Appendix A
Wetland Report of Findings

DRAFT

Wetland Strategies, Inc.

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Plymouth, MA 02360

Phone: 508.747.4266
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21 December, 2012

Phil Paradis, PE
BETA Group, Inc.
315 Norwood Park South
Norwood, MA 02062

RE: Professional Wetland Services
Cochituate Rail Trail
Natick, MA

Dear Phil:

Wetland Strategies, Inc. (WSI) is pleased to submit this report on the wetland resource areas associated with the Cochituate Rail Trail (CRT). The trail encompasses 2.4 miles and extends from the Framingham town line in a southerly direction to the MBTA station in Natick center. WSI understands that the town of Natick is proposing to convert the old rail line into a multi-use scenic trail. WSI has conducted a review of the trail and flagged the boundary of the bordering vegetated wetlands at each of the different locations described below. Inland bank resource areas were also noted and identified. In addition, WSI conducted a search of the publicly available site information. The findings of the site inspection and research have been compiled as follows.

The areas investigated and flagged by WSI include the locations where sections of the CRT overlap known wetland areas identified on a public map prepared by the Massachusetts Department of Environmental Protection (MA DEP). Other bordering vegetated wetland areas discovered during the site review were also identified and flagged. At each location, WSI identified and flagged the boundaries of the wetland resource areas. In total, WSI identified ten (10) areas of bordering vegetated series and three (3) small bank series. A description of each area follows herein.

Bordering Vegetated Wetland

A Series (North of the Wonderbread Spur)

Series A delineates a small urban area holding pond, located to the rear of the intersection of Commonwealth Road and Main Street. A total of 23 pink/black flags, sequentially numbered and labeled as Wetland Boundary Delineation were used to delineate the wetland/upland interface. Species used in the delineation included *Viburnum*, *Kalmia latifolia* and *Acer rubrum*. Upland areas were vegetated with False Solomon's Seal and *Lycopodium.* In addition to the vegetation, a clear break in slope along the wetland edge was used to further refine the wetland edge. Although maps reviewed by WSI do not show a hydraulic connection to another water body, WSI defined this A series as a bordering vegetated wetland due to the presence of a stream channel within the boundaries of the wetland.

B Series (South of Wonderbread Spur to American Veteran's facility)

Wetland series B begins at the northern end of Lake Cochituate's central basin. This series continues along the steep slopes of Lake Cochituate and is vegetated primarily with *Clethra alnifolia*, *Acer rubrum*, and *Rhodedendron viscosum*. During the course of the wetland flagging, WSI observed blue flags, labeled with numbers and a VHB designation, which appeared to be a delineation of the top of a bank along the shore of Lake Cochituate. WSI's flags were located at or just landward of the blue flags to denote the edge of the bordering vegetated wetland. At the B-15 flag WSI noted the presence of an 18-inch concrete pipe and headwall. The B series ended at flag number B36 where the trail meets with the American Veterans facility. At this point, the wetland adjacent to the lake is more than 100 feet from the rail trail.

C Series (North of Camp Arrowhead on eastern side)

Wetland series C begins just north of the American Veteran's office building and continues along an inlet of Lake Cochituate, associated with Camp Arrowhead. Series C includes 18 sequentially numbered pink/black flags. The designation was determined using a combination of vegetation and slope along with existing retaining walls. Wetland vegetation consisted primarily of *Clethra alnifolia* and *Nyssa sylvatica* species; the upland border was marked by White Oaks and Bracken ferns. Photo 1 below shows a portion of the area flagged by WSI.

Photo 1 showing the inlet north of Camp Arrowhead.

D Series (Southern End of Trail)

Wetland D is located at the MBTA station in Natick center. WSI observed a bordering vegetated wetland along a drainage channel which runs parallel to the existing MBTA rails. On both the east and west side of the passenger platform, WSI located a total of 13 flags to delineate the edge of the wetland. Species density was sparse as there was a very narrow area between the ditch and a vertical retaining wall. Species used to identify the wetland included *Onoclea sensibilis*, *Hamamelis virginiana*, and *Polygonum* species. Photo 2 below depicts a typical section of the drainage channel.

Photo 2 showing drainage channel at Natick center MBTA station

E Series (Kansas St and Main)

Wetland series E is located along the edge of a small body of water located roughly at the intersection of Kansas Street and Main Street in Natick. It follows on the north side of the water body and includes *Onoclea sensibilis* and *Nyssa sylvatica* species. A total of six (6) flags were used to delineate series E. A fence had been erected separating the trail from the water body and access was difficult. In addition, WSI noted the presence of a small growth of invasive Japanese Bamboo (*Polygonum cuspidatum*) north of the flagged area. Any work in this area will need to protect against the spread of the invasive plant.

F Series (Between Arcadia Road and Route 9)

Series F includes 34 sequentially numbered flags delineating a bordering vegetated wetland associated with three (3) separate water bodies. It was flagged as a continuous series because of the continuation of wetland vegetation between the water bodies. The first two (2) water bodies are small ponds and identified as potential vernal pools by the Natural Heritage and Endangered Species Program. A walking trail was observed along the third and largest water body and the wetland and trail are within 100 feet of the CRT. Vegetation within the F series was dominated by *Hamamelis virginiana*, *Acer rubrum*, *Vaccinium corybosum* and *Clethra alnifolia*. Buckthorn (*Rhamnus frangula*) was also noted in the mix of wetland and MA DEP has identified this species as an invasive. Photo 3 below shows the edge of the water along the first water body and the dominance of *Clethra.* Photo 3 is at the first of the two potential vernal pools and was covered with duck weed on the day of the site inspection.

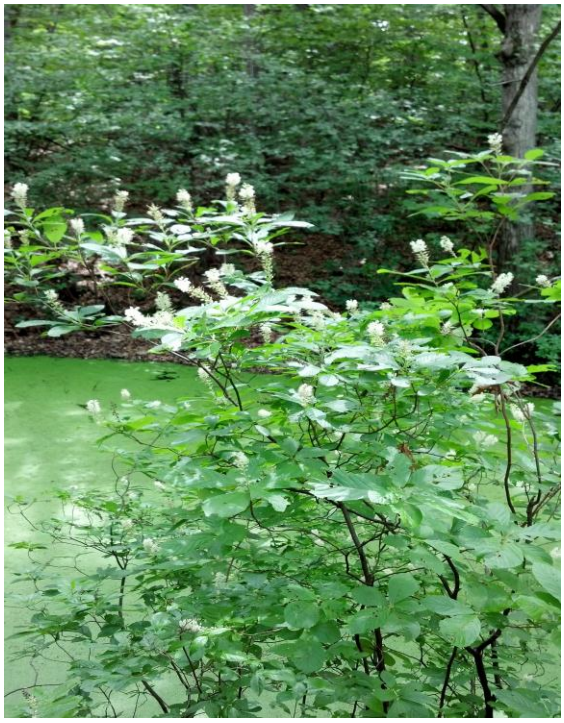


Photo 3

G Series (Directly south of Camp Arrowhead)

Wetland G consists of nine (9) wetland flags and vegetation consisted of Clethra *alnifo*lia and *Hamamelis virginiana*. It delineates a small pond, which is also likely a vernal pool. The small area identified by WSI does not connect to the larger basin of Lake Cochituate, but it appears to be large enough to qualify as a pond under both the state and local wetland regulations.

H Series (South of Camp Arrowhead)

Wetland series H is part of the bordering vegetated wetland associated with Lake Cochituate. Series H begins on the eastern shoreline of the lake and continues for 8 flags. Slopes are very steep and access to the edge of the wetland was difficult. Dominant wetland species in this area include *Clethra alnifolia* and *Lyonia ligustrina*. Series H continues over an old granite culvert which allows recreational boaters to travel under the proposed rail trail to the larger basin of Lake Cochituate. Photo 4 below shows the granite culvert and surrounding vegetation.

Photo 4 of old granite culvert located between the north and south basins of Lake Cochituate.

I Series (Directly West of C Series)

Wetland series I defines the bordering vegetated wetland along the shores of Lake Cochituate, along the southern basin. Steep slopes also characterize this area with wetland vegetation consisting of *Acer rubrum*, *Clethra alnifolia*, and *Vaccinium corymbosm* dominating the wetland plant community. WSI located a total of 24 flags in the I series of wetland flags. Photo 5 below shows the vegetation along the shoreline.

Photo 5 of wetland vegetation along Lake Cochituate.

J Series (Fisher St and North Main)

Wetland series J begins at a large culvert just off Fisher St and continues to follow the steep banks of this intermittent stream channel. The channel continues up-stream for approximately 500 feet where it abruptly ends. The stream begins relatively narrow and expands to approximately 75 feet before it ends. WSI located 21 wetland flags along the southern bank of the stream channel. The northern side of the bank was inaccessible due to a fence which presumably identifies the edge of private lands. Dominant wetland vegetation included *Acer rubrum* and *Osmunda cinnamomea*. Upland indicators including White pines and honeysuckle were observed and used to confirm the wetland/upland interface. Photo 6 below shows a portion of the stream channel on the day of the inspection.

Photo 6 of stream channel at Fisher St and Main St.

Inland Bank Delineation

In addition to identifying the extent of the bordering vegetated wetland along the CRT, WSI also identified several inland banks. Inland banks are protected under the MA Wetlands Protection Act and regulations as well as the town of Natick's wetland bylaws. Three (3) areas of bank were identified and they are briefly described as follows.

Bank A Series (West of the intersection of Main, Grove, and Lake St.)

WSI observed this large, oversized culvert to the west of Main, Grove and Lake Streets in Natick. Weather conditions were dry on the day of the site inspection, but there was a continuous flow from the culvert into the scoured creek bed. It is apparent from the degree of erosion that the culvert must carry significant flows which erode the banks and prevent any vegetation from surviving within the stream bed and along the steep banks. In addition, the top of the bank was too far above the apparent water table to support a wetland plant community. No wetland vegetation was observed by WSI; therefore WSI located 10 blue bank flags at the top of this bank. The photos below show the culvert and the evidence of under-cutting, scour, and slumping.

Photo 7 of inland bank A

Photo 8 of inland bank A.

Banks B & C (North of Kansas at Kansas St. and North Main)

Inland bank series B and C represent both the up-stream and down-stream segments of a small intermittent stream which is located to the west of the intersection of N. Main Street and Kansa/Gilbert Streets. Bank B represents the up-gradient stream channel and WSI located 9 flags. A clear break in slope was used as the primary indicator for locating the top of the bank. On the down-gradient end of the stream, dense vegetation prevented WSI from accessing the site easily; however, WSI was able to locate at least 2 blue flags to indicate the top of the bank at this location. Japanese bamboo covered the tops of the banks and because of its invasive tendencies; it likely will prevent any other plant species from establishing itself along the top of the bank.

Bordering Land Subject to Flooding

WSI reviewed the federal regulatory flood zone maps prepared by the Federal Emergency Management Agency (FEMA) and has identified one section of the CRT which falls within a regulatory flood zone. Under the MA Wetlands Protection Act, a flood zone is defined as Bordering Land Subject to Flooding at 310 CMR 10.57. The enclosed FEMA map shows the location of the flood zone, which is located just north of Camp Arrowhead and Route 9. Because BLSF is within the layout of the CRT, WSI is requesting that it be confirmed as part of this ANRAD request.

Regulatory jurisdiction

According to the MA Wetlands Protection Act and the Town of Natick's wetland regulations and bylaws, the top of bank, land under water bodies and waterways, bordering vegetated wetlands, and bordering land subject to flooding (flood zone) described above are areas subject to protection. In addition, any area within 100 feet of the BVW or top of bank is also an area subject to protection. Any work or activity in the bordering vegetated wetland, flood zone, or buffer zone requires the prior written permission of the Natick Conservation Commission.

GIS Research

In addition to establishing the wetland resource areas on the site, WSI reviewed the publicly available site information. BVW areas are consistent with those shown on MA DEP map of wetland areas. FEMA has identified an area of flooding on the site and the extent is shown on the enclosed FIRM map. Lake Cochituate is an area of Estimated and Priority wildlife habitat as defined by the MA Natural Heritage and Endangered Species Program. A copy of this Notice has been sent to Natural Heritage for their review. WSI learned that in 2009 Natural Heritage identified the Eastern pond mussel in the general area of the project. Please note that any proposed activities in their habitat must be reviewed by Natural Heritage prior to proceeding.

Thank you for using the professional wetland services provided by Wetland Strategies. If you wish to have the boundary of the wetlands confirmed by the Natick Conservation Commission, WSI is prepared to assist you. Should you have any questions, please do not hesitate to contact this office.

Sincerely,
Wetland Strategies, Inc.

Lenore White

Lenore White, PWS
Principal

Wetland Strategies, Inc.

5 Main Street Ext., Suite 303 Phone: 508.747.4266
Plymouth, MA 02360 FAX: 781.723.0406

ADDENDUM

TO: File

FROM: Lenore White, PWS

DATE: Jan. 11, 2013

SUBJECT: Additional wetland resource areas

Pursuant to a review of preliminary site plans, this office was requested to conduct additional site reconnaissance for the presence of additional wetland resource areas. Subsequent to the request and site review, Wetland Strategies, Inc. identified the following additional wetland resource areas. The final plans will reflect these areas and are to be considered part of the Abbreviated Notice of Resource Area Delineation request.

Wetland Series K:

On Jan. 10, 2013, this office flagged wetland series K with 20 sequentially numbered pink/black flags. K series of flags represents an area of bordering vegetated wetlands associated with an intermittent stream which ultimately drains to a large pond to the south of the rail trail. The bank was not flagged as the wetland was further up-gradient from the bank and any buffer zone would be measured from the furthest landward resource area. Flag K1 begins north of the trail and follows the edge of the wetland as it continues to the south of the trail. In addition, five flags KA 1 through KA 5, were located at the edge of the wetland located on the opposite side of the intermittent stream.

Wetland Series L:

Series L is located due east of the K series and delineates a bordering vegetated wetland associated with the pond to the south of the trail. Series L includes 13 flags and is located along the edge of the low flat area adjacent to the pond.

Inland Bank C:

Additional bank flags were also established by WSI on Jan. 10. Bank C series now continues in a southerly direction along an intermittent stream channel which drains from the rail trail to a pond to the south. It appears to be a man-made channel given the straight narrow configuration and height of the banks. There is no bordering vegetated wetland associated with this bank, as the height of the bank apparently is too far above the existing water table to support a wetland plant community. In addition, vegetation growth on the bank itself is primarily composed of the invasive bamboo which is not a wetland indicator plant.

Bank D: Bank D is located along another apparent man-made channel. It is located south of the rail trail, and to the southeast of Mechanic Street. Again, there was no wetland vegetation associated with the stream channel due to the height of the bank and the absence of any long-term hydrology. The photo below shows the downstream resource area. Areas up stream were inaccessible because of perimeter fencing.

Bank E: WSI located a series of bank flags beginning at the MBTA station traveling west to the Cochituate Street overpass. It is described as a narrow channel flowing west along the adjacent rock wall. It ends where the topography no longer supports any elevation difference between the stream bed and the adjacent upland area. No wetland vegetation was observed adjacent to the bank, and thus no BVW areas were flagged. On the day of the site inspection, WSI observed that stream flows are supported in part by water leaching out from beneath the adjacent stone wall and from a number of discharge pipes exiting the stone wall. In addition to the stream channel, WSI observed standing water beneath the Cochituate Street overpass on the day of the site inspection.

Although there were some wetland herbaceous wetland plants emerging from within the standing water, WSI did not identify the area as a wetland as the relative density of the plant community was too low (less than 50%). The photo below shows the stream channel and the lack of a topographical bank or break in slope.

The photo below shows the area beneath the Cochituate Street overpass.

Appendix B
Order of Resource Area Delineation

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 4B – Order of Resource Area Delineation

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:
233-707
MassDEP File Number

eDEP Transaction Number

Natick
City/Town

A. General Information

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

Note: Before completing this form consult your local Conservation Commission regarding any municipal bylaw or ordinance.

From: Natick
1. Conservation Commission

2. This Issuance is for (check one):

a. ☒ Order of Resource Area Delineation

b. ☐ Amended Order of Resource Area Delineation

3. Applicant:

Town of Natick
a. First Name

b. Last Name

Community Development
c. Organization

13 East Central Street
d. Mailing Address

Natick
e. City/Town

MA
f. State

01760
g. Zip Code

4. Property Owner (if different from applicant):

CSX Transportation Inc.
a. First Name

b. Last Name

c. Organization

6737 Southpoint Drive S.
d. Mailing Address

Jacksonville
e. City/Town

FL
f. State

32216
g. Zip Code

5. Project Location:

Natick Section of Cochituate Rail Trail
a. Street Address

Natick
b. City/Town

01760
c. Zip Code

d. Assessors Map/Plat Number

e. Parcel/Lot Number

Latitude and Longitude (in degrees, minutes, seconds):

d m s
f. Latitude

d m s
g. Longitude

6. Dates:

2-7-13
a. Date ANRAD filed

6-6-13
b. Date Public Hearing Closed

6-12-13
c. Date of Issuance

7. Title and Date (or Revised Date if applicable) of Final Plans and Other Documents:

Topographic Survey Cochituate Rail Trail, Natick, MA
a. Title

May 13, 2013
b. Date

c. Title

d. Date

Appendix C
Resource Area Photographs

Existing Railroad Bed

Existing Bridge Over Route 9

Cochituate Road overpass

Cochituate Road Overpass

Wetland near Commuter Rail Line

Wetland near Commuter Rail Connection

Existing Commuter Rail Connection

Appendix D
NHESP Letter

Letter from "Cochituate Rail Trail Conceptual Design Study"
Prepared by: Fay, Spofford & Thorndike, April 2010

Commonwealth of Massachusetts

Division of Fisheries & Wildlife

MassWildlife

Wayne F. MacCallum, *Director*

November 19, 2009

John Hendrickson
Fay, Spofford & Thorndike
5 Burlington Woods
Burlington MA 01803

RE: Project Location: Rail Trail, CSX Saxonville Branch right-of-way
Town: NATICK
NHESP Tracking No.: 09-27465

To Whom It May Concern:

Thank you for contacting the Natural Heritage and Endangered Species Program ("NHESP") of the MA Division of Fisheries & Wildlife for information regarding state-listed rare species in the vicinity of the above referenced site. Based on the information provided, this project site, or a portion thereof, is located **within** *Priority Habitat 200* (PH 200) and *Estimated Habitat 95* (EH 95) as indicated in the *Massachusetts Natural Heritage Atlas* (13th Edition). Our database indicates that the following state-listed rare species have been found in the vicinity of the site:

Scientific name	Common Name	Taxonomic Group	State Status
Ligumia nasuta	Eastern Pondmussel	Mussel	Special Concern

The species listed above is protected under the Massachusetts Endangered Species Act (MESA) (M.G.L. c. 131A) and its implementing regulations (321 CMR 10.00). State-listed wildlife are also protected under the state's Wetlands Protection Act (WPA) (M.G.L. c. 131, s. 40) and its implementing regulations (310 CMR 10.00). Fact sheets for most state-listed rare species can be found on our website (www.nhesp.org).

Please note that projects and activities located within Priority and/or Estimated Habitat **must** be reviewed by the NHESP for compliance with the state-listed rare species protection provisions of MESA (321 CMR 10.00) and/or the WPA (310 CMR 10.00).

Wetlands Protection Act (WPA)

If the project site is within Estimated Habitat and a Notice of Intent (NOI) is required, then a copy of the NOI must be submitted to the NHESP so that it is received at the same time as the local conservation commission. If the NHESP determines that the proposed project will adversely affect the actual Resource Area habitat of state-protected wildlife, then the proposed project may not be permitted (310 CMR 10.37, 10.58(4)(b) & 10.59). In such a case, the project proponent may request a consultation with the NHESP to discuss potential project design modifications that would avoid adverse effects to rare wildlife habitat.

A streamlined joint MESA/WPA review process is available. When filing a Notice of Intent (NOI), the applicant may file concurrently under the MESA on the same NOI form and qualify for a 30-day streamlined joint review. For a copy of the revised NOI form, please visit the MA Department of Environmental Protection's website: http://www.mass.gov/dep/water/approvals/wpaform3.doc.

MA Endangered Species Act (MESA)

If the proposed project is located within Priority Habitat and is not exempt from review (see 321 CMR 10.14), then project plans, a fee, and other required materials must be sent to NHESP Regulatory Review to determine whether a probable "take" under the MA Endangered Species Act would occur (321 CMR 10.18). Please note that all proposed and anticipated development must be disclosed, as MESA does not allow project segmentation (321 CMR 10.16). For a MESA filing checklist and additional information please see our website: www.nhesp.org ("Regulatory Review" tab).

We recommend that rare species habitat concerns be addressed during the project design phase prior to submission of a formal MESA filing, as avoidance and minimization of impacts to rare species and their habitats is likely to expedite endangered species regulatory review.

This evaluation is based on the most recent information available in the Natural Heritage database, which is constantly being expanded and updated through ongoing research and inventory. If you have any questions regarding this letter please contact Emily Holt, Endangered Species Review Assistant, at (508) 389-6361.

Sincerely,

Thomas W. French

Thomas W. French, Ph.D.
Assistant Director

Appendix E

Project Calculations

HydroCAD Existing Conditions

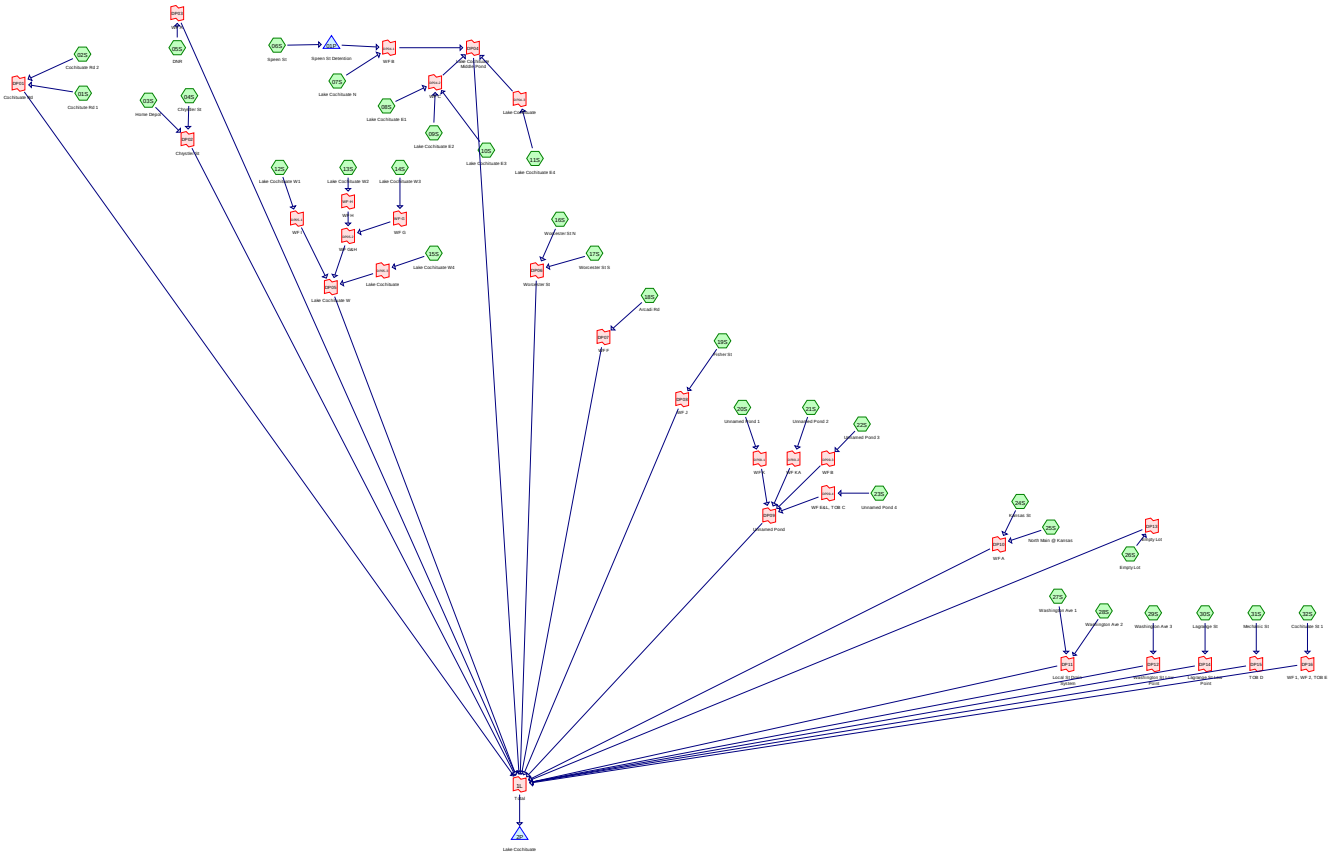
HydroCAD Proposed Conditions

Design Point Summaries

Recharge and Water Quality Volume Calculations

TSS Removal Worksheets

HydroCAD Existing Conditions



Subcat Reach Pond Link

Drainage Diagram for CRT Existing Watersheds
Prepared by BETA Group, Inc., Printed 5/8/2014
HydroCAD® 9.00 s/n 01895 © 2009 HydroCAD Software Solutions LLC

Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 01S: Cochitute Rd 1 Runoff Area=9,423 sf 2.98% Impervious Runoff Depth>0.50"
Flow Length=162' Tc=5.0 min CN=63 Runoff=0.09 cfs 390 cf

Subcatchment 02S: Cochituate Rd 2 Runoff Area=21,748 sf 11.45% Impervious Runoff Depth>0.66"
Flow Length=100' Slope=0.0270 '/' Tc=8.8 min CN=67 Runoff=0.29 cfs 1,195 cf

Subcatchment 03S: Home Depot Runoff Area=25,653 sf 0.00% Impervious Runoff Depth>0.42"
Flow Length=60' Slope=0.0088 '/' Tc=20.0 min CN=61 Runoff=0.13 cfs 899 cf

Subcatchment 04S: Chrystler St Runoff Area=30,203 sf 8.21% Impervious Runoff Depth>0.42"
Flow Length=311' Tc=37.7 min CN=61 Runoff=0.12 cfs 1,050 cf

Subcatchment 05S: DNR Runoff Area=99,015 sf 0.66% Impervious Runoff Depth>0.42"
Flow Length=725' Tc=17.3 min CN=61 Runoff=0.51 cfs 3,472 cf

Subcatchment 06S: Speen St Runoff Area=28,640 sf 6.23% Impervious Runoff Depth>0.66"
Flow Length=473' Tc=11.6 min CN=67 Runoff=0.35 cfs 1,572 cf

Subcatchment 07S: Lake Cochituate N Runoff Area=384,322 sf 7.17% Impervious Runoff Depth>0.45"
Flow Length=975' Tc=30.1 min CN=62 Runoff=1.89 cfs 14,553 cf

Subcatchment 08S: Lake Cochituate E1 Runoff Area=15,353 sf 0.00% Impervious Runoff Depth>0.39"
Flow Length=146' Tc=5.0 min CN=60 Runoff=0.09 cfs 497 cf

Subcatchment 09S: Lake Cochituate E2 Runoff Area=8,720 sf 0.00% Impervious Runoff Depth>0.46"
Flow Length=71' Tc=5.0 min CN=62 Runoff=0.07 cfs 333 cf

Subcatchment 10S: Lake Cochituate E3 Runoff Area=5,671 sf 0.00% Impervious Runoff Depth>0.39"
Flow Length=96' Tc=7.5 min CN=60 Runoff=0.03 cfs 183 cf

Subcatchment 11S: Lake Cochituate E4 Runoff Area=169,075 sf 7.42% Impervious Runoff Depth>0.42"
Flow Length=328' Tc=16.1 min CN=61 Runoff=0.88 cfs 5,932 cf

Subcatchment 12S: Lake Cochituate W1 Runoff Area=45,286 sf 7.97% Impervious Runoff Depth>0.50"
Flow Length=185' Tc=11.2 min CN=63 Runoff=0.35 cfs 1,869 cf

Subcatchment 13S: Lake Cochituate W2 Runoff Area=5,231 sf 0.00% Impervious Runoff Depth>0.29"
Flow Length=52' Slope=0.2426 '/' Tc=5.0 min CN=57 Runoff=0.02 cfs 128 cf

Subcatchment 14S: Lake Cochituate W3 Runoff Area=14,739 sf 0.00% Impervious Runoff Depth>0.35"
Flow Length=114' Tc=6.4 min CN=59 Runoff=0.07 cfs 436 cf

Subcatchment 15S: Lake Cochituate W4 Runoff Area=210,093 sf 18.76% Impervious Runoff Depth>0.57"
Flow Length=307' Tc=12.6 min CN=65 Runoff=1.99 cfs 10,046 cf

Subcatchment 16S: Worcester St N Runoff Area=157,456 sf 93.05% Impervious Runoff Depth>2.49"
Flow Length=1,809' Tc=22.6 min CN=94 Runoff=6.54 cfs 32,622 cf

Subcatchment 17S: Worcester St S Runoff Area=26,593 sf 39.48% Impervious Runoff Depth>1.00"
Flow Length=316' Tc=9.0 min CN=74 Runoff=0.61 cfs 2,221 cf

Subcatchment 18S: Arcadi Rd Runoff Area=253,846 sf 12.85% Impervious Runoff Depth>0.39"
Flow Length=806' Tc=17.7 min CN=60 Runoff=1.12 cfs 8,170 cf

Subcatchment 19S: Fisher St Runoff Area=357,165 sf 20.57% Impervious Runoff Depth>0.39"
Flow Length=940' Tc=22.9 min CN=60 Runoff=1.48 cfs 11,470 cf

Subcatchment 20S: Unnamed Pond 1 Runoff Area=22,399 sf 8.44% Impervious Runoff Depth>0.42"
Flow Length=222' Tc=14.3 min CN=61 Runoff=0.12 cfs 786 cf

Subcatchment 21S: Unnamed Pond 2 Runoff Area=79,608 sf 24.60% Impervious Runoff Depth>0.39"
Flow Length=279' Tc=7.9 min CN=60 Runoff=0.43 cfs 2,573 cf

Subcatchment 22S: Unnamed Pond 3 Runoff Area=61,232 sf 17.35% Impervious Runoff Depth>0.39"
Flow Length=309' Tc=11.7 min CN=60 Runoff=0.30 cfs 1,976 cf

Subcatchment 23S: Unnamed Pond 4 Runoff Area=52,964 sf 1.51% Impervious Runoff Depth>0.39"
Flow Length=167' Tc=19.8 min CN=60 Runoff=0.23 cfs 1,703 cf

Subcatchment 24S: Kansas St Runoff Area=83,215 sf 17.84% Impervious Runoff Depth>0.50"
Flow Length=227' Tc=7.7 min CN=63 Runoff=0.73 cfs 3,438 cf

Subcatchment 25S: North Main @ Kansas Runoff Area=12,322 sf 100.00% Impervious Runoff Depth>2.92"
Tc=5.0 min CN=98 Runoff=0.90 cfs 2,994 cf

Subcatchment 26S: Empty Lot Runoff Area=26,290 sf 0.00% Impervious Runoff Depth>0.95"
Tc=5.0 min CN=73 Runoff=0.65 cfs 2,081 cf

Subcatchment 27S: Washington Ave 1 Runoff Area=10,780 sf 84.48% Impervious Runoff Depth>2.59"
Tc=5.0 min CN=95 Runoff=0.74 cfs 2,330 cf

Subcatchment 28S: Washington Ave 2 Runoff Area=9,257 sf 66.71% Impervious Runoff Depth>2.21"
Tc=5.0 min CN=91 Runoff=0.56 cfs 1,704 cf

Subcatchment 29S: Washington Ave 3 Runoff Area=23,536 sf 31.05% Impervious Runoff Depth>0.35"
Flow Length=196' Tc=9.0 min CN=59 Runoff=0.10 cfs 695 cf

Subcatchment 30S: Lagrange St Runoff Area=59,645 sf 31.36% Impervious Runoff Depth>0.42"
Flow Length=194' Tc=8.7 min CN=61 Runoff=0.37 cfs 2,099 cf

Subcatchment 31S: Mechanic St Runoff Area=62,263 sf 50.59% Impervious Runoff Depth>1.24"
Flow Length=329' Tc=5.3 min CN=78 Runoff=2.08 cfs 6,410 cf

Subcatchment 32S: Cochituate St 1 Runoff Area=108,437 sf 32.30% Impervious Runoff Depth>0.70"
Flow Length=728' Tc=16.4 min CN=68 Runoff=1.26 cfs 6,343 cf

Pond 01P: Speen St Detention Peak Elev=159.61' Storage=10 cf Inflow=0.35 cfs 1,572 cf
Primary=0.00 cfs 0 cf Secondary=0.34 cfs 1,569 cf Outflow=0.34 cfs 1,569 cf

Pond 2P: Lake Cochituate Peak Elev=136.00' Storage=2.998 af Inflow=19.49 cfs 130,598 cf
Outflow=0.00 cfs 0 cf

Link 1L: Total Inflow=19.49 cfs 130,598 cf
Primary=19.49 cfs 130,598 cf

Link DP01: Cochituate Rd Inflow=0.37 cfs 1,584 cf
Primary=0.37 cfs 1,584 cf

Link DP02: Chrystler St Inflow=0.22 cfs 1,949 cf
Primary=0.22 cfs 1,949 cf

Link DP03: WF A Inflow=0.51 cfs 3,472 cf
Primary=0.51 cfs 3,472 cf

Link DP04: Lake Cochituate Middle Pond Inflow=2.72 cfs 21,498 cf
Primary=2.72 cfs 21,498 cf

Link DP04-1: WF B Inflow=1.89 cfs 14,553 cf
Primary=1.89 cfs 14,553 cf

Link DP04-2: WF C Inflow=0.19 cfs 1,014 cf
Primary=0.19 cfs 1,014 cf

Link DP04-3: Lake Cochituate Inflow=0.88 cfs 5,932 cf
Primary=0.88 cfs 5,932 cf

Link DP05: Lake Cochituate W Inflow=2.42 cfs 12,478 cf
Primary=2.42 cfs 12,478 cf

Link DP05-1: WF I Inflow=0.35 cfs 1,869 cf
Primary=0.35 cfs 1,869 cf

Link DP05-2: WF G&H Inflow=0.08 cfs 563 cf
Primary=0.08 cfs 563 cf

Link DP05-3: Lake Cochituate Inflow=1.99 cfs 10,046 cf
Primary=1.99 cfs 10,046 cf

Link DP06: Worcester St Inflow=6.94 cfs 34,843 cf
Primary=6.94 cfs 34,843 cf

Link DP07: WF F Inflow=1.12 cfs 8,170 cf
Primary=1.12 cfs 8,170 cf

Link DP08: WF J Inflow=1.48 cfs 11,470 cf
Primary=1.48 cfs 11,470 cf

Link DP09: Unnamed Pond Inflow=0.99 cfs 7,038 cf
Primary=0.99 cfs 7,038 cf

Link DP09-1: WF K Inflow=0.12 cfs 786 cf
Primary=0.12 cfs 786 cf

Link DP09-2: WF KA Inflow=0.43 cfs 2,573 cf
Primary=0.43 cfs 2,573 cf

Link DP09-3: WF B Inflow=0.30 cfs 1,976 cf
Primary=0.30 cfs 1,976 cf

Link DP09-4: WF E&L, TOB C Inflow=0.23 cfs 1,703 cf
Primary=0.23 cfs 1,703 cf

Link DP10: WF A Inflow=1.48 cfs 6,432 cf
Primary=1.48 cfs 6,432 cf

Link DP11: Local St Drain System Inflow=1.30 cfs 4,035 cf
Primary=1.30 cfs 4,035 cf

Link DP12: Washington St Low Point Inflow=0.10 cfs 695 cf
Primary=0.10 cfs 695 cf

Link DP13: Empty Lot Inflow=0.65 cfs 2,081 cf
Primary=0.65 cfs 2,081 cf

Link DP14: Lagrange St Low Point Inflow=0.37 cfs 2,099 cf
Primary=0.37 cfs 2,099 cf

Link DP15: TOB D Inflow=2.08 cfs 6,410 cf
Primary=2.08 cfs 6,410 cf

Link DP16: WF 1, WF 2, TOB E Inflow=1.26 cfs 6,343 cf
Primary=1.26 cfs 6,343 cf

Link WF-G: WF G Inflow=0.07 cfs 436 cf
Primary=0.07 cfs 436 cf

Link WF-H: WF H Inflow=0.02 cfs 128 cf
Primary=0.02 cfs 128 cf

Total Runoff Area = 2,480,180 sf Runoff Volume = 132,170 cf Average Runoff Depth = 0.64"
78.96% Pervious = 1,958,347 sf 21.04% Impervious = 521,833 sf

Summary for Subcatchment 01S: Cochitute Rd 1

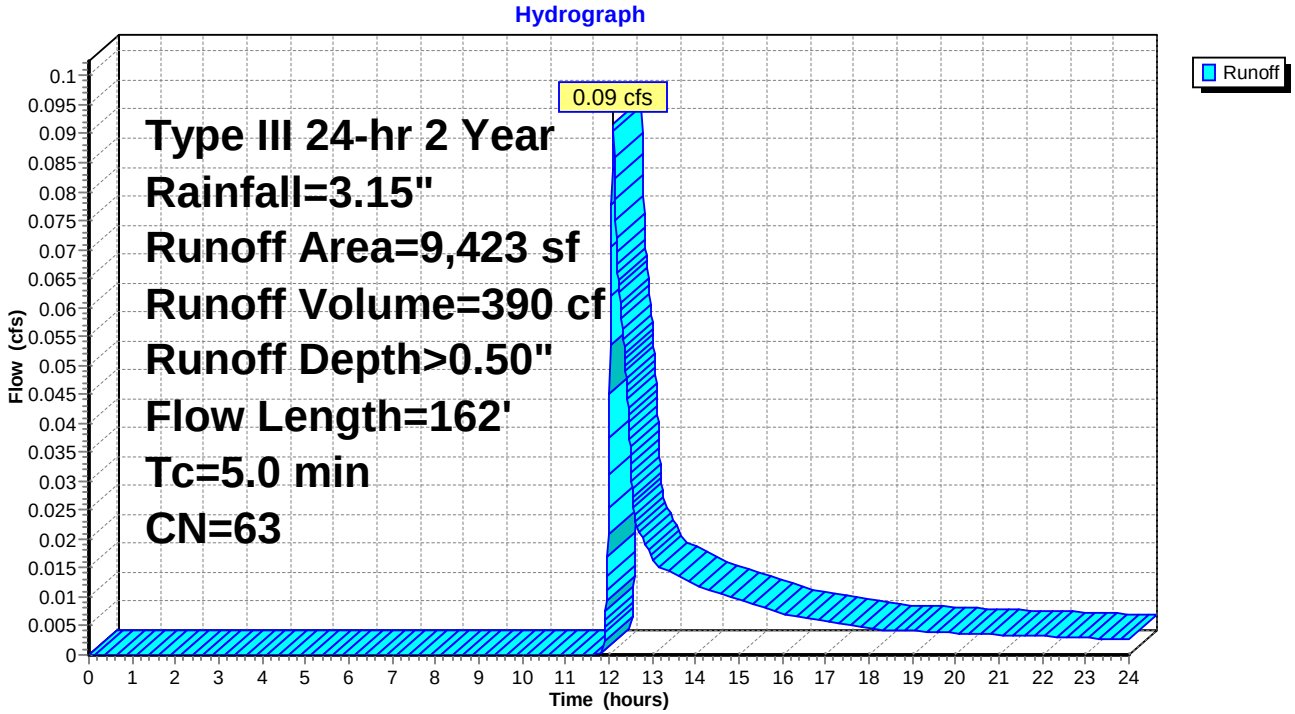
Runoff = 0.09 cfs @ 12.10 hrs, Volume= 390 cf, Depth> 0.50"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.15"

Area (sf)	CN	Description
6,995	57	Woods/grass comb., Poor, HSG A
2,147	76	Gravel roads, HSG A
281	98	Paved parking, HSG A
9,423	63	Weighted Average
9,142		97.02% Pervious Area
281		2.98% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.3	100	0.0040	0.72		**Sheet Flow, Gravel Path** Smooth surfaces n= 0.011 P2= 3.15"
1.1	62	0.0036	0.97		**Shallow Concentrated Flow, Gravel Path** Unpaved Kv= 16.1 fps
3.4	162	Total, Increased to minimum Tc = 5.0 min			

Subcatchment 01S: Cochitute Rd 1



Summary for Subcatchment 02S: Cochituate Rd 2

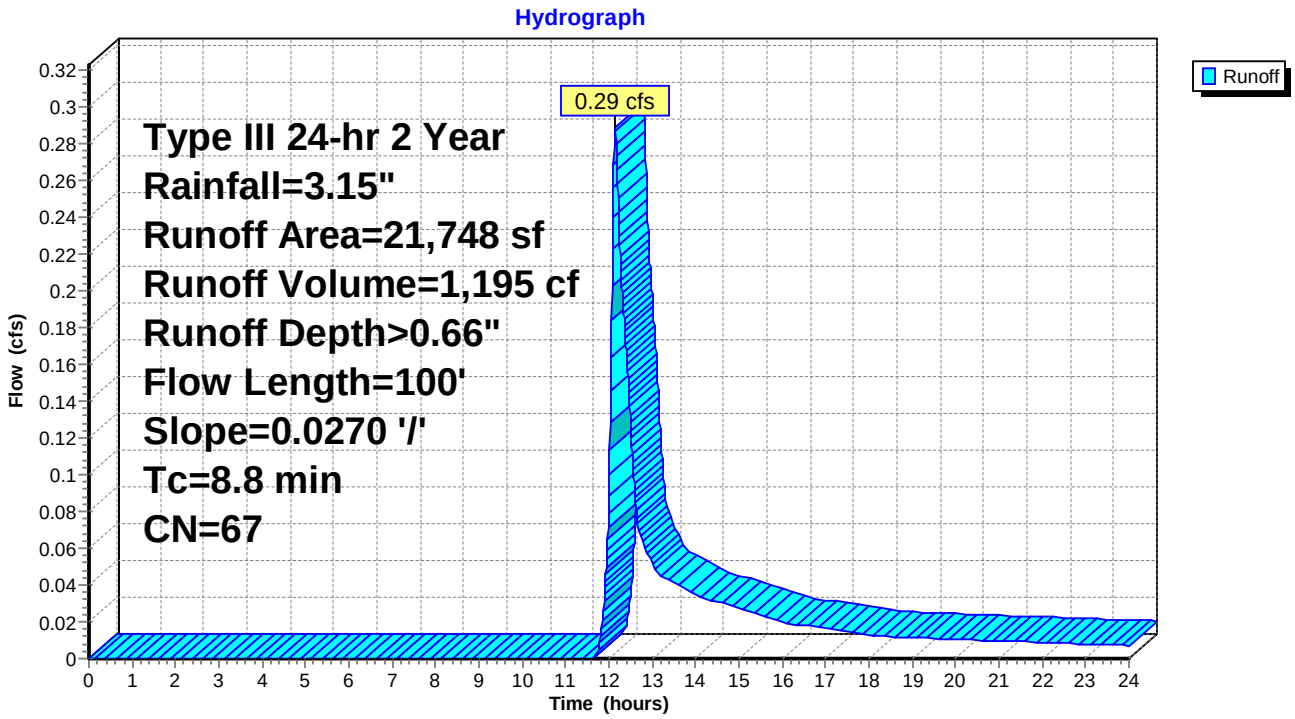
Runoff = 0.29 cfs @ 12.14 hrs, Volume= 1,195 cf, Depth> 0.66"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.15"

Area (sf)	CN	Description
8,506	57	Woods/grass comb., Poor, HSG A
714	76	Gravel roads, HSG A
2,491	98	Paved parking, HSG A
10,037	68	<50% Grass cover, Poor, HSG A
21,748	67	Weighted Average
19,257		88.55% Pervious Area
2,491		11.45% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.8	100	0.0270	0.19		**Sheet Flow, Grass** Grass: Short n= 0.150 P2= 3.15"

Subcatchment 02S: Cochituate Rd 2



Summary for Subcatchment 03S: Home Depot

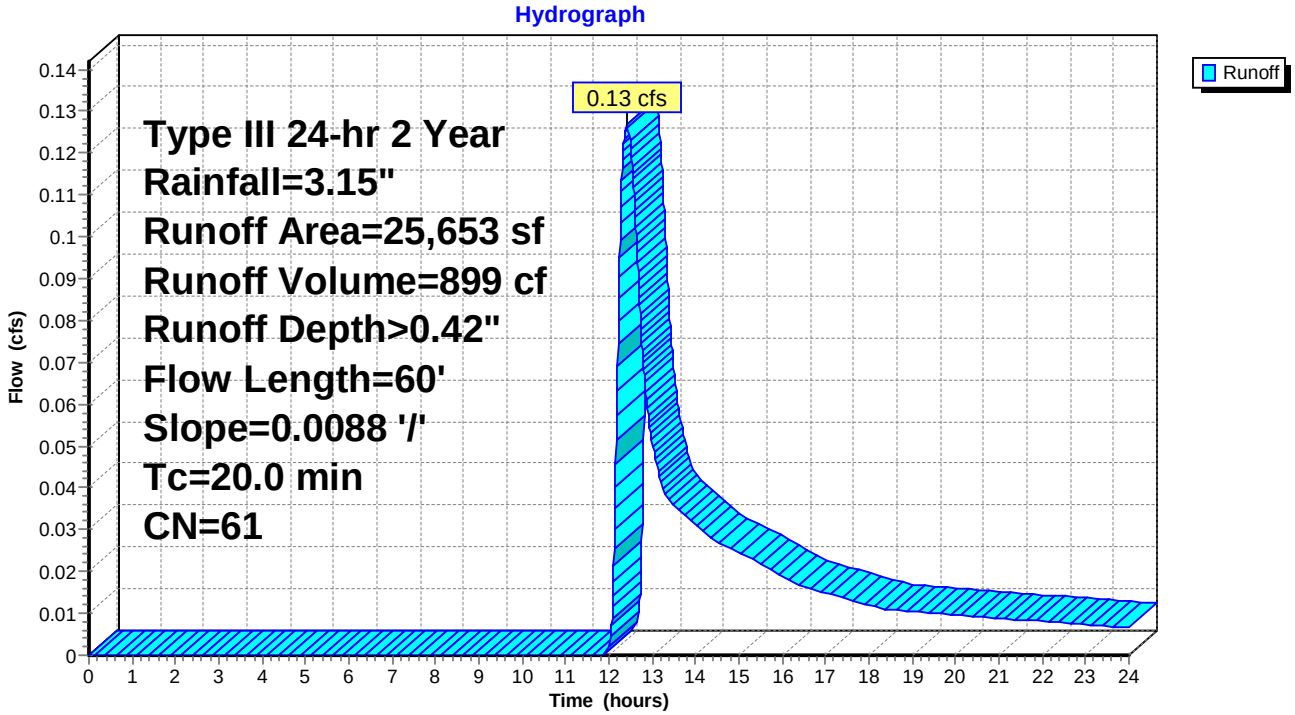
Runoff = 0.13 cfs @ 12.41 hrs, Volume= 899 cf, Depth> 0.42"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.15"

Area (sf)	CN	Description
4,785	76	Gravel roads, HSG A
20,868	57	Woods/grass comb., Poor, HSG A
25,653	61	Weighted Average
25,653		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.0	60	0.0088	0.05		**Sheet Flow, Woods**
					Woods: Light underbrush n= 0.400 P2= 3.15"

Subcatchment 03S: Home Depot



Summary for Subcatchment 04S: Chrystler St

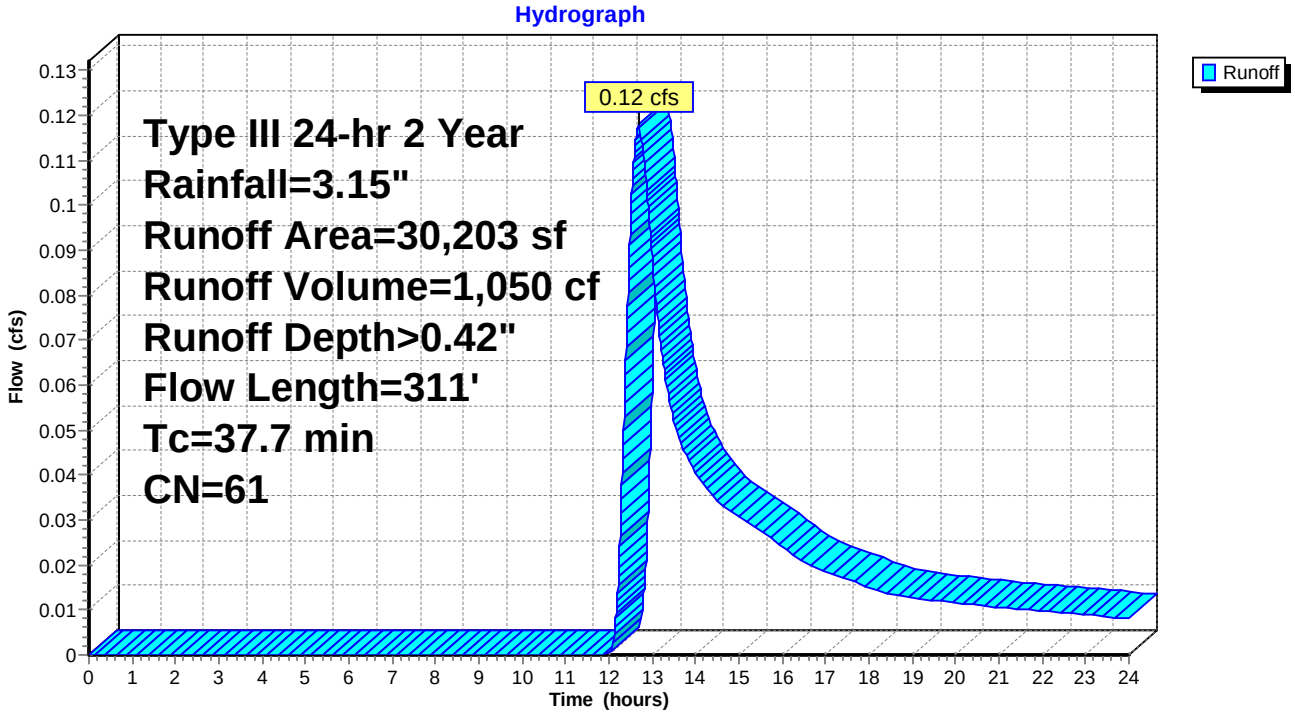
Runoff = 0.12 cfs @ 12.69 hrs, Volume= 1,050 cf, Depth> 0.42"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.15"

Area (sf)	CN	Description
27,297	57	Woods/grass comb., Poor, HSG A
425	76	Gravel roads, HSG A
2,481	98	Paved parking, HSG A
30,203	61	Weighted Average
27,722		91.79% Pervious Area
2,481		8.21% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
28.6	100	0.0100	0.06		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
9.1	211	0.0060	0.39		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
37.7	311	Total			

Subcatchment 04S: Chrystler St



Summary for Subcatchment 05S: DNR

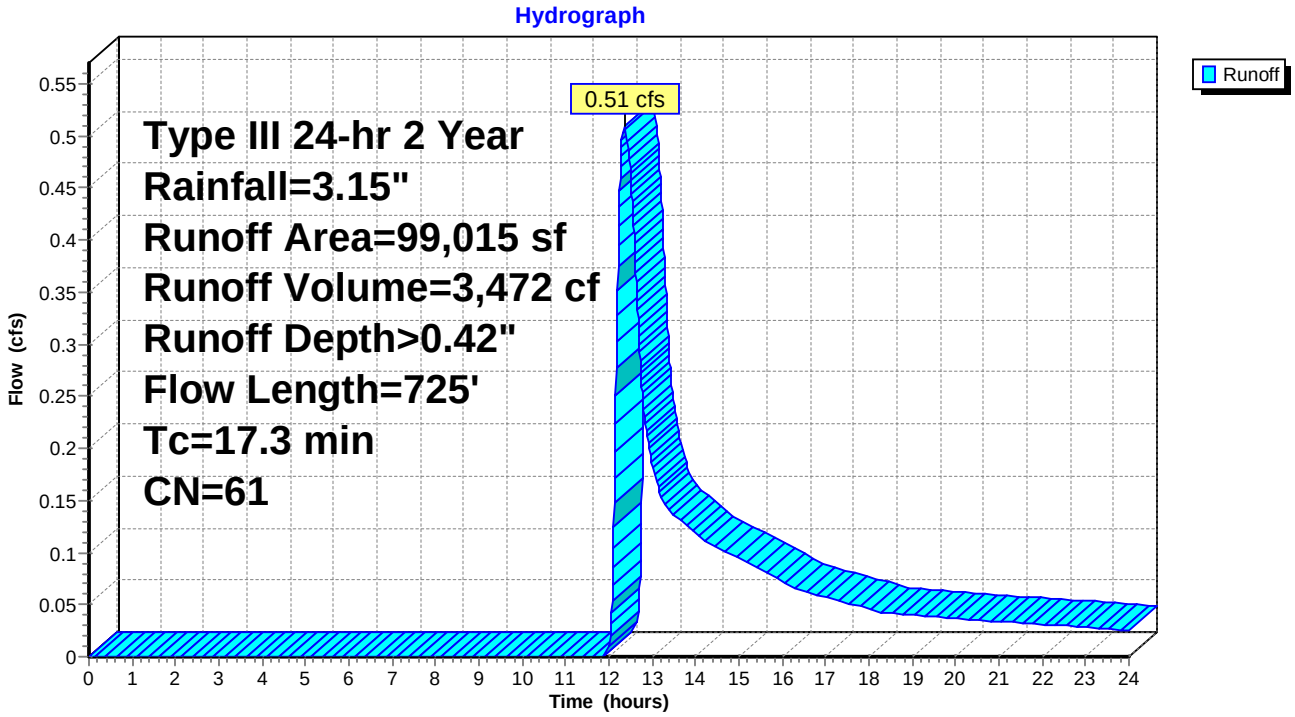
Runoff = 0.51 cfs @ 12.36 hrs, Volume= 3,472 cf, Depth> 0.42"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.15"

Area (sf)	CN	Description
81,414	57	Woods/grass comb., Poor, HSG A
16,946	76	Gravel roads, HSG A
655	98	Paved parking, HSG A
99,015	61	Weighted Average
98,360		99.34% Pervious Area
655		0.66% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0	100	0.3330	0.24		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
7.0	391	0.0033	0.92		**Shallow Concentrated Flow, Gravel Path** Unpaved Kv= 16.1 fps
3.3	234	0.0556	1.18		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
17.3	725	Total			

Subcatchment 05S: DNR



Summary for Subcatchment 06S: Speen St

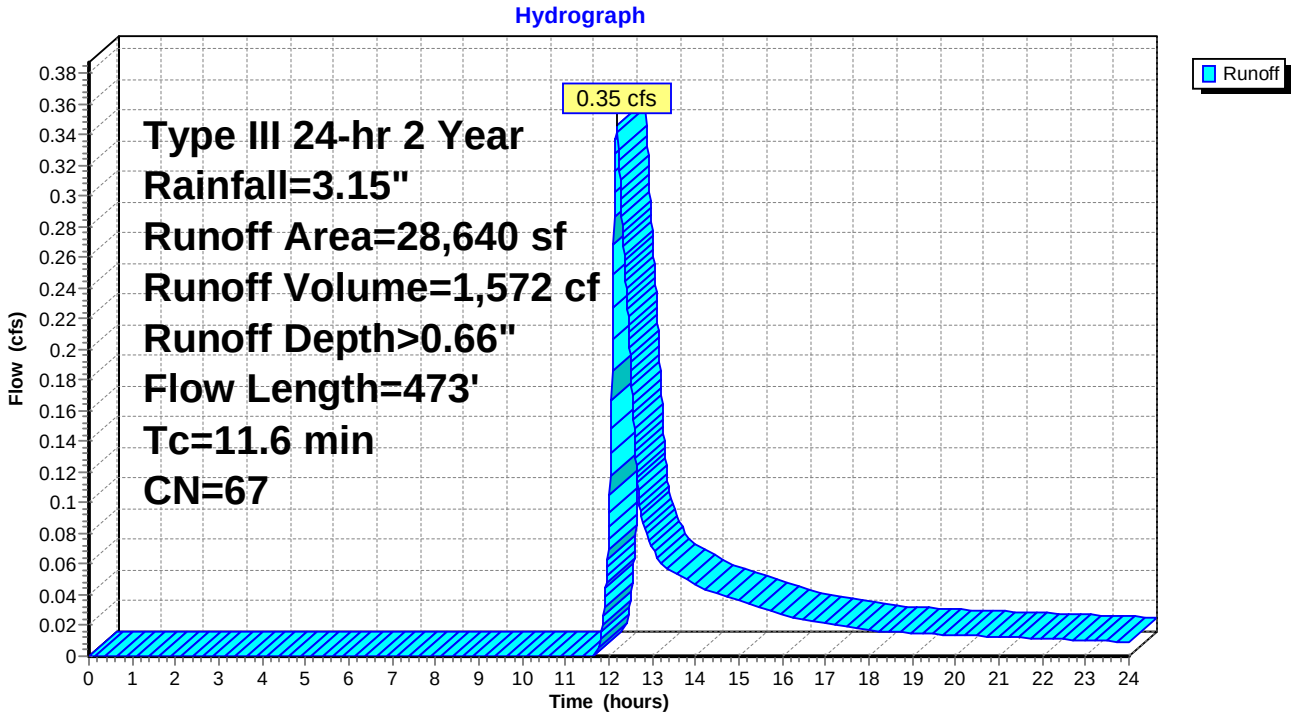
Runoff = 0.35 cfs @ 12.18 hrs, Volume= 1,572 cf, Depth> 0.66"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.15"

Area (sf)	CN	Description
11,348	57	Woods/grass comb., Poor, HSG A
3,881	76	Gravel roads, HSG A
1,783	98	Paved roads w/curbs & sewers, HSG A
11,628	68	<50% Grass cover, Poor, HSG A
28,640	67	Weighted Average
26,857		93.77% Pervious Area
1,783		6.23% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	22	0.1440	0.27		**Sheet Flow, Grass** Grass: Short n= 0.150 P2= 3.15"
7.8	58	0.0120	0.12		**Sheet Flow, Grass** Grass: Short n= 0.150 P2= 3.15"
2.5	393	0.0265	2.62		**Shallow Concentrated Flow, Gravel Path** Unpaved Kv= 16.1 fps
11.6	473	Total			

Subcatchment 06S: Speen St



Summary for Subcatchment 07S: Lake Cochituate N

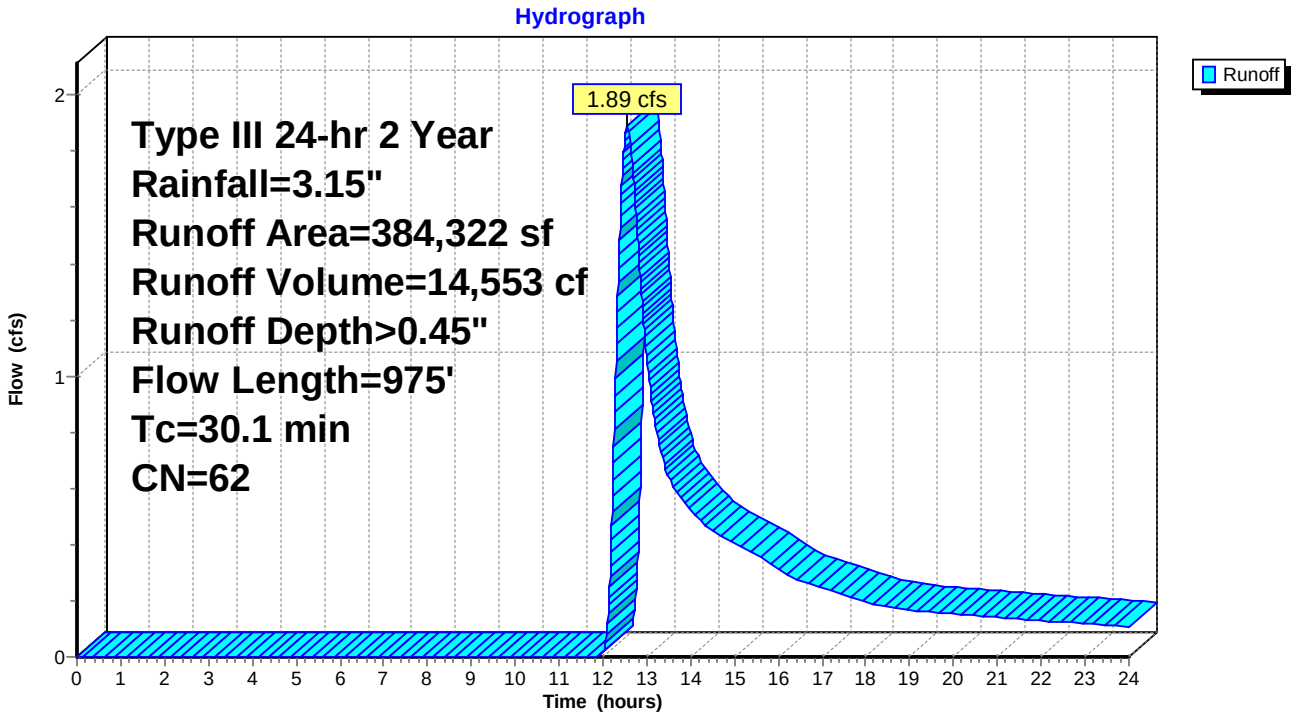
Runoff = 1.89 cfs @ 12.54 hrs, Volume= 14,553 cf, Depth> 0.45"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.15"

Area (sf)	CN	Description
317,071	57	Woods/grass comb., Poor, HSG A
39,676	76	Gravel roads, HSG A
27,575	98	Paved parking, HSG A
384,322	62	Weighted Average
356,747		92.83% Pervious Area
27,575		7.17% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.7	33	0.4091	0.21		**Sheet Flow, Woods**
					Woods: Light underbrush n= 0.400 P2= 3.15"
1.5	67	0.0209	0.72		**Shallow Concentrated Flow, Woods**
					Woodland Kv= 5.0 fps
23.7	664	0.0087	0.47		**Shallow Concentrated Flow, Woods**
					Woodland Kv= 5.0 fps
1.9	164	0.0079	1.43		**Shallow Concentrated Flow, Gravel Path**
					Unpaved Kv= 16.1 fps
0.3	47	0.3120	2.79		**Shallow Concentrated Flow, Woods**
					Woodland Kv= 5.0 fps
30.1	975	Total			

Subcatchment 07S: Lake Cochituate N



Summary for Subcatchment 08S: Lake Cochituate E1

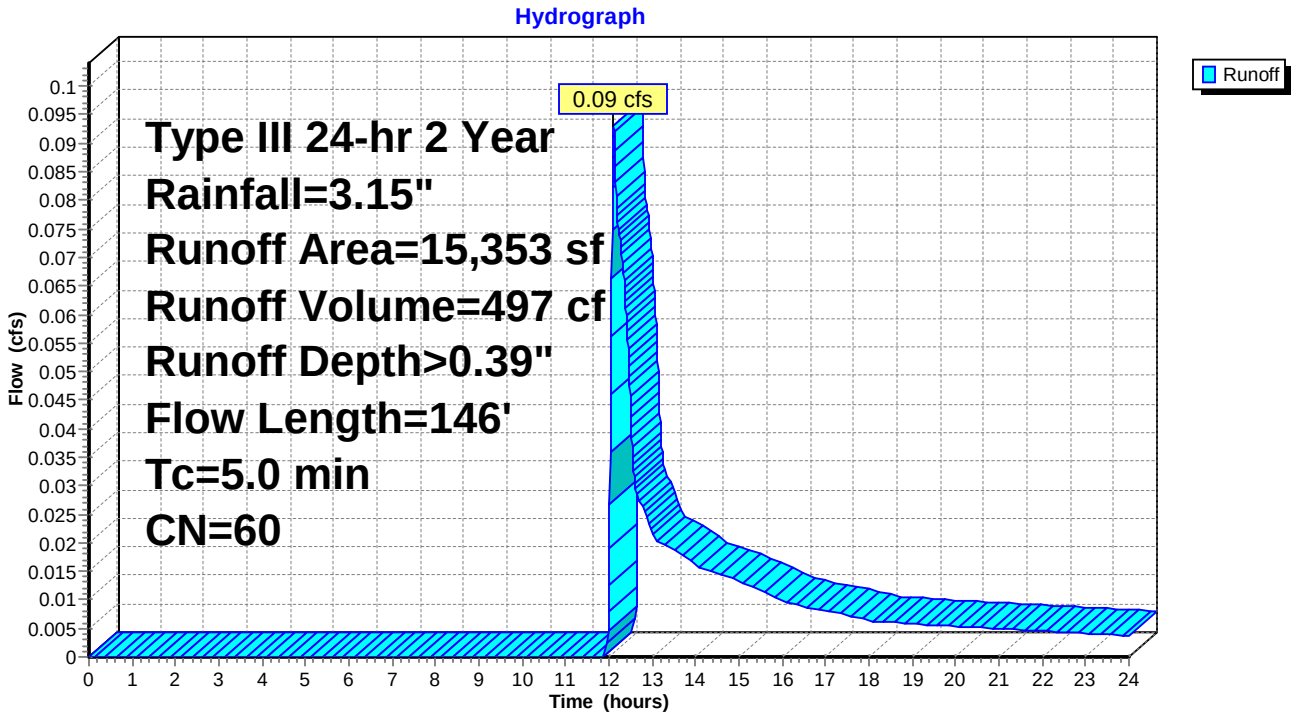
Runoff = 0.09 cfs @ 12.11 hrs, Volume= 497 cf, Depth> 0.39"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.15"

Area (sf)	CN	Description
12,685	57	Woods/grass comb., Poor, HSG A
2,668	76	Gravel roads, HSG A
15,353	60	Weighted Average
15,353		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	12	0.2500	0.14		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
0.4	45	0.0112	1.70		**Shallow Concentrated Flow, Gravel Path** Unpaved Kv= 16.1 fps
0.9	89	0.1157	1.70		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
2.7	146	Total, Increased to minimum Tc = 5.0 min			

Subcatchment 08S: Lake Cochituate E1



Summary for Subcatchment 09S: Lake Cochituate E2

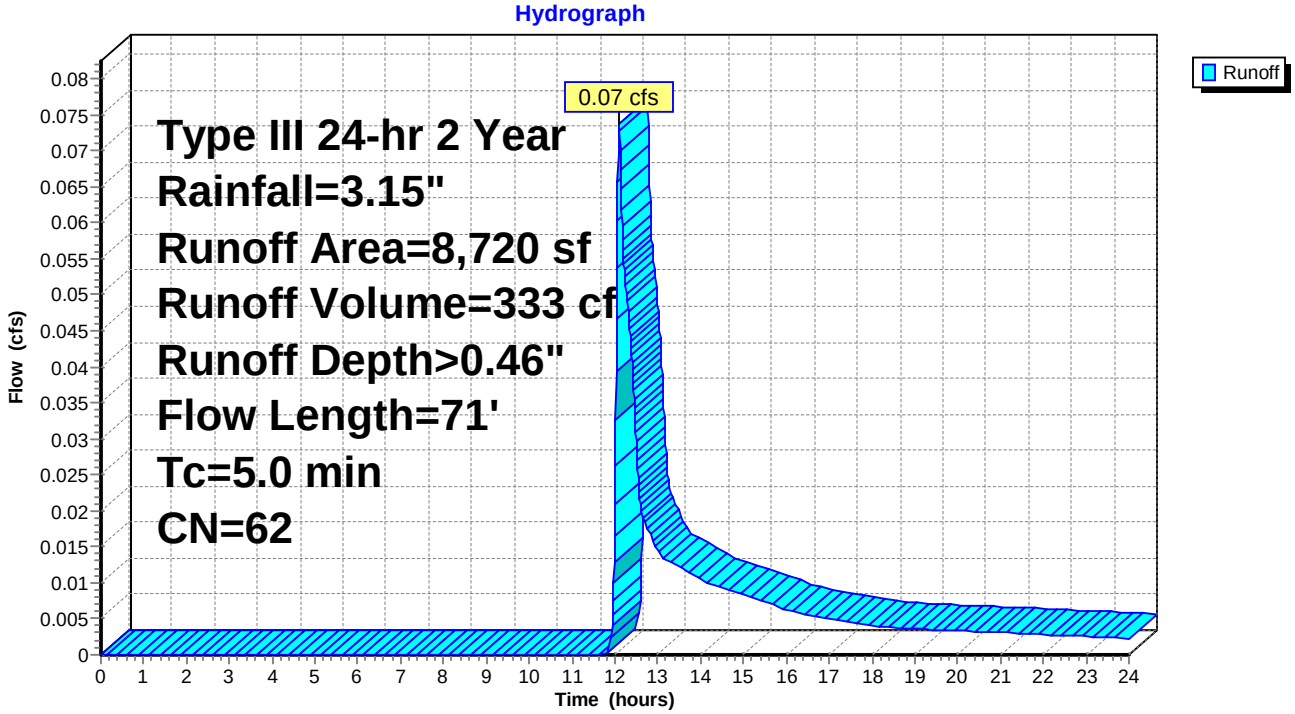
Runoff = 0.07 cfs @ 12.10 hrs, Volume= 333 cf, Depth> 0.46"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.15"

Area (sf)	CN	Description
6,212	57	Woods/grass comb., Poor, HSG A
2,508	76	Gravel roads, HSG A
8,720	62	Weighted Average
8,720		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	32	0.0333	1.33		**Sheet Flow, Gravel Path** Smooth surfaces n= 0.011 P2= 3.15"
2.8	39	0.4974	0.23		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
3.2	71	Total, Increased to minimum Tc = 5.0 min			

Subcatchment 09S: Lake Cochituate E2



Summary for Subcatchment 10S: Lake Cochituate E3

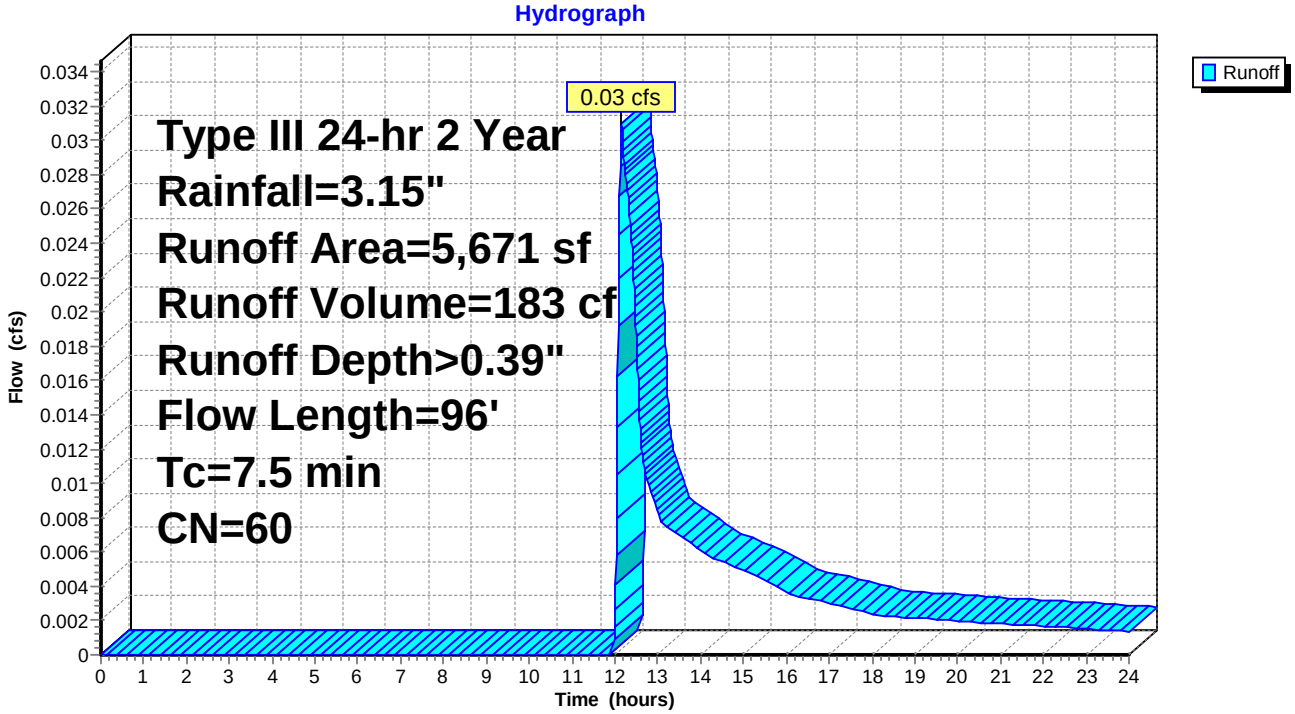
Runoff = 0.03 cfs @ 12.16 hrs, Volume= 183 cf, Depth> 0.39"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.15"

Area (sf)	CN	Description
4,892	57	Woods/grass comb., Poor, HSG A
779	76	Gravel roads, HSG A
5,671	60	Weighted Average
5,671		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	22	0.0023	0.42		**Sheet Flow, Gravel Path** Smooth surfaces n= 0.011 P2= 3.15"
6.6	74	0.2101	0.19		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
7.5	96	Total			

Subcatchment 10S: Lake Cochituate E3



Summary for Subcatchment 11S: Lake Cochituate E4

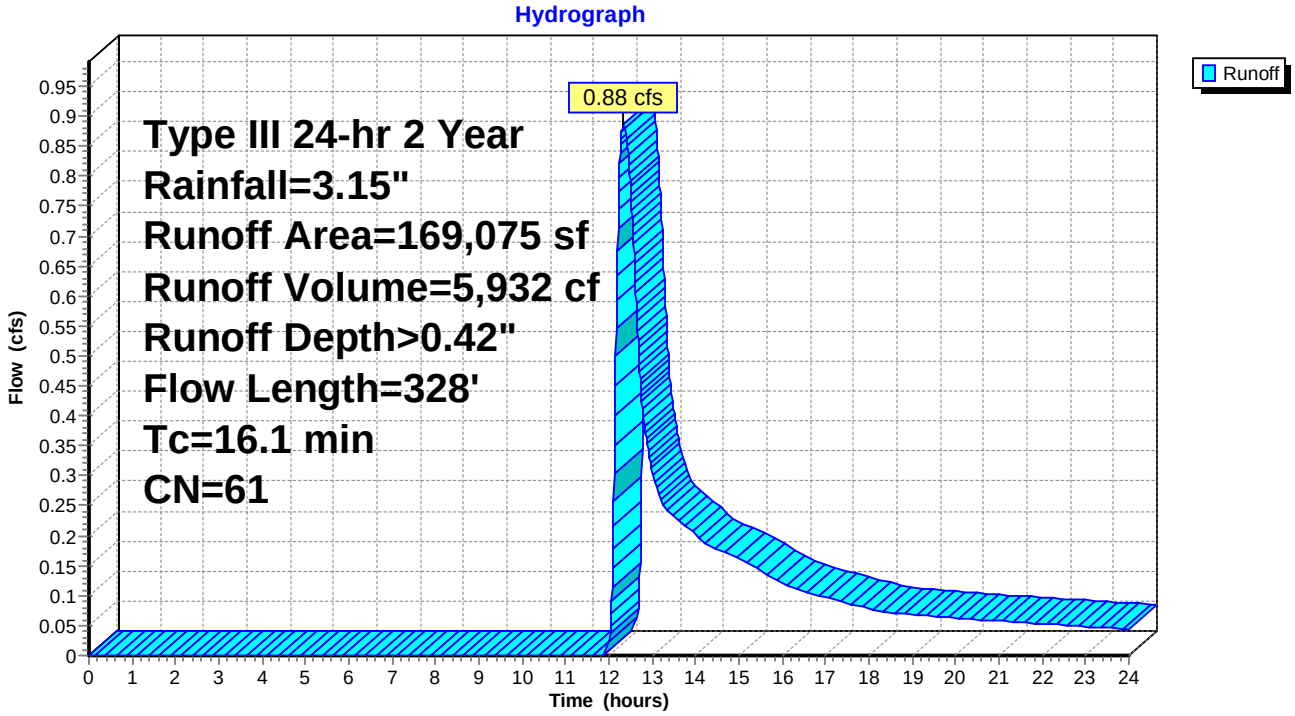
Runoff = 0.88 cfs @ 12.33 hrs, Volume= 5,932 cf, Depth> 0.42"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.15"

Area (sf)	CN	Description
151,451	57	Woods/grass comb., Poor, HSG A
5,071	76	Gravel roads, HSG A
12,553	98	Paved parking, HSG A
169,075	61	Weighted Average
156,522		92.58% Pervious Area
12,553		7.42% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.1	100	0.0700	0.13		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
2.0	125	0.0456	1.07		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
0.1	13	0.0192	2.81		**Shallow Concentrated Flow, Road** Paved Kv= 20.3 fps
0.9	90	0.1080	1.64		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
16.1	328	Total			

Subcatchment 11S: Lake Cochituate E4



Summary for Subcatchment 12S: Lake Cochituate W1

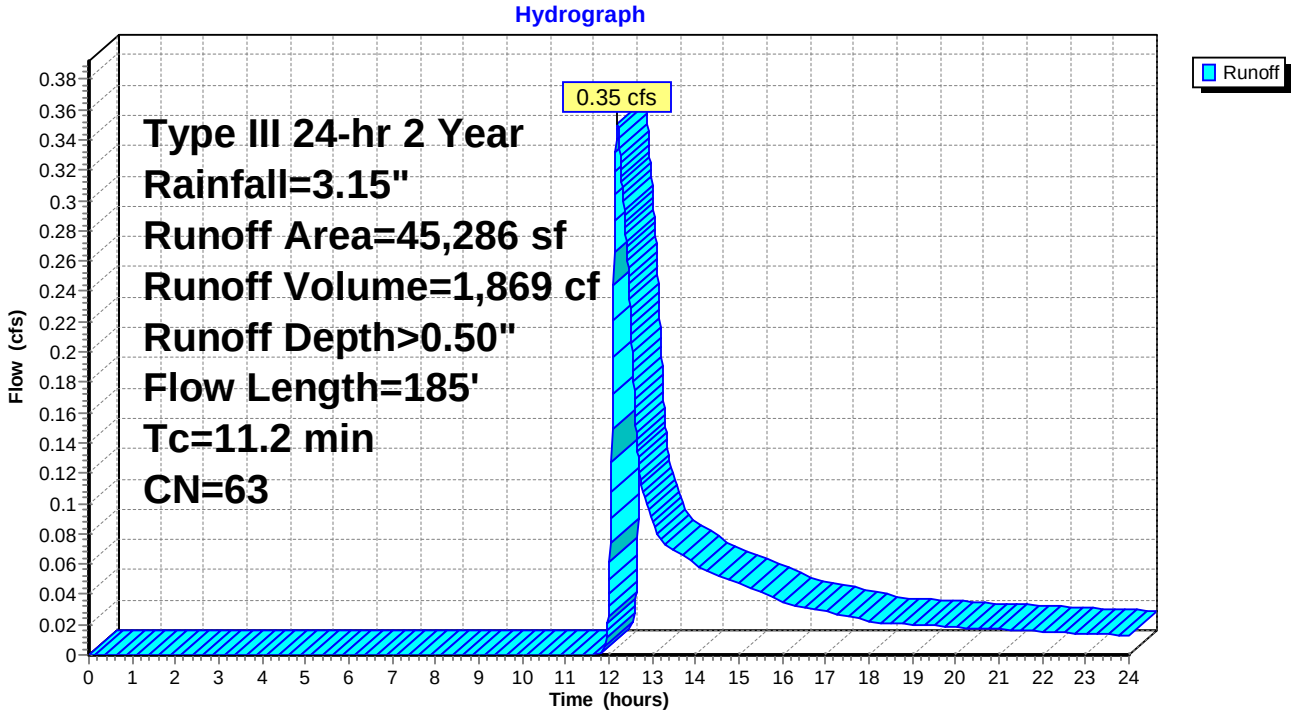
Runoff = 0.35 cfs @ 12.20 hrs, Volume= 1,869 cf, Depth> 0.50"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.15"

Area (sf)	CN	Description
35,546	57	Woods/grass comb., Poor, HSG A
6,132	76	Gravel roads, HSG A
3,608	98	Paved parking, HSG A
45,286	63	Weighted Average
41,678		92.03% Pervious Area
3,608		7.97% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	100	0.1200	0.16		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
0.6	85	0.2100	2.29		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
11.2	185	Total			

Subcatchment 12S: Lake Cochituate W1



Summary for Subcatchment 13S: Lake Cochituate W2

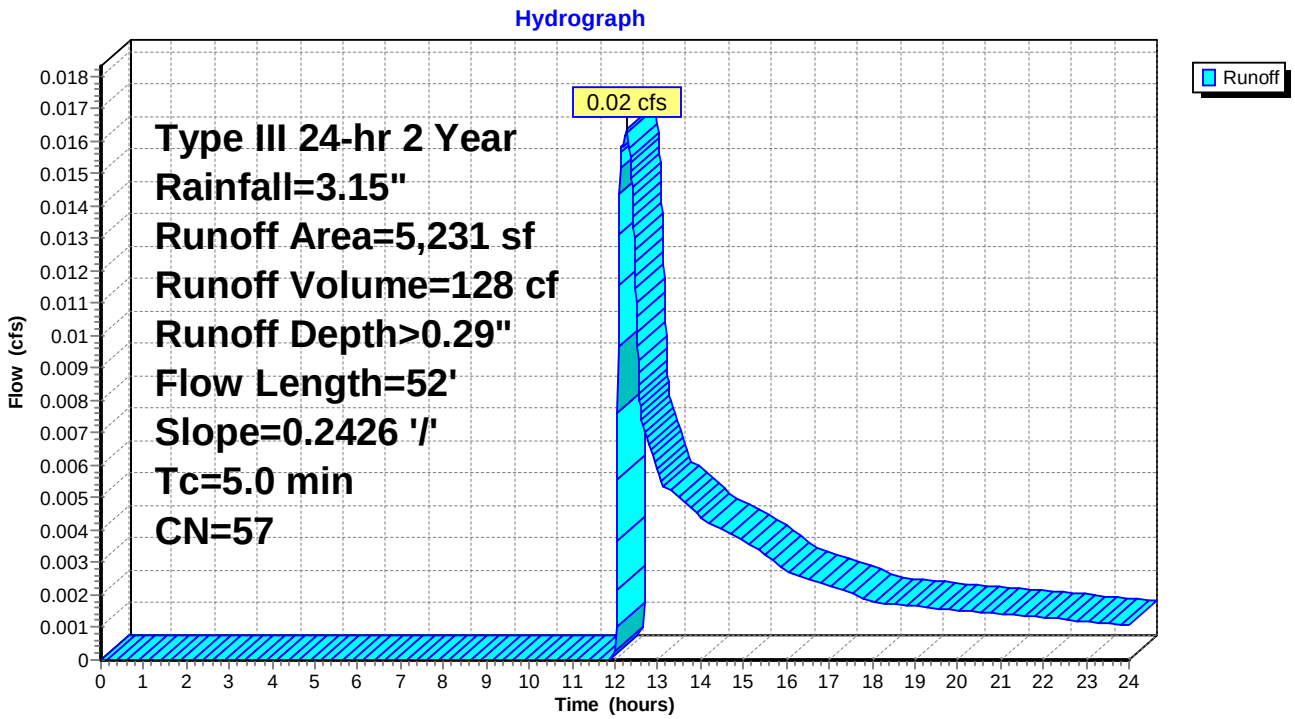
Runoff = 0.02 cfs @ 12.28 hrs, Volume= 128 cf, Depth> 0.29"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.15"

Area (sf)	CN	Description
5,231	57	Woods/grass comb., Poor, HSG A
5,231		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.7	52	0.2426	0.18		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
4.7	52	Total, Increased to minimum Tc = 5.0 min			

Subcatchment 13S: Lake Cochituate W2



Summary for Subcatchment 14S: Lake Cochituate W3

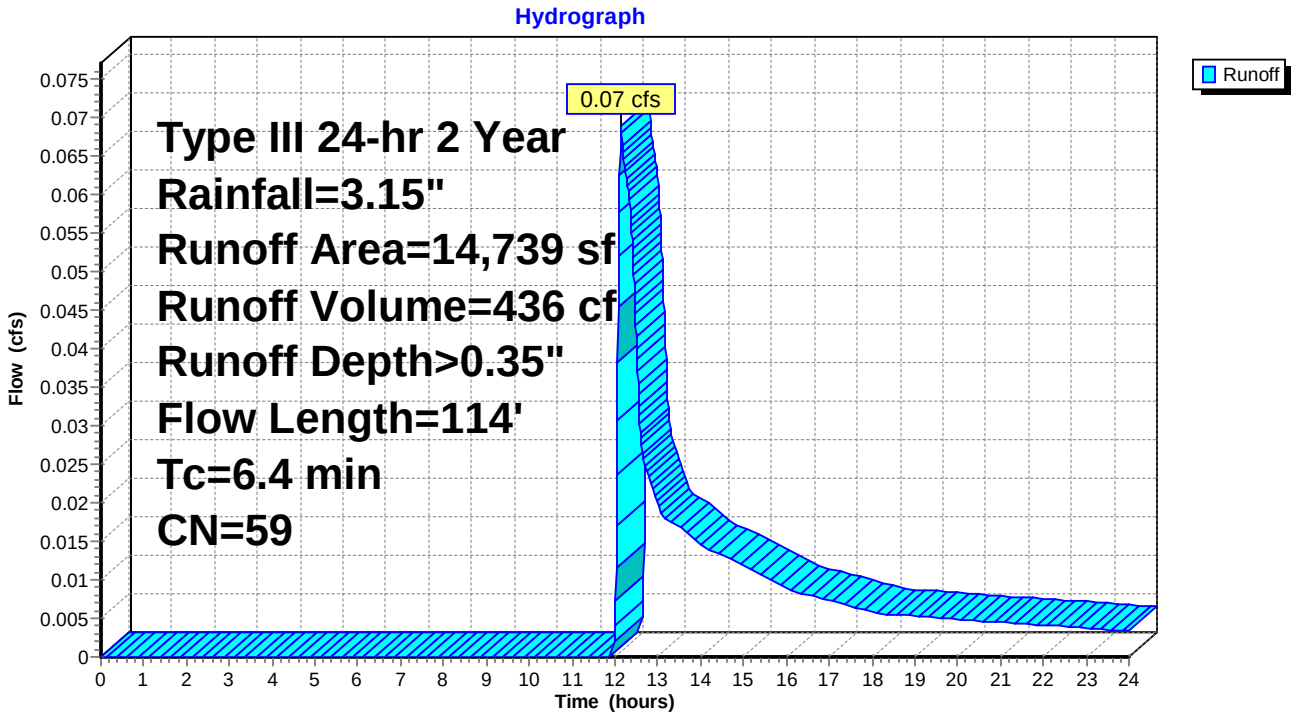
Runoff = 0.07 cfs @ 12.15 hrs, Volume= 436 cf, Depth> 0.35"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.15"

Area (sf)	CN	Description
13,168	57	Woods/grass comb., Poor, HSG A
1,571	76	Gravel roads, HSG A
14,739	59	Weighted Average
14,739		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	38	0.0132	0.95		**Sheet Flow, Gravel Path** Smooth surfaces n= 0.011 P2= 3.15"
5.6	62	0.2258	0.18		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
0.1	14	0.2500	2.50		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
6.4	114	Total			

Subcatchment 14S: Lake Cochituate W3



Summary for Subcatchment 15S: Lake Cochituate W4

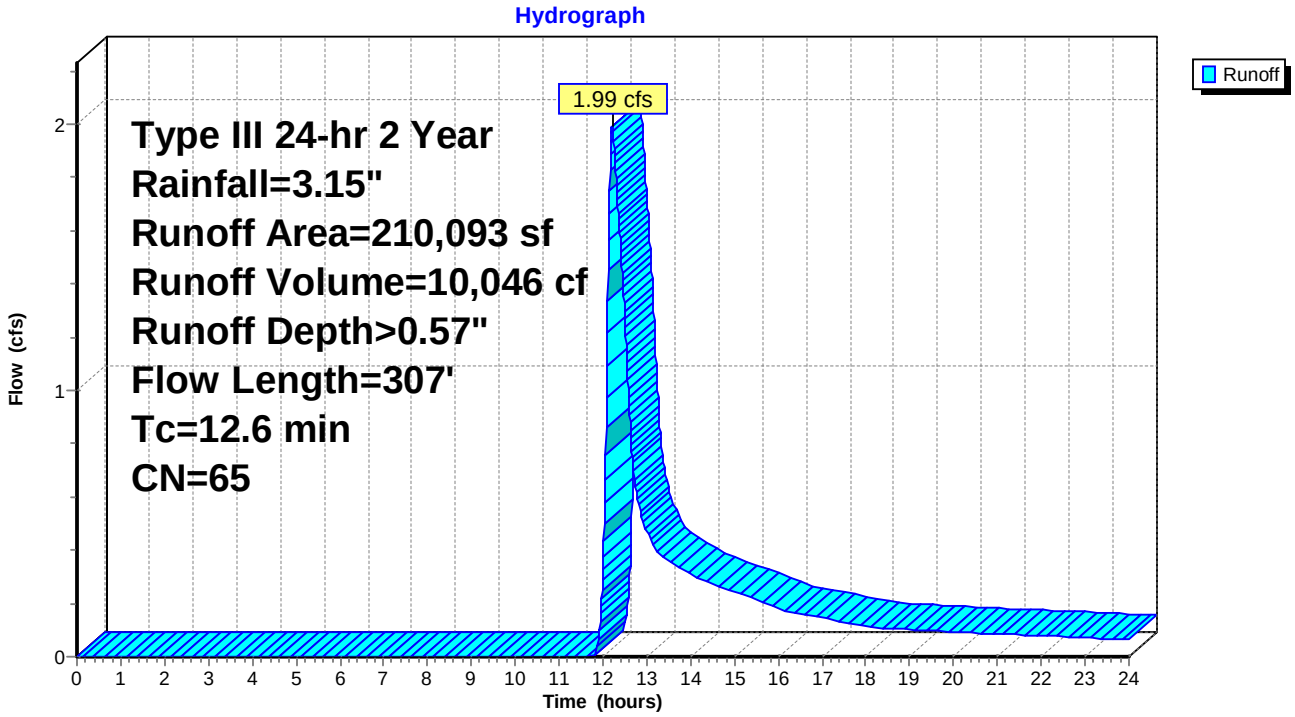
Runoff = 1.99 cfs @ 12.21 hrs, Volume= 10,046 cf, Depth> 0.57"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.15"

Area (sf)	CN	Description
166,247	57	Woods/grass comb., Poor, HSG A
4,427	76	Gravel roads, HSG A
39,419	98	Paved parking, HSG A
210,093	65	Weighted Average
170,674		81.24% Pervious Area
39,419		18.76% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	10	0.0050	0.49		**Sheet Flow, Gravel Path** Smooth surfaces n= 0.011 P2= 3.15"
9.0	90	0.1444	0.17		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
3.3	207	0.0431	1.04		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
12.6	307	Total			

Subcatchment 15S: Lake Cochituate W4



Summary for Subcatchment 16S: Worcester St N

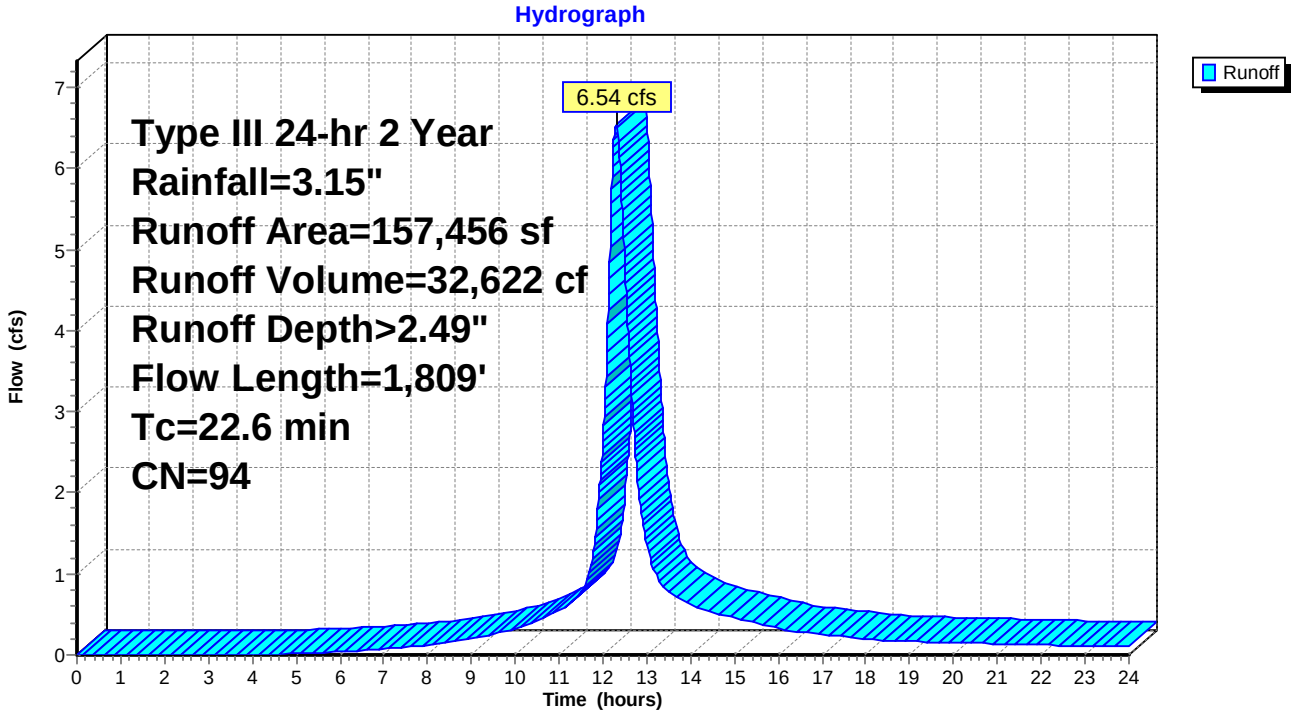
Runoff = 6.54 cfs @ 12.30 hrs, Volume= 32,622 cf, Depth> 2.49"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.15"

Area (sf)	CN	Description
68,655	89	Urban commercial, 85% imp, HSG A
648	76	Gravel roads, HSG A
88,153	98	Paved roads w/curbs & sewers, HSG A
157,456	94	Weighted Average
10,946		6.95% Pervious Area
146,510		93.05% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.0	100	0.0100	0.13		**Sheet Flow, Yards** Grass: Short n= 0.150 P2= 3.15"
9.6	1,709	0.0214	2.97		**Shallow Concentrated Flow, Road** Paved Kv= 20.3 fps
22.6	1,809	Total			

Subcatchment 16S: Worcester St N



Summary for Subcatchment 17S: Worcester St S

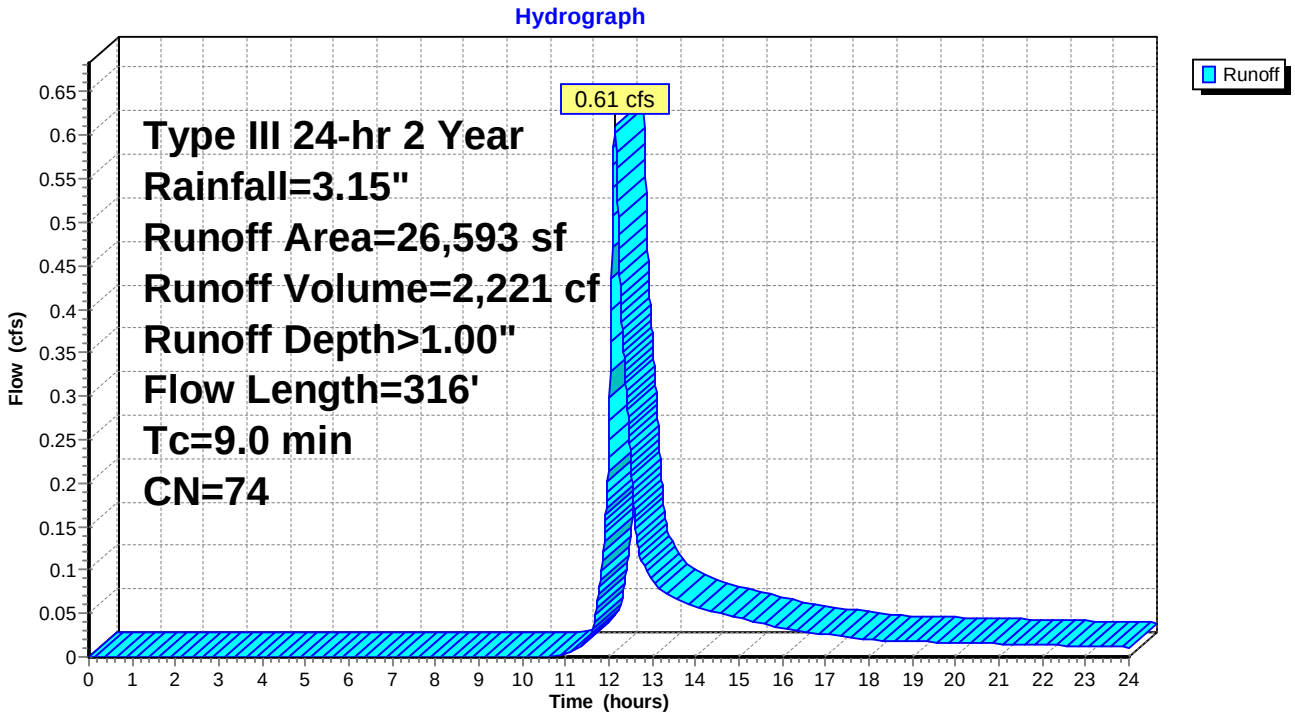
Runoff = 0.61 cfs @ 12.14 hrs, Volume= 2,221 cf, Depth> 1.00"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.15"

Area (sf)	CN	Description
15,358	57	Woods/grass comb., Poor, HSG A
10,499	98	Paved parking, HSG A
736	76	Gravel roads, HSG A
26,593	74	Weighted Average
16,094		60.52% Pervious Area
10,499		39.48% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.3	90	0.2444	0.21		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
1.7	226	0.0115	2.18		**Shallow Concentrated Flow, Road** Paved Kv= 20.3 fps
9.0	316	Total			

Subcatchment 17S: Worcester St S



Summary for Subcatchment 18S: Arcadi Rd

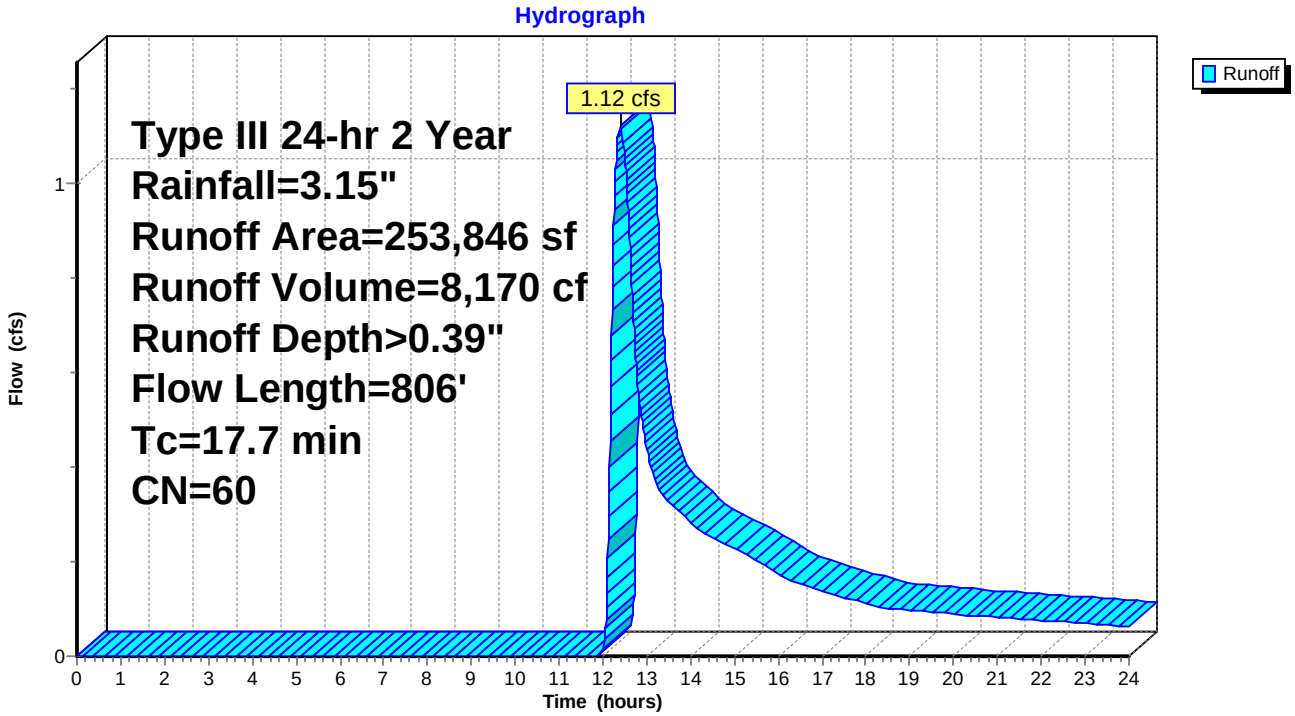
Runoff = 1.12 cfs @ 12.39 hrs, Volume= 8,170 cf, Depth> 0.39"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.15"

Area (sf)	CN	Description
24,868	76	Gravel roads, HSG A
1,306	98	Paved parking, HSG A
145,254	57	Woods/grass comb., Poor, HSG A
82,418	61	1/4 acre lots, 38% imp, HSG A
253,846	60	Weighted Average
221,221		87.15% Pervious Area
32,625		12.85% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.1	55	0.3853	0.22		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
12.5	625	0.0027	0.84		**Shallow Concentrated Flow, Gravel** Unpaved Kv= 16.1 fps
1.1	126	0.1433	1.89		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
17.7	806	Total			

Subcatchment 18S: Arcadi Rd



Summary for Subcatchment 19S: Fisher St

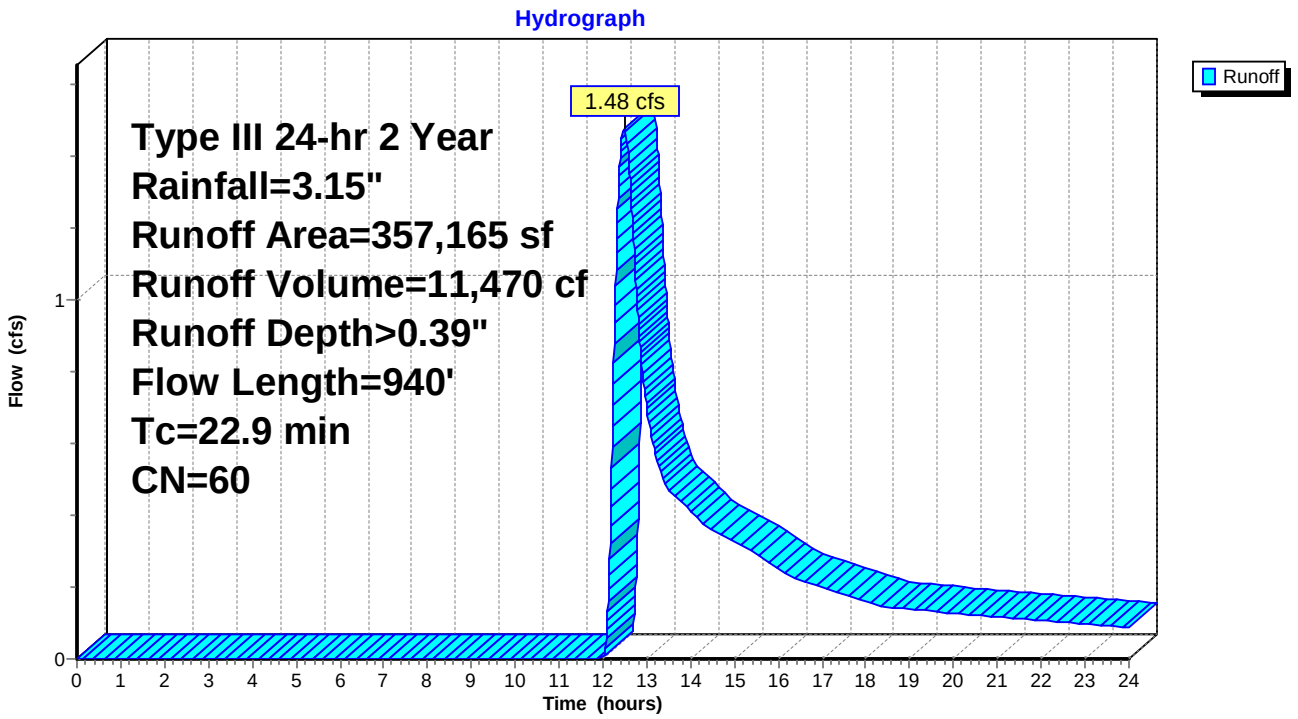
Runoff = 1.48 cfs @ 12.49 hrs, Volume= 11,470 cf, Depth> 0.39"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.15"

Area (sf)	CN	Description
193,343	61	1/4 acre lots, 38% imp, HSG A
19,772	76	Gravel roads, HSG A
144,050	57	Woods/grass comb., Poor, HSG A
357,165	60	Weighted Average
283,695		79.43% Pervious Area
73,470		20.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.6	100	0.0550	0.25		**Sheet Flow, Yards** Grass: Short n= 0.150 P2= 3.15"
0.5	30	0.0250	1.11		**Shallow Concentrated Flow, Yards** Short Grass Pasture Kv= 7.0 fps
3.0	38	0.4079	0.21		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
12.6	749	0.0038	0.99		**Shallow Concentrated Flow, Gravel Path** Unpaved Kv= 16.1 fps
0.2	23	0.1609	2.01		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
22.9	940	Total			

Subcatchment 19S: Fisher St



Summary for Subcatchment 20S: Unnamed Pond 1

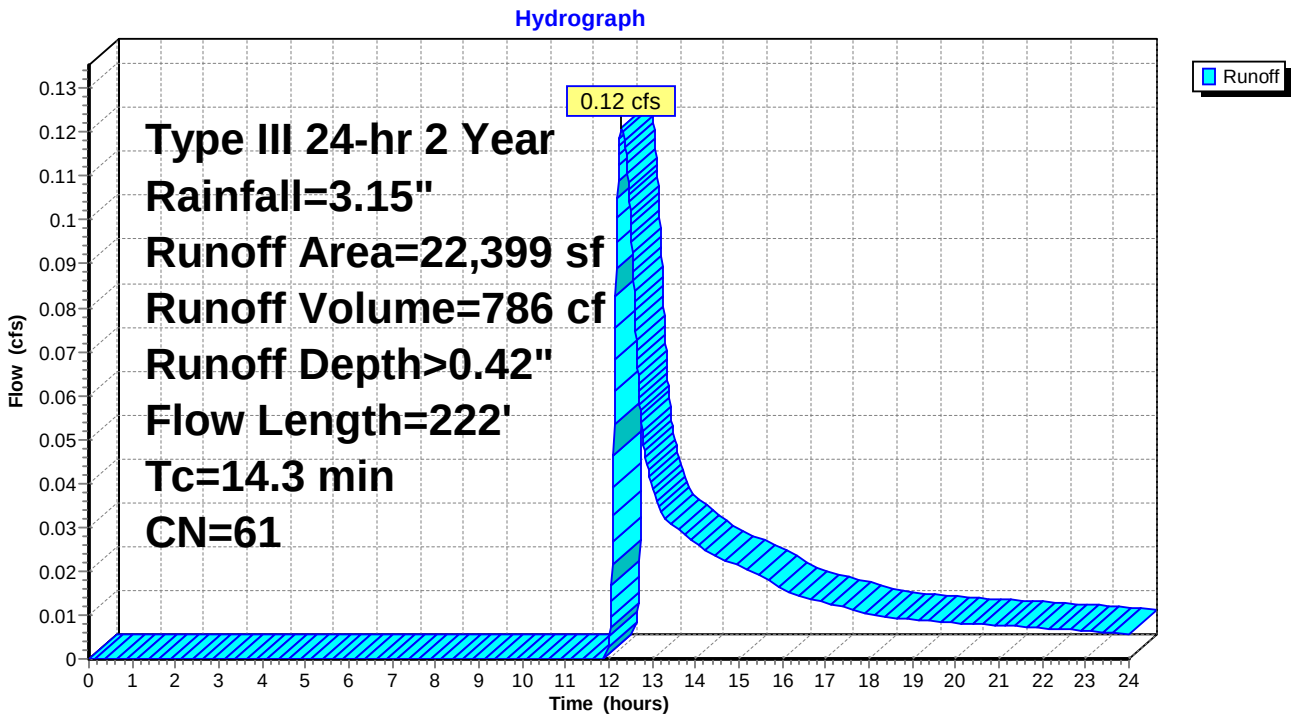
Runoff = 0.12 cfs @ 12.29 hrs, Volume= 786 cf, Depth> 0.42"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.15"

Area (sf)	CN	Description
1,842	61	1/4 acre lots, 38% imp, HSG A
1,190	98	Paved parking, HSG A
2,043	76	Gravel roads, HSG A
17,324	57	Woods/grass comb., Poor, HSG A
22,399	61	Weighted Average
20,509		91.56% Pervious Area
1,890		8.44% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	24	0.0154	0.92		**Sheet Flow, Driveway**
					Smooth surfaces n= 0.011 P2= 3.15"
1.9	16	0.0312	0.14		**Sheet Flow, Yards**
					Grass: Short n= 0.150 P2= 3.15"
10.4	60	0.0450	0.10		**Sheet Flow, Woods**
					Woods: Light underbrush n= 0.400 P2= 3.15"
1.6	122	0.0639	1.26		**Shallow Concentrated Flow, Woods**
					Woodland Kv= 5.0 fps
14.3	222	Total			

Subcatchment 20S: Unnamed Pond 1



Summary for Subcatchment 21S: Unnamed Pond 2

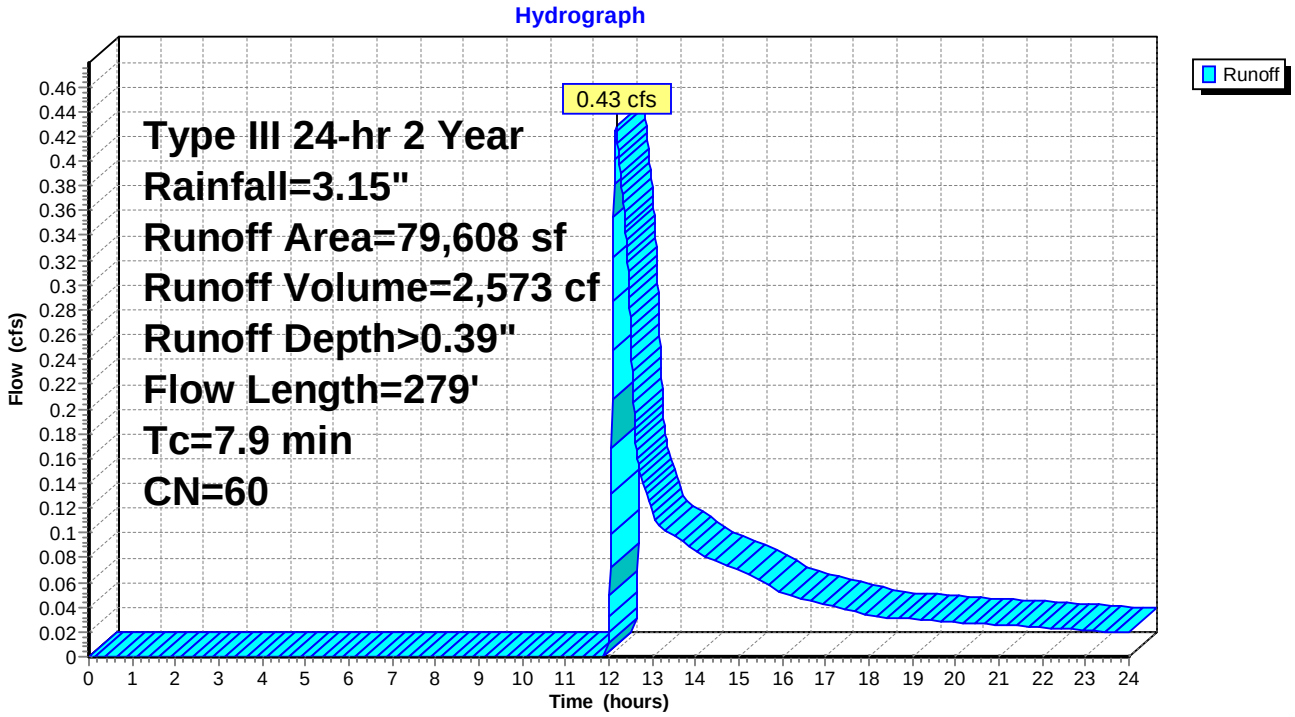
Runoff = 0.43 cfs @ 12.16 hrs, Volume= 2,573 cf, Depth> 0.39"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.15"

Area (sf)	CN	Description
51,542	61	1/4 acre lots, 38% imp, HSG A
3,537	76	Gravel roads, HSG A
24,529	57	Woods/grass comb., Poor, HSG A
79,608	60	Weighted Average
60,022		75.40% Pervious Area
19,586		24.60% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.7	100	0.0800	0.29		**Sheet Flow, Yards** Grass: Short n= 0.150 P2= 3.15"
1.3	105	0.0381	1.37		**Shallow Concentrated Flow, Yards** Short Grass Pasture Kv= 7.0 fps
0.9	74	0.0724	1.35		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
7.9	279	Total			

Subcatchment 21S: Unnamed Pond 2



Summary for Subcatchment 22S: Unnamed Pond 3

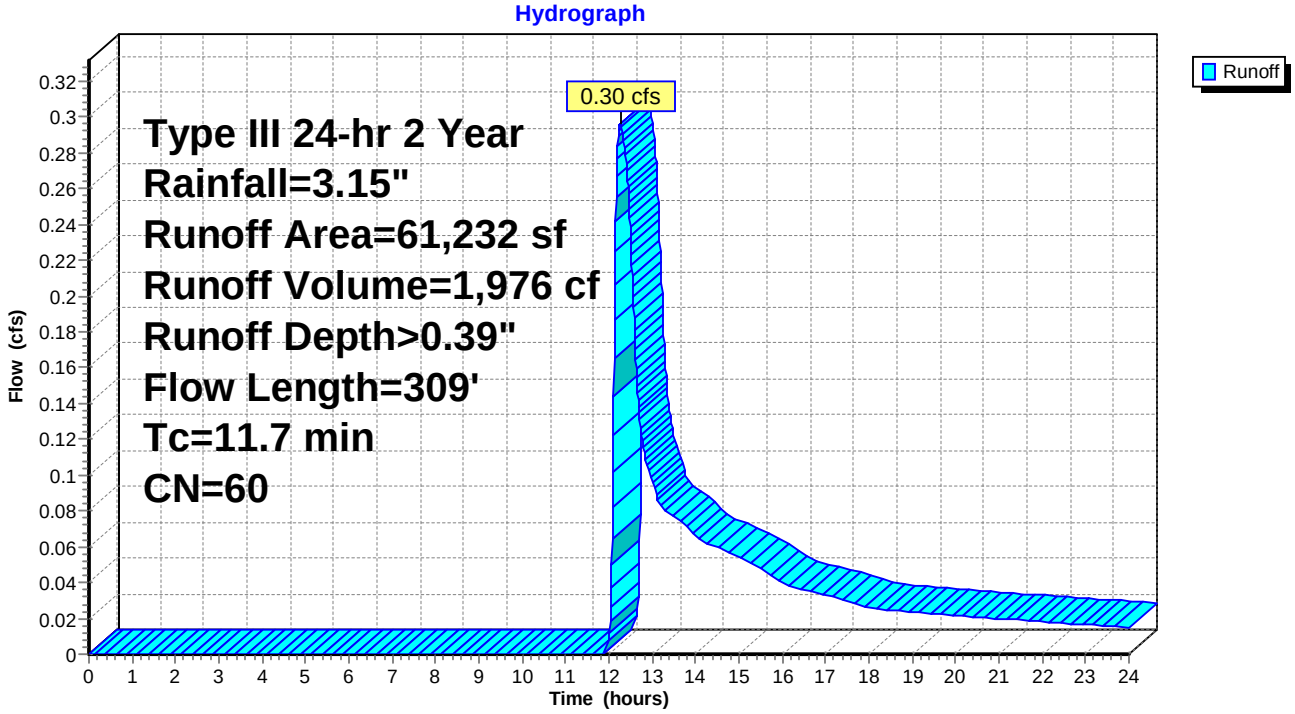
Runoff = 0.30 cfs @ 12.25 hrs, Volume= 1,976 cf, Depth> 0.39"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.15"

Area (sf)	CN	Description
27,651	61	1/4 acre lots, 38% imp, HSG A
2,864	76	Gravel roads, HSG A
119	98	Paved parking, HSG A
30,598	57	Woods/grass comb., Poor, HSG A
61,232	60	Weighted Average
50,606		82.65% Pervious Area
10,626		17.35% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.2	100	0.0320	0.20		**Sheet Flow, Grass** Grass: Short n= 0.150 P2= 3.15"
3.5	209	0.0400	1.00		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
11.7	309	Total			

Subcatchment 22S: Unnamed Pond 3



Summary for Subcatchment 23S: Unnamed Pond 4

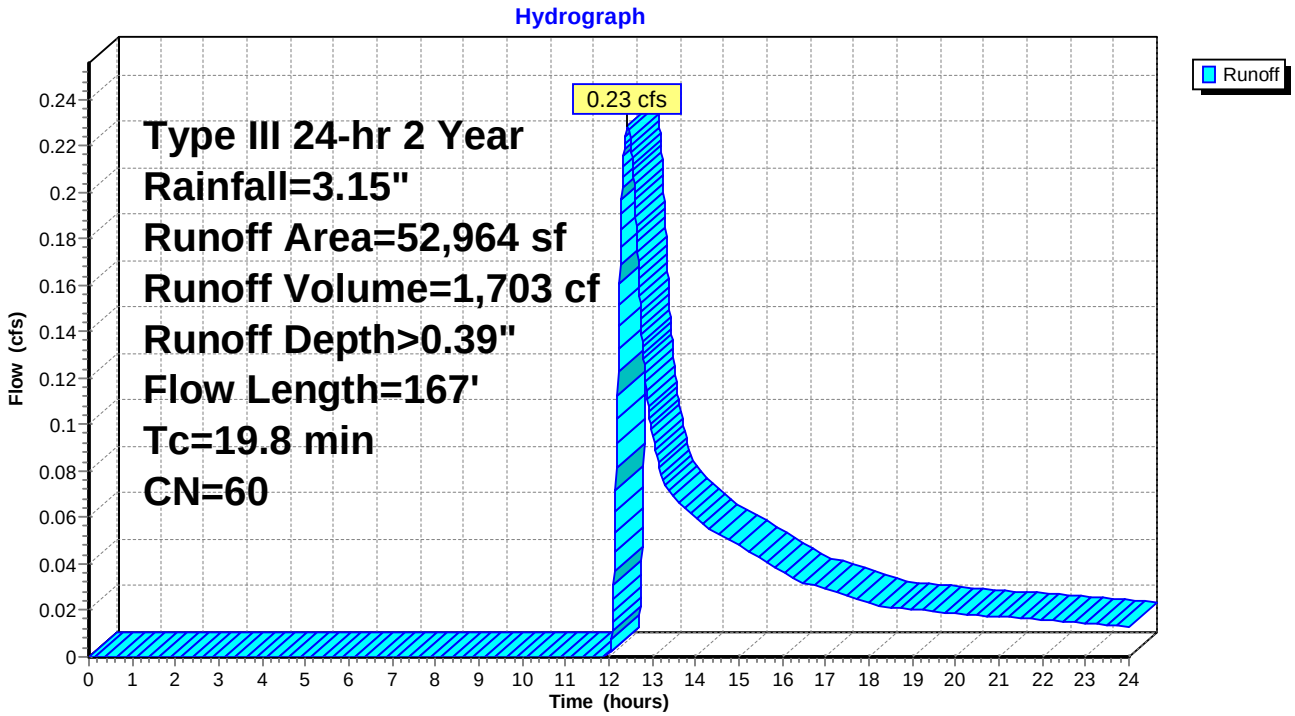
Runoff = 0.23 cfs @ 12.43 hrs, Volume= 1,703 cf, Depth> 0.39"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.15"

Area (sf)	CN	Description
44,170	57	Woods/grass comb., Poor, HSG A
7,994	76	Gravel roads, HSG A
800	98	Paved parking, HSG A
52,964	60	Weighted Average
52,164		98.49% Pervious Area
800		1.51% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.9	100	0.1100	0.15		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
8.9	67	0.0821	0.13		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
19.8	167	Total			

Subcatchment 23S: Unnamed Pond 4



Summary for Subcatchment 24S: Kansas St

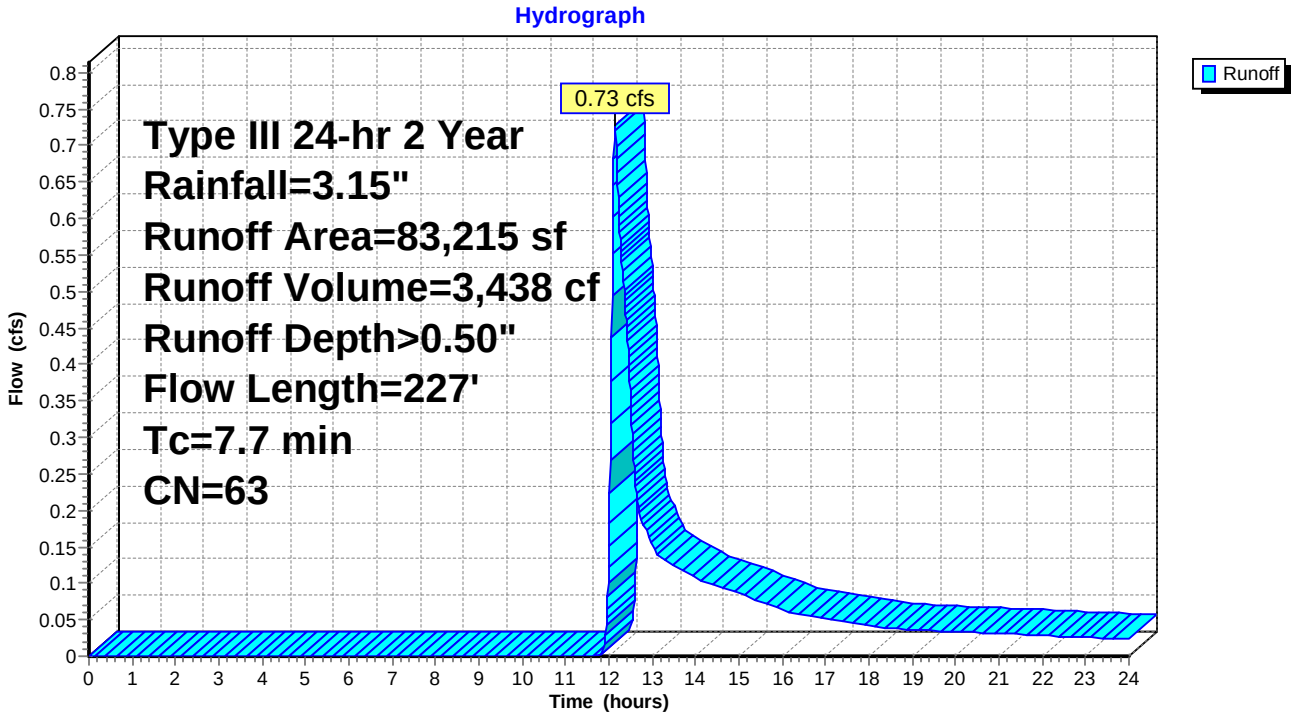
Runoff = 0.73 cfs @ 12.14 hrs, Volume= 3,438 cf, Depth> 0.50"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.15"

Area (sf)	CN	Description
20,750	61	1/4 acre lots, 38% imp, HSG A
7,064	76	Gravel roads, HSG A
6,960	98	Paved parking, HSG A
48,441	57	Woods/grass comb., Poor, HSG A
83,215	63	Weighted Average
68,370		82.16% Pervious Area
14,845		17.84% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.5	100	0.0575	0.26		**Sheet Flow, Yards** Grass: Short n= 0.150 P2= 3.15"
0.9	89	0.0590	1.70		**Shallow Concentrated Flow, Yards** Short Grass Pasture Kv= 7.0 fps
0.3	38	0.1974	2.22		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
7.7	227	Total			

Subcatchment 24S: Kansas St



Summary for Subcatchment 25S: North Main @ Kansas

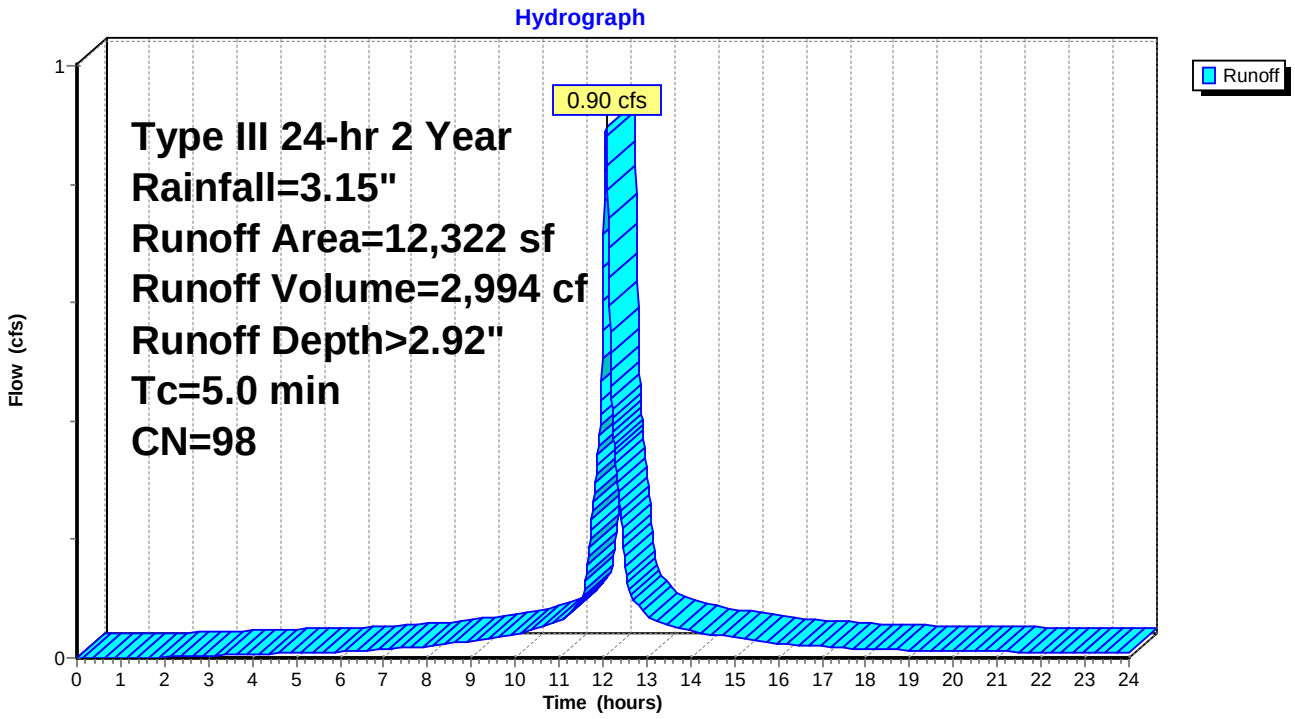
Runoff = 0.90 cfs @ 12.07 hrs, Volume= 2,994 cf, Depth> 2.92"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.15"

Area (sf)	CN	Description
12,322	98	Paved roads w/curbs & sewers, HSG A
12,322		100.00% Impervious Area

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

Subcatchment 25S: North Main @ Kansas



Summary for Subcatchment 26S: Empty Lot

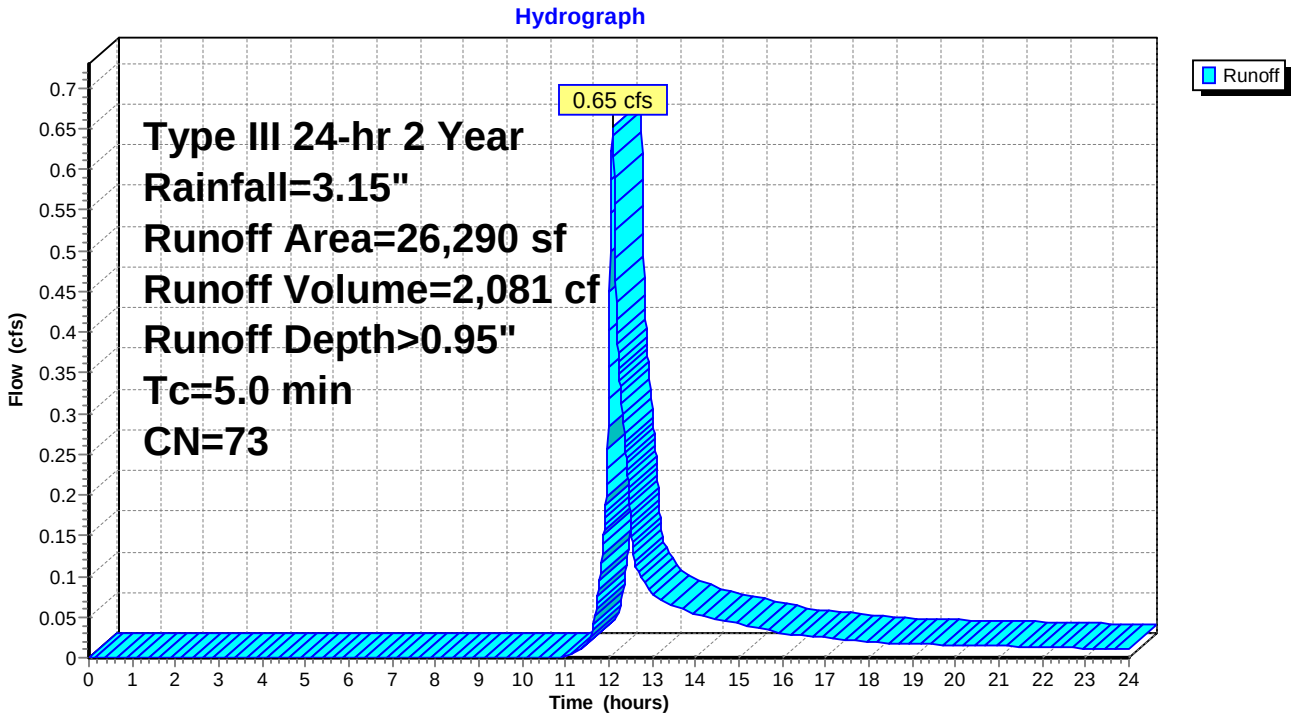
Runoff = 0.65 cfs @ 12.08 hrs, Volume= 2,081 cf, Depth> 0.95"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.15"

Area (sf)	CN	Description
18,679	72	Dirt roads, HSG A
7,611	76	Gravel roads, HSG A
26,290	73	Weighted Average
26,290		100.00% Pervious Area

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

Subcatchment 26S: Empty Lot



Summary for Subcatchment 27S: Washington Ave 1

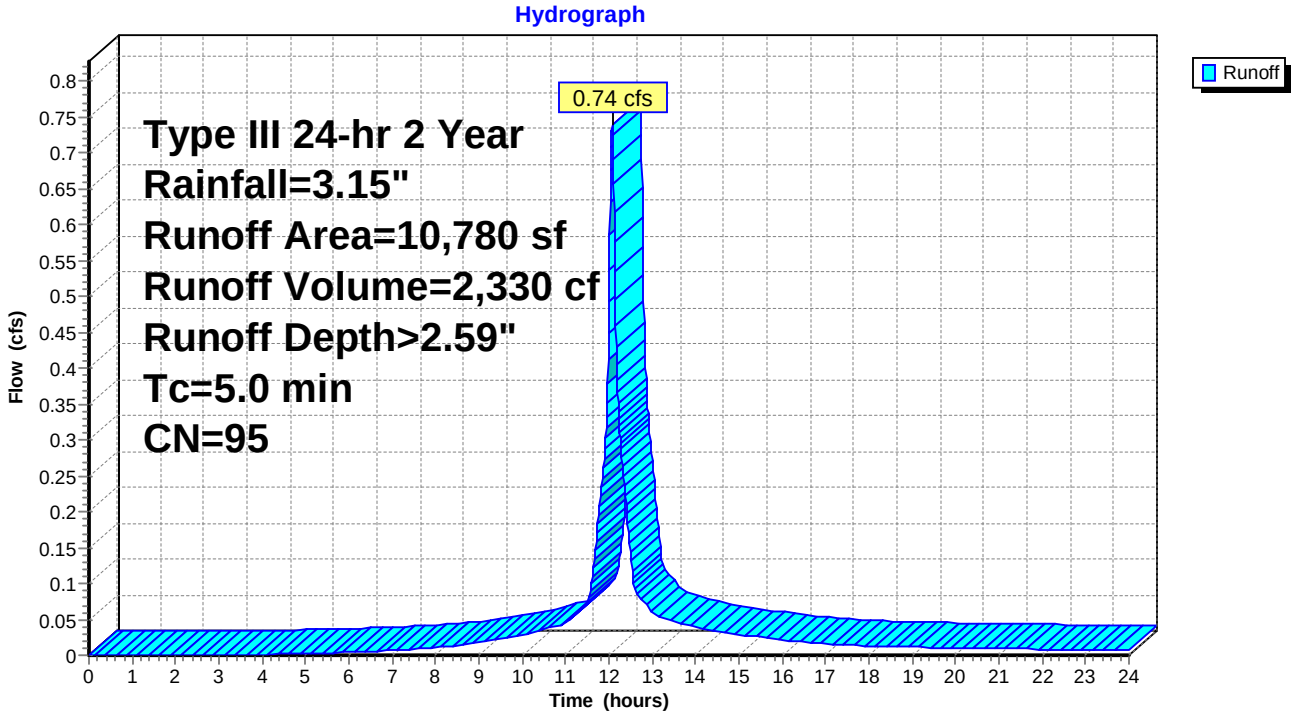
Runoff = 0.74 cfs @ 12.07 hrs, Volume= 2,330 cf, Depth> 2.59"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.15"

Area (sf)	CN	Description
1,673	76	Gravel roads, HSG A
9,107	98	Paved parking, HSG A
10,780	95	Weighted Average
1,673		15.52% Pervious Area
9,107		84.48% Impervious Area

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

Subcatchment 27S: Washington Ave 1



Summary for Subcatchment 28S: Washington Ave 2

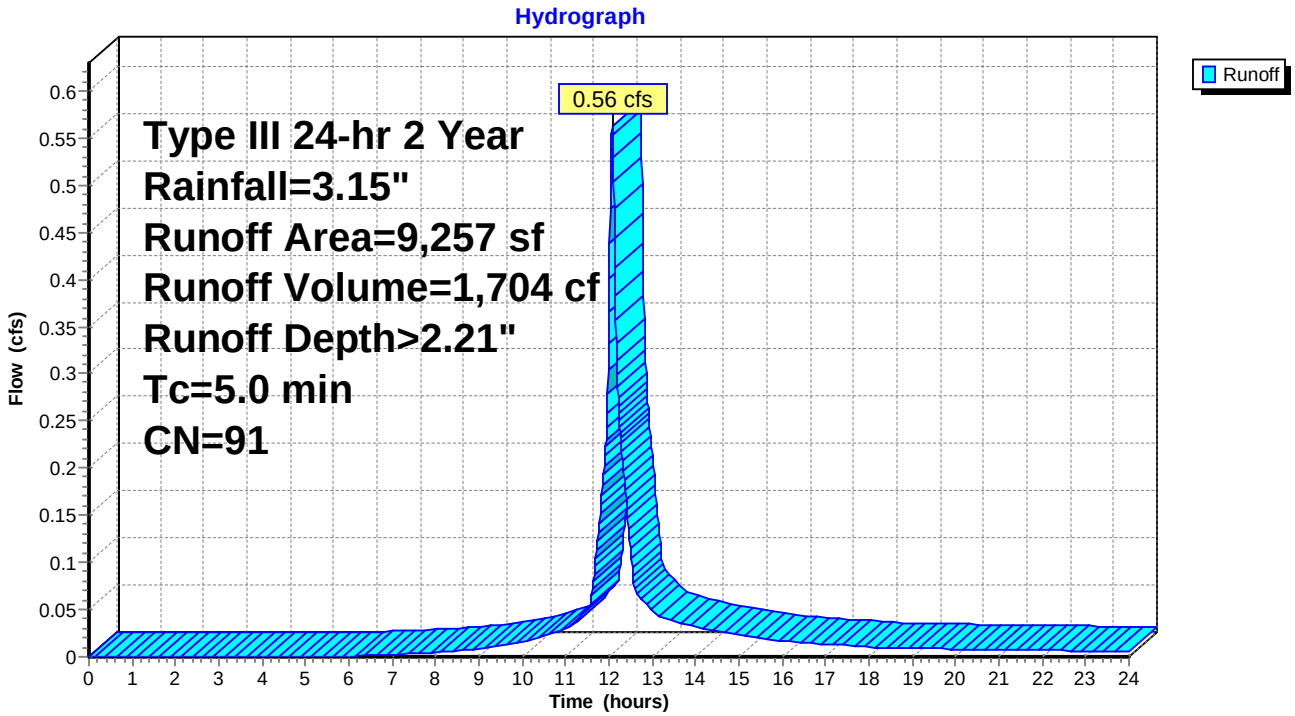
Runoff = 0.56 cfs @ 12.07 hrs, Volume= 1,704 cf, Depth> 2.21"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.15"

Area (sf)	CN	Description
3,039	76	Gravel roads, HSG A
6,175	98	Paved parking, HSG A
43	72	Dirt roads, HSG A
9,257	91	Weighted Average
3,082		33.29% Pervious Area
6,175		66.71% Impervious Area

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

Subcatchment 28S: Washington Ave 2



Summary for Subcatchment 29S: Washington Ave 3

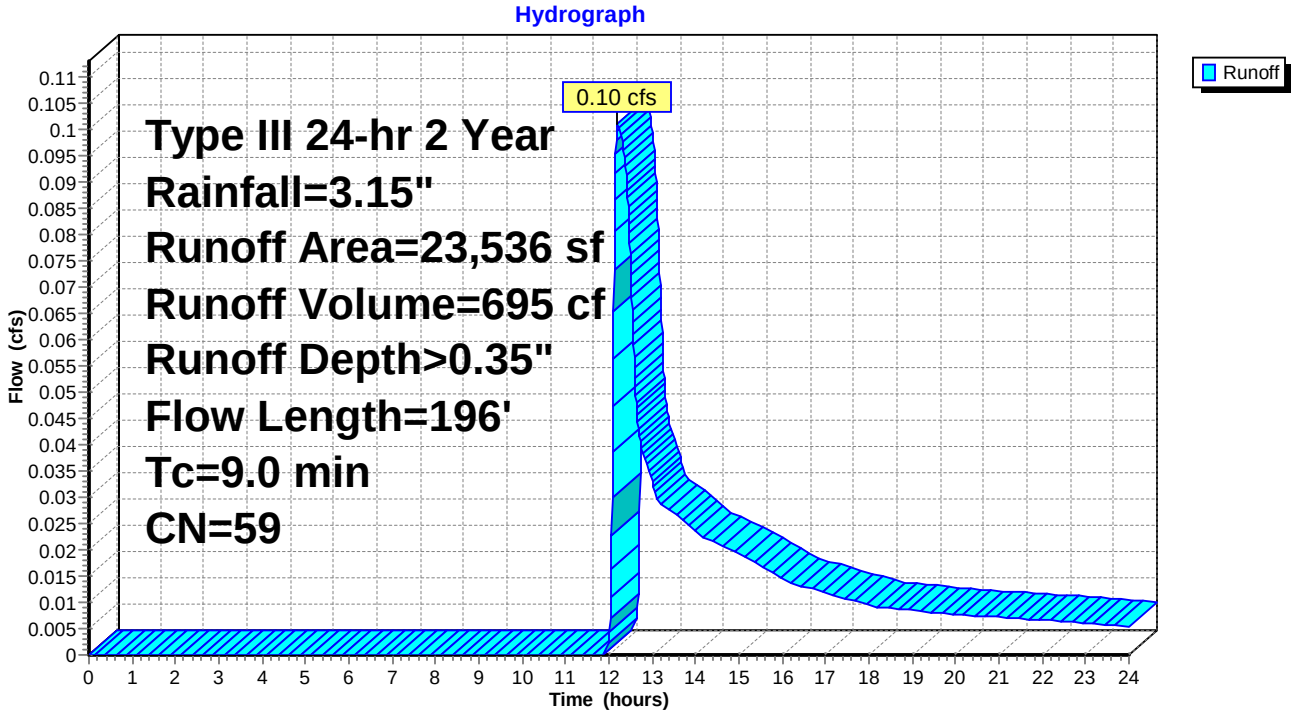
Runoff = 0.10 cfs @ 12.21 hrs, Volume= 695 cf, Depth> 0.35"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.15"

Area (sf)	CN	Description
19,229	61	1/4 acre lots, 38% imp, HSG A
621	76	Gravel roads, HSG A
3,686	45	Woods, Poor, HSG A
23,536	59	Weighted Average
16,229		68.95% Pervious Area
7,307		31.05% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	100	0.0350	0.21		**Sheet Flow, Yards** Grass: Short n= 0.150 P2= 3.15"
1.1	96	0.0427	1.45		**Shallow Concentrated Flow, Yards** Short Grass Pasture Kv= 7.0 fps
9.0	196	Total			

Subcatchment 29S: Washington Ave 3



Summary for Subcatchment 30S: Lagrange St

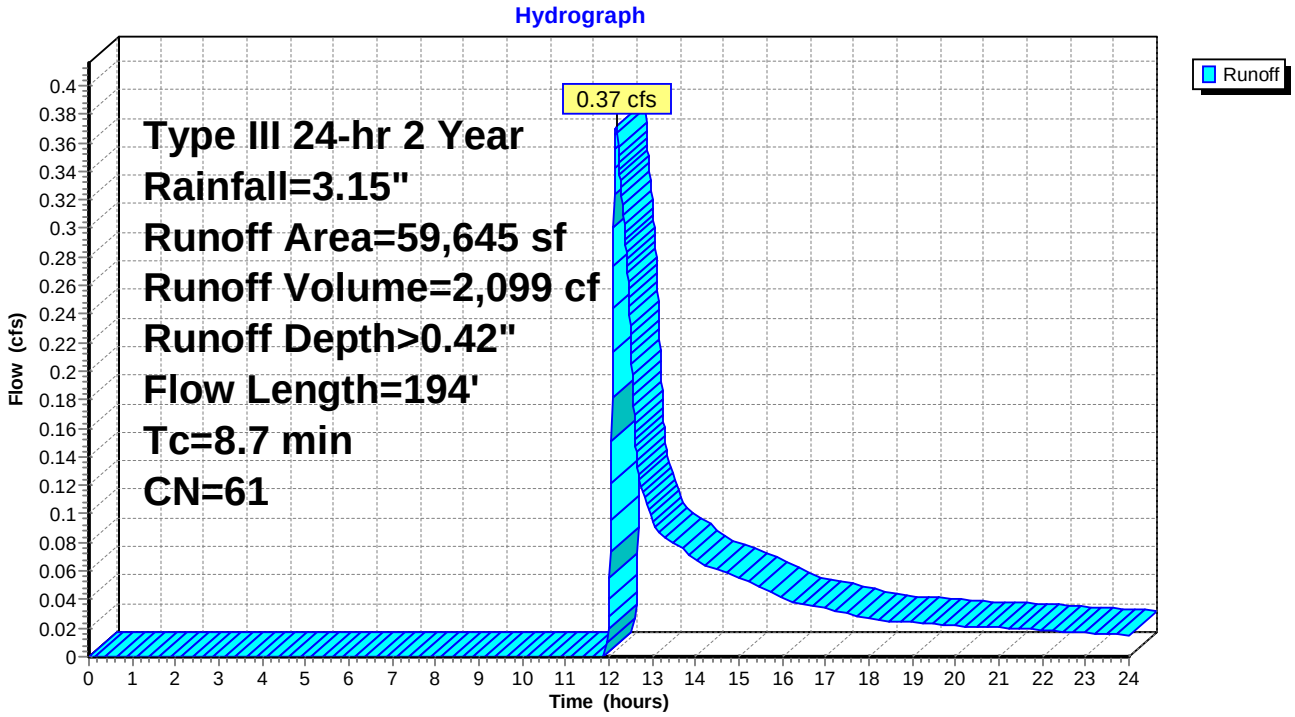
Runoff = 0.37 cfs @ 12.17 hrs, Volume= 2,099 cf, Depth> 0.42"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.15"

Area (sf)	CN	Description
49,221	61	1/4 acre lots, 38% imp, HSG A
686	76	Gravel roads, HSG A
9,738	57	Woods/grass comb., Poor, HSG A
59,645	61	Weighted Average
40,941		68.64% Pervious Area
18,704		31.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.1	100	0.0450	0.23		**Sheet Flow, Yards** Grass: Short n= 0.150 P2= 3.15"
0.9	53	0.0189	0.96		**Shallow Concentrated Flow, Yards** Short Grass Pasture Kv= 7.0 fps
0.7	41	0.0366	0.96		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
8.7	194	Total			

Subcatchment 30S: Lagrange St



Summary for Subcatchment 31S: Mechanic St

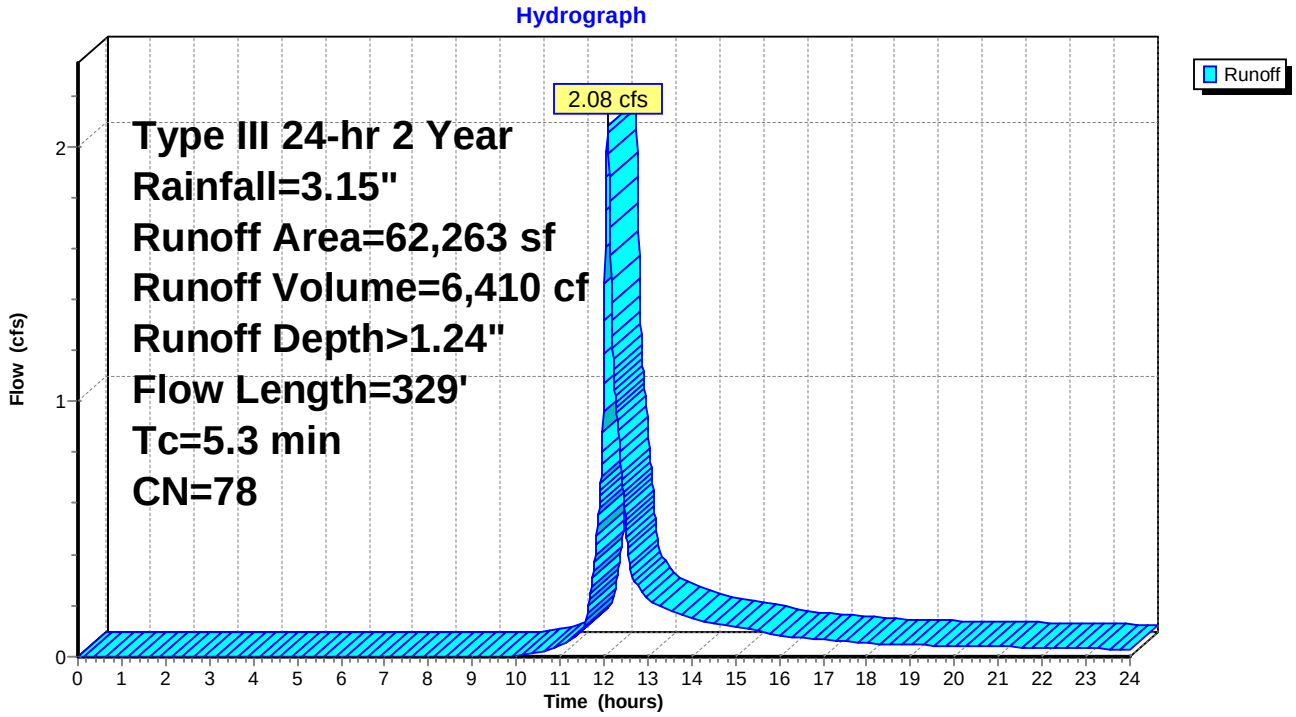
Runoff = 2.08 cfs @ 12.08 hrs, Volume= 6,410 cf, Depth> 1.24"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.15"

Area (sf)	CN	Description
40,274	81	Urban industrial, 72% imp, HSG A
8,476	76	Gravel roads, HSG A
2,503	98	Paved parking, HSG A
6,188	57	Woods/grass comb., Poor, HSG A
4,822	68	<50% Grass cover, Poor, HSG A
62,263	78	Weighted Average
30,763		49.41% Pervious Area
31,500		50.59% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	100	0.0150	1.22		**Sheet Flow, Road** Smooth surfaces n= 0.011 P2= 3.15"
3.9	229	0.0037	0.98		**Shallow Concentrated Flow, Gravel Path** Unpaved Kv= 16.1 fps
5.3	329	Total			

Subcatchment 31S: Mechanic St



Summary for Subcatchment 32S: Cochituate St 1

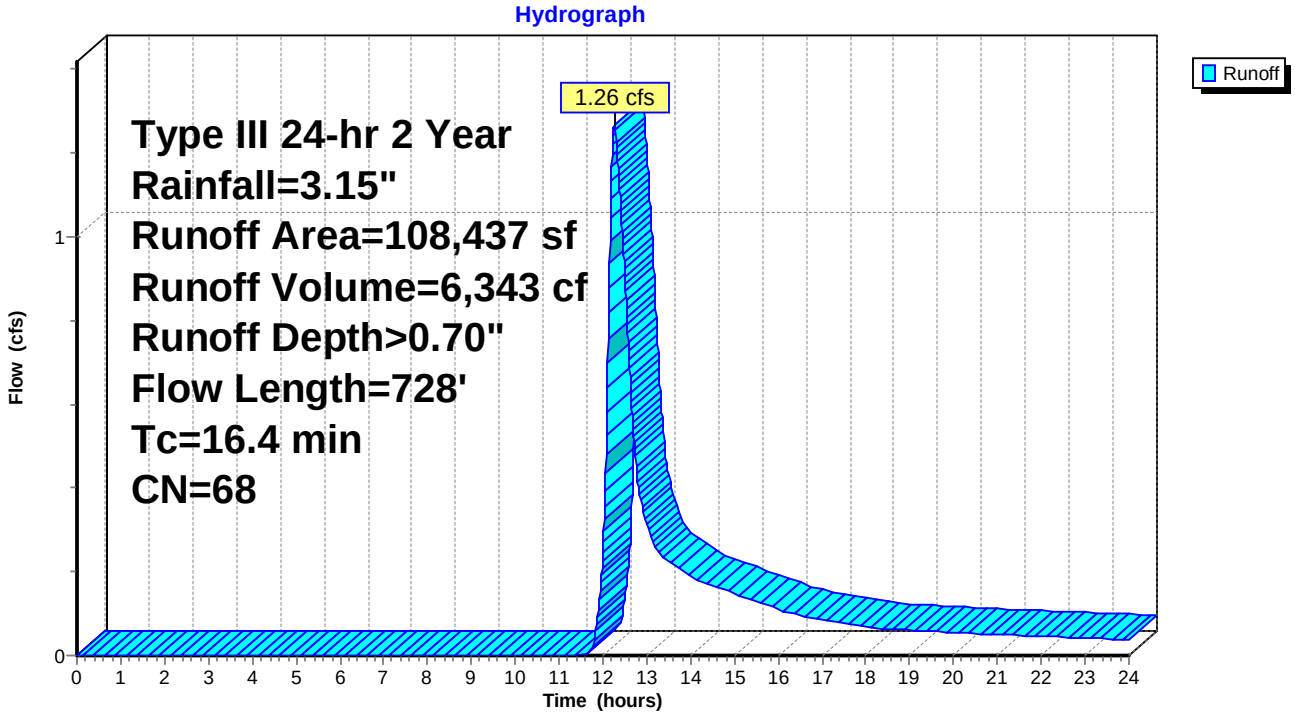
Runoff = 1.26 cfs @ 12.26 hrs, Volume= 6,343 cf, Depth> 0.70"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.15"

Area (sf)	CN	Description
12,744	81	Urban industrial, 72% imp, HSG A
15,529	76	Gravel roads, HSG A
30,613	57	Woods/grass comb., Poor, HSG A
11,315	98	Paved parking, HSG A
38,236	61	1/4 acre lots, 38% imp, HSG A
108,437	68	Weighted Average
73,417		67.70% Pervious Area
35,020		32.30% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.4	75	0.0333	0.20		**Sheet Flow, Yards** Grass: Short n= 0.150 P2= 3.15"
1.9	25	0.5200	0.21		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
8.1	628	0.0064	1.29		**Shallow Concentrated Flow, Gravel Path** Unpaved Kv= 16.1 fps
16.4	728	Total			

Subcatchment 32S: Cochituate St 1



Summary for Pond 01P: Speen St Detention

Inflow Area = 28,640 sf, 6.23% Impervious, Inflow Depth > 0.66" for 2 Year event
Inflow = 0.35 cfs @ 12.18 hrs, Volume= 1,572 cf
Outflow = 0.34 cfs @ 12.19 hrs, Volume= 1,569 cf, Atten= 0%, Lag= 0.4 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Secondary = 0.34 cfs @ 12.19 hrs, Volume= 1,569 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 159.61' @ 12.19 hrs Surf.Area= 42 sf Storage= 10 cf

Plug-Flow detention time= 1.6 min calculated for 1,569 cf (100% of inflow)
Center-of-Mass det. time= 0.7 min (892.3 - 891.6)

Volume	Invert	Avail.Storage	Storage Description
#1	159.00'	910 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

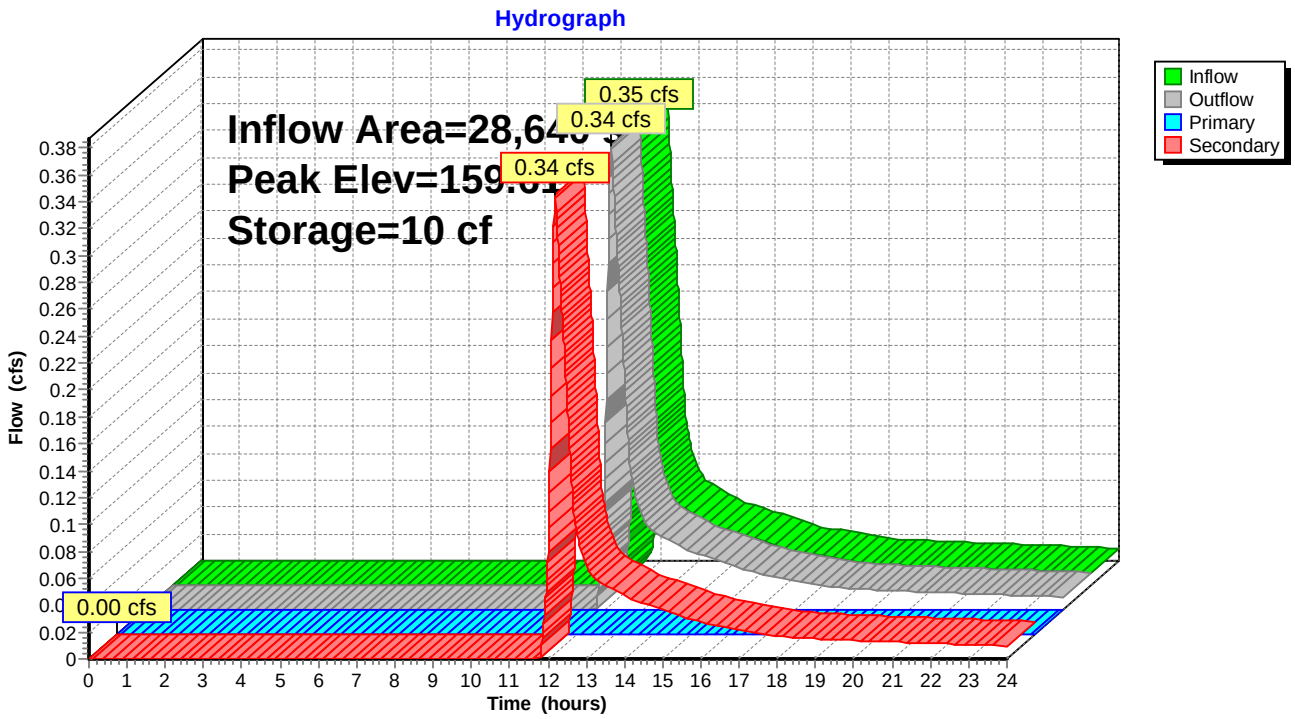
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
159.00	1	5.4	0	0	1
160.00	98	40.0	36	36	128
161.00	176	52.0	135	171	227
162.00	329	79.0	249	420	516
163.00	671	128.0	490	910	1,330

Device	Routing	Invert	Outlet Devices
#1	Primary	162.50'	**18.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32
#2	Secondary	159.30'	**24.0" Round Culvert** L= 30.0' CMP, projecting, no headwall, Ke= 0.900 Outlet Invert= 159.00' S= 0.0100 '/' Cc= 0.900 n= 0.025 Corrugated metal

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=159.00' (Free Discharge)
└**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Secondary OutFlow Max=0.34 cfs @ 12.19 hrs HW=159.61' (Free Discharge)
└**2=Culvert** (Barrel Controls 0.34 cfs @ 1.66 fps)

Pond 01P: Speen St Detention



Summary for Pond 2P: Lake Cochituate

Inflow Area = 2,480,180 sf, 21.04% Impervious, Inflow Depth > 0.63" for 2 Year event
Inflow = 19.49 cfs @ 12.31 hrs, Volume= 130,598 cf
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 100%, Lag= 0.0 min

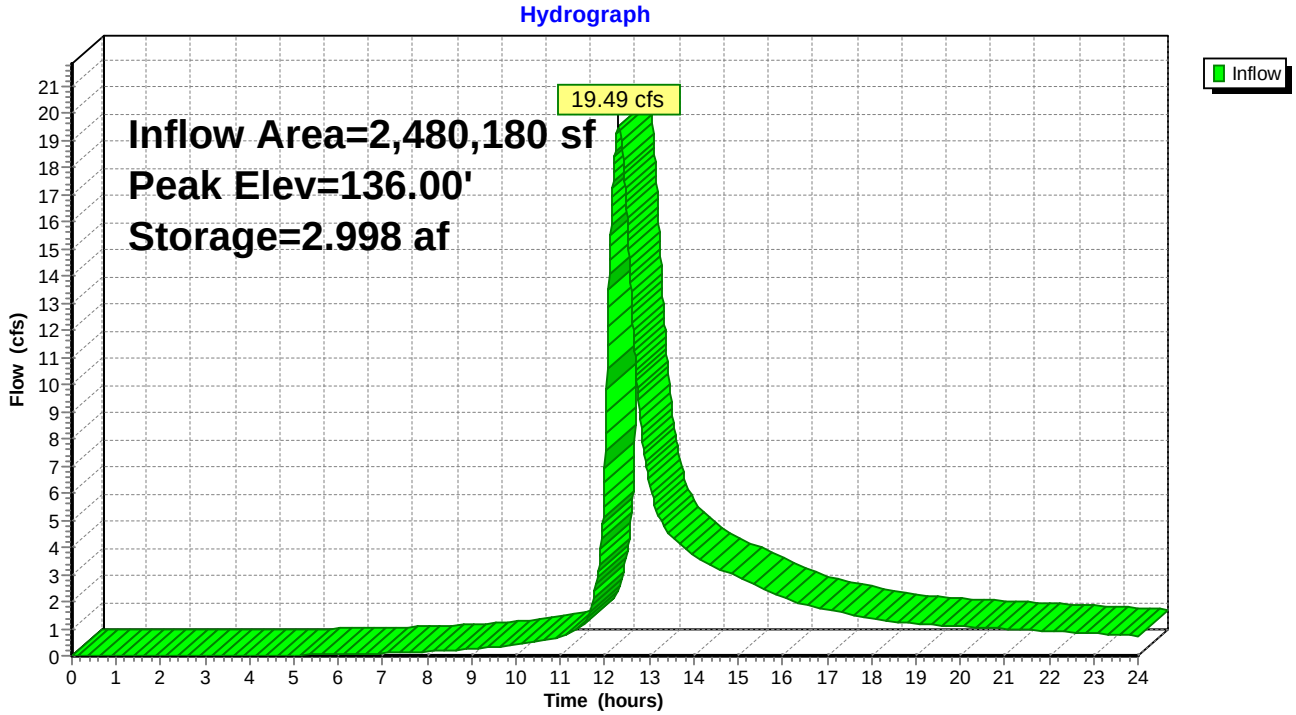
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 136.00' @ 24.00 hrs Surf.Area= 625.000 ac Storage= 2.998 af

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

Volume	Invert	Avail.Storage	Storage Description
#1	136.00'	625.000 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
136.00	625.000	0.000	0.000
137.00	625.000	625.000	625.000

Pond 2P: Lake Cochituate

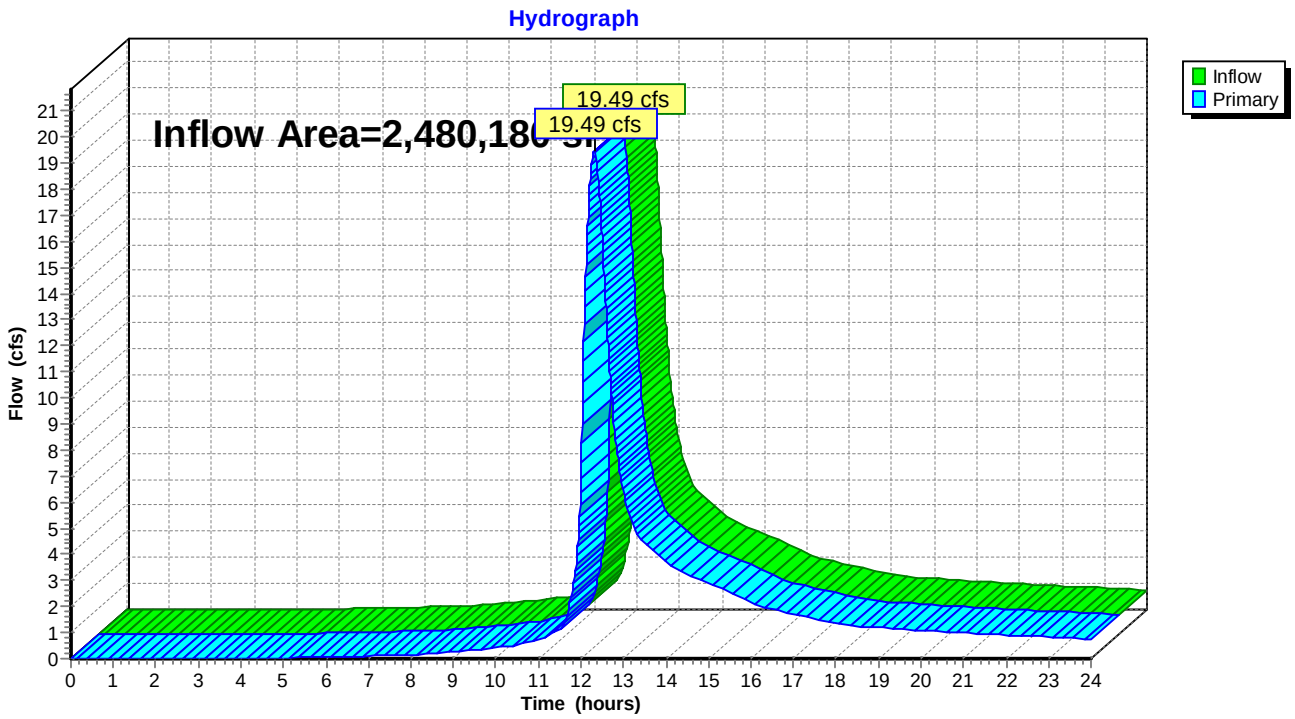


Summary for Link 1L: Total

Inflow Area = 2,480,180 sf, 21.04% Impervious, Inflow Depth > 0.63" for 2 Year event
Inflow = 19.49 cfs @ 12.31 hrs, Volume= 130,598 cf
Primary = 19.49 cfs @ 12.31 hrs, Volume= 130,598 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link 1L: Total

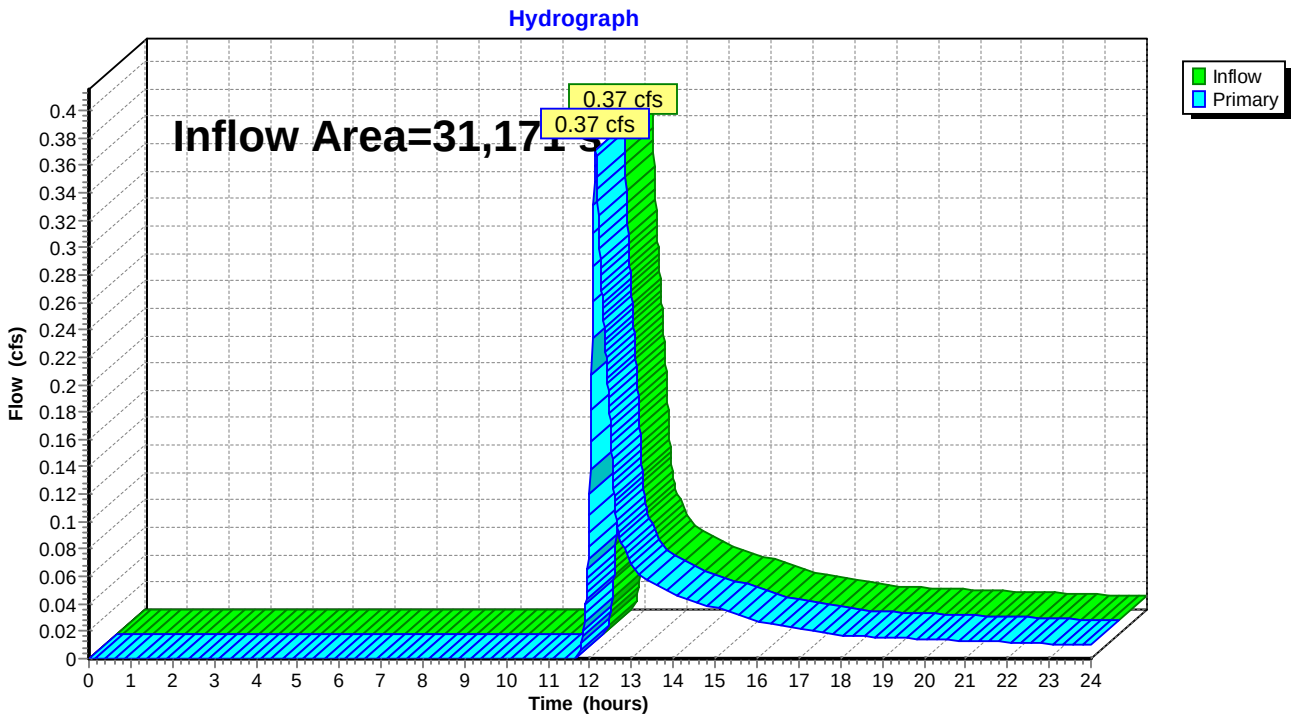


Summary for Link DP01: Cochituate Rd

Inflow Area = 31,171 sf, 8.89% Impervious, Inflow Depth > 0.61" for 2 Year event
Inflow = 0.37 cfs @ 12.13 hrs, Volume= 1,584 cf
Primary = 0.37 cfs @ 12.13 hrs, Volume= 1,584 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link DP01: Cochituate Rd

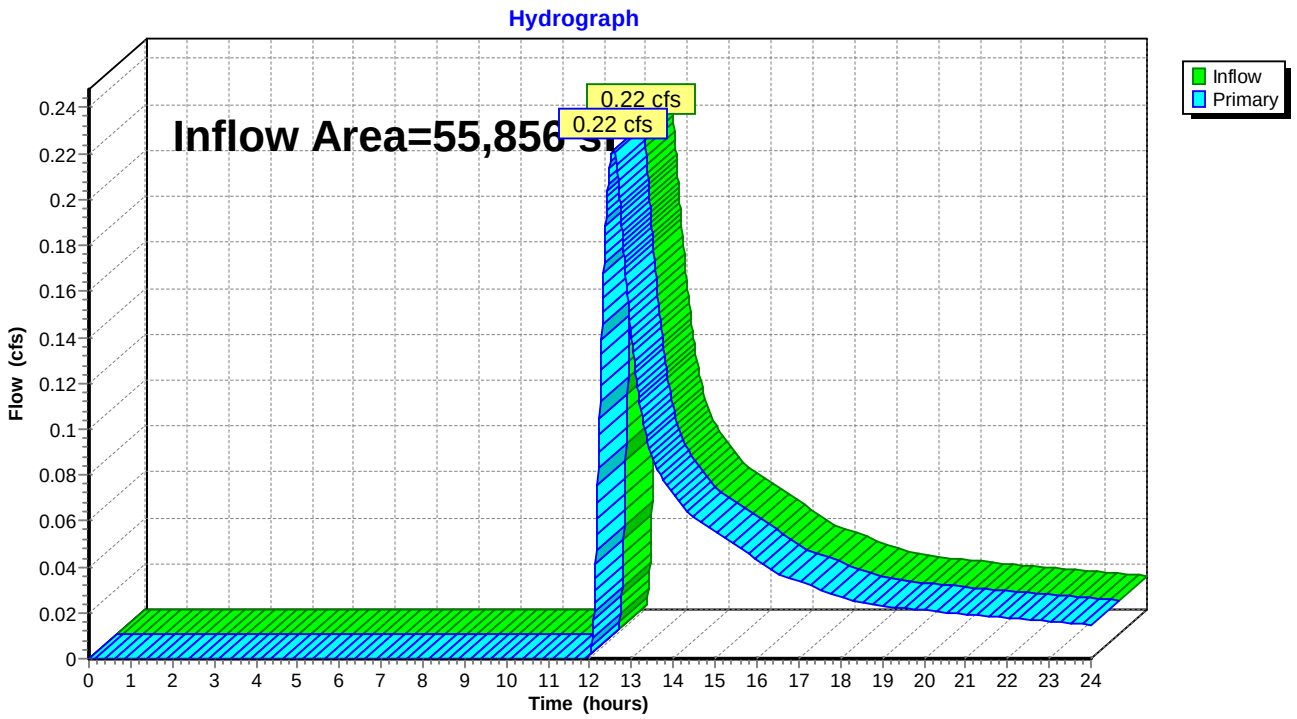


Summary for Link DP02: Chrystler St

Inflow Area = 55,856 sf, 4.44% Impervious, Inflow Depth > 0.42" for 2 Year event
Inflow = 0.22 cfs @ 12.56 hrs, Volume= 1,949 cf
Primary = 0.22 cfs @ 12.56 hrs, Volume= 1,949 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link DP02: Chrystler St

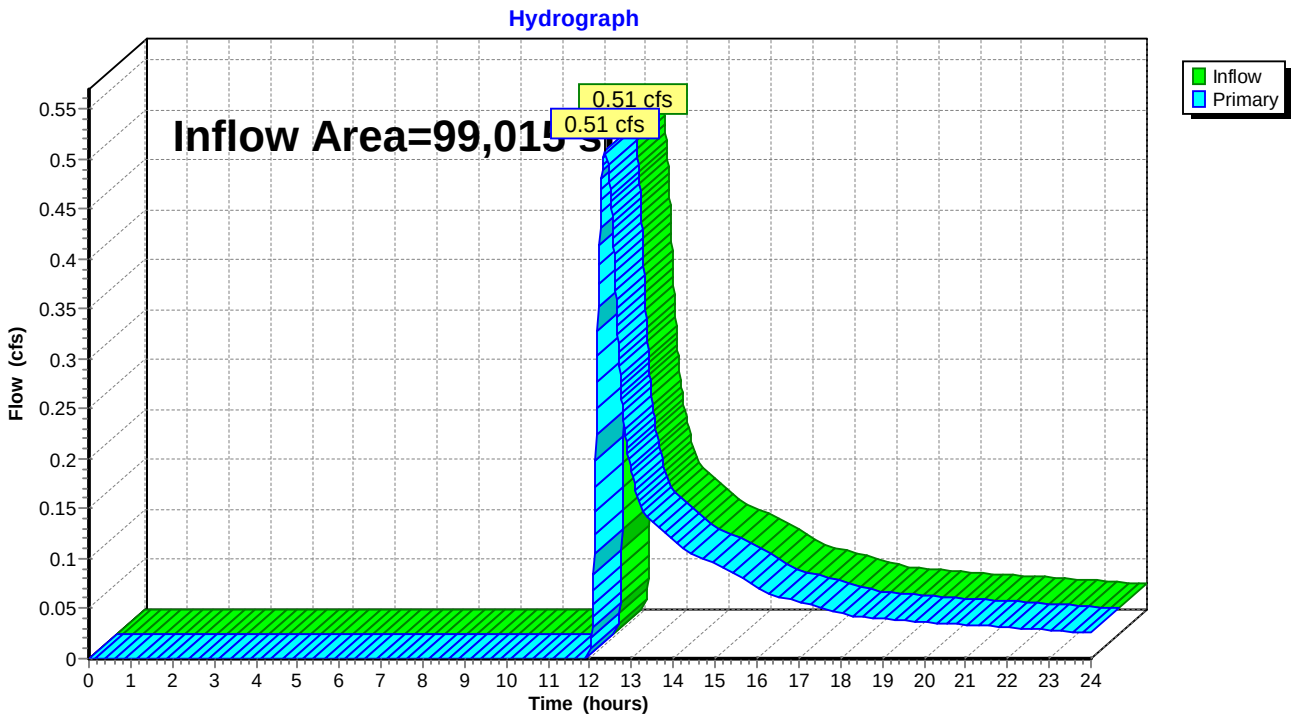


Summary for Link DP03: WF A

Inflow Area = 99,015 sf, 0.66% Impervious, Inflow Depth > 0.42" for 2 Year event
Inflow = 0.51 cfs @ 12.36 hrs, Volume= 3,472 cf
Primary = 0.51 cfs @ 12.36 hrs, Volume= 3,472 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link DP03: WF A

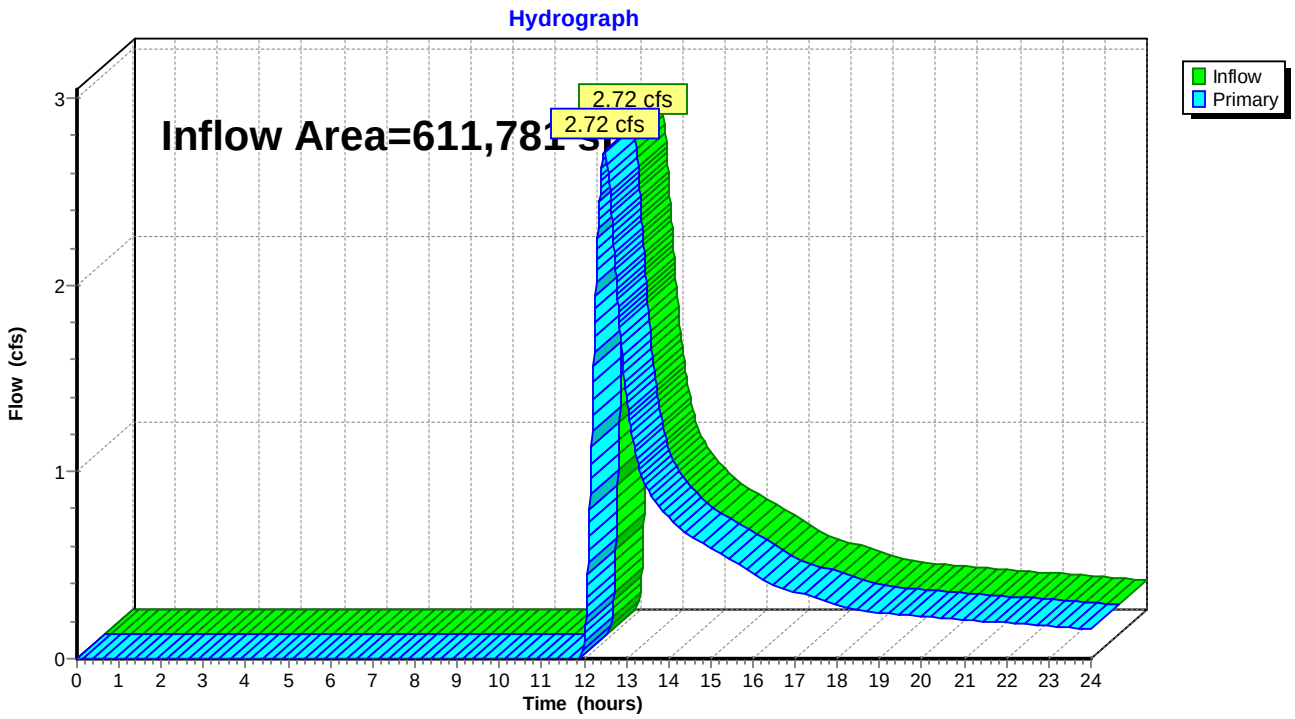


Summary for Link DP04: Lake Cochituate Middle Pond

Inflow Area = 611,781 sf, 6.85% Impervious, Inflow Depth > 0.42" for 2 Year event
Inflow = 2.72 cfs @ 12.50 hrs, Volume= 21,498 cf
Primary = 2.72 cfs @ 12.50 hrs, Volume= 21,498 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link DP04: Lake Cochituate Middle Pond

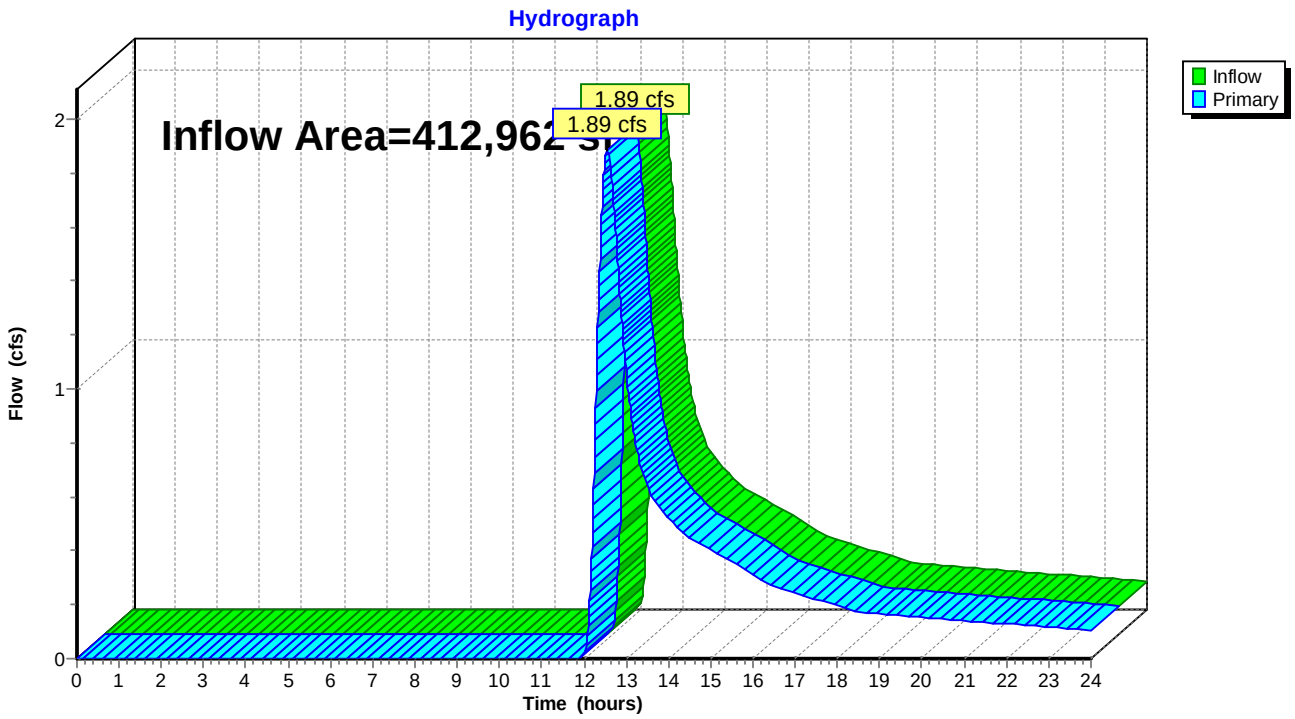


Summary for Link DP04-1: WF B

Inflow Area = 412,962 sf, 7.11% Impervious, Inflow Depth > 0.42" for 2 Year event
Inflow = 1.89 cfs @ 12.54 hrs, Volume= 14,553 cf
Primary = 1.89 cfs @ 12.54 hrs, Volume= 14,553 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link DP04-1: WF B

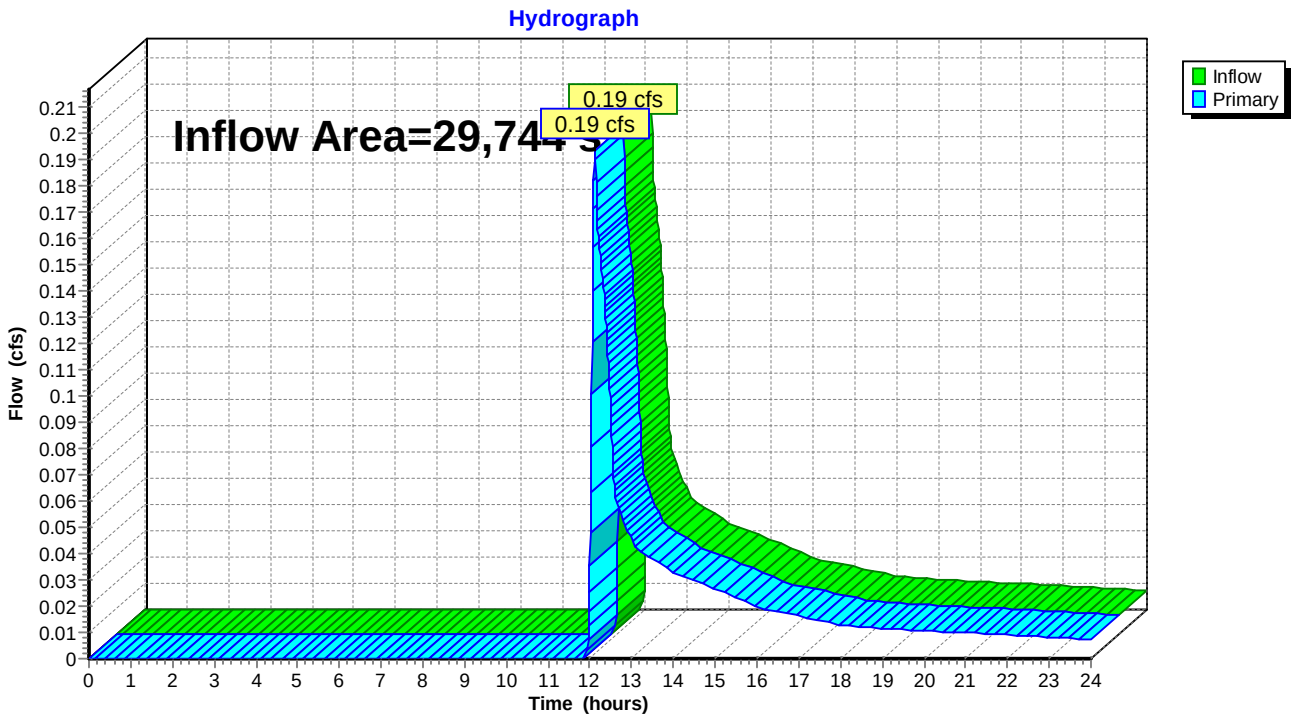


Summary for Link DP04-2: WF C

Inflow Area = 29,744 sf, 0.00% Impervious, Inflow Depth > 0.41" for 2 Year event
Inflow = 0.19 cfs @ 12.12 hrs, Volume= 1,014 cf
Primary = 0.19 cfs @ 12.12 hrs, Volume= 1,014 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link DP04-2: WF C

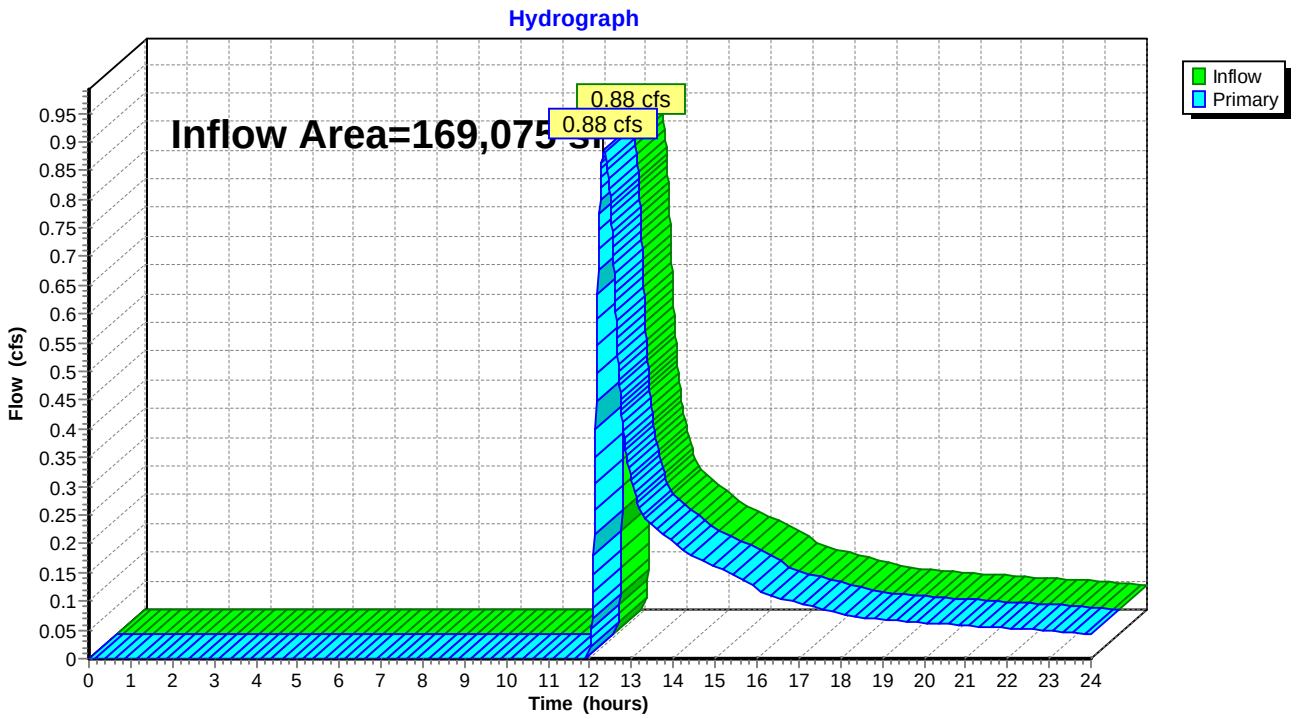


Summary for Link DP04-3: Lake Cochituate

Inflow Area = 169,075 sf, 7.42% Impervious, Inflow Depth > 0.42" for 2 Year event
Inflow = 0.88 cfs @ 12.33 hrs, Volume= 5,932 cf
Primary = 0.88 cfs @ 12.33 hrs, Volume= 5,932 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link DP04-3: Lake Cochituate

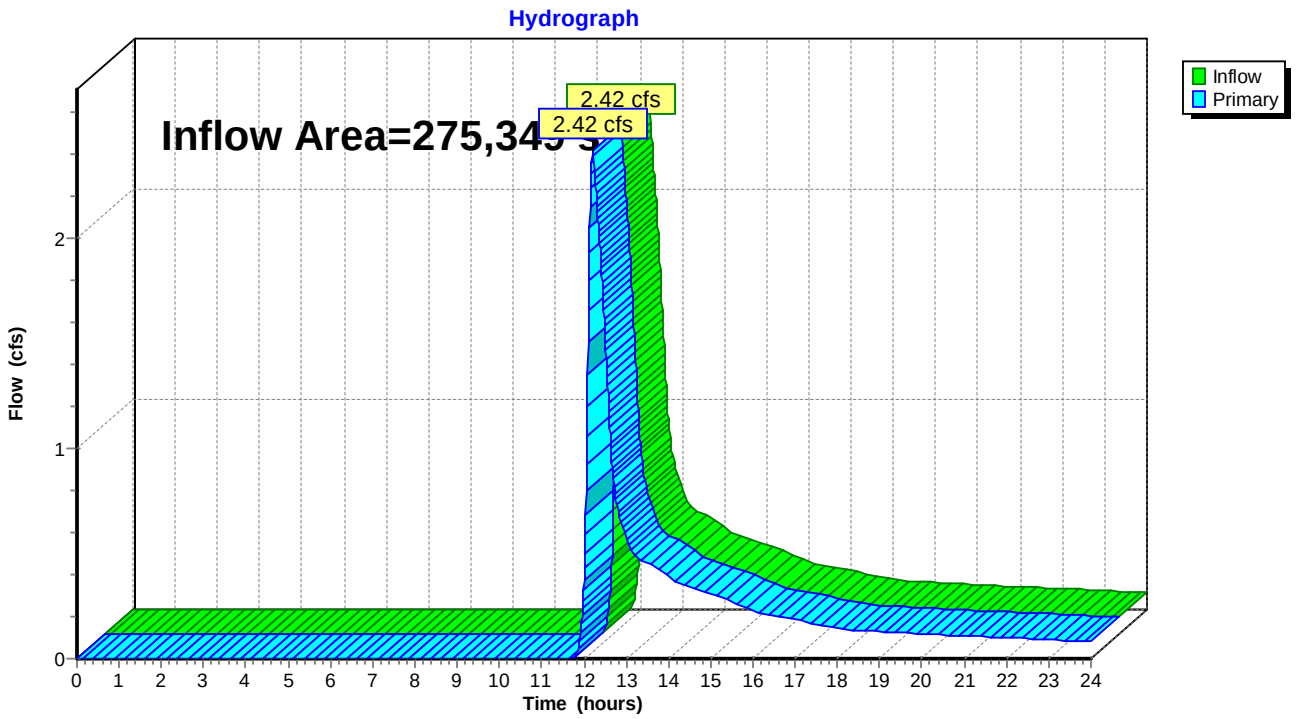


Summary for Link DP05: Lake Cochituate W

Inflow Area = 275,349 sf, 15.63% Impervious, Inflow Depth > 0.54" for 2 Year event
Inflow = 2.42 cfs @ 12.21 hrs, Volume= 12,478 cf
Primary = 2.42 cfs @ 12.21 hrs, Volume= 12,478 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link DP05: Lake Cochituate W

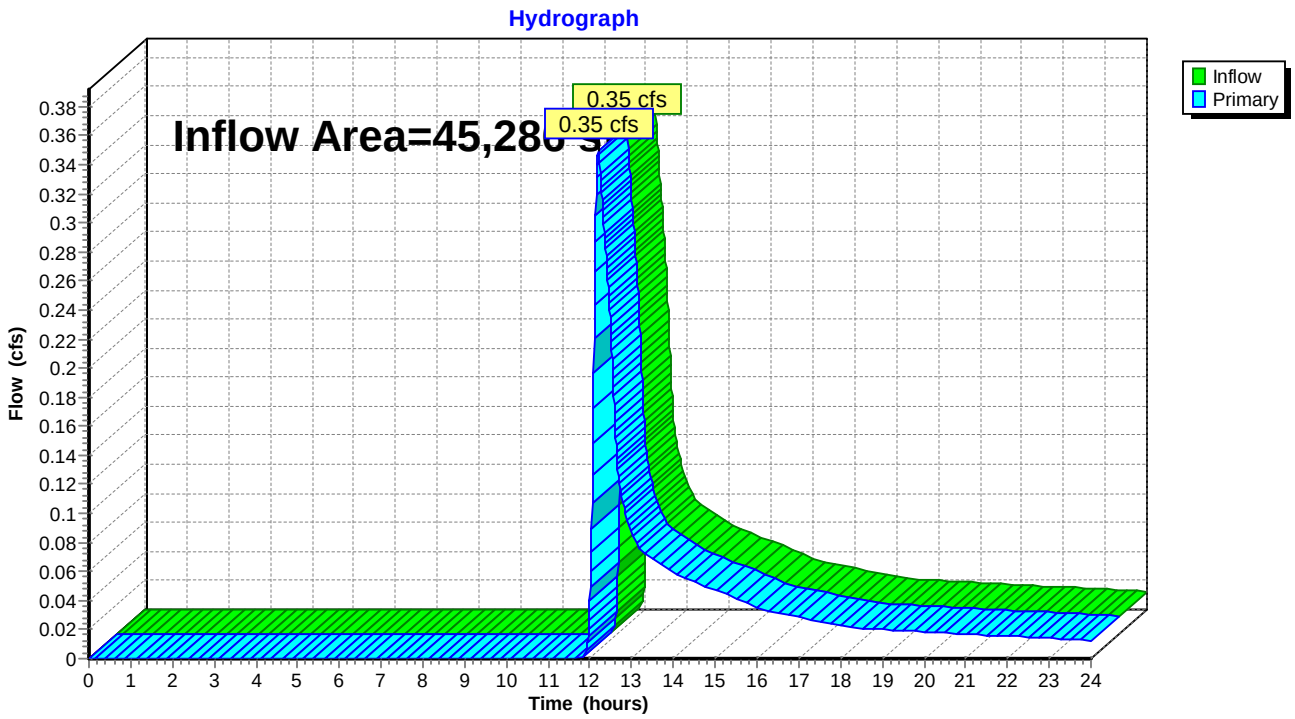


Summary for Link DP05-1: WF I

Inflow Area = 45,286 sf, 7.97% Impervious, Inflow Depth > 0.50" for 2 Year event
Inflow = 0.35 cfs @ 12.20 hrs, Volume= 1,869 cf
Primary = 0.35 cfs @ 12.20 hrs, Volume= 1,869 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link DP05-1: WF I

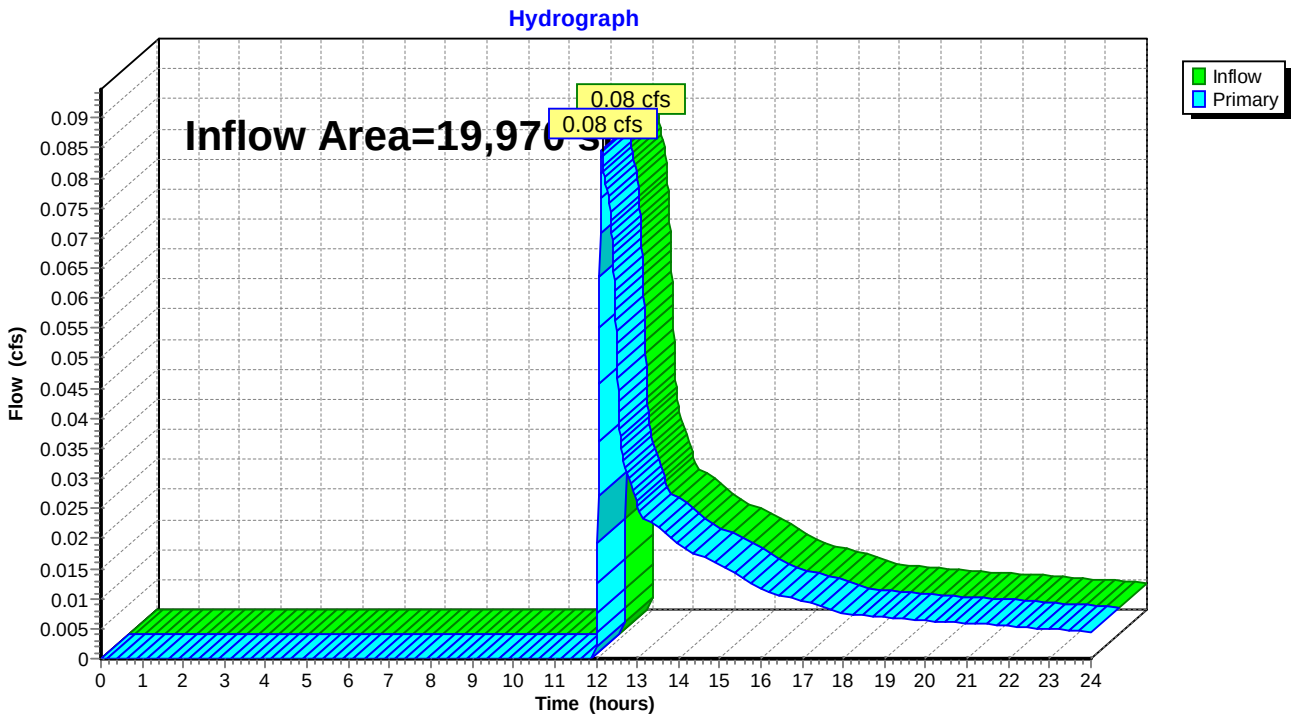


Summary for Link DP05-2: WF G&H

Inflow Area = 19,970 sf, 0.00% Impervious, Inflow Depth > 0.34" for 2 Year event
Inflow = 0.08 cfs @ 12.15 hrs, Volume= 563 cf
Primary = 0.08 cfs @ 12.15 hrs, Volume= 563 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link DP05-2: WF G&H

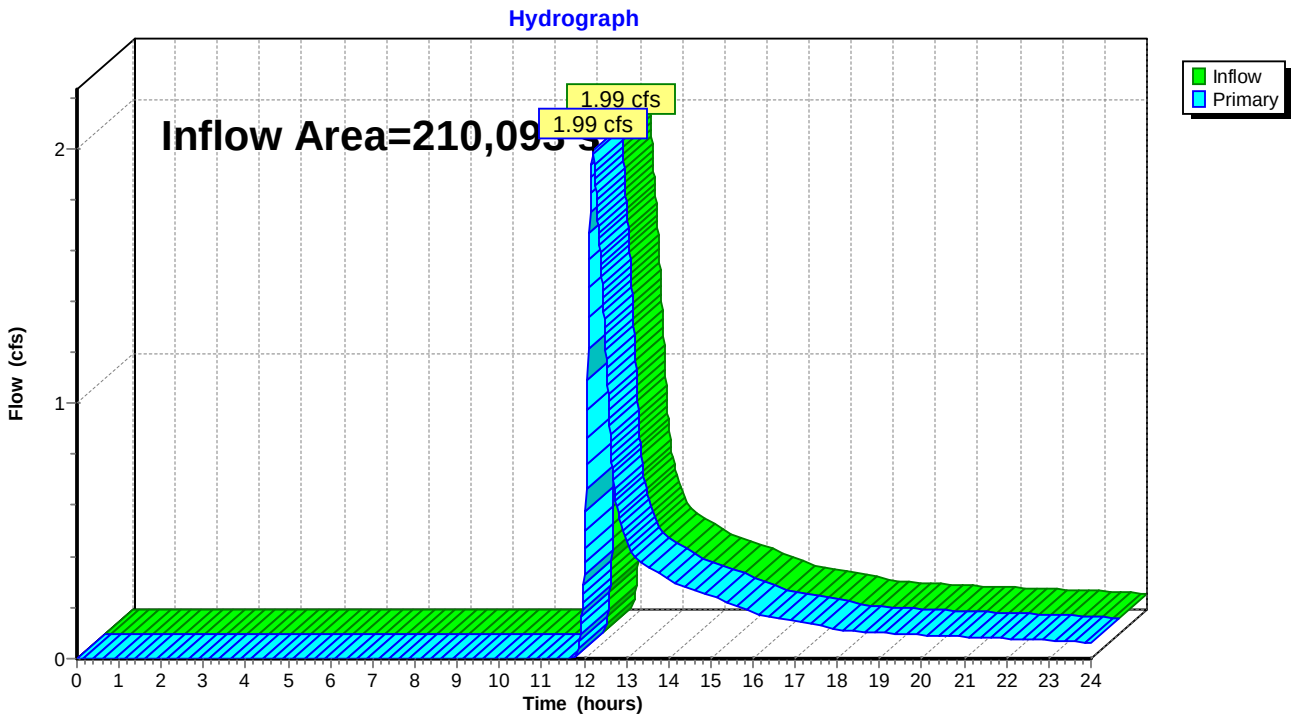


Summary for Link DP05-3: Lake Cochituate

Inflow Area = 210,093 sf, 18.76% Impervious, Inflow Depth > 0.57" for 2 Year event
Inflow = 1.99 cfs @ 12.21 hrs, Volume= 10,046 cf
Primary = 1.99 cfs @ 12.21 hrs, Volume= 10,046 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link DP05-3: Lake Cochituate

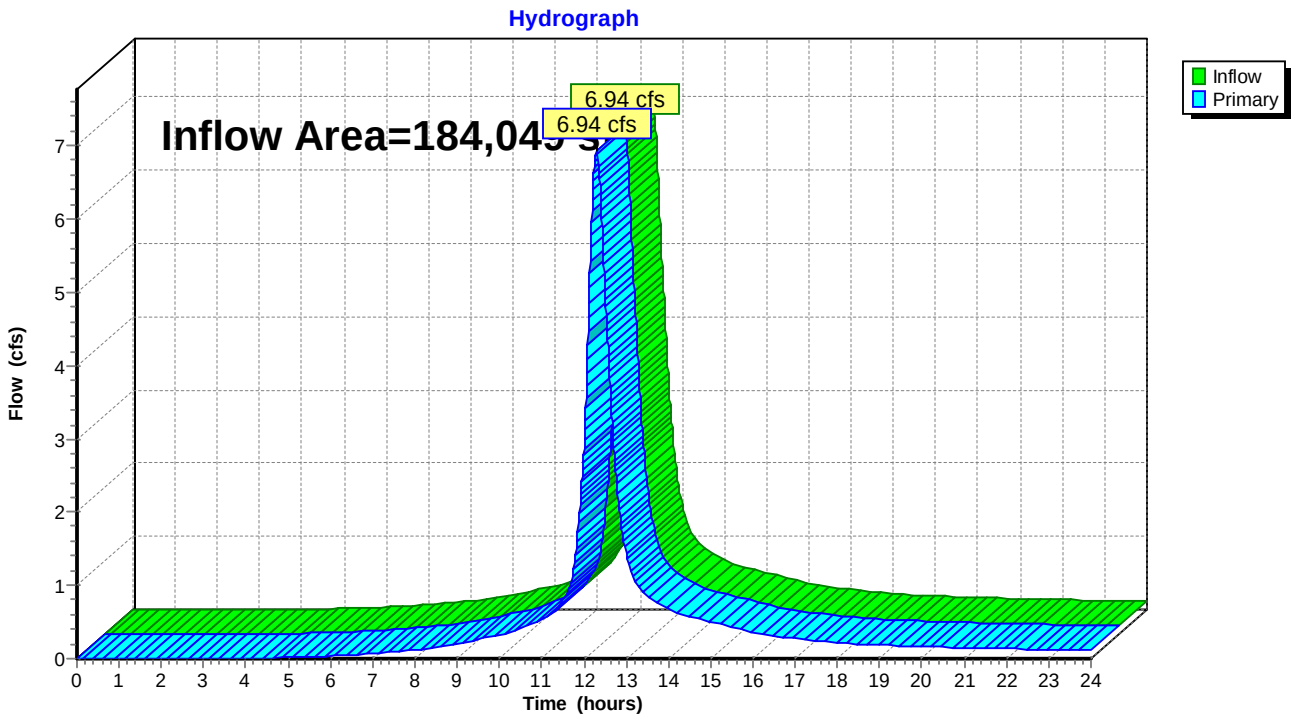


Summary for Link DP06: Worcester St

Inflow Area = 184,049 sf, 85.31% Impervious, Inflow Depth > 2.27" for 2 Year event
Inflow = 6.94 cfs @ 12.28 hrs, Volume= 34,843 cf
Primary = 6.94 cfs @ 12.28 hrs, Volume= 34,843 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link DP06: Worcester St

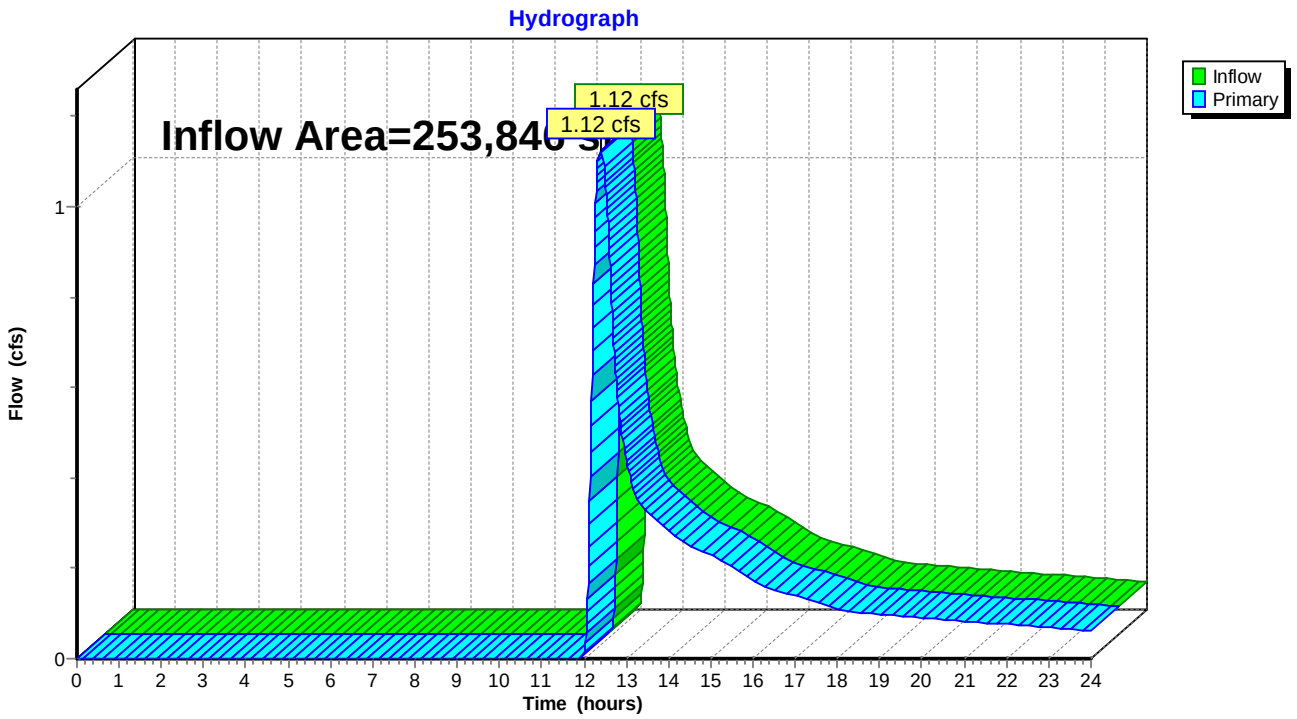


Summary for Link DP07: WF F

Inflow Area = 253,846 sf, 12.85% Impervious, Inflow Depth > 0.39" for 2 Year event
Inflow = 1.12 cfs @ 12.39 hrs, Volume= 8,170 cf
Primary = 1.12 cfs @ 12.39 hrs, Volume= 8,170 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link DP07: WF F

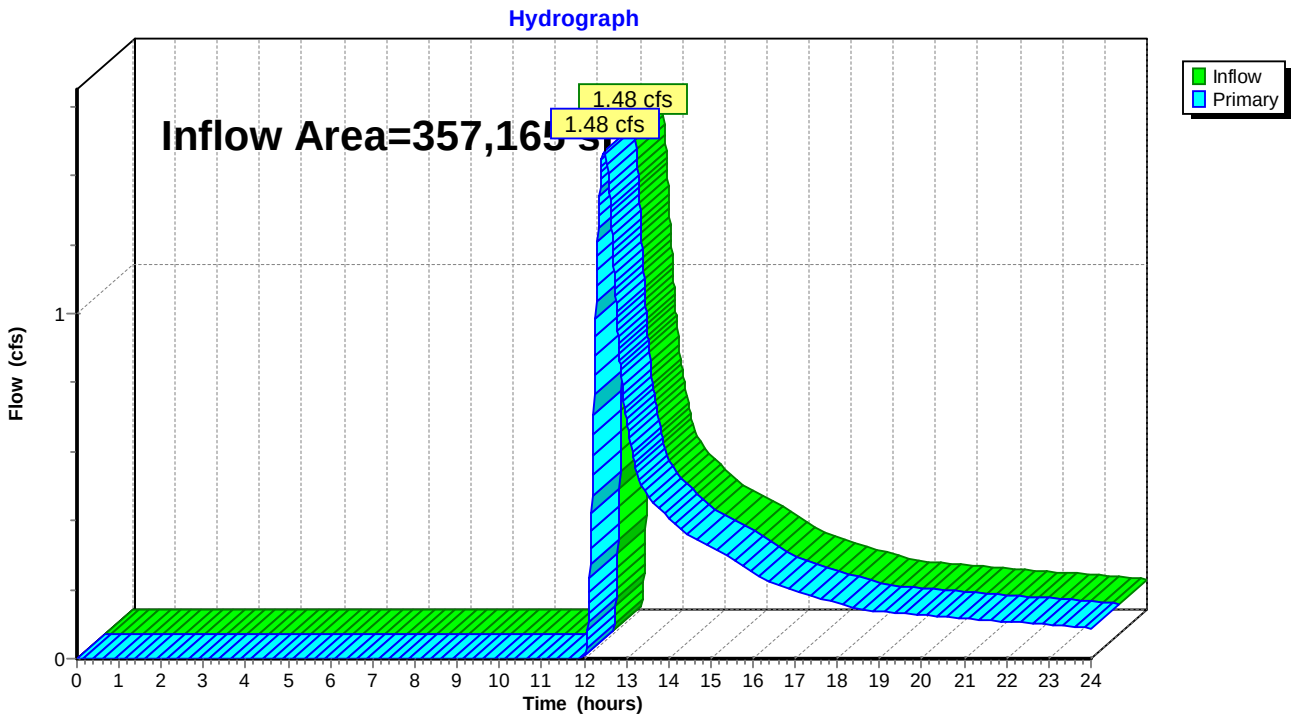


Summary for Link DP08: WF J

Inflow Area = 357,165 sf, 20.57% Impervious, Inflow Depth > 0.39" for 2 Year event
Inflow = 1.48 cfs @ 12.49 hrs, Volume= 11,470 cf
Primary = 1.48 cfs @ 12.49 hrs, Volume= 11,470 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link DP08: WF J

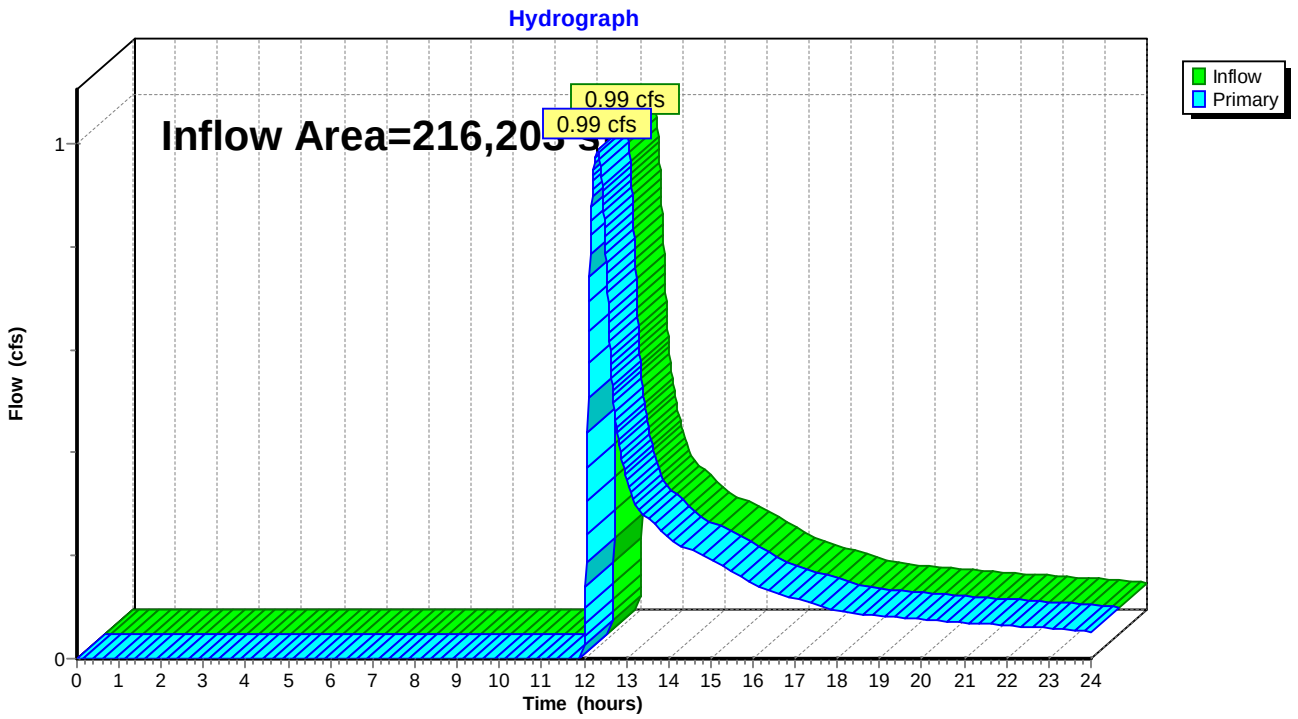


Summary for Link DP09: Unnamed Pond

Inflow Area = 216,203 sf, 15.22% Impervious, Inflow Depth > 0.39" for 2 Year event
Inflow = 0.99 cfs @ 12.31 hrs, Volume= 7,038 cf
Primary = 0.99 cfs @ 12.31 hrs, Volume= 7,038 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link DP09: Unnamed Pond

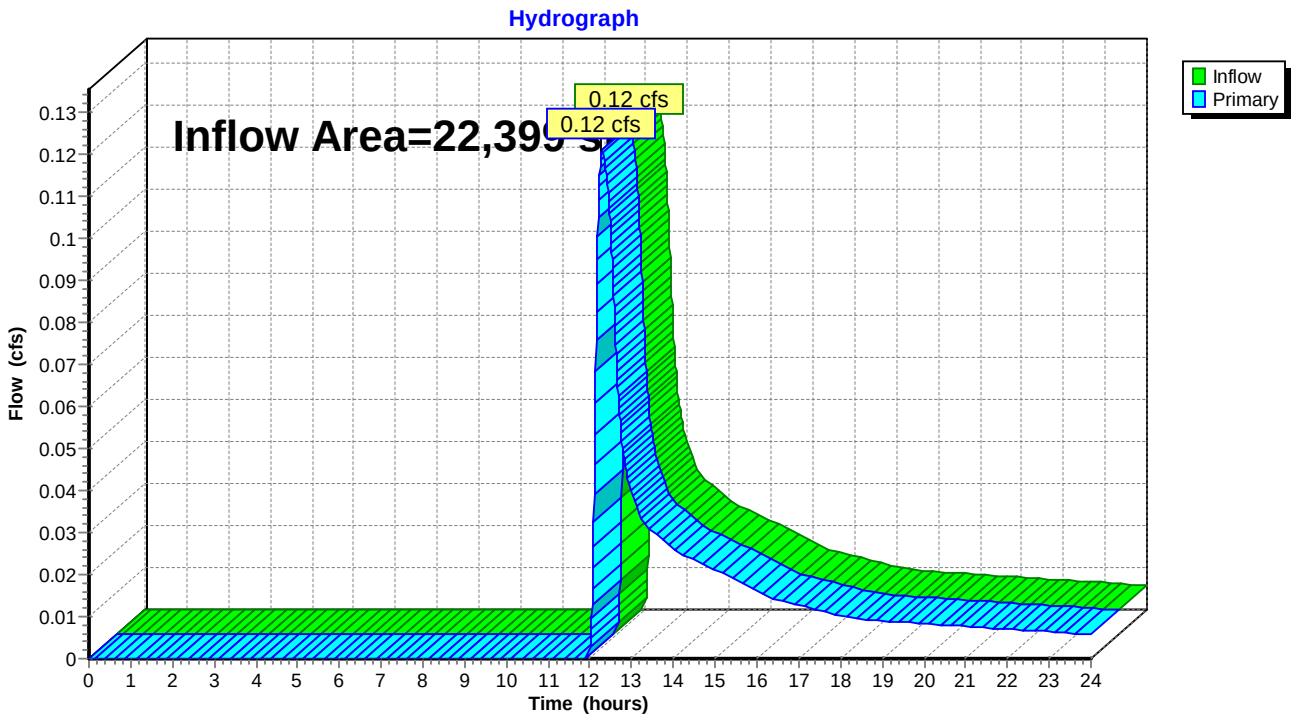


Summary for Link DP09-1: WF K

Inflow Area = 22,399 sf, 8.44% Impervious, Inflow Depth > 0.42" for 2 Year event
Inflow = 0.12 cfs @ 12.29 hrs, Volume= 786 cf
Primary = 0.12 cfs @ 12.29 hrs, Volume= 786 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link DP09-1: WF K

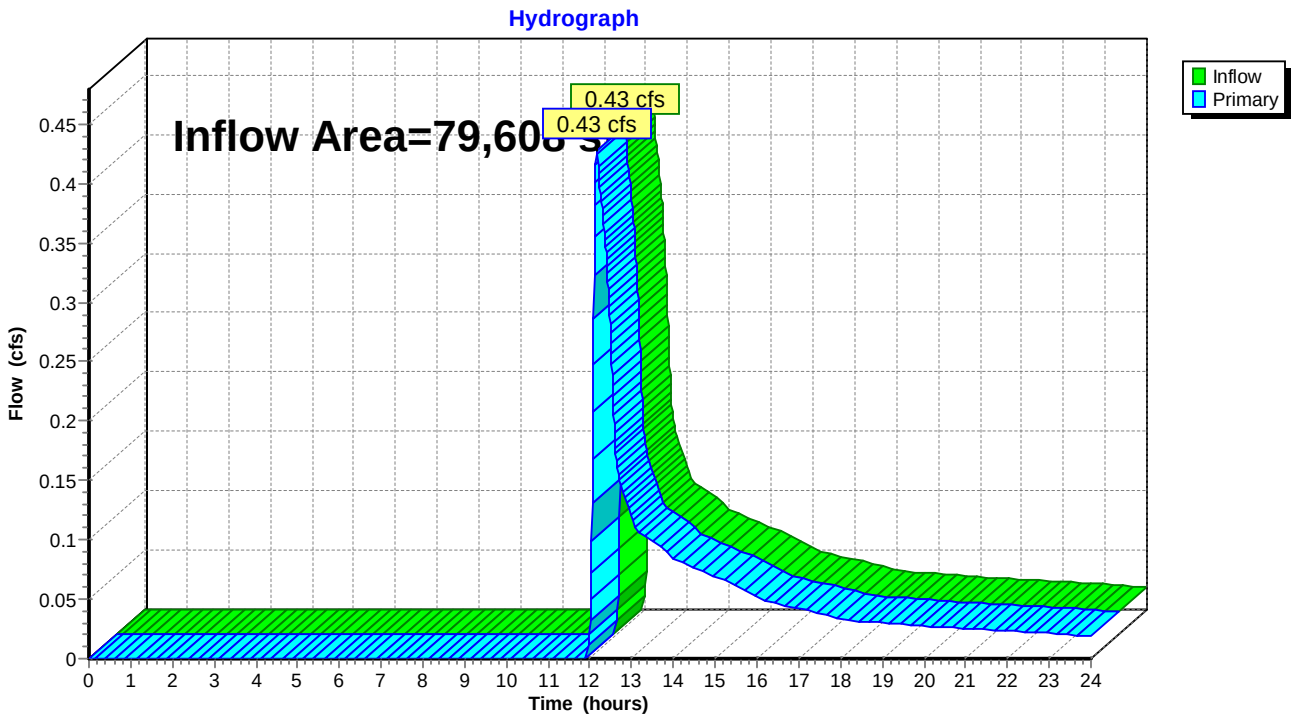


Summary for Link DP09-2: WF KA

Inflow Area = 79,608 sf, 24.60% Impervious, Inflow Depth > 0.39" for 2 Year event
Inflow = 0.43 cfs @ 12.16 hrs, Volume= 2,573 cf
Primary = 0.43 cfs @ 12.16 hrs, Volume= 2,573 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link DP09-2: WF KA

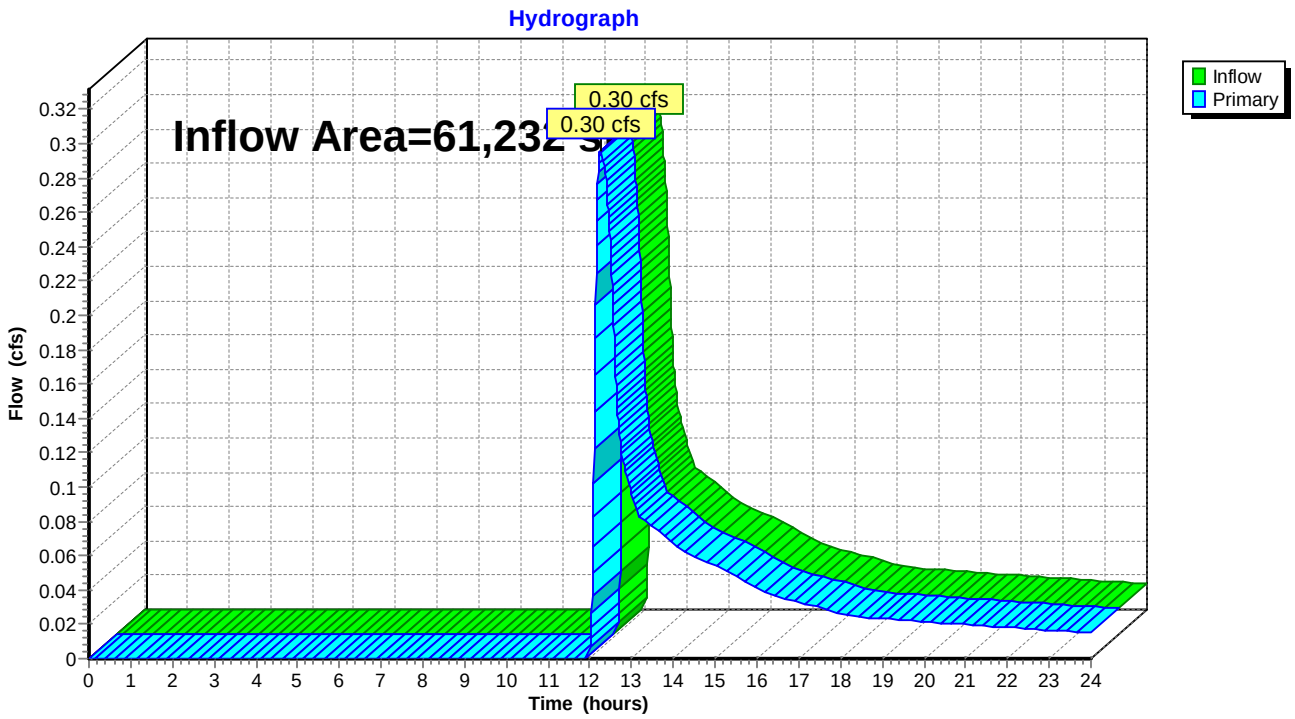


Summary for Link DP09-3: WF B

Inflow Area = 61,232 sf, 17.35% Impervious, Inflow Depth > 0.39" for 2 Year event
Inflow = 0.30 cfs @ 12.25 hrs, Volume= 1,976 cf
Primary = 0.30 cfs @ 12.25 hrs, Volume= 1,976 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link DP09-3: WF B

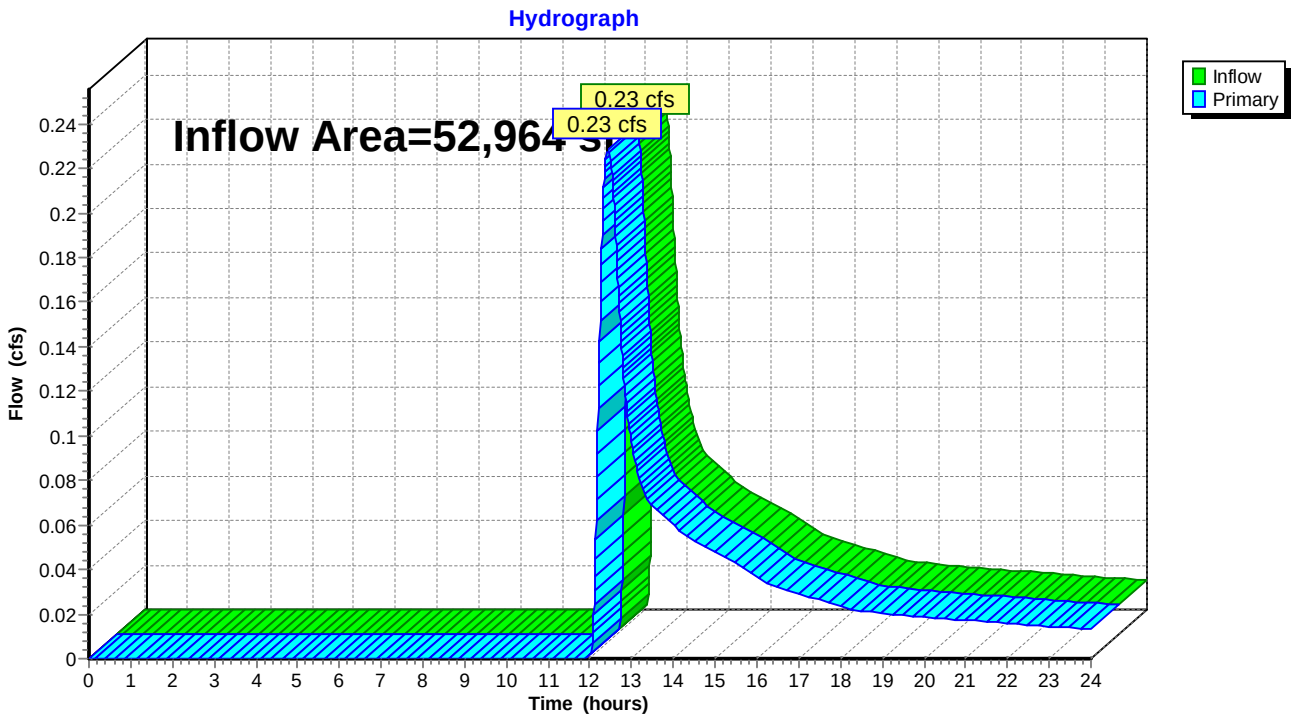


Summary for Link DP09-4: WF E&L, TOB C

Inflow Area = 52,964 sf, 1.51% Impervious, Inflow Depth > 0.39" for 2 Year event
Inflow = 0.23 cfs @ 12.43 hrs, Volume= 1,703 cf
Primary = 0.23 cfs @ 12.43 hrs, Volume= 1,703 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link DP09-4: WF E&L, TOB C

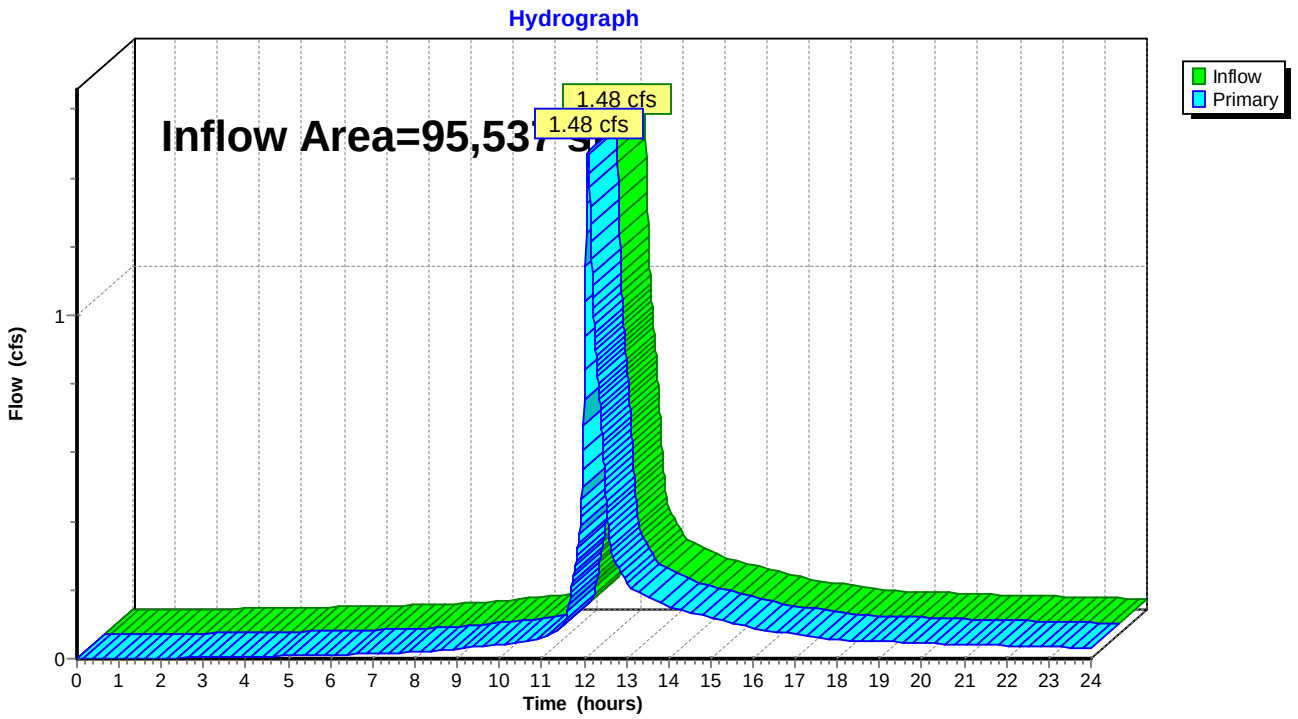


Summary for Link DP10: WF A

Inflow Area = 95,537 sf, 28.44% Impervious, Inflow Depth > 0.81" for 2 Year event
Inflow = 1.48 cfs @ 12.10 hrs, Volume= 6,432 cf
Primary = 1.48 cfs @ 12.10 hrs, Volume= 6,432 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link DP10: WF A

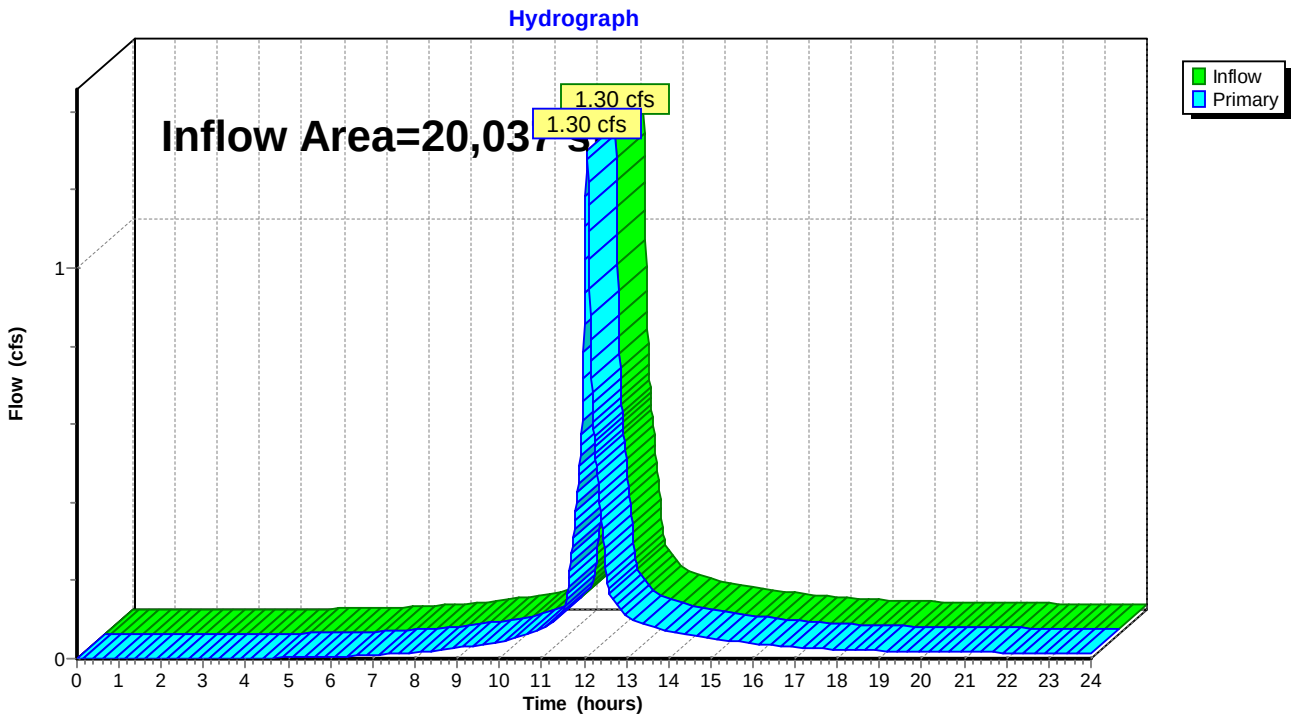


Summary for Link DP11: Local St Drain System

Inflow Area = 20,037 sf, 76.27% Impervious, Inflow Depth > 2.42" for 2 Year event
Inflow = 1.30 cfs @ 12.07 hrs, Volume= 4,035 cf
Primary = 1.30 cfs @ 12.07 hrs, Volume= 4,035 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link DP11: Local St Drain System

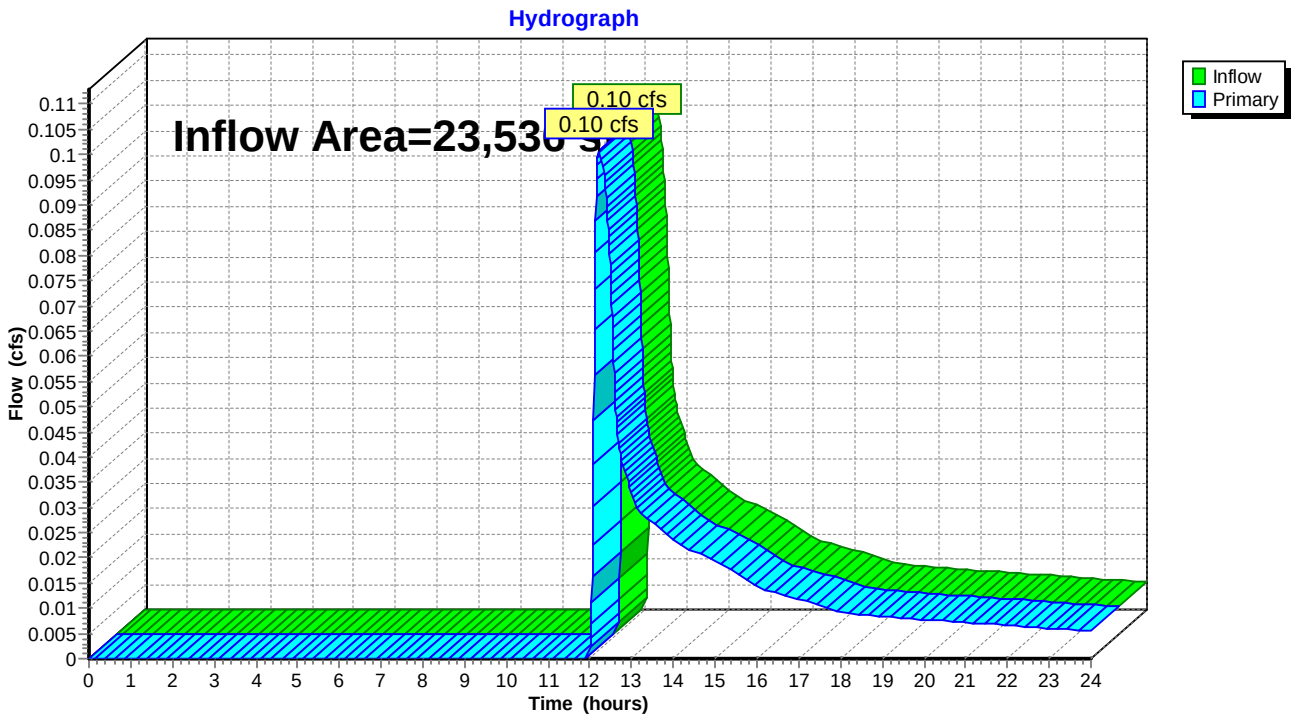


Summary for Link DP12: Washington St Low Point

Inflow Area = 23,536 sf, 31.05% Impervious, Inflow Depth > 0.35" for 2 Year event
Inflow = 0.10 cfs @ 12.21 hrs, Volume= 695 cf
Primary = 0.10 cfs @ 12.21 hrs, Volume= 695 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link DP12: Washington St Low Point

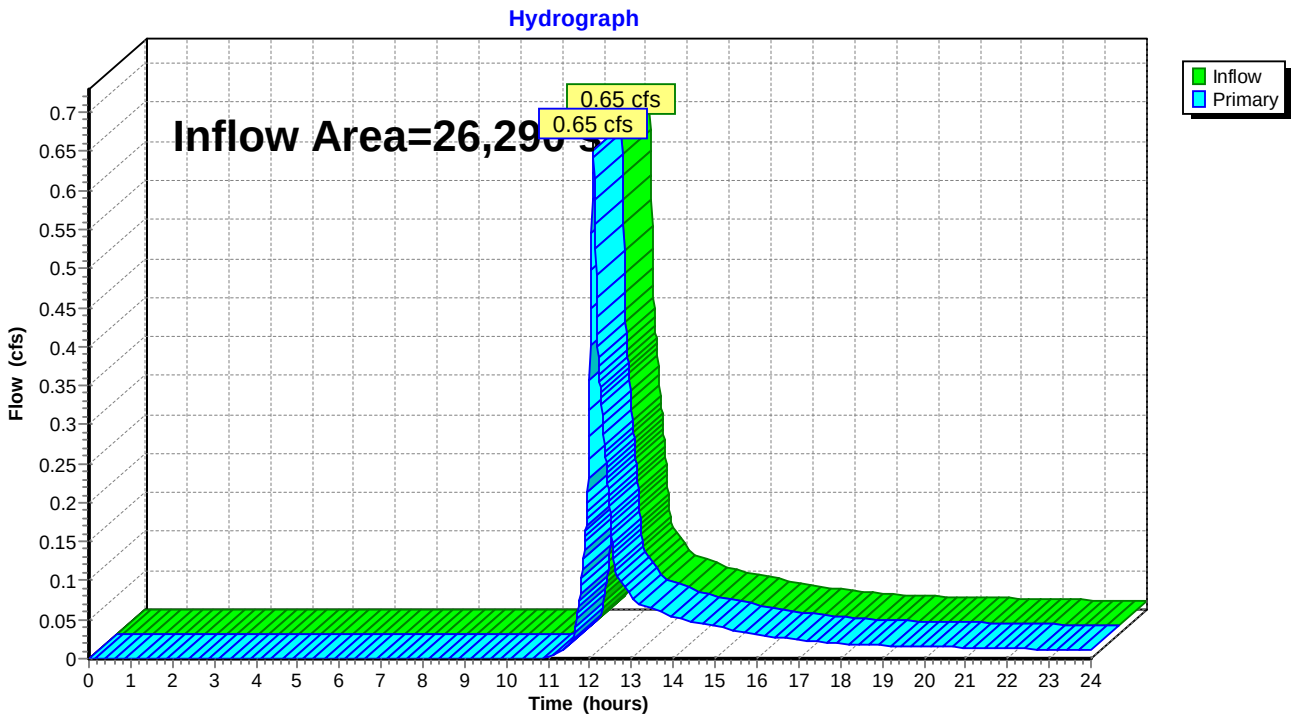


Summary for Link DP13: Empty Lot

Inflow Area = 26,290 sf, 0.00% Impervious, Inflow Depth > 0.95" for 2 Year event
Inflow = 0.65 cfs @ 12.08 hrs, Volume= 2,081 cf
Primary = 0.65 cfs @ 12.08 hrs, Volume= 2,081 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link DP13: Empty Lot

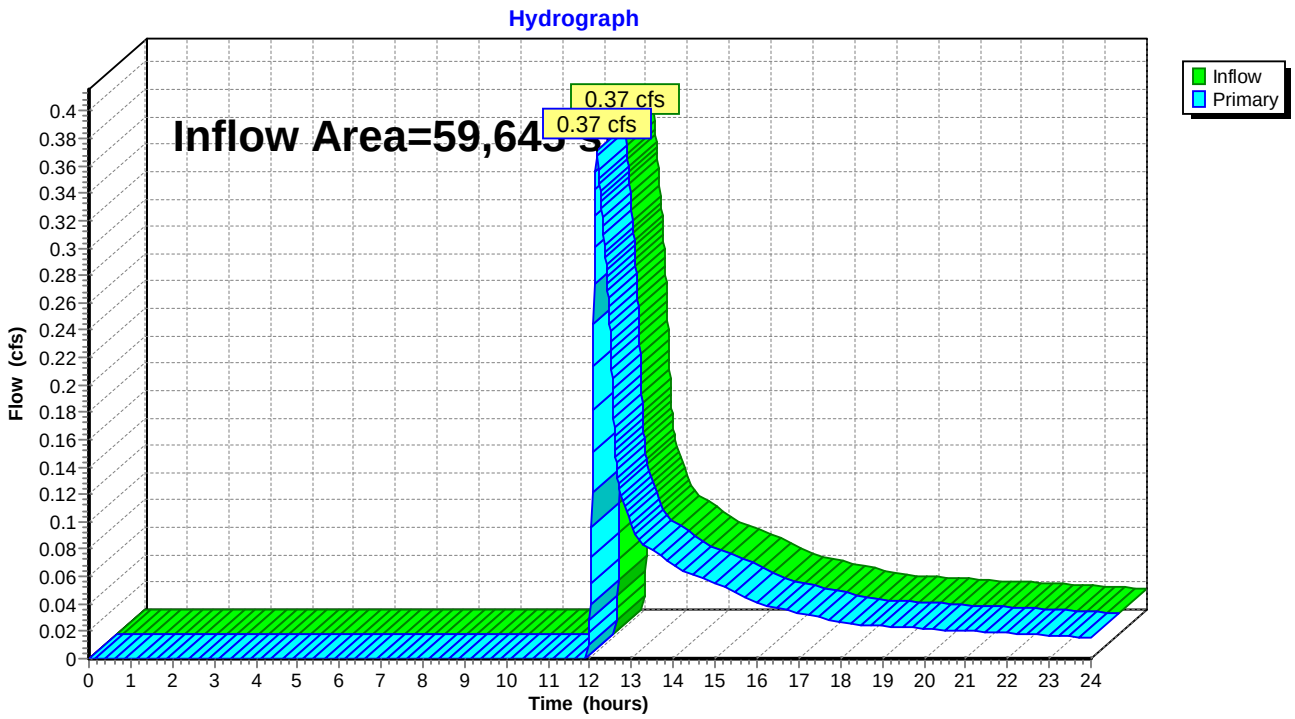


Summary for Link DP14: Lagrange St Low Point

Inflow Area = 59,645 sf, 31.36% Impervious, Inflow Depth > 0.42" for 2 Year event
Inflow = 0.37 cfs @ 12.17 hrs, Volume= 2,099 cf
Primary = 0.37 cfs @ 12.17 hrs, Volume= 2,099 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link DP14: Lagrange St Low Point

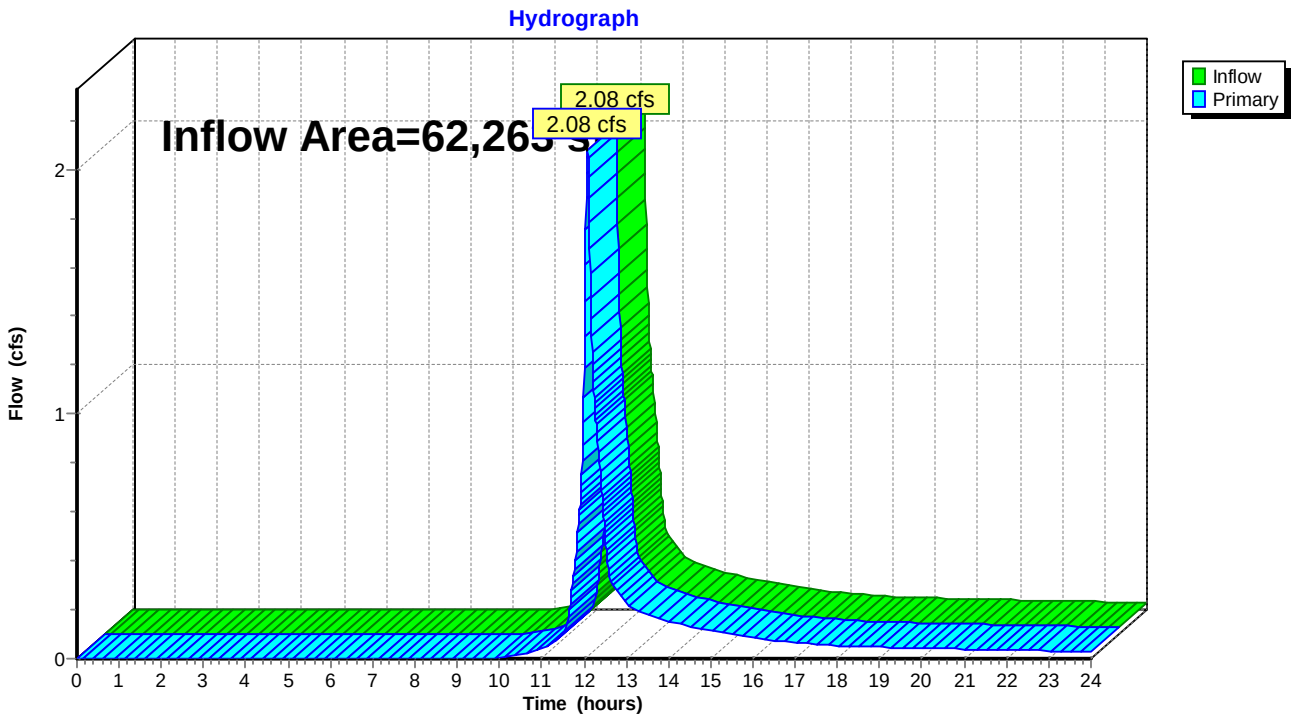


Summary for Link DP15: TOB D

Inflow Area = 62,263 sf, 50.59% Impervious, Inflow Depth > 1.24" for 2 Year event
Inflow = 2.08 cfs @ 12.08 hrs, Volume= 6,410 cf
Primary = 2.08 cfs @ 12.08 hrs, Volume= 6,410 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link DP15: TOB D

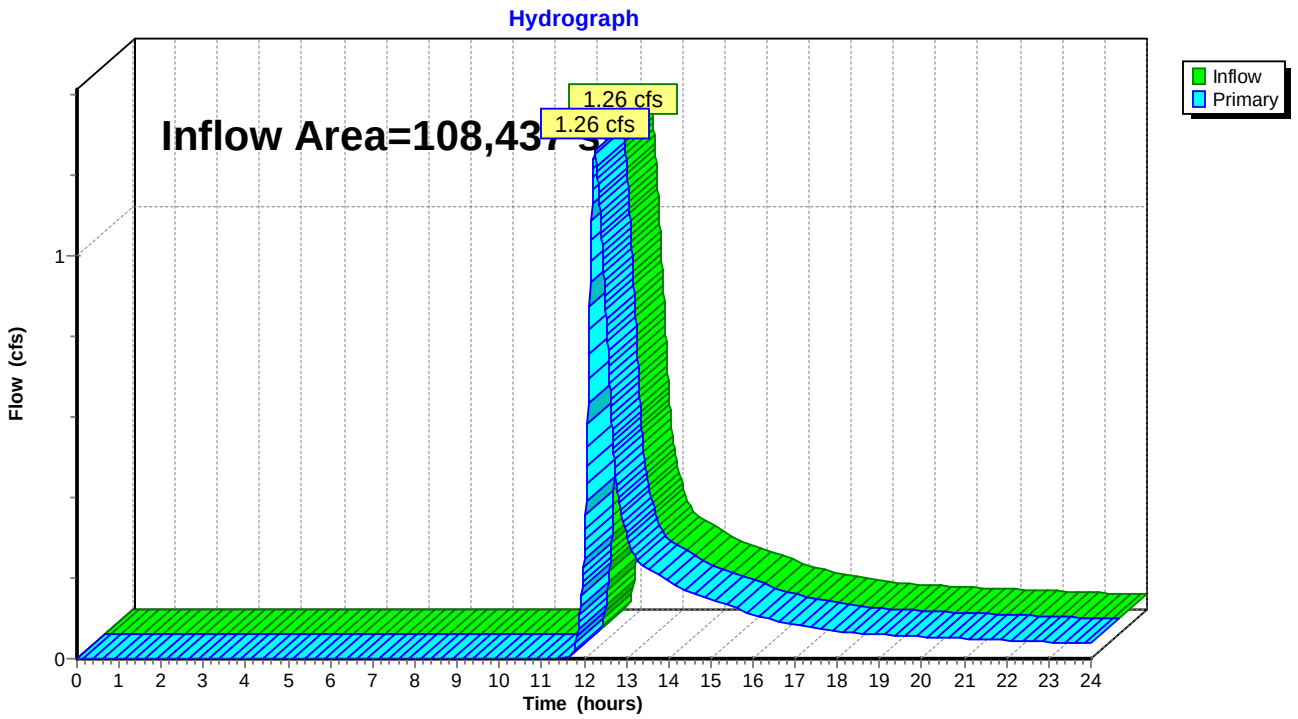


Summary for Link DP16: WF 1, WF 2, TOB E

Inflow Area = 108,437 sf, 32.30% Impervious, Inflow Depth > 0.70" for 2 Year event
Inflow = 1.26 cfs @ 12.26 hrs, Volume= 6,343 cf
Primary = 1.26 cfs @ 12.26 hrs, Volume= 6,343 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link DP16: WF 1, WF 2, TOB E

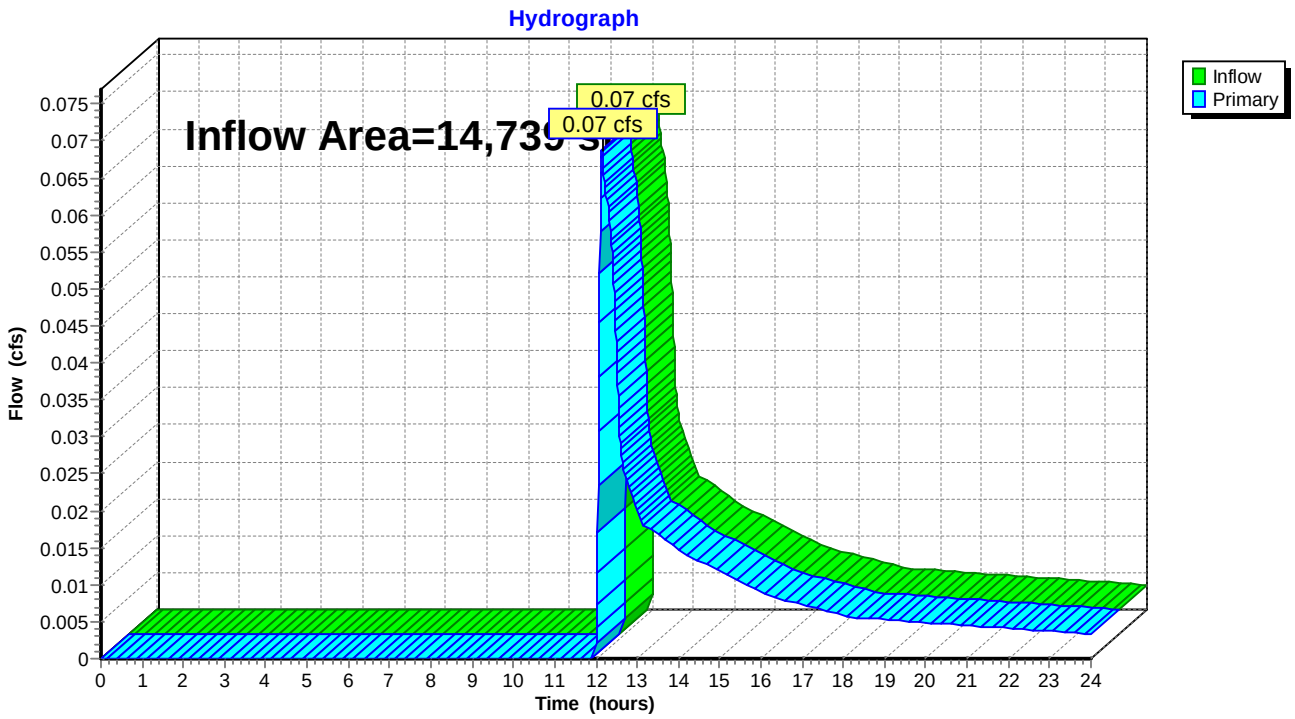


Summary for Link WF-G: WF G

Inflow Area = 14,739 sf, 0.00% Impervious, Inflow Depth > 0.35" for 2 Year event
Inflow = 0.07 cfs @ 12.15 hrs, Volume= 436 cf
Primary = 0.07 cfs @ 12.15 hrs, Volume= 436 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link WF-G: WF G

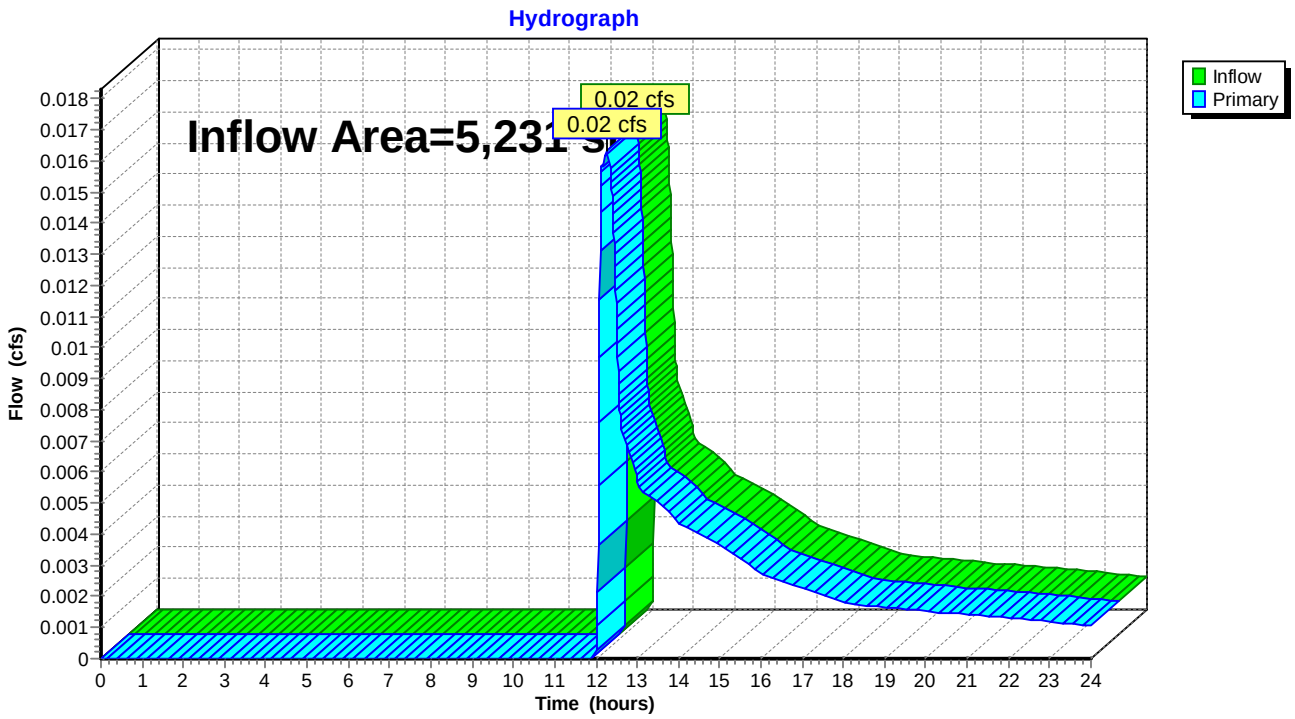


Summary for Link WF-H: WF H

Inflow Area = 5,231 sf, 0.00% Impervious, Inflow Depth > 0.29" for 2 Year event
Inflow = 0.02 cfs @ 12.28 hrs, Volume= 128 cf
Primary = 0.02 cfs @ 12.28 hrs, Volume= 128 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link WF-H: WF H



Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 01S: Cochitute Rd 1 Runoff Area=9,423 sf 2.98% Impervious Runoff Depth>1.26"
Flow Length=162' Tc=5.0 min CN=63 Runoff=0.30 cfs 990 cf

Subcatchment 02S: Cochituate Rd 2 Runoff Area=21,748 sf 11.45% Impervious Runoff Depth>1.53"
Flow Length=100' Slope=0.0270 '/' Tc=8.8 min CN=67 Runoff=0.77 cfs 2,767 cf

Subcatchment 03S: Home Depot Runoff Area=25,653 sf 0.00% Impervious Runoff Depth>1.13"
Flow Length=60' Slope=0.0088 '/' Tc=20.0 min CN=61 Runoff=0.46 cfs 2,413 cf

Subcatchment 04S: Chrystler St Runoff Area=30,203 sf 8.21% Impervious Runoff Depth>1.12"
Flow Length=311' Tc=37.7 min CN=61 Runoff=0.41 cfs 2,824 cf

Subcatchment 05S: DNR Runoff Area=99,015 sf 0.66% Impervious Runoff Depth>1.13"
Flow Length=725' Tc=17.3 min CN=61 Runoff=1.89 cfs 9,320 cf

Subcatchment 06S: Speen St Runoff Area=28,640 sf 6.23% Impervious Runoff Depth>1.53"
Flow Length=473' Tc=11.6 min CN=67 Runoff=0.93 cfs 3,641 cf

Subcatchment 07S: Lake Cochituate N Runoff Area=384,322 sf 7.17% Impervious Runoff Depth>1.19"
Flow Length=975' Tc=30.1 min CN=62 Runoff=6.28 cfs 38,021 cf

Subcatchment 08S: Lake Cochituate E1 Runoff Area=15,353 sf 0.00% Impervious Runoff Depth>1.07"
Flow Length=146' Tc=5.0 min CN=60 Runoff=0.40 cfs 1,372 cf

Subcatchment 09S: Lake Cochituate E2 Runoff Area=8,720 sf 0.00% Impervious Runoff Depth>1.20"
Flow Length=71' Tc=5.0 min CN=62 Runoff=0.26 cfs 869 cf

Subcatchment 10S: Lake Cochituate E3 Runoff Area=5,671 sf 0.00% Impervious Runoff Depth>1.07"
Flow Length=96' Tc=7.5 min CN=60 Runoff=0.13 cfs 507 cf

Subcatchment 11S: Lake Cochituate E4 Runoff Area=169,075 sf 7.42% Impervious Runoff Depth>1.13"
Flow Length=328' Tc=16.1 min CN=61 Runoff=3.31 cfs 15,921 cf

Subcatchment 12S: Lake Cochituate W1 Runoff Area=45,286 sf 7.97% Impervious Runoff Depth>1.26"
Flow Length=185' Tc=11.2 min CN=63 Runoff=1.17 cfs 4,747 cf

Subcatchment 13S: Lake Cochituate W2 Runoff Area=5,231 sf 0.00% Impervious Runoff Depth>0.90"
Flow Length=52' Slope=0.2426 '/' Tc=5.0 min CN=57 Runoff=0.10 cfs 391 cf

Subcatchment 14S: Lake Cochituate W3 Runoff Area=14,739 sf 0.00% Impervious Runoff Depth>1.01"
Flow Length=114' Tc=6.4 min CN=59 Runoff=0.33 cfs 1,243 cf

Subcatchment 15S: Lake Cochituate W4 Runoff Area=210,093 sf 18.76% Impervious Runoff Depth>1.39"
Flow Length=307' Tc=12.6 min CN=65 Runoff=5.89 cfs 24,312 cf

Subcatchment 16S: Worcester St N Runoff Area=157,456 sf 93.05% Impervious Runoff Depth>3.90"
Flow Length=1,809' Tc=22.6 min CN=94 Runoff=10.02 cfs 51,175 cf

Subcatchment 17S: Worcester St S Runoff Area=26,593 sf 39.48% Impervious Runoff Depth>2.05"
Flow Length=316' Tc=9.0 min CN=74 Runoff=1.31 cfs 4,533 cf

Subcatchment 18S: Arcadi Rd Runoff Area=253,846 sf 12.85% Impervious Runoff Depth>1.07"
Flow Length=806' Tc=17.7 min CN=60 Runoff=4.45 cfs 22,600 cf

Subcatchment 19S: Fisher St Runoff Area=357,165 sf 20.57% Impervious Runoff Depth>1.07"
Flow Length=940' Tc=22.9 min CN=60 Runoff=5.66 cfs 31,745 cf

Subcatchment 20S: Unnamed Pond 1 Runoff Area=22,399 sf 8.44% Impervious Runoff Depth>1.13"
Flow Length=222' Tc=14.3 min CN=61 Runoff=0.46 cfs 2,110 cf

Subcatchment 21S: Unnamed Pond 2 Runoff Area=79,608 sf 24.60% Impervious Runoff Depth>1.07"
Flow Length=279' Tc=7.9 min CN=60 Runoff=1.85 cfs 7,110 cf

Subcatchment 22S: Unnamed Pond 3 Runoff Area=61,232 sf 17.35% Impervious Runoff Depth>1.07"
Flow Length=309' Tc=11.7 min CN=60 Runoff=1.25 cfs 5,462 cf

Subcatchment 23S: Unnamed Pond 4 Runoff Area=52,964 sf 1.51% Impervious Runoff Depth>1.07"
Flow Length=167' Tc=19.8 min CN=60 Runoff=0.89 cfs 4,712 cf

Subcatchment 24S: Kansas St Runoff Area=83,215 sf 17.84% Impervious Runoff Depth>1.26"
Flow Length=227' Tc=7.7 min CN=63 Runoff=2.42 cfs 8,732 cf

Subcatchment 25S: North Main @ Kansas Runoff Area=12,322 sf 100.00% Impervious Runoff Depth>4.36"
Tc=5.0 min CN=98 Runoff=1.32 cfs 4,478 cf

Subcatchment 26S: Empty Lot Runoff Area=26,290 sf 0.00% Impervious Runoff Depth>1.97"
Tc=5.0 min CN=73 Runoff=1.43 cfs 4,314 cf

Subcatchment 27S: Washington Ave 1 Runoff Area=10,780 sf 84.48% Impervious Runoff Depth>4.02"
Tc=5.0 min CN=95 Runoff=1.12 cfs 3,612 cf

Subcatchment 28S: Washington Ave 2 Runoff Area=9,257 sf 66.71% Impervious Runoff Depth>3.59"
Tc=5.0 min CN=91 Runoff=0.89 cfs 2,771 cf

Subcatchment 29S: Washington Ave 3 Runoff Area=23,536 sf 31.05% Impervious Runoff Depth>1.01"
Flow Length=196' Tc=9.0 min CN=59 Runoff=0.49 cfs 1,984 cf

Subcatchment 30S: Lagrange St Runoff Area=59,645 sf 31.36% Impervious Runoff Depth>1.13"
Flow Length=194' Tc=8.7 min CN=61 Runoff=1.45 cfs 5,630 cf

Subcatchment 31S: Mechanic St Runoff Area=62,263 sf 50.59% Impervious Runoff Depth>2.37"
Flow Length=329' Tc=5.3 min CN=78 Runoff=4.08 cfs 12,313 cf

Subcatchment 32S: Cochituate St 1 Runoff Area=108,437 sf 32.30% Impervious Runoff Depth>1.59"
Flow Length=728' Tc=16.4 min CN=68 Runoff=3.25 cfs 14,401 cf

Pond 01P: Speen St Detention Peak Elev=159.81' Storage=21 cf Inflow=0.93 cfs 3,641 cf
Primary=0.00 cfs 0 cf Secondary=0.93 cfs 3,638 cf Outflow=0.93 cfs 3,638 cf

Pond 2P: Lake Cochituate Peak Elev=136.01' Storage=6.734 af Inflow=51.57 cfs 293,380 cf
Outflow=0.00 cfs 0 cf

Link 1L: Total Inflow=51.57 cfs 293,380 cf
Primary=51.57 cfs 293,380 cf

Link DP01: Cochituate Rd Inflow=1.04 cfs 3,756 cf
Primary=1.04 cfs 3,756 cf

Link DP02: Chrystler St Inflow=0.77 cfs 5,237 cf
Primary=0.77 cfs 5,237 cf

Link DP03: WF A Inflow=1.89 cfs 9,320 cf
Primary=1.89 cfs 9,320 cf

Link DP04: Lake Cochituate Middle Pond Inflow=9.11 cfs 56,690 cf
Primary=9.11 cfs 56,690 cf

Link DP04-1: WF B Inflow=6.28 cfs 38,021 cf
Primary=6.28 cfs 38,021 cf

Link DP04-2: WF C Inflow=0.78 cfs 2,748 cf
Primary=0.78 cfs 2,748 cf

Link DP04-3: Lake Cochituate Inflow=3.31 cfs 15,921 cf
Primary=3.31 cfs 15,921 cf

Link DP05: Lake Cochituate W Inflow=7.38 cfs 30,693 cf
Primary=7.38 cfs 30,693 cf

Link DP05-1: WF I Inflow=1.17 cfs 4,747 cf
Primary=1.17 cfs 4,747 cf

Link DP05-2: WF G&H Inflow=0.44 cfs 1,635 cf
Primary=0.44 cfs 1,635 cf

Link DP05-3: Lake Cochituate Inflow=5.89 cfs 24,312 cf
Primary=5.89 cfs 24,312 cf

Link DP06: Worcester St Inflow=10.83 cfs 55,708 cf
Primary=10.83 cfs 55,708 cf

Link DP07: WF F Inflow=4.45 cfs 22,600 cf
Primary=4.45 cfs 22,600 cf

Link DP08: WF J Inflow=5.66 cfs 31,745 cf
Primary=5.66 cfs 31,745 cf

Link DP09: Unnamed Pond Inflow=3.99 cfs 19,395 cf
Primary=3.99 cfs 19,395 cf

Link DP09-1: WF K Inflow=0.46 cfs 2,110 cf
Primary=0.46 cfs 2,110 cf

Link DP09-2: WF KA Inflow=1.85 cfs 7,110 cf
Primary=1.85 cfs 7,110 cf

Link DP09-3: WF B Inflow=1.25 cfs 5,462 cf
Primary=1.25 cfs 5,462 cf

Link DP09-4: WF E&L, TOB C Inflow=0.89 cfs 4,712 cf
Primary=0.89 cfs 4,712 cf

Link DP10: WF A Inflow=3.57 cfs 13,210 cf
Primary=3.57 cfs 13,210 cf

Link DP11: Local St Drain System Inflow=2.01 cfs 6,383 cf
Primary=2.01 cfs 6,383 cf

Link DP12: Washington St Low Point Inflow=0.49 cfs 1,984 cf
Primary=0.49 cfs 1,984 cf

Link DP13: Empty Lot Inflow=1.43 cfs 4,314 cf
Primary=1.43 cfs 4,314 cf

Link DP14: Lagrange St Low Point Inflow=1.45 cfs 5,630 cf
Primary=1.45 cfs 5,630 cf

Link DP15: TOB D Inflow=4.08 cfs 12,313 cf
Primary=4.08 cfs 12,313 cf

Link DP16: WF 1, WF 2, TOB E Inflow=3.25 cfs 14,401 cf
Primary=3.25 cfs 14,401 cf

Link WF-G: WF G Inflow=0.33 cfs 1,243 cf
Primary=0.33 cfs 1,243 cf

Link WF-H: WF H Inflow=0.10 cfs 391 cf
Primary=0.10 cfs 391 cf

Total Runoff Area = 2,480,180 sf Runoff Volume = 297,021 cf Average Runoff Depth = 1.44"
78.96% Pervious = 1,958,347 sf 21.04% Impervious = 521,833 sf

Summary for Subcatchment 01S: Cochitute Rd 1

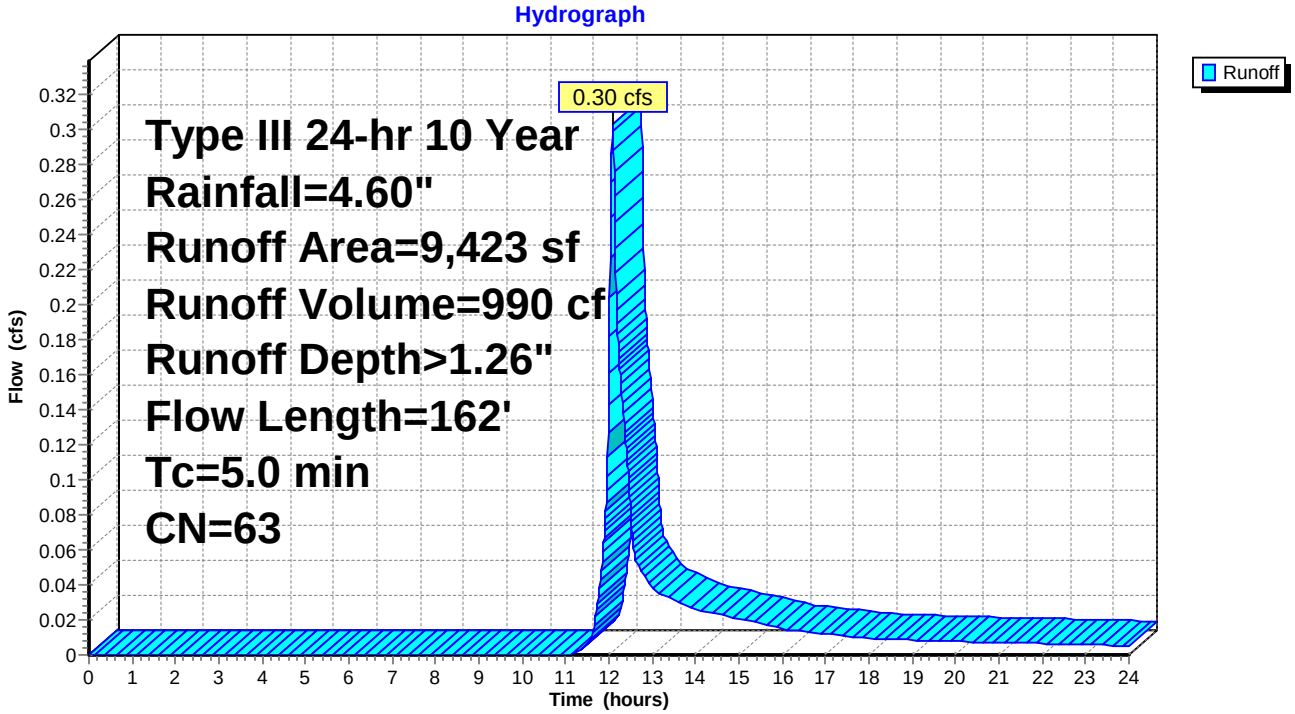
Runoff = 0.30 cfs @ 12.08 hrs, Volume= 990 cf, Depth> 1.26"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Rainfall=4.60"

Area (sf)	CN	Description
6,995	57	Woods/grass comb., Poor, HSG A
2,147	76	Gravel roads, HSG A
281	98	Paved parking, HSG A
9,423	63	Weighted Average
9,142		97.02% Pervious Area
281		2.98% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.3	100	0.0040	0.72		**Sheet Flow, Gravel Path** Smooth surfaces n= 0.011 P2= 3.15"
1.1	62	0.0036	0.97		**Shallow Concentrated Flow, Gravel Path** Unpaved Kv= 16.1 fps
3.4	162	Total, Increased to minimum Tc = 5.0 min			

Subcatchment 01S: Cochitute Rd 1



Summary for Subcatchment 02S: Cochituate Rd 2

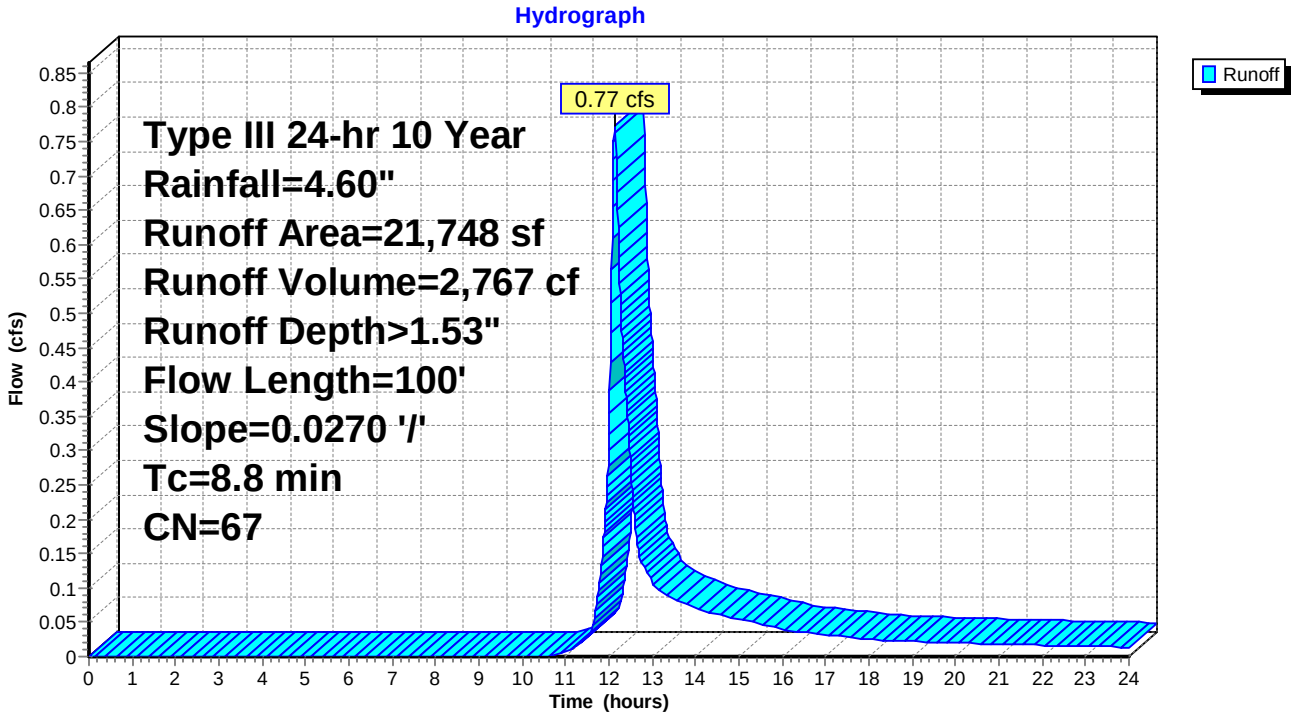
Runoff = 0.77 cfs @ 12.13 hrs, Volume= 2,767 cf, Depth> 1.53"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Rainfall=4.60"

Area (sf)	CN	Description
8,506	57	Woods/grass comb., Poor, HSG A
714	76	Gravel roads, HSG A
2,491	98	Paved parking, HSG A
10,037	68	<50% Grass cover, Poor, HSG A
21,748	67	Weighted Average
19,257		88.55% Pervious Area
2,491		11.45% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.8	100	0.0270	0.19		**Sheet Flow, Grass** Grass: Short n= 0.150 P2= 3.15"

Subcatchment 02S: Cochituate Rd 2



Summary for Subcatchment 03S: Home Depot

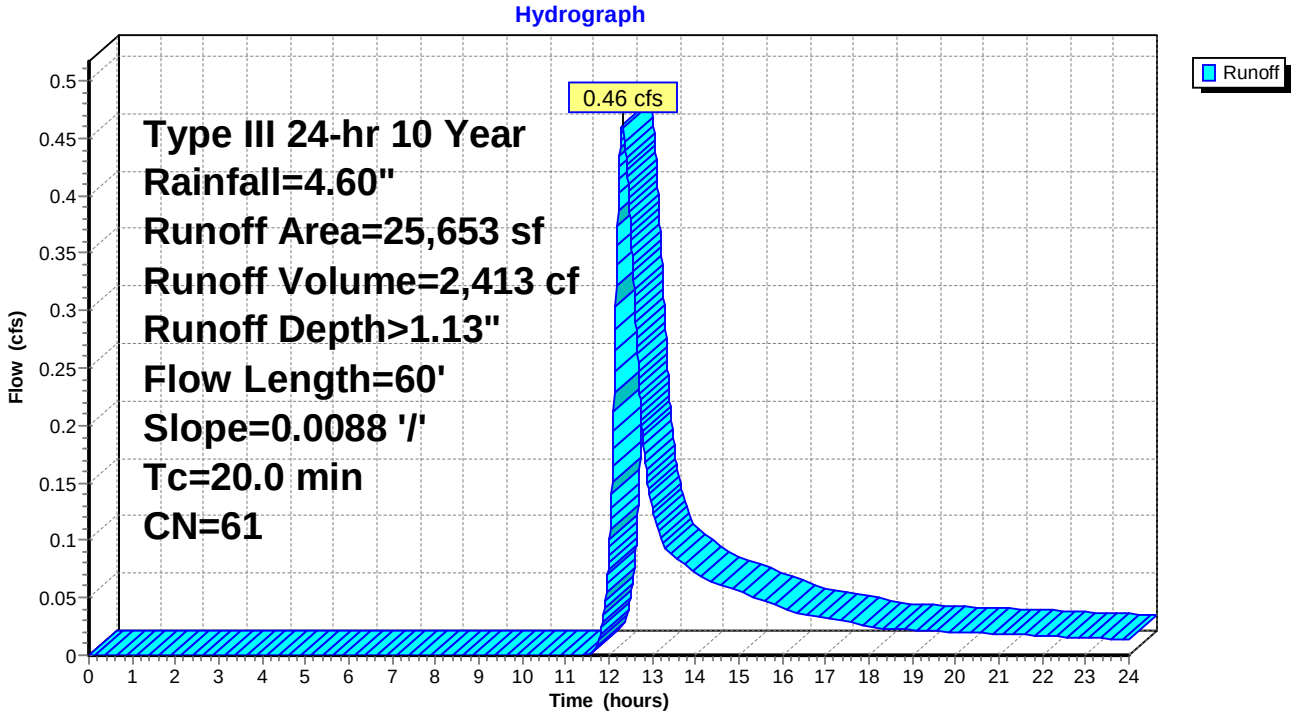
Runoff = 0.46 cfs @ 12.32 hrs, Volume= 2,413 cf, Depth> 1.13"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Rainfall=4.60"

Area (sf)	CN	Description
4,785	76	Gravel roads, HSG A
20,868	57	Woods/grass comb., Poor, HSG A
25,653	61	Weighted Average
25,653		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.0	60	0.0088	0.05		**Sheet Flow, Woods**
					Woods: Light underbrush n= 0.400 P2= 3.15"

Subcatchment 03S: Home Depot



Summary for Subcatchment 04S: Chrystler St

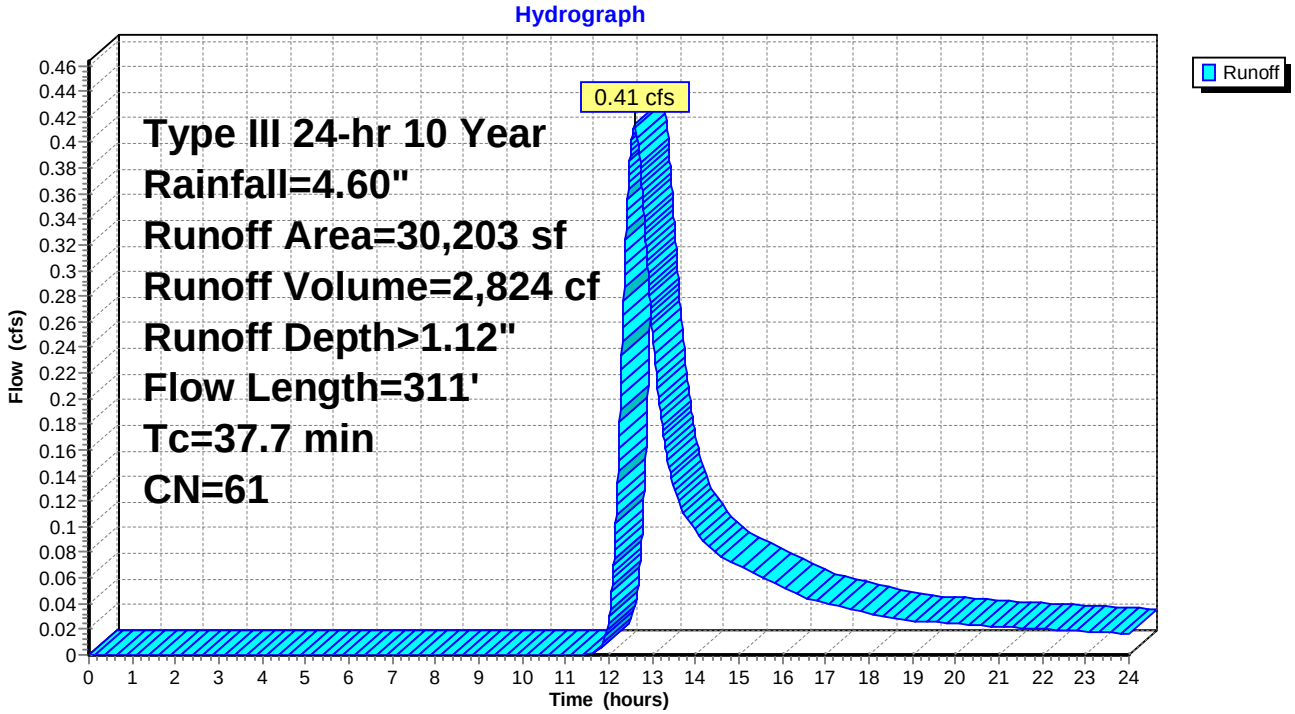
Runoff = 0.41 cfs @ 12.61 hrs, Volume= 2,824 cf, Depth> 1.12"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Rainfall=4.60"

Area (sf)	CN	Description
27,297	57	Woods/grass comb., Poor, HSG A
425	76	Gravel roads, HSG A
2,481	98	Paved parking, HSG A
30,203	61	Weighted Average
27,722		91.79% Pervious Area
2,481		8.21% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
28.6	100	0.0100	0.06		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
9.1	211	0.0060	0.39		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
37.7	311	Total			

Subcatchment 04S: Chrystler St



Summary for Subcatchment 05S: DNR

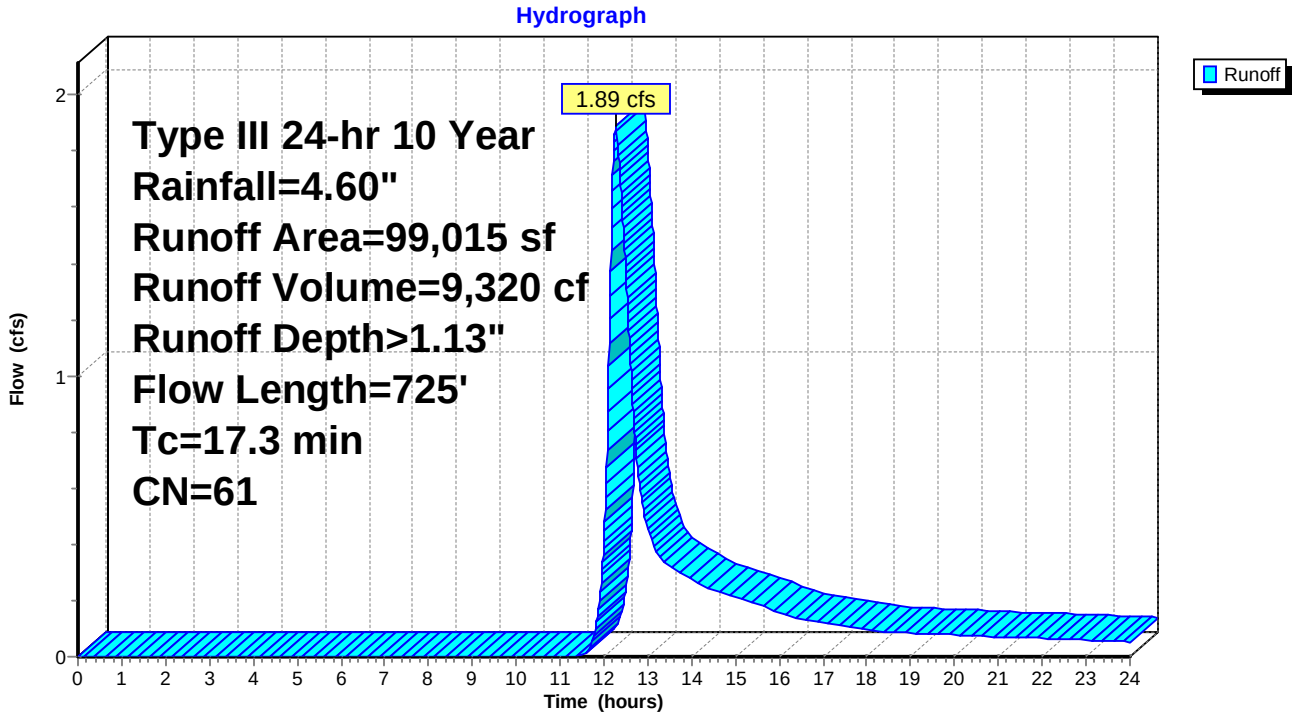
Runoff = 1.89 cfs @ 12.28 hrs, Volume= 9,320 cf, Depth> 1.13"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Rainfall=4.60"

Area (sf)	CN	Description
81,414	57	Woods/grass comb., Poor, HSG A
16,946	76	Gravel roads, HSG A
655	98	Paved parking, HSG A
99,015	61	Weighted Average
98,360		99.34% Pervious Area
655		0.66% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0	100	0.3330	0.24		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
7.0	391	0.0033	0.92		**Shallow Concentrated Flow, Gravel Path** Unpaved Kv= 16.1 fps
3.3	234	0.0556	1.18		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
17.3	725	Total			

Subcatchment 05S: DNR



Summary for Subcatchment 06S: Speen St

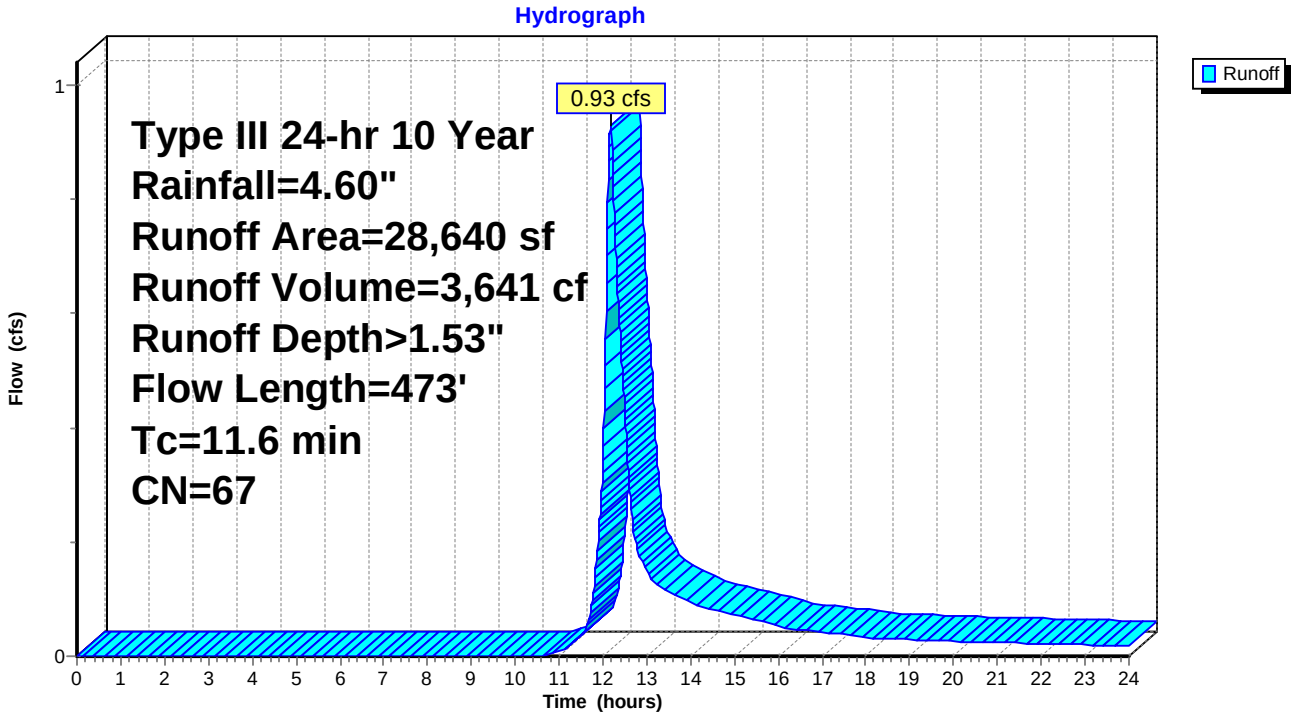
Runoff = 0.93 cfs @ 12.17 hrs, Volume= 3,641 cf, Depth> 1.53"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Rainfall=4.60"

Area (sf)	CN	Description
11,348	57	Woods/grass comb., Poor, HSG A
3,881	76	Gravel roads, HSG A
1,783	98	Paved roads w/curbs & sewers, HSG A
11,628	68	<50% Grass cover, Poor, HSG A
28,640	67	Weighted Average
26,857		93.77% Pervious Area
1,783		6.23% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	22	0.1440	0.27		**Sheet Flow, Grass** Grass: Short n= 0.150 P2= 3.15"
7.8	58	0.0120	0.12		**Sheet Flow, Grass** Grass: Short n= 0.150 P2= 3.15"
2.5	393	0.0265	2.62		**Shallow Concentrated Flow, Gravel Path** Unpaved Kv= 16.1 fps
11.6	473	Total			

Subcatchment 06S: Speen St



Summary for Subcatchment 07S: Lake Cochituate N

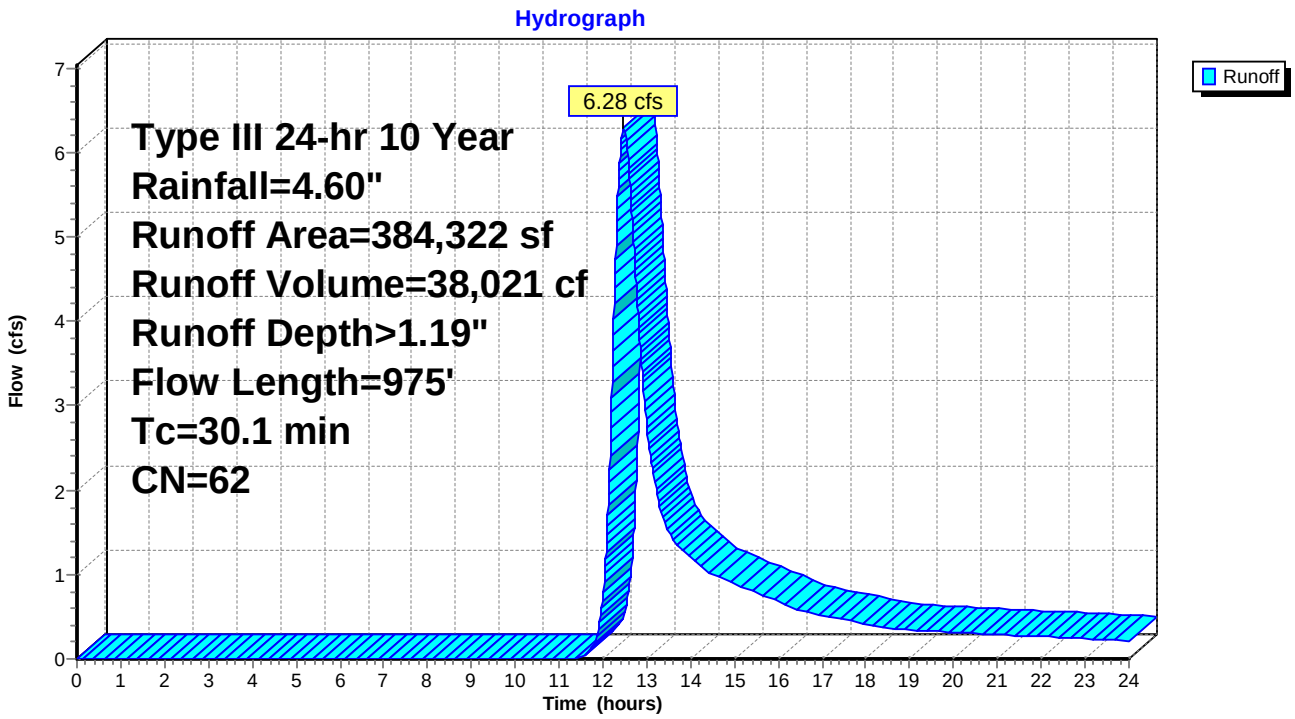
Runoff = 6.28 cfs @ 12.48 hrs, Volume= 38,021 cf, Depth> 1.19"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Rainfall=4.60"

Area (sf)	CN	Description
317,071	57	Woods/grass comb., Poor, HSG A
39,676	76	Gravel roads, HSG A
27,575	98	Paved parking, HSG A
384,322	62	Weighted Average
356,747		92.83% Pervious Area
27,575		7.17% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.7	33	0.4091	0.21		**Sheet Flow, Woods**
					Woods: Light underbrush n= 0.400 P2= 3.15"
1.5	67	0.0209	0.72		**Shallow Concentrated Flow, Woods**
					Woodland Kv= 5.0 fps
23.7	664	0.0087	0.47		**Shallow Concentrated Flow, Woods**
					Woodland Kv= 5.0 fps
1.9	164	0.0079	1.43		**Shallow Concentrated Flow, Gravel Path**
					Unpaved Kv= 16.1 fps
0.3	47	0.3120	2.79		**Shallow Concentrated Flow, Woods**
					Woodland Kv= 5.0 fps
30.1	975	Total			

Subcatchment 07S: Lake Cochituate N



Summary for Subcatchment 08S: Lake Cochituate E1

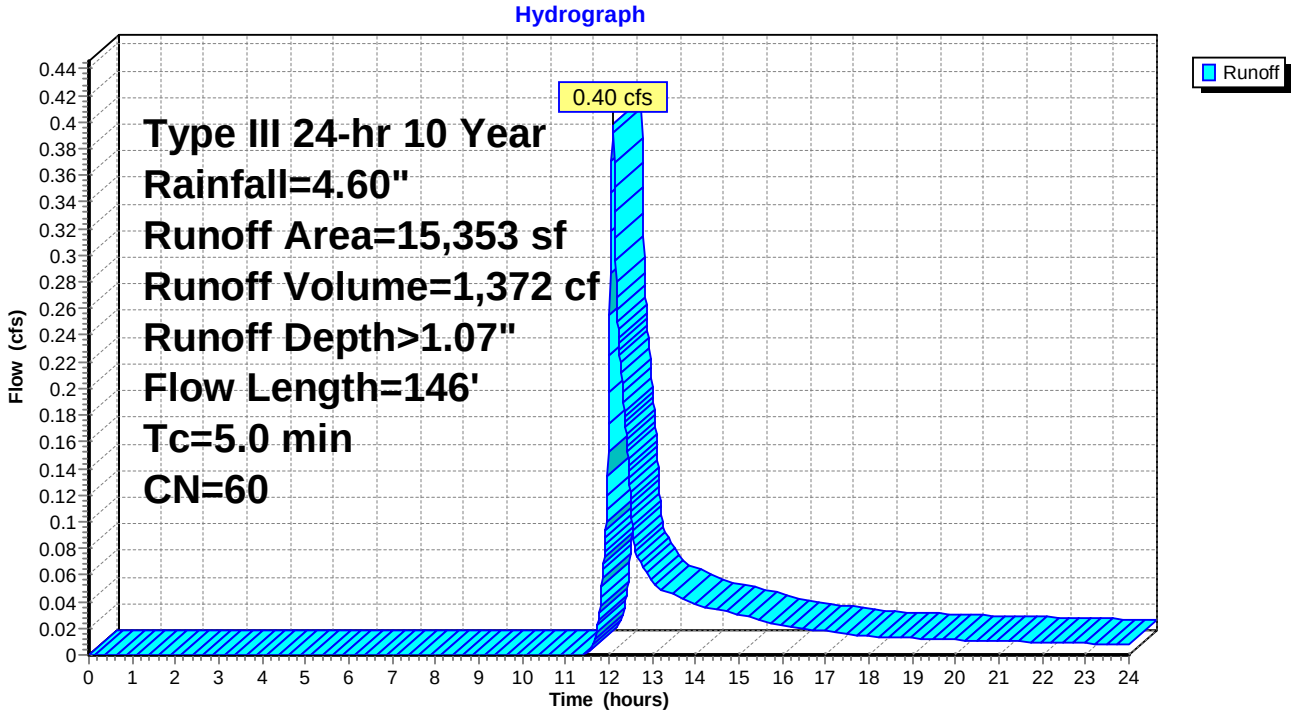
Runoff = 0.40 cfs @ 12.09 hrs, Volume= 1,372 cf, Depth> 1.07"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Rainfall=4.60"

Area (sf)	CN	Description
12,685	57	Woods/grass comb., Poor, HSG A
2,668	76	Gravel roads, HSG A
15,353	60	Weighted Average
15,353		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	12	0.2500	0.14		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
0.4	45	0.0112	1.70		**Shallow Concentrated Flow, Gravel Path** Unpaved Kv= 16.1 fps
0.9	89	0.1157	1.70		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
2.7	146	Total, Increased to minimum Tc = 5.0 min			

Subcatchment 08S: Lake Cochituate E1



Summary for Subcatchment 09S: Lake Cochituate E2

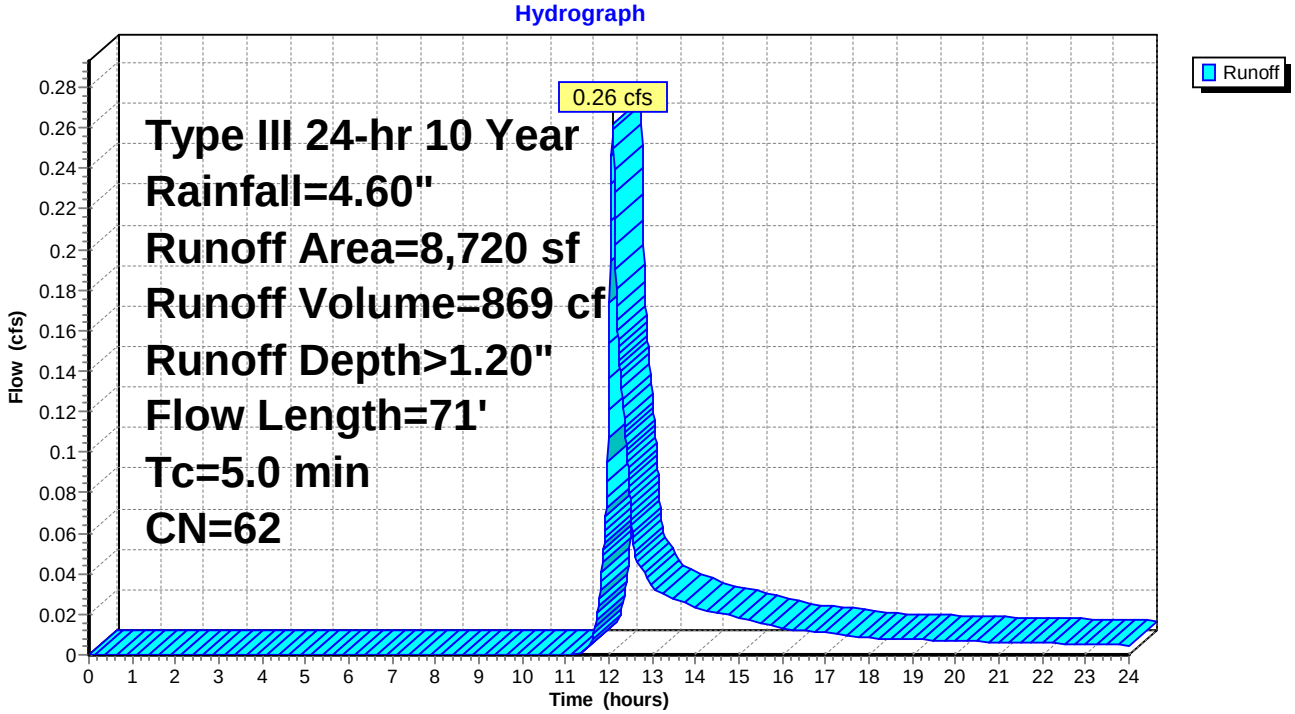
Runoff = 0.26 cfs @ 12.09 hrs, Volume= 869 cf, Depth> 1.20"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Rainfall=4.60"

Area (sf)	CN	Description
6,212	57	Woods/grass comb., Poor, HSG A
2,508	76	Gravel roads, HSG A
8,720	62	Weighted Average
8,720		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	32	0.0333	1.33		**Sheet Flow, Gravel Path** Smooth surfaces n= 0.011 P2= 3.15"
2.8	39	0.4974	0.23		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
3.2	71	Total, Increased to minimum Tc = 5.0 min			

Subcatchment 09S: Lake Cochituate E2



Summary for Subcatchment 10S: Lake Cochituate E3

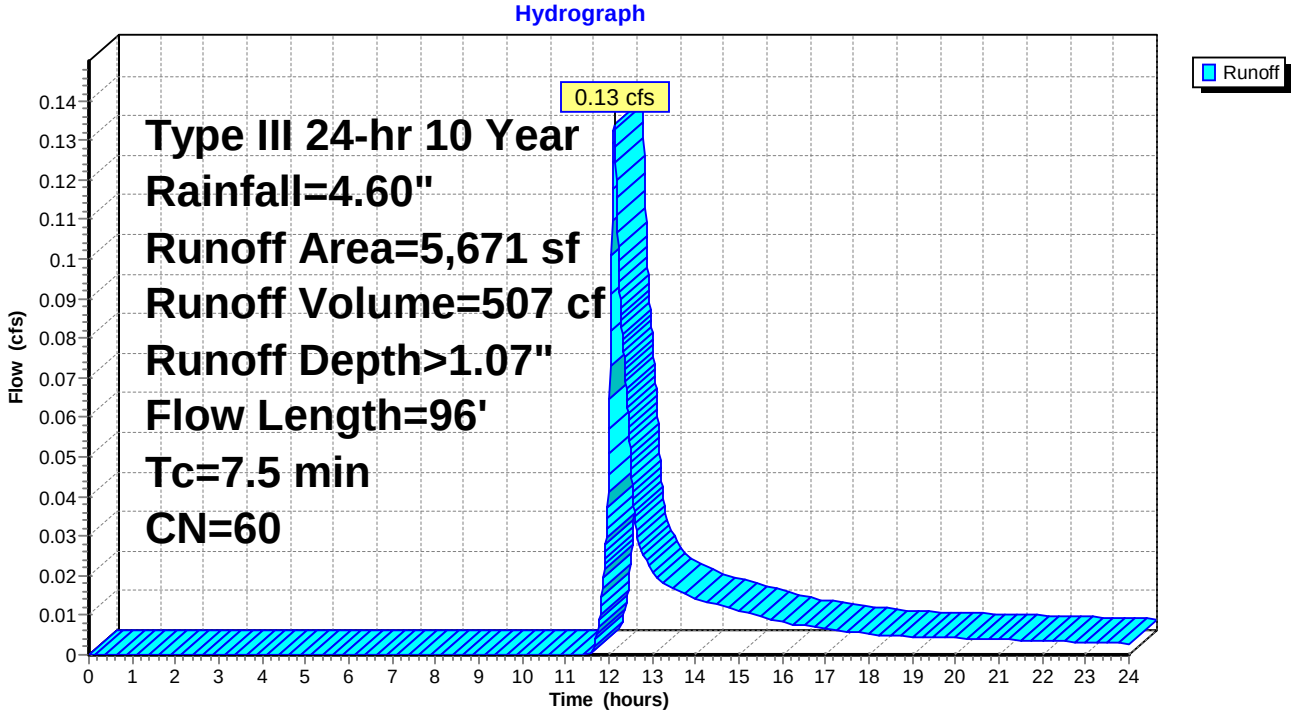
Runoff = 0.13 cfs @ 12.12 hrs, Volume= 507 cf, Depth> 1.07"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Rainfall=4.60"

Area (sf)	CN	Description
4,892	57	Woods/grass comb., Poor, HSG A
779	76	Gravel roads, HSG A
5,671	60	Weighted Average
5,671		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	22	0.0023	0.42		**Sheet Flow, Gravel Path** Smooth surfaces n= 0.011 P2= 3.15"
6.6	74	0.2101	0.19		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
7.5	96	Total			

Subcatchment 10S: Lake Cochituate E3



Summary for Subcatchment 11S: Lake Cochituate E4

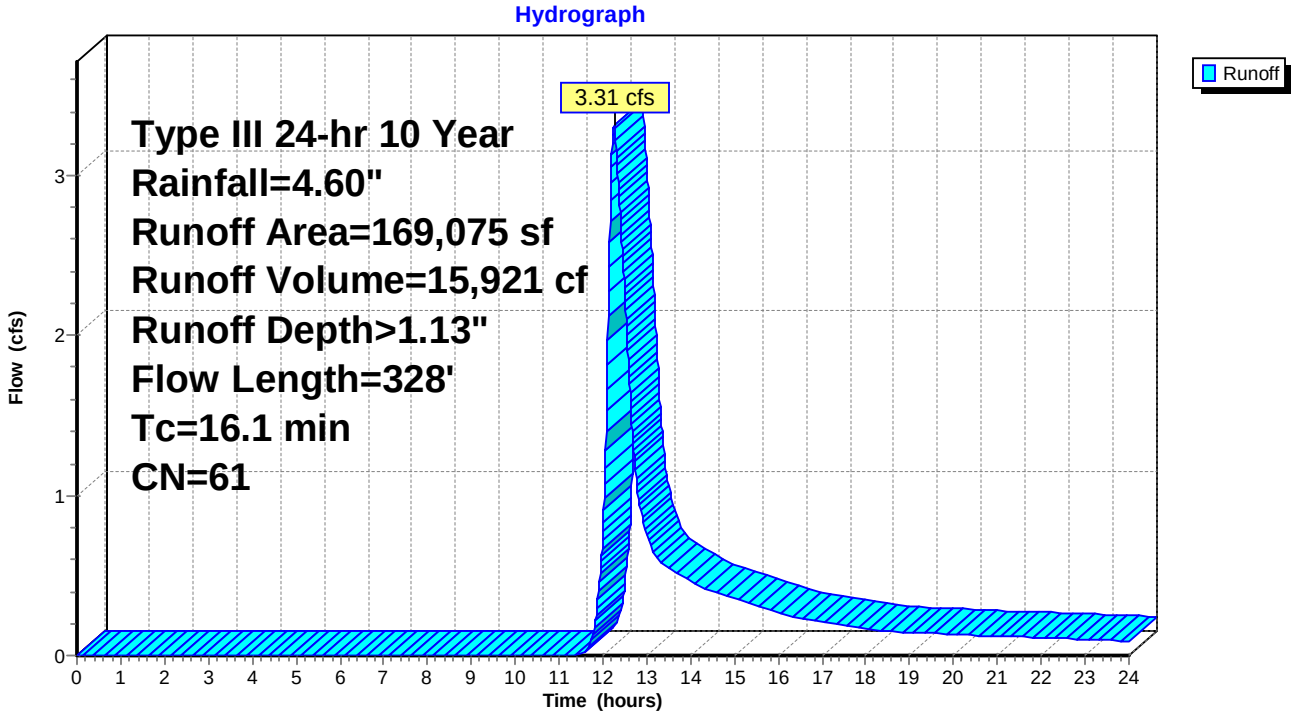
Runoff = 3.31 cfs @ 12.25 hrs, Volume= 15,921 cf, Depth> 1.13"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Rainfall=4.60"

Area (sf)	CN	Description
151,451	57	Woods/grass comb., Poor, HSG A
5,071	76	Gravel roads, HSG A
12,553	98	Paved parking, HSG A
169,075	61	Weighted Average
156,522		92.58% Pervious Area
12,553		7.42% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.1	100	0.0700	0.13		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
2.0	125	0.0456	1.07		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
0.1	13	0.0192	2.81		**Shallow Concentrated Flow, Road** Paved Kv= 20.3 fps
0.9	90	0.1080	1.64		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
16.1	328	Total			

Subcatchment 11S: Lake Cochituate E4



Summary for Subcatchment 12S: Lake Cochituate W1

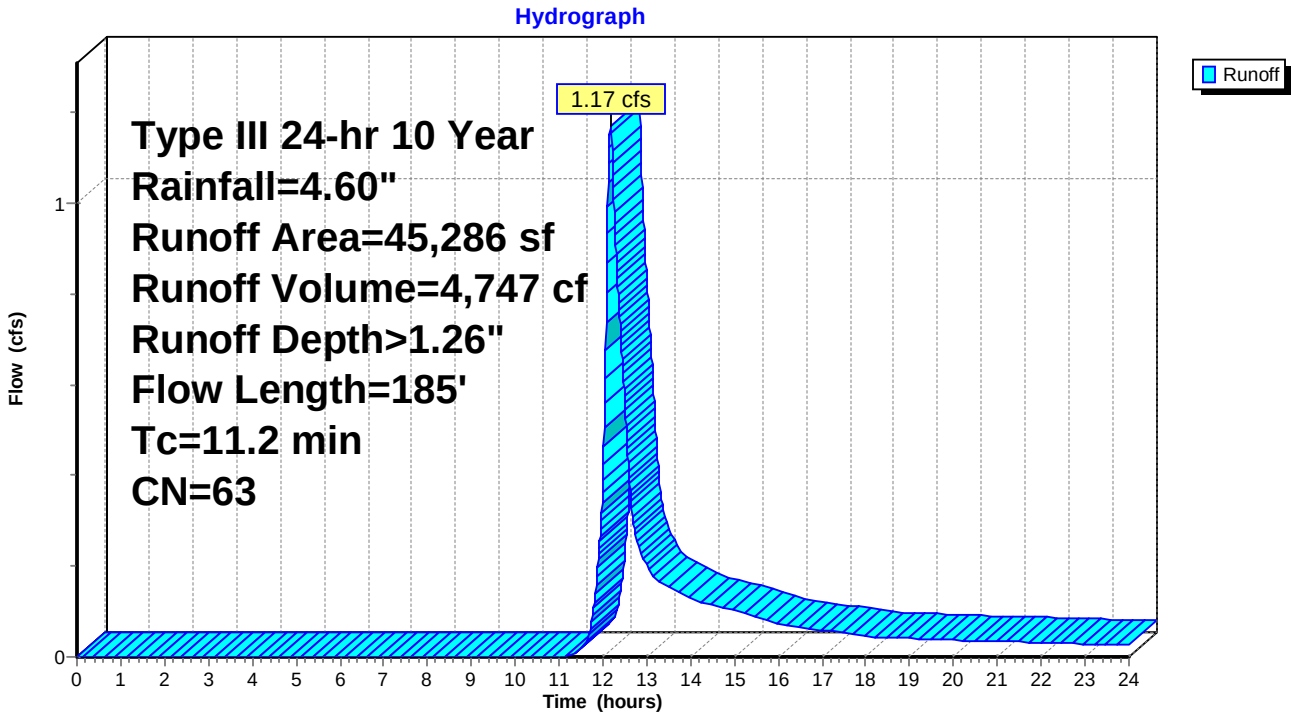
Runoff = 1.17 cfs @ 12.17 hrs, Volume= 4,747 cf, Depth> 1.26"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Rainfall=4.60"

Area (sf)	CN	Description
35,546	57	Woods/grass comb., Poor, HSG A
6,132	76	Gravel roads, HSG A
3,608	98	Paved parking, HSG A
45,286	63	Weighted Average
41,678		92.03% Pervious Area
3,608		7.97% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	100	0.1200	0.16		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
0.6	85	0.2100	2.29		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
11.2	185	Total			

Subcatchment 12S: Lake Cochituate W1



Summary for Subcatchment 13S: Lake Cochituate W2

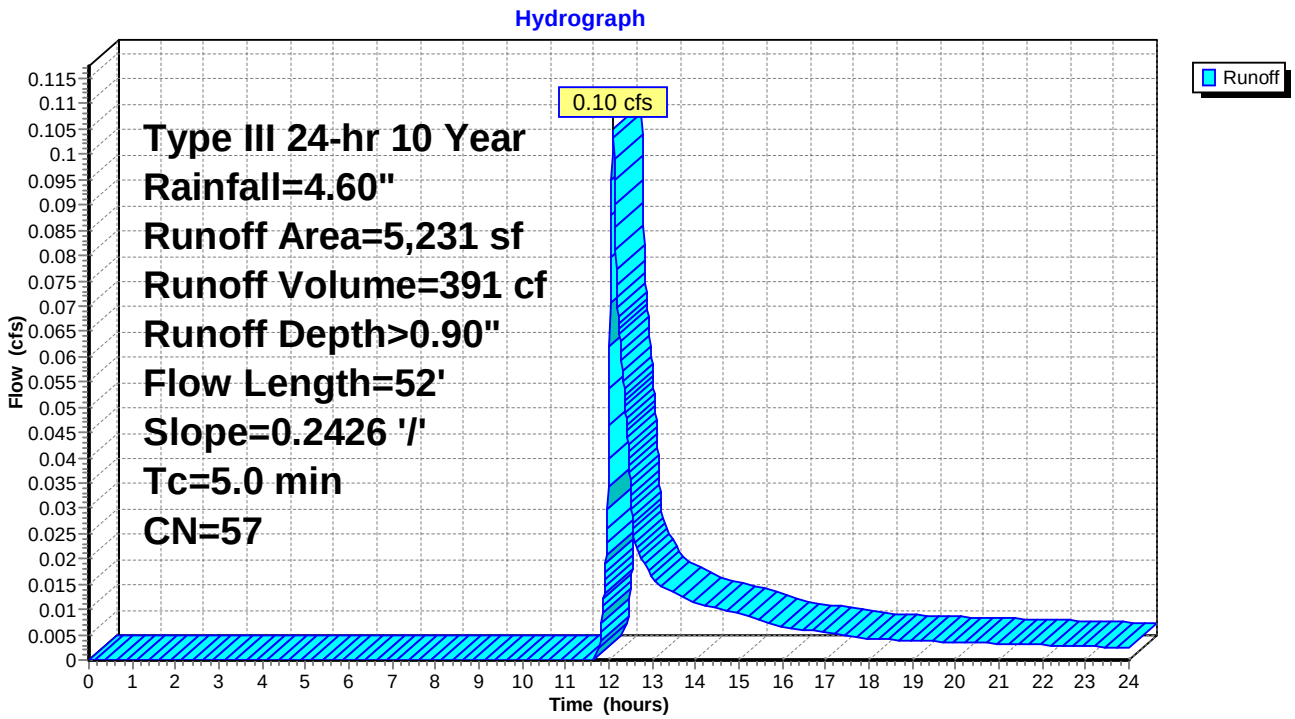
Runoff = 0.10 cfs @ 12.09 hrs, Volume= 391 cf, Depth> 0.90"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Rainfall=4.60"

Area (sf)	CN	Description
5,231	57	Woods/grass comb., Poor, HSG A
5,231		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.7	52	0.2426	0.18		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
4.7	52	Total, Increased to minimum Tc = 5.0 min			

Subcatchment 13S: Lake Cochituate W2



Summary for Subcatchment 14S: Lake Cochituate W3

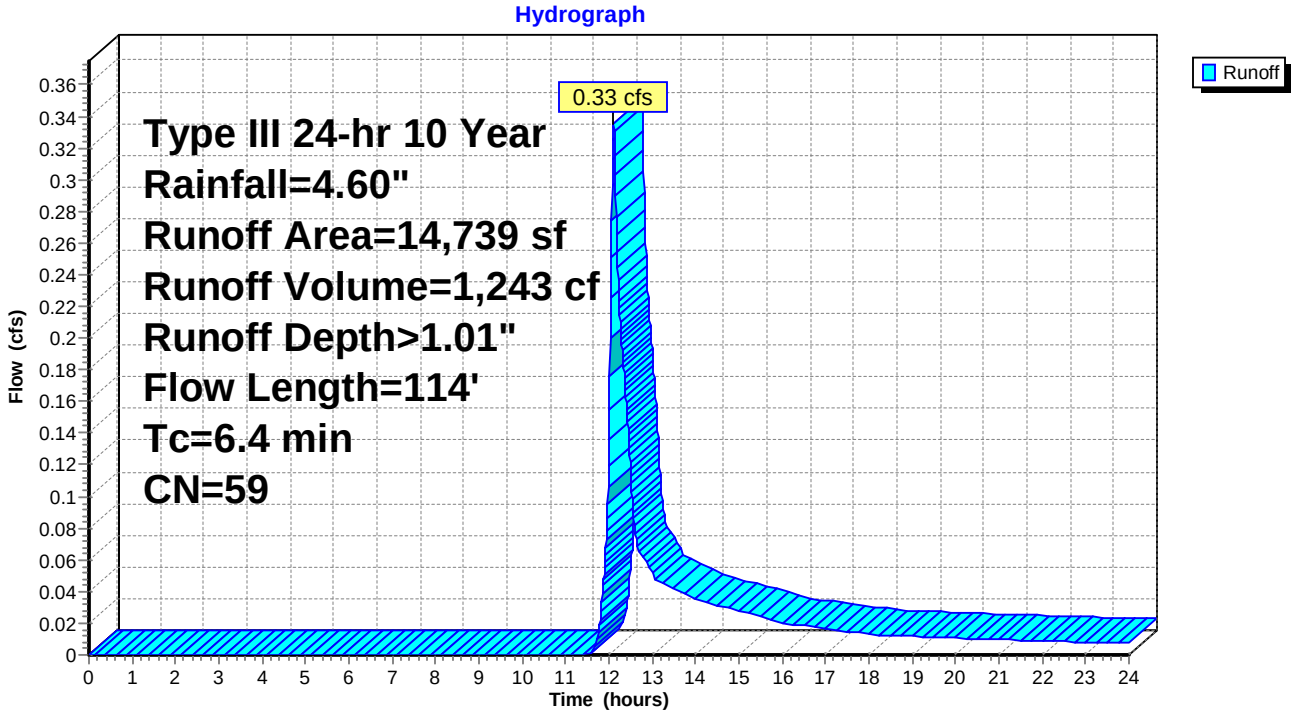
Runoff = 0.33 cfs @ 12.11 hrs, Volume= 1,243 cf, Depth> 1.01"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Rainfall=4.60"

Area (sf)	CN	Description
13,168	57	Woods/grass comb., Poor, HSG A
1,571	76	Gravel roads, HSG A
14,739	59	Weighted Average
14,739		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	38	0.0132	0.95		**Sheet Flow, Gravel Path** Smooth surfaces n= 0.011 P2= 3.15"
5.6	62	0.2258	0.18		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
0.1	14	0.2500	2.50		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
6.4	114	Total			

Subcatchment 14S: Lake Cochituate W3



Summary for Subcatchment 15S: Lake Cochituate W4

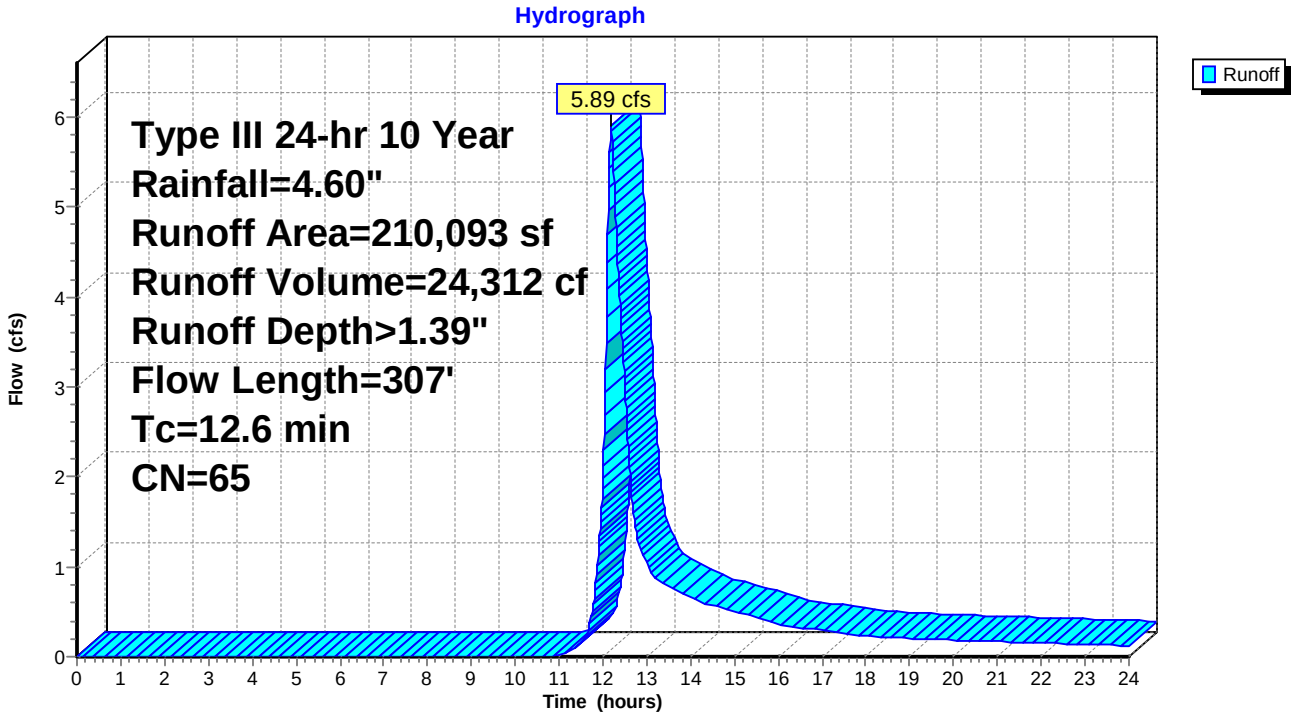
Runoff = 5.89 cfs @ 12.19 hrs, Volume= 24,312 cf, Depth> 1.39"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Rainfall=4.60"

Area (sf)	CN	Description
166,247	57	Woods/grass comb., Poor, HSG A
4,427	76	Gravel roads, HSG A
39,419	98	Paved parking, HSG A
210,093	65	Weighted Average
170,674		81.24% Pervious Area
39,419		18.76% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	10	0.0050	0.49		**Sheet Flow, Gravel Path** Smooth surfaces n= 0.011 P2= 3.15"
9.0	90	0.1444	0.17		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
3.3	207	0.0431	1.04		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
12.6	307	Total			

Subcatchment 15S: Lake Cochituate W4



Summary for Subcatchment 16S: Worcester St N

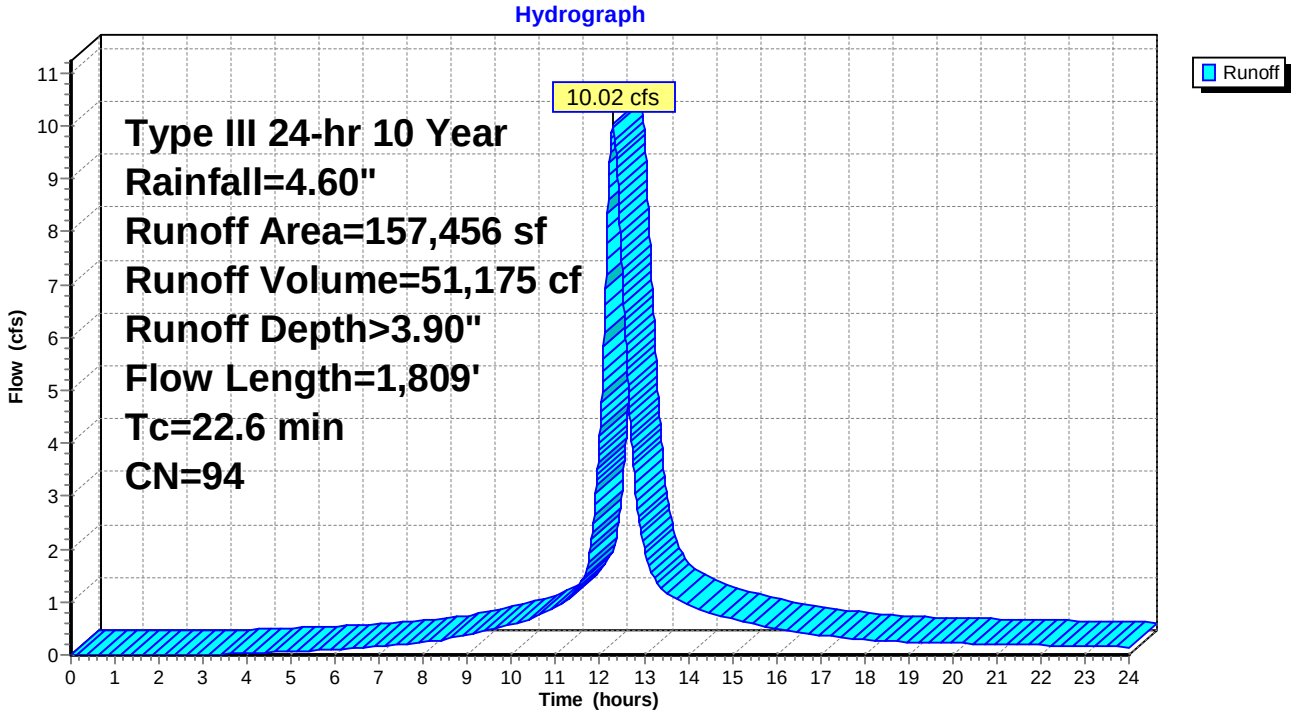
Runoff = 10.02 cfs @ 12.29 hrs, Volume= 51,175 cf, Depth> 3.90"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Rainfall=4.60"

Area (sf)	CN	Description
68,655	89	Urban commercial, 85% imp, HSG A
648	76	Gravel roads, HSG A
88,153	98	Paved roads w/curbs & sewers, HSG A
157,456	94	Weighted Average
10,946		6.95% Pervious Area
146,510		93.05% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.0	100	0.0100	0.13		**Sheet Flow, Yards** Grass: Short n= 0.150 P2= 3.15"
9.6	1,709	0.0214	2.97		**Shallow Concentrated Flow, Road** Paved Kv= 20.3 fps
22.6	1,809	Total			

Subcatchment 16S: Worcester St N



Summary for Subcatchment 17S: Worcester St S

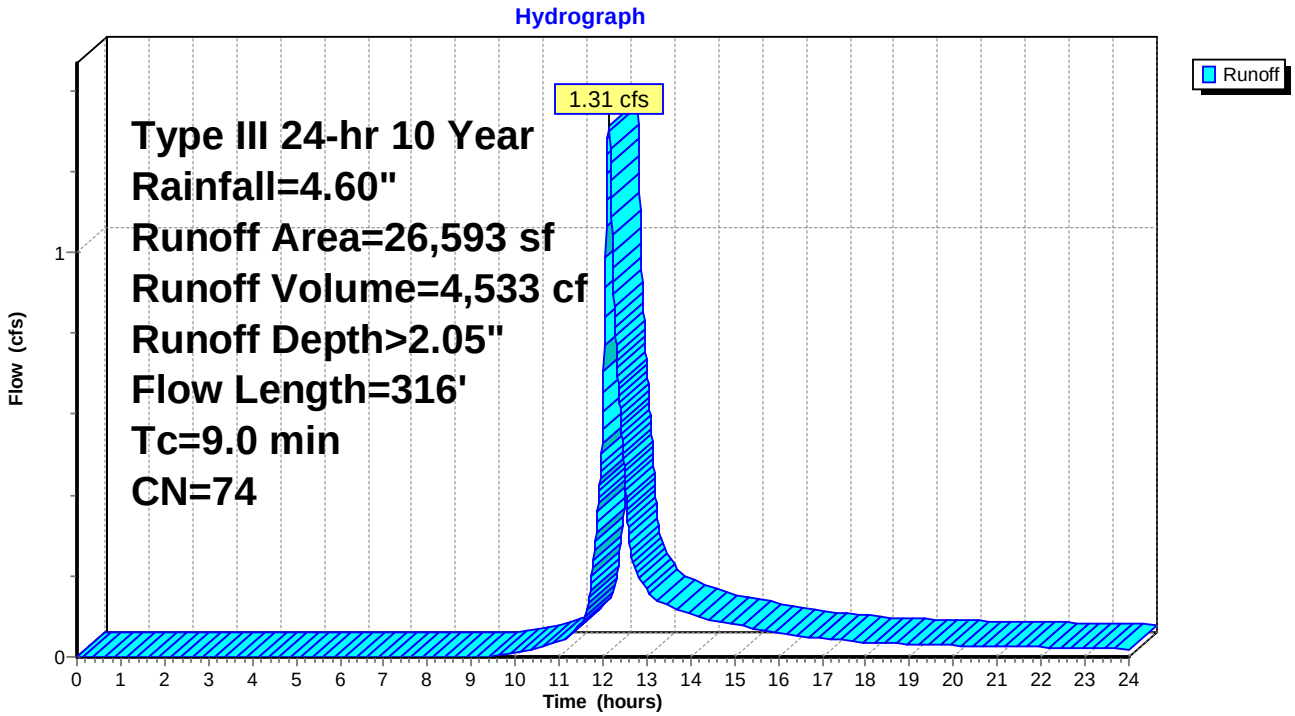
Runoff = 1.31 cfs @ 12.13 hrs, Volume= 4,533 cf, Depth> 2.05"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Rainfall=4.60"

Area (sf)	CN	Description
15,358	57	Woods/grass comb., Poor, HSG A
10,499	98	Paved parking, HSG A
736	76	Gravel roads, HSG A
26,593	74	Weighted Average
16,094		60.52% Pervious Area
10,499		39.48% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.3	90	0.2444	0.21		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
1.7	226	0.0115	2.18		**Shallow Concentrated Flow, Road** Paved Kv= 20.3 fps
9.0	316	Total			

Subcatchment 17S: Worcester St S



Summary for Subcatchment 18S: Arcadi Rd

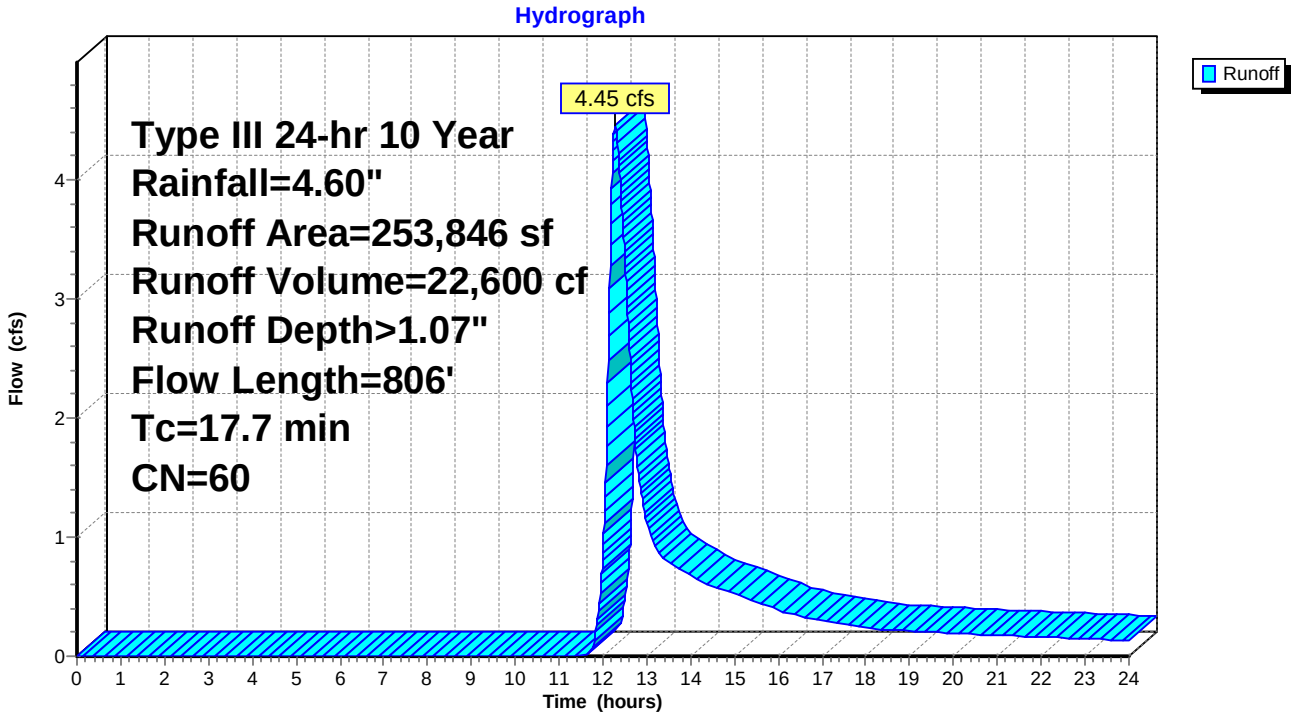
Runoff = 4.45 cfs @ 12.29 hrs, Volume= 22,600 cf, Depth> 1.07"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Rainfall=4.60"

Area (sf)	CN	Description
24,868	76	Gravel roads, HSG A
1,306	98	Paved parking, HSG A
145,254	57	Woods/grass comb., Poor, HSG A
82,418	61	1/4 acre lots, 38% imp, HSG A
253,846	60	Weighted Average
221,221		87.15% Pervious Area
32,625		12.85% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.1	55	0.3853	0.22		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
12.5	625	0.0027	0.84		**Shallow Concentrated Flow, Gravel** Unpaved Kv= 16.1 fps
1.1	126	0.1433	1.89		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
17.7	806	Total			

Subcatchment 18S: Arcadi Rd



Summary for Subcatchment 19S: Fisher St

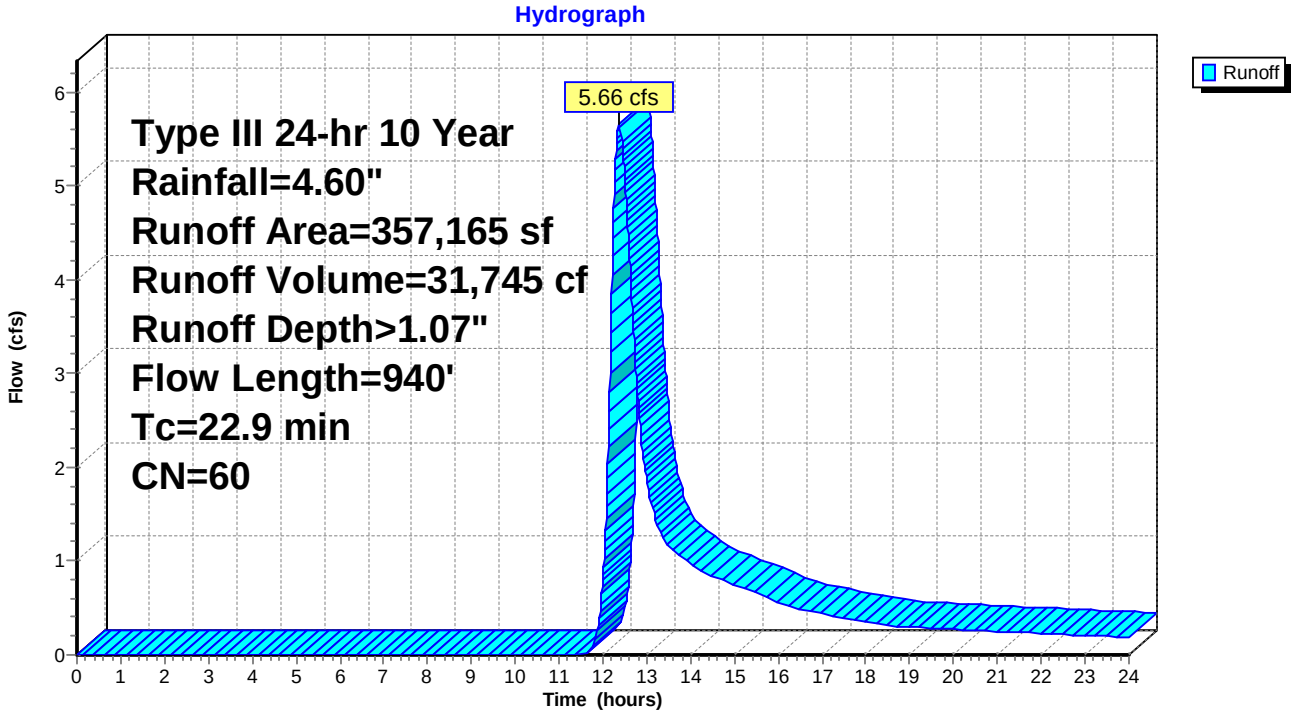
Runoff = 5.66 cfs @ 12.37 hrs, Volume= 31,745 cf, Depth> 1.07"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Rainfall=4.60"

Area (sf)	CN	Description
193,343	61	1/4 acre lots, 38% imp, HSG A
19,772	76	Gravel roads, HSG A
144,050	57	Woods/grass comb., Poor, HSG A
357,165	60	Weighted Average
283,695		79.43% Pervious Area
73,470		20.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.6	100	0.0550	0.25		**Sheet Flow, Yards** Grass: Short n= 0.150 P2= 3.15"
0.5	30	0.0250	1.11		**Shallow Concentrated Flow, Yards** Short Grass Pasture Kv= 7.0 fps
3.0	38	0.4079	0.21		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
12.6	749	0.0038	0.99		**Shallow Concentrated Flow, Gravel Path** Unpaved Kv= 16.1 fps
0.2	23	0.1609	2.01		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
22.9	940	Total			

Subcatchment 19S: Fisher St



Summary for Subcatchment 20S: Unnamed Pond 1

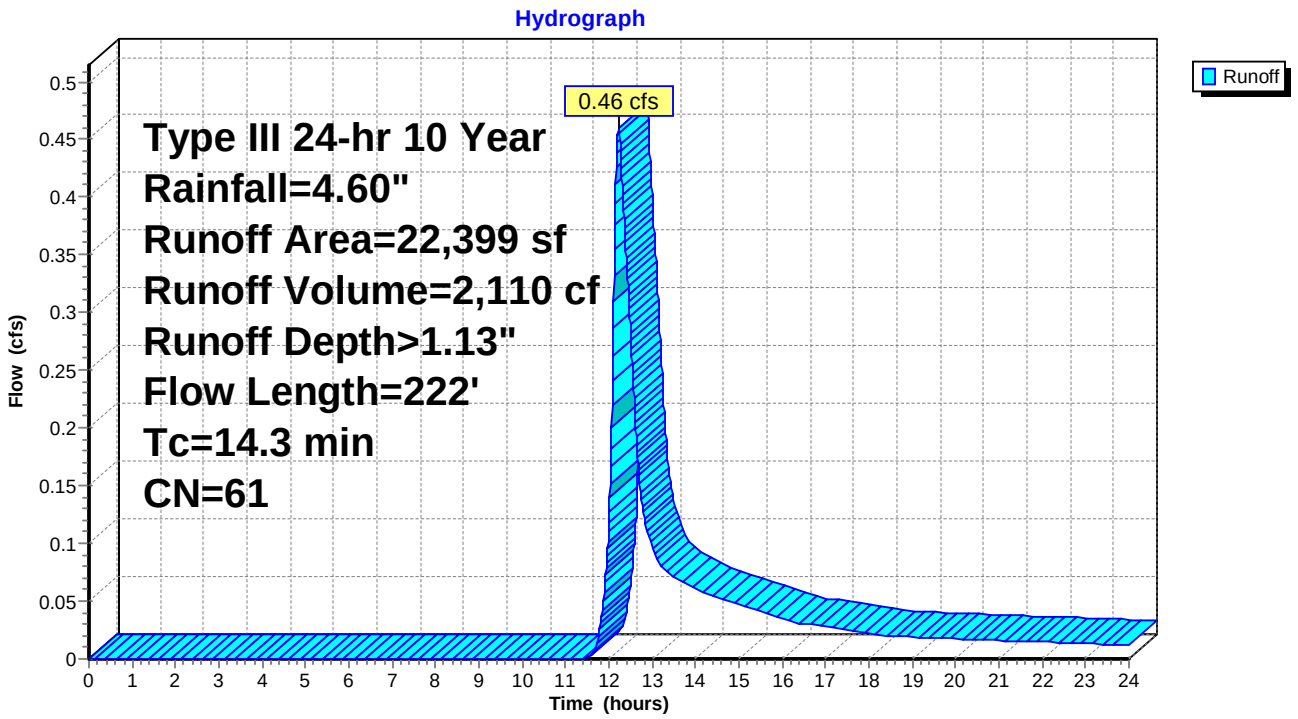
Runoff = 0.46 cfs @ 12.22 hrs, Volume= 2,110 cf, Depth> 1.13"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Rainfall=4.60"

Area (sf)	CN	Description
1,842	61	1/4 acre lots, 38% imp, HSG A
1,190	98	Paved parking, HSG A
2,043	76	Gravel roads, HSG A
17,324	57	Woods/grass comb., Poor, HSG A
22,399	61	Weighted Average
20,509		91.56% Pervious Area
1,890		8.44% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	24	0.0154	0.92		**Sheet Flow, Driveway**
					Smooth surfaces n= 0.011 P2= 3.15"
1.9	16	0.0312	0.14		**Sheet Flow, Yards**
					Grass: Short n= 0.150 P2= 3.15"
10.4	60	0.0450	0.10		**Sheet Flow, Woods**
					Woods: Light underbrush n= 0.400 P2= 3.15"
1.6	122	0.0639	1.26		**Shallow Concentrated Flow, Woods**
					Woodland Kv= 5.0 fps
14.3	222	Total			

Subcatchment 20S: Unnamed Pond 1



Summary for Subcatchment 21S: Unnamed Pond 2

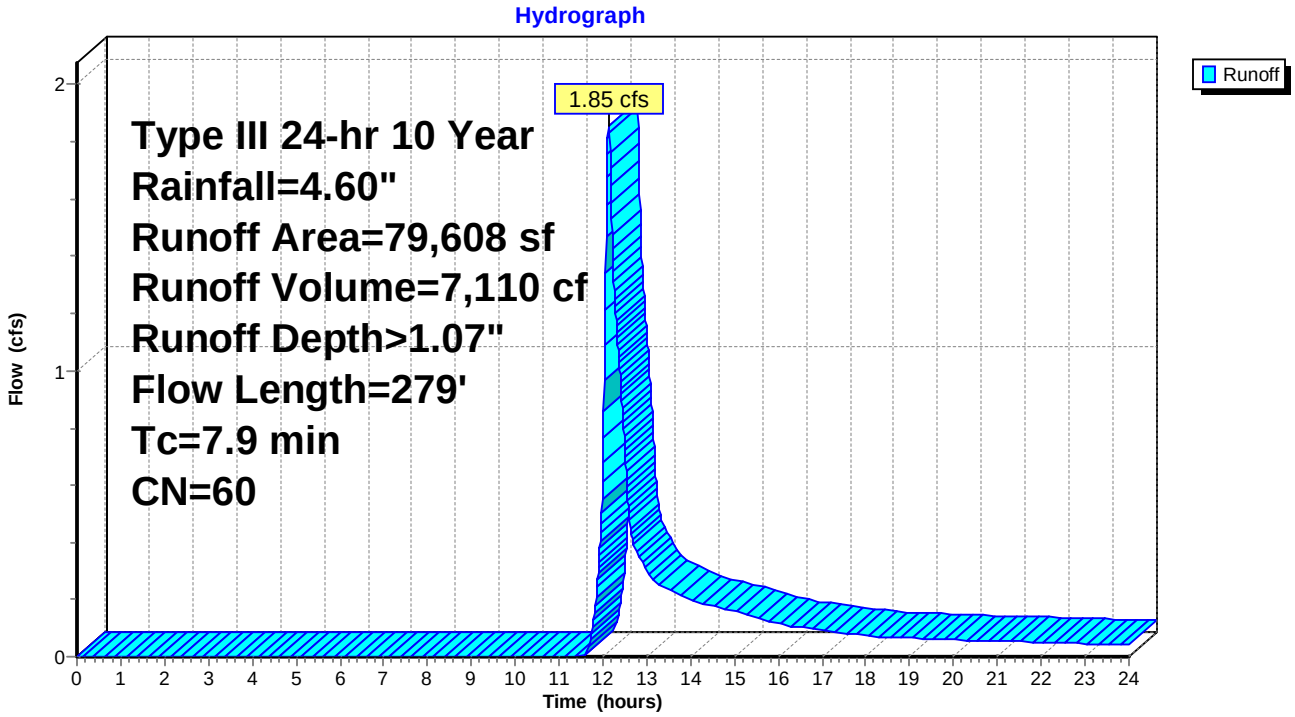
Runoff = 1.85 cfs @ 12.13 hrs, Volume= 7,110 cf, Depth> 1.07"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Rainfall=4.60"

Area (sf)	CN	Description
51,542	61	1/4 acre lots, 38% imp, HSG A
3,537	76	Gravel roads, HSG A
24,529	57	Woods/grass comb., Poor, HSG A
79,608	60	Weighted Average
60,022		75.40% Pervious Area
19,586		24.60% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.7	100	0.0800	0.29		**Sheet Flow, Yards** Grass: Short n= 0.150 P2= 3.15"
1.3	105	0.0381	1.37		**Shallow Concentrated Flow, Yards** Short Grass Pasture Kv= 7.0 fps
0.9	74	0.0724	1.35		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
7.9	279	Total			

Subcatchment 21S: Unnamed Pond 2



Summary for Subcatchment 22S: Unnamed Pond 3

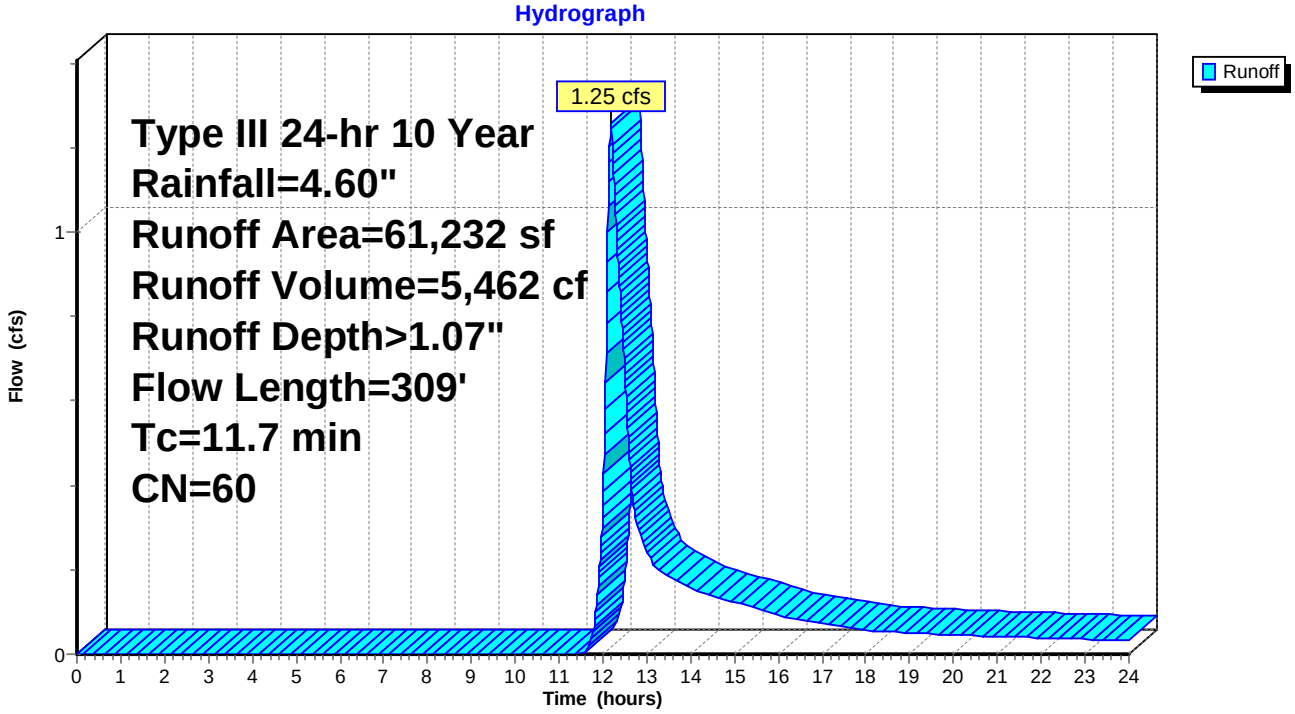
Runoff = 1.25 cfs @ 12.18 hrs, Volume= 5,462 cf, Depth> 1.07"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Rainfall=4.60"

Area (sf)	CN	Description
27,651	61	1/4 acre lots, 38% imp, HSG A
2,864	76	Gravel roads, HSG A
119	98	Paved parking, HSG A
30,598	57	Woods/grass comb., Poor, HSG A
61,232	60	Weighted Average
50,606		82.65% Pervious Area
10,626		17.35% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.2	100	0.0320	0.20		**Sheet Flow, Grass** Grass: Short n= 0.150 P2= 3.15"
3.5	209	0.0400	1.00		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
11.7	309	Total			

Subcatchment 22S: Unnamed Pond 3



Summary for Subcatchment 23S: Unnamed Pond 4

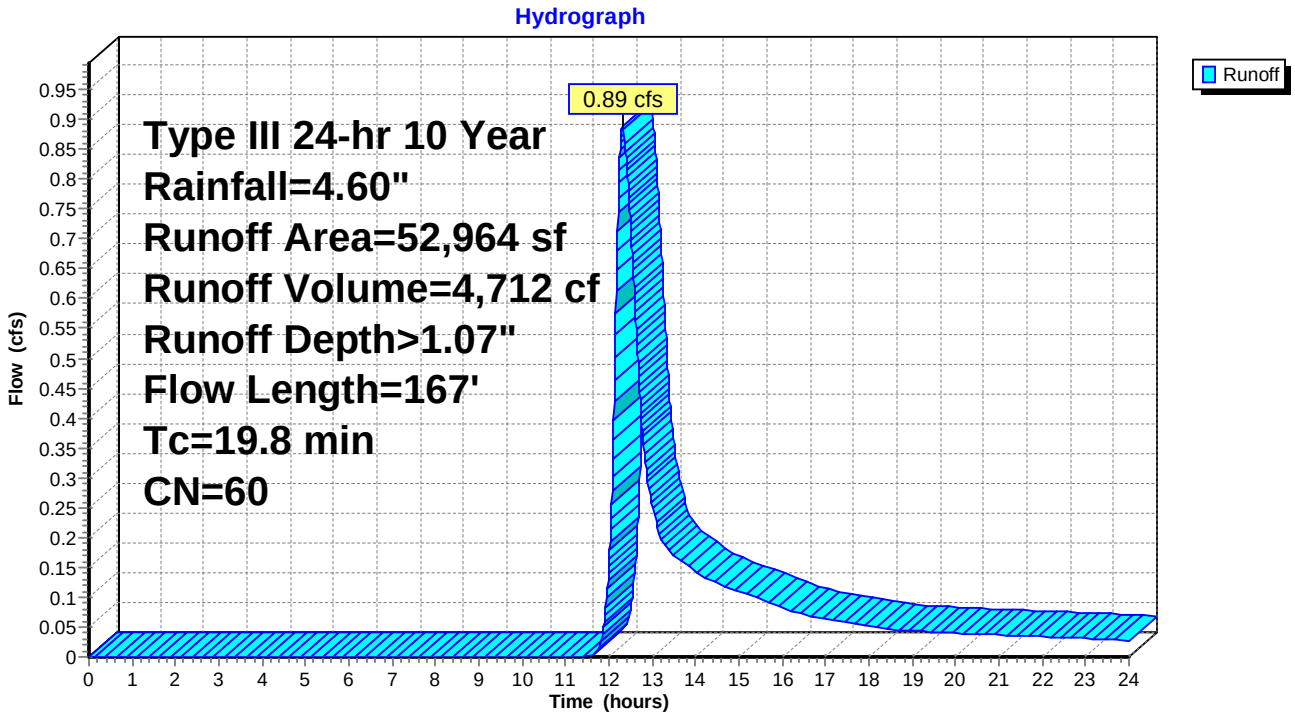
Runoff = 0.89 cfs @ 12.32 hrs, Volume= 4,712 cf, Depth> 1.07"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Rainfall=4.60"

Area (sf)	CN	Description
44,170	57	Woods/grass comb., Poor, HSG A
7,994	76	Gravel roads, HSG A
800	98	Paved parking, HSG A
52,964	60	Weighted Average
52,164		98.49% Pervious Area
800		1.51% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.9	100	0.1100	0.15		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
8.9	67	0.0821	0.13		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
19.8	167	Total			

Subcatchment 23S: Unnamed Pond 4



Summary for Subcatchment 24S: Kansas St

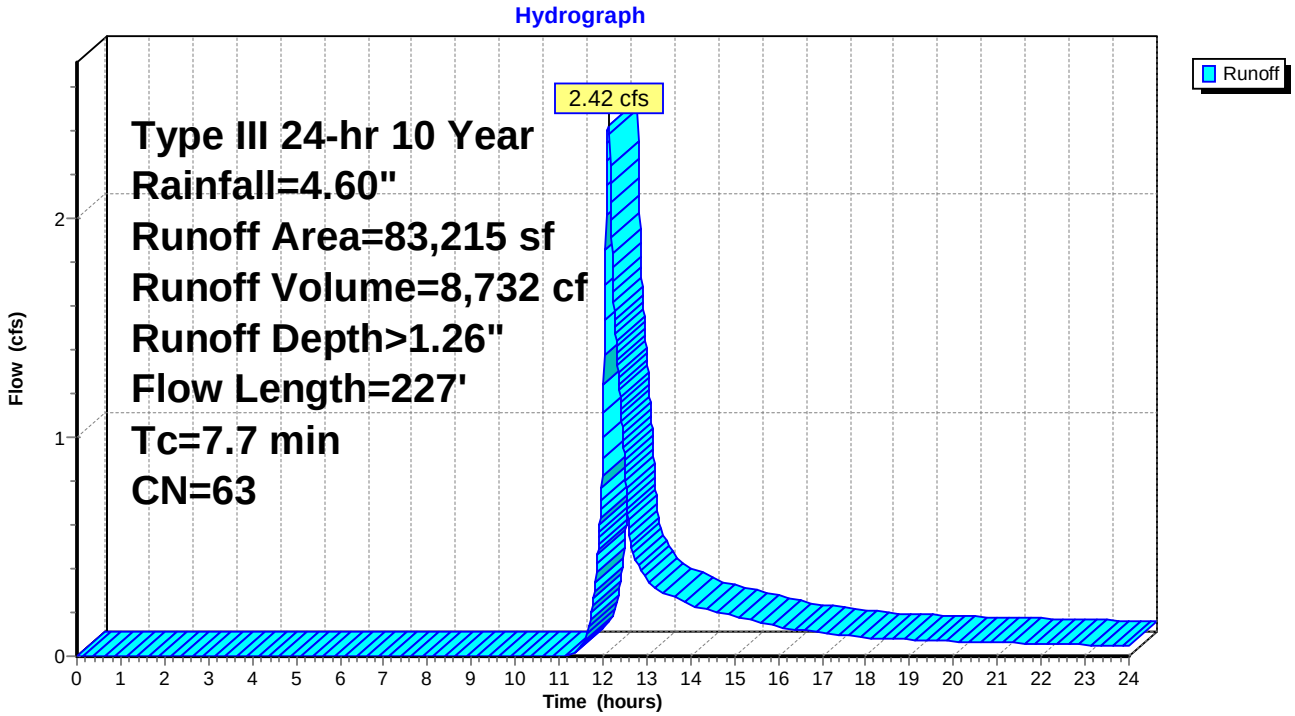
Runoff = 2.42 cfs @ 12.12 hrs, Volume= 8,732 cf, Depth> 1.26"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Rainfall=4.60"

Area (sf)	CN	Description
20,750	61	1/4 acre lots, 38% imp, HSG A
7,064	76	Gravel roads, HSG A
6,960	98	Paved parking, HSG A
48,441	57	Woods/grass comb., Poor, HSG A
83,215	63	Weighted Average
68,370		82.16% Pervious Area
14,845		17.84% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.5	100	0.0575	0.26		**Sheet Flow, Yards** Grass: Short n= 0.150 P2= 3.15"
0.9	89	0.0590	1.70		**Shallow Concentrated Flow, Yards** Short Grass Pasture Kv= 7.0 fps
0.3	38	0.1974	2.22		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
7.7	227	Total			

Subcatchment 24S: Kansas St



Summary for Subcatchment 25S: North Main @ Kansas

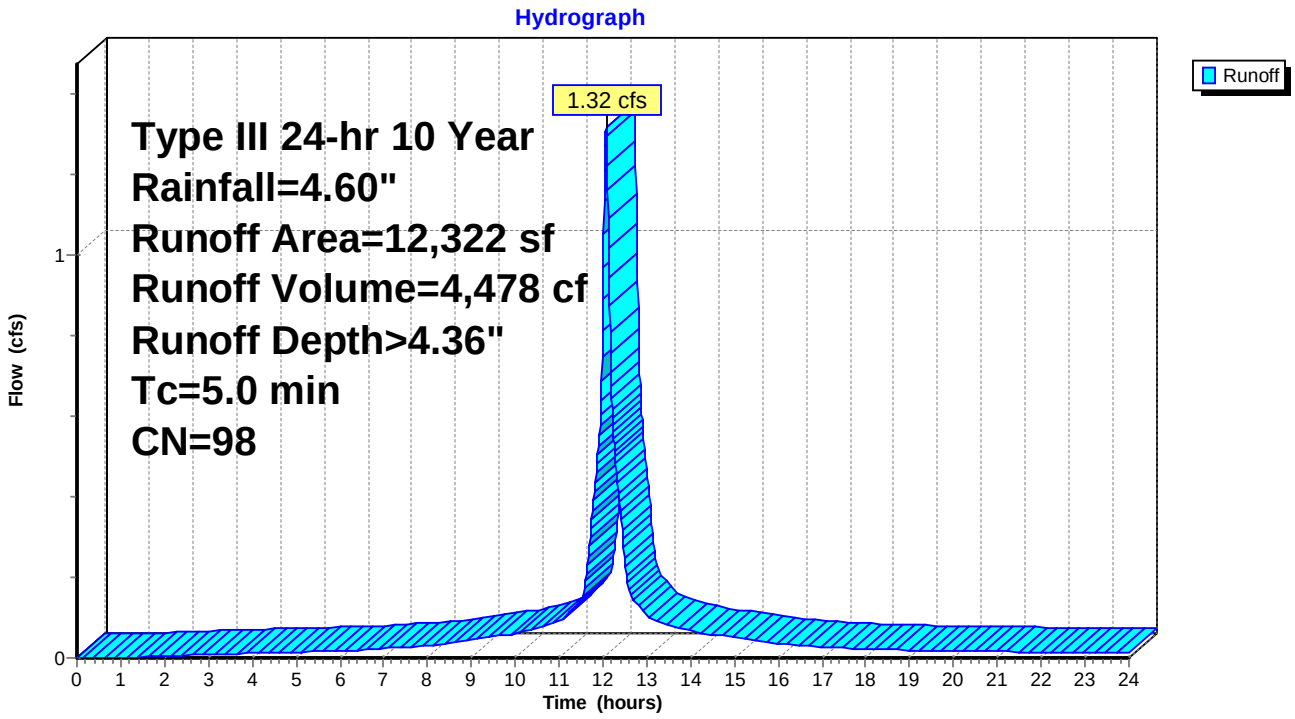
Runoff = 1.32 cfs @ 12.07 hrs, Volume= 4,478 cf, Depth> 4.36"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Rainfall=4.60"

Area (sf)	CN	Description
12,322	98	Paved roads w/curbs & sewers, HSG A
12,322		100.00% Impervious Area

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

Subcatchment 25S: North Main @ Kansas



Summary for Subcatchment 26S: Empty Lot

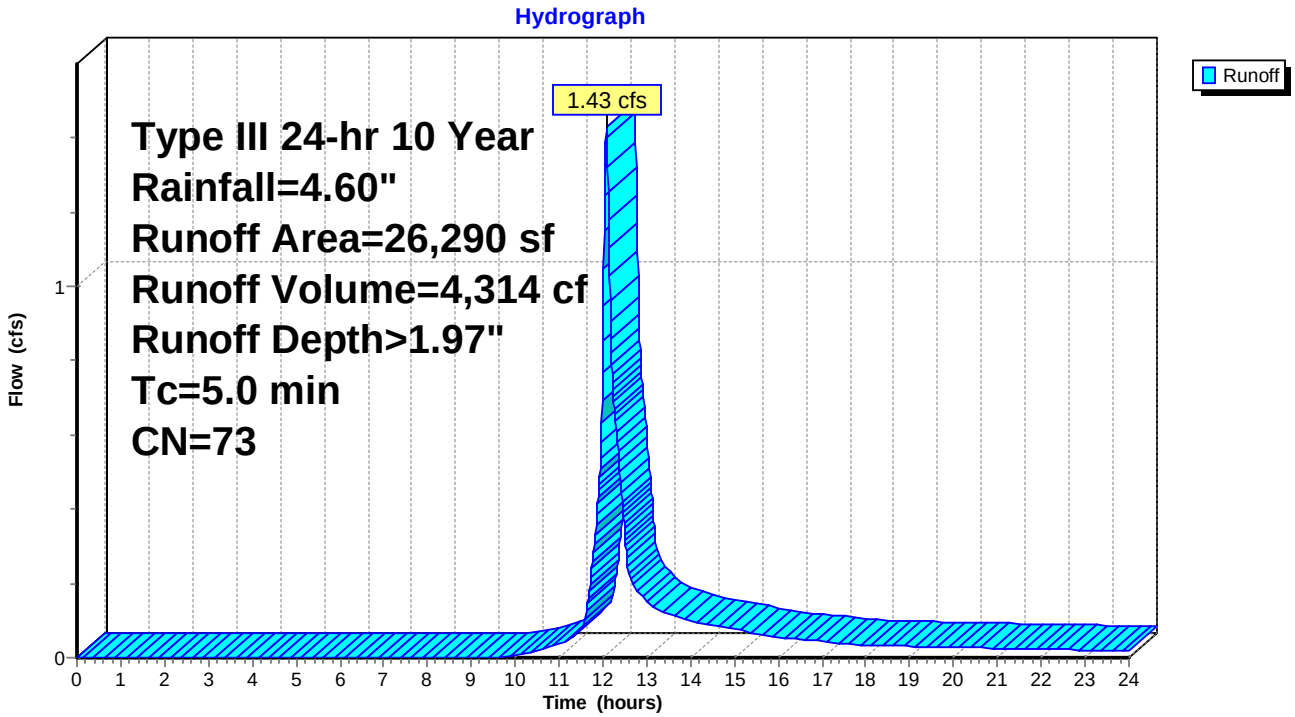
Runoff = 1.43 cfs @ 12.08 hrs, Volume= 4,314 cf, Depth> 1.97"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Rainfall=4.60"

Area (sf)	CN	Description
18,679	72	Dirt roads, HSG A
7,611	76	Gravel roads, HSG A
26,290	73	Weighted Average
26,290		100.00% Pervious Area

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

Subcatchment 26S: Empty Lot



Summary for Subcatchment 27S: Washington Ave 1

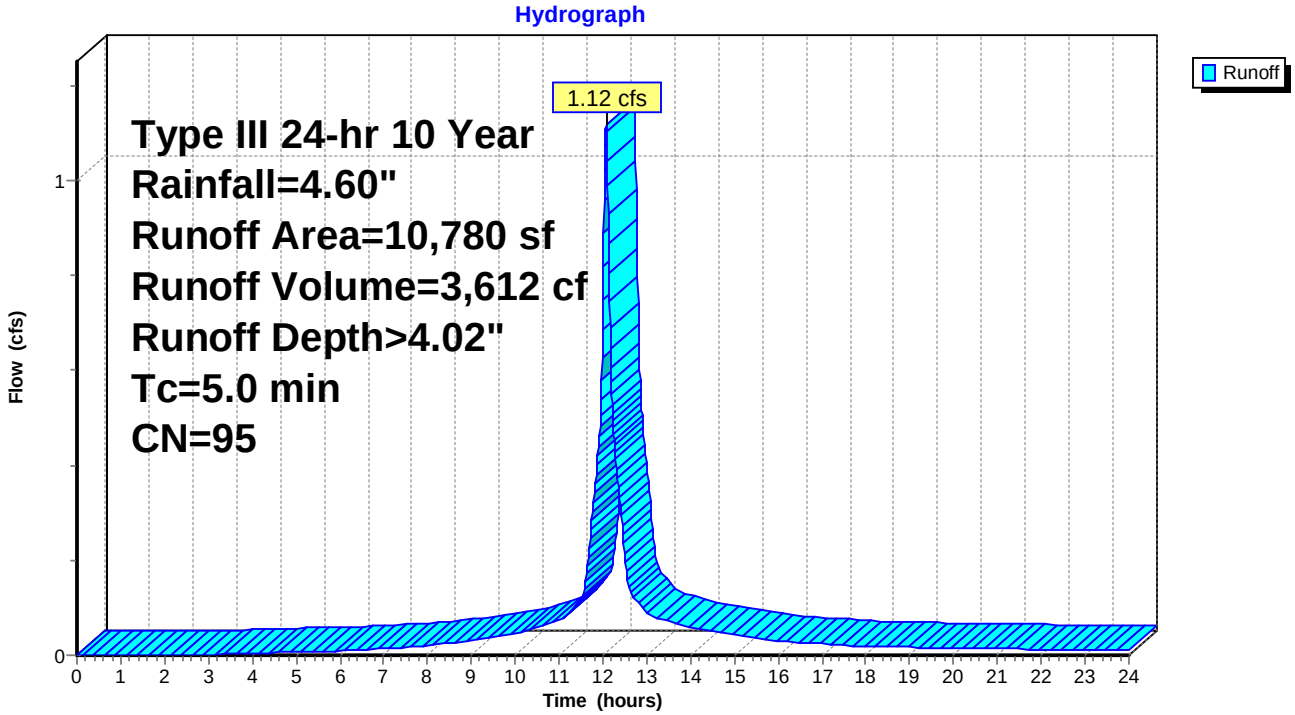
Runoff = 1.12 cfs @ 12.07 hrs, Volume= 3,612 cf, Depth> 4.02"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Rainfall=4.60"

Area (sf)	CN	Description
1,673	76	Gravel roads, HSG A
9,107	98	Paved parking, HSG A
10,780	95	Weighted Average
1,673		15.52% Pervious Area
9,107		84.48% Impervious Area

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

Subcatchment 27S: Washington Ave 1



Summary for Subcatchment 28S: Washington Ave 2

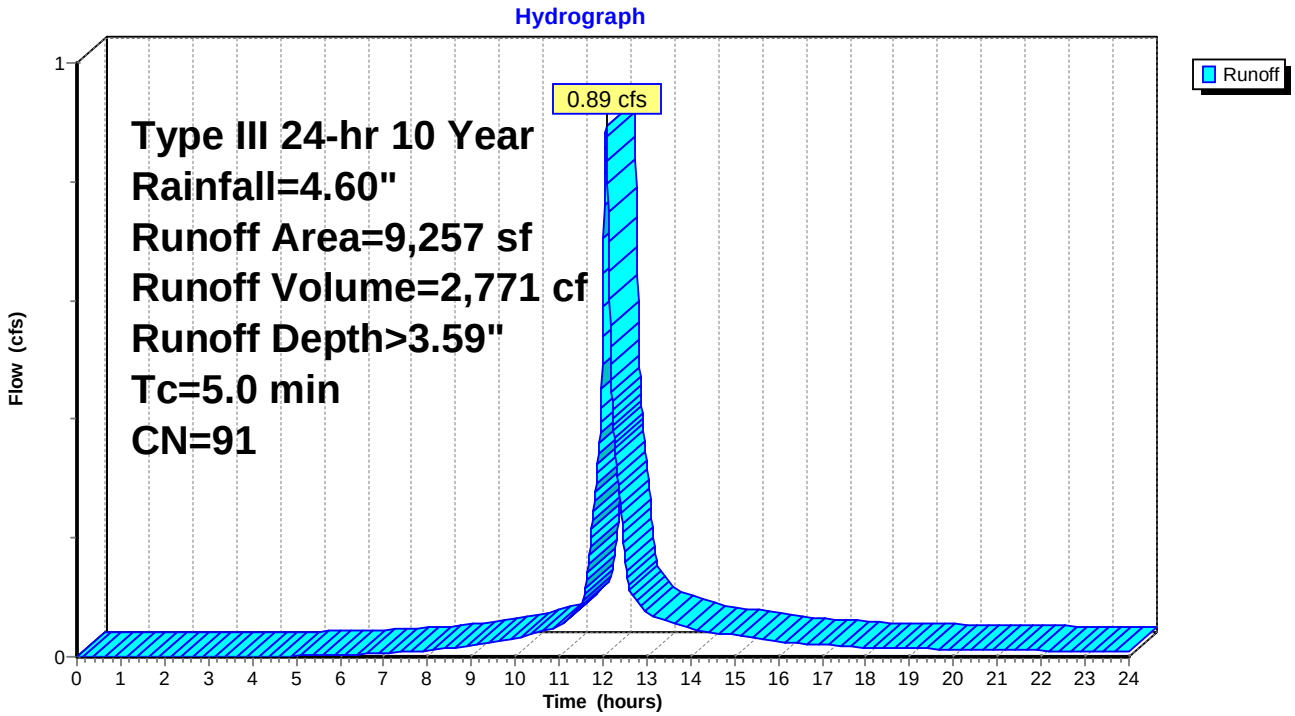
Runoff = 0.89 cfs @ 12.07 hrs, Volume= 2,771 cf, Depth> 3.59"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Rainfall=4.60"

Area (sf)	CN	Description
3,039	76	Gravel roads, HSG A
6,175	98	Paved parking, HSG A
43	72	Dirt roads, HSG A
9,257	91	Weighted Average
3,082		33.29% Pervious Area
6,175		66.71% Impervious Area

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

Subcatchment 28S: Washington Ave 2



Summary for Subcatchment 29S: Washington Ave 3

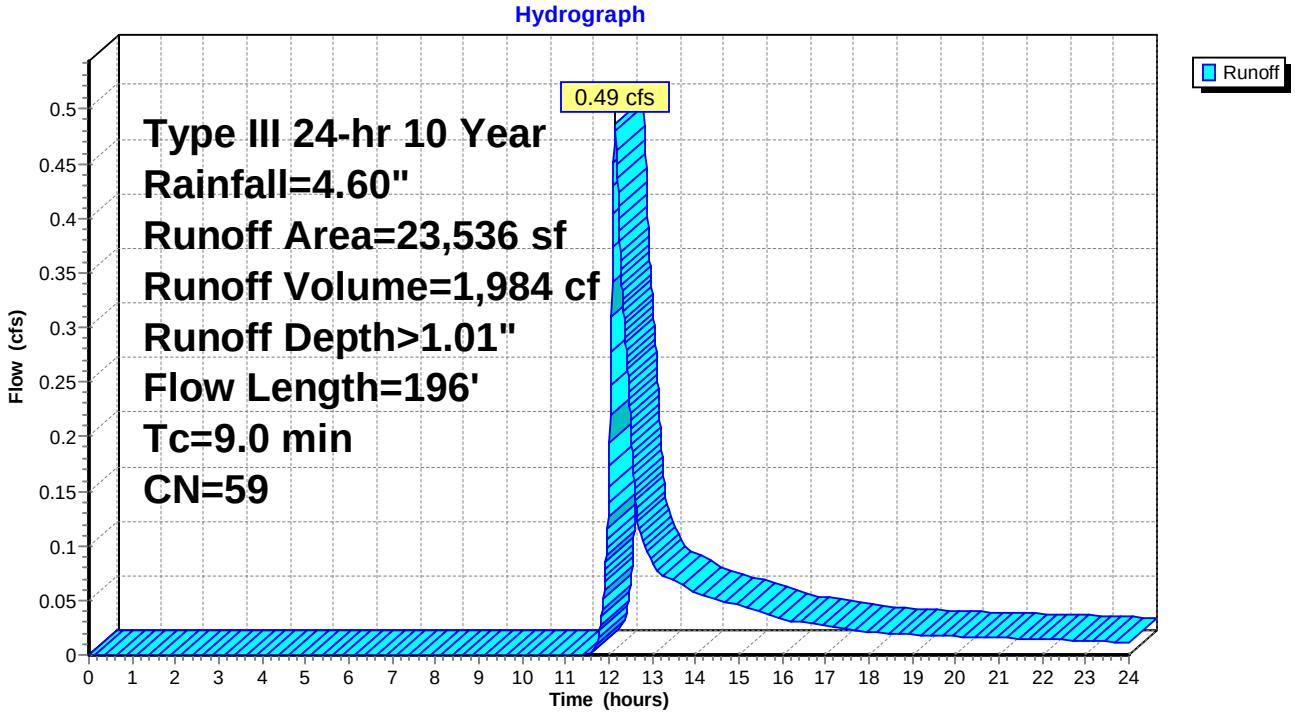
Runoff = 0.49 cfs @ 12.15 hrs, Volume= 1,984 cf, Depth> 1.01"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Rainfall=4.60"

Area (sf)	CN	Description
19,229	61	1/4 acre lots, 38% imp, HSG A
621	76	Gravel roads, HSG A
3,686	45	Woods, Poor, HSG A
23,536	59	Weighted Average
16,229		68.95% Pervious Area
7,307		31.05% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	100	0.0350	0.21		**Sheet Flow, Yards** Grass: Short n= 0.150 P2= 3.15"
1.1	96	0.0427	1.45		**Shallow Concentrated Flow, Yards** Short Grass Pasture Kv= 7.0 fps
9.0	196	Total			

Subcatchment 29S: Washington Ave 3



Summary for Subcatchment 30S: Lagrange St

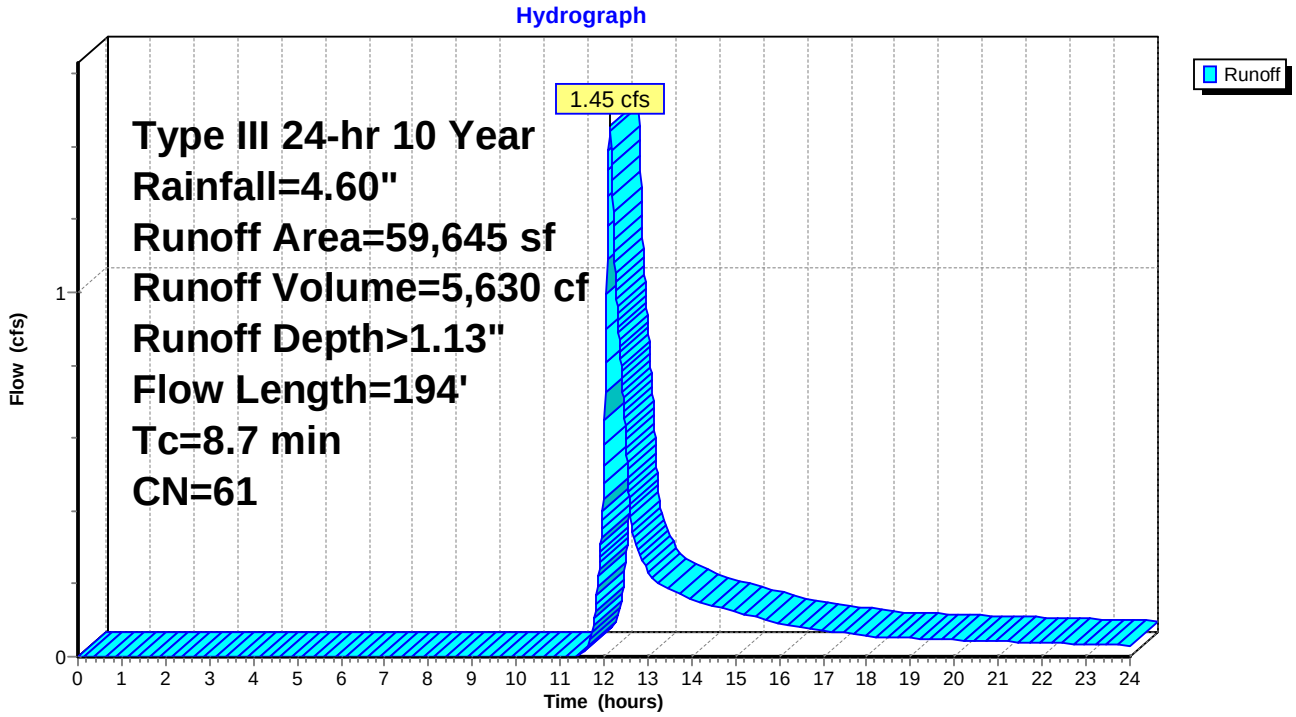
Runoff = 1.45 cfs @ 12.14 hrs, Volume= 5,630 cf, Depth> 1.13"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Rainfall=4.60"

Area (sf)	CN	Description
49,221	61	1/4 acre lots, 38% imp, HSG A
686	76	Gravel roads, HSG A
9,738	57	Woods/grass comb., Poor, HSG A
59,645	61	Weighted Average
40,941		68.64% Pervious Area
18,704		31.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.1	100	0.0450	0.23		**Sheet Flow, Yards** Grass: Short n= 0.150 P2= 3.15"
0.9	53	0.0189	0.96		**Shallow Concentrated Flow, Yards** Short Grass Pasture Kv= 7.0 fps
0.7	41	0.0366	0.96		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
8.7	194	Total			

Subcatchment 30S: Lagrange St



Summary for Subcatchment 31S: Mechanic St

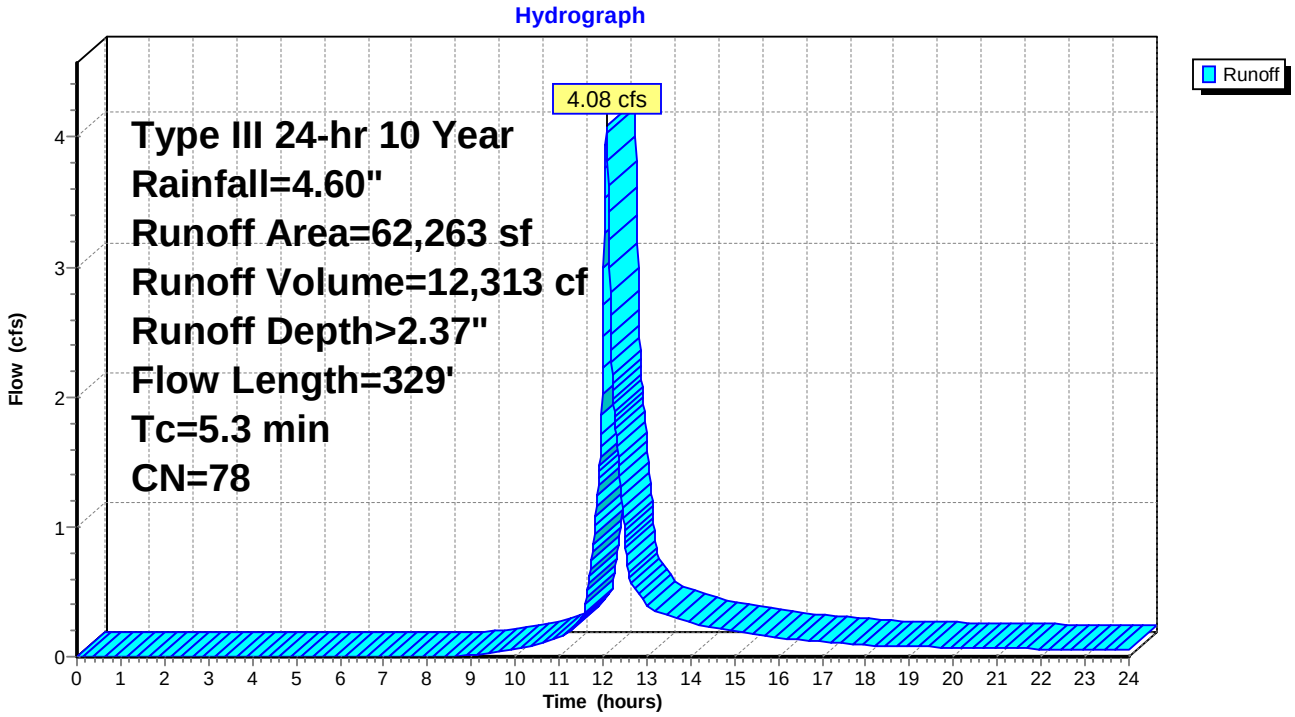
Runoff = 4.08 cfs @ 12.08 hrs, Volume= 12,313 cf, Depth> 2.37"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Rainfall=4.60"

Area (sf)	CN	Description
40,274	81	Urban industrial, 72% imp, HSG A
8,476	76	Gravel roads, HSG A
2,503	98	Paved parking, HSG A
6,188	57	Woods/grass comb., Poor, HSG A
4,822	68	<50% Grass cover, Poor, HSG A
62,263	78	Weighted Average
30,763		49.41% Pervious Area
31,500		50.59% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	100	0.0150	1.22		**Sheet Flow, Road** Smooth surfaces n= 0.011 P2= 3.15"
3.9	229	0.0037	0.98		**Shallow Concentrated Flow, Gravel Path** Unpaved Kv= 16.1 fps
5.3	329	Total			

Subcatchment 31S: Mechanic St



Summary for Subcatchment 32S: Cochituate St 1

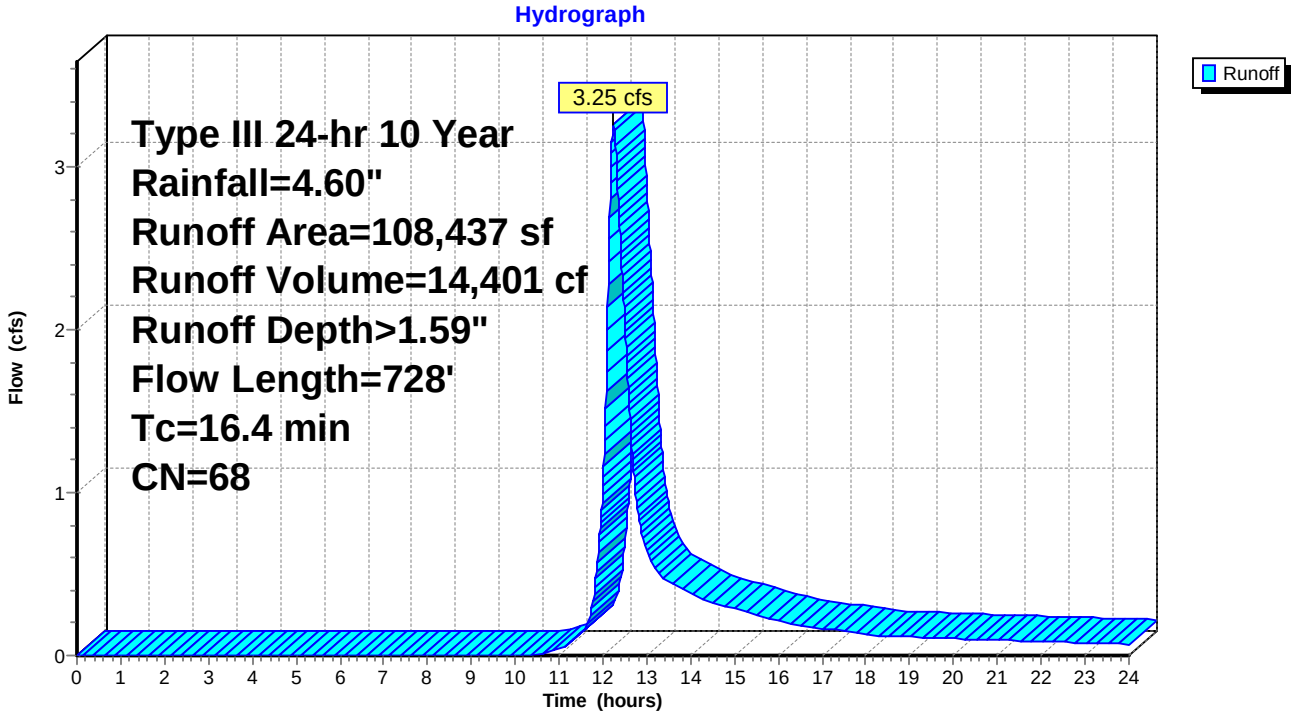
Runoff = 3.25 cfs @ 12.24 hrs, Volume= 14,401 cf, Depth> 1.59"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Rainfall=4.60"

Area (sf)	CN	Description
12,744	81	Urban industrial, 72% imp, HSG A
15,529	76	Gravel roads, HSG A
30,613	57	Woods/grass comb., Poor, HSG A
11,315	98	Paved parking, HSG A
38,236	61	1/4 acre lots, 38% imp, HSG A
108,437	68	Weighted Average
73,417		67.70% Pervious Area
35,020		32.30% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.4	75	0.0333	0.20		**Sheet Flow, Yards** Grass: Short n= 0.150 P2= 3.15"
1.9	25	0.5200	0.21		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
8.1	628	0.0064	1.29		**Shallow Concentrated Flow, Gravel Path** Unpaved Kv= 16.1 fps
16.4	728	Total			

Subcatchment 32S: Cochituate St 1



Summary for Pond 01P: Speen St Detention

Inflow Area = 28,640 sf, 6.23% Impervious, Inflow Depth > 1.53" for 10 Year event
Inflow = 0.93 cfs @ 12.17 hrs, Volume= 3,641 cf
Outflow = 0.93 cfs @ 12.18 hrs, Volume= 3,638 cf, Atten= 0%, Lag= 0.3 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Secondary = 0.93 cfs @ 12.18 hrs, Volume= 3,638 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 159.81' @ 12.18 hrs Surf.Area= 68 sf Storage= 21 cf

Plug-Flow detention time= 1.0 min calculated for 3,636 cf (100% of inflow)
Center-of-Mass det. time= 0.5 min (864.4 - 863.9)

Volume	Invert	Avail.Storage	Storage Description
#1	159.00'	910 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

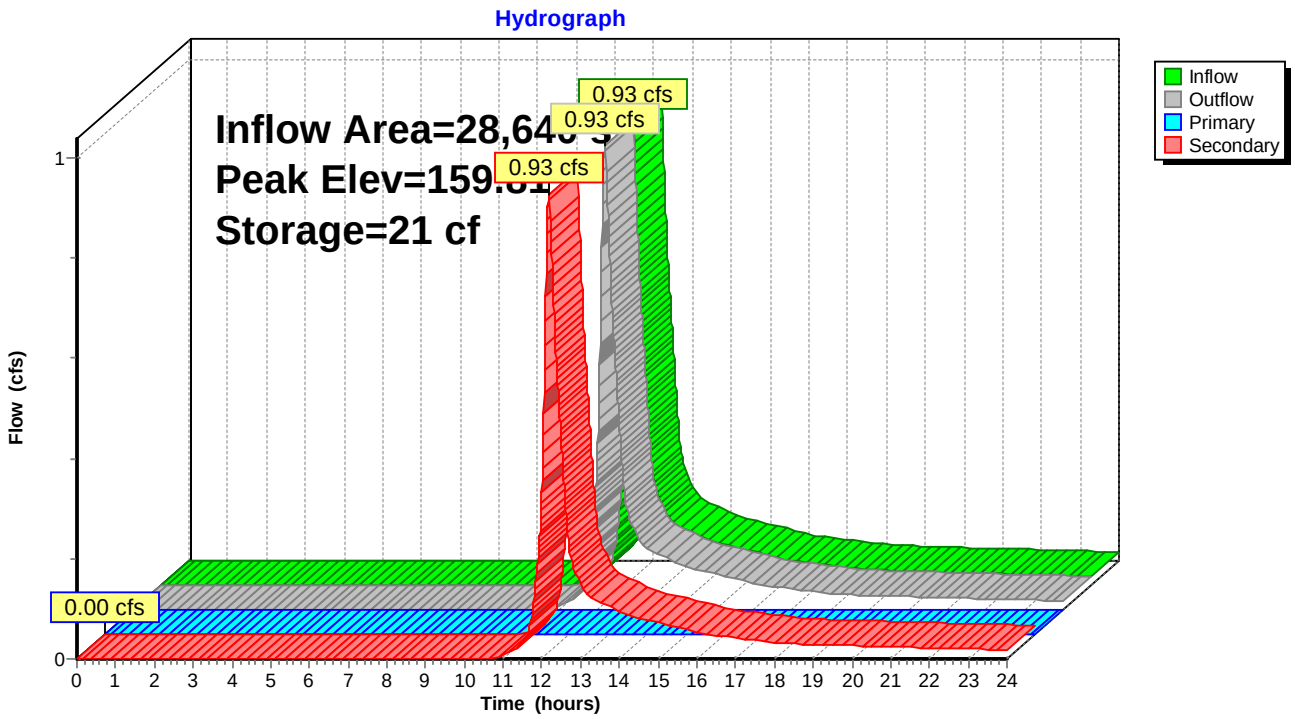
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
159.00	1	5.4	0	0	1
160.00	98	40.0	36	36	128
161.00	176	52.0	135	171	227
162.00	329	79.0	249	420	516
163.00	671	128.0	490	910	1,330

Device	Routing	Invert	Outlet Devices
#1	Primary	162.50'	**18.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32
#2	Secondary	159.30'	**24.0" Round Culvert** L= 30.0' CMP, projecting, no headwall, Ke= 0.900 Outlet Invert= 159.00' S= 0.0100 '/' Cc= 0.900 n= 0.025 Corrugated metal

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=159.00' (Free Discharge)
└**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Secondary OutFlow Max=0.93 cfs @ 12.18 hrs HW=159.81' (Free Discharge)
└**2=Culvert** (Barrel Controls 0.93 cfs @ 2.19 fps)

Pond 01P: Speen St Detention



Summary for Pond 2P: Lake Cochituate

Inflow Area = 2,480,180 sf, 21.04% Impervious, Inflow Depth > 1.42" for 10 Year event
Inflow = 51.57 cfs @ 12.26 hrs, Volume= 293,380 cf
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 100%, Lag= 0.0 min

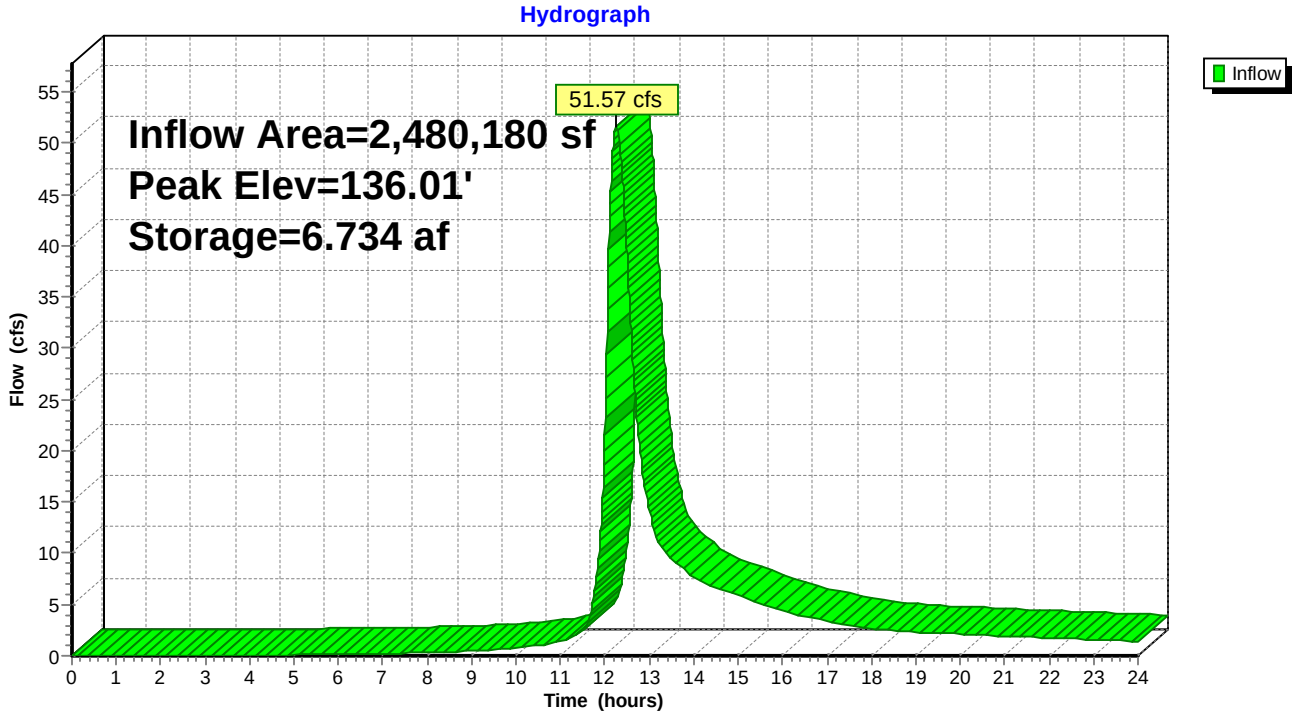
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 136.01' @ 24.00 hrs Surf.Area= 625.000 ac Storage= 6.734 af

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

Volume	Invert	Avail.Storage	Storage Description
#1	136.00'	625.000 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
136.00	625.000	0.000	0.000
137.00	625.000	625.000	625.000

Pond 2P: Lake Cochituate

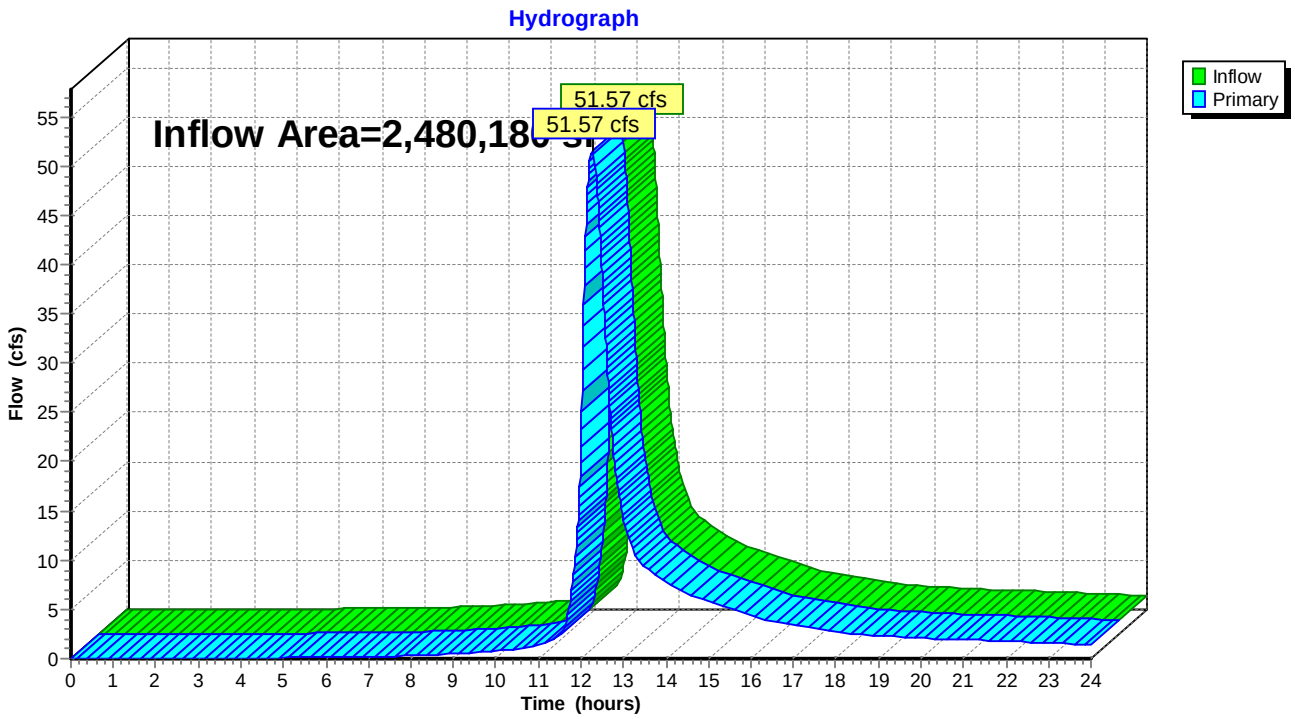


Summary for Link 1L: Total

Inflow Area = 2,480,180 sf, 21.04% Impervious, Inflow Depth > 1.42" for 10 Year event
Inflow = 51.57 cfs @ 12.26 hrs, Volume= 293,380 cf
Primary = 51.57 cfs @ 12.26 hrs, Volume= 293,380 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link 1L: Total

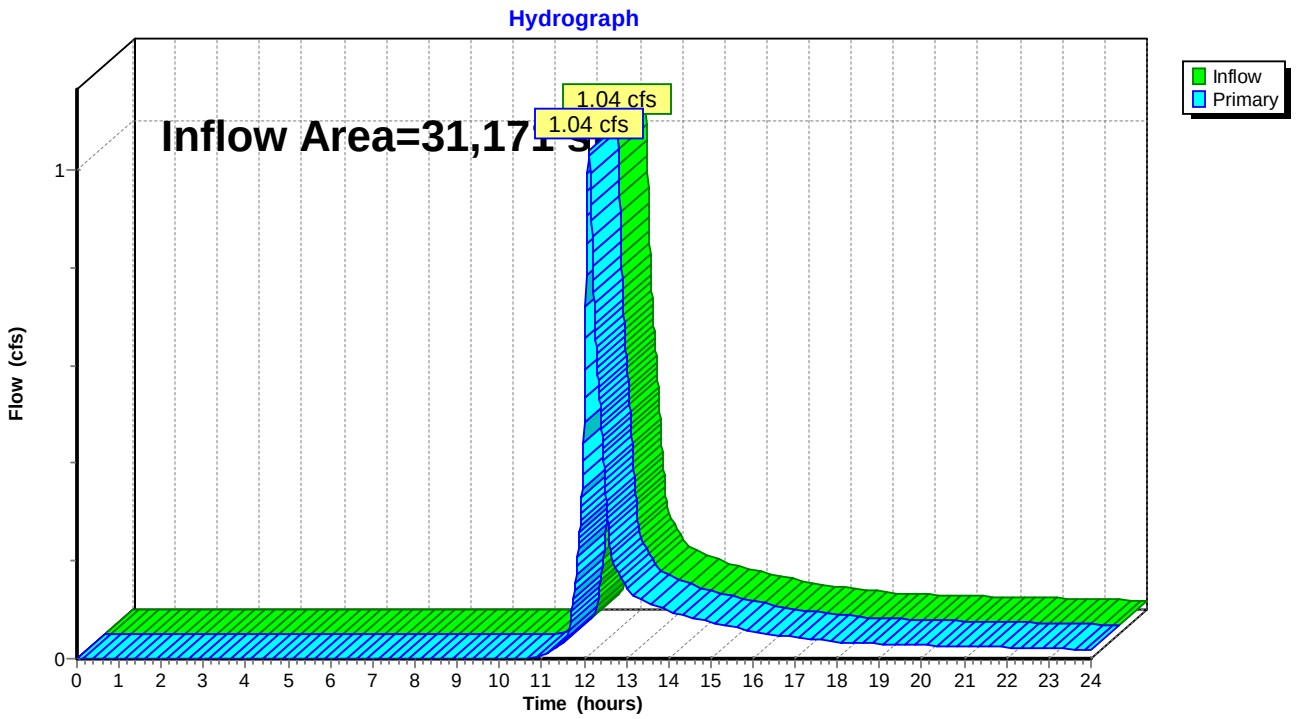


Summary for Link DP01: Cochituate Rd

Inflow Area = 31,171 sf, 8.89% Impervious, Inflow Depth > 1.45" for 10 Year event
Inflow = 1.04 cfs @ 12.12 hrs, Volume= 3,756 cf
Primary = 1.04 cfs @ 12.12 hrs, Volume= 3,756 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link DP01: Cochituate Rd

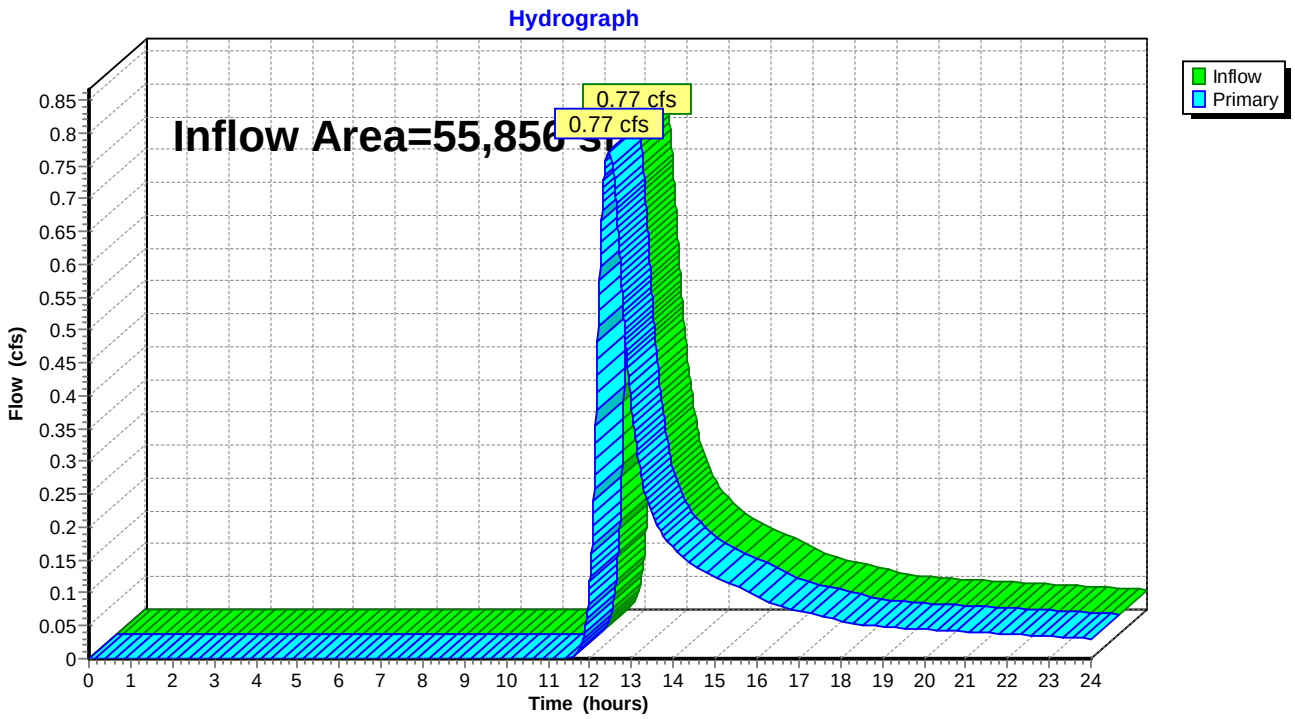


Summary for Link DP02: Chrystler St

Inflow Area = 55,856 sf, 4.44% Impervious, Inflow Depth > 1.13" for 10 Year event
Inflow = 0.77 cfs @ 12.44 hrs, Volume= 5,237 cf
Primary = 0.77 cfs @ 12.44 hrs, Volume= 5,237 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link DP02: Chrystler St

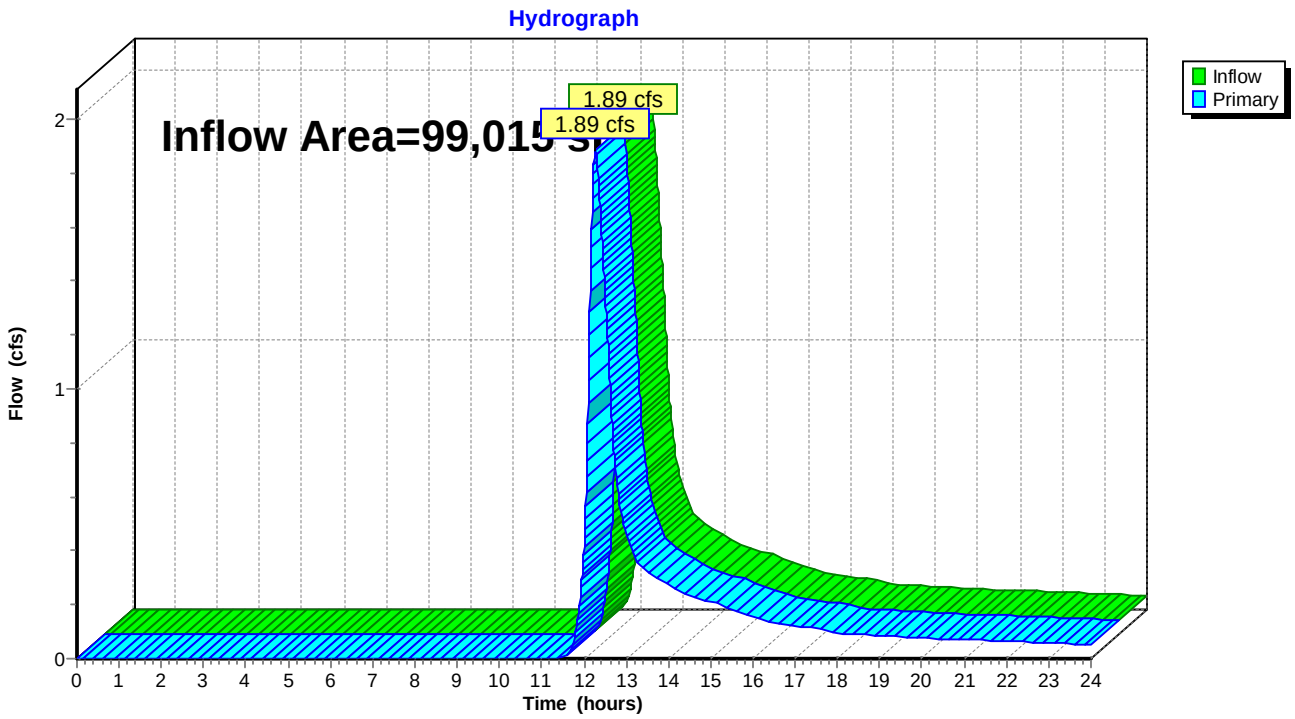


Summary for Link DP03: WF A

Inflow Area = 99,015 sf, 0.66% Impervious, Inflow Depth > 1.13" for 10 Year event
Inflow = 1.89 cfs @ 12.28 hrs, Volume= 9,320 cf
Primary = 1.89 cfs @ 12.28 hrs, Volume= 9,320 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link DP03: WF A

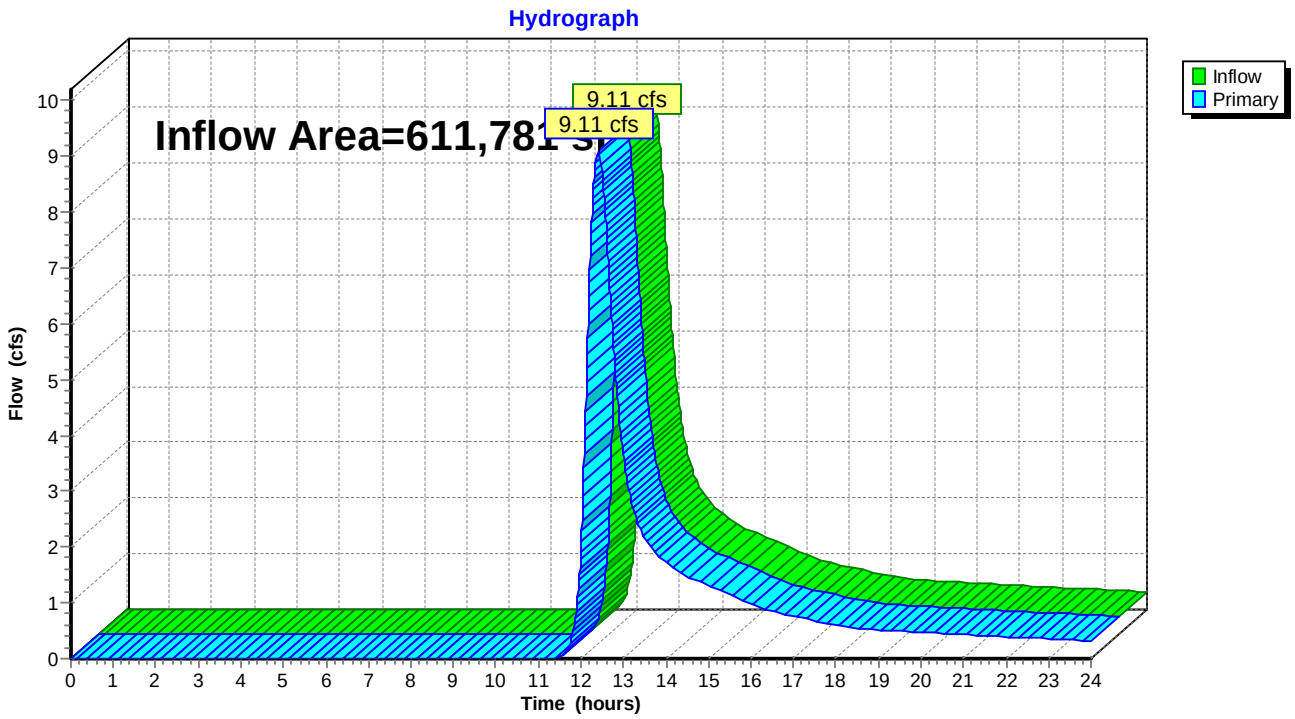


Summary for Link DP04: Lake Cochituate Middle Pond

Inflow Area = 611,781 sf, 6.85% Impervious, Inflow Depth > 1.11" for 10 Year event
Inflow = 9.11 cfs @ 12.41 hrs, Volume= 56,690 cf
Primary = 9.11 cfs @ 12.41 hrs, Volume= 56,690 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link DP04: Lake Cochituate Middle Pond

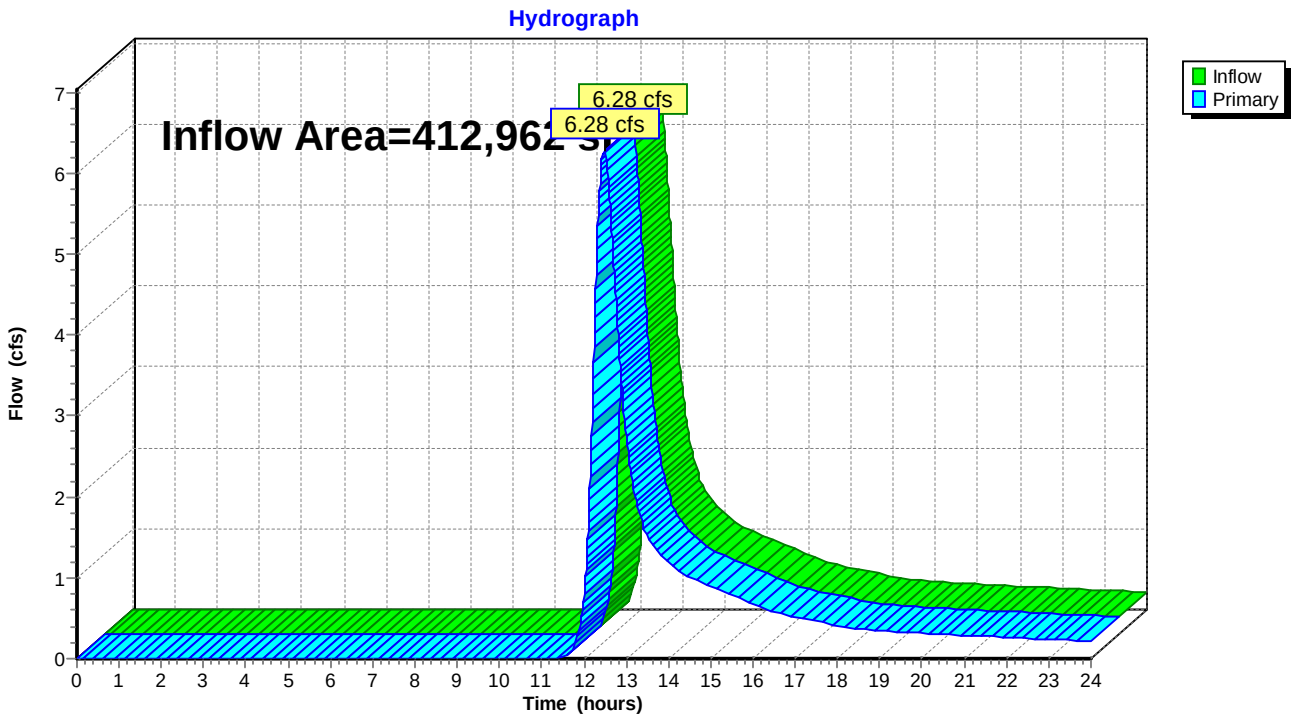


Summary for Link DP04-1: WF B

Inflow Area = 412,962 sf, 7.11% Impervious, Inflow Depth > 1.10" for 10 Year event
Inflow = 6.28 cfs @ 12.48 hrs, Volume= 38,021 cf
Primary = 6.28 cfs @ 12.48 hrs, Volume= 38,021 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link DP04-1: WF B

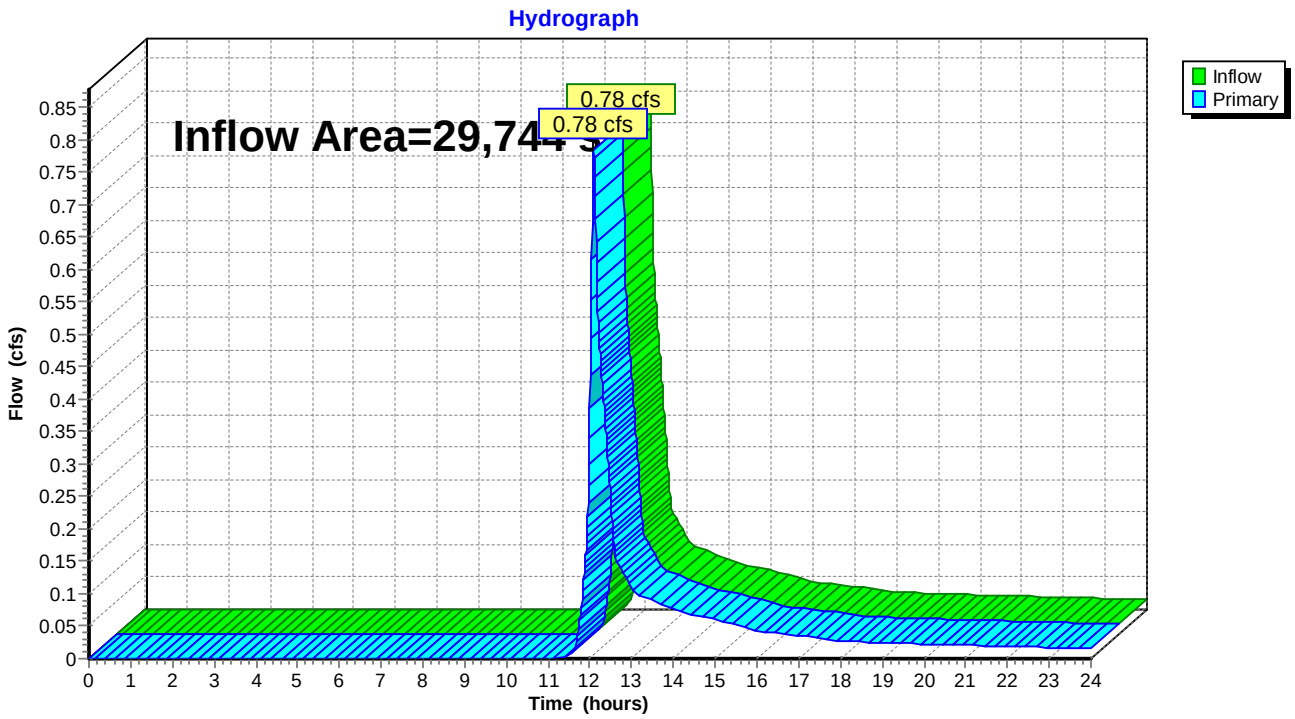


Summary for Link DP04-2: WF C

Inflow Area = 29,744 sf, 0.00% Impervious, Inflow Depth > 1.11" for 10 Year event
Inflow = 0.78 cfs @ 12.09 hrs, Volume= 2,748 cf
Primary = 0.78 cfs @ 12.09 hrs, Volume= 2,748 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link DP04-2: WF C

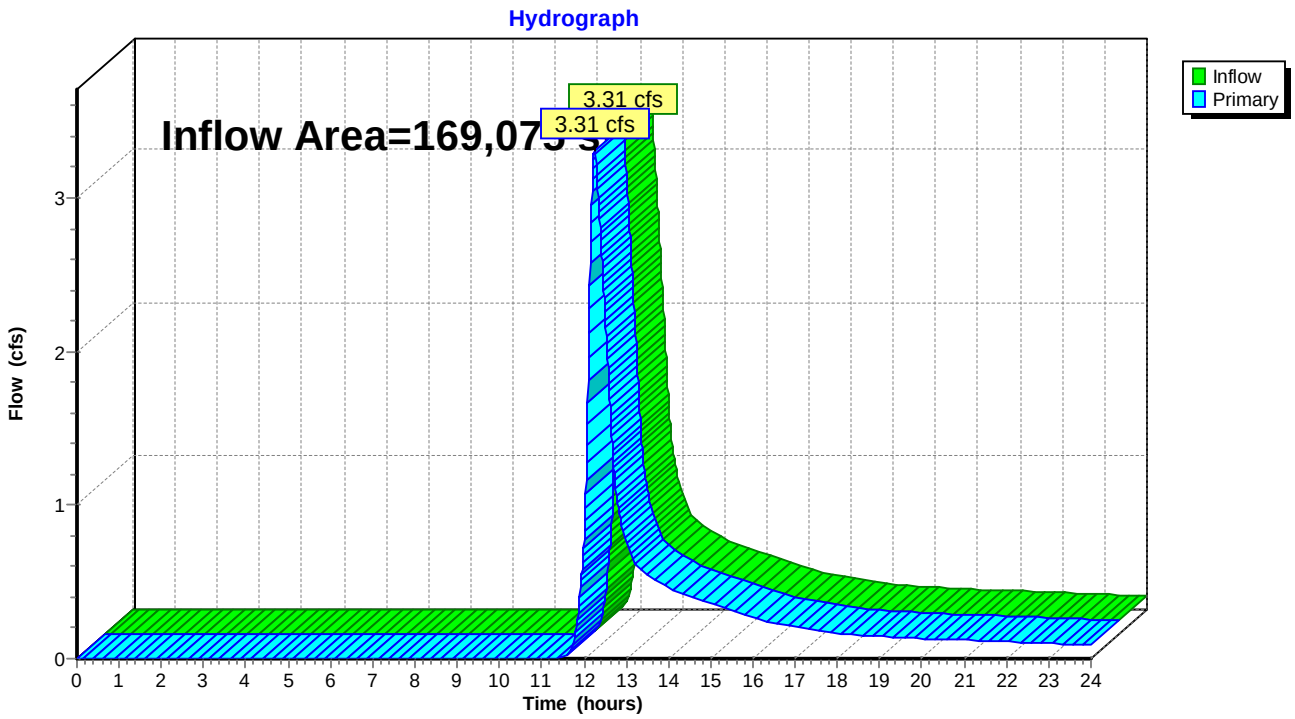


Summary for Link DP04-3: Lake Cochituate

Inflow Area = 169,075 sf, 7.42% Impervious, Inflow Depth > 1.13" for 10 Year event
Inflow = 3.31 cfs @ 12.25 hrs, Volume= 15,921 cf
Primary = 3.31 cfs @ 12.25 hrs, Volume= 15,921 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link DP04-3: Lake Cochituate

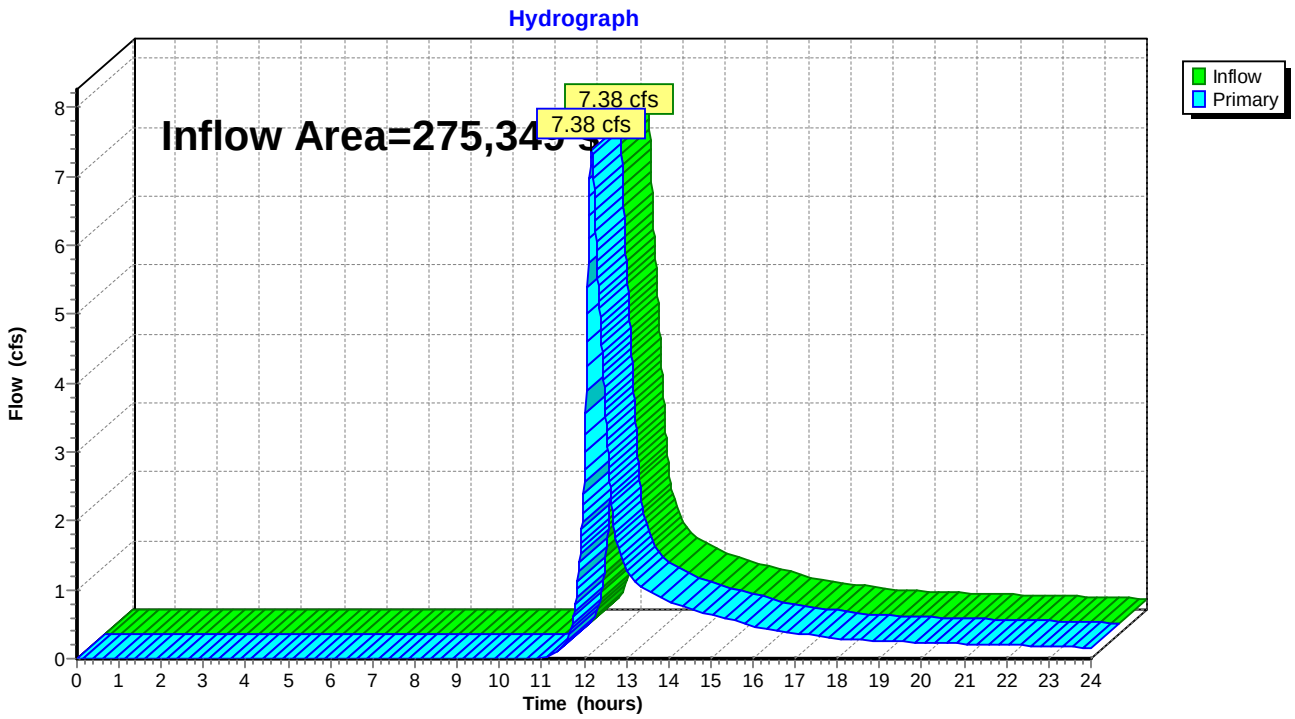


Summary for Link DP05: Lake Cochituate W

Inflow Area = 275,349 sf, 15.63% Impervious, Inflow Depth > 1.34" for 10 Year event
Inflow = 7.38 cfs @ 12.18 hrs, Volume= 30,693 cf
Primary = 7.38 cfs @ 12.18 hrs, Volume= 30,693 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link DP05: Lake Cochituate W

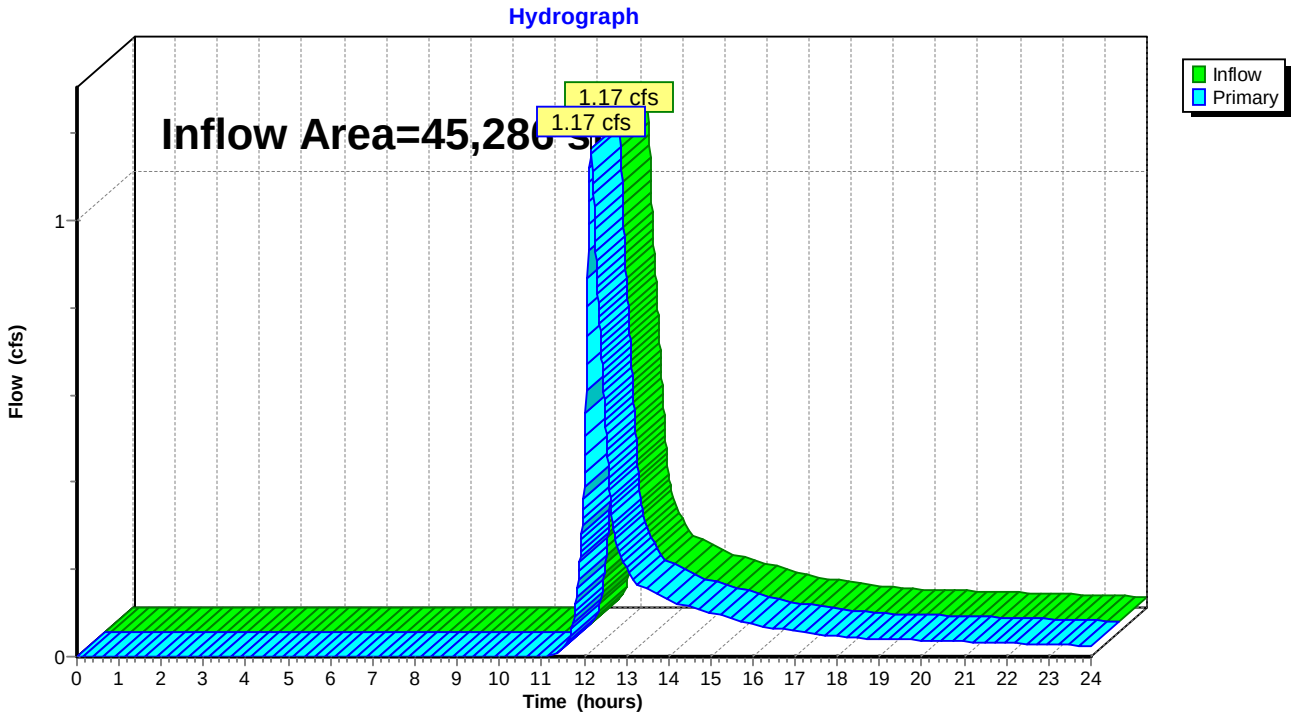


Summary for Link DP05-1: WF I

Inflow Area = 45,286 sf, 7.97% Impervious, Inflow Depth > 1.26" for 10 Year event
Inflow = 1.17 cfs @ 12.17 hrs, Volume= 4,747 cf
Primary = 1.17 cfs @ 12.17 hrs, Volume= 4,747 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link DP05-1: WF I

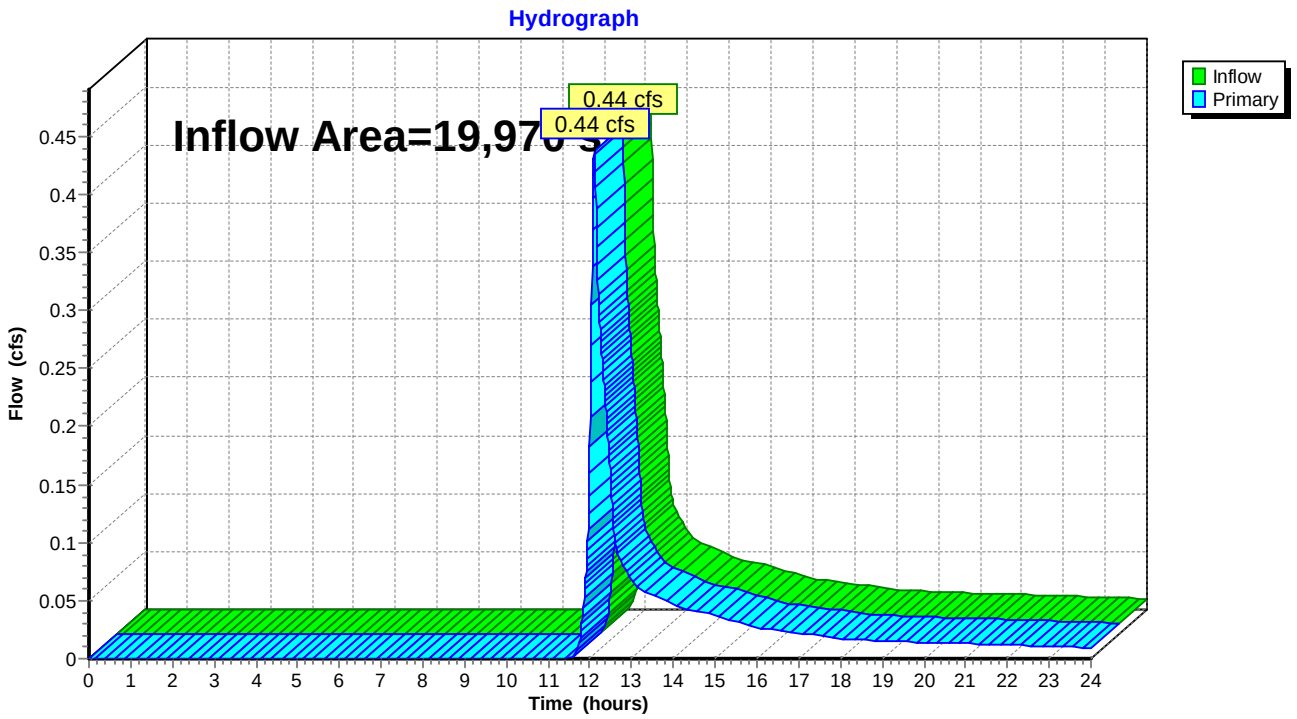


Summary for Link DP05-2: WF G&H

Inflow Area = 19,970 sf, 0.00% Impervious, Inflow Depth > 0.98" for 10 Year event
Inflow = 0.44 cfs @ 12.11 hrs, Volume= 1,635 cf
Primary = 0.44 cfs @ 12.11 hrs, Volume= 1,635 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link DP05-2: WF G&H

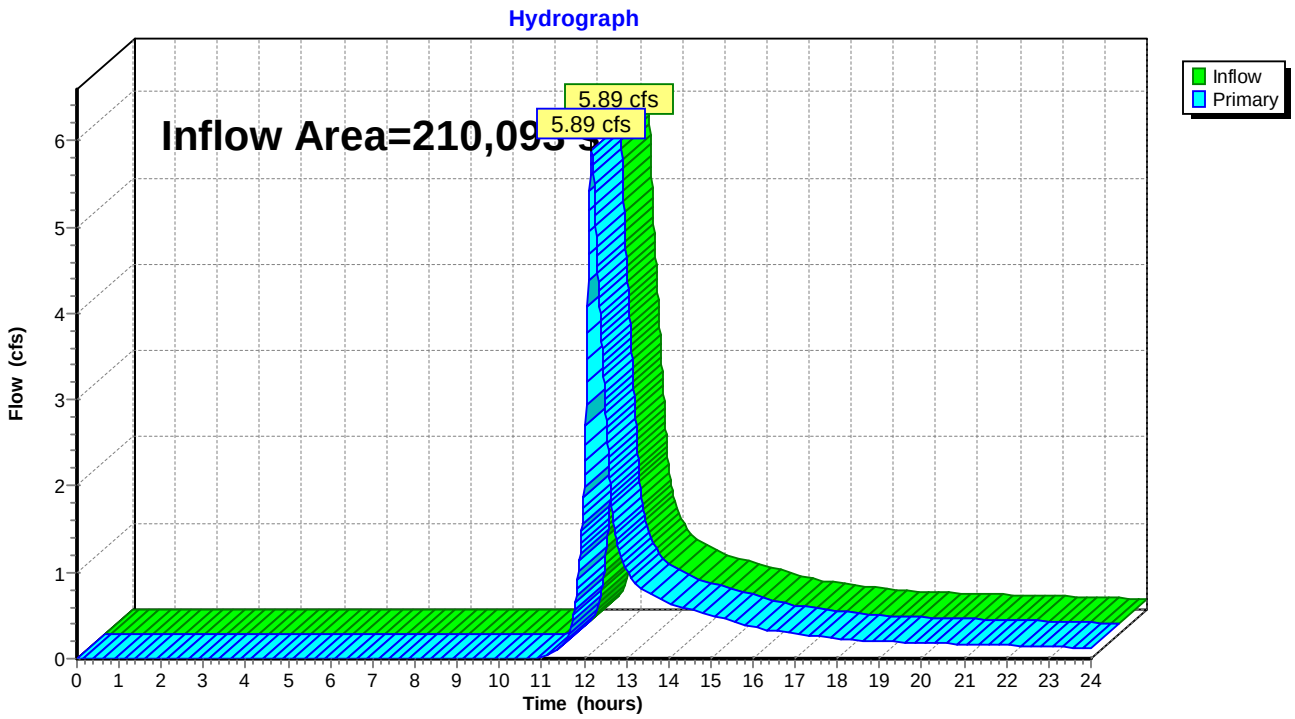


Summary for Link DP05-3: Lake Cochituate

Inflow Area = 210,093 sf, 18.76% Impervious, Inflow Depth > 1.39" for 10 Year event
Inflow = 5.89 cfs @ 12.19 hrs, Volume= 24,312 cf
Primary = 5.89 cfs @ 12.19 hrs, Volume= 24,312 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link DP05-3: Lake Cochituate

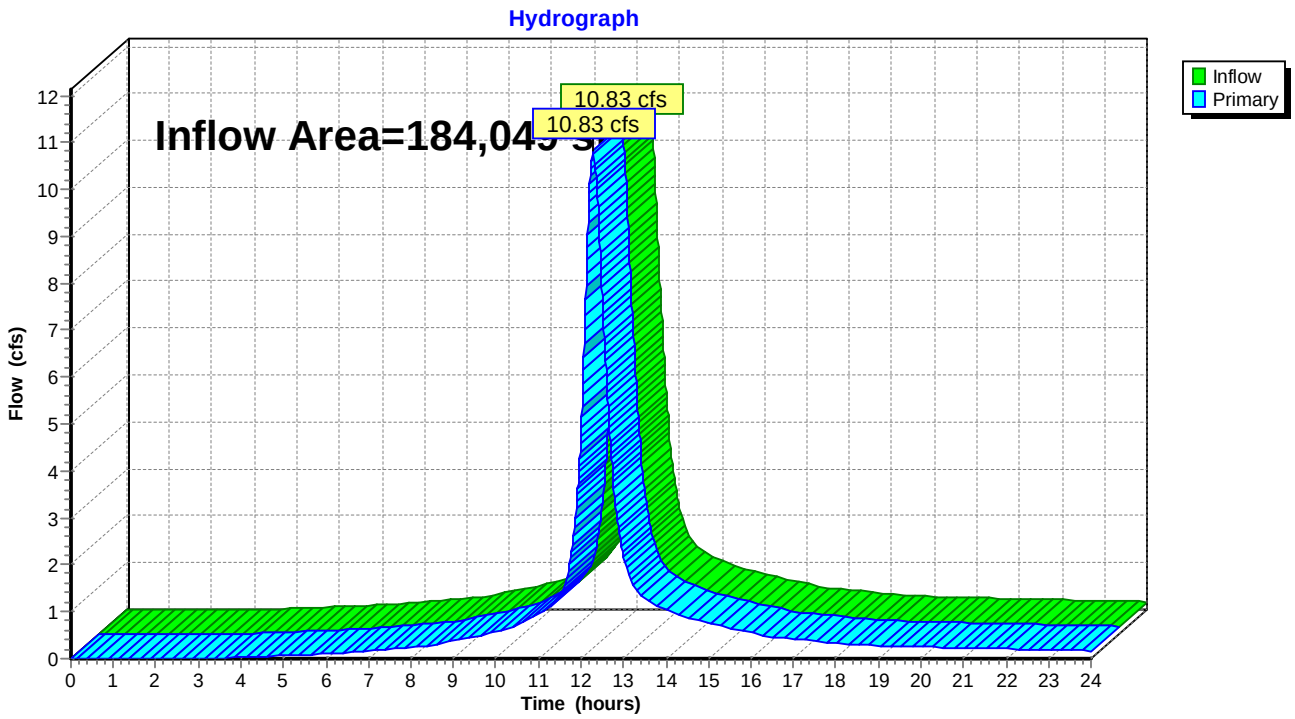


Summary for Link DP06: Worcester St

Inflow Area = 184,049 sf, 85.31% Impervious, Inflow Depth > 3.63" for 10 Year event
Inflow = 10.83 cfs @ 12.28 hrs, Volume= 55,708 cf
Primary = 10.83 cfs @ 12.28 hrs, Volume= 55,708 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link DP06: Worcester St

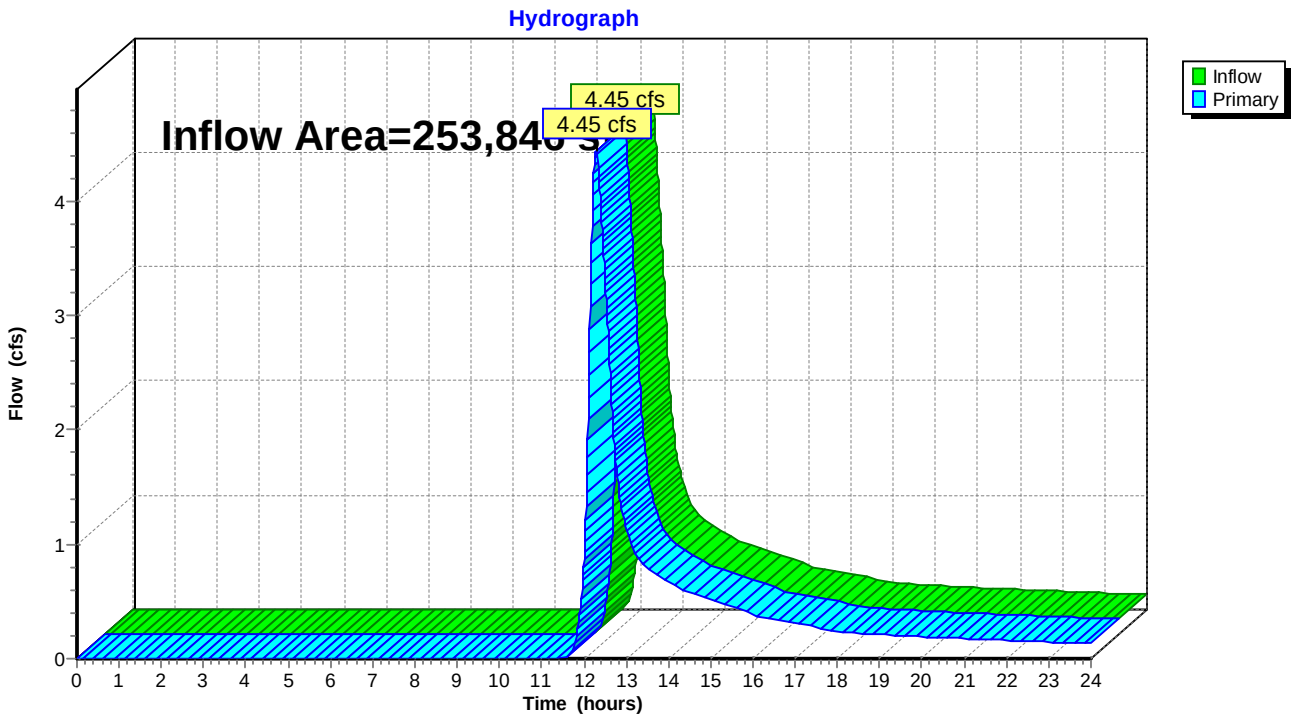


Summary for Link DP07: WF F

Inflow Area = 253,846 sf, 12.85% Impervious, Inflow Depth > 1.07" for 10 Year event
Inflow = 4.45 cfs @ 12.29 hrs, Volume= 22,600 cf
Primary = 4.45 cfs @ 12.29 hrs, Volume= 22,600 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link DP07: WF F

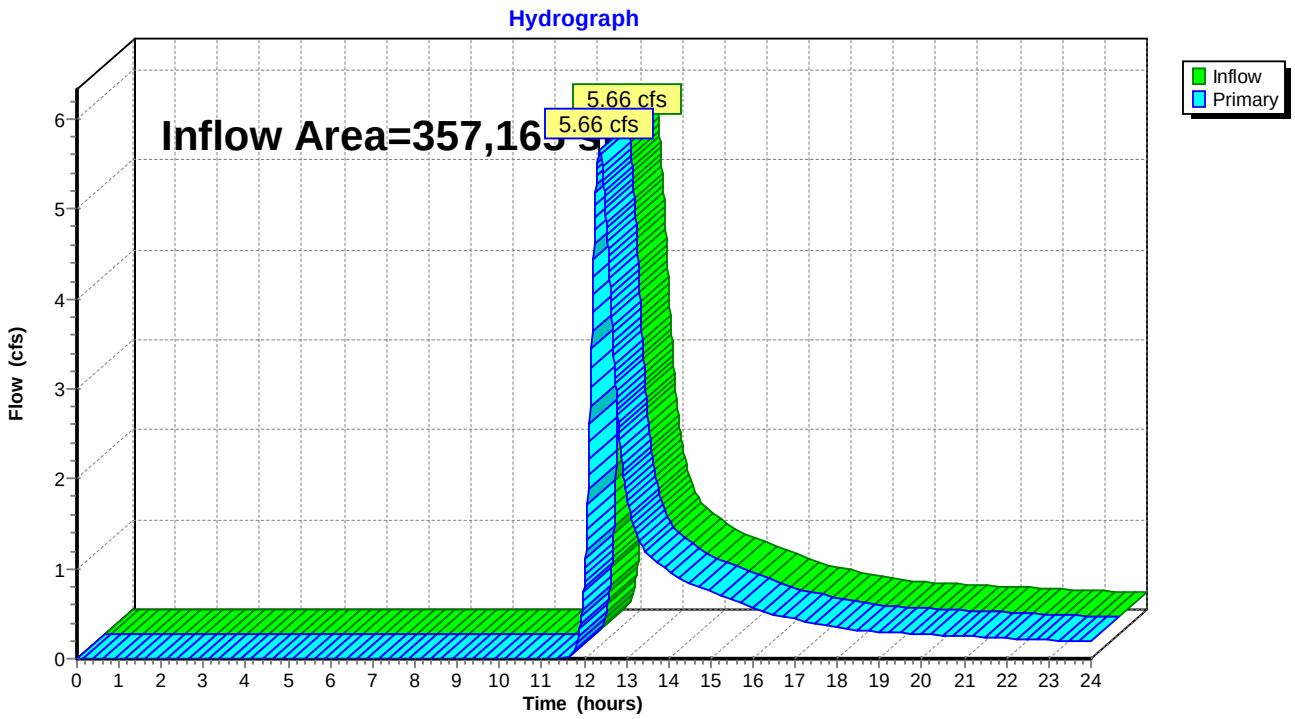


Summary for Link DP08: WF J

Inflow Area = 357,165 sf, 20.57% Impervious, Inflow Depth > 1.07" for 10 Year event
Inflow = 5.66 cfs @ 12.37 hrs, Volume= 31,745 cf
Primary = 5.66 cfs @ 12.37 hrs, Volume= 31,745 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link DP08: WF J

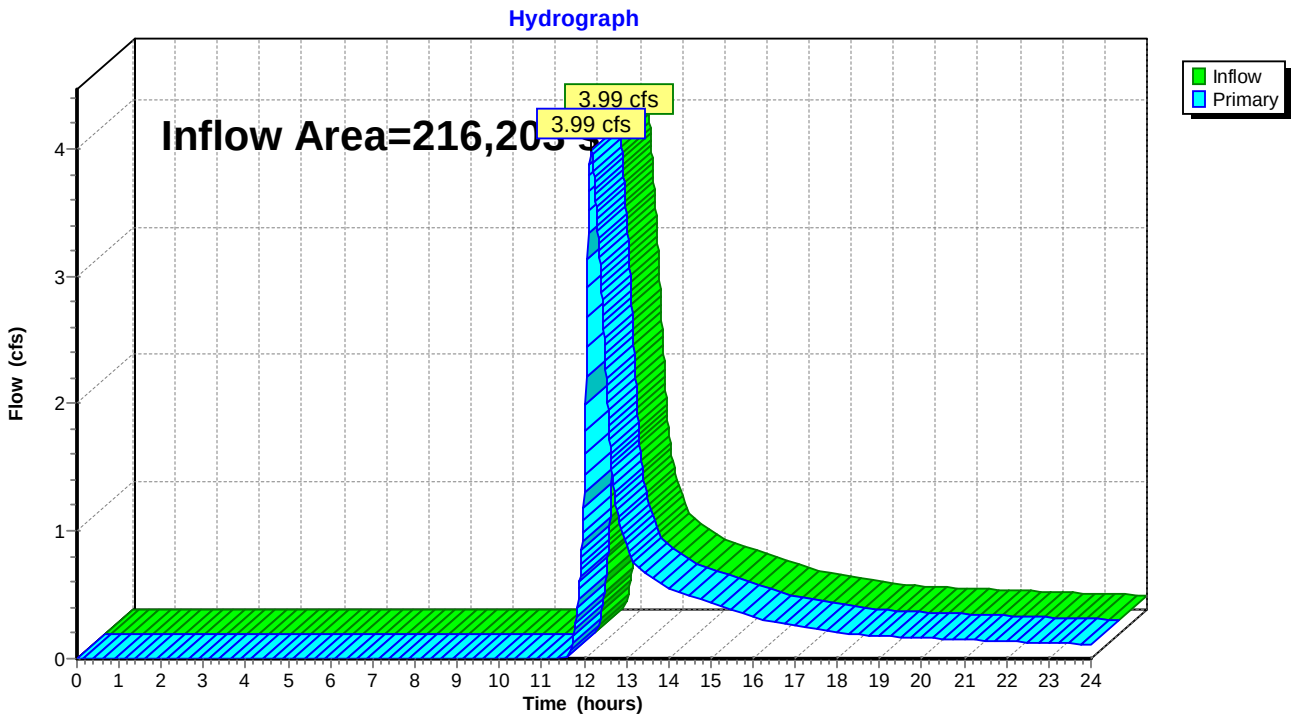


Summary for Link DP09: Unnamed Pond

Inflow Area = 216,203 sf, 15.22% Impervious, Inflow Depth > 1.08" for 10 Year event
Inflow = 3.99 cfs @ 12.17 hrs, Volume= 19,395 cf
Primary = 3.99 cfs @ 12.17 hrs, Volume= 19,395 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link DP09: Unnamed Pond

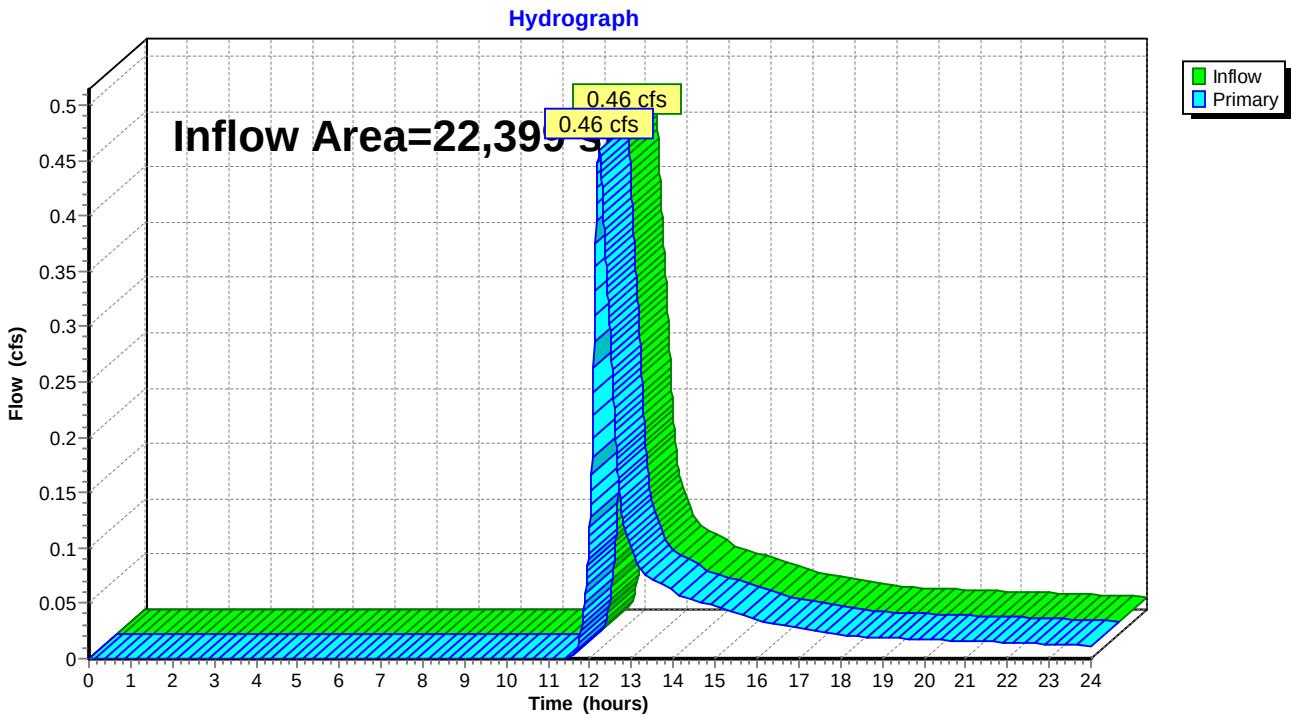


Summary for Link DP09-1: WF K

Inflow Area = 22,399 sf, 8.44% Impervious, Inflow Depth > 1.13" for 10 Year event
Inflow = 0.46 cfs @ 12.22 hrs, Volume= 2,110 cf
Primary = 0.46 cfs @ 12.22 hrs, Volume= 2,110 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link DP09-1: WF K

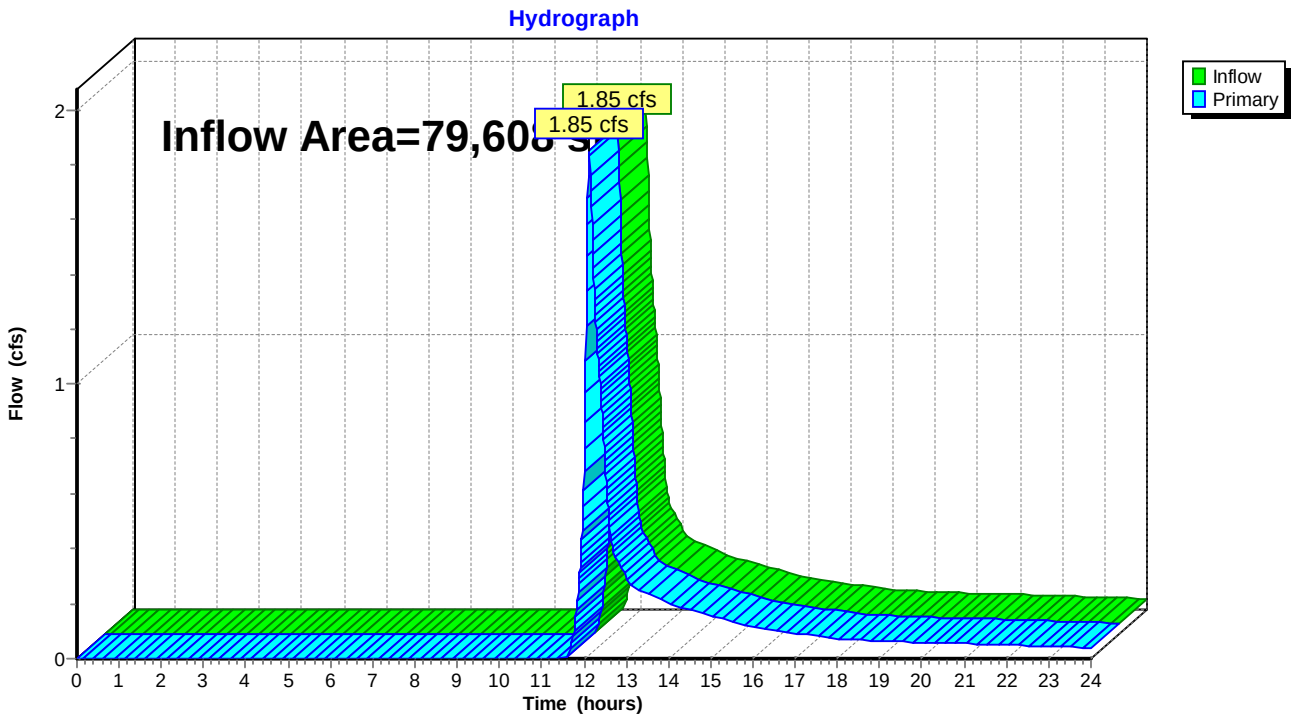


Summary for Link DP09-2: WF KA

Inflow Area = 79,608 sf, 24.60% Impervious, Inflow Depth > 1.07" for 10 Year event
Inflow = 1.85 cfs @ 12.13 hrs, Volume= 7,110 cf
Primary = 1.85 cfs @ 12.13 hrs, Volume= 7,110 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link DP09-2: WF KA

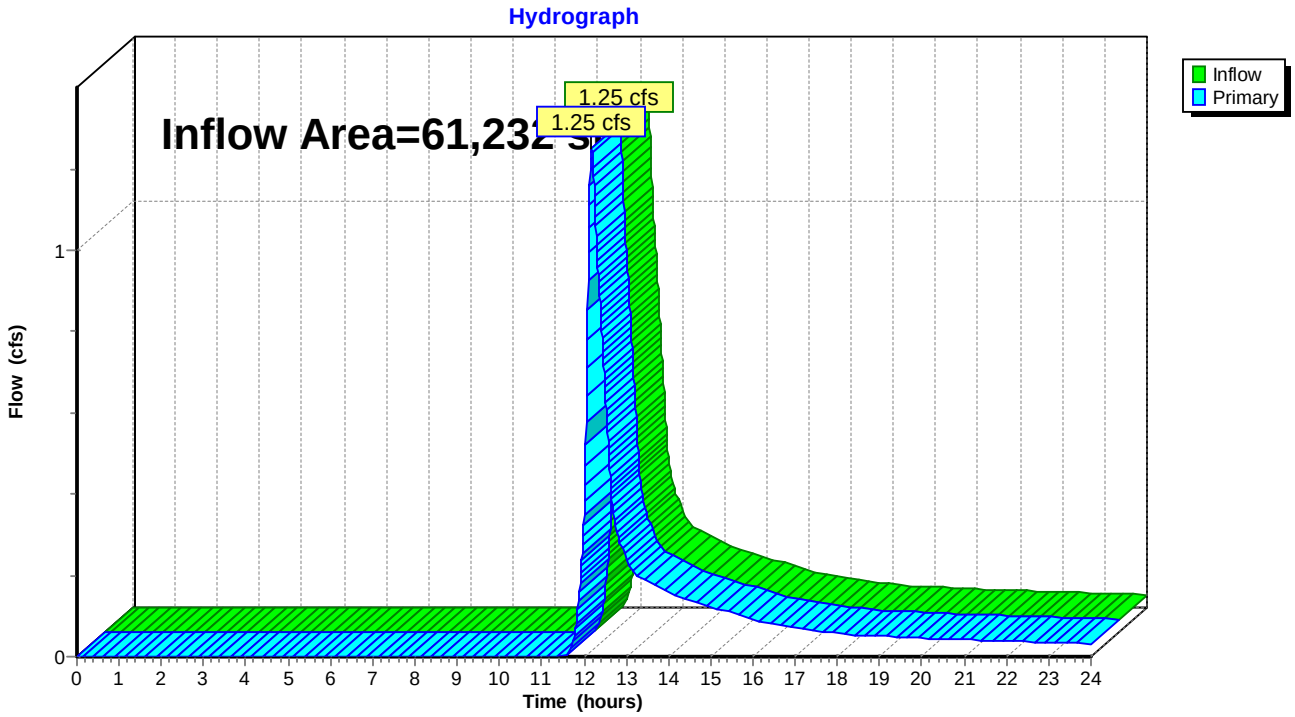


Summary for Link DP09-3: WF B

Inflow Area = 61,232 sf, 17.35% Impervious, Inflow Depth > 1.07" for 10 Year event
Inflow = 1.25 cfs @ 12.18 hrs, Volume= 5,462 cf
Primary = 1.25 cfs @ 12.18 hrs, Volume= 5,462 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link DP09-3: WF B

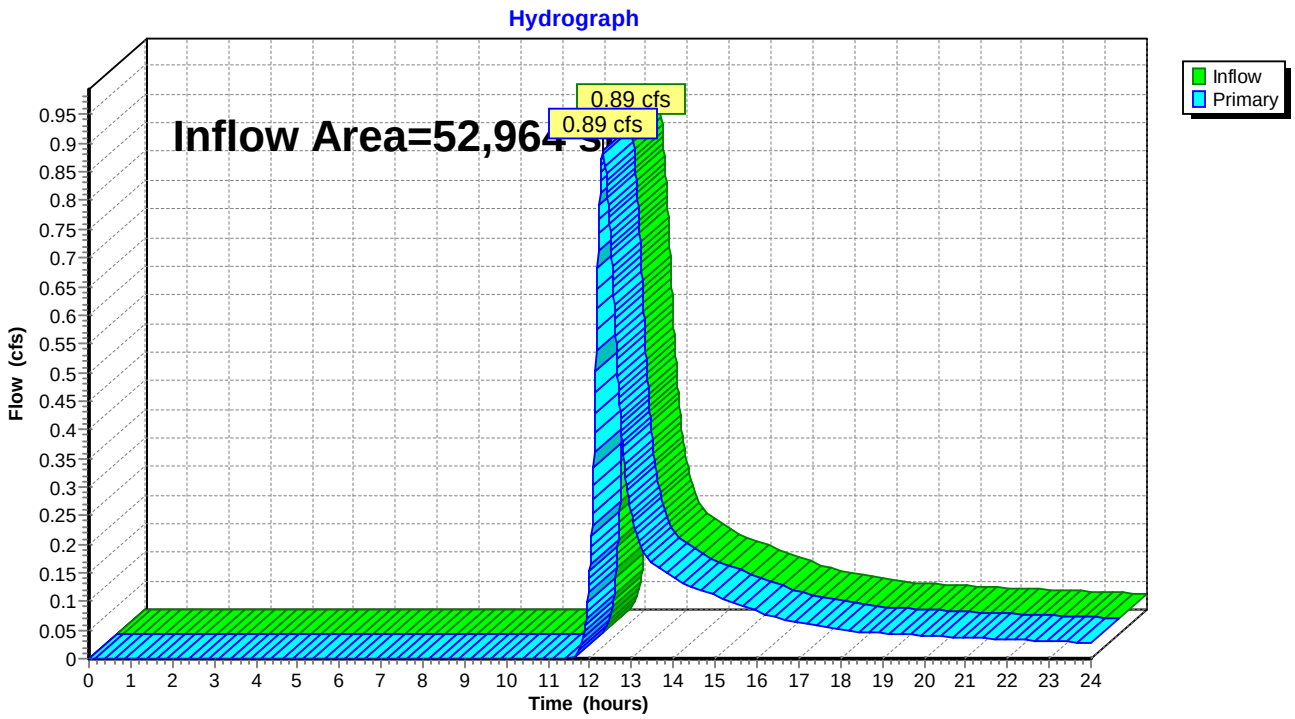


Summary for Link DP09-4: WF E&L, TOB C

Inflow Area = 52,964 sf, 1.51% Impervious, Inflow Depth > 1.07" for 10 Year event
Inflow = 0.89 cfs @ 12.32 hrs, Volume= 4,712 cf
Primary = 0.89 cfs @ 12.32 hrs, Volume= 4,712 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link DP09-4: WF E&L, TOB C

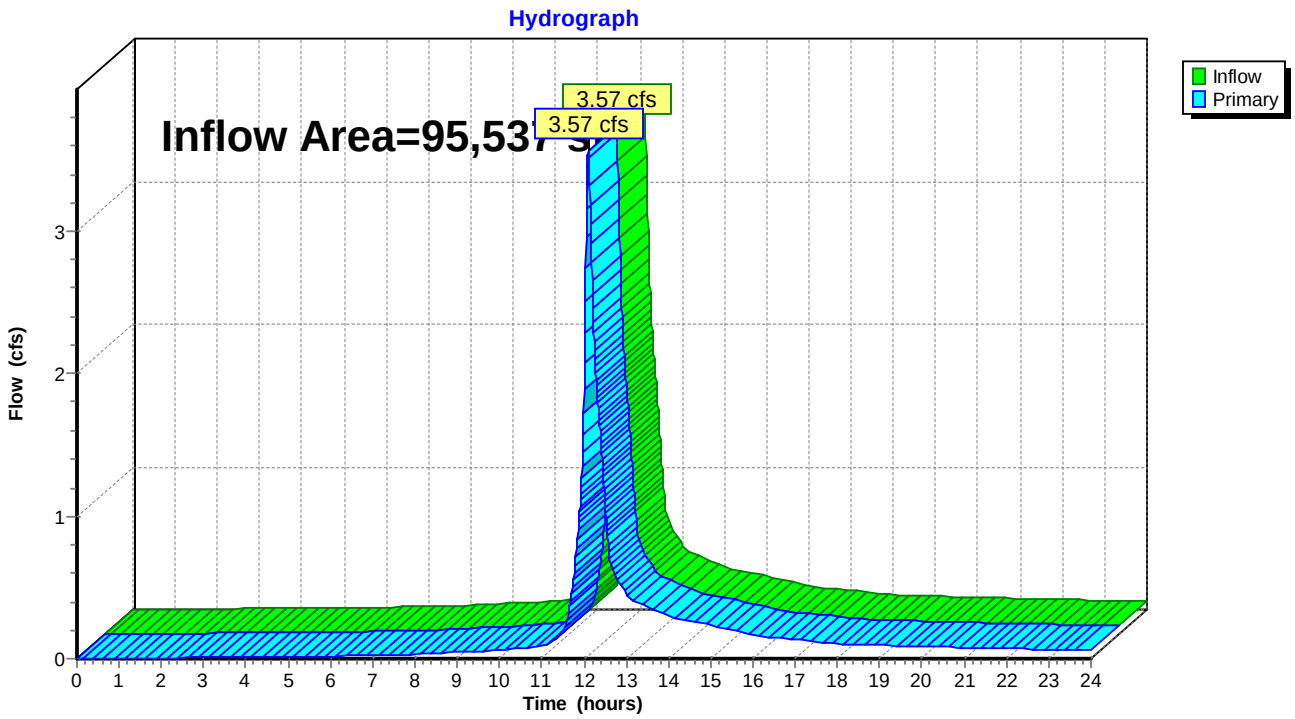


Summary for Link DP10: WF A

Inflow Area = 95,537 sf, 28.44% Impervious, Inflow Depth > 1.66" for 10 Year event
Inflow = 3.57 cfs @ 12.10 hrs, Volume= 13,210 cf
Primary = 3.57 cfs @ 12.10 hrs, Volume= 13,210 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link DP10: WF A

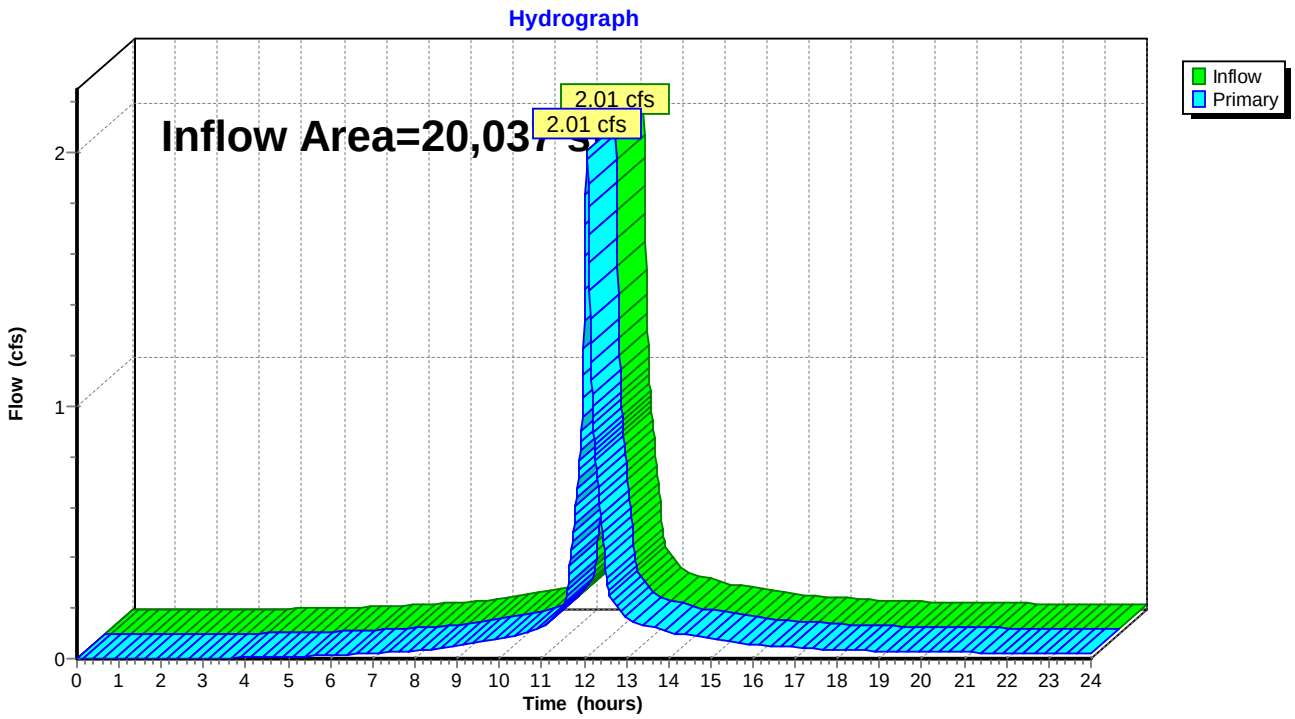


Summary for Link DP11: Local St Drain System

Inflow Area = 20,037 sf, 76.27% Impervious, Inflow Depth > 3.82" for 10 Year event
Inflow = 2.01 cfs @ 12.07 hrs, Volume= 6,383 cf
Primary = 2.01 cfs @ 12.07 hrs, Volume= 6,383 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link DP11: Local St Drain System

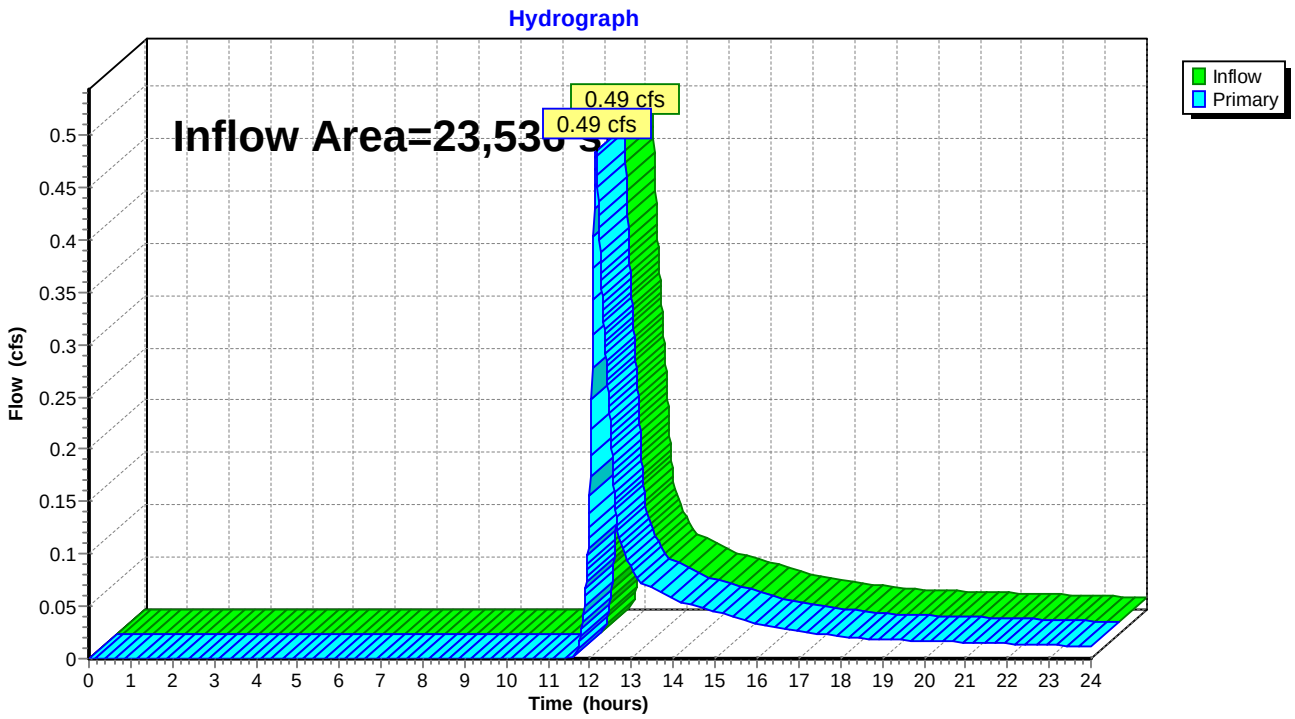


Summary for Link DP12: Washington St Low Point

Inflow Area = 23,536 sf, 31.05% Impervious, Inflow Depth > 1.01" for 10 Year event
Inflow = 0.49 cfs @ 12.15 hrs, Volume= 1,984 cf
Primary = 0.49 cfs @ 12.15 hrs, Volume= 1,984 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link DP12: Washington St Low Point

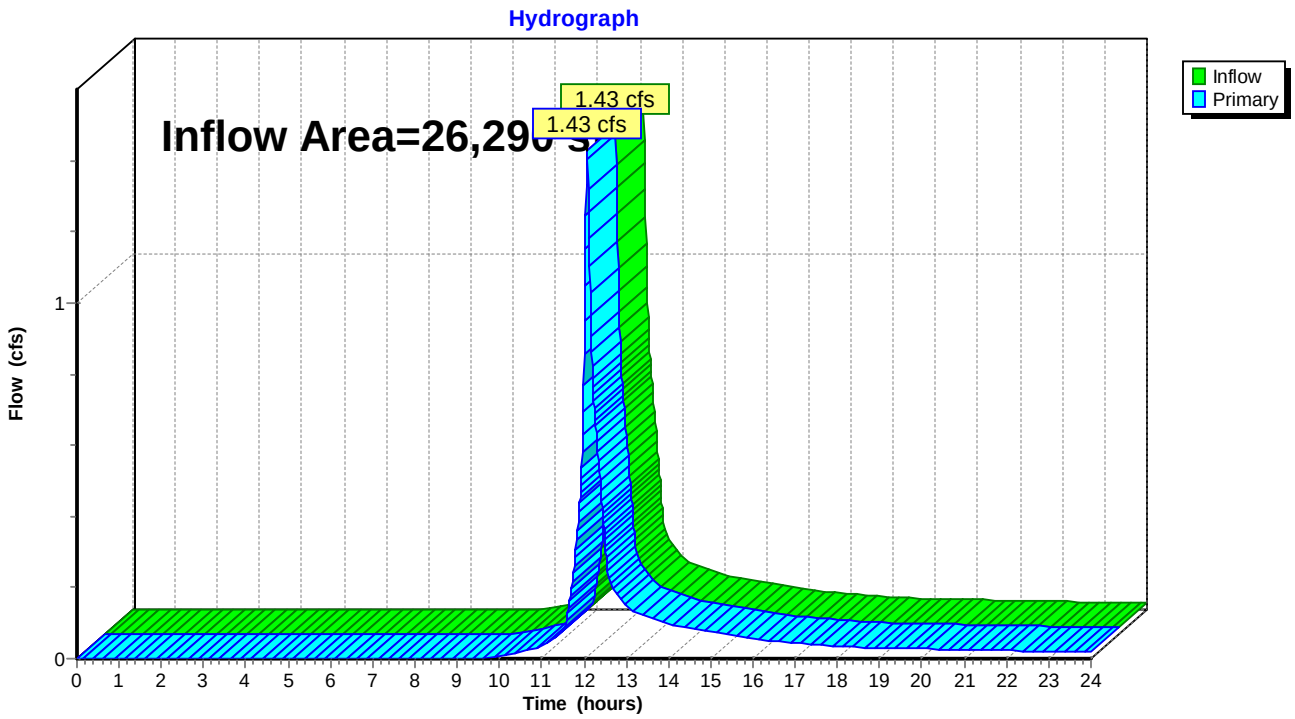


Summary for Link DP13: Empty Lot

Inflow Area = 26,290 sf, 0.00% Impervious, Inflow Depth > 1.97" for 10 Year event
Inflow = 1.43 cfs @ 12.08 hrs, Volume= 4,314 cf
Primary = 1.43 cfs @ 12.08 hrs, Volume= 4,314 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link DP13: Empty Lot

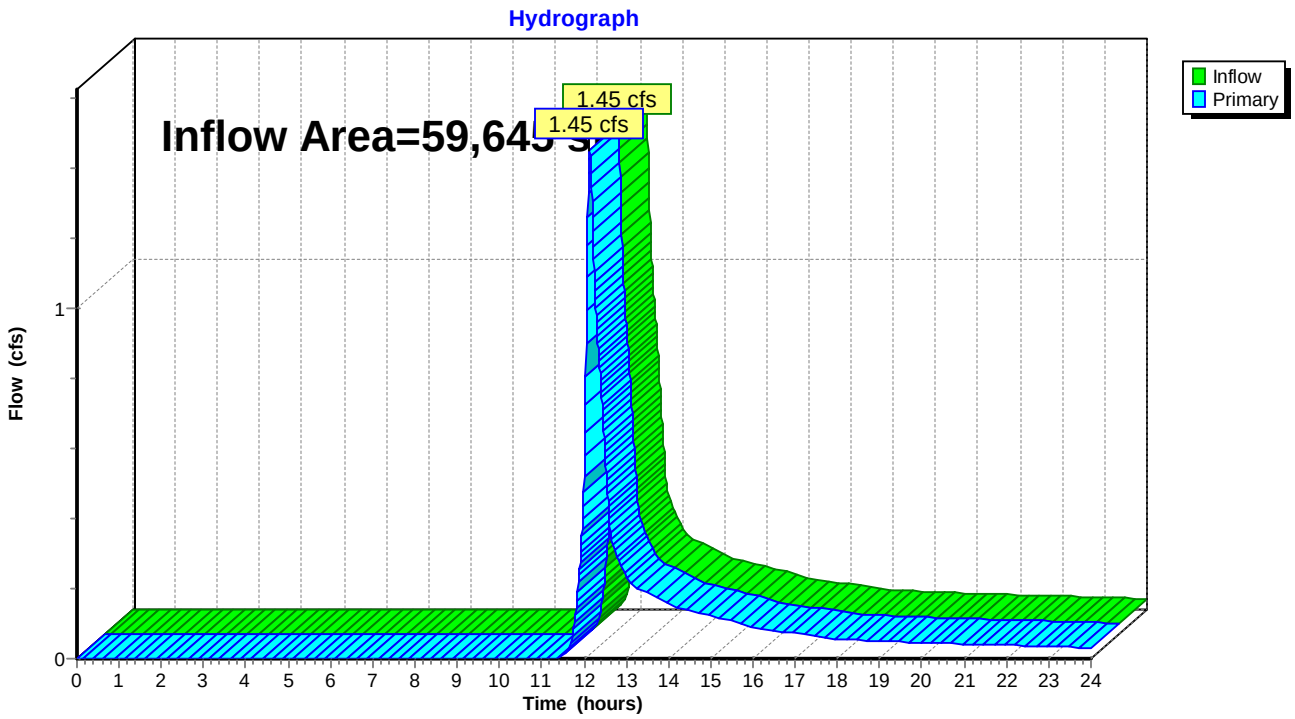


Summary for Link DP14: Lagrange St Low Point

Inflow Area = 59,645 sf, 31.36% Impervious, Inflow Depth > 1.13" for 10 Year event
Inflow = 1.45 cfs @ 12.14 hrs, Volume= 5,630 cf
Primary = 1.45 cfs @ 12.14 hrs, Volume= 5,630 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link DP14: Lagrange St Low Point

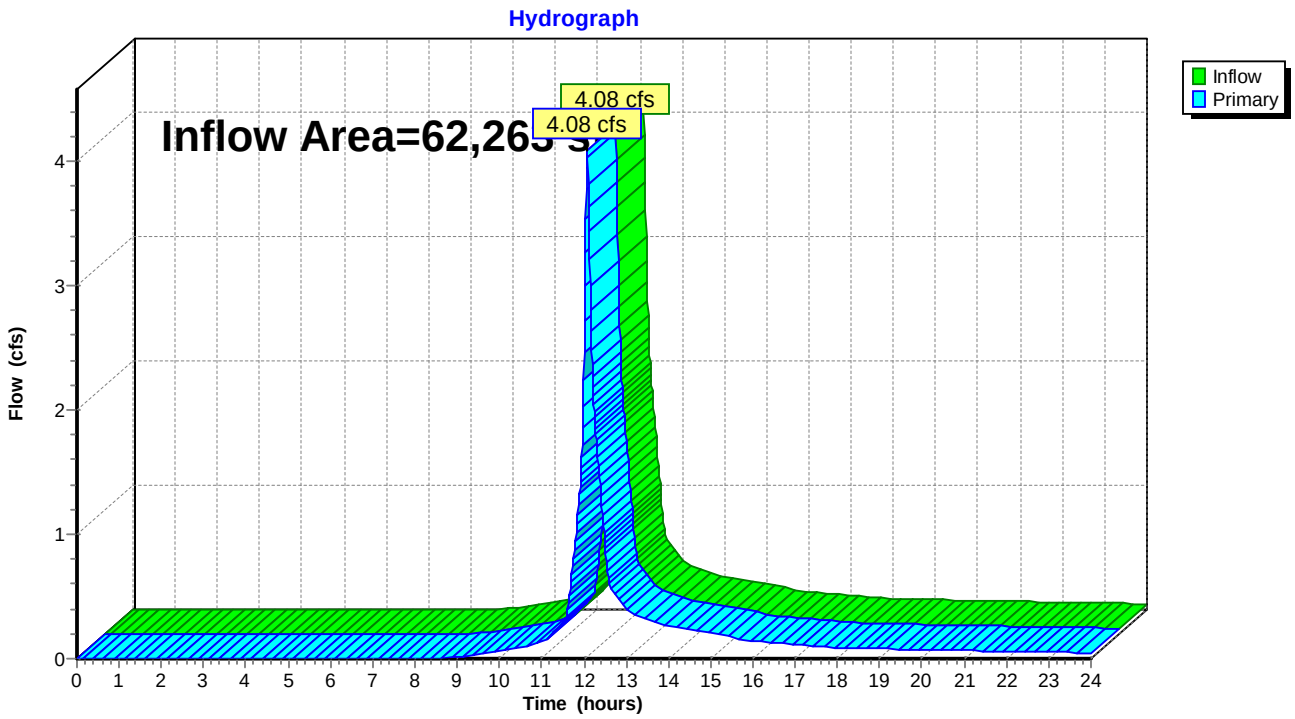


Summary for Link DP15: TOB D

Inflow Area = 62,263 sf, 50.59% Impervious, Inflow Depth > 2.37" for 10 Year event
Inflow = 4.08 cfs @ 12.08 hrs, Volume= 12,313 cf
Primary = 4.08 cfs @ 12.08 hrs, Volume= 12,313 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link DP15: TOB D

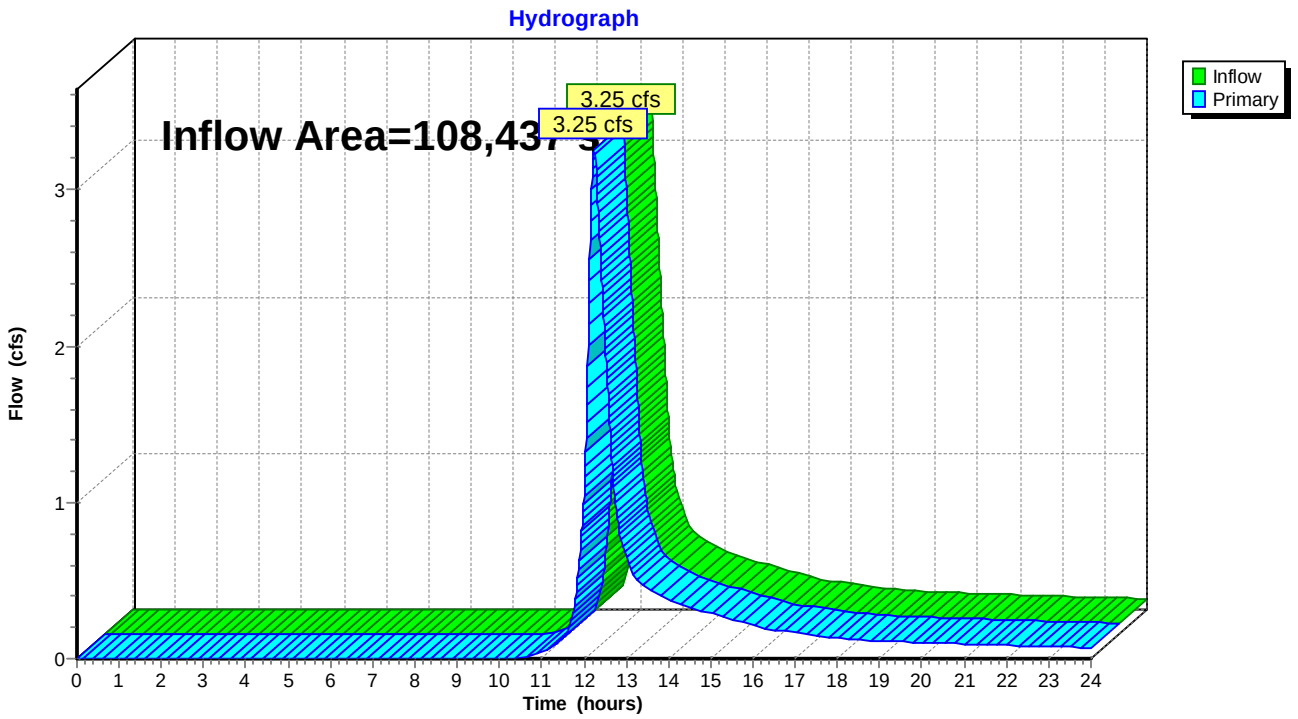


Summary for Link DP16: WF 1, WF 2, TOB E

Inflow Area = 108,437 sf, 32.30% Impervious, Inflow Depth > 1.59" for 10 Year event
Inflow = 3.25 cfs @ 12.24 hrs, Volume= 14,401 cf
Primary = 3.25 cfs @ 12.24 hrs, Volume= 14,401 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link DP16: WF 1, WF 2, TOB E

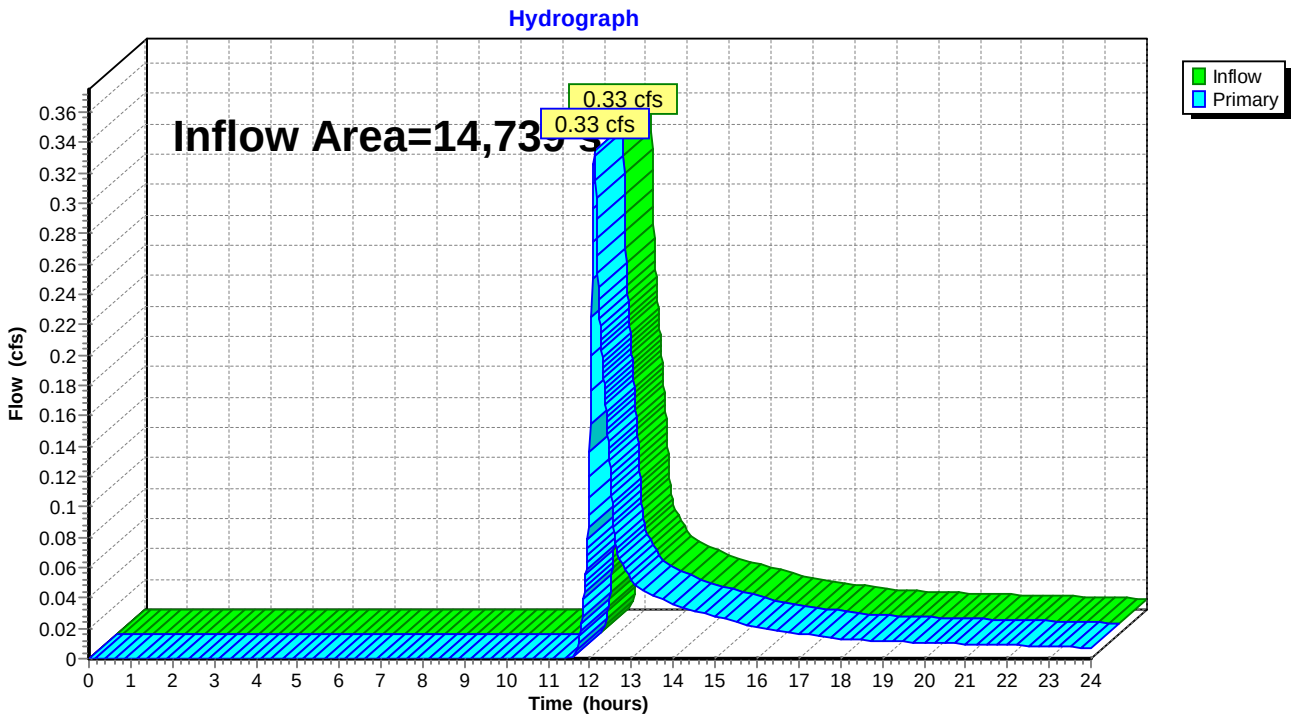


Summary for Link WF-G: WF G

Inflow Area = 14,739 sf, 0.00% Impervious, Inflow Depth > 1.01" for 10 Year event
Inflow = 0.33 cfs @ 12.11 hrs, Volume= 1,243 cf
Primary = 0.33 cfs @ 12.11 hrs, Volume= 1,243 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link WF-G: WF G

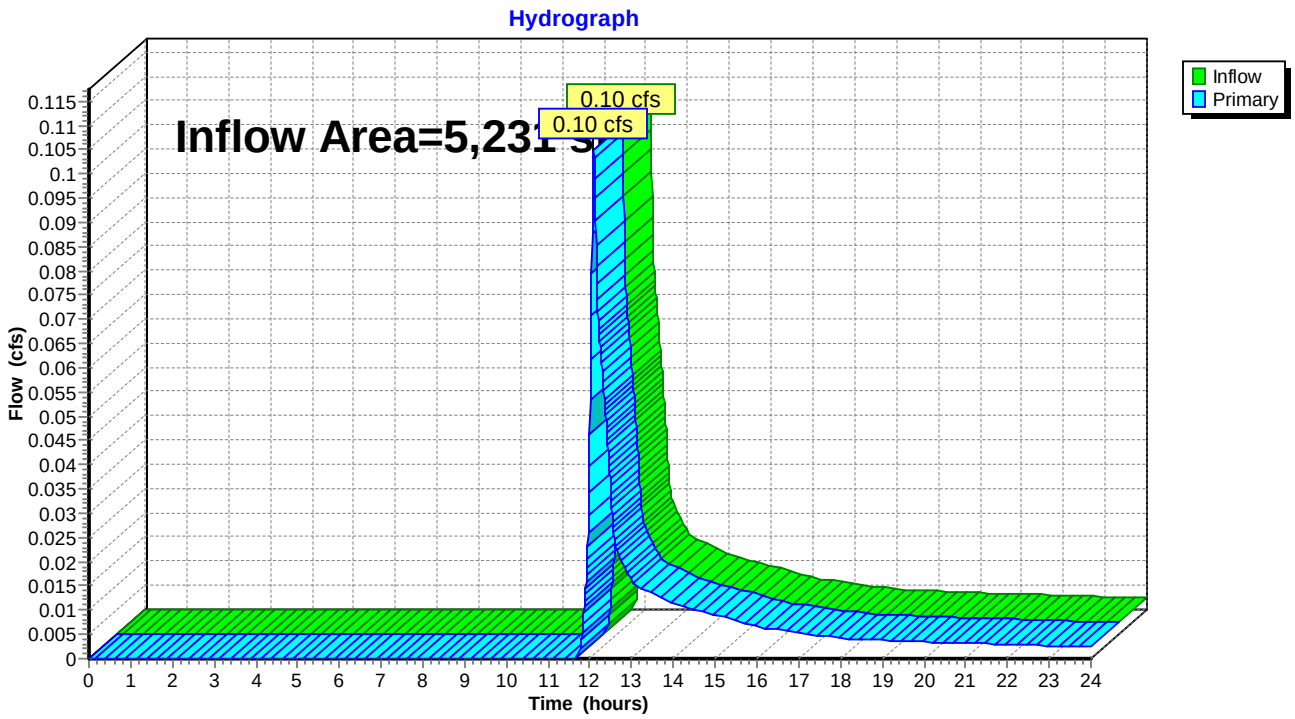


Summary for Link WF-H: WF H

Inflow Area = 5,231 sf, 0.00% Impervious, Inflow Depth > 0.90" for 10 Year event
Inflow = 0.10 cfs @ 12.09 hrs, Volume= 391 cf
Primary = 0.10 cfs @ 12.09 hrs, Volume= 391 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link WF-H: WF H



Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 01S: Cochitute Rd 1 Runoff Area=9,423 sf 2.98% Impervious Runoff Depth>1.80"
Flow Length=162' Tc=5.0 min CN=63 Runoff=0.45 cfs 1,413 cf

Subcatchment 02S: Cochituate Rd 2 Runoff Area=21,748 sf 11.45% Impervious Runoff Depth>2.12"
Flow Length=100' Slope=0.0270 '/' Tc=8.8 min CN=67 Runoff=1.10 cfs 3,840 cf

Subcatchment 03S: Home Depot Runoff Area=25,653 sf 0.00% Impervious Runoff Depth>1.64"
Flow Length=60' Slope=0.0088 '/' Tc=20.0 min CN=61 Runoff=0.71 cfs 3,501 cf

Subcatchment 04S: Chrystler St Runoff Area=30,203 sf 8.21% Impervious Runoff Depth>1.63"
Flow Length=311' Tc=37.7 min CN=61 Runoff=0.63 cfs 4,101 cf

Subcatchment 05S: DNR Runoff Area=99,015 sf 0.66% Impervious Runoff Depth>1.64"
Flow Length=725' Tc=17.3 min CN=61 Runoff=2.90 cfs 13,525 cf

Subcatchment 06S: Speen St Runoff Area=28,640 sf 6.23% Impervious Runoff Depth>2.12"
Flow Length=473' Tc=11.6 min CN=67 Runoff=1.32 cfs 5,053 cf

Subcatchment 07S: Lake Cochituate N Runoff Area=384,322 sf 7.17% Impervious Runoff Depth>1.71"
Flow Length=975' Tc=30.1 min CN=62 Runoff=9.46 cfs 54,739 cf

Subcatchment 08S: Lake Cochituate E1 Runoff Area=15,353 sf 0.00% Impervious Runoff Depth>1.57"
Flow Length=146' Tc=5.0 min CN=60 Runoff=0.62 cfs 2,008 cf

Subcatchment 09S: Lake Cochituate E2 Runoff Area=8,720 sf 0.00% Impervious Runoff Depth>1.72"
Flow Length=71' Tc=5.0 min CN=62 Runoff=0.40 cfs 1,251 cf

Subcatchment 10S: Lake Cochituate E3 Runoff Area=5,671 sf 0.00% Impervious Runoff Depth>1.57"
Flow Length=96' Tc=7.5 min CN=60 Runoff=0.21 cfs 741 cf

Subcatchment 11S: Lake Cochituate E4 Runoff Area=169,075 sf 7.42% Impervious Runoff Depth>1.64"
Flow Length=328' Tc=16.1 min CN=61 Runoff=5.10 cfs 23,102 cf

Subcatchment 12S: Lake Cochituate W1 Runoff Area=45,286 sf 7.97% Impervious Runoff Depth>1.80"
Flow Length=185' Tc=11.2 min CN=63 Runoff=1.75 cfs 6,778 cf

Subcatchment 13S: Lake Cochituate W2 Runoff Area=5,231 sf 0.00% Impervious Runoff Depth>1.35"
Flow Length=52' Slope=0.2426 '/' Tc=5.0 min CN=57 Runoff=0.17 cfs 589 cf

Subcatchment 14S: Lake Cochituate W3 Runoff Area=14,739 sf 0.00% Impervious Runoff Depth>1.49"
Flow Length=114' Tc=6.4 min CN=59 Runoff=0.53 cfs 1,836 cf

Subcatchment 15S: Lake Cochituate W4 Runoff Area=210,093 sf 18.76% Impervious Runoff Depth>1.95"
Flow Length=307' Tc=12.6 min CN=65 Runoff=8.58 cfs 34,204 cf

Subcatchment 16S: Worcester St N Runoff Area=157,456 sf 93.05% Impervious Runoff Depth>4.74"
Flow Length=1,809' Tc=22.6 min CN=94 Runoff=12.05 cfs 62,145 cf

Subcatchment 17S: Worcester St S Runoff Area=26,593 sf 39.48% Impervious Runoff Depth>2.72"
Flow Length=316' Tc=9.0 min CN=74 Runoff=1.76 cfs 6,034 cf

Subcatchment 18S: Arcadi Rd Runoff Area=253,846 sf 12.85% Impervious Runoff Depth>1.56"
Flow Length=806' Tc=17.7 min CN=60 Runoff=6.95 cfs 33,079 cf

Subcatchment 19S: Fisher St Runoff Area=357,165 sf 20.57% Impervious Runoff Depth>1.56"
Flow Length=940' Tc=22.9 min CN=60 Runoff=8.83 cfs 46,471 cf

Subcatchment 20S: Unnamed Pond 1 Runoff Area=22,399 sf 8.44% Impervious Runoff Depth>1.64"
Flow Length=222' Tc=14.3 min CN=61 Runoff=0.71 cfs 3,062 cf

Subcatchment 21S: Unnamed Pond 2 Runoff Area=79,608 sf 24.60% Impervious Runoff Depth>1.57"
Flow Length=279' Tc=7.9 min CN=60 Runoff=2.90 cfs 10,403 cf

Subcatchment 22S: Unnamed Pond 3 Runoff Area=61,232 sf 17.35% Impervious Runoff Depth>1.57"
Flow Length=309' Tc=11.7 min CN=60 Runoff=1.97 cfs 7,993 cf

Subcatchment 23S: Unnamed Pond 4 Runoff Area=52,964 sf 1.51% Impervious Runoff Depth>1.56"
Flow Length=167' Tc=19.8 min CN=60 Runoff=1.39 cfs 6,898 cf

Subcatchment 24S: Kansas St Runoff Area=83,215 sf 17.84% Impervious Runoff Depth>1.80"
Flow Length=227' Tc=7.7 min CN=63 Runoff=3.61 cfs 12,466 cf

Subcatchment 25S: North Main @ Kansas Runoff Area=12,322 sf 100.00% Impervious Runoff Depth>5.21"
Tc=5.0 min CN=98 Runoff=1.56 cfs 5,349 cf

Subcatchment 26S: Empty Lot Runoff Area=26,290 sf 0.00% Impervious Runoff Depth>2.64"
Tc=5.0 min CN=73 Runoff=1.93 cfs 5,775 cf

Subcatchment 27S: Washington Ave 1 Runoff Area=10,780 sf 84.48% Impervious Runoff Depth>4.86"
Tc=5.0 min CN=95 Runoff=1.34 cfs 4,368 cf

Subcatchment 28S: Washington Ave 2 Runoff Area=9,257 sf 66.71% Impervious Runoff Depth>4.42"
Tc=5.0 min CN=91 Runoff=1.09 cfs 3,407 cf

Subcatchment 29S: Washington Ave 3 Runoff Area=23,536 sf 31.05% Impervious Runoff Depth>1.49"
Flow Length=196' Tc=9.0 min CN=59 Runoff=0.77 cfs 2,929 cf

Subcatchment 30S: Lagrange St Runoff Area=59,645 sf 31.36% Impervious Runoff Depth>1.64"
Flow Length=194' Tc=8.7 min CN=61 Runoff=2.24 cfs 8,167 cf

Subcatchment 31S: Mechanic St Runoff Area=62,263 sf 50.59% Impervious Runoff Depth>3.09"
Flow Length=329' Tc=5.3 min CN=78 Runoff=5.33 cfs 16,056 cf

Subcatchment 32S: Cochituate St 1 Runoff Area=108,437 sf 32.30% Impervious Runoff Depth>2.20"
Flow Length=728' Tc=16.4 min CN=68 Runoff=4.60 cfs 19,858 cf

Pond 01P: Speen St Detention Peak Elev=159.91' Storage=28 cf Inflow=1.32 cfs 5,053 cf
Primary=0.00 cfs 0 cf Secondary=1.32 cfs 5,050 cf Outflow=1.32 cfs 5,050 cf

Pond 2P: Lake Cochituate Peak Elev=136.01' Storage=9.322 af Inflow=74.25 cfs 406,087 cf
Outflow=0.00 cfs 0 cf

Link 1L: Total Inflow=74.25 cfs 406,087 cf
Primary=74.25 cfs 406,087 cf

Link DP01: Cochituate Rd Inflow=1.50 cfs 5,252 cf
Primary=1.50 cfs 5,252 cf

Link DP02: Chrystler St Inflow=1.19 cfs 7,602 cf
Primary=1.19 cfs 7,602 cf

Link DP03: WF A Inflow=2.90 cfs 13,525 cf
Primary=2.90 cfs 13,525 cf

Link DP04: Lake Cochituate Middle Pond Inflow=13.75 cfs 81,841 cf
Primary=13.75 cfs 81,841 cf

Link DP04-1: WF B Inflow=9.46 cfs 54,739 cf
Primary=9.46 cfs 54,739 cf

Link DP04-2: WF C Inflow=1.21 cfs 4,000 cf
Primary=1.21 cfs 4,000 cf

Link DP04-3: Lake Cochituate Inflow=5.10 cfs 23,102 cf
Primary=5.10 cfs 23,102 cf

Link DP05: Lake Cochituate W Inflow=10.84 cfs 43,406 cf
Primary=10.84 cfs 43,406 cf

Link DP05-1: WF I Inflow=1.75 cfs 6,778 cf
Primary=1.75 cfs 6,778 cf

Link DP05-2: WF G&H Inflow=0.70 cfs 2,425 cf
Primary=0.70 cfs 2,425 cf

Link DP05-3: Lake Cochituate Inflow=8.58 cfs 34,204 cf
Primary=8.58 cfs 34,204 cf

Link DP06: Worcester St Inflow=13.11 cfs 68,179 cf
Primary=13.11 cfs 68,179 cf

Link DP07: WF F Inflow=6.95 cfs 33,079 cf
Primary=6.95 cfs 33,079 cf

Link DP08: WF J Inflow=8.83 cfs 46,471 cf
Primary=8.83 cfs 46,471 cf

Link DP09: Unnamed Pond Inflow=6.28 cfs 28,356 cf
Primary=6.28 cfs 28,356 cf

Link DP09-1: WF K Inflow=0.71 cfs 3,062 cf
Primary=0.71 cfs 3,062 cf

Link DP09-2: WF KA Inflow=2.90 cfs 10,403 cf
Primary=2.90 cfs 10,403 cf

Link DP09-3: WF B Inflow=1.97 cfs 7,993 cf
Primary=1.97 cfs 7,993 cf

Link DP09-4: WF E&L, TOB C Inflow=1.39 cfs 6,898 cf
Primary=1.39 cfs 6,898 cf

Link DP10: WF A Inflow=4.99 cfs 17,815 cf
Primary=4.99 cfs 17,815 cf

Link DP11: Local St Drain System Inflow=2.42 cfs 7,775 cf
Primary=2.42 cfs 7,775 cf

Link DP12: Washington St Low Point Inflow=0.77 cfs 2,929 cf
Primary=0.77 cfs 2,929 cf

Link DP13: Empty Lot Inflow=1.93 cfs 5,775 cf
Primary=1.93 cfs 5,775 cf

Link DP14: Lagrange St Low Point Inflow=2.24 cfs 8,167 cf
Primary=2.24 cfs 8,167 cf

Link DP15: TOB D Inflow=5.33 cfs 16,056 cf
Primary=5.33 cfs 16,056 cf

Link DP16: WF 1, WF 2, TOB E Inflow=4.60 cfs 19,858 cf
Primary=4.60 cfs 19,858 cf

Link WF-G: WF G Inflow=0.53 cfs 1,836 cf
Primary=0.53 cfs 1,836 cf

Link WF-H: WF H Inflow=0.17 cfs 589 cf
Primary=0.17 cfs 589 cf

Total Runoff Area = 2,480,180 sf Runoff Volume = 411,140 cf Average Runoff Depth = 1.99"
78.96% Pervious = 1,958,347 sf 21.04% Impervious = 521,833 sf

Summary for Subcatchment 01S: Cochitute Rd 1

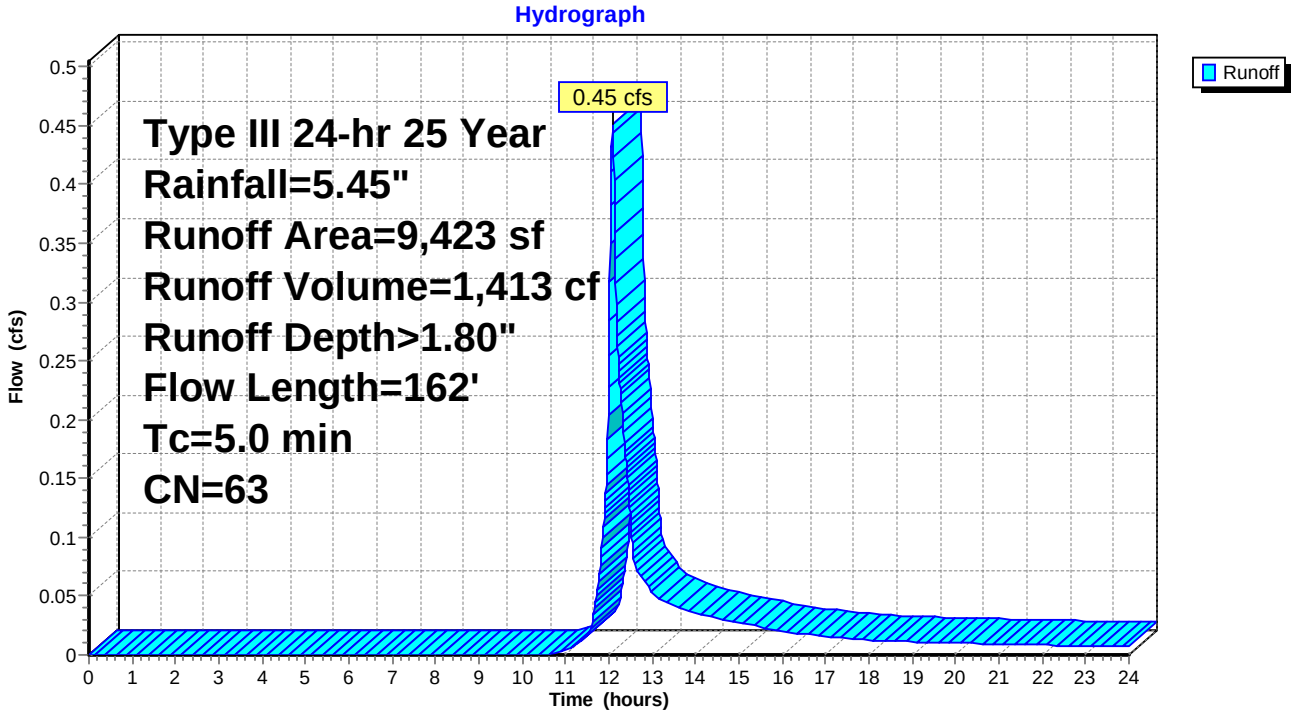
Runoff = 0.45 cfs @ 12.08 hrs, Volume= 1,413 cf, Depth> 1.80"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 Year Rainfall=5.45"

Area (sf)	CN	Description
6,995	57	Woods/grass comb., Poor, HSG A
2,147	76	Gravel roads, HSG A
281	98	Paved parking, HSG A
9,423	63	Weighted Average
9,142		97.02% Pervious Area
281		2.98% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.3	100	0.0040	0.72		**Sheet Flow, Gravel Path** Smooth surfaces n= 0.011 P2= 3.15"
1.1	62	0.0036	0.97		**Shallow Concentrated Flow, Gravel Path** Unpaved Kv= 16.1 fps
3.4	162	Total, Increased to minimum Tc = 5.0 min			

Subcatchment 01S: Cochitute Rd 1



Summary for Subcatchment 02S: Cochituate Rd 2

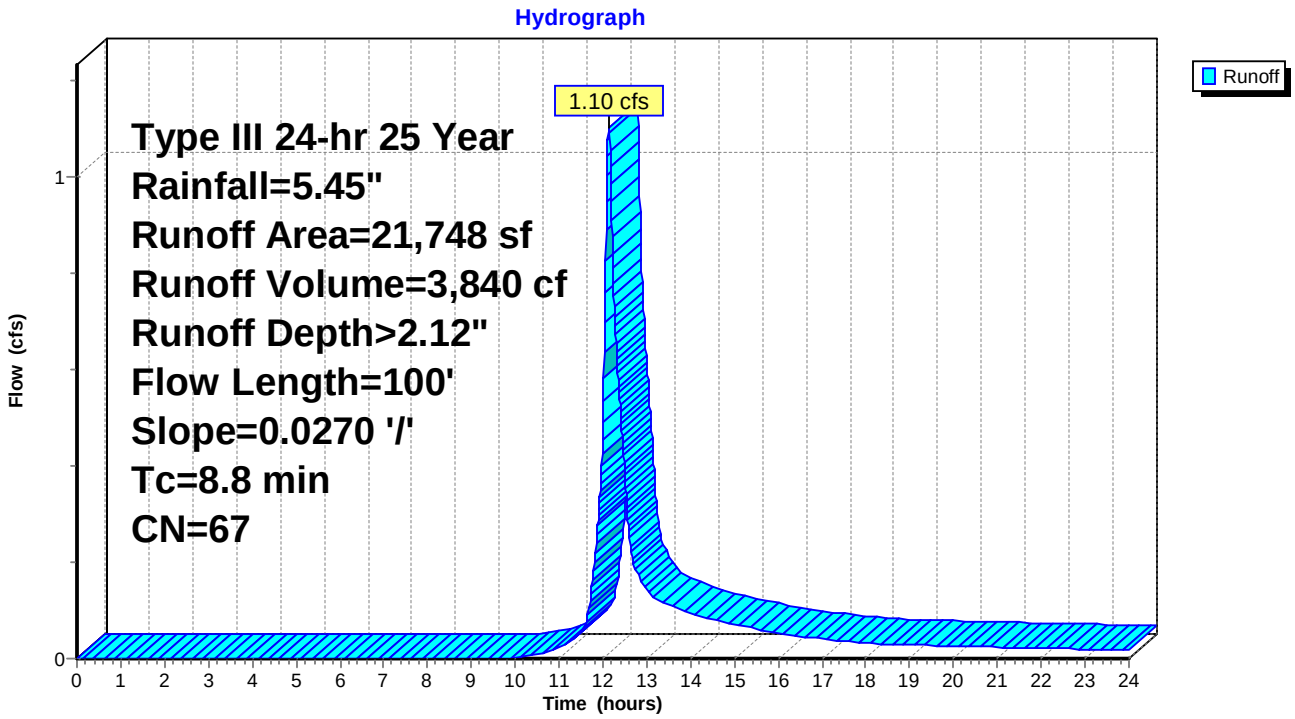
Runoff = 1.10 cfs @ 12.13 hrs, Volume= 3,840 cf, Depth> 2.12"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 Year Rainfall=5.45"

Area (sf)	CN	Description
8,506	57	Woods/grass comb., Poor, HSG A
714	76	Gravel roads, HSG A
2,491	98	Paved parking, HSG A
10,037	68	<50% Grass cover, Poor, HSG A
21,748	67	Weighted Average
19,257		88.55% Pervious Area
2,491		11.45% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.8	100	0.0270	0.19		**Sheet Flow, Grass** Grass: Short n= 0.150 P2= 3.15"

Subcatchment 02S: Cochituate Rd 2



Summary for Subcatchment 03S: Home Depot

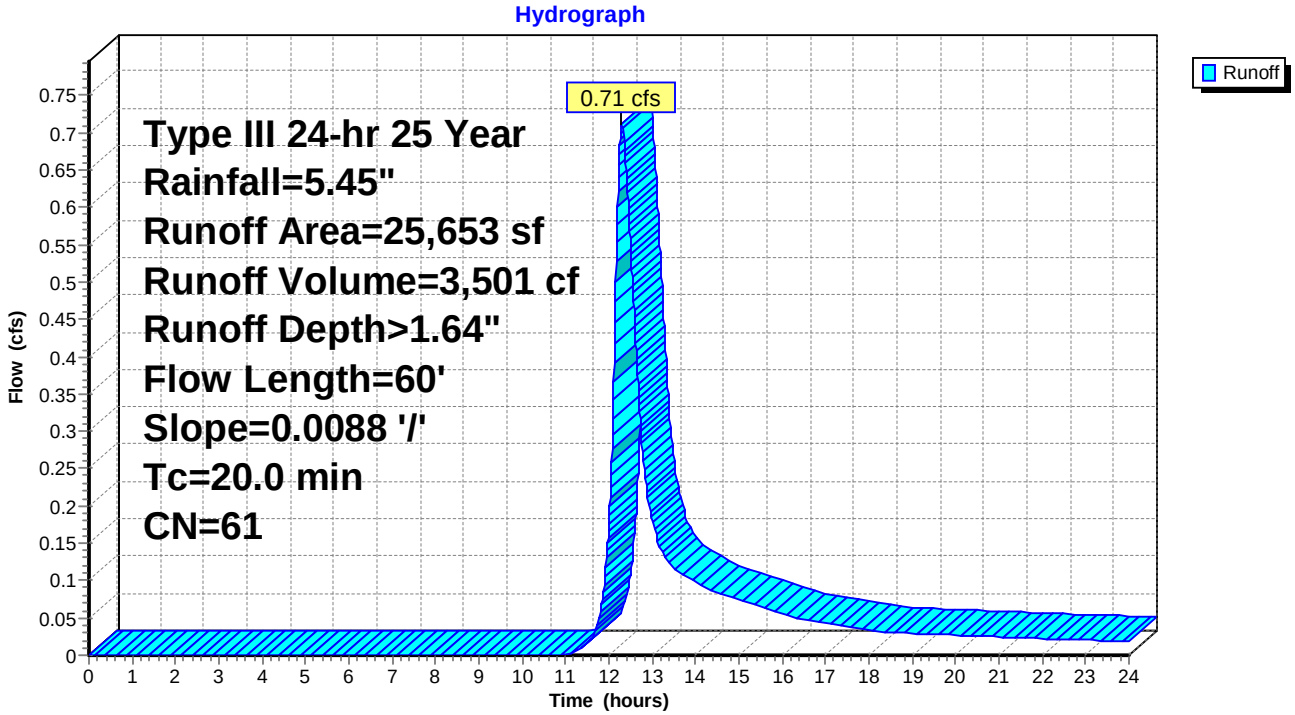
Runoff = 0.71 cfs @ 12.29 hrs, Volume= 3,501 cf, Depth> 1.64"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 Year Rainfall=5.45"

Area (sf)	CN	Description
4,785	76	Gravel roads, HSG A
20,868	57	Woods/grass comb., Poor, HSG A
25,653	61	Weighted Average
25,653		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.0	60	0.0088	0.05		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"

Subcatchment 03S: Home Depot



Summary for Subcatchment 04S: Chrystler St

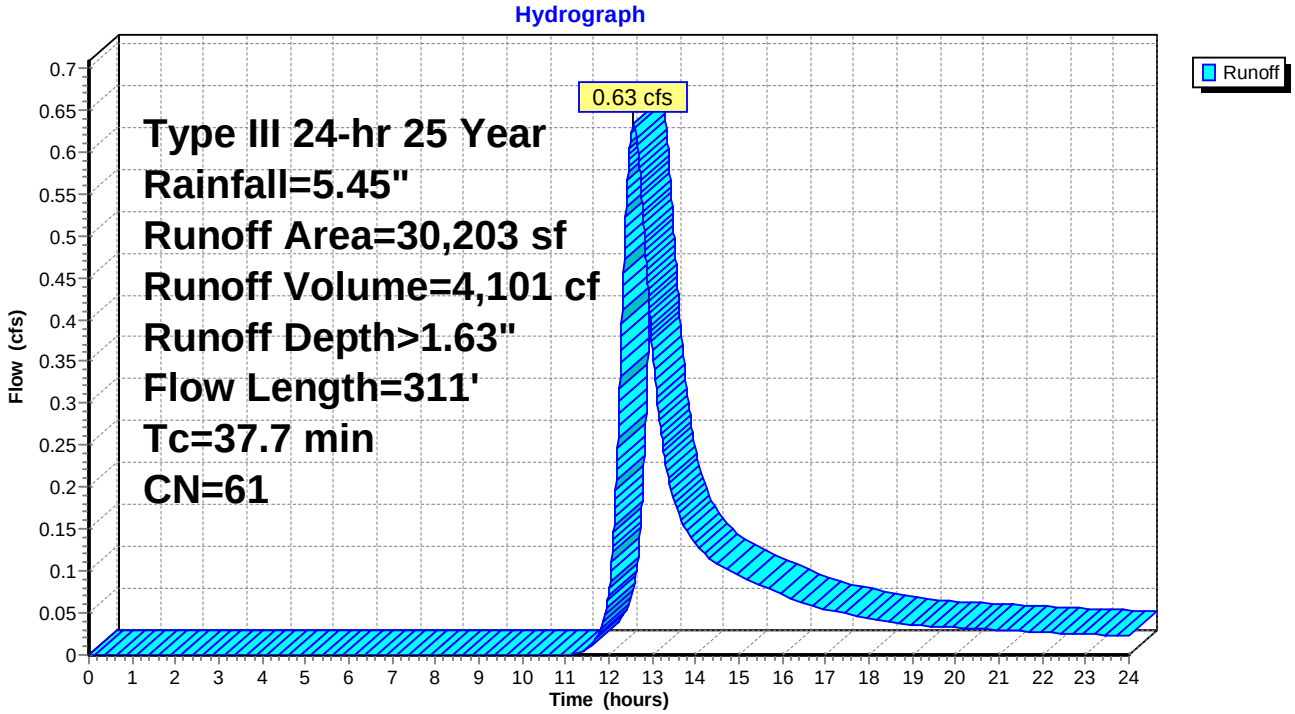
Runoff = 0.63 cfs @ 12.57 hrs, Volume= 4,101 cf, Depth> 1.63"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 Year Rainfall=5.45"

Area (sf)	CN	Description
27,297	57	Woods/grass comb., Poor, HSG A
425	76	Gravel roads, HSG A
2,481	98	Paved parking, HSG A
30,203	61	Weighted Average
27,722		91.79% Pervious Area
2,481		8.21% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
28.6	100	0.0100	0.06		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
9.1	211	0.0060	0.39		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
37.7	311	Total			

Subcatchment 04S: Chrystler St



Summary for Subcatchment 05S: DNR

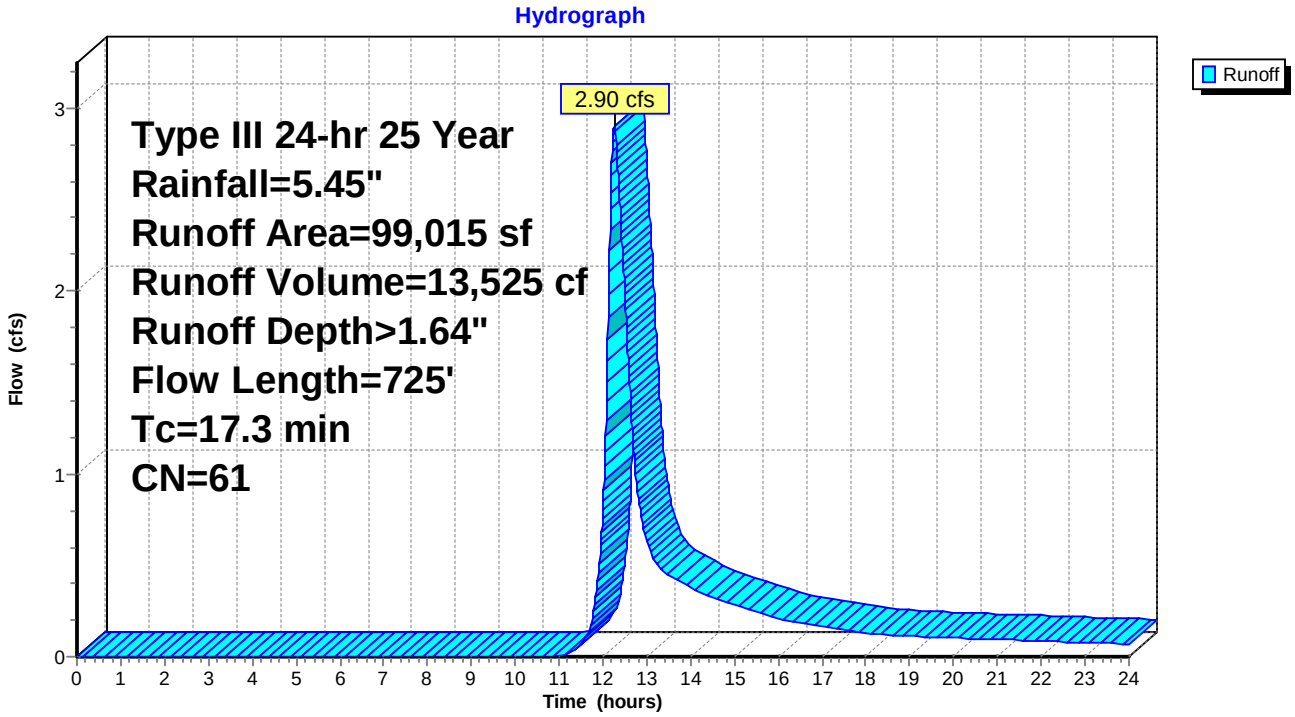
Runoff = 2.90 cfs @ 12.26 hrs, Volume= 13,525 cf, Depth> 1.64"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 Year Rainfall=5.45"

Area (sf)	CN	Description
81,414	57	Woods/grass comb., Poor, HSG A
16,946	76	Gravel roads, HSG A
655	98	Paved parking, HSG A
99,015	61	Weighted Average
98,360		99.34% Pervious Area
655		0.66% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0	100	0.3330	0.24		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
7.0	391	0.0033	0.92		**Shallow Concentrated Flow, Gravel Path** Unpaved Kv= 16.1 fps
3.3	234	0.0556	1.18		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
17.3	725	Total			

Subcatchment 05S: DNR



Summary for Subcatchment 06S: Speen St

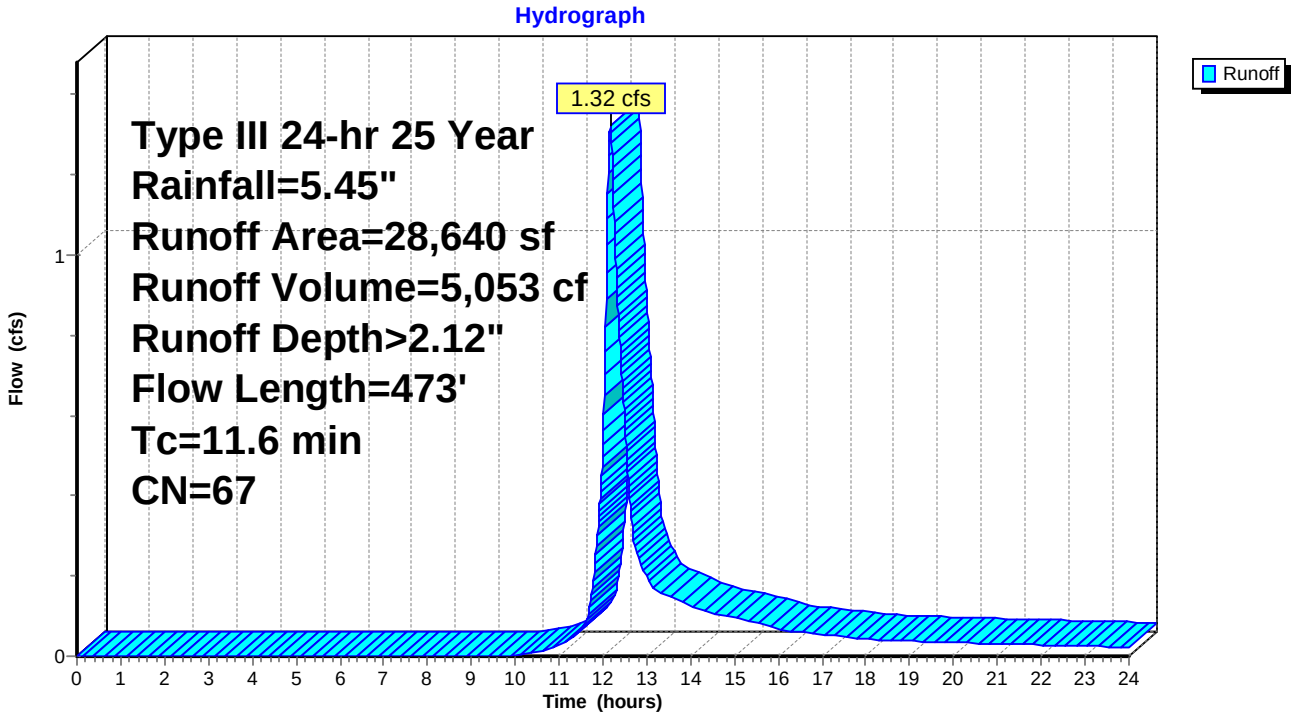
Runoff = 1.32 cfs @ 12.17 hrs, Volume= 5,053 cf, Depth> 2.12"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 Year Rainfall=5.45"

Area (sf)	CN	Description
11,348	57	Woods/grass comb., Poor, HSG A
3,881	76	Gravel roads, HSG A
1,783	98	Paved roads w/curbs & sewers, HSG A
11,628	68	<50% Grass cover, Poor, HSG A
28,640	67	Weighted Average
26,857		93.77% Pervious Area
1,783		6.23% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	22	0.1440	0.27		**Sheet Flow, Grass** Grass: Short n= 0.150 P2= 3.15"
7.8	58	0.0120	0.12		**Sheet Flow, Grass** Grass: Short n= 0.150 P2= 3.15"
2.5	393	0.0265	2.62		**Shallow Concentrated Flow, Gravel Path** Unpaved Kv= 16.1 fps
11.6	473	Total			

Subcatchment 06S: Speen St



Summary for Subcatchment 07S: Lake Cochituate N

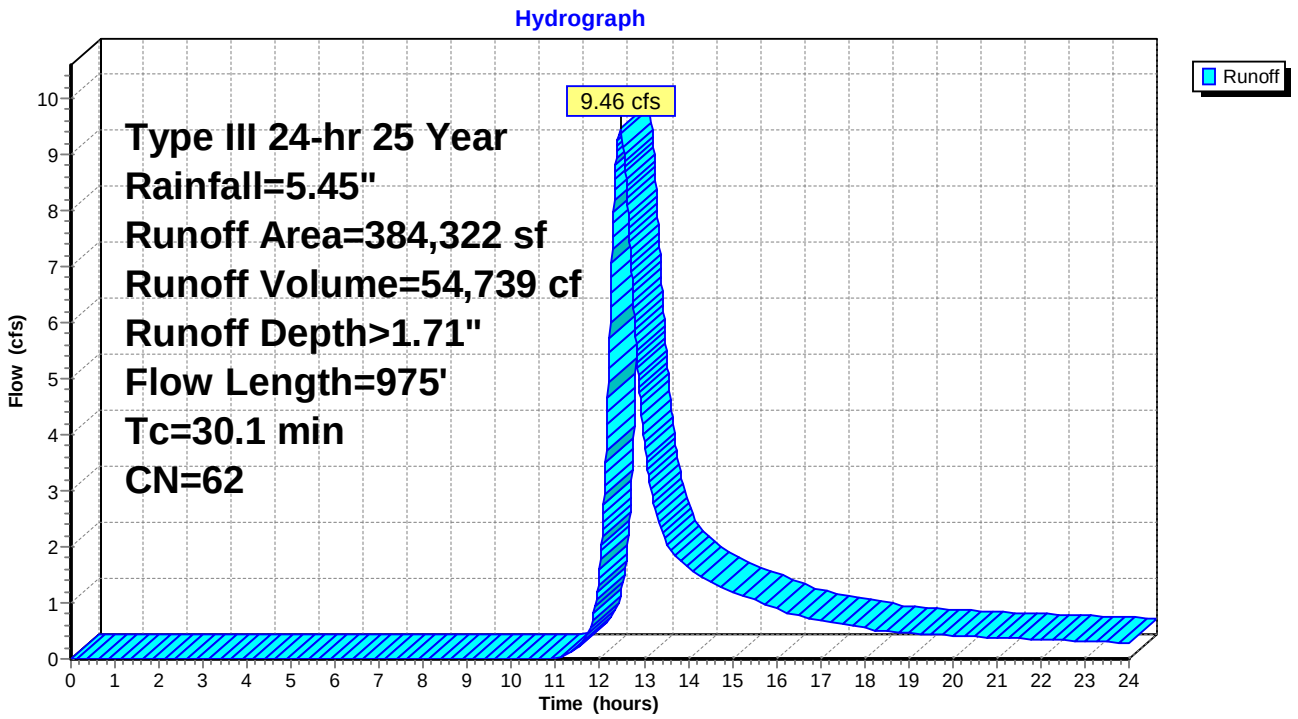
Runoff = 9.46 cfs @ 12.47 hrs, Volume= 54,739 cf, Depth> 1.71"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 Year Rainfall=5.45"

Area (sf)	CN	Description
317,071	57	Woods/grass comb., Poor, HSG A
39,676	76	Gravel roads, HSG A
27,575	98	Paved parking, HSG A
384,322	62	Weighted Average
356,747		92.83% Pervious Area
27,575		7.17% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.7	33	0.4091	0.21		**Sheet Flow, Woods**
					Woods: Light underbrush n= 0.400 P2= 3.15"
1.5	67	0.0209	0.72		**Shallow Concentrated Flow, Woods**
					Woodland Kv= 5.0 fps
23.7	664	0.0087	0.47		**Shallow Concentrated Flow, Woods**
					Woodland Kv= 5.0 fps
1.9	164	0.0079	1.43		**Shallow Concentrated Flow, Gravel Path**
					Unpaved Kv= 16.1 fps
0.3	47	0.3120	2.79		**Shallow Concentrated Flow, Woods**
					Woodland Kv= 5.0 fps
30.1	975	Total			

Subcatchment 07S: Lake Cochituate N



Summary for Subcatchment 08S: Lake Cochituate E1

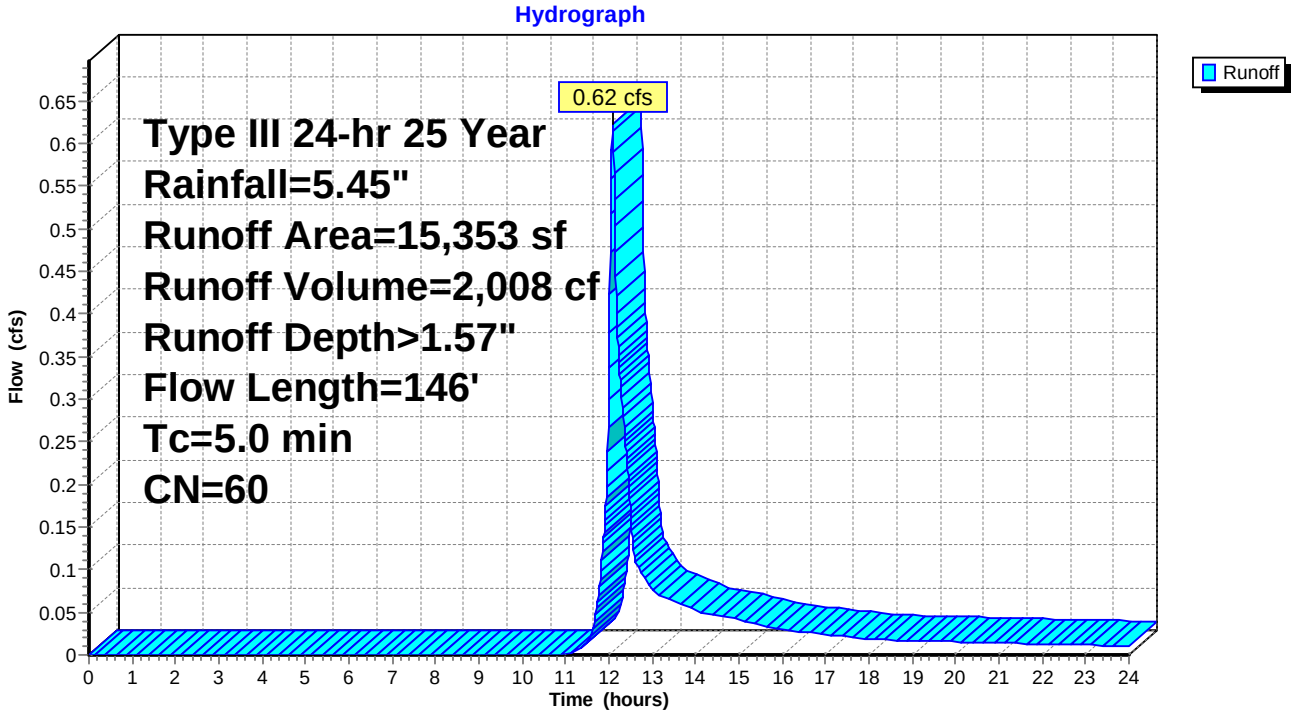
Runoff = 0.62 cfs @ 12.08 hrs, Volume= 2,008 cf, Depth> 1.57"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 Year Rainfall=5.45"

Area (sf)	CN	Description
12,685	57	Woods/grass comb., Poor, HSG A
2,668	76	Gravel roads, HSG A
15,353	60	Weighted Average
15,353		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	12	0.2500	0.14		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
0.4	45	0.0112	1.70		**Shallow Concentrated Flow, Gravel Path** Unpaved Kv= 16.1 fps
0.9	89	0.1157	1.70		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
2.7	146	Total, Increased to minimum Tc = 5.0 min			

Subcatchment 08S: Lake Cochituate E1



Summary for Subcatchment 09S: Lake Cochituate E2

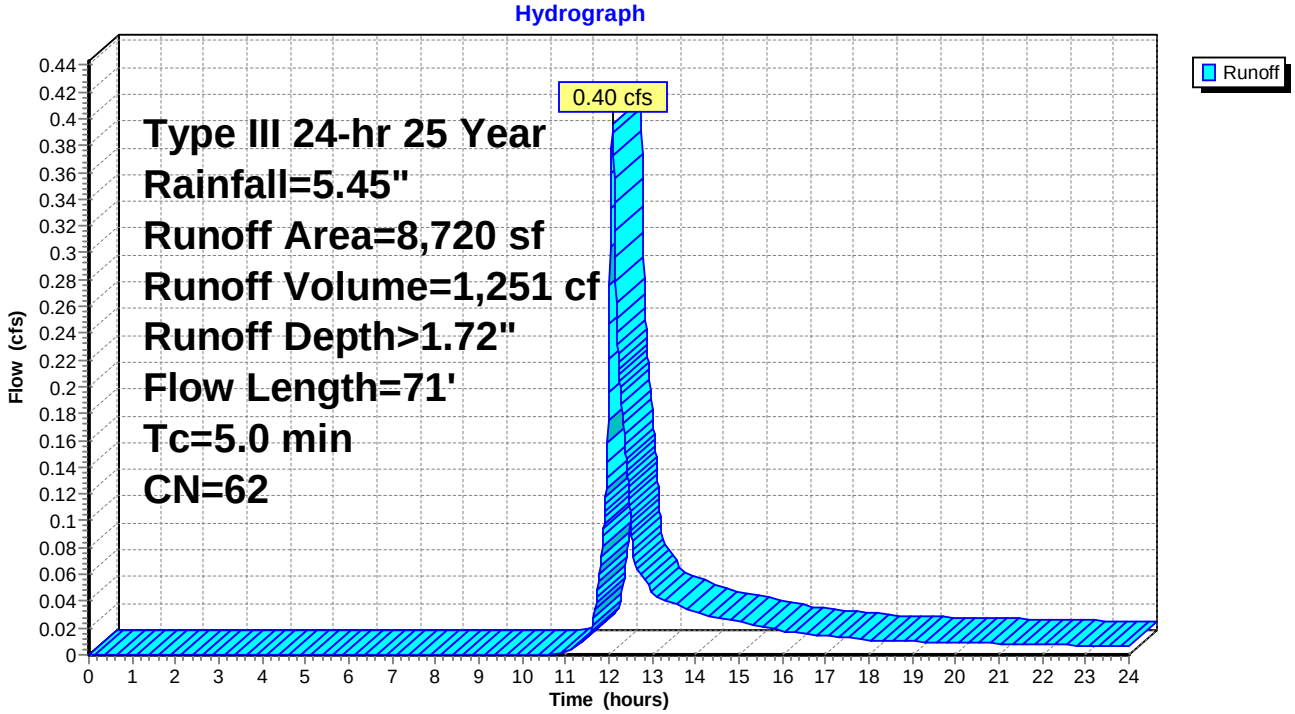
Runoff = 0.40 cfs @ 12.08 hrs, Volume= 1,251 cf, Depth> 1.72"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 Year Rainfall=5.45"

Area (sf)	CN	Description
6,212	57	Woods/grass comb., Poor, HSG A
2,508	76	Gravel roads, HSG A
8,720	62	Weighted Average
8,720		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	32	0.0333	1.33		**Sheet Flow, Gravel Path** Smooth surfaces n= 0.011 P2= 3.15"
2.8	39	0.4974	0.23		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
3.2	71	Total, Increased to minimum Tc = 5.0 min			

Subcatchment 09S: Lake Cochituate E2



Summary for Subcatchment 10S: Lake Cochituate E3

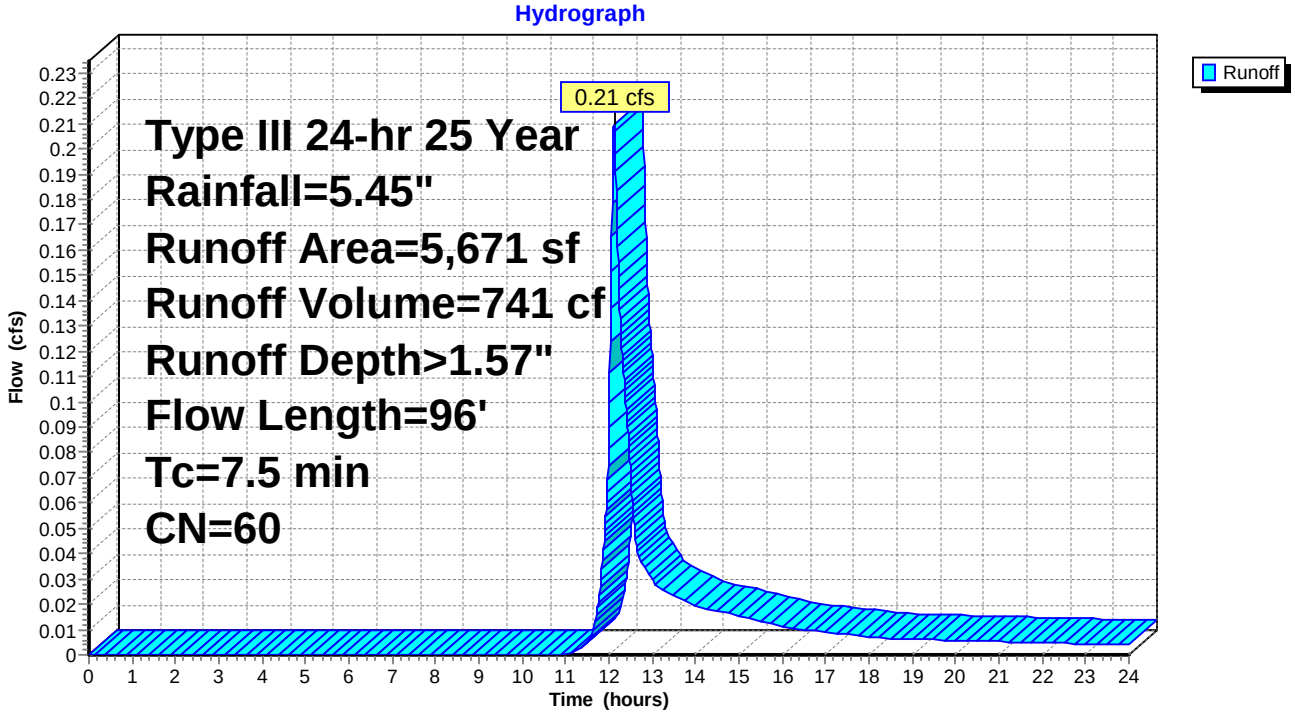
Runoff = 0.21 cfs @ 12.12 hrs, Volume= 741 cf, Depth> 1.57"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 Year Rainfall=5.45"

Area (sf)	CN	Description
4,892	57	Woods/grass comb., Poor, HSG A
779	76	Gravel roads, HSG A
5,671	60	Weighted Average
5,671		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	22	0.0023	0.42		**Sheet Flow, Gravel Path** Smooth surfaces n= 0.011 P2= 3.15"
6.6	74	0.2101	0.19		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
7.5	96	Total			

Subcatchment 10S: Lake Cochituate E3



Summary for Subcatchment 11S: Lake Cochituate E4

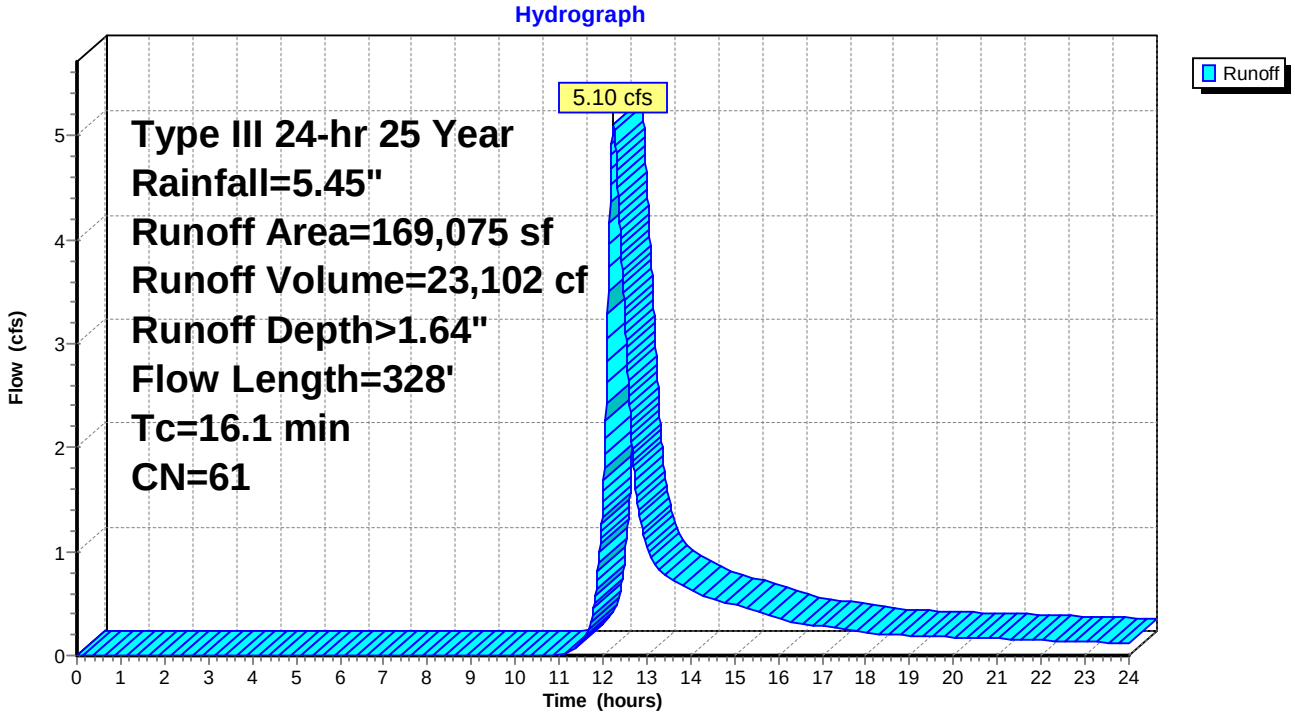
Runoff = 5.10 cfs @ 12.24 hrs, Volume= 23,102 cf, Depth> 1.64"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 Year Rainfall=5.45"

Area (sf)	CN	Description
151,451	57	Woods/grass comb., Poor, HSG A
5,071	76	Gravel roads, HSG A
12,553	98	Paved parking, HSG A
169,075	61	Weighted Average
156,522		92.58% Pervious Area
12,553		7.42% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.1	100	0.0700	0.13		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
2.0	125	0.0456	1.07		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
0.1	13	0.0192	2.81		**Shallow Concentrated Flow, Road** Paved Kv= 20.3 fps
0.9	90	0.1080	1.64		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
16.1	328	Total			

Subcatchment 11S: Lake Cochituate E4



Summary for Subcatchment 12S: Lake Cochituate W1

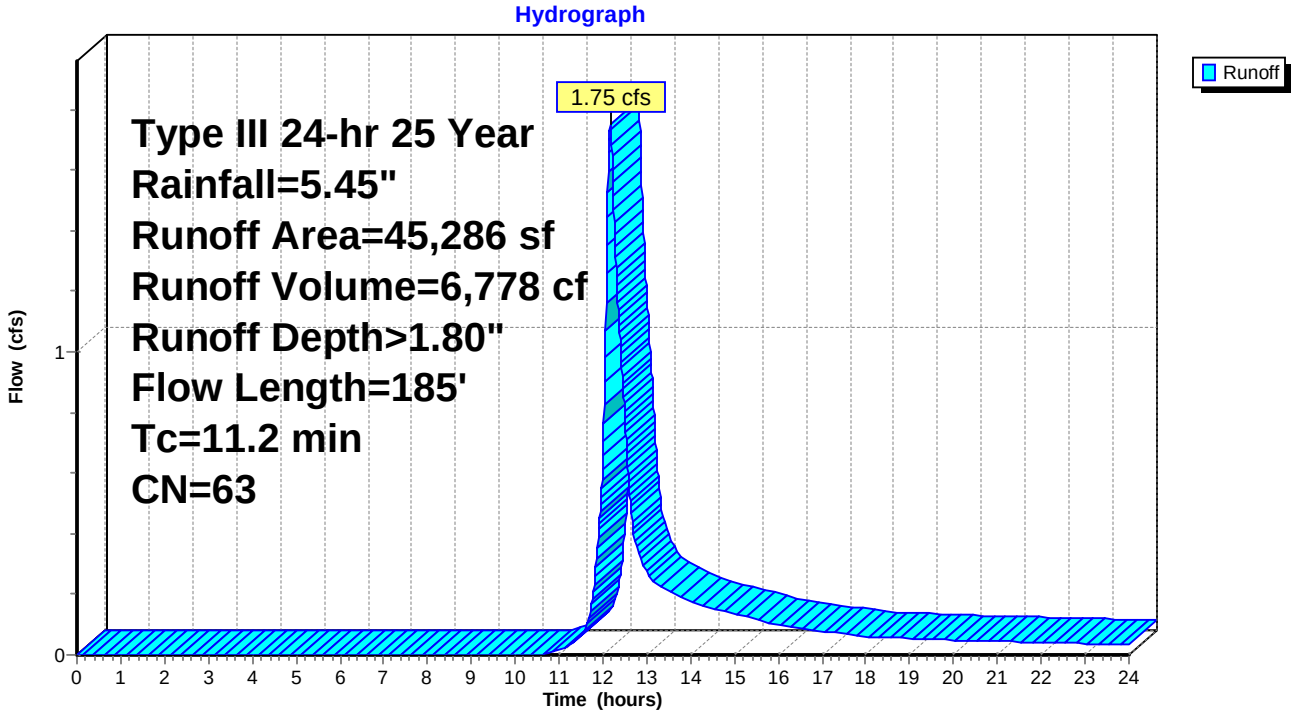
Runoff = 1.75 cfs @ 12.16 hrs, Volume= 6,778 cf, Depth> 1.80"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 Year Rainfall=5.45"

Area (sf)	CN	Description
35,546	57	Woods/grass comb., Poor, HSG A
6,132	76	Gravel roads, HSG A
3,608	98	Paved parking, HSG A
45,286	63	Weighted Average
41,678		92.03% Pervious Area
3,608		7.97% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	100	0.1200	0.16		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
0.6	85	0.2100	2.29		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
11.2	185	Total			

Subcatchment 12S: Lake Cochituate W1



Summary for Subcatchment 13S: Lake Cochituate W2

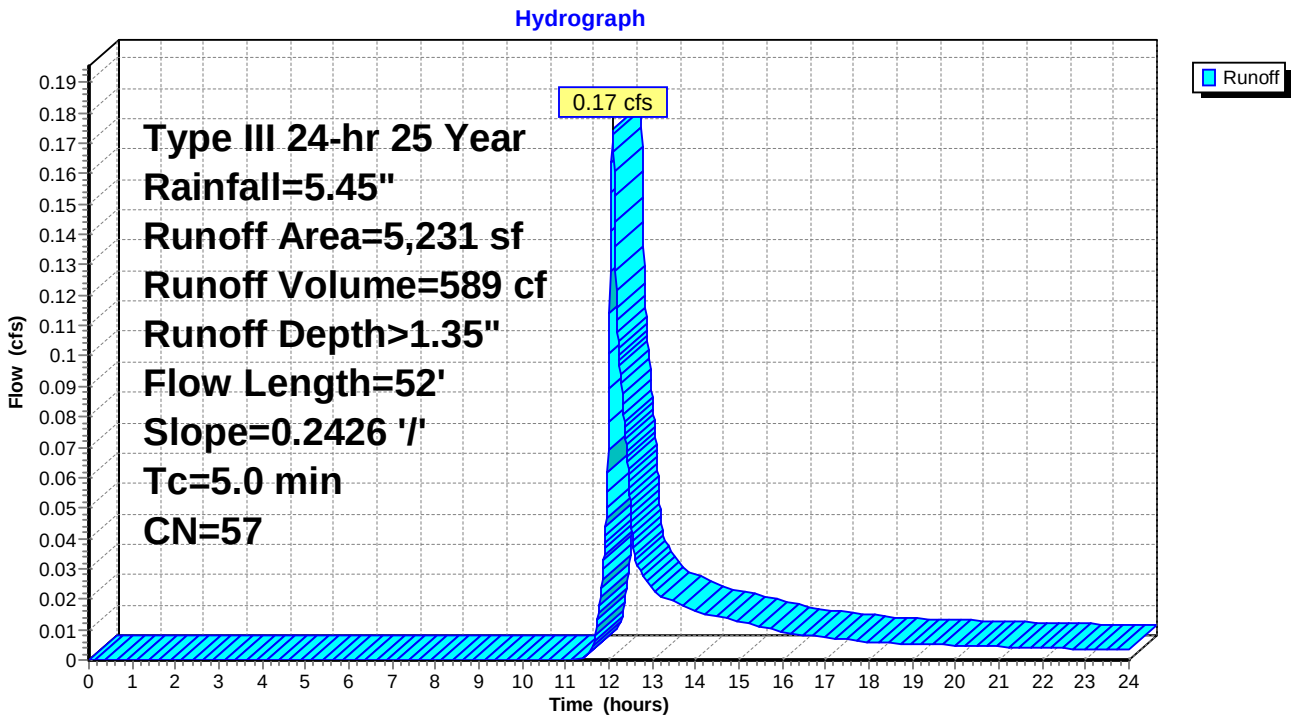
Runoff = 0.17 cfs @ 12.09 hrs, Volume= 589 cf, Depth> 1.35"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 Year Rainfall=5.45"

Area (sf)	CN	Description
5,231	57	Woods/grass comb., Poor, HSG A
5,231		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.7	52	0.2426	0.18		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
4.7	52	Total, Increased to minimum Tc = 5.0 min			

Subcatchment 13S: Lake Cochituate W2



Summary for Subcatchment 14S: Lake Cochituate W3

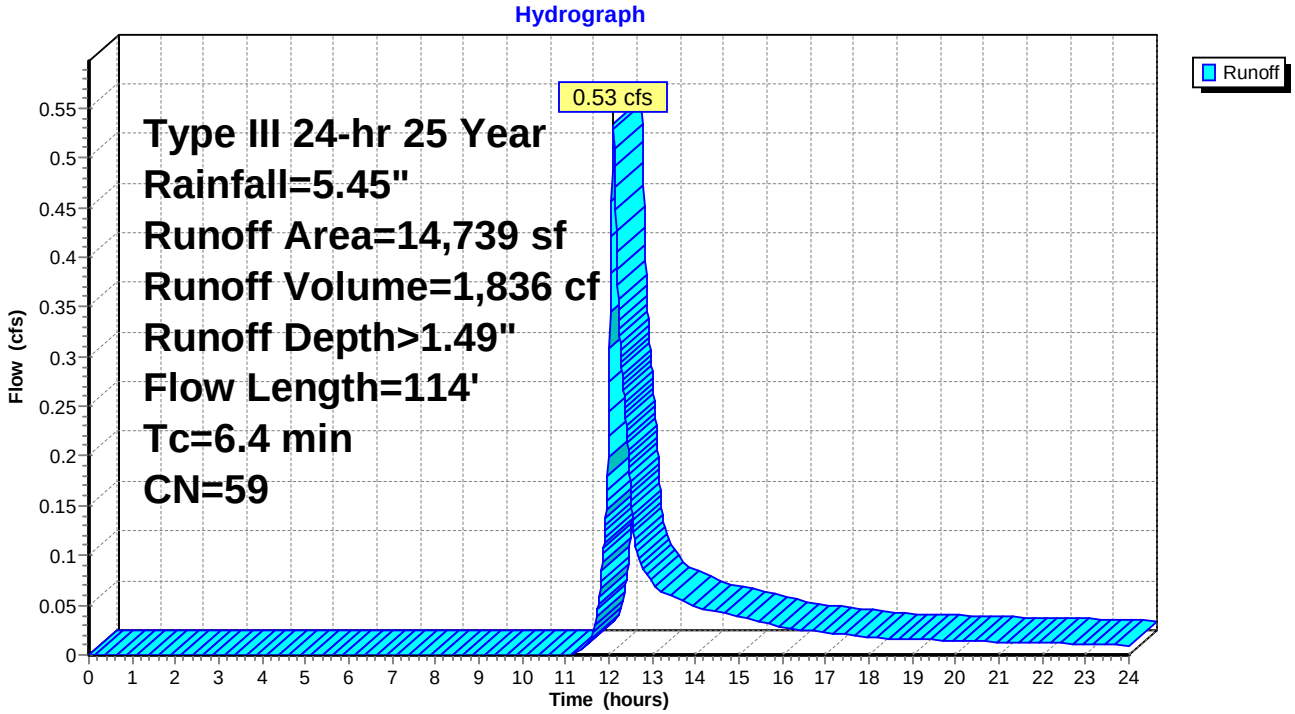
Runoff = 0.53 cfs @ 12.10 hrs, Volume= 1,836 cf, Depth> 1.49"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 Year Rainfall=5.45"

Area (sf)	CN	Description
13,168	57	Woods/grass comb., Poor, HSG A
1,571	76	Gravel roads, HSG A
14,739	59	Weighted Average
14,739		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	38	0.0132	0.95		**Sheet Flow, Gravel Path** Smooth surfaces n= 0.011 P2= 3.15"
5.6	62	0.2258	0.18		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
0.1	14	0.2500	2.50		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
6.4	114	Total			

Subcatchment 14S: Lake Cochituate W3



Summary for Subcatchment 15S: Lake Cochituate W4

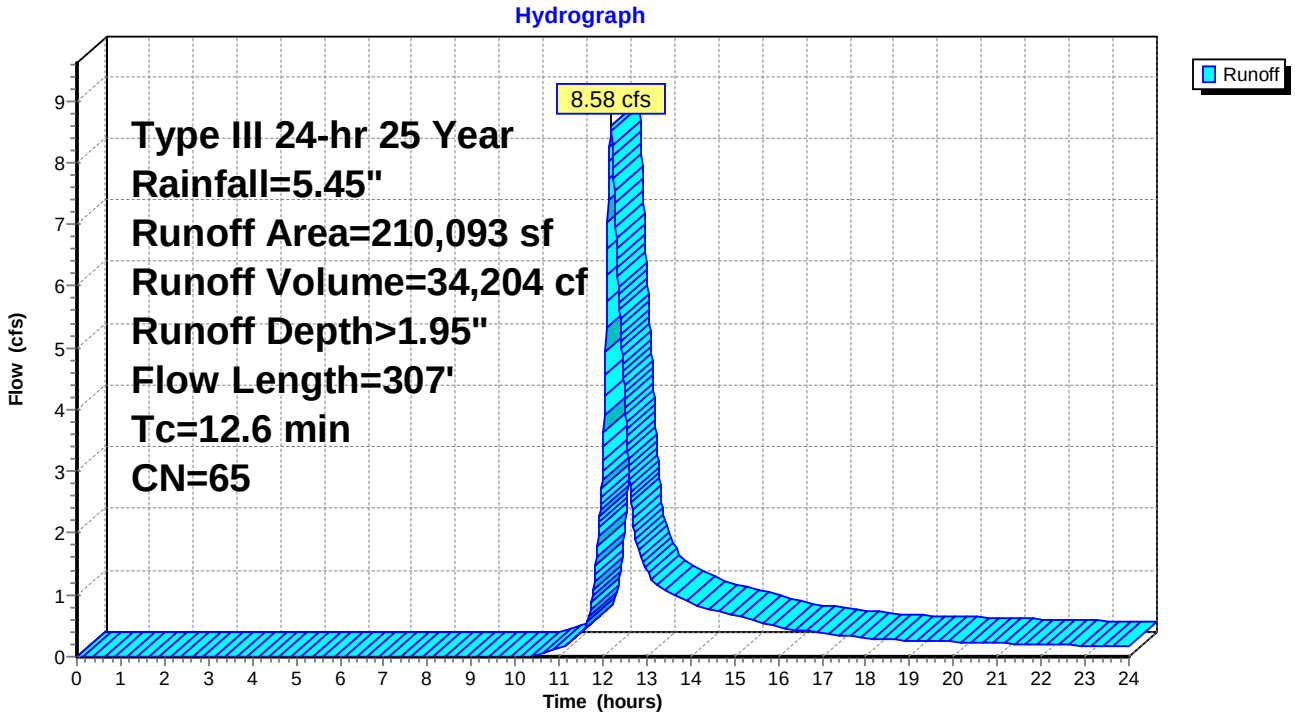
Runoff = 8.58 cfs @ 12.18 hrs, Volume= 34,204 cf, Depth> 1.95"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 Year Rainfall=5.45"

Area (sf)	CN	Description
166,247	57	Woods/grass comb., Poor, HSG A
4,427	76	Gravel roads, HSG A
39,419	98	Paved parking, HSG A
210,093	65	Weighted Average
170,674		81.24% Pervious Area
39,419		18.76% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	10	0.0050	0.49		**Sheet Flow, Gravel Path** Smooth surfaces n= 0.011 P2= 3.15"
9.0	90	0.1444	0.17		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
3.3	207	0.0431	1.04		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
12.6	307	Total			

Subcatchment 15S: Lake Cochituate W4



Summary for Subcatchment 16S: Worcester St N

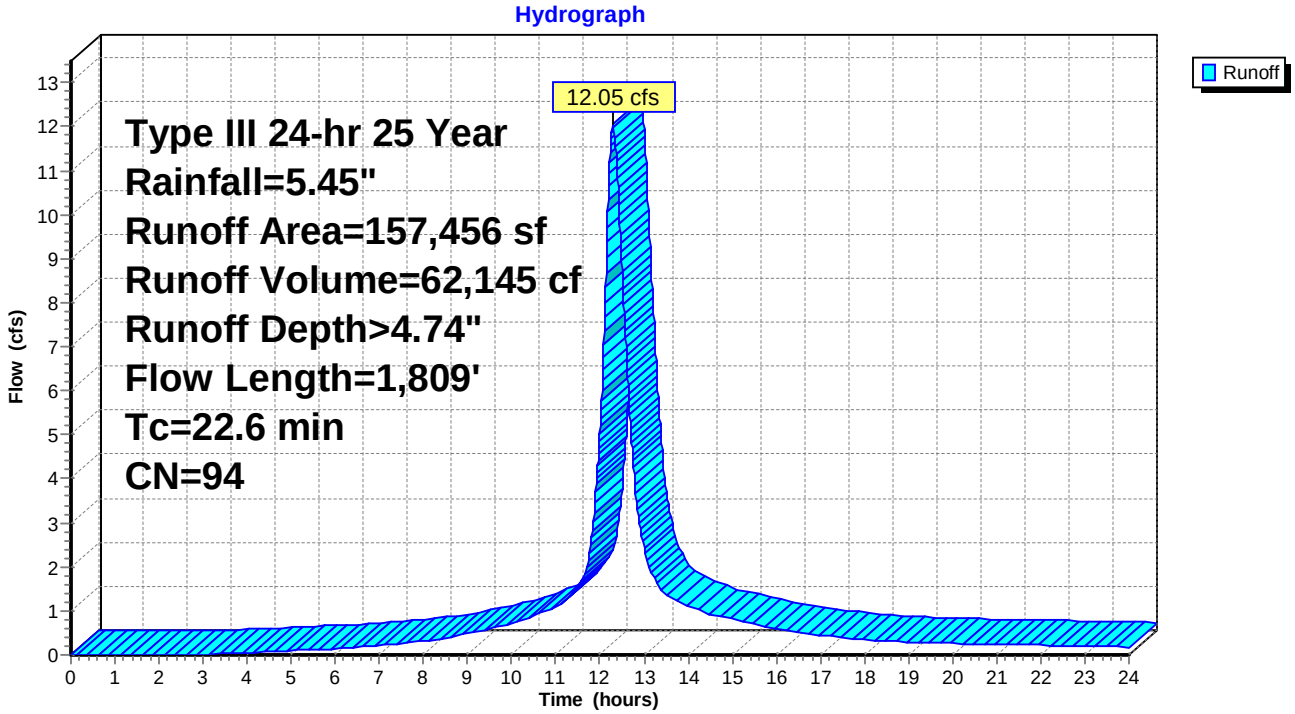
Runoff = 12.05 cfs @ 12.29 hrs, Volume= 62,145 cf, Depth> 4.74"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 Year Rainfall=5.45"

Area (sf)	CN	Description
68,655	89	Urban commercial, 85% imp, HSG A
648	76	Gravel roads, HSG A
88,153	98	Paved roads w/curbs & sewers, HSG A
157,456	94	Weighted Average
10,946		6.95% Pervious Area
146,510		93.05% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.0	100	0.0100	0.13		**Sheet Flow, Yards** Grass: Short n= 0.150 P2= 3.15"
9.6	1,709	0.0214	2.97		**Shallow Concentrated Flow, Road** Paved Kv= 20.3 fps
22.6	1,809	Total			

Subcatchment 16S: Worcester St N



Summary for Subcatchment 17S: Worcester St S

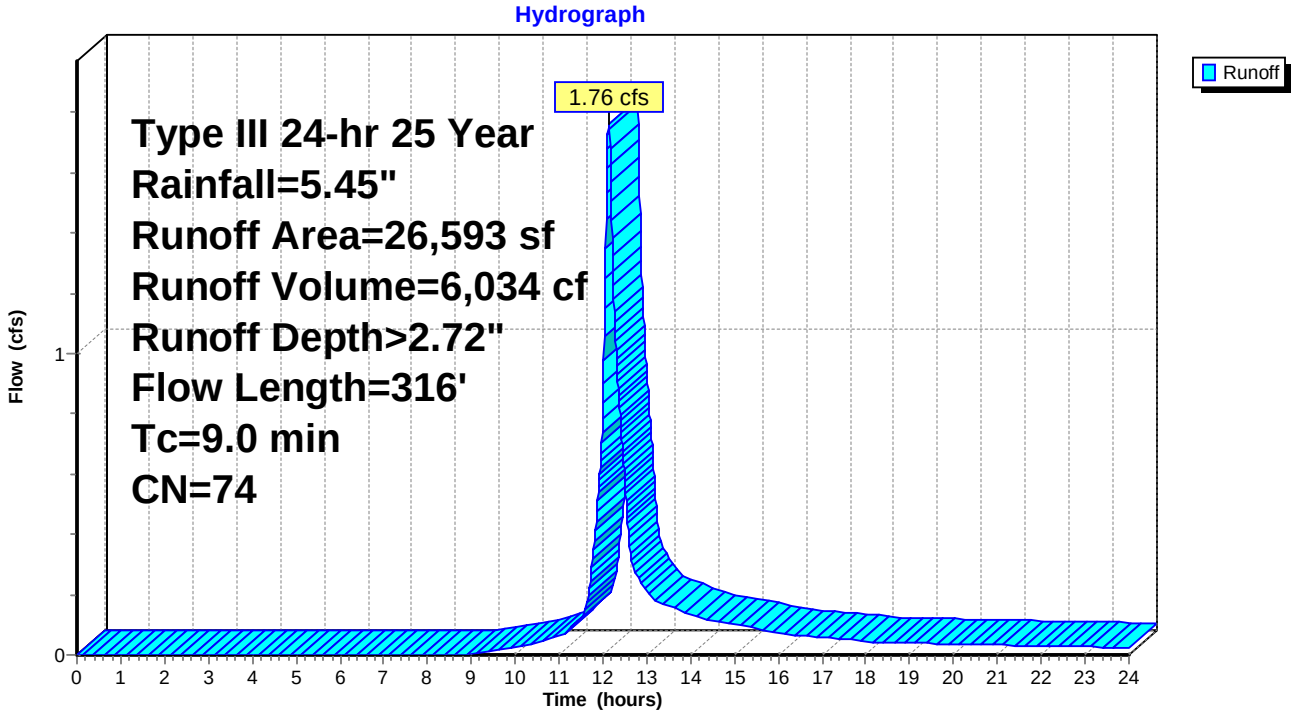
Runoff = 1.76 cfs @ 12.13 hrs, Volume= 6,034 cf, Depth> 2.72"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 Year Rainfall=5.45"

Area (sf)	CN	Description
15,358	57	Woods/grass comb., Poor, HSG A
10,499	98	Paved parking, HSG A
736	76	Gravel roads, HSG A
26,593	74	Weighted Average
16,094		60.52% Pervious Area
10,499		39.48% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.3	90	0.2444	0.21		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
1.7	226	0.0115	2.18		**Shallow Concentrated Flow, Road** Paved Kv= 20.3 fps
9.0	316	Total			

Subcatchment 17S: Worcester St S



Summary for Subcatchment 18S: Arcadi Rd

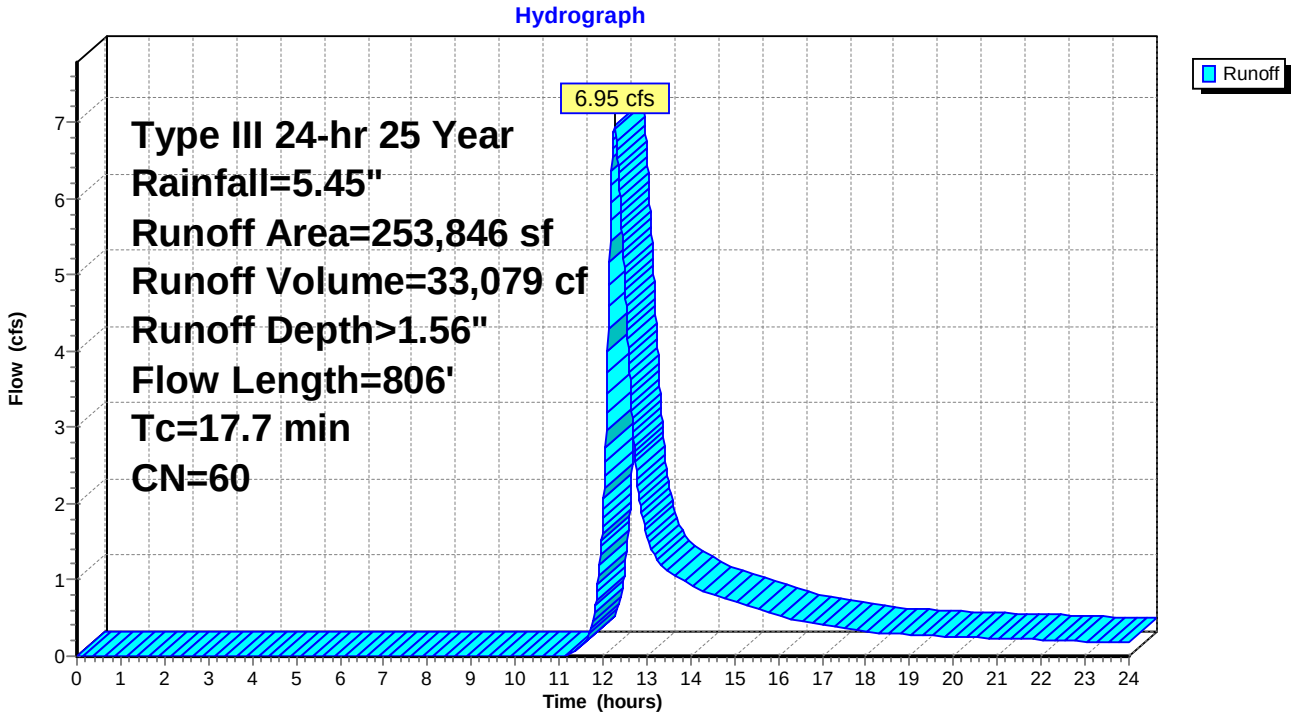
Runoff = 6.95 cfs @ 12.27 hrs, Volume= 33,079 cf, Depth> 1.56"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 Year Rainfall=5.45"

Area (sf)	CN	Description
24,868	76	Gravel roads, HSG A
1,306	98	Paved parking, HSG A
145,254	57	Woods/grass comb., Poor, HSG A
82,418	61	1/4 acre lots, 38% imp, HSG A
253,846	60	Weighted Average
221,221		87.15% Pervious Area
32,625		12.85% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.1	55	0.3853	0.22		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
12.5	625	0.0027	0.84		**Shallow Concentrated Flow, Gravel** Unpaved Kv= 16.1 fps
1.1	126	0.1433	1.89		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
17.7	806	Total			

Subcatchment 18S: Arcadi Rd



Summary for Subcatchment 19S: Fisher St

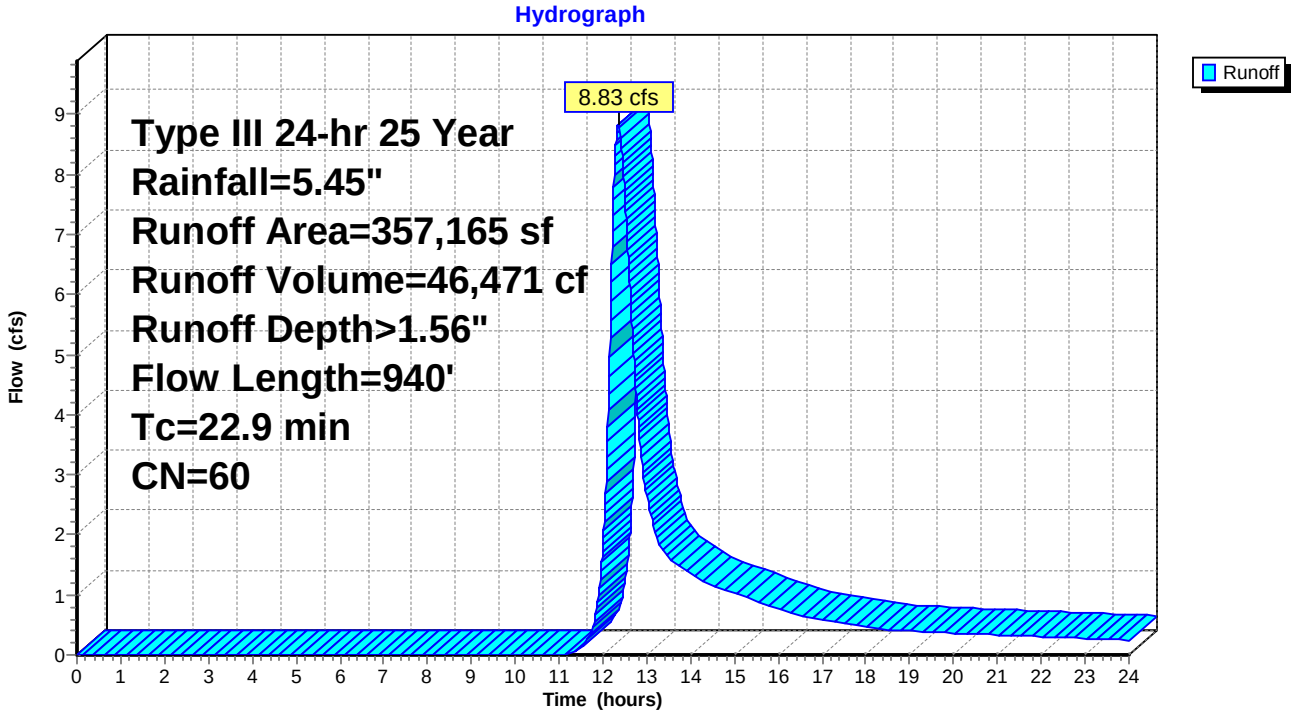
Runoff = 8.83 cfs @ 12.34 hrs, Volume= 46,471 cf, Depth> 1.56"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 Year Rainfall=5.45"

Area (sf)	CN	Description
193,343	61	1/4 acre lots, 38% imp, HSG A
19,772	76	Gravel roads, HSG A
144,050	57	Woods/grass comb., Poor, HSG A
357,165	60	Weighted Average
283,695		79.43% Pervious Area
73,470		20.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.6	100	0.0550	0.25		**Sheet Flow, Yards** Grass: Short n= 0.150 P2= 3.15"
0.5	30	0.0250	1.11		**Shallow Concentrated Flow, Yards** Short Grass Pasture Kv= 7.0 fps
3.0	38	0.4079	0.21		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
12.6	749	0.0038	0.99		**Shallow Concentrated Flow, Gravel Path** Unpaved Kv= 16.1 fps
0.2	23	0.1609	2.01		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
22.9	940	Total			

Subcatchment 19S: Fisher St



Summary for Subcatchment 20S: Unnamed Pond 1

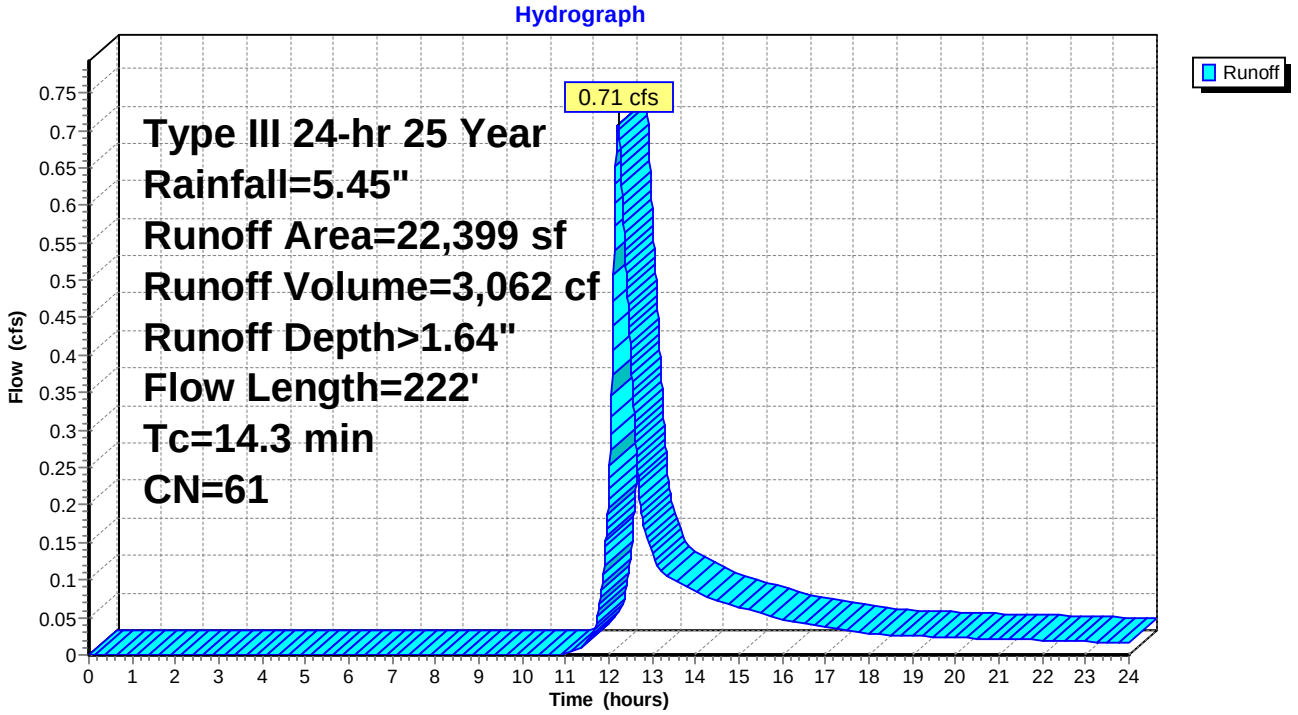
Runoff = 0.71 cfs @ 12.22 hrs, Volume= 3,062 cf, Depth> 1.64"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 Year Rainfall=5.45"

Area (sf)	CN	Description
1,842	61	1/4 acre lots, 38% imp, HSG A
1,190	98	Paved parking, HSG A
2,043	76	Gravel roads, HSG A
17,324	57	Woods/grass comb., Poor, HSG A
22,399	61	Weighted Average
20,509		91.56% Pervious Area
1,890		8.44% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	24	0.0154	0.92		**Sheet Flow, Driveway**
					Smooth surfaces n= 0.011 P2= 3.15"
1.9	16	0.0312	0.14		**Sheet Flow, Yards**
					Grass: Short n= 0.150 P2= 3.15"
10.4	60	0.0450	0.10		**Sheet Flow, Woods**
					Woods: Light underbrush n= 0.400 P2= 3.15"
1.6	122	0.0639	1.26		**Shallow Concentrated Flow, Woods**
					Woodland Kv= 5.0 fps
14.3	222	Total			

Subcatchment 20S: Unnamed Pond 1



Summary for Subcatchment 21S: Unnamed Pond 2

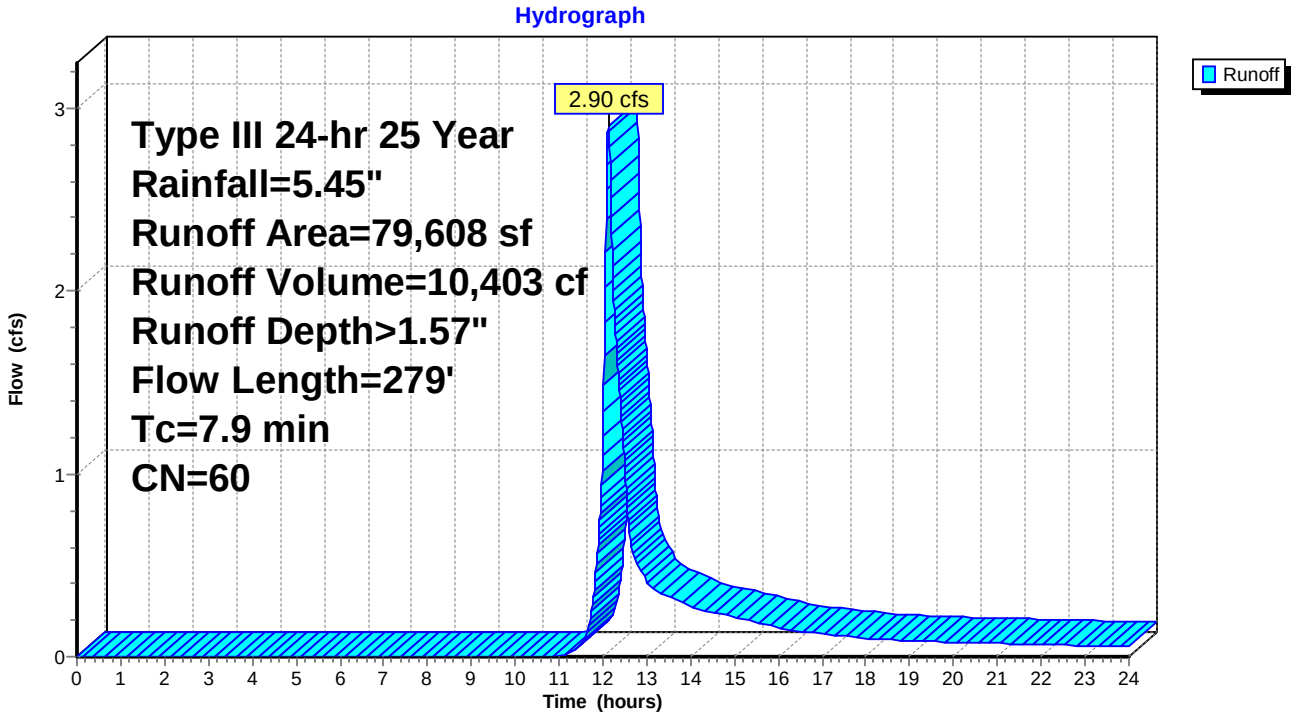
Runoff = 2.90 cfs @ 12.12 hrs, Volume= 10,403 cf, Depth> 1.57"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 Year Rainfall=5.45"

Area (sf)	CN	Description
51,542	61	1/4 acre lots, 38% imp, HSG A
3,537	76	Gravel roads, HSG A
24,529	57	Woods/grass comb., Poor, HSG A
79,608	60	Weighted Average
60,022		75.40% Pervious Area
19,586		24.60% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.7	100	0.0800	0.29		**Sheet Flow, Yards** Grass: Short n= 0.150 P2= 3.15"
1.3	105	0.0381	1.37		**Shallow Concentrated Flow, Yards** Short Grass Pasture Kv= 7.0 fps
0.9	74	0.0724	1.35		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
7.9	279	Total			

Subcatchment 21S: Unnamed Pond 2



Summary for Subcatchment 22S: Unnamed Pond 3

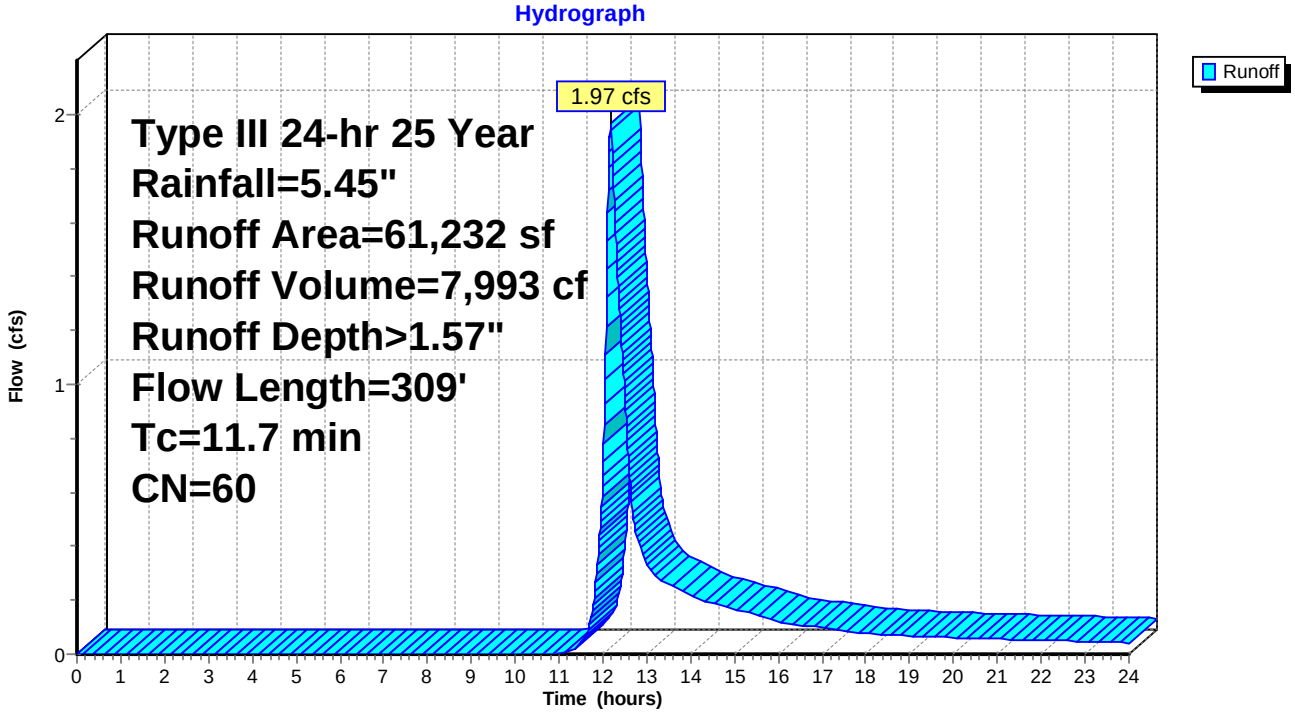
Runoff = 1.97 cfs @ 12.18 hrs, Volume= 7,993 cf, Depth> 1.57"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 Year Rainfall=5.45"

Area (sf)	CN	Description
27,651	61	1/4 acre lots, 38% imp, HSG A
2,864	76	Gravel roads, HSG A
119	98	Paved parking, HSG A
30,598	57	Woods/grass comb., Poor, HSG A
61,232	60	Weighted Average
50,606		82.65% Pervious Area
10,626		17.35% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.2	100	0.0320	0.20		**Sheet Flow, Grass** Grass: Short n= 0.150 P2= 3.15"
3.5	209	0.0400	1.00		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
11.7	309	Total			

Subcatchment 22S: Unnamed Pond 3



Summary for Subcatchment 23S: Unnamed Pond 4

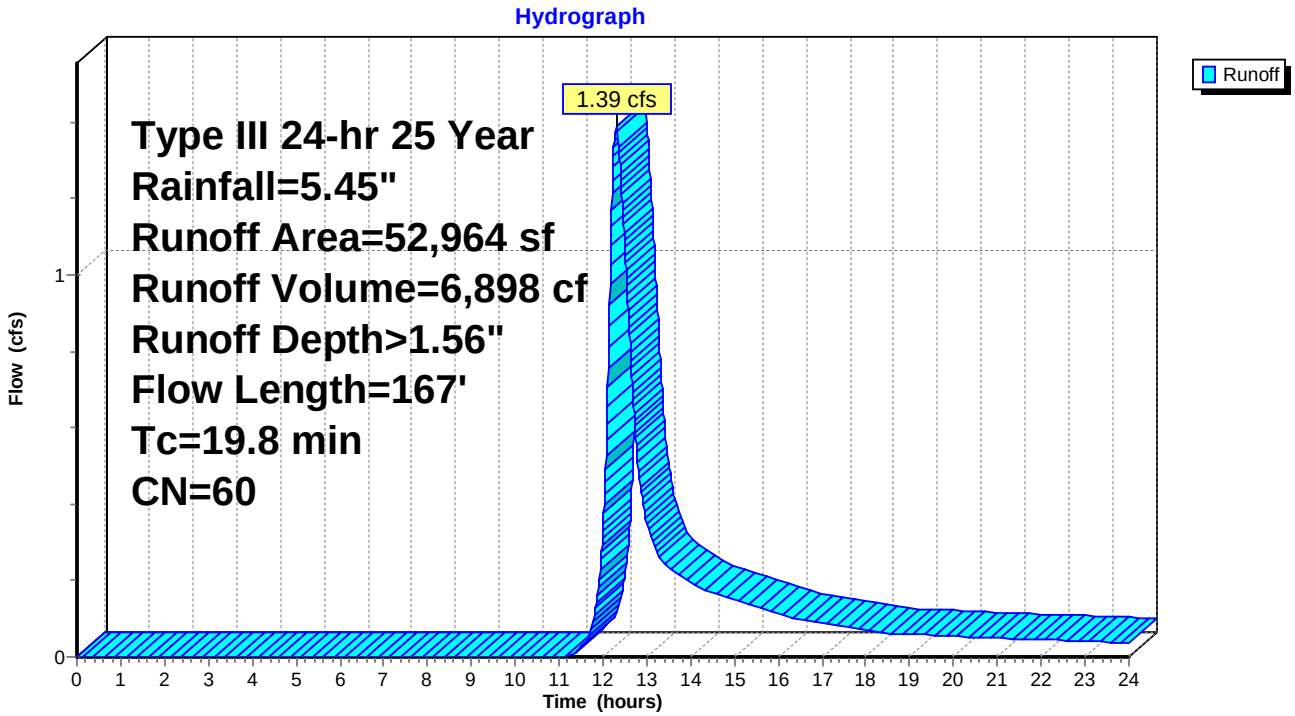
Runoff = 1.39 cfs @ 12.30 hrs, Volume= 6,898 cf, Depth> 1.56"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 Year Rainfall=5.45"

Area (sf)	CN	Description
44,170	57	Woods/grass comb., Poor, HSG A
7,994	76	Gravel roads, HSG A
800	98	Paved parking, HSG A
52,964	60	Weighted Average
52,164		98.49% Pervious Area
800		1.51% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.9	100	0.1100	0.15		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
8.9	67	0.0821	0.13		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
19.8	167	Total			

Subcatchment 23S: Unnamed Pond 4



Summary for Subcatchment 24S: Kansas St

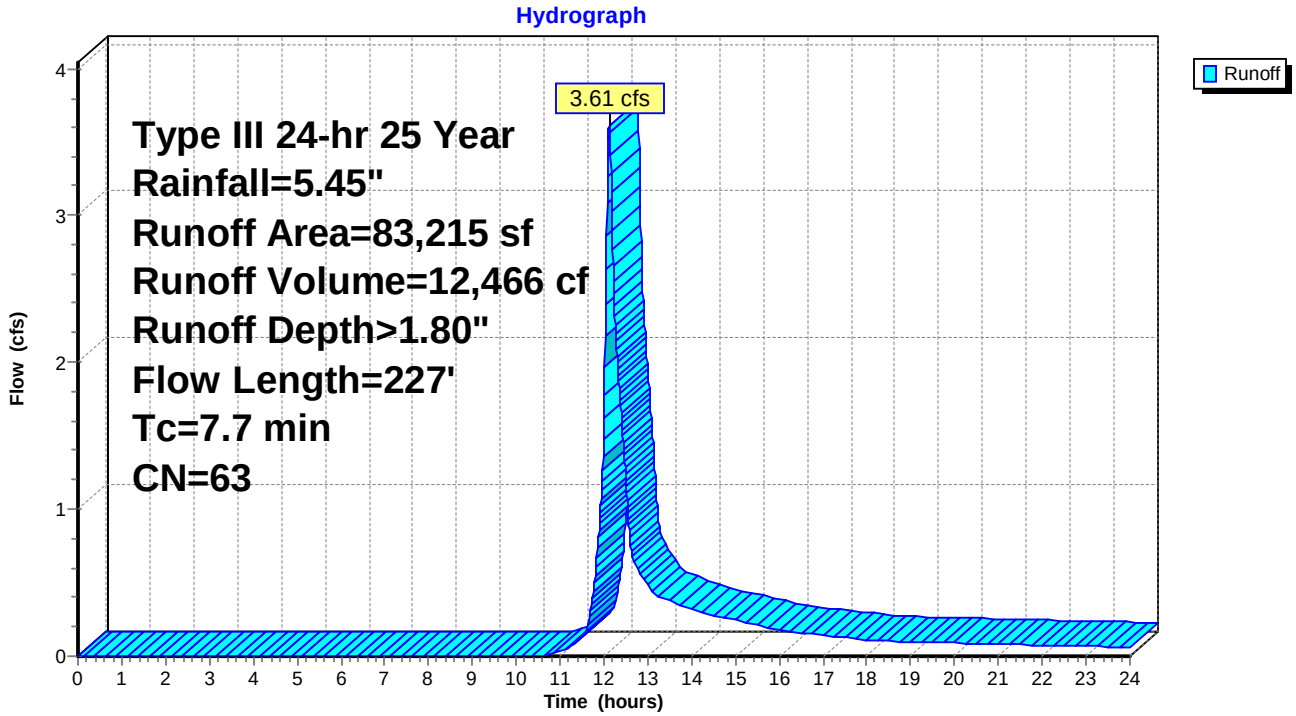
Runoff = 3.61 cfs @ 12.12 hrs, Volume= 12,466 cf, Depth> 1.80"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 Year Rainfall=5.45"

Area (sf)	CN	Description
20,750	61	1/4 acre lots, 38% imp, HSG A
7,064	76	Gravel roads, HSG A
6,960	98	Paved parking, HSG A
48,441	57	Woods/grass comb., Poor, HSG A
83,215	63	Weighted Average
68,370		82.16% Pervious Area
14,845		17.84% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.5	100	0.0575	0.26		**Sheet Flow, Yards** Grass: Short n= 0.150 P2= 3.15"
0.9	89	0.0590	1.70		**Shallow Concentrated Flow, Yards** Short Grass Pasture Kv= 7.0 fps
0.3	38	0.1974	2.22		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
7.7	227	Total			

Subcatchment 24S: Kansas St



Summary for Subcatchment 25S: North Main @ Kansas

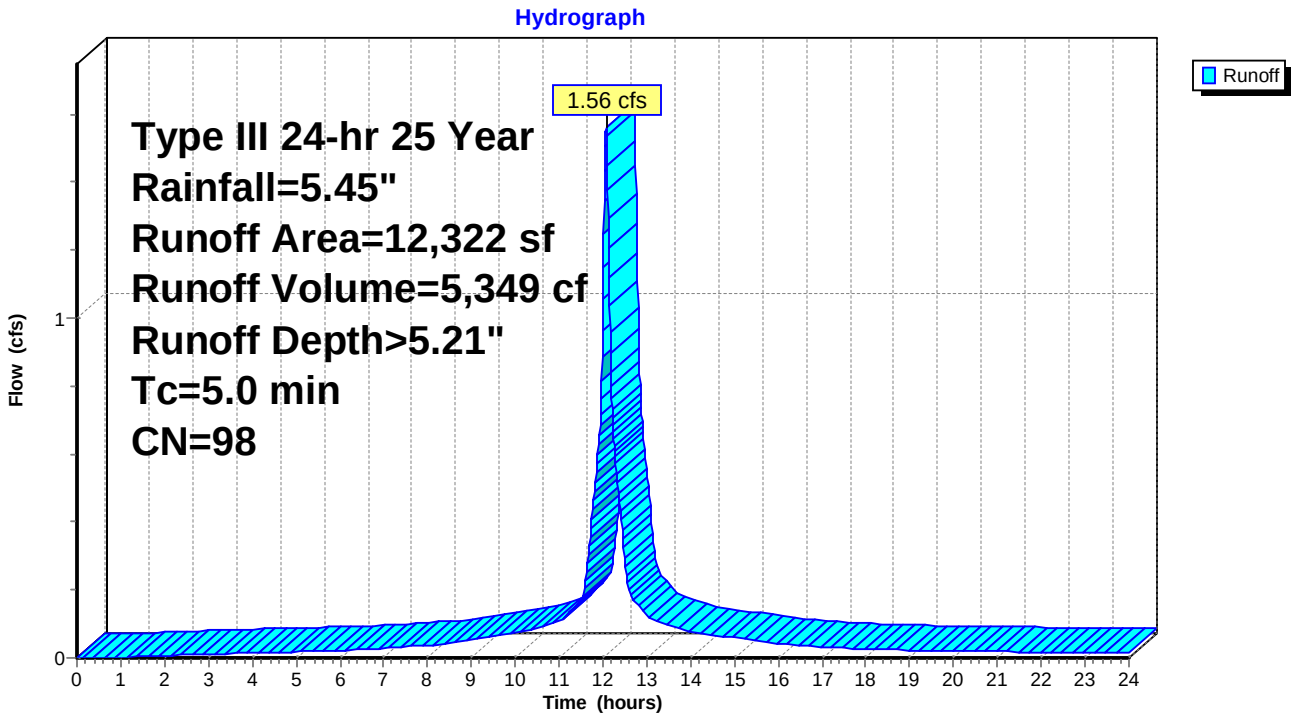
Runoff = 1.56 cfs @ 12.07 hrs, Volume= 5,349 cf, Depth> 5.21"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 Year Rainfall=5.45"

Area (sf)	CN	Description
12,322	98	Paved roads w/curbs & sewers, HSG A
12,322		100.00% Impervious Area

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

Subcatchment 25S: North Main @ Kansas



Summary for Subcatchment 26S: Empty Lot

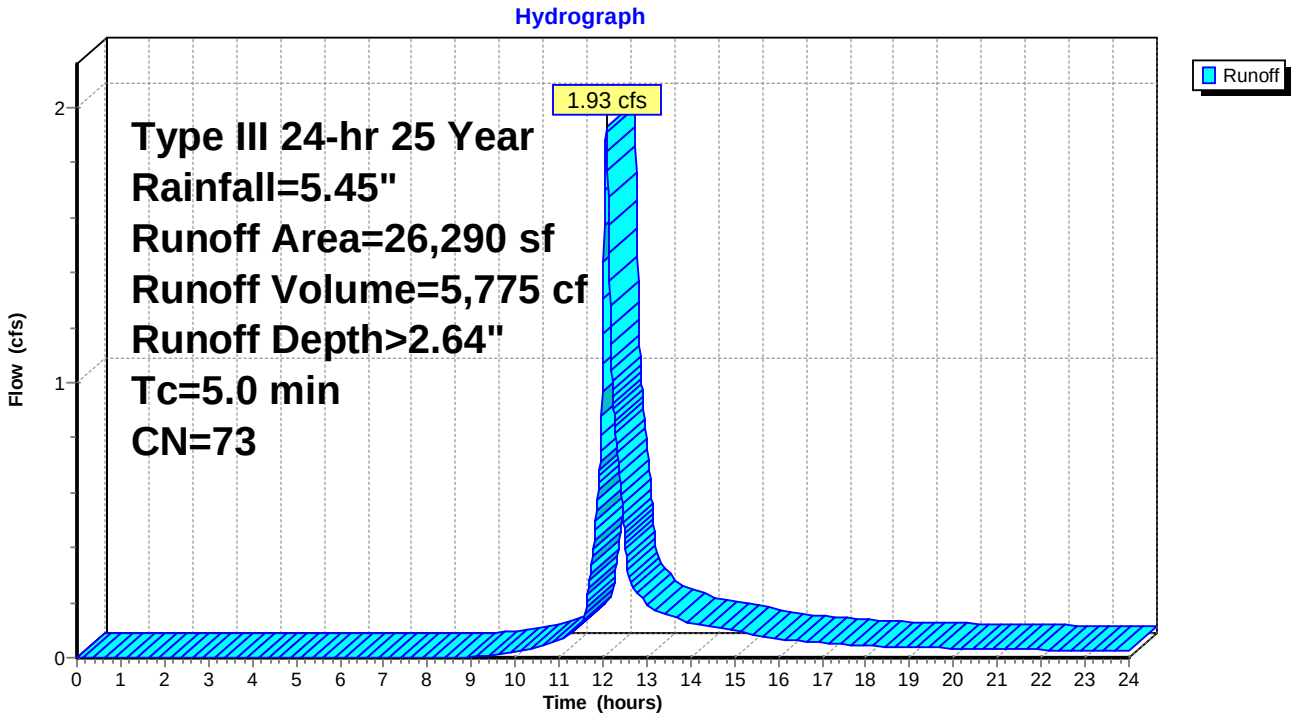
Runoff = 1.93 cfs @ 12.08 hrs, Volume= 5,775 cf, Depth> 2.64"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 Year Rainfall=5.45"

Area (sf)	CN	Description
18,679	72	Dirt roads, HSG A
7,611	76	Gravel roads, HSG A
26,290	73	Weighted Average
26,290		100.00% Pervious Area

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

Subcatchment 26S: Empty Lot



Summary for Subcatchment 27S: Washington Ave 1

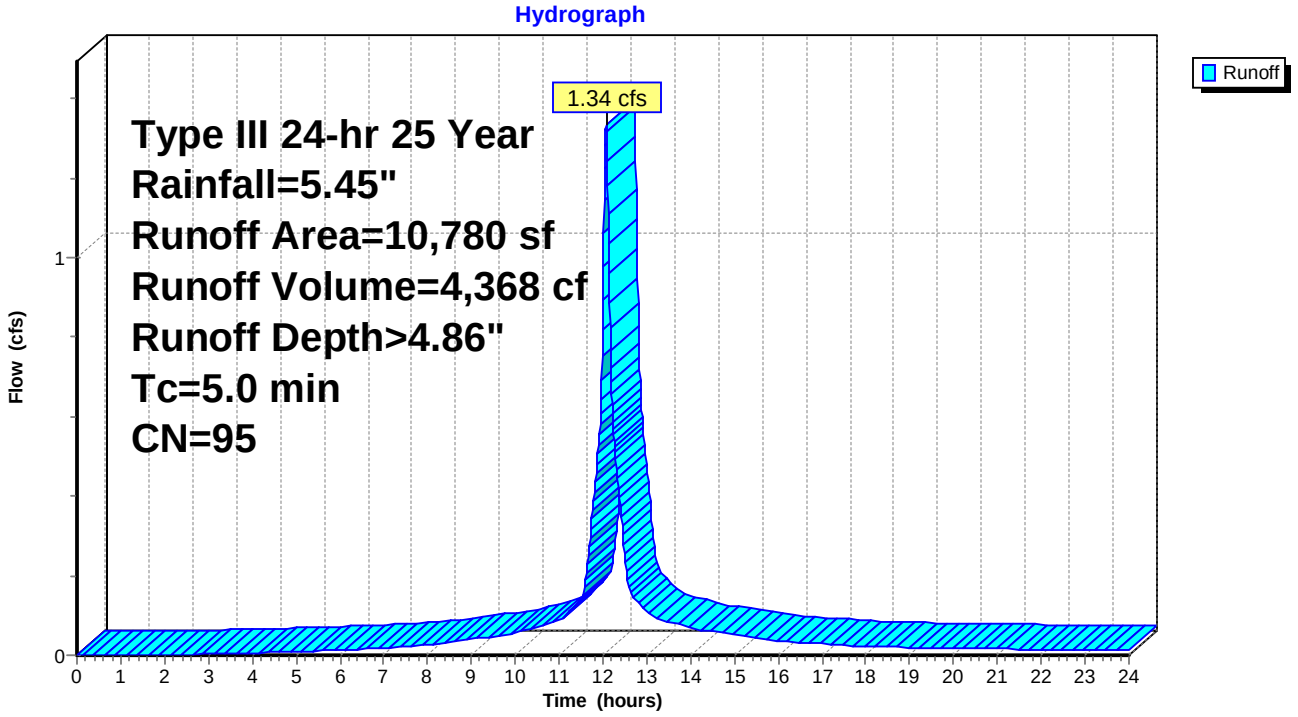
Runoff = 1.34 cfs @ 12.07 hrs, Volume= 4,368 cf, Depth> 4.86"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 Year Rainfall=5.45"

Area (sf)	CN	Description
1,673	76	Gravel roads, HSG A
9,107	98	Paved parking, HSG A
10,780	95	Weighted Average
1,673		15.52% Pervious Area
9,107		84.48% Impervious Area

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

Subcatchment 27S: Washington Ave 1



Summary for Subcatchment 28S: Washington Ave 2

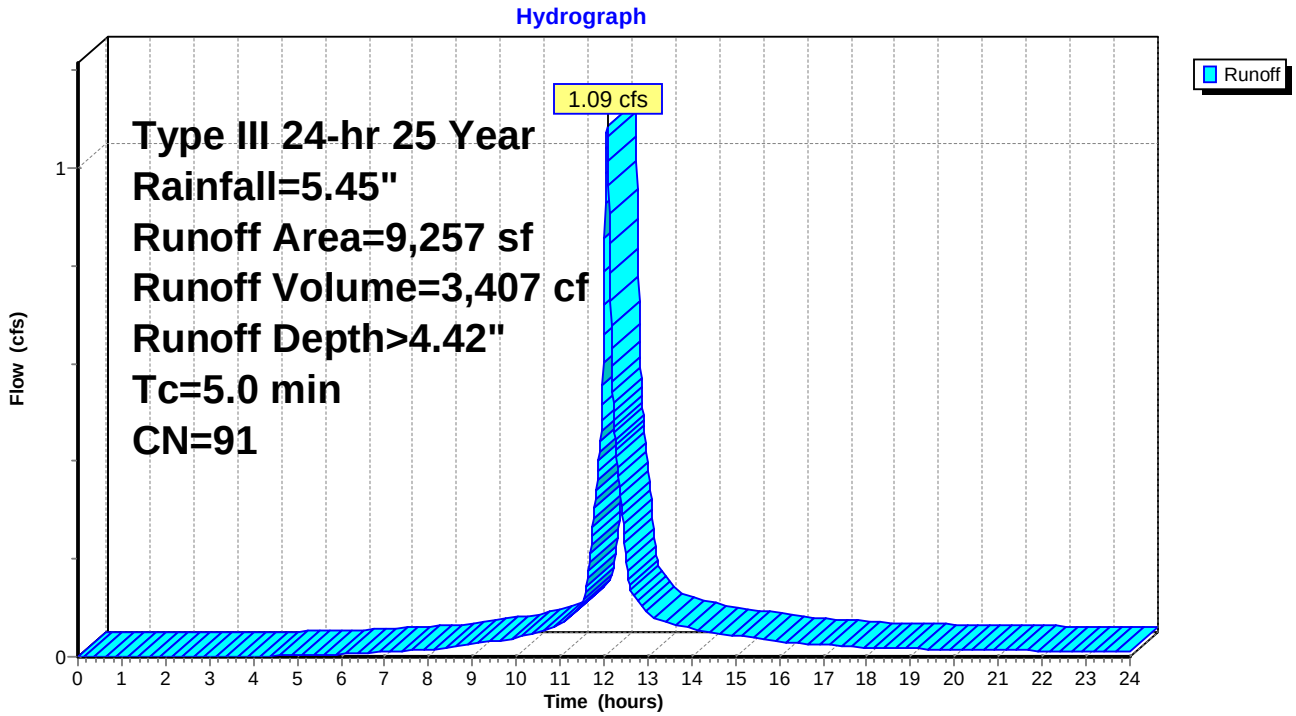
Runoff = 1.09 cfs @ 12.07 hrs, Volume= 3,407 cf, Depth> 4.42"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 Year Rainfall=5.45"

Area (sf)	CN	Description
3,039	76	Gravel roads, HSG A
6,175	98	Paved parking, HSG A
43	72	Dirt roads, HSG A
9,257	91	Weighted Average
3,082		33.29% Pervious Area
6,175		66.71% Impervious Area

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

Subcatchment 28S: Washington Ave 2



Summary for Subcatchment 29S: Washington Ave 3

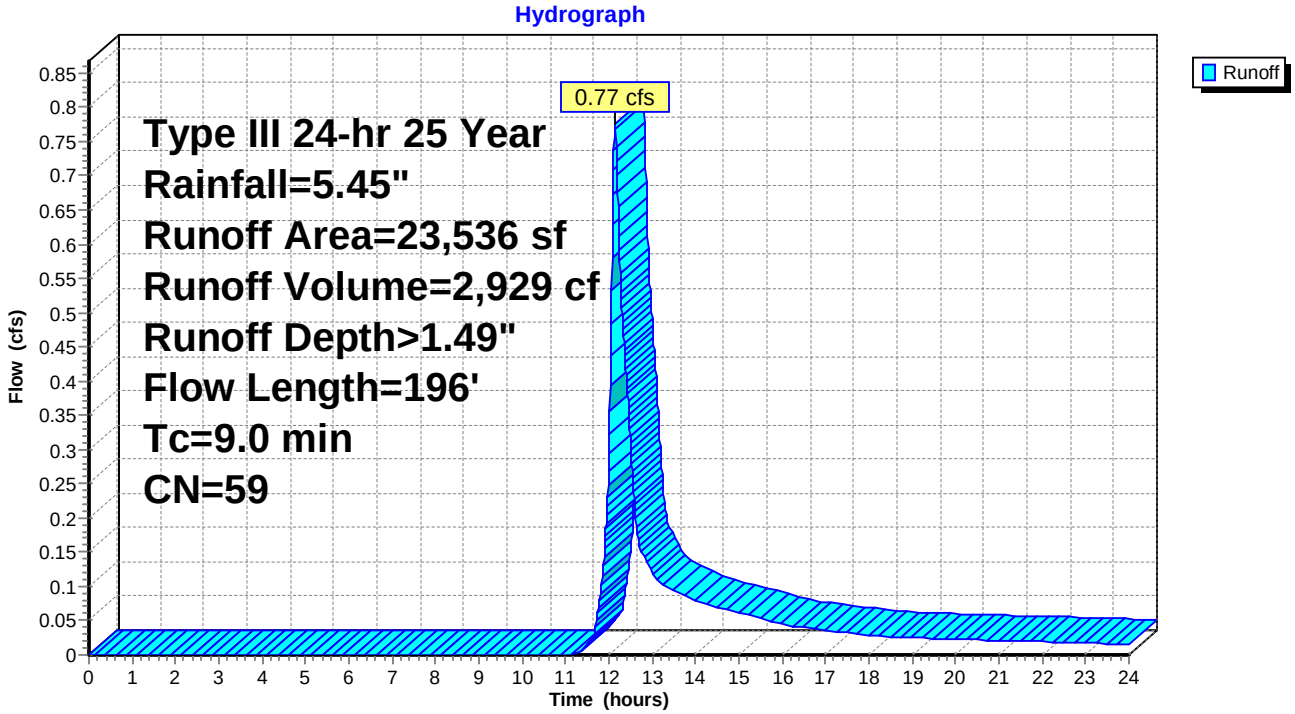
Runoff = 0.77 cfs @ 12.14 hrs, Volume= 2,929 cf, Depth> 1.49"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 Year Rainfall=5.45"

Area (sf)	CN	Description
19,229	61	1/4 acre lots, 38% imp, HSG A
621	76	Gravel roads, HSG A
3,686	45	Woods, Poor, HSG A
23,536	59	Weighted Average
16,229		68.95% Pervious Area
7,307		31.05% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	100	0.0350	0.21		**Sheet Flow, Yards** Grass: Short n= 0.150 P2= 3.15"
1.1	96	0.0427	1.45		**Shallow Concentrated Flow, Yards** Short Grass Pasture Kv= 7.0 fps
9.0	196	Total			

Subcatchment 29S: Washington Ave 3



Summary for Subcatchment 30S: Lagrange St

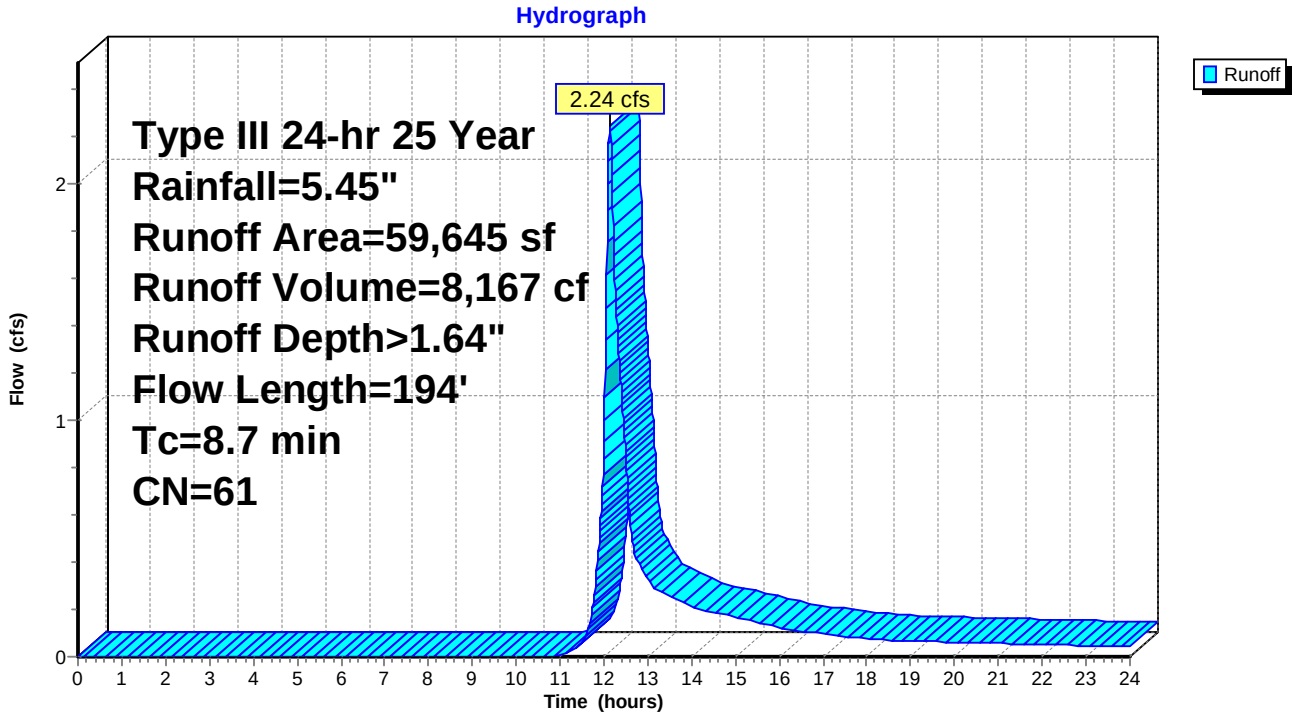
Runoff = 2.24 cfs @ 12.13 hrs, Volume= 8,167 cf, Depth> 1.64"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 Year Rainfall=5.45"

Area (sf)	CN	Description
49,221	61	1/4 acre lots, 38% imp, HSG A
686	76	Gravel roads, HSG A
9,738	57	Woods/grass comb., Poor, HSG A
59,645	61	Weighted Average
40,941		68.64% Pervious Area
18,704		31.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.1	100	0.0450	0.23		**Sheet Flow, Yards** Grass: Short n= 0.150 P2= 3.15"
0.9	53	0.0189	0.96		**Shallow Concentrated Flow, Yards** Short Grass Pasture Kv= 7.0 fps
0.7	41	0.0366	0.96		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
8.7	194	Total			

Subcatchment 30S: Lagrange St



Summary for Subcatchment 31S: Mechanic St

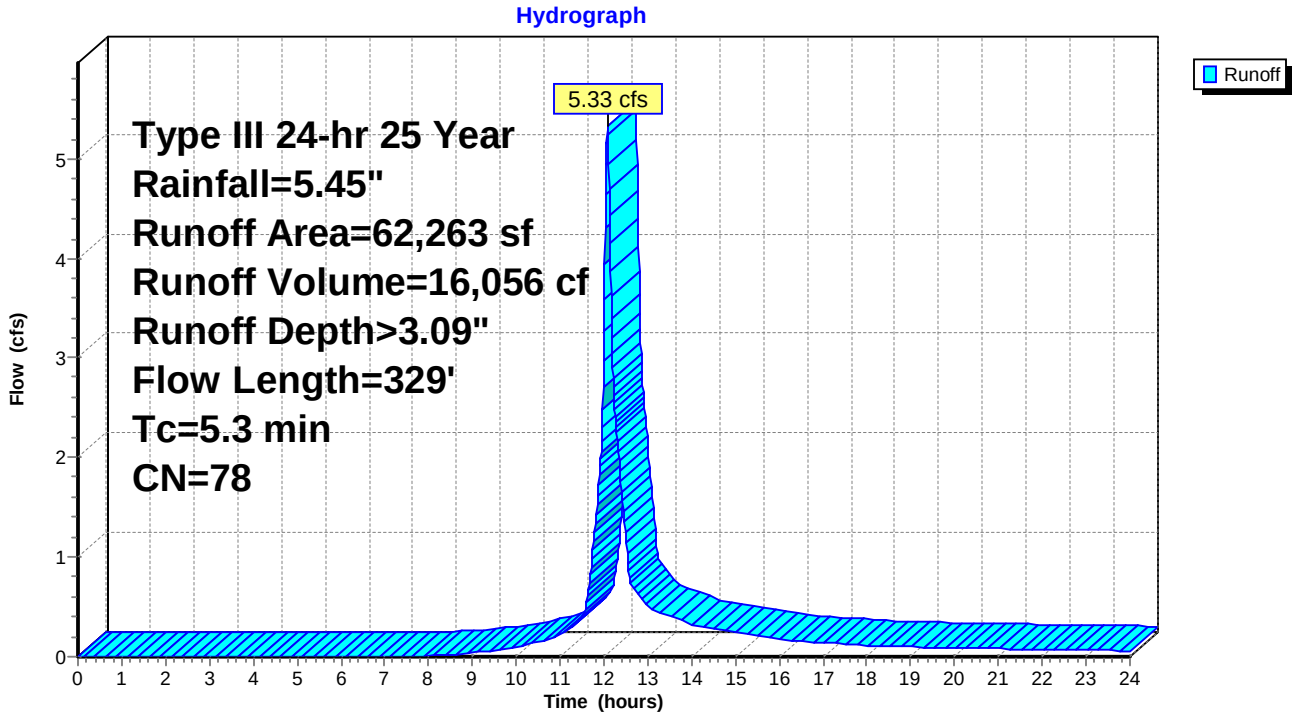
Runoff = 5.33 cfs @ 12.08 hrs, Volume= 16,056 cf, Depth> 3.09"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 Year Rainfall=5.45"

Area (sf)	CN	Description
40,274	81	Urban industrial, 72% imp, HSG A
8,476	76	Gravel roads, HSG A
2,503	98	Paved parking, HSG A
6,188	57	Woods/grass comb., Poor, HSG A
4,822	68	<50% Grass cover, Poor, HSG A
62,263	78	Weighted Average
30,763		49.41% Pervious Area
31,500		50.59% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	100	0.0150	1.22		**Sheet Flow, Road** Smooth surfaces n= 0.011 P2= 3.15"
3.9	229	0.0037	0.98		**Shallow Concentrated Flow, Gravel Path** Unpaved Kv= 16.1 fps
5.3	329	Total			

Subcatchment 31S: Mechanic St



Summary for Subcatchment 32S: Cochituate St 1

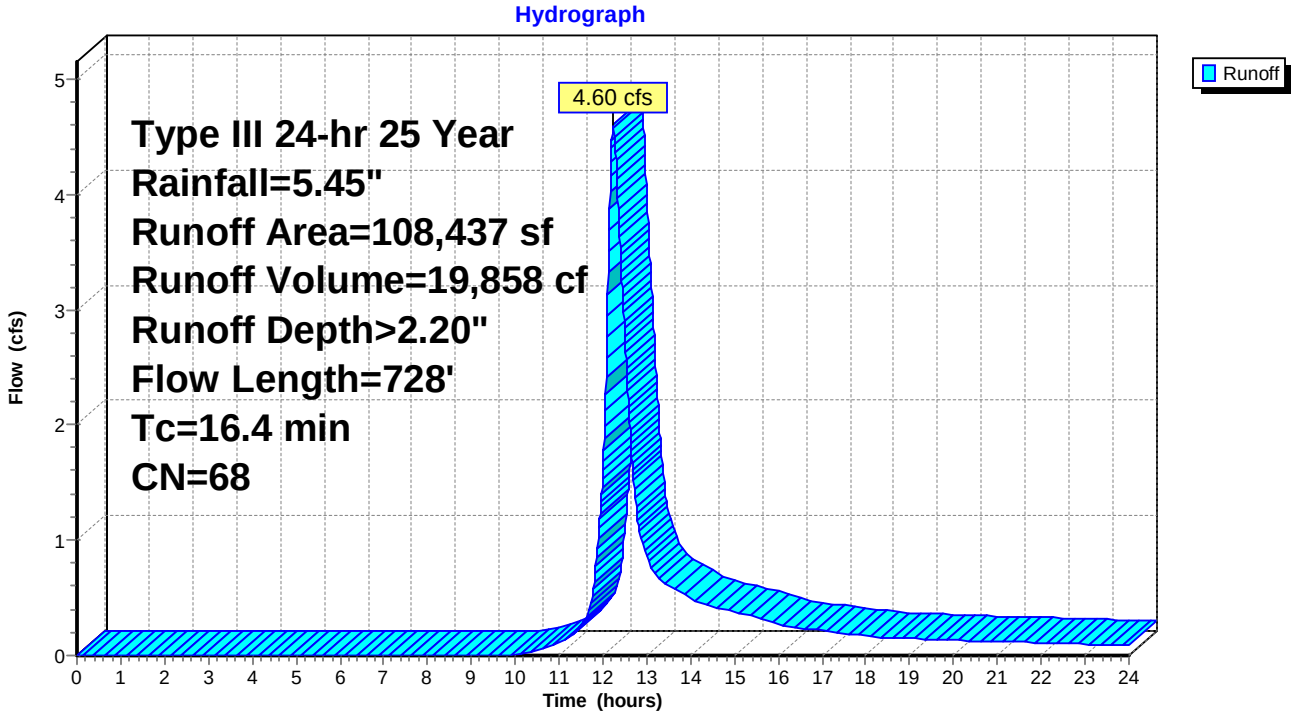
Runoff = 4.60 cfs @ 12.23 hrs, Volume= 19,858 cf, Depth> 2.20"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 Year Rainfall=5.45"

Area (sf)	CN	Description
12,744	81	Urban industrial, 72% imp, HSG A
15,529	76	Gravel roads, HSG A
30,613	57	Woods/grass comb., Poor, HSG A
11,315	98	Paved parking, HSG A
38,236	61	1/4 acre lots, 38% imp, HSG A
108,437	68	Weighted Average
73,417		67.70% Pervious Area
35,020		32.30% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.4	75	0.0333	0.20		**Sheet Flow, Yards** Grass: Short n= 0.150 P2= 3.15"
1.9	25	0.5200	0.21		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
8.1	628	0.0064	1.29		**Shallow Concentrated Flow, Gravel Path** Unpaved Kv= 16.1 fps
16.4	728	Total			

Subcatchment 32S: Cochituate St 1



Summary for Pond 01P: Speen St Detention

Inflow Area = 28,640 sf, 6.23% Impervious, Inflow Depth > 2.12" for 25 Year event
Inflow = 1.32 cfs @ 12.17 hrs, Volume= 5,053 cf
Outflow = 1.32 cfs @ 12.17 hrs, Volume= 5,050 cf, Atten= 0%, Lag= 0.4 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Secondary = 1.32 cfs @ 12.17 hrs, Volume= 5,050 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 159.91' @ 12.17 hrs Surf.Area= 83 sf Storage= 28 cf

Plug-Flow detention time= 0.8 min calculated for 5,050 cf (100% of inflow)
Center-of-Mass det. time= 0.5 min (854.5 - 854.1)

Volume	Invert	Avail.Storage	Storage Description
#1	159.00'	910 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

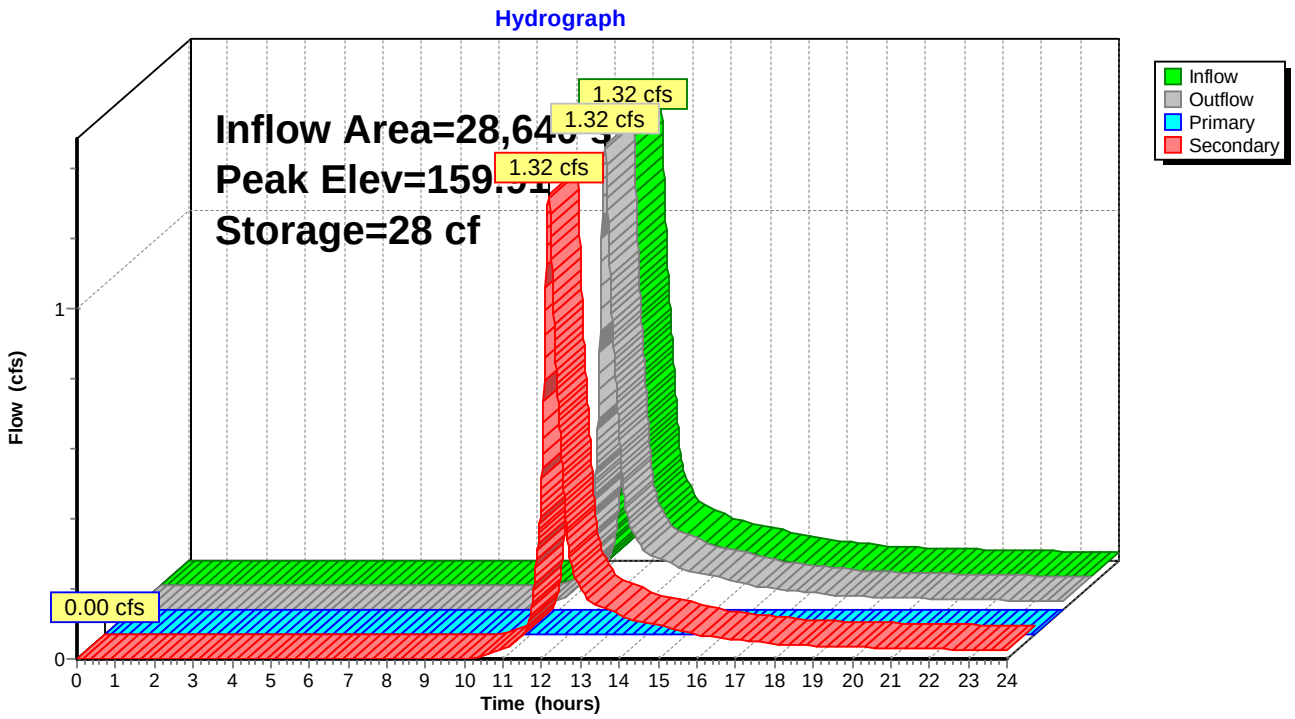
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
159.00	1	5.4	0	0	1
160.00	98	40.0	36	36	128
161.00	176	52.0	135	171	227
162.00	329	79.0	249	420	516
163.00	671	128.0	490	910	1,330

Device	Routing	Invert	Outlet Devices
#1	Primary	162.50'	**18.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32
#2	Secondary	159.30'	**24.0" Round Culvert** L= 30.0' CMP, projecting, no headwall, Ke= 0.900 Outlet Invert= 159.00' S= 0.0100 '/' Cc= 0.900 n= 0.025 Corrugated metal

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=159.00' (Free Discharge)
└**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Secondary OutFlow Max=1.32 cfs @ 12.17 hrs HW=159.91' (Free Discharge)
└**2=Culvert** (Barrel Controls 1.32 cfs @ 2.42 fps)

Pond 01P: Speen St Detention



Summary for Pond 2P: Lake Cochituate

Inflow Area = 2,480,180 sf, 21.04% Impervious, Inflow Depth > 1.96" for 25 Year event
Inflow = 74.25 cfs @ 12.25 hrs, Volume= 406,087 cf
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 100%, Lag= 0.0 min

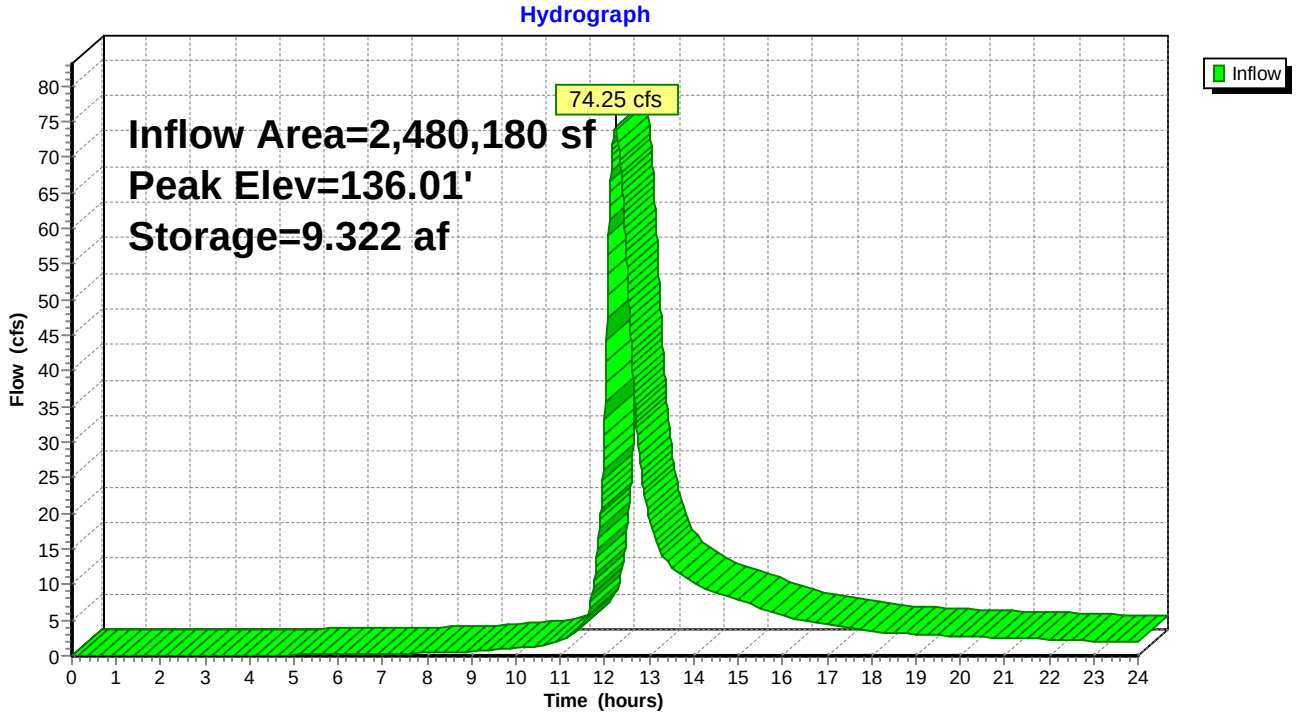
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 136.01' @ 24.00 hrs Surf.Area= 625.000 ac Storage= 9.322 af

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

Volume	Invert	Avail.Storage	Storage Description
#1	136.00'	625.000 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
136.00	625.000	0.000	0.000
137.00	625.000	625.000	625.000

Pond 2P: Lake Cochituate

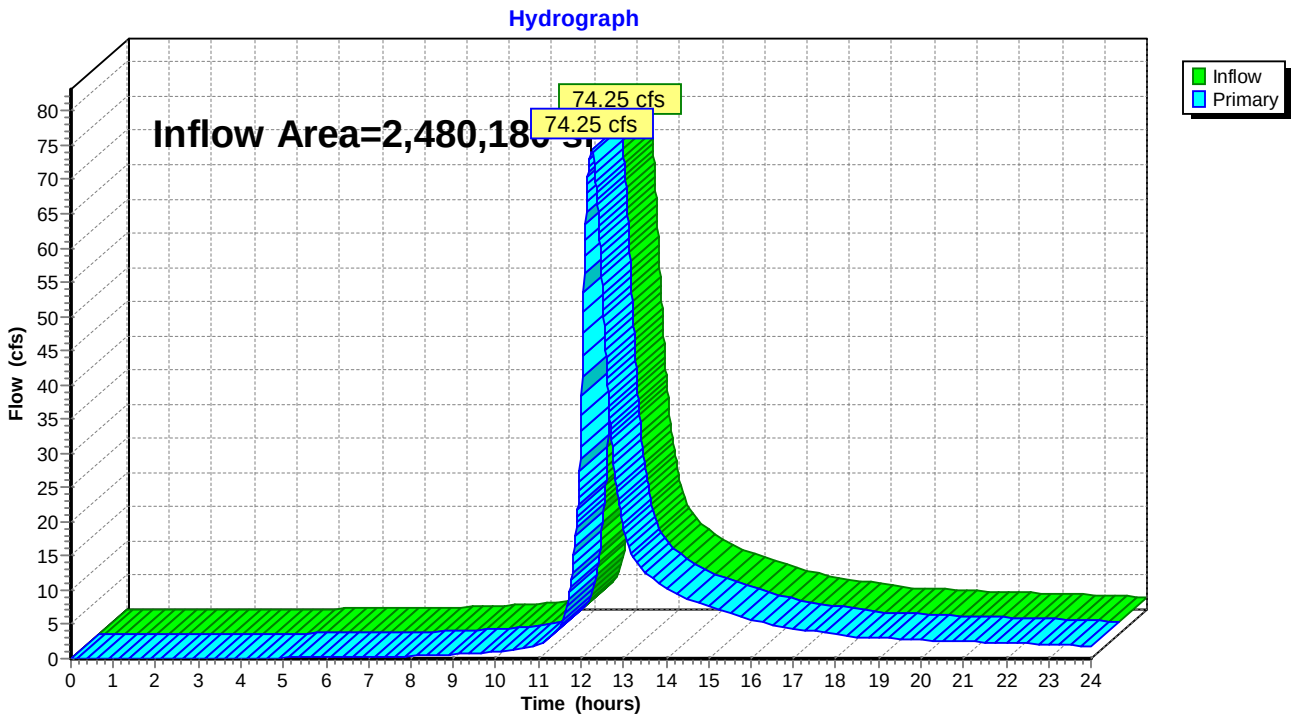


Summary for Link 1L: Total

Inflow Area = 2,480,180 sf, 21.04% Impervious, Inflow Depth > 1.96" for 25 Year event
Inflow = 74.25 cfs @ 12.25 hrs, Volume= 406,087 cf
Primary = 74.25 cfs @ 12.25 hrs, Volume= 406,087 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link 1L: Total

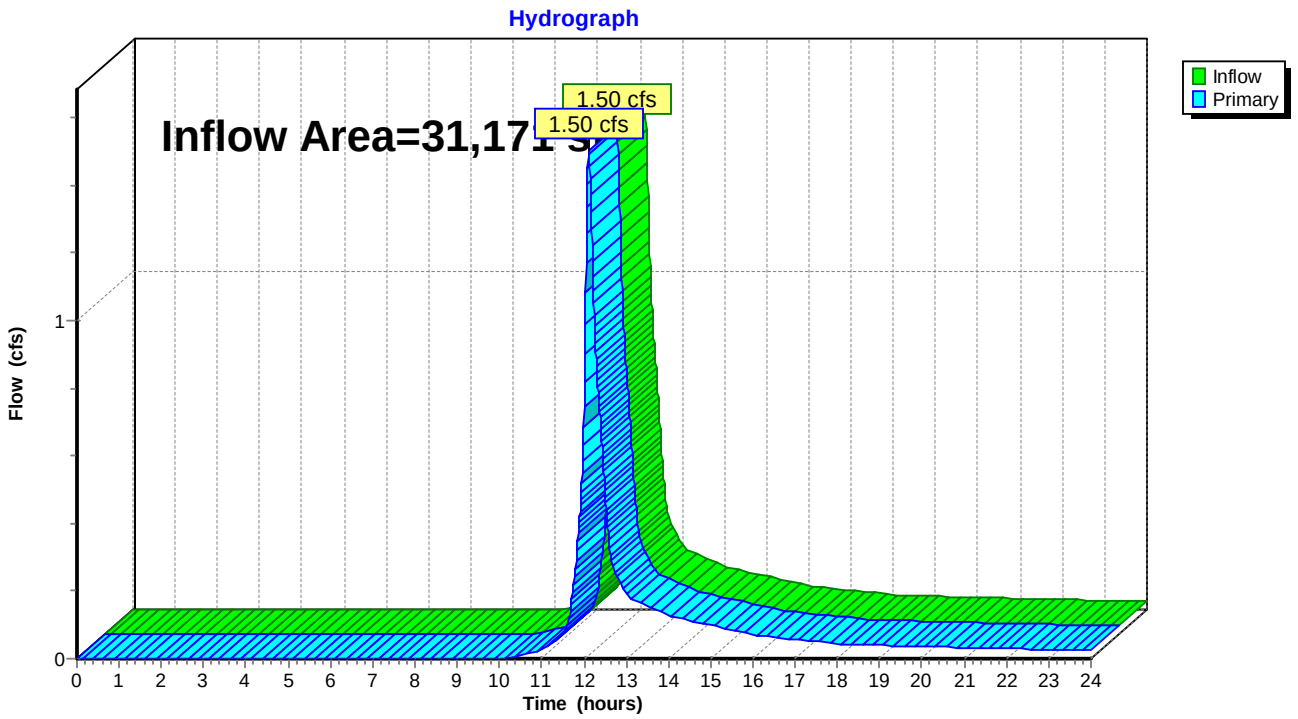


Summary for Link DP01: Cochituate Rd

Inflow Area = 31,171 sf, 8.89% Impervious, Inflow Depth > 2.02" for 25 Year event
Inflow = 1.50 cfs @ 12.11 hrs, Volume= 5,252 cf
Primary = 1.50 cfs @ 12.11 hrs, Volume= 5,252 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link DP01: Cochituate Rd

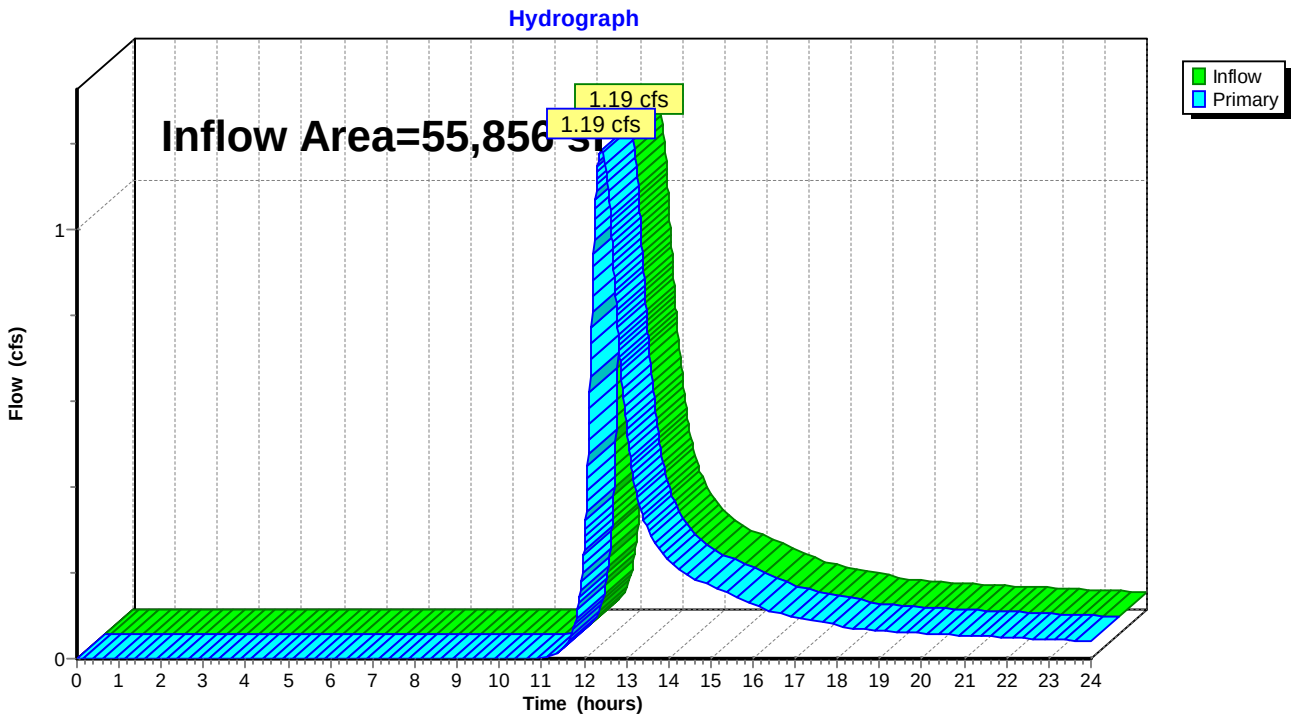


Summary for Link DP02: Chrystler St

Inflow Area = 55,856 sf, 4.44% Impervious, Inflow Depth > 1.63" for 25 Year event
Inflow = 1.19 cfs @ 12.42 hrs, Volume= 7,602 cf
Primary = 1.19 cfs @ 12.42 hrs, Volume= 7,602 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link DP02: Chrystler St

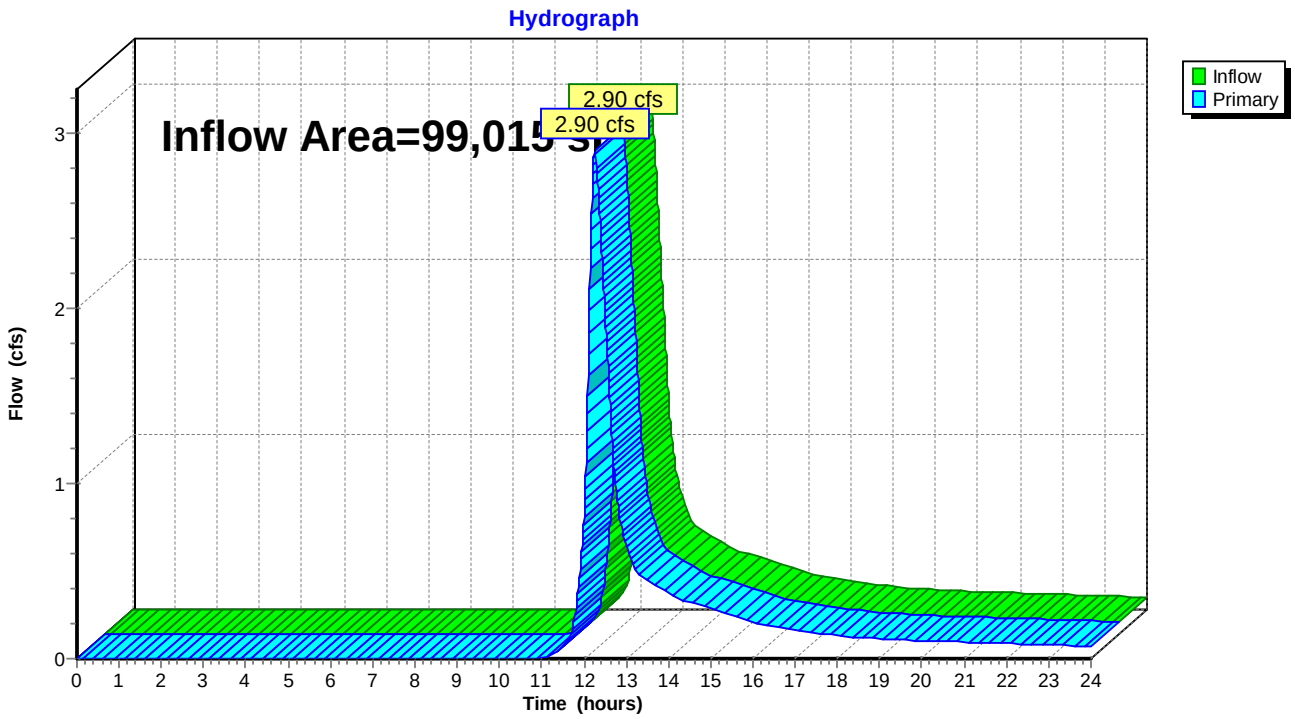


Summary for Link DP03: WF A

Inflow Area = 99,015 sf, 0.66% Impervious, Inflow Depth > 1.64" for 25 Year event
Inflow = 2.90 cfs @ 12.26 hrs, Volume= 13,525 cf
Primary = 2.90 cfs @ 12.26 hrs, Volume= 13,525 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link DP03: WF A

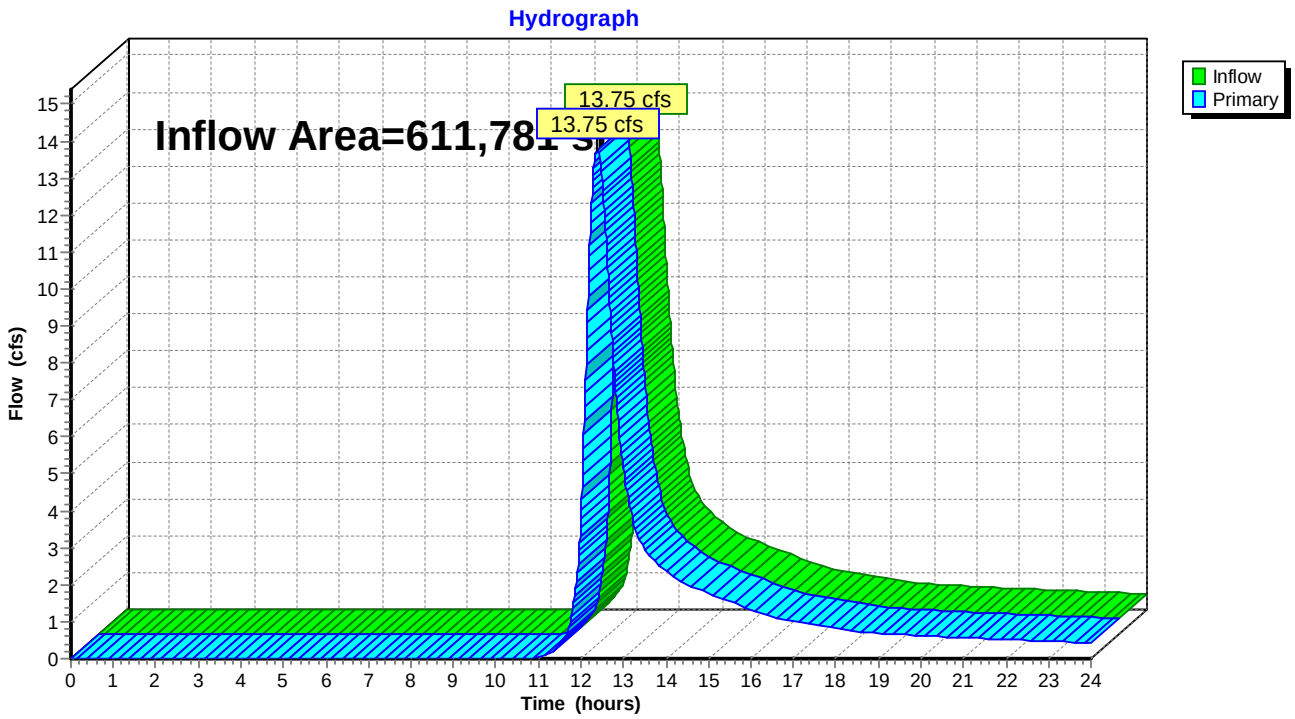


Summary for Link DP04: Lake Cochituate Middle Pond

Inflow Area = 611,781 sf, 6.85% Impervious, Inflow Depth > 1.61" for 25 Year event
Inflow = 13.75 cfs @ 12.40 hrs, Volume= 81,841 cf
Primary = 13.75 cfs @ 12.40 hrs, Volume= 81,841 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link DP04: Lake Cochituate Middle Pond

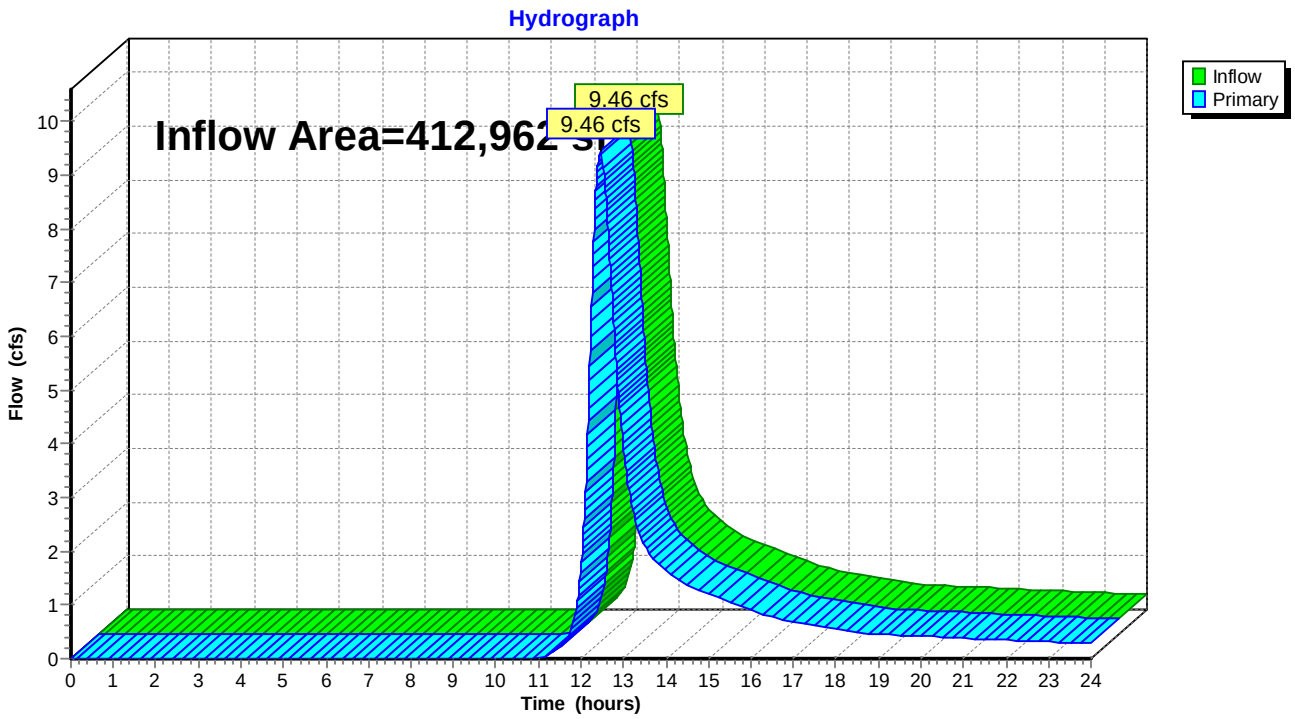


Summary for Link DP04-1: WF B

Inflow Area = 412,962 sf, 7.11% Impervious, Inflow Depth > 1.59" for 25 Year event
Inflow = 9.46 cfs @ 12.47 hrs, Volume= 54,739 cf
Primary = 9.46 cfs @ 12.47 hrs, Volume= 54,739 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link DP04-1: WF B

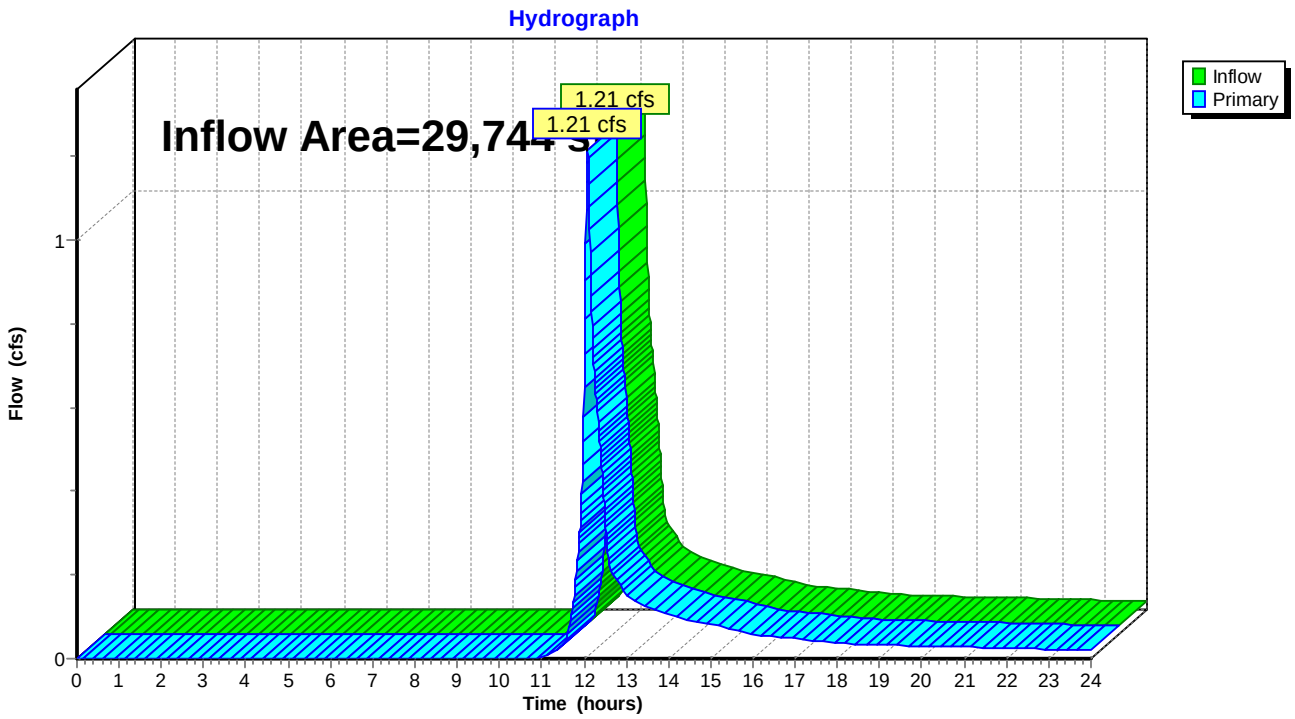


Summary for Link DP04-2: WF C

Inflow Area = 29,744 sf, 0.00% Impervious, Inflow Depth > 1.61" for 25 Year event
Inflow = 1.21 cfs @ 12.09 hrs, Volume= 4,000 cf
Primary = 1.21 cfs @ 12.09 hrs, Volume= 4,000 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link DP04-2: WF C

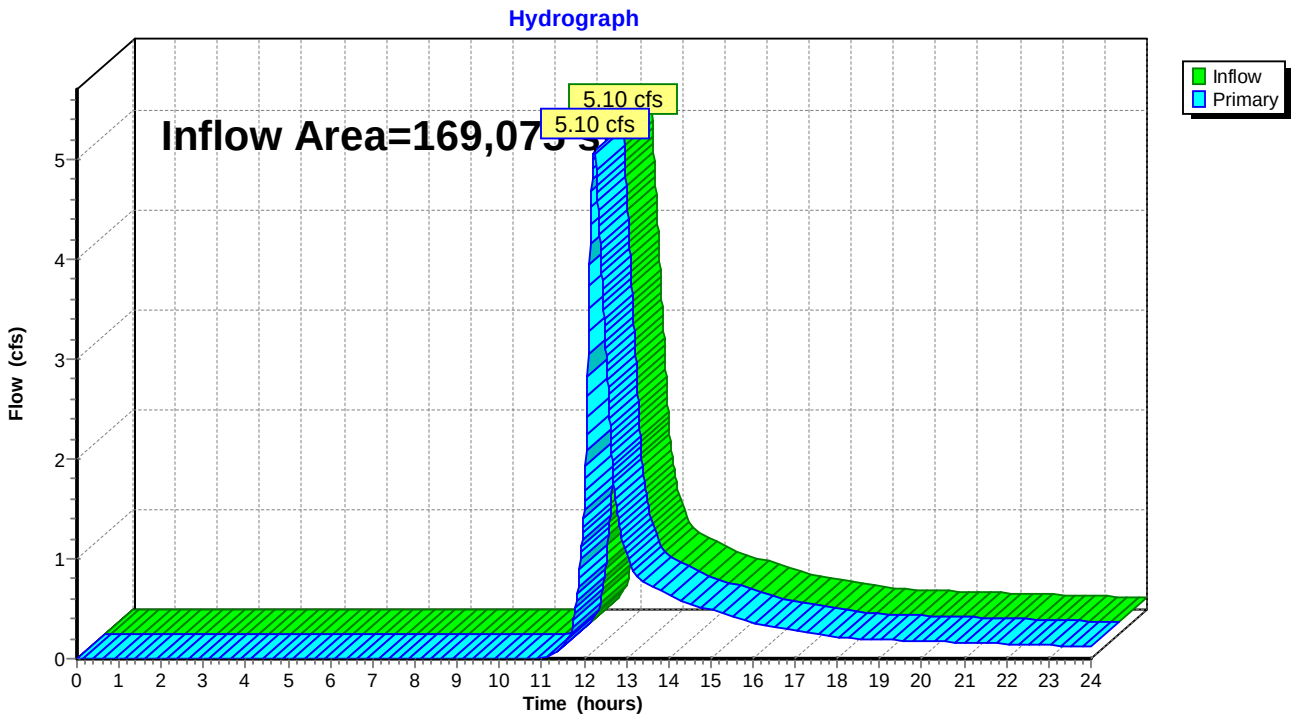


Summary for Link DP04-3: Lake Cochituate

Inflow Area = 169,075 sf, 7.42% Impervious, Inflow Depth > 1.64" for 25 Year event
Inflow = 5.10 cfs @ 12.24 hrs, Volume= 23,102 cf
Primary = 5.10 cfs @ 12.24 hrs, Volume= 23,102 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link DP04-3: Lake Cochituate

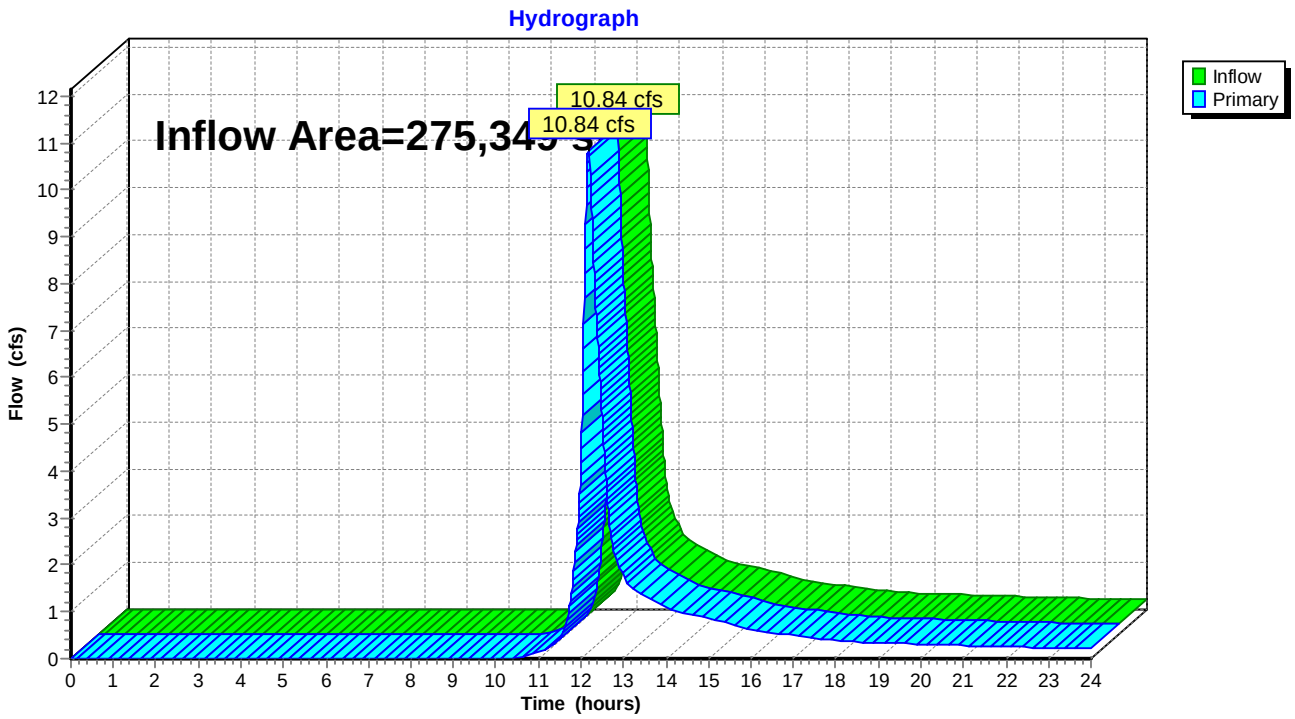


Summary for Link DP05: Lake Cochituate W

Inflow Area = 275,349 sf, 15.63% Impervious, Inflow Depth > 1.89" for 25 Year event
Inflow = 10.84 cfs @ 12.18 hrs, Volume= 43,406 cf
Primary = 10.84 cfs @ 12.18 hrs, Volume= 43,406 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link DP05: Lake Cochituate W

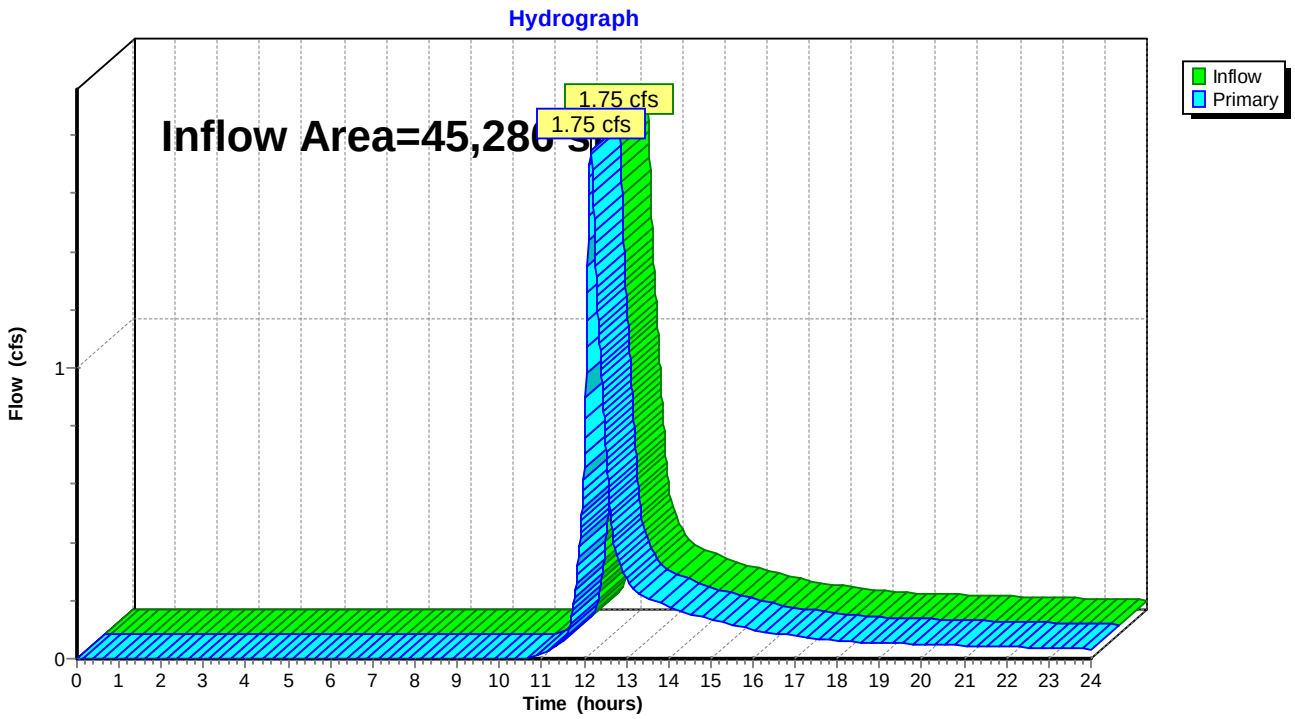


Summary for Link DP05-1: WF I

Inflow Area = 45,286 sf, 7.97% Impervious, Inflow Depth > 1.80" for 25 Year event
Inflow = 1.75 cfs @ 12.16 hrs, Volume= 6,778 cf
Primary = 1.75 cfs @ 12.16 hrs, Volume= 6,778 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link DP05-1: WF I

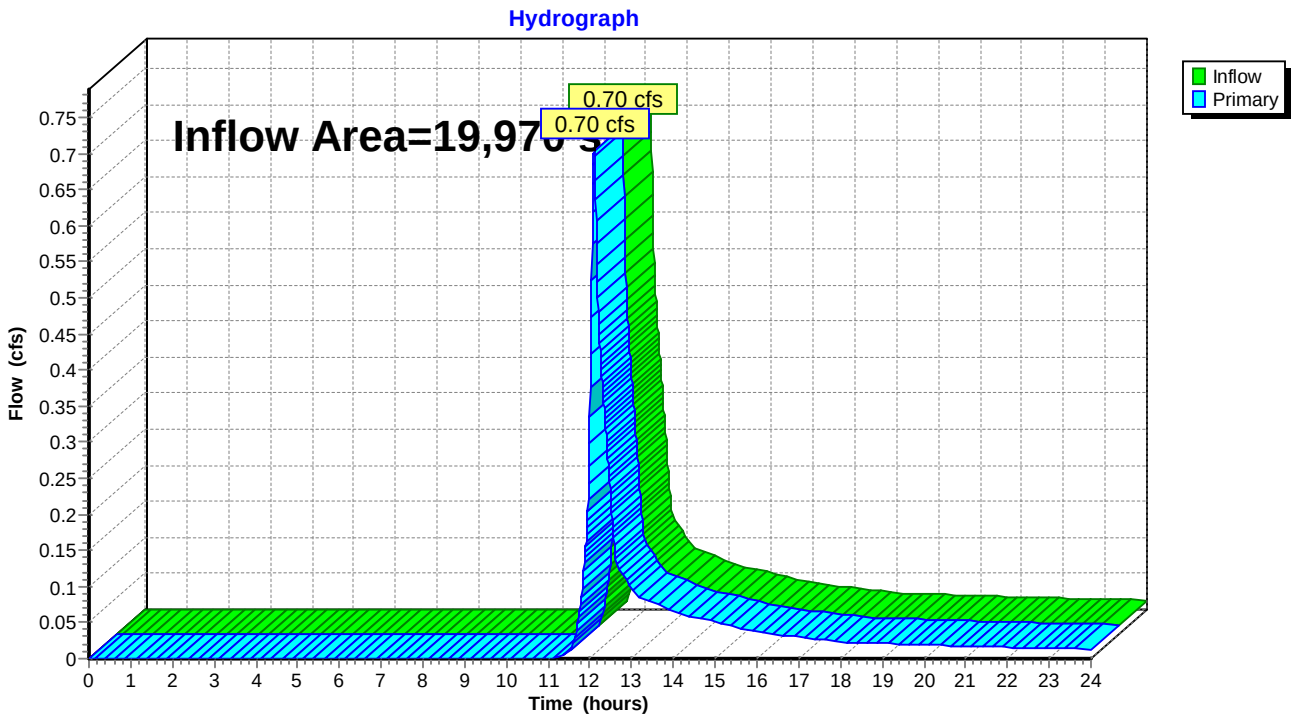


Summary for Link DP05-2: WF G&H

Inflow Area = 19,970 sf, 0.00% Impervious, Inflow Depth > 1.46" for 25 Year event
Inflow = 0.70 cfs @ 12.10 hrs, Volume= 2,425 cf
Primary = 0.70 cfs @ 12.10 hrs, Volume= 2,425 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link DP05-2: WF G&H

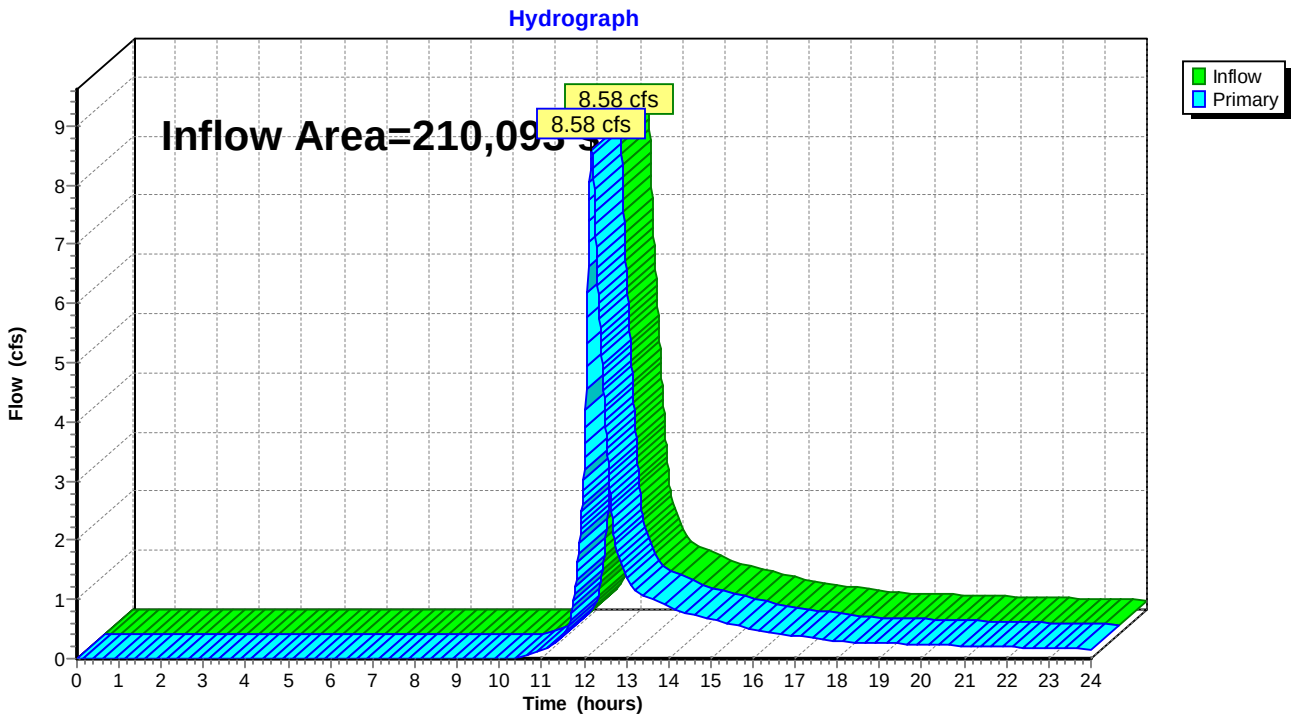


Summary for Link DP05-3: Lake Cochituate

Inflow Area = 210,093 sf, 18.76% Impervious, Inflow Depth > 1.95" for 25 Year event
Inflow = 8.58 cfs @ 12.18 hrs, Volume= 34,204 cf
Primary = 8.58 cfs @ 12.18 hrs, Volume= 34,204 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link DP05-3: Lake Cochituate

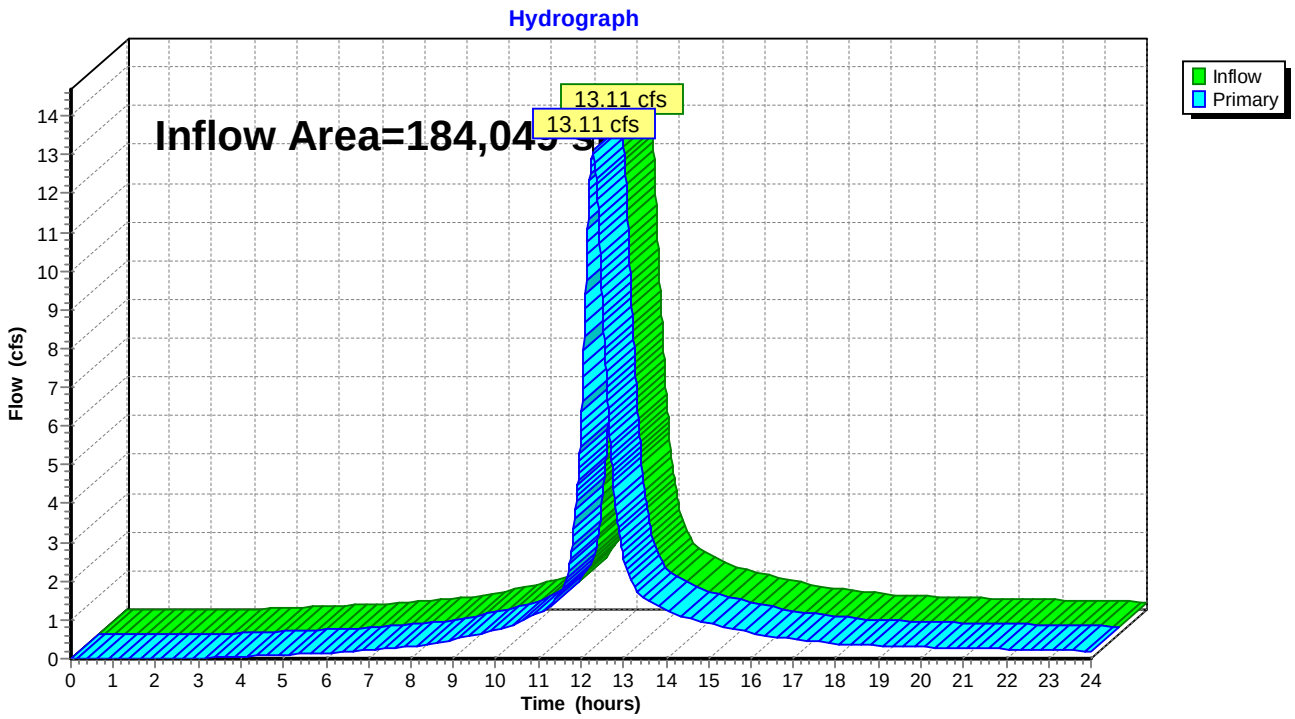


Summary for Link DP06: Worcester St

Inflow Area = 184,049 sf, 85.31% Impervious, Inflow Depth > 4.45" for 25 Year event
Inflow = 13.11 cfs @ 12.28 hrs, Volume= 68,179 cf
Primary = 13.11 cfs @ 12.28 hrs, Volume= 68,179 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link DP06: Worcester St

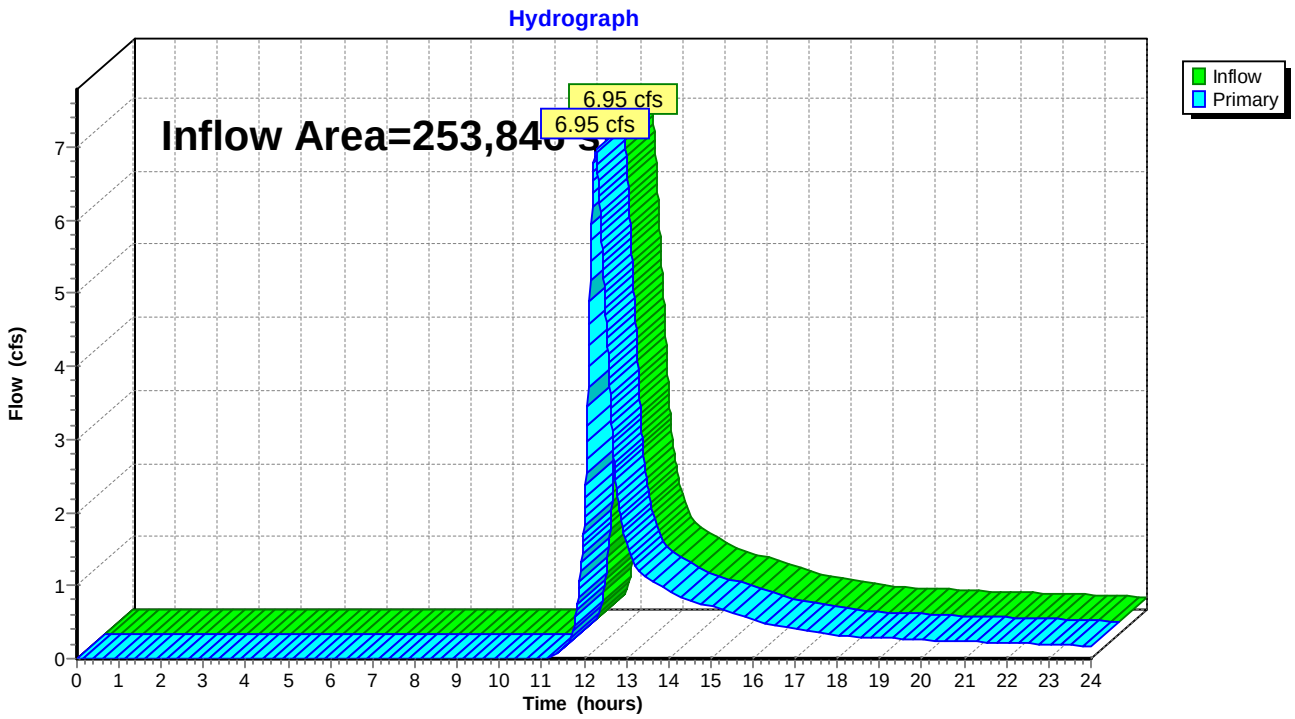


Summary for Link DP07: WF F

Inflow Area = 253,846 sf, 12.85% Impervious, Inflow Depth > 1.56" for 25 Year event
Inflow = 6.95 cfs @ 12.27 hrs, Volume= 33,079 cf
Primary = 6.95 cfs @ 12.27 hrs, Volume= 33,079 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link DP07: WF F

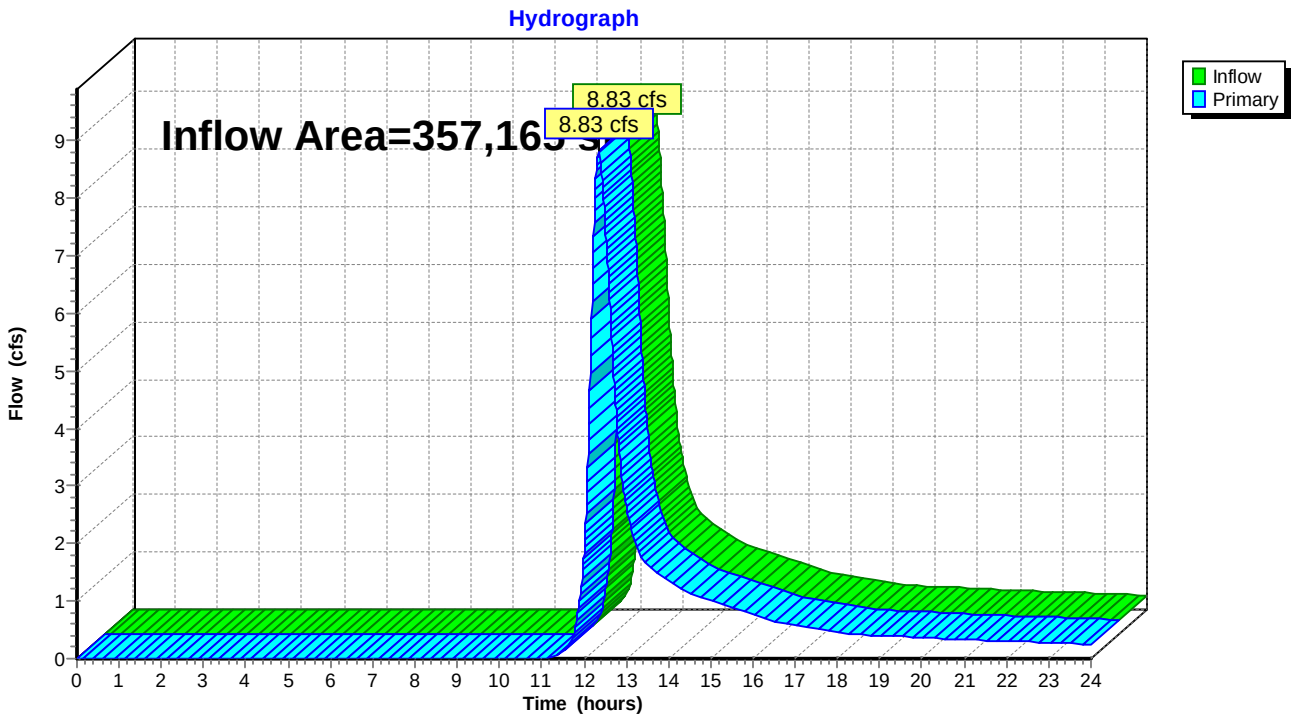


Summary for Link DP08: WF J

Inflow Area = 357,165 sf, 20.57% Impervious, Inflow Depth > 1.56" for 25 Year event
Inflow = 8.83 cfs @ 12.34 hrs, Volume= 46,471 cf
Primary = 8.83 cfs @ 12.34 hrs, Volume= 46,471 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link DP08: WF J

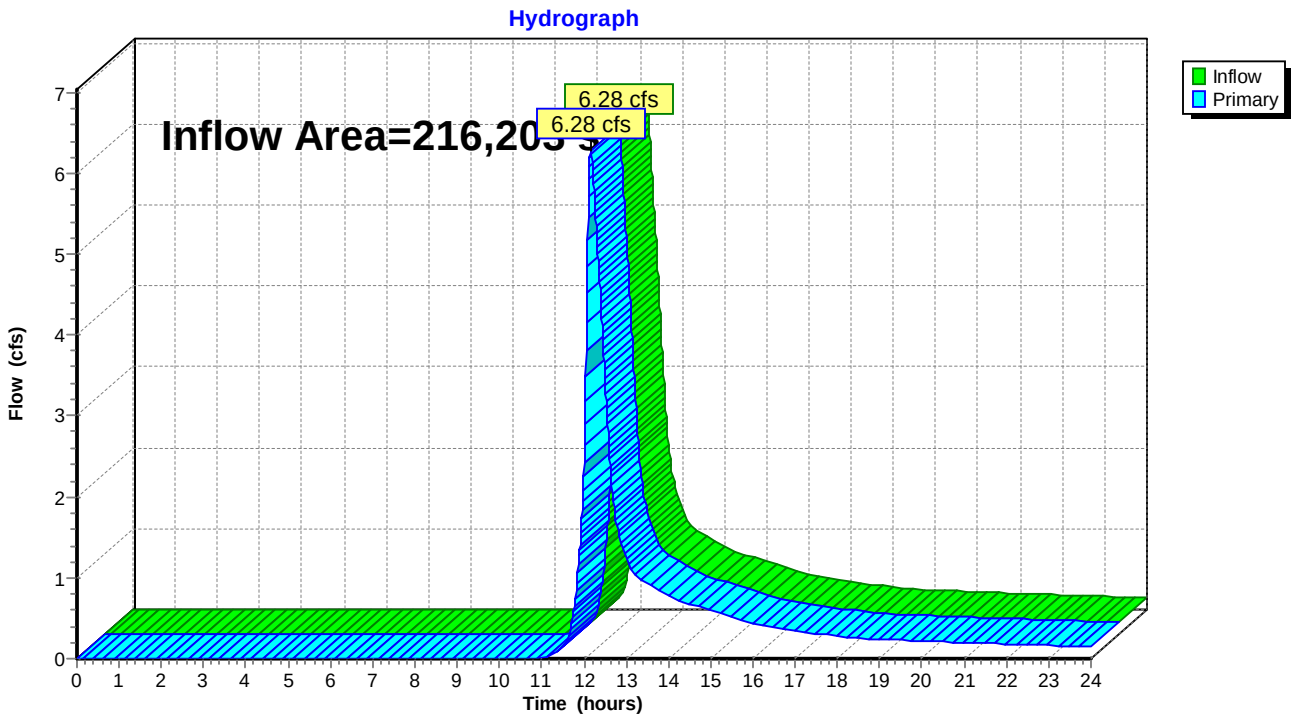


Summary for Link DP09: Unnamed Pond

Inflow Area = 216,203 sf, 15.22% Impervious, Inflow Depth > 1.57" for 25 Year event
Inflow = 6.28 cfs @ 12.16 hrs, Volume= 28,356 cf
Primary = 6.28 cfs @ 12.16 hrs, Volume= 28,356 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link DP09: Unnamed Pond

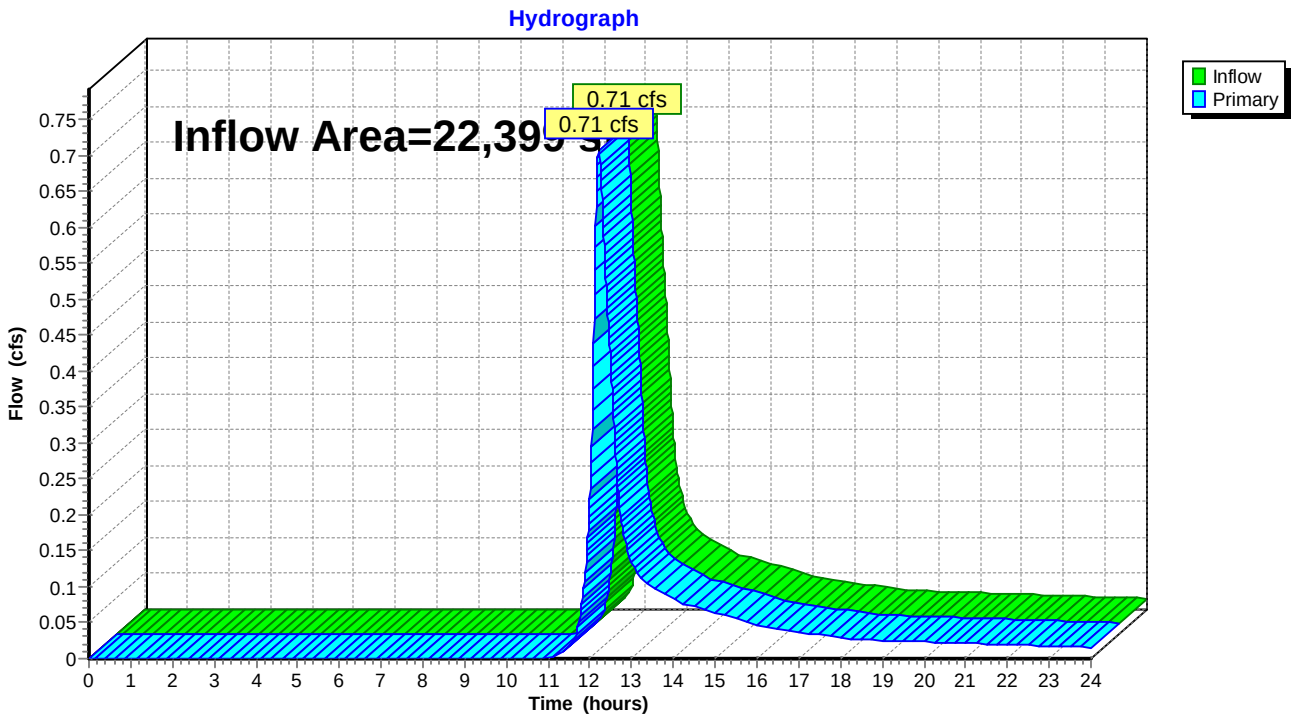


Summary for Link DP09-1: WF K

Inflow Area = 22,399 sf, 8.44% Impervious, Inflow Depth > 1.64" for 25 Year event
Inflow = 0.71 cfs @ 12.22 hrs, Volume= 3,062 cf
Primary = 0.71 cfs @ 12.22 hrs, Volume= 3,062 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link DP09-1: WF K

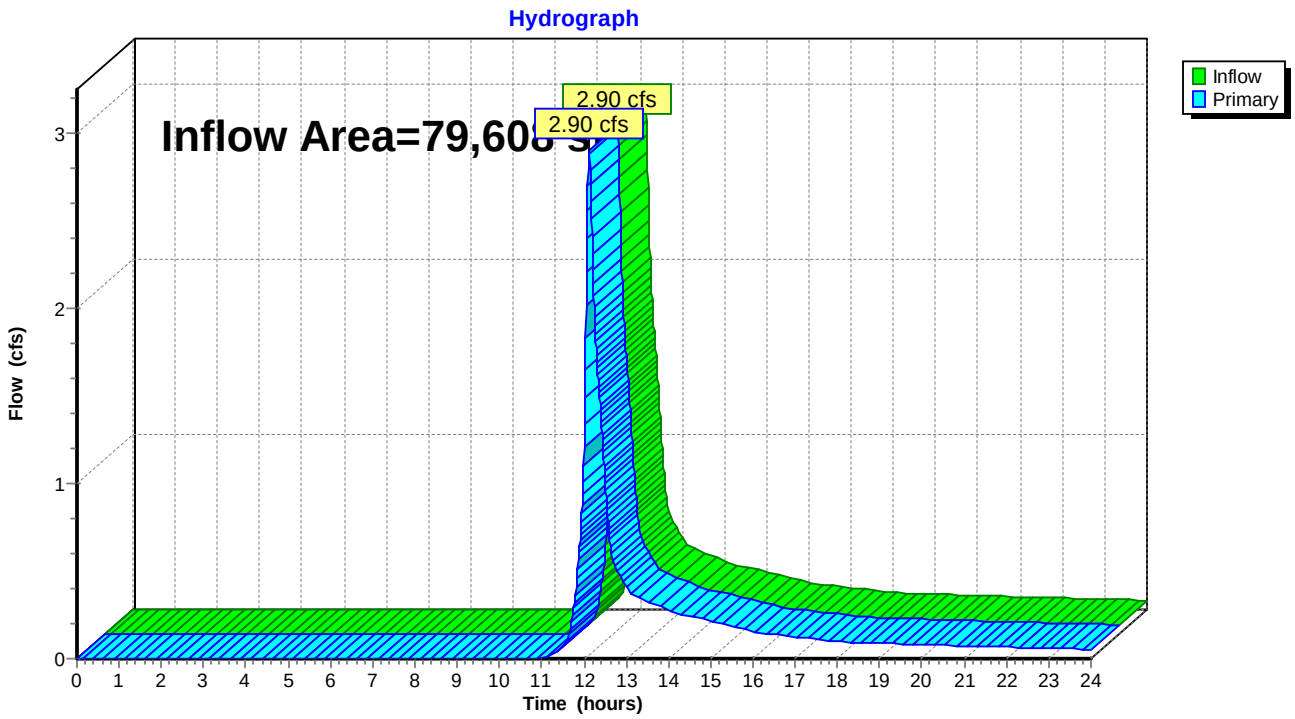


Summary for Link DP09-2: WF KA

Inflow Area = 79,608 sf, 24.60% Impervious, Inflow Depth > 1.57" for 25 Year event
Inflow = 2.90 cfs @ 12.12 hrs, Volume= 10,403 cf
Primary = 2.90 cfs @ 12.12 hrs, Volume= 10,403 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link DP09-2: WF KA

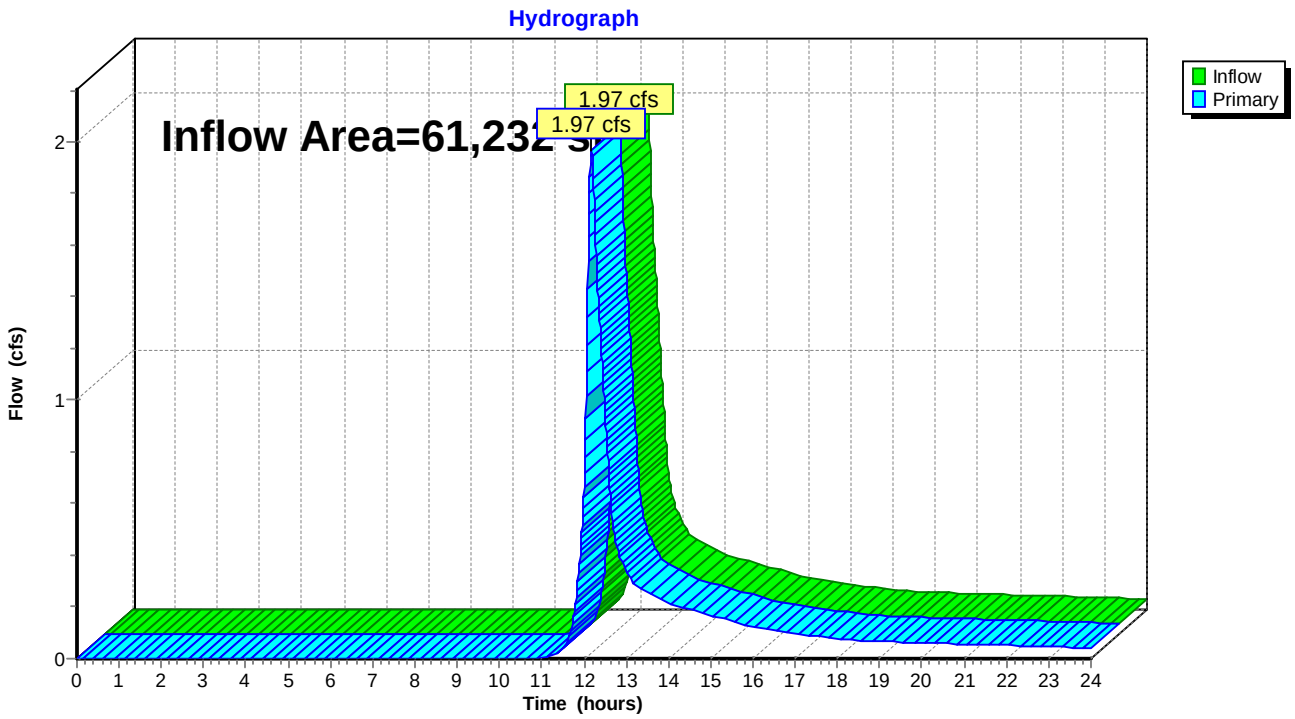


Summary for Link DP09-3: WF B

Inflow Area = 61,232 sf, 17.35% Impervious, Inflow Depth > 1.57" for 25 Year event
Inflow = 1.97 cfs @ 12.18 hrs, Volume= 7,993 cf
Primary = 1.97 cfs @ 12.18 hrs, Volume= 7,993 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link DP09-3: WF B

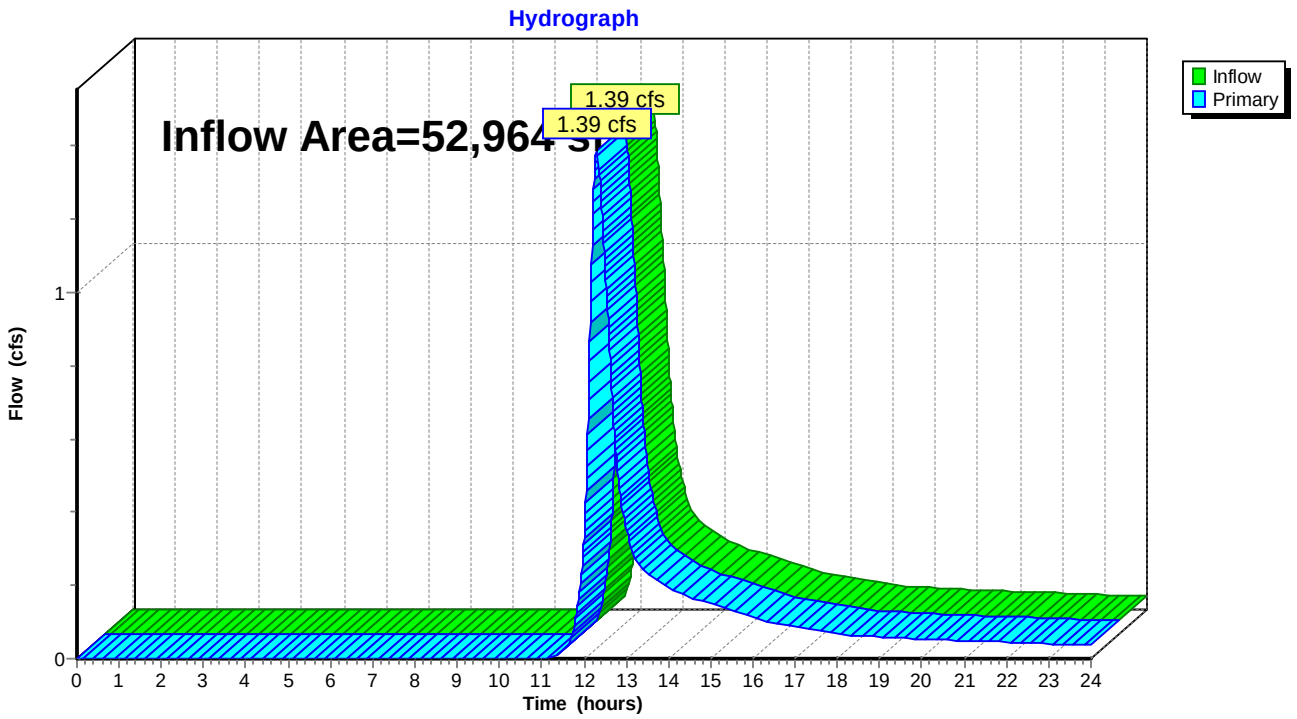


Summary for Link DP09-4: WF E&L, TOB C

Inflow Area = 52,964 sf, 1.51% Impervious, Inflow Depth > 1.56" for 25 Year event
Inflow = 1.39 cfs @ 12.30 hrs, Volume= 6,898 cf
Primary = 1.39 cfs @ 12.30 hrs, Volume= 6,898 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link DP09-4: WF E&L, TOB C

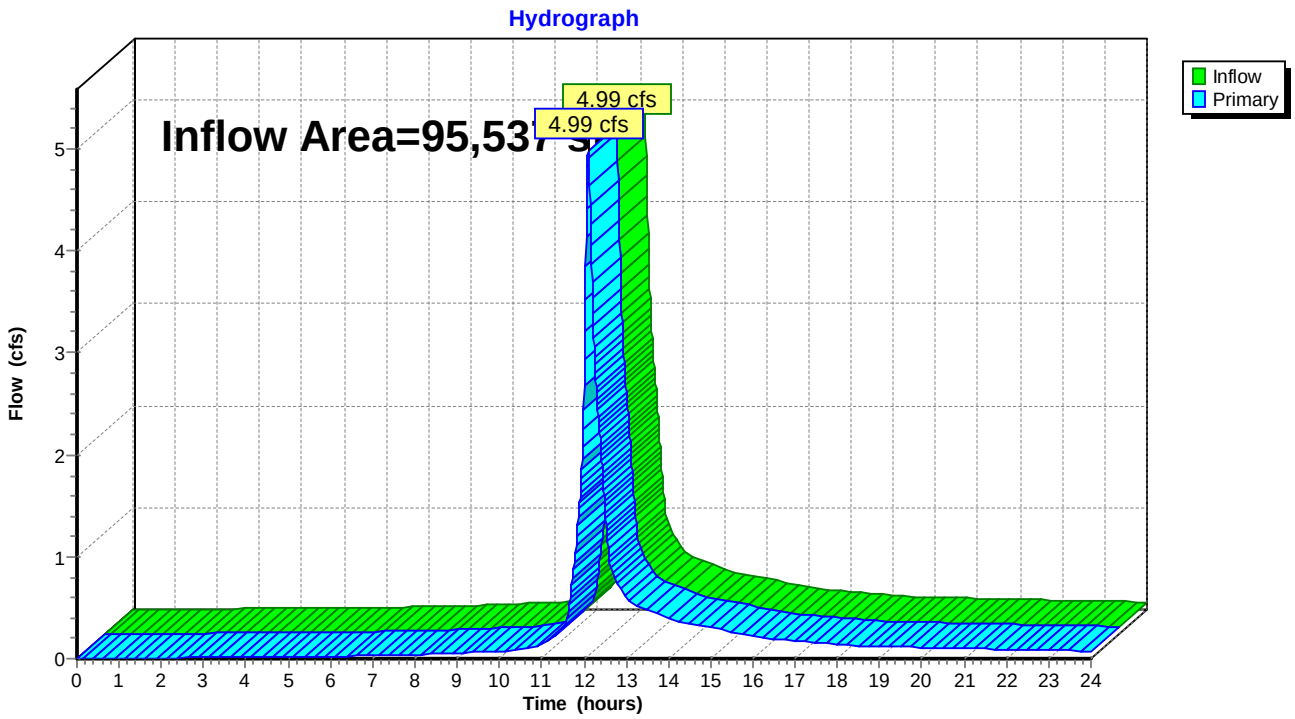


Summary for Link DP10: WF A

Inflow Area = 95,537 sf, 28.44% Impervious, Inflow Depth > 2.24" for 25 Year event
Inflow = 4.99 cfs @ 12.10 hrs, Volume= 17,815 cf
Primary = 4.99 cfs @ 12.10 hrs, Volume= 17,815 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link DP10: WF A

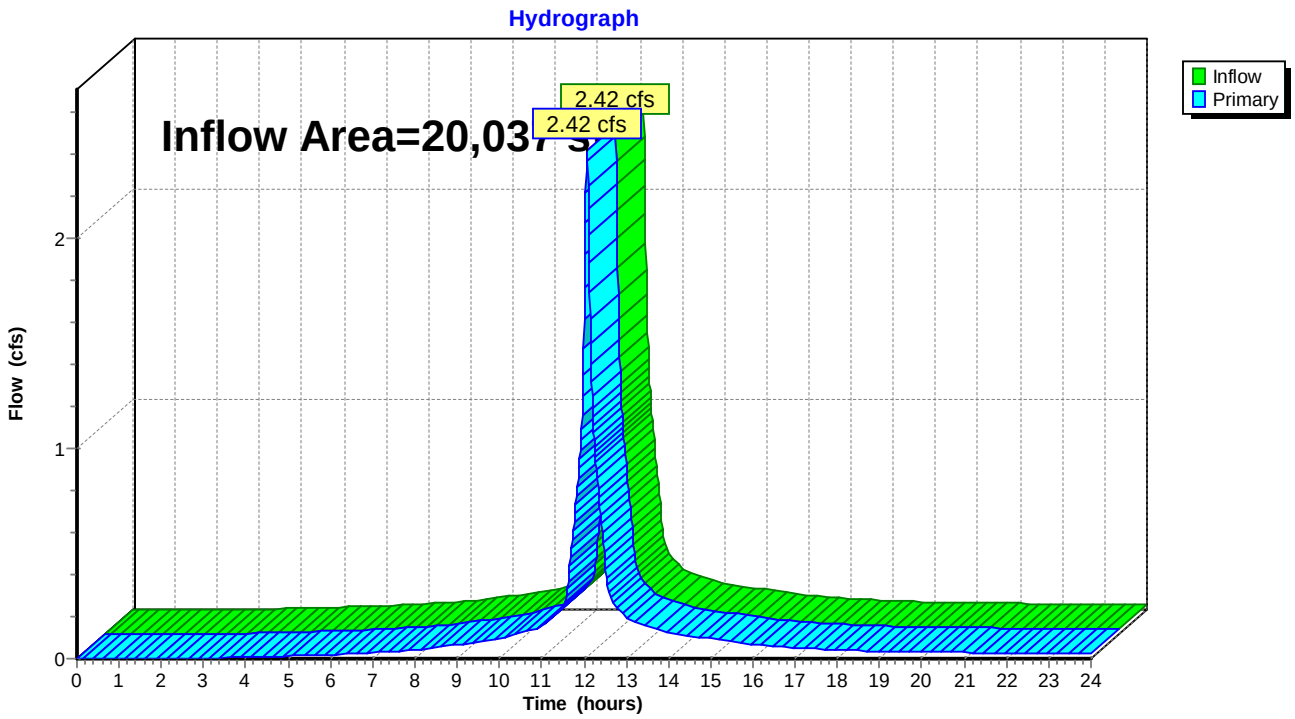


Summary for Link DP11: Local St Drain System

Inflow Area = 20,037 sf, 76.27% Impervious, Inflow Depth > 4.66" for 25 Year event
Inflow = 2.42 cfs @ 12.07 hrs, Volume= 7,775 cf
Primary = 2.42 cfs @ 12.07 hrs, Volume= 7,775 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link DP11: Local St Drain System

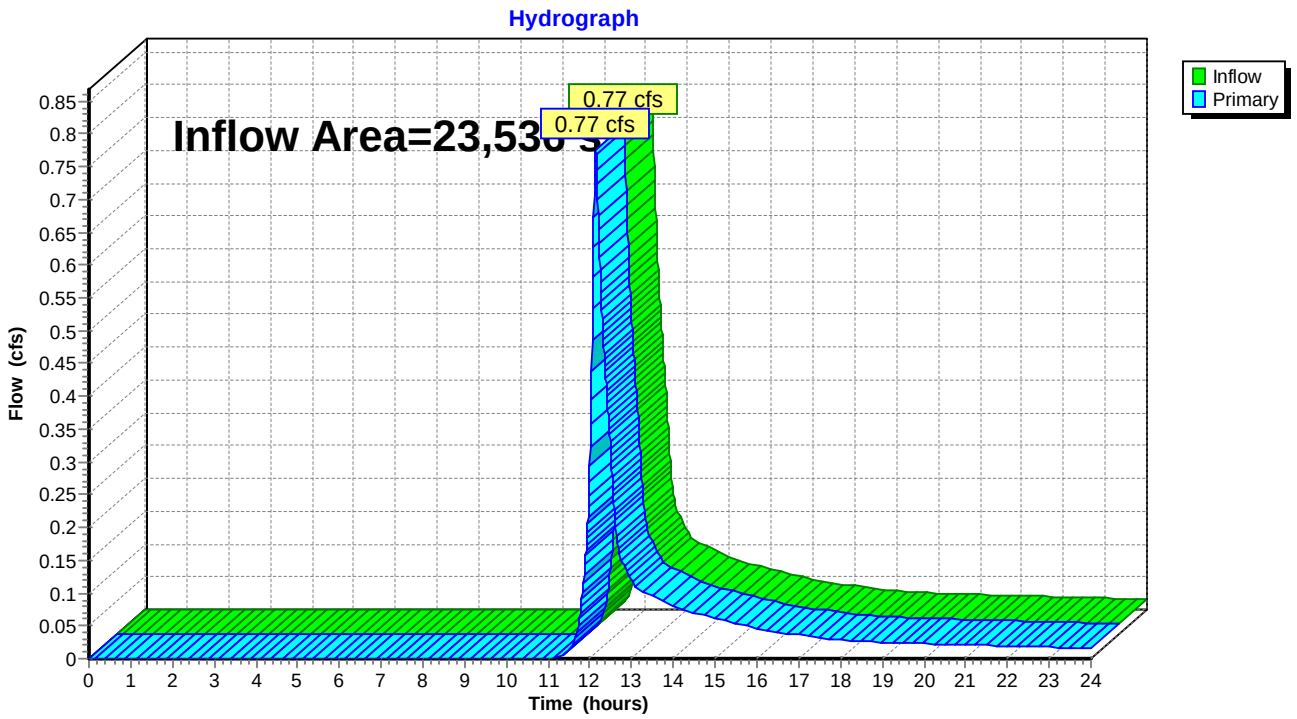


Summary for Link DP12: Washington St Low Point

Inflow Area = 23,536 sf, 31.05% Impervious, Inflow Depth > 1.49" for 25 Year event
Inflow = 0.77 cfs @ 12.14 hrs, Volume= 2,929 cf
Primary = 0.77 cfs @ 12.14 hrs, Volume= 2,929 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link DP12: Washington St Low Point

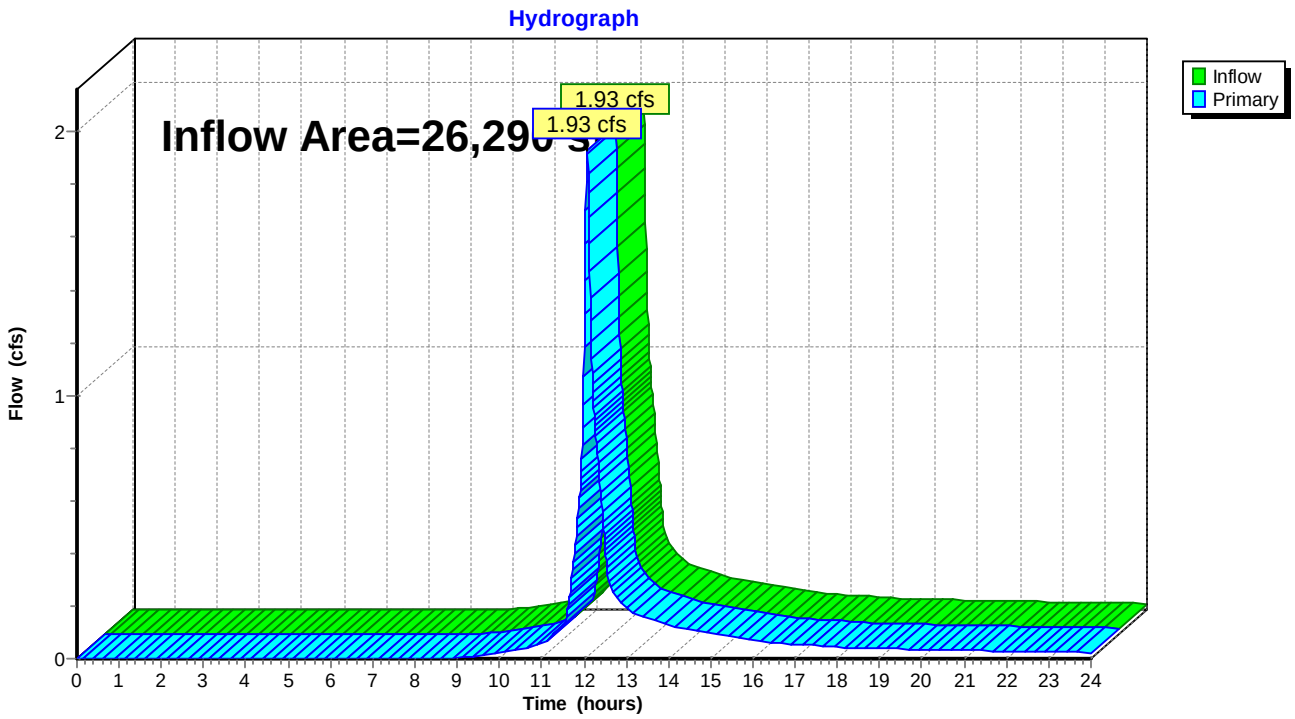


Summary for Link DP13: Empty Lot

Inflow Area = 26,290 sf, 0.00% Impervious, Inflow Depth > 2.64" for 25 Year event
Inflow = 1.93 cfs @ 12.08 hrs, Volume= 5,775 cf
Primary = 1.93 cfs @ 12.08 hrs, Volume= 5,775 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link DP13: Empty Lot

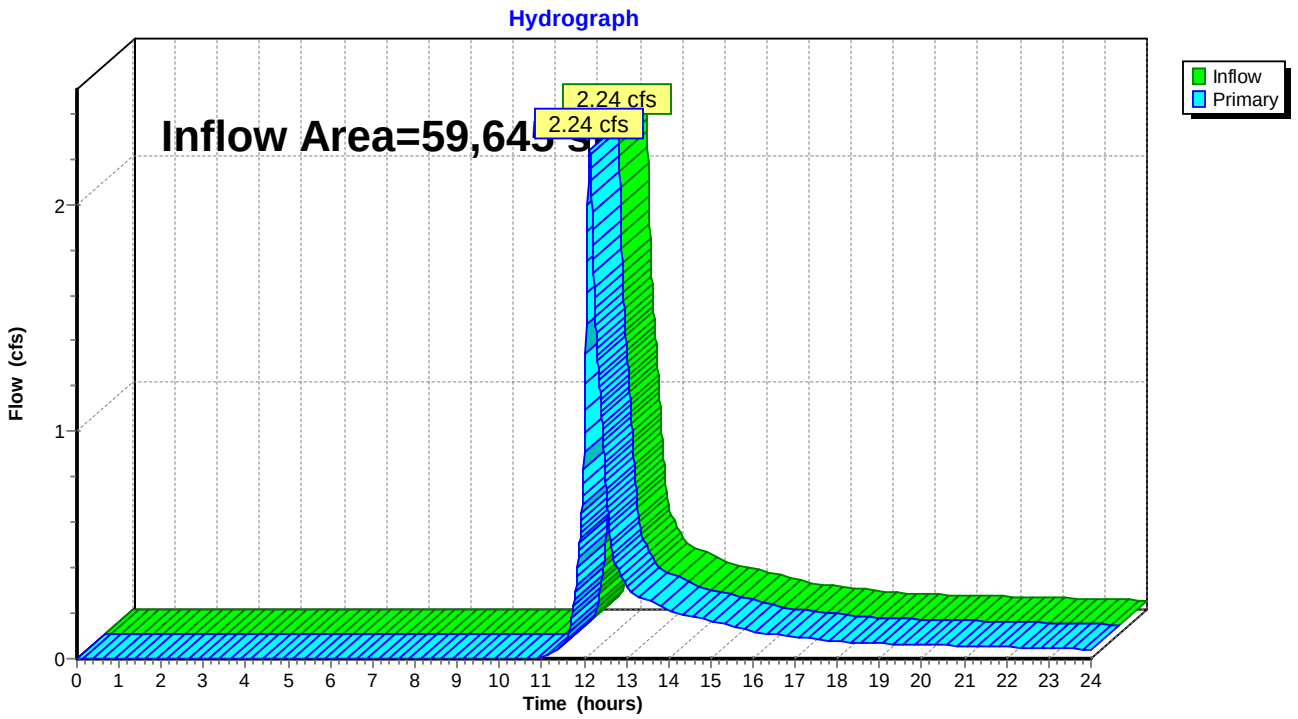


Summary for Link DP14: Lagrange St Low Point

Inflow Area = 59,645 sf, 31.36% Impervious, Inflow Depth > 1.64" for 25 Year event
Inflow = 2.24 cfs @ 12.13 hrs, Volume= 8,167 cf
Primary = 2.24 cfs @ 12.13 hrs, Volume= 8,167 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link DP14: Lagrange St Low Point

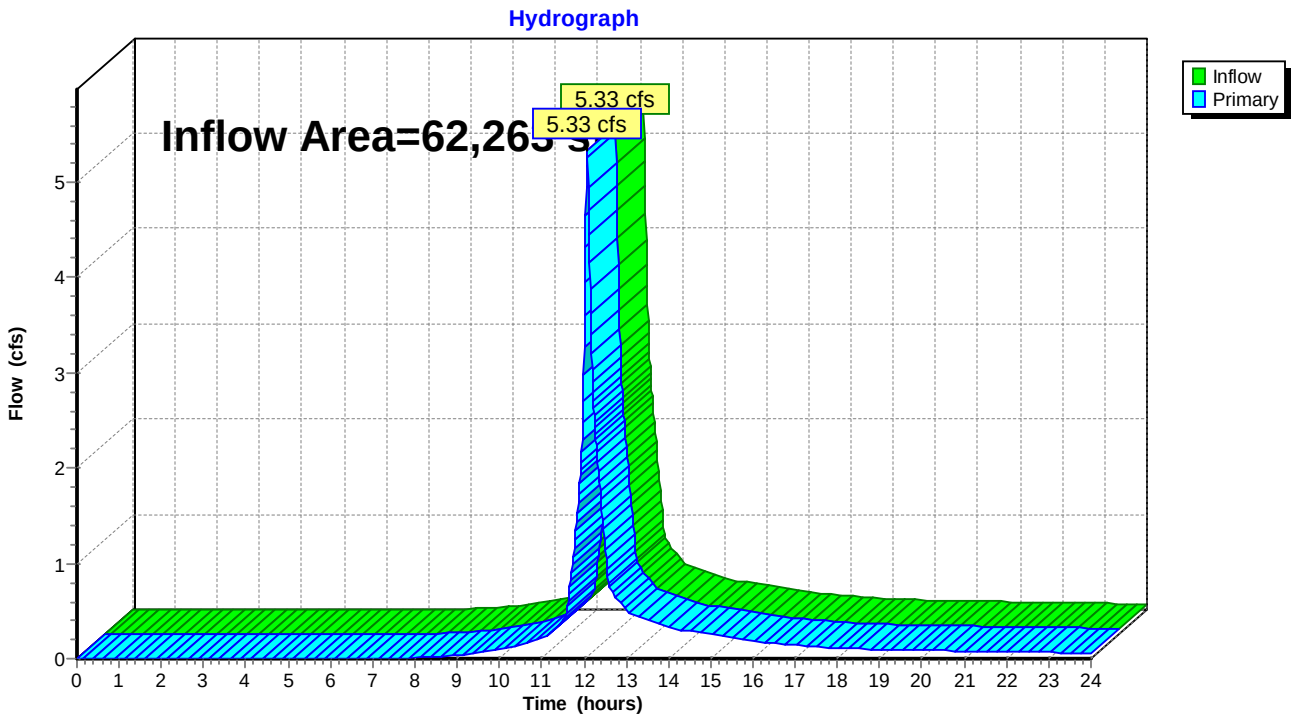


Summary for Link DP15: TOB D

Inflow Area = 62,263 sf, 50.59% Impervious, Inflow Depth > 3.09" for 25 Year event
Inflow = 5.33 cfs @ 12.08 hrs, Volume= 16,056 cf
Primary = 5.33 cfs @ 12.08 hrs, Volume= 16,056 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link DP15: TOB D

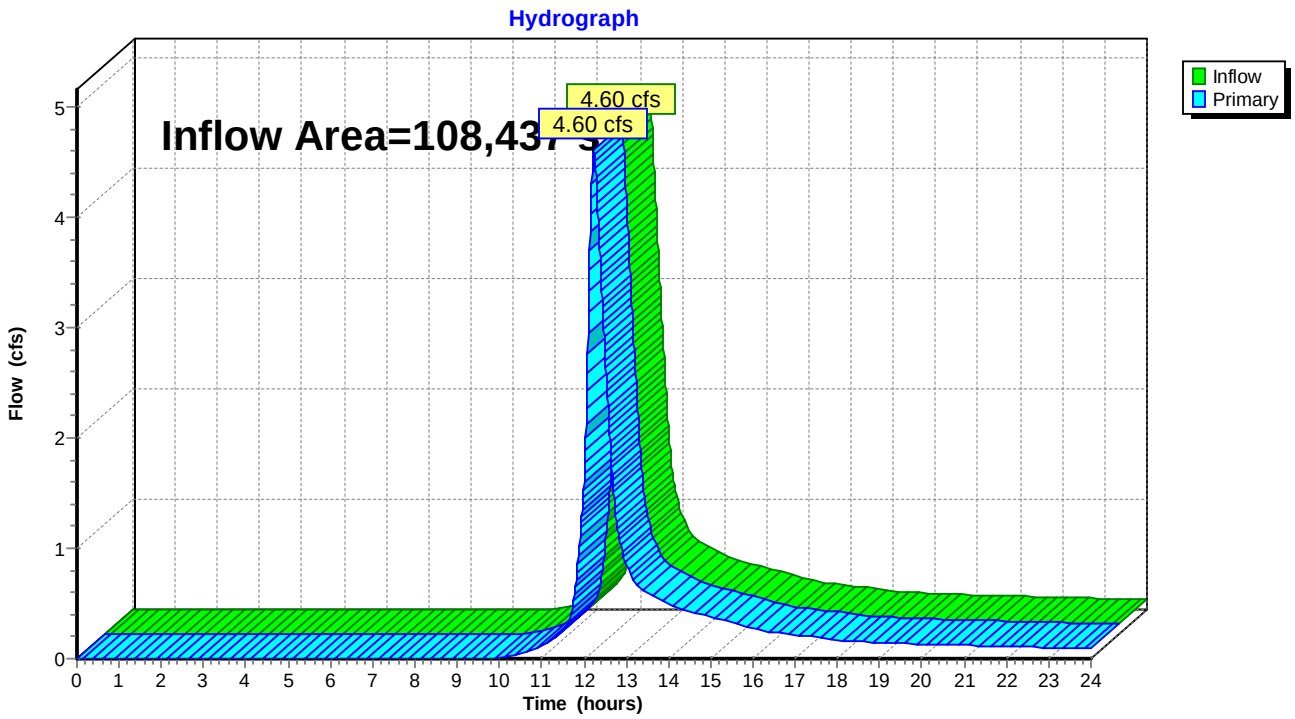


Summary for Link DP16: WF 1, WF 2, TOB E

Inflow Area = 108,437 sf, 32.30% Impervious, Inflow Depth > 2.20" for 25 Year event
Inflow = 4.60 cfs @ 12.23 hrs, Volume= 19,858 cf
Primary = 4.60 cfs @ 12.23 hrs, Volume= 19,858 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link DP16: WF 1, WF 2, TOB E

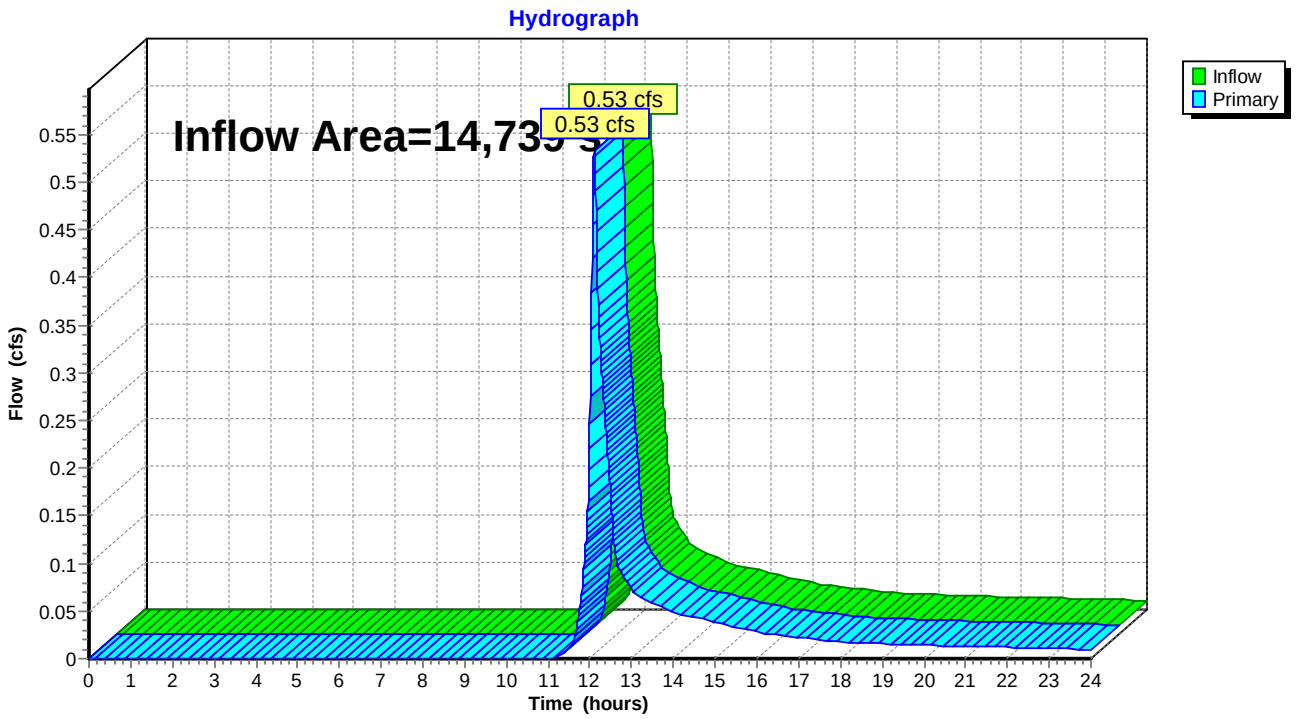


Summary for Link WF-G: WF G

Inflow Area = 14,739 sf, 0.00% Impervious, Inflow Depth > 1.49" for 25 Year event
Inflow = 0.53 cfs @ 12.10 hrs, Volume= 1,836 cf
Primary = 0.53 cfs @ 12.10 hrs, Volume= 1,836 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link WF-G: WF G

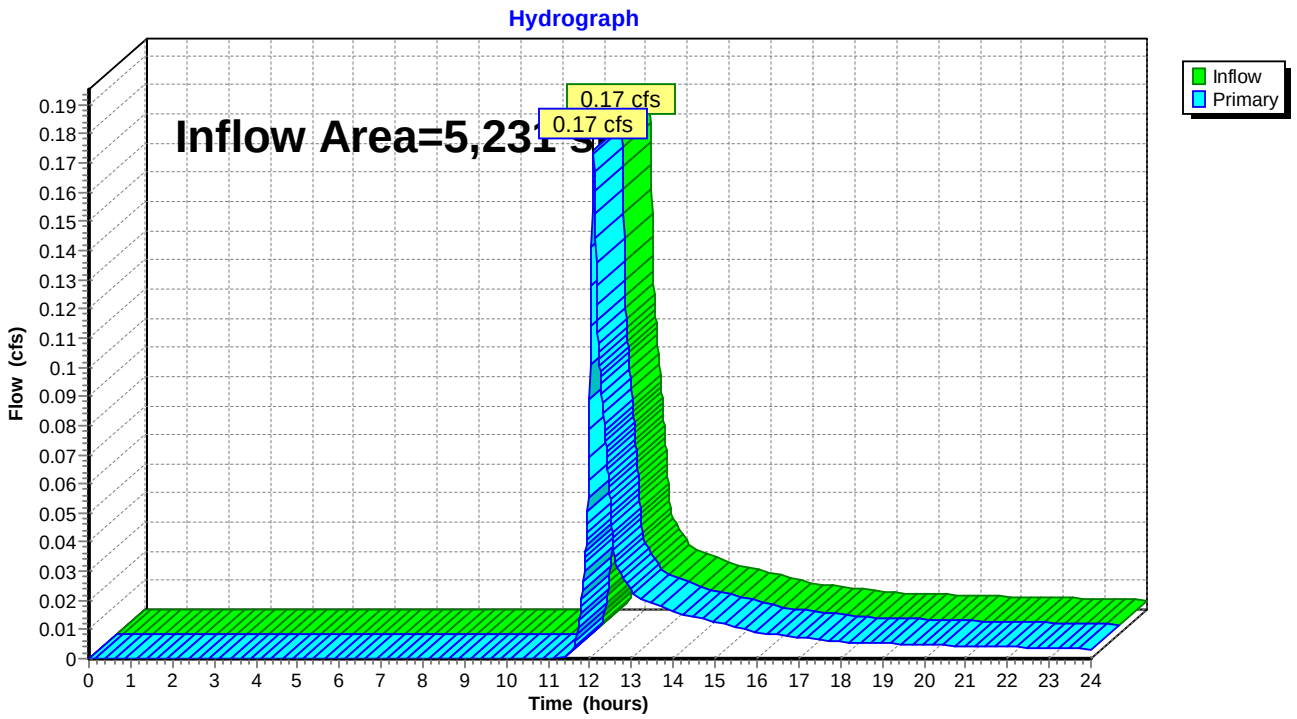


Summary for Link WF-H: WF H

Inflow Area = 5,231 sf, 0.00% Impervious, Inflow Depth > 1.35" for 25 Year event
Inflow = 0.17 cfs @ 12.09 hrs, Volume= 589 cf
Primary = 0.17 cfs @ 12.09 hrs, Volume= 589 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link WF-H: WF H



Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 01S: Cochitute Rd 1 Runoff Area=9,423 sf 2.98% Impervious Runoff Depth>2.60"
Flow Length=162' Tc=5.0 min CN=63 Runoff=0.67 cfs 2,043 cf

Subcatchment 02S: Cochituate Rd 2 Runoff Area=21,748 sf 11.45% Impervious Runoff Depth>2.99"
Flow Length=100' Slope=0.0270 '/' Tc=8.8 min CN=67 Runoff=1.58 cfs 5,410 cf

Subcatchment 03S: Home Depot Runoff Area=25,653 sf 0.00% Impervious Runoff Depth>2.40"
Flow Length=60' Slope=0.0088 '/' Tc=20.0 min CN=61 Runoff=1.08 cfs 5,141 cf

Subcatchment 04S: Chrystler St Runoff Area=30,203 sf 8.21% Impervious Runoff Depth>2.39"
Flow Length=311' Tc=37.7 min CN=61 Runoff=0.96 cfs 6,024 cf

Subcatchment 05S: DNR Runoff Area=99,015 sf 0.66% Impervious Runoff Depth>2.41"
Flow Length=725' Tc=17.3 min CN=61 Runoff=4.43 cfs 19,857 cf

Subcatchment 06S: Speen St Runoff Area=28,640 sf 6.23% Impervious Runoff Depth>2.98"
Flow Length=473' Tc=11.6 min CN=67 Runoff=1.90 cfs 7,120 cf

Subcatchment 07S: Lake Cochituate N Runoff Area=384,322 sf 7.17% Impervious Runoff Depth>2.49"
Flow Length=975' Tc=30.1 min CN=62 Runoff=14.22 cfs 79,798 cf

Subcatchment 08S: Lake Cochituate E1 Runoff Area=15,353 sf 0.00% Impervious Runoff Depth>2.32"
Flow Length=146' Tc=5.0 min CN=60 Runoff=0.96 cfs 2,970 cf

Subcatchment 09S: Lake Cochituate E2 Runoff Area=8,720 sf 0.00% Impervious Runoff Depth>2.51"
Flow Length=71' Tc=5.0 min CN=62 Runoff=0.60 cfs 1,822 cf

Subcatchment 10S: Lake Cochituate E3 Runoff Area=5,671 sf 0.00% Impervious Runoff Depth>2.32"
Flow Length=96' Tc=7.5 min CN=60 Runoff=0.32 cfs 1,096 cf

Subcatchment 11S: Lake Cochituate E4 Runoff Area=169,075 sf 7.42% Impervious Runoff Depth>2.41"
Flow Length=328' Tc=16.1 min CN=61 Runoff=7.78 cfs 33,919 cf

Subcatchment 12S: Lake Cochituate W1 Runoff Area=45,286 sf 7.97% Impervious Runoff Depth>2.60"
Flow Length=185' Tc=11.2 min CN=63 Runoff=2.61 cfs 9,805 cf

Subcatchment 13S: Lake Cochituate W2 Runoff Area=5,231 sf 0.00% Impervious Runoff Depth>2.05"
Flow Length=52' Slope=0.2426 '/' Tc=5.0 min CN=57 Runoff=0.28 cfs 893 cf

Subcatchment 14S: Lake Cochituate W3 Runoff Area=14,739 sf 0.00% Impervious Runoff Depth>2.23"
Flow Length=114' Tc=6.4 min CN=59 Runoff=0.83 cfs 2,738 cf

Subcatchment 15S: Lake Cochituate W4 Runoff Area=210,093 sf 18.76% Impervious Runoff Depth>2.79"
Flow Length=307' Tc=12.6 min CN=65 Runoff=12.54 cfs 48,819 cf

Subcatchment 16S: Worcester St N Runoff Area=157,456 sf 93.05% Impervious Runoff Depth>5.87"
Flow Length=1,809' Tc=22.6 min CN=94 Runoff=14.77 cfs 77,044 cf

Subcatchment 17S: Worcester St S Runoff Area=26,593 sf 39.48% Impervious Runoff Depth>3.69"
Flow Length=316' Tc=9.0 min CN=74 Runoff=2.39 cfs 8,175 cf

Subcatchment 18S: Arcadi Rd Runoff Area=253,846 sf 12.85% Impervious Runoff Depth>2.31"
Flow Length=806' Tc=17.7 min CN=60 Runoff=10.76 cfs 48,946 cf

Subcatchment 19S: Fisher St Runoff Area=357,165 sf 20.57% Impervious Runoff Depth>2.31"
Flow Length=940' Tc=22.9 min CN=60 Runoff=13.63 cfs 68,771 cf

Subcatchment 20S: Unnamed Pond 1 Runoff Area=22,399 sf 8.44% Impervious Runoff Depth>2.41"
Flow Length=222' Tc=14.3 min CN=61 Runoff=1.08 cfs 4,496 cf

Subcatchment 21S: Unnamed Pond 2 Runoff Area=79,608 sf 24.60% Impervious Runoff Depth>2.32"
Flow Length=279' Tc=7.9 min CN=60 Runoff=4.48 cfs 15,390 cf

Subcatchment 22S: Unnamed Pond 3 Runoff Area=61,232 sf 17.35% Impervious Runoff Depth>2.32"
Flow Length=309' Tc=11.7 min CN=60 Runoff=3.04 cfs 11,826 cf

Subcatchment 23S: Unnamed Pond 4 Runoff Area=52,964 sf 1.51% Impervious Runoff Depth>2.31"
Flow Length=167' Tc=19.8 min CN=60 Runoff=2.15 cfs 10,207 cf

Subcatchment 24S: Kansas St Runoff Area=83,215 sf 17.84% Impervious Runoff Depth>2.60"
Flow Length=227' Tc=7.7 min CN=63 Runoff=5.38 cfs 18,033 cf

Subcatchment 25S: North Main @ Kansas Runoff Area=12,322 sf 100.00% Impervious Runoff Depth>6.36"
Tc=5.0 min CN=98 Runoff=1.90 cfs 6,528 cf

Subcatchment 26S: Empty Lot Runoff Area=26,290 sf 0.00% Impervious Runoff Depth>3.59"
Tc=5.0 min CN=73 Runoff=2.64 cfs 7,864 cf

Subcatchment 27S: Washington Ave 1 Runoff Area=10,780 sf 84.48% Impervious Runoff Depth>6.00"
Tc=5.0 min CN=95 Runoff=1.63 cfs 5,393 cf

Subcatchment 28S: Washington Ave 2 Runoff Area=9,257 sf 66.71% Impervious Runoff Depth>5.54"
Tc=5.0 min CN=91 Runoff=1.35 cfs 4,275 cf

Subcatchment 29S: Washington Ave 3 Runoff Area=23,536 sf 31.05% Impervious Runoff Depth>2.23"
Flow Length=196' Tc=9.0 min CN=59 Runoff=1.22 cfs 4,369 cf

Subcatchment 30S: Lagrange St Runoff Area=59,645 sf 31.36% Impervious Runoff Depth>2.41"
Flow Length=194' Tc=8.7 min CN=61 Runoff=3.42 cfs 11,989 cf

Subcatchment 31S: Mechanic St Runoff Area=62,263 sf 50.59% Impervious Runoff Depth>4.11"
Flow Length=329' Tc=5.3 min CN=78 Runoff=7.05 cfs 21,324 cf

Subcatchment 32S: Cochituate St 1 Runoff Area=108,437 sf 32.30% Impervious Runoff Depth>3.08"
Flow Length=728' Tc=16.4 min CN=68 Runoff=6.54 cfs 27,816 cf

Pond 01P: Speen St Detention Peak Elev=160.04' Storage=40 cf Inflow=1.90 cfs 7,120 cf
Primary=0.00 cfs 0 cf Secondary=1.89 cfs 7,117 cf Outflow=1.89 cfs 7,117 cf

Pond 2P: Lake Cochituate Peak Elev=136.02' Storage=13.148 af Inflow=107.79 cfs 572,781 cf
Outflow=0.00 cfs 0 cf

Link 1L: Total Inflow=107.79 cfs 572,781 cf
Primary=107.79 cfs 572,781 cf

Link DP01: Cochituate Rd Inflow=2.17 cfs 7,454 cf
Primary=2.17 cfs 7,454 cf

Link DP02: Chrystler St Inflow=1.81 cfs 11,165 cf
Primary=1.81 cfs 11,165 cf

Link DP03: WF A Inflow=4.43 cfs 19,857 cf
Primary=4.43 cfs 19,857 cf

Link DP04: Lake Cochituate Middle Pond Inflow=20.71 cfs 119,606 cf
Primary=20.71 cfs 119,606 cf

Link DP04-1: WF B Inflow=14.22 cfs 79,798 cf
Primary=14.22 cfs 79,798 cf

Link DP04-2: WF C Inflow=1.86 cfs 5,889 cf
Primary=1.86 cfs 5,889 cf

Link DP04-3: Lake Cochituate Inflow=7.78 cfs 33,919 cf
Primary=7.78 cfs 33,919 cf

Link DP05: Lake Cochituate W Inflow=15.95 cfs 62,255 cf
Primary=15.95 cfs 62,255 cf

Link DP05-1: WF I Inflow=2.61 cfs 9,805 cf
Primary=2.61 cfs 9,805 cf

Link DP05-2: WF G&H Inflow=1.11 cfs 3,631 cf
Primary=1.11 cfs 3,631 cf

Link DP05-3: Lake Cochituate Inflow=12.54 cfs 48,819 cf
Primary=12.54 cfs 48,819 cf

Link DP06: Worcester St Inflow=16.19 cfs 85,219 cf
Primary=16.19 cfs 85,219 cf

Link DP07: WF F Inflow=10.76 cfs 48,946 cf
Primary=10.76 cfs 48,946 cf

Link DP08: WF J Inflow=13.63 cfs 68,771 cf
Primary=13.63 cfs 68,771 cf

Link DP09: Unnamed Pond Inflow=9.75 cfs 41,918 cf
Primary=9.75 cfs 41,918 cf

Link DP09-1: WF K Inflow=1.08 cfs 4,496 cf
Primary=1.08 cfs 4,496 cf

Link DP09-2: WF KA Inflow=4.48 cfs 15,390 cf
Primary=4.48 cfs 15,390 cf

Link DP09-3: WF B Inflow=3.04 cfs 11,826 cf
Primary=3.04 cfs 11,826 cf

Link DP09-4: WF E&L, TOB C Inflow=2.15 cfs 10,207 cf
Primary=2.15 cfs 10,207 cf

Link DP10: WF A Inflow=7.06 cfs 24,561 cf
Primary=7.06 cfs 24,561 cf

Link DP11: Local St Drain System Inflow=2.98 cfs 9,668 cf
Primary=2.98 cfs 9,668 cf

Link DP12: Washington St Low Point Inflow=1.22 cfs 4,369 cf
Primary=1.22 cfs 4,369 cf

Link DP13: Empty Lot Inflow=2.64 cfs 7,864 cf
Primary=2.64 cfs 7,864 cf

Link DP14: Lagrange St Low Point Inflow=3.42 cfs 11,989 cf
Primary=3.42 cfs 11,989 cf

Link DP15: TOB D Inflow=7.05 cfs 21,324 cf
Primary=7.05 cfs 21,324 cf

Link DP16: WF 1, WF 2, TOB E Inflow=6.54 cfs 27,816 cf
Primary=6.54 cfs 27,816 cf

Link WF-G: WF G Inflow=0.83 cfs 2,738 cf
Primary=0.83 cfs 2,738 cf

Link WF-H: WF H Inflow=0.28 cfs 893 cf
Primary=0.28 cfs 893 cf

Total Runoff Area = 2,480,180 sf Runoff Volume = 579,902 cf Average Runoff Depth = 2.81"
78.96% Pervious = 1,958,347 sf 21.04% Impervious = 521,833 sf

Summary for Subcatchment 01S: Cochitute Rd 1

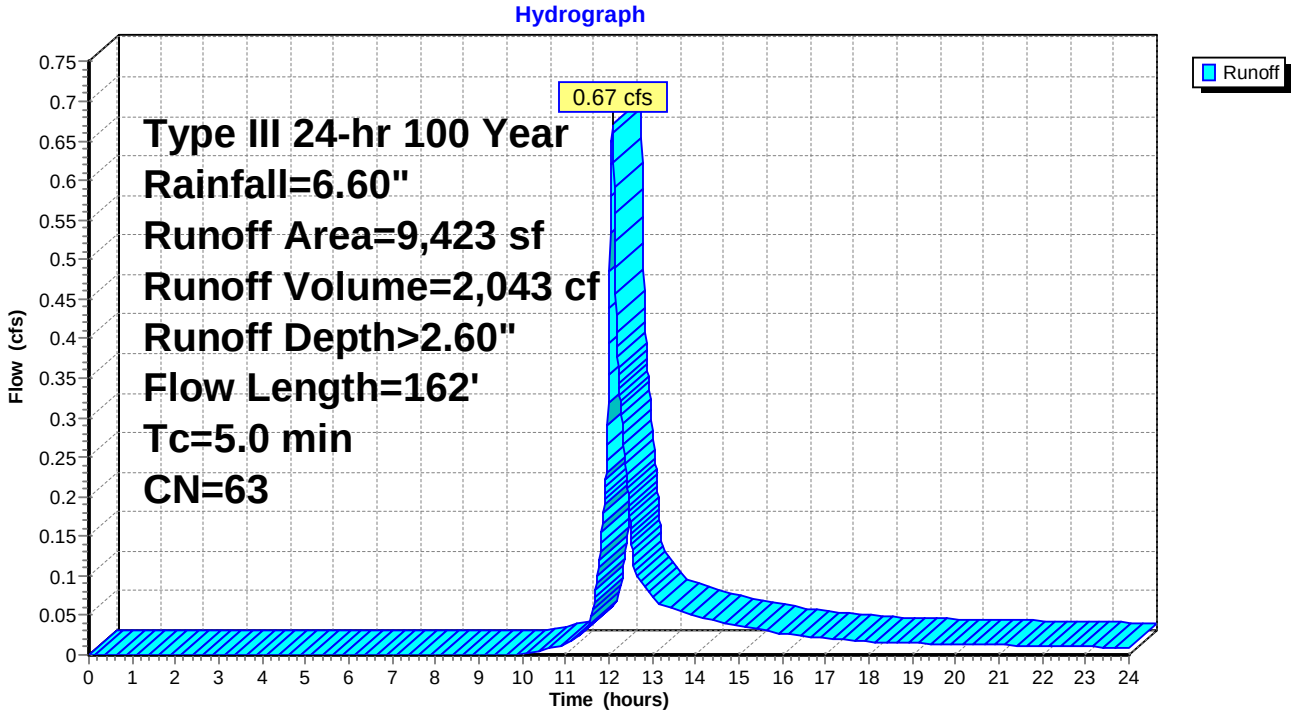
Runoff = 0.67 cfs @ 12.08 hrs, Volume= 2,043 cf, Depth> 2.60"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=6.60"

Area (sf)	CN	Description
6,995	57	Woods/grass comb., Poor, HSG A
2,147	76	Gravel roads, HSG A
281	98	Paved parking, HSG A
9,423	63	Weighted Average
9,142		97.02% Pervious Area
281		2.98% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.3	100	0.0040	0.72		**Sheet Flow, Gravel Path** Smooth surfaces n= 0.011 P2= 3.15"
1.1	62	0.0036	0.97		**Shallow Concentrated Flow, Gravel Path** Unpaved Kv= 16.1 fps
3.4	162	Total, Increased to minimum Tc = 5.0 min			

Subcatchment 01S: Cochitute Rd 1



Summary for Subcatchment 02S: Cochituate Rd 2

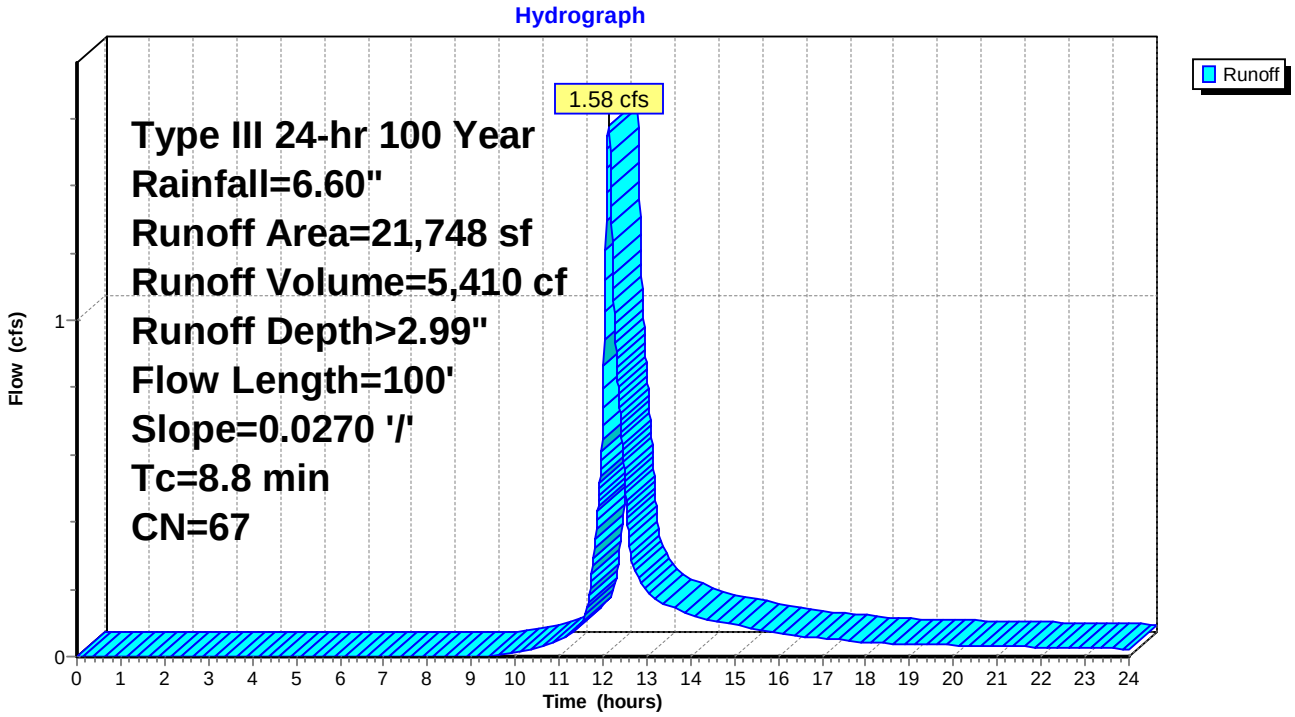
Runoff = 1.58 cfs @ 12.13 hrs, Volume= 5,410 cf, Depth> 2.99"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=6.60"

Area (sf)	CN	Description
8,506	57	Woods/grass comb., Poor, HSG A
714	76	Gravel roads, HSG A
2,491	98	Paved parking, HSG A
10,037	68	<50% Grass cover, Poor, HSG A
21,748	67	Weighted Average
19,257		88.55% Pervious Area
2,491		11.45% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.8	100	0.0270	0.19		**Sheet Flow, Grass** Grass: Short n= 0.150 P2= 3.15"

Subcatchment 02S: Cochituate Rd 2



Summary for Subcatchment 03S: Home Depot

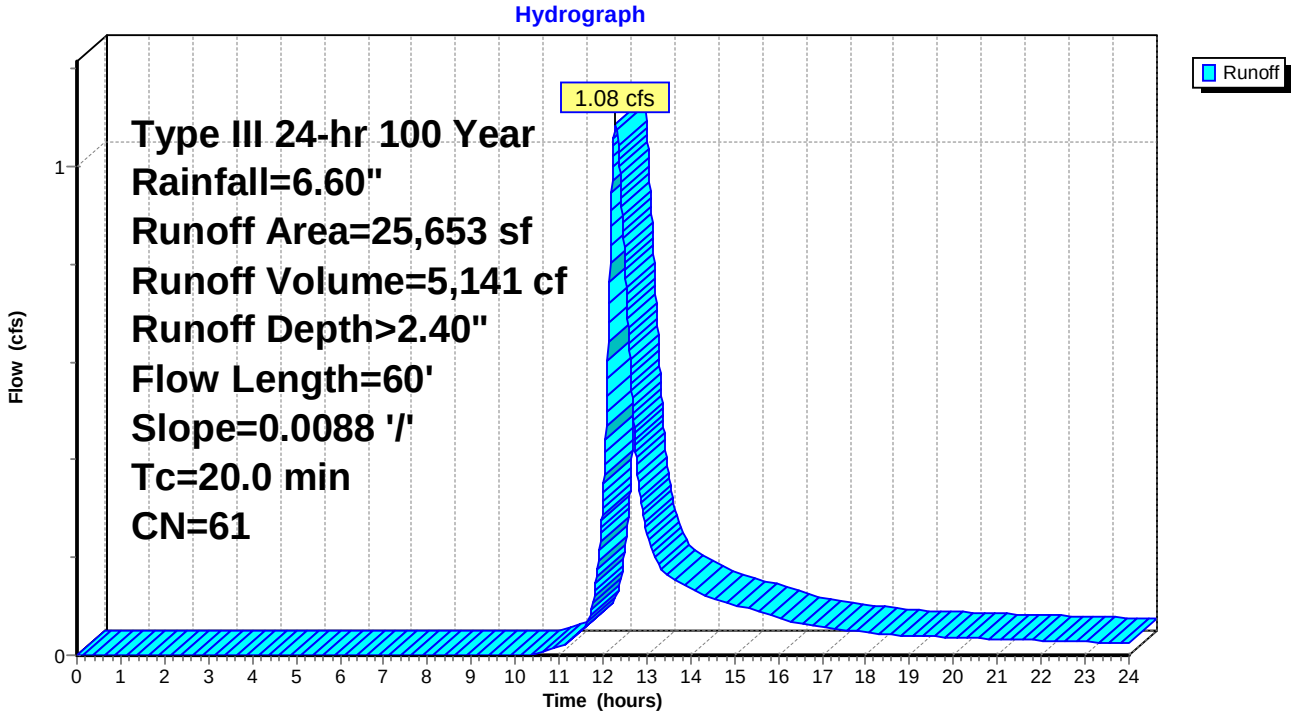
Runoff = 1.08 cfs @ 12.29 hrs, Volume= 5,141 cf, Depth> 2.40"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=6.60"

Area (sf)	CN	Description
4,785	76	Gravel roads, HSG A
20,868	57	Woods/grass comb., Poor, HSG A
25,653	61	Weighted Average
25,653		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.0	60	0.0088	0.05		**Sheet Flow, Woods**
					Woods: Light underbrush n= 0.400 P2= 3.15"

Subcatchment 03S: Home Depot



Summary for Subcatchment 04S: Chrystler St

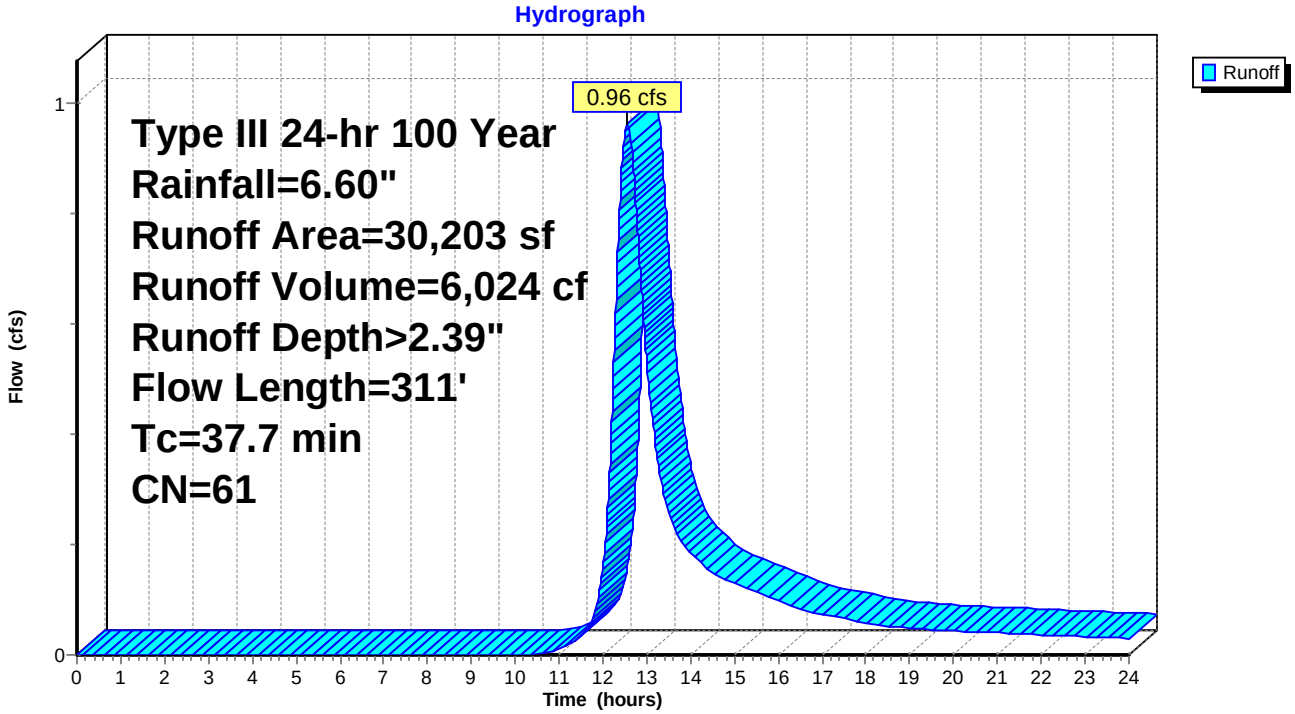
Runoff = 0.96 cfs @ 12.56 hrs, Volume= 6,024 cf, Depth> 2.39"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=6.60"

Area (sf)	CN	Description
27,297	57	Woods/grass comb., Poor, HSG A
425	76	Gravel roads, HSG A
2,481	98	Paved parking, HSG A
30,203	61	Weighted Average
27,722		91.79% Pervious Area
2,481		8.21% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
28.6	100	0.0100	0.06		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
9.1	211	0.0060	0.39		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
37.7	311	Total			

Subcatchment 04S: Chrystler St



Summary for Subcatchment 05S: DNR

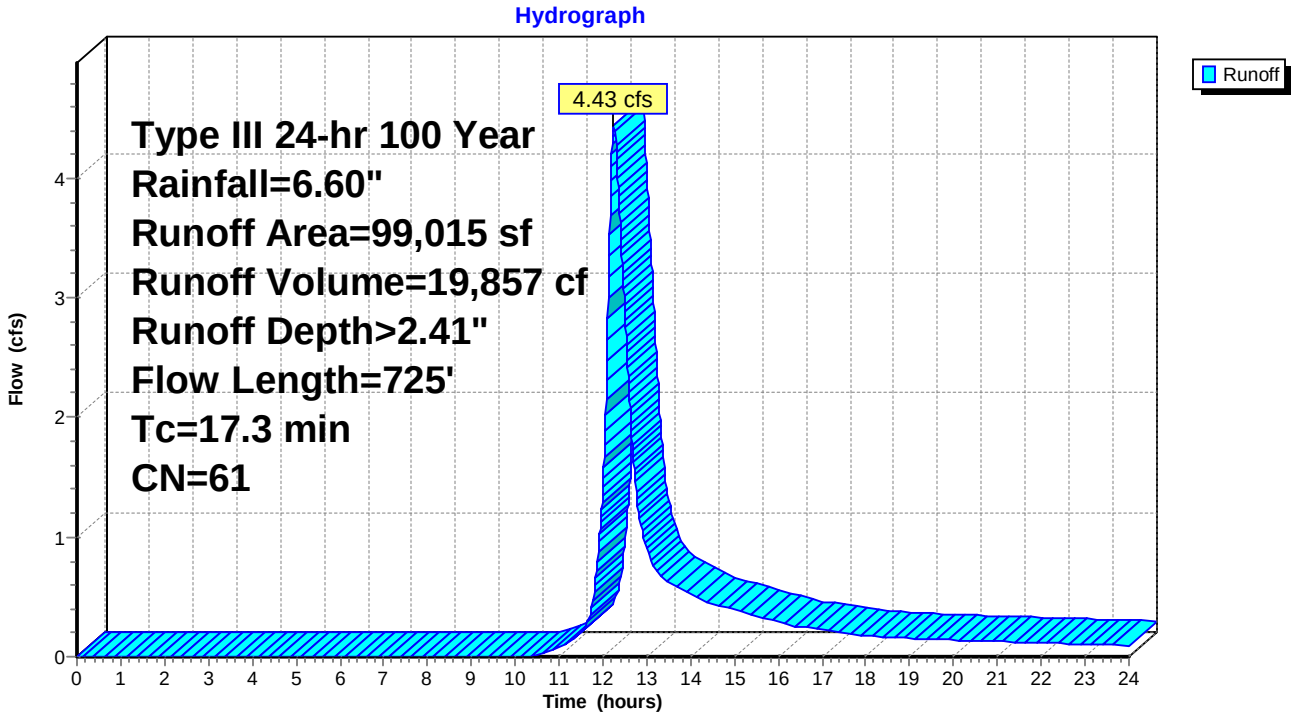
Runoff = 4.43 cfs @ 12.25 hrs, Volume= 19,857 cf, Depth> 2.41"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=6.60"

Area (sf)	CN	Description
81,414	57	Woods/grass comb., Poor, HSG A
16,946	76	Gravel roads, HSG A
655	98	Paved parking, HSG A
99,015	61	Weighted Average
98,360		99.34% Pervious Area
655		0.66% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0	100	0.3330	0.24		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
7.0	391	0.0033	0.92		**Shallow Concentrated Flow, Gravel Path** Unpaved Kv= 16.1 fps
3.3	234	0.0556	1.18		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
17.3	725	Total			

Subcatchment 05S: DNR



Summary for Subcatchment 06S: Speen St

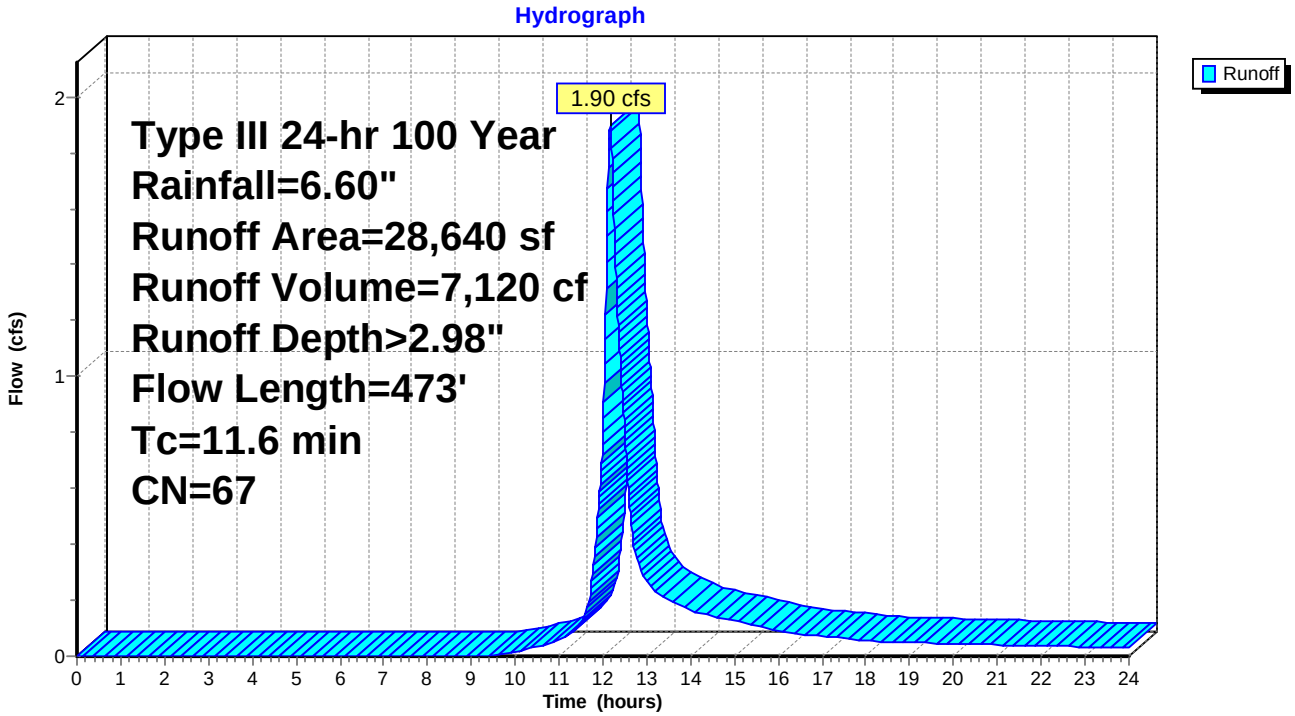
Runoff = 1.90 cfs @ 12.16 hrs, Volume= 7,120 cf, Depth> 2.98"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=6.60"

Area (sf)	CN	Description
11,348	57	Woods/grass comb., Poor, HSG A
3,881	76	Gravel roads, HSG A
1,783	98	Paved roads w/curbs & sewers, HSG A
11,628	68	<50% Grass cover, Poor, HSG A
28,640	67	Weighted Average
26,857		93.77% Pervious Area
1,783		6.23% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	22	0.1440	0.27		**Sheet Flow, Grass** Grass: Short n= 0.150 P2= 3.15"
7.8	58	0.0120	0.12		**Sheet Flow, Grass** Grass: Short n= 0.150 P2= 3.15"
2.5	393	0.0265	2.62		**Shallow Concentrated Flow, Gravel Path** Unpaved Kv= 16.1 fps
11.6	473	Total			

Subcatchment 06S: Speen St



Summary for Subcatchment 07S: Lake Cochituate N

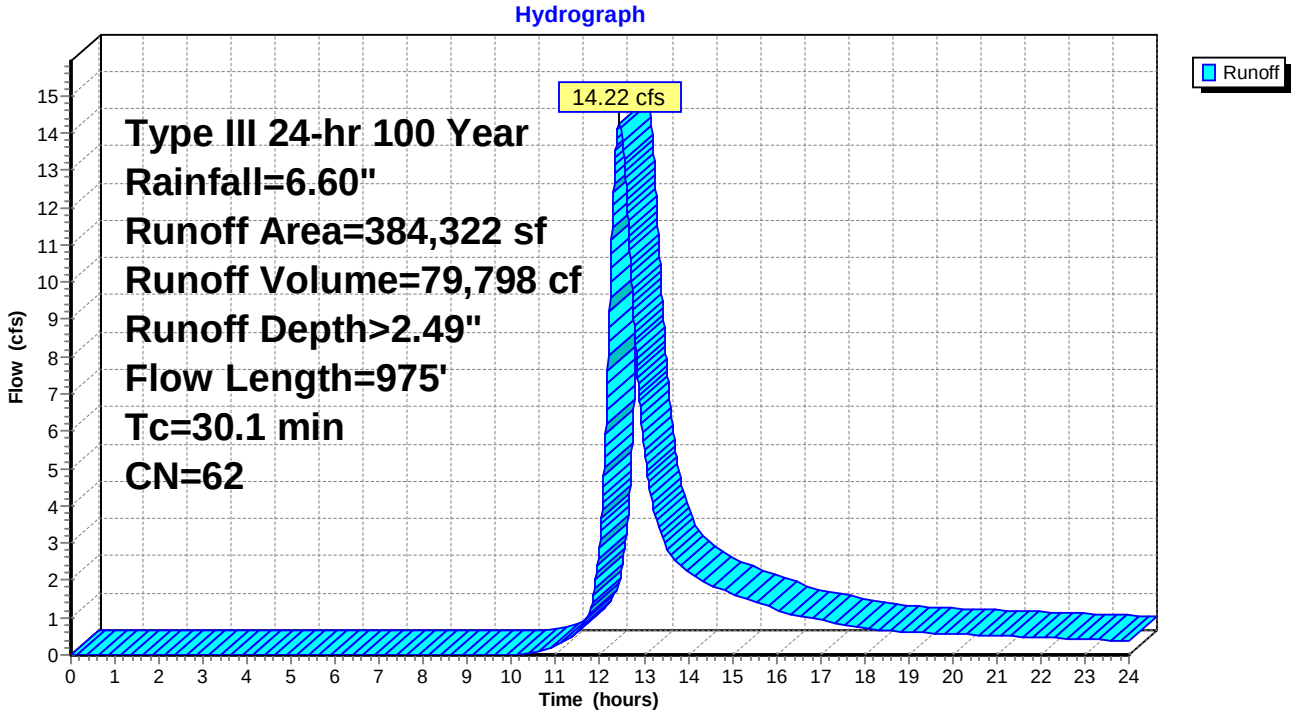
Runoff = 14.22 cfs @ 12.44 hrs, Volume= 79,798 cf, Depth> 2.49"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=6.60"

Area (sf)	CN	Description
317,071	57	Woods/grass comb., Poor, HSG A
39,676	76	Gravel roads, HSG A
27,575	98	Paved parking, HSG A
384,322	62	Weighted Average
356,747		92.83% Pervious Area
27,575		7.17% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.7	33	0.4091	0.21		**Sheet Flow, Woods**
					Woods: Light underbrush n= 0.400 P2= 3.15"
1.5	67	0.0209	0.72		**Shallow Concentrated Flow, Woods**
					Woodland Kv= 5.0 fps
23.7	664	0.0087	0.47		**Shallow Concentrated Flow, Woods**
					Woodland Kv= 5.0 fps
1.9	164	0.0079	1.43		**Shallow Concentrated Flow, Gravel Path**
					Unpaved Kv= 16.1 fps
0.3	47	0.3120	2.79		**Shallow Concentrated Flow, Woods**
					Woodland Kv= 5.0 fps
30.1	975	Total			

Subcatchment 07S: Lake Cochituate N



Summary for Subcatchment 08S: Lake Cochituate E1

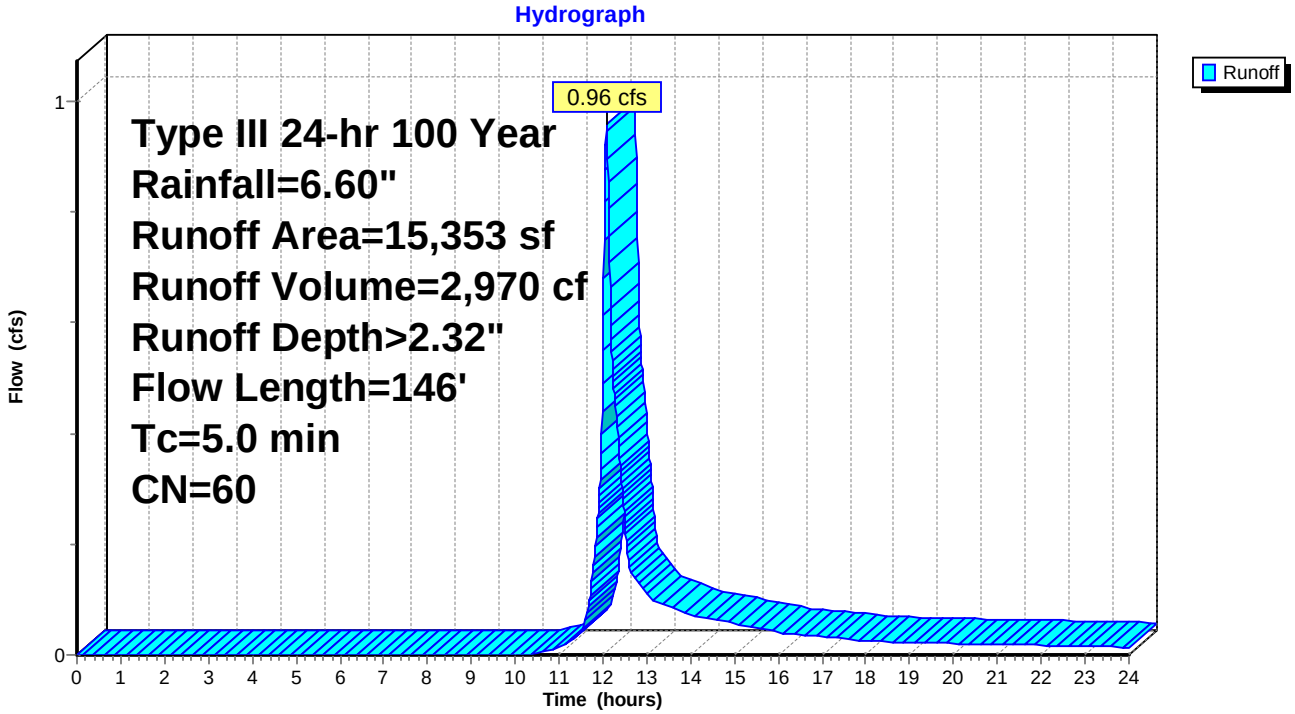
Runoff = 0.96 cfs @ 12.08 hrs, Volume= 2,970 cf, Depth> 2.32"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=6.60"

Area (sf)	CN	Description
12,685	57	Woods/grass comb., Poor, HSG A
2,668	76	Gravel roads, HSG A
15,353	60	Weighted Average
15,353		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	12	0.2500	0.14		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
0.4	45	0.0112	1.70		**Shallow Concentrated Flow, Gravel Path** Unpaved Kv= 16.1 fps
0.9	89	0.1157	1.70		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
2.7	146	Total, Increased to minimum Tc = 5.0 min			

Subcatchment 08S: Lake Cochituate E1



Summary for Subcatchment 09S: Lake Cochituate E2

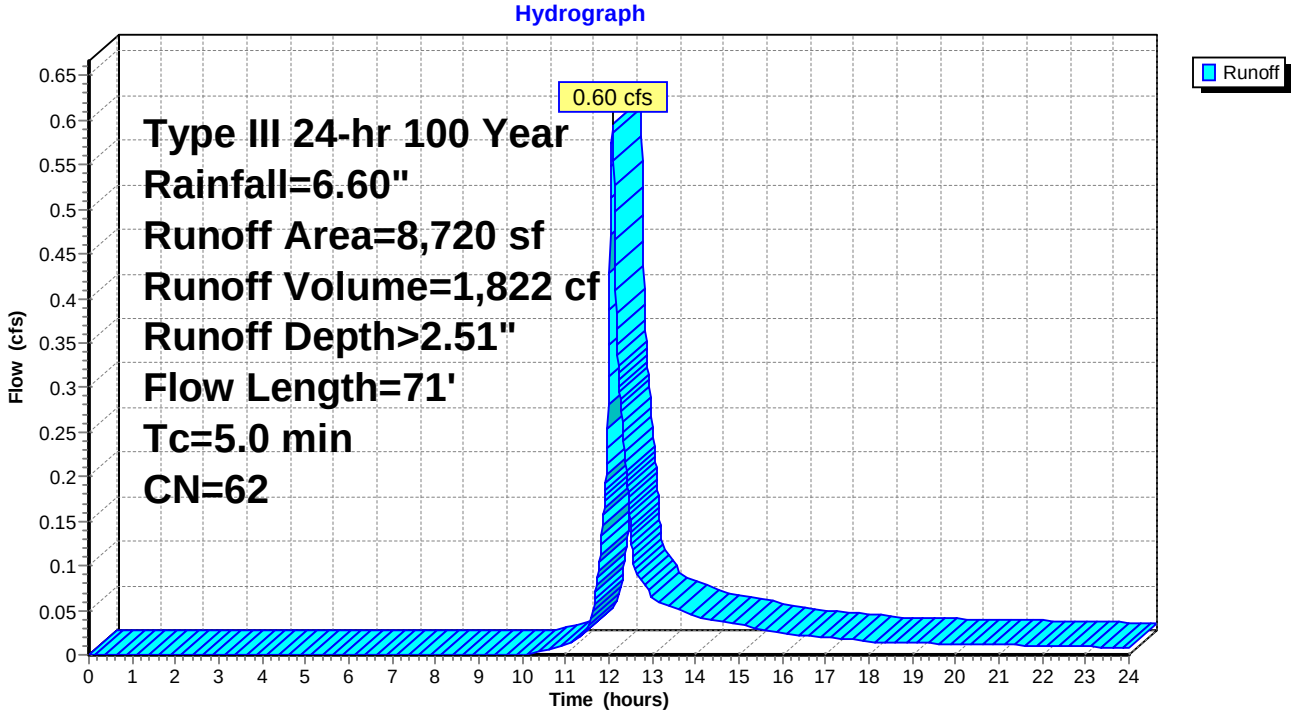
Runoff = 0.60 cfs @ 12.08 hrs, Volume= 1,822 cf, Depth> 2.51"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=6.60"

Area (sf)	CN	Description
6,212	57	Woods/grass comb., Poor, HSG A
2,508	76	Gravel roads, HSG A
8,720	62	Weighted Average
8,720		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	32	0.0333	1.33		**Sheet Flow, Gravel Path** Smooth surfaces n= 0.011 P2= 3.15"
2.8	39	0.4974	0.23		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
3.2	71	Total, Increased to minimum Tc = 5.0 min			

Subcatchment 09S: Lake Cochituate E2



Summary for Subcatchment 10S: Lake Cochituate E3

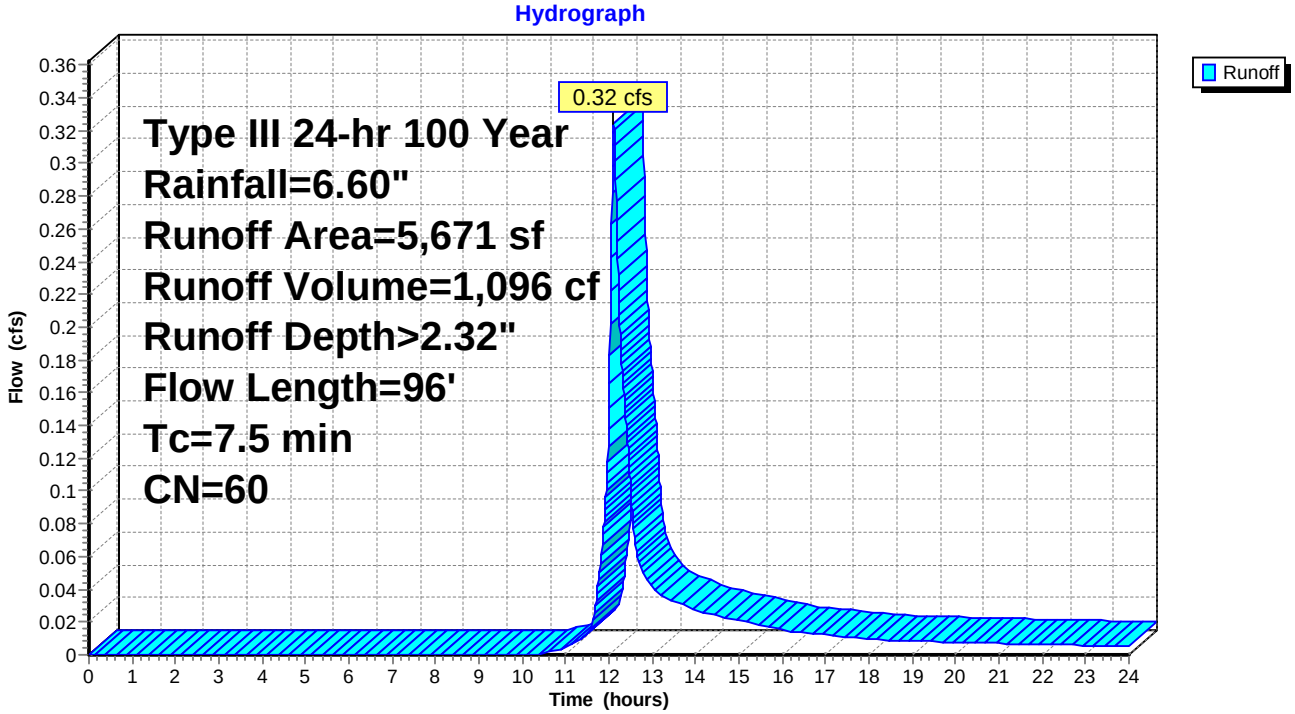
Runoff = 0.32 cfs @ 12.11 hrs, Volume= 1,096 cf, Depth> 2.32"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=6.60"

Area (sf)	CN	Description
4,892	57	Woods/grass comb., Poor, HSG A
779	76	Gravel roads, HSG A
5,671	60	Weighted Average
5,671		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	22	0.0023	0.42		**Sheet Flow, Gravel Path** Smooth surfaces n= 0.011 P2= 3.15"
6.6	74	0.2101	0.19		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
7.5	96	Total			

Subcatchment 10S: Lake Cochituate E3



Summary for Subcatchment 11S: Lake Cochituate E4

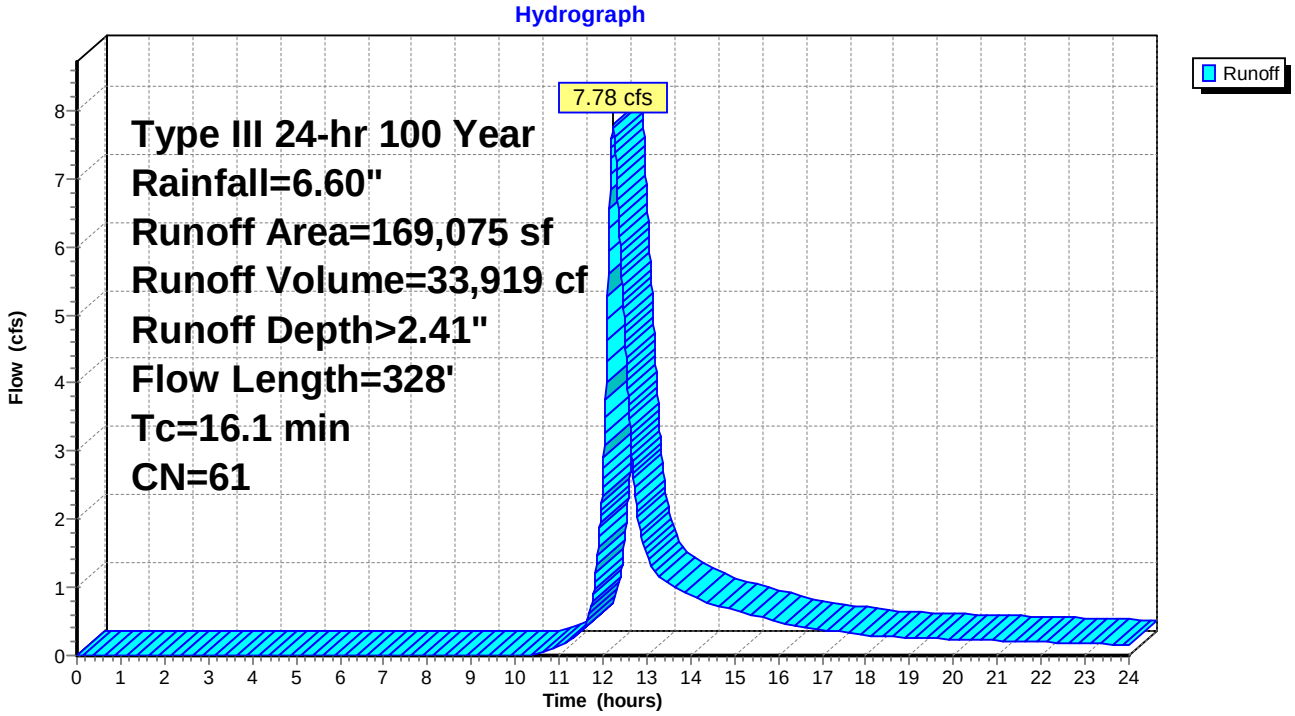
Runoff = 7.78 cfs @ 12.23 hrs, Volume= 33,919 cf, Depth> 2.41"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=6.60"

Area (sf)	CN	Description
151,451	57	Woods/grass comb., Poor, HSG A
5,071	76	Gravel roads, HSG A
12,553	98	Paved parking, HSG A
169,075	61	Weighted Average
156,522		92.58% Pervious Area
12,553		7.42% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.1	100	0.0700	0.13		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
2.0	125	0.0456	1.07		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
0.1	13	0.0192	2.81		**Shallow Concentrated Flow, Road** Paved Kv= 20.3 fps
0.9	90	0.1080	1.64		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
16.1	328	Total			

Subcatchment 11S: Lake Cochituate E4



Summary for Subcatchment 12S: Lake Cochituate W1

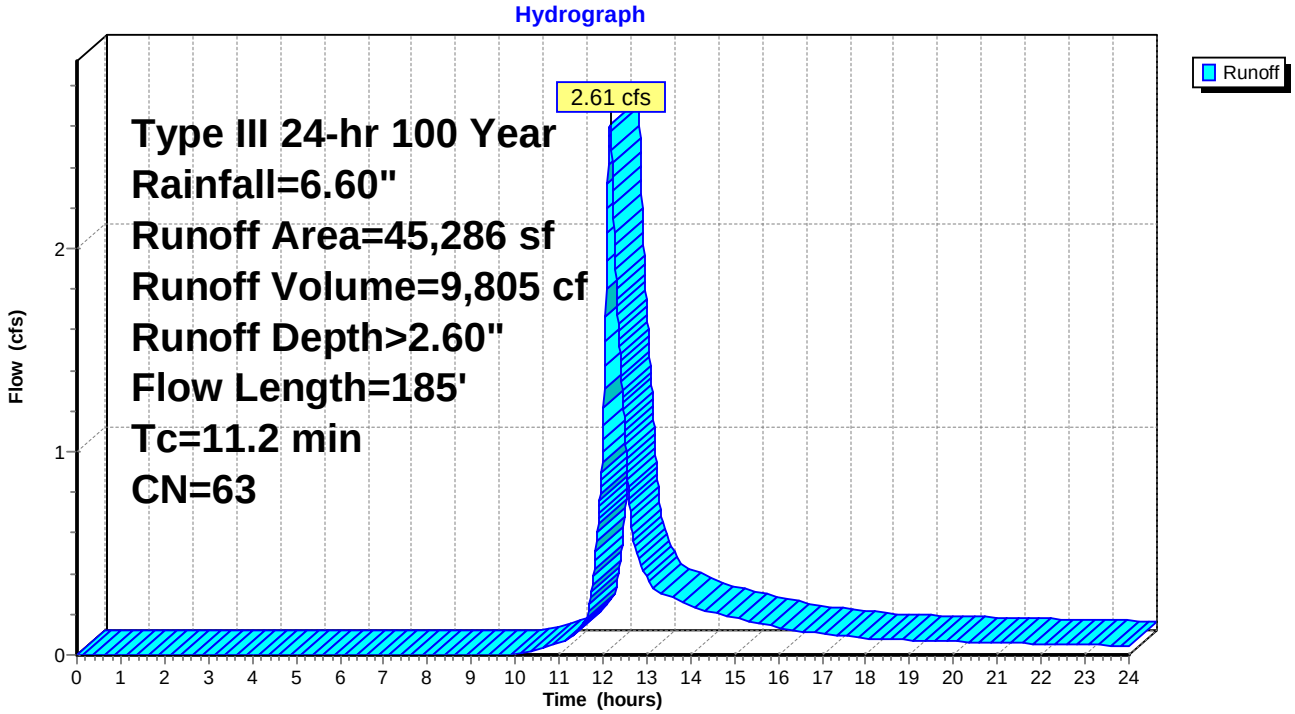
Runoff = 2.61 cfs @ 12.16 hrs, Volume= 9,805 cf, Depth> 2.60"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=6.60"

Area (sf)	CN	Description
35,546	57	Woods/grass comb., Poor, HSG A
6,132	76	Gravel roads, HSG A
3,608	98	Paved parking, HSG A
45,286	63	Weighted Average
41,678		92.03% Pervious Area
3,608		7.97% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	100	0.1200	0.16		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
0.6	85	0.2100	2.29		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
11.2	185	Total			

Subcatchment 12S: Lake Cochituate W1



Summary for Subcatchment 13S: Lake Cochituate W2

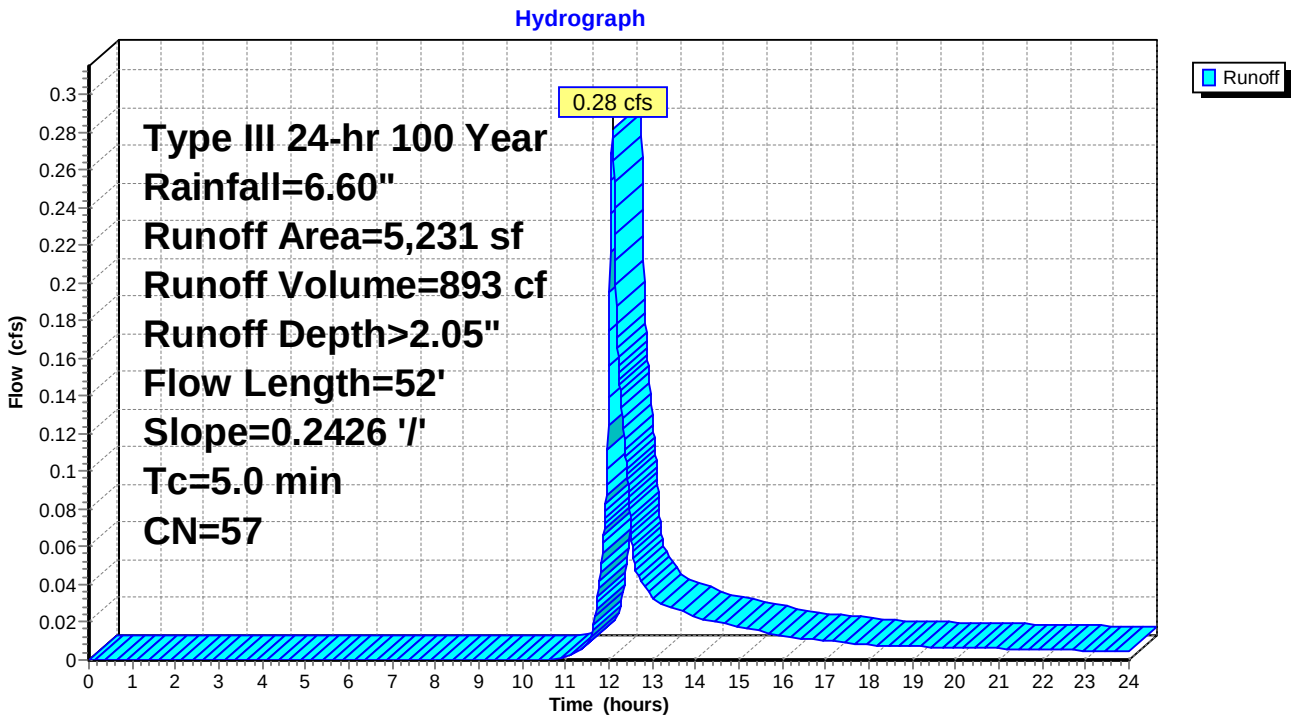
Runoff = 0.28 cfs @ 12.08 hrs, Volume= 893 cf, Depth> 2.05"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=6.60"

Area (sf)	CN	Description
5,231	57	Woods/grass comb., Poor, HSG A
5,231		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.7	52	0.2426	0.18		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
4.7	52	Total, Increased to minimum Tc = 5.0 min			

Subcatchment 13S: Lake Cochituate W2



Summary for Subcatchment 14S: Lake Cochituate W3

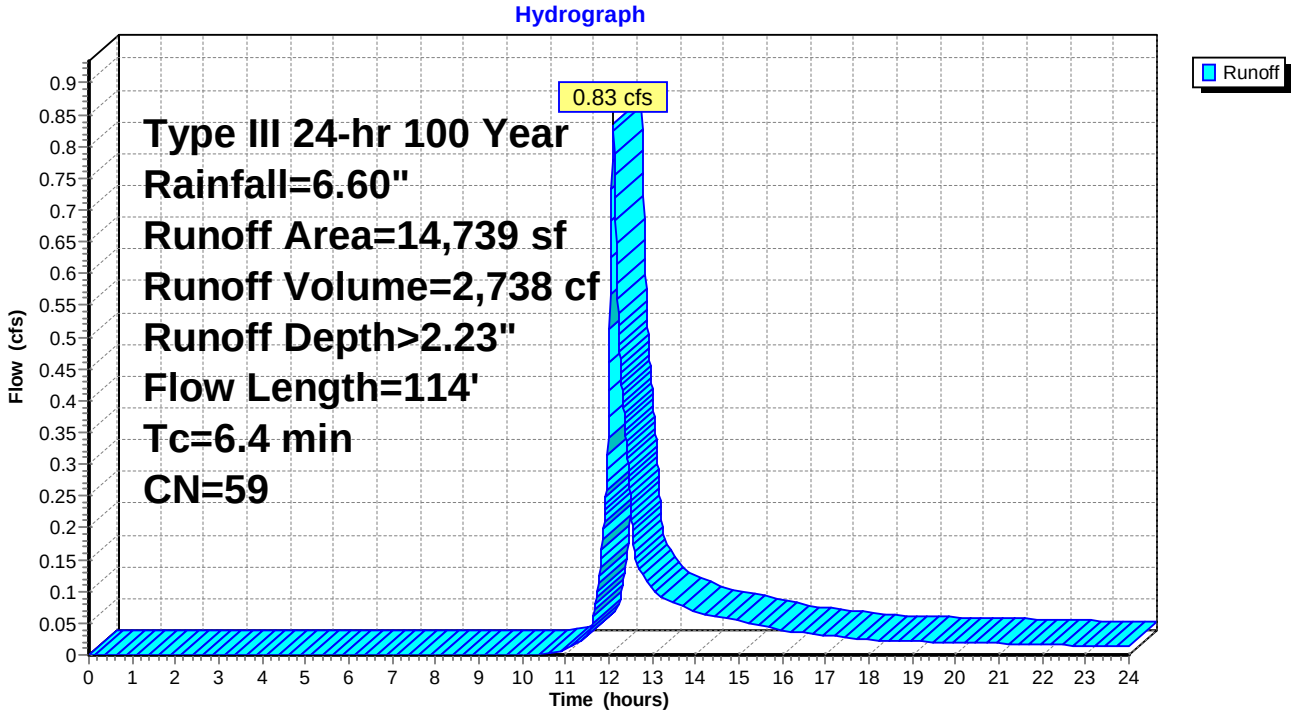
Runoff = 0.83 cfs @ 12.10 hrs, Volume= 2,738 cf, Depth> 2.23"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=6.60"

Area (sf)	CN	Description
13,168	57	Woods/grass comb., Poor, HSG A
1,571	76	Gravel roads, HSG A
14,739	59	Weighted Average
14,739		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	38	0.0132	0.95		**Sheet Flow, Gravel Path** Smooth surfaces n= 0.011 P2= 3.15"
5.6	62	0.2258	0.18		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
0.1	14	0.2500	2.50		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
6.4	114	Total			

Subcatchment 14S: Lake Cochituate W3



Summary for Subcatchment 15S: Lake Cochituate W4

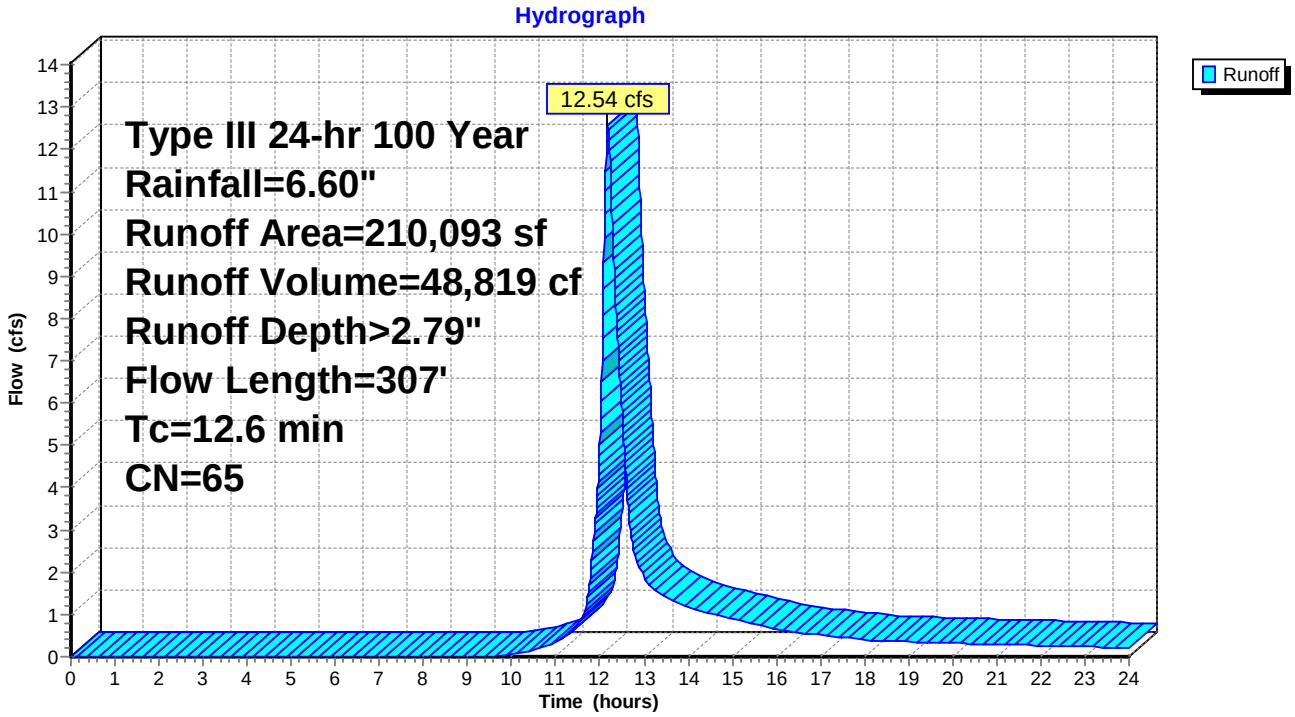
Runoff = 12.54 cfs @ 12.18 hrs, Volume= 48,819 cf, Depth> 2.79"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=6.60"

Area (sf)	CN	Description
166,247	57	Woods/grass comb., Poor, HSG A
4,427	76	Gravel roads, HSG A
39,419	98	Paved parking, HSG A
210,093	65	Weighted Average
170,674		81.24% Pervious Area
39,419		18.76% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	10	0.0050	0.49		**Sheet Flow, Gravel Path** Smooth surfaces n= 0.011 P2= 3.15"
9.0	90	0.1444	0.17		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
3.3	207	0.0431	1.04		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
12.6	307	Total			

Subcatchment 15S: Lake Cochituate W4



Summary for Subcatchment 16S: Worcester St N

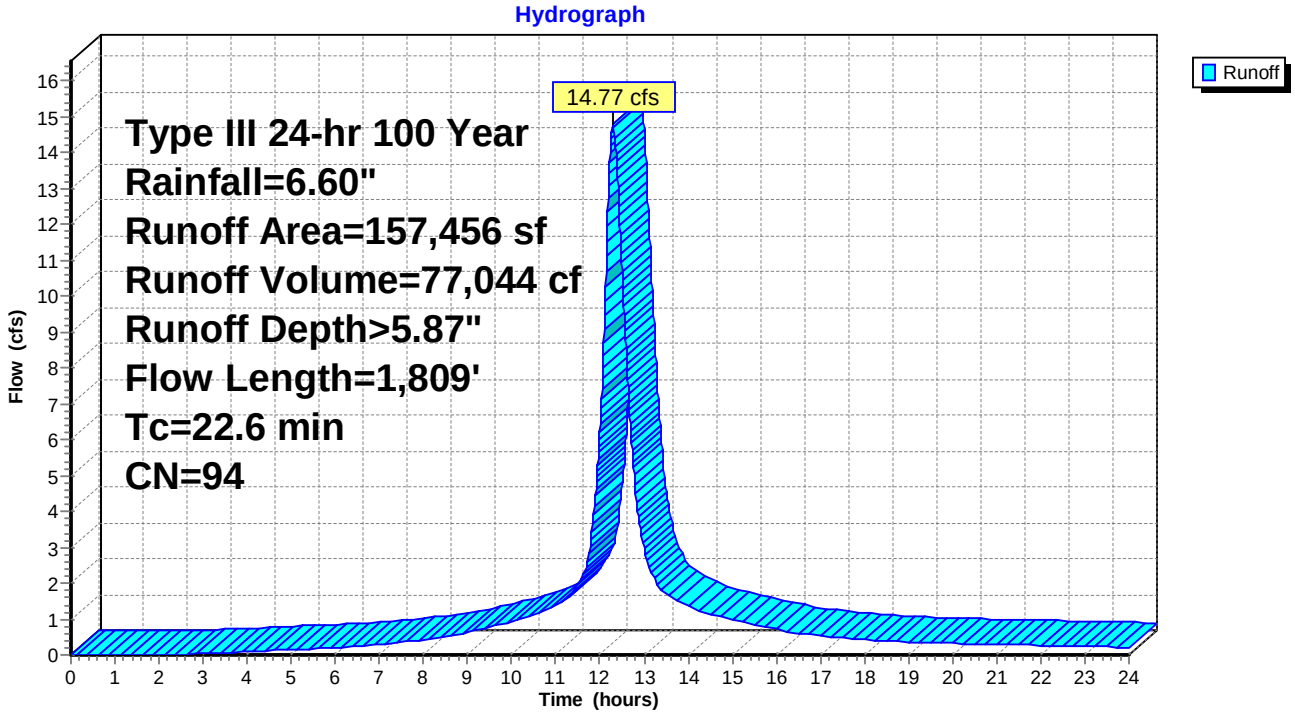
Runoff = 14.77 cfs @ 12.29 hrs, Volume= 77,044 cf, Depth> 5.87"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=6.60"

Area (sf)	CN	Description
68,655	89	Urban commercial, 85% imp, HSG A
648	76	Gravel roads, HSG A
88,153	98	Paved roads w/curbs & sewers, HSG A
157,456	94	Weighted Average
10,946		6.95% Pervious Area
146,510		93.05% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.0	100	0.0100	0.13		**Sheet Flow, Yards** Grass: Short n= 0.150 P2= 3.15"
9.6	1,709	0.0214	2.97		**Shallow Concentrated Flow, Road** Paved Kv= 20.3 fps
22.6	1,809	Total			

Subcatchment 16S: Worcester St N



Summary for Subcatchment 17S: Worcester St S

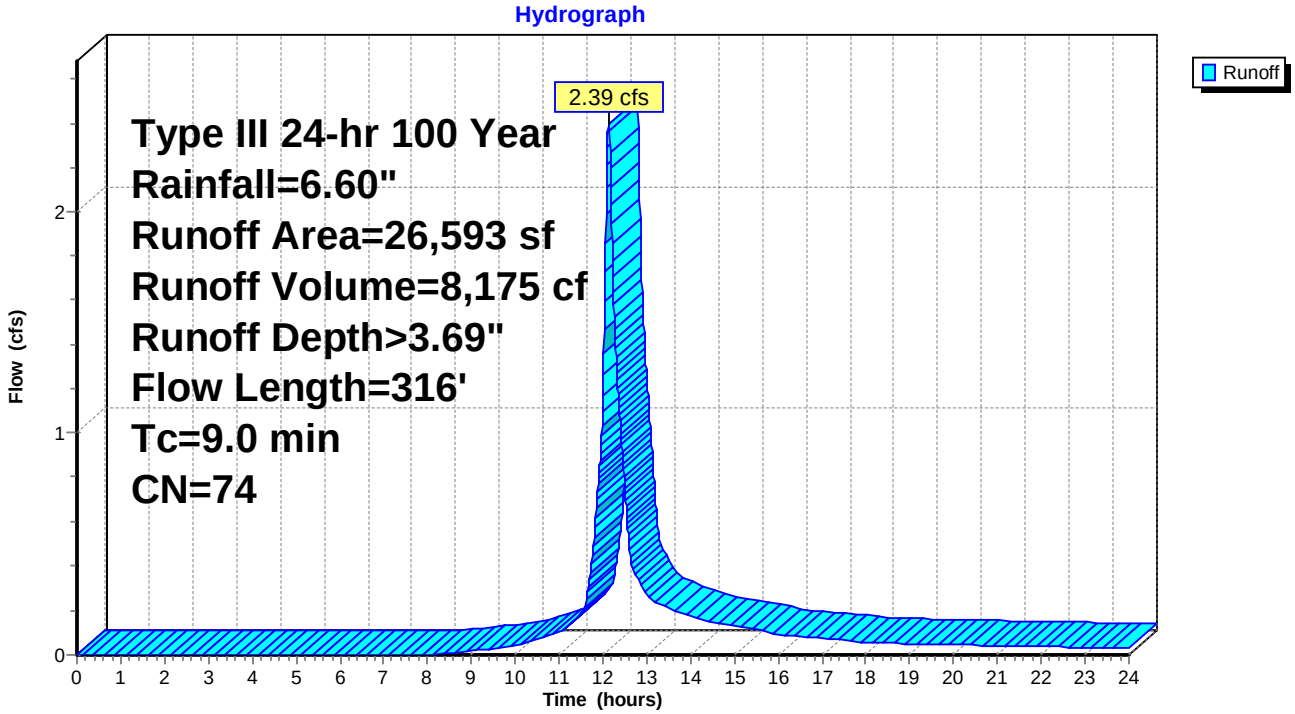
Runoff = 2.39 cfs @ 12.13 hrs, Volume= 8,175 cf, Depth> 3.69"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=6.60"

Area (sf)	CN	Description
15,358	57	Woods/grass comb., Poor, HSG A
10,499	98	Paved parking, HSG A
736	76	Gravel roads, HSG A
26,593	74	Weighted Average
16,094		60.52% Pervious Area
10,499		39.48% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.3	90	0.2444	0.21		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
1.7	226	0.0115	2.18		**Shallow Concentrated Flow, Road** Paved Kv= 20.3 fps
9.0	316	Total			

Subcatchment 17S: Worcester St S



Summary for Subcatchment 18S: Arcadi Rd

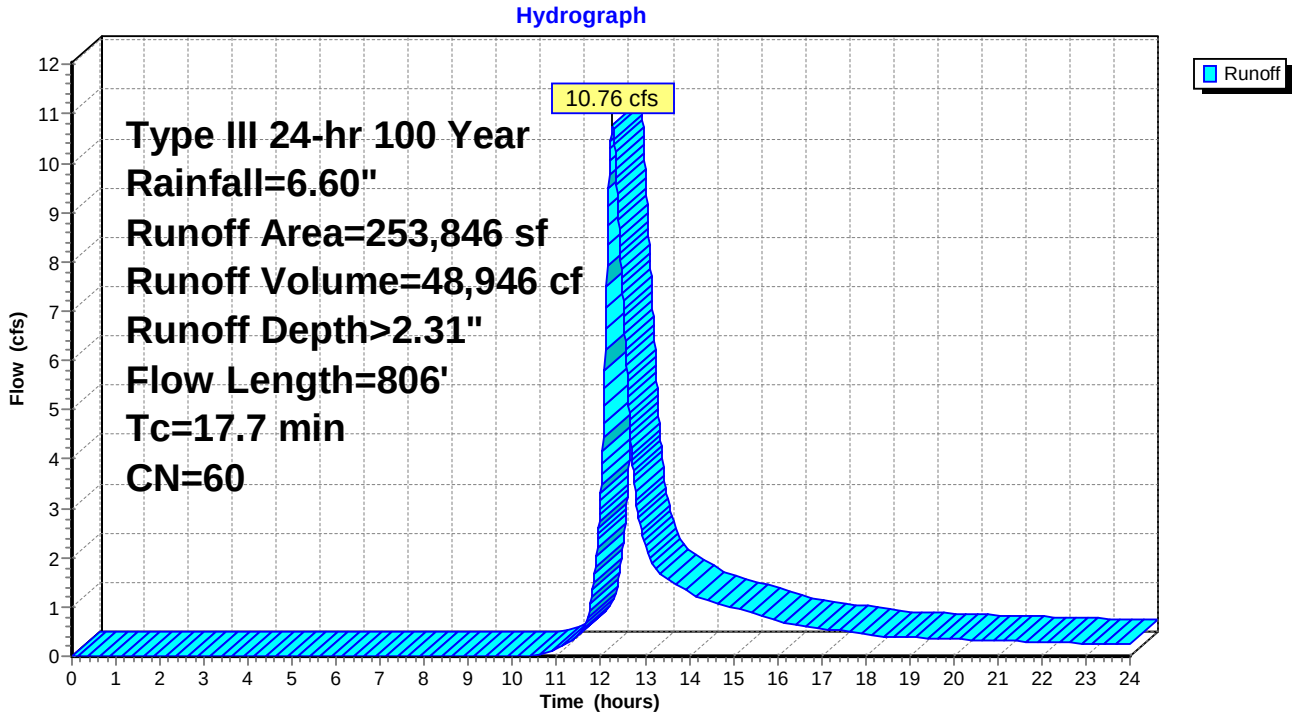
Runoff = 10.76 cfs @ 12.26 hrs, Volume= 48,946 cf, Depth> 2.31"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=6.60"

Area (sf)	CN	Description
24,868	76	Gravel roads, HSG A
1,306	98	Paved parking, HSG A
145,254	57	Woods/grass comb., Poor, HSG A
82,418	61	1/4 acre lots, 38% imp, HSG A
253,846	60	Weighted Average
221,221		87.15% Pervious Area
32,625		12.85% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.1	55	0.3853	0.22		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
12.5	625	0.0027	0.84		**Shallow Concentrated Flow, Gravel** Unpaved Kv= 16.1 fps
1.1	126	0.1433	1.89		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
17.7	806	Total			

Subcatchment 18S: Arcadi Rd



Summary for Subcatchment 19S: Fisher St

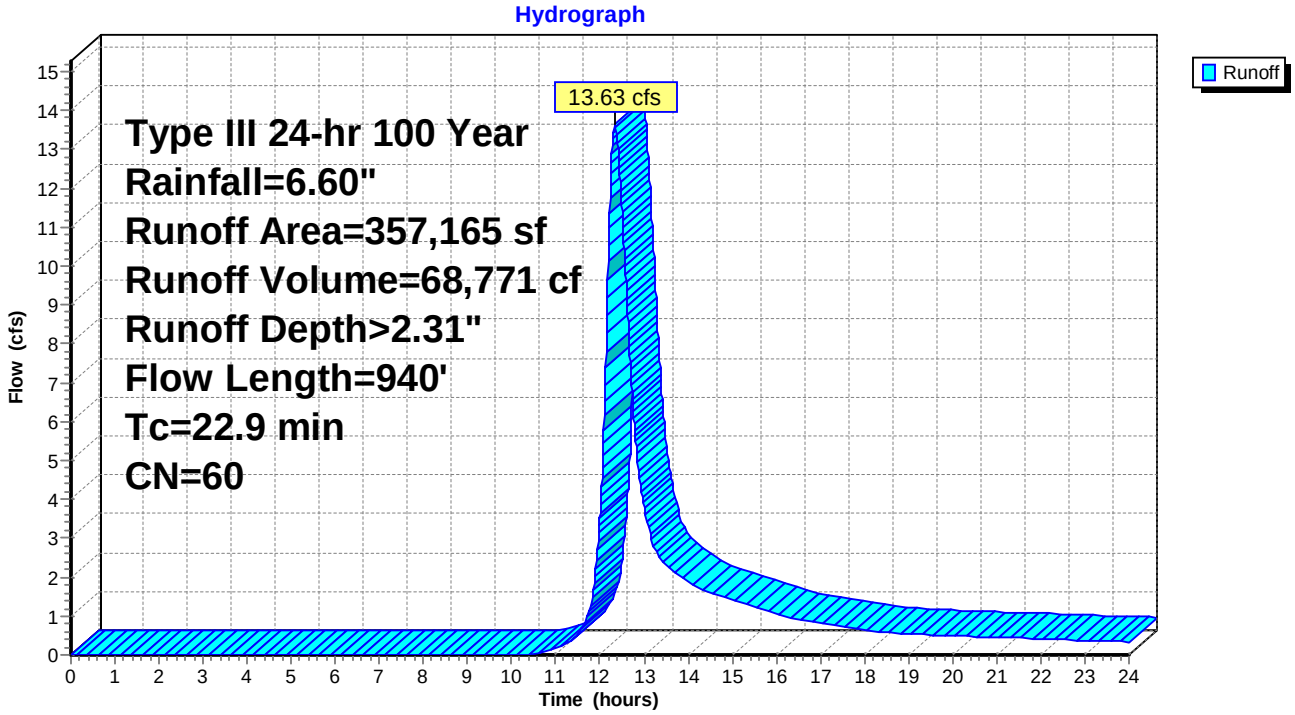
Runoff = 13.63 cfs @ 12.34 hrs, Volume= 68,771 cf, Depth> 2.31"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=6.60"

Area (sf)	CN	Description
193,343	61	1/4 acre lots, 38% imp, HSG A
19,772	76	Gravel roads, HSG A
144,050	57	Woods/grass comb., Poor, HSG A
357,165	60	Weighted Average
283,695		79.43% Pervious Area
73,470		20.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.6	100	0.0550	0.25		**Sheet Flow, Yards** Grass: Short n= 0.150 P2= 3.15"
0.5	30	0.0250	1.11		**Shallow Concentrated Flow, Yards** Short Grass Pasture Kv= 7.0 fps
3.0	38	0.4079	0.21		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
12.6	749	0.0038	0.99		**Shallow Concentrated Flow, Gravel Path** Unpaved Kv= 16.1 fps
0.2	23	0.1609	2.01		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
22.9	940	Total			

Subcatchment 19S: Fisher St



Summary for Subcatchment 20S: Unnamed Pond 1

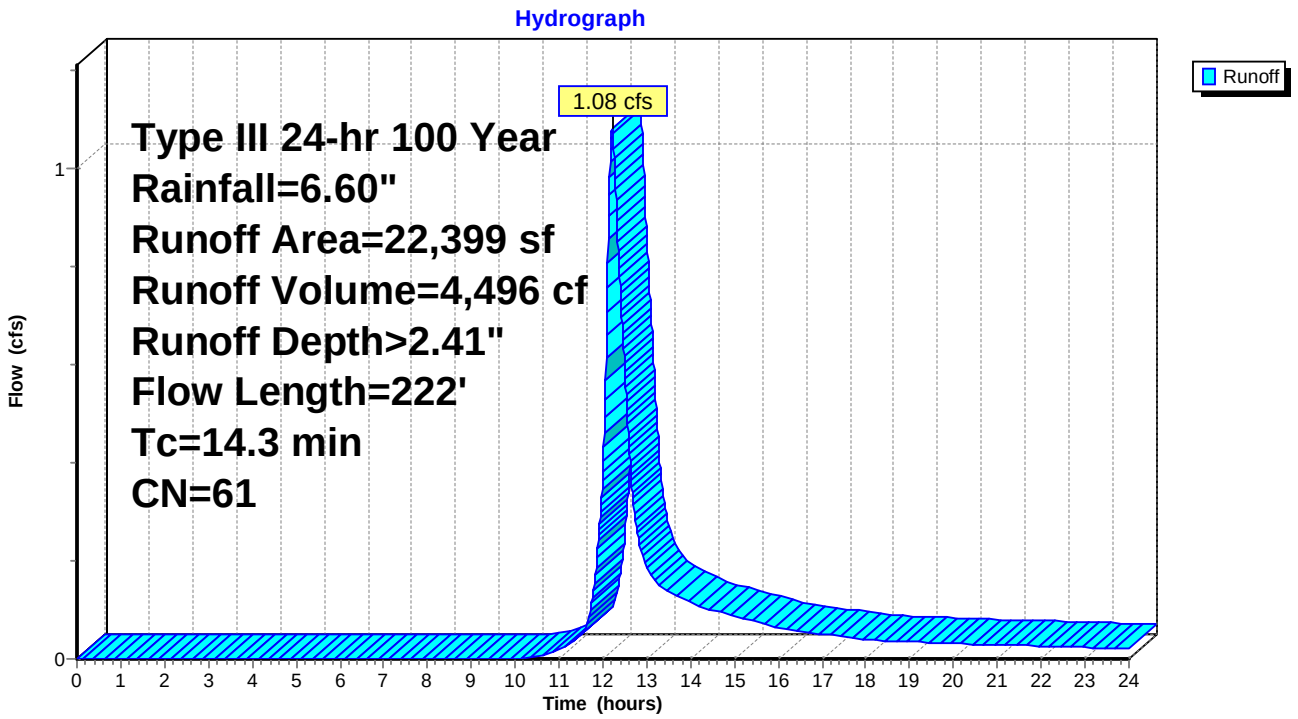
Runoff = 1.08 cfs @ 12.21 hrs, Volume= 4,496 cf, Depth> 2.41"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=6.60"

Area (sf)	CN	Description
1,842	61	1/4 acre lots, 38% imp, HSG A
1,190	98	Paved parking, HSG A
2,043	76	Gravel roads, HSG A
17,324	57	Woods/grass comb., Poor, HSG A
22,399	61	Weighted Average
20,509		91.56% Pervious Area
1,890		8.44% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	24	0.0154	0.92		**Sheet Flow, Driveway**
					Smooth surfaces n= 0.011 P2= 3.15"
1.9	16	0.0312	0.14		**Sheet Flow, Yards**
					Grass: Short n= 0.150 P2= 3.15"
10.4	60	0.0450	0.10		**Sheet Flow, Woods**
					Woods: Light underbrush n= 0.400 P2= 3.15"
1.6	122	0.0639	1.26		**Shallow Concentrated Flow, Woods**
					Woodland Kv= 5.0 fps
14.3	222	Total			

Subcatchment 20S: Unnamed Pond 1



Summary for Subcatchment 21S: Unnamed Pond 2

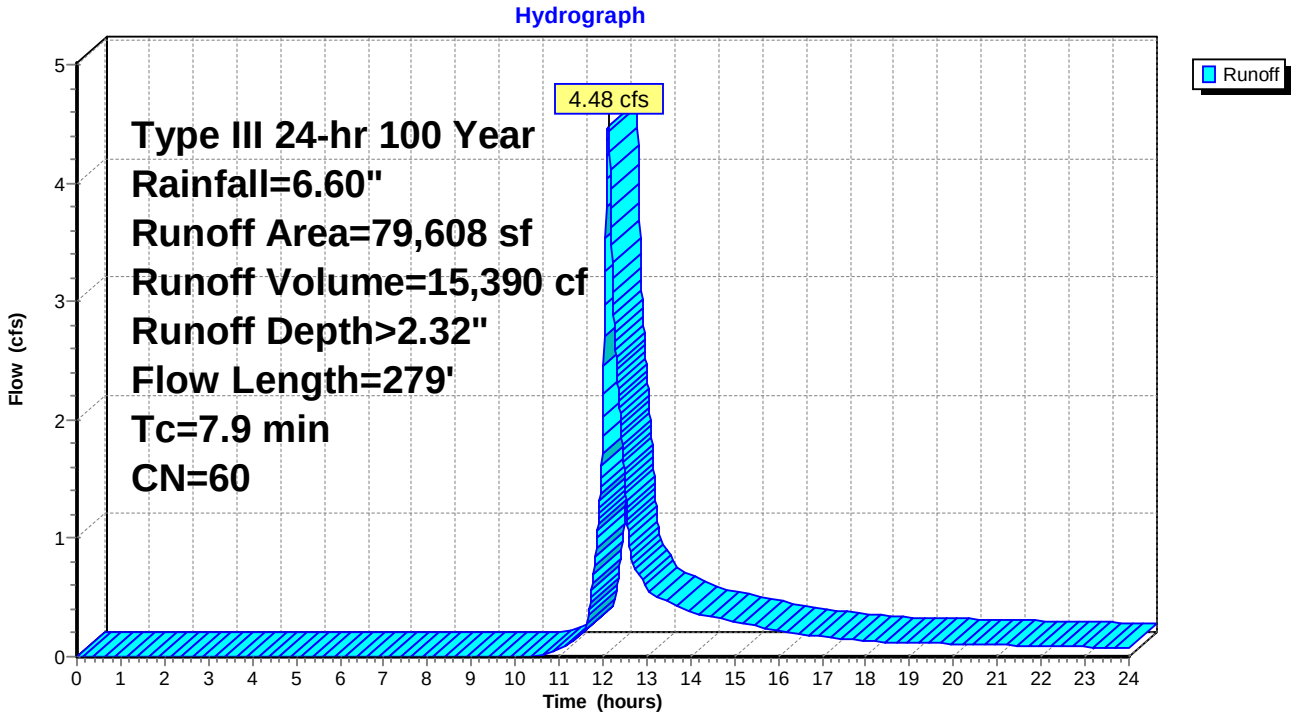
Runoff = 4.48 cfs @ 12.12 hrs, Volume= 15,390 cf, Depth> 2.32"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=6.60"

Area (sf)	CN	Description
51,542	61	1/4 acre lots, 38% imp, HSG A
3,537	76	Gravel roads, HSG A
24,529	57	Woods/grass comb., Poor, HSG A
79,608	60	Weighted Average
60,022		75.40% Pervious Area
19,586		24.60% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.7	100	0.0800	0.29		**Sheet Flow, Yards** Grass: Short n= 0.150 P2= 3.15"
1.3	105	0.0381	1.37		**Shallow Concentrated Flow, Yards** Short Grass Pasture Kv= 7.0 fps
0.9	74	0.0724	1.35		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
7.9	279	Total			

Subcatchment 21S: Unnamed Pond 2



Summary for Subcatchment 22S: Unnamed Pond 3

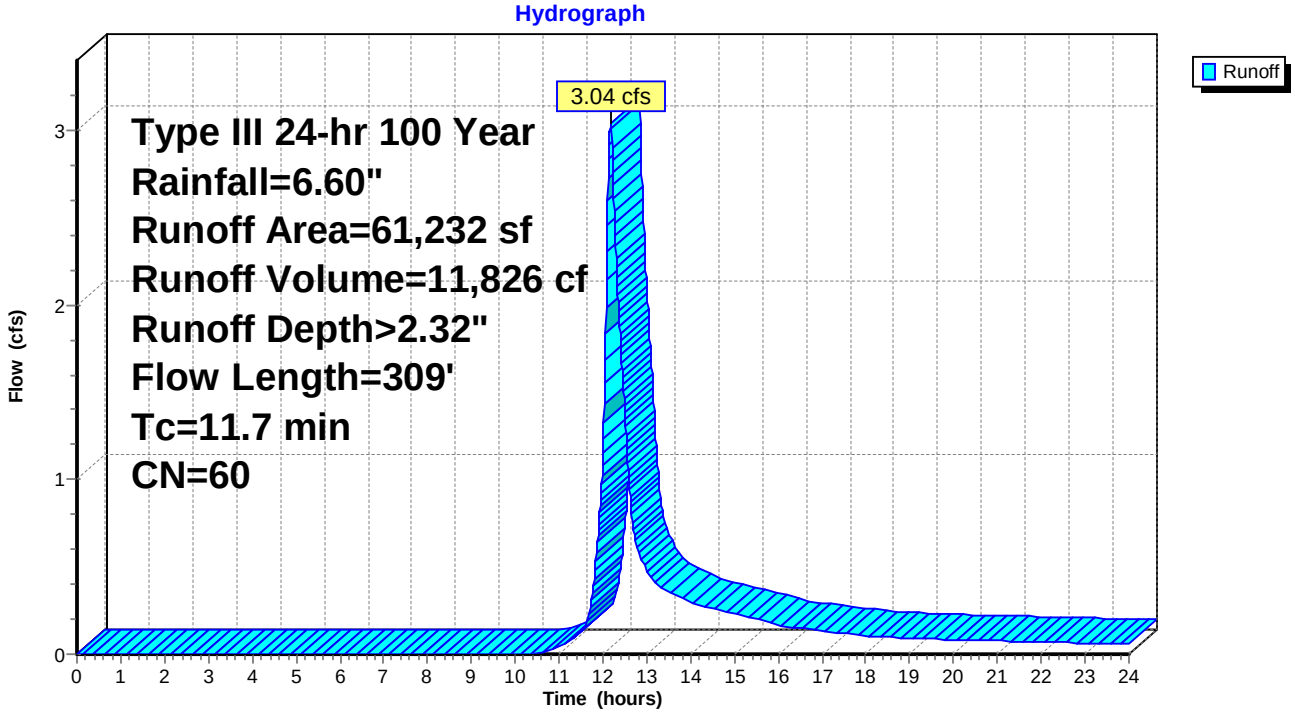
Runoff = 3.04 cfs @ 12.17 hrs, Volume= 11,826 cf, Depth> 2.32"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=6.60"

Area (sf)	CN	Description
27,651	61	1/4 acre lots, 38% imp, HSG A
2,864	76	Gravel roads, HSG A
119	98	Paved parking, HSG A
30,598	57	Woods/grass comb., Poor, HSG A
61,232	60	Weighted Average
50,606		82.65% Pervious Area
10,626		17.35% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.2	100	0.0320	0.20		**Sheet Flow, Grass** Grass: Short n= 0.150 P2= 3.15"
3.5	209	0.0400	1.00		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
11.7	309	Total			

Subcatchment 22S: Unnamed Pond 3



Summary for Subcatchment 23S: Unnamed Pond 4

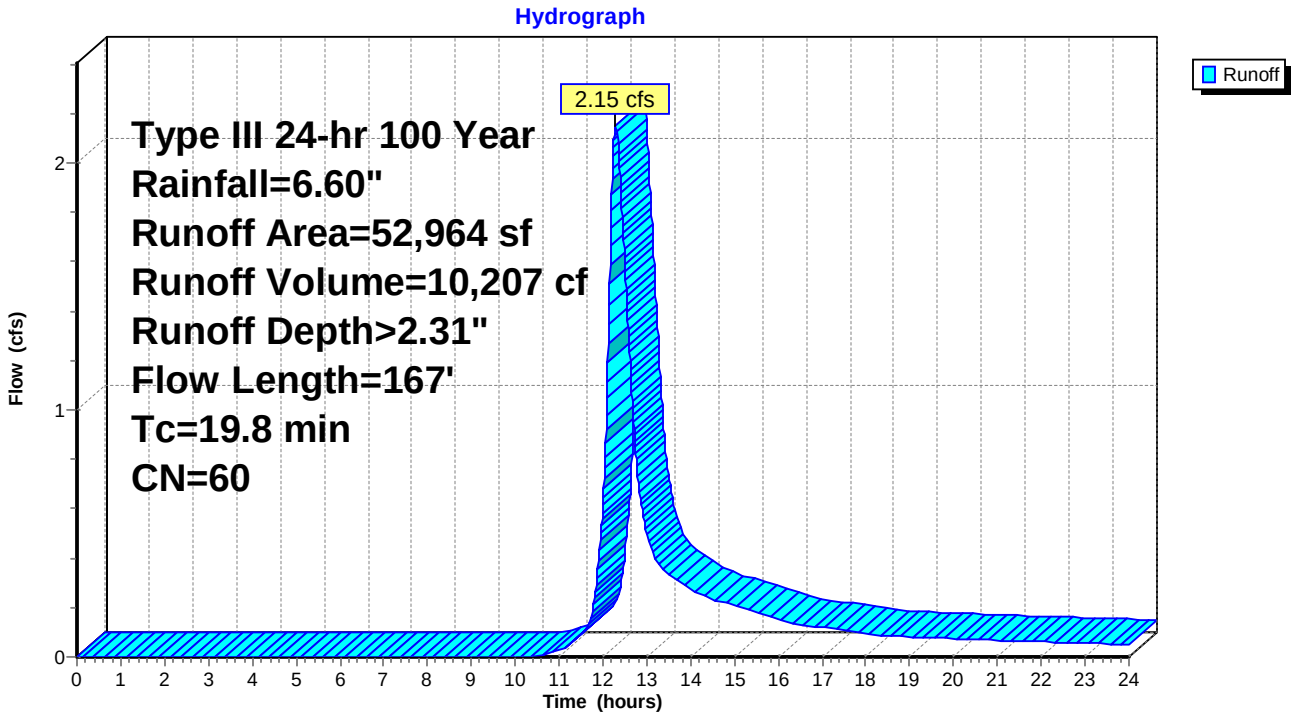
Runoff = 2.15 cfs @ 12.30 hrs, Volume= 10,207 cf, Depth> 2.31"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=6.60"

Area (sf)	CN	Description
44,170	57	Woods/grass comb., Poor, HSG A
7,994	76	Gravel roads, HSG A
800	98	Paved parking, HSG A
52,964	60	Weighted Average
52,164		98.49% Pervious Area
800		1.51% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.9	100	0.1100	0.15		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
8.9	67	0.0821	0.13		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
19.8	167	Total			

Subcatchment 23S: Unnamed Pond 4



Summary for Subcatchment 24S: Kansas St

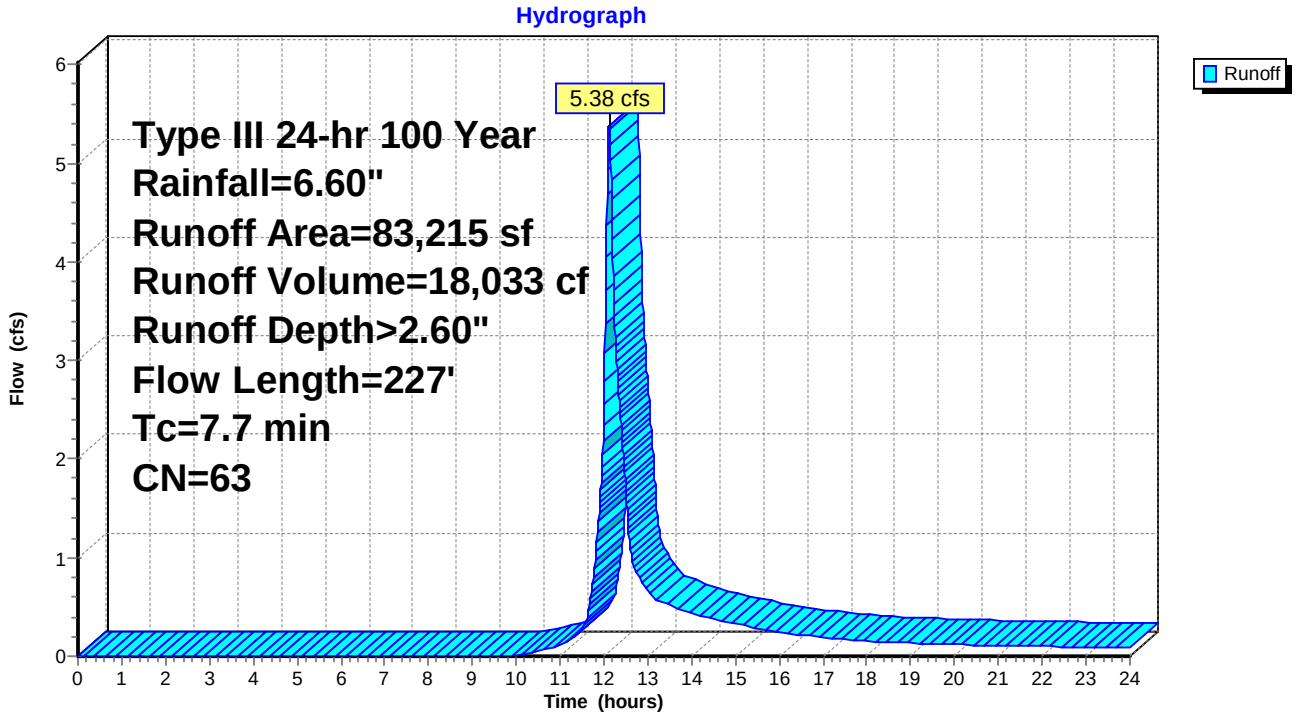
Runoff = 5.38 cfs @ 12.12 hrs, Volume= 18,033 cf, Depth> 2.60"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=6.60"

Area (sf)	CN	Description
20,750	61	1/4 acre lots, 38% imp, HSG A
7,064	76	Gravel roads, HSG A
6,960	98	Paved parking, HSG A
48,441	57	Woods/grass comb., Poor, HSG A
83,215	63	Weighted Average
68,370		82.16% Pervious Area
14,845		17.84% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.5	100	0.0575	0.26		**Sheet Flow, Yards** Grass: Short n= 0.150 P2= 3.15"
0.9	89	0.0590	1.70		**Shallow Concentrated Flow, Yards** Short Grass Pasture Kv= 7.0 fps
0.3	38	0.1974	2.22		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
7.7	227	Total			

Subcatchment 24S: Kansas St



Summary for Subcatchment 25S: North Main @ Kansas

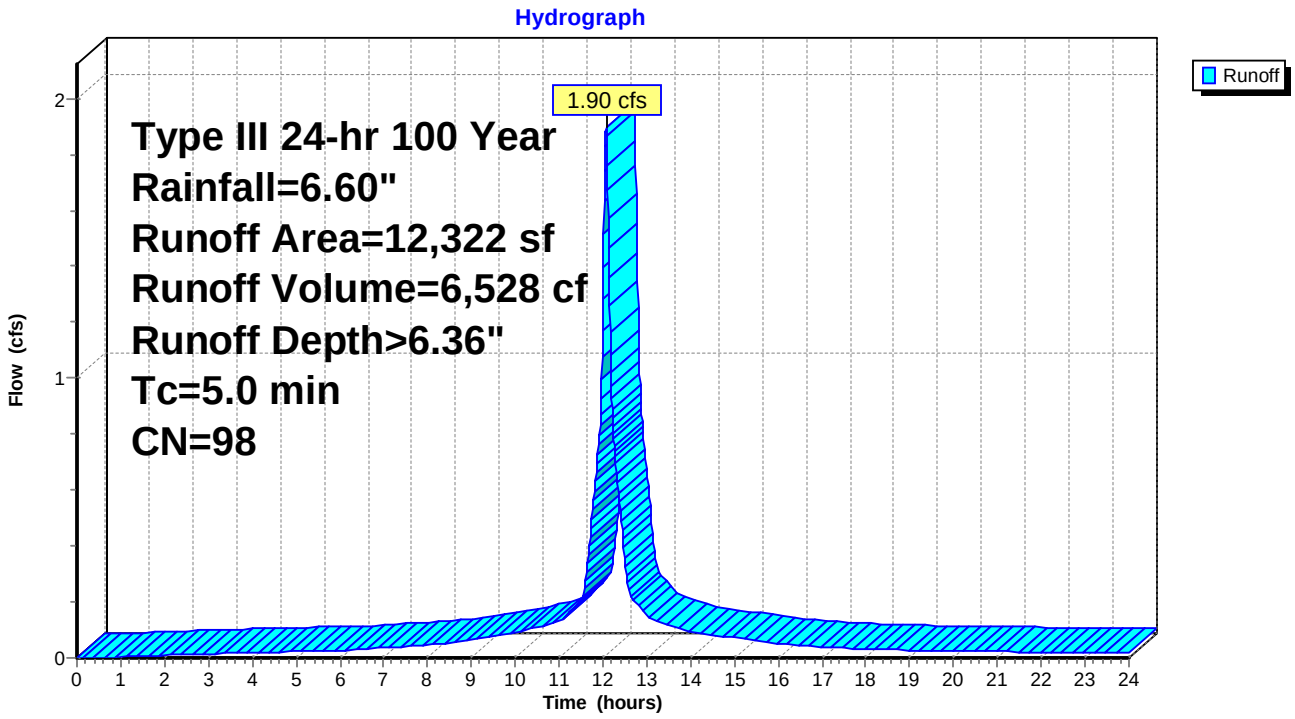
Runoff = 1.90 cfs @ 12.07 hrs, Volume= 6,528 cf, Depth> 6.36"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=6.60"

Area (sf)	CN	Description
12,322	98	Paved roads w/curbs & sewers, HSG A
12,322		100.00% Impervious Area

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

Subcatchment 25S: North Main @ Kansas



Summary for Subcatchment 26S: Empty Lot

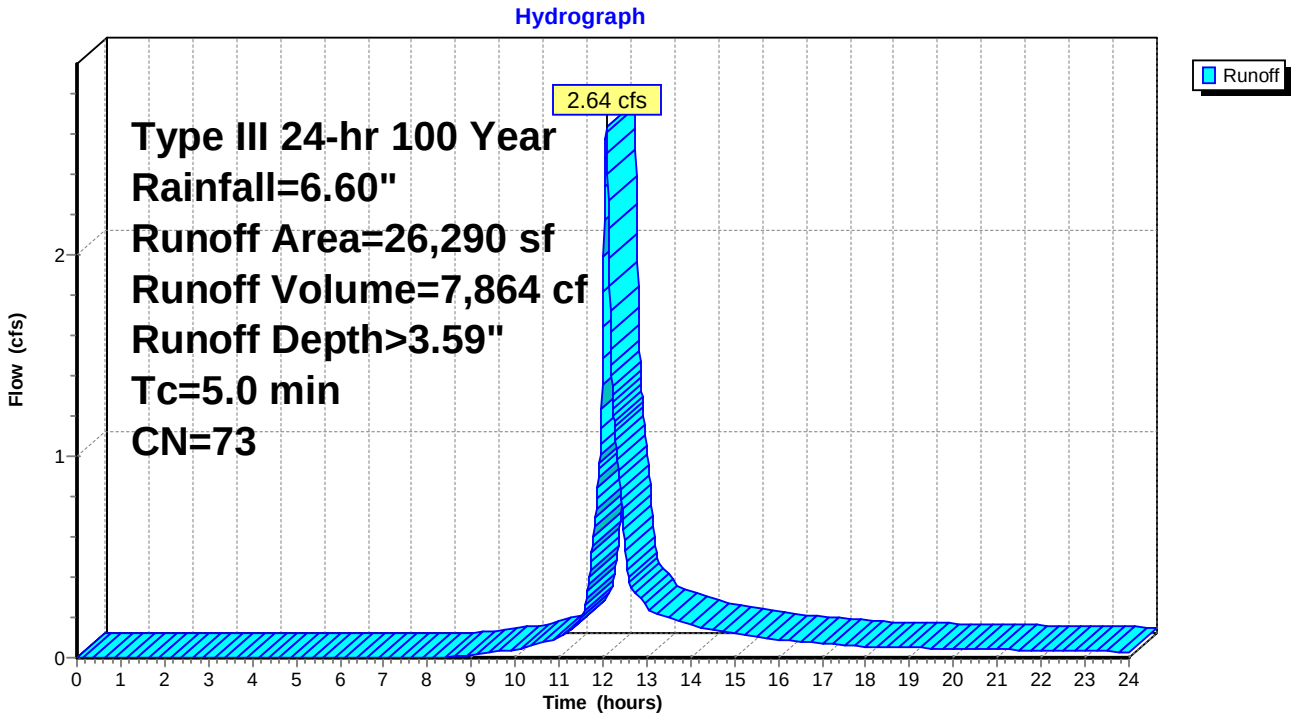
Runoff = 2.64 cfs @ 12.08 hrs, Volume= 7,864 cf, Depth> 3.59"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=6.60"

Area (sf)	CN	Description
18,679	72	Dirt roads, HSG A
7,611	76	Gravel roads, HSG A
26,290	73	Weighted Average
26,290		100.00% Pervious Area

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

Subcatchment 26S: Empty Lot



Summary for Subcatchment 27S: Washington Ave 1

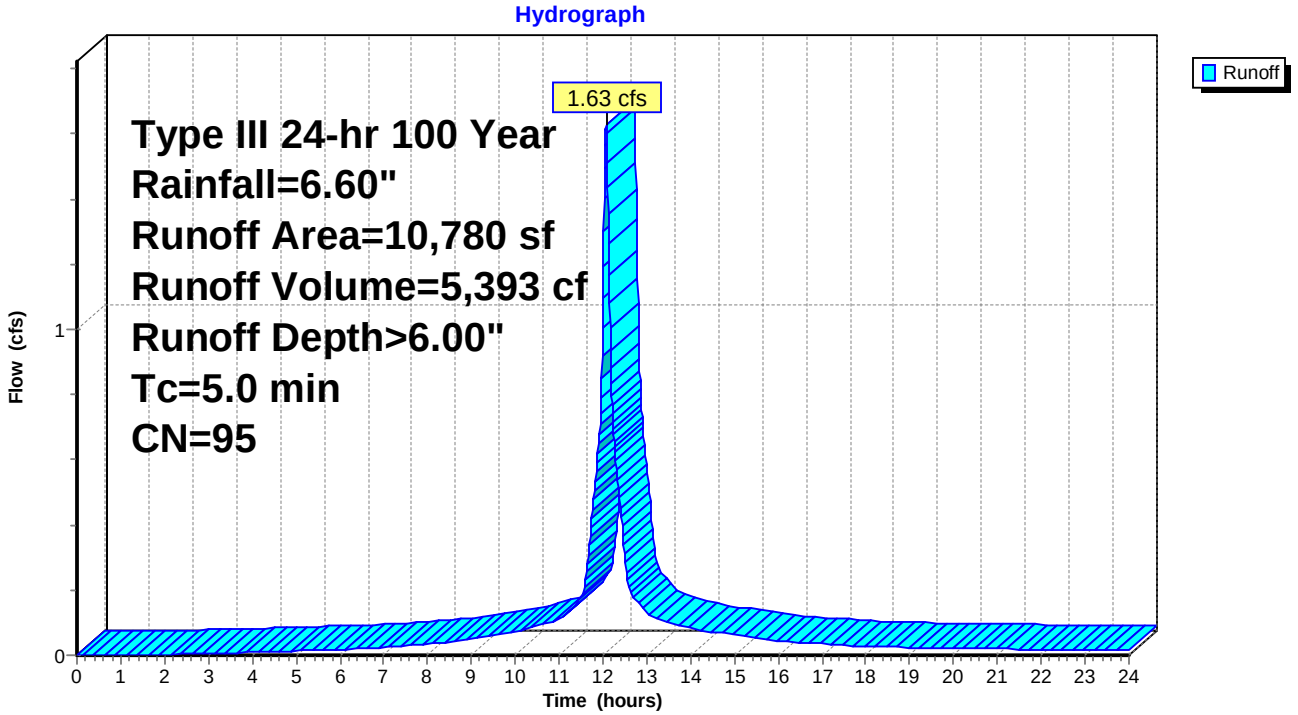
Runoff = 1.63 cfs @ 12.07 hrs, Volume= 5,393 cf, Depth> 6.00"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=6.60"

Area (sf)	CN	Description
1,673	76	Gravel roads, HSG A
9,107	98	Paved parking, HSG A
10,780	95	Weighted Average
1,673		15.52% Pervious Area
9,107		84.48% Impervious Area

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

Subcatchment 27S: Washington Ave 1



Summary for Subcatchment 28S: Washington Ave 2

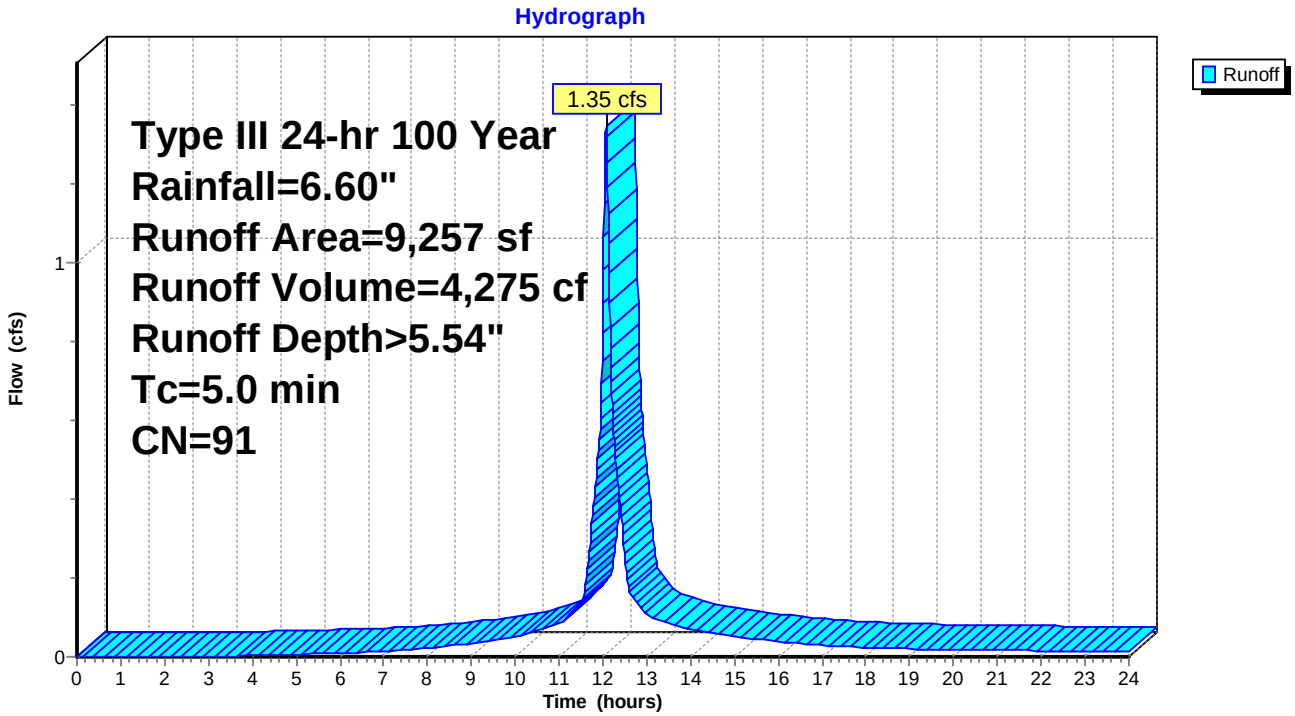
Runoff = 1.35 cfs @ 12.07 hrs, Volume= 4,275 cf, Depth> 5.54"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=6.60"

Area (sf)	CN	Description
3,039	76	Gravel roads, HSG A
6,175	98	Paved parking, HSG A
43	72	Dirt roads, HSG A
9,257	91	Weighted Average
3,082		33.29% Pervious Area
6,175		66.71% Impervious Area

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

Subcatchment 28S: Washington Ave 2



Summary for Subcatchment 29S: Washington Ave 3

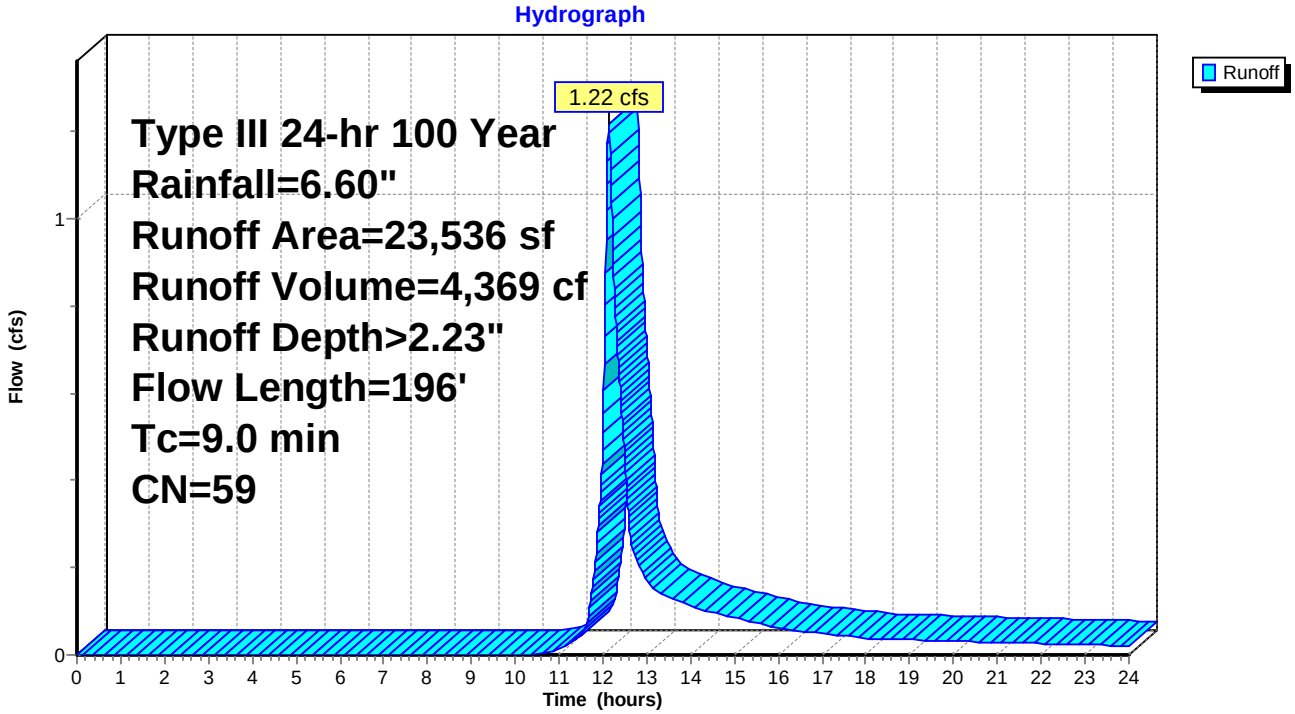
Runoff = 1.22 cfs @ 12.13 hrs, Volume= 4,369 cf, Depth> 2.23"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=6.60"

Area (sf)	CN	Description
19,229	61	1/4 acre lots, 38% imp, HSG A
621	76	Gravel roads, HSG A
3,686	45	Woods, Poor, HSG A
23,536	59	Weighted Average
16,229		68.95% Pervious Area
7,307		31.05% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	100	0.0350	0.21		**Sheet Flow, Yards** Grass: Short n= 0.150 P2= 3.15"
1.1	96	0.0427	1.45		**Shallow Concentrated Flow, Yards** Short Grass Pasture Kv= 7.0 fps
9.0	196	Total			

Subcatchment 29S: Washington Ave 3



Summary for Subcatchment 30S: Lagrange St

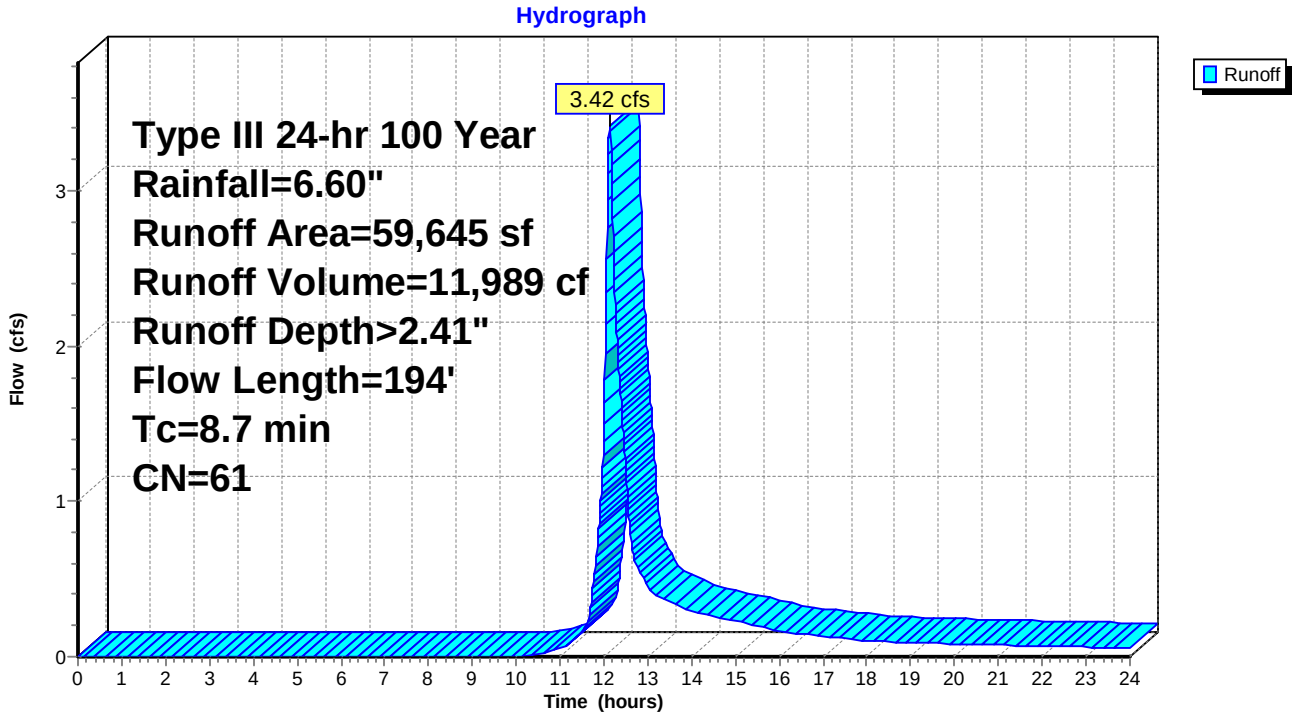
Runoff = 3.42 cfs @ 12.13 hrs, Volume= 11,989 cf, Depth> 2.41"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=6.60"

Area (sf)	CN	Description
49,221	61	1/4 acre lots, 38% imp, HSG A
686	76	Gravel roads, HSG A
9,738	57	Woods/grass comb., Poor, HSG A
59,645	61	Weighted Average
40,941		68.64% Pervious Area
18,704		31.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.1	100	0.0450	0.23		**Sheet Flow, Yards** Grass: Short n= 0.150 P2= 3.15"
0.9	53	0.0189	0.96		**Shallow Concentrated Flow, Yards** Short Grass Pasture Kv= 7.0 fps
0.7	41	0.0366	0.96		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
8.7	194	Total			

Subcatchment 30S: Lagrange St



Summary for Subcatchment 31S: Mechanic St

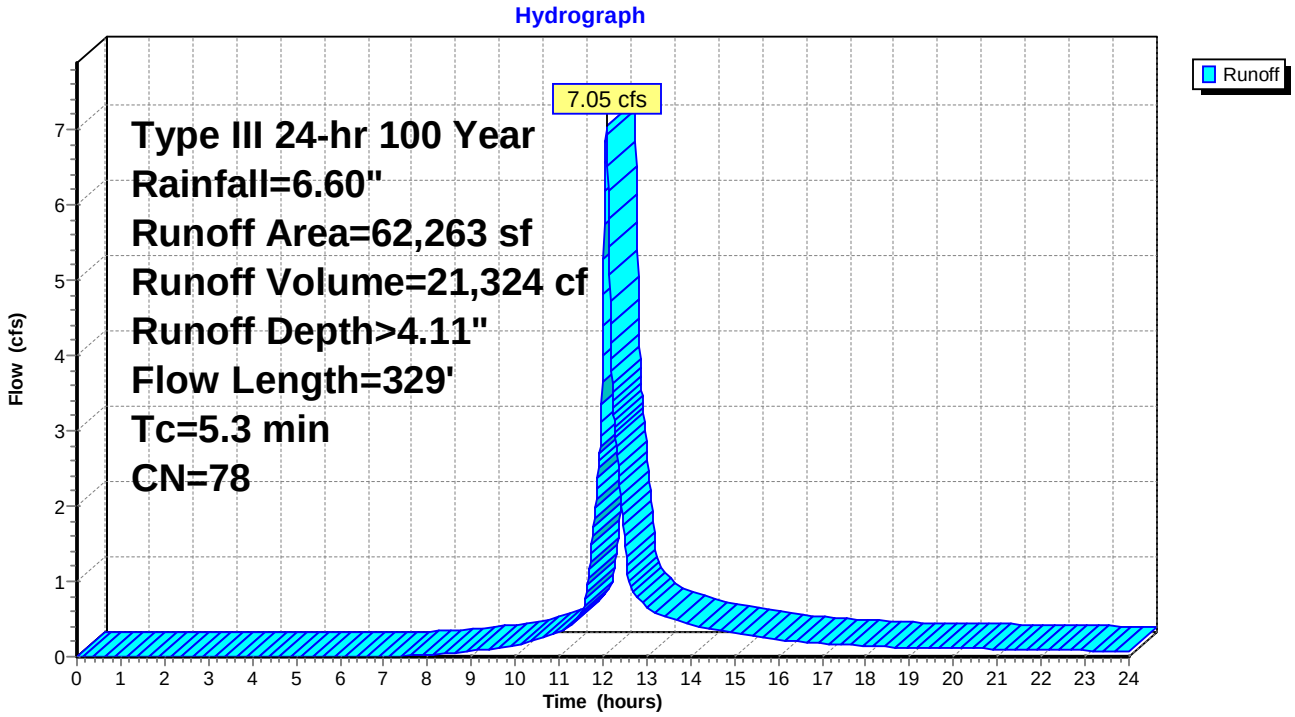
Runoff = 7.05 cfs @ 12.08 hrs, Volume= 21,324 cf, Depth> 4.11"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=6.60"

Area (sf)	CN	Description
40,274	81	Urban industrial, 72% imp, HSG A
8,476	76	Gravel roads, HSG A
2,503	98	Paved parking, HSG A
6,188	57	Woods/grass comb., Poor, HSG A
4,822	68	<50% Grass cover, Poor, HSG A
62,263	78	Weighted Average
30,763		49.41% Pervious Area
31,500		50.59% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	100	0.0150	1.22		**Sheet Flow, Road** Smooth surfaces n= 0.011 P2= 3.15"
3.9	229	0.0037	0.98		**Shallow Concentrated Flow, Gravel Path** Unpaved Kv= 16.1 fps
5.3	329	Total			

Subcatchment 31S: Mechanic St



Summary for Subcatchment 32S: Cochituate St 1

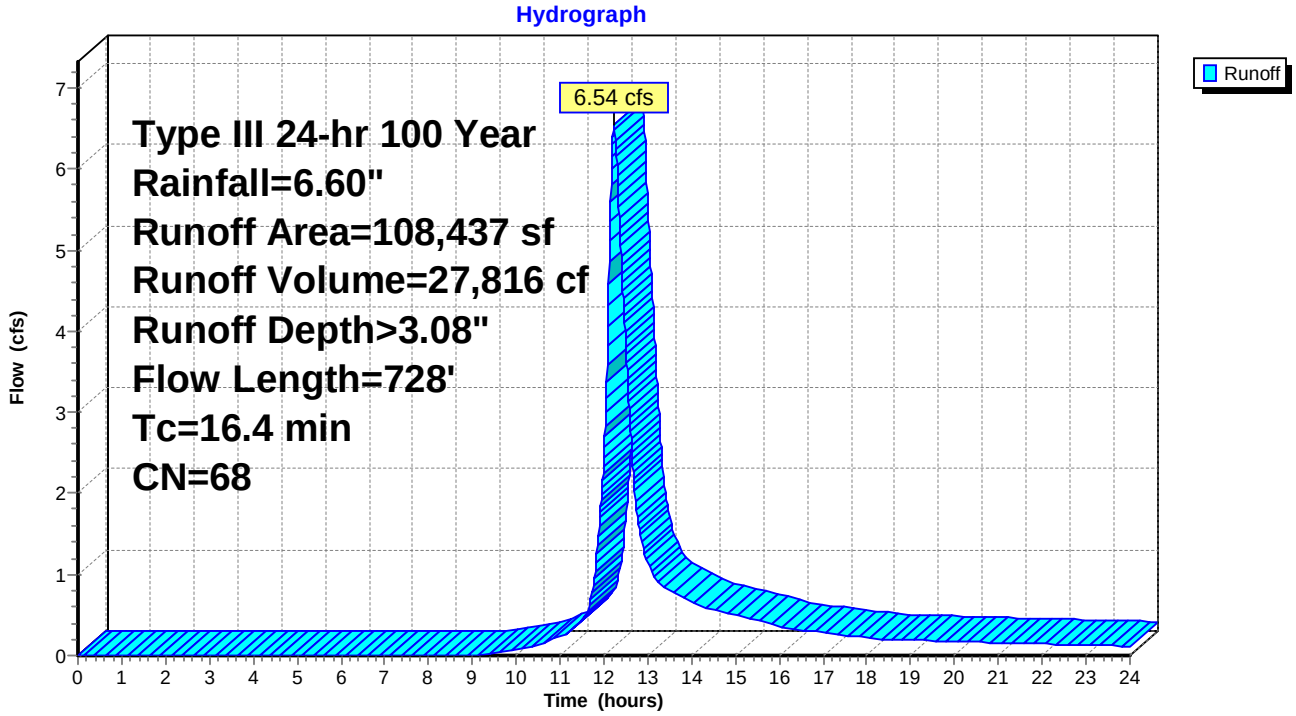
Runoff = 6.54 cfs @ 12.23 hrs, Volume= 27,816 cf, Depth> 3.08"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=6.60"

Area (sf)	CN	Description
12,744	81	Urban industrial, 72% imp, HSG A
15,529	76	Gravel roads, HSG A
30,613	57	Woods/grass comb., Poor, HSG A
11,315	98	Paved parking, HSG A
38,236	61	1/4 acre lots, 38% imp, HSG A
108,437	68	Weighted Average
73,417		67.70% Pervious Area
35,020		32.30% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.4	75	0.0333	0.20		**Sheet Flow, Yards** Grass: Short n= 0.150 P2= 3.15"
1.9	25	0.5200	0.21		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
8.1	628	0.0064	1.29		**Shallow Concentrated Flow, Gravel Path** Unpaved Kv= 16.1 fps
16.4	728	Total			

Subcatchment 32S: Cochituate St 1



Summary for Pond 01P: Speen St Detention

Inflow Area = 28,640 sf, 6.23% Impervious, Inflow Depth > 2.98" for 100 Year event
Inflow = 1.90 cfs @ 12.16 hrs, Volume= 7,120 cf
Outflow = 1.89 cfs @ 12.17 hrs, Volume= 7,117 cf, Atten= 0%, Lag= 0.4 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Secondary = 1.89 cfs @ 12.17 hrs, Volume= 7,117 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 160.04' @ 12.17 hrs Surf.Area= 101 sf Storage= 40 cf

Plug-Flow detention time= 0.7 min calculated for 7,114 cf (100% of inflow)
Center-of-Mass det. time= 0.4 min (844.5 - 844.1)

Volume	Invert	Avail.Storage	Storage Description
#1	159.00'	910 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

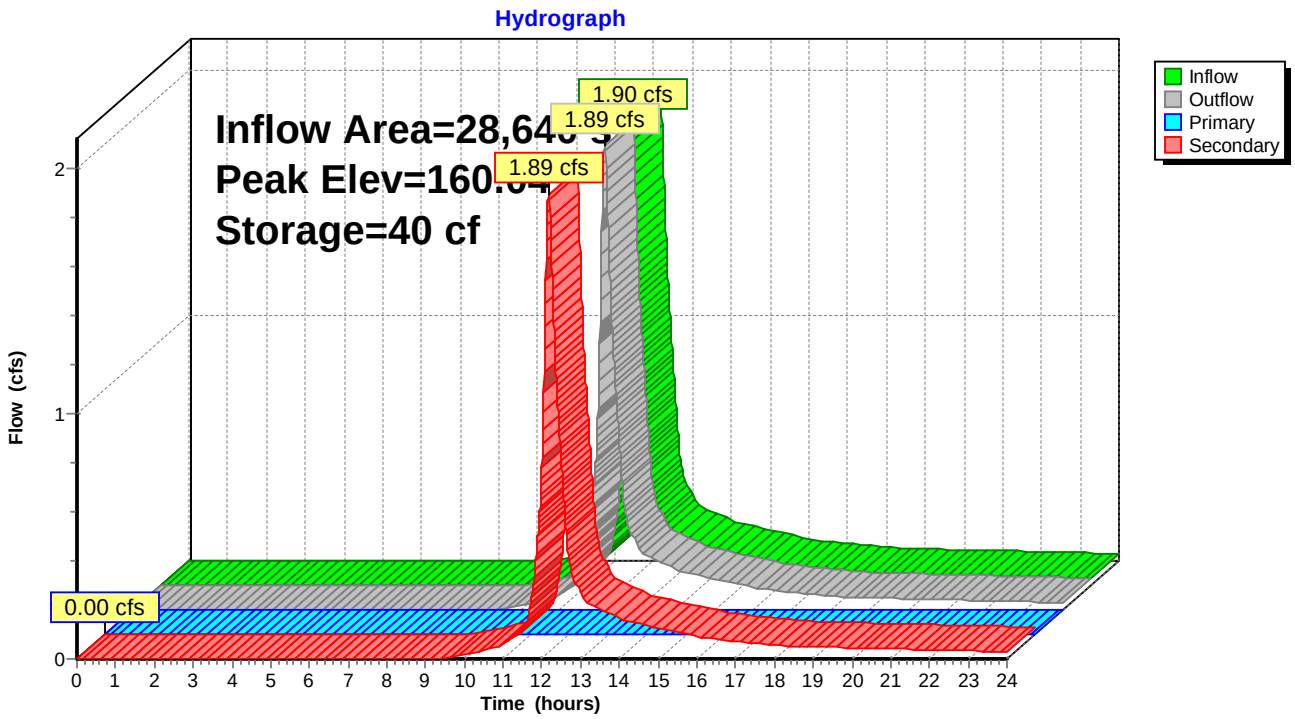
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
159.00	1	5.4	0	0	1
160.00	98	40.0	36	36	128
161.00	176	52.0	135	171	227
162.00	329	79.0	249	420	516
163.00	671	128.0	490	910	1,330

Device	Routing	Invert	Outlet Devices
#1	Primary	162.50'	**18.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32
#2	Secondary	159.30'	**24.0" Round Culvert** L= 30.0' CMP, projecting, no headwall, Ke= 0.900 Outlet Invert= 159.00' S= 0.0100 '/' Cc= 0.900 n= 0.025 Corrugated metal

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=159.00' (Free Discharge)
└**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Secondary OutFlow Max=1.89 cfs @ 12.17 hrs HW=160.04' (Free Discharge)
└**2=Culvert** (Barrel Controls 1.89 cfs @ 2.66 fps)

Pond 01P: Speen St Detention



Summary for Pond 2P: Lake Cochituate

Inflow Area = 2,480,180 sf, 21.04% Impervious, Inflow Depth > 2.77" for 100 Year event
Inflow = 107.79 cfs @ 12.23 hrs, Volume= 572,781 cf
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 100%, Lag= 0.0 min

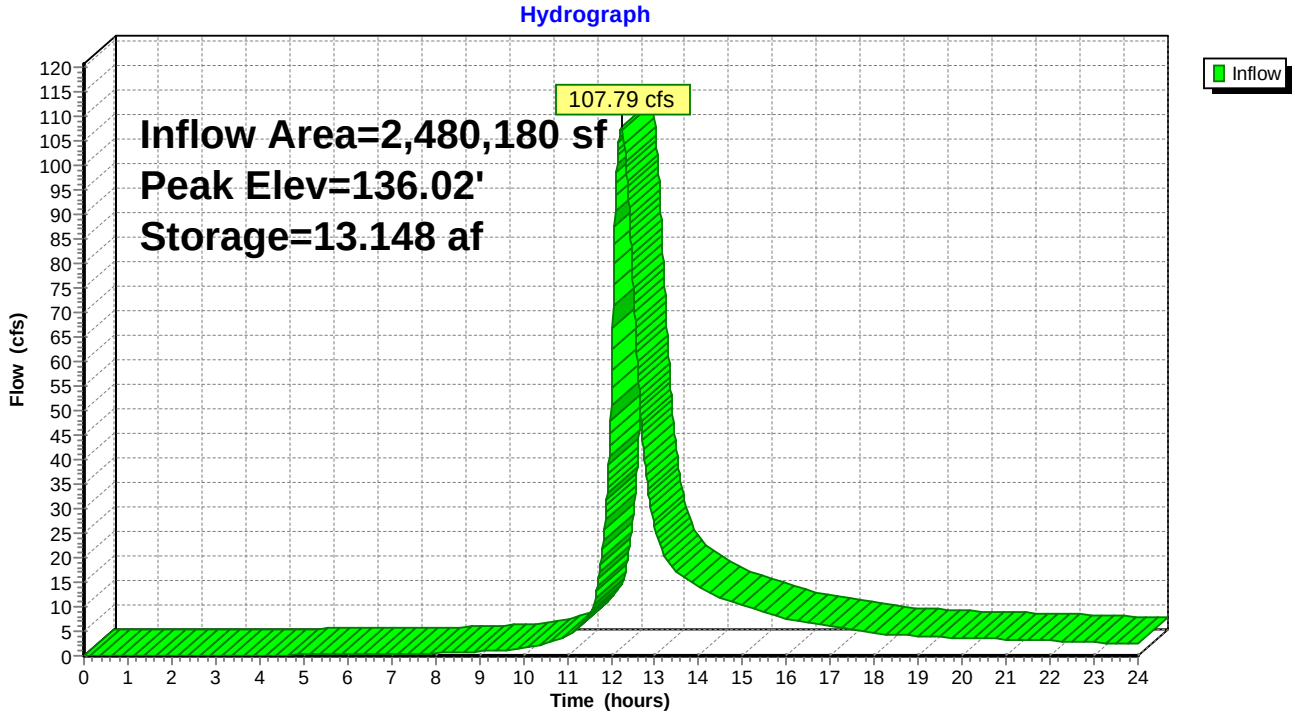
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 136.02' @ 24.00 hrs Surf.Area= 625.000 ac Storage= 13.148 af

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

Volume	Invert	Avail.Storage	Storage Description
#1	136.00'	625.000 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
136.00	625.000	0.000	0.000
137.00	625.000	625.000	625.000

Pond 2P: Lake Cochituate

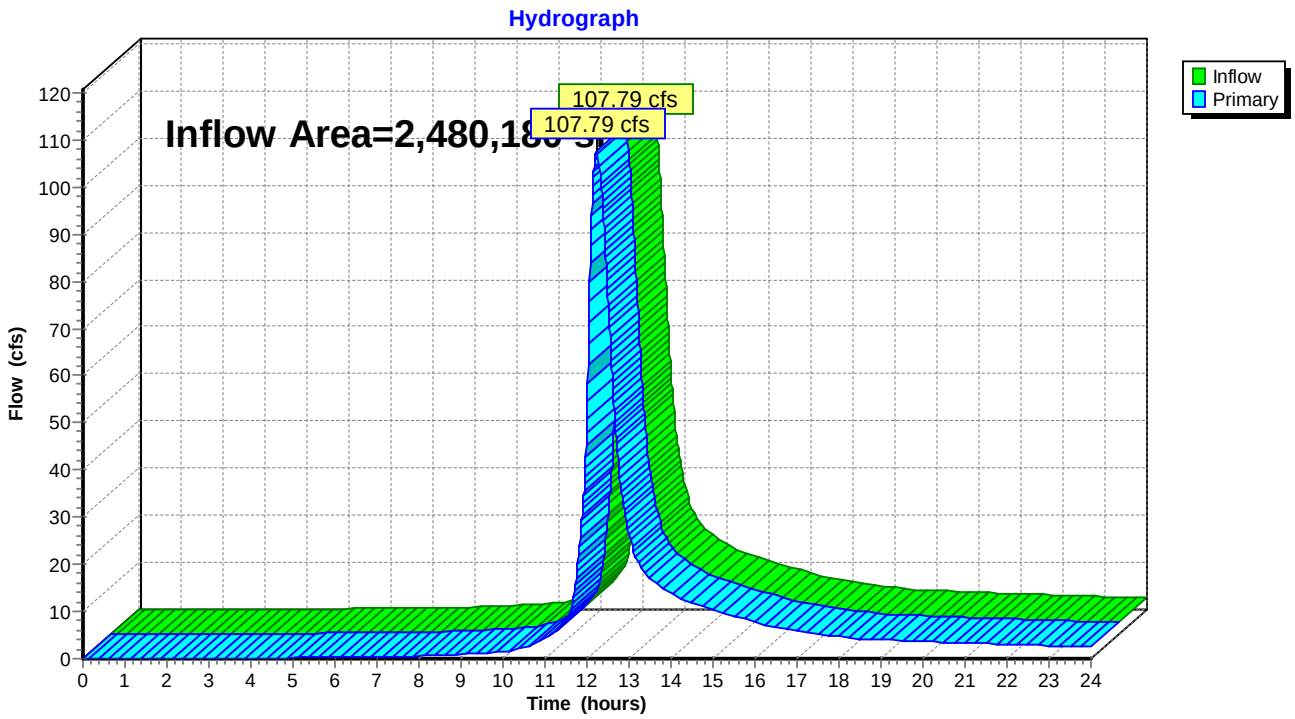


Summary for Link 1L: Total

Inflow Area = 2,480,180 sf, 21.04% Impervious, Inflow Depth > 2.77" for 100 Year event
Inflow = 107.79 cfs @ 12.23 hrs, Volume= 572,781 cf
Primary = 107.79 cfs @ 12.23 hrs, Volume= 572,781 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link 1L: Total

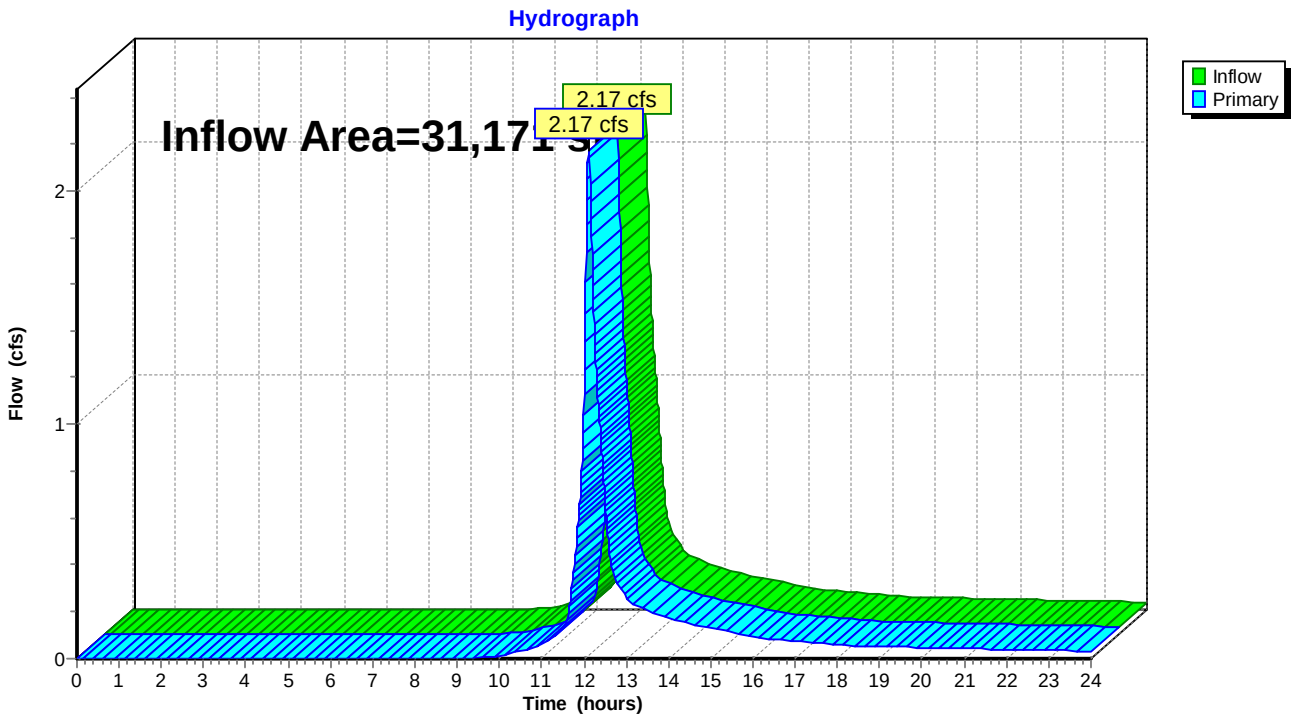


Summary for Link DP01: Cochituate Rd

Inflow Area = 31,171 sf, 8.89% Impervious, Inflow Depth > 2.87" for 100 Year event
Inflow = 2.17 cfs @ 12.11 hrs, Volume= 7,454 cf
Primary = 2.17 cfs @ 12.11 hrs, Volume= 7,454 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link DP01: Cochituate Rd

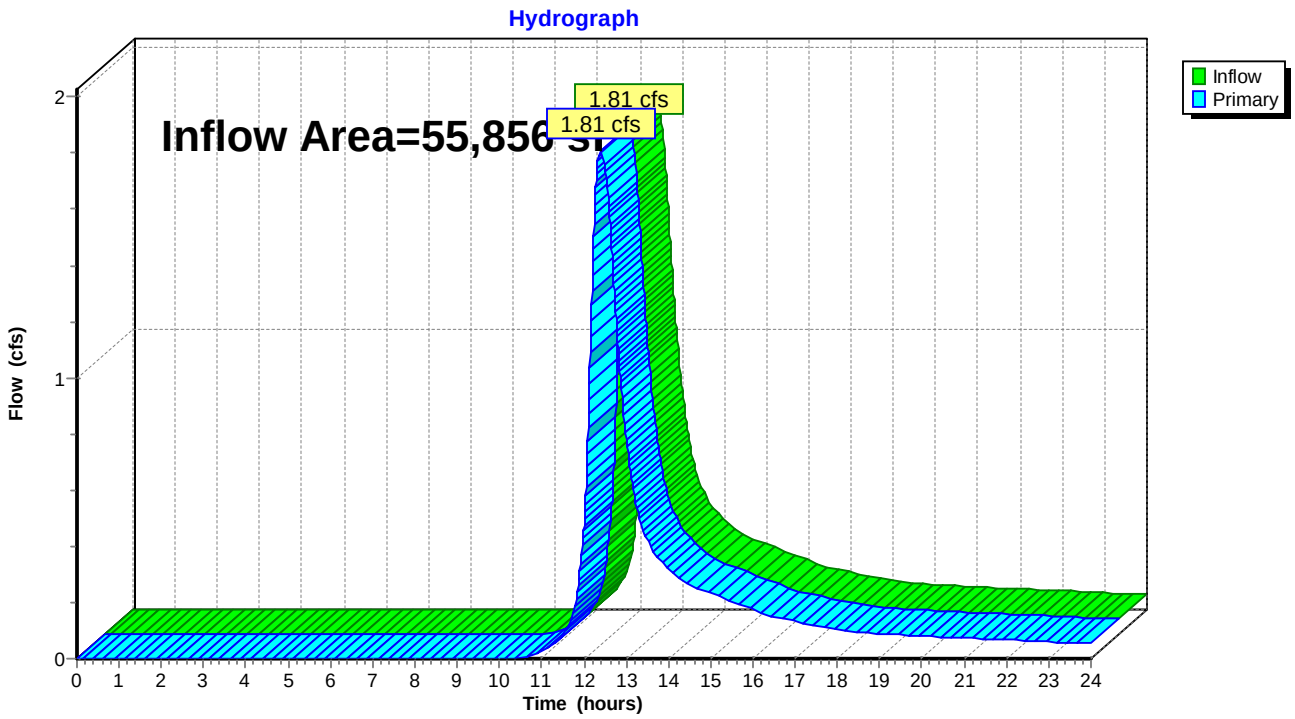


Summary for Link DP02: Chrystler St

Inflow Area = 55,856 sf, 4.44% Impervious, Inflow Depth > 2.40" for 100 Year event
Inflow = 1.81 cfs @ 12.40 hrs, Volume= 11,165 cf
Primary = 1.81 cfs @ 12.40 hrs, Volume= 11,165 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link DP02: Chrystler St

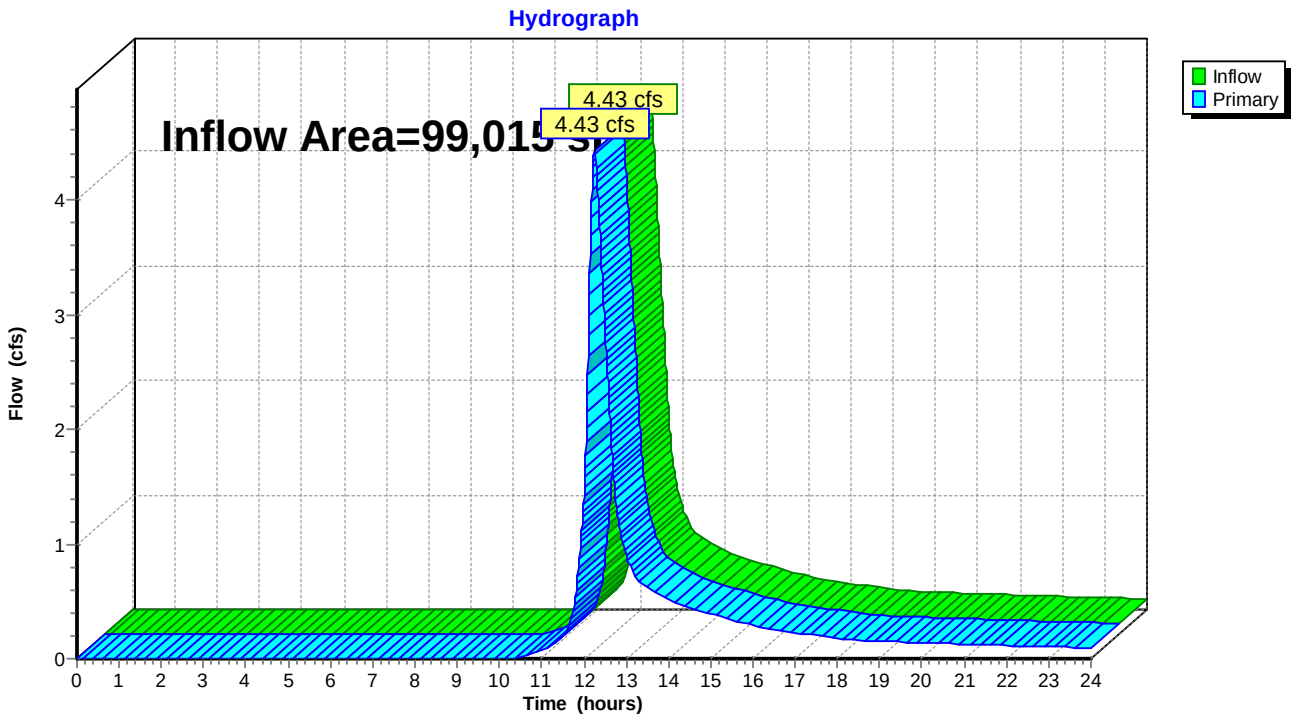


Summary for Link DP03: WF A

Inflow Area = 99,015 sf, 0.66% Impervious, Inflow Depth > 2.41" for 100 Year event
Inflow = 4.43 cfs @ 12.25 hrs, Volume= 19,857 cf
Primary = 4.43 cfs @ 12.25 hrs, Volume= 19,857 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link DP03: WF A

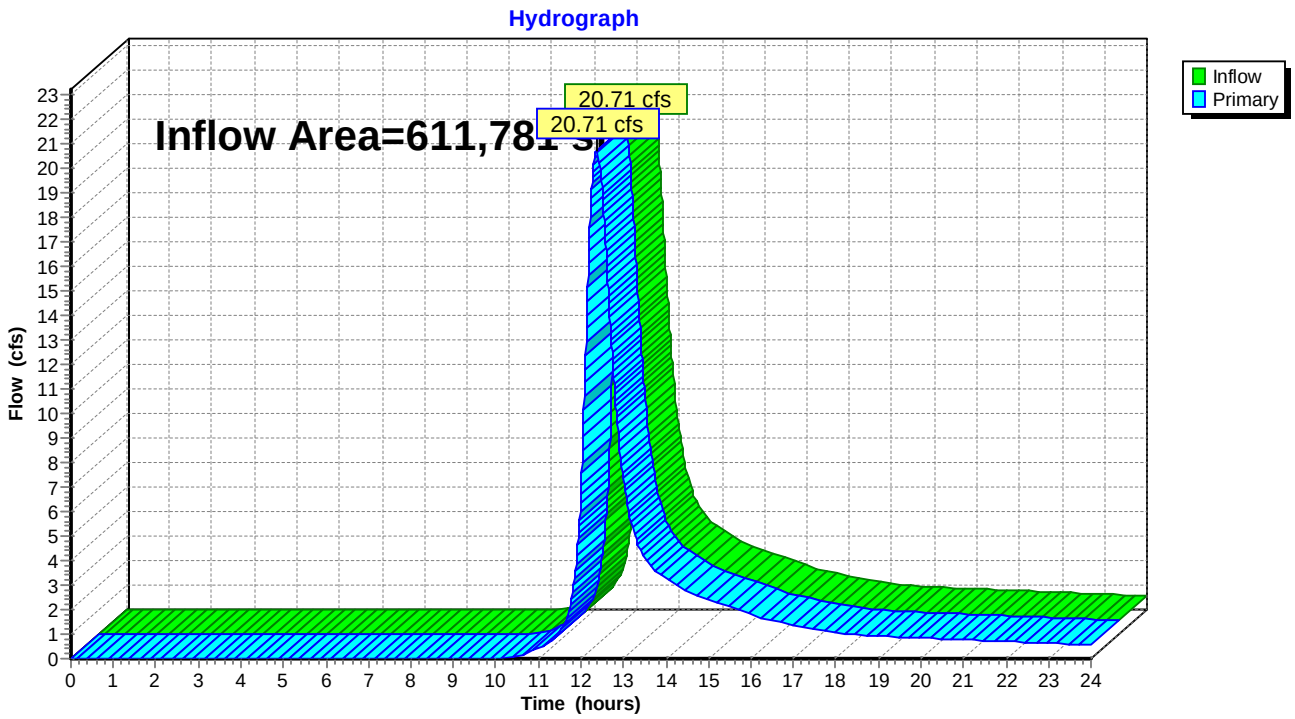


Summary for Link DP04: Lake Cochituate Middle Pond

Inflow Area = 611,781 sf, 6.85% Impervious, Inflow Depth > 2.35" for 100 Year event
Inflow = 20.71 cfs @ 12.37 hrs, Volume= 119,606 cf
Primary = 20.71 cfs @ 12.37 hrs, Volume= 119,606 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link DP04: Lake Cochituate Middle Pond

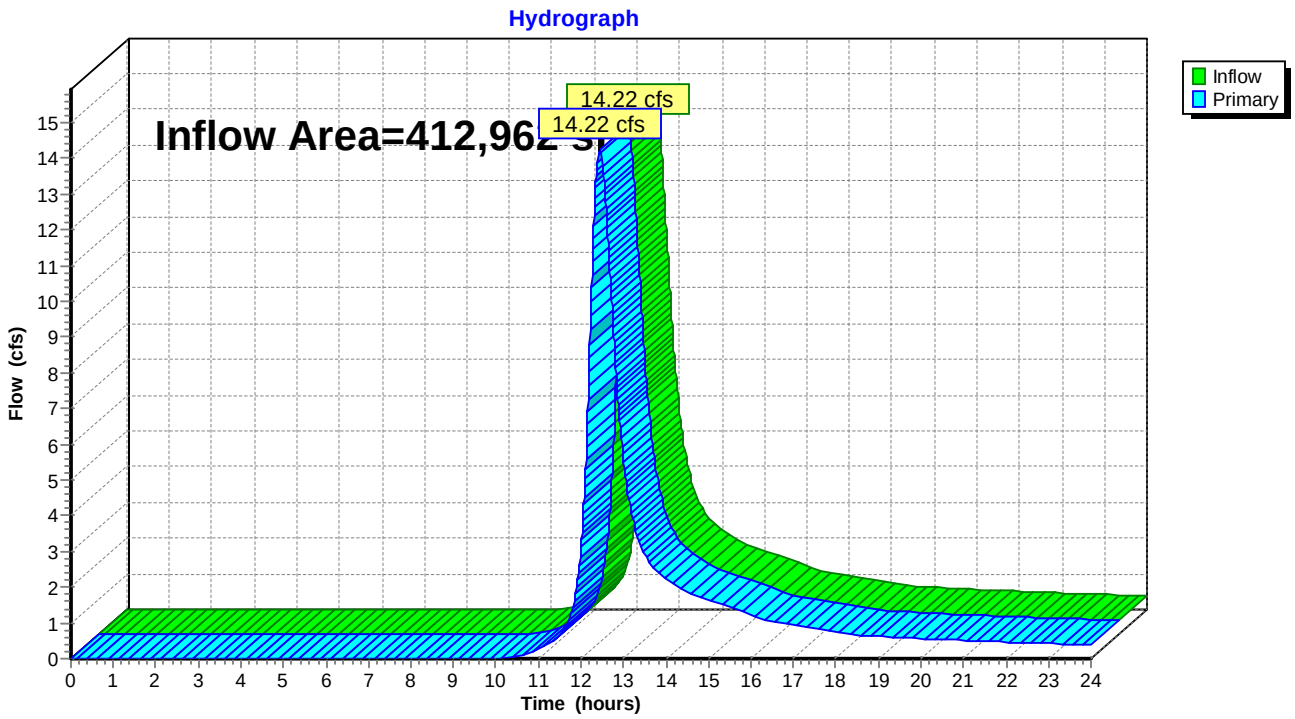


Summary for Link DP04-1: WF B

Inflow Area = 412,962 sf, 7.11% Impervious, Inflow Depth > 2.32" for 100 Year event
Inflow = 14.22 cfs @ 12.44 hrs, Volume= 79,798 cf
Primary = 14.22 cfs @ 12.44 hrs, Volume= 79,798 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link DP04-1: WF B

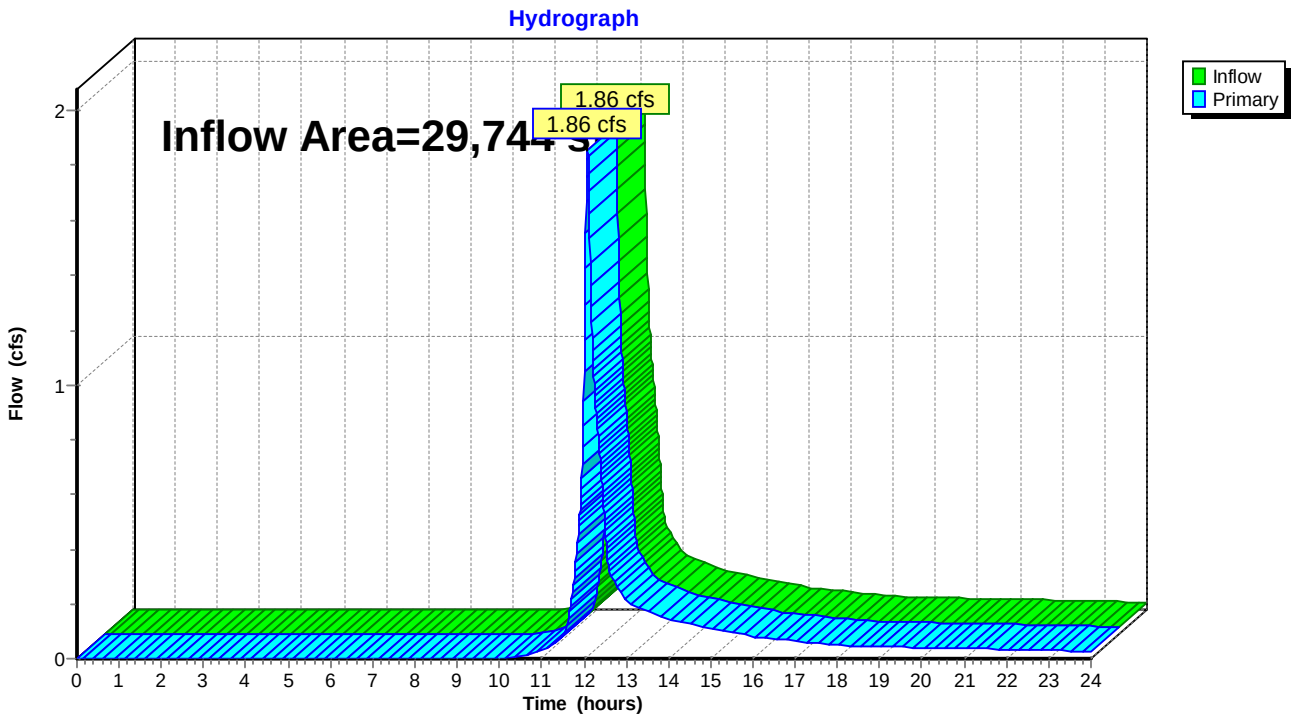


Summary for Link DP04-2: WF C

Inflow Area = 29,744 sf, 0.00% Impervious, Inflow Depth > 2.38" for 100 Year event
Inflow = 1.86 cfs @ 12.08 hrs, Volume= 5,889 cf
Primary = 1.86 cfs @ 12.08 hrs, Volume= 5,889 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link DP04-2: WF C

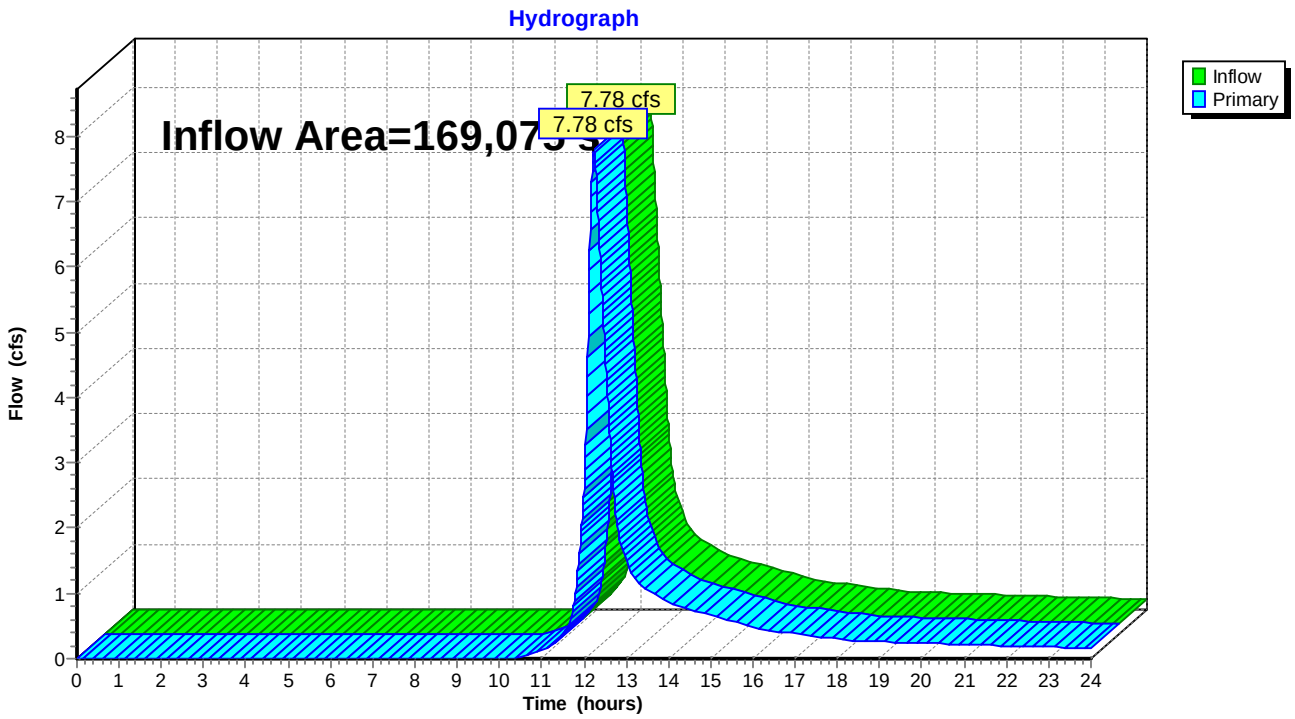


Summary for Link DP04-3: Lake Cochituate

Inflow Area = 169,075 sf, 7.42% Impervious, Inflow Depth > 2.41" for 100 Year event
Inflow = 7.78 cfs @ 12.23 hrs, Volume= 33,919 cf
Primary = 7.78 cfs @ 12.23 hrs, Volume= 33,919 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link DP04-3: Lake Cochituate

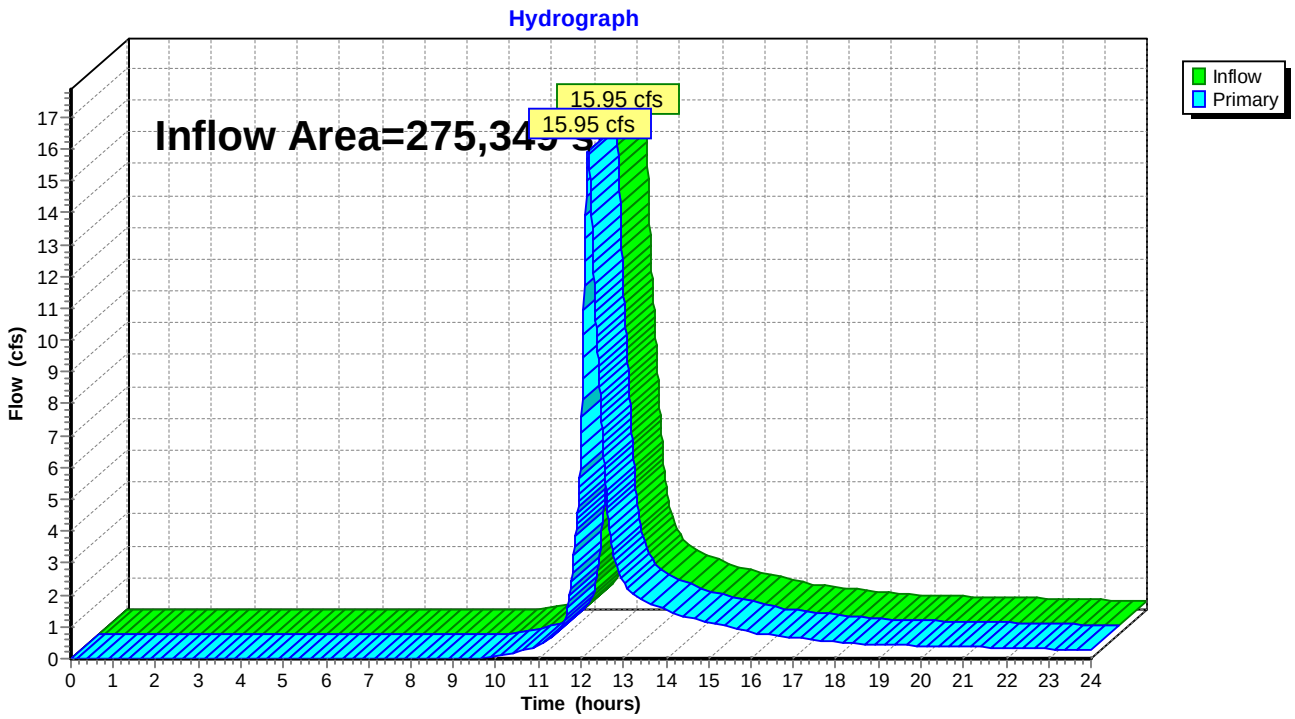


Summary for Link DP05: Lake Cochituate W

Inflow Area = 275,349 sf, 15.63% Impervious, Inflow Depth > 2.71" for 100 Year event
Inflow = 15.95 cfs @ 12.17 hrs, Volume= 62,255 cf
Primary = 15.95 cfs @ 12.17 hrs, Volume= 62,255 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link DP05: Lake Cochituate W

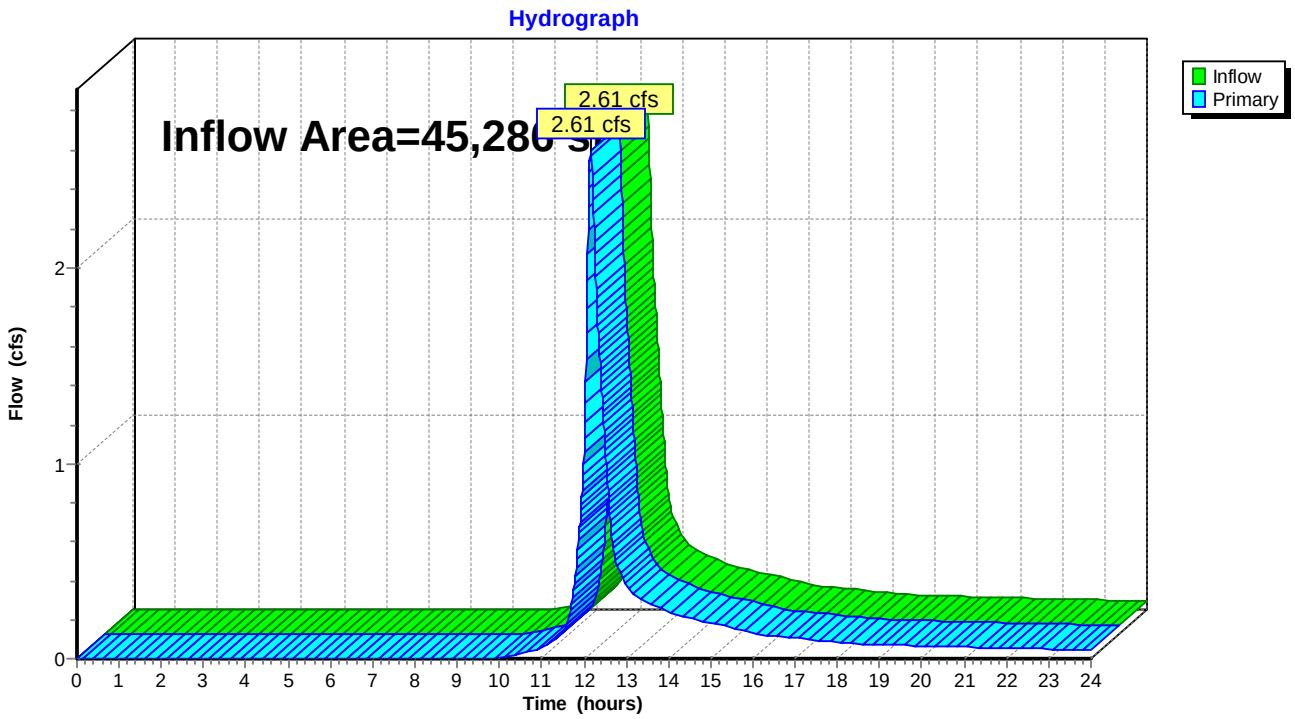


Summary for Link DP05-1: WF I

Inflow Area = 45,286 sf, 7.97% Impervious, Inflow Depth > 2.60" for 100 Year event
Inflow = 2.61 cfs @ 12.16 hrs, Volume= 9,805 cf
Primary = 2.61 cfs @ 12.16 hrs, Volume= 9,805 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link DP05-1: WF I

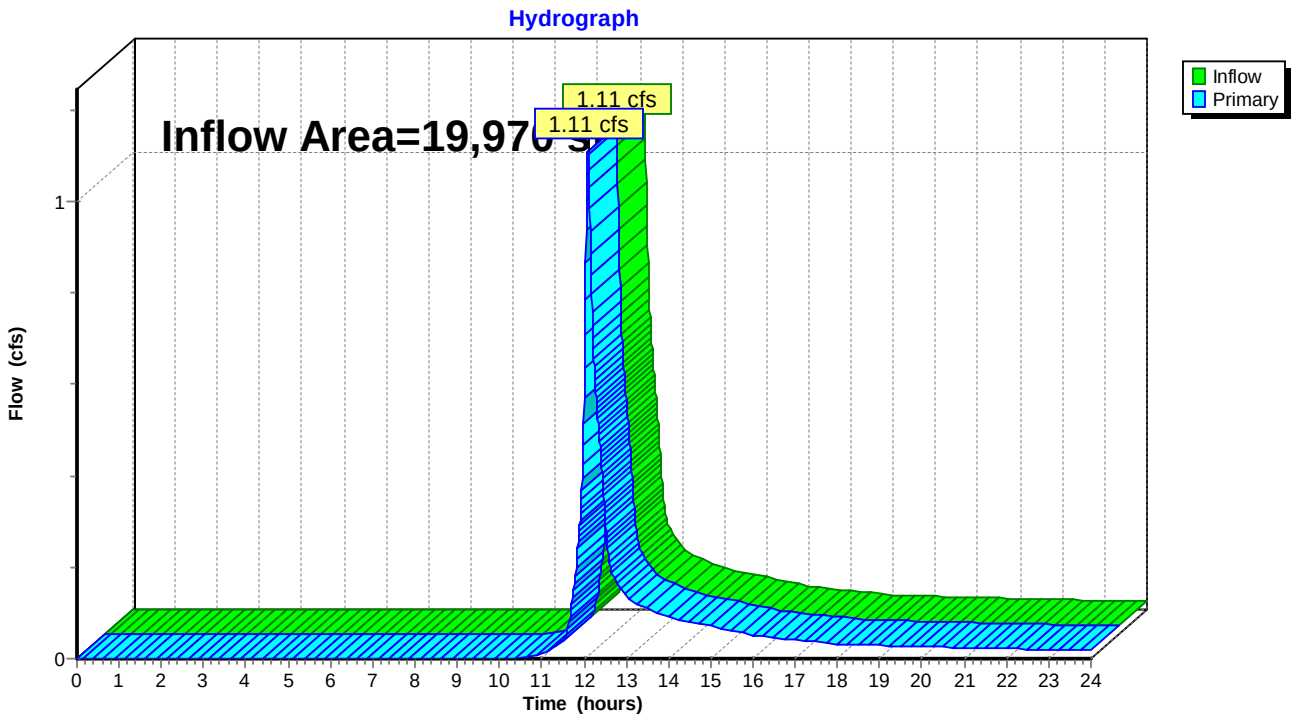


Summary for Link DP05-2: WF G&H

Inflow Area = 19,970 sf, 0.00% Impervious, Inflow Depth > 2.18" for 100 Year event
Inflow = 1.11 cfs @ 12.10 hrs, Volume= 3,631 cf
Primary = 1.11 cfs @ 12.10 hrs, Volume= 3,631 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link DP05-2: WF G&H

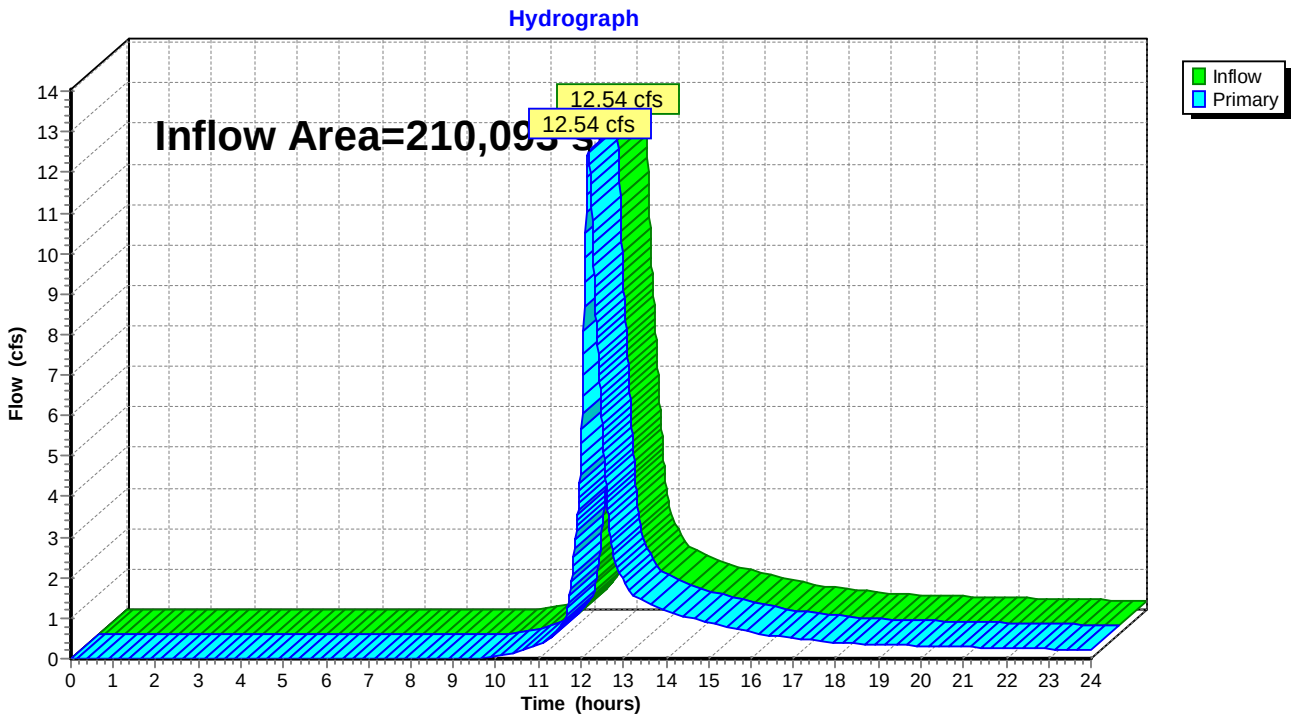


Summary for Link DP05-3: Lake Cochituate

Inflow Area = 210,093 sf, 18.76% Impervious, Inflow Depth > 2.79" for 100 Year event
Inflow = 12.54 cfs @ 12.18 hrs, Volume= 48,819 cf
Primary = 12.54 cfs @ 12.18 hrs, Volume= 48,819 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link DP05-3: Lake Cochituate

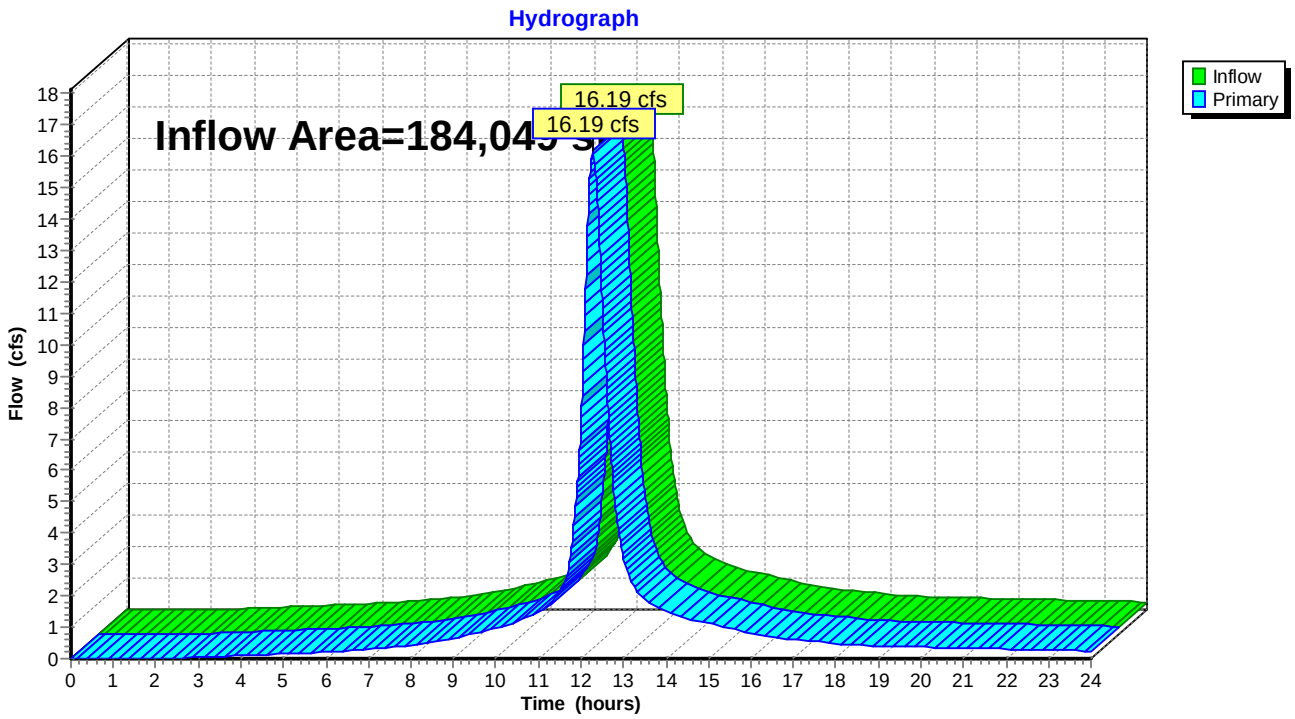


Summary for Link DP06: Worcester St

Inflow Area = 184,049 sf, 85.31% Impervious, Inflow Depth > 5.56" for 100 Year event
Inflow = 16.19 cfs @ 12.28 hrs, Volume= 85,219 cf
Primary = 16.19 cfs @ 12.28 hrs, Volume= 85,219 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link DP06: Worcester St

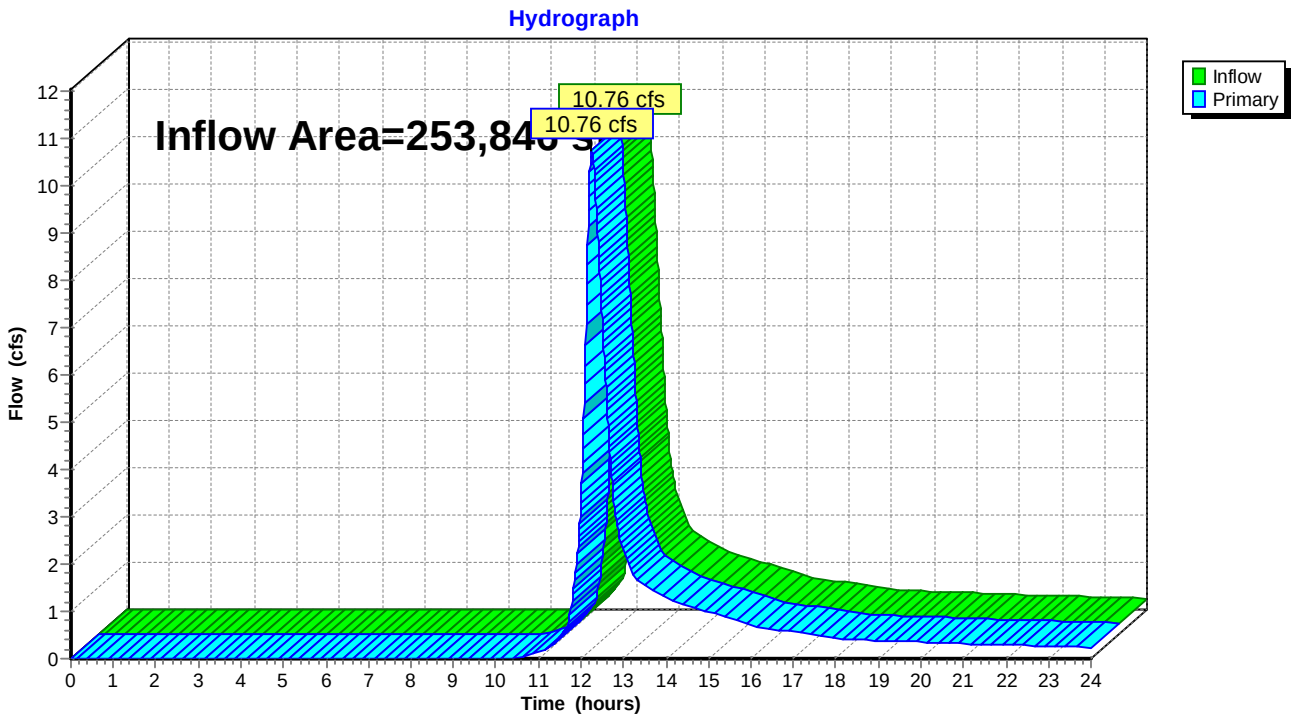


Summary for Link DP07: WF F

Inflow Area = 253,846 sf, 12.85% Impervious, Inflow Depth > 2.31" for 100 Year event
Inflow = 10.76 cfs @ 12.26 hrs, Volume= 48,946 cf
Primary = 10.76 cfs @ 12.26 hrs, Volume= 48,946 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link DP07: WF F

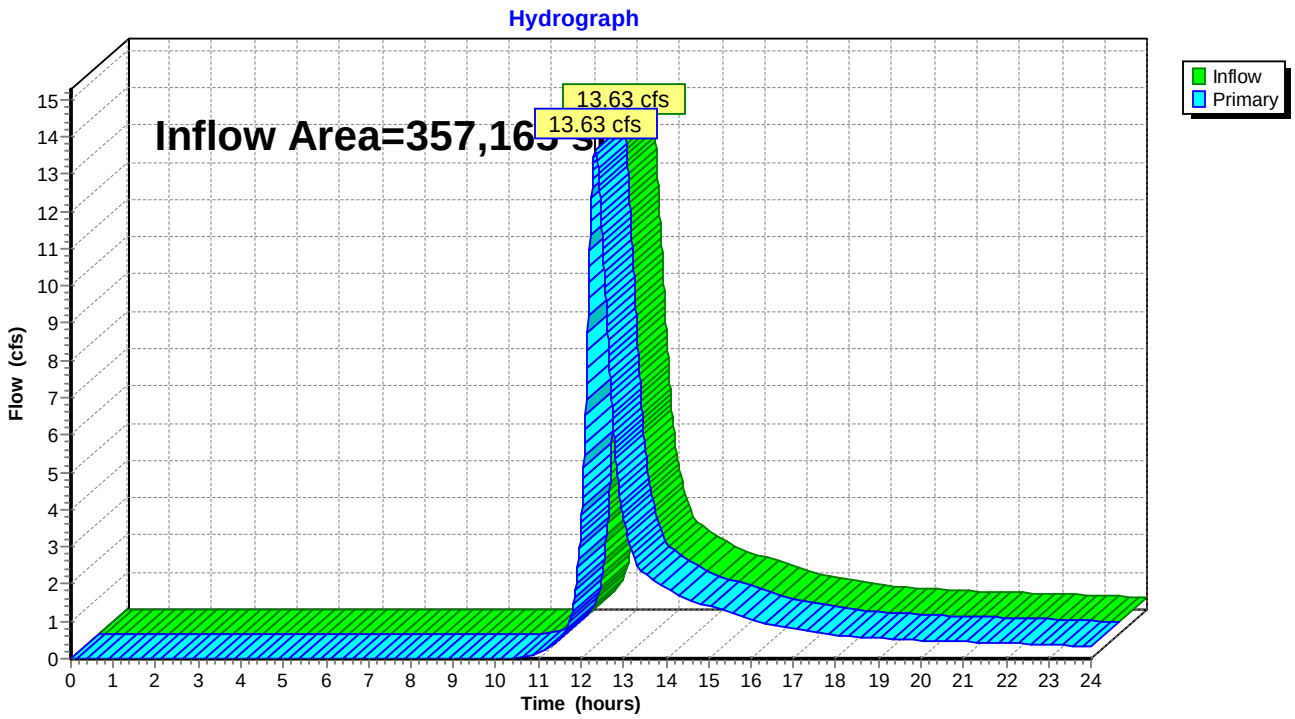


Summary for Link DP08: WF J

Inflow Area = 357,165 sf, 20.57% Impervious, Inflow Depth > 2.31" for 100 Year event
Inflow = 13.63 cfs @ 12.34 hrs, Volume= 68,771 cf
Primary = 13.63 cfs @ 12.34 hrs, Volume= 68,771 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link DP08: WF J

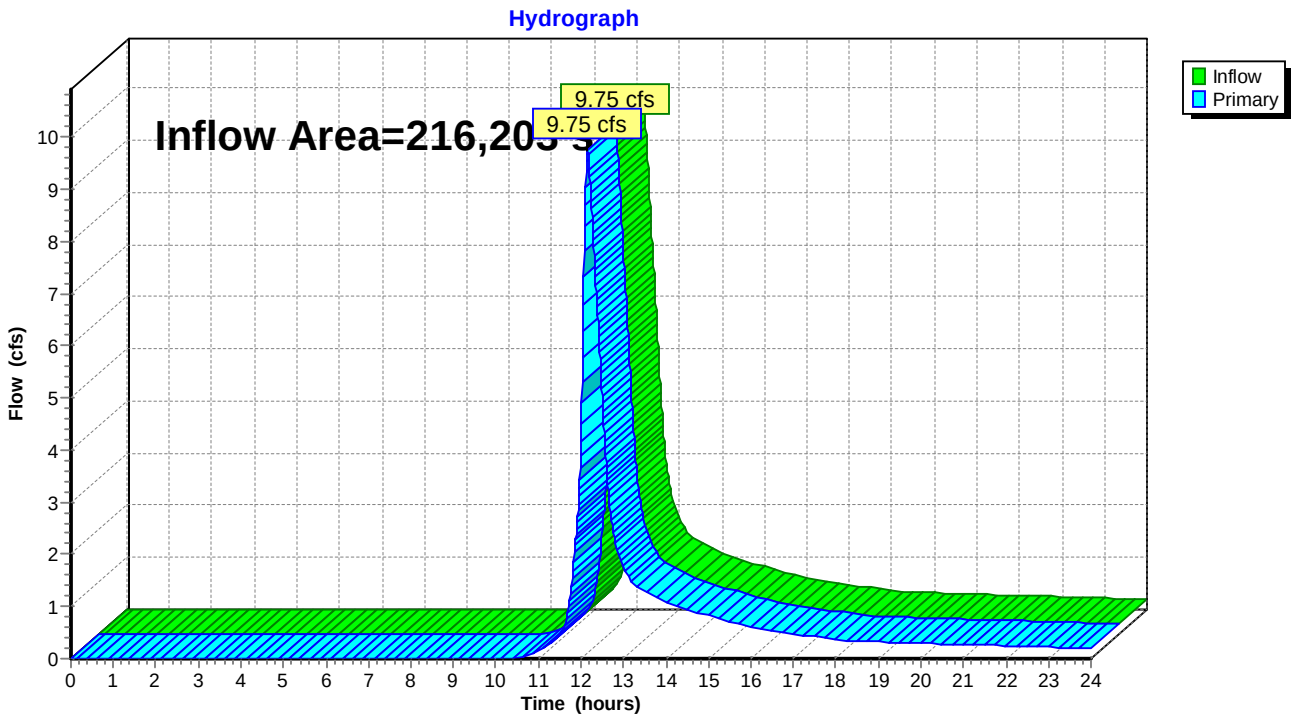


Summary for Link DP09: Unnamed Pond

Inflow Area = 216,203 sf, 15.22% Impervious, Inflow Depth > 2.33" for 100 Year event
Inflow = 9.75 cfs @ 12.16 hrs, Volume= 41,918 cf
Primary = 9.75 cfs @ 12.16 hrs, Volume= 41,918 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link DP09: Unnamed Pond

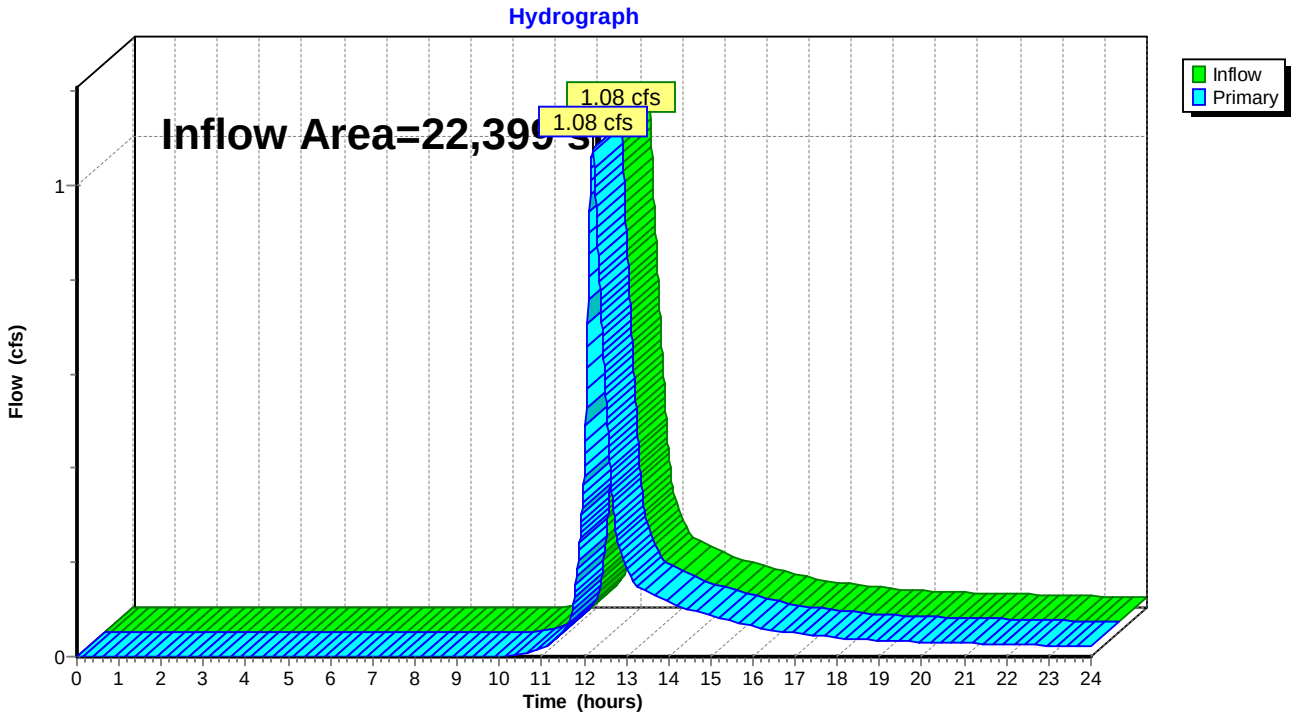


Summary for Link DP09-1: WF K

Inflow Area = 22,399 sf, 8.44% Impervious, Inflow Depth > 2.41" for 100 Year event
Inflow = 1.08 cfs @ 12.21 hrs, Volume= 4,496 cf
Primary = 1.08 cfs @ 12.21 hrs, Volume= 4,496 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link DP09-1: WF K

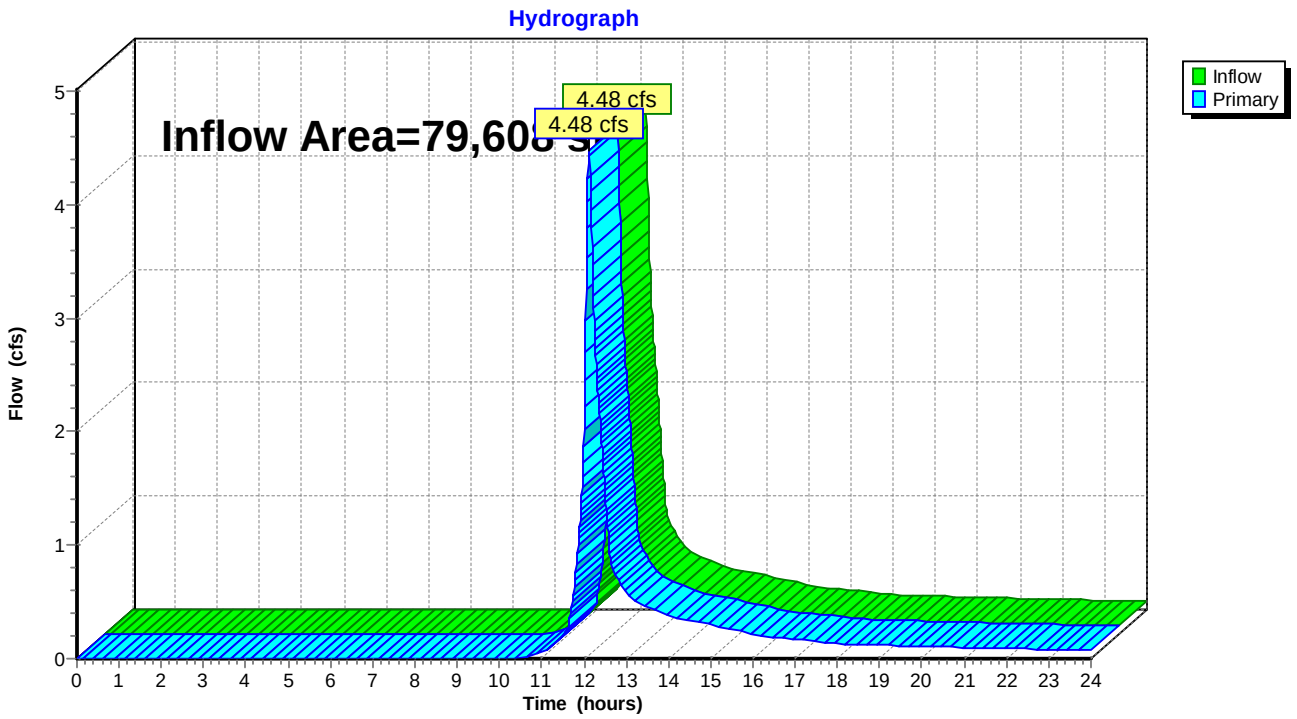


Summary for Link DP09-2: WF KA

Inflow Area = 79,608 sf, 24.60% Impervious, Inflow Depth > 2.32" for 100 Year event
Inflow = 4.48 cfs @ 12.12 hrs, Volume= 15,390 cf
Primary = 4.48 cfs @ 12.12 hrs, Volume= 15,390 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link DP09-2: WF KA

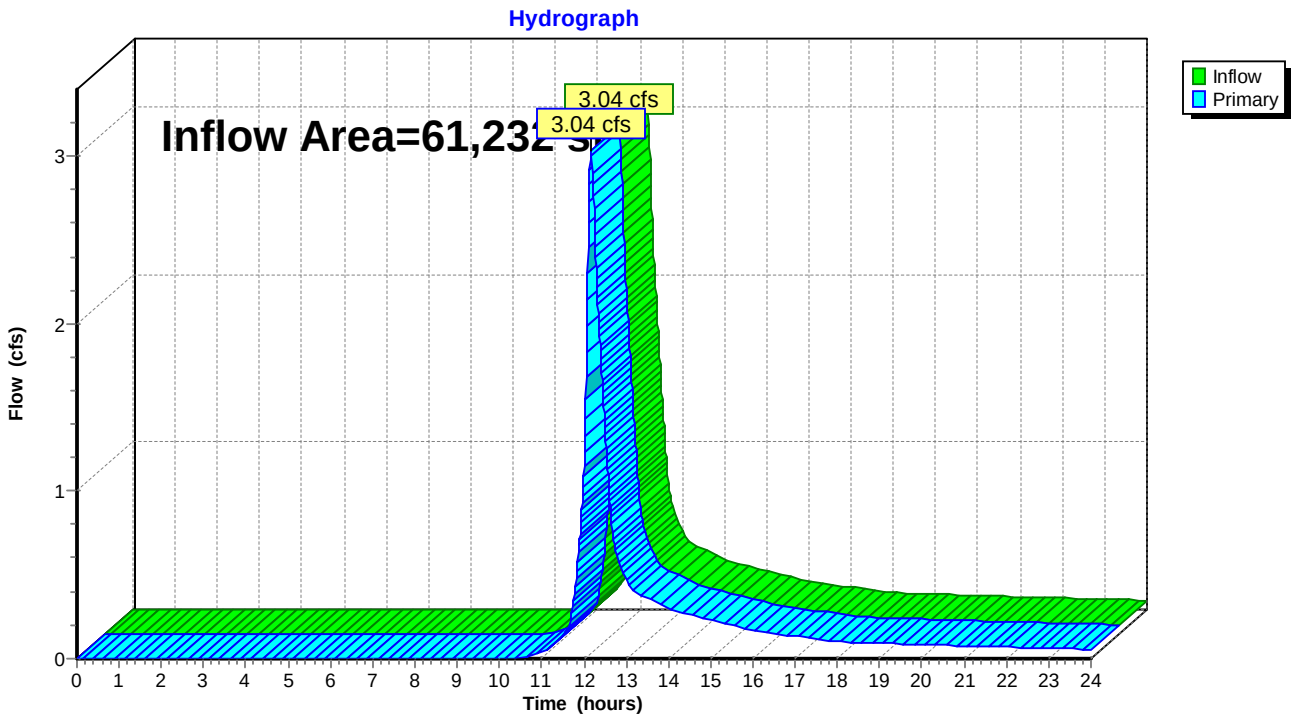


Summary for Link DP09-3: WF B

Inflow Area = 61,232 sf, 17.35% Impervious, Inflow Depth > 2.32" for 100 Year event
Inflow = 3.04 cfs @ 12.17 hrs, Volume= 11,826 cf
Primary = 3.04 cfs @ 12.17 hrs, Volume= 11,826 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link DP09-3: WF B

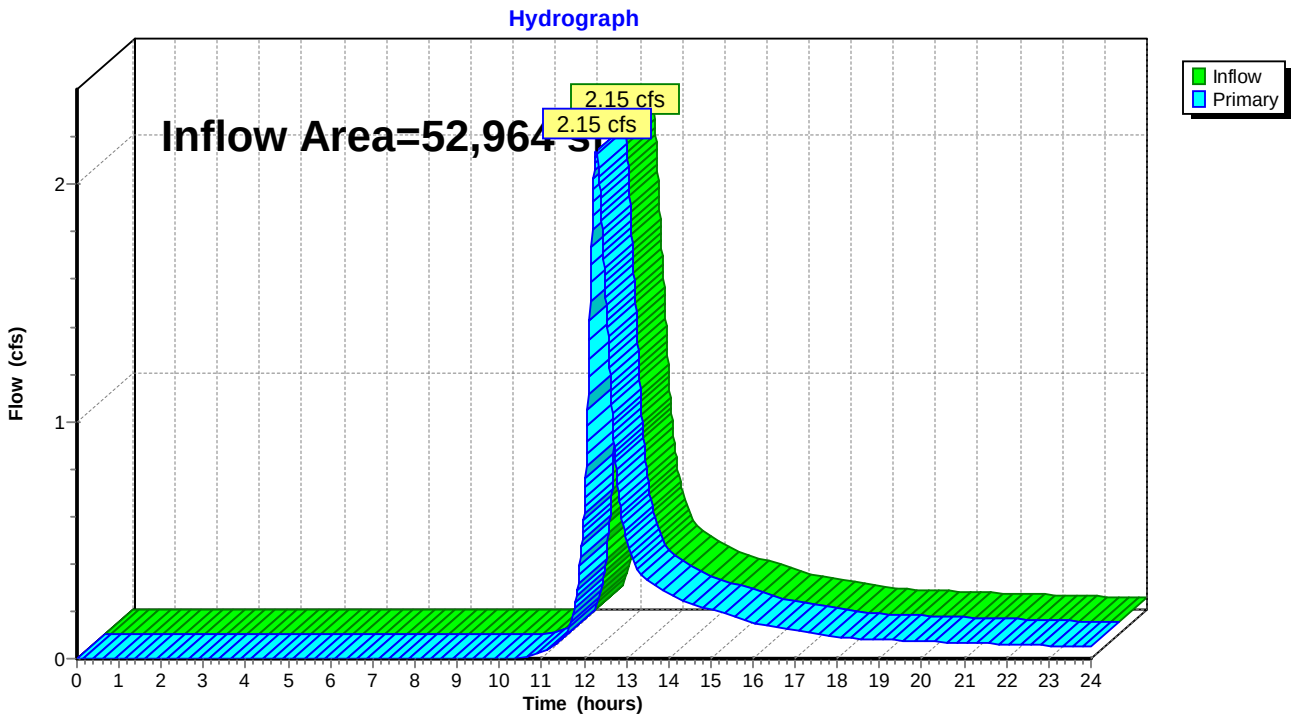


Summary for Link DP09-4: WF E&L, TOB C

Inflow Area = 52,964 sf, 1.51% Impervious, Inflow Depth > 2.31" for 100 Year event
Inflow = 2.15 cfs @ 12.30 hrs, Volume= 10,207 cf
Primary = 2.15 cfs @ 12.30 hrs, Volume= 10,207 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link DP09-4: WF E&L, TOB C

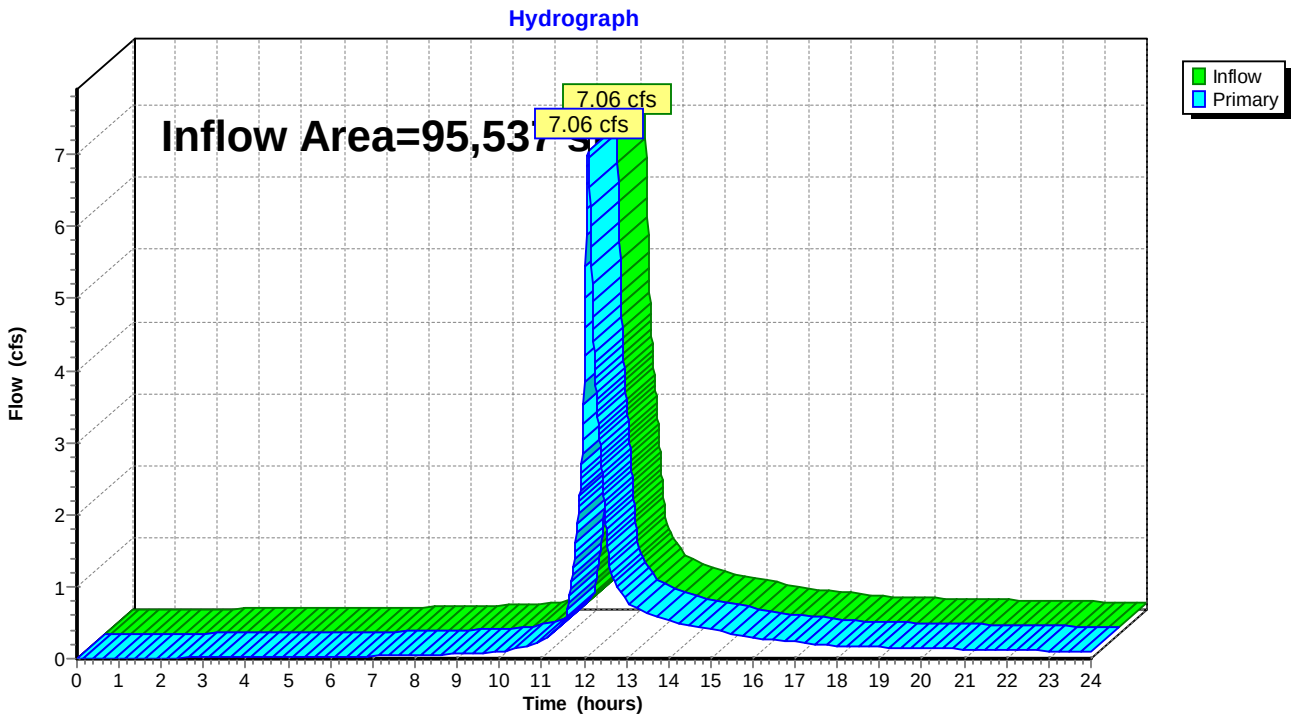


Summary for Link DP10: WF A

Inflow Area = 95,537 sf, 28.44% Impervious, Inflow Depth > 3.09" for 100 Year event
Inflow = 7.06 cfs @ 12.10 hrs, Volume= 24,561 cf
Primary = 7.06 cfs @ 12.10 hrs, Volume= 24,561 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link DP10: WF A

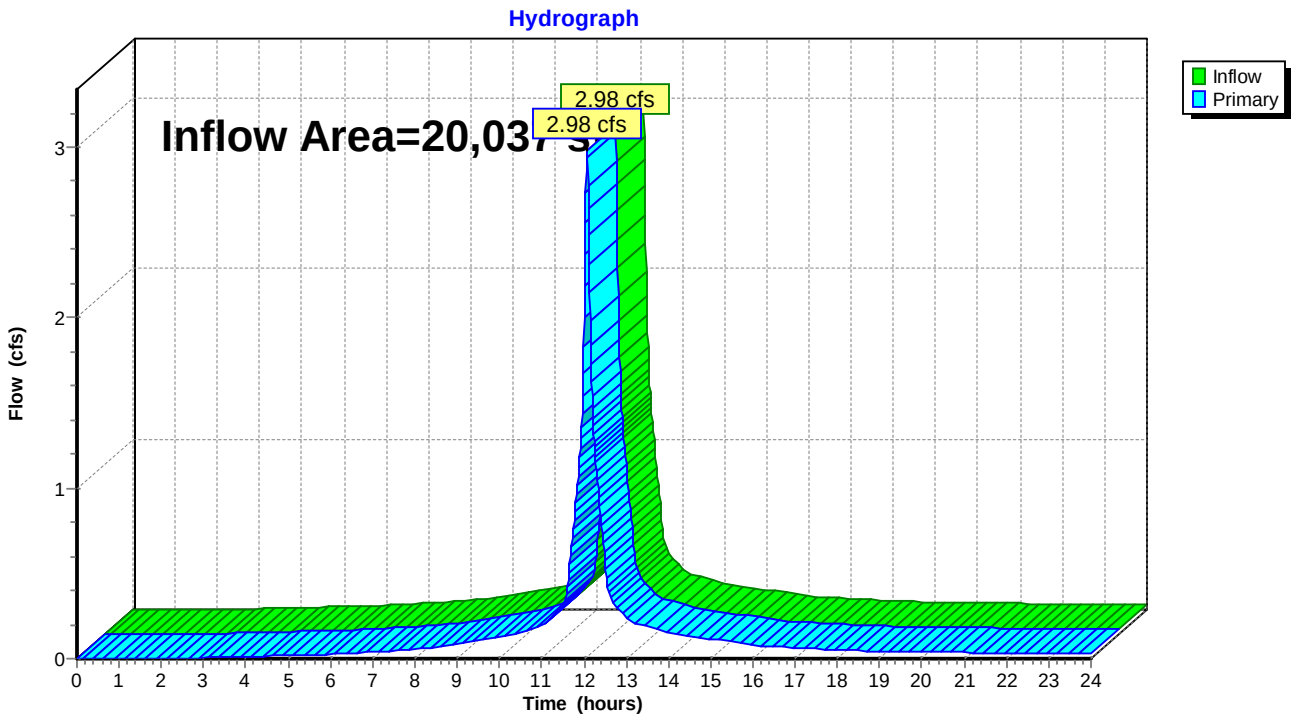


Summary for Link DP11: Local St Drain System

Inflow Area = 20,037 sf, 76.27% Impervious, Inflow Depth > 5.79" for 100 Year event
Inflow = 2.98 cfs @ 12.07 hrs, Volume= 9,668 cf
Primary = 2.98 cfs @ 12.07 hrs, Volume= 9,668 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link DP11: Local St Drain System

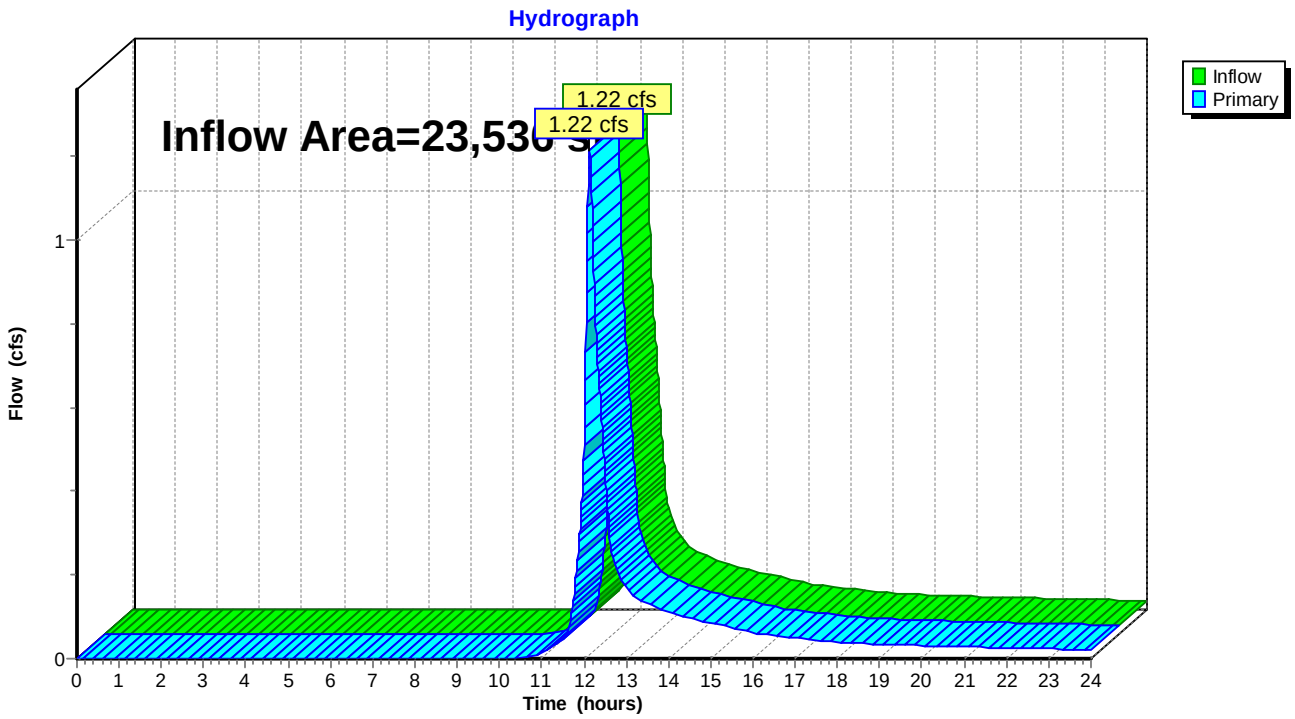


Summary for Link DP12: Washington St Low Point

Inflow Area = 23,536 sf, 31.05% Impervious, Inflow Depth > 2.23" for 100 Year event
Inflow = 1.22 cfs @ 12.13 hrs, Volume= 4,369 cf
Primary = 1.22 cfs @ 12.13 hrs, Volume= 4,369 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link DP12: Washington St Low Point

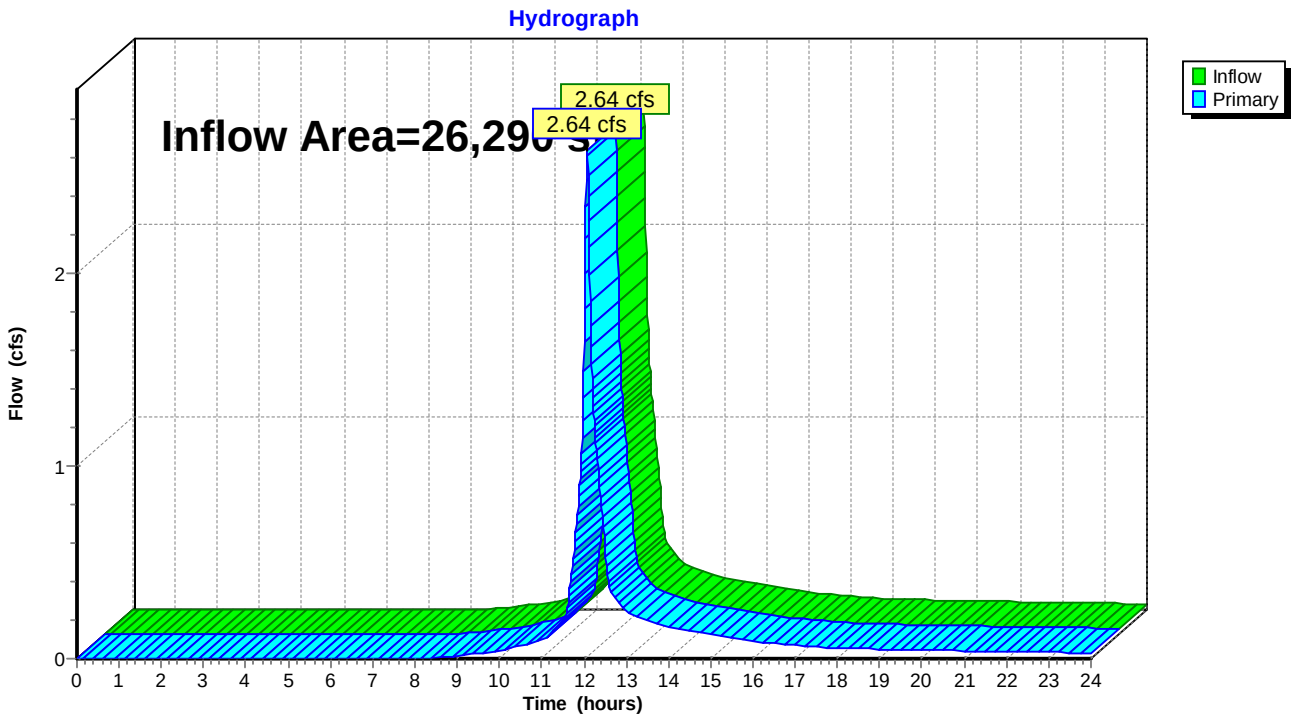


Summary for Link DP13: Empty Lot

Inflow Area = 26,290 sf, 0.00% Impervious, Inflow Depth > 3.59" for 100 Year event
Inflow = 2.64 cfs @ 12.08 hrs, Volume= 7,864 cf
Primary = 2.64 cfs @ 12.08 hrs, Volume= 7,864 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link DP13: Empty Lot

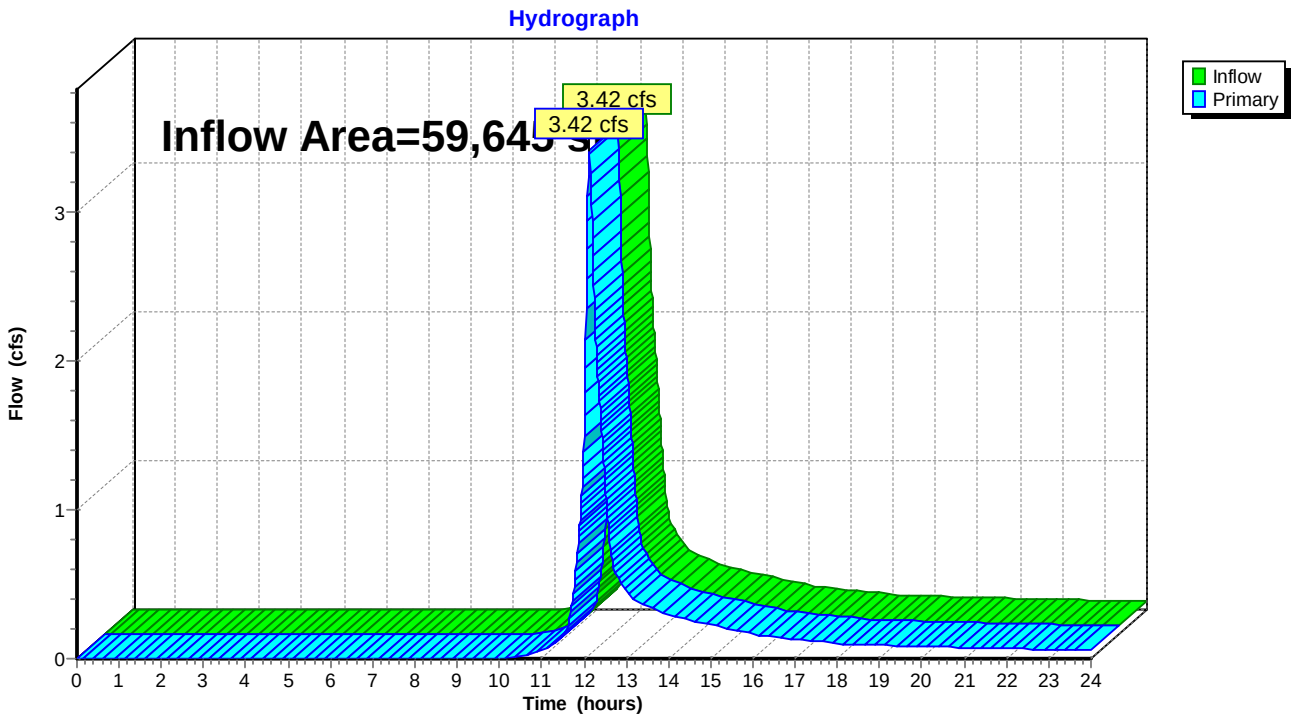


Summary for Link DP14: Lagrange St Low Point

Inflow Area = 59,645 sf, 31.36% Impervious, Inflow Depth > 2.41" for 100 Year event
Inflow = 3.42 cfs @ 12.13 hrs, Volume= 11,989 cf
Primary = 3.42 cfs @ 12.13 hrs, Volume= 11,989 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link DP14: Lagrange St Low Point

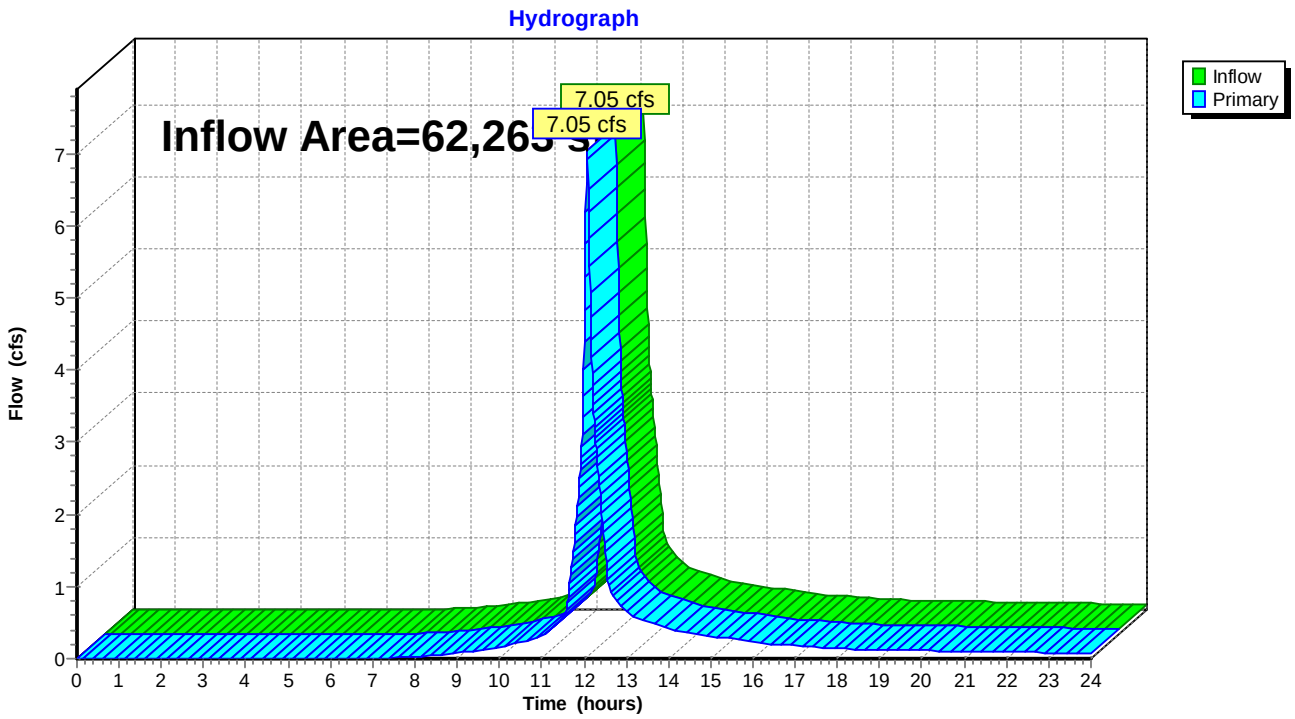


Summary for Link DP15: TOB D

Inflow Area = 62,263 sf, 50.59% Impervious, Inflow Depth > 4.11" for 100 Year event
Inflow = 7.05 cfs @ 12.08 hrs, Volume= 21,324 cf
Primary = 7.05 cfs @ 12.08 hrs, Volume= 21,324 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link DP15: TOB D

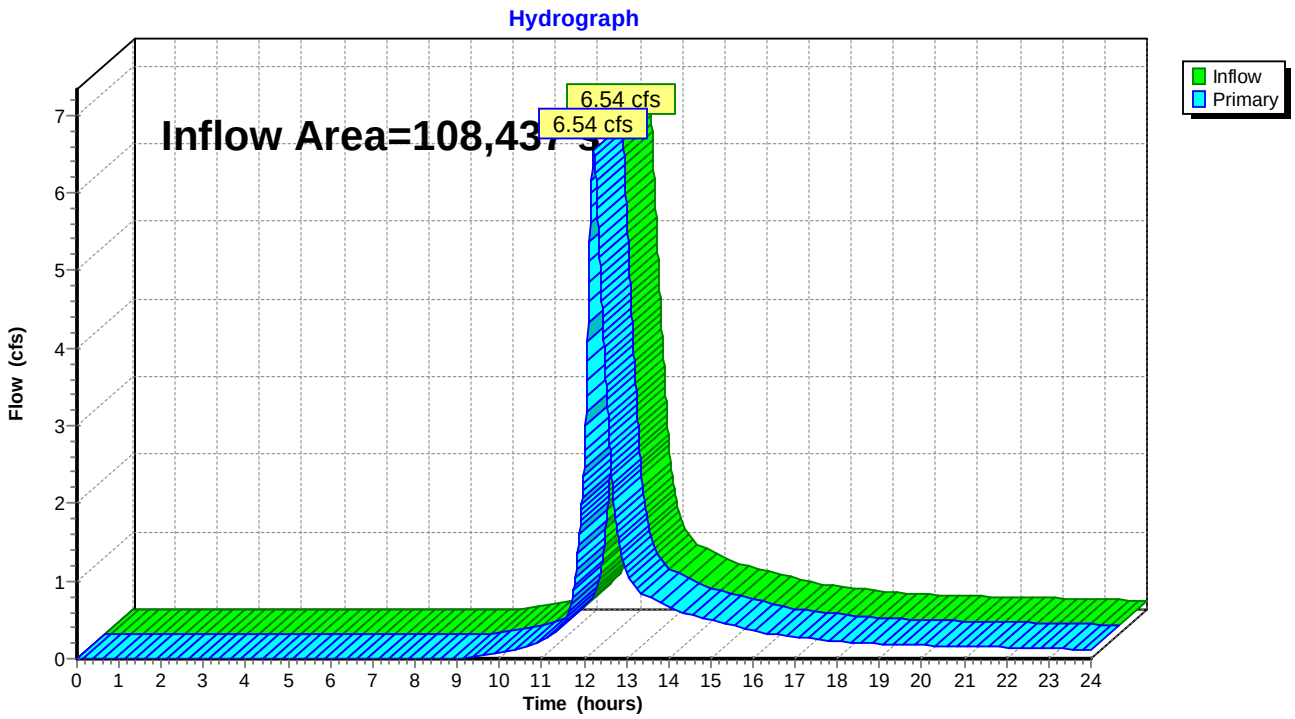


Summary for Link DP16: WF 1, WF 2, TOB E

Inflow Area = 108,437 sf, 32.30% Impervious, Inflow Depth > 3.08" for 100 Year event
Inflow = 6.54 cfs @ 12.23 hrs, Volume= 27,816 cf
Primary = 6.54 cfs @ 12.23 hrs, Volume= 27,816 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link DP16: WF 1, WF 2, TOB E

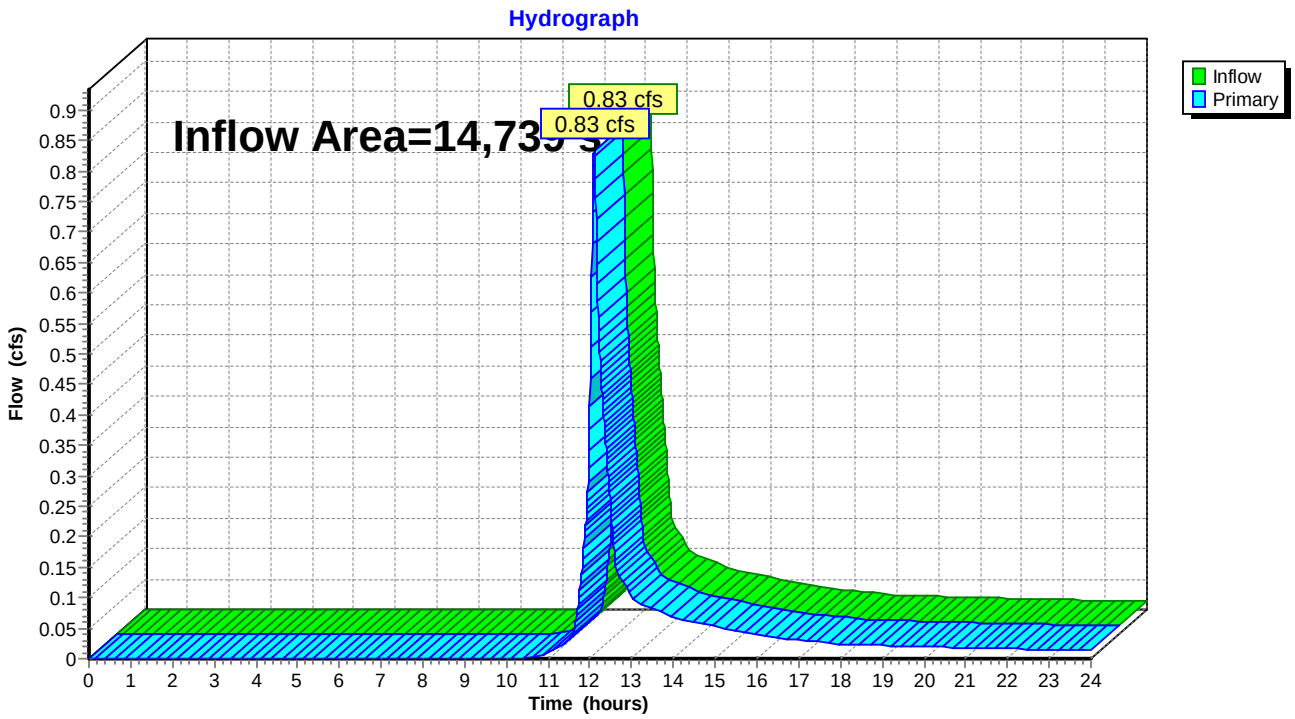


Summary for Link WF-G: WF G

Inflow Area = 14,739 sf, 0.00% Impervious, Inflow Depth > 2.23" for 100 Year event
Inflow = 0.83 cfs @ 12.10 hrs, Volume= 2,738 cf
Primary = 0.83 cfs @ 12.10 hrs, Volume= 2,738 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link WF-G: WF G

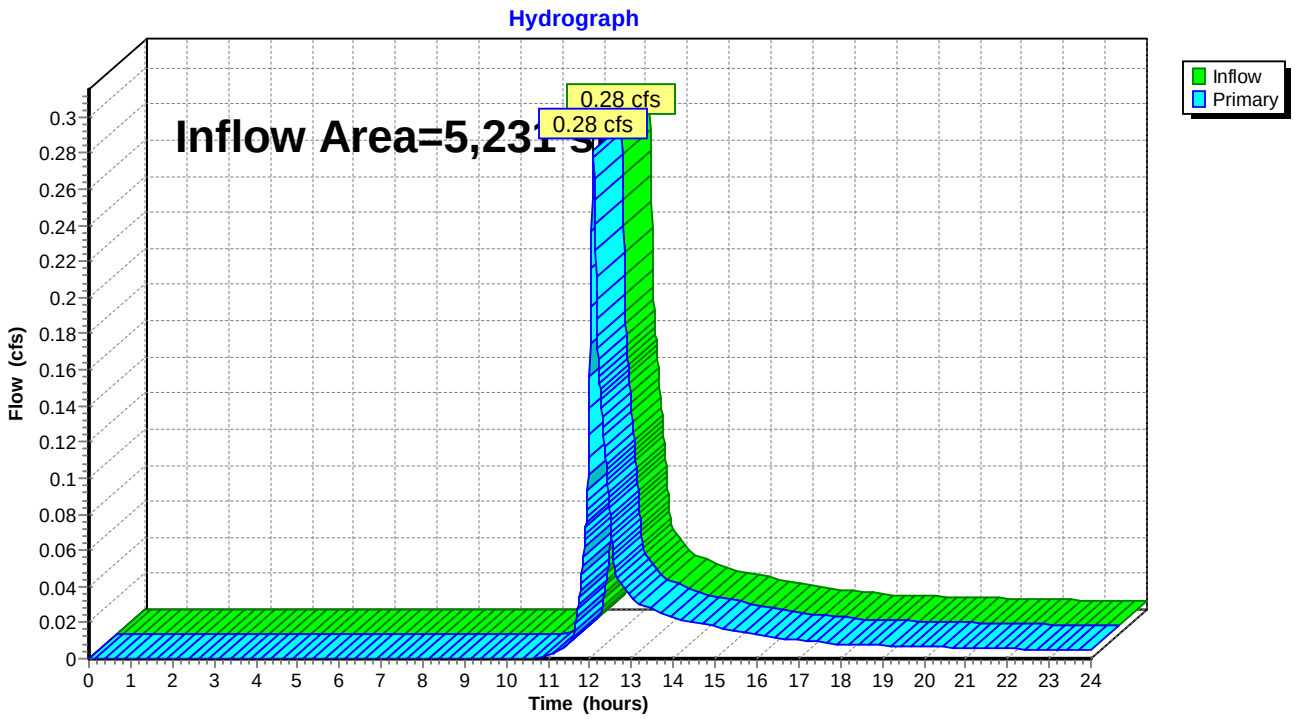


Summary for Link WF-H: WF H

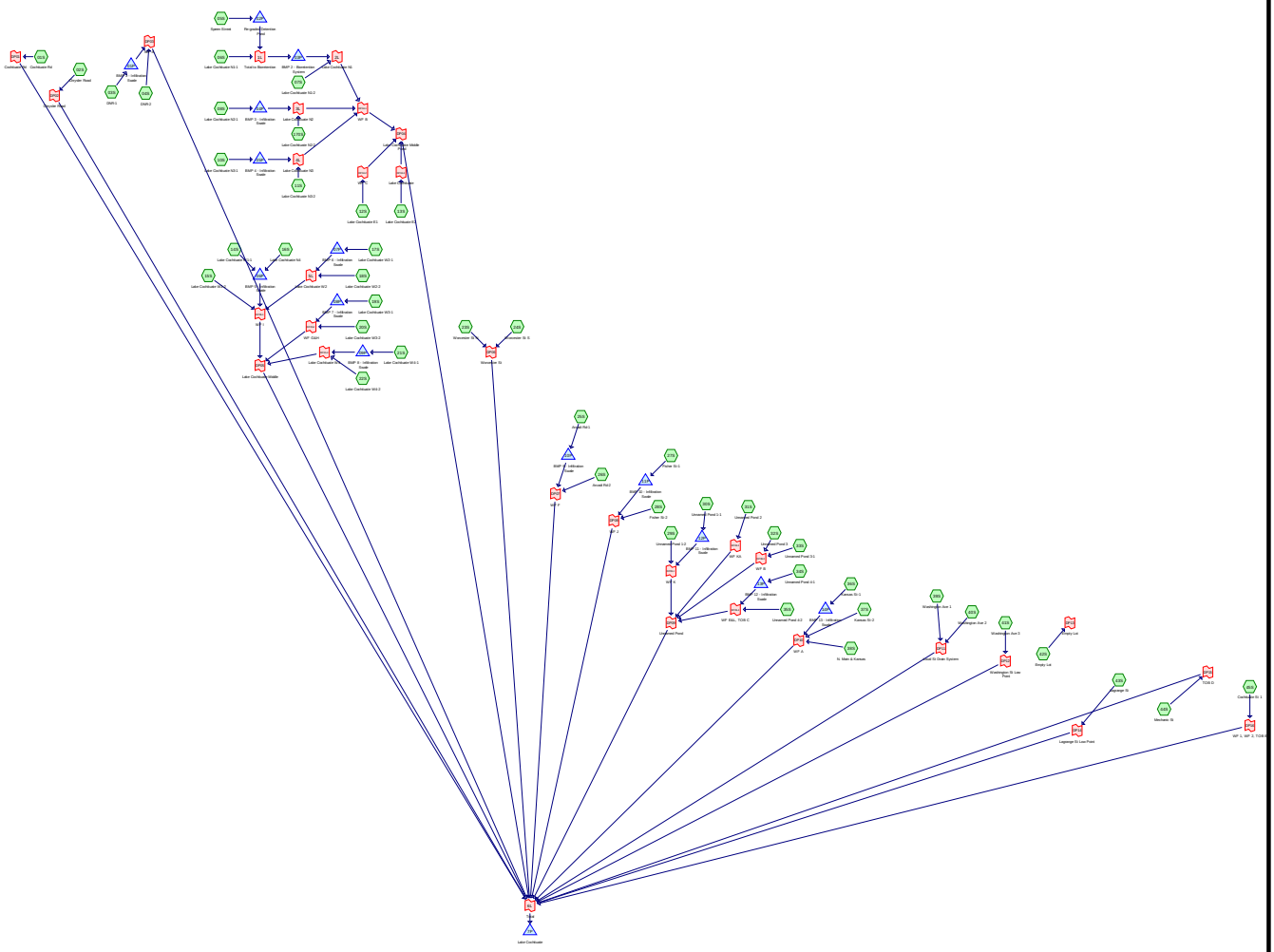
Inflow Area = 5,231 sf, 0.00% Impervious, Inflow Depth > 2.05" for 100 Year event
Inflow = 0.28 cfs @ 12.08 hrs, Volume= 893 cf
Primary = 0.28 cfs @ 12.08 hrs, Volume= 893 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link WF-H: WF H



HydroCAD Proposed Conditions



Subcat Reach Pond Link

Drainage Diagram for CRT Proposed Watersheds
Prepared by BETA Group, Inc., Printed 5/8/2014
HydroCAD® 9.00 s/n 01895 © 2009 HydroCAD Software Solutions LLC

Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points x 3
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 01S: Cochituate Rd Runoff Area=32,816 sf 19.44% Impervious Runoff Depth=0.71"
Flow Length=306' Slope=0.0050 '/' Tc=9.0 min CN=68 Runoff=0.47 cfs 1,930 cf

Subcatchment 02S: Chrysler Road Runoff Area=59,894 sf 5.23% Impervious Runoff Depth=0.36"
Flow Length=311' Tc=37.7 min CN=59 Runoff=0.18 cfs 1,776 cf

Subcatchment 03S: DNR-1 Runoff Area=50,164 sf 33.83% Impervious Runoff Depth=0.85"
Flow Length=759' Tc=15.8 min CN=71 Runoff=0.76 cfs 3,546 cf

Subcatchment 04S: DNR-2 Runoff Area=43,392 sf 0.00% Impervious Runoff Depth=0.29"
Flow Length=430' Tc=14.7 min CN=57 Runoff=0.12 cfs 1,060 cf

Subcatchment 05S: Speen Street Runoff Area=28,639 sf 30.10% Impervious Runoff Depth=1.00"
Flow Length=444' Tc=5.3 min CN=74 Runoff=0.75 cfs 2,398 cf

Subcatchment 06S: Lake Cochituate N1-1 Runoff Area=60,547 sf 17.98% Impervious Runoff Depth=0.54"
Flow Length=810' Tc=8.7 min CN=64 Runoff=0.58 cfs 2,705 cf

Subcatchment 07S: Lake Cochituate N1-2 Runoff Area=50,655 sf 14.07% Impervious Runoff Depth=0.50"
Flow Length=274' Tc=8.6 min CN=63 Runoff=0.43 cfs 2,099 cf

Subcatchment 08S: Lake Cochituate N2-1 Runoff Area=41,704 sf 17.25% Impervious Runoff Depth=0.54"
Flow Length=352' Tc=11.8 min CN=64 Runoff=0.36 cfs 1,863 cf

Subcatchment 10S: Lake Cochituate N3-1 Runoff Area=98,155 sf 15.90% Impervious Runoff Depth=0.54"
Flow Length=272' Tc=18.3 min CN=64 Runoff=0.73 cfs 4,384 cf

Subcatchment 11S: Lake Cochituate N3-2 Runoff Area=24,131 sf 4.50% Impervious Runoff Depth=0.36"
Flow Length=110' Tc=9.1 min CN=59 Runoff=0.10 cfs 715 cf

Subcatchment 12S: Lake Cochituate E1 Runoff Area=22,546 sf 0.00% Impervious Runoff Depth=0.29"
Flow Length=82' Slope=0.2101 '/' Tc=7.2 min CN=57 Runoff=0.07 cfs 551 cf

Subcatchment 13S: Lake Cochituate E2 Runoff Area=166,896 sf 9.27% Impervious Runoff Depth=0.42"
Flow Length=328' Tc=16.1 min CN=61 Runoff=0.87 cfs 5,893 cf

Subcatchment 14S: Lake Cochituate W1-1 Runoff Area=13,204 sf 47.79% Impervious Runoff Depth=1.18"
Flow Length=106' Tc=5.0 min CN=77 Runoff=0.42 cfs 1,294 cf

Subcatchment 15S: Lake Cochituate W1-2 Runoff Area=15,593 sf 0.00% Impervious Runoff Depth=0.29"
Flow Length=185' Tc=11.2 min CN=57 Runoff=0.05 cfs 381 cf

Subcatchment 16S: Lake Cochituate N4 Runoff Area=95,267 sf 23.06% Impervious Runoff Depth=0.62"
Flow Length=145' Tc=11.5 min CN=66 Runoff=1.04 cfs 4,906 cf

Subcatchment 17S: Lake Cochituate W2-1 Runoff Area=4,593 sf 65.38% Impervious Runoff Depth=1.64"
Tc=5.0 min CN=84 Runoff=0.21 cfs 628 cf

Subcatchment 18S: Lake Cochituate W2-2 Runoff Area=14,017 sf 9.52% Impervious Runoff Depth=0.42"
Flow Length=102' Tc=8.8 min CN=61 Runoff=0.09 cfs 495 cf

Subcatchment 19S: Lake Cochituate W3-1 Runoff Area=2,241 sf 67.51% Impervious Runoff Depth=1.72"
Tc=5.0 min CN=85 Runoff=0.11 cfs 320 cf

Subcatchment 20S: Lake Cochituate W3-2 Runoff Area=21,531 sf 11.61% Impervious Runoff Depth=0.46"
Flow Length=72' Slope=0.2220 '/' Tc=6.4 min CN=62 Runoff=0.17 cfs 825 cf

Subcatchment 21S: Lake Cochituate W4-1 Runoff Area=10,487 sf 62.20% Impervious Runoff Depth=1.57"
Tc=5.0 min CN=83 Runoff=0.46 cfs 1,371 cf

Subcatchment 22S: Lake Cochituate W4-2 Runoff Area=199,759 sf 19.73% Impervious Runoff Depth=0.58"
Flow Length=297' Tc=13.0 min CN=65 Runoff=1.87 cfs 9,593 cf

Subcatchment 23S: Worcester St N Runoff Area=159,601 sf 92.99% Impervious Runoff Depth=2.50"
Flow Length=1,809' Tc=22.6 min CN=94 Runoff=6.63 cfs 33,188 cf

Subcatchment 24S: Worcester St S Runoff Area=25,578 sf 43.13% Impervious Runoff Depth=1.06"
Flow Length=316' Tc=9.0 min CN=75 Runoff=0.63 cfs 2,260 cf

Subcatchment 25S: Arcadi Rd-1 Runoff Area=234,888 sf 22.66% Impervious Runoff Depth=0.46"
Flow Length=810' Tc=18.2 min CN=62 Runoff=1.36 cfs 8,999 cf

Subcatchment 26S: Arcadi Rd-2 Runoff Area=43,309 sf 0.00% Impervious Runoff Depth=0.29"
Flow Length=154' Tc=10.6 min CN=57 Runoff=0.13 cfs 1,058 cf

Subcatchment 27S: Fisher St-1 Runoff Area=316,495 sf 27.57% Impervious Runoff Depth=0.42"
Flow Length=500' Tc=15.5 min CN=61 Runoff=1.67 cfs 11,175 cf

Subcatchment 28S: Fisher St-2 Runoff Area=16,737 sf 0.00% Impervious Runoff Depth=0.29"
Flow Length=65' Slope=0.1369 '/' Tc=7.1 min CN=57 Runoff=0.05 cfs 409 cf

Subcatchment 29S: Unnamed Pond 1-2 Runoff Area=4,097 sf 0.00% Impervious Runoff Depth=0.29"
Flow Length=32' Slope=0.3850 '/' Tc=5.0 min CN=57 Runoff=0.01 cfs 100 cf

Subcatchment 30S: Unnamed Pond 1-1 Runoff Area=15,210 sf 38.96% Impervious Runoff Depth=0.90"
Flow Length=86' Tc=10.7 min CN=72 Runoff=0.29 cfs 1,139 cf

Subcatchment 31S: Unnamed Pond 2 Runoff Area=76,046 sf 25.44% Impervious Runoff Depth=0.39"
Flow Length=279' Tc=7.9 min CN=60 Runoff=0.41 cfs 2,465 cf

Subcatchment 32S: Unnamed Pond 3 Runoff Area=62,955 sf 16.69% Impervious Runoff Depth=0.36"
Flow Length=309' Tc=11.7 min CN=59 Runoff=0.26 cfs 1,866 cf

Subcatchment 33S: Unnamed Pond 3-1 Runoff Area=1,569 sf 100.00% Impervious Runoff Depth=2.92"
Tc=5.0 min CN=98 Runoff=0.11 cfs 381 cf

Subcatchment 34S: Unnamed Pond 4-1 Runoff Area=13,927 sf 62.52% Impervious Runoff Depth=1.57"
Tc=5.0 min CN=83 Runoff=0.61 cfs 1,820 cf

Subcatchment 35S: Unnamed Pond 4-2 Runoff Area=42,409 sf 0.00% Impervious Runoff Depth=0.29"
Flow Length=167' Tc=11.7 min CN=57 Runoff=0.13 cfs 1,036 cf

Subcatchment 36S: Kansas St-1 Runoff Area=26,591 sf 37.08% Impervious Runoff Depth=0.85"
Flow Length=92' Tc=11.0 min CN=71 Runoff=0.46 cfs 1,880 cf

Subcatchment 37S: Kansas St-2 Runoff Area=52,239 sf 17.16% Impervious Runoff Depth=0.42"
Flow Length=313' Tc=9.1 min CN=61 Runoff=0.32 cfs 1,844 cf

Subcatchment 38S: N. Main & Kansas Runoff Area=15,467 sf 100.00% Impervious Runoff Depth=2.92"
Tc=5.0 min CN=98 Runoff=1.12 cfs 3,761 cf

Subcatchment 39S: Washington Ave 1 Runoff Area=12,963 sf 90.09% Impervious Runoff Depth=2.60"
Tc=5.0 min CN=95 Runoff=0.89 cfs 2,804 cf

Subcatchment 40S: Washington Ave 2 Runoff Area=12,112 sf 83.16% Impervious Runoff Depth=2.40"
Tc=5.0 min CN=93 Runoff=0.79 cfs 2,420 cf

Subcatchment 41S: Washington Ave 3 Runoff Area=26,688 sf 37.75% Impervious Runoff Depth=0.50"
Flow Length=196' Tc=9.0 min CN=63 Runoff=0.22 cfs 1,106 cf

Subcatchment 42S: Empty Lot Runoff Area=13,350 sf 0.00% Impervious Runoff Depth=0.90"
Tc=5.0 min CN=72 Runoff=0.31 cfs 1,000 cf

Subcatchment 43S: Lagrange St Runoff Area=65,997 sf 35.65% Impervious Runoff Depth=0.46"
Flow Length=194' Tc=8.7 min CN=62 Runoff=0.48 cfs 2,529 cf

Subcatchment 44S: Mechanic St Runoff Area=61,456 sf 61.47% Impervious Runoff Depth=1.36"
Flow Length=329' Tc=5.0 min CN=80 Runoff=2.31 cfs 6,983 cf

Subcatchment 45S: Cochituate St 1 Runoff Area=108,852 sf 44.86% Impervious Runoff Depth=0.85"
Flow Length=740' Tc=21.3 min CN=71 Runoff=1.47 cfs 7,694 cf

Subcatchment 170S: Lake Cochituate N2-2 Runoff Area=15,884 sf 0.00% Impervious Runoff Depth=0.29"
Flow Length=53' Slope=0.3400 '/' Tc=5.0 min CN=57 Runoff=0.05 cfs 388 cf

Pond 01P: BMP 1 - Infiltration Swale Peak Elev=147.22' Storage=1,305 cf Inflow=0.76 cfs 3,546 cf
Discarded=0.13 cfs 3,546 cf Primary=0.00 cfs 0 cf Outflow=0.13 cfs 3,546 cf

Pond 02P: Re-graded Detention Pond Peak Elev=159.86' Storage=42 cf Inflow=0.75 cfs 2,398 cf
Primary=0.00 cfs 0 cf Secondary=0.75 cfs 2,385 cf Outflow=0.75 cfs 2,385 cf

Pond 03P: BMP 2 - Bioretention System Peak Elev=152.81' Storage=861 cf Inflow=0.58 cfs 2,705 cf
Discarded=0.07 cfs 2,598 cf Primary=0.03 cfs 107 cf Outflow=0.11 cfs 2,705 cf

Pond 04P: BMP 3 - Infiltration Swale Peak Elev=154.21' Storage=627 cf Inflow=0.36 cfs 1,863 cf
Discarded=0.06 cfs 1,863 cf Primary=0.00 cfs 0 cf Outflow=0.06 cfs 1,863 cf

Pond 05P: BMP 4 - Infiltration Swale Peak Elev=154.62' Storage=675 cf Inflow=0.73 cfs 4,384 cf
Discarded=0.06 cfs 2,604 cf Primary=0.57 cfs 1,780 cf Outflow=0.63 cfs 4,385 cf

Pond 06P: BMP 5 - Infiltration Swale Peak Elev=154.84' Storage=1,442 cf Inflow=1.30 cfs 6,200 cf
Discarded=0.13 cfs 4,721 cf Primary=0.70 cfs 1,479 cf Outflow=0.83 cfs 6,200 cf

Pond 07P: BMP 6 - Infiltration Swale Peak Elev=154.81' Storage=253 cf Inflow=0.21 cfs 628 cf
Discarded=0.02 cfs 628 cf Primary=0.00 cfs 0 cf Outflow=0.02 cfs 628 cf

Pond 7P: Lake Cochituate Peak Elev=136.00' Storage=2.461 af Inflow=16.37 cfs 107,186 cf
Outflow=0.00 cfs 0 cf

Pond 08P: BMP 7 - Infiltration Swale Peak Elev=156.40' Storage=131 cf Inflow=0.11 cfs 320 cf
Discarded=0.01 cfs 320 cf Primary=0.00 cfs 0 cf Outflow=0.01 cfs 320 cf

Pond 09P: BMP 8 - Infiltration Swale Peak Elev=157.65' Storage=551 cf Inflow=0.46 cfs 1,371 cf
Discarded=0.05 cfs 1,371 cf Primary=0.00 cfs 0 cf Outflow=0.05 cfs 1,371 cf

Pond 10P: BMP 9 - Infiltration Swale Peak Elev=157.84' Storage=2,245 cf Inflow=1.36 cfs 8,999 cf
Discarded=0.20 cfs 7,497 cf Primary=0.35 cfs 1,503 cf Outflow=0.56 cfs 8,999 cf

Pond 11P: BMP 10 - Infiltration Swale Peak Elev=158.13' Storage=1,609 cf Inflow=1.67 cfs 11,175 cf
Discarded=0.14 cfs 6,471 cf Primary=1.28 cfs 4,705 cf Outflow=1.42 cfs 11,175 cf

Pond 12P: BMP 11 - Infiltration Swale Peak Elev=157.50' Storage=432 cf Inflow=0.29 cfs 1,139 cf
Discarded=0.04 cfs 1,139 cf Primary=0.00 cfs 0 cf Outflow=0.04 cfs 1,139 cf

Pond 13P: BMP 12 - Infiltration Swale Peak Elev=155.90' Storage=732 cf Inflow=0.61 cfs 1,820 cf
Discarded=0.07 cfs 1,820 cf Primary=0.00 cfs 0 cf Outflow=0.07 cfs 1,820 cf

Pond 14P: BMP 13 - Infiltration Swale Peak Elev=155.90' Storage=697 cf Inflow=0.46 cfs 1,880 cf
Discarded=0.07 cfs 1,880 cf Primary=0.00 cfs 0 cf Outflow=0.07 cfs 1,880 cf

Link 1L: Total to Bioretention Inflow=0.58 cfs 2,705 cf
Primary=0.58 cfs 2,705 cf

Link 2L: Lake Cochituate N1 Inflow=0.43 cfs 2,206 cf
Primary=0.43 cfs 2,206 cf

Link 3L: Lake Cochituate N2 Inflow=0.05 cfs 388 cf
Primary=0.05 cfs 388 cf

Link 4L: Lake Cochituate N3 Inflow=0.65 cfs 2,496 cf
Primary=0.65 cfs 2,496 cf

Link 5L: Lake Cochituate W2 Inflow=0.09 cfs 495 cf
Primary=0.09 cfs 495 cf

Link 6L: Total Inflow=16.37 cfs 107,186 cf
Primary=16.37 cfs 107,186 cf

Link DP01: Cochituate Rd Inflow=0.47 cfs 1,930 cf
Primary=0.47 cfs 1,930 cf

Link DP02: Chrysler Road Inflow=0.18 cfs 1,776 cf
Primary=0.18 cfs 1,776 cf

Link DP03: WF A Inflow=0.12 cfs 1,060 cf
Primary=0.12 cfs 1,060 cf

Link DP04: Lake Cochituate Middle Pond Inflow=1.80 cfs 11,534 cf
Primary=1.80 cfs 11,534 cf

Link DP04-1: WF B Inflow=0.93 cfs 5,090 cf
Primary=0.93 cfs 5,090 cf

Link DP04-2: WF C Inflow=0.07 cfs 551 cf
Primary=0.07 cfs 551 cf

Link DP04-3: Lake Cochituate Inflow=0.87 cfs 5,893 cf
Primary=0.87 cfs 5,893 cf

Link DP05: Lake Cochituate Middle Inflow=2.37 cfs 12,773 cf
Primary=2.37 cfs 12,773 cf

Link DP05-1: WF I Inflow=0.81 cfs 2,355 cf
Primary=0.81 cfs 2,355 cf

Link DP05-2: WF G&H Inflow=0.17 cfs 825 cf
Primary=0.17 cfs 825 cf

Link DP05-3: Lake Cochituate W4 Inflow=1.87 cfs 9,593 cf
Primary=1.87 cfs 9,593 cf

Link DP06: Worcester St Inflow=7.03 cfs 35,448 cf
Primary=7.03 cfs 35,448 cf

Link DP07: WF F Inflow=0.41 cfs 2,561 cf
Primary=0.41 cfs 2,561 cf

Link DP08: WF J Inflow=1.32 cfs 5,114 cf
Primary=1.32 cfs 5,114 cf

Link DP09: Unnamed Pond Inflow=0.80 cfs 5,850 cf
Primary=0.80 cfs 5,850 cf

Link DP09-1: WF K Inflow=0.01 cfs 100 cf
Primary=0.01 cfs 100 cf

Link DP09-2: WF KA Inflow=0.41 cfs 2,465 cf
Primary=0.41 cfs 2,465 cf

Link DP09-3: WF B Inflow=0.30 cfs 2,248 cf
Primary=0.30 cfs 2,248 cf

Link DP09-4: WF E&L, TOB C Inflow=0.13 cfs 1,036 cf
Primary=0.13 cfs 1,036 cf

Link DP10: WF A Inflow=1.29 cfs 5,605 cf
Primary=1.29 cfs 5,605 cf

Link DP11: Local St Drain System Inflow=1.67 cfs 5,224 cf
Primary=1.67 cfs 5,224 cf

Link DP12: Washington St Low Point Inflow=0.22 cfs 1,106 cf
Primary=0.22 cfs 1,106 cf

Link DP13: Empty Lot Inflow=0.31 cfs 1,000 cf
Primary=0.31 cfs 1,000 cf

Link DP14: Lagrange St Low Point Inflow=0.48 cfs 2,529 cf
Primary=0.48 cfs 2,529 cf

Link DP15: TOB D Inflow=2.31 cfs 6,983 cf
Primary=2.31 cfs 6,983 cf

Link DP16: WF 1, WF 2, TOB E Inflow=1.47 cfs 7,694 cf
Primary=1.47 cfs 7,694 cf

Total Runoff Area = 2,480,651 sf Runoff Volume = 147,039 cf Average Runoff Depth = 0.71"
71.89% Pervious = 1,783,367 sf 28.11% Impervious = 697,284 sf

Summary for Subcatchment 01S: Cochituate Rd

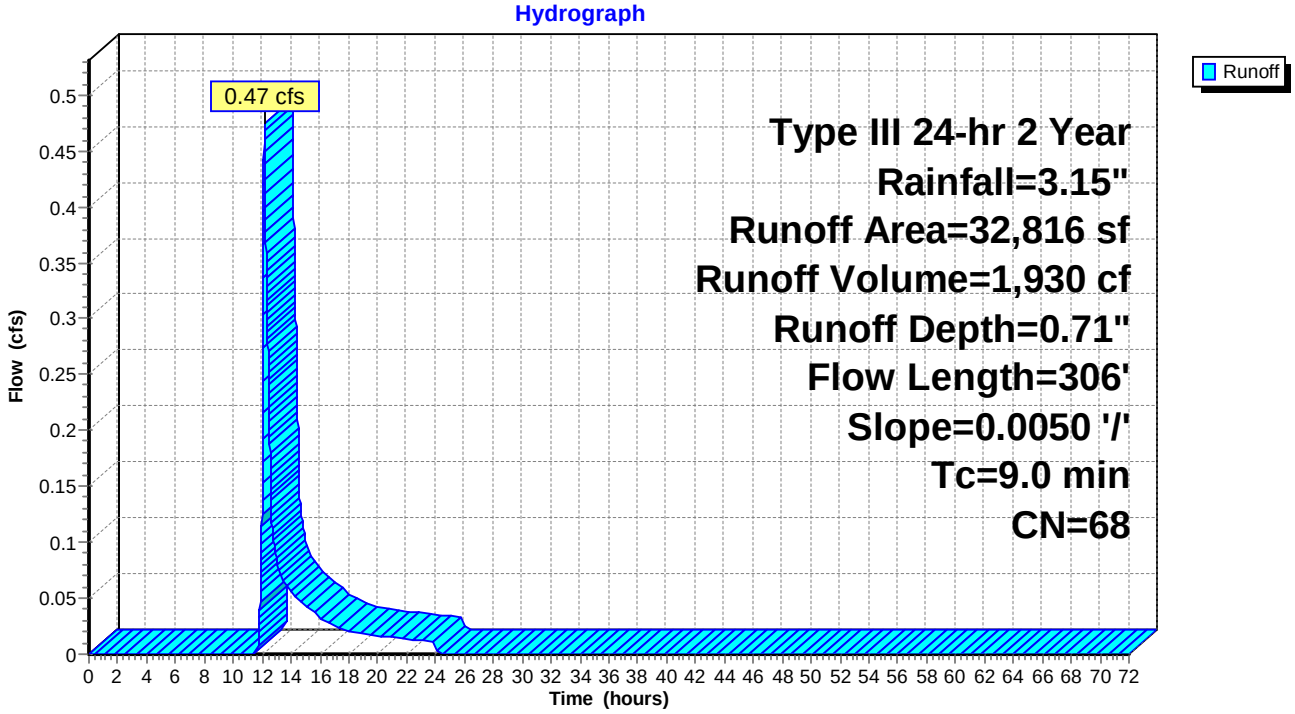
Runoff = 0.47 cfs @ 12.15 hrs, Volume= 1,930 cf, Depth= 0.71"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.15"

	Area (sf)	CN	Description
	16,401	57	Woods/grass comb., Poor, HSG A
	2,771	98	Paved parking, HSG A
*	3,607	98	Bike Trail, HSG A
	10,037	68	<50% Grass cover, Poor, HSG A
	32,816	68	Weighted Average
	26,438		80.56% Pervious Area
	6,378		19.44% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.1	100	0.0050	0.78		**Sheet Flow, Paved** Smooth surfaces n= 0.011 P2= 3.15"
6.9	206	0.0050	0.49		**Shallow Concentrated Flow, Grass** Short Grass Pasture Kv= 7.0 fps
9.0	306	Total			

Subcatchment 01S: Cochituate Rd



Summary for Subcatchment 02S: Chrysler Road

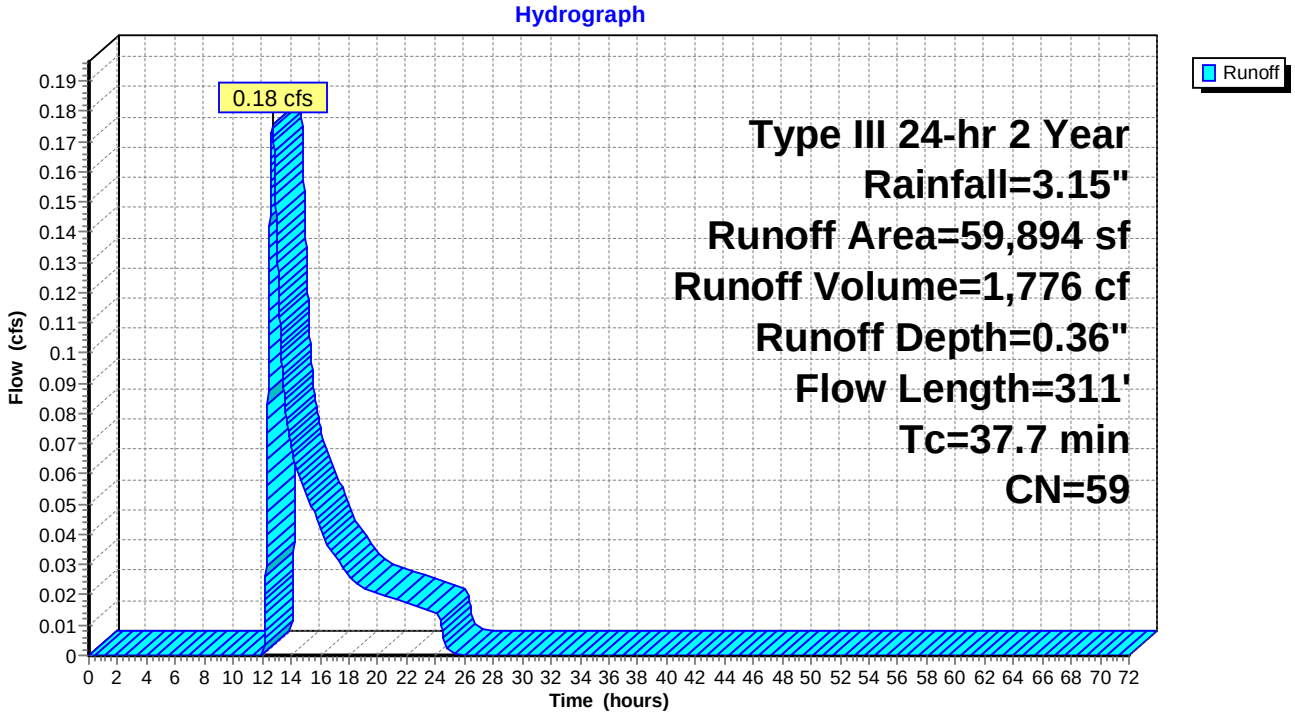
Runoff = 0.18 cfs @ 12.70 hrs, Volume= 1,776 cf, Depth= 0.36"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.15"

Area (sf)	CN	Description
56,760	57	Woods/grass comb., Poor, HSG A
3,134	98	Paved parking, HSG A
59,894	59	Weighted Average
56,760		94.77% Pervious Area
3,134		5.23% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
28.6	100	0.0100	0.06		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
9.1	211	0.0060	0.39		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
37.7	311	Total			

Subcatchment 02S: Chrysler Road



Summary for Subcatchment 03S: DNR-1

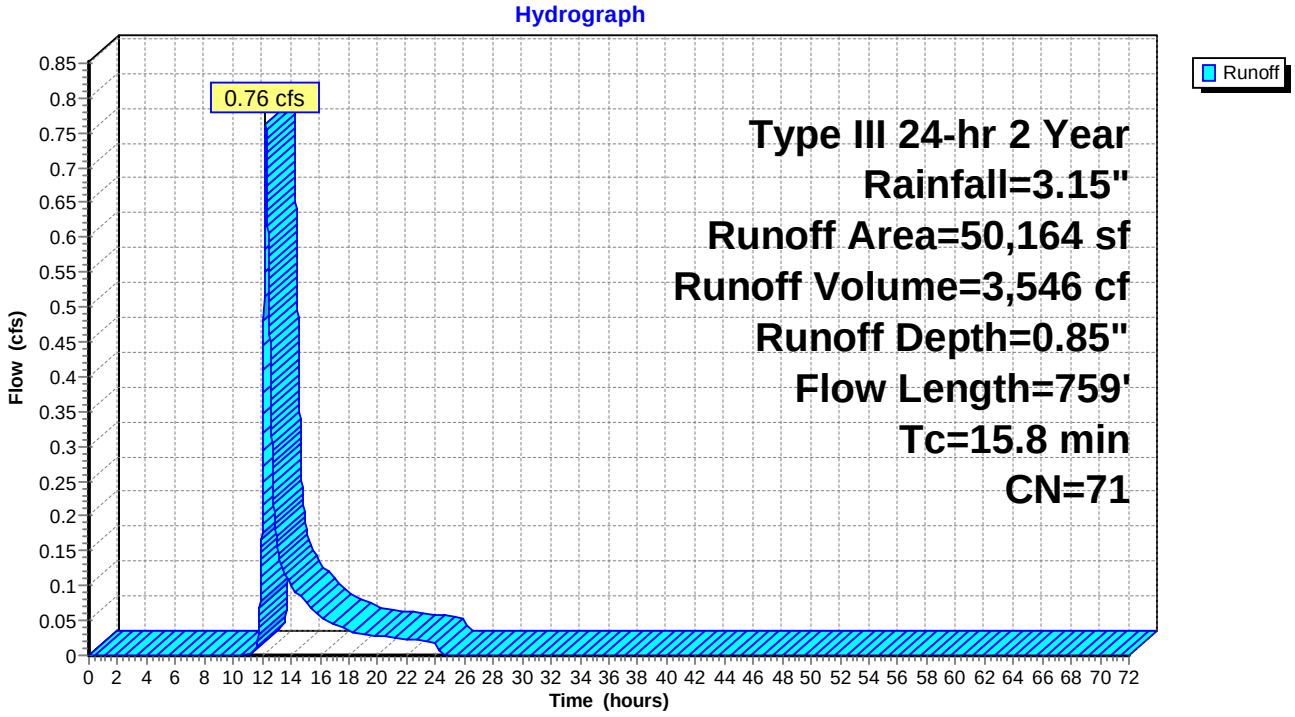
Runoff = 0.76 cfs @ 12.24 hrs, Volume= 3,546 cf, Depth= 0.85"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.15"

	Area (sf)	CN	Description
	33,195	57	Woods/grass comb., Poor, HSG A
*	16,969	98	Bike Trail, HSG A
	50,164	71	Weighted Average
	33,195		66.17% Pervious Area
	16,969		33.83% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0	100	0.3330	0.24		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
8.8	659	0.0069	1.25		**Shallow Concentrated Flow, Grass Channel** Grassed Waterway Kv= 15.0 fps
15.8	759	Total			

Subcatchment 03S: DNR-1



Summary for Subcatchment 04S: DNR-2

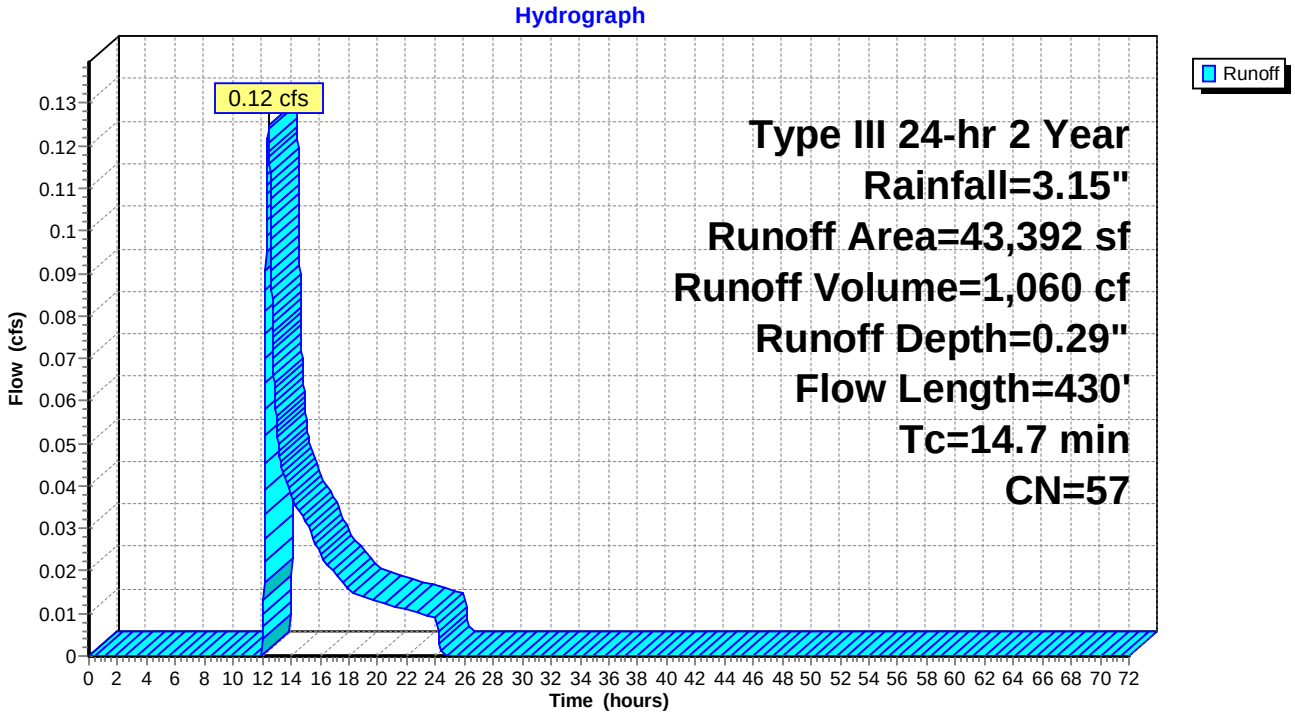
Runoff = 0.12 cfs @ 12.43 hrs, Volume= 1,060 cf, Depth= 0.29"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.15"

Area (sf)	CN	Description
43,392	57	Woods/grass comb., Poor, HSG A
43,392		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.4	100	0.1000	0.15		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
3.3	330	0.1090	1.65		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
14.7	430	Total			

Subcatchment 04S: DNR-2



Summary for Subcatchment 05S: Speen Street

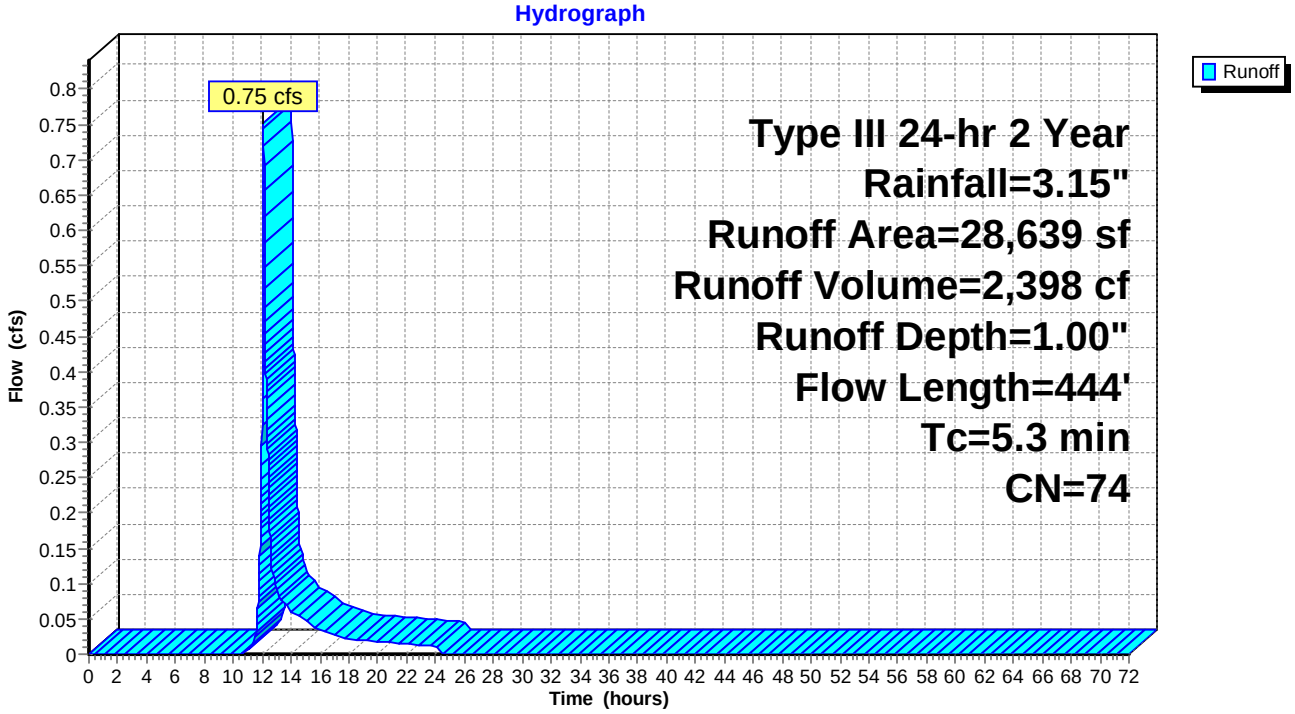
Runoff = 0.75 cfs @ 12.09 hrs, Volume= 2,398 cf, Depth= 1.00"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.15"

	Area (sf)	CN	Description
	8,689	57	Woods/grass comb., Poor, HSG A
*	6,838	98	Bike Path, HSG A
	1,783	98	Paved roads w/curbs & sewers, HSG A
	11,329	68	<50% Grass cover, Poor, HSG A
	28,639	74	Weighted Average
	20,018		69.90% Pervious Area
	8,621		30.10% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	22	0.1400	0.27		**Sheet Flow, Grass** Grass: Short n= 0.150 P2= 3.15"
3.9	422	0.0148	1.82		**Shallow Concentrated Flow, Grassed Channel** Grassed Waterway Kv= 15.0 fps
5.3	444	Total			

Subcatchment 05S: Speen Street



Summary for Subcatchment 06S: Lake Cochituate N1-1

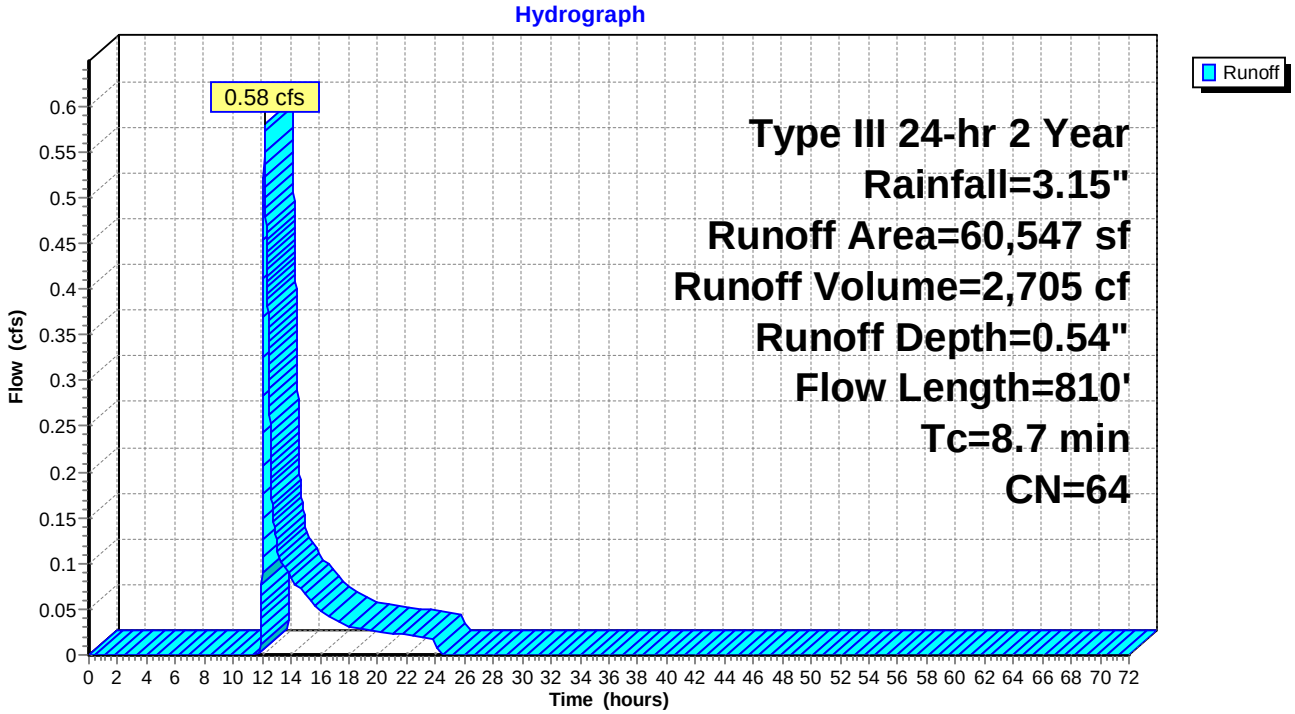
Runoff = 0.58 cfs @ 12.15 hrs, Volume= 2,705 cf, Depth= 0.54"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.15"

	Area (sf)	CN	Description
	49,662	57	Woods/grass comb., Poor, HSG A
*	10,885	98	Bike Path, HSG A
	60,547	64	Weighted Average
	49,662		82.02% Pervious Area
	10,885		17.98% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.7	33	0.4091	0.21		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
6.0	777	0.0103	2.16	0.81	**Trap/Vee/Rect Channel Flow, Grassed Channel** Bot.W=1.00' D=0.25' Z= 2.0 '/' Top.W=2.00' n= 0.022 Earth, clean & straight
8.7	810	Total			

Subcatchment 06S: Lake Cochituate N1-1



Summary for Subcatchment 07S: Lake Cochituate N1-2

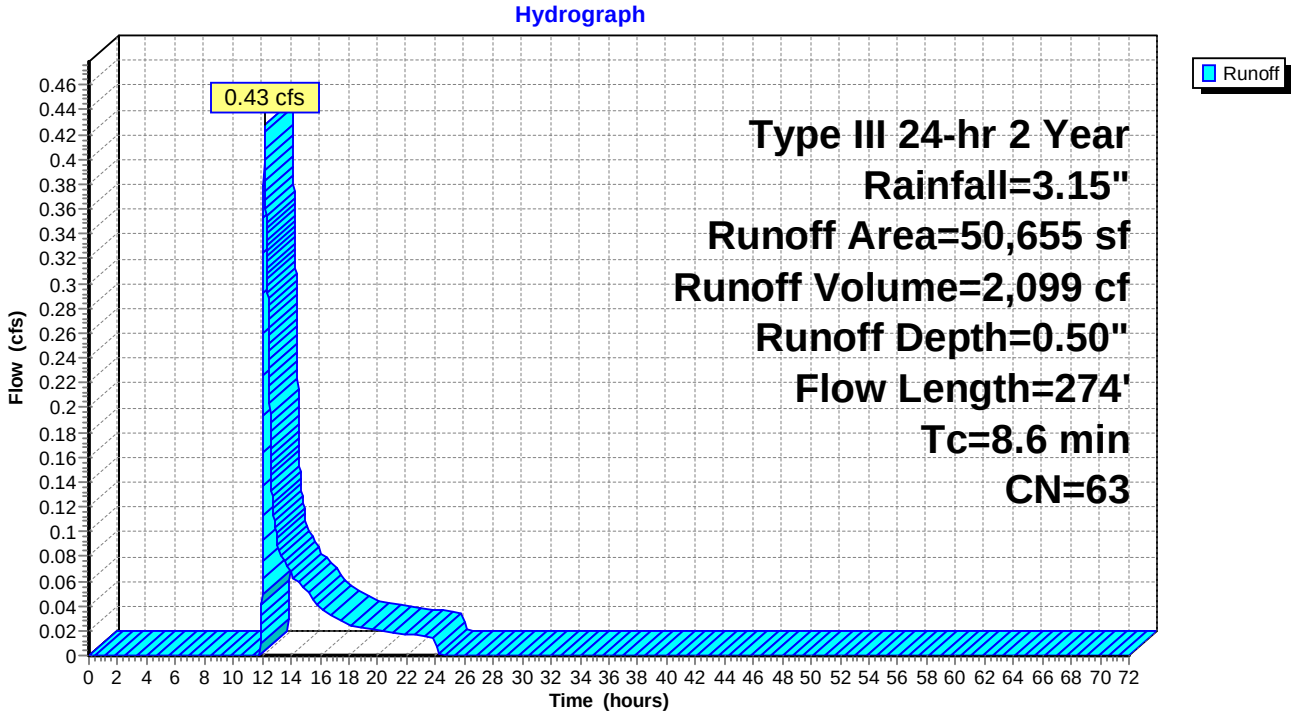
Runoff = 0.43 cfs @ 12.15 hrs, Volume= 2,099 cf, Depth= 0.50"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.15"

	Area (sf)	CN	Description
	43,526	57	Woods/grass comb., Poor, HSG A
*	7,129	98	Bike Path, HSG A
	50,655	63	Weighted Average
	43,526		85.93% Pervious Area
	7,129		14.07% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.7	27	0.0667	0.10		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
0.3	12	0.0150	0.80		**Sheet Flow, Bike Path** Smooth surfaces n= 0.011 P2= 3.15"
3.2	176	0.0050	0.91	0.11	**Trap/Vee/Rect Channel Flow, Grassed Channel** Bot.W=1.00' D=0.10' Z= 2.0 '/' Top.W=1.40' n= 0.022 Earth, clean & straight
0.4	59	0.2210	2.35		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
8.6	274	Total			

Subcatchment 07S: Lake Cochituate N1-2



Summary for Subcatchment 08S: Lake Cochituate N2-1

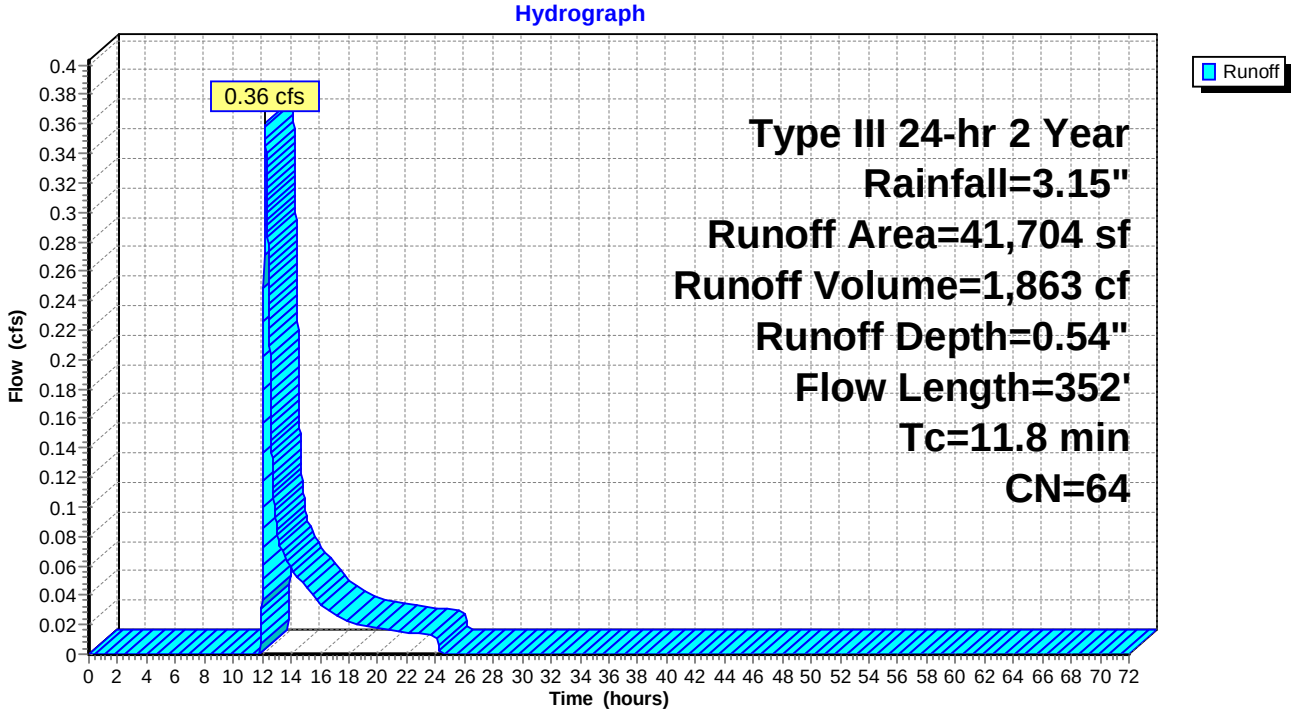
Runoff = 0.36 cfs @ 12.20 hrs, Volume= 1,863 cf, Depth= 0.54"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.15"

	Area (sf)	CN	Description
	34,512	57	Woods/grass comb., Poor, HSG A
*	7,192	98	Bike Path, HSG A
	41,704	64	Weighted Average
	34,512		82.75% Pervious Area
	7,192		17.25% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.6	76	0.1580	0.17		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
0.1	12	0.0150	2.49		**Shallow Concentrated Flow, Pavement** Paved Kv= 20.3 fps
4.1	264	0.0050	1.06		**Shallow Concentrated Flow, Grassed Channel** Grassed Waterway Kv= 15.0 fps
11.8	352	Total			

Subcatchment 08S: Lake Cochituate N2-1



Summary for Subcatchment 10S: Lake Cochituate N3-1

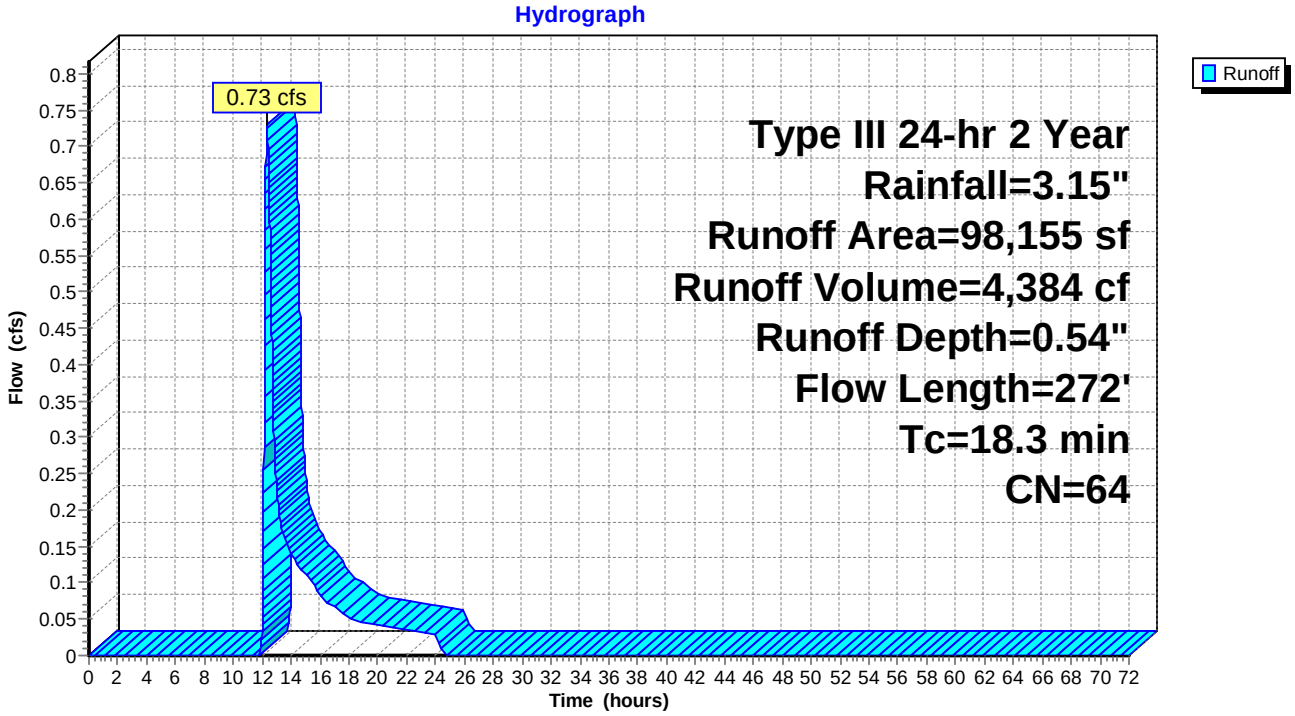
Runoff = 0.73 cfs @ 12.33 hrs, Volume= 4,384 cf, Depth= 0.54"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.15"

	Area (sf)	CN	Description
	82,552	57	Woods/grass comb., Poor, HSG A
	9,674	98	Paved parking, HSG A
*	5,929	98	Bike Path, HSG A
	98,155	64	Weighted Average
	82,552		84.10% Pervious Area
	15,603		15.90% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0	100	0.0500	0.11		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
3.1	140	0.0228	0.75		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
0.1	20	0.3200	2.83		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
0.1	12	0.0150	2.49		**Shallow Concentrated Flow, Pavement** Paved Kv= 20.3 fps
18.3	272	Total			

Subcatchment 10S: Lake Cochituate N3-1



Summary for Subcatchment 11S: Lake Cochituate N3-2

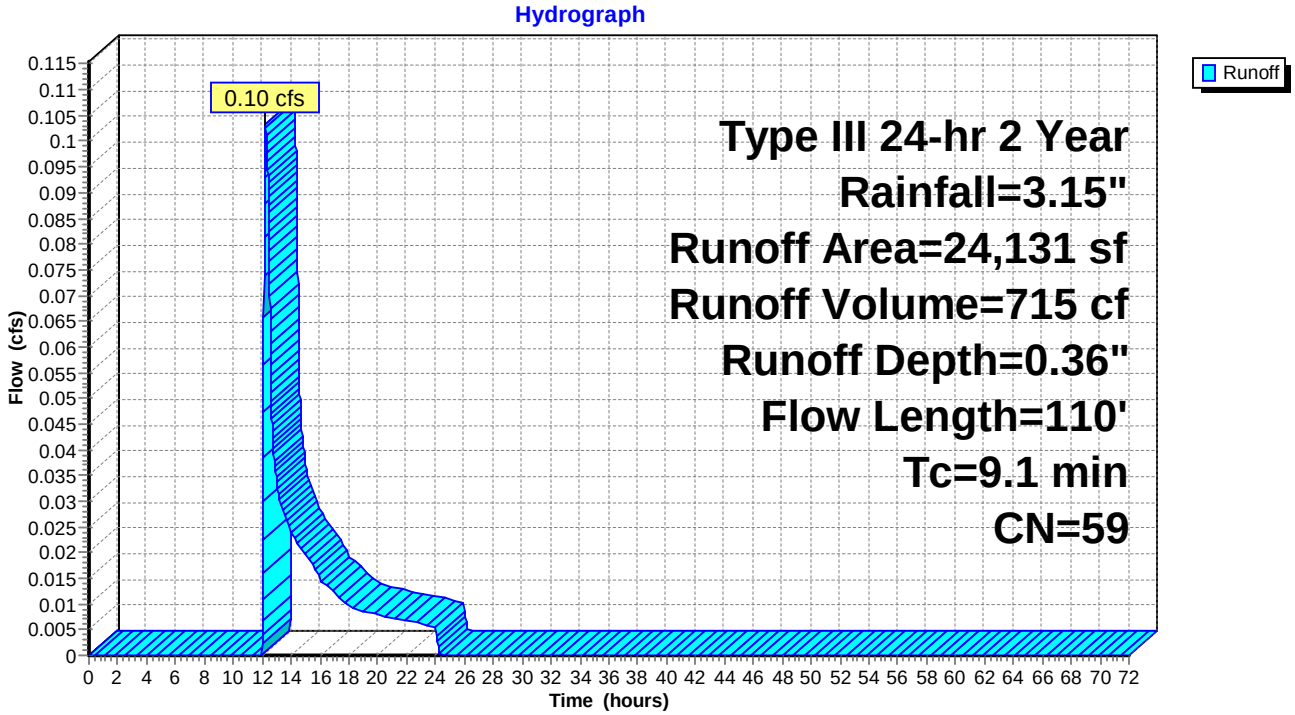
Runoff = 0.10 cfs @ 12.21 hrs, Volume= 715 cf, Depth= 0.36"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.15"

Area (sf)	CN	Description
23,045	57	Woods/grass comb., Poor, HSG A
1,086	98	Paved parking, HSG A
24,131	59	Weighted Average
23,045		95.50% Pervious Area
1,086		4.50% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.0	100	0.1780	0.18		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
0.1	10	0.1000	1.58		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
9.1	110	Total			

Subcatchment 11S: Lake Cochituate N3-2



Summary for Subcatchment 12S: Lake Cochituate E1

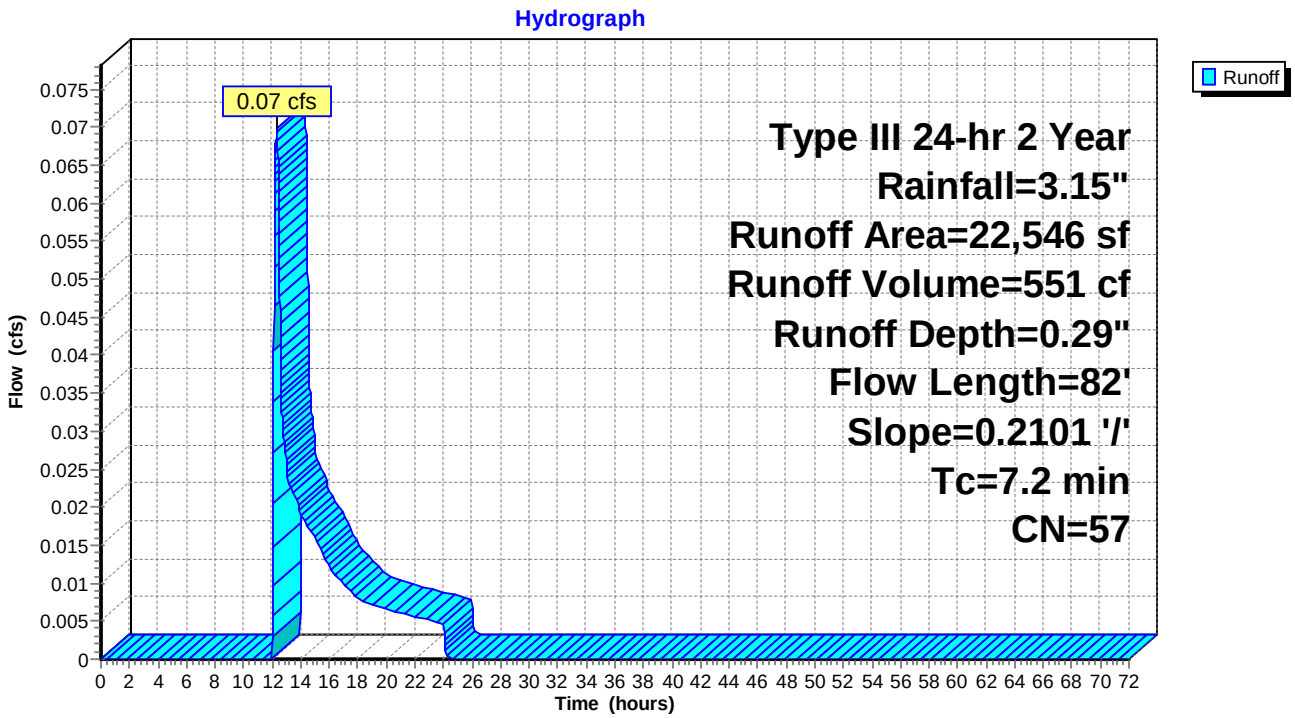
Runoff = 0.07 cfs @ 12.31 hrs, Volume= 551 cf, Depth= 0.29"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.15"

Area (sf)	CN	Description
22,546	57	Woods/grass comb., Poor, HSG A
22,546		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.2	82	0.2101	0.19		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"

Subcatchment 12S: Lake Cochituate E1



Summary for Subcatchment 13S: Lake Cochituate E2

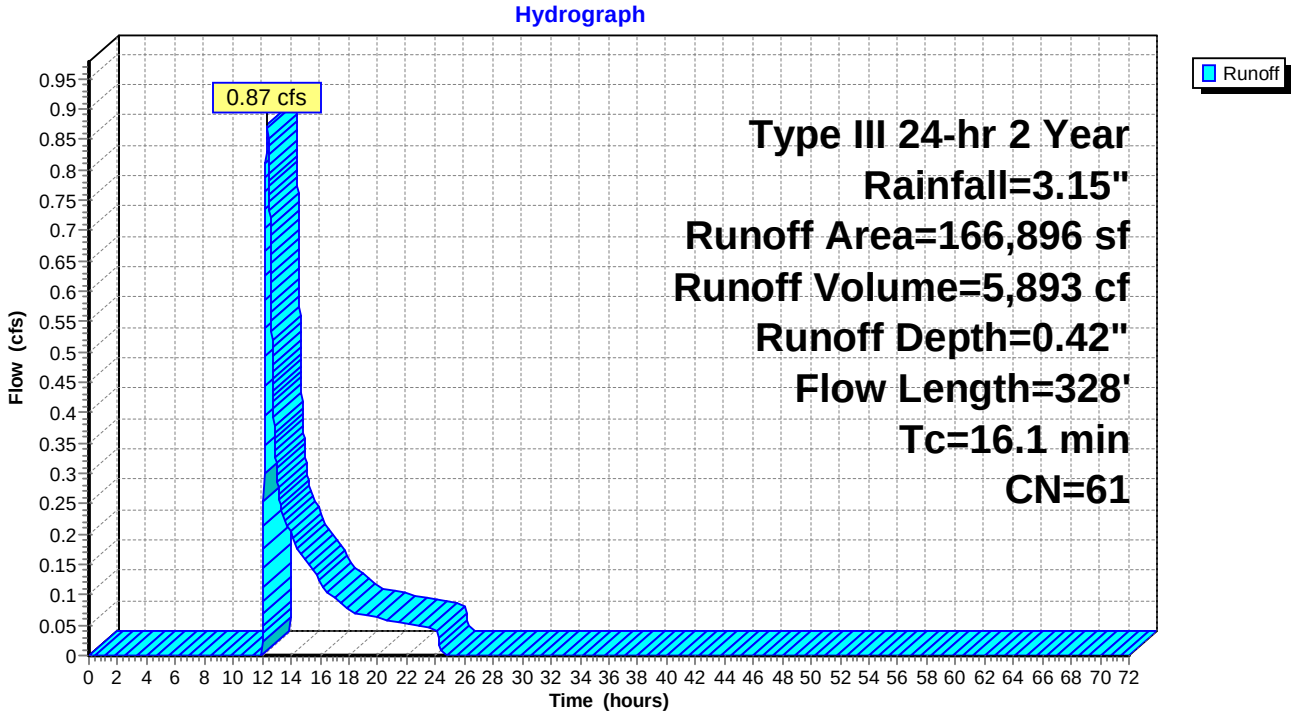
Runoff = 0.87 cfs @ 12.33 hrs, Volume= 5,893 cf, Depth= 0.42"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.15"

	Area (sf)	CN	Description
	151,423	57	Woods/grass comb., Poor, HSG A
	13,352	98	Paved parking, HSG A
*	2,121	98	Bike Path, HSG A
	166,896	61	Weighted Average
	151,423		90.73% Pervious Area
	15,473		9.27% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.1	100	0.0700	0.13		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
2.0	125	0.0456	1.07		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
0.1	13	0.0192	2.81		**Shallow Concentrated Flow, Road** Paved Kv= 20.3 fps
0.9	90	0.1080	1.64		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
16.1	328	Total			

Subcatchment 13S: Lake Cochituate E2



Summary for Subcatchment 14S: Lake Cochituate W1-1

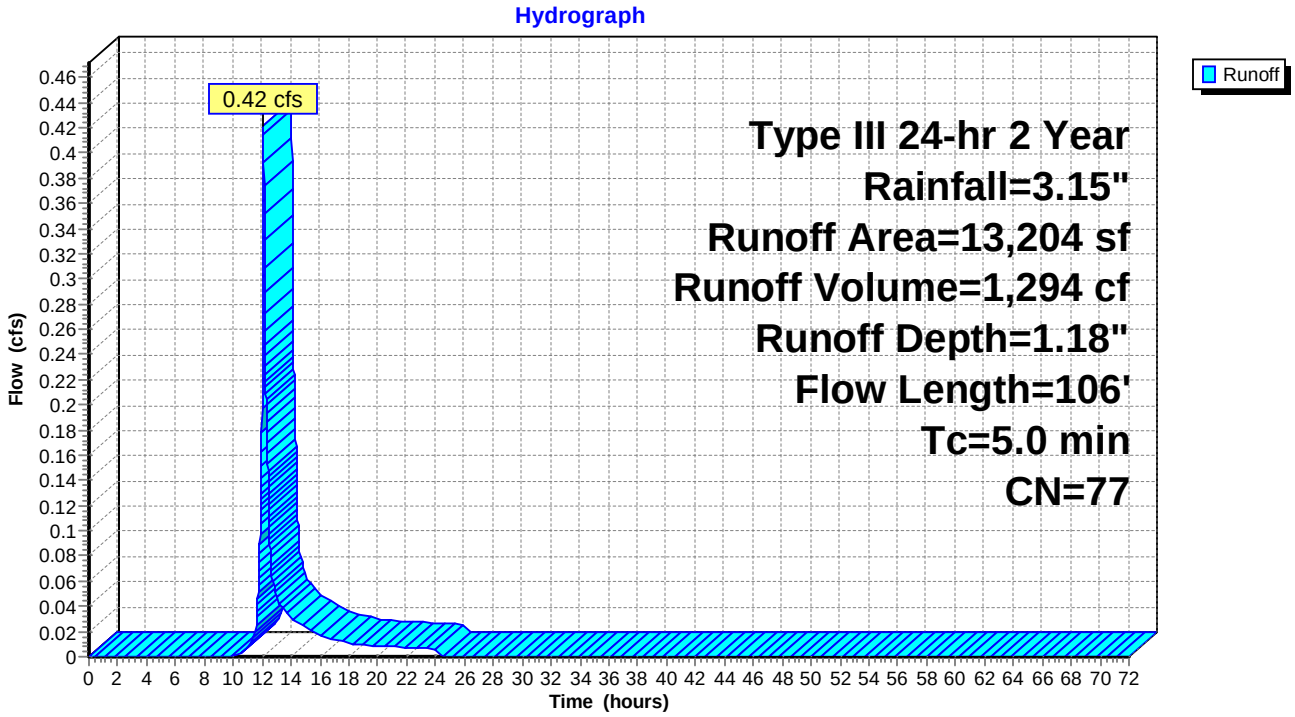
Runoff = 0.42 cfs @ 12.08 hrs, Volume= 1,294 cf, Depth= 1.18"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.15"

	Area (sf)	CN	Description
	6,894	57	Woods/grass comb., Poor, HSG A
*	3,476	98	Bike Path, HSG A
	2,834	98	Paved parking, HSG A
	13,204	77	Weighted Average
	6,894		52.21% Pervious Area
	6,310		47.79% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.9	15	0.2000	0.13		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
0.3	12	0.0150	0.80		**Sheet Flow, Bike Path** Smooth surfaces n= 0.011 P2= 3.15"
1.2	79	0.0050	1.06		**Shallow Concentrated Flow, Grass Channel** Grassed Waterway Kv= 15.0 fps
3.4	106	Total, Increased to minimum Tc = 5.0 min			

Subcatchment 14S: Lake Cochituate W1-1



Summary for Subcatchment 15S: Lake Cochituate W1-2

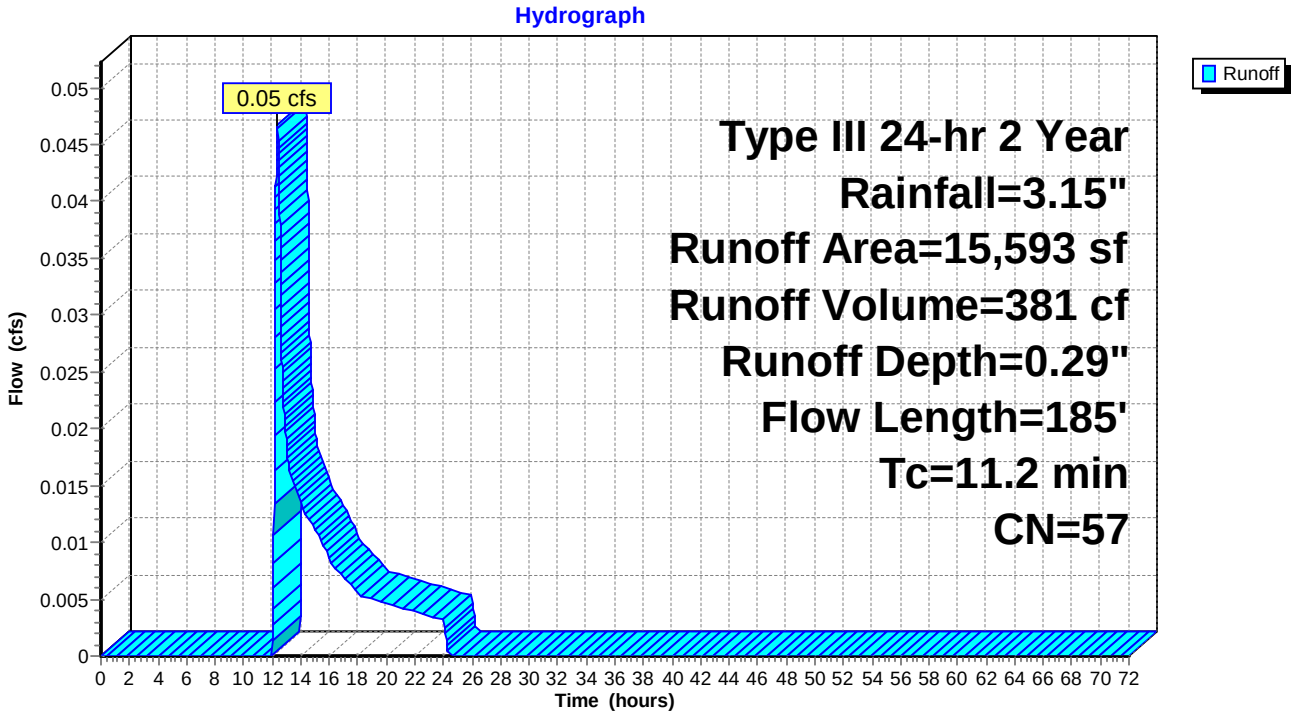
Runoff = 0.05 cfs @ 12.38 hrs, Volume= 381 cf, Depth= 0.29"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.15"

Area (sf)	CN	Description
15,593	57	Woods/grass comb., Poor, HSG A
15,593		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	100	0.1200	0.16		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
0.6	85	0.2100	2.29		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
11.2	185	Total			

Subcatchment 15S: Lake Cochituate W1-2



Summary for Subcatchment 16S: Lake Cochituate N4

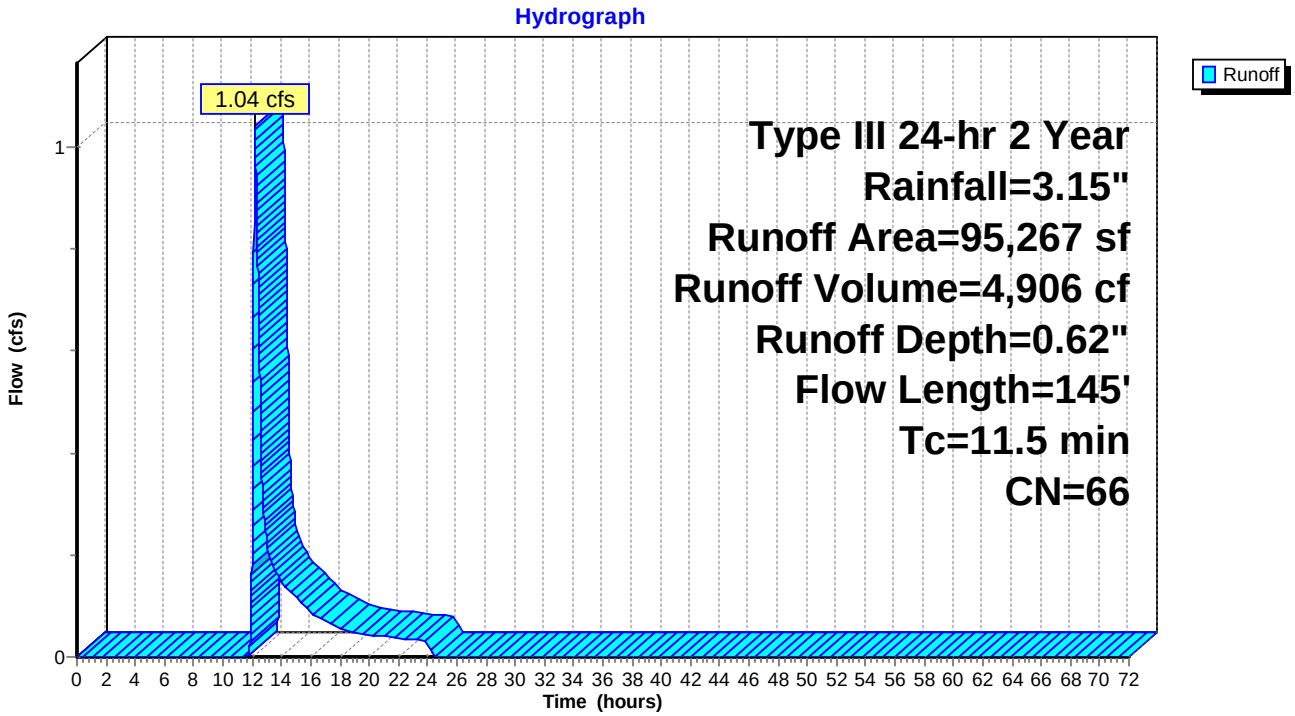
Runoff = 1.04 cfs @ 12.19 hrs, Volume= 4,906 cf, Depth= 0.62"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.15"

	Area (sf)	CN	Description
	73,296	57	Woods/grass comb., Poor, HSG A
	17,258	98	Paved parking, HSG A
*	4,713	98	Bike Path, HSG A
	95,267	66	Weighted Average
	73,296		76.94% Pervious Area
	21,971		23.06% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.9	100	0.1100	0.15		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
0.6	45	0.0578	1.20		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
11.5	145	Total			

Subcatchment 16S: Lake Cochituate N4



Summary for Subcatchment 17S: Lake Cochituate W2-1

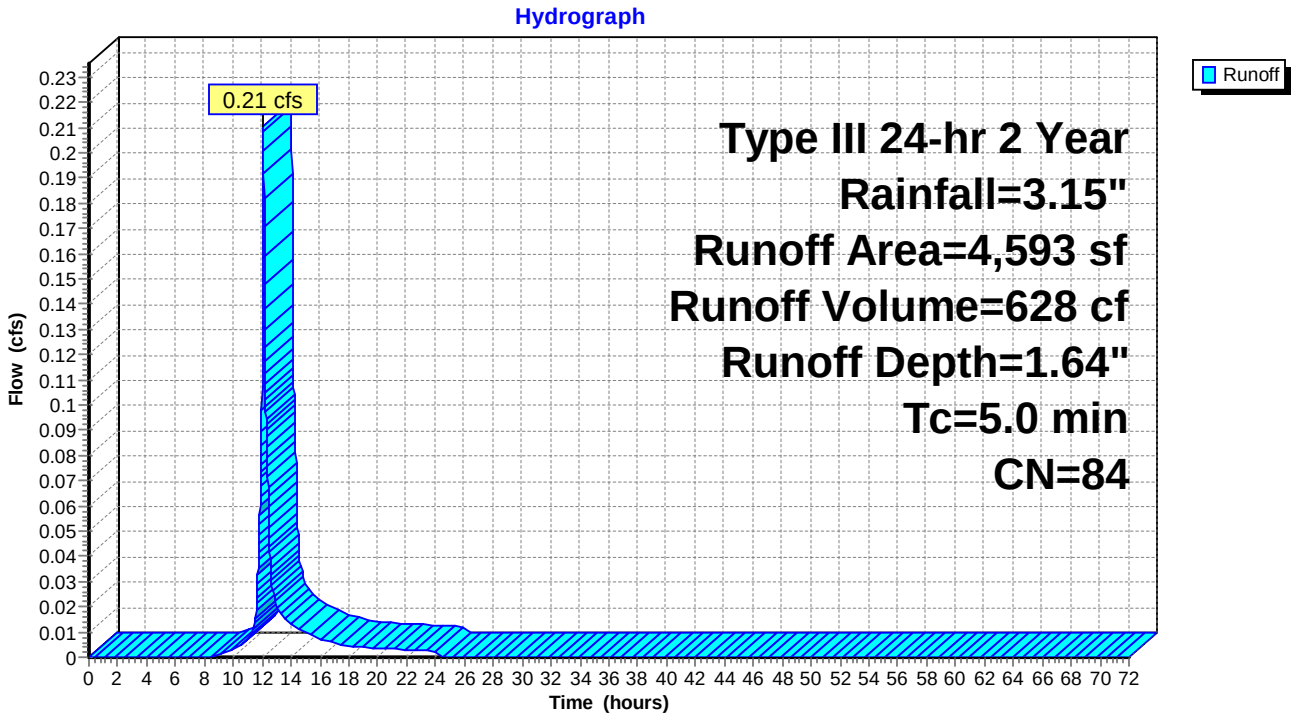
Runoff = 0.21 cfs @ 12.08 hrs, Volume= 628 cf, Depth= 1.64"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.15"

	Area (sf)	CN	Description
	1,590	57	Woods/grass comb., Poor, HSG A
*	3,003	98	Bike Path, HSG A
	4,593	84	Weighted Average
	1,590		34.62% Pervious Area
	3,003		65.38% Impervious Area

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

Subcatchment 17S: Lake Cochituate W2-1



Summary for Subcatchment 18S: Lake Cochituate W2-2

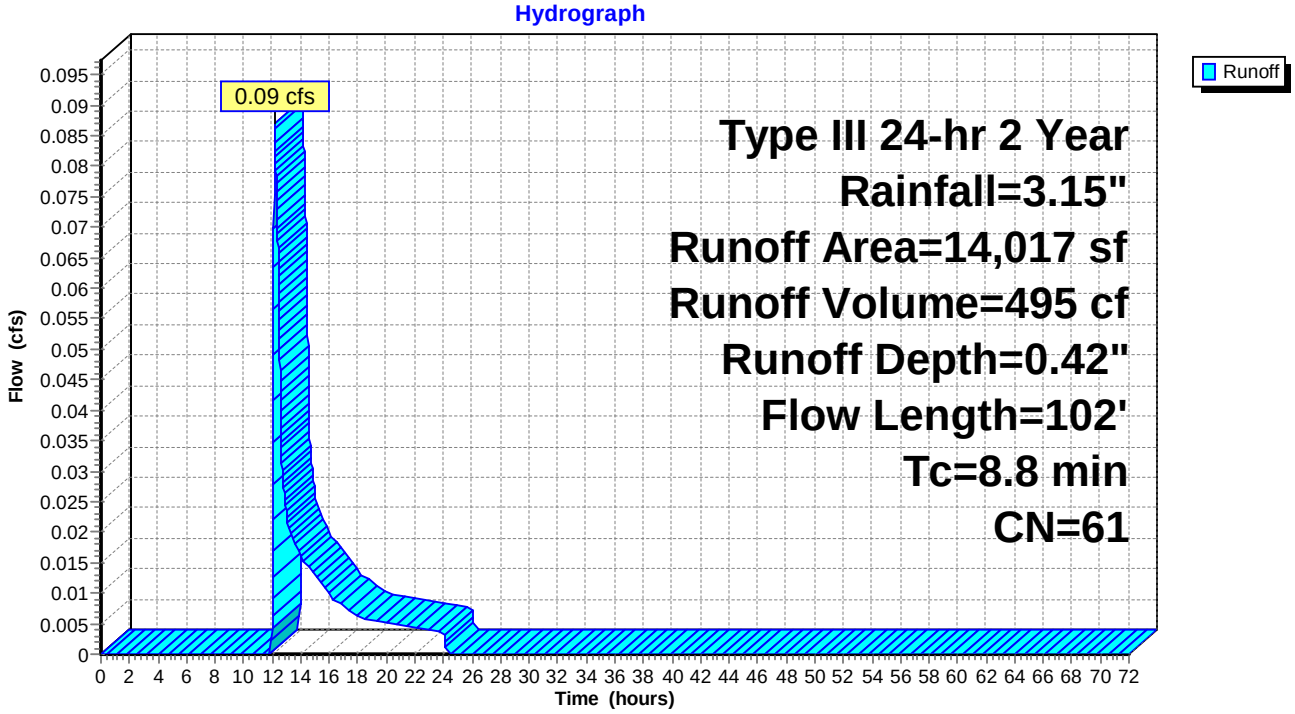
Runoff = 0.09 cfs @ 12.17 hrs, Volume= 495 cf, Depth= 0.42"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.15"

	Area (sf)	CN	Description
	12,683	57	Woods/grass comb., Poor, HSG A
*	1,334	98	Bike Path, HSG A
	14,017	61	Weighted Average
	12,683		90.48% Pervious Area
	1,334		9.52% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	24	0.0150	0.91		**Sheet Flow, Pavement** Smooth surfaces n= 0.011 P2= 3.15"
1.8	22	0.5200	0.21		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
6.6	56	0.1200	0.14		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
8.8	102	Total			

Subcatchment 18S: Lake Cochituate W2-2



Summary for Subcatchment 19S: Lake Cochituate W3-1

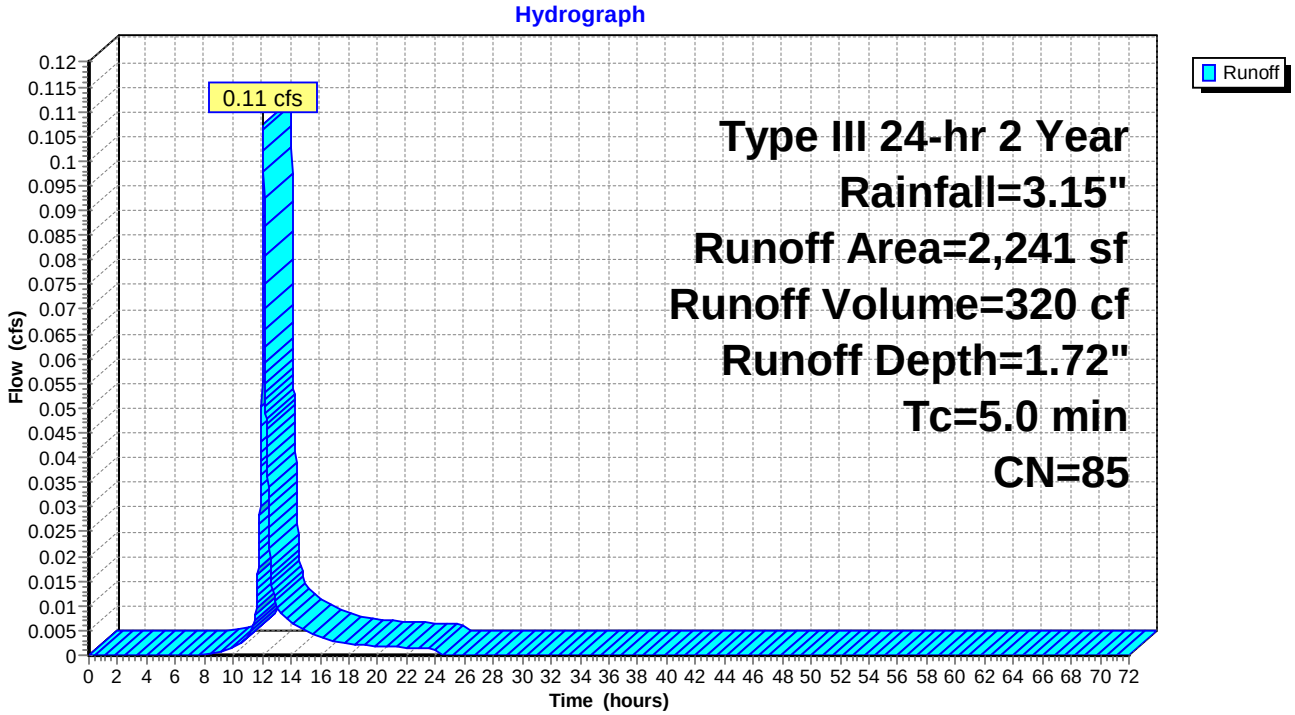
Runoff = 0.11 cfs @ 12.08 hrs, Volume= 320 cf, Depth= 1.72"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.15"

	Area (sf)	CN	Description
	728	57	Woods/grass comb., Poor, HSG A
*	1,513	98	Bike Path, HSG A
	2,241	85	Weighted Average
	728		32.49% Pervious Area
	1,513		67.51% Impervious Area

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

Subcatchment 19S: Lake Cochituate W3-1



Summary for Subcatchment 20S: Lake Cochituate W3-2

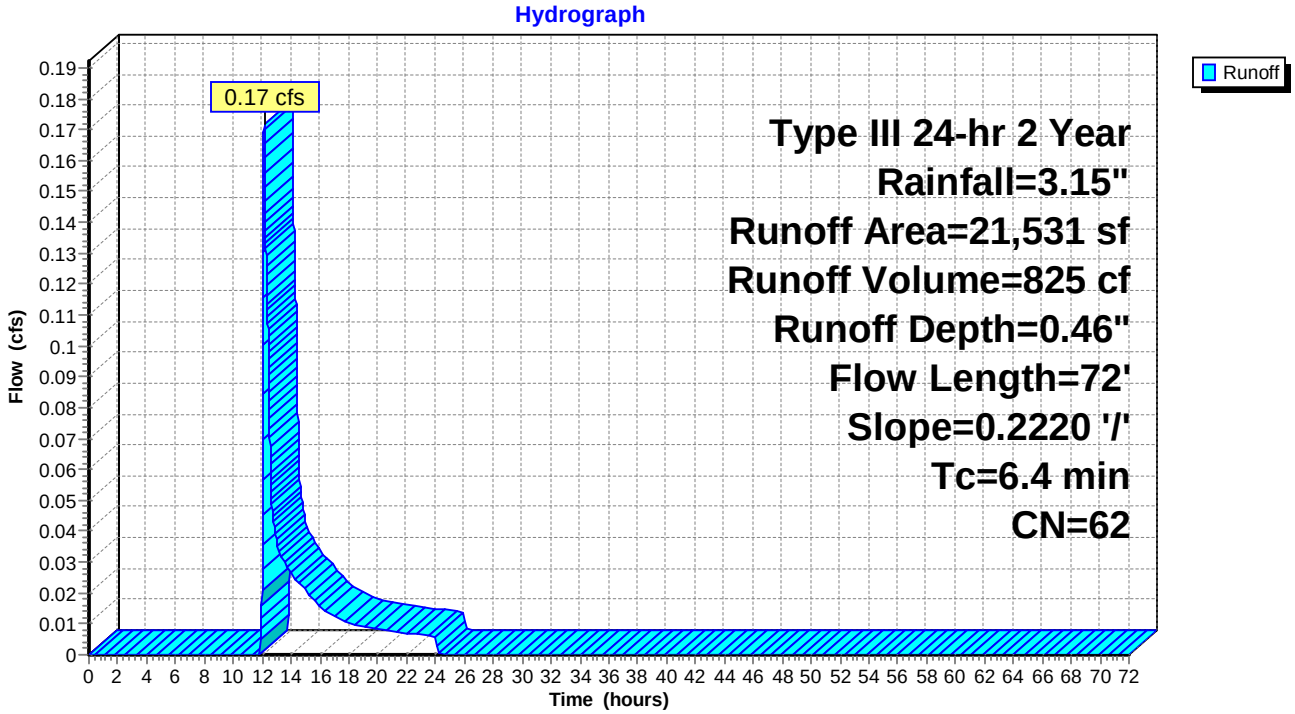
Runoff = 0.17 cfs @ 12.12 hrs, Volume= 825 cf, Depth= 0.46"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.15"

	Area (sf)	CN	Description
	19,031	57	Woods/grass comb., Poor, HSG A
*	2,500	98	Bike Path, HSG A
	21,531	62	Weighted Average
	19,031		88.39% Pervious Area
	2,500		11.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.4	72	0.2220	0.19		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"

Subcatchment 20S: Lake Cochituate W3-2



Summary for Subcatchment 21S: Lake Cochituate W4-1

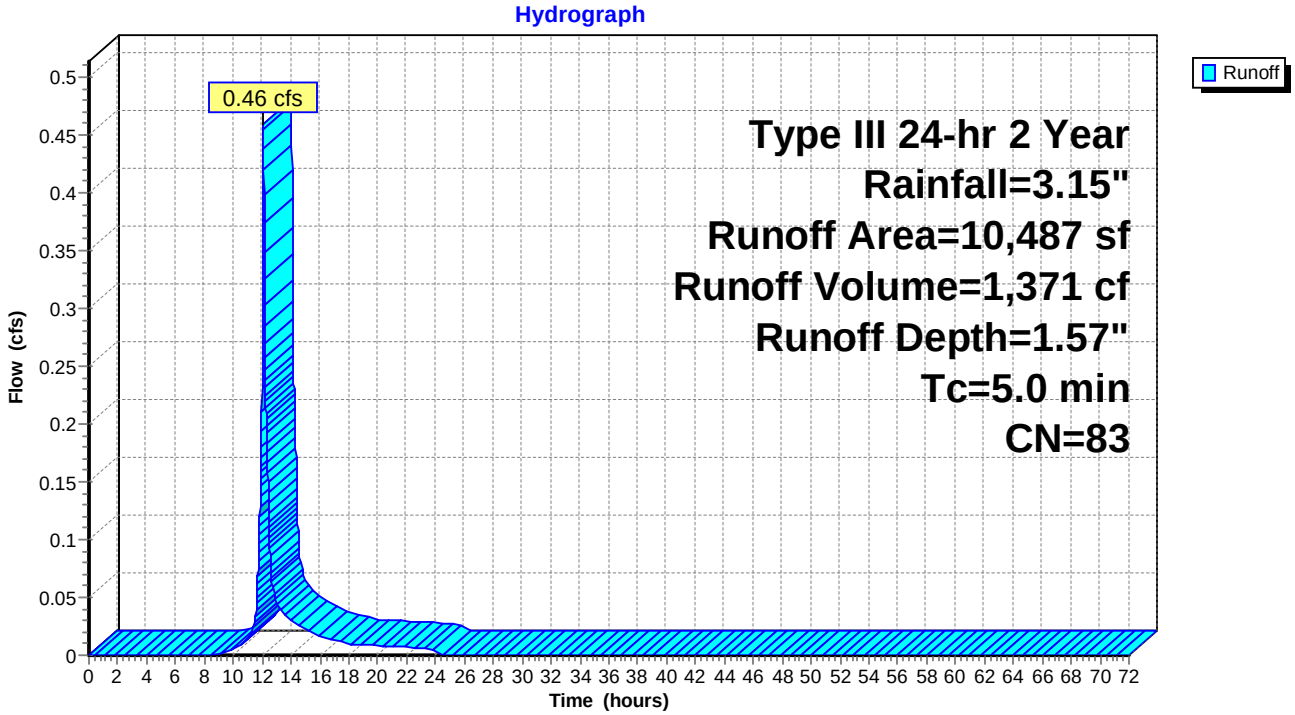
Runoff = 0.46 cfs @ 12.08 hrs, Volume= 1,371 cf, Depth= 1.57"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.15"

	Area (sf)	CN	Description
*	6,523	98	Bike Path, HSG A
	3,964	57	Woods/grass comb., Poor, HSG A
	10,487	83	Weighted Average
	3,964		37.80% Pervious Area
	6,523		62.20% Impervious Area

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

Subcatchment 21S: Lake Cochituate W4-1



Summary for Subcatchment 22S: Lake Cochituate W4-2

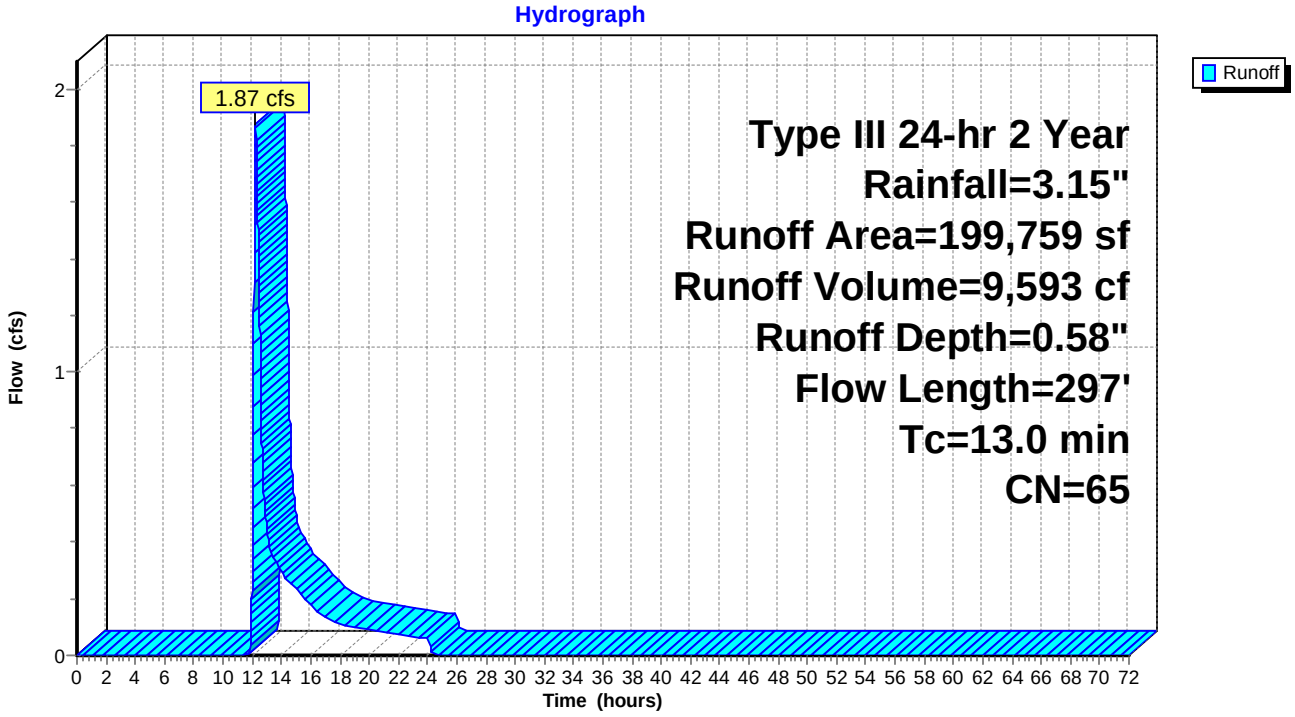
Runoff = 1.87 cfs @ 12.22 hrs, Volume= 9,593 cf, Depth= 0.58"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.15"

	Area (sf)	CN	Description
	160,339	57	Woods/grass comb., Poor, HSG A
*	39,420	98	Paved parking, HSG A
	199,759	65	Weighted Average
	160,339		80.27% Pervious Area
	39,420		19.73% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.8	100	0.1444	0.17		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
3.2	197	0.0431	1.04		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
13.0	297	Total			

Subcatchment 22S: Lake Cochituate W4-2



Summary for Subcatchment 23S: Worcester St N

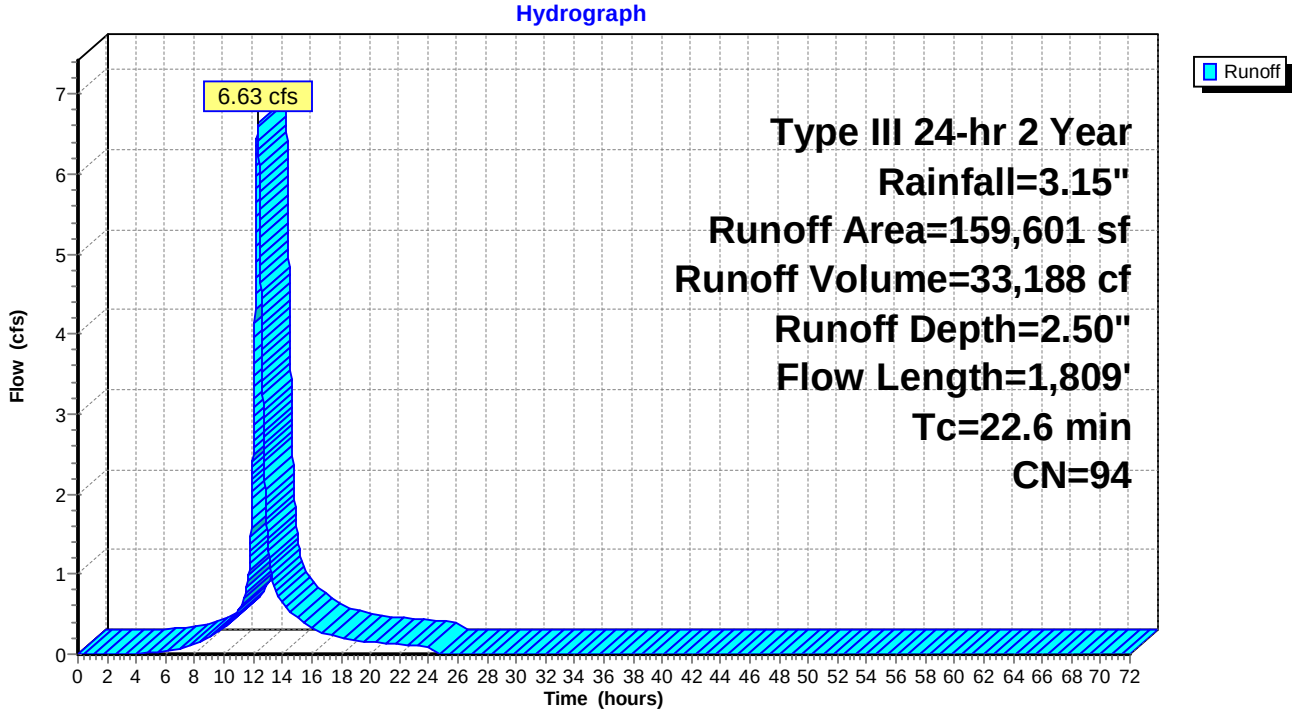
Runoff = 6.63 cfs @ 12.30 hrs, Volume= 33,188 cf, Depth= 2.50"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.15"

	Area (sf)	CN	Description
	68,655	89	Urban commercial, 85% imp, HSG A
*	1,908	98	Bike Path, HSG A
	88,153	98	Paved roads w/curbs & sewers, HSG A
	885	57	Woods/grass comb., Poor, HSG A
	159,601	94	Weighted Average
	11,183		7.01% Pervious Area
	148,418		92.99% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.0	100	0.0100	0.13		**Sheet Flow, Yards** Grass: Short n= 0.150 P2= 3.15"
9.6	1,709	0.0214	2.97		**Shallow Concentrated Flow, Road** Paved Kv= 20.3 fps
22.6	1,809	Total			

Subcatchment 23S: Worcester St N



Summary for Subcatchment 24S: Worcester St S

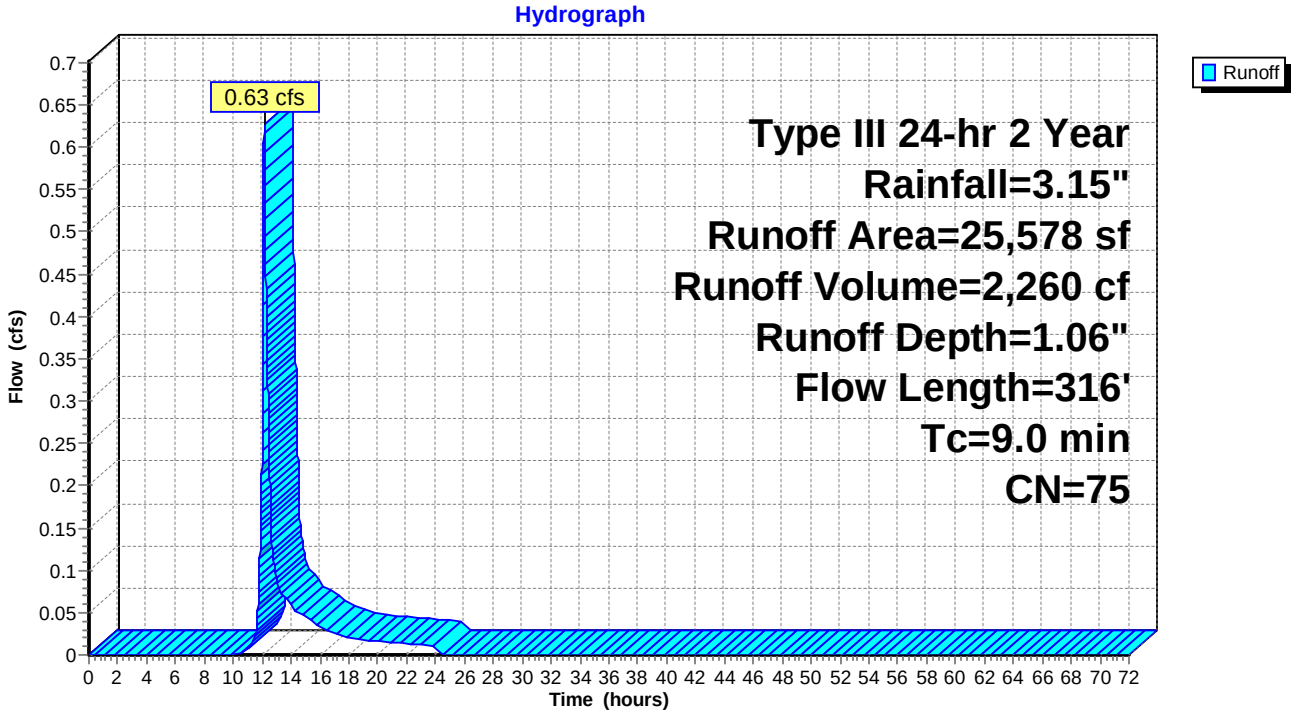
Runoff = 0.63 cfs @ 12.13 hrs, Volume= 2,260 cf, Depth= 1.06"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.15"

	Area (sf)	CN	Description
	14,547	57	Woods/grass comb., Poor, HSG A
	10,499	98	Paved parking, HSG A
*	532	98	Bike Path, HSG A
	25,578	75	Weighted Average
	14,547		56.87% Pervious Area
	11,031		43.13% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.3	90	0.2444	0.21		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
1.7	226	0.0115	2.18		**Shallow Concentrated Flow, Road** Paved Kv= 20.3 fps
9.0	316	Total			

Subcatchment 24S: Worcester St S



Summary for Subcatchment 25S: Arcadi Rd-1

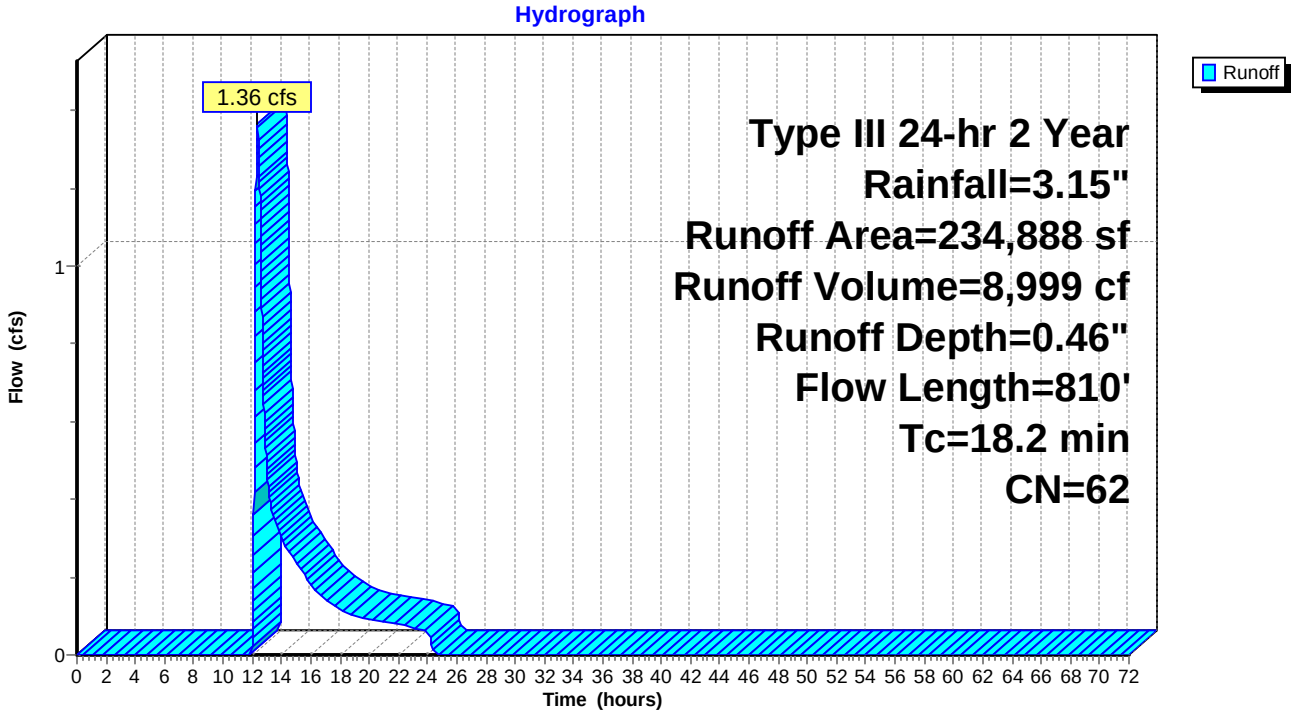
Runoff = 1.36 cfs @ 12.35 hrs, Volume= 8,999 cf, Depth= 0.46"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.15"

	Area (sf)	CN	Description
	82,419	61	1/4 acre lots, 38% imp, HSG A
	1,306	98	Paved parking, HSG A
	1,798	76	Gravel roads, HSG A
*	20,606	98	Bike Path, HSG A
	128,759	57	Woods/grass comb., Poor, HSG A
	234,888	62	Weighted Average
	181,657		77.34% Pervious Area
	53,231		22.66% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.6	100	0.0550	0.25		**Sheet Flow, Yards** Grass: Short n= 0.150 P2= 3.15"
0.5	30	0.0250	1.11		**Shallow Concentrated Flow, Yards** Short Grass Pasture Kv= 7.0 fps
0.2	38	0.4079	3.19		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
0.2	35	0.0150	2.49		**Shallow Concentrated Flow, Bike Path** Paved Kv= 20.3 fps
10.7	607	0.0040	0.95		**Shallow Concentrated Flow, Grass Channel** Grassed Waterway Kv= 15.0 fps
18.2	810	Total			

Subcatchment 25S: Arcadi Rd-1



Summary for Subcatchment 26S: Arcadi Rd-2

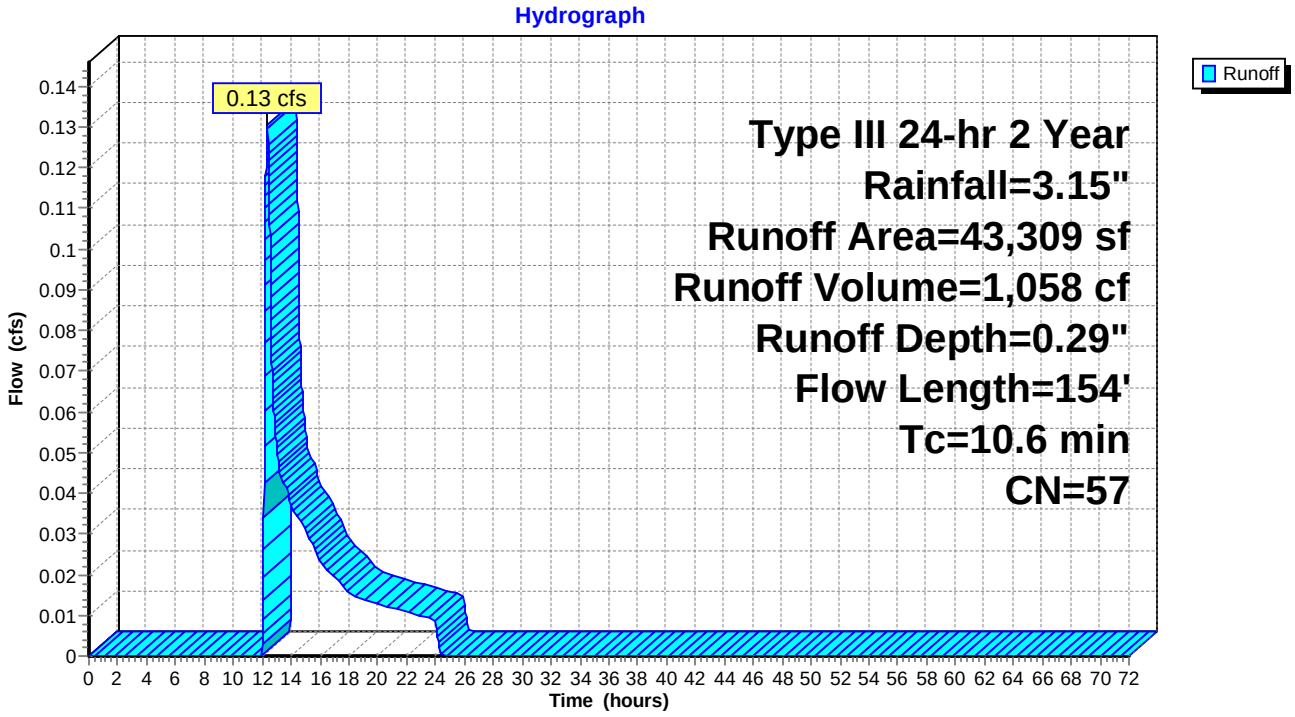
Runoff = 0.13 cfs @ 12.36 hrs, Volume= 1,058 cf, Depth= 0.29"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.15"

Area (sf)	CN	Description
43,309	57	Woods/grass comb., Poor, HSG A
43,309		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.3	100	0.1290	0.16		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
0.3	54	0.3148	2.81		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
10.6	154	Total			

Subcatchment 26S: Arcadi Rd-2



Summary for Subcatchment 27S: Fisher St-1

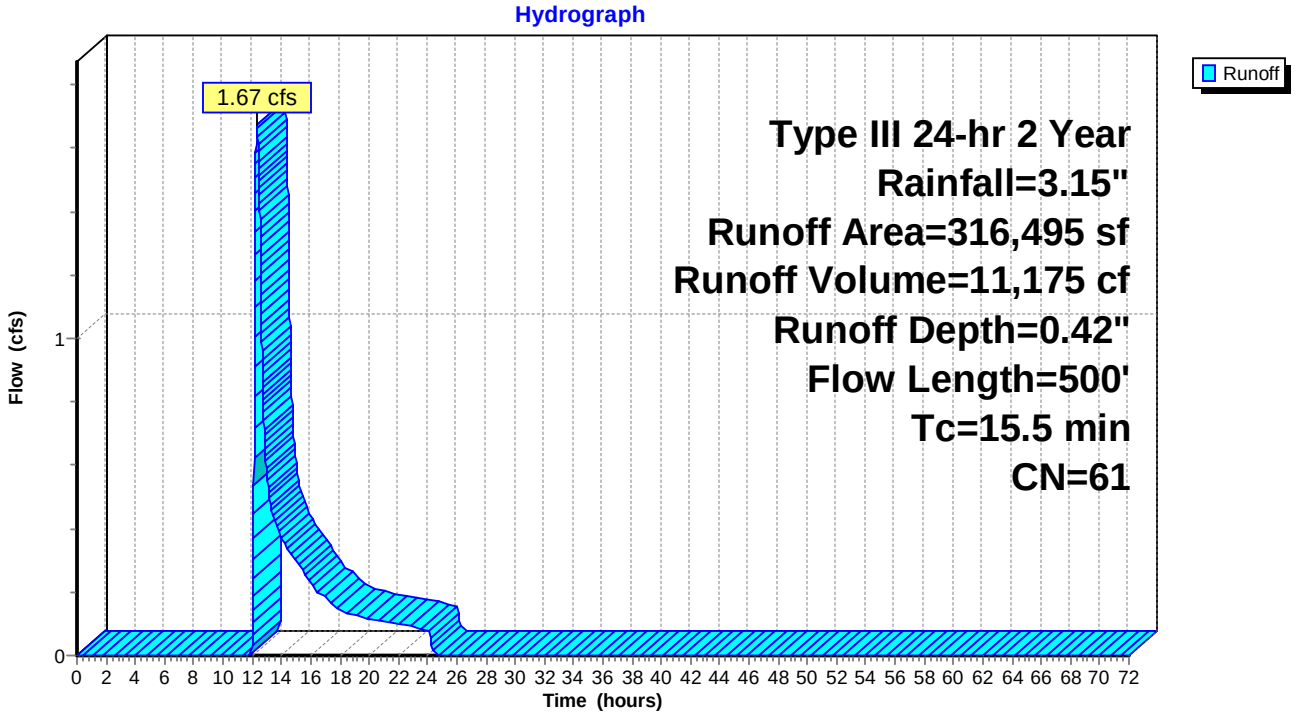
Runoff = 1.67 cfs @ 12.31 hrs, Volume= 11,175 cf, Depth= 0.42"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.15"

	Area (sf)	CN	Description
	190,932	61	1/4 acre lots, 38% imp, HSG A
*	14,693	98	Bike Path, HSG A
	110,870	57	Woods/grass comb., Poor, HSG A
	316,495	61	Weighted Average
	229,248		72.43% Pervious Area
	87,247		27.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.4	100	0.0175	0.16		**Sheet Flow, Yards** Grass: Short n= 0.150 P2= 3.15"
2.1	191	0.0477	1.53		**Shallow Concentrated Flow, Yards** Short Grass Pasture Kv= 7.0 fps
2.9	191	0.0477	1.09		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
0.1	18	0.0150	2.49		**Shallow Concentrated Flow, Pavement** Paved Kv= 20.3 fps
15.5	500	Total			

Subcatchment 27S: Fisher St-1



Summary for Subcatchment 28S: Fisher St-2

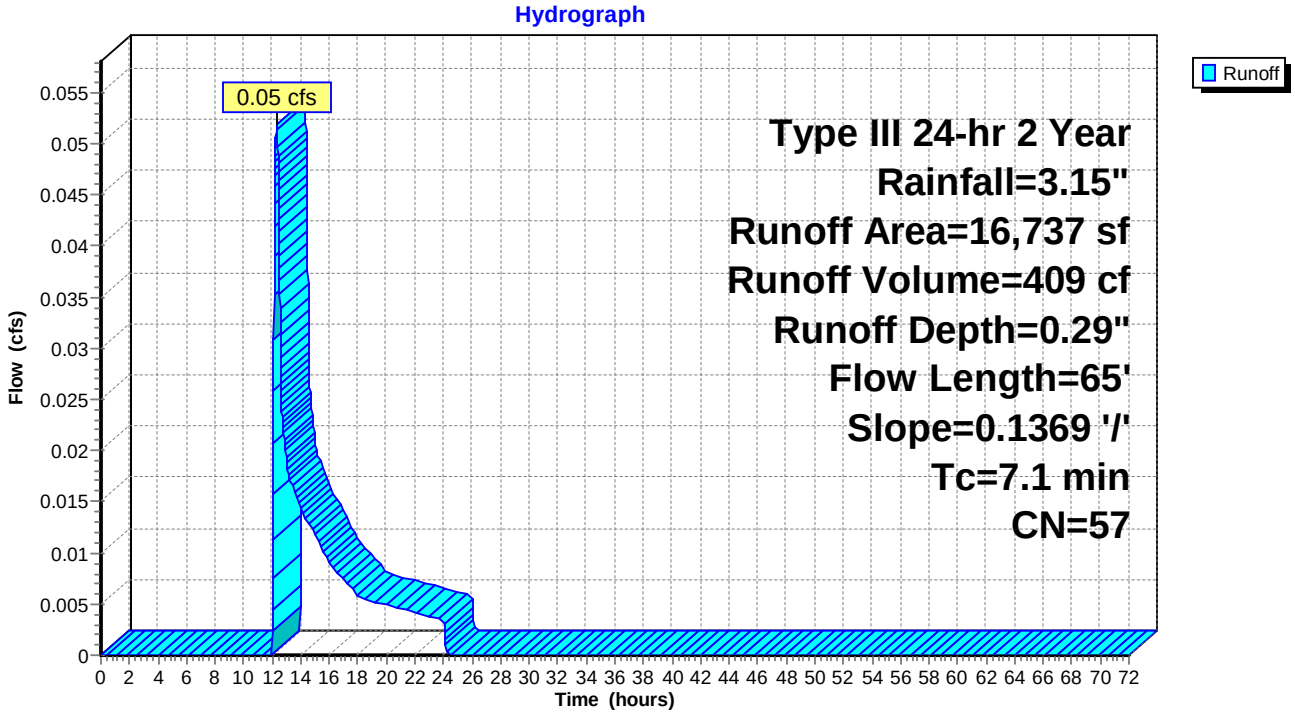
Runoff = 0.05 cfs @ 12.31 hrs, Volume= 409 cf, Depth= 0.29"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.15"

Area (sf)	CN	Description
16,737	57	Woods/grass comb., Poor, HSG A
16,737		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.1	65	0.1369	0.15		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"

Subcatchment 28S: Fisher St-2



Summary for Subcatchment 29S: Unnamed Pond 1-2

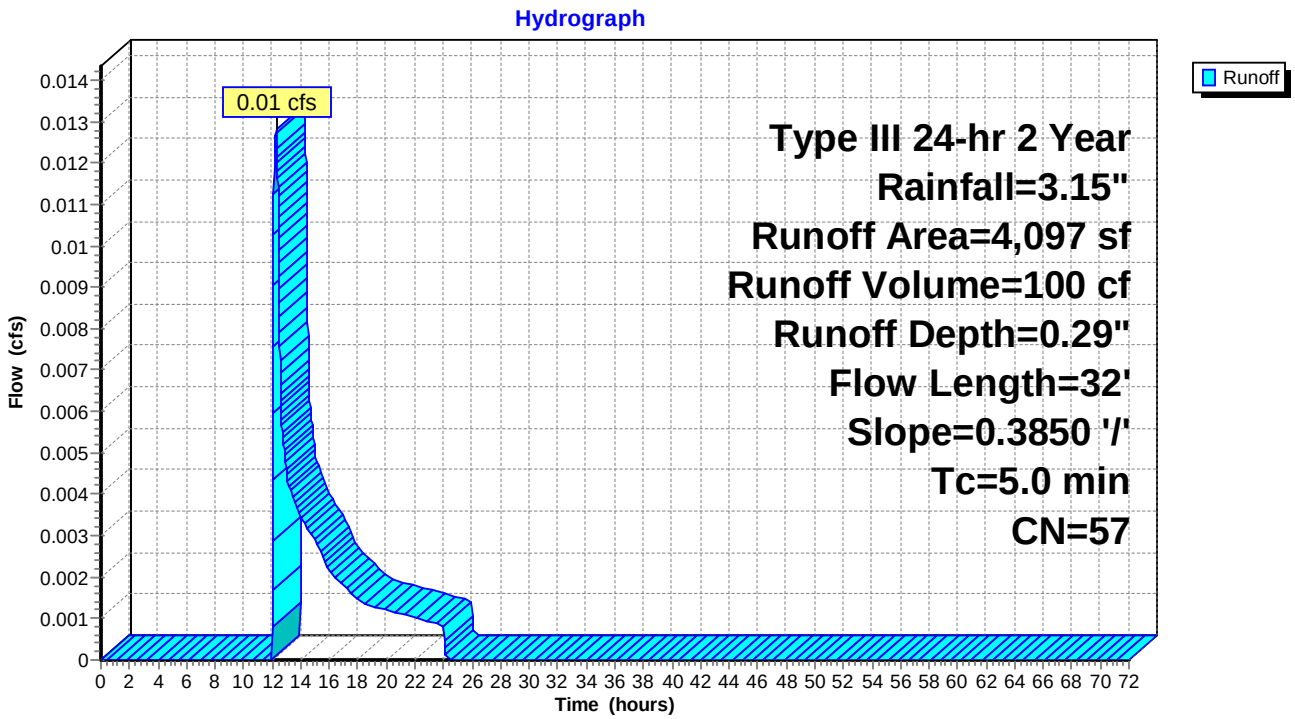
Runoff = 0.01 cfs @ 12.28 hrs, Volume= 100 cf, Depth= 0.29"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.15"

Area (sf)	CN	Description
4,097	57	Woods/grass comb., Poor, HSG A
4,097		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.7	32	0.3850	0.20		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
2.7	32	Total, Increased to minimum Tc = 5.0 min			

Subcatchment 29S: Unnamed Pond 1-2



Summary for Subcatchment 30S: Unnamed Pond 1-1

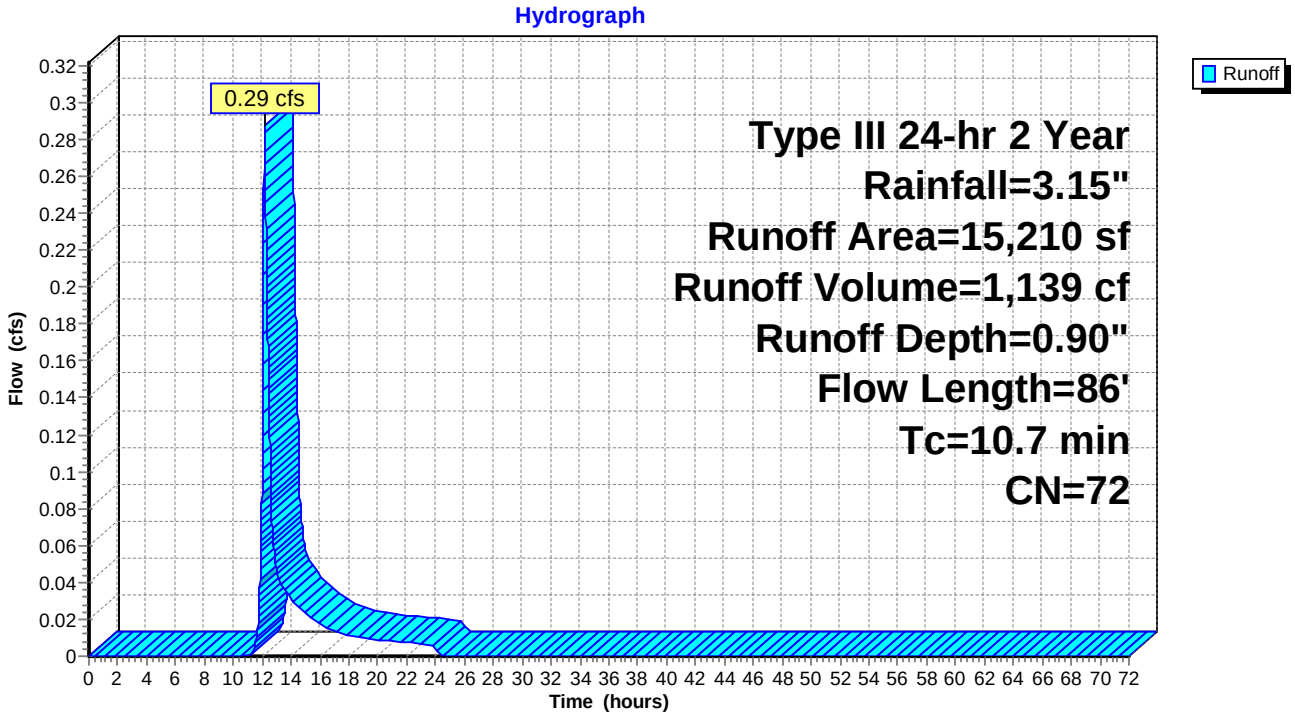
Runoff = 0.29 cfs @ 12.16 hrs, Volume= 1,139 cf, Depth= 0.90"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.15"

	Area (sf)	CN	Description
	1,843	61	1/4 acre lots, 38% imp, HSG A
*	4,035	98	Bike Path, HSG A
	8,142	57	Woods/grass comb., Poor, HSG A
*	1,190	98	Paved Parking, HSG A
	15,210	72	Weighted Average
	9,285		61.04% Pervious Area
	5,925		38.96% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	24	0.0154	0.92		**Sheet Flow, Driveway** Smooth surfaces n= 0.011 P2= 3.15"
1.9	16	0.0312	0.14		**Sheet Flow, Yards** Grass: Short n= 0.150 P2= 3.15"
8.4	46	0.0450	0.09		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
10.7	86	Total			

Subcatchment 30S: Unnamed Pond 1-1



Summary for Subcatchment 31S: Unnamed Pond 2

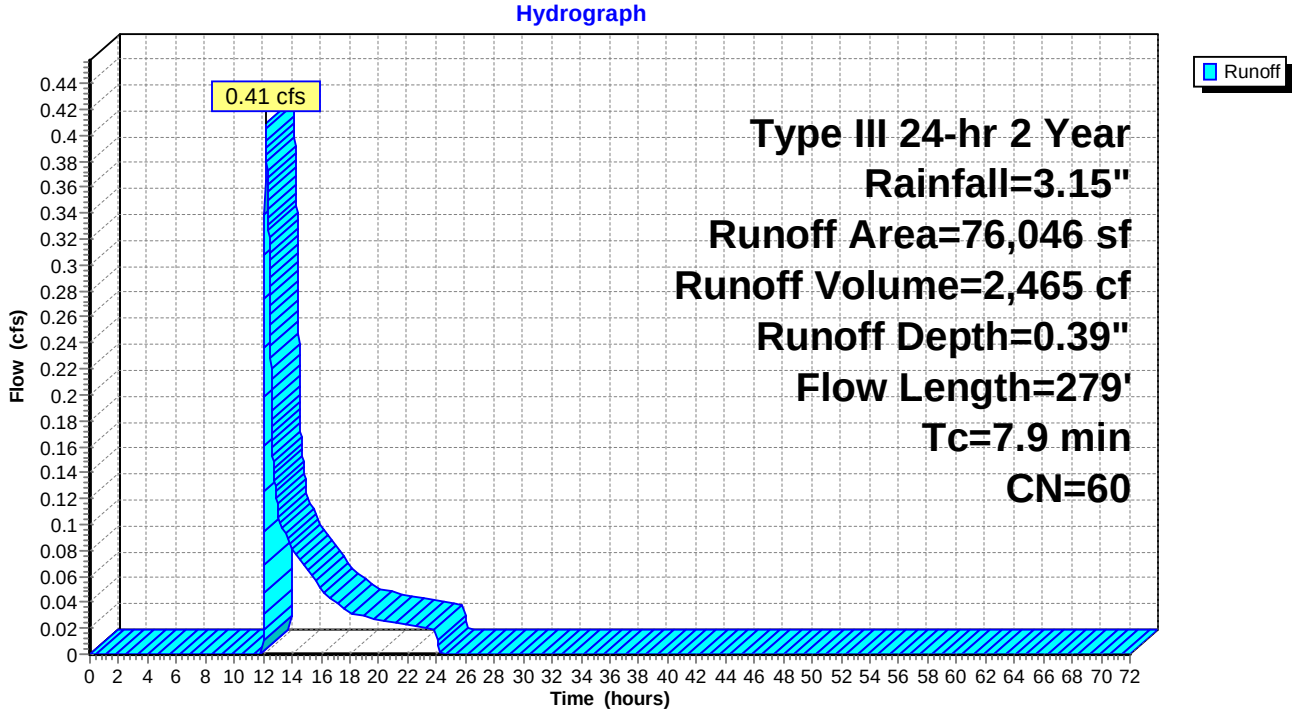
Runoff = 0.41 cfs @ 12.16 hrs, Volume= 2,465 cf, Depth= 0.39"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.15"

Area (sf)	CN	Description
50,917	61	1/4 acre lots, 38% imp, HSG A
25,129	57	Woods/grass comb., Poor, HSG A
76,046	60	Weighted Average
56,698		74.56% Pervious Area
19,348		25.44% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.7	100	0.0800	0.29		**Sheet Flow, Yards** Grass: Short n= 0.150 P2= 3.15"
1.3	105	0.0381	1.37		**Shallow Concentrated Flow, Yards** Short Grass Pasture Kv= 7.0 fps
0.9	74	0.0724	1.35		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
7.9	279	Total			

Subcatchment 31S: Unnamed Pond 2



Summary for Subcatchment 32S: Unnamed Pond 3

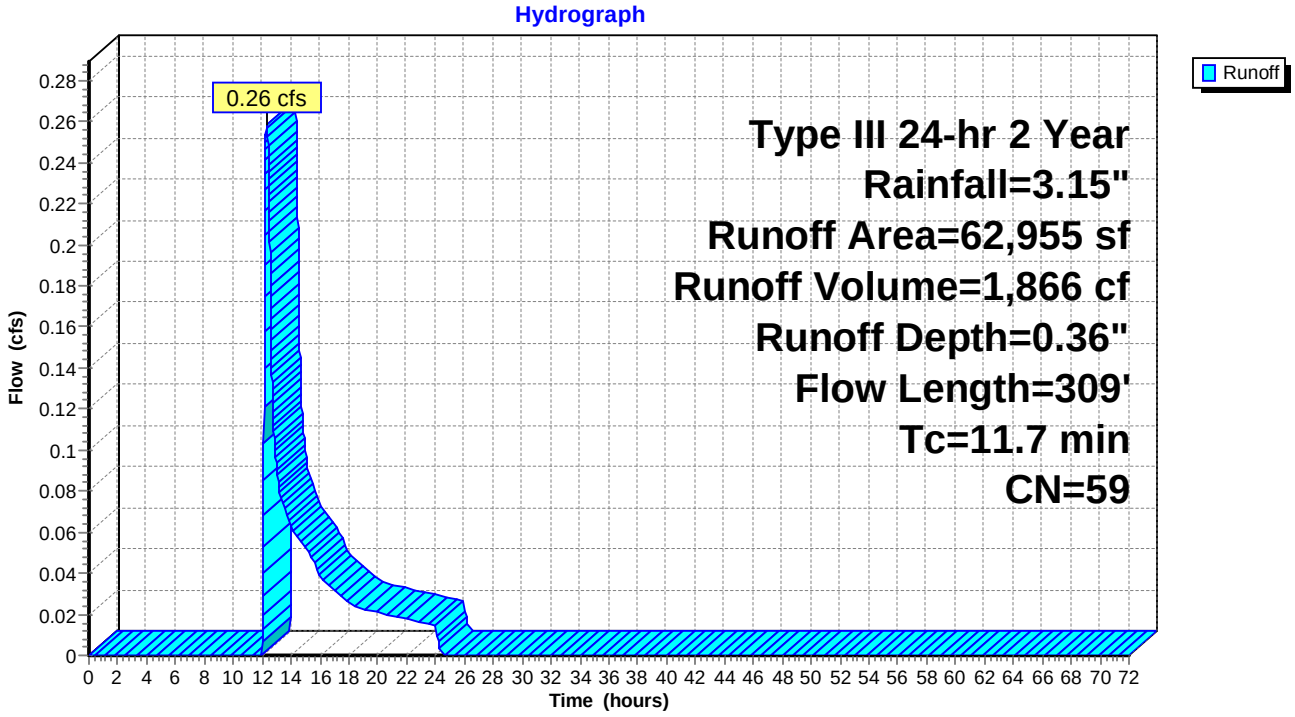
Runoff = 0.26 cfs @ 12.31 hrs, Volume= 1,866 cf, Depth= 0.36"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.15"

Area (sf)	CN	Description
27,650	61	1/4 acre lots, 38% imp, HSG A
35,305	57	Woods/grass comb., Poor, HSG A
62,955	59	Weighted Average
52,448		83.31% Pervious Area
10,507		16.69% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.2	100	0.0320	0.20		**Sheet Flow, Grass** Grass: Short n= 0.150 P2= 3.15"
3.5	209	0.0400	1.00		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
11.7	309	Total			

Subcatchment 32S: Unnamed Pond 3



Summary for Subcatchment 33S: Unnamed Pond 3-1

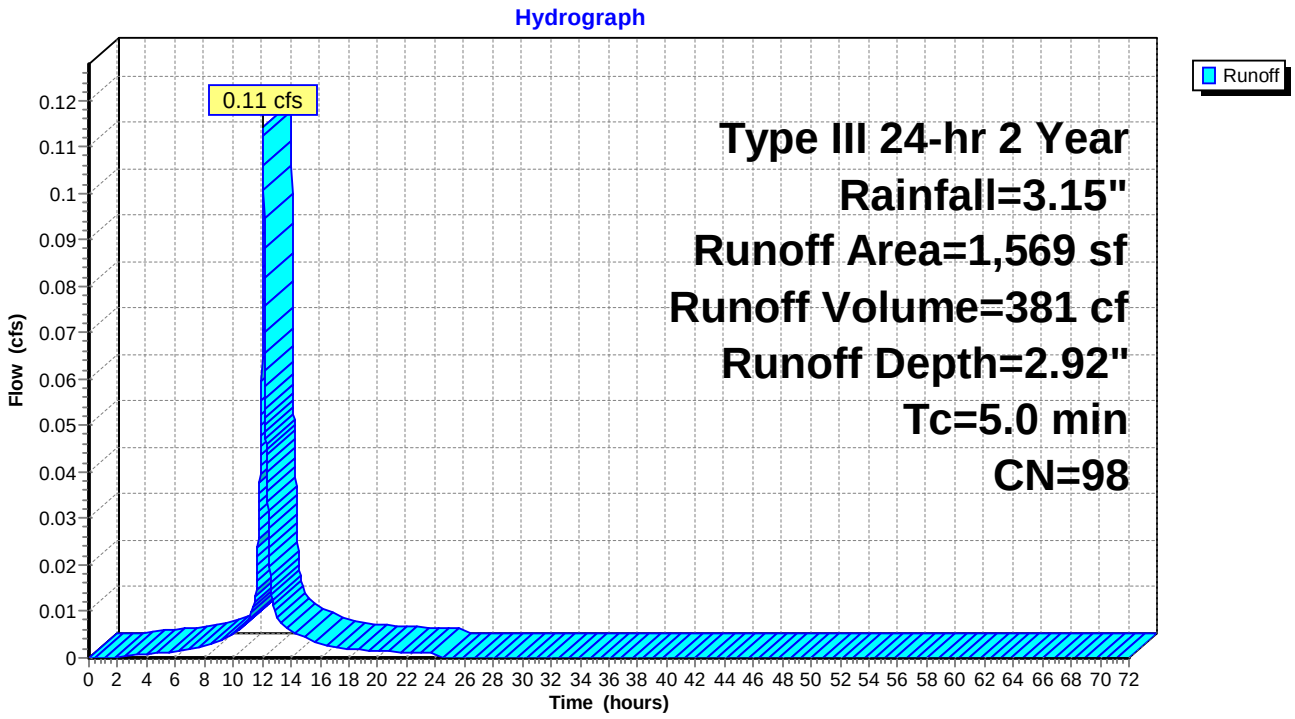
Runoff = 0.11 cfs @ 12.07 hrs, Volume= 381 cf, Depth= 2.92"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.15"

Area (sf)	CN	Description
1,569	98	Paved roads w/curbs & sewers, HSG A
1,569		100.00% Impervious Area

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

Subcatchment 33S: Unnamed Pond 3-1



Summary for Subcatchment 34S: Unnamed Pond 4-1

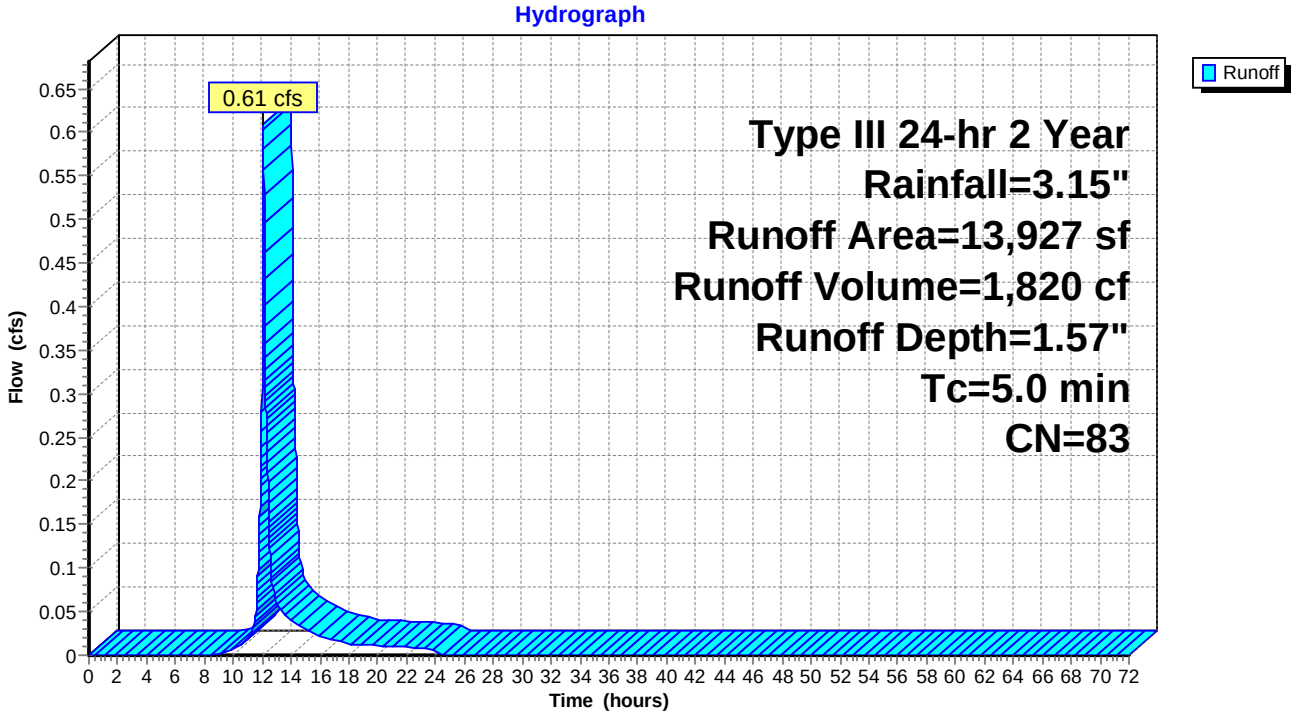
Runoff = 0.61 cfs @ 12.08 hrs, Volume= 1,820 cf, Depth= 1.57"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.15"

	Area (sf)	CN	Description
	5,220	57	Woods/grass comb., Poor, HSG A
*	8,707	98	Bike Path, HSG A
	13,927	83	Weighted Average
	5,220		37.48% Pervious Area
	8,707		62.52% Impervious Area

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

Subcatchment 34S: Unnamed Pond 4-1



Summary for Subcatchment 35S: Unnamed Pond 4-2

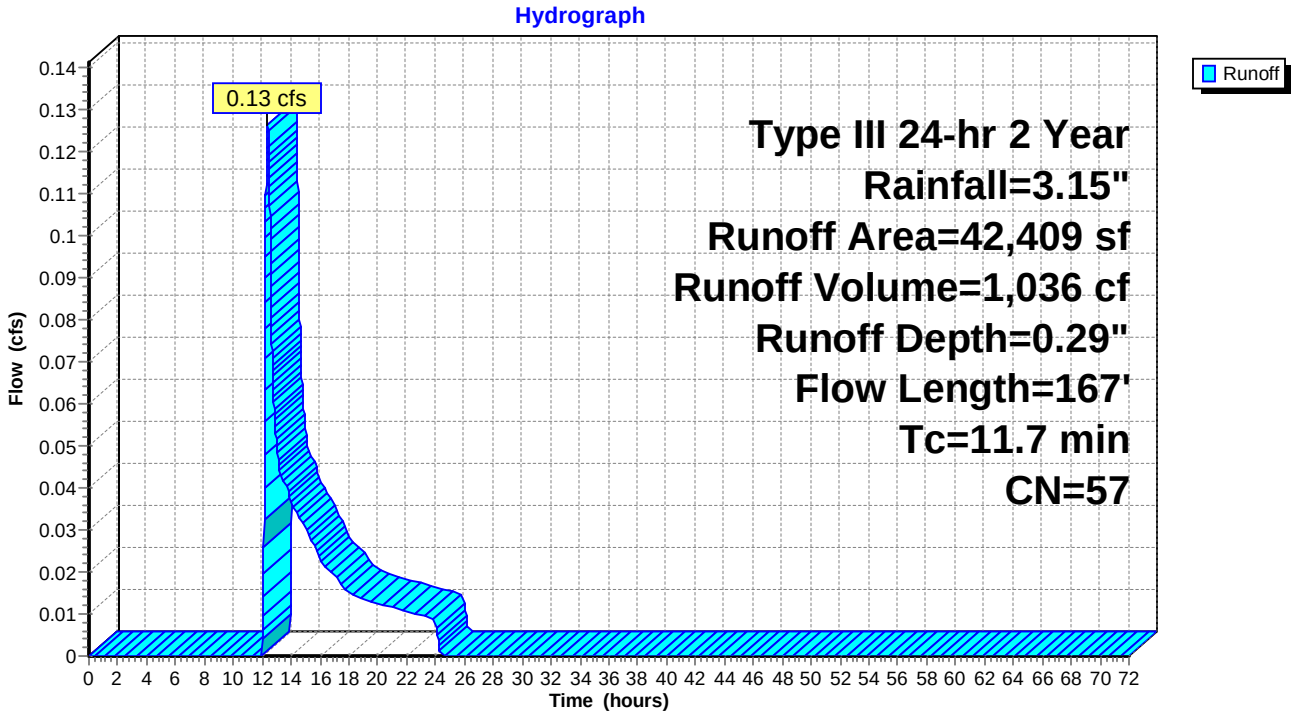
Runoff = 0.13 cfs @ 12.39 hrs, Volume= 1,036 cf, Depth= 0.29"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.15"

Area (sf)	CN	Description
42,409	57	Woods/grass comb., Poor, HSG A
42,409		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.9	100	0.1100	0.15		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
0.8	67	0.0821	1.43		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
11.7	167	Total			

Subcatchment 35S: Unnamed Pond 4-2



Summary for Subcatchment 36S: Kansas St-1

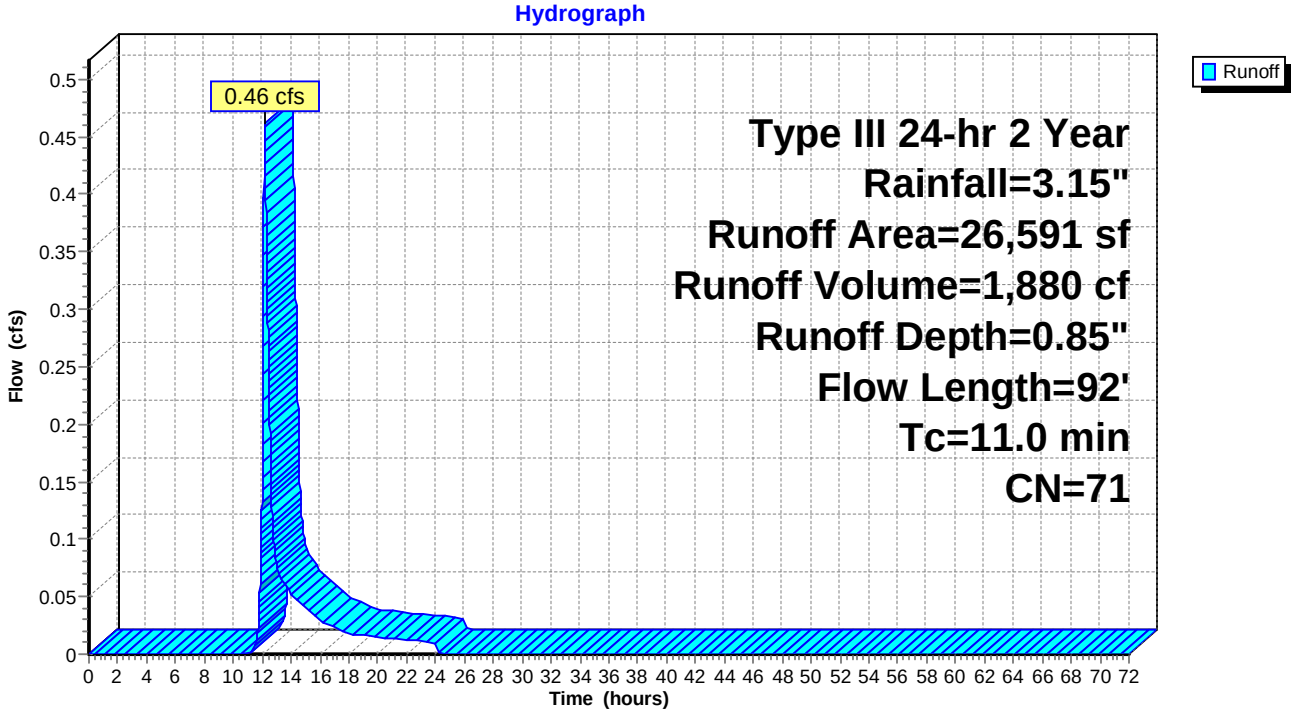
Runoff = 0.46 cfs @ 12.17 hrs, Volume= 1,880 cf, Depth= 0.85"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.15"

	Area (sf)	CN	Description
	3,799	61	1/4 acre lots, 38% imp, HSG A
	2,525	98	Paved parking, HSG A
*	5,891	98	Bike Path, HSG A
	14,376	57	Woods/grass comb., Poor, HSG A
	26,591	71	Weighted Average
	16,731		62.92% Pervious Area
	9,860		37.08% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.7	74	0.0090	0.12		**Sheet Flow, Grass** Grass: Short n= 0.150 P2= 3.15"
0.3	18	0.0150	0.86		**Sheet Flow, Bike Path** Smooth surfaces n= 0.011 P2= 3.15"
11.0	92	Total			

Subcatchment 36S: Kansas St-1



Summary for Subcatchment 37S: Kansas St-2

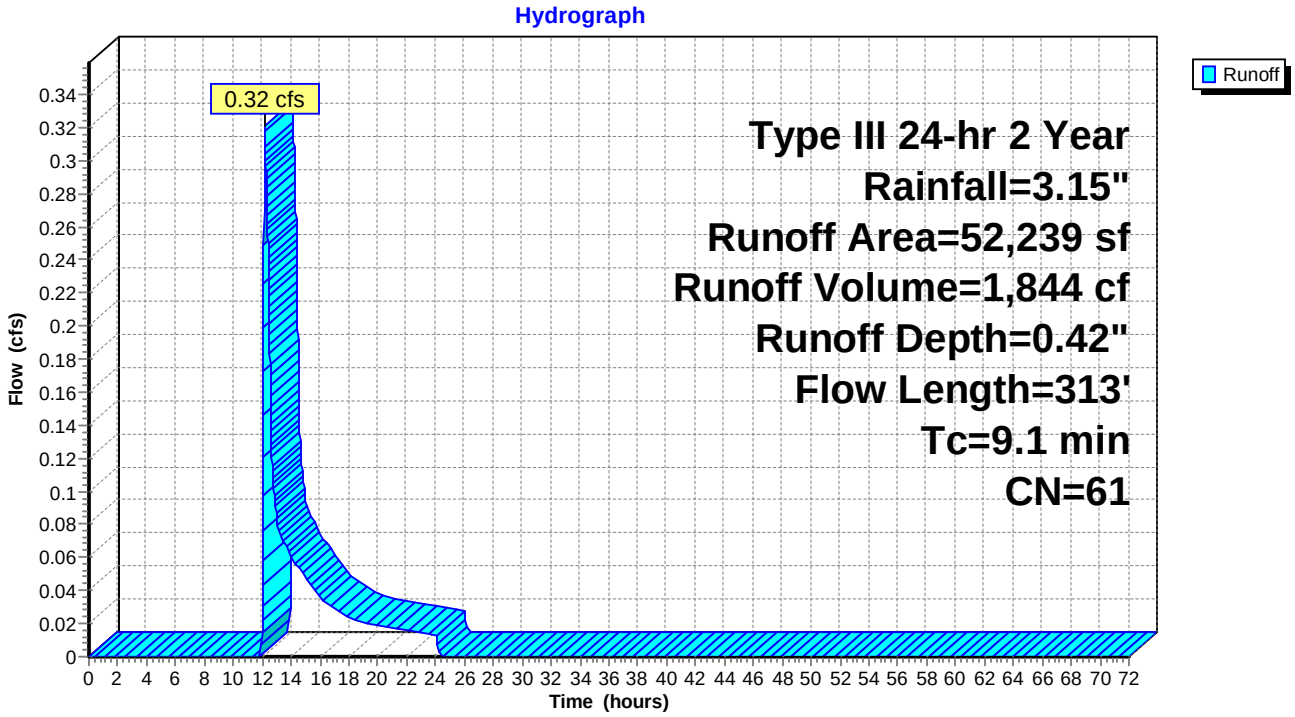
Runoff = 0.32 cfs @ 12.18 hrs, Volume= 1,844 cf, Depth= 0.42"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.15"

Area (sf)	CN	Description
34,065	57	Woods/grass comb., Poor, HSG A
3,317	98	Paved parking, HSG A
14,857	61	1/4 acre lots, 38% imp, HSG A
52,239	61	Weighted Average
43,276		82.84% Pervious Area
8,963		17.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.7	100	0.0775	0.29		**Sheet Flow, Yards** Grass: Short n= 0.150 P2= 3.15"
3.1	175	0.0186	0.95		**Shallow Concentrated Flow, Yards** Short Grass Pasture Kv= 7.0 fps
0.3	38	0.1974	2.22		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
9.1	313	Total			

Subcatchment 37S: Kansas St-2



Summary for Subcatchment 38S: N. Main & Kansas

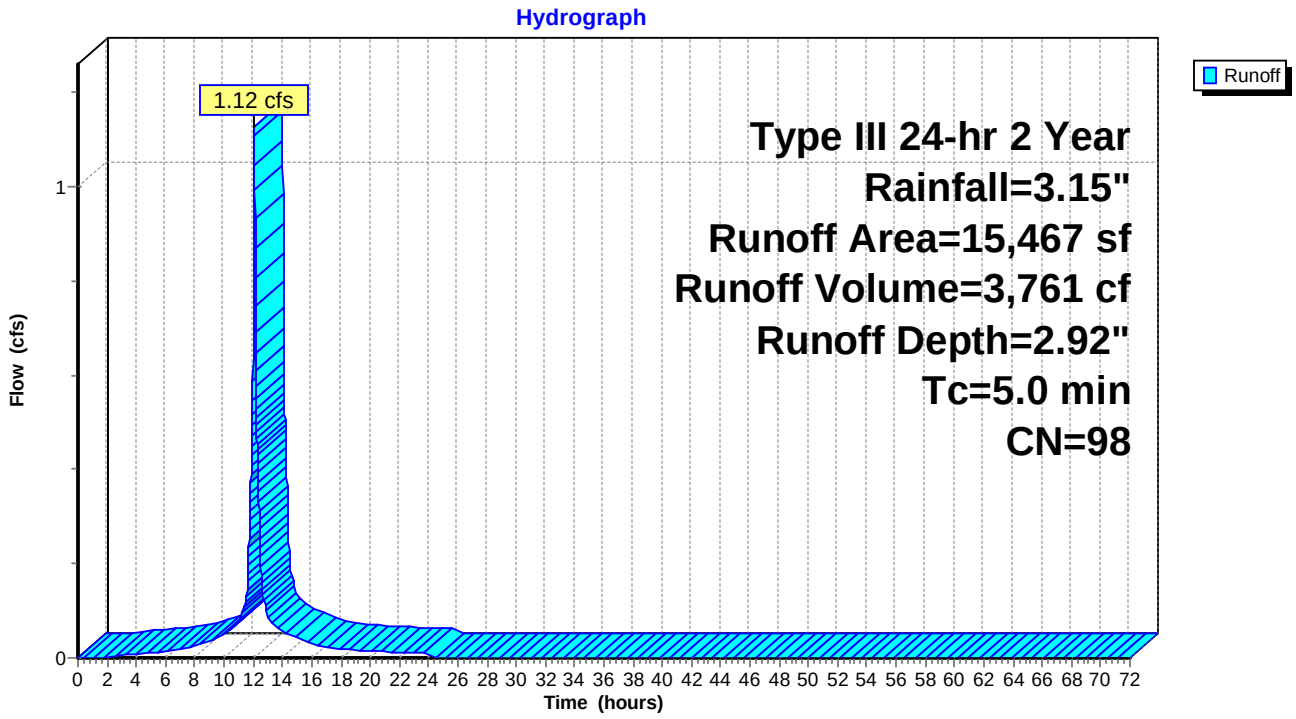
Runoff = 1.12 cfs @ 12.07 hrs, Volume= 3,761 cf, Depth= 2.92"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.15"

Area (sf)	CN	Description
15,467	98	Paved roads w/curbs & sewers, HSG A
15,467		100.00% Impervious Area

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

Subcatchment 38S: N. Main & Kansas



Summary for Subcatchment 39S: Washington Ave 1

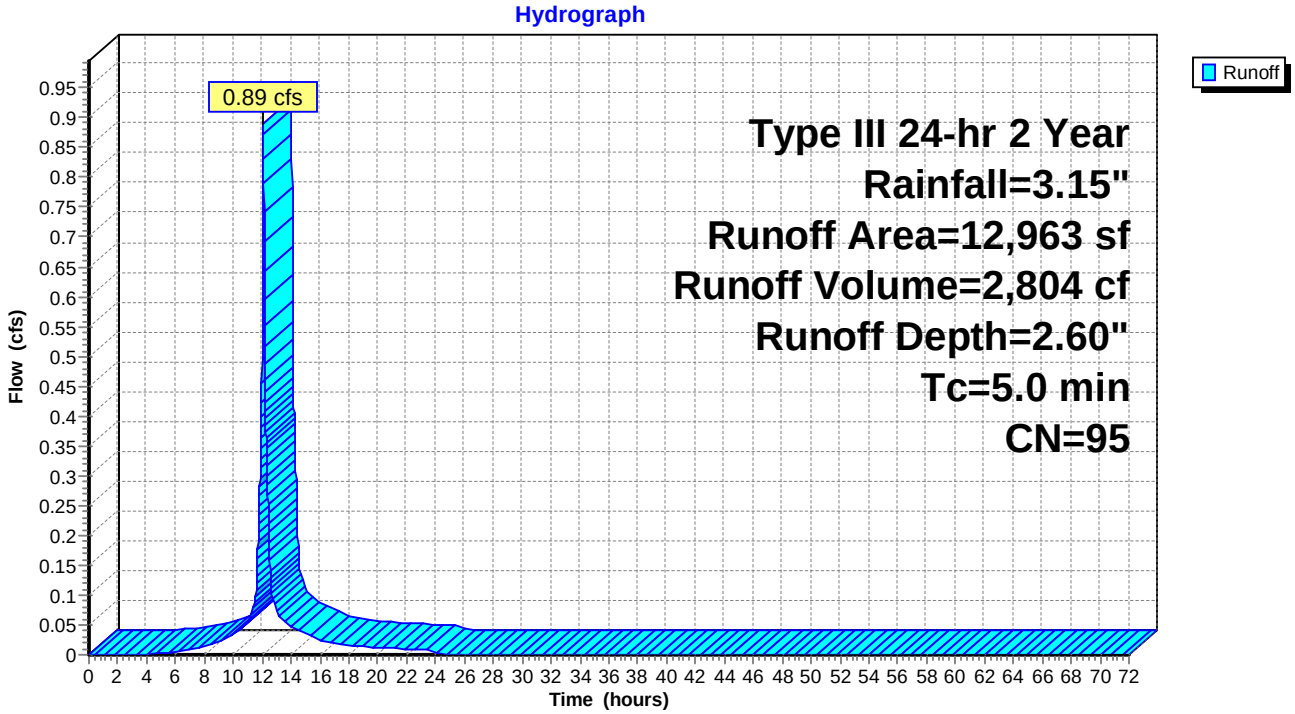
Runoff = 0.89 cfs @ 12.07 hrs, Volume= 2,804 cf, Depth= 2.60"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.15"

	Area (sf)	CN	Description
	10,635	98	Paved roads w/curbs & sewers, HSG A
	1,284	68	<50% Grass cover, Poor, HSG A
*	1,044	98	Bike Path, HSG A
	12,963	95	Weighted Average
	1,284		9.91% Pervious Area
	11,679		90.09% Impervious Area

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

Subcatchment 39S: Washington Ave 1



Summary for Subcatchment 40S: Washington Ave 2

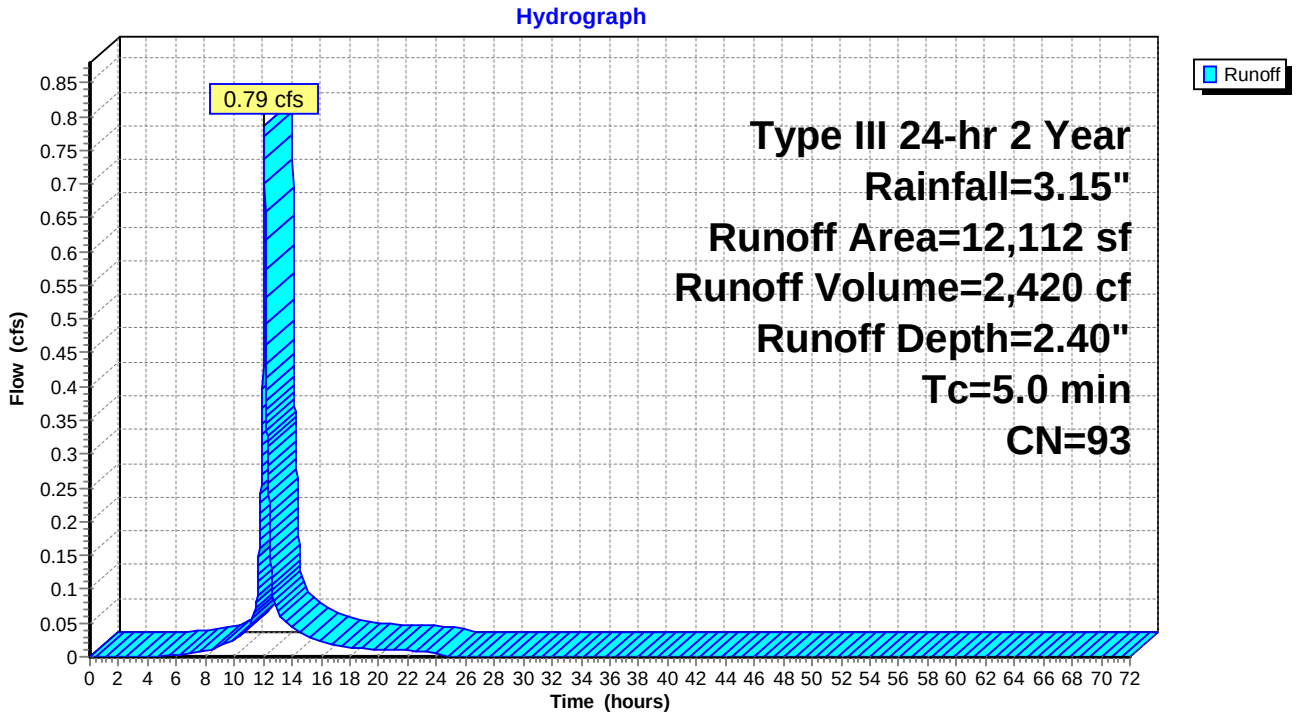
Runoff = 0.79 cfs @ 12.07 hrs, Volume= 2,420 cf, Depth= 2.40"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.15"

	Area (sf)	CN	Description
	2,040	68	<50% Grass cover, Poor, HSG A
	6,175	98	Paved parking, HSG A
*	3,897	98	Bike Path, HSG A
	12,112	93	Weighted Average
	2,040		16.84% Pervious Area
	10,072		83.16% Impervious Area

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

Subcatchment 40S: Washington Ave 2



Summary for Subcatchment 41S: Washington Ave 3

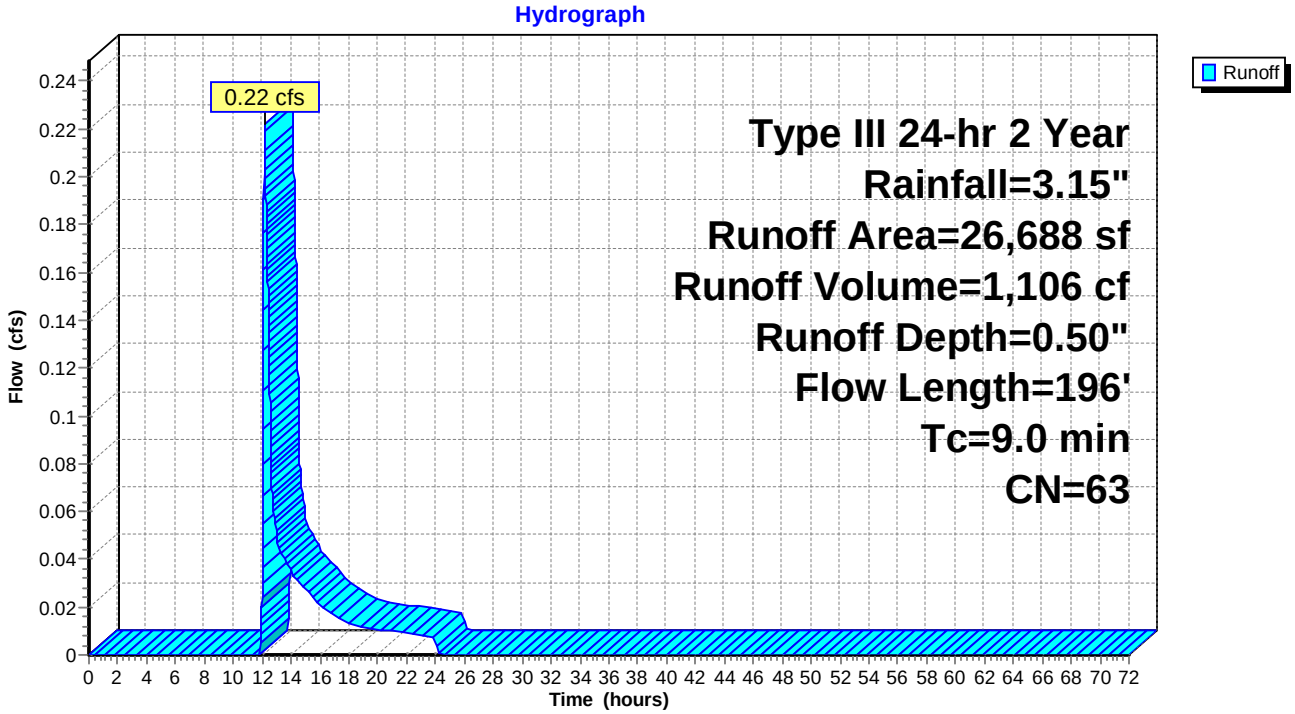
Runoff = 0.22 cfs @ 12.16 hrs, Volume= 1,106 cf, Depth= 0.50"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.15"

	Area (sf)	CN	Description
	20,850	61	1/4 acre lots, 38% imp, HSG A
*	2,152	98	Bike Path, HSG A
	3,686	57	Woods/grass comb., Poor, HSG A
	26,688	63	Weighted Average
	16,613		62.25% Pervious Area
	10,075		37.75% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	100	0.0350	0.21		**Sheet Flow, Yards** Grass: Short n= 0.150 P2= 3.15"
1.1	96	0.0427	1.45		**Shallow Concentrated Flow, Yards** Short Grass Pasture Kv= 7.0 fps
9.0	196	Total			

Subcatchment 41S: Washington Ave 3



Summary for Subcatchment 42S: Empty Lot

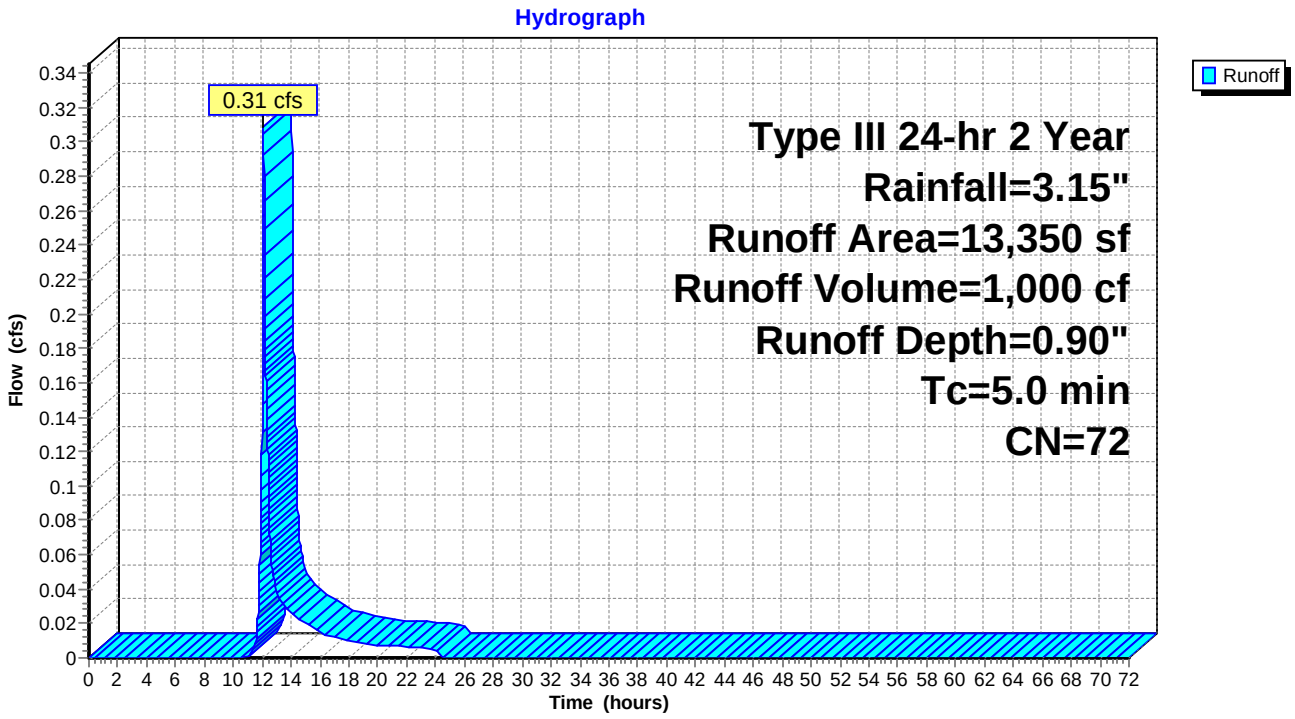
Runoff = 0.31 cfs @ 12.08 hrs, Volume= 1,000 cf, Depth= 0.90"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.15"

Area (sf)	CN	Description
13,350	72	Dirt roads, HSG A
13,350		100.00% Pervious Area

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

Subcatchment 42S: Empty Lot



Summary for Subcatchment 43S: Lagrange St

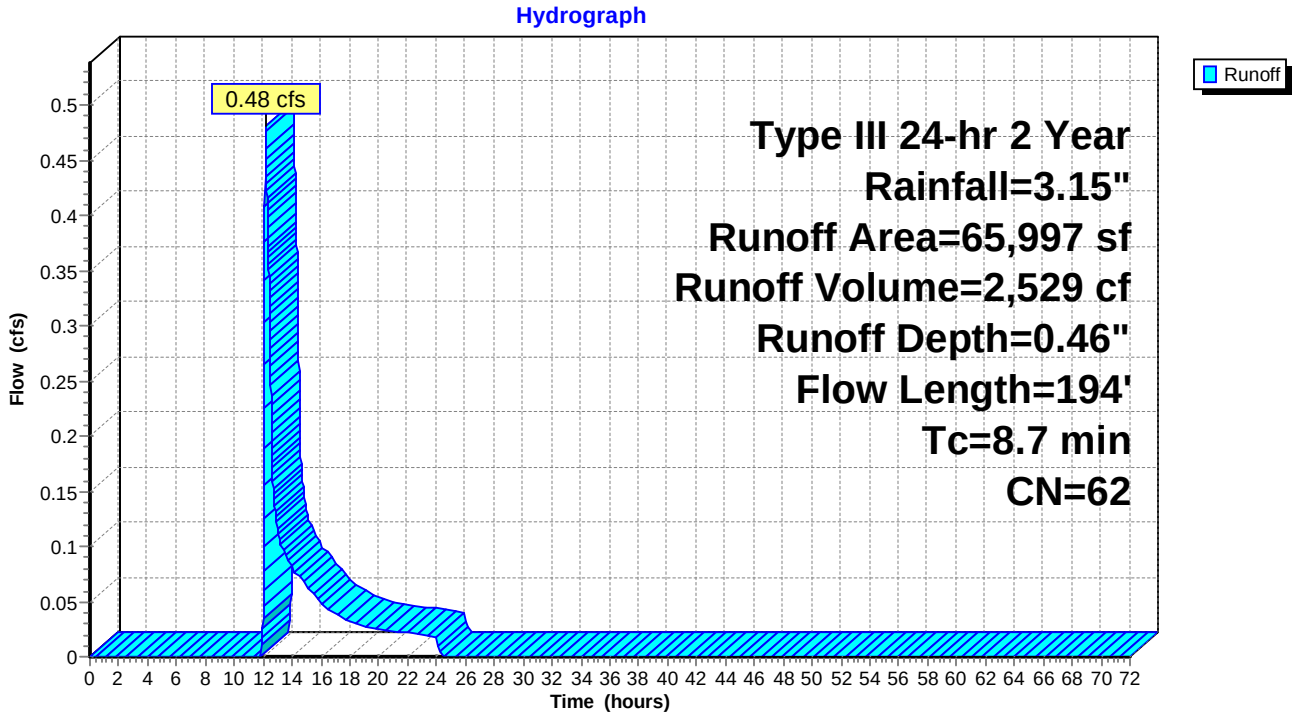
Runoff = 0.48 cfs @ 12.16 hrs, Volume= 2,529 cf, Depth= 0.46"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.15"

	Area (sf)	CN	Description
	52,794	61	1/4 acre lots, 38% imp, HSG A
	9,738	57	Woods/grass comb., Poor, HSG A
*	3,465	98	Bike Path, HSG A
	65,997	62	Weighted Average
	42,470		64.35% Pervious Area
	23,527		35.65% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.1	100	0.0450	0.23		**Sheet Flow, Yard** Grass: Short n= 0.150 P2= 3.15"
0.9	53	0.0189	0.96		**Shallow Concentrated Flow, Yard** Short Grass Pasture Kv= 7.0 fps
0.7	41	0.0366	0.96		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
8.7	194	Total			

Subcatchment 43S: Lagrange St



Summary for Subcatchment 44S: Mechanic St

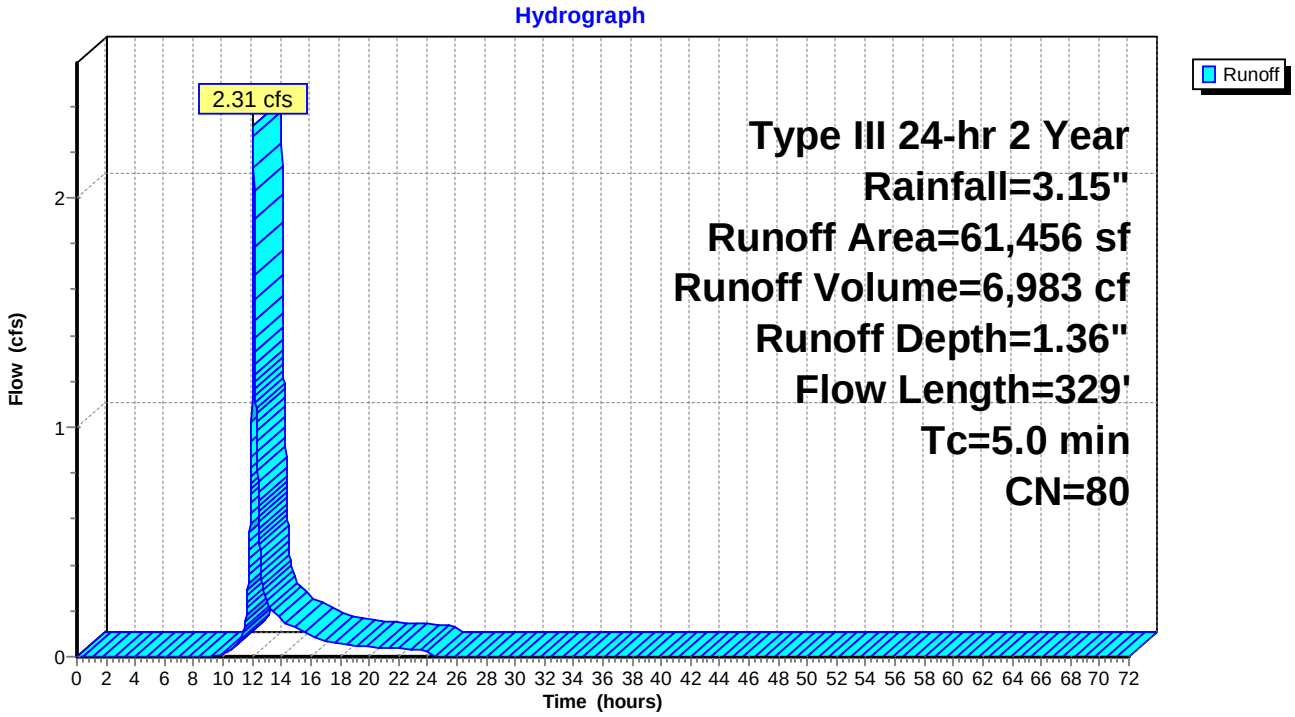
Runoff = 2.31 cfs @ 12.08 hrs, Volume= 6,983 cf, Depth= 1.36"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.15"

	Area (sf)	CN	Description
	37,417	81	Urban industrial, 72% imp, HSG A
	2,503	98	Paved parking, HSG A
*	8,336	98	Bike Path, HSG A
	7,222	68	<50% Grass cover, Poor, HSG A
	5,978	57	Woods/grass comb., Poor, HSG A
	61,456	80	Weighted Average
	23,677		38.53% Pervious Area
	37,779		61.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	100	0.0150	1.22		**Sheet Flow, Road** Smooth surfaces n= 0.011 P2= 3.15"
3.0	229	0.0040	1.28		**Shallow Concentrated Flow, Bike Path** Paved Kv= 20.3 fps
4.4	329	Total, Increased to minimum Tc = 5.0 min			

Subcatchment 44S: Mechanic St



Summary for Subcatchment 45S: Cochituate St 1

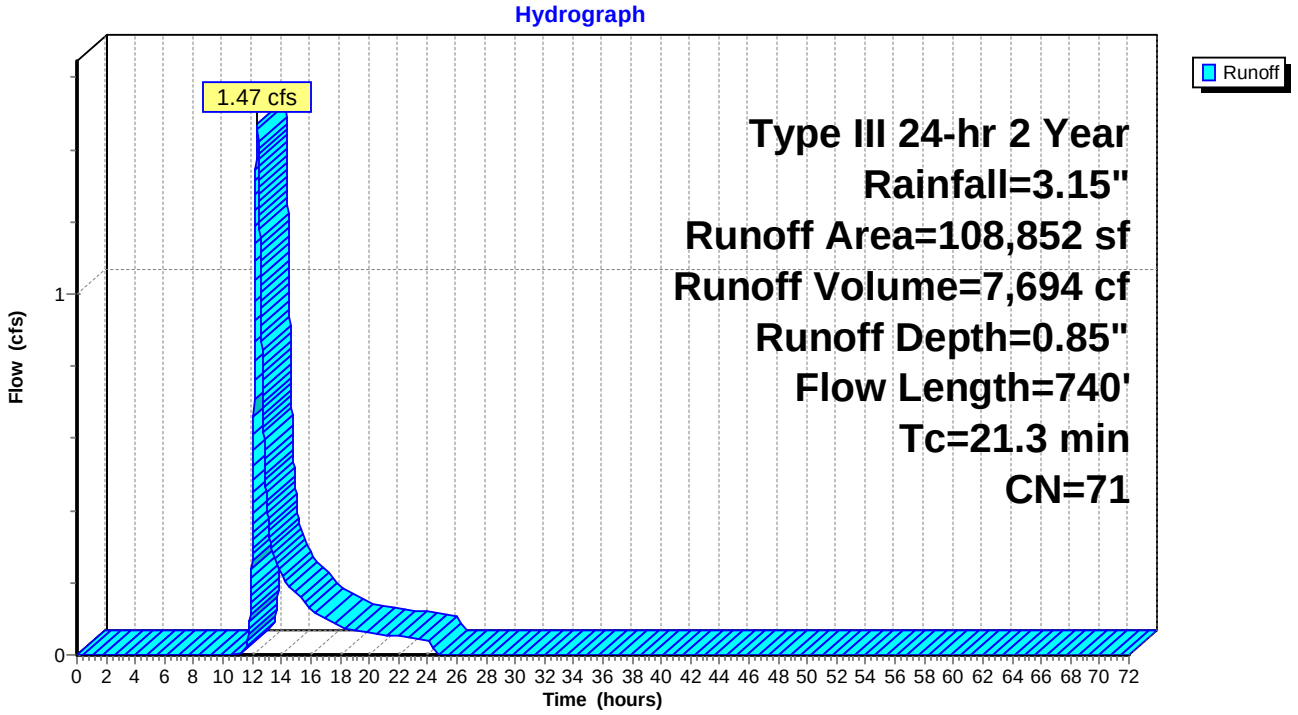
Runoff = 1.47 cfs @ 12.33 hrs, Volume= 7,694 cf, Depth= 0.85"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.15"

	Area (sf)	CN	Description
	13,087	81	Urban industrial, 72% imp, HSG A
	11,315	98	Paved parking, HSG A
*	13,568	98	Bike Path, HSG A
	30,345	57	Woods/grass comb., Poor, HSG A
	38,236	61	1/4 acre lots, 38% imp, HSG A
	2,301	76	Gravel roads, HSG A
	108,852	71	Weighted Average
	60,017		55.14% Pervious Area
	48,835		44.86% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.4	75	0.0333	0.20		**Sheet Flow, Yards** Grass: Short n= 0.150 P2= 3.15"
1.9	25	0.5200	0.21		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
0.1	12	0.0150	2.49		**Shallow Concentrated Flow, Bike Path** Paved Kv= 20.3 fps
12.9	628	0.0040	0.81	0.10	**Trap/Vee/Rect Channel Flow, Grass Channel** Bot.W=1.00' D=0.10' Z= 2.0 '/' Top.W=1.40' n= 0.022 Earth, clean & straight
21.3	740	Total			

Subcatchment 45S: Cochituate St 1



Summary for Subcatchment 170S: Lake Cochituate N2-2

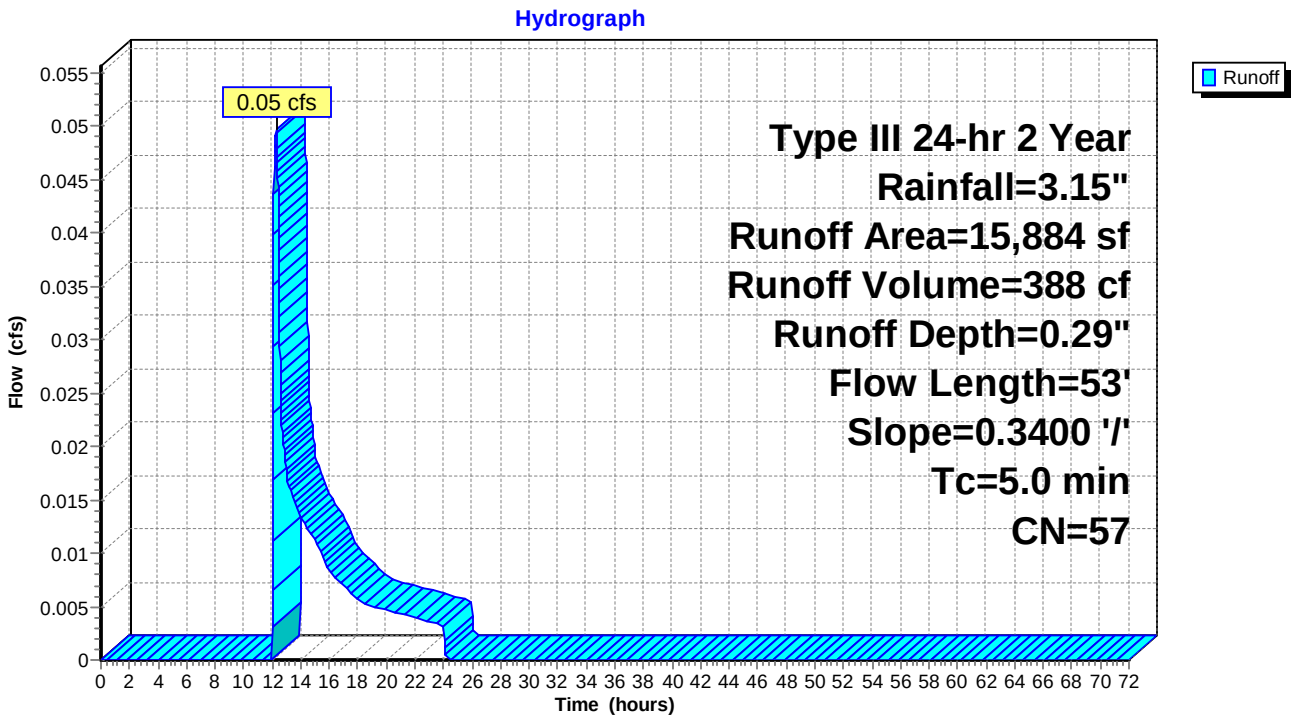
Runoff = 0.05 cfs @ 12.28 hrs, Volume= 388 cf, Depth= 0.29"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.15"

Area (sf)	CN	Description
15,884	57	Woods/grass comb., Poor, HSG A
15,884		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.2	53	0.3400	0.21		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
4.2	53	Total, Increased to minimum Tc = 5.0 min			

Subcatchment 170S: Lake Cochituate N2-2



Summary for Pond 01P: BMP 1 - Infiltration Swale

[87] Warning: Oscillations may require Finer Routing or smaller dt

Inflow Area =	50,164 sf, 33.83% Impervious, Inflow Depth = 0.85" for 2 Year event				
Inflow =	0.76 cfs @	12.24 hrs,	Volume=	3,546 cf	
Outflow =	0.13 cfs @	13.30 hrs,	Volume=	3,546 cf,	Atten= 83%, Lag= 63.3 min
Discarded =	0.13 cfs @	13.30 hrs,	Volume=	3,546 cf	
Primary =	0.00 cfs @	0.00 hrs,	Volume=	0 cf	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 147.22' @ 13.30 hrs Surf.Area= 2,294 sf Storage= 1,305 cf
Flood Elev= 148.05' Surf.Area= 3,956 sf Storage= 3,586 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 197.2 min (1,079.7 - 882.4)

Volume	Invert	Avail.Storage	Storage Description
#1	146.75'	5,109 cf	**Infiltration Swale (Irregular)** Listed below (Recalc)
#2	142.25'	787 cf	**1.00'W x 656.00'L x 3.00'H Crushed stone** 1,968 cf Overall x 40.0% Voids
		5,896 cf	Total Available Storage

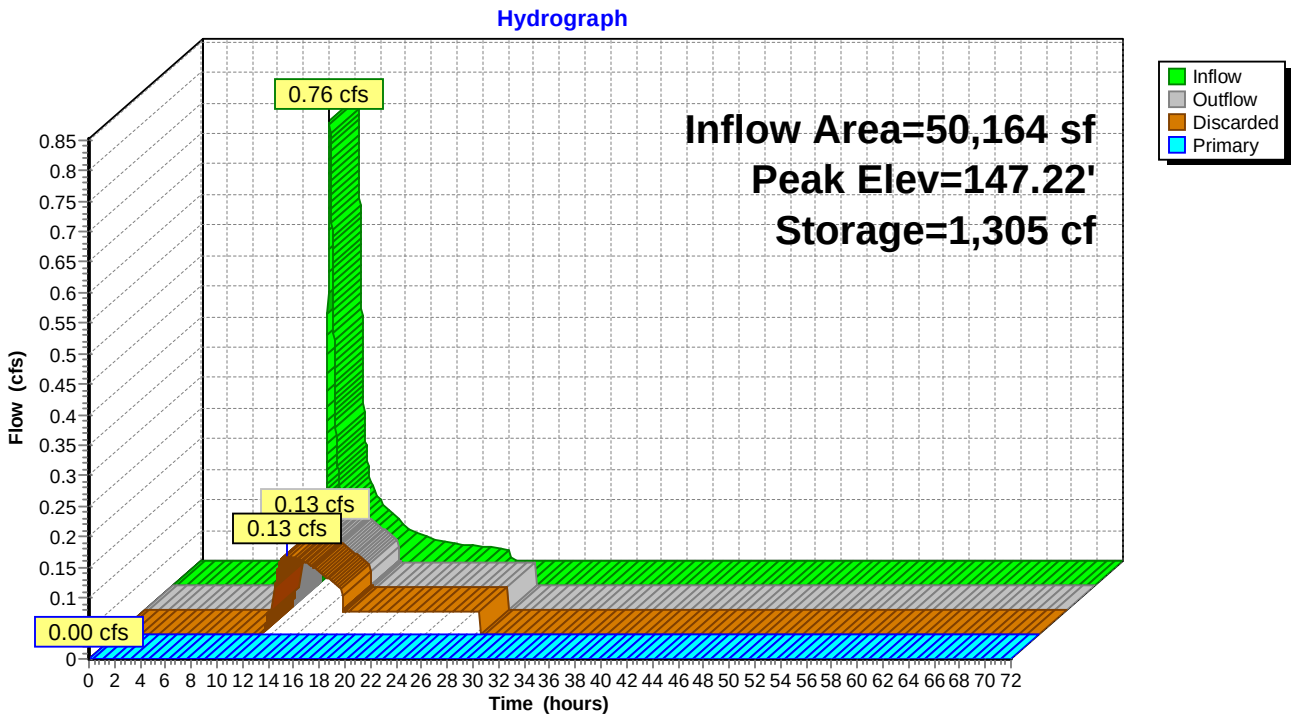
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
146.75	656	1,315.0	0	0	656
147.75	3,300	1,328.0	1,809	1,809	3,693
148.75	3,300	1,328.0	3,300	5,109	5,021

Device	Routing	Invert	Outlet Devices
#1	Discarded	142.25'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	147.25'	**3.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.13 cfs @ 13.30 hrs HW=147.22' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.13 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=142.25' TW=0.00' (Dynamic Tailwater)
└**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 01P: BMP 1 - Infiltration Swale



Summary for Pond 02P: Re-graded Detention Pond

Inflow Area = 28,639 sf, 30.10% Impervious, Inflow Depth = 1.00" for 2 Year event
Inflow = 0.75 cfs @ 12.09 hrs, Volume= 2,398 cf
Outflow = 0.75 cfs @ 12.09 hrs, Volume= 2,385 cf, Atten= 0%, Lag= 0.4 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Secondary = 0.75 cfs @ 12.09 hrs, Volume= 2,385 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 159.86' @ 12.09 hrs Surf.Area= 83 sf Storage= 42 cf
Flood Elev= 163.00' Surf.Area= 537 sf Storage= 945 cf

Plug-Flow detention time= 6.1 min calculated for 2,384 cf (99% of inflow)
Center-of-Mass det. time= 2.9 min (865.3 - 862.4)

Volume	Invert	Avail.Storage	Storage Description
#1	159.00'	945 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

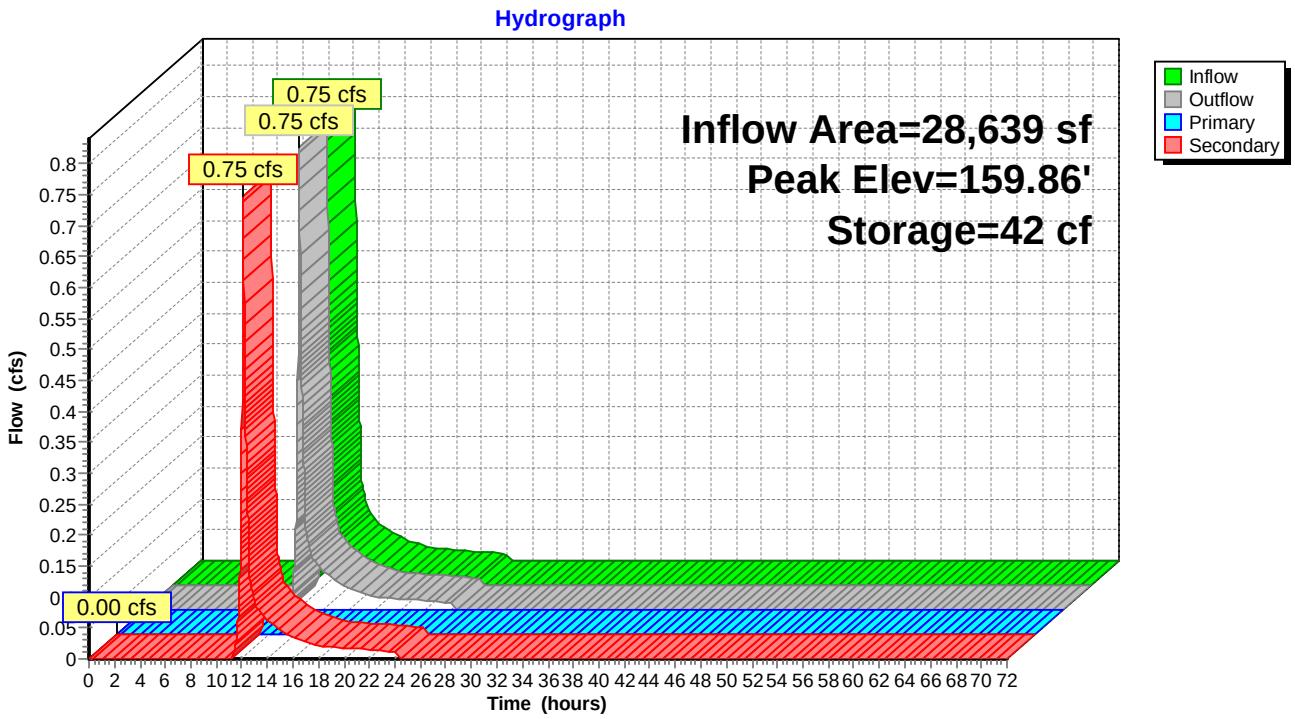
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
159.00	22	45.0	0	0	22
160.00	97	55.0	55	55	116
161.00	218	67.0	153	209	247
162.00	365	80.0	288	497	416
163.00	537	92.0	448	945	602

Device	Routing	Invert	Outlet Devices
#1	Secondary	159.40'	**24.0" Round Culvert** L= 40.0' CMP, projecting, no headwall, Ke= 0.900 Outlet Invert= 159.00' S= 0.0100 '/' Cc= 0.900 n= 0.025 Corrugated metal
#2	Primary	162.25'	**5.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=159.00' TW=0.00' (Dynamic Tailwater)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Secondary OutFlow Max=0.75 cfs @ 12.09 hrs HW=159.86' (Free Discharge)
└─**1=Culvert** (Barrel Controls 0.75 cfs @ 2.07 fps)

Pond 02P: Re-graded Detention Pond



Summary for Pond 03P: BMP 2 - Bioretention System

Inflow Area =	89,186 sf, 21.87% Impervious, Inflow Depth = 0.36" for 2 Year event				
Inflow =	0.58 cfs @	12.15 hrs,	Volume=	2,705 cf	
Outflow =	0.11 cfs @	13.20 hrs,	Volume=	2,705 cf,	Atten= 82%, Lag= 63.0 min
Discarded =	0.07 cfs @	13.20 hrs,	Volume=	2,598 cf	
Primary =	0.03 cfs @	13.20 hrs,	Volume=	107 cf	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 152.81' @ 13.20 hrs Surf.Area= 1,270 sf Storage= 861 cf
Flood Elev= 153.89' Surf.Area= 3,516 sf Storage= 2,588 cf

Plug-Flow detention time= 155.2 min calculated for 2,704 cf (100% of inflow)
Center-of-Mass det. time= 155.2 min (1,059.2 - 904.0)

Volume	Invert	Avail.Storage	Storage Description
#1	152.00'	5,949 cf	**Bioretention Area (Irregular)** Listed below (Recalc)
#2	150.00'	347 cf	**Bioretention Media (Irregular)** Listed below (Recalc) 1,050 cf Overall x 33.0% Voids
		6,296 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
152.00	525	131.0	0	0	525
153.00	800	144.0	658	658	841
154.00	3,359	300.0	1,933	2,590	6,357
155.00	3,359	300.0	3,359	5,949	6,657

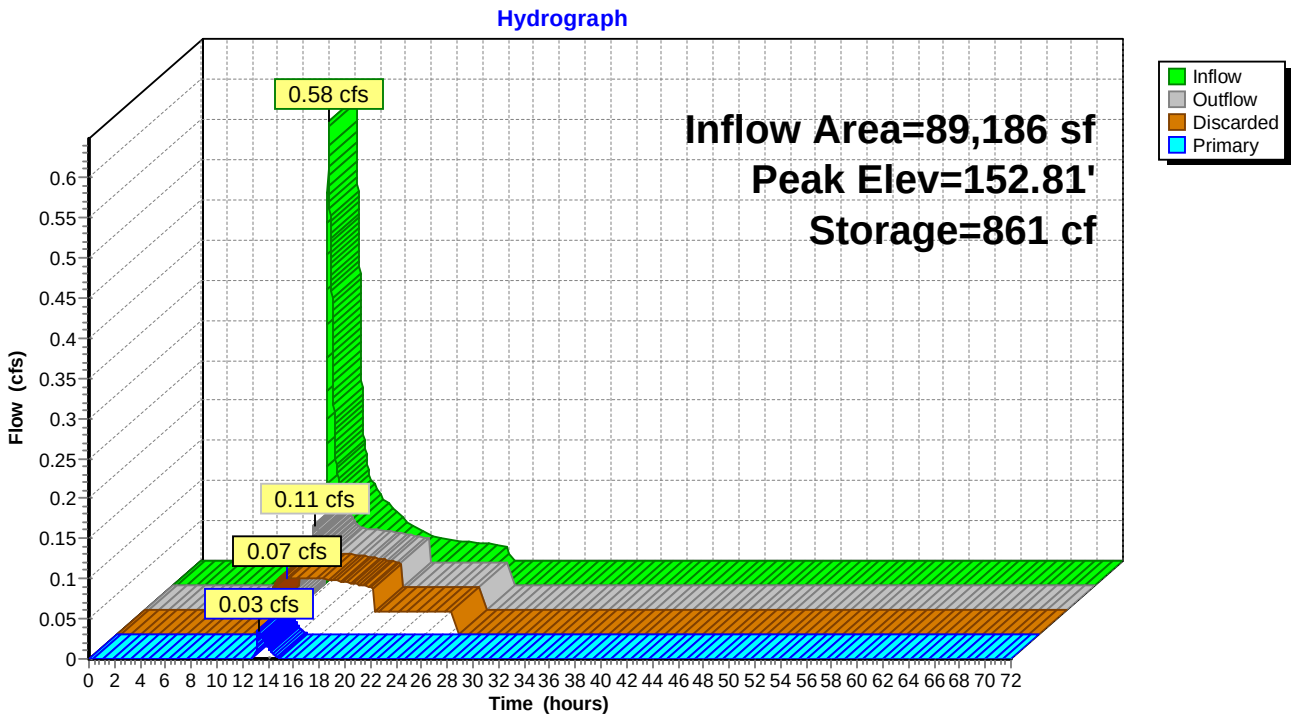
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
150.00	525	131.0	0	0	525
151.00	525	131.0	525	525	656
152.00	525	131.0	525	1,050	787

Device	Routing	Invert	Outlet Devices
#1	Discarded	150.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	149.33'	**8.0" Round Culvert** L= 33.0' RCP, square edge headwall, Ke= 0.500 Outlet Invert= 149.00' S= 0.0100 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections
#3	Device 2	152.80'	**24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.07 cfs @ 13.20 hrs HW=152.81' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.07 cfs)

Primary OutFlow Max=0.03 cfs @ 13.20 hrs HW=152.81' TW=0.00' (Dynamic Tailwater)
└─**2=Culvert** (Passes 0.03 cfs of 2.74 cfs potential flow)
└─**3=Orifice/Grate** (Weir Controls 0.03 cfs @ 0.39 fps)

Pond 03P: BMP 2 - Bioretention System



Summary for Pond 04P: BMP 3 - Infiltration Swale

Inflow Area = 41,704 sf, 17.25% Impervious, Inflow Depth = 0.54" for 2 Year event
Inflow = 0.36 cfs @ 12.20 hrs, Volume= 1,863 cf
Outflow = 0.06 cfs @ 13.98 hrs, Volume= 1,863 cf, Atten= 84%, Lag= 106.5 min
Discarded = 0.06 cfs @ 13.98 hrs, Volume= 1,863 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 154.21' @ 13.98 hrs Surf.Area= 1,051 sf Storage= 627 cf
Flood Elev= 154.69' Surf.Area= 1,401 sf Storage= 1,139 cf

Plug-Flow detention time= 188.0 min calculated for 1,863 cf (100% of inflow)
Center-of-Mass det. time= 188.0 min (1,094.9 - 906.9)

Volume	Invert	Avail.Storage	Storage Description
#1	153.50'	1,812 cf	**Infiltration Swale (Irregular)** Listed below (Recalc)
#2	149.00'	276 cf	**1.00'W x 230.00'L x 3.00'H Crushed stone** 690 cf Overall x 40.0% Voids
		2,088 cf	Total Available Storage

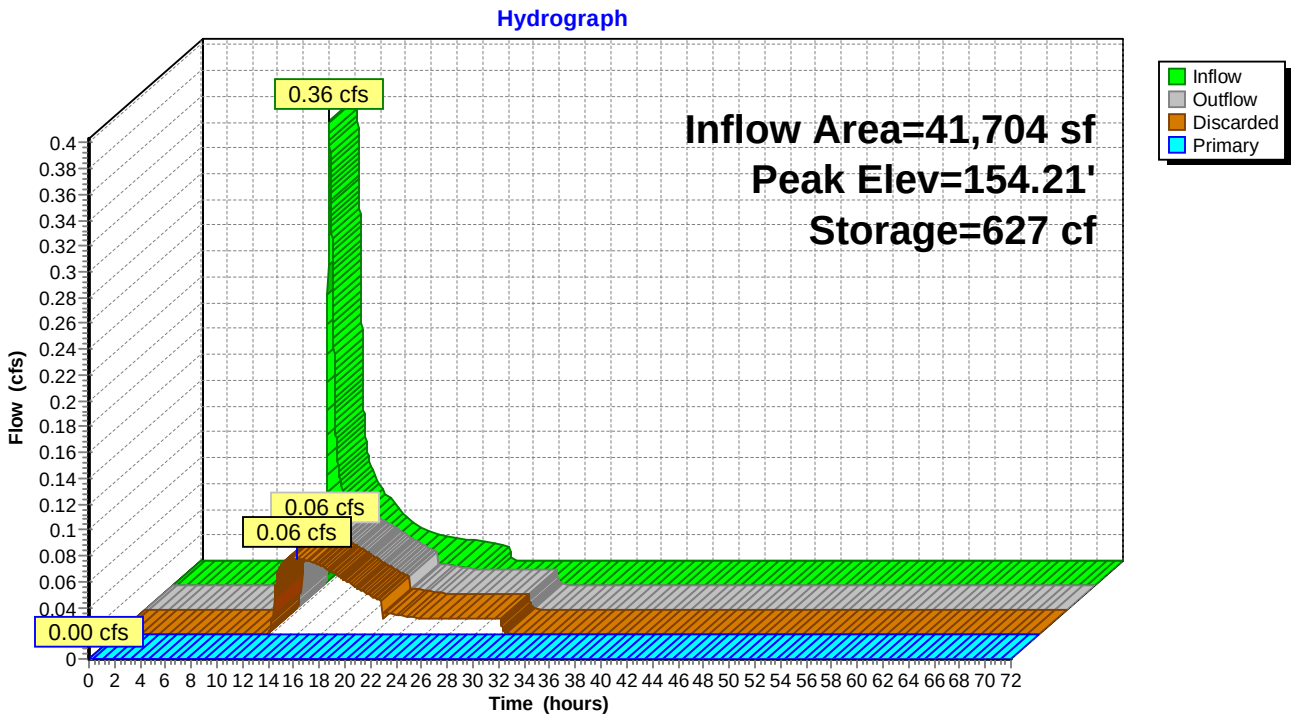
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
153.50	231	464.0	0	0	231
154.50	1,171	476.0	641	641	1,244
155.50	1,171	476.0	1,171	1,812	1,720

Device	Routing	Invert	Outlet Devices
#1	Discarded	149.00'	**2.410 in/hr Exfiltration over Surface area** Phase-In= 0.10'
#2	Primary	154.25'	**5.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.06 cfs @ 13.98 hrs HW=154.21' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.06 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=149.00' TW=0.00' (Dynamic Tailwater)
└**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 04P: BMP 3 - Infiltration Swale



Summary for Pond 05P: BMP 4 - Infiltration Swale

Inflow Area = 98,155 sf, 15.90% Impervious, Inflow Depth = 0.54" for 2 Year event
Inflow = 0.73 cfs @ 12.33 hrs, Volume= 4,384 cf
Outflow = 0.63 cfs @ 12.49 hrs, Volume= 4,385 cf, Atten= 13%, Lag= 10.1 min
Discarded = 0.06 cfs @ 12.49 hrs, Volume= 2,604 cf
Primary = 0.57 cfs @ 12.49 hrs, Volume= 1,780 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 154.62' @ 12.49 hrs Surf.Area= 1,080 sf Storage= 675 cf
Flood Elev= 155.05' Surf.Area= 1,224 sf Storage= 1,107 cf

Plug-Flow detention time= 105.4 min calculated for 4,384 cf (100% of inflow)
Center-of-Mass det. time= 105.4 min (1,018.3 - 912.9)

Volume	Invert	Avail.Storage	Storage Description
#1	153.75'	1,584 cf	**Infiltration Swale (Irregular)** Listed below (Recalc)
#2	149.25'	240 cf	**1.00'W x 200.00'L x 3.00'H Crushed stone** 600 cf Overall x 40.0% Voids
		1,824 cf	Total Available Storage

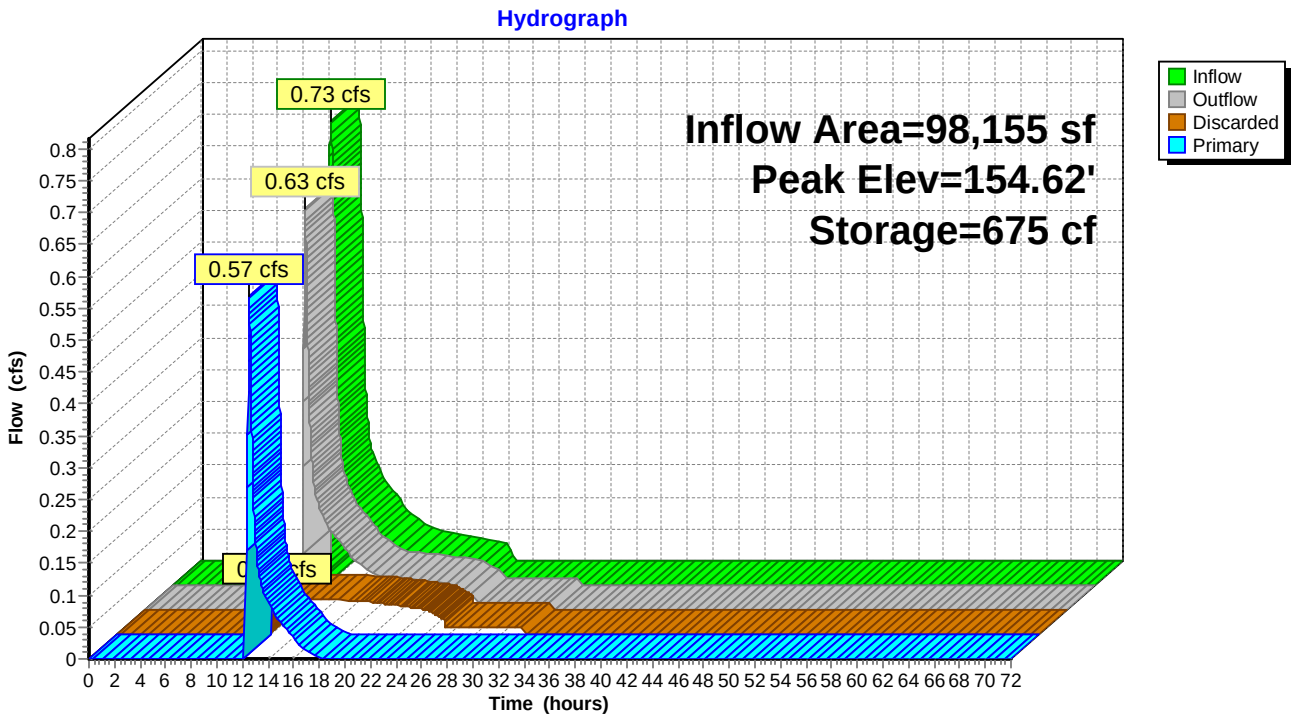
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
153.75	202	405.0	0	0	202
154.75	1,024	417.0	560	560	1,088
155.75	1,024	417.0	1,024	1,584	1,505

Device	Routing	Invert	Outlet Devices
#1	Discarded	149.25'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	154.50'	**5.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.06 cfs @ 12.49 hrs HW=154.62' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.06 cfs)

Primary OutFlow Max=0.57 cfs @ 12.49 hrs HW=154.62' TW=0.00' (Dynamic Tailwater)
└**2=Broad-Crested Rectangular Weir** (Weir Controls 0.57 cfs @ 0.96 fps)

Pond 05P: BMP 4 - Infiltration Swale



Summary for Pond 06P: BMP 5 - Infiltration Swale

[87] Warning: Oscillations may require Finer Routing or smaller dt

Inflow Area =	108,471 sf, 26.07% Impervious, Inflow Depth = 0.69" for 2 Year event				
Inflow =	1.30 cfs @	12.17 hrs,	Volume=	6,200 cf	
Outflow =	0.83 cfs @	12.43 hrs,	Volume=	6,200 cf,	Atten= 36%, Lag= 15.9 min
Discarded =	0.13 cfs @	12.43 hrs,	Volume=	4,721 cf	
Primary =	0.70 cfs @	12.43 hrs,	Volume=	1,479 cf	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 154.84' @ 12.43 hrs Surf.Area= 2,321 sf Storage= 1,442 cf
Flood Elev= 155.17' Surf.Area= 2,716 sf Storage= 2,167 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 133.4 min (1,021.7 - 888.2)

Volume	Invert	Avail.Storage	Storage Description
#1	154.00'	3,508 cf	**Infiltration Swale (Irregular)** Listed below (Recalc)
#2	150.00'	540 cf	**1.00'W x 450.00'L x 3.00'H Crushed stone** 1,350 cf Overall x 40.0% Voids
		4,048 cf	Total Available Storage

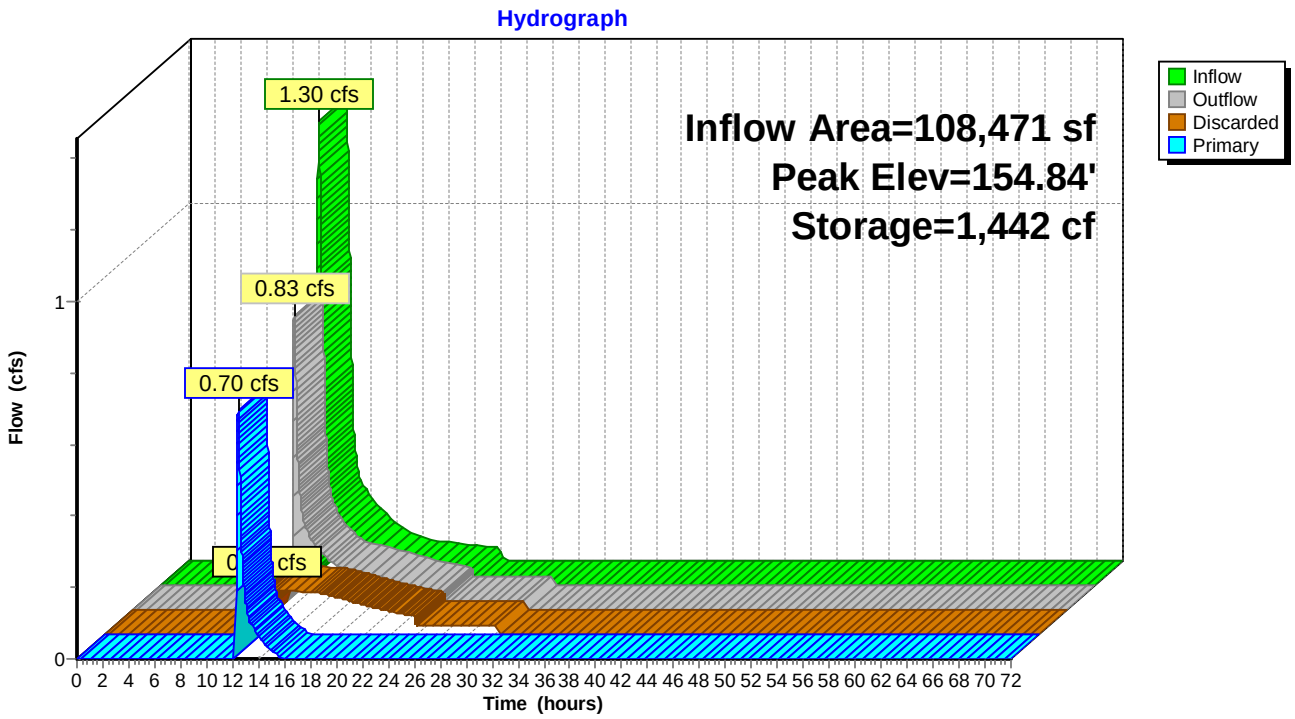
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
154.00	450	902.0	0	0	450
155.00	2,266	914.0	1,242	1,242	2,407
156.00	2,266	914.0	2,266	3,508	3,321

Device	Routing	Invert	Outlet Devices
#1	Discarded	150.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	154.75'	**10.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.13 cfs @ 12.43 hrs HW=154.84' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.13 cfs)

Primary OutFlow Max=0.70 cfs @ 12.43 hrs HW=154.84' TW=0.00' (Dynamic Tailwater)
└**2=Broad-Crested Rectangular Weir** (Weir Controls 0.70 cfs @ 0.82 fps)

Pond 06P: BMP 5 - Infiltration Swale



Summary for Pond 07P: BMP 6 - Infiltration Swale

[87] Warning: Oscillations may require Finer Routing or smaller dt

Inflow Area =	4,593 sf, 65.38% Impervious, Inflow Depth = 1.64" for 2 Year event				
Inflow =	0.21 cfs @	12.08 hrs,	Volume=	628 cf	
Outflow =	0.02 cfs @	12.83 hrs,	Volume=	628 cf,	Atten= 89%, Lag= 45.1 min
Discarded =	0.02 cfs @	12.83 hrs,	Volume=	628 cf	
Primary =	0.00 cfs @	0.00 hrs,	Volume=	0 cf	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 154.81' @ 12.83 hrs Surf.Area= 433 sf Storage= 253 cf
Flood Elev= 155.87' Surf.Area= 1,220 sf Storage= 920 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 195.8 min (1,025.2 - 829.4)

Volume	Invert	Avail.Storage	Storage Description
#1	154.75'	1,578 cf	**Infiltration Swale (Irregular)** Listed below (Recalc)
#2	150.25'	240 cf	**1.00'W x 200.00'L x 3.00'H Crushed stone** 600 cf Overall x 40.0% Voids
		1,818 cf	Total Available Storage

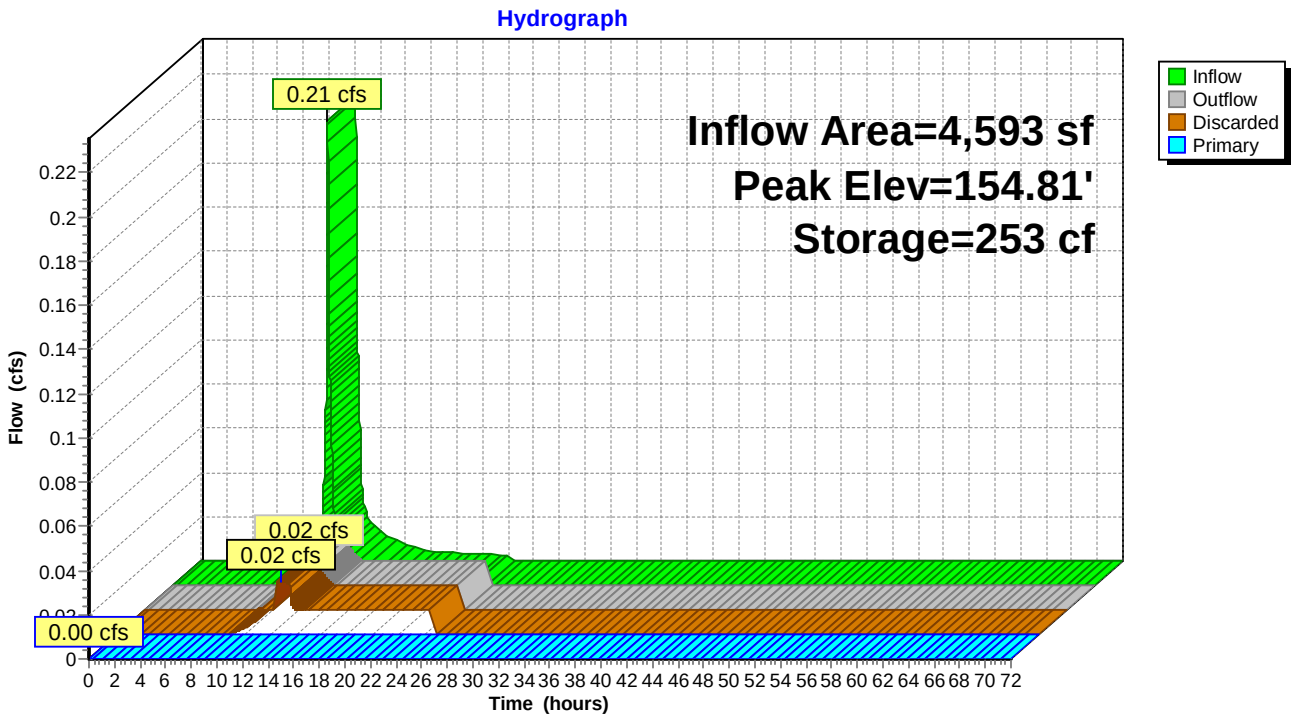
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
154.75	201	403.0	0	0	201
155.75	1,020	416.0	558	558	1,142
156.75	1,020	416.0	1,020	1,578	1,558

Device	Routing	Invert	Outlet Devices
#1	Discarded	150.25'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	155.50'	**5.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.02 cfs @ 12.83 hrs HW=154.81' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=150.25' TW=0.00' (Dynamic Tailwater)
└**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 07P: BMP 6 - Infiltration Swale



Summary for Pond 7P: Lake Cochituate

Inflow Area = 2,467,301 sf, 28.26% Impervious, Inflow Depth = 0.52" for 2 Year event
Inflow = 16.37 cfs @ 12.26 hrs, Volume= 107,186 cf
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 100%, Lag= 0.0 min

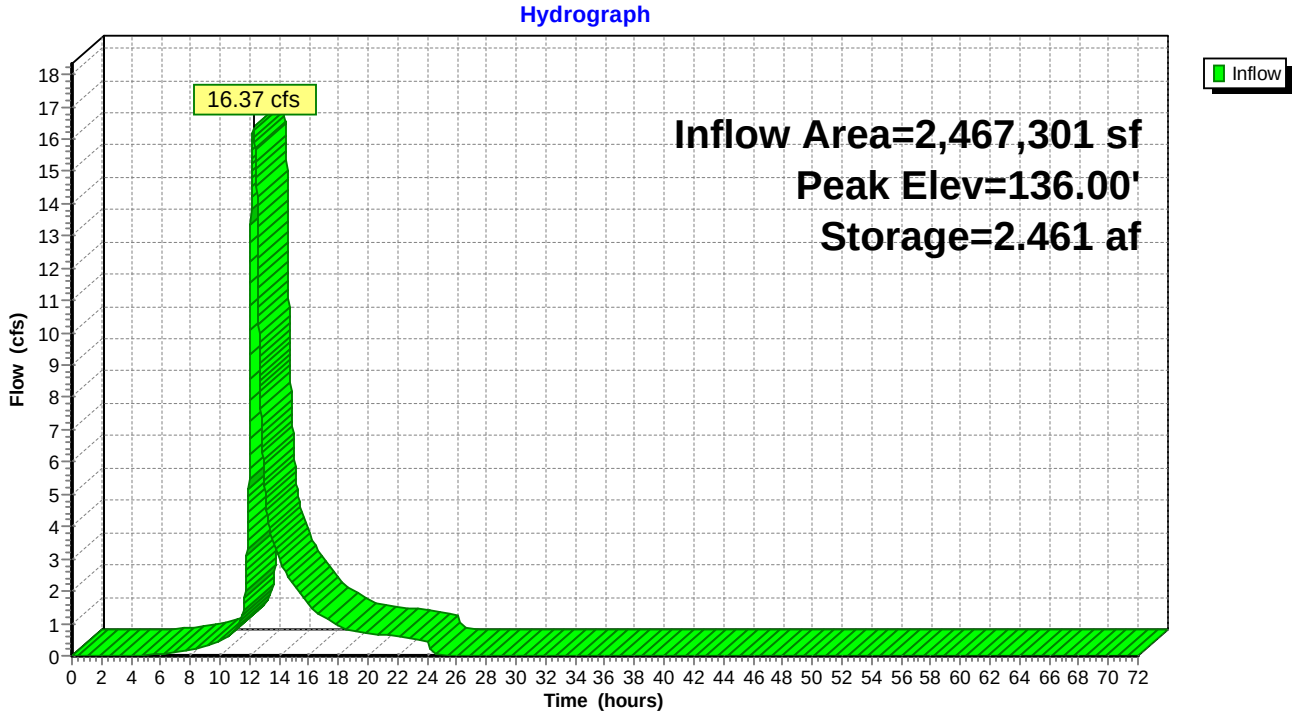
Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 136.00' @ 26.14 hrs Surf.Area= 625.000 ac Storage= 2.461 af

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

Volume	Invert	Avail.Storage	Storage Description
#1	136.00'	625.000 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
136.00	625.000	0.000	0.000
137.00	625.000	625.000	625.000

Pond 7P: Lake Cochituate



Summary for Pond 08P: BMP 7 - Infiltration Swale

[87] Warning: Oscillations may require Finer Routing or smaller dt

Inflow Area =	2,241 sf, 67.51% Impervious, Inflow Depth = 1.72" for 2 Year event				
Inflow =	0.11 cfs @	12.08 hrs,	Volume=	320 cf	
Outflow =	0.01 cfs @	12.74 hrs,	Volume=	320 cf,	Atten= 88%, Lag= 39.9 min
Discarded =	0.01 cfs @	12.74 hrs,	Volume=	320 cf	
Primary =	0.00 cfs @	0.00 hrs,	Volume=	0 cf	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 156.40' @ 12.74 hrs Surf.Area= 235 sf Storage= 131 cf
Flood Elev= 157.27' Surf.Area= 535 sf Storage= 401 cf

Plug-Flow detention time= 186.3 min calculated for 320 cf (100% of inflow)
Center-of-Mass det. time= 186.3 min (1,012.2 - 825.9)

Volume	Invert	Avail.Storage	Storage Description
#1	156.15'	695 cf	**Infiltration Swale (Irregular)** Listed below (Recalc)
#2	151.65'	102 cf	**1.00'W x 85.00'L x 3.00'H Crushed stone** 255 cf Overall x 40.0% Voids
		797 cf	Total Available Storage

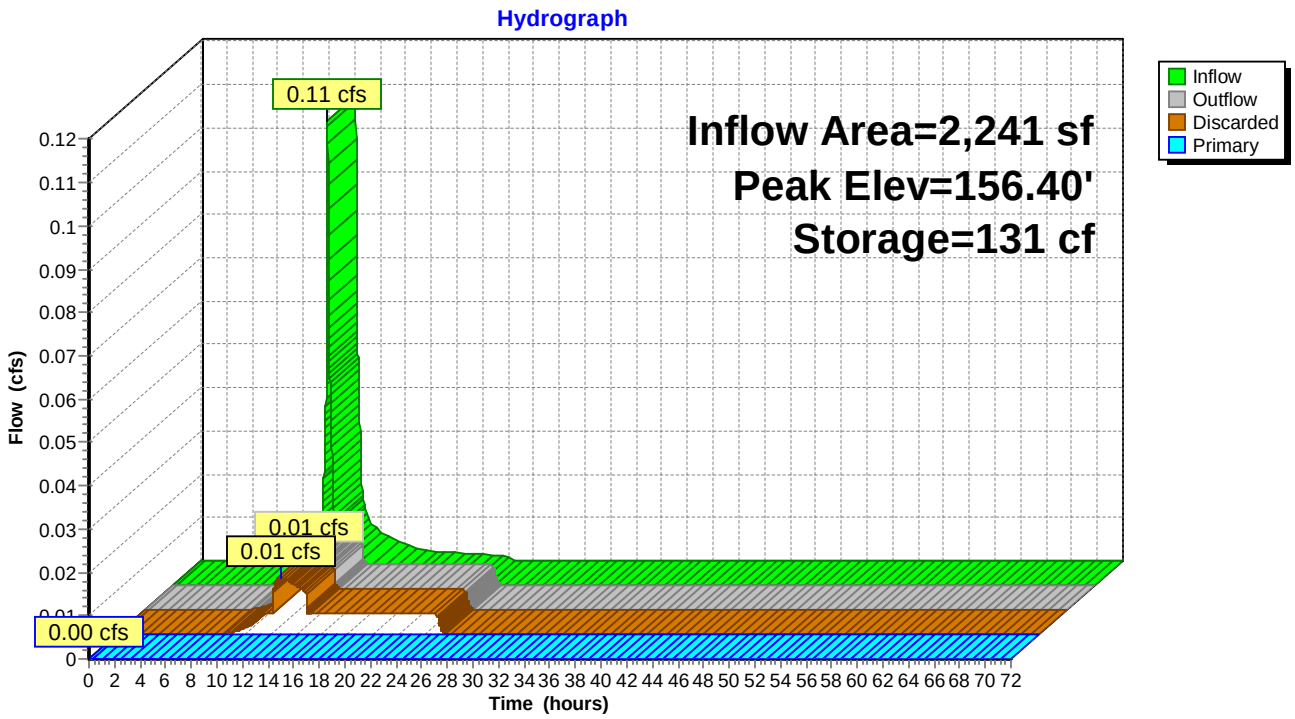
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
156.15	87	175.0	0	0	87
157.15	450	188.0	245	245	504
158.15	450	188.0	450	695	692

Device	Routing	Invert	Outlet Devices
#1	Discarded	151.65'	**2.410 in/hr Exfiltration over Surface area** Phase-In= 0.10'
#2	Primary	156.90'	**5.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.01 cfs @ 12.74 hrs HW=156.40' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=151.65' TW=0.00' (Dynamic Tailwater)
└**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 08P: BMP 7 - Infiltration Swale



Summary for Pond 09P: BMP 8 - Infiltration Swale

Inflow Area = 10,487 sf, 62.20% Impervious, Inflow Depth = 1.57" for 2 Year event
Inflow = 0.46 cfs @ 12.08 hrs, Volume= 1,371 cf
Outflow = 0.05 cfs @ 12.81 hrs, Volume= 1,371 cf, Atten= 88%, Lag= 43.8 min
Discarded = 0.05 cfs @ 12.81 hrs, Volume= 1,371 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 157.65' @ 12.81 hrs Surf.Area= 978 sf Storage= 551 cf
Flood Elev= 158.47' Surf.Area= 1,821 sf Storage= 1,527 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 182.4 min (1,015.2 - 832.8)

Volume	Invert	Avail.Storage	Storage Description
#1	157.25'	2,354 cf	**Infiltration Swale (Irregular)** Listed below (Recalc)
#2	152.75'	360 cf	**1.00'W x 300.00'L x 3.00'H Crushed stone** 900 cf Overall x 40.0% Voids
		2,714 cf	Total Available Storage

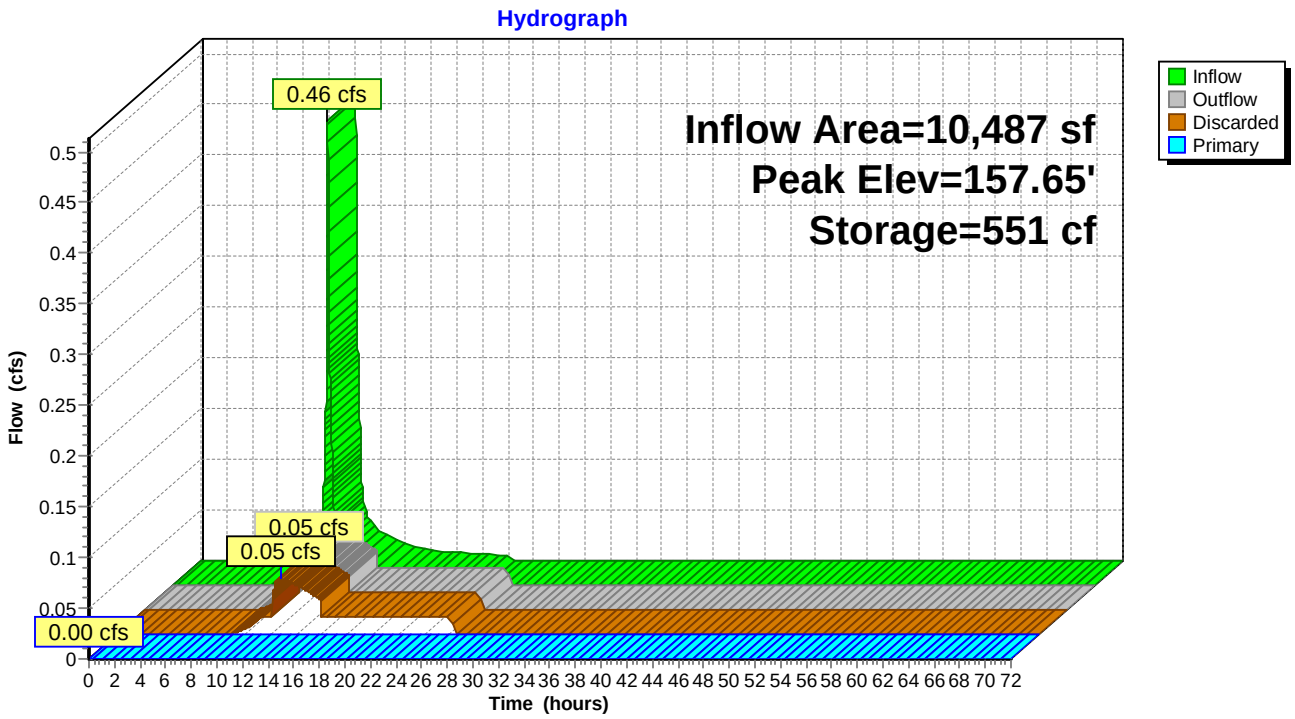
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
157.25	301	604.0	0	0	301
158.25	1,521	616.0	833	833	1,616
159.25	1,521	616.0	1,521	2,354	2,232

Device	Routing	Invert	Outlet Devices
#1	Discarded	152.75'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	158.00'	**5.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.05 cfs @ 12.81 hrs HW=157.65' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.05 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=152.75' TW=0.00' (Dynamic Tailwater)
└**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 09P: BMP 8 - Infiltration Swale



Summary for Pond 10P: BMP 9 - Infiltration Swale

Inflow Area = 234,888 sf, 22.66% Impervious, Inflow Depth = 0.46" for 2 Year event
Inflow = 1.36 cfs @ 12.35 hrs, Volume= 8,999 cf
Outflow = 0.56 cfs @ 12.89 hrs, Volume= 8,999 cf, Atten= 59%, Lag= 31.9 min
Discarded = 0.20 cfs @ 12.89 hrs, Volume= 7,497 cf
Primary = 0.35 cfs @ 12.89 hrs, Volume= 1,503 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 157.84' @ 12.89 hrs Surf.Area= 3,610 sf Storage= 2,245 cf
Flood Elev= 158.21' Surf.Area= 4,219 sf Storage= 3,509 cf

Plug-Flow detention time= 147.3 min calculated for 8,998 cf (100% of inflow)
Center-of-Mass det. time= 147.4 min (1,070.1 - 922.7)

Volume	Invert	Avail.Storage	Storage Description
#1	157.00'	5,449 cf	**Infiltration Swale (Irregular)** Listed below (Recalc)
#2	152.50'	840 cf	**1.00'W x 700.00'L x 3.00'H Crushed stone**
			2,100 cf Overall x 40.0% Voids
		6,289 cf	Total Available Storage

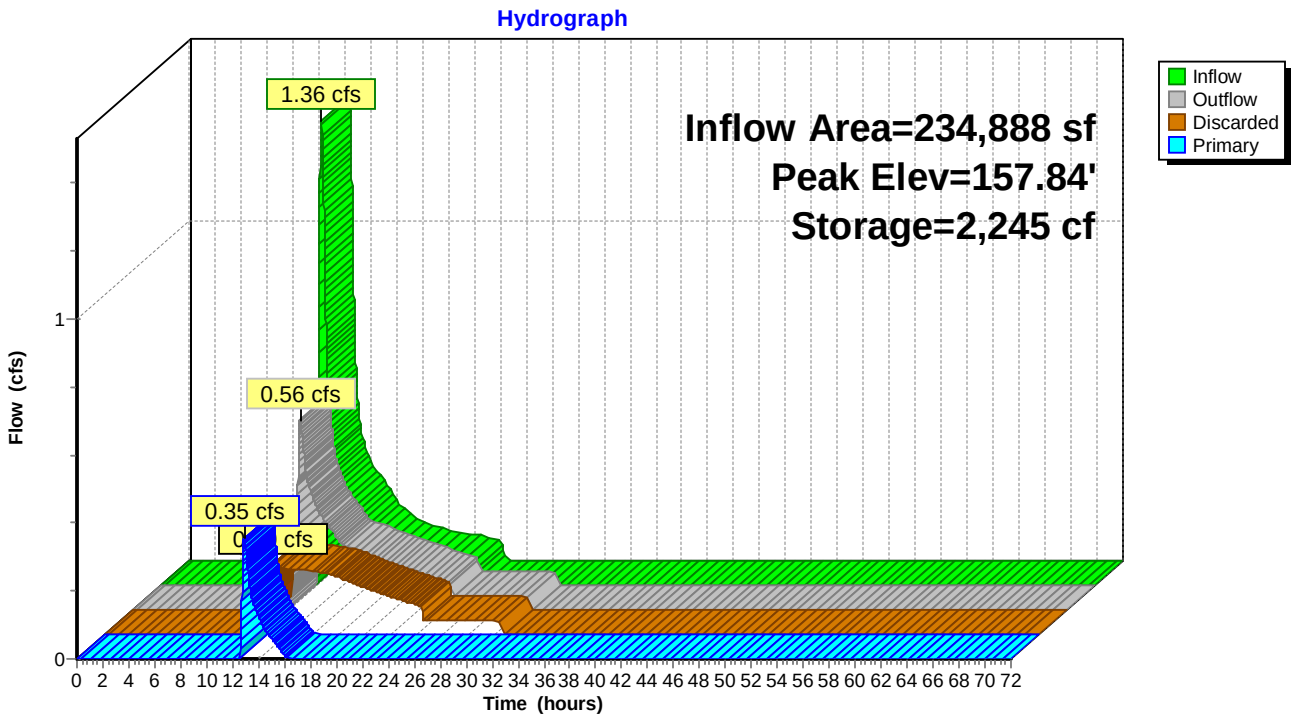
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
157.00	701	1,403.0	0	0	701
158.00	3,519	1,416.0	1,930	1,930	3,940
159.00	3,519	1,416.0	3,519	5,449	5,356

Device	Routing	Invert	Outlet Devices
#1	Discarded	152.50'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	157.75'	**5.0' long x 0.5' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00
			Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.20 cfs @ 12.89 hrs HW=157.84' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.20 cfs)

Primary OutFlow Max=0.35 cfs @ 12.89 hrs HW=157.84' TW=0.00' (Dynamic Tailwater)
└**2=Broad-Crested Rectangular Weir** (Weir Controls 0.35 cfs @ 0.82 fps)

Pond 10P: BMP 9 - Infiltration Swale



Summary for Pond 11P: BMP 10 - Infiltration Swale

Inflow Area = 316,495 sf, 27.57% Impervious, Inflow Depth = 0.42" for 2 Year event
Inflow = 1.67 cfs @ 12.31 hrs, Volume= 11,175 cf
Outflow = 1.42 cfs @ 12.51 hrs, Volume= 11,175 cf, Atten= 15%, Lag= 11.8 min
Discarded = 0.14 cfs @ 12.51 hrs, Volume= 6,471 cf
Primary = 1.28 cfs @ 12.51 hrs, Volume= 4,705 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 158.13' @ 12.51 hrs Surf.Area= 2,557 sf Storage= 1,609 cf
Flood Elev= 158.37' Surf.Area= 2,870 sf Storage= 2,170 cf

Plug-Flow detention time= 103.8 min calculated for 11,174 cf (100% of inflow)
Center-of-Mass det. time= 103.9 min (1,029.5 - 925.6)

Volume	Invert	Avail.Storage	Storage Description
#1	157.25'	3,707 cf	**Infiltration Swale (Irregular)** Listed below (Recalc)
#2	152.75'	570 cf	**1.00'W x 475.00'L x 3.00'H Crushed stone**
			1,425 cf Overall x 40.0% Voids
		4,277 cf	Total Available Storage

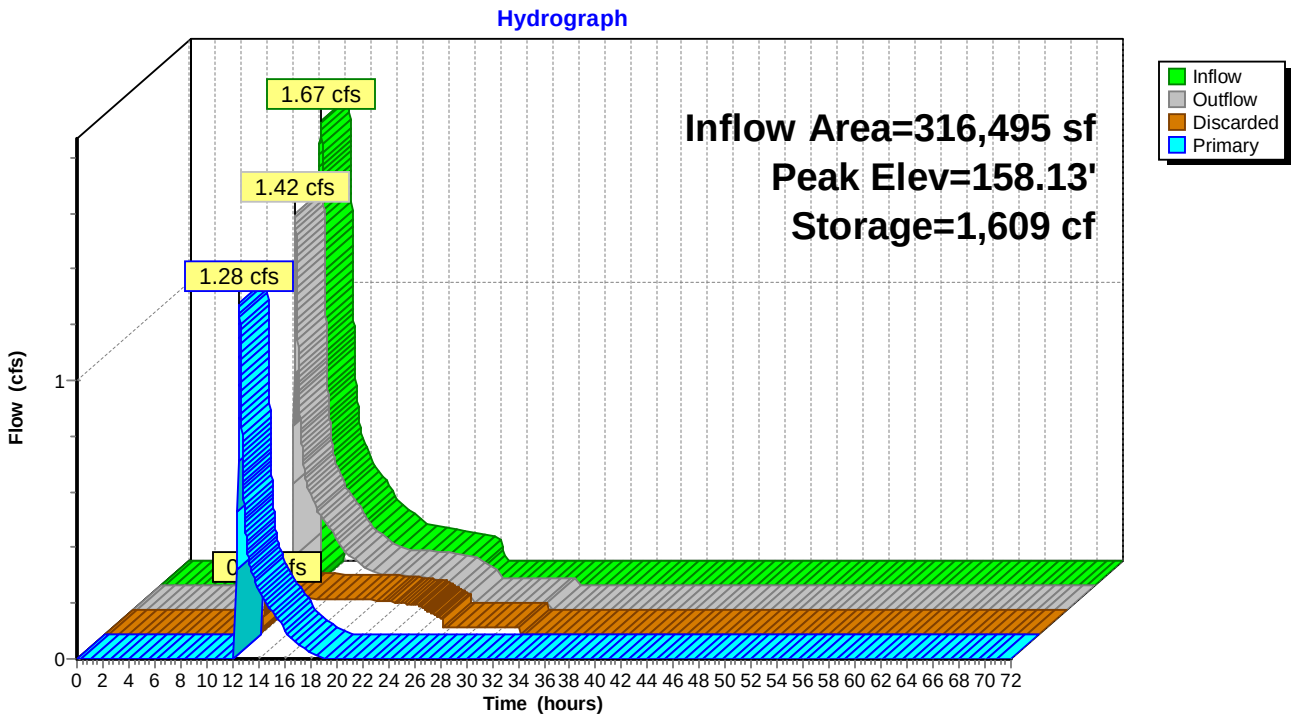
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
157.25	475	953.0	0	0	475
158.25	2,395	966.0	1,312	1,312	2,680
159.25	2,395	966.0	2,395	3,707	3,646

Device	Routing	Invert	Outlet Devices
#1	Discarded	152.75'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	158.00'	**10.0' long x 0.5' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00
			Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.14 cfs @ 12.51 hrs HW=158.13' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.14 cfs)

Primary OutFlow Max=1.28 cfs @ 12.51 hrs HW=158.13' TW=0.00' (Dynamic Tailwater)
└**2=Broad-Crested Rectangular Weir** (Weir Controls 1.28 cfs @ 1.00 fps)

Pond 11P: BMP 10 - Infiltration Swale



Summary for Pond 12P: BMP 11 - Infiltration Swale

[87] Warning: Oscillations may require Finer Routing or smaller dt

Inflow Area =	15,210 sf, 38.96% Impervious, Inflow Depth = 0.90" for 2 Year event				
Inflow =	0.29 cfs @	12.16 hrs,	Volume=	1,139 cf	
Outflow =	0.04 cfs @	13.22 hrs,	Volume=	1,139 cf,	Atten= 86%, Lag= 63.5 min
Discarded =	0.04 cfs @	13.22 hrs,	Volume=	1,139 cf	
Primary =	0.00 cfs @	0.00 hrs,	Volume=	0 cf	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 157.50' @ 13.22 hrs Surf.Area= 718 sf Storage= 432 cf
Flood Elev= 157.93' Surf.Area= 919 sf Storage= 739 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 191.6 min (1,065.8 - 874.2)

Volume	Invert	Avail.Storage	Storage Description
#1	156.75'	1,189 cf	**Infiltration Swale (Irregular)** Listed below (Recalc)
#2	152.25'	180 cf	**1.00'W x 150.00'L x 3.00'H Crushed stone** 450 cf Overall x 40.0% Voids
		1,369 cf	Total Available Storage

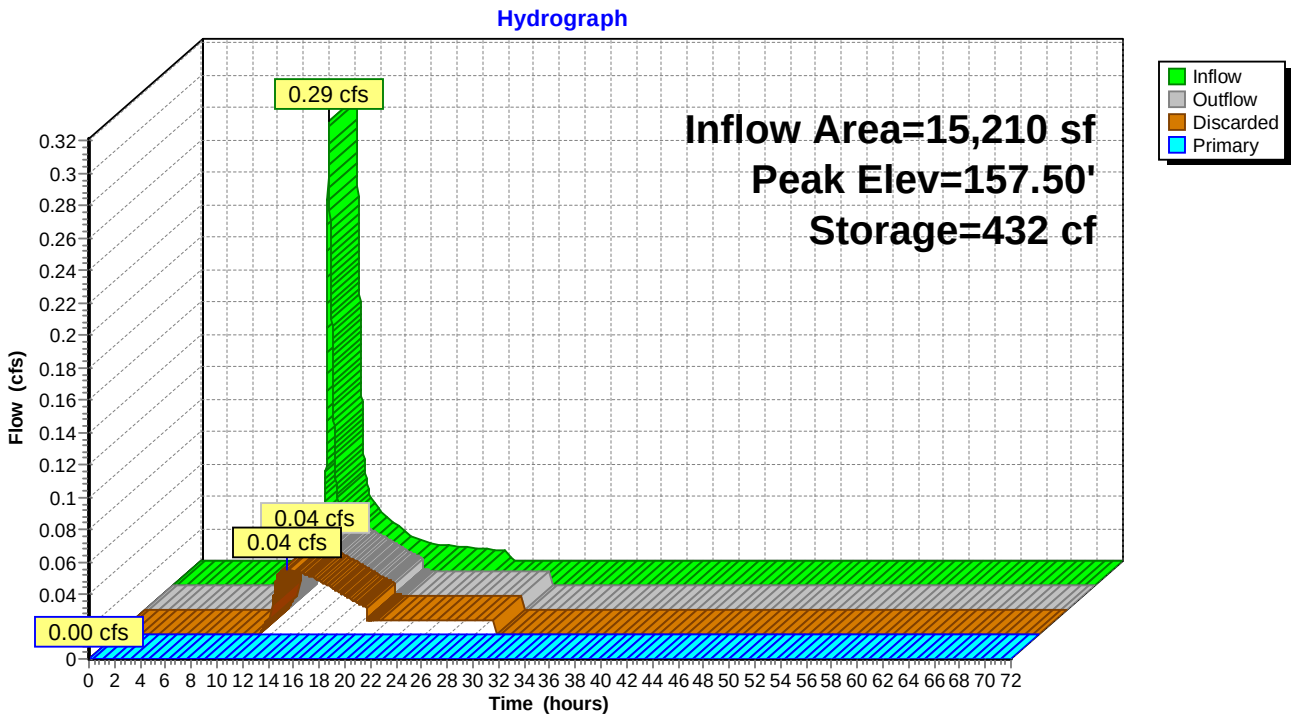
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
156.75	151	303.0	0	0	151
157.75	769	316.0	420	420	862
158.75	769	316.0	769	1,189	1,178

Device	Routing	Invert	Outlet Devices
#1	Discarded	152.25'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	157.50'	**5.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.04 cfs @ 13.22 hrs HW=157.50' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.04 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=152.25' TW=0.00' (Dynamic Tailwater)
└**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 12P: BMP 11 - Infiltration Swale



Summary for Pond 13P: BMP 12 - Infiltration Swale

Inflow Area = 13,927 sf, 62.52% Impervious, Inflow Depth = 1.57" for 2 Year event
Inflow = 0.61 cfs @ 12.08 hrs, Volume= 1,820 cf
Outflow = 0.07 cfs @ 12.81 hrs, Volume= 1,820 cf, Atten= 88%, Lag= 43.8 min
Discarded = 0.07 cfs @ 12.81 hrs, Volume= 1,820 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 155.90' @ 12.81 hrs Surf.Area= 1,297 sf Storage= 732 cf
Flood Elev= 156.49' Surf.Area= 2,398 sf Storage= 1,567 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 182.5 min (1,015.2 - 832.8)

Volume	Invert	Avail.Storage	Storage Description
#1	155.50'	3,127 cf	**Infiltration Swale (Irregular)** Listed below (Recalc)
#2	151.00'	480 cf	**1.00'W x 400.00'L x 3.00'H Crushed stone** 1,200 cf Overall x 40.0% Voids
		3,607 cf	Total Available Storage

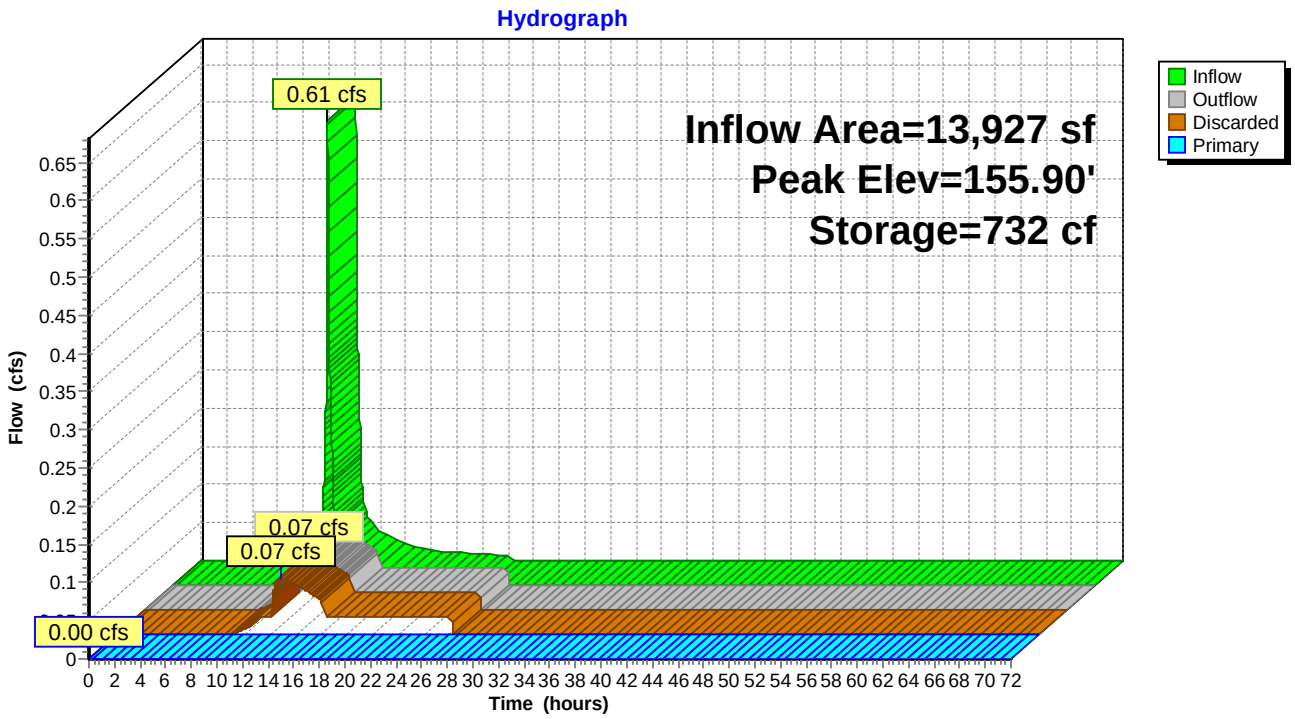
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
155.50	401	803.0	0	0	401
156.50	2,020	816.0	1,107	1,107	2,261
157.50	2,020	816.0	2,020	3,127	3,077

Device	Routing	Invert	Outlet Devices
#1	Discarded	151.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	156.25'	**5.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.07 cfs @ 12.81 hrs HW=155.90' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.07 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=151.00' TW=0.00' (Dynamic Tailwater)
└**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 13P: BMP 12 - Infiltration Swale



Summary for Pond 14P: BMP 13 - Infiltration Swale

[87] Warning: Oscillations may require Finer Routing or smaller dt

Inflow Area =	26,591 sf, 37.08% Impervious, Inflow Depth = 0.85" for 2 Year event				
Inflow =	0.46 cfs @	12.17 hrs,	Volume=	1,880 cf	
Outflow =	0.07 cfs @	13.17 hrs,	Volume=	1,880 cf,	Atten= 85%, Lag= 60.2 min
Discarded =	0.07 cfs @	13.17 hrs,	Volume=	1,880 cf	
Primary =	0.00 cfs @	0.00 hrs,	Volume=	0 cf	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 155.90' @ 13.17 hrs Surf.Area= 1,235 sf Storage= 697 cf
Flood Elev= 156.69' Surf.Area= 2,308 sf Storage= 1,879 cf

Plug-Flow detention time= 199.9 min calculated for 1,879 cf (100% of inflow)
Center-of-Mass det. time= 199.9 min (1,077.9 - 878.0)

Volume	Invert	Avail.Storage	Storage Description
#1	155.50'	2,983 cf	**Infiltration Swale (Irregular)** Listed below (Recalc)
#2	151.00'	457 cf	**1.00'W x 381.00'L x 3.00'H Crushed stone** 1,143 cf Overall x 40.0% Voids
		3,440 cf	Total Available Storage

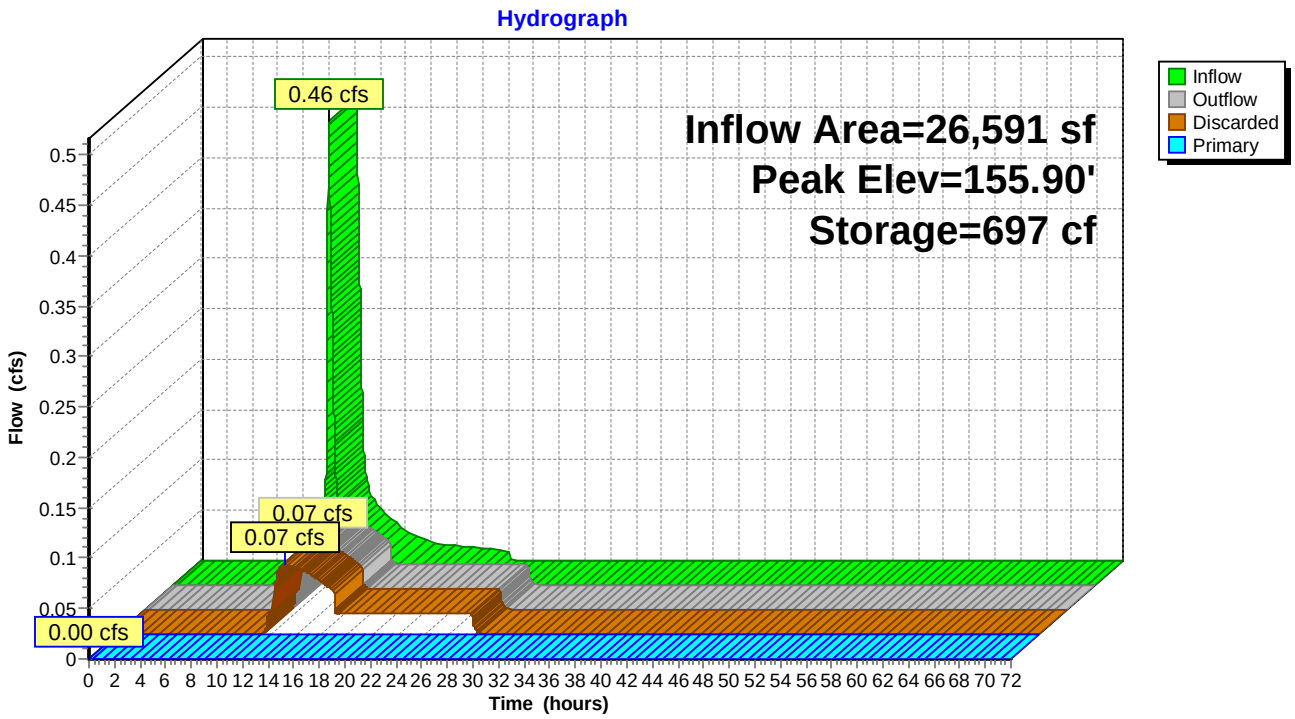
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
155.50	382	766.0	0	0	382
156.50	1,927	779.0	1,056	1,056	2,157
157.50	1,927	779.0	1,927	2,983	2,936

Device	Routing	Invert	Outlet Devices
#1	Discarded	151.00'	**2.410 in/hr Exfiltration over Surface area** Phase-In= 0.10'
#2	Primary	156.25'	**5.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.07 cfs @ 13.17 hrs HW=155.90' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.07 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=151.00' TW=0.00' (Dynamic Tailwater)
└**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 14P: BMP 13 - Infiltration Swale

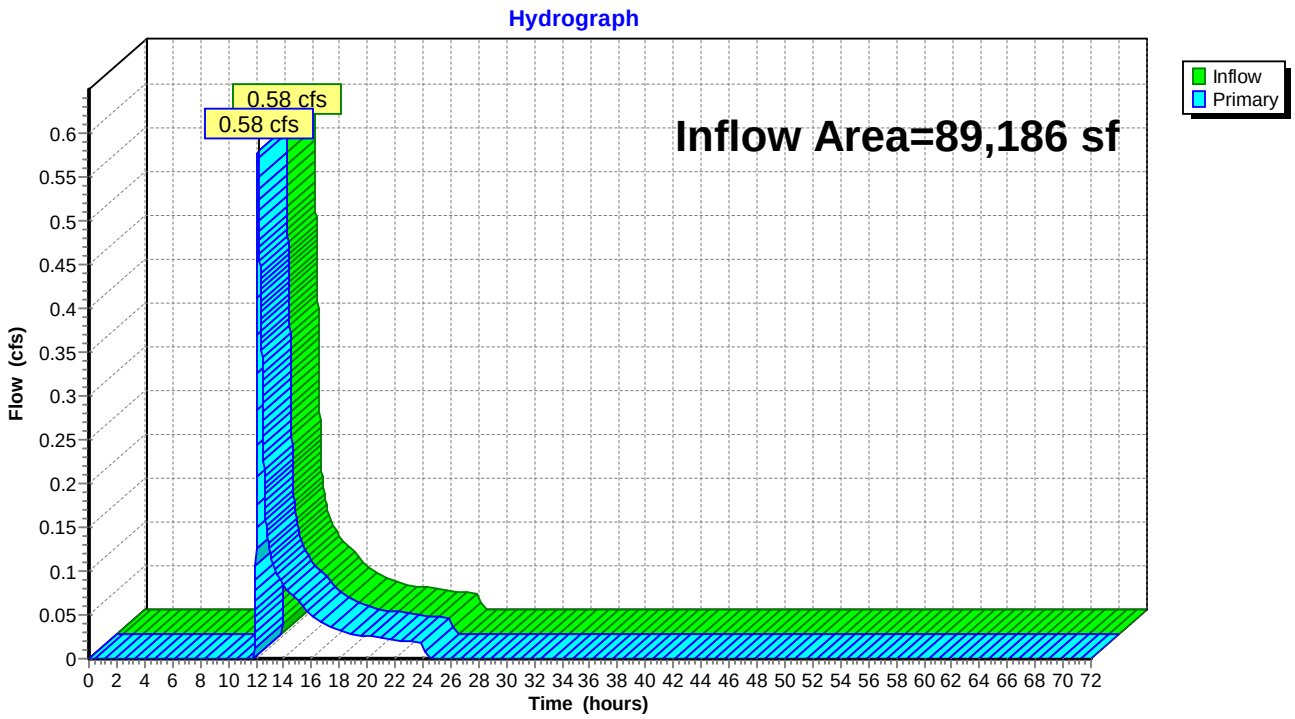


Summary for Link 1L: Total to Bioretention

Inflow Area = 89,186 sf, 21.87% Impervious, Inflow Depth = 0.36" for 2 Year event
Inflow = 0.58 cfs @ 12.15 hrs, Volume= 2,705 cf
Primary = 0.58 cfs @ 12.15 hrs, Volume= 2,705 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link 1L: Total to Bioretention

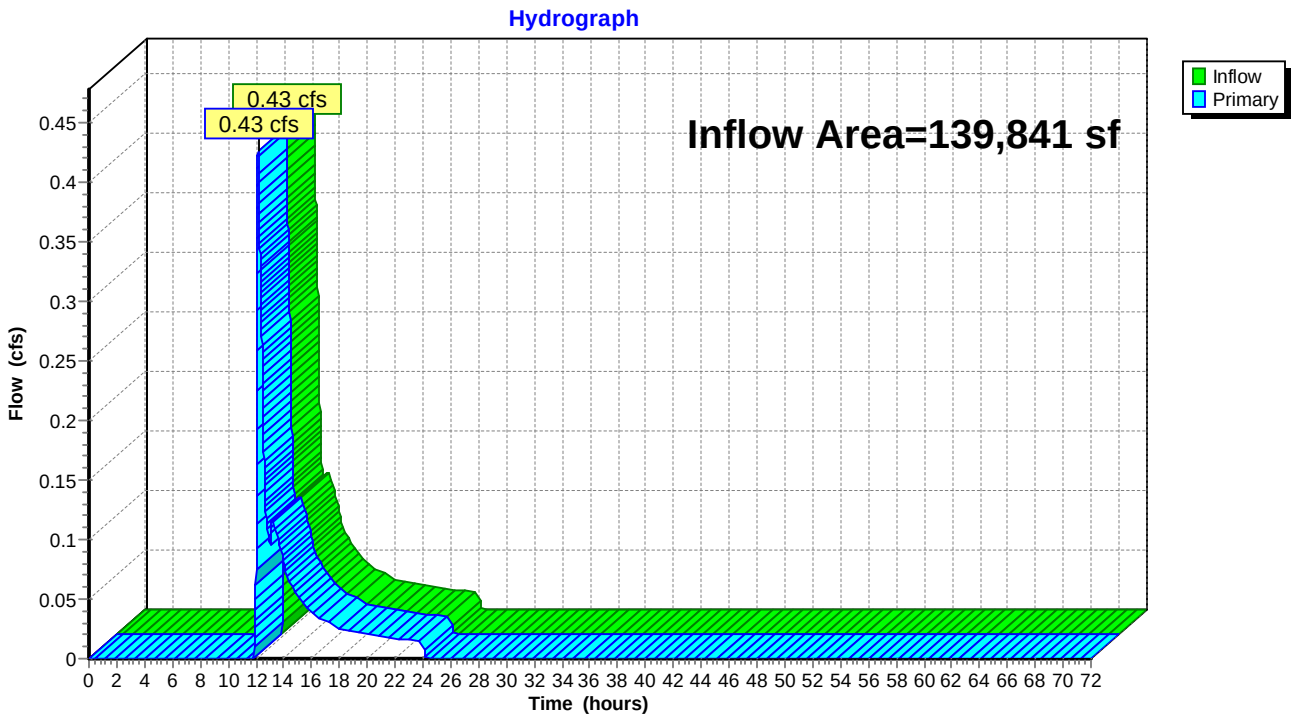


Summary for Link 2L: Lake Cochituate N1

Inflow Area = 139,841 sf, 19.05% Impervious, Inflow Depth = 0.19" for 2 Year event
Inflow = 0.43 cfs @ 12.15 hrs, Volume= 2,206 cf
Primary = 0.43 cfs @ 12.15 hrs, Volume= 2,206 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link 2L: Lake Cochituate N1

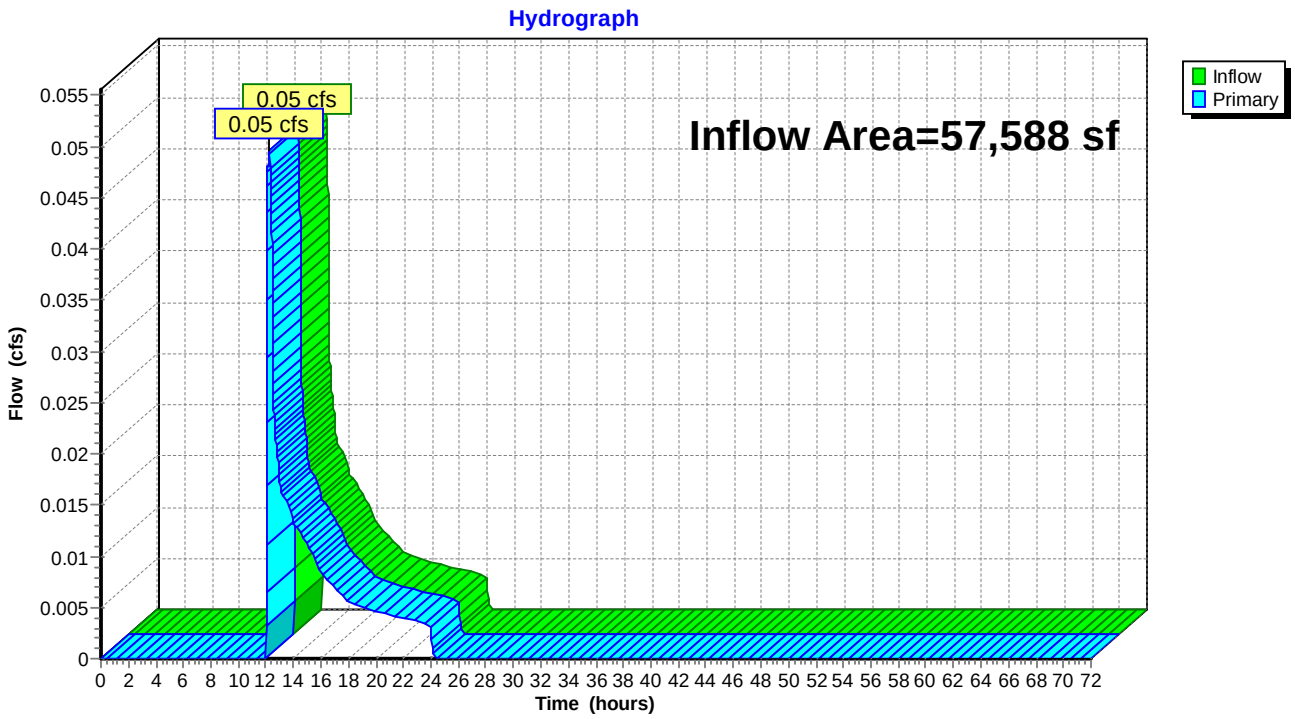


Summary for Link 3L: Lake Cochituate N2

Inflow Area = 57,588 sf, 12.49% Impervious, Inflow Depth = 0.08" for 2 Year event
Inflow = 0.05 cfs @ 12.28 hrs, Volume= 388 cf
Primary = 0.05 cfs @ 12.28 hrs, Volume= 388 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link 3L: Lake Cochituate N2

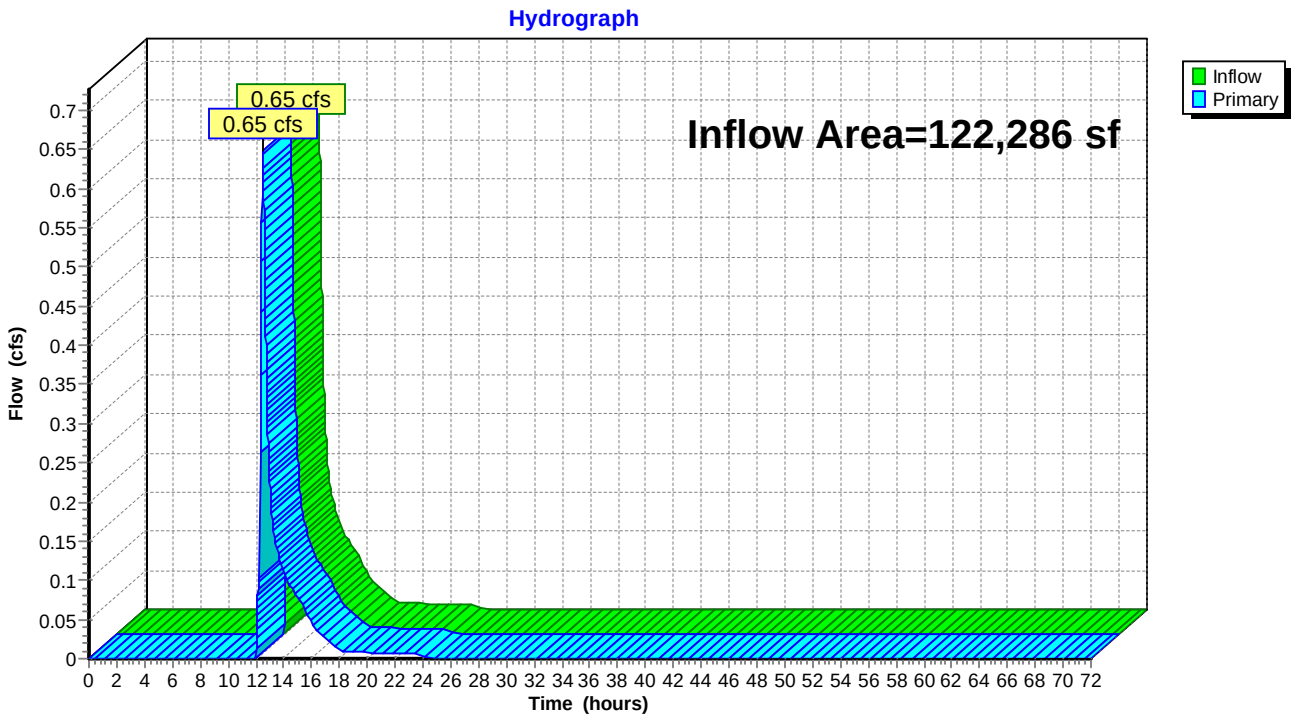


Summary for Link 4L: Lake Cochituate N3

Inflow Area = 122,286 sf, 13.65% Impervious, Inflow Depth = 0.24" for 2 Year event
Inflow = 0.65 cfs @ 12.49 hrs, Volume= 2,496 cf
Primary = 0.65 cfs @ 12.49 hrs, Volume= 2,496 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link 4L: Lake Cochituate N3

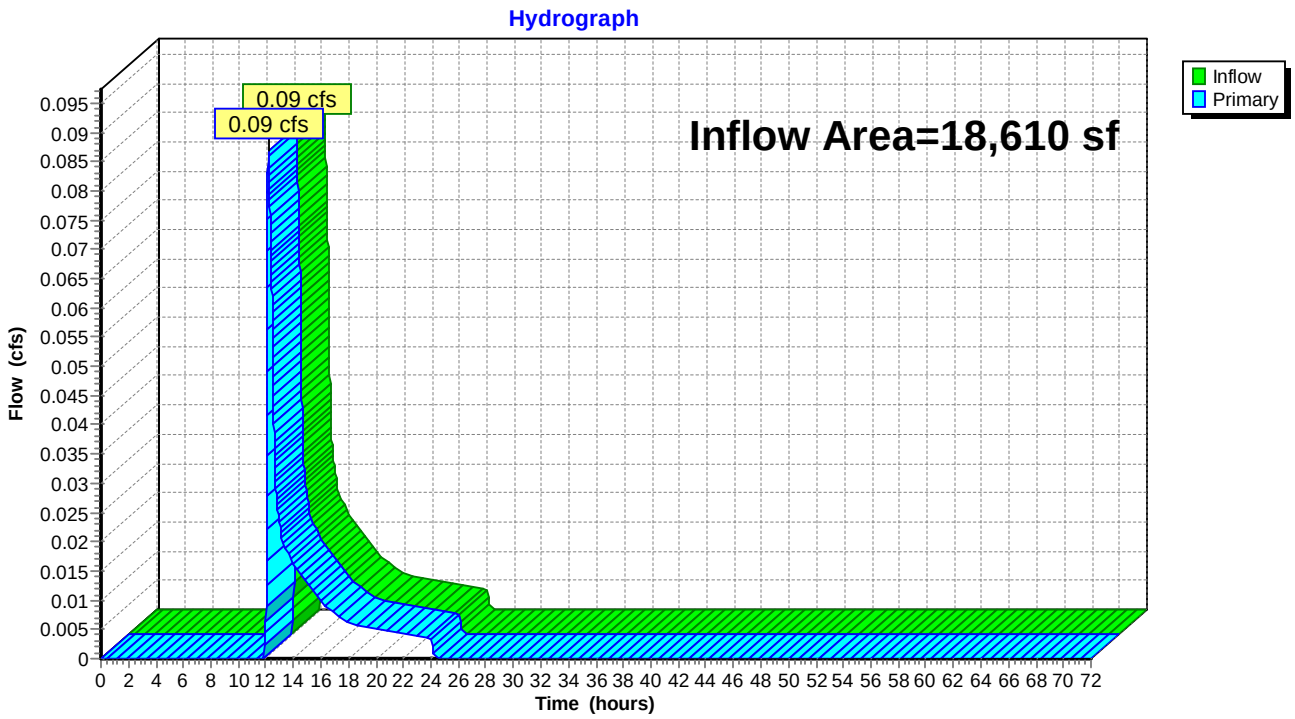


Summary for Link 5L: Lake Cochituate W2

Inflow Area = 18,610 sf, 23.30% Impervious, Inflow Depth = 0.32" for 2 Year event
Inflow = 0.09 cfs @ 12.17 hrs, Volume= 495 cf
Primary = 0.09 cfs @ 12.17 hrs, Volume= 495 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link 5L: Lake Cochituate W2

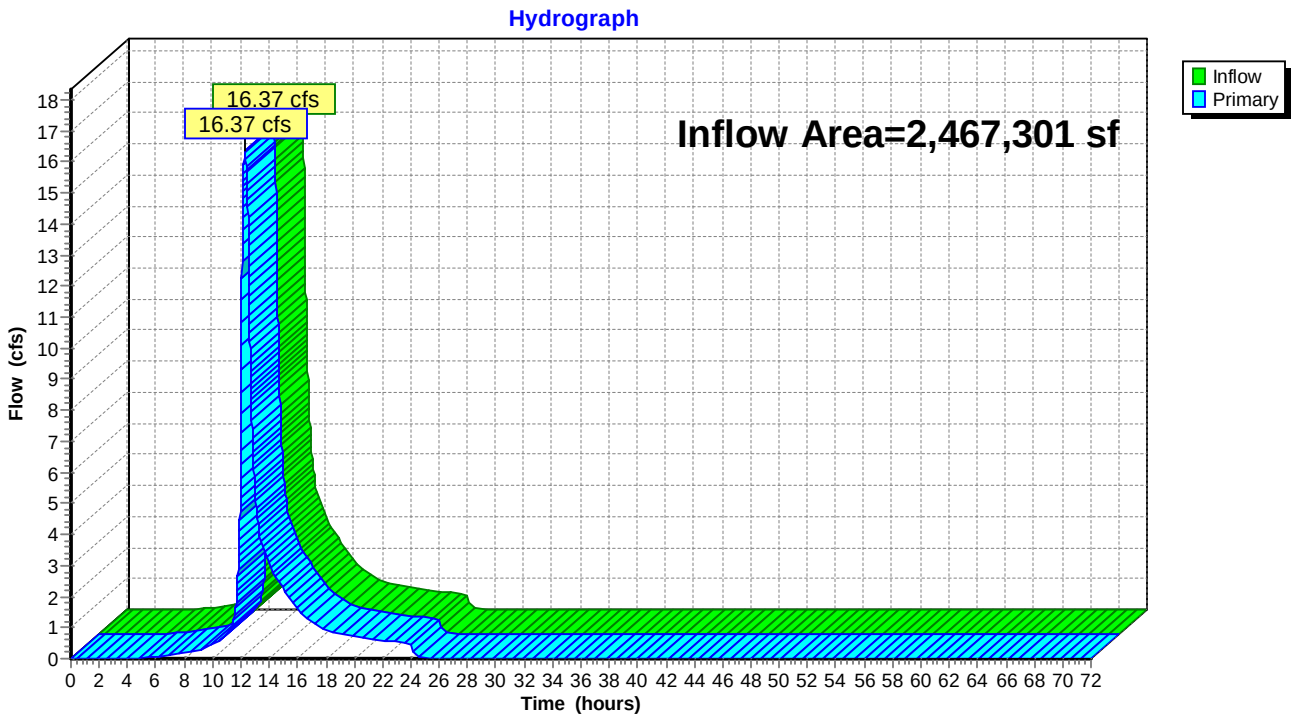


Summary for Link 6L: Total

Inflow Area = 2,467,301 sf, 28.26% Impervious, Inflow Depth = 0.52" for 2 Year event
Inflow = 16.37 cfs @ 12.26 hrs, Volume= 107,186 cf
Primary = 16.37 cfs @ 12.26 hrs, Volume= 107,186 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link 6L: Total

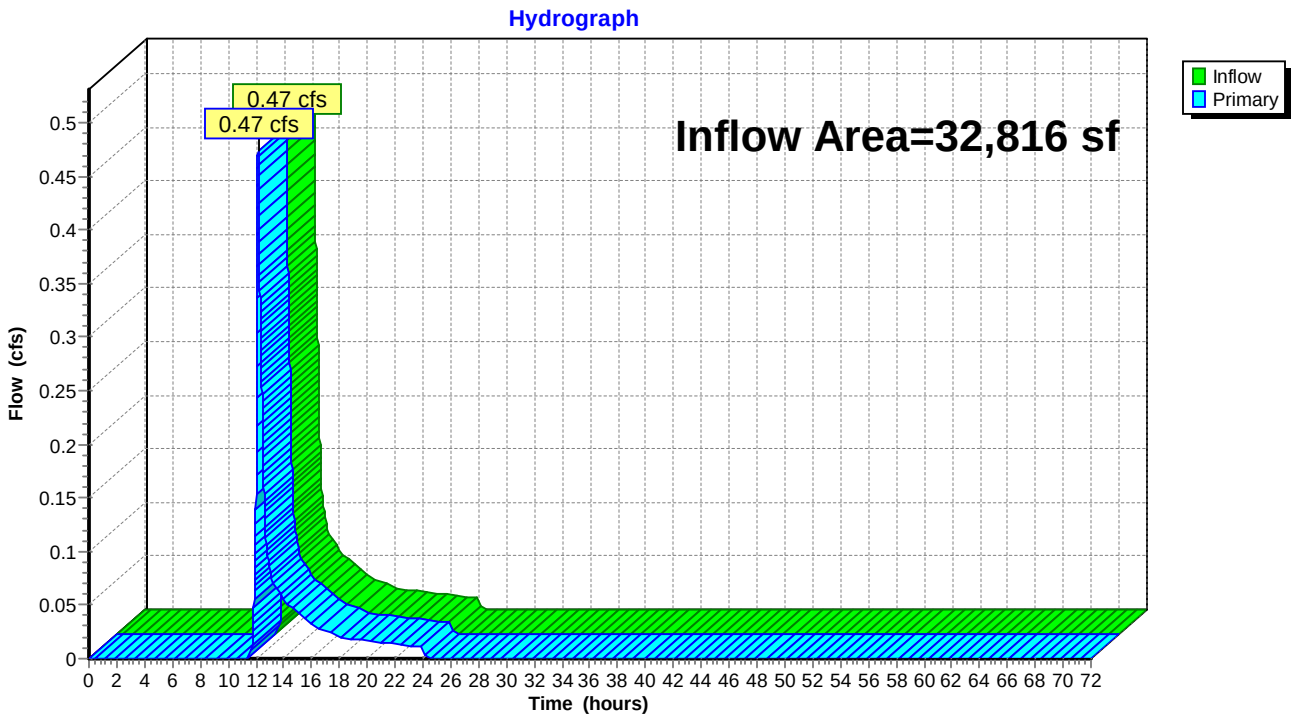


Summary for Link DP01: Cochituate Rd

Inflow Area = 32,816 sf, 19.44% Impervious, Inflow Depth = 0.71" for 2 Year event
Inflow = 0.47 cfs @ 12.15 hrs, Volume= 1,930 cf
Primary = 0.47 cfs @ 12.15 hrs, Volume= 1,930 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP01: Cochituate Rd

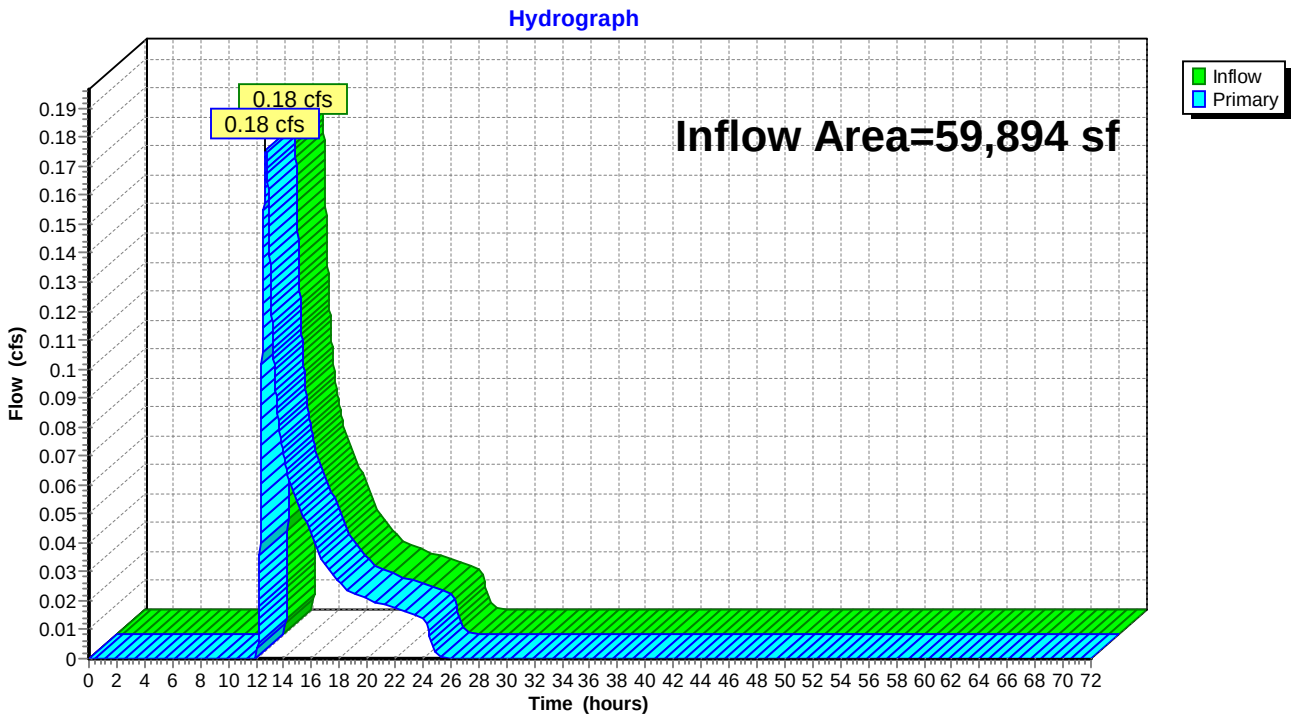


Summary for Link DP02: Chrysler Road

Inflow Area = 59,894 sf, 5.23% Impervious, Inflow Depth = 0.36" for 2 Year event
Inflow = 0.18 cfs @ 12.70 hrs, Volume= 1,776 cf
Primary = 0.18 cfs @ 12.70 hrs, Volume= 1,776 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP02: Chrysler Road

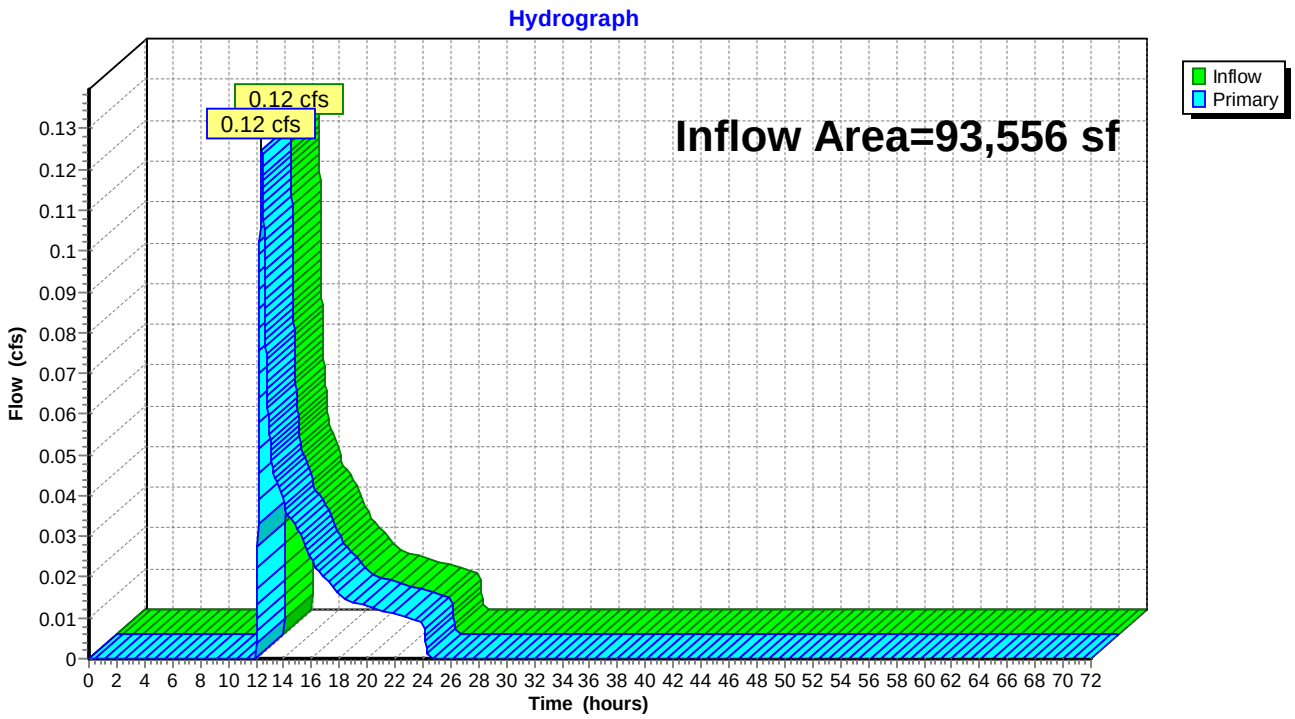


Summary for Link DP03: WF A

Inflow Area = 93,556 sf, 18.14% Impervious, Inflow Depth = 0.14" for 2 Year event
Inflow = 0.12 cfs @ 12.43 hrs, Volume= 1,060 cf
Primary = 0.12 cfs @ 12.43 hrs, Volume= 1,060 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP03: WF A

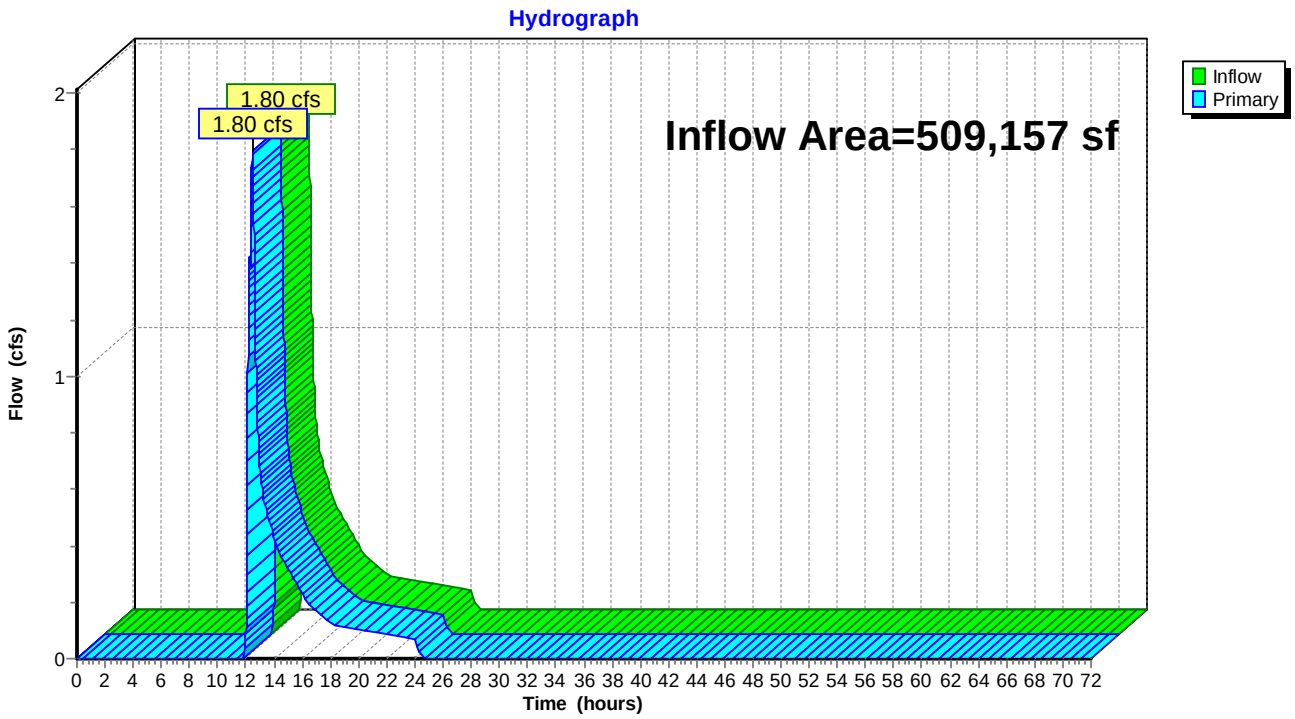


Summary for Link DP04: Lake Cochituate Middle Pond

Inflow Area = 509,157 sf, 12.96% Impervious, Inflow Depth = 0.27" for 2 Year event
Inflow = 1.80 cfs @ 12.45 hrs, Volume= 11,534 cf
Primary = 1.80 cfs @ 12.45 hrs, Volume= 11,534 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP04: Lake Cochituate Middle Pond

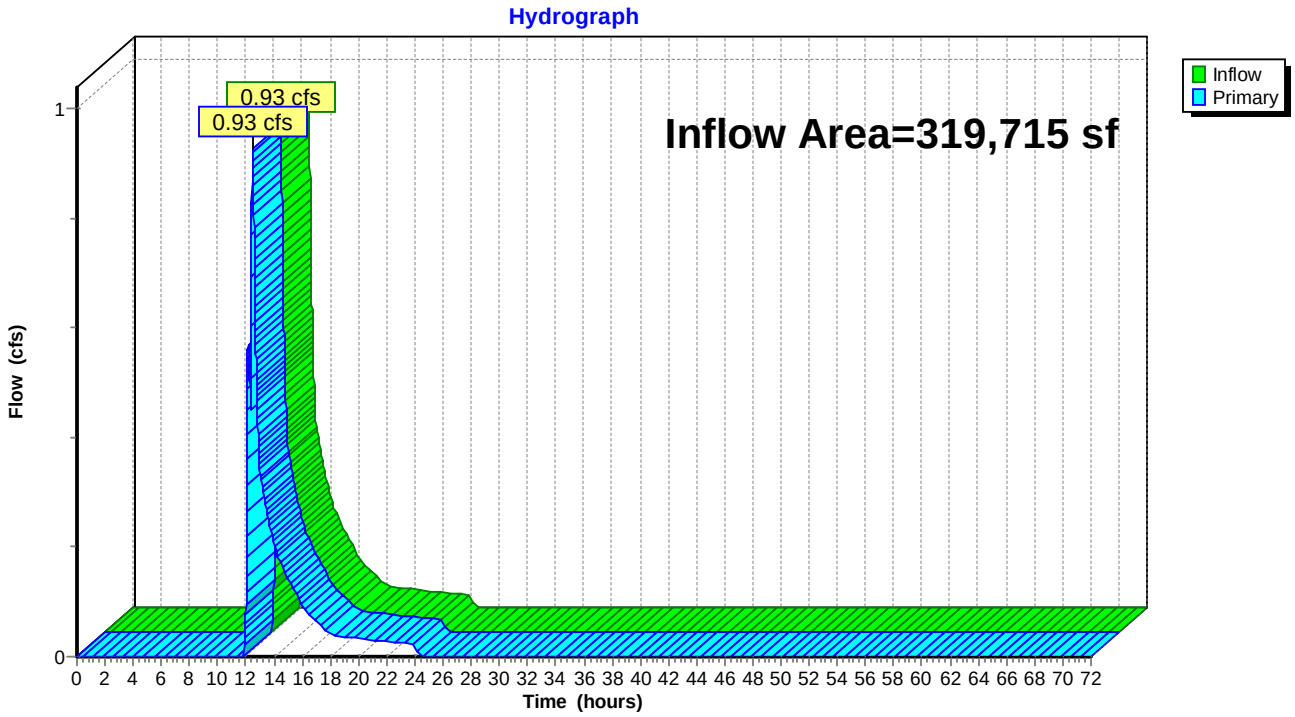


Summary for Link DP04-1: WF B

Inflow Area = 319,715 sf, 15.80% Impervious, Inflow Depth = 0.19" for 2 Year event
Inflow = 0.93 cfs @ 12.47 hrs, Volume= 5,090 cf
Primary = 0.93 cfs @ 12.47 hrs, Volume= 5,090 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP04-1: WF B

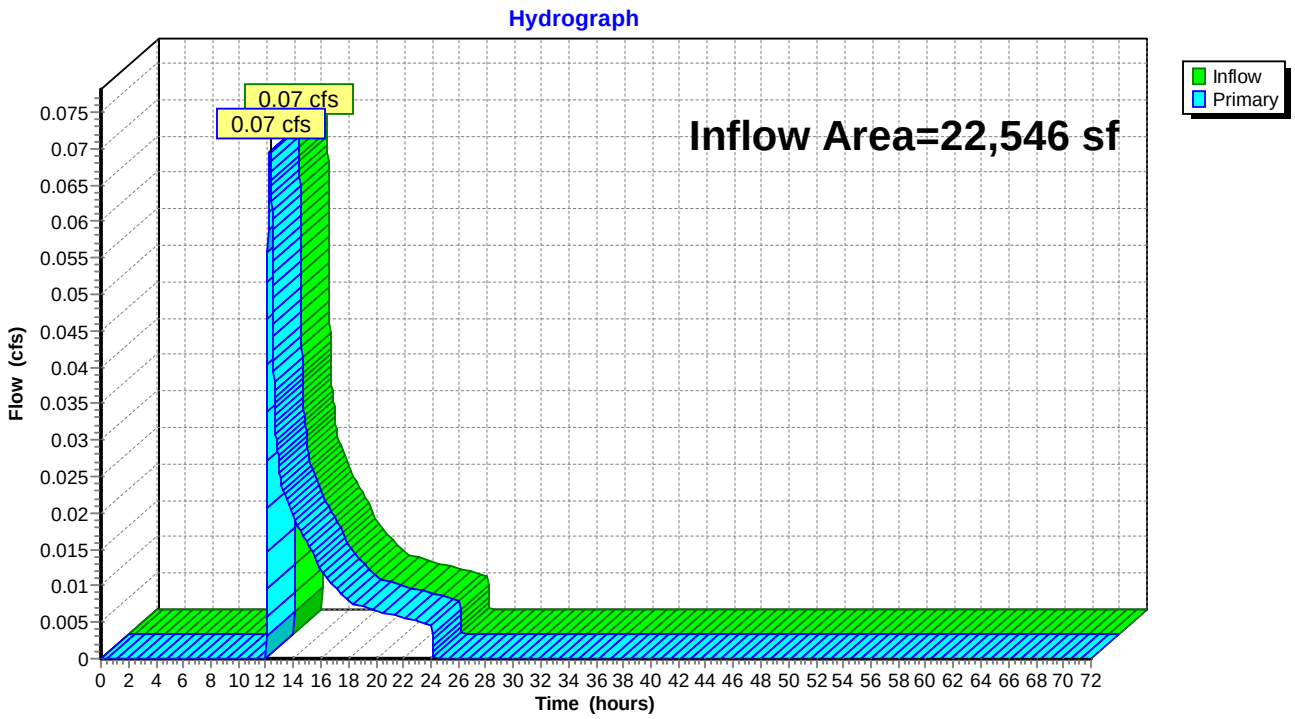


Summary for Link DP04-2: WF C

Inflow Area = 22,546 sf, 0.00% Impervious, Inflow Depth = 0.29" for 2 Year event
Inflow = 0.07 cfs @ 12.31 hrs, Volume= 551 cf
Primary = 0.07 cfs @ 12.31 hrs, Volume= 551 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP04-2: WF C

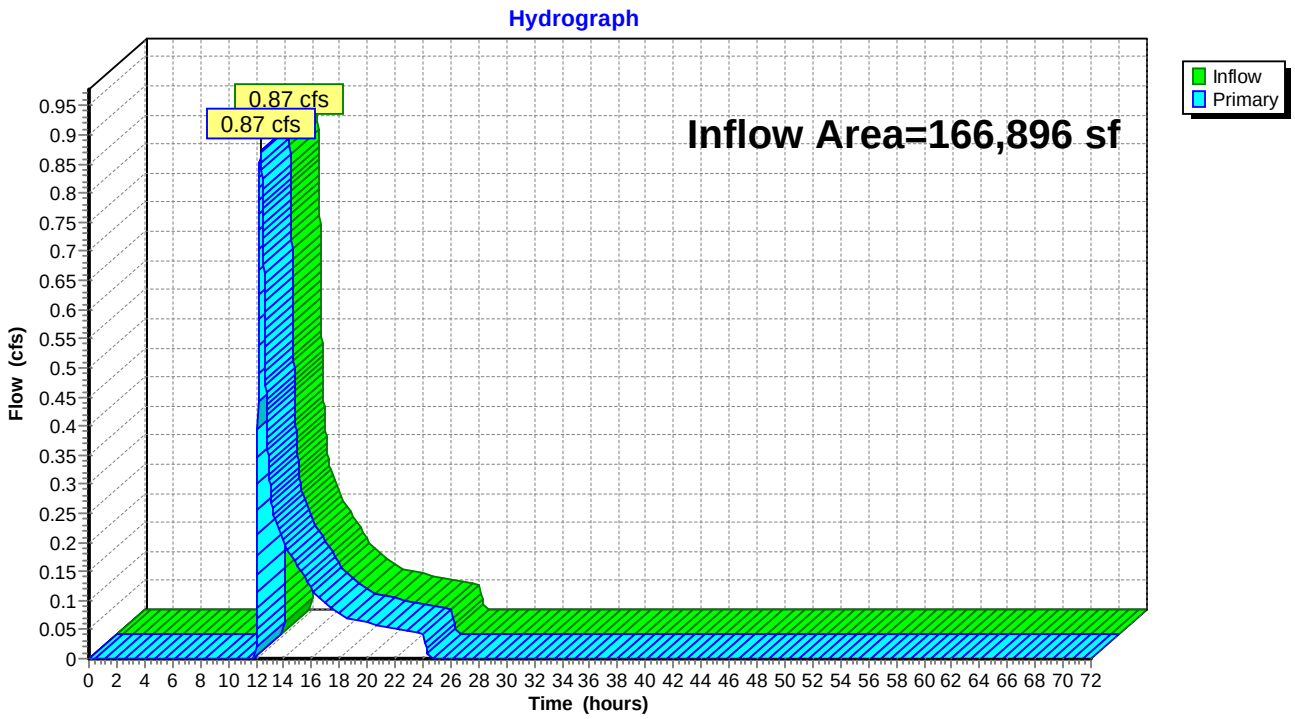


Summary for Link DP04-3: Lake Cochituate

Inflow Area = 166,896 sf, 9.27% Impervious, Inflow Depth = 0.42" for 2 Year event
Inflow = 0.87 cfs @ 12.33 hrs, Volume= 5,893 cf
Primary = 0.87 cfs @ 12.33 hrs, Volume= 5,893 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP04-3: Lake Cochituate

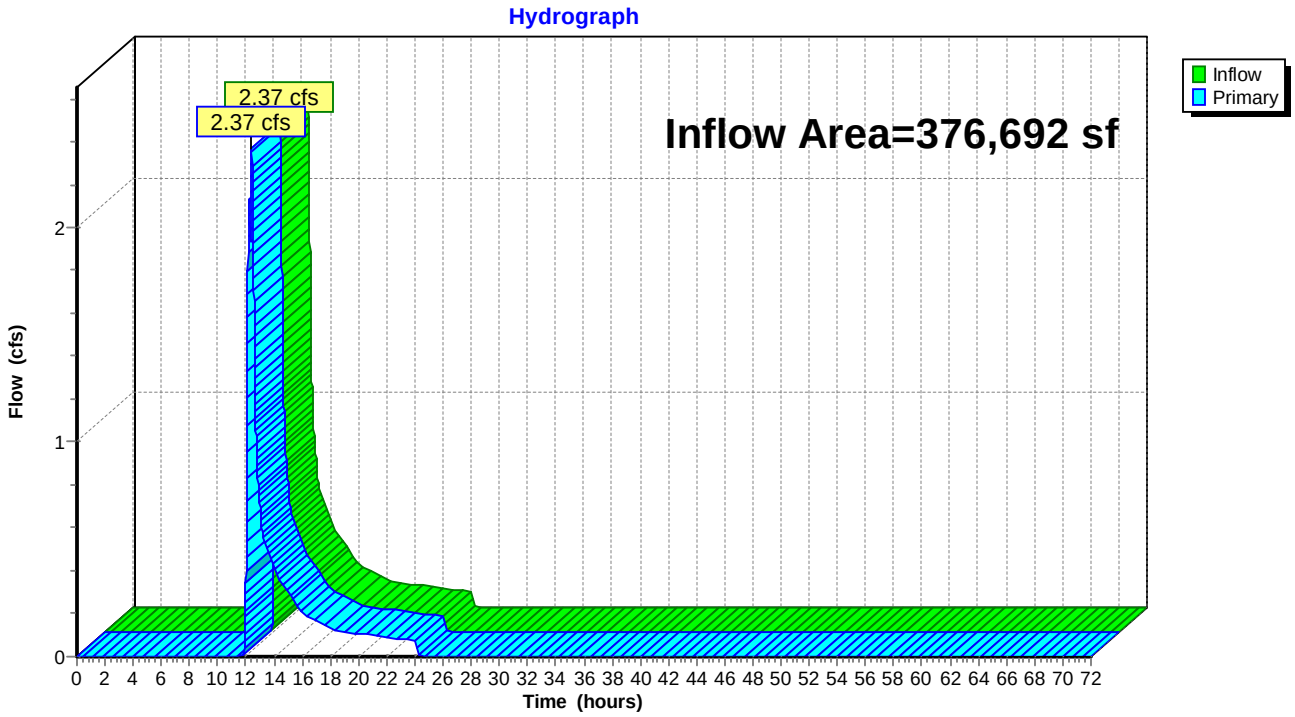


Summary for Link DP05: Lake Cochituate Middle

Inflow Area = 376,692 sf, 21.92% Impervious, Inflow Depth = 0.41" for 2 Year event
Inflow = 2.37 cfs @ 12.40 hrs, Volume= 12,773 cf
Primary = 2.37 cfs @ 12.40 hrs, Volume= 12,773 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP05: Lake Cochituate Middle

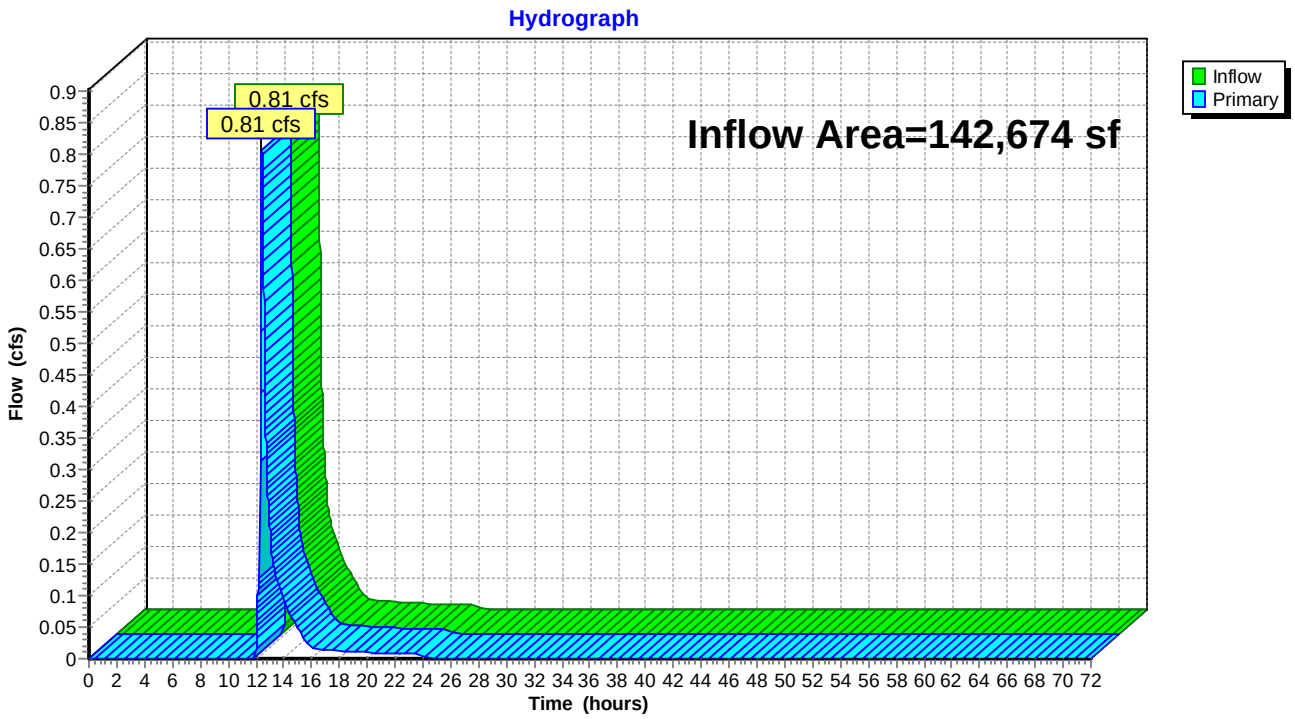


Summary for Link DP05-1: WF I

Inflow Area = 142,674 sf, 22.86% Impervious, Inflow Depth = 0.20" for 2 Year event
Inflow = 0.81 cfs @ 12.43 hrs, Volume= 2,355 cf
Primary = 0.81 cfs @ 12.43 hrs, Volume= 2,355 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP05-1: WF I

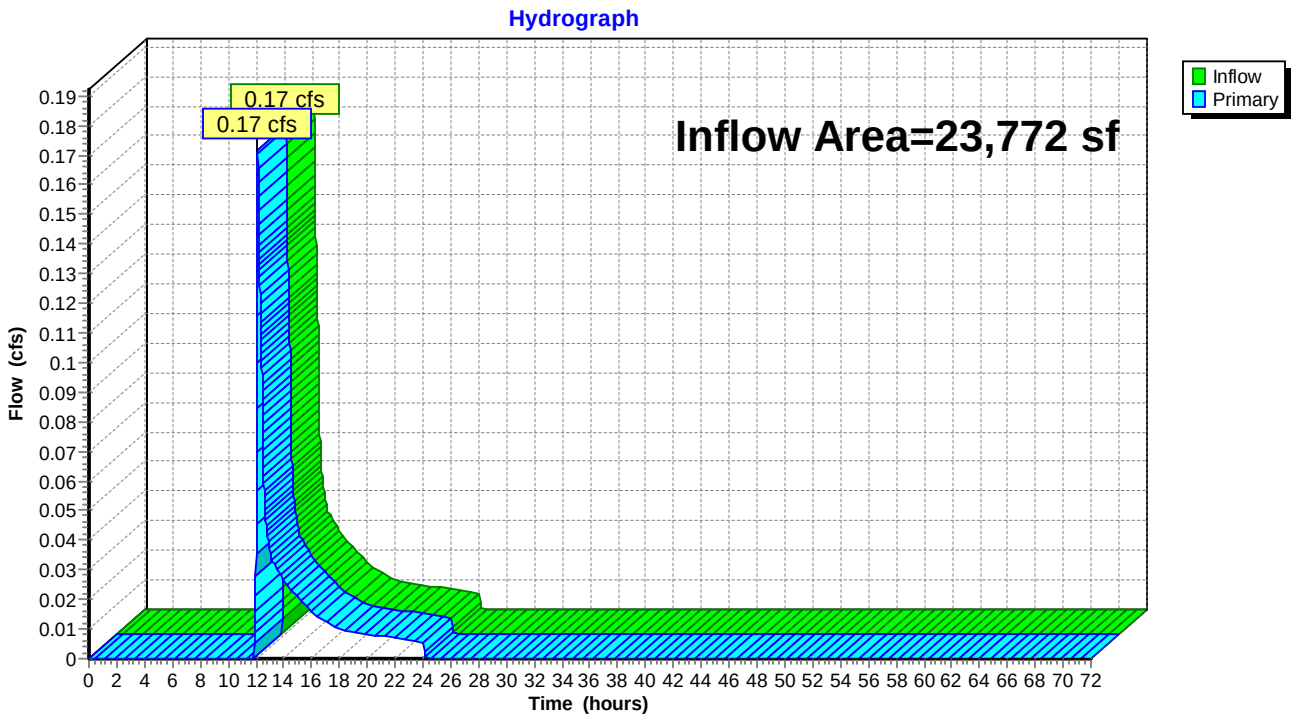


Summary for Link DP05-2: WF G&H

Inflow Area = 23,772 sf, 16.88% Impervious, Inflow Depth = 0.42" for 2 Year event
Inflow = 0.17 cfs @ 12.12 hrs, Volume= 825 cf
Primary = 0.17 cfs @ 12.12 hrs, Volume= 825 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP05-2: WF G&H

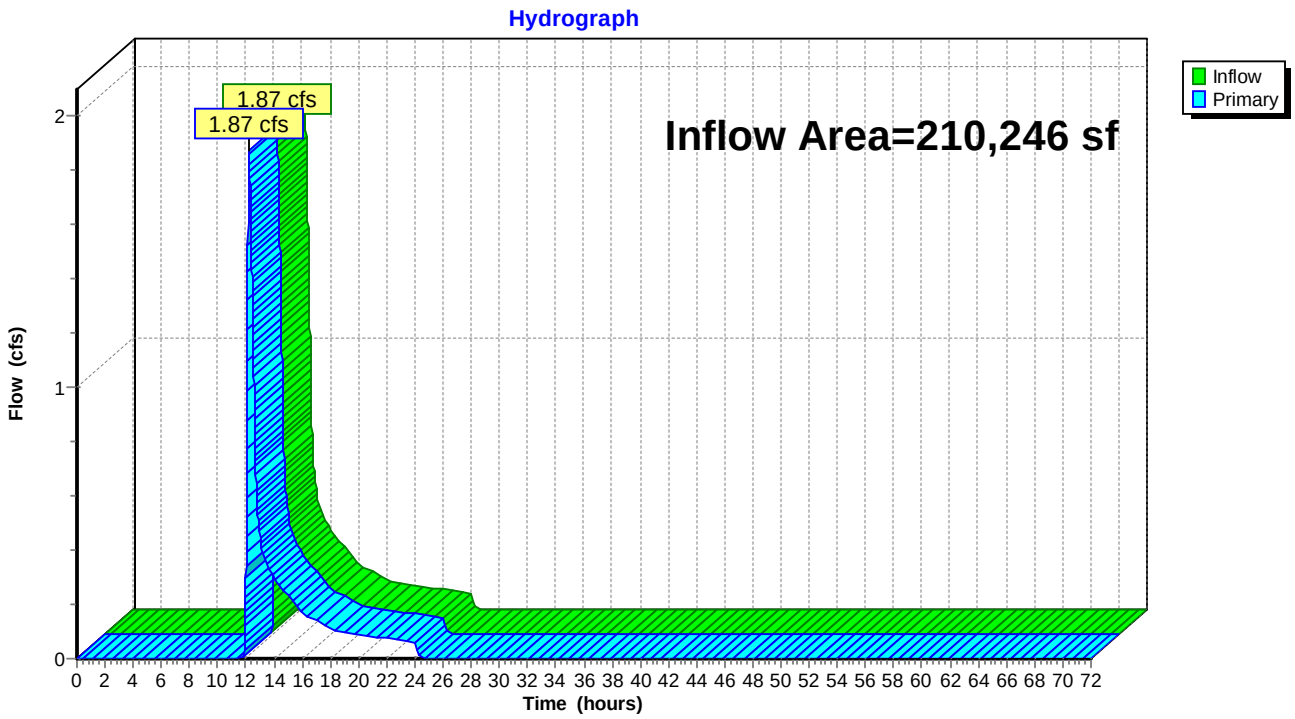


Summary for Link DP05-3: Lake Cochituate W4

Inflow Area = 210,246 sf, 21.85% Impervious, Inflow Depth = 0.55" for 2 Year event
Inflow = 1.87 cfs @ 12.22 hrs, Volume= 9,593 cf
Primary = 1.87 cfs @ 12.22 hrs, Volume= 9,593 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP05-3: Lake Cochituate W4

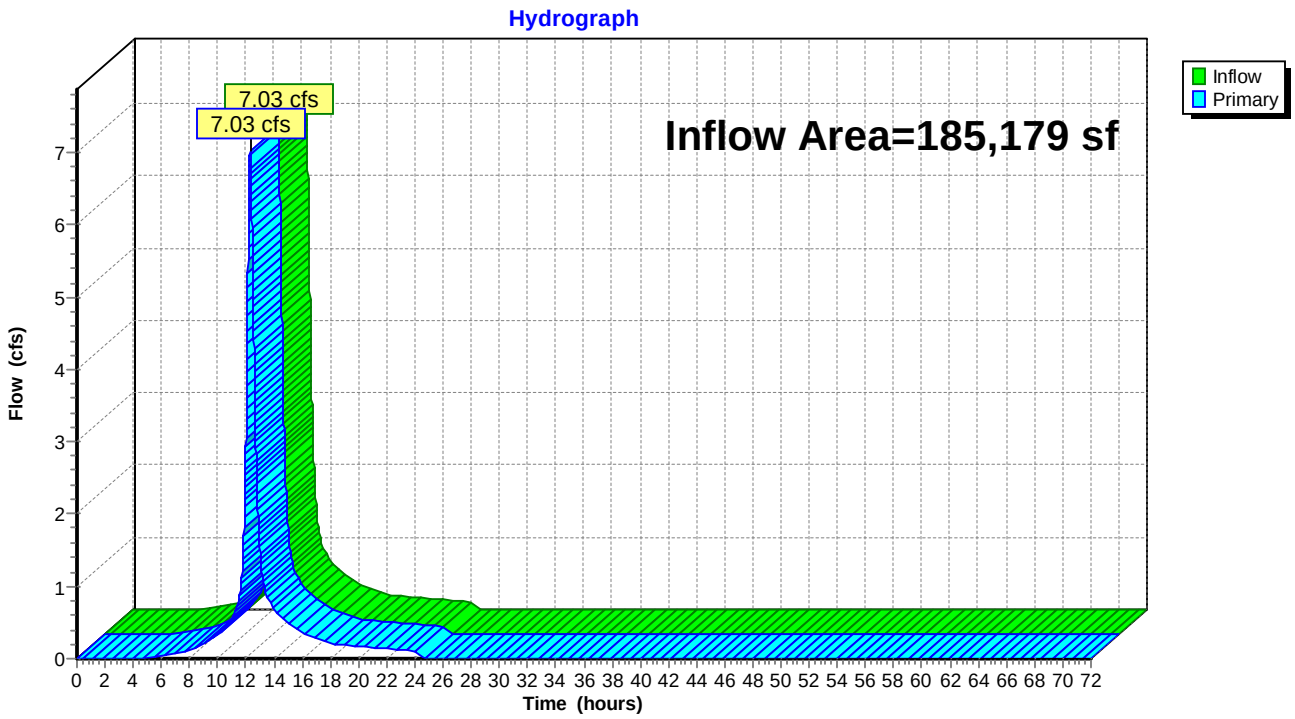


Summary for Link DP06: Worcester St

Inflow Area = 185,179 sf, 86.11% Impervious, Inflow Depth = 2.30" for 2 Year event
Inflow = 7.03 cfs @ 12.28 hrs, Volume= 35,448 cf
Primary = 7.03 cfs @ 12.28 hrs, Volume= 35,448 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP06: Worcester St

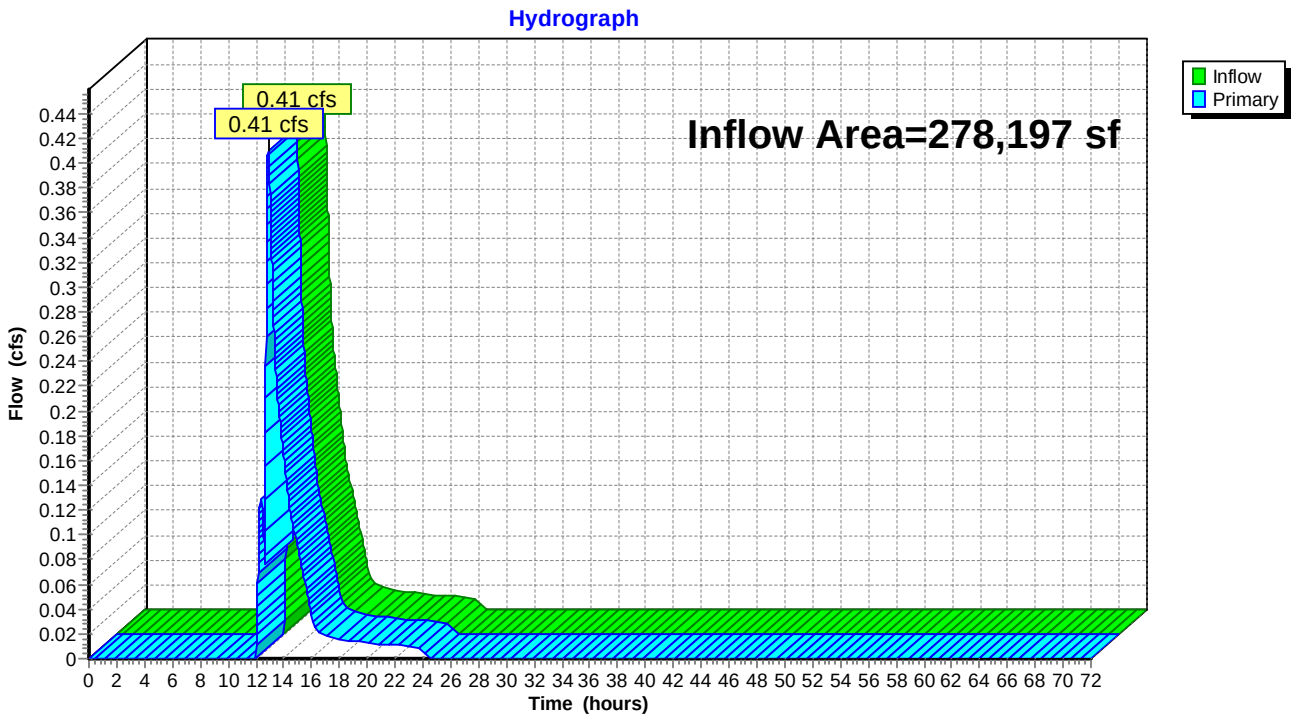


Summary for Link DP07: WF F

Inflow Area = 278,197 sf, 19.13% Impervious, Inflow Depth = 0.11" for 2 Year event
Inflow = 0.41 cfs @ 12.88 hrs, Volume= 2,561 cf
Primary = 0.41 cfs @ 12.88 hrs, Volume= 2,561 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP07: WF F

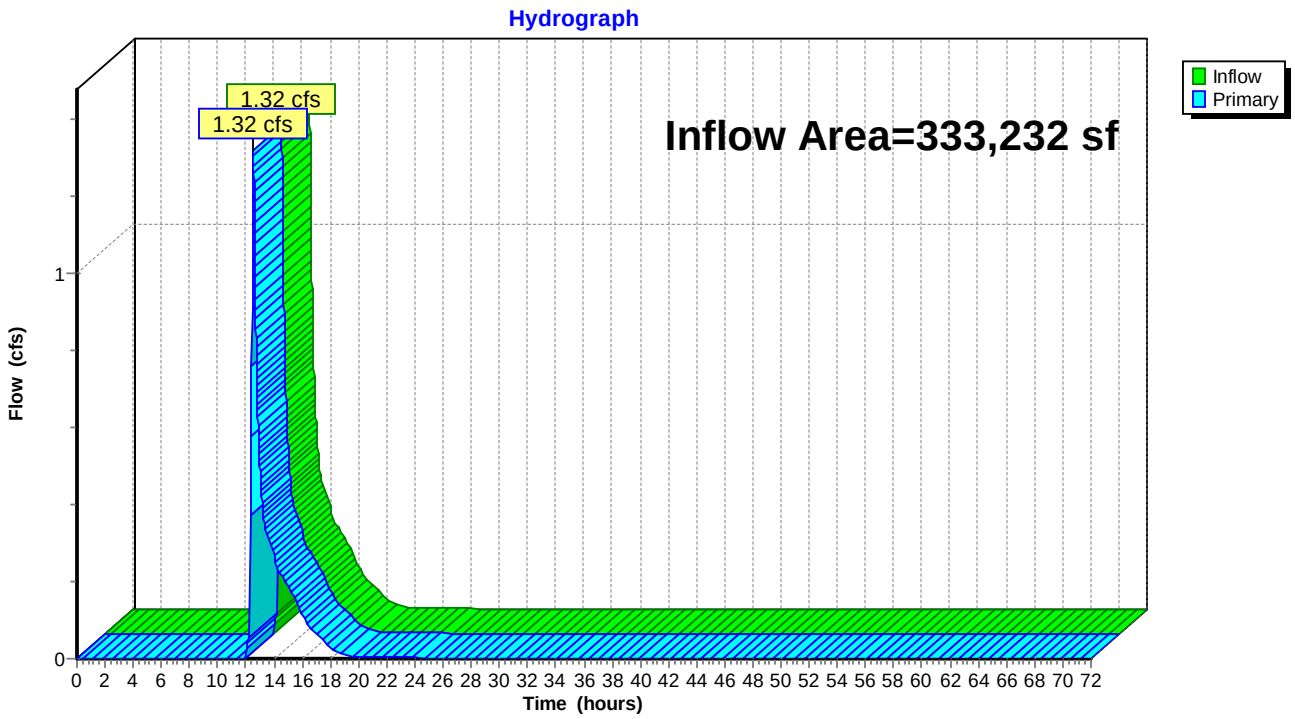


Summary for Link DP08: WF J

Inflow Area = 333,232 sf, 26.18% Impervious, Inflow Depth = 0.18" for 2 Year event
Inflow = 1.32 cfs @ 12.51 hrs, Volume= 5,114 cf
Primary = 1.32 cfs @ 12.51 hrs, Volume= 5,114 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP08: WF J

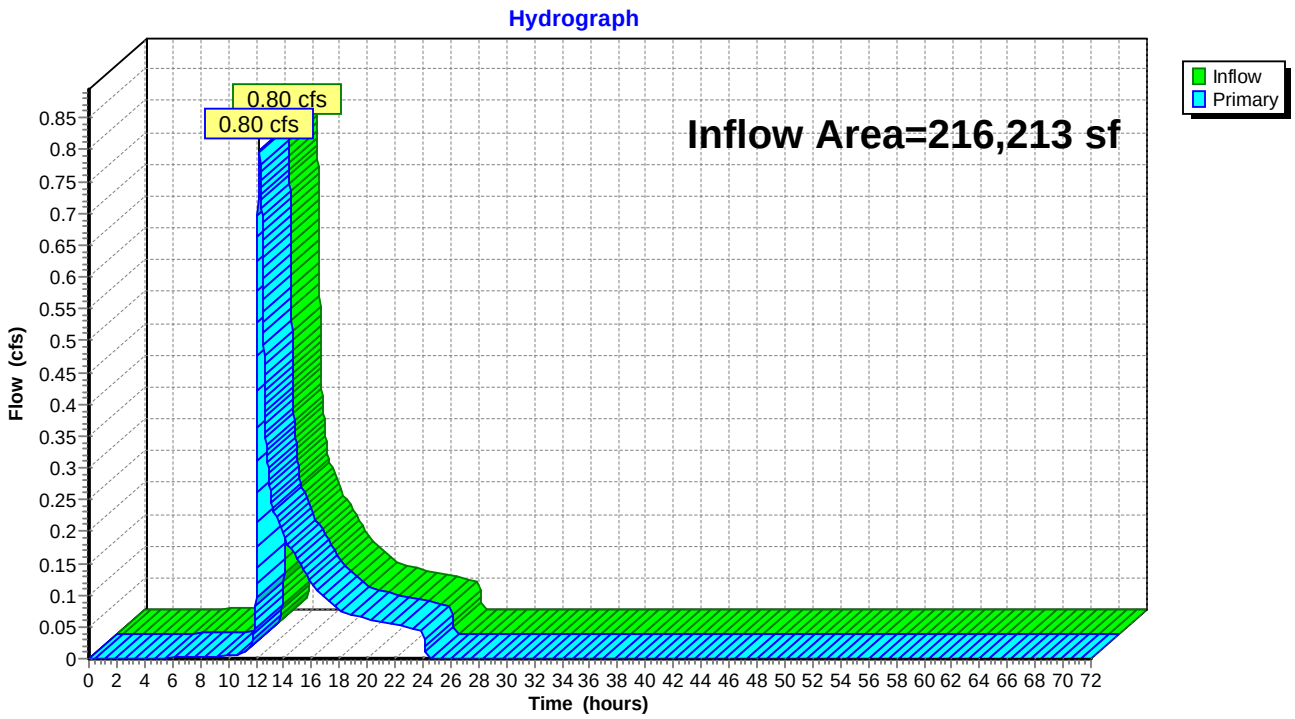


Summary for Link DP09: Unnamed Pond

Inflow Area = 216,213 sf, 21.30% Impervious, Inflow Depth = 0.32" for 2 Year event
Inflow = 0.80 cfs @ 12.26 hrs, Volume= 5,850 cf
Primary = 0.80 cfs @ 12.26 hrs, Volume= 5,850 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP09: Unnamed Pond

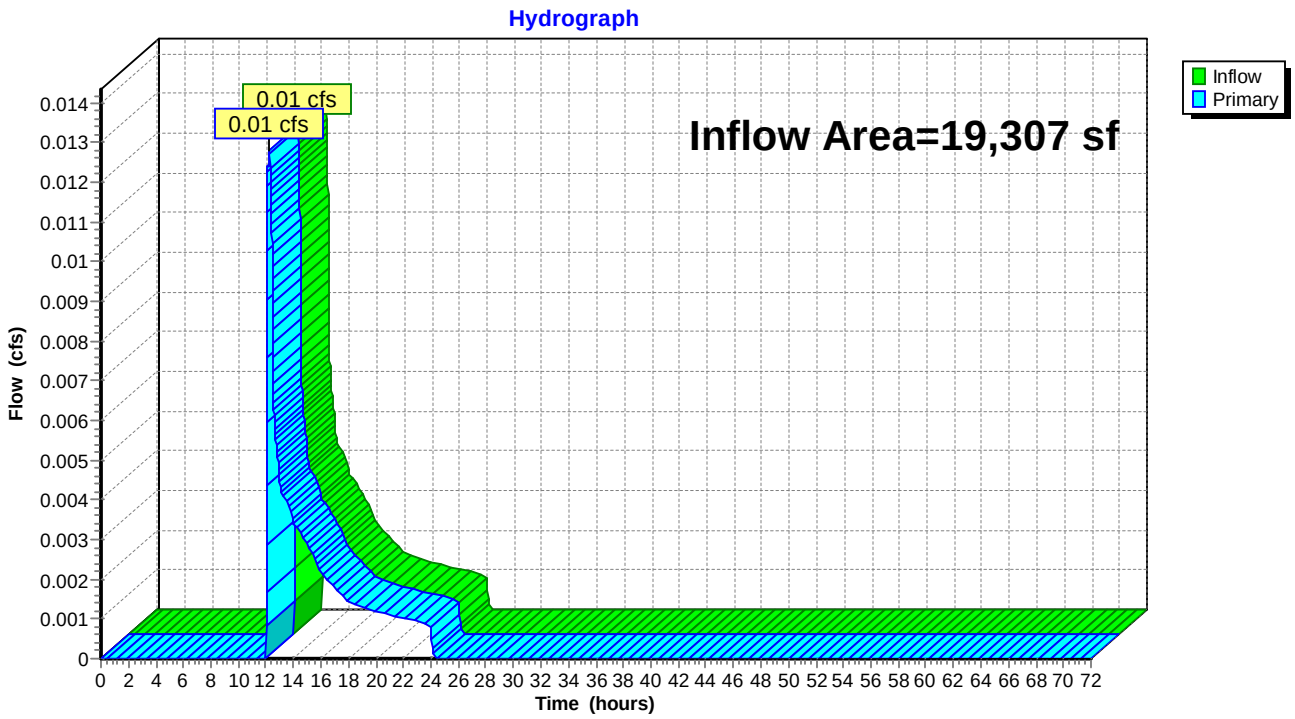


Summary for Link DP09-1: WF K

Inflow Area = 19,307 sf, 30.69% Impervious, Inflow Depth = 0.06" for 2 Year event
Inflow = 0.01 cfs @ 12.28 hrs, Volume= 100 cf
Primary = 0.01 cfs @ 12.28 hrs, Volume= 100 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP09-1: WF K

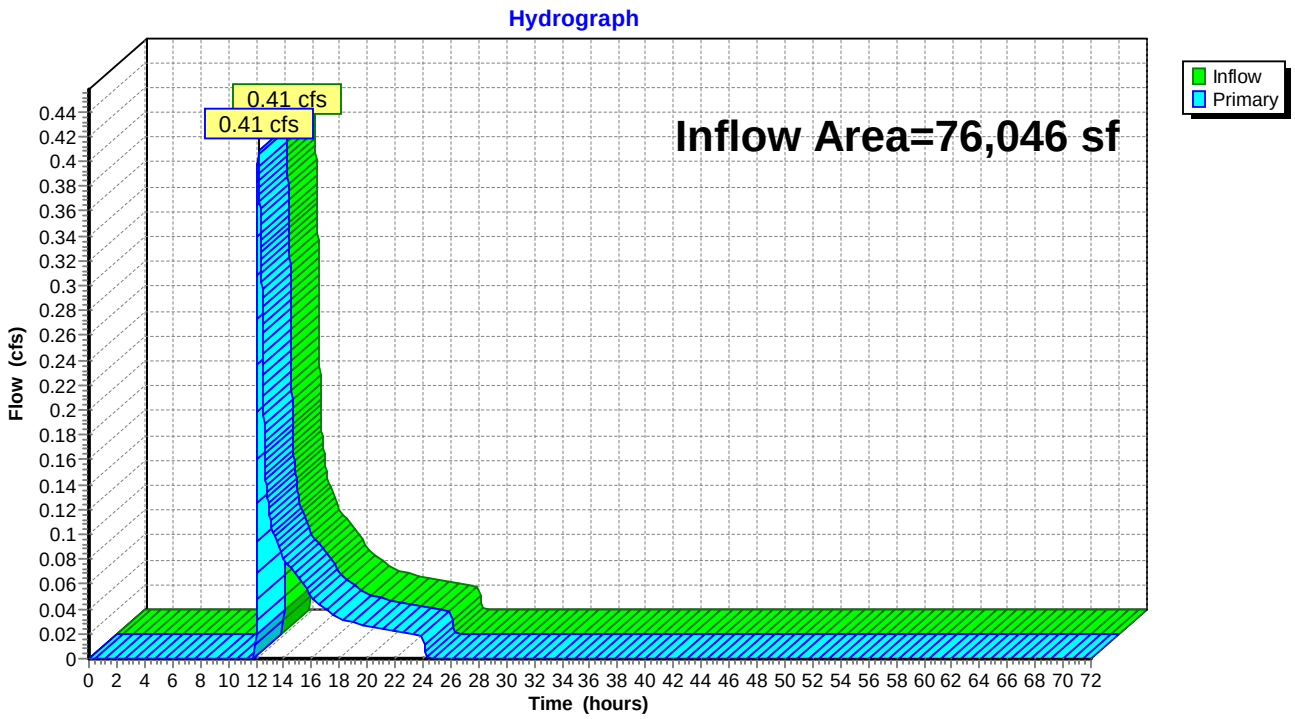


Summary for Link DP09-2: WF KA

Inflow Area = 76,046 sf, 25.44% Impervious, Inflow Depth = 0.39" for 2 Year event
Inflow = 0.41 cfs @ 12.16 hrs, Volume= 2,465 cf
Primary = 0.41 cfs @ 12.16 hrs, Volume= 2,465 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP09-2: WF KA

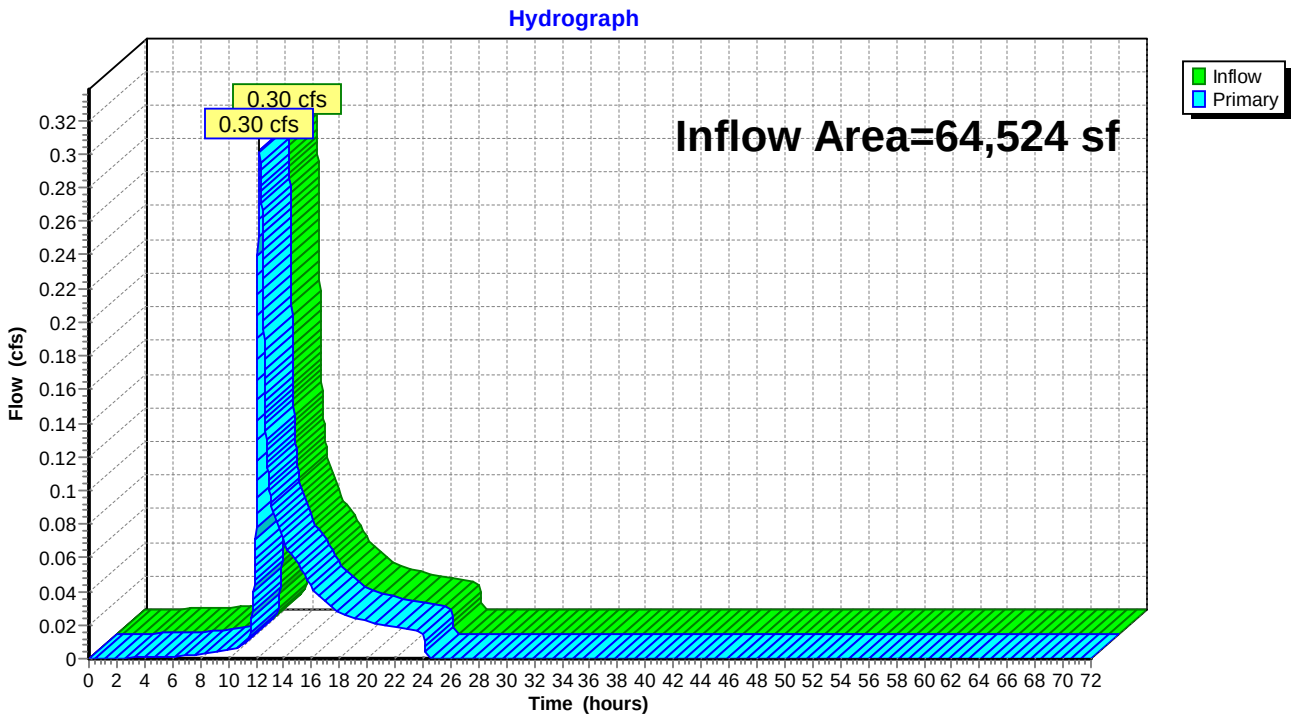


Summary for Link DP09-3: WF B

Inflow Area = 64,524 sf, 18.72% Impervious, Inflow Depth = 0.42" for 2 Year event
Inflow = 0.30 cfs @ 12.26 hrs, Volume= 2,248 cf
Primary = 0.30 cfs @ 12.26 hrs, Volume= 2,248 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP09-3: WF B

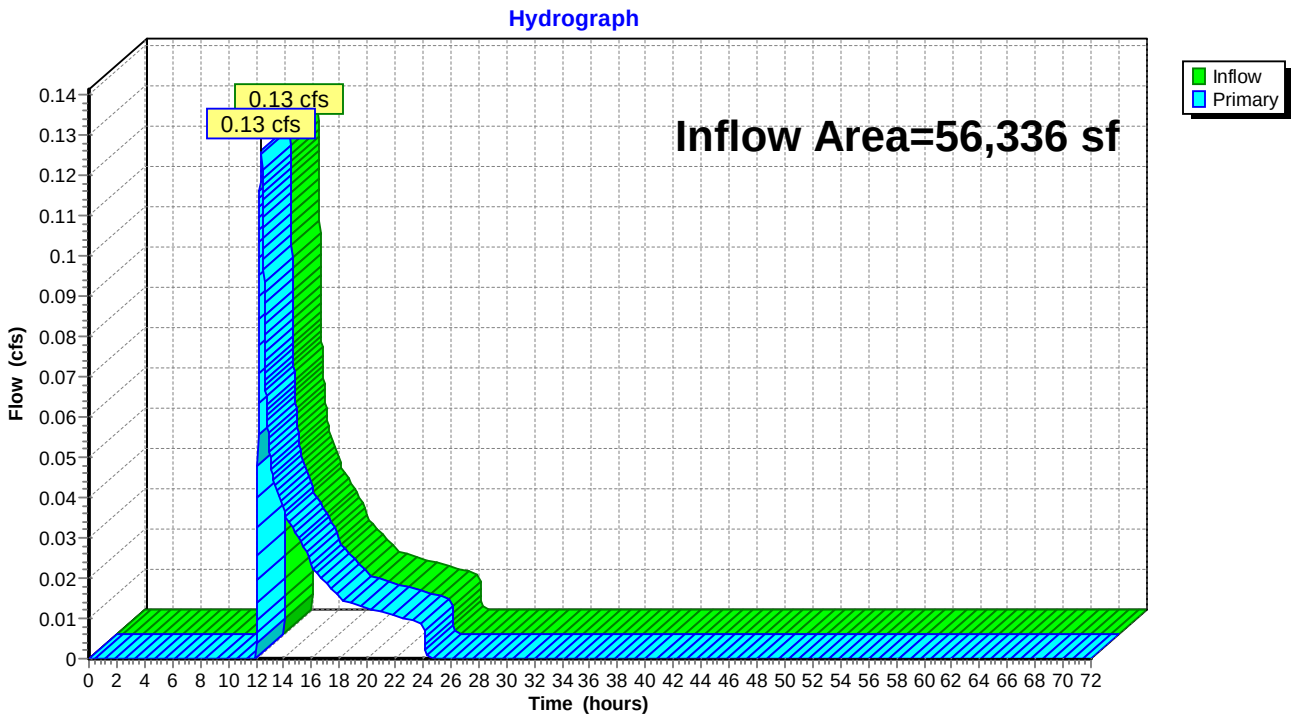


Summary for Link DP09-4: WF E&L, TOB C

Inflow Area = 56,336 sf, 15.46% Impervious, Inflow Depth = 0.22" for 2 Year event
Inflow = 0.13 cfs @ 12.39 hrs, Volume= 1,036 cf
Primary = 0.13 cfs @ 12.39 hrs, Volume= 1,036 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP09-4: WF E&L, TOB C

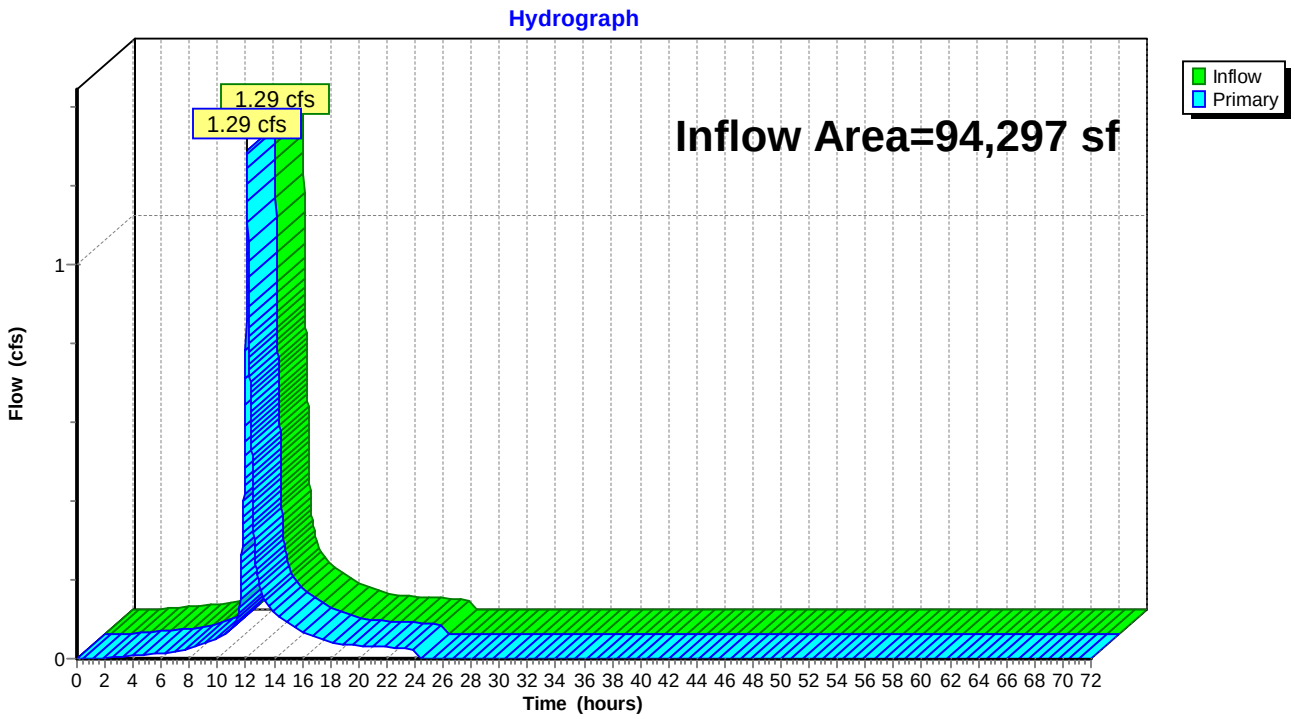


Summary for Link DP10: WF A

Inflow Area = 94,297 sf, 36.36% Impervious, Inflow Depth = 0.71" for 2 Year event
Inflow = 1.29 cfs @ 12.08 hrs, Volume= 5,605 cf
Primary = 1.29 cfs @ 12.08 hrs, Volume= 5,605 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP10: WF A

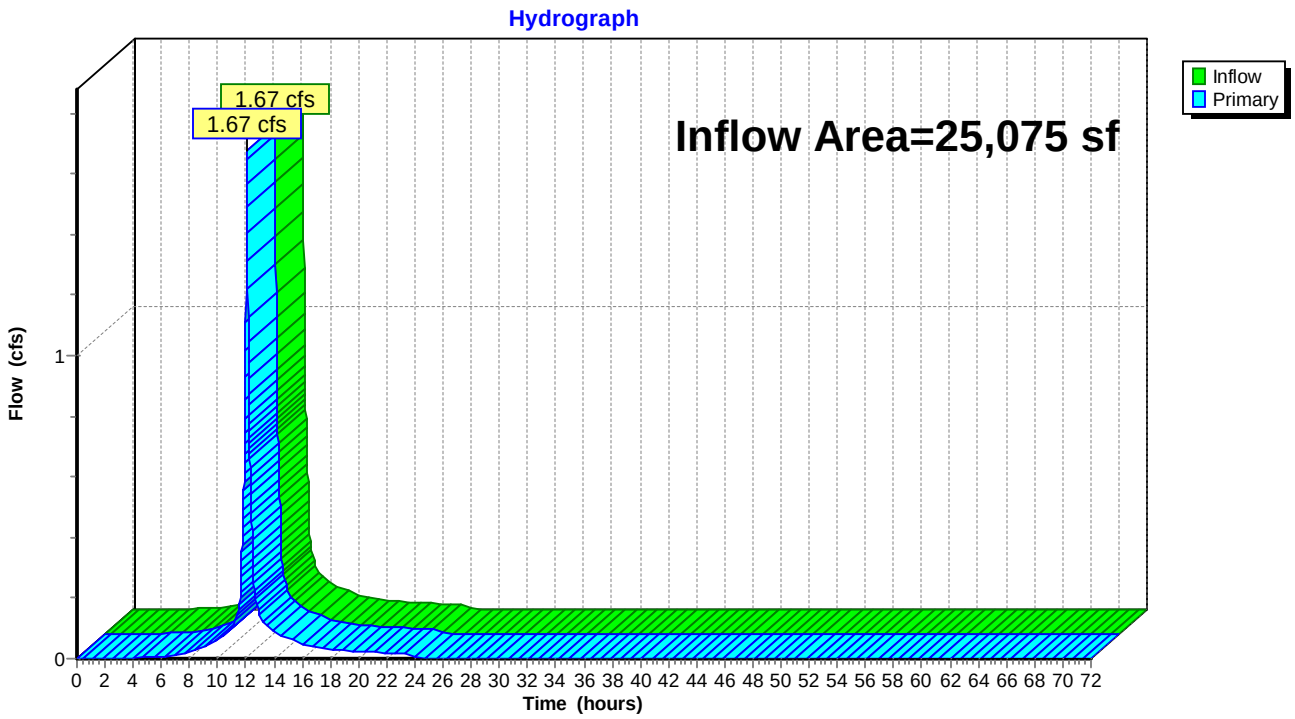


Summary for Link DP11: Local St Drain System

Inflow Area = 25,075 sf, 86.74% Impervious, Inflow Depth = 2.50" for 2 Year event
Inflow = 1.67 cfs @ 12.07 hrs, Volume= 5,224 cf
Primary = 1.67 cfs @ 12.07 hrs, Volume= 5,224 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP11: Local St Drain System

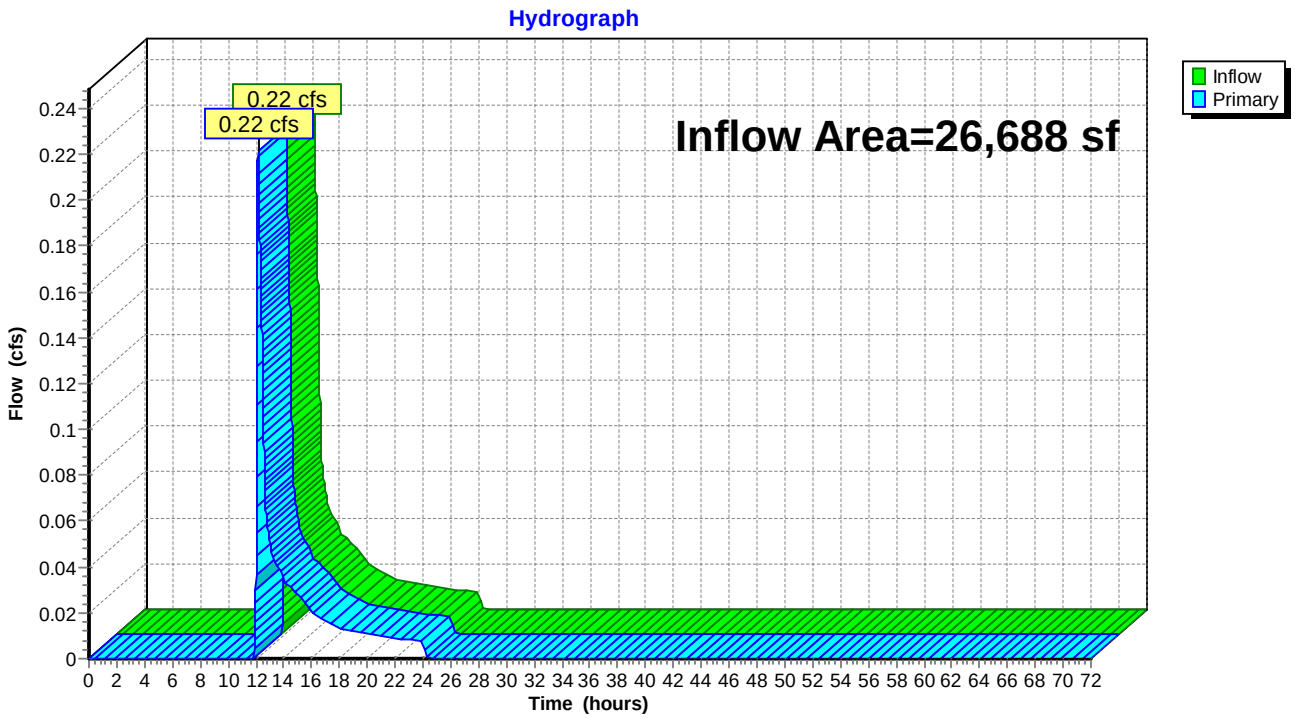


Summary for Link DP12: Washington St Low Point

Inflow Area = 26,688 sf, 37.75% Impervious, Inflow Depth = 0.50" for 2 Year event
Inflow = 0.22 cfs @ 12.16 hrs, Volume= 1,106 cf
Primary = 0.22 cfs @ 12.16 hrs, Volume= 1,106 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP12: Washington St Low Point

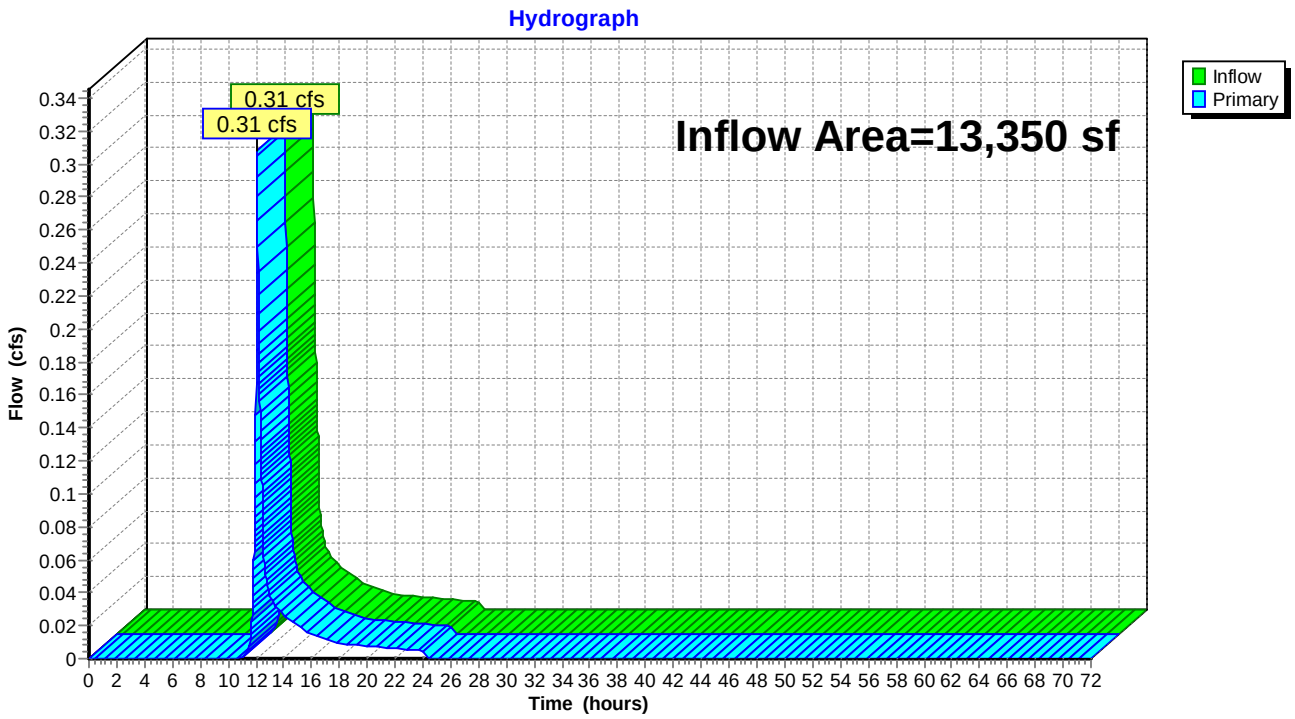


Summary for Link DP13: Empty Lot

Inflow Area = 13,350 sf, 0.00% Impervious, Inflow Depth = 0.90" for 2 Year event
Inflow = 0.31 cfs @ 12.08 hrs, Volume= 1,000 cf
Primary = 0.31 cfs @ 12.08 hrs, Volume= 1,000 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP13: Empty Lot

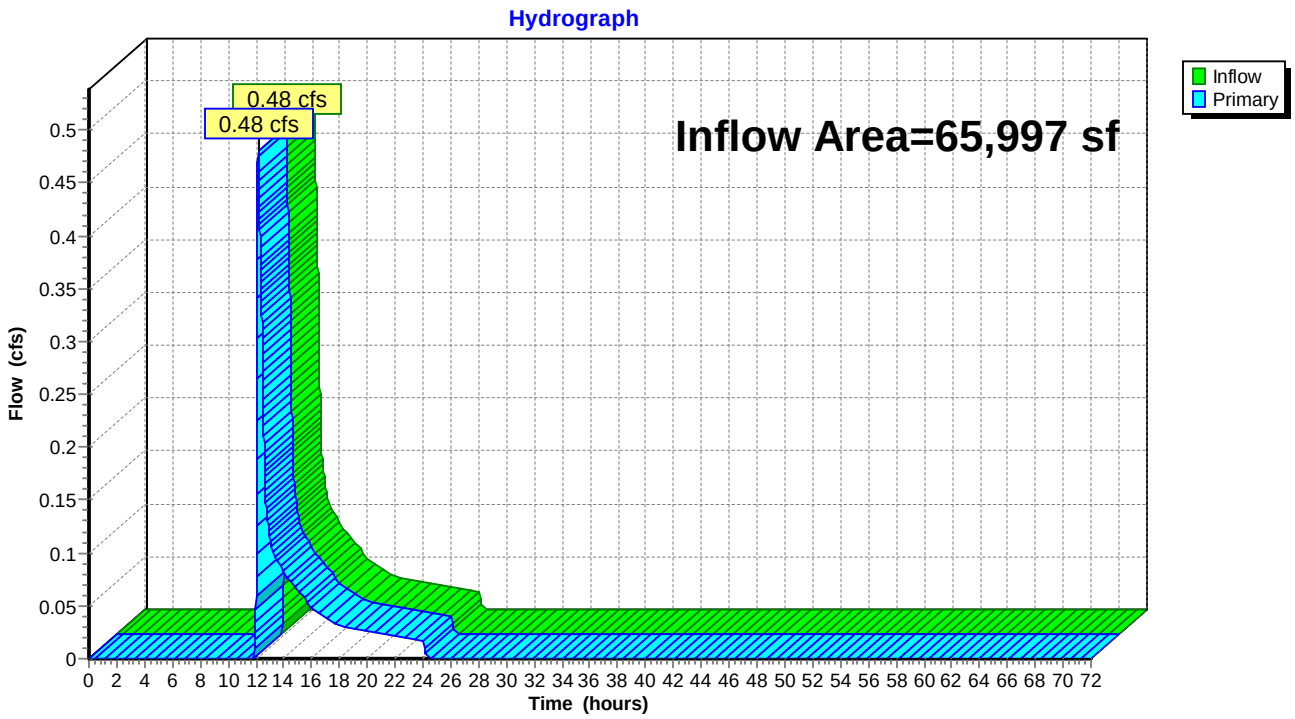


Summary for Link DP14: Lagrange St Low Point

Inflow Area = 65,997 sf, 35.65% Impervious, Inflow Depth = 0.46" for 2 Year event
Inflow = 0.48 cfs @ 12.16 hrs, Volume= 2,529 cf
Primary = 0.48 cfs @ 12.16 hrs, Volume= 2,529 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP14: Lagrange St Low Point

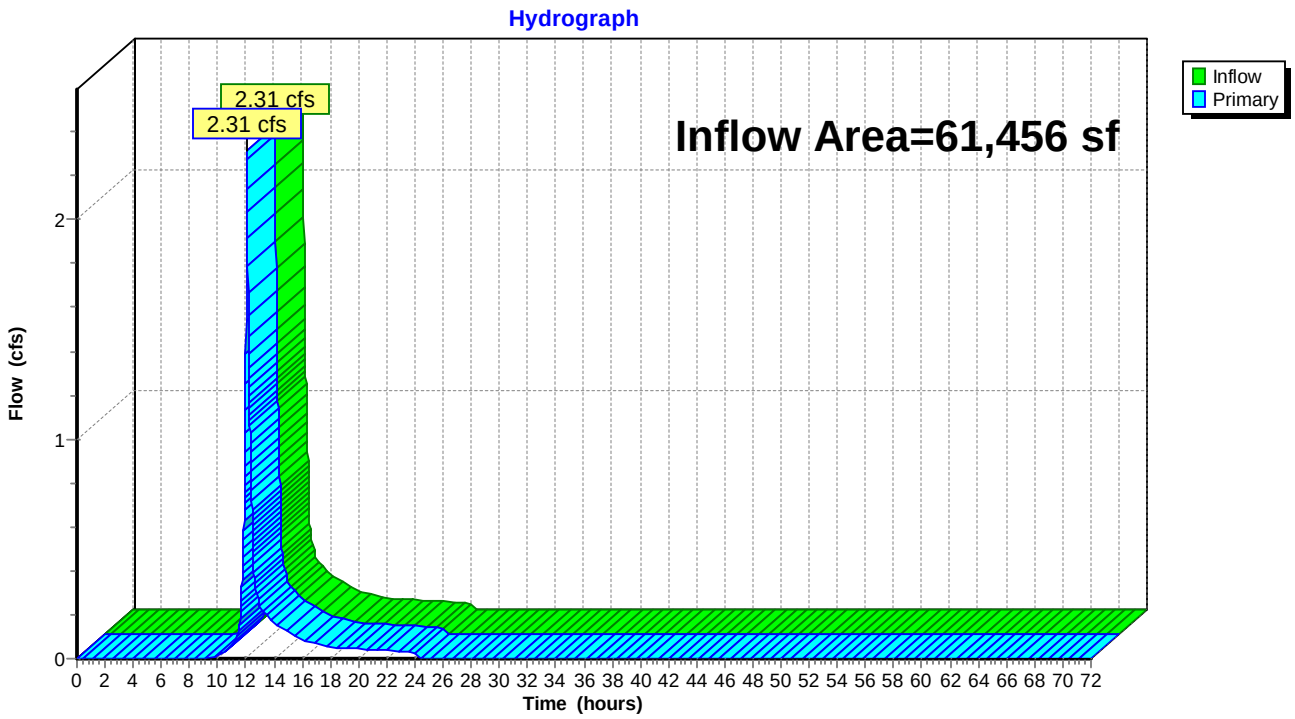


Summary for Link DP15: TOB D

Inflow Area = 61,456 sf, 61.47% Impervious, Inflow Depth = 1.36" for 2 Year event
Inflow = 2.31 cfs @ 12.08 hrs, Volume= 6,983 cf
Primary = 2.31 cfs @ 12.08 hrs, Volume= 6,983 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP15: TOB D

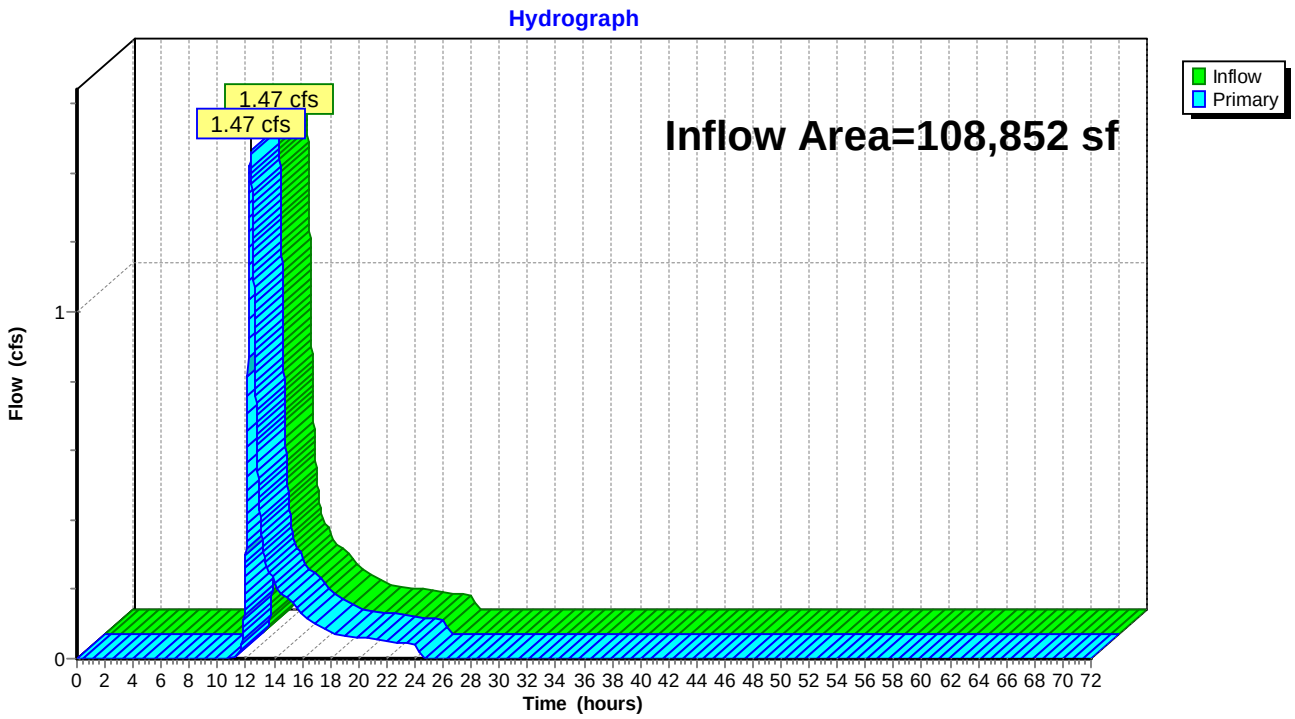


Summary for Link DP16: WF 1, WF 2, TOB E

Inflow Area = 108,852 sf, 44.86% Impervious, Inflow Depth = 0.85" for 2 Year event
Inflow = 1.47 cfs @ 12.33 hrs, Volume= 7,694 cf
Primary = 1.47 cfs @ 12.33 hrs, Volume= 7,694 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP16: WF 1, WF 2, TOB E



Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points x 3
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 01S: Cochituate Rd Runoff Area=32,816 sf 19.44% Impervious Runoff Depth=1.60"
Flow Length=306' Slope=0.0050 '/' Tc=9.0 min CN=68 Runoff=1.22 cfs 4,377 cf

Subcatchment 02S: Chrysler Road Runoff Area=59,894 sf 5.23% Impervious Runoff Depth=1.01"
Flow Length=311' Tc=37.7 min CN=59 Runoff=0.71 cfs 5,063 cf

Subcatchment 03S: DNR-1 Runoff Area=50,164 sf 33.83% Impervious Runoff Depth=1.82"
Flow Length=759' Tc=15.8 min CN=71 Runoff=1.77 cfs 7,604 cf

Subcatchment 04S: DNR-2 Runoff Area=43,392 sf 0.00% Impervious Runoff Depth=0.90"
Flow Length=430' Tc=14.7 min CN=57 Runoff=0.63 cfs 3,249 cf

Subcatchment 05S: Speen Street Runoff Area=28,639 sf 30.10% Impervious Runoff Depth=2.05"
Flow Length=444' Tc=5.3 min CN=74 Runoff=1.61 cfs 4,891 cf

Subcatchment 06S: Lake Cochituate N1-1 Runoff Area=60,547 sf 17.98% Impervious Runoff Depth=1.33"
Flow Length=810' Tc=8.7 min CN=64 Runoff=1.81 cfs 6,695 cf

Subcatchment 07S: Lake Cochituate N1-2 Runoff Area=50,655 sf 14.07% Impervious Runoff Depth=1.26"
Flow Length=274' Tc=8.6 min CN=63 Runoff=1.43 cfs 5,327 cf

Subcatchment 08S: Lake Cochituate N2-1 Runoff Area=41,704 sf 17.25% Impervious Runoff Depth=1.33"
Flow Length=352' Tc=11.8 min CN=64 Runoff=1.13 cfs 4,612 cf

Subcatchment 10S: Lake Cochituate N3-1 Runoff Area=98,155 sf 15.90% Impervious Runoff Depth=1.33"
Flow Length=272' Tc=18.3 min CN=64 Runoff=2.24 cfs 10,854 cf

Subcatchment 11S: Lake Cochituate N3-2 Runoff Area=24,131 sf 4.50% Impervious Runoff Depth=1.01"
Flow Length=110' Tc=9.1 min CN=59 Runoff=0.50 cfs 2,040 cf

Subcatchment 12S: Lake Cochituate E1 Runoff Area=22,546 sf 0.00% Impervious Runoff Depth=0.90"
Flow Length=82' Slope=0.2101 '/' Tc=7.2 min CN=57 Runoff=0.42 cfs 1,688 cf

Subcatchment 13S: Lake Cochituate E2 Runoff Area=166,896 sf 9.27% Impervious Runoff Depth=1.14"
Flow Length=328' Tc=16.1 min CN=61 Runoff=3.27 cfs 15,793 cf

Subcatchment 14S: Lake Cochituate W1-1 Runoff Area=13,204 sf 47.79% Impervious Runoff Depth=2.29"
Flow Length=106' Tc=5.0 min CN=77 Runoff=0.84 cfs 2,522 cf

Subcatchment 15S: Lake Cochituate W1-2 Runoff Area=15,593 sf 0.00% Impervious Runoff Depth=0.90"
Flow Length=185' Tc=11.2 min CN=57 Runoff=0.25 cfs 1,168 cf

Subcatchment 16S: Lake Cochituate N4 Runoff Area=95,267 sf 23.06% Impervious Runoff Depth=1.46"
Flow Length=145' Tc=11.5 min CN=66 Runoff=2.93 cfs 11,600 cf

Subcatchment 17S: Lake Cochituate W2-1 Runoff Area=4,593 sf 65.38% Impervious Runoff Depth=2.91"
Tc=5.0 min CN=84 Runoff=0.37 cfs 1,113 cf

Subcatchment 18S: Lake Cochituate W2-2 Runoff Area=14,017 sf 9.52% Impervious Runoff Depth=1.14"
Flow Length=102' Tc=8.8 min CN=61 Runoff=0.34 cfs 1,326 cf

Subcatchment 19S: Lake Cochituate W3-1 Runoff Area=2,241 sf 67.51% Impervious Runoff Depth=3.00"
Tc=5.0 min CN=85 Runoff=0.19 cfs 560 cf

Subcatchment 20S: Lake Cochituate W3-2 Runoff Area=21,531 sf 11.61% Impervious Runoff Depth=1.20"
Flow Length=72' Slope=0.2220 '/' Tc=6.4 min CN=62 Runoff=0.61 cfs 2,150 cf

Subcatchment 21S: Lake Cochituate W4-1 Runoff Area=10,487 sf 62.20% Impervious Runoff Depth=2.81"
Tc=5.0 min CN=83 Runoff=0.82 cfs 2,460 cf

Subcatchment 22S: Lake Cochituate W4-2 Runoff Area=199,759 sf 19.73% Impervious Runoff Depth=1.39"
Flow Length=297' Tc=13.0 min CN=65 Runoff=5.53 cfs 23,196 cf

Subcatchment 23S: Worcester St N Runoff Area=159,601 sf 92.99% Impervious Runoff Depth=3.91"
Flow Length=1,809' Tc=22.6 min CN=94 Runoff=10.16 cfs 52,053 cf

Subcatchment 24S: Worcester St S Runoff Area=25,578 sf 43.13% Impervious Runoff Depth=2.13"
Flow Length=316' Tc=9.0 min CN=75 Runoff=1.31 cfs 4,538 cf

Subcatchment 25S: Arcadi Rd-1 Runoff Area=234,888 sf 22.66% Impervious Runoff Depth=1.20"
Flow Length=810' Tc=18.2 min CN=62 Runoff=4.71 cfs 23,450 cf

Subcatchment 26S: Arcadi Rd-2 Runoff Area=43,309 sf 0.00% Impervious Runoff Depth=0.90"
Flow Length=154' Tc=10.6 min CN=57 Runoff=0.71 cfs 3,243 cf

Subcatchment 27S: Fisher St-1 Runoff Area=316,495 sf 27.57% Impervious Runoff Depth=1.14"
Flow Length=500' Tc=15.5 min CN=61 Runoff=6.29 cfs 29,948 cf

Subcatchment 28S: Fisher St-2 Runoff Area=16,737 sf 0.00% Impervious Runoff Depth=0.90"
Flow Length=65' Slope=0.1369 '/' Tc=7.1 min CN=57 Runoff=0.31 cfs 1,253 cf

Subcatchment 29S: Unnamed Pond 1-2 Runoff Area=4,097 sf 0.00% Impervious Runoff Depth=0.90"
Flow Length=32' Slope=0.3850 '/' Tc=5.0 min CN=57 Runoff=0.08 cfs 307 cf

Subcatchment 30S: Unnamed Pond 1-1 Runoff Area=15,210 sf 38.96% Impervious Runoff Depth=1.89"
Flow Length=86' Tc=10.7 min CN=72 Runoff=0.65 cfs 2,401 cf

Subcatchment 31S: Unnamed Pond 2 Runoff Area=76,046 sf 25.44% Impervious Runoff Depth=1.07"
Flow Length=279' Tc=7.9 min CN=60 Runoff=1.77 cfs 6,808 cf

Subcatchment 32S: Unnamed Pond 3 Runoff Area=62,955 sf 16.69% Impervious Runoff Depth=1.01"
Flow Length=309' Tc=11.7 min CN=59 Runoff=1.19 cfs 5,322 cf

Subcatchment 33S: Unnamed Pond 3-1 Runoff Area=1,569 sf 100.00% Impervious Runoff Depth=4.36"
Tc=5.0 min CN=98 Runoff=0.17 cfs 571 cf

Subcatchment 34S: Unnamed Pond 4-1 Runoff Area=13,927 sf 62.52% Impervious Runoff Depth=2.81"
Tc=5.0 min CN=83 Runoff=1.09 cfs 3,267 cf

Subcatchment 35S: Unnamed Pond 4-2 Runoff Area=42,409 sf 0.00% Impervious Runoff Depth=0.90"
Flow Length=167' Tc=11.7 min CN=57 Runoff=0.67 cfs 3,175 cf

Subcatchment 36S: Kansas St-1 Runoff Area=26,591 sf 37.08% Impervious Runoff Depth=1.82"
Flow Length=92' Tc=11.0 min CN=71 Runoff=1.08 cfs 4,031 cf

Subcatchment 37S: Kansas St-2 Runoff Area=52,239 sf 17.16% Impervious Runoff Depth=1.14"
Flow Length=313' Tc=9.1 min CN=61 Runoff=1.26 cfs 4,943 cf

Subcatchment 38S: N. Main & Kansas Runoff Area=15,467 sf 100.00% Impervious Runoff Depth=4.36"
Tc=5.0 min CN=98 Runoff=1.65 cfs 5,625 cf

Subcatchment 39S: Washington Ave 1 Runoff Area=12,963 sf 90.09% Impervious Runoff Depth=4.02"
Tc=5.0 min CN=95 Runoff=1.34 cfs 4,346 cf

Subcatchment 40S: Washington Ave 2 Runoff Area=12,112 sf 83.16% Impervious Runoff Depth=3.81"
Tc=5.0 min CN=93 Runoff=1.22 cfs 3,841 cf

Subcatchment 41S: Washington Ave 3 Runoff Area=26,688 sf 37.75% Impervious Runoff Depth=1.26"
Flow Length=196' Tc=9.0 min CN=63 Runoff=0.74 cfs 2,806 cf

Subcatchment 42S: Empty Lot Runoff Area=13,350 sf 0.00% Impervious Runoff Depth=1.89"
Tc=5.0 min CN=72 Runoff=0.69 cfs 2,108 cf

Subcatchment 43S: Lagrange St Runoff Area=65,997 sf 35.65% Impervious Runoff Depth=1.20"
Flow Length=194' Tc=8.7 min CN=62 Runoff=1.73 cfs 6,589 cf

Subcatchment 44S: Mechanic St Runoff Area=61,456 sf 61.47% Impervious Runoff Depth=2.55"
Flow Length=329' Tc=5.0 min CN=80 Runoff=4.37 cfs 13,044 cf

Subcatchment 45S: Cochituate St 1 Runoff Area=108,852 sf 44.86% Impervious Runoff Depth=1.82"
Flow Length=740' Tc=21.3 min CN=71 Runoff=3.41 cfs 16,501 cf

Subcatchment 170S: Lake Cochituate N2-2 Runoff Area=15,884 sf 0.00% Impervious Runoff Depth=0.90"
Flow Length=53' Slope=0.3400 '/' Tc=5.0 min CN=57 Runoff=0.32 cfs 1,189 cf

Pond 01P: BMP 1 - Infiltration Swale Peak Elev=147.50' Storage=1,872 cf Inflow=1.77 cfs 7,604 cf
Discarded=0.17 cfs 5,175 cf Primary=1.04 cfs 2,430 cf Outflow=1.21 cfs 7,605 cf

Pond 02P: Re-graded Detention Pond Peak Elev=160.08' Storage=63 cf Inflow=1.61 cfs 4,891 cf
Primary=0.00 cfs 0 cf Secondary=1.60 cfs 4,878 cf Outflow=1.60 cfs 4,878 cf

Pond 03P: BMP 2 - Bioretention System Peak Elev=152.98' Storage=989 cf Inflow=1.81 cfs 6,695 cf
Discarded=0.07 cfs 3,496 cf Primary=1.59 cfs 3,199 cf Outflow=1.66 cfs 6,696 cf

Pond 04P: BMP 3 - Infiltration Swale Peak Elev=154.41' Storage=812 cf Inflow=1.13 cfs 4,612 cf
Discarded=0.07 cfs 2,716 cf Primary=0.86 cfs 1,896 cf Outflow=0.93 cfs 4,612 cf

Pond 05P: BMP 4 - Infiltration Swale Peak Elev=154.78' Storage=835 cf Inflow=2.24 cfs 10,854 cf
Discarded=0.07 cfs 3,083 cf Primary=2.15 cfs 7,771 cf Outflow=2.22 cfs 10,854 cf

Pond 06P: BMP 5 - Infiltration Swale Peak Elev=154.99' Storage=1,749 cf Inflow=3.48 cfs 14,122 cf
Discarded=0.15 cfs 6,226 cf Primary=3.22 cfs 7,896 cf Outflow=3.37 cfs 14,122 cf

Pond 07P: BMP 6 - Infiltration Swale Peak Elev=155.34' Storage=466 cf Inflow=0.37 cfs 1,113 cf
Discarded=0.04 cfs 1,113 cf Primary=0.00 cfs 0 cf Outflow=0.04 cfs 1,113 cf

Pond 7P: Lake Cochituate Peak Elev=136.01' Storage=6.031 af Inflow=53.18 cfs 262,710 cf
Outflow=0.00 cfs 0 cf

Pond 08P: BMP 7 - Infiltration Swale Peak Elev=156.88' Storage=242 cf Inflow=0.19 cfs 560 cf
Discarded=0.02 cfs 560 cf Primary=0.00 cfs 0 cf Outflow=0.02 cfs 560 cf

Pond 09P: BMP 8 - Infiltration Swale Peak Elev=158.06' Storage=929 cf Inflow=0.82 cfs 2,460 cf
Discarded=0.08 cfs 2,233 cf Primary=0.19 cfs 226 cf Outflow=0.27 cfs 2,460 cf

Pond 10P: BMP 9 - Infiltration Swale Peak Elev=158.16' Storage=3,343 cf Inflow=4.71 cfs 23,450 cf
Discarded=0.24 cfs 10,193 cf Primary=3.89 cfs 13,257 cf Outflow=4.12 cfs 23,450 cf

Pond 11P: BMP 10 - Infiltration Swale Peak Elev=158.35' Storage=2,126 cf Inflow=6.29 cfs 29,948 cf
Discarded=0.16 cfs 7,284 cf Primary=6.04 cfs 22,664 cf Outflow=6.20 cfs 29,949 cf

Pond 12P: BMP 11 - Infiltration Swale Peak Elev=157.61' Storage=502 cf Inflow=0.65 cfs 2,401 cf
Discarded=0.04 cfs 1,567 cf Primary=0.52 cfs 834 cf Outflow=0.56 cfs 2,401 cf

Pond 13P: BMP 12 - Infiltration Swale Peak Elev=156.31' Storage=1,249 cf Inflow=1.09 cfs 3,267 cf
Discarded=0.11 cfs 2,974 cf Primary=0.23 cfs 292 cf Outflow=0.34 cfs 3,267 cf

Pond 14P: BMP 13 - Infiltration Swale Peak Elev=156.35' Storage=1,246 cf Inflow=1.08 cfs 4,031 cf
Discarded=0.11 cfs 3,315 cf Primary=0.44 cfs 716 cf Outflow=0.55 cfs 4,031 cf

Link 1L: Total to Bioretention Inflow=1.81 cfs 6,695 cf
Primary=1.81 cfs 6,695 cf

Link 2L: Lake Cochituate N1 Inflow=2.92 cfs 8,526 cf
Primary=2.92 cfs 8,526 cf

Link 3L: Lake Cochituate N2 Inflow=1.05 cfs 3,085 cf
Primary=1.05 cfs 3,085 cf

Link 4L: Lake Cochituate N3 Inflow=2.50 cfs 9,811 cf
Primary=2.50 cfs 9,811 cf

Link 5L: Lake Cochituate W2 Inflow=0.34 cfs 1,326 cf
Primary=0.34 cfs 1,326 cf

Link 6L: Total Inflow=53.18 cfs 262,710 cf
Primary=53.18 cfs 262,710 cf

Link DP01: Cochituate Rd Inflow=1.22 cfs 4,377 cf
Primary=1.22 cfs 4,377 cf

Link DP02: Chrysler Road Inflow=0.71 cfs 5,063 cf
Primary=0.71 cfs 5,063 cf

Link DP03: WF A Inflow=1.55 cfs 5,679 cf
Primary=1.55 cfs 5,679 cf

Link DP04: Lake Cochituate Middle Pond Inflow=9.35 cfs 38,902 cf
Primary=9.35 cfs 38,902 cf

Link DP04-1: WF B Inflow=5.78 cfs 21,422 cf
Primary=5.78 cfs 21,422 cf

Link DP04-2: WF C Inflow=0.42 cfs 1,688 cf
Primary=0.42 cfs 1,688 cf

Link DP04-3: Lake Cochituate Inflow=3.27 cfs 15,793 cf
Primary=3.27 cfs 15,793 cf

Link DP05: Lake Cochituate Middle Inflow=9.76 cfs 35,961 cf
Primary=9.76 cfs 35,961 cf

Link DP05-1: WF I Inflow=3.78 cfs 10,390 cf
Primary=3.78 cfs 10,390 cf

Link DP05-2: WF G&H Inflow=0.61 cfs 2,150 cf
Primary=0.61 cfs 2,150 cf

Link DP05-3: Lake Cochituate W4 Inflow=5.53 cfs 23,422 cf
Primary=5.53 cfs 23,422 cf

Link DP06: Worcester St Inflow=10.96 cfs 56,591 cf
Primary=10.96 cfs 56,591 cf

Link DP07: WF F Inflow=4.36 cfs 16,500 cf
Primary=4.36 cfs 16,500 cf

Link DP08: WF J Inflow=6.25 cfs 23,918 cf
Primary=6.25 cfs 23,918 cf

Link DP09: Unnamed Pond Inflow=3.98 cfs 17,309 cf
Primary=3.98 cfs 17,309 cf

Link DP09-1: WF K Inflow=0.57 cfs 1,141 cf
Primary=0.57 cfs 1,141 cf

Link DP09-2: WF KA Inflow=1.77 cfs 6,808 cf
Primary=1.77 cfs 6,808 cf

Link DP09-3: WF B Inflow=1.28 cfs 5,892 cf
Primary=1.28 cfs 5,892 cf

Link DP09-4: WF E&L, TOB C Inflow=0.74 cfs 3,468 cf
Primary=0.74 cfs 3,468 cf

Link DP10: WF A Inflow=2.66 cfs 11,283 cf
Primary=2.66 cfs 11,283 cf

Link DP11: Local St Drain System Inflow=2.56 cfs 8,188 cf
Primary=2.56 cfs 8,188 cf

Link DP12: Washington St Low Point Inflow=0.74 cfs 2,806 cf
Primary=0.74 cfs 2,806 cf

Link DP13: Empty Lot Inflow=0.69 cfs 2,108 cf
Primary=0.69 cfs 2,108 cf

Link DP14: Lagrange St Low Point Inflow=1.73 cfs 6,589 cf
Primary=1.73 cfs 6,589 cf

Link DP15: TOB D Inflow=4.37 cfs 13,044 cf
Primary=4.37 cfs 13,044 cf

Link DP16: WF 1, WF 2, TOB E Inflow=3.41 cfs 16,501 cf
Primary=3.41 cfs 16,501 cf

Total Runoff Area = 2,480,651 sf Runoff Volume = 319,646 cf Average Runoff Depth = 1.55"
71.89% Pervious = 1,783,367 sf 28.11% Impervious = 697,284 sf

Summary for Subcatchment 01S: Cochituate Rd

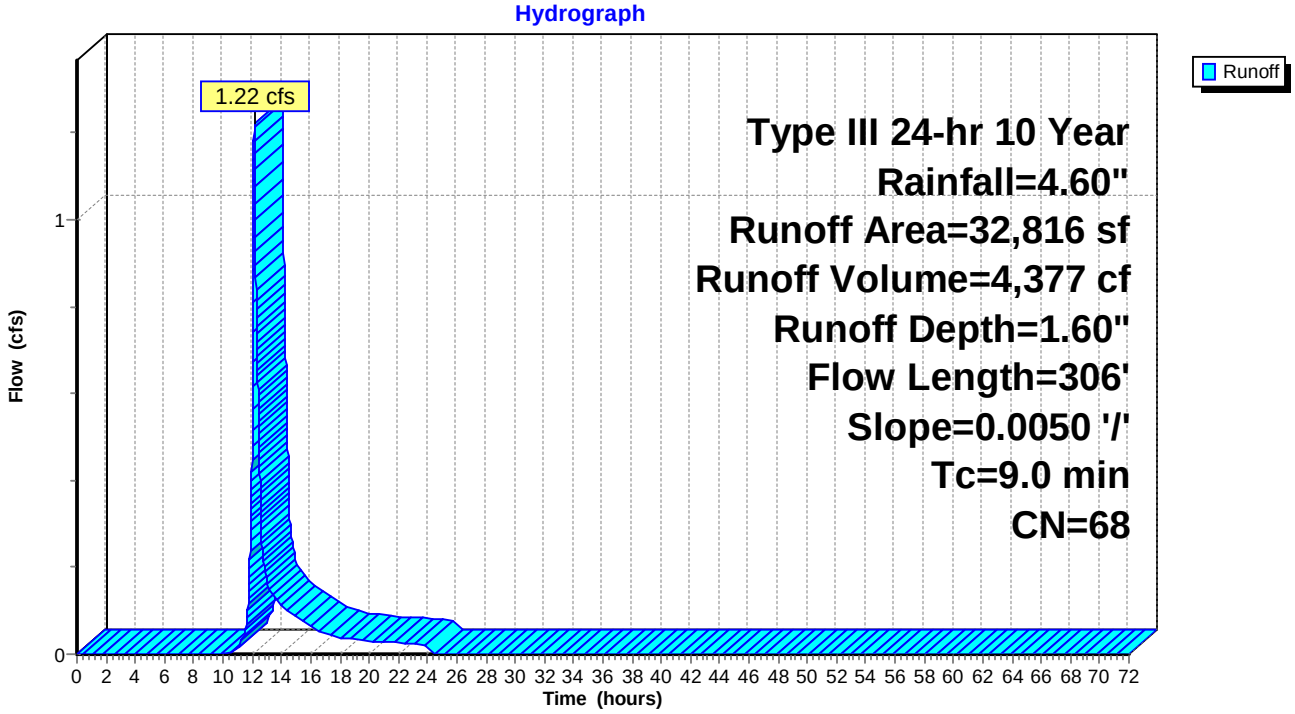
Runoff = 1.22 cfs @ 12.13 hrs, Volume= 4,377 cf, Depth= 1.60"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Rainfall=4.60"

	Area (sf)	CN	Description
	16,401	57	Woods/grass comb., Poor, HSG A
	2,771	98	Paved parking, HSG A
*	3,607	98	Bike Trail, HSG A
	10,037	68	<50% Grass cover, Poor, HSG A
	32,816	68	Weighted Average
	26,438		80.56% Pervious Area
	6,378		19.44% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.1	100	0.0050	0.78		**Sheet Flow, Paved** Smooth surfaces n= 0.011 P2= 3.15"
6.9	206	0.0050	0.49		**Shallow Concentrated Flow, Grass** Short Grass Pasture Kv= 7.0 fps
9.0	306	Total			

Subcatchment 01S: Cochituate Rd



Summary for Subcatchment 02S: Chrysler Road

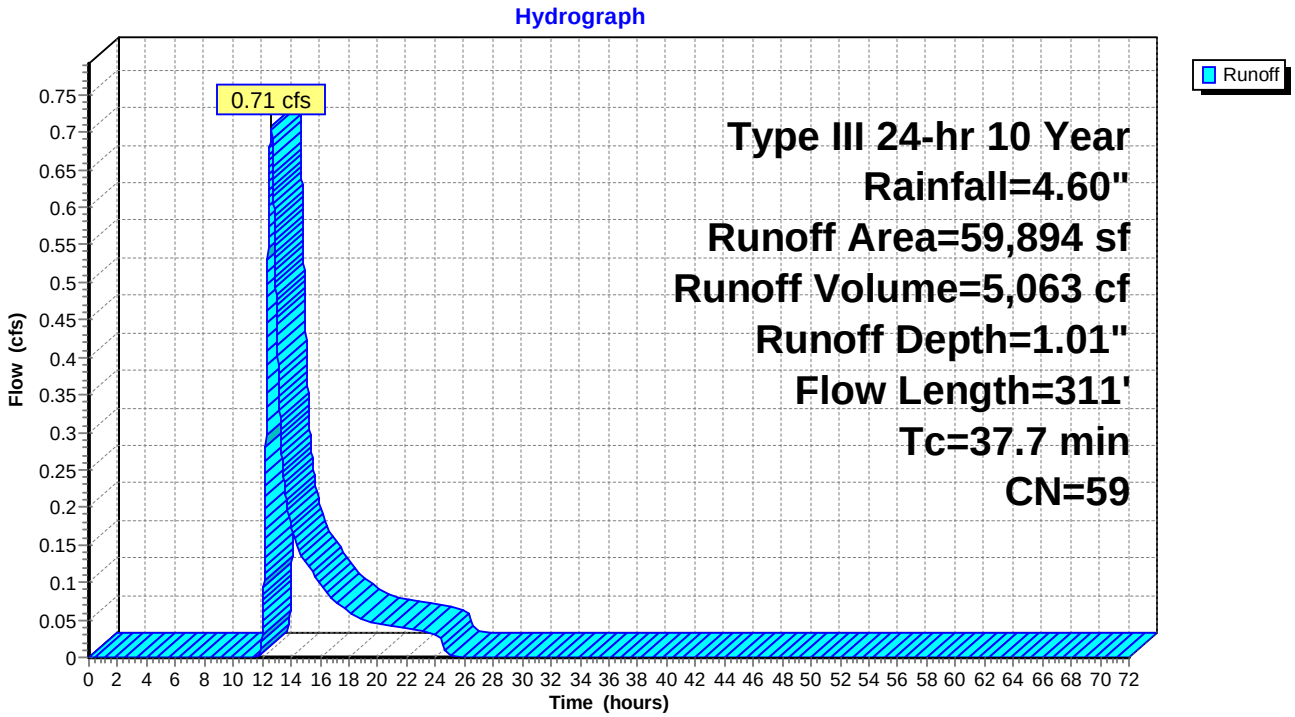
Runoff = 0.71 cfs @ 12.61 hrs, Volume= 5,063 cf, Depth= 1.01"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Rainfall=4.60"

Area (sf)	CN	Description
56,760	57	Woods/grass comb., Poor, HSG A
3,134	98	Paved parking, HSG A
59,894	59	Weighted Average
56,760		94.77% Pervious Area
3,134		5.23% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
28.6	100	0.0100	0.06		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
9.1	211	0.0060	0.39		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
37.7	311	Total			

Subcatchment 02S: Chrysler Road



Summary for Subcatchment 03S: DNR-1

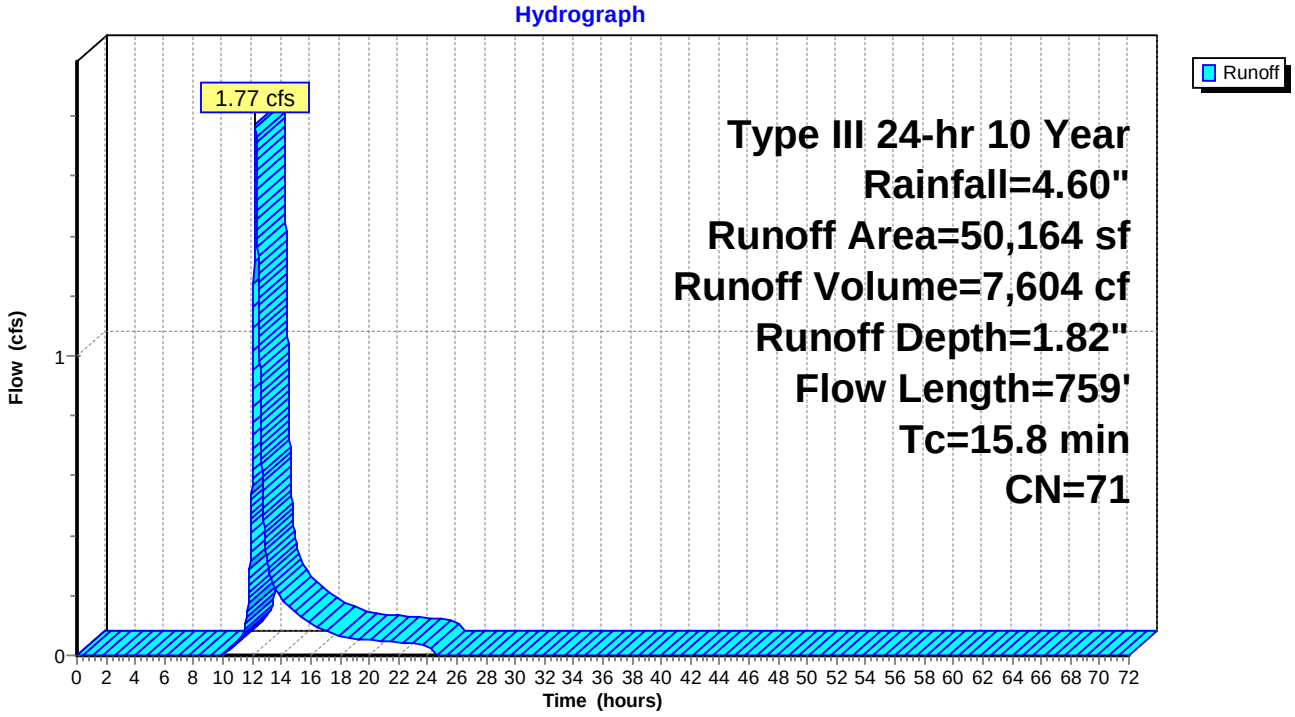
Runoff = 1.77 cfs @ 12.23 hrs, Volume= 7,604 cf, Depth= 1.82"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Rainfall=4.60"

	Area (sf)	CN	Description
	33,195	57	Woods/grass comb., Poor, HSG A
*	16,969	98	Bike Trail, HSG A
	50,164	71	Weighted Average
	33,195		66.17% Pervious Area
	16,969		33.83% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0	100	0.3330	0.24		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
8.8	659	0.0069	1.25		**Shallow Concentrated Flow, Grass Channel** Grassed Waterway Kv= 15.0 fps
15.8	759	Total			

Subcatchment 03S: DNR-1



Summary for Subcatchment 04S: DNR-2

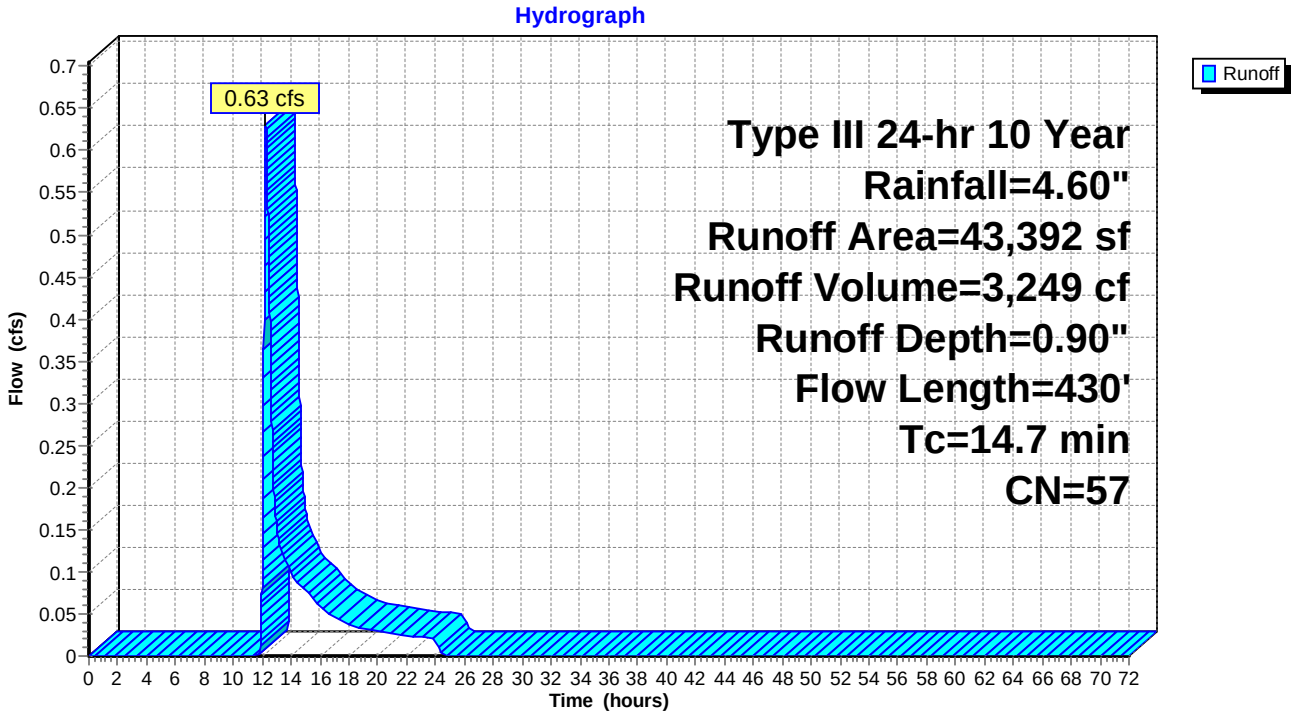
Runoff = 0.63 cfs @ 12.24 hrs, Volume= 3,249 cf, Depth= 0.90"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Rainfall=4.60"

Area (sf)	CN	Description
43,392	57	Woods/grass comb., Poor, HSG A
43,392		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.4	100	0.1000	0.15		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
3.3	330	0.1090	1.65		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
14.7	430	Total			

Subcatchment 04S: DNR-2



Summary for Subcatchment 05S: Speen Street

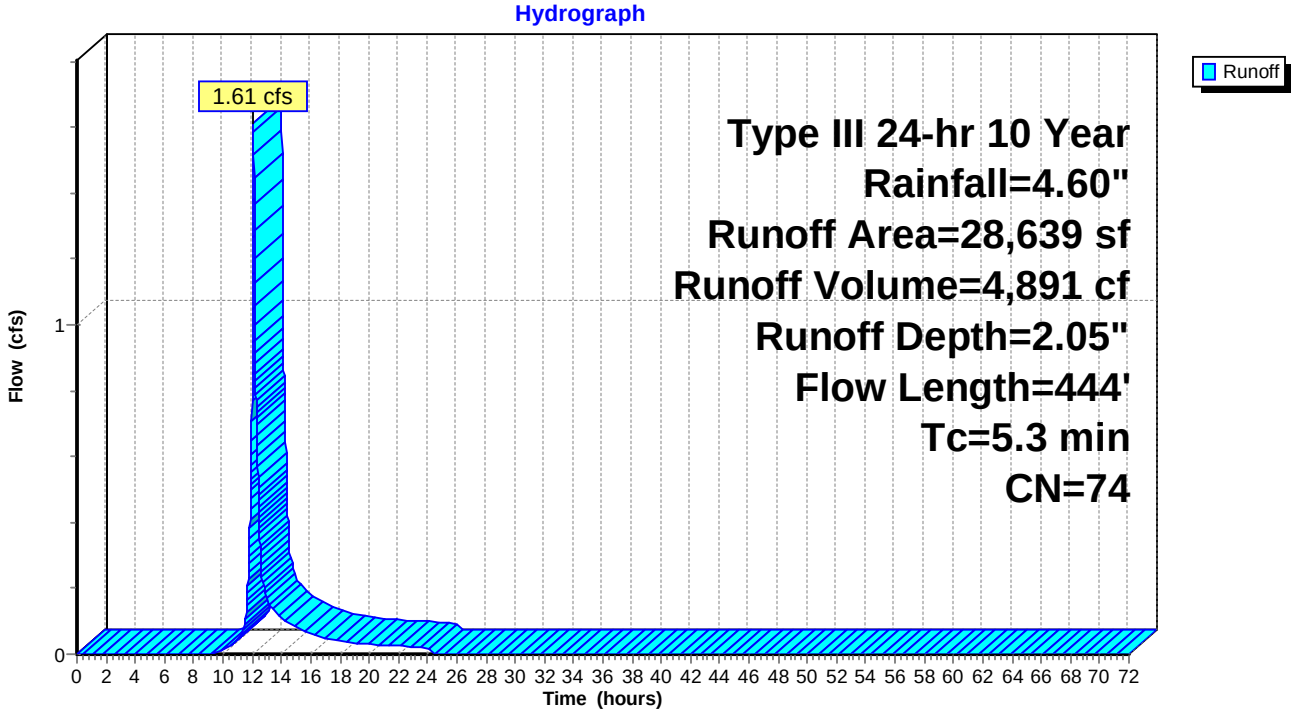
Runoff = 1.61 cfs @ 12.08 hrs, Volume= 4,891 cf, Depth= 2.05"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Rainfall=4.60"

	Area (sf)	CN	Description
	8,689	57	Woods/grass comb., Poor, HSG A
*	6,838	98	Bike Path, HSG A
	1,783	98	Paved roads w/curbs & sewers, HSG A
	11,329	68	<50% Grass cover, Poor, HSG A
	28,639	74	Weighted Average
	20,018		69.90% Pervious Area
	8,621		30.10% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	22	0.1400	0.27		**Sheet Flow, Grass** Grass: Short n= 0.150 P2= 3.15"
3.9	422	0.0148	1.82		**Shallow Concentrated Flow, Grassed Channel** Grassed Waterway Kv= 15.0 fps
5.3	444	Total			

Subcatchment 05S: Speen Street



Summary for Subcatchment 06S: Lake Cochituate N1-1

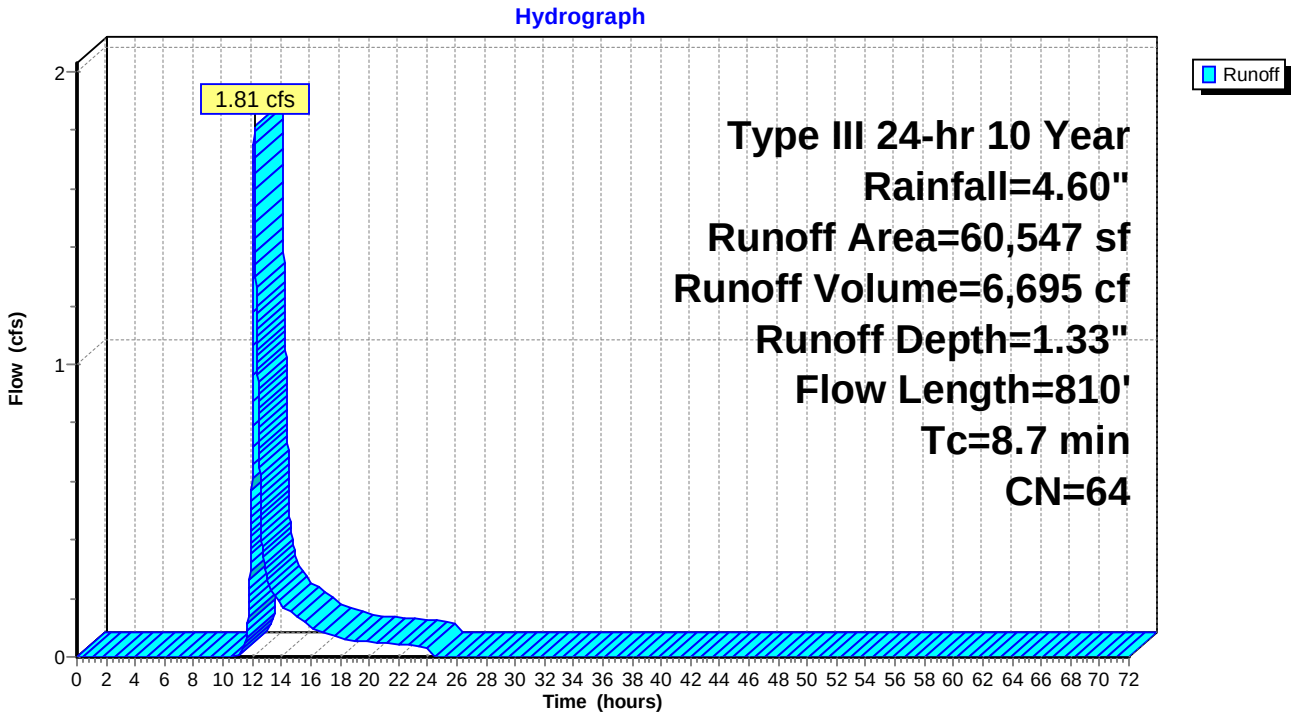
Runoff = 1.81 cfs @ 12.13 hrs, Volume= 6,695 cf, Depth= 1.33"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Rainfall=4.60"

	Area (sf)	CN	Description
	49,662	57	Woods/grass comb., Poor, HSG A
*	10,885	98	Bike Path, HSG A
	60,547	64	Weighted Average
	49,662		82.02% Pervious Area
	10,885		17.98% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.7	33	0.4091	0.21		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
6.0	777	0.0103	2.16	0.81	**Trap/Vee/Rect Channel Flow, Grassed Channel** Bot.W=1.00' D=0.25' Z= 2.0 '/' Top.W=2.00' n= 0.022 Earth, clean & straight
8.7	810	Total			

Subcatchment 06S: Lake Cochituate N1-1



Summary for Subcatchment 07S: Lake Cochituate N1-2

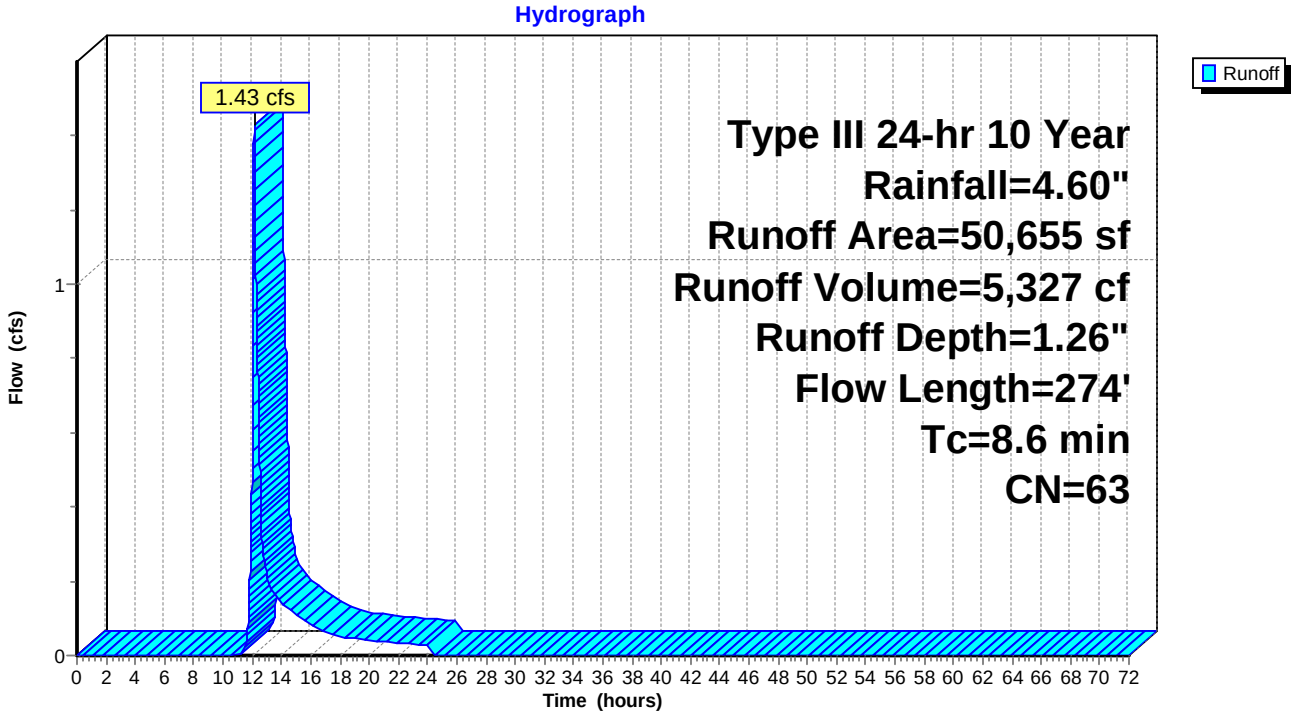
Runoff = 1.43 cfs @ 12.13 hrs, Volume= 5,327 cf, Depth= 1.26"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Rainfall=4.60"

	Area (sf)	CN	Description
	43,526	57	Woods/grass comb., Poor, HSG A
*	7,129	98	Bike Path, HSG A
	50,655	63	Weighted Average
	43,526		85.93% Pervious Area
	7,129		14.07% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.7	27	0.0667	0.10		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
0.3	12	0.0150	0.80		**Sheet Flow, Bike Path** Smooth surfaces n= 0.011 P2= 3.15"
3.2	176	0.0050	0.91	0.11	**Trap/Vee/Rect Channel Flow, Grassed Channel** Bot.W=1.00' D=0.10' Z= 2.0 '/' Top.W=1.40' n= 0.022 Earth, clean & straight
0.4	59	0.2210	2.35		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
8.6	274	Total			

Subcatchment 07S: Lake Cochituate N1-2



Summary for Subcatchment 08S: Lake Cochituate N2-1

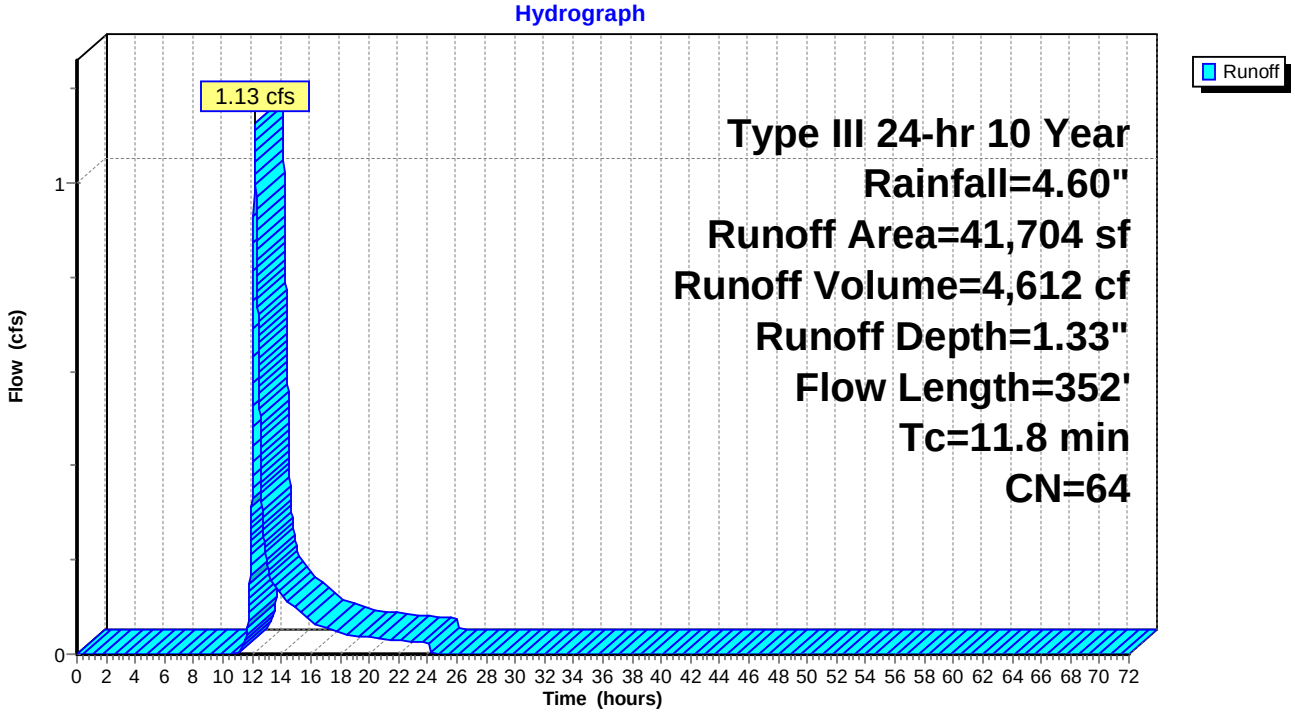
Runoff = 1.13 cfs @ 12.18 hrs, Volume= 4,612 cf, Depth= 1.33"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Rainfall=4.60"

	Area (sf)	CN	Description
	34,512	57	Woods/grass comb., Poor, HSG A
*	7,192	98	Bike Path, HSG A
	41,704	64	Weighted Average
	34,512		82.75% Pervious Area
	7,192		17.25% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.6	76	0.1580	0.17		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
0.1	12	0.0150	2.49		**Shallow Concentrated Flow, Pavement** Paved Kv= 20.3 fps
4.1	264	0.0050	1.06		**Shallow Concentrated Flow, Grassed Channel** Grassed Waterway Kv= 15.0 fps
11.8	352	Total			

Subcatchment 08S: Lake Cochituate N2-1



Summary for Subcatchment 10S: Lake Cochituate N3-1

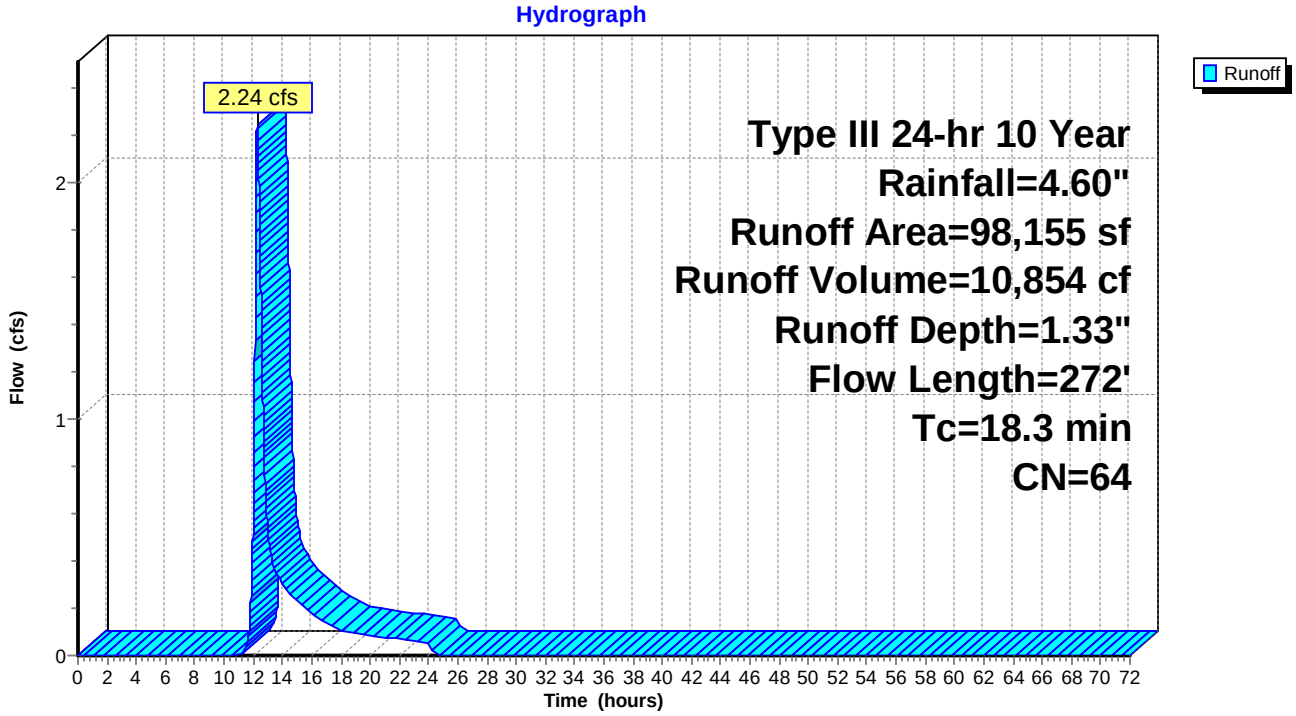
Runoff = 2.24 cfs @ 12.28 hrs, Volume= 10,854 cf, Depth= 1.33"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Rainfall=4.60"

	Area (sf)	CN	Description
	82,552	57	Woods/grass comb., Poor, HSG A
	9,674	98	Paved parking, HSG A
*	5,929	98	Bike Path, HSG A
	98,155	64	Weighted Average
	82,552		84.10% Pervious Area
	15,603		15.90% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0	100	0.0500	0.11		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
3.1	140	0.0228	0.75		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
0.1	20	0.3200	2.83		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
0.1	12	0.0150	2.49		**Shallow Concentrated Flow, Pavement** Paved Kv= 20.3 fps
18.3	272	Total			

Subcatchment 10S: Lake Cochituate N3-1



Summary for Subcatchment 11S: Lake Cochituate N3-2

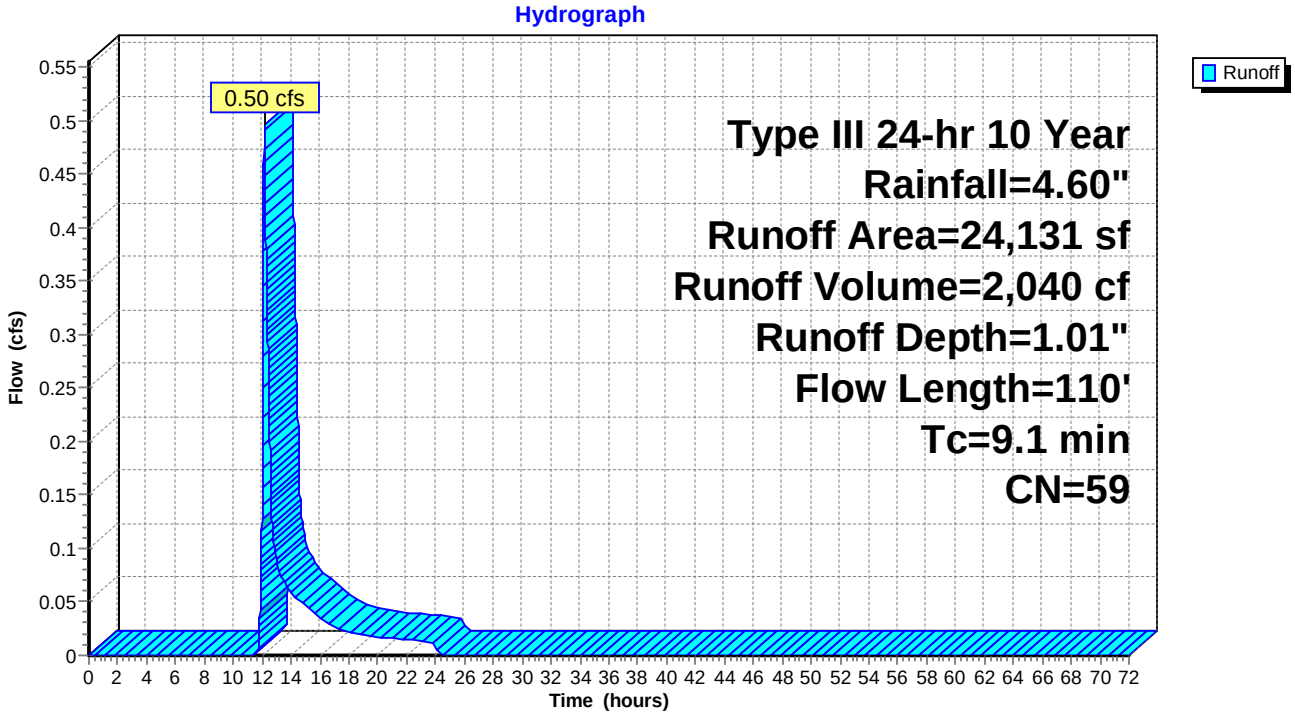
Runoff = 0.50 cfs @ 12.15 hrs, Volume= 2,040 cf, Depth= 1.01"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Rainfall=4.60"

Area (sf)	CN	Description
23,045	57	Woods/grass comb., Poor, HSG A
1,086	98	Paved parking, HSG A
24,131	59	Weighted Average
23,045		95.50% Pervious Area
1,086		4.50% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.0	100	0.1780	0.18		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
0.1	10	0.1000	1.58		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
9.1	110	Total			

Subcatchment 11S: Lake Cochituate N3-2



Summary for Subcatchment 12S: Lake Cochituate E1

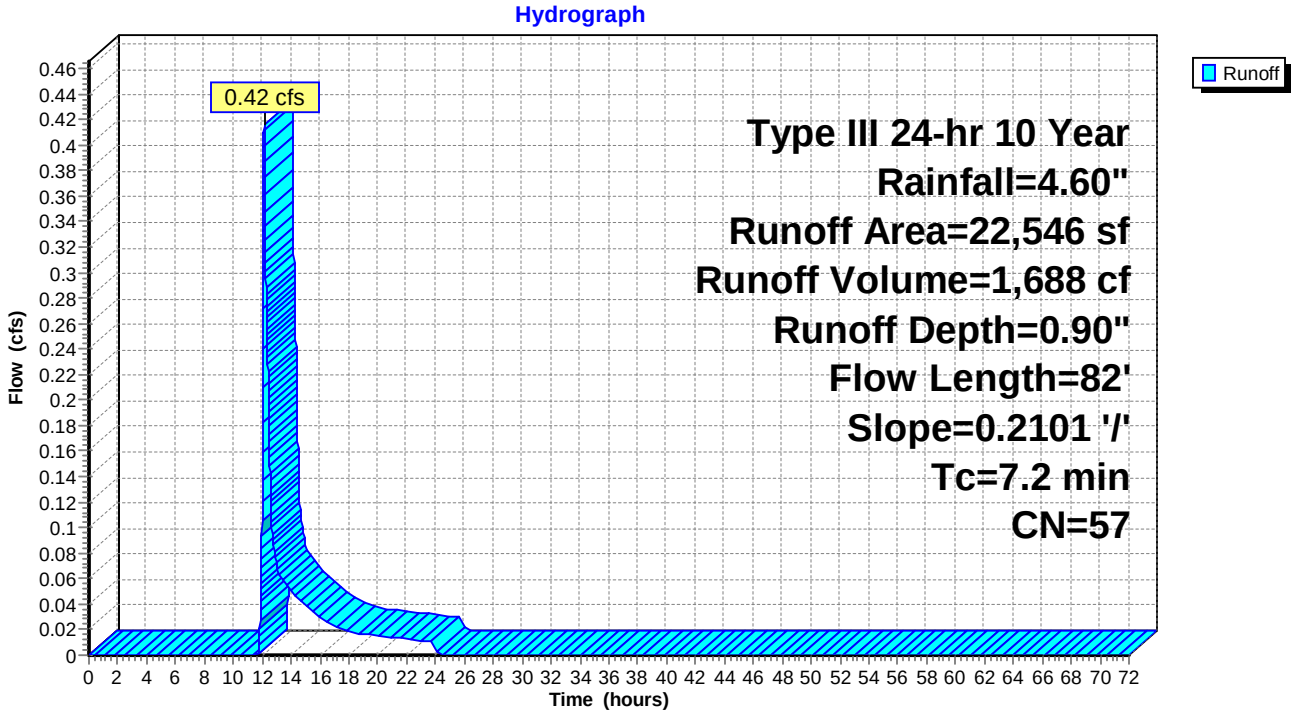
Runoff = 0.42 cfs @ 12.12 hrs, Volume= 1,688 cf, Depth= 0.90"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Rainfall=4.60"

Area (sf)	CN	Description
22,546	57	Woods/grass comb., Poor, HSG A
22,546		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.2	82	0.2101	0.19		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"

Subcatchment 12S: Lake Cochituate E1



Summary for Subcatchment 13S: Lake Cochituate E2

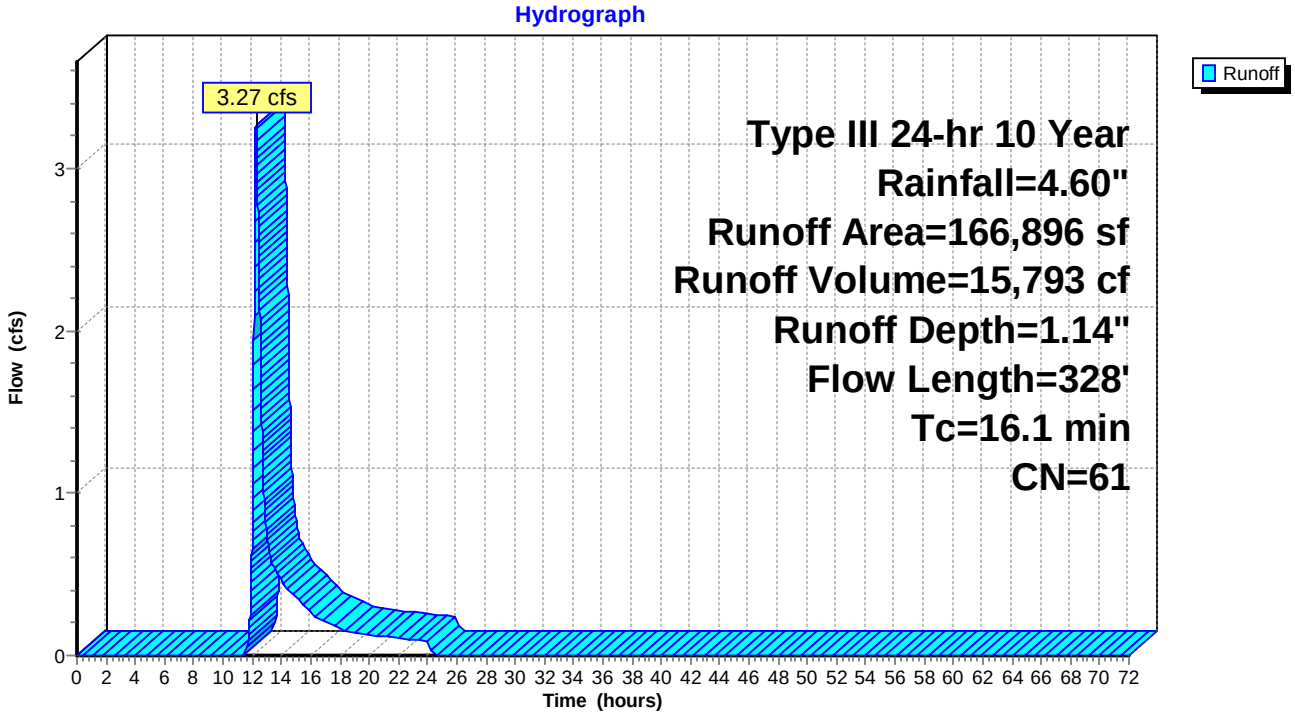
Runoff = 3.27 cfs @ 12.25 hrs, Volume= 15,793 cf, Depth= 1.14"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Rainfall=4.60"

	Area (sf)	CN	Description
	151,423	57	Woods/grass comb., Poor, HSG A
	13,352	98	Paved parking, HSG A
*	2,121	98	Bike Path, HSG A
	166,896	61	Weighted Average
	151,423		90.73% Pervious Area
	15,473		9.27% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.1	100	0.0700	0.13		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
2.0	125	0.0456	1.07		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
0.1	13	0.0192	2.81		**Shallow Concentrated Flow, Road** Paved Kv= 20.3 fps
0.9	90	0.1080	1.64		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
16.1	328	Total			

Subcatchment 13S: Lake Cochituate E2



Summary for Subcatchment 14S: Lake Cochituate W1-1

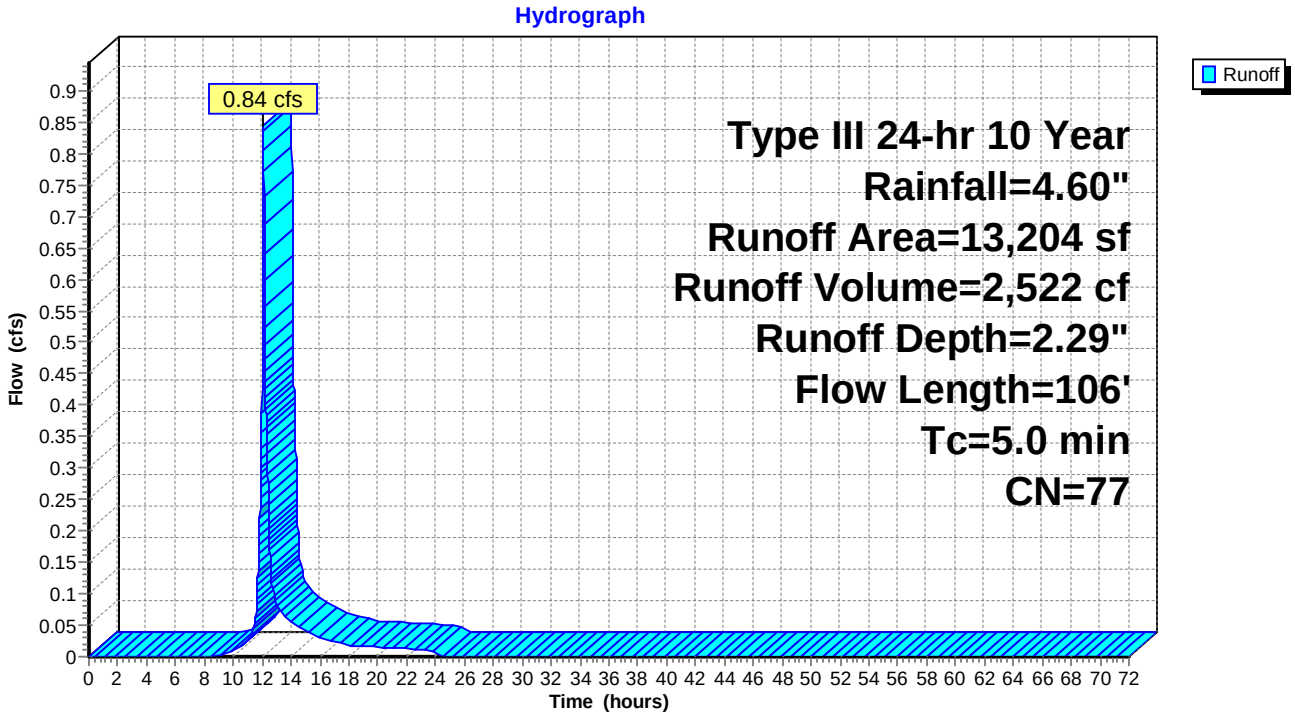
Runoff = 0.84 cfs @ 12.08 hrs, Volume= 2,522 cf, Depth= 2.29"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Rainfall=4.60"

	Area (sf)	CN	Description
	6,894	57	Woods/grass comb., Poor, HSG A
*	3,476	98	Bike Path, HSG A
	2,834	98	Paved parking, HSG A
	13,204	77	Weighted Average
	6,894		52.21% Pervious Area
	6,310		47.79% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.9	15	0.2000	0.13		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
0.3	12	0.0150	0.80		**Sheet Flow, Bike Path** Smooth surfaces n= 0.011 P2= 3.15"
1.2	79	0.0050	1.06		**Shallow Concentrated Flow, Grass Channel** Grassed Waterway Kv= 15.0 fps
3.4	106	Total, Increased to minimum Tc = 5.0 min			

Subcatchment 14S: Lake Cochituate W1-1



Summary for Subcatchment 15S: Lake Cochituate W1-2

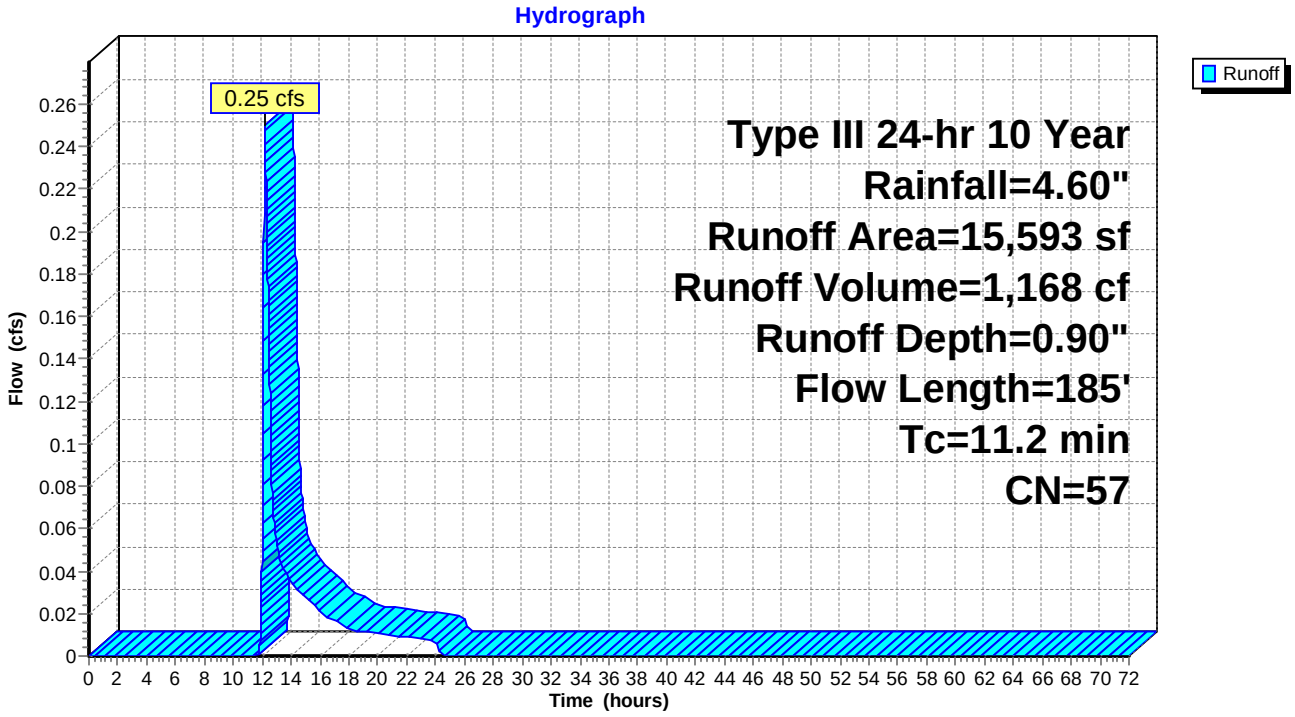
Runoff = 0.25 cfs @ 12.18 hrs, Volume= 1,168 cf, Depth= 0.90"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Rainfall=4.60"

Area (sf)	CN	Description
15,593	57	Woods/grass comb., Poor, HSG A
15,593		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	100	0.1200	0.16		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
0.6	85	0.2100	2.29		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
11.2	185	Total			

Subcatchment 15S: Lake Cochituate W1-2



Summary for Subcatchment 16S: Lake Cochituate N4

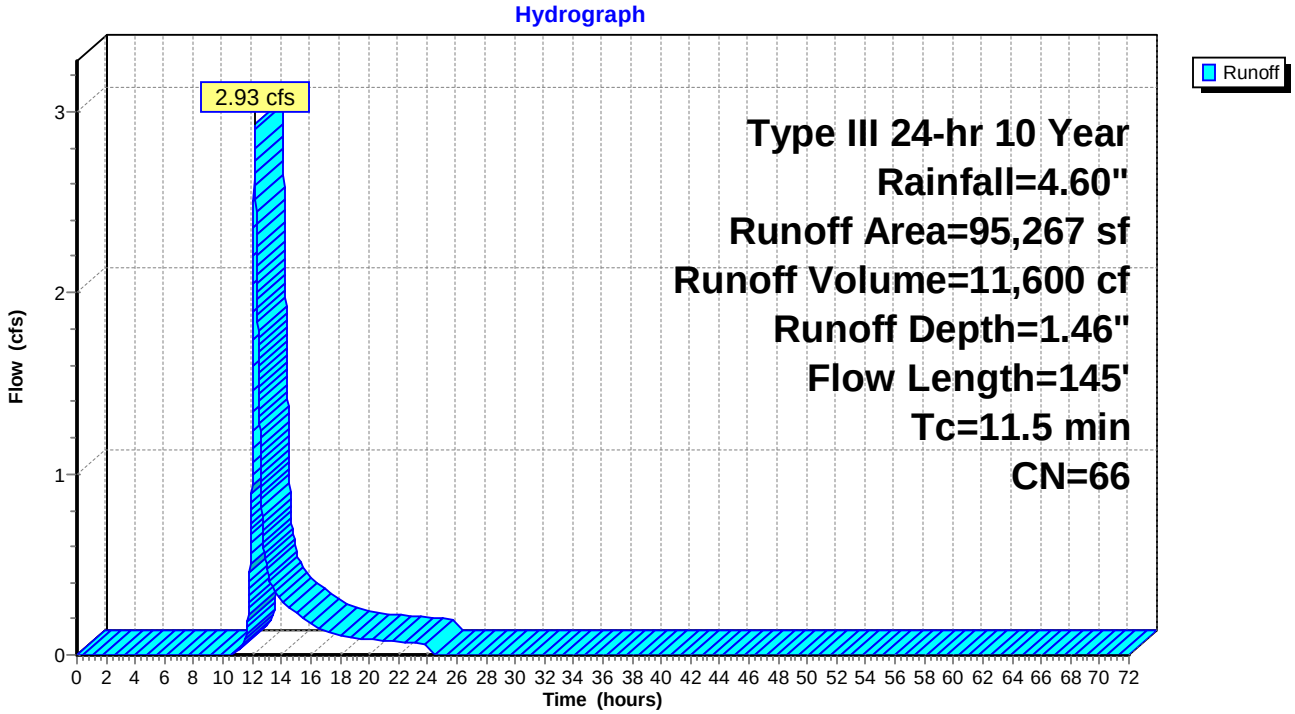
Runoff = 2.93 cfs @ 12.17 hrs, Volume= 11,600 cf, Depth= 1.46"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Rainfall=4.60"

	Area (sf)	CN	Description
	73,296	57	Woods/grass comb., Poor, HSG A
	17,258	98	Paved parking, HSG A
*	4,713	98	Bike Path, HSG A
	95,267	66	Weighted Average
	73,296		76.94% Pervious Area
	21,971		23.06% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.9	100	0.1100	0.15		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
0.6	45	0.0578	1.20		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
11.5	145	Total			

Subcatchment 16S: Lake Cochituate N4



Summary for Subcatchment 17S: Lake Cochituate W2-1

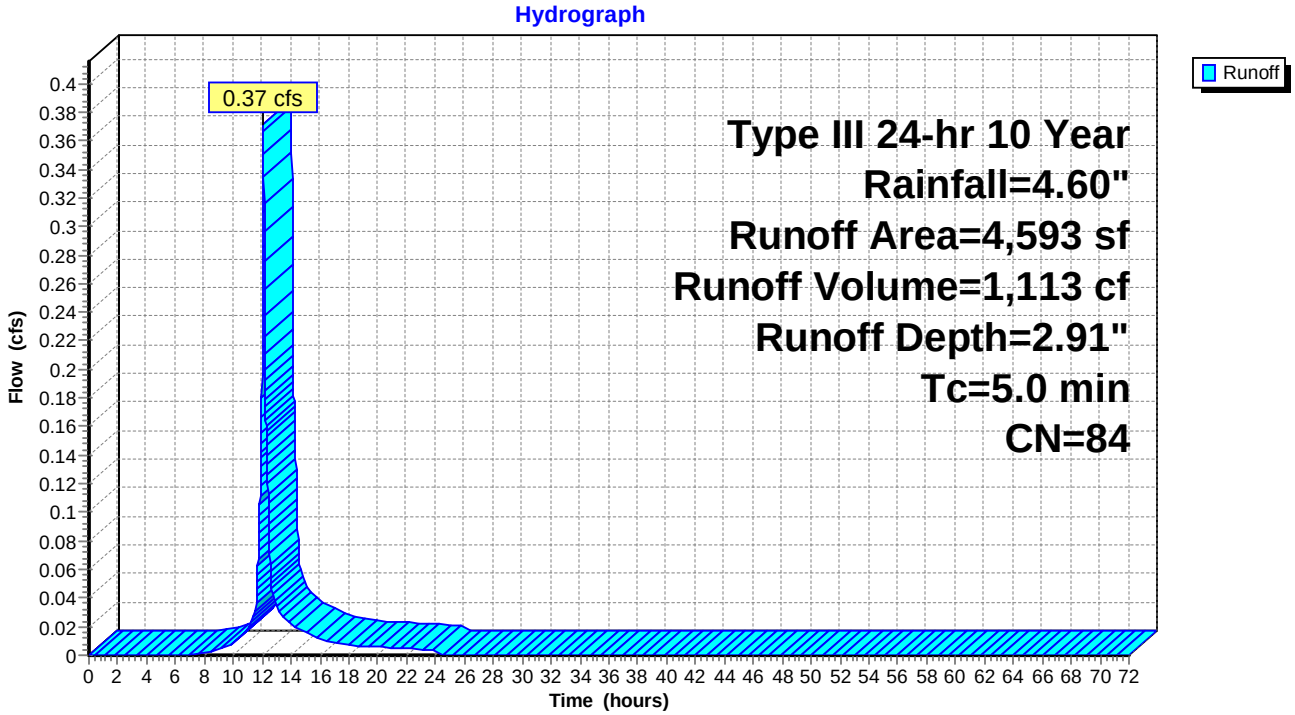
Runoff = 0.37 cfs @ 12.07 hrs, Volume= 1,113 cf, Depth= 2.91"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Rainfall=4.60"

	Area (sf)	CN	Description
	1,590	57	Woods/grass comb., Poor, HSG A
*	3,003	98	Bike Path, HSG A
	4,593	84	Weighted Average
	1,590		34.62% Pervious Area
	3,003		65.38% Impervious Area

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

Subcatchment 17S: Lake Cochituate W2-1



Summary for Subcatchment 18S: Lake Cochituate W2-2

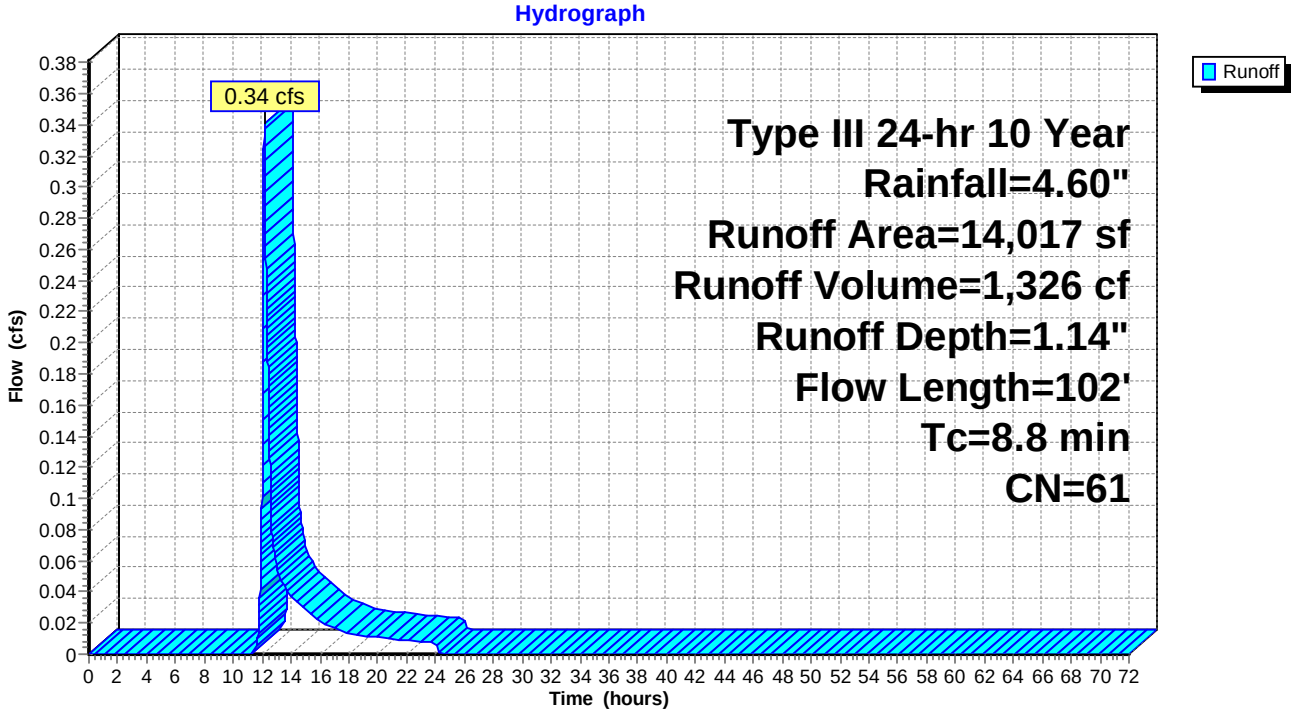
Runoff = 0.34 cfs @ 12.14 hrs, Volume= 1,326 cf, Depth= 1.14"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Rainfall=4.60"

	Area (sf)	CN	Description
	12,683	57	Woods/grass comb., Poor, HSG A
*	1,334	98	Bike Path, HSG A
	14,017	61	Weighted Average
	12,683		90.48% Pervious Area
	1,334		9.52% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	24	0.0150	0.91		**Sheet Flow, Pavement** Smooth surfaces n= 0.011 P2= 3.15"
1.8	22	0.5200	0.21		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
6.6	56	0.1200	0.14		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
8.8	102	Total			

Subcatchment 18S: Lake Cochituate W2-2



Summary for Subcatchment 19S: Lake Cochituate W3-1

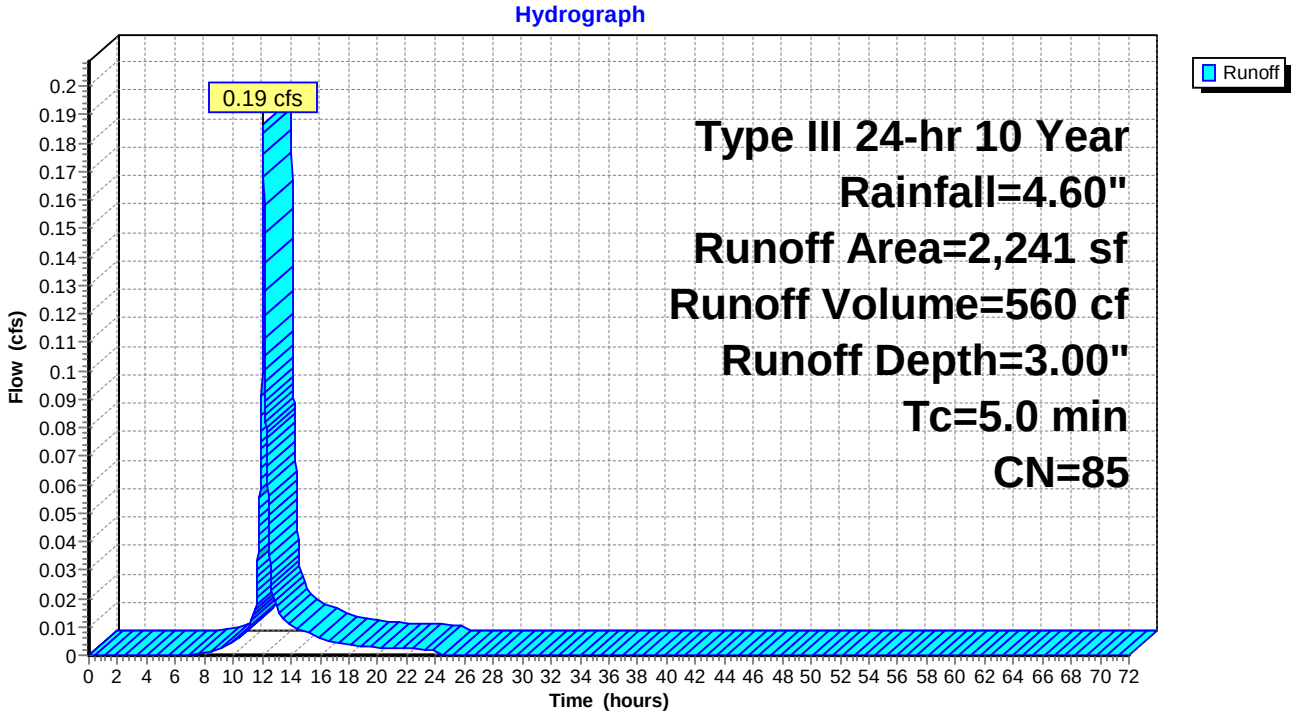
Runoff = 0.19 cfs @ 12.07 hrs, Volume= 560 cf, Depth= 3.00"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Rainfall=4.60"

	Area (sf)	CN	Description
	728	57	Woods/grass comb., Poor, HSG A
*	1,513	98	Bike Path, HSG A
	2,241	85	Weighted Average
	728		32.49% Pervious Area
	1,513		67.51% Impervious Area

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

Subcatchment 19S: Lake Cochituate W3-1



Summary for Subcatchment 20S: Lake Cochituate W3-2

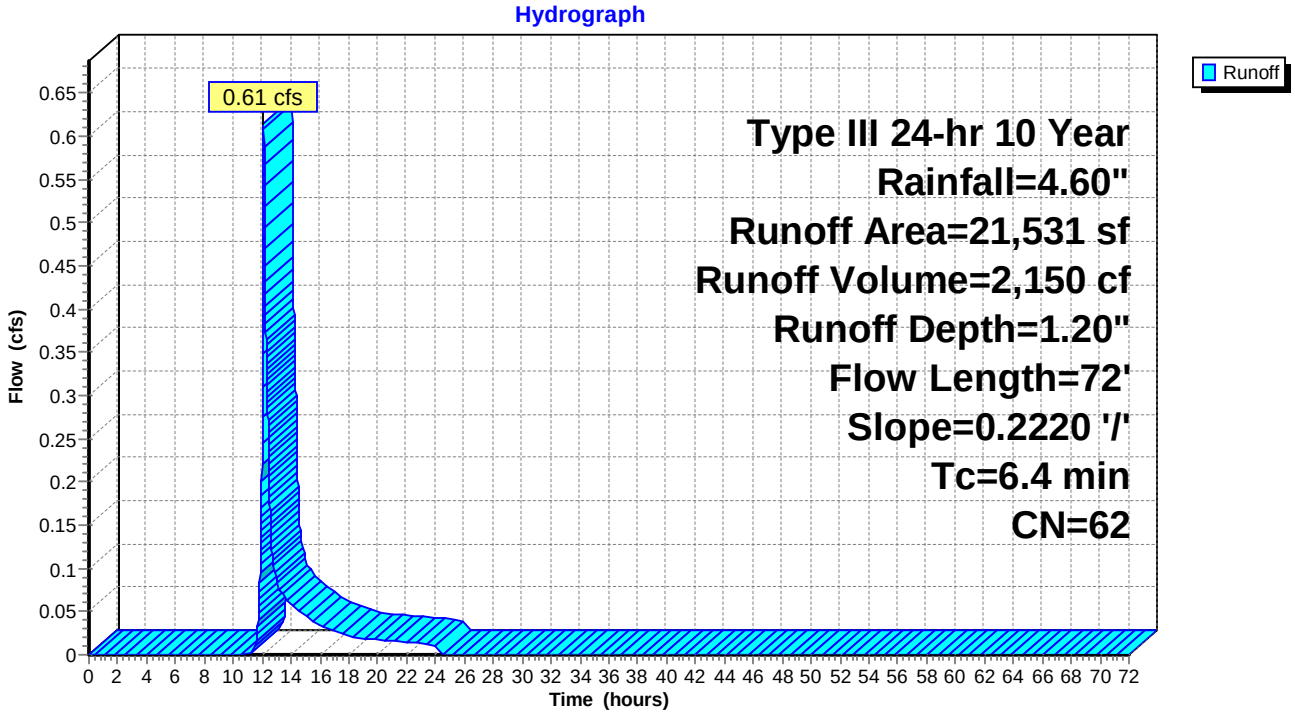
Runoff = 0.61 cfs @ 12.11 hrs, Volume= 2,150 cf, Depth= 1.20"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Rainfall=4.60"

	Area (sf)	CN	Description
	19,031	57	Woods/grass comb., Poor, HSG A
*	2,500	98	Bike Path, HSG A
	21,531	62	Weighted Average
	19,031		88.39% Pervious Area
	2,500		11.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.4	72	0.2220	0.19		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"

Subcatchment 20S: Lake Cochituate W3-2



Summary for Subcatchment 21S: Lake Cochituate W4-1

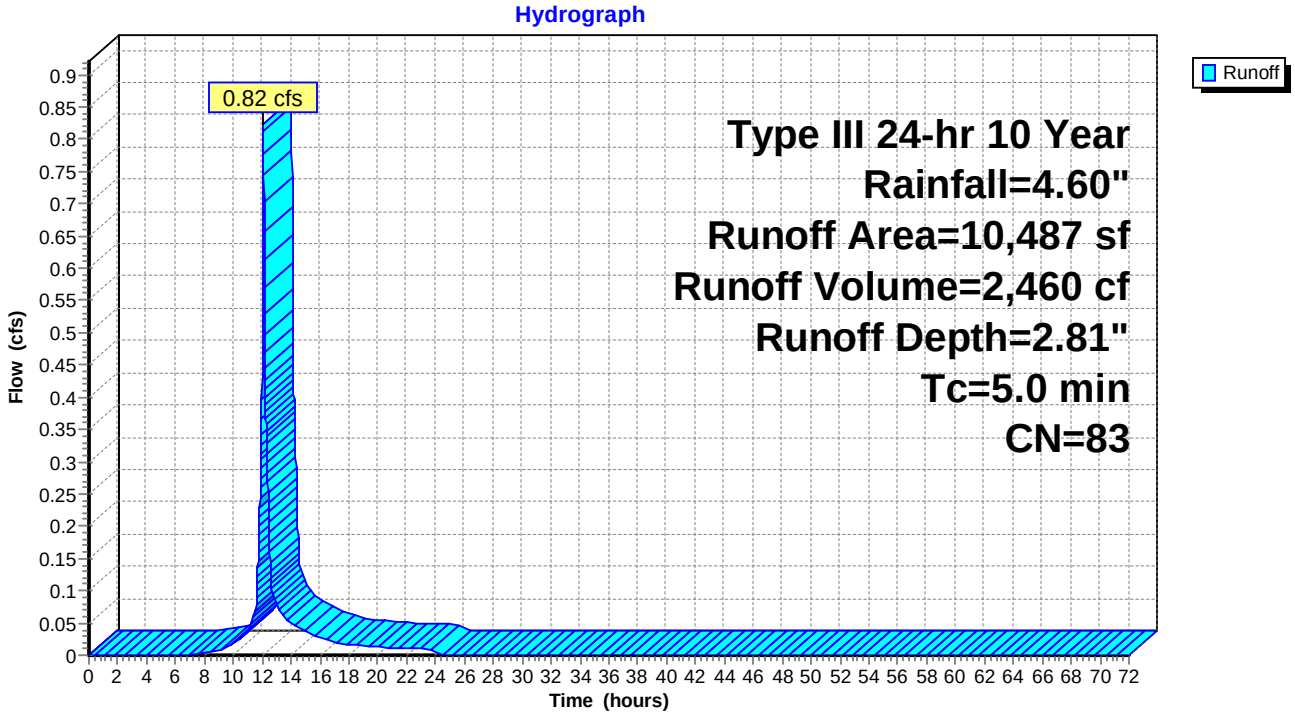
Runoff = 0.82 cfs @ 12.07 hrs, Volume= 2,460 cf, Depth= 2.81"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Rainfall=4.60"

	Area (sf)	CN	Description
*	6,523	98	Bike Path, HSG A
	3,964	57	Woods/grass comb., Poor, HSG A
	10,487	83	Weighted Average
	3,964		37.80% Pervious Area
	6,523		62.20% Impervious Area

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

Subcatchment 21S: Lake Cochituate W4-1



Summary for Subcatchment 22S: Lake Cochituate W4-2

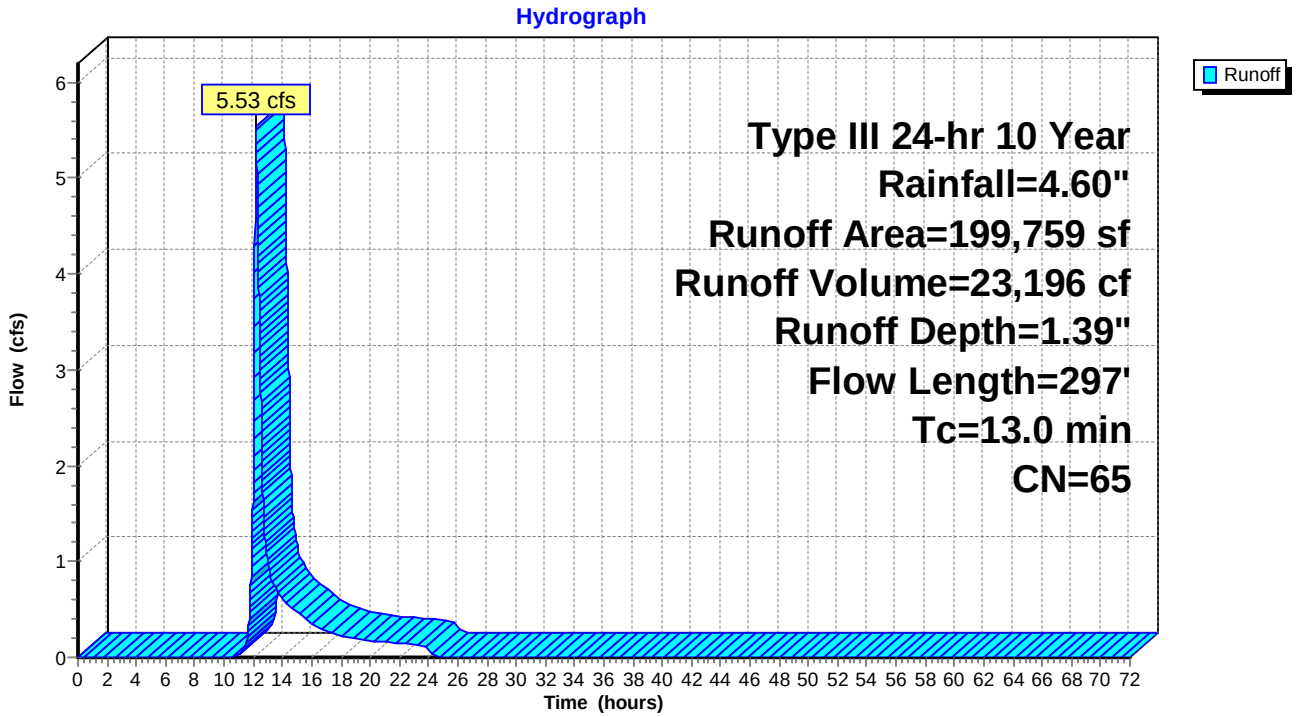
Runoff = 5.53 cfs @ 12.19 hrs, Volume= 23,196 cf, Depth= 1.39"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Rainfall=4.60"

	Area (sf)	CN	Description
	160,339	57	Woods/grass comb., Poor, HSG A
*	39,420	98	Paved parking, HSG A
	199,759	65	Weighted Average
	160,339		80.27% Pervious Area
	39,420		19.73% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.8	100	0.1444	0.17		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
3.2	197	0.0431	1.04		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
13.0	297	Total			

Subcatchment 22S: Lake Cochituate W4-2



Summary for Subcatchment 23S: Worcester St N

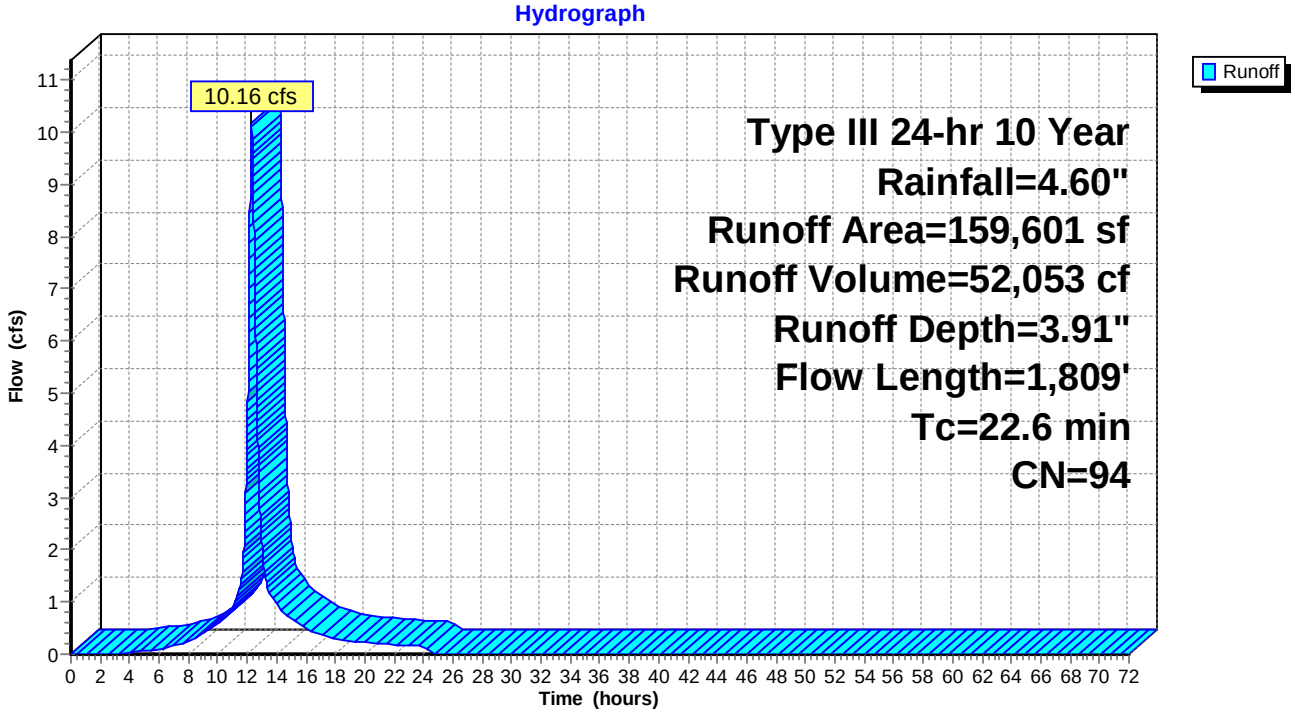
Runoff = 10.16 cfs @ 12.29 hrs, Volume= 52,053 cf, Depth= 3.91"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Rainfall=4.60"

	Area (sf)	CN	Description
	68,655	89	Urban commercial, 85% imp, HSG A
*	1,908	98	Bike Path, HSG A
	88,153	98	Paved roads w/curbs & sewers, HSG A
	885	57	Woods/grass comb., Poor, HSG A
	159,601	94	Weighted Average
	11,183		7.01% Pervious Area
	148,418		92.99% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.0	100	0.0100	0.13		**Sheet Flow, Yards** Grass: Short n= 0.150 P2= 3.15"
9.6	1,709	0.0214	2.97		**Shallow Concentrated Flow, Road** Paved Kv= 20.3 fps
22.6	1,809	Total			

Subcatchment 23S: Worcester St N



Summary for Subcatchment 24S: Worcester St S

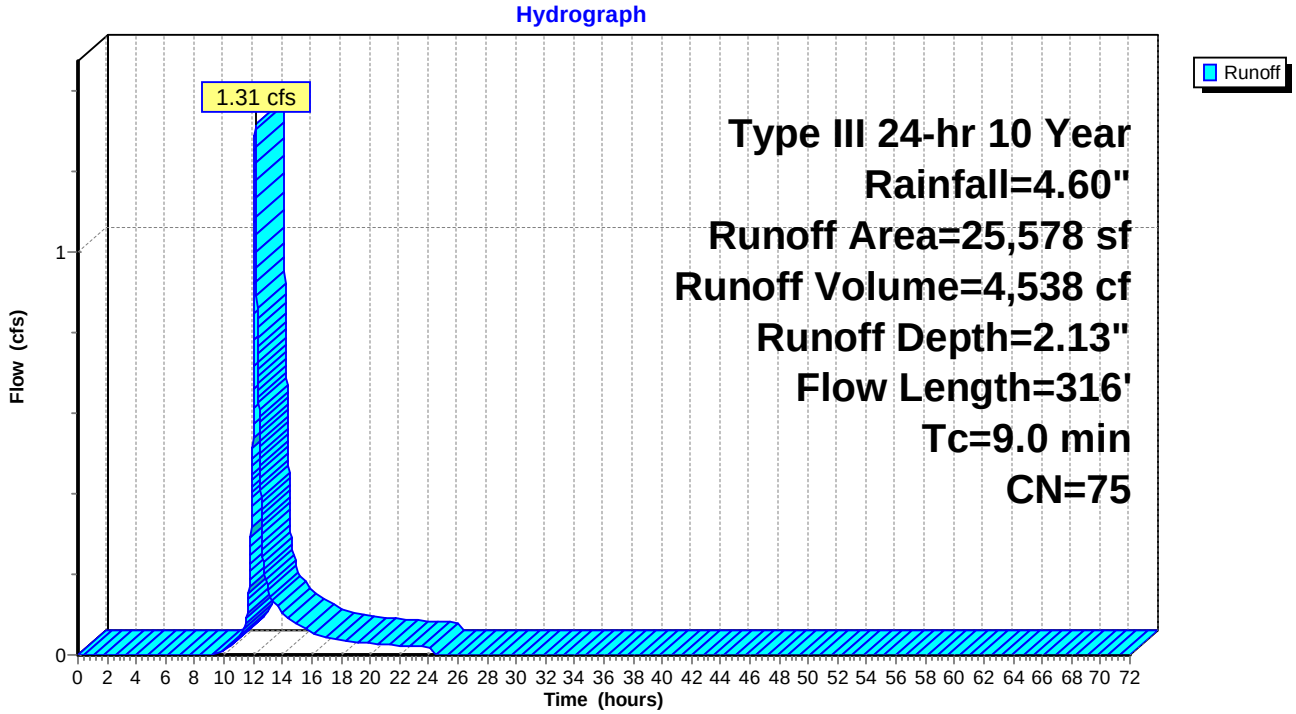
Runoff = 1.31 cfs @ 12.13 hrs, Volume= 4,538 cf, Depth= 2.13"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Rainfall=4.60"

	Area (sf)	CN	Description
	14,547	57	Woods/grass comb., Poor, HSG A
	10,499	98	Paved parking, HSG A
*	532	98	Bike Path, HSG A
	25,578	75	Weighted Average
	14,547		56.87% Pervious Area
	11,031		43.13% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.3	90	0.2444	0.21		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
1.7	226	0.0115	2.18		**Shallow Concentrated Flow, Road** Paved Kv= 20.3 fps
9.0	316	Total			

Subcatchment 24S: Worcester St S



Summary for Subcatchment 25S: Arcadi Rd-1

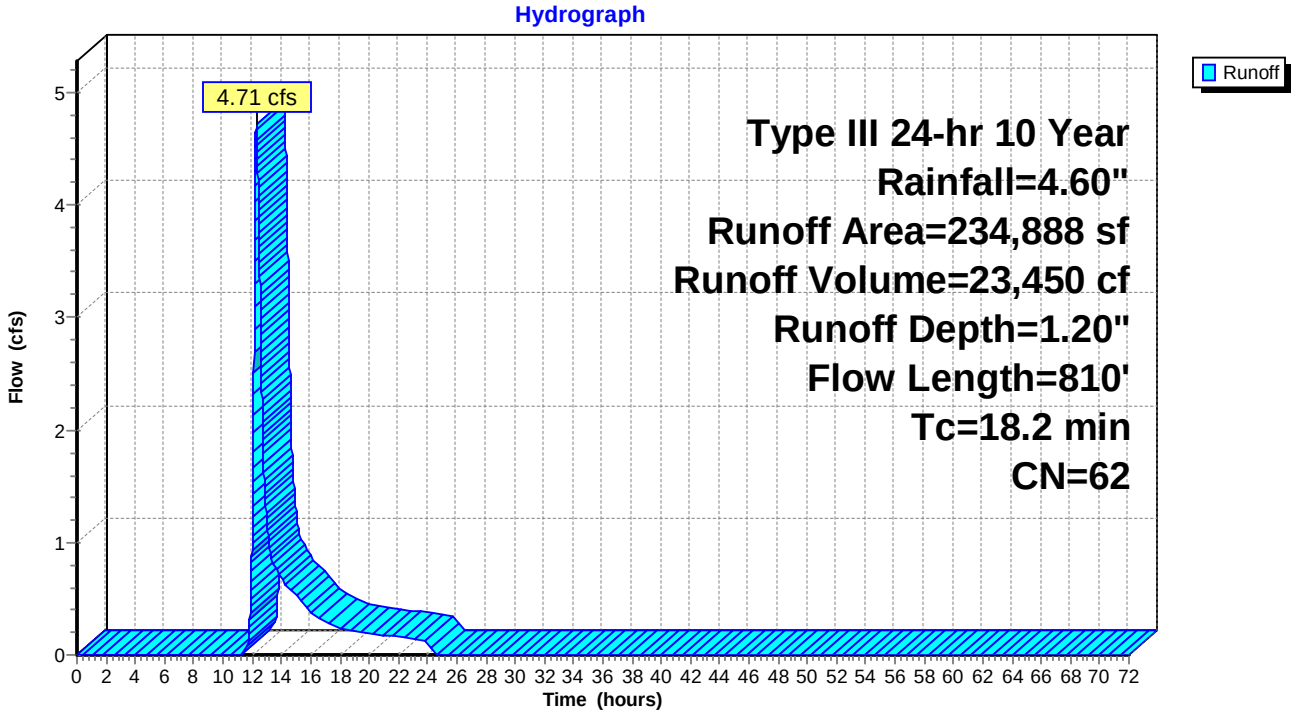
Runoff = 4.71 cfs @ 12.28 hrs, Volume= 23,450 cf, Depth= 1.20"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Rainfall=4.60"

	Area (sf)	CN	Description
	82,419	61	1/4 acre lots, 38% imp, HSG A
	1,306	98	Paved parking, HSG A
	1,798	76	Gravel roads, HSG A
*	20,606	98	Bike Path, HSG A
	128,759	57	Woods/grass comb., Poor, HSG A
	234,888	62	Weighted Average
	181,657		77.34% Pervious Area
	53,231		22.66% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.6	100	0.0550	0.25		**Sheet Flow, Yards** Grass: Short n= 0.150 P2= 3.15"
0.5	30	0.0250	1.11		**Shallow Concentrated Flow, Yards** Short Grass Pasture Kv= 7.0 fps
0.2	38	0.4079	3.19		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
0.2	35	0.0150	2.49		**Shallow Concentrated Flow, Bike Path** Paved Kv= 20.3 fps
10.7	607	0.0040	0.95		**Shallow Concentrated Flow, Grass Channel** Grassed Waterway Kv= 15.0 fps
18.2	810	Total			

Subcatchment 25S: Arcadi Rd-1



Summary for Subcatchment 26S: Arcadi Rd-2

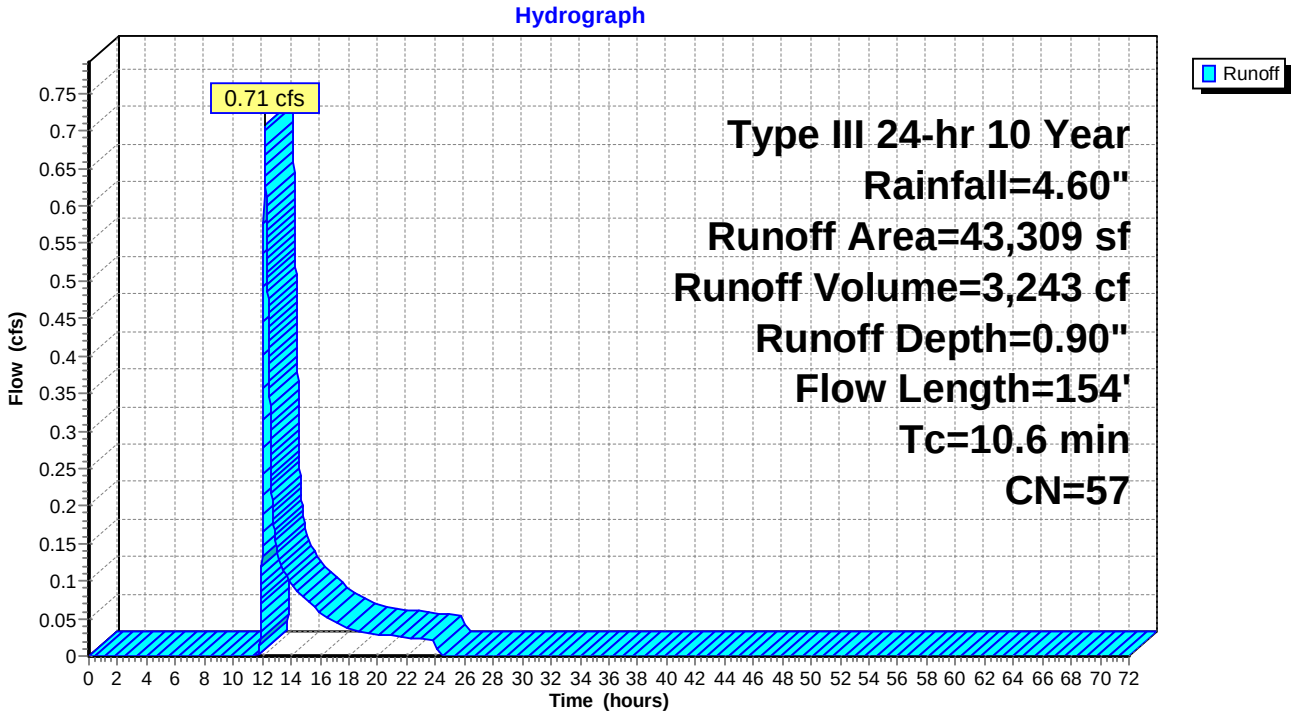
Runoff = 0.71 cfs @ 12.17 hrs, Volume= 3,243 cf, Depth= 0.90"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Rainfall=4.60"

Area (sf)	CN	Description
43,309	57	Woods/grass comb., Poor, HSG A
43,309		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.3	100	0.1290	0.16		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
0.3	54	0.3148	2.81		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
10.6	154	Total			

Subcatchment 26S: Arcadi Rd-2



Summary for Subcatchment 27S: Fisher St-1

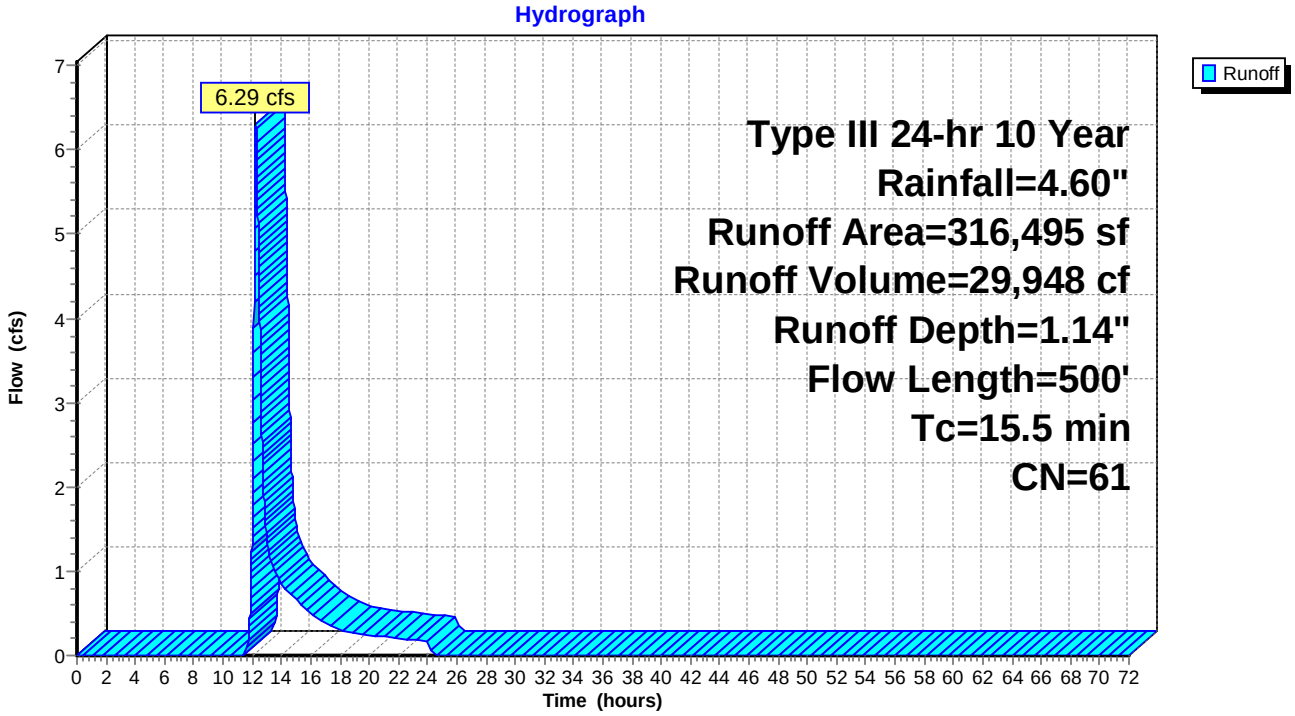
Runoff = 6.29 cfs @ 12.24 hrs, Volume= 29,948 cf, Depth= 1.14"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Rainfall=4.60"

	Area (sf)	CN	Description
	190,932	61	1/4 acre lots, 38% imp, HSG A
*	14,693	98	Bike Path, HSG A
	110,870	57	Woods/grass comb., Poor, HSG A
	316,495	61	Weighted Average
	229,248		72.43% Pervious Area
	87,247		27.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.4	100	0.0175	0.16		**Sheet Flow, Yards** Grass: Short n= 0.150 P2= 3.15"
2.1	191	0.0477	1.53		**Shallow Concentrated Flow, Yards** Short Grass Pasture Kv= 7.0 fps
2.9	191	0.0477	1.09		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
0.1	18	0.0150	2.49		**Shallow Concentrated Flow, Pavement** Paved Kv= 20.3 fps
15.5	500	Total			

Subcatchment 27S: Fisher St-1



Summary for Subcatchment 28S: Fisher St-2

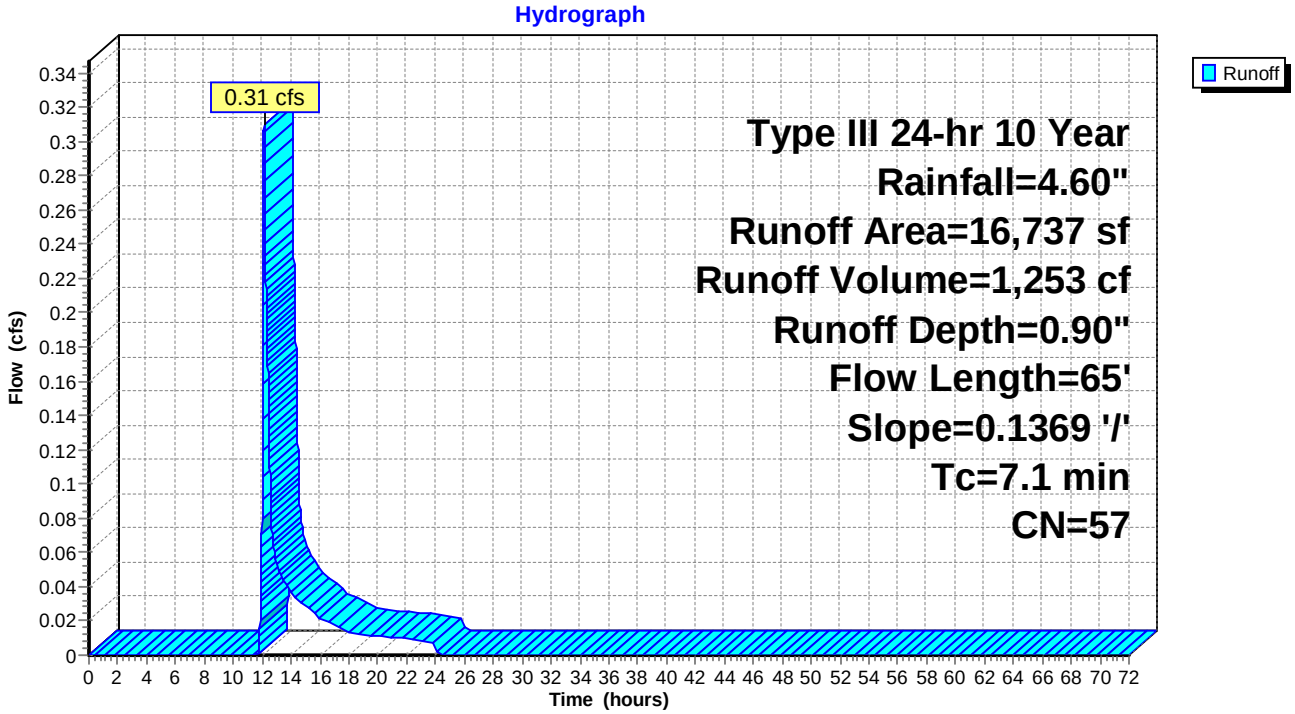
Runoff = 0.31 cfs @ 12.12 hrs, Volume= 1,253 cf, Depth= 0.90"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Rainfall=4.60"

Area (sf)	CN	Description
16,737	57	Woods/grass comb., Poor, HSG A
16,737		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.1	65	0.1369	0.15		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"

Subcatchment 28S: Fisher St-2



Summary for Subcatchment 29S: Unnamed Pond 1-2

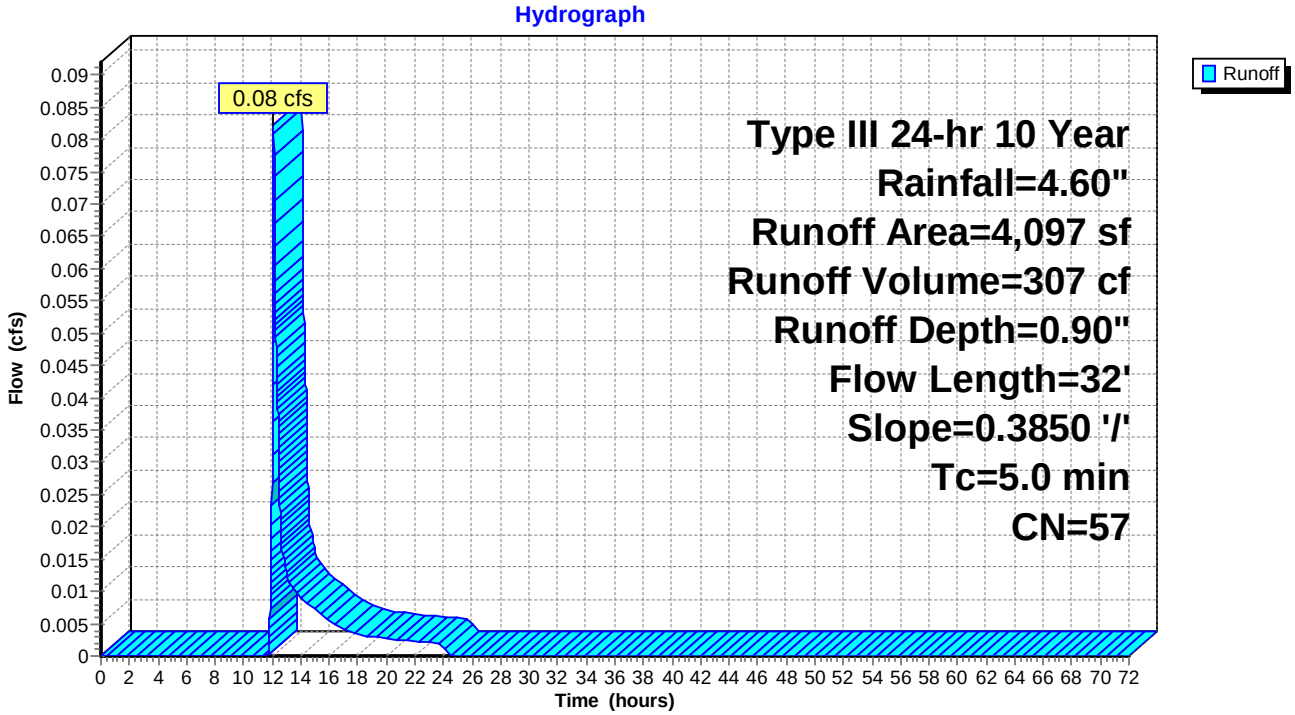
Runoff = 0.08 cfs @ 12.09 hrs, Volume= 307 cf, Depth= 0.90"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Rainfall=4.60"

Area (sf)	CN	Description
4,097	57	Woods/grass comb., Poor, HSG A
4,097		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.7	32	0.3850	0.20		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
2.7	32	Total, Increased to minimum Tc = 5.0 min			

Subcatchment 29S: Unnamed Pond 1-2



Summary for Subcatchment 30S: Unnamed Pond 1-1

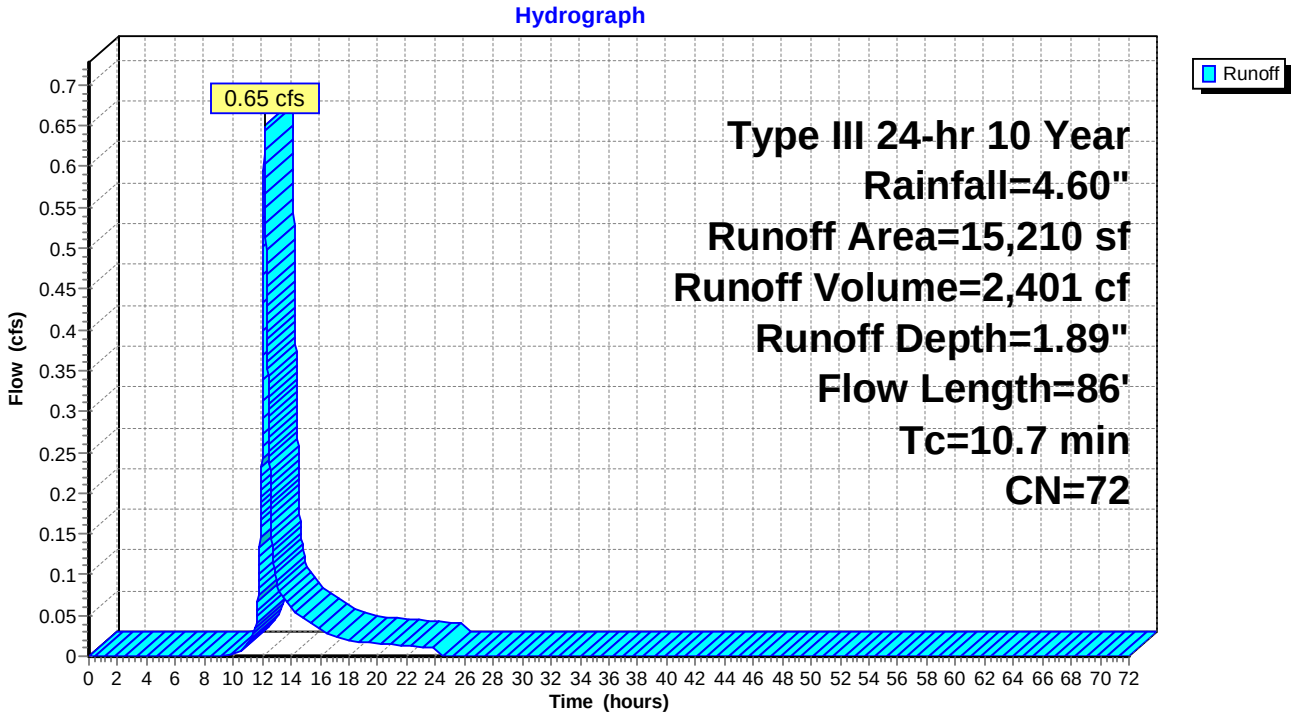
Runoff = 0.65 cfs @ 12.16 hrs, Volume= 2,401 cf, Depth= 1.89"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Rainfall=4.60"

	Area (sf)	CN	Description
	1,843	61	1/4 acre lots, 38% imp, HSG A
*	4,035	98	Bike Path, HSG A
	8,142	57	Woods/grass comb., Poor, HSG A
*	1,190	98	Paved Parking, HSG A
	15,210	72	Weighted Average
	9,285		61.04% Pervious Area
	5,925		38.96% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	24	0.0154	0.92		**Sheet Flow, Driveway** Smooth surfaces n= 0.011 P2= 3.15"
1.9	16	0.0312	0.14		**Sheet Flow, Yards** Grass: Short n= 0.150 P2= 3.15"
8.4	46	0.0450	0.09		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
10.7	86	Total			

Subcatchment 30S: Unnamed Pond 1-1



Summary for Subcatchment 31S: Unnamed Pond 2

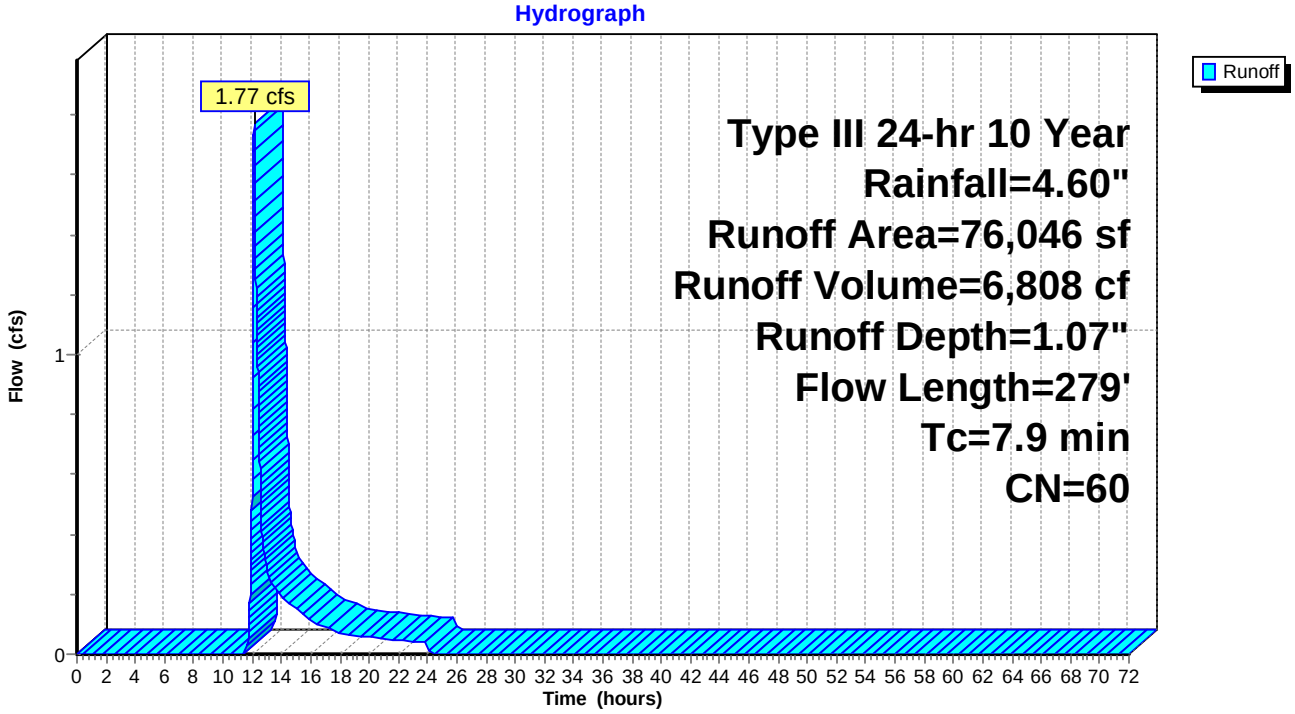
Runoff = 1.77 cfs @ 12.13 hrs, Volume= 6,808 cf, Depth= 1.07"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Rainfall=4.60"

Area (sf)	CN	Description
50,917	61	1/4 acre lots, 38% imp, HSG A
25,129	57	Woods/grass comb., Poor, HSG A
76,046	60	Weighted Average
56,698		74.56% Pervious Area
19,348		25.44% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.7	100	0.0800	0.29		**Sheet Flow, Yards** Grass: Short n= 0.150 P2= 3.15"
1.3	105	0.0381	1.37		**Shallow Concentrated Flow, Yards** Short Grass Pasture Kv= 7.0 fps
0.9	74	0.0724	1.35		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
7.9	279	Total			

Subcatchment 31S: Unnamed Pond 2



Summary for Subcatchment 32S: Unnamed Pond 3

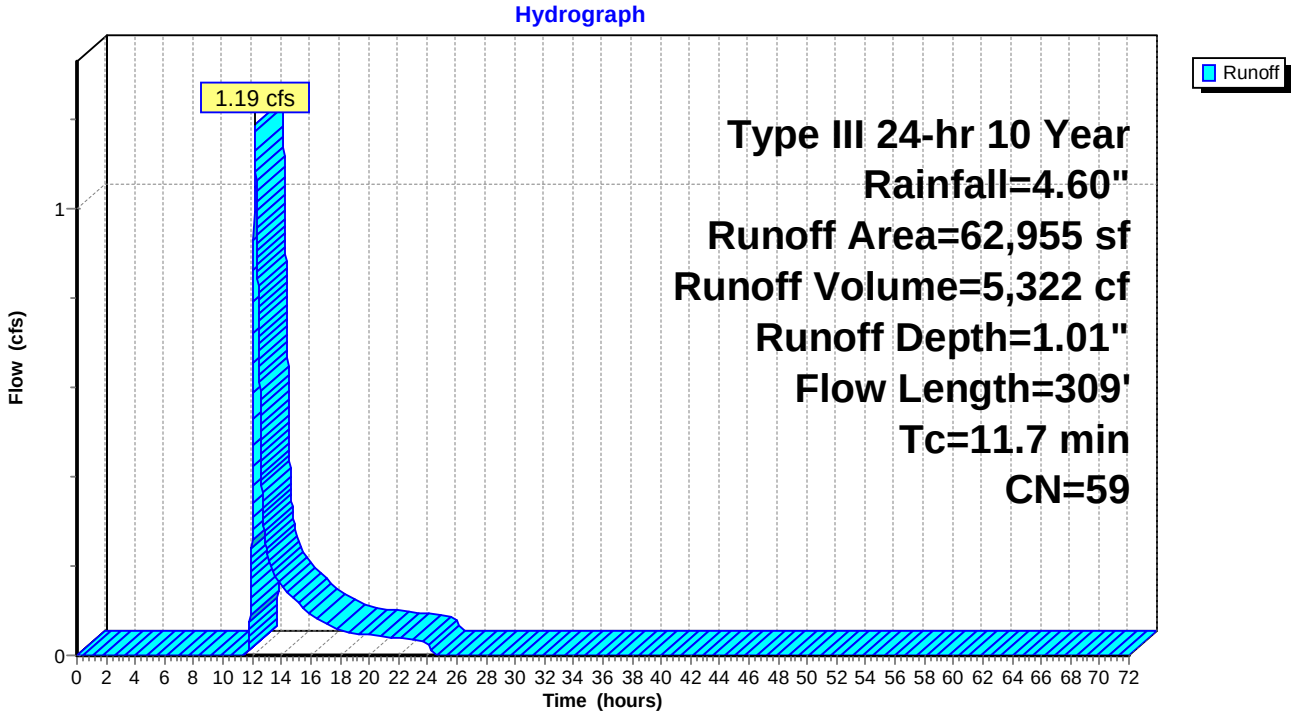
Runoff = 1.19 cfs @ 12.18 hrs, Volume= 5,322 cf, Depth= 1.01"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Rainfall=4.60"

Area (sf)	CN	Description
27,650	61	1/4 acre lots, 38% imp, HSG A
35,305	57	Woods/grass comb., Poor, HSG A
62,955	59	Weighted Average
52,448		83.31% Pervious Area
10,507		16.69% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.2	100	0.0320	0.20		**Sheet Flow, Grass** Grass: Short n= 0.150 P2= 3.15"
3.5	209	0.0400	1.00		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
11.7	309	Total			

Subcatchment 32S: Unnamed Pond 3



Summary for Subcatchment 33S: Unnamed Pond 3-1

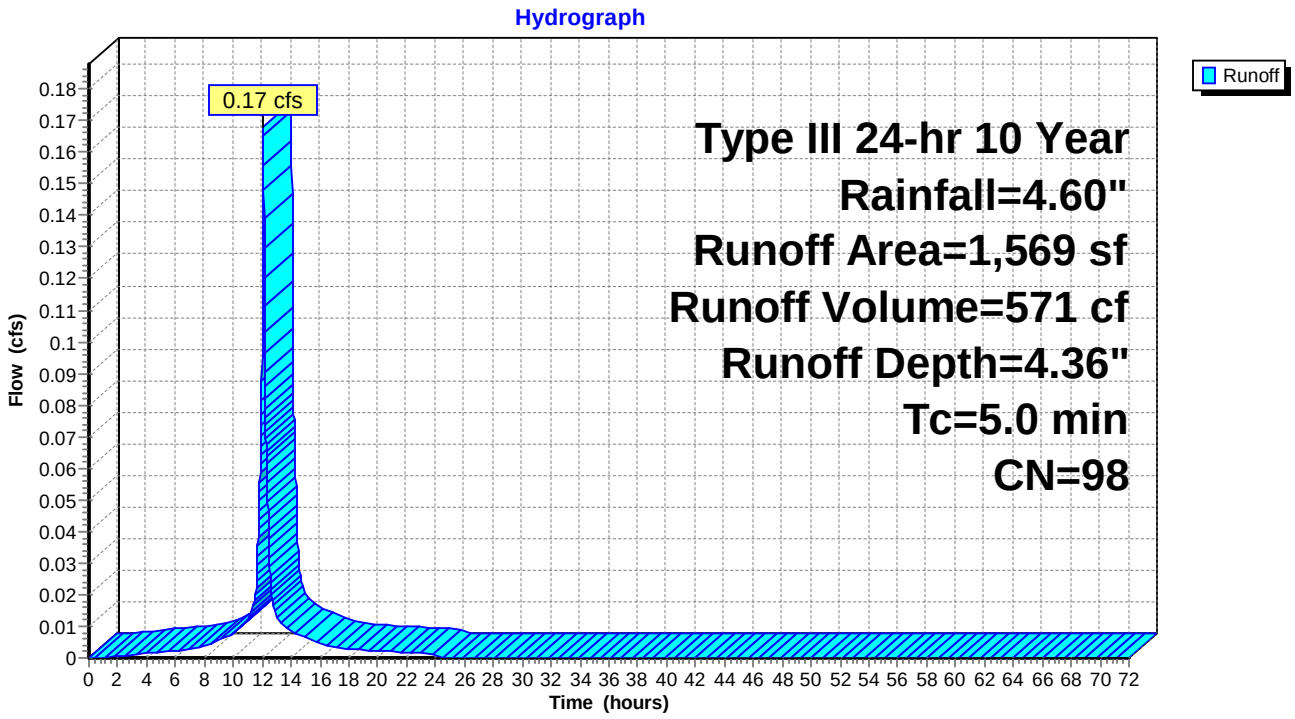
Runoff = 0.17 cfs @ 12.07 hrs, Volume= 571 cf, Depth= 4.36"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Rainfall=4.60"

Area (sf)	CN	Description
1,569	98	Paved roads w/curbs & sewers, HSG A
1,569		100.00% Impervious Area

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

Subcatchment 33S: Unnamed Pond 3-1



Summary for Subcatchment 34S: Unnamed Pond 4-1

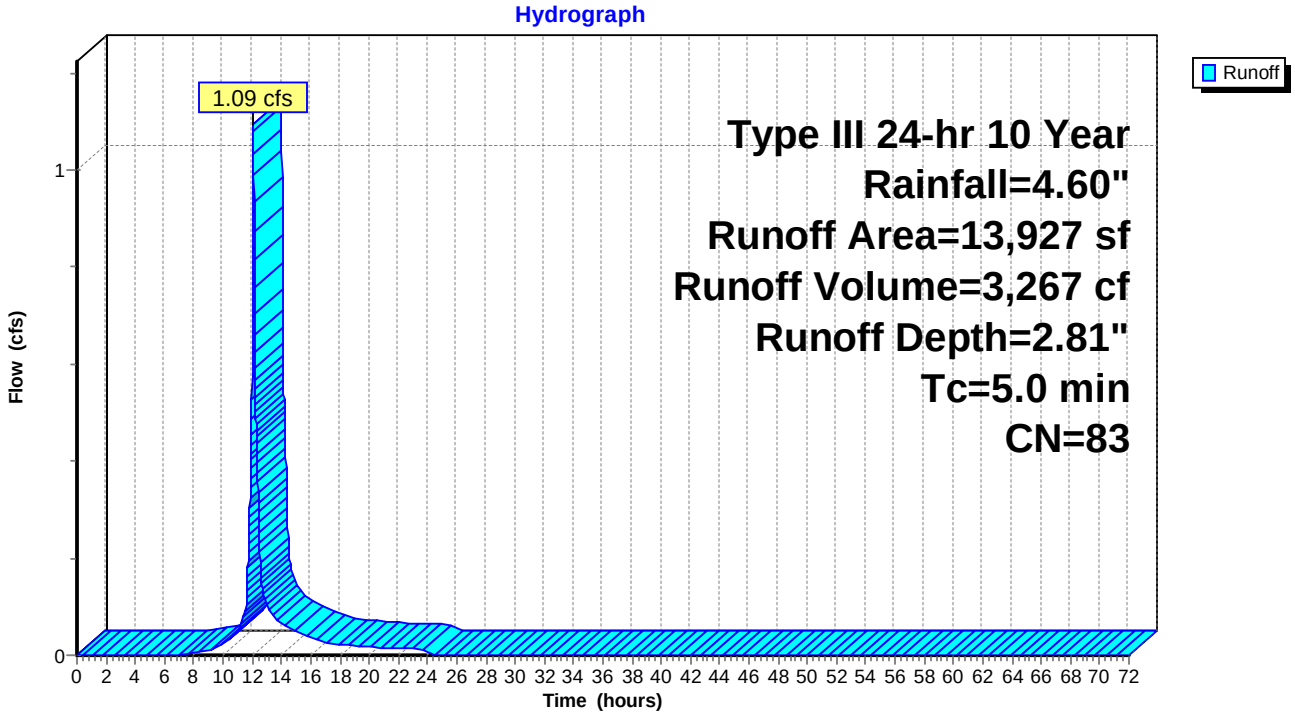
Runoff = 1.09 cfs @ 12.07 hrs, Volume= 3,267 cf, Depth= 2.81"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Rainfall=4.60"

	Area (sf)	CN	Description
	5,220	57	Woods/grass comb., Poor, HSG A
*	8,707	98	Bike Path, HSG A
	13,927	83	Weighted Average
	5,220		37.48% Pervious Area
	8,707		62.52% Impervious Area

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

Subcatchment 34S: Unnamed Pond 4-1



Summary for Subcatchment 35S: Unnamed Pond 4-2

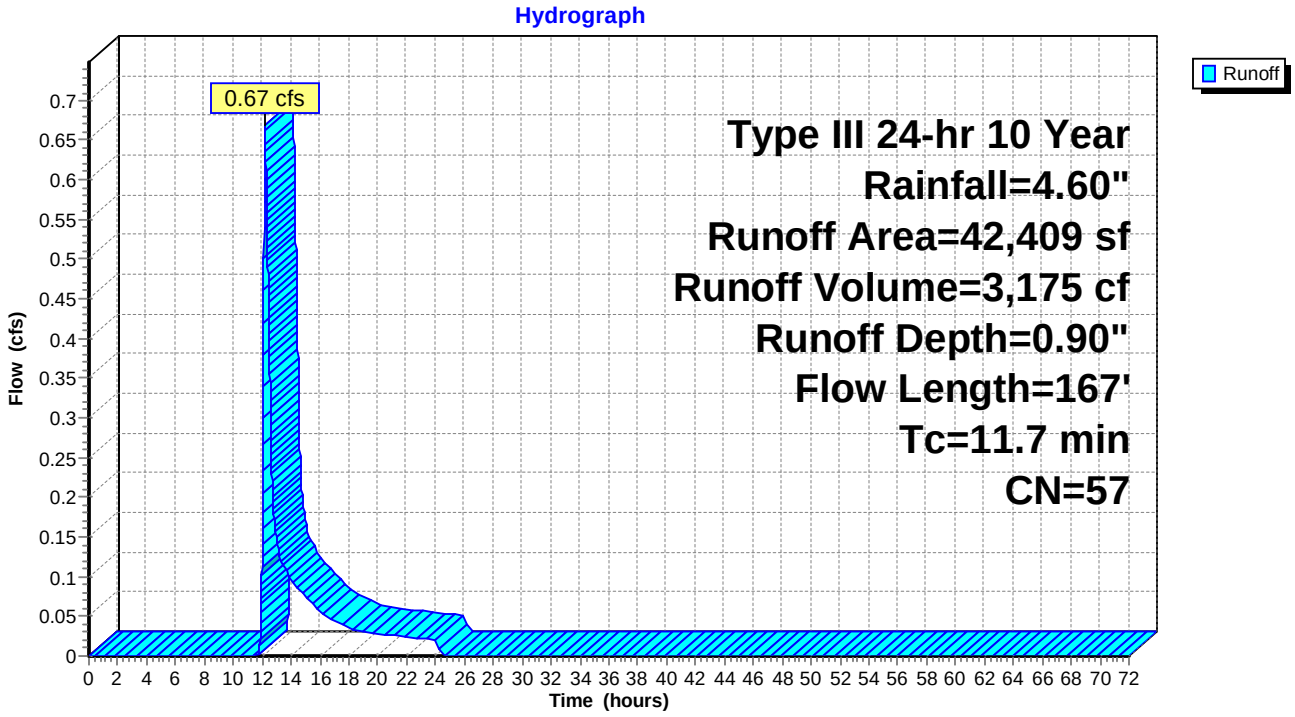
Runoff = 0.67 cfs @ 12.19 hrs, Volume= 3,175 cf, Depth= 0.90"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Rainfall=4.60"

Area (sf)	CN	Description
42,409	57	Woods/grass comb., Poor, HSG A
42,409		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.9	100	0.1100	0.15		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
0.8	67	0.0821	1.43		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
11.7	167	Total			

Subcatchment 35S: Unnamed Pond 4-2



Summary for Subcatchment 36S: Kansas St-1

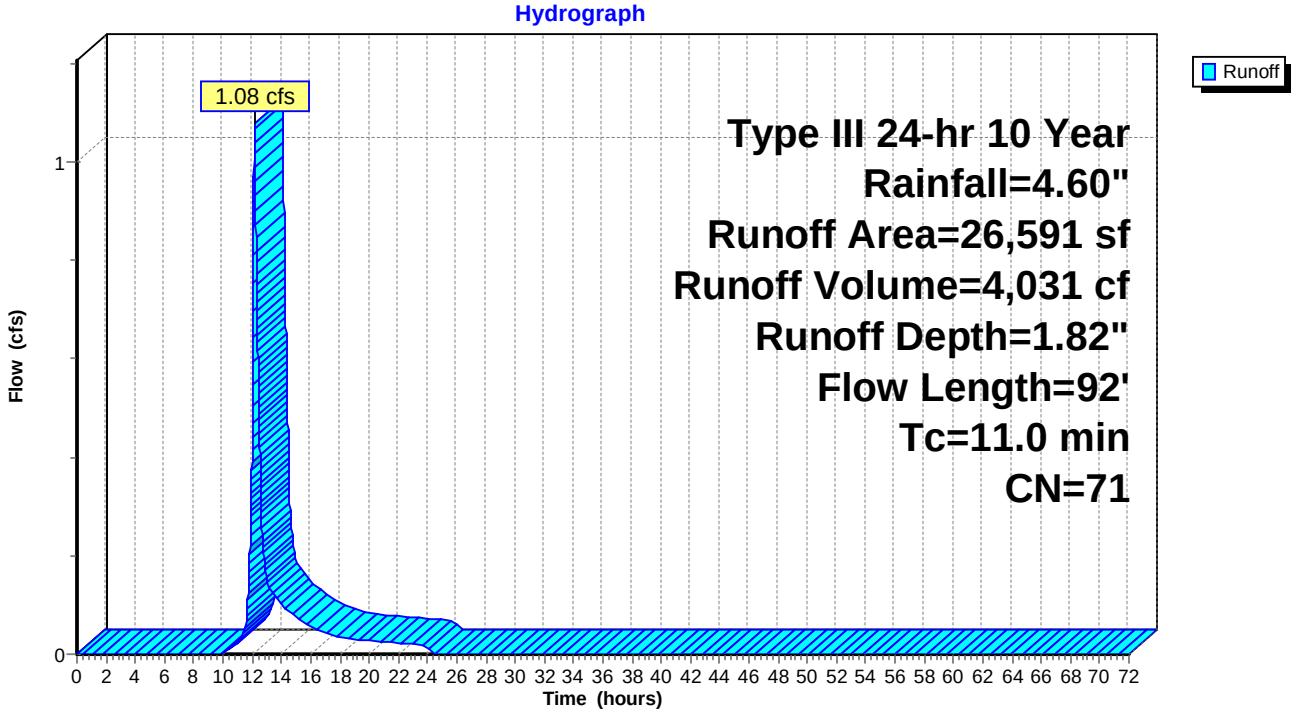
Runoff = 1.08 cfs @ 12.16 hrs, Volume= 4,031 cf, Depth= 1.82"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Rainfall=4.60"

	Area (sf)	CN	Description
	3,799	61	1/4 acre lots, 38% imp, HSG A
	2,525	98	Paved parking, HSG A
*	5,891	98	Bike Path, HSG A
	14,376	57	Woods/grass comb., Poor, HSG A
	26,591	71	Weighted Average
	16,731		62.92% Pervious Area
	9,860		37.08% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.7	74	0.0090	0.12		**Sheet Flow, Grass** Grass: Short n= 0.150 P2= 3.15"
0.3	18	0.0150	0.86		**Sheet Flow, Bike Path** Smooth surfaces n= 0.011 P2= 3.15"
11.0	92	Total			

Subcatchment 36S: Kansas St-1



Summary for Subcatchment 37S: Kansas St-2

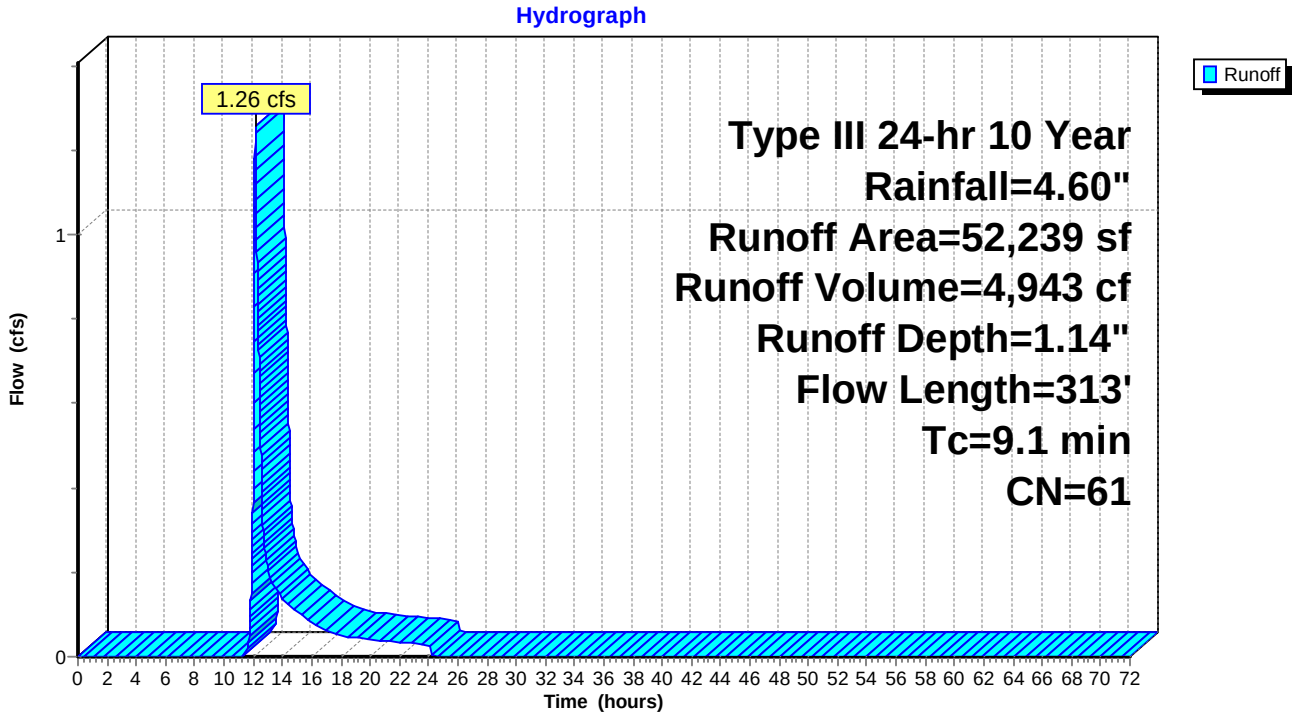
Runoff = 1.26 cfs @ 12.14 hrs, Volume= 4,943 cf, Depth= 1.14"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Rainfall=4.60"

Area (sf)	CN	Description
34,065	57	Woods/grass comb., Poor, HSG A
3,317	98	Paved parking, HSG A
14,857	61	1/4 acre lots, 38% imp, HSG A
52,239	61	Weighted Average
43,276		82.84% Pervious Area
8,963		17.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.7	100	0.0775	0.29		**Sheet Flow, Yards** Grass: Short n= 0.150 P2= 3.15"
3.1	175	0.0186	0.95		**Shallow Concentrated Flow, Yards** Short Grass Pasture Kv= 7.0 fps
0.3	38	0.1974	2.22		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
9.1	313	Total			

Subcatchment 37S: Kansas St-2



Summary for Subcatchment 38S: N. Main & Kansas

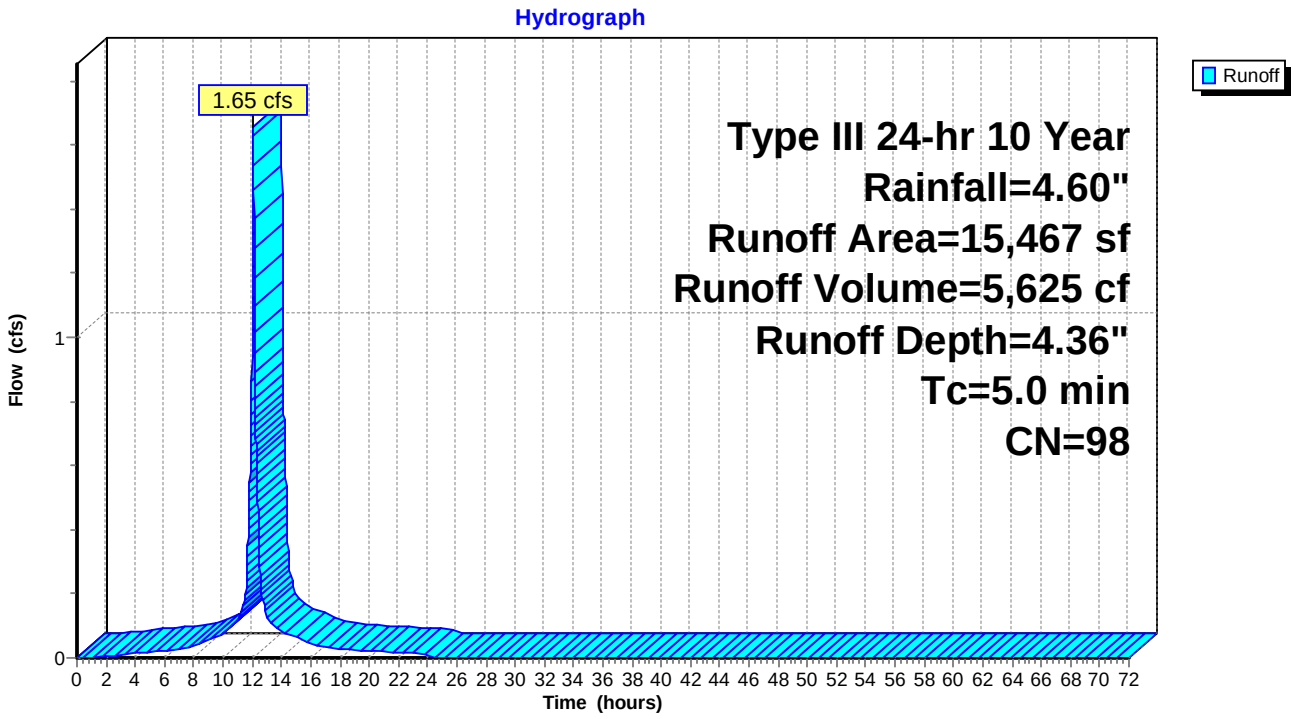
Runoff = 1.65 cfs @ 12.07 hrs, Volume= 5,625 cf, Depth= 4.36"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Rainfall=4.60"

Area (sf)	CN	Description
15,467	98	Paved roads w/curbs & sewers, HSG A
15,467		100.00% Impervious Area

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

Subcatchment 38S: N. Main & Kansas



Summary for Subcatchment 39S: Washington Ave 1

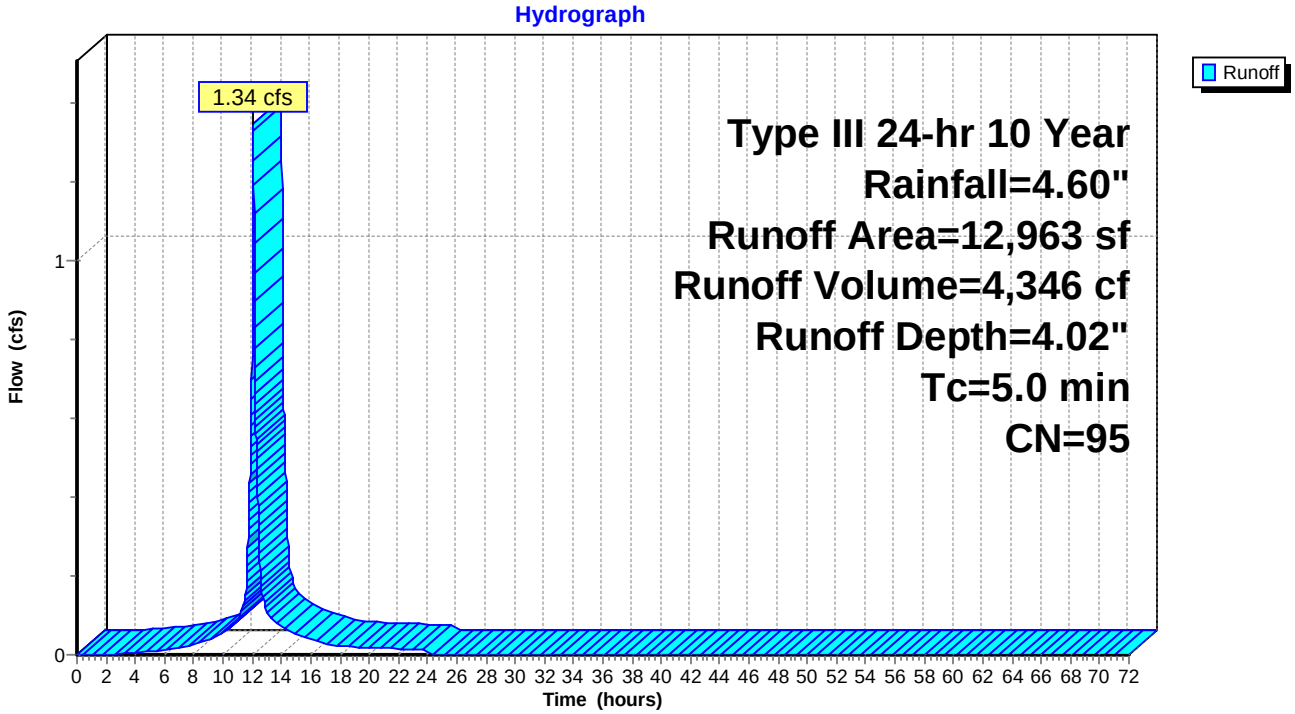
Runoff = 1.34 cfs @ 12.07 hrs, Volume= 4,346 cf, Depth= 4.02"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Rainfall=4.60"

	Area (sf)	CN	Description
	10,635	98	Paved roads w/curbs & sewers, HSG A
	1,284	68	<50% Grass cover, Poor, HSG A
*	1,044	98	Bike Path, HSG A
	12,963	95	Weighted Average
	1,284		9.91% Pervious Area
	11,679		90.09% Impervious Area

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

Subcatchment 39S: Washington Ave 1



Summary for Subcatchment 40S: Washington Ave 2

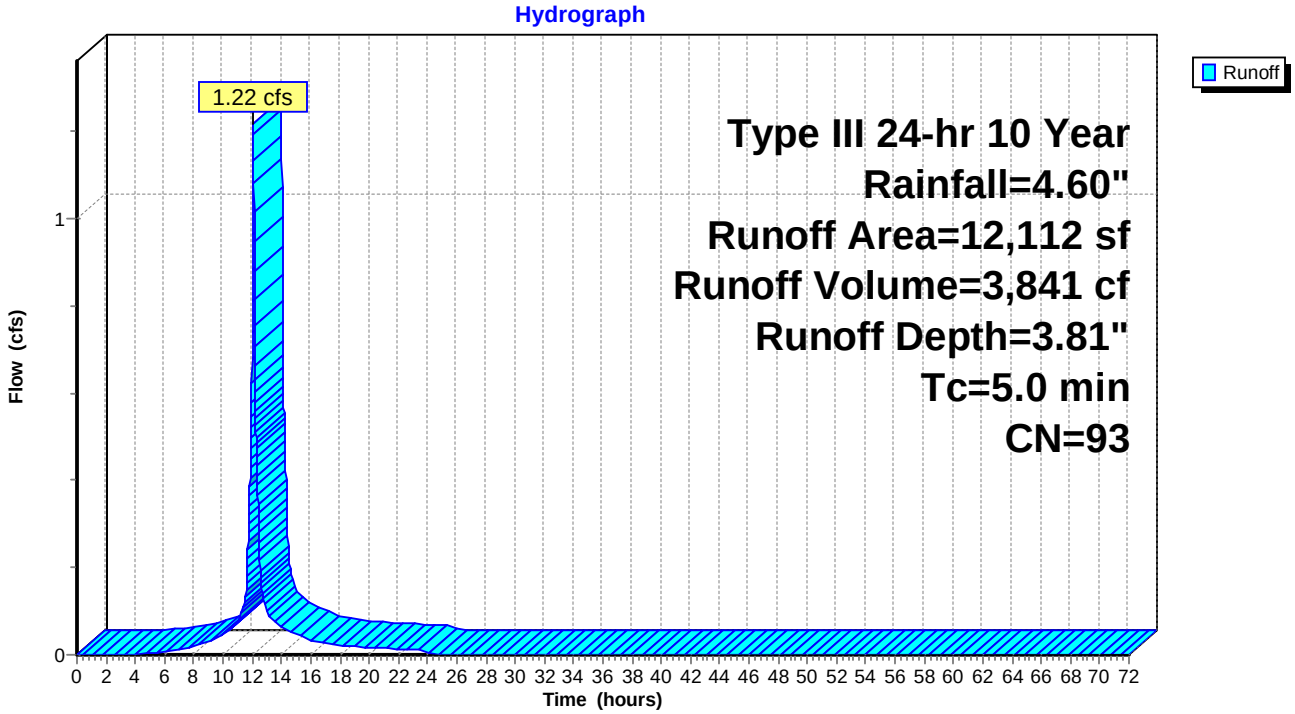
Runoff = 1.22 cfs @ 12.07 hrs, Volume= 3,841 cf, Depth= 3.81"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Rainfall=4.60"

	Area (sf)	CN	Description
	2,040	68	<50% Grass cover, Poor, HSG A
	6,175	98	Paved parking, HSG A
*	3,897	98	Bike Path, HSG A
	12,112	93	Weighted Average
	2,040		16.84% Pervious Area
	10,072		83.16% Impervious Area

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

Subcatchment 40S: Washington Ave 2



Summary for Subcatchment 41S: Washington Ave 3

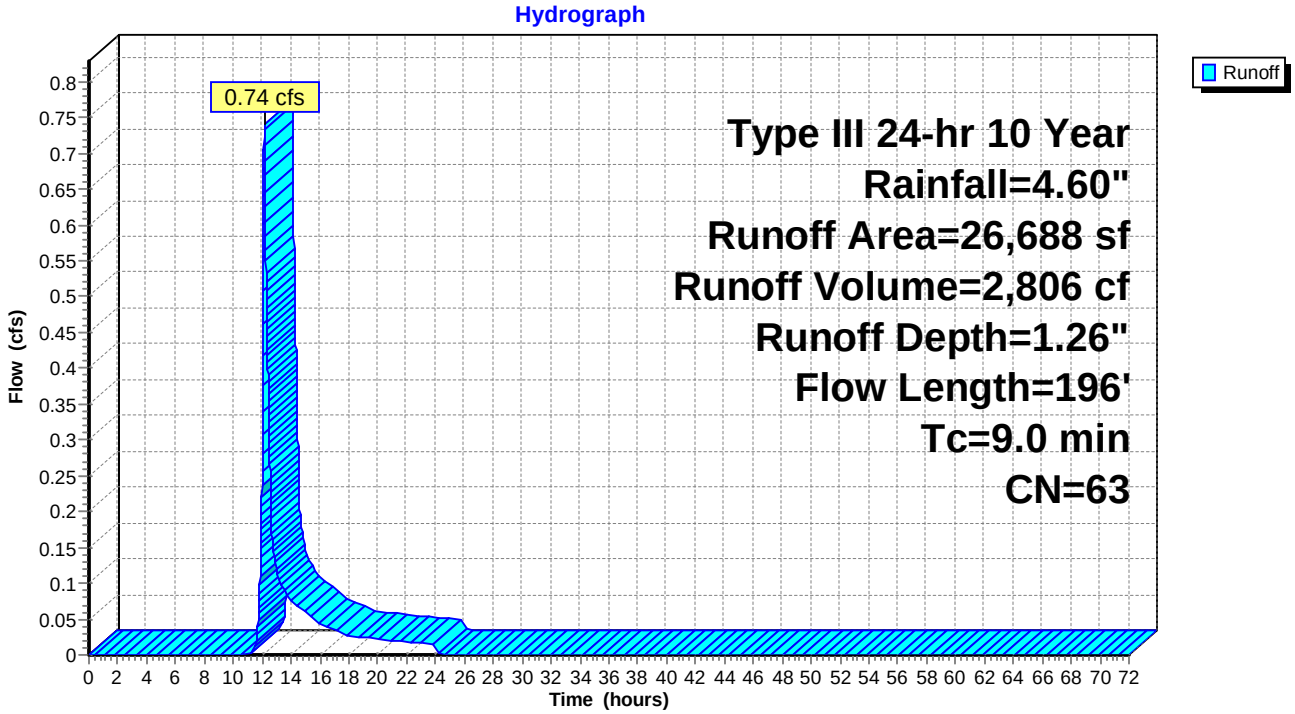
Runoff = 0.74 cfs @ 12.14 hrs, Volume= 2,806 cf, Depth= 1.26"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Rainfall=4.60"

	Area (sf)	CN	Description
	20,850	61	1/4 acre lots, 38% imp, HSG A
*	2,152	98	Bike Path, HSG A
	3,686	57	Woods/grass comb., Poor, HSG A
	26,688	63	Weighted Average
	16,613		62.25% Pervious Area
	10,075		37.75% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	100	0.0350	0.21		**Sheet Flow, Yards** Grass: Short n= 0.150 P2= 3.15"
1.1	96	0.0427	1.45		**Shallow Concentrated Flow, Yards** Short Grass Pasture Kv= 7.0 fps
9.0	196	Total			

Subcatchment 41S: Washington Ave 3



Summary for Subcatchment 42S: Empty Lot

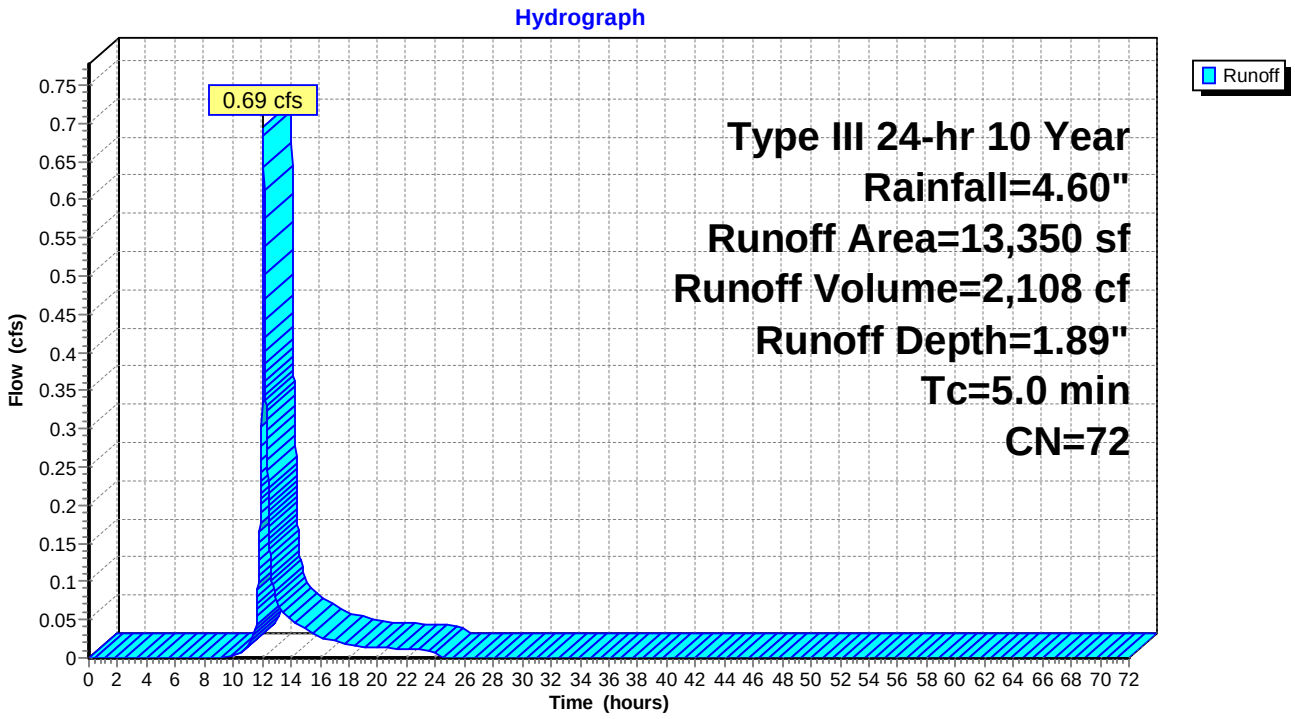
Runoff = 0.69 cfs @ 12.08 hrs, Volume= 2,108 cf, Depth= 1.89"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Rainfall=4.60"

Area (sf)	CN	Description
13,350	72	Dirt roads, HSG A
13,350		100.00% Pervious Area

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

Subcatchment 42S: Empty Lot



Summary for Subcatchment 43S: Lagrange St

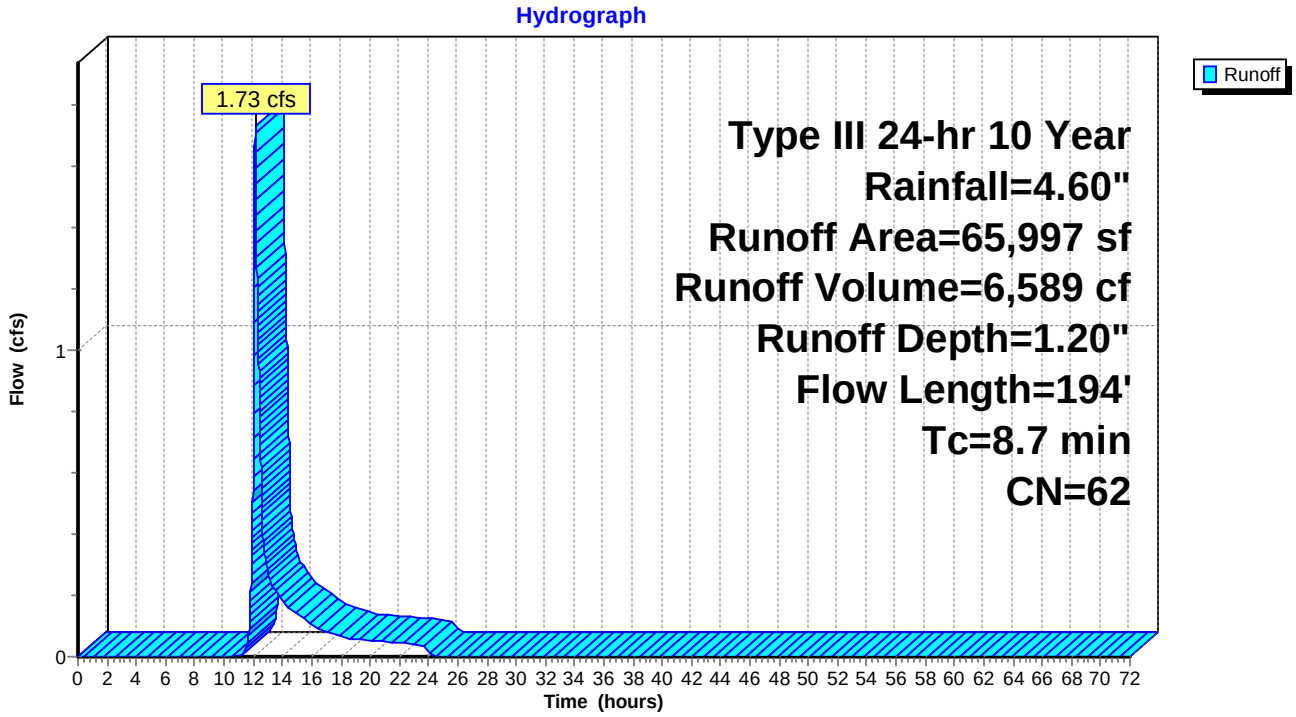
Runoff = 1.73 cfs @ 12.14 hrs, Volume= 6,589 cf, Depth= 1.20"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Rainfall=4.60"

	Area (sf)	CN	Description
	52,794	61	1/4 acre lots, 38% imp, HSG A
	9,738	57	Woods/grass comb., Poor, HSG A
*	3,465	98	Bike Path, HSG A
	65,997	62	Weighted Average
	42,470		64.35% Pervious Area
	23,527		35.65% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.1	100	0.0450	0.23		**Sheet Flow, Yard** Grass: Short n= 0.150 P2= 3.15"
0.9	53	0.0189	0.96		**Shallow Concentrated Flow, Yard** Short Grass Pasture Kv= 7.0 fps
0.7	41	0.0366	0.96		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
8.7	194	Total			

Subcatchment 43S: Lagrange St



Summary for Subcatchment 44S: Mechanic St

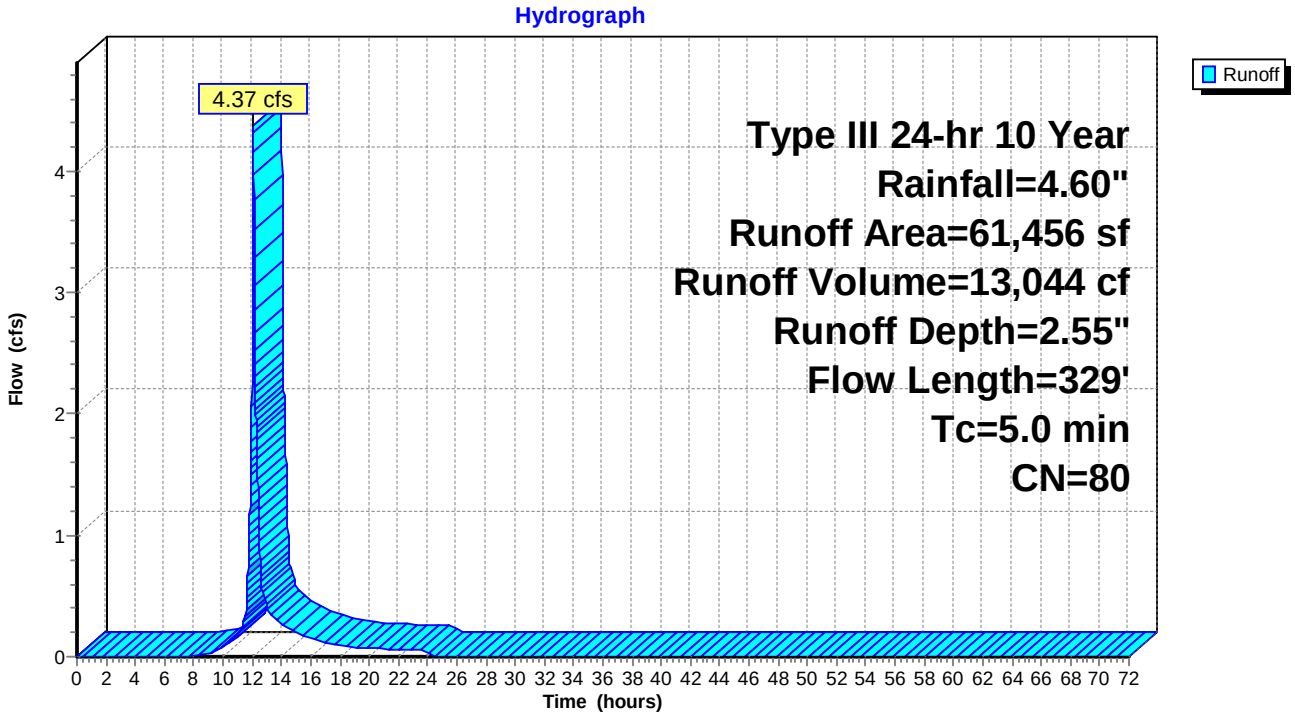
Runoff = 4.37 cfs @ 12.07 hrs, Volume= 13,044 cf, Depth= 2.55"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Rainfall=4.60"

	Area (sf)	CN	Description
	37,417	81	Urban industrial, 72% imp, HSG A
	2,503	98	Paved parking, HSG A
*	8,336	98	Bike Path, HSG A
	7,222	68	<50% Grass cover, Poor, HSG A
	5,978	57	Woods/grass comb., Poor, HSG A
	61,456	80	Weighted Average
	23,677		38.53% Pervious Area
	37,779		61.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	100	0.0150	1.22		**Sheet Flow, Road** Smooth surfaces n= 0.011 P2= 3.15"
3.0	229	0.0040	1.28		**Shallow Concentrated Flow, Bike Path** Paved Kv= 20.3 fps
4.4	329	Total, Increased to minimum Tc = 5.0 min			

Subcatchment 44S: Mechanic St



Summary for Subcatchment 45S: Cochituate St 1

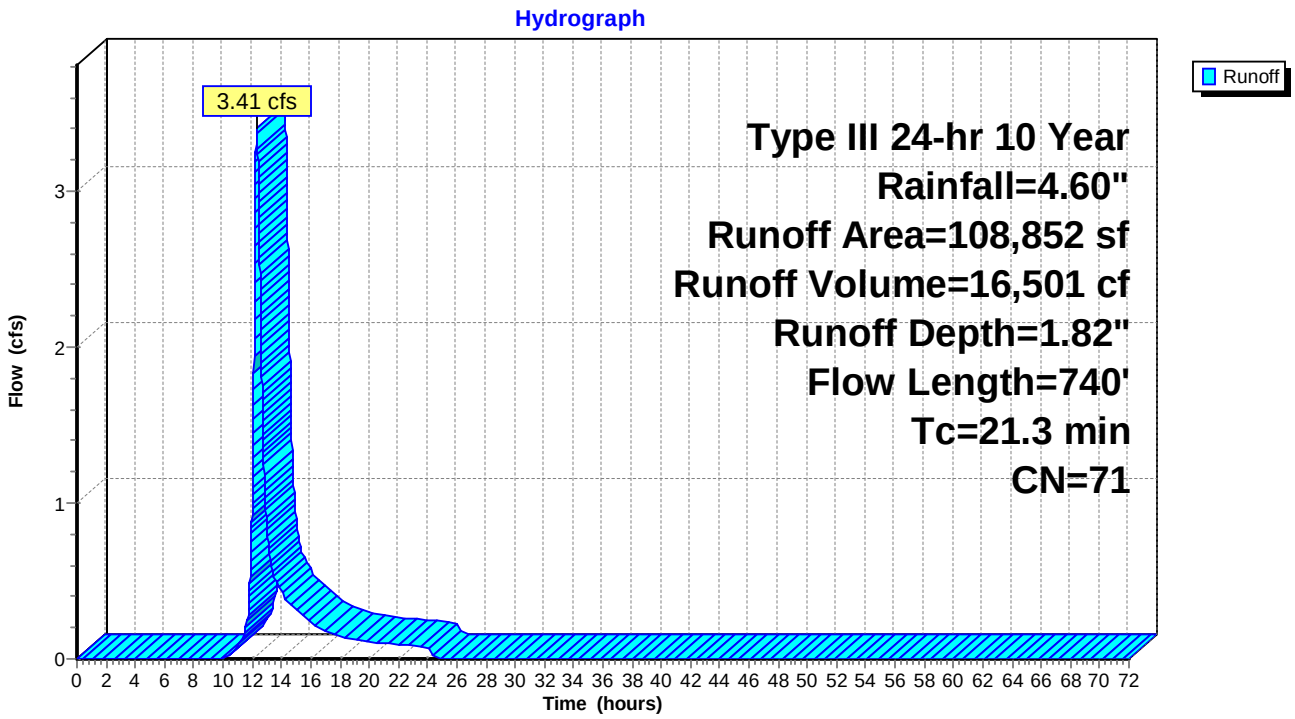
Runoff = 3.41 cfs @ 12.31 hrs, Volume= 16,501 cf, Depth= 1.82"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Rainfall=4.60"

	Area (sf)	CN	Description
	13,087	81	Urban industrial, 72% imp, HSG A
	11,315	98	Paved parking, HSG A
*	13,568	98	Bike Path, HSG A
	30,345	57	Woods/grass comb., Poor, HSG A
	38,236	61	1/4 acre lots, 38% imp, HSG A
	2,301	76	Gravel roads, HSG A
	108,852	71	Weighted Average
	60,017		55.14% Pervious Area
	48,835		44.86% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.4	75	0.0333	0.20		**Sheet Flow, Yards** Grass: Short n= 0.150 P2= 3.15"
1.9	25	0.5200	0.21		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
0.1	12	0.0150	2.49		**Shallow Concentrated Flow, Bike Path** Paved Kv= 20.3 fps
12.9	628	0.0040	0.81	0.10	**Trap/Vee/Rect Channel Flow, Grass Channel** Bot.W=1.00' D=0.10' Z= 2.0 '/' Top.W=1.40' n= 0.022 Earth, clean & straight
21.3	740	Total			

Subcatchment 45S: Cochituate St 1



Summary for Subcatchment 170S: Lake Cochituate N2-2

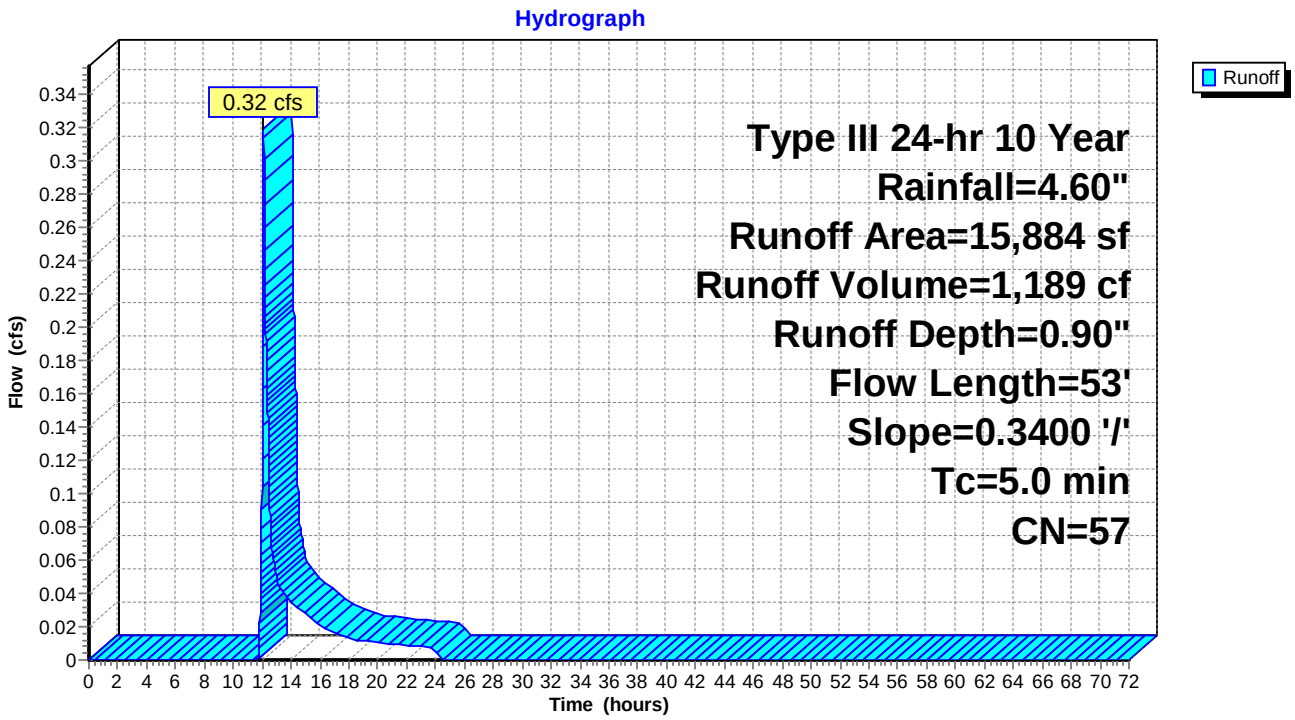
Runoff = 0.32 cfs @ 12.09 hrs, Volume= 1,189 cf, Depth= 0.90"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Rainfall=4.60"

Area (sf)	CN	Description
15,884	57	Woods/grass comb., Poor, HSG A
15,884		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.2	53	0.3400	0.21		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
4.2	53	Total, Increased to minimum Tc = 5.0 min			

Subcatchment 170S: Lake Cochituate N2-2



Summary for Pond 01P: BMP 1 - Infiltration Swale

[87] Warning: Oscillations may require Finer Routing or smaller dt

Inflow Area =	50,164 sf, 33.83% Impervious, Inflow Depth = 1.82" for 10 Year event				
Inflow =	1.77 cfs @	12.23 hrs,	Volume=	7,604 cf	
Outflow =	1.21 cfs @	12.43 hrs,	Volume=	7,605 cf,	Atten= 32%, Lag= 12.3 min
Discarded =	0.17 cfs @	12.43 hrs,	Volume=	5,175 cf	
Primary =	1.04 cfs @	12.43 hrs,	Volume=	2,430 cf	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 147.50' @ 12.43 hrs Surf.Area= 3,095 sf Storage= 1,872 cf
Flood Elev= 148.05' Surf.Area= 3,956 sf Storage= 3,586 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 125.0 min (983.7 - 858.7)

Volume	Invert	Avail.Storage	Storage Description
#1	146.75'	5,109 cf	**Infiltration Swale (Irregular)** Listed below (Recalc)
#2	142.25'	787 cf	**1.00'W x 656.00'L x 3.00'H Crushed stone** 1,968 cf Overall x 40.0% Voids
		5,896 cf	Total Available Storage

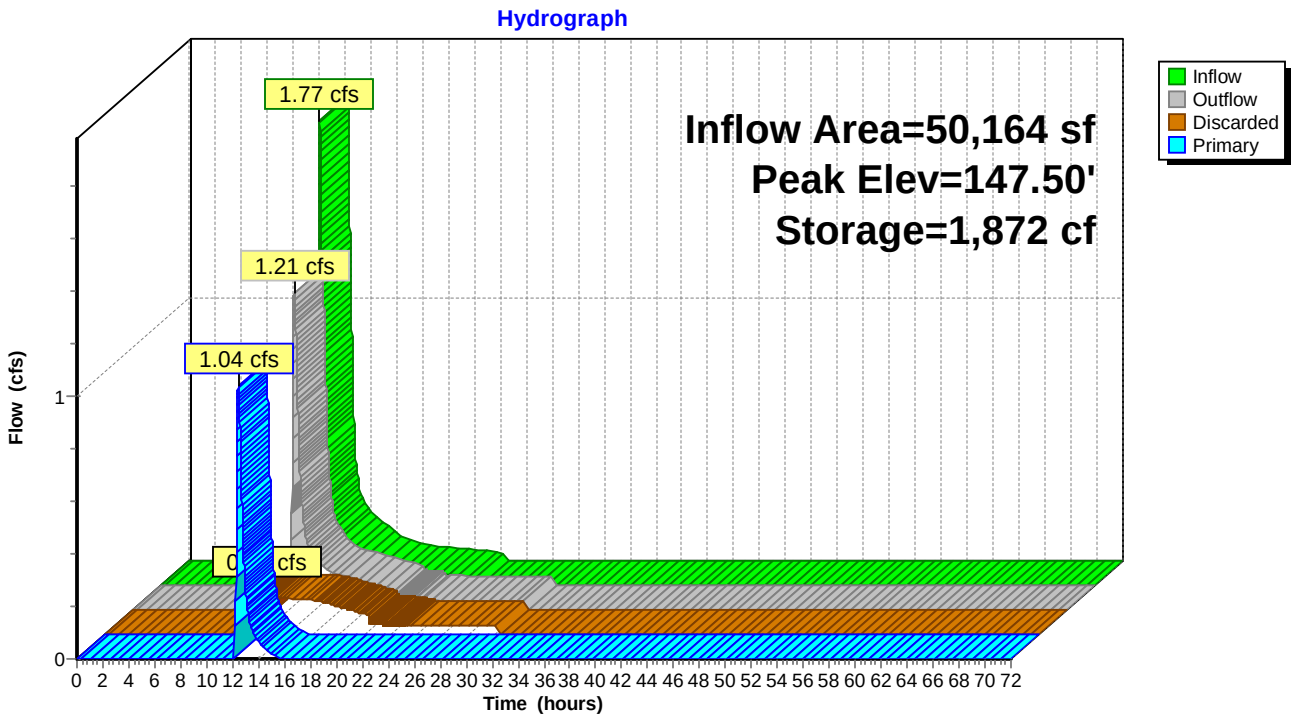
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
146.75	656	1,315.0	0	0	656
147.75	3,300	1,328.0	1,809	1,809	3,693
148.75	3,300	1,328.0	3,300	5,109	5,021

Device	Routing	Invert	Outlet Devices
#1	Discarded	142.25'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	147.25'	**3.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.17 cfs @ 12.43 hrs HW=147.50' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.17 cfs)

Primary OutFlow Max=1.04 cfs @ 12.43 hrs HW=147.50' TW=0.00' (Dynamic Tailwater)
└**2=Broad-Crested Rectangular Weir** (Weir Controls 1.04 cfs @ 1.40 fps)

Pond 01P: BMP 1 - Infiltration Swale



Summary for Pond 02P: Re-graded Detention Pond

Inflow Area = 28,639 sf, 30.10% Impervious, Inflow Depth = 2.05" for 10 Year event
Inflow = 1.61 cfs @ 12.08 hrs, Volume= 4,891 cf
Outflow = 1.60 cfs @ 12.09 hrs, Volume= 4,878 cf, Atten= 0%, Lag= 0.4 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Secondary = 1.60 cfs @ 12.09 hrs, Volume= 4,878 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 160.08' @ 12.09 hrs Surf.Area= 104 sf Storage= 63 cf
Flood Elev= 163.00' Surf.Area= 537 sf Storage= 945 cf

Plug-Flow detention time= 3.6 min calculated for 4,878 cf (100% of inflow)
Center-of-Mass det. time= 2.0 min (843.0 - 841.0)

Volume	Invert	Avail.Storage	Storage Description
#1	159.00'	945 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

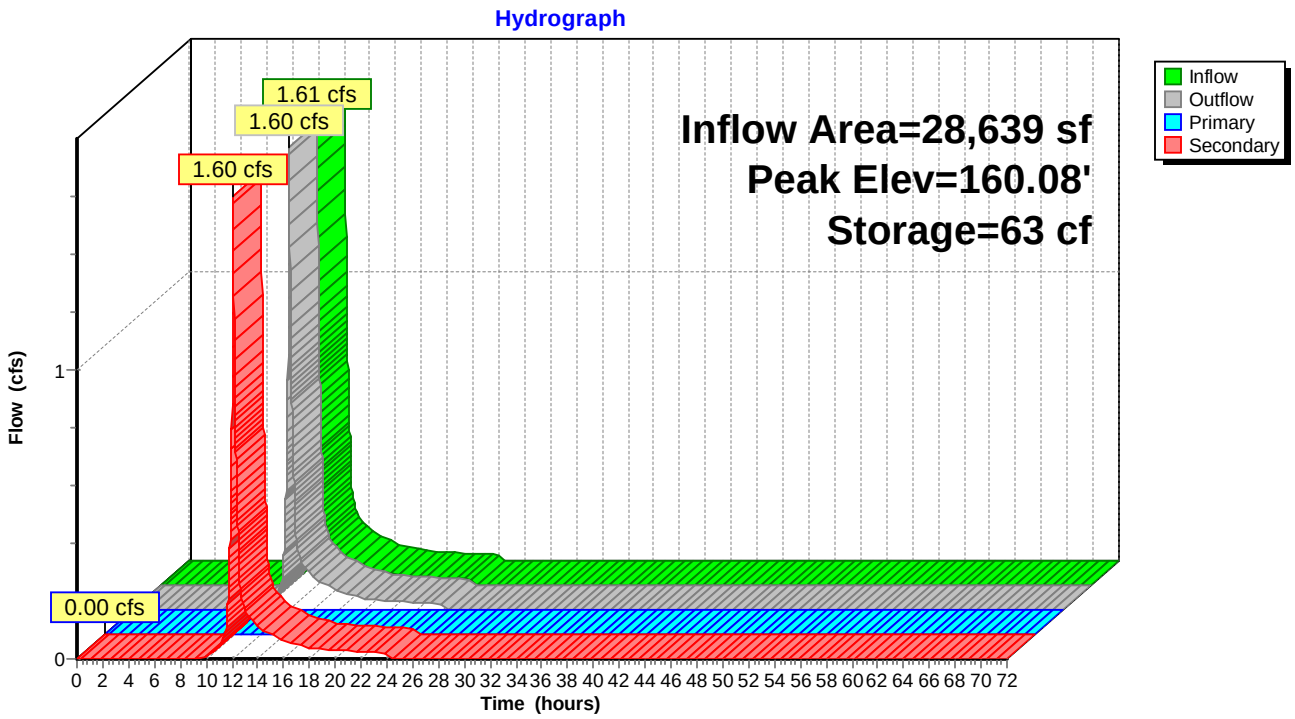
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
159.00	22	45.0	0	0	22
160.00	97	55.0	55	55	116
161.00	218	67.0	153	209	247
162.00	365	80.0	288	497	416
163.00	537	92.0	448	945	602

Device	Routing	Invert	Outlet Devices
#1	Secondary	159.40'	**24.0" Round Culvert** L= 40.0' CMP, projecting, no headwall, Ke= 0.900 Outlet Invert= 159.00' S= 0.0100 '/' Cc= 0.900 n= 0.025 Corrugated metal
#2	Primary	162.25'	**5.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=159.00' TW=0.00' (Dynamic Tailwater)
└**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Secondary OutFlow Max=1.60 cfs @ 12.09 hrs HW=160.08' (Free Discharge)
└**1=Culvert** (Barrel Controls 1.60 cfs @ 2.56 fps)

Pond 02P: Re-graded Detention Pond



Summary for Pond 03P: BMP 2 - Bioretention System

Inflow Area = 89,186 sf, 21.87% Impervious, Inflow Depth = 0.90" for 10 Year event
Inflow = 1.81 cfs @ 12.13 hrs, Volume= 6,695 cf
Outflow = 1.66 cfs @ 12.18 hrs, Volume= 6,696 cf, Atten= 8%, Lag= 2.7 min
Discarded = 0.07 cfs @ 12.18 hrs, Volume= 3,496 cf
Primary = 1.59 cfs @ 12.18 hrs, Volume= 3,199 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 152.98' @ 12.18 hrs Surf.Area= 1,319 sf Storage= 989 cf
Flood Elev= 153.89' Surf.Area= 3,516 sf Storage= 2,588 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 89.8 min (961.5 - 871.7)

Volume	Invert	Avail.Storage	Storage Description
#1	152.00'	5,949 cf	**Bioretention Area (Irregular)** Listed below (Recalc)
#2	150.00'	347 cf	**Bioretention Media (Irregular)** Listed below (Recalc) 1,050 cf Overall x 33.0% Voids
		6,296 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
152.00	525	131.0	0	0	525
153.00	800	144.0	658	658	841
154.00	3,359	300.0	1,933	2,590	6,357
155.00	3,359	300.0	3,359	5,949	6,657

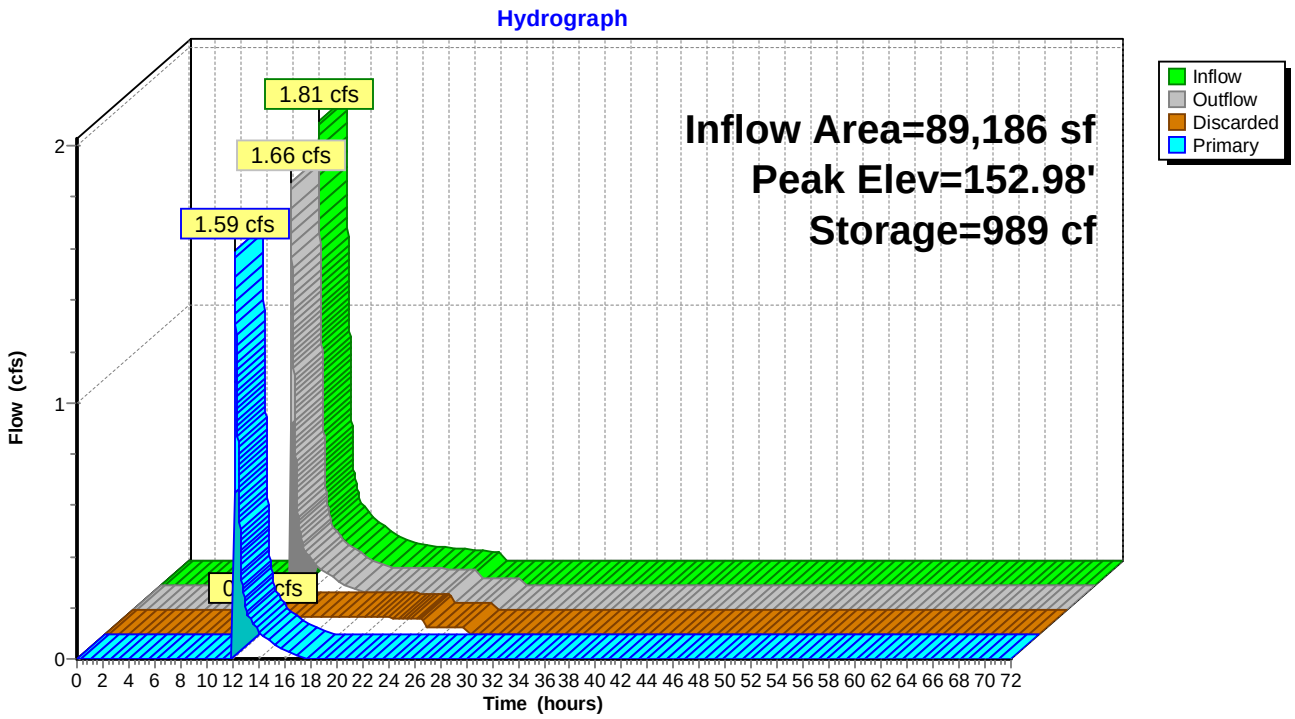
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
150.00	525	131.0	0	0	525
151.00	525	131.0	525	525	656
152.00	525	131.0	525	1,050	787

Device	Routing	Invert	Outlet Devices
#1	Discarded	150.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	149.33'	**8.0" Round Culvert** L= 33.0' RCP, square edge headwall, Ke= 0.500 Outlet Invert= 149.00' S= 0.0100 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections
#3	Device 2	152.80'	**24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.07 cfs @ 12.18 hrs HW=152.98' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.07 cfs)

Primary OutFlow Max=1.59 cfs @ 12.18 hrs HW=152.98' TW=0.00' (Dynamic Tailwater)
└─**2=Culvert** (Passes 1.59 cfs of 2.82 cfs potential flow)
└─**3=Orifice/Grate** (Weir Controls 1.59 cfs @ 1.39 fps)

Pond 03P: BMP 2 - Bioretention System



Summary for Pond 04P: BMP 3 - Infiltration Swale

Inflow Area = 41,704 sf, 17.25% Impervious, Inflow Depth = 1.33" for 10 Year event
Inflow = 1.13 cfs @ 12.18 hrs, Volume= 4,612 cf
Outflow = 0.93 cfs @ 12.28 hrs, Volume= 4,612 cf, Atten= 17%, Lag= 5.8 min
Discarded = 0.07 cfs @ 12.28 hrs, Volume= 2,716 cf
Primary = 0.86 cfs @ 12.28 hrs, Volume= 1,896 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 154.41' @ 12.28 hrs Surf.Area= 1,282 sf Storage= 812 cf
Flood Elev= 154.69' Surf.Area= 1,401 sf Storage= 1,139 cf

Plug-Flow detention time= 103.7 min calculated for 4,611 cf (100% of inflow)
Center-of-Mass det. time= 103.7 min (978.3 - 874.6)

Volume	Invert	Avail.Storage	Storage Description
#1	153.50'	1,812 cf	**Infiltration Swale (Irregular)** Listed below (Recalc)
#2	149.00'	276 cf	**1.00'W x 230.00'L x 3.00'H Crushed stone** 690 cf Overall x 40.0% Voids
		2,088 cf	Total Available Storage

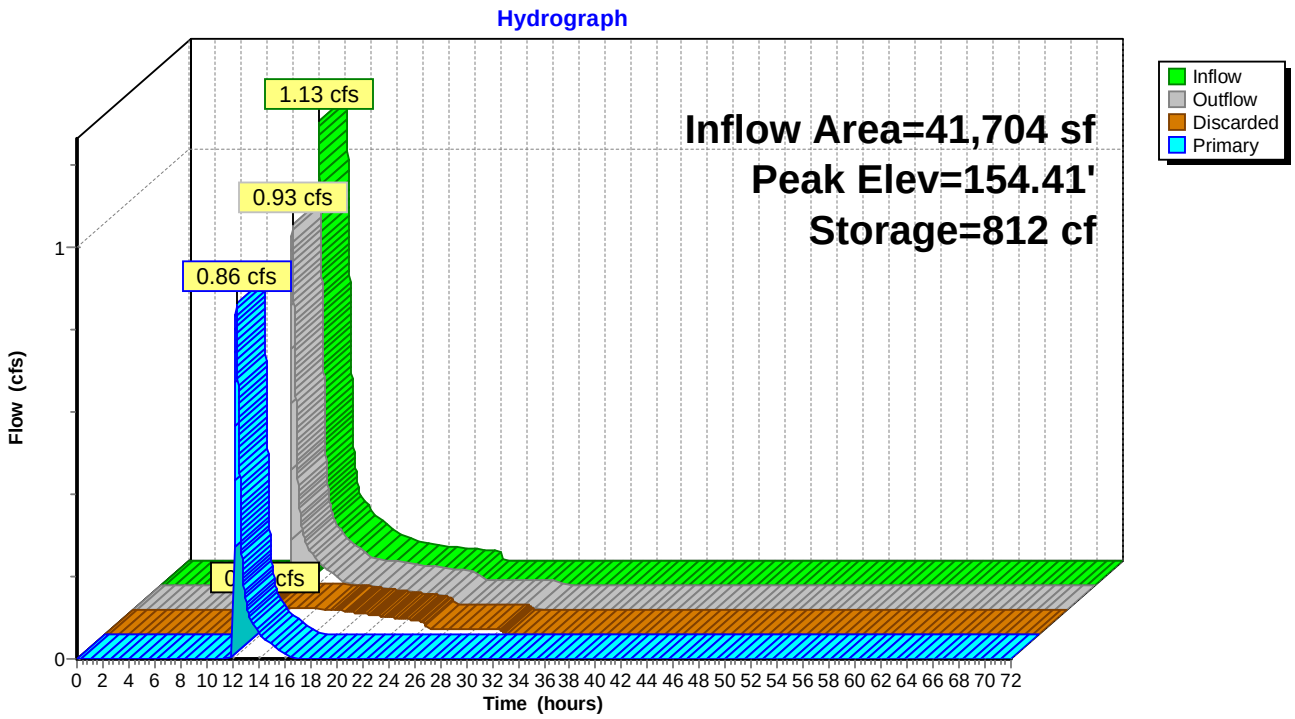
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
153.50	231	464.0	0	0	231
154.50	1,171	476.0	641	641	1,244
155.50	1,171	476.0	1,171	1,812	1,720

Device	Routing	Invert	Outlet Devices
#1	Discarded	149.00'	**2.410 in/hr Exfiltration over Surface area** Phase-In= 0.10'
#2	Primary	154.25'	**5.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.07 cfs @ 12.28 hrs HW=154.41' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.07 cfs)

Primary OutFlow Max=0.86 cfs @ 12.28 hrs HW=154.41' TW=0.00' (Dynamic Tailwater)
└**2=Broad-Crested Rectangular Weir** (Weir Controls 0.86 cfs @ 1.11 fps)

Pond 04P: BMP 3 - Infiltration Swale



Summary for Pond 05P: BMP 4 - Infiltration Swale

Inflow Area = 98,155 sf, 15.90% Impervious, Inflow Depth = 1.33" for 10 Year event
Inflow = 2.24 cfs @ 12.28 hrs, Volume= 10,854 cf
Outflow = 2.22 cfs @ 12.31 hrs, Volume= 10,854 cf, Atten= 1%, Lag= 1.7 min
Discarded = 0.07 cfs @ 12.21 hrs, Volume= 3,083 cf
Primary = 2.15 cfs @ 12.31 hrs, Volume= 7,771 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 154.78' @ 12.31 hrs Surf.Area= 1,224 sf Storage= 835 cf
Flood Elev= 155.05' Surf.Area= 1,224 sf Storage= 1,107 cf

Plug-Flow detention time= 51.1 min calculated for 10,853 cf (100% of inflow)
Center-of-Mass det. time= 51.2 min (931.8 - 880.6)

Volume	Invert	Avail.Storage	Storage Description
#1	153.75'	1,584 cf	**Infiltration Swale (Irregular)** Listed below (Recalc)
#2	149.25'	240 cf	**1.00'W x 200.00'L x 3.00'H Crushed stone** 600 cf Overall x 40.0% Voids
		1,824 cf	Total Available Storage

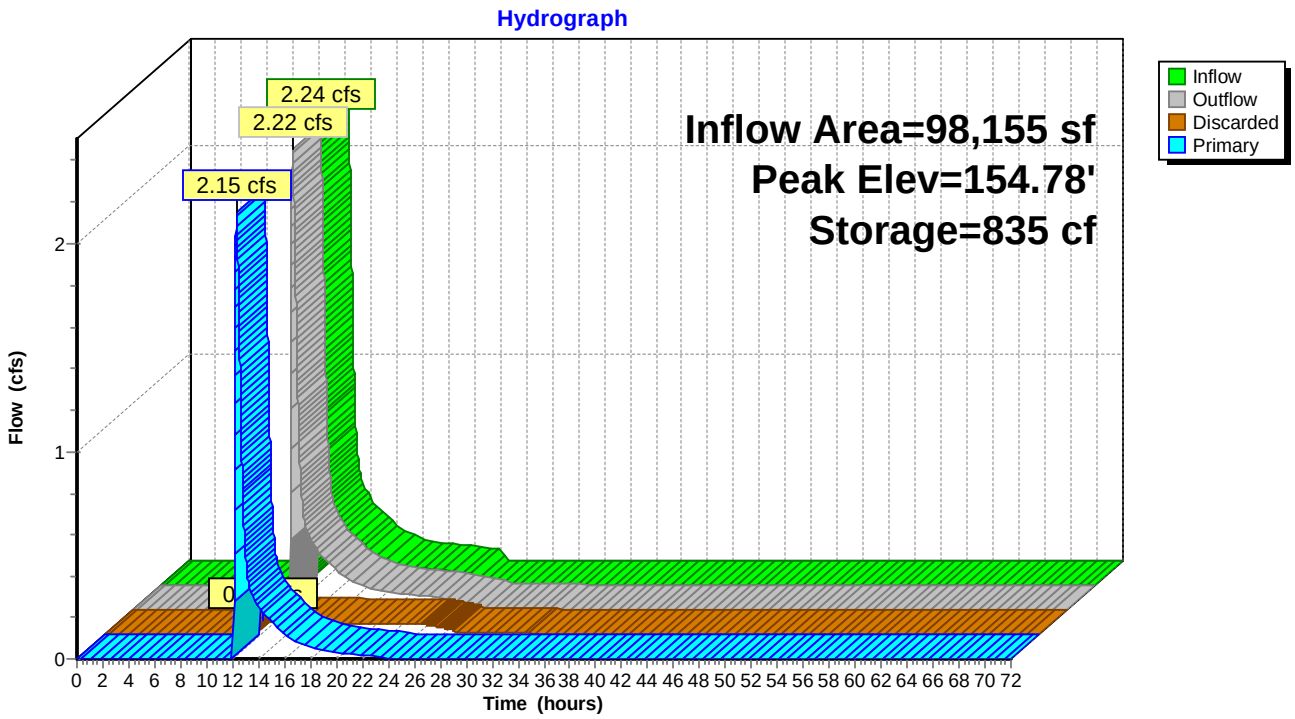
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
153.75	202	405.0	0	0	202
154.75	1,024	417.0	560	560	1,088
155.75	1,024	417.0	1,024	1,584	1,505

Device	Routing	Invert	Outlet Devices
#1	Discarded	149.25'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	154.50'	**5.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.07 cfs @ 12.21 hrs HW=154.75' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.07 cfs)

Primary OutFlow Max=2.15 cfs @ 12.31 hrs HW=154.78' TW=0.00' (Dynamic Tailwater)
└**2=Broad-Crested Rectangular Weir** (Weir Controls 2.15 cfs @ 1.52 fps)

Pond 05P: BMP 4 - Infiltration Swale



Summary for Pond 06P: BMP 5 - Infiltration Swale

Inflow Area = 108,471 sf, 26.07% Impervious, Inflow Depth = 1.56" for 10 Year event
Inflow = 3.48 cfs @ 12.15 hrs, Volume= 14,122 cf
Outflow = 3.37 cfs @ 12.19 hrs, Volume= 14,122 cf, Atten= 3%, Lag= 2.2 min
Discarded = 0.15 cfs @ 12.19 hrs, Volume= 6,226 cf
Primary = 3.22 cfs @ 12.19 hrs, Volume= 7,896 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 154.99' @ 12.19 hrs Surf.Area= 2,679 sf Storage= 1,749 cf
Flood Elev= 155.17' Surf.Area= 2,716 sf Storage= 2,167 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 77.6 min (939.7 - 862.1)

Volume	Invert	Avail.Storage	Storage Description
#1	154.00'	3,508 cf	**Infiltration Swale (Irregular)** Listed below (Recalc)
#2	150.00'	540 cf	**1.00'W x 450.00'L x 3.00'H Crushed stone** 1,350 cf Overall x 40.0% Voids
		4,048 cf	Total Available Storage

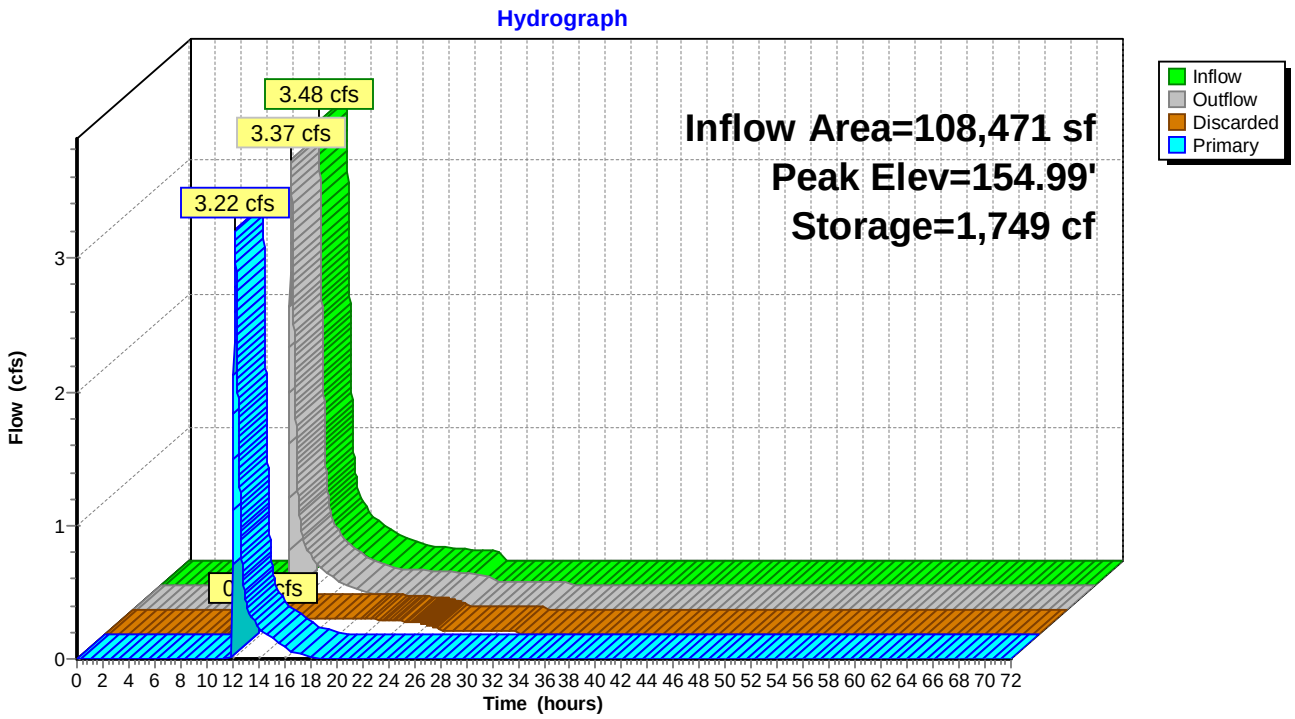
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
154.00	450	902.0	0	0	450
155.00	2,266	914.0	1,242	1,242	2,407
156.00	2,266	914.0	2,266	3,508	3,321

Device	Routing	Invert	Outlet Devices
#1	Discarded	150.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	154.75'	**10.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.15 cfs @ 12.19 hrs HW=154.99' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.15 cfs)

Primary OutFlow Max=3.22 cfs @ 12.19 hrs HW=154.99' TW=0.00' (Dynamic Tailwater)
└**2=Broad-Crested Rectangular Weir** (Weir Controls 3.22 cfs @ 1.37 fps)

Pond 06P: BMP 5 - Infiltration Swale



Summary for Pond 07P: BMP 6 - Infiltration Swale

Inflow Area = 4,593 sf, 65.38% Impervious, Inflow Depth = 2.91" for 10 Year event
Inflow = 0.37 cfs @ 12.07 hrs, Volume= 1,113 cf
Outflow = 0.04 cfs @ 12.69 hrs, Volume= 1,113 cf, Atten= 88%, Lag= 37.0 min
Discarded = 0.04 cfs @ 12.69 hrs, Volume= 1,113 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 155.34' @ 12.69 hrs Surf.Area= 805 sf Storage= 466 cf
Flood Elev= 155.87' Surf.Area= 1,220 sf Storage= 920 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 173.3 min (986.2 - 813.0)

Volume	Invert	Avail.Storage	Storage Description
#1	154.75'	1,578 cf	**Infiltration Swale (Irregular)** Listed below (Recalc)
#2	150.25'	240 cf	**1.00'W x 200.00'L x 3.00'H Crushed stone** 600 cf Overall x 40.0% Voids
		1,818 cf	Total Available Storage

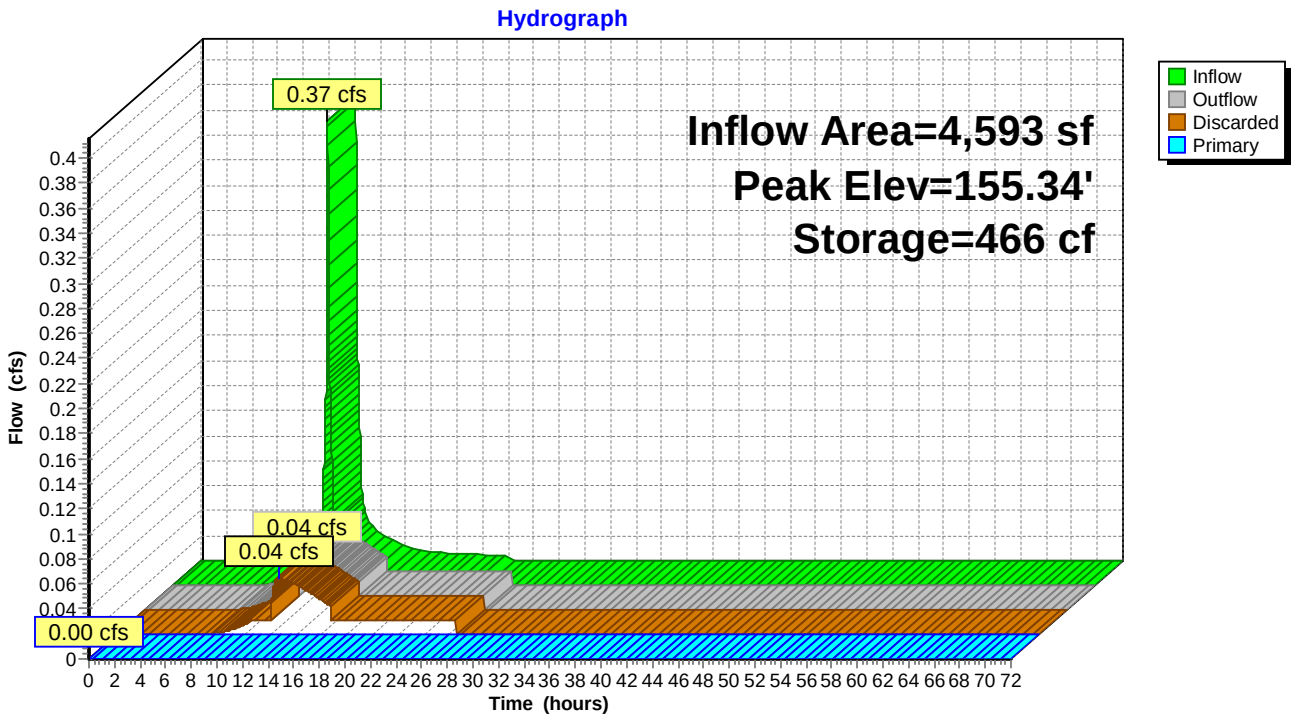
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
154.75	201	403.0	0	0	201
155.75	1,020	416.0	558	558	1,142
156.75	1,020	416.0	1,020	1,578	1,558

Device	Routing	Invert	Outlet Devices
#1	Discarded	150.25'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	155.50'	**5.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.04 cfs @ 12.69 hrs HW=155.34' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.04 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=150.25' TW=0.00' (Dynamic Tailwater)
└**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 07P: BMP 6 - Infiltration Swale



Summary for Pond 7P: Lake Cochituate

Inflow Area = 2,467,301 sf, 28.26% Impervious, Inflow Depth = 1.28" for 10 Year event
Inflow = 53.18 cfs @ 12.27 hrs, Volume= 262,710 cf
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 100%, Lag= 0.0 min

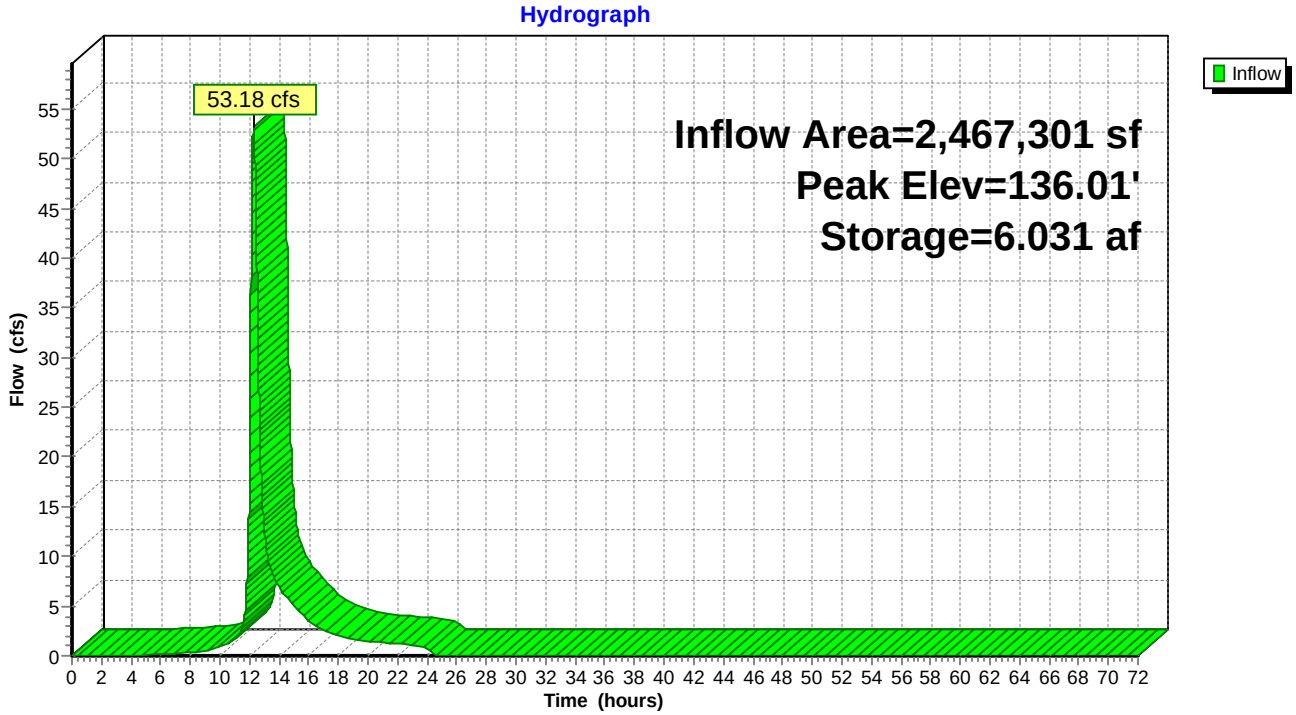
Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 136.01' @ 26.15 hrs Surf.Area= 625.000 ac Storage= 6.031 af

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

Volume	Invert	Avail.Storage	Storage Description
#1	136.00'	625.000 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
136.00	625.000	0.000	0.000
137.00	625.000	625.000	625.000

Pond 7P: Lake Cochituate



Summary for Pond 08P: BMP 7 - Infiltration Swale

Inflow Area = 2,241 sf, 67.51% Impervious, Inflow Depth = 3.00" for 10 Year event
Inflow = 0.19 cfs @ 12.07 hrs, Volume= 560 cf
Outflow = 0.02 cfs @ 12.67 hrs, Volume= 560 cf, Atten= 88%, Lag= 35.8 min
Discarded = 0.02 cfs @ 12.67 hrs, Volume= 560 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 156.88' @ 12.67 hrs Surf.Area= 408 sf Storage= 242 cf
Flood Elev= 157.27' Surf.Area= 535 sf Storage= 401 cf

Plug-Flow detention time= 175.2 min calculated for 560 cf (100% of inflow)
Center-of-Mass det. time= 175.2 min (985.1 - 809.9)

Volume	Invert	Avail.Storage	Storage Description
#1	156.15'	695 cf	**Infiltration Swale (Irregular)** Listed below (Recalc)
#2	151.65'	102 cf	**1.00'W x 85.00'L x 3.00'H Crushed stone** 255 cf Overall x 40.0% Voids
		797 cf	Total Available Storage

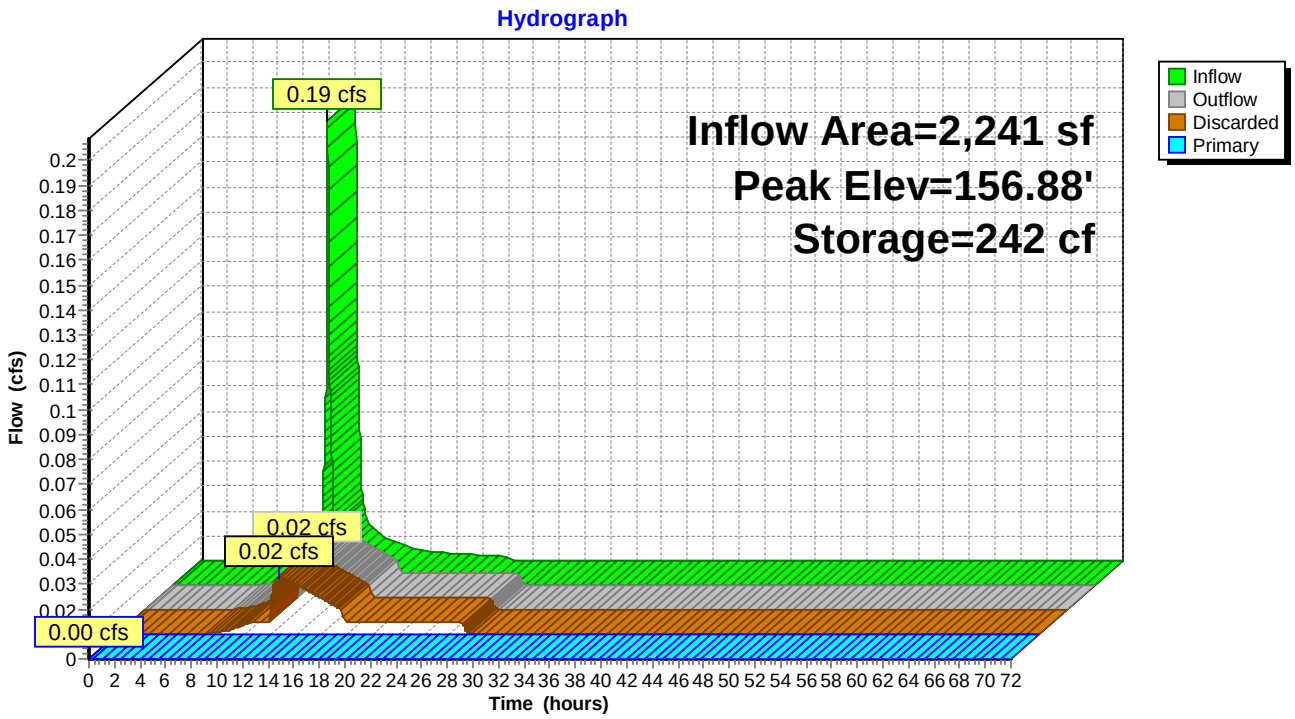
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
156.15	87	175.0	0	0	87
157.15	450	188.0	245	245	504
158.15	450	188.0	450	695	692

Device	Routing	Invert	Outlet Devices
#1	Discarded	151.65'	**2.410 in/hr Exfiltration over Surface area** Phase-In= 0.10'
#2	Primary	156.90'	**5.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.02 cfs @ 12.67 hrs HW=156.88' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=151.65' TW=0.00' (Dynamic Tailwater)
└**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 08P: BMP 7 - Infiltration Swale



Summary for Pond 09P: BMP 8 - Infiltration Swale

Inflow Area = 10,487 sf, 62.20% Impervious, Inflow Depth = 2.81" for 10 Year event
Inflow = 0.82 cfs @ 12.07 hrs, Volume= 2,460 cf
Outflow = 0.27 cfs @ 12.37 hrs, Volume= 2,460 cf, Atten= 67%, Lag= 17.7 min
Discarded = 0.08 cfs @ 12.37 hrs, Volume= 2,233 cf
Primary = 0.19 cfs @ 12.37 hrs, Volume= 226 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 158.06' @ 12.37 hrs Surf.Area= 1,512 sf Storage= 929 cf
Flood Elev= 158.47' Surf.Area= 1,821 sf Storage= 1,527 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 163.4 min (979.3 - 815.9)

Volume	Invert	Avail.Storage	Storage Description
#1	157.25'	2,354 cf	**Infiltration Swale (Irregular)** Listed below (Recalc)
#2	152.75'	360 cf	**1.00'W x 300.00'L x 3.00'H Crushed stone** 900 cf Overall x 40.0% Voids
		2,714 cf	Total Available Storage

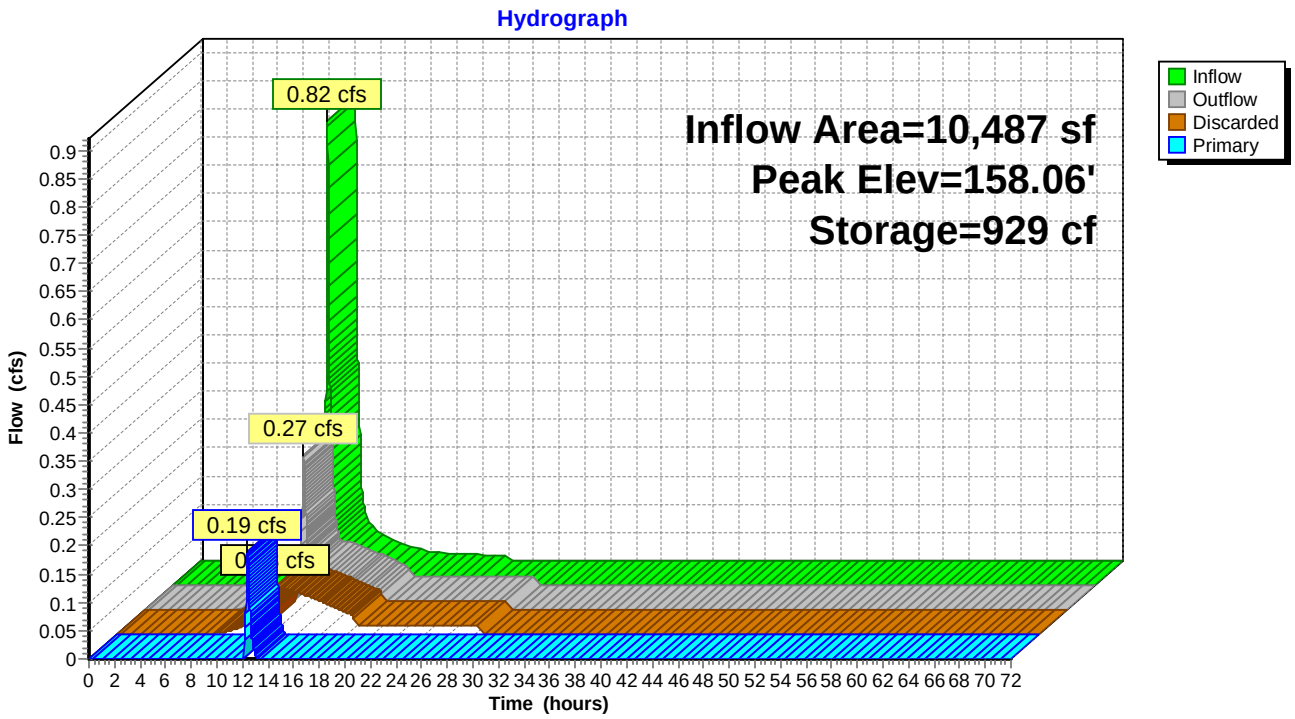
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
157.25	301	604.0	0	0	301
158.25	1,521	616.0	833	833	1,616
159.25	1,521	616.0	1,521	2,354	2,232

Device	Routing	Invert	Outlet Devices
#1	Discarded	152.75'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	158.00'	**5.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.08 cfs @ 12.37 hrs HW=158.06' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.08 cfs)

Primary OutFlow Max=0.19 cfs @ 12.37 hrs HW=158.06' TW=0.00' (Dynamic Tailwater)
└**2=Broad-Crested Rectangular Weir** (Weir Controls 0.19 cfs @ 0.67 fps)

Pond 09P: BMP 8 - Infiltration Swale



Summary for Pond 10P: BMP 9 - Infiltration Swale

Inflow Area = 234,888 sf, 22.66% Impervious, Inflow Depth = 1.20" for 10 Year event
Inflow = 4.71 cfs @ 12.28 hrs, Volume= 23,450 cf
Outflow = 4.12 cfs @ 12.40 hrs, Volume= 23,450 cf, Atten= 13%, Lag= 7.5 min
Discarded = 0.24 cfs @ 12.26 hrs, Volume= 10,193 cf
Primary = 3.89 cfs @ 12.40 hrs, Volume= 13,257 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 158.16' @ 12.40 hrs Surf.Area= 4,219 sf Storage= 3,343 cf
Flood Elev= 158.21' Surf.Area= 4,219 sf Storage= 3,509 cf

Plug-Flow detention time= 79.2 min calculated for 23,447 cf (100% of inflow)
Center-of-Mass det. time= 79.2 min (965.9 - 886.7)

Volume	Invert	Avail.Storage	Storage Description
#1	157.00'	5,449 cf	**Infiltration Swale (Irregular)** Listed below (Recalc)
#2	152.50'	840 cf	**1.00'W x 700.00'L x 3.00'H Crushed stone** 2,100 cf Overall x 40.0% Voids
		6,289 cf	Total Available Storage

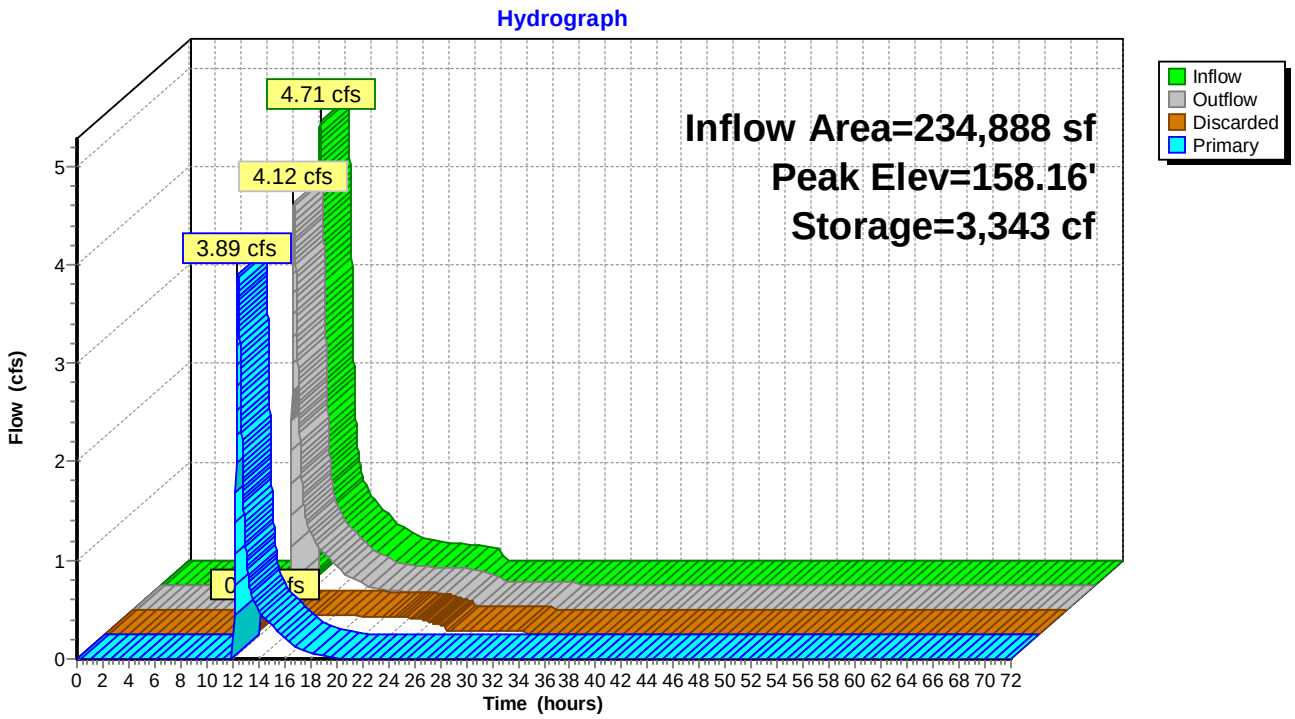
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
157.00	701	1,403.0	0	0	701
158.00	3,519	1,416.0	1,930	1,930	3,940
159.00	3,519	1,416.0	3,519	5,449	5,356

Device	Routing	Invert	Outlet Devices
#1	Discarded	152.50'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	157.75'	**5.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.24 cfs @ 12.26 hrs HW=158.02' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.24 cfs)

Primary OutFlow Max=3.88 cfs @ 12.40 hrs HW=158.16' TW=0.00' (Dynamic Tailwater)
└**2=Broad-Crested Rectangular Weir** (Weir Controls 3.88 cfs @ 1.88 fps)

Pond 10P: BMP 9 - Infiltration Swale



Summary for Pond 11P: BMP 10 - Infiltration Swale

Inflow Area =	316,495 sf, 27.57% Impervious, Inflow Depth = 1.14" for 10 Year event				
Inflow =	6.29 cfs @	12.24 hrs,	Volume=	29,948 cf	
Outflow =	6.20 cfs @	12.27 hrs,	Volume=	29,949 cf,	Atten= 2%, Lag= 1.7 min
Discarded =	0.16 cfs @	12.16 hrs,	Volume=	7,284 cf	
Primary =	6.04 cfs @	12.27 hrs,	Volume=	22,664 cf	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 158.35' @ 12.27 hrs Surf.Area= 2,870 sf Storage= 2,126 cf
Flood Elev= 158.37' Surf.Area= 2,870 sf Storage= 2,170 cf

Plug-Flow detention time= 44.3 min calculated for 29,945 cf (100% of inflow)
Center-of-Mass det. time= 44.3 min (931.7 - 887.4)

Volume	Invert	Avail.Storage	Storage Description
#1	157.25'	3,707 cf	**Infiltration Swale (Irregular)** Listed below (Recalc)
#2	152.75'	570 cf	**1.00'W x 475.00'L x 3.00'H Crushed stone** 1,425 cf Overall x 40.0% Voids
		4,277 cf	Total Available Storage

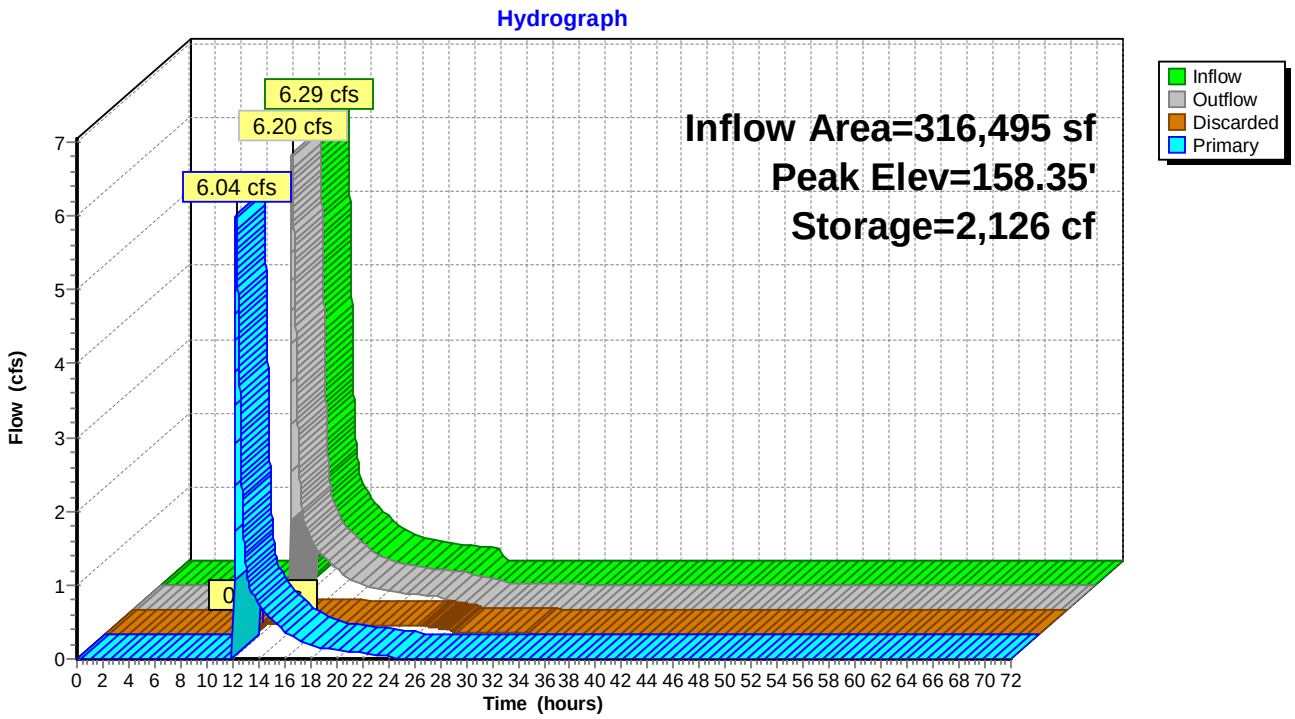
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
157.25	475	953.0	0	0	475
158.25	2,395	966.0	1,312	1,312	2,680
159.25	2,395	966.0	2,395	3,707	3,646

Device	Routing	Invert	Outlet Devices
#1	Discarded	152.75'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	158.00'	**10.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.16 cfs @ 12.16 hrs HW=158.27' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.16 cfs)

Primary OutFlow Max=6.04 cfs @ 12.27 hrs HW=158.35' TW=0.00' (Dynamic Tailwater)
└**2=Broad-Crested Rectangular Weir** (Weir Controls 6.04 cfs @ 1.72 fps)

Pond 11P: BMP 10 - Infiltration Swale



Summary for Pond 12P: BMP 11 - Infiltration Swale

Inflow Area = 15,210 sf, 38.96% Impervious, Inflow Depth = 1.89" for 10 Year event
Inflow = 0.65 cfs @ 12.16 hrs, Volume= 2,401 cf
Outflow = 0.56 cfs @ 12.22 hrs, Volume= 2,401 cf, Atten= 13%, Lag= 4.0 min
Discarded = 0.04 cfs @ 12.22 hrs, Volume= 1,567 cf
Primary = 0.52 cfs @ 12.22 hrs, Volume= 834 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 157.61' @ 12.22 hrs Surf.Area= 805 sf Storage= 502 cf
Flood Elev= 157.93' Surf.Area= 919 sf Storage= 739 cf

Plug-Flow detention time= 114.4 min calculated for 2,401 cf (100% of inflow)
Center-of-Mass det. time= 114.4 min (965.7 - 851.3)

Volume	Invert	Avail.Storage	Storage Description
#1	156.75'	1,189 cf	**Infiltration Swale (Irregular)** Listed below (Recalc)
#2	152.25'	180 cf	**1.00'W x 150.00'L x 3.00'H Crushed stone** 450 cf Overall x 40.0% Voids
		1,369 cf	Total Available Storage

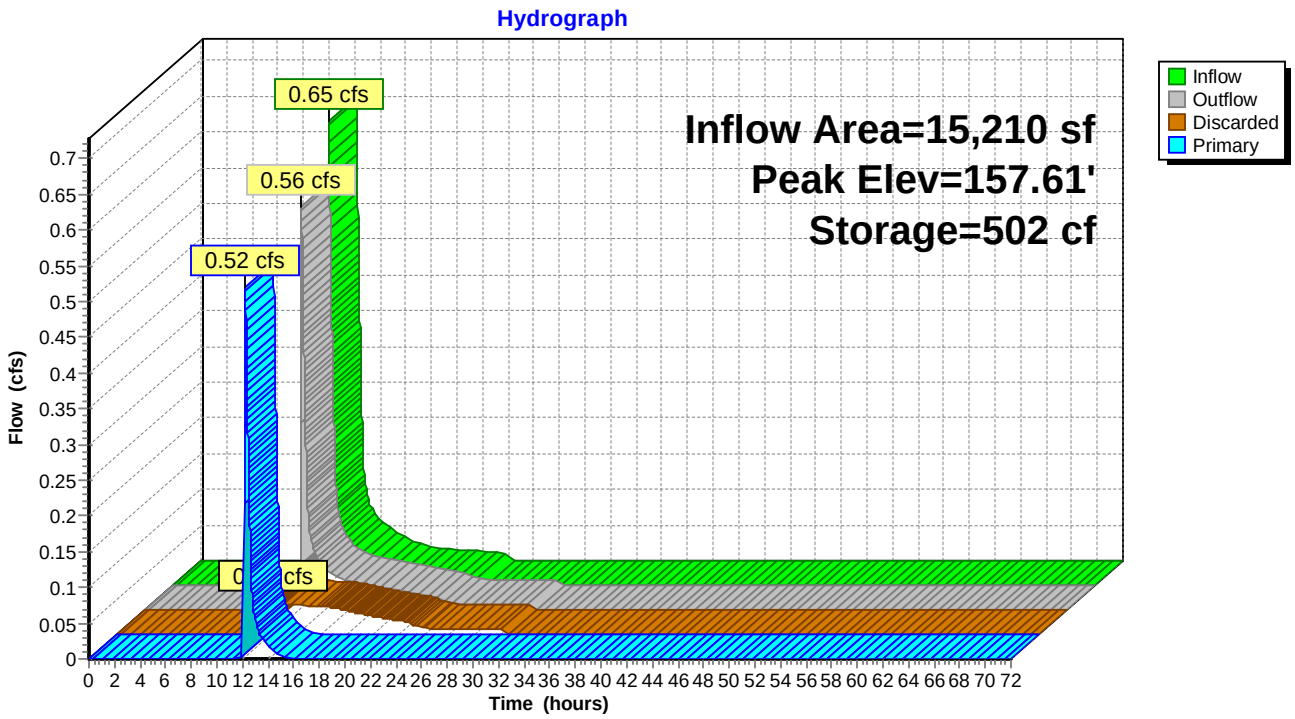
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
156.75	151	303.0	0	0	151
157.75	769	316.0	420	420	862
158.75	769	316.0	769	1,189	1,178

Device	Routing	Invert	Outlet Devices
#1	Discarded	152.25'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	157.50'	**5.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.04 cfs @ 12.22 hrs HW=157.61' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.04 cfs)

Primary OutFlow Max=0.52 cfs @ 12.22 hrs HW=157.61' TW=0.00' (Dynamic Tailwater)
└**2=Broad-Crested Rectangular Weir** (Weir Controls 0.52 cfs @ 0.93 fps)

Pond 12P: BMP 11 - Infiltration Swale



Summary for Pond 13P: BMP 12 - Infiltration Swale

Inflow Area = 13,927 sf, 62.52% Impervious, Inflow Depth = 2.81" for 10 Year event
Inflow = 1.09 cfs @ 12.07 hrs, Volume= 3,267 cf
Outflow = 0.34 cfs @ 12.39 hrs, Volume= 3,267 cf, Atten= 69%, Lag= 18.9 min
Discarded = 0.11 cfs @ 12.39 hrs, Volume= 2,974 cf
Primary = 0.23 cfs @ 12.39 hrs, Volume= 292 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 156.31' @ 12.39 hrs Surf.Area= 2,026 sf Storage= 1,249 cf
Flood Elev= 156.49' Surf.Area= 2,398 sf Storage= 1,567 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 164.0 min (979.9 - 815.9)

Volume	Invert	Avail.Storage	Storage Description
#1	155.50'	3,127 cf	**Infiltration Swale (Irregular)** Listed below (Recalc)
#2	151.00'	480 cf	**1.00'W x 400.00'L x 3.00'H Crushed stone** 1,200 cf Overall x 40.0% Voids
		3,607 cf	Total Available Storage

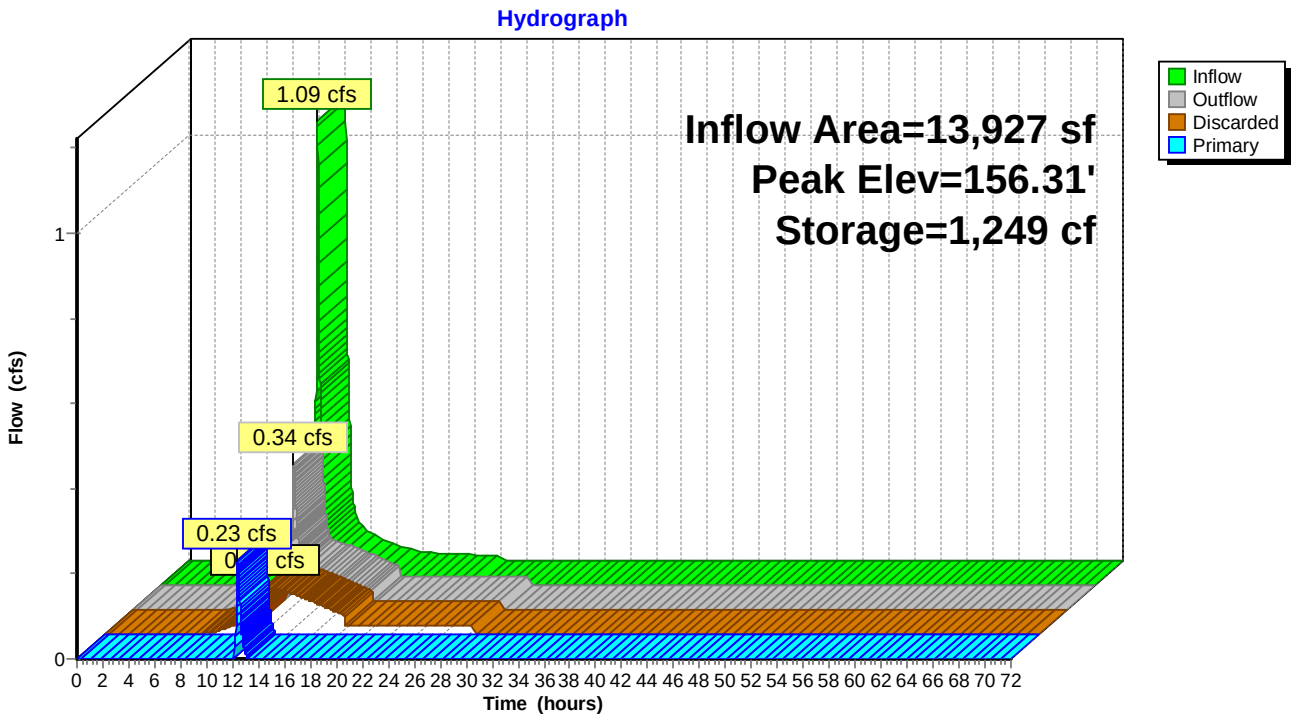
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
155.50	401	803.0	0	0	401
156.50	2,020	816.0	1,107	1,107	2,261
157.50	2,020	816.0	2,020	3,127	3,077

Device	Routing	Invert	Outlet Devices
#1	Discarded	151.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	156.25'	**5.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.11 cfs @ 12.39 hrs HW=156.31' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.11 cfs)

Primary OutFlow Max=0.23 cfs @ 12.39 hrs HW=156.31' TW=0.00' (Dynamic Tailwater)
└**2=Broad-Crested Rectangular Weir** (Weir Controls 0.23 cfs @ 0.71 fps)

Pond 13P: BMP 12 - Infiltration Swale



Summary for Pond 14P: BMP 13 - Infiltration Swale

[87] Warning: Oscillations may require Finer Routing or smaller dt

Inflow Area =	26,591 sf, 37.08% Impervious, Inflow Depth = 1.82" for 10 Year event				
Inflow =	1.08 cfs @	12.16 hrs,	Volume=	4,031 cf	
Outflow =	0.55 cfs @	12.43 hrs,	Volume=	4,031 cf,	Atten= 49%, Lag= 15.9 min
Discarded =	0.11 cfs @	12.43 hrs,	Volume=	3,315 cf	
Primary =	0.44 cfs @	12.43 hrs,	Volume=	716 cf	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 156.35' @ 12.43 hrs Surf.Area= 2,000 sf Storage= 1,246 cf
Flood Elev= 156.69' Surf.Area= 2,308 sf Storage= 1,879 cf

Plug-Flow detention time= 153.7 min calculated for 4,030 cf (100% of inflow)
Center-of-Mass det. time= 153.7 min (1,007.9 - 854.2)

Volume	Invert	Avail.Storage	Storage Description
#1	155.50'	2,983 cf	**Infiltration Swale (Irregular)** Listed below (Recalc)
#2	151.00'	457 cf	**1.00'W x 381.00'L x 3.00'H Crushed stone** 1,143 cf Overall x 40.0% Voids
		3,440 cf	Total Available Storage

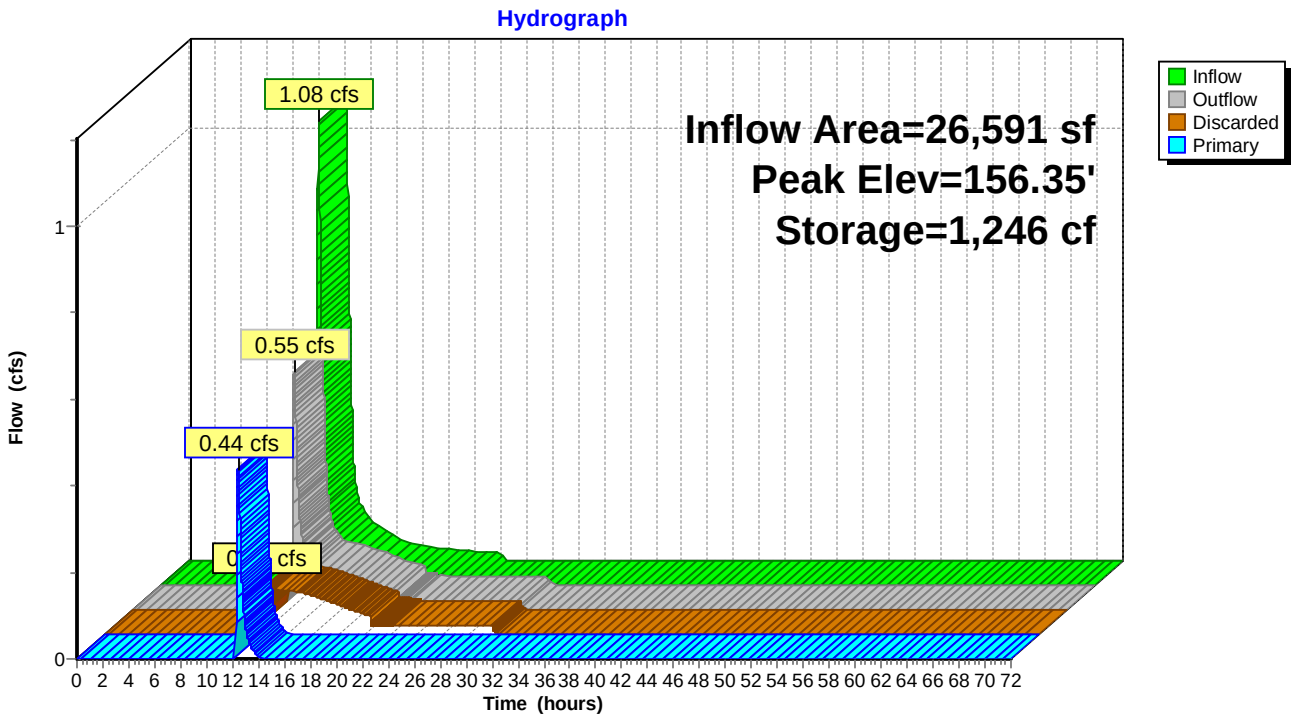
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
155.50	382	766.0	0	0	382
156.50	1,927	779.0	1,056	1,056	2,157
157.50	1,927	779.0	1,927	2,983	2,936

Device	Routing	Invert	Outlet Devices
#1	Discarded	151.00'	**2.410 in/hr Exfiltration over Surface area** Phase-In= 0.10'
#2	Primary	156.25'	**5.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.11 cfs @ 12.43 hrs HW=156.35' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.11 cfs)

Primary OutFlow Max=0.44 cfs @ 12.43 hrs HW=156.35' TW=0.00' (Dynamic Tailwater)
└**2=Broad-Crested Rectangular Weir** (Weir Controls 0.44 cfs @ 0.88 fps)

Pond 14P: BMP 13 - Infiltration Swale

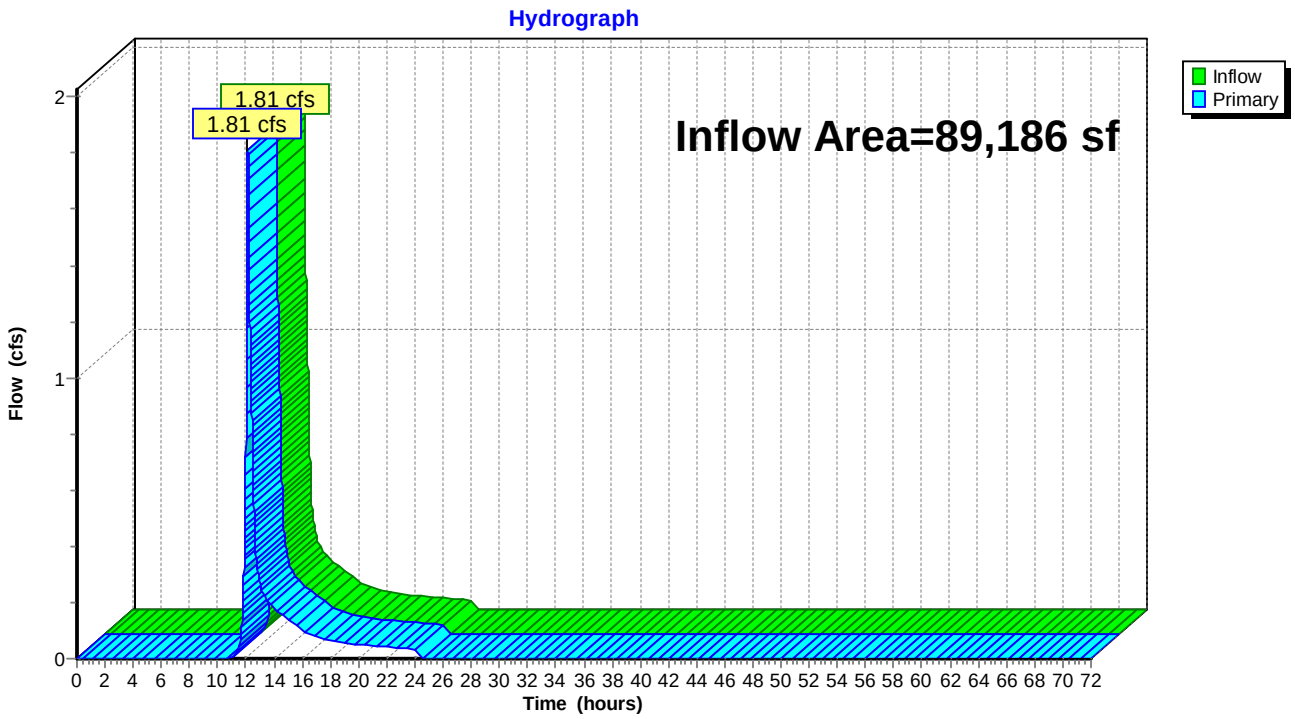


Summary for Link 1L: Total to Bioretention

Inflow Area = 89,186 sf, 21.87% Impervious, Inflow Depth = 0.90" for 10 Year event
Inflow = 1.81 cfs @ 12.13 hrs, Volume= 6,695 cf
Primary = 1.81 cfs @ 12.13 hrs, Volume= 6,695 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link 1L: Total to Bioretention

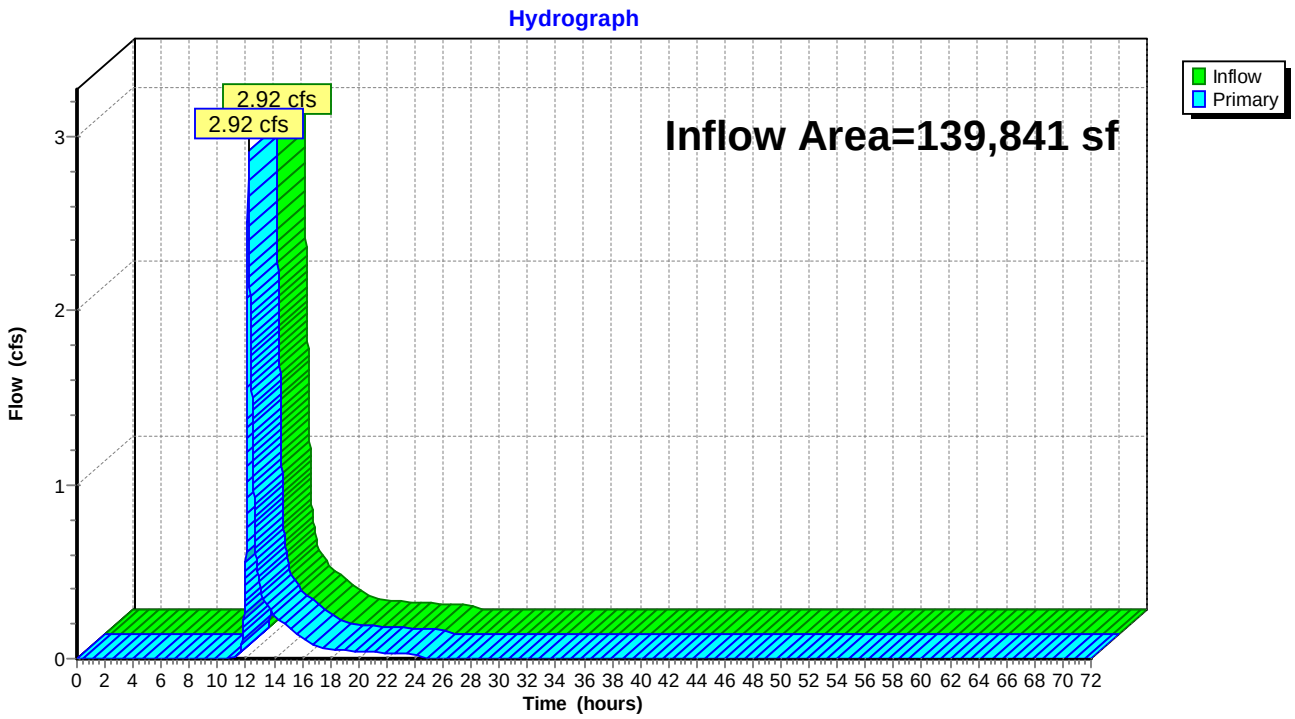


Summary for Link 2L: Lake Cochituate N1

Inflow Area = 139,841 sf, 19.05% Impervious, Inflow Depth = 0.73" for 10 Year event
Inflow = 2.92 cfs @ 12.17 hrs, Volume= 8,526 cf
Primary = 2.92 cfs @ 12.17 hrs, Volume= 8,526 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link 2L: Lake Cochituate N1

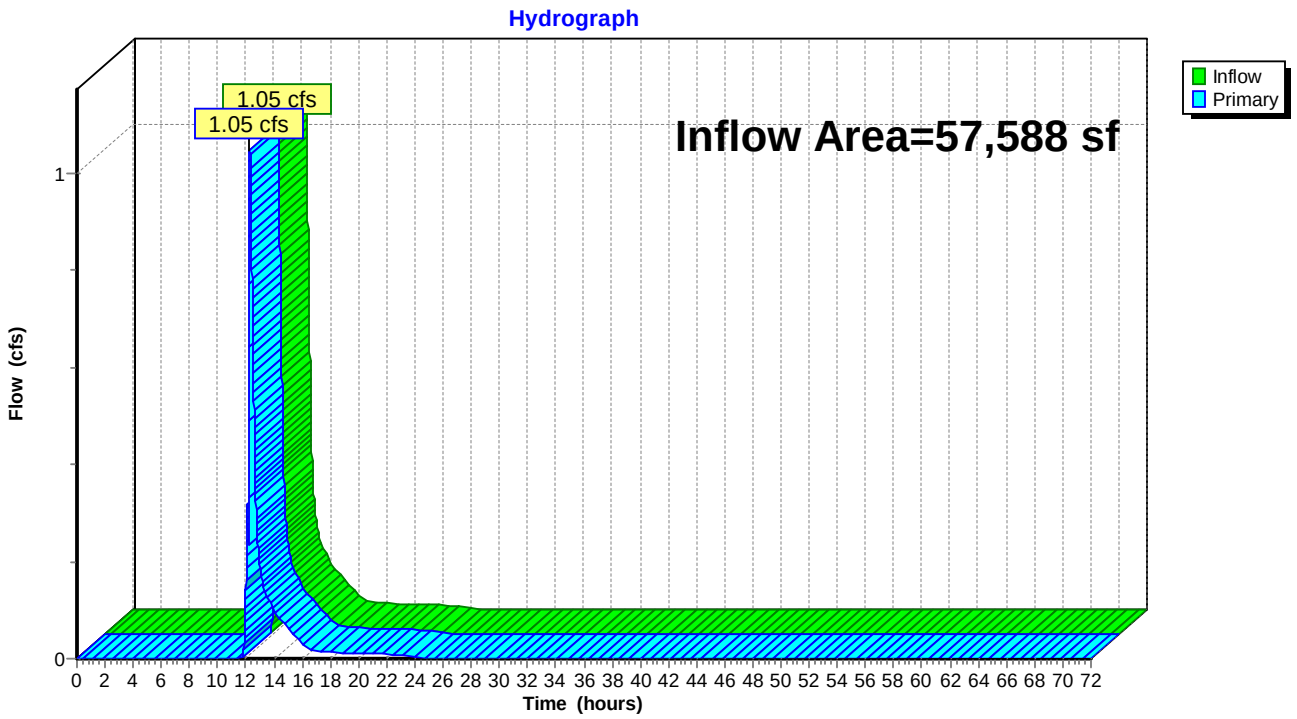


Summary for Link 3L: Lake Cochituate N2

Inflow Area = 57,588 sf, 12.49% Impervious, Inflow Depth = 0.64" for 10 Year event
Inflow = 1.05 cfs @ 12.27 hrs, Volume= 3,085 cf
Primary = 1.05 cfs @ 12.27 hrs, Volume= 3,085 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link 3L: Lake Cochituate N2

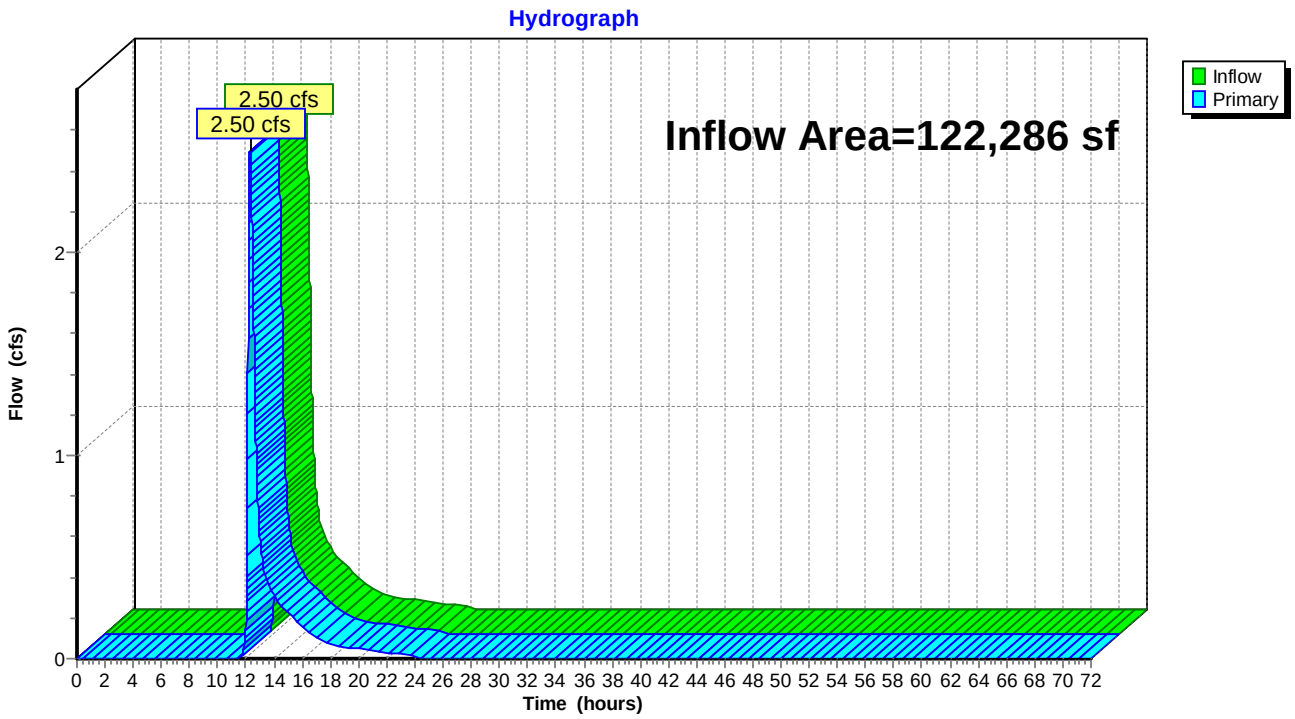


Summary for Link 4L: Lake Cochituate N3

Inflow Area = 122,286 sf, 13.65% Impervious, Inflow Depth = 0.96" for 10 Year event
Inflow = 2.50 cfs @ 12.29 hrs, Volume= 9,811 cf
Primary = 2.50 cfs @ 12.29 hrs, Volume= 9,811 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link 4L: Lake Cochituate N3

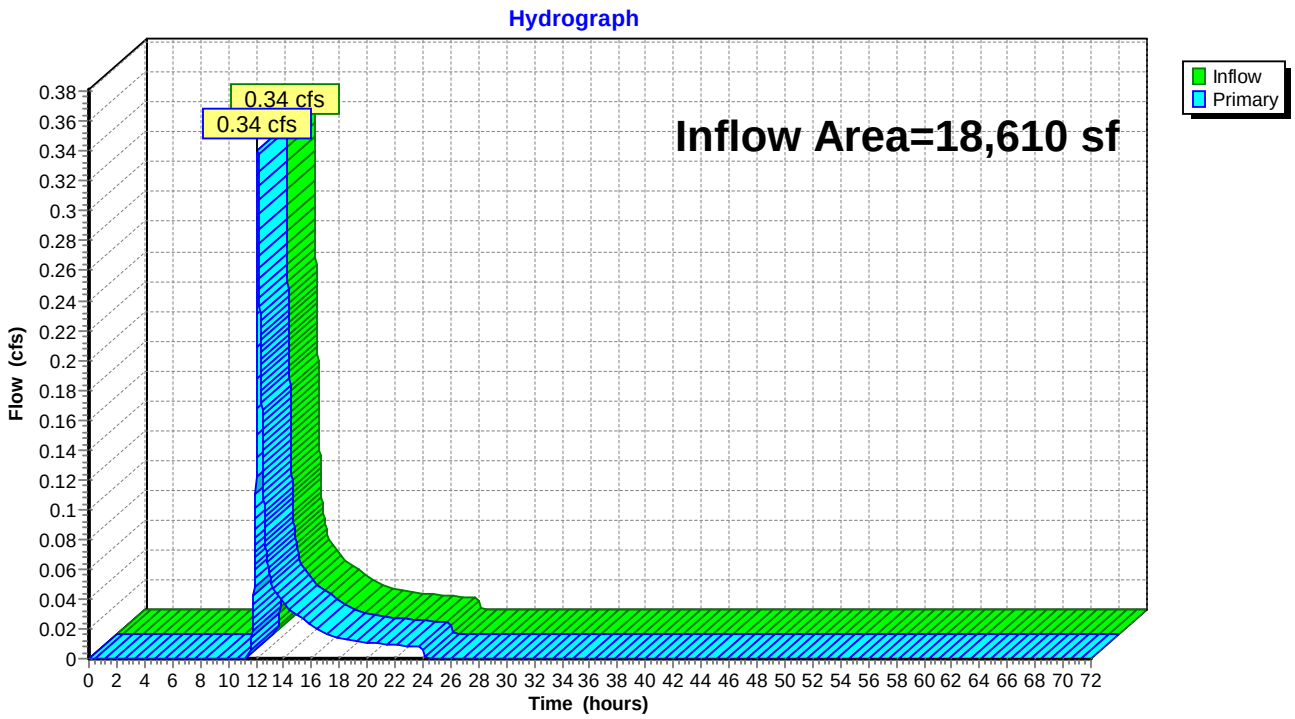


Summary for Link 5L: Lake Cochituate W2

Inflow Area = 18,610 sf, 23.30% Impervious, Inflow Depth = 0.86" for 10 Year event
Inflow = 0.34 cfs @ 12.14 hrs, Volume= 1,326 cf
Primary = 0.34 cfs @ 12.14 hrs, Volume= 1,326 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link 5L: Lake Cochituate W2

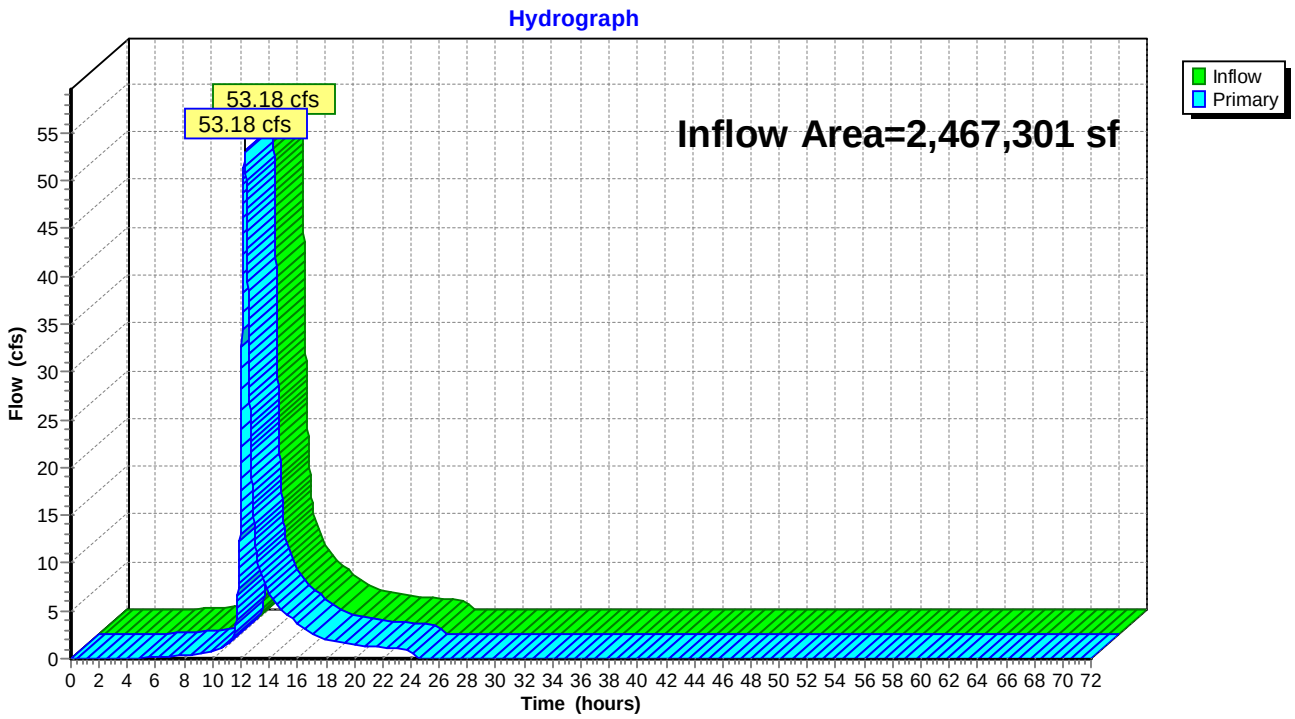


Summary for Link 6L: Total

Inflow Area = 2,467,301 sf, 28.26% Impervious, Inflow Depth = 1.28" for 10 Year event
Inflow = 53.18 cfs @ 12.27 hrs, Volume= 262,710 cf
Primary = 53.18 cfs @ 12.27 hrs, Volume= 262,710 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link 6L: Total

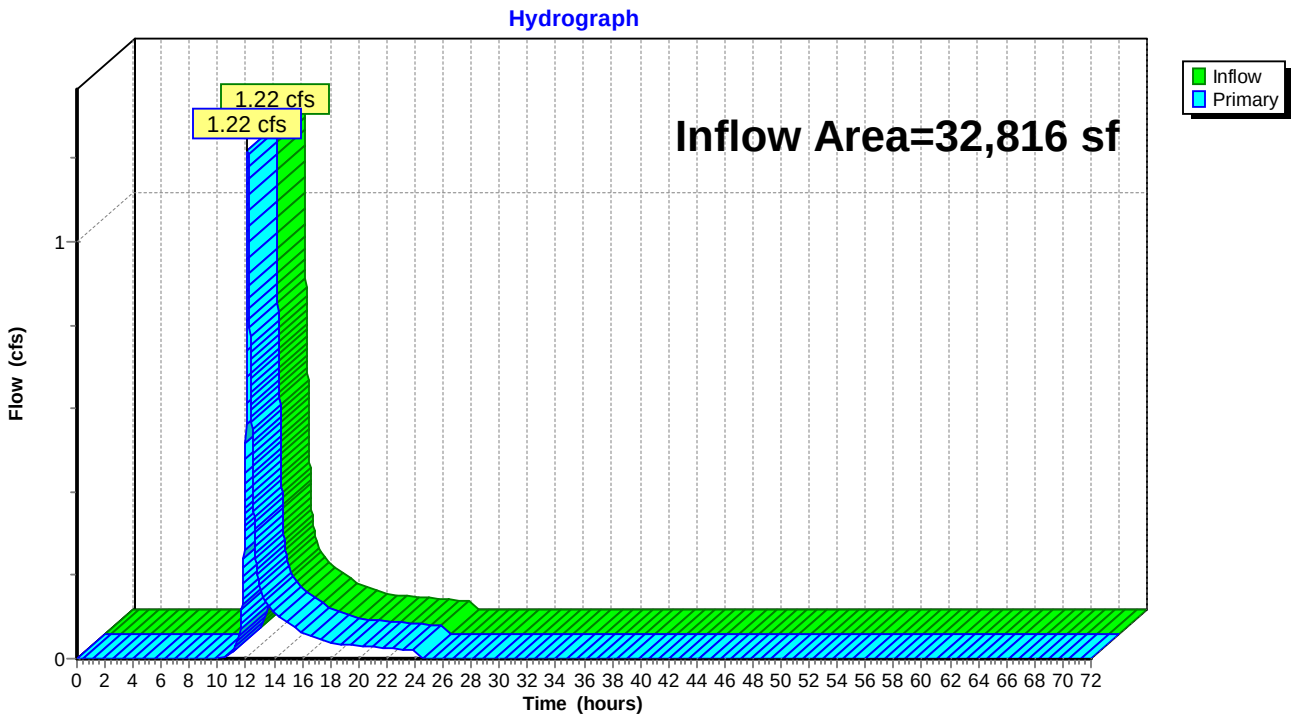


Summary for Link DP01: Cochituate Rd

Inflow Area = 32,816 sf, 19.44% Impervious, Inflow Depth = 1.60" for 10 Year event
Inflow = 1.22 cfs @ 12.13 hrs, Volume= 4,377 cf
Primary = 1.22 cfs @ 12.13 hrs, Volume= 4,377 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP01: Cochituate Rd

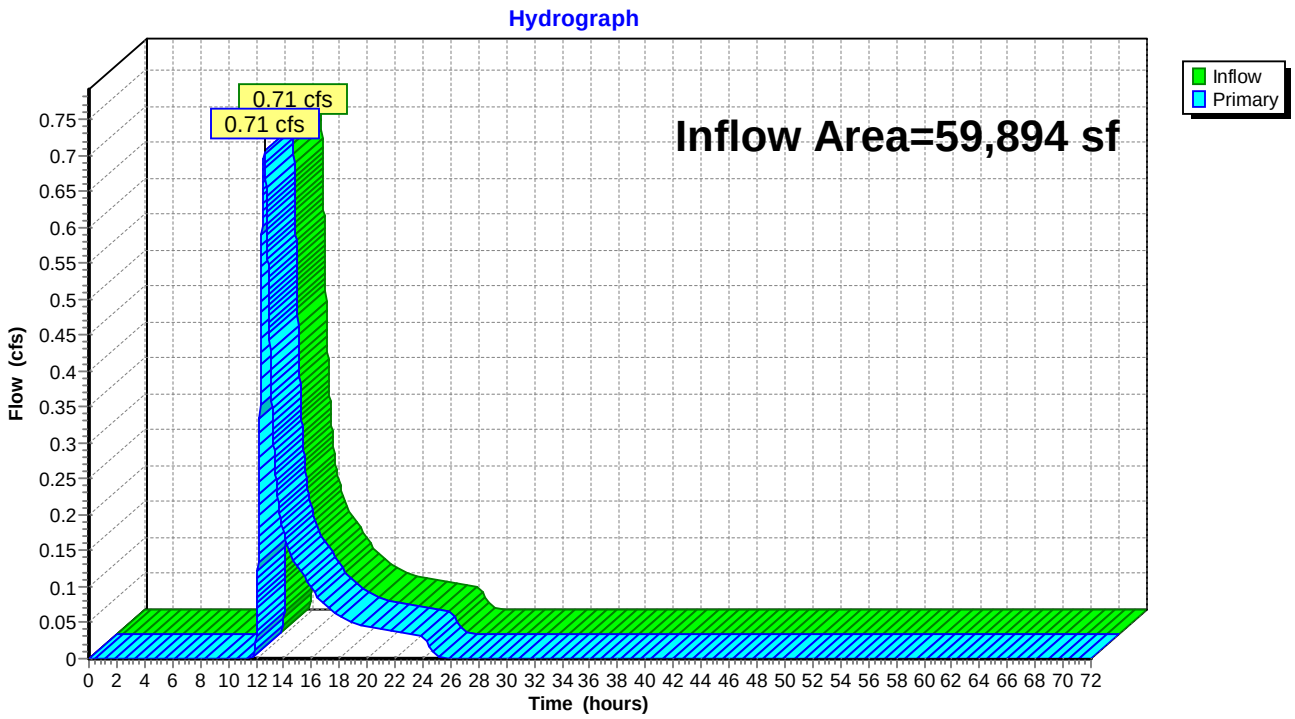


Summary for Link DP02: Chrysler Road

Inflow Area = 59,894 sf, 5.23% Impervious, Inflow Depth = 1.01" for 10 Year event
Inflow = 0.71 cfs @ 12.61 hrs, Volume= 5,063 cf
Primary = 0.71 cfs @ 12.61 hrs, Volume= 5,063 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP02: Chrysler Road

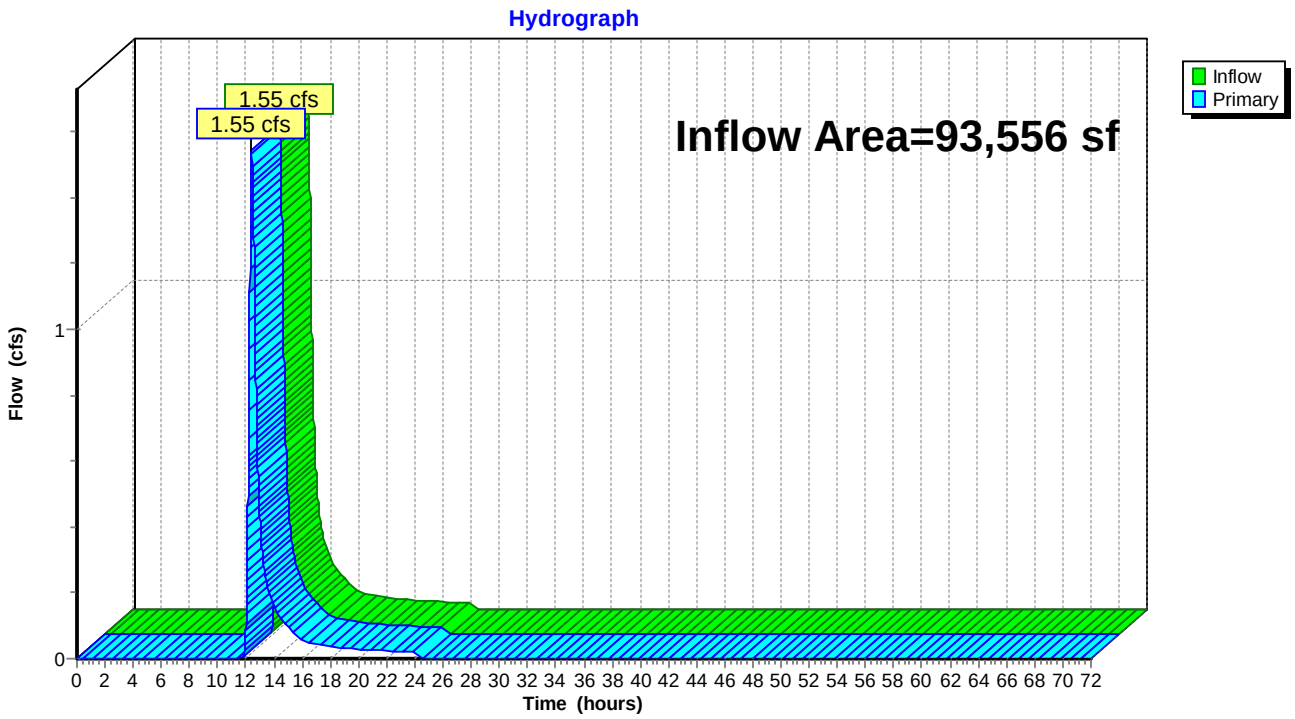


Summary for Link DP03: WF A

Inflow Area = 93,556 sf, 18.14% Impervious, Inflow Depth = 0.73" for 10 Year event
Inflow = 1.55 cfs @ 12.41 hrs, Volume= 5,679 cf
Primary = 1.55 cfs @ 12.41 hrs, Volume= 5,679 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP03: WF A

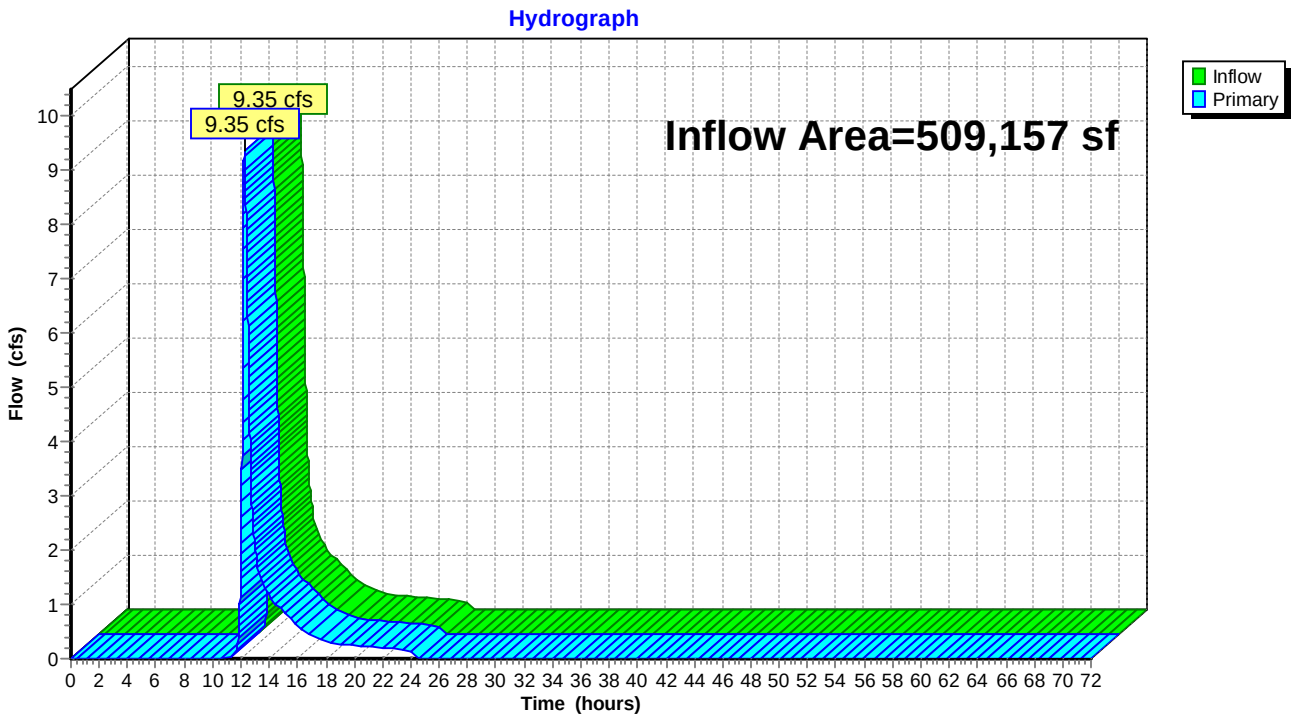


Summary for Link DP04: Lake Cochituate Middle Pond

Inflow Area = 509,157 sf, 12.96% Impervious, Inflow Depth = 0.92" for 10 Year event
Inflow = 9.35 cfs @ 12.24 hrs, Volume= 38,902 cf
Primary = 9.35 cfs @ 12.24 hrs, Volume= 38,902 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP04: Lake Cochituate Middle Pond

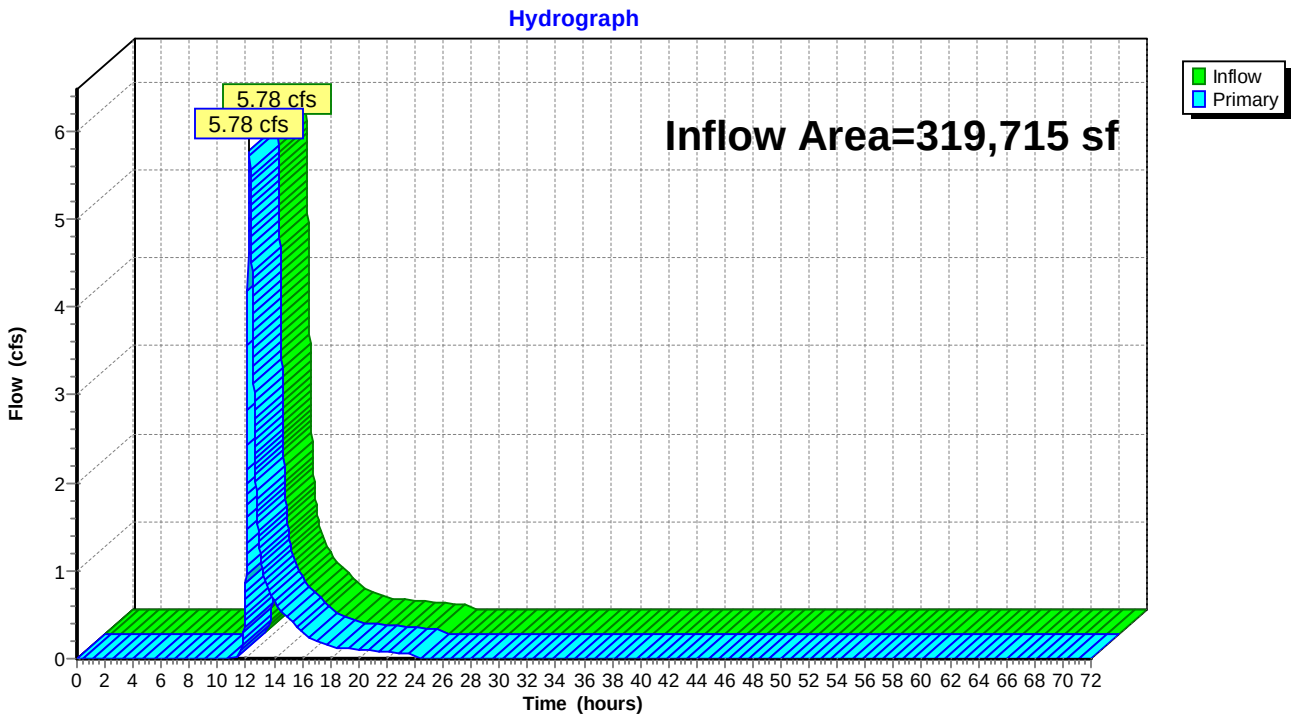


Summary for Link DP04-1: WF B

Inflow Area = 319,715 sf, 15.80% Impervious, Inflow Depth = 0.80" for 10 Year event
Inflow = 5.78 cfs @ 12.24 hrs, Volume= 21,422 cf
Primary = 5.78 cfs @ 12.24 hrs, Volume= 21,422 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP04-1: WF B

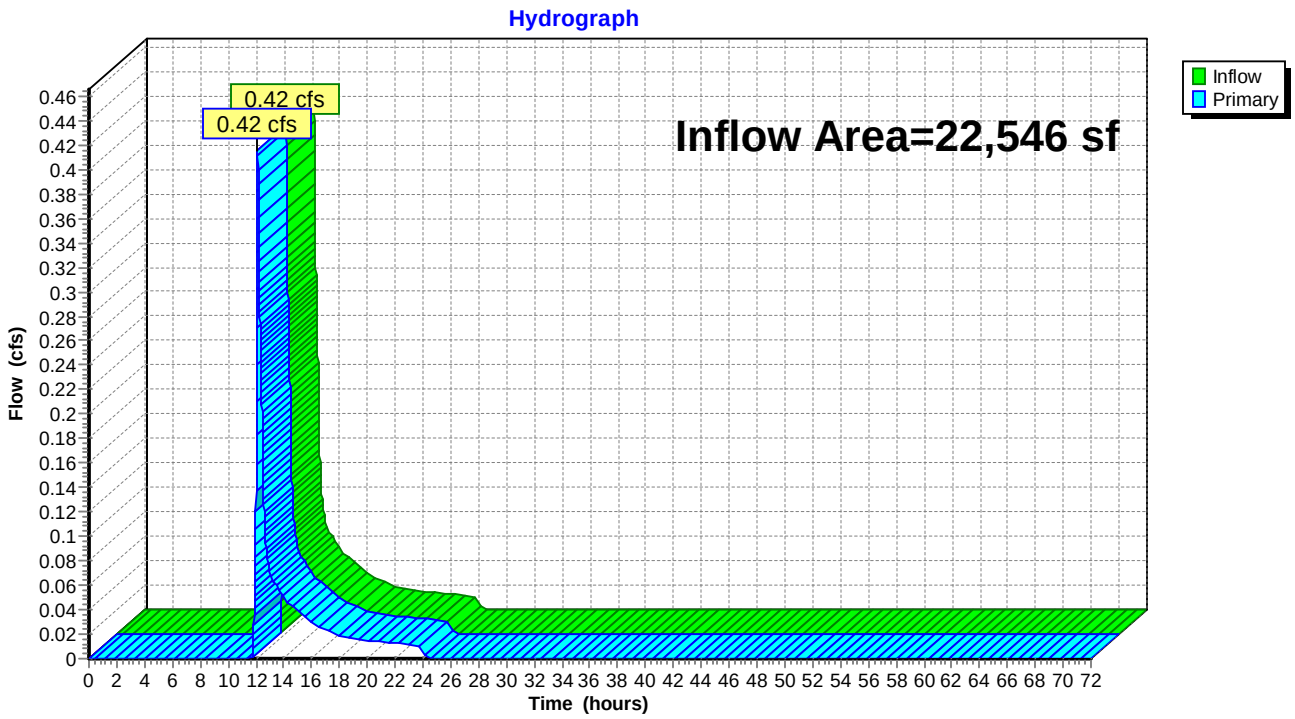


Summary for Link DP04-2: WF C

Inflow Area = 22,546 sf, 0.00% Impervious, Inflow Depth = 0.90" for 10 Year event
Inflow = 0.42 cfs @ 12.12 hrs, Volume= 1,688 cf
Primary = 0.42 cfs @ 12.12 hrs, Volume= 1,688 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP04-2: WF C

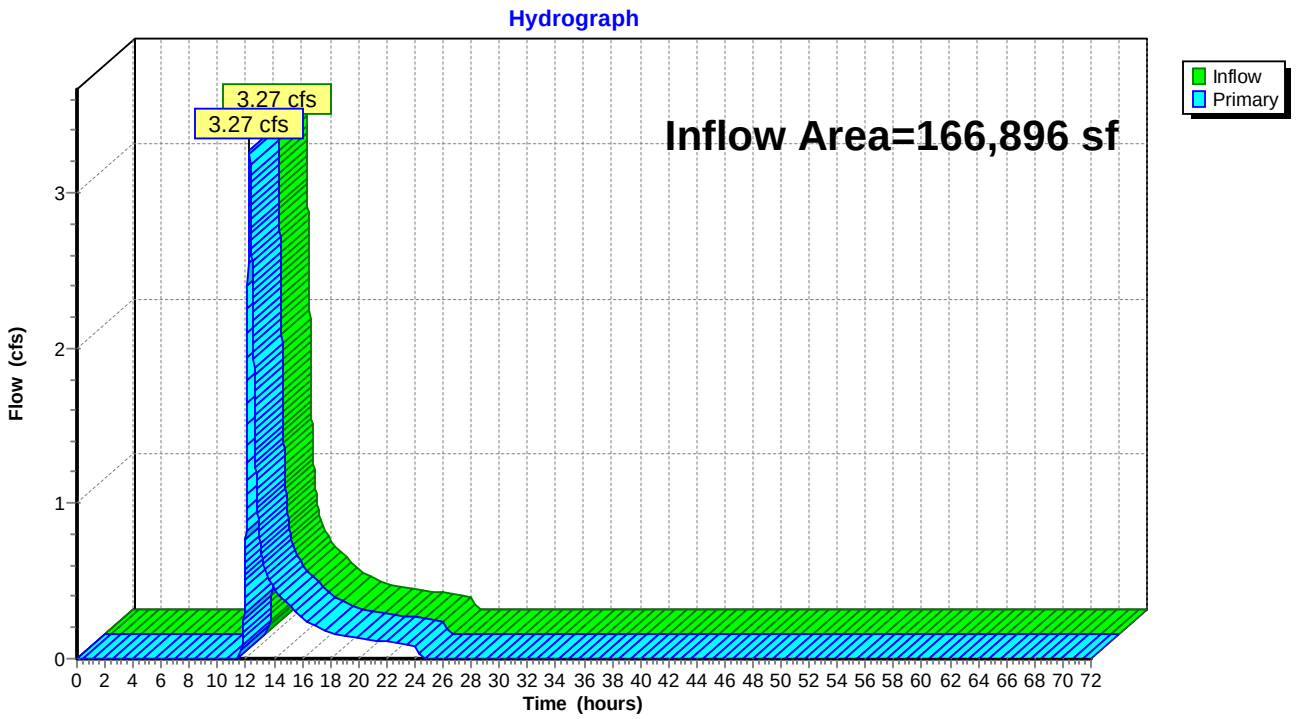


Summary for Link DP04-3: Lake Cochituate

Inflow Area = 166,896 sf, 9.27% Impervious, Inflow Depth = 1.14" for 10 Year event
Inflow = 3.27 cfs @ 12.25 hrs, Volume= 15,793 cf
Primary = 3.27 cfs @ 12.25 hrs, Volume= 15,793 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP04-3: Lake Cochituate

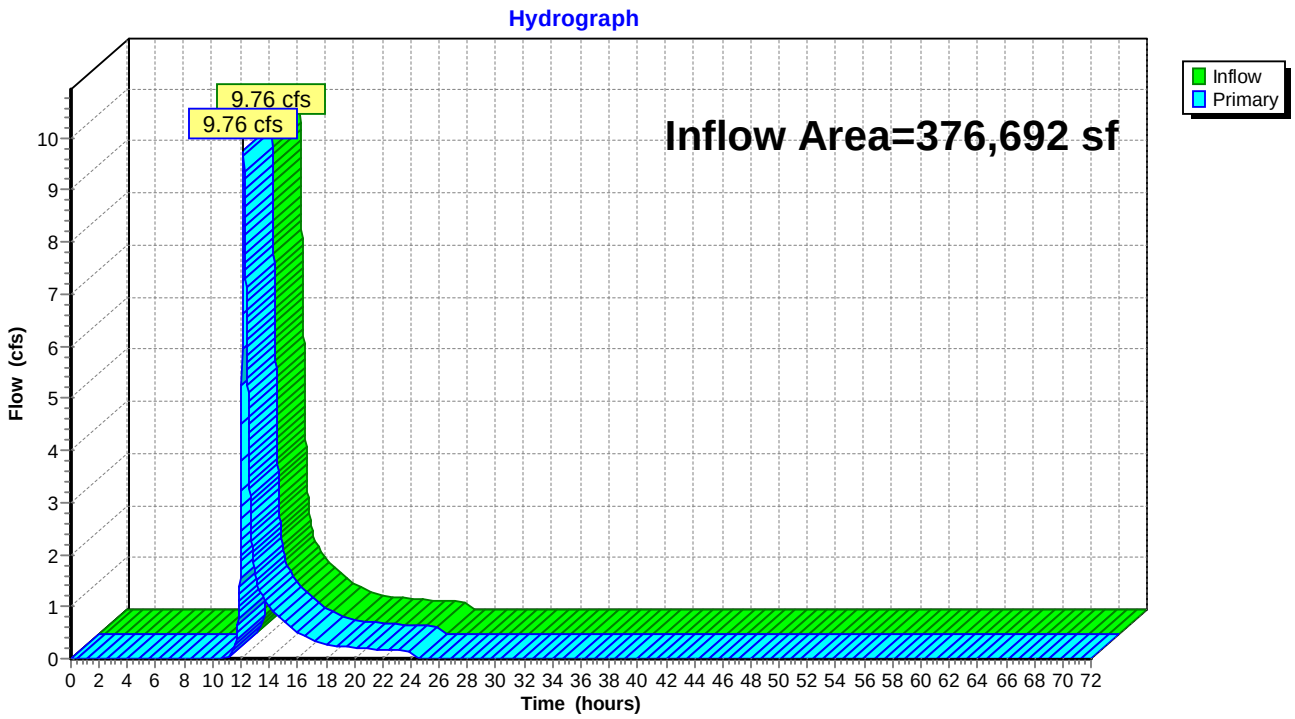


Summary for Link DP05: Lake Cochituate Middle

Inflow Area = 376,692 sf, 21.92% Impervious, Inflow Depth = 1.15" for 10 Year event
Inflow = 9.76 cfs @ 12.19 hrs, Volume= 35,961 cf
Primary = 9.76 cfs @ 12.19 hrs, Volume= 35,961 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP05: Lake Cochituate Middle

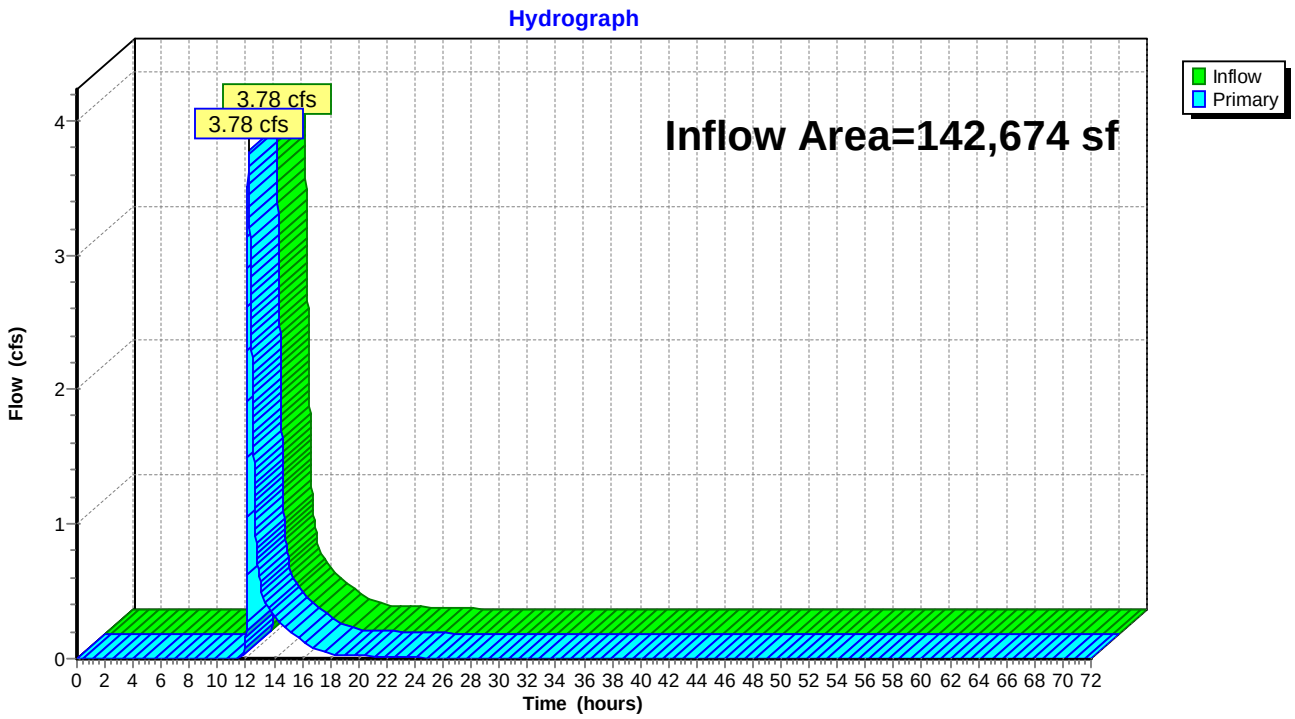


Summary for Link DP05-1: WF I

Inflow Area = 142,674 sf, 22.86% Impervious, Inflow Depth = 0.87" for 10 Year event
Inflow = 3.78 cfs @ 12.18 hrs, Volume= 10,390 cf
Primary = 3.78 cfs @ 12.18 hrs, Volume= 10,390 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP05-1: WF I

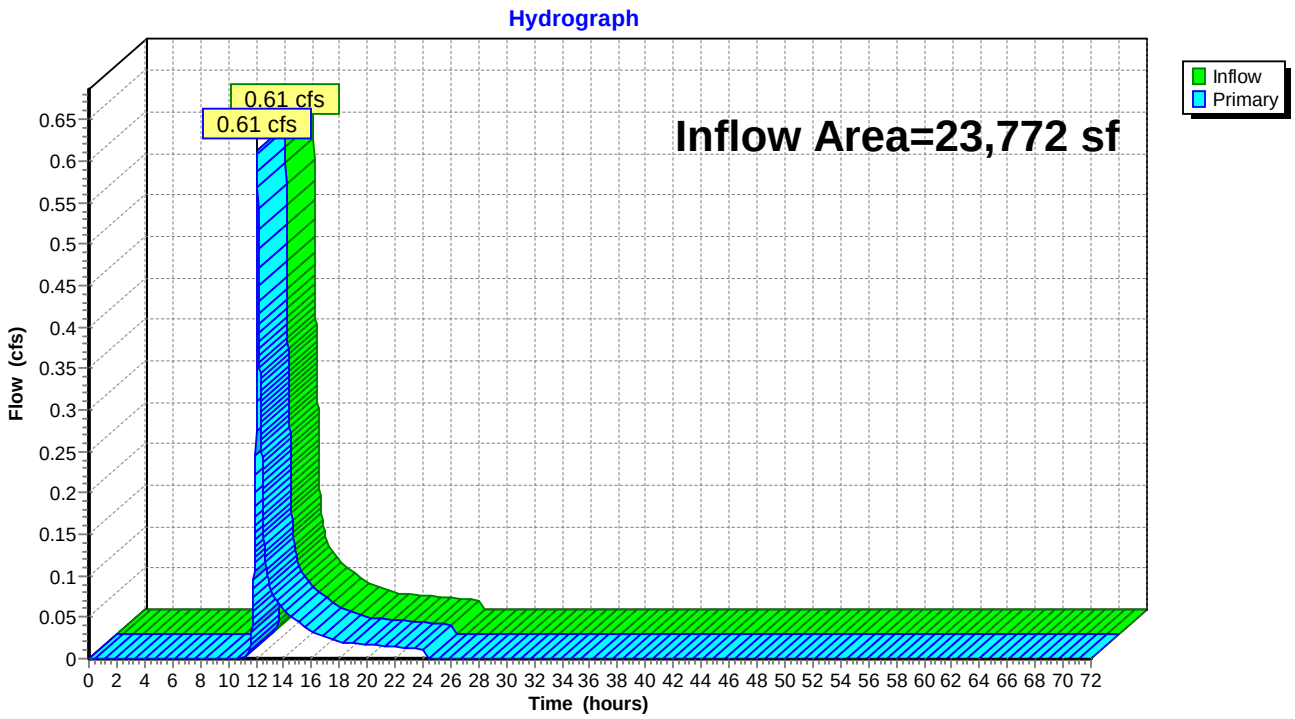


Summary for Link DP05-2: WF G&H

Inflow Area = 23,772 sf, 16.88% Impervious, Inflow Depth = 1.09" for 10 Year event
Inflow = 0.61 cfs @ 12.11 hrs, Volume= 2,150 cf
Primary = 0.61 cfs @ 12.11 hrs, Volume= 2,150 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP05-2: WF G&H

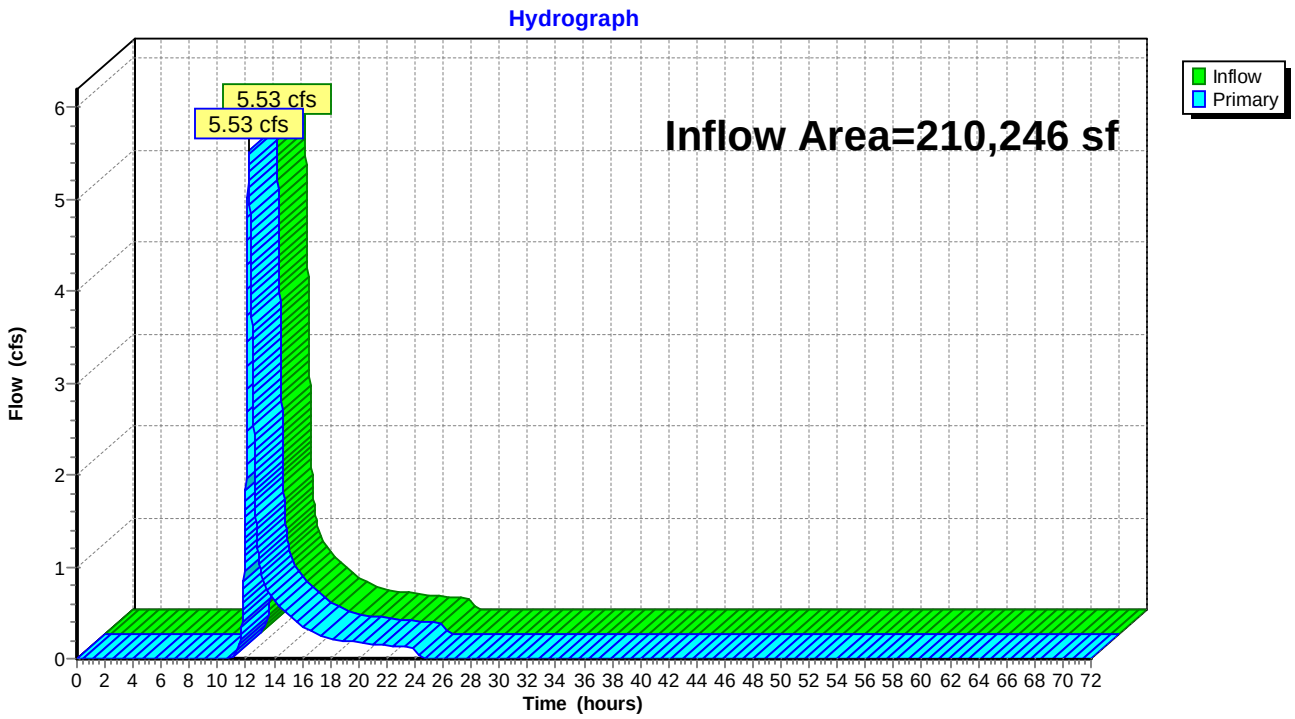


Summary for Link DP05-3: Lake Cochituate W4

Inflow Area = 210,246 sf, 21.85% Impervious, Inflow Depth = 1.34" for 10 Year event
Inflow = 5.53 cfs @ 12.19 hrs, Volume= 23,422 cf
Primary = 5.53 cfs @ 12.19 hrs, Volume= 23,422 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP05-3: Lake Cochituate W4

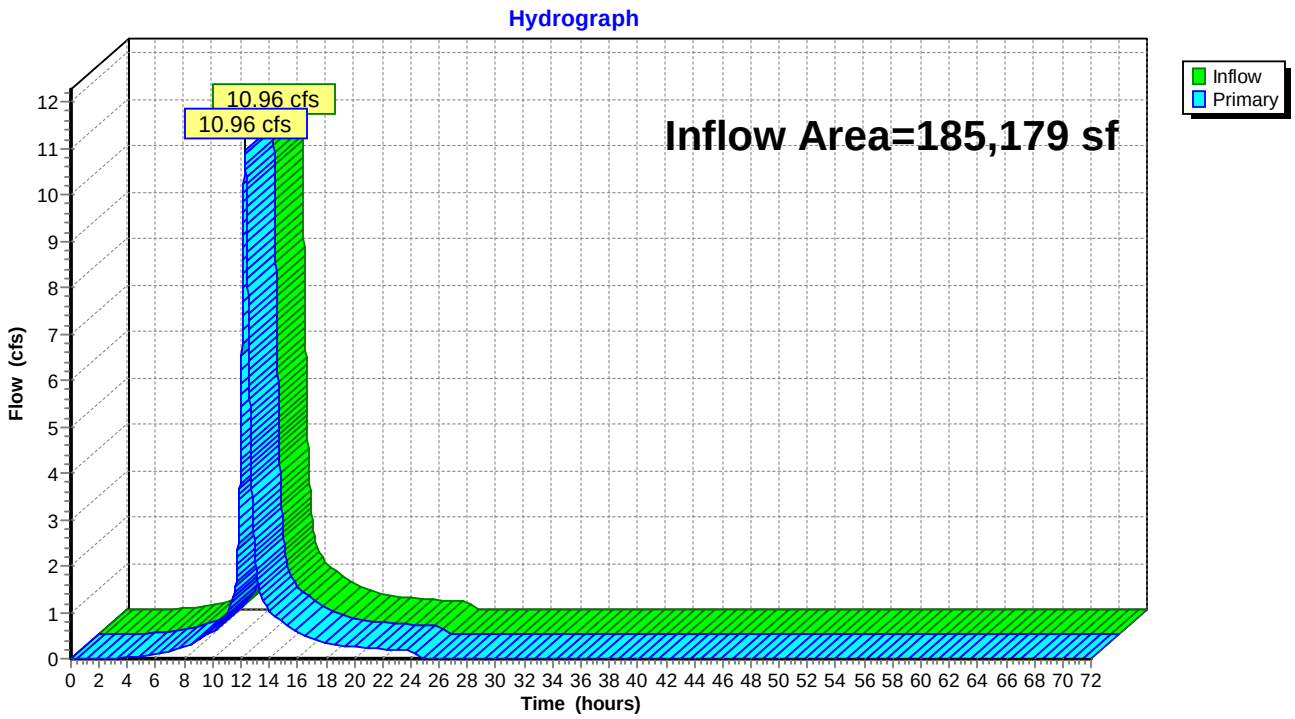


Summary for Link DP06: Worcester St

Inflow Area = 185,179 sf, 86.11% Impervious, Inflow Depth = 3.67" for 10 Year event
Inflow = 10.96 cfs @ 12.28 hrs, Volume= 56,591 cf
Primary = 10.96 cfs @ 12.28 hrs, Volume= 56,591 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP06: Worcester St

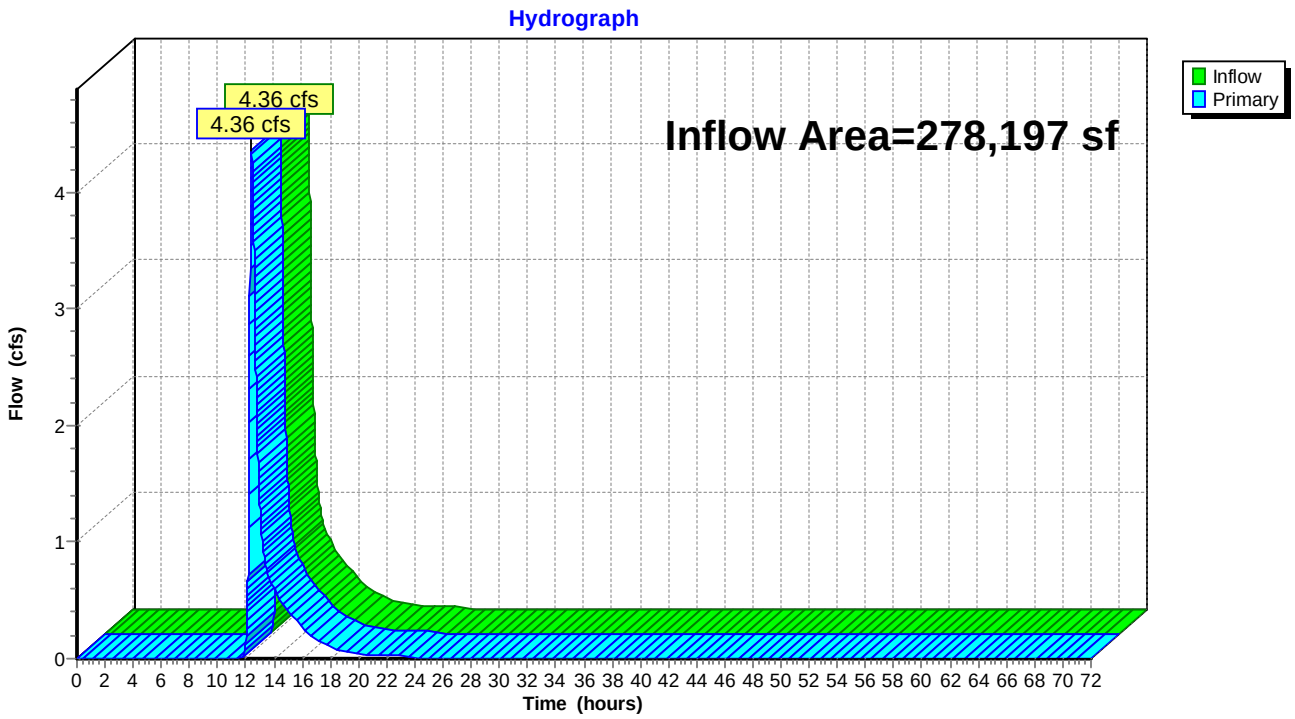


Summary for Link DP07: WF F

Inflow Area = 278,197 sf, 19.13% Impervious, Inflow Depth = 0.71" for 10 Year event
Inflow = 4.36 cfs @ 12.40 hrs, Volume= 16,500 cf
Primary = 4.36 cfs @ 12.40 hrs, Volume= 16,500 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP07: WF F

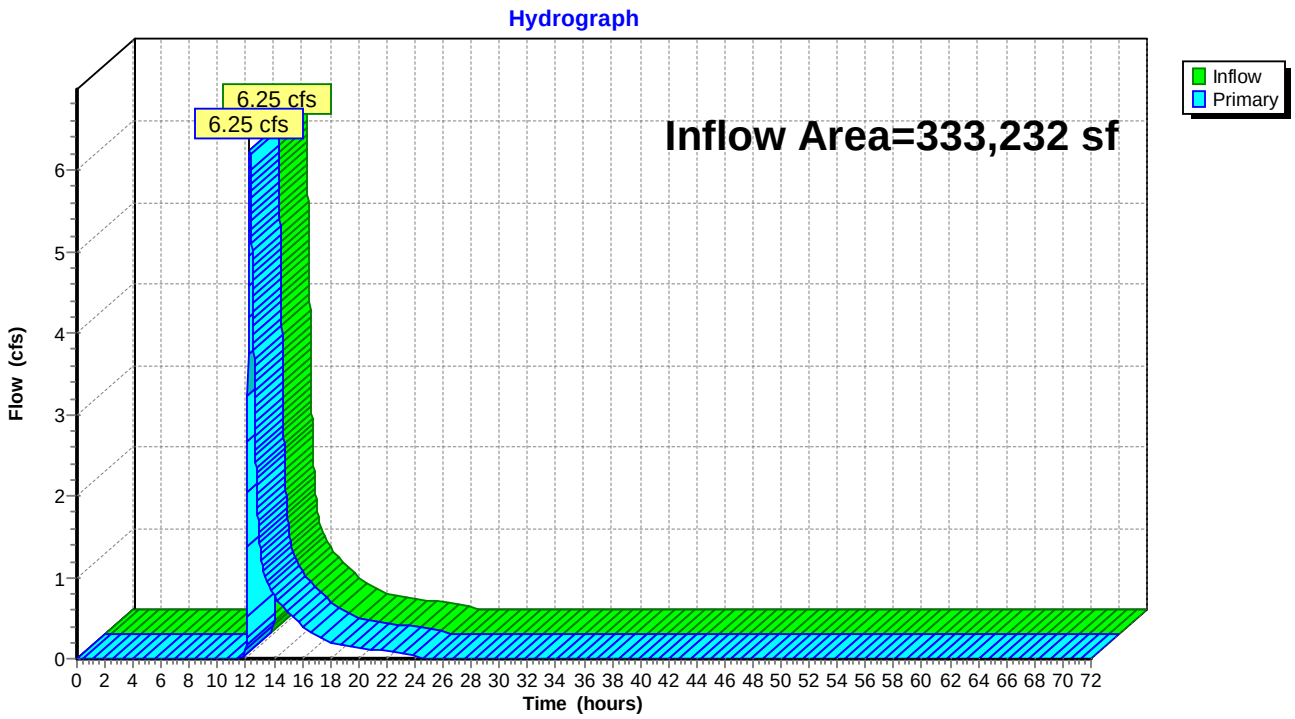


Summary for Link DP08: WF J

Inflow Area = 333,232 sf, 26.18% Impervious, Inflow Depth = 0.86" for 10 Year event
Inflow = 6.25 cfs @ 12.27 hrs, Volume= 23,918 cf
Primary = 6.25 cfs @ 12.27 hrs, Volume= 23,918 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP08: WF J

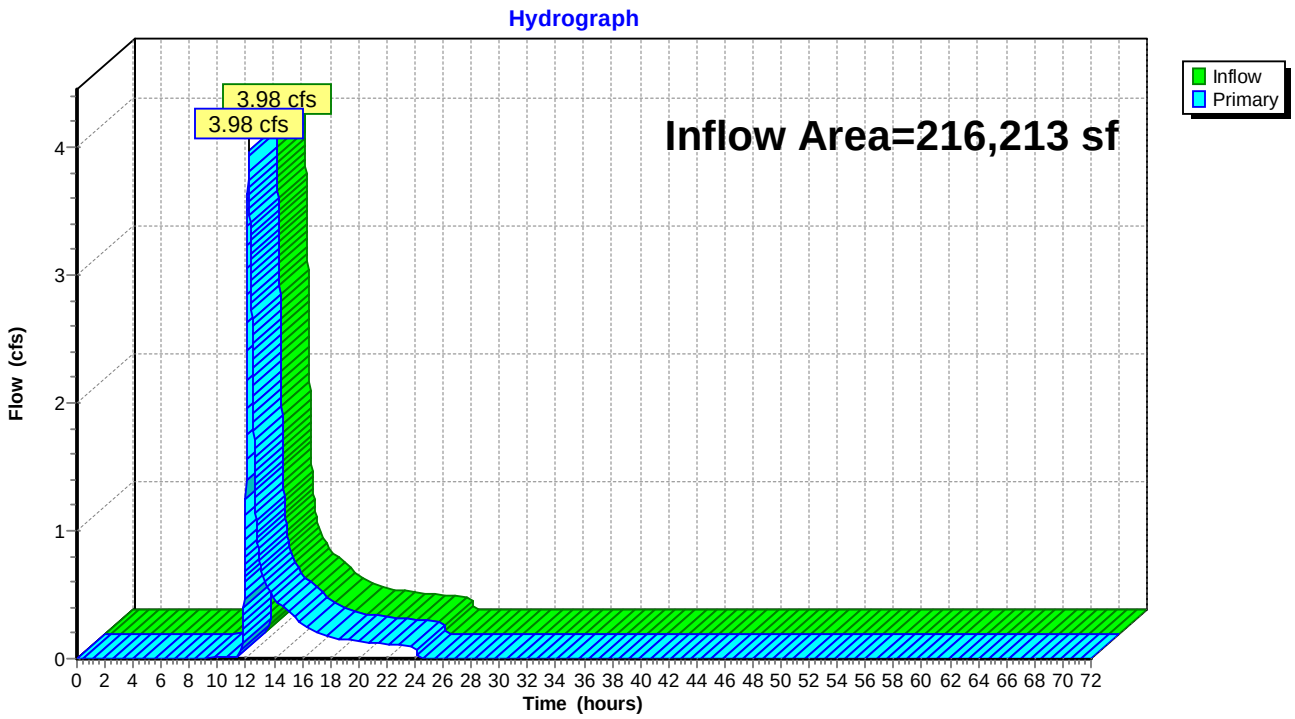


Summary for Link DP09: Unnamed Pond

Inflow Area = 216,213 sf, 21.30% Impervious, Inflow Depth = 0.96" for 10 Year event
Inflow = 3.98 cfs @ 12.18 hrs, Volume= 17,309 cf
Primary = 3.98 cfs @ 12.18 hrs, Volume= 17,309 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP09: Unnamed Pond

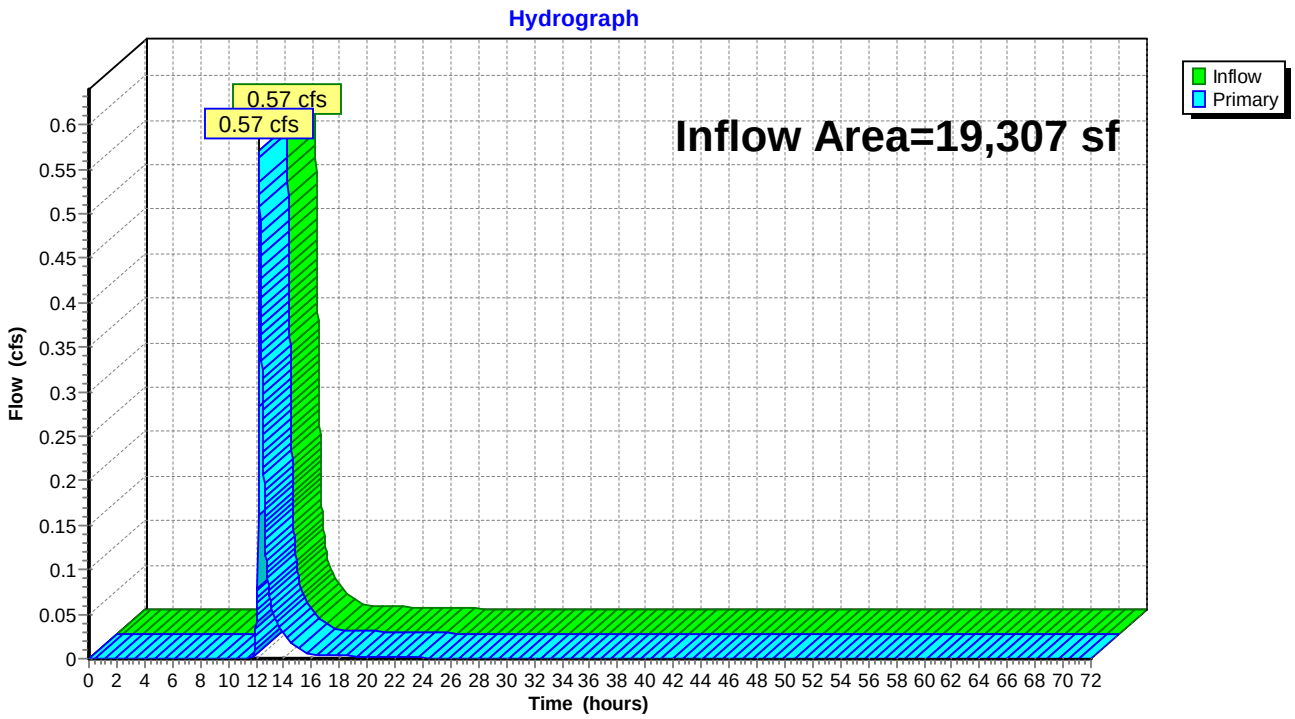


Summary for Link DP09-1: WF K

Inflow Area = 19,307 sf, 30.69% Impervious, Inflow Depth = 0.71" for 10 Year event
Inflow = 0.57 cfs @ 12.22 hrs, Volume= 1,141 cf
Primary = 0.57 cfs @ 12.22 hrs, Volume= 1,141 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP09-1: WF K

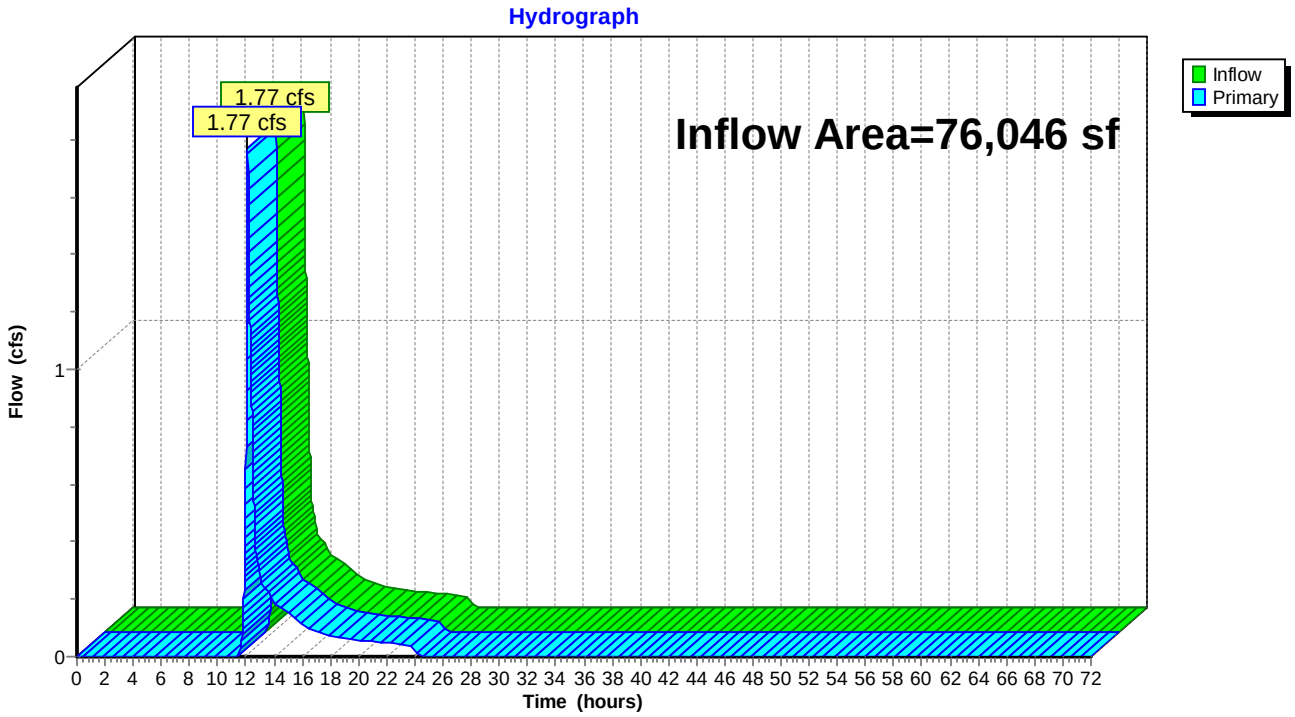


Summary for Link DP09-2: WF KA

Inflow Area = 76,046 sf, 25.44% Impervious, Inflow Depth = 1.07" for 10 Year event
Inflow = 1.77 cfs @ 12.13 hrs, Volume= 6,808 cf
Primary = 1.77 cfs @ 12.13 hrs, Volume= 6,808 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP09-2: WF KA

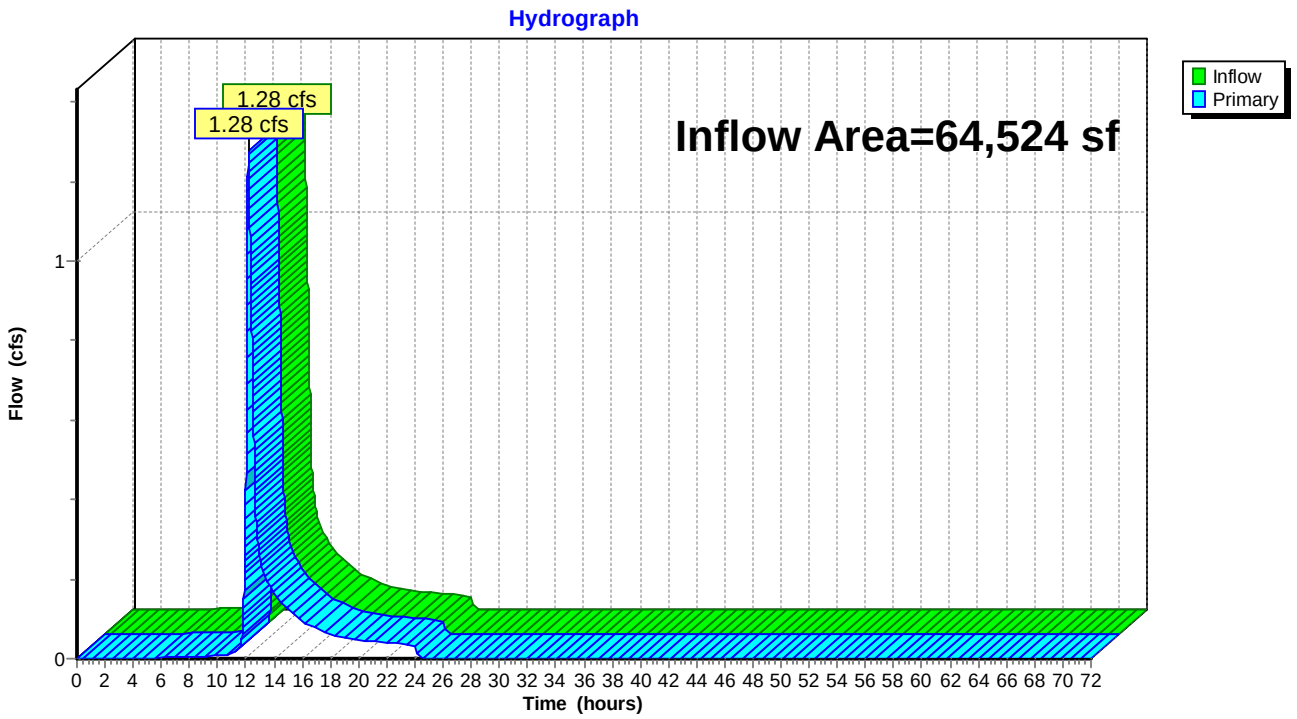


Summary for Link DP09-3: WF B

Inflow Area = 64,524 sf, 18.72% Impervious, Inflow Depth = 1.10" for 10 Year event
Inflow = 1.28 cfs @ 12.18 hrs, Volume= 5,892 cf
Primary = 1.28 cfs @ 12.18 hrs, Volume= 5,892 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP09-3: WF B

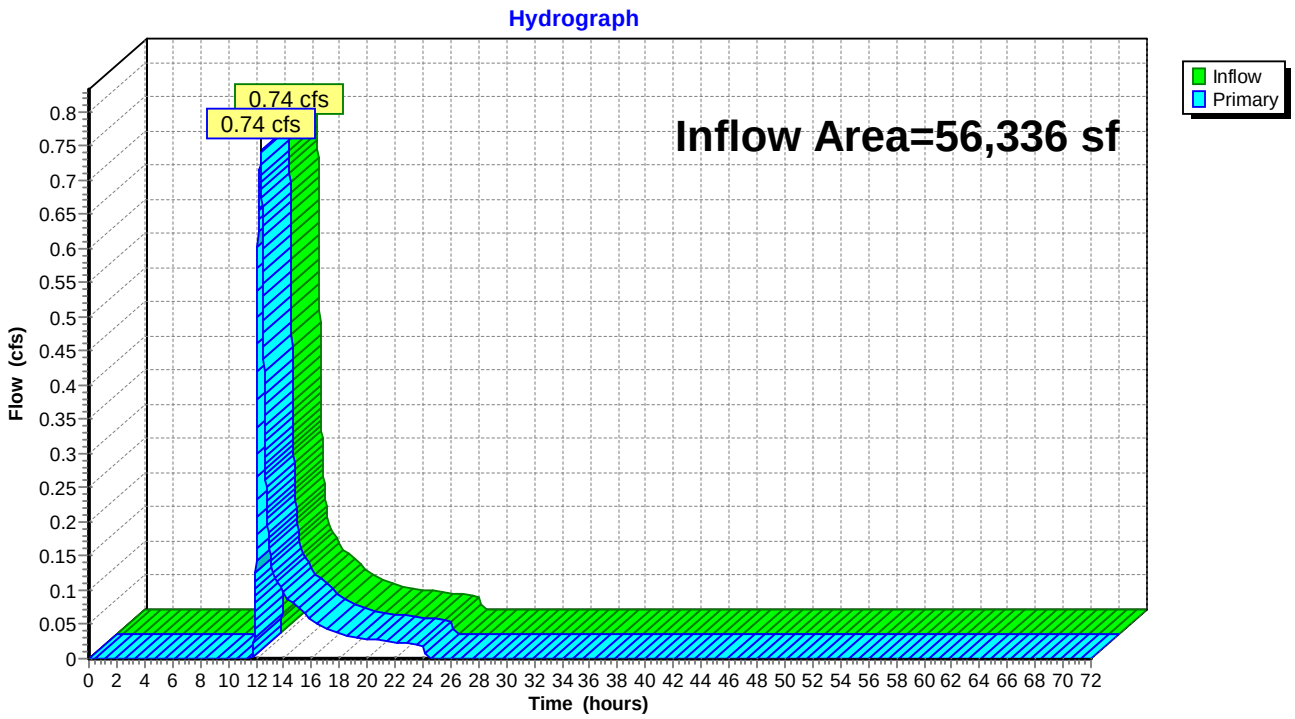


Summary for Link DP09-4: WF E&L, TOB C

Inflow Area = 56,336 sf, 15.46% Impervious, Inflow Depth = 0.74" for 10 Year event
Inflow = 0.74 cfs @ 12.34 hrs, Volume= 3,468 cf
Primary = 0.74 cfs @ 12.34 hrs, Volume= 3,468 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP09-4: WF E&L, TOB C

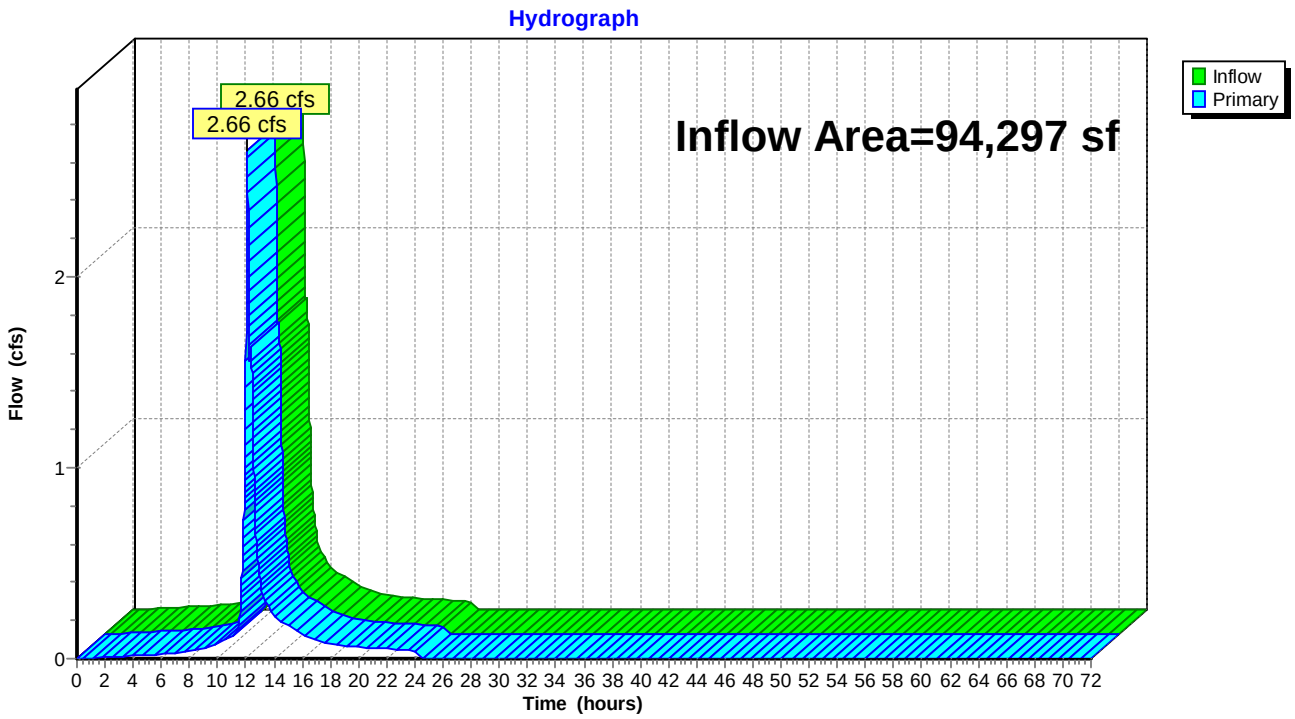


Summary for Link DP10: WF A

Inflow Area = 94,297 sf, 36.36% Impervious, Inflow Depth = 1.44" for 10 Year event
Inflow = 2.66 cfs @ 12.10 hrs, Volume= 11,283 cf
Primary = 2.66 cfs @ 12.10 hrs, Volume= 11,283 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP10: WF A

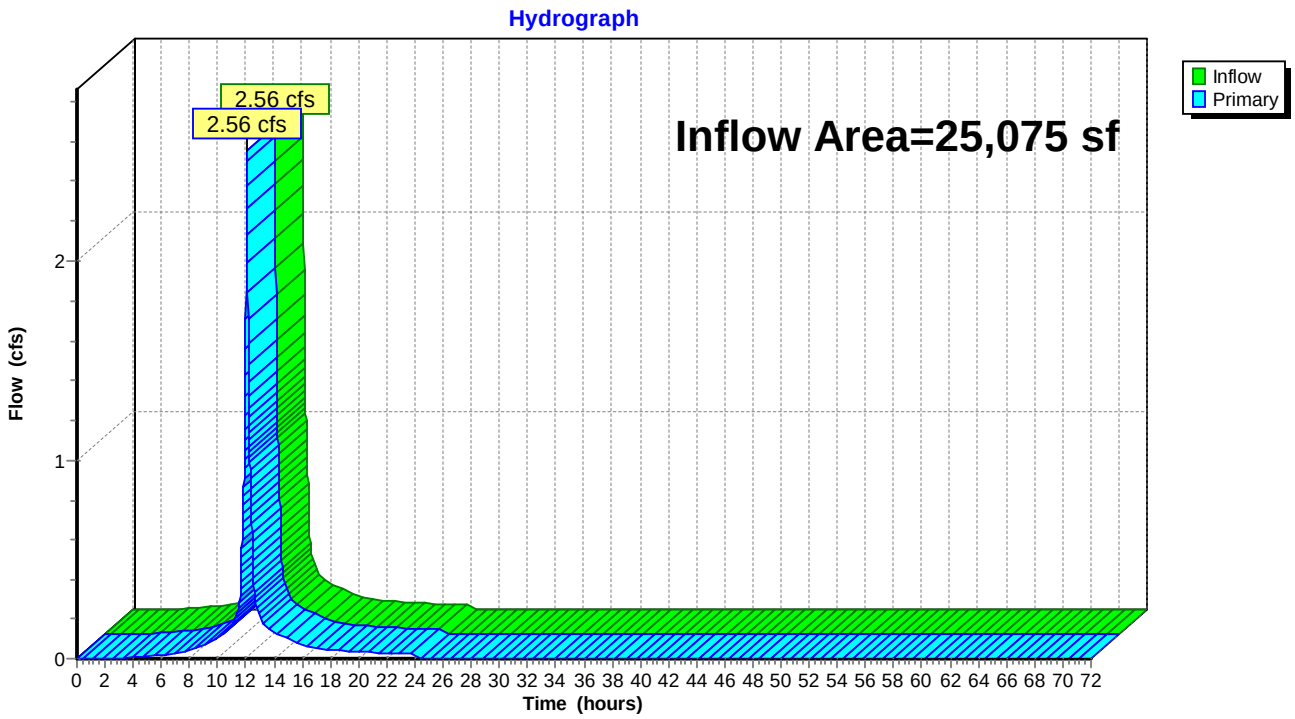


Summary for Link DP11: Local St Drain System

Inflow Area = 25,075 sf, 86.74% Impervious, Inflow Depth = 3.92" for 10 Year event
Inflow = 2.56 cfs @ 12.07 hrs, Volume= 8,188 cf
Primary = 2.56 cfs @ 12.07 hrs, Volume= 8,188 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP11: Local St Drain System

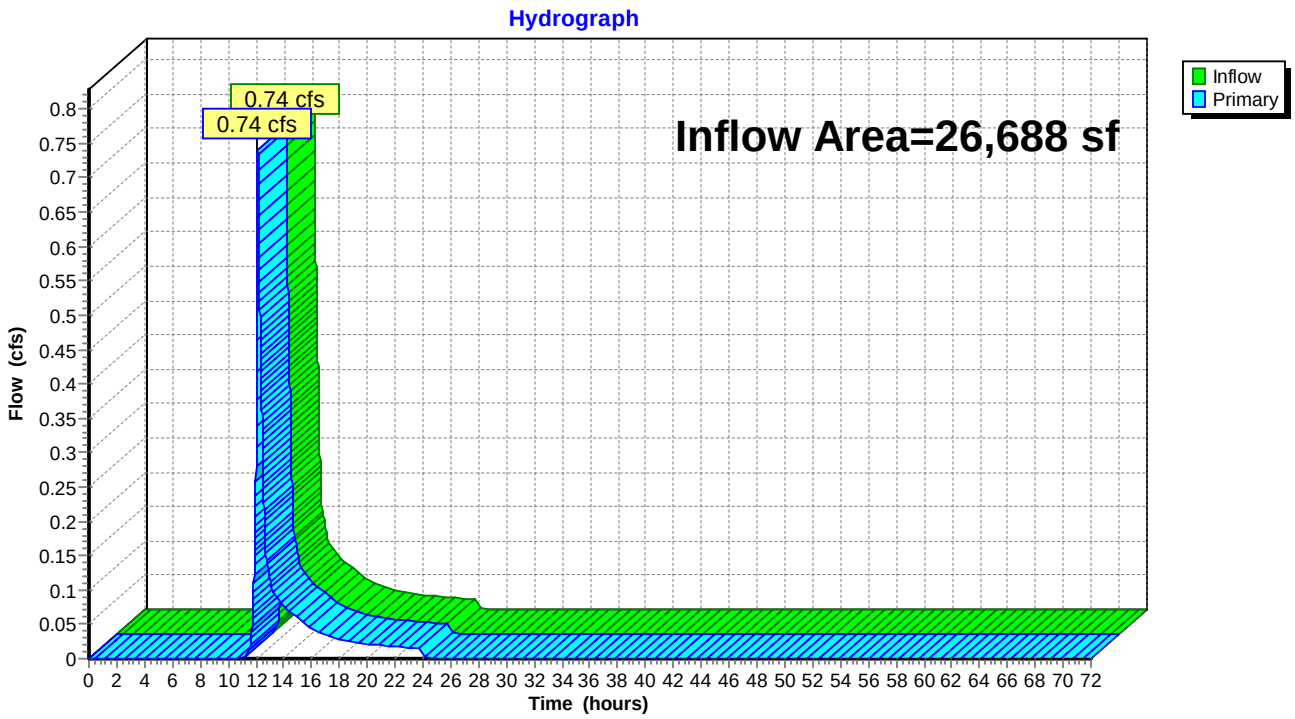


Summary for Link DP12: Washington St Low Point

Inflow Area = 26,688 sf, 37.75% Impervious, Inflow Depth = 1.26" for 10 Year event
Inflow = 0.74 cfs @ 12.14 hrs, Volume= 2,806 cf
Primary = 0.74 cfs @ 12.14 hrs, Volume= 2,806 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP12: Washington St Low Point

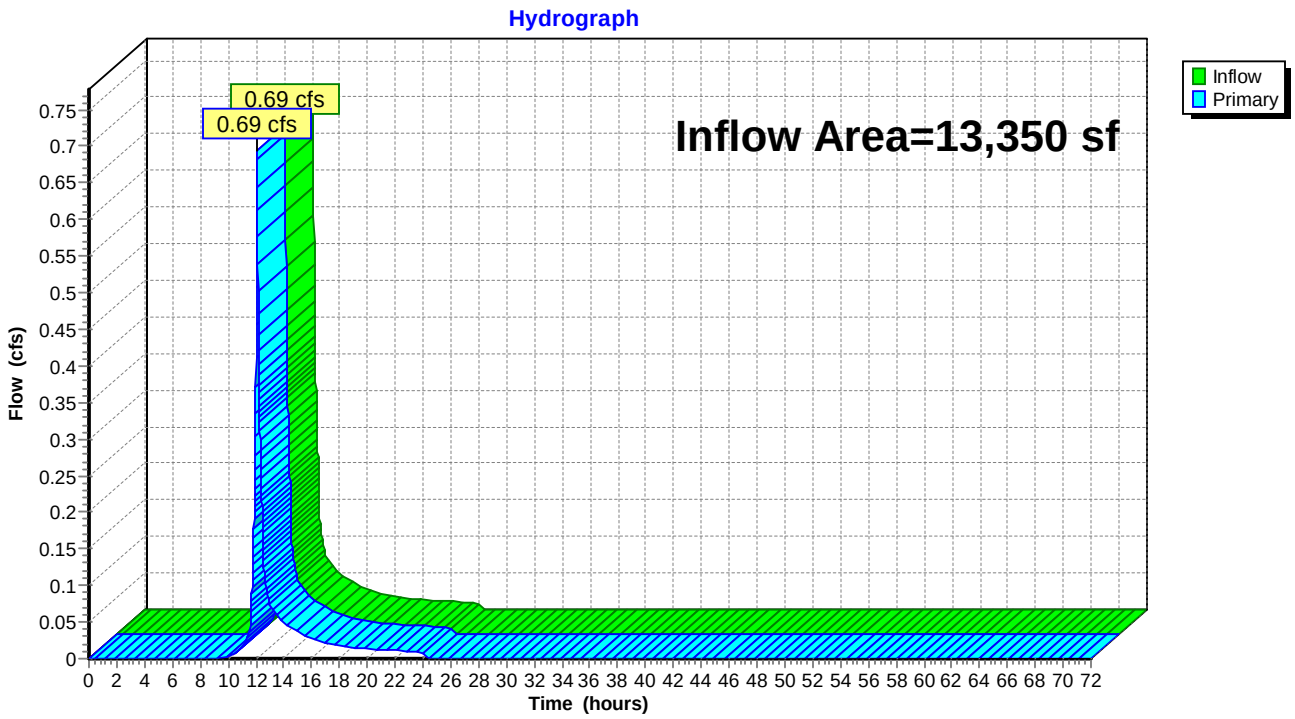


Summary for Link DP13: Empty Lot

Inflow Area = 13,350 sf, 0.00% Impervious, Inflow Depth = 1.89" for 10 Year event
Inflow = 0.69 cfs @ 12.08 hrs, Volume= 2,108 cf
Primary = 0.69 cfs @ 12.08 hrs, Volume= 2,108 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP13: Empty Lot

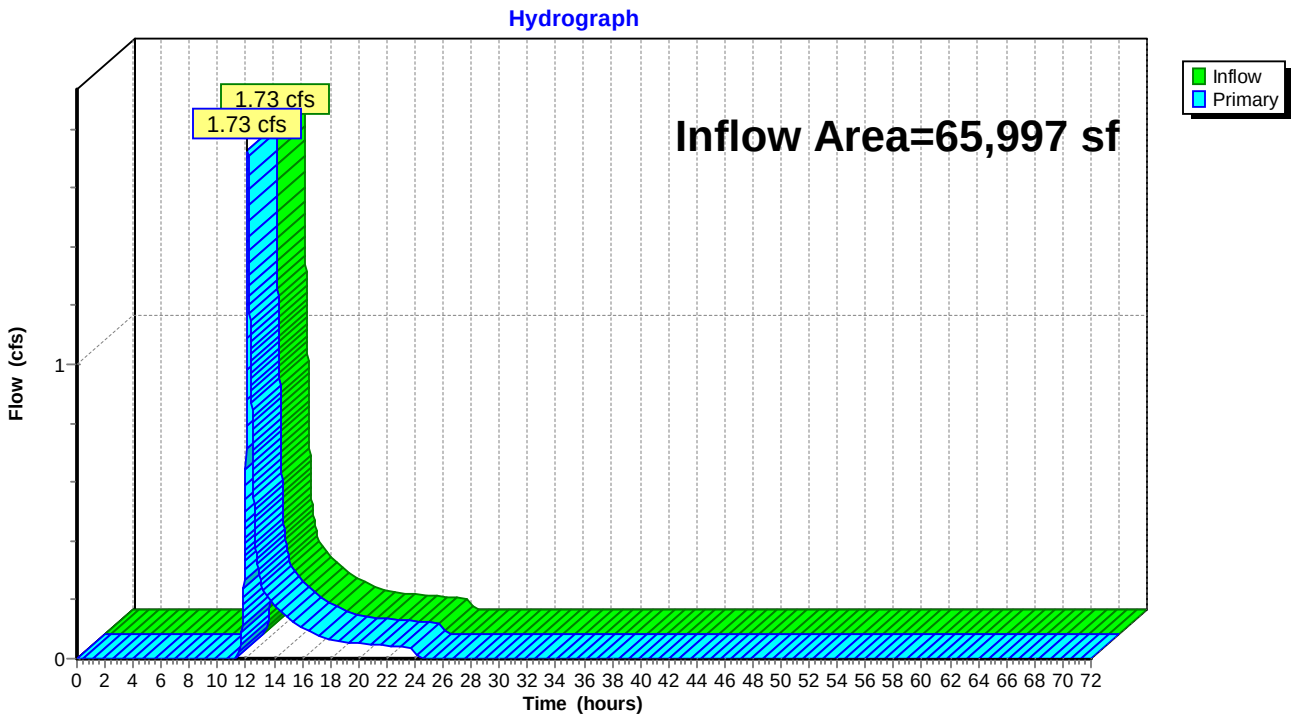


Summary for Link DP14: Lagrange St Low Point

Inflow Area = 65,997 sf, 35.65% Impervious, Inflow Depth = 1.20" for 10 Year event
Inflow = 1.73 cfs @ 12.14 hrs, Volume= 6,589 cf
Primary = 1.73 cfs @ 12.14 hrs, Volume= 6,589 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP14: Lagrange St Low Point

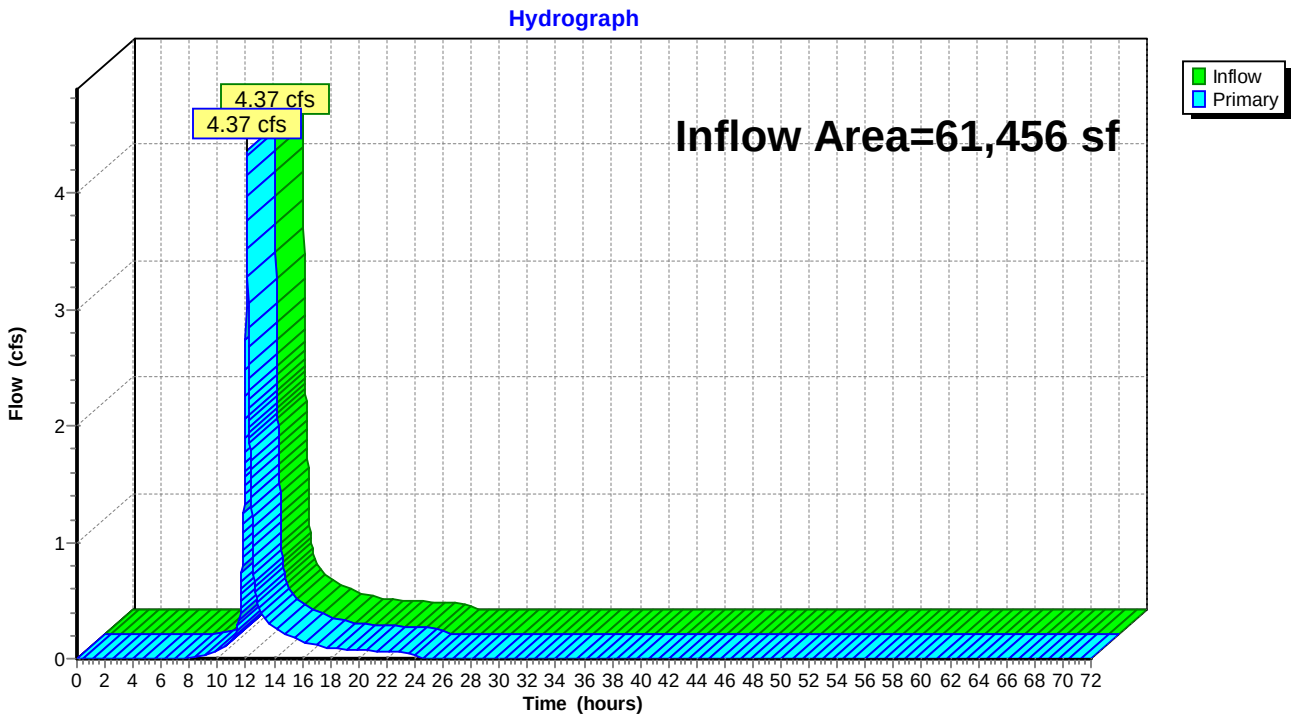


Summary for Link DP15: TOB D

Inflow Area = 61,456 sf, 61.47% Impervious, Inflow Depth = 2.55" for 10 Year event
Inflow = 4.37 cfs @ 12.07 hrs, Volume= 13,044 cf
Primary = 4.37 cfs @ 12.07 hrs, Volume= 13,044 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP15: TOB D

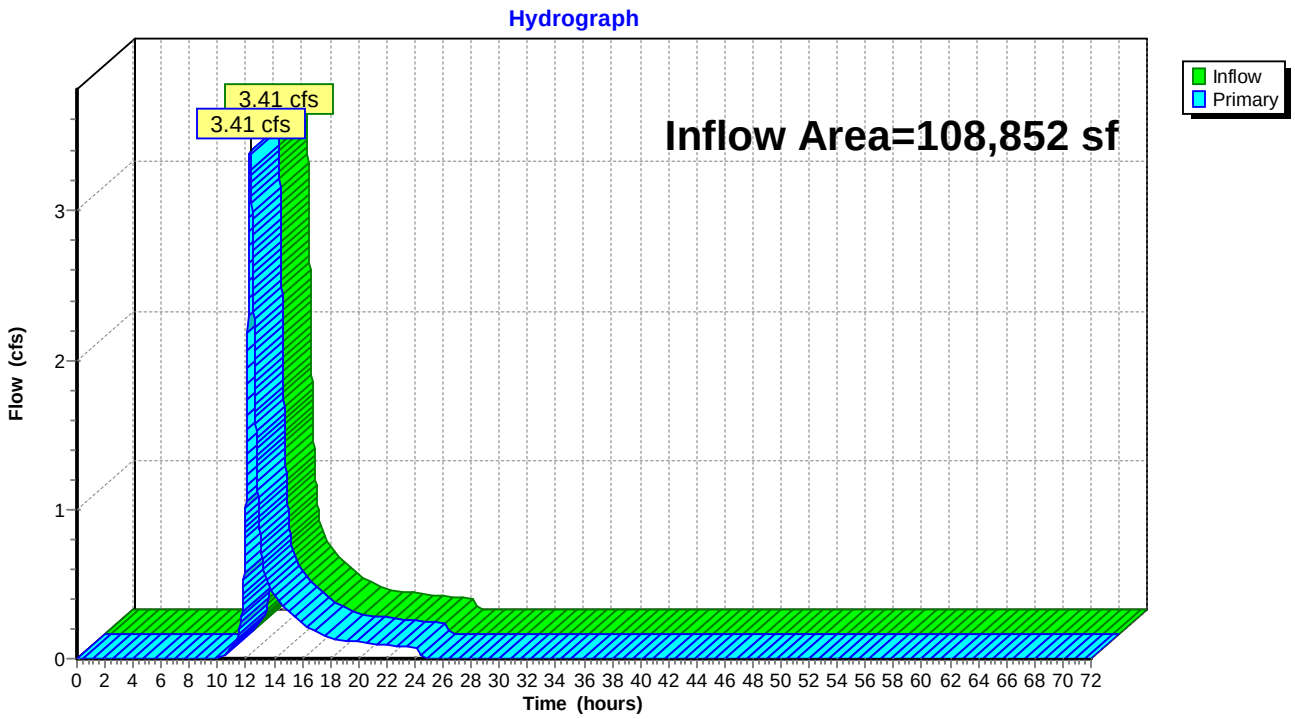


Summary for Link DP16: WF 1, WF 2, TOB E

Inflow Area = 108,852 sf, 44.86% Impervious, Inflow Depth = 1.82" for 10 Year event
Inflow = 3.41 cfs @ 12.31 hrs, Volume= 16,501 cf
Primary = 3.41 cfs @ 12.31 hrs, Volume= 16,501 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP16: WF 1, WF 2, TOB E



Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points x 3
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 01S: Cochituate Rd Runoff Area=32,816 sf 19.44% Impervious Runoff Depth=2.21"
Flow Length=306' Slope=0.0050 '/' Tc=9.0 min CN=68 Runoff=1.72 cfs 6,033 cf

Subcatchment 02S: Chrysler Road Runoff Area=59,894 sf 5.23% Impervious Runoff Depth=1.50"
Flow Length=311' Tc=37.7 min CN=59 Runoff=1.11 cfs 7,474 cf

Subcatchment 03S: DNR-1 Runoff Area=50,164 sf 33.83% Impervious Runoff Depth=2.46"
Flow Length=759' Tc=15.8 min CN=71 Runoff=2.44 cfs 10,293 cf

Subcatchment 04S: DNR-2 Runoff Area=43,392 sf 0.00% Impervious Runoff Depth=1.35"
Flow Length=430' Tc=14.7 min CN=57 Runoff=1.05 cfs 4,891 cf

Subcatchment 05S: Speen Street Runoff Area=28,639 sf 30.10% Impervious Runoff Depth=2.73"
Flow Length=444' Tc=5.3 min CN=74 Runoff=2.15 cfs 6,511 cf

Subcatchment 06S: Lake Cochituate N1-1 Runoff Area=60,547 sf 17.98% Impervious Runoff Depth=1.88"
Flow Length=810' Tc=8.7 min CN=64 Runoff=2.67 cfs 9,486 cf

Subcatchment 07S: Lake Cochituate N1-2 Runoff Area=50,655 sf 14.07% Impervious Runoff Depth=1.80"
Flow Length=274' Tc=8.6 min CN=63 Runoff=2.13 cfs 7,603 cf

Subcatchment 08S: Lake Cochituate N2-1 Runoff Area=41,704 sf 17.25% Impervious Runoff Depth=1.88"
Flow Length=352' Tc=11.8 min CN=64 Runoff=1.66 cfs 6,533 cf

Subcatchment 10S: Lake Cochituate N3-1 Runoff Area=98,155 sf 15.90% Impervious Runoff Depth=1.88"
Flow Length=272' Tc=18.3 min CN=64 Runoff=3.31 cfs 15,377 cf

Subcatchment 11S: Lake Cochituate N3-2 Runoff Area=24,131 sf 4.50% Impervious Runoff Depth=1.50"
Flow Length=110' Tc=9.1 min CN=59 Runoff=0.79 cfs 3,011 cf

Subcatchment 12S: Lake Cochituate E1 Runoff Area=22,546 sf 0.00% Impervious Runoff Depth=1.35"
Flow Length=82' Slope=0.2101 '/' Tc=7.2 min CN=57 Runoff=0.69 cfs 2,541 cf

Subcatchment 13S: Lake Cochituate E2 Runoff Area=166,896 sf 9.27% Impervious Runoff Depth=1.65"
Flow Length=328' Tc=16.1 min CN=61 Runoff=5.03 cfs 22,906 cf

Subcatchment 14S: Lake Cochituate W1-1 Runoff Area=13,204 sf 47.79% Impervious Runoff Depth=3.00"
Flow Length=106' Tc=5.0 min CN=77 Runoff=1.11 cfs 3,305 cf

Subcatchment 15S: Lake Cochituate W1-2 Runoff Area=15,593 sf 0.00% Impervious Runoff Depth=1.35"
Flow Length=185' Tc=11.2 min CN=57 Runoff=0.42 cfs 1,757 cf

Subcatchment 16S: Lake Cochituate N4 Runoff Area=95,267 sf 23.06% Impervious Runoff Depth=2.04"
Flow Length=145' Tc=11.5 min CN=66 Runoff=4.22 cfs 16,202 cf

Subcatchment 17S: Lake Cochituate W2-1 Runoff Area=4,593 sf 65.38% Impervious Runoff Depth=3.68"
Tc=5.0 min CN=84 Runoff=0.47 cfs 1,410 cf

Subcatchment 18S: Lake Cochituate W2-2 Runoff Area=14,017 sf 9.52% Impervious Runoff Depth=1.65"
Flow Length=102' Tc=8.8 min CN=61 Runoff=0.52 cfs 1,924 cf

Subcatchment 19S: Lake Cochituate W3-1 Runoff Area=2,241 sf 67.51% Impervious Runoff Depth=3.79"
Tc=5.0 min CN=85 Runoff=0.23 cfs 707 cf

Subcatchment 20S: Lake Cochituate W3-2 Runoff Area=21,531 sf 11.61% Impervious Runoff Depth=1.72"
Flow Length=72' Slope=0.2220 '/' Tc=6.4 min CN=62 Runoff=0.93 cfs 3,092 cf

Subcatchment 21S: Lake Cochituate W4-1 Runoff Area=10,487 sf 62.20% Impervious Runoff Depth=3.58"
Tc=5.0 min CN=83 Runoff=1.04 cfs 3,132 cf

Subcatchment 22S: Lake Cochituate W4-2 Runoff Area=199,759 sf 19.73% Impervious Runoff Depth=1.96"
Flow Length=297' Tc=13.0 min CN=65 Runoff=8.07 cfs 32,625 cf

Subcatchment 23S: Worcester St N Runoff Area=159,601 sf 92.99% Impervious Runoff Depth=4.75"
Flow Length=1,809' Tc=22.6 min CN=94 Runoff=12.21 cfs 63,207 cf

Subcatchment 24S: Worcester St S Runoff Area=25,578 sf 43.13% Impervious Runoff Depth=2.82"
Flow Length=316' Tc=9.0 min CN=75 Runoff=1.75 cfs 6,009 cf

Subcatchment 25S: Arcadi Rd-1 Runoff Area=234,888 sf 22.66% Impervious Runoff Depth=1.72"
Flow Length=810' Tc=18.2 min CN=62 Runoff=7.14 cfs 33,736 cf

Subcatchment 26S: Arcadi Rd-2 Runoff Area=43,309 sf 0.00% Impervious Runoff Depth=1.35"
Flow Length=154' Tc=10.6 min CN=57 Runoff=1.18 cfs 4,881 cf

Subcatchment 27S: Fisher St-1 Runoff Area=316,495 sf 27.57% Impervious Runoff Depth=1.65"
Flow Length=500' Tc=15.5 min CN=61 Runoff=9.68 cfs 43,438 cf

Subcatchment 28S: Fisher St-2 Runoff Area=16,737 sf 0.00% Impervious Runoff Depth=1.35"
Flow Length=65' Slope=0.1369 '/' Tc=7.1 min CN=57 Runoff=0.52 cfs 1,886 cf

Subcatchment 29S: Unnamed Pond 1-2 Runoff Area=4,097 sf 0.00% Impervious Runoff Depth=1.35"
Flow Length=32' Slope=0.3850 '/' Tc=5.0 min CN=57 Runoff=0.14 cfs 462 cf

Subcatchment 30S: Unnamed Pond 1-1 Runoff Area=15,210 sf 38.96% Impervious Runoff Depth=2.55"
Flow Length=86' Tc=10.7 min CN=72 Runoff=0.89 cfs 3,232 cf

Subcatchment 31S: Unnamed Pond 2 Runoff Area=76,046 sf 25.44% Impervious Runoff Depth=1.57"
Flow Length=279' Tc=7.9 min CN=60 Runoff=2.77 cfs 9,959 cf

Subcatchment 32S: Unnamed Pond 3 Runoff Area=62,955 sf 16.69% Impervious Runoff Depth=1.50"
Flow Length=309' Tc=11.7 min CN=59 Runoff=1.90 cfs 7,856 cf

Subcatchment 33S: Unnamed Pond 3-1 Runoff Area=1,569 sf 100.00% Impervious Runoff Depth=5.21"
Tc=5.0 min CN=98 Runoff=0.20 cfs 682 cf

Subcatchment 34S: Unnamed Pond 4-1 Runoff Area=13,927 sf 62.52% Impervious Runoff Depth=3.58"
Tc=5.0 min CN=83 Runoff=1.38 cfs 4,160 cf

Subcatchment 35S: Unnamed Pond 4-2 Runoff Area=42,409 sf 0.00% Impervious Runoff Depth=1.35"
Flow Length=167' Tc=11.7 min CN=57 Runoff=1.12 cfs 4,780 cf

Subcatchment 36S: Kansas St-1 Runoff Area=26,591 sf 37.08% Impervious Runoff Depth=2.46"
Flow Length=92' Tc=11.0 min CN=71 Runoff=1.48 cfs 5,456 cf

Subcatchment 37S: Kansas St-2 Runoff Area=52,239 sf 17.16% Impervious Runoff Depth=1.65"
Flow Length=313' Tc=9.1 min CN=61 Runoff=1.93 cfs 7,170 cf

Subcatchment 38S: N. Main & Kansas Runoff Area=15,467 sf 100.00% Impervious Runoff Depth=5.21"
Tc=5.0 min CN=98 Runoff=1.96 cfs 6,719 cf

Subcatchment 39S: Washington Ave 1 Runoff Area=12,963 sf 90.09% Impervious Runoff Depth=4.87"
Tc=5.0 min CN=95 Runoff=1.61 cfs 5,256 cf

Subcatchment 40S: Washington Ave 2 Runoff Area=12,112 sf 83.16% Impervious Runoff Depth=4.64"
Tc=5.0 min CN=93 Runoff=1.46 cfs 4,684 cf

Subcatchment 41S: Washington Ave 3 Runoff Area=26,688 sf 37.75% Impervious Runoff Depth=1.80"
Flow Length=196' Tc=9.0 min CN=63 Runoff=1.11 cfs 4,006 cf

Subcatchment 42S: Empty Lot Runoff Area=13,350 sf 0.00% Impervious Runoff Depth=2.55"
Tc=5.0 min CN=72 Runoff=0.95 cfs 2,837 cf

Subcatchment 43S: Lagrange St Runoff Area=65,997 sf 35.65% Impervious Runoff Depth=1.72"
Flow Length=194' Tc=8.7 min CN=62 Runoff=2.62 cfs 9,479 cf

Subcatchment 44S: Mechanic St Runoff Area=61,456 sf 61.47% Impervious Runoff Depth=3.29"
Flow Length=329' Tc=5.0 min CN=80 Runoff=5.63 cfs 16,844 cf

Subcatchment 45S: Cochituate St 1 Runoff Area=108,852 sf 44.86% Impervious Runoff Depth=2.46"
Flow Length=740' Tc=21.3 min CN=71 Runoff=4.68 cfs 22,336 cf

Subcatchment 170S: Lake Cochituate N2-2 Runoff Area=15,884 sf 0.00% Impervious Runoff Depth=1.35"
Flow Length=53' Slope=0.3400 '/' Tc=5.0 min CN=57 Runoff=0.53 cfs 1,790 cf

Pond 01P: BMP 1 - Infiltration Swale Peak Elev=147.60' Storage=2,134 cf Inflow=2.44 cfs 10,293 cf
Discarded=0.19 cfs 5,857 cf Primary=1.77 cfs 4,437 cf Outflow=1.97 cfs 10,294 cf

Pond 02P: Re-graded Detention Pond Peak Elev=160.19' Storage=75 cf Inflow=2.15 cfs 6,511 cf
Primary=0.00 cfs 0 cf Secondary=2.15 cfs 6,498 cf Outflow=2.15 cfs 6,498 cf

Pond 03P: BMP 2 - Bioretention System Peak Elev=153.05' Storage=1,045 cf Inflow=2.67 cfs 9,486 cf
Discarded=0.08 cfs 3,879 cf Primary=2.55 cfs 5,607 cf Outflow=2.63 cfs 9,486 cf

Pond 04P: BMP 3 - Infiltration Swale Peak Elev=154.48' Storage=888 cf Inflow=1.66 cfs 6,533 cf
Discarded=0.08 cfs 3,051 cf Primary=1.51 cfs 3,482 cf Outflow=1.58 cfs 6,533 cf

Pond 05P: BMP 4 - Infiltration Swale Peak Elev=154.87' Storage=919 cf Inflow=3.31 cfs 15,377 cf
Discarded=0.07 cfs 3,185 cf Primary=3.21 cfs 12,192 cf Outflow=3.28 cfs 15,377 cf

Pond 06P: BMP 5 - Infiltration Swale Peak Elev=155.05' Storage=1,895 cf Inflow=4.95 cfs 19,507 cf
Discarded=0.15 cfs 6,803 cf Primary=4.69 cfs 12,705 cf Outflow=4.84 cfs 19,507 cf

Pond 07P: BMP 6 - Infiltration Swale Peak Elev=155.52' Storage=593 cf Inflow=0.47 cfs 1,410 cf
Discarded=0.05 cfs 1,377 cf Primary=0.04 cfs 33 cf Outflow=0.10 cfs 1,410 cf

Pond 7P: Lake Cochituate Peak Elev=136.01' Storage=8.580 af Inflow=81.71 cfs 373,757 cf
Outflow=0.00 cfs 0 cf

Pond 08P: BMP 7 - Infiltration Swale Peak Elev=156.93' Storage=260 cf Inflow=0.23 cfs 707 cf
Discarded=0.02 cfs 635 cf Primary=0.07 cfs 72 cf Outflow=0.10 cfs 707 cf

Pond 09P: BMP 8 - Infiltration Swale Peak Elev=158.11' Storage=992 cf Inflow=1.04 cfs 3,132 cf
Discarded=0.09 cfs 2,499 cf Primary=0.49 cfs 633 cf Outflow=0.58 cfs 3,132 cf

Pond 10P: BMP 9 - Infiltration Swale Peak Elev=158.32' Storage=3,882 cf Inflow=7.14 cfs 33,736 cf
Discarded=0.24 cfs 10,922 cf Primary=6.50 cfs 22,814 cf Outflow=6.73 cfs 33,736 cf

Pond 11P: BMP 10 - Infiltration Swale Peak Elev=158.47' Storage=2,398 cf Inflow=9.68 cfs 43,438 cf
Discarded=0.16 cfs 7,516 cf Primary=9.44 cfs 35,923 cf Outflow=9.60 cfs 43,438 cf

Pond 12P: BMP 11 - Infiltration Swale Peak Elev=157.65' Storage=528 cf Inflow=0.89 cfs 3,232 cf
Discarded=0.05 cfs 1,753 cf Primary=0.81 cfs 1,479 cf Outflow=0.86 cfs 3,232 cf

Pond 13P: BMP 12 - Infiltration Swale Peak Elev=156.37' Storage=1,343 cf Inflow=1.38 cfs 4,160 cf
Discarded=0.12 cfs 3,329 cf Primary=0.58 cfs 831 cf Outflow=0.70 cfs 4,160 cf

Pond 14P: BMP 13 - Infiltration Swale Peak Elev=156.42' Storage=1,359 cf Inflow=1.48 cfs 5,456 cf
Discarded=0.12 cfs 3,768 cf Primary=0.95 cfs 1,688 cf Outflow=1.07 cfs 5,456 cf

Link 1L: Total to Bioretention Inflow=2.67 cfs 9,486 cf
Primary=2.67 cfs 9,486 cf

Link 2L: Lake Cochituate N1 Inflow=4.66 cfs 13,210 cf
Primary=4.66 cfs 13,210 cf

Link 3L: Lake Cochituate N2 Inflow=1.83 cfs 5,273 cf
Primary=1.83 cfs 5,273 cf

Link 4L: Lake Cochituate N3 Inflow=3.75 cfs 15,203 cf
Primary=3.75 cfs 15,203 cf

Link 5L: Lake Cochituate W2 Inflow=0.52 cfs 1,957 cf
Primary=0.52 cfs 1,957 cf

Link 6L: Total Inflow=81.71 cfs 373,757 cf
Primary=81.71 cfs 373,757 cf

Link DP01: Cochituate Rd Inflow=1.72 cfs 6,033 cf
Primary=1.72 cfs 6,033 cf

Link DP02: Chrysler Road Inflow=1.11 cfs 7,474 cf
Primary=1.11 cfs 7,474 cf

Link DP03: WF A Inflow=2.69 cfs 9,327 cf
Primary=2.69 cfs 9,327 cf

Link DP04: Lake Cochituate Middle Pond Inflow=14.67 cfs 59,133 cf
Primary=14.67 cfs 59,133 cf

Link DP04-1: WF B Inflow=9.35 cfs 33,686 cf
Primary=9.35 cfs 33,686 cf

Link DP04-2: WF C Inflow=0.69 cfs 2,541 cf
Primary=0.69 cfs 2,541 cf

Link DP04-3: Lake Cochituate Inflow=5.03 cfs 22,906 cf
Primary=5.03 cfs 22,906 cf

Link DP05: Lake Cochituate Middle Inflow=14.82 cfs 52,842 cf
Primary=14.82 cfs 52,842 cf

Link DP05-1: WF I Inflow=5.60 cfs 16,419 cf
Primary=5.60 cfs 16,419 cf

Link DP05-2: WF G&H Inflow=0.93 cfs 3,165 cf
Primary=0.93 cfs 3,165 cf

Link DP05-3: Lake Cochituate W4 Inflow=8.55 cfs 33,258 cf
Primary=8.55 cfs 33,258 cf

Link DP06: Worcester St Inflow=13.26 cfs 69,216 cf
Primary=13.26 cfs 69,216 cf

Link DP07: WF F Inflow=7.32 cfs 27,695 cf
Primary=7.32 cfs 27,695 cf

Link DP08: WF J Inflow=9.77 cfs 37,809 cf
Primary=9.77 cfs 37,809 cf

Link DP09: Unnamed Pond Inflow=7.10 cfs 26,048 cf
Primary=7.10 cfs 26,048 cf

Link DP09-1: WF K Inflow=0.91 cfs 1,941 cf
Primary=0.91 cfs 1,941 cf

Link DP09-2: WF KA Inflow=2.77 cfs 9,959 cf
Primary=2.77 cfs 9,959 cf

Link DP09-3: WF B Inflow=2.01 cfs 8,537 cf
Primary=2.01 cfs 8,537 cf

Link DP09-4: WF E&L, TOB C Inflow=1.69 cfs 5,611 cf
Primary=1.69 cfs 5,611 cf

Link DP10: WF A Inflow=3.60 cfs 15,576 cf
Primary=3.60 cfs 15,576 cf

Link DP11: Local St Drain System Inflow=3.07 cfs 9,940 cf
Primary=3.07 cfs 9,940 cf

Link DP12: Washington St Low Point Inflow=1.11 cfs 4,006 cf
Primary=1.11 cfs 4,006 cf

Link DP13: Empty Lot Inflow=0.95 cfs 2,837 cf
Primary=0.95 cfs 2,837 cf

Link DP14: Lagrange St Low Point Inflow=2.62 cfs 9,479 cf
Primary=2.62 cfs 9,479 cf

Link DP15: TOB D Inflow=5.63 cfs 16,844 cf
Primary=5.63 cfs 16,844 cf

Link DP16: WF 1, WF 2, TOB E Inflow=4.68 cfs 22,336 cf
Primary=4.68 cfs 22,336 cf

Total Runoff Area = 2,480,651 sf Runoff Volume = 437,677 cf Average Runoff Depth = 2.12"
71.89% Pervious = 1,783,367 sf 28.11% Impervious = 697,284 sf

Summary for Subcatchment 01S: Cochituate Rd

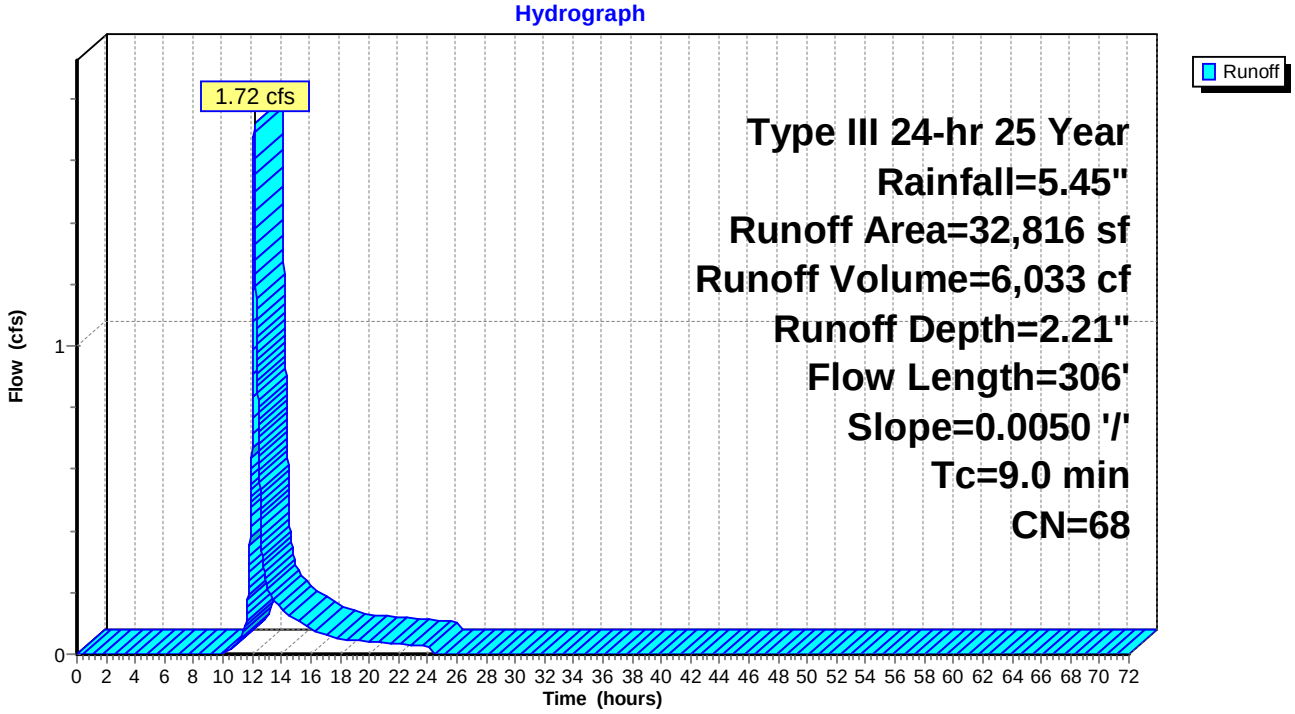
Runoff = 1.72 cfs @ 12.13 hrs, Volume= 6,033 cf, Depth= 2.21"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 Year Rainfall=5.45"

	Area (sf)	CN	Description
	16,401	57	Woods/grass comb., Poor, HSG A
	2,771	98	Paved parking, HSG A
*	3,607	98	Bike Trail, HSG A
	10,037	68	<50% Grass cover, Poor, HSG A
	32,816	68	Weighted Average
	26,438		80.56% Pervious Area
	6,378		19.44% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.1	100	0.0050	0.78		**Sheet Flow, Paved** Smooth surfaces n= 0.011 P2= 3.15"
6.9	206	0.0050	0.49		**Shallow Concentrated Flow, Grass** Short Grass Pasture Kv= 7.0 fps
9.0	306	Total			

Subcatchment 01S: Cochituate Rd



Summary for Subcatchment 02S: Chrysler Road

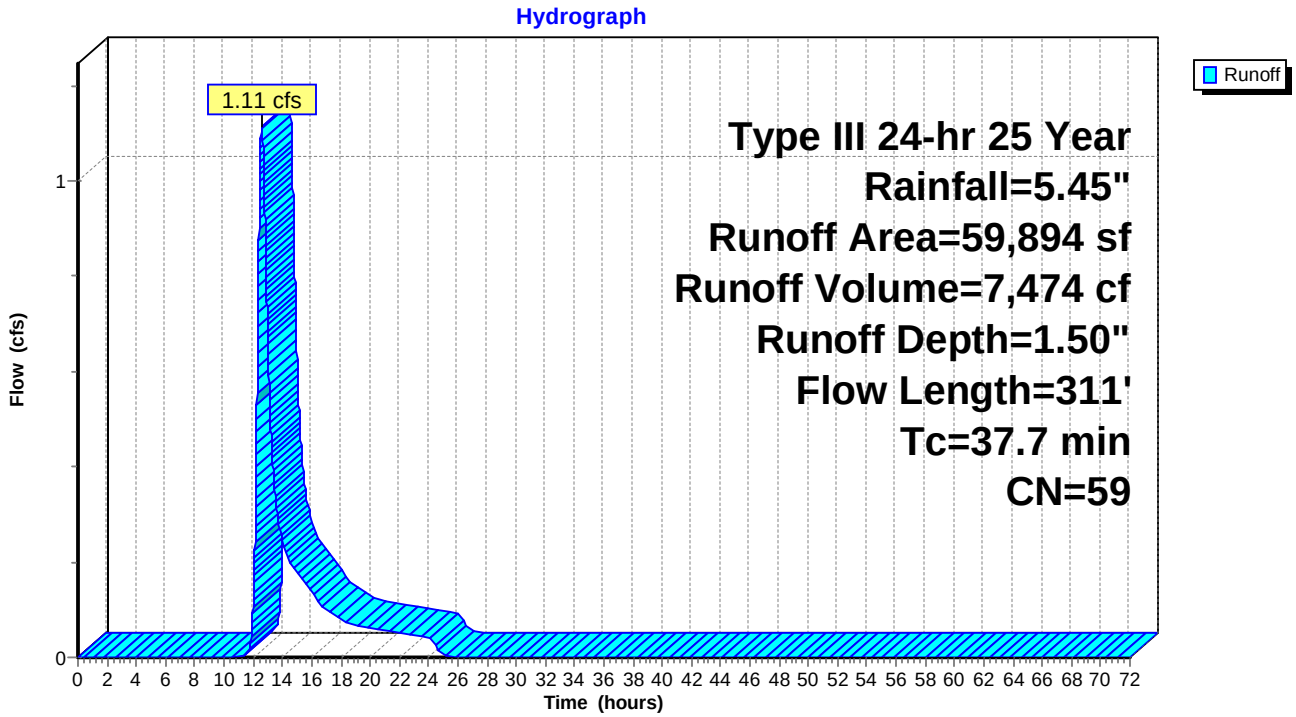
Runoff = 1.11 cfs @ 12.58 hrs, Volume= 7,474 cf, Depth= 1.50"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 Year Rainfall=5.45"

Area (sf)	CN	Description
56,760	57	Woods/grass comb., Poor, HSG A
3,134	98	Paved parking, HSG A
59,894	59	Weighted Average
56,760		94.77% Pervious Area
3,134		5.23% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
28.6	100	0.0100	0.06		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
9.1	211	0.0060	0.39		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
37.7	311	Total			

Subcatchment 02S: Chrysler Road



Summary for Subcatchment 03S: DNR-1

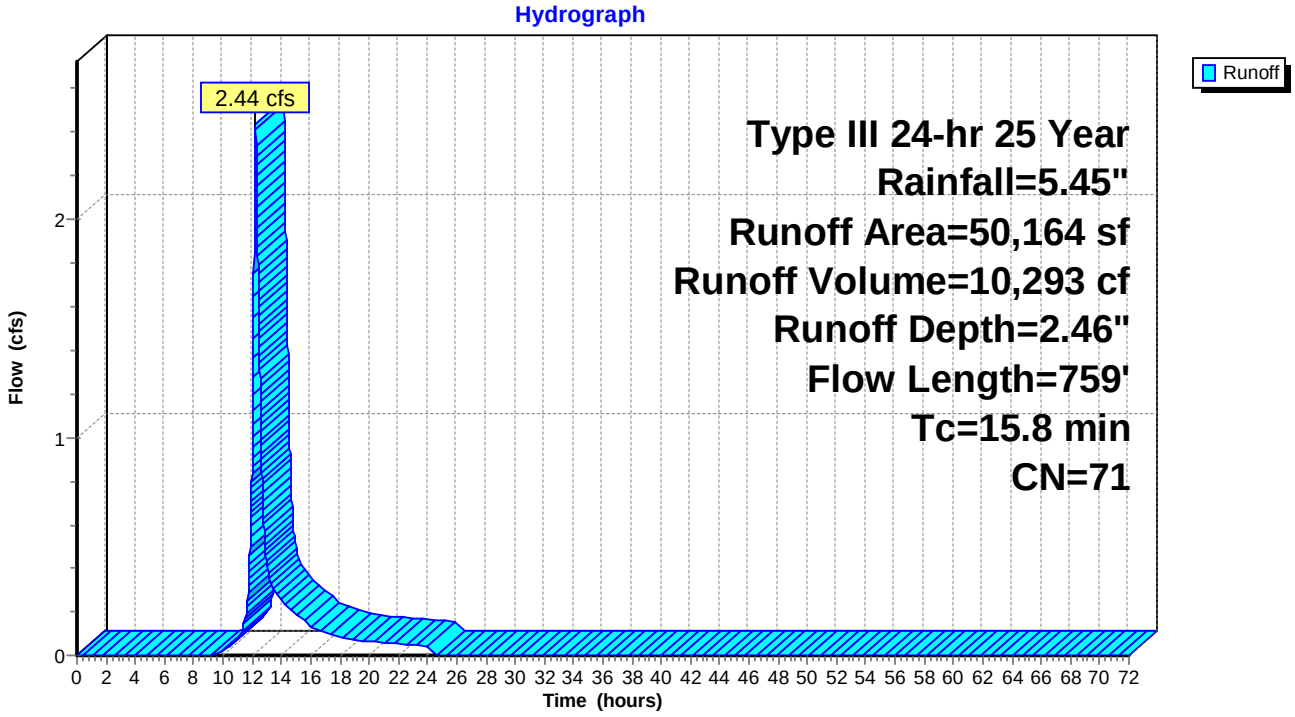
Runoff = 2.44 cfs @ 12.22 hrs, Volume= 10,293 cf, Depth= 2.46"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 Year Rainfall=5.45"

	Area (sf)	CN	Description
	33,195	57	Woods/grass comb., Poor, HSG A
*	16,969	98	Bike Trail, HSG A
	50,164	71	Weighted Average
	33,195		66.17% Pervious Area
	16,969		33.83% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0	100	0.3330	0.24		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
8.8	659	0.0069	1.25		**Shallow Concentrated Flow, Grass Channel** Grassed Waterway Kv= 15.0 fps
15.8	759	Total			

Subcatchment 03S: DNR-1



Summary for Subcatchment 04S: DNR-2

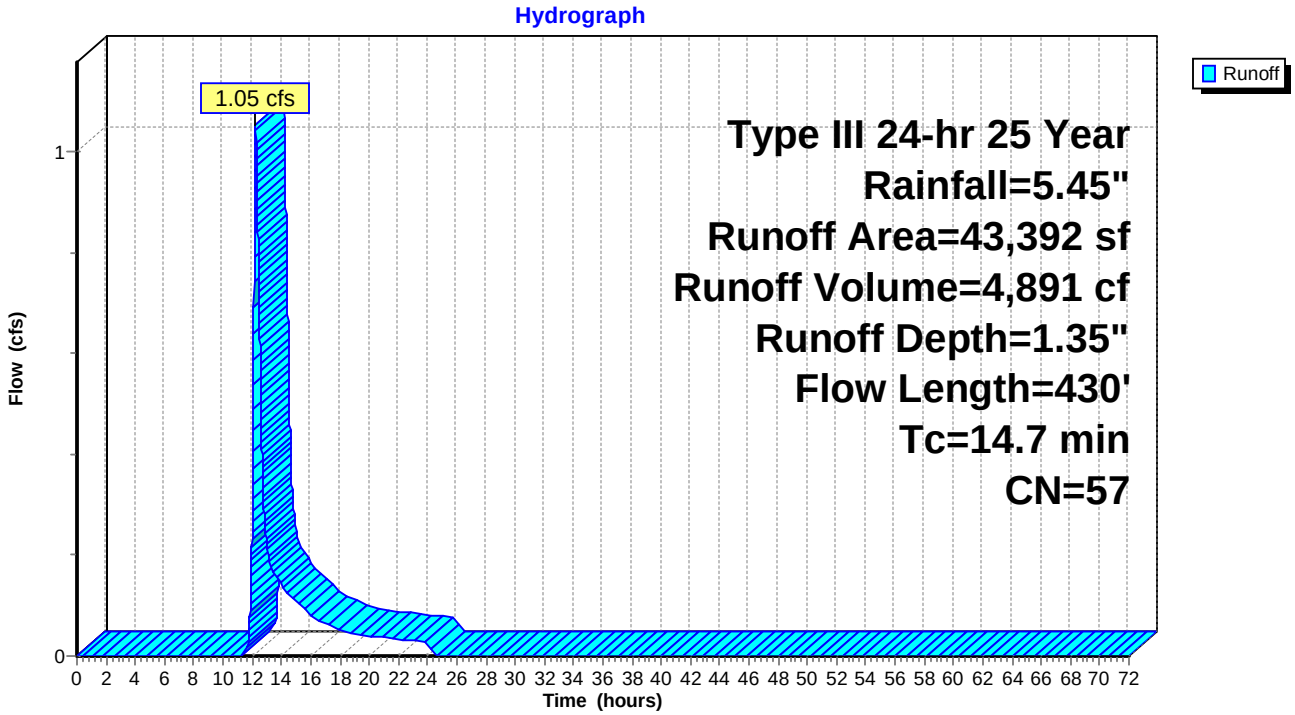
Runoff = 1.05 cfs @ 12.23 hrs, Volume= 4,891 cf, Depth= 1.35"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 Year Rainfall=5.45"

Area (sf)	CN	Description
43,392	57	Woods/grass comb., Poor, HSG A
43,392		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.4	100	0.1000	0.15		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
3.3	330	0.1090	1.65		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
14.7	430	Total			

Subcatchment 04S: DNR-2



Summary for Subcatchment 05S: Speen Street

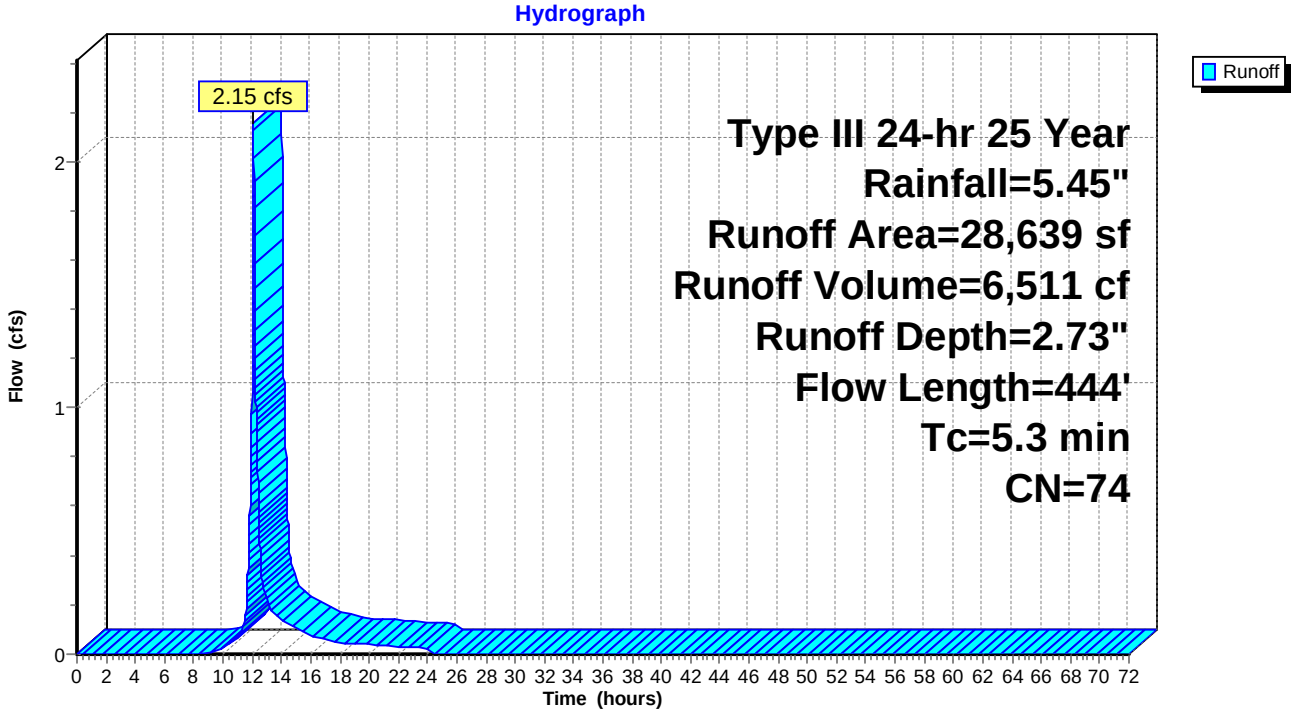
Runoff = 2.15 cfs @ 12.08 hrs, Volume= 6,511 cf, Depth= 2.73"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 Year Rainfall=5.45"

	Area (sf)	CN	Description
	8,689	57	Woods/grass comb., Poor, HSG A
*	6,838	98	Bike Path, HSG A
	1,783	98	Paved roads w/curbs & sewers, HSG A
	11,329	68	<50% Grass cover, Poor, HSG A
	28,639	74	Weighted Average
	20,018		69.90% Pervious Area
	8,621		30.10% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	22	0.1400	0.27		**Sheet Flow, Grass** Grass: Short n= 0.150 P2= 3.15"
3.9	422	0.0148	1.82		**Shallow Concentrated Flow, Grassed Channel** Grassed Waterway Kv= 15.0 fps
5.3	444	Total			

Subcatchment 05S: Speen Street



Summary for Subcatchment 06S: Lake Cochituate N1-1

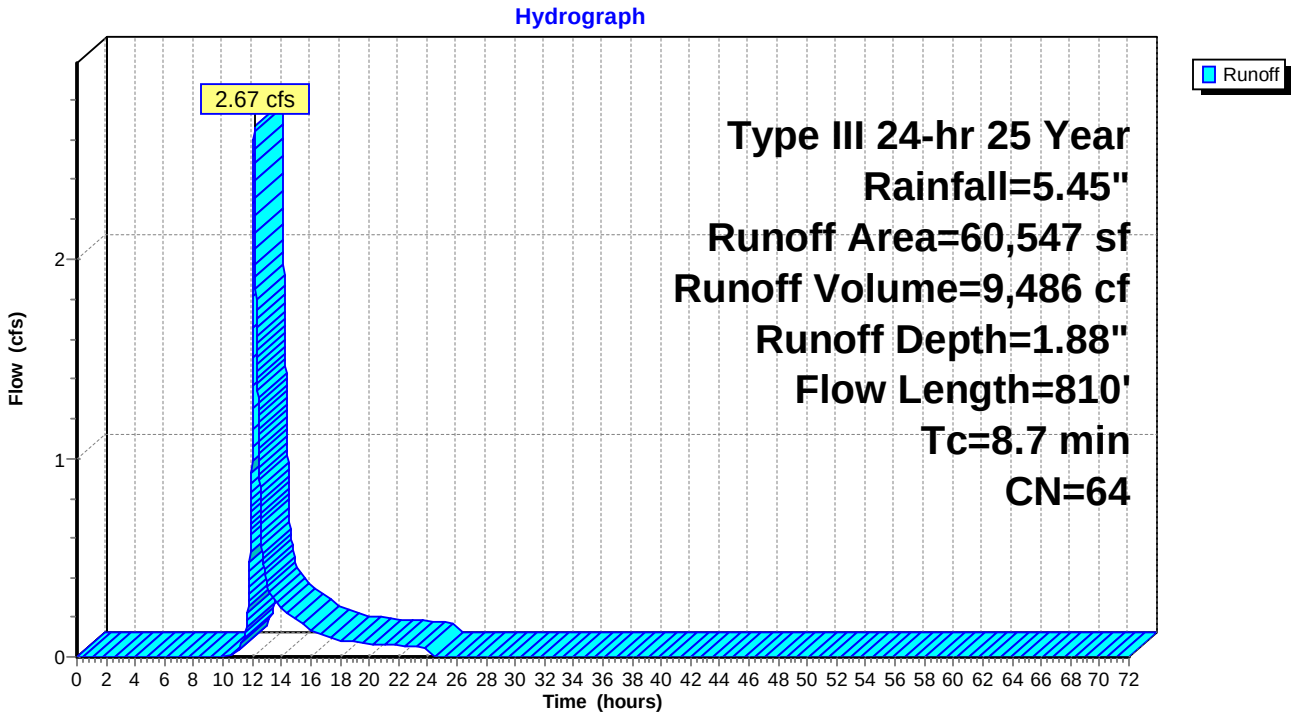
Runoff = 2.67 cfs @ 12.13 hrs, Volume= 9,486 cf, Depth= 1.88"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 Year Rainfall=5.45"

	Area (sf)	CN	Description
	49,662	57	Woods/grass comb., Poor, HSG A
*	10,885	98	Bike Path, HSG A
	60,547	64	Weighted Average
	49,662		82.02% Pervious Area
	10,885		17.98% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.7	33	0.4091	0.21		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
6.0	777	0.0103	2.16	0.81	**Trap/Vee/Rect Channel Flow, Grassed Channel** Bot.W=1.00' D=0.25' Z= 2.0 '/' Top.W=2.00' n= 0.022 Earth, clean & straight
8.7	810	Total			

Subcatchment 06S: Lake Cochituate N1-1



Summary for Subcatchment 07S: Lake Cochituate N1-2

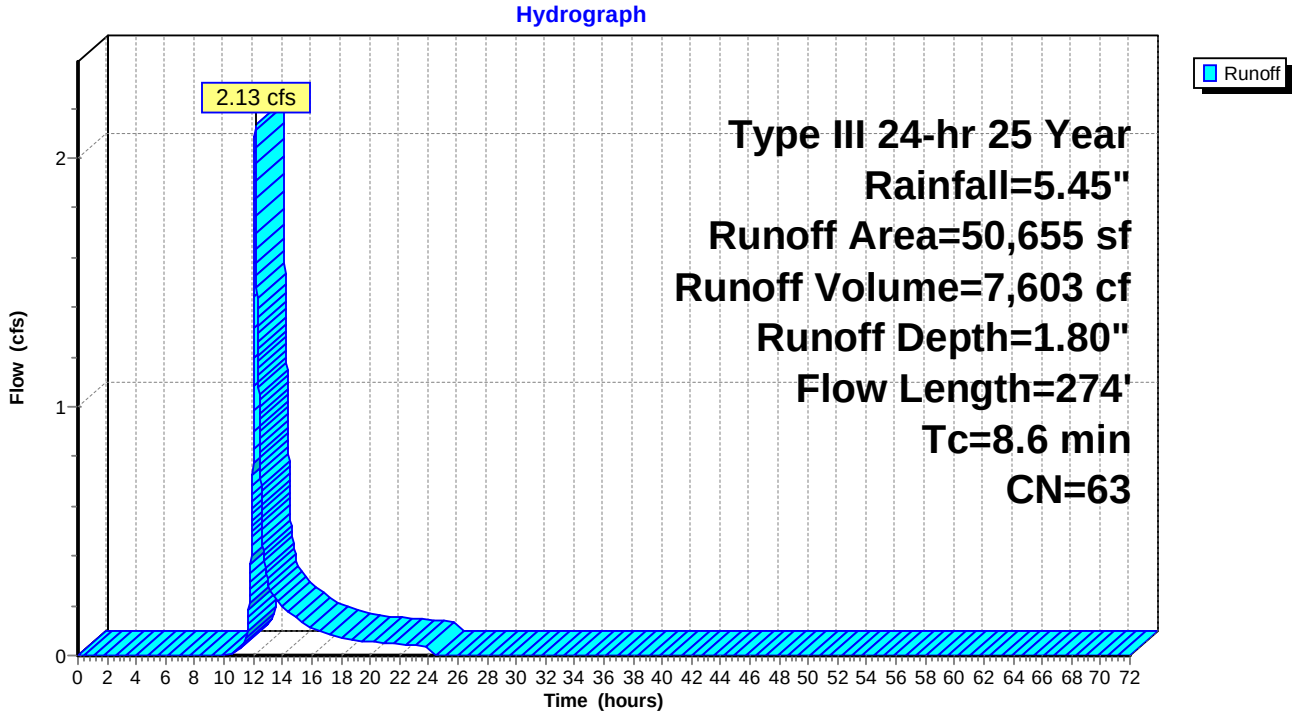
Runoff = 2.13 cfs @ 12.13 hrs, Volume= 7,603 cf, Depth= 1.80"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 Year Rainfall=5.45"

	Area (sf)	CN	Description
	43,526	57	Woods/grass comb., Poor, HSG A
*	7,129	98	Bike Path, HSG A
	50,655	63	Weighted Average
	43,526		85.93% Pervious Area
	7,129		14.07% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.7	27	0.0667	0.10		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
0.3	12	0.0150	0.80		**Sheet Flow, Bike Path** Smooth surfaces n= 0.011 P2= 3.15"
3.2	176	0.0050	0.91	0.11	**Trap/Vee/Rect Channel Flow, Grassed Channel** Bot.W=1.00' D=0.10' Z= 2.0 '/' Top.W=1.40' n= 0.022 Earth, clean & straight
0.4	59	0.2210	2.35		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
8.6	274	Total			

Subcatchment 07S: Lake Cochituate N1-2



Summary for Subcatchment 08S: Lake Cochituate N2-1

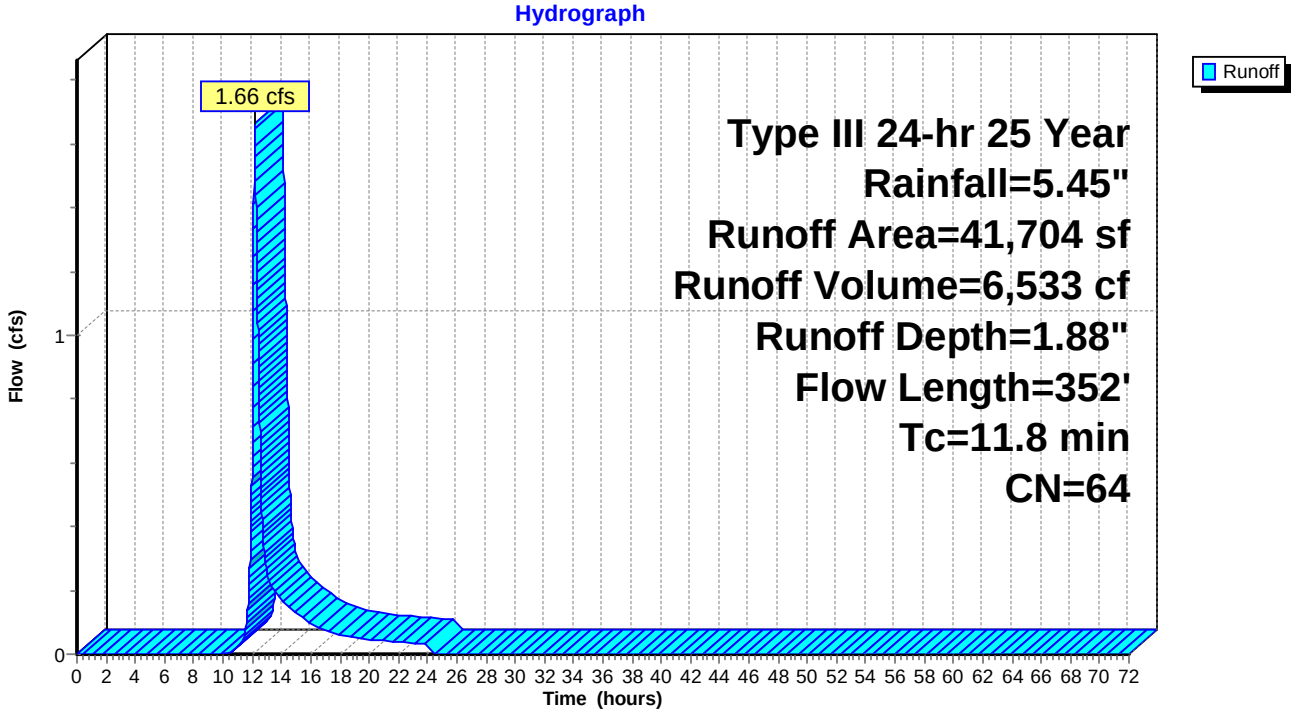
Runoff = 1.66 cfs @ 12.17 hrs, Volume= 6,533 cf, Depth= 1.88"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 Year Rainfall=5.45"

	Area (sf)	CN	Description
	34,512	57	Woods/grass comb., Poor, HSG A
*	7,192	98	Bike Path, HSG A
	41,704	64	Weighted Average
	34,512		82.75% Pervious Area
	7,192		17.25% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.6	76	0.1580	0.17		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
0.1	12	0.0150	2.49		**Shallow Concentrated Flow, Pavement** Paved Kv= 20.3 fps
4.1	264	0.0050	1.06		**Shallow Concentrated Flow, Grassed Channel** Grassed Waterway Kv= 15.0 fps
11.8	352	Total			

Subcatchment 08S: Lake Cochituate N2-1



Summary for Subcatchment 10S: Lake Cochituate N3-1

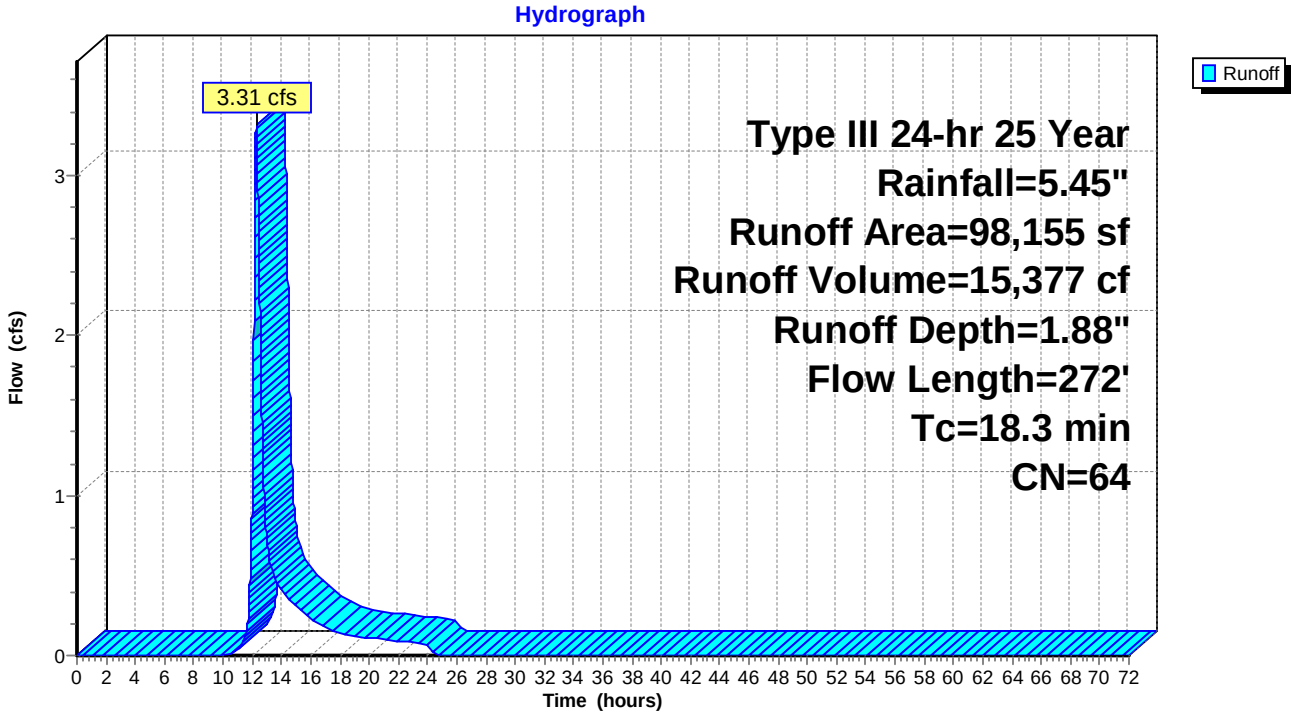
Runoff = 3.31 cfs @ 12.26 hrs, Volume= 15,377 cf, Depth= 1.88"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 Year Rainfall=5.45"

	Area (sf)	CN	Description
	82,552	57	Woods/grass comb., Poor, HSG A
	9,674	98	Paved parking, HSG A
*	5,929	98	Bike Path, HSG A
	98,155	64	Weighted Average
	82,552		84.10% Pervious Area
	15,603		15.90% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0	100	0.0500	0.11		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
3.1	140	0.0228	0.75		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
0.1	20	0.3200	2.83		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
0.1	12	0.0150	2.49		**Shallow Concentrated Flow, Pavement** Paved Kv= 20.3 fps
18.3	272	Total			

Subcatchment 10S: Lake Cochituate N3-1



Summary for Subcatchment 11S: Lake Cochituate N3-2

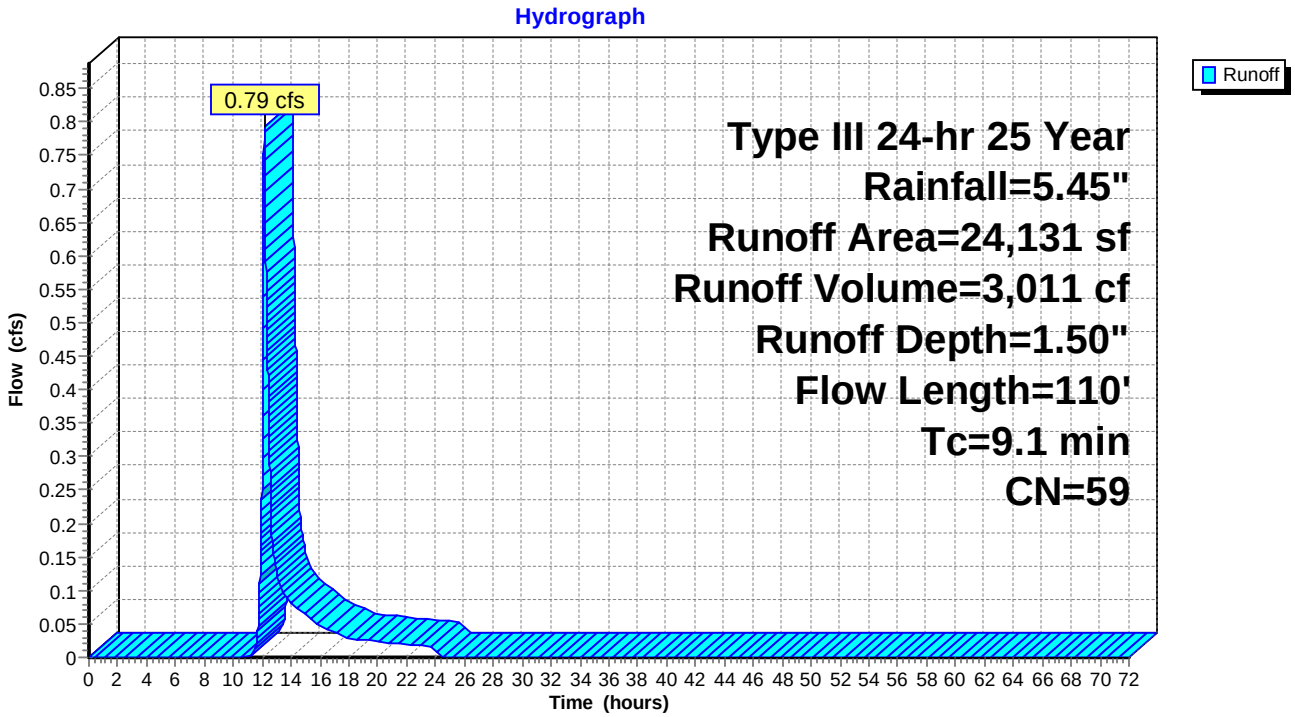
Runoff = 0.79 cfs @ 12.14 hrs, Volume= 3,011 cf, Depth= 1.50"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 Year Rainfall=5.45"

Area (sf)	CN	Description
23,045	57	Woods/grass comb., Poor, HSG A
1,086	98	Paved parking, HSG A
24,131	59	Weighted Average
23,045		95.50% Pervious Area
1,086		4.50% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.0	100	0.1780	0.18		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
0.1	10	0.1000	1.58		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
9.1	110	Total			

Subcatchment 11S: Lake Cochituate N3-2



Summary for Subcatchment 12S: Lake Cochituate E1

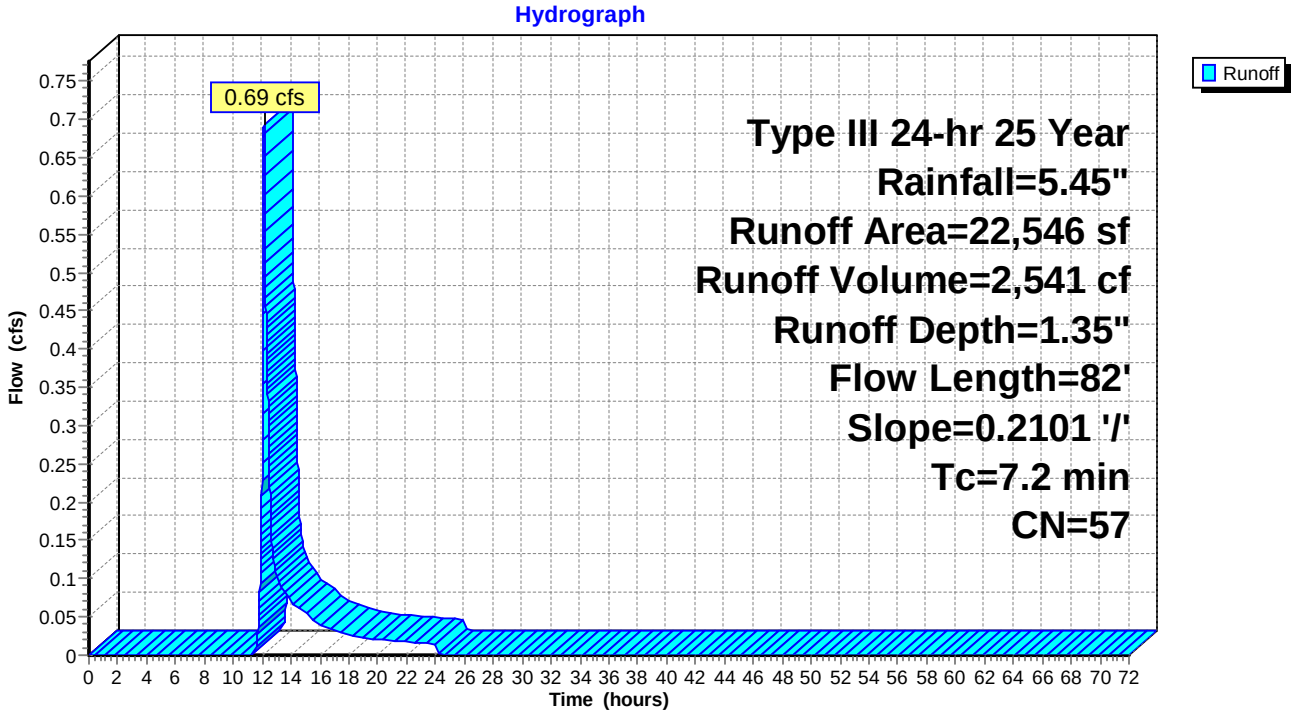
Runoff = 0.69 cfs @ 12.12 hrs, Volume= 2,541 cf, Depth= 1.35"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 Year Rainfall=5.45"

Area (sf)	CN	Description
22,546	57	Woods/grass comb., Poor, HSG A
22,546		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.2	82	0.2101	0.19		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"

Subcatchment 12S: Lake Cochituate E1



Summary for Subcatchment 13S: Lake Cochituate E2

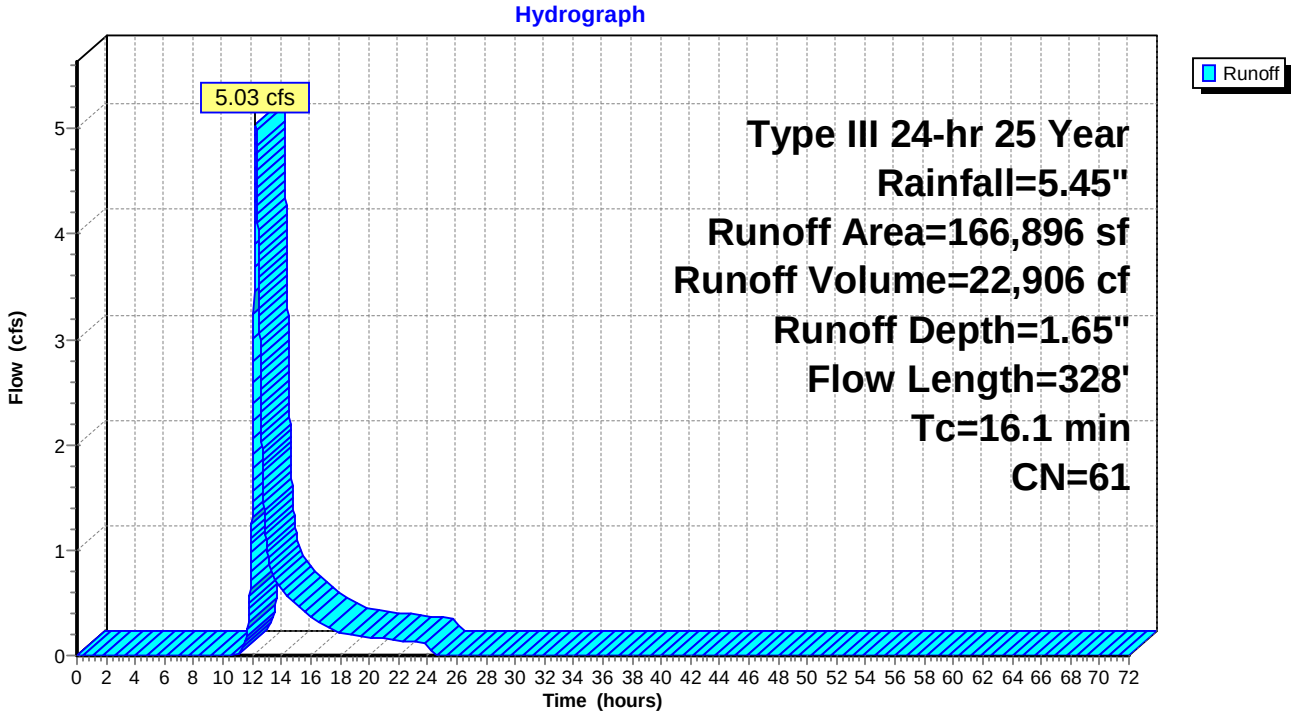
Runoff = 5.03 cfs @ 12.24 hrs, Volume= 22,906 cf, Depth= 1.65"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 Year Rainfall=5.45"

	Area (sf)	CN	Description
	151,423	57	Woods/grass comb., Poor, HSG A
	13,352	98	Paved parking, HSG A
*	2,121	98	Bike Path, HSG A
	166,896	61	Weighted Average
	151,423		90.73% Pervious Area
	15,473		9.27% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.1	100	0.0700	0.13		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
2.0	125	0.0456	1.07		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
0.1	13	0.0192	2.81		**Shallow Concentrated Flow, Road** Paved Kv= 20.3 fps
0.9	90	0.1080	1.64		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
16.1	328	Total			

Subcatchment 13S: Lake Cochituate E2



Summary for Subcatchment 14S: Lake Cochituate W1-1

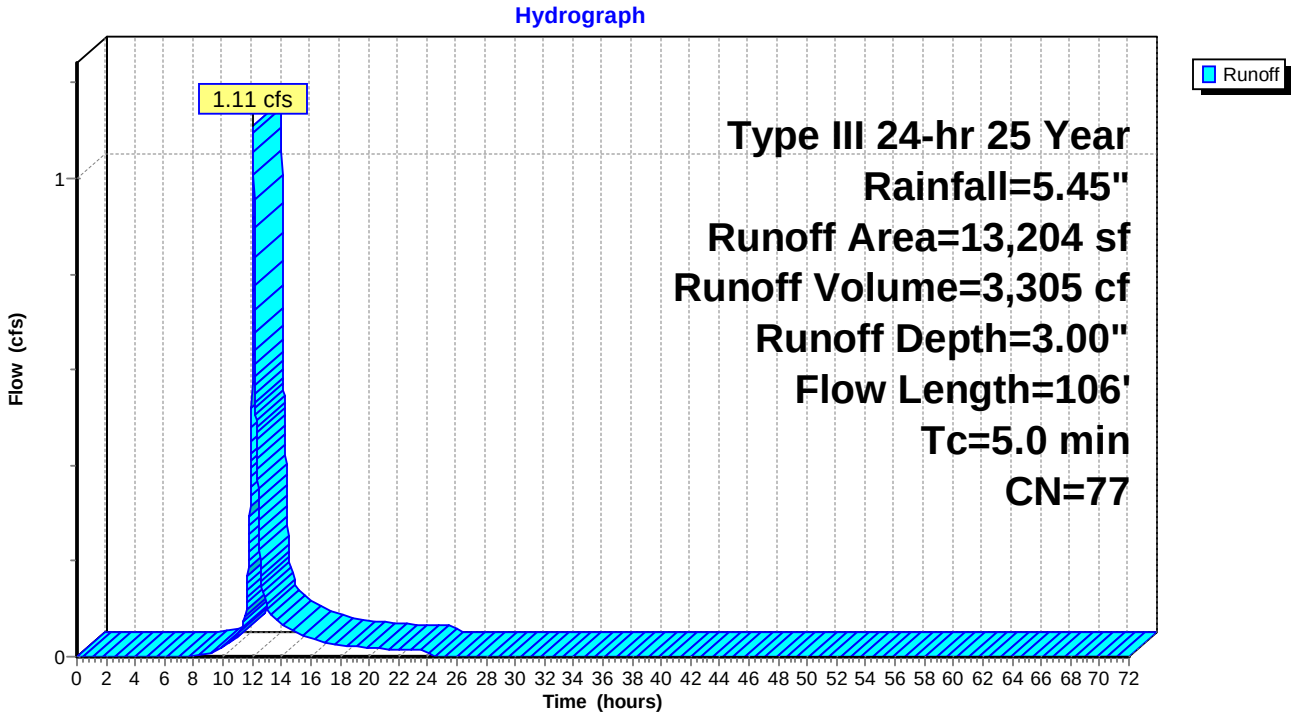
Runoff = 1.11 cfs @ 12.07 hrs, Volume= 3,305 cf, Depth= 3.00"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 Year Rainfall=5.45"

	Area (sf)	CN	Description
	6,894	57	Woods/grass comb., Poor, HSG A
*	3,476	98	Bike Path, HSG A
	2,834	98	Paved parking, HSG A
	13,204	77	Weighted Average
	6,894		52.21% Pervious Area
	6,310		47.79% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.9	15	0.2000	0.13		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
0.3	12	0.0150	0.80		**Sheet Flow, Bike Path** Smooth surfaces n= 0.011 P2= 3.15"
1.2	79	0.0050	1.06		**Shallow Concentrated Flow, Grass Channel** Grassed Waterway Kv= 15.0 fps
3.4	106	Total, Increased to minimum Tc = 5.0 min			

Subcatchment 14S: Lake Cochituate W1-1



Summary for Subcatchment 15S: Lake Cochituate W1-2

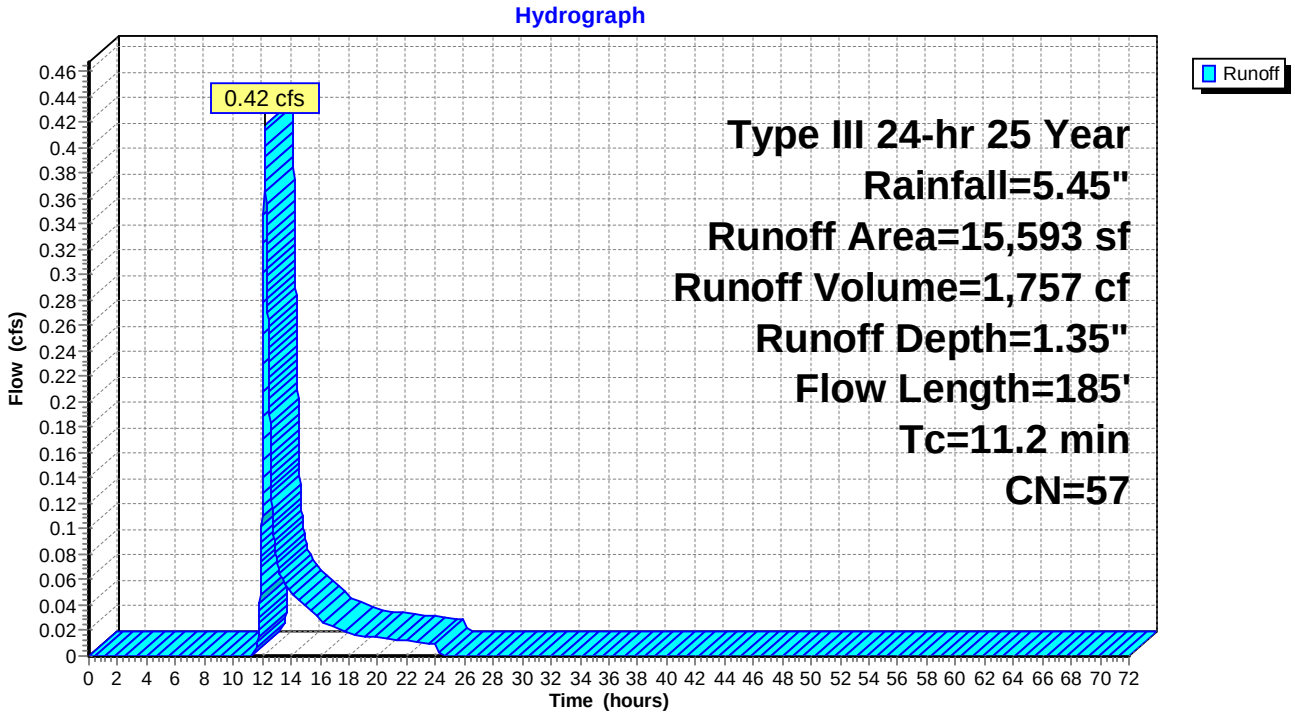
Runoff = 0.42 cfs @ 12.18 hrs, Volume= 1,757 cf, Depth= 1.35"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 Year Rainfall=5.45"

Area (sf)	CN	Description
15,593	57	Woods/grass comb., Poor, HSG A
15,593		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	100	0.1200	0.16		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
0.6	85	0.2100	2.29		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
11.2	185	Total			

Subcatchment 15S: Lake Cochituate W1-2



Summary for Subcatchment 16S: Lake Cochituate N4

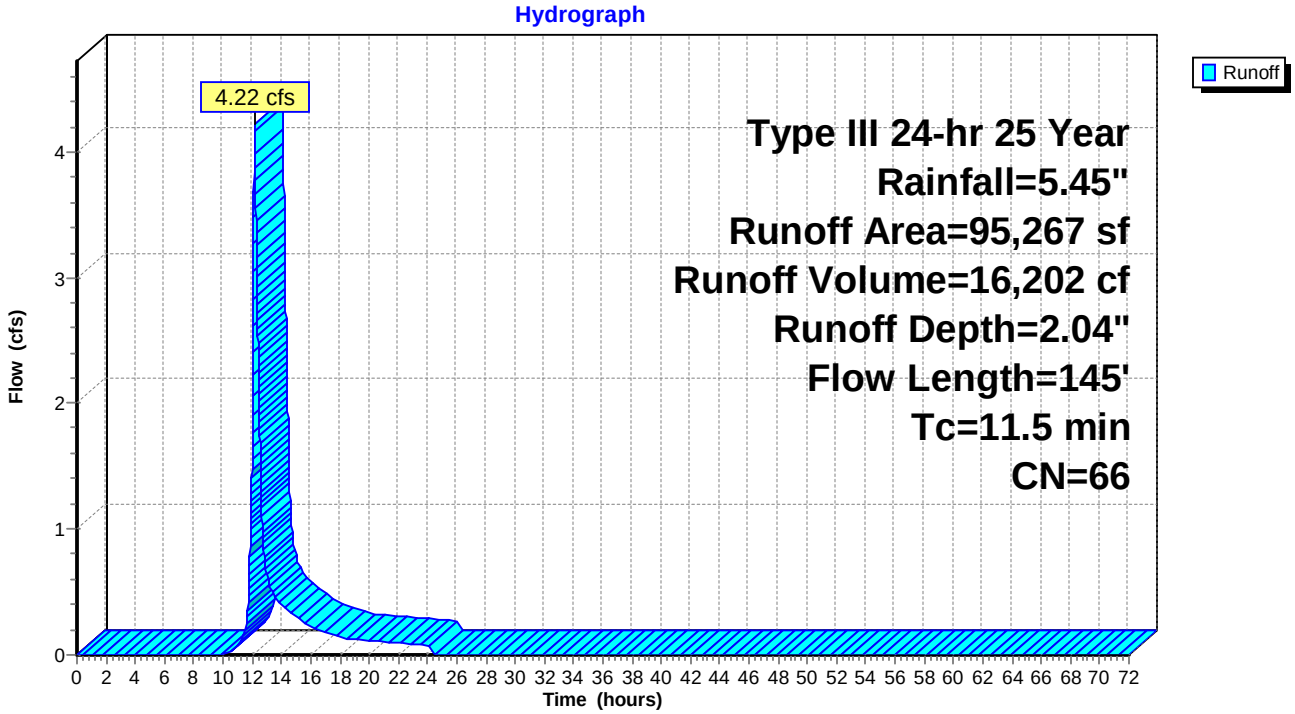
Runoff = 4.22 cfs @ 12.17 hrs, Volume= 16,202 cf, Depth= 2.04"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 Year Rainfall=5.45"

	Area (sf)	CN	Description
	73,296	57	Woods/grass comb., Poor, HSG A
	17,258	98	Paved parking, HSG A
*	4,713	98	Bike Path, HSG A
	95,267	66	Weighted Average
	73,296		76.94% Pervious Area
	21,971		23.06% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.9	100	0.1100	0.15		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
0.6	45	0.0578	1.20		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
11.5	145	Total			

Subcatchment 16S: Lake Cochituate N4



Summary for Subcatchment 17S: Lake Cochituate W2-1

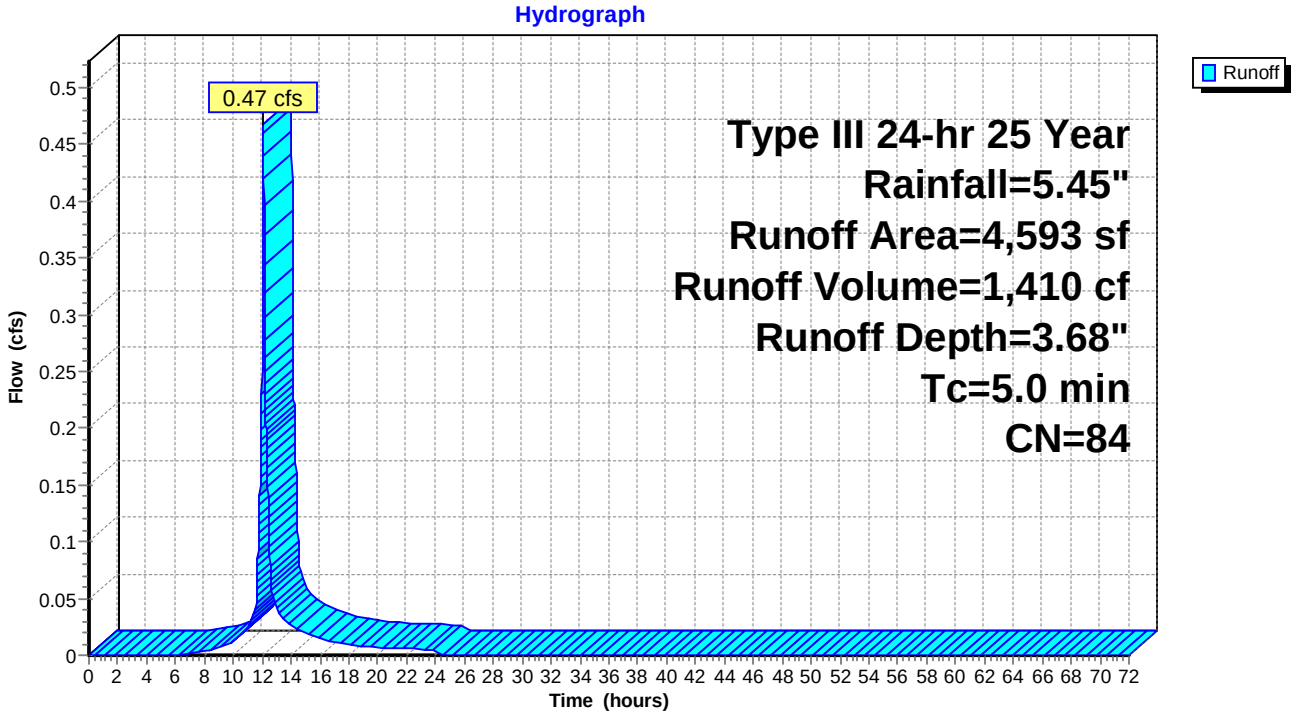
Runoff = 0.47 cfs @ 12.07 hrs, Volume= 1,410 cf, Depth= 3.68"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 Year Rainfall=5.45"

	Area (sf)	CN	Description
	1,590	57	Woods/grass comb., Poor, HSG A
*	3,003	98	Bike Path, HSG A
	4,593	84	Weighted Average
	1,590		34.62% Pervious Area
	3,003		65.38% Impervious Area

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

Subcatchment 17S: Lake Cochituate W2-1



Summary for Subcatchment 18S: Lake Cochituate W2-2

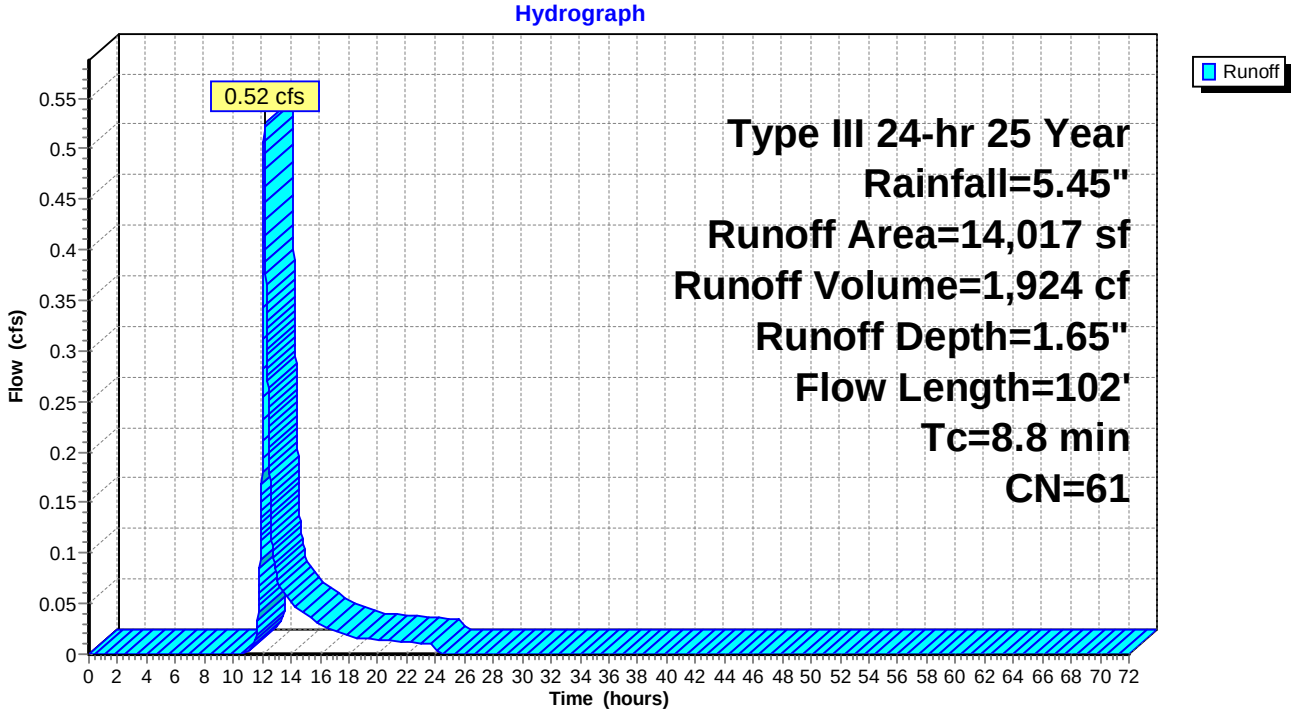
Runoff = 0.52 cfs @ 12.13 hrs, Volume= 1,924 cf, Depth= 1.65"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 Year Rainfall=5.45"

	Area (sf)	CN	Description
	12,683	57	Woods/grass comb., Poor, HSG A
*	1,334	98	Bike Path, HSG A
	14,017	61	Weighted Average
	12,683		90.48% Pervious Area
	1,334		9.52% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	24	0.0150	0.91		**Sheet Flow, Pavement** Smooth surfaces n= 0.011 P2= 3.15"
1.8	22	0.5200	0.21		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
6.6	56	0.1200	0.14		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
8.8	102	Total			

Subcatchment 18S: Lake Cochituate W2-2



Summary for Subcatchment 19S: Lake Cochituate W3-1

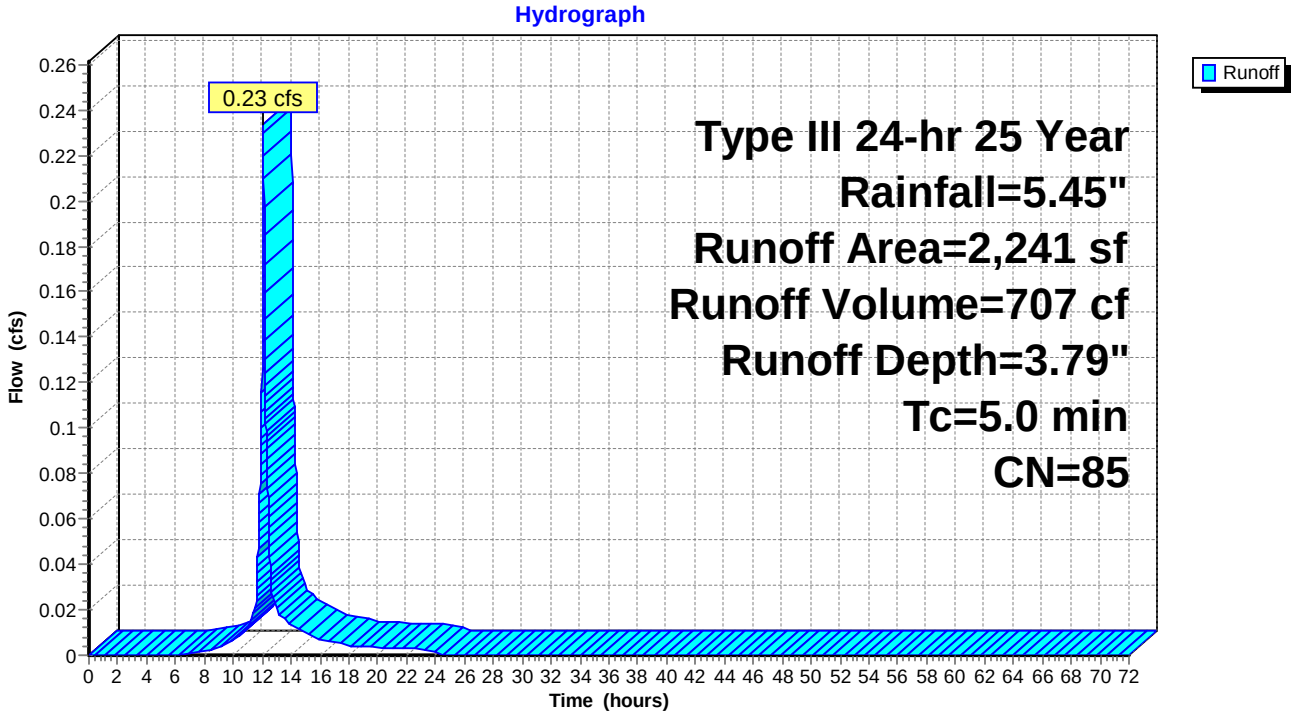
Runoff = 0.23 cfs @ 12.07 hrs, Volume= 707 cf, Depth= 3.79"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 Year Rainfall=5.45"

	Area (sf)	CN	Description
	728	57	Woods/grass comb., Poor, HSG A
*	1,513	98	Bike Path, HSG A
	2,241	85	Weighted Average
	728		32.49% Pervious Area
	1,513		67.51% Impervious Area

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

Subcatchment 19S: Lake Cochituate W3-1



Summary for Subcatchment 20S: Lake Cochituate W3-2

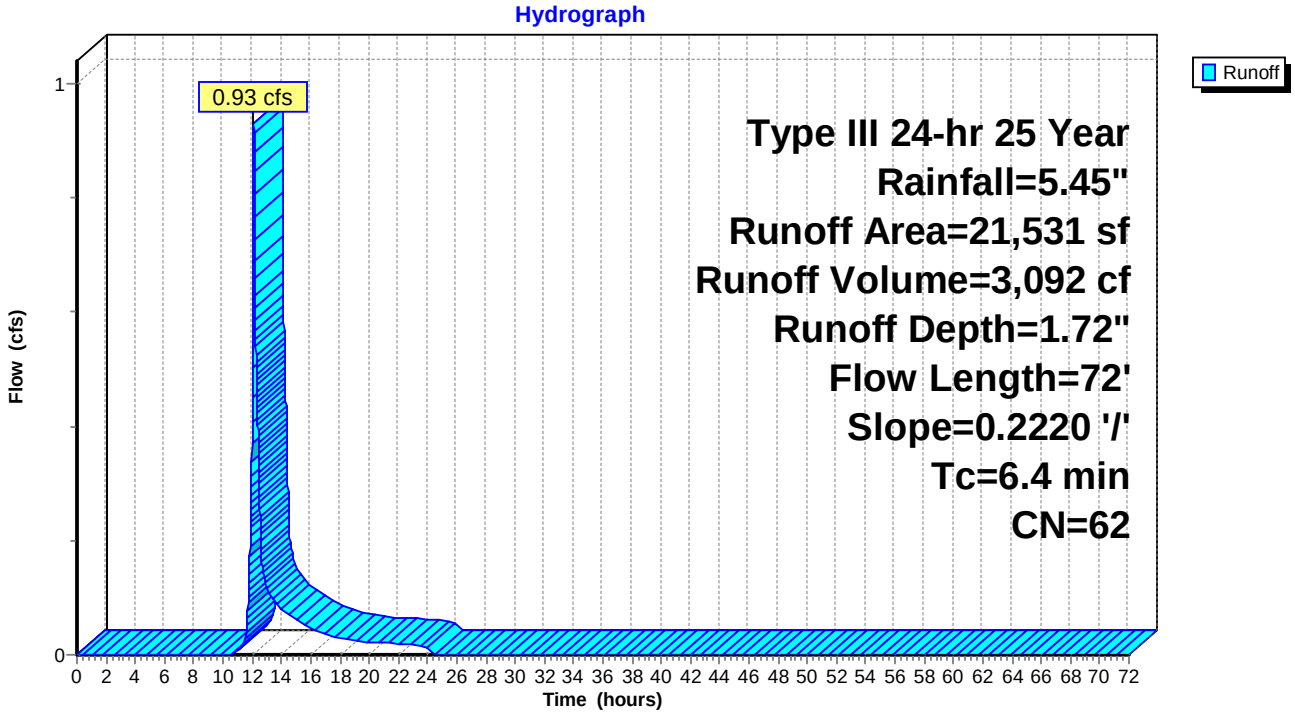
Runoff = 0.93 cfs @ 12.10 hrs, Volume= 3,092 cf, Depth= 1.72"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 Year Rainfall=5.45"

	Area (sf)	CN	Description
	19,031	57	Woods/grass comb., Poor, HSG A
*	2,500	98	Bike Path, HSG A
	21,531	62	Weighted Average
	19,031		88.39% Pervious Area
	2,500		11.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.4	72	0.2220	0.19		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"

Subcatchment 20S: Lake Cochituate W3-2



Summary for Subcatchment 21S: Lake Cochituate W4-1

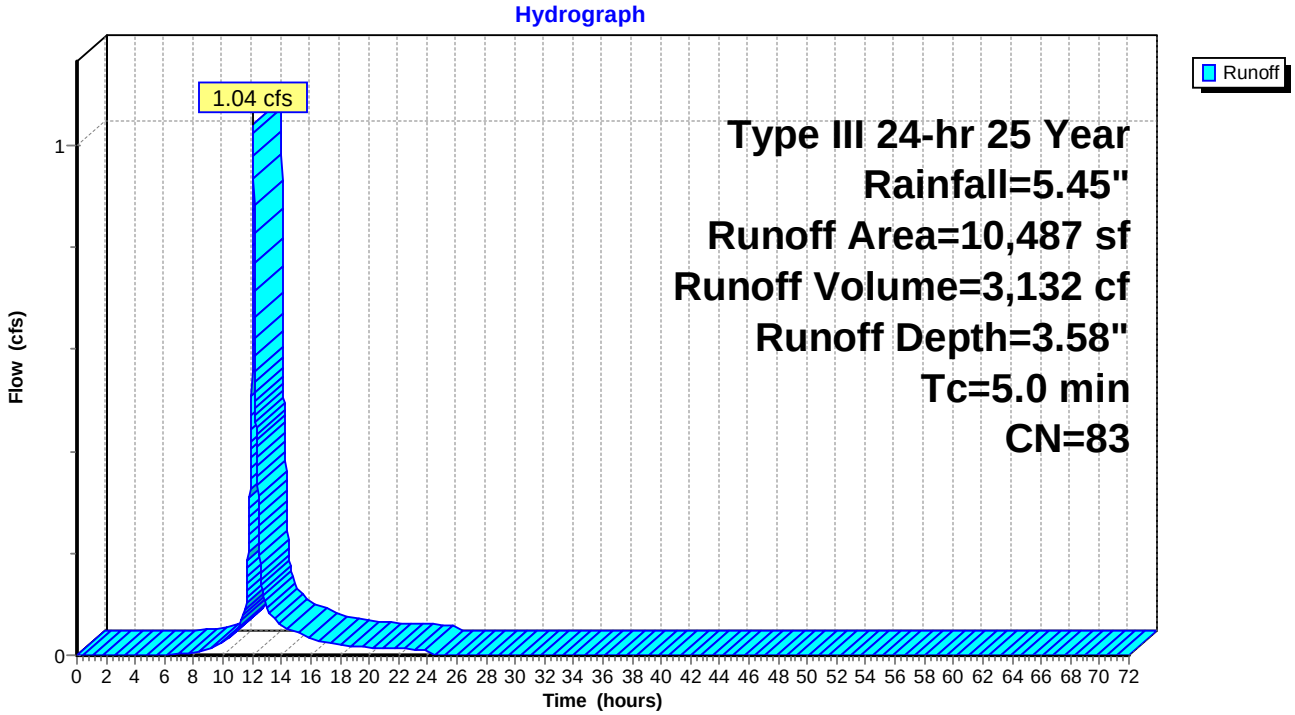
Runoff = 1.04 cfs @ 12.07 hrs, Volume= 3,132 cf, Depth= 3.58"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 Year Rainfall=5.45"

	Area (sf)	CN	Description
*	6,523	98	Bike Path, HSG A
	3,964	57	Woods/grass comb., Poor, HSG A
	10,487	83	Weighted Average
	3,964		37.80% Pervious Area
	6,523		62.20% Impervious Area

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

Subcatchment 21S: Lake Cochituate W4-1



Summary for Subcatchment 22S: Lake Cochituate W4-2

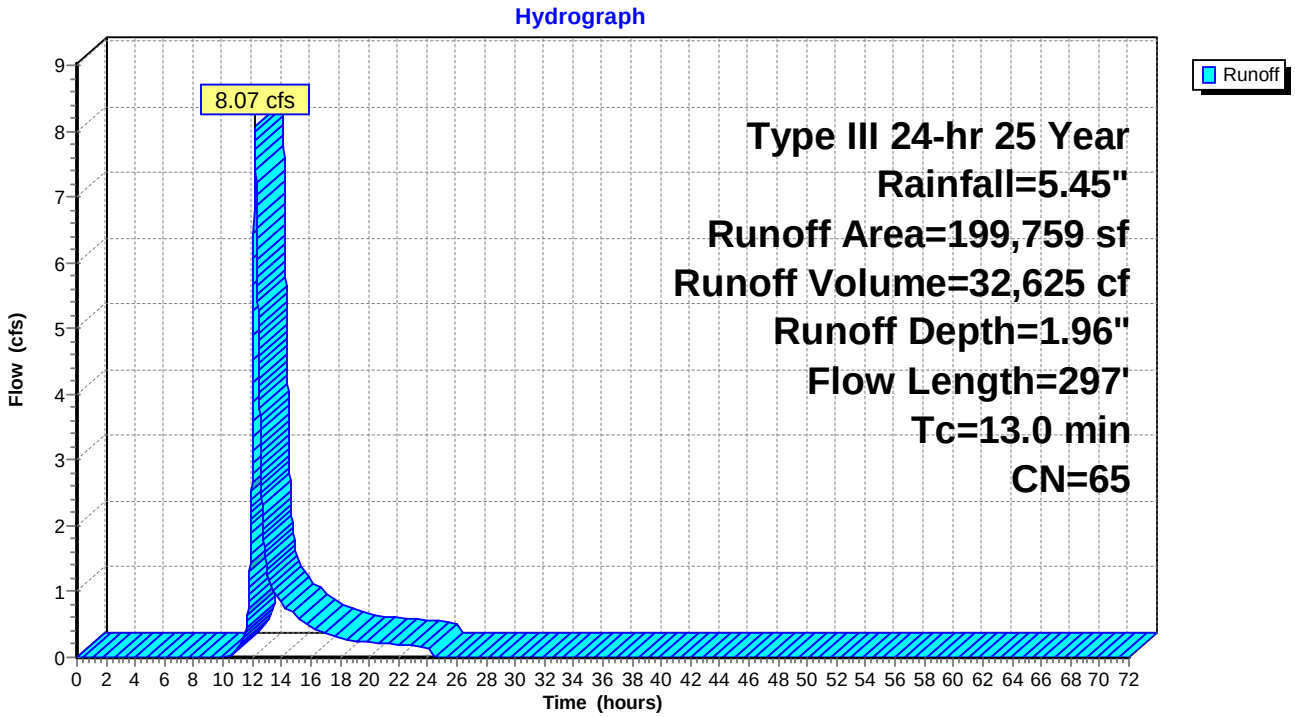
Runoff = 8.07 cfs @ 12.19 hrs, Volume= 32,625 cf, Depth= 1.96"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 Year Rainfall=5.45"

	Area (sf)	CN	Description
	160,339	57	Woods/grass comb., Poor, HSG A
*	39,420	98	Paved parking, HSG A
	199,759	65	Weighted Average
	160,339		80.27% Pervious Area
	39,420		19.73% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.8	100	0.1444	0.17		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
3.2	197	0.0431	1.04		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
13.0	297	Total			

Subcatchment 22S: Lake Cochituate W4-2



Summary for Subcatchment 23S: Worcester St N

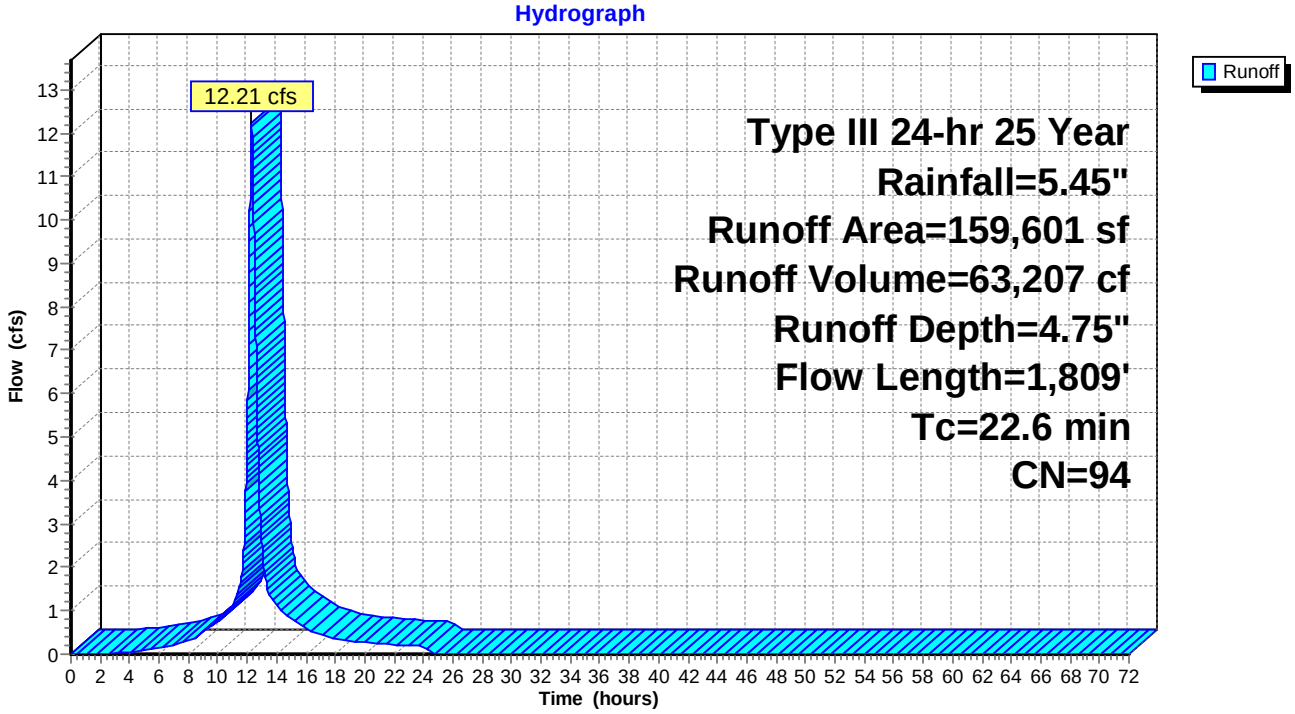
Runoff = 12.21 cfs @ 12.29 hrs, Volume= 63,207 cf, Depth= 4.75"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 Year Rainfall=5.45"

	Area (sf)	CN	Description
	68,655	89	Urban commercial, 85% imp, HSG A
*	1,908	98	Bike Path, HSG A
	88,153	98	Paved roads w/curbs & sewers, HSG A
	885	57	Woods/grass comb., Poor, HSG A
	159,601	94	Weighted Average
	11,183		7.01% Pervious Area
	148,418		92.99% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.0	100	0.0100	0.13		**Sheet Flow, Yards** Grass: Short n= 0.150 P2= 3.15"
9.6	1,709	0.0214	2.97		**Shallow Concentrated Flow, Road** Paved Kv= 20.3 fps
22.6	1,809	Total			

Subcatchment 23S: Worcester St N



Summary for Subcatchment 24S: Worcester St S

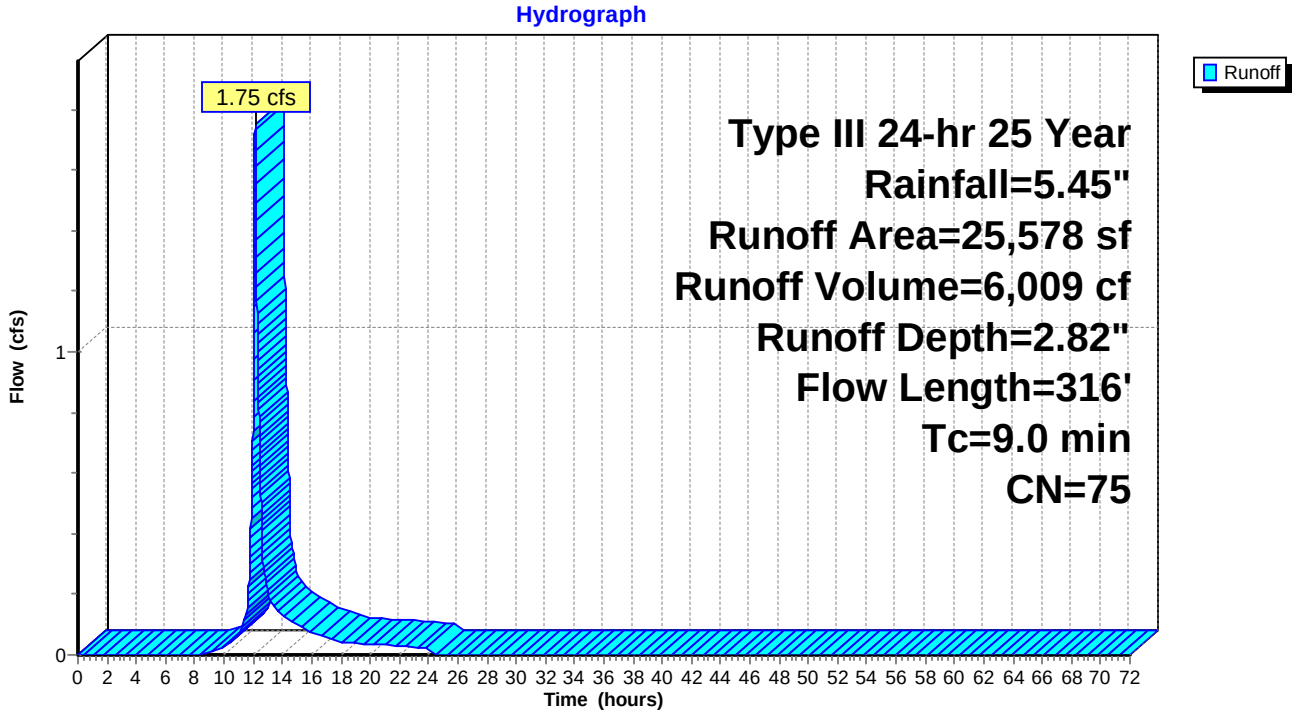
Runoff = 1.75 cfs @ 12.13 hrs, Volume= 6,009 cf, Depth= 2.82"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 Year Rainfall=5.45"

	Area (sf)	CN	Description
	14,547	57	Woods/grass comb., Poor, HSG A
	10,499	98	Paved parking, HSG A
*	532	98	Bike Path, HSG A
	25,578	75	Weighted Average
	14,547		56.87% Pervious Area
	11,031		43.13% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.3	90	0.2444	0.21		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
1.7	226	0.0115	2.18		**Shallow Concentrated Flow, Road** Paved Kv= 20.3 fps
9.0	316	Total			

Subcatchment 24S: Worcester St S



Summary for Subcatchment 25S: Arcadi Rd-1

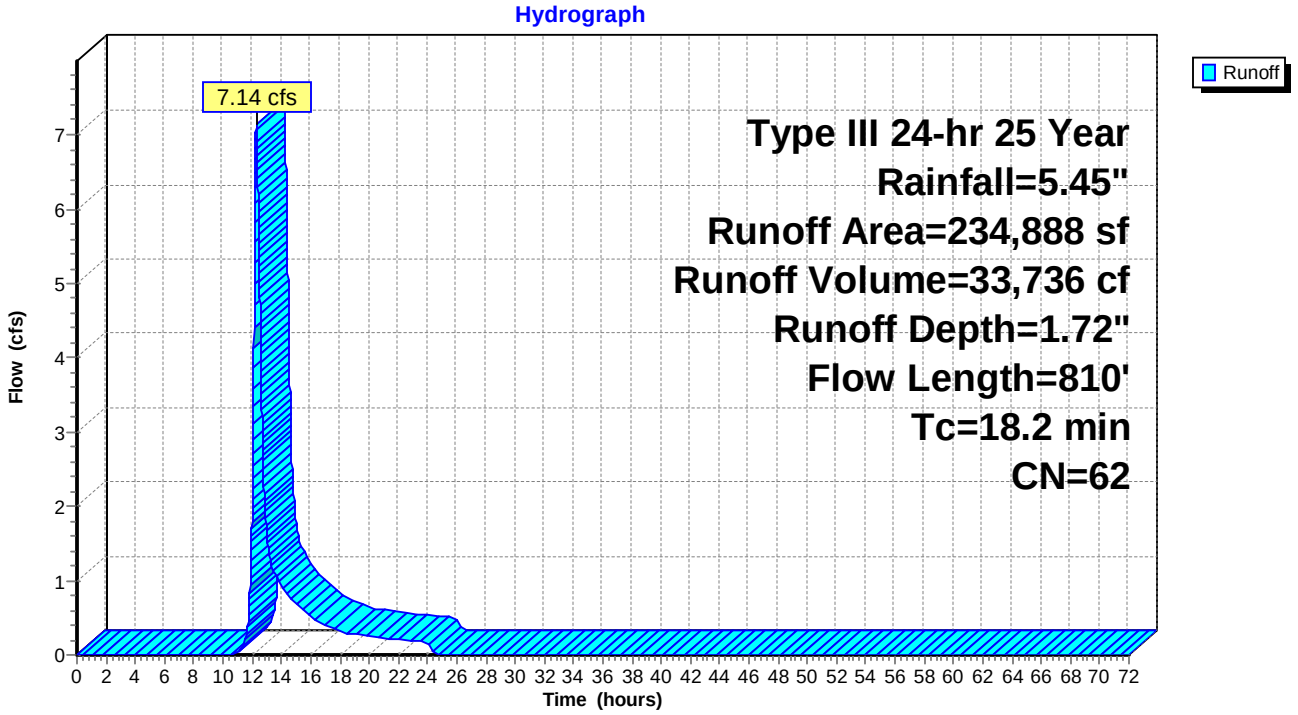
Runoff = 7.14 cfs @ 12.27 hrs, Volume= 33,736 cf, Depth= 1.72"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 Year Rainfall=5.45"

	Area (sf)	CN	Description
	82,419	61	1/4 acre lots, 38% imp, HSG A
	1,306	98	Paved parking, HSG A
	1,798	76	Gravel roads, HSG A
*	20,606	98	Bike Path, HSG A
	128,759	57	Woods/grass comb., Poor, HSG A
	234,888	62	Weighted Average
	181,657		77.34% Pervious Area
	53,231		22.66% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.6	100	0.0550	0.25		**Sheet Flow, Yards** Grass: Short n= 0.150 P2= 3.15"
0.5	30	0.0250	1.11		**Shallow Concentrated Flow, Yards** Short Grass Pasture Kv= 7.0 fps
0.2	38	0.4079	3.19		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
0.2	35	0.0150	2.49		**Shallow Concentrated Flow, Bike Path** Paved Kv= 20.3 fps
10.7	607	0.0040	0.95		**Shallow Concentrated Flow, Grass Channel** Grassed Waterway Kv= 15.0 fps
18.2	810	Total			

Subcatchment 25S: Arcadi Rd-1



Summary for Subcatchment 26S: Arcadi Rd-2

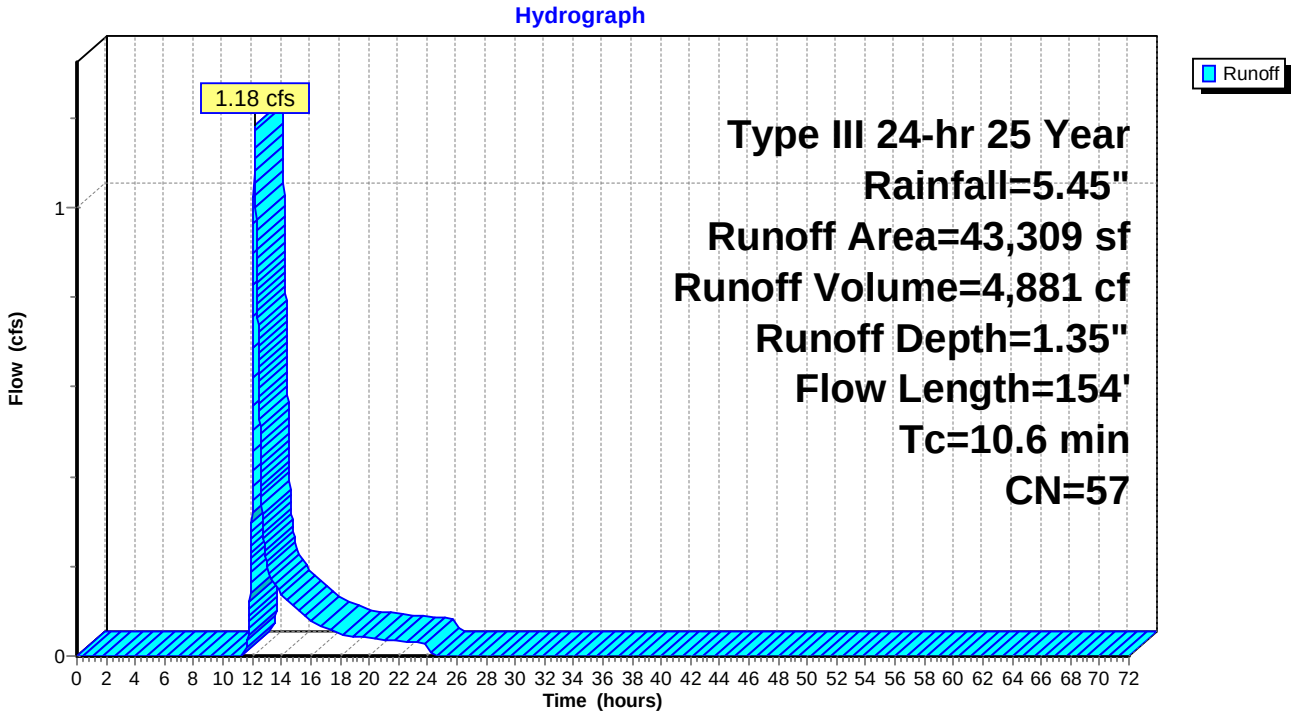
Runoff = 1.18 cfs @ 12.17 hrs, Volume= 4,881 cf, Depth= 1.35"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 Year Rainfall=5.45"

Area (sf)	CN	Description
43,309	57	Woods/grass comb., Poor, HSG A
43,309		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.3	100	0.1290	0.16		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
0.3	54	0.3148	2.81		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
10.6	154	Total			

Subcatchment 26S: Arcadi Rd-2



Summary for Subcatchment 27S: Fisher St-1

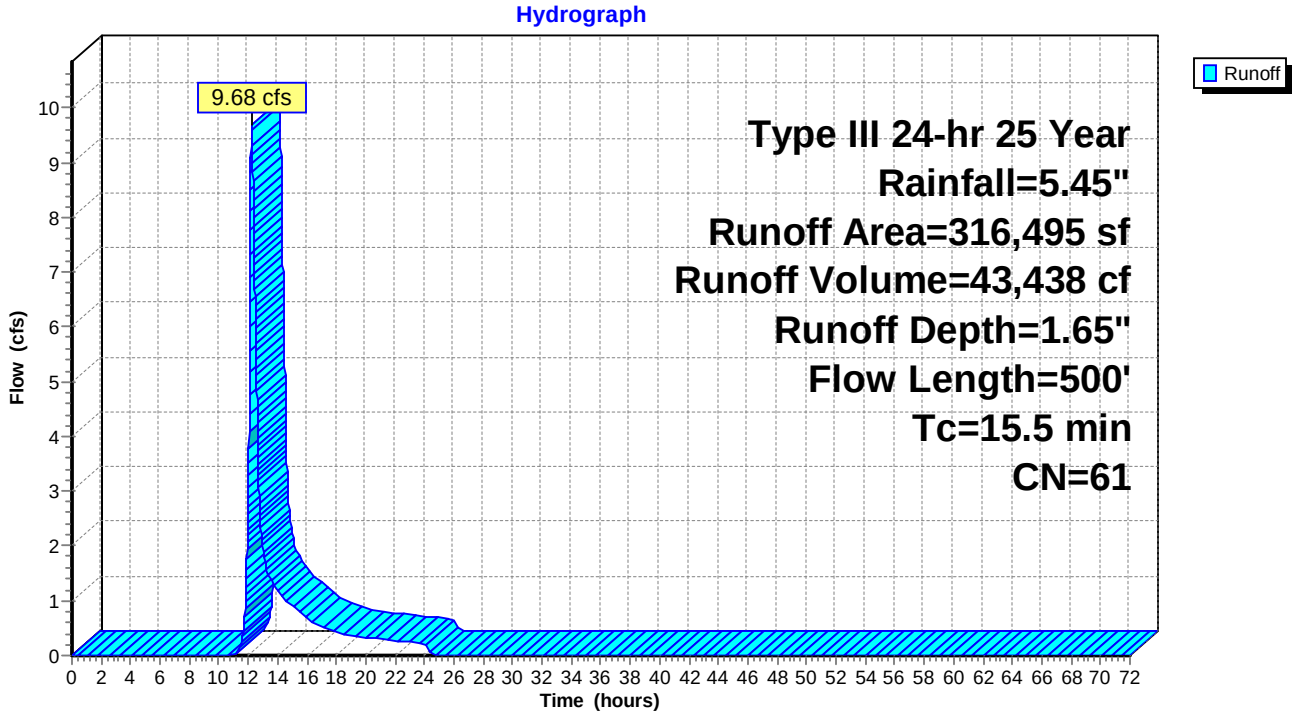
Runoff = 9.68 cfs @ 12.23 hrs, Volume= 43,438 cf, Depth= 1.65"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 Year Rainfall=5.45"

	Area (sf)	CN	Description
	190,932	61	1/4 acre lots, 38% imp, HSG A
*	14,693	98	Bike Path, HSG A
	110,870	57	Woods/grass comb., Poor, HSG A
	316,495	61	Weighted Average
	229,248		72.43% Pervious Area
	87,247		27.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.4	100	0.0175	0.16		**Sheet Flow, Yards** Grass: Short n= 0.150 P2= 3.15"
2.1	191	0.0477	1.53		**Shallow Concentrated Flow, Yards** Short Grass Pasture Kv= 7.0 fps
2.9	191	0.0477	1.09		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
0.1	18	0.0150	2.49		**Shallow Concentrated Flow, Pavement** Paved Kv= 20.3 fps
15.5	500	Total			

Subcatchment 27S: Fisher St-1



Summary for Subcatchment 28S: Fisher St-2

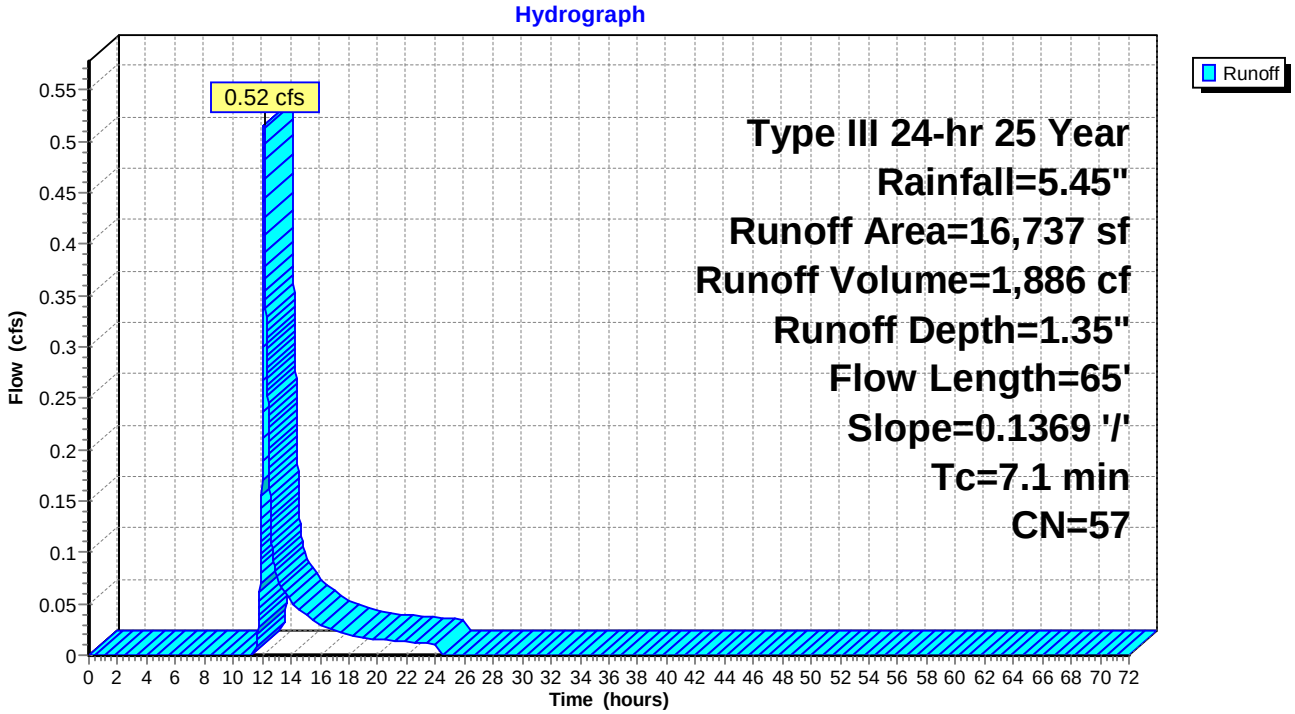
Runoff = 0.52 cfs @ 12.12 hrs, Volume= 1,886 cf, Depth= 1.35"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 Year Rainfall=5.45"

Area (sf)	CN	Description
16,737	57	Woods/grass comb., Poor, HSG A
16,737		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.1	65	0.1369	0.15		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"

Subcatchment 28S: Fisher St-2



Summary for Subcatchment 29S: Unnamed Pond 1-2

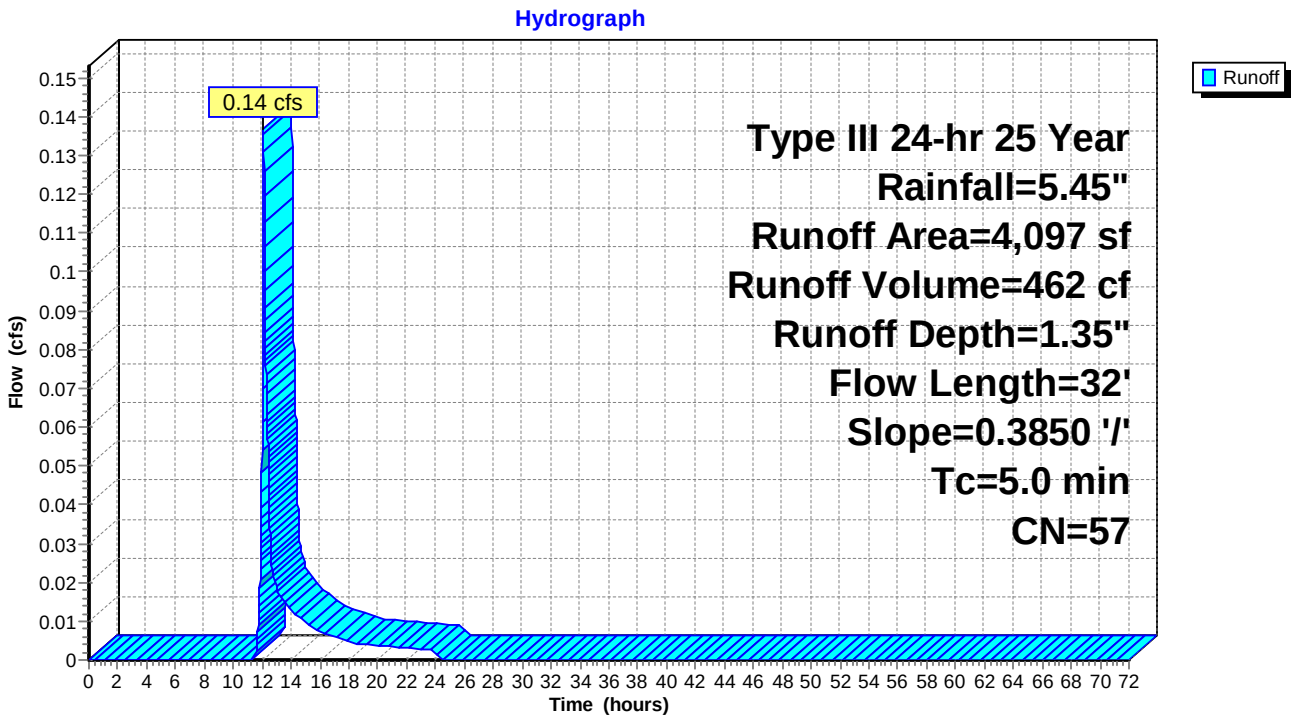
Runoff = 0.14 cfs @ 12.09 hrs, Volume= 462 cf, Depth= 1.35"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 Year Rainfall=5.45"

Area (sf)	CN	Description
4,097	57	Woods/grass comb., Poor, HSG A
4,097		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.7	32	0.3850	0.20		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
2.7	32	Total, Increased to minimum Tc = 5.0 min			

Subcatchment 29S: Unnamed Pond 1-2



Summary for Subcatchment 30S: Unnamed Pond 1-1

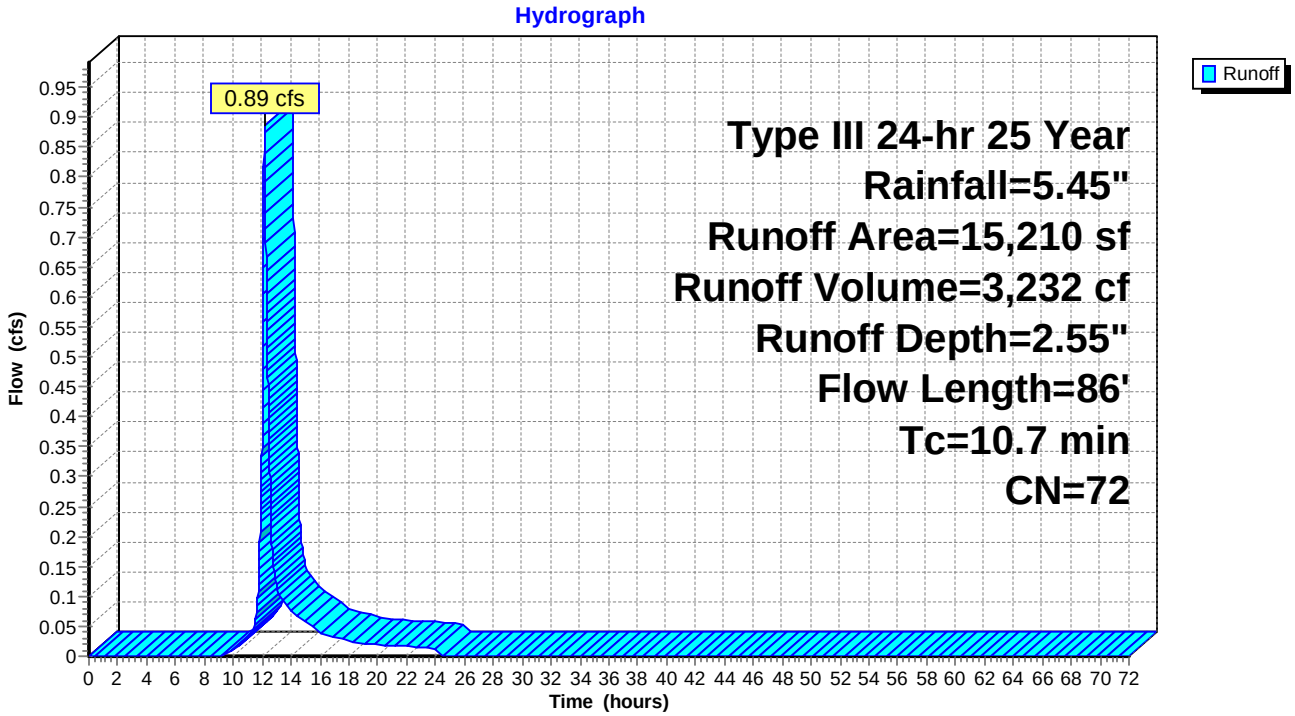
Runoff = 0.89 cfs @ 12.15 hrs, Volume= 3,232 cf, Depth= 2.55"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 Year Rainfall=5.45"

	Area (sf)	CN	Description
	1,843	61	1/4 acre lots, 38% imp, HSG A
*	4,035	98	Bike Path, HSG A
	8,142	57	Woods/grass comb., Poor, HSG A
*	1,190	98	Paved Parking, HSG A
	15,210	72	Weighted Average
	9,285		61.04% Pervious Area
	5,925		38.96% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	24	0.0154	0.92		**Sheet Flow, Driveway** Smooth surfaces n= 0.011 P2= 3.15"
1.9	16	0.0312	0.14		**Sheet Flow, Yards** Grass: Short n= 0.150 P2= 3.15"
8.4	46	0.0450	0.09		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
10.7	86	Total			

Subcatchment 30S: Unnamed Pond 1-1



Summary for Subcatchment 31S: Unnamed Pond 2

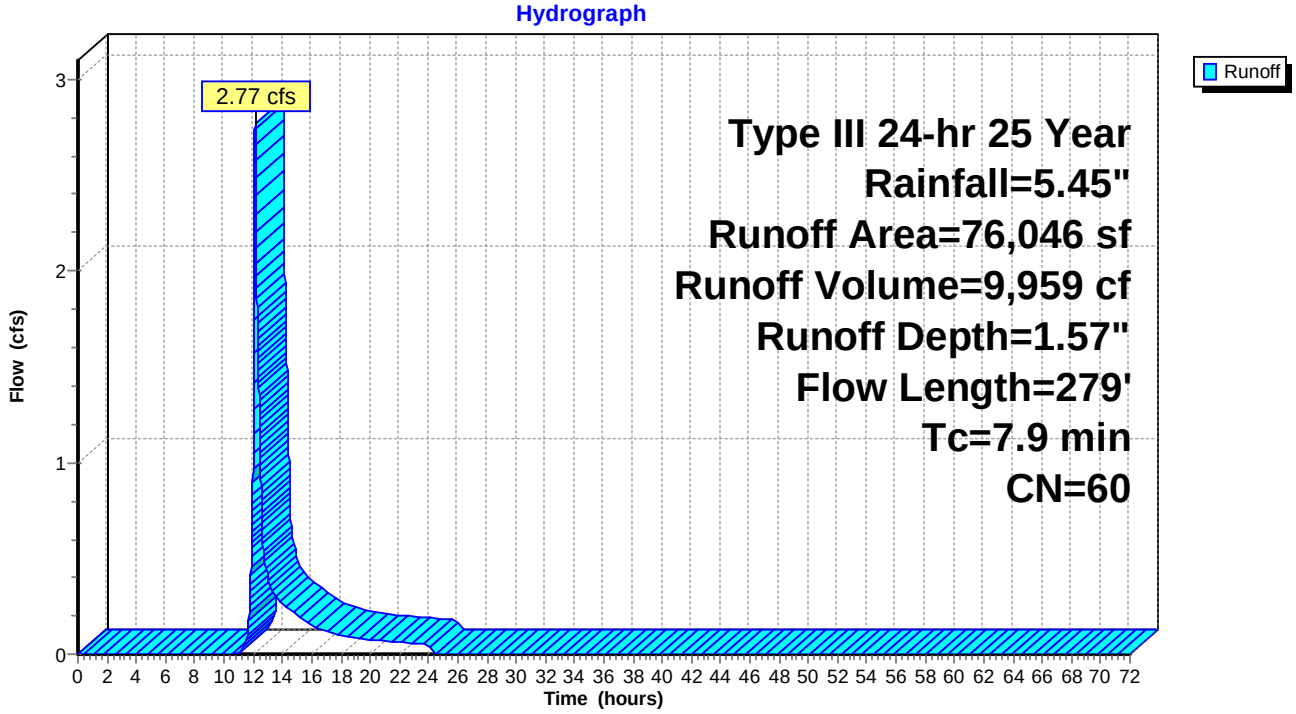
Runoff = 2.77 cfs @ 12.12 hrs, Volume= 9,959 cf, Depth= 1.57"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 Year Rainfall=5.45"

Area (sf)	CN	Description
50,917	61	1/4 acre lots, 38% imp, HSG A
25,129	57	Woods/grass comb., Poor, HSG A
76,046	60	Weighted Average
56,698		74.56% Pervious Area
19,348		25.44% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.7	100	0.0800	0.29		**Sheet Flow, Yards** Grass: Short n= 0.150 P2= 3.15"
1.3	105	0.0381	1.37		**Shallow Concentrated Flow, Yards** Short Grass Pasture Kv= 7.0 fps
0.9	74	0.0724	1.35		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
7.9	279	Total			

Subcatchment 31S: Unnamed Pond 2



Summary for Subcatchment 32S: Unnamed Pond 3

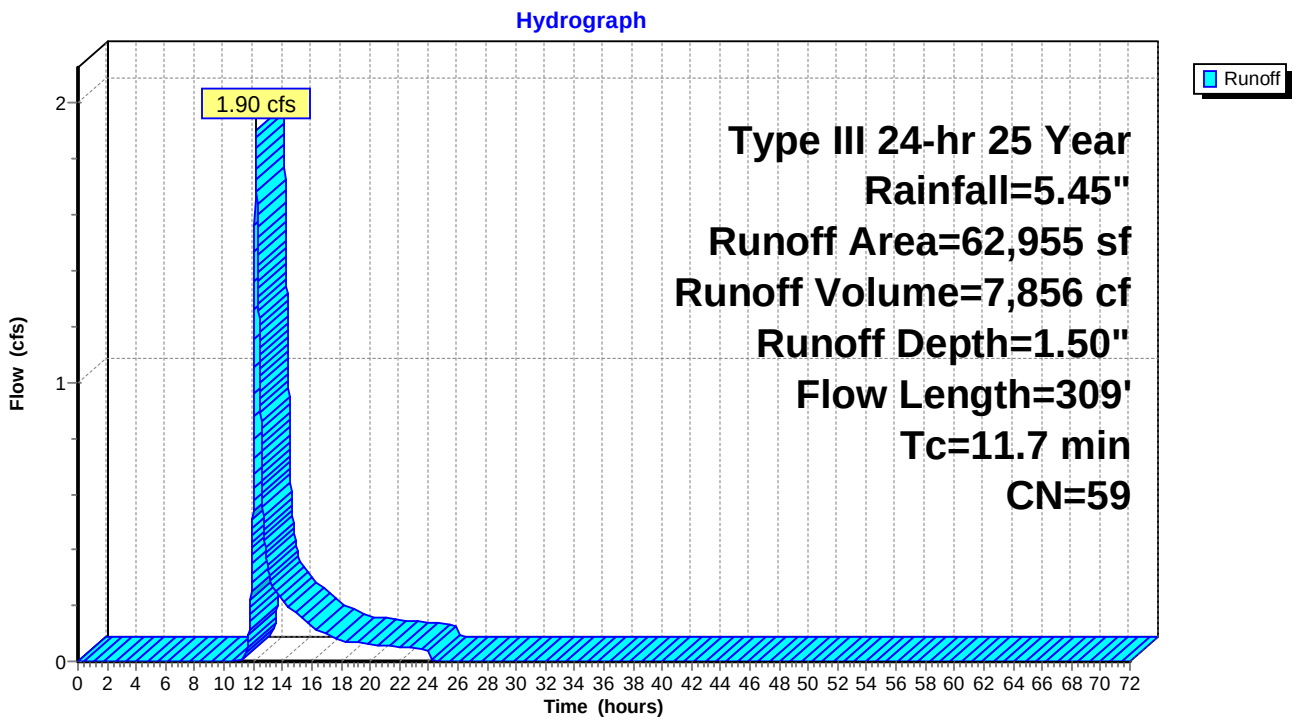
Runoff = 1.90 cfs @ 12.18 hrs, Volume= 7,856 cf, Depth= 1.50"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 Year Rainfall=5.45"

Area (sf)	CN	Description
27,650	61	1/4 acre lots, 38% imp, HSG A
35,305	57	Woods/grass comb., Poor, HSG A
62,955	59	Weighted Average
52,448		83.31% Pervious Area
10,507		16.69% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.2	100	0.0320	0.20		**Sheet Flow, Grass** Grass: Short n= 0.150 P2= 3.15"
3.5	209	0.0400	1.00		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
11.7	309	Total			

Subcatchment 32S: Unnamed Pond 3



Summary for Subcatchment 33S: Unnamed Pond 3-1

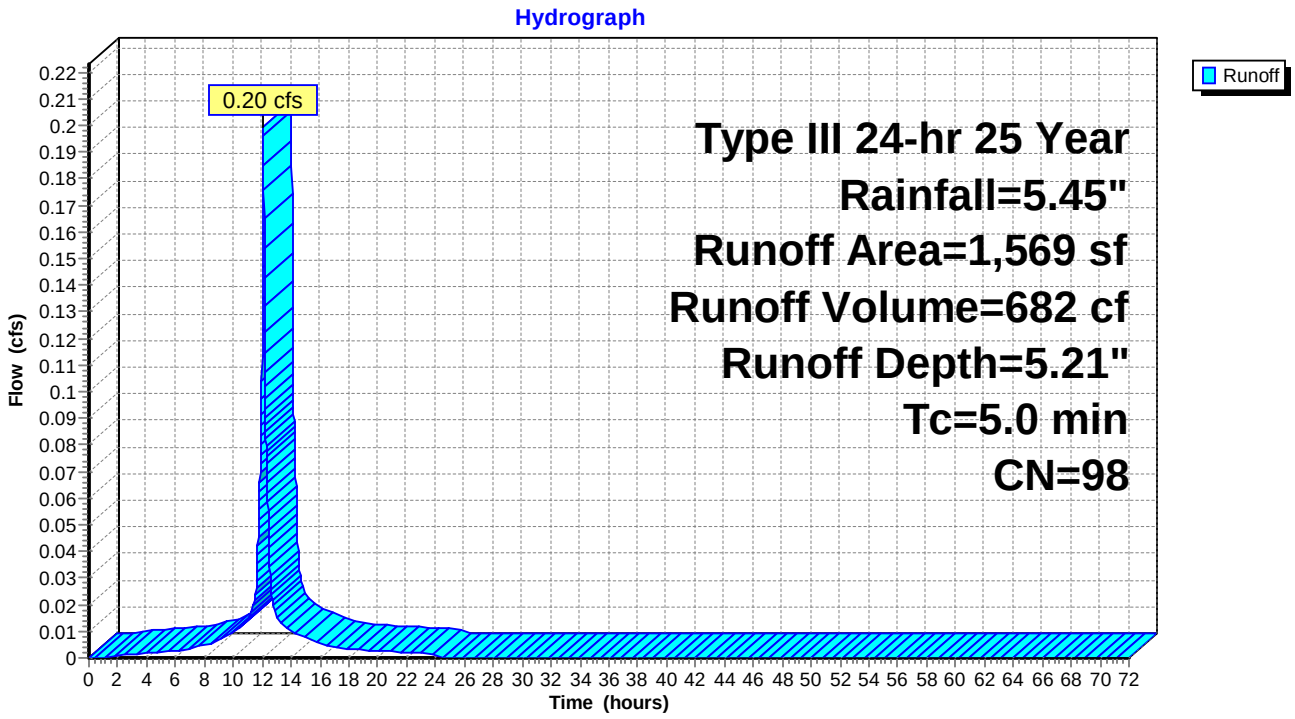
Runoff = 0.20 cfs @ 12.07 hrs, Volume= 682 cf, Depth= 5.21"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 Year Rainfall=5.45"

Area (sf)	CN	Description
1,569	98	Paved roads w/curbs & sewers, HSG A
1,569		100.00% Impervious Area

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

Subcatchment 33S: Unnamed Pond 3-1



Summary for Subcatchment 34S: Unnamed Pond 4-1

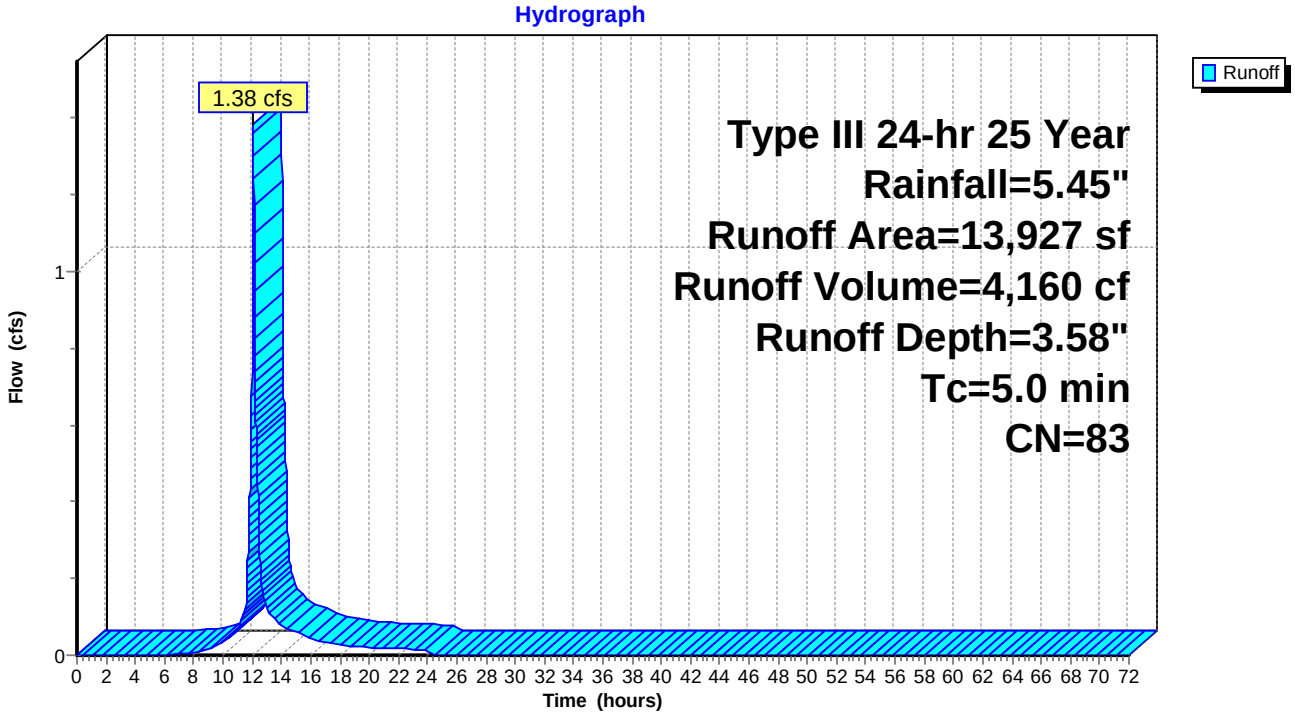
Runoff = 1.38 cfs @ 12.07 hrs, Volume= 4,160 cf, Depth= 3.58"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 Year Rainfall=5.45"

	Area (sf)	CN	Description
	5,220	57	Woods/grass comb., Poor, HSG A
*	8,707	98	Bike Path, HSG A
	13,927	83	Weighted Average
	5,220		37.48% Pervious Area
	8,707		62.52% Impervious Area

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

Subcatchment 34S: Unnamed Pond 4-1



Summary for Subcatchment 35S: Unnamed Pond 4-2

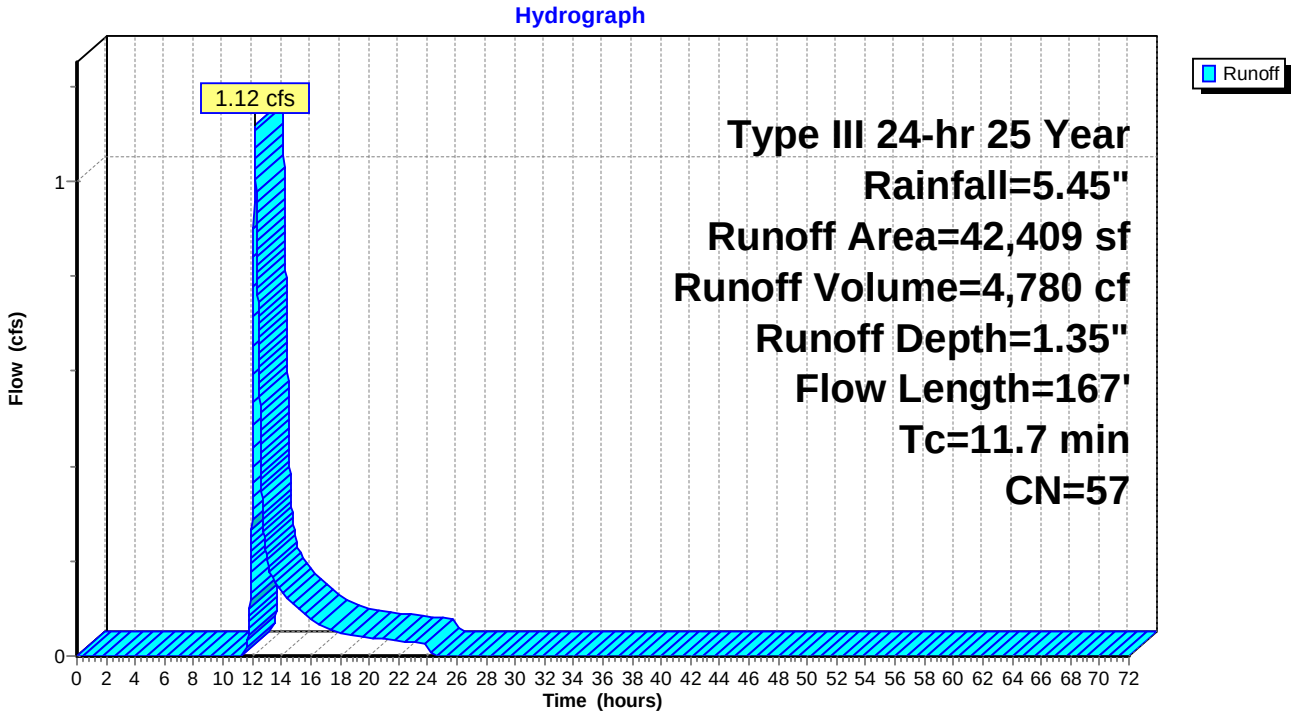
Runoff = 1.12 cfs @ 12.18 hrs, Volume= 4,780 cf, Depth= 1.35"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 Year Rainfall=5.45"

Area (sf)	CN	Description
42,409	57	Woods/grass comb., Poor, HSG A
42,409		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.9	100	0.1100	0.15		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
0.8	67	0.0821	1.43		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
11.7	167	Total			

Subcatchment 35S: Unnamed Pond 4-2



Summary for Subcatchment 36S: Kansas St-1

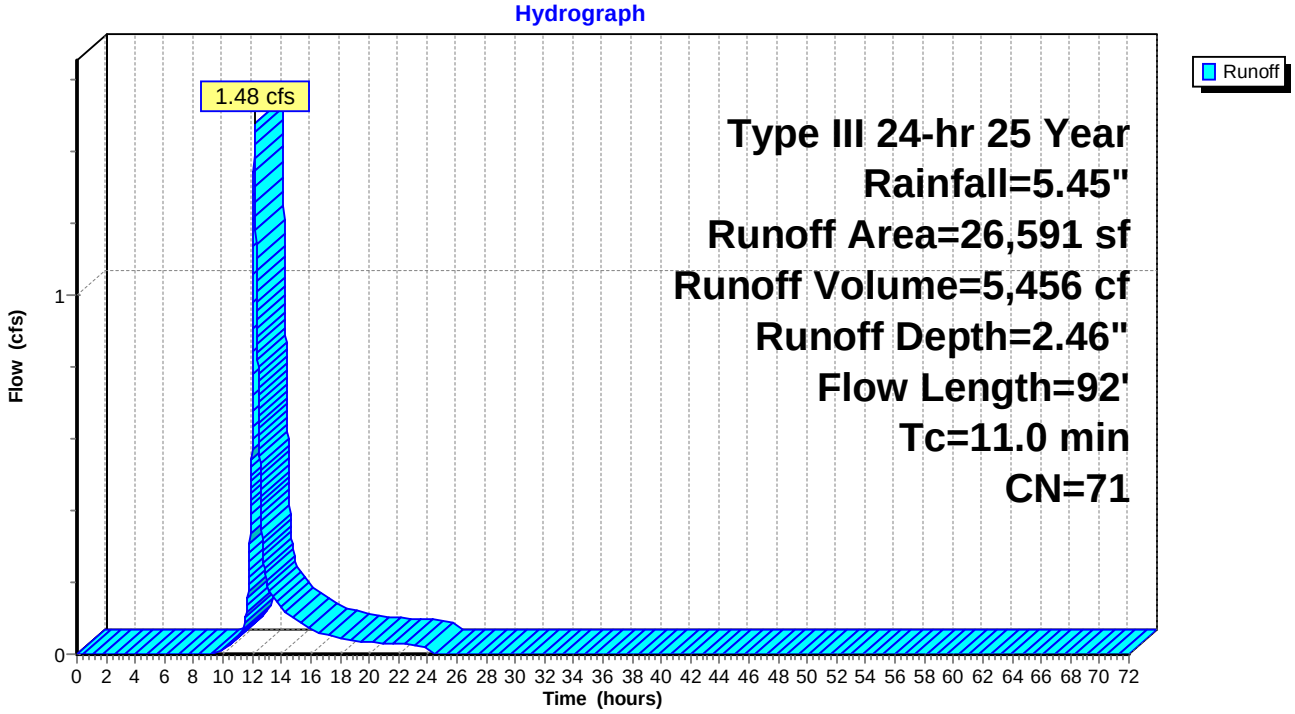
Runoff = 1.48 cfs @ 12.16 hrs, Volume= 5,456 cf, Depth= 2.46"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 Year Rainfall=5.45"

	Area (sf)	CN	Description
	3,799	61	1/4 acre lots, 38% imp, HSG A
	2,525	98	Paved parking, HSG A
*	5,891	98	Bike Path, HSG A
	14,376	57	Woods/grass comb., Poor, HSG A
	26,591	71	Weighted Average
	16,731		62.92% Pervious Area
	9,860		37.08% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.7	74	0.0090	0.12		**Sheet Flow, Grass** Grass: Short n= 0.150 P2= 3.15"
0.3	18	0.0150	0.86		**Sheet Flow, Bike Path** Smooth surfaces n= 0.011 P2= 3.15"
11.0	92	Total			

Subcatchment 36S: Kansas St-1



Summary for Subcatchment 37S: Kansas St-2

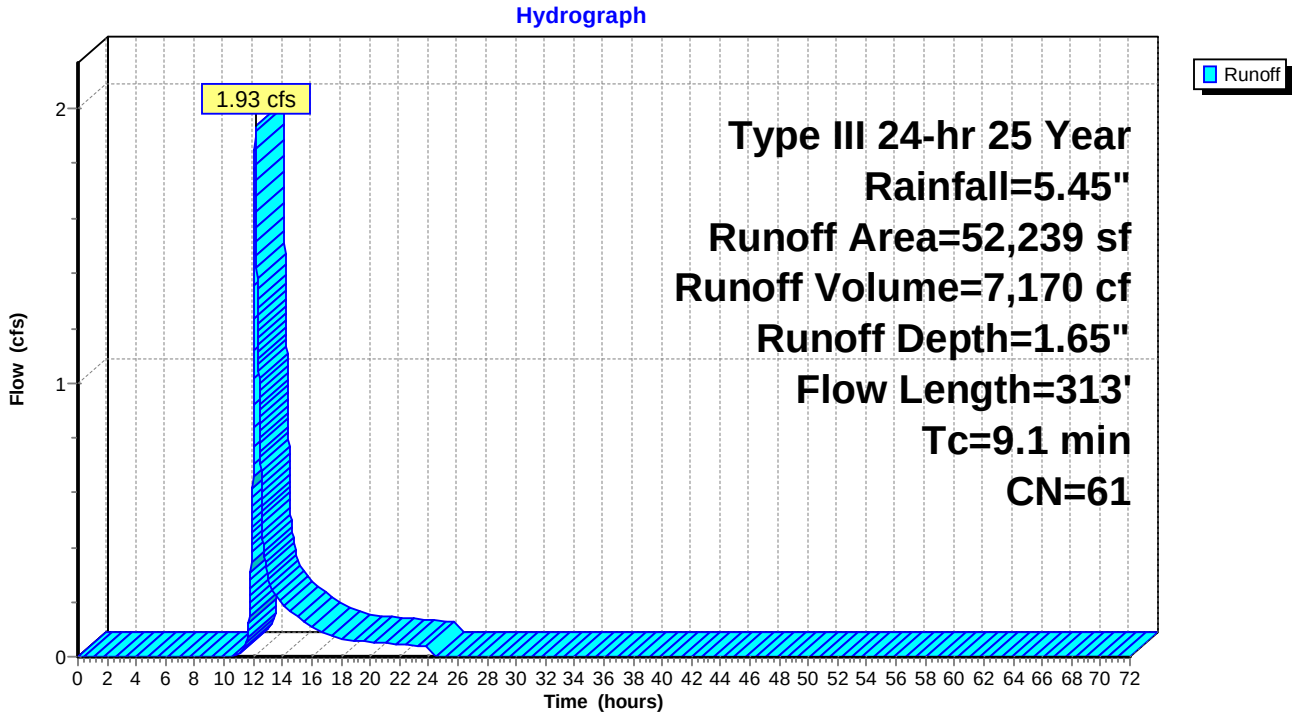
Runoff = 1.93 cfs @ 12.14 hrs, Volume= 7,170 cf, Depth= 1.65"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 Year Rainfall=5.45"

Area (sf)	CN	Description
34,065	57	Woods/grass comb., Poor, HSG A
3,317	98	Paved parking, HSG A
14,857	61	1/4 acre lots, 38% imp, HSG A
52,239	61	Weighted Average
43,276		82.84% Pervious Area
8,963		17.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.7	100	0.0775	0.29		**Sheet Flow, Yards** Grass: Short n= 0.150 P2= 3.15"
3.1	175	0.0186	0.95		**Shallow Concentrated Flow, Yards** Short Grass Pasture Kv= 7.0 fps
0.3	38	0.1974	2.22		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
9.1	313	Total			

Subcatchment 37S: Kansas St-2



Summary for Subcatchment 38S: N. Main & Kansas

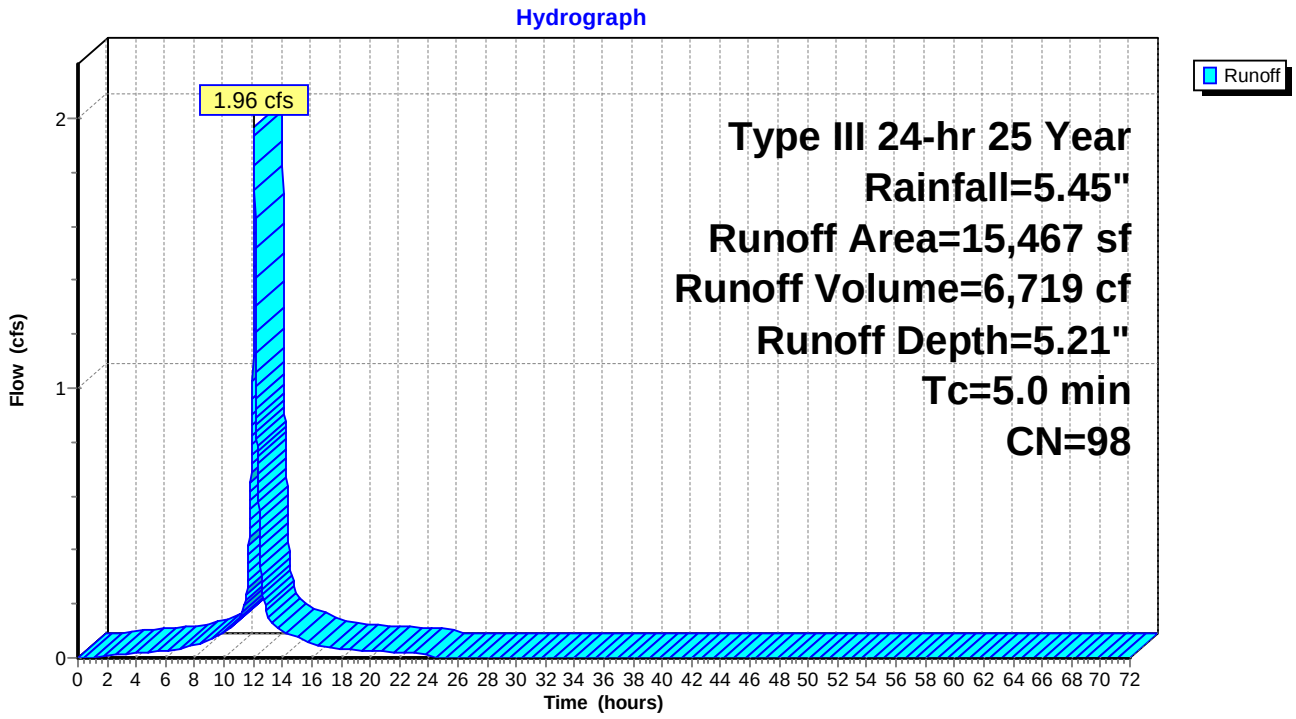
Runoff = 1.96 cfs @ 12.07 hrs, Volume= 6,719 cf, Depth= 5.21"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 Year Rainfall=5.45"

Area (sf)	CN	Description
15,467	98	Paved roads w/curbs & sewers, HSG A
15,467		100.00% Impervious Area

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

Subcatchment 38S: N. Main & Kansas



Summary for Subcatchment 39S: Washington Ave 1

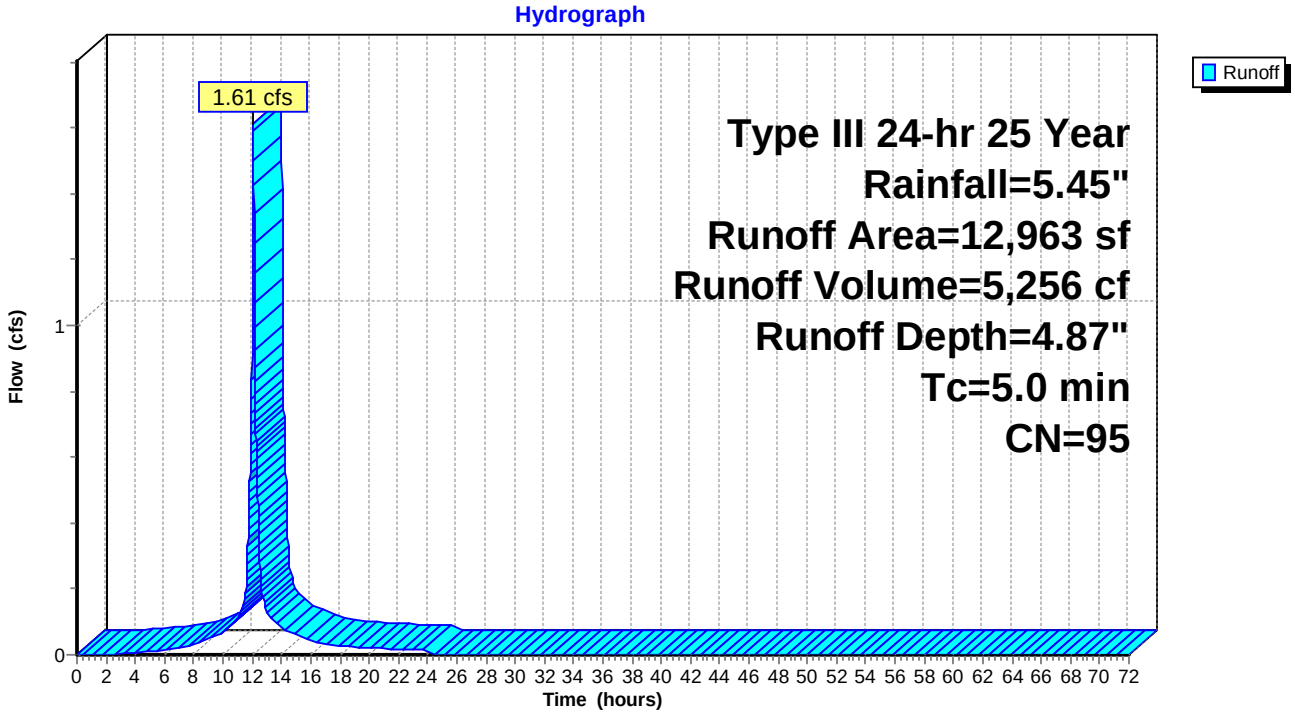
Runoff = 1.61 cfs @ 12.07 hrs, Volume= 5,256 cf, Depth= 4.87"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 Year Rainfall=5.45"

	Area (sf)	CN	Description
	10,635	98	Paved roads w/curbs & sewers, HSG A
	1,284	68	<50% Grass cover, Poor, HSG A
*	1,044	98	Bike Path, HSG A
	12,963	95	Weighted Average
	1,284		9.91% Pervious Area
	11,679		90.09% Impervious Area

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

Subcatchment 39S: Washington Ave 1



Summary for Subcatchment 40S: Washington Ave 2

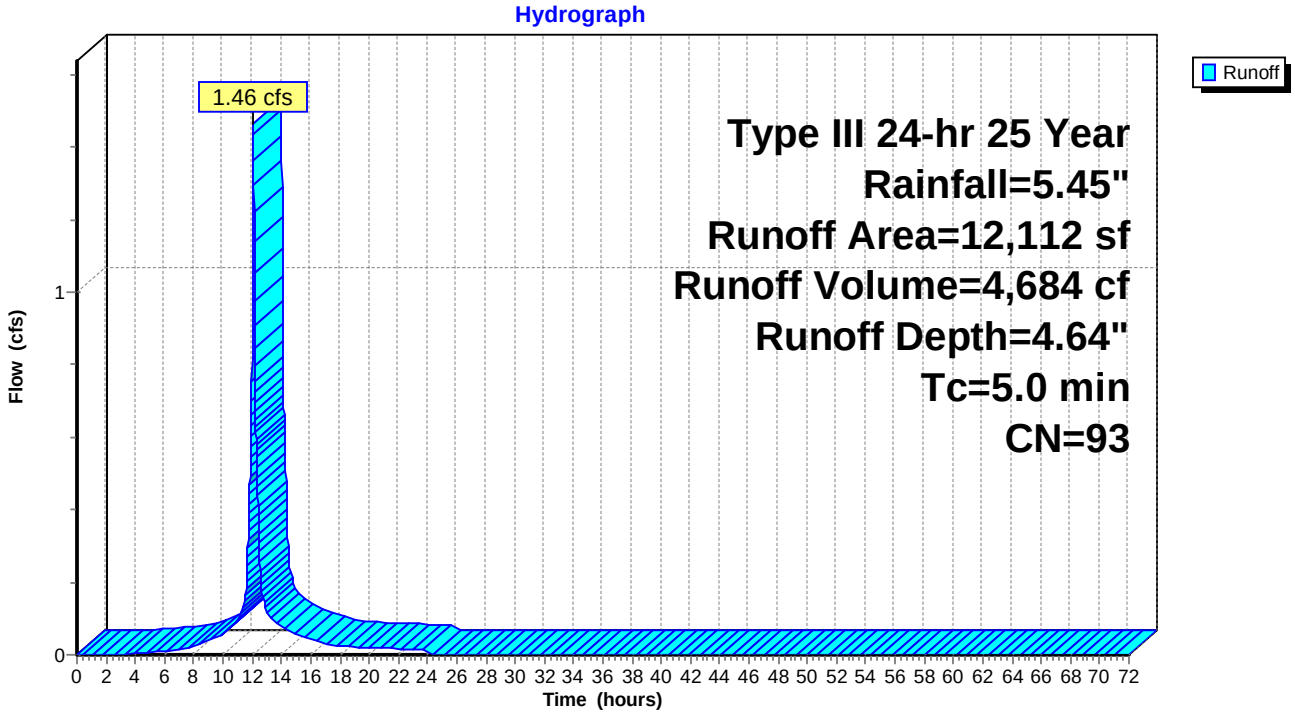
Runoff = 1.46 cfs @ 12.07 hrs, Volume= 4,684 cf, Depth= 4.64"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 Year Rainfall=5.45"

	Area (sf)	CN	Description
	2,040	68	<50% Grass cover, Poor, HSG A
	6,175	98	Paved parking, HSG A
*	3,897	98	Bike Path, HSG A
	12,112	93	Weighted Average
	2,040		16.84% Pervious Area
	10,072		83.16% Impervious Area

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

Subcatchment 40S: Washington Ave 2



Summary for Subcatchment 41S: Washington Ave 3

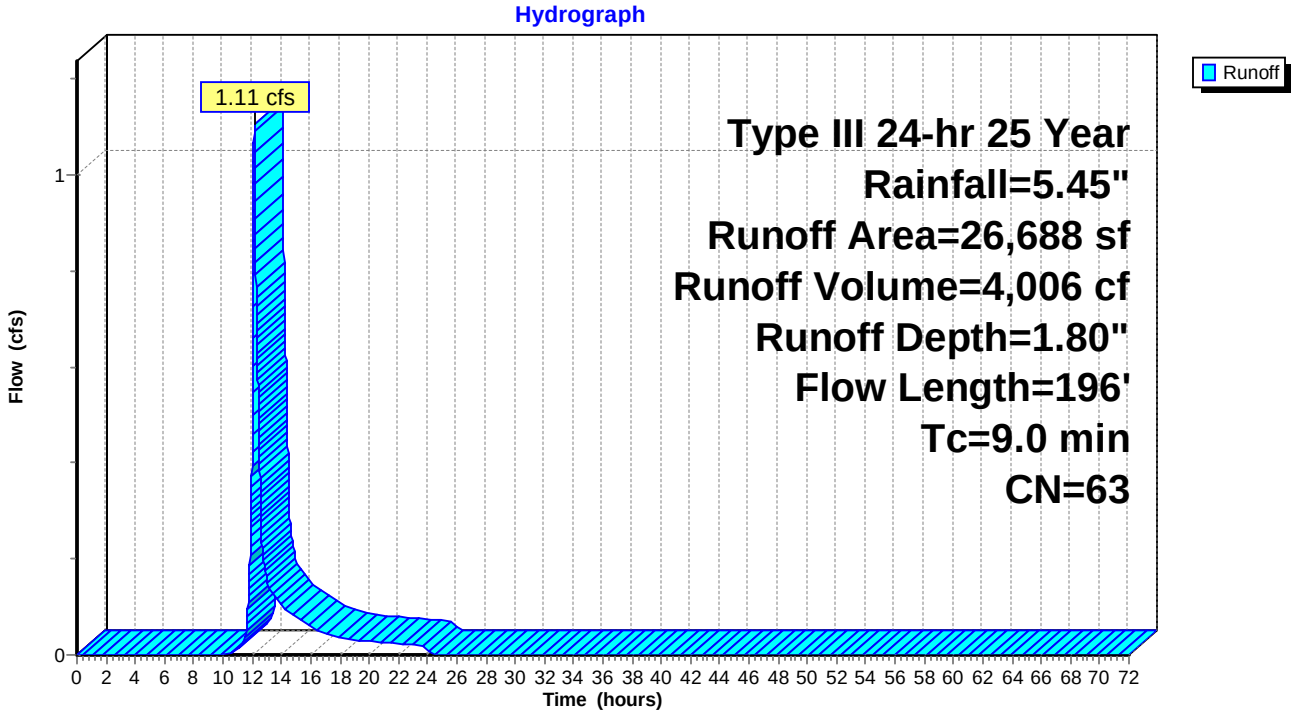
Runoff = 1.11 cfs @ 12.13 hrs, Volume= 4,006 cf, Depth= 1.80"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 Year Rainfall=5.45"

	Area (sf)	CN	Description
	20,850	61	1/4 acre lots, 38% imp, HSG A
*	2,152	98	Bike Path, HSG A
	3,686	57	Woods/grass comb., Poor, HSG A
	26,688	63	Weighted Average
	16,613		62.25% Pervious Area
	10,075		37.75% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	100	0.0350	0.21		**Sheet Flow, Yards** Grass: Short n= 0.150 P2= 3.15"
1.1	96	0.0427	1.45		**Shallow Concentrated Flow, Yards** Short Grass Pasture Kv= 7.0 fps
9.0	196	Total			

Subcatchment 41S: Washington Ave 3



Summary for Subcatchment 42S: Empty Lot

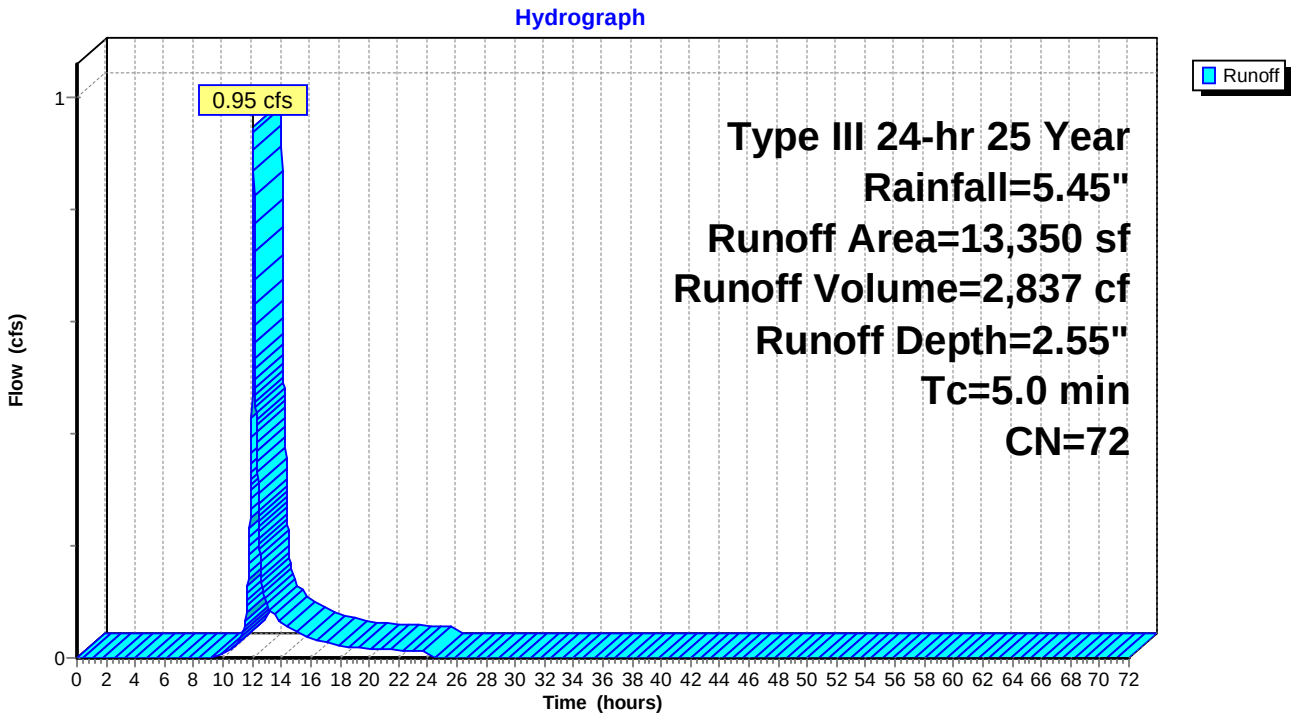
Runoff = 0.95 cfs @ 12.08 hrs, Volume= 2,837 cf, Depth= 2.55"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 Year Rainfall=5.45"

Area (sf)	CN	Description
13,350	72	Dirt roads, HSG A
13,350		100.00% Pervious Area

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

Subcatchment 42S: Empty Lot



Summary for Subcatchment 43S: Lagrange St

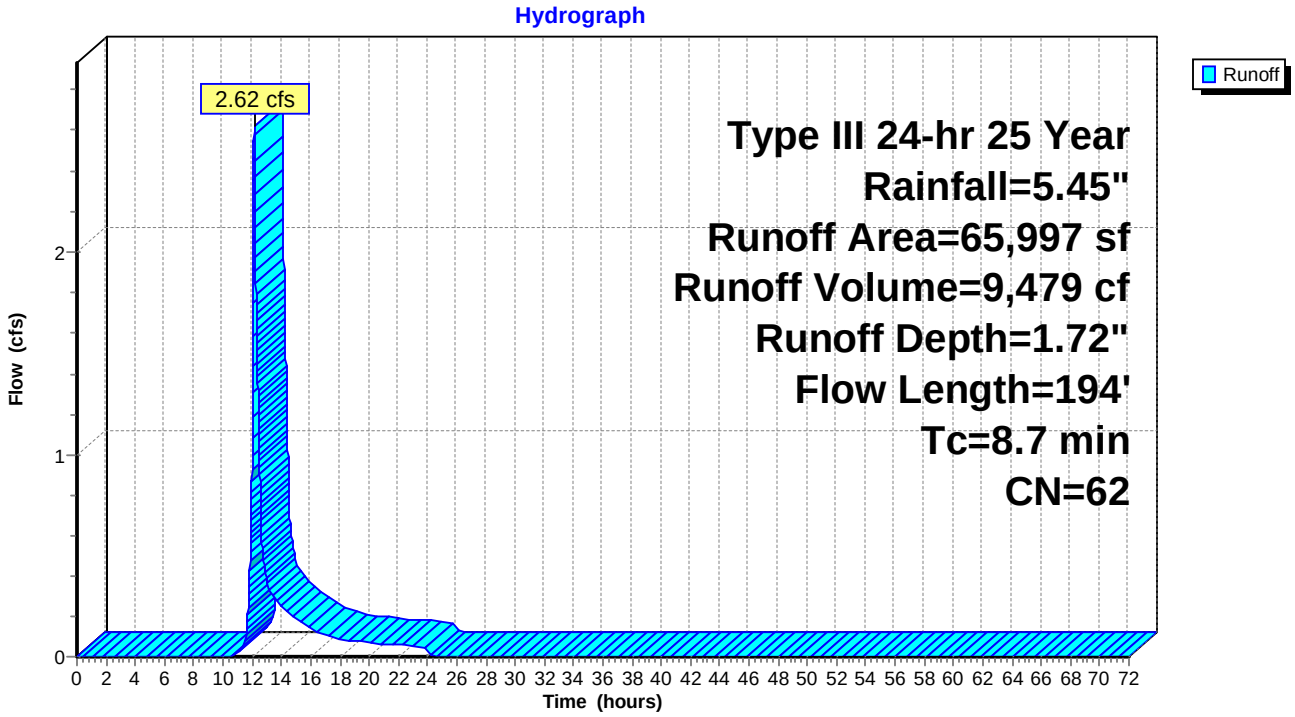
Runoff = 2.62 cfs @ 12.13 hrs, Volume= 9,479 cf, Depth= 1.72"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 Year Rainfall=5.45"

	Area (sf)	CN	Description
	52,794	61	1/4 acre lots, 38% imp, HSG A
	9,738	57	Woods/grass comb., Poor, HSG A
*	3,465	98	Bike Path, HSG A
	65,997	62	Weighted Average
	42,470		64.35% Pervious Area
	23,527		35.65% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.1	100	0.0450	0.23		**Sheet Flow, Yard** Grass: Short n= 0.150 P2= 3.15"
0.9	53	0.0189	0.96		**Shallow Concentrated Flow, Yard** Short Grass Pasture Kv= 7.0 fps
0.7	41	0.0366	0.96		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
8.7	194	Total			

Subcatchment 43S: Lagrange St



Summary for Subcatchment 44S: Mechanic St

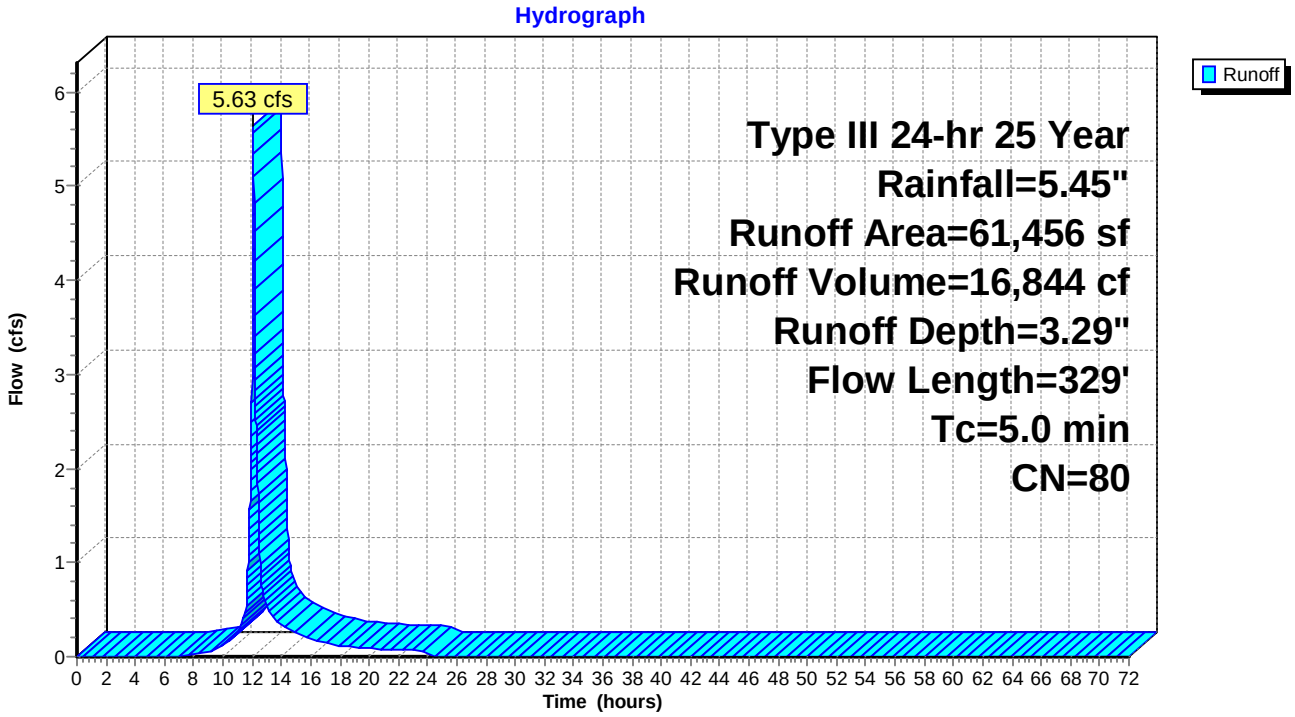
Runoff = 5.63 cfs @ 12.07 hrs, Volume= 16,844 cf, Depth= 3.29"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 Year Rainfall=5.45"

	Area (sf)	CN	Description
	37,417	81	Urban industrial, 72% imp, HSG A
	2,503	98	Paved parking, HSG A
*	8,336	98	Bike Path, HSG A
	7,222	68	<50% Grass cover, Poor, HSG A
	5,978	57	Woods/grass comb., Poor, HSG A
	61,456	80	Weighted Average
	23,677		38.53% Pervious Area
	37,779		61.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	100	0.0150	1.22		**Sheet Flow, Road** Smooth surfaces n= 0.011 P2= 3.15"
3.0	229	0.0040	1.28		**Shallow Concentrated Flow, Bike Path** Paved Kv= 20.3 fps
4.4	329	Total, Increased to minimum Tc = 5.0 min			

Subcatchment 44S: Mechanic St



Summary for Subcatchment 45S: Cochituate St 1

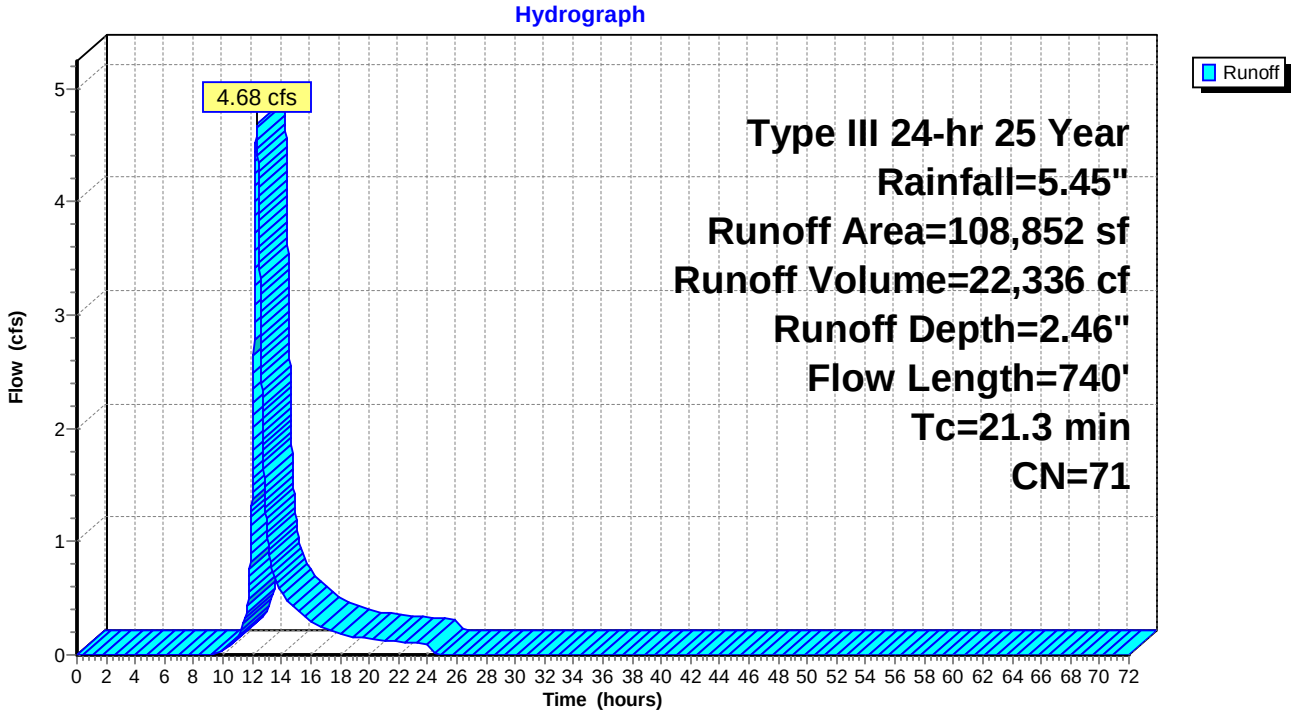
Runoff = 4.68 cfs @ 12.30 hrs, Volume= 22,336 cf, Depth= 2.46"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 Year Rainfall=5.45"

	Area (sf)	CN	Description
	13,087	81	Urban industrial, 72% imp, HSG A
	11,315	98	Paved parking, HSG A
*	13,568	98	Bike Path, HSG A
	30,345	57	Woods/grass comb., Poor, HSG A
	38,236	61	1/4 acre lots, 38% imp, HSG A
	2,301	76	Gravel roads, HSG A
	108,852	71	Weighted Average
	60,017		55.14% Pervious Area
	48,835		44.86% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.4	75	0.0333	0.20		**Sheet Flow, Yards** Grass: Short n= 0.150 P2= 3.15"
1.9	25	0.5200	0.21		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
0.1	12	0.0150	2.49		**Shallow Concentrated Flow, Bike Path** Paved Kv= 20.3 fps
12.9	628	0.0040	0.81	0.10	**Trap/Vee/Rect Channel Flow, Grass Channel** Bot.W=1.00' D=0.10' Z= 2.0 '/' Top.W=1.40' n= 0.022 Earth, clean & straight
21.3	740	Total			

Subcatchment 45S: Cochituate St 1



Summary for Subcatchment 170S: Lake Cochituate N2-2

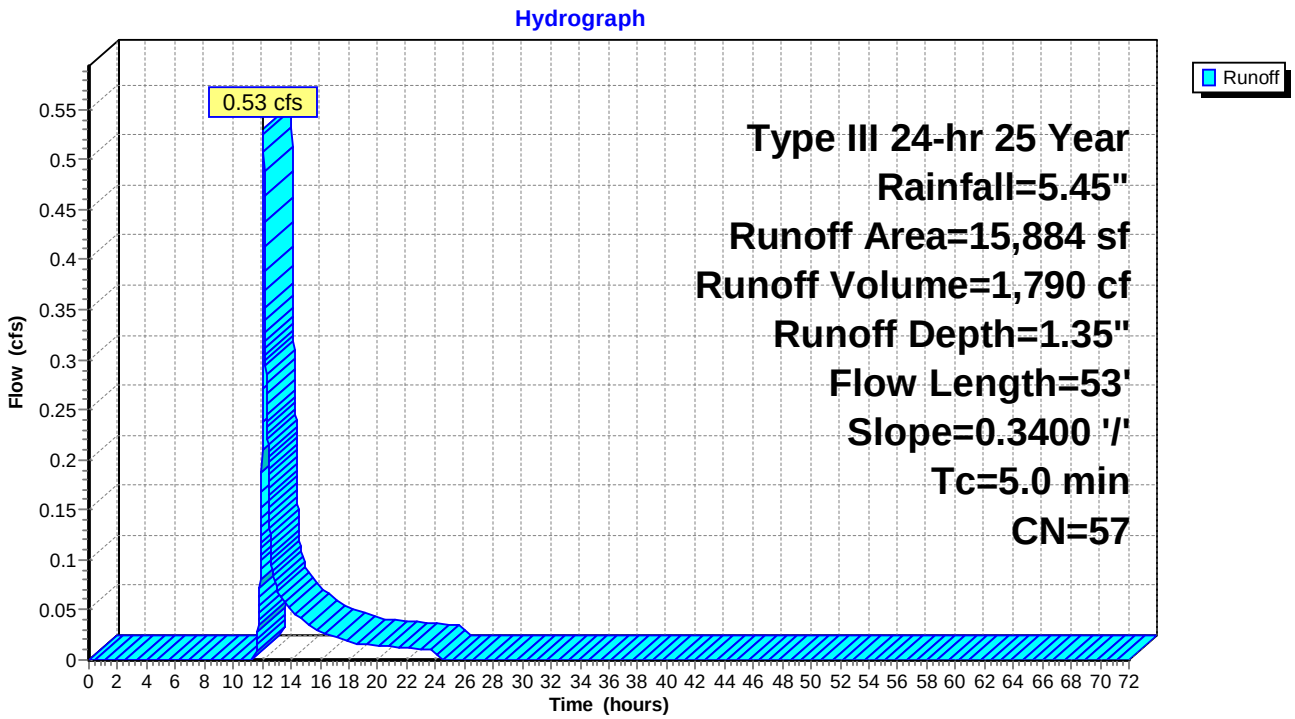
Runoff = 0.53 cfs @ 12.09 hrs, Volume= 1,790 cf, Depth= 1.35"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 Year Rainfall=5.45"

Area (sf)	CN	Description
15,884	57	Woods/grass comb., Poor, HSG A
15,884		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.2	53	0.3400	0.21		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
4.2	53	Total, Increased to minimum Tc = 5.0 min			

Subcatchment 170S: Lake Cochituate N2-2



Summary for Pond 01P: BMP 1 - Infiltration Swale

[87] Warning: Oscillations may require Finer Routing or smaller dt

Inflow Area =	50,164 sf, 33.83% Impervious, Inflow Depth = 2.46" for 25 Year event				
Inflow =	2.44 cfs @	12.22 hrs,	Volume=	10,293 cf	
Outflow =	1.97 cfs @	12.35 hrs,	Volume=	10,294 cf,	Atten= 19%, Lag= 7.6 min
Discarded =	0.19 cfs @	12.35 hrs,	Volume=	5,857 cf	
Primary =	1.77 cfs @	12.35 hrs,	Volume=	4,437 cf	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 147.60' @ 12.35 hrs Surf.Area= 3,422 sf Storage= 2,134 cf
Flood Elev= 148.05' Surf.Area= 3,956 sf Storage= 3,586 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 99.4 min (949.1 - 849.7)

Volume	Invert	Avail.Storage	Storage Description
#1	146.75'	5,109 cf	**Infiltration Swale (Irregular)** Listed below (Recalc)
#2	142.25'	787 cf	**1.00'W x 656.00'L x 3.00'H Crushed stone** 1,968 cf Overall x 40.0% Voids
		5,896 cf	Total Available Storage

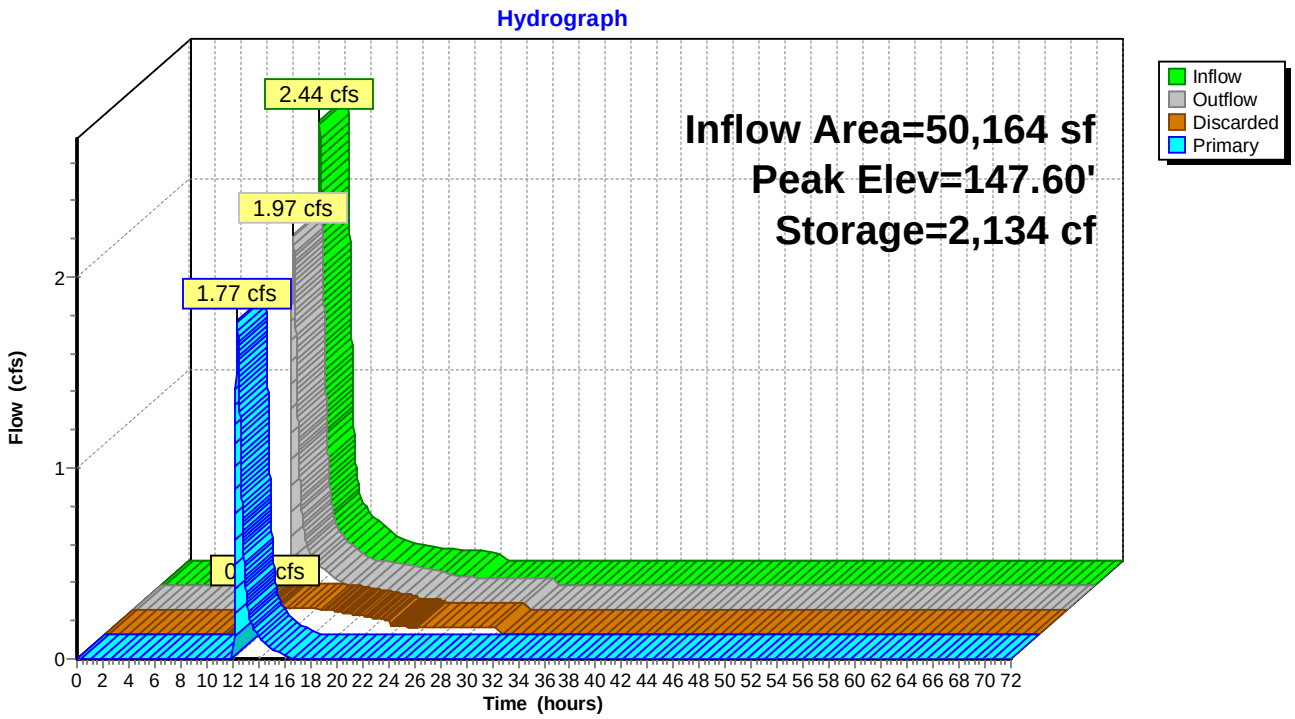
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
146.75	656	1,315.0	0	0	656
147.75	3,300	1,328.0	1,809	1,809	3,693
148.75	3,300	1,328.0	3,300	5,109	5,021

Device	Routing	Invert	Outlet Devices
#1	Discarded	142.25'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	147.25'	**3.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.19 cfs @ 12.35 hrs HW=147.60' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.19 cfs)

Primary OutFlow Max=1.77 cfs @ 12.35 hrs HW=147.60' TW=0.00' (Dynamic Tailwater)
└**2=Broad-Crested Rectangular Weir** (Weir Controls 1.77 cfs @ 1.70 fps)

Pond 01P: BMP 1 - Infiltration Swale



Summary for Pond 02P: Re-graded Detention Pond

Inflow Area = 28,639 sf, 30.10% Impervious, Inflow Depth = 2.73" for 25 Year event
Inflow = 2.15 cfs @ 12.08 hrs, Volume= 6,511 cf
Outflow = 2.15 cfs @ 12.09 hrs, Volume= 6,498 cf, Atten= 0%, Lag= 0.4 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Secondary = 2.15 cfs @ 12.09 hrs, Volume= 6,498 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 160.19' @ 12.09 hrs Surf.Area= 116 sf Storage= 75 cf
Flood Elev= 163.00' Surf.Area= 537 sf Storage= 945 cf

Plug-Flow detention time= 3.0 min calculated for 6,497 cf (100% of inflow)
Center-of-Mass det. time= 1.8 min (834.4 - 832.6)

Volume	Invert	Avail.Storage	Storage Description
#1	159.00'	945 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

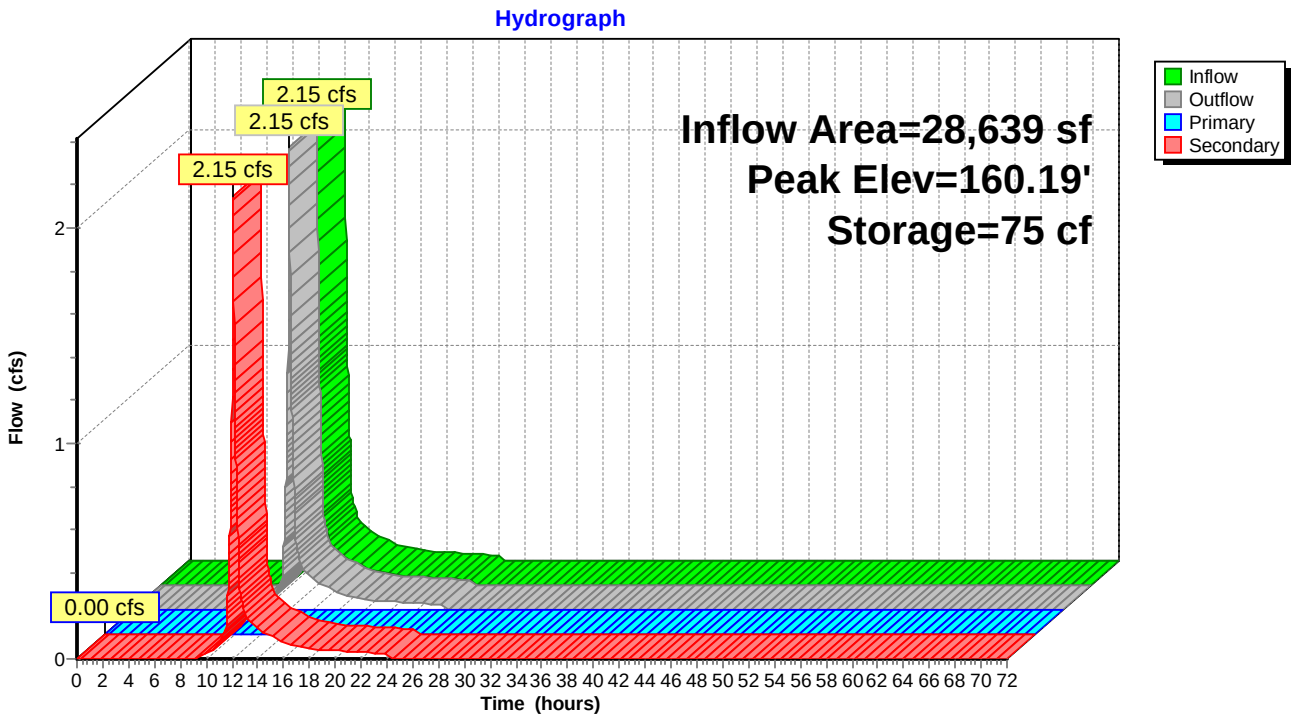
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
159.00	22	45.0	0	0	22
160.00	97	55.0	55	55	116
161.00	218	67.0	153	209	247
162.00	365	80.0	288	497	416
163.00	537	92.0	448	945	602

Device	Routing	Invert	Outlet Devices
#1	Secondary	159.40'	**24.0" Round Culvert** L= 40.0' CMP, projecting, no headwall, Ke= 0.900 Outlet Invert= 159.00' S= 0.0100 '/' Cc= 0.900 n= 0.025 Corrugated metal
#2	Primary	162.25'	**5.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=159.00' TW=0.00' (Dynamic Tailwater)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Secondary OutFlow Max=2.14 cfs @ 12.09 hrs HW=160.19' (Free Discharge)
└─**1=Culvert** (Barrel Controls 2.14 cfs @ 2.77 fps)

Pond 02P: Re-graded Detention Pond



Summary for Pond 03P: BMP 2 - Bioretention System

Inflow Area =	89,186 sf, 21.87% Impervious, Inflow Depth = 1.28" for 25 Year event				
Inflow =	2.67 cfs @	12.13 hrs,	Volume=	9,486 cf	
Outflow =	2.63 cfs @	12.15 hrs,	Volume=	9,486 cf,	Atten= 1%, Lag= 1.0 min
Discarded =	0.08 cfs @	12.15 hrs,	Volume=	3,879 cf	
Primary =	2.55 cfs @	12.15 hrs,	Volume=	5,607 cf	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 153.05' @ 12.15 hrs Surf.Area= 1,409 sf Storage= 1,045 cf
Flood Elev= 153.89' Surf.Area= 3,516 sf Storage= 2,588 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 73.3 min (934.0 - 860.8)

Volume	Invert	Avail.Storage	Storage Description
#1	152.00'	5,949 cf	**Bioretention Area (Irregular)** Listed below (Recalc)
#2	150.00'	347 cf	**Bioretention Media (Irregular)** Listed below (Recalc) 1,050 cf Overall x 33.0% Voids
		6,296 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
152.00	525	131.0	0	0	525
153.00	800	144.0	658	658	841
154.00	3,359	300.0	1,933	2,590	6,357
155.00	3,359	300.0	3,359	5,949	6,657

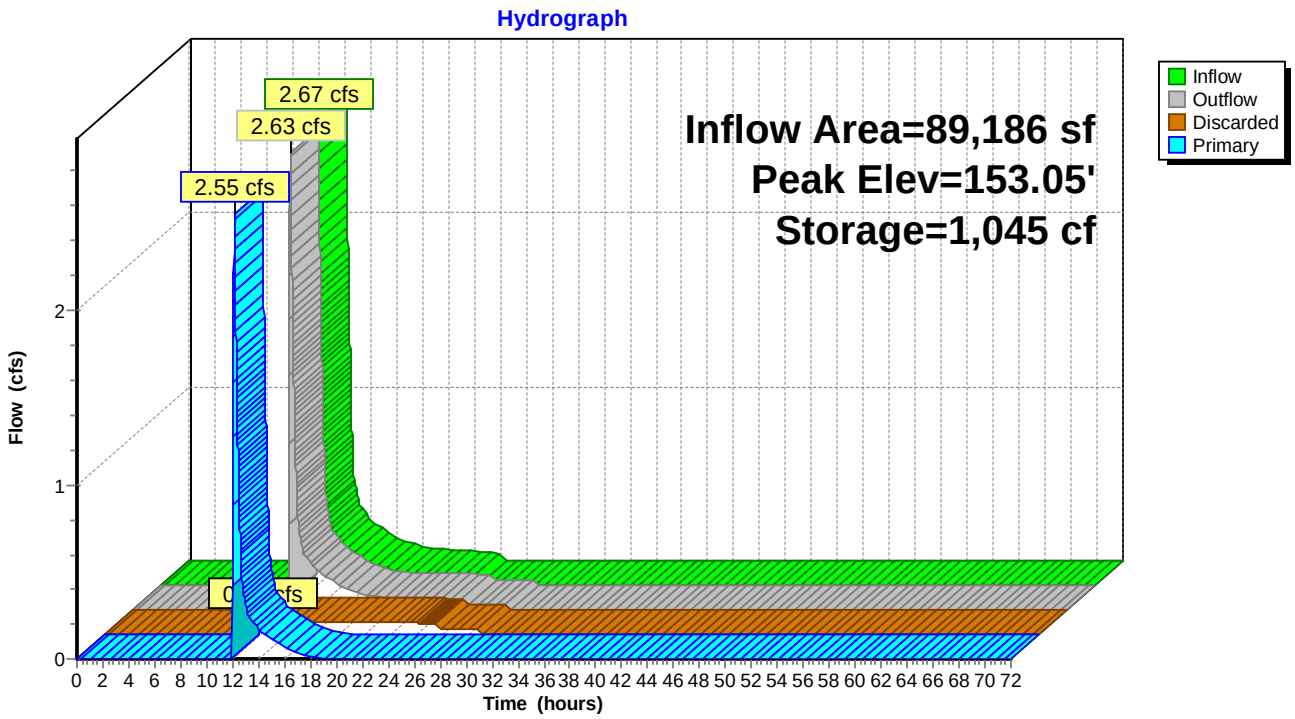
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
150.00	525	131.0	0	0	525
151.00	525	131.0	525	525	656
152.00	525	131.0	525	1,050	787

Device	Routing	Invert	Outlet Devices
#1	Discarded	150.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	149.33'	**8.0" Round Culvert** L= 33.0' RCP, square edge headwall, Ke= 0.500 Outlet Invert= 149.00' S= 0.0100 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections
#3	Device 2	152.80'	**24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.08 cfs @ 12.15 hrs HW=153.05' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.08 cfs)

Primary OutFlow Max=2.55 cfs @ 12.15 hrs HW=153.05' TW=0.00' (Dynamic Tailwater)
└─**2=Culvert** (Passes 2.55 cfs of 2.85 cfs potential flow)
  └─**3=Orifice/Grate** (Weir Controls 2.55 cfs @ 1.63 fps)

Pond 03P: BMP 2 - Bioretention System



Summary for Pond 04P: BMP 3 - Infiltration Swale

Inflow Area = 41,704 sf, 17.25% Impervious, Inflow Depth = 1.88" for 25 Year event
Inflow = 1.66 cfs @ 12.17 hrs, Volume= 6,533 cf
Outflow = 1.58 cfs @ 12.21 hrs, Volume= 6,533 cf, Atten= 5%, Lag= 2.3 min
Discarded = 0.08 cfs @ 12.21 hrs, Volume= 3,051 cf
Primary = 1.51 cfs @ 12.21 hrs, Volume= 3,482 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 154.48' @ 12.21 hrs Surf.Area= 1,369 sf Storage= 888 cf
Flood Elev= 154.69' Surf.Area= 1,401 sf Storage= 1,139 cf

Plug-Flow detention time= 82.6 min calculated for 6,533 cf (100% of inflow)
Center-of-Mass det. time= 82.6 min (946.3 - 863.6)

Volume	Invert	Avail.Storage	Storage Description
#1	153.50'	1,812 cf	**Infiltration Swale (Irregular)** Listed below (Recalc)
#2	149.00'	276 cf	**1.00'W x 230.00'L x 3.00'H Crushed stone** 690 cf Overall x 40.0% Voids
		2,088 cf	Total Available Storage

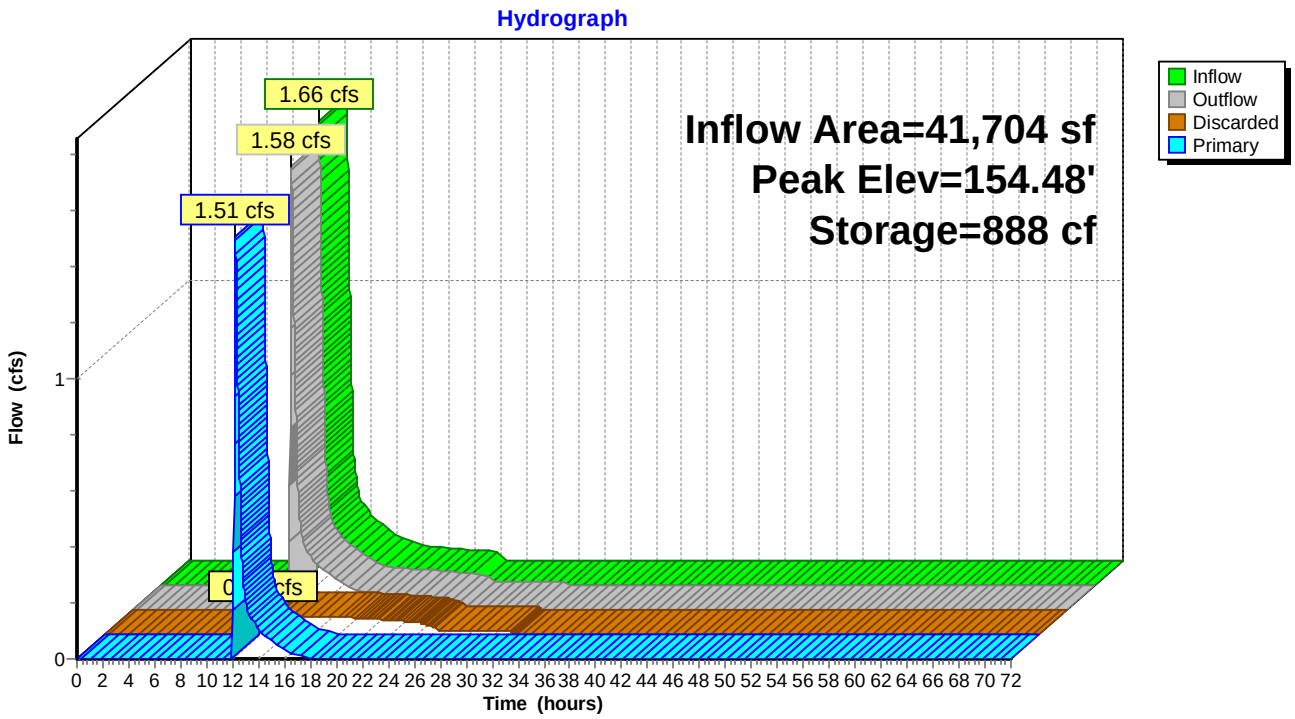
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
153.50	231	464.0	0	0	231
154.50	1,171	476.0	641	641	1,244
155.50	1,171	476.0	1,171	1,812	1,720

Device	Routing	Invert	Outlet Devices
#1	Discarded	149.00'	**2.410 in/hr Exfiltration over Surface area** Phase-In= 0.10'
#2	Primary	154.25'	**5.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.08 cfs @ 12.21 hrs HW=154.48' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.08 cfs)

Primary OutFlow Max=1.51 cfs @ 12.21 hrs HW=154.48' TW=0.00' (Dynamic Tailwater)
└**2=Broad-Crested Rectangular Weir** (Weir Controls 1.51 cfs @ 1.34 fps)

Pond 04P: BMP 3 - Infiltration Swale



Summary for Pond 05P: BMP 4 - Infiltration Swale

Inflow Area = 98,155 sf, 15.90% Impervious, Inflow Depth = 1.88" for 25 Year event
Inflow = 3.31 cfs @ 12.26 hrs, Volume= 15,377 cf
Outflow = 3.28 cfs @ 12.29 hrs, Volume= 15,377 cf, Atten= 1%, Lag= 1.6 min
Discarded = 0.07 cfs @ 12.13 hrs, Volume= 3,185 cf
Primary = 3.21 cfs @ 12.29 hrs, Volume= 12,192 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 154.87' @ 12.29 hrs Surf.Area= 1,224 sf Storage= 919 cf
Flood Elev= 155.05' Surf.Area= 1,224 sf Storage= 1,107 cf

Plug-Flow detention time= 37.5 min calculated for 15,375 cf (100% of inflow)
Center-of-Mass det. time= 37.5 min (907.2 - 869.7)

Volume	Invert	Avail.Storage	Storage Description
#1	153.75'	1,584 cf	**Infiltration Swale (Irregular)** Listed below (Recalc)
#2	149.25'	240 cf	**1.00'W x 200.00'L x 3.00'H Crushed stone** 600 cf Overall x 40.0% Voids
		1,824 cf	Total Available Storage

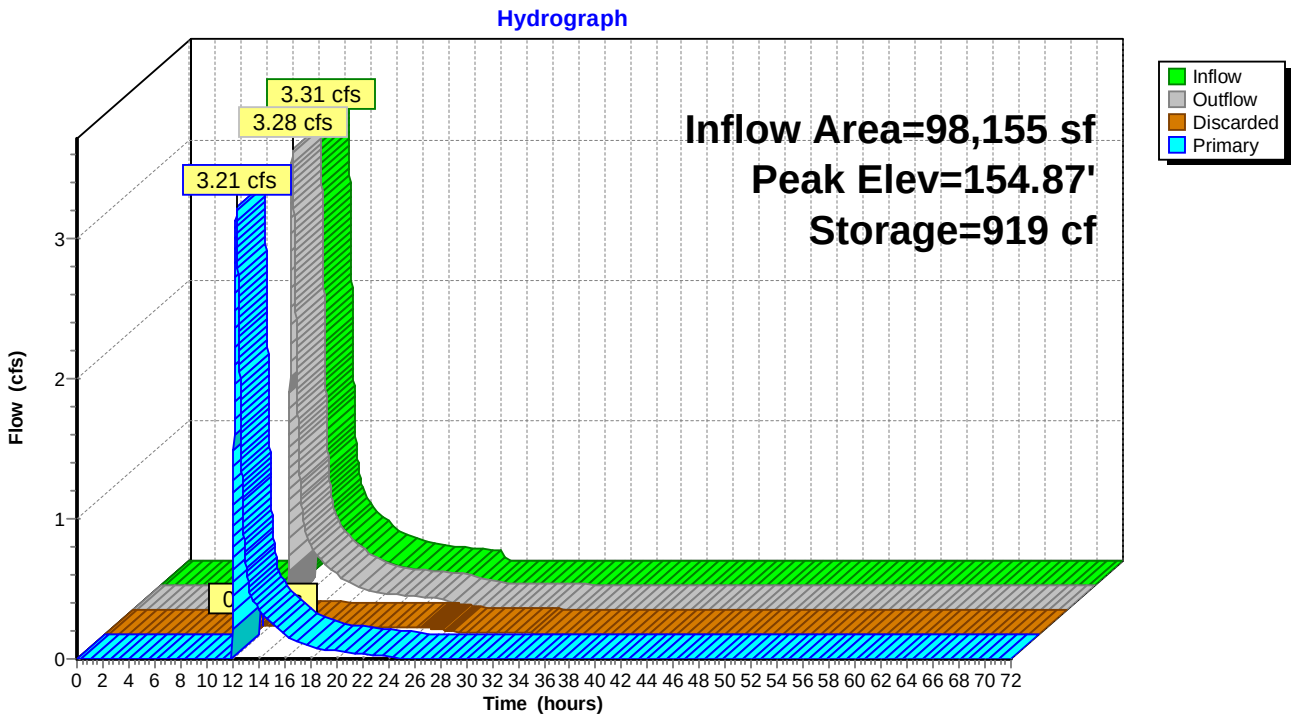
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
153.75	202	405.0	0	0	202
154.75	1,024	417.0	560	560	1,088
155.75	1,024	417.0	1,024	1,584	1,505

Device	Routing	Invert	Outlet Devices
#1	Discarded	149.25'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	154.50'	**5.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.07 cfs @ 12.13 hrs HW=154.76' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.07 cfs)

Primary OutFlow Max=3.21 cfs @ 12.29 hrs HW=154.87' TW=0.00' (Dynamic Tailwater)
└**2=Broad-Crested Rectangular Weir** (Weir Controls 3.21 cfs @ 1.75 fps)

Pond 05P: BMP 4 - Infiltration Swale



Summary for Pond 06P: BMP 5 - Infiltration Swale

Inflow Area = 108,471 sf, 26.07% Impervious, Inflow Depth = 2.16" for 25 Year event
Inflow = 4.95 cfs @ 12.15 hrs, Volume= 19,507 cf
Outflow = 4.84 cfs @ 12.18 hrs, Volume= 19,507 cf, Atten= 2%, Lag= 1.7 min
Discarded = 0.15 cfs @ 12.09 hrs, Volume= 6,803 cf
Primary = 4.69 cfs @ 12.18 hrs, Volume= 12,705 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 155.05' @ 12.18 hrs Surf.Area= 2,716 sf Storage= 1,895 cf
Flood Elev= 155.17' Surf.Area= 2,716 sf Storage= 2,167 cf

Plug-Flow detention time= 61.9 min calculated for 19,505 cf (100% of inflow)
Center-of-Mass det. time= 62.0 min (914.5 - 852.5)

Volume	Invert	Avail.Storage	Storage Description
#1	154.00'	3,508 cf	**Infiltration Swale (Irregular)** Listed below (Recalc)
#2	150.00'	540 cf	**1.00'W x 450.00'L x 3.00'H Crushed stone** 1,350 cf Overall x 40.0% Voids
		4,048 cf	Total Available Storage

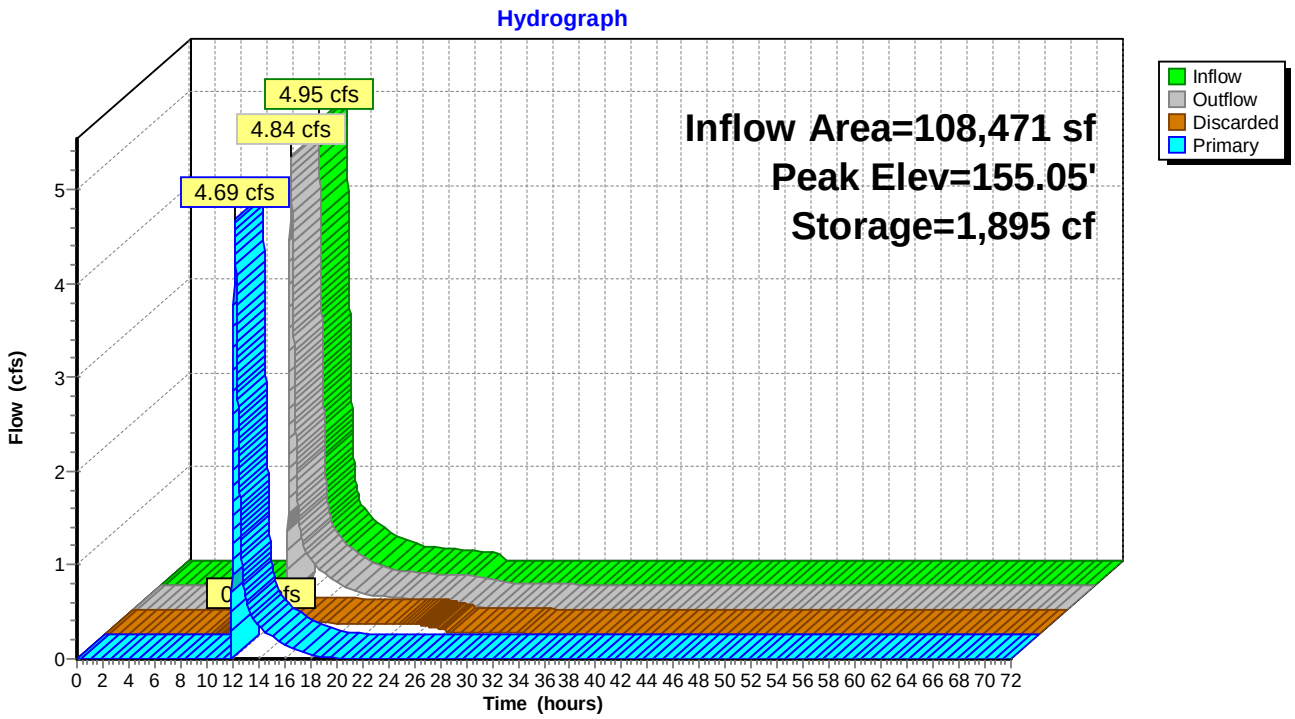
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
154.00	450	902.0	0	0	450
155.00	2,266	914.0	1,242	1,242	2,407
156.00	2,266	914.0	2,266	3,508	3,321

Device	Routing	Invert	Outlet Devices
#1	Discarded	150.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	154.75'	**10.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.15 cfs @ 12.09 hrs HW=155.00' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.15 cfs)

Primary OutFlow Max=4.69 cfs @ 12.18 hrs HW=155.05' TW=0.00' (Dynamic Tailwater)
└**2=Broad-Crested Rectangular Weir** (Weir Controls 4.69 cfs @ 1.57 fps)

Pond 06P: BMP 5 - Infiltration Swale



Summary for Pond 07P: BMP 6 - Infiltration Swale

Inflow Area = 4,593 sf, 65.38% Impervious, Inflow Depth = 3.68" for 25 Year event
Inflow = 0.47 cfs @ 12.07 hrs, Volume= 1,410 cf
Outflow = 0.10 cfs @ 12.49 hrs, Volume= 1,410 cf, Atten= 79%, Lag= 25.3 min
Discarded = 0.05 cfs @ 12.49 hrs, Volume= 1,377 cf
Primary = 0.04 cfs @ 12.49 hrs, Volume= 33 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 155.52' @ 12.49 hrs Surf.Area= 977 sf Storage= 593 cf
Flood Elev= 155.87' Surf.Area= 1,220 sf Storage= 920 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 170.3 min (976.5 - 806.2)

Volume	Invert	Avail.Storage	Storage Description
#1	154.75'	1,578 cf	**Infiltration Swale (Irregular)** Listed below (Recalc)
#2	150.25'	240 cf	**1.00'W x 200.00'L x 3.00'H Crushed stone** 600 cf Overall x 40.0% Voids
		1,818 cf	Total Available Storage

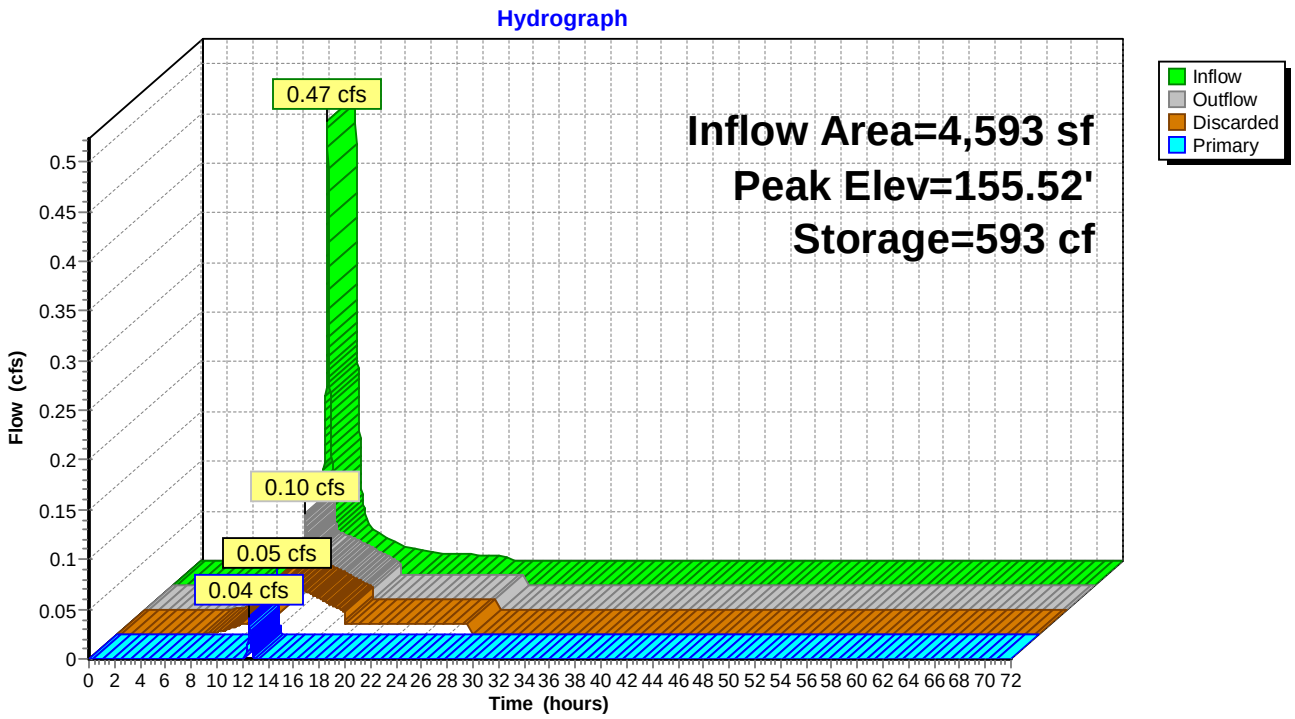
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
154.75	201	403.0	0	0	201
155.75	1,020	416.0	558	558	1,142
156.75	1,020	416.0	1,020	1,578	1,558

Device	Routing	Invert	Outlet Devices
#1	Discarded	150.25'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	155.50'	**5.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.05 cfs @ 12.49 hrs HW=155.52' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.05 cfs)

Primary OutFlow Max=0.04 cfs @ 12.49 hrs HW=155.52' TW=0.00' (Dynamic Tailwater)
└**2=Broad-Crested Rectangular Weir** (Weir Controls 0.04 cfs @ 0.40 fps)

Pond 07P: BMP 6 - Infiltration Swale



Summary for Pond 7P: Lake Cochituate

Inflow Area = 2,467,301 sf, 28.26% Impervious, Inflow Depth = 1.82" for 25 Year event
Inflow = 81.71 cfs @ 12.23 hrs, Volume= 373,757 cf
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 100%, Lag= 0.0 min

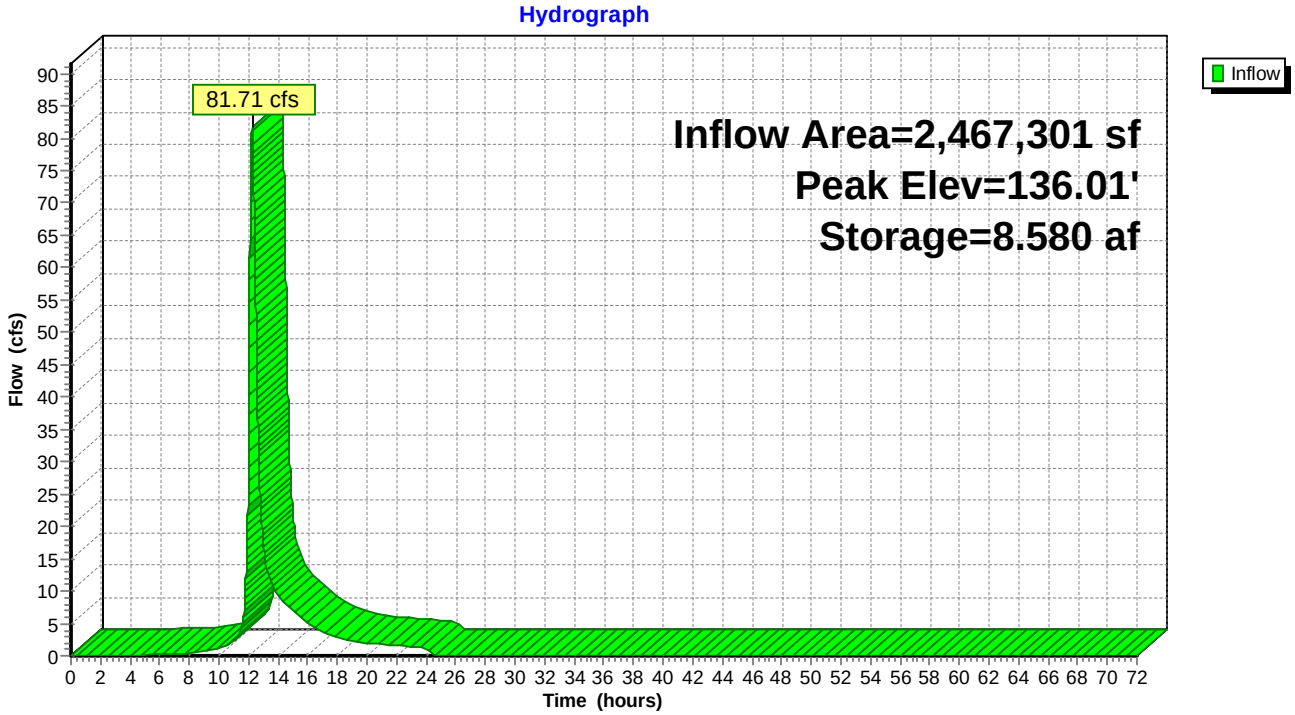
Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 136.01' @ 26.15 hrs Surf.Area= 625.000 ac Storage= 8.580 af

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

Volume	Invert	Avail.Storage	Storage Description
#1	136.00'	625.000 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
136.00	625.000	0.000	0.000
137.00	625.000	625.000	625.000

Pond 7P: Lake Cochituate



Summary for Pond 08P: BMP 7 - Infiltration Swale

Inflow Area = 2,241 sf, 67.51% Impervious, Inflow Depth = 3.79" for 25 Year event
Inflow = 0.23 cfs @ 12.07 hrs, Volume= 707 cf
Outflow = 0.10 cfs @ 12.27 hrs, Volume= 707 cf, Atten= 58%, Lag= 11.7 min
Discarded = 0.02 cfs @ 12.27 hrs, Volume= 635 cf
Primary = 0.07 cfs @ 12.27 hrs, Volume= 72 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 156.93' @ 12.27 hrs Surf.Area= 431 sf Storage= 260 cf
Flood Elev= 157.27' Surf.Area= 535 sf Storage= 401 cf

Plug-Flow detention time= 159.1 min calculated for 707 cf (100% of inflow)
Center-of-Mass det. time= 159.2 min (962.5 - 803.3)

Volume	Invert	Avail.Storage	Storage Description
#1	156.15'	695 cf	**Infiltration Swale (Irregular)** Listed below (Recalc)
#2	151.65'	102 cf	**1.00'W x 85.00'L x 3.00'H Crushed stone** 255 cf Overall x 40.0% Voids
		797 cf	Total Available Storage

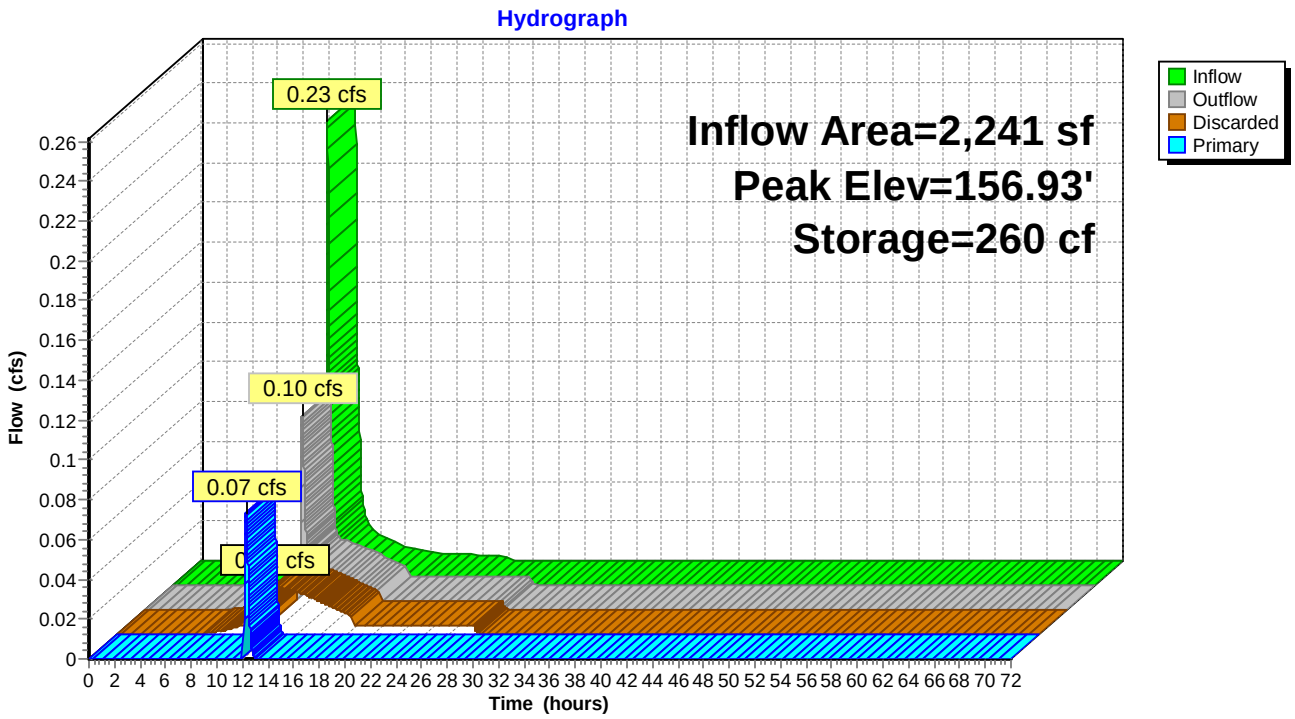
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
156.15	87	175.0	0	0	87
157.15	450	188.0	245	245	504
158.15	450	188.0	450	695	692

Device	Routing	Invert	Outlet Devices
#1	Discarded	151.65'	**2.410 in/hr Exfiltration over Surface area** Phase-In= 0.10'
#2	Primary	156.90'	**5.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.02 cfs @ 12.27 hrs HW=156.93' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=0.07 cfs @ 12.27 hrs HW=156.93' TW=0.00' (Dynamic Tailwater)
└**2=Broad-Crested Rectangular Weir** (Weir Controls 0.07 cfs @ 0.49 fps)

Pond 08P: BMP 7 - Infiltration Swale



Summary for Pond 09P: BMP 8 - Infiltration Swale

Inflow Area = 10,487 sf, 62.20% Impervious, Inflow Depth = 3.58" for 25 Year event
Inflow = 1.04 cfs @ 12.07 hrs, Volume= 3,132 cf
Outflow = 0.58 cfs @ 12.18 hrs, Volume= 3,132 cf, Atten= 45%, Lag= 6.7 min
Discarded = 0.09 cfs @ 12.18 hrs, Volume= 2,499 cf
Primary = 0.49 cfs @ 12.18 hrs, Volume= 633 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 158.11' @ 12.18 hrs Surf.Area= 1,588 sf Storage= 992 cf
Flood Elev= 158.47' Surf.Area= 1,821 sf Storage= 1,527 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 144.7 min (953.8 - 809.1)

Volume	Invert	Avail.Storage	Storage Description
#1	157.25'	2,354 cf	**Infiltration Swale (Irregular)** Listed below (Recalc)
#2	152.75'	360 cf	**1.00'W x 300.00'L x 3.00'H Crushed stone** 900 cf Overall x 40.0% Voids
		2,714 cf	Total Available Storage

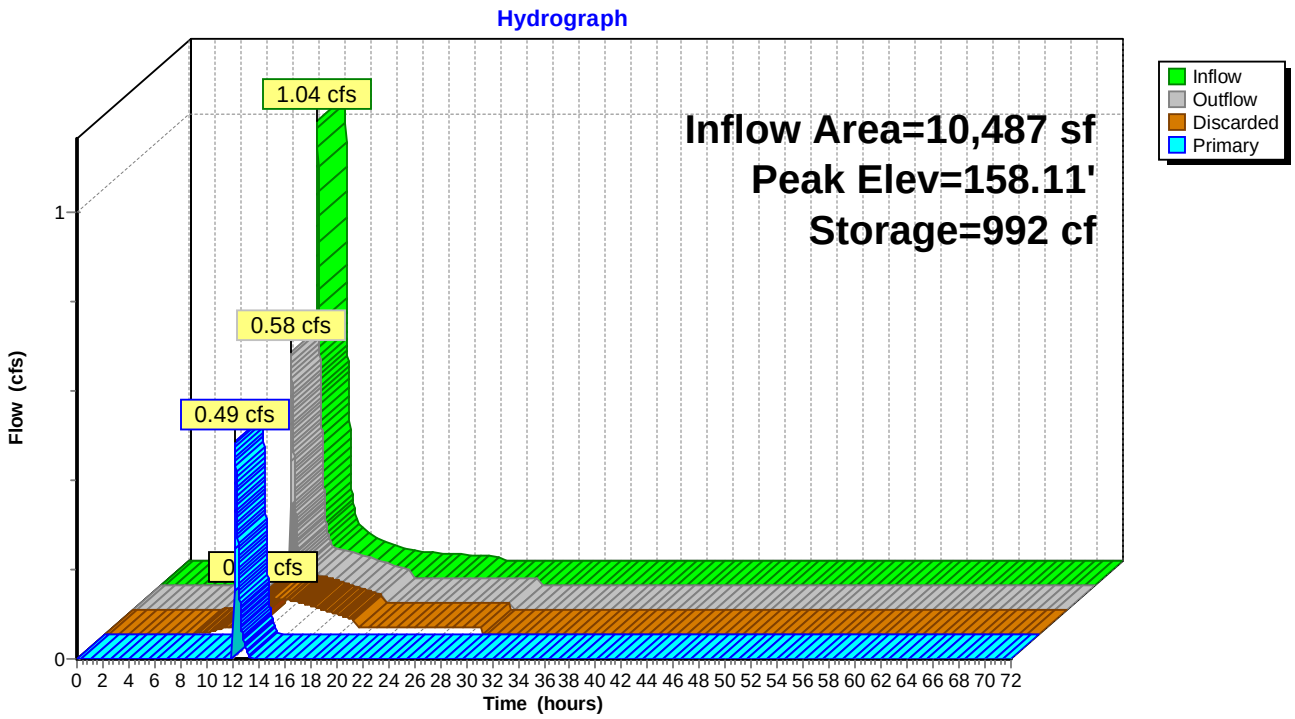
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
157.25	301	604.0	0	0	301
158.25	1,521	616.0	833	833	1,616
159.25	1,521	616.0	1,521	2,354	2,232

Device	Routing	Invert	Outlet Devices
#1	Discarded	152.75'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	158.00'	**5.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.09 cfs @ 12.18 hrs HW=158.11' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.09 cfs)

Primary OutFlow Max=0.49 cfs @ 12.18 hrs HW=158.11' TW=0.00' (Dynamic Tailwater)
└**2=Broad-Crested Rectangular Weir** (Weir Controls 0.49 cfs @ 0.91 fps)

Pond 09P: BMP 8 - Infiltration Swale



Summary for Pond 10P: BMP 9 - Infiltration Swale

[58] Hint: Peaked 0.11' above defined flood level

Inflow Area =	234,888 sf, 22.66% Impervious, Inflow Depth = 1.72" for 25 Year event				
Inflow =	7.14 cfs @	12.27 hrs,	Volume=	33,736 cf	
Outflow =	6.73 cfs @	12.34 hrs,	Volume=	33,736 cf,	Atten= 6%, Lag= 4.1 min
Discarded =	0.24 cfs @	12.15 hrs,	Volume=	10,922 cf	
Primary =	6.50 cfs @	12.34 hrs,	Volume=	22,814 cf	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 158.32' @ 12.34 hrs Surf.Area= 4,219 sf Storage= 3,882 cf
Flood Elev= 158.21' Surf.Area= 4,219 sf Storage= 3,509 cf

Plug-Flow detention time= 59.8 min calculated for 33,732 cf (100% of inflow)
Center-of-Mass det. time= 59.8 min (934.8 - 874.9)

Volume	Invert	Avail.Storage	Storage Description
#1	157.00'	5,449 cf	**Infiltration Swale (Irregular)** Listed below (Recalc)
#2	152.50'	840 cf	**1.00'W x 700.00'L x 3.00'H Crushed stone** 2,100 cf Overall x 40.0% Voids
		6,289 cf	Total Available Storage

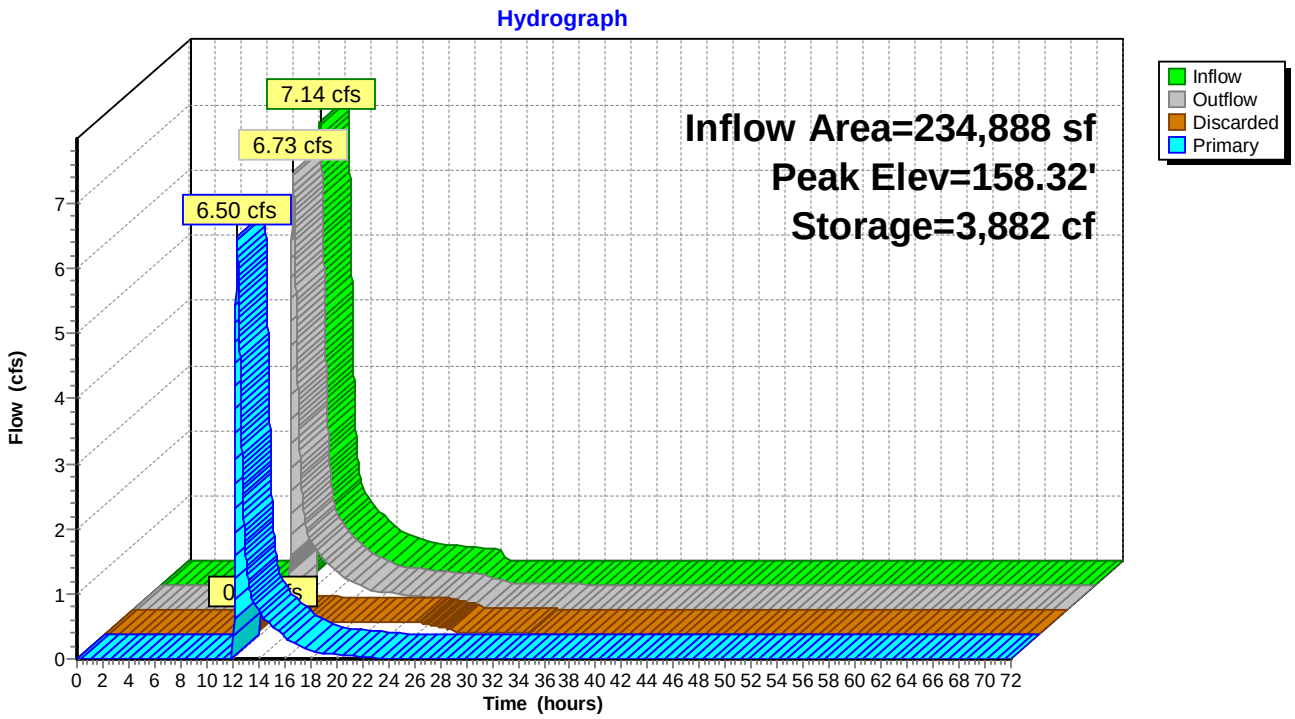
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
157.00	701	1,403.0	0	0	701
158.00	3,519	1,416.0	1,930	1,930	3,940
159.00	3,519	1,416.0	3,519	5,449	5,356

Device	Routing	Invert	Outlet Devices
#1	Discarded	152.50'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	157.75'	**5.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.24 cfs @ 12.15 hrs HW=158.02' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.24 cfs)

Primary OutFlow Max=6.50 cfs @ 12.34 hrs HW=158.32' TW=0.00' (Dynamic Tailwater)
└**2=Broad-Crested Rectangular Weir** (Weir Controls 6.50 cfs @ 2.30 fps)

Pond 10P: BMP 9 - Infiltration Swale



Summary for Pond 11P: BMP 10 - Infiltration Swale

[58] Hint: Peaked 0.10' above defined flood level

Inflow Area =	316,495 sf, 27.57% Impervious, Inflow Depth = 1.65" for 25 Year event				
Inflow =	9.68 cfs @	12.23 hrs,	Volume=	43,438 cf	
Outflow =	9.60 cfs @	12.25 hrs,	Volume=	43,438 cf,	Atten= 1%, Lag= 1.2 min
Discarded =	0.16 cfs @	12.07 hrs,	Volume=	7,516 cf	
Primary =	9.44 cfs @	12.25 hrs,	Volume=	35,923 cf	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 158.47' @ 12.25 hrs Surf.Area= 2,870 sf Storage= 2,398 cf
Flood Elev= 158.37' Surf.Area= 2,870 sf Storage= 2,170 cf

Plug-Flow detention time= 31.7 min calculated for 43,432 cf (100% of inflow)
Center-of-Mass det. time= 31.8 min (907.0 - 875.2)

Volume	Invert	Avail.Storage	Storage Description
#1	157.25'	3,707 cf	**Infiltration Swale (Irregular)** Listed below (Recalc)
#2	152.75'	570 cf	**1.00'W x 475.00'L x 3.00'H Crushed stone** 1,425 cf Overall x 40.0% Voids
		4,277 cf	Total Available Storage

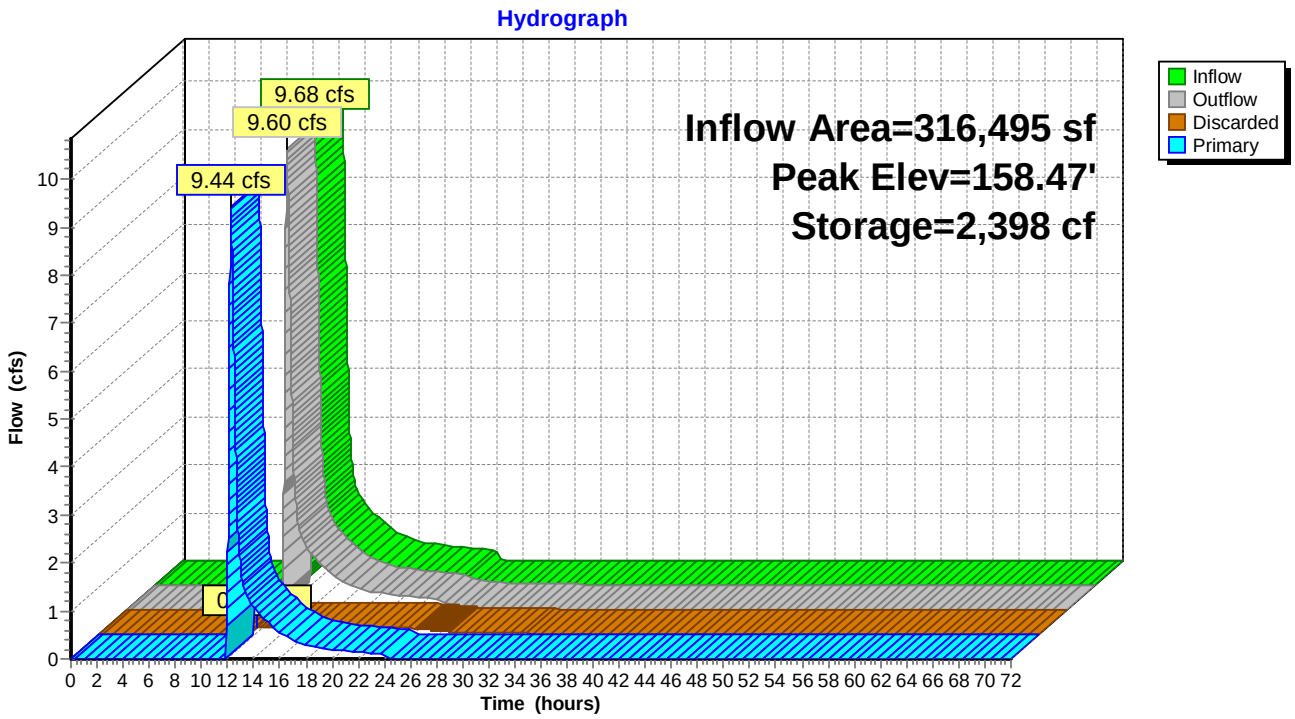
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
157.25	475	953.0	0	0	475
158.25	2,395	966.0	1,312	1,312	2,680
159.25	2,395	966.0	2,395	3,707	3,646

Device	Routing	Invert	Outlet Devices
#1	Discarded	152.75'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	158.00'	**10.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.16 cfs @ 12.07 hrs HW=158.26' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.16 cfs)

Primary OutFlow Max=9.43 cfs @ 12.25 hrs HW=158.47' TW=0.00' (Dynamic Tailwater)
└**2=Broad-Crested Rectangular Weir** (Weir Controls 9.43 cfs @ 2.03 fps)

Pond 11P: BMP 10 - Infiltration Swale



Summary for Pond 12P: BMP 11 - Infiltration Swale

Inflow Area = 15,210 sf, 38.96% Impervious, Inflow Depth = 2.55" for 25 Year event
Inflow = 0.89 cfs @ 12.15 hrs, Volume= 3,232 cf
Outflow = 0.86 cfs @ 12.18 hrs, Volume= 3,232 cf, Atten= 3%, Lag= 1.6 min
Discarded = 0.05 cfs @ 12.18 hrs, Volume= 1,753 cf
Primary = 0.81 cfs @ 12.18 hrs, Volume= 1,479 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 157.65' @ 12.18 hrs Surf.Area= 836 sf Storage= 528 cf
Flood Elev= 157.93' Surf.Area= 919 sf Storage= 739 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 93.6 min (936.1 - 842.5)

Volume	Invert	Avail.Storage	Storage Description
#1	156.75'	1,189 cf	**Infiltration Swale (Irregular)** Listed below (Recalc)
#2	152.25'	180 cf	**1.00'W x 150.00'L x 3.00'H Crushed stone** 450 cf Overall x 40.0% Voids
		1,369 cf	Total Available Storage

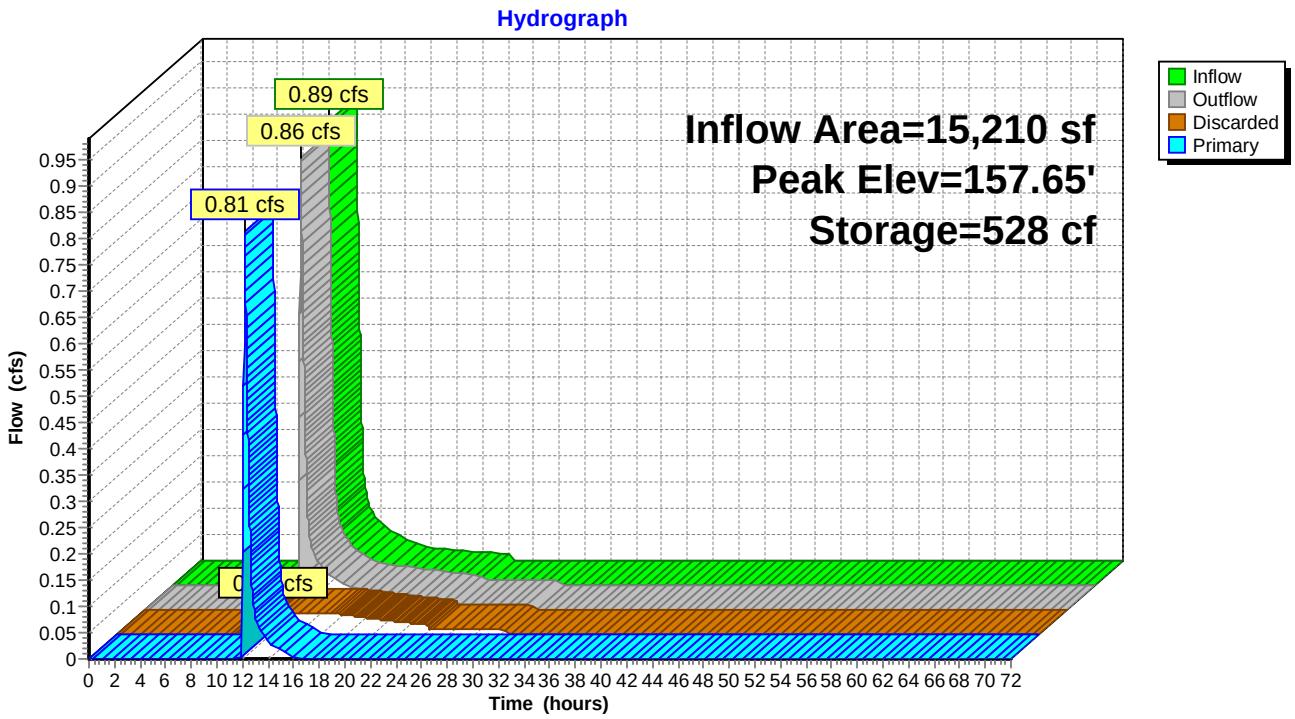
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
156.75	151	303.0	0	0	151
157.75	769	316.0	420	420	862
158.75	769	316.0	769	1,189	1,178

Device	Routing	Invert	Outlet Devices
#1	Discarded	152.25'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	157.50'	**5.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.05 cfs @ 12.18 hrs HW=157.65' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.05 cfs)

Primary OutFlow Max=0.81 cfs @ 12.18 hrs HW=157.65' TW=0.00' (Dynamic Tailwater)
└**2=Broad-Crested Rectangular Weir** (Weir Controls 0.81 cfs @ 1.08 fps)

Pond 12P: BMP 11 - Infiltration Swale



Summary for Pond 13P: BMP 12 - Infiltration Swale

Inflow Area =	13,927 sf, 62.52% Impervious, Inflow Depth = 3.58" for 25 Year event				
Inflow =	1.38 cfs @	12.07 hrs,	Volume=	4,160 cf	
Outflow =	0.70 cfs @	12.20 hrs,	Volume=	4,160 cf,	Atten= 49%, Lag= 7.8 min
Discarded =	0.12 cfs @	12.20 hrs,	Volume=	3,329 cf	
Primary =	0.58 cfs @	12.20 hrs,	Volume=	831 cf	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 156.37' @ 12.20 hrs Surf.Area= 2,140 sf Storage= 1,343 cf
Flood Elev= 156.49' Surf.Area= 2,398 sf Storage= 1,567 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 145.2 min (954.3 - 809.1)

Volume	Invert	Avail.Storage	Storage Description
#1	155.50'	3,127 cf	**Infiltration Swale (Irregular)** Listed below (Recalc)
#2	151.00'	480 cf	**1.00'W x 400.00'L x 3.00'H Crushed stone** 1,200 cf Overall x 40.0% Voids
		3,607 cf	Total Available Storage

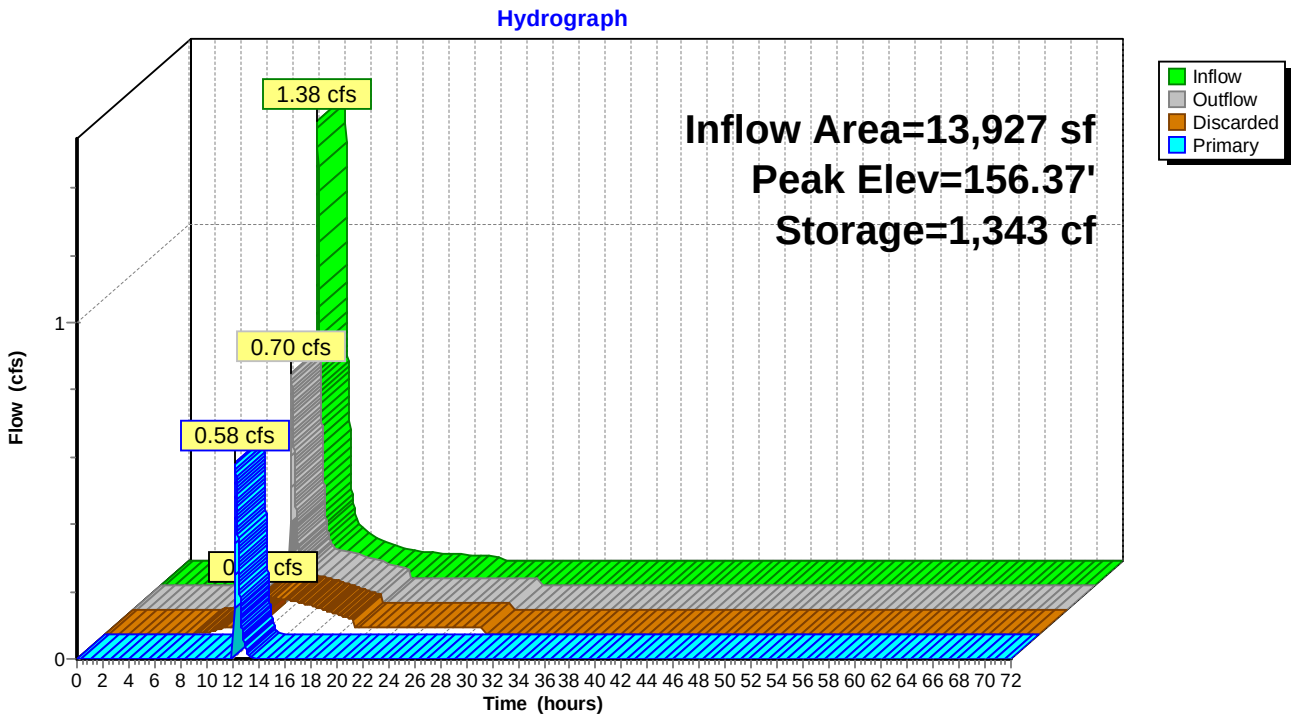
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
155.50	401	803.0	0	0	401
156.50	2,020	816.0	1,107	1,107	2,261
157.50	2,020	816.0	2,020	3,127	3,077

Device	Routing	Invert	Outlet Devices
#1	Discarded	151.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	156.25'	**5.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.12 cfs @ 12.20 hrs HW=156.37' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.12 cfs)

Primary OutFlow Max=0.58 cfs @ 12.20 hrs HW=156.37' TW=0.00' (Dynamic Tailwater)
└**2=Broad-Crested Rectangular Weir** (Weir Controls 0.58 cfs @ 0.97 fps)

Pond 13P: BMP 12 - Infiltration Swale



Summary for Pond 14P: BMP 13 - Infiltration Swale

[87] Warning: Oscillations may require Finer Routing or smaller dt

Inflow Area =	26,591 sf, 37.08% Impervious, Inflow Depth = 2.46" for 25 Year event				
Inflow =	1.48 cfs @	12.16 hrs,	Volume=	5,456 cf	
Outflow =	1.07 cfs @	12.28 hrs,	Volume=	5,456 cf,	Atten= 28%, Lag= 7.4 min
Discarded =	0.12 cfs @	12.28 hrs,	Volume=	3,768 cf	
Primary =	0.95 cfs @	12.28 hrs,	Volume=	1,688 cf	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 156.42' @ 12.28 hrs Surf.Area= 2,133 sf Storage= 1,359 cf
Flood Elev= 156.69' Surf.Area= 2,308 sf Storage= 1,879 cf

Plug-Flow detention time= 124.2 min calculated for 5,456 cf (100% of inflow)
Center-of-Mass det. time= 124.2 min (969.5 - 845.3)

Volume	Invert	Avail.Storage	Storage Description
#1	155.50'	2,983 cf	**Infiltration Swale (Irregular)** Listed below (Recalc)
#2	151.00'	457 cf	**1.00'W x 381.00'L x 3.00'H Crushed stone** 1,143 cf Overall x 40.0% Voids
		3,440 cf	Total Available Storage

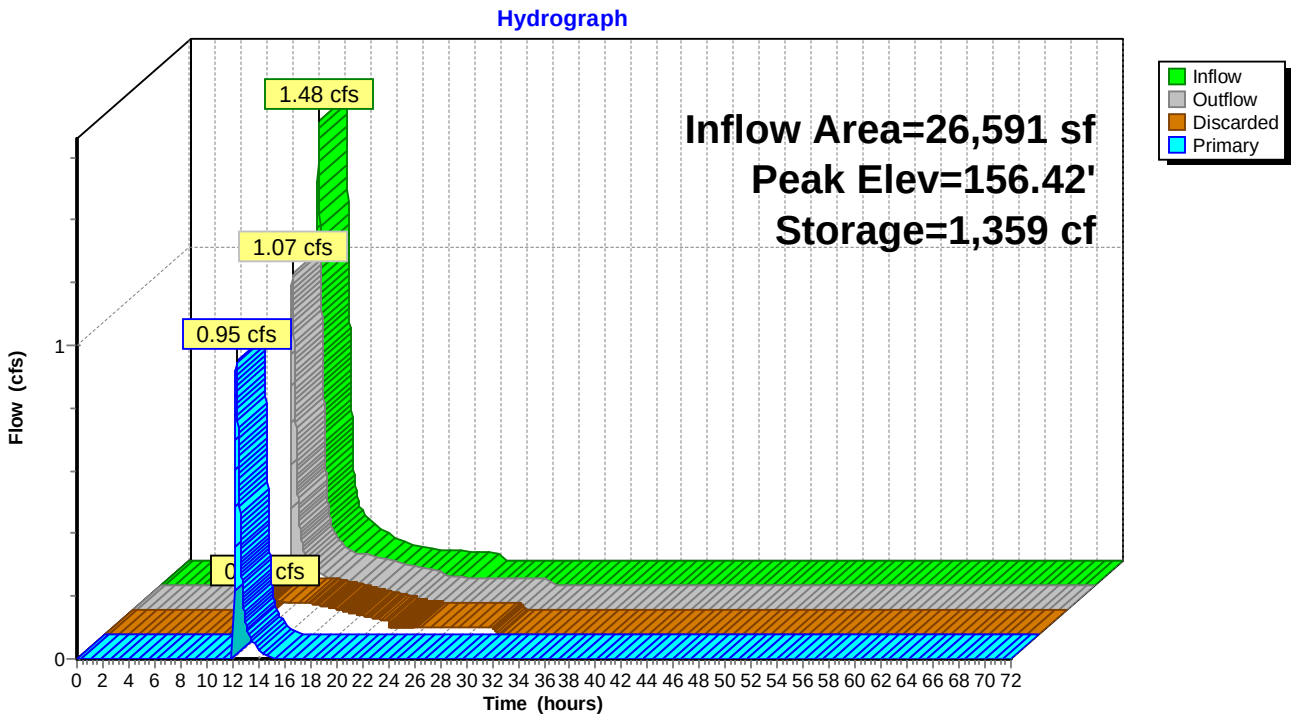
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
155.50	382	766.0	0	0	382
156.50	1,927	779.0	1,056	1,056	2,157
157.50	1,927	779.0	1,927	2,983	2,936

Device	Routing	Invert	Outlet Devices
#1	Discarded	151.00'	**2.410 in/hr Exfiltration over Surface area** Phase-In= 0.10'
#2	Primary	156.25'	**5.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.12 cfs @ 12.28 hrs HW=156.42' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.12 cfs)

Primary OutFlow Max=0.95 cfs @ 12.28 hrs HW=156.42' TW=0.00' (Dynamic Tailwater)
└**2=Broad-Crested Rectangular Weir** (Weir Controls 0.95 cfs @ 1.14 fps)

Pond 14P: BMP 13 - Infiltration Swale

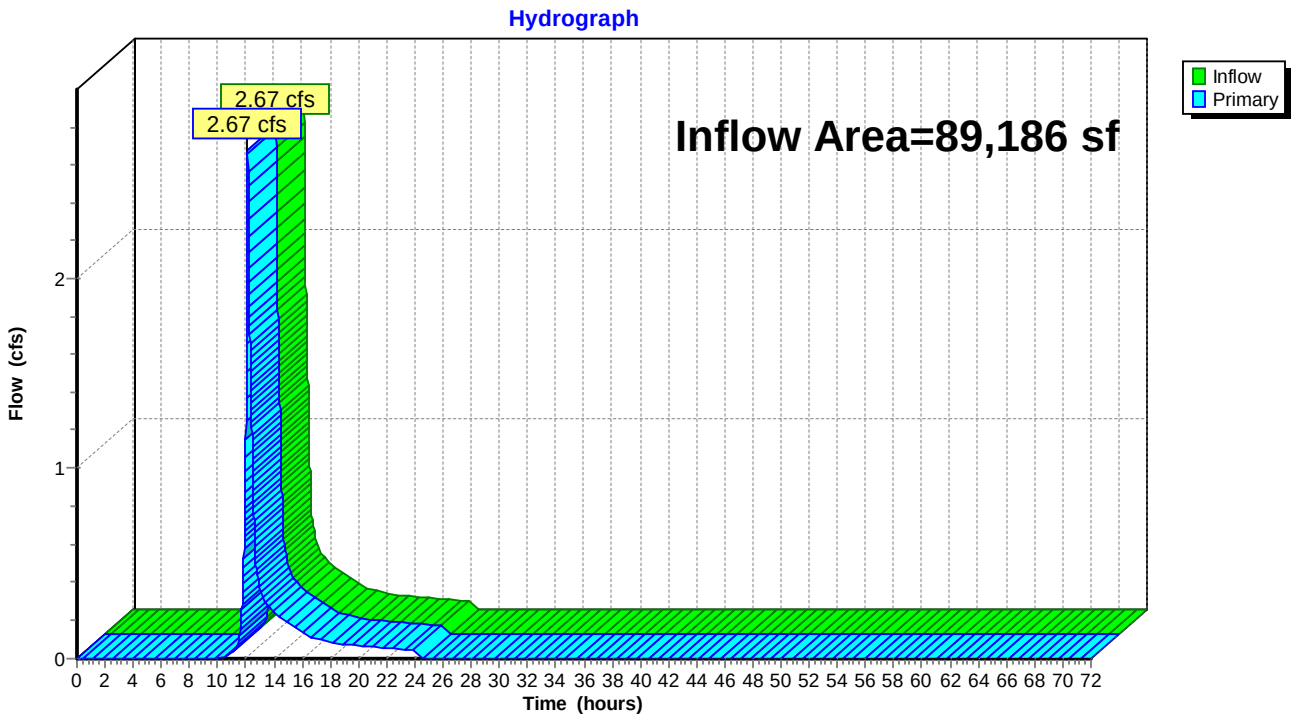


Summary for Link 1L: Total to Bioretention

Inflow Area = 89,186 sf, 21.87% Impervious, Inflow Depth = 1.28" for 25 Year event
Inflow = 2.67 cfs @ 12.13 hrs, Volume= 9,486 cf
Primary = 2.67 cfs @ 12.13 hrs, Volume= 9,486 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link 1L: Total to Bioretention

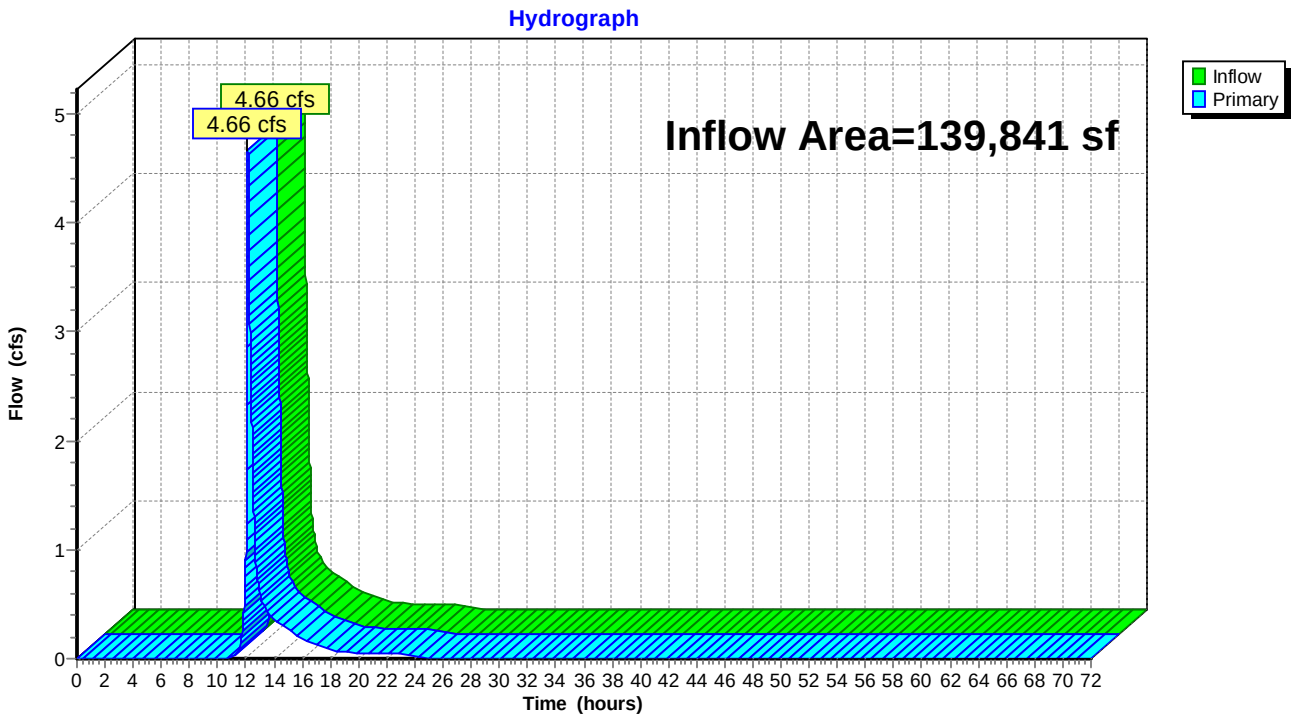


Summary for Link 2L: Lake Cochituate N1

Inflow Area = 139,841 sf, 19.05% Impervious, Inflow Depth = 1.13" for 25 Year event
Inflow = 4.66 cfs @ 12.14 hrs, Volume= 13,210 cf
Primary = 4.66 cfs @ 12.14 hrs, Volume= 13,210 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link 2L: Lake Cochituate N1

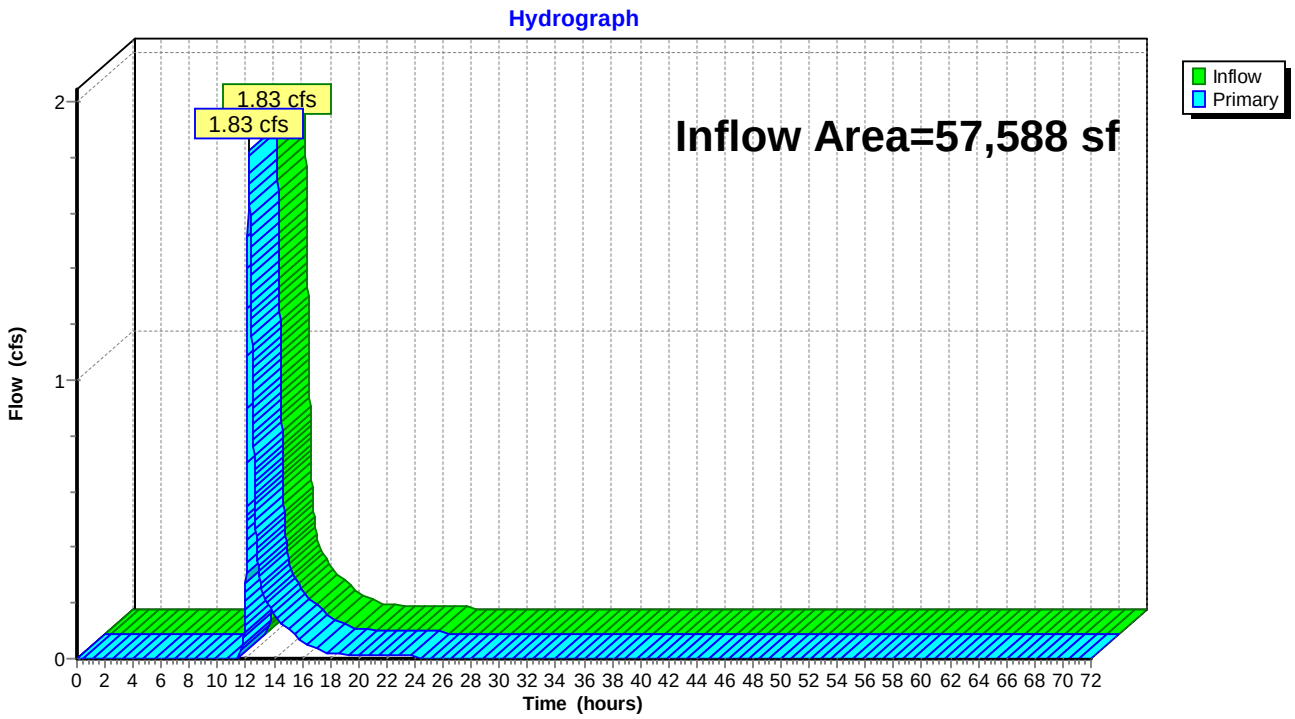


Summary for Link 3L: Lake Cochituate N2

Inflow Area = 57,588 sf, 12.49% Impervious, Inflow Depth = 1.10" for 25 Year event
Inflow = 1.83 cfs @ 12.21 hrs, Volume= 5,273 cf
Primary = 1.83 cfs @ 12.21 hrs, Volume= 5,273 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link 3L: Lake Cochituate N2

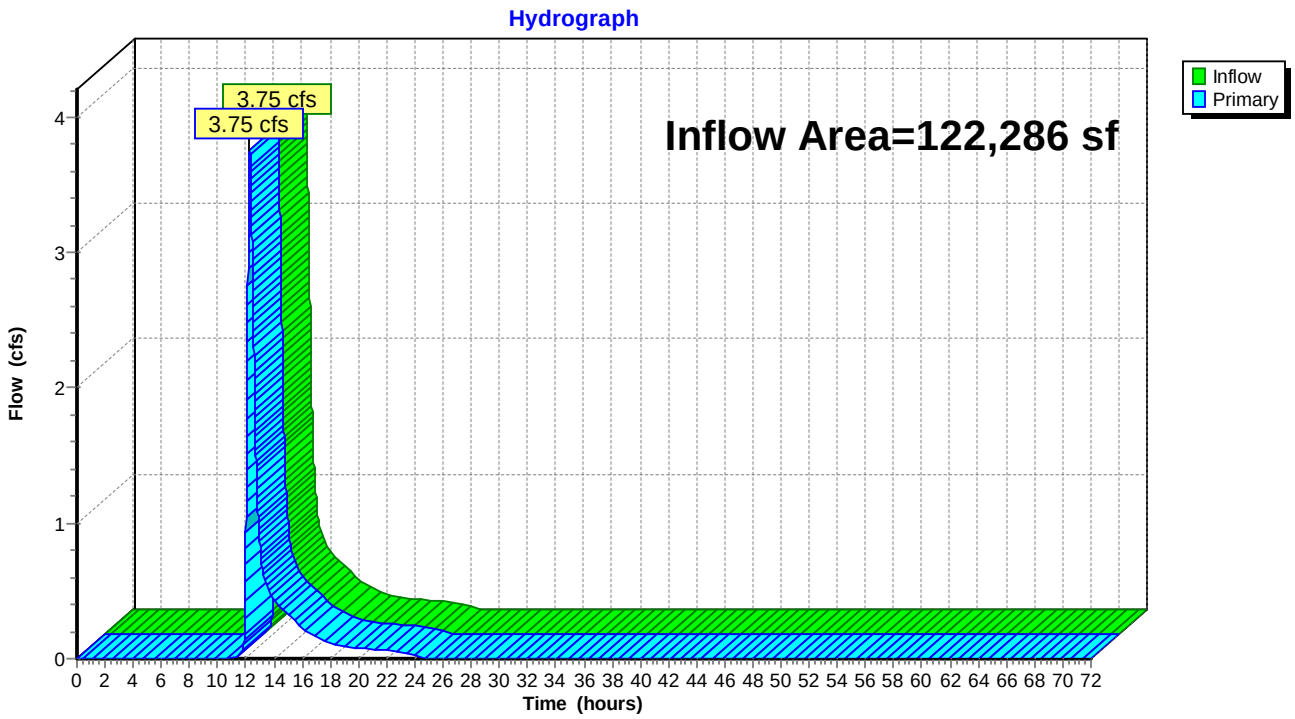


Summary for Link 4L: Lake Cochituate N3

Inflow Area = 122,286 sf, 13.65% Impervious, Inflow Depth = 1.49" for 25 Year event
Inflow = 3.75 cfs @ 12.28 hrs, Volume= 15,203 cf
Primary = 3.75 cfs @ 12.28 hrs, Volume= 15,203 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link 4L: Lake Cochituate N3

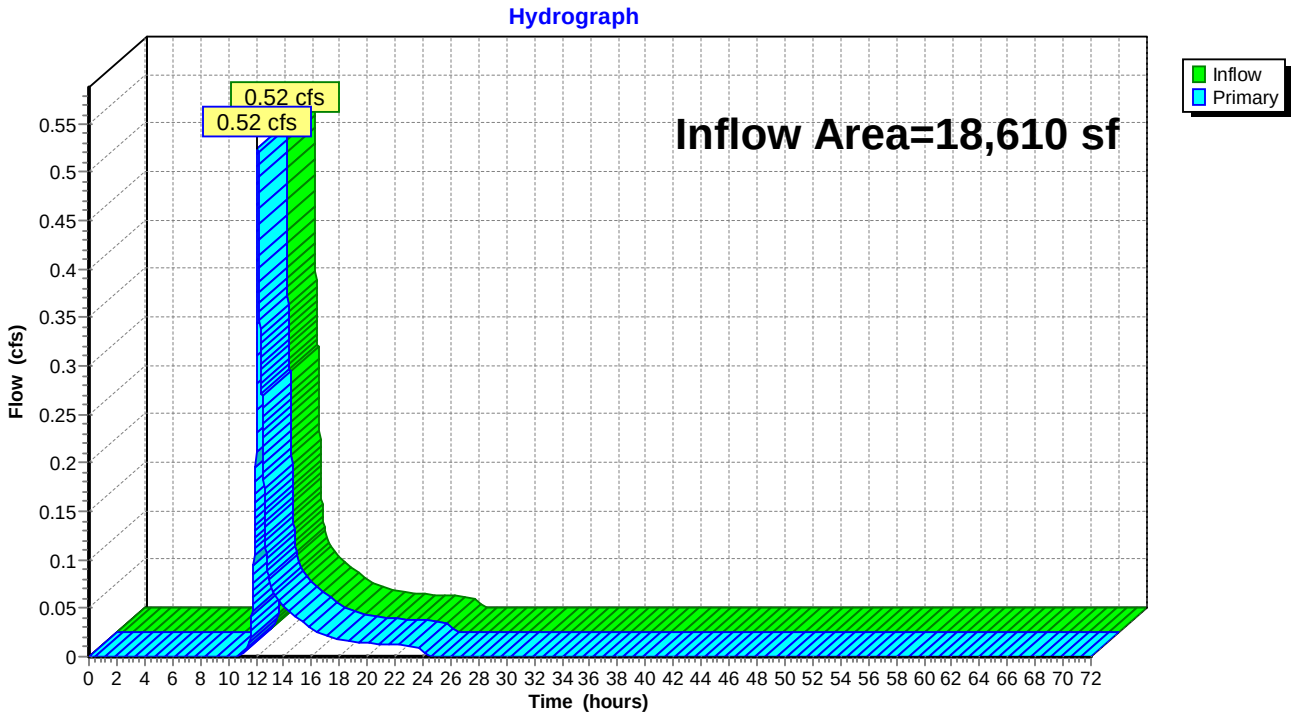


Summary for Link 5L: Lake Cochituate W2

Inflow Area = 18,610 sf, 23.30% Impervious, Inflow Depth = 1.26" for 25 Year event
Inflow = 0.52 cfs @ 12.13 hrs, Volume= 1,957 cf
Primary = 0.52 cfs @ 12.13 hrs, Volume= 1,957 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link 5L: Lake Cochituate W2

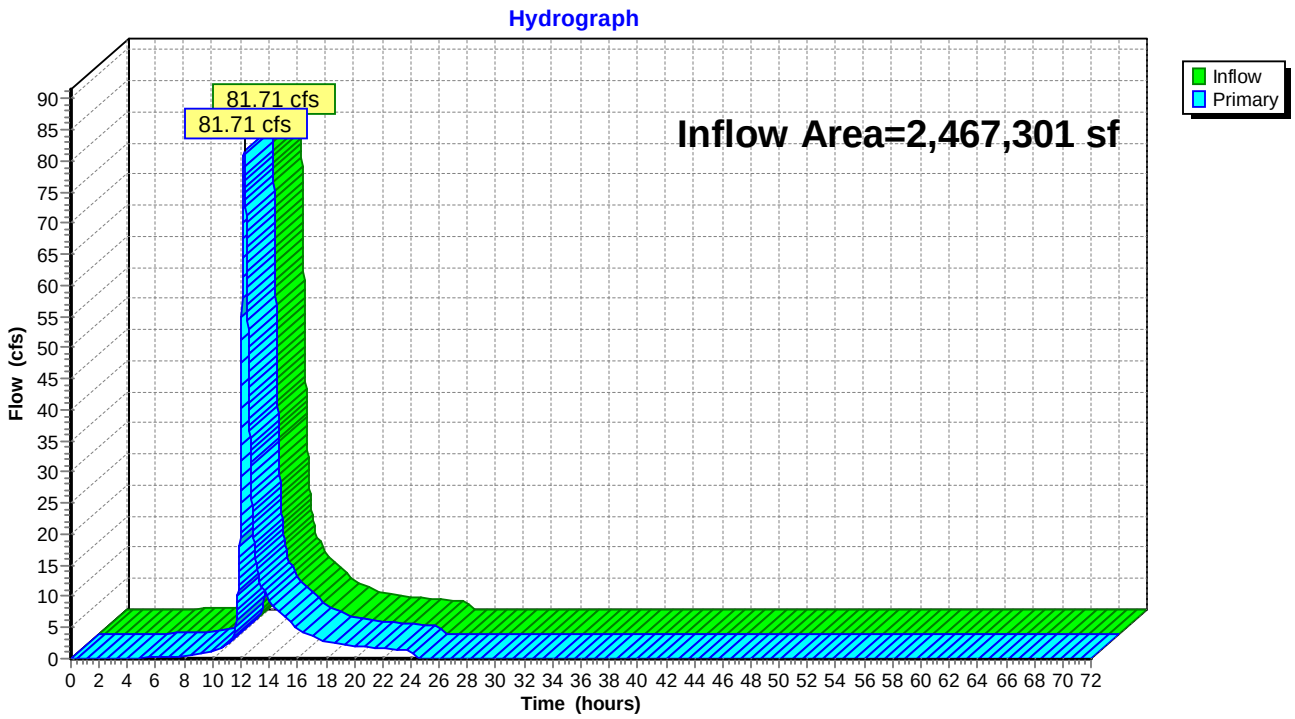


Summary for Link 6L: Total

Inflow Area = 2,467,301 sf, 28.26% Impervious, Inflow Depth = 1.82" for 25 Year event
Inflow = 81.71 cfs @ 12.23 hrs, Volume= 373,757 cf
Primary = 81.71 cfs @ 12.23 hrs, Volume= 373,757 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link 6L: Total

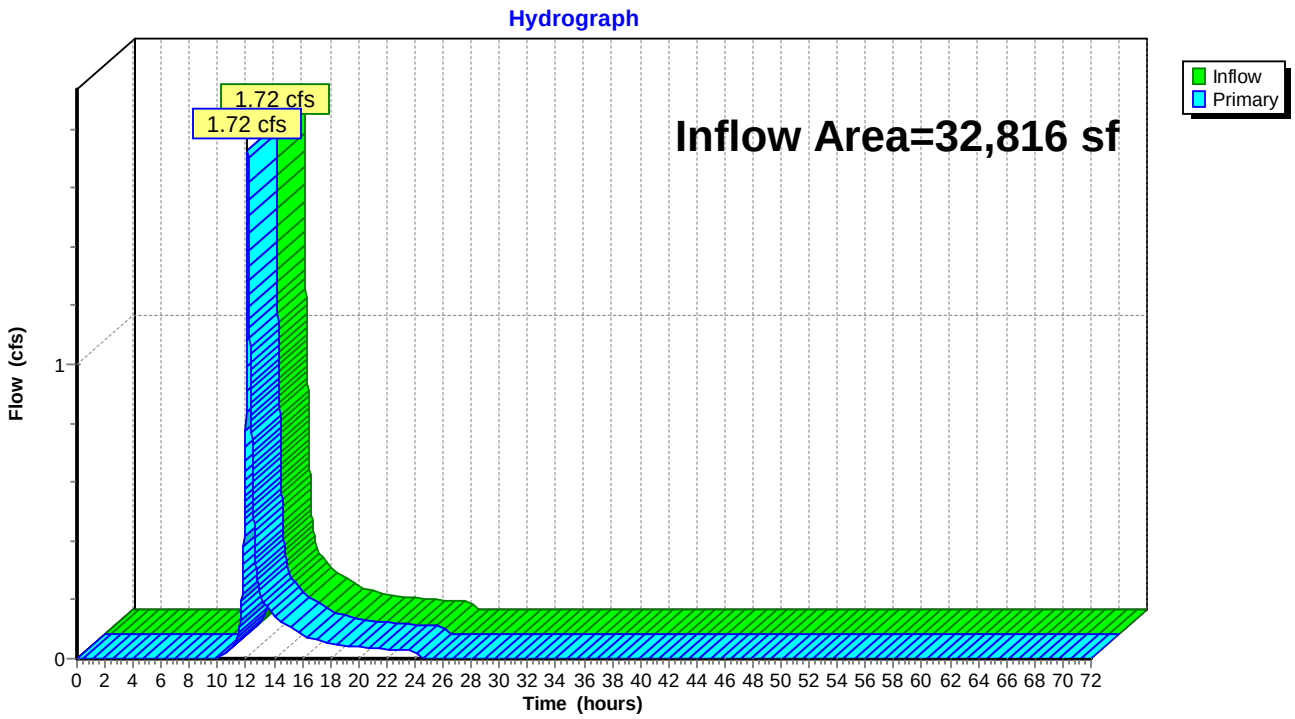


Summary for Link DP01: Cochituate Rd

Inflow Area = 32,816 sf, 19.44% Impervious, Inflow Depth = 2.21" for 25 Year event
Inflow = 1.72 cfs @ 12.13 hrs, Volume= 6,033 cf
Primary = 1.72 cfs @ 12.13 hrs, Volume= 6,033 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP01: Cochituate Rd

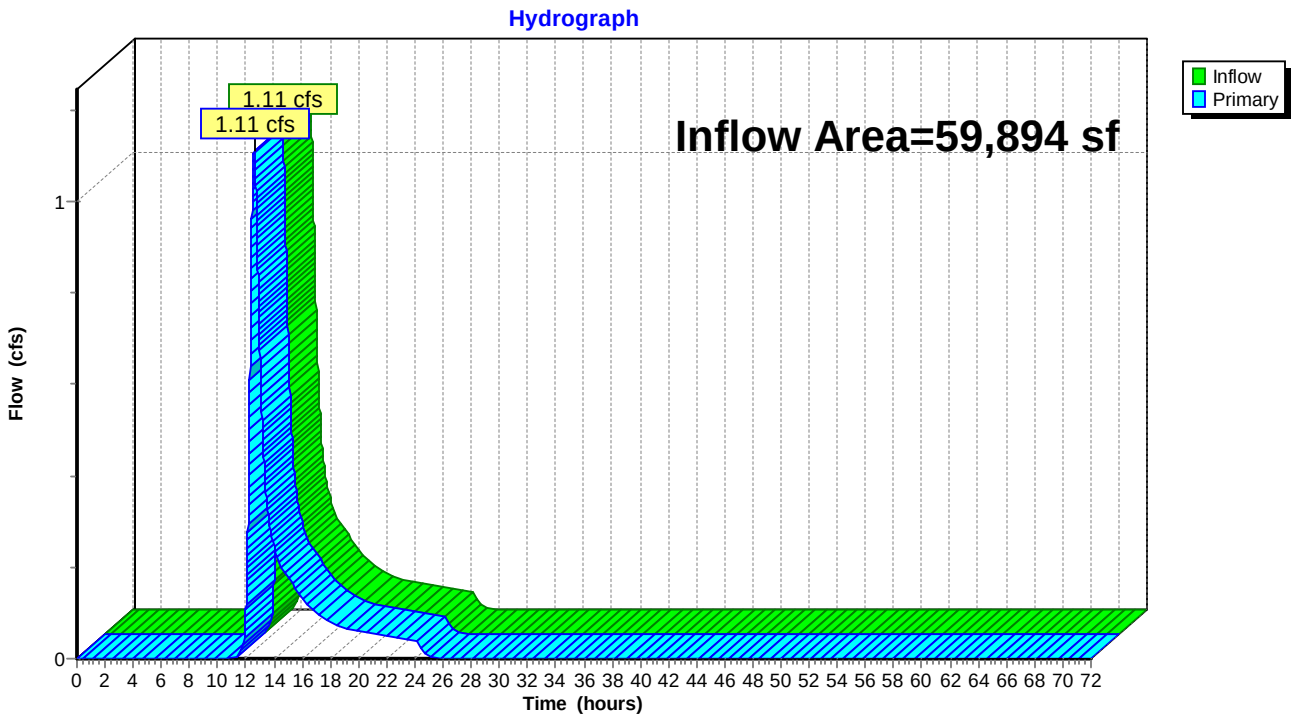


Summary for Link DP02: Chrysler Road

Inflow Area = 59,894 sf, 5.23% Impervious, Inflow Depth = 1.50" for 25 Year event
Inflow = 1.11 cfs @ 12.58 hrs, Volume= 7,474 cf
Primary = 1.11 cfs @ 12.58 hrs, Volume= 7,474 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP02: Chrysler Road

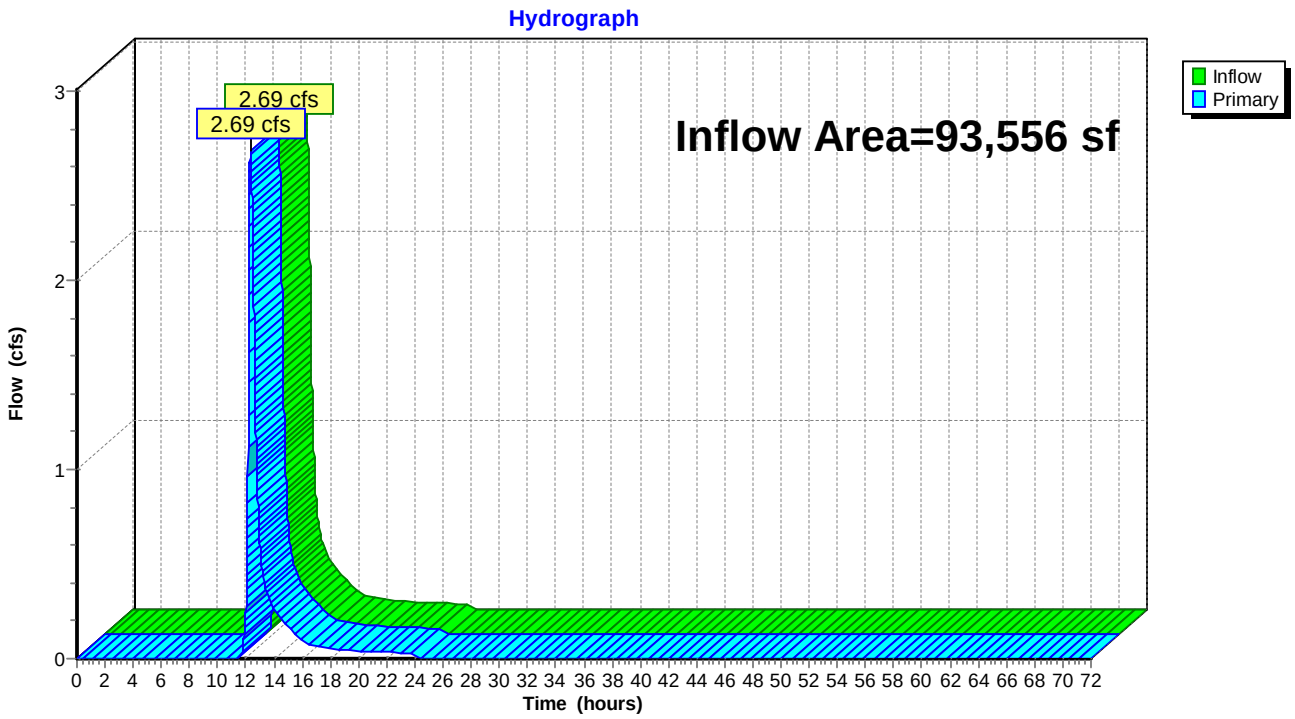


Summary for Link DP03: WF A

Inflow Area = 93,556 sf, 18.14% Impervious, Inflow Depth = 1.20" for 25 Year event
Inflow = 2.69 cfs @ 12.32 hrs, Volume= 9,327 cf
Primary = 2.69 cfs @ 12.32 hrs, Volume= 9,327 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP03: WF A

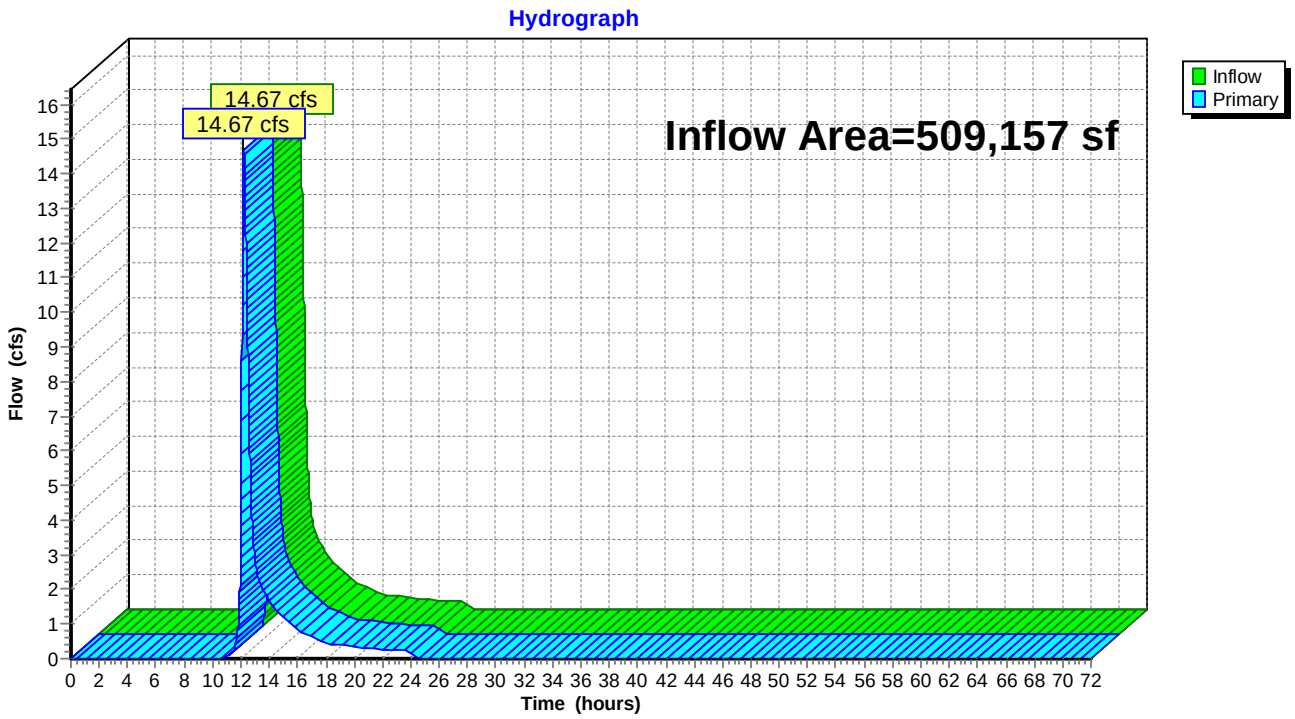


Summary for Link DP04: Lake Cochituate Middle Pond

Inflow Area = 509,157 sf, 12.96% Impervious, Inflow Depth = 1.39" for 25 Year event
Inflow = 14.67 cfs @ 12.20 hrs, Volume= 59,133 cf
Primary = 14.67 cfs @ 12.20 hrs, Volume= 59,133 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP04: Lake Cochituate Middle Pond

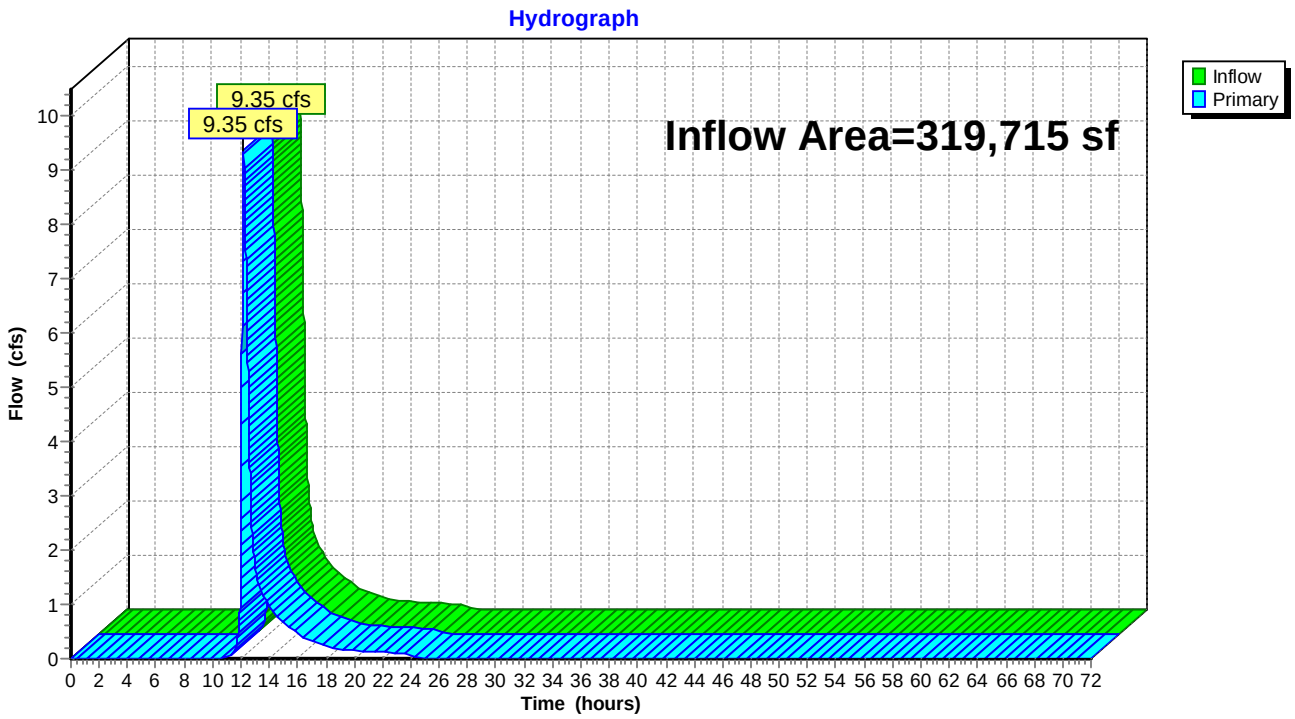


Summary for Link DP04-1: WF B

Inflow Area = 319,715 sf, 15.80% Impervious, Inflow Depth = 1.26" for 25 Year event
Inflow = 9.35 cfs @ 12.18 hrs, Volume= 33,686 cf
Primary = 9.35 cfs @ 12.18 hrs, Volume= 33,686 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP04-1: WF B

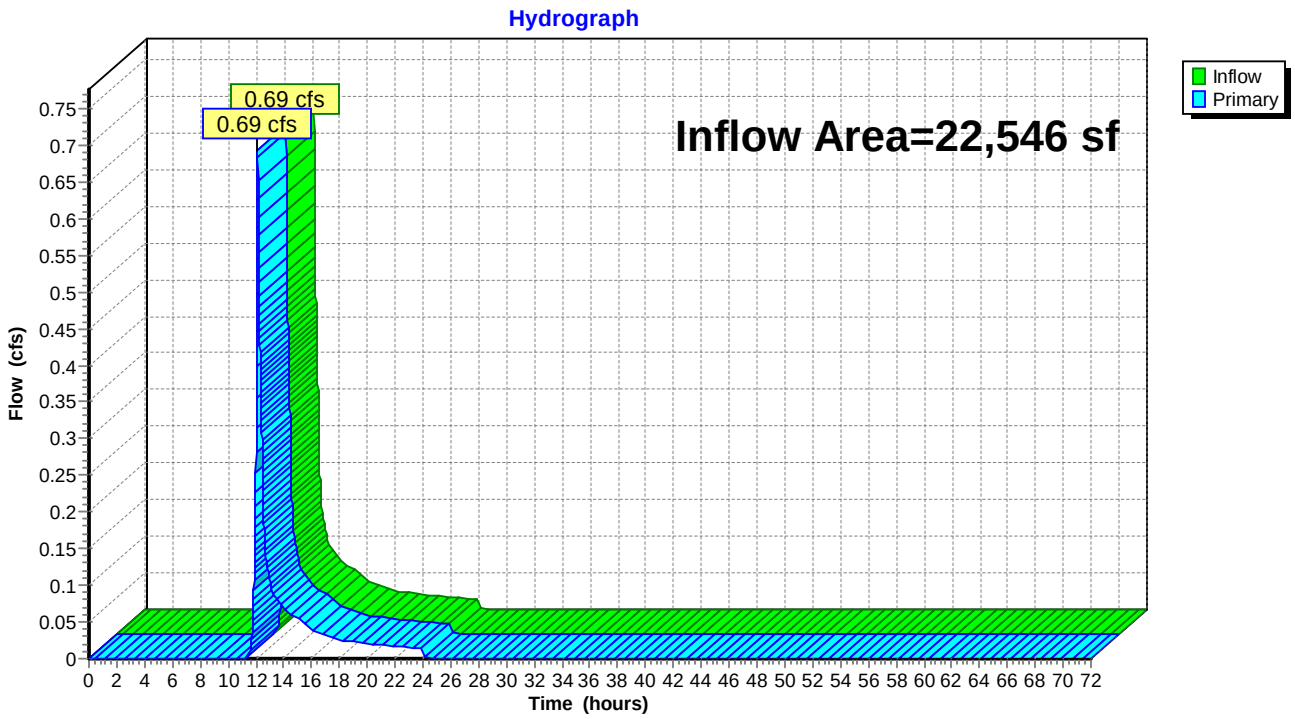


Summary for Link DP04-2: WF C

Inflow Area = 22,546 sf, 0.00% Impervious, Inflow Depth = 1.35" for 25 Year event
Inflow = 0.69 cfs @ 12.12 hrs, Volume= 2,541 cf
Primary = 0.69 cfs @ 12.12 hrs, Volume= 2,541 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP04-2: WF C

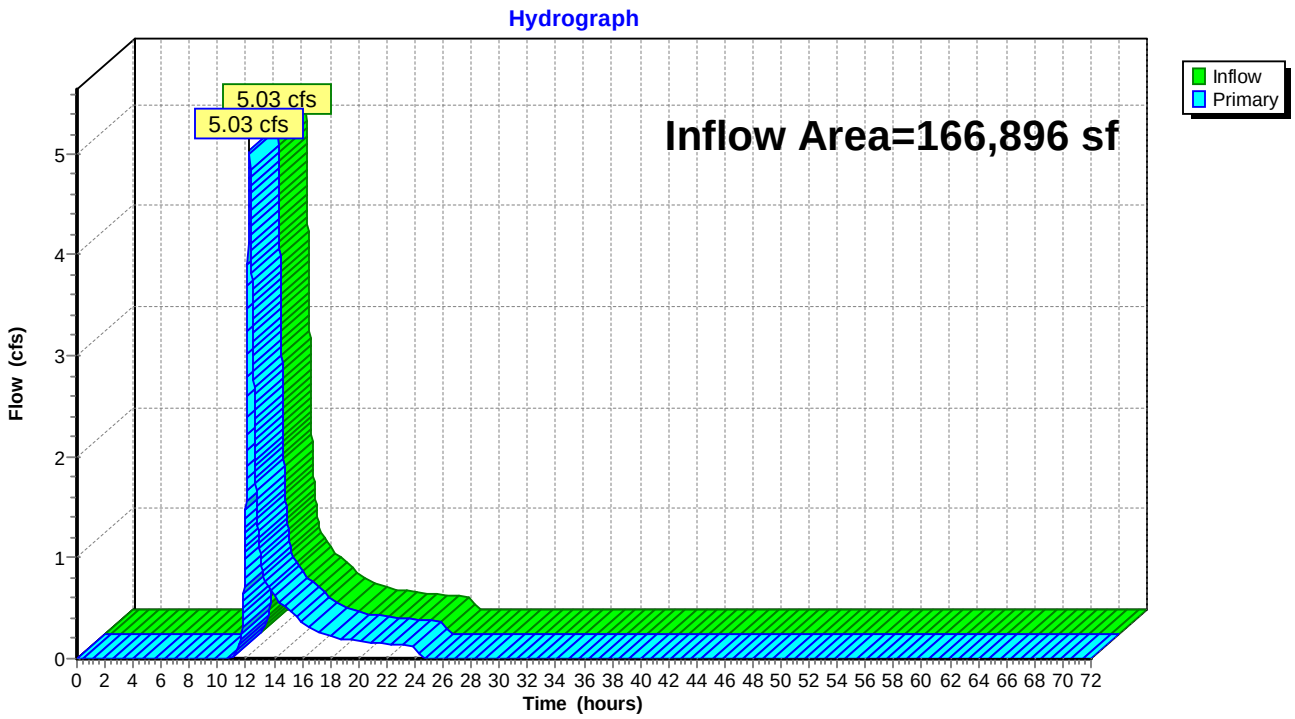


Summary for Link DP04-3: Lake Cochituate

Inflow Area = 166,896 sf, 9.27% Impervious, Inflow Depth = 1.65" for 25 Year event
Inflow = 5.03 cfs @ 12.24 hrs, Volume= 22,906 cf
Primary = 5.03 cfs @ 12.24 hrs, Volume= 22,906 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP04-3: Lake Cochituate

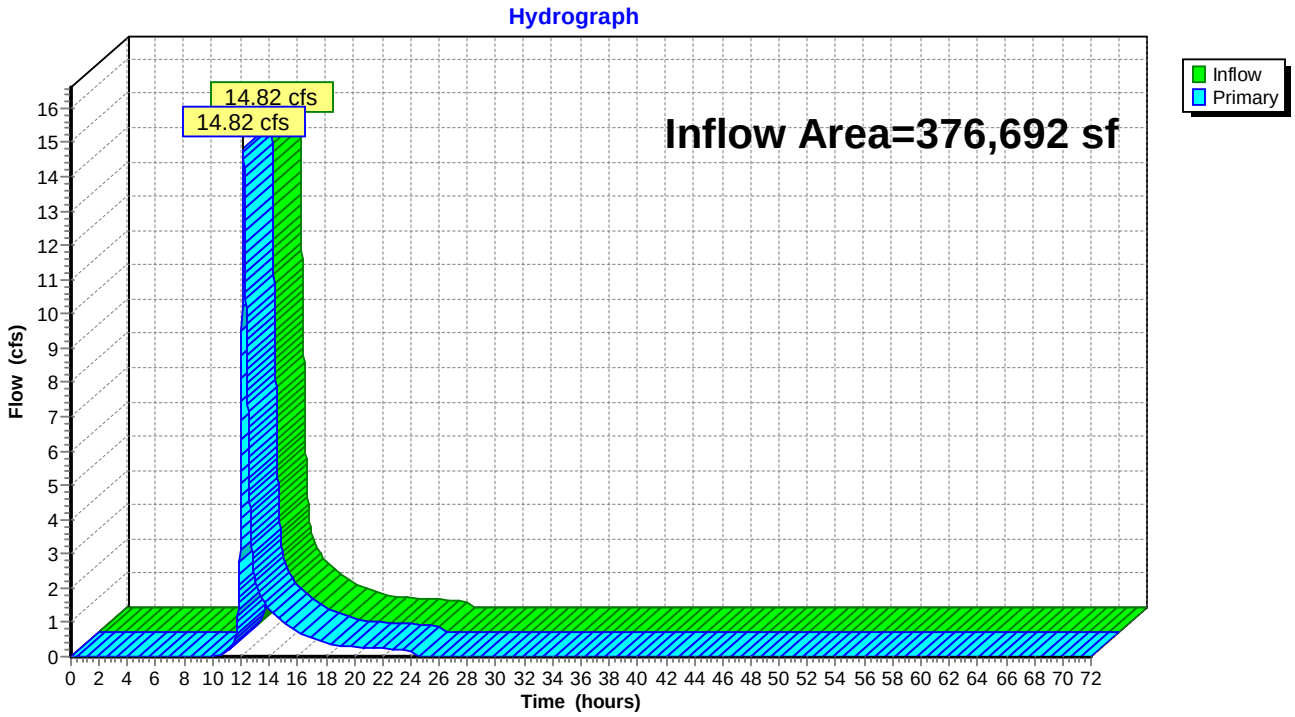


Summary for Link DP05: Lake Cochituate Middle

Inflow Area = 376,692 sf, 21.92% Impervious, Inflow Depth = 1.68" for 25 Year event
Inflow = 14.82 cfs @ 12.18 hrs, Volume= 52,842 cf
Primary = 14.82 cfs @ 12.18 hrs, Volume= 52,842 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP05: Lake Cochituate Middle

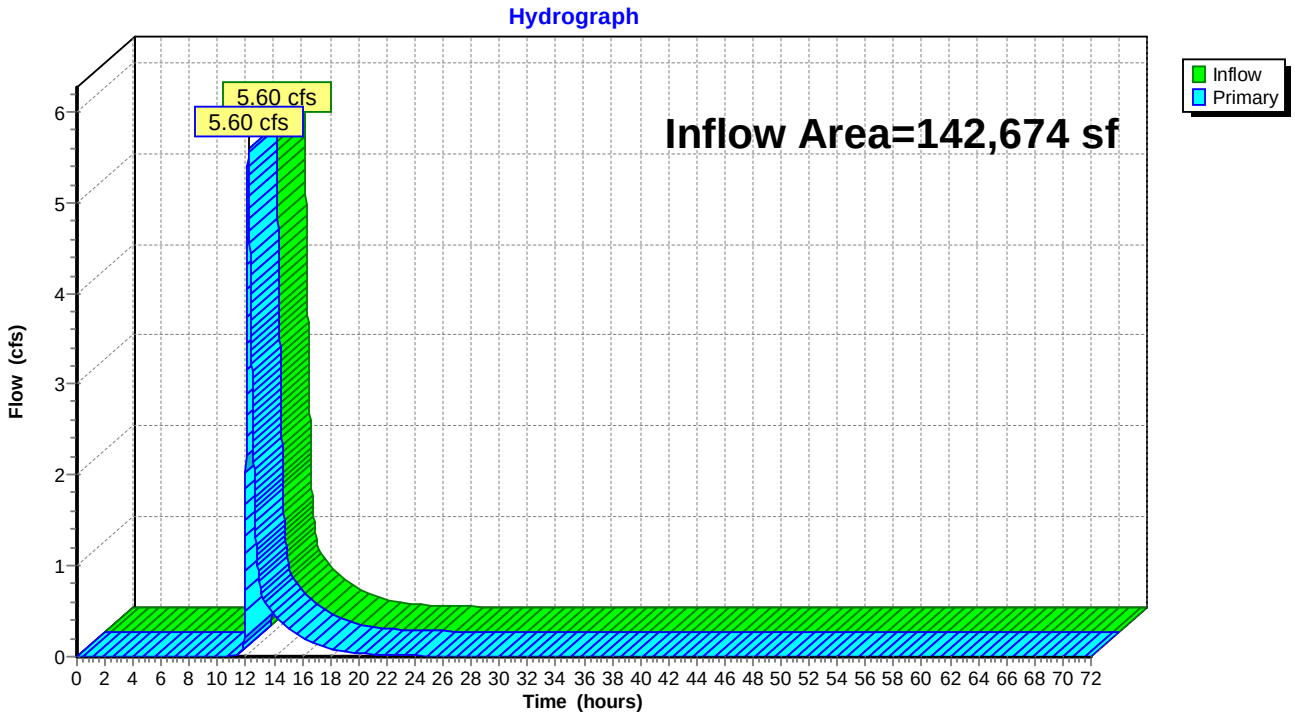


Summary for Link DP05-1: WF I

Inflow Area = 142,674 sf, 22.86% Impervious, Inflow Depth = 1.38" for 25 Year event
Inflow = 5.60 cfs @ 12.17 hrs, Volume= 16,419 cf
Primary = 5.60 cfs @ 12.17 hrs, Volume= 16,419 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP05-1: WF I

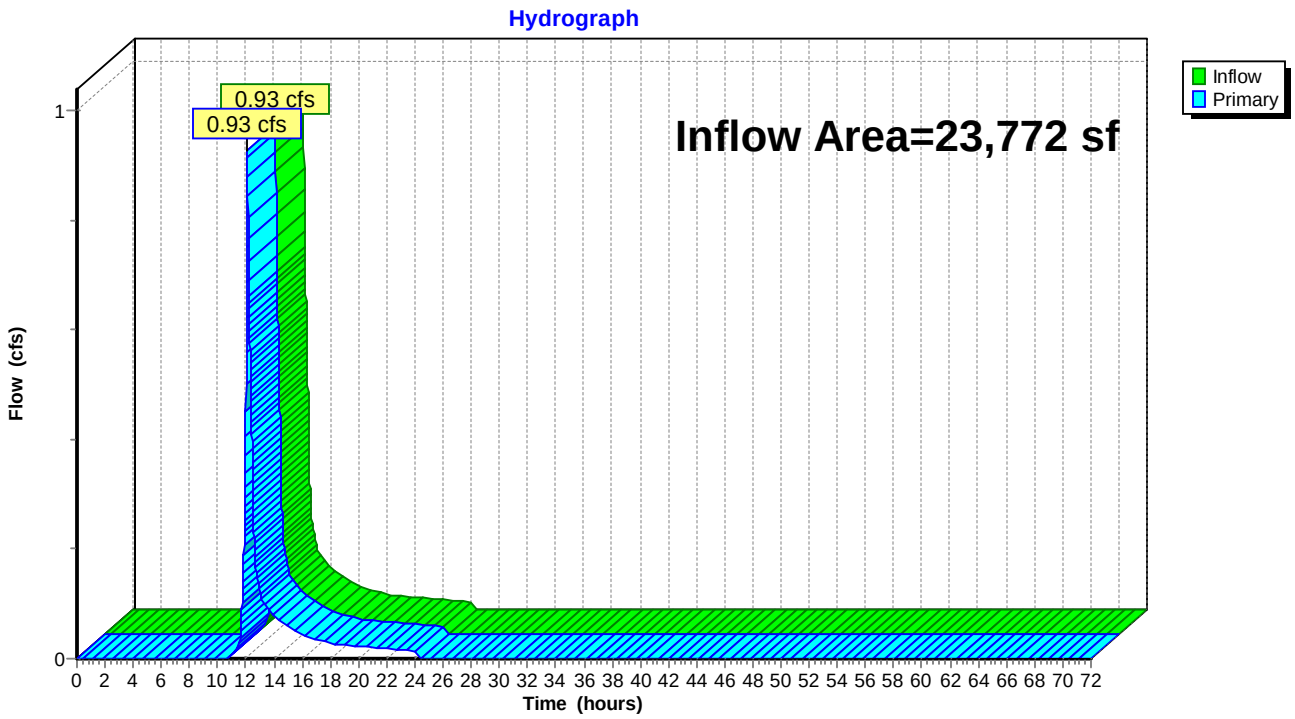


Summary for Link DP05-2: WF G&H

Inflow Area = 23,772 sf, 16.88% Impervious, Inflow Depth = 1.60" for 25 Year event
Inflow = 0.93 cfs @ 12.10 hrs, Volume= 3,165 cf
Primary = 0.93 cfs @ 12.10 hrs, Volume= 3,165 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP05-2: WF G&H

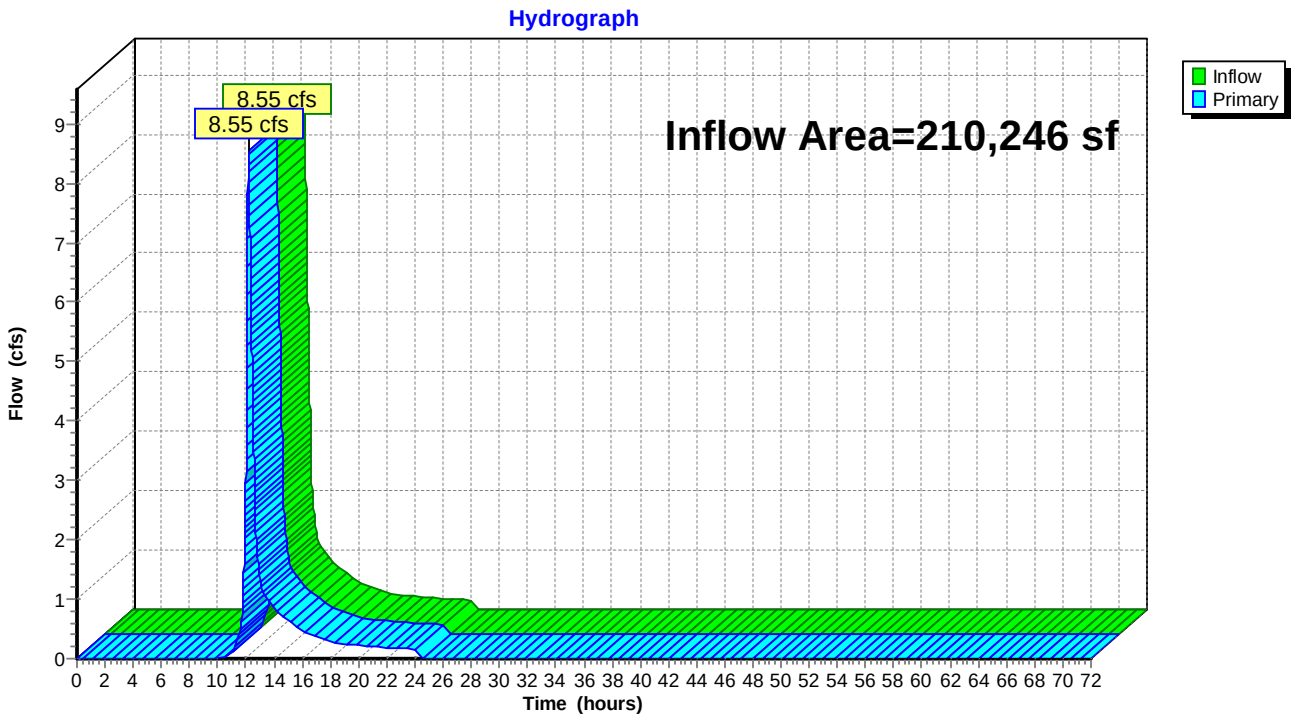


Summary for Link DP05-3: Lake Cochituate W4

Inflow Area = 210,246 sf, 21.85% Impervious, Inflow Depth = 1.90" for 25 Year event
Inflow = 8.55 cfs @ 12.19 hrs, Volume= 33,258 cf
Primary = 8.55 cfs @ 12.19 hrs, Volume= 33,258 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP05-3: Lake Cochituate W4

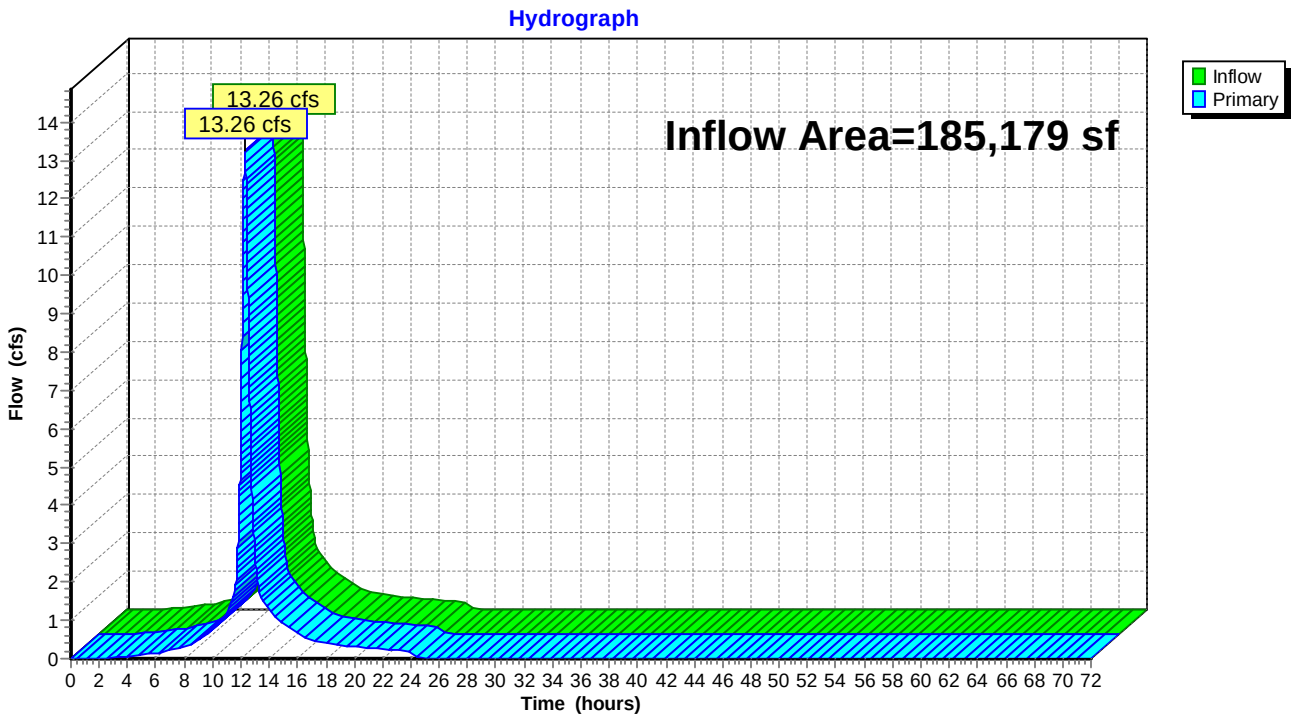


Summary for Link DP06: Worcester St

Inflow Area = 185,179 sf, 86.11% Impervious, Inflow Depth = 4.49" for 25 Year event
Inflow = 13.26 cfs @ 12.28 hrs, Volume= 69,216 cf
Primary = 13.26 cfs @ 12.28 hrs, Volume= 69,216 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP06: Worcester St

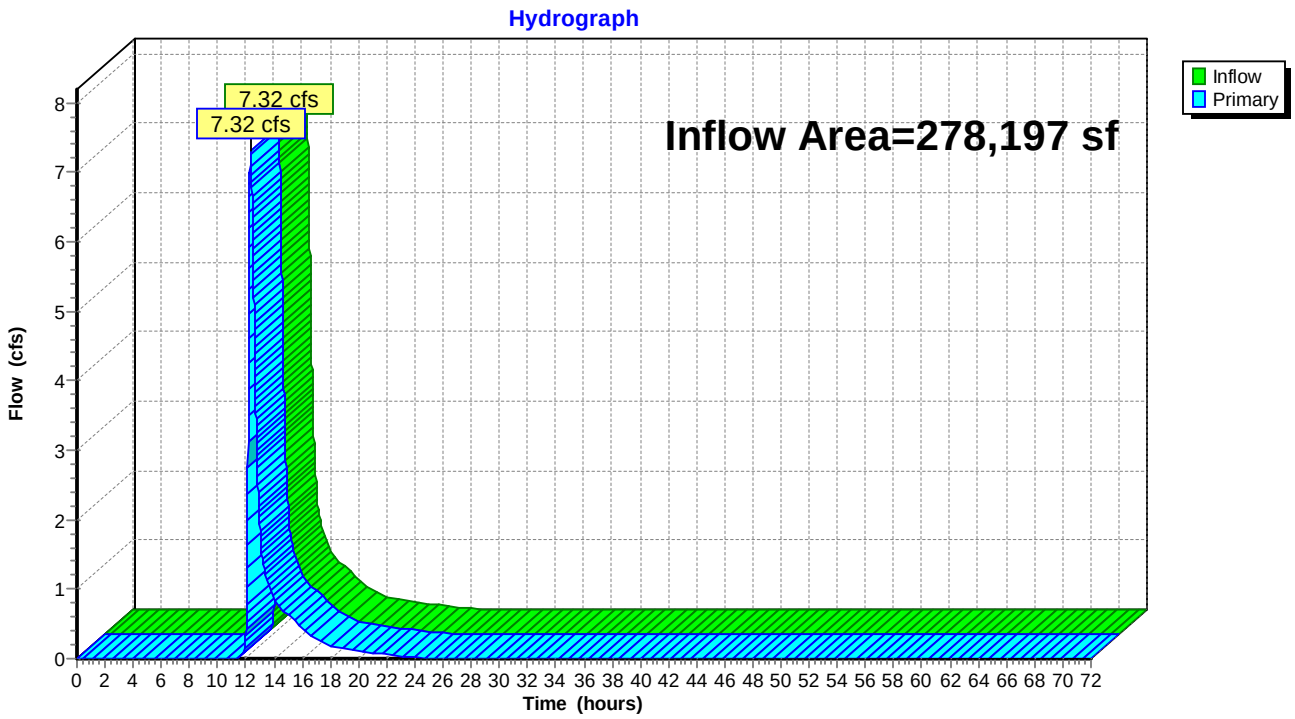


Summary for Link DP07: WF F

Inflow Area = 278,197 sf, 19.13% Impervious, Inflow Depth = 1.19" for 25 Year event
Inflow = 7.32 cfs @ 12.33 hrs, Volume= 27,695 cf
Primary = 7.32 cfs @ 12.33 hrs, Volume= 27,695 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP07: WF F

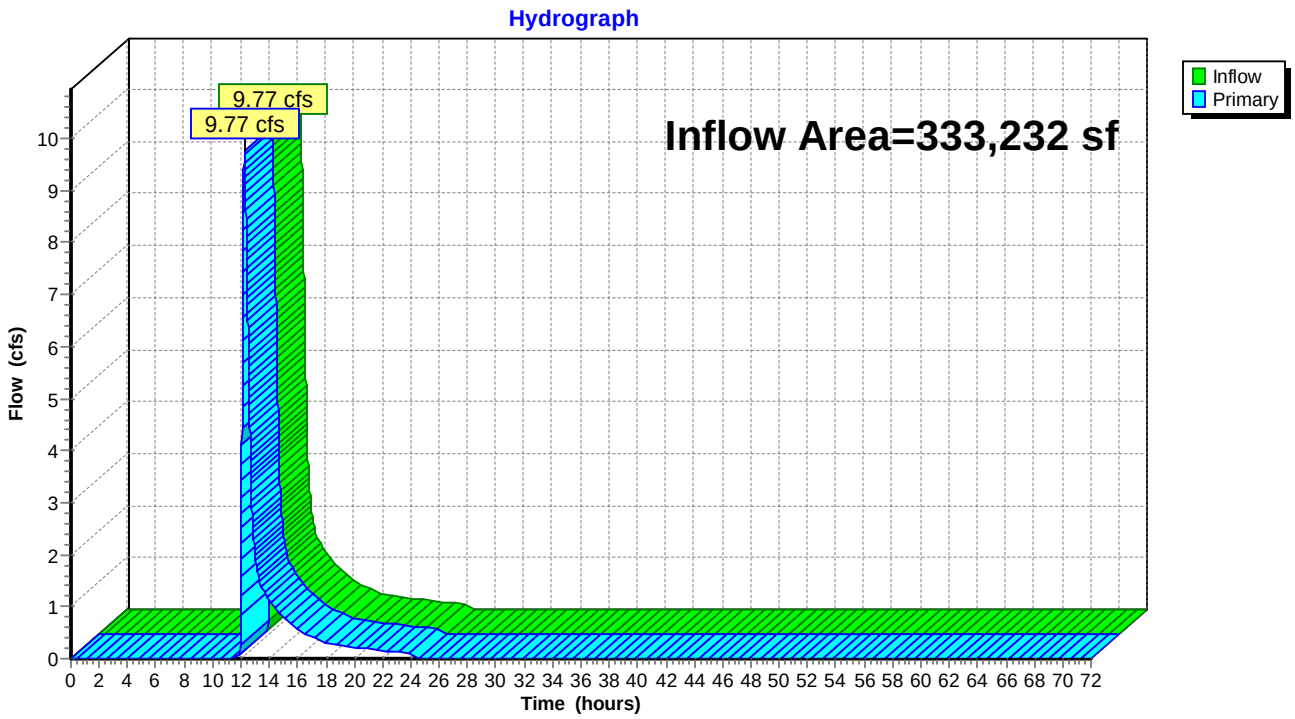


Summary for Link DP08: WF J

Inflow Area = 333,232 sf, 26.18% Impervious, Inflow Depth = 1.36" for 25 Year event
Inflow = 9.77 cfs @ 12.25 hrs, Volume= 37,809 cf
Primary = 9.77 cfs @ 12.25 hrs, Volume= 37,809 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP08: WF J

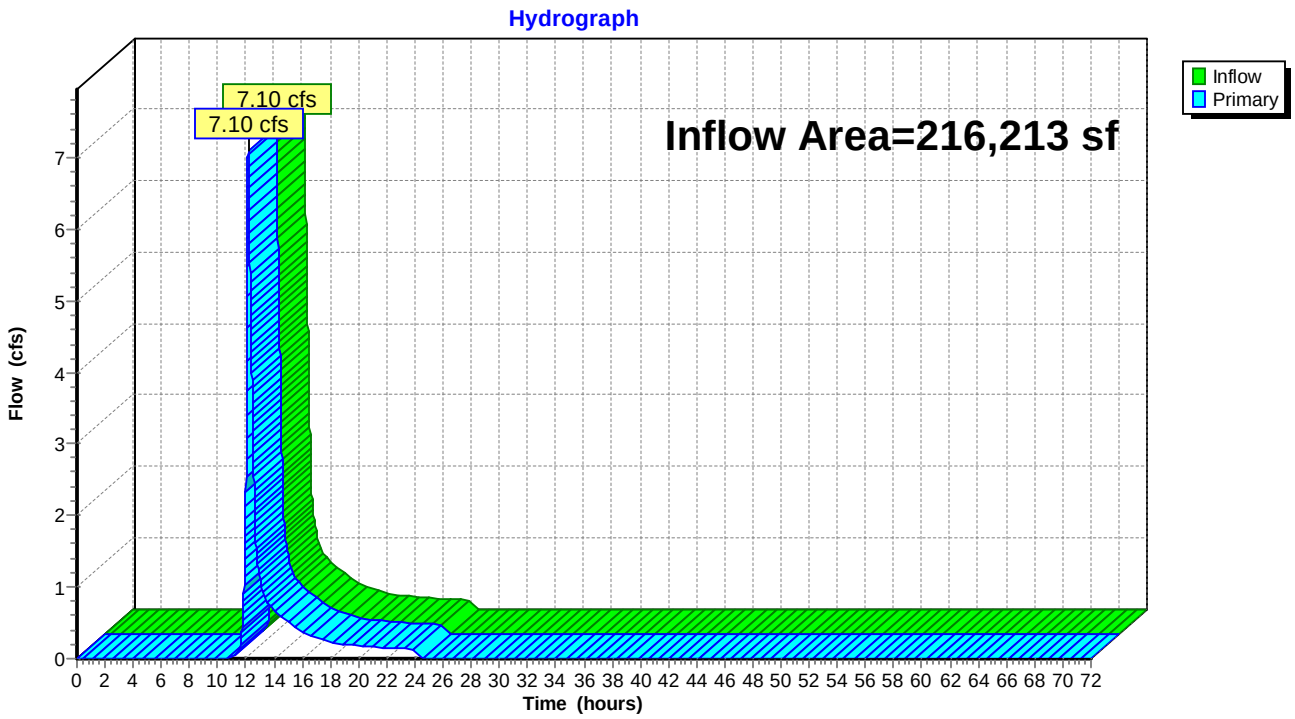


Summary for Link DP09: Unnamed Pond

Inflow Area = 216,213 sf, 21.30% Impervious, Inflow Depth = 1.45" for 25 Year event
Inflow = 7.10 cfs @ 12.16 hrs, Volume= 26,048 cf
Primary = 7.10 cfs @ 12.16 hrs, Volume= 26,048 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP09: Unnamed Pond

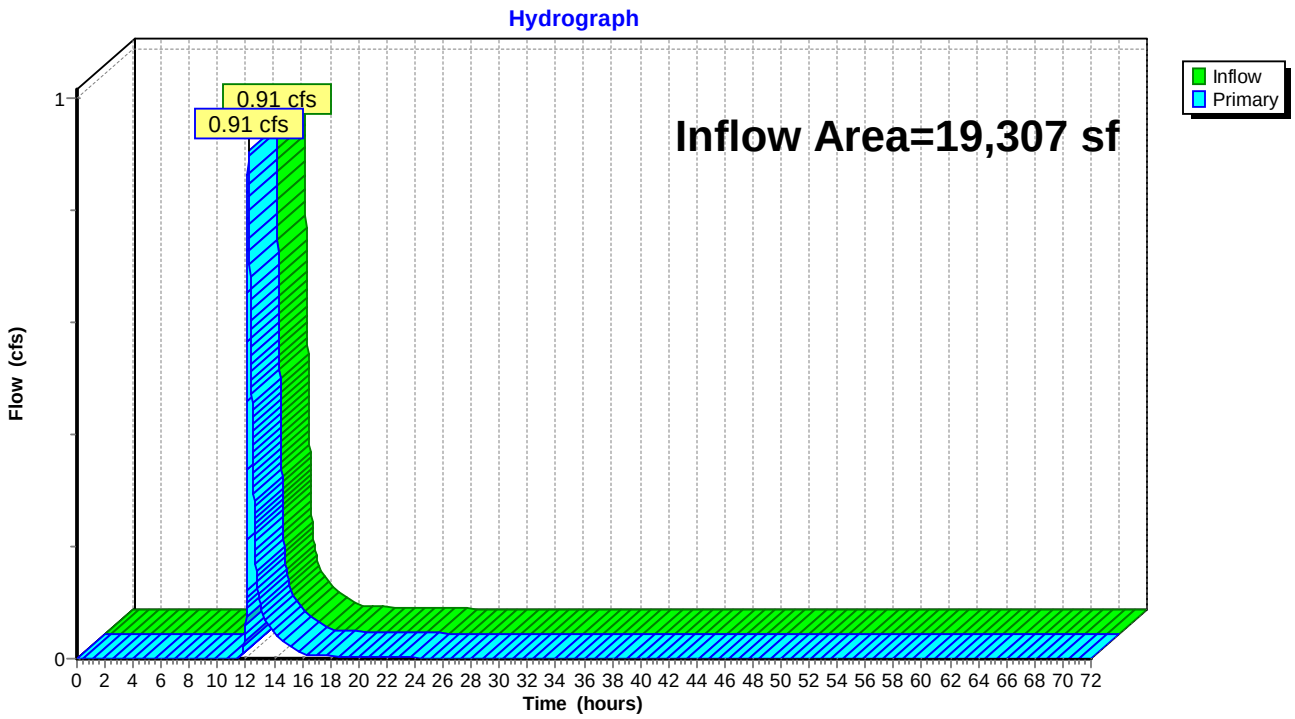


Summary for Link DP09-1: WF K

Inflow Area = 19,307 sf, 30.69% Impervious, Inflow Depth = 1.21" for 25 Year event
Inflow = 0.91 cfs @ 12.17 hrs, Volume= 1,941 cf
Primary = 0.91 cfs @ 12.17 hrs, Volume= 1,941 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP09-1: WF K

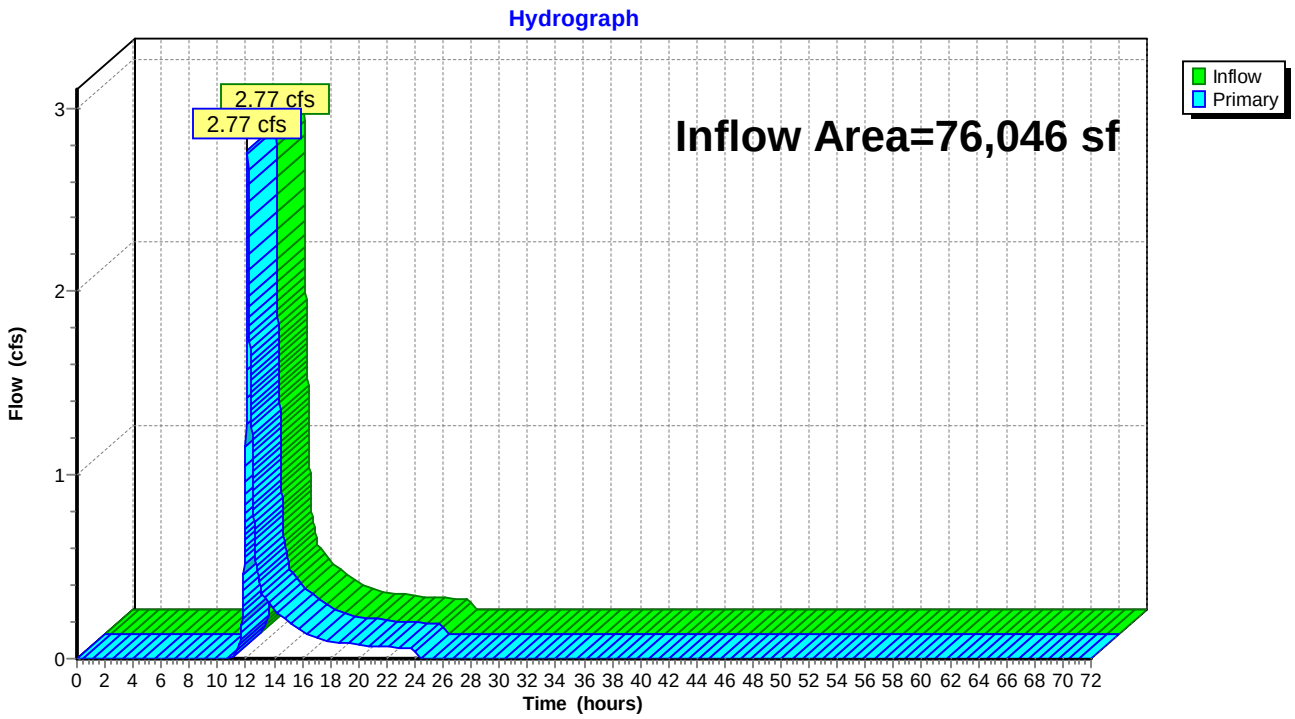


Summary for Link DP09-2: WF KA

Inflow Area = 76,046 sf, 25.44% Impervious, Inflow Depth = 1.57" for 25 Year event
Inflow = 2.77 cfs @ 12.12 hrs, Volume= 9,959 cf
Primary = 2.77 cfs @ 12.12 hrs, Volume= 9,959 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP09-2: WF KA

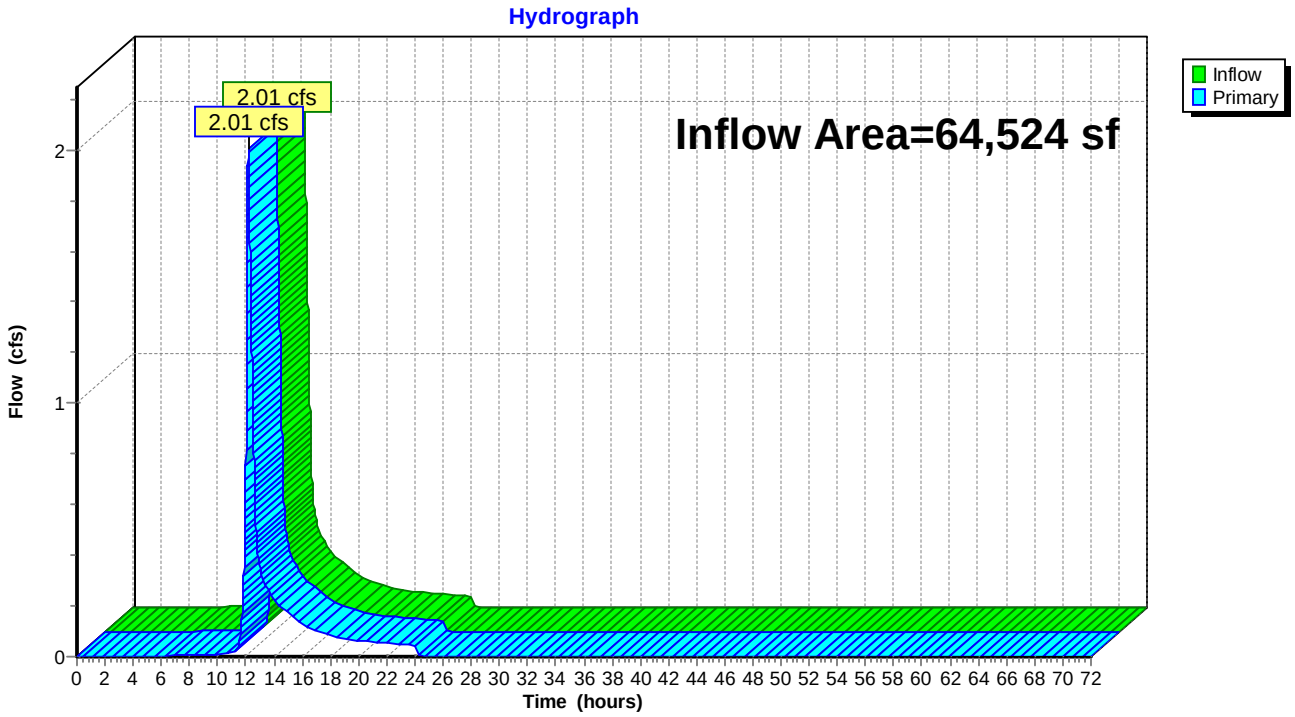


Summary for Link DP09-3: WF B

Inflow Area = 64,524 sf, 18.72% Impervious, Inflow Depth = 1.59" for 25 Year event
Inflow = 2.01 cfs @ 12.17 hrs, Volume= 8,537 cf
Primary = 2.01 cfs @ 12.17 hrs, Volume= 8,537 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP09-3: WF B

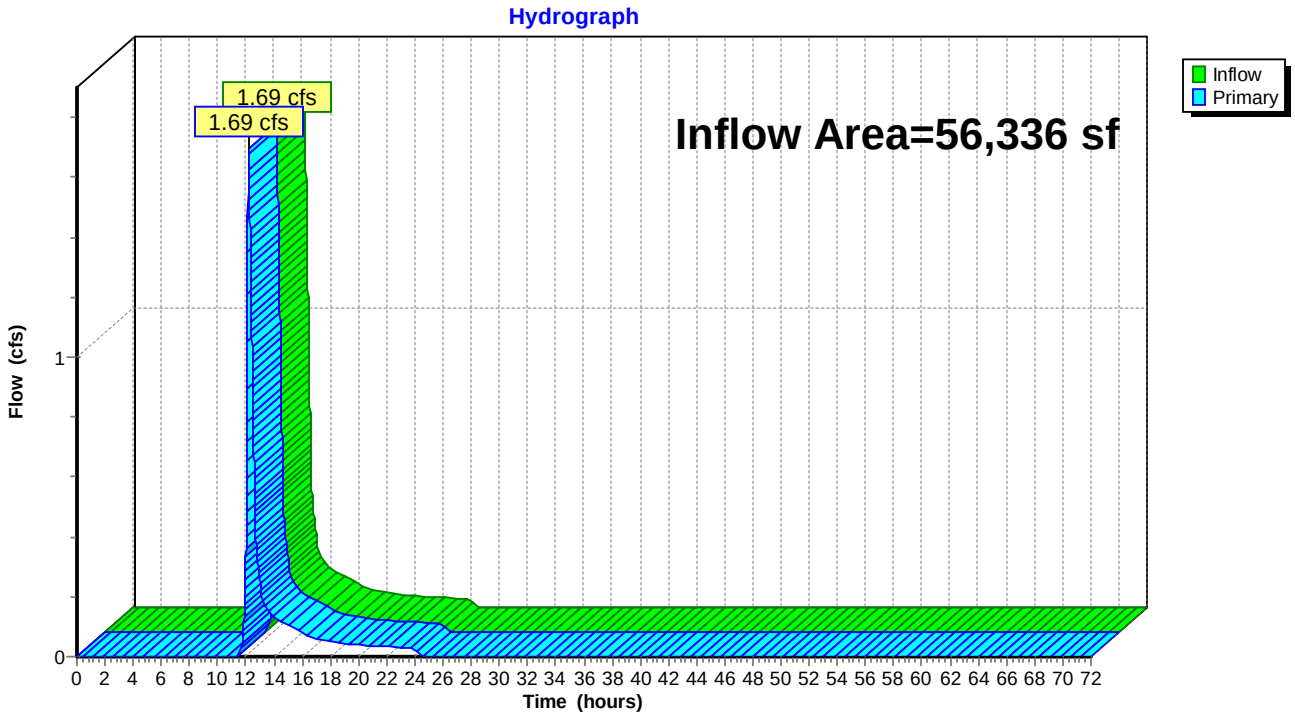


Summary for Link DP09-4: WF E&L, TOB C

Inflow Area = 56,336 sf, 15.46% Impervious, Inflow Depth = 1.20" for 25 Year event
Inflow = 1.69 cfs @ 12.19 hrs, Volume= 5,611 cf
Primary = 1.69 cfs @ 12.19 hrs, Volume= 5,611 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP09-4: WF E&L, TOB C

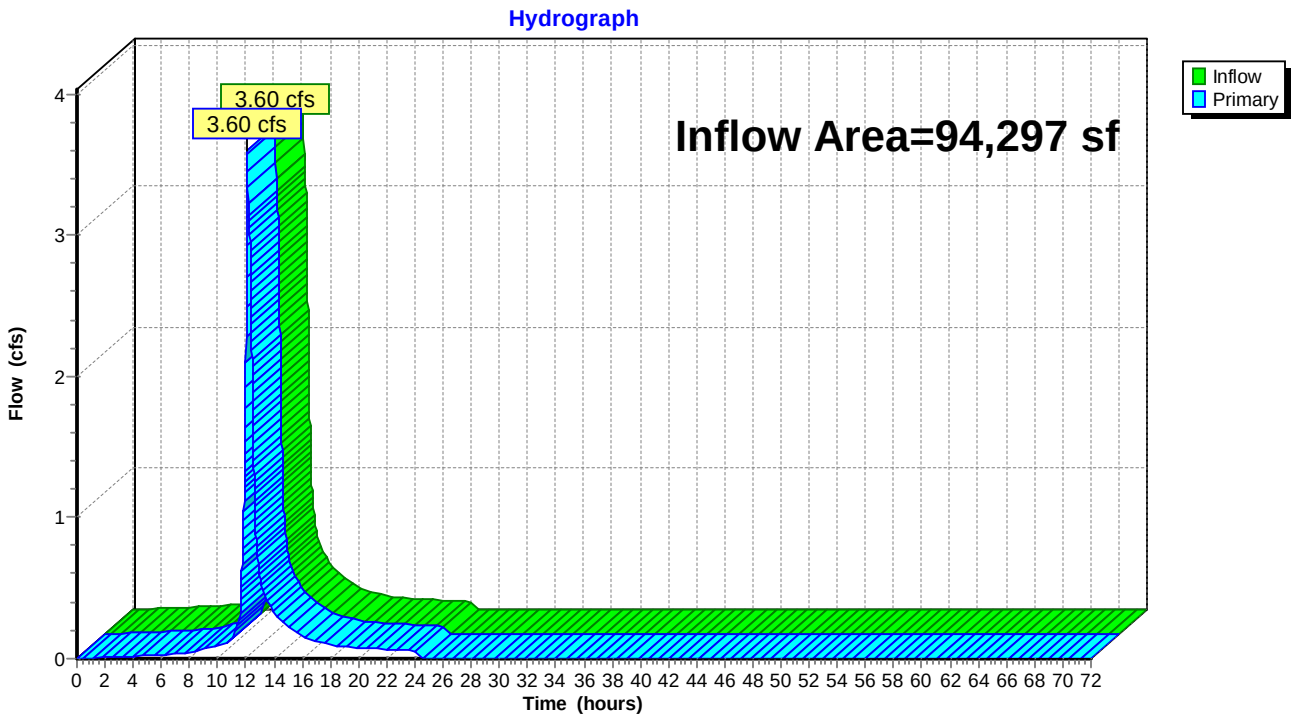


Summary for Link DP10: WF A

Inflow Area = 94,297 sf, 36.36% Impervious, Inflow Depth = 1.98" for 25 Year event
Inflow = 3.60 cfs @ 12.10 hrs, Volume= 15,576 cf
Primary = 3.60 cfs @ 12.10 hrs, Volume= 15,576 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP10: WF A

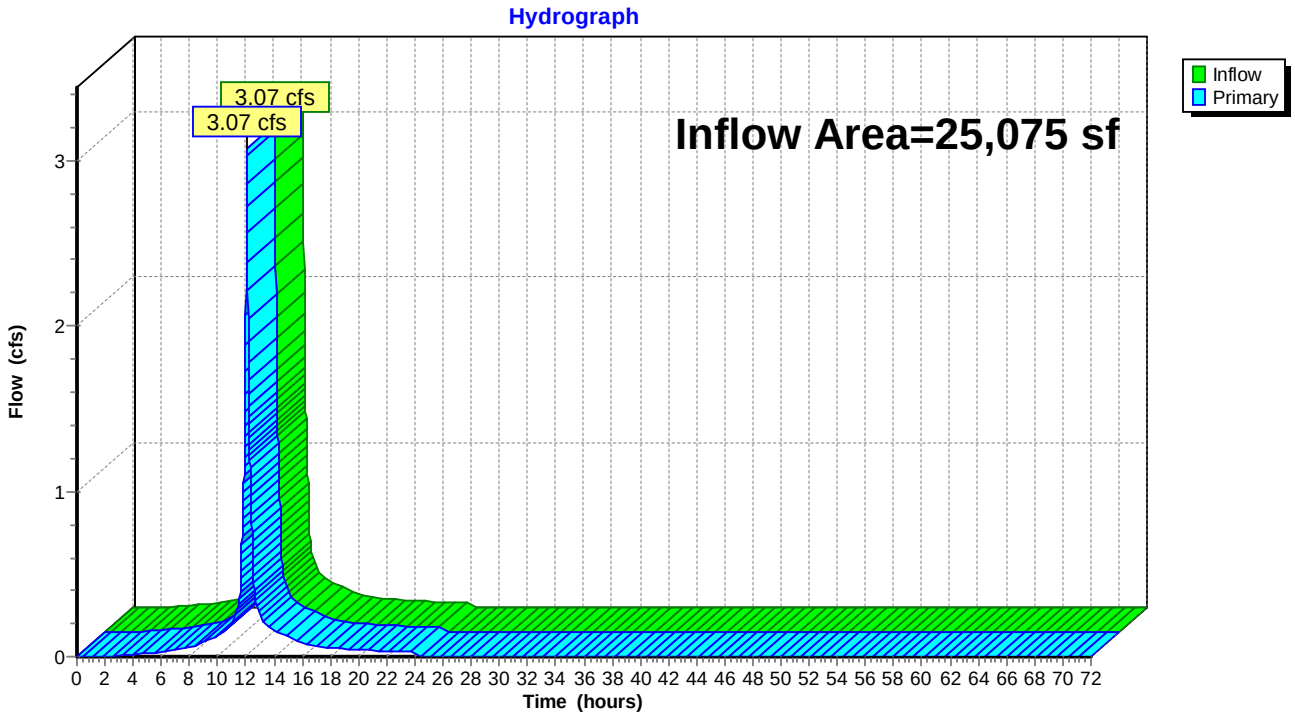


Summary for Link DP11: Local St Drain System

Inflow Area = 25,075 sf, 86.74% Impervious, Inflow Depth = 4.76" for 25 Year event
Inflow = 3.07 cfs @ 12.07 hrs, Volume= 9,940 cf
Primary = 3.07 cfs @ 12.07 hrs, Volume= 9,940 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP11: Local St Drain System

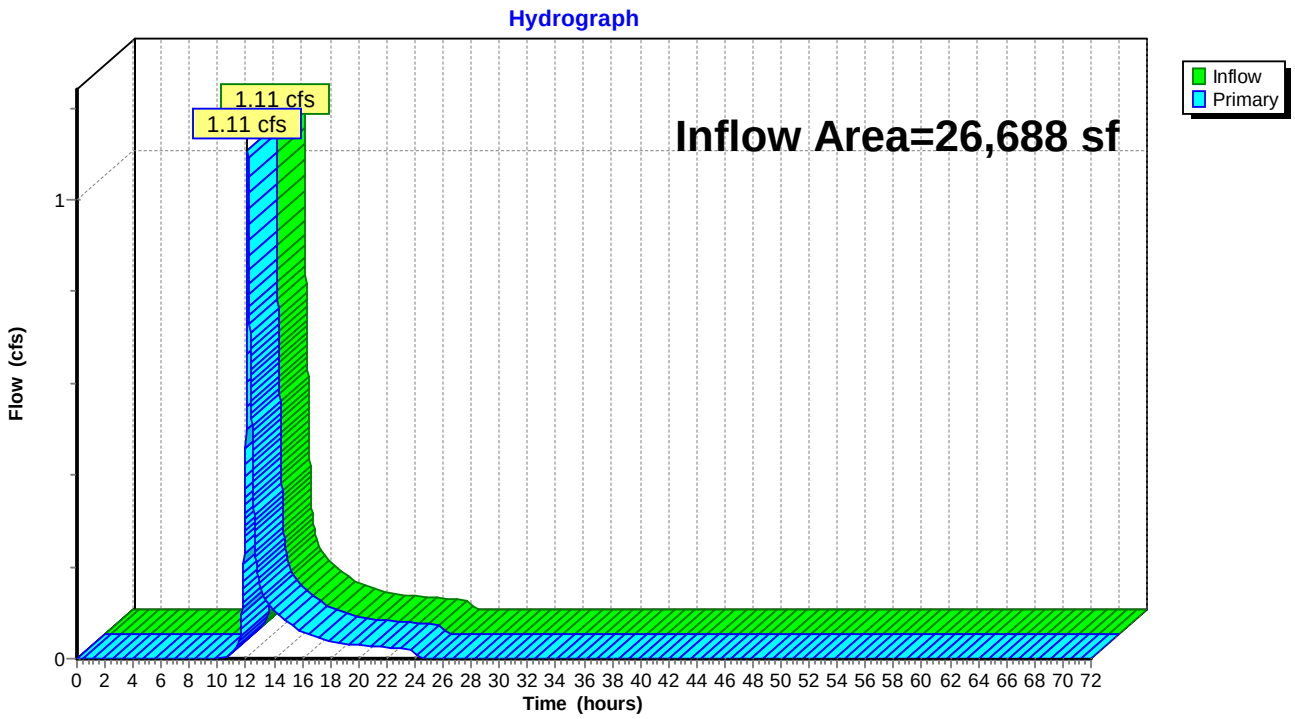


Summary for Link DP12: Washington St Low Point

Inflow Area = 26,688 sf, 37.75% Impervious, Inflow Depth = 1.80" for 25 Year event
Inflow = 1.11 cfs @ 12.13 hrs, Volume= 4,006 cf
Primary = 1.11 cfs @ 12.13 hrs, Volume= 4,006 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP12: Washington St Low Point

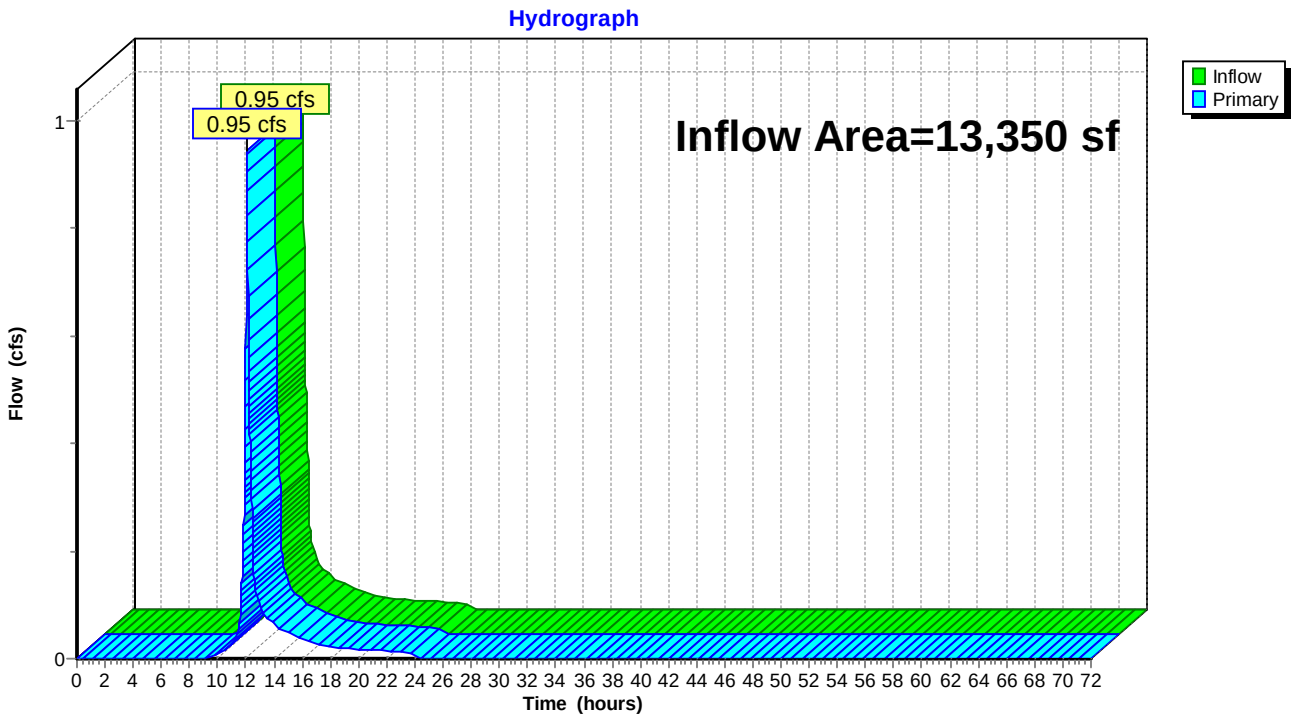


Summary for Link DP13: Empty Lot

Inflow Area = 13,350 sf, 0.00% Impervious, Inflow Depth = 2.55" for 25 Year event
Inflow = 0.95 cfs @ 12.08 hrs, Volume= 2,837 cf
Primary = 0.95 cfs @ 12.08 hrs, Volume= 2,837 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP13: Empty Lot

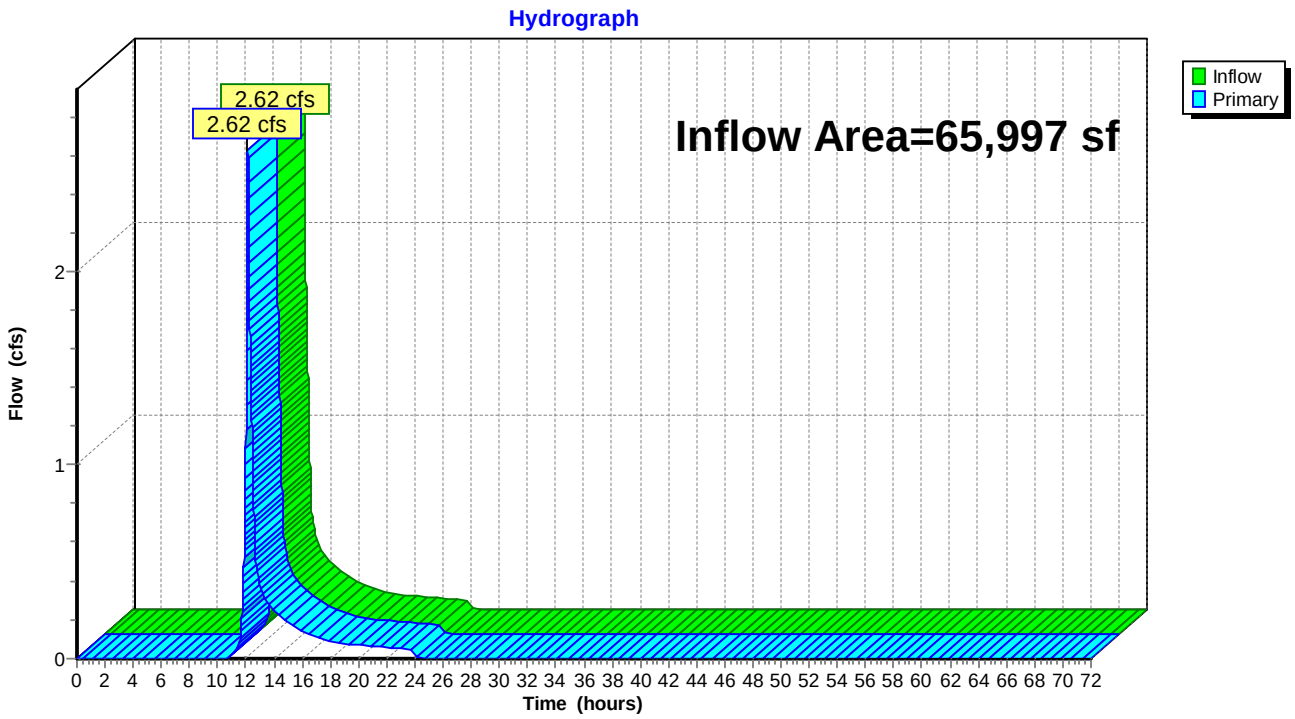


Summary for Link DP14: Lagrange St Low Point

Inflow Area = 65,997 sf, 35.65% Impervious, Inflow Depth = 1.72" for 25 Year event
Inflow = 2.62 cfs @ 12.13 hrs, Volume= 9,479 cf
Primary = 2.62 cfs @ 12.13 hrs, Volume= 9,479 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP14: Lagrange St Low Point

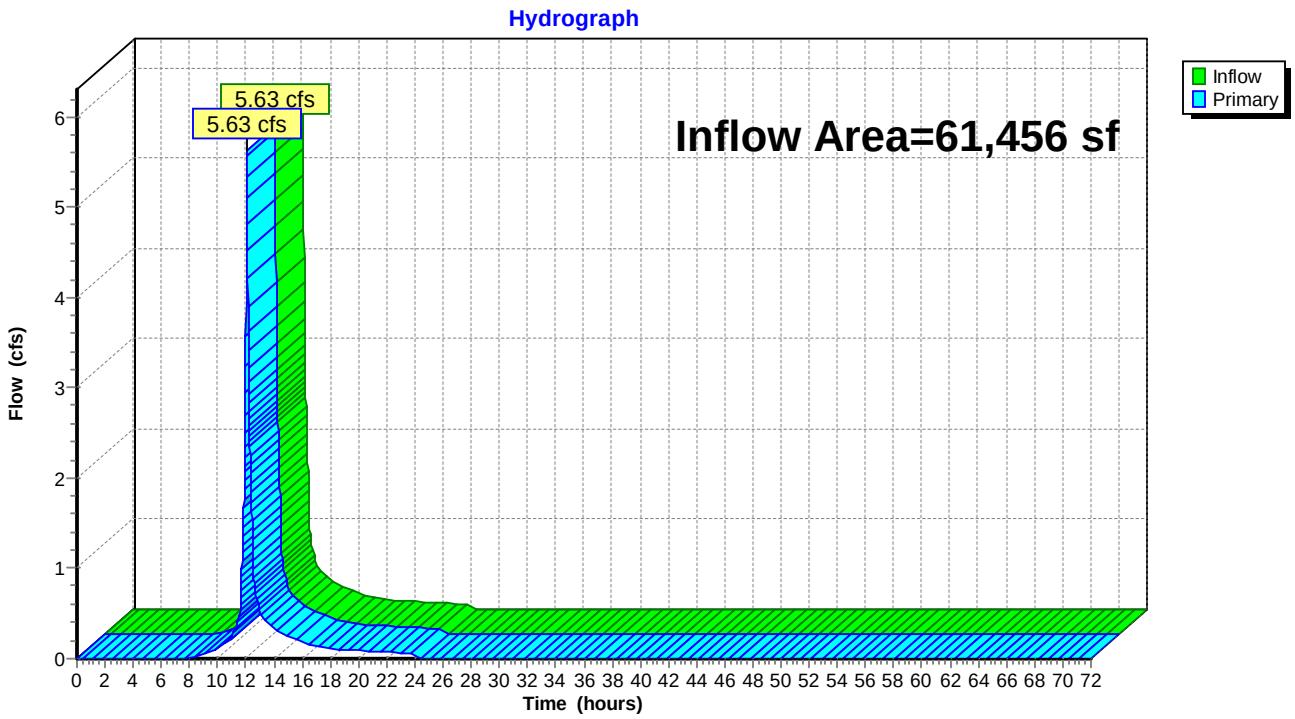


Summary for Link DP15: TOB D

Inflow Area = 61,456 sf, 61.47% Impervious, Inflow Depth = 3.29" for 25 Year event
Inflow = 5.63 cfs @ 12.07 hrs, Volume= 16,844 cf
Primary = 5.63 cfs @ 12.07 hrs, Volume= 16,844 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP15: TOB D

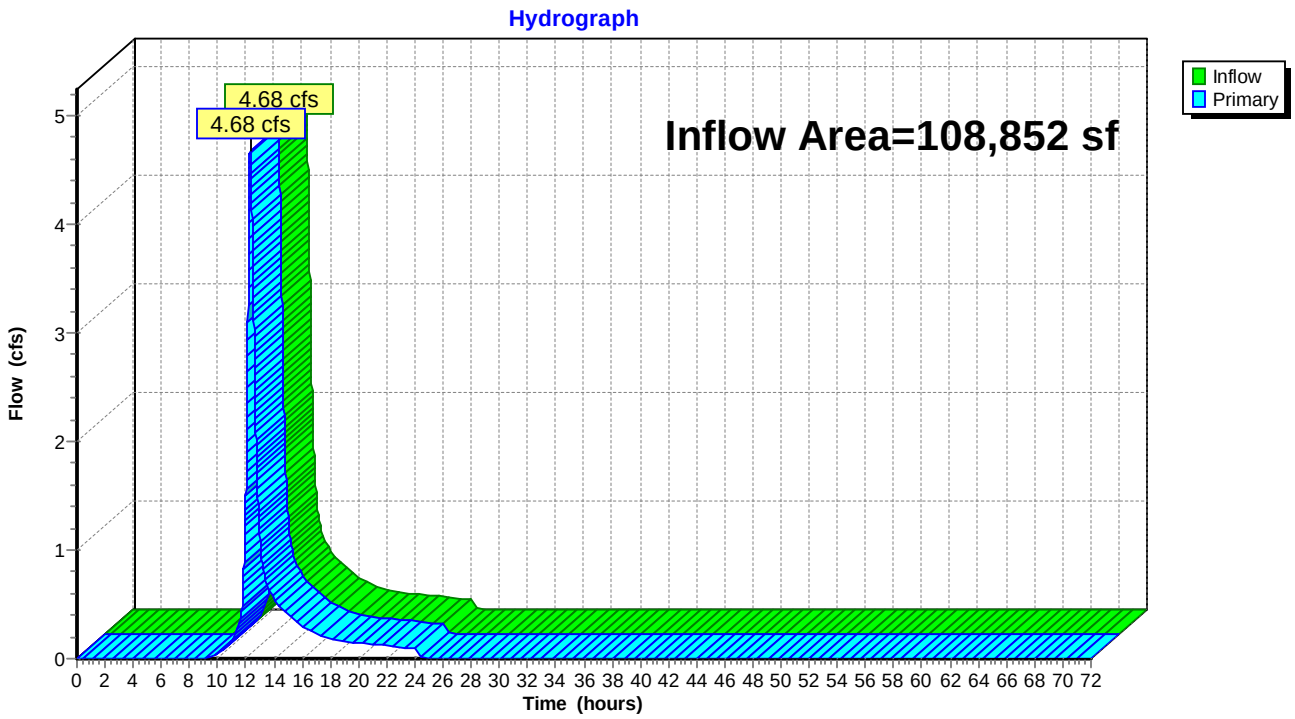


Summary for Link DP16: WF 1, WF 2, TOB E

Inflow Area = 108,852 sf, 44.86% Impervious, Inflow Depth = 2.46" for 25 Year event
Inflow = 4.68 cfs @ 12.30 hrs, Volume= 22,336 cf
Primary = 4.68 cfs @ 12.30 hrs, Volume= 22,336 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP16: WF 1, WF 2, TOB E



Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points x 3
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 01S: Cochituate Rd Runoff Area=32,816 sf 19.44% Impervious Runoff Depth=3.09"
Flow Length=306' Slope=0.0050 '/' Tc=9.0 min CN=68 Runoff=2.45 cfs 8,449 cf

Subcatchment 02S: Chrysler Road Runoff Area=59,894 sf 5.23% Impervious Runoff Depth=2.23"
Flow Length=311' Tc=37.7 min CN=59 Runoff=1.74 cfs 11,143 cf

Subcatchment 03S: DNR-1 Runoff Area=50,164 sf 33.83% Impervious Runoff Depth=3.39"
Flow Length=759' Tc=15.8 min CN=71 Runoff=3.38 cfs 14,168 cf

Subcatchment 04S: DNR-2 Runoff Area=43,392 sf 0.00% Impervious Runoff Depth=2.05"
Flow Length=430' Tc=14.7 min CN=57 Runoff=1.70 cfs 7,418 cf

Subcatchment 05S: Speen Street Runoff Area=28,639 sf 30.10% Impervious Runoff Depth=3.70"
Flow Length=444' Tc=5.3 min CN=74 Runoff=2.92 cfs 8,820 cf

Subcatchment 06S: Lake Cochituate N1-1 Runoff Area=60,547 sf 17.98% Impervious Runoff Depth=2.70"
Flow Length=810' Tc=8.7 min CN=64 Runoff=3.93 cfs 13,626 cf

Subcatchment 07S: Lake Cochituate N1-2 Runoff Area=50,655 sf 14.07% Impervious Runoff Depth=2.61"
Flow Length=274' Tc=8.6 min CN=63 Runoff=3.17 cfs 10,997 cf

Subcatchment 08S: Lake Cochituate N2-1 Runoff Area=41,704 sf 17.25% Impervious Runoff Depth=2.70"
Flow Length=352' Tc=11.8 min CN=64 Runoff=2.45 cfs 9,385 cf

Subcatchment 10S: Lake Cochituate N3-1 Runoff Area=98,155 sf 15.90% Impervious Runoff Depth=2.70"
Flow Length=272' Tc=18.3 min CN=64 Runoff=4.88 cfs 22,089 cf

Subcatchment 11S: Lake Cochituate N3-2 Runoff Area=24,131 sf 4.50% Impervious Runoff Depth=2.23"
Flow Length=110' Tc=9.1 min CN=59 Runoff=1.24 cfs 4,489 cf

Subcatchment 12S: Lake Cochituate E1 Runoff Area=22,546 sf 0.00% Impervious Runoff Depth=2.05"
Flow Length=82' Slope=0.2101 '/' Tc=7.2 min CN=57 Runoff=1.12 cfs 3,854 cf

Subcatchment 13S: Lake Cochituate E2 Runoff Area=166,896 sf 9.27% Impervious Runoff Depth=2.42"
Flow Length=328' Tc=16.1 min CN=61 Runoff=7.68 cfs 33,618 cf

Subcatchment 14S: Lake Cochituate W1-1 Runoff Area=13,204 sf 47.79% Impervious Runoff Depth=4.01"
Flow Length=106' Tc=5.0 min CN=77 Runoff=1.47 cfs 4,410 cf

Subcatchment 15S: Lake Cochituate W1-2 Runoff Area=15,593 sf 0.00% Impervious Runoff Depth=2.05"
Flow Length=185' Tc=11.2 min CN=57 Runoff=0.68 cfs 2,666 cf

Subcatchment 16S: Lake Cochituate N4 Runoff Area=95,267 sf 23.06% Impervious Runoff Depth=2.89"
Flow Length=145' Tc=11.5 min CN=66 Runoff=6.10 cfs 22,971 cf

Subcatchment 17S: Lake Cochituate W2-1 Runoff Area=4,593 sf 65.38% Impervious Runoff Depth=4.76"
Tc=5.0 min CN=84 Runoff=0.60 cfs 1,822 cf

Subcatchment 18S: Lake Cochituate W2-2 Runoff Area=14,017 sf 9.52% Impervious Runoff Depth=2.42"
Flow Length=102' Tc=8.8 min CN=61 Runoff=0.80 cfs 2,823 cf

Subcatchment 19S: Lake Cochituate W3-1 Runoff Area=2,241 sf 67.51% Impervious Runoff Depth=4.87"
Tc=5.0 min CN=85 Runoff=0.30 cfs 910 cf

Subcatchment 20S: Lake Cochituate W3-2 Runoff Area=21,531 sf 11.61% Impervious Runoff Depth=2.51"
Flow Length=72' Slope=0.2220 '/' Tc=6.4 min CN=62 Runoff=1.40 cfs 4,505 cf

Subcatchment 21S: Lake Cochituate W4-1 Runoff Area=10,487 sf 62.20% Impervious Runoff Depth=4.65"
Tc=5.0 min CN=83 Runoff=1.34 cfs 4,065 cf

Subcatchment 22S: Lake Cochituate W4-2 Runoff Area=199,759 sf 19.73% Impervious Runoff Depth=2.80"
Flow Length=297' Tc=13.0 min CN=65 Runoff=11.80 cfs 46,554 cf

Subcatchment 23S: Worcester St N Runoff Area=159,601 sf 92.99% Impervious Runoff Depth=5.89"
Flow Length=1,809' Tc=22.6 min CN=94 Runoff=14.97 cfs 78,355 cf

Subcatchment 24S: Worcester St S Runoff Area=25,578 sf 43.13% Impervious Runoff Depth=3.80"
Flow Length=316' Tc=9.0 min CN=75 Runoff=2.36 cfs 8,098 cf

Subcatchment 25S: Arcadi Rd-1 Runoff Area=234,888 sf 22.66% Impervious Runoff Depth=2.51"
Flow Length=810' Tc=18.2 min CN=62 Runoff=10.77 cfs 49,146 cf

Subcatchment 26S: Arcadi Rd-2 Runoff Area=43,309 sf 0.00% Impervious Runoff Depth=2.05"
Flow Length=154' Tc=10.6 min CN=57 Runoff=1.91 cfs 7,404 cf

Subcatchment 27S: Fisher St-1 Runoff Area=316,495 sf 27.57% Impervious Runoff Depth=2.42"
Flow Length=500' Tc=15.5 min CN=61 Runoff=14.79 cfs 63,751 cf

Subcatchment 28S: Fisher St-2 Runoff Area=16,737 sf 0.00% Impervious Runoff Depth=2.05"
Flow Length=65' Slope=0.1369 '/' Tc=7.1 min CN=57 Runoff=0.83 cfs 2,861 cf

Subcatchment 29S: Unnamed Pond 1-2 Runoff Area=4,097 sf 0.00% Impervious Runoff Depth=2.05"
Flow Length=32' Slope=0.3850 '/' Tc=5.0 min CN=57 Runoff=0.22 cfs 700 cf

Subcatchment 30S: Unnamed Pond 1-1 Runoff Area=15,210 sf 38.96% Impervious Runoff Depth=3.49"
Flow Length=86' Tc=10.7 min CN=72 Runoff=1.22 cfs 4,424 cf

Subcatchment 31S: Unnamed Pond 2 Runoff Area=76,046 sf 25.44% Impervious Runoff Depth=2.32"
Flow Length=279' Tc=7.9 min CN=60 Runoff=4.28 cfs 14,730 cf

Subcatchment 32S: Unnamed Pond 3 Runoff Area=62,955 sf 16.69% Impervious Runoff Depth=2.23"
Flow Length=309' Tc=11.7 min CN=59 Runoff=2.98 cfs 11,712 cf

Subcatchment 33S: Unnamed Pond 3-1 Runoff Area=1,569 sf 100.00% Impervious Runoff Depth=6.36"
Tc=5.0 min CN=98 Runoff=0.24 cfs 832 cf

Subcatchment 34S: Unnamed Pond 4-1 Runoff Area=13,927 sf 62.52% Impervious Runoff Depth=4.65"
Tc=5.0 min CN=83 Runoff=1.78 cfs 5,398 cf

Subcatchment 35S: Unnamed Pond 4-2 Runoff Area=42,409 sf 0.00% Impervious Runoff Depth=2.05"
Flow Length=167' Tc=11.7 min CN=57 Runoff=1.81 cfs 7,250 cf

Subcatchment 36S: Kansas St-1 Runoff Area=26,591 sf 37.08% Impervious Runoff Depth=3.39"
Flow Length=92' Tc=11.0 min CN=71 Runoff=2.05 cfs 7,510 cf

Subcatchment 37S: Kansas St-2 Runoff Area=52,239 sf 17.16% Impervious Runoff Depth=2.42"
Flow Length=313' Tc=9.1 min CN=61 Runoff=2.95 cfs 10,522 cf

Subcatchment 38S: N. Main & Kansas Runoff Area=15,467 sf 100.00% Impervious Runoff Depth=6.36"
Tc=5.0 min CN=98 Runoff=2.38 cfs 8,199 cf

Subcatchment 39S: Washington Ave 1 Runoff Area=12,963 sf 90.09% Impervious Runoff Depth=6.01"
Tc=5.0 min CN=95 Runoff=1.96 cfs 6,490 cf

Subcatchment 40S: Washington Ave 2 Runoff Area=12,112 sf 83.16% Impervious Runoff Depth=5.78"
Tc=5.0 min CN=93 Runoff=1.80 cfs 5,829 cf

Subcatchment 41S: Washington Ave 3 Runoff Area=26,688 sf 37.75% Impervious Runoff Depth=2.61"
Flow Length=196' Tc=9.0 min CN=63 Runoff=1.65 cfs 5,794 cf

Subcatchment 42S: Empty Lot Runoff Area=13,350 sf 0.00% Impervious Runoff Depth=3.49"
Tc=5.0 min CN=72 Runoff=1.30 cfs 3,883 cf

Subcatchment 43S: Lagrange St Runoff Area=65,997 sf 35.65% Impervious Runoff Depth=2.51"
Flow Length=194' Tc=8.7 min CN=62 Runoff=3.95 cfs 13,809 cf

Subcatchment 44S: Mechanic St Runoff Area=61,456 sf 61.47% Impervious Runoff Depth=4.33"
Flow Length=329' Tc=5.0 min CN=80 Runoff=7.36 cfs 22,159 cf

Subcatchment 45S: Cochituate St 1 Runoff Area=108,852 sf 44.86% Impervious Runoff Depth=3.39"
Flow Length=740' Tc=21.3 min CN=71 Runoff=6.50 cfs 30,744 cf

Subcatchment 170S: Lake Cochituate N2-2 Runoff Area=15,884 sf 0.00% Impervious Runoff Depth=2.05"
Flow Length=53' Slope=0.3400 '/' Tc=5.0 min CN=57 Runoff=0.85 cfs 2,715 cf

Pond 01P: BMP 1 - Infiltration Swale Peak Elev=147.71' Storage=2,460 cf Inflow=3.38 cfs 14,168 cf
Discarded=0.21 cfs 6,665 cf Primary=2.75 cfs 7,503 cf Outflow=2.97 cfs 14,169 cf

Pond 02P: Re-graded Detention Pond Peak Elev=160.33' Storage=92 cf Inflow=2.92 cfs 8,820 cf
Primary=0.00 cfs 0 cf Secondary=2.91 cfs 8,806 cf Outflow=2.91 cfs 8,806 cf

Pond 03P: BMP 2 - Bioretention System Peak Elev=153.33' Storage=1,370 cf Inflow=3.93 cfs 13,626 cf
Discarded=0.11 cfs 4,211 cf Primary=2.96 cfs 9,415 cf Outflow=3.07 cfs 13,626 cf

Pond 04P: BMP 3 - Infiltration Swale Peak Elev=154.55' Storage=971 cf Inflow=2.45 cfs 9,385 cf
Discarded=0.08 cfs 3,412 cf Primary=2.31 cfs 5,974 cf Outflow=2.39 cfs 9,385 cf

Pond 05P: BMP 4 - Infiltration Swale Peak Elev=154.97' Storage=1,025 cf Inflow=4.88 cfs 22,089 cf
Discarded=0.07 cfs 3,337 cf Primary=4.78 cfs 18,752 cf Outflow=4.85 cfs 22,089 cf

Pond 06P: BMP 5 - Infiltration Swale Peak Elev=155.13' Storage=2,077 cf Inflow=7.09 cfs 27,381 cf
Discarded=0.15 cfs 7,275 cf Primary=6.82 cfs 20,107 cf Outflow=6.97 cfs 27,382 cf

Pond 07P: BMP 6 - Infiltration Swale Peak Elev=155.56' Storage=627 cf Inflow=0.60 cfs 1,822 cf
Discarded=0.06 cfs 1,553 cf Primary=0.23 cfs 269 cf Outflow=0.28 cfs 1,822 cf

Pond 7P: Lake Cochituate Peak Elev=136.02' Storage=12.375 af Inflow=121.42 cfs 539,044 cf
Outflow=0.00 cfs 0 cf

Pond 08P: BMP 7 - Infiltration Swale Peak Elev=156.96' Storage=271 cf Inflow=0.30 cfs 910 cf
Discarded=0.02 cfs 715 cf Primary=0.22 cfs 195 cf Outflow=0.24 cfs 910 cf

Pond 09P: BMP 8 - Infiltration Swale Peak Elev=158.17' Storage=1,081 cf Inflow=1.34 cfs 4,065 cf
Discarded=0.09 cfs 2,819 cf Primary=1.01 cfs 1,246 cf Outflow=1.11 cfs 4,065 cf

Pond 10P: BMP 9 - Infiltration Swale Peak Elev=158.49' Storage=4,481 cf Inflow=10.77 cfs 49,146 cf
Discarded=0.24 cfs 11,489 cf Primary=10.20 cfs 37,657 cf Outflow=10.44 cfs 49,146 cf

Pond 11P: BMP 10 - Infiltration Swale Peak Elev=158.61' Storage=2,734 cf Inflow=14.79 cfs 63,751 cf
Discarded=0.16 cfs 7,866 cf Primary=14.54 cfs 55,886 cf Outflow=14.70 cfs 63,752 cf

Pond 12P: BMP 11 - Infiltration Swale Peak Elev=157.69' Storage=555 cf Inflow=1.22 cfs 4,424 cf
Discarded=0.05 cfs 1,977 cf Primary=1.15 cfs 2,447 cf Outflow=1.20 cfs 4,425 cf

Pond 13P: BMP 12 - Infiltration Swale Peak Elev=156.45' Storage=1,486 cf Inflow=1.78 cfs 5,398 cf
Discarded=0.13 cfs 3,757 cf Primary=1.24 cfs 1,641 cf Outflow=1.37 cfs 5,398 cf

Pond 14P: BMP 13 - Infiltration Swale Peak Elev=156.49' Storage=1,501 cf Inflow=2.05 cfs 7,510 cf
Discarded=0.13 cfs 4,280 cf Primary=1.70 cfs 3,230 cf Outflow=1.83 cfs 7,510 cf

Link 1L: Total to Bioretention Inflow=3.93 cfs 13,626 cf
Primary=3.93 cfs 13,626 cf

Link 2L: Lake Cochituate N1 Inflow=6.08 cfs 20,412 cf
Primary=6.08 cfs 20,412 cf

Link 3L: Lake Cochituate N2 Inflow=2.83 cfs 8,689 cf
Primary=2.83 cfs 8,689 cf

Link 4L: Lake Cochituate N3 Inflow=5.62 cfs 23,241 cf
Primary=5.62 cfs 23,241 cf

Link 5L: Lake Cochituate W2 Inflow=0.93 cfs 3,093 cf
Primary=0.93 cfs 3,093 cf

Link 6L: Total Inflow=121.42 cfs 539,044 cf
Primary=121.42 cfs 539,044 cf

Link DP01: Cochituate Rd Inflow=2.45 cfs 8,449 cf
Primary=2.45 cfs 8,449 cf

Link DP02: Chrysler Road Inflow=1.74 cfs 11,143 cf
Primary=1.74 cfs 11,143 cf

Link DP03: WF A Inflow=4.31 cfs 14,921 cf
Primary=4.31 cfs 14,921 cf

Link DP04: Lake Cochituate Middle Pond Inflow=21.99 cfs 89,815 cf
Primary=21.99 cfs 89,815 cf

Link DP04-1: WF B Inflow=13.63 cfs 52,343 cf
Primary=13.63 cfs 52,343 cf

Link DP04-2: WF C Inflow=1.12 cfs 3,854 cf
Primary=1.12 cfs 3,854 cf

Link DP04-3: Lake Cochituate Inflow=7.68 cfs 33,618 cf
Primary=7.68 cfs 33,618 cf

Link DP05: Lake Cochituate Middle Inflow=22.26 cfs 78,364 cf
Primary=22.26 cfs 78,364 cf

Link DP05-1: WF I Inflow=8.42 cfs 25,865 cf
Primary=8.42 cfs 25,865 cf

Link DP05-2: WF G&H Inflow=1.59 cfs 4,700 cf
Primary=1.59 cfs 4,700 cf

Link DP05-3: Lake Cochituate W4 Inflow=12.64 cfs 47,799 cf
Primary=12.64 cfs 47,799 cf

Link DP06: Worcester St Inflow=16.37 cfs 86,453 cf
Primary=16.37 cfs 86,453 cf

Link DP07: WF F Inflow=11.55 cfs 45,061 cf
Primary=11.55 cfs 45,061 cf

Link DP08: WF J Inflow=15.07 cfs 58,747 cf
Primary=15.07 cfs 58,747 cf

Link DP09: Unnamed Pond Inflow=11.45 cfs 39,313 cf
Primary=11.45 cfs 39,313 cf

Link DP09-1: WF K Inflow=1.30 cfs 3,148 cf
Primary=1.30 cfs 3,148 cf

Link DP09-2: WF KA Inflow=4.28 cfs 14,730 cf
Primary=4.28 cfs 14,730 cf

Link DP09-3: WF B Inflow=3.11 cfs 12,544 cf
Primary=3.11 cfs 12,544 cf

Link DP09-4: WF E&L, TOB C Inflow=2.99 cfs 8,892 cf
Primary=2.99 cfs 8,892 cf

Link DP10: WF A Inflow=5.94 cfs 21,952 cf
Primary=5.94 cfs 21,952 cf

Link DP11: Local St Drain System Inflow=3.76 cfs 12,319 cf
Primary=3.76 cfs 12,319 cf

Link DP12: Washington St Low Point Inflow=1.65 cfs 5,794 cf
Primary=1.65 cfs 5,794 cf

Link DP13: Empty Lot Inflow=1.30 cfs 3,883 cf
Primary=1.30 cfs 3,883 cf

Link DP14: Lagrange St Low Point Inflow=3.95 cfs 13,809 cf
Primary=3.95 cfs 13,809 cf

Link DP15: TOB D Inflow=7.36 cfs 22,159 cf
Primary=7.36 cfs 22,159 cf

Link DP16: WF 1, WF 2, TOB E Inflow=6.50 cfs 30,744 cf
Primary=6.50 cfs 30,744 cf

Total Runoff Area = 2,480,651 sf Runoff Volume = 611,101 cf Average Runoff Depth = 2.96"
71.89% Pervious = 1,783,367 sf 28.11% Impervious = 697,284 sf

Summary for Subcatchment 01S: Cochituate Rd

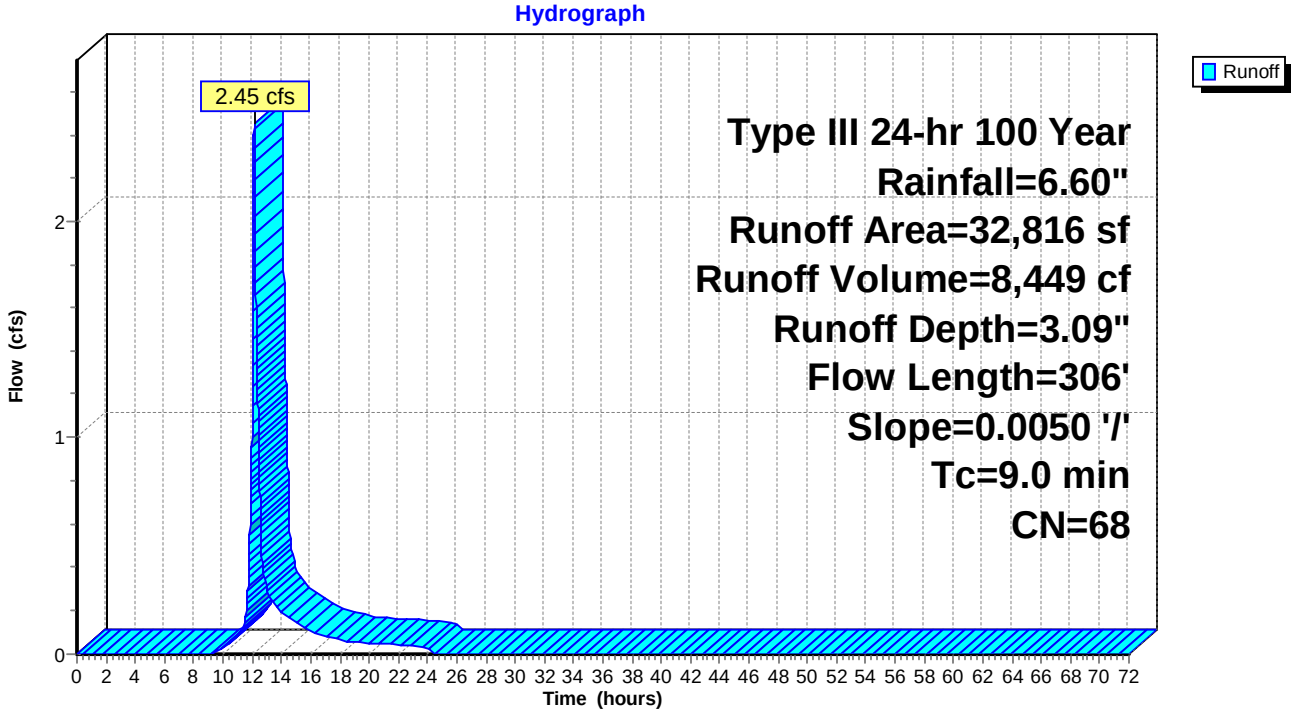
Runoff = 2.45 cfs @ 12.13 hrs, Volume= 8,449 cf, Depth= 3.09"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=6.60"

	Area (sf)	CN	Description
	16,401	57	Woods/grass comb., Poor, HSG A
	2,771	98	Paved parking, HSG A
*	3,607	98	Bike Trail, HSG A
	10,037	68	<50% Grass cover, Poor, HSG A
	32,816	68	Weighted Average
	26,438		80.56% Pervious Area
	6,378		19.44% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.1	100	0.0050	0.78		**Sheet Flow, Paved** Smooth surfaces n= 0.011 P2= 3.15"
6.9	206	0.0050	0.49		**Shallow Concentrated Flow, Grass** Short Grass Pasture Kv= 7.0 fps
9.0	306	Total			

Subcatchment 01S: Cochituate Rd



Summary for Subcatchment 02S: Chrysler Road

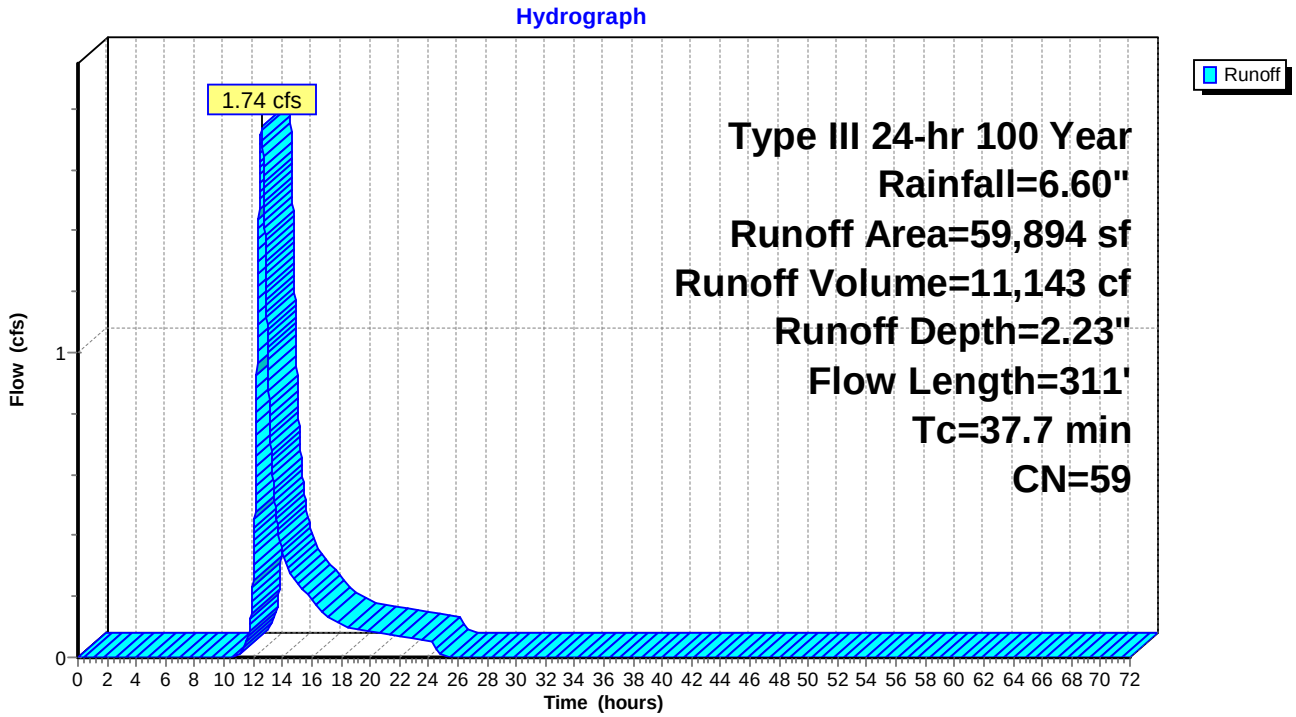
Runoff = 1.74 cfs @ 12.56 hrs, Volume= 11,143 cf, Depth= 2.23"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=6.60"

Area (sf)	CN	Description
56,760	57	Woods/grass comb., Poor, HSG A
3,134	98	Paved parking, HSG A
59,894	59	Weighted Average
56,760		94.77% Pervious Area
3,134		5.23% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
28.6	100	0.0100	0.06		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
9.1	211	0.0060	0.39		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
37.7	311	Total			

Subcatchment 02S: Chrysler Road



Summary for Subcatchment 03S: DNR-1

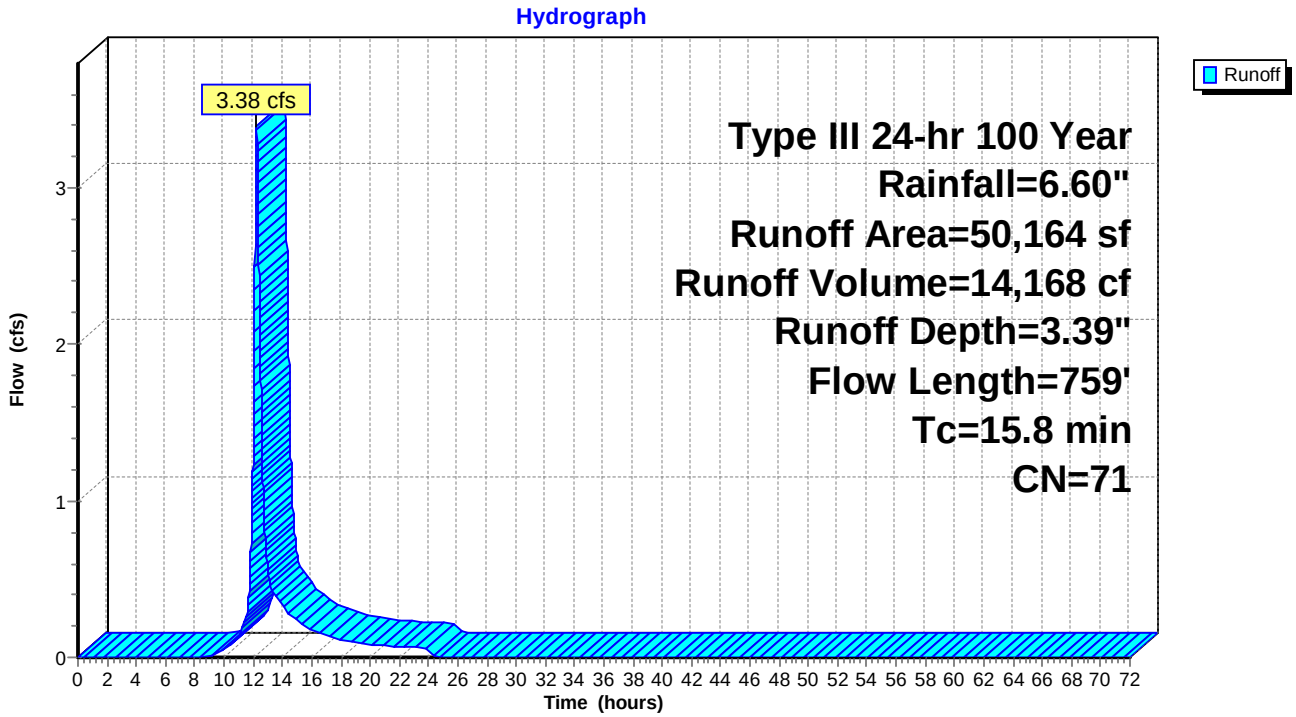
Runoff = 3.38 cfs @ 12.22 hrs, Volume= 14,168 cf, Depth= 3.39"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=6.60"

	Area (sf)	CN	Description
	33,195	57	Woods/grass comb., Poor, HSG A
*	16,969	98	Bike Trail, HSG A
	50,164	71	Weighted Average
	33,195		66.17% Pervious Area
	16,969		33.83% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0	100	0.3330	0.24		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
8.8	659	0.0069	1.25		**Shallow Concentrated Flow, Grass Channel** Grassed Waterway Kv= 15.0 fps
15.8	759	Total			

Subcatchment 03S: DNR-1



Summary for Subcatchment 04S: DNR-2

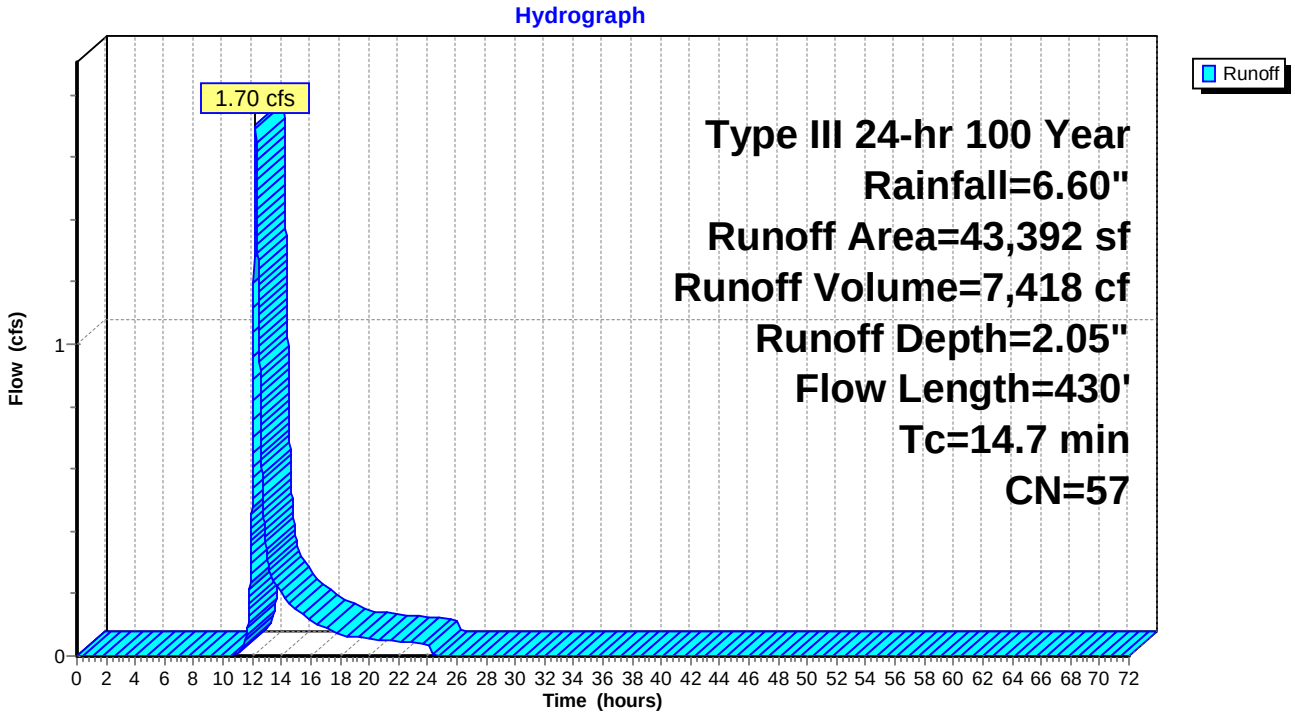
Runoff = 1.70 cfs @ 12.22 hrs, Volume= 7,418 cf, Depth= 2.05"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=6.60"

Area (sf)	CN	Description
43,392	57	Woods/grass comb., Poor, HSG A
43,392		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.4	100	0.1000	0.15		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
3.3	330	0.1090	1.65		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
14.7	430	Total			

Subcatchment 04S: DNR-2



Summary for Subcatchment 05S: Speen Street

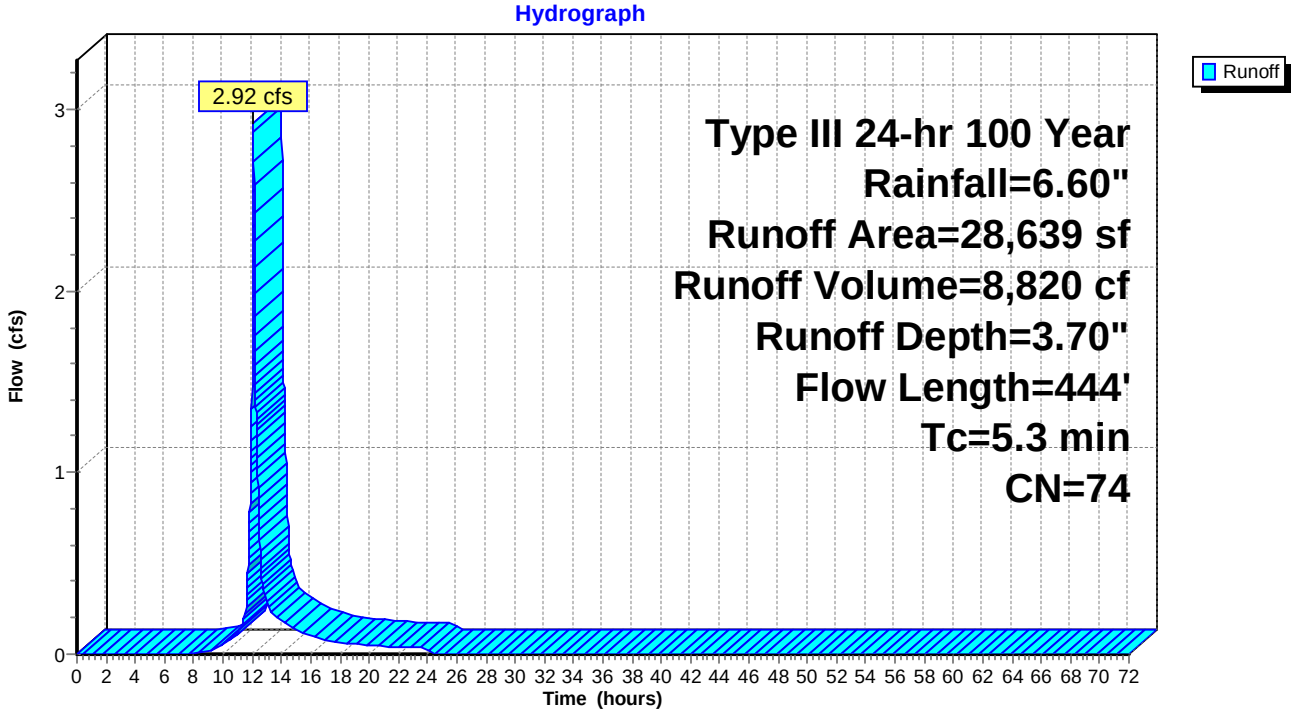
Runoff = 2.92 cfs @ 12.08 hrs, Volume= 8,820 cf, Depth= 3.70"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=6.60"

	Area (sf)	CN	Description
	8,689	57	Woods/grass comb., Poor, HSG A
*	6,838	98	Bike Path, HSG A
	1,783	98	Paved roads w/curbs & sewers, HSG A
	11,329	68	<50% Grass cover, Poor, HSG A
	28,639	74	Weighted Average
	20,018		69.90% Pervious Area
	8,621		30.10% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	22	0.1400	0.27		**Sheet Flow, Grass** Grass: Short n= 0.150 P2= 3.15"
3.9	422	0.0148	1.82		**Shallow Concentrated Flow, Grassed Channel** Grassed Waterway Kv= 15.0 fps
5.3	444	Total			

Subcatchment 05S: Speen Street



Summary for Subcatchment 06S: Lake Cochituate N1-1

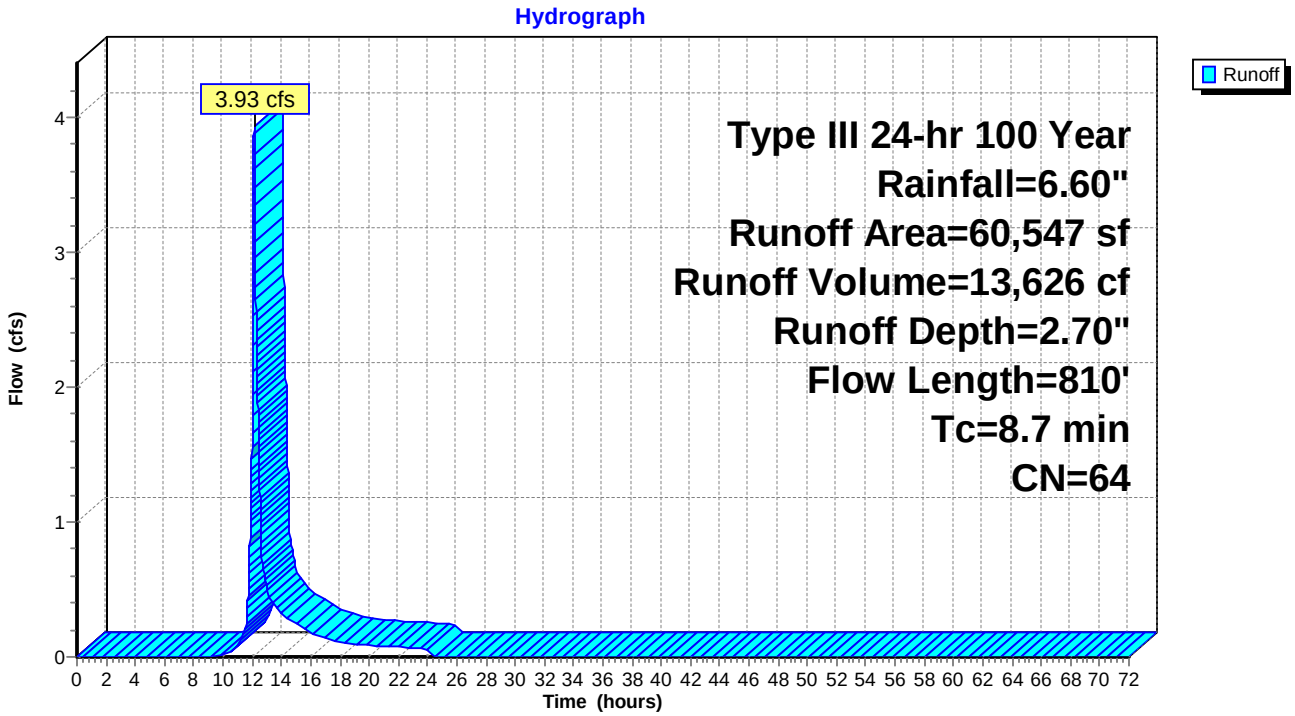
Runoff = 3.93 cfs @ 12.13 hrs, Volume= 13,626 cf, Depth= 2.70"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=6.60"

	Area (sf)	CN	Description
	49,662	57	Woods/grass comb., Poor, HSG A
*	10,885	98	Bike Path, HSG A
	60,547	64	Weighted Average
	49,662		82.02% Pervious Area
	10,885		17.98% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.7	33	0.4091	0.21		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
6.0	777	0.0103	2.16	0.81	**Trap/Vee/Rect Channel Flow, Grassed Channel** Bot.W=1.00' D=0.25' Z= 2.0 '/' Top.W=2.00' n= 0.022 Earth, clean & straight
8.7	810	Total			

Subcatchment 06S: Lake Cochituate N1-1



Summary for Subcatchment 07S: Lake Cochituate N1-2

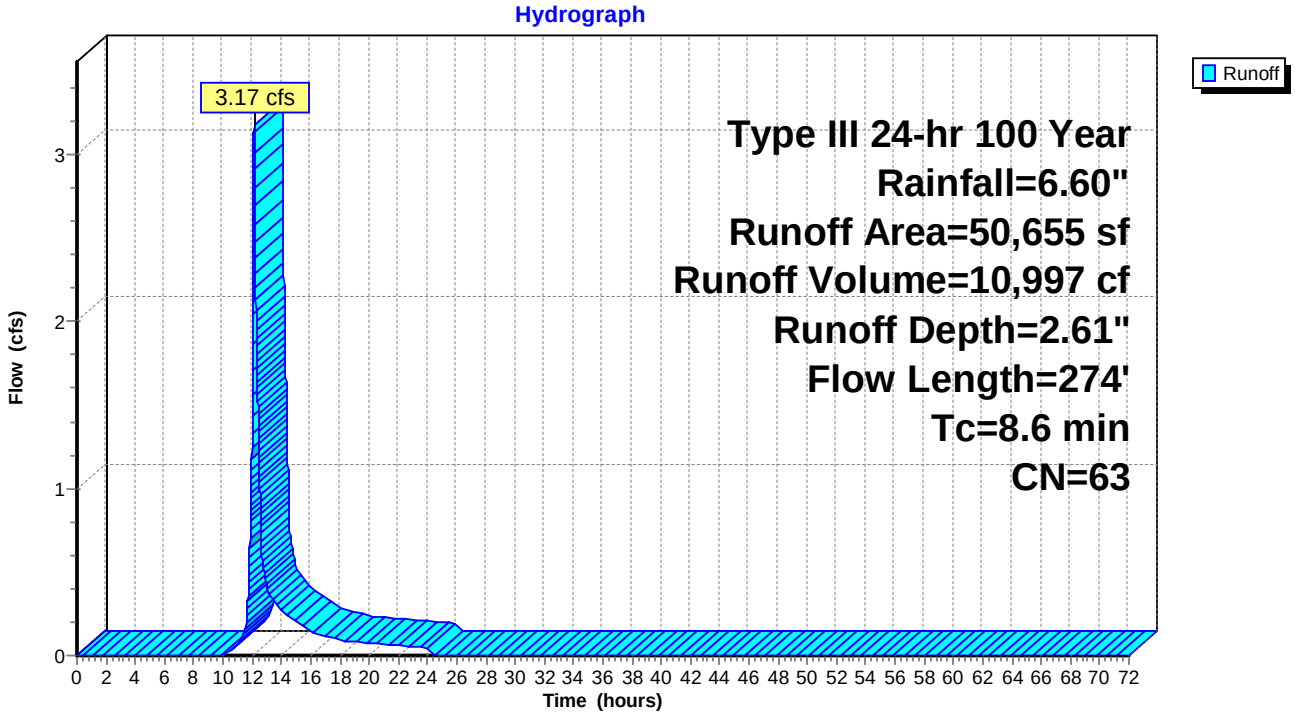
Runoff = 3.17 cfs @ 12.13 hrs, Volume= 10,997 cf, Depth= 2.61"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=6.60"

	Area (sf)	CN	Description
	43,526	57	Woods/grass comb., Poor, HSG A
*	7,129	98	Bike Path, HSG A
	50,655	63	Weighted Average
	43,526		85.93% Pervious Area
	7,129		14.07% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.7	27	0.0667	0.10		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
0.3	12	0.0150	0.80		**Sheet Flow, Bike Path** Smooth surfaces n= 0.011 P2= 3.15"
3.2	176	0.0050	0.91	0.11	**Trap/Vee/Rect Channel Flow, Grassed Channel** Bot.W=1.00' D=0.10' Z= 2.0 '/' Top.W=1.40' n= 0.022 Earth, clean & straight
0.4	59	0.2210	2.35		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
8.6	274	Total			

Subcatchment 07S: Lake Cochituate N1-2



Summary for Subcatchment 08S: Lake Cochituate N2-1

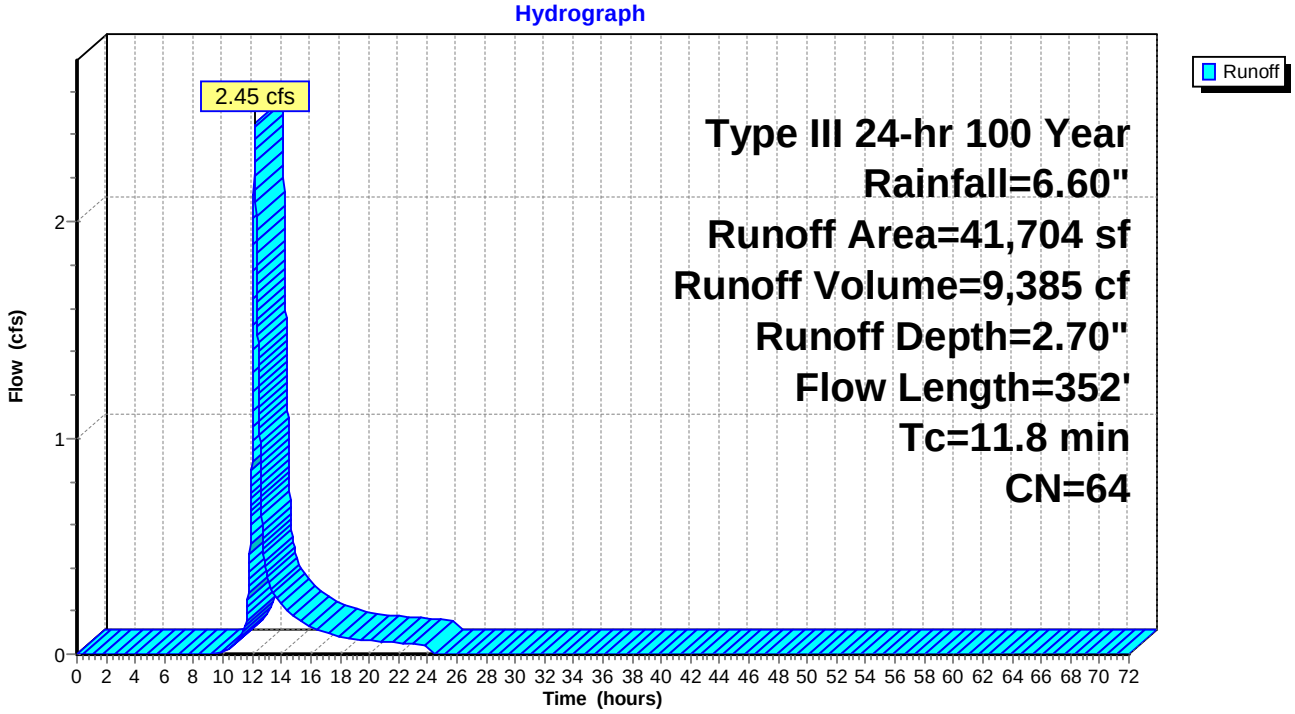
Runoff = 2.45 cfs @ 12.17 hrs, Volume= 9,385 cf, Depth= 2.70"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=6.60"

	Area (sf)	CN	Description
	34,512	57	Woods/grass comb., Poor, HSG A
*	7,192	98	Bike Path, HSG A
	41,704	64	Weighted Average
	34,512		82.75% Pervious Area
	7,192		17.25% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.6	76	0.1580	0.17		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
0.1	12	0.0150	2.49		**Shallow Concentrated Flow, Pavement** Paved Kv= 20.3 fps
4.1	264	0.0050	1.06		**Shallow Concentrated Flow, Grassed Channel** Grassed Waterway Kv= 15.0 fps
11.8	352	Total			

Subcatchment 08S: Lake Cochituate N2-1



Summary for Subcatchment 10S: Lake Cochituate N3-1

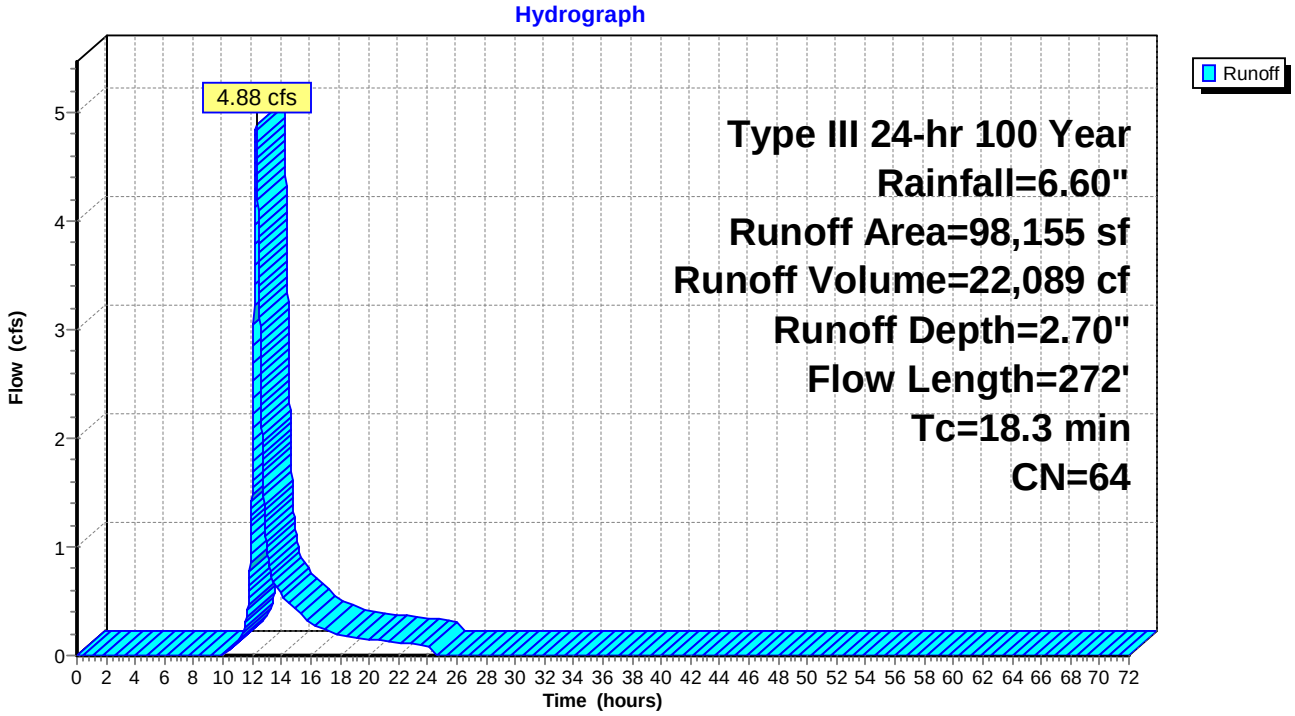
Runoff = 4.88 cfs @ 12.26 hrs, Volume= 22,089 cf, Depth= 2.70"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=6.60"

	Area (sf)	CN	Description
	82,552	57	Woods/grass comb., Poor, HSG A
	9,674	98	Paved parking, HSG A
*	5,929	98	Bike Path, HSG A
	98,155	64	Weighted Average
	82,552		84.10% Pervious Area
	15,603		15.90% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0	100	0.0500	0.11		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
3.1	140	0.0228	0.75		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
0.1	20	0.3200	2.83		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
0.1	12	0.0150	2.49		**Shallow Concentrated Flow, Pavement** Paved Kv= 20.3 fps
18.3	272	Total			

Subcatchment 10S: Lake Cochituate N3-1



Summary for Subcatchment 11S: Lake Cochituate N3-2

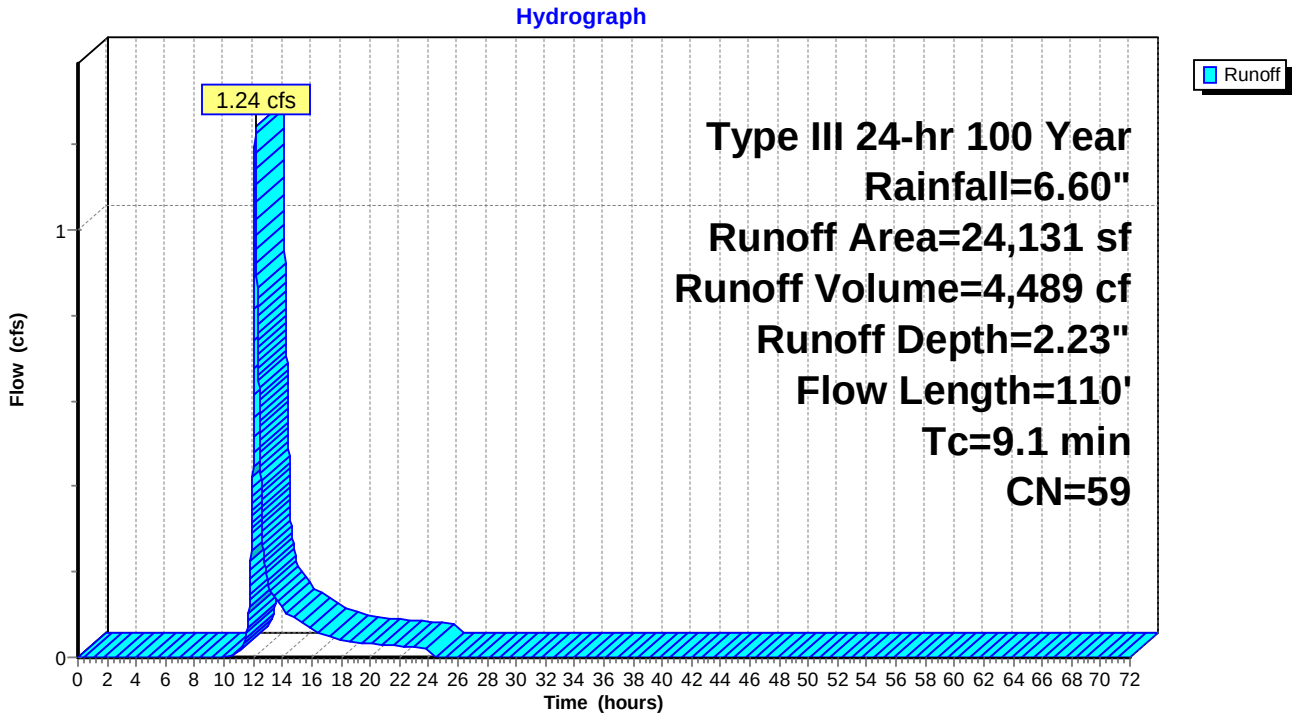
Runoff = 1.24 cfs @ 12.14 hrs, Volume= 4,489 cf, Depth= 2.23"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=6.60"

Area (sf)	CN	Description
23,045	57	Woods/grass comb., Poor, HSG A
1,086	98	Paved parking, HSG A
24,131	59	Weighted Average
23,045		95.50% Pervious Area
1,086		4.50% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.0	100	0.1780	0.18		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
0.1	10	0.1000	1.58		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
9.1	110	Total			

Subcatchment 11S: Lake Cochituate N3-2



Summary for Subcatchment 12S: Lake Cochituate E1

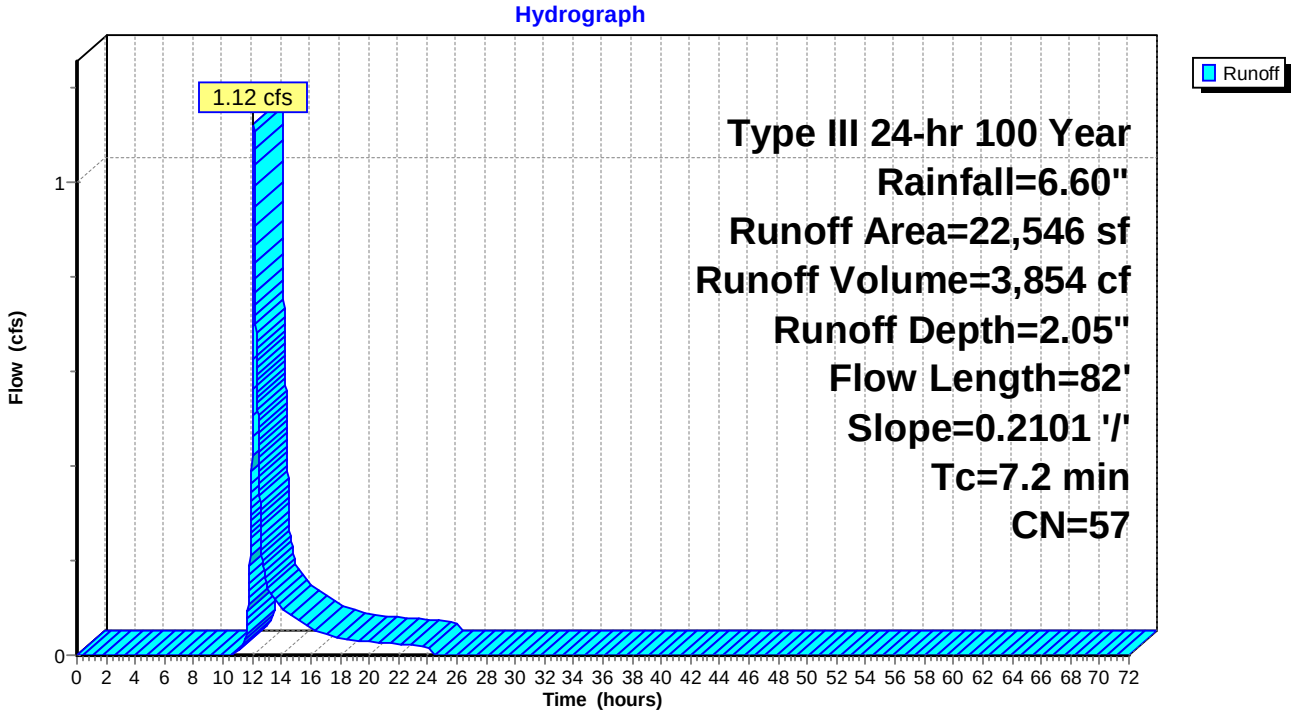
Runoff = 1.12 cfs @ 12.11 hrs, Volume= 3,854 cf, Depth= 2.05"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=6.60"

Area (sf)	CN	Description
22,546	57	Woods/grass comb., Poor, HSG A
22,546		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.2	82	0.2101	0.19		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"

Subcatchment 12S: Lake Cochituate E1



Summary for Subcatchment 13S: Lake Cochituate E2

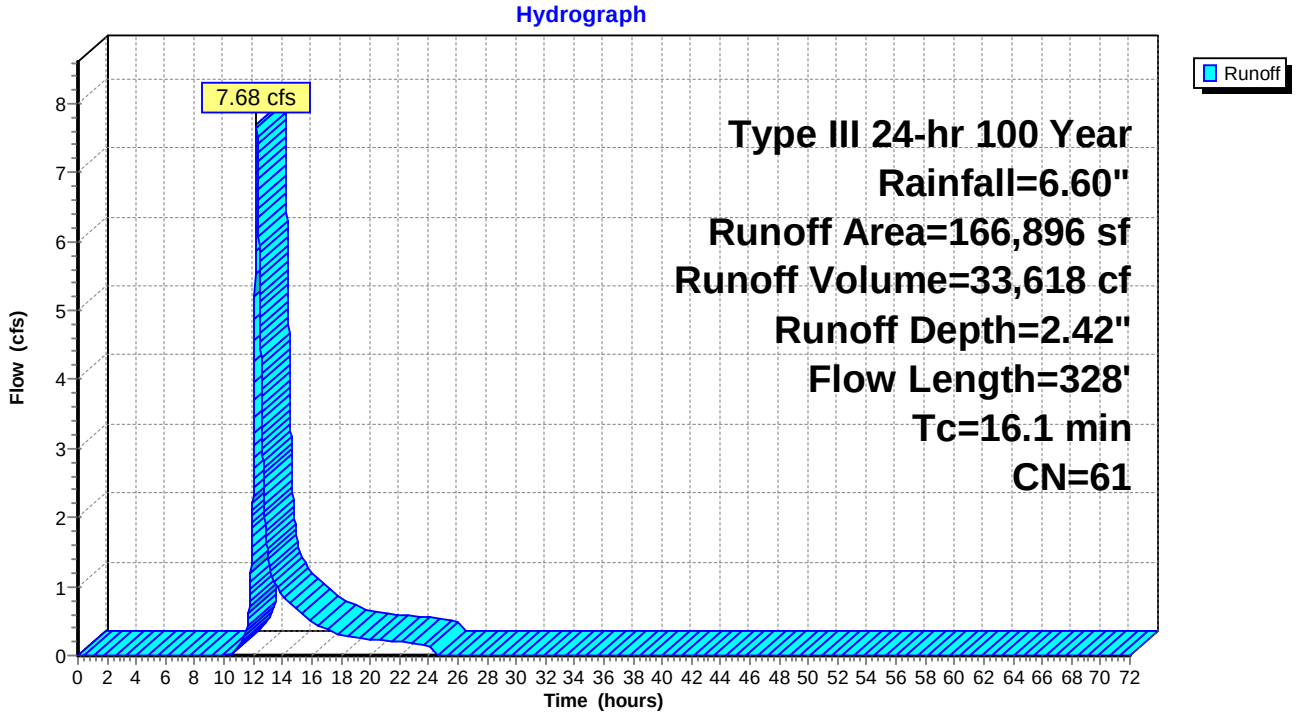
Runoff = 7.68 cfs @ 12.23 hrs, Volume= 33,618 cf, Depth= 2.42"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=6.60"

	Area (sf)	CN	Description
	151,423	57	Woods/grass comb., Poor, HSG A
	13,352	98	Paved parking, HSG A
*	2,121	98	Bike Path, HSG A
	166,896	61	Weighted Average
	151,423		90.73% Pervious Area
	15,473		9.27% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.1	100	0.0700	0.13		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
2.0	125	0.0456	1.07		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
0.1	13	0.0192	2.81		**Shallow Concentrated Flow, Road** Paved Kv= 20.3 fps
0.9	90	0.1080	1.64		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
16.1	328	Total			

Subcatchment 13S: Lake Cochituate E2



Summary for Subcatchment 14S: Lake Cochituate W1-1

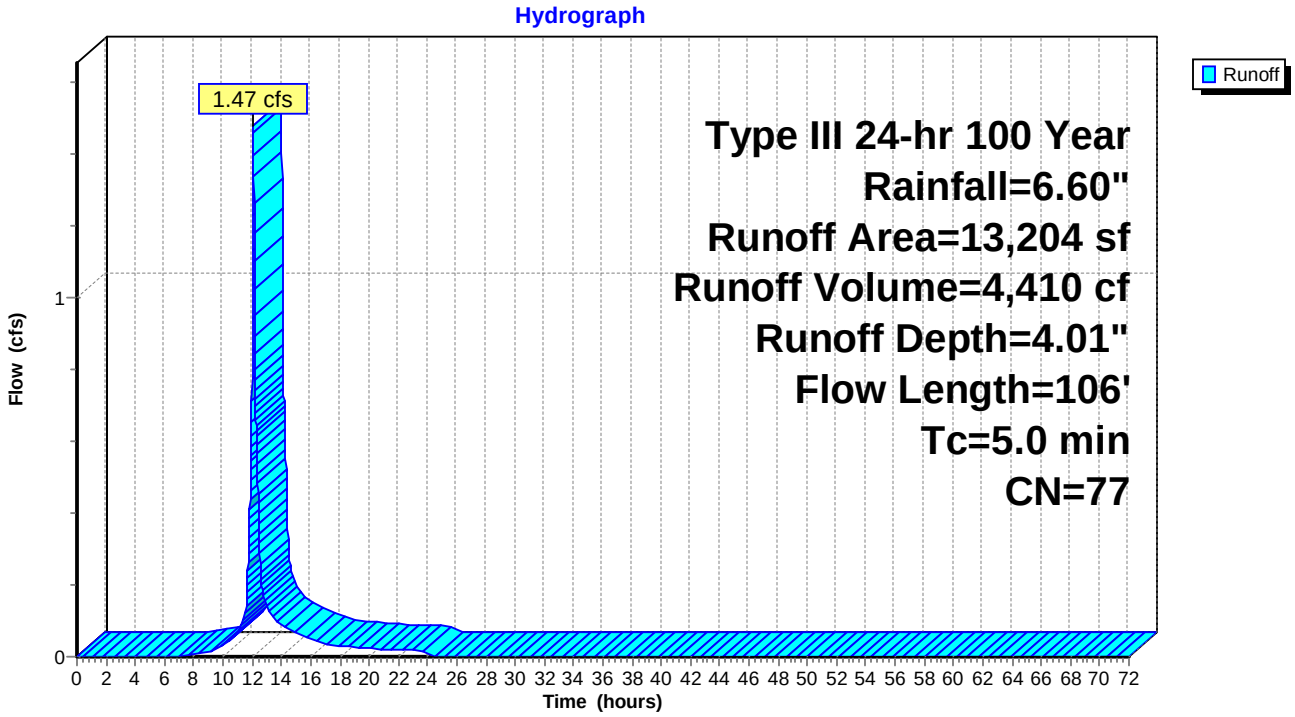
Runoff = 1.47 cfs @ 12.07 hrs, Volume= 4,410 cf, Depth= 4.01"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=6.60"

	Area (sf)	CN	Description
	6,894	57	Woods/grass comb., Poor, HSG A
*	3,476	98	Bike Path, HSG A
	2,834	98	Paved parking, HSG A
	13,204	77	Weighted Average
	6,894		52.21% Pervious Area
	6,310		47.79% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.9	15	0.2000	0.13		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
0.3	12	0.0150	0.80		**Sheet Flow, Bike Path** Smooth surfaces n= 0.011 P2= 3.15"
1.2	79	0.0050	1.06		**Shallow Concentrated Flow, Grass Channel** Grassed Waterway Kv= 15.0 fps
3.4	106	Total, Increased to minimum Tc = 5.0 min			

Subcatchment 14S: Lake Cochituate W1-1



Summary for Subcatchment 15S: Lake Cochituate W1-2

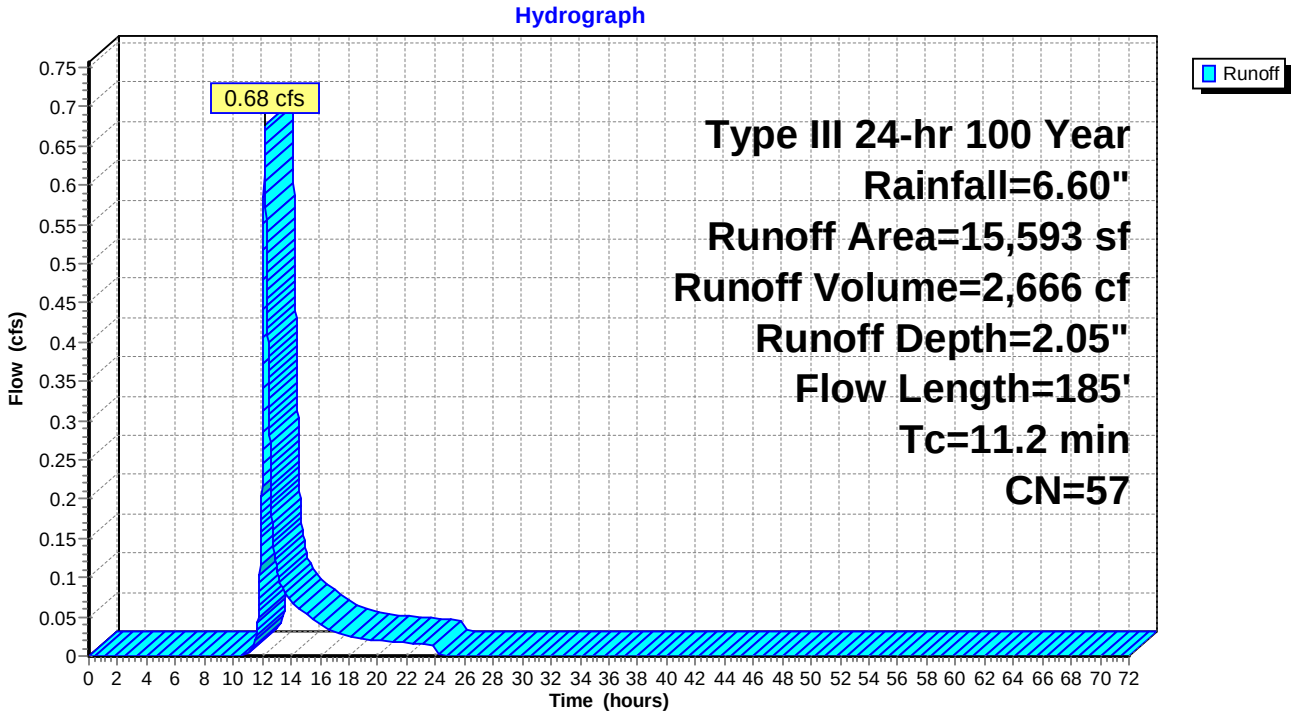
Runoff = 0.68 cfs @ 12.17 hrs, Volume= 2,666 cf, Depth= 2.05"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=6.60"

Area (sf)	CN	Description
15,593	57	Woods/grass comb., Poor, HSG A
15,593		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	100	0.1200	0.16		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
0.6	85	0.2100	2.29		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
11.2	185	Total			

Subcatchment 15S: Lake Cochituate W1-2



Summary for Subcatchment 16S: Lake Cochituate N4

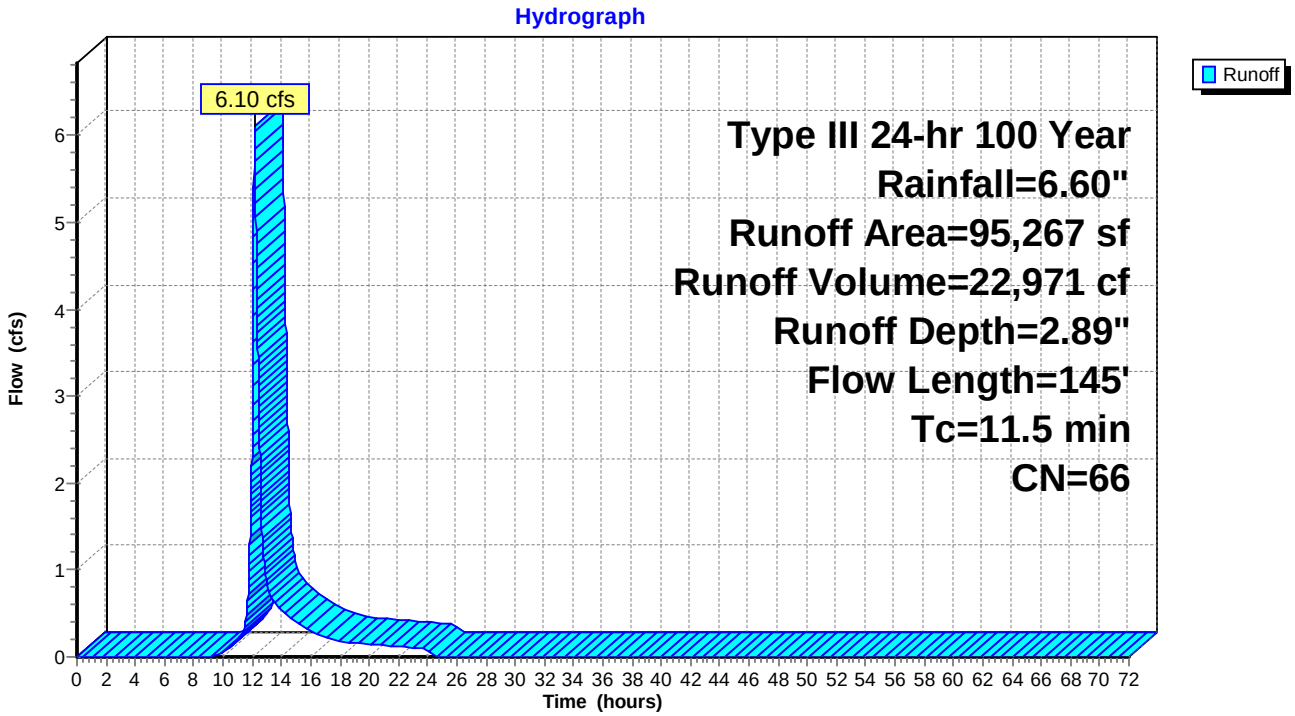
Runoff = 6.10 cfs @ 12.16 hrs, Volume= 22,971 cf, Depth= 2.89"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=6.60"

	Area (sf)	CN	Description
	73,296	57	Woods/grass comb., Poor, HSG A
	17,258	98	Paved parking, HSG A
*	4,713	98	Bike Path, HSG A
	95,267	66	Weighted Average
	73,296		76.94% Pervious Area
	21,971		23.06% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.9	100	0.1100	0.15		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
0.6	45	0.0578	1.20		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
11.5	145	Total			

Subcatchment 16S: Lake Cochituate N4



Summary for Subcatchment 17S: Lake Cochituate W2-1

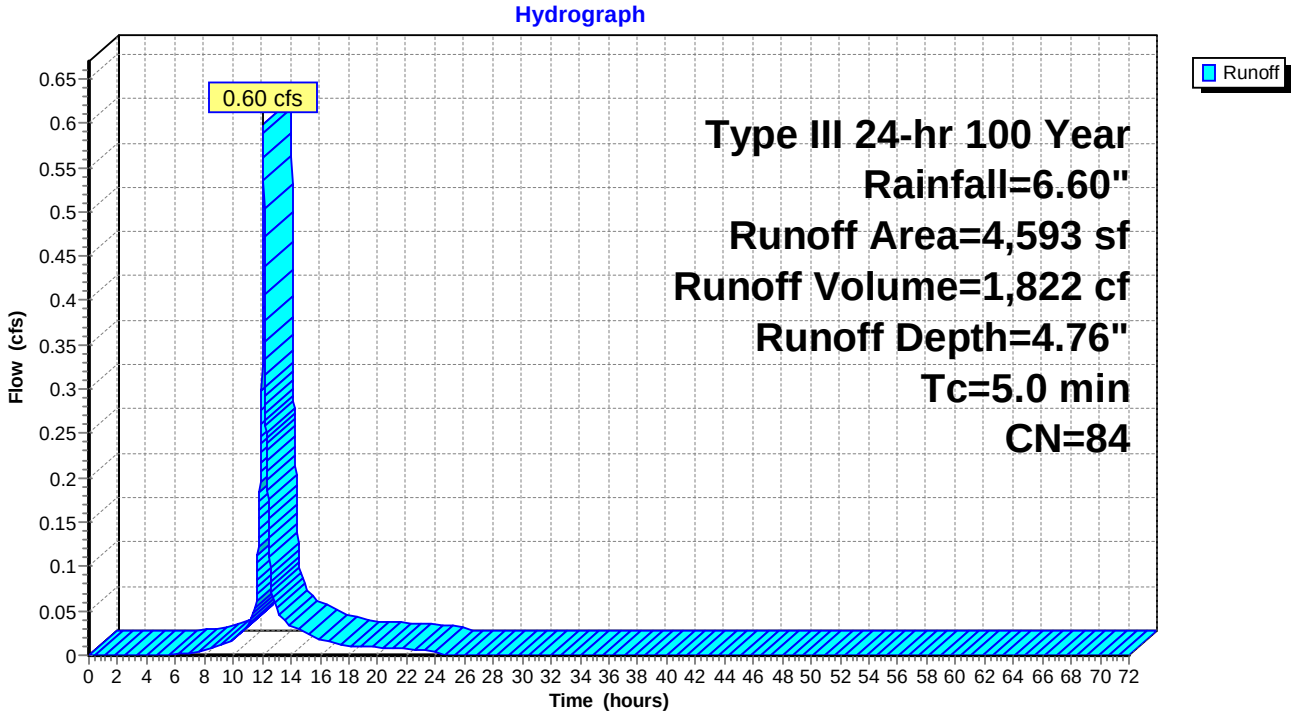
Runoff = 0.60 cfs @ 12.07 hrs, Volume= 1,822 cf, Depth= 4.76"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=6.60"

	Area (sf)	CN	Description
	1,590	57	Woods/grass comb., Poor, HSG A
*	3,003	98	Bike Path, HSG A
	4,593	84	Weighted Average
	1,590		34.62% Pervious Area
	3,003		65.38% Impervious Area

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

Subcatchment 17S: Lake Cochituate W2-1



Summary for Subcatchment 18S: Lake Cochituate W2-2

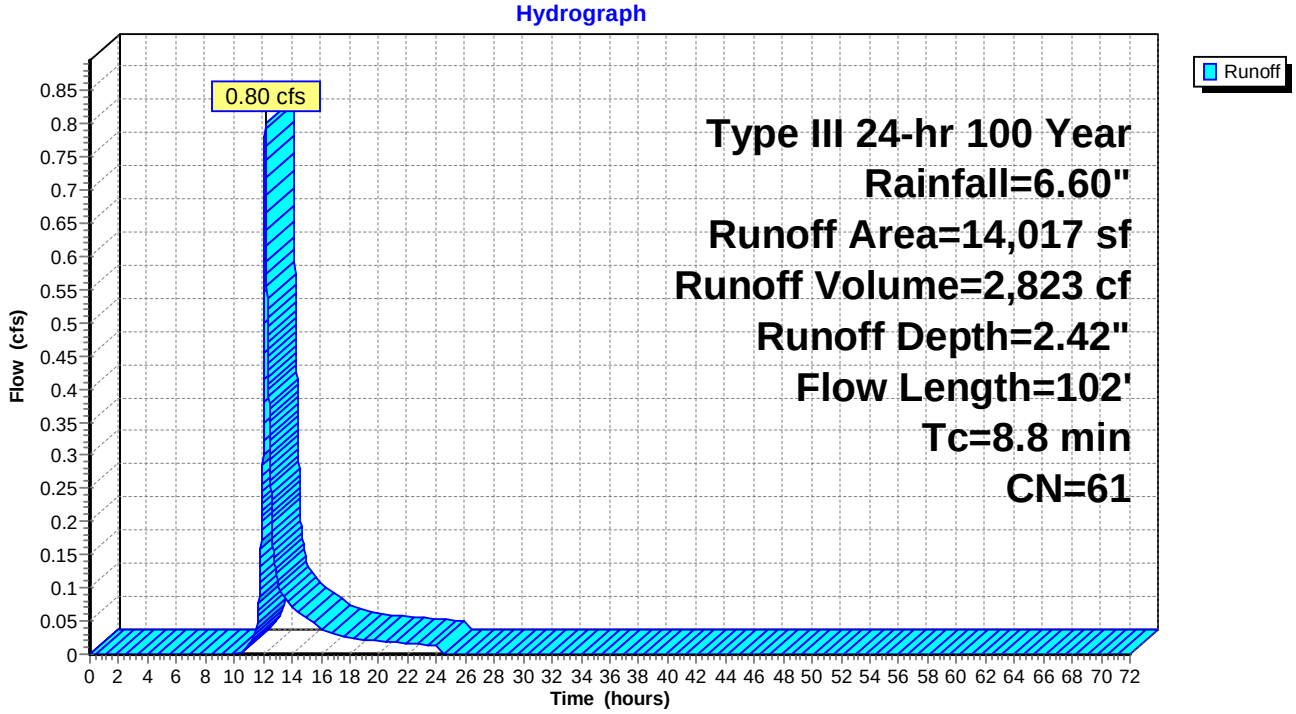
Runoff = 0.80 cfs @ 12.13 hrs, Volume= 2,823 cf, Depth= 2.42"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=6.60"

	Area (sf)	CN	Description
	12,683	57	Woods/grass comb., Poor, HSG A
*	1,334	98	Bike Path, HSG A
	14,017	61	Weighted Average
	12,683		90.48% Pervious Area
	1,334		9.52% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	24	0.0150	0.91		**Sheet Flow, Pavement** Smooth surfaces n= 0.011 P2= 3.15"
1.8	22	0.5200	0.21		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
6.6	56	0.1200	0.14		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
8.8	102	Total			

Subcatchment 18S: Lake Cochituate W2-2



Summary for Subcatchment 19S: Lake Cochituate W3-1

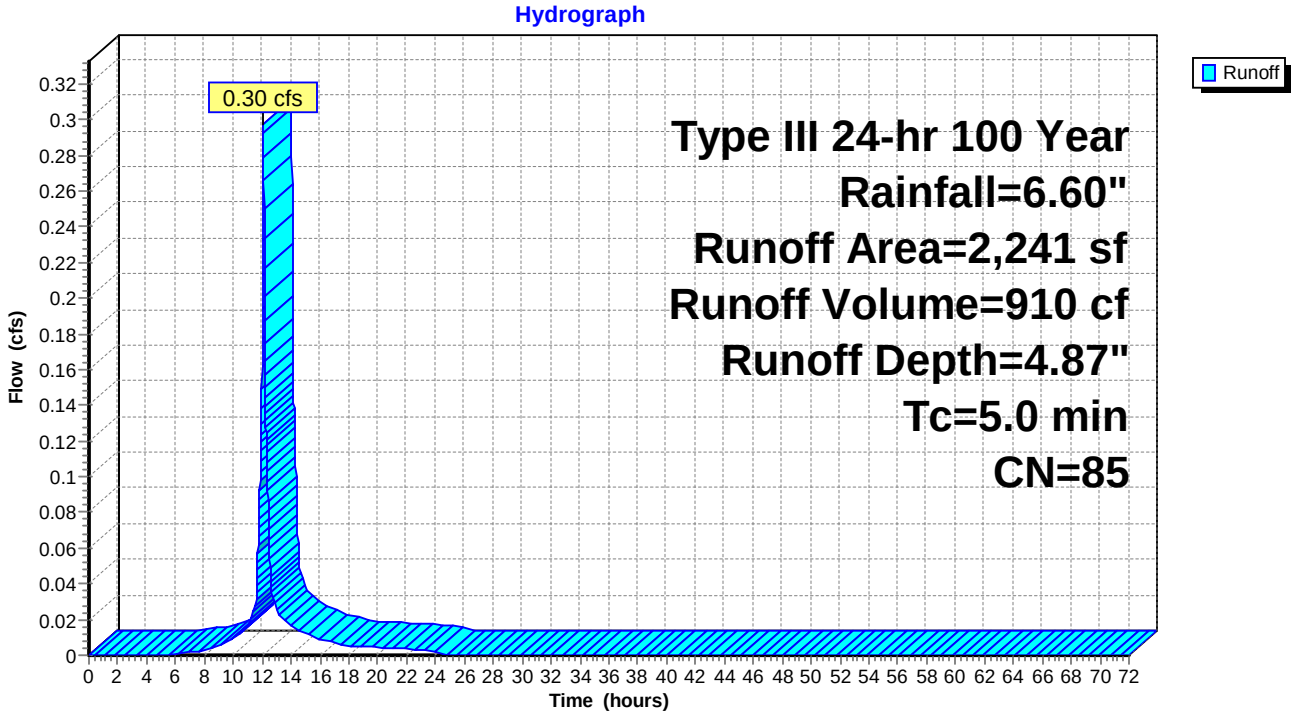
Runoff = 0.30 cfs @ 12.07 hrs, Volume= 910 cf, Depth= 4.87"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=6.60"

	Area (sf)	CN	Description
	728	57	Woods/grass comb., Poor, HSG A
*	1,513	98	Bike Path, HSG A
	2,241	85	Weighted Average
	728		32.49% Pervious Area
	1,513		67.51% Impervious Area

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

Subcatchment 19S: Lake Cochituate W3-1



Summary for Subcatchment 20S: Lake Cochituate W3-2

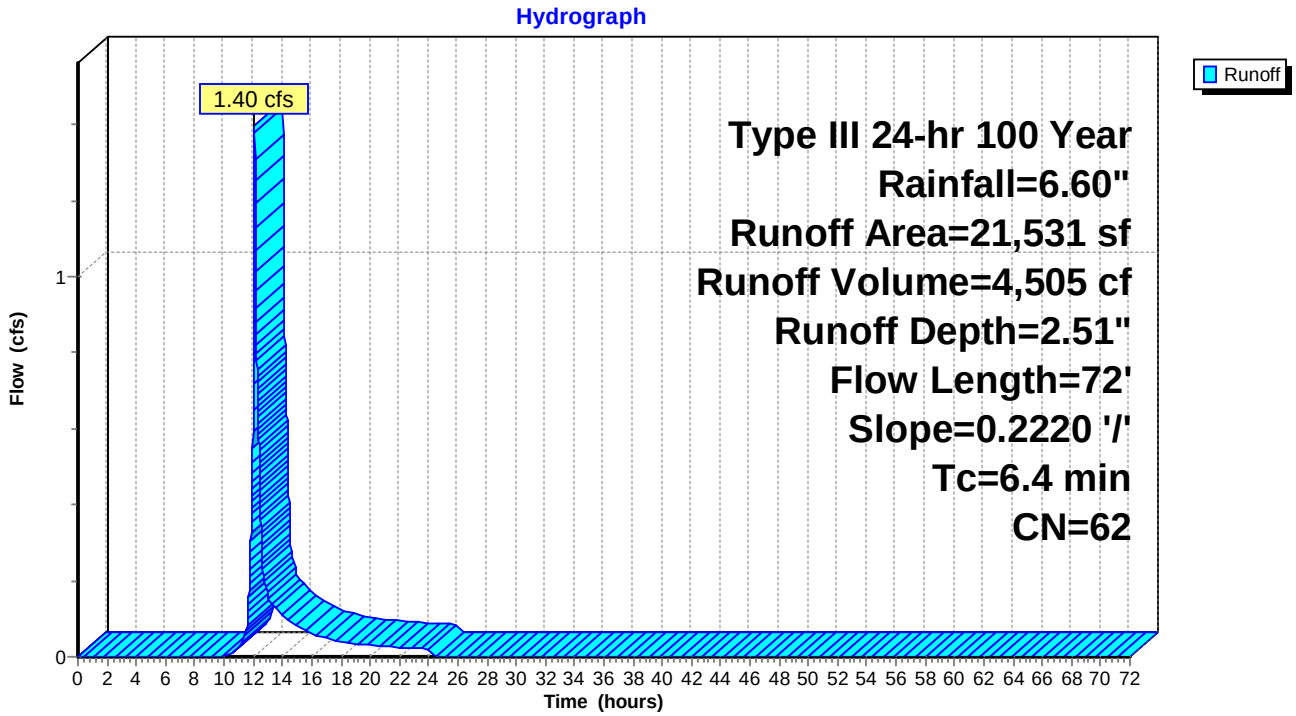
Runoff = 1.40 cfs @ 12.10 hrs, Volume= 4,505 cf, Depth= 2.51"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=6.60"

	Area (sf)	CN	Description
	19,031	57	Woods/grass comb., Poor, HSG A
*	2,500	98	Bike Path, HSG A
	21,531	62	Weighted Average
	19,031		88.39% Pervious Area
	2,500		11.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.4	72	0.2220	0.19		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"

Subcatchment 20S: Lake Cochituate W3-2



Summary for Subcatchment 21S: Lake Cochituate W4-1

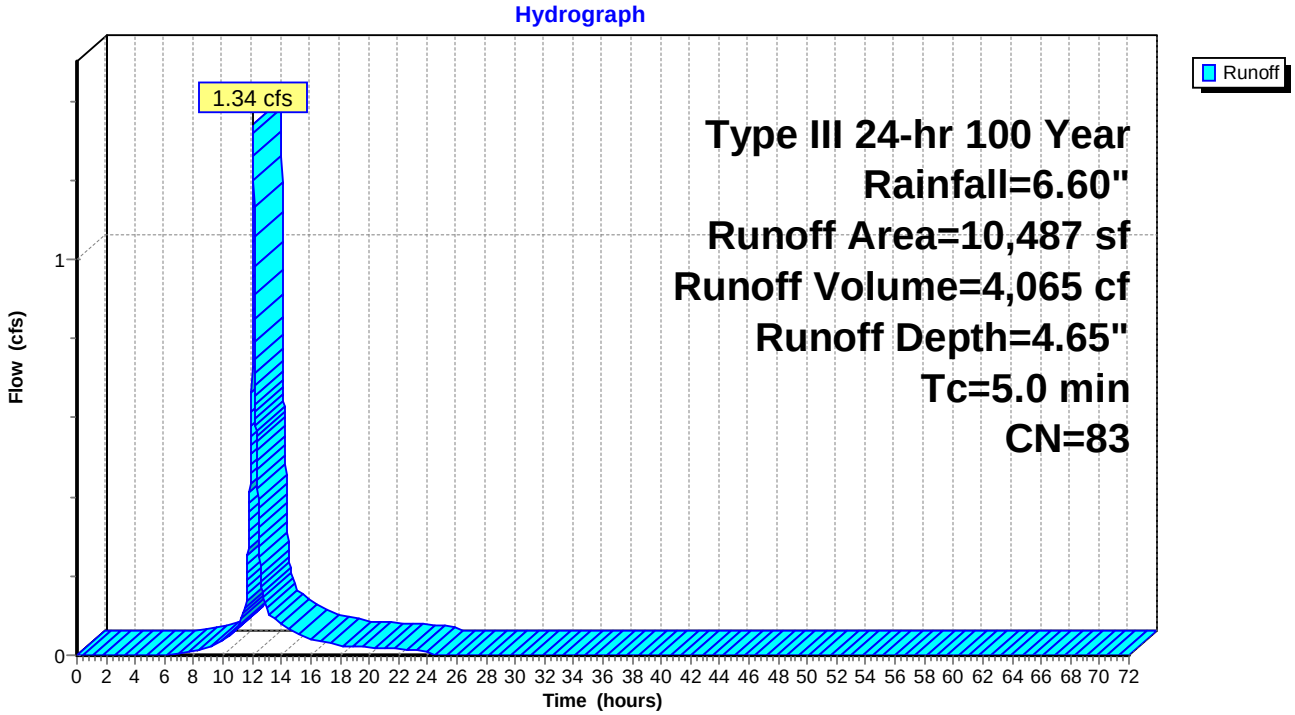
Runoff = 1.34 cfs @ 12.07 hrs, Volume= 4,065 cf, Depth= 4.65"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=6.60"

	Area (sf)	CN	Description
*	6,523	98	Bike Path, HSG A
	3,964	57	Woods/grass comb., Poor, HSG A
	10,487	83	Weighted Average
	3,964		37.80% Pervious Area
	6,523		62.20% Impervious Area

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

Subcatchment 21S: Lake Cochituate W4-1



Summary for Subcatchment 22S: Lake Cochituate W4-2

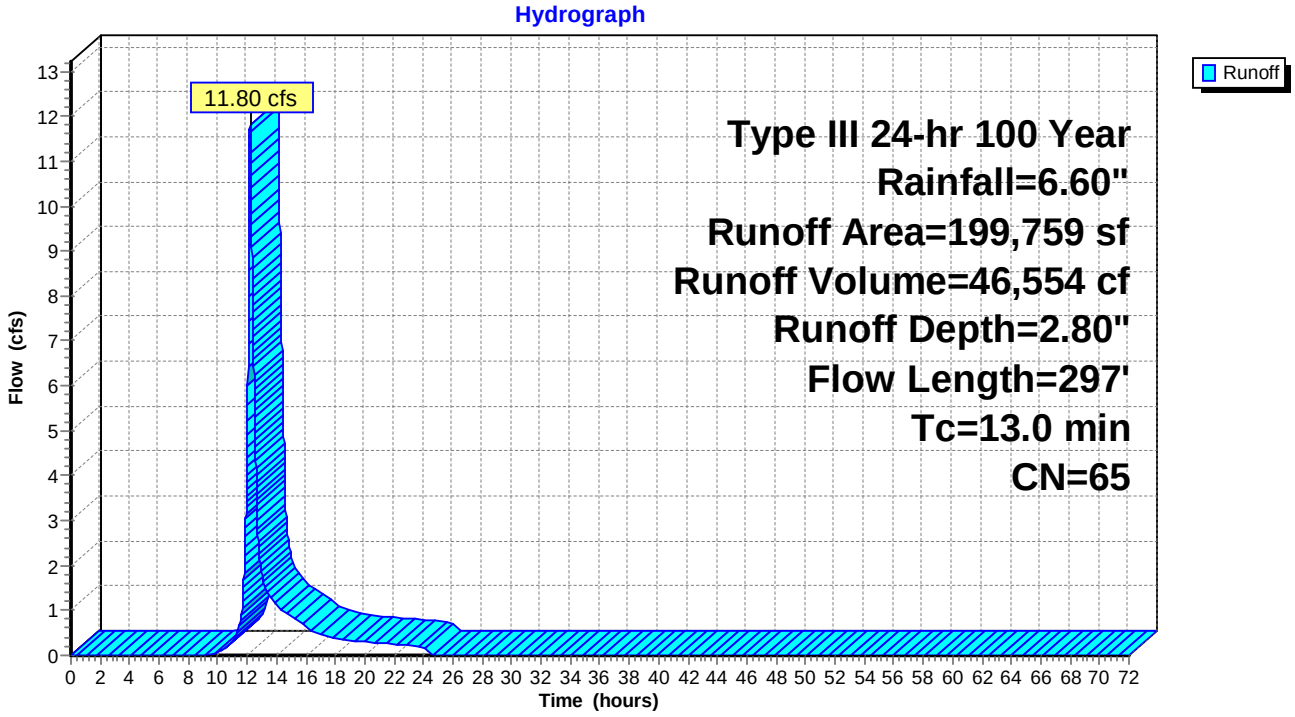
Runoff = 11.80 cfs @ 12.18 hrs, Volume= 46,554 cf, Depth= 2.80"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=6.60"

	Area (sf)	CN	Description
	160,339	57	Woods/grass comb., Poor, HSG A
*	39,420	98	Paved parking, HSG A
	199,759	65	Weighted Average
	160,339		80.27% Pervious Area
	39,420		19.73% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.8	100	0.1444	0.17		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
3.2	197	0.0431	1.04		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
13.0	297	Total			

Subcatchment 22S: Lake Cochituate W4-2



Summary for Subcatchment 23S: Worcester St N

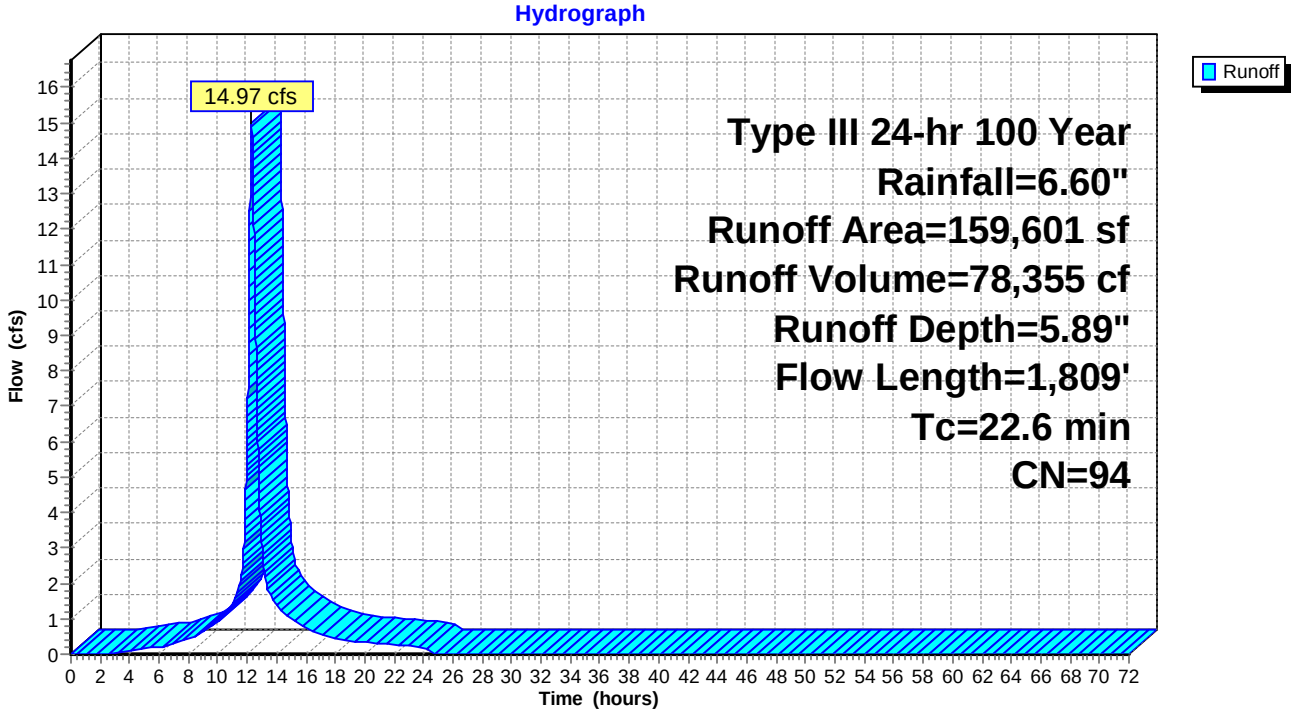
Runoff = 14.97 cfs @ 12.29 hrs, Volume= 78,355 cf, Depth= 5.89"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=6.60"

	Area (sf)	CN	Description
	68,655	89	Urban commercial, 85% imp, HSG A
*	1,908	98	Bike Path, HSG A
	88,153	98	Paved roads w/curbs & sewers, HSG A
	885	57	Woods/grass comb., Poor, HSG A
	159,601	94	Weighted Average
	11,183		7.01% Pervious Area
	148,418		92.99% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.0	100	0.0100	0.13		**Sheet Flow, Yards** Grass: Short n= 0.150 P2= 3.15"
9.6	1,709	0.0214	2.97		**Shallow Concentrated Flow, Road** Paved Kv= 20.3 fps
22.6	1,809	Total			

Subcatchment 23S: Worcester St N



Summary for Subcatchment 24S: Worcester St S

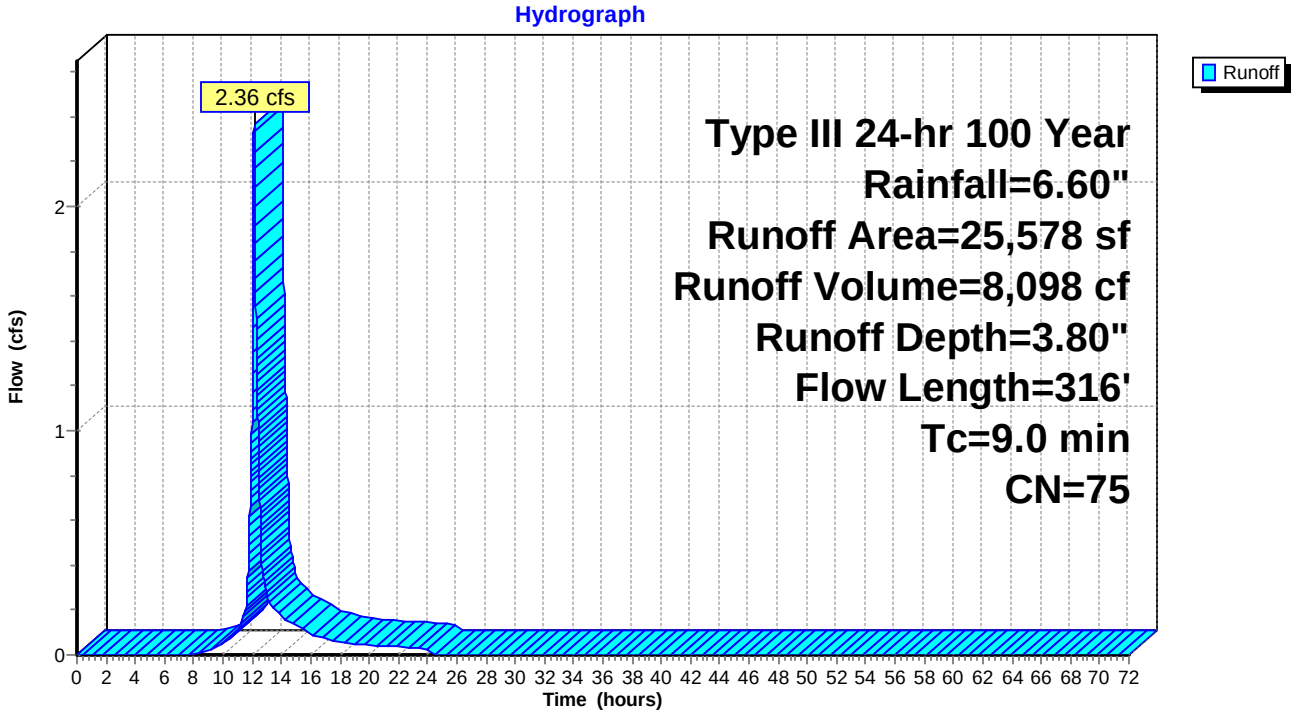
Runoff = 2.36 cfs @ 12.13 hrs, Volume= 8,098 cf, Depth= 3.80"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=6.60"

	Area (sf)	CN	Description
	14,547	57	Woods/grass comb., Poor, HSG A
	10,499	98	Paved parking, HSG A
*	532	98	Bike Path, HSG A
	25,578	75	Weighted Average
	14,547		56.87% Pervious Area
	11,031		43.13% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.3	90	0.2444	0.21		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
1.7	226	0.0115	2.18		**Shallow Concentrated Flow, Road** Paved Kv= 20.3 fps
9.0	316	Total			

Subcatchment 24S: Worcester St S



Summary for Subcatchment 25S: Arcadi Rd-1

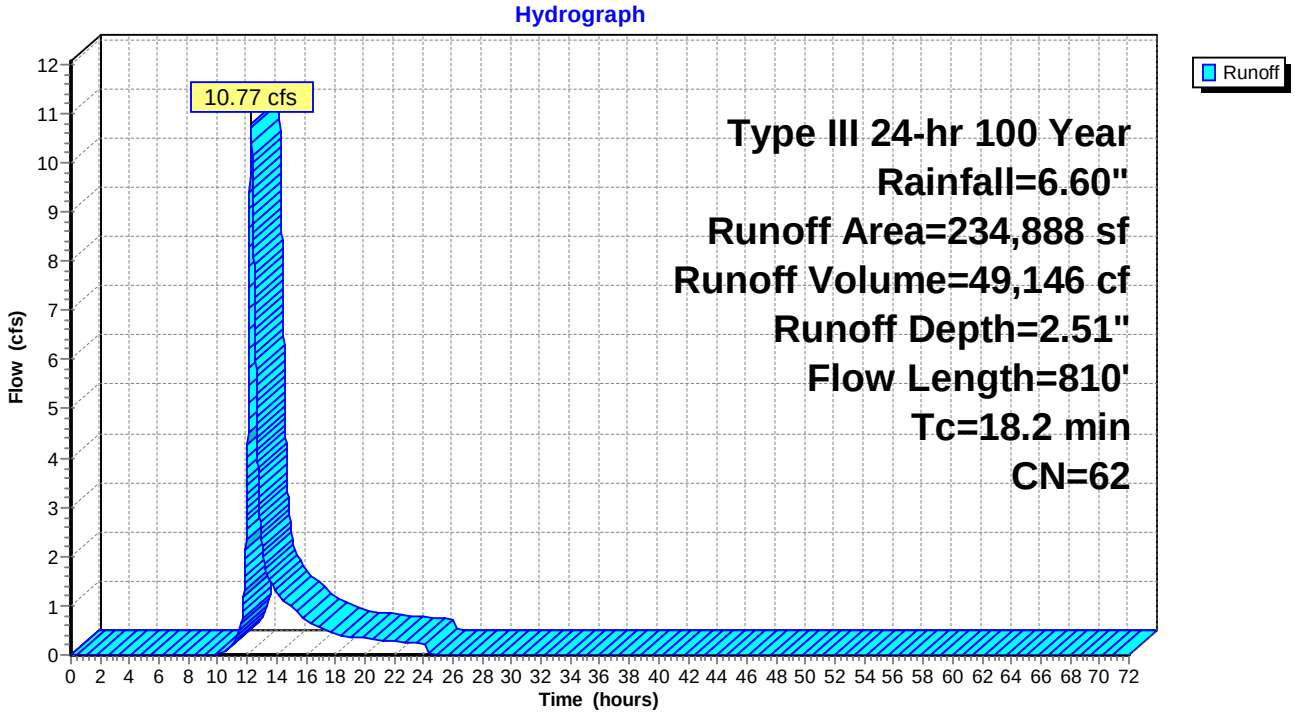
Runoff = 10.77 cfs @ 12.27 hrs, Volume= 49,146 cf, Depth= 2.51"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=6.60"

	Area (sf)	CN	Description
	82,419	61	1/4 acre lots, 38% imp, HSG A
	1,306	98	Paved parking, HSG A
	1,798	76	Gravel roads, HSG A
*	20,606	98	Bike Path, HSG A
	128,759	57	Woods/grass comb., Poor, HSG A
	234,888	62	Weighted Average
	181,657		77.34% Pervious Area
	53,231		22.66% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.6	100	0.0550	0.25		**Sheet Flow, Yards** Grass: Short n= 0.150 P2= 3.15"
0.5	30	0.0250	1.11		**Shallow Concentrated Flow, Yards** Short Grass Pasture Kv= 7.0 fps
0.2	38	0.4079	3.19		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
0.2	35	0.0150	2.49		**Shallow Concentrated Flow, Bike Path** Paved Kv= 20.3 fps
10.7	607	0.0040	0.95		**Shallow Concentrated Flow, Grass Channel** Grassed Waterway Kv= 15.0 fps
18.2	810	Total			

Subcatchment 25S: Arcadi Rd-1



Summary for Subcatchment 26S: Arcadi Rd-2

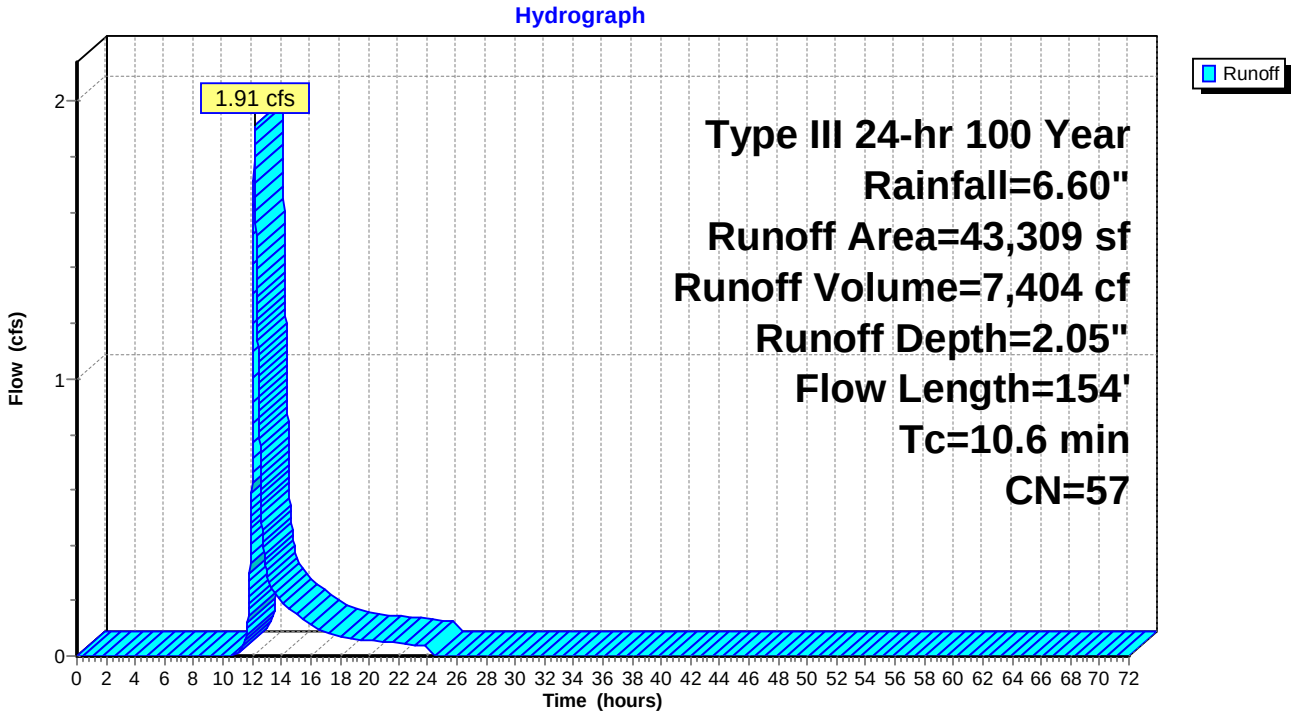
Runoff = 1.91 cfs @ 12.16 hrs, Volume= 7,404 cf, Depth= 2.05"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=6.60"

Area (sf)	CN	Description
43,309	57	Woods/grass comb., Poor, HSG A
43,309		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.3	100	0.1290	0.16		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
0.3	54	0.3148	2.81		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
10.6	154	Total			

Subcatchment 26S: Arcadi Rd-2



Summary for Subcatchment 27S: Fisher St-1

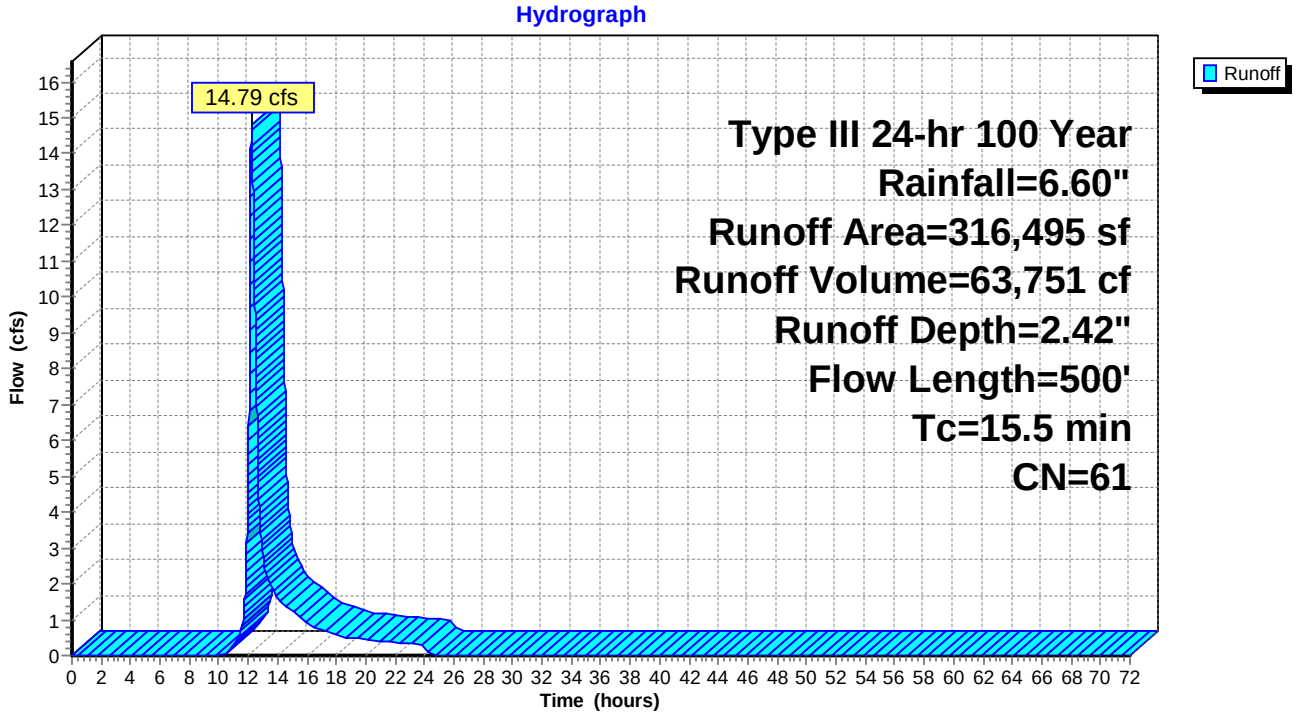
Runoff = 14.79 cfs @ 12.22 hrs, Volume= 63,751 cf, Depth= 2.42"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=6.60"

	Area (sf)	CN	Description
	190,932	61	1/4 acre lots, 38% imp, HSG A
*	14,693	98	Bike Path, HSG A
	110,870	57	Woods/grass comb., Poor, HSG A
	316,495	61	Weighted Average
	229,248		72.43% Pervious Area
	87,247		27.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.4	100	0.0175	0.16		**Sheet Flow, Yards** Grass: Short n= 0.150 P2= 3.15"
2.1	191	0.0477	1.53		**Shallow Concentrated Flow, Yards** Short Grass Pasture Kv= 7.0 fps
2.9	191	0.0477	1.09		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
0.1	18	0.0150	2.49		**Shallow Concentrated Flow, Pavement** Paved Kv= 20.3 fps
15.5	500	Total			

Subcatchment 27S: Fisher St-1



Summary for Subcatchment 28S: Fisher St-2

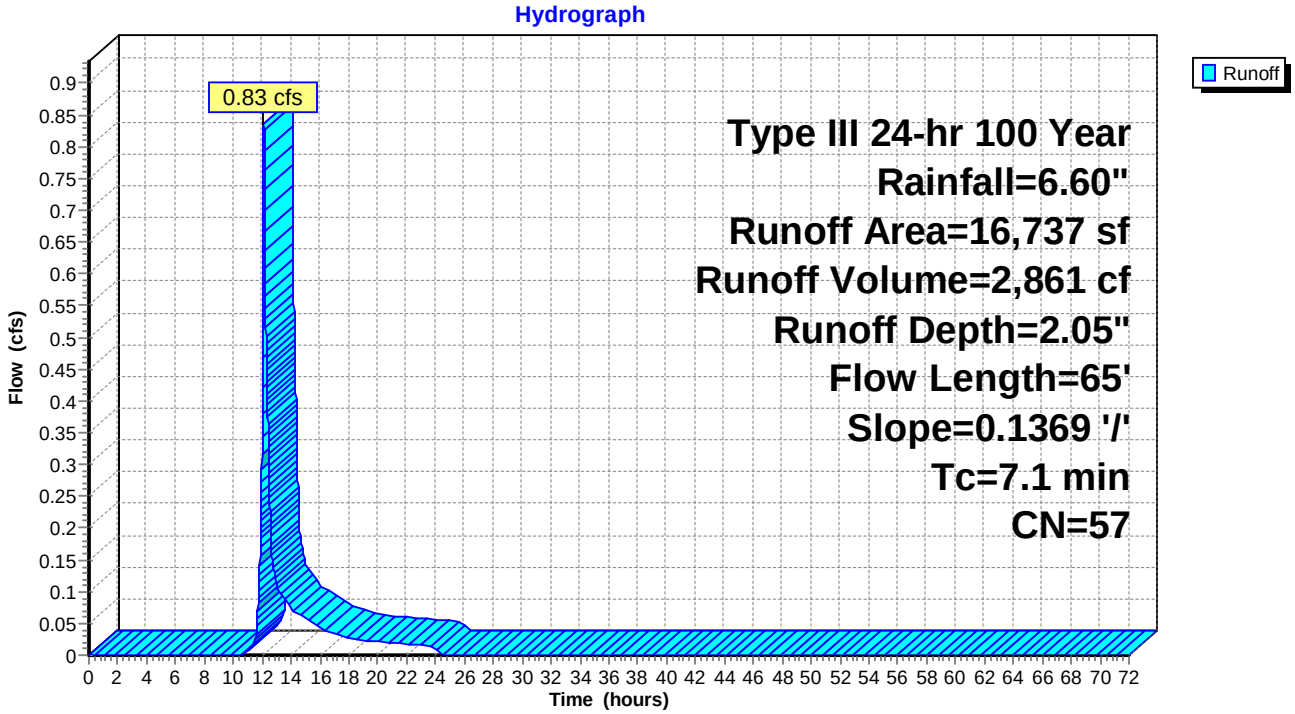
Runoff = 0.83 cfs @ 12.11 hrs, Volume= 2,861 cf, Depth= 2.05"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=6.60"

Area (sf)	CN	Description
16,737	57	Woods/grass comb., Poor, HSG A
16,737		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.1	65	0.1369	0.15		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"

Subcatchment 28S: Fisher St-2



Summary for Subcatchment 29S: Unnamed Pond 1-2

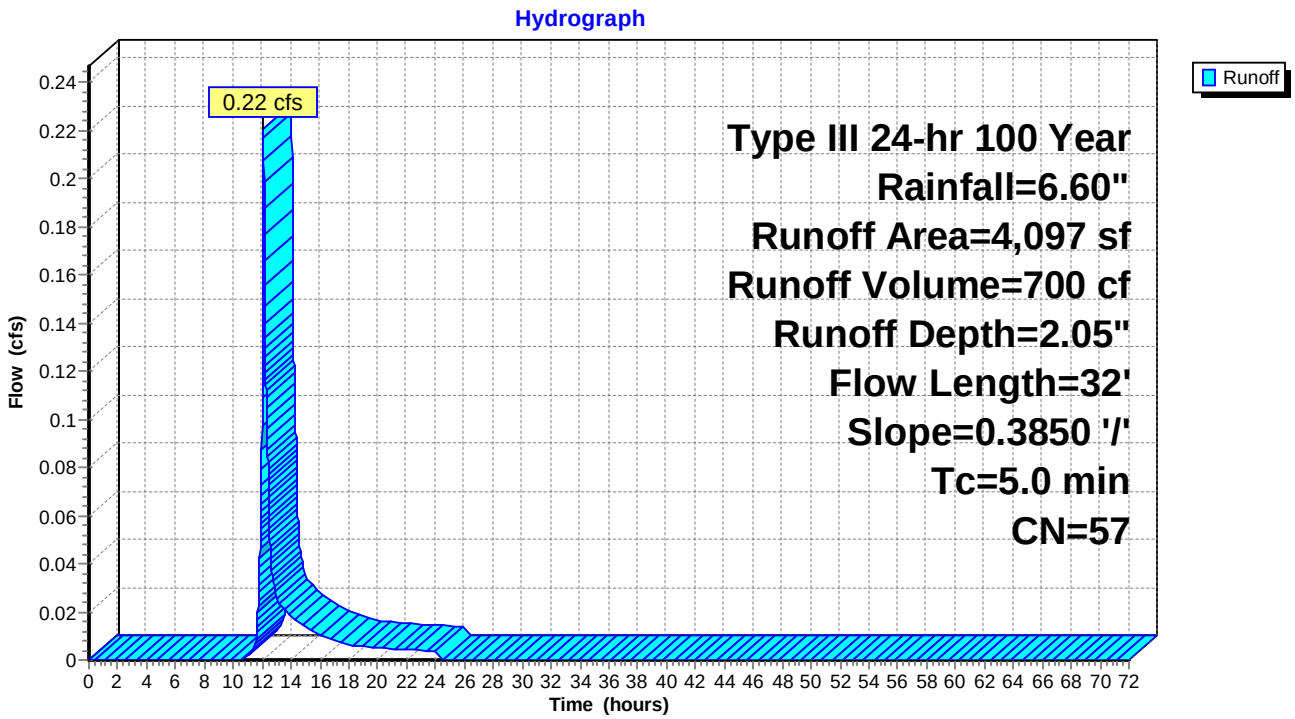
Runoff = 0.22 cfs @ 12.08 hrs, Volume= 700 cf, Depth= 2.05"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=6.60"

Area (sf)	CN	Description
4,097	57	Woods/grass comb., Poor, HSG A
4,097		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.7	32	0.3850	0.20		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
2.7	32	Total, Increased to minimum Tc = 5.0 min			

Subcatchment 29S: Unnamed Pond 1-2



Summary for Subcatchment 30S: Unnamed Pond 1-1

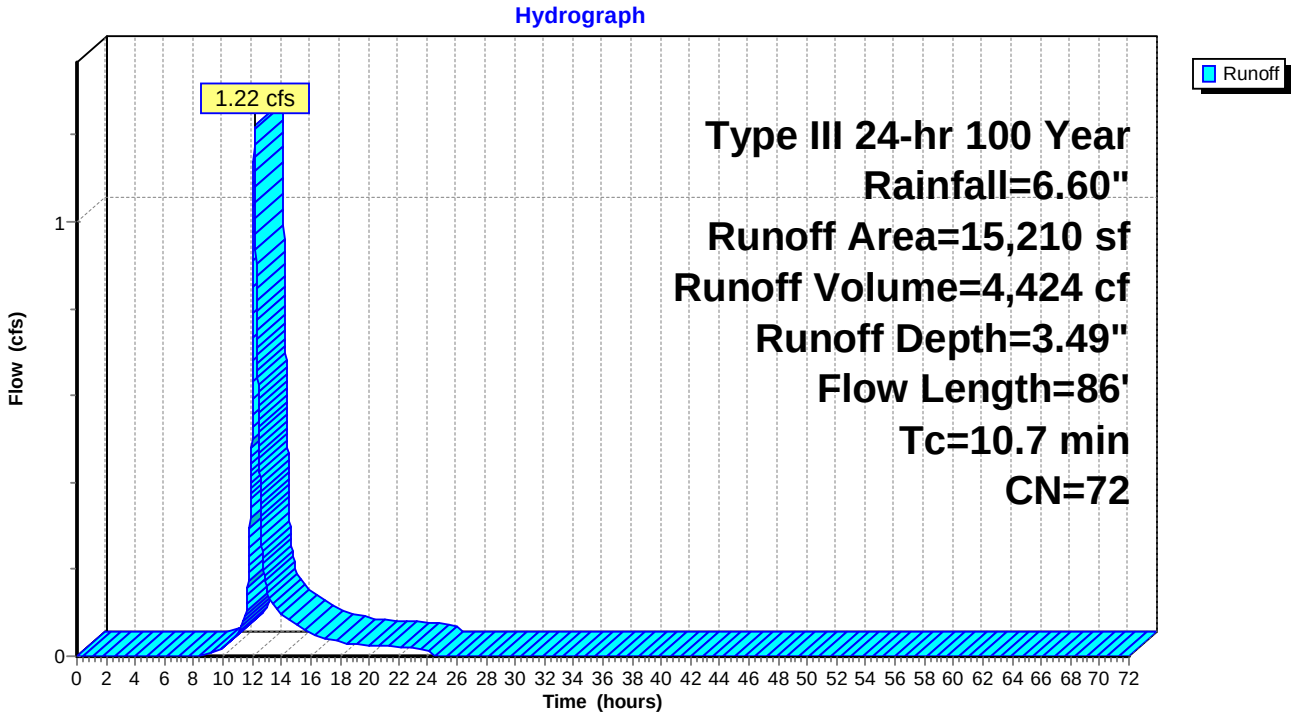
Runoff = 1.22 cfs @ 12.15 hrs, Volume= 4,424 cf, Depth= 3.49"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=6.60"

	Area (sf)	CN	Description
	1,843	61	1/4 acre lots, 38% imp, HSG A
*	4,035	98	Bike Path, HSG A
	8,142	57	Woods/grass comb., Poor, HSG A
*	1,190	98	Paved Parking, HSG A
	15,210	72	Weighted Average
	9,285		61.04% Pervious Area
	5,925		38.96% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	24	0.0154	0.92		**Sheet Flow, Driveway** Smooth surfaces n= 0.011 P2= 3.15"
1.9	16	0.0312	0.14		**Sheet Flow, Yards** Grass: Short n= 0.150 P2= 3.15"
8.4	46	0.0450	0.09		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
10.7	86	Total			

Subcatchment 30S: Unnamed Pond 1-1



Summary for Subcatchment 31S: Unnamed Pond 2

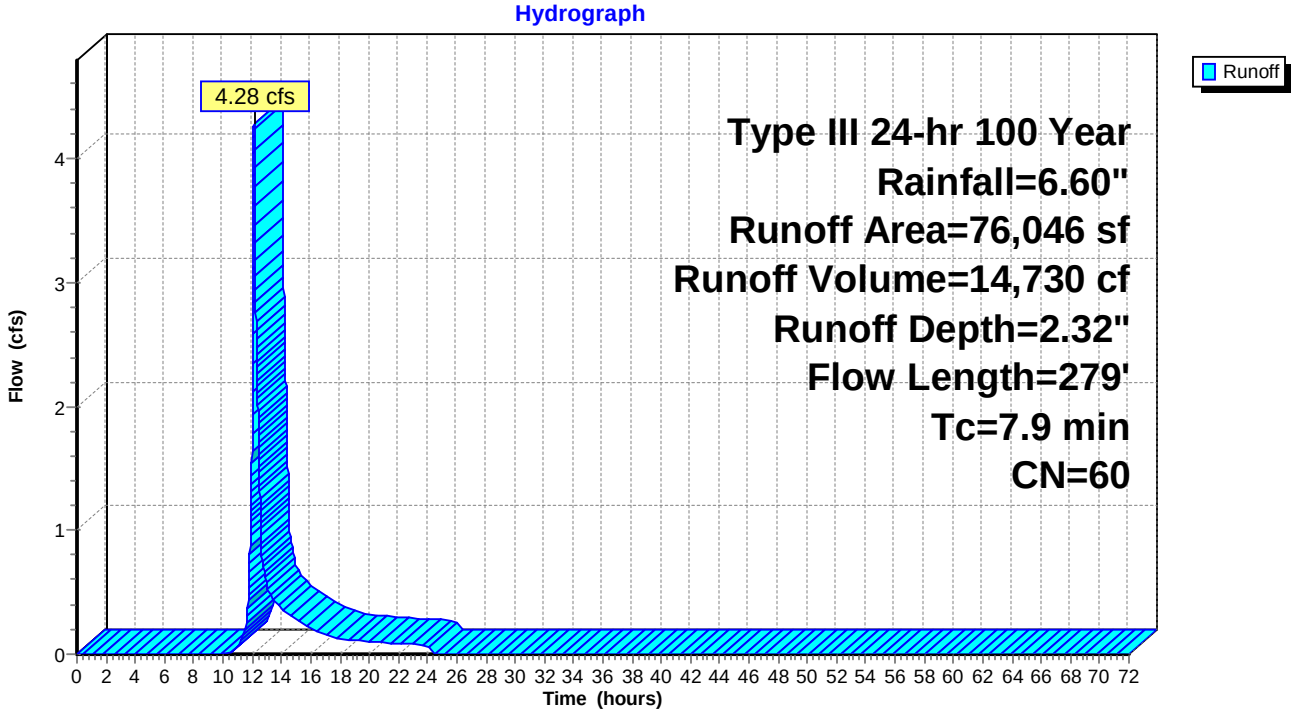
Runoff = 4.28 cfs @ 12.12 hrs, Volume= 14,730 cf, Depth= 2.32"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=6.60"

Area (sf)	CN	Description
50,917	61	1/4 acre lots, 38% imp, HSG A
25,129	57	Woods/grass comb., Poor, HSG A
76,046	60	Weighted Average
56,698		74.56% Pervious Area
19,348		25.44% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.7	100	0.0800	0.29		**Sheet Flow, Yards** Grass: Short n= 0.150 P2= 3.15"
1.3	105	0.0381	1.37		**Shallow Concentrated Flow, Yards** Short Grass Pasture Kv= 7.0 fps
0.9	74	0.0724	1.35		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
7.9	279	Total			

Subcatchment 31S: Unnamed Pond 2



Summary for Subcatchment 32S: Unnamed Pond 3

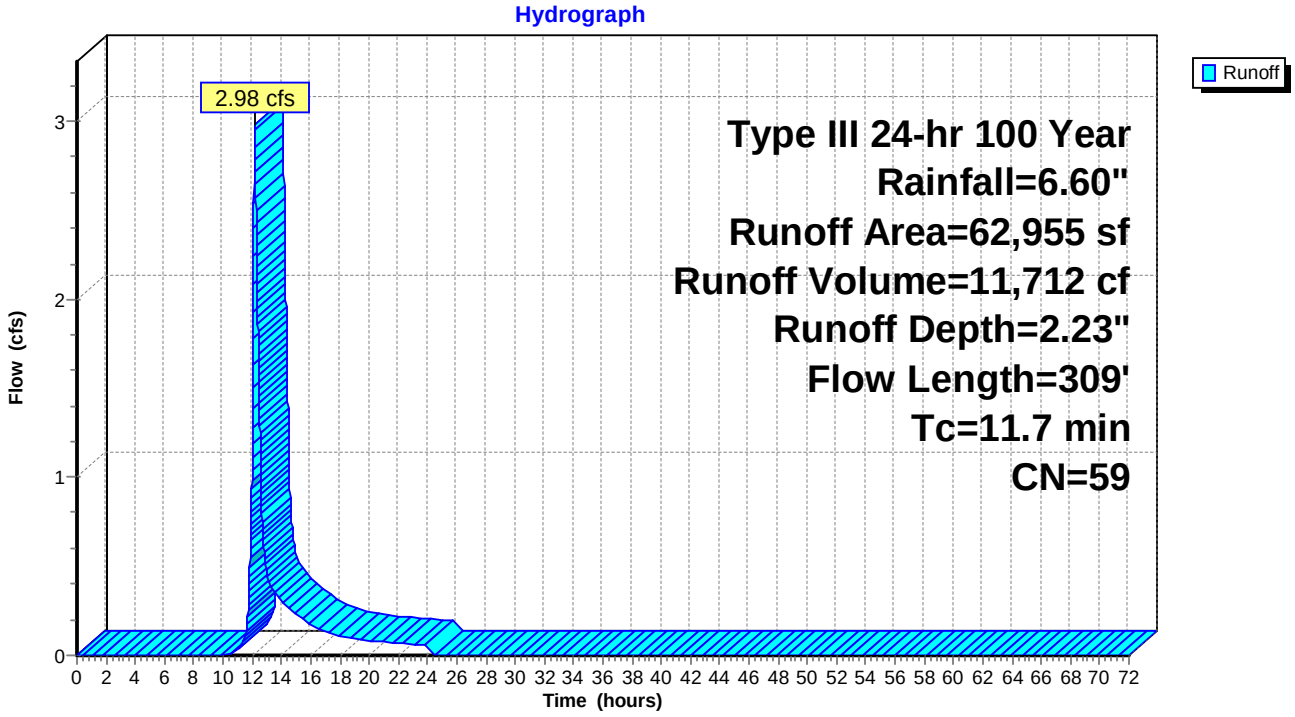
Runoff = 2.98 cfs @ 12.17 hrs, Volume= 11,712 cf, Depth= 2.23"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=6.60"

Area (sf)	CN	Description
27,650	61	1/4 acre lots, 38% imp, HSG A
35,305	57	Woods/grass comb., Poor, HSG A
62,955	59	Weighted Average
52,448		83.31% Pervious Area
10,507		16.69% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.2	100	0.0320	0.20		**Sheet Flow, Grass** Grass: Short n= 0.150 P2= 3.15"
3.5	209	0.0400	1.00		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
11.7	309	Total			

Subcatchment 32S: Unnamed Pond 3



Summary for Subcatchment 33S: Unnamed Pond 3-1

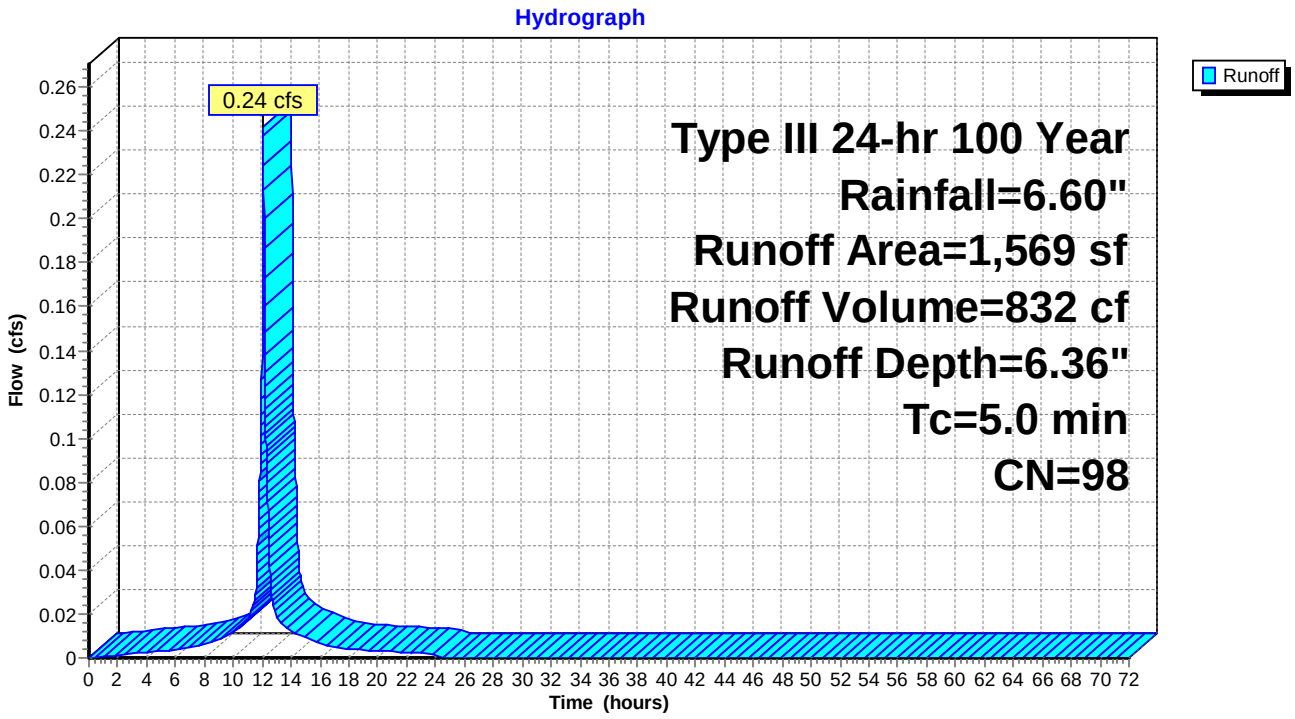
Runoff = 0.24 cfs @ 12.07 hrs, Volume= 832 cf, Depth= 6.36"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=6.60"

Area (sf)	CN	Description
1,569	98	Paved roads w/curbs & sewers, HSG A
1,569		100.00% Impervious Area

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

Subcatchment 33S: Unnamed Pond 3-1



Summary for Subcatchment 34S: Unnamed Pond 4-1

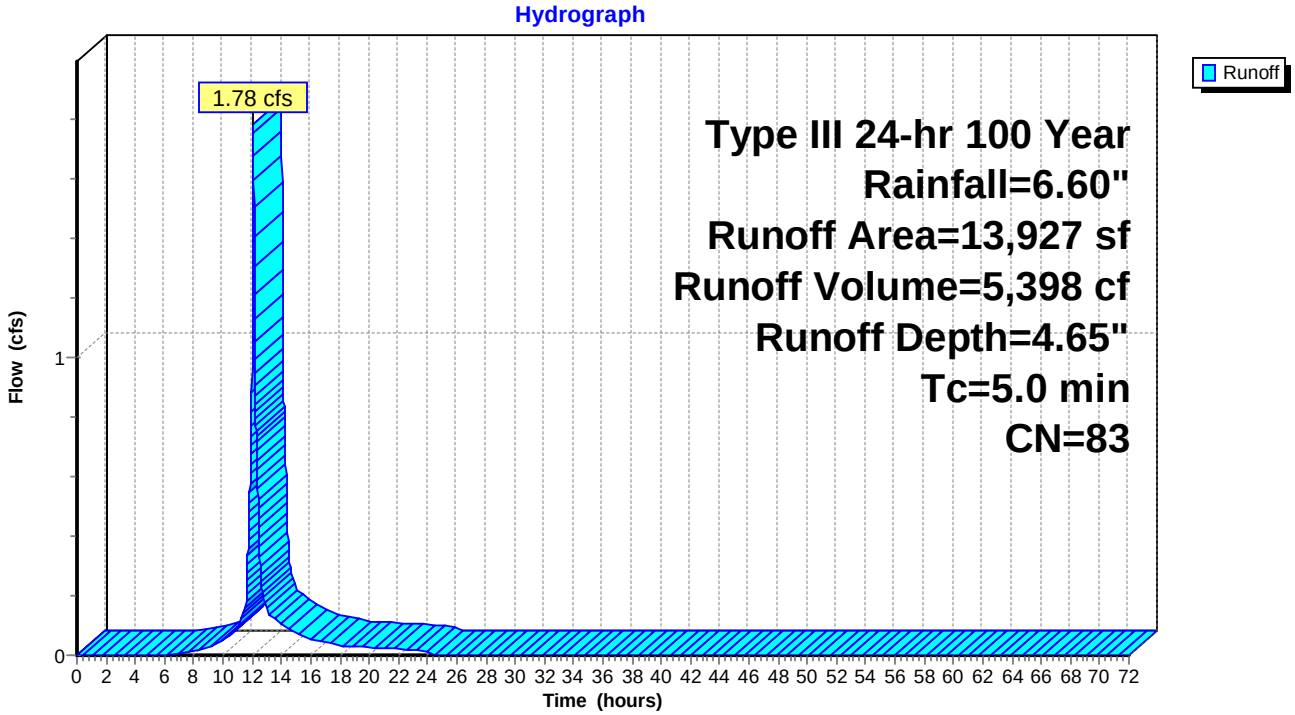
Runoff = 1.78 cfs @ 12.07 hrs, Volume= 5,398 cf, Depth= 4.65"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=6.60"

	Area (sf)	CN	Description
	5,220	57	Woods/grass comb., Poor, HSG A
*	8,707	98	Bike Path, HSG A
	13,927	83	Weighted Average
	5,220		37.48% Pervious Area
	8,707		62.52% Impervious Area

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

Subcatchment 34S: Unnamed Pond 4-1



Summary for Subcatchment 35S: Unnamed Pond 4-2

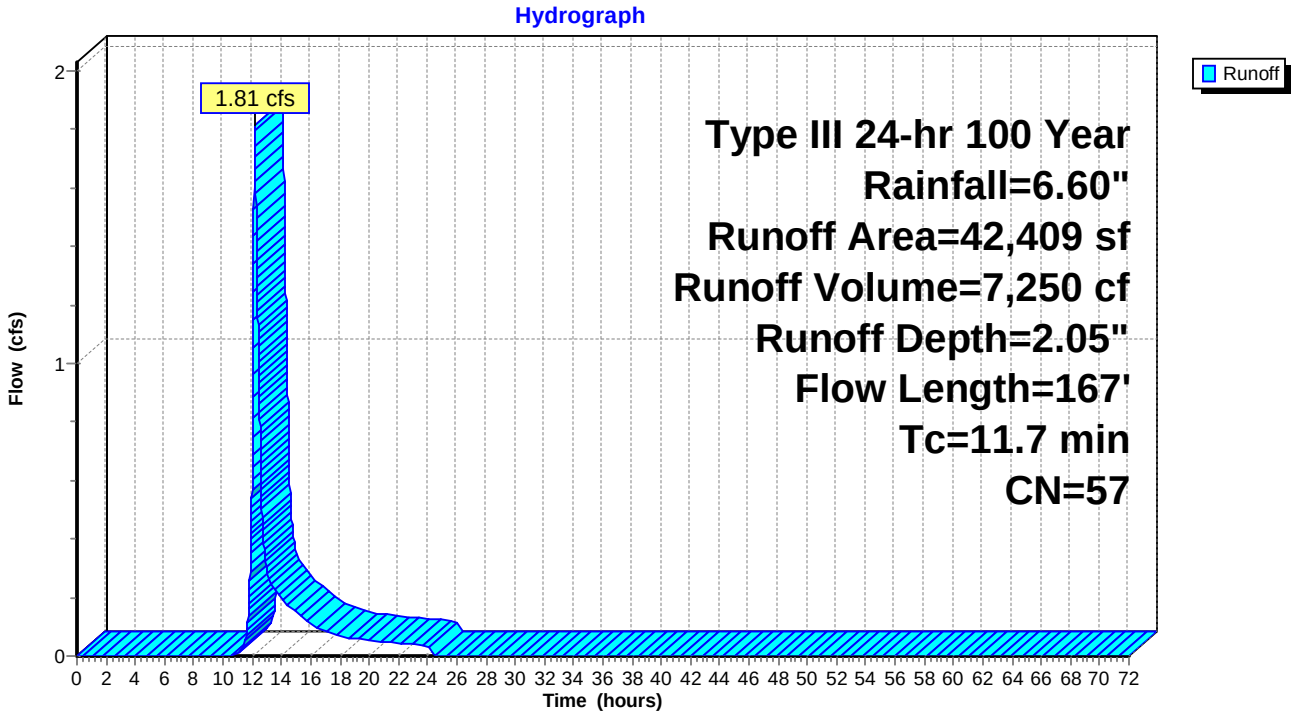
Runoff = 1.81 cfs @ 12.18 hrs, Volume= 7,250 cf, Depth= 2.05"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=6.60"

Area (sf)	CN	Description
42,409	57	Woods/grass comb., Poor, HSG A
42,409		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.9	100	0.1100	0.15		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
0.8	67	0.0821	1.43		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
11.7	167	Total			

Subcatchment 35S: Unnamed Pond 4-2



Summary for Subcatchment 36S: Kansas St-1

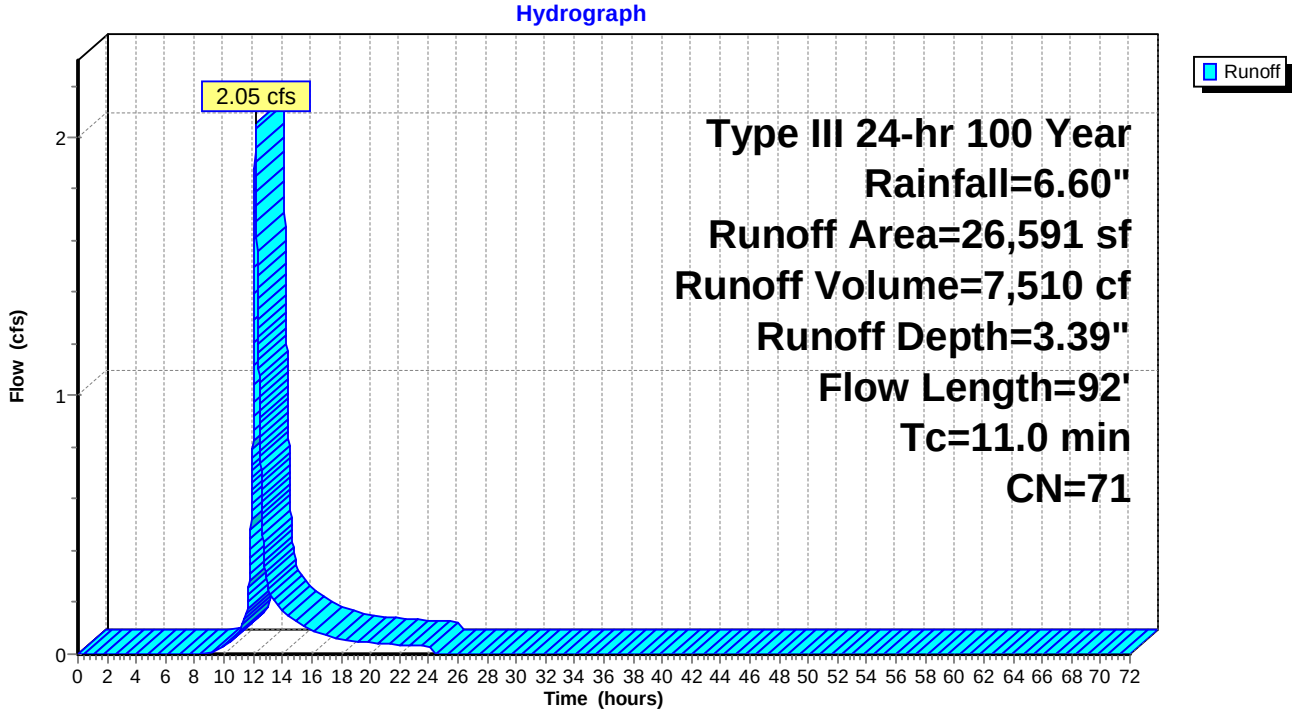
Runoff = 2.05 cfs @ 12.16 hrs, Volume= 7,510 cf, Depth= 3.39"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=6.60"

	Area (sf)	CN	Description
	3,799	61	1/4 acre lots, 38% imp, HSG A
	2,525	98	Paved parking, HSG A
*	5,891	98	Bike Path, HSG A
	14,376	57	Woods/grass comb., Poor, HSG A
	26,591	71	Weighted Average
	16,731		62.92% Pervious Area
	9,860		37.08% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.7	74	0.0090	0.12		**Sheet Flow, Grass** Grass: Short n= 0.150 P2= 3.15"
0.3	18	0.0150	0.86		**Sheet Flow, Bike Path** Smooth surfaces n= 0.011 P2= 3.15"
11.0	92	Total			

Subcatchment 36S: Kansas St-1



Summary for Subcatchment 37S: Kansas St-2

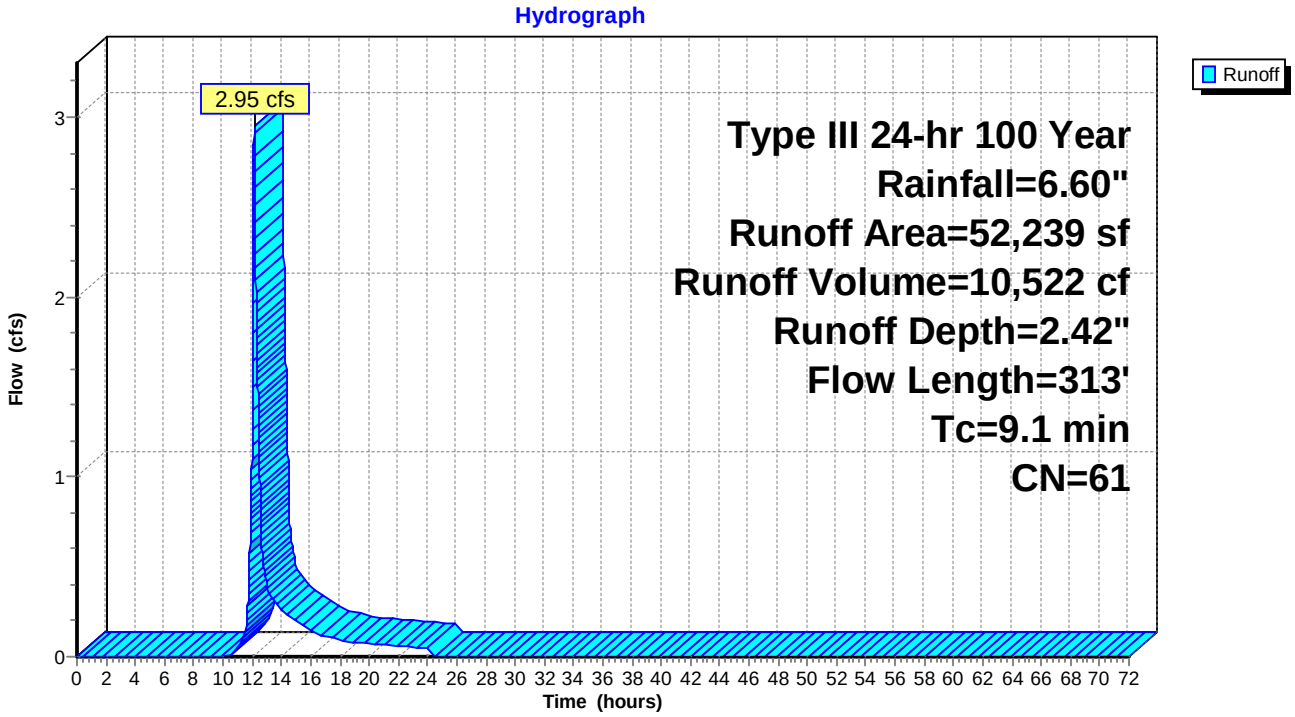
Runoff = 2.95 cfs @ 12.14 hrs, Volume= 10,522 cf, Depth= 2.42"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=6.60"

Area (sf)	CN	Description
34,065	57	Woods/grass comb., Poor, HSG A
3,317	98	Paved parking, HSG A
14,857	61	1/4 acre lots, 38% imp, HSG A
52,239	61	Weighted Average
43,276		82.84% Pervious Area
8,963		17.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.7	100	0.0775	0.29		**Sheet Flow, Yards** Grass: Short n= 0.150 P2= 3.15"
3.1	175	0.0186	0.95		**Shallow Concentrated Flow, Yards** Short Grass Pasture Kv= 7.0 fps
0.3	38	0.1974	2.22		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
9.1	313	Total			

Subcatchment 37S: Kansas St-2



Summary for Subcatchment 38S: N. Main & Kansas

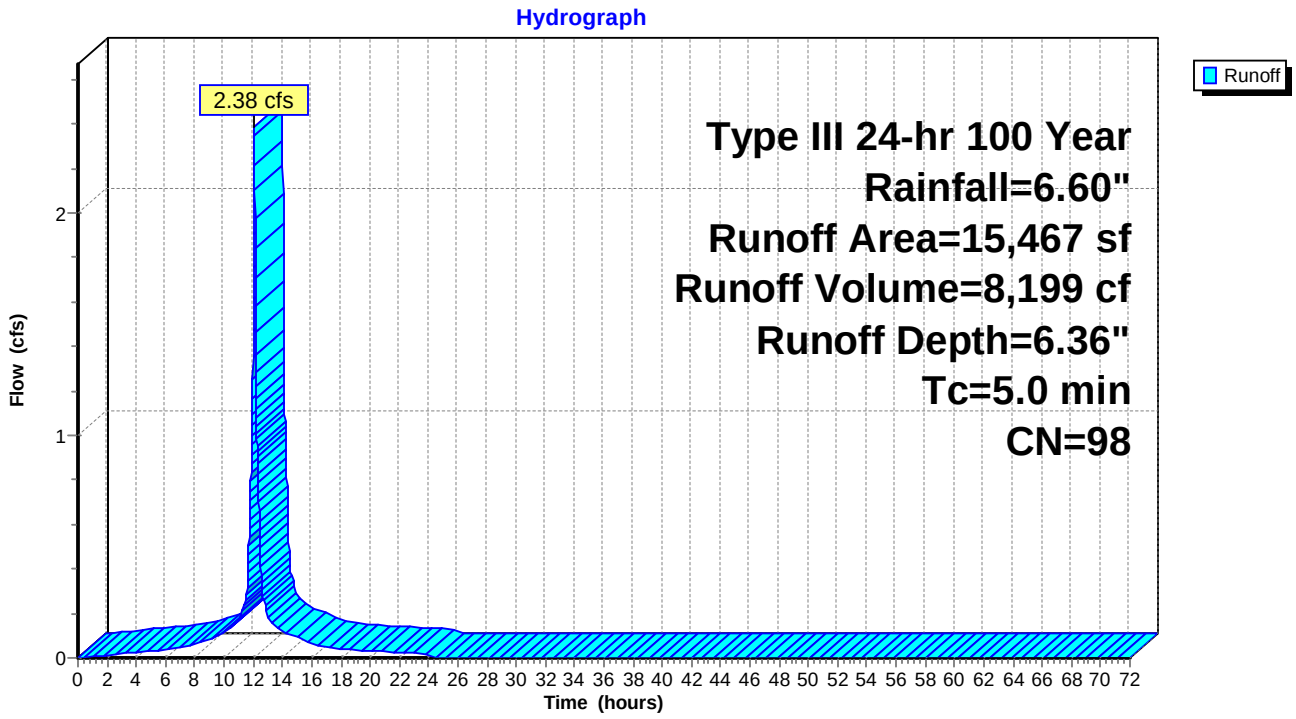
Runoff = 2.38 cfs @ 12.07 hrs, Volume= 8,199 cf, Depth= 6.36"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=6.60"

Area (sf)	CN	Description
15,467	98	Paved roads w/curbs & sewers, HSG A
15,467		100.00% Impervious Area

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

Subcatchment 38S: N. Main & Kansas



Summary for Subcatchment 39S: Washington Ave 1

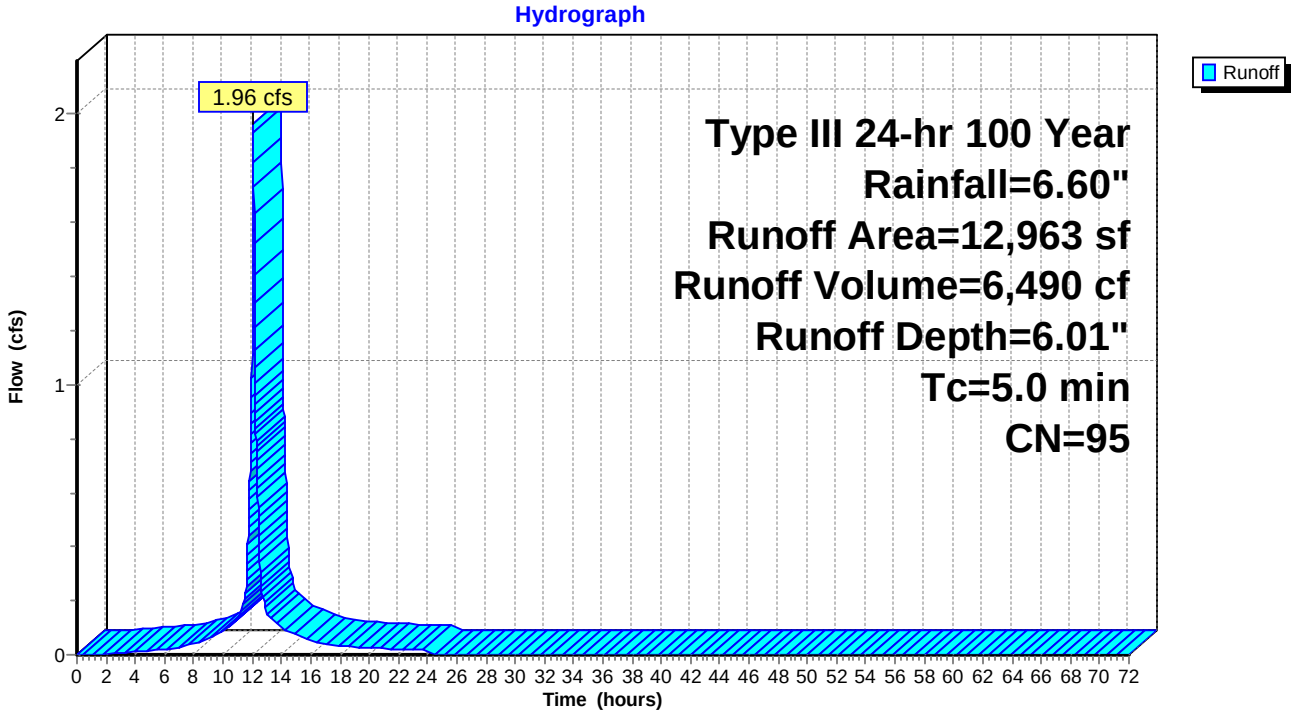
Runoff = 1.96 cfs @ 12.07 hrs, Volume= 6,490 cf, Depth= 6.01"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=6.60"

	Area (sf)	CN	Description
	10,635	98	Paved roads w/curbs & sewers, HSG A
	1,284	68	<50% Grass cover, Poor, HSG A
*	1,044	98	Bike Path, HSG A
	12,963	95	Weighted Average
	1,284		9.91% Pervious Area
	11,679		90.09% Impervious Area

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

Subcatchment 39S: Washington Ave 1



Summary for Subcatchment 40S: Washington Ave 2

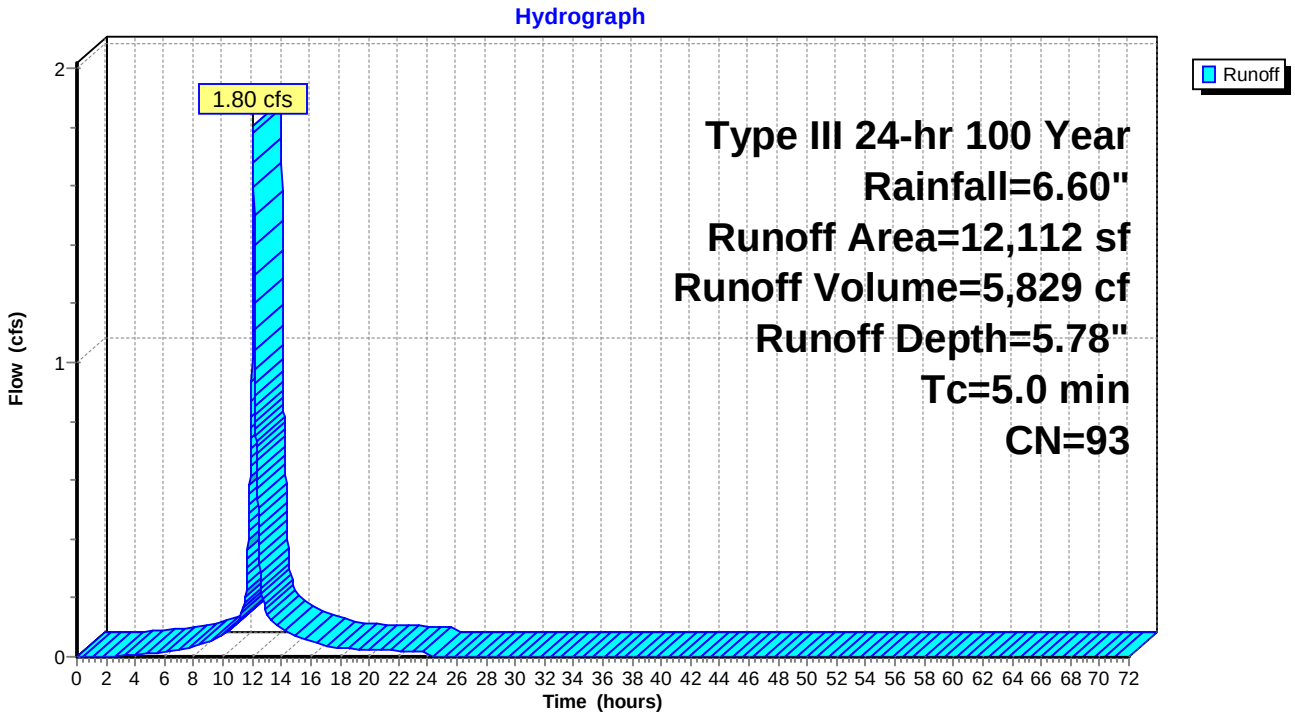
Runoff = 1.80 cfs @ 12.07 hrs, Volume= 5,829 cf, Depth= 5.78"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=6.60"

	Area (sf)	CN	Description
	2,040	68	<50% Grass cover, Poor, HSG A
	6,175	98	Paved parking, HSG A
*	3,897	98	Bike Path, HSG A
	12,112	93	Weighted Average
	2,040		16.84% Pervious Area
	10,072		83.16% Impervious Area

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

Subcatchment 40S: Washington Ave 2



Summary for Subcatchment 41S: Washington Ave 3

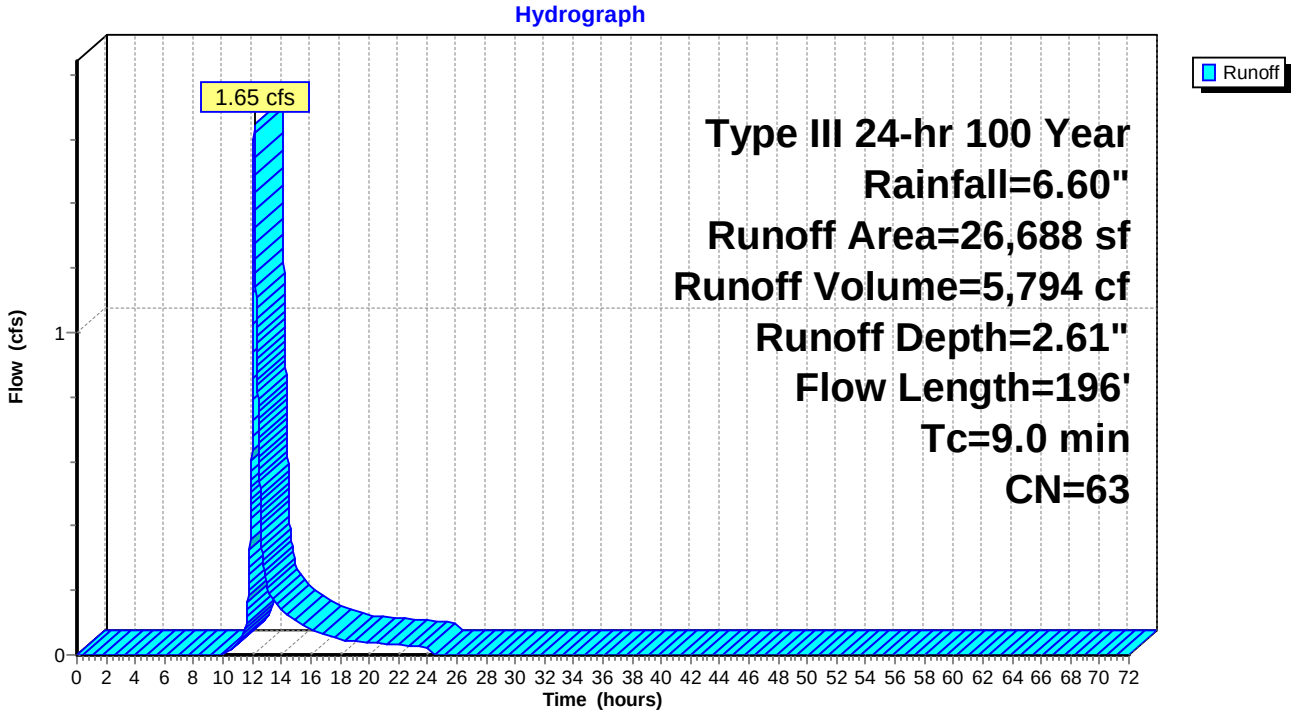
Runoff = 1.65 cfs @ 12.13 hrs, Volume= 5,794 cf, Depth= 2.61"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=6.60"

	Area (sf)	CN	Description
	20,850	61	1/4 acre lots, 38% imp, HSG A
*	2,152	98	Bike Path, HSG A
	3,686	57	Woods/grass comb., Poor, HSG A
	26,688	63	Weighted Average
	16,613		62.25% Pervious Area
	10,075		37.75% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	100	0.0350	0.21		**Sheet Flow, Yards** Grass: Short n= 0.150 P2= 3.15"
1.1	96	0.0427	1.45		**Shallow Concentrated Flow, Yards** Short Grass Pasture Kv= 7.0 fps
9.0	196	Total			

Subcatchment 41S: Washington Ave 3



Summary for Subcatchment 42S: Empty Lot

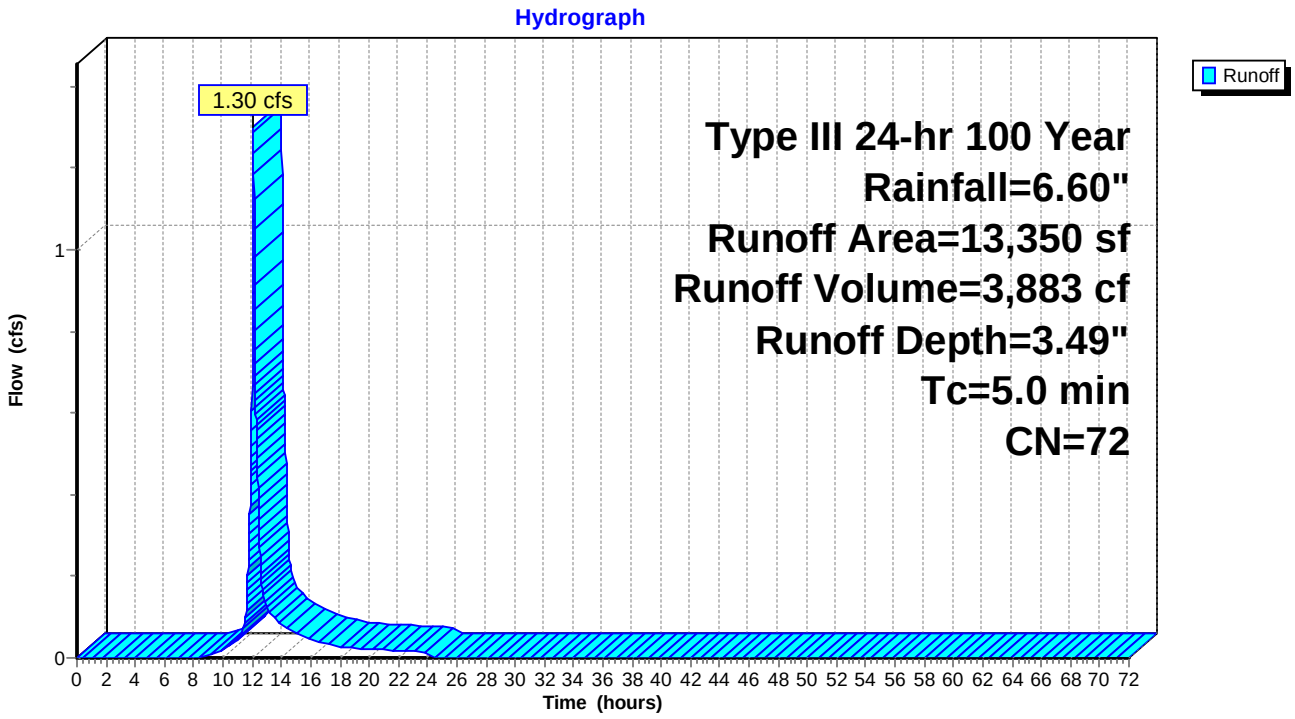
Runoff = 1.30 cfs @ 12.08 hrs, Volume= 3,883 cf, Depth= 3.49"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=6.60"

Area (sf)	CN	Description
13,350	72	Dirt roads, HSG A
13,350		100.00% Pervious Area

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

Subcatchment 42S: Empty Lot



Summary for Subcatchment 43S: Lagrange St

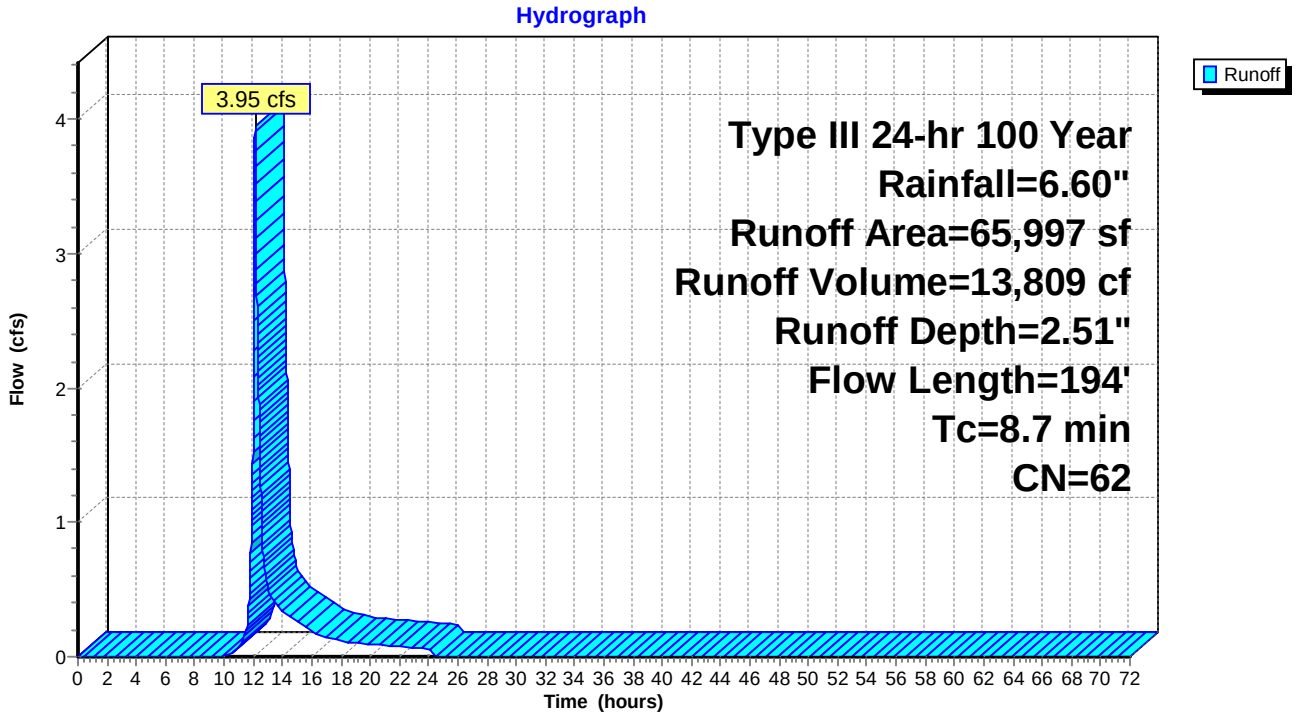
Runoff = 3.95 cfs @ 12.13 hrs, Volume= 13,809 cf, Depth= 2.51"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=6.60"

	Area (sf)	CN	Description
	52,794	61	1/4 acre lots, 38% imp, HSG A
	9,738	57	Woods/grass comb., Poor, HSG A
*	3,465	98	Bike Path, HSG A
	65,997	62	Weighted Average
	42,470		64.35% Pervious Area
	23,527		35.65% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.1	100	0.0450	0.23		**Sheet Flow, Yard** Grass: Short n= 0.150 P2= 3.15"
0.9	53	0.0189	0.96		**Shallow Concentrated Flow, Yard** Short Grass Pasture Kv= 7.0 fps
0.7	41	0.0366	0.96		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
8.7	194	Total			

Subcatchment 43S: Lagrange St



Summary for Subcatchment 44S: Mechanic St

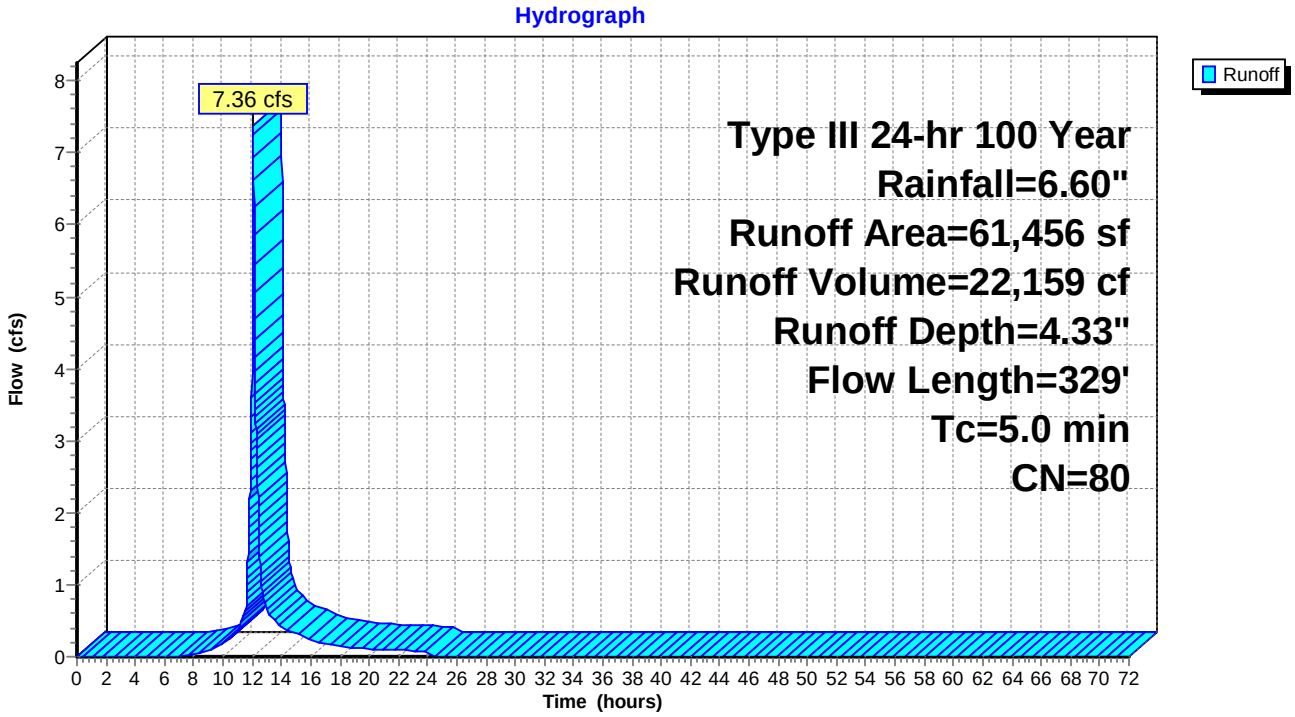
Runoff = 7.36 cfs @ 12.07 hrs, Volume= 22,159 cf, Depth= 4.33"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=6.60"

	Area (sf)	CN	Description
	37,417	81	Urban industrial, 72% imp, HSG A
	2,503	98	Paved parking, HSG A
*	8,336	98	Bike Path, HSG A
	7,222	68	<50% Grass cover, Poor, HSG A
	5,978	57	Woods/grass comb., Poor, HSG A
	61,456	80	Weighted Average
	23,677		38.53% Pervious Area
	37,779		61.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	100	0.0150	1.22		**Sheet Flow, Road** Smooth surfaces n= 0.011 P2= 3.15"
3.0	229	0.0040	1.28		**Shallow Concentrated Flow, Bike Path** Paved Kv= 20.3 fps
4.4	329	Total, Increased to minimum Tc = 5.0 min			

Subcatchment 44S: Mechanic St



Summary for Subcatchment 45S: Cochituate St 1

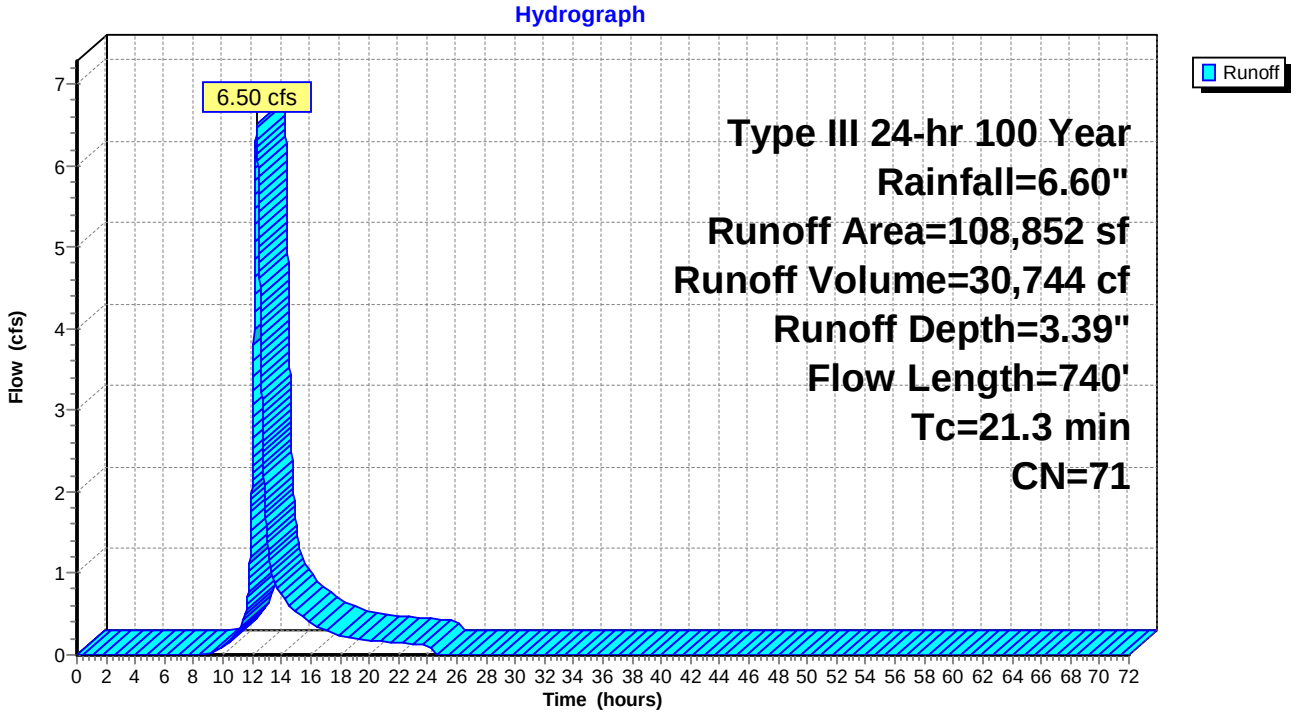
Runoff = 6.50 cfs @ 12.29 hrs, Volume= 30,744 cf, Depth= 3.39"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=6.60"

	Area (sf)	CN	Description
	13,087	81	Urban industrial, 72% imp, HSG A
	11,315	98	Paved parking, HSG A
*	13,568	98	Bike Path, HSG A
	30,345	57	Woods/grass comb., Poor, HSG A
	38,236	61	1/4 acre lots, 38% imp, HSG A
	2,301	76	Gravel roads, HSG A
	108,852	71	Weighted Average
	60,017		55.14% Pervious Area
	48,835		44.86% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.4	75	0.0333	0.20		**Sheet Flow, Yards** Grass: Short n= 0.150 P2= 3.15"
1.9	25	0.5200	0.21		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
0.1	12	0.0150	2.49		**Shallow Concentrated Flow, Bike Path** Paved Kv= 20.3 fps
12.9	628	0.0040	0.81	0.10	**Trap/Vee/Rect Channel Flow, Grass Channel** Bot.W=1.00' D=0.10' Z= 2.0 '/' Top.W=1.40' n= 0.022 Earth, clean & straight
21.3	740	Total			

Subcatchment 45S: Cochituate St 1



Summary for Subcatchment 170S: Lake Cochituate N2-2

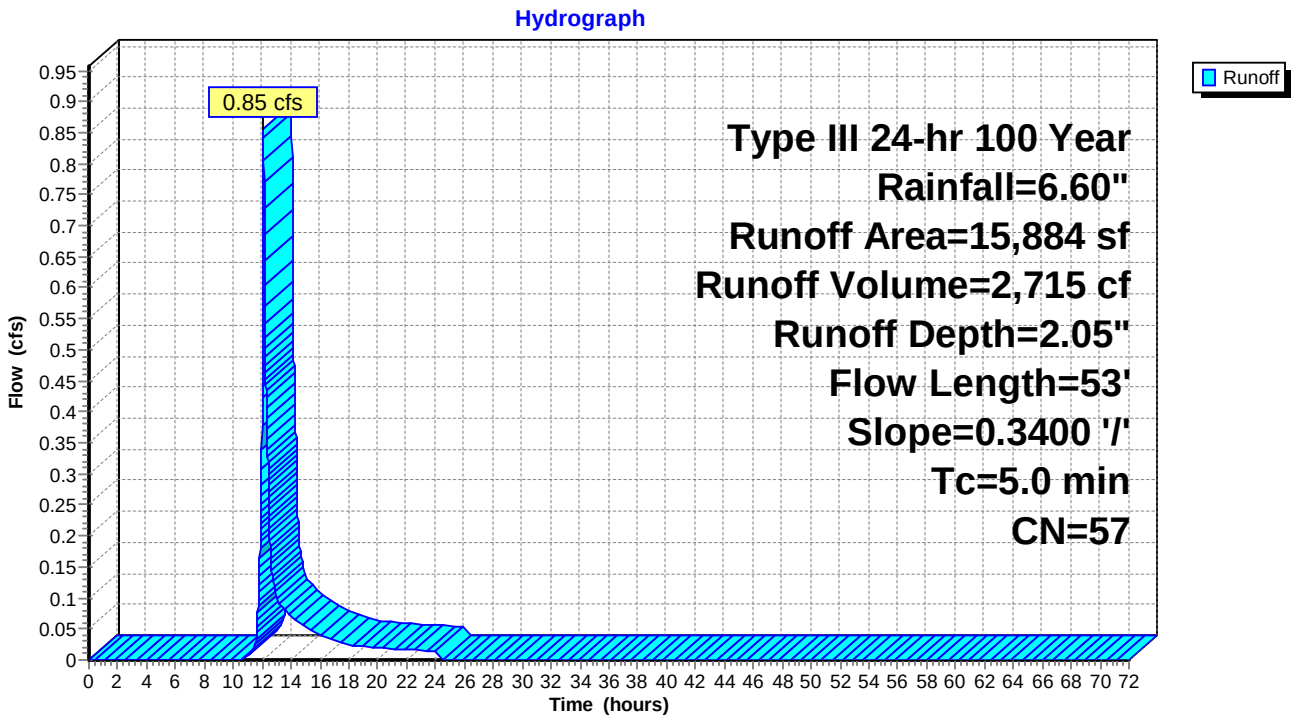
Runoff = 0.85 cfs @ 12.08 hrs, Volume= 2,715 cf, Depth= 2.05"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=6.60"

Area (sf)	CN	Description
15,884	57	Woods/grass comb., Poor, HSG A
15,884		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.2	53	0.3400	0.21		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.15"
4.2	53	Total, Increased to minimum Tc = 5.0 min			

Subcatchment 170S: Lake Cochituate N2-2



Summary for Pond 01P: BMP 1 - Infiltration Swale

Inflow Area = 50,164 sf, 33.83% Impervious, Inflow Depth = 3.39" for 100 Year event
Inflow = 3.38 cfs @ 12.22 hrs, Volume= 14,168 cf
Outflow = 2.97 cfs @ 12.31 hrs, Volume= 14,169 cf, Atten= 12%, Lag= 5.4 min
Discarded = 0.21 cfs @ 12.31 hrs, Volume= 6,665 cf
Primary = 2.75 cfs @ 12.31 hrs, Volume= 7,503 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 147.71' @ 12.31 hrs Surf.Area= 3,803 sf Storage= 2,460 cf
Flood Elev= 148.05' Surf.Area= 3,956 sf Storage= 3,586 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 79.6 min (920.1 - 840.4)

Volume	Invert	Avail.Storage	Storage Description
#1	146.75'	5,109 cf	**Infiltration Swale (Irregular)** Listed below (Recalc)
#2	142.25'	787 cf	**1.00'W x 656.00'L x 3.00'H Crushed stone** 1,968 cf Overall x 40.0% Voids
		5,896 cf	Total Available Storage

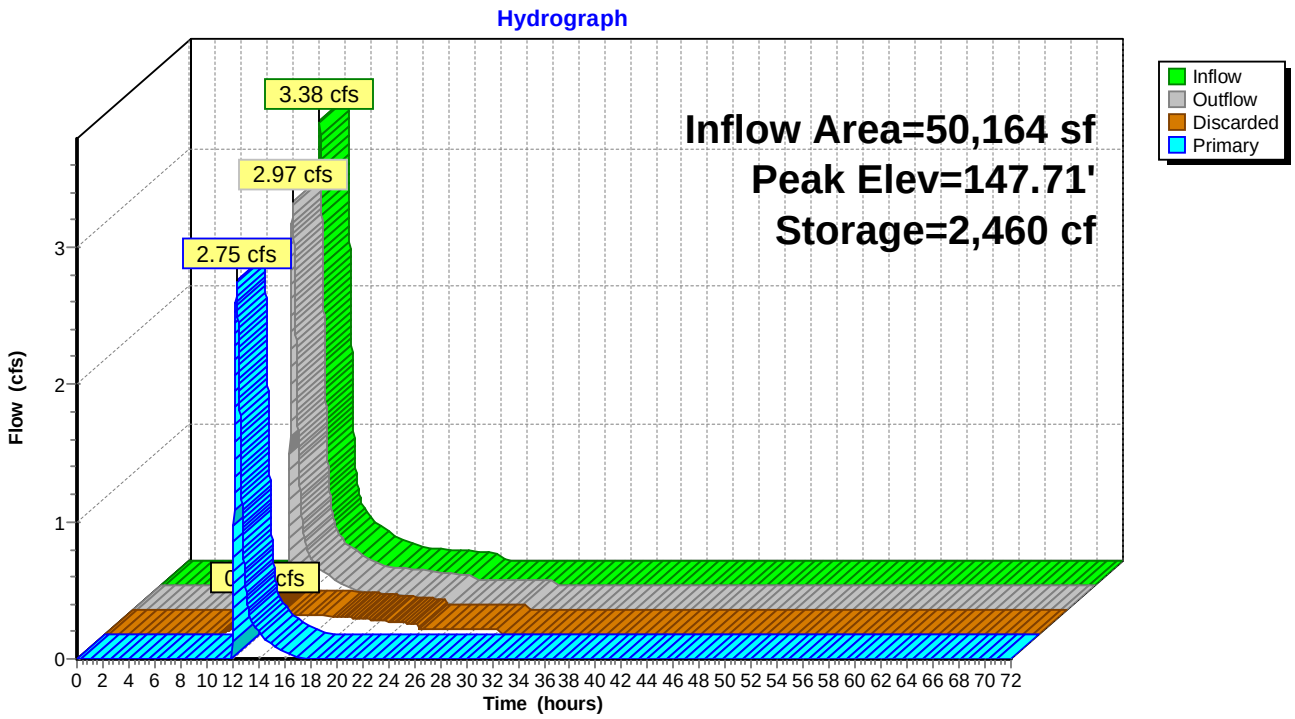
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
146.75	656	1,315.0	0	0	656
147.75	3,300	1,328.0	1,809	1,809	3,693
148.75	3,300	1,328.0	3,300	5,109	5,021

Device	Routing	Invert	Outlet Devices
#1	Discarded	142.25'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	147.25'	**3.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.21 cfs @ 12.31 hrs HW=147.71' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.21 cfs)

Primary OutFlow Max=2.75 cfs @ 12.31 hrs HW=147.71' TW=0.00' (Dynamic Tailwater)
└**2=Broad-Crested Rectangular Weir** (Weir Controls 2.75 cfs @ 2.01 fps)

Pond 01P: BMP 1 - Infiltration Swale



Summary for Pond 02P: Re-graded Detention Pond

Inflow Area = 28,639 sf, 30.10% Impervious, Inflow Depth = 3.70" for 100 Year event
Inflow = 2.92 cfs @ 12.08 hrs, Volume= 8,820 cf
Outflow = 2.91 cfs @ 12.09 hrs, Volume= 8,806 cf, Atten= 0%, Lag= 0.4 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Secondary = 2.91 cfs @ 12.09 hrs, Volume= 8,806 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 160.33' @ 12.09 hrs Surf.Area= 131 sf Storage= 92 cf
Flood Elev= 163.00' Surf.Area= 537 sf Storage= 945 cf

Plug-Flow detention time= 2.5 min calculated for 8,805 cf (100% of inflow)
Center-of-Mass det. time= 1.6 min (825.4 - 823.9)

Volume	Invert	Avail.Storage	Storage Description
#1	159.00'	945 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

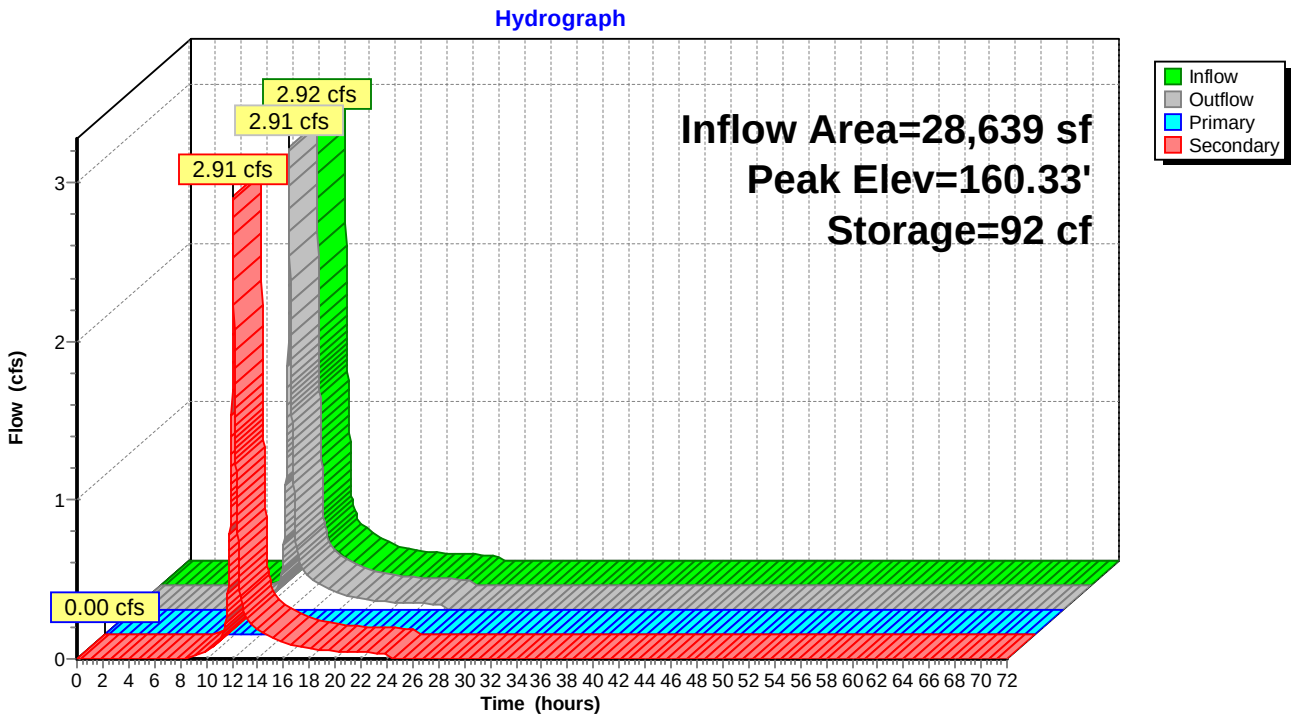
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
159.00	22	45.0	0	0	22
160.00	97	55.0	55	55	116
161.00	218	67.0	153	209	247
162.00	365	80.0	288	497	416
163.00	537	92.0	448	945	602

Device	Routing	Invert	Outlet Devices
#1	Secondary	159.40'	**24.0" Round Culvert** L= 40.0' CMP, projecting, no headwall, Ke= 0.900 Outlet Invert= 159.00' S= 0.0100 '/' Cc= 0.900 n= 0.025 Corrugated metal
#2	Primary	162.25'	**5.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=159.00' TW=0.00' (Dynamic Tailwater)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Secondary OutFlow Max=2.91 cfs @ 12.09 hrs HW=160.33' (Free Discharge)
└─**1=Culvert** (Barrel Controls 2.91 cfs @ 3.00 fps)

Pond 02P: Re-graded Detention Pond



Summary for Pond 03P: BMP 2 - Bioretention System

Inflow Area = 89,186 sf, 21.87% Impervious, Inflow Depth = 1.83" for 100 Year event
Inflow = 3.93 cfs @ 12.13 hrs, Volume= 13,626 cf
Outflow = 3.07 cfs @ 12.21 hrs, Volume= 13,626 cf, Atten= 22%, Lag= 5.0 min
Discarded = 0.11 cfs @ 12.21 hrs, Volume= 4,211 cf
Primary = 2.96 cfs @ 12.21 hrs, Volume= 9,415 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 153.33' @ 12.21 hrs Surf.Area= 1,975 sf Storage= 1,370 cf
Flood Elev= 153.89' Surf.Area= 3,516 sf Storage= 2,588 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 56.4 min (906.2 - 849.9)

Volume	Invert	Avail.Storage	Storage Description
#1	152.00'	5,949 cf	**Bioretention Area (Irregular)** Listed below (Recalc)
#2	150.00'	347 cf	**Bioretention Media (Irregular)** Listed below (Recalc) 1,050 cf Overall x 33.0% Voids
		6,296 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
152.00	525	131.0	0	0	525
153.00	800	144.0	658	658	841
154.00	3,359	300.0	1,933	2,590	6,357
155.00	3,359	300.0	3,359	5,949	6,657

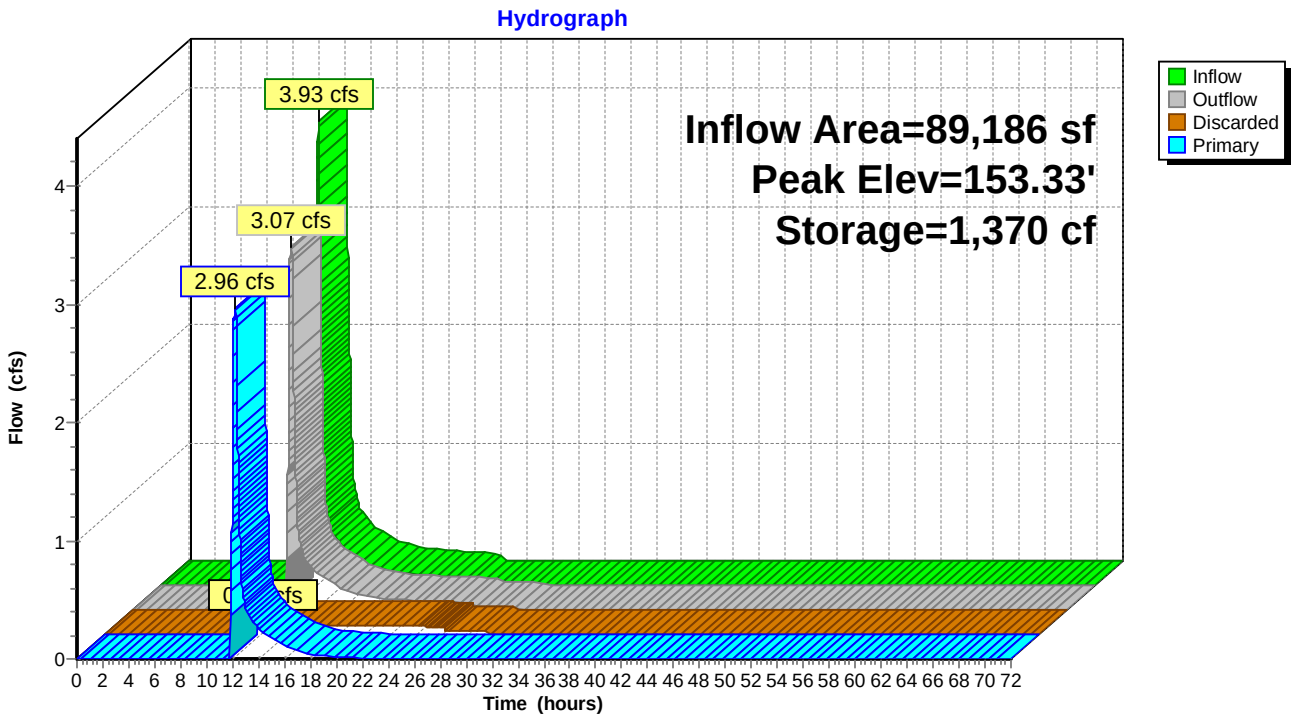
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
150.00	525	131.0	0	0	525
151.00	525	131.0	525	525	656
152.00	525	131.0	525	1,050	787

Device	Routing	Invert	Outlet Devices
#1	Discarded	150.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	149.33'	**8.0" Round Culvert** L= 33.0' RCP, square edge headwall, Ke= 0.500 Outlet Invert= 149.00' S= 0.0100 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections
#3	Device 2	152.80'	**24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.11 cfs @ 12.21 hrs HW=153.33' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.11 cfs)

Primary OutFlow Max=2.96 cfs @ 12.21 hrs HW=153.33' TW=0.00' (Dynamic Tailwater)
└─**2=Culvert** (Barrel Controls 2.96 cfs @ 8.48 fps)
└─**3=Orifice/Grate** (Passes 2.96 cfs of 7.93 cfs potential flow)

Pond 03P: BMP 2 - Bioretention System



Summary for Pond 04P: BMP 3 - Infiltration Swale

Inflow Area = 41,704 sf, 17.25% Impervious, Inflow Depth = 2.70" for 100 Year event
Inflow = 2.45 cfs @ 12.17 hrs, Volume= 9,385 cf
Outflow = 2.39 cfs @ 12.20 hrs, Volume= 9,385 cf, Atten= 3%, Lag= 1.7 min
Discarded = 0.08 cfs @ 12.12 hrs, Volume= 3,412 cf
Primary = 2.31 cfs @ 12.20 hrs, Volume= 5,974 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 154.55' @ 12.20 hrs Surf.Area= 1,401 sf Storage= 971 cf
Flood Elev= 154.69' Surf.Area= 1,401 sf Storage= 1,139 cf

Plug-Flow detention time= 64.9 min calculated for 9,384 cf (100% of inflow)
Center-of-Mass det. time= 65.0 min (917.7 - 852.7)

Volume	Invert	Avail.Storage	Storage Description
#1	153.50'	1,812 cf	**Infiltration Swale (Irregular)** Listed below (Recalc)
#2	149.00'	276 cf	**1.00'W x 230.00'L x 3.00'H Crushed stone** 690 cf Overall x 40.0% Voids
		2,088 cf	Total Available Storage

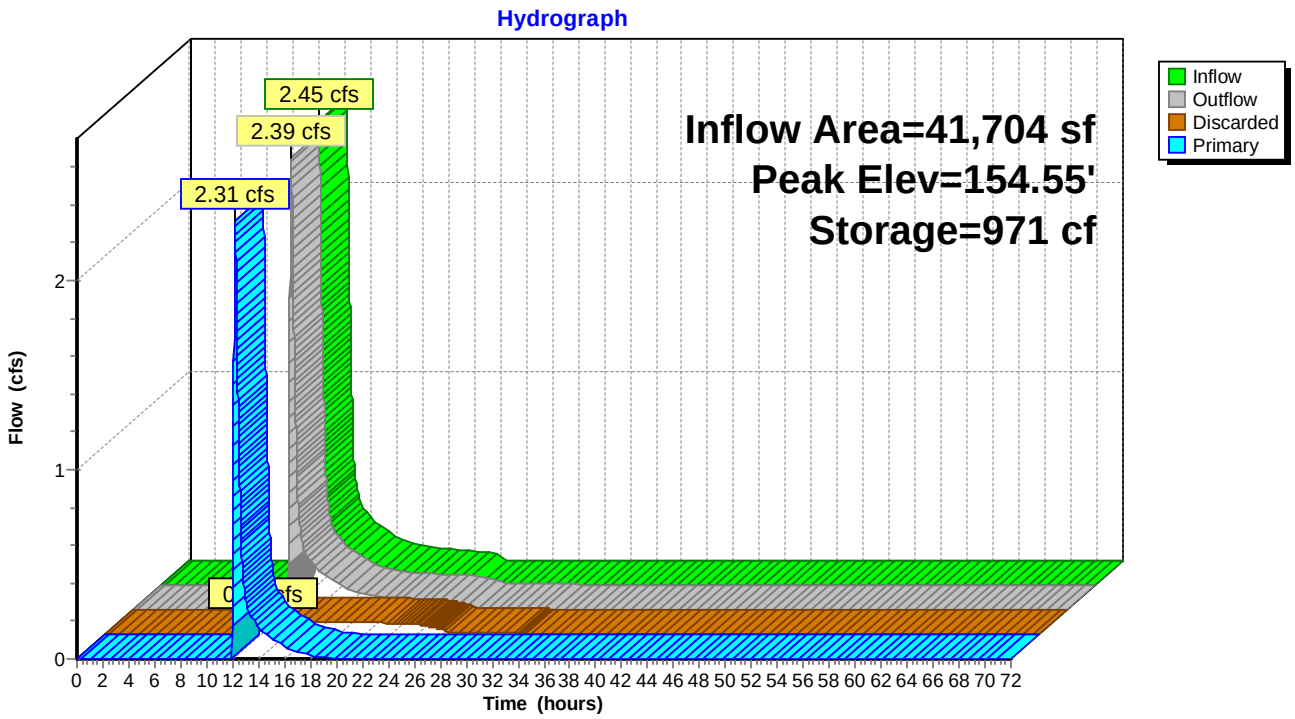
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
153.50	231	464.0	0	0	231
154.50	1,171	476.0	641	641	1,244
155.50	1,171	476.0	1,171	1,812	1,720

Device	Routing	Invert	Outlet Devices
#1	Discarded	149.00'	**2.410 in/hr Exfiltration over Surface area** Phase-In= 0.10'
#2	Primary	154.25'	**5.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.08 cfs @ 12.12 hrs HW=154.50' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.08 cfs)

Primary OutFlow Max=2.31 cfs @ 12.20 hrs HW=154.55' TW=0.00' (Dynamic Tailwater)
└**2=Broad-Crested Rectangular Weir** (Weir Controls 2.31 cfs @ 1.56 fps)

Pond 04P: BMP 3 - Infiltration Swale



Summary for Pond 05P: BMP 4 - Infiltration Swale

Inflow Area =	98,155 sf, 15.90% Impervious, Inflow Depth = 2.70" for 100 Year event				
Inflow =	4.88 cfs @	12.26 hrs,	Volume=	22,089 cf	
Outflow =	4.85 cfs @	12.28 hrs,	Volume=	22,089 cf,	Atten= 1%, Lag= 1.1 min
Discarded =	0.07 cfs @	12.05 hrs,	Volume=	3,337 cf	
Primary =	4.78 cfs @	12.28 hrs,	Volume=	18,752 cf	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 154.97' @ 12.28 hrs Surf.Area= 1,224 sf Storage= 1,025 cf
Flood Elev= 155.05' Surf.Area= 1,224 sf Storage= 1,107 cf

Plug-Flow detention time= 27.5 min calculated for 22,086 cf (100% of inflow)
Center-of-Mass det. time= 27.6 min (886.4 - 858.8)

Volume	Invert	Avail.Storage	Storage Description
#1	153.75'	1,584 cf	**Infiltration Swale (Irregular)** Listed below (Recalc)
#2	149.25'	240 cf	**1.00'W x 200.00'L x 3.00'H Crushed stone** 600 cf Overall x 40.0% Voids
		1,824 cf	Total Available Storage

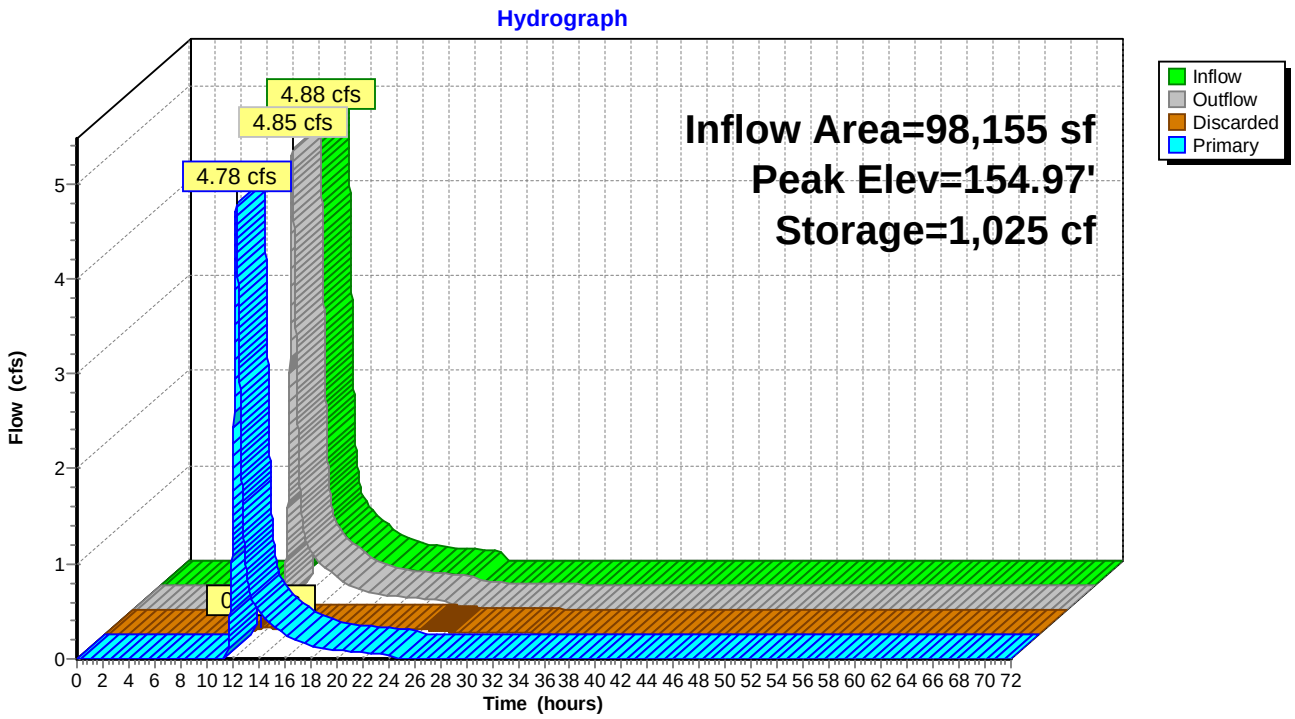
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
153.75	202	405.0	0	0	202
154.75	1,024	417.0	560	560	1,088
155.75	1,024	417.0	1,024	1,584	1,505

Device	Routing	Invert	Outlet Devices
#1	Discarded	149.25'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	154.50'	**5.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.07 cfs @ 12.05 hrs HW=154.75' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.07 cfs)

Primary OutFlow Max=4.78 cfs @ 12.28 hrs HW=154.97' TW=0.00' (Dynamic Tailwater)
└**2=Broad-Crested Rectangular Weir** (Weir Controls 4.78 cfs @ 2.04 fps)

Pond 05P: BMP 4 - Infiltration Swale



Summary for Pond 06P: BMP 5 - Infiltration Swale

Inflow Area =	108,471 sf, 26.07% Impervious, Inflow Depth = 3.03" for 100 Year event				
Inflow =	7.09 cfs @	12.15 hrs,	Volume=	27,381 cf	
Outflow =	6.97 cfs @	12.17 hrs,	Volume=	27,382 cf,	Atten= 2%, Lag= 1.4 min
Discarded =	0.15 cfs @	12.04 hrs,	Volume=	7,275 cf	
Primary =	6.82 cfs @	12.17 hrs,	Volume=	20,107 cf	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 155.13' @ 12.17 hrs Surf.Area= 2,716 sf Storage= 2,077 cf
Flood Elev= 155.17' Surf.Area= 2,716 sf Storage= 2,167 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 47.6 min (890.4 - 842.8)

Volume	Invert	Avail.Storage	Storage Description
#1	154.00'	3,508 cf	**Infiltration Swale (Irregular)** Listed below (Recalc)
#2	150.00'	540 cf	**1.00'W x 450.00'L x 3.00'H Crushed stone** 1,350 cf Overall x 40.0% Voids
		4,048 cf	Total Available Storage

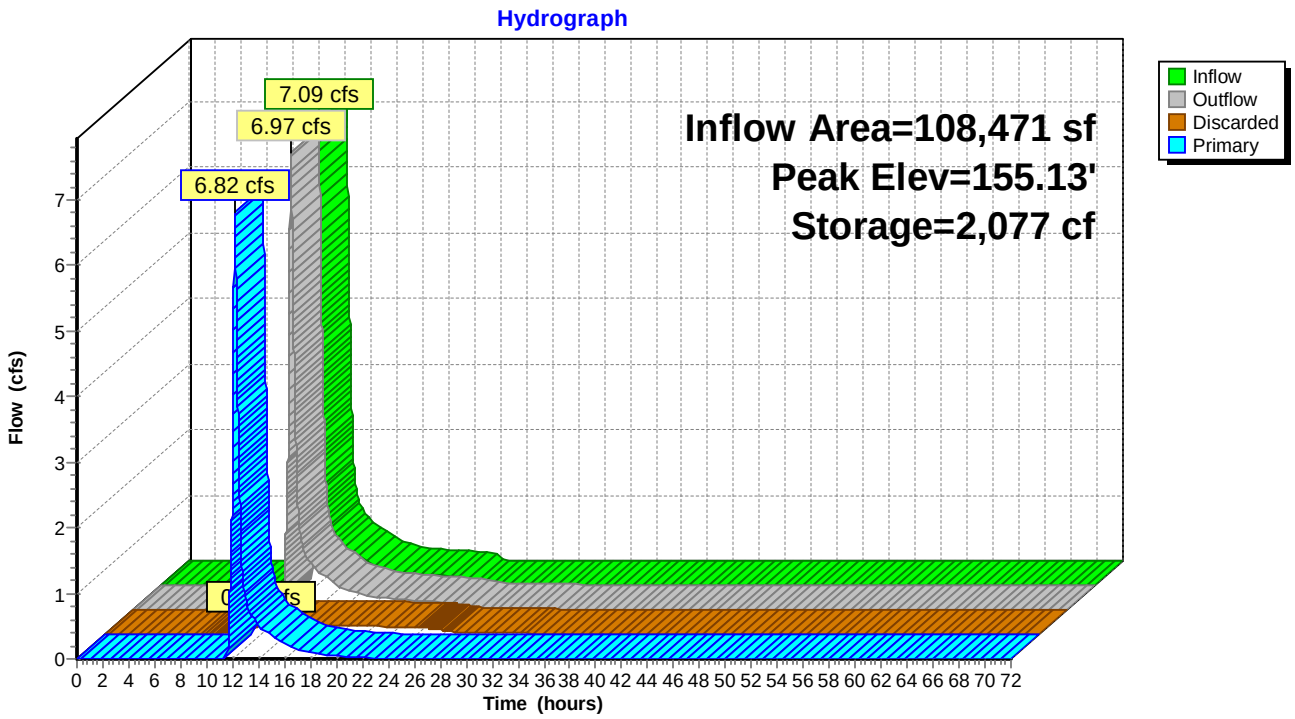
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
154.00	450	902.0	0	0	450
155.00	2,266	914.0	1,242	1,242	2,407
156.00	2,266	914.0	2,266	3,508	3,321

Device	Routing	Invert	Outlet Devices
#1	Discarded	150.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	154.75'	**10.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.15 cfs @ 12.04 hrs HW=155.01' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.15 cfs)

Primary OutFlow Max=6.81 cfs @ 12.17 hrs HW=155.13' TW=0.00' (Dynamic Tailwater)
└**2=Broad-Crested Rectangular Weir** (Weir Controls 6.81 cfs @ 1.79 fps)

Pond 06P: BMP 5 - Infiltration Swale



Summary for Pond 07P: BMP 6 - Infiltration Swale

Inflow Area = 4,593 sf, 65.38% Impervious, Inflow Depth = 4.76" for 100 Year event
Inflow = 0.60 cfs @ 12.07 hrs, Volume= 1,822 cf
Outflow = 0.28 cfs @ 12.22 hrs, Volume= 1,822 cf, Atten= 52%, Lag= 8.7 min
Discarded = 0.06 cfs @ 12.22 hrs, Volume= 1,553 cf
Primary = 0.23 cfs @ 12.22 hrs, Volume= 269 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 155.56' @ 12.22 hrs Surf.Area= 1,020 sf Storage= 627 cf
Flood Elev= 155.87' Surf.Area= 1,220 sf Storage= 920 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 150.8 min (949.8 - 799.0)

Volume	Invert	Avail.Storage	Storage Description
#1	154.75'	1,578 cf	**Infiltration Swale (Irregular)** Listed below (Recalc)
#2	150.25'	240 cf	**1.00'W x 200.00'L x 3.00'H Crushed stone** 600 cf Overall x 40.0% Voids
		1,818 cf	Total Available Storage

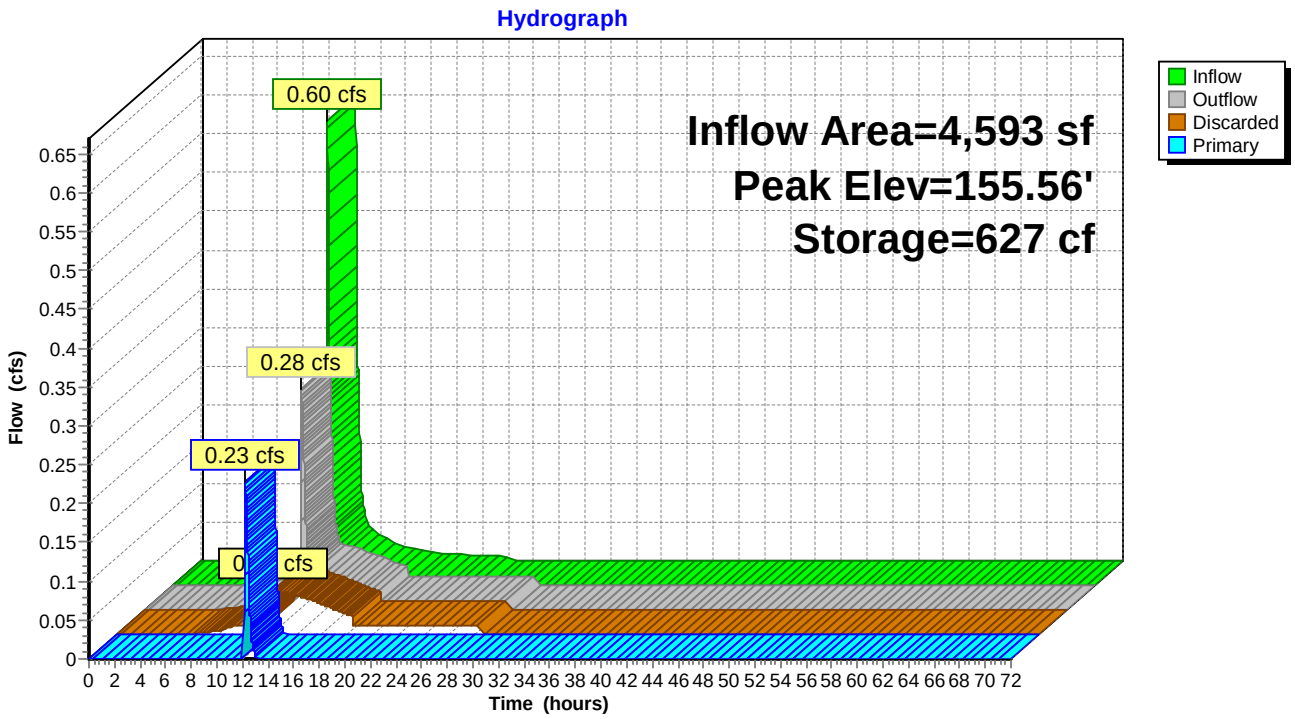
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
154.75	201	403.0	0	0	201
155.75	1,020	416.0	558	558	1,142
156.75	1,020	416.0	1,020	1,578	1,558

Device	Routing	Invert	Outlet Devices
#1	Discarded	150.25'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	155.50'	**5.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.06 cfs @ 12.22 hrs HW=155.56' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.06 cfs)

Primary OutFlow Max=0.23 cfs @ 12.22 hrs HW=155.56' TW=0.00' (Dynamic Tailwater)
└**2=Broad-Crested Rectangular Weir** (Weir Controls 0.23 cfs @ 0.71 fps)

Pond 07P: BMP 6 - Infiltration Swale



Summary for Pond 7P: Lake Cochituate

Inflow Area = 2,467,301 sf, 28.26% Impervious, Inflow Depth = 2.62" for 100 Year event
Inflow = 121.42 cfs @ 12.20 hrs, Volume= 539,044 cf
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 100%, Lag= 0.0 min

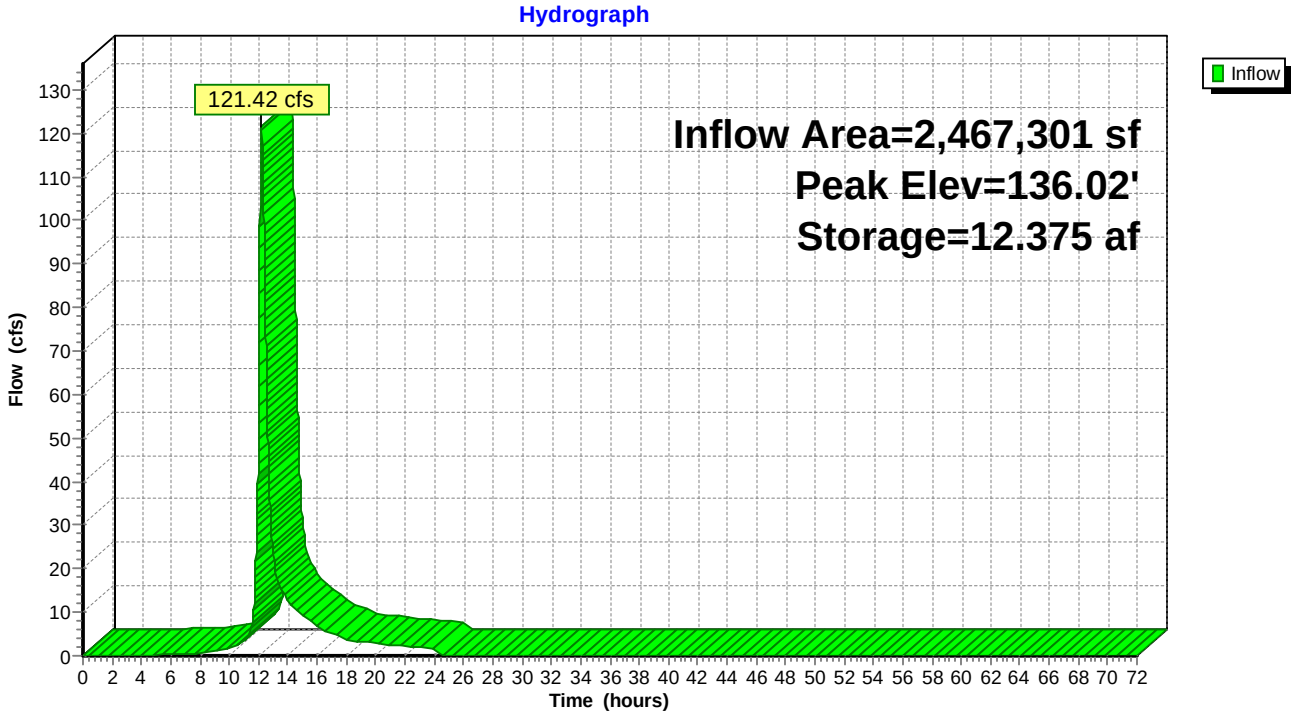
Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 136.02' @ 26.15 hrs Surf.Area= 625.000 ac Storage= 12.375 af

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

Volume	Invert	Avail.Storage	Storage Description
#1	136.00'	625.000 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
136.00	625.000	0.000	0.000
137.00	625.000	625.000	625.000

Pond 7P: Lake Cochituate



Summary for Pond 08P: BMP 7 - Infiltration Swale

Inflow Area = 2,241 sf, 67.51% Impervious, Inflow Depth = 4.87" for 100 Year event
Inflow = 0.30 cfs @ 12.07 hrs, Volume= 910 cf
Outflow = 0.24 cfs @ 12.13 hrs, Volume= 910 cf, Atten= 18%, Lag= 3.2 min
Discarded = 0.02 cfs @ 12.13 hrs, Volume= 715 cf
Primary = 0.22 cfs @ 12.13 hrs, Volume= 195 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 156.96' @ 12.13 hrs Surf.Area= 445 sf Storage= 271 cf
Flood Elev= 157.27' Surf.Area= 535 sf Storage= 401 cf

Plug-Flow detention time= 141.1 min calculated for 910 cf (100% of inflow)
Center-of-Mass det. time= 141.1 min (937.3 - 796.2)

Volume	Invert	Avail.Storage	Storage Description
#1	156.15'	695 cf	**Infiltration Swale (Irregular)** Listed below (Recalc)
#2	151.65'	102 cf	**1.00'W x 85.00'L x 3.00'H Crushed stone** 255 cf Overall x 40.0% Voids
		797 cf	Total Available Storage

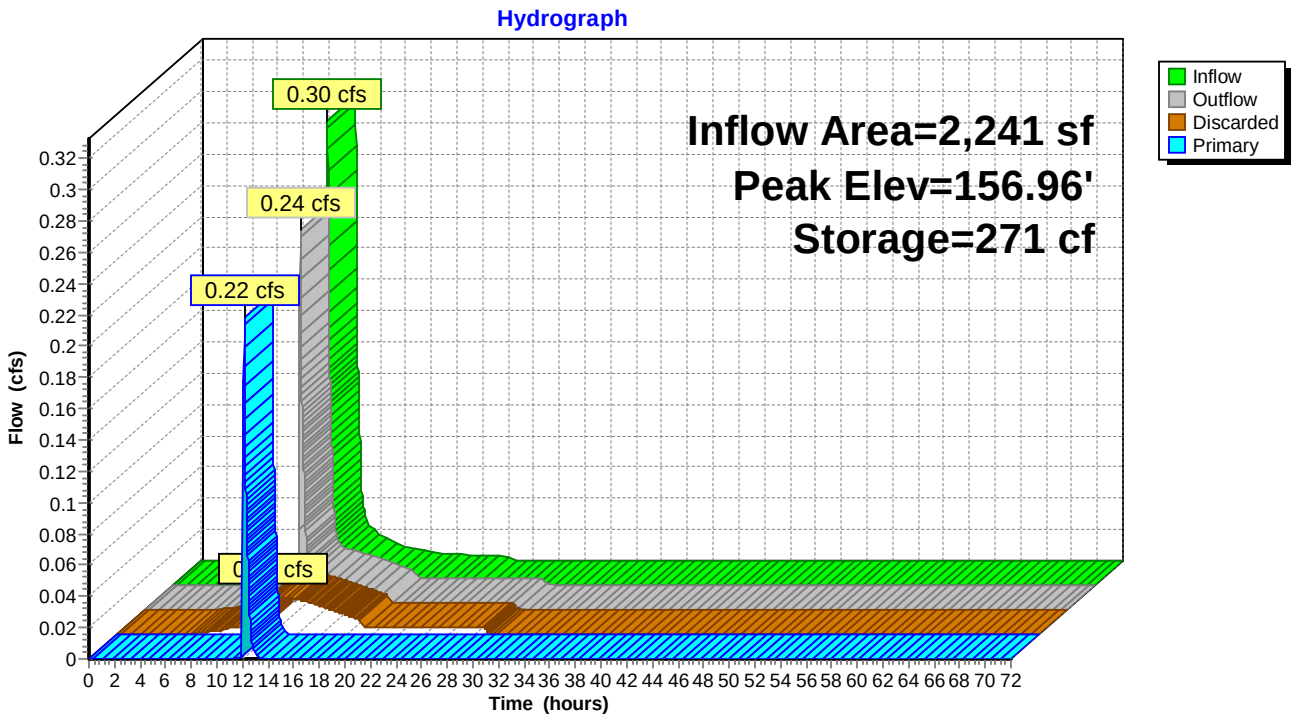
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
156.15	87	175.0	0	0	87
157.15	450	188.0	245	245	504
158.15	450	188.0	450	695	692

Device	Routing	Invert	Outlet Devices
#1	Discarded	151.65'	**2.410 in/hr Exfiltration over Surface area** Phase-In= 0.10'
#2	Primary	156.90'	**5.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.02 cfs @ 12.13 hrs HW=156.96' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=0.22 cfs @ 12.13 hrs HW=156.96' TW=0.00' (Dynamic Tailwater)
└**2=Broad-Crested Rectangular Weir** (Weir Controls 0.22 cfs @ 0.70 fps)

Pond 08P: BMP 7 - Infiltration Swale



Summary for Pond 09P: BMP 8 - Infiltration Swale

Inflow Area = 10,487 sf, 62.20% Impervious, Inflow Depth = 4.65" for 100 Year event
Inflow = 1.34 cfs @ 12.07 hrs, Volume= 4,065 cf
Outflow = 1.11 cfs @ 12.12 hrs, Volume= 4,065 cf, Atten= 17%, Lag= 3.1 min
Discarded = 0.09 cfs @ 12.12 hrs, Volume= 2,819 cf
Primary = 1.01 cfs @ 12.12 hrs, Volume= 1,246 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 158.17' @ 12.12 hrs Surf.Area= 1,694 sf Storage= 1,081 cf
Flood Elev= 158.47' Surf.Area= 1,821 sf Storage= 1,527 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 125.3 min (927.0 - 801.7)

Volume	Invert	Avail.Storage	Storage Description
#1	157.25'	2,354 cf	**Infiltration Swale (Irregular)** Listed below (Recalc)
#2	152.75'	360 cf	**1.00'W x 300.00'L x 3.00'H Crushed stone** 900 cf Overall x 40.0% Voids
		2,714 cf	Total Available Storage

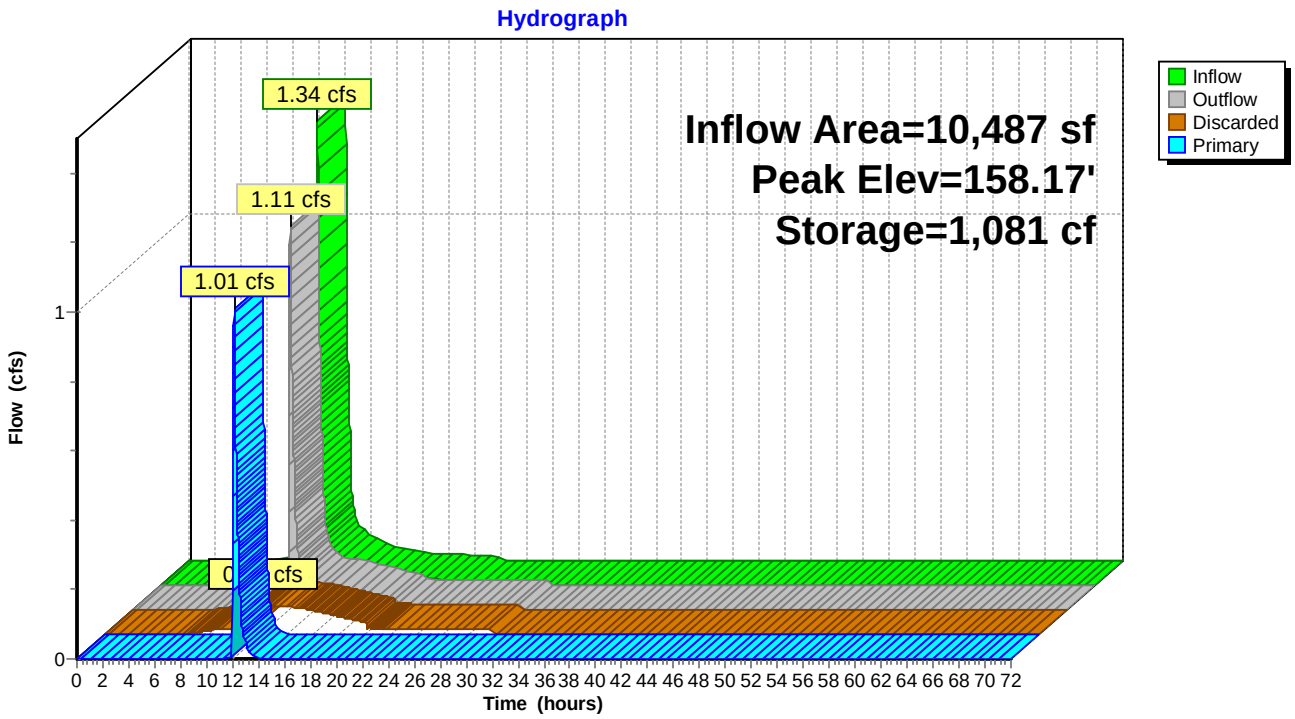
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
157.25	301	604.0	0	0	301
158.25	1,521	616.0	833	833	1,616
159.25	1,521	616.0	1,521	2,354	2,232

Device	Routing	Invert	Outlet Devices
#1	Discarded	152.75'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	158.00'	**5.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.09 cfs @ 12.12 hrs HW=158.17' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.09 cfs)

Primary OutFlow Max=1.01 cfs @ 12.12 hrs HW=158.17' TW=0.00' (Dynamic Tailwater)
└**2=Broad-Crested Rectangular Weir** (Weir Controls 1.01 cfs @ 1.17 fps)

Pond 09P: BMP 8 - Infiltration Swale



Summary for Pond 10P: BMP 9 - Infiltration Swale

[58] Hint: Peaked 0.28' above defined flood level

Inflow Area =	234,888 sf,	22.66% Impervious,	Inflow Depth =	2.51"	for	100 Year event
Inflow =	10.77 cfs @	12.27 hrs,	Volume=	49,146 cf		
Outflow =	10.44 cfs @	12.31 hrs,	Volume=	49,146 cf,	Atten= 3%,	Lag= 2.6 min
Discarded =	0.24 cfs @	12.02 hrs,	Volume=	11,489 cf		
Primary =	10.20 cfs @	12.31 hrs,	Volume=	37,657 cf		

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 158.49' @ 12.31 hrs Surf.Area= 4,219 sf Storage= 4,481 cf
Flood Elev= 158.21' Surf.Area= 4,219 sf Storage= 3,509 cf

Plug-Flow detention time= 43.9 min calculated for 49,139 cf (100% of inflow)
Center-of-Mass det. time= 44.0 min (907.4 - 863.4)

Volume	Invert	Avail.Storage	Storage Description
#1	157.00'	5,449 cf	**Infiltration Swale (Irregular)** Listed below (Recalc)
#2	152.50'	840 cf	**1.00'W x 700.00'L x 3.00'H Crushed stone** 2,100 cf Overall x 40.0% Voids
		6,289 cf	Total Available Storage

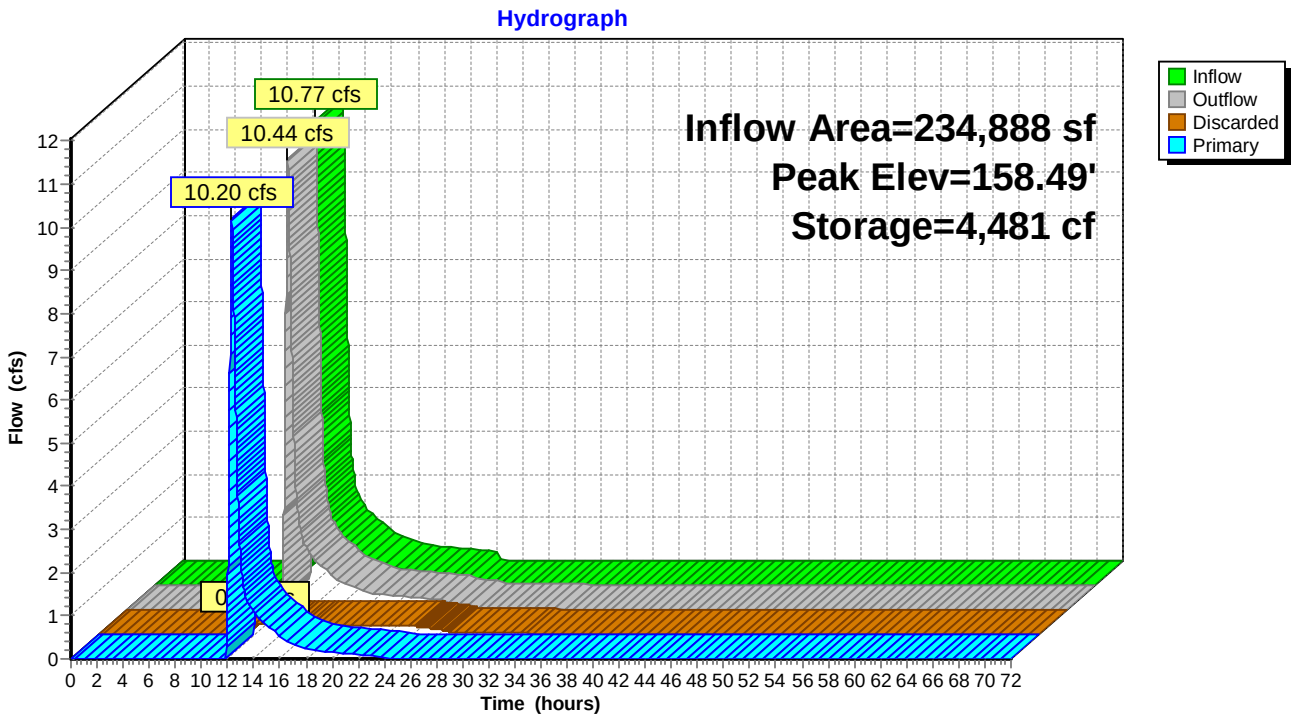
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
157.00	701	1,403.0	0	0	701
158.00	3,519	1,416.0	1,930	1,930	3,940
159.00	3,519	1,416.0	3,519	5,449	5,356

Device	Routing	Invert	Outlet Devices
#1	Discarded	152.50'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	157.75'	**5.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.24 cfs @ 12.02 hrs HW=158.02' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.24 cfs)

Primary OutFlow Max=10.20 cfs @ 12.31 hrs HW=158.49' TW=0.00' (Dynamic Tailwater)
└**2=Broad-Crested Rectangular Weir** (Weir Controls 10.20 cfs @ 2.77 fps)

Pond 10P: BMP 9 - Infiltration Swale



Summary for Pond 11P: BMP 10 - Infiltration Swale

[58] Hint: Peaked 0.24' above defined flood level

Inflow Area =	316,495 sf,	27.57% Impervious,	Inflow Depth =	2.42"	for	100 Year event
Inflow =	14.79 cfs @	12.22 hrs,	Volume=	63,751 cf		
Outflow =	14.70 cfs @	12.24 hrs,	Volume=	63,752 cf,	Atten= 1%,	Lag= 1.2 min
Discarded =	0.16 cfs @	11.97 hrs,	Volume=	7,866 cf		
Primary =	14.54 cfs @	12.24 hrs,	Volume=	55,886 cf		

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 158.61' @ 12.24 hrs Surf.Area= 2,870 sf Storage= 2,734 cf
Flood Elev= 158.37' Surf.Area= 2,870 sf Storage= 2,170 cf

Plug-Flow detention time= 22.9 min calculated for 63,743 cf (100% of inflow)
Center-of-Mass det. time= 22.9 min (886.2 - 863.3)

Volume	Invert	Avail.Storage	Storage Description
#1	157.25'	3,707 cf	**Infiltration Swale (Irregular)** Listed below (Recalc)
#2	152.75'	570 cf	**1.00'W x 475.00'L x 3.00'H Crushed stone** 1,425 cf Overall x 40.0% Voids
		4,277 cf	Total Available Storage

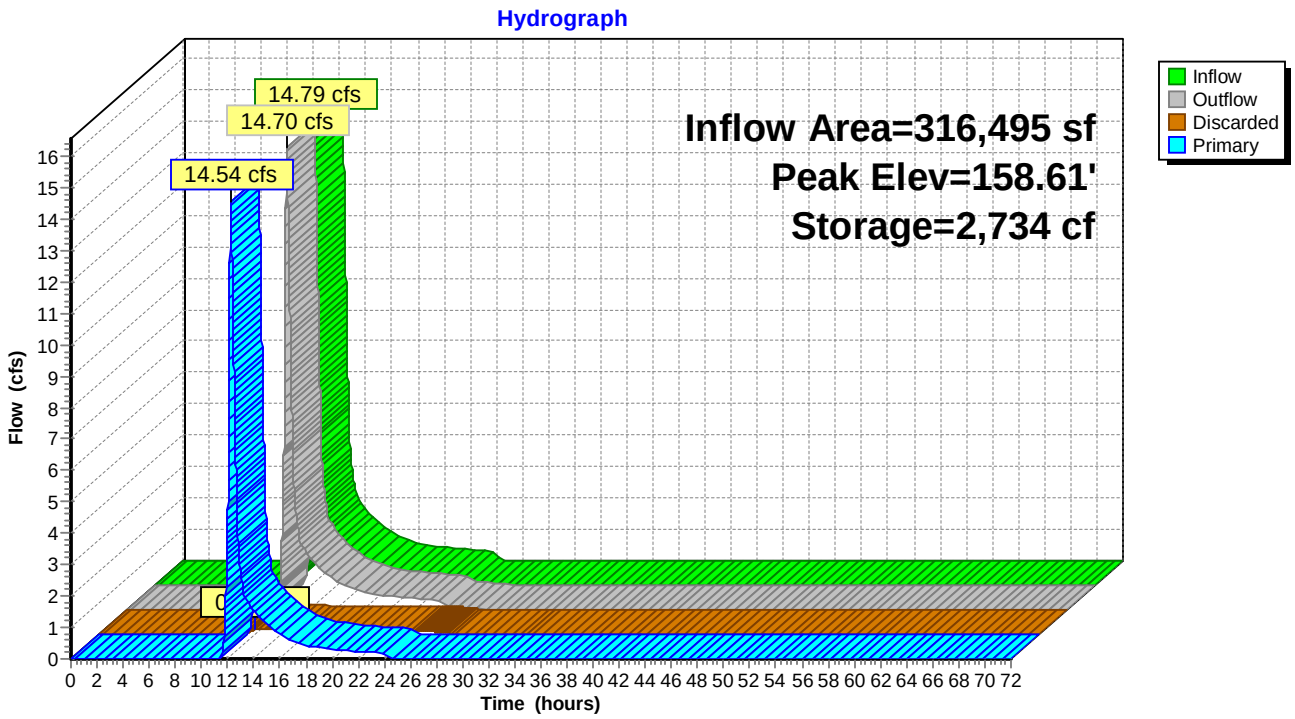
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
157.25	475	953.0	0	0	475
158.25	2,395	966.0	1,312	1,312	2,680
159.25	2,395	966.0	2,395	3,707	3,646

Device	Routing	Invert	Outlet Devices
#1	Discarded	152.75'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	158.00'	**10.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.16 cfs @ 11.97 hrs HW=158.26' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.16 cfs)

Primary OutFlow Max=14.54 cfs @ 12.24 hrs HW=158.61' TW=0.00' (Dynamic Tailwater)
└**2=Broad-Crested Rectangular Weir** (Weir Controls 14.54 cfs @ 2.40 fps)

Pond 11P: BMP 10 - Infiltration Swale



Summary for Pond 12P: BMP 11 - Infiltration Swale

Inflow Area = 15,210 sf, 38.96% Impervious, Inflow Depth = 3.49" for 100 Year event
Inflow = 1.22 cfs @ 12.15 hrs, Volume= 4,424 cf
Outflow = 1.20 cfs @ 12.17 hrs, Volume= 4,425 cf, Atten= 2%, Lag= 1.3 min
Discarded = 0.05 cfs @ 12.17 hrs, Volume= 1,977 cf
Primary = 1.15 cfs @ 12.17 hrs, Volume= 2,447 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 157.69' @ 12.17 hrs Surf.Area= 867 sf Storage= 555 cf
Flood Elev= 157.93' Surf.Area= 919 sf Storage= 739 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 77.6 min (911.1 - 833.4)

Volume	Invert	Avail.Storage	Storage Description
#1	156.75'	1,189 cf	**Infiltration Swale (Irregular)** Listed below (Recalc)
#2	152.25'	180 cf	**1.00'W x 150.00'L x 3.00'H Crushed stone** 450 cf Overall x 40.0% Voids
		1,369 cf	Total Available Storage

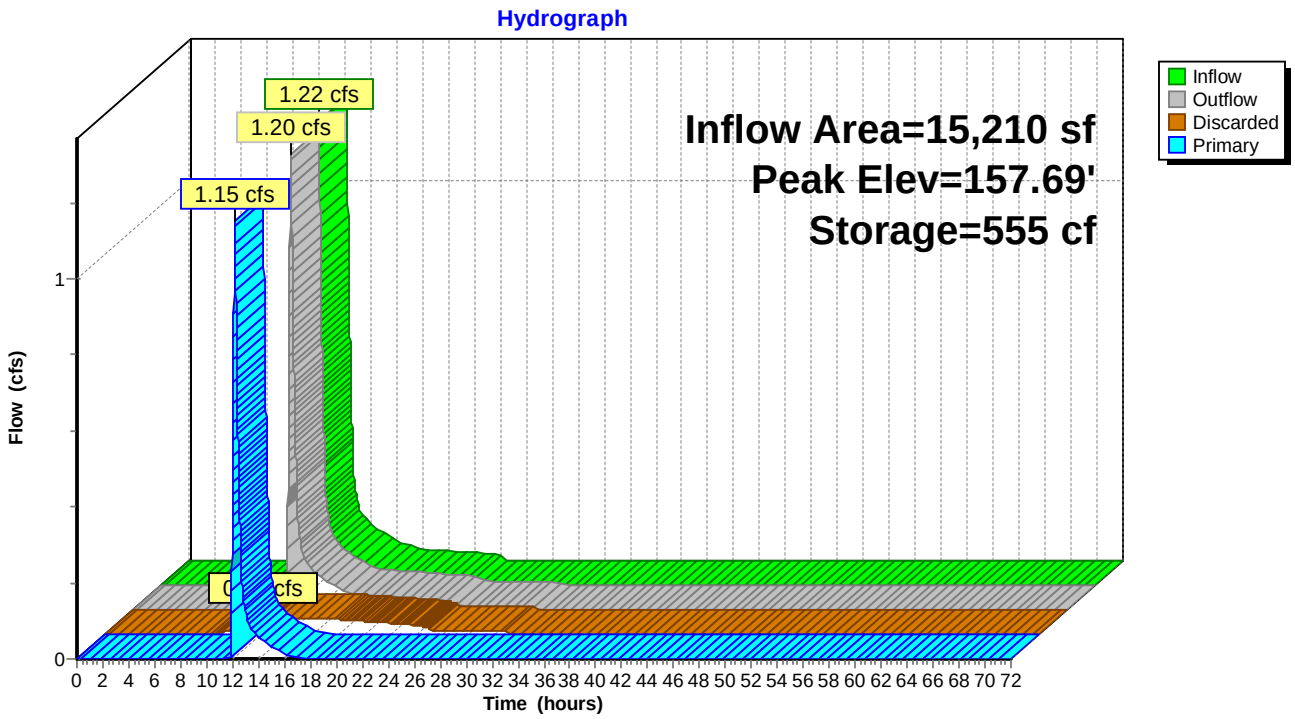
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
156.75	151	303.0	0	0	151
157.75	769	316.0	420	420	862
158.75	769	316.0	769	1,189	1,178

Device	Routing	Invert	Outlet Devices
#1	Discarded	152.25'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	157.50'	**5.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.05 cfs @ 12.17 hrs HW=157.69' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.05 cfs)

Primary OutFlow Max=1.15 cfs @ 12.17 hrs HW=157.69' TW=0.00' (Dynamic Tailwater)
└**2=Broad-Crested Rectangular Weir** (Weir Controls 1.15 cfs @ 1.22 fps)

Pond 12P: BMP 11 - Infiltration Swale



Summary for Pond 13P: BMP 12 - Infiltration Swale

Inflow Area =	13,927 sf, 62.52% Impervious, Inflow Depth = 4.65" for 100 Year event				
Inflow =	1.78 cfs @	12.07 hrs,	Volume=	5,398 cf	
Outflow =	1.37 cfs @	12.13 hrs,	Volume=	5,398 cf,	Atten= 23%, Lag= 3.7 min
Discarded =	0.13 cfs @	12.13 hrs,	Volume=	3,757 cf	
Primary =	1.24 cfs @	12.13 hrs,	Volume=	1,641 cf	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 156.45' @ 12.13 hrs Surf.Area= 2,307 sf Storage= 1,486 cf
Flood Elev= 156.49' Surf.Area= 2,398 sf Storage= 1,567 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 125.9 min (927.6 - 801.7)

Volume	Invert	Avail.Storage	Storage Description
#1	155.50'	3,127 cf	**Infiltration Swale (Irregular)** Listed below (Recalc)
#2	151.00'	480 cf	**1.00'W x 400.00'L x 3.00'H Crushed stone** 1,200 cf Overall x 40.0% Voids
		3,607 cf	Total Available Storage

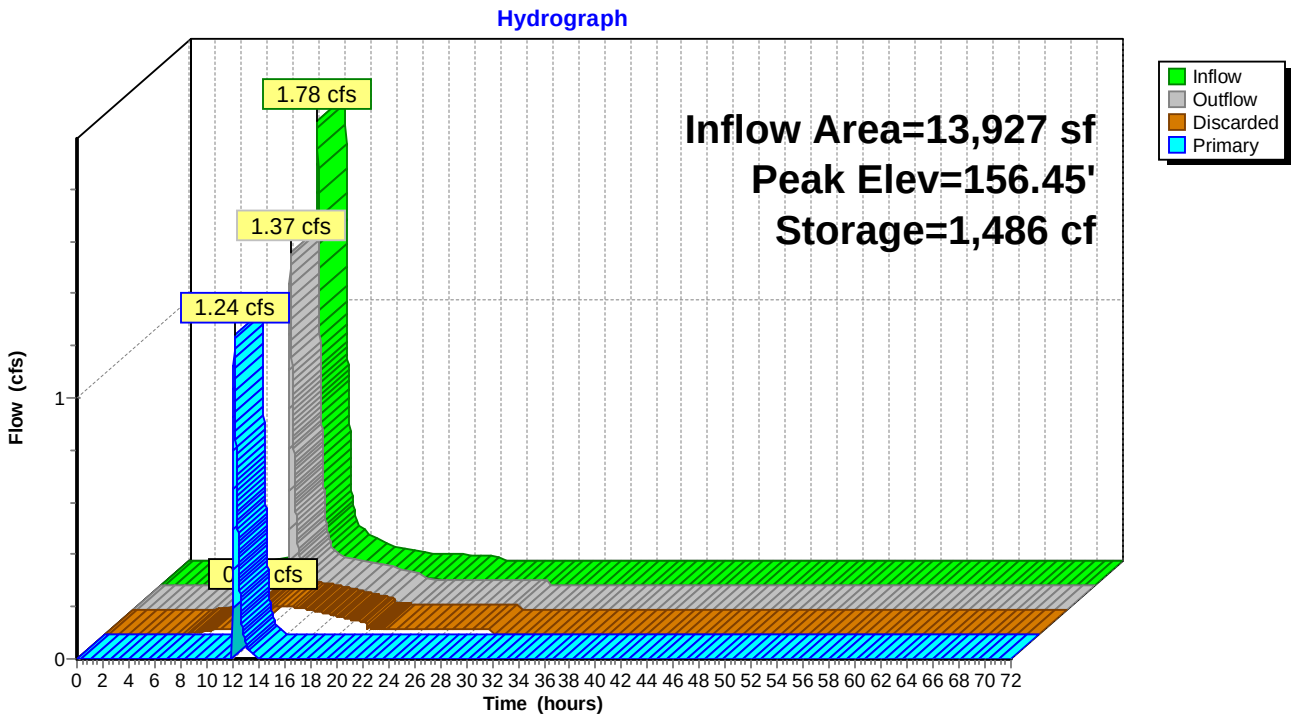
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
155.50	401	803.0	0	0	401
156.50	2,020	816.0	1,107	1,107	2,261
157.50	2,020	816.0	2,020	3,127	3,077

Device	Routing	Invert	Outlet Devices
#1	Discarded	151.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	156.25'	**5.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.13 cfs @ 12.13 hrs HW=156.45' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.13 cfs)

Primary OutFlow Max=1.24 cfs @ 12.13 hrs HW=156.45' TW=0.00' (Dynamic Tailwater)
└**2=Broad-Crested Rectangular Weir** (Weir Controls 1.24 cfs @ 1.25 fps)

Pond 13P: BMP 12 - Infiltration Swale



Summary for Pond 14P: BMP 13 - Infiltration Swale

Inflow Area = 26,591 sf, 37.08% Impervious, Inflow Depth = 3.39" for 100 Year event
Inflow = 2.05 cfs @ 12.16 hrs, Volume= 7,510 cf
Outflow = 1.83 cfs @ 12.21 hrs, Volume= 7,510 cf, Atten= 11%, Lag= 3.5 min
Discarded = 0.13 cfs @ 12.21 hrs, Volume= 4,280 cf
Primary = 1.70 cfs @ 12.21 hrs, Volume= 3,230 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 156.49' @ 12.21 hrs Surf.Area= 2,295 sf Storage= 1,501 cf
Flood Elev= 156.69' Surf.Area= 2,308 sf Storage= 1,879 cf

Plug-Flow detention time= 99.7 min calculated for 7,510 cf (100% of inflow)
Center-of-Mass det. time= 99.6 min (935.6 - 836.0)

Volume	Invert	Avail.Storage	Storage Description
#1	155.50'	2,983 cf	**Infiltration Swale (Irregular)** Listed below (Recalc)
#2	151.00'	457 cf	**1.00'W x 381.00'L x 3.00'H Crushed stone** 1,143 cf Overall x 40.0% Voids
		3,440 cf	Total Available Storage

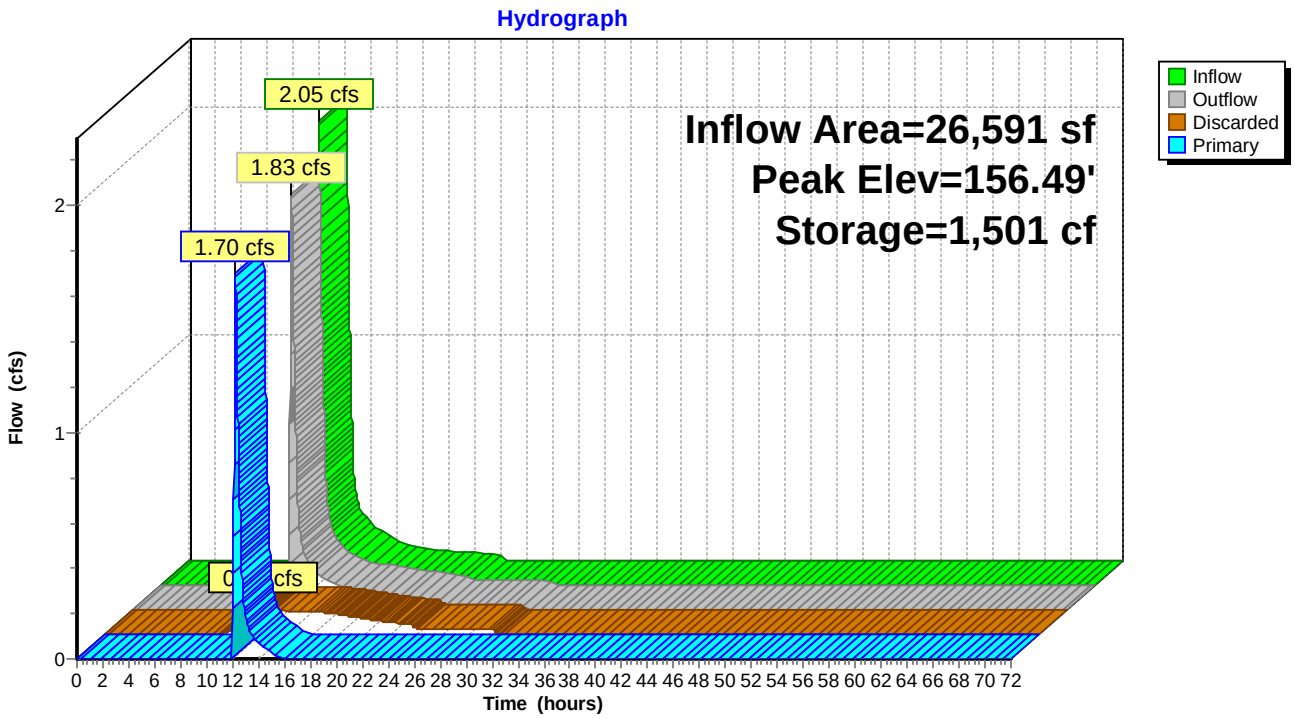
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
155.50	382	766.0	0	0	382
156.50	1,927	779.0	1,056	1,056	2,157
157.50	1,927	779.0	1,927	2,983	2,936

Device	Routing	Invert	Outlet Devices
#1	Discarded	151.00'	**2.410 in/hr Exfiltration over Surface area** Phase-In= 0.10'
#2	Primary	156.25'	**5.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.13 cfs @ 12.21 hrs HW=156.49' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.13 cfs)

Primary OutFlow Max=1.70 cfs @ 12.21 hrs HW=156.49' TW=0.00' (Dynamic Tailwater)
└**2=Broad-Crested Rectangular Weir** (Weir Controls 1.70 cfs @ 1.40 fps)

Pond 14P: BMP 13 - Infiltration Swale

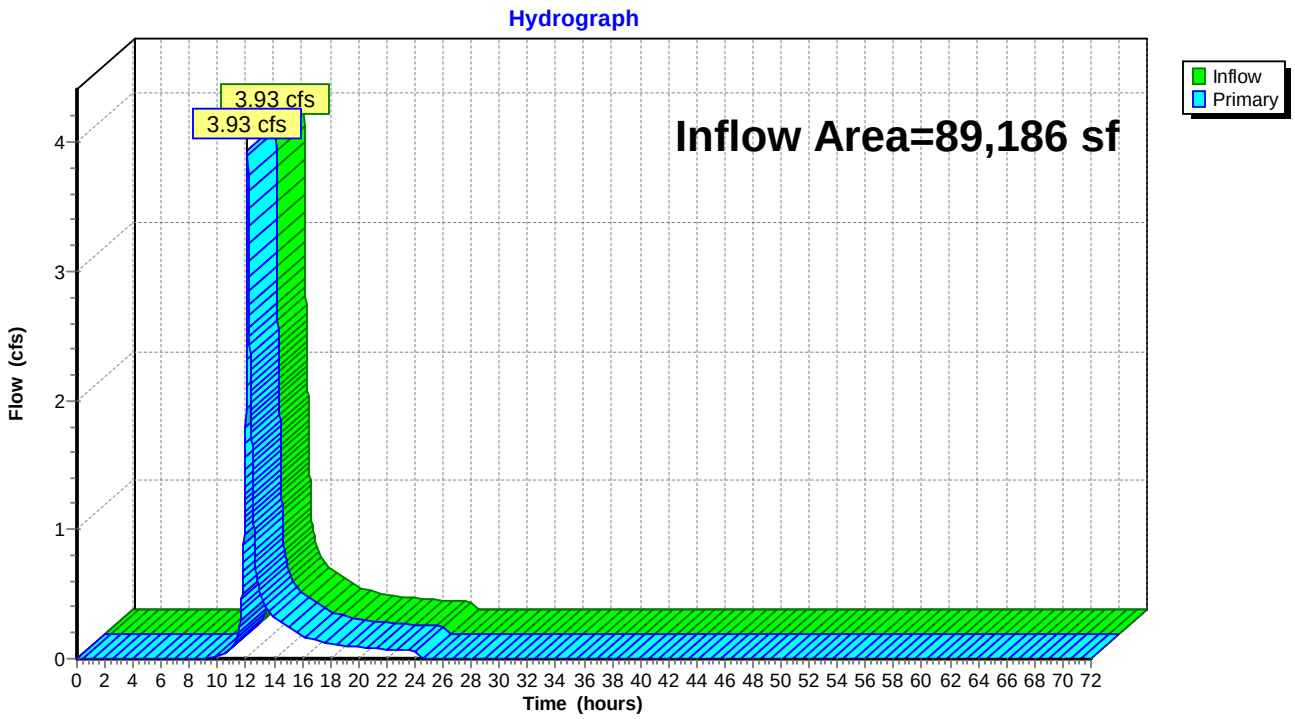


Summary for Link 1L: Total to Bioretention

Inflow Area = 89,186 sf, 21.87% Impervious, Inflow Depth = 1.83" for 100 Year event
Inflow = 3.93 cfs @ 12.13 hrs, Volume= 13,626 cf
Primary = 3.93 cfs @ 12.13 hrs, Volume= 13,626 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link 1L: Total to Bioretention

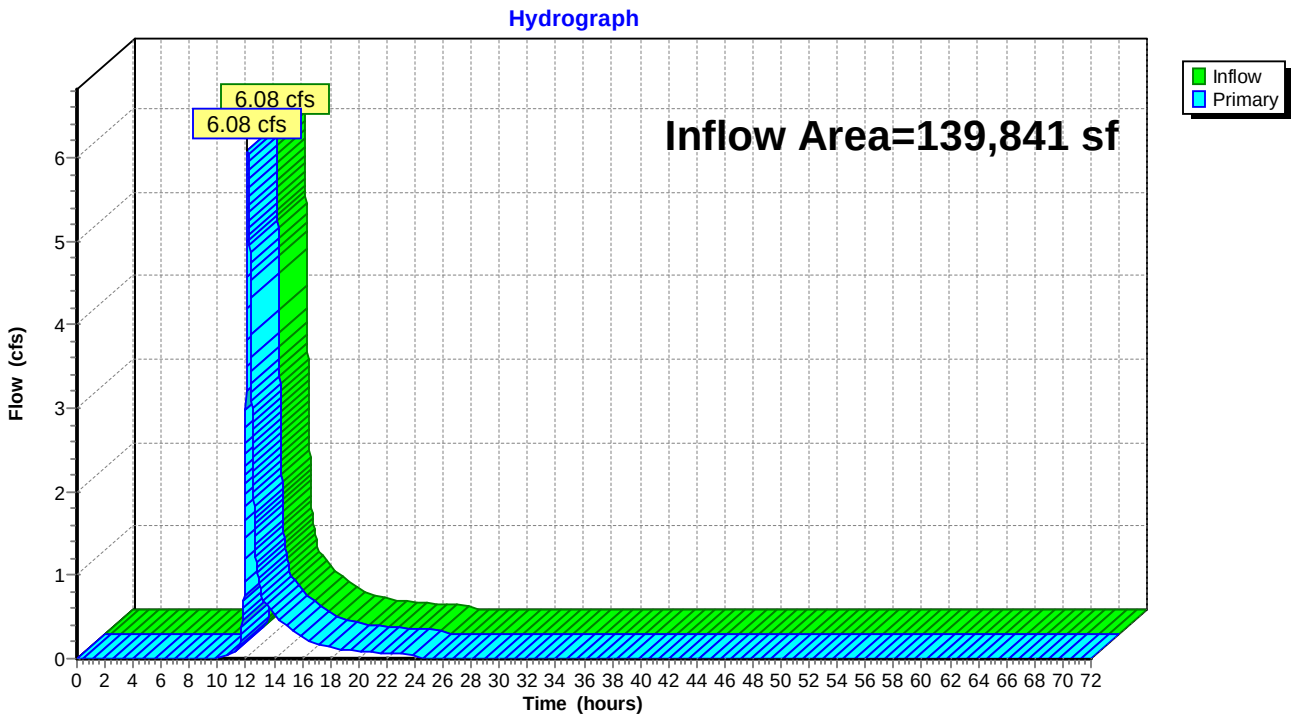


Summary for Link 2L: Lake Cochituate N1

Inflow Area = 139,841 sf, 19.05% Impervious, Inflow Depth = 1.75" for 100 Year event
Inflow = 6.08 cfs @ 12.13 hrs, Volume= 20,412 cf
Primary = 6.08 cfs @ 12.13 hrs, Volume= 20,412 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link 2L: Lake Cochituate N1

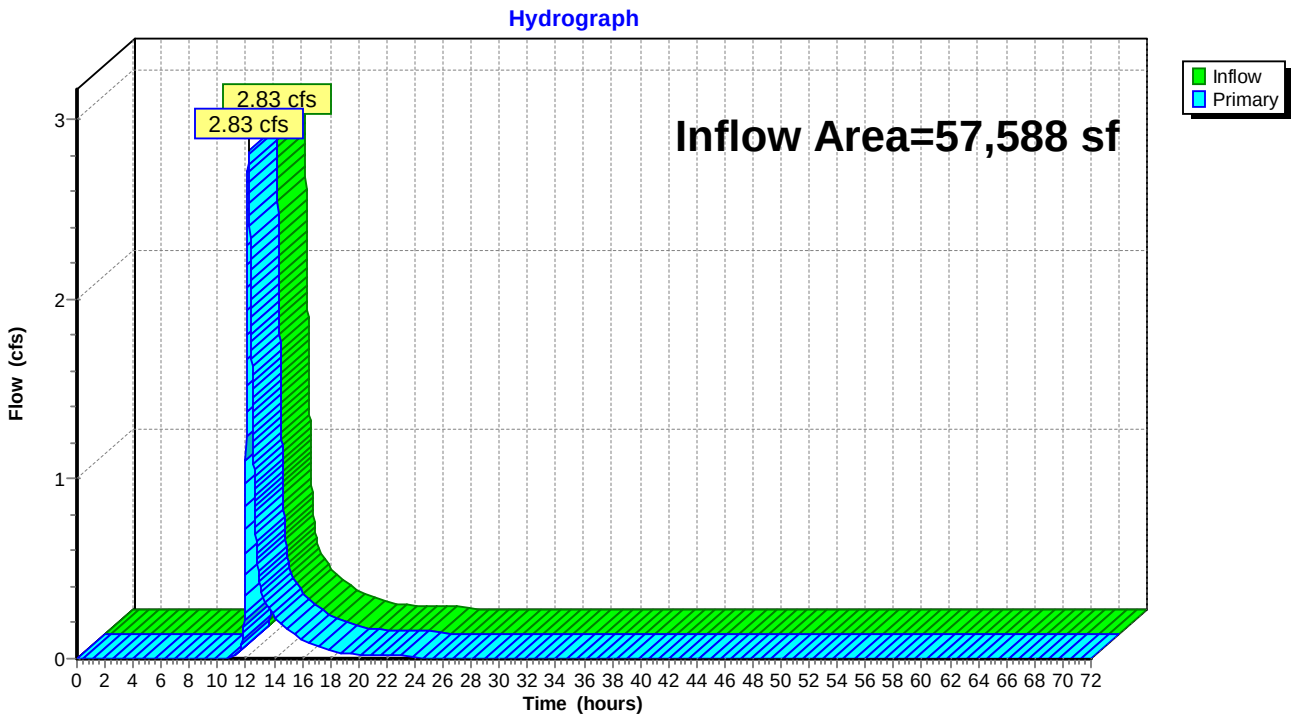


Summary for Link 3L: Lake Cochituate N2

Inflow Area = 57,588 sf, 12.49% Impervious, Inflow Depth = 1.81" for 100 Year event
Inflow = 2.83 cfs @ 12.18 hrs, Volume= 8,689 cf
Primary = 2.83 cfs @ 12.18 hrs, Volume= 8,689 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link 3L: Lake Cochituate N2

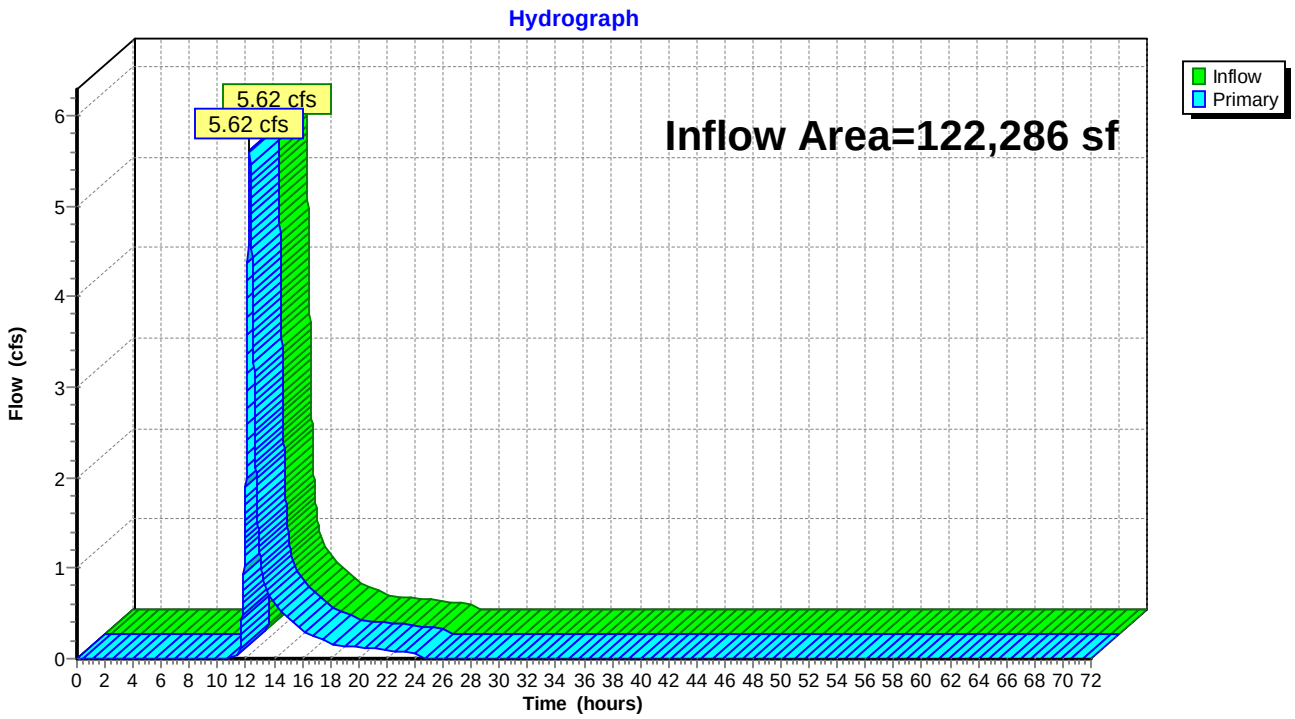


Summary for Link 4L: Lake Cochituate N3

Inflow Area = 122,286 sf, 13.65% Impervious, Inflow Depth = 2.28" for 100 Year event
Inflow = 5.62 cfs @ 12.27 hrs, Volume= 23,241 cf
Primary = 5.62 cfs @ 12.27 hrs, Volume= 23,241 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link 4L: Lake Cochituate N3

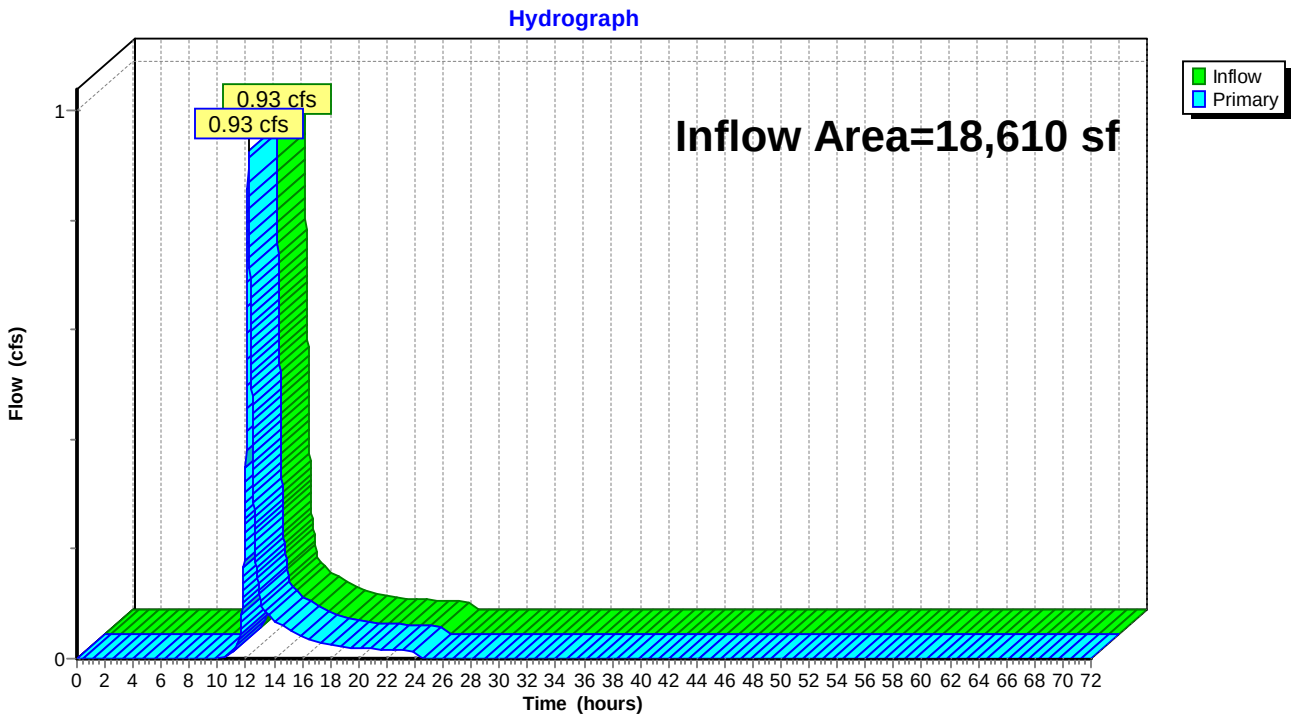


Summary for Link 5L: Lake Cochituate W2

Inflow Area = 18,610 sf, 23.30% Impervious, Inflow Depth = 1.99" for 100 Year event
Inflow = 0.93 cfs @ 12.17 hrs, Volume= 3,093 cf
Primary = 0.93 cfs @ 12.17 hrs, Volume= 3,093 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link 5L: Lake Cochituate W2

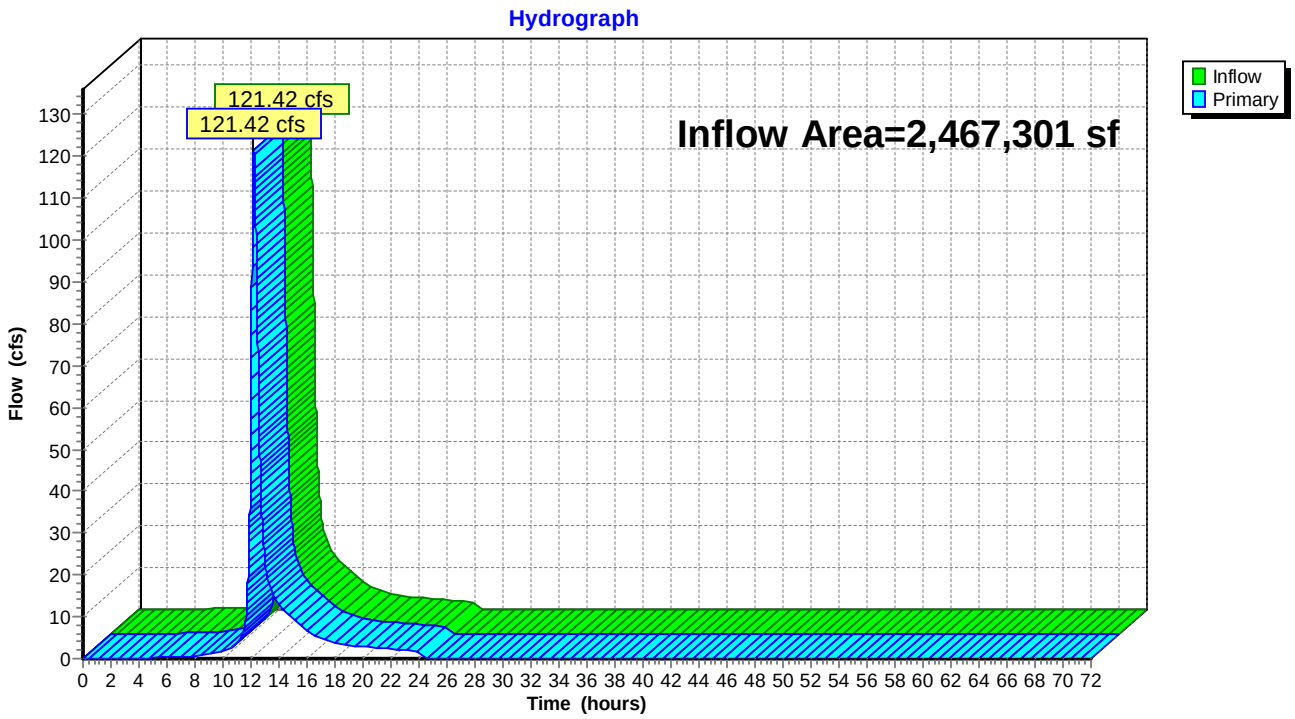


Summary for Link 6L: Total

Inflow Area = 2,467,301 sf, 28.26% Impervious, Inflow Depth = 2.62" for 100 Year event
Inflow = 121.42 cfs @ 12.20 hrs, Volume= 539,044 cf
Primary = 121.42 cfs @ 12.20 hrs, Volume= 539,044 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link 6L: Total

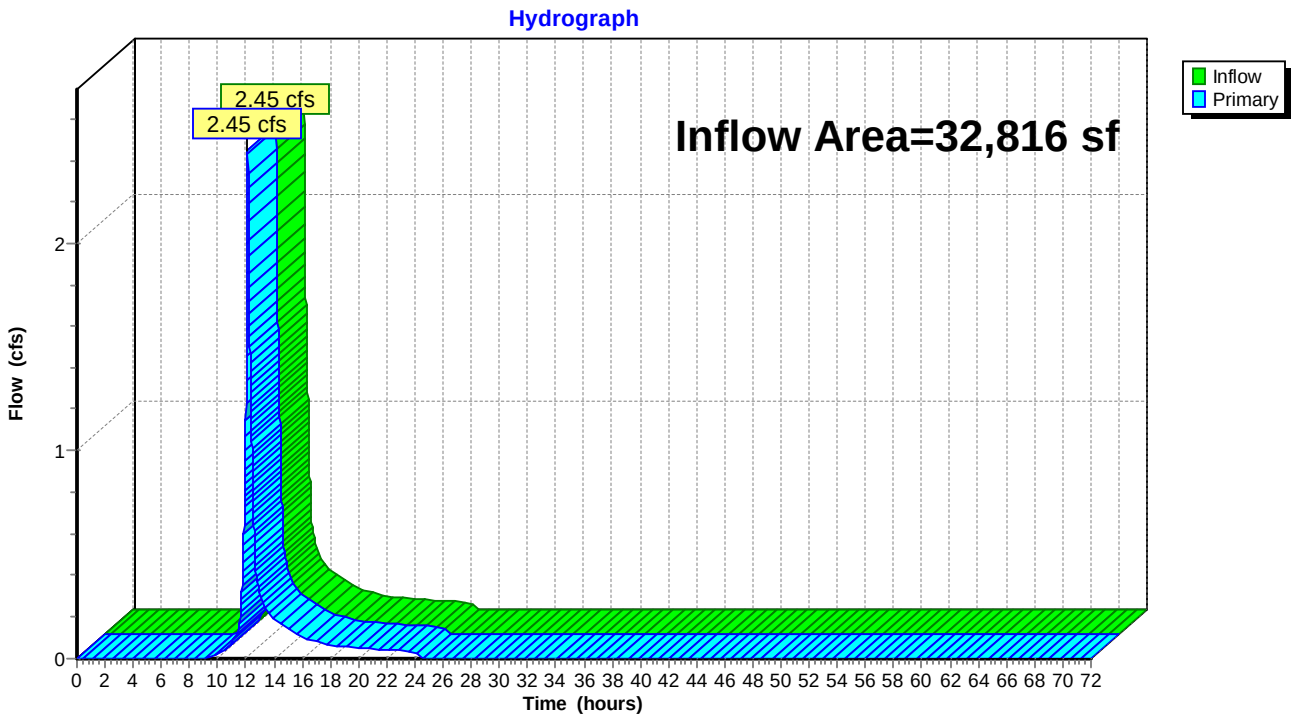


Summary for Link DP01: Cochituate Rd

Inflow Area = 32,816 sf, 19.44% Impervious, Inflow Depth = 3.09" for 100 Year event
Inflow = 2.45 cfs @ 12.13 hrs, Volume= 8,449 cf
Primary = 2.45 cfs @ 12.13 hrs, Volume= 8,449 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP01: Cochituate Rd

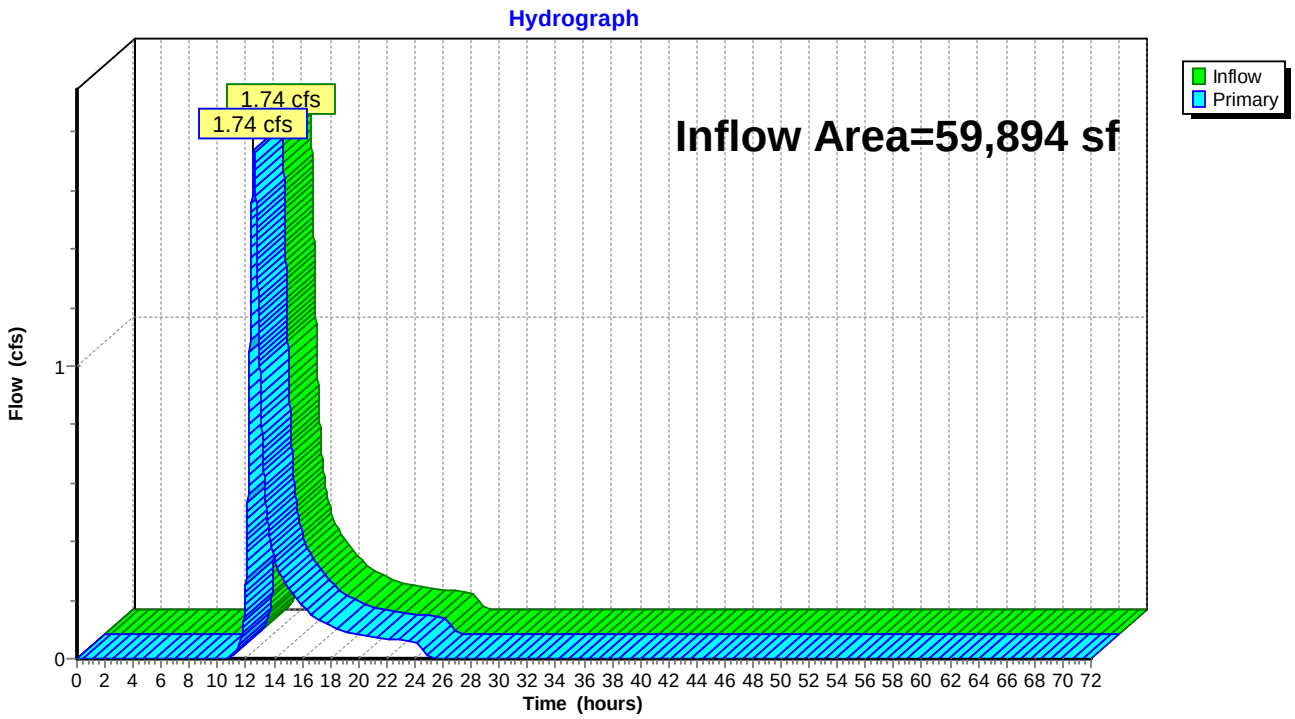


Summary for Link DP02: Chrysler Road

Inflow Area = 59,894 sf, 5.23% Impervious, Inflow Depth = 2.23" for 100 Year event
Inflow = 1.74 cfs @ 12.56 hrs, Volume= 11,143 cf
Primary = 1.74 cfs @ 12.56 hrs, Volume= 11,143 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP02: Chrysler Road

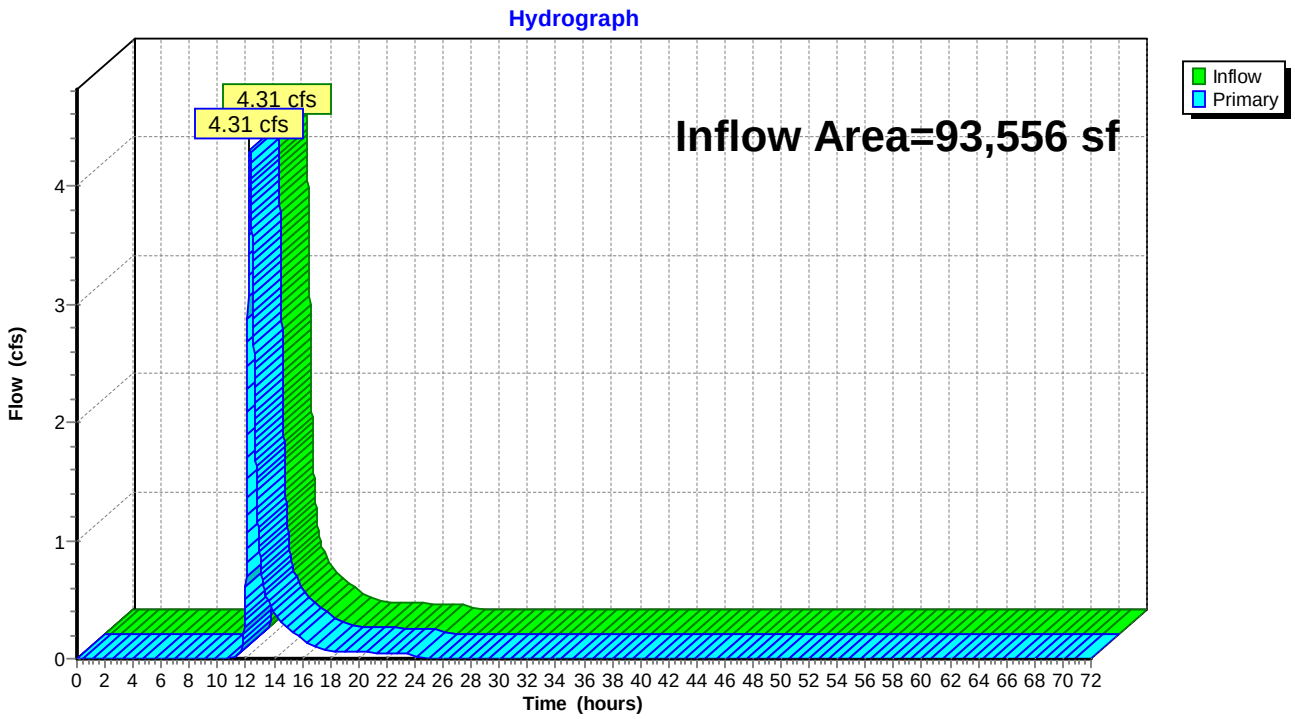


Summary for Link DP03: WF A

Inflow Area = 93,556 sf, 18.14% Impervious, Inflow Depth = 1.91" for 100 Year event
Inflow = 4.31 cfs @ 12.28 hrs, Volume= 14,921 cf
Primary = 4.31 cfs @ 12.28 hrs, Volume= 14,921 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP03: WF A

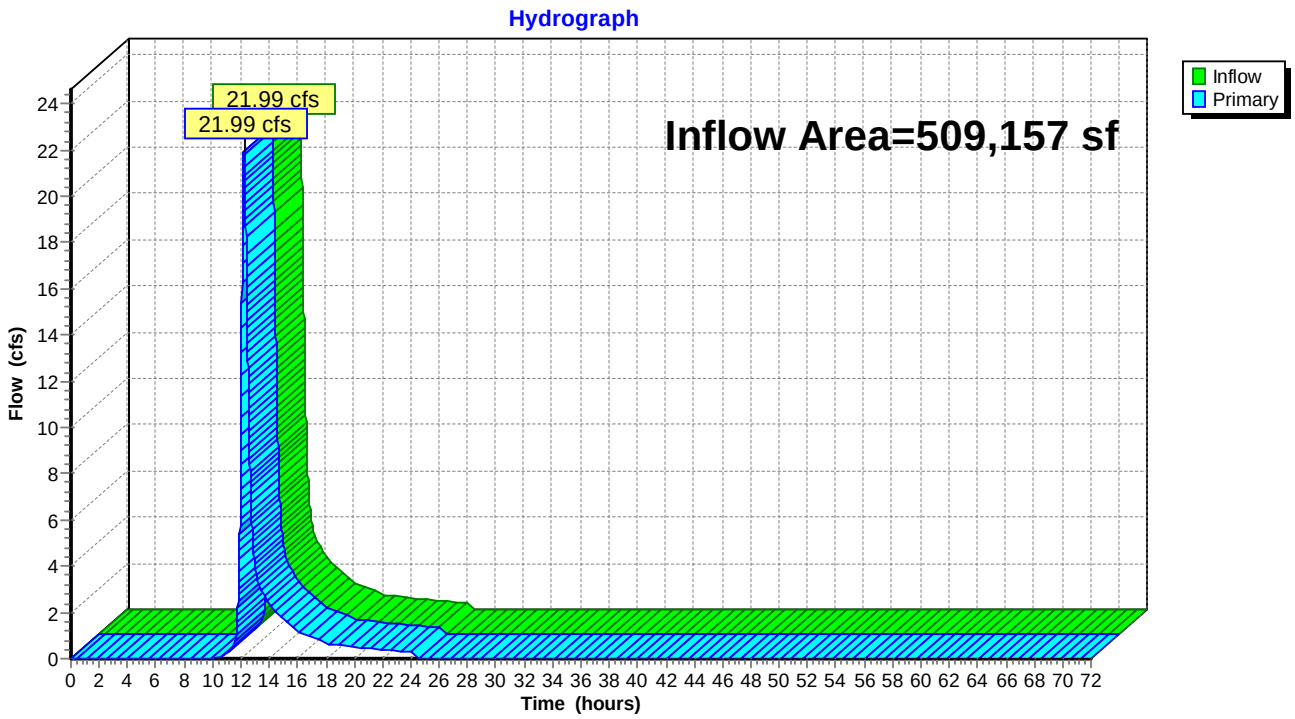


Summary for Link DP04: Lake Cochituate Middle Pond

Inflow Area = 509,157 sf, 12.96% Impervious, Inflow Depth = 2.12" for 100 Year event
Inflow = 21.99 cfs @ 12.21 hrs, Volume= 89,815 cf
Primary = 21.99 cfs @ 12.21 hrs, Volume= 89,815 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP04: Lake Cochituate Middle Pond

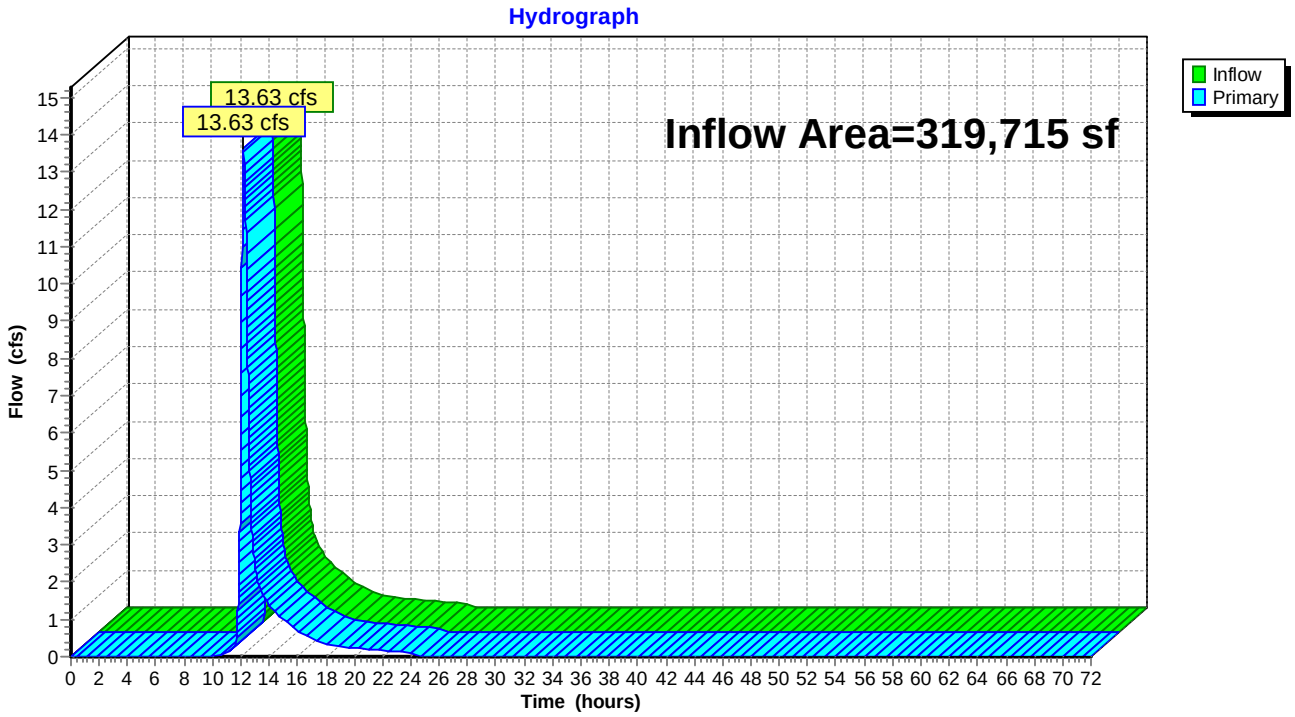


Summary for Link DP04-1: WF B

Inflow Area = 319,715 sf, 15.80% Impervious, Inflow Depth = 1.96" for 100 Year event
Inflow = 13.63 cfs @ 12.19 hrs, Volume= 52,343 cf
Primary = 13.63 cfs @ 12.19 hrs, Volume= 52,343 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP04-1: WF B

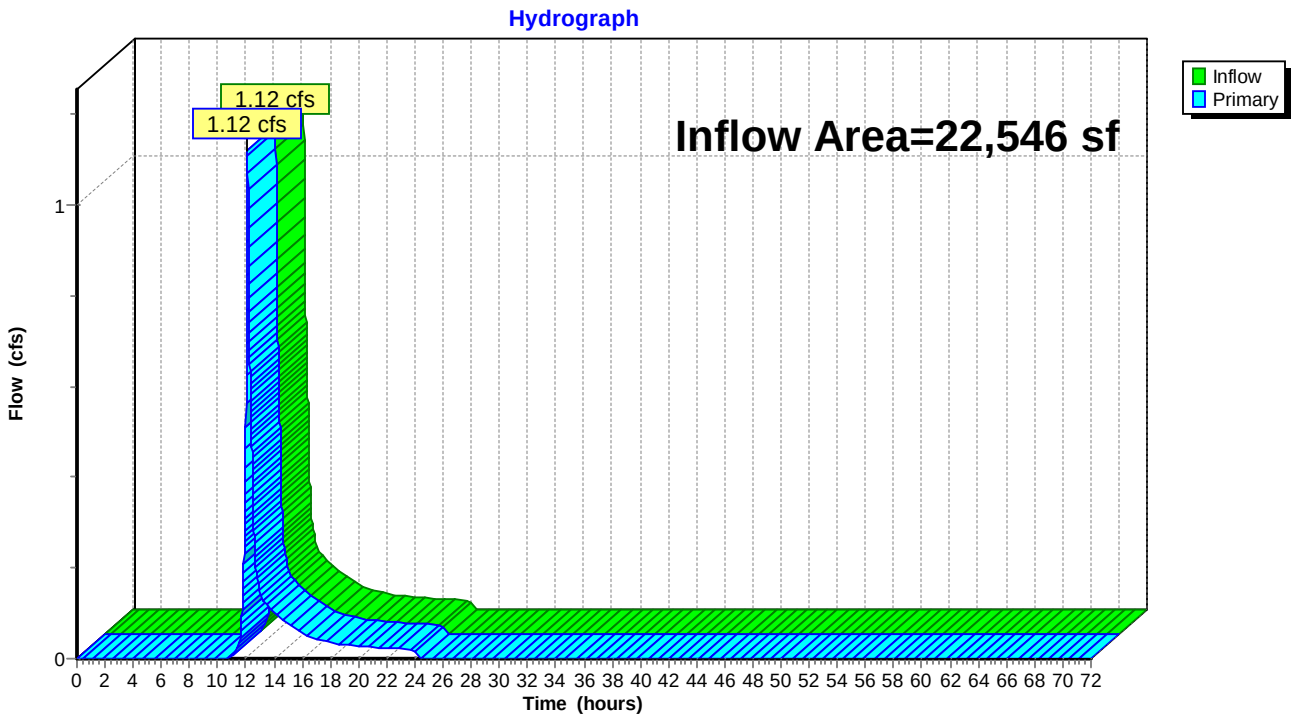


Summary for Link DP04-2: WF C

Inflow Area = 22,546 sf, 0.00% Impervious, Inflow Depth = 2.05" for 100 Year event
Inflow = 1.12 cfs @ 12.11 hrs, Volume= 3,854 cf
Primary = 1.12 cfs @ 12.11 hrs, Volume= 3,854 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP04-2: WF C

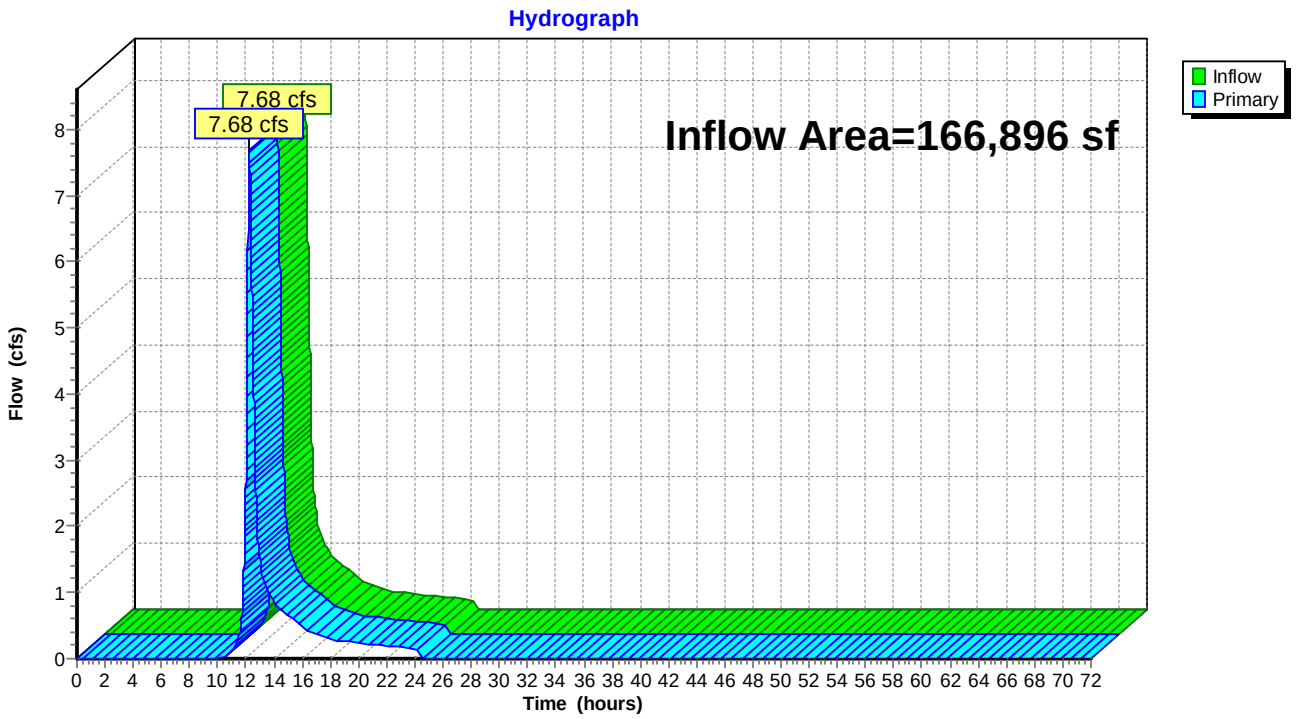


Summary for Link DP04-3: Lake Cochituate

Inflow Area = 166,896 sf, 9.27% Impervious, Inflow Depth = 2.42" for 100 Year event
Inflow = 7.68 cfs @ 12.23 hrs, Volume= 33,618 cf
Primary = 7.68 cfs @ 12.23 hrs, Volume= 33,618 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP04-3: Lake Cochituate

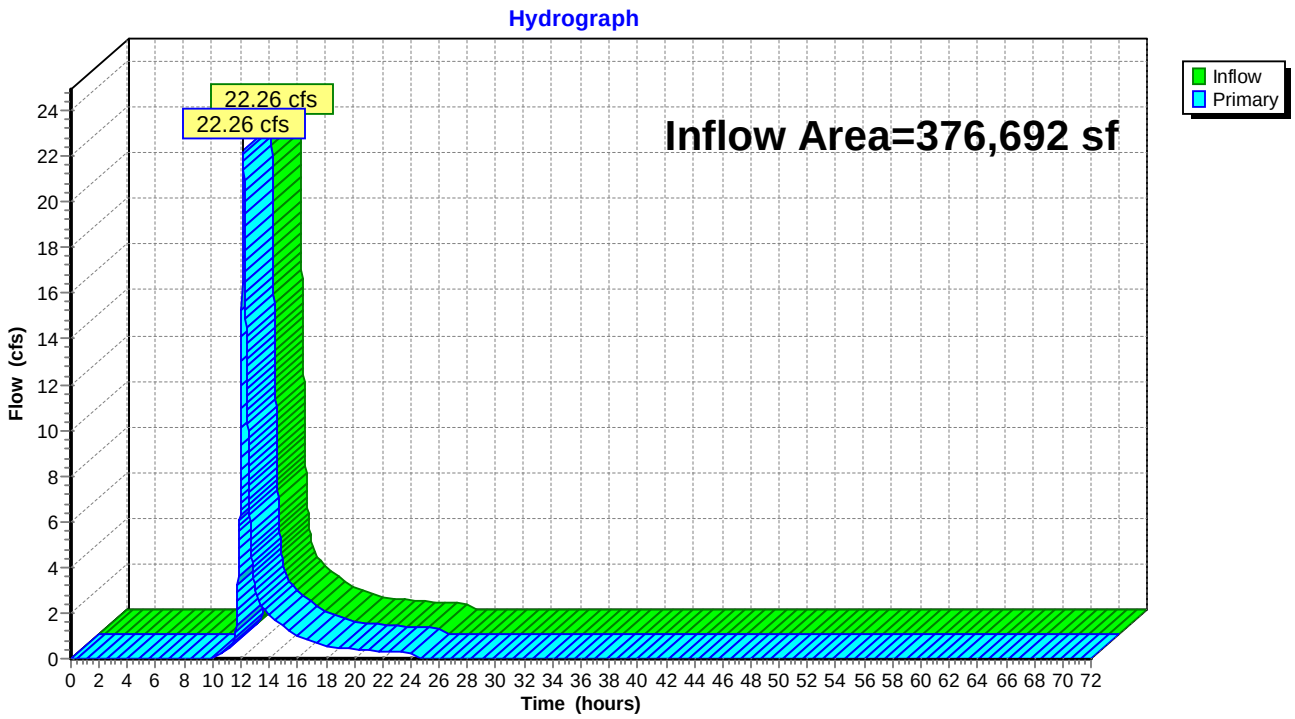


Summary for Link DP05: Lake Cochituate Middle

Inflow Area = 376,692 sf, 21.92% Impervious, Inflow Depth = 2.50" for 100 Year event
Inflow = 22.26 cfs @ 12.17 hrs, Volume= 78,364 cf
Primary = 22.26 cfs @ 12.17 hrs, Volume= 78,364 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP05: Lake Cochituate Middle

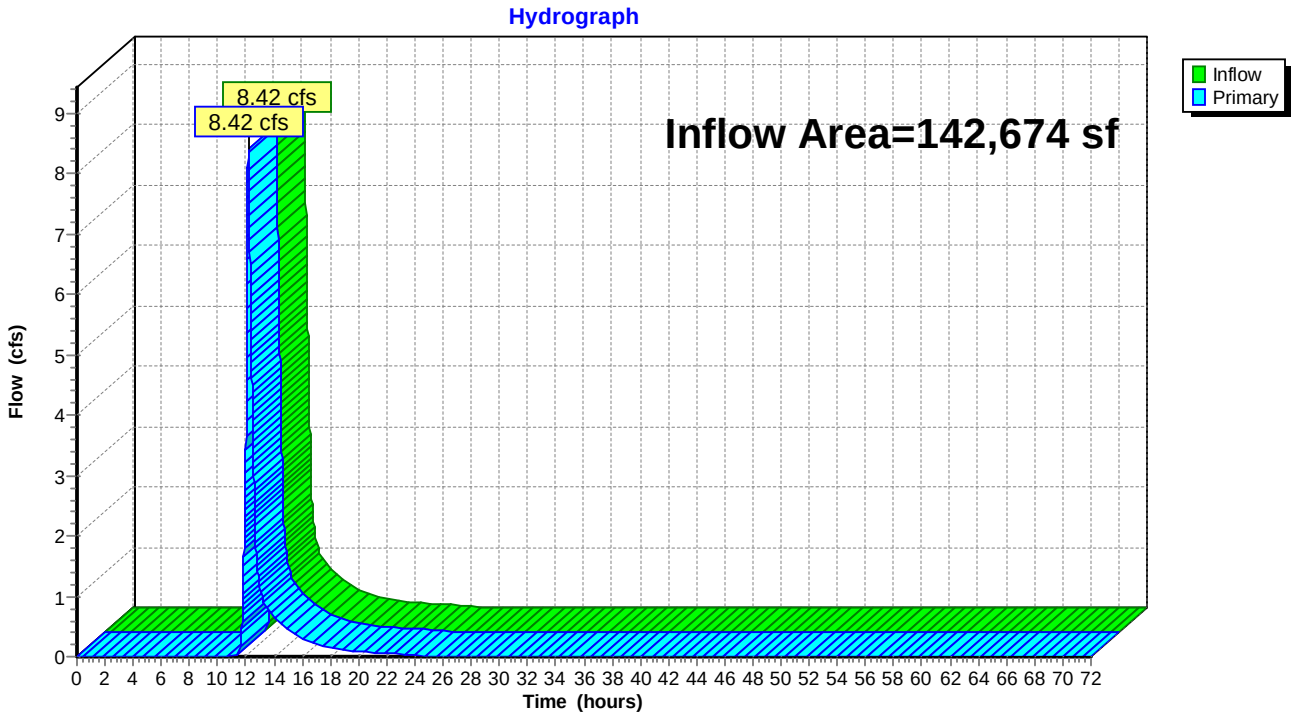


Summary for Link DP05-1: WF I

Inflow Area = 142,674 sf, 22.86% Impervious, Inflow Depth = 2.18" for 100 Year event
Inflow = 8.42 cfs @ 12.17 hrs, Volume= 25,865 cf
Primary = 8.42 cfs @ 12.17 hrs, Volume= 25,865 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP05-1: WF I

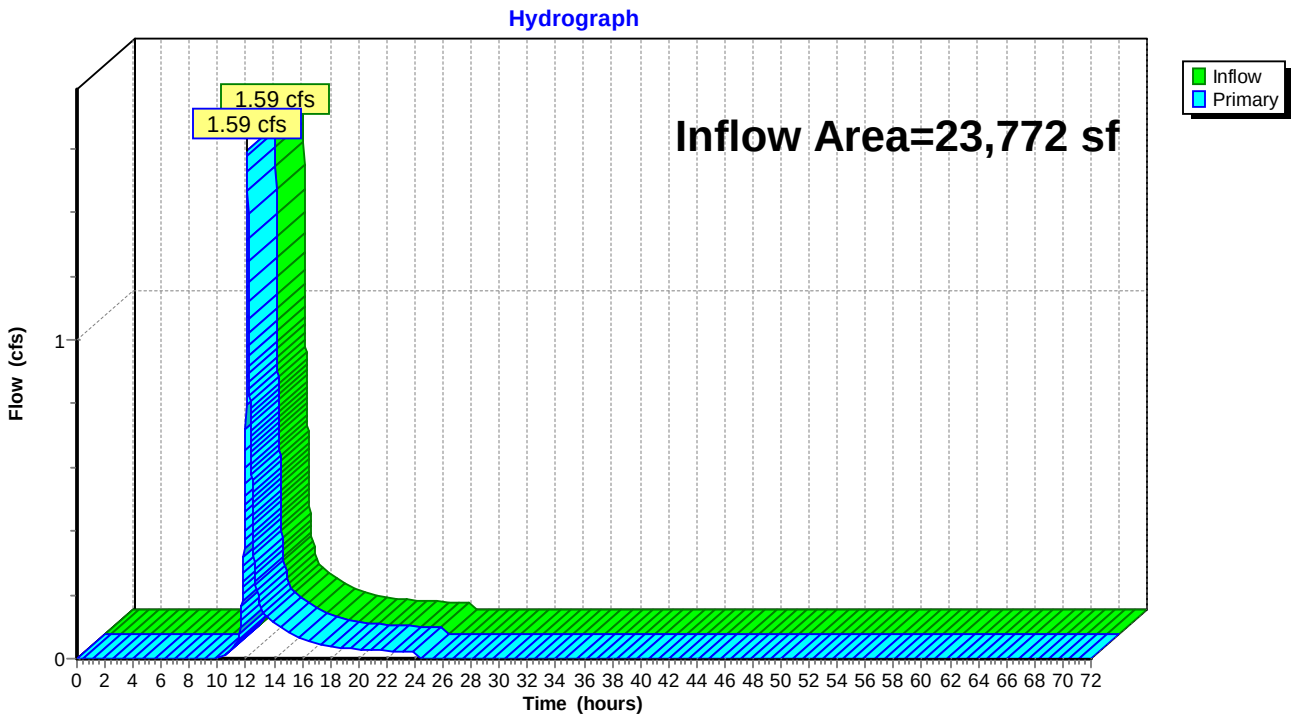


Summary for Link DP05-2: WF G&H

Inflow Area = 23,772 sf, 16.88% Impervious, Inflow Depth = 2.37" for 100 Year event
Inflow = 1.59 cfs @ 12.11 hrs, Volume= 4,700 cf
Primary = 1.59 cfs @ 12.11 hrs, Volume= 4,700 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP05-2: WF G&H

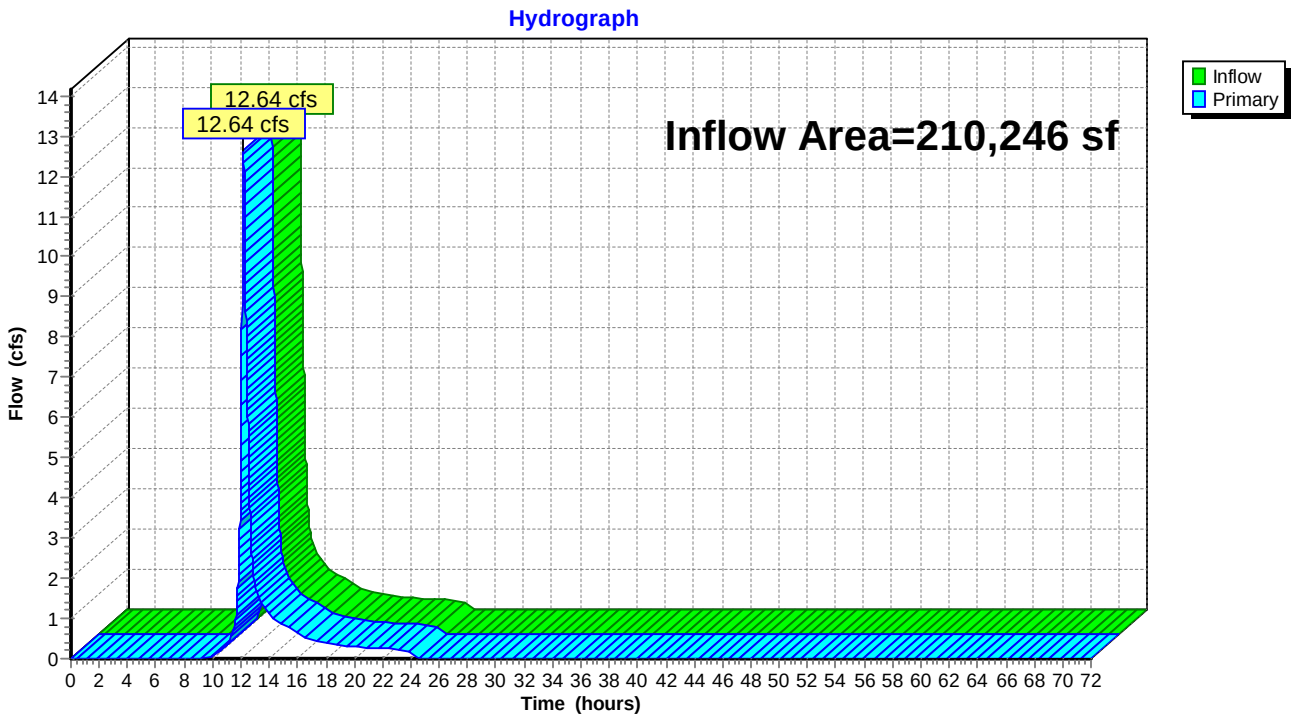


Summary for Link DP05-3: Lake Cochituate W4

Inflow Area = 210,246 sf, 21.85% Impervious, Inflow Depth = 2.73" for 100 Year event
Inflow = 12.64 cfs @ 12.18 hrs, Volume= 47,799 cf
Primary = 12.64 cfs @ 12.18 hrs, Volume= 47,799 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP05-3: Lake Cochituate W4

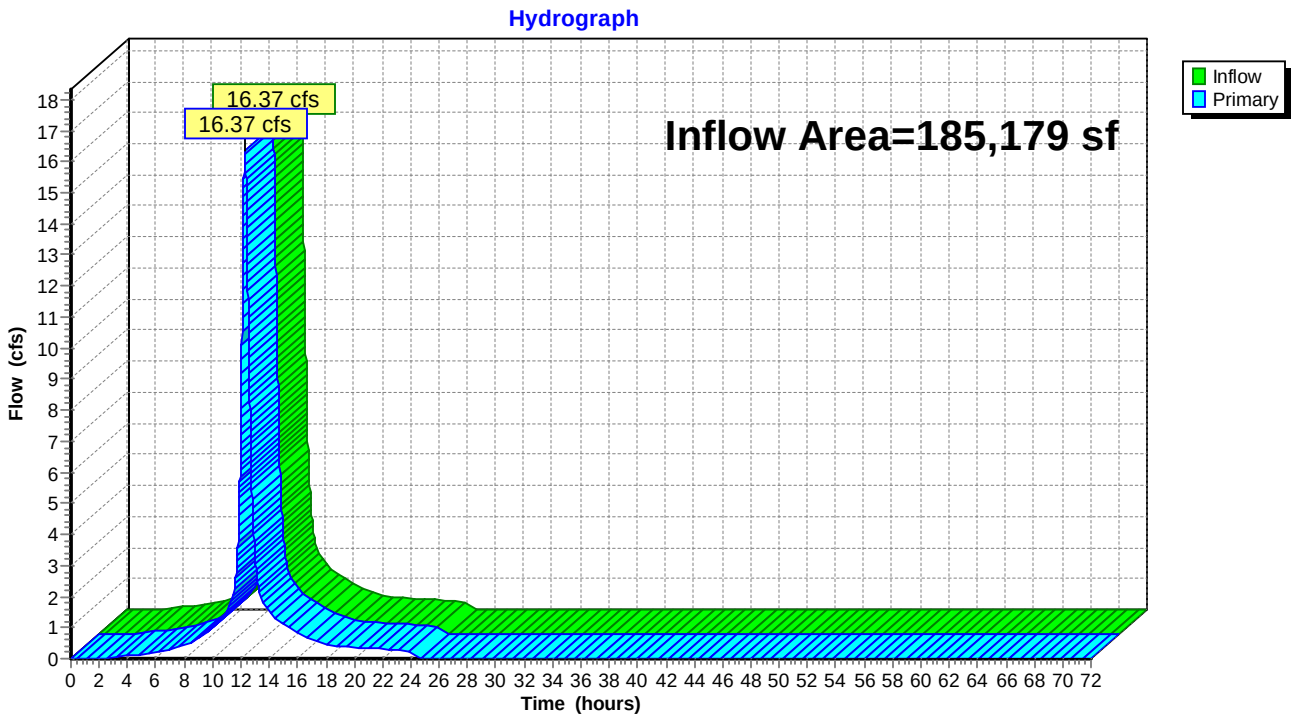


Summary for Link DP06: Worcester St

Inflow Area = 185,179 sf, 86.11% Impervious, Inflow Depth = 5.60" for 100 Year event
Inflow = 16.37 cfs @ 12.28 hrs, Volume= 86,453 cf
Primary = 16.37 cfs @ 12.28 hrs, Volume= 86,453 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP06: Worcester St

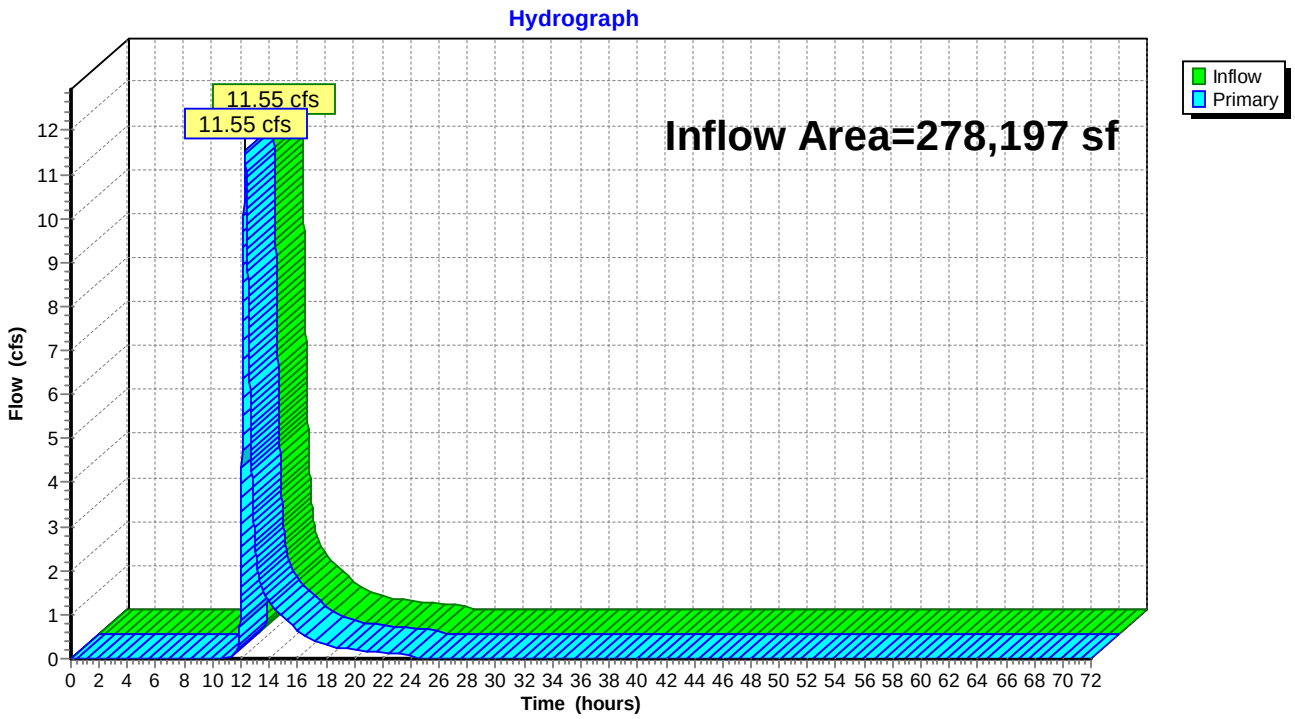


Summary for Link DP07: WF F

Inflow Area = 278,197 sf, 19.13% Impervious, Inflow Depth = 1.94" for 100 Year event
Inflow = 11.55 cfs @ 12.30 hrs, Volume= 45,061 cf
Primary = 11.55 cfs @ 12.30 hrs, Volume= 45,061 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP07: WF F

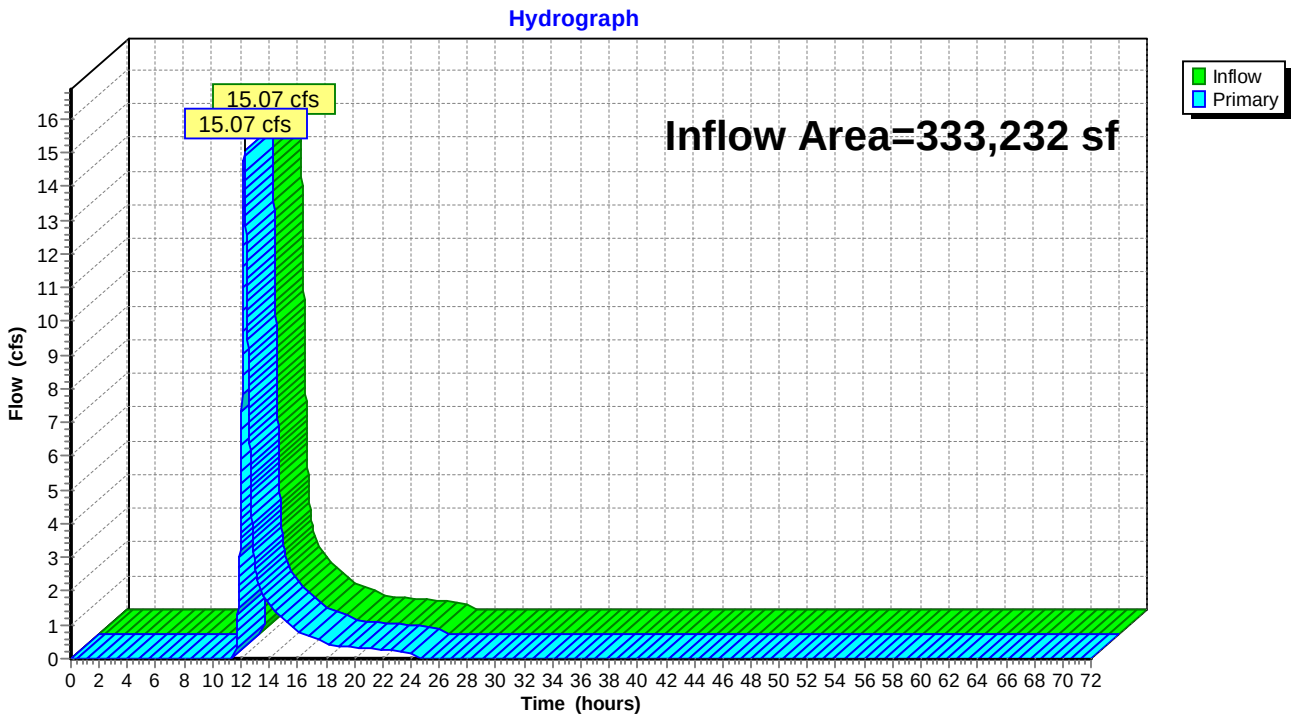


Summary for Link DP08: WF J

Inflow Area = 333,232 sf, 26.18% Impervious, Inflow Depth = 2.12" for 100 Year event
Inflow = 15.07 cfs @ 12.24 hrs, Volume= 58,747 cf
Primary = 15.07 cfs @ 12.24 hrs, Volume= 58,747 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP08: WF J

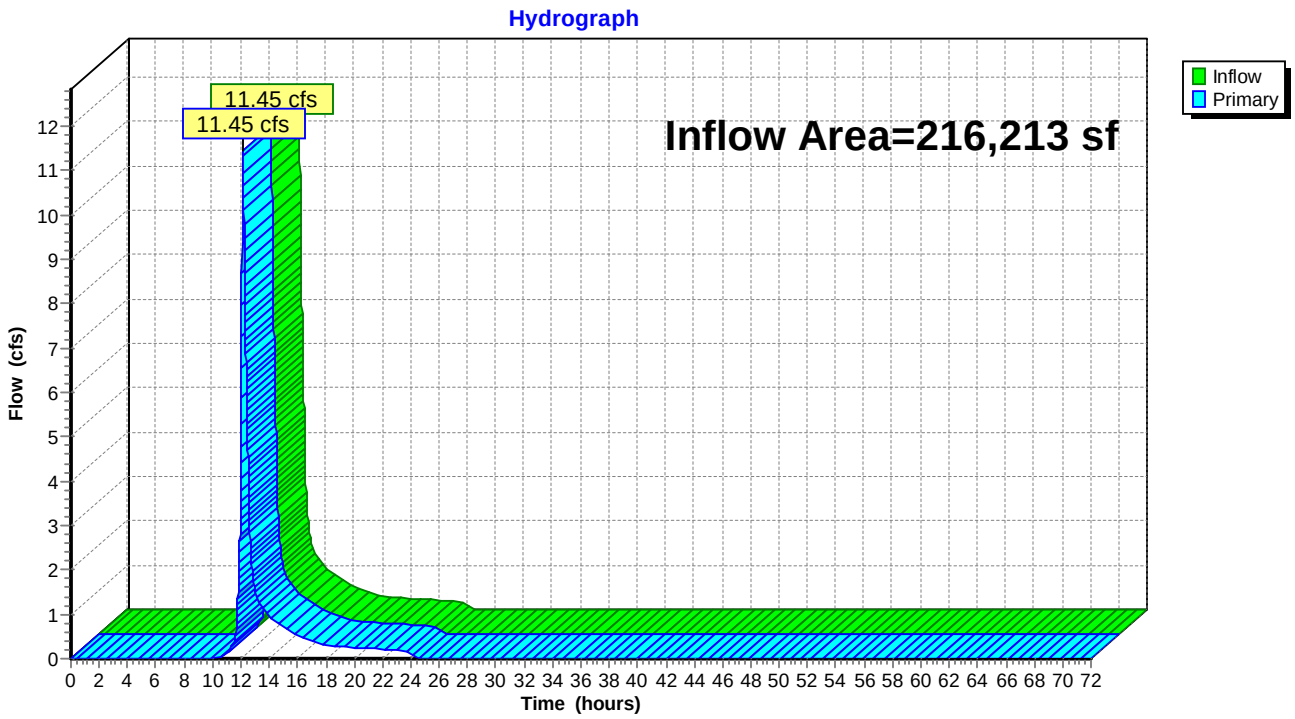


Summary for Link DP09: Unnamed Pond

Inflow Area = 216,213 sf, 21.30% Impervious, Inflow Depth = 2.18" for 100 Year event
Inflow = 11.45 cfs @ 12.14 hrs, Volume= 39,313 cf
Primary = 11.45 cfs @ 12.14 hrs, Volume= 39,313 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP09: Unnamed Pond

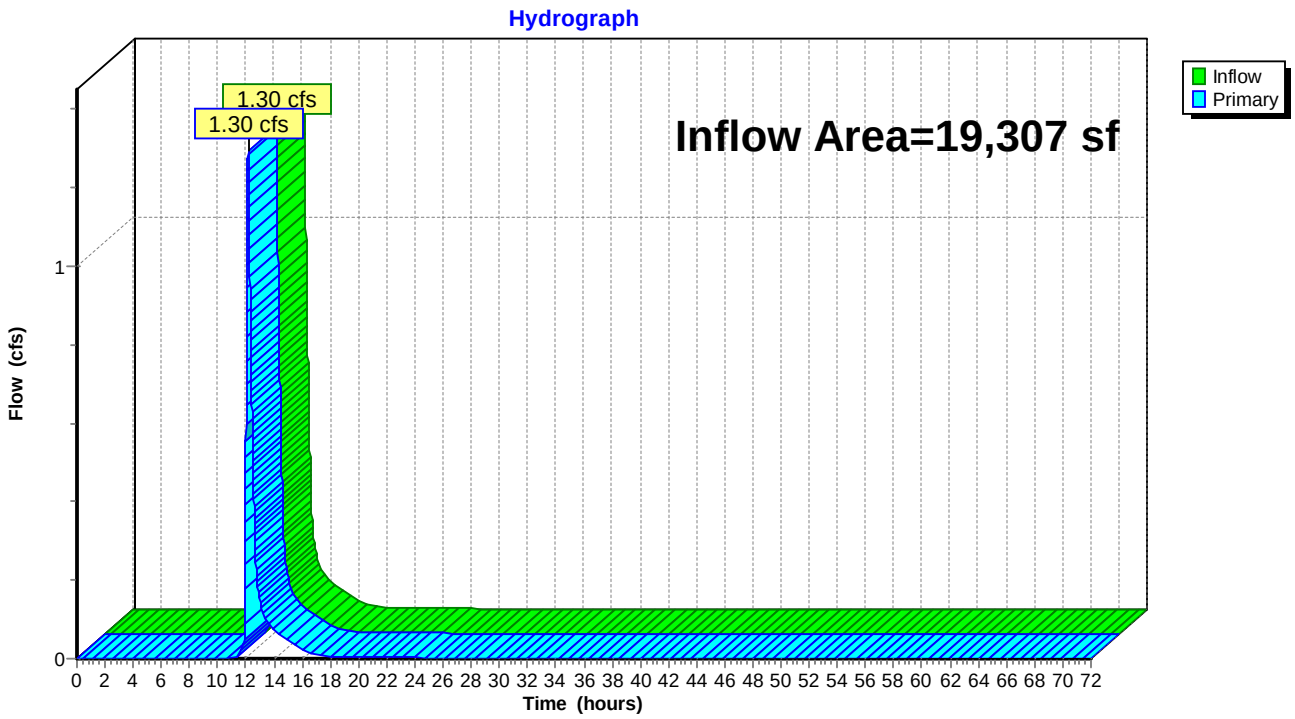


Summary for Link DP09-1: WF K

Inflow Area = 19,307 sf, 30.69% Impervious, Inflow Depth = 1.96" for 100 Year event
Inflow = 1.30 cfs @ 12.16 hrs, Volume= 3,148 cf
Primary = 1.30 cfs @ 12.16 hrs, Volume= 3,148 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP09-1: WF K

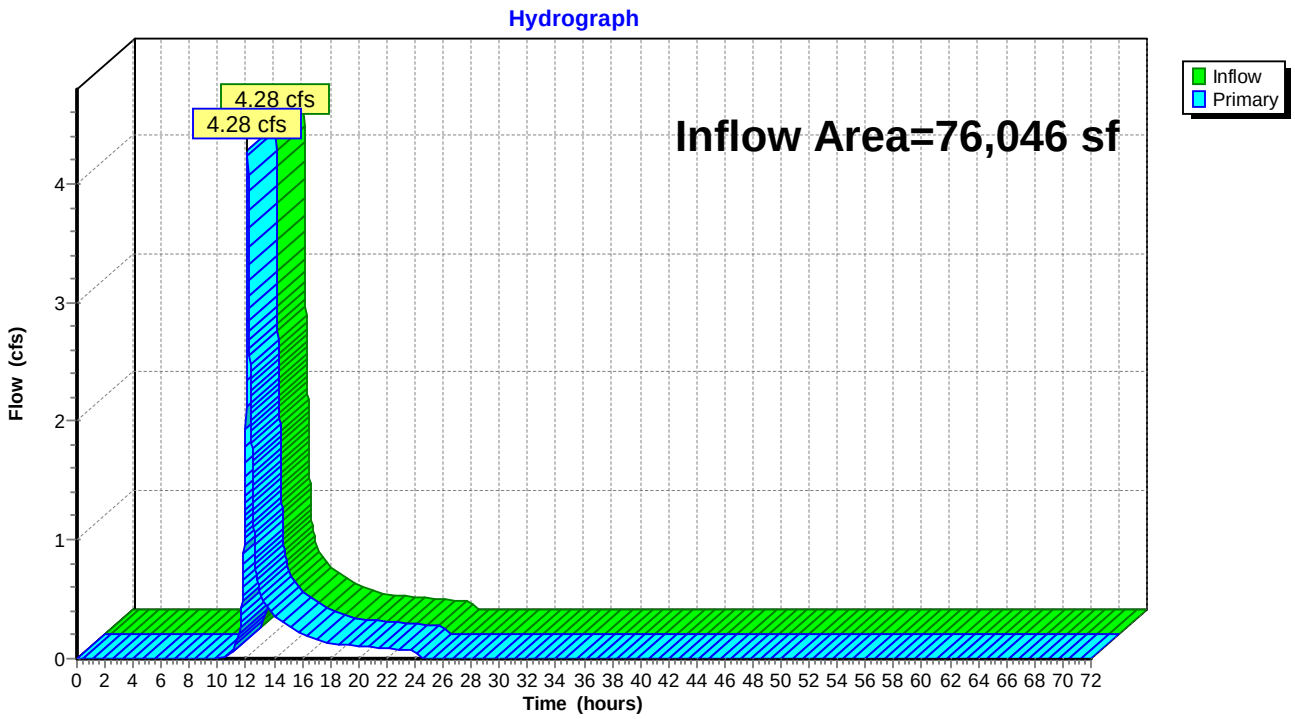


Summary for Link DP09-2: WF KA

Inflow Area = 76,046 sf, 25.44% Impervious, Inflow Depth = 2.32" for 100 Year event
Inflow = 4.28 cfs @ 12.12 hrs, Volume= 14,730 cf
Primary = 4.28 cfs @ 12.12 hrs, Volume= 14,730 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP09-2: WF KA

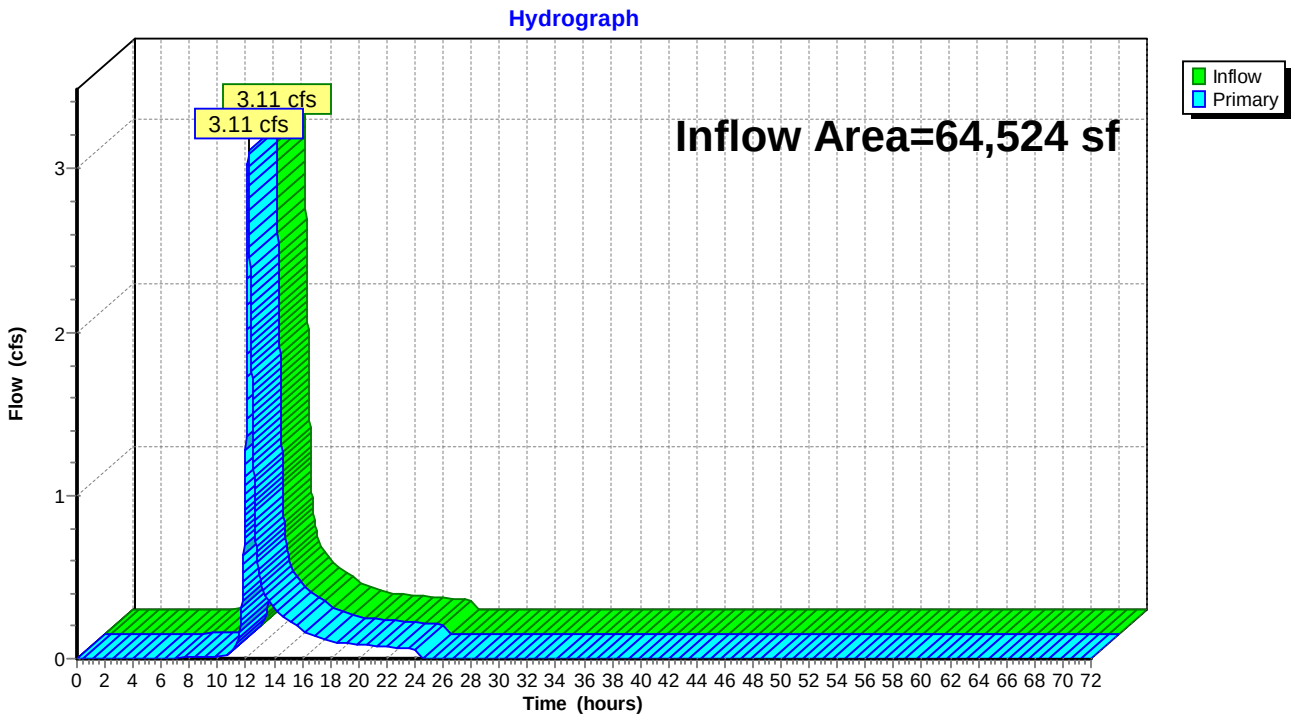


Summary for Link DP09-3: WF B

Inflow Area = 64,524 sf, 18.72% Impervious, Inflow Depth = 2.33" for 100 Year event
Inflow = 3.11 cfs @ 12.17 hrs, Volume= 12,544 cf
Primary = 3.11 cfs @ 12.17 hrs, Volume= 12,544 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP09-3: WF B

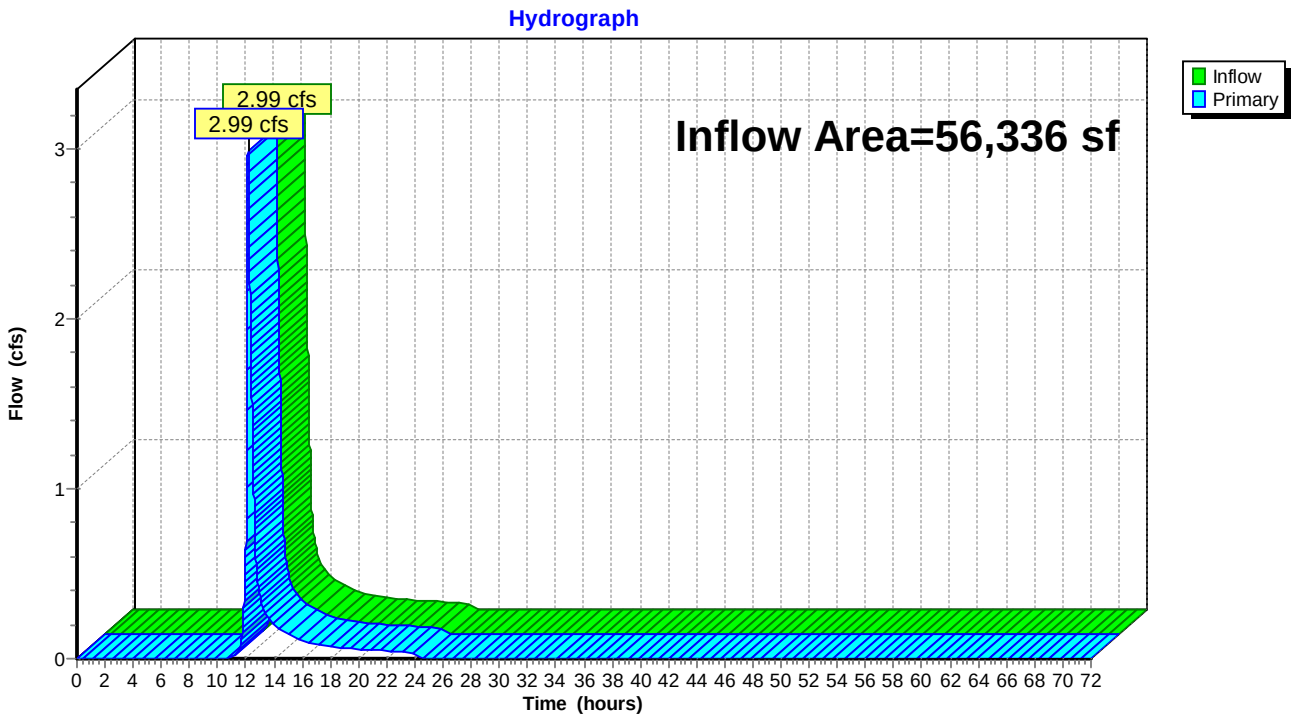


Summary for Link DP09-4: WF E&L, TOB C

Inflow Area = 56,336 sf, 15.46% Impervious, Inflow Depth = 1.89" for 100 Year event
Inflow = 2.99 cfs @ 12.15 hrs, Volume= 8,892 cf
Primary = 2.99 cfs @ 12.15 hrs, Volume= 8,892 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP09-4: WF E&L, TOB C

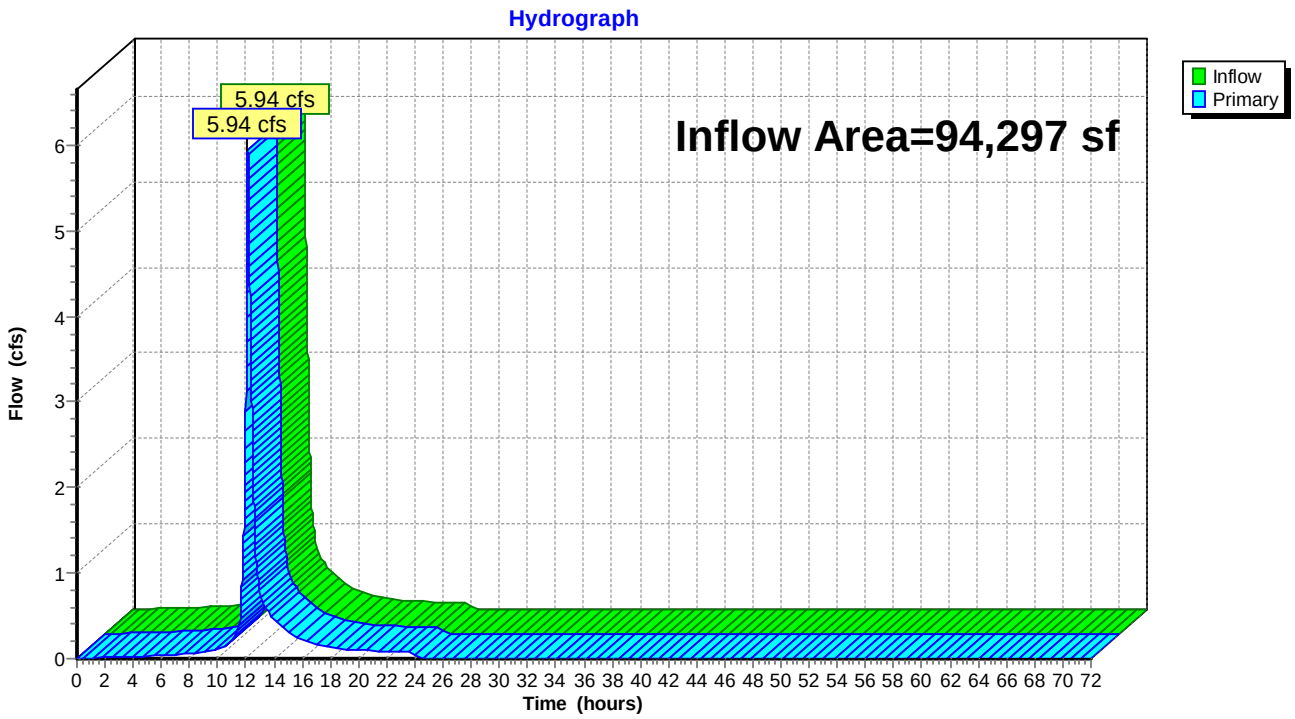


Summary for Link DP10: WF A

Inflow Area = 94,297 sf, 36.36% Impervious, Inflow Depth = 2.79" for 100 Year event
Inflow = 5.94 cfs @ 12.13 hrs, Volume= 21,952 cf
Primary = 5.94 cfs @ 12.13 hrs, Volume= 21,952 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP10: WF A

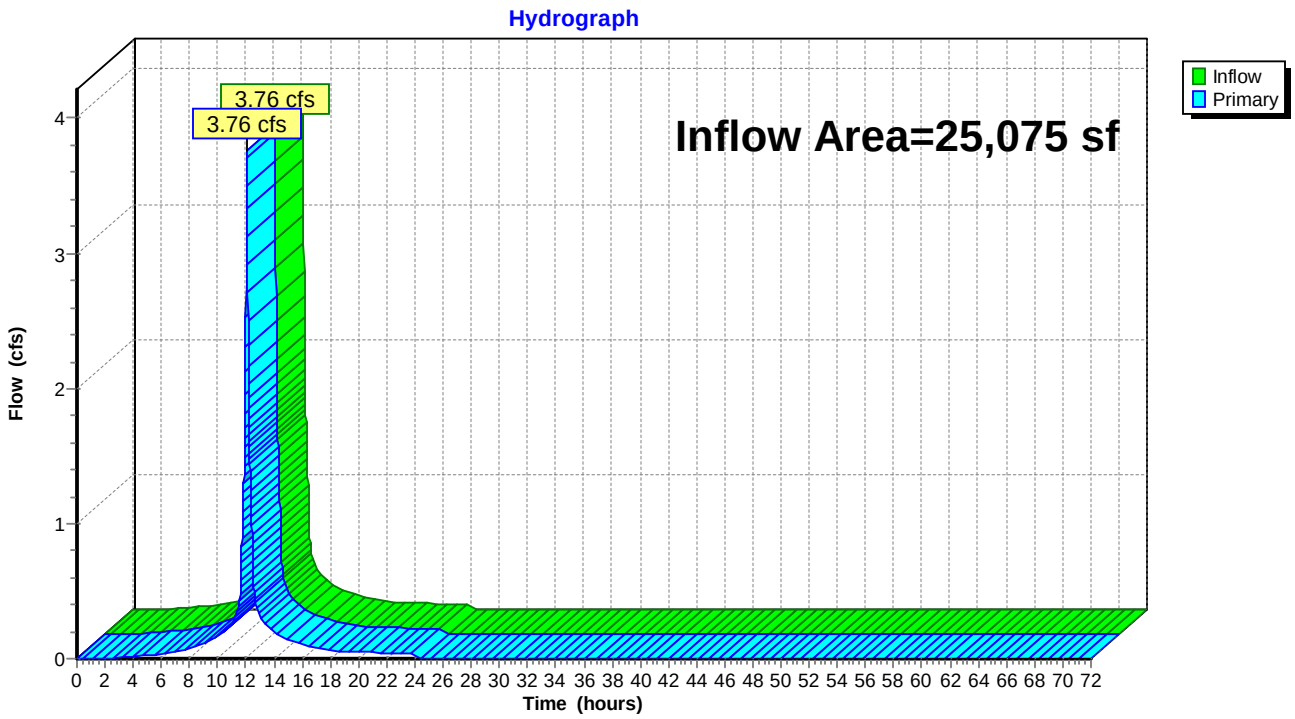


Summary for Link DP11: Local St Drain System

Inflow Area = 25,075 sf, 86.74% Impervious, Inflow Depth = 5.90" for 100 Year event
Inflow = 3.76 cfs @ 12.07 hrs, Volume= 12,319 cf
Primary = 3.76 cfs @ 12.07 hrs, Volume= 12,319 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP11: Local St Drain System

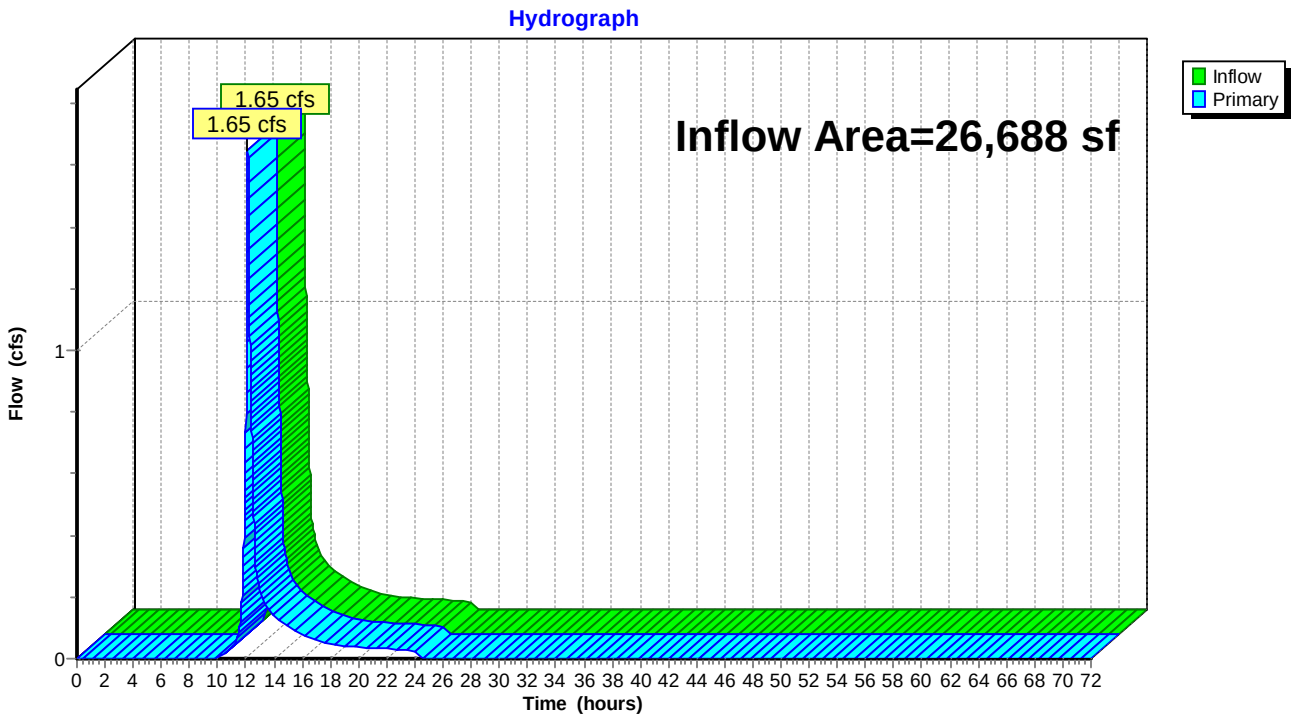


Summary for Link DP12: Washington St Low Point

Inflow Area = 26,688 sf, 37.75% Impervious, Inflow Depth = 2.61" for 100 Year event
Inflow = 1.65 cfs @ 12.13 hrs, Volume= 5,794 cf
Primary = 1.65 cfs @ 12.13 hrs, Volume= 5,794 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP12: Washington St Low Point

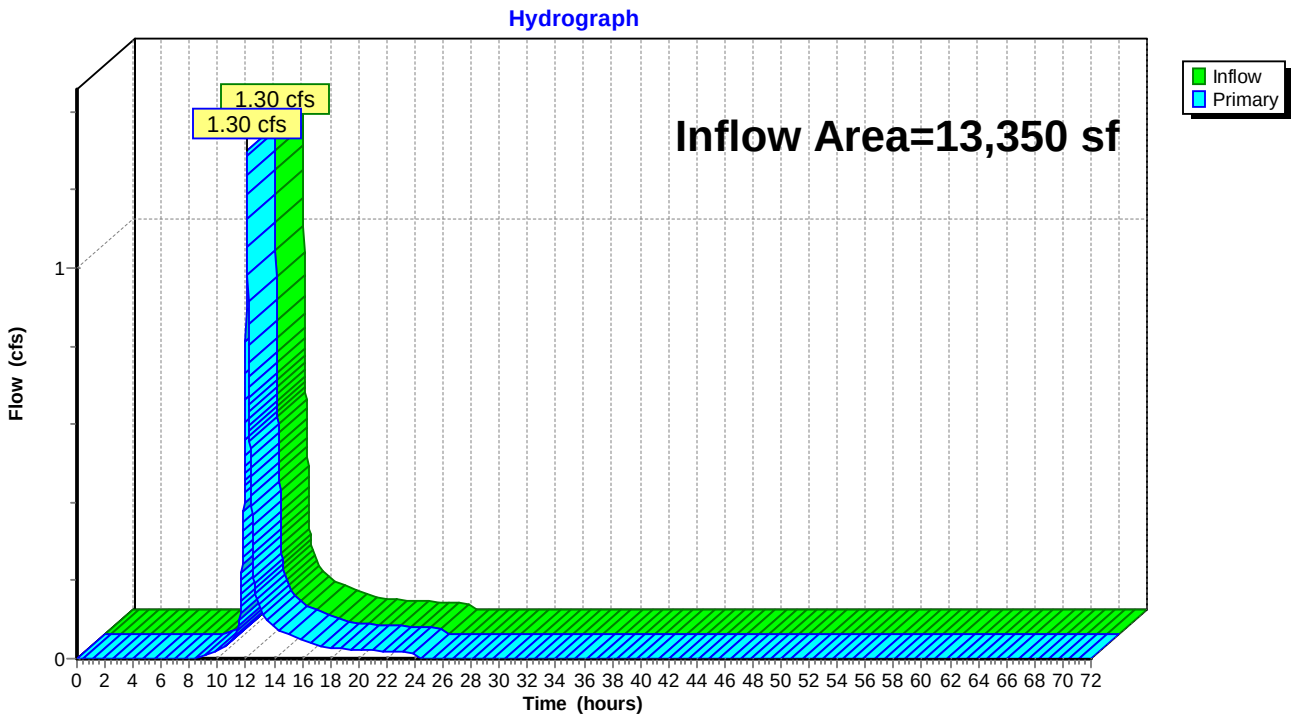


Summary for Link DP13: Empty Lot

Inflow Area = 13,350 sf, 0.00% Impervious, Inflow Depth = 3.49" for 100 Year event
Inflow = 1.30 cfs @ 12.08 hrs, Volume= 3,883 cf
Primary = 1.30 cfs @ 12.08 hrs, Volume= 3,883 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP13: Empty Lot

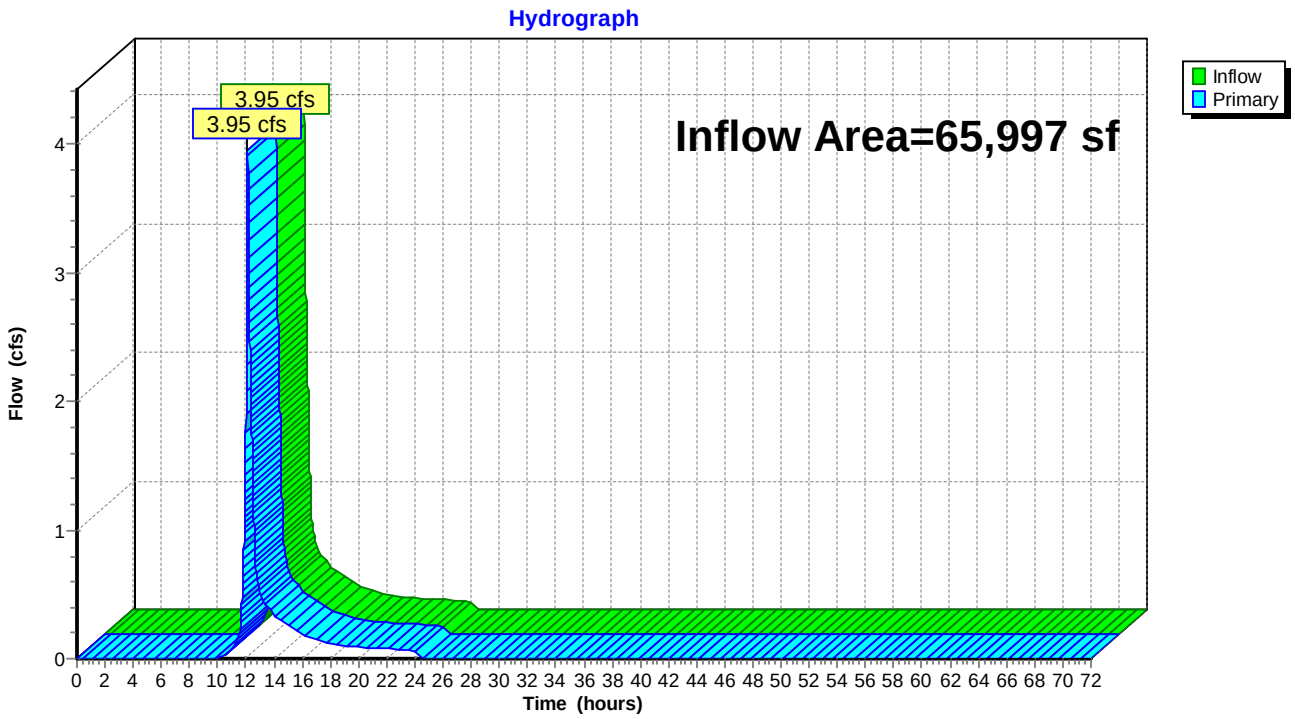


Summary for Link DP14: Lagrange St Low Point

Inflow Area = 65,997 sf, 35.65% Impervious, Inflow Depth = 2.51" for 100 Year event
Inflow = 3.95 cfs @ 12.13 hrs, Volume= 13,809 cf
Primary = 3.95 cfs @ 12.13 hrs, Volume= 13,809 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP14: Lagrange St Low Point

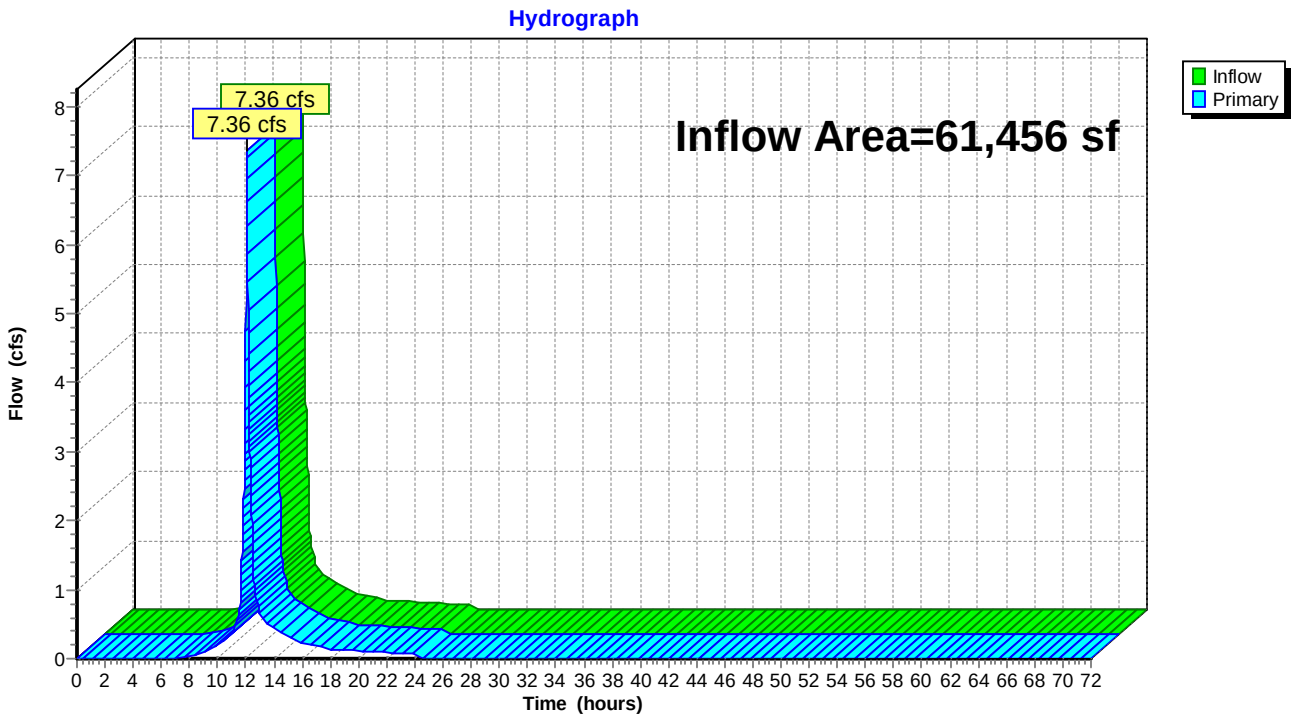


Summary for Link DP15: TOB D

Inflow Area = 61,456 sf, 61.47% Impervious, Inflow Depth = 4.33" for 100 Year event
Inflow = 7.36 cfs @ 12.07 hrs, Volume= 22,159 cf
Primary = 7.36 cfs @ 12.07 hrs, Volume= 22,159 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP15: TOB D

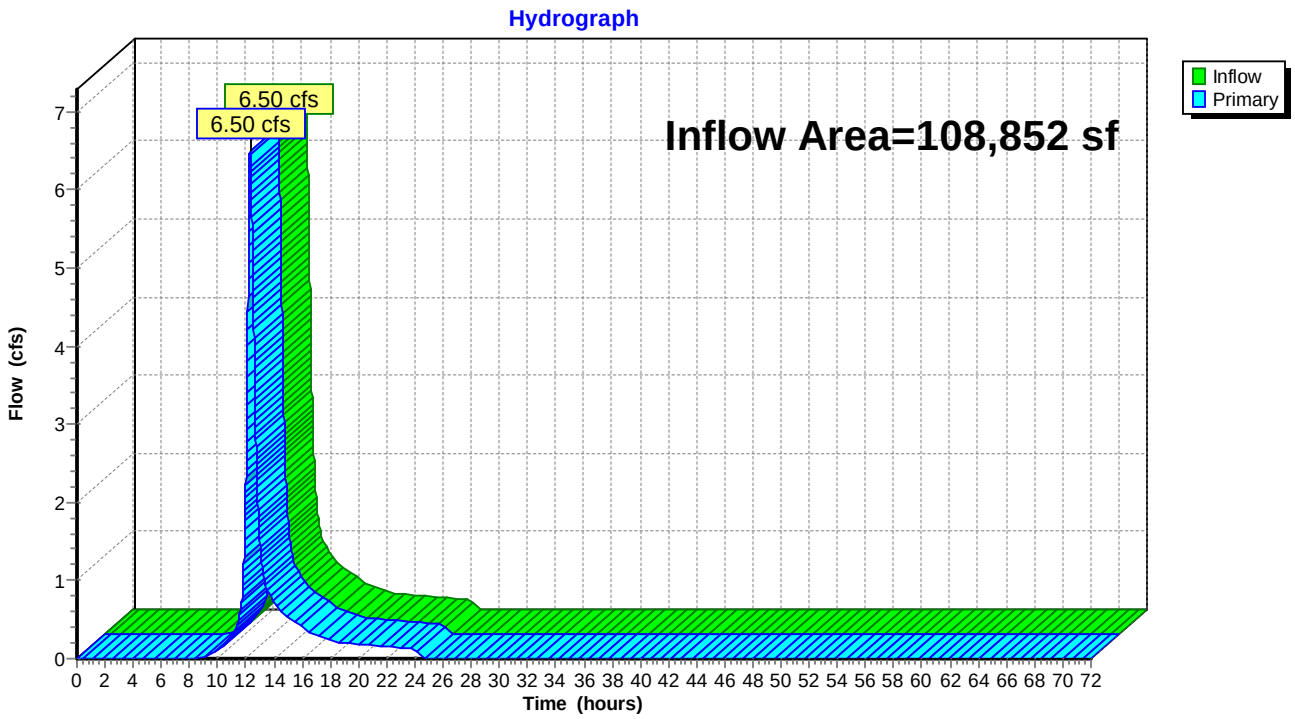


Summary for Link DP16: WF 1, WF 2, TOB E

Inflow Area = 108,852 sf, 44.86% Impervious, Inflow Depth = 3.39" for 100 Year event
Inflow = 6.50 cfs @ 12.29 hrs, Volume= 30,744 cf
Primary = 6.50 cfs @ 12.29 hrs, Volume= 30,744 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP16: WF 1, WF 2, TOB E



Design Point Summaries

Peak Discharge (cfs)

Design Point 1 - Cochituate Road				
Condition	2-Year	10-Year	25-Year	100-Year
Existing	0.37	1.04	1.50	2.17
Proposed	0.47	1.22	1.72	2.45
Difference	0.10	0.18	0.22	0.28

Design Point 2 - Chrysler Street				
Condition	2-Year	10-Year	25-Year	100-Year
Existing	0.22	0.77	1.19	1.81
Proposed	0.18	0.71	1.11	1.74
Difference	-0.04	-0.06	-0.08	-0.07

Design Point 3 - WF A				
Condition	2-Year	10-Year	25-Year	100-Year
Existing	0.51	1.89	2.90	4.43
Proposed	0.12	1.55	2.69	4.31
Difference	-0.39	-0.34	-0.21	-0.12

Design Point 4-1 - WF B				
Condition	2-Year	10-Year	25-Year	100-Year
Existing	1.89	6.28	9.46	14.22
Proposed	0.93	5.78	9.35	13.63
Difference	-0.96	-0.50	-0.11	-0.59

Design Point 4-2 - WF C				
Condition	2-Year	10-Year	25-Year	100-Year
Existing	0.19	0.78	1.21	1.86
Proposed	0.07	0.42	0.69	1.12
Difference	-0.12	-0.36	-0.52	-0.74

Design Point 4-3 - Lake Cochituate				
Condition	2-Year	10-Year	25-Year	100-Year
Existing	0.88	3.31	5.10	7.78
Proposed	0.87	3.27	5.03	7.68
Difference	-0.01	-0.04	-0.07	-0.10

Design Point 4 - Lake Cochituate Middle Pond				
Condition	2-Year	10-Year	25-Year	100-Year
Existing	2.72	9.11	13.75	20.71
Proposed	1.80	9.35	14.67	21.99
Difference	-0.92	0.24	0.92	1.28

Design Point 5-1 - WF I				
Condition	2-Year	10-Year	25-Year	100-Year
Existing	0.35	1.17	1.75	2.61
Proposed	0.74	3.47	5.11	7.49
Difference	0.39	2.30	3.36	4.88

Design Point 5-2 - WF G&H				
Condition	2-Year	10-Year	25-Year	100-Year
Existing	0.02	0.10	0.17	0.28
Proposed	0.17	0.61	0.93	1.59
Difference	0.15	0.51	0.76	1.31

Design Point 5-3 - Lake Cochituate				
Condition	2-Year	10-Year	25-Year	100-Year
Existing	1.99	5.89	8.58	12.54
Proposed	1.87	5.53	8.55	12.64
Difference	-0.12	-0.36	-0.03	0.10

Design Point 5 - Lake Cochituate				
Condition	2-Year	10-Year	25-Year	100-Year
Existing	2.42	7.38	10.84	15.95
Proposed	2.37	9.76	14.75	22.23
Difference	-0.05	2.38	3.91	6.28

Design Point 6 - Worcester Street				
Condition	2-Year	10-Year	25-Year	100-Year
Existing	6.94	10.83	13.11	16.19
Proposed	7.03	10.96	13.26	16.37
Difference	0.09	0.13	0.15	0.18

Design Point 7 - WF F				
Condition	2-Year	10-Year	25-Year	100-Year
Existing	1.12	4.45	6.95	10.76
Proposed	0.41	4.36	7.32	11.55
Difference	-0.71	-0.09	0.37	0.79

Design Point 8 - WF J				
Condition	2-Year	10-Year	25-Year	100-Year
Existing	1.48	5.66	8.83	13.63
Proposed	1.32	6.25	9.77	15.07
Difference	-0.16	0.59	0.94	1.44

Design Point 9-1 - WF K				
Condition	2-Year	10-Year	25-Year	100-Year
Existing	0.12	0.46	0.71	1.08
Proposed	0.01	0.57	0.91	1.30
Change	-0.11	0.11	0.20	0.22

Design Point 9-2 - WF KA				
Condition	2-Year	10-Year	25-Year	100-Year
Existing	0.43	1.85	2.90	4.48
Proposed	0.41	1.77	2.77	4.28
Difference	-0.02	-0.08	-0.13	-0.20

Design Point 9-3 - WF B				
Condition	2-Year	10-Year	25-Year	100-Year
Existing	0.30	1.25	1.97	3.04
Proposed	0.30	1.28	2.01	3.11
Difference	0.00	0.03	0.04	0.07

Design Point 9-4 - WF E&L, TOB C				
Condition	2-Year	10-Year	25-Year	100-Year
Existing	0.23	0.89	1.39	2.15
Proposed	0.13	0.74	1.69	2.99
Difference	-0.10	-0.15	0.30	0.84

Design Point 9 - Unnamed Pond				
Condition	2-Year	10-Year	25-Year	100-Year
Existing	0.99	3.99	6.28	9.75
Proposed	0.80	3.98	7.10	11.45
Difference	-0.19	-0.01	0.82	1.70

Design Point 10 - WF A				
Condition	2-Year	10-Year	25-Year	100-Year
Existing	1.48	3.57	4.99	7.06
Proposed	1.29	2.66	3.60	5.94
Difference	-0.19	-0.91	-1.39	-1.12

Design Point 11 -Local St Drain Systems				
Condition	2-Year	10-Year	25-Year	100-Year
Existing	1.30	2.01	2.42	2.98
Proposed	1.67	2.56	3.07	3.76
Change	0.37	0.55	0.65	0.78

Design Point 12 - Washington St Low Point				
Condition	2-Year	10-Year	25-Year	100-Year
Existing	0.10	0.49	0.77	1.22
Proposed	0.22	0.74	1.11	1.65
Difference	0.12	0.25	0.34	0.43

Design Point 13 - Empty Lot				
Condition	2-Year	10-Year	25-Year	100-Year
Existing	0.65	1.43	1.93	2.64
Proposed	0.31	0.69	0.95	1.30
Difference	-0.34	-0.74	-0.98	-1.34

Design Point 14 - Lagrange St Low Point				
Condition	2-Year	10-Year	25-Year	100-Year
Existing	0.37	1.45	2.24	3.42
Proposed	0.48	1.73	2.62	3.95
Difference	0.11	0.28	0.38	0.53

Design Point 15 - TOB D				
Condition	2-Year	10-Year	25-Year	100-Year
Existing	2.08	4.08	5.33	7.05
Proposed	2.31	4.37	5.63	7.36
Difference	0.23	0.29	0.30	0.31

Design Point 16 - WF 1, WF 2, TOB E				
Condition	2-Year	10-Year	25-Year	100-Year
Existing	1.26	3.25	4.60	6.54
Proposed	1.47	3.41	4.68	6.50
Difference	0.21	0.16	0.08	-0.04

All Design Points				
Condition	2-Year	10-Year	25-Year	100-Year
Existing	19.49	51.57	74.25	107.79
Proposed	16.37	53.18	81.71	121.42
Difference	-3.12	1.61	7.46	13.63

Lake Cochituate Water Levels				
Condition	2-Year	10-Year	25-Year	100-Year
Existing	136.00	136.01	136.01	136.02
Proposed	136.00	136.01	136.01	136.02
Difference	0.00	0.00	0.00	0.00

Recharge and Water Quality Volume Calculations

Water Quality and Recharge Volume Summary						
Watershed	Prop. Impervious Area (sf)	Water Quality Factor (inches)	Water Quality Volume (cf)	Recharge Factor (inches)	Recharge Volume (cf)	Provided Volume (cf)
Prop. Cochituate Rd WS	3,607	0.50	150.29	0.60	180.35	
Prop. Chrysler Rd WS	0					
Prop. DNR WS	16,969	0.50	707.04	0.60	848.45	1,361
Prop. Speen	6,838	0.50	284.92	0.60	341.90	
Prop. Lake Cochituate N1 WS	18,014	0.50	750.58	0.60	900.70	850
Prop. Lake Cochituate N2 WS	7,192	0.50	299.67	0.60	359.60	654
Prop. Lake Cochituate N3 WS	5,929	0.50	247.04	0.60	296.45	571
Prop. Lake Cochituate N4 WS	4,713	0.50	196.38	0.60	235.65	
Prop. Lake Cochituate W1 WS	3,476	0.50	144.83	0.60	173.80	1,274
Prop. Lake Cochituate W2 WS	4,337	0.50	180.71	0.60	216.85	569
Prop. Lake Cochituate W3 WS	4,013	0.50	167.21	0.60	200.65	246
Prop. Lake Cochituate W4 WS	6,523	0.50	271.79	0.60	326.15	852
Prop. Lake Cochituate E1 WS	0					
Prop. Lake Cochituate E2 WS	2,121	0.50	88.38	0.60	106.05	
Prop. Worcester St N	1,908	0.50	79.50	0.60	95.40	
Prop. Worcester St S	532	0.50	22.17	0.60	26.60	
Prop. Arcadia Rd WS	20,606	1.00	1,717.17	0.60	1,030.30	1,981
Prop. Fisher St WS	14,693	1.00	1,224.42	0.60	734.65	1,345
Prop. Unnamed Pond 2 WS	0					
Prop. Unnamed Pond 1 WS	4,035	1.00	336.25	0.60	201.75	428
Prop. Unnamed Pond 3 WS	0					
Prop. Unnamed Pond 4 WS	8,707	1.00	725.58	0.60	435.35	1,134
Prop. Kansas St WS	5,891	1.00	490.92	0.60	294.55	1,081
Prop. Empty Lot WS	0					
Prop. Washington Ave 1 WS	1,044	1.00	87.00	0.60	52.20	
Prop. Washington Ave 2 WS	3,897	1.00	324.75	0.60	194.85	
Prop. Washington Ave 3 WS	2,152	1.00	179.33	0.60	107.60	
Prop. Lagrange St WS	3,465	1.00	288.75	1.60	462.00	
Prop. Mechanic St. WS	8,336	1.00	694.67	0.60	416.80	
Prop. Cochituate St 1 WS	13,568	1.00	1,130.67	0.60	678.40	
Total	172,566		10,790.00		8,917.05	12,346
Say	172,600		10,790		8,920	12,350

Provided Water Quality Volumes		
BMP	Overflow Weir Elevation (ft)	Total Storage for BMP (cf)
1	147.25	1,361
2	152.80	850
3	154.25	654
4	154.50	571
5	154.75	1,274
6	155.50	569
7	156.90	246
8	158.00	852
9	157.75	1,981
10	158.00	1,345
11	157.50	428
12	156.25	1,134
13	156.25	1,081
Total		12,346
Say		12,350

TSS Removal Worksheet

INSTRUCTIONS:
1. In BMP Column, click on Blue Cell to Activate Drop Down Menu
2. Select BMP from Drop Down Menu
3. After BMP is selected, TSS Removal and other Columns are automatically completed.

Version 1, Automated: Mar. 4, 2008

Location: Cochituate Rail Trail

TSS Removal Calculation Worksheet

B BMP[1]	C TSS Removal Rate[1]	D Starting TSS Load*	E Amount Removed (C*D)	F Remaining Load (D-E)
Grass Channel	**0.50**	**1.00**	**0.50**	**0.50**
	0.00	**0.50**	**0.00**	**0.50**
	0.00	**0.50**	**0.00**	**0.50**
	0.00	**0.50**	**0.00**	**0.50**
	0.00	**0.50**	**0.00**	**0.50**

Total TSS Removal = 50%

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

Project: **Cochituate Rail Trail, Natick, MA**
Prepared By: **Angela Saunders**
Date: **May-14**

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

Non-automated TSS Calculation Sheet must be used if Proprietary BMP Proposed
1. From MassDEP Stormwater Handbook Vol. 1

Mass. Dept. of Environmental Protection

INSTRUCTIONS:
1. In BMP Column, click on Blue Cell to Activate Drop Down Menu
2. Select BMP from Drop Down Menu
3. After BMP is selected, TSS Removal and other Columns are automatically completed.

Version 1, Automated: Mar. 4, 2008

Location: Cochituate Rail Trail

TSS Removal Calculation Worksheet

B BMP[1]	C TSS Removal Rate[1]	D Starting TSS Load*	E Amount Removed (C*D)	F Remaining Load (D-E)
Infiltration Trench	**0.80**	**1.00**	**0.80**	**0.20**
	0.00	**0.20**	**0.00**	**0.20**
	0.00	**0.20**	**0.00**	**0.20**
	0.00	**0.20**	**0.00**	**0.20**
	0.00	**0.20**	**0.00**	**0.20**

Total TSS Removal = **80%**

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

Project: **Cochituate Rail Trail, Natick, MA**
Prepared By: **Angela Saunders**
Date: **May-14**

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

Non-automated TSS Calculation Sheet must be used if Proprietary BMP Proposed
1. From MassDEP Stormwater Handbook Vol. 1

Mass. Dept. of Environmental Protection

INSTRUCTIONS:
1. In BMP Column, click on Blue Cell to Activate Drop Down Menu
2. Select BMP from Drop Down Menu
3. After BMP is selected, TSS Removal and other Columns are automatically completed.

Version 1, Automated: Mar. 4, 2008

Location: Cochituate Rail Trail

TSS Removal Calculation Worksheet

B BMP[1]	C TSS Removal Rate[1]	D Starting TSS Load*	E Amount Removed (C*D)	F Remaining Load (D-E)
Vegetated Filter Strip >25 feet	**0.10**	**1.00**	**0.10**	**0.90**
Bioretention Area	**0.90**	**0.90**	**0.81**	**0.09**
	0.00	**0.09**	**0.00**	**0.09**
	0.00	**0.09**	**0.00**	**0.09**
	0.00	**0.09**	**0.00**	**0.09**

Total TSS Removal = 91%

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

Project: **Cochituate Rail Trail, Natick, MA**
Prepared By: **Angela Saunders**
Date: **May-14**

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

Non-automated TSS Calculation Sheet must be used if Proprietary BMP Proposed
1. From MassDEP Stormwater Handbook Vol. 1