Orchards on Hudson – Residential

Dock Road
Marlboro, New York

PREPARED FOR

SDL Marlboro LLC

561 Seventh Ave Suite 903
New York, NY 10018

PREPARED BY

VHB Engineering, Surveying and Landscape Architecture, Geology, P.C.
100 Motor Parkway
Suite 350
Hauppauge, NY 11788
631.787.3400

August 2024

VHB Project #: 20578.01

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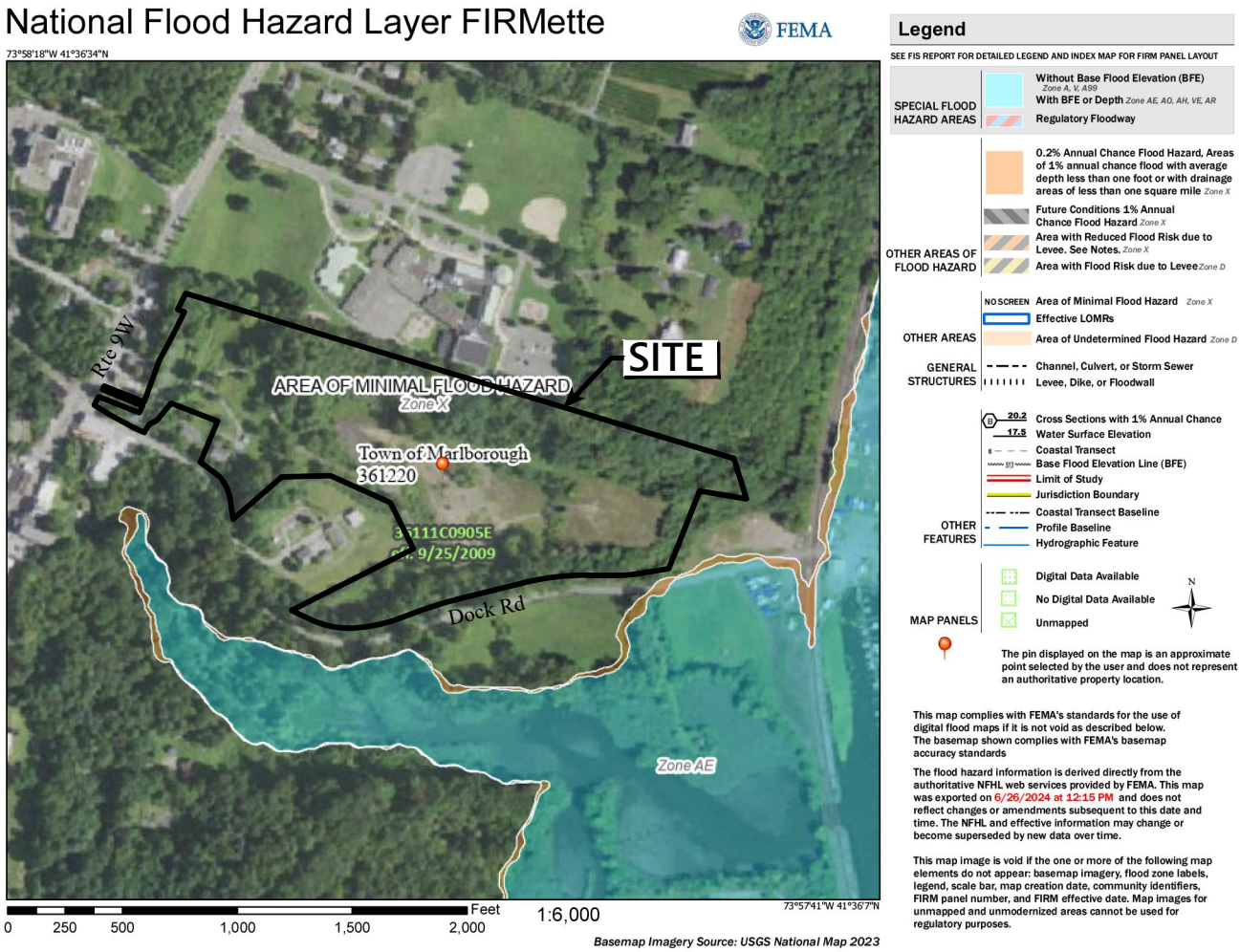
Site Location Map
Leyton Properties - Marlboro

Figure 1
July 2024

Dock Rd
Marlboro, NY 12542

0 200 400 Feet



FEMA Flood Map
Leyton Properties - Marlboro

Dock Rd
Marlboro, NY 12542

Figure 2
July 2024

Map #: 36111C0905E
(Revised 09/24/2009)

0 400 800 Feet

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Project Summary

Site Location and Summary

The Proposed Action involves an application for site plan approval, and other approvals associated with the proposed development of the 25.48±-acre Subject Property located at 103-107 Dock Road in the hamlet of Marlboro, Town of Marlborough, Ulster County, New York. The Subject Property spans across Dock Road with most of the property situated on the north side of the roadway and a small portion on the south side. Ulster County Tax Map #: Section 109.1 - Block 3 - Lots 13, 14.2 and 15 and Section 108.4 - Block 3 - Lot 29.1. The project site is bounded by the campus of Marlboro Elementary School to the north; A marina located at 140 Dock Road to the east; Dock Road to the south; The Hamlet of Marlboro Wastewater Treatment Facility to the southwest; Residential properties and commercial structures fronting Route 9W to the west.

The site is mostly vacant and wooded with three single family residences located on the western portion. The middle portion of the site was previously mined creating a depression on the eastern side of the property. There are varying steep slopes across most of the site ranging from elevation +/-160 at the west side of Dock Road to elevation +/-11.0 at the east side.

According to the Flood Insurance Rate Map (FIRM) prepared by Federal Emergency Management Agency (FEMA), the project site is not located within a flood zone, however it is located next to a 1% Annual Chance Flood Hazard area. See the Flood map numbered 36111C0905E dated 9/25/2009 in the Project figures section, Figure two, of this report).

Existing Conditions

Subsurface Conditions:

According to the NRCS soil survey for Ulster County, NY, the site consists of hydrologic soil group A and B and is made up of mostly 'Riverhead fine sandy loam, 0-3 percent slopes'(RvA), 'Hoosic soils, very steep' (HgD) and 'Chenango Gravely silt loam, 3-8 percent slopes. USDA soils report is included in Attachment A.

A subsurface geotechnical study was performed by Tectonic Engineering Consultants, Geologists & Land Surveyors, D.P.C. dated April 2, 2024. Based on the information provided in the Geotechnical Report provided, generally there are sandy soils with traces of silt and gravel present at the site. There was bedrock/auger refusal at some of the boring locations, however elevations provided are outside limits of the proposed project excavation. Percolation tests were performed at various locations on the site and infiltration rates ranged from three to seven in/hr.

Pre-Development Hydrology:

From a hydrological perspective, the site is divided into seven distinct sub catchments as shown in Figure B-1 in Attachment B. The predominant flow of stormwater runoff from the site is directed towards Dock Road from Subcatchment Areas B and C and eventually discharges directly to the Hudson River via overland flow. Sub catchments D, E and F located on the west side of the site discharge to dock road and flow along a swale on the north side of the road to a culvert that runs across the road to a lot owned by the applicant, which contains the wetlands of a tributary to the Hudson River. In addition, two subcatchment areas, A and G, as shown on the figure, discharge off site to the north and east respectively via overland flow.

Table 1 summarizes the key hydrologic parameters for each drainage area used in the existing conditions analysis.

Table 1
Existing Conditions Hydrologic Data

Description (Drainage Area #)	Discharge Location	Study Point	Area (acres)	Curve Number	Time of Concentration (min)
SC-A	*Campus of Marlboro Elementary School*	B	*2.683*	60, 67 and 98	*64*

SC-B	*Bottom of Dock Road*	*A*	*13.46*	*65 and 67*	*113.9*
SC-C	*Bottom of Dock Road*	*A*	*3.5*	*65*	*66.4*
SC-D	*Gutter to Culvert on Dock Road*	*C*	*2.16*	*65*	*25.8*
SC-E	*Gutter to Culvert on Dock Road*	*C*	*.530*	*65 and 98*	*4.7*
SC-F	*Gutter to Culvert on Dock Road*	*C*	*.230*	*65*	*2.4*
SC-G	*Marina*	*D*	*1.130*	*58*	*18*

Proposed Conditions

The proposed action will construct a residential development consisting of 103 townhome and cottage style units. Every home is designed to include a garage, with additional parking for guests dispersed throughout the development. A community clubhouse and swimming pool are also planned on the eastern side of the property.

The post-development conditions divide the site into six subcatchment areas. Figure B-2 in Attachment B details the subcatchment areas and where they discharge from the site. Generally, stormwater runoff sheet flows from impervious and landscaped areas and is collected via a series of catch basins and area drains, and piped into underground detention system which are designed to hold enough runoff and discharge at rates equal to or less than predevelopment rates. Outfall pipes are connected to the detention systems and once the volume stored reaches the design elevation, runoff is piped to engineered outfalls consisting of concrete flared end sections with rip rap scour protection aprons.

Below is a summary of each of the post-development subcatchment areas:

Drainage Area A – approximately 4.26-acres in area on the western most portion of the site. This area consists of the majority of the cottage style units, the western access road and landscaped areas created from excavation operations. Prior to discharge from the site, runoff will be stored in two underground detention systems

manufactured by StormTrap or approved equal. Area A will discharge via a culvert below dock road as shown on the project drainage plans. The discharge point from this area is shown as Study Point C (SPC) on Figure B-2.

Drainage Area B - is approximately 10.80 acres. It consists of the remainder o the cottage style units and over half of the proposed townhome units and access drives, as well as most of the steeply inclined land in the northern section of the site. Runoff from the northern portion of this area flows into a bioswale segmented by check dams to slow the velocity of the runoff and collected at the low point before being piped to a large underground detention system by StormTrap (or approved equal) designed to detain and infiltrate stormwater runoff before its controlled release to Study Point A (SPA) as depicted on Figure B-2.

Drainage Area C – is approximately 3.375 acres and includes additional townhome units and the proposed clubhouse as well as some access road, visitor parking and landscape areas. In addition, a portion of the northern sloped area also drains to this system. Runoff is collected and stored in an underground detention system by StormTrap (or approved equal) designed to detain and infiltrate stormwater runoff before its controlled release to SPA as depicted on Figure B-2.

Drainage Area D – is approximately 1.462 acres and includes the remainder of the proposed townhome units and the surrounding landscaped area. Runoff from this area sheet flows to Dock Road and discharges at SPA.

Drainage Area E – is approximately 3.086 acres and is comprised of wooded area that will remain undisturbed post development. Runoff from this area sheet flows overland to Dock Road and discharges ta SPA.

Drainage Area F – is approximately .950 acres in area. There is no proposed development in this drainage area and therefore peak discharges will not change from predevelopment conditions.

Table 2 summarizes the key hydrologic parameters for each drainage area used in the proposed condition analysis.

Table 2
Proposed Condition Hydrologic Data

Description (Drainage Area #)	Discharge Location	Study Point	Area (acres)	Curve Number	Time of Concentration (min)
DA- A	*Outlet to wetland across dock road*	*C*	*4.260*	*98, 61, and 98*	*26.1*
DA-B	*Bottom of Dock Road*	*A*	*10.800*	*98, 61 and 60*	*10.3*
DA-C	*Bottom of Dock Road*	*A*	*3.375*	*98, 61 and 60*	*10.0*
DA-D	*Bottom of Dock Road*	*A*	*1.462*	*98 and 61*	*10.0*
DA-E	*Bottom of Dock Road*	*A*	*3.086*	*58*	*68.2*
DA-F	*Marina*	*D*	*.950*	*23.8*	*23.8*

Post Development Hydrologic Analysis

In order to demonstrate that the proposed storm water management system for the project is capable of accommodating post-development runoff for the 2-year, 10-year and 100-year storm events, a model was developed using HydroCAD software to analyze each storm condition. The system was designed to limit peak discharge for the design storm events to pre-development rates or less. To establish these flows the following 2-, 10-, and 100-year, 24-hour storm precipitation values were used for the using Figures 4.1-4.4 in the New York State Stormwater Management Design Manul, January 2015.

Recurrence Interval	24-hour Rainfall Depth
2-Year	*3.5"*
10-Year	*4.75"*
100-Year	*8.8"*

In accordance with the NYSDEC requirements, the HydroCAD model uses the TR-20 methodology to calculate peak runoff rates for a specific design area. The program is then used to model storage over time in conjunction with infiltration through the proposed underground detention systems which contain controlled outlets which allow runoff below the pre-development peak discharge rate. The model also indicates the peak elevation of storage in the system during the storm.

As indicated above, the Geotechnical report indicated a range of infiltration rates between three and seven inches per hour throughout the site. An average infiltration rate of five inches per hour was used to model infiltration through the proposed detention systems.

Time of concentration and CN values were calculated under existing and proposed conditions by following TR-55 Handbook Guideline for each drainage area. Minimum time of concentration of 10 minutes is used.

Table 3 below shows the comparison of pre- and post-development peak discharge rates for the design storms. Attachment B of this report contains the hydrologic analysis for both pre- and post-development scenarios.

Table 3
Flows Comparison at Study Point A

Storm Frequency	Pre-Dev. Peak Discharge	Post-Dev. Peak Discharge	Percent Reduction
2-Year	*2.87 cfs*	*2.67 cfs*	*6.9%*
10-Year	*6.28 cfs*	*4.32 cfs*	*31.2%*
100-Year	*22.51cfs*	*20.61 cfs*	*8.4%*

Flows Comparison at Study Point B

Storm Frequency	Pre-Dev. Peak Discharge	Post-Dev. Peak Discharge	Percent Reduction
2-Year	*.01 cfs*	*0 cfs*	*100%*
10-Year	*1.02 cfs*	*0 cfs*	*100%*
100-Year	*4.67 cfs*	*0 cfs*	*100%*

Flows Comparison at Study Point C

Storm Frequency	Pre-Dev. Peak Discharge	Post-Dev. Peak Discharge	Percent Reduction
2-Year	*1.29 cfs*	*0 cfs*	*100%*
10-Year	*2.81 cfs*	*0 cfs*	*100%*
100-Year	*8.98 cfs*	*5.21 cfs*	*41.98%*

Flows Comparison at Study Point D

Storm Frequency	Pre-Dev. Peak Discharge	Post-Dev. Peak Discharge	Percent Reduction
2-Year	*.26 cfs*	*.20 cfs*	*23.00 %*
10-Year	*.80 cfs*	*.61 cfs*	*23.75%*
100-Year	*3.39 cfs*	*2.54 cfs*	*25.0 %*

As indicated above, there is no increase in peak discharge during the design storm events during post development conditions.

Attachment A:
NRCS Soil Survey Information

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 Ulster County, New York

June 27, 2024

Preface

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

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

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

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

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

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

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Contents

How Soil Surveys Are Made

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

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

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

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

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

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

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

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

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

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

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

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

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

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

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 1:15,800.

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

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

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

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

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

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

Soil Survey Area: Ulster County, New York
Survey Area Data: Version 22, Sep 5, 2023

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

Date(s) aerial images were photographed: Oct 21, 2022—Oct 27, 2022

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
CF	Cut and fill land	0.2	0.9%
CnB	Chenango gravelly silt loam, 3 to 8 percent slopes	3.0	12.1%
FW	Fresh water marsh	0.3	1.1%
HgD	Hoosic gravelly loam, 15 to 25 percent slopes	1.6	6.3%
HSF	Hoosic soils, very steep	10.4	41.5%
ML	Made land	0.1	0.5%
Ra	Raynham silt loam	1.9	7.8%
RvA	Riverhead fine sandy loam, 0 to 3 percent slopes	7.5	29.8%
Totals for Area of Interest		**25.0**	**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.

Ulster County, New York

CF—Cut and fill land

Map Unit Setting

National map unit symbol: 9xg2
Elevation: 160 to 1,970 feet
Mean annual precipitation: 41 to 62 inches
Mean annual air temperature: 41 to 50 degrees F
Frost-free period: 110 to 200 days
Farmland classification: Not prime farmland

Map Unit Composition

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

Description of Udorthents

Typical profile

H1 - 0 to 4 inches: gravelly sandy loam
H2 - 4 to 70 inches: very gravelly sandy loam

Properties and qualities

Slope: 0 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat excessively drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.06 to 5.95 in/hr)
Depth to water table: About 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Available water supply, 0 to 60 inches: Low (about 5.5 inches)

Interpretive groups

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

Minor Components

Cayuga

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

Tunkhannock

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

Lyons

Percent of map unit: 5 percent
Landform: Depressions
Hydric soil rating: Yes

Bath

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

CnB—Chenango gravelly silt loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 9xg8
Elevation: 600 to 1,800 feet
Mean annual precipitation: 41 to 62 inches
Mean annual air temperature: 41 to 50 degrees F
Frost-free period: 110 to 200 days
Farmland classification: All areas are prime farmland

Map Unit Composition

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

Description of Chenango

Setting

Landform: Terraces, valley trains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Gravelly loamy glaciofluvial deposits over sandy and gravelly glaciofluvial deposits, derived mainly from sandstone, shale, and siltstone

Typical profile

H1 - 0 to 9 inches: gravelly silt loam
H2 - 9 to 35 inches: gravelly silt loam
H3 - 35 to 80 inches: extremely gravelly sand

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 1 percent
Available water supply, 0 to 60 inches: Low (about 4.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2s

Hydrologic Soil Group: A
Ecological site: F140XY021NY - Dry Outwash
Hydric soil rating: No

Minor Components

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

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

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

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

FW—Fresh water marsh

Map Unit Setting
National map unit symbol: 9xgg
Elevation: 10 to 2,400 feet
Mean annual precipitation: 41 to 62 inches
Mean annual air temperature: 41 to 50 degrees F
Frost-free period: 110 to 200 days
Farmland classification: Not prime farmland

Map Unit Composition
Medisaprists and similar soils: 45 percent
Hydraquents and similar soils: 35 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Medisaprists

Setting
Landform: Marshes, swamps
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Talf
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Organic material

Typical profile
H1 - 0 to 70 inches: muck

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to very high (0.20 to 19.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Available water supply, 0 to 60 inches: Very high (about 22.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8w
Hydrologic Soil Group: A/D
Hydric soil rating: Yes

Description of Hydraquents

Setting

Landform: Marshes
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Talf
Down-slope shape: Concave
Across-slope shape: Concave

Typical profile

H1 - 0 to 9 inches: gravelly loam
H2 - 9 to 70 inches: silt loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.06 to 5.95 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 15 percent
Available water supply, 0 to 60 inches: Moderate (about 7.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8w
Hydrologic Soil Group: A/D
Hydric soil rating: Yes

Minor Components

Carlisle

Percent of map unit: 5 percent
Landform: Marshes, swamps
Hydric soil rating: Yes

Wayland

Percent of map unit: 5 percent

Landform: Flood plains
Hydric soil rating: Yes

Palms

Percent of map unit: 5 percent
Landform: Swamps, marshes
Hydric soil rating: Yes

Canandaigua

Percent of map unit: 5 percent
Landform: Depressions
Hydric soil rating: Yes

HgD—Hoosic gravelly loam, 15 to 25 percent slopes

Map Unit Setting

National map unit symbol: 9xgq
Elevation: 100 to 1,100 feet
Mean annual precipitation: 41 to 62 inches
Mean annual air temperature: 41 to 50 degrees F
Frost-free period: 110 to 200 days
Farmland classification: Not prime farmland

Map Unit Composition

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

Description of Hoosic

Setting

Landform: Deltas, terraces, outwash plains
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Riser
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Sandy and gravelly glaciofluvial deposits

Typical profile

H1 - 0 to 8 inches: gravelly loam
H2 - 8 to 14 inches: gravelly loam
H3 - 14 to 30 inches: very gravelly loamy sand
H4 - 30 to 80 inches: stratified extremely gravelly sand

Properties and qualities

Slope: 15 to 25 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat excessively drained
Capacity of the most limiting layer to transmit water (Ksat): High to very high (1.98 to 19.98 in/hr)

Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Very low (about 2.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: A
Ecological site: F140XY021NY - Dry Outwash
Hydric soil rating: No

Minor Components

Red hook

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

Riverhead

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

Castile

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

Plainfield

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

HSF—Hoosic soils, very steep

Map Unit Setting

National map unit symbol: 9xgr
Elevation: 100 to 1,100 feet
Mean annual precipitation: 41 to 62 inches
Mean annual air temperature: 41 to 50 degrees F
Frost-free period: 110 to 200 days
Farmland classification: Not prime farmland

Map Unit Composition

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

Description of Hoosic

Setting

Landform: Terraces, outwash plains, deltas
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Riser
Down-slope shape: Convex

Across-slope shape: Convex
Parent material: Sandy and gravelly glaciofluvial deposits

Typical profile

H1 - 0 to 8 inches: gravelly sandy loam
H2 - 8 to 14 inches: gravelly loam
H3 - 14 to 30 inches: very gravelly loamy sand
H4 - 30 to 80 inches: stratified extremely gravelly sand

Properties and qualities

Slope: 25 to 55 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat excessively drained
Capacity of the most limiting layer to transmit water (Ksat): High to very high (1.98 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Very low (about 2.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: A
Ecological site: F140XY021NY - Dry Outwash
Hydric soil rating: No

Minor Components

Plainfield

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

Tunkhannock

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

Valois

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

Lordstown

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

ML—Made land

Map Unit Setting

National map unit symbol: 9xhb
Elevation: 160 to 1,970 feet
Mean annual precipitation: 41 to 62 inches
Mean annual air temperature: 41 to 50 degrees F

Frost-free period: 110 to 200 days
Farmland classification: Not prime farmland

Map Unit Composition

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

Description of Udorthents

Typical profile

H1 - 0 to 4 inches: channery loam
H2 - 4 to 70 inches: very gravelly sandy loam

Properties and qualities

Slope: 0 to 5 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat excessively drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.06 to 5.95 in/hr)
Depth to water table: About 24 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Available water supply, 0 to 60 inches: Low (about 5.4 inches)

Interpretive groups

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

Minor Components

Canandaigua

Percent of map unit: 5 percent
Landform: Depressions
Hydric soil rating: Yes

Middlebury

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

Red hook

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

Churchville

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

Cambridge

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

Ra—Raynham silt loam

Map Unit Setting

National map unit symbol: 9xj3
Elevation: 50 to 500 feet
Mean annual precipitation: 41 to 62 inches
Mean annual air temperature: 41 to 50 degrees F
Frost-free period: 110 to 200 days
Farmland classification: Prime farmland if drained

Map Unit Composition

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

Description of Raynham

Setting

Landform: Lake plains
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Glaciolacustrine, eolian, or old alluvial deposits, comprised mainly of silt and very fine sand

Typical profile

H1 - 0 to 8 inches: silt loam
H2 - 8 to 37 inches: silt loam
H3 - 37 to 56 inches: very fine sandy loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
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 6 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Available water supply, 0 to 60 inches: High (about 11.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: C/D
Ecological site: F140XY016NY - Mineral Wetlands
Hydric soil rating: No

Minor Components

Madalin
Percent of map unit: 5 percent
Landform: Depressions
Hydric soil rating: Yes

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

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

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

Canandaigua
Percent of map unit: 5 percent
Landform: Depressions
Hydric soil rating: Yes

RvA—Riverhead fine sandy loam, 0 to 3 percent slopes

Map Unit Setting
National map unit symbol: 9xj7
Elevation: 590 to 1,970 feet
Mean annual precipitation: 41 to 62 inches
Mean annual air temperature: 41 to 50 degrees F
Frost-free period: 110 to 200 days
Farmland classification: All areas are prime farmland

Map Unit Composition
Riverhead and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Riverhead

Setting
Landform: Terraces, deltas
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy glaciofluvial deposits overlying stratified sand and gravel

Typical profile
H1 - 0 to 8 inches: fine sandy loam

H2 - 8 to 26 inches: sandy loam
H3 - 26 to 49 inches: loamy sand
H4 - 49 to 62 inches: sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 5.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2s
Hydrologic Soil Group: A
Ecological site: F144AY023CT - Well Drained Outwash
Hydric soil rating: No

Minor Components

Hoosic

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

Plainfield

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

Pompton

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

Walpole

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

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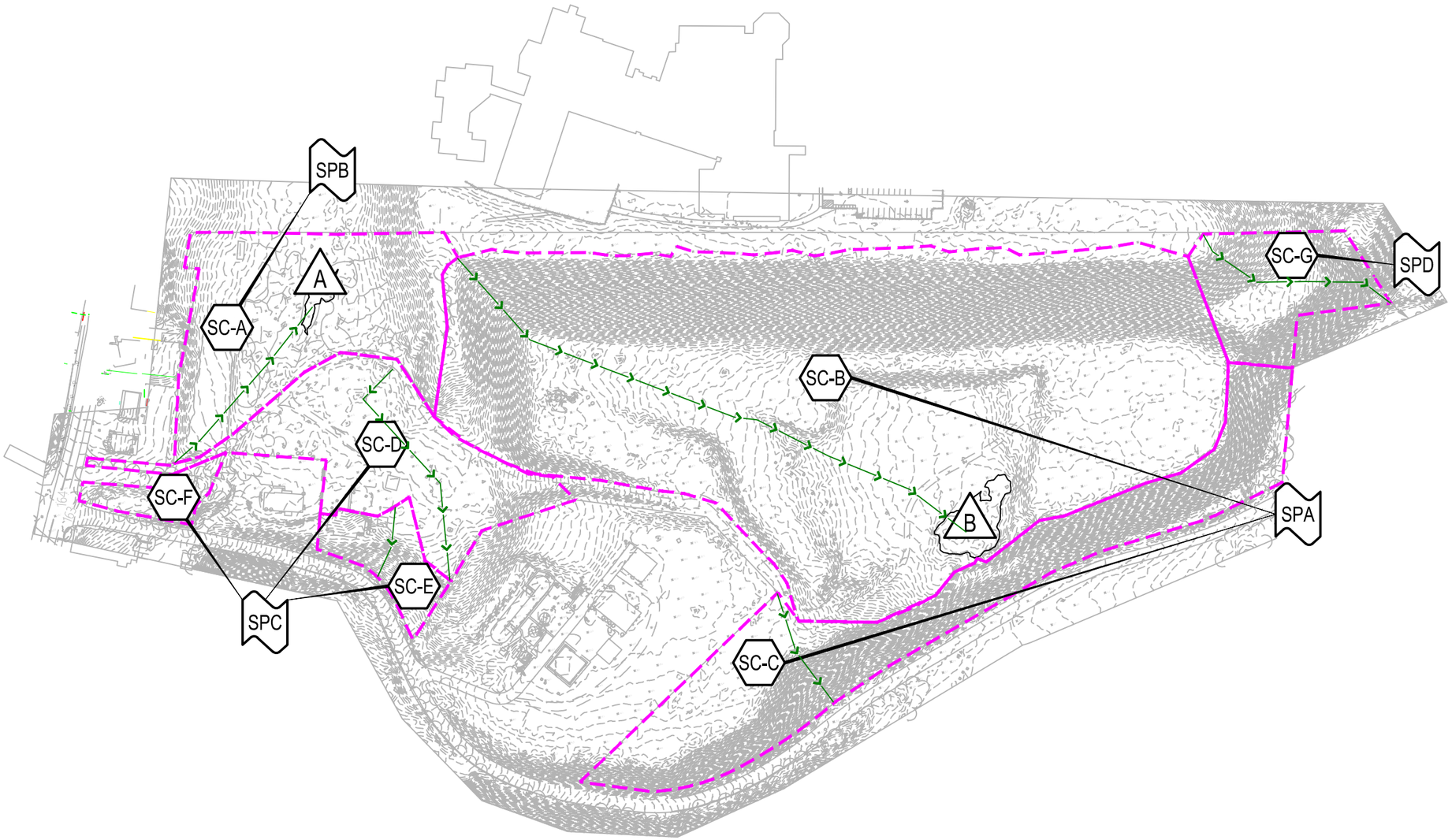
Attachment B:
HydroCAD Reports



Legend

SYMBOLS

X — **STUDY POINT**

X — **DRAINAGE AREA DESIGNATION**

X — **POND**

LINETYPES

DRAINAGE AREA BOUNDARY

TIME OF CONCENTRATION FLOW LINE

Existing Drainage Conditions
Orchards on Hudson Residential
103-107 Dock Road
Marlboro, NY

Figure B-1

August 2024

Legend

SYMBOLS

X — **STUDY POINT**

X — **DRAINAGE AREA DESIGNATION**

X — **POND**

LINETYPES

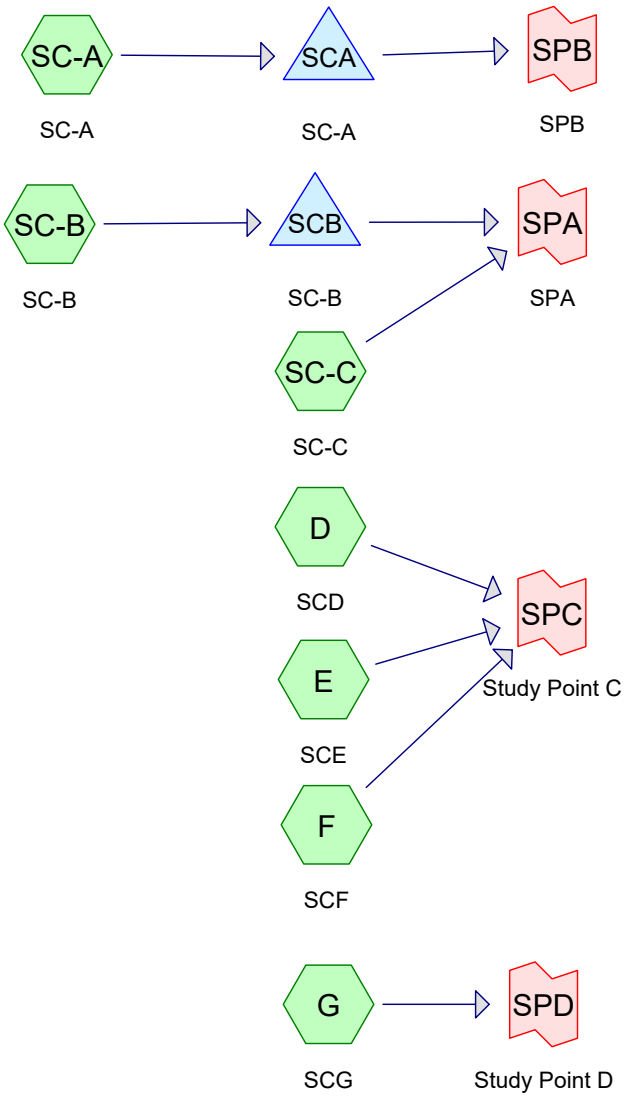
DRAINAGE AREA BOUNDARY

TIME OF CONCENTRATION FLOW LINE

Proposed Drainage Conditions
Orchards on Hudson Residential
103-107 Dock Road
Marlboro, NY

Figure B-2

August 2024



Subcat Reach Pond Link

Routing Diagram for 20578.01_ Pre and Post Hydro CAD
Prepared by VHB, Inc, Printed 8/2/2024

Rainfall Events Listing

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2 Year	Type III 24-hr		Default	24.00	1	3.50	2
2	10 Year	Type III 24-hr		Default	24.00	1	4.75	2
3	100 Year	Type III 24-hr		Default	24.00	1	8.80	2

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
4.890	67	Brush, Poor, HSG B (SC-A, SC-B)
0.033	98	Paved parking, HSG B (SC-A)
0.060	98	Unconnected roofs, HSG A (E)
1.870	60	Woods, Fair, HSG B (SC-A)
15.710	65	Woods/grass comb., Fair, HSG B (D, E, F, SC-B, SC-C)
1.130	58	Woods/grass comb., Good, HSG B (G)
23.693	**65**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.060	HSG A	E
23.633	HSG B	D, E, F, G, SC-A, SC-B, SC-C
0.000	HSG C	
0.000	HSG D	
0.000	Other	
23.693		**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	4.890	0.000	0.000	0.000	4.890	Brush, Poor	SC-A, SC-B
0.000	0.033	0.000	0.000	0.000	0.033	Paved parking	SC-A
0.060	0.000	0.000	0.000	0.000	0.060	Unconnected roofs	E
0.000	1.870	0.000	0.000	0.000	1.870	Woods, Fair	SC-A
0.000	15.710	0.000	0.000	0.000	15.710	Woods/grass comb., Fair	D, E, F, SC-B, SC-C
0.000	1.130	0.000	0.000	0.000	1.130	Woods/grass comb., Good	G
0.060	**23.633**	**0.000**	**0.000**	**0.000**	**23.693**	**TOTAL AREA**	

Time span=0.00-30.00 hrs, dt=0.01 hrs, 3001 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 D: SCD Runoff Area=2.160 ac 0.00% Impervious Runoff Depth=0.75"
Flow Length=266' Tc=25.8 min CN=65 Runoff=0.97 cfs 0.135 af

Subcatchment E: SCE Runoff Area=0.530 ac 11.32% Impervious Runoff Depth=0.85"
Flow Length=112' Tc=10.0 min UI Adjusted CN=67 Runoff=0.40 cfs 0.038 af

Subcatchment F: SCF Runoff Area=0.230 ac 0.00% Impervious Runoff Depth=0.75"
Flow Length=55' Slope=0.1900 '/' Tc=10.0 min CN=65 Runoff=0.15 cfs 0.014 af

Subcatchment G: SCG Runoff Area=1.130 ac 0.00% Impervious Runoff Depth=0.45"
Flow Length=320' Tc=18.0 min CN=58 Runoff=0.26 cfs 0.043 af

Subcatchment SC-A: SC-A Runoff Area=2.683 ac 1.23% Impervious Runoff Depth=0.66"
Flow Length=344' Tc=64.0 min CN=63 Runoff=0.62 cfs 0.147 af

Subcatchment SC-B: SC-B Runoff Area=13.460 ac 0.00% Impervious Runoff Depth=0.80"
Flow Length=813' Tc=91.9 min CN=66 Runoff=3.20 cfs 0.898 af

Subcatchment SC-C: SC-C Runoff Area=3.500 ac 0.00% Impervious Runoff Depth=0.75"
Flow Length=213' Tc=66.4 min CN=65 Runoff=0.95 cfs 0.219 af

Pond SCA: SC-A Peak Elev=140.99' Storage=0.020 af Inflow=0.62 cfs 0.147 af
Discarded=0.43 cfs 0.147 af Primary=0.01 cfs 0.001 af Outflow=0.44 cfs 0.147 af

Pond SCB: SC-B Peak Elev=65.50' Storage=0.148 af Inflow=3.20 cfs 0.898 af
Discarded=1.01 cfs 0.876 af Primary=2.16 cfs 0.170 af Outflow=3.17 cfs 1.046 af

Link SPA: SPA Inflow=2.87 cfs 0.389 af
Primary=2.87 cfs 0.389 af

Link SPB: SPB Inflow=0.01 cfs 0.001 af
Primary=0.01 cfs 0.001 af

Link SPC: Study Point C

Inflow=1.29 cfs 0.187 af
Primary=1.29 cfs 0.187 af

Link SPD: Study Point D

Inflow=0.26 cfs 0.043 af
Primary=0.26 cfs 0.043 af

Total Runoff Area = 23.693 ac Runoff Volume = 1.494 af Average Runoff Depth = 0.76"
99.61% Pervious = 23.600 ac 0.39% Impervious = 0.093 ac

Summary for Subcatchment D: SCD

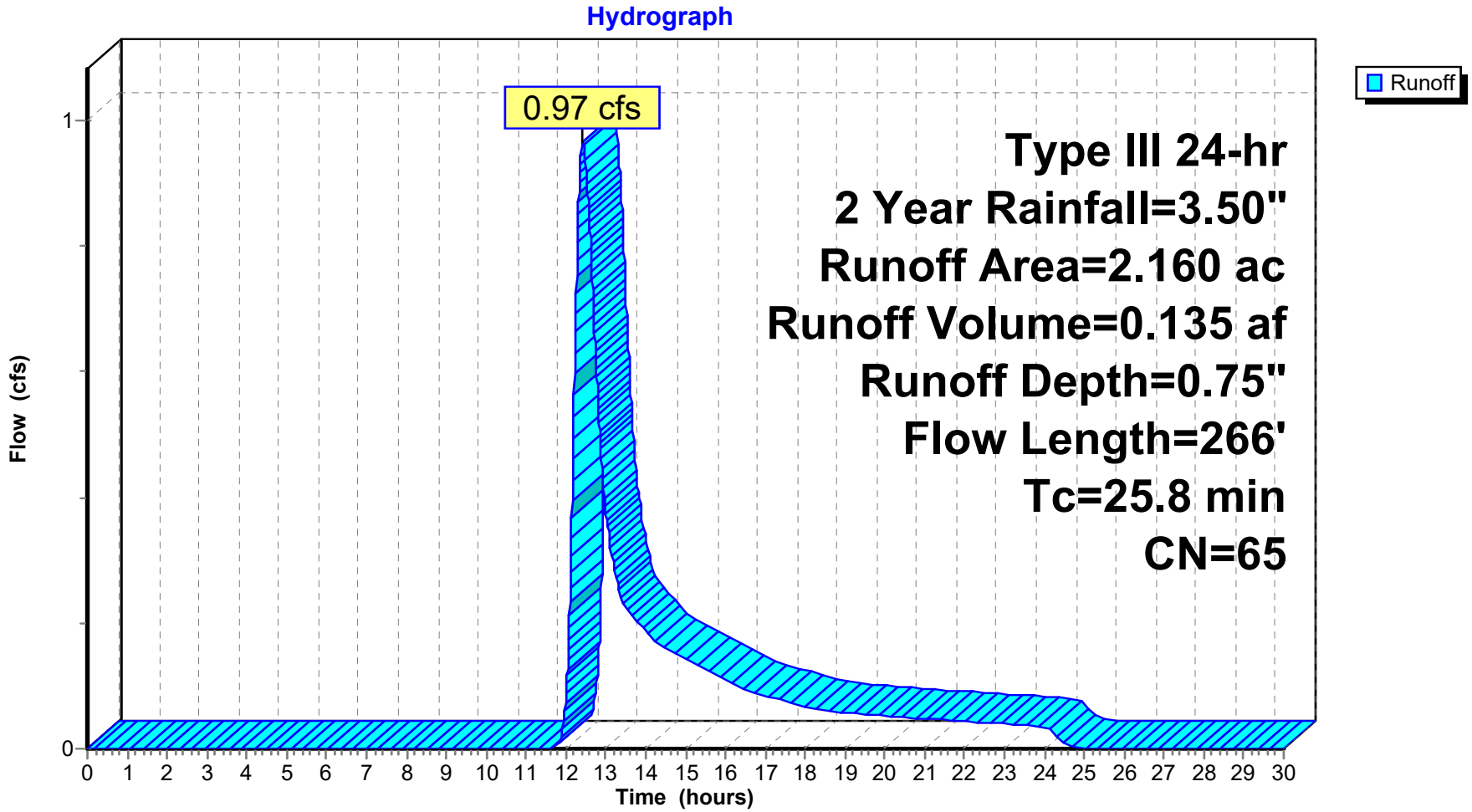
Runoff = 0.97 cfs @ 12.42 hrs, Volume= 0.135 af, Depth= 0.75"
Routed to Link SPC : Study Point C

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.50"

Area (ac)	CN	Description
2.160	65	Woods/grass comb., Fair, HSG B
2.160		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.4	70	0.0258	0.18		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.50"
19.4	196	0.0125	0.17		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.50"
25.8	266	Total			

Subcatchment D: SCD



Summary for Subcatchment E: SCE

Runoff = 0.40 cfs @ 12.16 hrs, Volume= 0.038 af, Depth= 0.85"
Routed to Link SPC : Study Point C

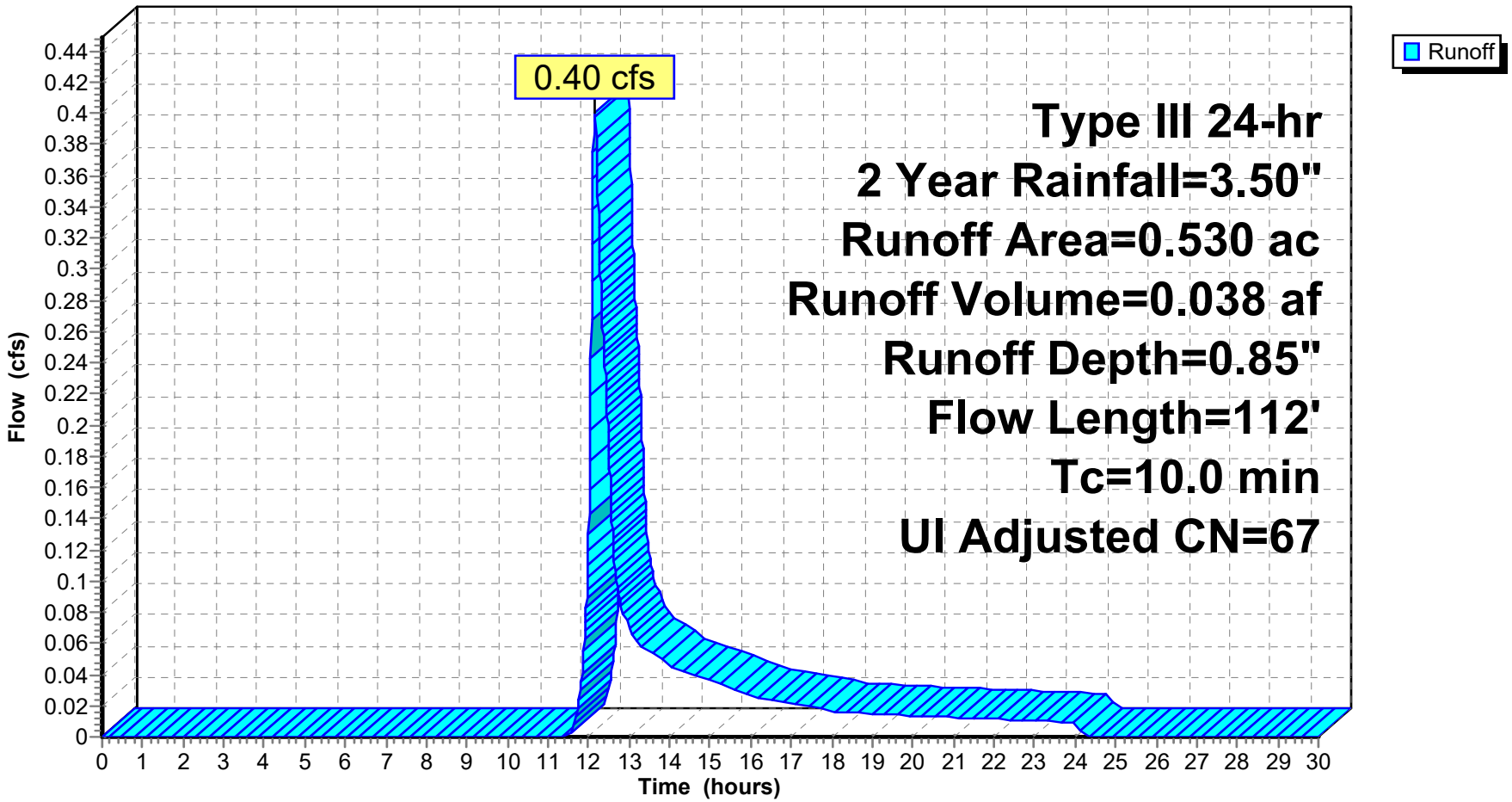
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.50"

Area (ac)	CN	Adj	Description
0.470	65		Woods/grass comb., Fair, HSG B
0.060	98		Unconnected roofs, HSG A
0.530	69	67	Weighted Average, UI Adjusted
0.470			88.68% Pervious Area
0.060			11.32% Impervious Area
0.060			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.6	40	0.0800	0.26		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.50"
2.1	72	0.4200	0.56		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.50"
4.7	112	Total, Increased to minimum Tc = 10.0 min			

Subcatchment E: SCE

Hydrograph



Summary for Subcatchment F: SCF

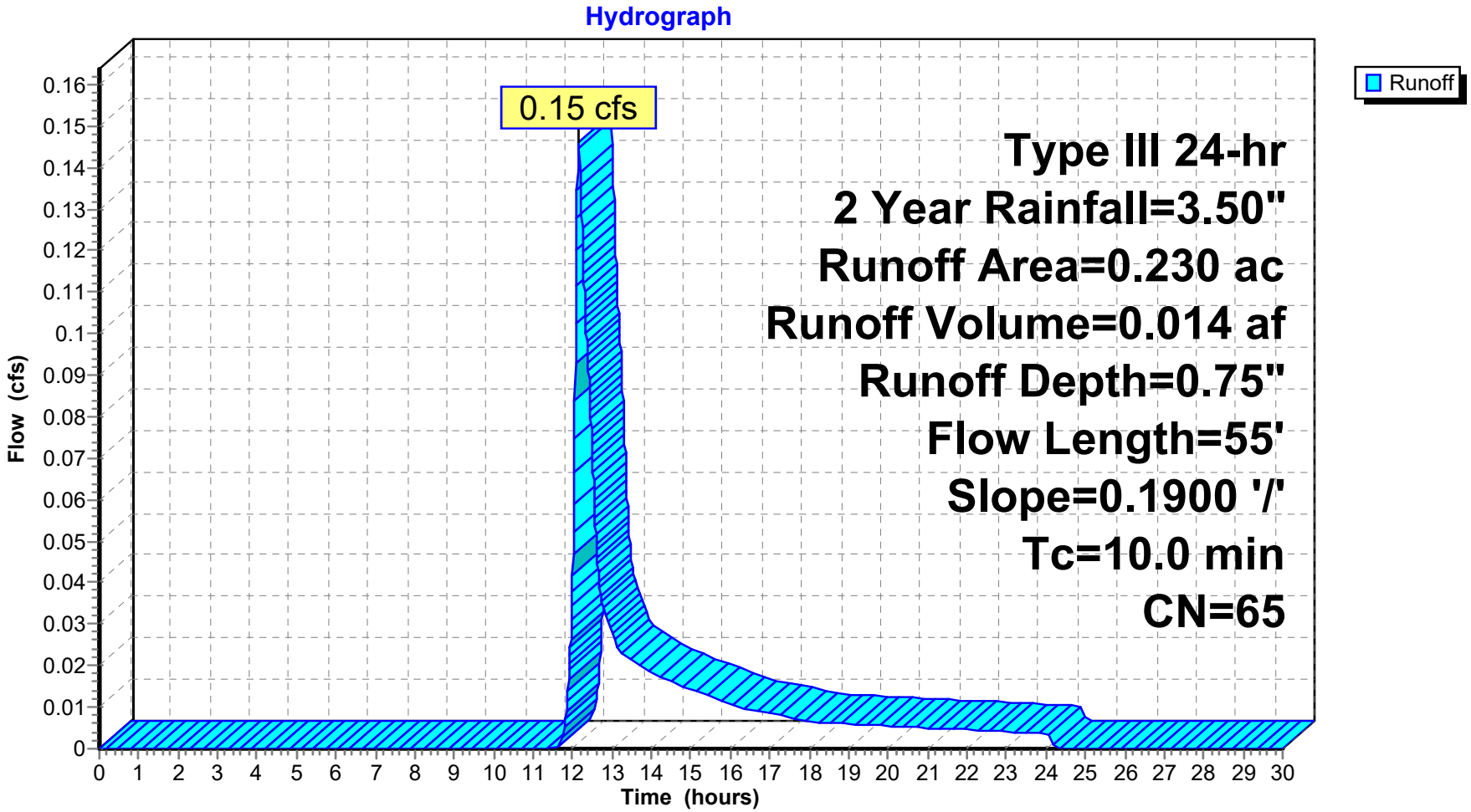
Runoff = 0.15 cfs @ 12.16 hrs, Volume= 0.014 af, Depth= 0.75"
Routed to Link SPC : Study Point C

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.50"

Area (ac)	CN	Description
0.230	65	Woods/grass comb., Fair, HSG B
0.230		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.4	55	0.1900	0.39		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.50"
2.4	55	Total, Increased to minimum Tc = 10.0 min			

Subcatchment F: SCF



Summary for Subcatchment G: SCG

Runoff = 0.26 cfs @ 12.38 hrs, Volume= 0.043 af, Depth= 0.45"
Routed to Link SPD : Study Point D

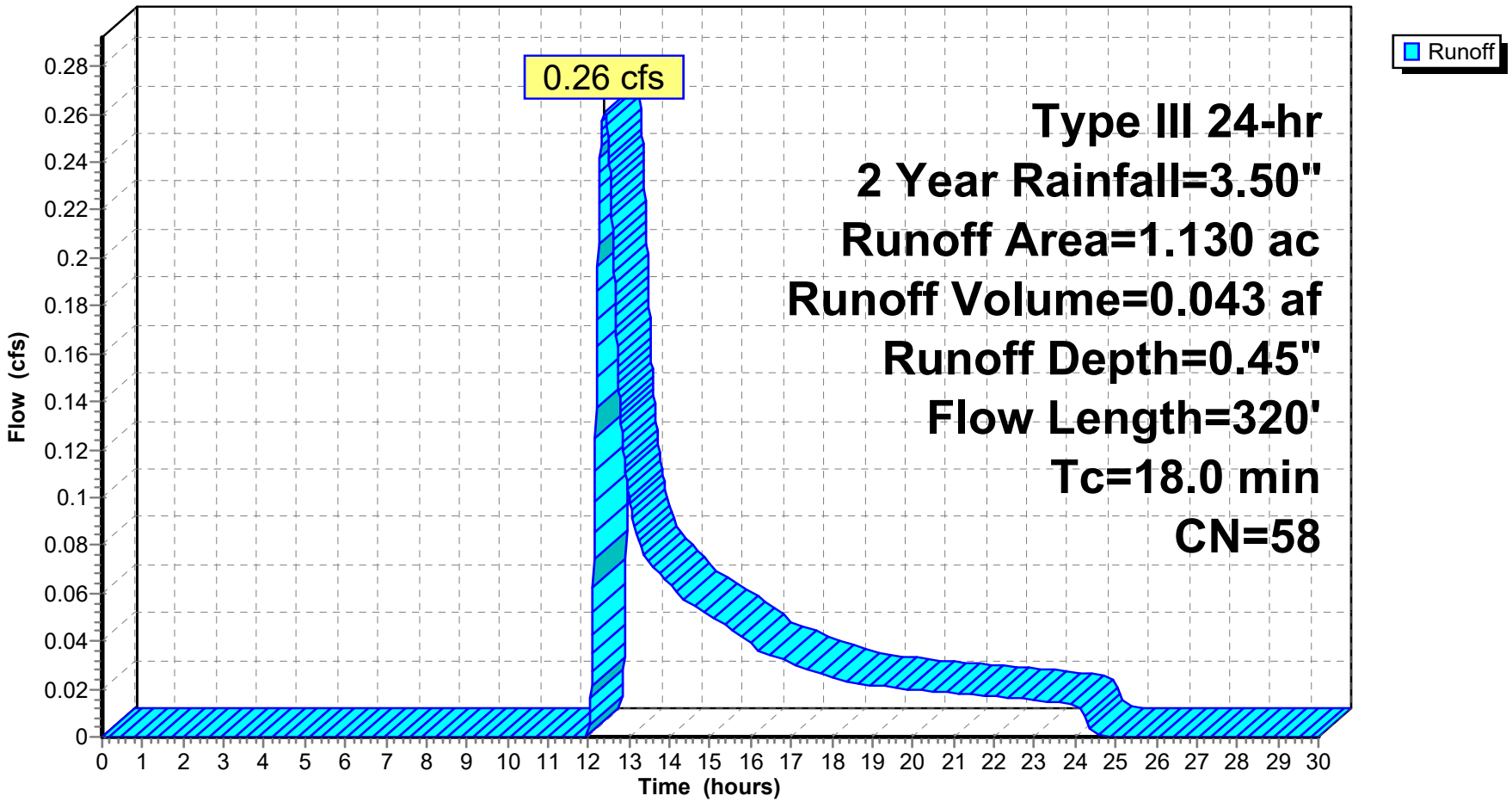
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.50"

Area (ac)	CN	Description
1.130	58	Woods/grass comb., Good, HSG B
1.130		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.5	95	0.4755	0.29		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.50"
3.9	76	0.7573	0.33		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.50"
5.1	95	0.5883	0.31		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.50"
3.5	54	0.4811	0.26		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.50"
18.0	320	Total			

Subcatchment G: SCG

Hydrograph



Summary for Subcatchment SC-A: SC-A

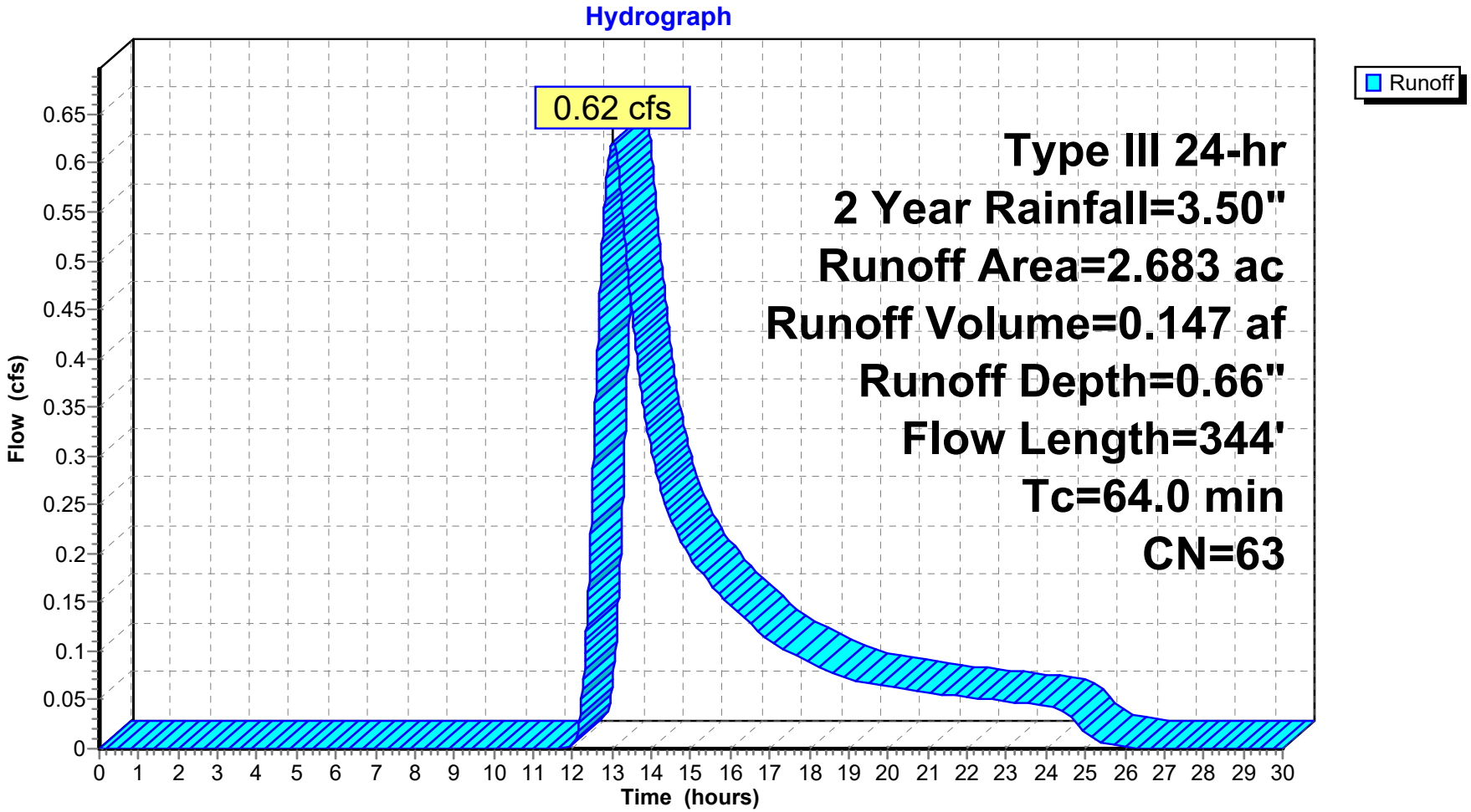
Runoff = 0.62 cfs @ 13.01 hrs, Volume= 0.147 af, Depth= 0.66"
Routed to Pond SCA : SC-A

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.50"

Area (ac)	CN	Description
1.870	60	Woods, Fair, HSG B
0.780	67	Brush, Poor, HSG B
0.033	98	Paved parking, HSG B
2.683	63	Weighted Average
2.650		98.77% Pervious Area
0.033		1.23% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.8	50	0.1200	0.14		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.50"
30.7	177	0.0230	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.50"
27.5	117	0.0132	0.07		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.50"
64.0	344	Total			

Subcatchment SC-A: SC-A



Summary for Subcatchment SC-B: SC-B

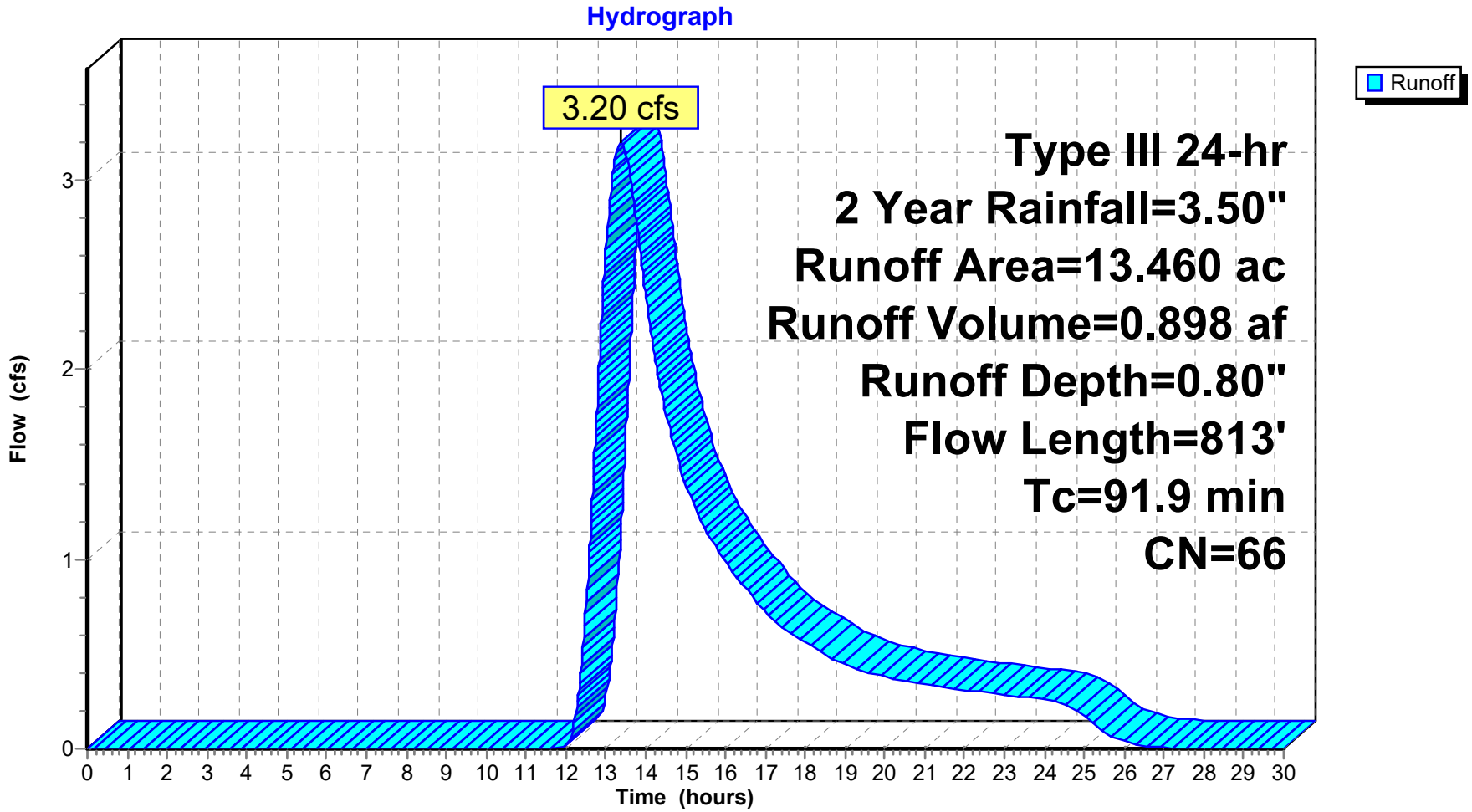
Runoff = 3.20 cfs @ 13.38 hrs, Volume= 0.898 af, Depth= 0.80"
Routed to Pond SCB : SC-B

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.50"

Area (ac)	CN	Description
9.350	65	Woods/grass comb., Fair, HSG B
4.110	67	Brush, Poor, HSG B
13.460	66	Weighted Average
13.460		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.3	166	0.3100	0.27		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.50"
31.2	284	0.0568	0.15		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.50"
16.8	128	0.0541	0.13		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.50"
11.8	104	0.0860	0.15		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.50"
21.8	131	0.0297	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.50"
91.9	813	Total			

Subcatchment SC-B: SC-B



Summary for Subcatchment SC-C: SC-C

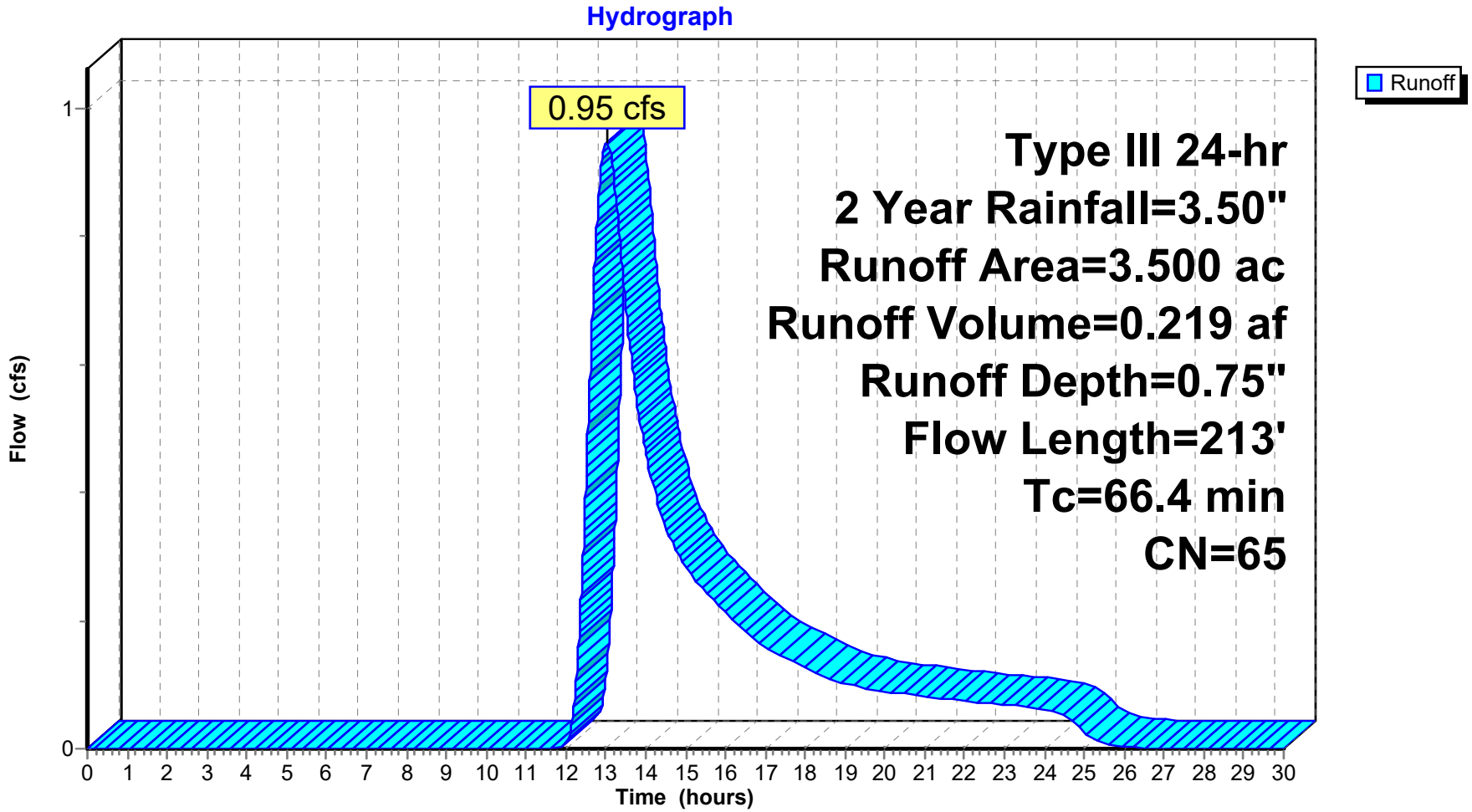
Runoff = 0.95 cfs @ 13.05 hrs, Volume= 0.219 af, Depth= 0.75"
Routed to Link SPA : SPA

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.50"

Area (ac)	CN	Description
3.500	65	Woods/grass comb., Fair, HSG B
3.500		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
62.7	104	0.0053	0.03		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.50"
3.7	109	0.6400	0.50		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.50"
66.4	213	Total			

Subcatchment SC-C: SC-C



Summary for Pond SCA: SC-A

Inflow Area = 2.683 ac, 1.23% Impervious, Inflow Depth = 0.66" for 2 Year event
Inflow = 0.62 cfs @ 13.01 hrs, Volume= 0.147 af
Outflow = 0.44 cfs @ 13.52 hrs, Volume= 0.147 af, Atten= 29%, Lag= 30.5 min
Discarded = 0.43 cfs @ 13.52 hrs, Volume= 0.147 af
Primary = 0.01 cfs @ 13.52 hrs, Volume= 0.001 af
Routed to Link SPB : SPB

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 140.99' @ 13.52 hrs Surf.Area= 0.084 ac Storage= 0.020 af

Plug-Flow detention time= 27.3 min calculated for 0.147 af (100% of inflow)
Center-of-Mass det. time= 27.3 min (976.2 - 948.9)

Volume	Invert	Avail.Storage	Storage Description
#1	140.30'	0.021 af	**Custom Stage Data (Conic)** Listed below (Recalc)

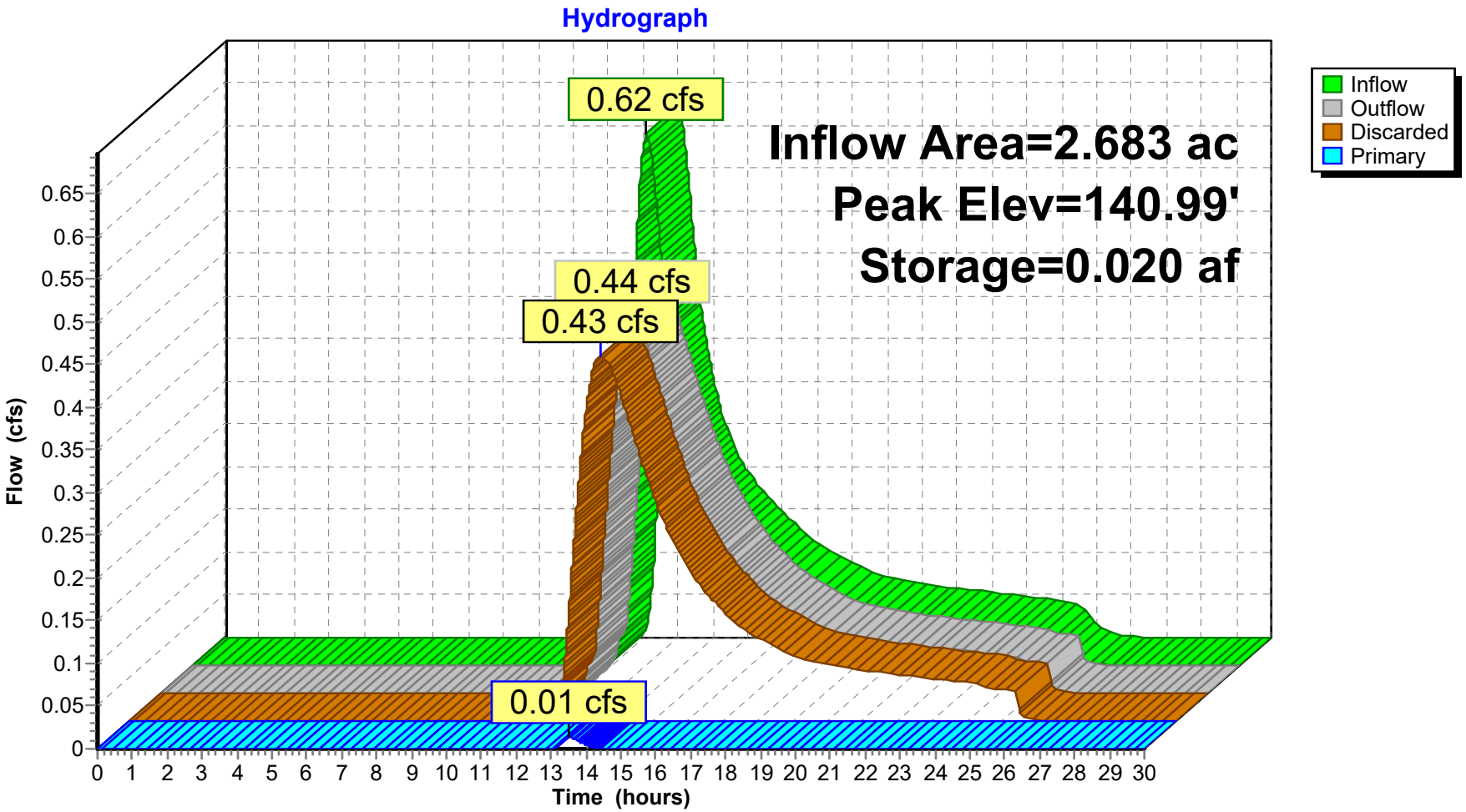
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
140.30	0.007	0.000	0.000	0.007
140.50	0.007	0.001	0.001	0.007
141.00	0.088	0.020	0.021	0.088

Device	Routing	Invert	Outlet Devices
#0	Primary	141.00'	**Automatic Storage Overflow** (Discharged without head)
#1	Discarded	140.30'	**5.000 in/hr Exfiltration over Wetted area**
#2	Primary	140.90'	**135.0 deg Sharp-Crested Vee/Trap Weir** Cv= 2.48 (C= 3.10)

Discarded OutFlow Max=0.43 cfs @ 13.52 hrs HW=140.99' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.43 cfs)

Primary OutFlow Max=0.01 cfs @ 13.52 hrs HW=140.99' (Free Discharge)
↑—**2=Sharp-Crested Vee/Trap Weir** (Weir Controls 0.01 cfs @ 0.73 fps)

Pond SCA: SC-A


Hydrograph
Inflow Area=2.683 ac
Peak Elev=140.99'
Storage=0.020 af
0.62 cfs
0.44 cfs
0.43 cfs
0.01 cfs
Inflow
Outflow
Discarded
Primary
Flow (cfs)
0 0.05 0.1 0.15 0.2 0.25 0.3 0.35 0.4 0.45 0.5 0.55 0.6 0.65
Time (hours)
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30

Summary for Pond SCB: SC-B

Inflow Area = 13.460 ac, 0.00% Impervious, Inflow Depth = 0.80" for 2 Year event
Inflow = 3.20 cfs @ 13.38 hrs, Volume= 0.898 af
Outflow = 3.17 cfs @ 13.47 hrs, Volume= 1.046 af, Atten= 1%, Lag= 5.5 min
Discarded = 1.01 cfs @ 0.00 hrs, Volume= 0.876 af
Primary = 2.16 cfs @ 13.47 hrs, Volume= 0.170 af
Routed to Link SPA : SPA

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Starting Elev= 65.50' Surf.Area= 0.200 ac Storage= 0.148 af
Peak Elev= 65.50' @ 0.00 hrs Surf.Area= 0.200 ac Storage= 0.148 af

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= (not calculated: outflow precedes inflow)

Volume	Invert	Avail.Storage	Storage Description
#1	63.60'	0.148 af	**Custom Stage Data (Conic)** Listed below

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
63.60	0.001	0.000	0.000	0.001
65.00	0.130	0.066	0.066	0.130
65.50	0.200	0.082	0.148	0.200

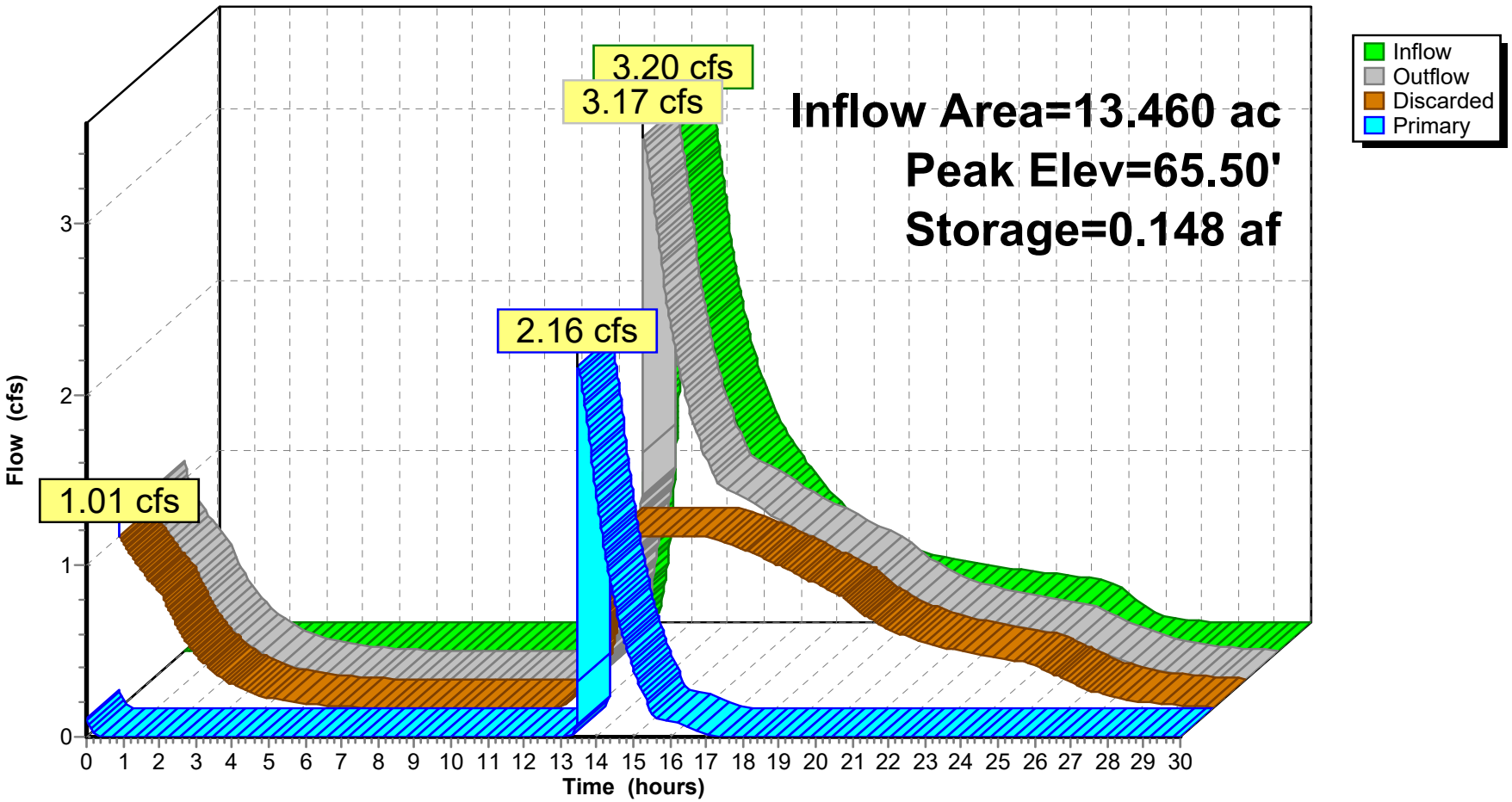
Device	Routing	Invert	Outlet Devices
#0	Primary	65.50'	**Automatic Storage Overflow** (Discharged without head)
#1	Discarded	63.60'	**5.000 in/hr Exfiltration over Wetted area**
#2	Primary	65.30'	**135.0 deg Sharp-Crested Vee/Trap Weir** Cv= 2.48 (C= 3.10)

Discarded OutFlow Max=1.01 cfs @ 0.00 hrs HW=65.50' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 1.01 cfs)

Primary OutFlow Max=0.11 cfs @ 13.47 hrs HW=65.50' (Free Discharge)
↑—**2=Sharp-Crested Vee/Trap Weir** (Weir Controls 0.11 cfs @ 1.11 fps)

Pond SCB: SC-B

Hydrograph

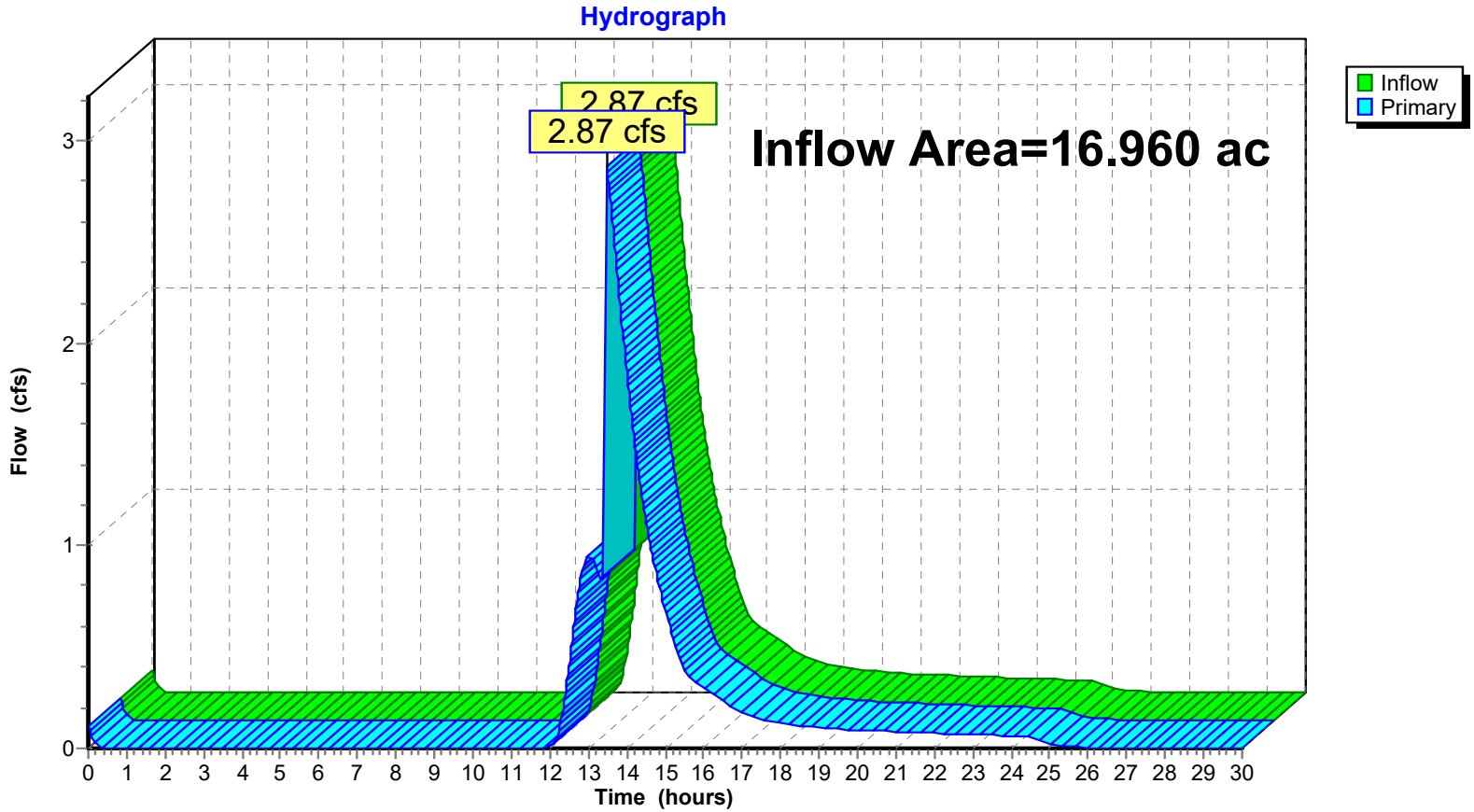


Summary for Link SPA: SPA

Inflow Area = 16.960 ac, 0.00% Impervious, Inflow Depth = 0.28" for 2 Year event
Inflow = 2.87 cfs @ 13.47 hrs, Volume= 0.389 af
Primary = 2.87 cfs @ 13.47 hrs, Volume= 0.389 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Link SPA: SPA

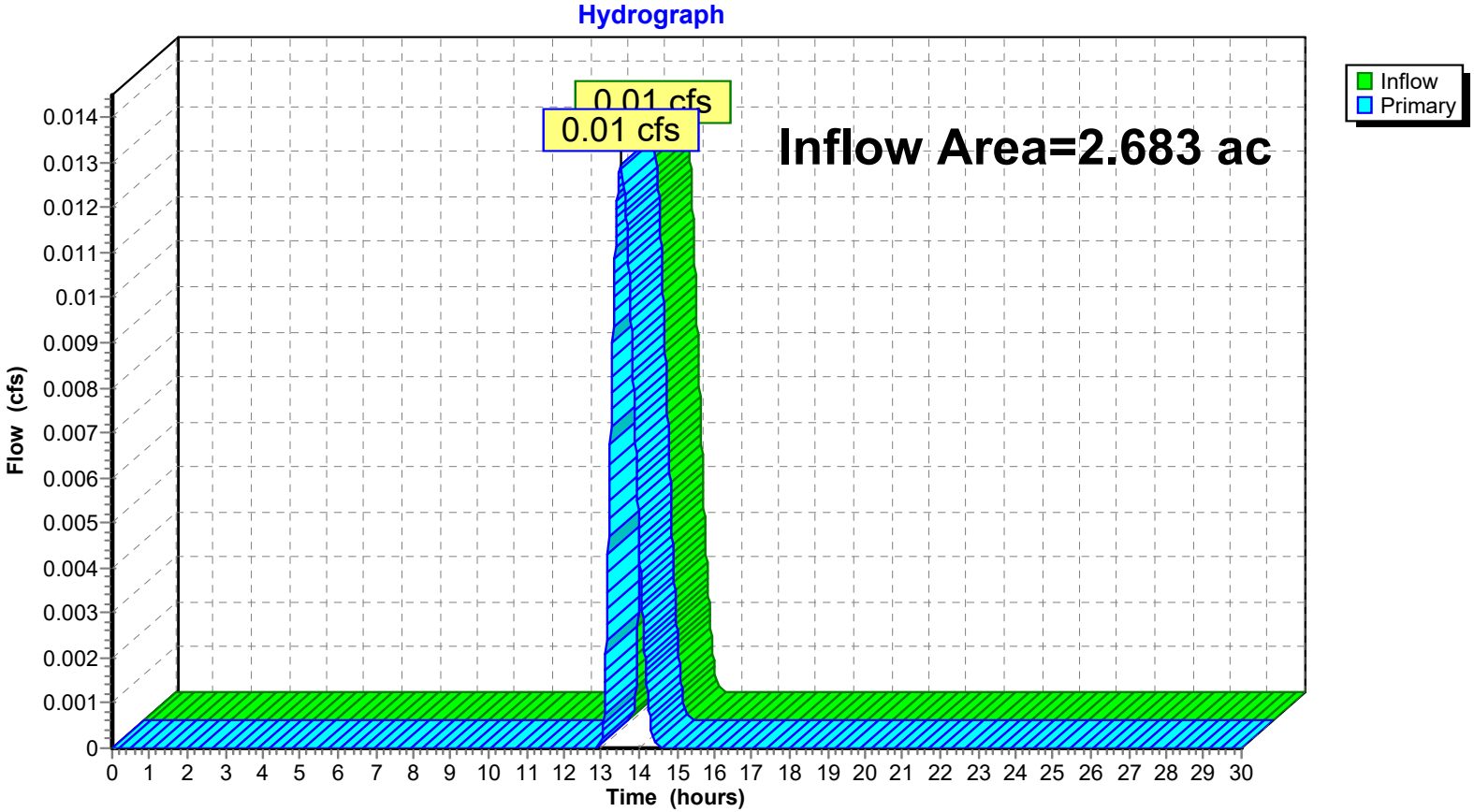


Summary for Link SPB: SPB

Inflow Area = 2.683 ac, 1.23% Impervious, Inflow Depth = 0.00" for 2 Year event
Inflow = 0.01 cfs @ 13.52 hrs, Volume= 0.001 af
Primary = 0.01 cfs @ 13.52 hrs, Volume= 0.001 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Link SPB: SPB

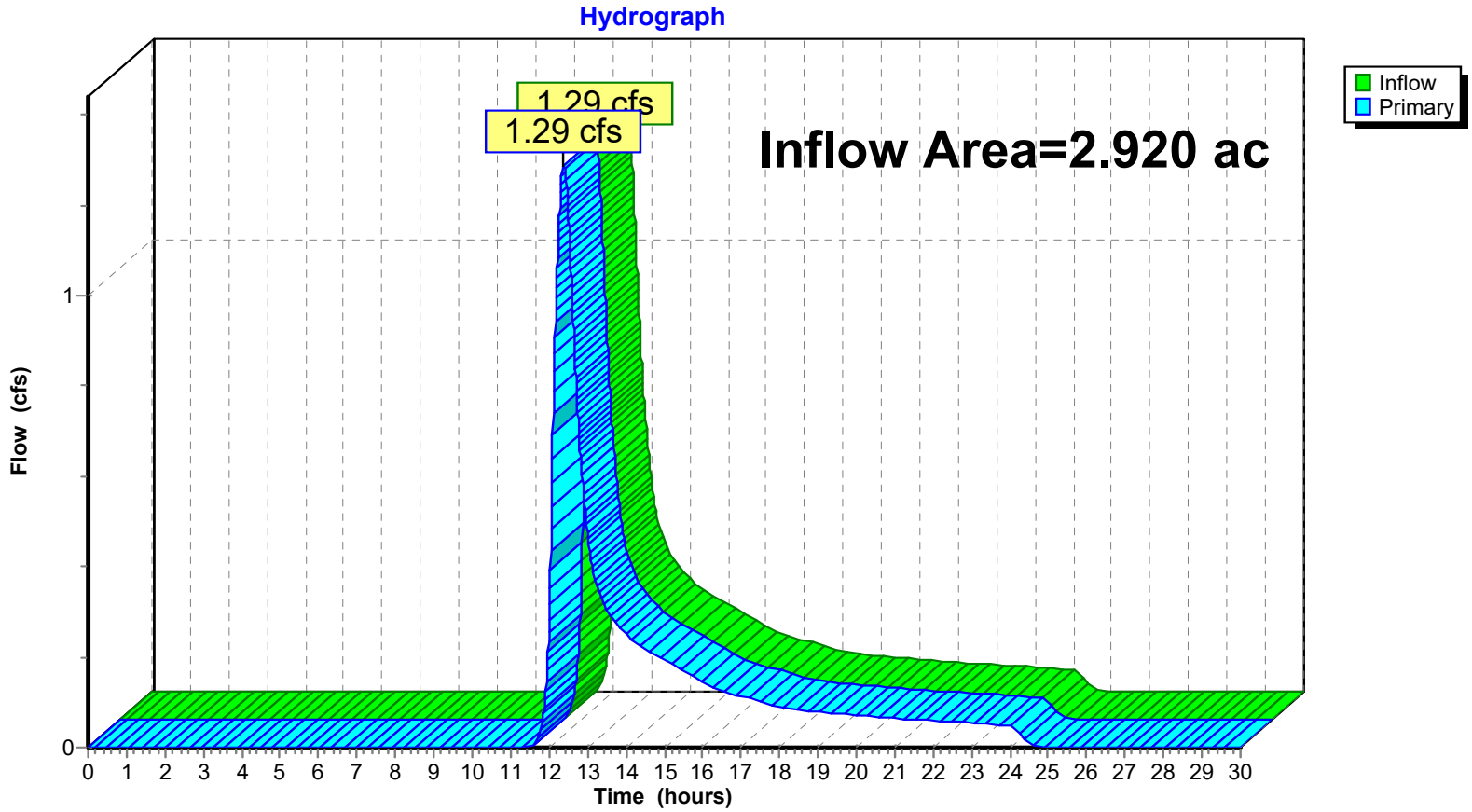


Summary for Link SPC: Study Point C

Inflow Area = 2.920 ac, 2.05% Impervious, Inflow Depth = 0.77" for 2 Year event
Inflow = 1.29 cfs @ 12.38 hrs, Volume= 0.187 af
Primary = 1.29 cfs @ 12.38 hrs, Volume= 0.187 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Link SPC: Study Point C

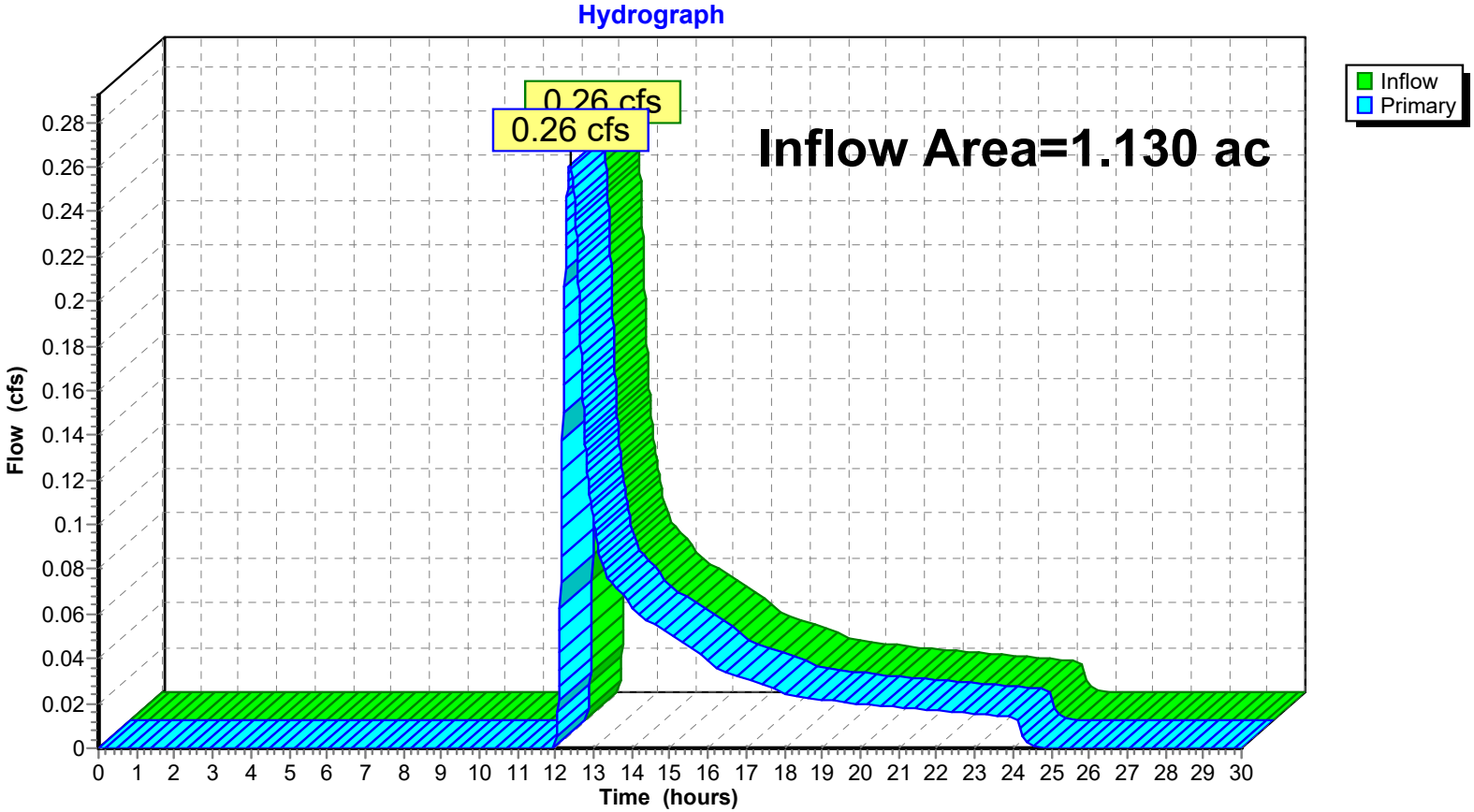


Summary for Link SPD: Study Point D

Inflow Area = 1.130 ac, 0.00% Impervious, Inflow Depth = 0.45" for 2 Year event
Inflow = 0.26 cfs @ 12.38 hrs, Volume= 0.043 af
Primary = 0.26 cfs @ 12.38 hrs, Volume= 0.043 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Link SPD: Study Point D



Time span=0.00-30.00 hrs, dt=0.01 hrs, 3001 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 D: SCD Runoff Area=2.160 ac 0.00% Impervious Runoff Depth=1.49"
Flow Length=266' Tc=25.8 min CN=65 Runoff=2.14 cfs 0.268 af

Subcatchment E: SCE Runoff Area=0.530 ac 11.32% Impervious Runoff Depth=1.63"
Flow Length=112' Tc=10.0 min UI Adjusted CN=67 Runoff=0.84 cfs 0.072 af

Subcatchment F: SCF Runoff Area=0.230 ac 0.00% Impervious Runoff Depth=1.49"
Flow Length=55' Slope=0.1900 '/' Tc=10.0 min CN=65 Runoff=0.33 cfs 0.029 af

Subcatchment G: SCG Runoff Area=1.130 ac 0.00% Impervious Runoff Depth=1.03"
Flow Length=320' Tc=18.0 min CN=58 Runoff=0.80 cfs 0.097 af

Subcatchment SC-A: SC-A Runoff Area=2.683 ac 1.23% Impervious Runoff Depth=1.35"
Flow Length=344' Tc=64.0 min CN=63 Runoff=1.46 cfs 0.303 af

Subcatchment SC-B: SC-B Runoff Area=13.460 ac 0.00% Impervious Runoff Depth=1.56"
Flow Length=813' Tc=91.9 min CN=66 Runoff=6.86 cfs 1.749 af

Subcatchment SC-C: SC-C Runoff Area=3.500 ac 0.00% Impervious Runoff Depth=1.49"
Flow Length=213' Tc=66.4 min CN=65 Runoff=2.10 cfs 0.434 af

Pond SCA: SC-A Peak Elev=141.00' Storage=0.021 af Inflow=1.46 cfs 0.303 af
Discarded=0.45 cfs 0.230 af Primary=1.02 cfs 0.073 af Outflow=1.46 cfs 0.303 af

Pond SCB: SC-B Peak Elev=65.50' Storage=0.148 af Inflow=6.86 cfs 1.749 af
Discarded=1.01 cfs 1.090 af Primary=5.85 cfs 0.808 af Outflow=6.86 cfs 1.897 af

Link SPA: SPA Inflow=7.68 cfs 1.242 af
Primary=7.68 cfs 1.242 af

Link SPB: SPB Inflow=1.02 cfs 0.073 af
Primary=1.02 cfs 0.073 af

Link SPC: Study Point C Inflow=2.81 cfs 0.369 af
Primary=2.81 cfs 0.369 af

Link SPD: Study Point D Inflow=0.80 cfs 0.097 af
Primary=0.80 cfs 0.097 af

Total Runoff Area = 23.693 ac Runoff Volume = 2.952 af Average Runoff Depth = 1.50"
99.61% Pervious = 23.600 ac 0.39% Impervious = 0.093 ac

Summary for Subcatchment D: SCD

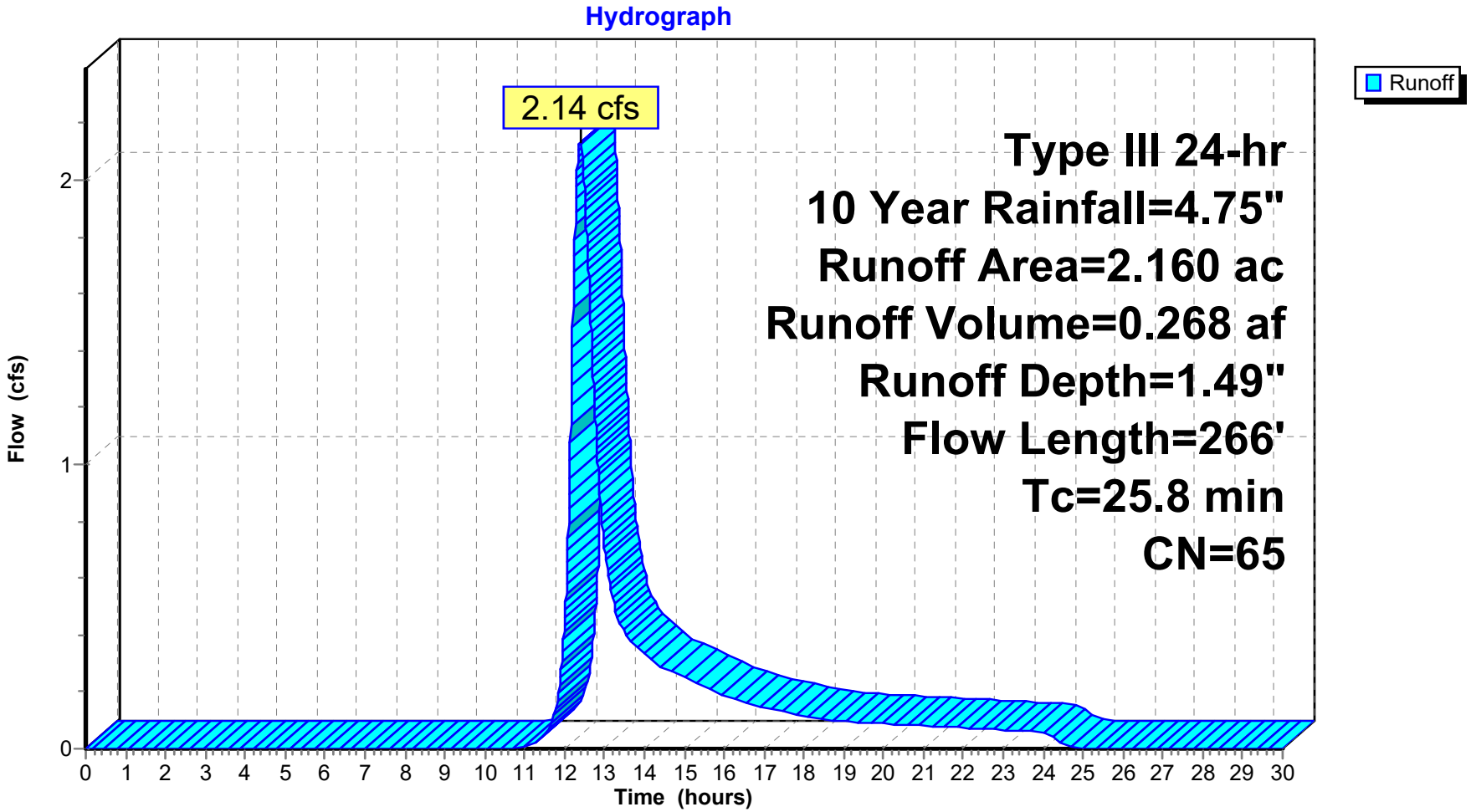
Runoff = 2.14 cfs @ 12.39 hrs, Volume= 0.268 af, Depth= 1.49"
Routed to Link SPC : Study Point C

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Rainfall=4.75"

Area (ac)	CN	Description
2.160	65	Woods/grass comb., Fair, HSG B
2.160		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.4	70	0.0258	0.18		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.50"
19.4	196	0.0125	0.17		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.50"
25.8	266	Total			

Subcatchment D: SCD



Summary for Subcatchment E: SCE

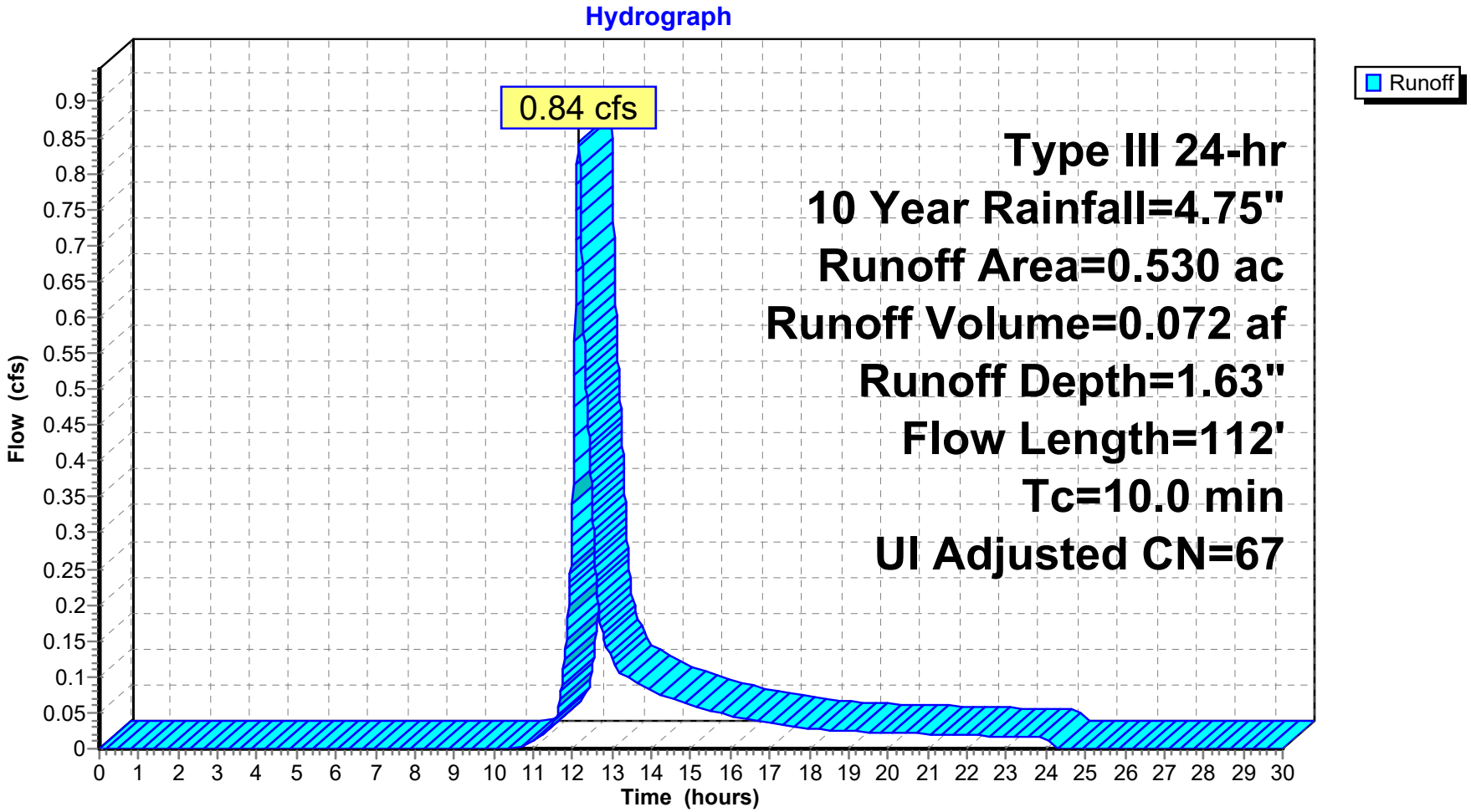
Runoff = 0.84 cfs @ 12.15 hrs, Volume= 0.072 af, Depth= 1.63"
Routed to Link SPC : Study Point C

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Rainfall=4.75"

Area (ac)	CN	Adj	Description
0.470	65		Woods/grass comb., Fair, HSG B
0.060	98		Unconnected roofs, HSG A
0.530	69	67	Weighted Average, UI Adjusted
0.470			88.68% Pervious Area
0.060			11.32% Impervious Area
0.060			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.6	40	0.0800	0.26		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.50"
2.1	72	0.4200	0.56		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.50"
4.7	112	Total, Increased to minimum Tc = 10.0 min			

Subcatchment E: SCE



Summary for Subcatchment F: SCF

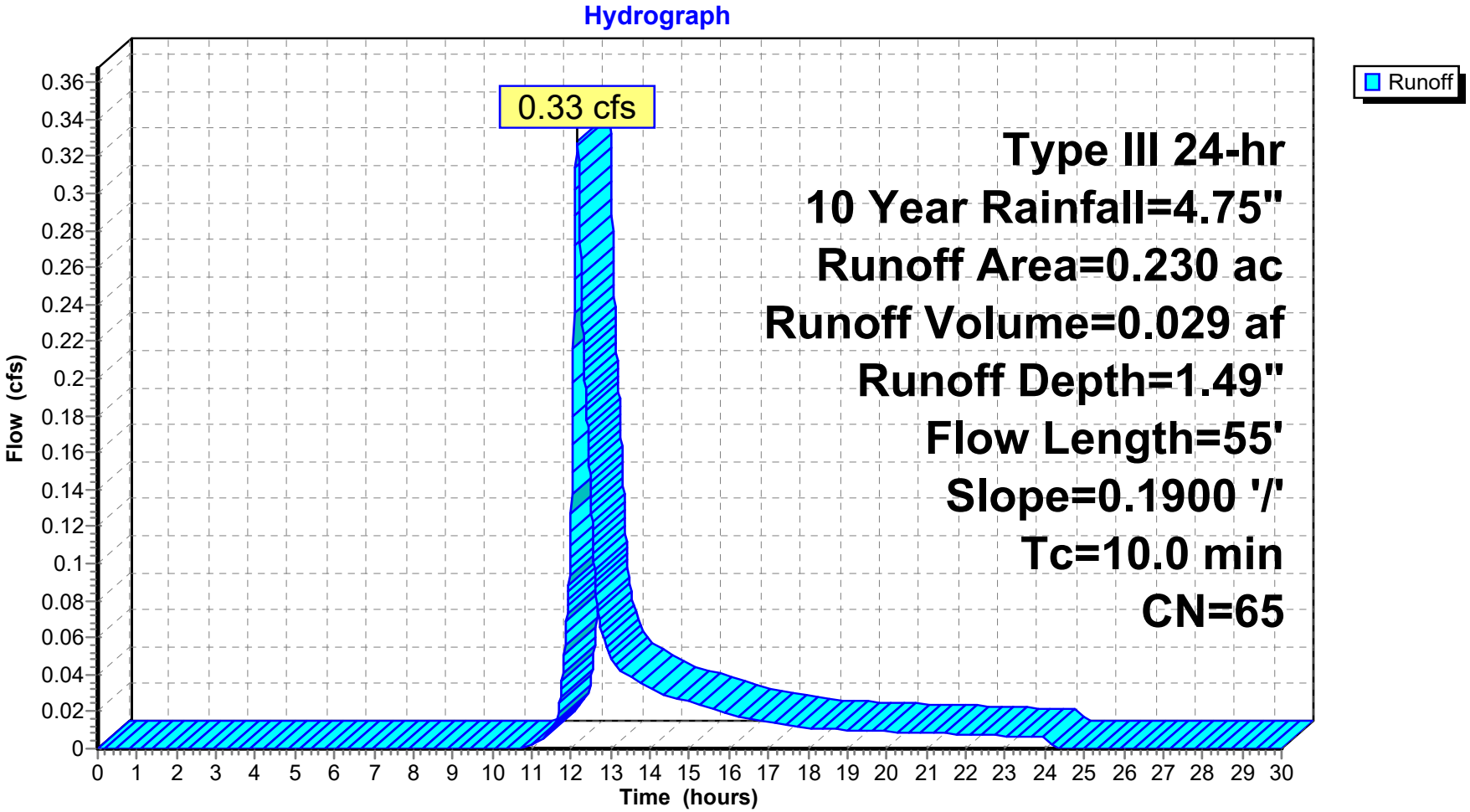
Runoff = 0.33 cfs @ 12.15 hrs, Volume= 0.029 af, Depth= 1.49"
Routed to Link SPC : Study Point C

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Rainfall=4.75"

Area (ac)	CN	Description
0.230	65	Woods/grass comb., Fair, HSG B
0.230		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.4	55	0.1900	0.39		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.50"
2.4	55	Total, Increased to minimum Tc = 10.0 min			

Subcatchment F: SCF



Summary for Subcatchment G: SCG

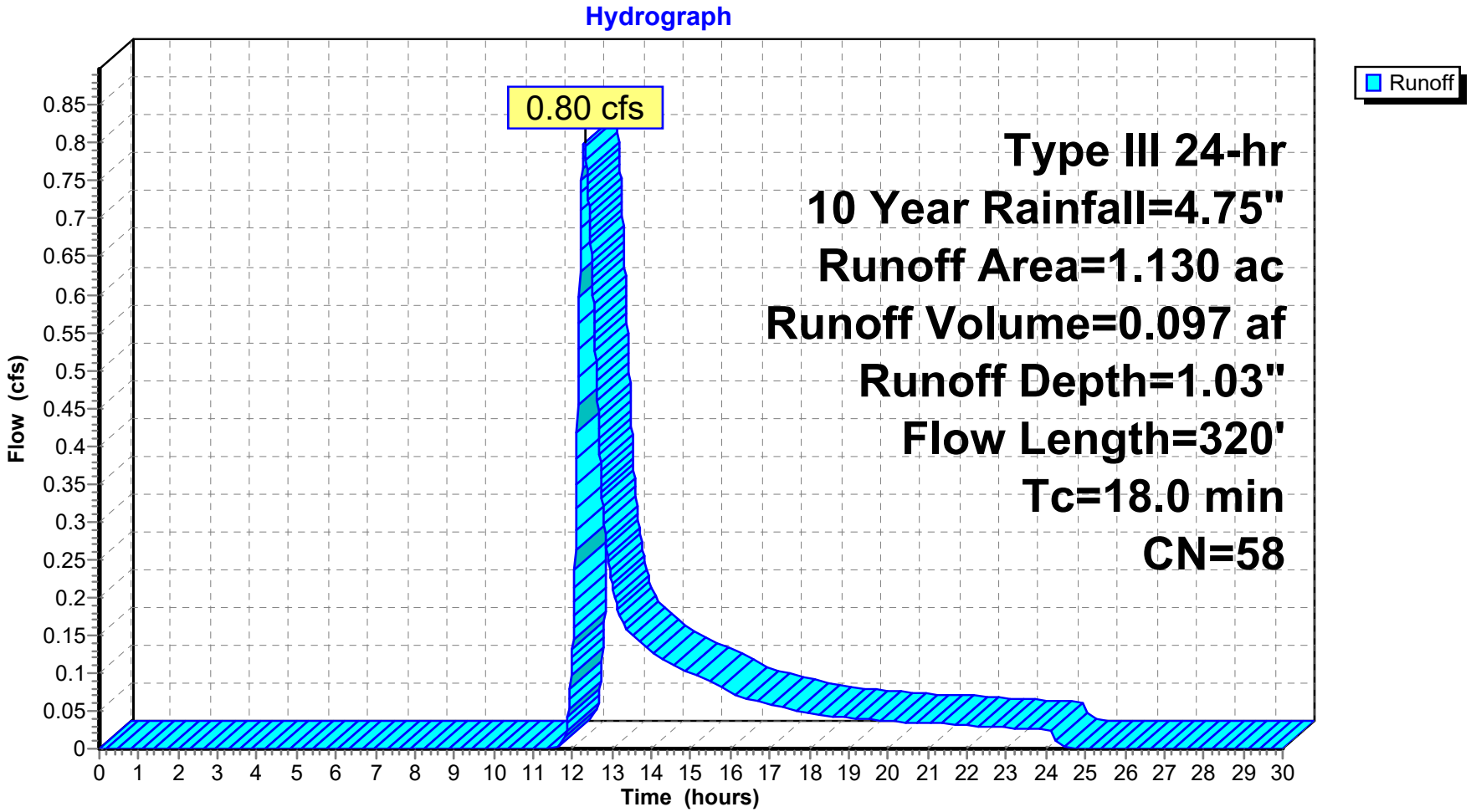
Runoff = 0.80 cfs @ 12.30 hrs, Volume= 0.097 af, Depth= 1.03"
Routed to Link SPD : Study Point D

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Rainfall=4.75"

Area (ac)	CN	Description
1.130	58	Woods/grass comb., Good, HSG B
1.130		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.5	95	0.4755	0.29		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.50"
3.9	76	0.7573	0.33		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.50"
5.1	95	0.5883	0.31		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.50"
3.5	54	0.4811	0.26		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.50"
18.0	320	Total			

Subcatchment G: SCG



Summary for Subcatchment SC-A: SC-A

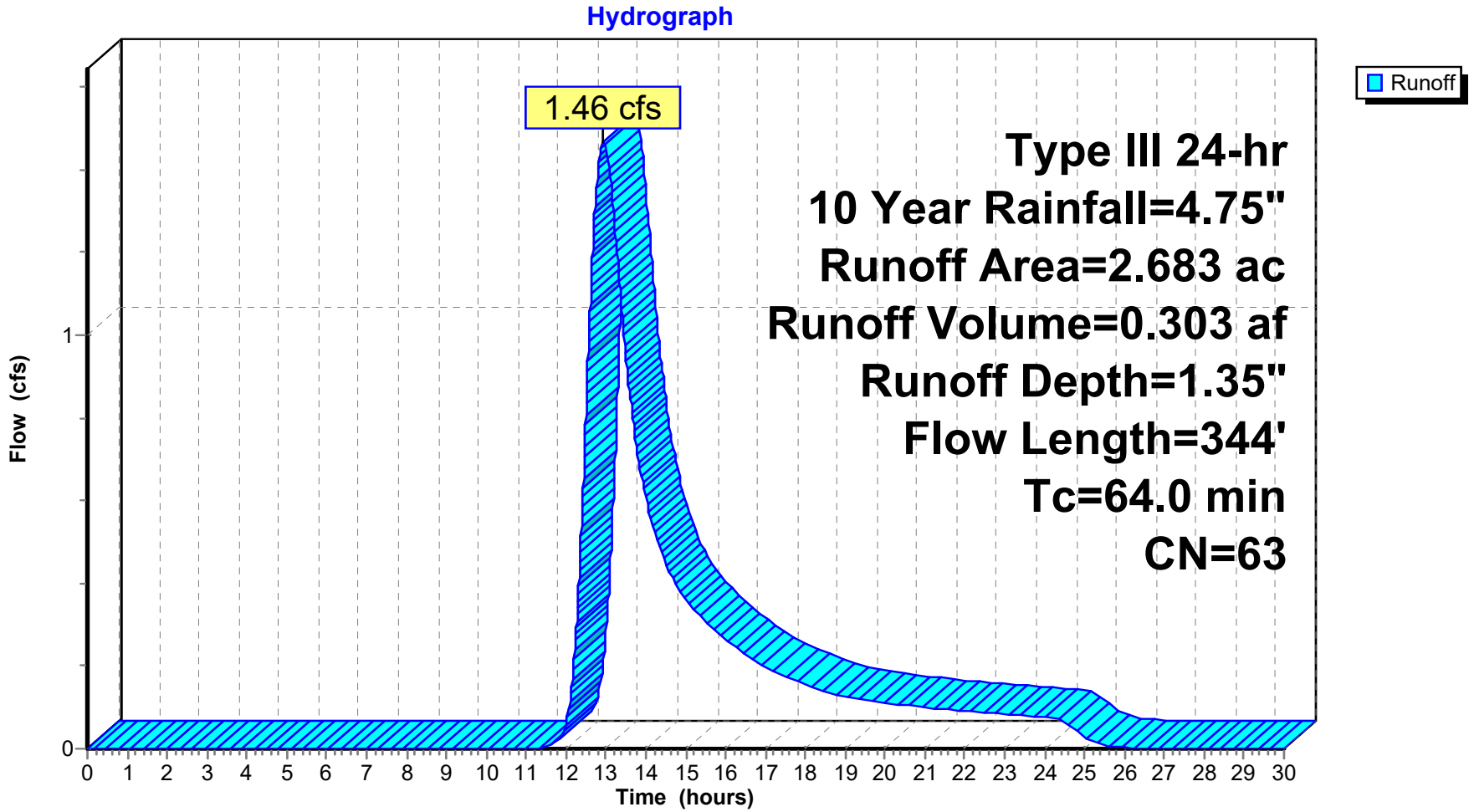
Runoff = 1.46 cfs @ 12.94 hrs, Volume= 0.303 af, Depth= 1.35"
Routed to Pond SCA : SC-A

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Rainfall=4.75"

Area (ac)	CN	Description
1.870	60	Woods, Fair, HSG B
0.780	67	Brush, Poor, HSG B
0.033	98	Paved parking, HSG B
2.683	63	Weighted Average
2.650		98.77% Pervious Area
0.033		1.23% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.8	50	0.1200	0.14		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.50"
30.7	177	0.0230	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.50"
27.5	117	0.0132	0.07		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.50"
64.0	344	Total			

Subcatchment SC-A: SC-A



Summary for Subcatchment SC-B: SC-B

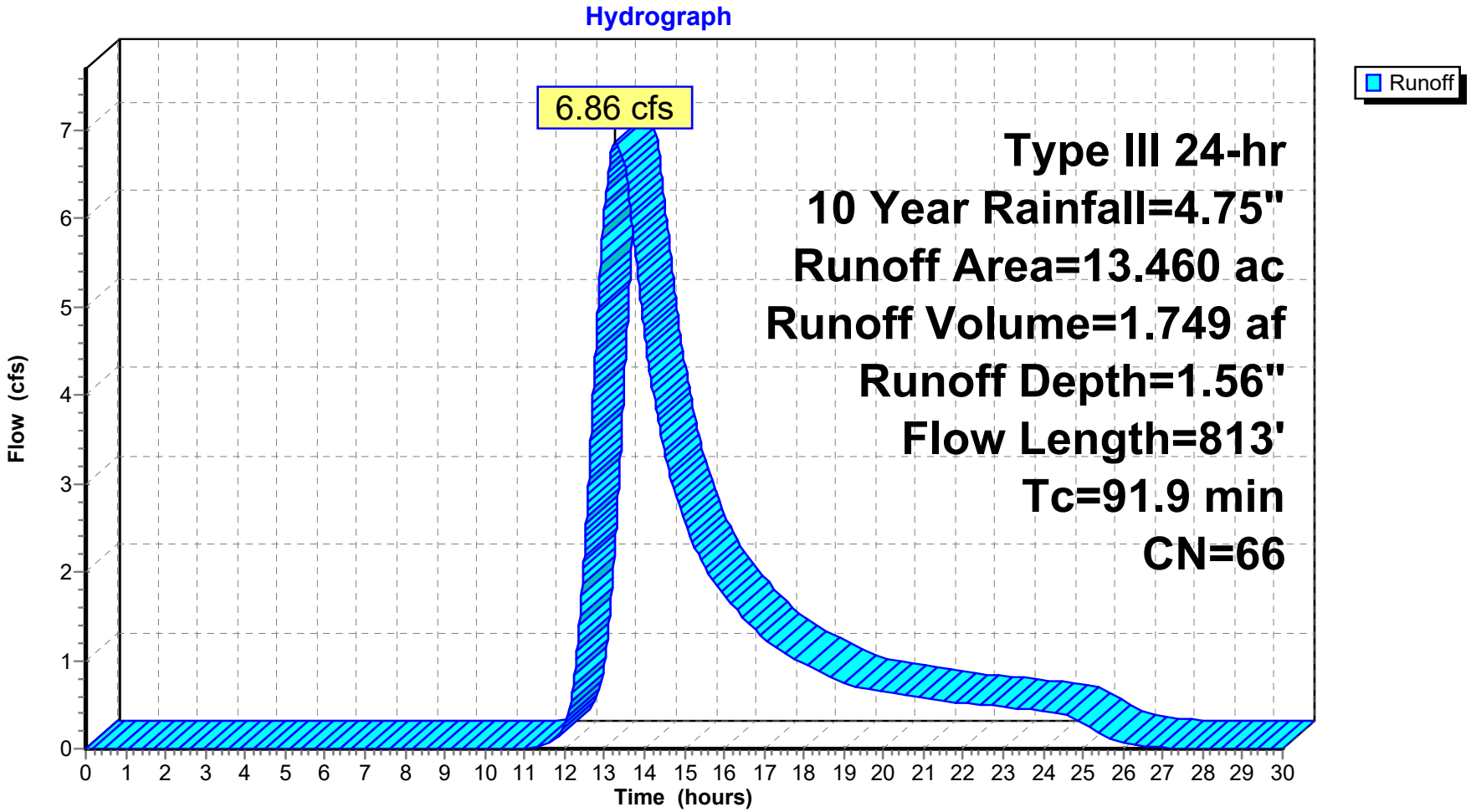
Runoff = 6.86 cfs @ 13.28 hrs, Volume= 1.749 af, Depth= 1.56"
Routed to Pond SCB : SC-B

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Rainfall=4.75"

Area (ac)	CN	Description
9.350	65	Woods/grass comb., Fair, HSG B
4.110	67	Brush, Poor, HSG B
13.460	66	Weighted Average
13.460		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.3	166	0.3100	0.27		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.50"
31.2	284	0.0568	0.15		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.50"
16.8	128	0.0541	0.13		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.50"
11.8	104	0.0860	0.15		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.50"
21.8	131	0.0297	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.50"
91.9	813	Total			

Subcatchment SC-B: SC-B



Summary for Subcatchment SC-C: SC-C

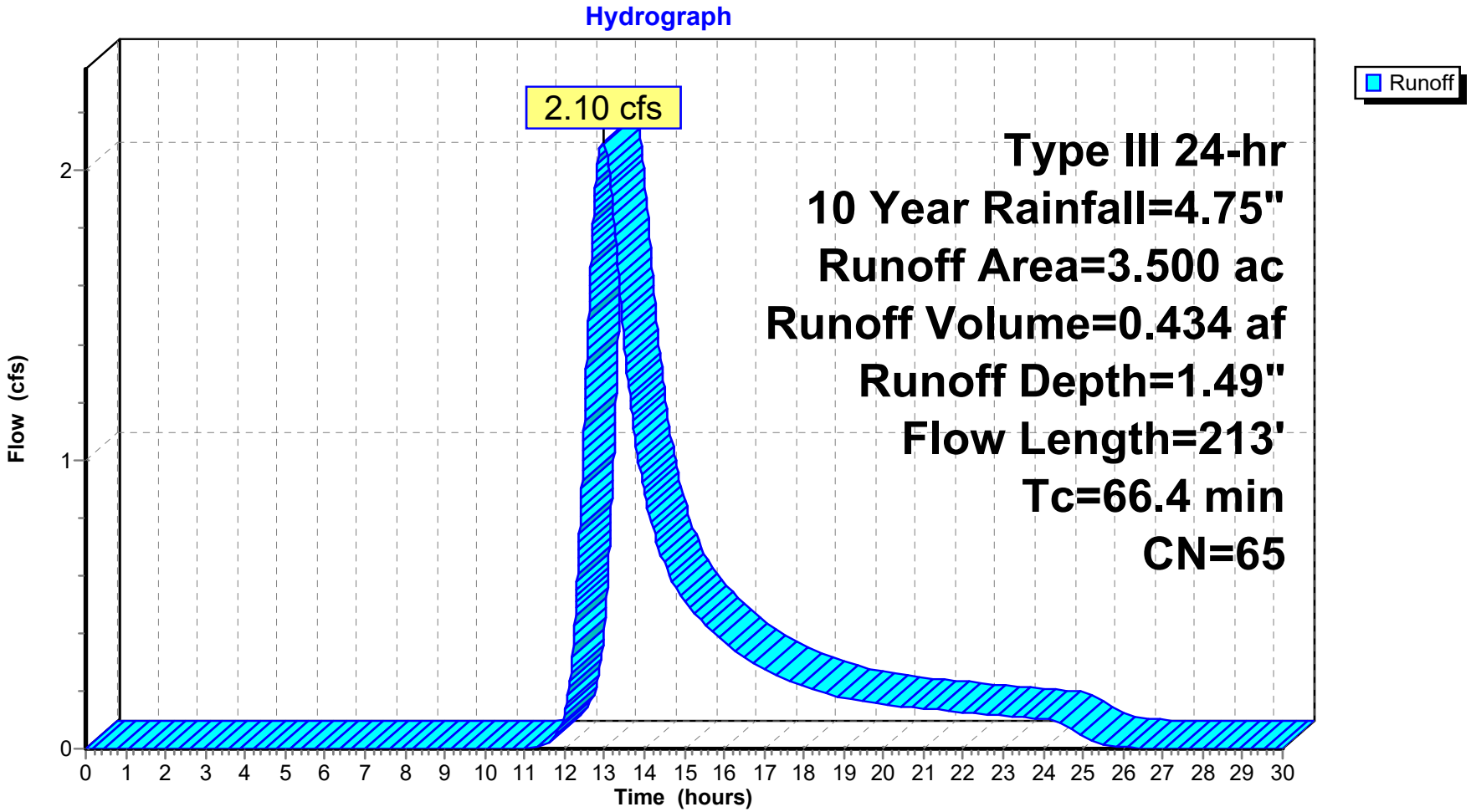
Runoff = 2.10 cfs @ 12.98 hrs, Volume= 0.434 af, Depth= 1.49"
Routed to Link SPA : SPA

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Rainfall=4.75"

Area (ac)	CN	Description
3.500	65	Woods/grass comb., Fair, HSG B
3.500		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
62.7	104	0.0053	0.03		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.50"
3.7	109	0.6400	0.50		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.50"
66.4	213	Total			

Subcatchment SC-C: SC-C



Summary for Pond SCA: SC-A

Inflow Area = 2.683 ac, 1.23% Impervious, Inflow Depth = 1.35" for 10 Year event
Inflow = 1.46 cfs @ 12.94 hrs, Volume= 0.303 af
Outflow = 1.46 cfs @ 12.95 hrs, Volume= 0.303 af, Atten= 0%, Lag= 0.3 min
Discarded = 0.45 cfs @ 12.71 hrs, Volume= 0.230 af
Primary = 1.02 cfs @ 12.95 hrs, Volume= 0.073 af
Routed to Link SPB : SPB

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 141.00' @ 12.71 hrs Surf.Area= 0.088 ac Storage= 0.021 af

Plug-Flow detention time= 22.4 min calculated for 0.303 af (100% of inflow)
Center-of-Mass det. time= 22.4 min (946.2 - 923.7)

Volume	Invert	Avail.Storage	Storage Description
#1	140.30'	0.021 af	**Custom Stage Data (Conic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
140.30	0.007	0.000	0.000	0.007
140.50	0.007	0.001	0.001	0.007
141.00	0.088	0.020	0.021	0.088

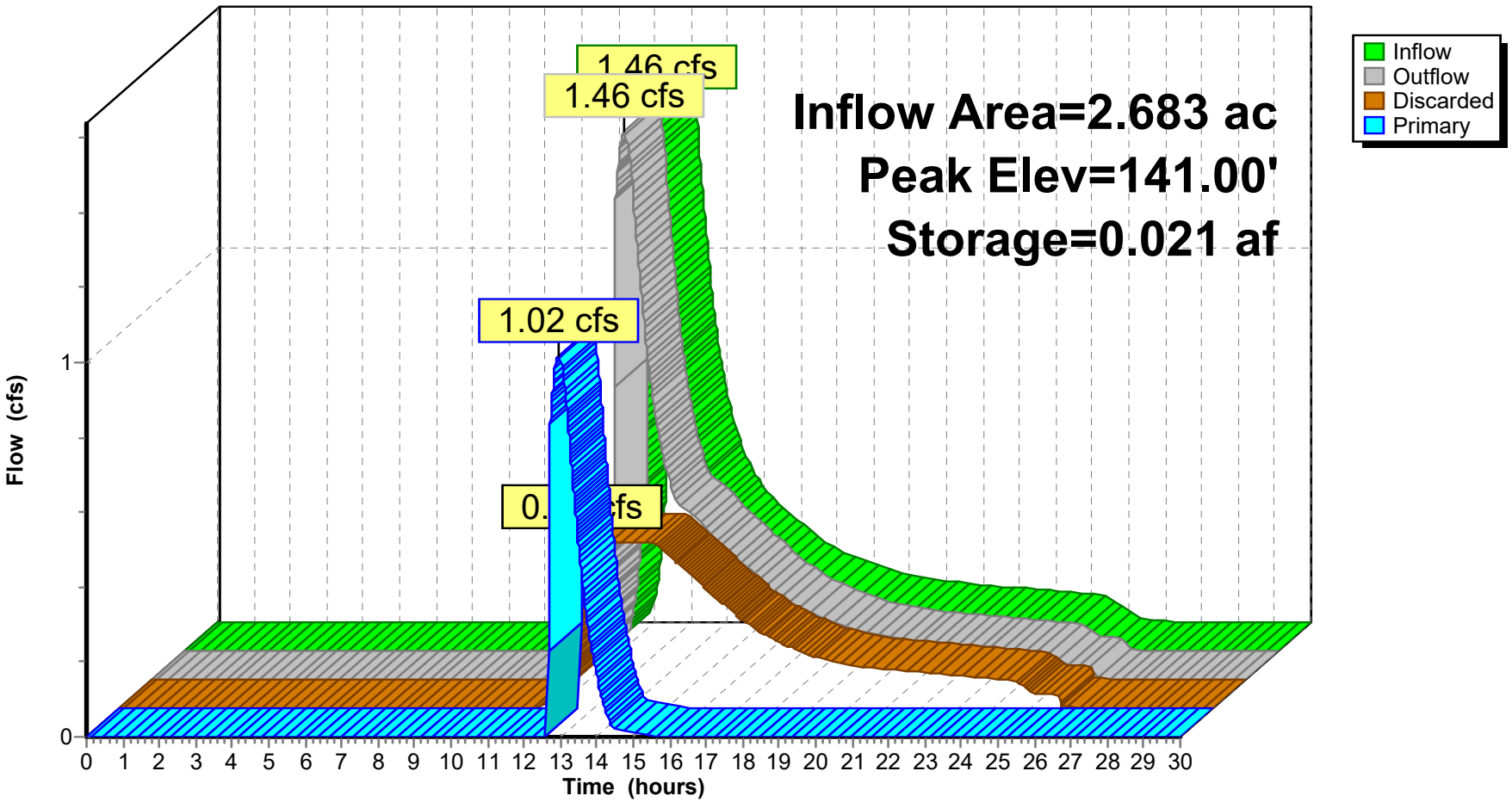
Device	Routing	Invert	Outlet Devices
#0	Primary	141.00'	**Automatic Storage Overflow** (Discharged without head)
#1	Discarded	140.30'	**5.000 in/hr Exfiltration over Wetted area**
#2	Primary	140.90'	**135.0 deg Sharp-Crested Vee/Trap Weir** Cv= 2.48 (C= 3.10)

Discarded OutFlow Max=0.45 cfs @ 12.71 hrs HW=141.00' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.45 cfs)

Primary OutFlow Max=0.02 cfs @ 12.95 hrs HW=141.00' (Free Discharge)
↑—**2=Sharp-Crested Vee/Trap Weir** (Weir Controls 0.02 cfs @ 0.78 fps)

Pond SCA: SC-A

Hydrograph



Summary for Pond SCB: SC-B

Inflow Area = 13.460 ac, 0.00% Impervious, Inflow Depth = 1.56" for 10 Year event
Inflow = 6.86 cfs @ 13.28 hrs, Volume= 1.749 af
Outflow = 6.86 cfs @ 13.29 hrs, Volume= 1.897 af, Atten= 0%, Lag= 0.5 min
Discarded = 1.01 cfs @ 0.00 hrs, Volume= 1.090 af
Primary = 5.85 cfs @ 13.29 hrs, Volume= 0.808 af
Routed to Link SPA : SPA

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Starting Elev= 65.50' Surf.Area= 0.200 ac Storage= 0.148 af
Peak Elev= 65.50' @ 0.00 hrs Surf.Area= 0.200 ac Storage= 0.148 af

Plug-Flow detention time= 51.3 min calculated for 1.749 af (100% of inflow)
Center-of-Mass det. time= (not calculated: outflow precedes inflow)

Volume	Invert	Avail.Storage	Storage Description
#1	63.60'	0.148 af	**Custom Stage Data (Conic)** Listed below

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
63.60	0.001	0.000	0.000	0.001
65.00	0.130	0.066	0.066	0.130
65.50	0.200	0.082	0.148	0.200

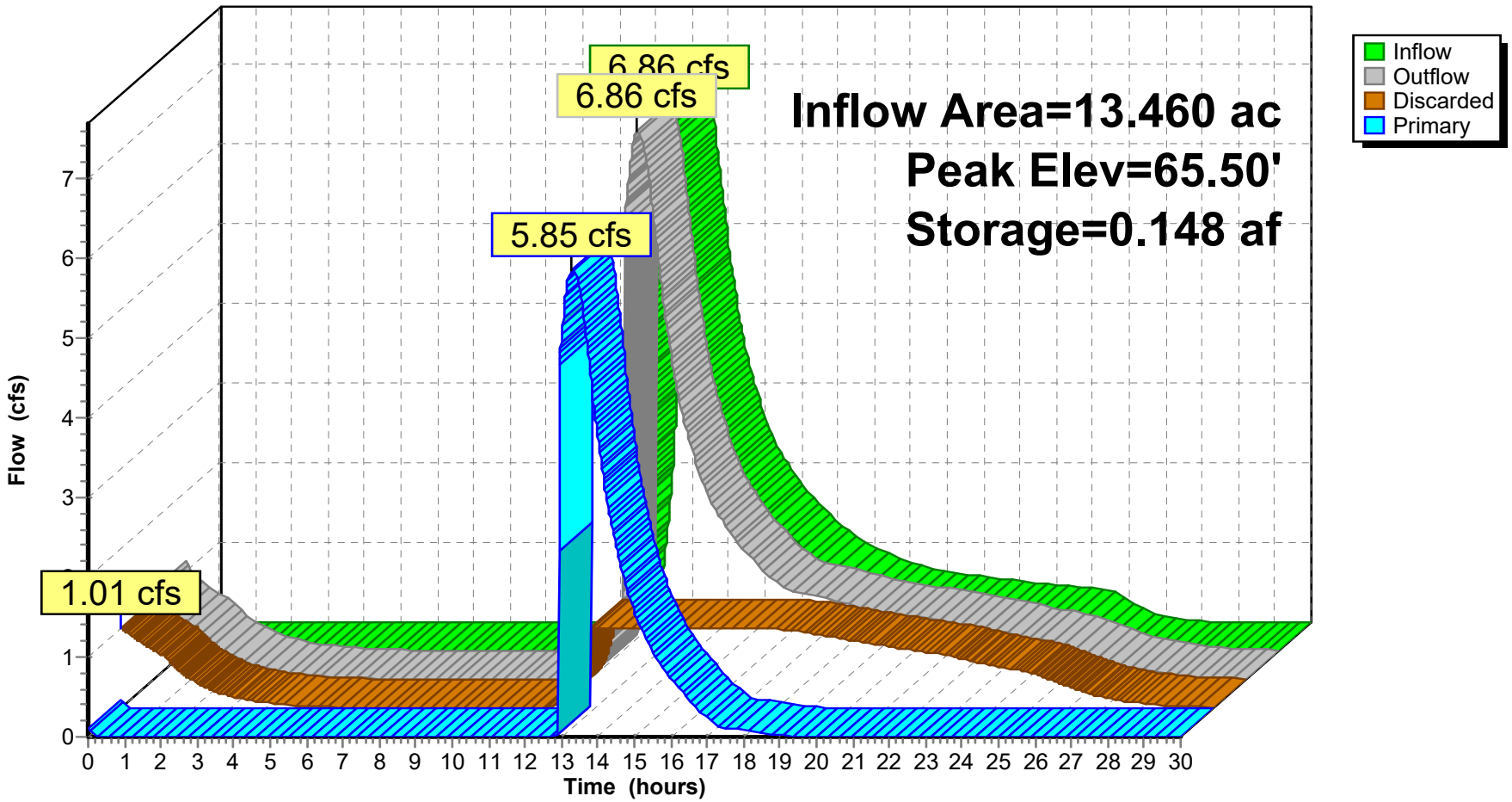
Device	Routing	Invert	Outlet Devices
#0	Primary	65.50'	**Automatic Storage Overflow** (Discharged without head)
#1	Discarded	63.60'	**5.000 in/hr Exfiltration over Wetted area**
#2	Primary	65.30'	**135.0 deg Sharp-Crested Vee/Trap Weir** Cv= 2.48 (C= 3.10)

Discarded OutFlow Max=1.01 cfs @ 0.00 hrs HW=65.50' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 1.01 cfs)

Primary OutFlow Max=0.11 cfs @ 13.29 hrs HW=65.50' (Free Discharge)
↑—**2=Sharp-Crested Vee/Trap Weir** (Weir Controls 0.11 cfs @ 1.11 fps)

Pond SCB: SC-B

Hydrograph

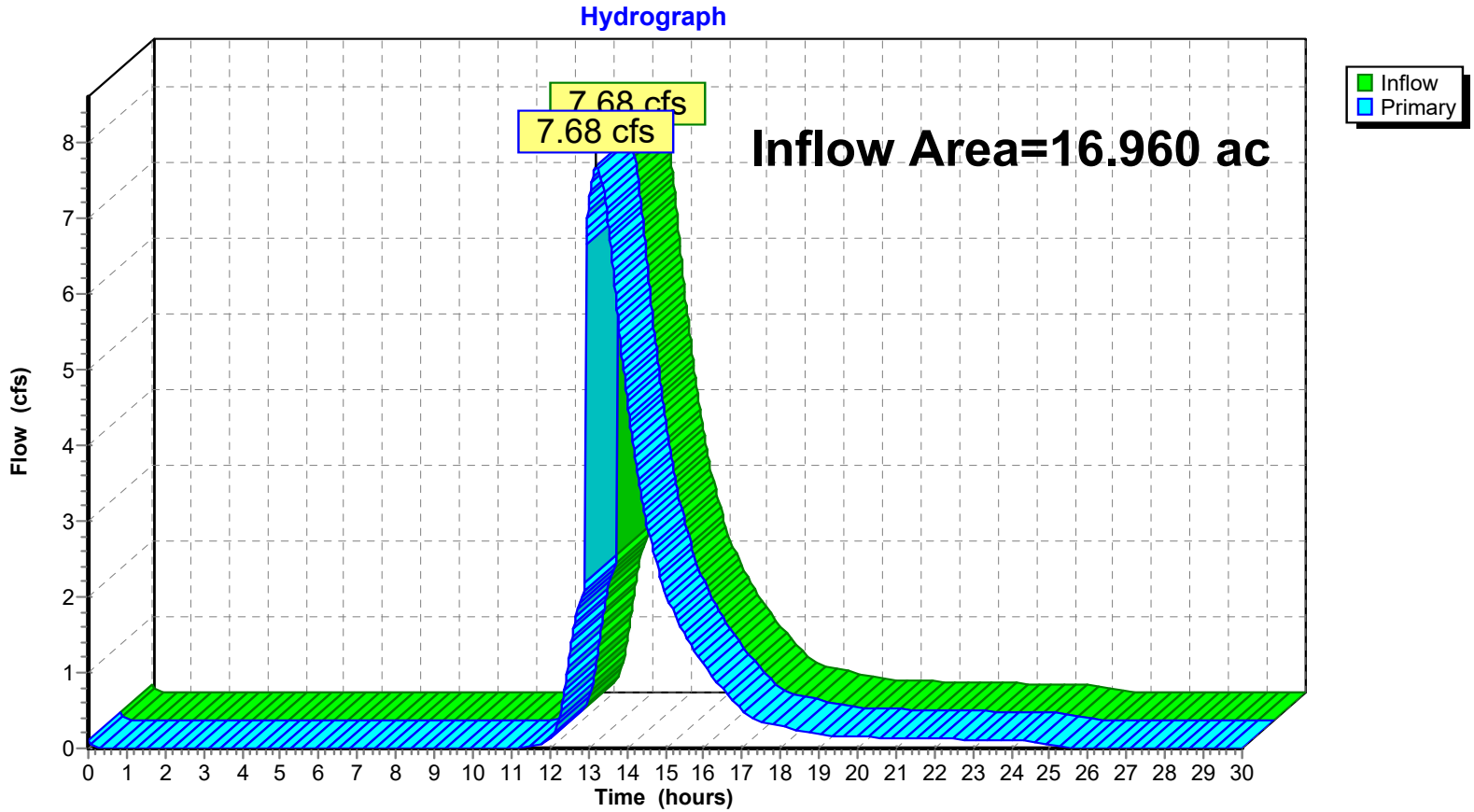


Summary for Link SPA: SPA

Inflow Area = 16.960 ac, 0.00% Impervious, Inflow Depth = 0.88" for 10 Year event
Inflow = 7.68 cfs @ 13.19 hrs, Volume= 1.242 af
Primary = 7.68 cfs @ 13.19 hrs, Volume= 1.242 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Link SPA: SPA

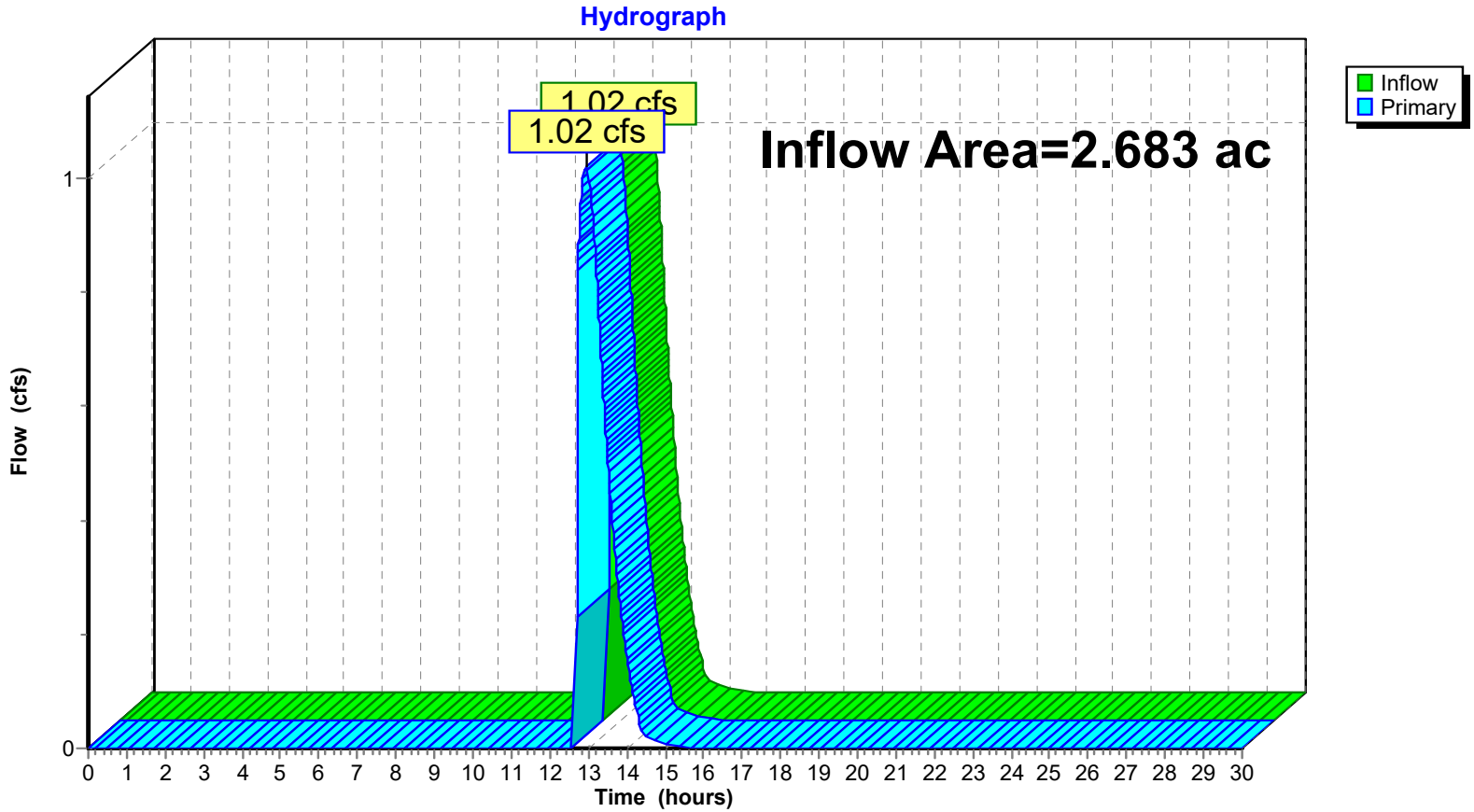


Summary for Link SPB: SPB

Inflow Area = 2.683 ac, 1.23% Impervious, Inflow Depth = 0.32" for 10 Year event
Inflow = 1.02 cfs @ 12.95 hrs, Volume= 0.073 af
Primary = 1.02 cfs @ 12.95 hrs, Volume= 0.073 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Link SPB: SPB

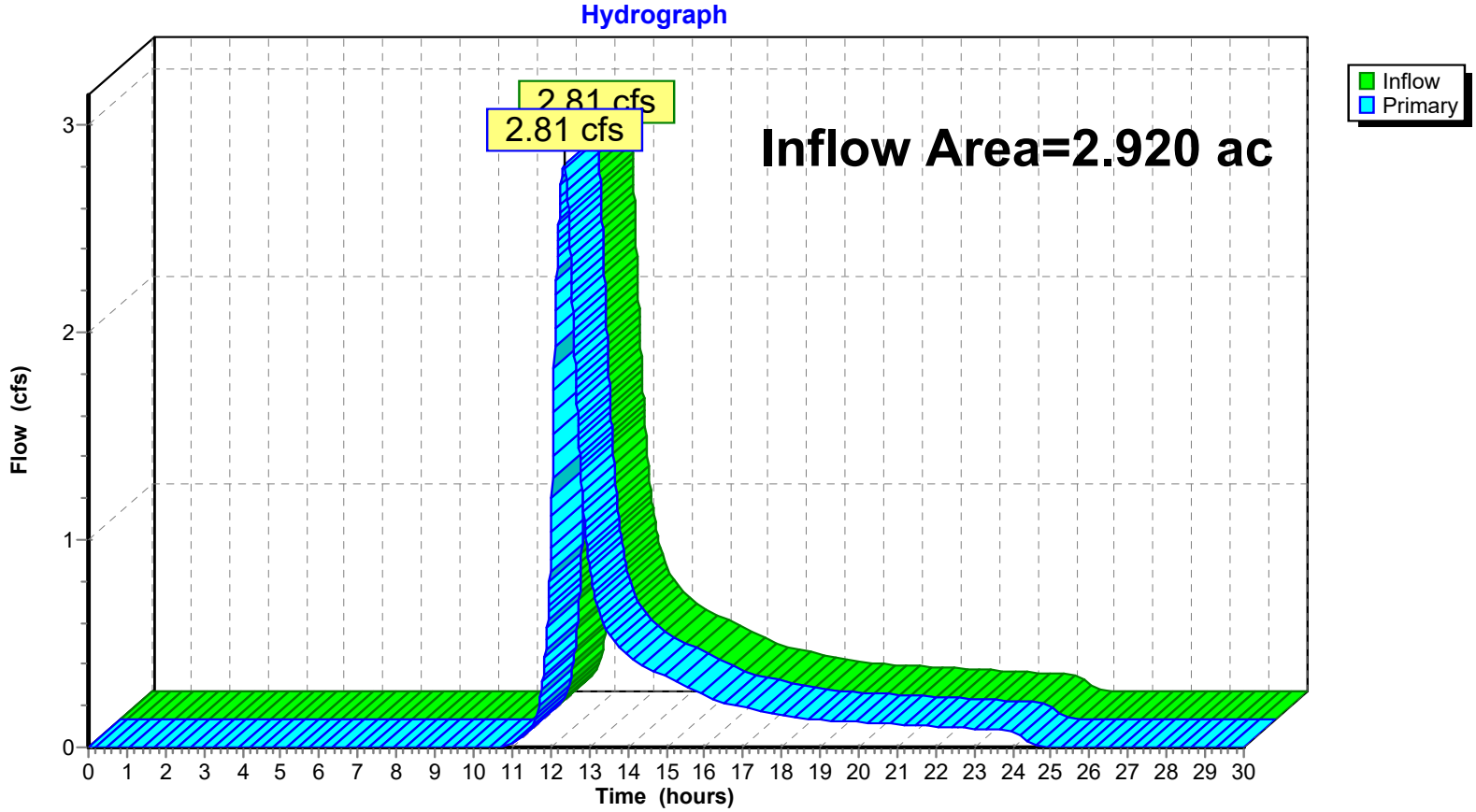


Summary for Link SPC: Study Point C

Inflow Area = 2.920 ac, 2.05% Impervious, Inflow Depth = 1.52" for 10 Year event
Inflow = 2.81 cfs @ 12.35 hrs, Volume= 0.369 af
Primary = 2.81 cfs @ 12.35 hrs, Volume= 0.369 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Link SPC: Study Point C

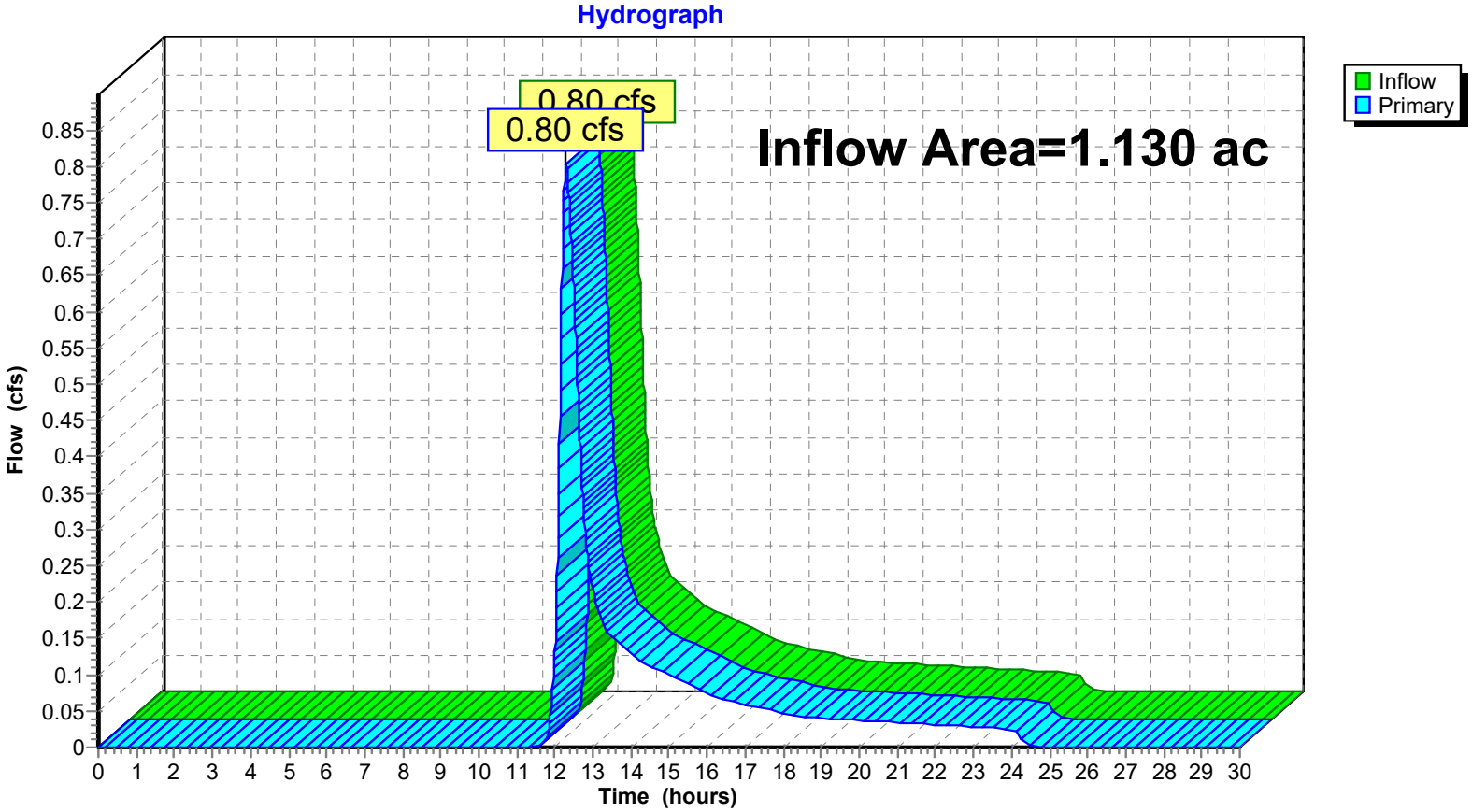


Summary for Link SPD: Study Point D

Inflow Area = 1.130 ac, 0.00% Impervious, Inflow Depth = 1.03" for 10 Year event
Inflow = 0.80 cfs @ 12.30 hrs, Volume= 0.097 af
Primary = 0.80 cfs @ 12.30 hrs, Volume= 0.097 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Link SPD: Study Point D



Time span=0.00-30.00 hrs, dt=0.01 hrs, 3001 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 D: SCD Runoff Area=2.160 ac 0.00% Impervious Runoff Depth=4.55"
Flow Length=266' Tc=25.8 min CN=65 Runoff=6.97 cfs 0.819 af

Subcatchment E: SCE Runoff Area=0.530 ac 11.32% Impervious Runoff Depth=4.79"
Flow Length=112' Tc=10.0 min UI Adjusted CN=67 Runoff=2.60 cfs 0.212 af

Subcatchment F: SCF Runoff Area=0.230 ac 0.00% Impervious Runoff Depth=4.55"
Flow Length=55' Slope=0.1900 '/' Tc=10.0 min CN=65 Runoff=1.07 cfs 0.087 af

Subcatchment G: SCG Runoff Area=1.130 ac 0.00% Impervious Runoff Depth=3.70"
Flow Length=320' Tc=18.0 min CN=58 Runoff=3.39 cfs 0.349 af

Subcatchment SC-A: SC-A Runoff Area=2.683 ac 1.23% Impervious Runoff Depth=4.31"
Flow Length=344' Tc=64.0 min CN=63 Runoff=5.11 cfs 0.963 af

Subcatchment SC-B: SC-B Runoff Area=13.460 ac 0.00% Impervious Runoff Depth=4.67"
Flow Length=813' Tc=91.9 min CN=66 Runoff=22.00 cfs 5.240 af

Subcatchment SC-C: SC-C Runoff Area=3.500 ac 0.00% Impervious Runoff Depth=4.55"
Flow Length=213' Tc=66.4 min CN=65 Runoff=6.91 cfs 1.327 af

Pond SCA: SC-A Peak Elev=141.00' Storage=0.021 af Inflow=5.11 cfs 0.963 af
Discarded=0.45 cfs 0.407 af Primary=4.67 cfs 0.556 af Outflow=5.11 cfs 0.963 af

Pond SCB: SC-B Peak Elev=65.50' Storage=0.148 af Inflow=22.00 cfs 5.240 af
Discarded=1.01 cfs 1.466 af Primary=20.98 cfs 3.919 af Outflow=21.99 cfs 5.385 af

Link SPA: SPA Inflow=27.01 cfs 5.246 af
Primary=27.01 cfs 5.246 af

Link SPB: SPB Inflow=4.67 cfs 0.556 af
Primary=4.67 cfs 0.556 af

Link SPC: Study Point C

Inflow=8.98 cfs 1.118 af
Primary=8.98 cfs 1.118 af

Link SPD: Study Point D

Inflow=3.39 cfs 0.349 af
Primary=3.39 cfs 0.349 af

Total Runoff Area = 23.693 ac Runoff Volume = 8.998 af Average Runoff Depth = 4.56"
99.61% Pervious = 23.600 ac 0.39% Impervious = 0.093 ac

Summary for Subcatchment D: SCD

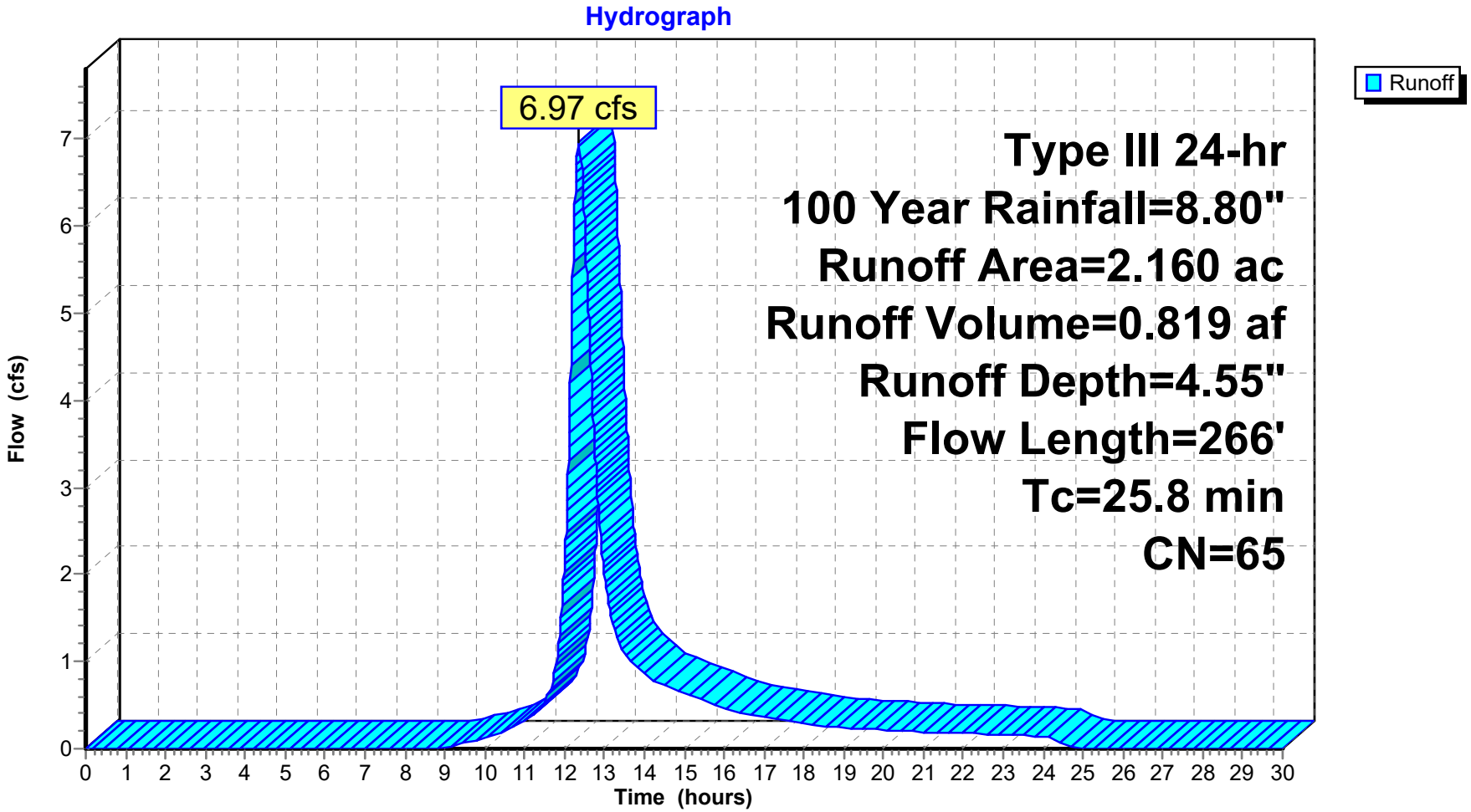
Runoff = 6.97 cfs @ 12.36 hrs, Volume= 0.819 af, Depth= 4.55"
Routed to Link SPC : Study Point C

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=8.80"

Area (ac)	CN	Description
2.160	65	Woods/grass comb., Fair, HSG B
2.160		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.4	70	0.0258	0.18		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.50"
19.4	196	0.0125	0.17		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.50"
25.8	266	Total			

Subcatchment D: SCD



Summary for Subcatchment E: SCE

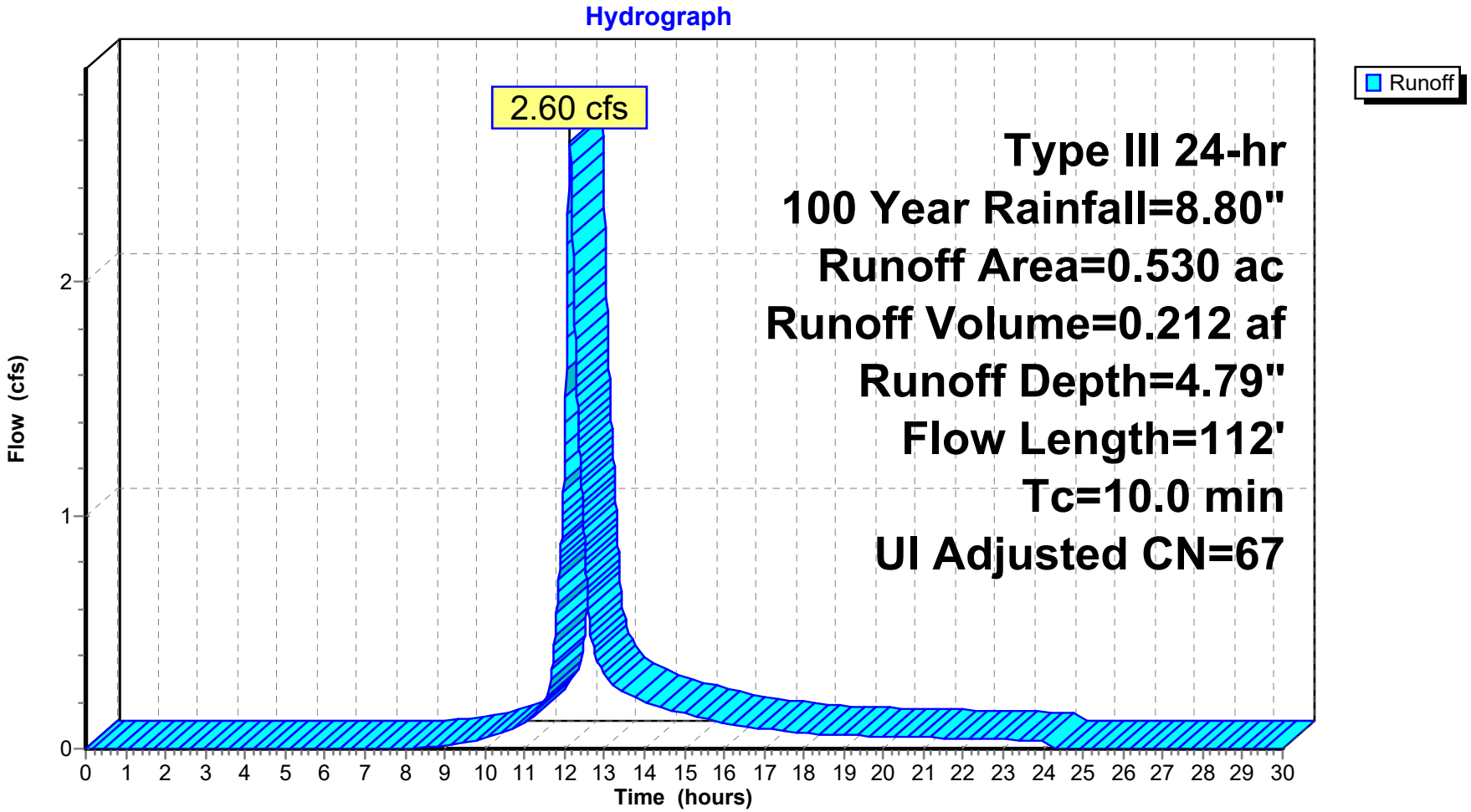
Runoff = 2.60 cfs @ 12.14 hrs, Volume= 0.212 af, Depth= 4.79"
Routed to Link SPC : Study Point C

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=8.80"

Area (ac)	CN	Adj	Description
0.470	65		Woods/grass comb., Fair, HSG B
0.060	98		Unconnected roofs, HSG A
0.530	69	67	Weighted Average, UI Adjusted
0.470			88.68% Pervious Area
0.060			11.32% Impervious Area
0.060			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.6	40	0.0800	0.26		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.50"
2.1	72	0.4200	0.56		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.50"
4.7	112	Total, Increased to minimum Tc = 10.0 min			

Subcatchment E: SCE



Summary for Subcatchment F: SCF

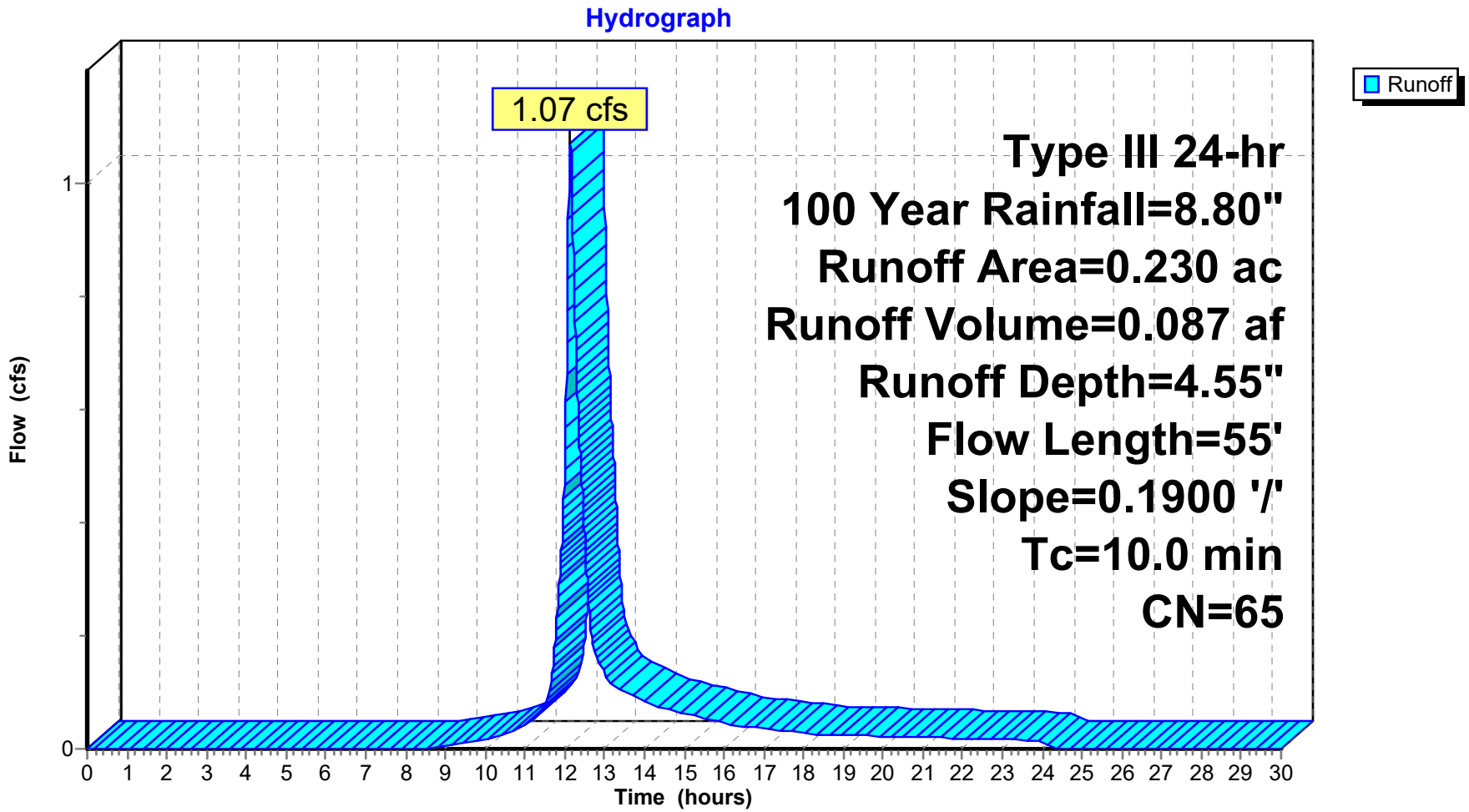
Runoff = 1.07 cfs @ 12.14 hrs, Volume= 0.087 af, Depth= 4.55"
Routed to Link SPC : Study Point C

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=8.80"

Area (ac)	CN	Description
0.230	65	Woods/grass comb., Fair, HSG B
0.230		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.4	55	0.1900	0.39		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.50"
2.4	55	Total, Increased to minimum Tc = 10.0 min			

Subcatchment F: SCF



Summary for Subcatchment G: SCG

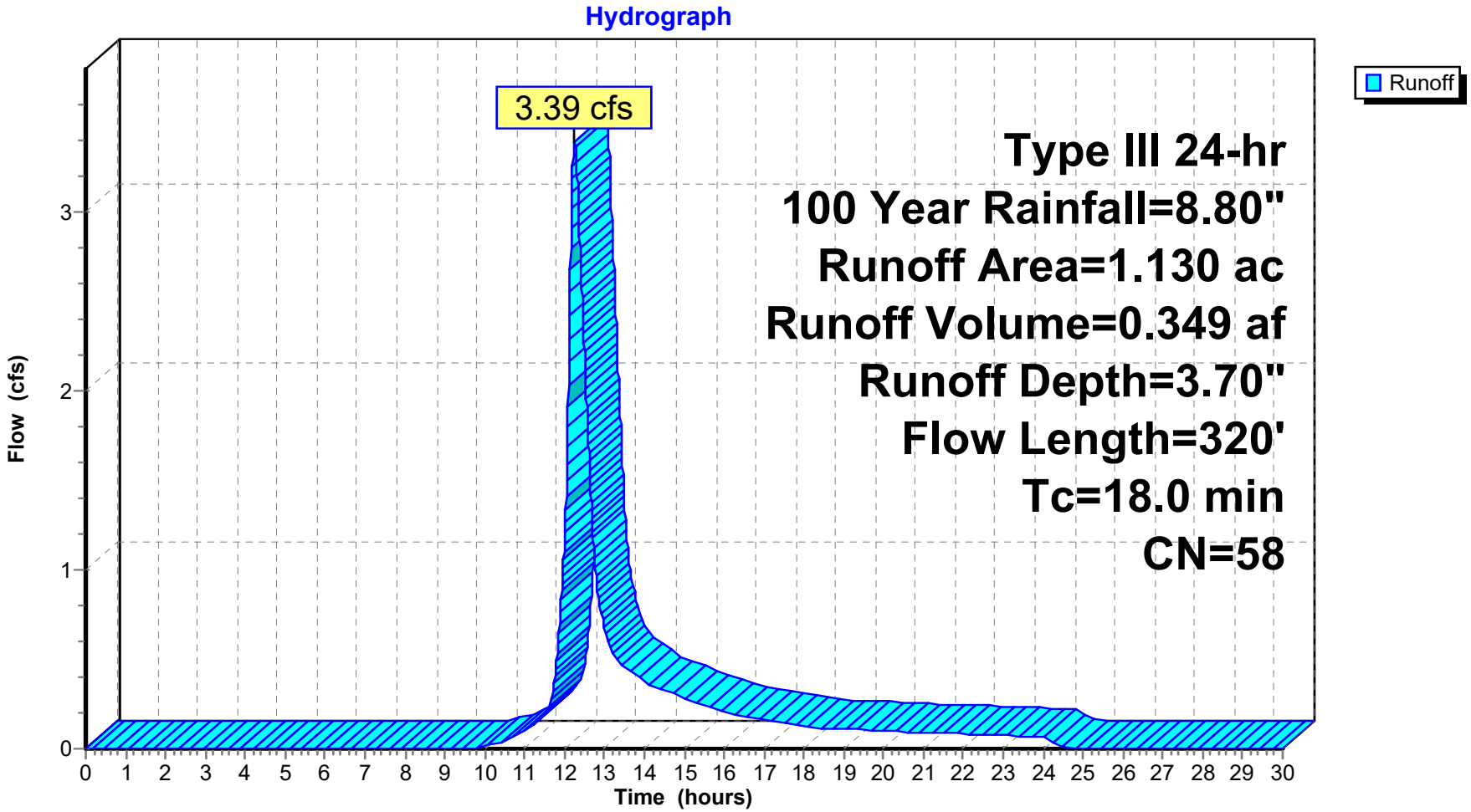
Runoff = 3.39 cfs @ 12.26 hrs, Volume= 0.349 af, Depth= 3.70"
Routed to Link SPD : Study Point D

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=8.80"

Area (ac)	CN	Description
1.130	58	Woods/grass comb., Good, HSG B
1.130		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.5	95	0.4755	0.29		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.50"
3.9	76	0.7573	0.33		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.50"
5.1	95	0.5883	0.31		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.50"
3.5	54	0.4811	0.26		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.50"
18.0	320	Total			

Subcatchment G: SCG



Summary for Subcatchment SC-A: SC-A

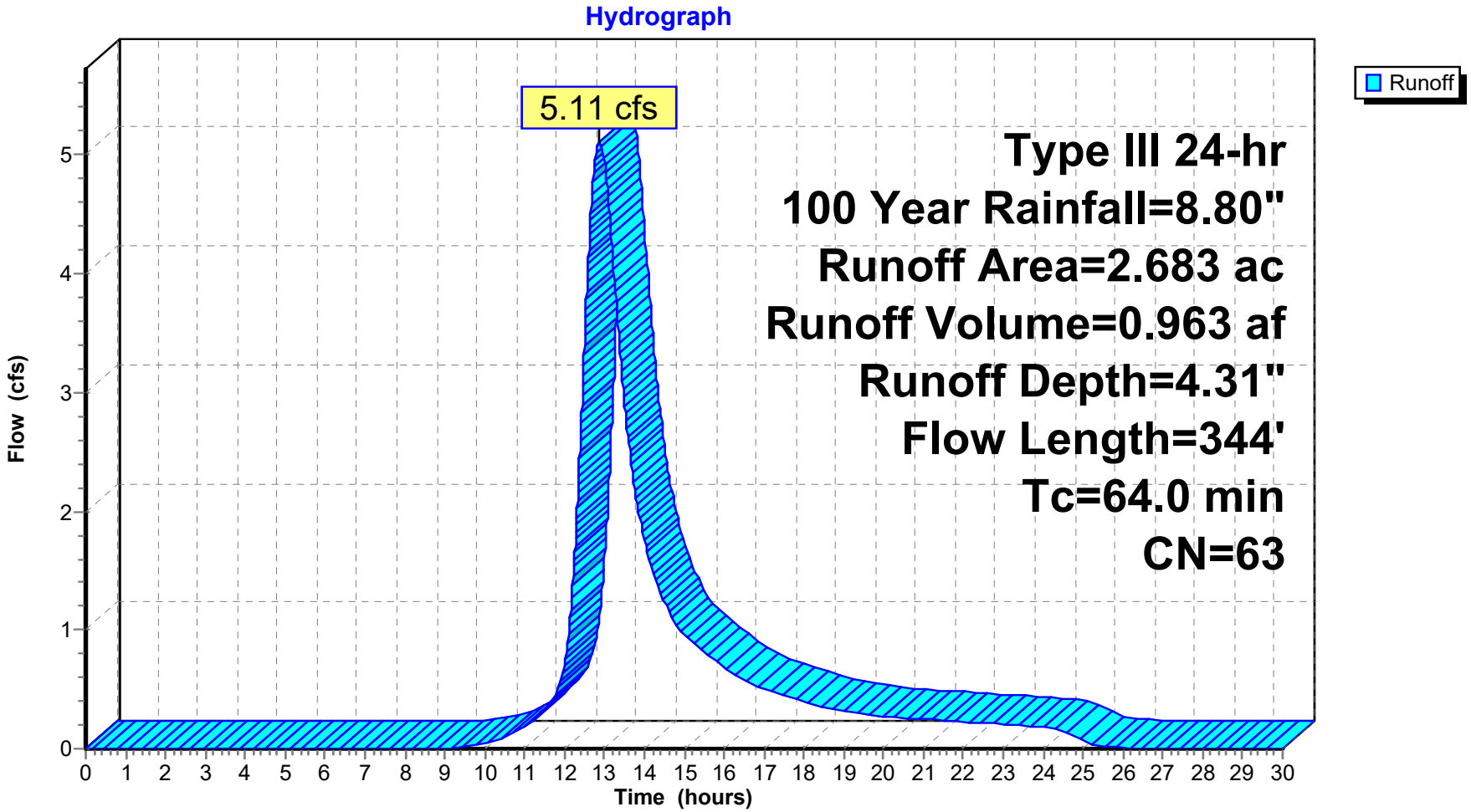
Runoff = 5.11 cfs @ 12.87 hrs, Volume= 0.963 af, Depth= 4.31"
Routed to Pond SCA : SC-A

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=8.80"

Area (ac)	CN	Description
1.870	60	Woods, Fair, HSG B
0.780	67	Brush, Poor, HSG B
0.033	98	Paved parking, HSG B
2.683	63	Weighted Average
2.650		98.77% Pervious Area
0.033		1.23% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.8	50	0.1200	0.14		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.50"
30.7	177	0.0230	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.50"
27.5	117	0.0132	0.07		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.50"
64.0	344	Total			

Subcatchment SC-A: SC-A



Summary for Subcatchment SC-B: SC-B

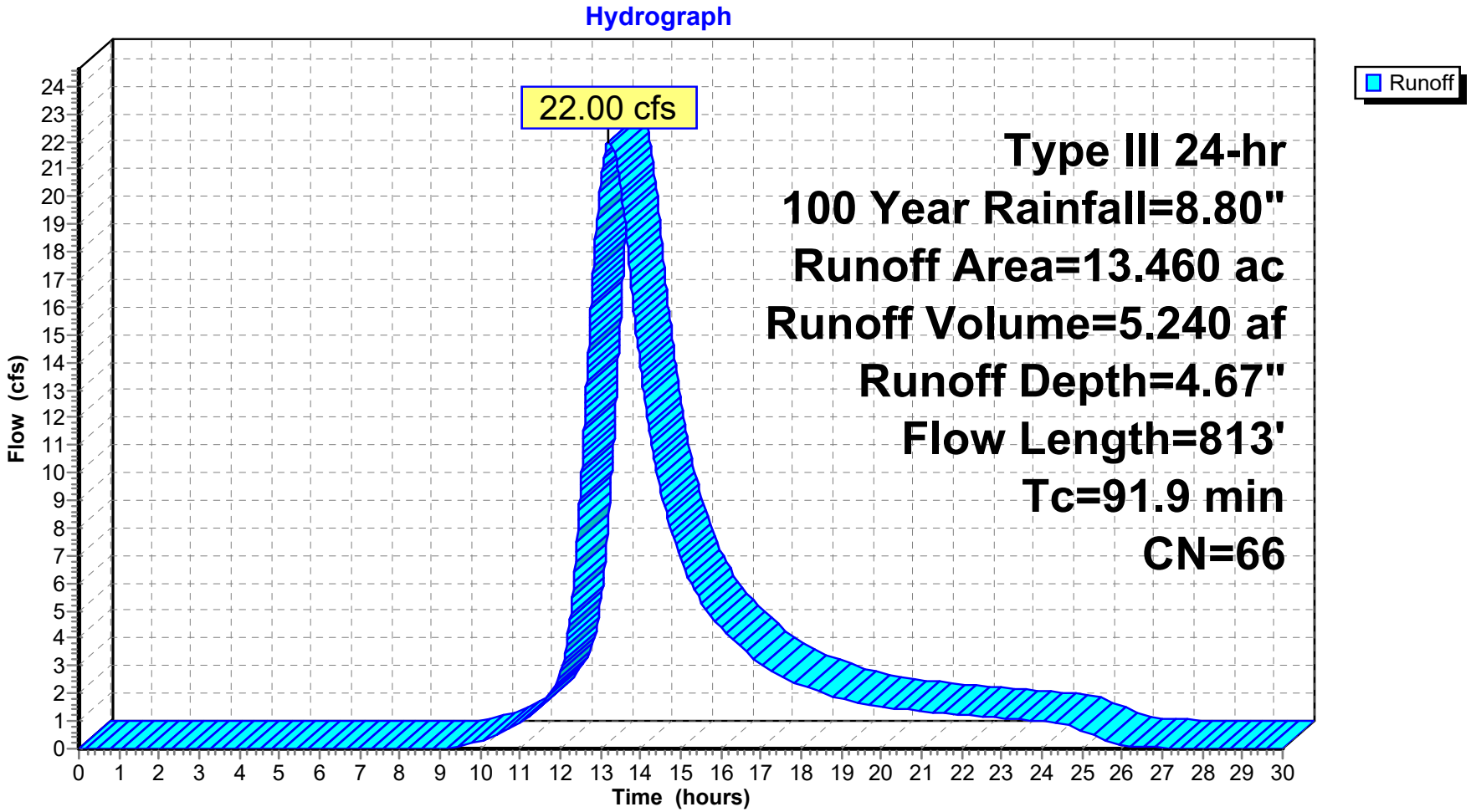
Runoff = 22.00 cfs @ 13.18 hrs, Volume= 5.240 af, Depth= 4.67"
Routed to Pond SCB : SC-B

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=8.80"

Area (ac)	CN	Description
9.350	65	Woods/grass comb., Fair, HSG B
4.110	67	Brush, Poor, HSG B
13.460	66	Weighted Average
13.460		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.3	166	0.3100	0.27		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.50"
31.2	284	0.0568	0.15		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.50"
16.8	128	0.0541	0.13		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.50"
11.8	104	0.0860	0.15		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.50"
21.8	131	0.0297	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.50"
91.9	813	Total			

Subcatchment SC-B: SC-B



Summary for Subcatchment SC-C: SC-C

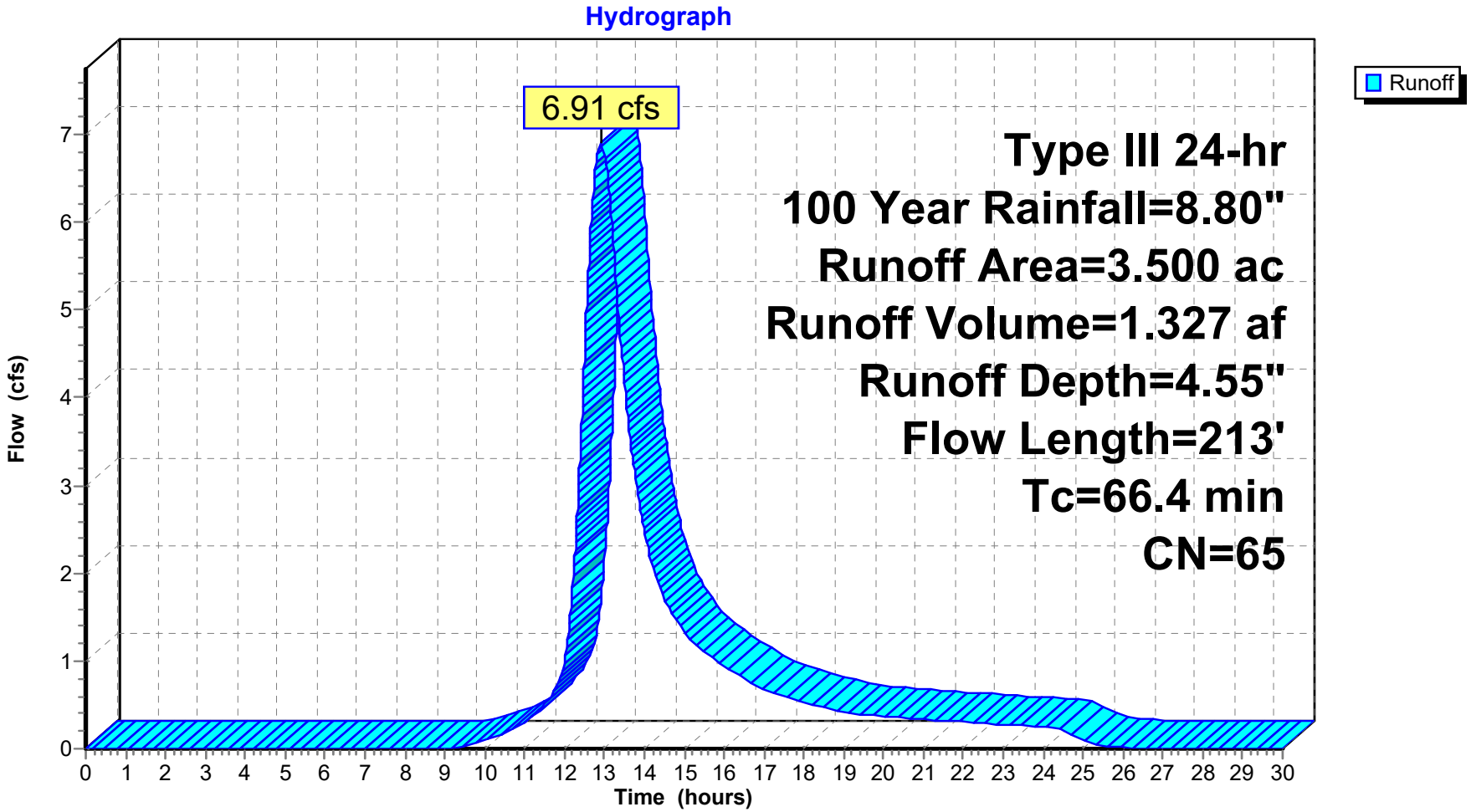
Runoff = 6.91 cfs @ 12.91 hrs, Volume= 1.327 af, Depth= 4.55"
Routed to Link SPA : SPA

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=8.80"

Area (ac)	CN	Description
3.500	65	Woods/grass comb., Fair, HSG B
3.500		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
62.7	104	0.0053	0.03		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.50"
3.7	109	0.6400	0.50		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.50"
66.4	213	Total			

Subcatchment SC-C: SC-C



Summary for Pond SCA: SC-A

Inflow Area = 2.683 ac, 1.23% Impervious, Inflow Depth = 4.31" for 100 Year event
Inflow = 5.11 cfs @ 12.87 hrs, Volume= 0.963 af
Outflow = 5.11 cfs @ 12.88 hrs, Volume= 0.963 af, Atten= 0%, Lag= 0.4 min
Discarded = 0.45 cfs @ 12.14 hrs, Volume= 0.407 af
Primary = 4.67 cfs @ 12.88 hrs, Volume= 0.556 af
Routed to Link SPB : SPB

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 141.00' @ 12.14 hrs Surf.Area= 0.088 ac Storage= 0.021 af

Plug-Flow detention time= 13.6 min calculated for 0.963 af (100% of inflow)
Center-of-Mass det. time= 13.6 min (902.3 - 888.7)

Volume	Invert	Avail.Storage	Storage Description
#1	140.30'	0.021 af	**Custom Stage Data (Conic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
140.30	0.007	0.000	0.000	0.007
140.50	0.007	0.001	0.001	0.007
141.00	0.088	0.020	0.021	0.088

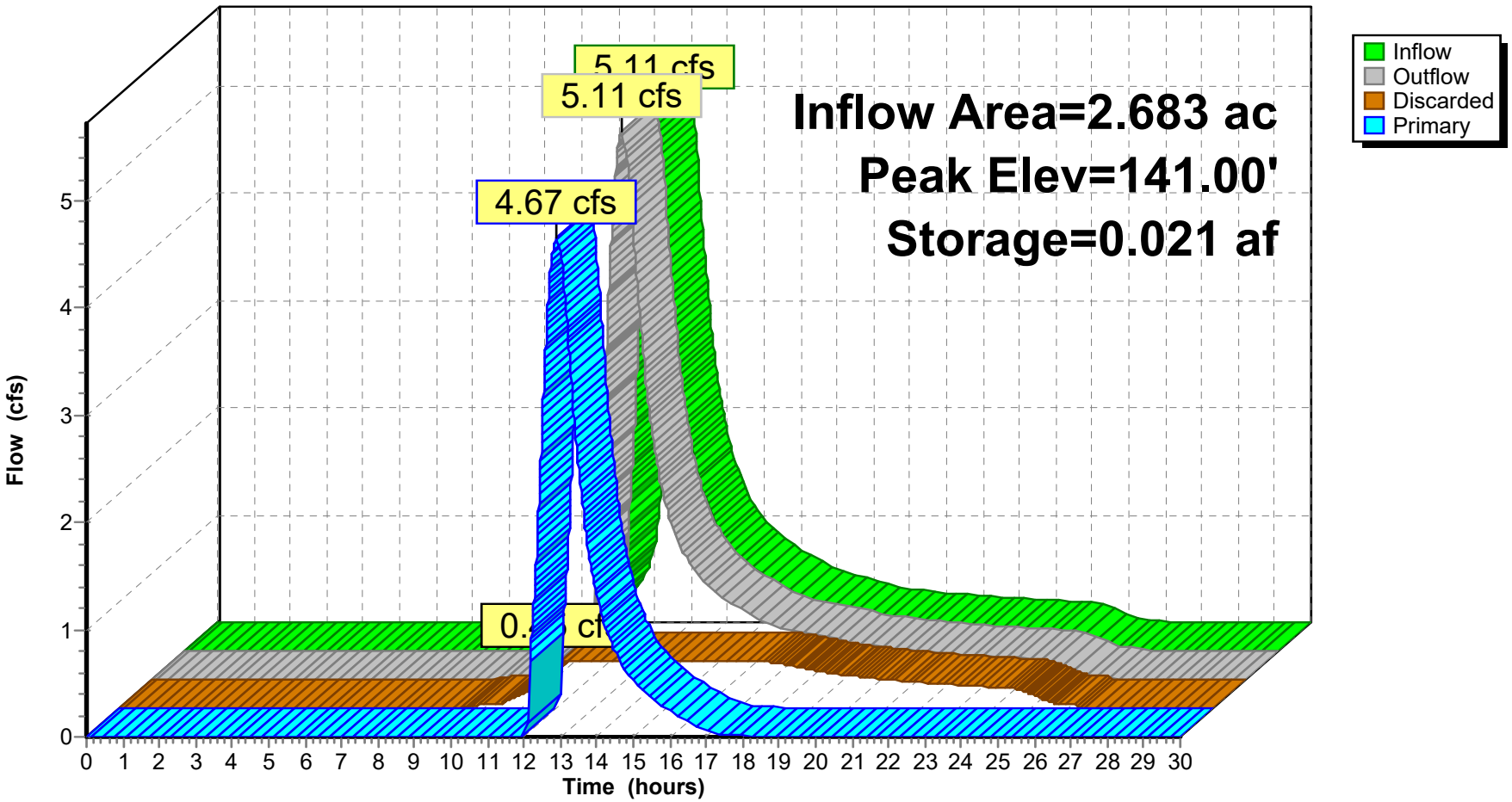
Device	Routing	Invert	Outlet Devices
#0	Primary	141.00'	**Automatic Storage Overflow** (Discharged without head)
#1	Discarded	140.30'	**5.000 in/hr Exfiltration over Wetted area**
#2	Primary	140.90'	**135.0 deg Sharp-Crested Vee/Trap Weir** Cv= 2.48 (C= 3.10)

Discarded OutFlow Max=0.45 cfs @ 12.14 hrs HW=141.00' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.45 cfs)

Primary OutFlow Max=0.02 cfs @ 12.88 hrs HW=141.00' (Free Discharge)
↑—**2=Sharp-Crested Vee/Trap Weir** (Weir Controls 0.02 cfs @ 0.78 fps)

Pond SCA: SC-A

Hydrograph



Summary for Pond SCB: SC-B

Inflow Area = 13.460 ac, 0.00% Impervious, Inflow Depth = 4.67" for 100 Year event
Inflow = 22.00 cfs @ 13.18 hrs, Volume= 5.240 af
Outflow = 21.99 cfs @ 13.19 hrs, Volume= 5.385 af, Atten= 0%, Lag= 0.4 min
Discarded = 1.01 cfs @ 0.00 hrs, Volume= 1.466 af
Primary = 20.98 cfs @ 13.19 hrs, Volume= 3.919 af
Routed to Link SPA : SPA

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Starting Elev= 65.50' Surf.Area= 0.200 ac Storage= 0.148 af
Peak Elev= 65.50' @ 0.00 hrs Surf.Area= 0.200 ac Storage= 0.148 af

Plug-Flow detention time= 25.8 min calculated for 5.237 af (100% of inflow)
Center-of-Mass det. time= 1.8 min (910.1 - 908.3)

Volume	Invert	Avail.Storage	Storage Description
#1	63.60'	0.148 af	**Custom Stage Data (Conic)** Listed below

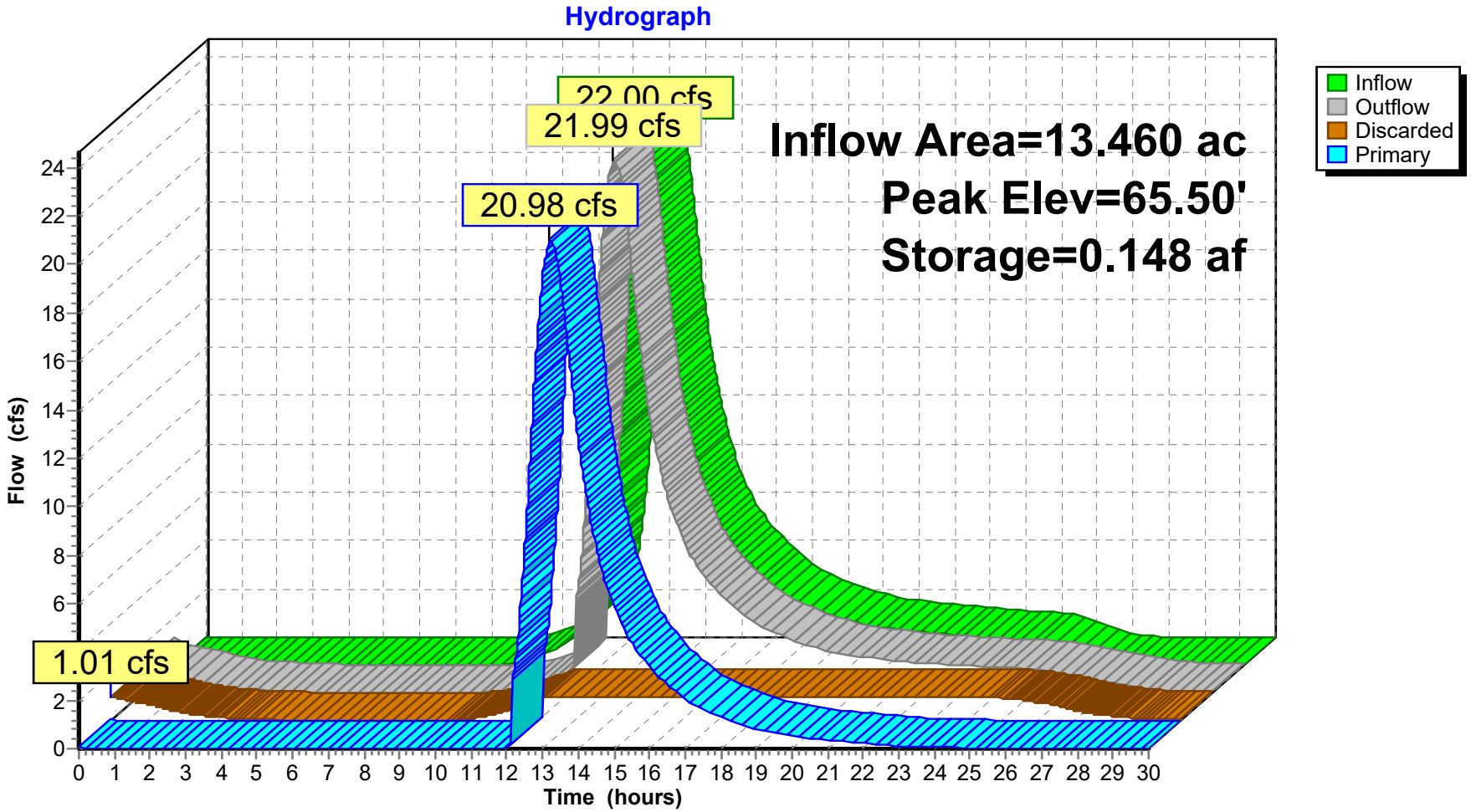
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
63.60	0.001	0.000	0.000	0.001
65.00	0.130	0.066	0.066	0.130
65.50	0.200	0.082	0.148	0.200

Device	Routing	Invert	Outlet Devices
#0	Primary	65.50'	**Automatic Storage Overflow** (Discharged without head)
#1	Discarded	63.60'	**5.000 in/hr Exfiltration over Wetted area**
#2	Primary	65.30'	**135.0 deg Sharp-Crested Vee/Trap Weir** Cv= 2.48 (C= 3.10)

Discarded OutFlow Max=1.01 cfs @ 0.00 hrs HW=65.50' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 1.01 cfs)

Primary OutFlow Max=0.11 cfs @ 13.19 hrs HW=65.50' (Free Discharge)
↑—**2=Sharp-Crested Vee/Trap Weir** (Weir Controls 0.11 cfs @ 1.11 fps)

Pond SCB: SC-B

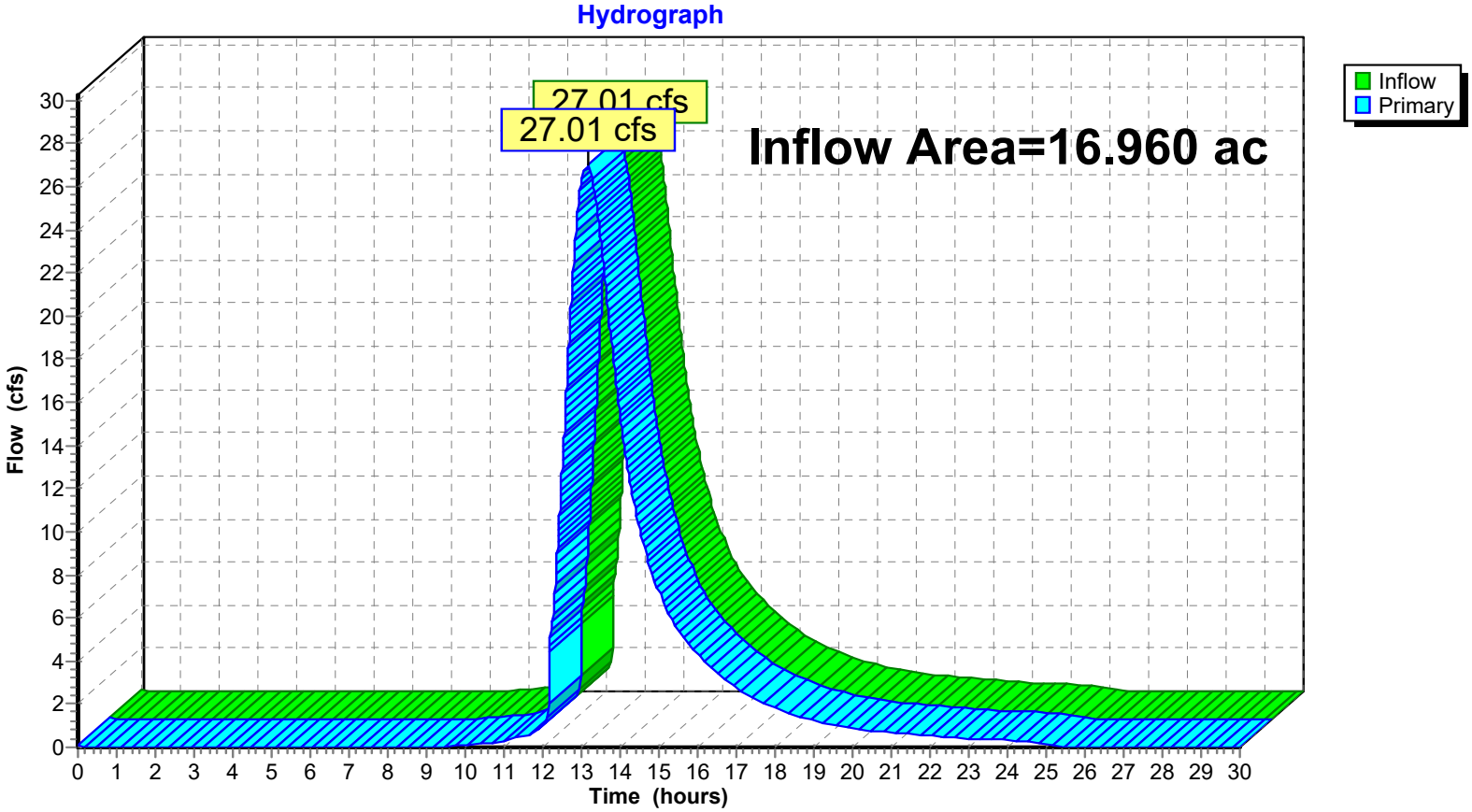

Hydrograph
22.00 cfs
21.99 cfs
20.98 cfs
1.01 cfs
Inflow Area=13.460 ac
Peak Elev=65.50'
Storage=0.148 af
Inflow
Outflow
Discarded
Primary
Flow (cfs)
Time (hours)
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30
0 2 6 8 10 12 14 16 18 20 22 24

Summary for Link SPA: SPA

Inflow Area = 16.960 ac, 0.00% Impervious, Inflow Depth = 3.71" for 100 Year event
Inflow = 27.01 cfs @ 13.17 hrs, Volume= 5.246 af
Primary = 27.01 cfs @ 13.17 hrs, Volume= 5.246 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Link SPA: SPA

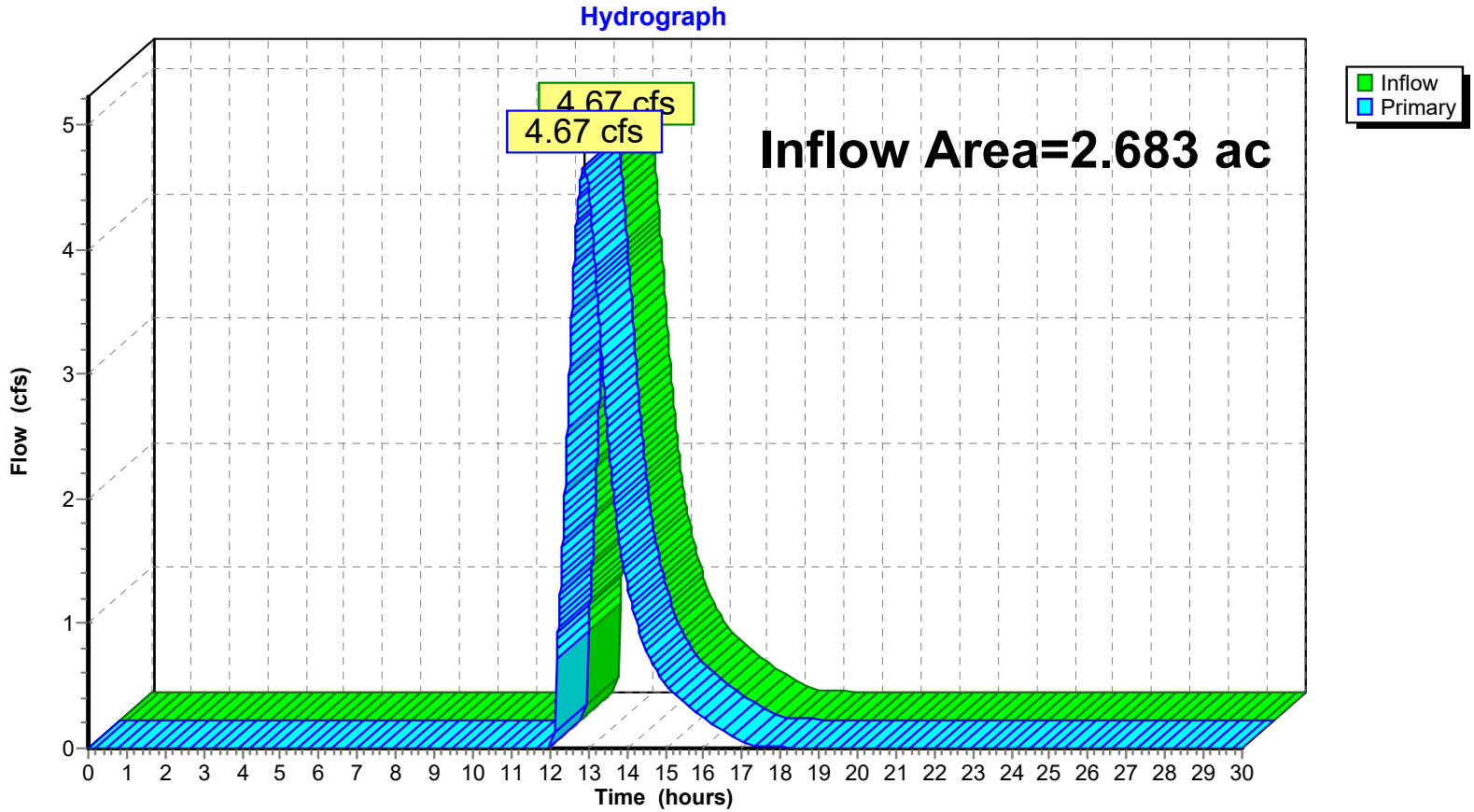


Summary for Link SPB: SPB

Inflow Area = 2.683 ac, 1.23% Impervious, Inflow Depth = 2.49" for 100 Year event
Inflow = 4.67 cfs @ 12.88 hrs, Volume= 0.556 af
Primary = 4.67 cfs @ 12.88 hrs, Volume= 0.556 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Link SPB: SPB

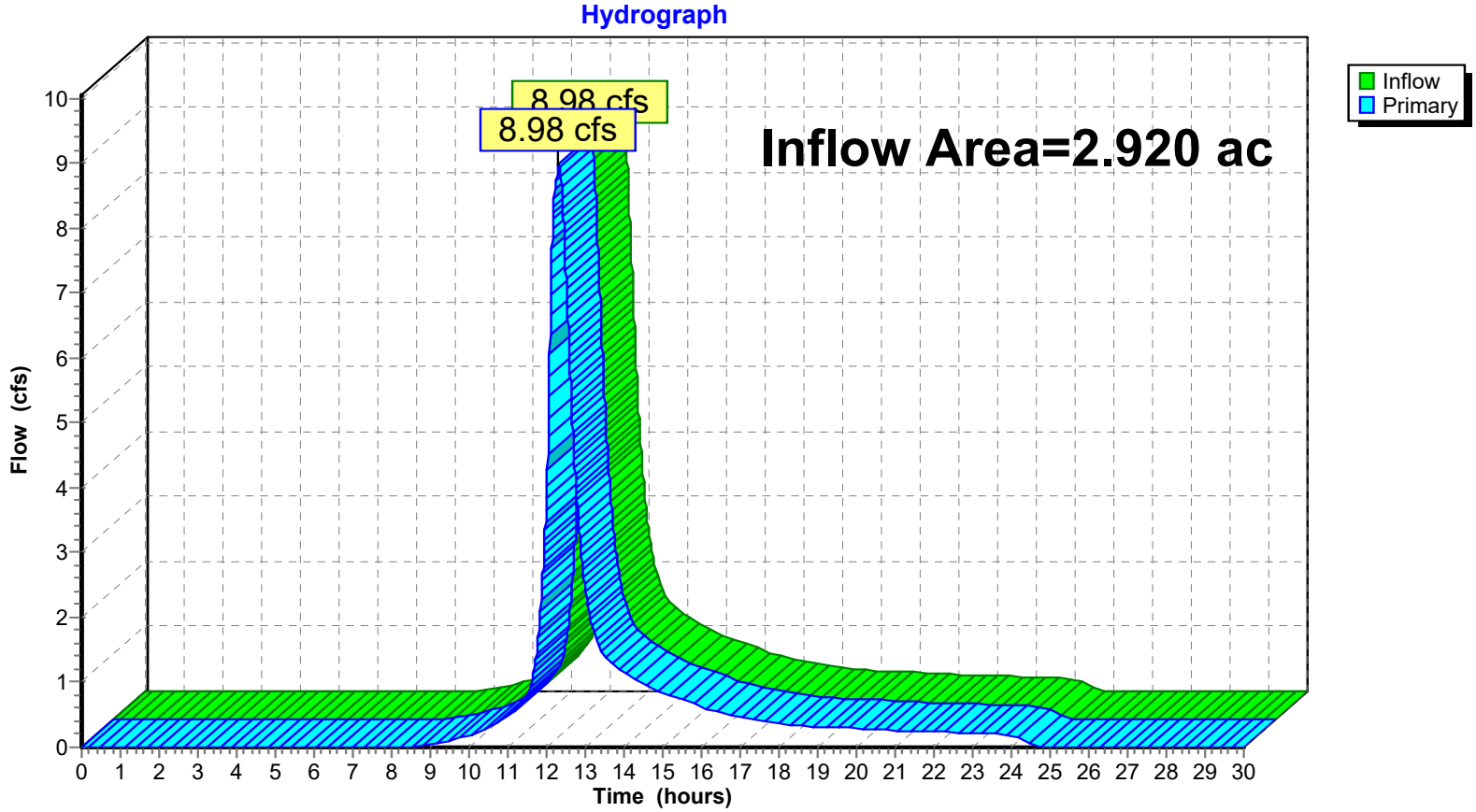


Summary for Link SPC: Study Point C

Inflow Area = 2.920 ac, 2.05% Impervious, Inflow Depth = 4.59" for 100 Year event
Inflow = 8.98 cfs @ 12.30 hrs, Volume= 1.118 af
Primary = 8.98 cfs @ 12.30 hrs, Volume= 1.118 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Link SPC: Study Point C

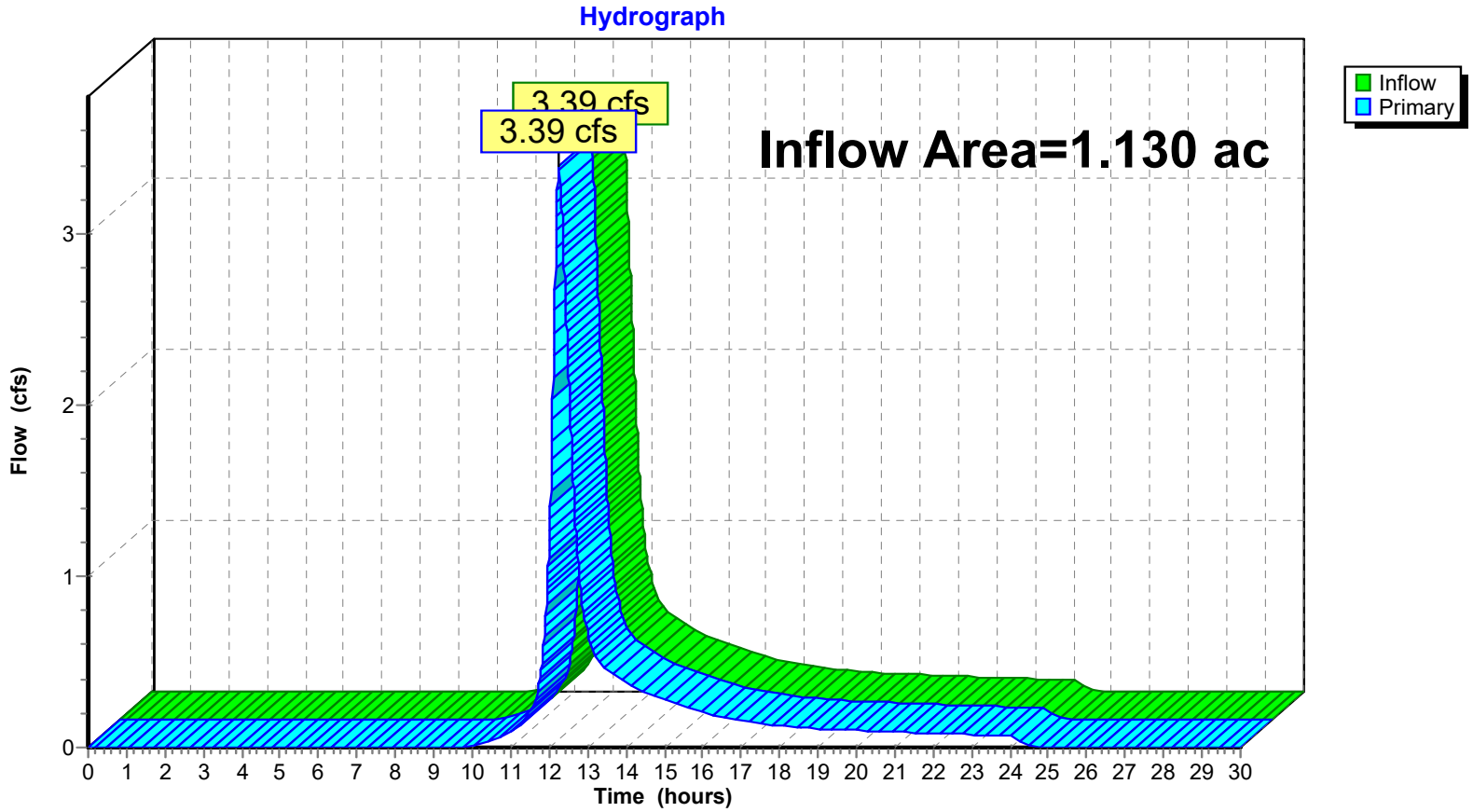


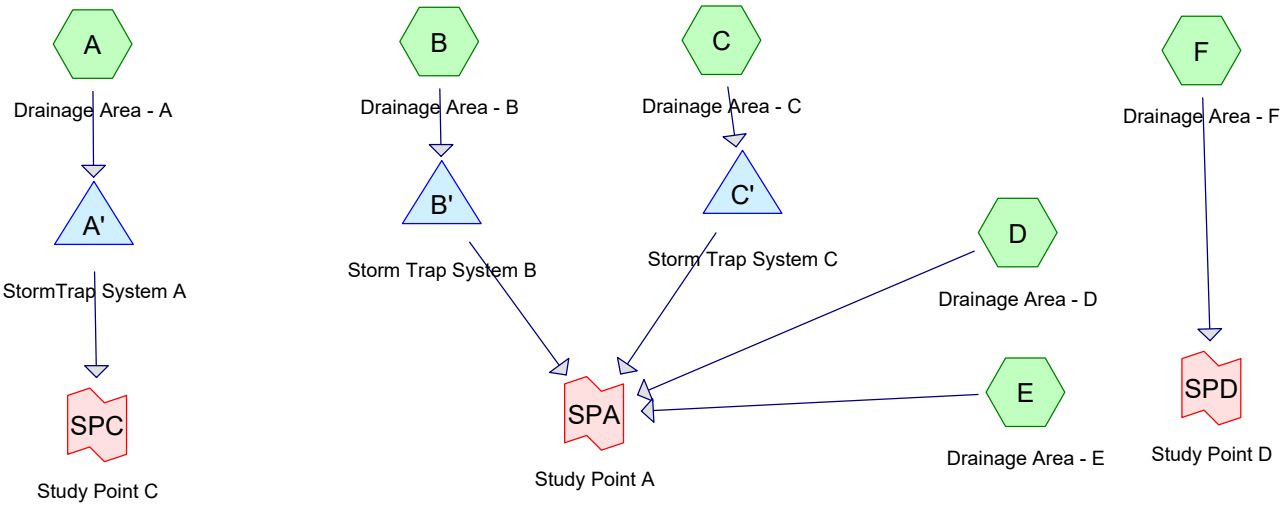
Summary for Link SPD: Study Point D

Inflow Area = 1.130 ac, 0.00% Impervious, Inflow Depth = 3.70" for 100 Year event
Inflow = 3.39 cfs @ 12.26 hrs, Volume= 0.349 af
Primary = 3.39 cfs @ 12.26 hrs, Volume= 0.349 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Link SPD: Study Point D





Subcat Reach Pond Link

Routing Diagram for 20240722_HydroCAD
Prepared by VHB, Inc, Printed 8/8/2024

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2 year	Type III 24-hr		Default	24.00	1	3.50	2
2	10 year	Type III 24-hr		Default	24.00	1	4.75	2
3	100 year	Type III 24-hr		Default	24.00	1	8.80	2

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
7.477	61	>75% Grass cover, Good, HSG B (A, B, C, D)
3.325	98	Paved parking, HSG B (A, B, C, D)
3.308	98	Roofs, HSG B (A, B, C, D)
5.810	60	Woods, Fair, HSG B (B, C)
4.036	58	Woods/grass comb., Good, HSG B (E, F)
23.955	**70**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
23.955	HSG B	A, B, C, D, E, F
0.000	HSG C	
0.000	HSG D	
0.000	Other	
23.955		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	7.477	0.000	0.000	0.000	7.477	>75% Grass cover, Good	A, B, C, D
0.000	3.325	0.000	0.000	0.000	3.325	Paved parking	A, B, C, D
0.000	3.308	0.000	0.000	0.000	3.308	Roofs	A, B, C, D
0.000	5.810	0.000	0.000	0.000	5.810	Woods, Fair	B, C
0.000	4.036	0.000	0.000	0.000	4.036	Woods/grass comb., Good	E, F
0.000	**23.955**	**0.000**	**0.000**	**0.000**	**23.955**	**TOTAL AREA**	

Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Width (inches)	Diam/Height (inches)	Inside-Fill (inches)	Node Name
1	A	0.00	0.00	302.0	0.0100	0.018	0.0	15.0	0.0	
2	B	0.00	0.00	351.0	0.0100	0.013	0.0	15.0	0.0	
3	C	0.00	0.00	261.0	0.0100	0.018	0.0	15.0	0.0	

Time span=0.00-30.00 hrs, dt=0.01 hrs, 3001 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 A: Drainage Area - A Runoff Area=185,549 sf 44.70% Impervious Runoff Depth=1.50"
Flow Length=533' Tc=26.1 min CN=78 Runoff=4.43 cfs 0.532 af

Subcatchment B: Drainage Area - B Runoff Area=471,440 sf 24.25% Impervious Runoff Depth=1.01"
Flow Length=1,087' Tc=10.3 min CN=70 Runoff=10.13 cfs 0.909 af

Subcatchment C: Drainage Area - C Runoff Area=147,009 sf 38.07% Impervious Runoff Depth=1.30"
Flow Length=443' Tc=10.0 min CN=75 Runoff=4.35 cfs 0.366 af

Subcatchment D: Drainage Area - D Runoff Area=63,683 sf 56.08% Impervious Runoff Depth=1.78"
Flow Length=150' Slope=0.0475 '/' Tc=10.0 min CN=82 Runoff=2.66 cfs 0.217 af

Subcatchment E: Drainage Area - E Runoff Area=134,419 sf 0.00% Impervious Runoff Depth=0.45"
Flow Length=213' Tc=68.2 min CN=58 Runoff=0.39 cfs 0.116 af

Subcatchment F: Drainage Area - F Runoff Area=41,378 sf 0.00% Impervious Runoff Depth=0.45"
Flow Length=314' Tc=23.8 min CN=58 Runoff=0.20 cfs 0.036 af

Pond A': StormTrap System A Peak Elev=126.33' Storage=8,848 cf Inflow=4.43 cfs 0.532 af
Discarded=0.64 cfs 0.518 af Primary=0.00 cfs 0.000 af Outflow=0.64 cfs 0.518 af

Pond B': Storm Trap System B Peak Elev=73.68' Storage=15,986 cf Inflow=10.13 cfs 0.909 af
Discarded=0.94 cfs 0.890 af Primary=0.00 cfs 0.000 af Outflow=0.94 cfs 0.890 af

Pond C': Storm Trap System C Peak Elev=69.50' Storage=7,238 cf Inflow=4.35 cfs 0.366 af
Discarded=0.32 cfs 0.366 af Primary=0.00 cfs 0.000 af Outflow=0.32 cfs 0.366 af

Link SPA: Study Point A Inflow=2.67 cfs 0.334 af
Primary=2.67 cfs 0.334 af

Link SPC: Study Point C below 15.00 cfs Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af Secondary=0.00 cfs 0.000 af

Link SPD: Study Point D Inflow=0.20 cfs 0.036 af
Primary=0.20 cfs 0.036 af

Total Runoff Area = 23.955 ac Runoff Volume = 2.176 af Average Runoff Depth = 1.09"
72.31% Pervious = 17.322 ac 27.69% Impervious = 6.633 ac

Summary for Subcatchment A: Drainage Area - A

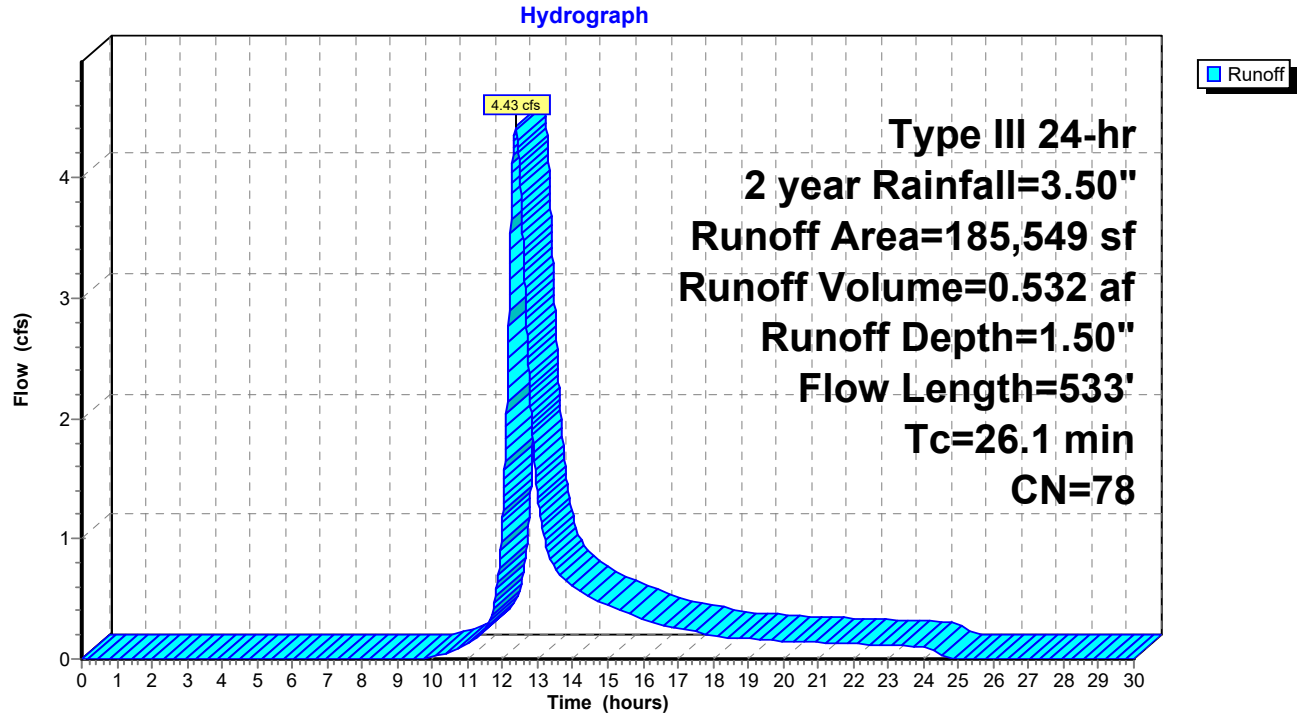
Runoff = 4.43 cfs @ 12.38 hrs, Volume= 0.532 af, Depth= 1.50"
Routed to Pond A' : StormTrap System A

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 year Rainfall=3.50"

Area (sf)	CN	Description
50,170	98	Paved parking, HSG B
102,617	61	>75% Grass cover, Good, HSG B
32,762	98	Roofs, HSG B
185,549	78	Weighted Average
102,617		55.30% Pervious Area
82,932		44.70% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.6	41	0.2668	0.19		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.50"
21.2	190	0.0094	0.15		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.50"
1.3	302	0.0100	3.80	4.67	**Pipe Channel, PIPES TO STORMTRAP** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.018 Corrugated PE, corrugated interior
26.1	533	Total			

Subcatchment A: Drainage Area - A



Summary for Subcatchment B: Drainage Area - B

[47] Hint: Peak is 157% of capacity of segment #3

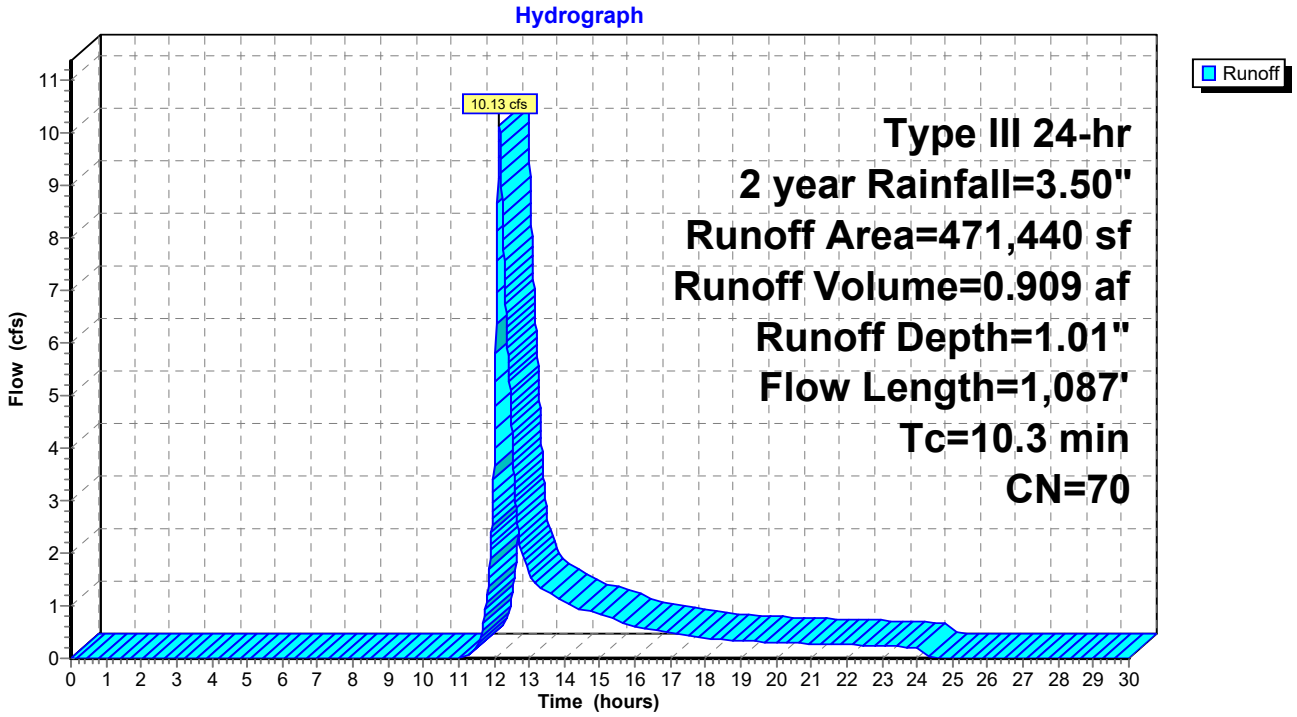
Runoff = 10.13 cfs @ 12.16 hrs, Volume= 0.909 af, Depth= 1.01"
Routed to Pond B' : Storm Trap System B

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 year Rainfall=3.50"

Area (sf)	CN	Description
49,256	98	Paved parking, HSG B
152,096	61	>75% Grass cover, Good, HSG B
65,055	98	Roofs, HSG B
205,033	60	Woods, Fair, HSG B
471,440	70	Weighted Average
357,129		75.75% Pervious Area
114,311		24.25% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	599	0.0348	36.88	457,149.18	**Channel Flow, BIOSWALE** Area= 12,397.0 sf Perim= 1,234.0' r= 10.05' n= 0.035 Riprap, 6-inch
8.9	137	0.3016	0.26		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.50"
1.1	351	0.0100	5.26	6.46	**Pipe Channel, PIPES TO STORMTRAP** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
10.3	1,087	Total			

Subcatchment B: Drainage Area - B



Summary for Subcatchment C: Drainage Area - C

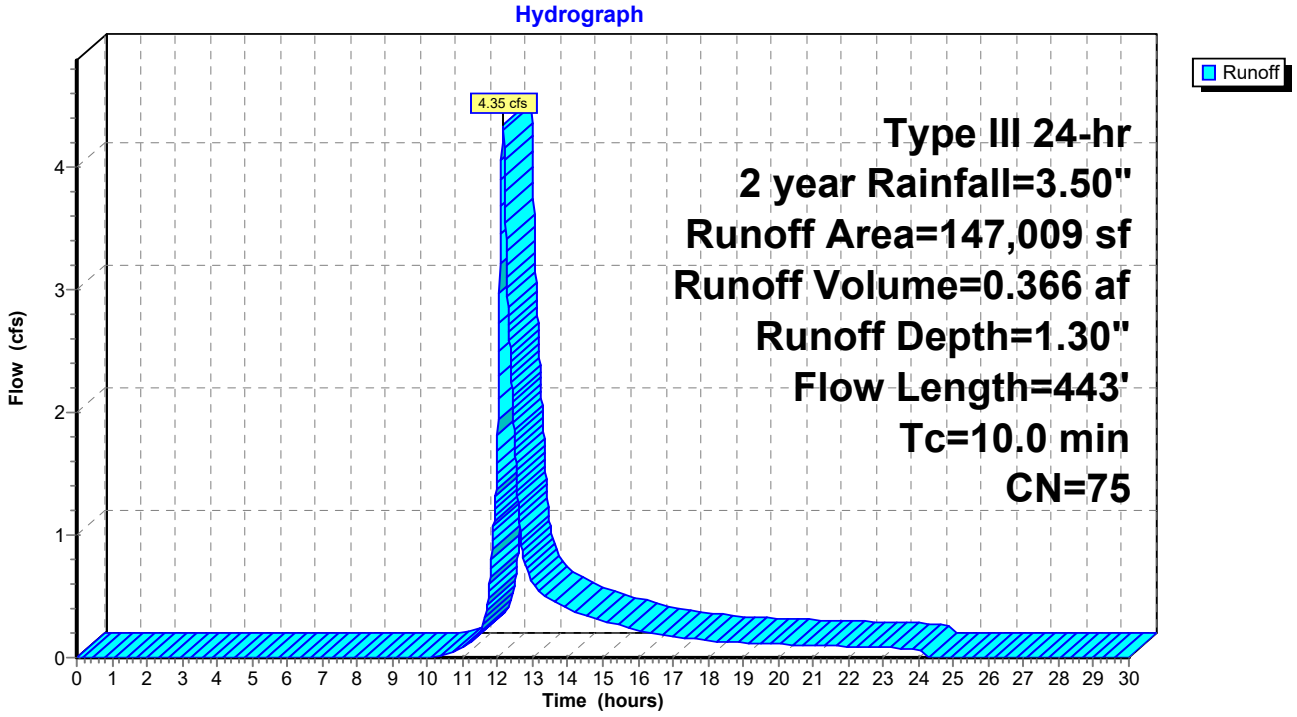
Runoff = 4.35 cfs @ 12.15 hrs, Volume= 0.366 af, Depth= 1.30"
Routed to Pond C' : Storm Trap System C

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 year Rainfall=3.50"

Area (sf)	CN	Description
36,356	98	Paved parking, HSG B
42,997	61	>75% Grass cover, Good, HSG B
19,606	98	Roofs, HSG B
48,050	60	Woods, Fair, HSG B
147,009	75	Weighted Average
91,047		61.93% Pervious Area
55,962		38.07% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.9	182	0.0198	1.62		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.50"
1.1	261	0.0100	3.80	4.67	**Pipe Channel, PIPES TO STORMTRAP** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.018 Corrugated PE, corrugated interior
3.0	443	Total, Increased to minimum Tc = 10.0 min			

Subcatchment C: Drainage Area - C



Summary for Subcatchment D: Drainage Area - D

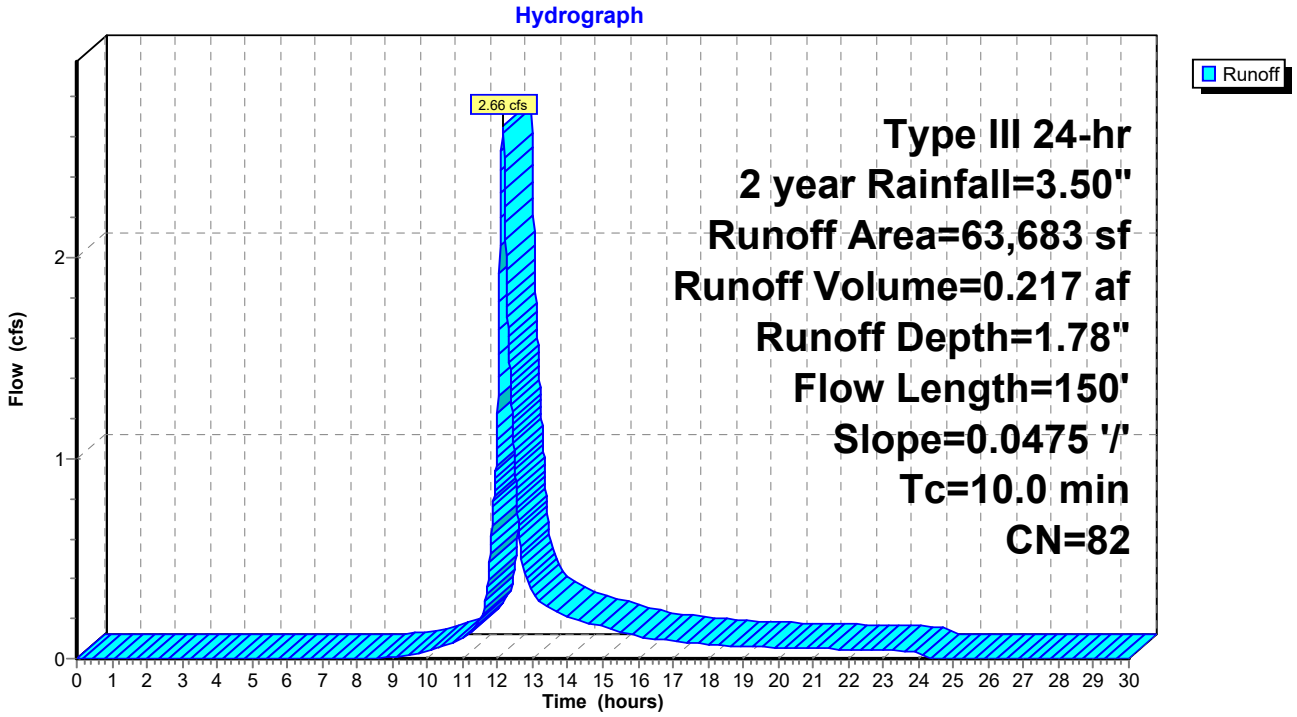
Runoff = 2.66 cfs @ 12.14 hrs, Volume= 0.217 af, Depth= 1.78"
Routed to Link SPA : Study Point A

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 year Rainfall=3.50"

Area (sf)	CN	Description
9,034	98	Paved parking, HSG B
27,967	61	>75% Grass cover, Good, HSG B
26,682	98	Roofs, HSG B
63,683	82	Weighted Average
27,967		43.92% Pervious Area
35,716		56.08% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.2	150	0.0475	0.27		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.50"
9.2	150	Total, Increased to minimum Tc = 10.0 min			

Subcatchment D: Drainage Area - D



Summary for Subcatchment E: Drainage Area - E

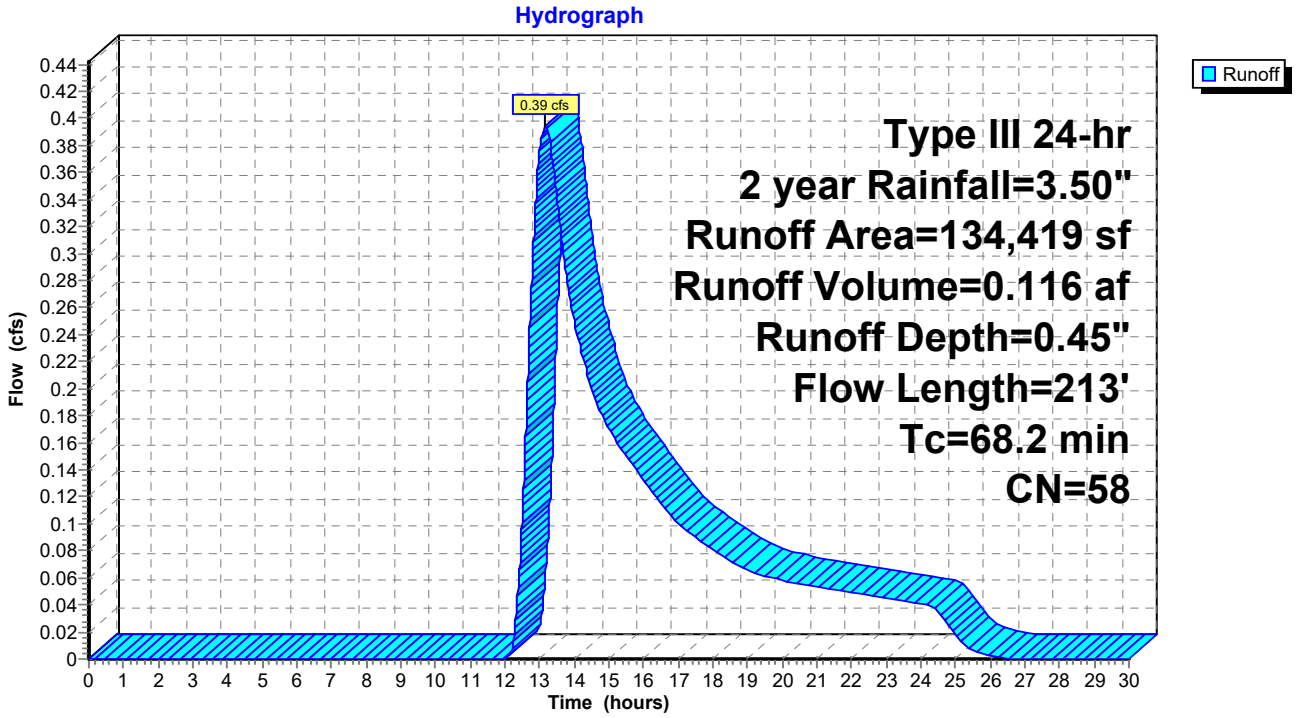
Runoff = 0.39 cfs @ 13.18 hrs, Volume= 0.116 af, Depth= 0.45"
Routed to Link SPA : Study Point A

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 year Rainfall=3.50"

Area (sf)	CN	Description
134,419	58	Woods/grass comb., Good, HSG B
134,419		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
62.7	104	0.0053	0.03		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.50"
5.5	109	0.6400	0.33		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.50"
68.2	213	Total			

Subcatchment E: Drainage Area - E



Summary for Subcatchment F: Drainage Area - F

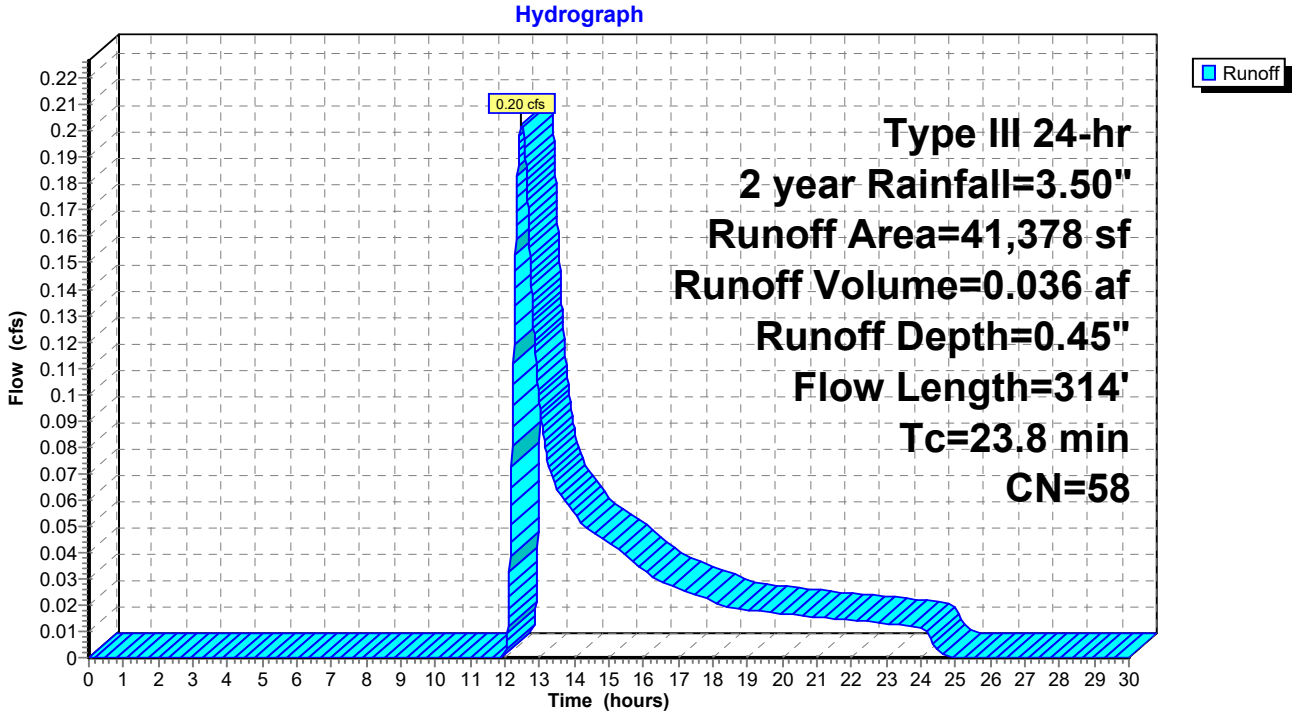
Runoff = 0.20 cfs @ 12.48 hrs, Volume= 0.036 af, Depth= 0.45"
Routed to Link SPD : Study Point D

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 year Rainfall=3.50"

Area (sf)	CN	Description
41,378	58	Woods/grass comb., Good, HSG B
41,378		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.4	71	0.0707	0.13		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.50"
7.7	127	0.3708	0.27		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.50"
4.1	84	0.7722	0.34		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.50"
2.6	32	0.3741	0.21		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.50"
23.8	314	Total			

Subcatchment F: Drainage Area - F



Summary for Pond A': StormTrap System A

Inflow Area = 4.260 ac, 44.70% Impervious, Inflow Depth = 1.50" for 2 year event
Inflow = 4.43 cfs @ 12.38 hrs, Volume= 0.532 af
Outflow = 0.64 cfs @ 11.86 hrs, Volume= 0.518 af, Atten= 86%, Lag= 0.0 min
Discarded = 0.64 cfs @ 11.86 hrs, Volume= 0.518 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Link SPC : Study Point C

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 126.33' @ 13.84 hrs Surf.Area= 5,543 sf Storage= 8,848 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 115.8 min (978.8 - 863.0)

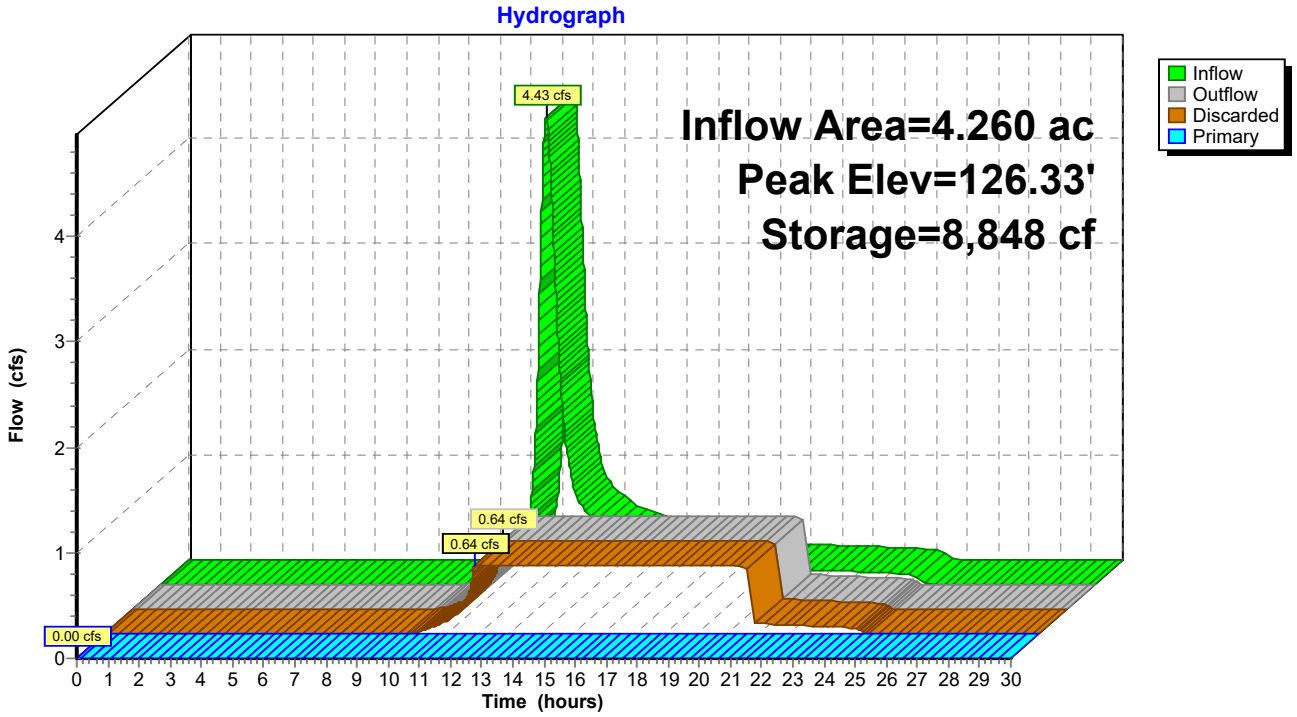
Volume	Invert	Avail.Storage	Storage Description
#1	124.06'	21,599 cf	**StormTrap DoubleTrap 8-6** x 12 Inside= 101.7"W x 102.0"H => 66.71 sf x 15.40'L = 1,027.0 cf Outside= 101.7"W x 114.0"H => 80.55 sf x 15.40'L = 1,240.2 cf 12 Chambers in 4 Rows 33.92' x 46.19' Core + 6.66' Border = 47.23' x 59.50' System
#2	124.06'	20,918 cf	**StormTrap DoubleTrap 8-6** x 10 Inside= 101.7"W x 102.0"H => 66.71 sf x 15.40'L = 1,027.0 cf Outside= 101.7"W x 114.0"H => 80.55 sf x 15.40'L = 1,240.2 cf 10 Chambers in 2 Rows 16.96' x 76.98' Core + 6.66' Border = 30.27' x 90.29' System
		42,517 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	124.06'	**5.000 in/hr Exfiltration over Surface area**
#2	Primary	130.00'	**12.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.64 cfs @ 11.86 hrs HW=124.56' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.64 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=124.06' (Free Discharge)
↑—**2=Orifice/Grate** (Controls 0.00 cfs)

Pond A': StormTrap System A



Summary for Pond B': Storm Trap System B

Inflow Area = 10.823 ac, 24.25% Impervious, Inflow Depth = 1.01" for 2 year event
Inflow = 10.13 cfs @ 12.16 hrs, Volume= 0.909 af
Outflow = 0.94 cfs @ 11.77 hrs, Volume= 0.890 af, Atten= 91%, Lag= 0.0 min
Discarded = 0.94 cfs @ 11.77 hrs, Volume= 0.890 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Link SPA : Study Point A

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 73.68' @ 14.47 hrs Surf.Area= 8,092 sf Storage= 15,986 cf

Plug-Flow detention time= 178.8 min calculated for 0.890 af (98% of inflow)
Center-of-Mass det. time= 167.3 min (1,040.5 - 873.3)

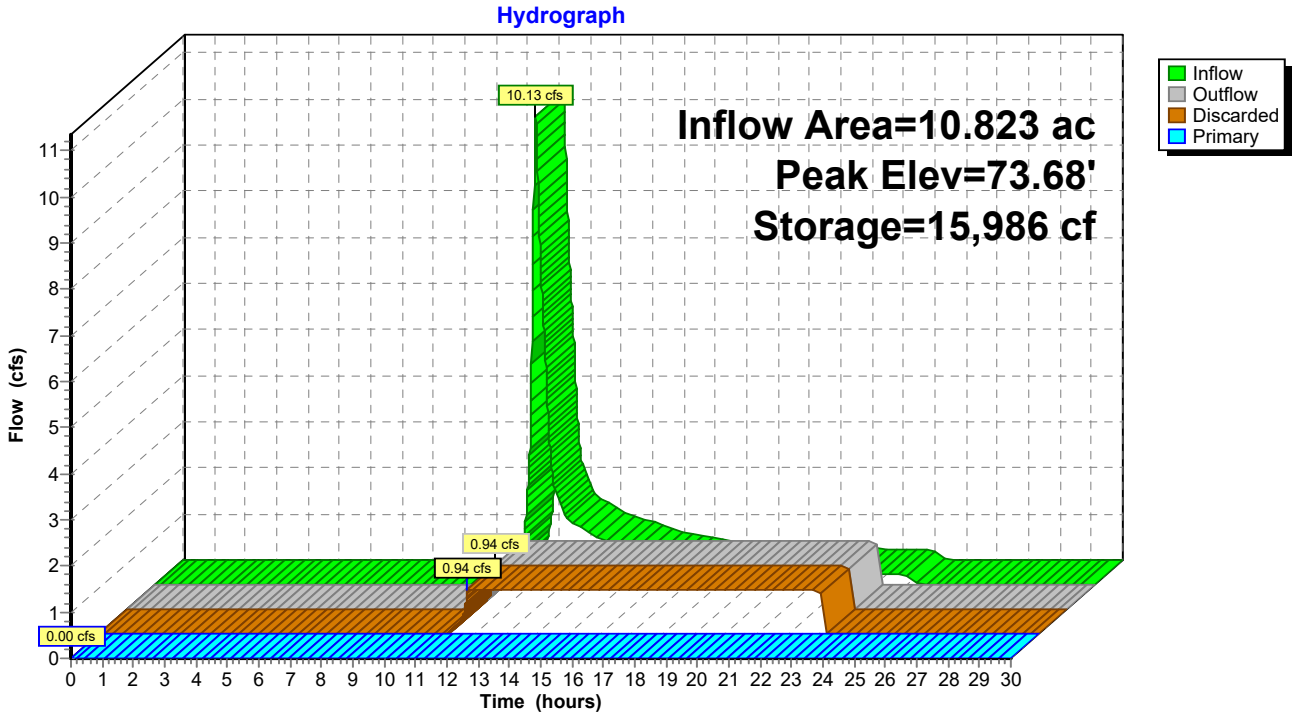
Volume	Invert	Avail.Storage	Storage Description
#1	71.00'	109,769 cf	**StormTrap DoubleTrap 15-0** x 45 Inside= 101.7"W x 180.0"H => 117.67 sf x 15.40'L = 1,811.6 cf Outside= 101.7"W x 192.0"H => 135.67 sf x 15.40'L = 2,088.7 cf 45 Chambers in 9 Rows 76.31' x 76.98' Core + 6.66' Border = 89.63' x 90.29' System

Device	Routing	Invert	Outlet Devices
#1	Discarded	71.00'	**5.000 in/hr Exfiltration over Surface area**
#2	Primary	79.00'	**12.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.94 cfs @ 11.77 hrs HW=71.50' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 0.94 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=71.00' (Free Discharge)
↑**2=Orifice/Grate** (Controls 0.00 cfs)

Pond B': Storm Trap System B



Summary for Pond C': Storm Trap System C

Inflow Area = 3.375 ac, 38.07% Impervious, Inflow Depth = 1.30" for 2 year event
Inflow = 4.35 cfs @ 12.15 hrs, Volume= 0.366 af
Outflow = 0.32 cfs @ 11.65 hrs, Volume= 0.366 af, Atten= 93%, Lag= 0.0 min
Discarded = 0.32 cfs @ 11.65 hrs, Volume= 0.366 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Link SPA : Study Point A

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 69.50' @ 14.85 hrs Surf.Area= 2,733 sf Storage= 7,238 cf

Plug-Flow detention time= 236.7 min calculated for 0.366 af (100% of inflow)
Center-of-Mass det. time= 236.6 min (1,093.8 - 857.2)

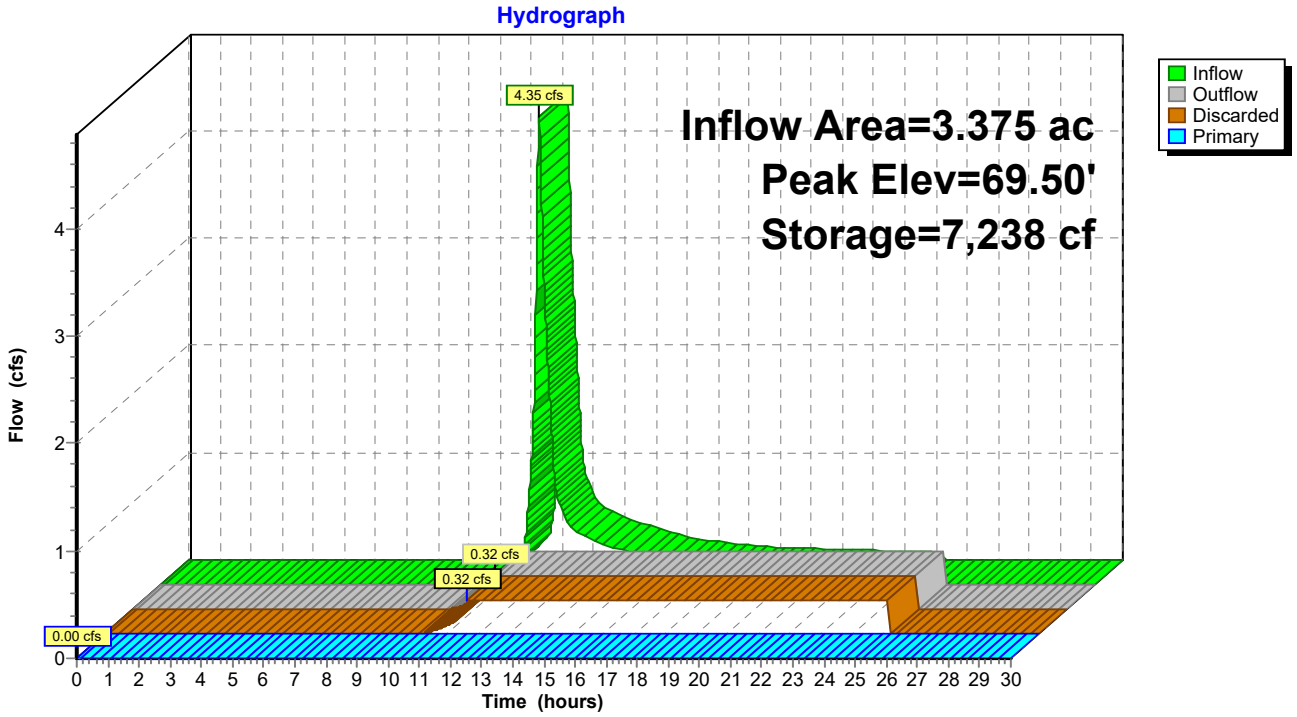
Volume	Invert	Avail.Storage	Storage Description
#1	66.00'	33,796 cf	**StormTrap DoubleTrap 14-0** x 10 Inside= 101.7"W x 168.0"H => 109.55 sf x 15.40'L = 1,686.7 cf Outside= 101.7"W x 180.0"H => 127.19 sf x 15.40'L = 1,958.2 cf 10 Chambers in 2 Rows 16.96' x 76.98' Core + 6.66' Border = 30.27' x 90.29' System

Device	Routing	Invert	Outlet Devices
#1	Discarded	66.00'	**5.000 in/hr Exfiltration over Surface area**
#2	Primary	76.00'	**15.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.32 cfs @ 11.65 hrs HW=66.50' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.32 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=66.00' (Free Discharge)
↑—**2=Orifice/Grate** (Controls 0.00 cfs)

Pond C': Storm Trap System C

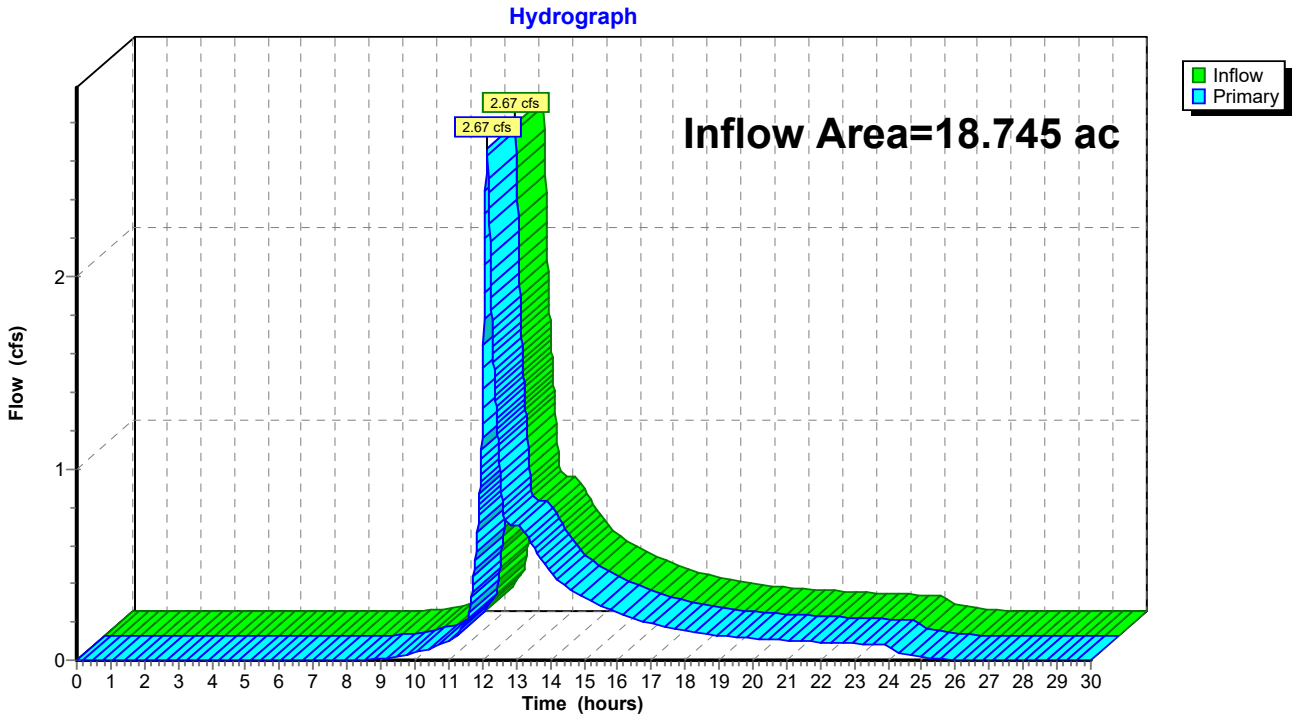


Summary for Link SPA: Study Point A

Inflow Area = 18.745 ac, 25.23% Impervious, Inflow Depth = 0.21" for 2 year event
Inflow = 2.67 cfs @ 12.14 hrs, Volume= 0.334 af
Primary = 2.67 cfs @ 12.14 hrs, Volume= 0.334 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Link SPA: Study Point A

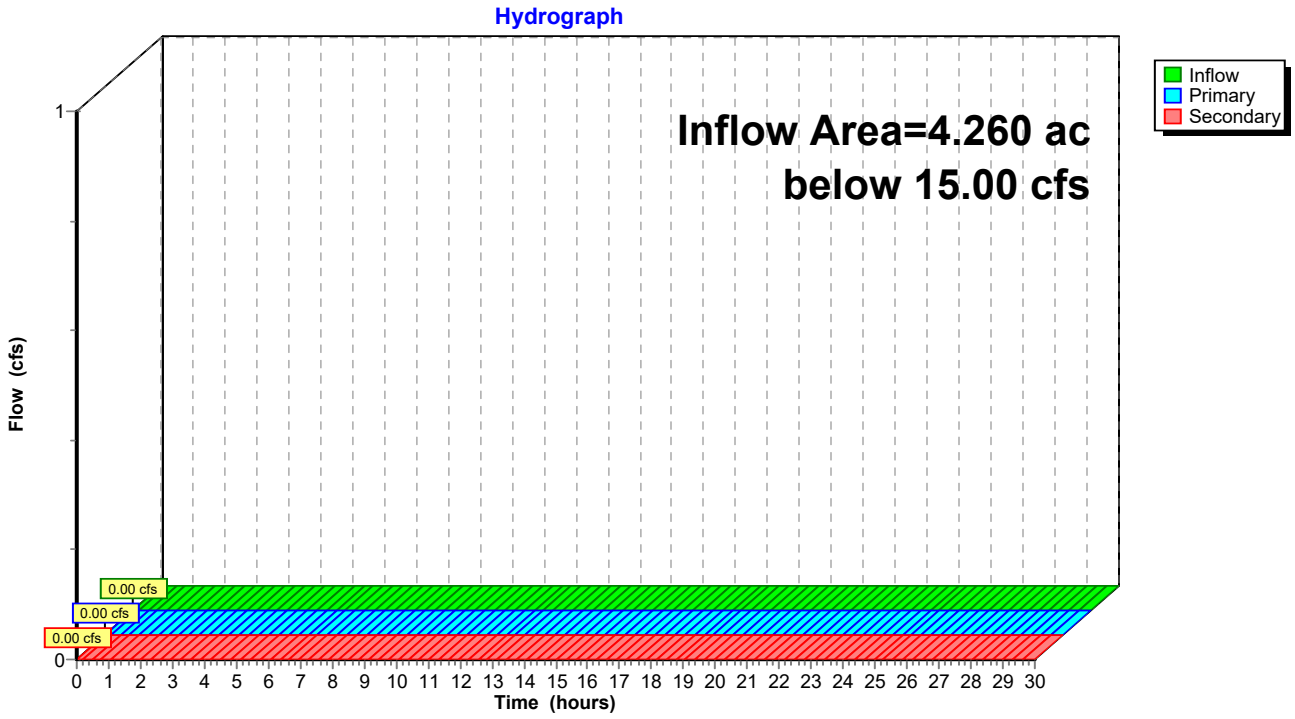


Summary for Link SPC: Study Point C

Inflow Area = 4.260 ac, 44.70% Impervious, Inflow Depth = 0.00" for 2 year event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Primary outflow = Inflow below 15.00 cfs, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Link SPC: Study Point C

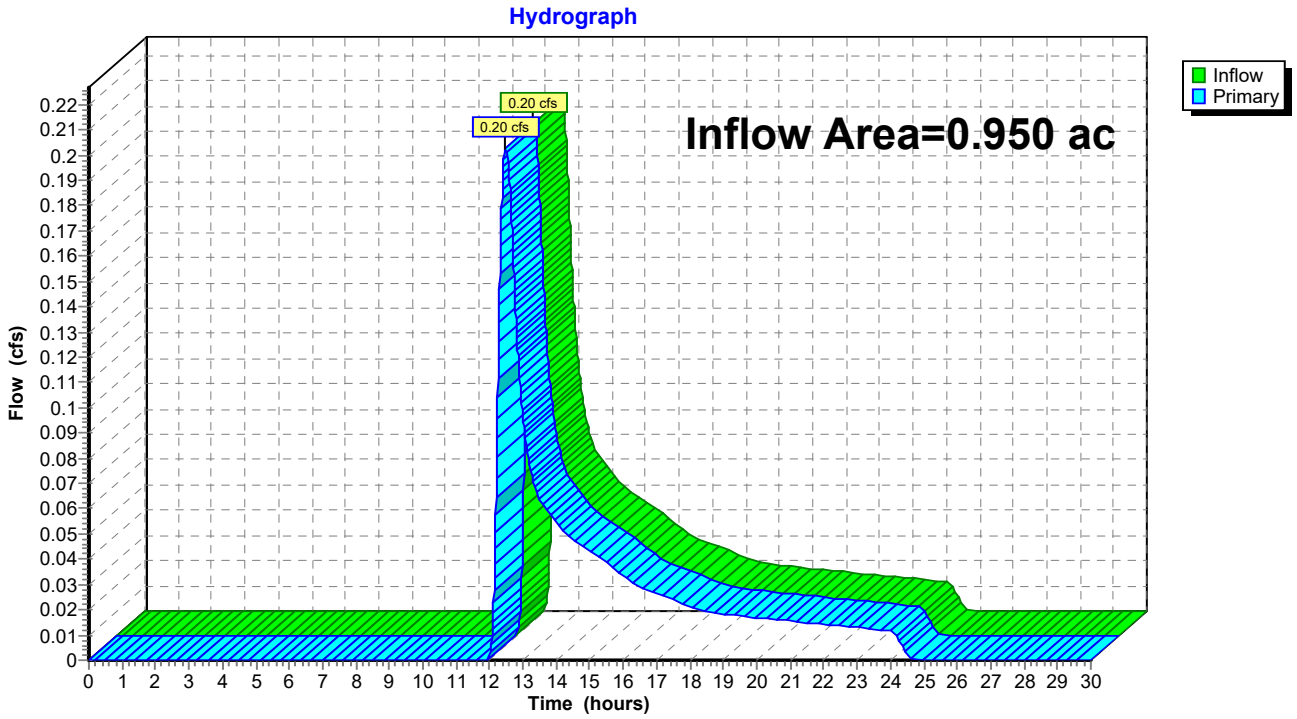


Summary for Link SPD: Study Point D

Inflow Area = 0.950 ac, 0.00% Impervious, Inflow Depth = 0.45" for 2 year event
Inflow = 0.20 cfs @ 12.48 hrs, Volume= 0.036 af
Primary = 0.20 cfs @ 12.48 hrs, Volume= 0.036 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Link SPD: Study Point D



Time span=0.00-30.00 hrs, dt=0.01 hrs, 3001 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 A: Drainage Area - A Runoff Area=185,549 sf 44.70% Impervious Runoff Depth=2.50"
Flow Length=533' Tc=26.1 min CN=78 Runoff=7.50 cfs 0.888 af

Subcatchment B: Drainage Area - B Runoff Area=471,440 sf 24.25% Impervious Runoff Depth=1.85"
Flow Length=1,087' Tc=10.3 min CN=70 Runoff=19.80 cfs 1.671 af

Subcatchment C: Drainage Area - C Runoff Area=147,009 sf 38.07% Impervious Runoff Depth=2.25"
Flow Length=443' Tc=10.0 min CN=75 Runoff=7.72 cfs 0.632 af

Subcatchment D: Drainage Area - D Runoff Area=63,683 sf 56.08% Impervious Runoff Depth=2.86"
Flow Length=150' Slope=0.0475 '/' Tc=10.0 min CN=82 Runoff=4.27 cfs 0.348 af

Subcatchment E: Drainage Area - E Runoff Area=134,419 sf 0.00% Impervious Runoff Depth=1.03"
Flow Length=213' Tc=68.2 min CN=58 Runoff=1.14 cfs 0.266 af

Subcatchment F: Drainage Area - F Runoff Area=41,378 sf 0.00% Impervious Runoff Depth=1.03"
Flow Length=314' Tc=23.8 min CN=58 Runoff=0.61 cfs 0.082 af

Pond A': StormTrap System A Peak Elev=128.34' Storage=18,897 cf Inflow=7.50 cfs 0.888 af
Discarded=0.64 cfs 0.888 af Primary=0.00 cfs 0.000 af Outflow=0.64 cfs 0.888 af

Pond B': Storm Trap System B Peak Elev=76.99' Storage=40,201 cf Inflow=19.80 cfs 1.671 af
Discarded=0.94 cfs 1.475 af Primary=0.00 cfs 0.000 af Outflow=0.94 cfs 1.475 af

Pond C': Storm Trap System C Peak Elev=73.04' Storage=15,794 cf Inflow=7.72 cfs 0.632 af
Discarded=0.32 cfs 0.513 af Primary=0.00 cfs 0.000 af Outflow=0.32 cfs 0.513 af

Link SPA: Study Point A Inflow=4.32 cfs 0.614 af
Primary=4.32 cfs 0.614 af

Link SPC: Study Point C below 15.00 cfs Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af Secondary=0.00 cfs 0.000 af

Link SPD: Study Point D Inflow=0.61 cfs 0.082 af
Primary=0.61 cfs 0.082 af

Total Runoff Area = 23.955 ac Runoff Volume = 3.887 af Average Runoff Depth = 1.95"
72.31% Pervious = 17.322 ac 27.69% Impervious = 6.633 ac

Summary for Subcatchment A: Drainage Area - A

[47] Hint: Peak is 161% of capacity of segment #3

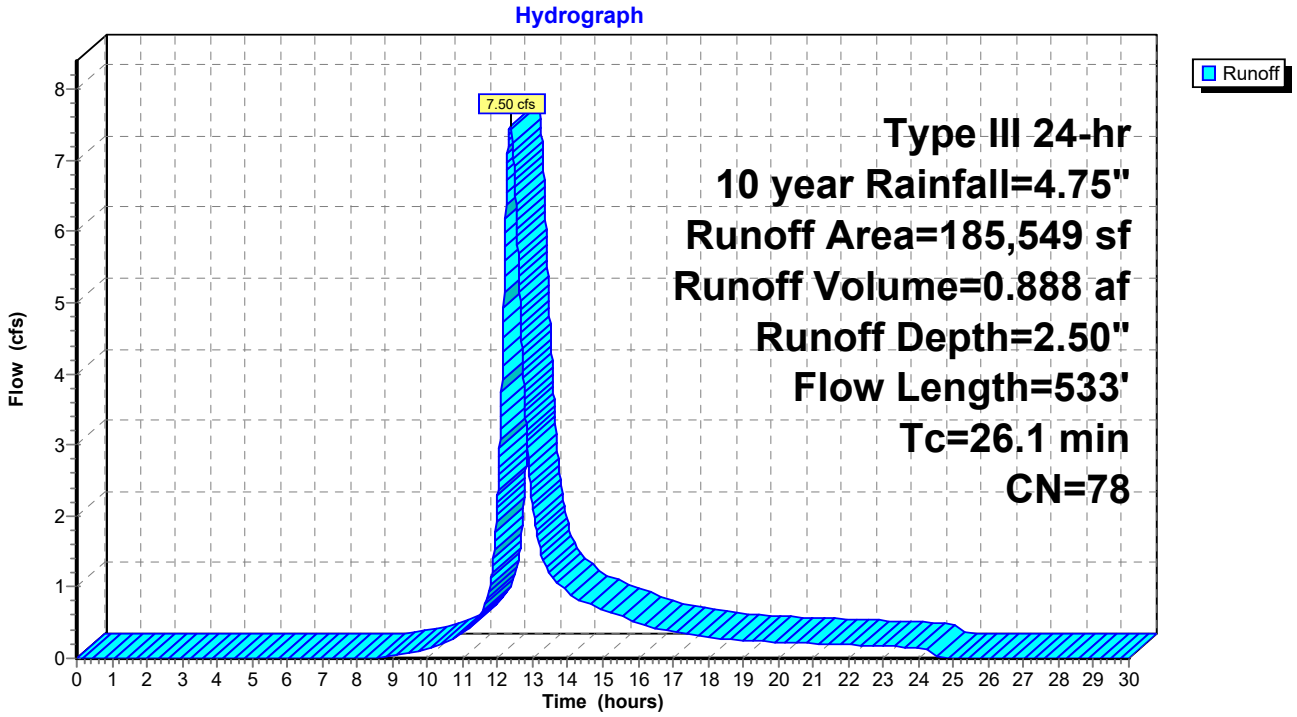
Runoff = 7.50 cfs @ 12.38 hrs, Volume= 0.888 af, Depth= 2.50"
Routed to Pond A' : StormTrap System A

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 year Rainfall=4.75"

Area (sf)	CN	Description
50,170	98	Paved parking, HSG B
102,617	61	>75% Grass cover, Good, HSG B
32,762	98	Roofs, HSG B
185,549	78	Weighted Average
102,617		55.30% Pervious Area
82,932		44.70% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.6	41	0.2668	0.19		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.50"
21.2	190	0.0094	0.15		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.50"
1.3	302	0.0100	3.80	4.67	**Pipe Channel, PIPES TO STORMTRAP** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.018 Corrugated PE, corrugated interior
26.1	533	Total			

Subcatchment A: Drainage Area - A



Summary for Subcatchment B: Drainage Area - B

[47] Hint: Peak is 306% of capacity of segment #3

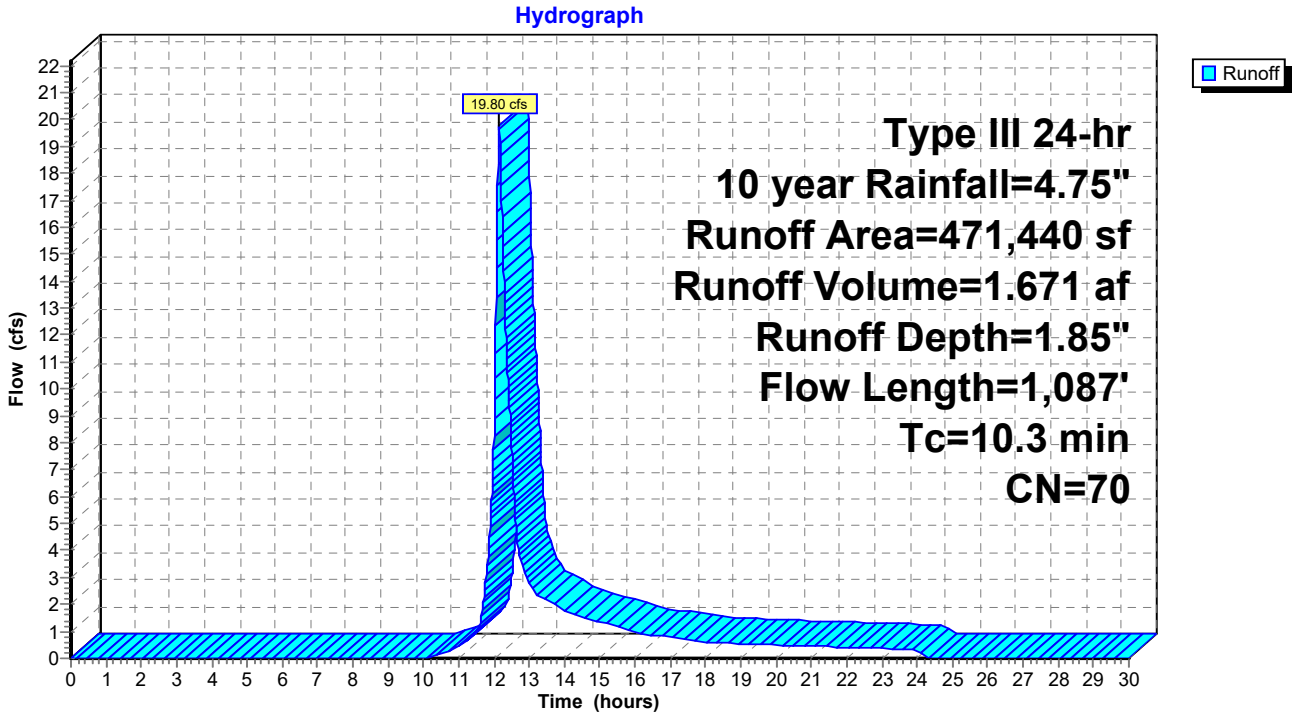
Runoff = 19.80 cfs @ 12.15 hrs, Volume= 1.671 af, Depth= 1.85"
Routed to Pond B' : Storm Trap System B

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 year Rainfall=4.75"

Area (sf)	CN	Description
49,256	98	Paved parking, HSG B
152,096	61	>75% Grass cover, Good, HSG B
65,055	98	Roofs, HSG B
205,033	60	Woods, Fair, HSG B
471,440	70	Weighted Average
357,129		75.75% Pervious Area
114,311		24.25% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	599	0.0348	36.88	457,149.18	**Channel Flow, BIOSWALE** Area= 12,397.0 sf Perim= 1,234.0' r= 10.05' n= 0.035 Riprap, 6-inch
8.9	137	0.3016	0.26		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.50"
1.1	351	0.0100	5.26	6.46	**Pipe Channel, PIPES TO STORMTRAP** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
10.3	1,087	Total			

Subcatchment B: Drainage Area - B



Summary for Subcatchment C: Drainage Area - C

[47] Hint: Peak is 166% of capacity of segment #2

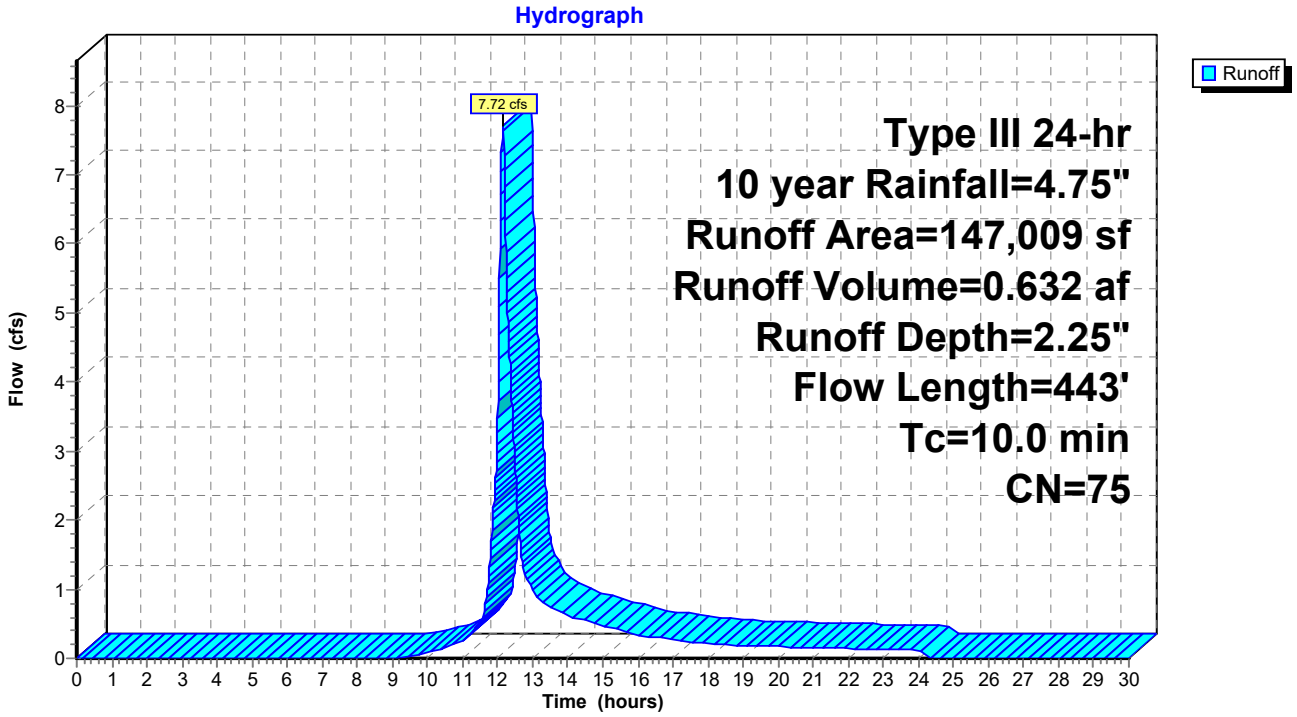
Runoff = 7.72 cfs @ 12.14 hrs, Volume= 0.632 af, Depth= 2.25"
Routed to Pond C' : Storm Trap System C

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 year Rainfall=4.75"

Area (sf)	CN	Description
36,356	98	Paved parking, HSG B
42,997	61	>75% Grass cover, Good, HSG B
19,606	98	Roofs, HSG B
48,050	60	Woods, Fair, HSG B
147,009	75	Weighted Average
91,047		61.93% Pervious Area
55,962		38.07% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.9	182	0.0198	1.62		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.50"
1.1	261	0.0100	3.80	4.67	**Pipe Channel, PIPES TO STORMTRAP** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.018 Corrugated PE, corrugated interior
3.0	443	Total, Increased to minimum Tc = 10.0 min			

Subcatchment C: Drainage Area - C



Summary for Subcatchment D: Drainage Area - D

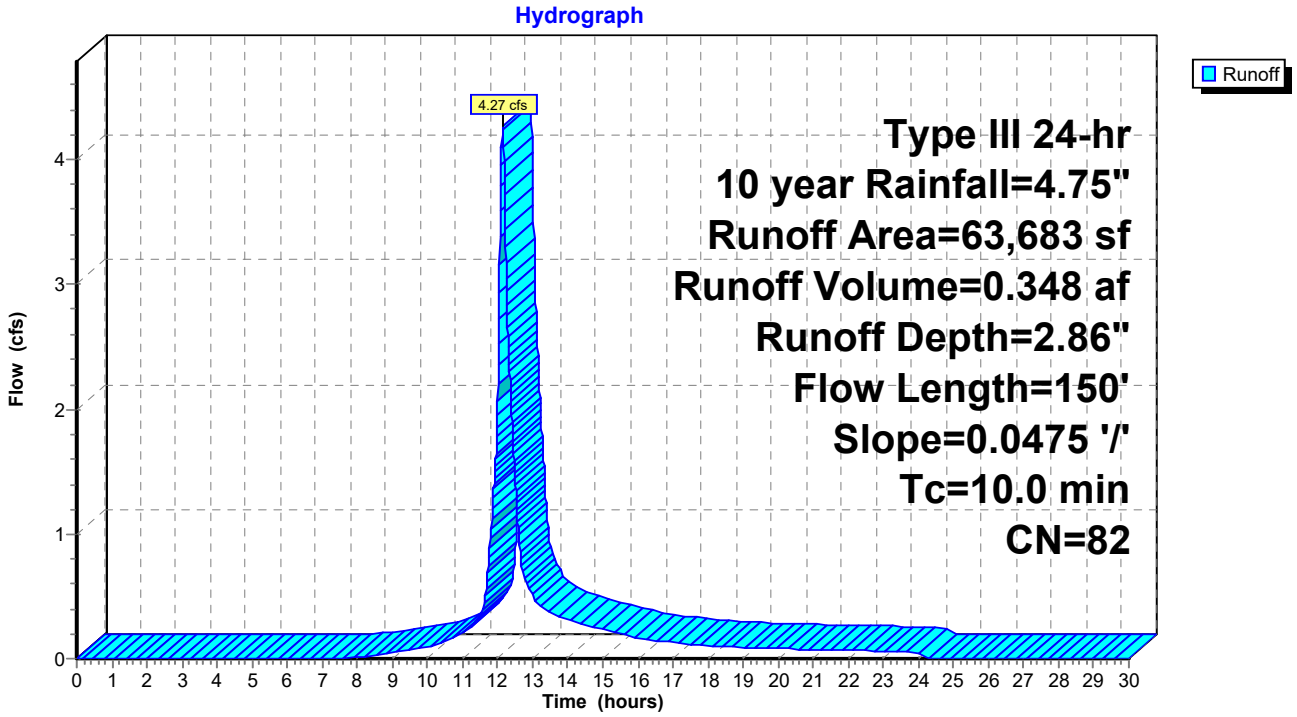
Runoff = 4.27 cfs @ 12.14 hrs, Volume= 0.348 af, Depth= 2.86"
Routed to Link SPA : Study Point A

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 year Rainfall=4.75"

Area (sf)	CN	Description
9,034	98	Paved parking, HSG B
27,967	61	>75% Grass cover, Good, HSG B
26,682	98	Roofs, HSG B
63,683	82	Weighted Average
27,967		43.92% Pervious Area
35,716		56.08% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.2	150	0.0475	0.27		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.50"
9.2	150	Total, Increased to minimum Tc = 10.0 min			

Subcatchment D: Drainage Area - D



Summary for Subcatchment E: Drainage Area - E

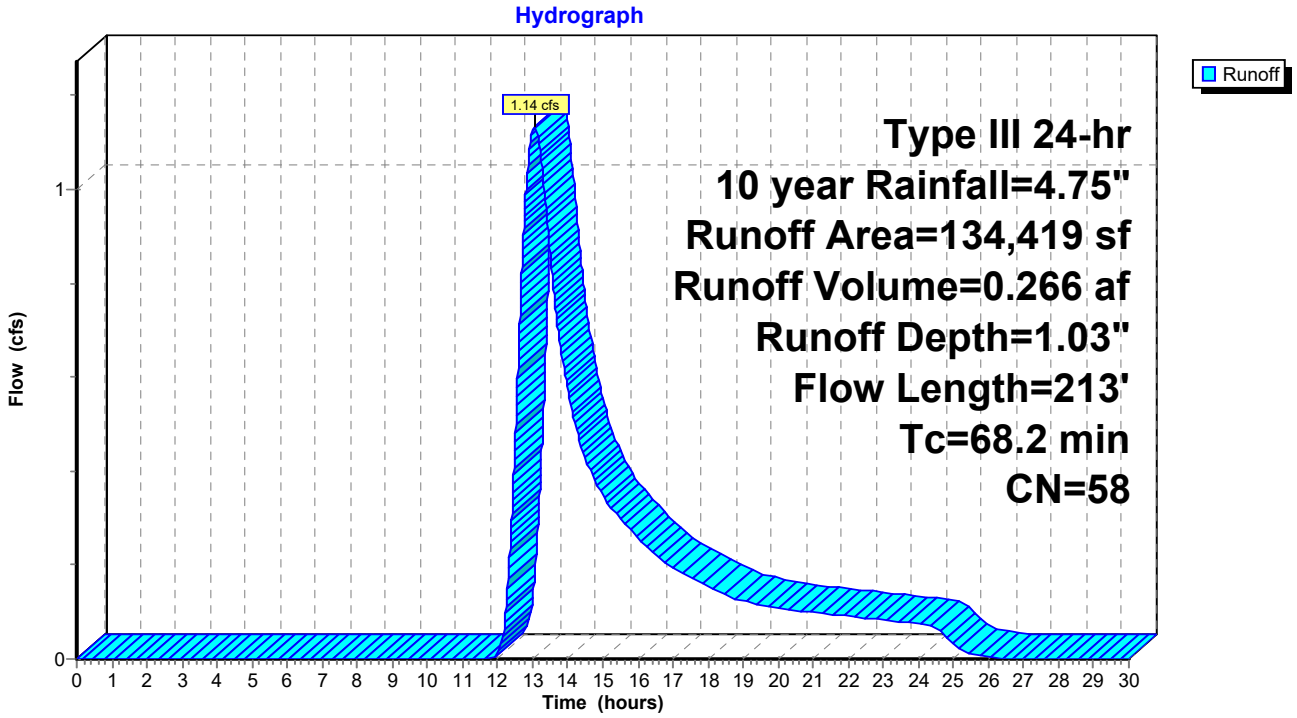
Runoff = 1.14 cfs @ 13.04 hrs, Volume= 0.266 af, Depth= 1.03"
Routed to Link SPA : Study Point A

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 year Rainfall=4.75"

Area (sf)	CN	Description
134,419	58	Woods/grass comb., Good, HSG B
134,419		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
62.7	104	0.0053	0.03		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.50"
5.5	109	0.6400	0.33		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.50"
68.2	213	Total			

Subcatchment E: Drainage Area - E



Summary for Subcatchment F: Drainage Area - F

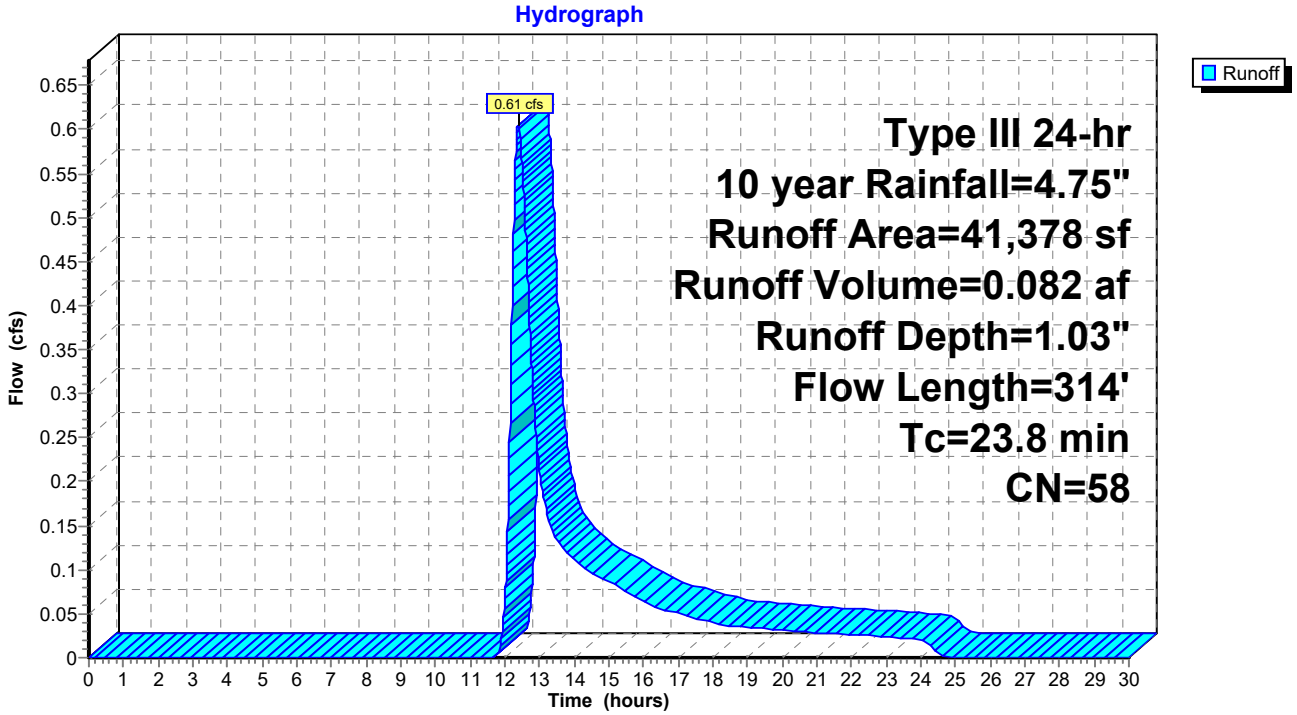
Runoff = 0.61 cfs @ 12.40 hrs, Volume= 0.082 af, Depth= 1.03"
Routed to Link SPD : Study Point D

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 year Rainfall=4.75"

Area (sf)	CN	Description
41,378	58	Woods/grass comb., Good, HSG B
41,378		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.4	71	0.0707	0.13		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.50"
7.7	127	0.3708	0.27		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.50"
4.1	84	0.7722	0.34		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.50"
2.6	32	0.3741	0.21		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.50"
23.8	314	Total			

Subcatchment F: Drainage Area - F



Summary for Pond A': StormTrap System A

Inflow Area = 4.260 ac, 44.70% Impervious, Inflow Depth = 2.50" for 10 year event
Inflow = 7.50 cfs @ 12.38 hrs, Volume= 0.888 af
Outflow = 0.64 cfs @ 11.55 hrs, Volume= 0.888 af, Atten= 91%, Lag= 0.0 min
Discarded = 0.64 cfs @ 11.55 hrs, Volume= 0.888 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Link SPC : Study Point C

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 128.34' @ 15.24 hrs Surf.Area= 5,543 sf Storage= 18,897 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 291.7 min (1,139.8 - 848.1)

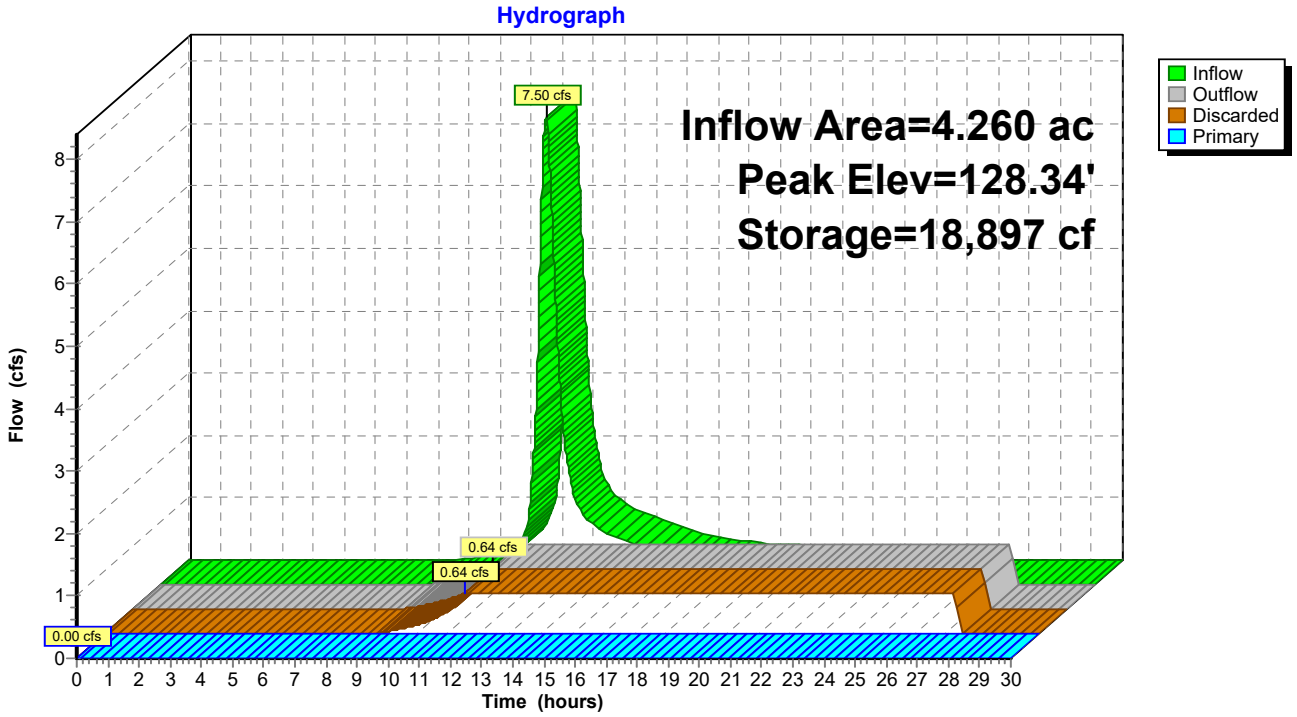
Volume	Invert	Avail.Storage	Storage Description
#1	124.06'	21,599 cf	**StormTrap DoubleTrap 8-6** x 12 Inside= 101.7"W x 102.0"H => 66.71 sf x 15.40'L = 1,027.0 cf Outside= 101.7"W x 114.0"H => 80.55 sf x 15.40'L = 1,240.2 cf 12 Chambers in 4 Rows 33.92' x 46.19' Core + 6.66' Border = 47.23' x 59.50' System
#2	124.06'	20,918 cf	**StormTrap DoubleTrap 8-6** x 10 Inside= 101.7"W x 102.0"H => 66.71 sf x 15.40'L = 1,027.0 cf Outside= 101.7"W x 114.0"H => 80.55 sf x 15.40'L = 1,240.2 cf 10 Chambers in 2 Rows 16.96' x 76.98' Core + 6.66' Border = 30.27' x 90.29' System
		42,517 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	124.06'	**5.000 in/hr Exfiltration over Surface area**
#2	Primary	130.00'	**12.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.64 cfs @ 11.55 hrs HW=124.56' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 0.64 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=124.06' (Free Discharge)
↑**2=Orifice/Grate** (Controls 0.00 cfs)

Pond A': StormTrap System A



Summary for Pond B': Storm Trap System B

Inflow Area = 10.823 ac, 24.25% Impervious, Inflow Depth = 1.85" for 10 year event
Inflow = 19.80 cfs @ 12.15 hrs, Volume= 1.671 af
Outflow = 0.94 cfs @ 11.45 hrs, Volume= 1.475 af, Atten= 95%, Lag= 0.0 min
Discarded = 0.94 cfs @ 11.45 hrs, Volume= 1.475 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Link SPA : Study Point A

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 76.99' @ 16.13 hrs Surf.Area= 8,092 sf Storage= 40,201 cf

Plug-Flow detention time= 429.1 min calculated for 1.475 af (88% of inflow)
Center-of-Mass det. time= 373.9 min (1,228.3 - 854.5)

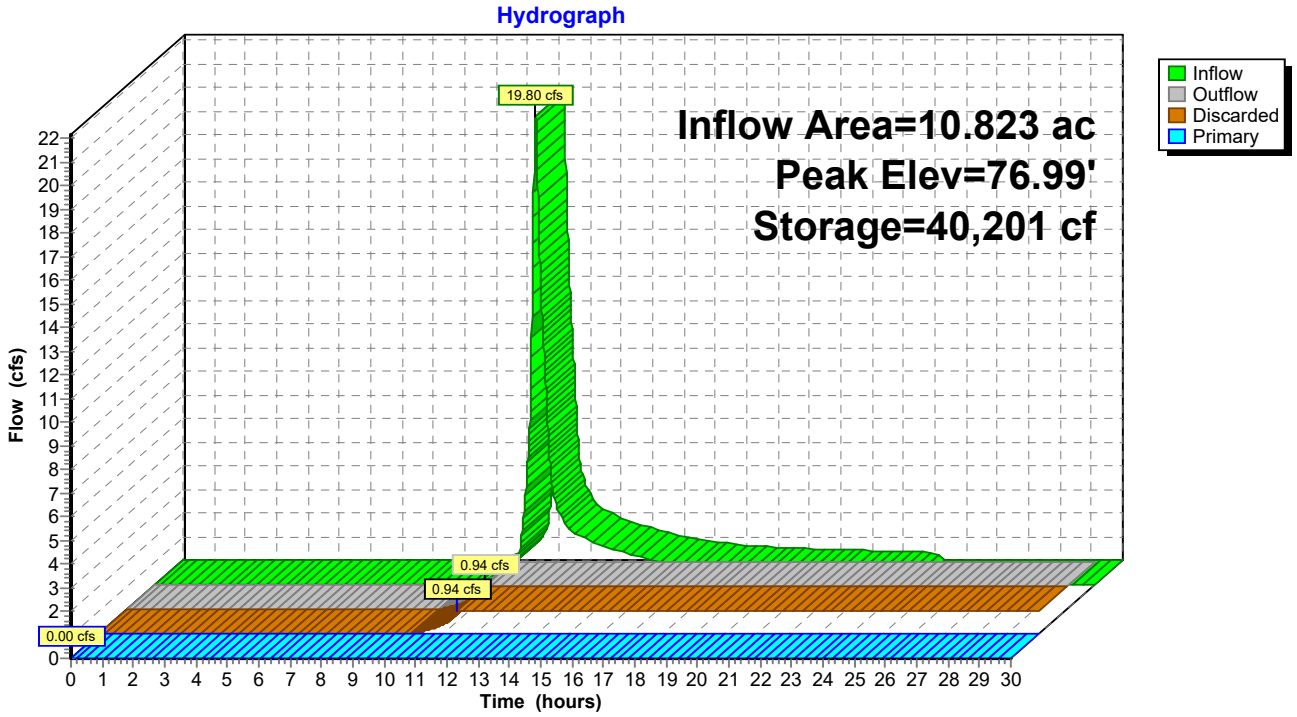
Volume	Invert	Avail.Storage	Storage Description
#1	71.00'	109,769 cf	**StormTrap DoubleTrap 15-0** x 45 Inside= 101.7"W x 180.0"H => 117.67 sf x 15.40'L = 1,811.6 cf Outside= 101.7"W x 192.0"H => 135.67 sf x 15.40'L = 2,088.7 cf 45 Chambers in 9 Rows 76.31' x 76.98' Core + 6.66' Border = 89.63' x 90.29' System

Device	Routing	Invert	Outlet Devices
#1	Discarded	71.00'	**5.000 in/hr Exfiltration over Surface area**
#2	Primary	79.00'	**12.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.94 cfs @ 11.45 hrs HW=71.50' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 0.94 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=71.00' (Free Discharge)
↑**2=Orifice/Grate** (Controls 0.00 cfs)

Pond B': Storm Trap System B



Summary for Pond C': Storm Trap System C

Inflow Area = 3.375 ac, 38.07% Impervious, Inflow Depth = 2.25" for 10 year event
Inflow = 7.72 cfs @ 12.14 hrs, Volume= 0.632 af
Outflow = 0.32 cfs @ 11.18 hrs, Volume= 0.513 af, Atten= 96%, Lag= 0.0 min
Discarded = 0.32 cfs @ 11.18 hrs, Volume= 0.513 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Link SPA : Study Point A

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 73.04' @ 16.25 hrs Surf.Area= 2,733 sf Storage= 15,794 cf

Plug-Flow detention time= 446.7 min calculated for 0.513 af (81% of inflow)
Center-of-Mass det. time= 370.4 min (1,211.4 - 841.1)

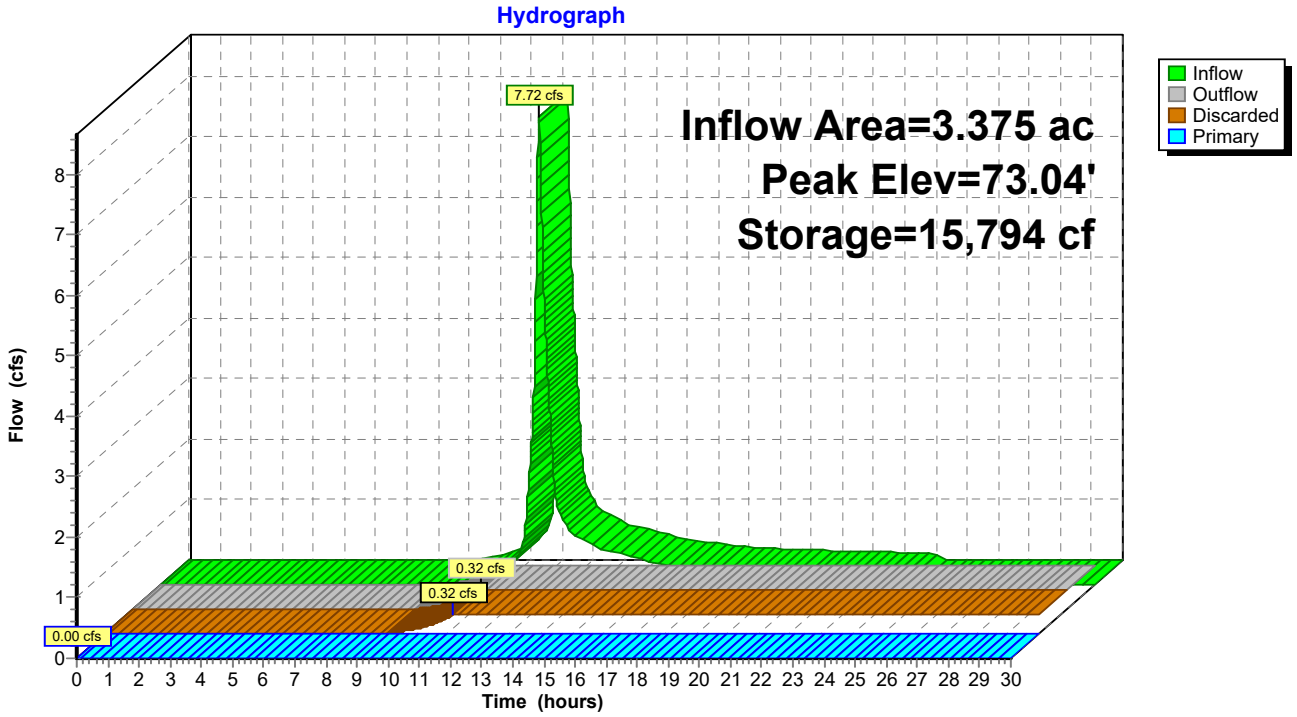
Volume	Invert	Avail.Storage	Storage Description
#1	66.00'	33,796 cf	**StormTrap DoubleTrap 14-0** x 10 Inside= 101.7"W x 168.0"H => 109.55 sf x 15.40'L = 1,686.7 cf Outside= 101.7"W x 180.0"H => 127.19 sf x 15.40'L = 1,958.2 cf 10 Chambers in 2 Rows 16.96' x 76.98' Core + 6.66' Border = 30.27' x 90.29' System

Device	Routing	Invert	Outlet Devices
#1	Discarded	66.00'	**5.000 in/hr Exfiltration over Surface area**
#2	Primary	76.00'	**15.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.32 cfs @ 11.18 hrs HW=66.50' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 0.32 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=66.00' (Free Discharge)
↑**2=Orifice/Grate** (Controls 0.00 cfs)

Pond C': Storm Trap System C

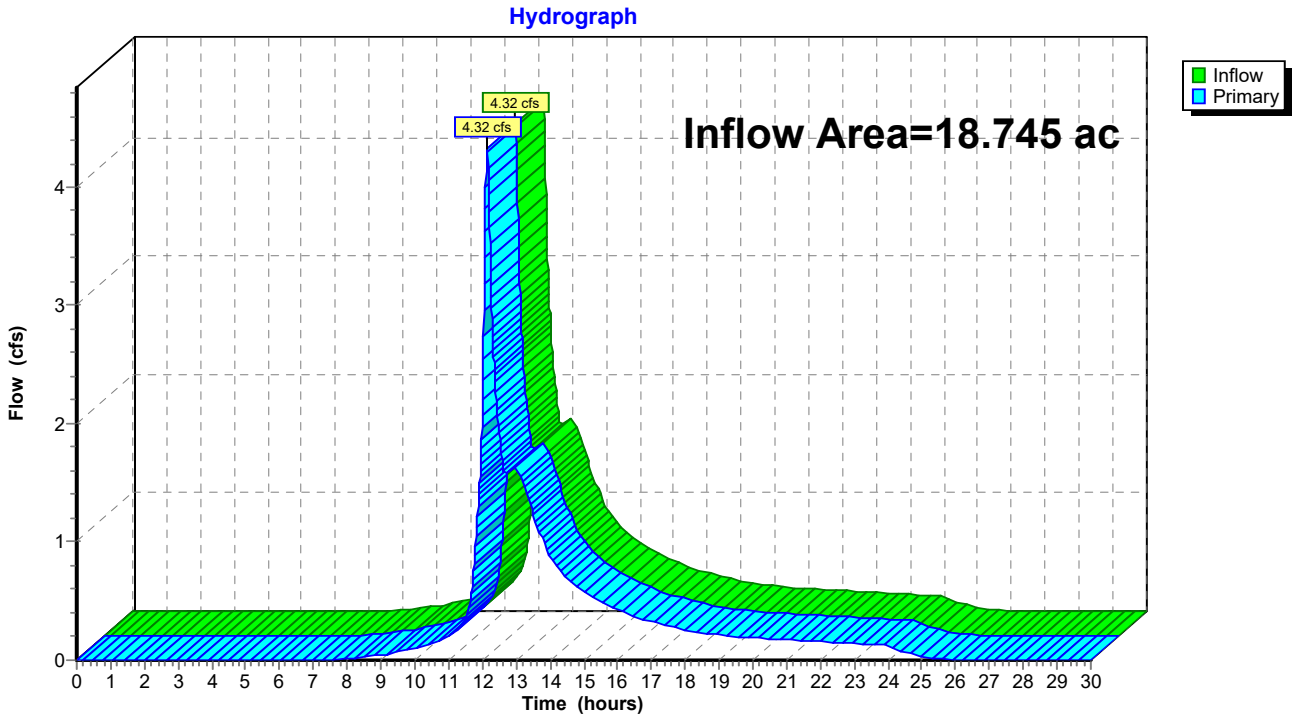


Summary for Link SPA: Study Point A

Inflow Area = 18.745 ac, 25.23% Impervious, Inflow Depth = 0.39" for 10 year event
Inflow = 4.32 cfs @ 12.14 hrs, Volume= 0.614 af
Primary = 4.32 cfs @ 12.14 hrs, Volume= 0.614 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Link SPA: Study Point A

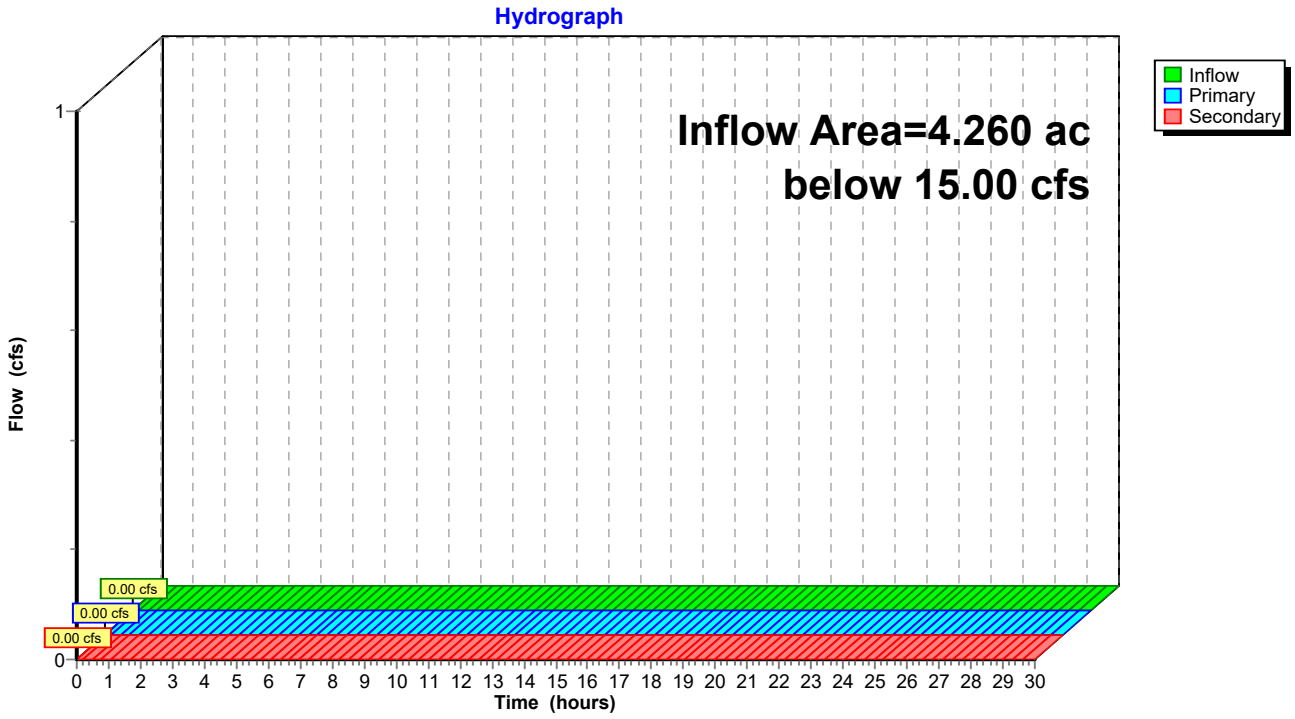


Summary for Link SPC: Study Point C

Inflow Area = 4.260 ac, 44.70% Impervious, Inflow Depth = 0.00" for 10 year event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Primary outflow = Inflow below 15.00 cfs, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Link SPC: Study Point C

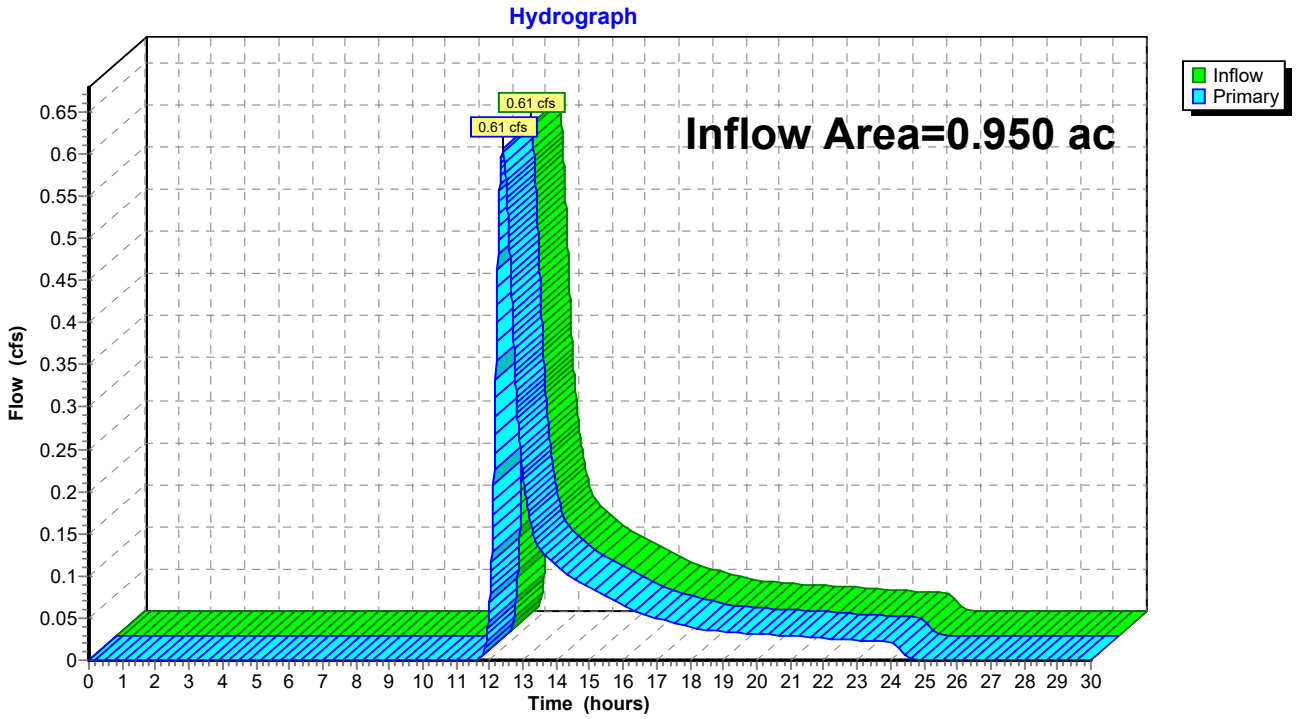


Summary for Link SPD: Study Point D

Inflow Area = 0.950 ac, 0.00% Impervious, Inflow Depth = 1.03" for 10 year event
Inflow = 0.61 cfs @ 12.40 hrs, Volume= 0.082 af
Primary = 0.61 cfs @ 12.40 hrs, Volume= 0.082 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Link SPD: Study Point D



Time span=0.00-30.00 hrs, dt=0.01 hrs, 3001 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 A: Drainage Area - A Runoff Area=185,549 sf 44.70% Impervious Runoff Depth=6.13"
Flow Length=533' Tc=26.1 min CN=78 Runoff=18.22 cfs 2.178 af

Subcatchment B: Drainage Area - B Runoff Area=471,440 sf 24.25% Impervious Runoff Depth=5.16"
Flow Length=1,087' Tc=10.3 min CN=70 Runoff=56.67 cfs 4.653 af

Subcatchment C: Drainage Area - C Runoff Area=147,009 sf 38.07% Impervious Runoff Depth=5.77"
Flow Length=443' Tc=10.0 min CN=75 Runoff=19.82 cfs 1.622 af

Subcatchment D: Drainage Area - D Runoff Area=63,683 sf 56.08% Impervious Runoff Depth=6.62"
Flow Length=150' Slope=0.0475 '/' Tc=10.0 min CN=82 Runoff=9.66 cfs 0.807 af

Subcatchment E: Drainage Area - E Runoff Area=134,419 sf 0.00% Impervious Runoff Depth=3.70"
Flow Length=213' Tc=68.2 min CN=58 Runoff=4.79 cfs 0.952 af

Subcatchment F: Drainage Area - F Runoff Area=41,378 sf 0.00% Impervious Runoff Depth=3.70"
Flow Length=314' Tc=23.8 min CN=58 Runoff=2.54 cfs 0.293 af

Pond A': StormTrap System A Peak Elev=132.40' Storage=39,218 cf Inflow=18.22 cfs 2.178 af
Discarded=0.64 cfs 1.143 af Primary=5.21 cfs 0.804 af Outflow=5.85 cfs 1.947 af

Pond B': Storm Trap System B Peak Elev=84.01' Storage=91,582 cf Inflow=56.67 cfs 4.653 af
Discarded=0.94 cfs 1.642 af Primary=8.03 cfs 2.209 af Outflow=8.97 cfs 3.851 af

Pond C': Storm Trap System C Peak Elev=78.14' Storage=28,097 cf Inflow=19.82 cfs 1.622 af
Discarded=0.32 cfs 0.572 af Primary=7.27 cfs 0.684 af Outflow=7.59 cfs 1.256 af

Link SPA: Study Point A Inflow=20.61 cfs 4.652 af
Primary=20.61 cfs 4.652 af

Link SPC: Study Point C below 15.00 cfs Inflow=5.21 cfs 0.804 af
Primary=5.21 cfs 0.804 af Secondary=0.00 cfs 0.000 af

Link SPD: Study Point D Inflow=2.54 cfs 0.293 af
Primary=2.54 cfs 0.293 af

Total Runoff Area = 23.955 ac Runoff Volume = 10.506 af Average Runoff Depth = 5.26"
72.31% Pervious = 17.322 ac 27.69% Impervious = 6.633 ac

Summary for Subcatchment A: Drainage Area - A

[47] Hint: Peak is 391% of capacity of segment #3

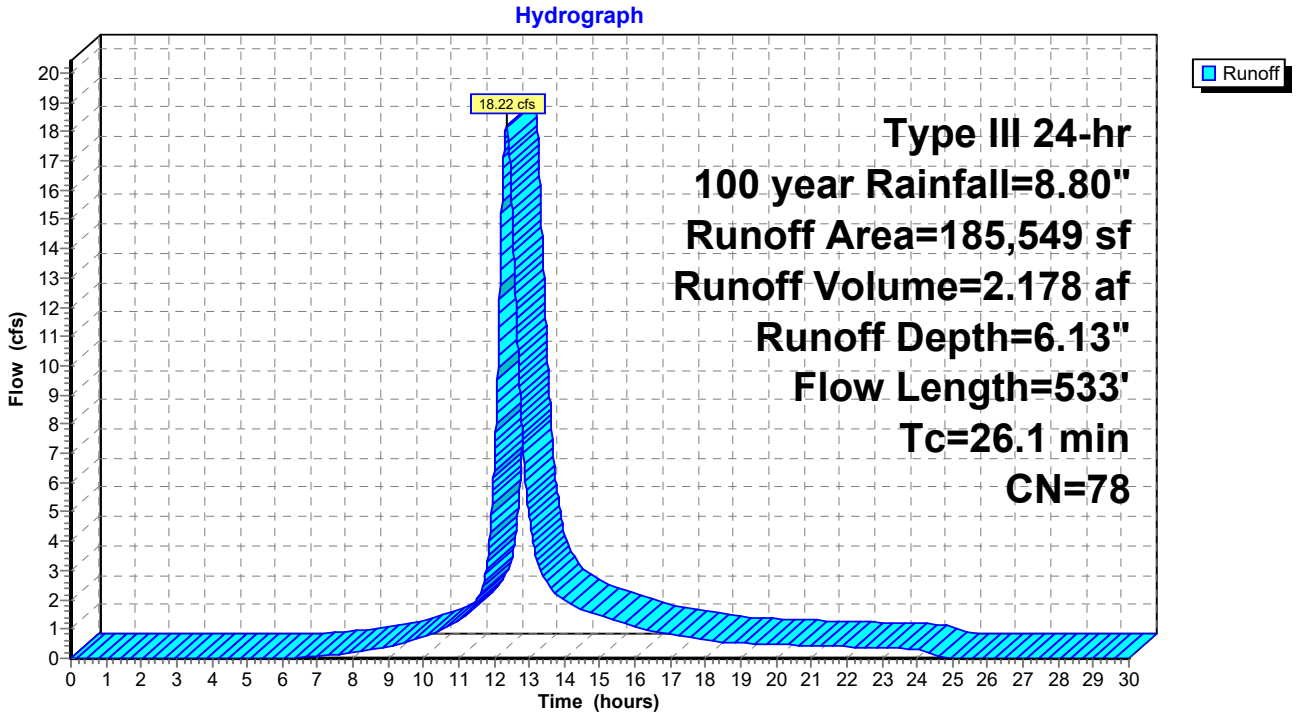
Runoff = 18.22 cfs @ 12.35 hrs, Volume= 2.178 af, Depth= 6.13"
Routed to Pond A' : StormTrap System A

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 year Rainfall=8.80"

Area (sf)	CN	Description
50,170	98	Paved parking, HSG B
102,617	61	>75% Grass cover, Good, HSG B
32,762	98	Roofs, HSG B
185,549	78	Weighted Average
102,617		55.30% Pervious Area
82,932		44.70% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.6	41	0.2668	0.19		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.50"
21.2	190	0.0094	0.15		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.50"
1.3	302	0.0100	3.80	4.67	**Pipe Channel, PIPES TO STORMTRAP** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.018 Corrugated PE, corrugated interior
26.1	533	Total			

Subcatchment A: Drainage Area - A



Summary for Subcatchment B: Drainage Area - B

[47] Hint: Peak is 877% of capacity of segment #3

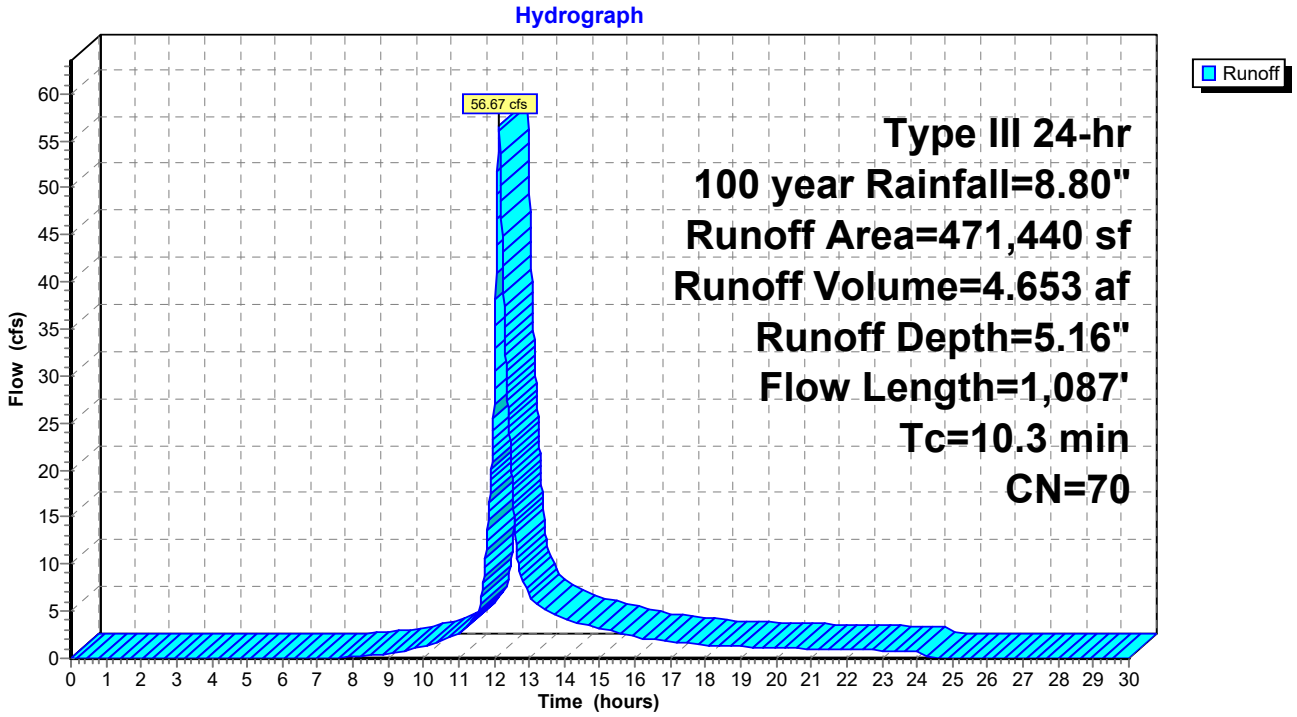
Runoff = 56.67 cfs @ 12.14 hrs, Volume= 4.653 af, Depth= 5.16"
Routed to Pond B' : Storm Trap System B

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 year Rainfall=8.80"

Area (sf)	CN	Description
49,256	98	Paved parking, HSG B
152,096	61	>75% Grass cover, Good, HSG B
65,055	98	Roofs, HSG B
205,033	60	Woods, Fair, HSG B
471,440	70	Weighted Average
357,129		75.75% Pervious Area
114,311		24.25% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	599	0.0348	36.88	457,149.18	**Channel Flow, BIOSWALE** Area= 12,397.0 sf Perim= 1,234.0' r= 10.05' n= 0.035 Riprap, 6-inch
8.9	137	0.3016	0.26		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.50"
1.1	351	0.0100	5.26	6.46	**Pipe Channel, PIPES TO STORMTRAP** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
10.3	1,087	Total			

Subcatchment B: Drainage Area - B



Summary for Subcatchment C: Drainage Area - C

[47] Hint: Peak is 425% of capacity of segment #2

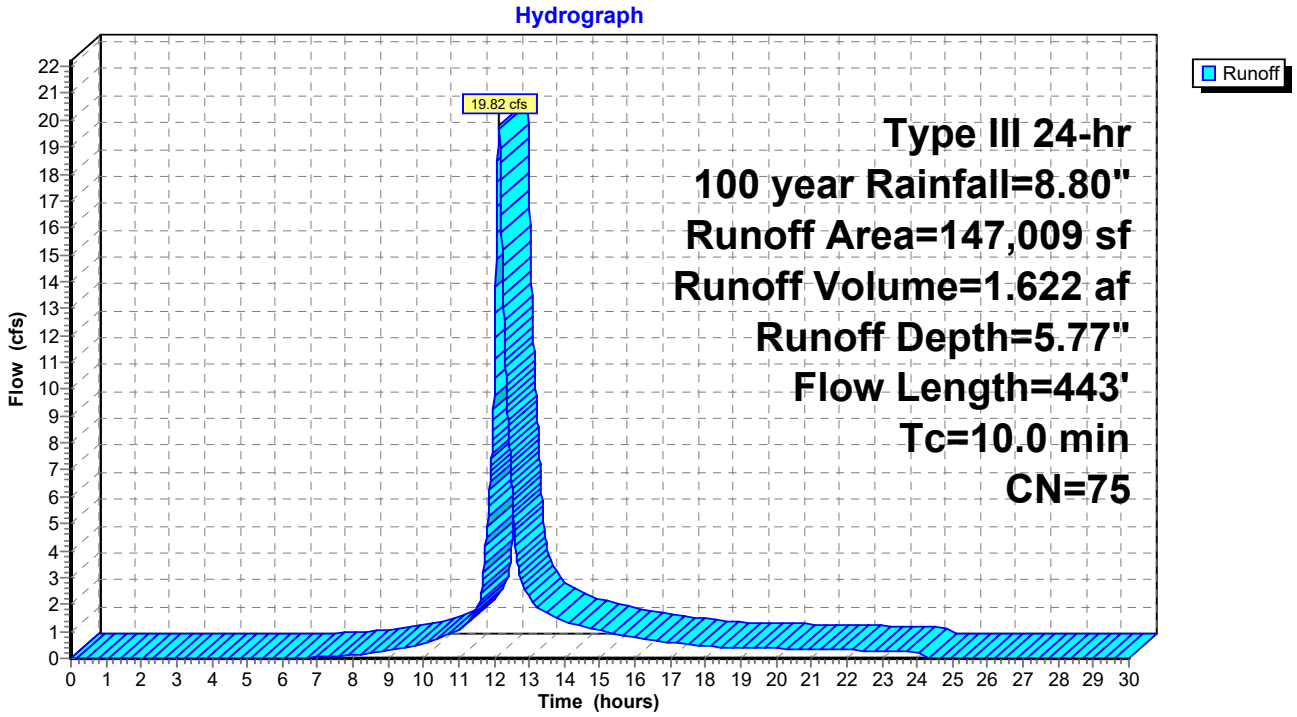
Runoff = 19.82 cfs @ 12.14 hrs, Volume= 1.622 af, Depth= 5.77"
Routed to Pond C' : Storm Trap System C

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 year Rainfall=8.80"

Area (sf)	CN	Description
36,356	98	Paved parking, HSG B
42,997	61	>75% Grass cover, Good, HSG B
19,606	98	Roofs, HSG B
48,050	60	Woods, Fair, HSG B
147,009	75	Weighted Average
91,047		61.93% Pervious Area
55,962		38.07% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.9	182	0.0198	1.62		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.50"
1.1	261	0.0100	3.80	4.67	**Pipe Channel, PIPES TO STORMTRAP** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.018 Corrugated PE, corrugated interior
3.0	443	Total, Increased to minimum Tc = 10.0 min			

Subcatchment C: Drainage Area - C



Summary for Subcatchment D: Drainage Area - D

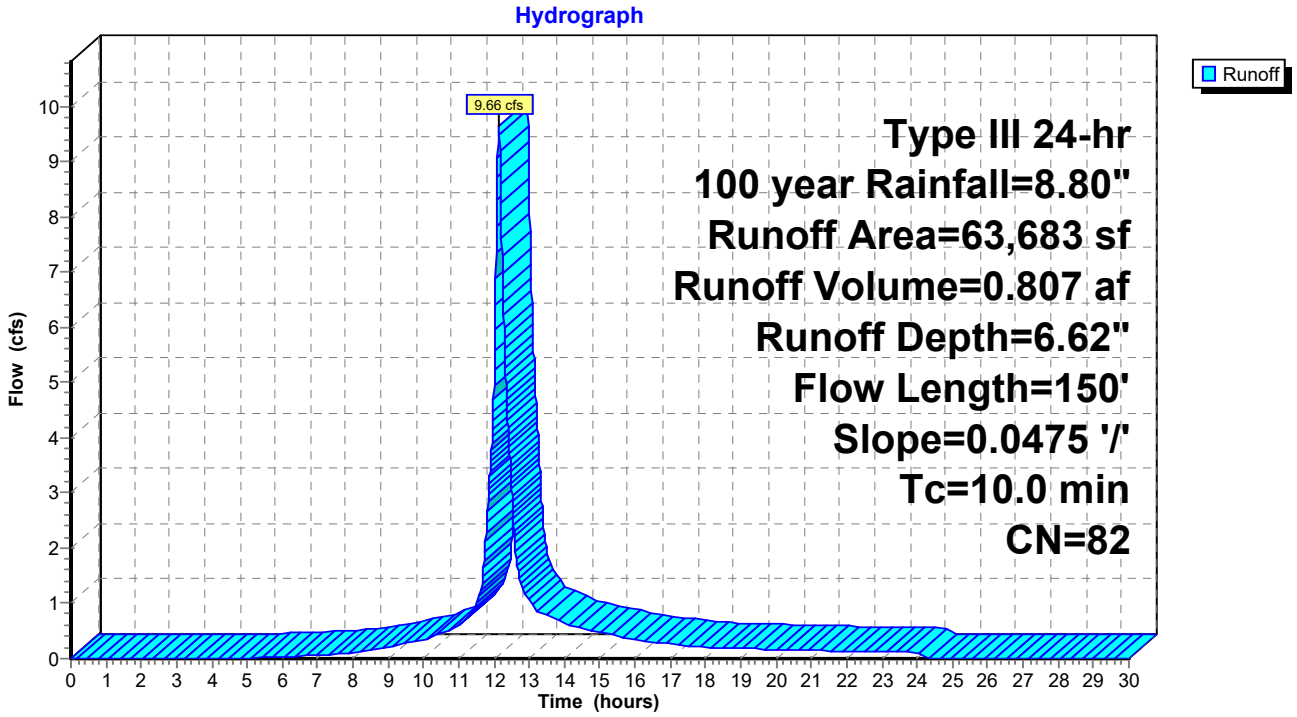
Runoff = 9.66 cfs @ 12.14 hrs, Volume= 0.807 af, Depth= 6.62"
Routed to Link SPA : Study Point A

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 year Rainfall=8.80"

Area (sf)	CN	Description
9,034	98	Paved parking, HSG B
27,967	61	>75% Grass cover, Good, HSG B
26,682	98	Roofs, HSG B
63,683	82	Weighted Average
27,967		43.92% Pervious Area
35,716		56.08% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.2	150	0.0475	0.27		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.50"
9.2	150	Total, Increased to minimum Tc = 10.0 min			

Subcatchment D: Drainage Area - D



Summary for Subcatchment E: Drainage Area - E

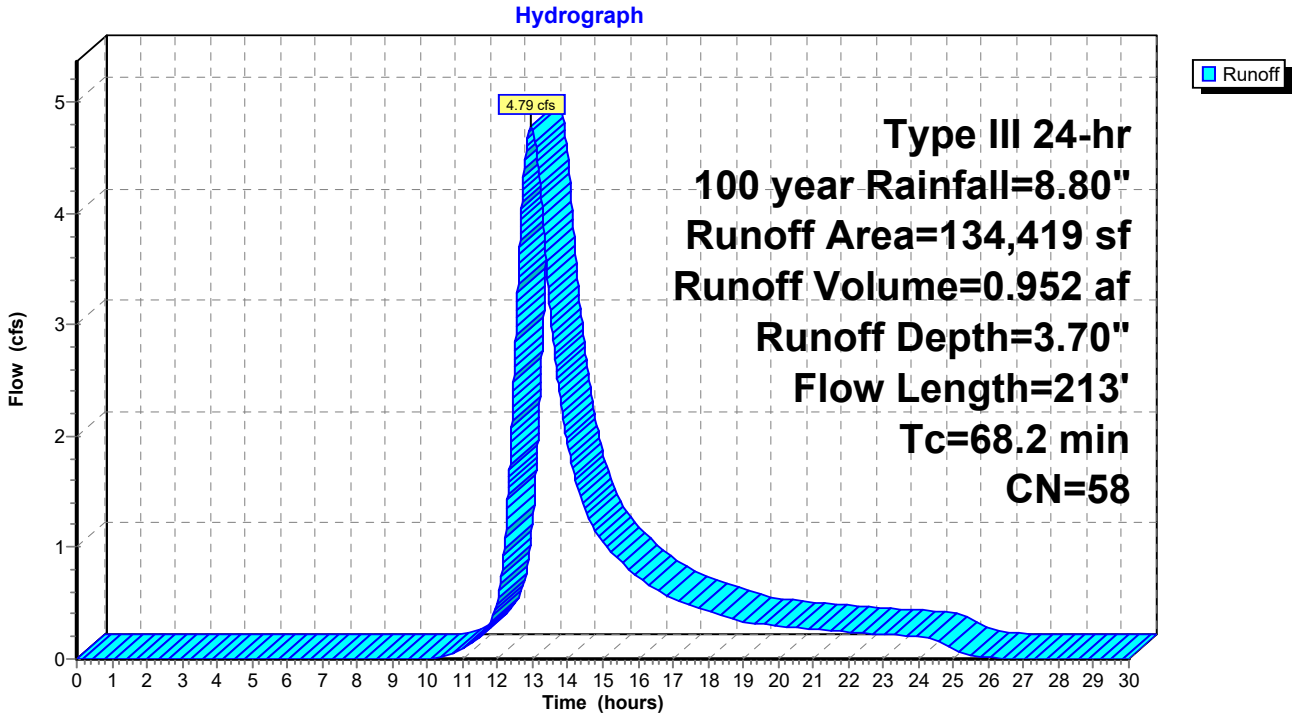
Runoff = 4.79 cfs @ 12.96 hrs, Volume= 0.952 af, Depth= 3.70"
Routed to Link SPA : Study Point A

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 year Rainfall=8.80"

Area (sf)	CN	Description
134,419	58	Woods/grass comb., Good, HSG B
134,419		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
62.7	104	0.0053	0.03		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.50"
5.5	109	0.6400	0.33		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.50"
68.2	213	Total			

Subcatchment E: Drainage Area - E



Summary for Subcatchment F: Drainage Area - F

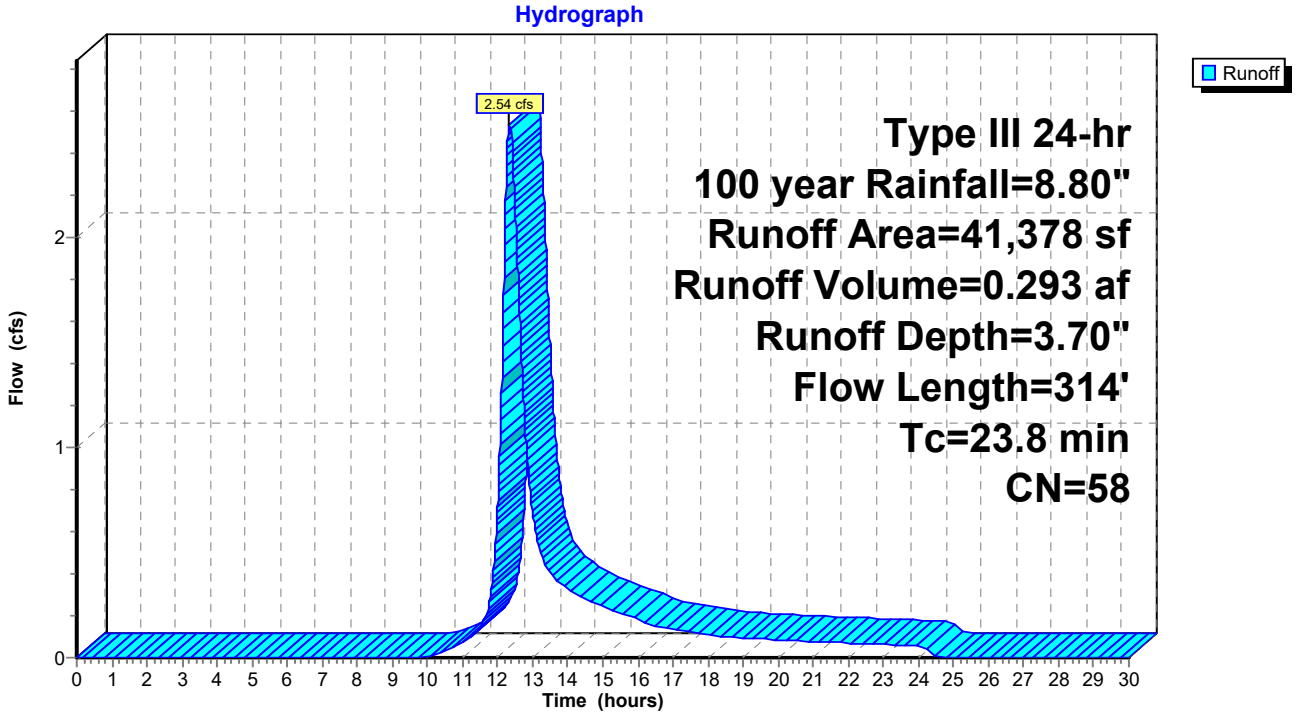
Runoff = 2.54 cfs @ 12.35 hrs, Volume= 0.293 af, Depth= 3.70"
Routed to Link SPD : Study Point D

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 year Rainfall=8.80"

Area (sf)	CN	Description
41,378	58	Woods/grass comb., Good, HSG B
41,378		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.4	71	0.0707	0.13		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.50"
7.7	127	0.3708	0.27		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.50"
4.1	84	0.7722	0.34		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.50"
2.6	32	0.3741	0.21		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.50"
23.8	314	Total			

Subcatchment F: Drainage Area - F



Summary for Pond A': StormTrap System A

Inflow Area = 4.260 ac, 44.70% Impervious, Inflow Depth = 6.13" for 100 year event
Inflow = 18.22 cfs @ 12.35 hrs, Volume= 2.178 af
Outflow = 5.85 cfs @ 12.91 hrs, Volume= 1.947 af, Atten= 68%, Lag= 33.4 min
Discarded = 0.64 cfs @ 9.76 hrs, Volume= 1.143 af
Primary = 5.21 cfs @ 12.91 hrs, Volume= 0.804 af
Routed to Link SPC : Study Point C

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 132.40' @ 12.91 hrs Surf.Area= 5,543 sf Storage= 39,218 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 197.9 min (1,020.4 - 822.5)

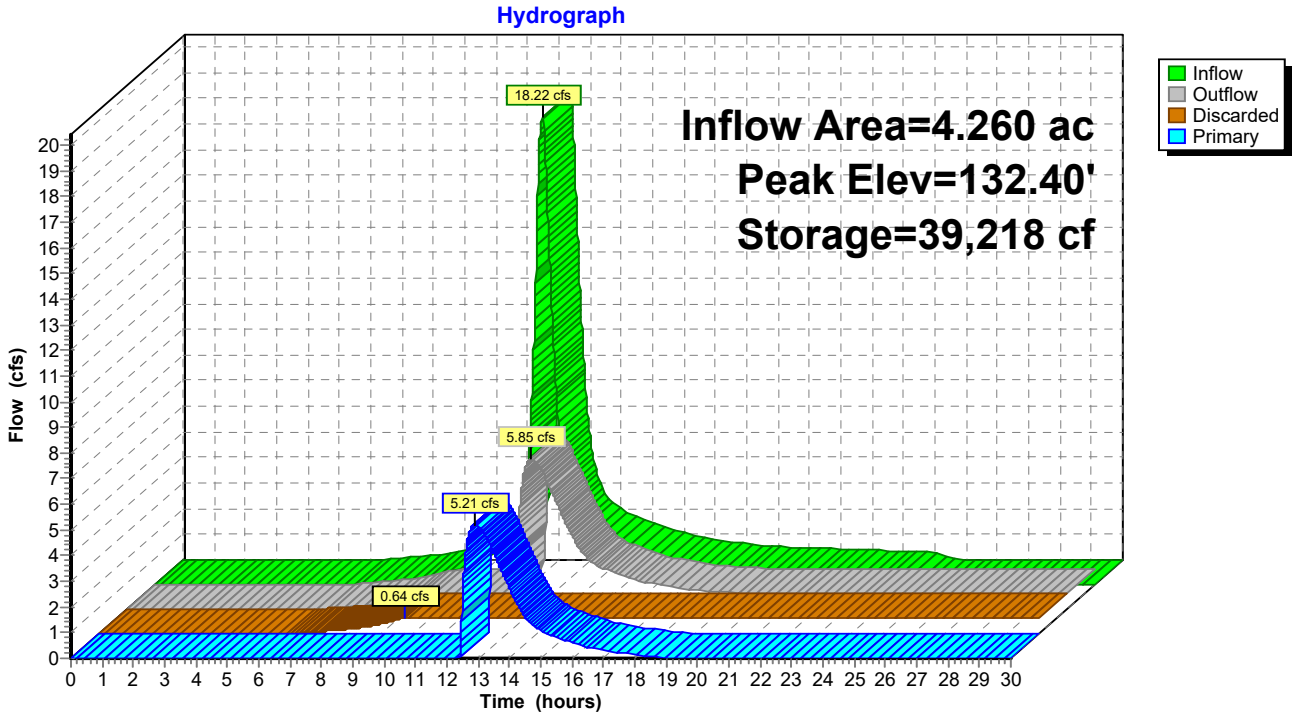
Volume	Invert	Avail.Storage	Storage Description
#1	124.06'	21,599 cf	**StormTrap DoubleTrap 8-6** x 12 Inside= 101.7"W x 102.0"H => 66.71 sf x 15.40'L = 1,027.0 cf Outside= 101.7"W x 114.0"H => 80.55 sf x 15.40'L = 1,240.2 cf 12 Chambers in 4 Rows 33.92' x 46.19' Core + 6.66' Border = 47.23' x 59.50' System
#2	124.06'	20,918 cf	**StormTrap DoubleTrap 8-6** x 10 Inside= 101.7"W x 102.0"H => 66.71 sf x 15.40'L = 1,027.0 cf Outside= 101.7"W x 114.0"H => 80.55 sf x 15.40'L = 1,240.2 cf 10 Chambers in 2 Rows 16.96' x 76.98' Core + 6.66' Border = 30.27' x 90.29' System
		42,517 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	124.06'	**5.000 in/hr Exfiltration over Surface area**
#2	Primary	130.00'	**12.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.64 cfs @ 9.76 hrs HW=124.56' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.64 cfs)

Primary OutFlow Max=5.21 cfs @ 12.91 hrs HW=132.40' (Free Discharge)
↑—**2=Orifice/Grate** (Orifice Controls 5.21 cfs @ 6.64 fps)

Pond A': StormTrap System A



Summary for Pond B': Storm Trap System B

Inflow Area = 10.823 ac, 24.25% Impervious, Inflow Depth = 5.16" for 100 year event
Inflow = 56.67 cfs @ 12.14 hrs, Volume= 4.653 af
Outflow = 8.97 cfs @ 12.75 hrs, Volume= 3.851 af, Atten= 84%, Lag= 36.6 min
Discarded = 0.94 cfs @ 9.63 hrs, Volume= 1.642 af
Primary = 8.03 cfs @ 12.75 hrs, Volume= 2.209 af
Routed to Link SPA : Study Point A

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 84.01' @ 12.75 hrs Surf.Area= 8,092 sf Storage= 91,582 cf

Plug-Flow detention time= 240.3 min calculated for 3.850 af (83% of inflow)
Center-of-Mass det. time= 169.7 min (994.4 - 824.6)

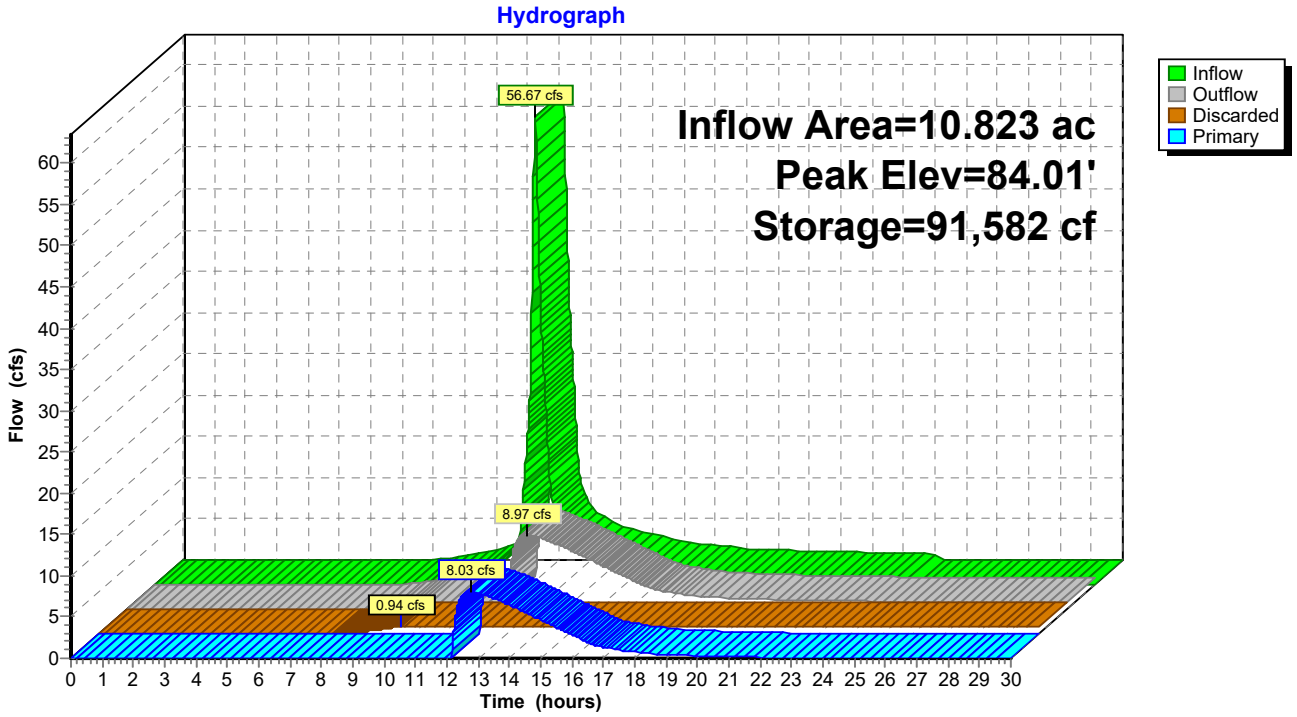
Volume	Invert	Avail.Storage	Storage Description
#1	71.00'	109,769 cf	**StormTrap DoubleTrap 15-0** x 45 Inside= 101.7"W x 180.0"H => 117.67 sf x 15.40'L = 1,811.6 cf Outside= 101.7"W x 192.0"H => 135.67 sf x 15.40'L = 2,088.7 cf 45 Chambers in 9 Rows 76.31' x 76.98' Core + 6.66' Border = 89.63' x 90.29' System

Device	Routing	Invert	Outlet Devices
#1	Discarded	71.00'	**5.000 in/hr Exfiltration over Surface area**
#2	Primary	79.00'	**12.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.94 cfs @ 9.63 hrs HW=71.50' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 0.94 cfs)

Primary OutFlow Max=8.04 cfs @ 12.75 hrs HW=84.01' (Free Discharge)
↑**2=Orifice/Grate** (Orifice Controls 8.04 cfs @ 10.23 fps)

Pond B': Storm Trap System B



Summary for Pond C': Storm Trap System C

Inflow Area = 3.375 ac, 38.07% Impervious, Inflow Depth = 5.77" for 100 year event
Inflow = 19.82 cfs @ 12.14 hrs, Volume= 1.622 af
Outflow = 7.59 cfs @ 12.45 hrs, Volume= 1.256 af, Atten= 62%, Lag= 18.9 min
Discarded = 0.32 cfs @ 9.13 hrs, Volume= 0.572 af
Primary = 7.27 cfs @ 12.45 hrs, Volume= 0.684 af
Routed to Link SPA : Study Point A

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 78.14' @ 12.45 hrs Surf.Area= 2,733 sf Storage= 28,097 cf

Plug-Flow detention time= 237.6 min calculated for 1.256 af (77% of inflow)
Center-of-Mass det. time= 155.9 min (969.9 - 814.0)

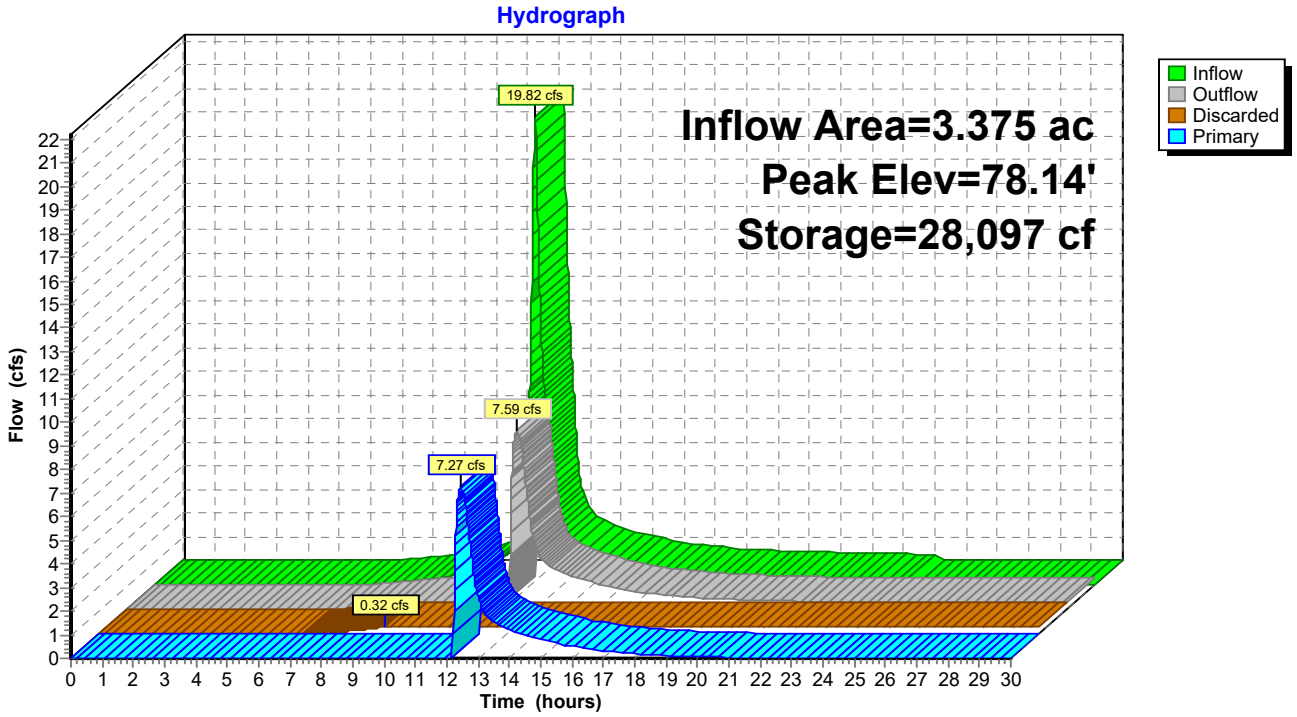
Volume	Invert	Avail.Storage	Storage Description
#1	66.00'	33,796 cf	**StormTrap DoubleTrap 14-0** x 10 Inside= 101.7"W x 168.0"H => 109.55 sf x 15.40'L = 1,686.7 cf Outside= 101.7"W x 180.0"H => 127.19 sf x 15.40'L = 1,958.2 cf 10 Chambers in 2 Rows 16.96' x 76.98' Core + 6.66' Border = 30.27' x 90.29' System

Device	Routing	Invert	Outlet Devices
#1	Discarded	66.00'	**5.000 in/hr Exfiltration over Surface area**
#2	Primary	76.00'	**15.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.32 cfs @ 9.13 hrs HW=66.50' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.32 cfs)

Primary OutFlow Max=7.27 cfs @ 12.45 hrs HW=78.14' (Free Discharge)
↑—**2=Orifice/Grate** (Orifice Controls 7.27 cfs @ 5.92 fps)

Pond C': Storm Trap System C

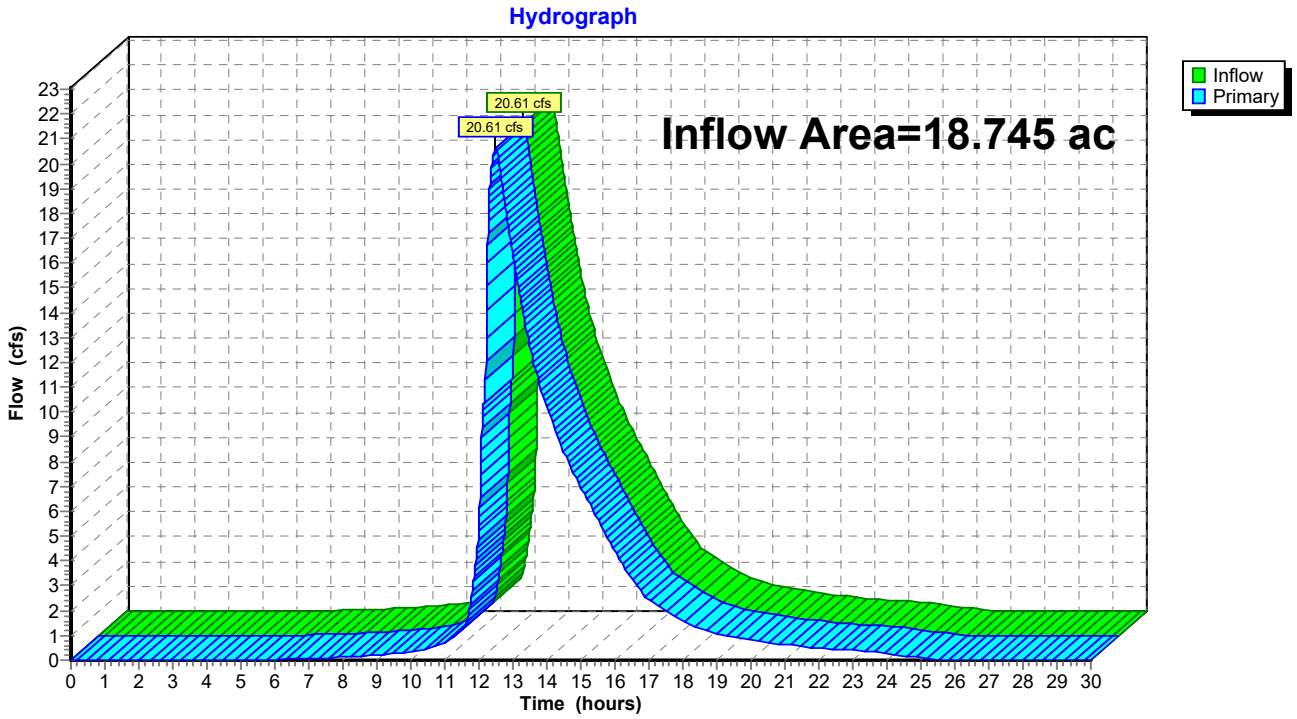


Summary for Link SPA: Study Point A

Inflow Area = 18.745 ac, 25.23% Impervious, Inflow Depth = 2.98" for 100 year event
Inflow = 20.61 cfs @ 12.48 hrs, Volume= 4.652 af
Primary = 20.61 cfs @ 12.48 hrs, Volume= 4.652 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Link SPA: Study Point A

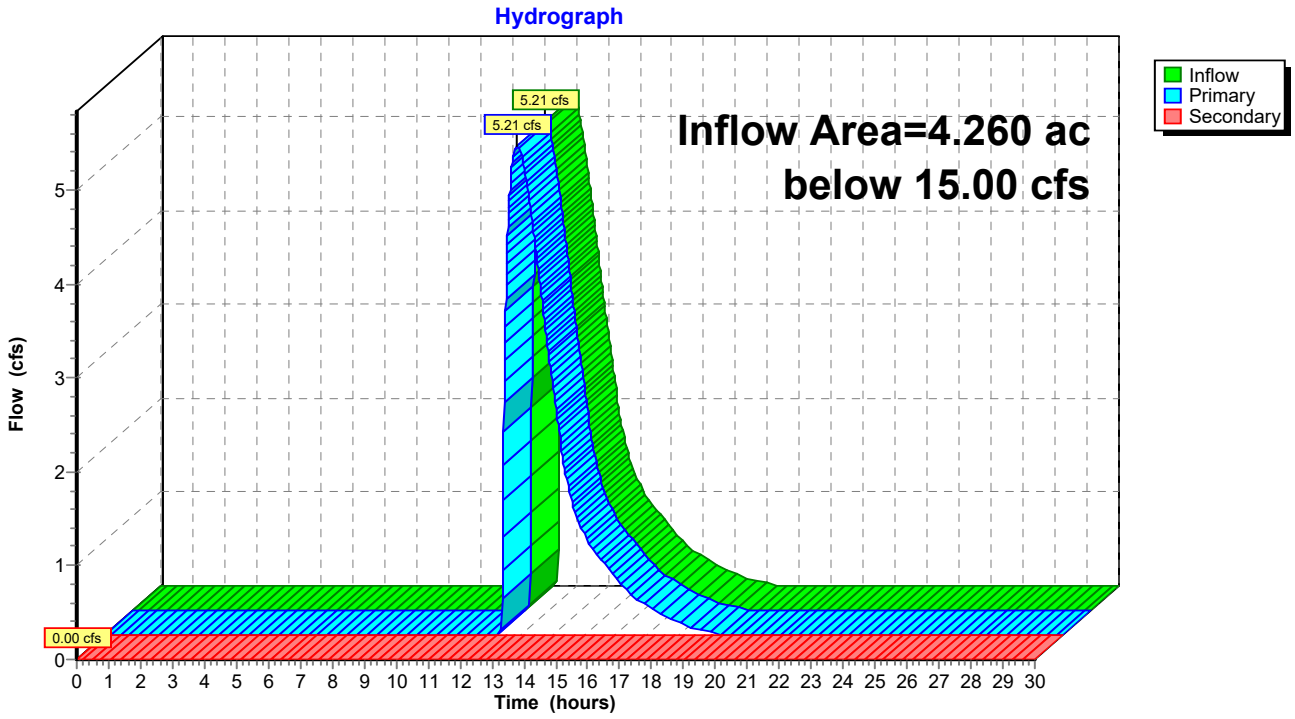


Summary for Link SPC: Study Point C

Inflow Area = 4.260 ac, 44.70% Impervious, Inflow Depth = 2.27" for 100 year event
Inflow = 5.21 cfs @ 12.91 hrs, Volume= 0.804 af
Primary = 5.21 cfs @ 12.91 hrs, Volume= 0.804 af, Atten= 0%, Lag= 0.0 min
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Primary outflow = Inflow below 15.00 cfs, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Link SPC: Study Point C

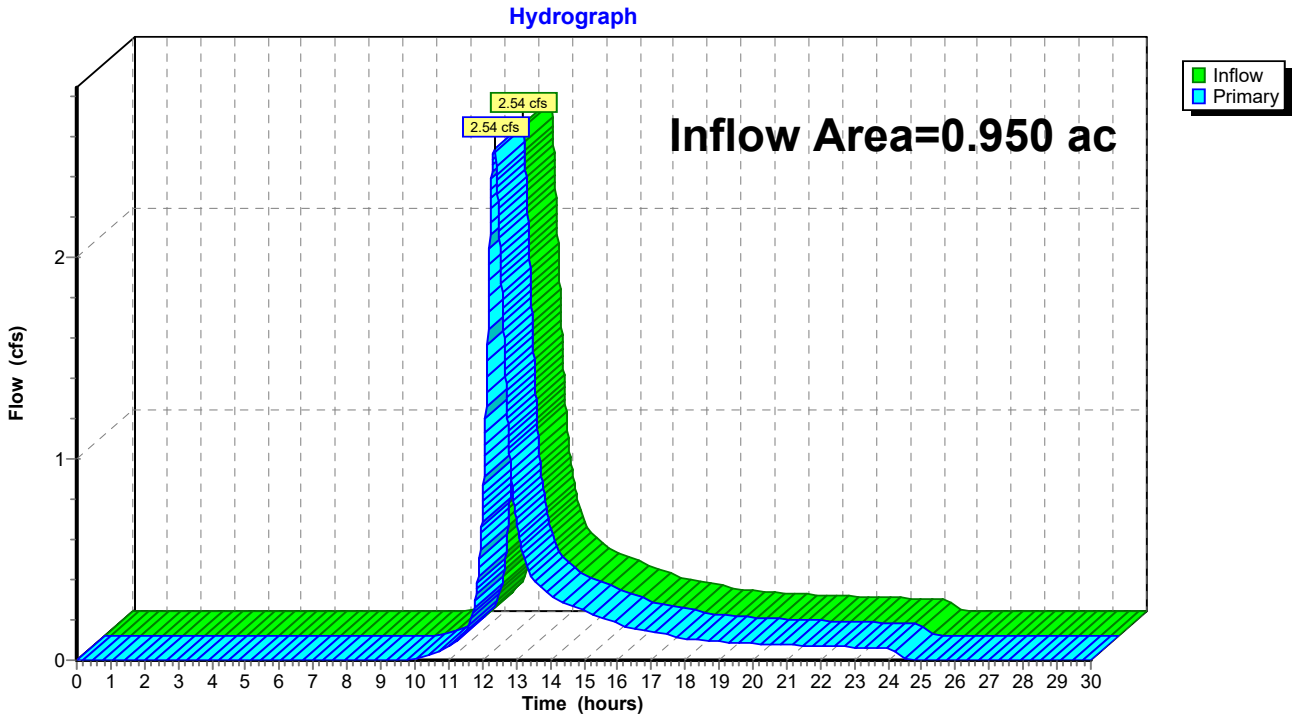


Summary for Link SPD: Study Point D

Inflow Area = 0.950 ac, 0.00% Impervious, Inflow Depth = 3.70" for 100 year event
Inflow = 2.54 cfs @ 12.35 hrs, Volume= 0.293 af
Primary = 2.54 cfs @ 12.35 hrs, Volume= 0.293 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Link SPD: Study Point D



Attachment C:
Operations and Maintenance

Operations & Maintenance Plan

The Site Operator is responsible for the operation and maintenance of the installed stormwater management practices to ensure proper functionality throughout the life of the system. Regular maintenance of stormwater management practices is important for flood control, structural integrity, and water quality. The following lists all procedures for inspection and maintenance for post-development Stormwater Management Practices:

Pipe Manifold Storage and Catch Basin System:

Inspection Requirements:

Drainage structures should be inspected at least once per year to ensure proper operation. Common system deficiencies which may occur over time, include but are not limited to:

- Excessive debris, silt, or sediment build-up inside of structure/piping
- Cracks or other damage to the structure
- Collapsed or blocked pipes
- Excessive ponding around drainage structures

Maintenance Requirements:

Should problems be encountered during inspection, maintenance is required as follows:

- Debris, silt, and sediment buildup shall be removed from structures.
- Pipes shall be cleaned of debris and/or sediment.
- Repair to existing structures/piping.

The Site Operator is required to maintain a log of all inspections and/or maintenance that is performed on the system. The log shall include all pertinent information necessary to record the results of the inspections as well as any necessary repair to the system.

Landscape Areas and Rain Garden:

Inspection Requirements:

Landscaped areas, including the proposed Rain Garden, should be inspected at least twice per year to ensure proper operation. Common system deficiencies which may occur over time, include but are not limited to:

- Dead plants or turf areas resulting from drought or illness.
- Erosion from surface runoff.
- Sediment build-up in low areas.

Maintenance Requirements:

- Re-seeding/watering of dead lawn areas.
- Removal of sediment build-up.
- Re-grading and re-establishment of landscaping in eroded areas.
- Weeding and mulching as needed.
- Mowing, watering, and general landscape maintenance as required.

Parking Areas:

Inspection Requirements:

Parking and paved areas should be inspected at least twice per year to ensure proper operation. Common system deficiencies which may occur over time, include but are not limited to:

- Broken pavement or sink holes around drainage inlets.
- Evidence of ponding in intermittent low areas.
- Sand and Salt build up from snow operations.

Maintenance Requirements:

- Repairing of any damaged pavement or low areas.
- Sweeping and removing any sediment or debris on the pavement, as necessary.

The Site Operator is required to maintain a log of all inspections and/or maintenance that is performed on the system. The log shall include all pertinent information necessary to record the results of the inspections as well as any necessary repair to the system.