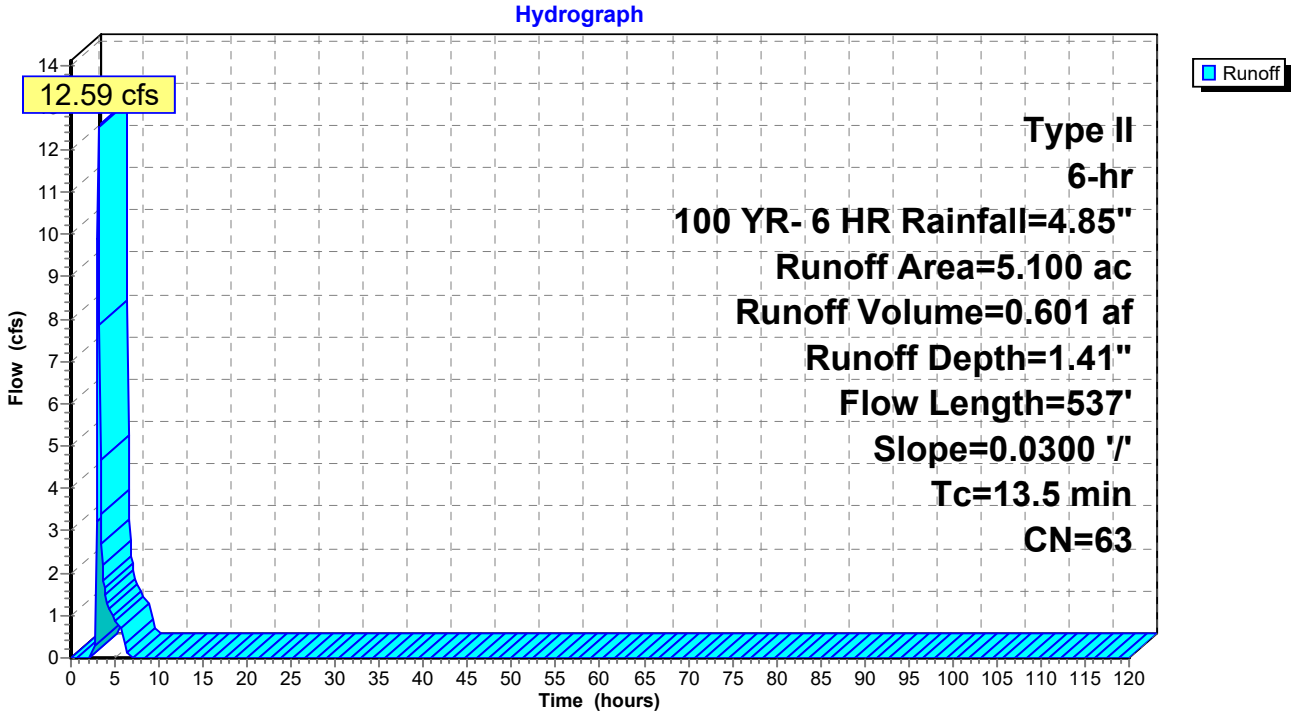
Runoff = 12.59 cfs @ 3.09 hrs, Volume= 0.601 af, Depth= 1.41"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 6-hr 100 YR- 6 HR Rainfall=4.85"

Area (ac)	CN	Description
0.640	55	Woods, Good, HSG B
2.530	69	50-75% Grass cover, Fair, HSG B
1.930	58	Meadow, non-grazed, HSG B
5.100	63	Weighted Average
5.100		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.8	50	0.0300	0.12		**Sheet Flow, SF-1** Grass: Dense n= 0.240 P2= 3.39"
6.7	487	0.0300	1.21		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
13.5	537	Total			

Subcatchment 45S: POST AREA-20



Summary for Subcatchment 46S: POST AREA-21

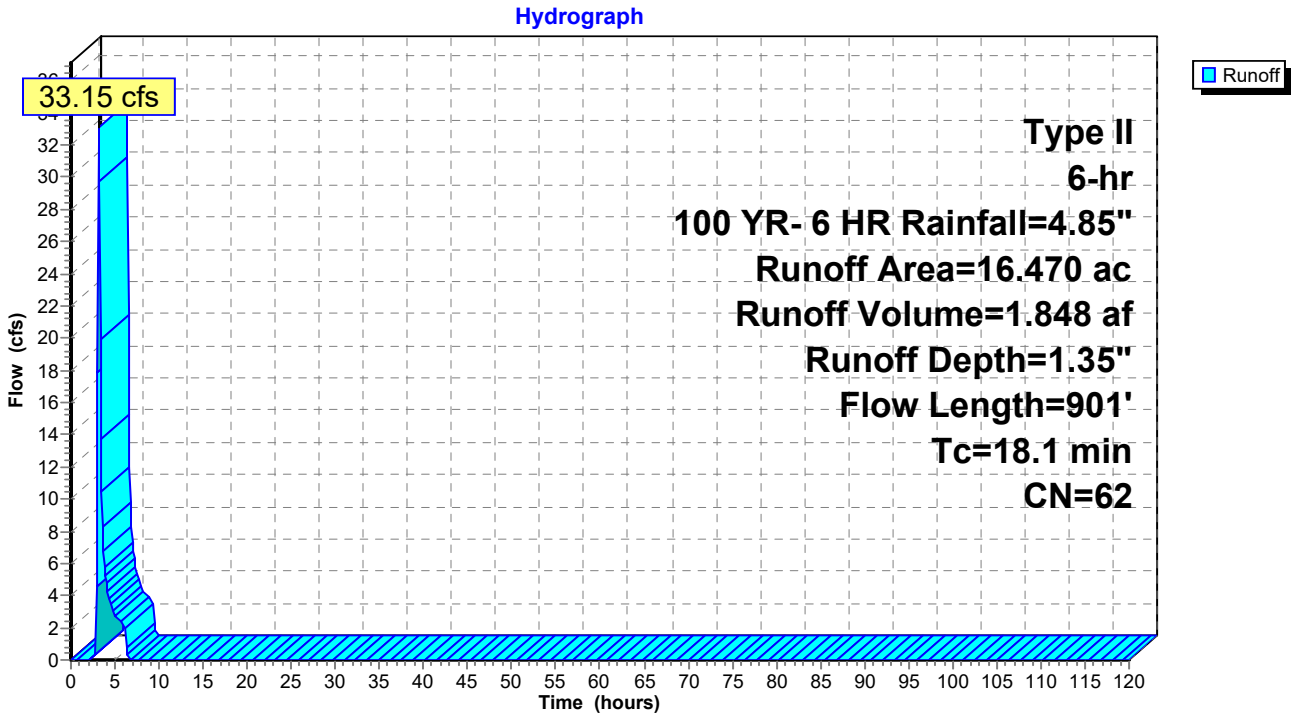
Runoff = 33.15 cfs @ 3.14 hrs, Volume= 1.848 af, Depth= 1.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 6-hr 100 YR- 6 HR Rainfall=4.85"

Area (ac)	CN	Description
0.870	55	Woods, Good, HSG B
0.390	70	Woods, Good, HSG C
4.430	69	50-75% Grass cover, Fair, HSG B
10.330	58	Meadow, non-grazed, HSG B
0.450	85	Gravel roads, HSG B
16.470	62	Weighted Average
16.470		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.0	50	0.0200	0.10		**Sheet Flow, SF-1** Grass: Dense n= 0.240 P2= 3.39"
10.1	851	0.0400	1.40		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
18.1	901	Total			

Subcatchment 46S: POST AREA-21



Summary for Subcatchment 47S: POST AREA-22

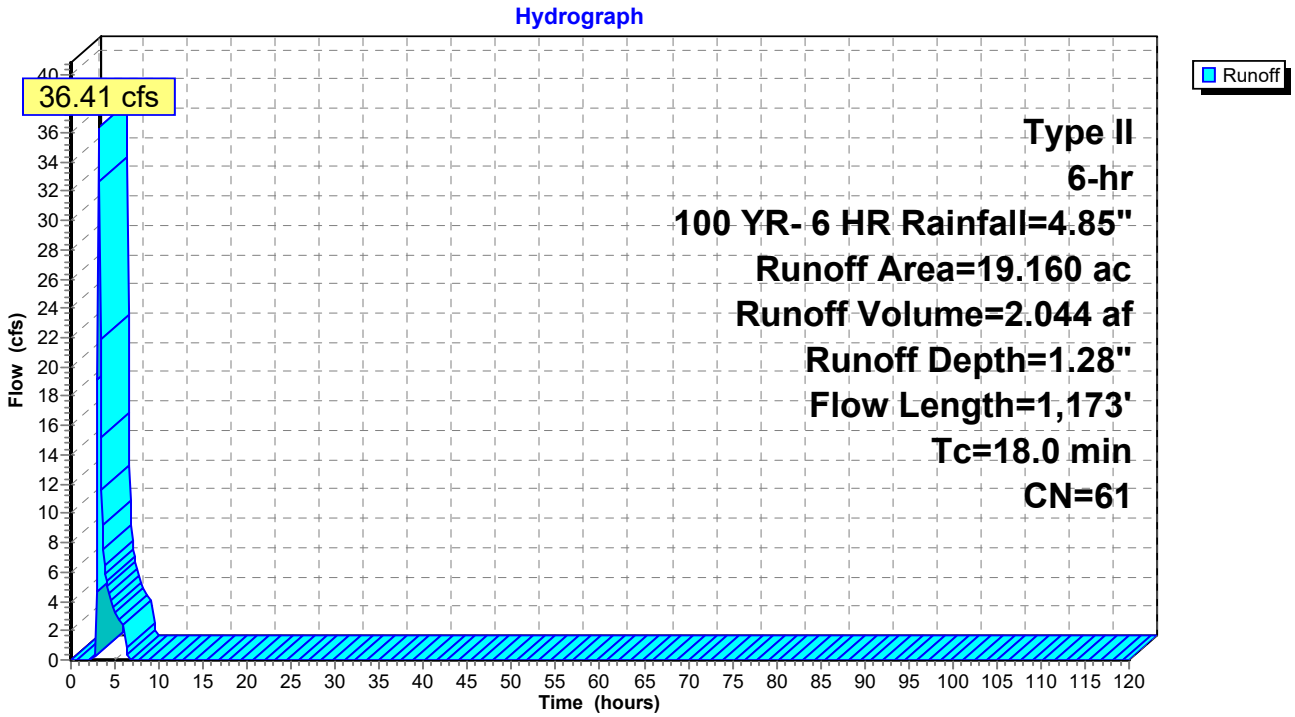
Runoff = 36.41 cfs @ 3.14 hrs, Volume= 2.044 af, Depth= 1.28"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 6-hr 100 YR- 6 HR Rainfall=4.85"

Area (ac)	CN	Description
0.530	55	Woods, Good, HSG B
2.570	69	50-75% Grass cover, Fair, HSG B
13.650	58	Meadow, non-grazed, HSG B
2.100	71	Meadow, non-grazed, HSG C
0.310	85	Gravel roads, HSG B
19.160	61	Weighted Average
19.160		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	50	0.0400	0.14		**Sheet Flow, SF-1** Grass: Dense n= 0.240 P2= 3.39"
12.0	1,123	0.0500	1.57		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
18.0	1,173	Total			

Subcatchment 47S: POST AREA-22



Summary for Subcatchment 48S: POST AREA-23

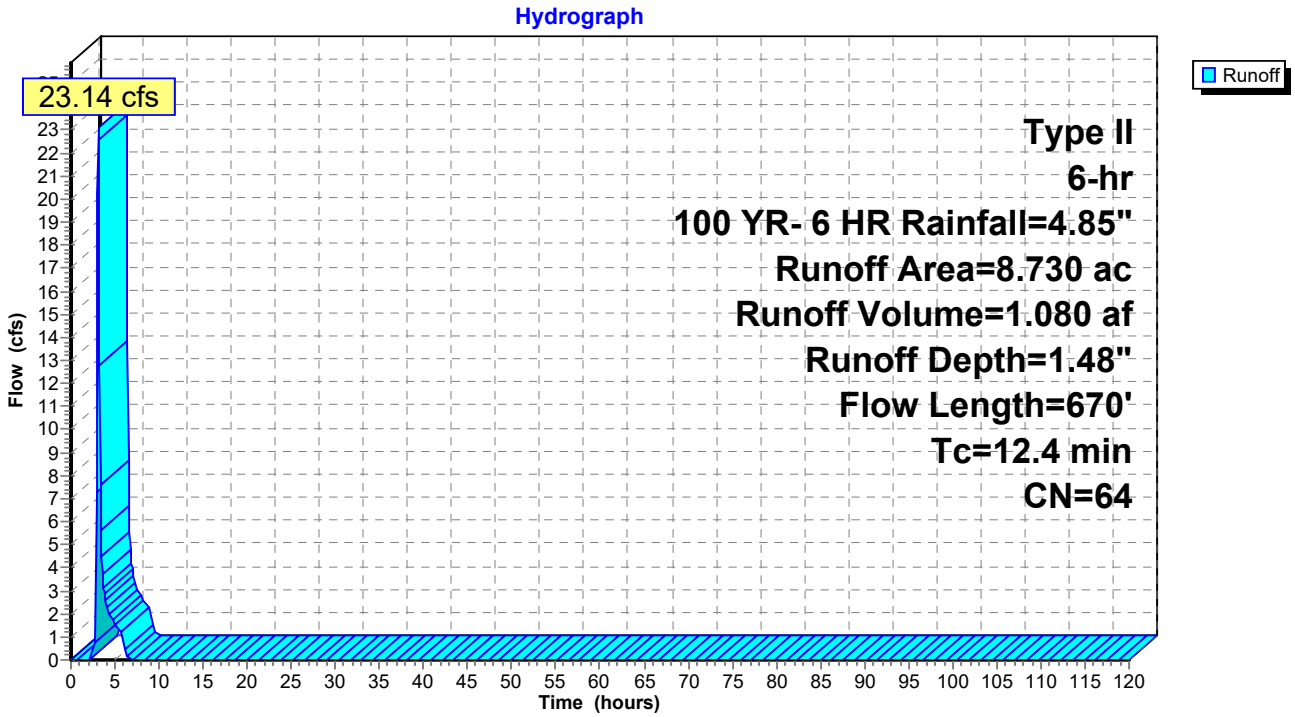
Runoff = 23.14 cfs @ 3.07 hrs, Volume= 1.080 af, Depth= 1.48"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 6-hr 100 YR- 6 HR Rainfall=4.85"

Area (ac)	CN	Description
3.620	55	Woods, Good, HSG B
1.010	70	Woods, Good, HSG C
4.100	71	Meadow, non-grazed, HSG C
8.730	64	Weighted Average
8.730		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	50	0.0400	0.14		**Sheet Flow, SF-1** Grass: Dense n= 0.240 P2= 3.39"
2.0	210	0.0600	1.71		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
4.4	410	0.0500	1.57		**Shallow Concentrated Flow, SCF-2** Short Grass Pasture Kv= 7.0 fps
12.4	670	Total			

Subcatchment 48S: POST AREA-23



Summary for Subcatchment 49S: POST AREA-24

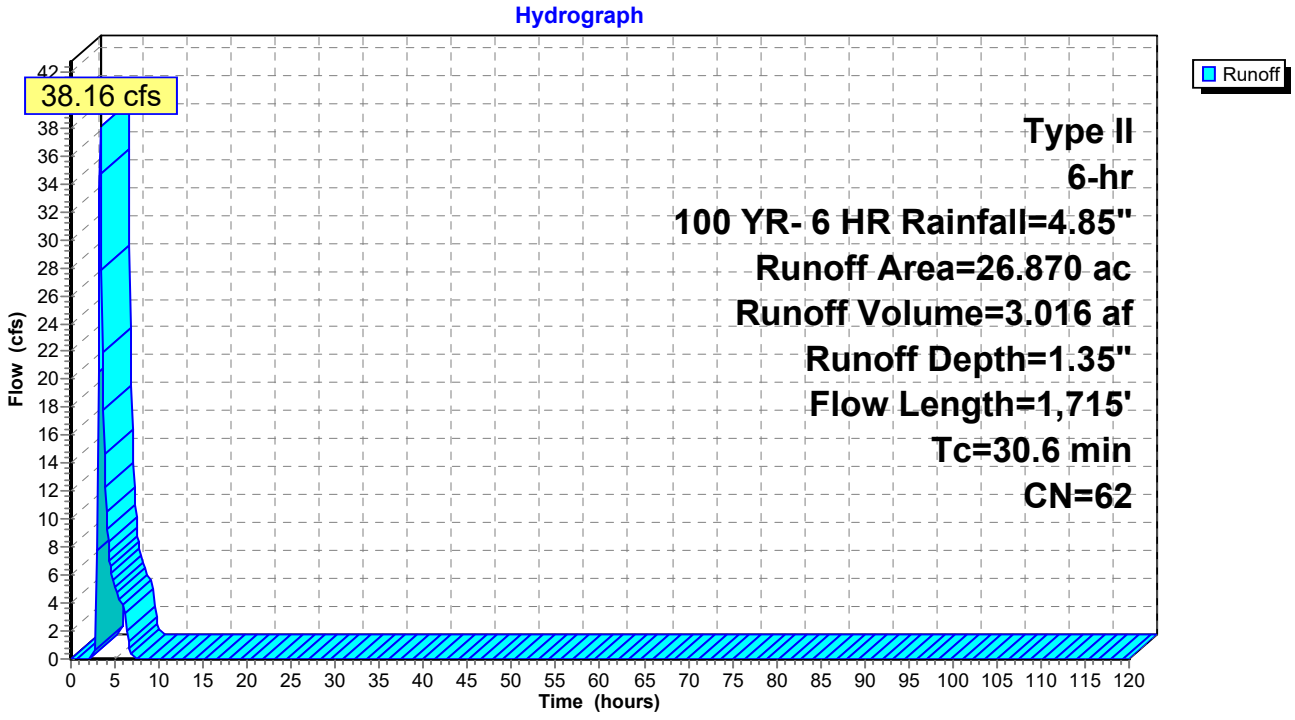
Runoff = 38.16 cfs @ 3.31 hrs, Volume= 3.016 af, Depth= 1.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 6-hr 100 YR- 6 HR Rainfall=4.85"

Area (ac)	CN	Description
2.610	55	Woods, Good, HSG B
4.460	69	50-75% Grass cover, Fair, HSG B
0.570	79	50-75% Grass cover, Fair, HSG C
16.660	58	Meadow, non-grazed, HSG B
2.570	78	Meadow, non-grazed, HSG D
26.870	62	Weighted Average
26.870		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.5	50	0.0100	0.08		**Sheet Flow, SF-1** Grass: Dense n= 0.240 P2= 3.39"
5.3	586	0.0700	1.85		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
14.8	1,079	0.0300	1.21		**Shallow Concentrated Flow, SCF-2** Short Grass Pasture Kv= 7.0 fps
30.6	1,715	Total			

Subcatchment 49S: POST AREA-24



Summary for Subcatchment 50S: POST AREA-25

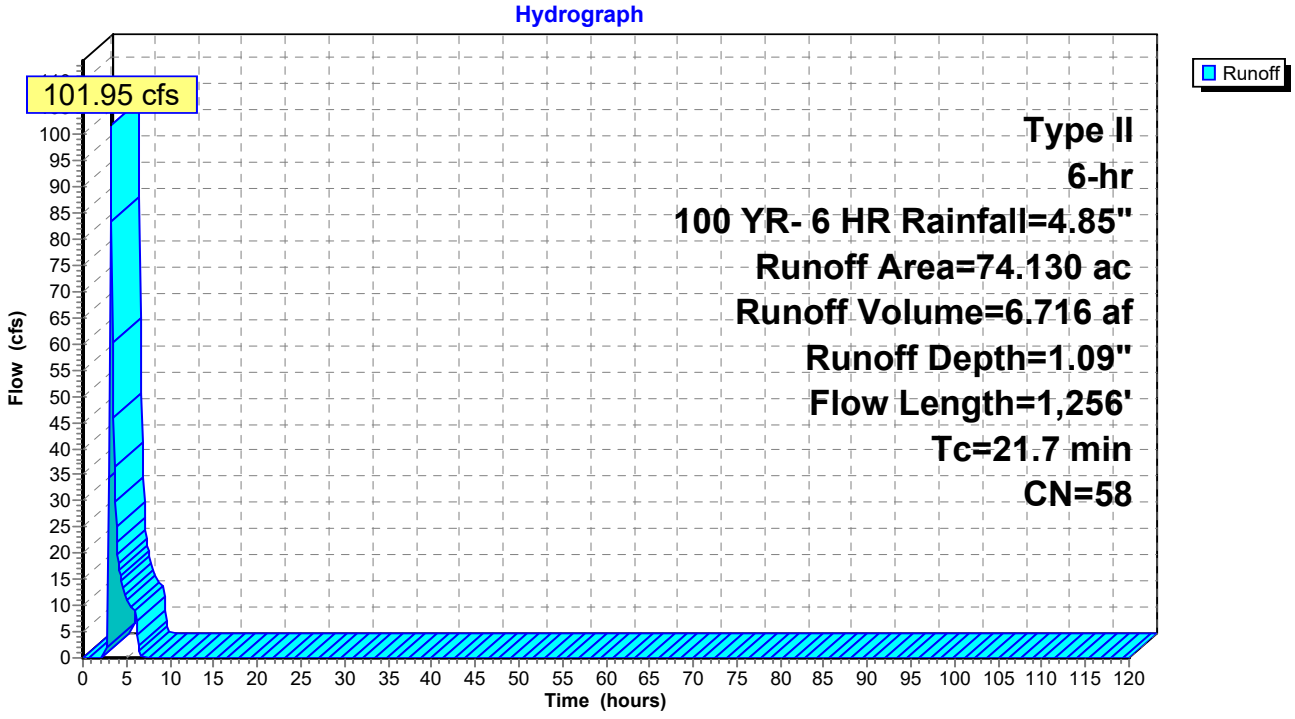
Runoff = 101.95 cfs @ 3.20 hrs, Volume= 6.716 af, Depth= 1.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 6-hr 100 YR- 6 HR Rainfall=4.85"

Area (ac)	CN	Description
1.200	69	50-75% Grass cover, Fair, HSG B
72.620	58	Meadow, non-grazed, HSG B
0.310	85	Gravel roads, HSG B
74.130	58	Weighted Average
74.130		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.1	50	0.0600	0.16		**Sheet Flow, SF-1** Grass: Dense n= 0.240 P2= 3.39"
16.6	1,206	0.0300	1.21		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
21.7	1,256	Total			

Subcatchment 50S: POST AREA-25



Summary for Subcatchment 55S: POST AREA-26(Gen-Tie Route)

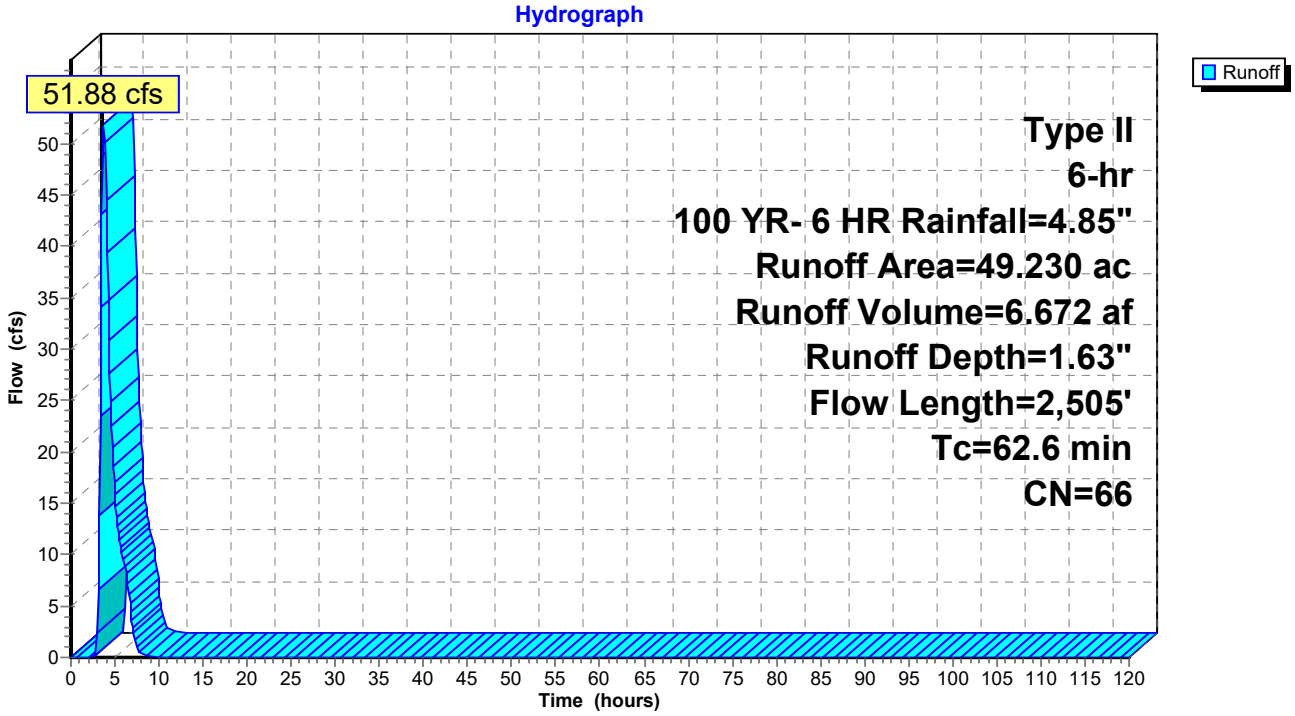
Runoff = 51.88 cfs @ 3.74 hrs, Volume= 6.672 af, Depth= 1.63"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Type II 6-hr 100 YR- 6 HR Rainfall=4.85"

Area (ac)	CN	Description
33.070	69	50-75% Grass cover, Fair, HSG B
7.900	55	Woods, Good, HSG B
2.750	85	Gravel roads, HSG B
5.510	58	Meadow, non-grazed, HSG B
49.230	66	Weighted Average
49.230		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.1	50	0.0400	0.20		**Sheet Flow, SF-1** Grass: Short n= 0.150 P2= 3.39"
58.5	2,455	0.0100	0.70		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
62.6	2,505	Total			

Subcatchment 55S: POST AREA-26(Gen-Tie Route)



Summary for Pond 53P: Exisitng Wetland

Inflow Area = 7.840 ac, 0.00% Impervious, Inflow Depth = 1.35" for 100 YR- 6 HR event
Inflow = 16.09 cfs @ 3.13 hrs, Volume= 0.880 af
Outflow = 4.76 cfs @ 3.52 hrs, Volume= 0.749 af, Atten= 70%, Lag= 23.4 min
Primary = 4.76 cfs @ 3.52 hrs, Volume= 0.749 af

Routing by Stor-Ind method, Time Span= 0.00-120.00 hrs, dt= 0.10 hrs
Peak Elev= 718.57' @ 3.52 hrs Surf.Area= 8,718 sf Storage= 15,929 cf

Plug-Flow detention time= 63.1 min calculated for 0.748 af (85% of inflow)
Center-of-Mass det. time= 47.0 min (274.4 - 227.4)

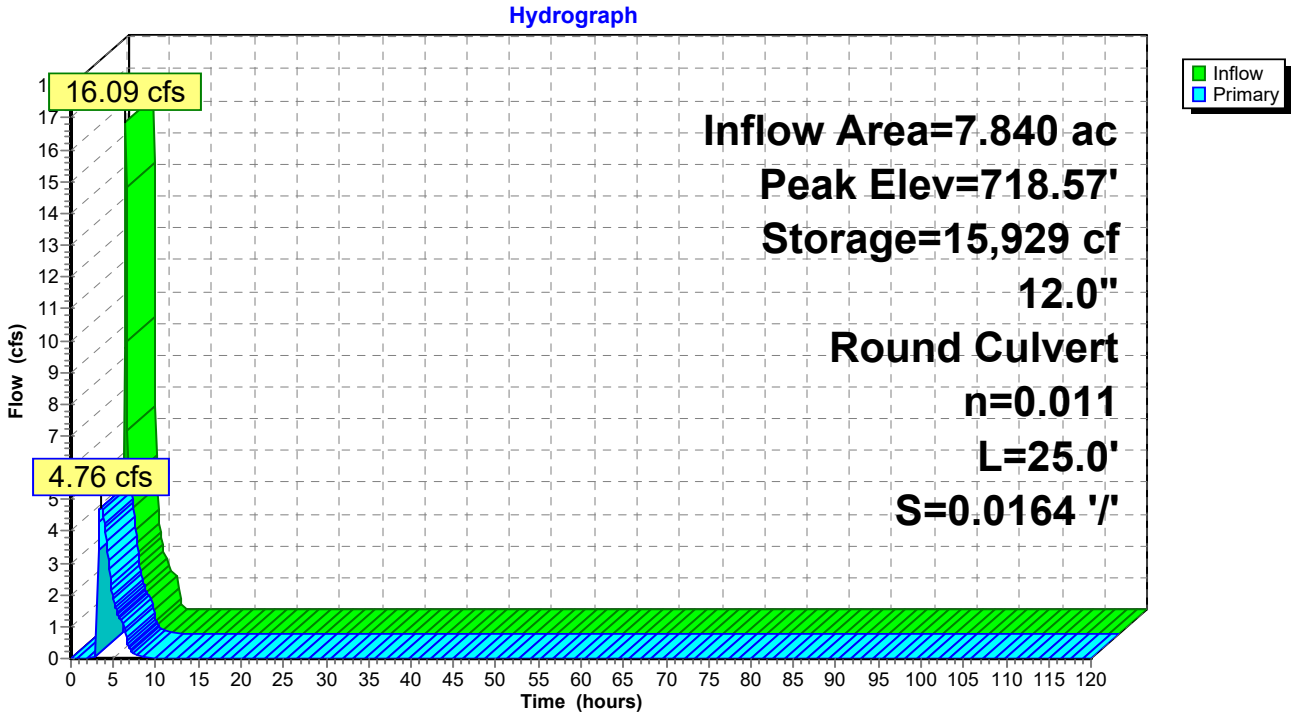
Volume	Invert	Avail.Storage	Storage Description
#1	715.00'	128,076 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
715.00	2,360	0	0
716.00	2,360	2,360	2,360
718.00	6,807	9,167	11,527
720.00	13,548	20,355	31,882
722.00	23,063	36,611	68,493
724.00	36,520	59,583	128,076

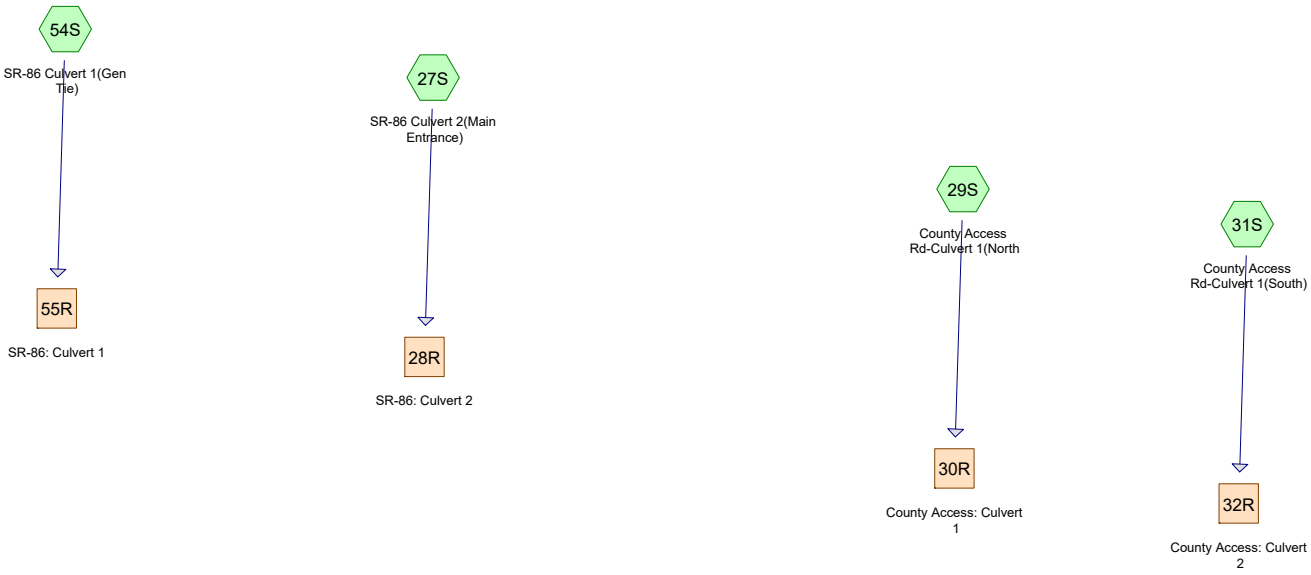
Device	Routing	Invert	Outlet Devices
#1	Primary	716.97'	**12.0" Round Culvert** L= 25.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 716.97' / 716.56' S= 0.0164 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.79 sf

Primary OutFlow Max=4.76 cfs @ 3.52 hrs HW=718.56' (Free Discharge)
1=Culvert (Barrel Controls 4.76 cfs @ 6.05 fps)

Pond 53P: Exisitng Wetland



Appendix E – State Route Entrance Culvert Designs



Subcat Reach Pond Link

Routing Diagram for Access Drive Culverts
Prepared by TRC, Printed 5/11/2021
HydroCAD® 10.00-11 s/n 01402 © 2014 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
3.220	84	1 acre lots, 20% imp, HSG D (54S)
0.500	91	Gravel roads, HSG D (54S)
5.300	85	Row crops, SR + CR, Good, HSG D (27S, 29S, 31S)
3.600	77	Woods, Good, HSG D (54S)
12.620	**83**	**TOTAL AREA**

Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Diam/Width (inches)	Height (inches)	Inside-Fill (inches)
1	28R	710.00	709.00	36.0	0.0278	0.012	18.0	0.0	0.0
2	30R	735.25	734.76	36.0	0.0136	0.012	18.0	0.0	0.0
3	32R	715.50	715.12	36.0	0.0106	0.012	18.0	0.0	0.0
4	55R	712.00	711.00	36.0	0.0278	0.012	18.0	0.0	0.0

Time span=0.01-99.00 hrs, dt=0.05 hrs, 1981 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 27S: SR-86 Culvert 2(Main Runoff Area=4.900 ac 0.00% Impervious Runoff Depth=1.48"
Flow Length=730' Tc=18.3 min CN=85 Runoff=8.43 cfs 0.604 af

Subcatchment 29S: County Access Runoff Area=0.200 ac 0.00% Impervious Runoff Depth=1.48"
Tc=5.0 min CN=85 Runoff=0.54 cfs 0.025 af

Subcatchment 31S: County Access Runoff Area=0.200 ac 0.00% Impervious Runoff Depth=1.48"
Tc=5.0 min CN=85 Runoff=0.54 cfs 0.025 af

Subcatchment 54S: SR-86 Culvert 1(Gen Tie) Runoff Area=7.320 ac 8.80% Impervious Runoff Depth=1.21"
Flow Length=934' Tc=21.6 min CN=81 Runoff=9.27 cfs 0.741 af

Reach 28R: SR-86: Culvert 2 Avg. Flow Depth=0.70' Max Vel=10.42 fps Inflow=8.43 cfs 0.604 af
18.0" Round Pipe n=0.012 L=36.0' S=0.0278 '/' Capacity=18.97 cfs Outflow=8.42 cfs 0.604 af

Reach 30R: County Access: Culvert 1 Avg. Flow Depth=0.21' Max Vel=3.67 fps Inflow=0.54 cfs 0.025 af
18.0" Round Pipe n=0.012 L=36.0' S=0.0136 '/' Capacity=13.28 cfs Outflow=0.53 cfs 0.025 af

Reach 32R: County Access: Culvert 2 Avg. Flow Depth=0.22' Max Vel=3.36 fps Inflow=0.54 cfs 0.025 af
18.0" Round Pipe n=0.012 L=36.0' S=0.0106 '/' Capacity=11.69 cfs Outflow=0.53 cfs 0.025 af

Reach 55R: SR-86: Culvert 1 Avg. Flow Depth=0.74' Max Vel=10.67 fps Inflow=9.27 cfs 0.741 af
18.0" Round Pipe n=0.012 L=36.0' S=0.0278 '/' Capacity=18.97 cfs Outflow=9.26 cfs 0.741 af

Total Runoff Area = 12.620 ac Runoff Volume = 1.394 af Average Runoff Depth = 1.33"
94.90% Pervious = 11.976 ac 5.10% Impervious = 0.644 ac

Summary for Subcatchment 27S: SR-86 Culvert 2(Main Entrance)

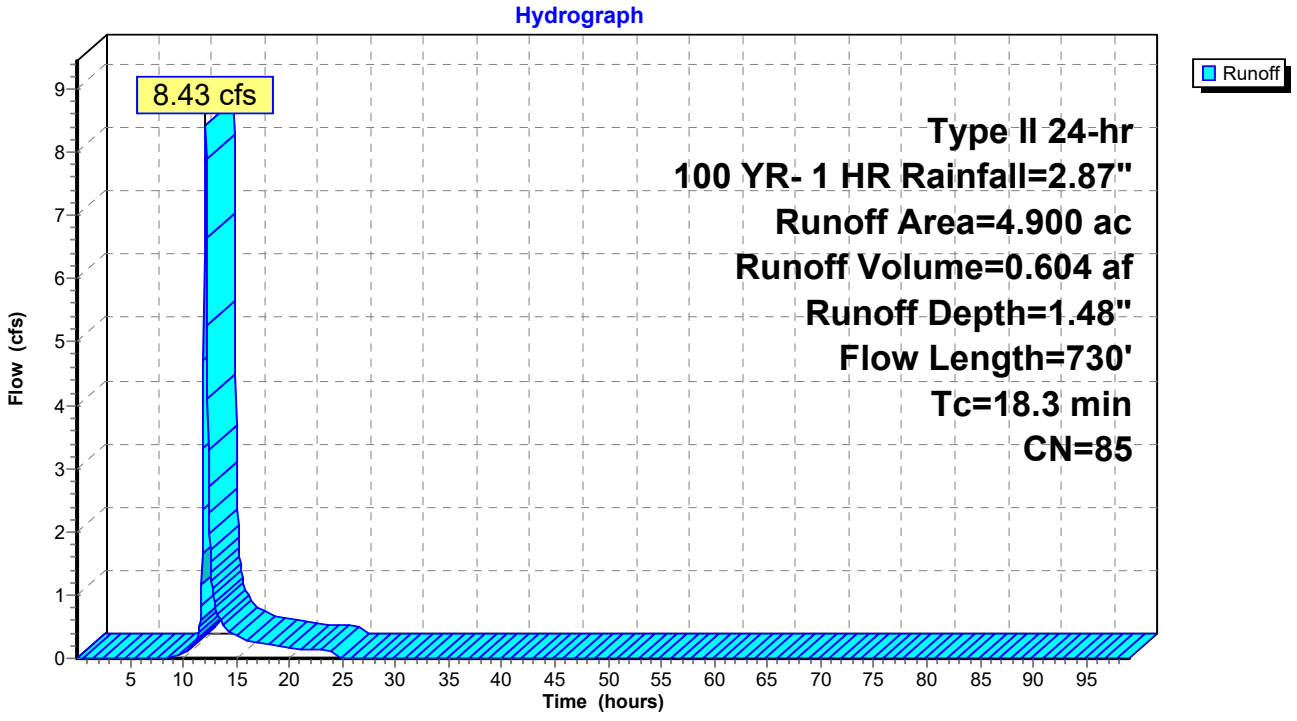
Runoff = 8.43 cfs @ 12.11 hrs, Volume= 0.604 af, Depth= 1.48"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.01-99.01 hrs, dt= 0.05 hrs
Type II 24-hr 100 YR- 1 HR Rainfall=2.87"

Area (ac)	CN	Description
4.900	85	Row crops, SR + CR, Good, HSG D
4.900		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.2	50	0.0300	0.08		**Sheet Flow, SF-1** Woods: Light underbrush n= 0.400 P2= 3.39"
8.1	680	0.0400	1.40		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
18.3	730	Total			

Subcatchment 27S: SR-86 Culvert 2(Main Entrance)



Summary for Subcatchment 29S: County Access Rd-Culvert 1(North

[49] Hint: Tc<2dt may require smaller dt

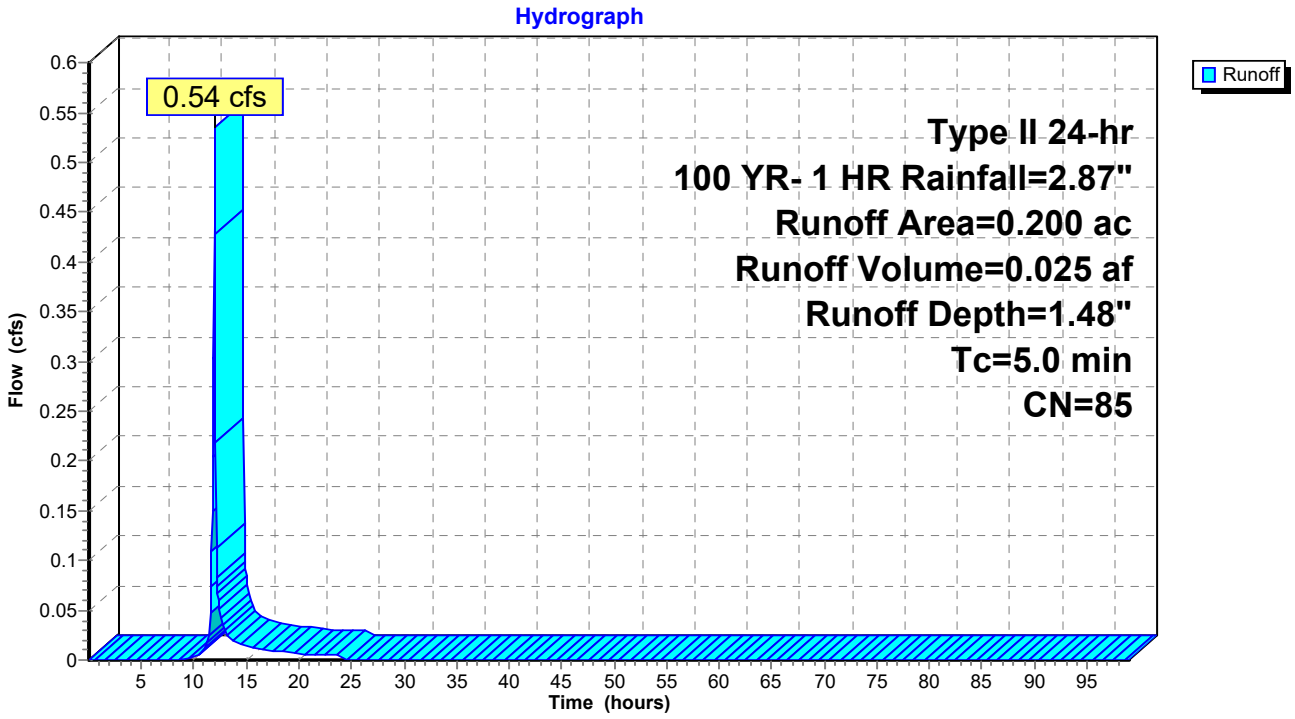
Runoff = 0.54 cfs @ 11.96 hrs, Volume= 0.025 af, Depth= 1.48"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.01-99.01 hrs, dt= 0.05 hrs
Type II 24-hr 100 YR- 1 HR Rainfall=2.87"

Area (ac)	CN	Description
0.200	85	Row crops, SR + CR, Good, HSG D
0.200		100.00% Pervious Area

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

Subcatchment 29S: County Access Rd-Culvert 1(North



Summary for Subcatchment 31S: County Access Rd-Culvert 1(South)

[49] Hint: Tc<2dt may require smaller dt

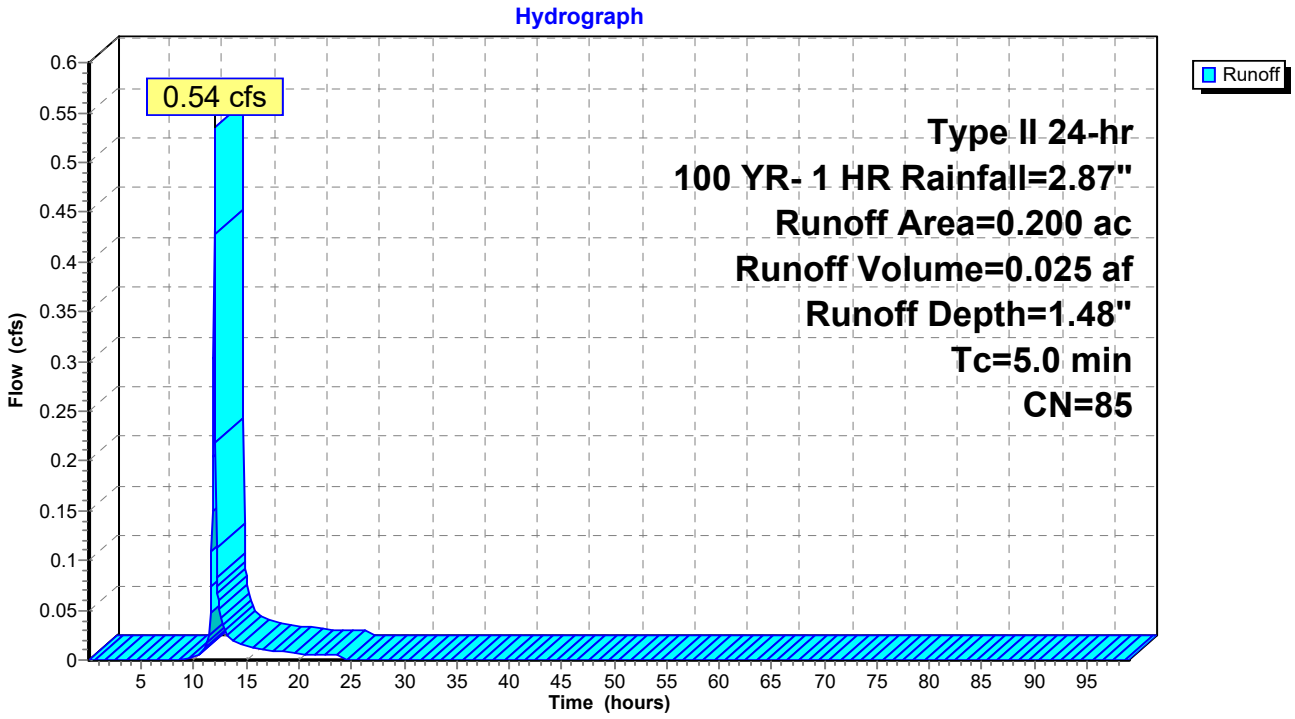
Runoff = 0.54 cfs @ 11.96 hrs, Volume= 0.025 af, Depth= 1.48"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.01-99.01 hrs, dt= 0.05 hrs
Type II 24-hr 100 YR- 1 HR Rainfall=2.87"

Area (ac)	CN	Description
0.200	85	Row crops, SR + CR, Good, HSG D
0.200		100.00% Pervious Area

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

Subcatchment 31S: County Access Rd-Culvert 1(South)



Summary for Subcatchment 54S: SR-86 Culvert 1(Gen Tie)

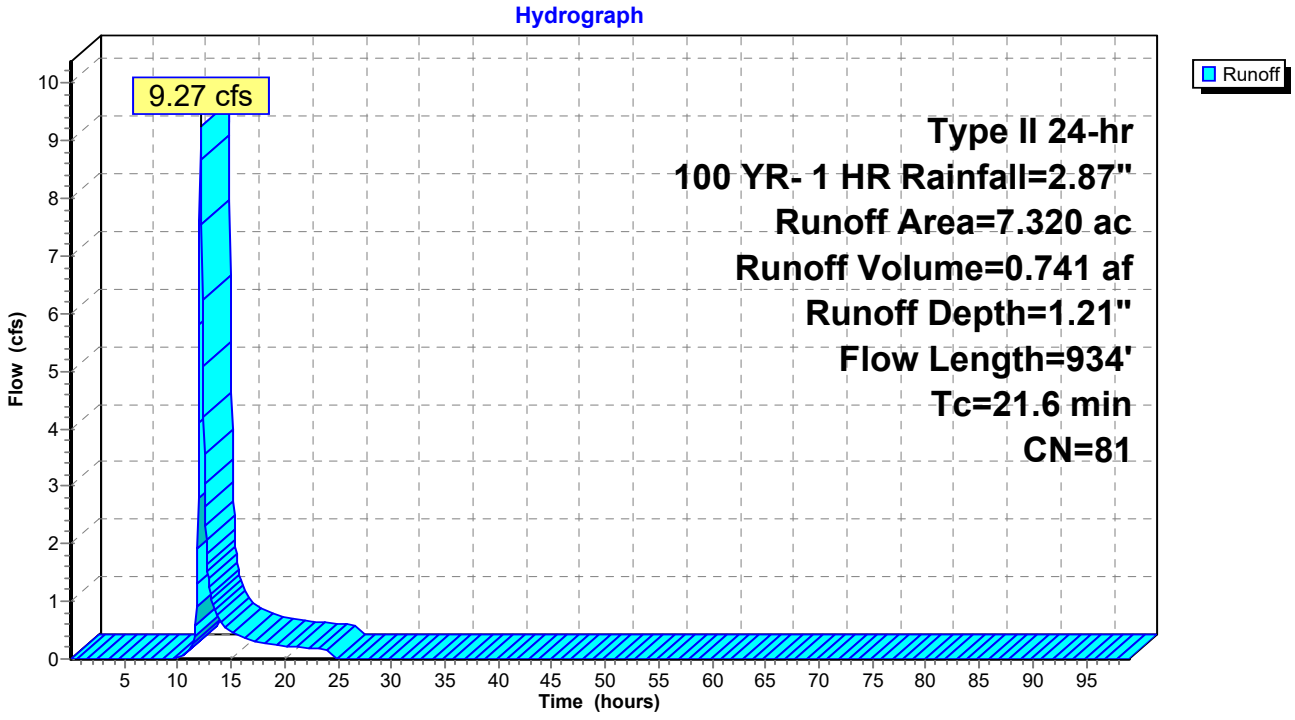
Runoff = 9.27 cfs @ 12.15 hrs, Volume= 0.741 af, Depth= 1.21"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.01-99.01 hrs, dt= 0.05 hrs
Type II 24-hr 100 YR- 1 HR Rainfall=2.87"

Area (ac)	CN	Description
3.600	77	Woods, Good, HSG D
3.220	84	1 acre lots, 20% imp, HSG D
0.500	91	Gravel roads, HSG D
7.320	81	Weighted Average
6.676		91.20% Pervious Area
0.644		8.80% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0	50	0.0200	0.07		**Sheet Flow, SF-1** Woods: Light underbrush n= 0.400 P2= 3.39"
9.3	674	0.0300	1.21		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
0.3	210	0.0200	12.33	27.13	**Channel Flow, Road side swale** Area= 2.2 sf Perim= 1.5' r= 1.47' n= 0.022 Earth, clean & straight
21.6	934	Total			

Subcatchment 54S: SR-86 Culvert 1(Gen Tie)



Summary for Reach 28R: SR-86: Culvert 2

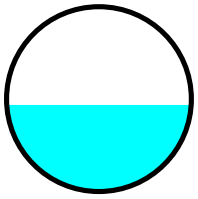
[52] Hint: Inlet/Outlet conditions not evaluated

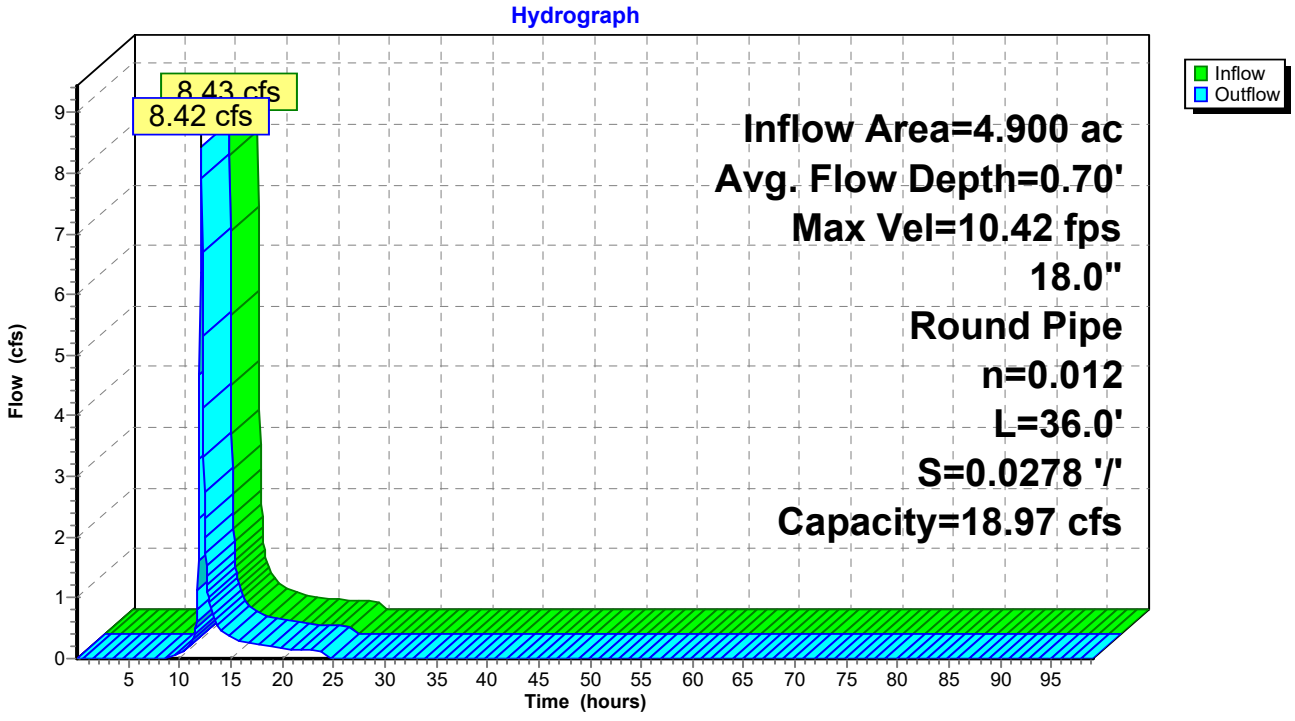
Inflow Area = 4.900 ac, 0.00% Impervious, Inflow Depth = 1.48" for 100 YR- 1 HR event
Inflow = 8.43 cfs @ 12.11 hrs, Volume= 0.604 af
Outflow = 8.42 cfs @ 12.11 hrs, Volume= 0.604 af, Atten= 0%, Lag= 0.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.01-99.01 hrs, dt= 0.05 hrs
Max. Velocity= 10.42 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 3.64 fps, Avg. Travel Time= 0.2 min

Peak Storage= 29 cf @ 12.11 hrs
Average Depth at Peak Storage= 0.70'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 18.97 cfs

18.0" Round Pipe
n= 0.012 Steel, smooth
Length= 36.0' Slope= 0.0278 '/'
Inlet Invert= 710.00', Outlet Invert= 709.00'





Summary for Reach 30R: County Access: Culvert 1

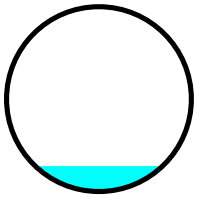
[52] Hint: Inlet/Outlet conditions not evaluated

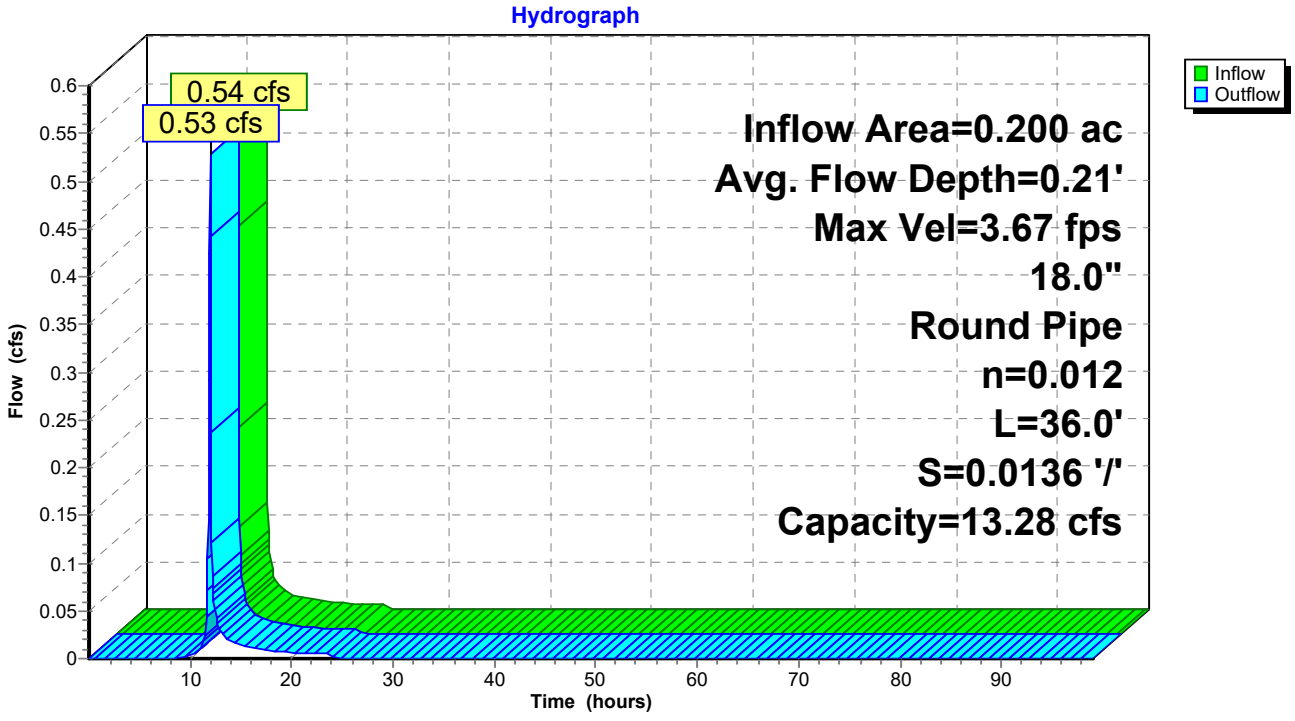
Inflow Area = 0.200 ac, 0.00% Impervious, Inflow Depth = 1.48" for 100 YR- 1 HR event
Inflow = 0.54 cfs @ 11.96 hrs, Volume= 0.025 af
Outflow = 0.53 cfs @ 11.96 hrs, Volume= 0.025 af, Atten= 1%, Lag= 0.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.01-99.01 hrs, dt= 0.05 hrs
Max. Velocity= 3.67 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 1.13 fps, Avg. Travel Time= 0.5 min

Peak Storage= 5 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.21'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 13.28 cfs

18.0" Round Pipe
n= 0.012 Steel, smooth
Length= 36.0' Slope= 0.0136 '/'
Inlet Invert= 735.25', Outlet Invert= 734.76'





Summary for Reach 32R: County Access: Culvert 2

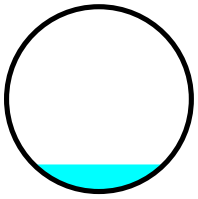
[52] Hint: Inlet/Outlet conditions not evaluated

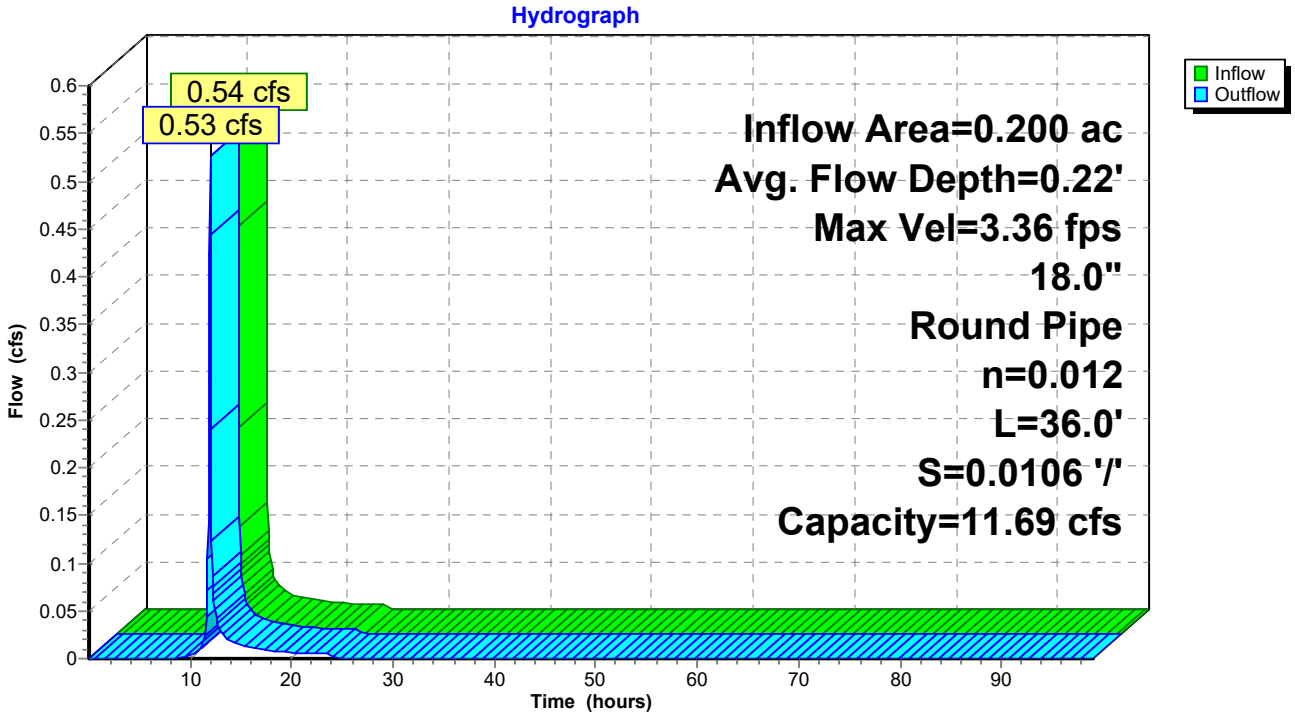
Inflow Area = 0.200 ac, 0.00% Impervious, Inflow Depth = 1.48" for 100 YR- 1 HR event
Inflow = 0.54 cfs @ 11.96 hrs, Volume= 0.025 af
Outflow = 0.53 cfs @ 11.96 hrs, Volume= 0.025 af, Atten= 2%, Lag= 0.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.01-99.01 hrs, dt= 0.05 hrs
Max. Velocity= 3.36 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 1.03 fps, Avg. Travel Time= 0.6 min

Peak Storage= 6 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.22'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 11.69 cfs

18.0" Round Pipe
n= 0.012 Steel, smooth
Length= 36.0' Slope= 0.0106 '/'
Inlet Invert= 715.50', Outlet Invert= 715.12'





Summary for Reach 55R: SR-86: Culvert 1

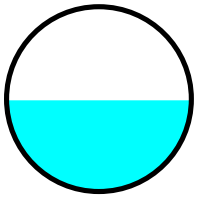
[52] Hint: Inlet/Outlet conditions not evaluated

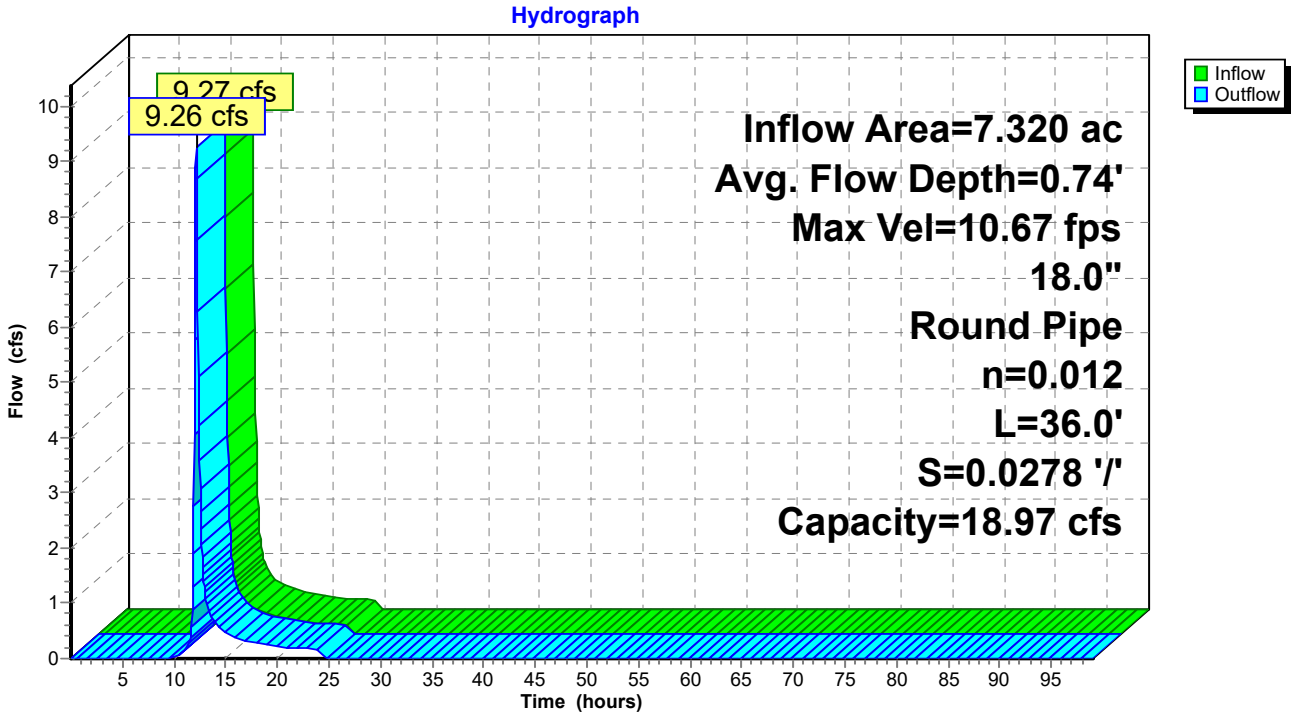
Inflow Area = 7.320 ac, 8.80% Impervious, Inflow Depth = 1.21" for 100 YR- 1 HR event
Inflow = 9.27 cfs @ 12.15 hrs, Volume= 0.741 af
Outflow = 9.26 cfs @ 12.16 hrs, Volume= 0.741 af, Atten= 0%, Lag= 0.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.01-99.01 hrs, dt= 0.05 hrs
Max. Velocity= 10.67 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 4.00 fps, Avg. Travel Time= 0.2 min

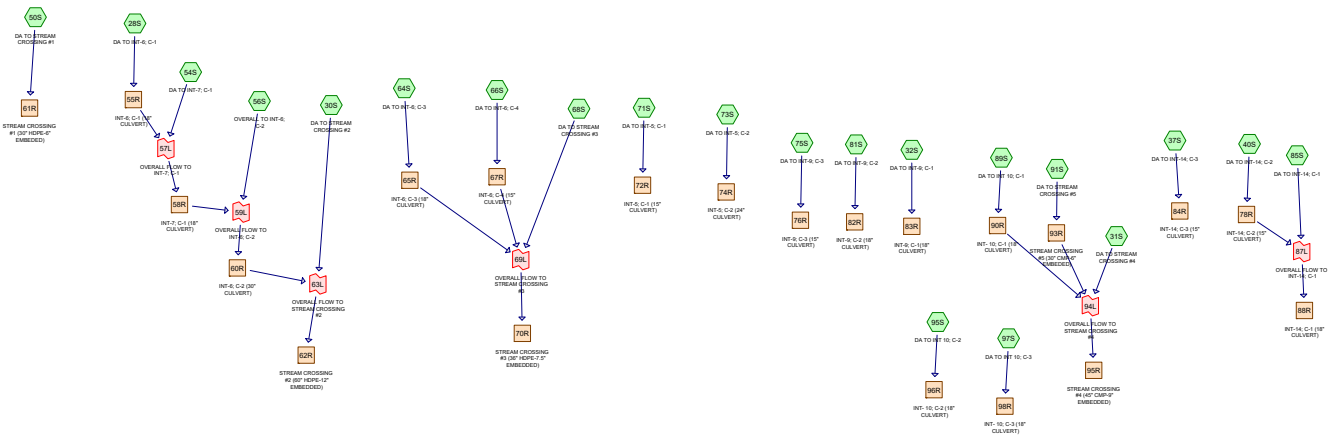
Peak Storage= 31 cf @ 12.15 hrs
Average Depth at Peak Storage= 0.74'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 18.97 cfs

18.0" Round Pipe
n= 0.012 Steel, smooth
Length= 36.0' Slope= 0.0278 '/'
Inlet Invert= 712.00', Outlet Invert= 711.00'





Appendix E – Stream Crossing Culvert
&
Internal Access Drive Culverts Design



Subcat Reach Pond Link

Routing Diagram for Culvert Design
Prepared by TRC, Printed 5/11/2021

Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Diam/Width (inches)	Height (inches)	Inside-Fill (inches)
1	55R	734.30	734.20	30.0	0.0033	0.013	18.0	0.0	0.0
2	58R	725.16	725.00	20.0	0.0080	0.013	18.0	0.0	0.0
3	60R	721.10	720.90	25.0	0.0080	0.013	30.0	0.0	0.0
4	61R	690.00	689.83	35.0	0.0049	0.020	30.0	0.0	6.0
5	62R	703.43	702.00	30.0	0.0477	0.020	60.0	0.0	12.0
6	65R	721.10	721.00	23.0	0.0043	0.013	18.0	0.0	0.0
7	67R	724.70	724.60	26.0	0.0038	0.013	15.0	0.0	0.0
8	70R	708.33	707.53	30.0	0.0267	0.020	36.0	0.0	7.5
9	72R	732.40	732.25	22.0	0.0068	0.013	15.0	0.0	0.0
10	74R	712.50	712.38	22.0	0.0055	0.013	24.0	0.0	0.0
11	76R	716.60	716.40	25.0	0.0080	0.013	15.0	0.0	0.0
12	78R	730.50	730.30	30.0	0.0067	0.013	15.0	0.0	0.0
13	82R	722.50	722.40	25.0	0.0040	0.013	18.0	0.0	0.0
14	83R	731.20	731.10	25.0	0.0040	0.013	18.0	0.0	0.0
15	84R	743.50	743.18	25.0	0.0128	0.013	15.0	0.0	0.0
16	88R	716.00	715.80	30.0	0.0067	0.013	18.0	0.0	0.0
17	90R	726.40	726.10	25.0	0.0120	0.013	18.0	0.0	0.0
18	93R	717.50	716.75	30.0	0.0250	0.025	30.0	0.0	6.0
19	95R	708.11	706.55	30.0	0.0520	0.025	45.0	0.0	9.0
20	96R	721.00	720.90	15.0	0.0067	0.013	18.0	0.0	0.0
21	98R	716.00	715.84	25.0	0.0064	0.013	18.0	0.0	0.0

Time span=0.01-99.00 hrs, dt=0.05 hrs, 1981 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 28S: DA TO INT-6; C-1 Runoff Area=9.900 ac 0.00% Impervious Runoff Depth=0.64"
Flow Length=1,092' Tc=15.7 min CN=70 Runoff=6.98 cfs 0.531 af

Subcatchment 30S: DA TO STREAM Runoff Area=47.680 ac 0.31% Impervious Runoff Depth=0.45"
Flow Length=2,177' Tc=18.9 min CN=65 Runoff=17.52 cfs 1.780 af

Subcatchment 31S: DA TO STREAM Runoff Area=16.050 ac 0.00% Impervious Runoff Depth=0.78"
Flow Length=1,750' Tc=16.9 min CN=73 Runoff=13.93 cfs 1.041 af

Subcatchment 32S: DA TO INT-9; C-1 Runoff Area=5.480 ac 0.00% Impervious Runoff Depth=0.52"
Flow Length=779' Tc=21.3 min CN=67 Runoff=2.36 cfs 0.238 af

Subcatchment 37S: DA TO INT-14; C-3 Runoff Area=3.480 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=675' Slope=0.0400 '/' Tc=13.4 min CN=59 Runoff=0.59 cfs 0.075 af

Subcatchment 40S: DA TO INT-14; C-2 Runoff Area=10.090 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=1,218' Tc=17.3 min CN=59 Runoff=1.44 cfs 0.219 af

Subcatchment 50S: DA TO STREAM Runoff Area=18.090 ac 0.00% Impervious Runoff Depth=0.23"
Flow Length=1,256' Tc=21.7 min CN=58 Runoff=1.76 cfs 0.352 af

Subcatchment 54S: DA TO INT-7; C-1 Runoff Area=11.970 ac 1.55% Impervious Runoff Depth=0.56"
Flow Length=545' Tc=11.0 min CN=68 Runoff=8.47 cfs 0.559 af

Subcatchment 56S: OVERALL TO INT-6; C-2 Runoff Area=41.190 ac 0.20% Impervious Runoff Depth=0.60"
Flow Length=953' Tc=20.4 min CN=69 Runoff=22.48 cfs 2.064 af

Subcatchment 64S: DA TO INT-6; C-3 Runoff Area=7.860 ac 0.00% Impervious Runoff Depth=0.52"
Flow Length=656' Slope=0.0400 '/' Tc=13.2 min CN=67 Runoff=4.58 cfs 0.342 af

Subcatchment 66S: DA TO INT-6; C-4 Runoff Area=3.350 ac 0.00% Impervious Runoff Depth=0.29"
Flow Length=656' Slope=0.0400 '/' Tc=13.2 min CN=60 Runoff=0.70 cfs 0.080 af

Subcatchment 68S: DA TO STREAM Runoff Area=15.990 ac 0.06% Impervious Runoff Depth=0.26"
Flow Length=886' Slope=0.0400 '/' Tc=16.0 min CN=59 Runoff=2.39 cfs 0.346 af

Subcatchment 71S: DA TO INT-5; C-1 Runoff Area=1.920 ac 0.00% Impervious Runoff Depth=1.09"
Tc=5.0 min CN=79 Runoff=3.82 cfs 0.175 af

Subcatchment 73S: DA TO INT-5; C-2 Runoff Area=5.130 ac 0.00% Impervious Runoff Depth=1.09"
Flow Length=429' Tc=9.1 min CN=79 Runoff=8.78 cfs 0.468 af

Subcatchment 75S: DA TO INT-9; C-3 Runoff Area=1.410 ac 0.00% Impervious Runoff Depth=1.28"
Tc=5.0 min CN=82 Runoff=3.28 cfs 0.150 af

Subcatchment 81S: DA TO INT-9; C-2 Runoff Area=3.800 ac 0.00% Impervious Runoff Depth=1.09"
Tc=5.0 min CN=79 Runoff=7.56 cfs 0.347 af

Subcatchment 85S: DA TO INT-14; C-1 Runoff Area=16.080 ac 0.00% Impervious Runoff Depth=0.26"
Tc=5.0 min CN=59 Runoff=4.36 cfs 0.348 af

Subcatchment 89S: DA TO INT 10; C-1 Runoff Area=11.770 ac 0.00% Impervious Runoff Depth=0.38"
Flow Length=898' Tc=14.1 min CN=63 Runoff=3.97 cfs 0.373 af

Subcatchment 91S: DA TO STREAM Runoff Area=28.690 ac 1.46% Impervious Runoff Depth=1.04"
Flow Length=756' Tc=22.4 min CN=78 Runoff=29.73 cfs 2.480 af

Subcatchment 95S: DA TO INT 10; C-2 Runoff Area=0.920 ac 0.00% Impervious Runoff Depth=0.69"
Tc=5.0 min CN=71 Runoff=1.09 cfs 0.053 af

Subcatchment 97S: DA TO INT 10; C-3 Runoff Area=3.110 ac 0.00% Impervious Runoff Depth=0.64"
Tc=5.0 min CN=70 Runoff=3.41 cfs 0.167 af

Reach 55R: INT-6; C-1 (18" CULVERT) Avg. Flow Depth=1.50' Max Vel=3.91 fps Inflow=6.98 cfs 0.531 af
18.0" Round Pipe n=0.013 L=30.0' S=0.0033 '/' Capacity=6.06 cfs Outflow=6.52 cfs 0.531 af

Reach 58R: INT-7; C-1 (18" CULVERT) Avg. Flow Depth=1.50' Max Vel=5.97 fps Inflow=14.85 cfs 1.090 af
18.0" Round Pipe n=0.013 L=20.0' S=0.0080 '/' Capacity=9.40 cfs Outflow=9.40 cfs 1.090 af

Reach 60R: INT-6; C-2 (30" CULVERT) Avg. Flow Depth=1.80' Max Vel=8.42 fps Inflow=31.87 cfs 3.154 af
30.0" Round Pipe n=0.013 L=25.0' S=0.0080 '/' Capacity=36.69 cfs Outflow=31.83 cfs 3.154 af

Reach 61R: STREAM CROSSING #1 (30" Avg. Flow Depth=0.36' Max Vel=2.22 fps Inflow=1.76 cfs 0.352 af
30.0" Round Pipe w/ 6.0" inside fill n=0.020 L=35.0' S=0.0049 '/' Capacity=14.79 cfs Outflow=1.75 cfs 0.352 af

Reach 62R: STREAM CROSSING #2 Avg. Flow Depth=0.89' Max Vel=12.38 fps Inflow=49.35 cfs 4.934 af
60.0" Round Pipe w/ 12.0" inside fill n=0.020 L=30.0' S=0.0477 '/' Capacity=294.13 cfs Outflow=49.31 cfs 4.934 af

Reach 65R: INT-6; C-3 (18" CULVERT) Avg. Flow Depth=0.89' Max Vel=4.17 fps Inflow=4.58 cfs 0.342 af
18.0" Round Pipe n=0.013 L=23.0' S=0.0043 '/' Capacity=6.93 cfs Outflow=4.56 cfs 0.342 af

Reach 67R: INT-6; C-4 (15" CULVERT) Avg. Flow Depth=0.35' Max Vel=2.46 fps Inflow=0.70 cfs 0.080 af
15.0" Round Pipe n=0.013 L=26.0' S=0.0038 '/' Capacity=4.01 cfs Outflow=0.70 cfs 0.080 af

Reach 70R: STREAM CROSSING #3 (36" Avg. Flow Depth=0.45' Max Vel=6.04 fps Inflow=7.31 cfs 0.768 af
36.0" Round Pipe w/ 7.5" inside fill n=0.020 L=30.0' S=0.0267 '/' Capacity=55.51 cfs Outflow=7.30 cfs 0.768 af

Reach 72R: INT-5; C-1 (15" CULVERT) Avg. Flow Depth=0.78' Max Vel=4.72 fps Inflow=3.82 cfs 0.175 af
15.0" Round Pipe n=0.013 L=22.0' S=0.0068 '/' Capacity=5.33 cfs Outflow=3.79 cfs 0.175 af

Reach 74R: INT-5; C-2 (24" CULVERT) Avg. Flow Depth=1.03' Max Vel=5.38 fps Inflow=8.78 cfs 0.468 af
24.0" Round Pipe n=0.013 L=22.0' S=0.0055 '/' Capacity=16.71 cfs Outflow=8.74 cfs 0.468 af

Reach 76R: INT-9; C-3 (15" CULVERT) Avg. Flow Depth=0.67' Max Vel=4.85 fps Inflow=3.28 cfs 0.150 af
15.0" Round Pipe n=0.013 L=25.0' S=0.0080 '/' Capacity=5.78 cfs Outflow=3.25 cfs 0.150 af

Reach 78R: INT-14; C-2 (15" CULVERT) Avg. Flow Depth=0.45' Max Vel=3.65 fps Inflow=1.44 cfs 0.219 af
15.0" Round Pipe n=0.013 L=30.0' S=0.0067 '/' Capacity=5.27 cfs Outflow=1.43 cfs 0.219 af

Reach 82R: INT-9; C-2 (18" CULVERT) Avg. Flow Depth=1.50' Max Vel=4.24 fps Inflow=7.56 cfs 0.347 af
18.0" Round Pipe n=0.013 L=25.0' S=0.0040 '/' Capacity=6.64 cfs Outflow=7.40 cfs 0.347 af

Reach 83R: INT-9; C-1(18" CULVERT) Avg. Flow Depth=0.62' Max Vel=3.43 fps Inflow=2.36 cfs 0.238 af
18.0" Round Pipe n=0.013 L=25.0' S=0.0040 '/' Capacity=6.64 cfs Outflow=2.36 cfs 0.238 af

Reach 84R: INT-14; C-3 (15" CULVERT) Avg. Flow Depth=0.24' Max Vel=3.57 fps Inflow=0.59 cfs 0.075 af
15.0" Round Pipe n=0.013 L=25.0' S=0.0128 '/' Capacity=7.31 cfs Outflow=0.58 cfs 0.075 af

Reach 88R: INT-14; C-1 (18" CULVERT) Avg. Flow Depth=0.79' Max Vel=4.97 fps Inflow=4.70 cfs 0.567 af
18.0" Round Pipe n=0.013 L=30.0' S=0.0067 '/' Capacity=8.58 cfs Outflow=4.68 cfs 0.567 af

Reach 90R: INT- 10; C-1 (18" CULVERT) Avg. Flow Depth=0.61' Max Vel=5.91 fps Inflow=3.97 cfs 0.373 af
18.0" Round Pipe n=0.013 L=25.0' S=0.0120 '/' Capacity=11.51 cfs Outflow=3.96 cfs 0.373 af

Reach 93R: STREAM CROSSING #5 Avg. Flow Depth=2.00' Max Vel=7.23 fps Inflow=29.73 cfs 2.480 af
30.0" Round Pipe w/ 6.0" inside fill n=0.025 L=30.0' S=0.0250 '/' Capacity=26.84 cfs Outflow=27.92 cfs 2.480 af

Reach 95R: STREAM CROSSING #4 Avg. Flow Depth=1.16' Max Vel=11.13 fps Inflow=45.66 cfs 3.894 af
45.0" Round Pipe w/ 9.0" inside fill n=0.025 L=30.0' S=0.0520 '/' Capacity=114.12 cfs Outflow=45.58 cfs 3.894 af

Reach 96R: INT- 10; C-2 (18" CULVERT) Avg. Flow Depth=0.36' Max Vel=3.32 fps Inflow=1.09 cfs 0.053 af
18.0" Round Pipe n=0.013 L=15.0' S=0.0067 '/' Capacity=8.58 cfs Outflow=1.08 cfs 0.053 af

Reach 98R: INT- 10; C-3 (18" CULVERT) Avg. Flow Depth=0.66' Max Vel=4.49 fps Inflow=3.41 cfs 0.167 af
18.0" Round Pipe n=0.013 L=25.0' S=0.0064 '/' Capacity=8.40 cfs Outflow=3.37 cfs 0.167 af

Link 57L: OVERALL FLOW TO INT-7; C-1 Inflow=14.85 cfs 1.090 af
Primary=14.85 cfs 1.090 af

Link 59L: OVERALL FLOW TO INT-6; C-2 Inflow=31.87 cfs 3.154 af
Primary=31.87 cfs 3.154 af

Link 63L: OVERALL FLOW TO STREAM CROSSING #2 Inflow=49.35 cfs 4.934 af
Primary=49.35 cfs 4.934 af

Link 69L: OVERALL FLOW TO STREAM CROSSING #3 Inflow=7.31 cfs 0.768 af
Primary=7.31 cfs 0.768 af

Link 87L: OVERALL FLOW TO INT-14; C-1 Inflow=4.70 cfs 0.567 af
Primary=4.70 cfs 0.567 af

Link 94L: OVERALL FLOW TO STREAM CROSSING #4 Inflow=45.66 cfs 3.894 af
Primary=45.66 cfs 3.894 af

Total Runoff Area = 263.960 ac Runoff Volume = 12.187 af Average Runoff Depth = 0.55"
99.68% Pervious = 263.110 ac 0.32% Impervious = 0.850 ac

Summary for Subcatchment 28S: DA TO INT-6; C-1

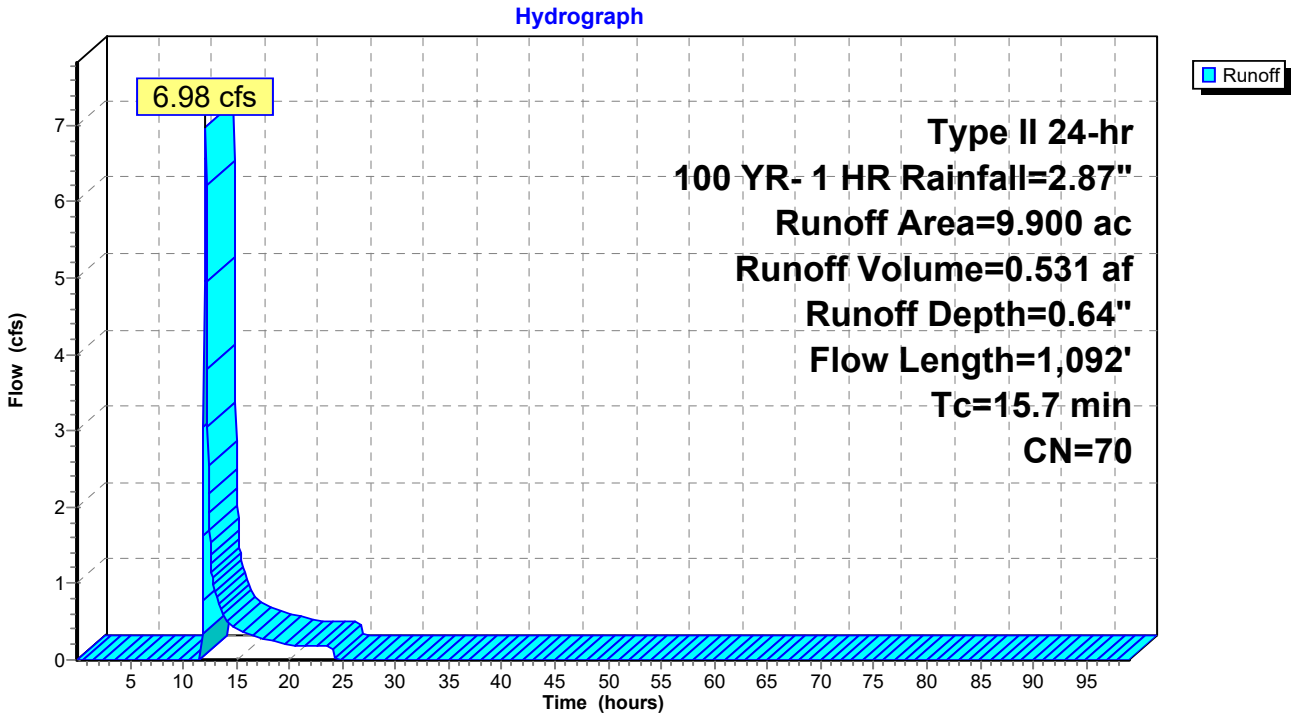
Runoff = 6.98 cfs @ 12.10 hrs, Volume= 0.531 af, Depth= 0.64"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.01-99.01 hrs, dt= 0.05 hrs
Type II 24-hr 100 YR- 1 HR Rainfall=2.87"

Area (ac)	CN	Description
1.200	69	50-75% Grass cover, Fair, HSG B
0.400	84	50-75% Grass cover, Fair, HSG D
0.100	85	Gravel roads, HSG B
3.600	58	Meadow, non-grazed, HSG B
4.600	78	Meadow, non-grazed, HSG D
9.900	70	Weighted Average
9.900		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.6	50	0.0800	0.18		**Sheet Flow, SF-1** Grass: Dense n= 0.240 P2= 3.39"
11.1	1,042	0.0500	1.57		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
15.7	1,092	Total			

Subcatchment 28S: DA TO INT-6; C-1



Summary for Subcatchment 30S: DA TO STREAM CROSSING #2

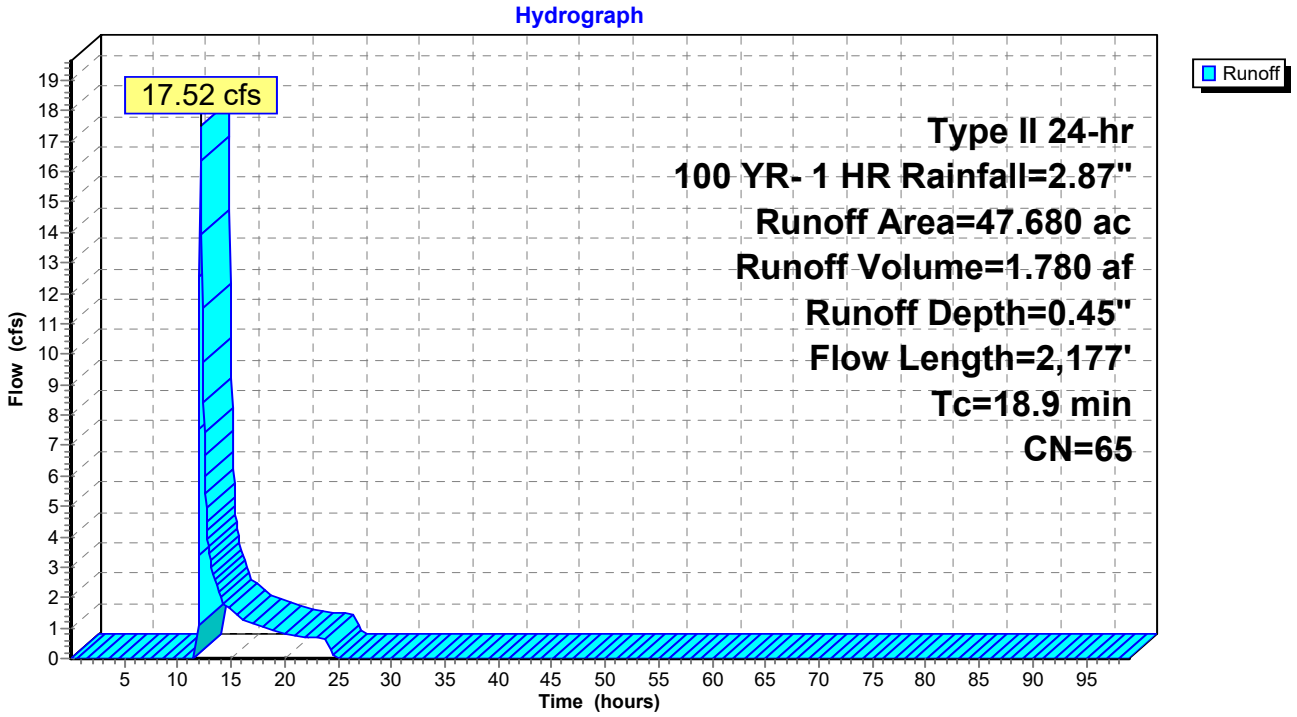
Runoff = 17.52 cfs @ 12.16 hrs, Volume= 1.780 af, Depth= 0.45"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.01-99.01 hrs, dt= 0.05 hrs
Type II 24-hr 100 YR- 1 HR Rainfall=2.87"

Area (ac)	CN	Description
31.880	58	Meadow, non-grazed, HSG B
12.550	78	Meadow, non-grazed, HSG D
1.600	98	Water Surface, 0% imp, HSG D
0.400	85	Gravel roads, HSG B
0.540	91	Gravel roads, HSG D
0.700	68	1 acre lots, 20% imp, HSG B
0.010	98	Unconnected pavement, HSG D
47.680	65	Weighted Average
47.530		99.69% Pervious Area
0.150		0.31% Impervious Area
0.010		6.67% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	50	0.0400	0.14		**Sheet Flow, SF-1** Grass: Dense n= 0.240 P2= 3.39"
9.8	827	0.0400	1.40		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
3.1	1,300	0.0500	6.98	24.42	**Channel Flow, CF-1** Area= 3.5 sf Perim= 7.0' r= 0.50' n= 0.030 Earth, grassed & winding
18.9	2,177	Total			

Subcatchment 30S: DA TO STREAM CROSSING #2



Summary for Subcatchment 31S: DA TO STREAM CROSSING #4

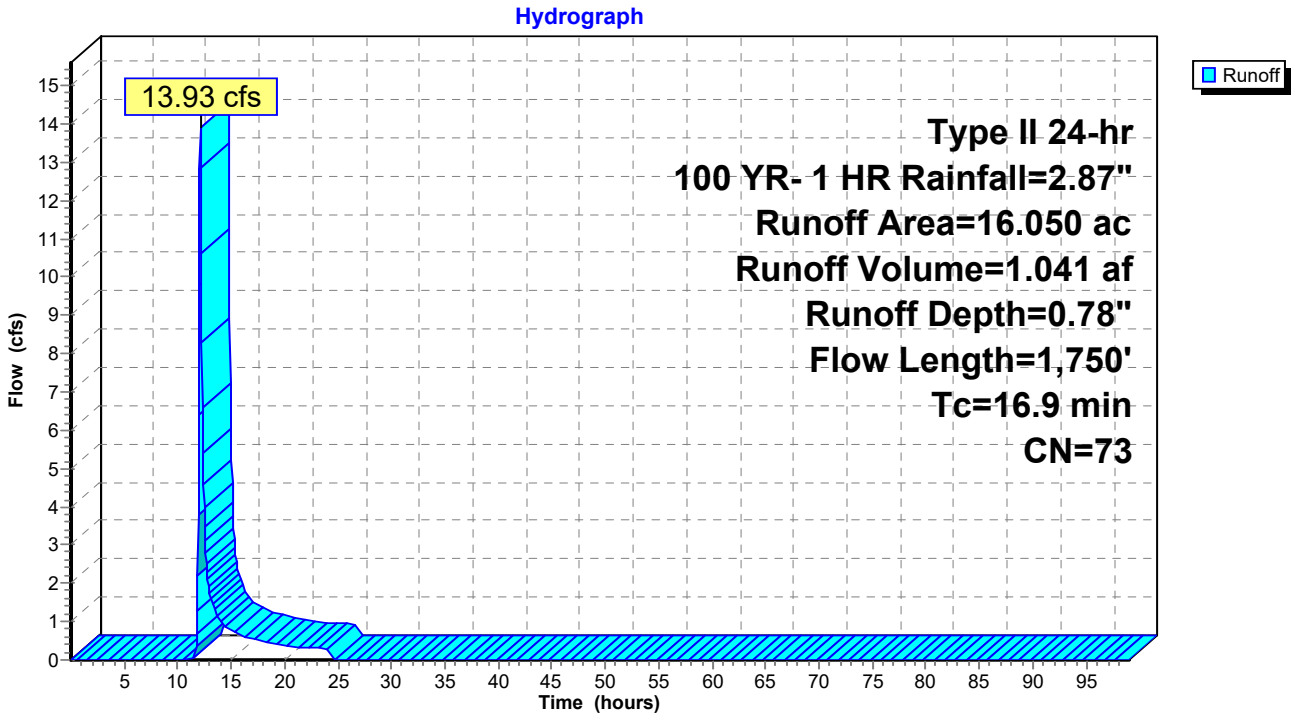
Runoff = 13.93 cfs @ 12.11 hrs, Volume= 1.041 af, Depth= 0.78"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.01-99.01 hrs, dt= 0.05 hrs
Type II 24-hr 100 YR- 1 HR Rainfall=2.87"

Area (ac)	CN	Description
5.050	58	Meadow, non-grazed, HSG B
9.820	78	Meadow, non-grazed, HSG D
0.510	98	Water Surface, 0% imp, HSG D
0.670	91	Gravel roads, HSG D
16.050	73	Weighted Average
16.050		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.5	50	0.0100	0.08		**Sheet Flow, SF-1** Grass: Dense n= 0.240 P2= 3.39"
6.4	1,700	0.0200	4.41	15.45	**Channel Flow, CF-1** Area= 3.5 sf Perim= 7.0' r= 0.50' n= 0.030 Earth, grassed & winding
16.9	1,750	Total			

Subcatchment 31S: DA TO STREAM CROSSING #4



Summary for Subcatchment 32S: DA TO INT-9; C-1

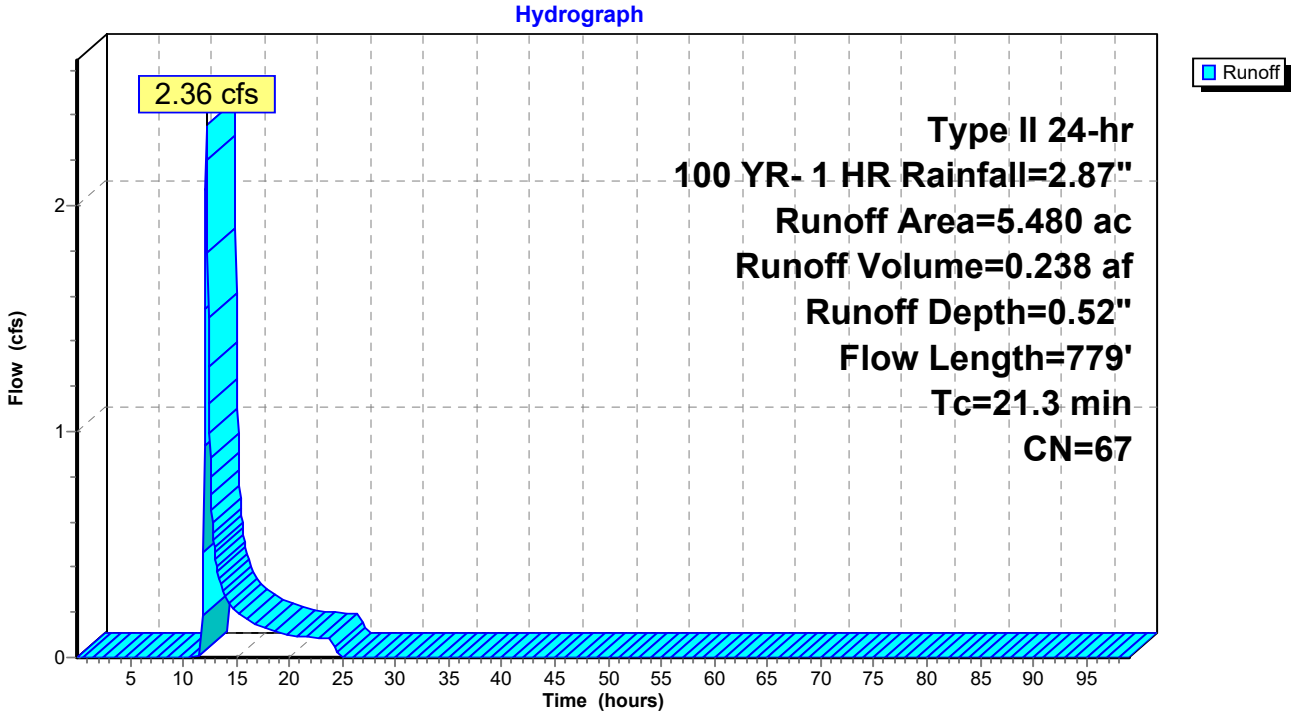
Runoff = 2.36 cfs @ 12.18 hrs, Volume= 0.238 af, Depth= 0.52"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.01-99.01 hrs, dt= 0.05 hrs
Type II 24-hr 100 YR- 1 HR Rainfall=2.87"

Area (ac)	CN	Description
0.200	85	Gravel roads, HSG B
0.100	91	Gravel roads, HSG D
3.230	58	Meadow, non-grazed, HSG B
1.950	78	Meadow, non-grazed, HSG D
5.480	67	Weighted Average
5.480		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.5	50	0.0100	0.08		**Sheet Flow, SF-1** Grass: Dense n= 0.240 P2= 3.39"
2.0	86	0.0100	0.70		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
0.2	18	0.0100	1.61		**Shallow Concentrated Flow, SCF-2** Unpaved Kv= 16.1 fps
8.6	625	0.0300	1.21		**Shallow Concentrated Flow, SCF-3** Short Grass Pasture Kv= 7.0 fps
21.3	779	Total			

Subcatchment 32S: DA TO INT-9; C-1



Summary for Subcatchment 37S: DA TO INT-14; C-3

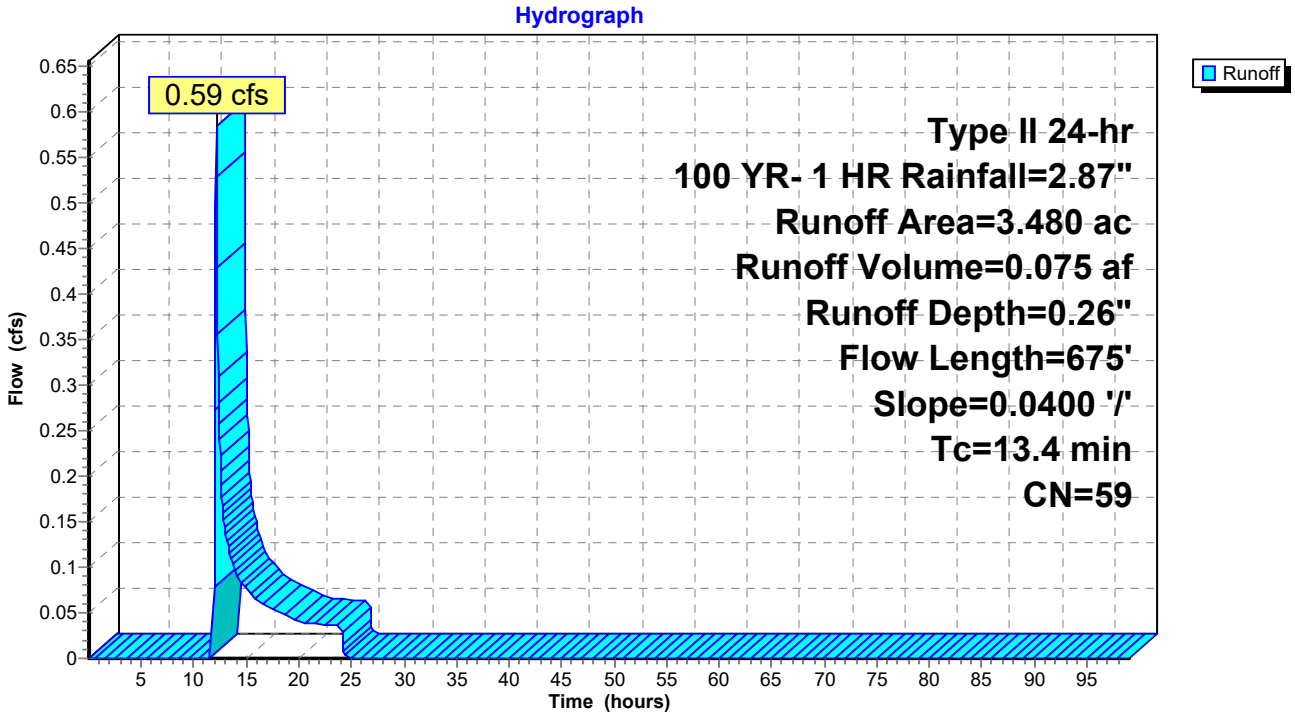
Runoff = 0.59 cfs @ 12.12 hrs, Volume= 0.075 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.01-99.01 hrs, dt= 0.05 hrs
Type II 24-hr 100 YR- 1 HR Rainfall=2.87"

Area (ac)	CN	Description
3.400	58	Meadow, non-grazed, HSG B
0.080	85	Gravel roads, HSG B
3.480	59	Weighted Average
3.480		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	50	0.0400	0.14		**Sheet Flow, SF-1** Grass: Dense n= 0.240 P2= 3.39"
7.4	625	0.0400	1.40		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
13.4	675	Total			

Subcatchment 37S: DA TO INT-14; C-3



Summary for Subcatchment 40S: DA TO INT-14; C-2

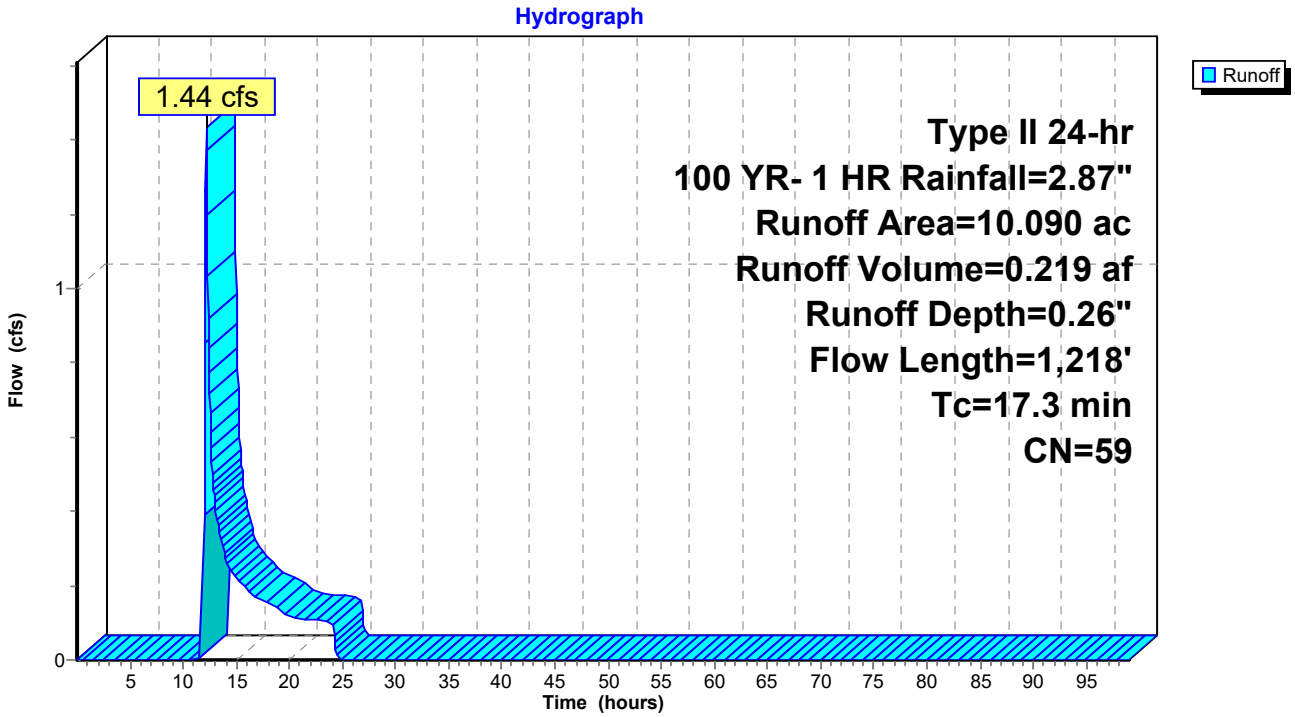
Runoff = 1.44 cfs @ 12.17 hrs, Volume= 0.219 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.01-99.01 hrs, dt= 0.05 hrs
Type II 24-hr 100 YR- 1 HR Rainfall=2.87"

Area (ac)	CN	Description
0.340	91	Gravel roads, HSG D
9.750	58	Meadow, non-grazed, HSG B
10.090	59	Weighted Average
10.090		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.8	50	0.0300	0.12		**Sheet Flow, SF-1** Grass: Dense n= 0.240 P2= 3.39"
9.3	677	0.0300	1.21		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
1.2	491	0.0400	6.58	42.79	**Channel Flow, CF-1** Area= 6.5 sf Perim= 12.0' r= 0.54' n= 0.030 Earth, grassed & winding
17.3	1,218	Total			

Subcatchment 40S: DA TO INT-14; C-2



Summary for Subcatchment 50S: DA TO STREAM CROSSING #1

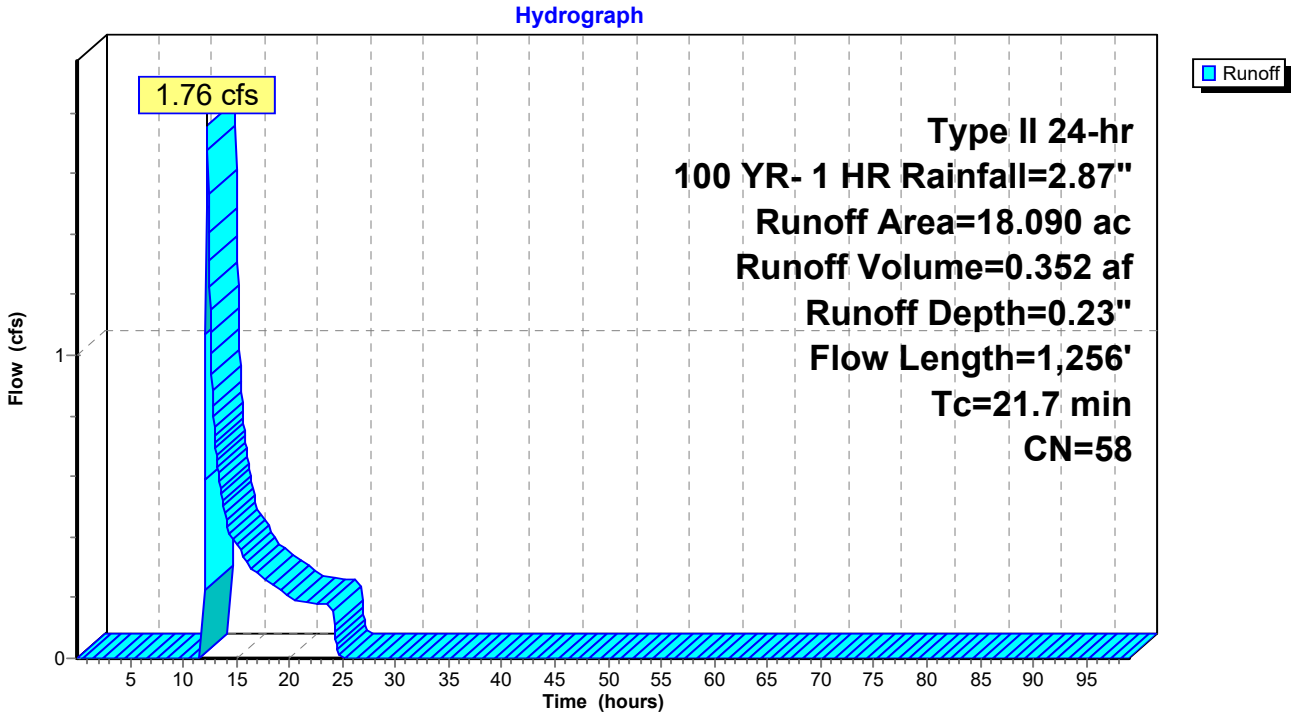
Runoff = 1.76 cfs @ 12.25 hrs, Volume= 0.352 af, Depth= 0.23"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.01-99.01 hrs, dt= 0.05 hrs
Type II 24-hr 100 YR- 1 HR Rainfall=2.87"

Area (ac)	CN	Description
18.090	58	Meadow, non-grazed, HSG B
18.090		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.1	50	0.0600	0.16		**Sheet Flow, SF-1** Grass: Dense n= 0.240 P2= 3.39"
16.6	1,206	0.0300	1.21		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
21.7	1,256	Total			

Subcatchment 50S: DA TO STREAM CROSSING #1



Summary for Subcatchment 54S: DA TO INT-7; C-1

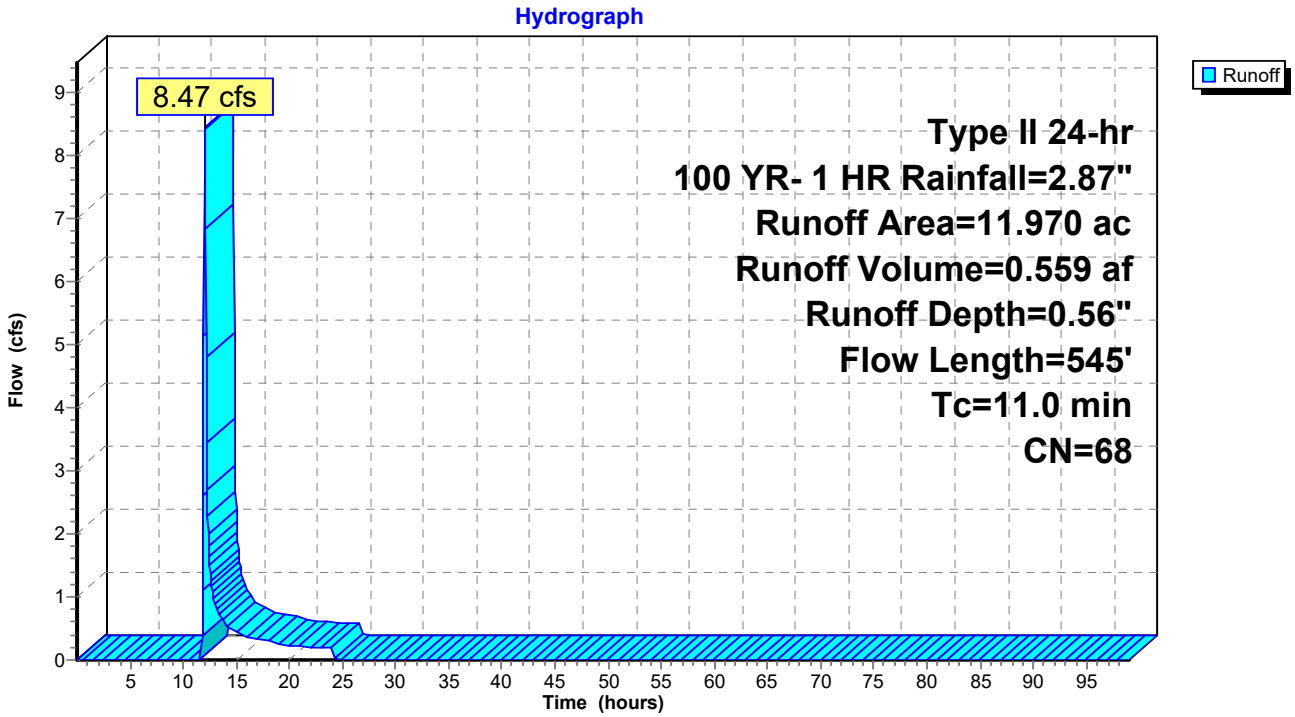
Runoff = 8.47 cfs @ 12.05 hrs, Volume= 0.559 af, Depth= 0.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.01-99.01 hrs, dt= 0.05 hrs
Type II 24-hr 100 YR- 1 HR Rainfall=2.87"

Area (ac)	CN	Description
0.590	85	Gravel roads, HSG B
0.930	68	1 acre lots, 20% imp, HSG B
5.990	58	Meadow, non-grazed, HSG B
4.460	78	Meadow, non-grazed, HSG D
11.970	68	Weighted Average
11.784		98.45% Pervious Area
0.186		1.55% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.1	50	0.0600	0.16		**Sheet Flow, SF-1** Grass: Dense n= 0.240 P2= 3.39"
5.9	495	0.0400	1.40		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
11.0	545	Total			

Subcatchment 54S: DA TO INT-7; C-1



Summary for Subcatchment 56S: OVERALL TO INT-6; C-2

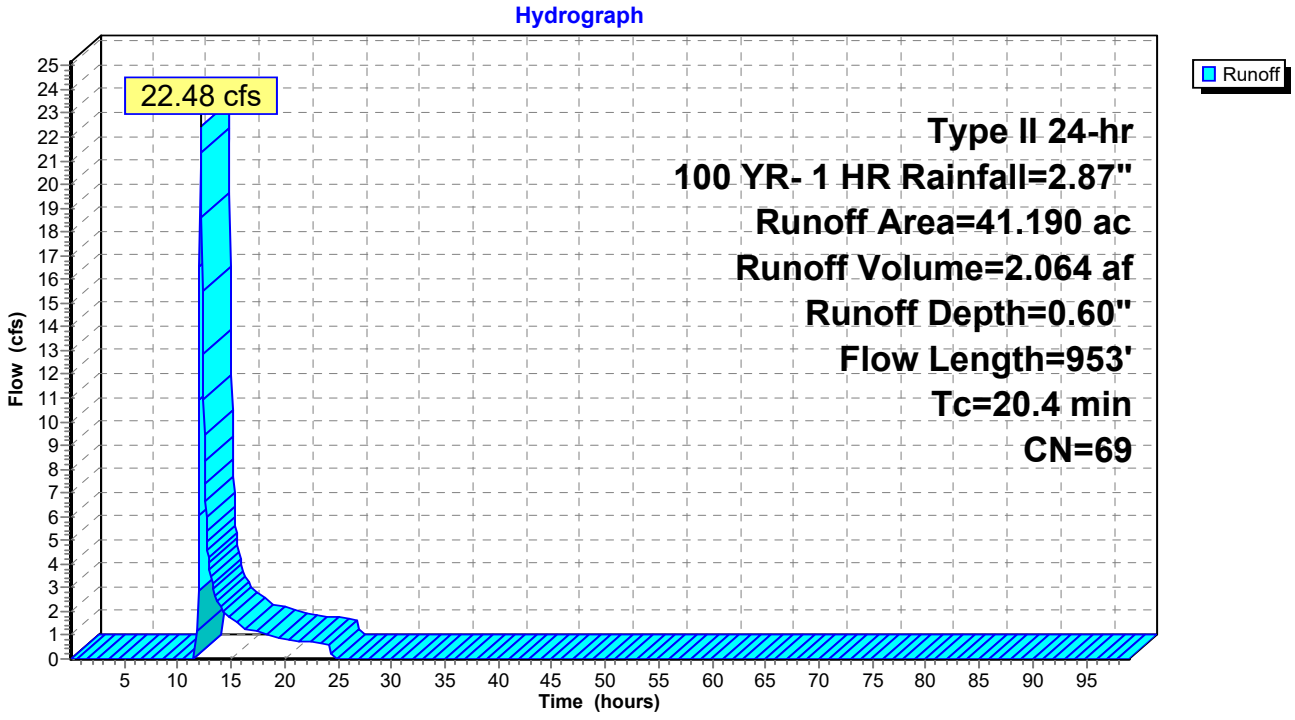
Runoff = 22.48 cfs @ 12.16 hrs, Volume= 2.064 af, Depth= 0.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.01-99.01 hrs, dt= 0.05 hrs
Type II 24-hr 100 YR- 1 HR Rainfall=2.87"

Area (ac)	CN	Description
10.910	69	50-75% Grass cover, Fair, HSG B
2.650	84	50-75% Grass cover, Fair, HSG D
0.480	85	Gravel roads, HSG B
0.420	84	1 acre lots, 20% imp, HSG D
14.710	58	Meadow, non-grazed, HSG B
12.020	78	Meadow, non-grazed, HSG D
41.190	69	Weighted Average
41.106		99.80% Pervious Area
0.084		0.20% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.0	50	0.0200	0.10		**Sheet Flow, SF-1** Grass: Dense n= 0.240 P2= 3.39"
12.4	903	0.0300	1.21		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
20.4	953	Total			

Subcatchment 56S: OVERALL TO INT-6; C-2



Summary for Subcatchment 64S: DA TO INT-6; C-3

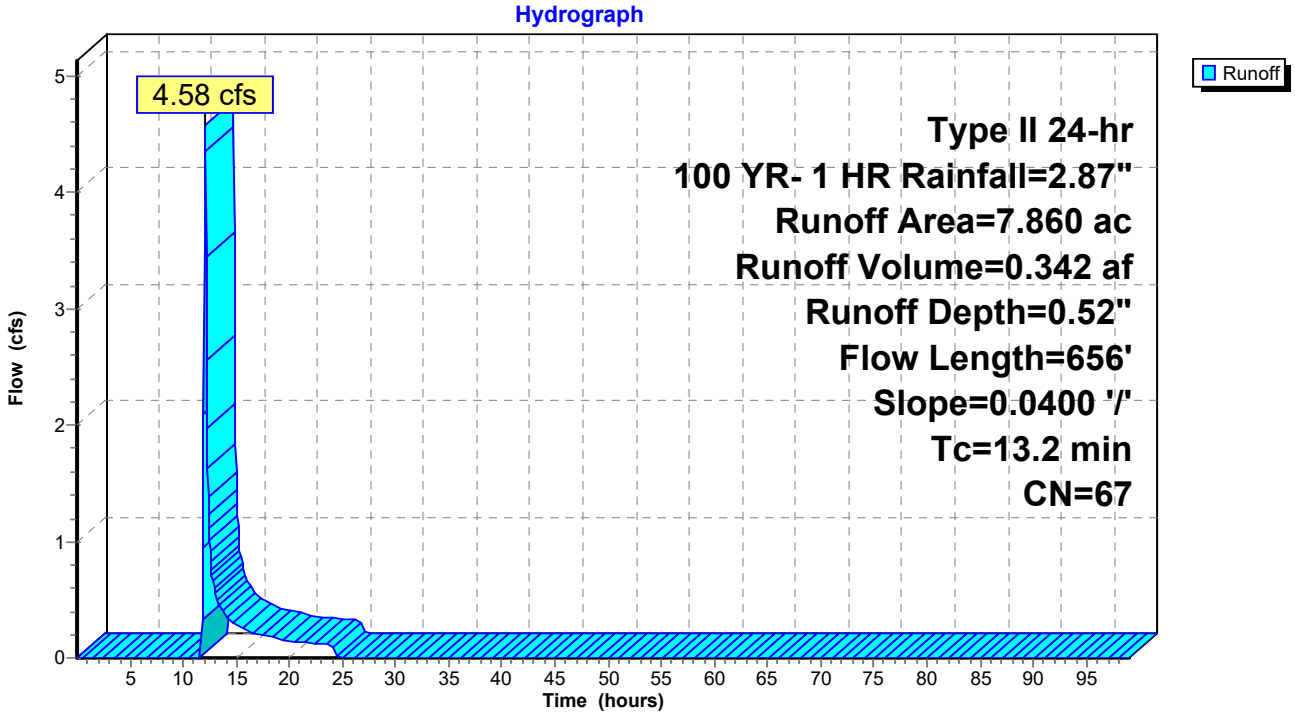
Runoff = 4.58 cfs @ 12.08 hrs, Volume= 0.342 af, Depth= 0.52"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.01-99.01 hrs, dt= 0.05 hrs
Type II 24-hr 100 YR- 1 HR Rainfall=2.87"

Area (ac)	CN	Description
4.320	58	Meadow, non-grazed, HSG B
3.340	78	Meadow, non-grazed, HSG D
0.200	85	Gravel roads, HSG B
7.860	67	Weighted Average
7.860		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	50	0.0400	0.14		**Sheet Flow, SF-1** Grass: Dense n= 0.240 P2= 3.39"
7.2	606	0.0400	1.40		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
13.2	656	Total			

Subcatchment 64S: DA TO INT-6; C-3



Summary for Subcatchment 66S: DA TO INT-6; C-4

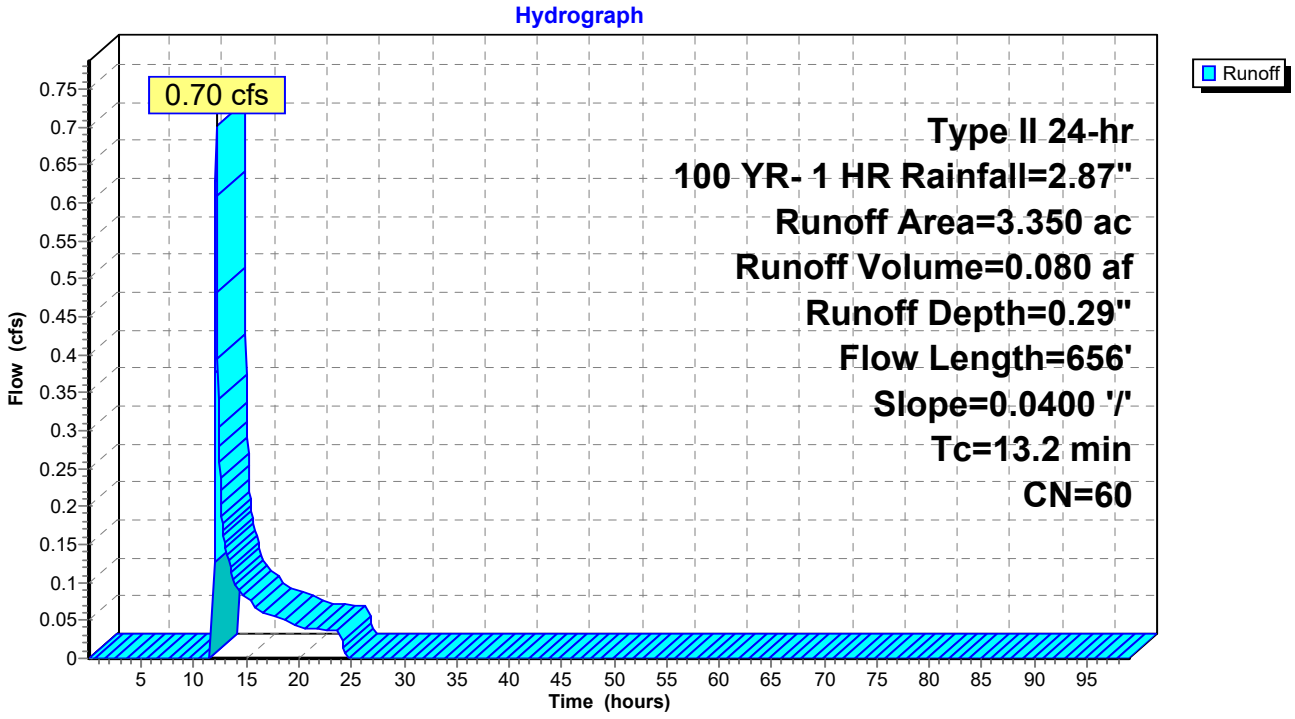
Runoff = 0.70 cfs @ 12.11 hrs, Volume= 0.080 af, Depth= 0.29"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.01-99.01 hrs, dt= 0.05 hrs
Type II 24-hr 100 YR- 1 HR Rainfall=2.87"

Area (ac)	CN	Description
3.110	58	Meadow, non-grazed, HSG B
0.240	85	Gravel roads, HSG B
3.350	60	Weighted Average
3.350		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	50	0.0400	0.14		**Sheet Flow, SF-1** Grass: Dense n= 0.240 P2= 3.39"
7.2	606	0.0400	1.40		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
13.2	656	Total			

Subcatchment 66S: DA TO INT-6; C-4



Summary for Subcatchment 68S: DA TO STREAM CROSSING #3

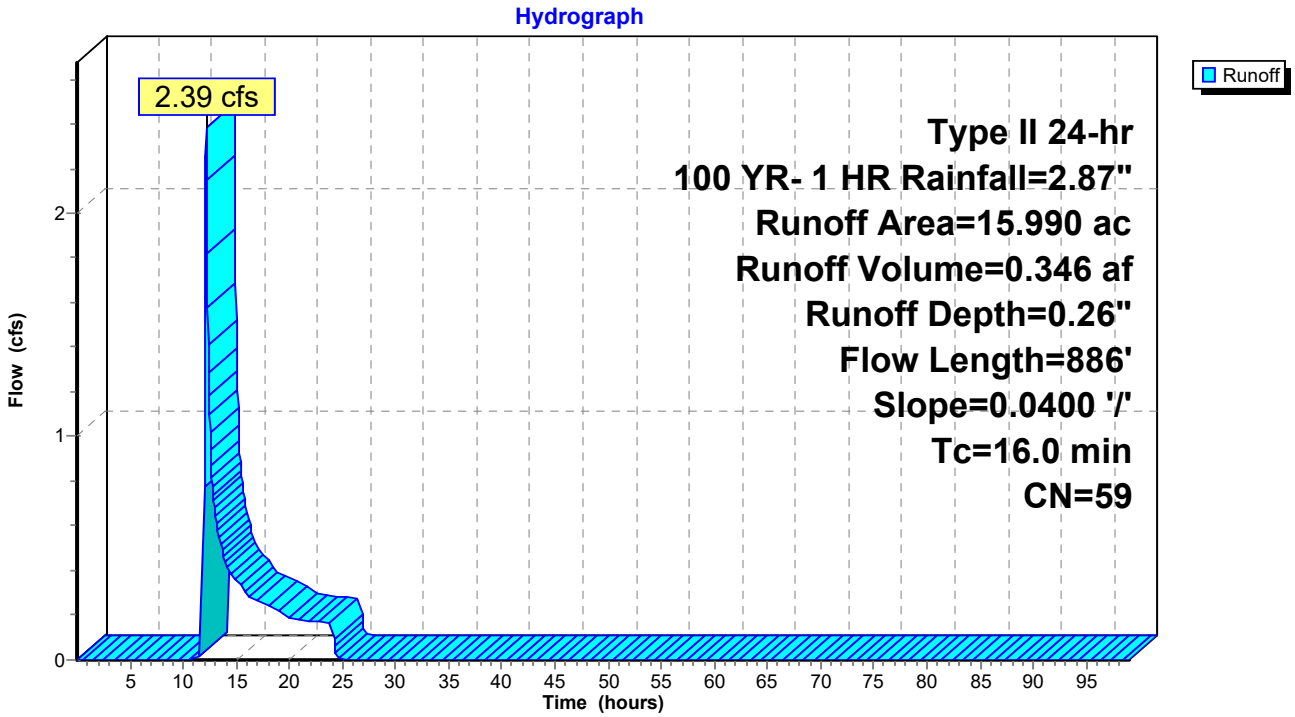
Runoff = 2.39 cfs @ 12.15 hrs, Volume= 0.346 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.01-99.01 hrs, dt= 0.05 hrs
Type II 24-hr 100 YR- 1 HR Rainfall=2.87"

Area (ac)	CN	Description
15.500	58	Meadow, non-grazed, HSG B
0.480	91	Gravel roads, HSG D
0.010	98	Unconnected roofs, HSG D
15.990	59	Weighted Average
15.980		99.94% Pervious Area
0.010		0.06% Impervious Area
0.010		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	50	0.0400	0.14		**Sheet Flow, SF-1** Grass: Dense n= 0.240 P2= 3.39"
10.0	836	0.0400	1.40		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
16.0	886	Total			

Subcatchment 68S: DA TO STREAM CROSSING #3



Summary for Subcatchment 71S: DA TO INT-5; C-1

[49] Hint: Tc<2dt may require smaller dt

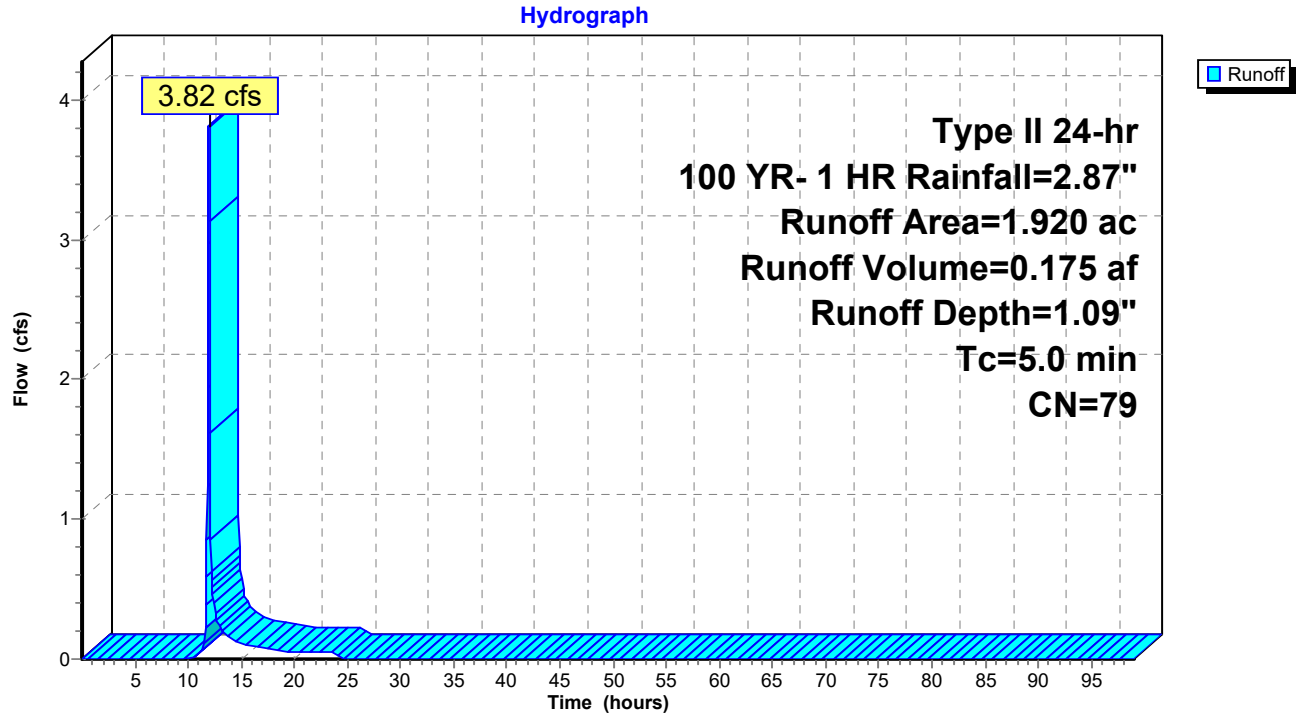
Runoff = 3.82 cfs @ 11.96 hrs, Volume= 0.175 af, Depth= 1.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.01-99.01 hrs, dt= 0.05 hrs
Type II 24-hr 100 YR- 1 HR Rainfall=2.87"

Area (ac)	CN	Description
1.840	78	Meadow, non-grazed, HSG D
0.080	91	Gravel roads, HSG D
1.920	79	Weighted Average
1.920		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, MIN. TC**

Subcatchment 71S: DA TO INT-5; C-1



Summary for Subcatchment 73S: DA TO INT-5; C-2

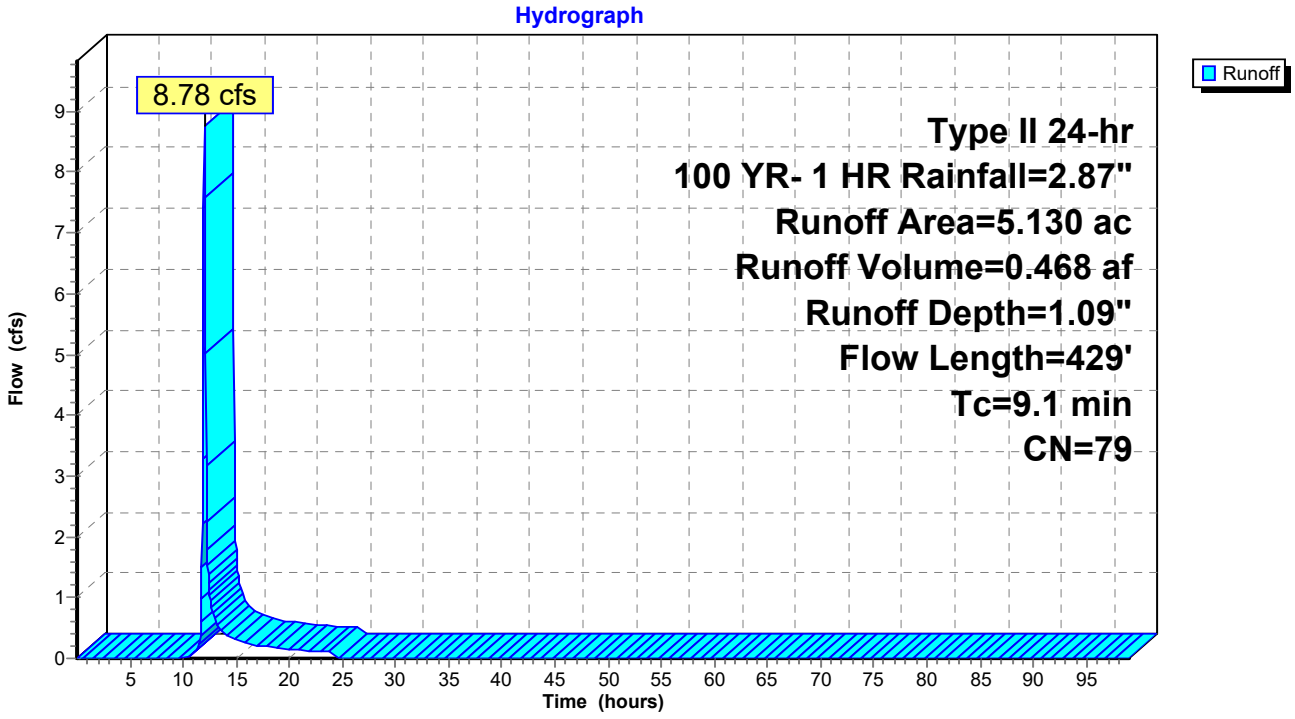
Runoff = 8.78 cfs @ 12.01 hrs, Volume= 0.468 af, Depth= 1.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.01-99.01 hrs, dt= 0.05 hrs
Type II 24-hr 100 YR- 1 HR Rainfall=2.87"

Area (ac)	CN	Description
4.710	78	Meadow, non-grazed, HSG D
0.420	91	Gravel roads, HSG D
5.130	79	Weighted Average
5.130		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.1	50	0.0600	0.16		**Sheet Flow, SF-1** Grass: Dense n= 0.240 P2= 3.39"
4.0	379	0.0500	1.57		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
9.1	429	Total			

Subcatchment 73S: DA TO INT-5; C-2



Summary for Subcatchment 75S: DA TO INT-9; C-3

[49] Hint: Tc<2dt may require smaller dt

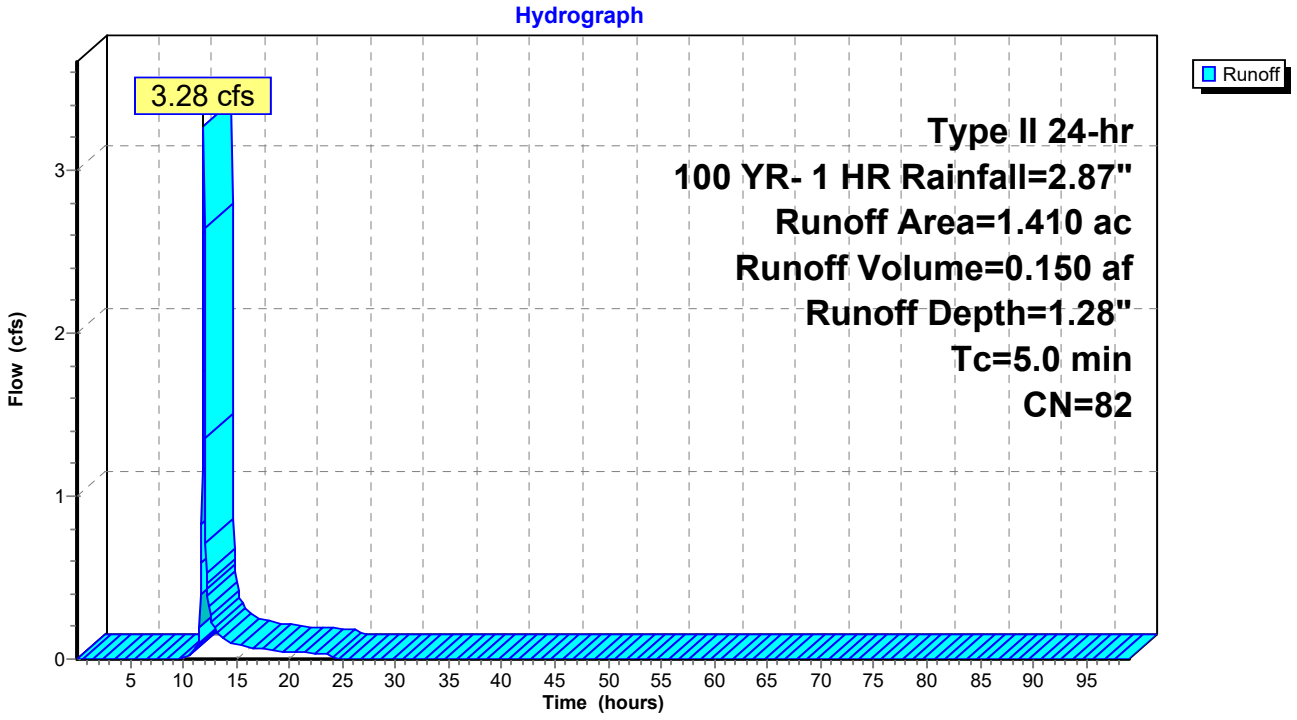
Runoff = 3.28 cfs @ 11.96 hrs, Volume= 0.150 af, Depth= 1.28"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.01-99.01 hrs, dt= 0.05 hrs
Type II 24-hr 100 YR- 1 HR Rainfall=2.87"

Area (ac)	CN	Description
0.990	78	Meadow, non-grazed, HSG D
0.420	91	Gravel roads, HSG D
1.410	82	Weighted Average
1.410		100.00% Pervious Area

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

Subcatchment 75S: DA TO INT-9; C-3



Summary for Subcatchment 81S: DA TO INT-9; C-2

[49] Hint: Tc<2dt may require smaller dt

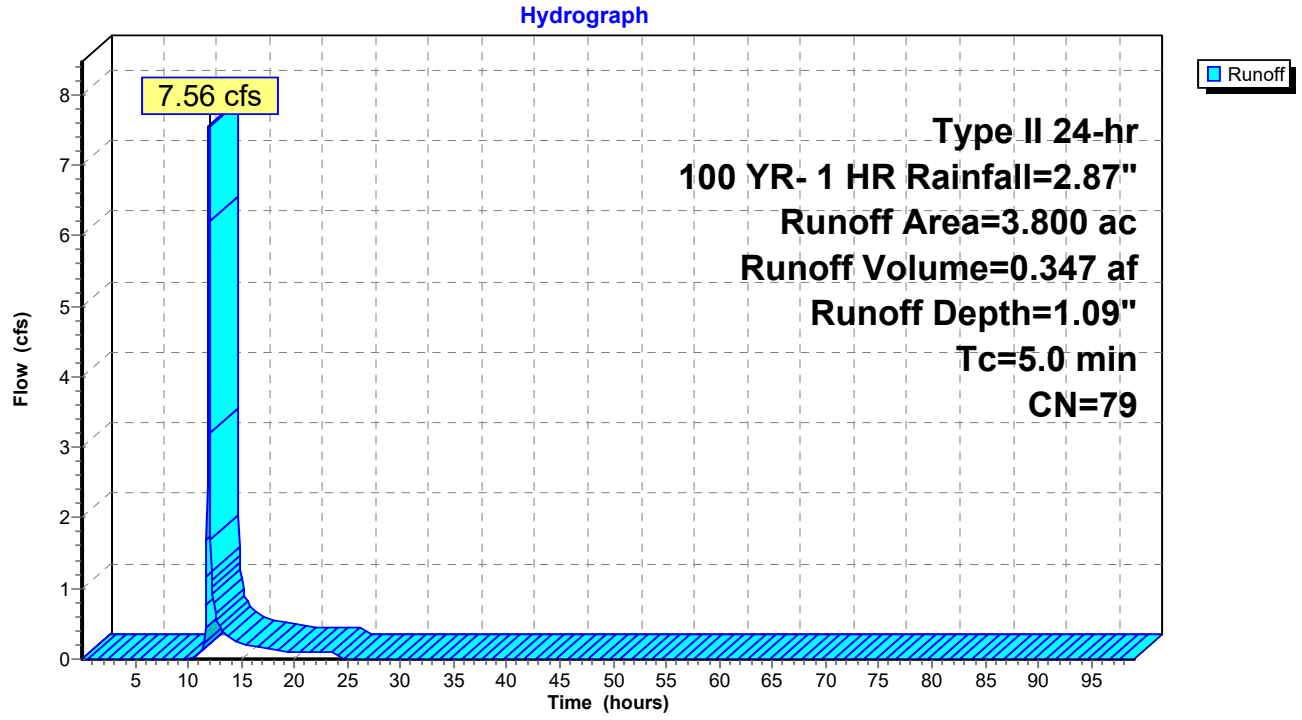
Runoff = 7.56 cfs @ 11.96 hrs, Volume= 0.347 af, Depth= 1.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.01-99.01 hrs, dt= 0.05 hrs
Type II 24-hr 100 YR- 1 HR Rainfall=2.87"

Area (ac)	CN	Description
3.380	78	Meadow, non-grazed, HSG D
0.420	91	Gravel roads, HSG D
3.800	79	Weighted Average
3.800		100.00% Pervious Area

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

Subcatchment 81S: DA TO INT-9; C-2



Summary for Subcatchment 85S: DA TO INT-14; C-1

[49] Hint: Tc<2dt may require smaller dt

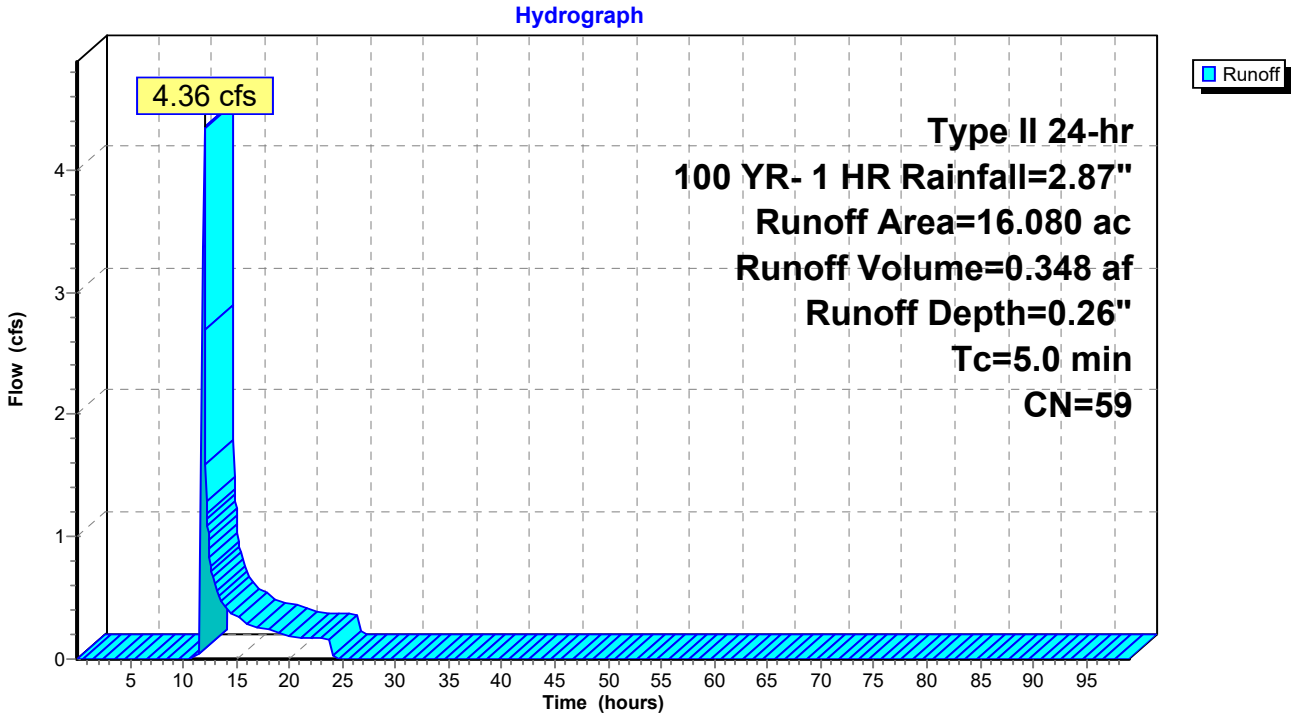
Runoff = 4.36 cfs @ 12.00 hrs, Volume= 0.348 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.01-99.01 hrs, dt= 0.05 hrs
Type II 24-hr 100 YR- 1 HR Rainfall=2.87"

Area (ac)	CN	Description
0.340	91	Gravel roads, HSG D
15.740	58	Meadow, non-grazed, HSG B
16.080	59	Weighted Average
16.080		100.00% Pervious Area

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

Subcatchment 85S: DA TO INT-14; C-1



Summary for Subcatchment 89S: DA TO INT 10; C-1

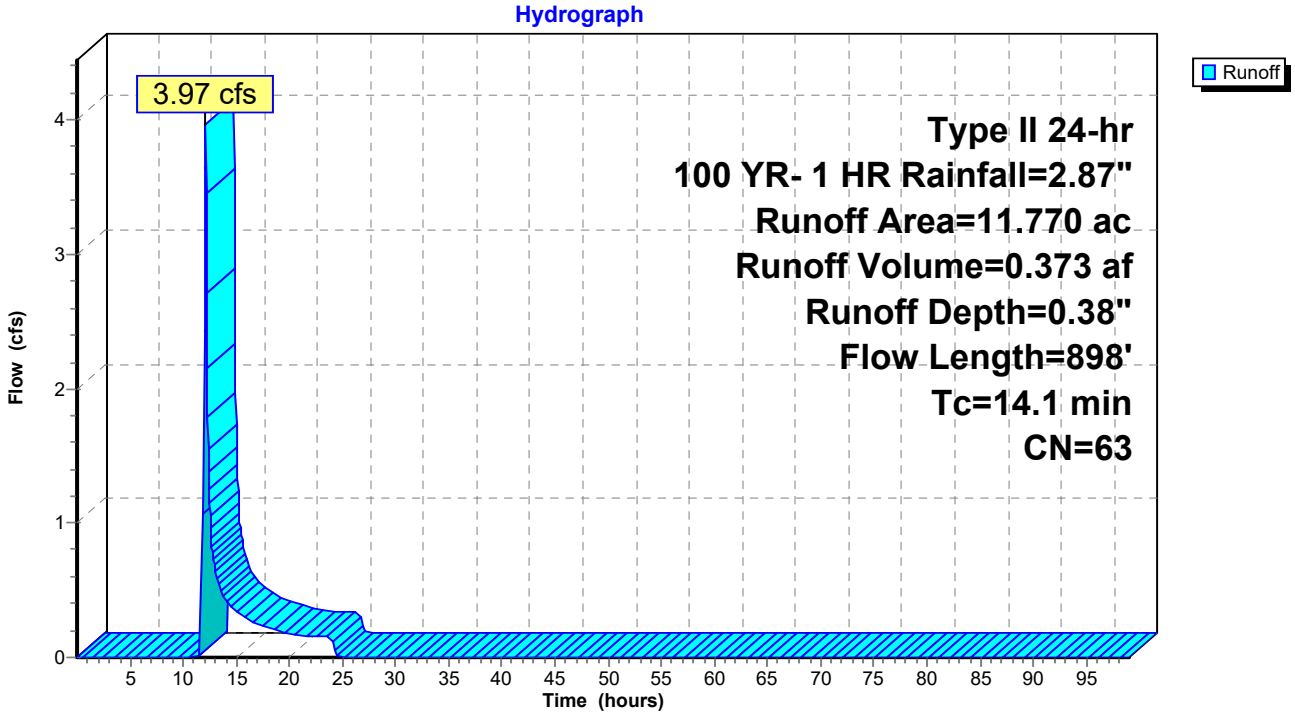
Runoff = 3.97 cfs @ 12.10 hrs, Volume= 0.373 af, Depth= 0.38"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.01-99.01 hrs, dt= 0.05 hrs
Type II 24-hr 100 YR- 1 HR Rainfall=2.87"

Area (ac)	CN	Description
4.250	69	50-75% Grass cover, Fair, HSG B
7.310	58	Meadow, non-grazed, HSG B
0.050	98	Water Surface, 0% imp, HSG B
0.160	85	Gravel roads, HSG B
11.770	63	Weighted Average
11.770		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.1	50	0.0600	0.16		**Sheet Flow, SF-1** Grass: Dense n= 0.240 P2= 3.39"
9.0	848	0.0500	1.57		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
14.1	898	Total			

Subcatchment 89S: DA TO INT 10; C-1



Summary for Subcatchment 91S: DA TO STREAM CROSSING #5

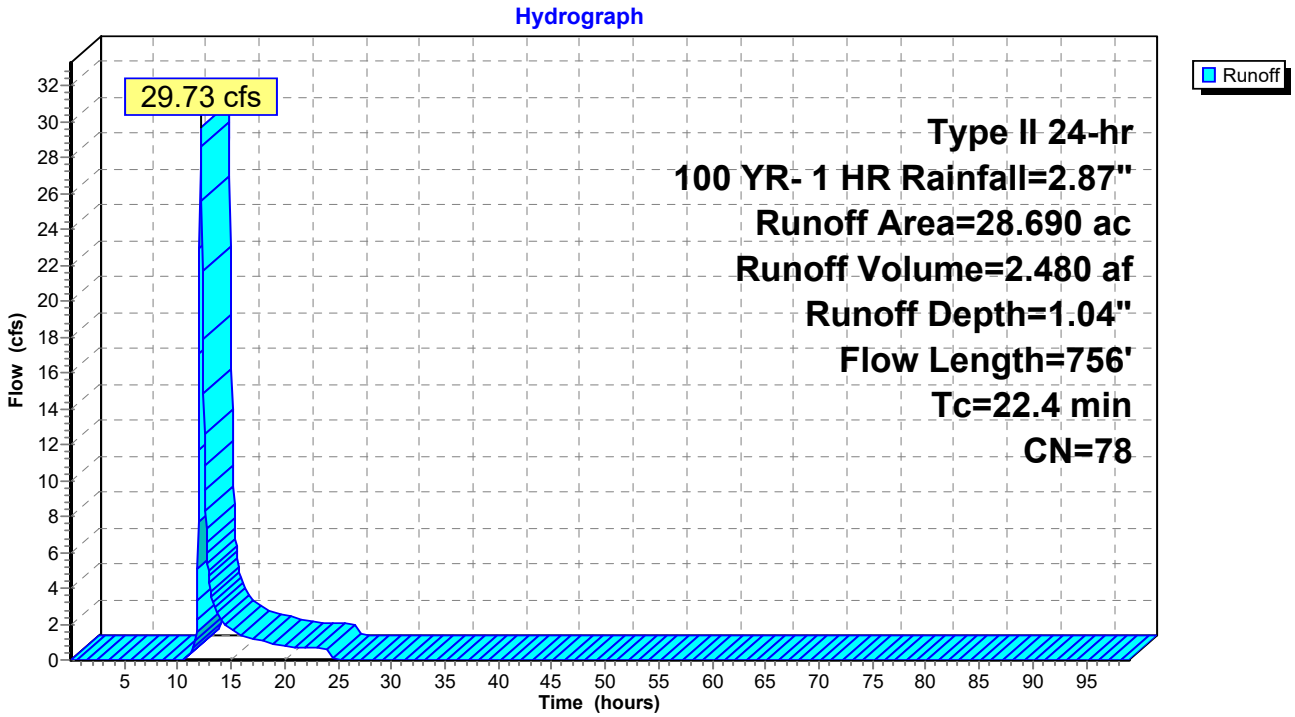
Runoff = 29.73 cfs @ 12.17 hrs, Volume= 2.480 af, Depth= 1.04"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.01-99.01 hrs, dt= 0.05 hrs
Type II 24-hr 100 YR- 1 HR Rainfall=2.87"

Area (ac)	CN	Description
25.380	78	Meadow, non-grazed, HSG D
0.400	98	Water Surface, 0% imp, HSG D
0.810	91	Gravel roads, HSG D
2.100	68	1 acre lots, 20% imp, HSG B
28.690	78	Weighted Average
28.270		98.54% Pervious Area
0.420		1.46% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.5	50	0.0100	0.08		**Sheet Flow, SF-1** Grass: Dense n= 0.240 P2= 3.39"
11.9	706	0.0200	0.99		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
22.4	756	Total			

Subcatchment 91S: DA TO STREAM CROSSING #5



Summary for Subcatchment 95S: DA TO INT 10; C-2

[49] Hint: Tc<2dt may require smaller dt

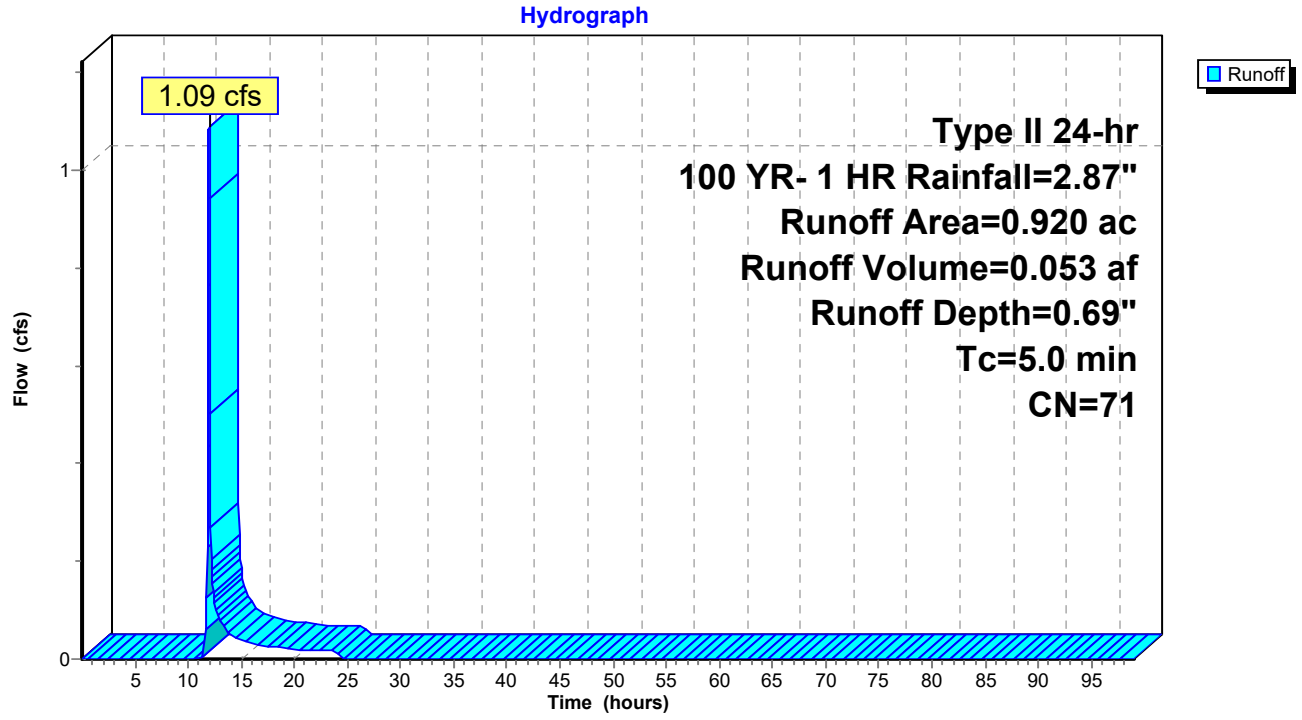
Runoff = 1.09 cfs @ 11.97 hrs, Volume= 0.053 af, Depth= 0.69"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.01-99.01 hrs, dt= 0.05 hrs
Type II 24-hr 100 YR- 1 HR Rainfall=2.87"

Area (ac)	CN	Description
0.810	69	50-75% Grass cover, Fair, HSG B
0.110	85	Gravel roads, HSG B
0.920	71	Weighted Average
0.920		100.00% Pervious Area

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

Subcatchment 95S: DA TO INT 10; C-2



Summary for Subcatchment 97S: DA TO INT 10; C-3

[49] Hint: Tc<2dt may require smaller dt

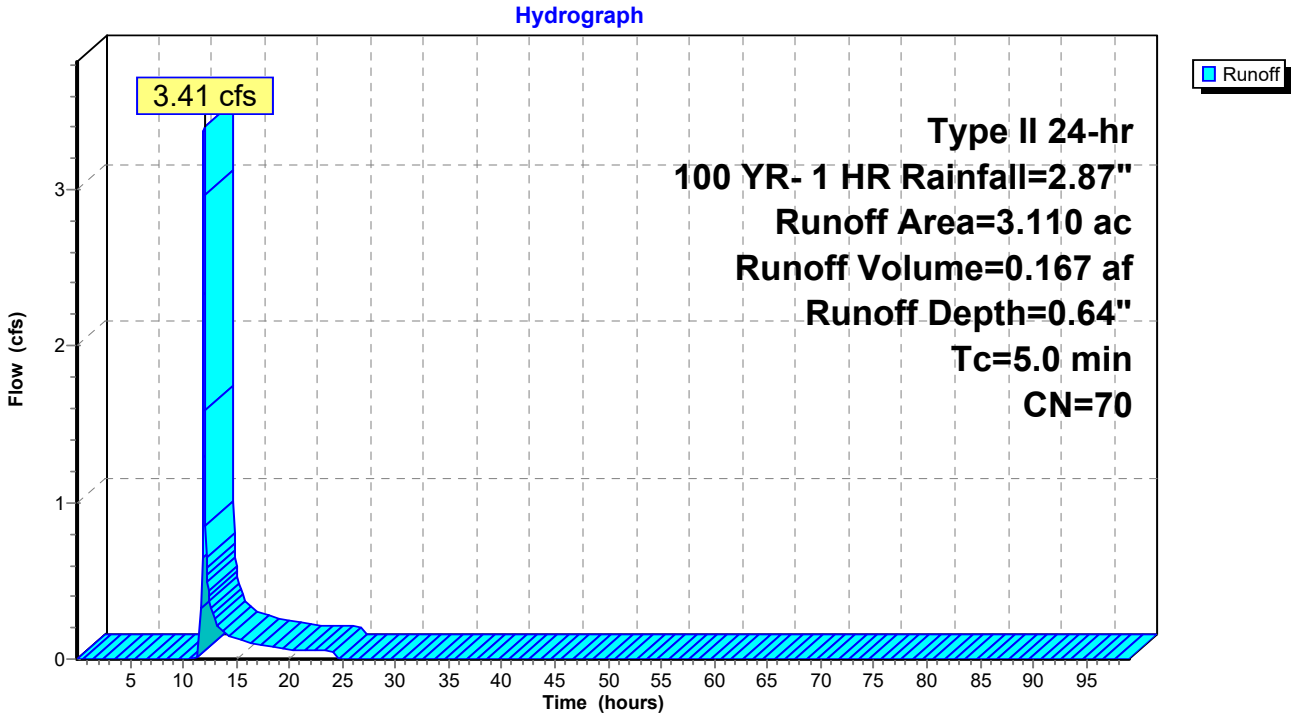
Runoff = 3.41 cfs @ 11.97 hrs, Volume= 0.167 af, Depth= 0.64"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.01-99.01 hrs, dt= 0.05 hrs
Type II 24-hr 100 YR- 1 HR Rainfall=2.87"

Area (ac)	CN	Description
2.900	69	50-75% Grass cover, Fair, HSG B
0.210	85	Gravel roads, HSG B
3.110	70	Weighted Average
3.110		100.00% Pervious Area

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

Subcatchment 97S: DA TO INT 10; C-3



Summary for Reach 55R: INT-6; C-1 (18" CULVERT)

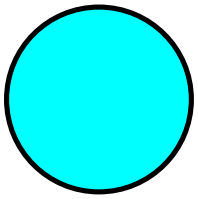
[52] Hint: Inlet/Outlet conditions not evaluated
[55] Hint: Peak inflow is 115% of Manning's capacity
[76] Warning: Detained 0.004 af (Pond w/culvert advised)

Inflow Area = 9.900 ac, 0.00% Impervious, Inflow Depth = 0.64" for 100 YR- 1 HR event
Inflow = 6.98 cfs @ 12.10 hrs, Volume= 0.531 af
Outflow = 6.52 cfs @ 12.08 hrs, Volume= 0.531 af, Atten= 7%, Lag= 0.0 min

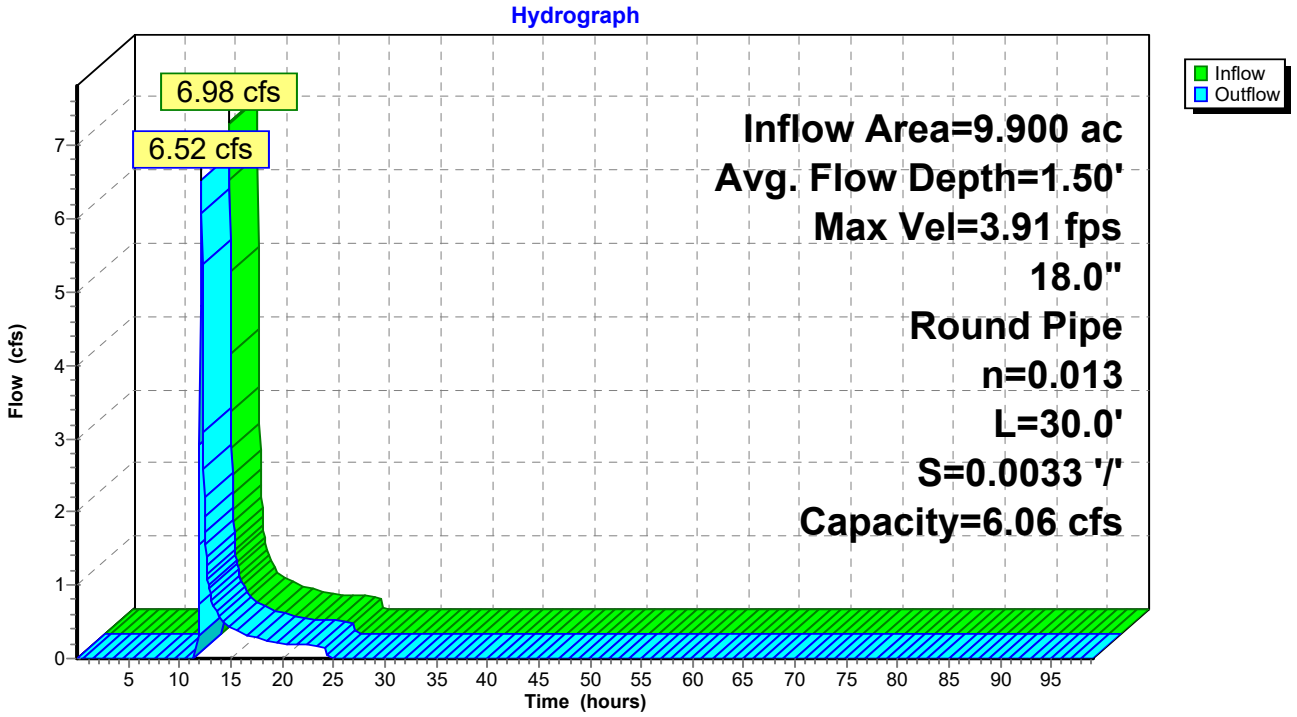
Routing by Stor-Ind+Trans method, Time Span= 0.01-99.01 hrs, dt= 0.05 hrs
Max. Velocity= 3.91 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 1.78 fps, Avg. Travel Time= 0.3 min

Peak Storage= 53 cf @ 12.14 hrs
Average Depth at Peak Storage= 1.50'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 6.06 cfs

18.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 30.0' Slope= 0.0033 '/'
Inlet Invert= 734.30', Outlet Invert= 734.20'



Reach 55R: INT-6; C-1 (18" CULVERT)



Summary for Reach 58R: INT-7; C-1 (18" CULVERT)

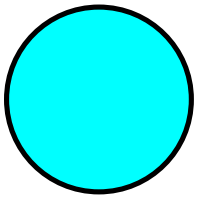
[52] Hint: Inlet/Outlet conditions not evaluated
[55] Hint: Peak inflow is 158% of Manning's capacity
[76] Warning: Detained 0.057 af (Pond w/culvert advised)

Inflow Area = 21.870 ac, 0.85% Impervious, Inflow Depth = 0.60" for 100 YR- 1 HR event
Inflow = 14.85 cfs @ 12.06 hrs, Volume= 1.090 af
Outflow = 9.40 cfs @ 12.06 hrs, Volume= 1.090 af, Atten= 37%, Lag= 0.0 min

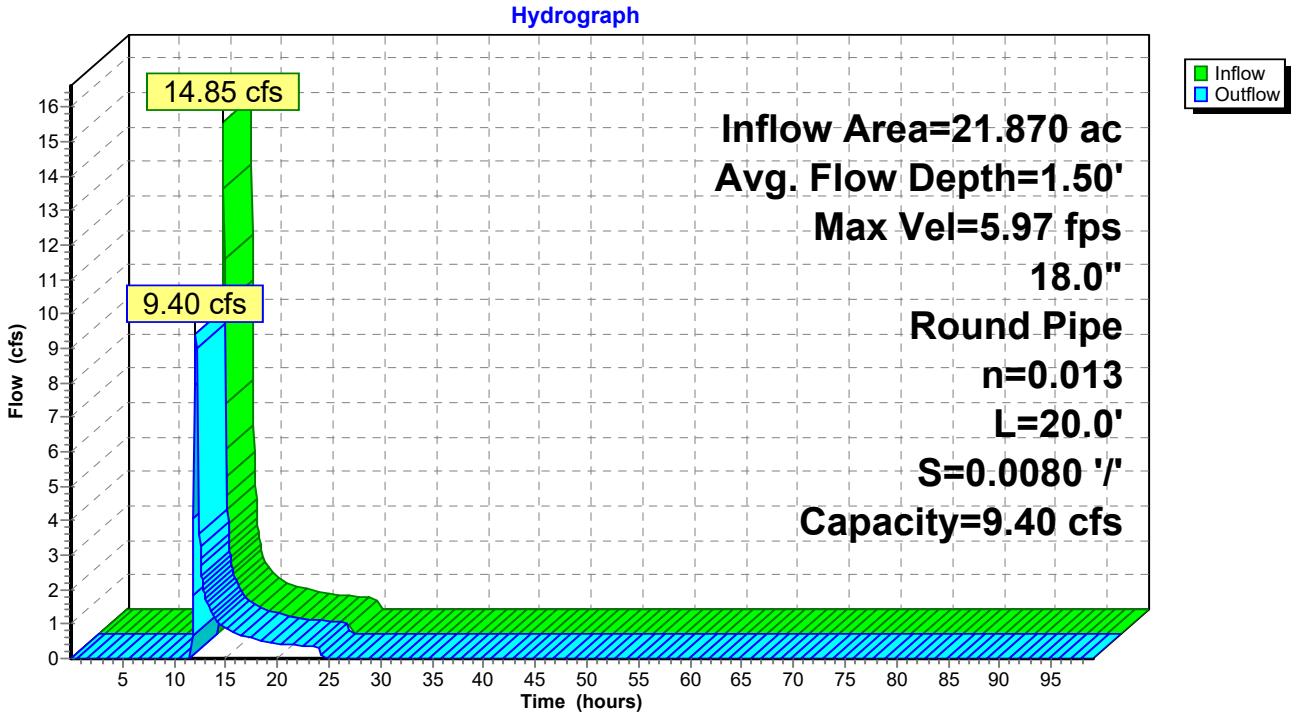
Routing by Stor-Ind+Trans method, Time Span= 0.01-99.01 hrs, dt= 0.05 hrs
Max. Velocity= 5.97 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 2.99 fps, Avg. Travel Time= 0.1 min

Peak Storage= 35 cf @ 12.01 hrs
Average Depth at Peak Storage= 1.50'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 9.40 cfs

18.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 20.0' Slope= 0.0080 '/'
Inlet Invert= 725.16', Outlet Invert= 725.00'



Reach 58R: INT-7; C-1 (18" CULVERT)



Summary for Reach 60R: INT-6; C-2 (30" CULVERT)

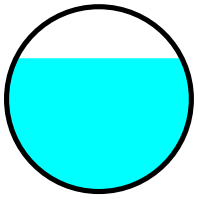
[52] Hint: Inlet/Outlet conditions not evaluated

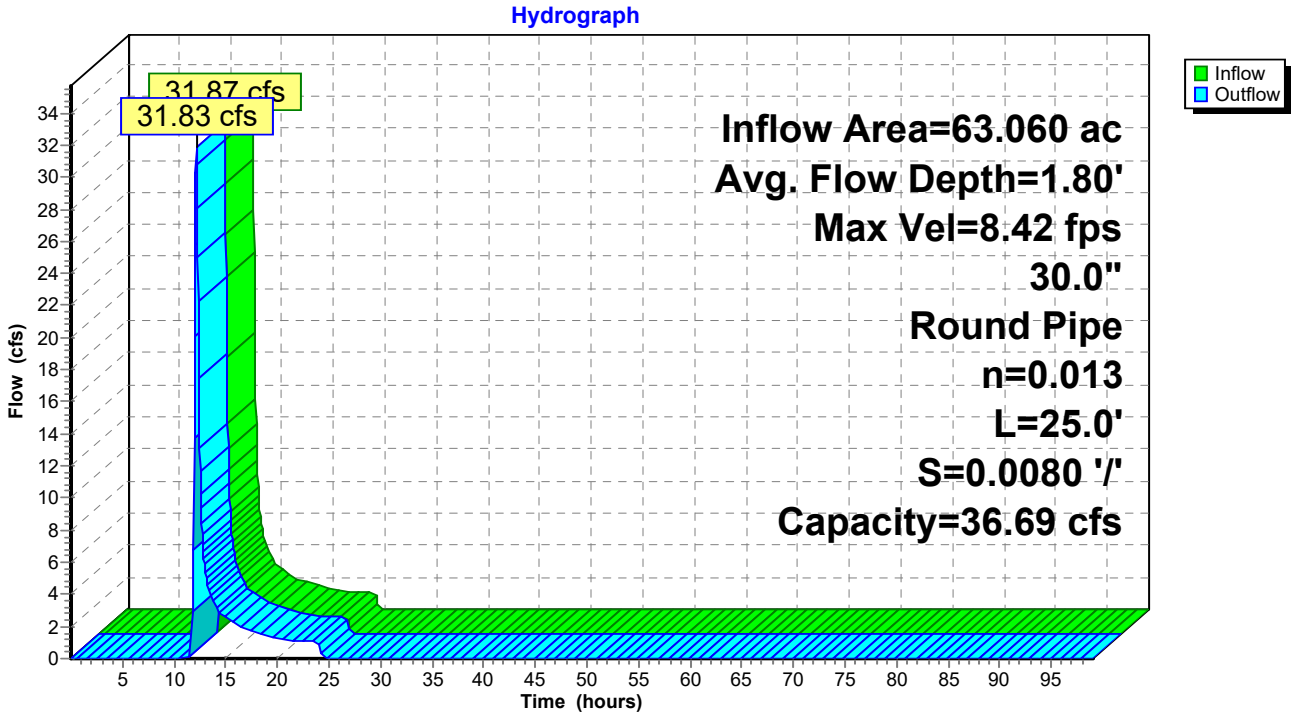
Inflow Area = 63.060 ac, 0.43% Impervious, Inflow Depth = 0.60" for 100 YR- 1 HR event
Inflow = 31.87 cfs @ 12.16 hrs, Volume= 3.154 af
Outflow = 31.83 cfs @ 12.17 hrs, Volume= 3.154 af, Atten= 0%, Lag= 0.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.01-99.01 hrs, dt= 0.05 hrs
Max. Velocity= 8.42 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 3.86 fps, Avg. Travel Time= 0.1 min

Peak Storage= 95 cf @ 12.16 hrs
Average Depth at Peak Storage= 1.80'
Bank-Full Depth= 2.50' Flow Area= 4.9 sf, Capacity= 36.69 cfs

30.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 25.0' Slope= 0.0080 '/'
Inlet Invert= 721.10', Outlet Invert= 720.90'





Summary for Reach 61R: STREAM CROSSING #1 (30" HDPE-6" EMBEDED)

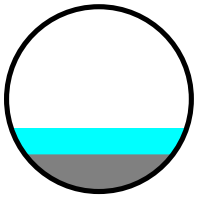
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 18.090 ac, 0.00% Impervious, Inflow Depth = 0.23" for 100 YR- 1 HR event
Inflow = 1.76 cfs @ 12.25 hrs, Volume= 0.352 af
Outflow = 1.75 cfs @ 12.26 hrs, Volume= 0.352 af, Atten= 0%, Lag= 0.5 min

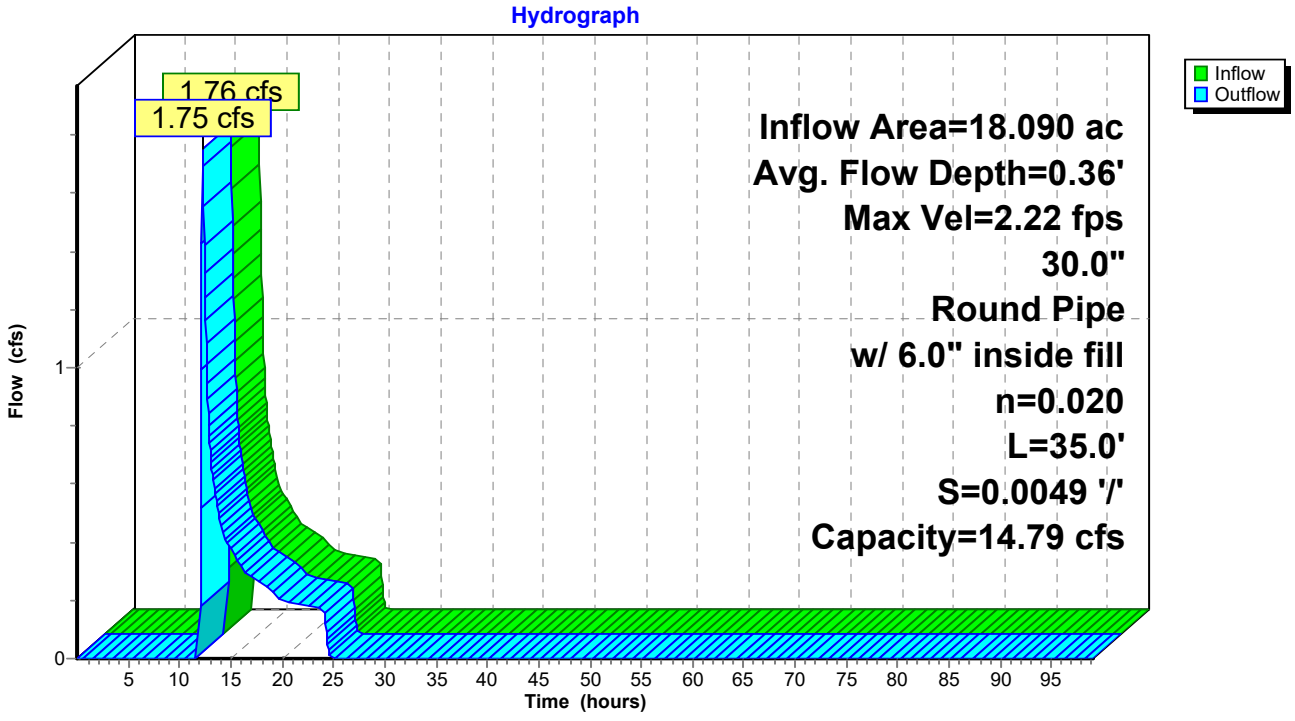
Routing by Stor-Ind+Trans method, Time Span= 0.01-99.01 hrs, dt= 0.05 hrs
Max. Velocity= 2.22 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 1.14 fps, Avg. Travel Time= 0.5 min

Peak Storage= 28 cf @ 12.26 hrs
Average Depth at Peak Storage= 0.86' above invert (0.36' above fill)
Bank-Full Depth= 2.50' above invert (2.00' above fill) Flow Area= 4.2 sf, Capacity= 14.79 cfs

30.0" Round Pipe w/ 6.0" inside fill
n= 0.020 Corrugated PE, corrugated interior
Length= 35.0' Slope= 0.0049 '/'
Inlet Invert= 690.00', Outlet Invert= 689.83'



Reach 61R: STREAM CROSSING #1 (30" HDPE-6" EMBEDED)



Summary for Reach 62R: STREAM CROSSING #2 (60" HDPE-12" EMBEDDED)

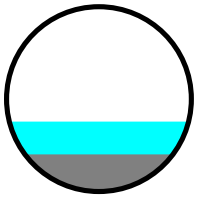
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 110.740 ac, 0.38% Impervious, Inflow Depth = 0.53" for 100 YR- 1 HR event
Inflow = 49.35 cfs @ 12.16 hrs, Volume= 4.934 af
Outflow = 49.31 cfs @ 12.16 hrs, Volume= 4.934 af, Atten= 0%, Lag= 0.1 min

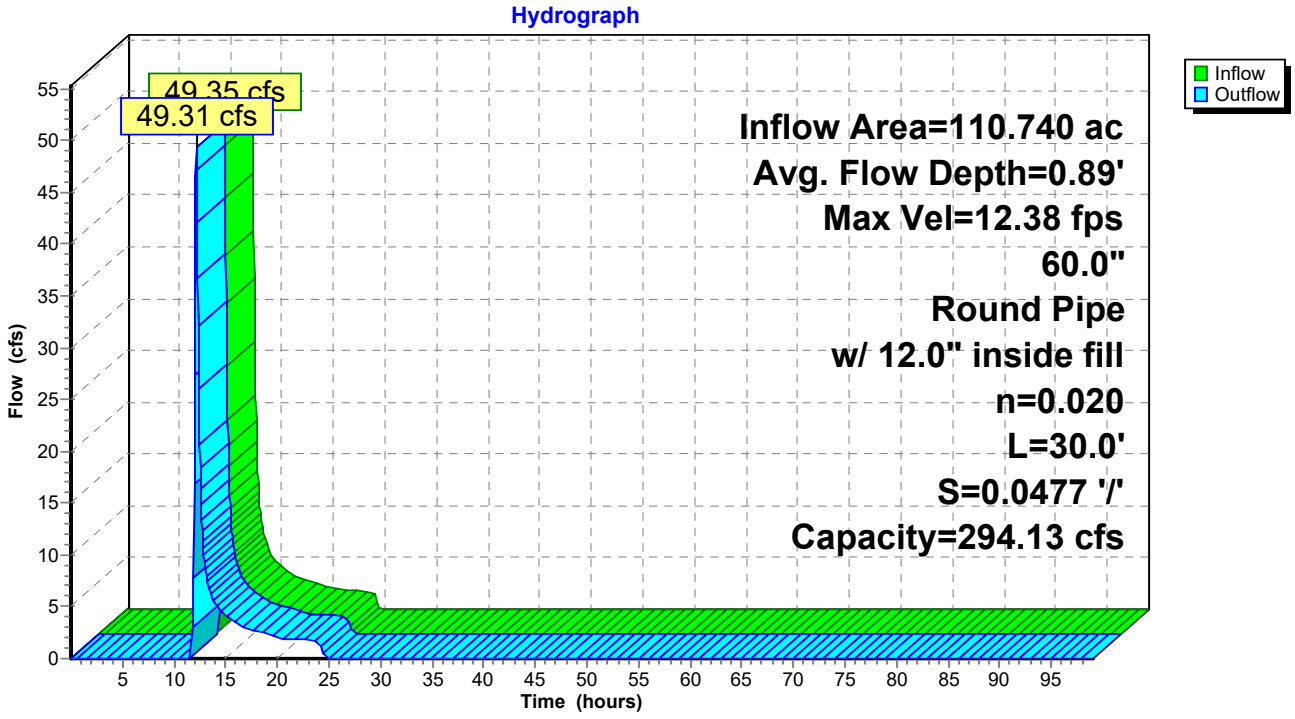
Routing by Stor-Ind+Trans method, Time Span= 0.01-99.01 hrs, dt= 0.05 hrs
Max. Velocity= 12.38 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 4.68 fps, Avg. Travel Time= 0.1 min

Peak Storage= 120 cf @ 12.16 hrs
Average Depth at Peak Storage= 1.89' above invert (0.89' above fill)
Bank-Full Depth= 5.00' above invert (4.00' above fill) Flow Area= 16.8 sf, Capacity= 294.13 cfs

60.0" Round Pipe w/ 12.0" inside fill
n= 0.020 Corrugated PE, corrugated interior
Length= 30.0' Slope= 0.0477 '/'
Inlet Invert= 703.43', Outlet Invert= 702.00'



Reach 62R: STREAM CROSSING #2 (60" HDPE-12" EMBEDDED)



Summary for Reach 65R: INT-6; C-3 (18" CULVERT)

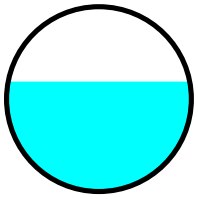
[52] Hint: Inlet/Outlet conditions not evaluated

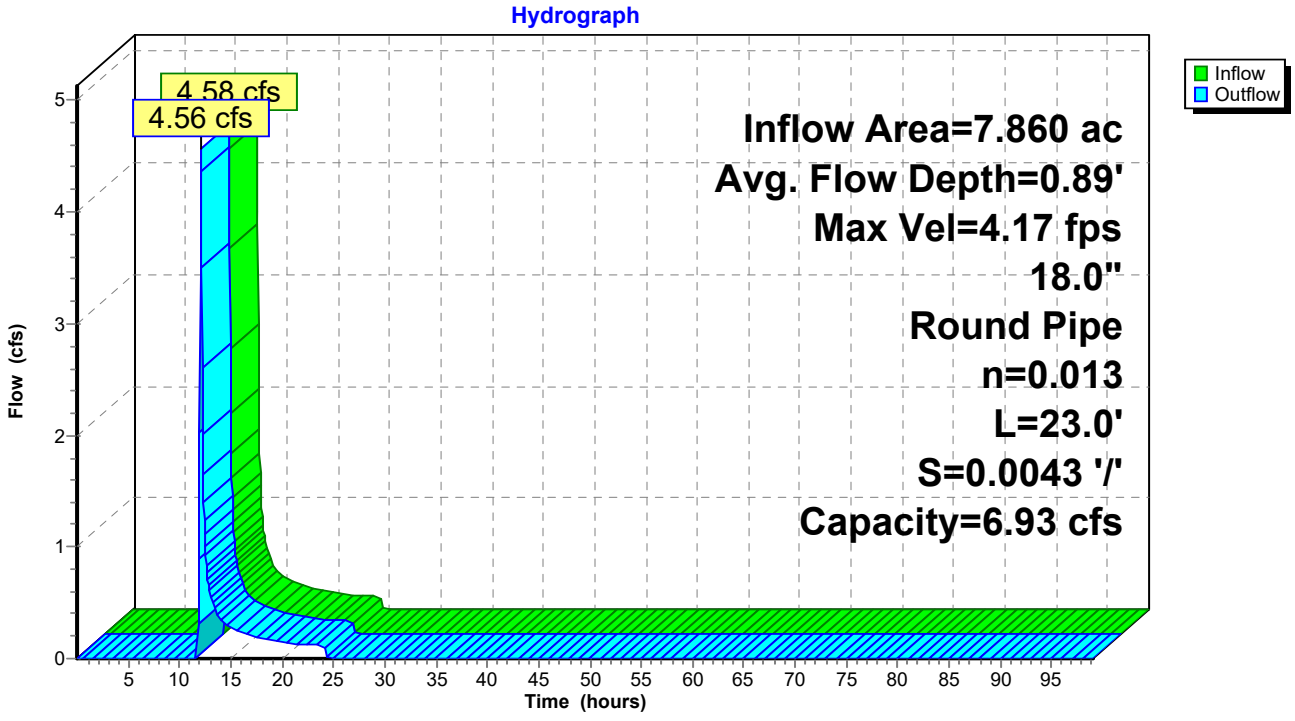
Inflow Area = 7.860 ac, 0.00% Impervious, Inflow Depth = 0.52" for 100 YR- 1 HR event
Inflow = 4.58 cfs @ 12.08 hrs, Volume= 0.342 af
Outflow = 4.56 cfs @ 12.08 hrs, Volume= 0.342 af, Atten= 0%, Lag= 0.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.01-99.01 hrs, dt= 0.05 hrs
Max. Velocity= 4.17 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 1.77 fps, Avg. Travel Time= 0.2 min

Peak Storage= 25 cf @ 12.08 hrs
Average Depth at Peak Storage= 0.89'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 6.93 cfs

18.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 23.0' Slope= 0.0043 '/'
Inlet Invert= 721.10', Outlet Invert= 721.00'





Summary for Reach 67R: INT-6; C-4 (15" CULVERT)

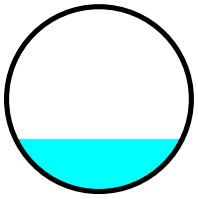
[52] Hint: Inlet/Outlet conditions not evaluated

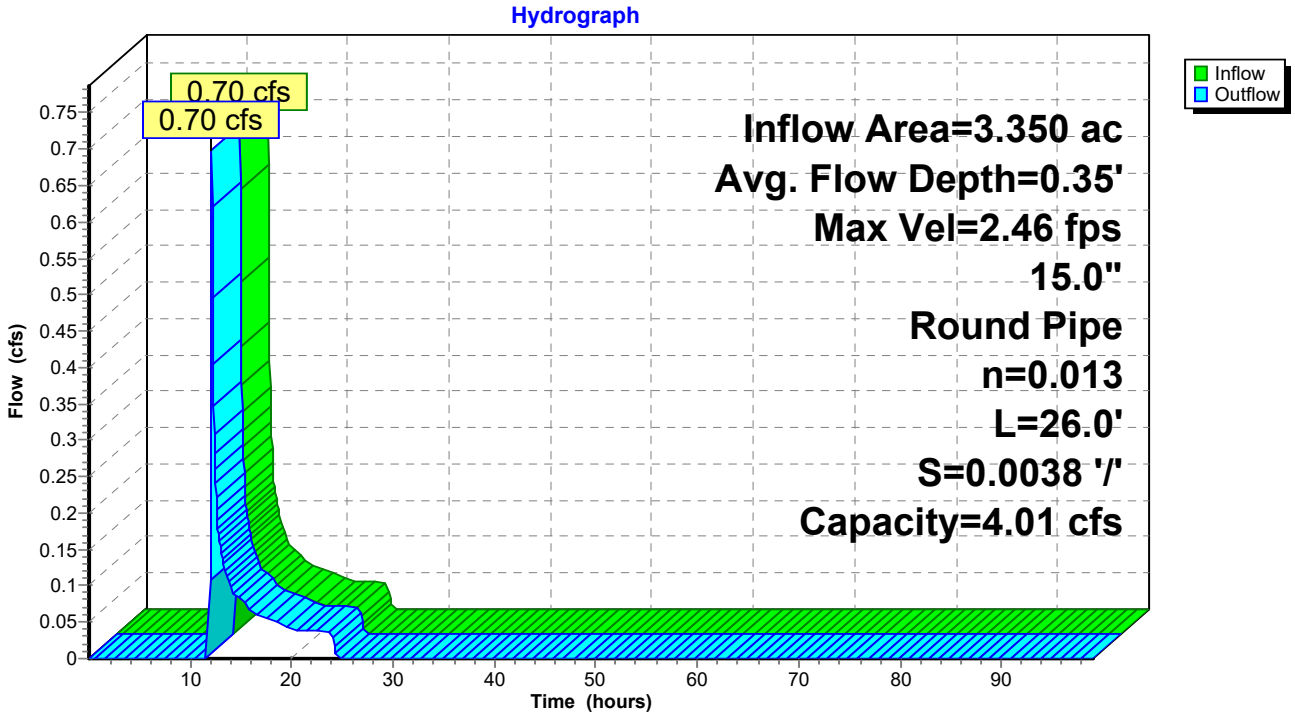
Inflow Area = 3.350 ac, 0.00% Impervious, Inflow Depth = 0.29" for 100 YR- 1 HR event
Inflow = 0.70 cfs @ 12.11 hrs, Volume= 0.080 af
Outflow = 0.70 cfs @ 12.11 hrs, Volume= 0.080 af, Atten= 1%, Lag= 0.3 min

Routing by Stor-Ind+Trans method, Time Span= 0.01-99.01 hrs, dt= 0.05 hrs
Max. Velocity= 2.46 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 1.18 fps, Avg. Travel Time= 0.4 min

Peak Storage= 7 cf @ 12.11 hrs
Average Depth at Peak Storage= 0.35'
Bank-Full Depth= 1.25' Flow Area= 1.2 sf, Capacity= 4.01 cfs

15.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 26.0' Slope= 0.0038 '/'
Inlet Invert= 724.70', Outlet Invert= 724.60'





Summary for Reach 70R: STREAM CROSSING #3 (36" HDPE-7.5" EMBEDDED)

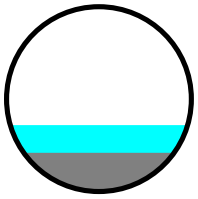
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 27.200 ac, 0.04% Impervious, Inflow Depth = 0.34" for 100 YR- 1 HR event
Inflow = 7.31 cfs @ 12.11 hrs, Volume= 0.768 af
Outflow = 7.30 cfs @ 12.11 hrs, Volume= 0.768 af, Atten= 0%, Lag= 0.1 min

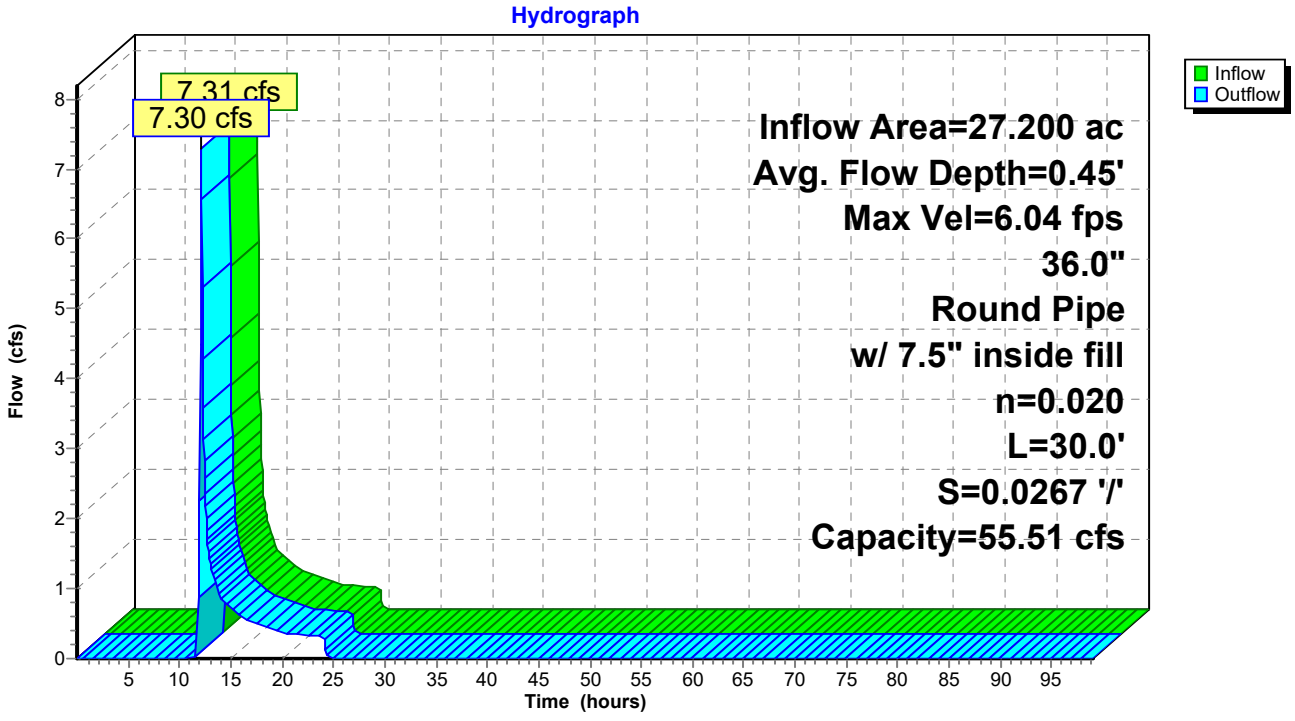
Routing by Stor-Ind+Trans method, Time Span= 0.01-99.01 hrs, dt= 0.05 hrs
Max. Velocity= 6.04 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 2.37 fps, Avg. Travel Time= 0.2 min

Peak Storage= 36 cf @ 12.11 hrs
Average Depth at Peak Storage= 1.08' above invert (0.45' above fill)
Bank-Full Depth= 3.00' above invert (2.38' above fill) Flow Area= 6.0 sf, Capacity= 55.51 cfs

36.0" Round Pipe w/ 7.5" inside fill
n= 0.020 Corrugated PE, corrugated interior
Length= 30.0' Slope= 0.0267 '/'
Inlet Invert= 708.33', Outlet Invert= 707.53'



Reach 70R: STREAM CROSSING #3 (36" HDPE-7.5" EMBEDDED)



Summary for Reach 72R: INT-5; C-1 (15" CULVERT)

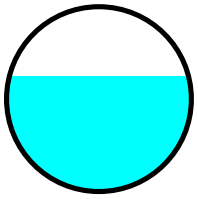
[52] Hint: Inlet/Outlet conditions not evaluated

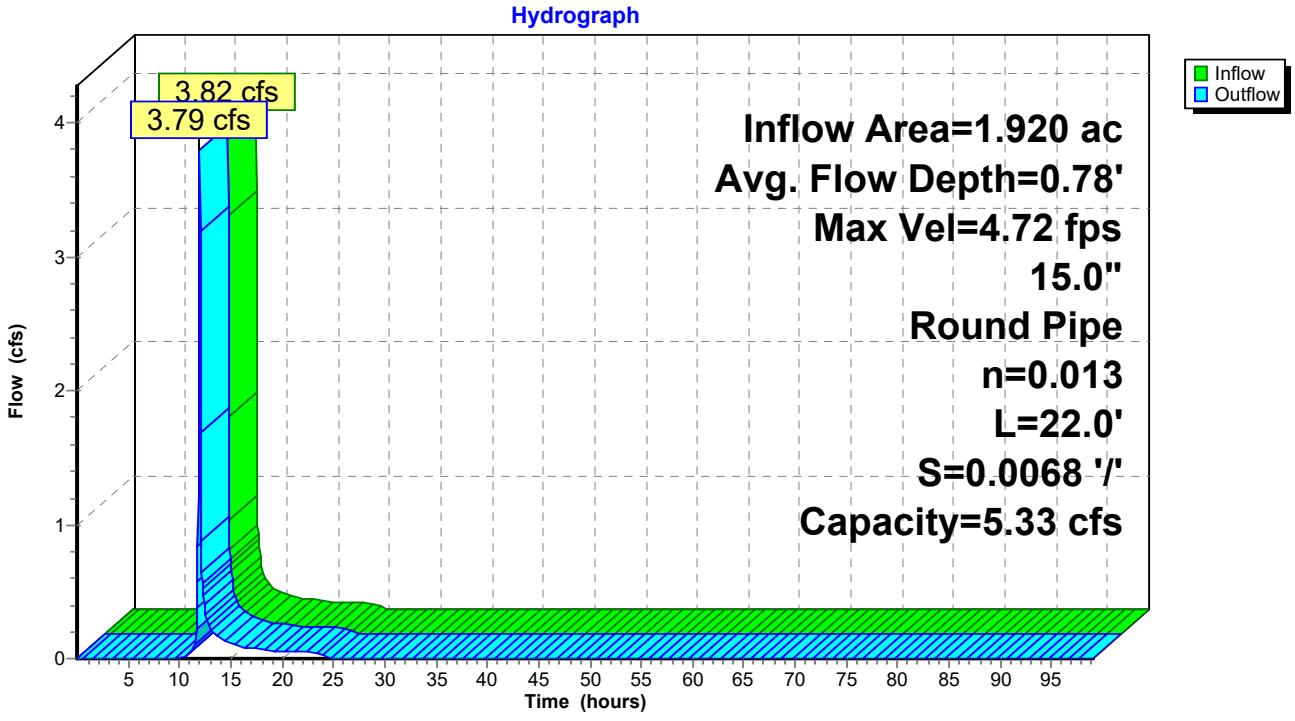
Inflow Area = 1.920 ac, 0.00% Impervious, Inflow Depth = 1.09" for 100 YR- 1 HR event
Inflow = 3.82 cfs @ 11.96 hrs, Volume= 0.175 af
Outflow = 3.79 cfs @ 11.96 hrs, Volume= 0.175 af, Atten= 1%, Lag= 0.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.01-99.01 hrs, dt= 0.05 hrs
Max. Velocity= 4.72 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 1.61 fps, Avg. Travel Time= 0.2 min

Peak Storage= 18 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.78'
Bank-Full Depth= 1.25' Flow Area= 1.2 sf, Capacity= 5.33 cfs

15.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 22.0' Slope= 0.0068 '/'
Inlet Invert= 732.40', Outlet Invert= 732.25'





Summary for Reach 74R: INT-5; C-2 (24" CULVERT)

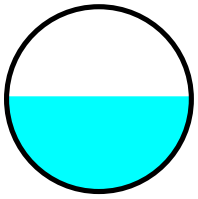
[52] Hint: Inlet/Outlet conditions not evaluated

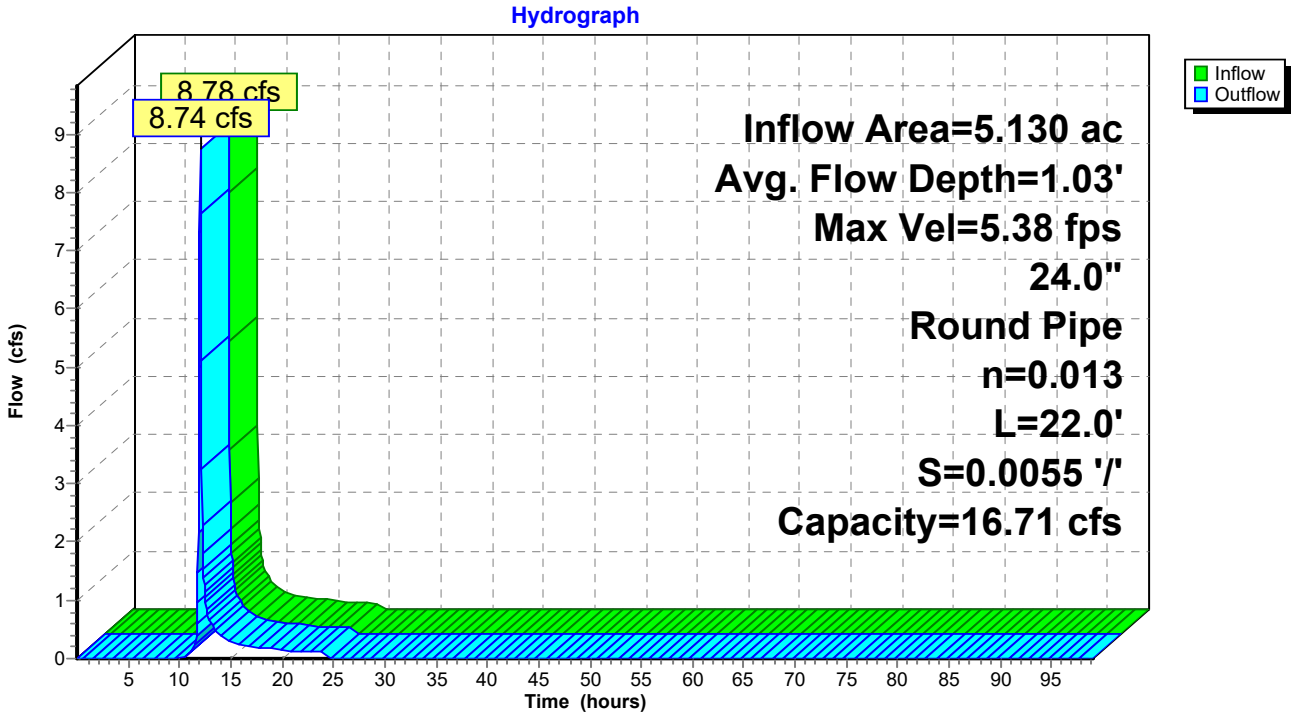
Inflow Area = 5.130 ac, 0.00% Impervious, Inflow Depth = 1.09" for 100 YR- 1 HR event
Inflow = 8.78 cfs @ 12.01 hrs, Volume= 0.468 af
Outflow = 8.74 cfs @ 12.01 hrs, Volume= 0.468 af, Atten= 0%, Lag= 0.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.01-99.01 hrs, dt= 0.05 hrs
Max. Velocity= 5.38 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 1.87 fps, Avg. Travel Time= 0.2 min

Peak Storage= 36 cf @ 12.01 hrs
Average Depth at Peak Storage= 1.03'
Bank-Full Depth= 2.00' Flow Area= 3.1 sf, Capacity= 16.71 cfs

24.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 22.0' Slope= 0.0055 '/'
Inlet Invert= 712.50', Outlet Invert= 712.38'





Summary for Reach 76R: INT-9; C-3 (15" CULVERT)

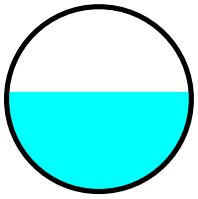
[52] Hint: Inlet/Outlet conditions not evaluated

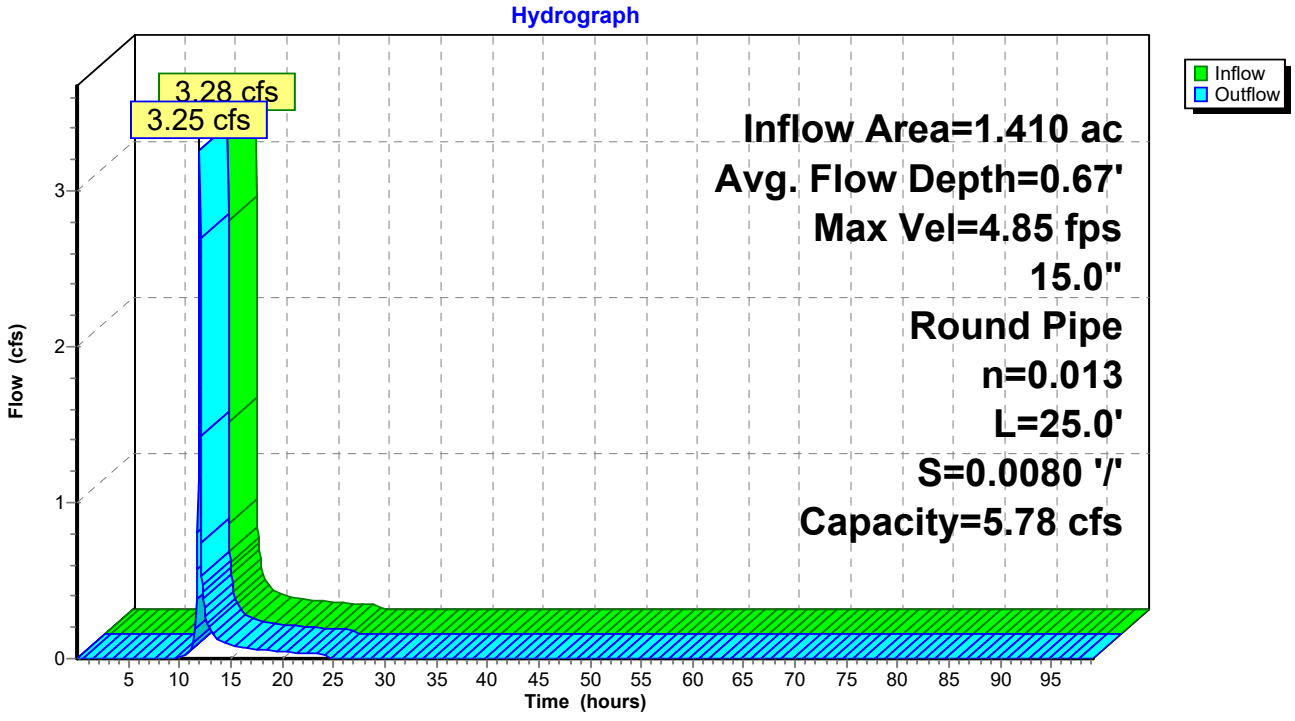
Inflow Area = 1.410 ac, 0.00% Impervious, Inflow Depth = 1.28" for 100 YR- 1 HR event
Inflow = 3.28 cfs @ 11.96 hrs, Volume= 0.150 af
Outflow = 3.25 cfs @ 11.96 hrs, Volume= 0.150 af, Atten= 1%, Lag= 0.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.01-99.01 hrs, dt= 0.05 hrs
Max. Velocity= 4.85 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 1.58 fps, Avg. Travel Time= 0.3 min

Peak Storage= 17 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.67'
Bank-Full Depth= 1.25' Flow Area= 1.2 sf, Capacity= 5.78 cfs

15.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 25.0' Slope= 0.0080 '/'
Inlet Invert= 716.60', Outlet Invert= 716.40'





Summary for Reach 78R: INT-14; C-2 (15" CULVERT)

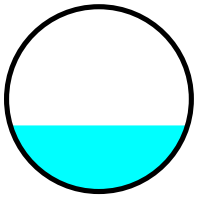
[52] Hint: Inlet/Outlet conditions not evaluated

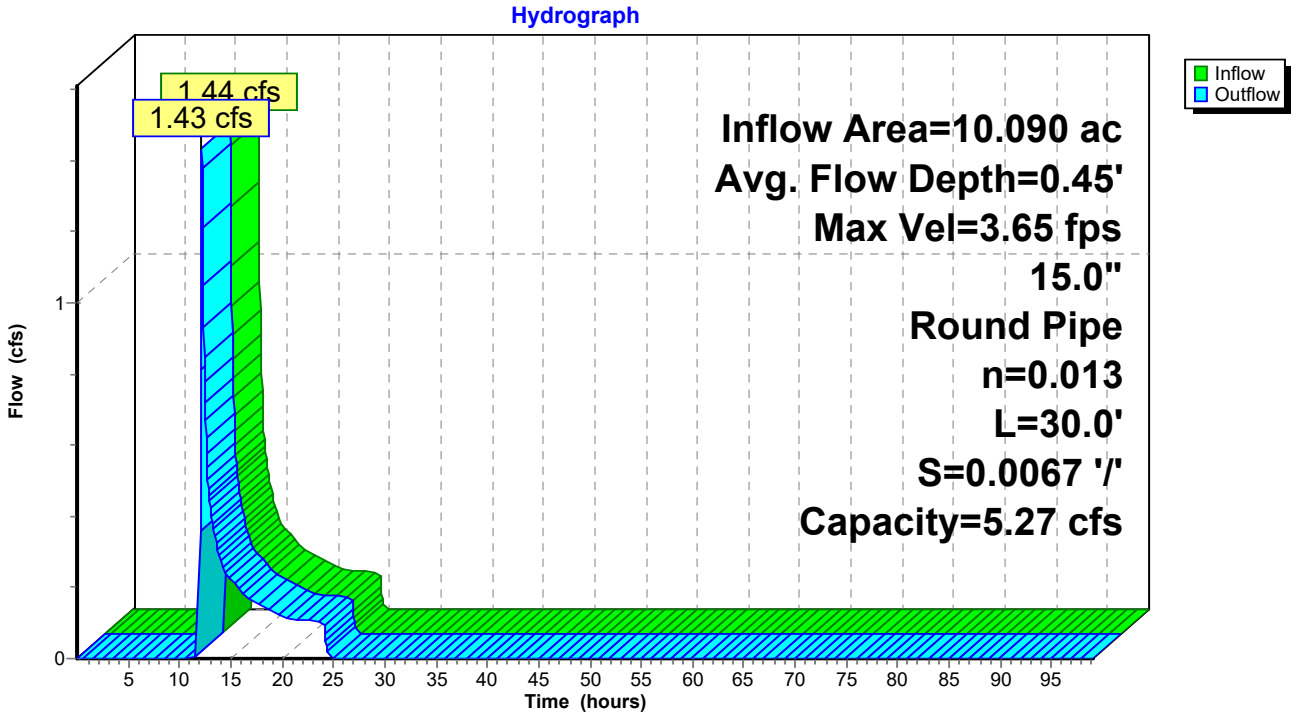
Inflow Area = 10.090 ac, 0.00% Impervious, Inflow Depth = 0.26" for 100 YR- 1 HR event
Inflow = 1.44 cfs @ 12.17 hrs, Volume= 0.219 af
Outflow = 1.43 cfs @ 12.18 hrs, Volume= 0.219 af, Atten= 0%, Lag= 0.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.01-99.01 hrs, dt= 0.05 hrs
Max. Velocity= 3.65 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 1.93 fps, Avg. Travel Time= 0.3 min

Peak Storage= 12 cf @ 12.17 hrs
Average Depth at Peak Storage= 0.45'
Bank-Full Depth= 1.25' Flow Area= 1.2 sf, Capacity= 5.27 cfs

15.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 30.0' Slope= 0.0067 '/'
Inlet Invert= 730.50', Outlet Invert= 730.30'





Summary for Reach 82R: INT-9; C-2 (18" CULVERT)

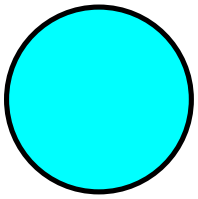
[52] Hint: Inlet/Outlet conditions not evaluated
[55] Hint: Peak inflow is 114% of Manning's capacity
[76] Warning: Detained 0.004 af (Pond w/culvert advised)

Inflow Area = 3.800 ac, 0.00% Impervious, Inflow Depth = 1.09" for 100 YR- 1 HR event
Inflow = 7.56 cfs @ 11.96 hrs, Volume= 0.347 af
Outflow = 7.40 cfs @ 11.99 hrs, Volume= 0.347 af, Atten= 2%, Lag= 1.7 min

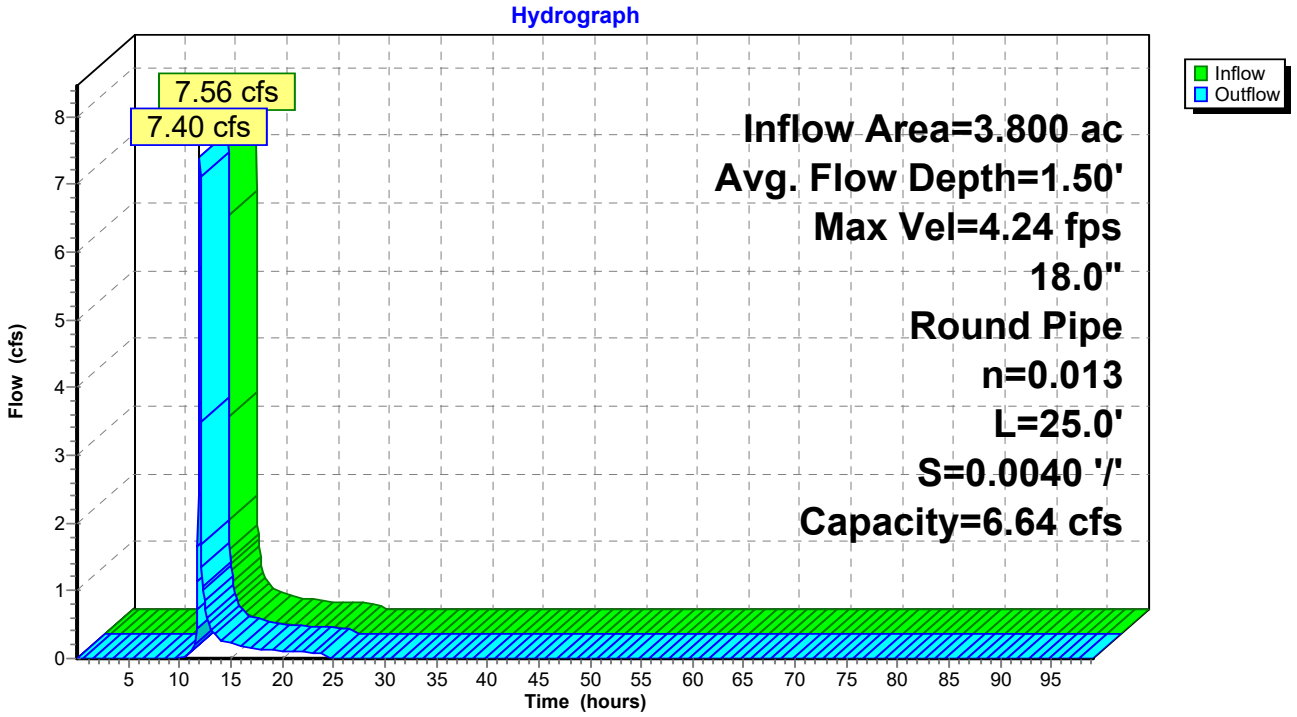
Routing by Stor-Ind+Trans method, Time Span= 0.01-99.01 hrs, dt= 0.05 hrs
Max. Velocity= 4.24 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 1.60 fps, Avg. Travel Time= 0.3 min

Peak Storage= 45 cf @ 11.98 hrs
Average Depth at Peak Storage= 1.50'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 6.64 cfs

18.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 25.0' Slope= 0.0040 '/'
Inlet Invert= 722.50', Outlet Invert= 722.40'



Reach 82R: INT-9; C-2 (18" CULVERT)



Summary for Reach 83R: INT-9; C-1(18" CULVERT)

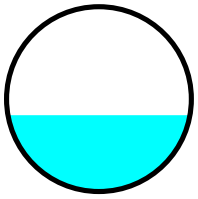
[52] Hint: Inlet/Outlet conditions not evaluated

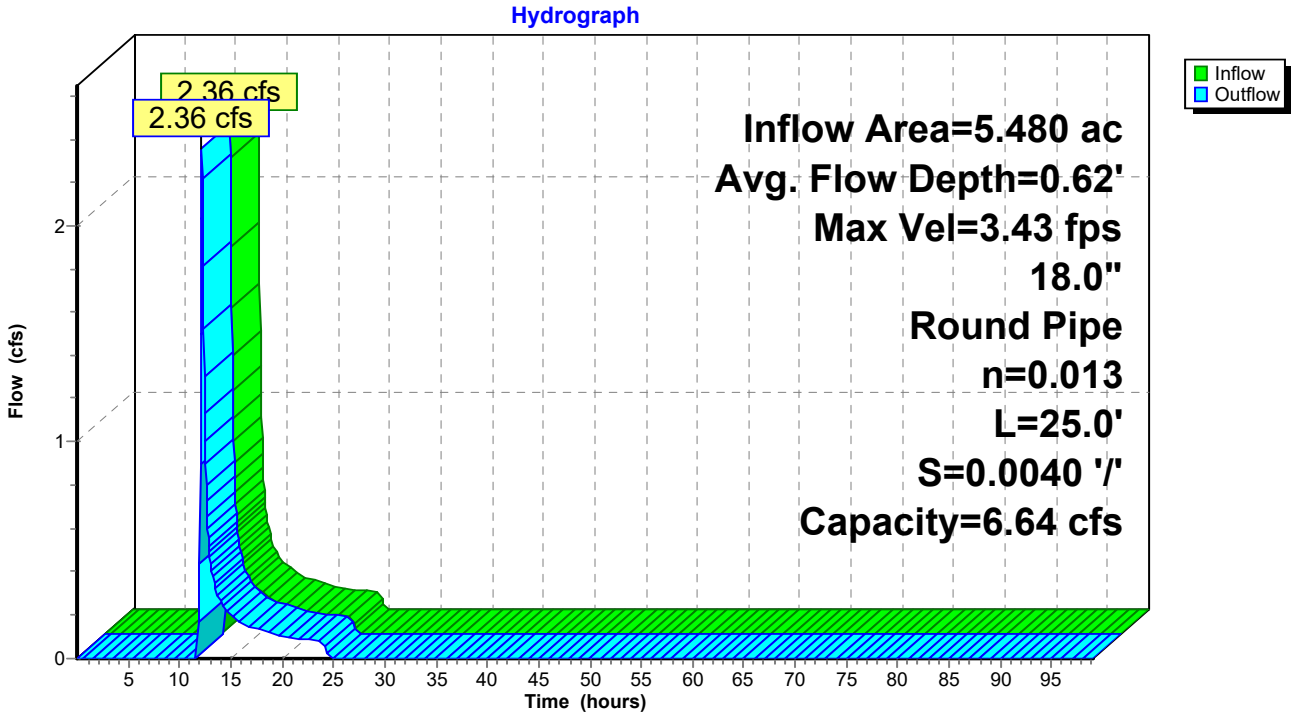
Inflow Area = 5.480 ac, 0.00% Impervious, Inflow Depth = 0.52" for 100 YR- 1 HR event
Inflow = 2.36 cfs @ 12.18 hrs, Volume= 0.238 af
Outflow = 2.36 cfs @ 12.18 hrs, Volume= 0.238 af, Atten= 0%, Lag= 0.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.01-99.01 hrs, dt= 0.05 hrs
Max. Velocity= 3.43 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 1.53 fps, Avg. Travel Time= 0.3 min

Peak Storage= 17 cf @ 12.18 hrs
Average Depth at Peak Storage= 0.62'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 6.64 cfs

18.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 25.0' Slope= 0.0040 '/'
Inlet Invert= 731.20', Outlet Invert= 731.10'





Summary for Reach 84R: INT-14; C-3 (15" CULVERT)

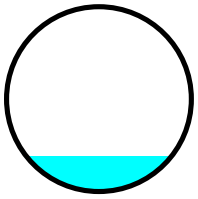
[52] Hint: Inlet/Outlet conditions not evaluated

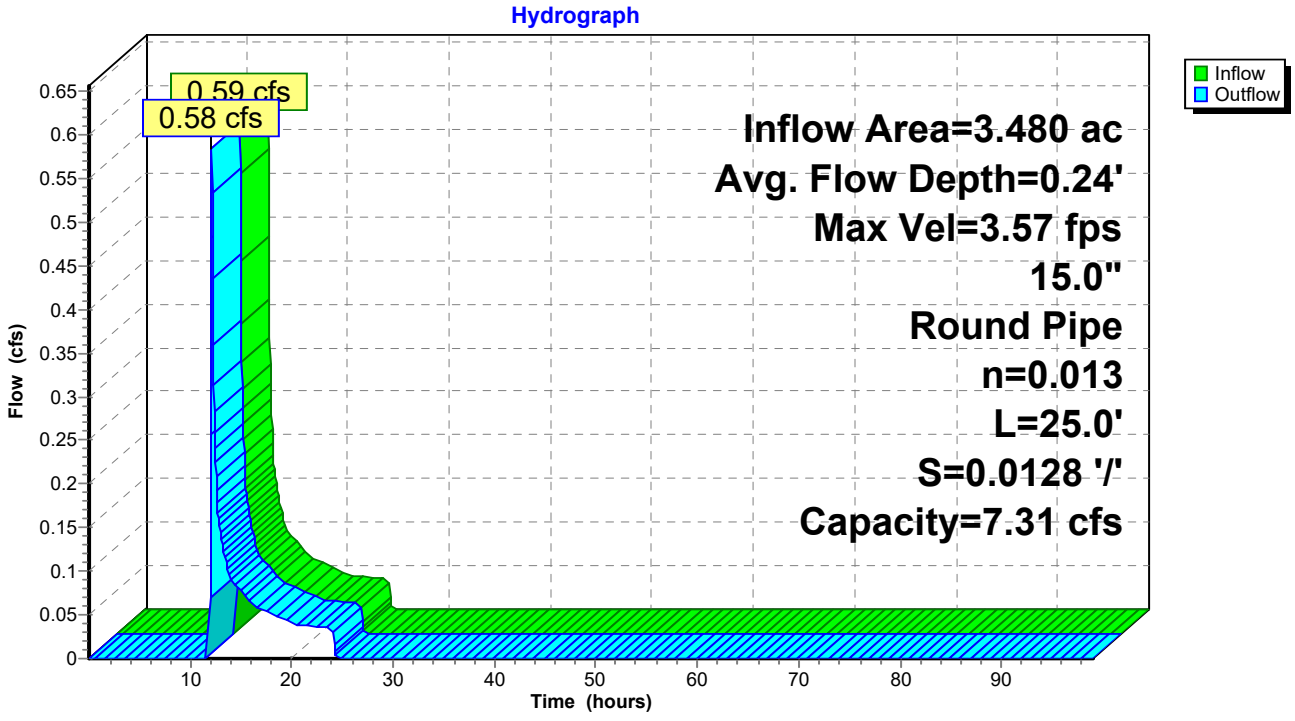
Inflow Area = 3.480 ac, 0.00% Impervious, Inflow Depth = 0.26" for 100 YR- 1 HR event
Inflow = 0.59 cfs @ 12.12 hrs, Volume= 0.075 af
Outflow = 0.58 cfs @ 12.12 hrs, Volume= 0.075 af, Atten= 0%, Lag= 0.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.01-99.01 hrs, dt= 0.05 hrs
Max. Velocity= 3.57 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 1.78 fps, Avg. Travel Time= 0.2 min

Peak Storage= 4 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.24'
Bank-Full Depth= 1.25' Flow Area= 1.2 sf, Capacity= 7.31 cfs

15.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 25.0' Slope= 0.0128 '/'
Inlet Invert= 743.50', Outlet Invert= 743.18'





Summary for Reach 88R: INT-14; C-1 (18" CULVERT)

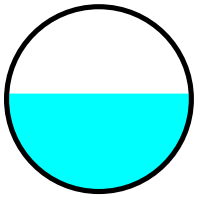
[52] Hint: Inlet/Outlet conditions not evaluated

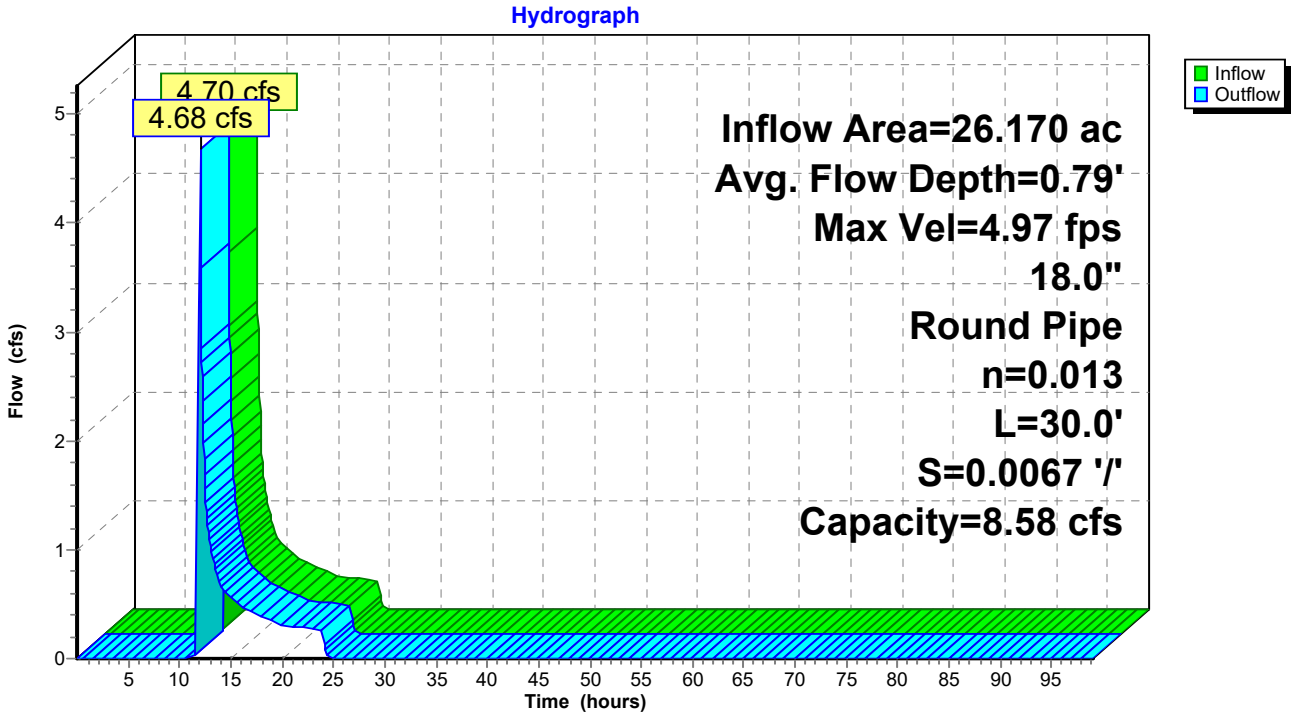
Inflow Area = 26.170 ac, 0.00% Impervious, Inflow Depth = 0.26" for 100 YR- 1 HR event
Inflow = 4.70 cfs @ 12.01 hrs, Volume= 0.567 af
Outflow = 4.68 cfs @ 12.01 hrs, Volume= 0.567 af, Atten= 0%, Lag= 0.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.01-99.01 hrs, dt= 0.05 hrs
Max. Velocity= 4.97 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 2.48 fps, Avg. Travel Time= 0.2 min

Peak Storage= 29 cf @ 12.01 hrs
Average Depth at Peak Storage= 0.79'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 8.58 cfs

18.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 30.0' Slope= 0.0067 '/'
Inlet Invert= 716.00', Outlet Invert= 715.80'





Summary for Reach 90R: INT- 10; C-1 (18" CULVERT)

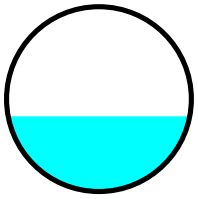
[52] Hint: Inlet/Outlet conditions not evaluated

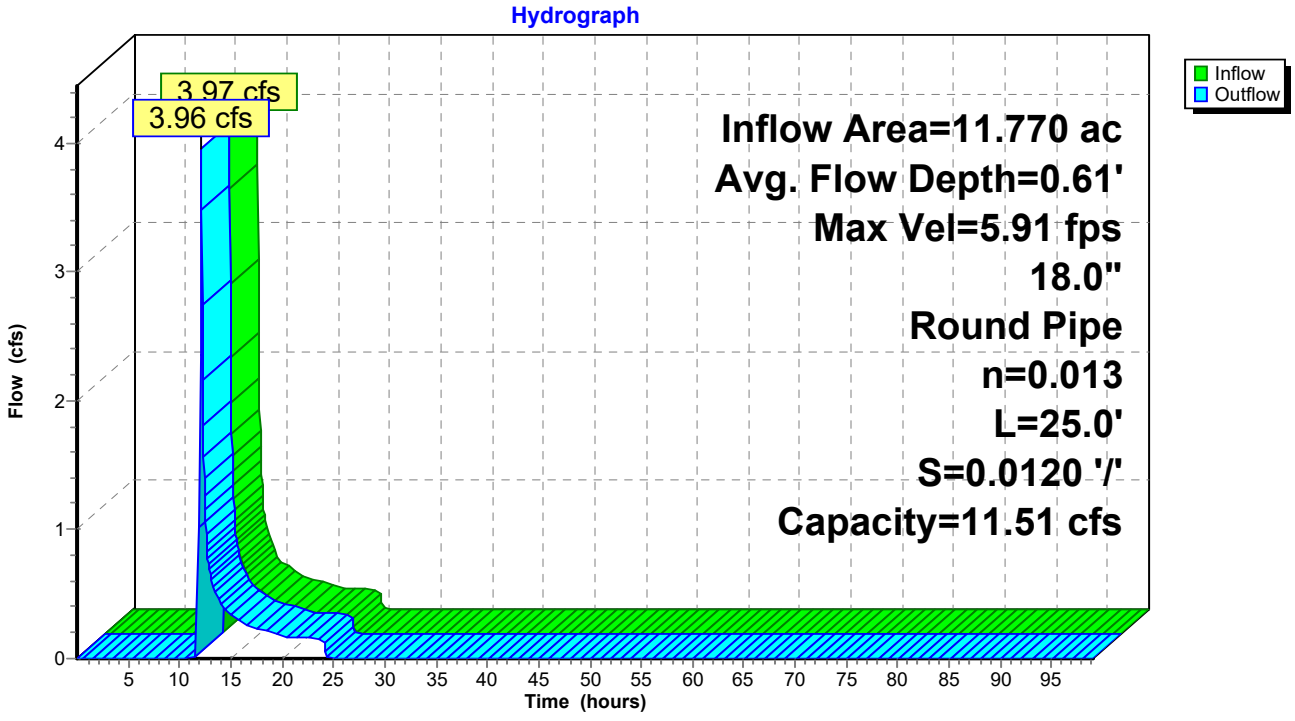
Inflow Area = 11.770 ac, 0.00% Impervious, Inflow Depth = 0.38" for 100 YR- 1 HR event
Inflow = 3.97 cfs @ 12.10 hrs, Volume= 0.373 af
Outflow = 3.96 cfs @ 12.11 hrs, Volume= 0.373 af, Atten= 0%, Lag= 0.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.01-99.01 hrs, dt= 0.05 hrs
Max. Velocity= 5.91 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 2.65 fps, Avg. Travel Time= 0.2 min

Peak Storage= 17 cf @ 12.11 hrs
Average Depth at Peak Storage= 0.61'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 11.51 cfs

18.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 25.0' Slope= 0.0120 '/'
Inlet Invert= 726.40', Outlet Invert= 726.10'





Summary for Reach 93R: STREAM CROSSING #5 (30" CMP-6" EMBEDED)

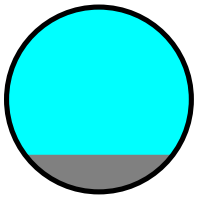
[52] Hint: Inlet/Outlet conditions not evaluated
[55] Hint: Peak inflow is 111% of Manning's capacity
[76] Warning: Detained 0.019 af (Pond w/culvert advised)

Inflow Area = 28.690 ac, 1.46% Impervious, Inflow Depth = 1.04" for 100 YR- 1 HR event
Inflow = 29.73 cfs @ 12.17 hrs, Volume= 2.480 af
Outflow = 27.92 cfs @ 12.13 hrs, Volume= 2.480 af, Atten= 6%, Lag= 0.0 min

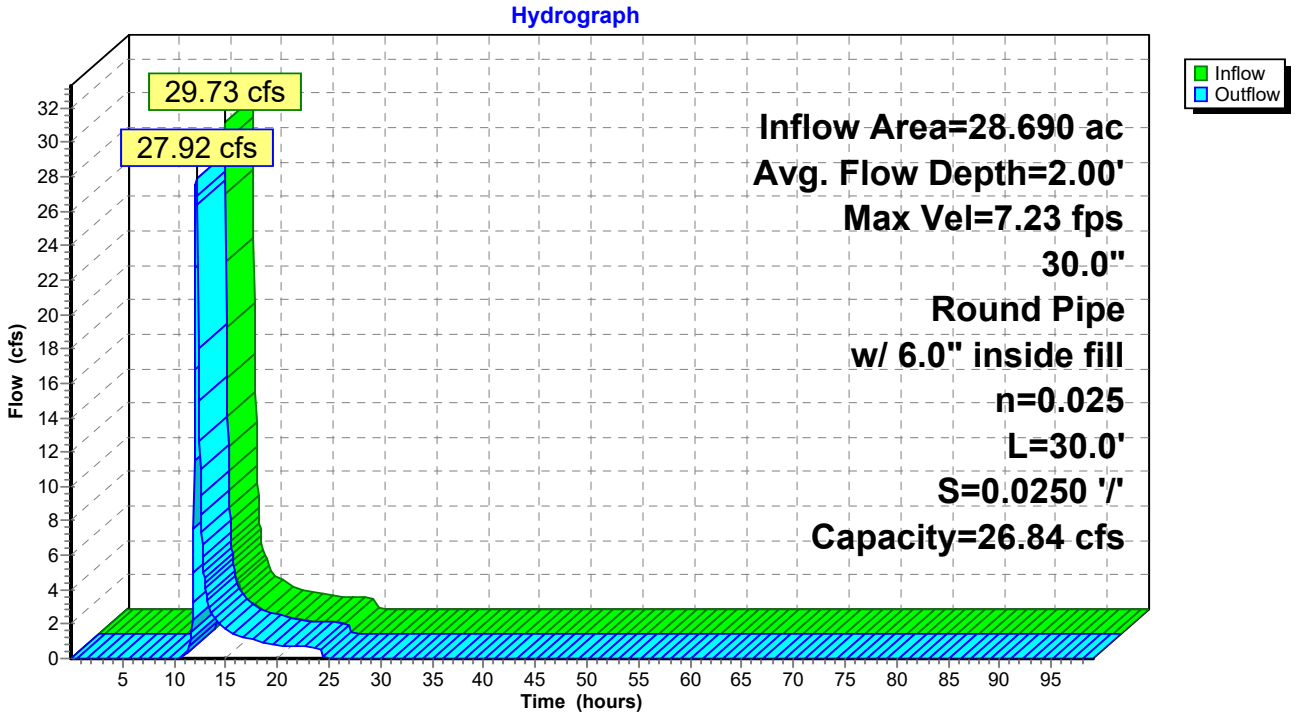
Routing by Stor-Ind+Trans method, Time Span= 0.01-99.01 hrs, dt= 0.05 hrs
Max. Velocity= 7.23 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 2.82 fps, Avg. Travel Time= 0.2 min

Peak Storage= 126 cf @ 12.16 hrs
Average Depth at Peak Storage= 2.50' above invert (2.00' above fill)
Bank-Full Depth= 2.50' above invert (2.00' above fill) Flow Area= 4.2 sf, Capacity= 26.84 cfs

30.0" Round Pipe w/ 6.0" inside fill
n= 0.025 Corrugated metal
Length= 30.0' Slope= 0.0250 '/'
Inlet Invert= 717.50', Outlet Invert= 716.75'



Reach 93R: STREAM CROSSING #5 (30" CMP-6" EMBEDED)



Summary for Reach 95R: STREAM CROSSING #4 (45" CMP-9" EMBEDDED)

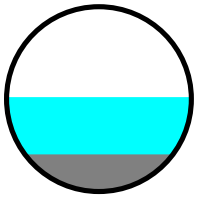
[52] Hint: Inlet/Outlet conditions not evaluated

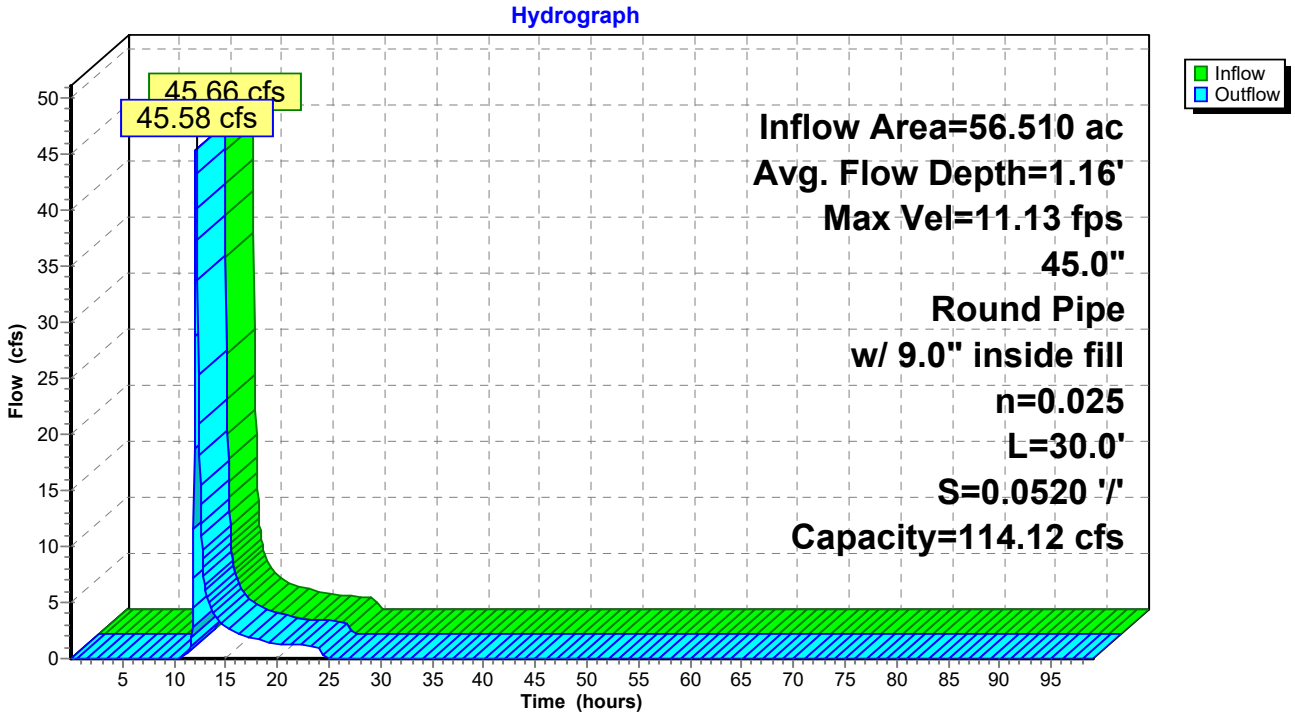
Inflow Area = 56.510 ac, 0.74% Impervious, Inflow Depth = 0.83" for 100 YR- 1 HR event
Inflow = 45.66 cfs @ 12.12 hrs, Volume= 3.894 af
Outflow = 45.58 cfs @ 12.12 hrs, Volume= 3.894 af, Atten= 0%, Lag= 0.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.01-99.01 hrs, dt= 0.05 hrs
Max. Velocity= 11.13 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 3.83 fps, Avg. Travel Time= 0.1 min

Peak Storage= 123 cf @ 12.12 hrs
Average Depth at Peak Storage= 1.91' above invert (1.16' above fill)
Bank-Full Depth= 3.75' above invert (3.00' above fill) Flow Area= 9.5 sf, Capacity= 114.12 cfs

45.0" Round Pipe w/ 9.0" inside fill
n= 0.025 Corrugated metal
Length= 30.0' Slope= 0.0520 '/'
Inlet Invert= 708.11', Outlet Invert= 706.55'





Summary for Reach 96R: INT- 10; C-2 (18" CULVERT)

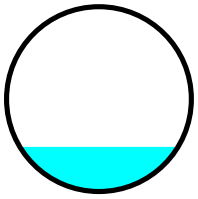
[52] Hint: Inlet/Outlet conditions not evaluated

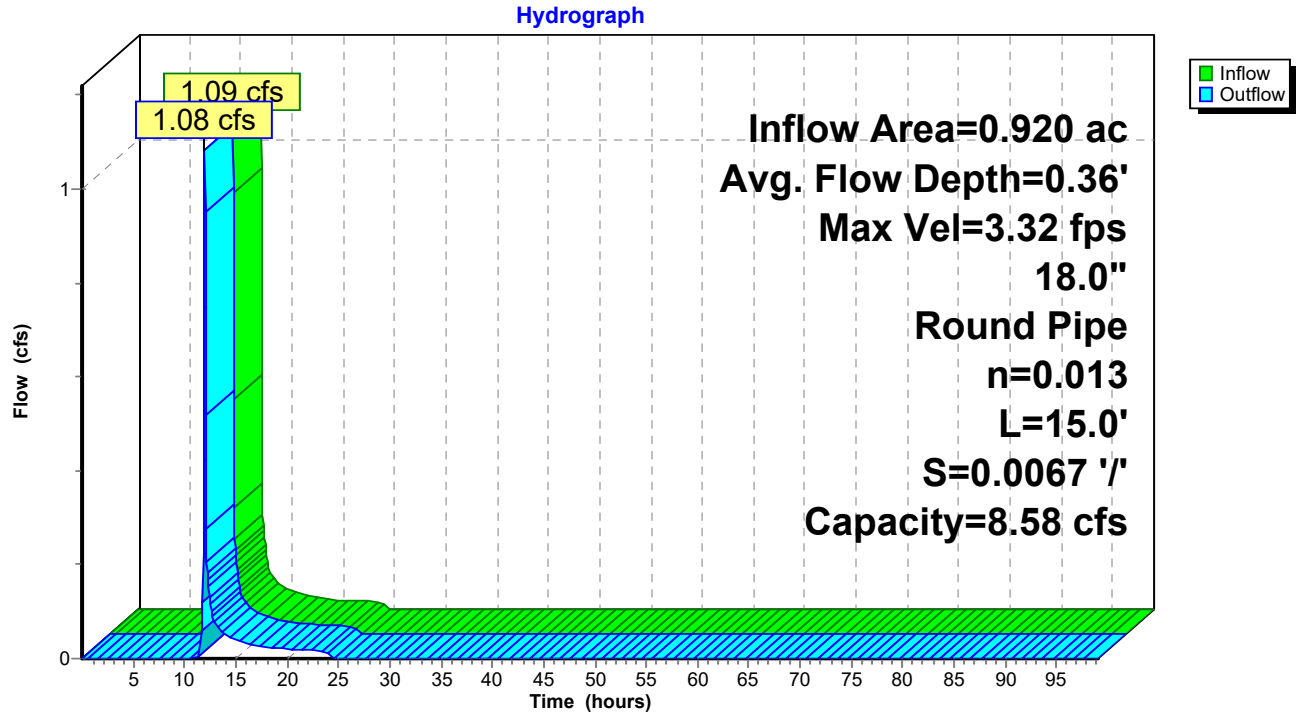
Inflow Area = 0.920 ac, 0.00% Impervious, Inflow Depth = 0.69" for 100 YR- 1 HR event
Inflow = 1.09 cfs @ 11.97 hrs, Volume= 0.053 af
Outflow = 1.08 cfs @ 11.97 hrs, Volume= 0.053 af, Atten= 1%, Lag= 0.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.01-99.01 hrs, dt= 0.05 hrs
Max. Velocity= 3.32 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 1.17 fps, Avg. Travel Time= 0.2 min

Peak Storage= 5 cf @ 11.97 hrs
Average Depth at Peak Storage= 0.36'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 8.58 cfs

18.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 15.0' Slope= 0.0067 '/'
Inlet Invert= 721.00', Outlet Invert= 720.90'





Summary for Reach 98R: INT- 10; C-3 (18" CULVERT)

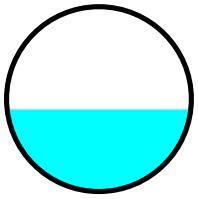
[52] Hint: Inlet/Outlet conditions not evaluated

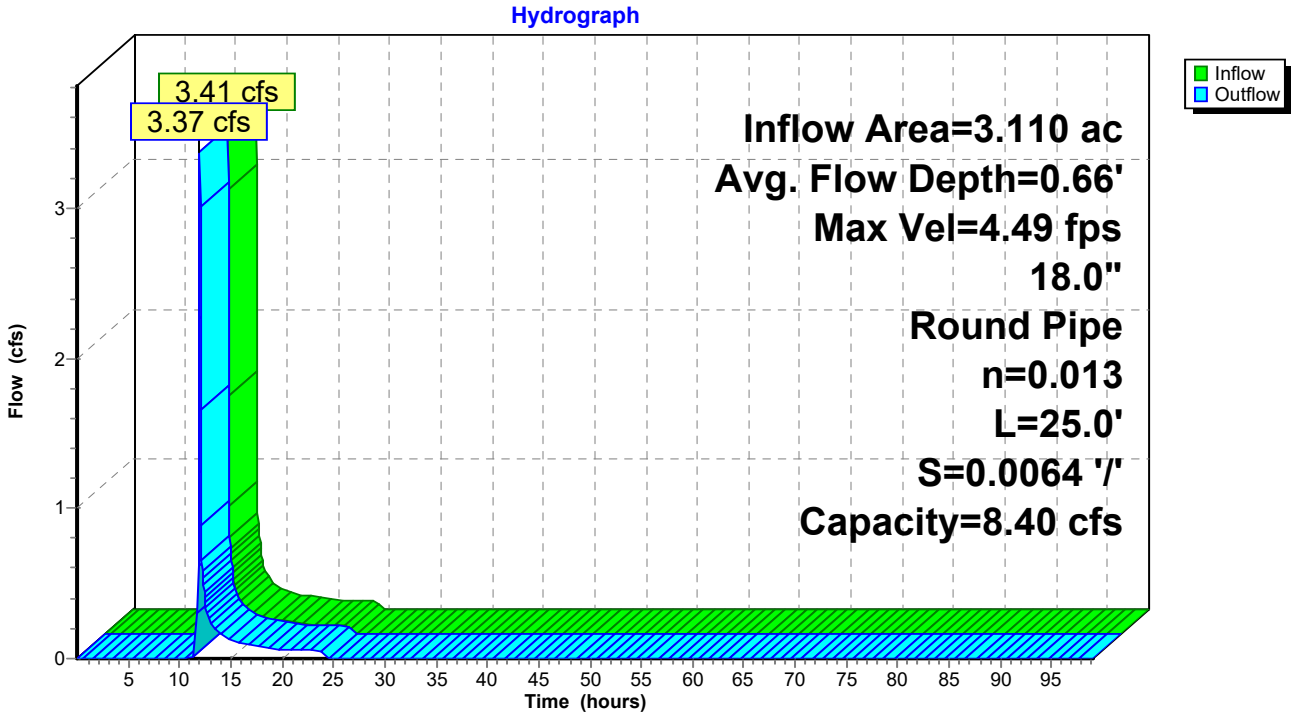
Inflow Area = 3.110 ac, 0.00% Impervious, Inflow Depth = 0.64" for 100 YR- 1 HR event
Inflow = 3.41 cfs @ 11.97 hrs, Volume= 0.167 af
Outflow = 3.37 cfs @ 11.97 hrs, Volume= 0.167 af, Atten= 1%, Lag= 0.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.01-99.01 hrs, dt= 0.05 hrs
Max. Velocity= 4.49 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 1.64 fps, Avg. Travel Time= 0.3 min

Peak Storage= 19 cf @ 11.97 hrs
Average Depth at Peak Storage= 0.66'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 8.40 cfs

18.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 25.0' Slope= 0.0064 '/'
Inlet Invert= 716.00', Outlet Invert= 715.84'



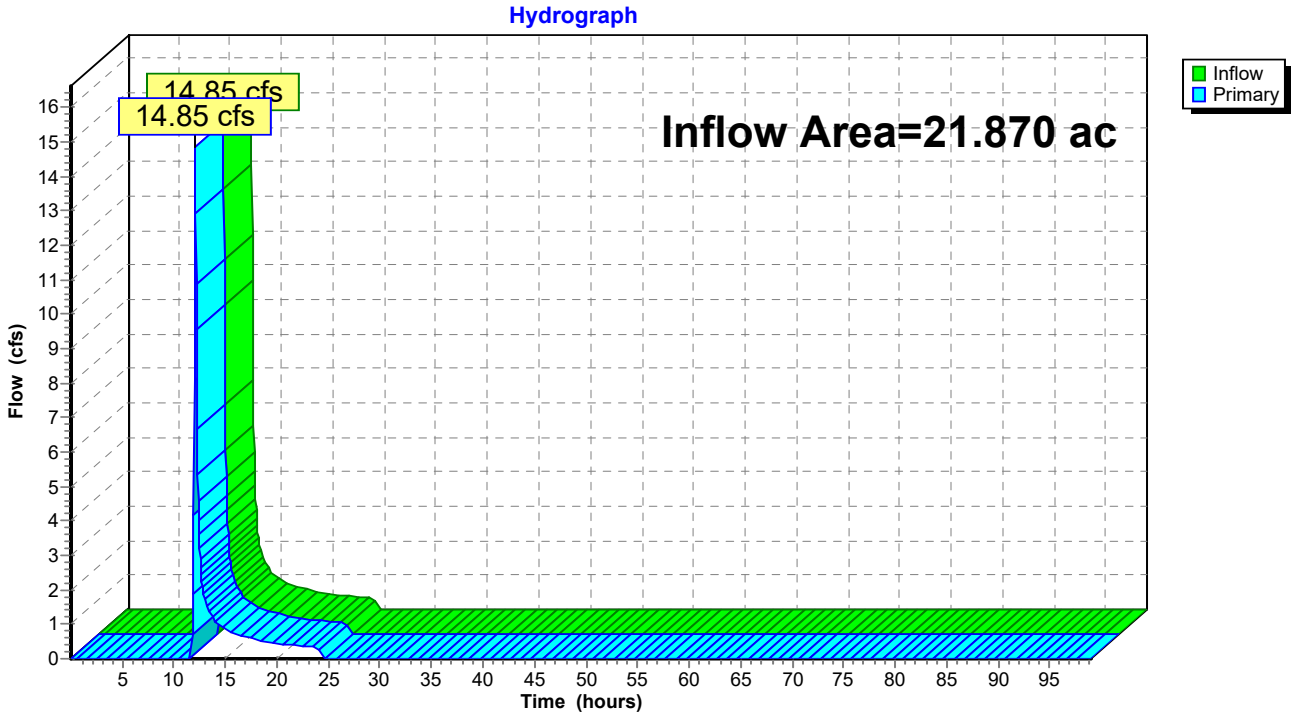


Summary for Link 57L: OVERALL FLOW TO INT-7; C-1

Inflow Area = 21.870 ac, 0.85% Impervious, Inflow Depth = 0.60" for 100 YR- 1 HR event
Inflow = 14.85 cfs @ 12.06 hrs, Volume= 1.090 af
Primary = 14.85 cfs @ 12.06 hrs, Volume= 1.090 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.01-99.01 hrs, dt= 0.05 hrs

Link 57L: OVERALL FLOW TO INT-7; C-1

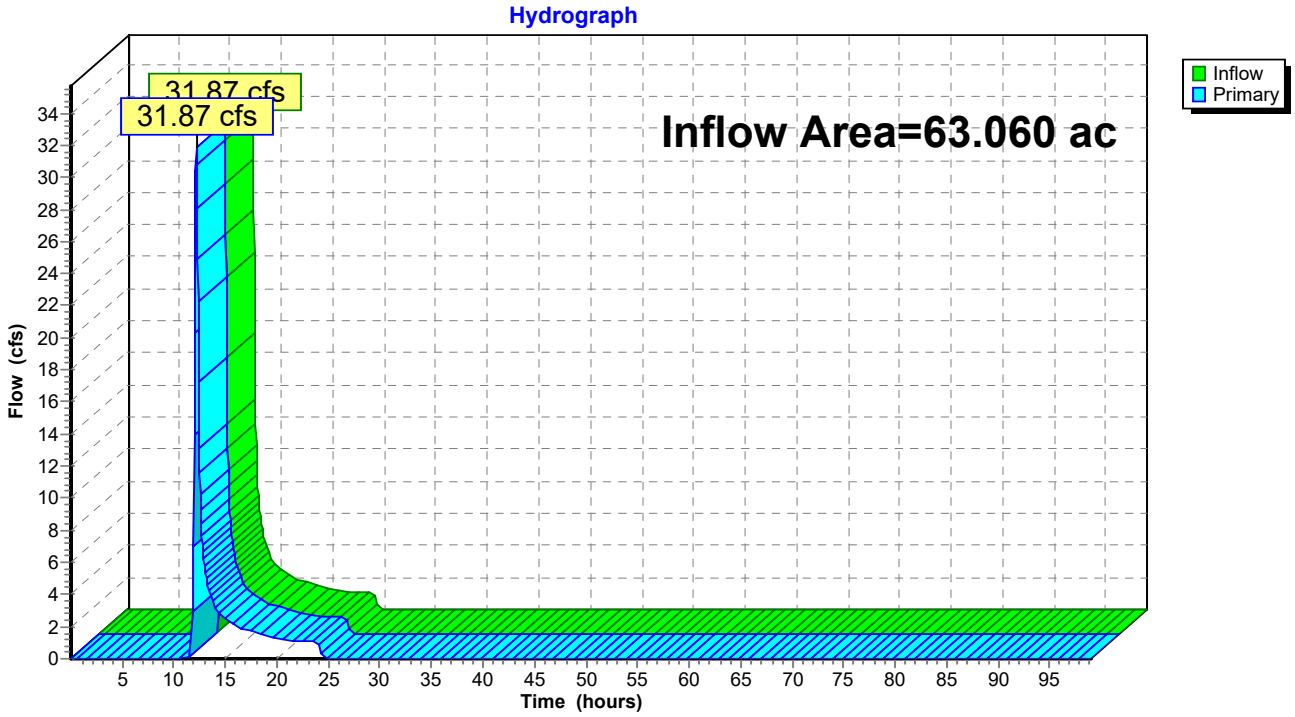


Summary for Link 59L: OVERALL FLOW TO INT-6; C-2

Inflow Area = 63.060 ac, 0.43% Impervious, Inflow Depth = 0.60" for 100 YR- 1 HR event
Inflow = 31.87 cfs @ 12.16 hrs, Volume= 3.154 af
Primary = 31.87 cfs @ 12.16 hrs, Volume= 3.154 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.01-99.01 hrs, dt= 0.05 hrs

Link 59L: OVERALL FLOW TO INT-6; C-2

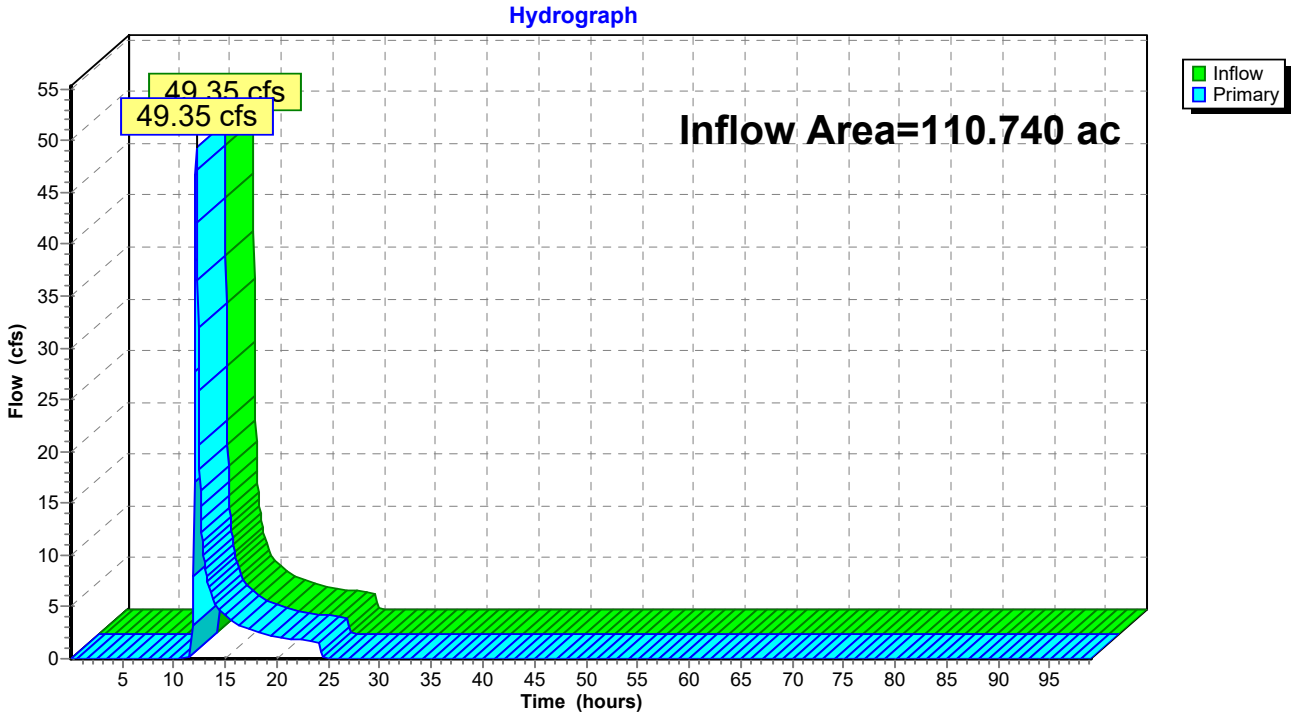


Summary for Link 63L: OVERALL FLOW TO STREAM CROSSING #2

Inflow Area = 110.740 ac, 0.38% Impervious, Inflow Depth = 0.53" for 100 YR- 1 HR event
Inflow = 49.35 cfs @ 12.16 hrs, Volume= 4.934 af
Primary = 49.35 cfs @ 12.16 hrs, Volume= 4.934 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.01-99.01 hrs, dt= 0.05 hrs

Link 63L: OVERALL FLOW TO STREAM CROSSING #2

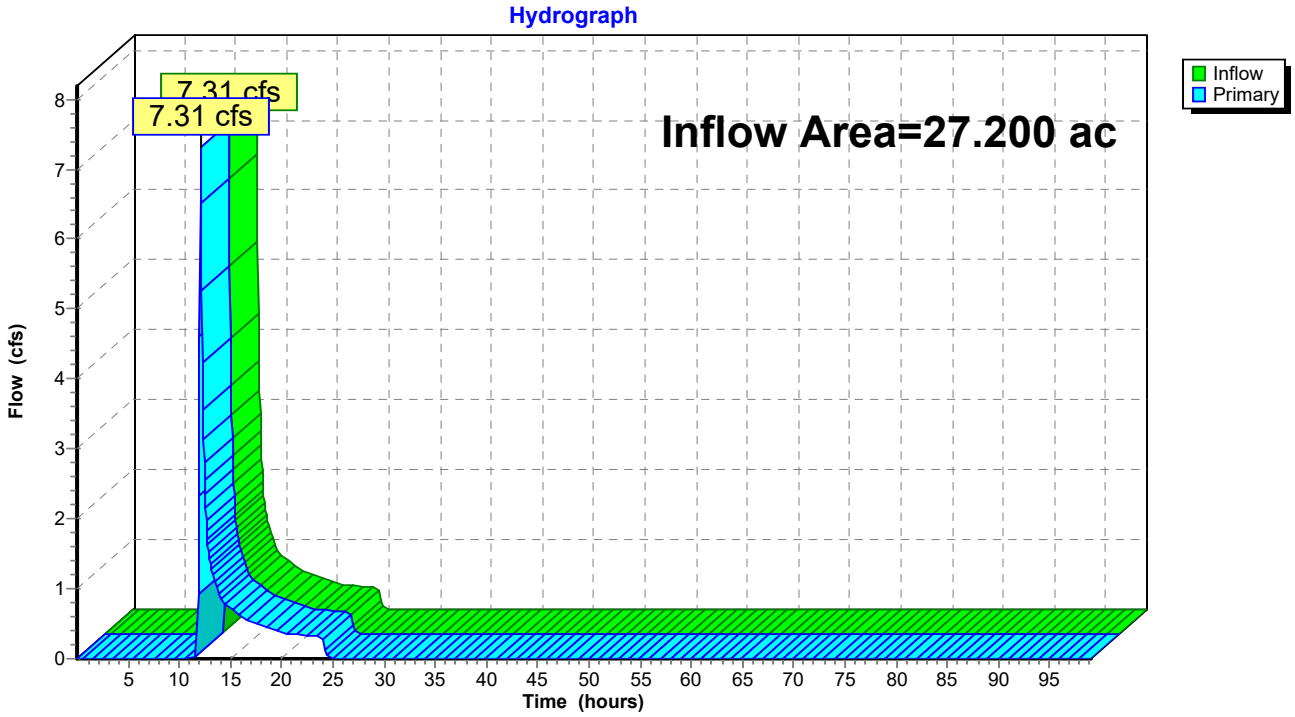


Summary for Link 69L: OVERALL FLOW TO STREAM CROSSING #3

Inflow Area = 27.200 ac, 0.04% Impervious, Inflow Depth = 0.34" for 100 YR- 1 HR event
Inflow = 7.31 cfs @ 12.11 hrs, Volume= 0.768 af
Primary = 7.31 cfs @ 12.11 hrs, Volume= 0.768 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.01-99.01 hrs, dt= 0.05 hrs

Link 69L: OVERALL FLOW TO STREAM CROSSING #3

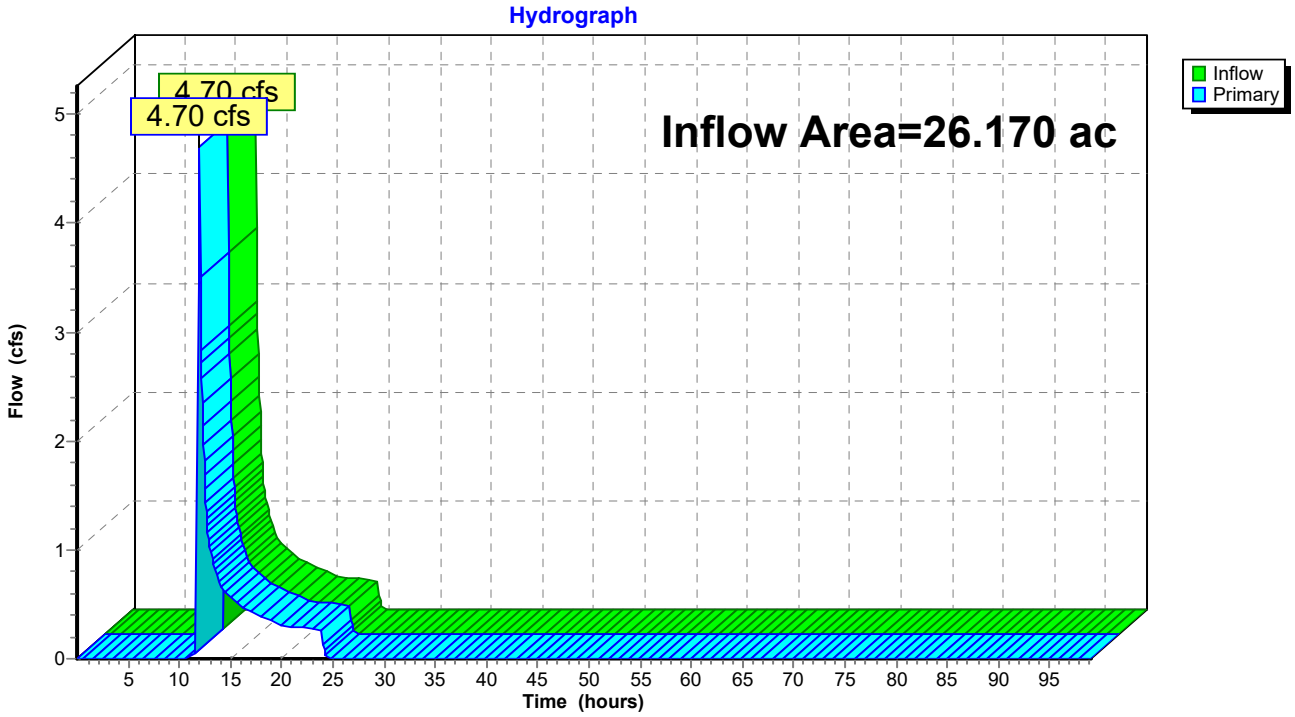


Summary for Link 87L: OVERALL FLOW TO INT-14; C-1

Inflow Area = 26.170 ac, 0.00% Impervious, Inflow Depth = 0.26" for 100 YR- 1 HR event
Inflow = 4.70 cfs @ 12.01 hrs, Volume= 0.567 af
Primary = 4.70 cfs @ 12.01 hrs, Volume= 0.567 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.01-99.01 hrs, dt= 0.05 hrs

Link 87L: OVERALL FLOW TO INT-14; C-1

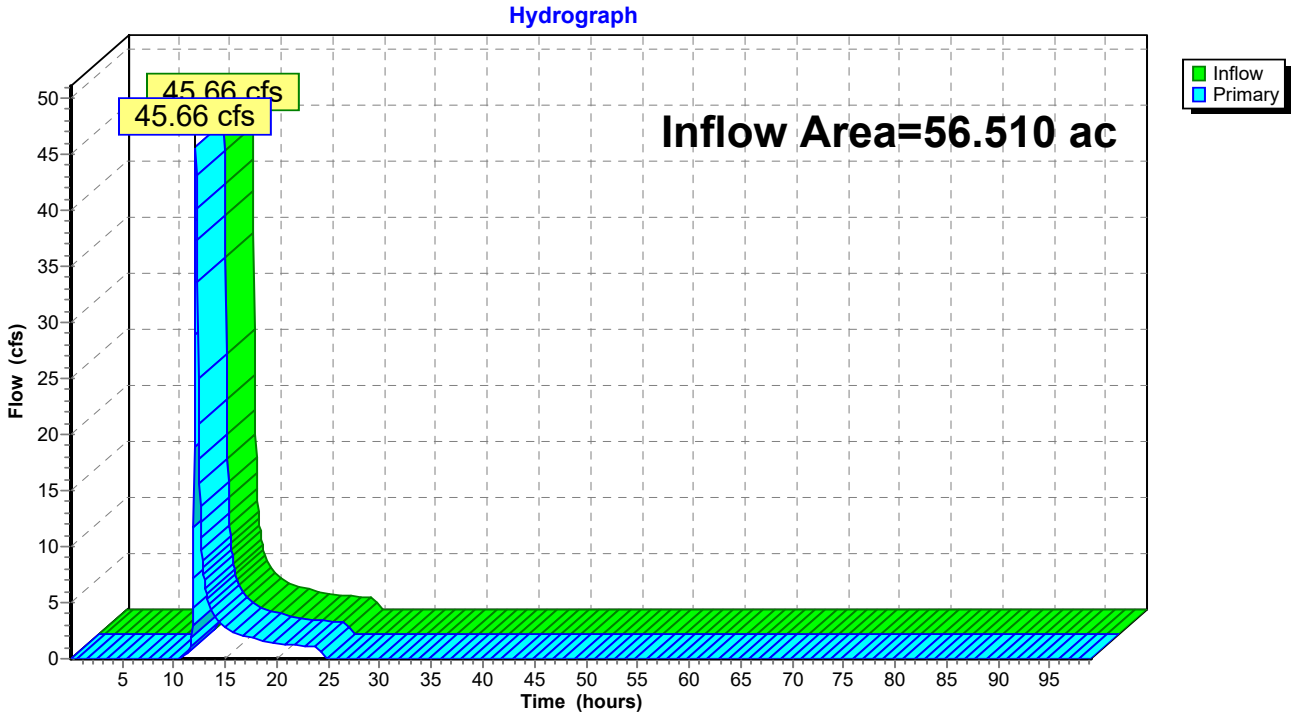


Summary for Link 94L: OVERALL FLOW TO STREAM CROSSING #4

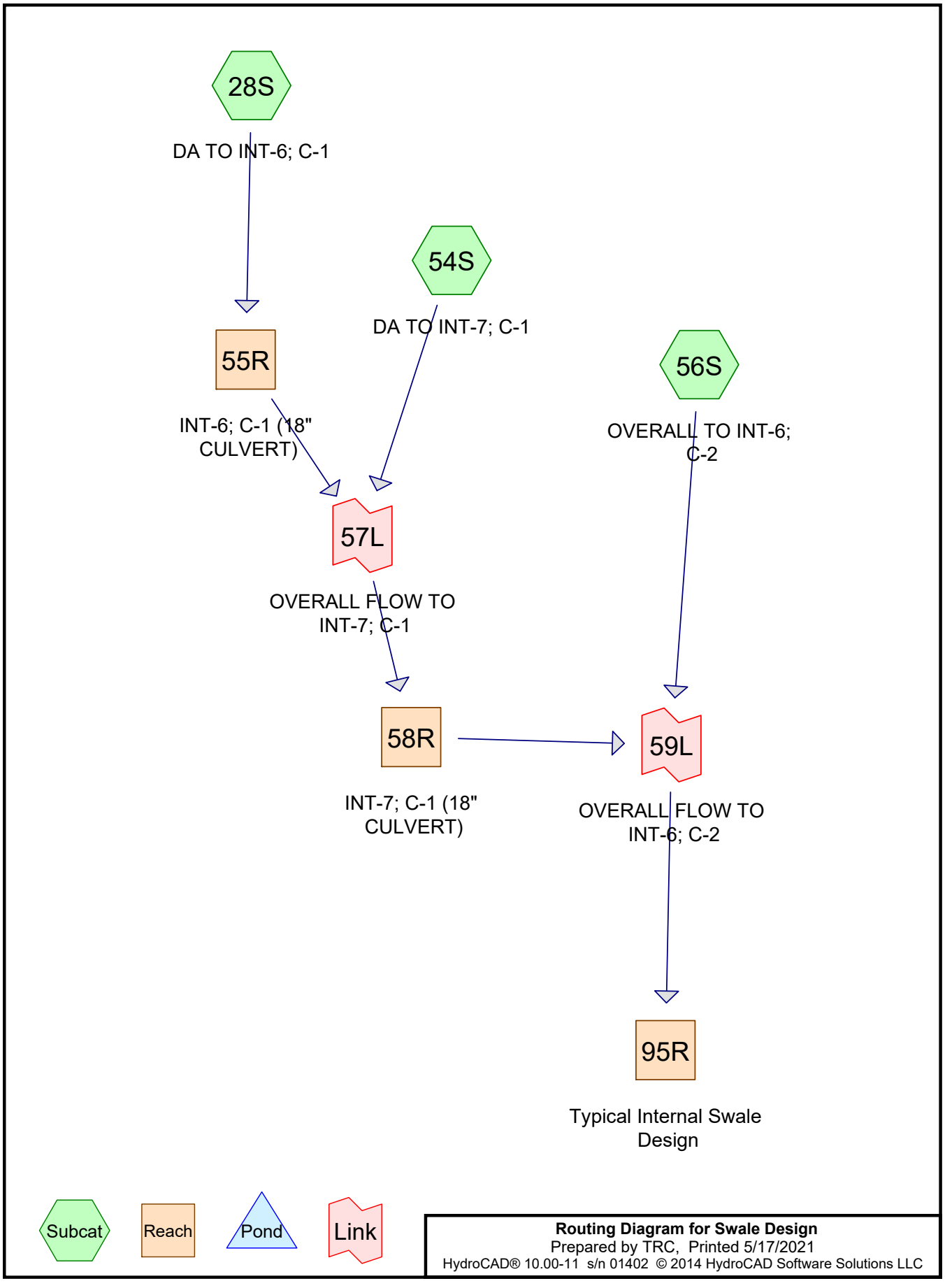
Inflow Area = 56.510 ac, 0.74% Impervious, Inflow Depth = 0.83" for 100 YR- 1 HR event
Inflow = 45.66 cfs @ 12.12 hrs, Volume= 3.894 af
Primary = 45.66 cfs @ 12.12 hrs, Volume= 3.894 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.01-99.01 hrs, dt= 0.05 hrs

Link 94L: OVERALL FLOW TO STREAM CROSSING #4



Appendix E – Typical Internal Roadside Swale Design



Routing Diagram for Swale Design
Prepared by TRC, Printed 5/17/2021

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.930	68	1 acre lots, 20% imp, HSG B (54S)
0.420	84	1 acre lots, 20% imp, HSG D (56S)
12.110	69	50-75% Grass cover, Fair, HSG B (28S, 56S)
3.050	84	50-75% Grass cover, Fair, HSG D (28S, 56S)
1.170	85	Gravel roads, HSG B (28S, 54S, 56S)
24.300	58	Meadow, non-grazed, HSG B (28S, 54S, 56S)
21.080	78	Meadow, non-grazed, HSG D (28S, 54S, 56S)
63.060	**69**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
38.510	HSG B	28S, 54S, 56S
0.000	HSG C	
24.550	HSG D	28S, 54S, 56S
0.000	Other	
63.060		**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	0.930	0.000	0.420	0.000	1.350	1 acre lots, 20% imp	54S, 56S
0.000	12.110	0.000	3.050	0.000	15.160	50-75% Grass cover, Fair	28S, 56S
0.000	1.170	0.000	0.000	0.000	1.170	Gravel roads	28S, 54S, 56S
0.000	24.300	0.000	21.080	0.000	45.380	Meadow, non-grazed	28S, 54S, 56S
0.000	**38.510**	**0.000**	**24.550**	**0.000**	**63.060**	**TOTAL AREA**	

Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Diam/Width (inches)	Height (inches)	Inside-Fill (inches)
1	55R	734.30	734.20	30.0	0.0033	0.013	18.0	0.0	0.0
2	58R	725.16	725.00	20.0	0.0080	0.013	18.0	0.0	0.0

Time span=0.01-99.00 hrs, dt=0.05 hrs, 1981 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 28S: DA TO INT-6; C-1 Runoff Area=9.900 ac 0.00% Impervious Runoff Depth=0.64"
Flow Length=1,092' Tc=15.7 min CN=70 Runoff=6.98 cfs 0.531 af

Subcatchment 54S: DA TO INT-7; C-1 Runoff Area=11.970 ac 1.55% Impervious Runoff Depth=0.56"
Flow Length=545' Tc=11.0 min CN=68 Runoff=8.47 cfs 0.559 af

Subcatchment 56S: OVERALL TO INT-6; C-2 Runoff Area=41.190 ac 0.20% Impervious Runoff Depth=0.60"
Flow Length=953' Tc=20.4 min CN=69 Runoff=22.48 cfs 2.064 af

Reach 55R: INT-6; C-1 (18" CULVERT) Avg. Flow Depth=1.50' Max Vel=3.91 fps Inflow=6.98 cfs 0.531 af
18.0" Round Pipe n=0.013 L=30.0' S=0.0033 '/' Capacity=6.06 cfs Outflow=6.52 cfs 0.531 af

Reach 58R: INT-7; C-1 (18" CULVERT) Avg. Flow Depth=1.50' Max Vel=5.97 fps Inflow=14.85 cfs 1.090 af
18.0" Round Pipe n=0.013 L=20.0' S=0.0080 '/' Capacity=9.40 cfs Outflow=9.40 cfs 1.090 af

Reach 95R: Typical Internal Swale Avg. Flow Depth=0.95' Max Vel=6.86 fps Inflow=31.87 cfs 3.154 af
n=0.022 L=280.0' S=0.0214 '/' Capacity=86.42 cfs Outflow=31.61 cfs 3.154 af

Link 57L: OVERALL FLOW TO INT-7; C-1 Inflow=14.85 cfs 1.090 af
Primary=14.85 cfs 1.090 af

Link 59L: OVERALL FLOW TO INT-6; C-2 Inflow=31.87 cfs 3.154 af
Primary=31.87 cfs 3.154 af

Total Runoff Area = 63.060 ac Runoff Volume = 3.154 af Average Runoff Depth = 0.60"
99.57% Pervious = 62.790 ac 0.43% Impervious = 0.270 ac

Summary for Subcatchment 28S: DA TO INT-6; C-1

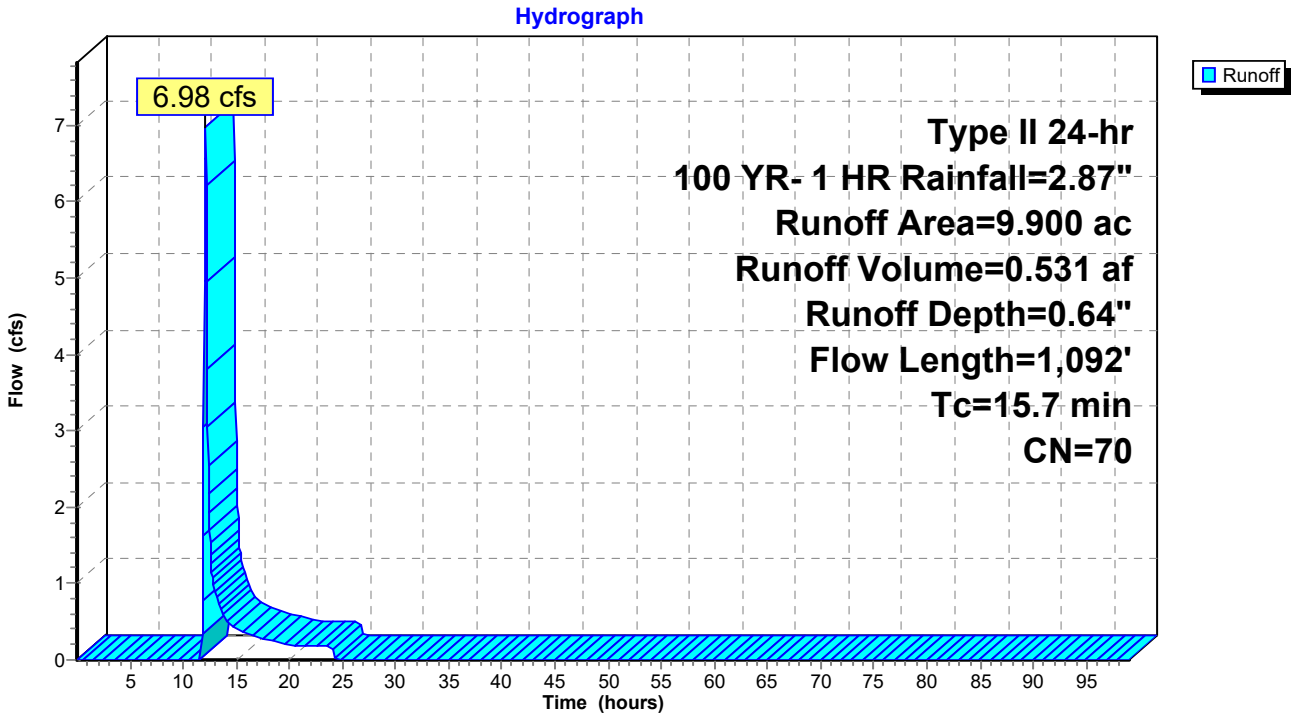
Runoff = 6.98 cfs @ 12.10 hrs, Volume= 0.531 af, Depth= 0.64"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.01-99.01 hrs, dt= 0.05 hrs
Type II 24-hr 100 YR- 1 HR Rainfall=2.87"

Area (ac)	CN	Description
1.200	69	50-75% Grass cover, Fair, HSG B
0.400	84	50-75% Grass cover, Fair, HSG D
0.100	85	Gravel roads, HSG B
3.600	58	Meadow, non-grazed, HSG B
4.600	78	Meadow, non-grazed, HSG D
9.900	70	Weighted Average
9.900		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.6	50	0.0800	0.18		**Sheet Flow, SF-1** Grass: Dense n= 0.240 P2= 3.39"
11.1	1,042	0.0500	1.57		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
15.7	1,092	Total			

Subcatchment 28S: DA TO INT-6; C-1



Summary for Subcatchment 54S: DA TO INT-7; C-1

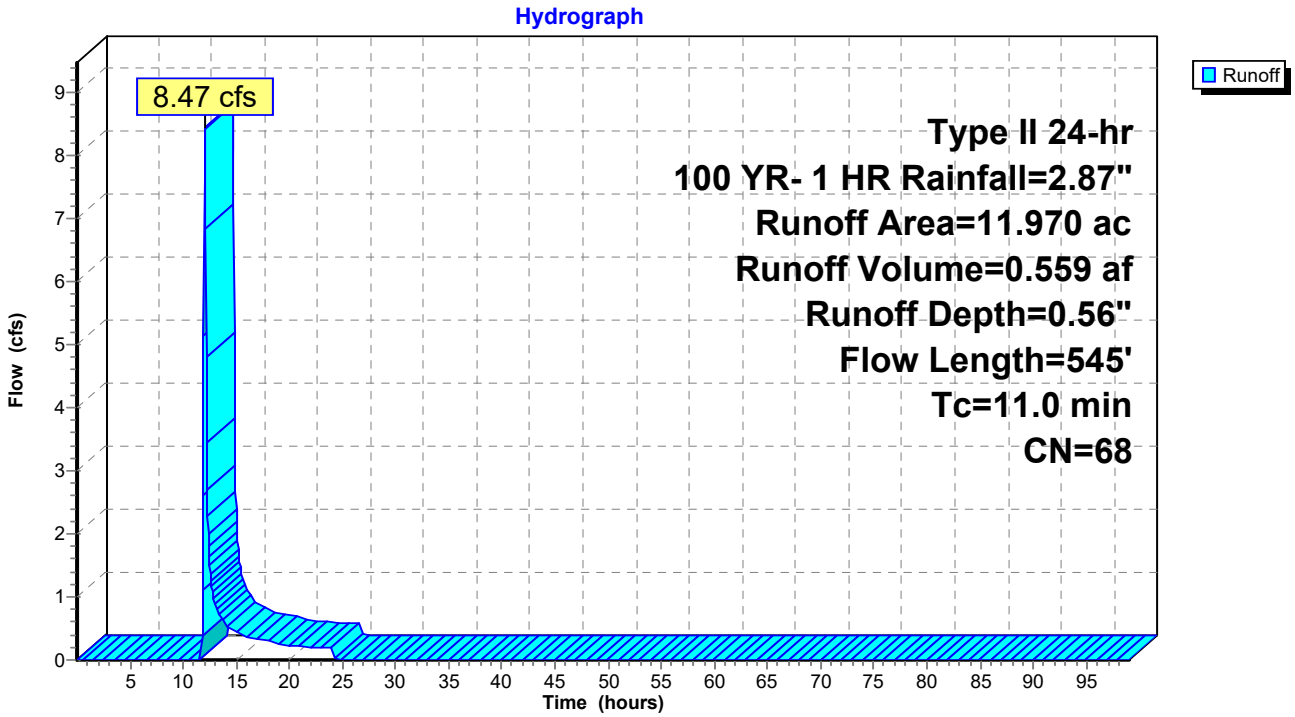
Runoff = 8.47 cfs @ 12.05 hrs, Volume= 0.559 af, Depth= 0.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.01-99.01 hrs, dt= 0.05 hrs
Type II 24-hr 100 YR- 1 HR Rainfall=2.87"

Area (ac)	CN	Description
0.590	85	Gravel roads, HSG B
0.930	68	1 acre lots, 20% imp, HSG B
5.990	58	Meadow, non-grazed, HSG B
4.460	78	Meadow, non-grazed, HSG D
11.970	68	Weighted Average
11.784		98.45% Pervious Area
0.186		1.55% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.1	50	0.0600	0.16		**Sheet Flow, SF-1** Grass: Dense n= 0.240 P2= 3.39"
5.9	495	0.0400	1.40		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
11.0	545	Total			

Subcatchment 54S: DA TO INT-7; C-1



Summary for Subcatchment 56S: OVERALL TO INT-6; C-2

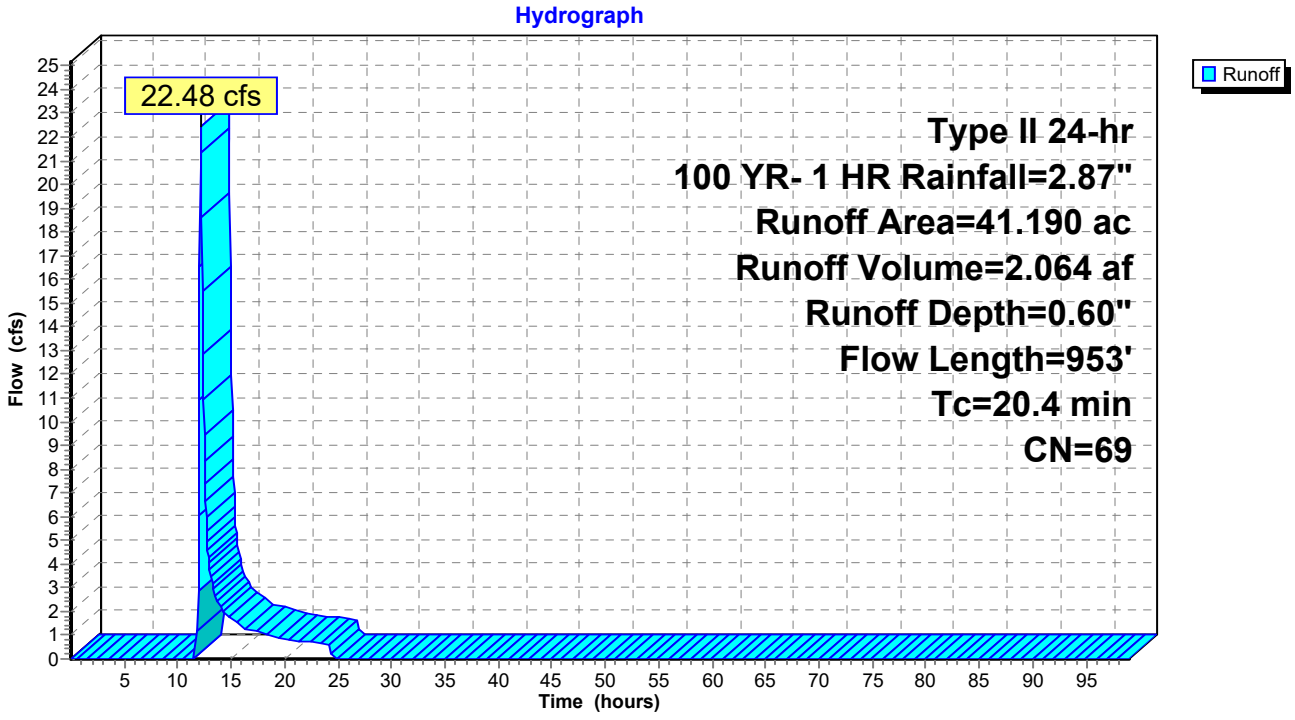
Runoff = 22.48 cfs @ 12.16 hrs, Volume= 2.064 af, Depth= 0.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.01-99.01 hrs, dt= 0.05 hrs
Type II 24-hr 100 YR- 1 HR Rainfall=2.87"

Area (ac)	CN	Description
10.910	69	50-75% Grass cover, Fair, HSG B
2.650	84	50-75% Grass cover, Fair, HSG D
0.480	85	Gravel roads, HSG B
0.420	84	1 acre lots, 20% imp, HSG D
14.710	58	Meadow, non-grazed, HSG B
12.020	78	Meadow, non-grazed, HSG D
41.190	69	Weighted Average
41.106		99.80% Pervious Area
0.084		0.20% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.0	50	0.0200	0.10		**Sheet Flow, SF-1** Grass: Dense n= 0.240 P2= 3.39"
12.4	903	0.0300	1.21		**Shallow Concentrated Flow, SCF-1** Short Grass Pasture Kv= 7.0 fps
20.4	953	Total			

Subcatchment 56S: OVERALL TO INT-6; C-2



Summary for Reach 55R: INT-6; C-1 (18" CULVERT)

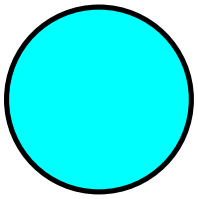
[52] Hint: Inlet/Outlet conditions not evaluated
[55] Hint: Peak inflow is 115% of Manning's capacity
[76] Warning: Detained 0.004 af (Pond w/culvert advised)

Inflow Area = 9.900 ac, 0.00% Impervious, Inflow Depth = 0.64" for 100 YR- 1 HR event
Inflow = 6.98 cfs @ 12.10 hrs, Volume= 0.531 af
Outflow = 6.52 cfs @ 12.08 hrs, Volume= 0.531 af, Atten= 7%, Lag= 0.0 min

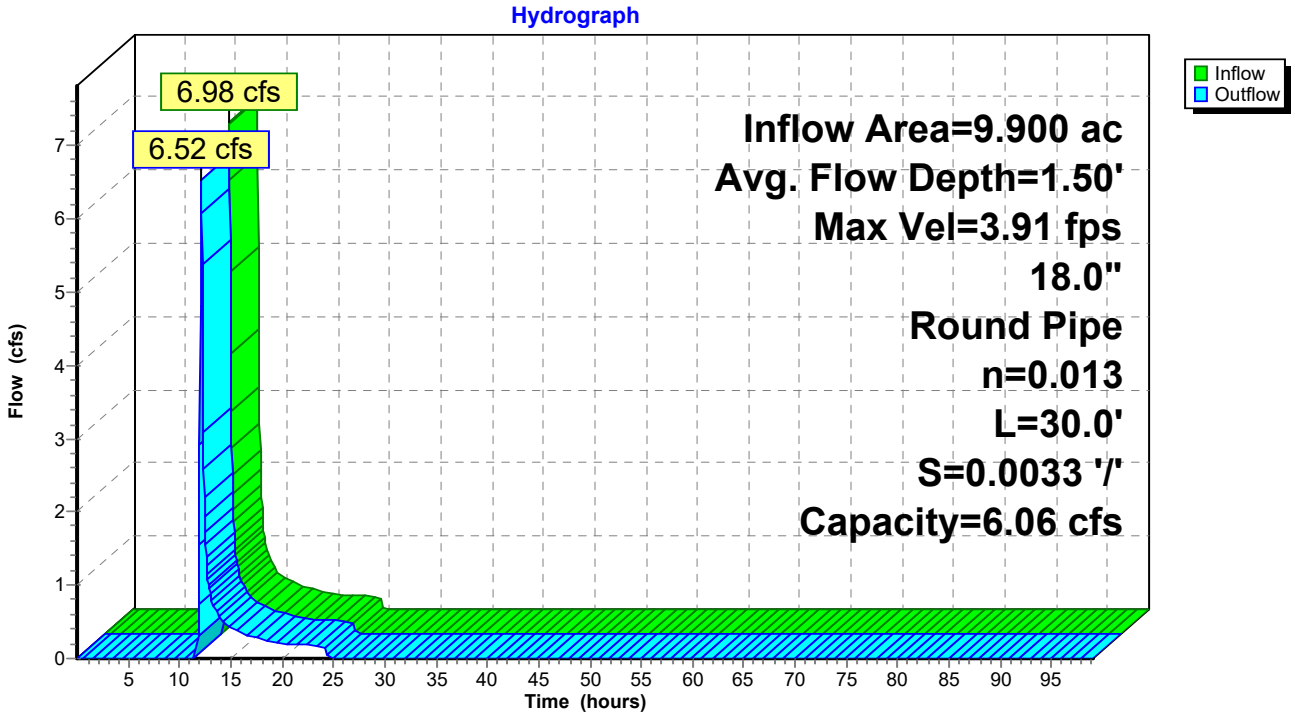
Routing by Stor-Ind+Trans method, Time Span= 0.01-99.01 hrs, dt= 0.05 hrs
Max. Velocity= 3.91 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 1.78 fps, Avg. Travel Time= 0.3 min

Peak Storage= 53 cf @ 12.14 hrs
Average Depth at Peak Storage= 1.50'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 6.06 cfs

18.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 30.0' Slope= 0.0033 '/'
Inlet Invert= 734.30', Outlet Invert= 734.20'



Reach 55R: INT-6; C-1 (18" CULVERT)



Summary for Reach 58R: INT-7; C-1 (18" CULVERT)

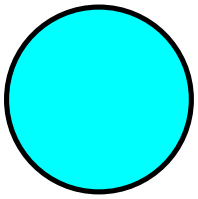
[52] Hint: Inlet/Outlet conditions not evaluated
[55] Hint: Peak inflow is 158% of Manning's capacity
[76] Warning: Detained 0.057 af (Pond w/culvert advised)

Inflow Area = 21.870 ac, 0.85% Impervious, Inflow Depth = 0.60" for 100 YR- 1 HR event
Inflow = 14.85 cfs @ 12.06 hrs, Volume= 1.090 af
Outflow = 9.40 cfs @ 12.06 hrs, Volume= 1.090 af, Atten= 37%, Lag= 0.0 min

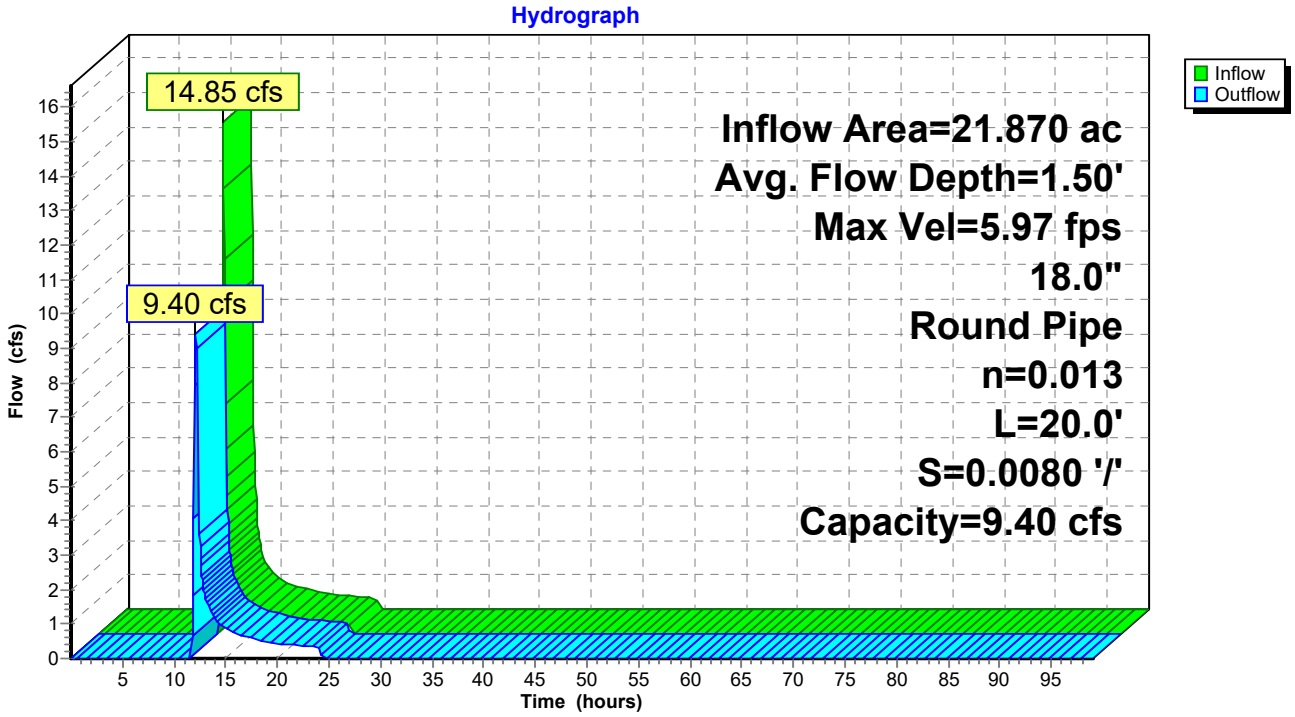
Routing by Stor-Ind+Trans method, Time Span= 0.01-99.01 hrs, dt= 0.05 hrs
Max. Velocity= 5.97 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 2.99 fps, Avg. Travel Time= 0.1 min

Peak Storage= 35 cf @ 12.01 hrs
Average Depth at Peak Storage= 1.50'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 9.40 cfs

18.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 20.0' Slope= 0.0080 '/'
Inlet Invert= 725.16', Outlet Invert= 725.00'



Reach 58R: INT-7; C-1 (18" CULVERT)



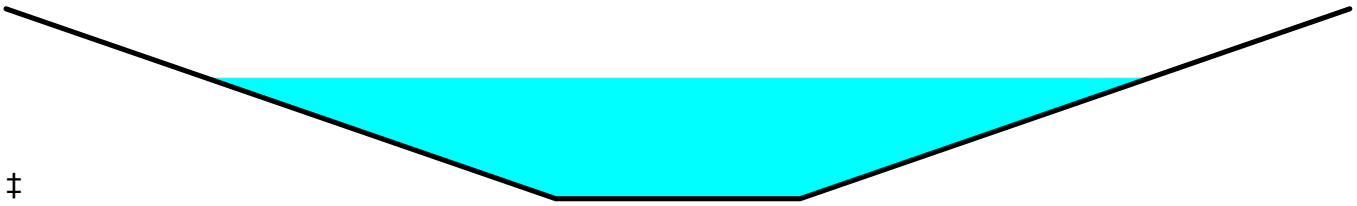
Summary for Reach 95R: Typical Internal Swale Design

Inflow Area = 63.060 ac, 0.43% Impervious, Inflow Depth = 0.60" for 100 YR- 1 HR event
Inflow = 31.87 cfs @ 12.16 hrs, Volume= 3.154 af
Outflow = 31.61 cfs @ 12.18 hrs, Volume= 3.154 af, Atten= 1%, Lag= 1.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.01-99.01 hrs, dt= 0.05 hrs
Max. Velocity= 6.86 fps, Min. Travel Time= 0.7 min
Avg. Velocity = 2.97 fps, Avg. Travel Time= 1.6 min

Peak Storage= 1,301 cf @ 12.17 hrs
Average Depth at Peak Storage= 0.95'
Bank-Full Depth= 1.50' Flow Area= 9.8 sf, Capacity= 86.42 cfs

2.00' x 1.50' deep channel, n= 0.022 Earth, clean & straight
Side Slope Z-value= 3.0 '/' Top Width= 11.00'
Length= 280.0' Slope= 0.0214 '/'
Inlet Invert= 720.00', Outlet Invert= 714.00'



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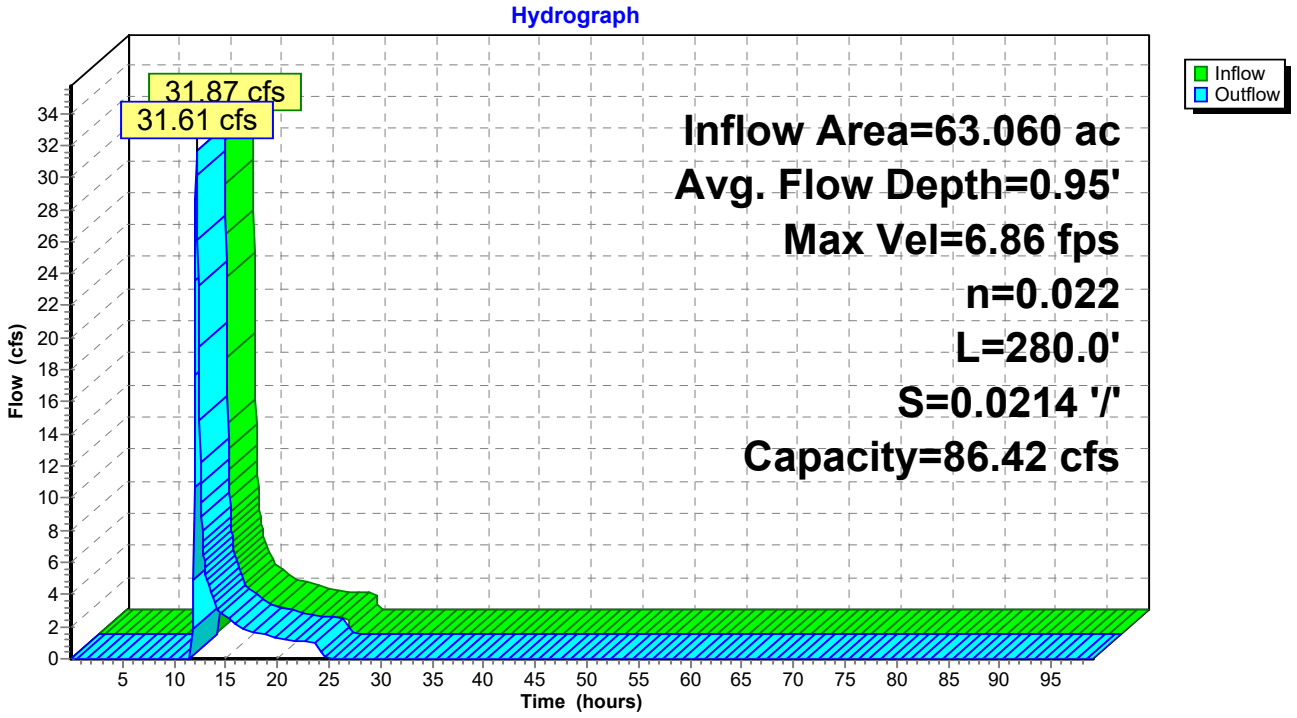
Reach 95R: Typical Internal Swale Design

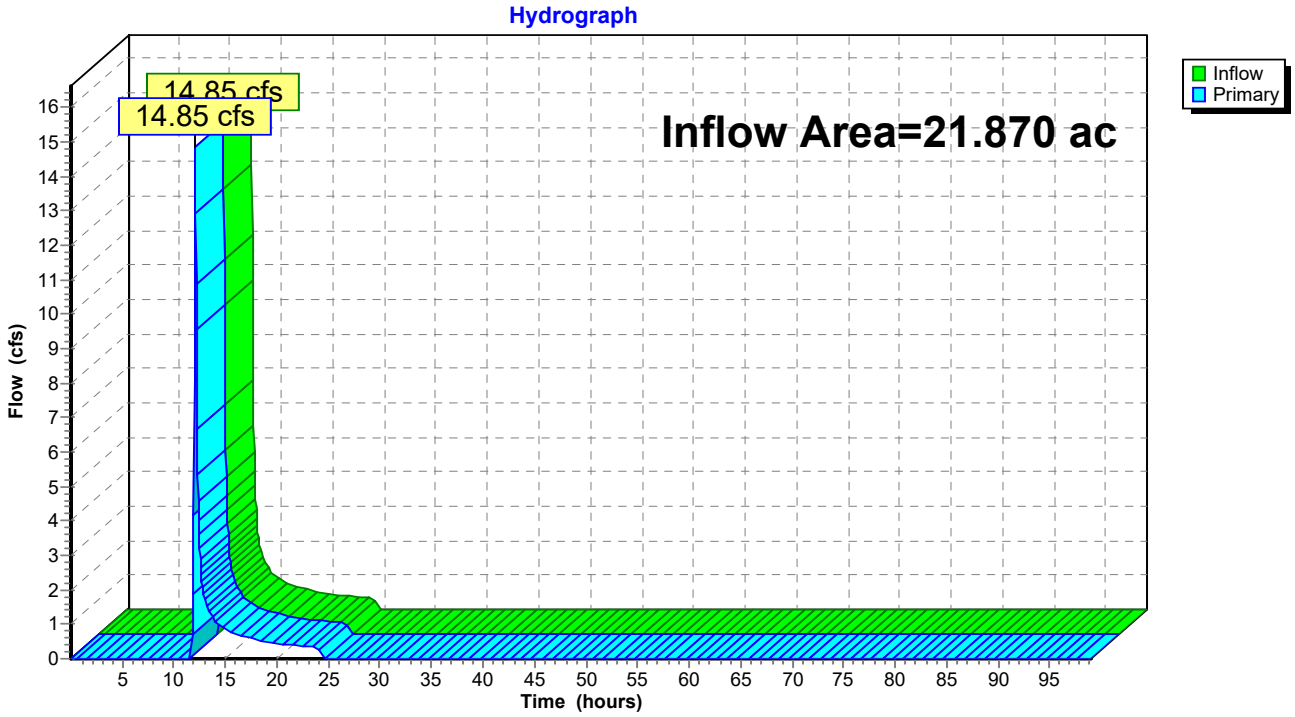


Summary for Link 57L: OVERALL FLOW TO INT-7; C-1

Inflow Area = 21.870 ac, 0.85% Impervious, Inflow Depth = 0.60" for 100 YR- 1 HR event
Inflow = 14.85 cfs @ 12.06 hrs, Volume= 1.090 af
Primary = 14.85 cfs @ 12.06 hrs, Volume= 1.090 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.01-99.01 hrs, dt= 0.05 hrs

Link 57L: OVERALL FLOW TO INT-7; C-1

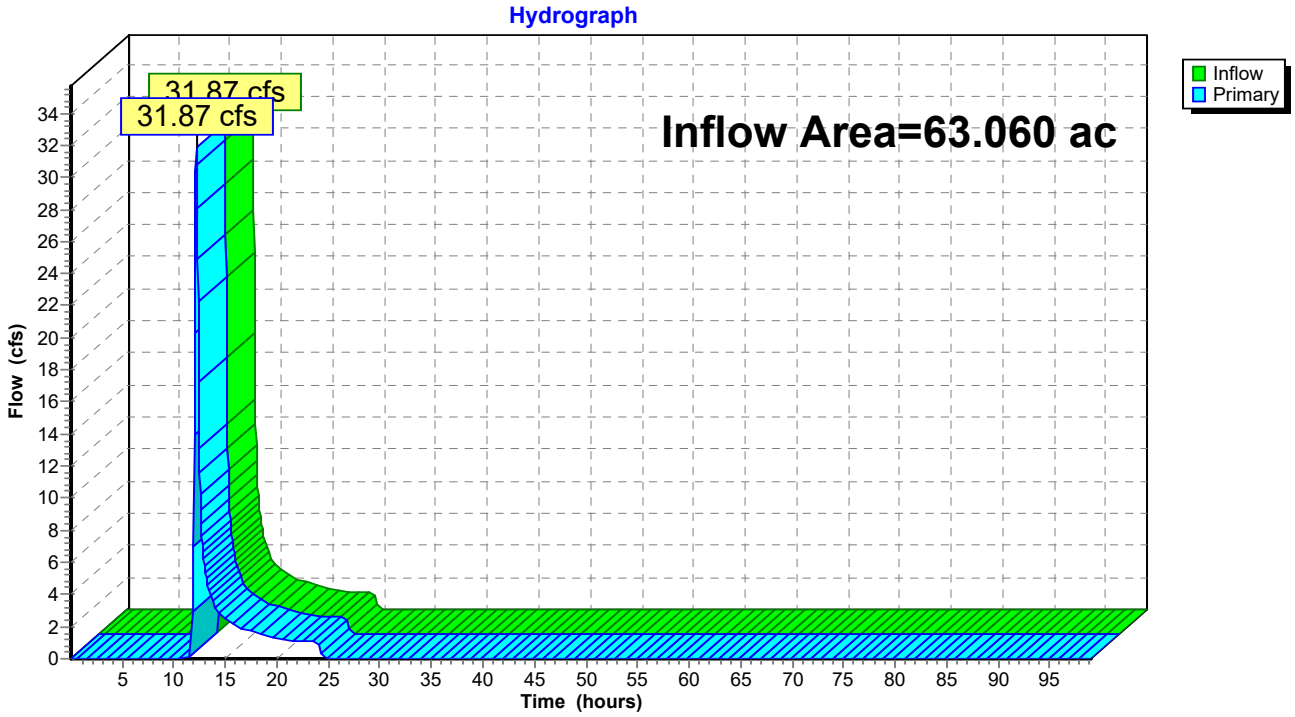


Summary for Link 59L: OVERALL FLOW TO INT-6; C-2

Inflow Area = 63.060 ac, 0.43% Impervious, Inflow Depth = 0.60" for 100 YR- 1 HR event
Inflow = 31.87 cfs @ 12.16 hrs, Volume= 3.154 af
Primary = 31.87 cfs @ 12.16 hrs, Volume= 3.154 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.01-99.01 hrs, dt= 0.05 hrs

Link 59L: OVERALL FLOW TO INT-6; C-2



Appendix F – SWPPP Amendments

The Owner/Operator shall have a Qualified Professional amend the SWPPP when one or more of the following occur:

- There is a significant change in design, construction, operation, or maintenance which may have a significant effect on the potential for the discharge of pollutants to the waters of the United States and which has not otherwise been addressed in the SWPPP; or
- The SWPPP proves to be ineffective in:
    - Eliminating or significantly minimizing pollutants from sources identified in the SWPPP and as required by this permit; or
    - Achieving the general objectives of controlling pollutants in stormwater discharges from permitted construction activity; and

Additionally, the SWPPP shall be amended to identify any new Contractor or Subcontractor that will implement any measure of the SWPPP.

The following information should be documented in this section:

- Dates when major grading activities occur;
- Dates when construction activities temporarily or permanently cease on a portion of the Project Site; and
- Dates when stabilization measures (temporary and permanent) are initiated.

Appendix G – SWPPP Inspection Reports

- Blank SWPPP Inspection Form -

- Completed SWPPP Inspection Reports -

Appendix G – Blank SWPPP Inspection Form

General Project Information					
Project Name:					
SPDES Permit Number:				**Type of Construction Activities Being Completed:**	
Date of Inspection:					
Inspector's Name:					
Time On Site:				**Inspection Type:**	
Time Off Site:					
General Project Notes:					
SWPPP Amendment Required:	☐ Yes	☐ No	**If yes, describe:**		

Weather Information		
Has there been a storm event since the last inspection?	☒ Yes	☐ No
If yes, what was the approx. amount of precipitation (inches) since the last inspection:		
Weather conditions at the time of inspection?	Temperature:	°F
☐ Clear ☐ Cloudy ☐ Rain ☐ Sleet ☐ Snow ☐ Fog ☐ High Winds		
Does the Project Site discharge to natural surface waterbodies located within or immediately adjacent to the Project area?	☐ Yes	☐ No
If yes, describe:		
Were there any discharges observed at the time of inspection?	☐ Yes	☐ No
If yes, were sediment laden discharges observed?	☐ Yes	☐ No
Describe:		
If yes, was erosion or sedimentation observed at the discharge location?	☐ Yes	☐ No
Describe:		
Soil Condition:		
Were areas of soil disturbance observed at the time of inspection?	☐ Yes	☐ No
If yes, describe:		

Maintaining Water Quality

Water Quality Observations	Yes	No	N/A
Is there an increase in turbidity causing a substantial visual contrast to natural conditions?	☐	☐	☐
Is there residue from oil and floating substances, visible oil film, or grease or globules?	☐	☐	☐
Are all disturbances within the approved limits, as outlined on the plans?	☐	☐	☐
Have receiving waterbodies and/or wetland been impacted by the Project?	☐	☐	☐
Are the concrete washout facilities located a minimum of 100 feet from sensitive areas and properly maintained?	☐	☐	☐
Comments:			

General Housekeeping

Site Conditions	Yes	No	N/A
Is construction site litter and debris appropriately managed?	☐	☐	☐
Are facilities and equipment necessary for implementation of erosion and sediment controls in working and/or properly maintained?	☐	☐	☐
Is construction impacting adjacent properties?	☐	☐	☐
Is dust adequately controlled?	☐	☐	☐
Comments:			

Runoff Control Practices

Temporary Stream Crossings	Yes	No	N/A
Are the maximum necessary diameter pipes installed to span stream without dredging?	☐	☐	☐
Is non-woven geotextile fabric installed beneath the approaches?	☐	☐	☐
Is fill composed of aggregate (no earthen or soil material)?	☐	☐	☐
Is the rock on approaches clean enough to remove mud/sediment from vehicles and prevent sediment from entering the stream during high flows?	☐	☐	☐
Comments:			

Excavation Dewatering	Yes	No	N/A
Are upstream and downstream berms (sandbags, inflatable dams, etc.) are installed per the Construction Drawings?	☐	☐	☐
Is clean water from the upstream pool being pumped to the downstream pool?	☐	☐	☐
Is sediment laden water from the work area being discharged to a sediment trapping device?	☐	☐	☐
Is the water discharging from the sediment trapping device clear and free of sediment?	☐	☐	☐
Does the constructed upstream berm have a minimum of one-foot freeboard?	☐	☐	☐
Comments:			

Flow Spreader(s)	Yes	No	N/A
Is the flow spreader installed per the Construction Drawings?	☐	☐	☐
Was the flow spreader constructed on undisturbed soil, not on fill?	☐	☐	☐
Does the flow spreader receive only clear, non-sediment laden flows?	☐	☐	☐
Does the discharge from the flow spreader sheet flow out of the spreader without erosion downstream?	☐	☐	☐
Comments:			

Interceptor Dikes and Swales	Yes	No	N/A
Is the dike/swale installed per the Construction Drawings?	☐	☐	☐
Has the dike/swale been stabilized by geotextile fabric, seed, and/or mulch?	☐	☐	☐
Was erosion observed within the dike/swale?	☐	☐	☐
Is sediment-laden runoff directed to a sediment trapping device?	☐	☐	☐
Comments:			

Stone Check Dam(s)	Yes	No	N/A
Are the check dams in good condition (rocks in place and no ponding behind the dams)?	☐	☐	☐
Has geotextile fabric been placed beneath the rock fill?	☐	☐	☐
Was sediment accumulation greater than 50% of the design capacity?	☐	☐	☐
Was erosion observed within the channel?	☐	☐	☐
Comments:			

Rock Outlet Protection	Yes	No	N/A
Is the rock outlet protection installed per approved plans?	☐	☐	☐
Was the outlet protection installed concurrently with pipe installation?	☐	☐	☐
Have the rocks been displaced?	☐	☐	☐
Is the sediment accumulation 0% of the design capacity?	☐	☐	☐
Comments:			

Soil Stabilization

Topsoil and Spoil Stockpiles	Yes	No	N/A
Are stockpiles properly stabilized and contained?	☐	☐	☐
Are sediment control installed at the toe of the slope?	☐	☐	☐
Are idle soil stockpiles are stabilized with vegetation and/or mulch?	☐	☐	☐
Comments:			

Revegetation	Yes	No	N/A
Has temporary seed and mulch been applied to idle areas?	☐	☐	☐
Has a minimum of 4 inches of topsoil been applied under permanent seeding areas?	☐	☐	☐
Comments:			

Sediment Control Practices

Stabilized Construction Entrance(s)	Yes	No	N/A
Is the entrance installed per the Construction Drawings?	☐	☐	☐
Is the stone clean enough to effectively remove mud/sediment from vehicle tires?	☐	☐	☐
Does all traffic enter and exit the site at the stabilized construction entrance(s)?	☐	☐	☐
Is adequate drainage provided to prevent ponding at the entrance(s)?	☐	☐	☐
Comments:			

Linear Sediment Control Barriers	Yes	No	N/A
Are the sediment controls installed along the contour, 10 feet from toe of slope and not within conveyance channels?	☐	☐	☐
Are silt fence joints constructed by wrapping the two ends together for continuous support?	☐	☐	☐
Is the silt fence fabric is buried a minimum of 6 inches?	☐	☐	☐
Are the posts stable and the fabric is tight and without rips/frayed areas?	☐	☐	☐
Does the compost filter sock have good contact with the soil?	☐	☐	☐
Is the sediment accumulation 0% of the design capacity?	☐	☐	☐
Comments:			

Storm Drain Inlet Protection	Yes	No	N/A
Is the inlet protection installed in accordance with the Construction Drawings?	☐	☐	☐
Is the inlet protection structurally sound?	☐	☐	☐
Are the posts stable and the fabric is tight and without rips/frayed areas?	☐	☐	☐
Is the sediment accumulation greater than 50% of the design capacity?	☐	☐	☐
Comments:			

Temporary Sediment Basin	Yes	No	N/A
Is the basin and outlet structure constructed per the Construction Drawings?	☐	☐	☐
Are the basin side slopes stabilized?	☐	☐	☐
Was the drainage structure flushed and basin surface restored upon removal of the sediment basin facility?	☐	☐	☐
Is the sediment basin dewatering at an appropriate rate?	☐	☐	☐
Is the sediment accumulation greater than 50% of the design capacity?	☐	☐	☐
Comments:			

Temporary Sediment Trap	Yes	No	N/A
Is the outlet structure constructed per the Construction Drawings?	☐	☐	☐
Has geotextile fabric been placed beneath the rock fill?	☐	☐	☐
Are the sediment trap slopes and disturbed areas are stabilized?	☐	☐	☐
Is the sediment accumulation greater than 50% of the design capacity?	☐	☐	☐
Comments:			

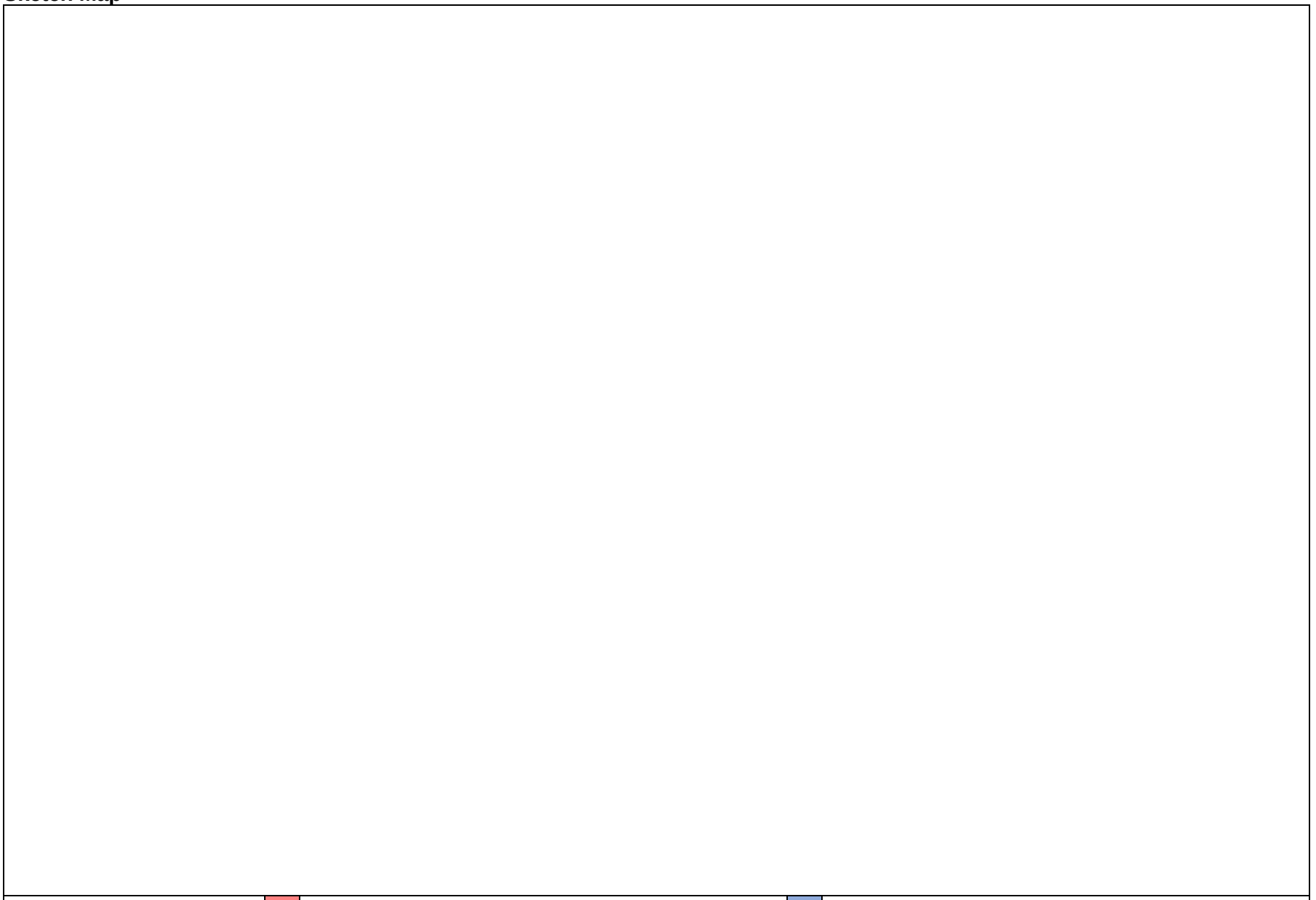
Note: Not all erosion and sediment control practices are included in this listing. Add additional pages to this list as required by site specific design. All practices shall be maintained in accordance with their respective standards.

Qualified Inspector _____ Qualified Inspector Signature _____

Qualified Professional _____ Qualified Professional Signature _____

The above signed acknowledges that, to the best of his/her knowledge, all information provided in this report is accurate and complete. If there are any questions, comments, or concerns regarding the contents of this report, feel free to contact Inspector's Name at XXX-XXX-XXXX or email address.

Sketch Map



Legend:		Area of Active Soil Disturbance		Area has Achieved Temporary Stabilization
		Area of Inactive Soil Disturbance		Area has Achieved Final Stabilization

Inspection Photographs

1		**2**	

3		**4**	

5		**6**	

7		**8**	

9	**10**

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11	**12**

Appendix G – Completed SWPPP Inspection Reports