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Division of Pennoni

STORMWATER MANAGEMENT REPORT

**Montclair Kimberley Academy
Block 302, Lot 16
Montclair Township,
Essex County, New Jersey**

Prepared For:

**Montclair Kimberley Academy,
201 Valley Rd, Montclair, NJ 07042**

A handwritten signature in blue ink, reading 'Mark S. Mayhew', is written over a horizontal line. The signature is fluid and cursive.

Mark S. Mayhew

New Jersey Professional Engineer #35596

VNHA #46124-400-21

#VAMAX22004

August 31, 2023

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I. EXECUTIVE SUMMARY:

Montclair Kimberley Academy (the applicant) is proposing to construct a building addition on the center part of property connecting with the existing building of Montclair Kimberley Academy Upper School and a reconstruction of existing driveway. The project building is located at 6 Lloyd Road, Block 302, Lot 16 Montclair, NJ.

The project is proposing to increase building and impervious surfaces. To address the increase in impervious surfaces, the design includes construction of an underground stone storage facility to meet the stormwater requirements for the building addition and Green Infrastructure Manufactured Treatment Devices (MTDs) for the driveway improvements.

The project is designed to address the requirements of Montclair Township's and Essex County's stormwater management standards.

II. STORMWATER MANAGEMENT DESCRIPTION AND METHODOLOGY:

1. HYDROLOGIC ANALYSIS:

The existing (pre-development) and proposed (post-development) hydrologic characteristics for the design of the stormwater management system are based upon the 2-, 10-, and 100-year frequency storm events. The calculations have been developed in conformance with the requirements of the Montclair Township Land Use Ordinance and the New Jersey Department of Environmental Protection (NJDEP) codes (N.J.A.C.7:8).

Runoff characteristics were established for the existing and proposed scenarios with Bentley's Pond Pack (V8i), utilizing the USDSA/NRCS "TR-55" methodology, and hydrologic routings were performed for the same storm events under each scenario. In accordance with the most stringent stormwater management requirements, 'connected' impervious surfaces were considered separately from the pervious surfaces for TR-55 runoff computations. For the purposes of water quantity analysis, all impervious surfaces were conservatively considered to be connected; therefore, impervious disconnections that occur throughout the site will provide a factor of safety towards the reduction in total volume and rate of runoff.

The stormwater management for the project has been analyzed for the pre-developed (existing) site condition and the post-developed (proposed) conditions. To understand the impact of the proposed site design on the existing hydrology, the project site limit is established based on the disturbed land cover and associated discharge storm drain structure points. Project site improvements have been covered by the four study points. The building addition with the underground stone storage facility are proposed at the POI-2 and driveway improvement with Manufactured Treatment Devices (MTDs) are proposed at the POI-4 to meet the stormwater management Runoff Quantity, Quality and Groundwater Recharge requirement criteria. Total Drainage area to POI-1 and POI-3 have been reduced by reducing the impervious area by shifting it to the POI-2 to address the stormwater management requirements. The drainage area was analyzed under existing and proposed

conditions to determine the hydrological impact. Refer to the Drainage Area Maps in Appendix-B for the improvement area study at the associated discharge points.

The Essex County 24-hrs rainfall frequency data for 2-year, 10-year and 100-year are 3.44 inches, 5.22 inches and 8.66 inches respectively based on the current rainfall (year 1950-1999) condition recorded by NOAA Atlas 14, Volume 2, Version 3. For the future/projected rainfall condition (year 2100) 2-year, 10-year and 100-year rainfall are 4.09 inches, 6.37 inches and 11.52 inches respectively. Existing (pre-development) and proposed (post-development) hydrology was determined based on the Future/Projected Rainfall condition to justify the safety factor scenario. Refer to the appendix- C and -D for stormwater routings used to develop the hydrology under existing and proposed site conditions.

Based on the “Soil Survey Geographic Database” (SSURGO) USDA soil survey report for Essex County, New Jersey, the Project site soils consist of BowrB- Urban and Boonton substratum complex, which is representative of hydrologic soil group “C”. Refer to Appendix-A for the USDA Soil Survey report for the site.

2. WATER QUANTITY CONTROL:

As mentioned earlier, the building addition is within drainage area POI-2. Therefore, the stormwater management quantity control requirement criteria N.J.A.C. – 7:8-5.6 apply. To address the water quantity aspect of the regulations, an underground stone storage system is proposed with three 45’ long 36-inch diameter perforated pipes. Pipes are contained within a stone storage bed 47’ L X 13’ W X 4’ H. An outlet structure is utilized to control discharge and direct same to a headwall. Refer to the plan for details and elevation information.

The water quantity design of the stormwater management system is determined based upon the future/projected (year 2100) Essex County rainfall 2-, 10-, and 100-year frequency storm events. The hydrology and corresponding runoff hydrographs were calculated using Bentley's Pond Pack (V8i) hydrologic modeling computer software and the United States Department of Agriculture, the National Resource Conservation Service (USDA/NRCS) Technical Release 55 (TR-55) “Urban Hydrology for Small Watersheds” methodology and NRCS Type ‘D’ rainfall distributions. In accordance with the current stormwater management regulations, impervious surfaces were considered separately from the previous surfaces for runoff computations.

Refer to Table-1 below for the allowable and proposed site flows for Future/Projected Essex County Rainfall (Year 2100) Condition.

Table 1 – Allowable vs. Proposed Stormwater Runoff Rates – On Site Discharge				
Storm Event	Existing Discharge Q (cfs)	Reduction Factors	Allowable Site Discharge Q (cfs)	Proposed Discharge Q (cfs)
2-YEAR	0.18	50%	0.09	0.09
10-YEAR	0.36	75%	0.27	0.24
100-YEAR	0.76	80%	0.61	0.58

As demonstrated in Table-1, water quantity control/peak rate reductions have been met for the proposed design in accordance with the governing agency requirements. Refer to Appendices - C and D for existing and proposed hydrology, respectively.

3. WATER QUALITY CONTROL:

The project meets the stormwater management water quality requirement standards of the NJDEP by proposing Green infrastructure Manufactured treatment divides at several locations along the proposed driveway.

The site proposes two Filtrerra Bioretention systems with 8' L X 6' W dimensions manufactured and provided by the Contech Engineered solutions LLC. The devices satisfy the requirements for the stormwater quality control and Green Infrastructure (GI) measures (N.J.A.C. 7:8-5.3) which have been approved by the New Jersey Department of Environmental Protection (NJDEP). Refer to the Appendix-E for the Water Quality Requirements and NJDEP certifications, specification and dimension detail for the MTDs device.

4. GROUNDWATER RECHARGE REQUIREMENT:

The project needs to meet the stormwater management requirement standards. In accordance with the NJDEP code N.J.A.C. 7:8-5.4.

Compliance with this groundwater recharge requirement was verified through a hydrologic and hydraulic analysis of the site in its pre-development and post-development condition. The pre-development and post-development hydrologic condition have been computed at the site location using the New Jersey Groundwater Recharge Spreadsheet (NJGSR-32). After evaluating the data for the SSURGO Web soil Survey, the site has been determined to be Udorthents classified as HSG 'C' soil. Refer to the Appendix-F to evaluate that the proposed development satisfies the required recharge deficit volume by providing the stone storage stormwater management facility.

Therefore, the site demonstrates that the groundwater recharge requirement has been met.

Drain Time Calculations:

The underground storage system has the ability to drain in less than 72 hours in accordance with state regulations. The Darcy's Law was used to calculate the constant infiltration rate based on the calculated infiltration rate. Per the soil borings provided by SOR Consulting Engineers, no ground water was encountered above elevation 458.25. Refer to Appendix G for the Darcy's Law calculation worksheets and hydrologic routings used to calculate the drain time.

5. STORMWATER MANAGEMENT FACILITY DESIGN SUMMARY:

1. Underground Stone Storage Facility:

Storm Event	Runoff Into Facility (cfs)	Runoff Out of Facility (cfs)	Depth of Water in Facility (ft.)	Water Surface Elevation (Ft.)
2-YEAR	0.30	0.09	1.53	467.53
10-YEAR	0.47	0.24	1.92	467.92
100-YEAR	0.85	0.58	2.33	468.33

- Bottom Elevation of Facility = 466.00 ft.
- 1st Stage Orifice=3” diameter; Invert= 467.25 ft.
- 2nd Stage Weir=3” wide; Invert= 467.75 ft.
- Top Elevation of Facility =470.00 ft.
- Drain Time – 16.6 hrs (100-Yr storm event).
- Outlet Pipe=12” HDPE; Invert Out=465.50 ft.

2. Manufactured treatment Devices (MTDs):

Refer to the appendix-E for the certificate, specification and details of the stormwater management facility provided by the manufacturers.

6. SOIL TYPES:

1. BowrB- Boonton – Urban land, Boonton substratum complex, red sandstone lowland, 0 to 8 percent slopes – representative of HSG-C.

7. REFERENCES:

1. “New Jersey Stormwater Best Management Practices Manual,” published by the New Jersey Department of Environmental Protection (NJDEP), March 2021, latest revision.
2. “Soil Survey Geographic (SSURGO) Database for Essex County, New Jersey,” published by the United States Department of Agriculture (USDA), Natural Resources Conservations Service (NRCS), latest revision.
3. Montclair Township Land Use Code, latest revision.
4. Storm Water Management Land Development standards of the Essex County, New Jersey.

Appendix – A:

GEOTECHNICAL INFORMATION

Appendix – A1:

GEOTECHNICAL INVESTIGATION REPORT

SOR CONSULTING ENGINEERS, INC.

Geotechnical Engineering - Materials Testing - Forensic Studies

98 Sand Park Rd., Cedar Grove, NJ 07009
(973) 239-6001 Fax (973) 239-8380

GEOTECHNICAL INVESTIGATION REPORT MONTCLAIR KIMBERLEY ACADEMY – STEM ADDITION MONTCLAIR, NEW JERSEY

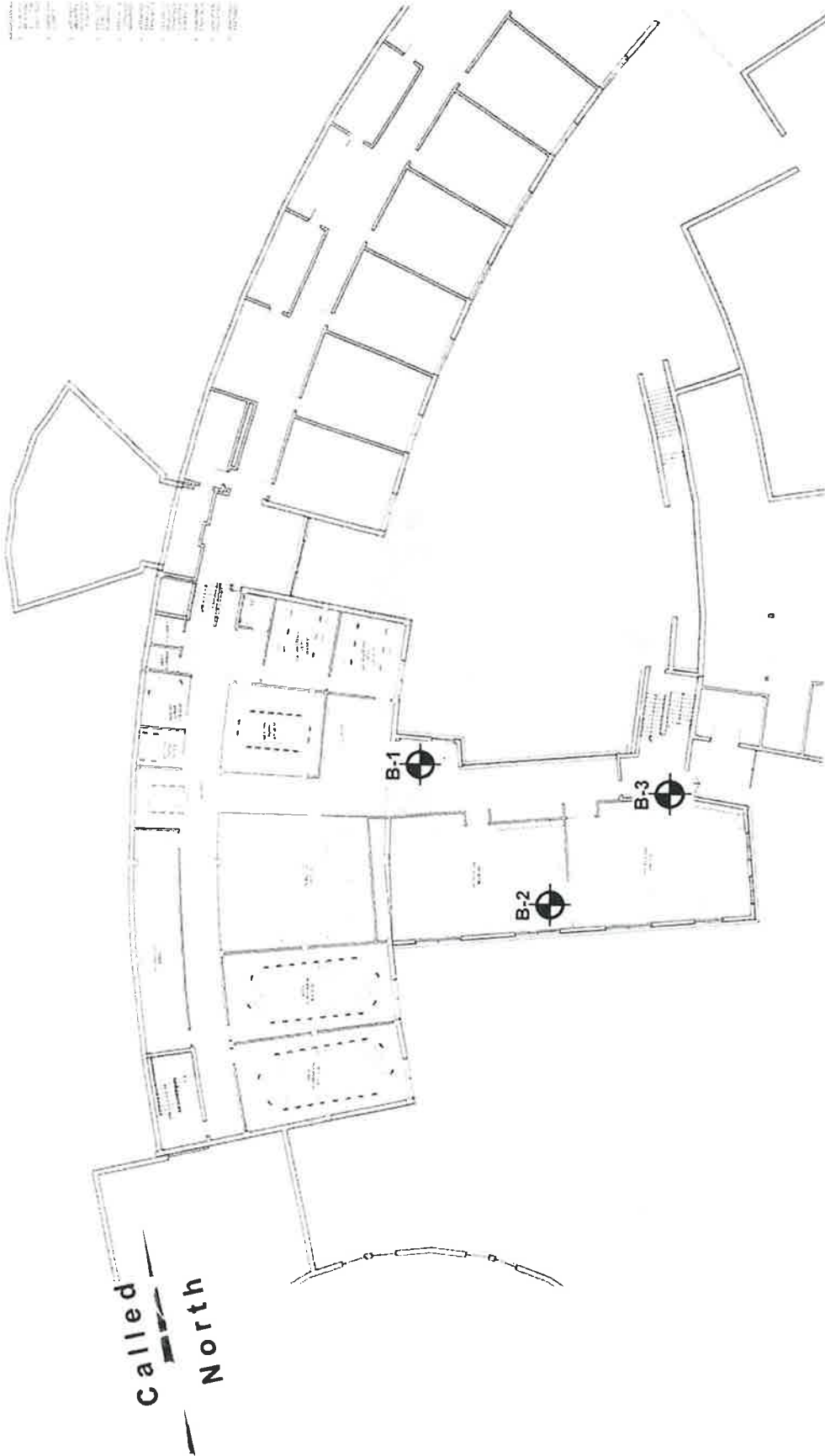
FOR

**MONTCLAIR KIMBERLEY ACADEMY
MONTCLAIR, NEW JERSEY**

**Prepared by: Sor Consulting Engineers, Inc.
98 Sand Park Road
Cedar Grove, New Jersey 07009**

**Report No. 23-C-23
Job No. 23-C-21
July 5, 2023**

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



BORING LOCATION PLAN
MONTCLAIR KIMBERLEY ACADEMY
MKA-STEM ADDITION
MONTCLAIR, NEW JERSEY

SOR CONSULTING ENGINEERS, INC.
 Geotechnical Engineering – Materials Testing – Forensic Studies
 98 Sand Park Road, Cedar Grove, New Jersey 07009

Prepared By : A.S	Approved By :	DRAWING NO.
Date : 06/29/2023	Date :	23-C-21-1
Scale : NTS	Report No. : 23-C-23	Sheet No. 1 of 1

LEGEND



Number and approximate location of test borings performed by SCE for this study.

NOTES

1. This drawing is part of Sor Consulting Engineers, Inc. Report No. 23-C-23 and should be read together with the report for complete evaluation.
2. General Layout was obtained from a plan provided by the Client.

SOR CONSULTING ENGINEERS, INC.				TEST BORING LOG				BORING 1	
CLIENT MONTCLAIR KIMBERLEY ACADEMY							GSE	+480'	
PROJEC MKA-STEM ADDITION							DATUM	Ground Surface	
LOCATIC MONTCLAIR, NEW JERSEY							DATE START	06/27/23	
GROUND WATER				CAS.	SAMP.	CORE	TUBE	DATE FINISH	
DATE	TIME	DEPTH	CASING	TYPE	HSA	SS			
27-Jun		NE		DIA.	4 1/4"	2" OD		JOB NO. 23-C-21	
				WT.		140 lb		REPORT NO. 23-C-23	
				FALL		30"			

DEPTH (ft.)	CASING BLOWS	SAMPLE TYPE/NO.	DEPTH	SAMPLER BLOWS PER 6"	N VALUE	DESCRIPTION	REMARKS
1				3		Topsoil 3"	
2		S-1	0'-2'	6	12	Brown medium to fine Sand, some Silt, some medium to fine Gravel, trace brick (Fill)	
3				7			
4		S-2	2'-4'	9	25	Same	3'-0"
5				15			
6		U-1	4'-6'	15	35	Brown coarse to fine Sand, some Silt, some coarse to fine Gravel	
7		S-3		20		Same	
8		S-4	6'-8'	10	25	Same	
9				12			
10		S-5	8'-10'	13	32	Same	
11				15			
12		S-6	10'-12'	17	32	Same w/Rock Fragments	
13				20			
14				15			
15				15			
16		S-7	15'-16'	50	100/8"	Rock Fragments	
17				50/2"			
18						Test Boring Completed at 15'-8"	
19							
20							
21							
22							
23							
24							
25							
26							
27							
28							
29							
30							

S - SPLIT SPOON SAMPLER
 U - UNDISTURBED SAMPLE
 C - CORE DRILLED

DRILLING CONTRACTOR
 DRILLING EQUIPMENT
 SCE REPRESENTATIVE

ETD, Inc
 Geoprobe 7822 DT
 A Sencar

W=6.7%
 Permeability
 K=2.59 in/hr (K3)

SOR CONSULTING ENGINEERS, INC.		TEST BORING LOG				BORING 2	
CLIENT MONTCLAIR KIMBERLEY ACADEMY						GSE	+482'
PROJEC MKA-STEM ADDITION						DATUM	Ground Surface
LOCATIC MONTCLAIR, NEW JERSEY						DATE START	06/27/23
GROUND WATER				CAS.	SAMP.	CORE	TUBE
DATE	TIME	DEPTH	CASING	TYPE	HSA	SS	
27-Jun		NE		DIA.	4 1/4"	2" OD	
				WT.		140 lb	
				FALL		30"	
						DATE FINISH	06/27/23
						JOB NO.	23-C-21
						REPORT NO.	23-C-23

DEPTH (ft.)	CASING BLOWS	SAMPLE TYPE/NO.	DEPTH	SAMPLER BLOWS PER 6"	N VALUE	DESCRIPTION	REMARKS
1				4		Topsoil 3"	
2		S-1	0'-2'	6 7	13	Brown medium to fine Sand, some Silt, some medium to fine Gravel, trace Asphalt(Fill)	
3				6			
4		S-2	2'-4'	8 5	13	Same (Fill)	
5				7			
6		S-3	4'-6'	5 9	14	Brown to yellow brown coarse to fine Sand, some Silt, little medium to fine Gravel (Fill)	
7				6			
8		S-4	6'-8'	5 3	8	Same (Fill)	
9				6			
10		S-5	8'-10'	8 7	15	Brown coarse to fine Sand, some Silt, some coarse to fine Gravel	
11				7			
12		S-6	10'-12'	8 10	18	Same	W=8.6%
13				15			
14		S-7	13'-15'	20 20	40	Same w/Rock Fragments	
15				15			
16		S-8	15'-17'	20 20	40	Same w/Rock Fragments	
17				22			
18							
19							
20		S-9	20'-21'	50 50/2"	100/8"	Same	
21							
22						Test Boring Completed at 20'-8"	
23							
24							
25							
26							
27							
28							
29							
30							

S - SPLIT SPOON SAMPLER
 U - UNDISTURBED SAMPLE
 C - CORE DRILLED

DRILLING CONTRACTOR
 DRILLING EQUIPMENT
 SCE REPRESENTATIVE

ETD Inc
 Geoprobe 7822 DT
 A Sencar

SOR CONSULTING ENGINEERS, INC.		TEST BORING LOG				BORING 3	
CLIENT MONTCLAIR KIMBERLEY ACADEMY						GSE	+475'
PROJEC MKA-STEM ADDITION						DATUM	Ground Surface
LOCATIC MONTCLAIR, NEW JERSEY						DATE START	06/27/23
GROUND WATER				CAS.	SAMP.	CORE	TUBE
DATE	TIME	DEPTH	CASING	TYPE	HSA	SS	
27-Jun		NE		DIA.	4 1/4"	2" OD	
				WT.		140 lb	
				FALL		30'	
						DATE FINISH	06/27/23
						JOB NO.	23-C-21
						REPORT NO.	23-C-23

DEPTH (ft.)	CASING BLOWS	SAMPLE TYPE/NO.	DEPTH	SAMPLER BLOWS PER 6"	N VALUE	DESCRIPTION	REMARKS
1				5		Topsoil 3"	
2		S-1	0-2'	9	20	Brown medium to fine Sand, some Silt, some medium to fine Gravel, trace Asphalt(Fill)	
3				11			
4		S-2	2'-4'	8	9	Same (Fill)	
5				6			
6		S-3	4'-6'	5	4	Same (Fill)	
7				4			
8		S-4	6'-8'	3	4	Same (Fill)	
9				1			
10		S-5	8'-10'	2	28	Same	
11				2			
12		S-6	10'-12'	2	33	Same	
13				10			
14				8			
15				8			
16		S-7	15'-17'	8	65	Same w/Rock Fragments	
17				12			
18				16			
19				12			
20				10			
21				15			
22				18			
23				20			
24				30			
25				35			
26				50/3"			
27							
28							
29							
30							

W=6.1%
Permeability
K=3.82 in/hr (K3)

Test Boring Completed at 16'-9"

S - SPLIT SPOON SAMPLER
U - UNDISTURBED SAMPLE
C - CORE DRILLED

DRILLING CONTRACTOR
DRILLING EQUIPMENT
SCE REPRESENTATIVE

ETD, Inc.
Geoprobe 7622 DT
A Sencar

Appendix – A2:

USDA SOIL SURVEY REPORT



United States
Department of
Agriculture

NRCS

Natural
Resources
Conservation
Service

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

Custom Soil Resource Report for **Essex County, New Jersey**



Preface

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

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

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

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

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

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

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How Soil Surveys Are Made

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

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

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

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

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

Custom Soil Resource Report

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

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

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

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

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

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

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

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

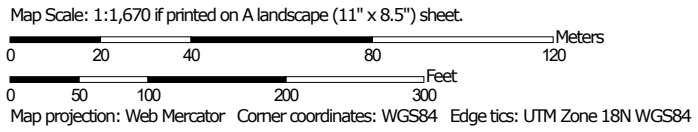
Soil Map

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

Custom Soil Resource Report Soil Map




Soil Map may not be valid at this scale.




MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)




















Soils







 Soil Map Unit Polygons

 Soil Map Unit Lines


 Soil Map Unit Points

Special Point Features






-  Blowout
-  Borrow Pit
-  Clay Spot
-  Closed Depression
-  Gravel Pit
-  Gravelly Spot
-  Landfill
-  Lava Flow
-  Marsh or swamp
-  Mine or Quarry
-  Miscellaneous Water
-  Perennial Water
-  Rock Outcrop
-  Saline Spot
-  Sandy Spot
-  Severely Eroded Spot
-  Sinkhole
-  Slide or Slip
-  Sodic Spot

-  Spoil Area
-  Stony Spot
-  Very Stony Spot
-  Wet Spot
-  Other
-  Special Line Features


Water Features

 Streams and Canals

Transportation

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

Background

 Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:12,000.

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

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

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

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

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

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

Soil Survey Area: Essex County, New Jersey
 Survey Area Data: Version 18, Aug 29, 2022

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

Date(s) aerial images were photographed: Oct 10, 2022—Oct 16, 2022

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

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
BouD	Boonton - Urban land, Boonton substratum complex, 15 to 25 percent slopes	0.0	0.1%
BowrB	Boonton - Urban land, Boonton substratum complex, red sandstone lowland, 0 to 8 percent slopes	4.3	43.7%
USBOOB	Urban land, Boonton substratum - Boonton complex, red sandstone lowland, 0 to 8 percent slopes	2.9	29.5%
YaohEh	Yalesville - Holyoke complex, 35 to 60 percent slopes, very rocky	2.6	26.7%
Totals for Area of Interest		9.9	100.0%

Map Unit Descriptions

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

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

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

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mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

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

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

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

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

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

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

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

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

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

Essex County, New Jersey

BouD—Boonton - Urban land, Boonton substratum complex, 15 to 25 percent slopes

Map Unit Setting

National map unit symbol: b06b

Elevation: 50 to 500 feet

Mean annual precipitation: 30 to 64 inches

Mean annual air temperature: 46 to 79 degrees F

Frost-free period: 131 to 178 days

Farmland classification: Not prime farmland

Map Unit Composition

Boonton and similar soils: 60 percent

Urban land, boonton substratum: 30 percent

Minor components: 10 percent

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

Description of Boonton

Setting

Landform: Ground moraines

Landform position (two-dimensional): Summit, shoulder

Landform position (three-dimensional): Upper third of mountainflank, center third of mountainflank

Down-slope shape: Convex

Across-slope shape: Linear

Parent material: Coarse-loamy basal till derived from basalt

Typical profile

A - 0 to 5 inches: loam

BA - 5 to 8 inches: silt loam

BE - 8 to 17 inches: silt loam

Bt - 17 to 30 inches: silt loam

Btx1 - 30 to 40 inches: gravelly fine sandy loam

Btx2 - 40 to 47 inches: fine sandy loam

CBt1 - 47 to 58 inches: loamy sand

CBt2 - 58 to 72 inches: loamy sand

Properties and qualities

Slope: 15 to 25 percent

Depth to restrictive feature: 20 to 36 inches to fragipan

Drainage class: Well drained

Runoff class: High

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Available water supply, 0 to 60 inches: Low (about 4.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 4e

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Hydrologic Soil Group: C

Ecological site: F144AY037MA - Moist Dense Till Uplands

Hydric soil rating: No

Description of Urban Land, Boonton Substratum

Setting

Landform: Ground moraines

Landform position (two-dimensional): Summit, shoulder

Landform position (three-dimensional): Lower third of mountainflank, upper third of mountainflank, center third of mountainflank

Down-slope shape: Convex

Across-slope shape: Linear

Parent material: Surface covered by pavement, concrete, buildings, and other structures underlain by disturbed and natural soil material

Typical profile

H1 - 0 to 12 inches: material

H2 - 12 to 47 inches: silt loam

2CBt1 - 47 to 58 inches: loamy sand

2CBt2 - 58 to 72 inches: loamy sand

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 8s

Hydric soil rating: Unranked

Minor Components

Udorthents, boonton substratum

Percent of map unit: 10 percent

Landform: Ground moraines

Landform position (two-dimensional): Summit, shoulder

Landform position (three-dimensional): Lower third of mountainflank, upper third of mountainflank, center third of mountainflank

Down-slope shape: Convex

Across-slope shape: Linear

Hydric soil rating: No

BowrB—Boonton - Urban land, Boonton substratum complex, red sandstone lowland, 0 to 8 percent slopes

Map Unit Setting

National map unit symbol: w8p8

Elevation: 20 to 560 feet

Mean annual precipitation: 30 to 64 inches

Mean annual air temperature: 46 to 79 degrees F

Frost-free period: 131 to 178 days

Farmland classification: Not prime farmland

Map Unit Composition

Boonton, red sandstone lowland, and similar soils: 50 percent

Urban land, boonton red sandstone lowland substratum: 40 percent

Minor components: 10 percent

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

Description of Boonton, Red Sandstone Lowland

Setting

Landform: Ground moraines

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Coarse-loamy till derived from sandstone and shale

Typical profile

Oi - 0 to 1 inches: slightly decomposed plant material

A - 1 to 3 inches: silt loam

BE - 3 to 10 inches: loam

Bw - 10 to 27 inches: gravelly loam

Bx1 - 27 to 40 inches: gravelly fine sandy loam

Bx2 - 40 to 67 inches: gravelly fine sandy loam

BCx - 67 to 83 inches: gravelly sandy loam

Properties and qualities

Slope: 3 to 8 percent

Depth to restrictive feature: 20 to 36 inches to fragipan

Drainage class: Well drained

Runoff class: Medium

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Available water supply, 0 to 60 inches: Low (about 4.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 2e

Hydrologic Soil Group: C

Ecological site: F144AY037MA - Moist Dense Till Uplands

Hydric soil rating: No

Description of Urban Land, Boonton Red Sandstone Lowland Substratum

Setting

Landform: Ground moraines

Landform position (three-dimensional): Lower third of mountainflank

Down-slope shape: Linear, convex

Across-slope shape: Linear, convex

Parent material: Surface covered by pavement, concrete, buildings, and other structures underlain by disturbed and natural soil material

Typical profile

H1 - 0 to 12 inches: material

H2 - 12 to 67 inches: gravelly loam

2CB - 67 to 83 inches: gravelly sandy loam

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8s
Hydric soil rating: Unranked

Minor Components

Udorthents, boonton red sandstone lowland substratum

Percent of map unit: 10 percent
Landform: Ground moraines
Landform position (three-dimensional): Lower third of mountainflank
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

USBOOB—Urban land, Boonton substratum - Boonton complex, red sandstone lowland, 0 to 8 percent slopes

Map Unit Setting

National map unit symbol: w9c3
Elevation: 0 to 560 feet
Mean annual precipitation: 30 to 64 inches
Mean annual air temperature: 46 to 79 degrees F
Frost-free period: 131 to 178 days
Farmland classification: Not prime farmland

Map Unit Composition

Urban land, boonton red sandstone lowland substratum: 60 percent
Boonton, red sandstone lowland, and similar soils: 30 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Urban Land, Boonton Red Sandstone Lowland Substratum

Setting

Landform: Ground moraines
Landform position (three-dimensional): Lower third of mountainflank
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Surface covered by pavement, concrete, buildings, and other structures underlain by disturbed and natural soil material

Typical profile

H1 - 0 to 12 inches: material
H2 - 12 to 67 inches: gravelly loam
2CB - 67 to 83 inches: gravelly sandy loam

Interpretive groups

Land capability classification (irrigated): None specified

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Land capability classification (nonirrigated): 8s
Hydric soil rating: Unranked

Description of Boonton, Red Sandstone Lowland

Setting

Landform: Ground moraines
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Coarse-loamy till derived from sandstone and shale

Typical profile

O_i - 0 to 1 inches: slightly decomposed plant material
A - 1 to 3 inches: silt loam
BE - 3 to 10 inches: loam
B_w - 10 to 27 inches: gravelly loam
B_{x1} - 27 to 40 inches: gravelly fine sandy loam
B_{x2} - 40 to 67 inches: gravelly fine sandy loam
BC_x - 67 to 83 inches: gravelly sandy loam

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: 20 to 36 inches to fragipan
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (K_{sat}): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C
Ecological site: F144AY037MA - Moist Dense Till Uplands
Hydric soil rating: No

Minor Components

Udorthents, boonton red sandstone lowland substratum

Percent of map unit: 10 percent
Landform: Ground moraines
Landform position (three-dimensional): Lower third of mountainflank
Down-slope shape: Convex
Across-slope shape: Linear
Hydric soil rating: No

YaohEh—Yalesville - Holyoke complex, 35 to 60 percent slopes, very rocky

Map Unit Setting

National map unit symbol: w9g0
Elevation: 50 to 660 feet
Mean annual precipitation: 30 to 64 inches
Mean annual air temperature: 46 to 79 degrees F
Frost-free period: 131 to 178 days
Farmland classification: Not prime farmland

Map Unit Composition

Yalesville, very rocky, and similar soils: 50 percent
Holyoke, very rocky, and similar soils: 30 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Yalesville, Very Rocky

Setting

Landform: Ground moraines
Landform position (three-dimensional): Mountaintop
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Coarse-loamy till derived from basalt

Typical profile

Oa - 0 to 1 inches: highly decomposed plant material
A - 1 to 5 inches: loam
Bw1 - 5 to 19 inches: fine sandy loam
Bw2 - 19 to 31 inches: fine sandy loam
BC - 31 to 32 inches: fine sandy loam
R - 32 to 80 inches: bedrock

Properties and qualities

Slope: 35 to 60 percent
Surface area covered with cobbles, stones or boulders: 10.0 percent
Depth to restrictive feature: 20 to 39 inches to lithic bedrock
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high
(0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.9 inches)

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Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: C
Ecological site: F145XY013CT - Well Drained Till Uplands
Hydric soil rating: No

Description of Holyoke, Very Rocky

Setting

Landform: Ground moraines, hills, ridges
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Mountaintop
Down-slope shape: Convex, linear
Across-slope shape: Linear, convex
Parent material: Loamy till derived from basalt

Typical profile

O_i - 0 to 1 inches: slightly decomposed plant material
O_a - 1 to 3 inches: highly decomposed plant material
A - 3 to 5 inches: loam
Bw₁ - 5 to 14 inches: loam
Bw₂ - 14 to 18 inches: loam
R - 18 to 80 inches: bedrock

Properties and qualities

Slope: 35 to 60 percent
Surface area covered with cobbles, stones or boulders: 10.0 percent
Depth to restrictive feature: 10 to 20 inches to lithic bedrock
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (K_{sat}): Moderately high to high
(0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: D
Ecological site: F145XY011CT - Well Drained Shallow Till Uplands
Hydric soil rating: No

Minor Components

Rock outcrop

Percent of map unit: 10 percent
Landform: Ridges
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Hydric soil rating: Unranked

Custom Soil Resource Report

Boonton, very rocky

Percent of map unit: 10 percent

Landform: Ground moraines

Landform position (two-dimensional): Summit, shoulder

Landform position (three-dimensional): Upper third of mountainflank, center third of mountainflank

Down-slope shape: Convex

Across-slope shape: Linear

Hydric soil rating: No

Soil Information for All Uses

Soil Properties and Qualities

The Soil Properties and Qualities section includes various soil properties and qualities displayed as thematic maps with a summary table for the soil map units in the selected area of interest. A single value or rating for each map unit is generated by aggregating the interpretive ratings of individual map unit components. This aggregation process is defined for each property or quality.

Soil Qualities and Features

Soil qualities are behavior and performance attributes that are not directly measured, but are inferred from observations of dynamic conditions and from soil properties. Example soil qualities include natural drainage, and frost action. Soil features are attributes that are not directly part of the soil. Example soil features include slope and depth to restrictive layer. These features can greatly impact the use and management of the soil.

Hydrologic Soil Group (Montclair Kimberly Academy)

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

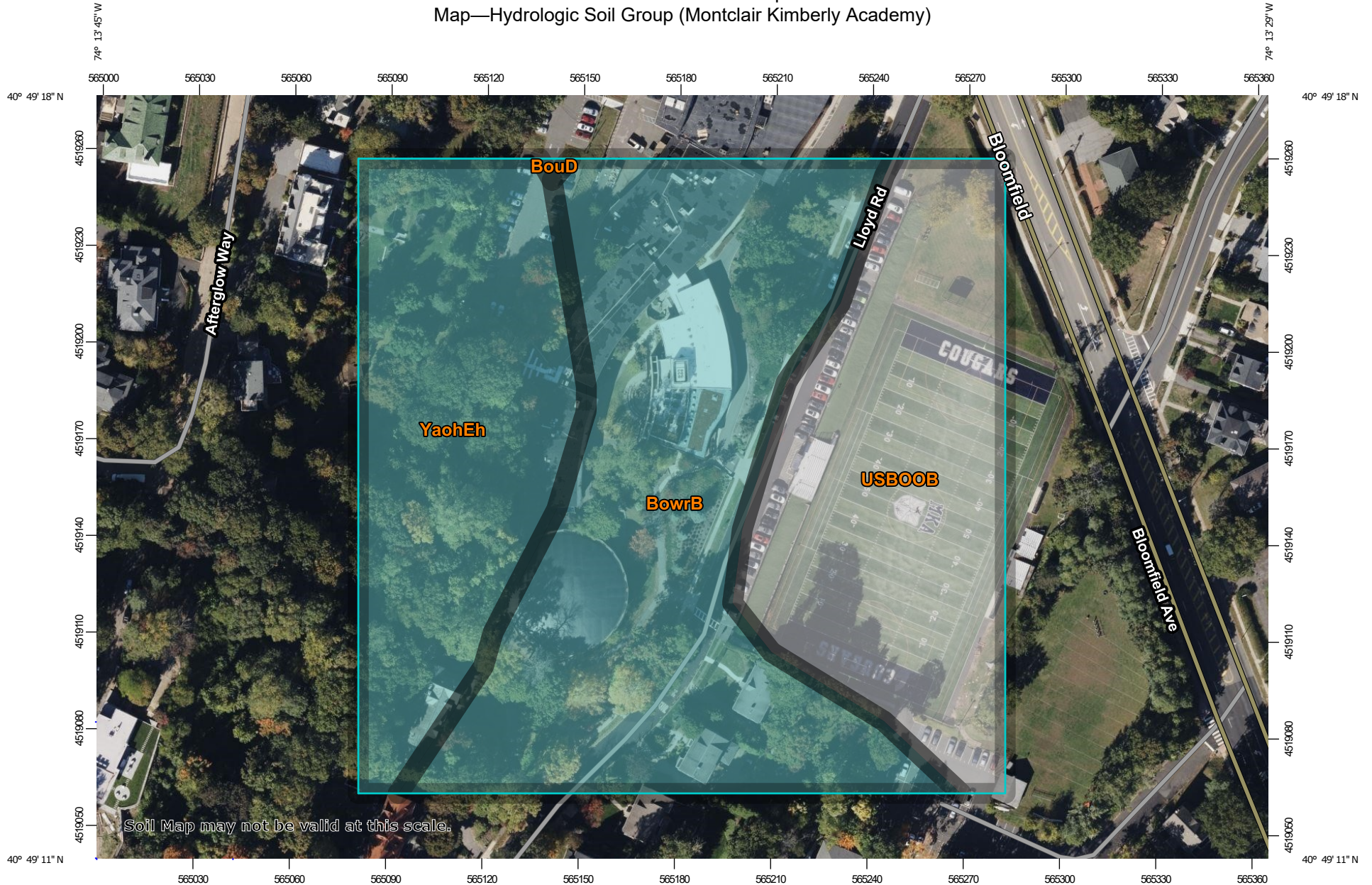
Custom Soil Resource Report

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

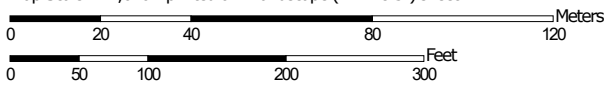
Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Custom Soil Resource Report
 Map—Hydrologic Soil Group (Montclair Kimberly Academy)




Map Scale: 1:1,670 if printed on A landscape (11" x 8.5") sheet.











Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

MAP LEGEND









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

Soils





Soil Rating Polygons

-  A
-  A/D
-  B
-  B/D
-  C
-  C/D
-  D
-  Not rated or not available





Soil Rating Lines

-  A
-  A/D
-  B
-  B/D
-  C
-  C/D
-  D
-  Not rated or not available


Soil Rating Points

-  A
-  A/D
-  B
-  B/D






Soils

-  C
-  C/D
-  D
-  Not rated or not available


Water Features

-  Streams and Canals

Transportation

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

Background

-  Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:12,000.

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

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

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

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

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

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

Soil Survey Area: Essex County, New Jersey
 Survey Area Data: Version 18, Aug 29, 2022

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

Date(s) aerial images were photographed: Oct 10, 2022—Oct 16, 2022

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

Table—Hydrologic Soil Group (Montclair Kimberly Academy)

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
BouD	Boonton - Urban land, Boonton substratum complex, 15 to 25 percent slopes	C	0.0	0.1%
BowrB	Boonton - Urban land, Boonton substratum complex, red sandstone lowland, 0 to 8 percent slopes	C	4.3	43.7%
USBOOB	Urban land, Boonton substratum - Boonton complex, red sandstone lowland, 0 to 8 percent slopes		2.9	29.5%
YaohEh	Yalesville - Holyoke complex, 35 to 60 percent slopes, very rocky	C	2.6	26.7%
Totals for Area of Interest			9.9	100.0%

Rating Options—Hydrologic Soil Group (Montclair Kimberly Academy)

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

References

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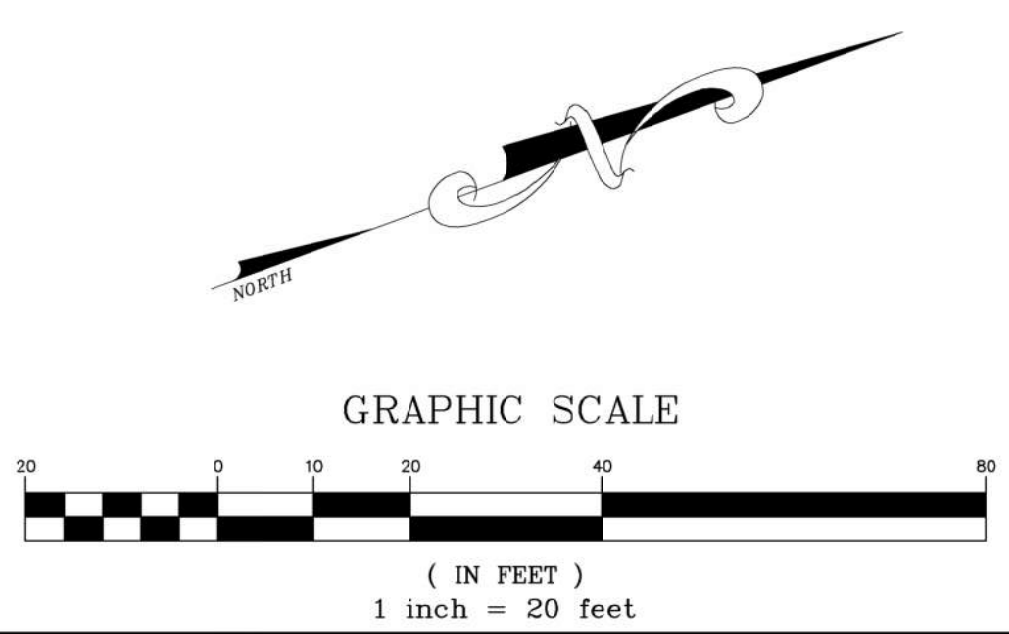
Appendix - B:
DRAINAGE AREA MAPS



LOT 16 BLOCK 302
 N/F MONTCLAIR ACADEMY FOUNDATION
 CONTAINING 289,875 S.F. OR 6.655 Ac ±

NOTE:
 THE GREEN HATCH REPRESENT THE IMPERVIOUS AREA.

Existing Drainage Area (SF)	Total DA		
	IMP	Grass	
POI-1	9167	3823	5344
POI-2	17270	3843	13427
POI-3	2745	1370	1375
POI-4	40798	7842	32956



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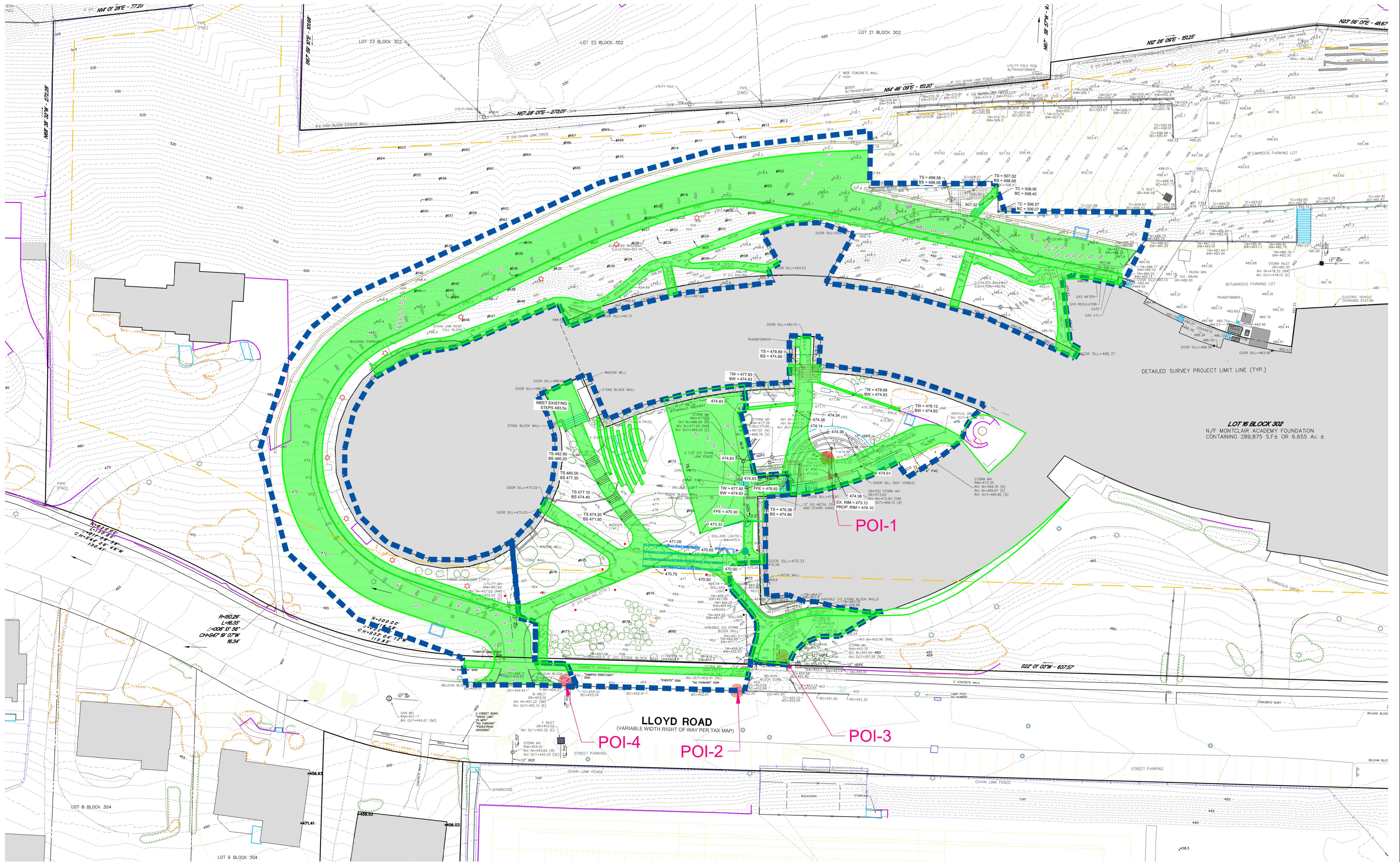
**BOUNDARY AND TOPOGRAPHIC
 EXISTING DRAINAGE AREA MAP**
 P/O LOT 16, BLOCK 302
 PREPARED FOR
MONTCLAIR KIMBERLEY ACADEMY
 SITUATED IN

MONTCLAIR TOWNSHIP ESSEX CO., N.J.
 SCALE 1" = 20' AUGUST 31, 2023

DRAWN BY: FIELD BK: ORDER No.: FILE No.: SHEET No.
 DATE: ESSEX CO. 3 46124- ESSEX 100-11

CHECKED BY: PAGE: DATE: DATE: DATE:

REV. DESCRIPTION DATE DFLYBY CKD.BY



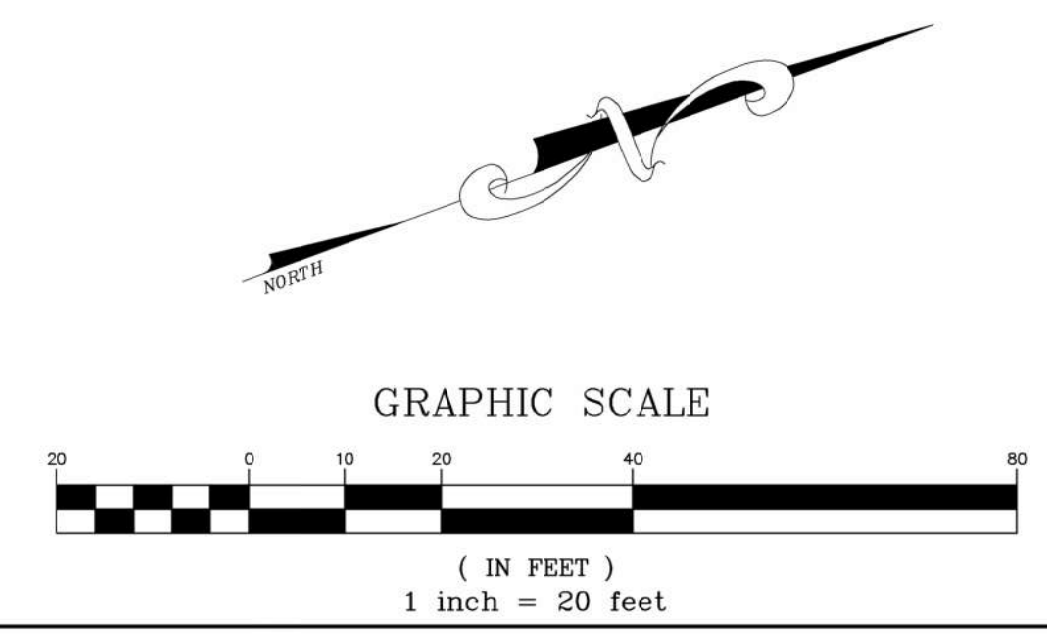
DETAILED SURVEY PROJECT LIMIT LINE (TYP.)

LOT 16, BLOCK 302
 N/4 MONTCLAIR ACADEMY FOUNDATION
 CONTAINING 289,875 S.F. OR 6.655 AC ±

NOTE:
 THE GREEN HATCH REPRESENT THE IMPERVIOUS AREA.

	Proposed Drainage Area (SF)		Grass
	Total DA	IMP	
POI-1*	7065	3823	3242
POI-2	20172	3679	16493
POI-3	1978	1295	683
POI-4	42390	20665	21725

NOTE: * Impervious coverage associated with POI-1 is based on the existing impervious coverage that is conveyed to the existing underground basin, where actual proposed is being reduced from 3,823 SF to 2,288 SF.



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PROPOSED DRAINAGE AREA MAP
 OF
P/O LOT 16, BLOCK 302
 PREPARED FOR
MONTCLAIR KIMBERLEY ACADEMY
 SITUATED IN

MONTCLAIR TOWNSHIP ESSEX CO., N.J.
 SCALE 1" = 20' AUGUST 31, 2023

DRAWN BY: FIELD BK: ORDER NO.: FILE NO.: SHEET NO.:
 DATE: ESSEX CO. 3 PAGE 1-1 46124-100-11 ESSEX

CHECKED BY: DATE: 1-10-11

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Appendix - C:

**EXISTING HYDROLOGIC ROUTINGS -
FUTURE/PROJECTED RAINFALL (YEAR 2100)
CONDITION FOR 2-, 10-, AND 100- YEAR
STORM EVENTS**

Project Summary

Title	Kimberley Academy
Engineer	DP
Company	VNH/Pennoni
Date	8/31/2023

Notes

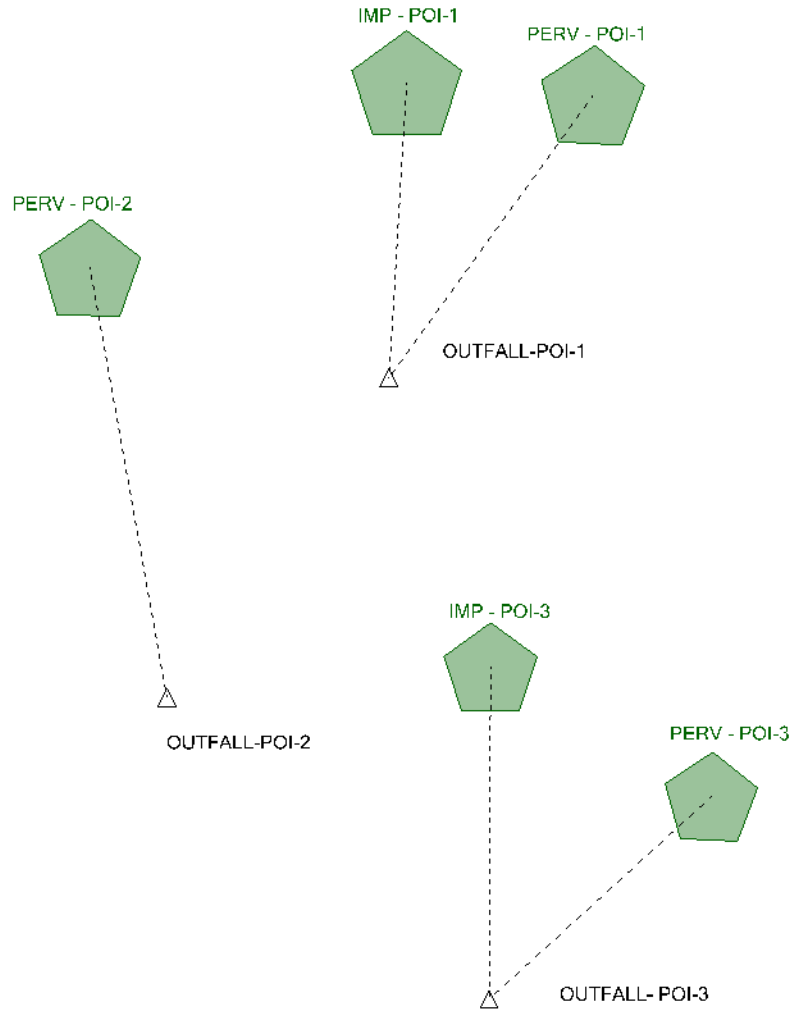


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Subsection: User Notifications

User Notifications

Message Id	7
Scenario	ESSEX CO. 2-YR (PROJ)
Element Type	Catchment
Element Id	31
Label	PERV - POI-1
Time	(N/A)
Message	The difference between calculated peak flow and interpolated peak flow 2.0 % is greater than 1.5 %. Computed peak flow= 0.31 ft ³ /s Interp. peak flow= 0.30 ft ³ /s. Output increment for this catchment may be too large.
Source	Warning

Message Id	7
Scenario	ESSEX CO. 2-YR (PROJ)
Element Type	Catchment
Element Id	33
Label	PERV - POI-2
Time	(N/A)
Message	The difference between calculated peak flow and interpolated peak flow 2.0 % is greater than 1.5 %. Computed peak flow= 0.19 ft ³ /s Interp. peak flow= 0.18 ft ³ /s. Output increment for this catchment may be too large.
Source	Warning

Message Id	7
Scenario	ESSEX CO. 2-YR (PROJ)
Element Type	Catchment
Element Id	365
Label	PERV - POI-3
Time	(N/A)
Message	The difference between calculated peak flow and interpolated peak flow 2.0 % is greater than 1.5 %. Computed peak flow= 0.08 ft ³ /s Interp. peak flow= 0.08 ft ³ /s. Output increment for this catchment may be too large.
Source	Warning

Subsection: Master Network Summary

Catchments Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (ft ³ /s)
IMP - POI-1	ESSEX CO. 2-YR (PROJ)	2	0.028	12.100	0.35
IMP - POI-1	ESSEX CO. 10-YR (PROJ)	10	0.045	12.100	0.55
IMP - POI-1	ESSEX CO. 100-YR (PROJ)	100	0.082	12.100	1.00
PERV - POI-1	ESSEX CO. 2-YR (PROJ)	2	0.021	12.100	0.30
PERV - POI-1	ESSEX CO. 10-YR (PROJ)	10	0.041	12.100	0.59
PERV - POI-1	ESSEX CO. 100-YR (PROJ)	100	0.090	12.100	1.24
PERV - POI-2	ESSEX CO. 2-YR (PROJ)	2	0.013	12.100	0.18
PERV - POI-2	ESSEX CO. 10-YR (PROJ)	10	0.025	12.100	0.36
PERV - POI-2	ESSEX CO. 100-YR (PROJ)	100	0.055	12.100	0.76
IMP - POI-3	ESSEX CO. 2-YR (PROJ)	2	0.010	12.100	0.13
IMP - POI-3	ESSEX CO. 10-YR (PROJ)	10	0.016	12.100	0.20
IMP - POI-3	ESSEX CO. 100-YR (PROJ)	100	0.030	12.100	0.36
PERV - POI-3	ESSEX CO. 2-YR (PROJ)	2	0.005	12.100	0.08
PERV - POI-3	ESSEX CO. 10-YR (PROJ)	10	0.011	12.100	0.15
PERV - POI-3	ESSEX CO. 100-YR (PROJ)	100	0.023	12.100	0.32

Node Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (ft ³ /s)
OUTFALL- POI-3	ESSEX CO. 2-YR (PROJ)	2	0.015	12.100	0.20
OUTFALL- POI-3	ESSEX CO. 10-YR (PROJ)	10	0.027	12.100	0.35
OUTFALL- POI-3	ESSEX CO. 100-YR (PROJ)	100	0.053	12.100	0.68
OUTFALL-POI-1	ESSEX CO. 2-YR (PROJ)	2	0.049	12.100	0.65
OUTFALL-POI-1	ESSEX CO. 10-YR (PROJ)	10	0.086	12.100	1.14
OUTFALL-POI-1	ESSEX CO. 100-YR (PROJ)	100	0.173	12.100	2.24

Subsection: Master Network Summary

Node Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (ft ³ /s)
OUTFALL-POI-2	ESSEX CO. 2-YR (PROJ)	2	0.013	12.100	0.18
OUTFALL-POI-2	ESSEX CO. 10-YR (PROJ)	10	0.025	12.100	0.36
OUTFALL-POI-2	ESSEX CO. 100-YR (PROJ)	100	0.055	12.100	0.76

Subsection: Time-Depth Curve
 Label: ESSEX CO.
 Scenario: ESSEX CO. 100-YR (PROJ)

Return Event: 100 years
 Storm Event: ESSEX CO. 100-YR (PROJ)

Time-Depth Curve: ESSEX CO. 100-YR (PROJ)

Label	ESSEX CO. 100-YR (PROJ)
Start Time	0.000 hours
Increment	0.100 hours
End Time	24.000 hours
Return Event	100 years

CUMULATIVE RAINFALL (in)
Output Time Increment = 0.100 hours
Time on left represents time for first value in each row.

Time (hours)	Depth (in)	Depth (in)	Depth (in)	Depth (in)	Depth (in)
0.000	0.0	0.0	0.0	0.0	0.1
0.500	0.1	0.1	0.1	0.1	0.1
1.000	0.1	0.1	0.2	0.2	0.2
1.500	0.2	0.2	0.2	0.2	0.3
2.000	0.3	0.3	0.3	0.3	0.3
2.500	0.4	0.4	0.4	0.4	0.4
3.000	0.4	0.5	0.5	0.5	0.5
3.500	0.5	0.5	0.6	0.6	0.6
4.000	0.6	0.6	0.6	0.7	0.7
4.500	0.7	0.7	0.7	0.7	0.8
5.000	0.8	0.8	0.8	0.8	0.9
5.500	0.9	0.9	0.9	0.9	1.0
6.000	1.0	1.0	1.0	1.0	1.1
6.500	1.1	1.1	1.1	1.2	1.2
7.000	1.2	1.2	1.3	1.3	1.3
7.500	1.3	1.4	1.4	1.4	1.5
8.000	1.5	1.5	1.6	1.6	1.6
8.500	1.7	1.7	1.7	1.8	1.8
9.000	1.8	1.9	1.9	1.9	2.0
9.500	2.0	2.1	2.1	2.2	2.2
10.000	2.3	2.3	2.4	2.5	2.5
10.500	2.6	2.6	2.7	2.8	2.9
11.000	3.0	3.1	3.2	3.4	3.5
11.500	3.7	3.9	4.1	4.4	4.8
12.000	5.5	6.7	7.1	7.4	7.7
12.500	7.9	8.0	8.2	8.3	8.4
13.000	8.5	8.6	8.7	8.8	8.9
13.500	8.9	9.0	9.1	9.1	9.2
14.000	9.2	9.3	9.3	9.4	9.4
14.500	9.5	9.5	9.6	9.6	9.7
15.000	9.7	9.7	9.8	9.8	9.8
15.500	9.9	9.9	9.9	10.0	10.0
16.000	10.0	10.1	10.1	10.1	10.1
16.500	10.2	10.2	10.2	10.3	10.3

Subsection: Time-Depth Curve
 Label: ESSEX CO.
 Scenario: ESSEX CO. 100-YR (PROJ)

Return Event: 100 years
 Storm Event: ESSEX CO. 100-YR (PROJ)

CUMULATIVE RAINFALL (in)
Output Time Increment = 0.100 hours
Time on left represents time for first value in each row.

Time (hours)	Depth (in)	Depth (in)	Depth (in)	Depth (in)	Depth (in)
17.000	10.3	10.3	10.4	10.4	10.4
17.500	10.4	10.5	10.5	10.5	10.5
18.000	10.5	10.6	10.6	10.6	10.6
18.500	10.6	10.7	10.7	10.7	10.7
19.000	10.7	10.8	10.8	10.8	10.8
19.500	10.8	10.8	10.9	10.9	10.9
20.000	10.9	10.9	11.0	11.0	11.0
20.500	11.0	11.0	11.0	11.1	11.1
21.000	11.1	11.1	11.1	11.1	11.2
21.500	11.2	11.2	11.2	11.2	11.2
22.000	11.2	11.3	11.3	11.3	11.3
22.500	11.3	11.3	11.3	11.4	11.4
23.000	11.4	11.4	11.4	11.4	11.4
23.500	11.5	11.5	11.5	11.5	11.5
24.000	11.5	(N/A)	(N/A)	(N/A)	(N/A)

Subsection: Time-Depth Curve
 Label: ESSEX CO.
 Scenario: ESSEX CO. 10-YR (PROJ)

Return Event: 10 years
 Storm Event: ESSEX CO. 10-YR (PROJ)

Time-Depth Curve: ESSEX CO. 10-YR (PROJ)	
Label	ESSEX CO. 10-YR (PROJ)
Start Time	0.000 hours
Increment	0.100 hours
End Time	24.000 hours
Return Event	10 years

CUMULATIVE RAINFALL (in)
Output Time Increment = 0.100 hours
Time on left represents time for first value in each row.

Time (hours)	Depth (in)	Depth (in)	Depth (in)	Depth (in)	Depth (in)
0.000	0.0	0.0	0.0	0.0	0.0
0.500	0.0	0.0	0.1	0.1	0.1
1.000	0.1	0.1	0.1	0.1	0.1
1.500	0.1	0.1	0.1	0.1	0.1
2.000	0.2	0.2	0.2	0.2	0.2
2.500	0.2	0.2	0.2	0.2	0.2
3.000	0.2	0.2	0.3	0.3	0.3
3.500	0.3	0.3	0.3	0.3	0.3
4.000	0.3	0.3	0.4	0.4	0.4
4.500	0.4	0.4	0.4	0.4	0.4
5.000	0.4	0.4	0.5	0.5	0.5
5.500	0.5	0.5	0.5	0.5	0.5
6.000	0.5	0.6	0.6	0.6	0.6
6.500	0.6	0.6	0.6	0.6	0.7
7.000	0.7	0.7	0.7	0.7	0.7
7.500	0.7	0.8	0.8	0.8	0.8
8.000	0.8	0.8	0.9	0.9	0.9
8.500	0.9	0.9	1.0	1.0	1.0
9.000	1.0	1.0	1.1	1.1	1.1
9.500	1.1	1.1	1.2	1.2	1.2
10.000	1.3	1.3	1.3	1.4	1.4
10.500	1.4	1.5	1.5	1.6	1.6
11.000	1.7	1.7	1.8	1.9	1.9
11.500	2.0	2.1	2.3	2.4	2.7
12.000	3.1	3.7	3.9	4.1	4.2
12.500	4.4	4.4	4.5	4.6	4.7
13.000	4.7	4.8	4.8	4.9	4.9
13.500	4.9	5.0	5.0	5.0	5.1
14.000	5.1	5.1	5.2	5.2	5.2
14.500	5.2	5.3	5.3	5.3	5.3
15.000	5.4	5.4	5.4	5.4	5.4
15.500	5.5	5.5	5.5	5.5	5.5
16.000	5.5	5.6	5.6	5.6	5.6
16.500	5.6	5.6	5.7	5.7	5.7

Subsection: Time-Depth Curve
 Label: ESSEX CO.
 Scenario: ESSEX CO. 10-YR (PROJ)

Return Event: 10 years
 Storm Event: ESSEX CO. 10-YR (PROJ)

CUMULATIVE RAINFALL (in)
Output Time Increment = 0.100 hours
Time on left represents time for first value in each row.

Time (hours)	Depth (in)	Depth (in)	Depth (in)	Depth (in)	Depth (in)
17.000	5.7	5.7	5.7	5.7	5.8
17.500	5.8	5.8	5.8	5.8	5.8
18.000	5.8	5.8	5.8	5.9	5.9
18.500	5.9	5.9	5.9	5.9	5.9
19.000	5.9	5.9	6.0	6.0	6.0
19.500	6.0	6.0	6.0	6.0	6.0
20.000	6.0	6.0	6.1	6.1	6.1
20.500	6.1	6.1	6.1	6.1	6.1
21.000	6.1	6.1	6.1	6.2	6.2
21.500	6.2	6.2	6.2	6.2	6.2
22.000	6.2	6.2	6.2	6.2	6.2
22.500	6.3	6.3	6.3	6.3	6.3
23.000	6.3	6.3	6.3	6.3	6.3
23.500	6.3	6.3	6.3	6.4	6.4
24.000	6.4	(N/A)	(N/A)	(N/A)	(N/A)

Subsection: Time-Depth Curve
 Label: ESSEX CO.
 Scenario: ESSEX CO. 2-YR (PROJ)

Return Event: 2 years
 Storm Event: ESSEX CO. 2-YR (PROJ)

Time-Depth Curve: ESSEX CO. 2-YR (PROJ)	
Label	ESSEX CO. 2-YR (PROJ)
Start Time	0.000 hours
Increment	0.100 hours
End Time	24.000 hours
Return Event	2 years

CUMULATIVE RAINFALL (in)
Output Time Increment = 0.100 hours
Time on left represents time for first value in each row.

Time (hours)	Depth (in)	Depth (in)	Depth (in)	Depth (in)	Depth (in)
0.000	0.0	0.0	0.0	0.0	0.0
0.500	0.0	0.0	0.0	0.0	0.0
1.000	0.0	0.1	0.1	0.1	0.1
1.500	0.1	0.1	0.1	0.1	0.1
2.000	0.1	0.1	0.1	0.1	0.1
2.500	0.1	0.1	0.1	0.1	0.1
3.000	0.2	0.2	0.2	0.2	0.2
3.500	0.2	0.2	0.2	0.2	0.2
4.000	0.2	0.2	0.2	0.2	0.2
4.500	0.2	0.3	0.3	0.3	0.3
5.000	0.3	0.3	0.3	0.3	0.3
5.500	0.3	0.3	0.3	0.3	0.3
6.000	0.3	0.4	0.4	0.4	0.4
6.500	0.4	0.4	0.4	0.4	0.4
7.000	0.4	0.4	0.4	0.5	0.5
7.500	0.5	0.5	0.5	0.5	0.5
8.000	0.5	0.5	0.6	0.6	0.6
8.500	0.6	0.6	0.6	0.6	0.6
9.000	0.6	0.7	0.7	0.7	0.7
9.500	0.7	0.7	0.8	0.8	0.8
10.000	0.8	0.8	0.9	0.9	0.9
10.500	0.9	0.9	1.0	1.0	1.0
11.000	1.1	1.1	1.1	1.2	1.2
11.500	1.3	1.4	1.4	1.6	1.7
12.000	2.0	2.4	2.5	2.6	2.7
12.500	2.8	2.8	2.9	2.9	3.0
13.000	3.0	3.1	3.1	3.1	3.1
13.500	3.2	3.2	3.2	3.2	3.3
14.000	3.3	3.3	3.3	3.3	3.4
14.500	3.4	3.4	3.4	3.4	3.4
15.000	3.4	3.5	3.5	3.5	3.5
15.500	3.5	3.5	3.5	3.5	3.5
16.000	3.6	3.6	3.6	3.6	3.6
16.500	3.6	3.6	3.6	3.6	3.6

Subsection: Time-Depth Curve
 Label: ESSEX CO.
 Scenario: ESSEX CO. 2-YR (PROJ)

Return Event: 2 years
 Storm Event: ESSEX CO. 2-YR (PROJ)

CUMULATIVE RAINFALL (in)
Output Time Increment = 0.100 hours
Time on left represents time for first value in each row.

Time (hours)	Depth (in)	Depth (in)	Depth (in)	Depth (in)	Depth (in)
17.000	3.7	3.7	3.7	3.7	3.7
17.500	3.7	3.7	3.7	3.7	3.7
18.000	3.7	3.7	3.8	3.8	3.8
18.500	3.8	3.8	3.8	3.8	3.8
19.000	3.8	3.8	3.8	3.8	3.8
19.500	3.8	3.8	3.9	3.9	3.9
20.000	3.9	3.9	3.9	3.9	3.9
20.500	3.9	3.9	3.9	3.9	3.9
21.000	3.9	3.9	3.9	4.0	4.0
21.500	4.0	4.0	4.0	4.0	4.0
22.000	4.0	4.0	4.0	4.0	4.0
22.500	4.0	4.0	4.0	4.0	4.0
23.000	4.0	4.0	4.1	4.1	4.1
23.500	4.1	4.1	4.1	4.1	4.1
24.000	4.1	(N/A)	(N/A)	(N/A)	(N/A)

Subsection: Unit Hydrograph Equations

Unit Hydrograph Method (Computational Notes)

Definition of Terms

At	Total area (acres): $A_t = A_i + A_p$
Ai	Impervious area (acres)
Ap	Pervious area (acres)
CNi	Runoff curve number for impervious area
CNp	Runoff curve number for pervious area
fLoss	f loss constant infiltration (depth/time)
gKs	Saturated Hydraulic Conductivity (depth/time)
Md	Volumetric Moisture Deficit
Psi	Capillary Suction (length)
hK	Horton Infiltration Decay Rate (time^{-1})
fo	Initial Infiltration Rate (depth/time)
fc	Ultimate(capacity)Infiltration Rate (depth/time)
Ia	Initial Abstraction (length)
dt	Computational increment (duration of unit excess rainfall) Default dt is smallest value of $0.1333T_c$, r_{tm} , and t_h (Smallest dt is then adjusted to match up with T_p)
UDdt	User specified override computational main time increment (only used if UDdt is $\Rightarrow .1333T_c$)
D(t)	Point on distribution curve (fraction of P) for time step t
K	$2 / (1 + (T_r/T_p))$: default $K = 0.75$: (for $T_r/T_p = 1.67$)
Ks	Hydrograph shape factor = Unit Conversions * $K = ((1\text{hr}/3600\text{sec}) * (1\text{ft}/12\text{in}) * ((5280\text{ft})^2/\text{sq.mi})) * K$ Default $K_s = 645.333 * 0.75 = 484$
Lag	Lag time from center of excess runoff (dt) to T_p : $\text{Lag} = 0.6T_c$
P	Total precipitation depth, inches
Pa(t)	Accumulated rainfall at time step t
Pi(t)	Incremental rainfall at time step t
qp	Peak discharge (cfs) for 1in. runoff, for 1hr, for 1 sq.mi. = $(K_s * A * Q) / T_p$ (where $Q = 1\text{in. runoff}$, $A = \text{sq.mi.}$)
Qu(t)	Unit hydrograph ordinate (cfs) at time step t
Q(t)	Final hydrograph ordinate (cfs) at time step t
Rai(t)	Accumulated runoff (inches) at time step t for impervious area
Rap(t)	Accumulated runoff (inches) at time step t for pervious area
Rii(t)	Incremental runoff (inches) at time step t for impervious area
Rip(t)	Incremental runoff (inches) at time step t for pervious area
R(t)	Incremental weighted total runoff (inches)
Rtm	Time increment for rainfall table
Si	S for impervious area: $S_i = (1000/CN_i) - 10$
Sp	S for pervious area: $S_p = (1000/CN_p) - 10$
t	Time step (row) number
Tc	Time of concentration
Tb	Time (hrs) of entire unit hydrograph: $T_b = T_p + T_r$
Tp	Time (hrs) to peak of a unit hydrograph: $T_p = (dt/2) + \text{Lag}$
Tr	Time (hrs) of receding limb of unit hydrograph: $T_r = \text{ratio of } T_p$

Subsection: Unit Hydrograph Equations

Unit Hydrograph Method

Computational Notes

Precipitation

Column (1) Time for time step t
Column (2) $D(t)$ = Point on distribution curve for time step t
Column (3) $P_i(t) = P_a(t) - P_a(t-1)$: Col.(4) - Preceding Col.(4)
Column (4) $P_a(t) = D(t) \times P$: Col.(2) \times P

Pervious Area Runoff (using SCS Runoff CN Method)

Column (5) $R_{ap}(t)$ = Accumulated pervious runoff for time step t
If $(P_a(t))$ is $\leq 0.2Sp$ then use: $R_{ap}(t) = 0.0$
If $(P_a(t))$ is $> 0.2Sp$ then use:
 $R_{ap}(t) = (Col.(4) - 0.2Sp)^2 / (Col.(4) + 0.8Sp)$
Column (6) $R_{ip}(t)$ = Incremental pervious runoff for time step t
 $R_{ip}(t) = R_{ap}(t) - R_{ap}(t-1)$
 $R_{ip}(t) = Col.(5)$ for current row - $Col.(5)$ for preceding row.

Impervious Area Runoff

Column (7 & 8)... Did not specify to use impervious areas.

Incremental Weighted Runoff

Column (9) $R(t) = (A_p/A_t) \times R_{ip}(t) + (A_i/A_t) \times R_{ii}(t)$
 $R(t) = (A_p/A_t) \times Col.(6) + (A_i/A_t) \times Col.(8)$

SCS Unit Hydrograph Method

Column (10) $Q(t)$ is computed with the SCS unit hydrograph method using $R(t)$ and $Q_u(t)$.

Subsection: Unit Hydrograph Summary
 Label: IMP - POI-1
 Scenario: ESSEX CO. 2-YR (PROJ)

Return Event: 2 years
 Storm Event: ESSEX CO. 2-YR (PROJ)

Storm Event	ESSEX CO. 2-YR (PROJ)
Return Event	2 years
Duration	24.000 hours
Depth	4.1 in
Time of Concentration (Composite)	0.083 hours
Area (User Defined)	3,823.00 ft ²
Computational Time Increment	0.011 hours
Time to Peak (Computed)	12.111 hours
Flow (Peak, Computed)	0.35 ft ³ /s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	12.100 hours
Flow (Peak Interpolated Output)	0.35 ft ³ /s
Drainage Area	
SCS CN (Composite)	98.000
Area (User Defined)	3,823.00 ft ²
Maximum Retention (Pervious)	0.2 in
Maximum Retention (Pervious, 20 percent)	0.0 in
Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	3.9 in
Runoff Volume (Pervious)	0.028 ac-ft
Hydrograph Volume (Area under Hydrograph curve)	
Volume	0.028 ac-ft
SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.083 hours
Computational Time Increment	0.011 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	1.19 ft ³ /s

Subsection: Unit Hydrograph Summary
Label: IMP - POI-1
Scenario: ESSEX CO. 2-YR (PROJ)

Return Event: 2 years
Storm Event: ESSEX CO. 2-YR (PROJ)

SCS Unit Hydrograph Parameters	
Unit peak time, Tp	0.056 hours
Unit receding limb, Tr	0.222 hours
Total unit time, Tb	0.278 hours

Subsection: Unit Hydrograph (Hydrograph Table)
 Label: IMP - POI-1
 Scenario: ESSEX CO. 2-YR (PROJ)

Return Event: 2 years
 Storm Event: ESSEX CO. 2-YR (PROJ)

Storm Event	ESSEX CO. 2-YR (PROJ)
Return Event	2 years
Duration	24.000 hours
Depth	4.1 in
Time of Concentration (Composite)	0.083 hours
Area (User Defined)	3,823.00 ft ²

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
1.500	0.00	0.00	0.00	0.00	0.00
1.750	0.00	0.00	0.00	0.00	0.00
2.000	0.00	0.00	0.00	0.00	0.00
2.250	0.00	0.00	0.00	0.00	0.00
2.500	0.00	0.00	0.00	0.00	0.00
2.750	0.00	0.00	0.00	0.00	0.00
3.000	0.00	0.00	0.00	0.00	0.00
3.250	0.00	0.00	0.00	0.00	0.00
3.500	0.00	0.00	0.00	0.00	0.00
3.750	0.00	0.00	0.00	0.00	0.00
4.000	0.00	0.00	0.00	0.00	0.00
4.250	0.00	0.00	0.00	0.00	0.00
4.500	0.00	0.00	0.00	0.00	0.00
4.750	0.00	0.00	0.00	0.00	0.00
5.000	0.00	0.00	0.00	0.00	0.00
5.250	0.00	0.00	0.00	0.00	0.00
5.500	0.00	0.01	0.01	0.01	0.01
5.750	0.01	0.01	0.01	0.01	0.01
6.000	0.01	0.01	0.01	0.01	0.01
6.250	0.01	0.01	0.01	0.01	0.01
6.500	0.01	0.01	0.01	0.01	0.01
6.750	0.01	0.01	0.01	0.01	0.01
7.000	0.01	0.01	0.01	0.01	0.01
7.250	0.01	0.01	0.01	0.01	0.01
7.500	0.01	0.01	0.01	0.01	0.01
7.750	0.01	0.01	0.01	0.01	0.01
8.000	0.01	0.01	0.01	0.01	0.01
8.250	0.01	0.01	0.01	0.01	0.01
8.500	0.01	0.01	0.01	0.01	0.01
8.750	0.01	0.01	0.01	0.01	0.01
9.000	0.01	0.01	0.01	0.01	0.01
9.250	0.01	0.01	0.01	0.01	0.01
9.500	0.01	0.01	0.01	0.01	0.01

Subsection: Unit Hydrograph (Hydrograph Table)
 Label: IMP - POI-1
 Scenario: ESSEX CO. 2-YR (PROJ)

Return Event: 2 years
 Storm Event: ESSEX CO. 2-YR (PROJ)

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
9.750	0.01	0.01	0.02	0.02	0.02
10.000	0.02	0.02	0.02	0.02	0.02
10.250	0.02	0.02	0.02	0.02	0.02
10.500	0.02	0.02	0.02	0.02	0.02
10.750	0.02	0.02	0.03	0.03	0.03
11.000	0.03	0.03	0.03	0.03	0.04
11.250	0.04	0.04	0.04	0.04	0.05
11.500	0.05	0.05	0.06	0.07	0.07
11.750	0.08	0.09	0.11	0.12	0.16
12.000	0.21	0.28	0.35	0.28	0.17
12.250	0.13	0.10	0.09	0.07	0.07
12.500	0.07	0.06	0.05	0.05	0.05
12.750	0.04	0.04	0.04	0.04	0.04
13.000	0.03	0.03	0.03	0.03	0.03
13.250	0.03	0.03	0.03	0.02	0.02
13.500	0.02	0.02	0.02	0.02	0.02
13.750	0.02	0.02	0.02	0.02	0.02
14.000	0.02	0.02	0.02	0.02	0.02
14.250	0.02	0.02	0.02	0.02	0.01
14.500	0.01	0.01	0.01	0.01	0.01
14.750	0.01	0.01	0.01	0.01	0.01
15.000	0.01	0.01	0.01	0.01	0.01
15.250	0.01	0.01	0.01	0.01	0.01
15.500	0.01	0.01	0.01	0.01	0.01
15.750	0.01	0.01	0.01	0.01	0.01
16.000	0.01	0.01	0.01	0.01	0.01
16.250	0.01	0.01	0.01	0.01	0.01
16.500	0.01	0.01	0.01	0.01	0.01
16.750	0.01	0.01	0.01	0.01	0.01
17.000	0.01	0.01	0.01	0.01	0.01
17.250	0.01	0.01	0.01	0.01	0.01
17.500	0.01	0.01	0.01	0.01	0.01
17.750	0.01	0.01	0.01	0.01	0.01
18.000	0.01	0.01	0.01	0.01	0.01
18.250	0.01	0.01	0.01	0.01	0.01
18.500	0.01	0.01	0.01	0.01	0.01
18.750	0.01	0.01	0.01	0.01	0.01
19.000	0.01	0.01	0.01	0.01	0.01
19.250	0.01	0.01	0.01	0.01	0.01
19.500	0.01	0.01	0.01	0.01	0.01
19.750	0.01	0.01	0.01	0.01	0.01
20.000	0.01	0.01	0.01	0.01	0.01
20.250	0.01	0.01	0.01	0.01	0.01

Subsection: Unit Hydrograph (Hydrograph Table)
 Label: IMP - POI-1
 Scenario: ESSEX CO. 2-YR (PROJ)

Return Event: 2 years
 Storm Event: ESSEX CO. 2-YR (PROJ)

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
20.500	0.01	0.01	0.01	0.01	0.01
20.750	0.01	0.01	0.01	0.01	0.01
21.000	0.01	0.01	0.01	0.01	0.01
21.250	0.01	0.01	0.01	0.01	0.00
21.500	0.00	0.00	0.00	0.00	0.00
21.750	0.00	0.00	0.00	0.00	0.00
22.000	0.00	0.00	0.00	0.00	0.00
22.250	0.00	0.00	0.00	0.00	0.00
22.500	0.00	0.00	0.00	0.00	0.00
22.750	0.00	0.00	0.00	0.00	0.00
23.000	0.00	0.00	0.00	0.00	0.00
23.250	0.00	0.00	0.00	0.00	0.00
23.500	0.00	0.00	0.00	0.00	0.00
23.750	0.00	0.00	0.00	0.00	0.00
24.000	0.00	(N/A)	(N/A)	(N/A)	(N/A)

Subsection: Unit Hydrograph Summary
 Label: IMP - POI-1
 Scenario: ESSEX CO. 10-YR (PROJ)

Return Event: 10 years
 Storm Event: ESSEX CO. 10-YR (PROJ)

Storm Event	ESSEX CO. 10-YR (PROJ)
Return Event	10 years
Duration	24.000 hours
Depth	6.4 in
Time of Concentration (Composite)	0.083 hours
Area (User Defined)	3,823.00 ft ²
Computational Time Increment	0.011 hours
Time to Peak (Computed)	12.111 hours
Flow (Peak, Computed)	0.55 ft ³ /s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	12.100 hours
Flow (Peak Interpolated Output)	0.55 ft ³ /s
Drainage Area	
SCS CN (Composite)	98.000
Area (User Defined)	3,823.00 ft ²
Maximum Retention (Pervious)	0.2 in
Maximum Retention (Pervious, 20 percent)	0.0 in
Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	6.1 in
Runoff Volume (Pervious)	0.045 ac-ft
Hydrograph Volume (Area under Hydrograph curve)	
Volume	0.045 ac-ft
SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.083 hours
Computational Time Increment	0.011 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	1.19 ft ³ /s

Subsection: Unit Hydrograph Summary
Label: IMP - POI-1
Scenario: ESSEX CO. 10-YR (PROJ)

Return Event: 10 years
Storm Event: ESSEX CO. 10-YR (PROJ)

SCS Unit Hydrograph Parameters	
Unit peak time, T_p	0.056 hours
Unit receding limb, T_r	0.222 hours
Total unit time, T_b	0.278 hours

Subsection: Unit Hydrograph (Hydrograph Table)
 Label: IMP - POI-1
 Scenario: ESSEX CO. 10-YR (PROJ)

Return Event: 10 years
 Storm Event: ESSEX CO. 10-YR (PROJ)

Storm Event	ESSEX CO. 10-YR (PROJ)
Return Event	10 years
Duration	24.000 hours
Depth	6.4 in
Time of Concentration (Composite)	0.083 hours
Area (User Defined)	3,823.00 ft ²

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
0.850	0.00	0.00	0.00	0.00	0.00
1.100	0.00	0.00	0.00	0.00	0.00
1.350	0.00	0.00	0.00	0.00	0.00
1.600	0.00	0.00	0.00	0.00	0.00
1.850	0.00	0.00	0.00	0.00	0.00
2.100	0.00	0.00	0.00	0.00	0.00
2.350	0.00	0.00	0.01	0.01	0.01
2.600	0.01	0.01	0.01	0.01	0.01
2.850	0.01	0.01	0.01	0.01	0.01
3.100	0.01	0.01	0.01	0.01	0.01
3.350	0.01	0.01	0.01	0.01	0.01
3.600	0.01	0.01	0.01	0.01	0.01
3.850	0.01	0.01	0.01	0.01	0.01
4.100	0.01	0.01	0.01	0.01	0.01
4.350	0.01	0.01	0.01	0.01	0.01
4.600	0.01	0.01	0.01	0.01	0.01
4.850	0.01	0.01	0.01	0.01	0.01
5.100	0.01	0.01	0.01	0.01	0.01
5.350	0.01	0.01	0.01	0.01	0.01
5.600	0.01	0.01	0.01	0.01	0.01
5.850	0.01	0.01	0.01	0.01	0.01
6.100	0.01	0.01	0.01	0.01	0.01
6.350	0.01	0.01	0.01	0.01	0.01
6.600	0.01	0.01	0.01	0.01	0.01
6.850	0.01	0.01	0.01	0.01	0.01
7.100	0.01	0.01	0.01	0.01	0.01
7.350	0.01	0.01	0.01	0.01	0.01
7.600	0.01	0.01	0.01	0.01	0.01
7.850	0.01	0.01	0.01	0.01	0.01
8.100	0.01	0.01	0.01	0.01	0.01
8.350	0.02	0.02	0.02	0.02	0.02
8.600	0.02	0.02	0.02	0.02	0.02
8.850	0.02	0.02	0.02	0.02	0.02

Subsection: Unit Hydrograph (Hydrograph Table)
 Label: IMP - POI-1
 Scenario: ESSEX CO. 10-YR (PROJ)

Return Event: 10 years
 Storm Event: ESSEX CO. 10-YR (PROJ)

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
9.100	0.02	0.02	0.02	0.02	0.02
9.350	0.02	0.02	0.02	0.02	0.02
9.600	0.02	0.02	0.02	0.02	0.02
9.850	0.02	0.02	0.03	0.03	0.03
10.100	0.03	0.03	0.03	0.03	0.03
10.350	0.03	0.03	0.03	0.03	0.03
10.600	0.03	0.03	0.04	0.04	0.04
10.850	0.04	0.04	0.04	0.05	0.05
11.100	0.05	0.05	0.06	0.06	0.06
11.350	0.07	0.07	0.07	0.07	0.08
11.600	0.10	0.10	0.11	0.12	0.14
11.850	0.17	0.19	0.26	0.33	0.43
12.100	0.55	0.43	0.26	0.20	0.16
12.350	0.13	0.11	0.11	0.10	0.09
12.600	0.08	0.07	0.07	0.07	0.07
12.850	0.06	0.06	0.06	0.05	0.05
13.100	0.05	0.05	0.04	0.04	0.04
13.350	0.04	0.04	0.04	0.03	0.03
13.600	0.03	0.03	0.03	0.03	0.03
13.850	0.03	0.03	0.03	0.03	0.03
14.100	0.03	0.03	0.03	0.03	0.02
14.350	0.02	0.02	0.02	0.02	0.02
14.600	0.02	0.02	0.02	0.02	0.02
14.850	0.02	0.02	0.02	0.02	0.02
15.100	0.02	0.02	0.02	0.02	0.02
15.350	0.02	0.02	0.02	0.02	0.02
15.600	0.02	0.02	0.02	0.02	0.02
15.850	0.02	0.02	0.02	0.02	0.02
16.100	0.01	0.01	0.01	0.01	0.01
16.350	0.01	0.01	0.01	0.01	0.01
16.600	0.01	0.01	0.01	0.01	0.01
16.850	0.01	0.01	0.01	0.01	0.01
17.100	0.01	0.01	0.01	0.01	0.01
17.350	0.01	0.01	0.01	0.01	0.01
17.600	0.01	0.01	0.01	0.01	0.01
17.850	0.01	0.01	0.01	0.01	0.01
18.100	0.01	0.01	0.01	0.01	0.01
18.350	0.01	0.01	0.01	0.01	0.01
18.600	0.01	0.01	0.01	0.01	0.01
18.850	0.01	0.01	0.01	0.01	0.01
19.100	0.01	0.01	0.01	0.01	0.01
19.350	0.01	0.01	0.01	0.01	0.01
19.600	0.01	0.01	0.01	0.01	0.01

Subsection: Unit Hydrograph (Hydrograph Table)
 Label: IMP - POI-1
 Scenario: ESSEX CO. 10-YR (PROJ)

Return Event: 10 years
 Storm Event: ESSEX CO. 10-YR (PROJ)

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
19.850	0.01	0.01	0.01	0.01	0.01
20.100	0.01	0.01	0.01	0.01	0.01
20.350	0.01	0.01	0.01	0.01	0.01
20.600	0.01	0.01	0.01	0.01	0.01
20.850	0.01	0.01	0.01	0.01	0.01
21.100	0.01	0.01	0.01	0.01	0.01
21.350	0.01	0.01	0.01	0.01	0.01
21.600	0.01	0.01	0.01	0.01	0.01
21.850	0.01	0.01	0.01	0.01	0.01
22.100	0.01	0.01	0.01	0.01	0.01
22.350	0.01	0.01	0.01	0.01	0.01
22.600	0.01	0.01	0.01	0.01	0.01
22.850	0.01	0.01	0.01	0.01	0.01
23.100	0.01	0.01	0.01	0.01	0.01
23.350	0.01	0.01	0.01	0.01	0.01
23.600	0.01	0.01	0.01	0.01	0.01
23.850	0.01	0.01	0.01	0.01	(N/A)

Subsection: Unit Hydrograph Summary
 Label: IMP - POI-1
 Scenario: ESSEX CO. 100-YR (PROJ)

Return Event: 100 years
 Storm Event: ESSEX CO. 100-YR (PROJ)

Storm Event	ESSEX CO. 100-YR (PROJ)
Return Event	100 years
Duration	24.000 hours
Depth	11.5 in
Time of Concentration (Composite)	0.083 hours
Area (User Defined)	3,823.00 ft ²
Computational Time Increment	0.011 hours
Time to Peak (Computed)	12.111 hours
Flow (Peak, Computed)	1.00 ft ³ /s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	12.100 hours
Flow (Peak Interpolated Output)	1.00 ft ³ /s
Drainage Area	
SCS CN (Composite)	98.000
Area (User Defined)	3,823.00 ft ²
Maximum Retention (Pervious)	0.2 in
Maximum Retention (Pervious, 20 percent)	0.0 in
Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	11.3 in
Runoff Volume (Pervious)	0.082 ac-ft
Hydrograph Volume (Area under Hydrograph curve)	
Volume	0.082 ac-ft
SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.083 hours
Computational Time Increment	0.011 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	1.19 ft ³ /s

Subsection: Unit Hydrograph Summary
Label: IMP - POI-1
Scenario: ESSEX CO. 100-YR (PROJ)

Return Event: 100 years
Storm Event: ESSEX CO. 100-YR (PROJ)

SCS Unit Hydrograph Parameters	
Unit peak time, Tp	0.056 hours
Unit receding limb, Tr	0.222 hours
Total unit time, Tb	0.278 hours

Subsection: Unit Hydrograph (Hydrograph Table)
 Label: IMP - POI-1
 Scenario: ESSEX CO. 100-YR (PROJ)

Return Event: 100 years
 Storm Event: ESSEX CO. 100-YR (PROJ)

Storm Event	ESSEX CO. 100-YR (PROJ)
Return Event	100 years
Duration	24.000 hours
Depth	11.5 in
Time of Concentration (Composite)	0.083 hours
Area (User Defined)	3,823.00 ft ²

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
0.450	0.00	0.00	0.00	0.00	0.00
0.700	0.00	0.00	0.00	0.00	0.01
0.950	0.01	0.01	0.01	0.01	0.01
1.200	0.01	0.01	0.01	0.01	0.01
1.450	0.01	0.01	0.01	0.01	0.01
1.700	0.01	0.01	0.01	0.01	0.01
1.950	0.01	0.01	0.01	0.01	0.01
2.200	0.01	0.01	0.01	0.01	0.01
2.450	0.01	0.01	0.01	0.01	0.01
2.700	0.01	0.01	0.01	0.01	0.01
2.950	0.01	0.01	0.01	0.01	0.01
3.200	0.01	0.01	0.01	0.01	0.01
3.450	0.01	0.01	0.01	0.01	0.01
3.700	0.01	0.01	0.01	0.01	0.01
3.950	0.01	0.01	0.01	0.01	0.01
4.200	0.01	0.01	0.01	0.01	0.02
4.450	0.02	0.02	0.02	0.02	0.02
4.700	0.02	0.02	0.02	0.02	0.02
4.950	0.02	0.02	0.02	0.02	0.02
5.200	0.02	0.02	0.02	0.02	0.02
5.450	0.02	0.02	0.02	0.02	0.02
5.700	0.02	0.02	0.02	0.02	0.02
5.950	0.02	0.02	0.02	0.02	0.02
6.200	0.02	0.02	0.02	0.02	0.02
6.450	0.02	0.02	0.02	0.02	0.02
6.700	0.02	0.02	0.02	0.02	0.02
6.950	0.02	0.02	0.02	0.02	0.02
7.200	0.02	0.02	0.02	0.02	0.02
7.450	0.02	0.02	0.02	0.02	0.02
7.700	0.03	0.03	0.03	0.03	0.03
7.950	0.03	0.03	0.03	0.03	0.03
8.200	0.03	0.03	0.03	0.03	0.03
8.450	0.03	0.03	0.03	0.03	0.03

Subsection: Unit Hydrograph (Hydrograph Table)
 Label: IMP - POI-1
 Scenario: ESSEX CO. 100-YR (PROJ)

Return Event: 100 years
 Storm Event: ESSEX CO. 100-YR (PROJ)

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
8.700	0.03	0.03	0.03	0.03	0.03
8.950	0.03	0.03	0.03	0.03	0.03
9.200	0.03	0.03	0.04	0.04	0.04
9.450	0.04	0.04	0.04	0.04	0.04
9.700	0.04	0.04	0.04	0.04	0.05
9.950	0.05	0.05	0.05	0.05	0.05
10.200	0.05	0.05	0.05	0.05	0.05
10.450	0.05	0.06	0.06	0.06	0.06
10.700	0.07	0.07	0.07	0.08	0.08
10.950	0.08	0.08	0.09	0.09	0.10
11.200	0.10	0.11	0.11	0.12	0.12
11.450	0.13	0.13	0.15	0.18	0.19
11.700	0.19	0.22	0.25	0.30	0.35
11.950	0.47	0.60	0.79	1.00	0.79
12.200	0.47	0.35	0.29	0.24	0.21
12.450	0.19	0.19	0.17	0.14	0.13
12.700	0.13	0.12	0.12	0.11	0.11
12.950	0.10	0.10	0.09	0.09	0.08
13.200	0.08	0.08	0.07	0.07	0.07
13.450	0.07	0.06	0.06	0.06	0.06
13.700	0.05	0.05	0.05	0.05	0.05
13.950	0.05	0.05	0.05	0.05	0.05
14.200	0.05	0.05	0.04	0.04	0.04
14.450	0.04	0.04	0.04	0.04	0.04
14.700	0.04	0.04	0.04	0.04	0.03
14.950	0.03	0.03	0.03	0.03	0.03
15.200	0.03	0.03	0.03	0.03	0.03
15.450	0.03	0.03	0.03	0.03	0.03
15.700	0.03	0.03	0.03	0.03	0.03
15.950	0.03	0.03	0.03	0.03	0.03
16.200	0.03	0.03	0.03	0.03	0.03
16.450	0.03	0.03	0.02	0.02	0.02
16.700	0.02	0.02	0.02	0.02	0.02
16.950	0.02	0.02	0.02	0.02	0.02
17.200	0.02	0.02	0.02	0.02	0.02
17.450	0.02	0.02	0.02	0.02	0.02
17.700	0.02	0.02	0.02	0.02	0.02
17.950	0.02	0.02	0.02	0.02	0.02
18.200	0.02	0.02	0.02	0.02	0.02
18.450	0.02	0.02	0.02	0.02	0.02
18.700	0.02	0.02	0.02	0.02	0.02
18.950	0.02	0.02	0.02	0.02	0.02
19.200	0.02	0.02	0.02	0.02	0.02

Subsection: Unit Hydrograph (Hydrograph Table)
 Label: IMP - POI-1
 Scenario: ESSEX CO. 100-YR (PROJ)

Return Event: 100 years
 Storm Event: ESSEX CO. 100-YR (PROJ)

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
19.450	0.02	0.02	0.02	0.02	0.02
19.700	0.02	0.02	0.02	0.02	0.02
19.950	0.02	0.02	0.02	0.02	0.02
20.200	0.02	0.02	0.02	0.02	0.02
20.450	0.02	0.02	0.02	0.02	0.02
20.700	0.01	0.01	0.01	0.01	0.01
20.950	0.01	0.01	0.01	0.01	0.01
21.200	0.01	0.01	0.01	0.01	0.01
21.450	0.01	0.01	0.01	0.01	0.01
21.700	0.01	0.01	0.01	0.01	0.01
21.950	0.01	0.01	0.01	0.01	0.01
22.200	0.01	0.01	0.01	0.01	0.01
22.450	0.01	0.01	0.01	0.01	0.01
22.700	0.01	0.01	0.01	0.01	0.01
22.950	0.01	0.01	0.01	0.01	0.01
23.200	0.01	0.01	0.01	0.01	0.01
23.450	0.01	0.01	0.01	0.01	0.01
23.700	0.01	0.01	0.01	0.01	0.01
23.950	0.01	0.01	(N/A)	(N/A)	(N/A)

Subsection: Unit Hydrograph Summary
 Label: IMP - POI-3
 Scenario: ESSEX CO. 2-YR (PROJ)

Return Event: 2 years
 Storm Event: ESSEX CO. 2-YR (PROJ)

Storm Event	ESSEX CO. 2-YR (PROJ)
Return Event	2 years
Duration	24.000 hours
Depth	4.1 in
Time of Concentration (Composite)	0.083 hours
Area (User Defined)	1,370.00 ft ²
Computational Time Increment	0.011 hours
Time to Peak (Computed)	12.111 hours
Flow (Peak, Computed)	0.13 ft ³ /s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	12.100 hours
Flow (Peak Interpolated Output)	0.13 ft ³ /s
Drainage Area	
SCS CN (Composite)	98.000
Area (User Defined)	1,370.00 ft ²
Maximum Retention (Pervious)	0.2 in
Maximum Retention (Pervious, 20 percent)	0.0 in
Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	3.9 in
Runoff Volume (Pervious)	0.010 ac-ft
Hydrograph Volume (Area under Hydrograph curve)	
Volume	0.010 ac-ft
SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.083 hours
Computational Time Increment	0.011 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	0.43 ft ³ /s

Subsection: Unit Hydrograph Summary
Label: IMP - POI-3
Scenario: ESSEX CO. 2-YR (PROJ)

Return Event: 2 years
Storm Event: ESSEX CO. 2-YR (PROJ)

SCS Unit Hydrograph Parameters	
Unit peak time, Tp	0.056 hours
Unit receding limb, Tr	0.222 hours
Total unit time, Tb	0.278 hours

Subsection: Unit Hydrograph (Hydrograph Table)
 Label: IMP - POI-3
 Scenario: ESSEX CO. 2-YR (PROJ)

Return Event: 2 years
 Storm Event: ESSEX CO. 2-YR (PROJ)

Storm Event	ESSEX CO. 2-YR (PROJ)
Return Event	2 years
Duration	24.000 hours
Depth	4.1 in
Time of Concentration (Composite)	0.083 hours
Area (User Defined)	1,370.00 ft ²

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
2.950	0.00	0.00	0.00	0.00	0.00
3.200	0.00	0.00	0.00	0.00	0.00
3.450	0.00	0.00	0.00	0.00	0.00
3.700	0.00	0.00	0.00	0.00	0.00
3.950	0.00	0.00	0.00	0.00	0.00
4.200	0.00	0.00	0.00	0.00	0.00
4.450	0.00	0.00	0.00	0.00	0.00
4.700	0.00	0.00	0.00	0.00	0.00
4.950	0.00	0.00	0.00	0.00	0.00
5.200	0.00	0.00	0.00	0.00	0.00
5.450	0.00	0.00	0.00	0.00	0.00
5.700	0.00	0.00	0.00	0.00	0.00
5.950	0.00	0.00	0.00	0.00	0.00
6.200	0.00	0.00	0.00	0.00	0.00
6.450	0.00	0.00	0.00	0.00	0.00
6.700	0.00	0.00	0.00	0.00	0.00
6.950	0.00	0.00	0.00	0.00	0.00
7.200	0.00	0.00	0.00	0.00	0.00
7.450	0.00	0.00	0.00	0.00	0.00
7.700	0.00	0.00	0.00	0.00	0.00
7.950	0.00	0.00	0.00	0.00	0.00
8.200	0.00	0.00	0.00	0.00	0.00
8.450	0.00	0.00	0.00	0.00	0.00
8.700	0.00	0.00	0.00	0.00	0.00
8.950	0.00	0.00	0.00	0.00	0.00
9.200	0.00	0.00	0.00	0.00	0.00
9.450	0.00	0.00	0.00	0.00	0.01
9.700	0.01	0.01	0.01	0.01	0.01
9.950	0.01	0.01	0.01	0.01	0.01
10.200	0.01	0.01	0.01	0.01	0.01
10.450	0.01	0.01	0.01	0.01	0.01
10.700	0.01	0.01	0.01	0.01	0.01
10.950	0.01	0.01	0.01	0.01	0.01

Subsection: Unit Hydrograph (Hydrograph Table)
 Label: IMP - POI-3
 Scenario: ESSEX CO. 2-YR (PROJ)

Return Event: 2 years
 Storm Event: ESSEX CO. 2-YR (PROJ)

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
11.200	0.01	0.01	0.01	0.01	0.02
11.450	0.02	0.02	0.02	0.02	0.02
11.700	0.02	0.03	0.03	0.04	0.04
11.950	0.06	0.08	0.10	0.13	0.10
12.200	0.06	0.04	0.04	0.03	0.03
12.450	0.02	0.02	0.02	0.02	0.02
12.700	0.02	0.02	0.01	0.01	0.01
12.950	0.01	0.01	0.01	0.01	0.01
13.200	0.01	0.01	0.01	0.01	0.01
13.450	0.01	0.01	0.01	0.01	0.01
13.700	0.01	0.01	0.01	0.01	0.01
13.950	0.01	0.01	0.01	0.01	0.01
14.200	0.01	0.01	0.01	0.01	0.01
14.450	0.01	0.01	0.01	0.01	0.00
14.700	0.00	0.00	0.00	0.00	0.00
14.950	0.00	0.00	0.00	0.00	0.00
15.200	0.00	0.00	0.00	0.00	0.00
15.450	0.00	0.00	0.00	0.00	0.00
15.700	0.00	0.00	0.00	0.00	0.00
15.950	0.00	0.00	0.00	0.00	0.00
16.200	0.00	0.00	0.00	0.00	0.00
16.450	0.00	0.00	0.00	0.00	0.00
16.700	0.00	0.00	0.00	0.00	0.00
16.950	0.00	0.00	0.00	0.00	0.00
17.200	0.00	0.00	0.00	0.00	0.00
17.450	0.00	0.00	0.00	0.00	0.00
17.700	0.00	0.00	0.00	0.00	0.00
17.950	0.00	0.00	0.00	0.00	0.00
18.200	0.00	0.00	0.00	0.00	0.00
18.450	0.00	0.00	0.00	0.00	0.00
18.700	0.00	0.00	0.00	0.00	0.00
18.950	0.00	0.00	0.00	0.00	0.00
19.200	0.00	0.00	0.00	0.00	0.00
19.450	0.00	0.00	0.00	0.00	0.00
19.700	0.00	0.00	0.00	0.00	0.00
19.950	0.00	0.00	0.00	0.00	0.00
20.200	0.00	0.00	0.00	0.00	0.00
20.450	0.00	0.00	0.00	0.00	0.00
20.700	0.00	0.00	0.00	0.00	0.00
20.950	0.00	0.00	0.00	0.00	0.00
21.200	0.00	0.00	0.00	0.00	0.00
21.450	0.00	0.00	0.00	0.00	0.00
21.700	0.00	0.00	0.00	0.00	0.00

Subsection: Unit Hydrograph (Hydrograph Table)
 Label: IMP - POI-3
 Scenario: ESSEX CO. 2-YR (PROJ)

Return Event: 2 years
 Storm Event: ESSEX CO. 2-YR (PROJ)

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
21.950	0.00	0.00	0.00	0.00	0.00
22.200	0.00	0.00	0.00	0.00	0.00
22.450	0.00	0.00	0.00	0.00	0.00
22.700	0.00	0.00	0.00	0.00	0.00
22.950	0.00	0.00	0.00	0.00	0.00
23.200	0.00	0.00	0.00	0.00	0.00
23.450	0.00	0.00	0.00	0.00	0.00
23.700	0.00	0.00	0.00	0.00	0.00
23.950	0.00	0.00	(N/A)	(N/A)	(N/A)

Subsection: Unit Hydrograph Summary
 Label: IMP - POI-3
 Scenario: ESSEX CO. 10-YR (PROJ)

Return Event: 10 years
 Storm Event: ESSEX CO. 10-YR (PROJ)

Storm Event	ESSEX CO. 10-YR (PROJ)
Return Event	10 years
Duration	24.000 hours
Depth	6.4 in
Time of Concentration (Composite)	0.083 hours
Area (User Defined)	1,370.00 ft ²
Computational Time Increment	0.011 hours
Time to Peak (Computed)	12.111 hours
Flow (Peak, Computed)	0.20 ft ³ /s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	12.100 hours
Flow (Peak Interpolated Output)	0.20 ft ³ /s
Drainage Area	
SCS CN (Composite)	98.000
Area (User Defined)	1,370.00 ft ²
Maximum Retention (Pervious)	0.2 in
Maximum Retention (Pervious, 20 percent)	0.0 in
Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	6.1 in
Runoff Volume (Pervious)	0.016 ac-ft
Hydrograph Volume (Area under Hydrograph curve)	
Volume	0.016 ac-ft
SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.083 hours
Computational Time Increment	0.011 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	0.43 ft ³ /s

Subsection: Unit Hydrograph Summary
Label: IMP - POI-3
Scenario: ESSEX CO. 10-YR (PROJ)

Return Event: 10 years
Storm Event: ESSEX CO. 10-YR (PROJ)

SCS Unit Hydrograph Parameters	
Unit peak time, T_p	0.056 hours
Unit receding limb, T_r	0.222 hours
Total unit time, T_b	0.278 hours

Subsection: Unit Hydrograph (Hydrograph Table)
 Label: IMP - POI-3
 Scenario: ESSEX CO. 10-YR (PROJ)

Return Event: 10 years
 Storm Event: ESSEX CO. 10-YR (PROJ)

Storm Event	ESSEX CO. 10-YR (PROJ)
Return Event	10 years
Duration	24.000 hours
Depth	6.4 in
Time of Concentration (Composite)	0.083 hours
Area (User Defined)	1,370.00 ft ²

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
1.450	0.00	0.00	0.00	0.00	0.00
1.700	0.00	0.00	0.00	0.00	0.00
1.950	0.00	0.00	0.00	0.00	0.00
2.200	0.00	0.00	0.00	0.00	0.00
2.450	0.00	0.00	0.00	0.00	0.00
2.700	0.00	0.00	0.00	0.00	0.00
2.950	0.00	0.00	0.00	0.00	0.00
3.200	0.00	0.00	0.00	0.00	0.00
3.450	0.00	0.00	0.00	0.00	0.00
3.700	0.00	0.00	0.00	0.00	0.00
3.950	0.00	0.00	0.00	0.00	0.00
4.200	0.00	0.00	0.00	0.00	0.00
4.450	0.00	0.00	0.00	0.00	0.00
4.700	0.00	0.00	0.00	0.00	0.00
4.950	0.00	0.00	0.00	0.00	0.00
5.200	0.00	0.00	0.00	0.00	0.00
5.450	0.00	0.00	0.00	0.00	0.00
5.700	0.00	0.00	0.00	0.00	0.00
5.950	0.00	0.00	0.00	0.00	0.00
6.200	0.00	0.00	0.00	0.00	0.00
6.450	0.00	0.00	0.00	0.00	0.00
6.700	0.00	0.00	0.00	0.00	0.00
6.950	0.00	0.00	0.00	0.00	0.00
7.200	0.00	0.00	0.00	0.00	0.00
7.450	0.00	0.00	0.00	0.00	0.00
7.700	0.00	0.00	0.00	0.00	0.00
7.950	0.01	0.01	0.01	0.01	0.01
8.200	0.01	0.01	0.01	0.01	0.01
8.450	0.01	0.01	0.01	0.01	0.01
8.700	0.01	0.01	0.01	0.01	0.01
8.950	0.01	0.01	0.01	0.01	0.01
9.200	0.01	0.01	0.01	0.01	0.01
9.450	0.01	0.01	0.01	0.01	0.01

Subsection: Unit Hydrograph (Hydrograph Table)
 Label: IMP - POI-3
 Scenario: ESSEX CO. 10-YR (PROJ)

Return Event: 10 years
 Storm Event: ESSEX CO. 10-YR (PROJ)

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
9.700	0.01	0.01	0.01	0.01	0.01
9.950	0.01	0.01	0.01	0.01	0.01
10.200	0.01	0.01	0.01	0.01	0.01
10.450	0.01	0.01	0.01	0.01	0.01
10.700	0.01	0.01	0.01	0.01	0.02
10.950	0.02	0.02	0.02	0.02	0.02
11.200	0.02	0.02	0.02	0.02	0.02
11.450	0.03	0.03	0.03	0.03	0.04
11.700	0.04	0.04	0.05	0.06	0.07
11.950	0.09	0.12	0.16	0.20	0.16
12.200	0.09	0.07	0.06	0.05	0.04
12.450	0.04	0.04	0.03	0.03	0.03
12.700	0.03	0.02	0.02	0.02	0.02
12.950	0.02	0.02	0.02	0.02	0.02
13.200	0.02	0.02	0.01	0.01	0.01
13.450	0.01	0.01	0.01	0.01	0.01
13.700	0.01	0.01	0.01	0.01	0.01
13.950	0.01	0.01	0.01	0.01	0.01
14.200	0.01	0.01	0.01	0.01	0.01
14.450	0.01	0.01	0.01	0.01	0.01
14.700	0.01	0.01	0.01	0.01	0.01
14.950	0.01	0.01	0.01	0.01	0.01
15.200	0.01	0.01	0.01	0.01	0.01
15.450	0.01	0.01	0.01	0.01	0.01
15.700	0.01	0.01	0.01	0.01	0.01
15.950	0.01	0.01	0.01	0.01	0.01
16.200	0.01	0.01	0.01	0.01	0.01
16.450	0.01	0.00	0.00	0.00	0.00
16.700	0.00	0.00	0.00	0.00	0.00
16.950	0.00	0.00	0.00	0.00	0.00
17.200	0.00	0.00	0.00	0.00	0.00
17.450	0.00	0.00	0.00	0.00	0.00
17.700	0.00	0.00	0.00	0.00	0.00
17.950	0.00	0.00	0.00	0.00	0.00
18.200	0.00	0.00	0.00	0.00	0.00
18.450	0.00	0.00	0.00	0.00	0.00
18.700	0.00	0.00	0.00	0.00	0.00
18.950	0.00	0.00	0.00	0.00	0.00
19.200	0.00	0.00	0.00	0.00	0.00
19.450	0.00	0.00	0.00	0.00	0.00
19.700	0.00	0.00	0.00	0.00	0.00
19.950	0.00	0.00	0.00	0.00	0.00
20.200	0.00	0.00	0.00	0.00	0.00

Subsection: Unit Hydrograph (Hydrograph Table)
 Label: IMP - POI-3
 Scenario: ESSEX CO. 10-YR (PROJ)

Return Event: 10 years
 Storm Event: ESSEX CO. 10-YR (PROJ)

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
20.450	0.00	0.00	0.00	0.00	0.00
20.700	0.00	0.00	0.00	0.00	0.00
20.950	0.00	0.00	0.00	0.00	0.00
21.200	0.00	0.00	0.00	0.00	0.00
21.450	0.00	0.00	0.00	0.00	0.00
21.700	0.00	0.00	0.00	0.00	0.00
21.950	0.00	0.00	0.00	0.00	0.00
22.200	0.00	0.00	0.00	0.00	0.00
22.450	0.00	0.00	0.00	0.00	0.00
22.700	0.00	0.00	0.00	0.00	0.00
22.950	0.00	0.00	0.00	0.00	0.00
23.200	0.00	0.00	0.00	0.00	0.00
23.450	0.00	0.00	0.00	0.00	0.00
23.700	0.00	0.00	0.00	0.00	0.00
23.950	0.00	0.00	(N/A)	(N/A)	(N/A)

Subsection: Unit Hydrograph Summary
 Label: IMP - POI-3
 Scenario: ESSEX CO. 100-YR (PROJ)

Return Event: 100 years
 Storm Event: ESSEX CO. 100-YR (PROJ)

Storm Event	ESSEX CO. 100-YR (PROJ)
Return Event	100 years
Duration	24.000 hours
Depth	11.5 in
Time of Concentration (Composite)	0.083 hours
Area (User Defined)	1,370.00 ft ²
Computational Time Increment	0.011 hours
Time to Peak (Computed)	12.111 hours
Flow (Peak, Computed)	0.36 ft ³ /s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	12.100 hours
Flow (Peak Interpolated Output)	0.36 ft ³ /s
Drainage Area	
SCS CN (Composite)	98.000
Area (User Defined)	1,370.00 ft ²
Maximum Retention (Pervious)	0.2 in
Maximum Retention (Pervious, 20 percent)	0.0 in
Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	11.3 in
Runoff Volume (Pervious)	0.030 ac-ft
Hydrograph Volume (Area under Hydrograph curve)	
Volume	0.030 ac-ft
SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.083 hours
Computational Time Increment	0.011 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	0.43 ft ³ /s

Subsection: Unit Hydrograph Summary
Label: IMP - POI-3
Scenario: ESSEX CO. 100-YR (PROJ)

Return Event: 100 years
Storm Event: ESSEX CO. 100-YR (PROJ)

SCS Unit Hydrograph Parameters	
Unit peak time, T_p	0.056 hours
Unit receding limb, T_r	0.222 hours
Total unit time, T_b	0.278 hours

Subsection: Unit Hydrograph (Hydrograph Table)
 Label: IMP - POI-3
 Scenario: ESSEX CO. 100-YR (PROJ)

Return Event: 100 years
 Storm Event: ESSEX CO. 100-YR (PROJ)

Storm Event	ESSEX CO. 100-YR (PROJ)
Return Event	100 years
Duration	24.000 hours
Depth	11.5 in
Time of Concentration (Composite)	0.083 hours
Area (User Defined)	1,370.00 ft ²

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
0.600	0.00	0.00	0.00	0.00	0.00
0.850	0.00	0.00	0.00	0.00	0.00
1.100	0.00	0.00	0.00	0.00	0.00
1.350	0.00	0.00	0.00	0.00	0.00
1.600	0.00	0.00	0.00	0.00	0.00
1.850	0.00	0.00	0.00	0.00	0.00
2.100	0.00	0.00	0.00	0.00	0.00
2.350	0.00	0.00	0.00	0.00	0.00
2.600	0.00	0.00	0.00	0.00	0.00
2.850	0.00	0.00	0.00	0.00	0.00
3.100	0.00	0.00	0.00	0.00	0.00
3.350	0.00	0.00	0.00	0.00	0.00
3.600	0.00	0.00	0.01	0.01	0.01
3.850	0.01	0.01	0.01	0.01	0.01
4.100	0.01	0.01	0.01	0.01	0.01
4.350	0.01	0.01	0.01	0.01	0.01
4.600	0.01	0.01	0.01	0.01	0.01
4.850	0.01	0.01	0.01	0.01	0.01
5.100	0.01	0.01	0.01	0.01	0.01
5.350	0.01	0.01	0.01	0.01	0.01
5.600	0.01	0.01	0.01	0.01	0.01
5.850	0.01	0.01	0.01	0.01	0.01
6.100	0.01	0.01	0.01	0.01	0.01
6.350	0.01	0.01	0.01	0.01	0.01
6.600	0.01	0.01	0.01	0.01	0.01
6.850	0.01	0.01	0.01	0.01	0.01
7.100	0.01	0.01	0.01	0.01	0.01
7.350	0.01	0.01	0.01	0.01	0.01
7.600	0.01	0.01	0.01	0.01	0.01
7.850	0.01	0.01	0.01	0.01	0.01
8.100	0.01	0.01	0.01	0.01	0.01
8.350	0.01	0.01	0.01	0.01	0.01
8.600	0.01	0.01	0.01	0.01	0.01

Subsection: Unit Hydrograph (Hydrograph Table)
 Label: IMP - POI-3
 Scenario: ESSEX CO. 100-YR (PROJ)

Return Event: 100 years
 Storm Event: ESSEX CO. 100-YR (PROJ)

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
8.850	0.01	0.01	0.01	0.01	0.01
9.100	0.01	0.01	0.01	0.01	0.01
9.350	0.01	0.01	0.01	0.01	0.01
9.600	0.01	0.01	0.02	0.02	0.02
9.850	0.02	0.02	0.02	0.02	0.02
10.100	0.02	0.02	0.02	0.02	0.02
10.350	0.02	0.02	0.02	0.02	0.02
10.600	0.02	0.02	0.02	0.02	0.03
10.850	0.03	0.03	0.03	0.03	0.03
11.100	0.03	0.04	0.04	0.04	0.04
11.350	0.04	0.04	0.05	0.05	0.06
11.600	0.06	0.07	0.07	0.08	0.09
11.850	0.11	0.13	0.17	0.21	0.28
12.100	0.36	0.28	0.17	0.13	0.10
12.350	0.09	0.07	0.07	0.07	0.06
12.600	0.05	0.05	0.05	0.04	0.04
12.850	0.04	0.04	0.04	0.03	0.03
13.100	0.03	0.03	0.03	0.03	0.03
13.350	0.03	0.02	0.02	0.02	0.02
13.600	0.02	0.02	0.02	0.02	0.02
13.850	0.02	0.02	0.02	0.02	0.02
14.100	0.02	0.02	0.02	0.02	0.02
14.350	0.02	0.02	0.02	0.01	0.01
14.600	0.01	0.01	0.01	0.01	0.01
14.850	0.01	0.01	0.01	0.01	0.01
15.100	0.01	0.01	0.01	0.01	0.01
15.350	0.01	0.01	0.01	0.01	0.01
15.600	0.01	0.01	0.01	0.01	0.01
15.850	0.01	0.01	0.01	0.01	0.01
16.100	0.01	0.01	0.01	0.01	0.01
16.350	0.01	0.01	0.01	0.01	0.01
16.600	0.01	0.01	0.01	0.01	0.01
16.850	0.01	0.01	0.01	0.01	0.01
17.100	0.01	0.01	0.01	0.01	0.01
17.350	0.01	0.01	0.01	0.01	0.01
17.600	0.01	0.01	0.01	0.01	0.01
17.850	0.01	0.01	0.01	0.01	0.01
18.100	0.01	0.01	0.01	0.01	0.01
18.350	0.01	0.01	0.01	0.01	0.01
18.600	0.01	0.01	0.01	0.01	0.01
18.850	0.01	0.01	0.01	0.01	0.01
19.100	0.01	0.01	0.01	0.01	0.01
19.350	0.01	0.01	0.01	0.01	0.01

Subsection: Unit Hydrograph (Hydrograph Table)
 Label: IMP - POI-3
 Scenario: ESSEX CO. 100-YR (PROJ)

Return Event: 100 years
 Storm Event: ESSEX CO. 100-YR (PROJ)

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
19.600	0.01	0.01	0.01	0.01	0.01
19.850	0.01	0.01	0.01	0.01	0.01
20.100	0.01	0.01	0.01	0.01	0.01
20.350	0.01	0.01	0.01	0.01	0.01
20.600	0.01	0.01	0.01	0.01	0.01
20.850	0.01	0.01	0.01	0.01	0.01
21.100	0.01	0.01	0.01	0.01	0.01
21.350	0.01	0.01	0.01	0.01	0.00
21.600	0.00	0.00	0.00	0.00	0.00
21.850	0.00	0.00	0.00	0.00	0.00
22.100	0.00	0.00	0.00	0.00	0.00
22.350	0.00	0.00	0.00	0.00	0.00
22.600	0.00	0.00	0.00	0.00	0.00
22.850	0.00	0.00	0.00	0.00	0.00
23.100	0.00	0.00	0.00	0.00	0.00
23.350	0.00	0.00	0.00	0.00	0.00
23.600	0.00	0.00	0.00	0.00	0.00
23.850	0.00	0.00	0.00	0.00	(N/A)

Subsection: Unit Hydrograph Summary
 Label: PERV - POI-1
 Scenario: ESSEX CO. 2-YR (PROJ)

Return Event: 2 years
 Storm Event: ESSEX CO. 2-YR (PROJ)

Storm Event	ESSEX CO. 2-YR (PROJ)
Return Event	2 years
Duration	24.000 hours
Depth	4.1 in
Time of Concentration (Composite)	0.083 hours
Area (User Defined)	5,344.00 ft ²
Computational Time Increment	0.011 hours
Time to Peak (Computed)	12.111 hours
Flow (Peak, Computed)	0.31 ft ³ /s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	12.100 hours
Flow (Peak Interpolated Output)	0.30 ft ³ /s
Drainage Area	
SCS CN (Composite)	79.000
Area (User Defined)	5,344.00 ft ²
Maximum Retention (Pervious)	2.7 in
Maximum Retention (Pervious, 20 percent)	0.5 in
Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	2.0 in
Runoff Volume (Pervious)	0.021 ac-ft
Hydrograph Volume (Area under Hydrograph curve)	
Volume	0.021 ac-ft
SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.083 hours
Computational Time Increment	0.011 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	1.67 ft ³ /s

Subsection: Unit Hydrograph Summary
Label: PERV - POI-1
Scenario: ESSEX CO. 2-YR (PROJ)

Return Event: 2 years
Storm Event: ESSEX CO. 2-YR (PROJ)

SCS Unit Hydrograph Parameters	
Unit peak time, Tp	0.056 hours
Unit receding limb, Tr	0.222 hours
Total unit time, Tb	0.278 hours

Subsection: Unit Hydrograph (Hydrograph Table)
 Label: PERV - POI-1
 Scenario: ESSEX CO. 2-YR (PROJ)

Return Event: 2 years
 Storm Event: ESSEX CO. 2-YR (PROJ)

Storm Event	ESSEX CO. 2-YR (PROJ)
Return Event	2 years
Duration	24.000 hours
Depth	4.1 in
Time of Concentration (Composite)	0.083 hours
Area (User Defined)	5,344.00 ft ²

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
8.850	0.00	0.00	0.00	0.00	0.00
9.100	0.00	0.00	0.00	0.00	0.00
9.350	0.00	0.00	0.00	0.00	0.00
9.600	0.00	0.00	0.00	0.00	0.00
9.850	0.00	0.00	0.00	0.00	0.00
10.100	0.00	0.00	0.00	0.01	0.01
10.350	0.01	0.01	0.01	0.01	0.01
10.600	0.01	0.01	0.01	0.01	0.01
10.850	0.01	0.01	0.01	0.01	0.01
11.100	0.01	0.02	0.02	0.02	0.02
11.350	0.02	0.02	0.02	0.03	0.03
11.600	0.04	0.04	0.04	0.05	0.06
11.850	0.07	0.09	0.12	0.16	0.22
12.100	0.30	0.25	0.15	0.12	0.10
12.350	0.08	0.07	0.07	0.06	0.06
12.600	0.05	0.05	0.05	0.04	0.04
12.850	0.04	0.04	0.04	0.04	0.03
13.100	0.03	0.03	0.03	0.03	0.03
13.350	0.03	0.03	0.02	0.02	0.02
13.600	0.02	0.02	0.02	0.02	0.02
13.850	0.02	0.02	0.02	0.02	0.02
14.100	0.02	0.02	0.02	0.02	0.02
14.350	0.02	0.02	0.02	0.02	0.02
14.600	0.02	0.01	0.01	0.01	0.01
14.850	0.01	0.01	0.01	0.01	0.01
15.100	0.01	0.01	0.01	0.01	0.01
15.350	0.01	0.01	0.01	0.01	0.01
15.600	0.01	0.01	0.01	0.01	0.01
15.850	0.01	0.01	0.01	0.01	0.01
16.100	0.01	0.01	0.01	0.01	0.01
16.350	0.01	0.01	0.01	0.01	0.01
16.600	0.01	0.01	0.01	0.01	0.01
16.850	0.01	0.01	0.01	0.01	0.01

Subsection: Unit Hydrograph (Hydrograph Table)
 Label: PERV - POI-1
 Scenario: ESSEX CO. 2-YR (PROJ)

Return Event: 2 years
 Storm Event: ESSEX CO. 2-YR (PROJ)

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
17.100	0.01	0.01	0.01	0.01	0.01
17.350	0.01	0.01	0.01	0.01	0.01
17.600	0.01	0.01	0.01	0.01	0.01
17.850	0.01	0.01	0.01	0.01	0.01
18.100	0.01	0.01	0.01	0.01	0.01
18.350	0.01	0.01	0.01	0.01	0.01
18.600	0.01	0.01	0.01	0.01	0.01
18.850	0.01	0.01	0.01	0.01	0.01
19.100	0.01	0.01	0.01	0.01	0.01
19.350	0.01	0.01	0.01	0.01	0.01
19.600	0.01	0.01	0.01	0.01	0.01
19.850	0.01	0.01	0.01	0.01	0.01
20.100	0.01	0.01	0.01	0.01	0.01
20.350	0.01	0.01	0.01	0.01	0.01
20.600	0.01	0.01	0.01	0.01	0.01
20.850	0.01	0.01	0.01	0.01	0.01
21.100	0.01	0.01	0.01	0.01	0.01
21.350	0.01	0.01	0.01	0.01	0.01
21.600	0.01	0.01	0.01	0.01	0.01
21.850	0.01	0.01	0.01	0.01	0.01
22.100	0.01	0.01	0.01	0.01	0.01
22.350	0.01	0.01	0.01	0.01	0.01
22.600	0.01	0.01	0.01	0.01	0.01
22.850	0.01	0.01	0.00	0.00	0.00
23.100	0.00	0.00	0.00	0.00	0.00
23.350	0.00	0.00	0.00	0.00	0.00
23.600	0.00	0.00	0.00	0.00	0.00
23.850	0.00	0.00	0.00	0.00	(N/A)

Subsection: Unit Hydrograph Summary
 Label: PERV - POI-1
 Scenario: ESSEX CO. 10-YR (PROJ)

Return Event: 10 years
 Storm Event: ESSEX CO. 10-YR (PROJ)

Storm Event	ESSEX CO. 10-YR (PROJ)
Return Event	10 years
Duration	24.000 hours
Depth	6.4 in
Time of Concentration (Composite)	0.083 hours
Area (User Defined)	5,344.00 ft ²
Computational Time Increment	0.011 hours
Time to Peak (Computed)	12.111 hours
Flow (Peak, Computed)	0.60 ft ³ /s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	12.100 hours
Flow (Peak Interpolated Output)	0.59 ft ³ /s
Drainage Area	
SCS CN (Composite)	79.000
Area (User Defined)	5,344.00 ft ²
Maximum Retention (Pervious)	2.7 in
Maximum Retention (Pervious, 20 percent)	0.5 in
Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	4.0 in
Runoff Volume (Pervious)	0.041 ac-ft
Hydrograph Volume (Area under Hydrograph curve)	
Volume	0.041 ac-ft
SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.083 hours
Computational Time Increment	0.011 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	1.67 ft ³ /s

Subsection: Unit Hydrograph Summary
Label: PERV - POI-1
Scenario: ESSEX CO. 10-YR (PROJ)

Return Event: 10 years
Storm Event: ESSEX CO. 10-YR (PROJ)

SCS Unit Hydrograph Parameters	
Unit peak time, T_p	0.056 hours
Unit receding limb, T_r	0.222 hours
Total unit time, T_b	0.278 hours

Subsection: Unit Hydrograph (Hydrograph Table)
 Label: PERV - POI-1
 Scenario: ESSEX CO. 10-YR (PROJ)

Return Event: 10 years
 Storm Event: ESSEX CO. 10-YR (PROJ)

Storm Event	ESSEX CO. 10-YR (PROJ)
Return Event	10 years
Duration	24.000 hours
Depth	6.4 in
Time of Concentration (Composite)	0.083 hours
Area (User Defined)	5,344.00 ft ²

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
6.700	0.00	0.00	0.00	0.00	0.00
6.950	0.00	0.00	0.00	0.00	0.00
7.200	0.00	0.00	0.00	0.00	0.00
7.450	0.00	0.00	0.00	0.00	0.00
7.700	0.00	0.00	0.00	0.00	0.00
7.950	0.00	0.00	0.00	0.00	0.00
8.200	0.00	0.00	0.00	0.00	0.00
8.450	0.01	0.01	0.01	0.01	0.01
8.700	0.01	0.01	0.01	0.01	0.01
8.950	0.01	0.01	0.01	0.01	0.01
9.200	0.01	0.01	0.01	0.01	0.01
9.450	0.01	0.01	0.01	0.01	0.01
9.700	0.01	0.01	0.01	0.01	0.01
9.950	0.01	0.01	0.01	0.01	0.02
10.200	0.02	0.02	0.02	0.02	0.02
10.450	0.02	0.02	0.02	0.02	0.02
10.700	0.02	0.02	0.03	0.03	0.03
10.950	0.03	0.03	0.03	0.04	0.04
11.200	0.04	0.05	0.05	0.05	0.05
11.450	0.06	0.06	0.07	0.08	0.09
11.700	0.09	0.11	0.13	0.15	0.18
11.950	0.25	0.33	0.45	0.59	0.48
12.200	0.29	0.22	0.18	0.15	0.13
12.450	0.12	0.12	0.11	0.09	0.09
12.700	0.08	0.08	0.08	0.07	0.07
12.950	0.07	0.06	0.06	0.06	0.05
13.200	0.05	0.05	0.05	0.05	0.05
13.450	0.04	0.04	0.04	0.04	0.04
13.700	0.04	0.04	0.04	0.03	0.03
13.950	0.03	0.03	0.03	0.03	0.03
14.200	0.03	0.03	0.03	0.03	0.03
14.450	0.03	0.03	0.03	0.03	0.03
14.700	0.03	0.03	0.02	0.02	0.02

Subsection: Unit Hydrograph (Hydrograph Table)
 Label: PERV - POI-1
 Scenario: ESSEX CO. 10-YR (PROJ)

Return Event: 10 years
 Storm Event: ESSEX CO. 10-YR (PROJ)

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
14.950	0.02	0.02	0.02	0.02	0.02
15.200	0.02	0.02	0.02	0.02	0.02
15.450	0.02	0.02	0.02	0.02	0.02
15.700	0.02	0.02	0.02	0.02	0.02
15.950	0.02	0.02	0.02	0.02	0.02
16.200	0.02	0.02	0.02	0.02	0.02
16.450	0.02	0.02	0.02	0.02	0.02
16.700	0.02	0.02	0.02	0.02	0.02
16.950	0.02	0.02	0.02	0.02	0.02
17.200	0.02	0.01	0.01	0.01	0.01
17.450	0.01	0.01	0.01	0.01	0.01
17.700	0.01	0.01	0.01	0.01	0.01
17.950	0.01	0.01	0.01	0.01	0.01
18.200	0.01	0.01	0.01	0.01	0.01
18.450	0.01	0.01	0.01	0.01	0.01
18.700	0.01	0.01	0.01	0.01	0.01
18.950	0.01	0.01	0.01	0.01	0.01
19.200	0.01	0.01	0.01	0.01	0.01
19.450	0.01	0.01	0.01	0.01	0.01
19.700	0.01	0.01	0.01	0.01	0.01
19.950	0.01	0.01	0.01	0.01	0.01
20.200	0.01	0.01	0.01	0.01	0.01
20.450	0.01	0.01	0.01	0.01	0.01
20.700	0.01	0.01	0.01	0.01	0.01
20.950	0.01	0.01	0.01	0.01	0.01
21.200	0.01	0.01	0.01	0.01	0.01
21.450	0.01	0.01	0.01	0.01	0.01
21.700	0.01	0.01	0.01	0.01	0.01
21.950	0.01	0.01	0.01	0.01	0.01
22.200	0.01	0.01	0.01	0.01	0.01
22.450	0.01	0.01	0.01	0.01	0.01
22.700	0.01	0.01	0.01	0.01	0.01
22.950	0.01	0.01	0.01	0.01	0.01
23.200	0.01	0.01	0.01	0.01	0.01
23.450	0.01	0.01	0.01	0.01	0.01
23.700	0.01	0.01	0.01	0.01	0.01
23.950	0.01	0.01	(N/A)	(N/A)	(N/A)

Subsection: Unit Hydrograph Summary
 Label: PERV - POI-1
 Scenario: ESSEX CO. 100-YR (PROJ)

Return Event: 100 years
 Storm Event: ESSEX CO. 100-YR (PROJ)

Storm Event	ESSEX CO. 100-YR (PROJ)
Return Event	100 years
Duration	24.000 hours
Depth	11.5 in
Time of Concentration (Composite)	0.083 hours
Area (User Defined)	5,344.00 ft ²
Computational Time Increment	0.011 hours
Time to Peak (Computed)	12.111 hours
Flow (Peak, Computed)	1.26 ft ³ /s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	12.100 hours
Flow (Peak Interpolated Output)	1.24 ft ³ /s
Drainage Area	
SCS CN (Composite)	79.000
Area (User Defined)	5,344.00 ft ²
Maximum Retention (Pervious)	2.7 in
Maximum Retention (Pervious, 20 percent)	0.5 in
Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	8.8 in
Runoff Volume (Pervious)	0.090 ac-ft
Hydrograph Volume (Area under Hydrograph curve)	
Volume	0.090 ac-ft
SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.083 hours
Computational Time Increment	0.011 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	1.67 ft ³ /s

Subsection: Unit Hydrograph Summary
Label: PERV - POI-1
Scenario: ESSEX CO. 100-YR (PROJ)

Return Event: 100 years
Storm Event: ESSEX CO. 100-YR (PROJ)

SCS Unit Hydrograph Parameters	
Unit peak time, Tp	0.056 hours
Unit receding limb, Tr	0.222 hours
Total unit time, Tb	0.278 hours

Subsection: Unit Hydrograph (Hydrograph Table)
 Label: PERV - POI-1
 Scenario: ESSEX CO. 100-YR (PROJ)

Return Event: 100 years
 Storm Event: ESSEX CO. 100-YR (PROJ)

Storm Event	ESSEX CO. 100-YR (PROJ)
Return Event	100 years
Duration	24.000 hours
Depth	11.5 in
Time of Concentration (Composite)	0.083 hours
Area (User Defined)	5,344.00 ft ²

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
4.000	0.00	0.00	0.00	0.00	0.00
4.250	0.00	0.00	0.00	0.00	0.00
4.500	0.00	0.00	0.00	0.00	0.00
4.750	0.00	0.00	0.00	0.00	0.00
5.000	0.00	0.00	0.00	0.00	0.00
5.250	0.00	0.00	0.00	0.00	0.01
5.500	0.01	0.01	0.01	0.01	0.01
5.750	0.01	0.01	0.01	0.01	0.01
6.000	0.01	0.01	0.01	0.01	0.01
6.250	0.01	0.01	0.01	0.01	0.01
6.500	0.01	0.01	0.01	0.01	0.01
6.750	0.01	0.01	0.01	0.01	0.01
7.000	0.01	0.01	0.01	0.01	0.01
7.250	0.01	0.01	0.01	0.01	0.01
7.500	0.01	0.01	0.01	0.01	0.02
7.750	0.02	0.02	0.02	0.02	0.02
8.000	0.02	0.02	0.02	0.02	0.02
8.250	0.02	0.02	0.02	0.02	0.02
8.500	0.02	0.02	0.02	0.02	0.02
8.750	0.02	0.02	0.02	0.02	0.02
9.000	0.02	0.02	0.03	0.03	0.03
9.250	0.03	0.03	0.03	0.03	0.03
9.500	0.03	0.03	0.03	0.03	0.04
9.750	0.04	0.04	0.04	0.04	0.04
10.000	0.04	0.04	0.04	0.04	0.05
10.250	0.05	0.05	0.05	0.05	0.05
10.500	0.05	0.05	0.06	0.06	0.06
10.750	0.07	0.07	0.07	0.08	0.08
11.000	0.09	0.09	0.10	0.10	0.11
11.250	0.11	0.12	0.13	0.13	0.14
11.500	0.15	0.17	0.20	0.21	0.22
11.750	0.25	0.29	0.35	0.42	0.56
12.000	0.72	0.97	1.24	1.00	0.60

Subsection: Unit Hydrograph (Hydrograph Table)
 Label: PERV - POI-1
 Scenario: ESSEX CO. 100-YR (PROJ)

Return Event: 100 years
 Storm Event: ESSEX CO. 100-YR (PROJ)

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
12.250	0.45	0.37	0.31	0.27	0.25
12.500	0.24	0.22	0.19	0.18	0.17
12.750	0.16	0.15	0.15	0.14	0.13
13.000	0.13	0.12	0.11	0.11	0.11
13.250	0.10	0.10	0.09	0.09	0.09
13.500	0.08	0.08	0.07	0.07	0.07
13.750	0.07	0.07	0.07	0.07	0.07
14.000	0.07	0.06	0.06	0.06	0.06
14.250	0.06	0.06	0.06	0.06	0.06
14.500	0.05	0.05	0.05	0.05	0.05
14.750	0.05	0.05	0.05	0.05	0.05
15.000	0.04	0.04	0.04	0.04	0.04
15.250	0.04	0.04	0.04	0.04	0.04
15.500	0.04	0.04	0.04	0.04	0.04
15.750	0.04	0.04	0.04	0.04	0.04
16.000	0.04	0.04	0.04	0.04	0.04
16.250	0.04	0.03	0.03	0.03	0.03
16.500	0.03	0.03	0.03	0.03	0.03
16.750	0.03	0.03	0.03	0.03	0.03
17.000	0.03	0.03	0.03	0.03	0.03
17.250	0.03	0.03	0.03	0.03	0.03
17.500	0.03	0.03	0.03	0.03	0.03
17.750	0.03	0.03	0.03	0.03	0.02
18.000	0.02	0.02	0.02	0.02	0.02
18.250	0.02	0.02	0.02	0.02	0.02
18.500	0.02	0.02	0.02	0.02	0.02
18.750	0.02	0.02	0.02	0.02	0.02
19.000	0.02	0.02	0.02	0.02	0.02
19.250	0.02	0.02	0.02	0.02	0.02
19.500	0.02	0.02	0.02	0.02	0.02
19.750	0.02	0.02	0.02	0.02	0.02
20.000	0.02	0.02	0.02	0.02	0.02
20.250	0.02	0.02	0.02	0.02	0.02
20.500	0.02	0.02	0.02	0.02	0.02
20.750	0.02	0.02	0.02	0.02	0.02
21.000	0.02	0.02	0.02	0.02	0.02
21.250	0.02	0.02	0.02	0.02	0.02
21.500	0.02	0.02	0.02	0.02	0.02
21.750	0.02	0.02	0.02	0.02	0.02
22.000	0.02	0.02	0.02	0.02	0.02
22.250	0.02	0.02	0.02	0.02	0.02
22.500	0.02	0.02	0.02	0.02	0.02
22.750	0.02	0.02	0.02	0.02	0.02

Subsection: Unit Hydrograph (Hydrograph Table)
 Label: PERV - POI-1
 Scenario: ESSEX CO. 100-YR (PROJ)

Return Event: 100 years
 Storm Event: ESSEX CO. 100-YR (PROJ)

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
23.000	0.02	0.02	0.02	0.02	0.02
23.250	0.02	0.02	0.02	0.02	0.02
23.500	0.02	0.02	0.02	0.02	0.02
23.750	0.02	0.02	0.02	0.02	0.02
24.000	0.02	(N/A)	(N/A)	(N/A)	(N/A)

Subsection: Unit Hydrograph Summary
 Label: PERV - POI-2
 Scenario: ESSEX CO. 2-YR (PROJ)

Return Event: 2 years
 Storm Event: ESSEX CO. 2-YR (PROJ)

Storm Event	ESSEX CO. 2-YR (PROJ)
Return Event	2 years
Duration	24.000 hours
Depth	4.1 in
Time of Concentration (Composite)	0.083 hours
Area (User Defined)	3,263.00 ft ²
Computational Time Increment	0.011 hours
Time to Peak (Computed)	12.111 hours
Flow (Peak, Computed)	0.19 ft ³ /s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	12.100 hours
Flow (Peak Interpolated Output)	0.18 ft ³ /s
Drainage Area	
SCS CN (Composite)	79.000
Area (User Defined)	3,263.00 ft ²
Maximum Retention (Pervious)	2.7 in
Maximum Retention (Pervious, 20 percent)	0.5 in
Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	2.0 in
Runoff Volume (Pervious)	0.013 ac-ft
Hydrograph Volume (Area under Hydrograph curve)	
Volume	0.013 ac-ft
SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.083 hours
Computational Time Increment	0.011 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	1.02 ft ³ /s

Subsection: Unit Hydrograph Summary
Label: PERV - POI-2
Scenario: ESSEX CO. 2-YR (PROJ)

Return Event: 2 years
Storm Event: ESSEX CO. 2-YR (PROJ)

SCS Unit Hydrograph Parameters	
Unit peak time, T_p	0.056 hours
Unit receding limb, T_r	0.222 hours
Total unit time, T_b	0.278 hours

Subsection: Unit Hydrograph (Hydrograph Table)
 Label: PERV - POI-2
 Scenario: ESSEX CO. 2-YR (PROJ)

Return Event: 2 years
 Storm Event: ESSEX CO. 2-YR (PROJ)

Storm Event	ESSEX CO. 2-YR (PROJ)
Return Event	2 years
Duration	24.000 hours
Depth	4.1 in
Time of Concentration (Composite)	0.083 hours
Area (User Defined)	3,263.00 ft ²

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
9.200	0.00	0.00	0.00	0.00	0.00
9.450	0.00	0.00	0.00	0.00	0.00
9.700	0.00	0.00	0.00	0.00	0.00
9.950	0.00	0.00	0.00	0.00	0.00
10.200	0.00	0.00	0.00	0.00	0.00
10.450	0.00	0.00	0.00	0.00	0.00
10.700	0.01	0.01	0.01	0.01	0.01
10.950	0.01	0.01	0.01	0.01	0.01
11.200	0.01	0.01	0.01	0.01	0.01
11.450	0.01	0.02	0.02	0.02	0.02
11.700	0.03	0.03	0.04	0.04	0.05
11.950	0.07	0.10	0.14	0.18	0.15
12.200	0.09	0.07	0.06	0.05	0.04
12.450	0.04	0.04	0.04	0.03	0.03
12.700	0.03	0.03	0.03	0.02	0.02
12.950	0.02	0.02	0.02	0.02	0.02
13.200	0.02	0.02	0.02	0.02	0.02
13.450	0.01	0.01	0.01	0.01	0.01
13.700	0.01	0.01	0.01	0.01	0.01
13.950	0.01	0.01	0.01	0.01	0.01
14.200	0.01	0.01	0.01	0.01	0.01
14.450	0.01	0.01	0.01	0.01	0.01
14.700	0.01	0.01	0.01	0.01	0.01
14.950	0.01	0.01	0.01	0.01	0.01
15.200	0.01	0.01	0.01	0.01	0.01
15.450	0.01	0.01	0.01	0.01	0.01
15.700	0.01	0.01	0.01	0.01	0.01
15.950	0.01	0.01	0.01	0.01	0.01
16.200	0.01	0.01	0.01	0.01	0.01
16.450	0.01	0.01	0.01	0.01	0.01
16.700	0.01	0.01	0.01	0.01	0.01
16.950	0.01	0.01	0.01	0.01	0.01
17.200	0.01	0.01	0.01	0.01	0.01

Subsection: Unit Hydrograph (Hydrograph Table)
 Label: PERV - POI-2
 Scenario: ESSEX CO. 2-YR (PROJ)

Return Event: 2 years
 Storm Event: ESSEX CO. 2-YR (PROJ)

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
17.450	0.01	0.00	0.00	0.00	0.00
17.700	0.00	0.00	0.00	0.00	0.00
17.950	0.00	0.00	0.00	0.00	0.00
18.200	0.00	0.00	0.00	0.00	0.00
18.450	0.00	0.00	0.00	0.00	0.00
18.700	0.00	0.00	0.00	0.00	0.00
18.950	0.00	0.00	0.00	0.00	0.00
19.200	0.00	0.00	0.00	0.00	0.00
19.450	0.00	0.00	0.00	0.00	0.00
19.700	0.00	0.00	0.00	0.00	0.00
19.950	0.00	0.00	0.00	0.00	0.00
20.200	0.00	0.00	0.00	0.00	0.00
20.450	0.00	0.00	0.00	0.00	0.00
20.700	0.00	0.00	0.00	0.00	0.00
20.950	0.00	0.00	0.00	0.00	0.00
21.200	0.00	0.00	0.00	0.00	0.00
21.450	0.00	0.00	0.00	0.00	0.00
21.700	0.00	0.00	0.00	0.00	0.00
21.950	0.00	0.00	0.00	0.00	0.00
22.200	0.00	0.00	0.00	0.00	0.00
22.450	0.00	0.00	0.00	0.00	0.00
22.700	0.00	0.00	0.00	0.00	0.00
22.950	0.00	0.00	0.00	0.00	0.00
23.200	0.00	0.00	0.00	0.00	0.00
23.450	0.00	0.00	0.00	0.00	0.00
23.700	0.00	0.00	0.00	0.00	0.00
23.950	0.00	0.00	(N/A)	(N/A)	(N/A)

Subsection: Unit Hydrograph Summary
 Label: PERV - POI-2
 Scenario: ESSEX CO. 10-YR (PROJ)

Return Event: 10 years
 Storm Event: ESSEX CO. 10-YR (PROJ)

Storm Event	ESSEX CO. 10-YR (PROJ)
Return Event	10 years
Duration	24.000 hours
Depth	6.4 in
Time of Concentration (Composite)	0.083 hours
Area (User Defined)	3,263.00 ft ²
Computational Time Increment	0.011 hours
Time to Peak (Computed)	12.111 hours
Flow (Peak, Computed)	0.36 ft ³ /s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	12.100 hours
Flow (Peak Interpolated Output)	0.36 ft ³ /s
Drainage Area	
SCS CN (Composite)	79.000
Area (User Defined)	3,263.00 ft ²
Maximum Retention (Pervious)	2.7 in
Maximum Retention (Pervious, 20 percent)	0.5 in
Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	4.0 in
Runoff Volume (Pervious)	0.025 ac-ft
Hydrograph Volume (Area under Hydrograph curve)	
Volume	0.025 ac-ft
SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.083 hours
Computational Time Increment	0.011 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	1.02 ft ³ /s

Subsection: Unit Hydrograph Summary
Label: PERV - POI-2
Scenario: ESSEX CO. 10-YR (PROJ)

Return Event: 10 years
Storm Event: ESSEX CO. 10-YR (PROJ)

SCS Unit Hydrograph Parameters	
Unit peak time, T_p	0.056 hours
Unit receding limb, T_r	0.222 hours
Total unit time, T_b	0.278 hours

Subsection: Unit Hydrograph (Hydrograph Table)
 Label: PERV - POI-2
 Scenario: ESSEX CO. 10-YR (PROJ)

Return Event: 10 years
 Storm Event: ESSEX CO. 10-YR (PROJ)

Storm Event	ESSEX CO. 10-YR (PROJ)
Return Event	10 years
Duration	24.000 hours
Depth	6.4 in
Time of Concentration (Composite)	0.083 hours
Area (User Defined)	3,263.00 ft ²

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
7.050	0.00	0.00	0.00	0.00	0.00
7.300	0.00	0.00	0.00	0.00	0.00
7.550	0.00	0.00	0.00	0.00	0.00
7.800	0.00	0.00	0.00	0.00	0.00
8.050	0.00	0.00	0.00	0.00	0.00
8.300	0.00	0.00	0.00	0.00	0.00
8.550	0.00	0.00	0.00	0.00	0.00
8.800	0.00	0.00	0.00	0.00	0.00
9.050	0.00	0.00	0.00	0.00	0.00
9.300	0.01	0.01	0.01	0.01	0.01
9.550	0.01	0.01	0.01	0.01	0.01
9.800	0.01	0.01	0.01	0.01	0.01
10.050	0.01	0.01	0.01	0.01	0.01
10.300	0.01	0.01	0.01	0.01	0.01
10.550	0.01	0.01	0.01	0.01	0.02
10.800	0.02	0.02	0.02	0.02	0.02
11.050	0.02	0.02	0.02	0.03	0.03
11.300	0.03	0.03	0.03	0.03	0.04
11.550	0.04	0.05	0.05	0.06	0.07
11.800	0.08	0.09	0.11	0.15	0.20
12.050	0.27	0.36	0.29	0.18	0.13
12.300	0.11	0.09	0.08	0.08	0.07
12.550	0.07	0.06	0.05	0.05	0.05
12.800	0.05	0.04	0.04	0.04	0.04
13.050	0.04	0.03	0.03	0.03	0.03
13.300	0.03	0.03	0.03	0.03	0.03
13.550	0.02	0.02	0.02	0.02	0.02
13.800	0.02	0.02	0.02	0.02	0.02
14.050	0.02	0.02	0.02	0.02	0.02
14.300	0.02	0.02	0.02	0.02	0.02
14.550	0.02	0.02	0.02	0.02	0.02
14.800	0.02	0.01	0.01	0.01	0.01
15.050	0.01	0.01	0.01	0.01	0.01

Subsection: Unit Hydrograph (Hydrograph Table)
 Label: PERV - POI-2
 Scenario: ESSEX CO. 10-YR (PROJ)

Return Event: 10 years
 Storm Event: ESSEX CO. 10-YR (PROJ)

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
15.300	0.01	0.01	0.01	0.01	0.01
15.550	0.01	0.01	0.01	0.01	0.01
15.800	0.01	0.01	0.01	0.01	0.01
16.050	0.01	0.01	0.01	0.01	0.01
16.300	0.01	0.01	0.01	0.01	0.01
16.550	0.01	0.01	0.01	0.01	0.01
16.800	0.01	0.01	0.01	0.01	0.01
17.050	0.01	0.01	0.01	0.01	0.01
17.300	0.01	0.01	0.01	0.01	0.01
17.550	0.01	0.01	0.01	0.01	0.01
17.800	0.01	0.01	0.01	0.01	0.01
18.050	0.01	0.01	0.01	0.01	0.01
18.300	0.01	0.01	0.01	0.01	0.01
18.550	0.01	0.01	0.01	0.01	0.01
18.800	0.01	0.01	0.01	0.01	0.01
19.050	0.01	0.01	0.01	0.01	0.01
19.300	0.01	0.01	0.01	0.01	0.01
19.550	0.01	0.01	0.01	0.01	0.01
19.800	0.01	0.01	0.01	0.01	0.01
20.050	0.01	0.01	0.01	0.01	0.01
20.300	0.01	0.01	0.01	0.01	0.01
20.550	0.01	0.01	0.01	0.01	0.01
20.800	0.01	0.01	0.01	0.01	0.01
21.050	0.01	0.01	0.01	0.01	0.01
21.300	0.01	0.01	0.01	0.01	0.01
21.550	0.01	0.01	0.01	0.01	0.01
21.800	0.01	0.01	0.01	0.01	0.01
22.050	0.01	0.01	0.01	0.01	0.01
22.300	0.01	0.01	0.01	0.01	0.01
22.550	0.01	0.01	0.01	0.01	0.01
22.800	0.01	0.01	0.01	0.01	0.01
23.050	0.01	0.01	0.01	0.01	0.01
23.300	0.01	0.01	0.01	0.01	0.00
23.550	0.00	0.00	0.00	0.00	0.00
23.800	0.00	0.00	0.00	0.00	0.00

Subsection: Unit Hydrograph Summary
 Label: PERV - POI-2
 Scenario: ESSEX CO. 100-YR (PROJ)

Return Event: 100 years
 Storm Event: ESSEX CO. 100-YR (PROJ)

Storm Event	ESSEX CO. 100-YR (PROJ)
Return Event	100 years
Duration	24.000 hours
Depth	11.5 in
Time of Concentration (Composite)	0.083 hours
Area (User Defined)	3,263.00 ft ²
Computational Time Increment	0.011 hours
Time to Peak (Computed)	12.111 hours
Flow (Peak, Computed)	0.77 ft ³ /s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	12.100 hours
Flow (Peak Interpolated Output)	0.76 ft ³ /s
Drainage Area	
SCS CN (Composite)	79.000
Area (User Defined)	3,263.00 ft ²
Maximum Retention (Pervious)	2.7 in
Maximum Retention (Pervious, 20 percent)	0.5 in
Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	8.8 in
Runoff Volume (Pervious)	0.055 ac-ft
Hydrograph Volume (Area under Hydrograph curve)	
Volume	0.055 ac-ft
SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.083 hours
Computational Time Increment	0.011 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	1.02 ft ³ /s

Subsection: Unit Hydrograph Summary
Label: PERV - POI-2
Scenario: ESSEX CO. 100-YR (PROJ)

Return Event: 100 years
Storm Event: ESSEX CO. 100-YR (PROJ)

SCS Unit Hydrograph Parameters	
Unit peak time, T_p	0.056 hours
Unit receding limb, T_r	0.222 hours
Total unit time, T_b	0.278 hours

Subsection: Unit Hydrograph (Hydrograph Table)
 Label: PERV - POI-2
 Scenario: ESSEX CO. 100-YR (PROJ)

Return Event: 100 years
 Storm Event: ESSEX CO. 100-YR (PROJ)

Storm Event	ESSEX CO. 100-YR (PROJ)
Return Event	100 years
Duration	24.000 hours
Depth	11.5 in
Time of Concentration (Composite)	0.083 hours
Area (User Defined)	3,263.00 ft ²

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
4.250	0.00	0.00	0.00	0.00	0.00
4.500	0.00	0.00	0.00	0.00	0.00
4.750	0.00	0.00	0.00	0.00	0.00
5.000	0.00	0.00	0.00	0.00	0.00
5.250	0.00	0.00	0.00	0.00	0.00
5.500	0.00	0.00	0.00	0.00	0.00
5.750	0.00	0.00	0.00	0.00	0.00
6.000	0.00	0.00	0.00	0.00	0.00
6.250	0.00	0.00	0.00	0.01	0.01
6.500	0.01	0.01	0.01	0.01	0.01
6.750	0.01	0.01	0.01	0.01	0.01
7.000	0.01	0.01	0.01	0.01	0.01
7.250	0.01	0.01	0.01	0.01	0.01
7.500	0.01	0.01	0.01	0.01	0.01
7.750	0.01	0.01	0.01	0.01	0.01
8.000	0.01	0.01	0.01	0.01	0.01
8.250	0.01	0.01	0.01	0.01	0.01
8.500	0.01	0.01	0.01	0.01	0.01
8.750	0.01	0.01	0.01	0.01	0.01
9.000	0.01	0.01	0.02	0.02	0.02
9.250	0.02	0.02	0.02	0.02	0.02
9.500	0.02	0.02	0.02	0.02	0.02
9.750	0.02	0.02	0.02	0.02	0.02
10.000	0.03	0.03	0.03	0.03	0.03
10.250	0.03	0.03	0.03	0.03	0.03
10.500	0.03	0.03	0.04	0.04	0.04
10.750	0.04	0.04	0.05	0.05	0.05
11.000	0.05	0.06	0.06	0.06	0.07
11.250	0.07	0.07	0.08	0.08	0.09
11.500	0.09	0.10	0.12	0.13	0.13
11.750	0.15	0.18	0.21	0.25	0.34
12.000	0.44	0.59	0.76	0.61	0.37
12.250	0.28	0.22	0.19	0.16	0.15

Subsection: Unit Hydrograph (Hydrograph Table)
 Label: PERV - POI-2
 Scenario: ESSEX CO. 100-YR (PROJ)

Return Event: 100 years
 Storm Event: ESSEX CO. 100-YR (PROJ)

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
12.500	0.15	0.13	0.11	0.11	0.10
12.750	0.10	0.09	0.09	0.09	0.08
13.000	0.08	0.07	0.07	0.07	0.06
13.250	0.06	0.06	0.06	0.05	0.05
13.500	0.05	0.05	0.05	0.04	0.04
13.750	0.04	0.04	0.04	0.04	0.04
14.000	0.04	0.04	0.04	0.04	0.04
14.250	0.04	0.04	0.04	0.03	0.03
14.500	0.03	0.03	0.03	0.03	0.03
14.750	0.03	0.03	0.03	0.03	0.03
15.000	0.03	0.03	0.03	0.03	0.03
15.250	0.03	0.02	0.02	0.02	0.02
15.500	0.02	0.02	0.02	0.02	0.02
15.750	0.02	0.02	0.02	0.02	0.02
16.000	0.02	0.02	0.02	0.02	0.02
16.250	0.02	0.02	0.02	0.02	0.02
16.500	0.02	0.02	0.02	0.02	0.02
16.750	0.02	0.02	0.02	0.02	0.02
17.000	0.02	0.02	0.02	0.02	0.02
17.250	0.02	0.02	0.02	0.02	0.02
17.500	0.02	0.02	0.02	0.02	0.02
17.750	0.02	0.02	0.02	0.02	0.02
18.000	0.02	0.01	0.01	0.01	0.01
18.250	0.01	0.01	0.01	0.01	0.01
18.500	0.01	0.01	0.01	0.01	0.01
18.750	0.01	0.01	0.01	0.01	0.01
19.000	0.01	0.01	0.01	0.01	0.01
19.250	0.01	0.01	0.01	0.01	0.01
19.500	0.01	0.01	0.01	0.01	0.01
19.750	0.01	0.01	0.01	0.01	0.01
20.000	0.01	0.01	0.01	0.01	0.01
20.250	0.01	0.01	0.01	0.01	0.01
20.500	0.01	0.01	0.01	0.01	0.01
20.750	0.01	0.01	0.01	0.01	0.01
21.000	0.01	0.01	0.01	0.01	0.01
21.250	0.01	0.01	0.01	0.01	0.01
21.500	0.01	0.01	0.01	0.01	0.01
21.750	0.01	0.01	0.01	0.01	0.01
22.000	0.01	0.01	0.01	0.01	0.01
22.250	0.01	0.01	0.01	0.01	0.01
22.500	0.01	0.01	0.01	0.01	0.01
22.750	0.01	0.01	0.01	0.01	0.01
23.000	0.01	0.01	0.01	0.01	0.01

Subsection: Unit Hydrograph (Hydrograph Table)
Label: PERV - POI-2
Scenario: ESSEX CO. 100-YR (PROJ)

Return Event: 100 years
Storm Event: ESSEX CO. 100-YR (PROJ)

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
23.250	0.01	0.01	0.01	0.01	0.01
23.500	0.01	0.01	0.01	0.01	0.01
23.750	0.01	0.01	0.01	0.01	0.01
24.000	0.01	(N/A)	(N/A)	(N/A)	(N/A)

Subsection: Unit Hydrograph Summary
 Label: PERV - POI-3
 Scenario: ESSEX CO. 2-YR (PROJ)

Return Event: 2 years
 Storm Event: ESSEX CO. 2-YR (PROJ)

Storm Event	ESSEX CO. 2-YR (PROJ)
Return Event	2 years
Duration	24.000 hours
Depth	4.1 in
Time of Concentration (Composite)	0.083 hours
Area (User Defined)	1,375.00 ft ²
Computational Time Increment	0.011 hours
Time to Peak (Computed)	12.111 hours
Flow (Peak, Computed)	0.08 ft ³ /s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	12.100 hours
Flow (Peak Interpolated Output)	0.08 ft ³ /s
Drainage Area	
SCS CN (Composite)	79.000
Area (User Defined)	1,375.00 ft ²
Maximum Retention (Pervious)	2.7 in
Maximum Retention (Pervious, 20 percent)	0.5 in
Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	2.0 in
Runoff Volume (Pervious)	0.005 ac-ft
Hydrograph Volume (Area under Hydrograph curve)	
Volume	0.005 ac-ft
SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.083 hours
Computational Time Increment	0.011 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	0.43 ft ³ /s

Subsection: Unit Hydrograph Summary
Label: PERV - POI-3
Scenario: ESSEX CO. 2-YR (PROJ)

Return Event: 2 years
Storm Event: ESSEX CO. 2-YR (PROJ)

SCS Unit Hydrograph Parameters	
Unit peak time, T_p	0.056 hours
Unit receding limb, T_r	0.222 hours
Total unit time, T_b	0.278 hours

Subsection: Unit Hydrograph (Hydrograph Table)
 Label: PERV - POI-3
 Scenario: ESSEX CO. 2-YR (PROJ)

Return Event: 2 years
 Storm Event: ESSEX CO. 2-YR (PROJ)

Storm Event	ESSEX CO. 2-YR (PROJ)
Return Event	2 years
Duration	24.000 hours
Depth	4.1 in
Time of Concentration (Composite)	0.083 hours
Area (User Defined)	1,375.00 ft ²

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
9.950	0.00	0.00	0.00	0.00	0.00
10.200	0.00	0.00	0.00	0.00	0.00
10.450	0.00	0.00	0.00	0.00	0.00
10.700	0.00	0.00	0.00	0.00	0.00
10.950	0.00	0.00	0.00	0.00	0.00
11.200	0.00	0.00	0.01	0.01	0.01
11.450	0.01	0.01	0.01	0.01	0.01
11.700	0.01	0.01	0.01	0.02	0.02
11.950	0.03	0.04	0.06	0.08	0.06
12.200	0.04	0.03	0.02	0.02	0.02
12.450	0.02	0.02	0.02	0.01	0.01
12.700	0.01	0.01	0.01	0.01	0.01
12.950	0.01	0.01	0.01	0.01	0.01
13.200	0.01	0.01	0.01	0.01	0.01
13.450	0.01	0.01	0.01	0.01	0.01
13.700	0.01	0.01	0.01	0.00	0.00
13.950	0.00	0.00	0.00	0.00	0.00
14.200	0.00	0.00	0.00	0.00	0.00
14.450	0.00	0.00	0.00	0.00	0.00
14.700	0.00	0.00	0.00	0.00	0.00
14.950	0.00	0.00	0.00	0.00	0.00
15.200	0.00	0.00	0.00	0.00	0.00
15.450	0.00	0.00	0.00	0.00	0.00
15.700	0.00	0.00	0.00	0.00	0.00
15.950	0.00	0.00	0.00	0.00	0.00
16.200	0.00	0.00	0.00	0.00	0.00
16.450	0.00	0.00	0.00	0.00	0.00
16.700	0.00	0.00	0.00	0.00	0.00
16.950	0.00	0.00	0.00	0.00	0.00
17.200	0.00	0.00	0.00	0.00	0.00
17.450	0.00	0.00	0.00	0.00	0.00
17.700	0.00	0.00	0.00	0.00	0.00
17.950	0.00	0.00	0.00	0.00	0.00

Subsection: Unit Hydrograph (Hydrograph Table)
 Label: PERV - POI-3
 Scenario: ESSEX CO. 2-YR (PROJ)

Return Event: 2 years
 Storm Event: ESSEX CO. 2-YR (PROJ)

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
18.200	0.00	0.00	0.00	0.00	0.00
18.450	0.00	0.00	0.00	0.00	0.00
18.700	0.00	0.00	0.00	0.00	0.00
18.950	0.00	0.00	0.00	0.00	0.00
19.200	0.00	0.00	0.00	0.00	0.00
19.450	0.00	0.00	0.00	0.00	0.00
19.700	0.00	0.00	0.00	0.00	0.00
19.950	0.00	0.00	0.00	0.00	0.00
20.200	0.00	0.00	0.00	0.00	0.00
20.450	0.00	0.00	0.00	0.00	0.00
20.700	0.00	0.00	0.00	0.00	0.00
20.950	0.00	0.00	0.00	0.00	0.00
21.200	0.00	0.00	0.00	0.00	0.00
21.450	0.00	0.00	0.00	0.00	0.00
21.700	0.00	0.00	0.00	0.00	0.00
21.950	0.00	0.00	0.00	0.00	0.00
22.200	0.00	0.00	0.00	0.00	0.00
22.450	0.00	0.00	0.00	0.00	0.00
22.700	0.00	0.00	0.00	0.00	0.00
22.950	0.00	0.00	0.00	0.00	0.00
23.200	0.00	0.00	0.00	0.00	0.00
23.450	0.00	0.00	0.00	0.00	0.00
23.700	0.00	0.00	0.00	0.00	0.00
23.950	0.00	0.00	(N/A)	(N/A)	(N/A)

Subsection: Unit Hydrograph Summary
 Label: PERV - POI-3
 Scenario: ESSEX CO. 10-YR (PROJ)

Return Event: 10 years
 Storm Event: ESSEX CO. 10-YR (PROJ)

Storm Event	ESSEX CO. 10-YR (PROJ)
Return Event	10 years
Duration	24.000 hours
Depth	6.4 in
Time of Concentration (Composite)	0.083 hours
Area (User Defined)	1,375.00 ft ²
Computational Time Increment	0.011 hours
Time to Peak (Computed)	12.111 hours
Flow (Peak, Computed)	0.15 ft ³ /s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	12.100 hours
Flow (Peak Interpolated Output)	0.15 ft ³ /s
Drainage Area	
SCS CN (Composite)	79.000
Area (User Defined)	1,375.00 ft ²
Maximum Retention (Pervious)	2.7 in
Maximum Retention (Pervious, 20 percent)	0.5 in
Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	4.0 in
Runoff Volume (Pervious)	0.011 ac-ft
Hydrograph Volume (Area under Hydrograph curve)	
Volume	0.011 ac-ft
SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.083 hours
Computational Time Increment	0.011 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	0.43 ft ³ /s

Subsection: Unit Hydrograph Summary
Label: PERV - POI-3
Scenario: ESSEX CO. 10-YR (PROJ)

Return Event: 10 years
Storm Event: ESSEX CO. 10-YR (PROJ)

SCS Unit Hydrograph Parameters	
Unit peak time, T_p	0.056 hours
Unit receding limb, T_r	0.222 hours
Total unit time, T_b	0.278 hours

Subsection: Unit Hydrograph (Hydrograph Table)
 Label: PERV - POI-3
 Scenario: ESSEX CO. 10-YR (PROJ)

Return Event: 10 years
 Storm Event: ESSEX CO. 10-YR (PROJ)

Storm Event	ESSEX CO. 10-YR (PROJ)
Return Event	10 years
Duration	24.000 hours
Depth	6.4 in
Time of Concentration (Composite)	0.083 hours
Area (User Defined)	1,375.00 ft ²

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
8.100	0.00	0.00	0.00	0.00	0.00
8.350	0.00	0.00	0.00	0.00	0.00
8.600	0.00	0.00	0.00	0.00	0.00
8.850	0.00	0.00	0.00	0.00	0.00
9.100	0.00	0.00	0.00	0.00	0.00
9.350	0.00	0.00	0.00	0.00	0.00
9.600	0.00	0.00	0.00	0.00	0.00
9.850	0.00	0.00	0.00	0.00	0.00
10.100	0.00	0.00	0.00	0.00	0.00
10.350	0.00	0.00	0.00	0.00	0.01
10.600	0.01	0.01	0.01	0.01	0.01
10.850	0.01	0.01	0.01	0.01	0.01
11.100	0.01	0.01	0.01	0.01	0.01
11.350	0.01	0.01	0.01	0.02	0.02
11.600	0.02	0.02	0.02	0.03	0.03
11.850	0.04	0.05	0.06	0.08	0.12
12.100	0.15	0.12	0.07	0.06	0.05
12.350	0.04	0.03	0.03	0.03	0.03
12.600	0.02	0.02	0.02	0.02	0.02
12.850	0.02	0.02	0.02	0.02	0.02
13.100	0.01	0.01	0.01	0.01	0.01
13.350	0.01	0.01	0.01	0.01	0.01
13.600	0.01	0.01	0.01	0.01	0.01
13.850	0.01	0.01	0.01	0.01	0.01
14.100	0.01	0.01	0.01	0.01	0.01
14.350	0.01	0.01	0.01	0.01	0.01
14.600	0.01	0.01	0.01	0.01	0.01
14.850	0.01	0.01	0.01	0.01	0.01
15.100	0.01	0.01	0.01	0.01	0.01
15.350	0.01	0.01	0.01	0.01	0.01
15.600	0.01	0.01	0.01	0.01	0.00
15.850	0.00	0.00	0.00	0.00	0.00
16.100	0.00	0.00	0.00	0.00	0.00

Subsection: Unit Hydrograph (Hydrograph Table)
 Label: PERV - POI-3
 Scenario: ESSEX CO. 10-YR (PROJ)

Return Event: 10 years
 Storm Event: ESSEX CO. 10-YR (PROJ)

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
16.350	0.00	0.00	0.00	0.00	0.00
16.600	0.00	0.00	0.00	0.00	0.00
16.850	0.00	0.00	0.00	0.00	0.00
17.100	0.00	0.00	0.00	0.00	0.00
17.350	0.00	0.00	0.00	0.00	0.00
17.600	0.00	0.00	0.00	0.00	0.00
17.850	0.00	0.00	0.00	0.00	0.00
18.100	0.00	0.00	0.00	0.00	0.00
18.350	0.00	0.00	0.00	0.00	0.00
18.600	0.00	0.00	0.00	0.00	0.00
18.850	0.00	0.00	0.00	0.00	0.00
19.100	0.00	0.00	0.00	0.00	0.00
19.350	0.00	0.00	0.00	0.00	0.00
19.600	0.00	0.00	0.00	0.00	0.00
19.850	0.00	0.00	0.00	0.00	0.00
20.100	0.00	0.00	0.00	0.00	0.00
20.350	0.00	0.00	0.00	0.00	0.00
20.600	0.00	0.00	0.00	0.00	0.00
20.850	0.00	0.00	0.00	0.00	0.00
21.100	0.00	0.00	0.00	0.00	0.00
21.350	0.00	0.00	0.00	0.00	0.00
21.600	0.00	0.00	0.00	0.00	0.00
21.850	0.00	0.00	0.00	0.00	0.00
22.100	0.00	0.00	0.00	0.00	0.00
22.350	0.00	0.00	0.00	0.00	0.00
22.600	0.00	0.00	0.00	0.00	0.00
22.850	0.00	0.00	0.00	0.00	0.00
23.100	0.00	0.00	0.00	0.00	0.00
23.350	0.00	0.00	0.00	0.00	0.00
23.600	0.00	0.00	0.00	0.00	0.00
23.850	0.00	0.00	0.00	0.00	(N/A)

Subsection: Unit Hydrograph Summary
 Label: PERV - POI-3
 Scenario: ESSEX CO. 100-YR (PROJ)

Return Event: 100 years
 Storm Event: ESSEX CO. 100-YR (PROJ)

Storm Event	ESSEX CO. 100-YR (PROJ)
Return Event	100 years
Duration	24.000 hours
Depth	11.5 in
Time of Concentration (Composite)	0.083 hours
Area (User Defined)	1,375.00 ft ²
Computational Time Increment	0.011 hours
Time to Peak (Computed)	12.111 hours
Flow (Peak, Computed)	0.32 ft ³ /s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	12.100 hours
Flow (Peak Interpolated Output)	0.32 ft ³ /s
Drainage Area	
SCS CN (Composite)	79.000
Area (User Defined)	1,375.00 ft ²
Maximum Retention (Pervious)	2.7 in
Maximum Retention (Pervious, 20 percent)	0.5 in
Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	8.8 in
Runoff Volume (Pervious)	0.023 ac-ft
Hydrograph Volume (Area under Hydrograph curve)	
Volume	0.023 ac-ft
SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.083 hours
Computational Time Increment	0.011 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	0.43 ft ³ /s

Subsection: Unit Hydrograph Summary
Label: PERV - POI-3
Scenario: ESSEX CO. 100-YR (PROJ)

Return Event: 100 years
Storm Event: ESSEX CO. 100-YR (PROJ)

SCS Unit Hydrograph Parameters	
Unit peak time, Tp	0.056 hours
Unit receding limb, Tr	0.222 hours
Total unit time, Tb	0.278 hours

Subsection: Unit Hydrograph (Hydrograph Table)
 Label: PERV - POI-3
 Scenario: ESSEX CO. 100-YR (PROJ)

Return Event: 100 years
 Storm Event: ESSEX CO. 100-YR (PROJ)

Storm Event	ESSEX CO. 100-YR (PROJ)
Return Event	100 years
Duration	24.000 hours
Depth	11.5 in
Time of Concentration (Composite)	0.083 hours
Area (User Defined)	1,375.00 ft ²

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.050 hours

Time on left represents time for first value in each row.

Time (hours)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
5.100	0.00	0.00	0.00	0.00	0.00
5.350	0.00	0.00	0.00	0.00	0.00
5.600	0.00	0.00	0.00	0.00	0.00
5.850	0.00	0.00	0.00	0.00	0.00
6.100	0.00	0.00	0.00	0.00	0.00
6.350	0.00	0.00	0.00	0.00	0.00
6.600	0.00	0.00	0.00	0.00	0.00
6.850	0.00	0.00	0.00	0.00	0.00
7.100	0.00	0.00	0.00	0.00	0.00
7.350	0.00	0.00	0.00	0.00	0.00
7.600	0.00	0.00	0.00	0.00	0.00
7.850	0.00	0.00	0.00	0.00	0.00
8.100	0.00	0.00	0.00	0.00	0.00
8.350	0.00	0.01	0.01	0.01	0.01
8.600	0.01	0.01	0.01	0.01	0.01
8.850	0.01	0.01	0.01	0.01	0.01
9.100	0.01	0.01	0.01	0.01	0.01
9.350	0.01	0.01	0.01	0.01	0.01
9.600	0.01	0.01	0.01	0.01	0.01
9.850	0.01	0.01	0.01	0.01	0.01
10.100	0.01	0.01	0.01	0.01	0.01
10.350	0.01	0.01	0.01	0.01	0.01
10.600	0.01	0.02	0.02	0.02	0.02
10.850	0.02	0.02	0.02	0.02	0.02
11.100	0.02	0.03	0.03	0.03	0.03
11.350	0.03	0.03	0.04	0.04	0.04
11.600	0.05	0.05	0.06	0.06	0.08
11.850	0.09	0.11	0.14	0.19	0.25
12.100	0.32	0.26	0.15	0.12	0.09
12.350	0.08	0.07	0.06	0.06	0.06
12.600	0.05	0.05	0.04	0.04	0.04
12.850	0.04	0.04	0.03	0.03	0.03
13.100	0.03	0.03	0.03	0.03	0.03

Subsection: Unit Hydrograph (Hydrograph Table)
 Label: PERV - POI-3
 Scenario: ESSEX CO. 100-YR (PROJ)

Return Event: 100 years
 Storm Event: ESSEX CO. 100-YR (PROJ)

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
13.350	0.02	0.02	0.02	0.02	0.02
13.600	0.02	0.02	0.02	0.02	0.02
13.850	0.02	0.02	0.02	0.02	0.02
14.100	0.02	0.02	0.02	0.02	0.02
14.350	0.01	0.01	0.01	0.01	0.01
14.600	0.01	0.01	0.01	0.01	0.01
14.850	0.01	0.01	0.01	0.01	0.01
15.100	0.01	0.01	0.01	0.01	0.01
15.350	0.01	0.01	0.01	0.01	0.01
15.600	0.01	0.01	0.01	0.01	0.01
15.850	0.01	0.01	0.01	0.01	0.01
16.100	0.01	0.01	0.01	0.01	0.01
16.350	0.01	0.01	0.01	0.01	0.01
16.600	0.01	0.01	0.01	0.01	0.01
16.850	0.01	0.01	0.01	0.01	0.01
17.100	0.01	0.01	0.01	0.01	0.01
17.350	0.01	0.01	0.01	0.01	0.01
17.600	0.01	0.01	0.01	0.01	0.01
17.850	0.01	0.01	0.01	0.01	0.01
18.100	0.01	0.01	0.01	0.01	0.01
18.350	0.01	0.01	0.01	0.01	0.01
18.600	0.01	0.01	0.01	0.01	0.01
18.850	0.01	0.01	0.01	0.01	0.01
19.100	0.01	0.01	0.01	0.01	0.01
19.350	0.01	0.01	0.01	0.01	0.01
19.600	0.01	0.01	0.01	0.01	0.01
19.850	0.01	0.01	0.01	0.01	0.01
20.100	0.01	0.01	0.01	0.01	0.01
20.350	0.01	0.01	0.01	0.01	0.01
20.600	0.01	0.01	0.01	0.01	0.01
20.850	0.01	0.01	0.01	0.01	0.01
21.100	0.00	0.00	0.00	0.00	0.00
21.350	0.00	0.00	0.00	0.00	0.00
21.600	0.00	0.00	0.00	0.00	0.00
21.850	0.00	0.00	0.00	0.00	0.00
22.100	0.00	0.00	0.00	0.00	0.00
22.350	0.00	0.00	0.00	0.00	0.00
22.600	0.00	0.00	0.00	0.00	0.00
22.850	0.00	0.00	0.00	0.00	0.00
23.100	0.00	0.00	0.00	0.00	0.00
23.350	0.00	0.00	0.00	0.00	0.00
23.600	0.00	0.00	0.00	0.00	0.00
23.850	0.00	0.00	0.00	0.00	(N/A)

Subsection: Addition Summary
 Label: OUTFALL- POI-3
 Scenario: ESSEX CO. 2-YR (PROJ)

Return Event: 2 years
 Storm Event: ESSEX CO. 2-YR (PROJ)

Summary for Hydrograph Addition at 'OUTFALL- POI-3'

Upstream Link	Upstream Node
<Catchment to Outflow Node>	PERV - POI-3
<Catchment to Outflow Node>	IMP - POI-3

Node Inflows

Inflow Type	Element	Volume (ac-ft)	Time to Peak (hours)	Flow (Peak) (ft ³ /s)
Flow (From)	PERV - POI-3	0.005	12.100	0.08
Flow (From)	IMP - POI-3	0.010	12.100	0.13
Flow (In)	OUTFALL- POI-3	0.015	12.100	0.20

Subsection: Addition Summary
 Label: OUTFALL- POI-3
 Scenario: ESSEX CO. 10-YR (PROJ)

Return Event: 10 years
 Storm Event: ESSEX CO. 10-YR (PROJ)

Summary for Hydrograph Addition at 'OUTFALL- POI-3'

Upstream Link	Upstream Node
<Catchment to Outflow Node>	PERV - POI-3
<Catchment to Outflow Node>	IMP - POI-3

Node Inflows

Inflow Type	Element	Volume (ac-ft)	Time to Peak (hours)	Flow (Peak) (ft ³ /s)
Flow (From)	PERV - POI-3	0.011	12.100	0.15
Flow (From)	IMP - POI-3	0.016	12.100	0.20
Flow (In)	OUTFALL- POI-3	0.027	12.100	0.35

Subsection: Addition Summary
 Label: OUTFALL- POI-3
 Scenario: ESSEX CO. 100-YR (PROJ)

Return Event: 100 years
 Storm Event: ESSEX CO. 100-YR (PROJ)

Summary for Hydrograph Addition at 'OUTFALL- POI-3'

Upstream Link	Upstream Node
<Catchment to Outflow Node>	PERV - POI-3
<Catchment to Outflow Node>	IMP - POI-3

Node Inflows

Inflow Type	Element	Volume (ac-ft)	Time to Peak (hours)	Flow (Peak) (ft ³ /s)
Flow (From)	PERV - POI-3	0.023	12.100	0.32
Flow (From)	IMP - POI-3	0.030	12.100	0.36
Flow (In)	OUTFALL- POI-3	0.053	12.100	0.68

Subsection: Addition Summary
 Label: OUTFALL-POI-1
 Scenario: ESSEX CO. 2-YR (PROJ)

Return Event: 2 years
 Storm Event: ESSEX CO. 2-YR (PROJ)

Summary for Hydrograph Addition at 'OUTFALL-POI-1'

Upstream Link	Upstream Node
<Catchment to Outflow Node>	IMP - POI-1
<Catchment to Outflow Node>	PERV - POI-1

Node Inflows

Inflow Type	Element	Volume (ac-ft)	Time to Peak (hours)	Flow (Peak) (ft ³ /s)
Flow (From)	IMP - POI-1	0.028	12.100	0.35
Flow (From)	PERV - POI-1	0.021	12.100	0.30
Flow (In)	OUTFALL-POI-1	0.049	12.100	0.65

Subsection: Addition Summary
Label: OUTFALL-POI-1
Scenario: ESSEX CO. 10-YR (PROJ)

Return Event: 10 years
Storm Event: ESSEX CO. 10-YR (PROJ)

Summary for Hydrograph Addition at 'OUTFALL-POI-1'

Upstream Link	Upstream Node
<Catchment to Outflow Node>	IMP - POI-1
<Catchment to Outflow Node>	PERV - POI-1

Node Inflows

Inflow Type	Element	Volume (ac-ft)	Time to Peak (hours)	Flow (Peak) (ft ³ /s)
Flow (From)	IMP - POI-1	0.045	12.100	0.55
Flow (From)	PERV - POI-1	0.041	12.100	0.59
Flow (In)	OUTFALL-POI-1	0.086	12.100	1.14

Subsection: Addition Summary
 Label: OUTFALL-POI-1
 Scenario: ESSEX CO. 100-YR (PROJ)

Return Event: 100 years
 Storm Event: ESSEX CO. 100-YR (PROJ)

Summary for Hydrograph Addition at 'OUTFALL-POI-1'

Upstream Link	Upstream Node
<Catchment to Outflow Node>	IMP - POI-1
<Catchment to Outflow Node>	PERV - POI-1

Node Inflows

Inflow Type	Element	Volume (ac-ft)	Time to Peak (hours)	Flow (Peak) (ft ³ /s)
Flow (From)	IMP - POI-1	0.082	12.100	1.00
Flow (From)	PERV - POI-1	0.090	12.100	1.24
Flow (In)	OUTFALL-POI-1	0.173	12.100	2.24

Subsection: Addition Summary
Label: OUTFALL-POI-2
Scenario: ESSEX CO. 2-YR (PROJ)

Return Event: 2 years
Storm Event: ESSEX CO. 2-YR (PROJ)

Summary for Hydrograph Addition at 'OUTFALL-POI-2'

Upstream Link	Upstream Node
<Catchment to Outflow Node>	PERV - POI-2

Node Inflows

Inflow Type	Element	Volume (ac-ft)	Time to Peak (hours)	Flow (Peak) (ft ³ /s)
Flow (From)	PERV - POI-2	0.013	12.100	0.18
Flow (In)	OUTFALL-POI-2	0.013	12.100	0.18

Subsection: Addition Summary
Label: OUTFALL-POI-2
Scenario: ESSEX CO. 10-YR (PROJ)

Return Event: 10 years
Storm Event: ESSEX CO. 10-YR (PROJ)

Summary for Hydrograph Addition at 'OUTFALL-POI-2'

Upstream Link	Upstream Node
<Catchment to Outflow Node>	PERV - POI-2

Node Inflows

Inflow Type	Element	Volume (ac-ft)	Time to Peak (hours)	Flow (Peak) (ft ³ /s)
Flow (From)	PERV - POI-2	0.025	12.100	0.36
Flow (In)	OUTFALL-POI-2	0.025	12.100	0.36

Subsection: Addition Summary
Label: OUTFALL-POI-2
Scenario: ESSEX CO. 100-YR (PROJ)

Return Event: 100 years
Storm Event: ESSEX CO. 100-YR (PROJ)

Summary for Hydrograph Addition at 'OUTFALL-POI-2'

Upstream Link	Upstream Node
<Catchment to Outflow Node>	PERV - POI-2

Node Inflows

Inflow Type	Element	Volume (ac-ft)	Time to Peak (hours)	Flow (Peak) (ft ³ /s)
Flow (From)	PERV - POI-2	0.055	12.100	0.76
Flow (In)	OUTFALL-POI-2	0.055	12.100	0.76

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**PROPOSED HYDROLOGIC ROUTINGS -
FUTURE/PROJECTED RAINFALL (YEAR 2100)
CONDITION FOR 2-, 10-, AND 100- YEAR
STORM EVENTS**

Project Summary

Title	Kimberley Academy
Engineer	DP
Company	VNH/Pennoni
Date	8/31/2023

Notes

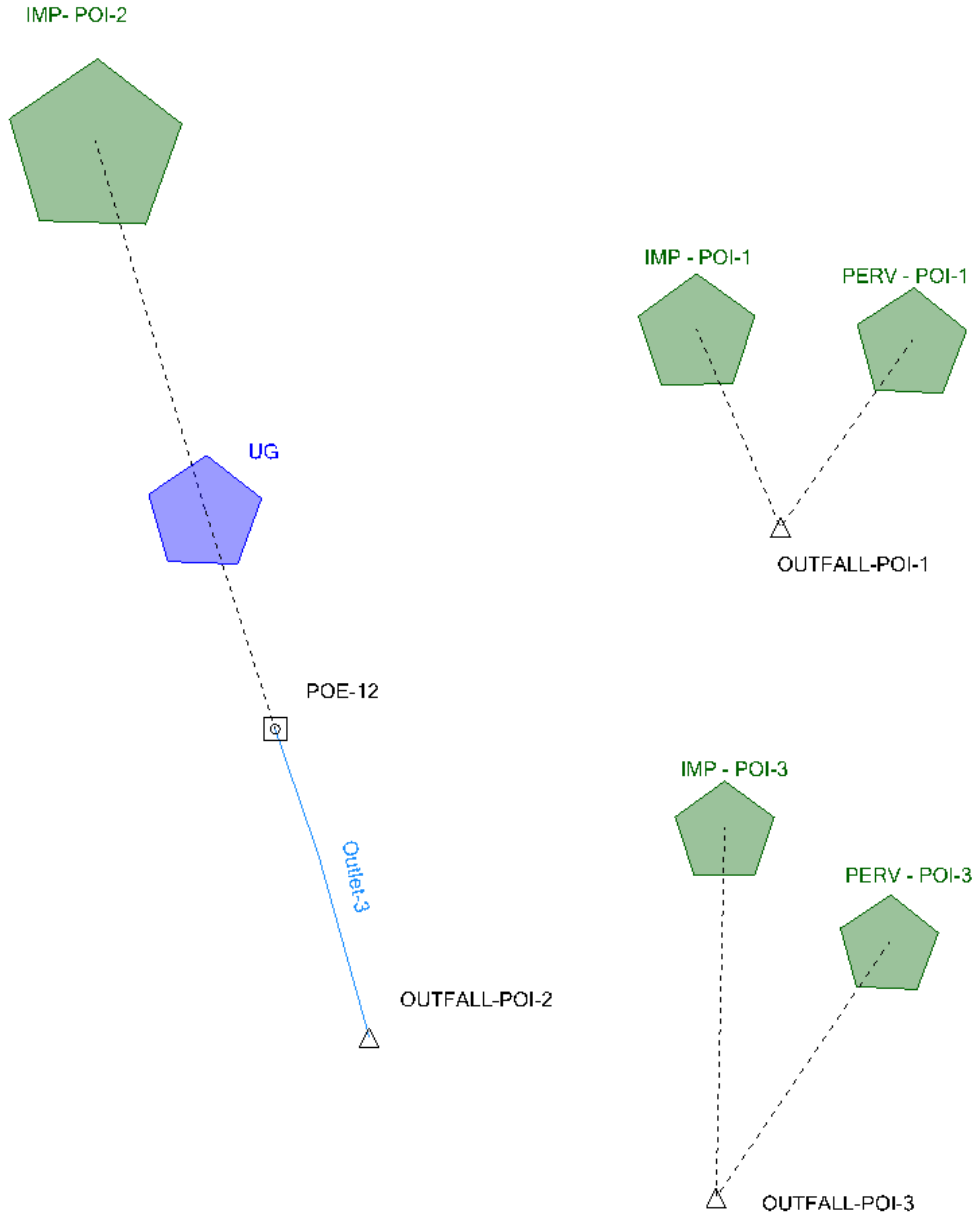


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Subsection: User Notifications

User Notifications

Message Id 7
Scenario ESSEX CO. 2-YR (PROJ)
Element Type Catchment
Element Id 31
Label PERV - POI-1
Time (N/A)
Message The difference between calculated peak flow and interpolated peak flow 2.0 % is greater than 1.5 %. Computed peak flow= 0.27 ft³/s Interp. peak flow= 0.27 ft³/s. Output increment for this catchment may be too large.
Source Warning

Message Id 7
Scenario ESSEX CO. 2-YR (PROJ)
Element Type Catchment
Element Id 365
Label PERV - POI-3
Time (N/A)
Message The difference between calculated peak flow and interpolated peak flow 2.0 % is greater than 1.5 %. Computed peak flow= 0.04 ft³/s Interp. peak flow= 0.04 ft³/s. Output increment for this catchment may be too large.
Source Warning

Subsection: Master Network Summary

Catchments Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ft ³)	Time to Peak (hours)	Peak Flow (ft ³ /s)
IMP - POI-1	ESSEX CO. 2-YR (PROJ)	2	734.000	12.100	0.21
IMP - POI-1	ESSEX CO. 10-YR (PROJ)	10	1,168.000	12.100	0.33
IMP - POI-1	ESSEX CO. 100-YR (PROJ)	100	2,149.000	12.100	0.60
PERV - POI-1	ESSEX CO. 2-YR (PROJ)	2	810.000	12.100	0.27
PERV - POI-1	ESSEX CO. 10-YR (PROJ)	10	1,595.000	12.100	0.52
PERV - POI-1	ESSEX CO. 100-YR (PROJ)	100	3,519.000	12.100	1.11
IMP - POI-3	ESSEX CO. 2-YR (PROJ)	2	416.000	12.100	0.12
IMP - POI-3	ESSEX CO. 10-YR (PROJ)	10	661.000	12.100	0.19
IMP - POI-3	ESSEX CO. 100-YR (PROJ)	100	1,216.000	12.100	0.34
PERV - POI-3	ESSEX CO. 2-YR (PROJ)	2	116.000	12.100	0.04
PERV - POI-3	ESSEX CO. 10-YR (PROJ)	10	228.000	12.100	0.07
PERV - POI-3	ESSEX CO. 100-YR (PROJ)	100	503.000	12.100	0.16
IMP- POI-2	ESSEX CO. 2-YR (PROJ)	2	1,047.000	12.100	0.30
IMP- POI-2	ESSEX CO. 10-YR (PROJ)	10	1,666.000	12.100	0.47
IMP- POI-2	ESSEX CO. 100-YR (PROJ)	100	3,065.000	12.100	0.85

Node Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ft ³)	Time to Peak (hours)	Peak Flow (ft ³ /s)
OUTFALL-POI-1	ESSEX CO. 2-YR (PROJ)	2	1,544.000	12.100	0.48
OUTFALL-POI-1	ESSEX CO. 10-YR (PROJ)	10	2,763.000	12.100	0.85
OUTFALL-POI-1	ESSEX CO. 100-YR (PROJ)	100	5,668.000	12.100	1.71
OUTFALL-POI-3	ESSEX CO. 2-YR (PROJ)	2	531.000	12.100	0.16
OUTFALL-POI-3	ESSEX CO. 10-YR (PROJ)	10	889.000	12.100	0.26

Subsection: Master Network Summary

Node Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ft ³)	Time to Peak (hours)	Peak Flow (ft ³ /s)
OUTFALL-POI-3	ESSEX CO. 100-YR (PROJ)	100	1,719.000	12.100	0.50
OUTFALL-POI-2	ESSEX CO. 2-YR (PROJ)	2	583.000	12.300	0.09
OUTFALL-POI-2	ESSEX CO. 10-YR (PROJ)	10	1,199.000	12.200	0.24
OUTFALL-POI-2	ESSEX CO. 100-YR (PROJ)	100	2,592.000	12.150	0.58

Pond Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ft ³)	Time to Peak (hours)	Peak Flow (ft ³ /s)	Maximum Water Surface Elevation (ft)	Maximum Pond Storage (ft ³)
UG (IN)	ESSEX CO. 2-YR (PROJ)	2	1,047.000	12.100	0.30	(N/A)	(N/A)
UG (OUT)	ESSEX CO. 2-YR (PROJ)	2	583.000	12.300	0.09	467.53	576.000
UG (IN)	ESSEX CO. 10-YR (PROJ)	10	1,666.000	12.100	0.47	(N/A)	(N/A)
UG (OUT)	ESSEX CO. 10-YR (PROJ)	10	1,199.000	12.200	0.24	467.92	743.000
UG (IN)	ESSEX CO. 100-YR (PROJ)	100	3,065.000	12.100	0.85	(N/A)	(N/A)
UG (OUT)	ESSEX CO. 100-YR (PROJ)	100	2,592.000	12.150	0.58	468.33	908.000

Subsection: Time-Depth Curve

Return Event: 100 years

Label: ESSEX CO.

Storm Event: ESSEX CO. 100-YR (PROJ)

Scenario: ESSEX CO. 100-YR (PROJ)

Time-Depth Curve: ESSEX CO. 100-YR (PROJ)	
Label	ESSEX CO. 100-YR (PROJ)
Start Time	0.000 hours
Increment	0.100 hours
End Time	24.000 hours
Return Event	100 years

CUMULATIVE RAINFALL (in)
Output Time Increment = 0.100 hours
Time on left represents time for first value in each row.

Time (hours)	Depth (in)	Depth (in)	Depth (in)	Depth (in)	Depth (in)
0.000	0.0	0.0	0.0	0.0	0.1
0.500	0.1	0.1	0.1	0.1	0.1
1.000	0.1	0.1	0.2	0.2	0.2
1.500	0.2	0.2	0.2	0.2	0.3
2.000	0.3	0.3	0.3	0.3	0.3
2.500	0.4	0.4	0.4	0.4	0.4
3.000	0.4	0.5	0.5	0.5	0.5
3.500	0.5	0.5	0.6	0.6	0.6
4.000	0.6	0.6	0.6	0.7	0.7
4.500	0.7	0.7	0.7	0.7	0.8
5.000	0.8	0.8	0.8	0.8	0.9
5.500	0.9	0.9	0.9	0.9	1.0
6.000	1.0	1.0	1.0	1.0	1.1
6.500	1.1	1.1	1.1	1.2	1.2
7.000	1.2	1.2	1.3	1.3	1.3
7.500	1.3	1.4	1.4	1.4	1.5
8.000	1.5	1.5	1.6	1.6	1.6
8.500	1.7	1.7	1.7	1.8	1.8
9.000	1.8	1.9	1.9	1.9	2.0
9.500	2.0	2.1	2.1	2.2	2.2
10.000	2.3	2.3	2.4	2.5	2.5
10.500	2.6	2.6	2.7	2.8	2.9
11.000	3.0	3.1	3.2	3.4	3.5
11.500	3.7	3.9	4.1	4.4	4.8
12.000	5.5	6.7	7.1	7.4	7.7
12.500	7.9	8.0	8.2	8.3	8.4
13.000	8.5	8.6	8.7	8.8	8.9
13.500	8.9	9.0	9.1	9.1	9.2
14.000	9.2	9.3	9.3	9.4	9.4
14.500	9.5	9.5	9.6	9.6	9.7
15.000	9.7	9.7	9.8	9.8	9.8
15.500	9.9	9.9	9.9	10.0	10.0
16.000	10.0	10.1	10.1	10.1	10.1

Subsection: Time-Depth Curve
 Label: ESSEX CO.
 Scenario: ESSEX CO. 100-YR (PROJ)

Return Event: 100 years
 Storm Event: ESSEX CO. 100-YR (PROJ)

CUMULATIVE RAINFALL (in)
Output Time Increment = 0.100 hours
Time on left represents time for first value in each row.

Time (hours)	Depth (in)	Depth (in)	Depth (in)	Depth (in)	Depth (in)
16.500	10.2	10.2	10.2	10.3	10.3
17.000	10.3	10.3	10.4	10.4	10.4
17.500	10.4	10.5	10.5	10.5	10.5
18.000	10.5	10.6	10.6	10.6	10.6
18.500	10.6	10.7	10.7	10.7	10.7
19.000	10.7	10.8	10.8	10.8	10.8
19.500	10.8	10.8	10.9	10.9	10.9
20.000	10.9	10.9	11.0	11.0	11.0
20.500	11.0	11.0	11.0	11.1	11.1
21.000	11.1	11.1	11.1	11.1	11.2
21.500	11.2	11.2	11.2	11.2	11.2
22.000	11.2	11.3	11.3	11.3	11.3
22.500	11.3	11.3	11.3	11.4	11.4
23.000	11.4	11.4	11.4	11.4	11.4
23.500	11.5	11.5	11.5	11.5	11.5
24.000	11.5	(N/A)	(N/A)	(N/A)	(N/A)

Subsection: Time-Depth Curve
 Label: ESSEX CO.
 Scenario: ESSEX CO. 10-YR (PROJ)

Return Event: 10 years
 Storm Event: ESSEX CO. 10-YR (PROJ)

Time-Depth Curve: ESSEX CO. 10-YR (PROJ)	
Label	ESSEX CO. 10-YR (PROJ)
Start Time	0.000 hours
Increment	0.100 hours
End Time	24.000 hours
Return Event	10 years

CUMULATIVE RAINFALL (in)
Output Time Increment = 0.100 hours
Time on left represents time for first value in each row.

Time (hours)	Depth (in)	Depth (in)	Depth (in)	Depth (in)	Depth (in)
0.000	0.0	0.0	0.0	0.0	0.0
0.500	0.0	0.0	0.1	0.1	0.1
1.000	0.1	0.1	0.1	0.1	0.1
1.500	0.1	0.1	0.1	0.1	0.1
2.000	0.2	0.2	0.2	0.2	0.2
2.500	0.2	0.2	0.2	0.2	0.2
3.000	0.2	0.2	0.3	0.3	0.3
3.500	0.3	0.3	0.3	0.3	0.3
4.000	0.3	0.3	0.4	0.4	0.4
4.500	0.4	0.4	0.4	0.4	0.4
5.000	0.4	0.4	0.5	0.5	0.5
5.500	0.5	0.5	0.5	0.5	0.5
6.000	0.5	0.6	0.6	0.6	0.6
6.500	0.6	0.6	0.6	0.6	0.7
7.000	0.7	0.7	0.7	0.7	0.7
7.500	0.7	0.8	0.8	0.8	0.8
8.000	0.8	0.8	0.9	0.9	0.9
8.500	0.9	0.9	1.0	1.0	1.0
9.000	1.0	1.0	1.1	1.1	1.1
9.500	1.1	1.1	1.2	1.2	1.2
10.000	1.3	1.3	1.3	1.4	1.4
10.500	1.4	1.5	1.5	1.6	1.6
11.000	1.7	1.7	1.8	1.9	1.9
11.500	2.0	2.1	2.3	2.4	2.7
12.000	3.1	3.7	3.9	4.1	4.2
12.500	4.4	4.4	4.5	4.6	4.7
13.000	4.7	4.8	4.8	4.9	4.9
13.500	4.9	5.0	5.0	5.0	5.1
14.000	5.1	5.1	5.2	5.2	5.2
14.500	5.2	5.3	5.3	5.3	5.3
15.000	5.4	5.4	5.4	5.4	5.4
15.500	5.5	5.5	5.5	5.5	5.5
16.000	5.5	5.6	5.6	5.6	5.6

Subsection: Time-Depth Curve
 Label: ESSEX CO.
 Scenario: ESSEX CO. 10-YR (PROJ)

Return Event: 10 years
 Storm Event: ESSEX CO. 10-YR (PROJ)

CUMULATIVE RAINFALL (in)
Output Time Increment = 0.100 hours
Time on left represents time for first value in each row.

Time (hours)	Depth (in)	Depth (in)	Depth (in)	Depth (in)	Depth (in)
16.500	5.6	5.6	5.7	5.7	5.7
17.000	5.7	5.7	5.7	5.7	5.8
17.500	5.8	5.8	5.8	5.8	5.8
18.000	5.8	5.8	5.8	5.9	5.9
18.500	5.9	5.9	5.9	5.9	5.9
19.000	5.9	5.9	6.0	6.0	6.0
19.500	6.0	6.0	6.0	6.0	6.0
20.000	6.0	6.0	6.1	6.1	6.1
20.500	6.1	6.1	6.1	6.1	6.1
21.000	6.1	6.1	6.1	6.2	6.2
21.500	6.2	6.2	6.2	6.2	6.2
22.000	6.2	6.2	6.2	6.2	6.2
22.500	6.3	6.3	6.3	6.3	6.3
23.000	6.3	6.3	6.3	6.3	6.3
23.500	6.3	6.3	6.3	6.4	6.4
24.000	6.4	(N/A)	(N/A)	(N/A)	(N/A)

Subsection: Time-Depth Curve
 Label: ESSEX CO.
 Scenario: ESSEX CO. 2-YR (PROJ)

Return Event: 2 years
 Storm Event: ESSEX CO. 2-YR (PROJ)

Time-Depth Curve: ESSEX CO. 2-YR (PROJ)	
Label	ESSEX CO. 2-YR (PROJ)
Start Time	0.000 hours
Increment	0.100 hours
End Time	24.000 hours
Return Event	2 years

CUMULATIVE RAINFALL (in)
Output Time Increment = 0.100 hours
Time on left represents time for first value in each row.

Time (hours)	Depth (in)	Depth (in)	Depth (in)	Depth (in)	Depth (in)
0.000	0.0	0.0	0.0	0.0	0.0
0.500	0.0	0.0	0.0	0.0	0.0
1.000	0.0	0.1	0.1	0.1	0.1
1.500	0.1	0.1	0.1	0.1	0.1
2.000	0.1	0.1	0.1	0.1	0.1
2.500	0.1	0.1	0.1	0.1	0.1
3.000	0.2	0.2	0.2	0.2	0.2
3.500	0.2	0.2	0.2	0.2	0.2
4.000	0.2	0.2	0.2	0.2	0.2
4.500	0.2	0.3	0.3	0.3	0.3
5.000	0.3	0.3	0.3	0.3	0.3
5.500	0.3	0.3	0.3	0.3	0.3
6.000	0.3	0.4	0.4	0.4	0.4
6.500	0.4	0.4	0.4	0.4	0.4
7.000	0.4	0.4	0.4	0.5	0.5
7.500	0.5	0.5	0.5	0.5	0.5
8.000	0.5	0.5	0.6	0.6	0.6
8.500	0.6	0.6	0.6	0.6	0.6
9.000	0.6	0.7	0.7	0.7	0.7
9.500	0.7	0.7	0.8	0.8	0.8
10.000	0.8	0.8	0.9	0.9	0.9
10.500	0.9	0.9	1.0	1.0	1.0
11.000	1.1	1.1	1.1	1.2	1.2
11.500	1.3	1.4	1.4	1.6	1.7
12.000	2.0	2.4	2.5	2.6	2.7
12.500	2.8	2.8	2.9	2.9	3.0
13.000	3.0	3.1	3.1	3.1	3.1
13.500	3.2	3.2	3.2	3.2	3.3
14.000	3.3	3.3	3.3	3.3	3.4
14.500	3.4	3.4	3.4	3.4	3.4
15.000	3.4	3.5	3.5	3.5	3.5
15.500	3.5	3.5	3.5	3.5	3.5
16.000	3.6	3.6	3.6	3.6	3.6

Subsection: Time-Depth Curve
 Label: ESSEX CO.
 Scenario: ESSEX CO. 2-YR (PROJ)

Return Event: 2 years
 Storm Event: ESSEX CO. 2-YR (PROJ)

CUMULATIVE RAINFALL (in)
Output Time Increment = 0.100 hours
Time on left represents time for first value in each row.

Time (hours)	Depth (in)	Depth (in)	Depth (in)	Depth (in)	Depth (in)
16.500	3.6	3.6	3.6	3.6	3.6
17.000	3.7	3.7	3.7	3.7	3.7
17.500	3.7	3.7	3.7	3.7	3.7
18.000	3.7	3.7	3.8	3.8	3.8
18.500	3.8	3.8	3.8	3.8	3.8
19.000	3.8	3.8	3.8	3.8	3.8
19.500	3.8	3.8	3.9	3.9	3.9
20.000	3.9	3.9	3.9	3.9	3.9
20.500	3.9	3.9	3.9	3.9	3.9
21.000	3.9	3.9	3.9	4.0	4.0
21.500	4.0	4.0	4.0	4.0	4.0
22.000	4.0	4.0	4.0	4.0	4.0
22.500	4.0	4.0	4.0	4.0	4.0
23.000	4.0	4.0	4.1	4.1	4.1
23.500	4.1	4.1	4.1	4.1	4.1
24.000	4.1	(N/A)	(N/A)	(N/A)	(N/A)

Subsection: Unit Hydrograph Equations

Unit Hydrograph Method (Computational Notes)

Definition of Terms

At	Total area (acres): $At = Ai + Ap$
Ai	Impervious area (acres)
Ap	Pervious area (acres)
CNi	Runoff curve number for impervious area
CNp	Runoff curve number for pervious area
fLoss	f loss constant infiltration (depth/time)
gKs	Saturated Hydraulic Conductivity (depth/time)
Md	Volumetric Moisture Deficit
Psi	Capillary Suction (length)
hK	Horton Infiltration Decay Rate ($time^{-1}$)
fo	Initial Infiltration Rate (depth/time)
fc	Ultimate(capacity)Infiltration Rate (depth/time)
Ia	Initial Abstraction (length)
dt	Computational increment (duration of unit excess rainfall) Default dt is smallest value of $0.1333Tc$, r_{tm} , and t_h (Smallest dt is then adjusted to match up with T_p)
UDdt	User specified override computational main time increment (only used if UDdt is $=> .1333Tc$)
D(t)	Point on distribution curve (fraction of P) for time step t
K	$2 / (1 + (Tr/Tp))$: default $K = 0.75$: (for $Tr/Tp = 1.67$)
Ks	Hydrograph shape factor = Unit Conversions * $K = ((1hr/3600sec) * (1ft/12in) * ((5280ft)^2/sq.mi)) * K$ Default $K_s = 645.333 * 0.75 = 484$
Lag	Lag time from center of excess runoff (dt) to T_p : $Lag = 0.6Tc$
P	Total precipitation depth, inches
Pa(t)	Accumulated rainfall at time step t
Pi(t)	Incremental rainfall at time step t
qp	Peak discharge (cfs) for 1in. runoff, for 1hr, for 1 sq.mi. = $(K_s * A * Q) / T_p$ (where $Q = 1in.$ runoff, $A=sq.mi.$)
Qu(t)	Unit hydrograph ordinate (cfs) at time step t
Q(t)	Final hydrograph ordinate (cfs) at time step t
Rai(t)	Accumulated runoff (inches) at time step t for impervious area
Rap(t)	Accumulated runoff (inches) at time step t for pervious area
Rii(t)	Incremental runoff (inches) at time step t for impervious area
Rip(t)	Incremental runoff (inches) at time step t for pervious area
R(t)	Incremental weighted total runoff (inches)
Rtm	Time increment for rainfall table
Si	S for impervious area: $Si = (1000/CNi) - 10$
Sp	S for pervious area: $Sp = (1000/CNp) - 10$
t	Time step (row) number
Tc	Time of concentration
Tb	Time (hrs) of entire unit hydrograph: $Tb = T_p + Tr$
Tp	Time (hrs) to peak of a unit hydrograph: $T_p = (dt/2) + Lag$
Tr	Time (hrs) of receding limb of unit hydrograph: $Tr = ratio\ of\ T_p$

Subsection: Unit Hydrograph Equations

Unit Hydrograph Method

Computational Notes

Precipitation

Column (1) Time for time step t
Column (2) $D(t)$ = Point on distribution curve for time step t
Column (3) $P_i(t) = P_a(t) - P_a(t-1)$: Col.(4) - Preceding Col.(4)
Column (4) $P_a(t) = D(t) \times P$: Col.(2) x P

Pervious Area Runoff (using SCS Runoff CN Method)

Column (5) $R_{ap}(t)$ = Accumulated pervious runoff for time step t
If $(P_a(t))$ is $\leq 0.2Sp$ then use: $R_{ap}(t) = 0.0$
If $(P_a(t))$ is $> 0.2Sp$ then use:
 $R_{ap}(t) = (Col.(4) - 0.2Sp) \times 2 / (Col.(4) + 0.8Sp)$
Column (6) $R_{ip}(t)$ = Incremental pervious runoff for time step t
 $R_{ip}(t) = R_{ap}(t) - R_{ap}(t-1)$
 $R_{ip}(t) = Col.(5)$ for current row - $Col.(5)$ for preceding row.

Impervious Area Runoff

Column (7 & 8)... Did not specify to use impervious areas.

Incremental Weighted Runoff

Column (9) $R(t) = (A_p/A_t) \times R_{ip}(t) + (A_i/A_t) \times R_{ii}(t)$
 $R(t) = (A_p/A_t) \times Col.(6) + (A_i/A_t) \times Col.(8)$

SCS Unit Hydrograph Method

Column (10) $Q(t)$ is computed with the SCS unit hydrograph method using $R(t)$ and $Q_u(t)$.

Subsection: Unit Hydrograph Summary

Label: IMP - POI-1

Scenario: ESSEX CO. 2-YR (PROJ)

Return Event: 2 years

Storm Event: ESSEX CO. 2-YR (PROJ)

Storm Event	ESSEX CO. 2-YR (PROJ)
Return Event	2 years
Duration	24.000 hours
Depth	4.1 in
Time of Concentration (Composite)	0.083 hours
Area (User Defined)	2,288.00 ft ²
Computational Time Increment	0.011 hours
Time to Peak (Computed)	12.111 hours
Flow (Peak, Computed)	0.21 ft ³ /s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	12.100 hours
Flow (Peak Interpolated Output)	0.21 ft ³ /s
Drainage Area	
SCS CN (Composite)	98.000
Area (User Defined)	2,288.00 ft ²
Maximum Retention (Pervious)	0.2 in
Maximum Retention (Pervious, 20 percent)	0.0 in
Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	3.9 in
Runoff Volume (Pervious)	735.000 ft ³
Hydrograph Volume (Area under Hydrograph curve)	
Volume	734.000 ft ³
SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.083 hours
Computational Time Increment	0.011 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749

Subsection: Unit Hydrograph Summary

Label: IMP - POI-1

Scenario: ESSEX CO. 2-YR (PROJ)

Return Event: 2 years

Storm Event: ESSEX CO. 2-YR (PROJ)

SCS Unit Hydrograph Parameters	
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	0.71 ft ³ /s
Unit peak time, Tp	0.056 hours
Unit receding limb, Tr	0.222 hours
Total unit time, Tb	0.278 hours

Subsection: Unit Hydrograph (Hydrograph Table)

Label: IMP - POI-1

Scenario: ESSEX CO. 2-YR (PROJ)

Return Event: 2 years

Storm Event: ESSEX CO. 2-YR (PROJ)

Storm Event	ESSEX CO. 2-YR (PROJ)
Return Event	2 years
Duration	24.000 hours
Depth	4.1 in
Time of Concentration (Composite)	0.083 hours
Area (User Defined)	2,288.00 ft ²

HYDROGRAPH ORDINATES (ft³/s)

Output Time Increment = 0.050 hours

Time on left represents time for first value in each row.

Time (hours)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
1.950	0.00	0.00	0.00	0.00	0.00
2.200	0.00	0.00	0.00	0.00	0.00
2.450	0.00	0.00	0.00	0.00	0.00
2.700	0.00	0.00	0.00	0.00	0.00
2.950	0.00	0.00	0.00	0.00	0.00
3.200	0.00	0.00	0.00	0.00	0.00
3.450	0.00	0.00	0.00	0.00	0.00
3.700	0.00	0.00	0.00	0.00	0.00
3.950	0.00	0.00	0.00	0.00	0.00
4.200	0.00	0.00	0.00	0.00	0.00
4.450	0.00	0.00	0.00	0.00	0.00
4.700	0.00	0.00	0.00	0.00	0.00
4.950	0.00	0.00	0.00	0.00	0.00
5.200	0.00	0.00	0.00	0.00	0.00
5.450	0.00	0.00	0.00	0.00	0.00
5.700	0.00	0.00	0.00	0.00	0.00
5.950	0.00	0.00	0.00	0.00	0.00
6.200	0.00	0.00	0.00	0.00	0.00
6.450	0.00	0.00	0.00	0.00	0.00
6.700	0.00	0.00	0.00	0.00	0.00
6.950	0.00	0.00	0.00	0.00	0.00
7.200	0.00	0.00	0.00	0.00	0.00
7.450	0.00	0.00	0.00	0.00	0.00
7.700	0.00	0.00	0.01	0.01	0.01
7.950	0.01	0.01	0.01	0.01	0.01
8.200	0.01	0.01	0.01	0.01	0.01
8.450	0.01	0.01	0.01	0.01	0.01
8.700	0.01	0.01	0.01	0.01	0.01
8.950	0.01	0.01	0.01	0.01	0.01
9.200	0.01	0.01	0.01	0.01	0.01
9.450	0.01	0.01	0.01	0.01	0.01
9.700	0.01	0.01	0.01	0.01	0.01

Subsection: Unit Hydrograph (Hydrograph Table)

Return Event: 2 years

Label: IMP - POI-1

Storm Event: ESSEX CO. 2-YR (PROJ)

Scenario: ESSEX CO. 2-YR (PROJ)

HYDROGRAPH ORDINATES (ft³/s)

Output Time Increment = 0.050 hours

Time on left represents time for first value in each row.

Time (hours)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
9.950	0.01	0.01	0.01	0.01	0.01
10.200	0.01	0.01	0.01	0.01	0.01
10.450	0.01	0.01	0.01	0.01	0.01
10.700	0.01	0.01	0.01	0.02	0.02
10.950	0.02	0.02	0.02	0.02	0.02
11.200	0.02	0.02	0.02	0.02	0.03
11.450	0.03	0.03	0.03	0.04	0.04
11.700	0.04	0.05	0.05	0.06	0.07
11.950	0.10	0.13	0.17	0.21	0.17
12.200	0.10	0.07	0.06	0.05	0.04
12.450	0.04	0.04	0.04	0.03	0.03
12.700	0.03	0.03	0.02	0.02	0.02
12.950	0.02	0.02	0.02	0.02	0.02
13.200	0.02	0.02	0.02	0.02	0.01
13.450	0.01	0.01	0.01	0.01	0.01
13.700	0.01	0.01	0.01	0.01	0.01
13.950	0.01	0.01	0.01	0.01	0.01
14.200	0.01	0.01	0.01	0.01	0.01
14.450	0.01	0.01	0.01	0.01	0.01
14.700	0.01	0.01	0.01	0.01	0.01
14.950	0.01	0.01	0.01	0.01	0.01
15.200	0.01	0.01	0.01	0.01	0.01
15.450	0.01	0.01	0.01	0.01	0.01
15.700	0.01	0.01	0.01	0.01	0.01
15.950	0.01	0.01	0.01	0.01	0.01
16.200	0.01	0.01	0.01	0.01	0.01
16.450	0.01	0.01	0.01	0.01	0.01
16.700	0.01	0.01	0.01	0.01	0.00
16.950	0.00	0.00	0.00	0.00	0.00
17.200	0.00	0.00	0.00	0.00	0.00
17.450	0.00	0.00	0.00	0.00	0.00
17.700	0.00	0.00	0.00	0.00	0.00
17.950	0.00	0.00	0.00	0.00	0.00
18.200	0.00	0.00	0.00	0.00	0.00
18.450	0.00	0.00	0.00	0.00	0.00
18.700	0.00	0.00	0.00	0.00	0.00
18.950	0.00	0.00	0.00	0.00	0.00
19.200	0.00	0.00	0.00	0.00	0.00
19.450	0.00	0.00	0.00	0.00	0.00
19.700	0.00	0.00	0.00	0.00	0.00
19.950	0.00	0.00	0.00	0.00	0.00
20.200	0.00	0.00	0.00	0.00	0.00

Subsection: Unit Hydrograph (Hydrograph Table)

Label: IMP - POI-1

Scenario: ESSEX CO. 2-YR (PROJ)

Return Event: 2 years

Storm Event: ESSEX CO. 2-YR (PROJ)

HYDROGRAPH ORDINATES (ft³/s)

Output Time Increment = 0.050 hours

Time on left represents time for first value in each row.

Time (hours)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
20.450	0.00	0.00	0.00	0.00	0.00
20.700	0.00	0.00	0.00	0.00	0.00
20.950	0.00	0.00	0.00	0.00	0.00
21.200	0.00	0.00	0.00	0.00	0.00
21.450	0.00	0.00	0.00	0.00	0.00
21.700	0.00	0.00	0.00	0.00	0.00
21.950	0.00	0.00	0.00	0.00	0.00
22.200	0.00	0.00	0.00	0.00	0.00
22.450	0.00	0.00	0.00	0.00	0.00
22.700	0.00	0.00	0.00	0.00	0.00
22.950	0.00	0.00	0.00	0.00	0.00
23.200	0.00	0.00	0.00	0.00	0.00
23.450	0.00	0.00	0.00	0.00	0.00
23.700	0.00	0.00	0.00	0.00	0.00
23.950	0.00	0.00	(N/A)	(N/A)	(N/A)

Subsection: Unit Hydrograph Summary

Label: IMP - POI-1

Scenario: ESSEX CO. 10-YR (PROJ)

Return Event: 10 years

Storm Event: ESSEX CO. 10-YR (PROJ)

Storm Event	ESSEX CO. 10-YR (PROJ)
Return Event	10 years
Duration	24.000 hours
Depth	6.4 in
Time of Concentration (Composite)	0.083 hours
Area (User Defined)	2,288.00 ft ²
Computational Time Increment	0.011 hours
Time to Peak (Computed)	12.111 hours
Flow (Peak, Computed)	0.33 ft ³ /s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	12.100 hours
Flow (Peak Interpolated Output)	0.33 ft ³ /s
Drainage Area	
SCS CN (Composite)	98.000
Area (User Defined)	2,288.00 ft ²
Maximum Retention (Pervious)	0.2 in
Maximum Retention (Pervious, 20 percent)	0.0 in
Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	6.1 in
Runoff Volume (Pervious)	1,169.068 ft ³
Hydrograph Volume (Area under Hydrograph curve)	
Volume	1,168.000 ft ³
SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.083 hours
Computational Time Increment	0.011 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749

Subsection: Unit Hydrograph Summary

Label: IMP - POI-1

Scenario: ESSEX CO. 10-YR (PROJ)

Return Event: 10 years

Storm Event: ESSEX CO. 10-YR (PROJ)

SCS Unit Hydrograph Parameters	
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	0.71 ft ³ /s
Unit peak time, Tp	0.056 hours
Unit receding limb, Tr	0.222 hours
Total unit time, Tb	0.278 hours

Subsection: Unit Hydrograph (Hydrograph Table)

Label: IMP - POI-1

Scenario: ESSEX CO. 10-YR (PROJ)

Return Event: 10 years

Storm Event: ESSEX CO. 10-YR (PROJ)

Storm Event	ESSEX CO. 10-YR (PROJ)
Return Event	10 years
Duration	24.000 hours
Depth	6.4 in
Time of Concentration (Composite)	0.083 hours
Area (User Defined)	2,288.00 ft ²

HYDROGRAPH ORDINATES (ft³/s)

Output Time Increment = 0.050 hours

Time on left represents time for first value in each row.

Time (hours)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
1.050	0.00	0.00	0.00	0.00	0.00
1.300	0.00	0.00	0.00	0.00	0.00
1.550	0.00	0.00	0.00	0.00	0.00
1.800	0.00	0.00	0.00	0.00	0.00
2.050	0.00	0.00	0.00	0.00	0.00
2.300	0.00	0.00	0.00	0.00	0.00
2.550	0.00	0.00	0.00	0.00	0.00
2.800	0.00	0.00	0.00	0.00	0.00
3.050	0.00	0.00	0.00	0.00	0.00
3.300	0.00	0.00	0.00	0.00	0.00
3.550	0.00	0.00	0.00	0.00	0.00
3.800	0.00	0.00	0.00	0.00	0.00
4.050	0.00	0.00	0.00	0.00	0.00
4.300	0.00	0.00	0.00	0.00	0.00
4.550	0.00	0.00	0.00	0.00	0.00
4.800	0.00	0.00	0.00	0.00	0.00
5.050	0.00	0.00	0.00	0.00	0.01
5.300	0.01	0.01	0.01	0.01	0.01
5.550	0.01	0.01	0.01	0.01	0.01
5.800	0.01	0.01	0.01	0.01	0.01
6.050	0.01	0.01	0.01	0.01	0.01
6.300	0.01	0.01	0.01	0.01	0.01
6.550	0.01	0.01	0.01	0.01	0.01
6.800	0.01	0.01	0.01	0.01	0.01
7.050	0.01	0.01	0.01	0.01	0.01
7.300	0.01	0.01	0.01	0.01	0.01
7.550	0.01	0.01	0.01	0.01	0.01
7.800	0.01	0.01	0.01	0.01	0.01
8.050	0.01	0.01	0.01	0.01	0.01
8.300	0.01	0.01	0.01	0.01	0.01
8.550	0.01	0.01	0.01	0.01	0.01
8.800	0.01	0.01	0.01	0.01	0.01

Subsection: Unit Hydrograph (Hydrograph Table)

Label: IMP - POI-1

Scenario: ESSEX CO. 10-YR (PROJ)

Return Event: 10 years

Storm Event: ESSEX CO. 10-YR (PROJ)

HYDROGRAPH ORDINATES (ft³/s)

Output Time Increment = 0.050 hours

Time on left represents time for first value in each row.

Time (hours)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
9.050	0.01	0.01	0.01	0.01	0.01
9.300	0.01	0.01	0.01	0.01	0.01
9.550	0.01	0.01	0.01	0.01	0.01
9.800	0.01	0.01	0.01	0.02	0.02
10.050	0.02	0.02	0.02	0.02	0.02
10.300	0.02	0.02	0.02	0.02	0.02
10.550	0.02	0.02	0.02	0.02	0.02
10.800	0.02	0.02	0.03	0.03	0.03
11.050	0.03	0.03	0.03	0.03	0.04
11.300	0.04	0.04	0.04	0.04	0.04
11.550	0.05	0.06	0.06	0.06	0.07
11.800	0.08	0.10	0.12	0.15	0.20
12.050	0.26	0.33	0.26	0.16	0.12
12.300	0.09	0.08	0.07	0.06	0.06
12.550	0.06	0.05	0.04	0.04	0.04
12.800	0.04	0.04	0.04	0.03	0.03
13.050	0.03	0.03	0.03	0.03	0.03
13.300	0.02	0.02	0.02	0.02	0.02
13.550	0.02	0.02	0.02	0.02	0.02
13.800	0.02	0.02	0.02	0.02	0.02
14.050	0.02	0.02	0.02	0.02	0.02
14.300	0.01	0.01	0.01	0.01	0.01
14.550	0.01	0.01	0.01	0.01	0.01
14.800	0.01	0.01	0.01	0.01	0.01
15.050	0.01	0.01	0.01	0.01	0.01
15.300	0.01	0.01	0.01	0.01	0.01
15.550	0.01	0.01	0.01	0.01	0.01
15.800	0.01	0.01	0.01	0.01	0.01
16.050	0.01	0.01	0.01	0.01	0.01
16.300	0.01	0.01	0.01	0.01	0.01
16.550	0.01	0.01	0.01	0.01	0.01
16.800	0.01	0.01	0.01	0.01	0.01
17.050	0.01	0.01	0.01	0.01	0.01
17.300	0.01	0.01	0.01	0.01	0.01
17.550	0.01	0.01	0.01	0.01	0.01
17.800	0.01	0.01	0.01	0.01	0.01
18.050	0.01	0.01	0.01	0.01	0.01
18.300	0.01	0.01	0.01	0.01	0.01
18.550	0.01	0.01	0.01	0.01	0.01
18.800	0.01	0.01	0.01	0.01	0.01
19.050	0.01	0.01	0.01	0.01	0.01
19.300	0.01	0.01	0.01	0.01	0.01

Subsection: Unit Hydrograph (Hydrograph Table)

Label: IMP - POI-1

Scenario: ESSEX CO. 10-YR (PROJ)

Return Event: 10 years

Storm Event: ESSEX CO. 10-YR (PROJ)

HYDROGRAPH ORDINATES (ft³/s)

Output Time Increment = 0.050 hours

Time on left represents time for first value in each row.

Time (hours)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
19.550	0.01	0.01	0.01	0.01	0.01
19.800	0.01	0.01	0.01	0.01	0.01
20.050	0.01	0.01	0.01	0.01	0.01
20.300	0.01	0.01	0.01	0.01	0.00
20.550	0.00	0.00	0.00	0.00	0.00
20.800	0.00	0.00	0.00	0.00	0.00
21.050	0.00	0.00	0.00	0.00	0.00
21.300	0.00	0.00	0.00	0.00	0.00
21.550	0.00	0.00	0.00	0.00	0.00
21.800	0.00	0.00	0.00	0.00	0.00
22.050	0.00	0.00	0.00	0.00	0.00
22.300	0.00	0.00	0.00	0.00	0.00
22.550	0.00	0.00	0.00	0.00	0.00
22.800	0.00	0.00	0.00	0.00	0.00
23.050	0.00	0.00	0.00	0.00	0.00
23.300	0.00	0.00	0.00	0.00	0.00
23.550	0.00	0.00	0.00	0.00	0.00
23.800	0.00	0.00	0.00	0.00	0.00

Subsection: Unit Hydrograph Summary

Label: IMP - POI-1

Scenario: ESSEX CO. 100-YR (PROJ)

Return Event: 100 years

Storm Event: ESSEX CO. 100-YR (PROJ)

Storm Event	ESSEX CO. 100-YR (PROJ)
Return Event	100 years
Duration	24.000 hours
Depth	11.5 in
Time of Concentration (Composite)	0.083 hours
Area (User Defined)	2,288.00 ft ²
Computational Time Increment	0.011 hours
Time to Peak (Computed)	12.111 hours
Flow (Peak, Computed)	0.60 ft ³ /s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	12.100 hours
Flow (Peak Interpolated Output)	0.60 ft ³ /s
Drainage Area	
SCS CN (Composite)	98.000
Area (User Defined)	2,288.00 ft ²
Maximum Retention (Pervious)	0.2 in
Maximum Retention (Pervious, 20 percent)	0.0 in
Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	11.3 in
Runoff Volume (Pervious)	2,150.466 ft ³
Hydrograph Volume (Area under Hydrograph curve)	
Volume	2,149.000 ft ³
SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.083 hours
Computational Time Increment	0.011 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749

Subsection: Unit Hydrograph Summary

Label: IMP - POI-1

Scenario: ESSEX CO. 100-YR (PROJ)

Return Event: 100 years

Storm Event: ESSEX CO. 100-YR (PROJ)

SCS Unit Hydrograph Parameters	
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	0.71 ft ³ /s
Unit peak time, Tp	0.056 hours
Unit receding limb, Tr	0.222 hours
Total unit time, Tb	0.278 hours

Subsection: Unit Hydrograph (Hydrograph Table)

Label: IMP - POI-1

Scenario: ESSEX CO. 100-YR (PROJ)

Return Event: 100 years

Storm Event: ESSEX CO. 100-YR (PROJ)

Storm Event	ESSEX CO. 100-YR (PROJ)
Return Event	100 years
Duration	24.000 hours
Depth	11.5 in
Time of Concentration (Composite)	0.083 hours
Area (User Defined)	2,288.00 ft ²

HYDROGRAPH ORDINATES (ft³/s)

Output Time Increment = 0.050 hours

Time on left represents time for first value in each row.

Time (hours)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
0.500	0.00	0.00	0.00	0.00	0.00
0.750	0.00	0.00	0.00	0.00	0.00
1.000	0.00	0.00	0.00	0.00	0.00
1.250	0.00	0.00	0.00	0.00	0.00
1.500	0.01	0.01	0.01	0.01	0.01
1.750	0.01	0.01	0.01	0.01	0.01
2.000	0.01	0.01	0.01	0.01	0.01
2.250	0.01	0.01	0.01	0.01	0.01
2.500	0.01	0.01	0.01	0.01	0.01
2.750	0.01	0.01	0.01	0.01	0.01
3.000	0.01	0.01	0.01	0.01	0.01
3.250	0.01	0.01	0.01	0.01	0.01
3.500	0.01	0.01	0.01	0.01	0.01
3.750	0.01	0.01	0.01	0.01	0.01
4.000	0.01	0.01	0.01	0.01	0.01
4.250	0.01	0.01	0.01	0.01	0.01
4.500	0.01	0.01	0.01	0.01	0.01
4.750	0.01	0.01	0.01	0.01	0.01
5.000	0.01	0.01	0.01	0.01	0.01
5.250	0.01	0.01	0.01	0.01	0.01
5.500	0.01	0.01	0.01	0.01	0.01
5.750	0.01	0.01	0.01	0.01	0.01
6.000	0.01	0.01	0.01	0.01	0.01
6.250	0.01	0.01	0.01	0.01	0.01
6.500	0.01	0.01	0.01	0.01	0.01
6.750	0.01	0.01	0.01	0.01	0.01
7.000	0.01	0.01	0.01	0.01	0.01
7.250	0.01	0.01	0.01	0.01	0.01
7.500	0.01	0.01	0.01	0.01	0.02
7.750	0.02	0.02	0.02	0.02	0.02
8.000	0.02	0.02	0.02	0.02	0.02
8.250	0.02	0.02	0.02	0.02	0.02

Subsection: Unit Hydrograph (Hydrograph Table)

Return Event: 100 years

Label: IMP - POI-1

Storm Event: ESSEX CO. 100-YR (PROJ)

Scenario: ESSEX CO. 100-YR (PROJ)

HYDROGRAPH ORDINATES (ft³/s)

Output Time Increment = 0.050 hours

Time on left represents time for first value in each row.

Time (hours)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
8.500	0.02	0.02	0.02	0.02	0.02
8.750	0.02	0.02	0.02	0.02	0.02
9.000	0.02	0.02	0.02	0.02	0.02
9.250	0.02	0.02	0.02	0.02	0.02
9.500	0.02	0.02	0.02	0.02	0.03
9.750	0.03	0.03	0.03	0.03	0.03
10.000	0.03	0.03	0.03	0.03	0.03
10.250	0.03	0.03	0.03	0.03	0.03
10.500	0.03	0.03	0.04	0.04	0.04
10.750	0.04	0.04	0.04	0.05	0.05
11.000	0.05	0.05	0.06	0.06	0.06
11.250	0.07	0.07	0.07	0.07	0.08
11.500	0.08	0.09	0.11	0.11	0.11
11.750	0.13	0.15	0.18	0.21	0.28
12.000	0.36	0.47	0.60	0.47	0.28
12.250	0.21	0.17	0.15	0.12	0.12
12.500	0.11	0.10	0.09	0.08	0.08
12.750	0.07	0.07	0.07	0.06	0.06
13.000	0.06	0.06	0.05	0.05	0.05
13.250	0.05	0.04	0.04	0.04	0.04
13.500	0.04	0.04	0.03	0.03	0.03
13.750	0.03	0.03	0.03	0.03	0.03
14.000	0.03	0.03	0.03	0.03	0.03
14.250	0.03	0.03	0.03	0.03	0.03
14.500	0.02	0.02	0.02	0.02	0.02
14.750	0.02	0.02	0.02	0.02	0.02
15.000	0.02	0.02	0.02	0.02	0.02
15.250	0.02	0.02	0.02	0.02	0.02
15.500	0.02	0.02	0.02	0.02	0.02
15.750	0.02	0.02	0.02	0.02	0.02
16.000	0.02	0.02	0.02	0.02	0.02
16.250	0.02	0.02	0.02	0.02	0.02
16.500	0.02	0.01	0.01	0.01	0.01
16.750	0.01	0.01	0.01	0.01	0.01
17.000	0.01	0.01	0.01	0.01	0.01
17.250	0.01	0.01	0.01	0.01	0.01
17.500	0.01	0.01	0.01	0.01	0.01
17.750	0.01	0.01	0.01	0.01	0.01
18.000	0.01	0.01	0.01	0.01	0.01
18.250	0.01	0.01	0.01	0.01	0.01
18.500	0.01	0.01	0.01	0.01	0.01
18.750	0.01	0.01	0.01	0.01	0.01

Subsection: Unit Hydrograph (Hydrograph Table)

Label: IMP - POI-1

Scenario: ESSEX CO. 100-YR (PROJ)

Return Event: 100 years

Storm Event: ESSEX CO. 100-YR (PROJ)

HYDROGRAPH ORDINATES (ft³/s)

Output Time Increment = 0.050 hours

Time on left represents time for first value in each row.

Time (hours)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
19.000	0.01	0.01	0.01	0.01	0.01
19.250	0.01	0.01	0.01	0.01	0.01
19.500	0.01	0.01	0.01	0.01	0.01
19.750	0.01	0.01	0.01	0.01	0.01
20.000	0.01	0.01	0.01	0.01	0.01
20.250	0.01	0.01	0.01	0.01	0.01
20.500	0.01	0.01	0.01	0.01	0.01
20.750	0.01	0.01	0.01	0.01	0.01
21.000	0.01	0.01	0.01	0.01	0.01
21.250	0.01	0.01	0.01	0.01	0.01
21.500	0.01	0.01	0.01	0.01	0.01
21.750	0.01	0.01	0.01	0.01	0.01
22.000	0.01	0.01	0.01	0.01	0.01
22.250	0.01	0.01	0.01	0.01	0.01
22.500	0.01	0.01	0.01	0.01	0.01
22.750	0.01	0.01	0.01	0.01	0.01
23.000	0.01	0.01	0.01	0.01	0.01
23.250	0.01	0.01	0.01	0.01	0.01
23.500	0.01	0.01	0.01	0.01	0.01
23.750	0.01	0.01	0.01	0.01	0.01
24.000	0.01	(N/A)	(N/A)	(N/A)	(N/A)

Subsection: Unit Hydrograph Summary

Label: IMP - POI-3

Scenario: ESSEX CO. 2-YR (PROJ)

Return Event: 2 years

Storm Event: ESSEX CO. 2-YR (PROJ)

Storm Event	ESSEX CO. 2-YR (PROJ)
Return Event	2 years
Duration	24.000 hours
Depth	4.1 in
Time of Concentration (Composite)	0.083 hours
Area (User Defined)	1,295.00 ft ²
Computational Time Increment	0.011 hours
Time to Peak (Computed)	12.111 hours
Flow (Peak, Computed)	0.12 ft ³ /s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	12.100 hours
Flow (Peak Interpolated Output)	0.12 ft ³ /s
Drainage Area	
SCS CN (Composite)	98.000
Area (User Defined)	1,295.00 ft ²
Maximum Retention (Pervious)	0.2 in
Maximum Retention (Pervious, 20 percent)	0.0 in
Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	3.9 in
Runoff Volume (Pervious)	416.007 ft ³
Hydrograph Volume (Area under Hydrograph curve)	
Volume	416.000 ft ³
SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.083 hours
Computational Time Increment	0.011 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749

Subsection: Unit Hydrograph Summary

Label: IMP - POI-3

Scenario: ESSEX CO. 2-YR (PROJ)

Return Event: 2 years

Storm Event: ESSEX CO. 2-YR (PROJ)

SCS Unit Hydrograph Parameters	
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	0.40 ft ³ /s
Unit peak time, Tp	0.056 hours
Unit receding limb, Tr	0.222 hours
Total unit time, Tb	0.278 hours

Subsection: Unit Hydrograph (Hydrograph Table)

Label: IMP - POI-3

Scenario: ESSEX CO. 2-YR (PROJ)

Return Event: 2 years

Storm Event: ESSEX CO. 2-YR (PROJ)

Storm Event	ESSEX CO. 2-YR (PROJ)
Return Event	2 years
Duration	24.000 hours
Depth	4.1 in
Time of Concentration (Composite)	0.083 hours
Area (User Defined)	1,295.00 ft ²

HYDROGRAPH ORDINATES (ft³/s)

Output Time Increment = 0.050 hours

Time on left represents time for first value in each row.

Time (hours)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
3.100	0.00	0.00	0.00	0.00	0.00
3.350	0.00	0.00	0.00	0.00	0.00
3.600	0.00	0.00	0.00	0.00	0.00
3.850	0.00	0.00	0.00	0.00	0.00
4.100	0.00	0.00	0.00	0.00	0.00
4.350	0.00	0.00	0.00	0.00	0.00
4.600	0.00	0.00	0.00	0.00	0.00
4.850	0.00	0.00	0.00	0.00	0.00
5.100	0.00	0.00	0.00	0.00	0.00
5.350	0.00	0.00	0.00	0.00	0.00
5.600	0.00	0.00	0.00	0.00	0.00
5.850	0.00	0.00	0.00	0.00	0.00
6.100	0.00	0.00	0.00	0.00	0.00
6.350	0.00	0.00	0.00	0.00	0.00
6.600	0.00	0.00	0.00	0.00	0.00
6.850	0.00	0.00	0.00	0.00	0.00
7.100	0.00	0.00	0.00	0.00	0.00
7.350	0.00	0.00	0.00	0.00	0.00
7.600	0.00	0.00	0.00	0.00	0.00
7.850	0.00	0.00	0.00	0.00	0.00
8.100	0.00	0.00	0.00	0.00	0.00
8.350	0.00	0.00	0.00	0.00	0.00
8.600	0.00	0.00	0.00	0.00	0.00
8.850	0.00	0.00	0.00	0.00	0.00
9.100	0.00	0.00	0.00	0.00	0.00
9.350	0.00	0.00	0.00	0.00	0.00
9.600	0.00	0.00	0.00	0.00	0.01
9.850	0.01	0.01	0.01	0.01	0.01
10.100	0.01	0.01	0.01	0.01	0.01
10.350	0.01	0.01	0.01	0.01	0.01
10.600	0.01	0.01	0.01	0.01	0.01
10.850	0.01	0.01	0.01	0.01	0.01

Subsection: Unit Hydrograph (Hydrograph Table)

Label: IMP - POI-3

Scenario: ESSEX CO. 2-YR (PROJ)

Return Event: 2 years

Storm Event: ESSEX CO. 2-YR (PROJ)

HYDROGRAPH ORDINATES (ft³/s)

Output Time Increment = 0.050 hours

Time on left represents time for first value in each row.

Time (hours)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
11.100	0.01	0.01	0.01	0.01	0.01
11.350	0.01	0.01	0.02	0.02	0.02
11.600	0.02	0.02	0.02	0.03	0.03
11.850	0.04	0.04	0.06	0.07	0.09
12.100	0.12	0.09	0.06	0.04	0.03
12.350	0.03	0.02	0.02	0.02	0.02
12.600	0.02	0.02	0.02	0.01	0.01
12.850	0.01	0.01	0.01	0.01	0.01
13.100	0.01	0.01	0.01	0.01	0.01
13.350	0.01	0.01	0.01	0.01	0.01
13.600	0.01	0.01	0.01	0.01	0.01
13.850	0.01	0.01	0.01	0.01	0.01
14.100	0.01	0.01	0.01	0.01	0.01
14.350	0.01	0.01	0.01	0.00	0.00
14.600	0.00	0.00	0.00	0.00	0.00
14.850	0.00	0.00	0.00	0.00	0.00
15.100	0.00	0.00	0.00	0.00	0.00
15.350	0.00	0.00	0.00	0.00	0.00
15.600	0.00	0.00	0.00	0.00	0.00
15.850	0.00	0.00	0.00	0.00	0.00
16.100	0.00	0.00	0.00	0.00	0.00
16.350	0.00	0.00	0.00	0.00	0.00
16.600	0.00	0.00	0.00	0.00	0.00
16.850	0.00	0.00	0.00	0.00	0.00
17.100	0.00	0.00	0.00	0.00	0.00
17.350	0.00	0.00	0.00	0.00	0.00
17.600	0.00	0.00	0.00	0.00	0.00
17.850	0.00	0.00	0.00	0.00	0.00
18.100	0.00	0.00	0.00	0.00	0.00
18.350	0.00	0.00	0.00	0.00	0.00
18.600	0.00	0.00	0.00	0.00	0.00
18.850	0.00	0.00	0.00	0.00	0.00
19.100	0.00	0.00	0.00	0.00	0.00
19.350	0.00	0.00	0.00	0.00	0.00
19.600	0.00	0.00	0.00	0.00	0.00
19.850	0.00	0.00	0.00	0.00	0.00
20.100	0.00	0.00	0.00	0.00	0.00
20.350	0.00	0.00	0.00	0.00	0.00
20.600	0.00	0.00	0.00	0.00	0.00
20.850	0.00	0.00	0.00	0.00	0.00
21.100	0.00	0.00	0.00	0.00	0.00
21.350	0.00	0.00	0.00	0.00	0.00

Subsection: Unit Hydrograph (Hydrograph Table)

Label: IMP - POI-3

Scenario: ESSEX CO. 2-YR (PROJ)

Return Event: 2 years

Storm Event: ESSEX CO. 2-YR (PROJ)

HYDROGRAPH ORDINATES (ft³/s)

Output Time Increment = 0.050 hours

Time on left represents time for first value in each row.

Time (hours)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
21.600	0.00	0.00	0.00	0.00	0.00
21.850	0.00	0.00	0.00	0.00	0.00
22.100	0.00	0.00	0.00	0.00	0.00
22.350	0.00	0.00	0.00	0.00	0.00
22.600	0.00	0.00	0.00	0.00	0.00
22.850	0.00	0.00	0.00	0.00	0.00
23.100	0.00	0.00	0.00	0.00	0.00
23.350	0.00	0.00	0.00	0.00	0.00
23.600	0.00	0.00	0.00	0.00	0.00
23.850	0.00	0.00	0.00	0.00	(N/A)

Subsection: Unit Hydrograph Summary

Label: IMP - POI-3

Scenario: ESSEX CO. 10-YR (PROJ)

Return Event: 10 years

Storm Event: ESSEX CO. 10-YR (PROJ)

Storm Event	ESSEX CO. 10-YR (PROJ)
Return Event	10 years
Duration	24.000 hours
Depth	6.4 in
Time of Concentration (Composite)	0.083 hours
Area (User Defined)	1,295.00 ft ²
Computational Time Increment	0.011 hours
Time to Peak (Computed)	12.111 hours
Flow (Peak, Computed)	0.19 ft ³ /s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	12.100 hours
Flow (Peak Interpolated Output)	0.19 ft ³ /s
Drainage Area	
SCS CN (Composite)	98.000
Area (User Defined)	1,295.00 ft ²
Maximum Retention (Pervious)	0.2 in
Maximum Retention (Pervious, 20 percent)	0.0 in
Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	6.1 in
Runoff Volume (Pervious)	661.689 ft ³
Hydrograph Volume (Area under Hydrograph curve)	
Volume	661.000 ft ³
SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.083 hours
Computational Time Increment	0.011 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749

Subsection: Unit Hydrograph Summary

Label: IMP - POI-3

Scenario: ESSEX CO. 10-YR (PROJ)

Return Event: 10 years

Storm Event: ESSEX CO. 10-YR (PROJ)

SCS Unit Hydrograph Parameters	
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	0.40 ft ³ /s
Unit peak time, Tp	0.056 hours
Unit receding limb, Tr	0.222 hours
Total unit time, Tb	0.278 hours

Subsection: Unit Hydrograph (Hydrograph Table)

Label: IMP - POI-3

Scenario: ESSEX CO. 10-YR (PROJ)

Return Event: 10 years

Storm Event: ESSEX CO. 10-YR (PROJ)

Storm Event	ESSEX CO. 10-YR (PROJ)
Return Event	10 years
Duration	24.000 hours
Depth	6.4 in
Time of Concentration (Composite)	0.083 hours
Area (User Defined)	1,295.00 ft ²

HYDROGRAPH ORDINATES (ft³/s)

Output Time Increment = 0.050 hours

Time on left represents time for first value in each row.

Time (hours)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
1.500	0.00	0.00	0.00	0.00	0.00
1.750	0.00	0.00	0.00	0.00	0.00
2.000	0.00	0.00	0.00	0.00	0.00
2.250	0.00	0.00	0.00	0.00	0.00
2.500	0.00	0.00	0.00	0.00	0.00
2.750	0.00	0.00	0.00	0.00	0.00
3.000	0.00	0.00	0.00	0.00	0.00
3.250	0.00	0.00	0.00	0.00	0.00
3.500	0.00	0.00	0.00	0.00	0.00
3.750	0.00	0.00	0.00	0.00	0.00
4.000	0.00	0.00	0.00	0.00	0.00
4.250	0.00	0.00	0.00	0.00	0.00
4.500	0.00	0.00	0.00	0.00	0.00
4.750	0.00	0.00	0.00	0.00	0.00
5.000	0.00	0.00	0.00	0.00	0.00
5.250	0.00	0.00	0.00	0.00	0.00
5.500	0.00	0.00	0.00	0.00	0.00
5.750	0.00	0.00	0.00	0.00	0.00
6.000	0.00	0.00	0.00	0.00	0.00
6.250	0.00	0.00	0.00	0.00	0.00
6.500	0.00	0.00	0.00	0.00	0.00
6.750	0.00	0.00	0.00	0.00	0.00
7.000	0.00	0.00	0.00	0.00	0.00
7.250	0.00	0.00	0.00	0.00	0.00
7.500	0.00	0.00	0.00	0.00	0.00
7.750	0.00	0.00	0.00	0.00	0.00
8.000	0.00	0.00	0.00	0.00	0.00
8.250	0.01	0.01	0.01	0.01	0.01
8.500	0.01	0.01	0.01	0.01	0.01
8.750	0.01	0.01	0.01	0.01	0.01
9.000	0.01	0.01	0.01	0.01	0.01
9.250	0.01	0.01	0.01	0.01	0.01

Subsection: Unit Hydrograph (Hydrograph Table)

Label: IMP - POI-3

Scenario: ESSEX CO. 10-YR (PROJ)

Return Event: 10 years

Storm Event: ESSEX CO. 10-YR (PROJ)

HYDROGRAPH ORDINATES (ft³/s)

Output Time Increment = 0.050 hours

Time on left represents time for first value in each row.

Time (hours)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
9.500	0.01	0.01	0.01	0.01	0.01
9.750	0.01	0.01	0.01	0.01	0.01
10.000	0.01	0.01	0.01	0.01	0.01
10.250	0.01	0.01	0.01	0.01	0.01
10.500	0.01	0.01	0.01	0.01	0.01
10.750	0.01	0.01	0.01	0.01	0.02
11.000	0.02	0.02	0.02	0.02	0.02
11.250	0.02	0.02	0.02	0.02	0.02
11.500	0.03	0.03	0.03	0.03	0.04
11.750	0.04	0.05	0.06	0.07	0.09
12.000	0.11	0.15	0.19	0.15	0.09
12.250	0.07	0.05	0.05	0.04	0.04
12.500	0.03	0.03	0.03	0.03	0.02
12.750	0.02	0.02	0.02	0.02	0.02
13.000	0.02	0.02	0.02	0.02	0.02
13.250	0.01	0.01	0.01	0.01	0.01
13.500	0.01	0.01	0.01	0.01	0.01
13.750	0.01	0.01	0.01	0.01	0.01
14.000	0.01	0.01	0.01	0.01	0.01
14.250	0.01	0.01	0.01	0.01	0.01
14.500	0.01	0.01	0.01	0.01	0.01
14.750	0.01	0.01	0.01	0.01	0.01
15.000	0.01	0.01	0.01	0.01	0.01
15.250	0.01	0.01	0.01	0.01	0.01
15.500	0.01	0.01	0.01	0.01	0.01
15.750	0.01	0.01	0.01	0.01	0.01
16.000	0.01	0.01	0.01	0.01	0.00
16.250	0.00	0.00	0.00	0.00	0.00
16.500	0.00	0.00	0.00	0.00	0.00
16.750	0.00	0.00	0.00	0.00	0.00
17.000	0.00	0.00	0.00	0.00	0.00
17.250	0.00	0.00	0.00	0.00	0.00
17.500	0.00	0.00	0.00	0.00	0.00
17.750	0.00	0.00	0.00	0.00	0.00
18.000	0.00	0.00	0.00	0.00	0.00
18.250	0.00	0.00	0.00	0.00	0.00
18.500	0.00	0.00	0.00	0.00	0.00
18.750	0.00	0.00	0.00	0.00	0.00
19.000	0.00	0.00	0.00	0.00	0.00
19.250	0.00	0.00	0.00	0.00	0.00
19.500	0.00	0.00	0.00	0.00	0.00
19.750	0.00	0.00	0.00	0.00	0.00

Subsection: Unit Hydrograph (Hydrograph Table)

Label: IMP - POI-3

Scenario: ESSEX CO. 10-YR (PROJ)

Return Event: 10 years

Storm Event: ESSEX CO. 10-YR (PROJ)

HYDROGRAPH ORDINATES (ft³/s)

Output Time Increment = 0.050 hours

Time on left represents time for first value in each row.

Time (hours)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
20.000	0.00	0.00	0.00	0.00	0.00
20.250	0.00	0.00	0.00	0.00	0.00
20.500	0.00	0.00	0.00	0.00	0.00
20.750	0.00	0.00	0.00	0.00	0.00
21.000	0.00	0.00	0.00	0.00	0.00
21.250	0.00	0.00	0.00	0.00	0.00
21.500	0.00	0.00	0.00	0.00	0.00
21.750	0.00	0.00	0.00	0.00	0.00
22.000	0.00	0.00	0.00	0.00	0.00
22.250	0.00	0.00	0.00	0.00	0.00
22.500	0.00	0.00	0.00	0.00	0.00
22.750	0.00	0.00	0.00	0.00	0.00
23.000	0.00	0.00	0.00	0.00	0.00
23.250	0.00	0.00	0.00	0.00	0.00
23.500	0.00	0.00	0.00	0.00	0.00
23.750	0.00	0.00	0.00	0.00	0.00
24.000	0.00	(N/A)	(N/A)	(N/A)	(N/A)

Subsection: Unit Hydrograph Summary

Label: IMP - POI-3

Scenario: ESSEX CO. 100-YR (PROJ)

Return Event: 100 years

Storm Event: ESSEX CO. 100-YR (PROJ)

Storm Event	ESSEX CO. 100-YR (PROJ)
Return Event	100 years
Duration	24.000 hours
Depth	11.5 in
Time of Concentration (Composite)	0.083 hours
Area (User Defined)	1,295.00 ft ²
Computational Time Increment	0.011 hours
Time to Peak (Computed)	12.111 hours
Flow (Peak, Computed)	0.34 ft ³ /s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	12.100 hours
Flow (Peak Interpolated Output)	0.34 ft ³ /s
Drainage Area	
SCS CN (Composite)	98.000
Area (User Defined)	1,295.00 ft ²
Maximum Retention (Pervious)	0.2 in
Maximum Retention (Pervious, 20 percent)	0.0 in
Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	11.3 in
Runoff Volume (Pervious)	1,217.156 ft ³
Hydrograph Volume (Area under Hydrograph curve)	
Volume	1,216.000 ft ³
SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.083 hours
Computational Time Increment	0.011 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749

Subsection: Unit Hydrograph Summary

Label: IMP - POI-3

Scenario: ESSEX CO. 100-YR (PROJ)

Return Event: 100 years

Storm Event: ESSEX CO. 100-YR (PROJ)

SCS Unit Hydrograph Parameters	
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	0.40 ft ³ /s
Unit peak time, Tp	0.056 hours
Unit receding limb, Tr	0.222 hours
Total unit time, Tb	0.278 hours

Subsection: Unit Hydrograph (Hydrograph Table)

Label: IMP - POI-3

Scenario: ESSEX CO. 100-YR (PROJ)

Return Event: 100 years

Storm Event: ESSEX CO. 100-YR (PROJ)

Storm Event	ESSEX CO. 100-YR (PROJ)
Return Event	100 years
Duration	24.000 hours
Depth	11.5 in
Time of Concentration (Composite)	0.083 hours
Area (User Defined)	1,295.00 ft ²

HYDROGRAPH ORDINATES (ft³/s)

Output Time Increment = 0.050 hours

Time on left represents time for first value in each row.

Time (hours)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
0.600	0.00	0.00	0.00	0.00	0.00
0.850	0.00	0.00	0.00	0.00	0.00
1.100	0.00	0.00	0.00	0.00	0.00
1.350	0.00	0.00	0.00	0.00	0.00
1.600	0.00	0.00	0.00	0.00	0.00
1.850	0.00	0.00	0.00	0.00	0.00
2.100	0.00	0.00	0.00	0.00	0.00
2.350	0.00	0.00	0.00	0.00	0.00
2.600	0.00	0.00	0.00	0.00	0.00
2.850	0.00	0.00	0.00	0.00	0.00
3.100	0.00	0.00	0.00	0.00	0.00
3.350	0.00	0.00	0.00	0.00	0.00
3.600	0.00	0.00	0.00	0.00	0.00
3.850	0.00	0.00	0.00	0.00	0.00
4.100	0.00	0.00	0.00	0.01	0.01
4.350	0.01	0.01	0.01	0.01	0.01
4.600	0.01	0.01	0.01	0.01	0.01
4.850	0.01	0.01	0.01	0.01	0.01
5.100	0.01	0.01	0.01	0.01	0.01
5.350	0.01	0.01	0.01	0.01	0.01
5.600	0.01	0.01	0.01	0.01	0.01
5.850	0.01	0.01	0.01	0.01	0.01
6.100	0.01	0.01	0.01	0.01	0.01
6.350	0.01	0.01	0.01	0.01	0.01
6.600	0.01	0.01	0.01	0.01	0.01
6.850	0.01	0.01	0.01	0.01	0.01
7.100	0.01	0.01	0.01	0.01	0.01
7.350	0.01	0.01	0.01	0.01	0.01
7.600	0.01	0.01	0.01	0.01	0.01
7.850	0.01	0.01	0.01	0.01	0.01
8.100	0.01	0.01	0.01	0.01	0.01
8.350	0.01	0.01	0.01	0.01	0.01

Subsection: Unit Hydrograph (Hydrograph Table)

Return Event: 100 years

Label: IMP - POI-3

Storm Event: ESSEX CO. 100-YR (PROJ)

Scenario: ESSEX CO. 100-YR (PROJ)

HYDROGRAPH ORDINATES (ft³/s)

Output Time Increment = 0.050 hours

Time on left represents time for first value in each row.

Time (hours)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
8.600	0.01	0.01	0.01	0.01	0.01
8.850	0.01	0.01	0.01	0.01	0.01
9.100	0.01	0.01	0.01	0.01	0.01
9.350	0.01	0.01	0.01	0.01	0.01
9.600	0.01	0.01	0.01	0.01	0.01
9.850	0.02	0.02	0.02	0.02	0.02
10.100	0.02	0.02	0.02	0.02	0.02
10.350	0.02	0.02	0.02	0.02	0.02
10.600	0.02	0.02	0.02	0.02	0.02
10.850	0.03	0.03	0.03	0.03	0.03
11.100	0.03	0.03	0.04	0.04	0.04
11.350	0.04	0.04	0.04	0.05	0.05
11.600	0.06	0.06	0.07	0.07	0.09
11.850	0.10	0.12	0.16	0.20	0.27
12.100	0.34	0.27	0.16	0.12	0.10
12.350	0.08	0.07	0.07	0.06	0.06
12.600	0.05	0.05	0.04	0.04	0.04
12.850	0.04	0.04	0.03	0.03	0.03
13.100	0.03	0.03	0.03	0.03	0.03
13.350	0.02	0.02	0.02	0.02	0.02
13.600	0.02	0.02	0.02	0.02	0.02
13.850	0.02	0.02	0.02	0.02	0.02
14.100	0.02	0.02	0.02	0.02	0.02
14.350	0.01	0.01	0.01	0.01	0.01
14.600	0.01	0.01	0.01	0.01	0.01
14.850	0.01	0.01	0.01	0.01	0.01
15.100	0.01	0.01	0.01	0.01	0.01
15.350	0.01	0.01	0.01	0.01	0.01
15.600	0.01	0.01	0.01	0.01	0.01
15.850	0.01	0.01	0.01	0.01	0.01
16.100	0.01	0.01	0.01	0.01	0.01
16.350	0.01	0.01	0.01	0.01	0.01
16.600	0.01	0.01	0.01	0.01	0.01
16.850	0.01	0.01	0.01	0.01	0.01
17.100	0.01	0.01	0.01	0.01	0.01
17.350	0.01	0.01	0.01	0.01	0.01
17.600	0.01	0.01	0.01	0.01	0.01
17.850	0.01	0.01	0.01	0.01	0.01
18.100	0.01	0.01	0.01	0.01	0.01
18.350	0.01	0.01	0.01	0.01	0.01
18.600	0.01	0.01	0.01	0.01	0.01
18.850	0.01	0.01	0.01	0.01	0.01

Subsection: Unit Hydrograph (Hydrograph Table)

Label: IMP - POI-3

Scenario: ESSEX CO. 100-YR (PROJ)

Return Event: 100 years

Storm Event: ESSEX CO. 100-YR (PROJ)

HYDROGRAPH ORDINATES (ft³/s)

Output Time Increment = 0.050 hours

Time on left represents time for first value in each row.

Time (hours)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
19.100	0.01	0.01	0.01	0.01	0.01
19.350	0.01	0.01	0.01	0.01	0.01
19.600	0.01	0.01	0.01	0.01	0.01
19.850	0.01	0.01	0.01	0.01	0.01
20.100	0.01	0.01	0.01	0.01	0.01
20.350	0.01	0.01	0.01	0.01	0.01
20.600	0.01	0.01	0.01	0.01	0.01
20.850	0.00	0.00	0.00	0.00	0.00
21.100	0.00	0.00	0.00	0.00	0.00
21.350	0.00	0.00	0.00	0.00	0.00
21.600	0.00	0.00	0.00	0.00	0.00
21.850	0.00	0.00	0.00	0.00	0.00
22.100	0.00	0.00	0.00	0.00	0.00
22.350	0.00	0.00	0.00	0.00	0.00
22.600	0.00	0.00	0.00	0.00	0.00
22.850	0.00	0.00	0.00	0.00	0.00
23.100	0.00	0.00	0.00	0.00	0.00
23.350	0.00	0.00	0.00	0.00	0.00
23.600	0.00	0.00	0.00	0.00	0.00
23.850	0.00	0.00	0.00	0.00	(N/A)

Subsection: Unit Hydrograph Summary

Label: IMP- POI-2

Scenario: ESSEX CO. 2-YR (PROJ)

Return Event: 2 years

Storm Event: ESSEX CO. 2-YR (PROJ)

Storm Event	ESSEX CO. 2-YR (PROJ)
Return Event	2 years
Duration	24.000 hours
Depth	4.1 in
Time of Concentration (Composite)	0.083 hours
Area (User Defined)	3,263.00 ft ²
Computational Time Increment	0.011 hours
Time to Peak (Computed)	12.111 hours
Flow (Peak, Computed)	0.30 ft ³ /s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	12.100 hours
Flow (Peak Interpolated Output)	0.30 ft ³ /s
Drainage Area	
SCS CN (Composite)	98.000
Area (User Defined)	3,263.00 ft ²
Maximum Retention (Pervious)	0.2 in
Maximum Retention (Pervious, 20 percent)	0.0 in
Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	3.9 in
Runoff Volume (Pervious)	1,048.210 ft ³
Hydrograph Volume (Area under Hydrograph curve)	
Volume	1,047.000 ft ³
SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.083 hours
Computational Time Increment	0.011 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749

Subsection: Unit Hydrograph Summary

Label: IMP- POI-2

Scenario: ESSEX CO. 2-YR (PROJ)

Return Event: 2 years

Storm Event: ESSEX CO. 2-YR (PROJ)

SCS Unit Hydrograph Parameters	
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	1.02 ft ³ /s
Unit peak time, Tp	0.056 hours
Unit receding limb, Tr	0.222 hours
Total unit time, Tb	0.278 hours

Subsection: Unit Hydrograph (Hydrograph Table)

Label: IMP- POI-2

Scenario: ESSEX CO. 2-YR (PROJ)

Return Event: 2 years

Storm Event: ESSEX CO. 2-YR (PROJ)

Storm Event	ESSEX CO. 2-YR (PROJ)
Return Event	2 years
Duration	24.000 hours
Depth	4.1 in
Time of Concentration (Composite)	0.083 hours
Area (User Defined)	3,263.00 ft ²

HYDROGRAPH ORDINATES (ft³/s)

Output Time Increment = 0.050 hours

Time on left represents time for first value in each row.

Time (hours)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
1.600	0.00	0.00	0.00	0.00	0.00
1.850	0.00	0.00	0.00	0.00	0.00
2.100	0.00	0.00	0.00	0.00	0.00
2.350	0.00	0.00	0.00	0.00	0.00
2.600	0.00	0.00	0.00	0.00	0.00
2.850	0.00	0.00	0.00	0.00	0.00
3.100	0.00	0.00	0.00	0.00	0.00
3.350	0.00	0.00	0.00	0.00	0.00
3.600	0.00	0.00	0.00	0.00	0.00
3.850	0.00	0.00	0.00	0.00	0.00
4.100	0.00	0.00	0.00	0.00	0.00
4.350	0.00	0.00	0.00	0.00	0.00
4.600	0.00	0.00	0.00	0.00	0.00
4.850	0.00	0.00	0.00	0.00	0.00
5.100	0.00	0.00	0.00	0.00	0.00
5.350	0.00	0.00	0.00	0.00	0.00
5.600	0.00	0.00	0.00	0.00	0.00
5.850	0.00	0.00	0.00	0.00	0.00
6.100	0.00	0.00	0.00	0.00	0.00
6.350	0.01	0.01	0.01	0.01	0.01
6.600	0.01	0.01	0.01	0.01	0.01
6.850	0.01	0.01	0.01	0.01	0.01
7.100	0.01	0.01	0.01	0.01	0.01
7.350	0.01	0.01	0.01	0.01	0.01
7.600	0.01	0.01	0.01	0.01	0.01
7.850	0.01	0.01	0.01	0.01	0.01
8.100	0.01	0.01	0.01	0.01	0.01
8.350	0.01	0.01	0.01	0.01	0.01
8.600	0.01	0.01	0.01	0.01	0.01
8.850	0.01	0.01	0.01	0.01	0.01
9.100	0.01	0.01	0.01	0.01	0.01
9.350	0.01	0.01	0.01	0.01	0.01

Subsection: Unit Hydrograph (Hydrograph Table)

Return Event: 2 years

Label: IMP- POI-2

Storm Event: ESSEX CO. 2-YR (PROJ)

Scenario: ESSEX CO. 2-YR (PROJ)

HYDROGRAPH ORDINATES (ft³/s)

Output Time Increment = 0.050 hours

Time on left represents time for first value in each row.

Time (hours)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
9.600	0.01	0.01	0.01	0.01	0.01
9.850	0.01	0.01	0.01	0.01	0.01
10.100	0.01	0.01	0.01	0.01	0.02
10.350	0.02	0.02	0.02	0.02	0.02
10.600	0.02	0.02	0.02	0.02	0.02
10.850	0.02	0.02	0.02	0.02	0.03
11.100	0.03	0.03	0.03	0.03	0.03
11.350	0.04	0.04	0.04	0.04	0.05
11.600	0.05	0.06	0.06	0.07	0.08
11.850	0.09	0.11	0.14	0.18	0.24
12.100	0.30	0.24	0.14	0.11	0.09
12.350	0.07	0.06	0.06	0.06	0.05
12.600	0.04	0.04	0.04	0.04	0.04
12.850	0.03	0.03	0.03	0.03	0.03
13.100	0.03	0.03	0.02	0.02	0.02
13.350	0.02	0.02	0.02	0.02	0.02
13.600	0.02	0.02	0.02	0.02	0.02
13.850	0.02	0.02	0.02	0.01	0.01
14.100	0.01	0.01	0.01	0.01	0.01
14.350	0.01	0.01	0.01	0.01	0.01
14.600	0.01	0.01	0.01	0.01	0.01
14.850	0.01	0.01	0.01	0.01	0.01
15.100	0.01	0.01	0.01	0.01	0.01
15.350	0.01	0.01	0.01	0.01	0.01
15.600	0.01	0.01	0.01	0.01	0.01
15.850	0.01	0.01	0.01	0.01	0.01
16.100	0.01	0.01	0.01	0.01	0.01
16.350	0.01	0.01	0.01	0.01	0.01
16.600	0.01	0.01	0.01	0.01	0.01
16.850	0.01	0.01	0.01	0.01	0.01
17.100	0.01	0.01	0.01	0.01	0.01
17.350	0.01	0.01	0.01	0.01	0.01
17.600	0.01	0.01	0.01	0.01	0.01
17.850	0.01	0.01	0.01	0.01	0.01
18.100	0.01	0.01	0.01	0.01	0.01
18.350	0.01	0.01	0.01	0.01	0.01
18.600	0.01	0.01	0.01	0.01	0.01
18.850	0.01	0.01	0.01	0.01	0.01
19.100	0.01	0.01	0.01	0.01	0.00
19.350	0.00	0.00	0.00	0.00	0.00
19.600	0.00	0.00	0.00	0.00	0.00
19.850	0.00	0.00	0.00	0.00	0.00

Subsection: Unit Hydrograph (Hydrograph Table)

Label: IMP- POI-2

Scenario: ESSEX CO. 2-YR (PROJ)

Return Event: 2 years

Storm Event: ESSEX CO. 2-YR (PROJ)

HYDROGRAPH ORDINATES (ft³/s)

Output Time Increment = 0.050 hours

Time on left represents time for first value in each row.

Time (hours)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
20.100	0.00	0.00	0.00	0.00	0.00
20.350	0.00	0.00	0.00	0.00	0.00
20.600	0.00	0.00	0.00	0.00	0.00
20.850	0.00	0.00	0.00	0.00	0.00
21.100	0.00	0.00	0.00	0.00	0.00
21.350	0.00	0.00	0.00	0.00	0.00
21.600	0.00	0.00	0.00	0.00	0.00
21.850	0.00	0.00	0.00	0.00	0.00
22.100	0.00	0.00	0.00	0.00	0.00
22.350	0.00	0.00	0.00	0.00	0.00
22.600	0.00	0.00	0.00	0.00	0.00
22.850	0.00	0.00	0.00	0.00	0.00
23.100	0.00	0.00	0.00	0.00	0.00
23.350	0.00	0.00	0.00	0.00	0.00
23.600	0.00	0.00	0.00	0.00	0.00
23.850	0.00	0.00	0.00	0.00	(N/A)

Subsection: Unit Hydrograph Summary

Label: IMP- POI-2

Scenario: ESSEX CO. 10-YR (PROJ)

Return Event: 10 years
Storm Event: ESSEX CO. 10-YR (PROJ)

Storm Event	ESSEX CO. 10-YR (PROJ)
Return Event	10 years
Duration	24.000 hours
Depth	6.4 in
Time of Concentration (Composite)	0.083 hours
Area (User Defined)	3,263.00 ft ²
Computational Time Increment	0.011 hours
Time to Peak (Computed)	12.111 hours
Flow (Peak, Computed)	0.47 ft ³ /s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	12.100 hours
Flow (Peak Interpolated Output)	0.47 ft ³ /s
Drainage Area	
SCS CN (Composite)	98.000
Area (User Defined)	3,263.00 ft ²
Maximum Retention (Pervious)	0.2 in
Maximum Retention (Pervious, 20 percent)	0.0 in
Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	6.1 in
Runoff Volume (Pervious)	1,667.251 ft ³
Hydrograph Volume (Area under Hydrograph curve)	
Volume	1,666.000 ft ³
SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.083 hours
Computational Time Increment	0.011 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749

Subsection: Unit Hydrograph Summary

Label: IMP- POI-2

Scenario: ESSEX CO. 10-YR (PROJ)

Return Event: 10 years

Storm Event: ESSEX CO. 10-YR (PROJ)

SCS Unit Hydrograph Parameters	
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	1.02 ft ³ /s
Unit peak time, Tp	0.056 hours
Unit receding limb, Tr	0.222 hours
Total unit time, Tb	0.278 hours

Subsection: Unit Hydrograph (Hydrograph Table)

Label: IMP- POI-2

Scenario: ESSEX CO. 10-YR (PROJ)

Return Event: 10 years

Storm Event: ESSEX CO. 10-YR (PROJ)

Storm Event	ESSEX CO. 10-YR (PROJ)
Return Event	10 years
Duration	24.000 hours
Depth	6.4 in
Time of Concentration (Composite)	0.083 hours
Area (User Defined)	3,263.00 ft ²

HYDROGRAPH ORDINATES (ft³/s)

Output Time Increment = 0.050 hours

Time on left represents time for first value in each row.

Time (hours)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
0.900	0.00	0.00	0.00	0.00	0.00
1.150	0.00	0.00	0.00	0.00	0.00
1.400	0.00	0.00	0.00	0.00	0.00
1.650	0.00	0.00	0.00	0.00	0.00
1.900	0.00	0.00	0.00	0.00	0.00
2.150	0.00	0.00	0.00	0.00	0.00
2.400	0.00	0.00	0.00	0.00	0.00
2.650	0.00	0.00	0.00	0.00	0.00
2.900	0.00	0.00	0.00	0.01	0.01
3.150	0.01	0.01	0.01	0.01	0.01
3.400	0.01	0.01	0.01	0.01	0.01
3.650	0.01	0.01	0.01	0.01	0.01
3.900	0.01	0.01	0.01	0.01	0.01
4.150	0.01	0.01	0.01	0.01	0.01
4.400	0.01	0.01	0.01	0.01	0.01
4.650	0.01	0.01	0.01	0.01	0.01
4.900	0.01	0.01	0.01	0.01	0.01
5.150	0.01	0.01	0.01	0.01	0.01
5.400	0.01	0.01	0.01	0.01	0.01
5.650	0.01	0.01	0.01	0.01	0.01
5.900	0.01	0.01	0.01	0.01	0.01
6.150	0.01	0.01	0.01	0.01	0.01
6.400	0.01	0.01	0.01	0.01	0.01
6.650	0.01	0.01	0.01	0.01	0.01
6.900	0.01	0.01	0.01	0.01	0.01
7.150	0.01	0.01	0.01	0.01	0.01
7.400	0.01	0.01	0.01	0.01	0.01
7.650	0.01	0.01	0.01	0.01	0.01
7.900	0.01	0.01	0.01	0.01	0.01
8.150	0.01	0.01	0.01	0.01	0.01
8.400	0.01	0.01	0.01	0.01	0.01
8.650	0.01	0.01	0.01	0.01	0.01

Subsection: Unit Hydrograph (Hydrograph Table)

Label: IMP- POI-2

Scenario: ESSEX CO. 10-YR (PROJ)

Return Event: 10 years

Storm Event: ESSEX CO. 10-YR (PROJ)

HYDROGRAPH ORDINATES (ft³/s)

Output Time Increment = 0.050 hours

Time on left represents time for first value in each row.

Time (hours)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
8.900	0.01	0.01	0.01	0.01	0.02
9.150	0.02	0.02	0.02	0.02	0.02
9.400	0.02	0.02	0.02	0.02	0.02
9.650	0.02	0.02	0.02	0.02	0.02
9.900	0.02	0.02	0.02	0.02	0.02
10.150	0.02	0.02	0.02	0.02	0.02
10.400	0.02	0.03	0.03	0.03	0.03
10.650	0.03	0.03	0.03	0.03	0.04
10.900	0.04	0.04	0.04	0.04	0.04
11.150	0.05	0.05	0.05	0.05	0.06
11.400	0.06	0.06	0.06	0.07	0.08
11.650	0.09	0.09	0.10	0.12	0.14
11.900	0.17	0.22	0.28	0.37	0.47
12.150	0.37	0.22	0.17	0.14	0.11
12.400	0.10	0.09	0.09	0.08	0.07
12.650	0.06	0.06	0.06	0.06	0.05
12.900	0.05	0.05	0.05	0.04	0.04
13.150	0.04	0.04	0.04	0.04	0.03
13.400	0.03	0.03	0.03	0.03	0.03
13.650	0.03	0.03	0.03	0.02	0.02
13.900	0.02	0.02	0.02	0.02	0.02
14.150	0.02	0.02	0.02	0.02	0.02
14.400	0.02	0.02	0.02	0.02	0.02
14.650	0.02	0.02	0.02	0.02	0.02
14.900	0.02	0.02	0.02	0.02	0.01
15.150	0.01	0.01	0.01	0.01	0.01
15.400	0.01	0.01	0.01	0.01	0.01
15.650	0.01	0.01	0.01	0.01	0.01
15.900	0.01	0.01	0.01	0.01	0.01
16.150	0.01	0.01	0.01	0.01	0.01
16.400	0.01	0.01	0.01	0.01	0.01
16.650	0.01	0.01	0.01	0.01	0.01
16.900	0.01	0.01	0.01	0.01	0.01
17.150	0.01	0.01	0.01	0.01	0.01
17.400	0.01	0.01	0.01	0.01	0.01
17.650	0.01	0.01	0.01	0.01	0.01
17.900	0.01	0.01	0.01	0.01	0.01
18.150	0.01	0.01	0.01	0.01	0.01
18.400	0.01	0.01	0.01	0.01	0.01
18.650	0.01	0.01	0.01	0.01	0.01
18.900	0.01	0.01	0.01	0.01	0.01
19.150	0.01	0.01	0.01	0.01	0.01

Subsection: Unit Hydrograph (Hydrograph Table)

Label: IMP- POI-2

Scenario: ESSEX CO. 10-YR (PROJ)

Return Event: 10 years

Storm Event: ESSEX CO. 10-YR (PROJ)

HYDROGRAPH ORDINATES (ft³/s)

Output Time Increment = 0.050 hours

Time on left represents time for first value in each row.

Time (hours)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
19.400	0.01	0.01	0.01	0.01	0.01
19.650	0.01	0.01	0.01	0.01	0.01
19.900	0.01	0.01	0.01	0.01	0.01
20.150	0.01	0.01	0.01	0.01	0.01
20.400	0.01	0.01	0.01	0.01	0.01
20.650	0.01	0.01	0.01	0.01	0.01
20.900	0.01	0.01	0.01	0.01	0.01
21.150	0.01	0.01	0.01	0.01	0.01
21.400	0.01	0.01	0.01	0.01	0.01
21.650	0.01	0.01	0.01	0.01	0.01
21.900	0.01	0.01	0.01	0.01	0.01
22.150	0.01	0.01	0.01	0.01	0.01
22.400	0.01	0.01	0.01	0.01	0.01
22.650	0.01	0.01	0.01	0.01	0.01
22.900	0.01	0.01	0.01	0.01	0.01
23.150	0.01	0.01	0.01	0.01	0.01
23.400	0.01	0.01	0.01	0.01	0.01
23.650	0.01	0.01	0.01	0.01	0.01
23.900	0.01	0.01	0.01	(N/A)	(N/A)

Subsection: Unit Hydrograph Summary
 Label: IMP- POI-2
 Scenario: ESSEX CO. 100-YR (PROJ)

Return Event: 100 years
 Storm Event: ESSEX CO. 100-YR (PROJ)

Storm Event	ESSEX CO. 100-YR (PROJ)
Return Event	100 years
Duration	24.000 hours
Depth	11.5 in
Time of Concentration (Composite)	0.083 hours
Area (User Defined)	3,263.00 ft ²
Computational Time Increment	0.011 hours
Time to Peak (Computed)	12.111 hours
Flow (Peak, Computed)	0.86 ft ³ /s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	12.100 hours
Flow (Peak Interpolated Output)	0.85 ft ³ /s
Drainage Area	
SCS CN (Composite)	98.000
Area (User Defined)	3,263.00 ft ²
Maximum Retention (Pervious)	0.2 in
Maximum Retention (Pervious, 20 percent)	0.0 in
Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	11.3 in
Runoff Volume (Pervious)	3,066.857 ft ³
Hydrograph Volume (Area under Hydrograph curve)	
Volume	3,065.000 ft ³
SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.083 hours
Computational Time Increment	0.011 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749

Subsection: Unit Hydrograph Summary

Label: IMP- POI-2

Scenario: ESSEX CO. 100-YR (PROJ)

Return Event: 100 years

Storm Event: ESSEX CO. 100-YR (PROJ)

SCS Unit Hydrograph Parameters	
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	1.02 ft ³ /s
Unit peak time, Tp	0.056 hours
Unit receding limb, Tr	0.222 hours
Total unit time, Tb	0.278 hours

Subsection: Unit Hydrograph (Hydrograph Table)

Label: IMP- POI-2

Scenario: ESSEX CO. 100-YR (PROJ)

Return Event: 100 years

Storm Event: ESSEX CO. 100-YR (PROJ)

Storm Event	ESSEX CO. 100-YR (PROJ)
Return Event	100 years
Duration	24.000 hours
Depth	11.5 in
Time of Concentration (Composite)	0.083 hours
Area (User Defined)	3,263.00 ft ²

HYDROGRAPH ORDINATES (ft³/s)

Output Time Increment = 0.050 hours

Time on left represents time for first value in each row.

Time (hours)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
0.450	0.00	0.00	0.00	0.00	0.00
0.700	0.00	0.00	0.00	0.00	0.00
0.950	0.00	0.01	0.01	0.01	0.01
1.200	0.01	0.01	0.01	0.01	0.01
1.450	0.01	0.01	0.01	0.01	0.01
1.700	0.01	0.01	0.01	0.01	0.01
1.950	0.01	0.01	0.01	0.01	0.01
2.200	0.01	0.01	0.01	0.01	0.01
2.450	0.01	0.01	0.01	0.01	0.01
2.700	0.01	0.01	0.01	0.01	0.01
2.950	0.01	0.01	0.01	0.01	0.01
3.200	0.01	0.01	0.01	0.01	0.01
3.450	0.01	0.01	0.01	0.01	0.01
3.700	0.01	0.01	0.01	0.01	0.01
3.950	0.01	0.01	0.01	0.01	0.01
4.200	0.01	0.01	0.01	0.01	0.01
4.450	0.01	0.01	0.01	0.01	0.01
4.700	0.01	0.01	0.01	0.01	0.01
4.950	0.01	0.01	0.01	0.01	0.01
5.200	0.01	0.01	0.01	0.01	0.01
5.450	0.01	0.01	0.01	0.01	0.01
5.700	0.01	0.01	0.01	0.01	0.01
5.950	0.01	0.01	0.01	0.02	0.02
6.200	0.02	0.02	0.02	0.02	0.02
6.450	0.02	0.02	0.02	0.02	0.02
6.700	0.02	0.02	0.02	0.02	0.02
6.950	0.02	0.02	0.02	0.02	0.02
7.200	0.02	0.02	0.02	0.02	0.02
7.450	0.02	0.02	0.02	0.02	0.02
7.700	0.02	0.02	0.02	0.02	0.02
7.950	0.02	0.02	0.02	0.02	0.02
8.200	0.02	0.02	0.02	0.02	0.02

Subsection: Unit Hydrograph (Hydrograph Table)

Return Event: 100 years

Label: IMP- POI-2

Storm Event: ESSEX CO. 100-YR (PROJ)

Scenario: ESSEX CO. 100-YR (PROJ)

HYDROGRAPH ORDINATES (ft³/s)

Output Time Increment = 0.050 hours

Time on left represents time for first value in each row.

Time (hours)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
8.450	0.02	0.02	0.02	0.02	0.03
8.700	0.03	0.03	0.03	0.03	0.03
8.950	0.03	0.03	0.03	0.03	0.03
9.200	0.03	0.03	0.03	0.03	0.03
9.450	0.03	0.03	0.03	0.03	0.04
9.700	0.04	0.04	0.04	0.04	0.04
9.950	0.04	0.04	0.04	0.04	0.04
10.200	0.04	0.04	0.04	0.04	0.05
10.450	0.05	0.05	0.05	0.05	0.05
10.700	0.06	0.06	0.06	0.06	0.07
10.950	0.07	0.07	0.08	0.08	0.08
11.200	0.09	0.09	0.10	0.10	0.11
11.450	0.11	0.12	0.13	0.15	0.16
11.700	0.16	0.19	0.22	0.26	0.30
11.950	0.40	0.51	0.67	0.85	0.67
12.200	0.40	0.30	0.24	0.21	0.18
12.450	0.16	0.16	0.14	0.12	0.11
12.700	0.11	0.11	0.10	0.10	0.09
12.950	0.09	0.08	0.08	0.07	0.07
13.200	0.07	0.07	0.06	0.06	0.06
13.450	0.06	0.05	0.05	0.05	0.05
13.700	0.05	0.05	0.04	0.04	0.04
13.950	0.04	0.04	0.04	0.04	0.04
14.200	0.04	0.04	0.04	0.04	0.04
14.450	0.04	0.04	0.03	0.03	0.03
14.700	0.03	0.03	0.03	0.03	0.03
14.950	0.03	0.03	0.03	0.03	0.03
15.200	0.03	0.03	0.03	0.03	0.03
15.450	0.03	0.03	0.03	0.02	0.02
15.700	0.02	0.02	0.02	0.02	0.02
15.950	0.02	0.02	0.02	0.02	0.02
16.200	0.02	0.02	0.02	0.02	0.02
16.450	0.02	0.02	0.02	0.02	0.02
16.700	0.02	0.02	0.02	0.02	0.02
16.950	0.02	0.02	0.02	0.02	0.02
17.200	0.02	0.02	0.02	0.02	0.02
17.450	0.02	0.02	0.02	0.02	0.02
17.700	0.02	0.02	0.02	0.02	0.02
17.950	0.02	0.02	0.02	0.02	0.02
18.200	0.02	0.02	0.02	0.02	0.01
18.450	0.01	0.01	0.01	0.01	0.01
18.700	0.01	0.01	0.01	0.01	0.01

Subsection: Unit Hydrograph (Hydrograph Table)

Label: IMP- POI-2

Scenario: ESSEX CO. 100-YR (PROJ)

Return Event: 100 years

Storm Event: ESSEX CO. 100-YR (PROJ)

HYDROGRAPH ORDINATES (ft³/s)

Output Time Increment = 0.050 hours

Time on left represents time for first value in each row.

Time (hours)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
18.950	0.01	0.01	0.01	0.01	0.01
19.200	0.01	0.01	0.01	0.01	0.01
19.450	0.01	0.01	0.01	0.01	0.01
19.700	0.01	0.01	0.01	0.01	0.01
19.950	0.01	0.01	0.01	0.01	0.01
20.200	0.01	0.01	0.01	0.01	0.01
20.450	0.01	0.01	0.01	0.01	0.01
20.700	0.01	0.01	0.01	0.01	0.01
20.950	0.01	0.01	0.01	0.01	0.01
21.200	0.01	0.01	0.01	0.01	0.01
21.450	0.01	0.01	0.01	0.01	0.01
21.700	0.01	0.01	0.01	0.01	0.01
21.950	0.01	0.01	0.01	0.01	0.01
22.200	0.01	0.01	0.01	0.01	0.01
22.450	0.01	0.01	0.01	0.01	0.01
22.700	0.01	0.01	0.01	0.01	0.01
22.950	0.01	0.01	0.01	0.01	0.01
23.200	0.01	0.01	0.01	0.01	0.01
23.450	0.01	0.01	0.01	0.01	0.01
23.700	0.01	0.01	0.01	0.01	0.01
23.950	0.01	0.01	(N/A)	(N/A)	(N/A)

Subsection: Unit Hydrograph Summary

Label: PERV - POI-1

Scenario: ESSEX CO. 2-YR (PROJ)

Return Event: 2 years

Storm Event: ESSEX CO. 2-YR (PROJ)

Storm Event	ESSEX CO. 2-YR (PROJ)
Return Event	2 years
Duration	24.000 hours
Depth	4.1 in
Time of Concentration (Composite)	0.083 hours
Area (User Defined)	4,777.00 ft ²
Computational Time Increment	0.011 hours
Time to Peak (Computed)	12.111 hours
Flow (Peak, Computed)	0.27 ft ³ /s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	12.100 hours
Flow (Peak Interpolated Output)	0.27 ft ³ /s
Drainage Area	
SCS CN (Composite)	79.000
Area (User Defined)	4,777.00 ft ²
Maximum Retention (Pervious)	2.7 in
Maximum Retention (Pervious, 20 percent)	0.5 in
Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	2.0 in
Runoff Volume (Pervious)	810.813 ft ³
Hydrograph Volume (Area under Hydrograph curve)	
Volume	810.000 ft ³
SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.083 hours
Computational Time Increment	0.011 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749

Subsection: Unit Hydrograph Summary

Label: PERV - POI-1

Scenario: ESSEX CO. 2-YR (PROJ)

Return Event: 2 years

Storm Event: ESSEX CO. 2-YR (PROJ)

SCS Unit Hydrograph Parameters	
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	1.49 ft ³ /s
Unit peak time, Tp	0.056 hours
Unit receding limb, Tr	0.222 hours
Total unit time, Tb	0.278 hours

Subsection: Unit Hydrograph (Hydrograph Table)

Label: PERV - POI-1

Scenario: ESSEX CO. 2-YR (PROJ)

Return Event: 2 years

Storm Event: ESSEX CO. 2-YR (PROJ)

Storm Event	ESSEX CO. 2-YR (PROJ)
Return Event	2 years
Duration	24.000 hours
Depth	4.1 in
Time of Concentration (Composite)	0.083 hours
Area (User Defined)	4,777.00 ft ²

HYDROGRAPH ORDINATES (ft³/s)

Output Time Increment = 0.050 hours

Time on left represents time for first value in each row.

Time (hours)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
8.950	0.00	0.00	0.00	0.00	0.00
9.200	0.00	0.00	0.00	0.00	0.00
9.450	0.00	0.00	0.00	0.00	0.00
9.700	0.00	0.00	0.00	0.00	0.00
9.950	0.00	0.00	0.00	0.00	0.00
10.200	0.00	0.00	0.00	0.00	0.01
10.450	0.01	0.01	0.01	0.01	0.01
10.700	0.01	0.01	0.01	0.01	0.01
10.950	0.01	0.01	0.01	0.01	0.01
11.200	0.02	0.02	0.02	0.02	0.02
11.450	0.02	0.02	0.03	0.03	0.03
11.700	0.04	0.04	0.05	0.06	0.08
11.950	0.11	0.14	0.20	0.27	0.22
12.200	0.14	0.10	0.09	0.07	0.06
12.450	0.06	0.06	0.05	0.05	0.04
12.700	0.04	0.04	0.04	0.04	0.03
12.950	0.03	0.03	0.03	0.03	0.03
13.200	0.03	0.03	0.02	0.02	0.02
13.450	0.02	0.02	0.02	0.02	0.02
13.700	0.02	0.02	0.02	0.02	0.02
13.950	0.02	0.02	0.02	0.02	0.02
14.200	0.02	0.02	0.02	0.01	0.01
14.450	0.01	0.01	0.01	0.01	0.01
14.700	0.01	0.01	0.01	0.01	0.01
14.950	0.01	0.01	0.01	0.01	0.01
15.200	0.01	0.01	0.01	0.01	0.01
15.450	0.01	0.01	0.01	0.01	0.01
15.700	0.01	0.01	0.01	0.01	0.01
15.950	0.01	0.01	0.01	0.01	0.01
16.200	0.01	0.01	0.01	0.01	0.01
16.450	0.01	0.01	0.01	0.01	0.01
16.700	0.01	0.01	0.01	0.01	0.01

Subsection: Unit Hydrograph (Hydrograph Table)

Label: PERV - POI-1

Scenario: ESSEX CO. 2-YR (PROJ)

Return Event: 2 years

Storm Event: ESSEX CO. 2-YR (PROJ)

HYDROGRAPH ORDINATES (ft³/s)

Output Time Increment = 0.050 hours

Time on left represents time for first value in each row.

Time (hours)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
16.950	0.01	0.01	0.01	0.01	0.01
17.200	0.01	0.01	0.01	0.01	0.01
17.450	0.01	0.01	0.01	0.01	0.01
17.700	0.01	0.01	0.01	0.01	0.01
17.950	0.01	0.01	0.01	0.01	0.01
18.200	0.01	0.01	0.01	0.01	0.01
18.450	0.01	0.01	0.01	0.01	0.01
18.700	0.01	0.01	0.01	0.01	0.01
18.950	0.01	0.01	0.01	0.01	0.01
19.200	0.01	0.01	0.01	0.01	0.01
19.450	0.01	0.01	0.01	0.01	0.01
19.700	0.01	0.01	0.01	0.01	0.01
19.950	0.01	0.01	0.01	0.01	0.01
20.200	0.01	0.01	0.01	0.01	0.01
20.450	0.01	0.01	0.01	0.01	0.01
20.700	0.01	0.01	0.01	0.01	0.01
20.950	0.01	0.01	0.01	0.01	0.01
21.200	0.01	0.01	0.01	0.01	0.01
21.450	0.01	0.01	0.01	0.00	0.00
21.700	0.00	0.00	0.00	0.00	0.00
21.950	0.00	0.00	0.00	0.00	0.00
22.200	0.00	0.00	0.00	0.00	0.00
22.450	0.00	0.00	0.00	0.00	0.00
22.700	0.00	0.00	0.00	0.00	0.00
22.950	0.00	0.00	0.00	0.00	0.00
23.200	0.00	0.00	0.00	0.00	0.00
23.450	0.00	0.00	0.00	0.00	0.00
23.700	0.00	0.00	0.00	0.00	0.00
23.950	0.00	0.00	(N/A)	(N/A)	(N/A)

Subsection: Unit Hydrograph Summary

Label: PERV - POI-1

Scenario: ESSEX CO. 10-YR (PROJ)

Return Event: 10 years
Storm Event: ESSEX CO. 10-YR (PROJ)

Storm Event	ESSEX CO. 10-YR (PROJ)
Return Event	10 years
Duration	24.000 hours
Depth	6.4 in
Time of Concentration (Composite)	0.083 hours
Area (User Defined)	4,777.00 ft ²
Computational Time Increment	0.011 hours
Time to Peak (Computed)	12.111 hours
Flow (Peak, Computed)	0.53 ft ³ /s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	12.100 hours
Flow (Peak Interpolated Output)	0.52 ft ³ /s
Drainage Area	
SCS CN (Composite)	79.000
Area (User Defined)	4,777.00 ft ²
Maximum Retention (Pervious)	2.7 in
Maximum Retention (Pervious, 20 percent)	0.5 in
Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	4.0 in
Runoff Volume (Pervious)	1,597.021 ft ³
Hydrograph Volume (Area under Hydrograph curve)	
Volume	1,595.000 ft ³
SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.083 hours
Computational Time Increment	0.011 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749

Subsection: Unit Hydrograph Summary

Label: PERV - POI-1

Scenario: ESSEX CO. 10-YR (PROJ)

Return Event: 10 years

Storm Event: ESSEX CO. 10-YR (PROJ)

SCS Unit Hydrograph Parameters	
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	1.49 ft ³ /s
Unit peak time, Tp	0.056 hours
Unit receding limb, Tr	0.222 hours
Total unit time, Tb	0.278 hours

Subsection: Unit Hydrograph (Hydrograph Table)

Label: PERV - POI-1

Scenario: ESSEX CO. 10-YR (PROJ)

Return Event: 10 years

Storm Event: ESSEX CO. 10-YR (PROJ)

Storm Event	ESSEX CO. 10-YR (PROJ)
Return Event	10 years
Duration	24.000 hours
Depth	6.4 in
Time of Concentration (Composite)	0.083 hours
Area (User Defined)	4,777.00 ft ²

HYDROGRAPH ORDINATES (ft³/s)

Output Time Increment = 0.050 hours

Time on left represents time for first value in each row.

Time (hours)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
6.750	0.00	0.00	0.00	0.00	0.00
7.000	0.00	0.00	0.00	0.00	0.00
7.250	0.00	0.00	0.00	0.00	0.00
7.500	0.00	0.00	0.00	0.00	0.00
7.750	0.00	0.00	0.00	0.00	0.00
8.000	0.00	0.00	0.00	0.00	0.00
8.250	0.00	0.00	0.00	0.00	0.00
8.500	0.00	0.00	0.00	0.01	0.01
8.750	0.01	0.01	0.01	0.01	0.01
9.000	0.01	0.01	0.01	0.01	0.01
9.250	0.01	0.01	0.01	0.01	0.01
9.500	0.01	0.01	0.01	0.01	0.01
9.750	0.01	0.01	0.01	0.01	0.01
10.000	0.01	0.01	0.01	0.01	0.01
10.250	0.01	0.01	0.02	0.02	0.02
10.500	0.02	0.02	0.02	0.02	0.02
10.750	0.02	0.02	0.02	0.03	0.03
11.000	0.03	0.03	0.03	0.04	0.04
11.250	0.04	0.04	0.05	0.05	0.05
11.500	0.05	0.06	0.07	0.08	0.08
11.750	0.10	0.11	0.14	0.16	0.22
12.000	0.29	0.40	0.52	0.42	0.26
12.250	0.20	0.16	0.14	0.12	0.11
12.500	0.11	0.10	0.08	0.08	0.07
12.750	0.07	0.07	0.07	0.06	0.06
13.000	0.06	0.05	0.05	0.05	0.05
13.250	0.05	0.04	0.04	0.04	0.04
13.500	0.04	0.04	0.03	0.03	0.03
13.750	0.03	0.03	0.03	0.03	0.03
14.000	0.03	0.03	0.03	0.03	0.03
14.250	0.03	0.03	0.03	0.03	0.03
14.500	0.02	0.02	0.02	0.02	0.02

Subsection: Unit Hydrograph (Hydrograph Table)

Label: PERV - POI-1

Scenario: ESSEX CO. 10-YR (PROJ)

Return Event: 10 years

Storm Event: ESSEX CO. 10-YR (PROJ)

HYDROGRAPH ORDINATES (ft³/s)

Output Time Increment = 0.050 hours

Time on left represents time for first value in each row.

Time (hours)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
14.750	0.02	0.02	0.02	0.02	0.02
15.000	0.02	0.02	0.02	0.02	0.02
15.250	0.02	0.02	0.02	0.02	0.02
15.500	0.02	0.02	0.02	0.02	0.02
15.750	0.02	0.02	0.02	0.02	0.02
16.000	0.02	0.02	0.02	0.02	0.02
16.250	0.02	0.02	0.02	0.02	0.02
16.500	0.02	0.02	0.02	0.01	0.01
16.750	0.01	0.01	0.01	0.01	0.01
17.000	0.01	0.01	0.01	0.01	0.01
17.250	0.01	0.01	0.01	0.01	0.01
17.500	0.01	0.01	0.01	0.01	0.01
17.750	0.01	0.01	0.01	0.01	0.01
18.000	0.01	0.01	0.01	0.01	0.01
18.250	0.01	0.01	0.01	0.01	0.01
18.500	0.01	0.01	0.01	0.01	0.01
18.750	0.01	0.01	0.01	0.01	0.01
19.000	0.01	0.01	0.01	0.01	0.01
19.250	0.01	0.01	0.01	0.01	0.01
19.500	0.01	0.01	0.01	0.01	0.01
19.750	0.01	0.01	0.01	0.01	0.01
20.000	0.01	0.01	0.01	0.01	0.01
20.250	0.01	0.01	0.01	0.01	0.01
20.500	0.01	0.01	0.01	0.01	0.01
20.750	0.01	0.01	0.01	0.01	0.01
21.000	0.01	0.01	0.01	0.01	0.01
21.250	0.01	0.01	0.01	0.01	0.01
21.500	0.01	0.01	0.01	0.01	0.01
21.750	0.01	0.01	0.01	0.01	0.01
22.000	0.01	0.01	0.01	0.01	0.01
22.250	0.01	0.01	0.01	0.01	0.01
22.500	0.01	0.01	0.01	0.01	0.01
22.750	0.01	0.01	0.01	0.01	0.01
23.000	0.01	0.01	0.01	0.01	0.01
23.250	0.01	0.01	0.01	0.01	0.01
23.500	0.01	0.01	0.01	0.01	0.01
23.750	0.01	0.01	0.01	0.01	0.01
24.000	0.01	(N/A)	(N/A)	(N/A)	(N/A)

Subsection: Unit Hydrograph Summary

Label: PERV - POI-1

Scenario: ESSEX CO. 100-YR (PROJ)

Return Event: 100 years

Storm Event: ESSEX CO. 100-YR (PROJ)

Storm Event	ESSEX CO. 100-YR (PROJ)
Return Event	100 years
Duration	24.000 hours
Depth	11.5 in
Time of Concentration (Composite)	0.083 hours
Area (User Defined)	4,777.00 ft ²
Computational Time Increment	0.011 hours
Time to Peak (Computed)	12.111 hours
Flow (Peak, Computed)	1.12 ft ³ /s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	12.100 hours
Flow (Peak Interpolated Output)	1.11 ft ³ /s
Drainage Area	
SCS CN (Composite)	79.000
Area (User Defined)	4,777.00 ft ²
Maximum Retention (Pervious)	2.7 in
Maximum Retention (Pervious, 20 percent)	0.5 in
Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	8.8 in
Runoff Volume (Pervious)	3,522.211 ft ³
Hydrograph Volume (Area under Hydrograph curve)	
Volume	3,519.000 ft ³
SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.083 hours
Computational Time Increment	0.011 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749

Subsection: Unit Hydrograph Summary

Label: PERV - POI-1

Scenario: ESSEX CO. 100-YR (PROJ)

Return Event: 100 years

Storm Event: ESSEX CO. 100-YR (PROJ)

SCS Unit Hydrograph Parameters	
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	1.49 ft ³ /s
Unit peak time, Tp	0.056 hours
Unit receding limb, Tr	0.222 hours
Total unit time, Tb	0.278 hours

Subsection: Unit Hydrograph (Hydrograph Table)

Return Event: 100 years

Label: PERV - POI-1

Storm Event: ESSEX CO. 100-YR (PROJ)

Scenario: ESSEX CO. 100-YR (PROJ)

Storm Event	ESSEX CO. 100-YR (PROJ)
Return Event	100 years
Duration	24.000 hours
Depth	11.5 in
Time of Concentration (Composite)	0.083 hours
Area (User Defined)	4,777.00 ft ²

HYDROGRAPH ORDINATES (ft³/s)

Output Time Increment = 0.050 hours

Time on left represents time for first value in each row.

Time (hours)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
4.050	0.00	0.00	0.00	0.00	0.00
4.300	0.00	0.00	0.00	0.00	0.00
4.550	0.00	0.00	0.00	0.00	0.00
4.800	0.00	0.00	0.00	0.00	0.00
5.050	0.00	0.00	0.00	0.00	0.00
5.300	0.00	0.00	0.00	0.00	0.00
5.550	0.00	0.00	0.00	0.01	0.01
5.800	0.01	0.01	0.01	0.01	0.01
6.050	0.01	0.01	0.01	0.01	0.01
6.300	0.01	0.01	0.01	0.01	0.01
6.550	0.01	0.01	0.01	0.01	0.01
6.800	0.01	0.01	0.01	0.01	0.01
7.050	0.01	0.01	0.01	0.01	0.01
7.300	0.01	0.01	0.01	0.01	0.01
7.550	0.01	0.01	0.01	0.01	0.01
7.800	0.01	0.01	0.01	0.01	0.02
8.050	0.02	0.02	0.02	0.02	0.02
8.300	0.02	0.02	0.02	0.02	0.02
8.550	0.02	0.02	0.02	0.02	0.02
8.800	0.02	0.02	0.02	0.02	0.02
9.050	0.02	0.02	0.02	0.02	0.02
9.300	0.03	0.03	0.03	0.03	0.03
9.550	0.03	0.03	0.03	0.03	0.03
9.800	0.03	0.03	0.04	0.04	0.04
10.050	0.04	0.04	0.04	0.04	0.04
10.300	0.04	0.04	0.04	0.05	0.05
10.550	0.05	0.05	0.05	0.06	0.06
10.800	0.06	0.07	0.07	0.07	0.08
11.050	0.08	0.09	0.09	0.10	0.10
11.300	0.11	0.11	0.12	0.13	0.13
11.550	0.15	0.18	0.19	0.19	0.23
11.800	0.26	0.31	0.37	0.50	0.64

Subsection: Unit Hydrograph (Hydrograph Table)

Return Event: 100 years

Label: PERV - POI-1

Storm Event: ESSEX CO. 100-YR (PROJ)

Scenario: ESSEX CO. 100-YR (PROJ)

HYDROGRAPH ORDINATES (ft³/s)

Output Time Increment = 0.050 hours

Time on left represents time for first value in each row.

Time (hours)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
12.050	0.86	1.11	0.89	0.54	0.41
12.300	0.33	0.28	0.24	0.22	0.22
12.550	0.19	0.17	0.16	0.15	0.14
12.800	0.14	0.13	0.13	0.12	0.11
13.050	0.11	0.10	0.10	0.09	0.09
13.300	0.09	0.08	0.08	0.08	0.07
13.550	0.07	0.07	0.07	0.06	0.06
13.800	0.06	0.06	0.06	0.06	0.06
14.050	0.06	0.06	0.06	0.05	0.05
14.300	0.05	0.05	0.05	0.05	0.05
14.550	0.05	0.05	0.05	0.05	0.04
14.800	0.04	0.04	0.04	0.04	0.04
15.050	0.04	0.04	0.04	0.04	0.04
15.300	0.04	0.04	0.04	0.04	0.04
15.550	0.04	0.03	0.03	0.03	0.03
15.800	0.03	0.03	0.03	0.03	0.03
16.050	0.03	0.03	0.03	0.03	0.03
16.300	0.03	0.03	0.03	0.03	0.03
16.550	0.03	0.03	0.03	0.03	0.03
16.800	0.03	0.03	0.03	0.03	0.03
17.050	0.03	0.03	0.03	0.03	0.03
17.300	0.03	0.03	0.03	0.02	0.02
17.550	0.02	0.02	0.02	0.02	0.02
17.800	0.02	0.02	0.02	0.02	0.02
18.050	0.02	0.02	0.02	0.02	0.02
18.300	0.02	0.02	0.02	0.02	0.02
18.550	0.02	0.02	0.02	0.02	0.02
18.800	0.02	0.02	0.02	0.02	0.02
19.050	0.02	0.02	0.02	0.02	0.02
19.300	0.02	0.02	0.02	0.02	0.02
19.550	0.02	0.02	0.02	0.02	0.02
19.800	0.02	0.02	0.02	0.02	0.02
20.050	0.02	0.02	0.02	0.02	0.02
20.300	0.02	0.02	0.02	0.02	0.02
20.550	0.02	0.02	0.02	0.02	0.02
20.800	0.02	0.02	0.02	0.02	0.02
21.050	0.02	0.02	0.02	0.02	0.02
21.300	0.02	0.02	0.02	0.02	0.02
21.550	0.02	0.02	0.02	0.02	0.02
21.800	0.02	0.02	0.02	0.02	0.02
22.050	0.02	0.02	0.02	0.02	0.02
22.300	0.02	0.02	0.02	0.02	0.02

Subsection: Unit Hydrograph (Hydrograph Table)

Label: PERV - POI-1

Scenario: ESSEX CO. 100-YR (PROJ)

Return Event: 100 years

Storm Event: ESSEX CO. 100-YR (PROJ)

HYDROGRAPH ORDINATES (ft³/s)

Output Time Increment = 0.050 hours

Time on left represents time for first value in each row.

Time (hours)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
22.550	0.02	0.02	0.02	0.02	0.02
22.800	0.02	0.02	0.01	0.01	0.01
23.050	0.01	0.01	0.01	0.01	0.01
23.300	0.01	0.01	0.01	0.01	0.01
23.550	0.01	0.01	0.01	0.01	0.01
23.800	0.01	0.01	0.01	0.01	0.01

Subsection: Unit Hydrograph Summary

Label: PERV - POI-3

Scenario: ESSEX CO. 2-YR (PROJ)

Return Event: 2 years

Storm Event: ESSEX CO. 2-YR (PROJ)

Storm Event	ESSEX CO. 2-YR (PROJ)
Return Event	2 years
Duration	24.000 hours
Depth	4.1 in
Time of Concentration (Composite)	0.083 hours
Area (User Defined)	683.00 ft ²
Computational Time Increment	0.011 hours
Time to Peak (Computed)	12.111 hours
Flow (Peak, Computed)	0.04 ft ³ /s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	12.100 hours
Flow (Peak Interpolated Output)	0.04 ft ³ /s
Drainage Area	
SCS CN (Composite)	79.000
Area (User Defined)	683.00 ft ²
Maximum Retention (Pervious)	2.7 in
Maximum Retention (Pervious, 20 percent)	0.5 in
Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	2.0 in
Runoff Volume (Pervious)	115.927 ft ³
Hydrograph Volume (Area under Hydrograph curve)	
Volume	116.000 ft ³
SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.083 hours
Computational Time Increment	0.011 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749

Subsection: Unit Hydrograph Summary

Label: PERV - POI-3

Scenario: ESSEX CO. 2-YR (PROJ)

Return Event: 2 years

Storm Event: ESSEX CO. 2-YR (PROJ)

SCS Unit Hydrograph Parameters	
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	0.21 ft ³ /s
Unit peak time, Tp	0.056 hours
Unit receding limb, Tr	0.222 hours
Total unit time, Tb	0.278 hours

Subsection: Unit Hydrograph (Hydrograph Table)

Label: PERV - POI-3

Scenario: ESSEX CO. 2-YR (PROJ)

Return Event: 2 years

Storm Event: ESSEX CO. 2-YR (PROJ)

Storm Event	ESSEX CO. 2-YR (PROJ)
Return Event	2 years
Duration	24.000 hours
Depth	4.1 in
Time of Concentration (Composite)	0.083 hours
Area (User Defined)	683.00 ft ²

HYDROGRAPH ORDINATES (ft³/s)

Output Time Increment = 0.050 hours

Time on left represents time for first value in each row.

Time (hours)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
10.650	0.00	0.00	0.00	0.00	0.00
10.900	0.00	0.00	0.00	0.00	0.00
11.150	0.00	0.00	0.00	0.00	0.00
11.400	0.00	0.00	0.00	0.00	0.00
11.650	0.00	0.01	0.01	0.01	0.01
11.900	0.01	0.02	0.02	0.03	0.04
12.150	0.03	0.02	0.02	0.01	0.01
12.400	0.01	0.01	0.01	0.01	0.01
12.650	0.01	0.01	0.01	0.01	0.01
12.900	0.00	0.00	0.00	0.00	0.00
13.150	0.00	0.00	0.00	0.00	0.00
13.400	0.00	0.00	0.00	0.00	0.00
13.650	0.00	0.00	0.00	0.00	0.00
13.900	0.00	0.00	0.00	0.00	0.00
14.150	0.00	0.00	0.00	0.00	0.00
14.400	0.00	0.00	0.00	0.00	0.00
14.650	0.00	0.00	0.00	0.00	0.00
14.900	0.00	0.00	0.00	0.00	0.00
15.150	0.00	0.00	0.00	0.00	0.00
15.400	0.00	0.00	0.00	0.00	0.00
15.650	0.00	0.00	0.00	0.00	0.00
15.900	0.00	0.00	0.00	0.00	0.00
16.150	0.00	0.00	0.00	0.00	0.00
16.400	0.00	0.00	0.00	0.00	0.00
16.650	0.00	0.00	0.00	0.00	0.00
16.900	0.00	0.00	0.00	0.00	0.00
17.150	0.00	0.00	0.00	0.00	0.00
17.400	0.00	0.00	(N/A)	(N/A)	(N/A)

Subsection: Unit Hydrograph Summary
 Label: PERV - POI-3
 Scenario: ESSEX CO. 10-YR (PROJ)

Return Event: 10 years
 Storm Event: ESSEX CO. 10-YR (PROJ)

Storm Event	ESSEX CO. 10-YR (PROJ)
Return Event	10 years
Duration	24.000 hours
Depth	6.4 in
Time of Concentration (Composite)	0.083 hours
Area (User Defined)	683.00 ft ²
Computational Time Increment	0.011 hours
Time to Peak (Computed)	12.111 hours
Flow (Peak, Computed)	0.08 ft ³ /s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	12.100 hours
Flow (Peak Interpolated Output)	0.07 ft ³ /s
Drainage Area	
SCS CN (Composite)	79.000
Area (User Defined)	683.00 ft ²
Maximum Retention (Pervious)	2.7 in
Maximum Retention (Pervious, 20 percent)	0.5 in
Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	4.0 in
Runoff Volume (Pervious)	228.337 ft ³
Hydrograph Volume (Area under Hydrograph curve)	
Volume	228.000 ft ³
SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.083 hours
Computational Time Increment	0.011 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749

Subsection: Unit Hydrograph Summary

Label: PERV - POI-3

Scenario: ESSEX CO. 10-YR (PROJ)

Return Event: 10 years

Storm Event: ESSEX CO. 10-YR (PROJ)

SCS Unit Hydrograph Parameters	
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	0.21 ft ³ /s
Unit peak time, Tp	0.056 hours
Unit receding limb, Tr	0.222 hours
Total unit time, Tb	0.278 hours

Subsection: Unit Hydrograph (Hydrograph Table)

Label: PERV - POI-3

Scenario: ESSEX CO. 10-YR (PROJ)

Return Event: 10 years

Storm Event: ESSEX CO. 10-YR (PROJ)

Storm Event	ESSEX CO. 10-YR (PROJ)
Return Event	10 years
Duration	24.000 hours
Depth	6.4 in
Time of Concentration (Composite)	0.083 hours
Area (User Defined)	683.00 ft ²

HYDROGRAPH ORDINATES (ft³/s)

Output Time Increment = 0.050 hours

Time on left represents time for first value in each row.

Time (hours)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
9.250	0.00	0.00	0.00	0.00	0.00
9.500	0.00	0.00	0.00	0.00	0.00
9.750	0.00	0.00	0.00	0.00	0.00
10.000	0.00	0.00	0.00	0.00	0.00
10.250	0.00	0.00	0.00	0.00	0.00
10.500	0.00	0.00	0.00	0.00	0.00
10.750	0.00	0.00	0.00	0.00	0.00
11.000	0.00	0.00	0.00	0.01	0.01
11.250	0.01	0.01	0.01	0.01	0.01
11.500	0.01	0.01	0.01	0.01	0.01
11.750	0.01	0.02	0.02	0.02	0.03
12.000	0.04	0.06	0.07	0.06	0.04
12.250	0.03	0.02	0.02	0.02	0.02
12.500	0.02	0.01	0.01	0.01	0.01
12.750	0.01	0.01	0.01	0.01	0.01
13.000	0.01	0.01	0.01	0.01	0.01
13.250	0.01	0.01	0.01	0.01	0.01
13.500	0.01	0.01	0.00	0.00	0.00
13.750	0.00	0.00	0.00	0.00	0.00
14.000	0.00	0.00	0.00	0.00	0.00
14.250	0.00	0.00	0.00	0.00	0.00
14.500	0.00	0.00	0.00	0.00	0.00
14.750	0.00	0.00	0.00	0.00	0.00
15.000	0.00	0.00	0.00	0.00	0.00
15.250	0.00	0.00	0.00	0.00	0.00
15.500	0.00	0.00	0.00	0.00	0.00
15.750	0.00	0.00	0.00	0.00	0.00
16.000	0.00	0.00	0.00	0.00	0.00
16.250	0.00	0.00	0.00	0.00	0.00
16.500	0.00	0.00	0.00	0.00	0.00
16.750	0.00	0.00	0.00	0.00	0.00
17.000	0.00	0.00	0.00	0.00	0.00

Subsection: Unit Hydrograph (Hydrograph Table)

Label: PERV - POI-3

Scenario: ESSEX CO. 10-YR (PROJ)

Return Event: 10 years

Storm Event: ESSEX CO. 10-YR (PROJ)

HYDROGRAPH ORDINATES (ft³/s)

Output Time Increment = 0.050 hours

Time on left represents time for first value in each row.

Time (hours)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
17.250	0.00	0.00	0.00	0.00	0.00
17.500	0.00	0.00	0.00	0.00	0.00
17.750	0.00	0.00	0.00	0.00	0.00
18.000	0.00	0.00	0.00	0.00	0.00
18.250	0.00	0.00	0.00	0.00	0.00
18.500	0.00	0.00	0.00	0.00	0.00
18.750	0.00	0.00	0.00	0.00	0.00
19.000	0.00	0.00	0.00	0.00	0.00
19.250	0.00	0.00	0.00	0.00	0.00
19.500	0.00	0.00	0.00	0.00	0.00
19.750	0.00	0.00	0.00	0.00	0.00
20.000	0.00	0.00	0.00	0.00	0.00
20.250	0.00	0.00	0.00	0.00	0.00
20.500	0.00	0.00	0.00	0.00	0.00
20.750	0.00	0.00	0.00	0.00	0.00
21.000	0.00	0.00	0.00	0.00	0.00
21.250	0.00	0.00	0.00	0.00	0.00
21.500	0.00	0.00	0.00	0.00	0.00
21.750	0.00	0.00	0.00	0.00	0.00
22.000	0.00	0.00	0.00	0.00	0.00
22.250	0.00	0.00	0.00	0.00	0.00
22.500	0.00	0.00	0.00	0.00	0.00
22.750	0.00	0.00	0.00	0.00	0.00
23.000	0.00	0.00	0.00	0.00	0.00
23.250	0.00	0.00	0.00	0.00	0.00

Subsection: Unit Hydrograph Summary
 Label: PERV - POI-3
 Scenario: ESSEX CO. 100-YR (PROJ)

Return Event: 100 years
 Storm Event: ESSEX CO. 100-YR (PROJ)

Storm Event	ESSEX CO. 100-YR (PROJ)
Return Event	100 years
Duration	24.000 hours
Depth	11.5 in
Time of Concentration (Composite)	0.083 hours
Area (User Defined)	683.00 ft ²
Computational Time Increment	0.011 hours
Time to Peak (Computed)	12.111 hours
Flow (Peak, Computed)	0.16 ft ³ /s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	12.100 hours
Flow (Peak Interpolated Output)	0.16 ft ³ /s
Drainage Area	
SCS CN (Composite)	79.000
Area (User Defined)	683.00 ft ²
Maximum Retention (Pervious)	2.7 in
Maximum Retention (Pervious, 20 percent)	0.5 in
Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	8.8 in
Runoff Volume (Pervious)	503.594 ft ³
Hydrograph Volume (Area under Hydrograph curve)	
Volume	503.000 ft ³
SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.083 hours
Computational Time Increment	0.011 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749

Subsection: Unit Hydrograph Summary

Label: PERV - POI-3

Scenario: ESSEX CO. 100-YR (PROJ)

Return Event: 100 years

Storm Event: ESSEX CO. 100-YR (PROJ)

SCS Unit Hydrograph Parameters	
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	0.21 ft ³ /s
Unit peak time, Tp	0.056 hours
Unit receding limb, Tr	0.222 hours
Total unit time, Tb	0.278 hours

Subsection: Unit Hydrograph (Hydrograph Table)

Label: PERV - POI-3

Scenario: ESSEX CO. 100-YR (PROJ)

Return Event: 100 years

Storm Event: ESSEX CO. 100-YR (PROJ)

Storm Event	ESSEX CO. 100-YR (PROJ)
Return Event	100 years
Duration	24.000 hours
Depth	11.5 in
Time of Concentration (Composite)	0.083 hours
Area (User Defined)	683.00 ft ²

HYDROGRAPH ORDINATES (ft³/s)

Output Time Increment = 0.050 hours

Time on left represents time for first value in each row.

Time (hours)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
6.350	0.00	0.00	0.00	0.00	0.00
6.600	0.00	0.00	0.00	0.00	0.00
6.850	0.00	0.00	0.00	0.00	0.00
7.100	0.00	0.00	0.00	0.00	0.00
7.350	0.00	0.00	0.00	0.00	0.00
7.600	0.00	0.00	0.00	0.00	0.00
7.850	0.00	0.00	0.00	0.00	0.00
8.100	0.00	0.00	0.00	0.00	0.00
8.350	0.00	0.00	0.00	0.00	0.00
8.600	0.00	0.00	0.00	0.00	0.00
8.850	0.00	0.00	0.00	0.00	0.00
9.100	0.00	0.00	0.00	0.00	0.00
9.350	0.00	0.00	0.00	0.00	0.00
9.600	0.00	0.00	0.00	0.00	0.00
9.850	0.00	0.01	0.01	0.01	0.01
10.100	0.01	0.01	0.01	0.01	0.01
10.350	0.01	0.01	0.01	0.01	0.01
10.600	0.01	0.01	0.01	0.01	0.01
10.850	0.01	0.01	0.01	0.01	0.01
11.100	0.01	0.01	0.01	0.01	0.02
11.350	0.02	0.02	0.02	0.02	0.02
11.600	0.03	0.03	0.03	0.03	0.04
11.850	0.04	0.05	0.07	0.09	0.12
12.100	0.16	0.13	0.08	0.06	0.05
12.350	0.04	0.03	0.03	0.03	0.03
12.600	0.02	0.02	0.02	0.02	0.02
12.850	0.02	0.02	0.02	0.02	0.02
13.100	0.01	0.01	0.01	0.01	0.01
13.350	0.01	0.01	0.01	0.01	0.01
13.600	0.01	0.01	0.01	0.01	0.01
13.850	0.01	0.01	0.01	0.01	0.01
14.100	0.01	0.01	0.01	0.01	0.01

Subsection: Unit Hydrograph (Hydrograph Table)

Label: PERV - POI-3

Scenario: ESSEX CO. 100-YR (PROJ)

Return Event: 100 years

Storm Event: ESSEX CO. 100-YR (PROJ)

HYDROGRAPH ORDINATES (ft³/s)

Output Time Increment = 0.050 hours

Time on left represents time for first value in each row.

Time (hours)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
14.350	0.01	0.01	0.01	0.01	0.01
14.600	0.01	0.01	0.01	0.01	0.01
14.850	0.01	0.01	0.01	0.01	0.01
15.100	0.01	0.01	0.01	0.01	0.01
15.350	0.01	0.01	0.01	0.01	0.01
15.600	0.00	0.00	0.00	0.00	0.00
15.850	0.00	0.00	0.00	0.00	0.00
16.100	0.00	0.00	0.00	0.00	0.00
16.350	0.00	0.00	0.00	0.00	0.00
16.600	0.00	0.00	0.00	0.00	0.00
16.850	0.00	0.00	0.00	0.00	0.00
17.100	0.00	0.00	0.00	0.00	0.00
17.350	0.00	0.00	0.00	0.00	0.00
17.600	0.00	0.00	0.00	0.00	0.00
17.850	0.00	0.00	0.00	0.00	0.00
18.100	0.00	0.00	0.00	0.00	0.00
18.350	0.00	0.00	0.00	0.00	0.00
18.600	0.00	0.00	0.00	0.00	0.00
18.850	0.00	0.00	0.00	0.00	0.00
19.100	0.00	0.00	0.00	0.00	0.00
19.350	0.00	0.00	0.00	0.00	0.00
19.600	0.00	0.00	0.00	0.00	0.00
19.850	0.00	0.00	0.00	0.00	0.00
20.100	0.00	0.00	0.00	0.00	0.00
20.350	0.00	0.00	0.00	0.00	0.00
20.600	0.00	0.00	0.00	0.00	0.00
20.850	0.00	0.00	0.00	0.00	0.00
21.100	0.00	0.00	0.00	0.00	0.00
21.350	0.00	0.00	0.00	0.00	0.00
21.600	0.00	0.00	0.00	0.00	0.00
21.850	0.00	0.00	0.00	0.00	0.00
22.100	0.00	0.00	0.00	0.00	0.00
22.350	0.00	0.00	0.00	0.00	0.00
22.600	0.00	0.00	0.00	0.00	0.00
22.850	0.00	0.00	0.00	0.00	0.00
23.100	0.00	0.00	0.00	0.00	0.00
23.350	0.00	0.00	0.00	0.00	0.00
23.600	0.00	0.00	0.00	0.00	0.00
23.850	0.00	0.00	0.00	0.00	(N/A)

Subsection: Addition Summary
 Label: OUTFALL-POI-1
 Scenario: ESSEX CO. 2-YR (PROJ)

Return Event: 2 years
 Storm Event: ESSEX CO. 2-YR (PROJ)

Summary for Hydrograph Addition at 'OUTFALL-POI-1'

Upstream Link	Upstream Node
<Catchment to Outflow Node>	IMP - POI-1
<Catchment to Outflow Node>	PERV - POI-1

Node Inflows

Inflow Type	Element	Volume (ft ³)	Time to Peak (hours)	Flow (Peak) (ft ³ /s)
Flow (From)	IMP - POI-1	734.431	12.100	0.21
Flow (From)	PERV - POI-1	809.775	12.100	0.27
Flow (In)	OUTFALL-POI-1	1,544.205	12.100	0.48

Subsection: Addition Summary
 Label: OUTFALL-POI-1
 Scenario: ESSEX CO. 10-YR (PROJ)

Return Event: 10 years
 Storm Event: ESSEX CO. 10-YR (PROJ)

Summary for Hydrograph Addition at 'OUTFALL-POI-1'

Upstream Link	Upstream Node
<Catchment to Outflow Node>	IMP - POI-1
<Catchment to Outflow Node>	PERV - POI-1

Node Inflows

Inflow Type	Element	Volume (ft ³)	Time to Peak (hours)	Flow (Peak) (ft ³ /s)
Flow (From)	IMP - POI-1	1,168.182	12.100	0.33
Flow (From)	PERV - POI-1	1,595.269	12.100	0.52
Flow (In)	OUTFALL-POI-1	2,763.452	12.100	0.85

Subsection: Addition Summary
 Label: OUTFALL-POI-1
 Scenario: ESSEX CO. 100-YR (PROJ)

Return Event: 100 years
 Storm Event: ESSEX CO. 100-YR (PROJ)

Summary for Hydrograph Addition at 'OUTFALL-POI-1'

Upstream Link	Upstream Node
<Catchment to Outflow Node>	IMP - POI-1
<Catchment to Outflow Node>	PERV - POI-1

Node Inflows

Inflow Type	Element	Volume (ft ³)	Time to Peak (hours)	Flow (Peak) (ft ³ /s)
Flow (From)	IMP - POI-1	2,148.864	12.100	0.60
Flow (From)	PERV - POI-1	3,518.904	12.100	1.11
Flow (In)	OUTFALL-POI-1	5,667.768	12.100	1.71

Subsection: Addition Summary
 Label: OUTFALL-POI-2
 Scenario: ESSEX CO. 2-YR (PROJ)

Return Event: 2 years
 Storm Event: ESSEX CO. 2-YR (PROJ)

Summary for Hydrograph Addition at 'OUTFALL-POI-2'

Upstream Link	Upstream Node
Outlet-3	UG

Node Inflows

Inflow Type	Element	Volume (ft ³)	Time to Peak (hours)	Flow (Peak) (ft ³ /s)
Flow (From)	Outlet-3	583.007	12.300	0.09
Flow (In)	OUTFALL-POI-2	583.007	12.300	0.09

Subsection: Addition Summary
 Label: OUTFALL-POI-2
 Scenario: ESSEX CO. 10-YR (PROJ)

Return Event: 10 years
 Storm Event: ESSEX CO. 10-YR (PROJ)

Summary for Hydrograph Addition at 'OUTFALL-POI-2'

Upstream Link	Upstream Node
Outlet-3	UG

Node Inflows

Inflow Type	Element	Volume (ft ³)	Time to Peak (hours)	Flow (Peak) (ft ³ /s)
Flow (From)	Outlet-3	1,199.034	12.200	0.24
Flow (In)	OUTFALL-POI-2	1,199.034	12.200	0.24

Subsection: Addition Summary
 Label: OUTFALL-POI-2
 Scenario: ESSEX CO. 100-YR (PROJ)

Return Event: 100 years
 Storm Event: ESSEX CO. 100-YR (PROJ)

Summary for Hydrograph Addition at 'OUTFALL-POI-2'

Upstream Link	Upstream Node
Outlet-3	UG

Node Inflows

Inflow Type	Element	Volume (ft ³)	Time to Peak (hours)	Flow (Peak) (ft ³ /s)
Flow (From)	Outlet-3	2,591.933	12.150	0.58
Flow (In)	OUTFALL-POI-2	2,591.933	12.150	0.58

Subsection: Addition Summary
 Label: OUTFALL-POI-3
 Scenario: ESSEX CO. 2-YR (PROJ)

Return Event: 2 years
 Storm Event: ESSEX CO. 2-YR (PROJ)

Summary for Hydrograph Addition at 'OUTFALL-POI-3'

Upstream Link	Upstream Node
<Catchment to Outflow Node>	IMP - POI-3
<Catchment to Outflow Node>	PERV - POI-3

Node Inflows

Inflow Type	Element	Volume (ft ³)	Time to Peak (hours)	Flow (Peak) (ft ³ /s)
Flow (From)	IMP - POI-3	415.685	12.100	0.12
Flow (From)	PERV - POI-3	115.779	12.100	0.04
Flow (In)	OUTFALL-POI-3	531.464	12.100	0.16

Subsection: Addition Summary
 Label: OUTFALL-POI-3
 Scenario: ESSEX CO. 10-YR (PROJ)

Return Event: 10 years
 Storm Event: ESSEX CO. 10-YR (PROJ)

Summary for Hydrograph Addition at 'OUTFALL-POI-3'

Upstream Link	Upstream Node
<Catchment to Outflow Node>	IMP - POI-3
<Catchment to Outflow Node>	PERV - POI-3

Node Inflows

Inflow Type	Element	Volume (ft ³)	Time to Peak (hours)	Flow (Peak) (ft ³ /s)
Flow (From)	IMP - POI-3	661.187	12.100	0.19
Flow (From)	PERV - POI-3	228.086	12.100	0.07
Flow (In)	OUTFALL-POI-3	889.273	12.100	0.26

Subsection: Addition Summary
 Label: OUTFALL-POI-3
 Scenario: ESSEX CO. 100-YR (PROJ)

Return Event: 100 years
 Storm Event: ESSEX CO. 100-YR (PROJ)

Summary for Hydrograph Addition at 'OUTFALL-POI-3'

Upstream Link	Upstream Node
<Catchment to Outflow Node>	IMP - POI-3
<Catchment to Outflow Node>	PERV - POI-3

Node Inflows

Inflow Type	Element	Volume (ft ³)	Time to Peak (hours)	Flow (Peak) (ft ³ /s)
Flow (From)	IMP - POI-3	1,216.250	12.100	0.34
Flow (From)	PERV - POI-3	503.122	12.100	0.16
Flow (In)	OUTFALL-POI-3	1,719.371	12.100	0.50

Subsection: Time vs. Elevation
 Label: UG (IN)
 Scenario: ESSEX CO. 2-YR (PROJ)

Return Event: 2 years
 Storm Event: ESSEX CO. 2-YR (PROJ)

Time vs. Elevation (ft)

Output Time increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)
0.000	466.00	466.00	466.00	466.00	466.00
0.250	466.00	466.00	466.00	466.00	466.00
0.500	466.00	466.00	466.00	466.00	466.00
0.750	466.00	466.00	466.00	466.00	466.00
1.000	466.00	466.00	466.00	466.00	466.00
1.250	466.00	466.00	466.00	466.00	466.00
1.500	466.00	466.00	466.00	466.00	466.01
1.750	466.01	466.01	466.01	466.01	466.01
2.000	466.01	466.01	466.01	466.01	466.01
2.250	466.01	466.02	466.02	466.02	466.02
2.500	466.02	466.02	466.02	466.02	466.02
2.750	466.03	466.03	466.03	466.03	466.03
3.000	466.03	466.03	466.04	466.04	466.04
3.250	466.04	466.04	466.04	466.04	466.05
3.500	466.05	466.05	466.05	466.05	466.06
3.750	466.06	466.06	466.06	466.06	466.06
4.000	466.07	466.07	466.07	466.07	466.07
4.250	466.08	466.08	466.08	466.08	466.08
4.500	466.09	466.09	466.09	466.09	466.09
4.750	466.10	466.10	466.10	466.10	466.11
5.000	466.11	466.11	466.11	466.11	466.12
5.250	466.12	466.12	466.12	466.13	466.13
5.500	466.13	466.13	466.14	466.14	466.14
5.750	466.14	466.15	466.15	466.15	466.15
6.000	466.16	466.16	466.16	466.16	466.17
6.250	466.17	466.17	466.17	466.18	466.18
6.500	466.18	466.19	466.19	466.19	466.20
6.750	466.20	466.20	466.21	466.21	466.21
7.000	466.22	466.22	466.22	466.23	466.23
7.250	466.23	466.24	466.24	466.24	466.25
7.500	466.25	466.25	466.26	466.26	466.27
7.750	466.27	466.27	466.28	466.28	466.29
8.000	466.29	466.30	466.30	466.30	466.31
8.250	466.31	466.32	466.32	466.33	466.33
8.500	466.34	466.34	466.34	466.35	466.35
8.750	466.36	466.36	466.37	466.37	466.38
9.000	466.38	466.39	466.39	466.40	466.40
9.250	466.41	466.42	466.42	466.43	466.43
9.500	466.44	466.45	466.45	466.46	466.47
9.750	466.47	466.48	466.49	466.50	466.50

Subsection: Time vs. Elevation
 Label: UG (IN)
 Scenario: ESSEX CO. 2-YR (PROJ)

Return Event: 2 years
 Storm Event: ESSEX CO. 2-YR (PROJ)

Time vs. Elevation (ft)

Output Time increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)
10.000	466.51	466.52	466.52	466.53	466.54
10.250	466.54	466.55	466.56	466.56	466.57
10.500	466.58	466.59	466.59	466.60	466.61
10.750	466.62	466.63	466.64	466.65	466.66
11.000	466.67	466.68	466.70	466.71	466.72
11.250	466.74	466.75	466.77	466.78	466.80
11.500	466.82	466.84	466.86	466.89	466.91
11.750	466.94	466.97	467.01	467.05	467.11
12.000	467.17	467.26	467.37	467.46	467.51
12.250	467.52	467.53	467.52	467.51	467.50
12.500	467.49	467.48	467.47	467.46	467.44
12.750	467.43	467.42	467.41	467.41	467.40
13.000	467.39	467.38	467.38	467.37	467.36
13.250	467.36	467.35	467.35	467.34	467.34
13.500	467.33	467.33	467.33	467.32	467.32
13.750	467.32	467.31	467.31	467.31	467.31
14.000	467.31	467.31	467.30	467.30	467.30
14.250	467.30	467.30	467.30	467.30	467.30
14.500	467.29	467.29	467.29	467.29	467.29
14.750	467.29	467.29	467.29	467.29	467.29
15.000	467.29	467.28	467.28	467.28	467.28
15.250	467.28	467.28	467.28	467.28	467.28
15.500	467.28	467.28	467.28	467.28	467.28
15.750	467.28	467.28	467.28	467.28	467.28
16.000	467.28	467.28	467.28	467.28	467.28
16.250	467.28	467.28	467.27	467.27	467.27
16.500	467.27	467.27	467.27	467.27	467.27
16.750	467.27	467.27	467.27	467.27	467.27
17.000	467.27	467.27	467.27	467.27	467.27
17.250	467.27	467.27	467.27	467.27	467.27
17.500	467.27	467.27	467.27	467.27	467.27
17.750	467.27	467.27	467.27	467.27	467.27
18.000	467.27	467.27	467.27	467.27	467.27
18.250	467.27	467.27	467.27	467.27	467.27
18.500	467.27	467.27	467.27	467.27	467.27
18.750	467.27	467.27	467.27	467.27	467.27
19.000	467.27	467.27	467.27	467.27	467.27
19.250	467.27	467.27	467.27	467.27	467.27
19.500	467.27	467.27	467.26	467.26	467.26
19.750	467.26	467.26	467.26	467.26	467.26
20.000	467.26	467.26	467.26	467.26	467.26

Subsection: Time vs. Elevation
 Label: UG (IN)
 Scenario: ESSEX CO. 2-YR (PROJ)

Return Event: 2 years
 Storm Event: ESSEX CO. 2-YR (PROJ)

Time vs. Elevation (ft)

Output Time increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)
20.250	467.26	467.26	467.26	467.26	467.26
20.500	467.26	467.26	467.26	467.26	467.26
20.750	467.26	467.26	467.26	467.26	467.26
21.000	467.26	467.26	467.26	467.26	467.26
21.250	467.26	467.26	467.26	467.26	467.26
21.500	467.26	467.26	467.26	467.26	467.26
21.750	467.26	467.26	467.26	467.26	467.26
22.000	467.26	467.26	467.26	467.26	467.26
22.250	467.26	467.26	467.26	467.26	467.26
22.500	467.26	467.26	467.26	467.26	467.26
22.750	467.26	467.26	467.26	467.26	467.26
23.000	467.26	467.26	467.26	467.26	467.26
23.250	467.26	467.26	467.26	467.26	467.26
23.500	467.26	467.26	467.26	467.26	467.26
23.750	467.26	467.26	467.26	467.26	467.26
24.000	467.26	(N/A)	(N/A)	(N/A)	(N/A)

Subsection: Time vs. Elevation
 Label: UG (IN)
 Scenario: ESSEX CO. 10-YR (PROJ)

Return Event: 10 years
 Storm Event: ESSEX CO. 10-YR (PROJ)

Time vs. Elevation (ft)

Output Time increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)
0.000	466.00	466.00	466.00	466.00	466.00
0.250	466.00	466.00	466.00	466.00	466.00
0.500	466.00	466.00	466.00	466.00	466.00
0.750	466.00	466.00	466.00	466.00	466.00
1.000	466.00	466.00	466.00	466.01	466.01
1.250	466.01	466.01	466.01	466.01	466.01
1.500	466.01	466.02	466.02	466.02	466.02
1.750	466.02	466.02	466.03	466.03	466.03
2.000	466.03	466.03	466.04	466.04	466.04
2.250	466.04	466.04	466.05	466.05	466.05
2.500	466.05	466.06	466.06	466.06	466.06
2.750	466.07	466.07	466.07	466.07	466.08
3.000	466.08	466.08	466.09	466.09	466.09
3.250	466.10	466.10	466.10	466.10	466.11
3.500	466.11	466.11	466.12	466.12	466.12
3.750	466.13	466.13	466.13	466.14	466.14
4.000	466.14	466.15	466.15	466.15	466.16
4.250	466.16	466.16	466.17	466.17	466.18
4.500	466.18	466.18	466.19	466.19	466.19
4.750	466.20	466.20	466.21	466.21	466.21
5.000	466.22	466.22	466.23	466.23	466.23
5.250	466.24	466.24	466.25	466.25	466.25
5.500	466.26	466.26	466.27	466.27	466.28
5.750	466.28	466.28	466.29	466.29	466.30
6.000	466.30	466.31	466.31	466.31	466.32
6.250	466.32	466.33	466.33	466.34	466.34
6.500	466.35	466.35	466.36	466.36	466.37
6.750	466.37	466.38	466.38	466.39	466.40
7.000	466.40	466.41	466.41	466.42	466.42
7.250	466.43	466.44	466.44	466.45	466.45
7.500	466.46	466.47	466.47	466.48	466.49
7.750	466.49	466.50	466.50	466.51	466.52
8.000	466.52	466.53	466.53	466.54	466.54
8.250	466.55	466.55	466.56	466.57	466.57
8.500	466.58	466.58	466.59	466.60	466.60
8.750	466.61	466.62	466.62	466.63	466.64
9.000	466.64	466.65	466.66	466.66	466.67
9.250	466.68	466.68	466.69	466.70	466.71
9.500	466.72	466.72	466.73	466.74	466.75
9.750	466.76	466.77	466.78	466.79	466.80

Subsection: Time vs. Elevation
 Label: UG (IN)
 Scenario: ESSEX CO. 10-YR (PROJ)

Return Event: 10 years
 Storm Event: ESSEX CO. 10-YR (PROJ)

Time vs. Elevation (ft)

Output Time increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)
10.000	466.81	466.82	466.83	466.84	466.85
10.250	466.86	466.87	466.88	466.89	466.90
10.500	466.92	466.93	466.94	466.95	466.97
10.750	466.98	467.00	467.01	467.03	467.04
11.000	467.06	467.08	467.10	467.12	467.14
11.250	467.16	467.18	467.20	467.23	467.25
11.500	467.28	467.30	467.33	467.35	467.37
11.750	467.39	467.42	467.45	467.48	467.53
12.000	467.59	467.68	467.80	467.89	467.92
12.250	467.91	467.88	467.84	467.81	467.78
12.500	467.75	467.72	467.70	467.67	467.65
12.750	467.62	467.60	467.58	467.56	467.54
13.000	467.52	467.50	467.48	467.47	467.46
13.250	467.44	467.43	467.42	467.41	467.40
13.500	467.39	467.39	467.38	467.37	467.37
13.750	467.36	467.36	467.35	467.35	467.34
14.000	467.34	467.34	467.34	467.33	467.33
14.250	467.33	467.33	467.32	467.32	467.32
14.500	467.32	467.32	467.32	467.32	467.31
14.750	467.31	467.31	467.31	467.31	467.31
15.000	467.31	467.30	467.30	467.30	467.30
15.250	467.30	467.30	467.30	467.30	467.30
15.500	467.30	467.30	467.30	467.29	467.29
15.750	467.29	467.29	467.29	467.29	467.29
16.000	467.29	467.29	467.29	467.29	467.29
16.250	467.29	467.29	467.29	467.29	467.29
16.500	467.29	467.29	467.29	467.29	467.29
16.750	467.29	467.29	467.29	467.29	467.28
17.000	467.28	467.28	467.28	467.28	467.28
17.250	467.28	467.28	467.28	467.28	467.28
17.500	467.28	467.28	467.28	467.28	467.28
17.750	467.28	467.28	467.28	467.28	467.28
18.000	467.28	467.28	467.28	467.28	467.28
18.250	467.28	467.28	467.28	467.28	467.28
18.500	467.28	467.28	467.28	467.28	467.28
18.750	467.27	467.27	467.27	467.27	467.27
19.000	467.27	467.27	467.27	467.27	467.27
19.250	467.27	467.27	467.27	467.27	467.27
19.500	467.27	467.27	467.27	467.27	467.27
19.750	467.27	467.27	467.27	467.27	467.27
20.000	467.27	467.27	467.27	467.27	467.27

Subsection: Time vs. Elevation
 Label: UG (IN)
 Scenario: ESSEX CO. 10-YR (PROJ)

Return Event: 10 years
 Storm Event: ESSEX CO. 10-YR (PROJ)

Time vs. Elevation (ft)

Output Time increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)
20.250	467.27	467.27	467.27	467.27	467.27
20.500	467.27	467.27	467.27	467.27	467.27
20.750	467.27	467.27	467.27	467.27	467.27
21.000	467.27	467.27	467.27	467.27	467.27
21.250	467.27	467.27	467.27	467.27	467.27
21.500	467.27	467.27	467.27	467.27	467.27
21.750	467.27	467.27	467.27	467.27	467.27
22.000	467.27	467.27	467.27	467.27	467.27
22.250	467.27	467.27	467.27	467.27	467.27
22.500	467.27	467.27	467.27	467.27	467.27
22.750	467.27	467.27	467.27	467.27	467.27
23.000	467.27	467.27	467.27	467.27	467.27
23.250	467.27	467.27	467.27	467.27	467.27
23.500	467.27	467.27	467.27	467.27	467.27
23.750	467.27	467.27	467.27	467.27	467.27
24.000	467.27	(N/A)	(N/A)	(N/A)	(N/A)

Subsection: Time vs. Elevation

Return Event: 100 years

Label: UG (IN)

Storm Event: ESSEX CO. 100-YR (PROJ)

Scenario: ESSEX CO. 100-YR (PROJ)

Time vs. Elevation (ft)

Output Time increment = 0.050 hours

Time on left represents time for first value in each row.

Time (hours)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)
0.000	466.00	466.00	466.00	466.00	466.00
0.250	466.00	466.00	466.00	466.00	466.00
0.500	466.00	466.00	466.00	466.00	466.01
0.750	466.01	466.01	466.01	466.01	466.02
1.000	466.02	466.02	466.03	466.03	466.03
1.250	466.04	466.04	466.04	466.05	466.05
1.500	466.06	466.06	466.06	466.07	466.07
1.750	466.08	466.08	466.09	466.09	466.10
2.000	466.10	466.11	466.11	466.12	466.12
2.250	466.13	466.13	466.14	466.14	466.15
2.500	466.15	466.16	466.17	466.17	466.18
2.750	466.18	466.19	466.20	466.20	466.21
3.000	466.21	466.22	466.23	466.23	466.24
3.250	466.25	466.25	466.26	466.26	466.27
3.500	466.28	466.28	466.29	466.30	466.30
3.750	466.31	466.32	466.32	466.33	466.34
4.000	466.35	466.35	466.36	466.37	466.37
4.250	466.38	466.39	466.40	466.40	466.41
4.500	466.42	466.42	466.43	466.44	466.45
4.750	466.45	466.46	466.47	466.48	466.48
5.000	466.49	466.50	466.51	466.51	466.52
5.250	466.53	466.53	466.54	466.54	466.55
5.500	466.56	466.56	466.57	466.58	466.58
5.750	466.59	466.60	466.60	466.61	466.62
6.000	466.62	466.63	466.64	466.64	466.65
6.250	466.66	466.67	466.67	466.68	466.69
6.500	466.70	466.70	466.71	466.72	466.73
6.750	466.73	466.74	466.75	466.76	466.77
7.000	466.78	466.78	466.79	466.80	466.81
7.250	466.82	466.83	466.84	466.85	466.86
7.500	466.87	466.88	466.89	466.89	466.90
7.750	466.91	466.92	466.93	466.94	466.95
8.000	466.96	466.98	466.99	467.00	467.01
8.250	467.02	467.03	467.04	467.05	467.06
8.500	467.07	467.08	467.09	467.10	467.11
8.750	467.12	467.13	467.14	467.16	467.17
9.000	467.18	467.19	467.20	467.21	467.23
9.250	467.24	467.25	467.26	467.27	467.28
9.500	467.29	467.30	467.31	467.31	467.32
9.750	467.32	467.33	467.33	467.34	467.34

Subsection: Time vs. Elevation

Return Event: 100 years

Label: UG (IN)

Storm Event: ESSEX CO. 100-YR (PROJ)

Scenario: ESSEX CO. 100-YR (PROJ)

Time vs. Elevation (ft)

Output Time increment = 0.050 hours

Time on left represents time for first value in each row.

Time (hours)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)
10.000	467.35	467.35	467.35	467.36	467.36
10.250	467.36	467.36	467.37	467.37	467.37
10.500	467.37	467.38	467.38	467.38	467.39
10.750	467.39	467.40	467.40	467.41	467.41
11.000	467.42	467.43	467.43	467.44	467.45
11.250	467.46	467.47	467.48	467.49	467.50
11.500	467.51	467.53	467.55	467.57	467.60
11.750	467.63	467.66	467.71	467.77	467.84
12.000	467.94	468.07	468.23	468.33	468.31
12.250	468.23	468.15	468.08	468.02	467.97
12.500	467.93	467.89	467.86	467.83	467.80
12.750	467.77	467.75	467.73	467.71	467.70
13.000	467.68	467.66	467.64	467.62	467.60
13.250	467.59	467.57	467.56	467.54	467.53
13.500	467.51	467.50	467.48	467.47	467.46
13.750	467.45	467.44	467.43	467.43	467.42
14.000	467.42	467.41	467.41	467.40	467.40
14.250	467.39	467.39	467.39	467.38	467.38
14.500	467.38	467.37	467.37	467.37	467.37
14.750	467.36	467.36	467.36	467.36	467.35
15.000	467.35	467.35	467.35	467.34	467.34
15.250	467.34	467.34	467.34	467.34	467.34
15.500	467.33	467.33	467.33	467.33	467.33
15.750	467.33	467.33	467.33	467.33	467.33
16.000	467.33	467.32	467.32	467.32	467.32
16.250	467.32	467.32	467.32	467.32	467.32
16.500	467.32	467.32	467.32	467.32	467.32
16.750	467.32	467.32	467.31	467.31	467.31
17.000	467.31	467.31	467.31	467.31	467.31
17.250	467.31	467.31	467.31	467.31	467.31
17.500	467.31	467.31	467.31	467.31	467.30
17.750	467.30	467.30	467.30	467.30	467.30
18.000	467.30	467.30	467.30	467.30	467.30
18.250	467.30	467.30	467.30	467.30	467.30
18.500	467.30	467.30	467.30	467.30	467.30
18.750	467.30	467.30	467.29	467.29	467.29
19.000	467.29	467.29	467.29	467.29	467.29
19.250	467.29	467.29	467.29	467.29	467.29
19.500	467.29	467.29	467.29	467.29	467.29
19.750	467.29	467.29	467.29	467.29	467.29
20.000	467.29	467.29	467.29	467.29	467.29

Subsection: Time vs. Elevation

Label: UG (IN)

Scenario: ESSEX CO. 100-YR (PROJ)

Return Event: 100 years

Storm Event: ESSEX CO. 100-YR (PROJ)

Time vs. Elevation (ft)

Output Time increment = 0.050 hours

Time on left represents time for first value in each row.

Time (hours)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)
20.250	467.29	467.29	467.29	467.29	467.29
20.500	467.29	467.29	467.29	467.29	467.29
20.750	467.29	467.29	467.29	467.29	467.29
21.000	467.29	467.29	467.29	467.29	467.29
21.250	467.29	467.29	467.29	467.29	467.29
21.500	467.29	467.29	467.29	467.29	467.29
21.750	467.29	467.29	467.29	467.29	467.29
22.000	467.29	467.29	467.29	467.28	467.28
22.250	467.28	467.28	467.28	467.28	467.28
22.500	467.28	467.28	467.28	467.28	467.28
22.750	467.28	467.28	467.28	467.28	467.28
23.000	467.28	467.28	467.28	467.28	467.28
23.250	467.28	467.28	467.28	467.28	467.28
23.500	467.28	467.28	467.28	467.28	467.28
23.750	467.28	467.28	467.28	467.28	467.28
24.000	467.28	(N/A)	(N/A)	(N/A)	(N/A)

Subsection: Time vs. Volume

Return Event: 2 years

Label: UG

Storm Event: ESSEX CO. 2-YR (PROJ)

Scenario: ESSEX CO. 2-YR (PROJ)

Time vs. Volume (ft³)

Output Time increment = 0.050 hours

Time on left represents time for first value in each row.

Time (hours)	Volume (ft ³)	Volume (ft ³)	Volume (ft ³)	Volume (ft ³)	Volume (ft ³)
0.000	0.000	0.000	0.000	0.000	0.000
0.250	0.000	0.000	0.000	0.000	0.000
0.500	0.000	0.000	0.000	0.000	0.000
0.750	0.000	0.000	0.000	0.000	0.000
1.000	0.000	0.000	0.000	0.000	0.000
1.250	0.000	0.000	0.000	1.000	1.000
1.500	1.000	1.000	1.000	1.000	1.000
1.750	2.000	2.000	2.000	2.000	2.000
2.000	3.000	3.000	3.000	3.000	4.000
2.250	4.000	4.000	4.000	5.000	5.000
2.500	5.000	6.000	6.000	6.000	7.000
2.750	7.000	7.000	8.000	8.000	8.000
3.000	9.000	9.000	10.000	10.000	10.000
3.250	11.000	11.000	12.000	12.000	12.000
3.500	13.000	13.000	14.000	14.000	15.000
3.750	15.000	16.000	16.000	17.000	17.000
4.000	18.000	18.000	19.000	19.000	20.000
4.250	20.000	21.000	21.000	22.000	22.000
4.500	23.000	23.000	24.000	25.000	25.000
4.750	26.000	26.000	27.000	27.000	28.000
5.000	29.000	29.000	30.000	30.000	31.000
5.250	32.000	32.000	33.000	34.000	34.000
5.500	35.000	35.000	36.000	37.000	37.000
5.750	38.000	39.000	39.000	40.000	41.000
6.000	42.000	43.000	43.000	44.000	45.000
6.250	46.000	47.000	48.000	49.000	50.000
6.500	51.000	52.000	52.000	53.000	54.000
6.750	55.000	56.000	57.000	59.000	60.000
7.000	61.000	62.000	63.000	64.000	65.000
7.250	66.000	67.000	68.000	70.000	71.000
7.500	72.000	73.000	74.000	76.000	77.000
7.750	78.000	80.000	81.000	82.000	83.000
8.000	85.000	86.000	87.000	89.000	90.000
8.250	92.000	94.000	95.000	97.000	98.000
8.500	100.000	102.000	103.000	105.000	106.000
8.750	108.000	110.000	112.000	113.000	115.000
9.000	117.000	119.000	120.000	122.000	124.000
9.250	126.000	128.000	130.000	132.000	134.000
9.500	137.000	139.000	141.000	144.000	146.000
9.750	149.000	152.000	154.000	157.000	160.000

Subsection: Time vs. Volume

Return Event: 2 years

Label: UG

Storm Event: ESSEX CO. 2-YR (PROJ)

Scenario: ESSEX CO. 2-YR (PROJ)

Time vs. Volume (ft³)

Output Time increment = 0.050 hours

Time on left represents time for first value in each row.

Time (hours)	Volume (ft³)	Volume (ft³)	Volume (ft³)	Volume (ft³)	Volume (ft³)
10.000	162.000	164.000	167.000	169.000	172.000
10.250	174.000	177.000	179.000	182.000	185.000
10.500	187.000	190.000	193.000	196.000	200.000
10.750	203.000	207.000	211.000	215.000	219.000
11.000	223.000	228.000	232.000	237.000	243.000
11.250	248.000	254.000	261.000	267.000	274.000
11.500	282.000	289.000	298.000	308.000	319.000
11.750	330.000	344.000	359.000	377.000	399.000
12.000	427.000	465.000	509.000	548.000	568.000
12.250	575.000	576.000	574.000	571.000	566.000
12.500	562.000	557.000	552.000	547.000	542.000
12.750	537.000	533.000	529.000	525.000	522.000
13.000	519.000	516.000	513.000	510.000	507.000
13.250	505.000	503.000	501.000	499.000	497.000
13.500	495.000	493.000	492.000	490.000	489.000
13.750	488.000	487.000	486.000	485.000	484.000
14.000	483.000	483.000	482.000	481.000	481.000
14.250	480.000	480.000	479.000	479.000	478.000
14.500	478.000	478.000	477.000	477.000	476.000
14.750	476.000	476.000	475.000	475.000	475.000
15.000	474.000	474.000	474.000	473.000	473.000
15.250	473.000	473.000	472.000	472.000	472.000
15.500	472.000	472.000	471.000	471.000	471.000
15.750	471.000	471.000	471.000	471.000	471.000
16.000	470.000	470.000	470.000	470.000	470.000
16.250	470.000	470.000	470.000	470.000	470.000
16.500	470.000	469.000	469.000	469.000	469.000
16.750	469.000	469.000	469.000	469.000	469.000
17.000	469.000	469.000	468.000	468.000	468.000
17.250	468.000	468.000	468.000	468.000	468.000
17.500	468.000	468.000	468.000	467.000	467.000
17.750	467.000	467.000	467.000	467.000	467.000
18.000	467.000	467.000	467.000	467.000	467.000
18.250	466.000	466.000	466.000	466.000	466.000
18.500	466.000	466.000	466.000	466.000	466.000
18.750	466.000	466.000	466.000	466.000	466.000
19.000	466.000	466.000	466.000	466.000	466.000
19.250	466.000	466.000	466.000	466.000	466.000
19.500	466.000	466.000	466.000	466.000	466.000
19.750	466.000	465.000	465.000	465.000	465.000
20.000	465.000	465.000	465.000	465.000	465.000

Subsection: Time vs. Volume

Return Event: 2 years

Label: UG

Storm Event: ESSEX CO. 2-YR (PROJ)

Scenario: ESSEX CO. 2-YR (PROJ)

Time vs. Volume (ft³)

Output Time increment = 0.050 hours

Time on left represents time for first value in each row.

Time (hours)	Volume (ft ³)	Volume (ft ³)	Volume (ft ³)	Volume (ft ³)	Volume (ft ³)
20.250	465.000	465.000	465.000	465.000	465.000
20.500	465.000	465.000	465.000	465.000	465.000
20.750	465.000	465.000	465.000	465.000	465.000
21.000	465.000	465.000	465.000	465.000	465.000
21.250	465.000	465.000	465.000	465.000	465.000
21.500	465.000	465.000	465.000	465.000	465.000
21.750	465.000	465.000	465.000	465.000	465.000
22.000	465.000	465.000	464.000	464.000	464.000
22.250	464.000	464.000	464.000	464.000	464.000
22.500	464.000	464.000	464.000	464.000	464.000
22.750	464.000	464.000	464.000	464.000	464.000
23.000	464.000	464.000	464.000	464.000	464.000
23.250	464.000	464.000	464.000	464.000	464.000
23.500	464.000	464.000	464.000	464.000	464.000
23.750	464.000	464.000	464.000	464.000	464.000
24.000	464.000	(N/A)	(N/A)	(N/A)	(N/A)

Subsection: Time vs. Volume
 Label: UG
 Scenario: ESSEX CO. 10-YR (PROJ)

Return Event: 10 years
 Storm Event: ESSEX CO. 10-YR (PROJ)

Time vs. Volume (ft³)

Output Time increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Volume (ft³)	Volume (ft³)	Volume (ft³)	Volume (ft³)	Volume (ft³)
0.000	0.000	0.000	0.000	0.000	0.000
0.250	0.000	0.000	0.000	0.000	0.000
0.500	0.000	0.000	0.000	0.000	0.000
0.750	0.000	0.000	0.000	0.000	1.000
1.000	1.000	1.000	1.000	1.000	2.000
1.250	2.000	2.000	3.000	3.000	3.000
1.500	4.000	4.000	4.000	5.000	5.000
1.750	6.000	6.000	7.000	7.000	8.000
2.000	8.000	9.000	9.000	10.000	11.000
2.250	11.000	12.000	12.000	13.000	14.000
2.500	14.000	15.000	16.000	16.000	17.000
2.750	18.000	19.000	19.000	20.000	21.000
3.000	21.000	22.000	23.000	24.000	25.000
3.250	25.000	26.000	27.000	28.000	29.000
3.500	29.000	30.000	31.000	32.000	33.000
3.750	34.000	35.000	36.000	36.000	37.000
4.000	38.000	39.000	40.000	41.000	42.000
4.250	44.000	45.000	46.000	47.000	48.000
4.500	49.000	51.000	52.000	53.000	54.000
4.750	55.000	57.000	58.000	59.000	60.000
5.000	62.000	63.000	64.000	65.000	67.000
5.250	68.000	69.000	70.000	72.000	73.000
5.500	74.000	76.000	77.000	78.000	80.000
5.750	81.000	82.000	84.000	85.000	87.000
6.000	88.000	90.000	91.000	93.000	94.000
6.250	96.000	98.000	99.000	101.000	103.000
6.500	104.000	106.000	108.000	110.000	111.000
6.750	113.000	115.000	117.000	119.000	121.000
7.000	123.000	125.000	127.000	129.000	131.000
7.250	133.000	135.000	137.000	139.000	141.000
7.500	144.000	146.000	148.000	151.000	153.000
7.750	156.000	158.000	160.000	162.000	164.000
8.000	166.000	168.000	170.000	172.000	175.000
8.250	177.000	179.000	181.000	183.000	185.000
8.500	188.000	190.000	192.000	195.000	197.000
8.750	199.000	202.000	204.000	207.000	209.000
9.000	212.000	214.000	217.000	220.000	223.000
9.250	225.000	228.000	231.000	234.000	237.000
9.500	241.000	244.000	247.000	251.000	254.000
9.750	258.000	261.000	265.000	269.000	273.000

Subsection: Time vs. Volume
 Label: UG
 Scenario: ESSEX CO. 10-YR (PROJ)

Return Event: 10 years
 Storm Event: ESSEX CO. 10-YR (PROJ)

Time vs. Volume (ft³)

Output Time increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Volume (ft ³)	Volume (ft ³)	Volume (ft ³)	Volume (ft ³)	Volume (ft ³)
10.000	277.000	281.000	285.000	289.000	293.000
10.250	298.000	302.000	307.000	311.000	316.000
10.500	321.000	326.000	331.000	336.000	342.000
10.750	348.000	354.000	360.000	366.000	373.000
11.000	380.000	387.000	395.000	403.000	412.000
11.250	421.000	430.000	440.000	450.000	461.000
11.500	471.000	481.000	491.000	501.000	510.000
11.750	520.000	531.000	543.000	558.000	578.000
12.000	605.000	642.000	691.000	731.000	743.000
12.250	736.000	724.000	709.000	695.000	682.000
12.500	671.000	660.000	649.000	638.000	627.000
12.750	617.000	607.000	598.000	589.000	581.000
13.000	573.000	566.000	559.000	552.000	546.000
13.250	541.000	536.000	532.000	528.000	524.000
13.500	520.000	517.000	514.000	511.000	509.000
13.750	506.000	504.000	502.000	501.000	499.000
14.000	498.000	497.000	495.000	494.000	493.000
14.250	493.000	492.000	491.000	490.000	489.000
14.500	489.000	488.000	487.000	487.000	486.000
14.750	486.000	485.000	484.000	484.000	483.000
15.000	483.000	482.000	482.000	481.000	481.000
15.250	480.000	480.000	480.000	479.000	479.000
15.500	479.000	479.000	478.000	478.000	478.000
15.750	478.000	477.000	477.000	477.000	477.000
16.000	477.000	477.000	476.000	476.000	476.000
16.250	476.000	476.000	476.000	476.000	475.000
16.500	475.000	475.000	475.000	475.000	475.000
16.750	475.000	474.000	474.000	474.000	474.000
17.000	474.000	474.000	474.000	473.000	473.000
17.250	473.000	473.000	473.000	473.000	473.000
17.500	473.000	472.000	472.000	472.000	472.000
17.750	472.000	472.000	472.000	471.000	471.000
18.000	471.000	471.000	471.000	471.000	471.000
18.250	471.000	470.000	470.000	470.000	470.000
18.500	470.000	470.000	470.000	470.000	470.000
18.750	470.000	470.000	470.000	470.000	470.000
19.000	470.000	470.000	470.000	469.000	469.000
19.250	469.000	469.000	469.000	469.000	469.000
19.500	469.000	469.000	469.000	469.000	469.000
19.750	469.000	469.000	469.000	469.000	469.000
20.000	469.000	469.000	469.000	469.000	469.000

Subsection: Time vs. Volume
 Label: UG
 Scenario: ESSEX CO. 10-YR (PROJ)

Return Event: 10 years
 Storm Event: ESSEX CO. 10-YR (PROJ)

Time vs. Volume (ft³)

Output Time increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Volume (ft ³)	Volume (ft ³)	Volume (ft ³)	Volume (ft ³)	Volume (ft ³)
20.250	469.000	469.000	469.000	469.000	469.000
20.500	469.000	468.000	468.000	468.000	468.000
20.750	468.000	468.000	468.000	468.000	468.000
21.000	468.000	468.000	468.000	468.000	468.000
21.250	468.000	468.000	468.000	468.000	468.000
21.500	468.000	468.000	468.000	468.000	468.000
21.750	468.000	468.000	468.000	468.000	468.000
22.000	468.000	467.000	467.000	467.000	467.000
22.250	467.000	467.000	467.000	467.000	467.000
22.500	467.000	467.000	467.000	467.000	467.000
22.750	467.000	467.000	467.000	467.000	467.000
23.000	467.000	467.000	467.000	467.000	467.000
23.250	467.000	467.000	467.000	467.000	467.000
23.500	466.000	466.000	466.000	466.000	466.000
23.750	466.000	466.000	466.000	466.000	466.000
24.000	466.000	(N/A)	(N/A)	(N/A)	(N/A)

Subsection: Time vs. Volume

Return Event: 100 years

Label: UG

Storm Event: ESSEX CO. 100-YR (PROJ)

Scenario: ESSEX CO. 100-YR (PROJ)

Time vs. Volume (ft³)

Output Time increment = 0.050 hours

Time on left represents time for first value in each row.

Time (hours)	Volume (ft³)	Volume (ft³)	Volume (ft³)	Volume (ft³)	Volume (ft³)
0.000	0.000	0.000	0.000	0.000	0.000
0.250	0.000	0.000	0.000	0.000	0.000
0.500	0.000	0.000	1.000	1.000	2.000
0.750	2.000	3.000	3.000	4.000	5.000
1.000	5.000	6.000	7.000	8.000	9.000
1.250	10.000	11.000	12.000	13.000	14.000
1.500	15.000	16.000	17.000	18.000	19.000
1.750	21.000	22.000	23.000	24.000	26.000
2.000	27.000	28.000	30.000	31.000	33.000
2.250	34.000	35.000	37.000	38.000	40.000
2.500	42.000	43.000	45.000	47.000	49.000
2.750	51.000	53.000	54.000	56.000	58.000
3.000	60.000	62.000	64.000	66.000	68.000
3.250	70.000	72.000	74.000	76.000	78.000
3.500	81.000	83.000	85.000	87.000	89.000
3.750	92.000	94.000	96.000	99.000	101.000
4.000	104.000	106.000	108.000	111.000	113.000
4.250	116.000	118.000	121.000	123.000	126.000
4.500	129.000	131.000	134.000	136.000	139.000
4.750	142.000	144.000	147.000	150.000	153.000
5.000	156.000	159.000	161.000	163.000	166.000
5.250	168.000	170.000	173.000	175.000	177.000
5.500	180.000	182.000	185.000	187.000	190.000
5.750	192.000	194.000	197.000	200.000	202.000
6.000	205.000	207.000	210.000	213.000	215.000
6.250	218.000	221.000	224.000	227.000	230.000
6.500	233.000	236.000	239.000	242.000	245.000
6.750	248.000	251.000	254.000	257.000	261.000
7.000	264.000	268.000	271.000	275.000	278.000
7.250	282.000	285.000	289.000	293.000	297.000
7.500	300.000	304.000	308.000	312.000	316.000
7.750	320.000	324.000	328.000	332.000	336.000
8.000	341.000	345.000	349.000	353.000	358.000
8.250	362.000	366.000	370.000	374.000	379.000
8.500	383.000	388.000	392.000	397.000	401.000
8.750	406.000	410.000	415.000	420.000	424.000
9.000	429.000	434.000	439.000	444.000	449.000
9.250	455.000	460.000	465.000	470.000	474.000
9.500	477.000	481.000	483.000	486.000	489.000
9.750	491.000	493.000	495.000	496.000	498.000

Subsection: Time vs. Volume

Return Event: 100 years

Label: UG

Storm Event: ESSEX CO. 100-YR (PROJ)

Scenario: ESSEX CO. 100-YR (PROJ)

Time vs. Volume (ft³)

Output Time increment = 0.050 hours

Time on left represents time for first value in each row.

Time (hours)	Volume (ft³)	Volume (ft³)	Volume (ft³)	Volume (ft³)	Volume (ft³)
10.000	500.000	501.000	502.000	504.000	505.000
10.250	506.000	507.000	508.000	509.000	511.000
10.500	512.000	513.000	514.000	516.000	517.000
10.750	519.000	522.000	524.000	526.000	529.000
11.000	531.000	534.000	537.000	541.000	544.000
11.250	548.000	553.000	557.000	562.000	566.000
11.500	571.000	578.000	586.000	596.000	607.000
11.750	618.000	634.000	653.000	678.000	709.000
12.000	751.000	805.000	868.000	908.000	902.000
12.250	870.000	836.000	807.000	782.000	763.000
12.500	746.000	732.000	717.000	703.000	691.000
12.750	681.000	672.000	664.000	656.000	648.000
13.000	640.000	632.000	625.000	617.000	609.000
13.250	602.000	595.000	589.000	582.000	576.000
13.500	570.000	564.000	559.000	553.000	549.000
13.750	545.000	541.000	538.000	535.000	532.000
14.000	529.000	527.000	525.000	523.000	521.000
14.250	520.000	518.000	517.000	515.000	514.000
14.500	513.000	511.000	510.000	509.000	508.000
14.750	507.000	506.000	505.000	504.000	503.000
15.000	502.000	501.000	500.000	499.000	498.000
15.250	498.000	497.000	496.000	496.000	495.000
15.500	495.000	494.000	494.000	493.000	493.000
15.750	493.000	492.000	492.000	492.000	491.000
16.000	491.000	491.000	490.000	490.000	490.000
16.250	490.000	489.000	489.000	489.000	489.000
16.500	488.000	488.000	488.000	487.000	487.000
16.750	487.000	487.000	486.000	486.000	486.000
17.000	486.000	485.000	485.000	485.000	485.000
17.250	484.000	484.000	484.000	484.000	484.000
17.500	483.000	483.000	483.000	483.000	482.000
17.750	482.000	482.000	482.000	481.000	481.000
18.000	481.000	481.000	480.000	480.000	480.000
18.250	480.000	479.000	479.000	479.000	479.000
18.500	479.000	479.000	479.000	479.000	478.000
18.750	478.000	478.000	478.000	478.000	478.000
19.000	478.000	478.000	478.000	478.000	478.000
19.250	478.000	478.000	477.000	477.000	477.000
19.500	477.000	477.000	477.000	477.000	477.000
19.750	477.000	477.000	477.000	477.000	477.000
20.000	477.000	477.000	477.000	476.000	476.000

Subsection: Time vs. Volume

Return Event: 100 years

Label: UG

Storm Event: ESSEX CO. 100-YR (PROJ)

Scenario: ESSEX CO. 100-YR (PROJ)

Time vs. Volume (ft³)

Output Time increment = 0.050 hours

Time on left represents time for first value in each row.

Time (hours)	Volume (ft ³)	Volume (ft ³)	Volume (ft ³)	Volume (ft ³)	Volume (ft ³)
20.250	476.000	476.000	476.000	476.000	476.000
20.500	476.000	476.000	476.000	476.000	476.000
20.750	476.000	476.000	476.000	476.000	475.000
21.000	475.000	475.000	475.000	475.000	475.000
21.250	475.000	475.000	475.000	475.000	475.000
21.500	475.000	475.000	475.000	475.000	475.000
21.750	474.000	474.000	474.000	474.000	474.000
22.000	474.000	474.000	474.000	474.000	474.000
22.250	474.000	474.000	474.000	474.000	474.000
22.500	474.000	473.000	473.000	473.000	473.000
22.750	473.000	473.000	473.000	473.000	473.000
23.000	473.000	473.000	473.000	473.000	473.000
23.250	473.000	473.000	473.000	472.000	472.000
23.500	472.000	472.000	472.000	472.000	472.000
23.750	472.000	472.000	472.000	472.000	472.000
24.000	472.000	(N/A)	(N/A)	(N/A)	(N/A)

Subsection: Elevation vs. Volume Curve
Label: UG
Scenario: ESSEX CO. 2-YR (PROJ)

Return Event: 2 years
Storm Event: ESSEX CO. 2-YR (PROJ)

Elevation-Volume

Pond Elevation (ft)	Pond Volume (ft ³)
466.00	0.000
466.15	39.950
466.30	87.650
466.45	139.930
466.60	195.560
466.75	253.730
466.90	313.860
467.05	375.470
467.20	438.140
467.35	501.500
467.50	565.210
467.65	628.910
467.80	692.270
467.95	754.940
468.10	816.550
468.25	876.680
468.40	934.850
468.55	990.480
468.70	1,042.770
468.85	1,090.460
469.00	1,130.410
470.00	1,330.410

Subsection: Elevation vs. Volume Curve
 Label: UG
 Scenario: ESSEX CO. 10-YR (PROJ)

Return Event: 10 years
 Storm Event: ESSEX CO. 10-YR (PROJ)

Elevation-Volume

Pond Elevation (ft)	Pond Volume (ft ³)
466.00	0.000
466.15	39.950
466.30	87.650
466.45	139.930
466.60	195.560
466.75	253.730
466.90	313.860
467.05	375.470
467.20	438.140
467.35	501.500
467.50	565.210
467.65	628.910
467.80	692.270
467.95	754.940
468.10	816.550
468.25	876.680
468.40	934.850
468.55	990.480
468.70	1,042.770
468.85	1,090.460
469.00	1,130.410
470.00	1,330.410

Subsection: Elevation vs. Volume Curve
 Label: UG
 Scenario: ESSEX CO. 100-YR (PROJ)

Return Event: 100 years
 Storm Event: ESSEX CO. 100-YR (PROJ)

Elevation-Volume

Pond Elevation (ft)	Pond Volume (ft ³)
466.00	0.000
466.15	39.950
466.30	87.650
466.45	139.930
466.60	195.560
466.75	253.730
466.90	313.860
467.05	375.470
467.20	438.140
467.35	501.500
467.50	565.210
467.65	628.910
467.80	692.270
467.95	754.940
468.10	816.550
468.25	876.680
468.40	934.850
468.55	990.480
468.70	1,042.770
468.85	1,090.460
469.00	1,130.410
470.00	1,330.410

Subsection: Outlet Input Data
 Label: POND-5
 Scenario: ESSEX CO. 2-YR (PROJ)

Return Event: 2 years
 Storm Event: ESSEX CO. 2-YR (PROJ)

Requested Pond Water Surface Elevations	
Minimum (Headwater)	466.00 ft
Increment (Headwater)	0.50 ft
Maximum (Headwater)	470.00 ft

Outlet Connectivity

Structure Type	Outlet ID	Direction	Outfall	E1 (ft)	E2 (ft)
Orifice-Circular	Orifice - 5	Forward	TW	467.25	470.00
Rectangular Weir	Weir - 5	Forward	TW	467.75	470.00
Tailwater Settings	Tailwater			(N/A)	(N/A)

Subsection: Outlet Input Data
 Label: POND-5
 Scenario: ESSEX CO. 2-YR (PROJ)

Return Event: 2 years
 Storm Event: ESSEX CO. 2-YR (PROJ)

Structure ID: Weir - 5	
Structure Type: Rectangular Weir	
Number of Openings	1
Elevation	467.75 ft
Weir Length	0.25 ft
Weir Coefficient	3.00 (ft ^{0.5})/s

Structure ID: Orifice - 5	
Structure Type: Orifice-Circular	
Number of Openings	1
Elevation	467.25 ft
Orifice Diameter	3.0 in
Orifice Coefficient	0.600

Structure ID: TW	
Structure Type: TW Setup, DS Channel	
Tailwater Type	Free Outfall

Convergence Tolerances	
Maximum Iterations	30
Tailwater Tolerance (Minimum)	0.01 ft
Tailwater Tolerance (Maximum)	0.50 ft
Headwater Tolerance (Minimum)	0.01 ft
Headwater Tolerance (Maximum)	0.50 ft
Flow Tolerance (Minimum)	0.001 ft ³ /s
Flow Tolerance (Maximum)	10.000 ft ³ /s

Subsection: Individual Outlet Curves
 Label: POND-5
 Scenario: ESSEX CO. 2-YR (PROJ)

Return Event: 2 years
 Storm Event: ESSEX CO. 2-YR (PROJ)

RATING TABLE FOR ONE OUTLET TYPE
 Structure ID = Weir - 5 (Rectangular Weir)

Upstream ID = (Pond Water Surface)
 Downstream ID = Tailwater (Pond Outfall)

Water Surface Elevation (ft)	Flow (ft ³ /s)	Tailwater Elevation (ft)	Convergence Error (ft)
466.00	0.00	(N/A)	0.00
466.50	0.00	(N/A)	0.00
467.00	0.00	(N/A)	0.00
467.25	0.00	(N/A)	0.00
467.50	0.00	(N/A)	0.00
467.75	0.00	(N/A)	0.00
468.00	0.09	(N/A)	0.00
468.50	0.49	(N/A)	0.00
469.00	1.05	(N/A)	0.00
469.50	1.74	(N/A)	0.00
470.00	2.53	(N/A)	0.00

Computation Messages

HW & TW below
 Inv.El.=467.750
 HW & TW below
 Inv.El.=467.750
 HW & TW below
 Inv.El.=467.750
 HW & TW below
 Inv.El.=467.750
 HW & TW below
 Inv.El.=467.750
 H=.00; Htw=.00;
 Qfree=.00;
 H=.25; Htw=.00;
 Qfree=.09;
 H=.75; Htw=.00;
 Qfree=.49;
 H=1.25; Htw=.00;
 Qfree=1.05;
 H=1.75; Htw=.00;
 Qfree=1.74;
 H=2.25; Htw=.00;
 Qfree=2.53;

Subsection: Individual Outlet Curves
 Label: POND-5
 Scenario: ESSEX CO. 2-YR (PROJ)

Return Event: 2 years
 Storm Event: ESSEX CO. 2-YR (PROJ)

RATING TABLE FOR ONE OUTLET TYPE
 Structure ID = Orifice - 5 (Orifice-Circular)

Upstream ID = (Pond Water Surface)
 Downstream ID = Tailwater (Pond Outfall)

Water Surface Elevation (ft)	Flow (ft ³ /s)	Tailwater Elevation (ft)	Convergence Error (ft)
466.00	0.00	(N/A)	0.00
466.50	0.00	(N/A)	0.00
467.00	0.00	(N/A)	0.00
467.25	0.00	(N/A)	0.00
467.50	0.08	(N/A)	0.00
467.75	0.14	(N/A)	0.00
468.00	0.19	(N/A)	0.00
468.50	0.25	(N/A)	0.00
469.00	0.30	(N/A)	0.00
469.50	0.34	(N/A)	0.00
470.00	0.38	(N/A)	0.00

Computation Messages

HW & TW below invert
 HW & TW below invert
 HW & TW below invert
 Upstream HW &
 DNstream TW < Inv.El
 H =.13
 H =.38
 H =.63
 H =1.13
 H =1.63
 H =2.13
 H =2.63

Subsection: Composite Rating Curve
 Label: POND-5
 Scenario: ESSEX CO. 2-YR (PROJ)

Return Event: 2 years
 Storm Event: ESSEX CO. 2-YR (PROJ)

Composite Outflow Summary

Water Surface Elevation (ft)	Flow (ft ³ /s)	Tailwater Elevation (ft)	Convergence Error (ft)
466.00	0.00	(N/A)	0.00
466.50	0.00	(N/A)	0.00
467.00	0.00	(N/A)	0.00
467.25	0.00	(N/A)	0.00
467.50	0.08	(N/A)	0.00
467.75	0.14	(N/A)	0.00
468.00	0.28	(N/A)	0.00
468.50	0.74	(N/A)	0.00
469.00	1.35	(N/A)	0.00
469.50	2.08	(N/A)	0.00
470.00	2.91	(N/A)	0.00

Contributing Structures

None Contributing
None Contributing
None Contributing
None Contributing
Orifice - 5
Orifice - 5 + Weir - 5
Orifice - 5 + Weir - 5
Orifice - 5 + Weir - 5
Orifice - 5 + Weir - 5
Orifice - 5 + Weir - 5
Orifice - 5 + Weir - 5

Subsection: Outlet Input Data
 Label: POND-5
 Scenario: ESSEX CO. 10-YR (PROJ)

Return Event: 10 years
 Storm Event: ESSEX CO. 10-YR (PROJ)

Requested Pond Water Surface Elevations	
Minimum (Headwater)	466.00 ft
Increment (Headwater)	0.50 ft
Maximum (Headwater)	470.00 ft

Outlet Connectivity

Structure Type	Outlet ID	Direction	Outfall	E1 (ft)	E2 (ft)
Orifice-Circular	Orifice - 5	Forward	TW	467.25	470.00
Rectangular Weir	Weir - 5	Forward	TW	467.75	470.00
Tailwater Settings	Tailwater			(N/A)	(N/A)

Subsection: Outlet Input Data
 Label: POND-5
 Scenario: ESSEX CO. 10-YR (PROJ)

Return Event: 10 years
 Storm Event: ESSEX CO. 10-YR (PROJ)

Structure ID: Weir - 5	
Structure Type: Rectangular Weir	
Number of Openings	1
Elevation	467.75 ft
Weir Length	0.25 ft
Weir Coefficient	3.00 (ft ^{0.5})/s

Structure ID: Orifice - 5	
Structure Type: Orifice-Circular	
Number of Openings	1
Elevation	467.25 ft
Orifice Diameter	3.0 in
Orifice Coefficient	0.600

Structure ID: TW	
Structure Type: TW Setup, DS Channel	
Tailwater Type	Free Outfall

Convergence Tolerances	
Maximum Iterations	30
Tailwater Tolerance (Minimum)	0.01 ft
Tailwater Tolerance (Maximum)	0.50 ft
Headwater Tolerance (Minimum)	0.01 ft
Headwater Tolerance (Maximum)	0.50 ft
Flow Tolerance (Minimum)	0.001 ft ³ /s
Flow Tolerance (Maximum)	10.000 ft ³ /s

Subsection: Individual Outlet Curves
 Label: POND-5
 Scenario: ESSEX CO. 10-YR (PROJ)

Return Event: 10 years
 Storm Event: ESSEX CO. 10-YR (PROJ)

RATING TABLE FOR ONE OUTLET TYPE
 Structure ID = Weir - 5 (Rectangular Weir)

Upstream ID = (Pond Water Surface)
 Downstream ID = Tailwater (Pond Outfall)

Water Surface Elevation (ft)	Flow (ft ³ /s)	Tailwater Elevation (ft)	Convergence Error (ft)
466.00	0.00	(N/A)	0.00
466.50	0.00	(N/A)	0.00
467.00	0.00	(N/A)	0.00
467.25	0.00	(N/A)	0.00
467.50	0.00	(N/A)	0.00
467.75	0.00	(N/A)	0.00
468.00	0.09	(N/A)	0.00
468.50	0.49	(N/A)	0.00
469.00	1.05	(N/A)	0.00
469.50	1.74	(N/A)	0.00
470.00	2.53	(N/A)	0.00

Computation Messages

HW & TW below
 Inv.El.=467.750
 HW & TW below
 Inv.El.=467.750
 HW & TW below
 Inv.El.=467.750
 HW & TW below
 Inv.El.=467.750
 HW & TW below
 Inv.El.=467.750
 H=.00; Htw=.00;
 Qfree=.00;
 H=.25; Htw=.00;
 Qfree=.09;
 H=.75; Htw=.00;
 Qfree=.49;
 H=1.25; Htw=.00;
 Qfree=1.05;
 H=1.75; Htw=.00;
 Qfree=1.74;
 H=2.25; Htw=.00;
 Qfree=2.53;

Subsection: Individual Outlet Curves
 Label: POND-5
 Scenario: ESSEX CO. 10-YR (PROJ)

Return Event: 10 years
 Storm Event: ESSEX CO. 10-YR (PROJ)

RATING TABLE FOR ONE OUTLET TYPE
 Structure ID = Orifice - 5 (Orifice-Circular)

Upstream ID = (Pond Water Surface)
 Downstream ID = Tailwater (Pond Outfall)

Water Surface Elevation (ft)	Flow (ft ³ /s)	Tailwater Elevation (ft)	Convergence Error (ft)
466.00	0.00	(N/A)	0.00
466.50	0.00	(N/A)	0.00
467.00	0.00	(N/A)	0.00
467.25	0.00	(N/A)	0.00
467.50	0.08	(N/A)	0.00
467.75	0.14	(N/A)	0.00
468.00	0.19	(N/A)	0.00
468.50	0.25	(N/A)	0.00
469.00	0.30	(N/A)	0.00
469.50	0.34	(N/A)	0.00
470.00	0.38	(N/A)	0.00

Computation Messages

HW & TW below invert
 HW & TW below invert
 HW & TW below invert
 Upstream HW &
 DNstream TW < Inv.El
 H =.13
 H =.38
 H =.63
 H =1.13
 H =1.63
 H =2.13
 H =2.63

Subsection: Composite Rating Curve
 Label: POND-5
 Scenario: ESSEX CO. 10-YR (PROJ)

Return Event: 10 years
 Storm Event: ESSEX CO. 10-YR (PROJ)

Composite Outflow Summary

Water Surface Elevation (ft)	Flow (ft ³ /s)	Tailwater Elevation (ft)	Convergence Error (ft)
466.00	0.00	(N/A)	0.00
466.50	0.00	(N/A)	0.00
467.00	0.00	(N/A)	0.00
467.25	0.00	(N/A)	0.00
467.50	0.08	(N/A)	0.00
467.75	0.14	(N/A)	0.00
468.00	0.28	(N/A)	0.00
468.50	0.74	(N/A)	0.00
469.00	1.35	(N/A)	0.00
469.50	2.08	(N/A)	0.00
470.00	2.91	(N/A)	0.00

Contributing Structures

None Contributing
None Contributing
None Contributing
None Contributing
Orifice - 5
Orifice - 5 + Weir - 5
Orifice - 5 + Weir - 5
Orifice - 5 + Weir - 5
Orifice - 5 + Weir - 5
Orifice - 5 + Weir - 5
Orifice - 5 + Weir - 5

Subsection: Outlet Input Data
 Label: POND-5
 Scenario: ESSEX CO. 100-YR (PROJ)

Return Event: 100 years
 Storm Event: ESSEX CO. 100-YR (PROJ)

Requested Pond Water Surface Elevations	
Minimum (Headwater)	466.00 ft
Increment (Headwater)	0.50 ft
Maximum (Headwater)	470.00 ft

Outlet Connectivity

Structure Type	Outlet ID	Direction	Outfall	E1 (ft)	E2 (ft)
Orifice-Circular	Orifice - 5	Forward	TW	467.25	470.00
Rectangular Weir	Weir - 5	Forward	TW	467.75	470.00
Tailwater Settings	Tailwater			(N/A)	(N/A)

Subsection: Outlet Input Data
 Label: POND-5
 Scenario: ESSEX CO. 100-YR (PROJ)

Return Event: 100 years
 Storm Event: ESSEX CO. 100-YR (PROJ)

Structure ID: Weir - 5	
Structure Type: Rectangular Weir	
Number of Openings	1
Elevation	467.75 ft
Weir Length	0.25 ft
Weir Coefficient	3.00 (ft ^{0.5})/s

Structure ID: Orifice - 5	
Structure Type: Orifice-Circular	
Number of Openings	1
Elevation	467.25 ft
Orifice Diameter	3.0 in
Orifice Coefficient	0.600

Structure ID: TW	
Structure Type: TW Setup, DS Channel	
Tailwater Type	Free Outfall

Convergence Tolerances	
Maximum Iterations	30
Tailwater Tolerance (Minimum)	0.01 ft
Tailwater Tolerance (Maximum)	0.50 ft
Headwater Tolerance (Minimum)	0.01 ft
Headwater Tolerance (Maximum)	0.50 ft
Flow Tolerance (Minimum)	0.001 ft ³ /s
Flow Tolerance (Maximum)	10.000 ft ³ /s

Subsection: Individual Outlet Curves
 Label: POND-5
 Scenario: ESSEX CO. 100-YR (PROJ)

Return Event: 100 years
 Storm Event: ESSEX CO. 100-YR (PROJ)

RATING TABLE FOR ONE OUTLET TYPE
 Structure ID = Weir - 5 (Rectangular Weir)

Upstream ID = (Pond Water Surface)
 Downstream ID = Tailwater (Pond Outfall)

Water Surface Elevation (ft)	Flow (ft ³ /s)	Tailwater Elevation (ft)	Convergence Error (ft)
466.00	0.00	(N/A)	0.00
466.50	0.00	(N/A)	0.00
467.00	0.00	(N/A)	0.00
467.25	0.00	(N/A)	0.00
467.50	0.00	(N/A)	0.00
467.75	0.00	(N/A)	0.00
468.00	0.09	(N/A)	0.00
468.50	0.49	(N/A)	0.00
469.00	1.05	(N/A)	0.00
469.50	1.74	(N/A)	0.00
470.00	2.53	(N/A)	0.00

Computation Messages

HW & TW below
 Inv.El.=467.750
 HW & TW below
 Inv.El.=467.750
 HW & TW below
 Inv.El.=467.750
 HW & TW below
 Inv.El.=467.750
 HW & TW below
 Inv.El.=467.750
 H=.00; Htw=.00;
 Qfree=.00;
 H=.25; Htw=.00;
 Qfree=.09;
 H=.75; Htw=.00;
 Qfree=.49;
 H=1.25; Htw=.00;
 Qfree=1.05;
 H=1.75; Htw=.00;
 Qfree=1.74;
 H=2.25; Htw=.00;
 Qfree=2.53;

Subsection: Individual Outlet Curves
 Label: POND-5
 Scenario: ESSEX CO. 100-YR (PROJ)

Return Event: 100 years
 Storm Event: ESSEX CO. 100-YR (PROJ)

RATING TABLE FOR ONE OUTLET TYPE
 Structure ID = Orifice - 5 (Orifice-Circular)

Upstream ID = (Pond Water Surface)
 Downstream ID = Tailwater (Pond Outfall)

Water Surface Elevation (ft)	Flow (ft ³ /s)	Tailwater Elevation (ft)	Convergence Error (ft)
466.00	0.00	(N/A)	0.00
466.50	0.00	(N/A)	0.00
467.00	0.00	(N/A)	0.00
467.25	0.00	(N/A)	0.00
467.50	0.08	(N/A)	0.00
467.75	0.14	(N/A)	0.00
468.00	0.19	(N/A)	0.00
468.50	0.25	(N/A)	0.00
469.00	0.30	(N/A)	0.00
469.50	0.34	(N/A)	0.00
470.00	0.38	(N/A)	0.00

Computation Messages

HW & TW below invert
 HW & TW below invert
 HW & TW below invert
 Upstream HW &
 DNstream TW < Inv.El
 H =.13
 H =.38
 H =.63
 H =1.13
 H =1.63
 H =2.13
 H =2.63

Subsection: Composite Rating Curve
 Label: POND-5
 Scenario: ESSEX CO. 100-YR (PROJ)

Return Event: 100 years
 Storm Event: ESSEX CO. 100-YR (PROJ)

Composite Outflow Summary

Water Surface Elevation (ft)	Flow (ft ³ /s)	Tailwater Elevation (ft)	Convergence Error (ft)
466.00	0.00	(N/A)	0.00
466.50	0.00	(N/A)	0.00
467.00	0.00	(N/A)	0.00
467.25	0.00	(N/A)	0.00
467.50	0.08	(N/A)	0.00
467.75	0.14	(N/A)	0.00
468.00	0.28	(N/A)	0.00
468.50	0.74	(N/A)	0.00
469.00	1.35	(N/A)	0.00
469.50	2.08	(N/A)	0.00
470.00	2.91	(N/A)	0.00

Contributing Structures

None Contributing
None Contributing
None Contributing
None Contributing
Orifice - 5
Orifice - 5 + Weir - 5
Orifice - 5 + Weir - 5
Orifice - 5 + Weir - 5
Orifice - 5 + Weir - 5
Orifice - 5 + Weir - 5
Orifice - 5 + Weir - 5

Subsection: Diverted Hydrograph
 Label: Outlet-3
 Scenario: ESSEX CO. 2-YR (PROJ)

Return Event: 2 years
 Storm Event: ESSEX CO. 2-YR (PROJ)

Peak Discharge	0.09 ft ³ /s
Time to Peak	12.300 hours
Hydrograph Volume	583.007 ft ³

HYDROGRAPH ORDINATES (ft³/s)

Output Time Increment = 0.050 hours

Time on left represents time for first value in each row.

Time (hours)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
12.000	0.00	0.00	0.04	0.07	0.09
12.250	0.09	0.09	0.09	0.09	0.08
12.500	0.08	0.08	0.07	0.07	0.07
12.750	0.06	0.06	0.06	0.05	0.05
13.000	0.05	0.04	0.04	0.04	0.04
13.250	0.04	0.03	0.03	0.03	0.03
13.500	0.03	0.03	0.03	0.02	0.02
13.750	0.02	0.02	0.02	0.02	0.02
14.000	0.02	0.02	0.02	0.02	0.02
14.250	0.02	0.02	0.02	0.02	0.02
14.500	0.01	0.01	0.01	0.01	0.01
14.750	0.01	0.01	0.01	0.01	0.01
15.000	0.01	0.01	0.01	0.01	0.01
15.250	0.01	0.01	0.01	0.01	0.01
15.500	0.01	0.01	0.01	0.01	0.01
15.750	0.01	0.01	0.01	0.01	0.01
16.000	0.01	0.01	0.01	0.01	0.01
16.250	0.01	0.01	0.01	0.01	0.01
16.500	0.01	0.01	0.01	0.01	0.01
16.750	0.01	0.01	0.01	0.01	0.01
17.000	0.01	0.01	0.01	0.01	0.01
17.250	0.01	0.01	0.01	0.01	0.01
17.500	0.01	0.01	0.01	0.01	0.01
17.750	0.01	0.01	0.01	0.01	0.01
18.000	0.01	0.01	0.01	0.01	0.01
18.250	0.01	0.01	0.01	0.01	0.01
18.500	0.01	0.01	0.01	0.01	0.01
18.750	0.01	0.01	0.01	0.01	0.01
19.000	0.01	0.01	0.01	0.01	0.01
19.250	0.01	0.01	0.01	0.01	0.01
19.500	0.01	0.01	0.01	0.00	0.00
19.750	0.00	0.00	0.00	0.00	0.00
20.000	0.00	0.00	0.00	0.00	0.00
20.250	0.00	0.00	0.00	0.00	0.00
20.500	0.00	0.00	0.00	0.00	0.00
20.750	0.00	0.00	0.00	0.00	0.00
21.000	0.00	0.00	0.00	0.00	0.00

Subsection: Diverted Hydrograph

Label: Outlet-3

Scenario: ESSEX CO. 2-YR (PROJ)

Return Event: 2 years

Storm Event: ESSEX CO. 2-YR (PROJ)

HYDROGRAPH ORDINATES (ft³/s)

Output Time Increment = 0.050 hours

Time on left represents time for first value in each row.

Time (hours)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
21.250	0.00	0.00	0.00	0.00	0.00
21.500	0.00	0.00	0.00	0.00	0.00
21.750	0.00	0.00	0.00	0.00	0.00
22.000	0.00	0.00	0.00	0.00	0.00
22.250	0.00	0.00	0.00	0.00	0.00
22.500	0.00	0.00	0.00	0.00	0.00
22.750	0.00	0.00	0.00	0.00	0.00
23.000	0.00	0.00	0.00	0.00	0.00
23.250	0.00	0.00	0.00	0.00	0.00
23.500	0.00	0.00	0.00	0.00	0.00
23.750	0.00	0.00	0.00	0.00	0.00
24.000	0.00	(N/A)	(N/A)	(N/A)	(N/A)

Subsection: Diverted Hydrograph
 Label: Outlet-3
 Scenario: ESSEX CO. 10-YR (PROJ)

Return Event: 10 years
 Storm Event: ESSEX CO. 10-YR (PROJ)

Peak Discharge	0.24 ft ³ /s
Time to Peak	12.200 hours
Hydrograph Volume	1,199.034 ft ³

HYDROGRAPH ORDINATES (ft³/s)

Output Time Increment = 0.050 hours

Time on left represents time for first value in each row.

Time (hours)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
11.400	0.00	0.00	0.01	0.02	0.03
11.650	0.03	0.04	0.05	0.06	0.07
11.900	0.08	0.09	0.11	0.13	0.17
12.150	0.22	0.24	0.23	0.21	0.19
12.400	0.18	0.16	0.14	0.14	0.13
12.650	0.13	0.12	0.11	0.11	0.10
12.900	0.10	0.09	0.09	0.08	0.08
13.150	0.07	0.07	0.06	0.06	0.06
13.400	0.05	0.05	0.05	0.05	0.04
13.650	0.04	0.04	0.04	0.04	0.03
13.900	0.03	0.03	0.03	0.03	0.03
14.150	0.03	0.03	0.03	0.03	0.03
14.400	0.02	0.02	0.02	0.02	0.02
14.650	0.02	0.02	0.02	0.02	0.02
14.900	0.02	0.02	0.02	0.02	0.02
15.150	0.02	0.02	0.02	0.02	0.02
15.400	0.02	0.02	0.02	0.02	0.02
15.650	0.01	0.01	0.01	0.01	0.01
15.900	0.01	0.01	0.01	0.01	0.01
16.150	0.01	0.01	0.01	0.01	0.01
16.400	0.01	0.01	0.01	0.01	0.01
16.650	0.01	0.01	0.01	0.01	0.01
16.900	0.01	0.01	0.01	0.01	0.01
17.150	0.01	0.01	0.01	0.01	0.01
17.400	0.01	0.01	0.01	0.01	0.01
17.650	0.01	0.01	0.01	0.01	0.01
17.900	0.01	0.01	0.01	0.01	0.01
18.150	0.01	0.01	0.01	0.01	0.01
18.400	0.01	0.01	0.01	0.01	0.01
18.650	0.01	0.01	0.01	0.01	0.01
18.900	0.01	0.01	0.01	0.01	0.01
19.150	0.01	0.01	0.01	0.01	0.01
19.400	0.01	0.01	0.01	0.01	0.01
19.650	0.01	0.01	0.01	0.01	0.01
19.900	0.01	0.01	0.01	0.01	0.01
20.150	0.01	0.01	0.01	0.01	0.01
20.400	0.01	0.01	0.01	0.01	0.01

Subsection: Diverted Hydrograph
 Label: Outlet-3
 Scenario: ESSEX CO. 10-YR (PROJ)

Return Event: 10 years
 Storm Event: ESSEX CO. 10-YR (PROJ)

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
20.650	0.01	0.01	0.01	0.01	0.01
20.900	0.01	0.01	0.01	0.01	0.01
21.150	0.01	0.01	0.01	0.01	0.01
21.400	0.01	0.01	0.01	0.01	0.01
21.650	0.01	0.01	0.01	0.01	0.01
21.900	0.01	0.01	0.01	0.01	0.01
22.150	0.01	0.01	0.01	0.01	0.01
22.400	0.01	0.01	0.01	0.01	0.01
22.650	0.01	0.01	0.01	0.01	0.01
22.900	0.01	0.01	0.01	0.01	0.01
23.150	0.01	0.01	0.01	0.01	0.01
23.400	0.01	0.01	0.01	0.01	0.01
23.650	0.01	0.01	0.01	0.01	0.01
23.900	0.01	0.01	0.01	(N/A)	(N/A)

Subsection: Diverted Hydrograph
 Label: Outlet-3
 Scenario: ESSEX CO. 100-YR (PROJ)

Return Event: 100 years
 Storm Event: ESSEX CO. 100-YR (PROJ)

Peak Discharge	0.58 ft ³ /s
Time to Peak	12.150 hours
Hydrograph Volume	2,591.869 ft ³

HYDROGRAPH ORDINATES (ft³/s)

Output Time Increment = 0.050 hours

Time on left represents time for first value in each row.

Time (hours)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
9.300	0.00	0.00	0.01	0.01	0.01
9.550	0.02	0.02	0.02	0.02	0.02
9.800	0.03	0.03	0.03	0.03	0.03
10.050	0.03	0.03	0.04	0.04	0.04
10.300	0.04	0.04	0.04	0.04	0.04
10.550	0.04	0.04	0.04	0.05	0.05
10.800	0.05	0.05	0.05	0.05	0.06
11.050	0.06	0.06	0.06	0.07	0.07
11.300	0.07	0.08	0.08	0.08	0.09
11.550	0.09	0.10	0.10	0.11	0.11
11.800	0.12	0.13	0.15	0.19	0.25
12.050	0.35	0.49	0.58	0.57	0.49
12.300	0.42	0.35	0.30	0.26	0.24
12.550	0.22	0.20	0.19	0.17	0.16
12.800	0.15	0.14	0.14	0.13	0.13
13.050	0.12	0.12	0.11	0.11	0.10
13.300	0.10	0.10	0.09	0.09	0.09
13.550	0.08	0.08	0.07	0.07	0.07
13.800	0.06	0.06	0.06	0.06	0.06
14.050	0.05	0.05	0.05	0.05	0.05
14.300	0.05	0.05	0.04	0.04	0.04
14.550	0.04	0.04	0.04	0.04	0.04
14.800	0.04	0.04	0.04	0.03	0.03
15.050	0.03	0.03	0.03	0.03	0.03
15.300	0.03	0.03	0.03	0.03	0.03
15.550	0.03	0.03	0.03	0.03	0.03
15.800	0.03	0.03	0.03	0.03	0.03
16.050	0.02	0.02	0.02	0.02	0.02
16.300	0.02	0.02	0.02	0.02	0.02
16.550	0.02	0.02	0.02	0.02	0.02
16.800	0.02	0.02	0.02	0.02	0.02
17.050	0.02	0.02	0.02	0.02	0.02
17.300	0.02	0.02	0.02	0.02	0.02
17.550	0.02	0.02	0.02	0.02	0.02
17.800	0.02	0.02	0.02	0.02	0.02
18.050	0.02	0.02	0.02	0.02	0.02
18.300	0.02	0.02	0.02	0.02	0.02

Subsection: Diverted Hydrograph
 Label: Outlet-3
 Scenario: ESSEX CO. 100-YR (PROJ)

Return Event: 100 years
 Storm Event: ESSEX CO. 100-YR (PROJ)

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
18.550	0.02	0.02	0.02	0.02	0.02
18.800	0.02	0.01	0.01	0.01	0.01
19.050	0.01	0.01	0.01	0.01	0.01
19.300	0.01	0.01	0.01	0.01	0.01
19.550	0.01	0.01	0.01	0.01	0.01
19.800	0.01	0.01	0.01	0.01	0.01
20.050	0.01	0.01	0.01	0.01	0.01
20.300	0.01	0.01	0.01	0.01	0.01
20.550	0.01	0.01	0.01	0.01	0.01
20.800	0.01	0.01	0.01	0.01	0.01
21.050	0.01	0.01	0.01	0.01	0.01
21.300	0.01	0.01	0.01	0.01	0.01
21.550	0.01	0.01	0.01	0.01	0.01
21.800	0.01	0.01	0.01	0.01	0.01
22.050	0.01	0.01	0.01	0.01	0.01
22.300	0.01	0.01	0.01	0.01	0.01
22.550	0.01	0.01	0.01	0.01	0.01
22.800	0.01	0.01	0.01	0.01	0.01
23.050	0.01	0.01	0.01	0.01	0.01
23.300	0.01	0.01	0.01	0.01	0.01
23.550	0.01	0.01	0.01	0.01	0.01
23.800	0.01	0.01	0.01	0.01	0.01

Subsection: Elevation-Volume-Flow Table (Pond)

Label: UG

Scenario: ESSEX CO. 2-YR (PROJ)

Return Event: 2 years

Storm Event: ESSEX CO. 2-YR (PROJ)

Infiltration	
Infiltration Method (Computed)	Constant
Infiltration Rate (Constant)	0.00 ft ³ /s

Initial Conditions	
Elevation (Water Surface, Initial)	466.00 ft
Volume (Initial)	0.000 ft ³
Flow (Initial Outlet)	0.00 ft ³ /s
Flow (Initial Infiltration)	0.00 ft ³ /s
Flow (Initial, Total)	0.00 ft ³ /s
Time Increment	0.050 hours

Elevation (ft)	Outflow (ft ³ /s)	Storage (ft ³)	Area (ft ²)	Infiltration (ft ³ /s)	Flow (Total) (ft ³ /s)	2S/t + O (ft ³ /s)
466.00	0.00	0.000	0.00	0.00	0.00	0.00
466.50	0.00	158.473	0.00	0.00	0.00	1.76
467.00	0.00	354.933	0.00	0.00	0.00	3.94
467.25	0.00	459.260	0.00	0.00	0.00	5.10
467.50	0.08	565.210	0.00	0.00	0.08	6.36
467.75	0.14	671.150	0.00	0.00	0.14	7.60
468.00	0.28	775.477	0.00	0.00	0.28	8.90
468.50	0.74	971.937	0.00	0.00	0.74	11.54
469.00	1.35	1,130.410	0.00	0.00	1.35	13.91
469.50	2.08	1,230.410	0.00	0.00	2.08	15.75
470.00	2.91	1,330.410	0.00	0.00	2.91	17.70

Subsection: Elevation-Volume-Flow Table (Pond)
 Label: UG
 Scenario: ESSEX CO. 10-YR (PROJ)

Return Event: 10 years
 Storm Event: ESSEX CO. 10-YR (PROJ)

Infiltration	
Infiltration Method (Computed)	Constant
Infiltration Rate (Constant)	0.00 ft ³ /s
Initial Conditions	
Elevation (Water Surface, Initial)	466.00 ft
Volume (Initial)	0.000 ft ³
Flow (Initial Outlet)	0.00 ft ³ /s
Flow (Initial Infiltration)	0.00 ft ³ /s
Flow (Initial, Total)	0.00 ft ³ /s
Time Increment	0.050 hours

Elevation (ft)	Outflow (ft ³ /s)	Storage (ft ³)	Area (ft ²)	Infiltration (ft ³ /s)	Flow (Total) (ft ³ /s)	2S/t + O (ft ³ /s)
466.00	0.00	0.000	0.00	0.00	0.00	0.00
466.50	0.00	158.473	0.00	0.00	0.00	1.76
467.00	0.00	354.933	0.00	0.00	0.00	3.94
467.25	0.00	459.260	0.00	0.00	0.00	5.10
467.50	0.08	565.210	0.00	0.00	0.08	6.36
467.75	0.14	671.150	0.00	0.00	0.14	7.60
468.00	0.28	775.477	0.00	0.00	0.28	8.90
468.50	0.74	971.937	0.00	0.00	0.74	11.54
469.00	1.35	1,130.410	0.00	0.00	1.35	13.91
469.50	2.08	1,230.410	0.00	0.00	2.08	15.75
470.00	2.91	1,330.410	0.00	0.00	2.91	17.70

Subsection: Elevation-Volume-Flow Table (Pond)
 Label: UG
 Scenario: ESSEX CO. 100-YR (PROJ)

Return Event: 100 years
 Storm Event: ESSEX CO. 100-YR (PROJ)

Infiltration	
Infiltration Method (Computed)	Constant
Infiltration Rate (Constant)	0.00 ft ³ /s

Initial Conditions	
Elevation (Water Surface, Initial)	466.00 ft
Volume (Initial)	0.000 ft ³
Flow (Initial Outlet)	0.00 ft ³ /s
Flow (Initial Infiltration)	0.00 ft ³ /s
Flow (Initial, Total)	0.00 ft ³ /s
Time Increment	0.050 hours

Elevation (ft)	Outflow (ft ³ /s)	Storage (ft ³)	Area (ft ²)	Infiltration (ft ³ /s)	Flow (Total) (ft ³ /s)	2S/t + O (ft ³ /s)
466.00	0.00	0.000	0.00	0.00	0.00	0.00
466.50	0.00	158.473	0.00	0.00	0.00	1.76
467.00	0.00	354.933	0.00	0.00	0.00	3.94
467.25	0.00	459.260	0.00	0.00	0.00	5.10
467.50	0.08	565.210	0.00	0.00	0.08	6.36
467.75	0.14	671.150	0.00	0.00	0.14	7.60
468.00	0.28	775.477	0.00	0.00	0.28	8.90
468.50	0.74	971.937	0.00	0.00	0.74	11.54
469.00	1.35	1,130.410	0.00	0.00	1.35	13.91
469.50	2.08	1,230.410	0.00	0.00	2.08	15.75
470.00	2.91	1,330.410	0.00	0.00	2.91	17.70

Subsection: Level Pool Pond Routing Summary
 Label: UG (IN)
 Scenario: ESSEX CO. 2-YR (PROJ)

Return Event: 2 years
 Storm Event: ESSEX CO. 2-YR (PROJ)

Infiltration			
Infiltration Method (Computed)	Constant		
Infiltration Rate (Constant)	0.00 ft ³ /s		
Initial Conditions			
Elevation (Water Surface, Initial)	466.00 ft		
Volume (Initial)	0.000 ft ³		
Flow (Initial Outlet)	0.00 ft ³ /s		
Flow (Initial Infiltration)	0.00 ft ³ /s		
Flow (Initial, Total)	0.00 ft ³ /s		
Time Increment	0.050 hours		
Inflow/Outflow Hydrograph Summary			
Flow (Peak In)	0.30 ft ³ /s	Time to Peak (Flow, In)	12.100 hours
Infiltration (Peak)	0.00 ft ³ /s	Time to Peak (Infiltration)	9.950 hours
Flow (Peak Outlet)	0.09 ft ³ /s	Time to Peak (Flow, Outlet)	12.300 hours
<hr/>			
Elevation (Water Surface, Peak)	467.53 ft		
Volume (Peak)	575.898 ft ³		
Mass Balance (ft ³)			
Volume (Initial)	0.000 ft ³		
Volume (Total Inflow)	1,047.000 ft ³		
Volume (Total Infiltration)	1.000 ft ³		
Volume (Total Outlet Outflow)	583.000 ft ³		
Volume (Retained)	463.000 ft ³		
Volume (Unrouted)	-1.000 ft ³		
Error (Mass Balance)	0.1 %		

Subsection: Level Pool Pond Routing Summary
 Label: UG (IN)
 Scenario: ESSEX CO. 10-YR (PROJ)

Return Event: 10 years
 Storm Event: ESSEX CO. 10-YR (PROJ)

Infiltration	
Infiltration Method (Computed)	Constant
Infiltration Rate (Constant)	0.00 ft ³ /s

Initial Conditions	
Elevation (Water Surface, Initial)	466.00 ft
Volume (Initial)	0.000 ft ³
Flow (Initial Outlet)	0.00 ft ³ /s
Flow (Initial Infiltration)	0.00 ft ³ /s
Flow (Initial, Total)	0.00 ft ³ /s
Time Increment	0.050 hours

Inflow/Outflow Hydrograph Summary			
Flow (Peak In)	0.47 ft ³ /s	Time to Peak (Flow, In)	12.100 hours
Infiltration (Peak)	0.00 ft ³ /s	Time to Peak (Infiltration)	7.850 hours
Flow (Peak Outlet)	0.24 ft ³ /s	Time to Peak (Flow, Outlet)	12.200 hours

Elevation (Water Surface, Peak)	467.92 ft
Volume (Peak)	743.336 ft ³

Mass Balance (ft ³)	
Volume (Initial)	0.000 ft ³
Volume (Total Inflow)	1,666.000 ft ³
Volume (Total Infiltration)	1.000 ft ³
Volume (Total Outlet Outflow)	1,199.000 ft ³
Volume (Retained)	465.000 ft ³
Volume (Unrouted)	-1.000 ft ³
Error (Mass Balance)	0.1 %

Subsection: Level Pool Pond Routing Summary
 Label: UG (IN)
 Scenario: ESSEX CO. 100-YR (PROJ)

Return Event: 100 years
 Storm Event: ESSEX CO. 100-YR (PROJ)

Infiltration	
Infiltration Method (Computed)	Constant
Infiltration Rate (Constant)	0.00 ft ³ /s

Initial Conditions	
Elevation (Water Surface, Initial)	466.00 ft
Volume (Initial)	0.000 ft ³
Flow (Initial Outlet)	0.00 ft ³ /s
Flow (Initial Infiltration)	0.00 ft ³ /s
Flow (Initial, Total)	0.00 ft ³ /s
Time Increment	0.050 hours

Inflow/Outflow Hydrograph Summary			
Flow (Peak In)	0.85 ft ³ /s	Time to Peak (Flow, In)	12.100 hours
Infiltration (Peak)	0.00 ft ³ /s	Time to Peak (Infiltration)	5.050 hours
Flow (Peak Outlet)	0.58 ft ³ /s	Time to Peak (Flow, Outlet)	12.150 hours

Elevation (Water Surface, Peak)	468.33 ft
Volume (Peak)	908.387 ft ³

Mass Balance (ft ³)	
Volume (Initial)	0.000 ft ³
Volume (Total Inflow)	3,065.000 ft ³
Volume (Total Infiltration)	1.000 ft ³
Volume (Total Outlet Outflow)	2,592.000 ft ³
Volume (Retained)	470.000 ft ³
Volume (Unrouted)	-2.000 ft ³
Error (Mass Balance)	0.1 %

Subsection: Pond Infiltration Hydrograph
 Label: UG (INF)
 Scenario: ESSEX CO. 2-YR (PROJ)

Return Event: 2 years
 Storm Event: ESSEX CO. 2-YR (PROJ)

Peak Discharge	0.00 ft ³ /s
Time to Peak	14.650 hours
Hydrograph Volume	0.000 ft ³

HYDROGRAPH ORDINATES (ft³/s)

Output Time Increment = 0.050 hours

Time on left represents time for first value in each row.

Time (hours)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
0.000	0.00	0.00	(N/A)	(N/A)	(N/A)

Subsection: Pond Infiltration Hydrograph
 Label: UG (INF)
 Scenario: ESSEX CO. 10-YR (PROJ)

Return Event: 10 years
 Storm Event: ESSEX CO. 10-YR (PROJ)

Peak Discharge	0.00 ft ³ /s
Time to Peak	13.200 hours
Hydrograph Volume	0.000 ft ³

HYDROGRAPH ORDINATES (ft³/s)

Output Time Increment = 0.050 hours

Time on left represents time for first value in each row.

Time (hours)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
0.000	0.00	0.00	(N/A)	(N/A)	(N/A)

Subsection: Pond Infiltration Hydrograph
 Label: UG (INF)
 Scenario: ESSEX CO. 100-YR (PROJ)

Return Event: 100 years
 Storm Event: ESSEX CO. 100-YR (PROJ)

Peak Discharge	0.00 ft ³ /s
Time to Peak	11.350 hours
Hydrograph Volume	0.000 ft ³

HYDROGRAPH ORDINATES (ft³/s)

Output Time Increment = 0.050 hours

Time on left represents time for first value in each row.

Time (hours)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
0.000	0.00	0.00	(N/A)	(N/A)	(N/A)

Subsection: Pond Routed Hydrograph (total out)
 Label: UG (OUT)
 Scenario: ESSEX CO. 2-YR (PROJ)

Return Event: 2 years
 Storm Event: ESSEX CO. 2-YR (PROJ)

Peak Discharge	0.09 ft ³ /s
Time to Peak	12.300 hours
Hydrograph Volume	583.007 ft ³

HYDROGRAPH ORDINATES (ft³/s)

Output Time Increment = 0.050 hours

Time on left represents time for first value in each row.

Time (hours)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
12.000	0.00	0.00	0.04	0.07	0.09
12.250	0.09	0.09	0.09	0.09	0.08
12.500	0.08	0.08	0.07	0.07	0.07
12.750	0.06	0.06	0.06	0.05	0.05
13.000	0.05	0.04	0.04	0.04	0.04
13.250	0.04	0.03	0.03	0.03	0.03
13.500	0.03	0.03	0.03	0.02	0.02
13.750	0.02	0.02	0.02	0.02	0.02
14.000	0.02	0.02	0.02	0.02	0.02
14.250	0.02	0.02	0.02	0.02	0.02
14.500	0.01	0.01	0.01	0.01	0.01
14.750	0.01	0.01	0.01	0.01	0.01
15.000	0.01	0.01	0.01	0.01	0.01
15.250	0.01	0.01	0.01	0.01	0.01
15.500	0.01	0.01	0.01	0.01	0.01
15.750	0.01	0.01	0.01	0.01	0.01
16.000	0.01	0.01	0.01	0.01	0.01
16.250	0.01	0.01	0.01	0.01	0.01
16.500	0.01	0.01	0.01	0.01	0.01
16.750	0.01	0.01	0.01	0.01	0.01
17.000	0.01	0.01	0.01	0.01	0.01
17.250	0.01	0.01	0.01	0.01	0.01
17.500	0.01	0.01	0.01	0.01	0.01
17.750	0.01	0.01	0.01	0.01	0.01
18.000	0.01	0.01	0.01	0.01	0.01
18.250	0.01	0.01	0.01	0.01	0.01
18.500	0.01	0.01	0.01	0.01	0.01
18.750	0.01	0.01	0.01	0.01	0.01
19.000	0.01	0.01	0.01	0.01	0.01
19.250	0.01	0.01	0.01	0.01	0.01
19.500	0.01	0.01	0.01	0.00	0.00
19.750	0.00	0.00	0.00	0.00	0.00
20.000	0.00	0.00	0.00	0.00	0.00
20.250	0.00	0.00	0.00	0.00	0.00
20.500	0.00	0.00	0.00	0.00	0.00
20.750	0.00	0.00	0.00	0.00	0.00
21.000	0.00	0.00	0.00	0.00	0.00

Subsection: Pond Routed Hydrograph (total out)

Label: UG (OUT)

Scenario: ESSEX CO. 2-YR (PROJ)

Return Event: 2 years

Storm Event: ESSEX CO. 2-YR (PROJ)

HYDROGRAPH ORDINATES (ft³/s)

Output Time Increment = 0.050 hours

Time on left represents time for first value in each row.

Time (hours)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
21.250	0.00	0.00	0.00	0.00	0.00
21.500	0.00	0.00	0.00	0.00	0.00
21.750	0.00	0.00	0.00	0.00	0.00
22.000	0.00	0.00	0.00	0.00	0.00
22.250	0.00	0.00	0.00	0.00	0.00
22.500	0.00	0.00	0.00	0.00	0.00
22.750	0.00	0.00	0.00	0.00	0.00
23.000	0.00	0.00	0.00	0.00	0.00
23.250	0.00	0.00	0.00	0.00	0.00
23.500	0.00	0.00	0.00	0.00	0.00
23.750	0.00	0.00	0.00	0.00	0.00
24.000	0.00	(N/A)	(N/A)	(N/A)	(N/A)

Subsection: Pond Routed Hydrograph (total out)
 Label: UG (OUT)
 Scenario: ESSEX CO. 10-YR (PROJ)

Return Event: 10 years
 Storm Event: ESSEX CO. 10-YR (PROJ)

Peak Discharge	0.24 ft ³ /s
Time to Peak	12.200 hours
Hydrograph Volume	1,199.034 ft ³

HYDROGRAPH ORDINATES (ft³/s)

Output Time Increment = 0.050 hours

Time on left represents time for first value in each row.

Time (hours)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
11.400	0.00	0.00	0.01	0.02	0.03
11.650	0.03	0.04	0.05	0.06	0.07
11.900	0.08	0.09	0.11	0.13	0.17
12.150	0.22	0.24	0.23	0.21	0.19
12.400	0.18	0.16	0.14	0.14	0.13
12.650	0.13	0.12	0.11	0.11	0.10
12.900	0.10	0.09	0.09	0.08	0.08
13.150	0.07	0.07	0.06	0.06	0.06
13.400	0.05	0.05	0.05	0.05	0.04
13.650	0.04	0.04	0.04	0.04	0.03
13.900	0.03	0.03	0.03	0.03	0.03
14.150	0.03	0.03	0.03	0.03	0.03
14.400	0.02	0.02	0.02	0.02	0.02
14.650	0.02	0.02	0.02	0.02	0.02
14.900	0.02	0.02	0.02	0.02	0.02
15.150	0.02	0.02	0.02	0.02	0.02
15.400	0.02	0.02	0.02	0.02	0.02
15.650	0.01	0.01	0.01	0.01	0.01
15.900	0.01	0.01	0.01	0.01	0.01
16.150	0.01	0.01	0.01	0.01	0.01
16.400	0.01	0.01	0.01	0.01	0.01
16.650	0.01	0.01	0.01	0.01	0.01
16.900	0.01	0.01	0.01	0.01	0.01
17.150	0.01	0.01	0.01	0.01	0.01
17.400	0.01	0.01	0.01	0.01	0.01
17.650	0.01	0.01	0.01	0.01	0.01
17.900	0.01	0.01	0.01	0.01	0.01
18.150	0.01	0.01	0.01	0.01	0.01
18.400	0.01	0.01	0.01	0.01	0.01
18.650	0.01	0.01	0.01	0.01	0.01
18.900	0.01	0.01	0.01	0.01	0.01
19.150	0.01	0.01	0.01	0.01	0.01
19.400	0.01	0.01	0.01	0.01	0.01
19.650	0.01	0.01	0.01	0.01	0.01
19.900	0.01	0.01	0.01	0.01	0.01
20.150	0.01	0.01	0.01	0.01	0.01
20.400	0.01	0.01	0.01	0.01	0.01

Subsection: Pond Routed Hydrograph (total out)
 Label: UG (OUT)
 Scenario: ESSEX CO. 10-YR (PROJ)

Return Event: 10 years
 Storm Event: ESSEX CO. 10-YR (PROJ)

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
20.650	0.01	0.01	0.01	0.01	0.01
20.900	0.01	0.01	0.01	0.01	0.01
21.150	0.01	0.01	0.01	0.01	0.01
21.400	0.01	0.01	0.01	0.01	0.01
21.650	0.01	0.01	0.01	0.01	0.01
21.900	0.01	0.01	0.01	0.01	0.01
22.150	0.01	0.01	0.01	0.01	0.01
22.400	0.01	0.01	0.01	0.01	0.01
22.650	0.01	0.01	0.01	0.01	0.01
22.900	0.01	0.01	0.01	0.01	0.01
23.150	0.01	0.01	0.01	0.01	0.01
23.400	0.01	0.01	0.01	0.01	0.01
23.650	0.01	0.01	0.01	0.01	0.01
23.900	0.01	0.01	0.01	(N/A)	(N/A)

Subsection: Pond Routed Hydrograph (total out)
 Label: UG (OUT)
 Scenario: ESSEX CO. 100-YR (PROJ)

Return Event: 100 years
 Storm Event: ESSEX CO. 100-YR (PROJ)

Peak Discharge	0.58 ft ³ /s
Time to Peak	12.150 hours
Hydrograph Volume	2,591.869 ft ³

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
9.300	0.00	0.00	0.01	0.01	0.01
9.550	0.02	0.02	0.02	0.02	0.02
9.800	0.03	0.03	0.03	0.03	0.03
10.050	0.03	0.03	0.04	0.04	0.04
10.300	0.04	0.04	0.04	0.04	0.04
10.550	0.04	0.04	0.04	0.05	0.05
10.800	0.05	0.05	0.05	0.05	0.06
11.050	0.06	0.06	0.06	0.07	0.07
11.300	0.07	0.08	0.08	0.08	0.09
11.550	0.09	0.10	0.10	0.11	0.11
11.800	0.12	0.13	0.15	0.19	0.25
12.050	0.35	0.49	0.58	0.57	0.49
12.300	0.42	0.35	0.30	0.26	0.24
12.550	0.22	0.20	0.19	0.17	0.16
12.800	0.15	0.14	0.14	0.13	0.13
13.050	0.12	0.12	0.11	0.11	0.10
13.300	0.10	0.10	0.09	0.09	0.09
13.550	0.08	0.08	0.07	0.07	0.07
13.800	0.06	0.06	0.06	0.06	0.06
14.050	0.05	0.05	0.05	0.05	0.05
14.300	0.05	0.05	0.04	0.04	0.04
14.550	0.04	0.04	0.04	0.04	0.04
14.800	0.04	0.04	0.04	0.03	0.03
15.050	0.03	0.03	0.03	0.03	0.03
15.300	0.03	0.03	0.03	0.03	0.03
15.550	0.03	0.03	0.03	0.03	0.03
15.800	0.03	0.03	0.03	0.03	0.03
16.050	0.02	0.02	0.02	0.02	0.02
16.300	0.02	0.02	0.02	0.02	0.02
16.550	0.02	0.02	0.02	0.02	0.02
16.800	0.02	0.02	0.02	0.02	0.02
17.050	0.02	0.02	0.02	0.02	0.02
17.300	0.02	0.02	0.02	0.02	0.02
17.550	0.02	0.02	0.02	0.02	0.02
17.800	0.02	0.02	0.02	0.02	0.02
18.050	0.02	0.02	0.02	0.02	0.02
18.300	0.02	0.02	0.02	0.02	0.02

Subsection: Pond Routed Hydrograph (total out)
 Label: UG (OUT)
 Scenario: ESSEX CO. 100-YR (PROJ)

Return Event: 100 years
 Storm Event: ESSEX CO. 100-YR (PROJ)

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
18.550	0.02	0.02	0.02	0.02	0.02
18.800	0.02	0.01	0.01	0.01	0.01
19.050	0.01	0.01	0.01	0.01	0.01
19.300	0.01	0.01	0.01	0.01	0.01
19.550	0.01	0.01	0.01	0.01	0.01
19.800	0.01	0.01	0.01	0.01	0.01
20.050	0.01	0.01	0.01	0.01	0.01
20.300	0.01	0.01	0.01	0.01	0.01
20.550	0.01	0.01	0.01	0.01	0.01
20.800	0.01	0.01	0.01	0.01	0.01
21.050	0.01	0.01	0.01	0.01	0.01
21.300	0.01	0.01	0.01	0.01	0.01
21.550	0.01	0.01	0.01	0.01	0.01
21.800	0.01	0.01	0.01	0.01	0.01
22.050	0.01	0.01	0.01	0.01	0.01
22.300	0.01	0.01	0.01	0.01	0.01
22.550	0.01	0.01	0.01	0.01	0.01
22.800	0.01	0.01	0.01	0.01	0.01
23.050	0.01	0.01	0.01	0.01	0.01
23.300	0.01	0.01	0.01	0.01	0.01
23.550	0.01	0.01	0.01	0.01	0.01
23.800	0.01	0.01	0.01	0.01	0.01

Subsection: Pond Inflow Summary
 Label: UG (IN)
 Scenario: ESSEX CO. 2-YR (PROJ)

Return Event: 2 years
 Storm Event: ESSEX CO. 2-YR (PROJ)

Summary for Hydrograph Addition at 'UG'

Upstream Link	Upstream Node
<Catchment to Outflow Node>	IMP- POI-2

Node Inflows

Inflow Type	Element	Volume (ft ³)	Time to Peak (hours)	Flow (Peak) (ft ³ /s)
Flow (From)	IMP- POI-2	1,047.398	12.100	0.30
Flow (In)	UG	1,047.398	12.100	0.30

Subsection: Pond Inflow Summary
Label: UG (IN)
Scenario: ESSEX CO. 10-YR (PROJ)

Return Event: 10 years
Storm Event: ESSEX CO. 10-YR (PROJ)

Summary for Hydrograph Addition at 'UG'

Upstream Link	Upstream Node
<Catchment to Outflow Node>	IMP- POI-2

Node Inflows

Inflow Type	Element	Volume (ft ³)	Time to Peak (hours)	Flow (Peak) (ft ³ /s)
Flow (From)	IMP- POI-2	1,665.987	12.100	0.47
Flow (In)	UG	1,665.987	12.100	0.47

Subsection: Pond Inflow Summary
 Label: UG (IN)
 Scenario: ESSEX CO. 100-YR (PROJ)

Return Event: 100 years
 Storm Event: ESSEX CO. 100-YR (PROJ)

Summary for Hydrograph Addition at 'UG'

Upstream Link	Upstream Node
<Catchment to Outflow Node>	IMP- POI-2

Node Inflows

Inflow Type	Element	Volume (ft ³)	Time to Peak (hours)	Flow (Peak) (ft ³ /s)
Flow (From)	IMP- POI-2	3,064.573	12.100	0.85
Flow (In)	UG	3,064.573	12.100	0.85

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UNDERGROUND STONE STORAGE SYSTEM STAGE STORAGE TABLE



Pipe Manifold Description
 Pipe Diameter = 3 ft.
 Basin Bottom/Pipe Invert = 466.0 ft.
 Length of Pipe = 45.0 ft.
 # of Pipes = 3
 Width of Stone Between Pipes = 1.00 ft.
 Depth of Stone Above Pipes = 1.0 ft.
 Void Ratio = 0.40

Depth Above Invert	Elevation	Cross-Section Area of Pipe(s)	Volume in Pipe	Volume in Stone	Incremental Storage Volume	Total Storage Volume
(FT)	(FT)	(SF)	(CF)	(CF)	(CF)	(CF)
0.00	466.00	0.00	0.00	0.00	0.00	0.00
0.15	466.15	0.40	17.91	25.24	43.14	43.14
0.30	466.30	1.11	49.76	44.89	51.51	94.66
0.45	466.45	2.00	89.88	61.25	56.47	151.13
0.60	466.60	3.02	136.01	75.20	60.08	211.21
0.75	466.75	4.15	186.72	87.31	62.83	274.03
0.90	466.90	5.35	240.95	98.02	64.94	338.97
1.05	467.05	6.62	297.85	107.66	66.54	405.51
1.20	467.20	7.93	356.66	116.54	67.69	473.19
1.35	467.35	9.26	416.71	124.92	68.43	541.62
1.50	467.50	10.61	477.37	133.05	68.80	610.42
1.65	467.65	11.96	538.04	141.19	68.80	679.22
1.80	467.80	13.29	598.09	149.57	68.43	747.65
1.95	467.95	14.60	656.90	158.44	67.69	815.34
2.10	468.10	15.86	713.79	168.08	66.54	881.87
2.25	468.25	17.07	768.02	178.79	64.94	946.81
2.40	468.40	18.19	818.73	190.91	62.83	1009.64
2.55	468.55	19.22	864.86	204.86	60.08	1069.72
2.70	468.70	20.11	904.98	221.21	56.47	1126.19
2.85	468.85	20.82	936.84	240.87	51.51	1177.70
3.00	469.00	21.22	954.74	266.10	43.14	1220.85
4.00	470.00	21.22	954.74	482.10	216.00	1436.85

Appendix - E:

**NEW JERSEY STORM WATER MANAGEMENT
WATER QUALITY FOR MANUFACTURED
TREATMENT DEVICE**

Project Summary

Title	Kimberly Academy - NJDEP-WQ
Engineer	DP
Company	VNH/Pennoni
Date	8/31/2023

Notes

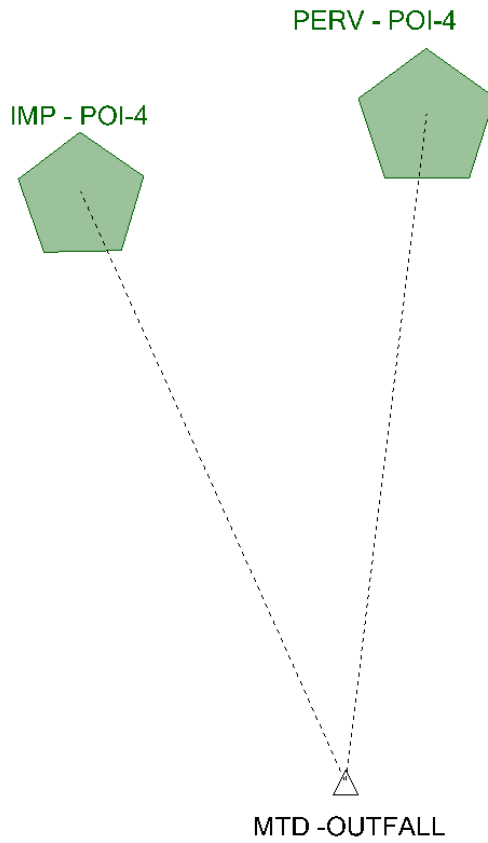


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Subsection: User Notifications

User Notifications

Message Id	7
Scenario	NJDEP-WQ
Element Type	Catchment
Element Id	363
Label	PERV - POI-4
Time	(N/A)
Message	The difference between calculated peak flow and interpolated peak flow 2.9 % is greater than 1.5 %. Computed peak flow= 0.39 ft ³ /s Interp. peak flow= 0.38 ft ³ /s. Output increment for this catchment may be too large.
Source	Warning

Subsection: Master Network Summary

Catchments Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ft ³)	Time to Peak (hours)	Peak Flow (ft ³ /s)
IMP - POI-4	NJDEP-WQ	1	2,171.000	1.100	1.68
PERV - POI-4	NJDEP-WQ	1	448.000	1.100	0.38

Node Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ft ³)	Time to Peak (hours)	Peak Flow (ft ³ /s)
MTD -OUTFALL	NJDEP-WQ	1	2,619.000	1.100	2.06

Subsection: Time-Depth Curve
 Label: NJDEP: WQ-STORM
 Scenario: NJDEP-WQ

Return Event: 1 years
 Storm Event: NJ WQ DISTRIBUTION

Time-Depth Curve: NJ WQ DISTRIBUTION	
Label	NJ WQ DISTRIBUTION
Start Time	0.000 hours
Increment	0.083 hours
End Time	2.000 hours
Return Event	1 years

CUMULATIVE RAINFALL (in)
Output Time Increment = 0.083 hours
Time on left represents time for first value in each row.

Time (hours)	Depth (in)	Depth (in)	Depth (in)	Depth (in)	Depth (in)
0.000	0.0	0.0	0.0	0.0	0.1
0.417	0.1	0.1	0.2	0.2	0.2
0.833	0.3	0.4	0.8	1.1	1.2
1.250	1.3	1.3	1.3	1.4	1.4
1.667	1.4	1.5	1.5	1.5	1.5

Subsection: Time of Concentration Calculations
 Label: IMP - POI-4
 Scenario: NJDEP-WQ

Return Event: 1 years
 Storm Event: NJ WQ DISTRIBUTION

Time of Concentration Results

Segment #1: TR-55 Sheet Flow	
Hydraulic Length	100.00 ft
Manning's n	0.011
Slope	0.100 ft/ft
2 Year 24 Hour Depth	3.4 in
Average Velocity	2.71 ft/s
Segment Time of Concentration	0.010 hours
Segment #2: TR-55 Shallow Concentrated Flow	
Hydraulic Length	377.00 ft
Is Paved?	True
Slope	0.100 ft/ft
Average Velocity	6.43 ft/s
Segment Time of Concentration	0.016 hours
Segment #3: TR-55 Channel Flow	
Flow Area	7.1 ft ²
Hydraulic Length	83.00 ft
Manning's n	0.013
Slope	0.050 ft/ft
Wetted Perimeter	9.42 ft
Average Velocity	21.17 ft/s
Segment Time of Concentration	0.001 hours
Time of Concentration (Composite)	
Time of Concentration (Composite)	0.083 hours

Subsection: Time of Concentration Calculations
Label: IMP - POI-4
Scenario: NJDEP-WQ

Return Event: 1 years
Storm Event: NJ WQ DISTRIBUTION

==== SCS Channel Flow

$$T_c = \frac{R = Q_a / W_p}{V = (1.49 * (R^{2/3}) * (S_f^{0.5})) / n}$$

Where: $(L_f / V) / 3600$
R= Hydraulic radius
Aq= Flow area, square feet
Wp= Wetted perimeter, feet
V= Velocity, ft/sec
Sf= Slope, ft/ft
n= Manning's n
Tc= Time of concentration, hours
Lf= Flow length, feet

==== SCS TR-55 Shallow Concentration Flow

$$T_c = \frac{\text{Unpaved surface:}}{V = 16.1345 * (S_f^{0.5})}$$

$$\text{Paved Surface:}$$
$$V = 20.3282 * (S_f^{0.5})$$

Where: $(L_f / V) / 3600$
V= Velocity, ft/sec
Sf= Slope, ft/ft
Tc= Time of concentration, hours
Lf= Flow length, feet

==== SCS TR-55 Sheet Flow

$$T_c = \frac{(0.007 * ((n * L_f)^{0.8}))}{((P^{0.5}) * (S_f^{0.4}))}$$

Where: Tc= Time of concentration, hours
n= Manning's n
Lf= Flow length, feet
P= 2yr, 24hr Rain depth, inches
Sf= Slope, %

Subsection: Time of Concentration Calculations
 Label: PERV - POI-4
 Scenario: NJDEP-WQ

Return Event: 1 years
 Storm Event: NJ WQ DISTRIBUTION

Time of Concentration Results

Segment #1: TR-55 Sheet Flow	
Hydraulic Length	100.00 ft
Manning's n	0.011
Slope	0.100 ft/ft
2 Year 24 Hour Depth	3.4 in
Average Velocity	2.70 ft/s
Segment Time of Concentration	0.010 hours
Segment #2: TR-55 Shallow Concentrated Flow	
Hydraulic Length	377.00 ft
Is Paved?	False
Slope	0.100 ft/ft
Average Velocity	5.10 ft/s
Segment Time of Concentration	0.021 hours
Segment #3: TR-55 Channel Flow	
Flow Area	7.1 ft ²
Hydraulic Length	83.00 ft
Manning's n	0.013
Slope	0.050 ft/ft
Wetted Perimeter	9.42 ft
Average Velocity	21.23 ft/s
Segment Time of Concentration	0.001 hours
Time of Concentration (Composite)	
Time of Concentration (Composite)	0.083 hours

Subsection: Time of Concentration Calculations
Label: PERV - POI-4
Scenario: NJDEP-WQ

Return Event: 1 years
Storm Event: NJ WQ DISTRIBUTION

==== SCS Channel Flow

Tc = $R = Qa / Wp$
 $V = (1.49 * (R^{2/3}) * (Sf^{0.5})) / n$

(Lf / V) / 3600

Where: R= Hydraulic radius
Aq= Flow area, square feet
Wp= Wetted perimeter, feet
V= Velocity, ft/sec
Sf= Slope, ft/ft
n= Manning's n
Tc= Time of concentration, hours
Lf= Flow length, feet

==== SCS TR-55 Shallow Concentration Flow

Tc = Unpaved surface:
 $V = 16.1345 * (Sf^{0.5})$

Paved Surface:
 $V = 20.3282 * (Sf^{0.5})$

(Lf / V) / 3600

Where: V= Velocity, ft/sec
Sf= Slope, ft/ft
Tc= Time of concentration, hours
Lf= Flow length, feet

==== SCS TR-55 Sheet Flow

Tc = $(0.007 * ((n * Lf)^{0.8}) / ((P^{0.5}) * (Sf^{0.4}))$

Where: Tc= Time of concentration, hours
n= Manning's n
Lf= Flow length, feet
P= 2yr, 24hr Rain depth, inches
Sf= Slope, %

Subsection: Unit Hydrograph Equations

Unit Hydrograph Method (Computational Notes)

Definition of Terms

At	Total area (acres): $At = Ai + Ap$
Ai	Impervious area (acres)
Ap	Pervious area (acres)
CNi	Runoff curve number for impervious area
CNp	Runoff curve number for pervious area
fLoss	f loss constant infiltration (depth/time)
gKs	Saturated Hydraulic Conductivity (depth/time)
Md	Volumetric Moisture Deficit
Psi	Capillary Suction (length)
hK	Horton Infiltration Decay Rate (time^{-1})
fo	Initial Infiltration Rate (depth/time)
fc	Ultimate(capacity)Infiltration Rate (depth/time)
Ia	Initial Abstraction (length)
dt	Computational increment (duration of unit excess rainfall) Default dt is smallest value of $0.1333Tc$, r_{tm} , and t_h (Smallest dt is then adjusted to match up with T_p)
UDdt	User specified override computational main time increment (only used if UDdt is $\Rightarrow .1333Tc$)
D(t)	Point on distribution curve (fraction of P) for time step t
K	$2 / (1 + (Tr/Tp))$: default $K = 0.75$: (for $Tr/Tp = 1.67$)
Ks	Hydrograph shape factor = Unit Conversions * $K = ((1\text{hr}/3600\text{sec}) * (1\text{ft}/12\text{in}) * ((5280\text{ft})^2/\text{sq.mi})) * K$ Default $K_s = 645.333 * 0.75 = 484$
Lag	Lag time from center of excess runoff (dt) to T_p : $Lag = 0.6Tc$
P	Total precipitation depth, inches
Pa(t)	Accumulated rainfall at time step t
Pi(t)	Incremental rainfall at time step t
qp	Peak discharge (cfs) for 1in. runoff, for 1hr, for 1 sq.mi. = $(K_s * A * Q) / T_p$ (where $Q = 1\text{in. runoff}$, $A = \text{sq.mi.}$)
Qu(t)	Unit hydrograph ordinate (cfs) at time step t
Q(t)	Final hydrograph ordinate (cfs) at time step t
Rai(t)	Accumulated runoff (inches) at time step t for impervious area
Rap(t)	Accumulated runoff (inches) at time step t for pervious area
Rii(t)	Incremental runoff (inches) at time step t for impervious area
Rip(t)	Incremental runoff (inches) at time step t for pervious area
R(t)	Incremental weighted total runoff (inches)
Rtm	Time increment for rainfall table
Si	S for impervious area: $S_i = (1000/CNi) - 10$
Sp	S for pervious area: $S_p = (1000/CNp) - 10$
t	Time step (row) number
Tc	Time of concentration
Tb	Time (hrs) of entire unit hydrograph: $T_b = T_p + T_r$
Tp	Time (hrs) to peak of a unit hydrograph: $T_p = (dt/2) + Lag$
Tr	Time (hrs) of receding limb of unit hydrograph: $T_r = \text{ratio of } T_p$

Subsection: Unit Hydrograph Equations

Unit Hydrograph Method

Computational Notes

Precipitation

Column (1) Time for time step t
Column (2) $D(t)$ = Point on distribution curve for time step t
Column (3) $P_i(t) = P_a(t) - P_a(t-1)$: Col.(4) - Preceding Col.(4)
Column (4) $P_a(t) = D(t) \times P$: Col.(2) x P

Pervious Area Runoff (using SCS Runoff CN Method)

Column (5) $R_{ap}(t)$ = Accumulated pervious runoff for time step t
If $(P_a(t))$ is $\leq 0.2Sp$ then use: $R_{ap}(t) = 0.0$
If $(P_a(t))$ is $> 0.2Sp$ then use:
 $R_{ap}(t) = (Col.(4) - 0.2Sp)^2 / (Col.(4) + 0.8Sp)$
Column (6) $R_{ip}(t)$ = Incremental pervious runoff for time step t
 $R_{ip}(t) = R_{ap}(t) - R_{ap}(t-1)$
 $R_{ip}(t) = Col.(5)$ for current row - $Col.(5)$ for preceding row.

Impervious Area Runoff

Column (7 & 8)... Did not specify to use impervious areas.

Incremental Weighted Runoff

Column (9) $R(t) = (A_p/A_t) \times R_{ip}(t) + (A_i/A_t) \times R_{ii}(t)$
 $R(t) = (A_p/A_t) \times Col.(6) + (A_i/A_t) \times Col.(8)$

SCS Unit Hydrograph Method

Column (10) $Q(t)$ is computed with the SCS unit hydrograph method using $R(t)$ and $Q_u(t)$.

Subsection: Unit Hydrograph Summary
 Label: IMP - POI-4
 Scenario: NJDEP-WQ

Return Event: 1 years
 Storm Event: NJ WQ DISTRIBUTION

Storm Event	NJ WQ DISTRIBUTION
Return Event	1 years
Duration	24.000 hours
Depth	1.5 in
Time of Concentration (Composite)	0.083 hours
Area (User Defined)	20,332.00 ft ²
Computational Time Increment	0.011 hours
Time to Peak (Computed)	1.089 hours
Flow (Peak, Computed)	1.70 ft ³ /s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	1.100 hours
Flow (Peak Interpolated Output)	1.68 ft ³ /s
Drainage Area	
SCS CN (Composite)	98.000
Area (User Defined)	20,332.00 ft ²
Maximum Retention (Pervious)	0.2 in
Maximum Retention (Pervious, 20 percent)	0.0 in
Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	1.3 in
Runoff Volume (Pervious)	2,168.989 ft ³
Hydrograph Volume (Area under Hydrograph curve)	
Volume	2,171.000 ft ³
SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.083 hours
Computational Time Increment	0.011 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	6.35 ft ³ /s

Subsection: Unit Hydrograph Summary
Label: IMP - POI-4
Scenario: NJDEP-WQ

Return Event: 1 years
Storm Event: NJ WQ DISTRIBUTION

SCS Unit Hydrograph Parameters	
Unit peak time, T_p	0.056 hours
Unit receding limb, T_r	0.222 hours
Total unit time, T_b	0.278 hours

Subsection: Unit Hydrograph (Hydrograph Table)
 Label: IMP - POI-4
 Scenario: NJDEP-WQ

Return Event: 1 years
 Storm Event: NJ WQ DISTRIBUTION

Storm Event	NJ WQ DISTRIBUTION
Return Event	1 years
Duration	24.000 hours
Depth	1.5 in
Time of Concentration (Composite)	0.083 hours
Area (User Defined)	20,332.00 ft ²

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.050 hours

Time on left represents time for first value in each row.

Time (hours)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
0.300	0.00	0.01	0.03	0.05	0.06
0.550	0.09	0.11	0.13	0.15	0.16
0.800	0.22	0.30	0.46	0.73	1.38
1.050	1.64	1.68	1.11	0.72	0.48
1.300	0.35	0.25	0.23	0.22	0.22
1.550	0.20	0.17	0.17	0.17	0.17
1.800	0.13	0.08	0.06	0.06	0.05
2.050	0.03	0.01	0.00	0.00	(N/A)

Subsection: Unit Hydrograph Summary
 Label: PERV - POI-4
 Scenario: NJDEP-WQ

Return Event: 1 years
 Storm Event: NJ WQ DISTRIBUTION

Storm Event	NJ WQ DISTRIBUTION
Return Event	1 years
Duration	24.000 hours
Depth	1.5 in
Time of Concentration (Composite)	0.083 hours
Area (User Defined)	20,783.00 ft ²
Computational Time Increment	0.011 hours
Time to Peak (Computed)	1.111 hours
Flow (Peak, Computed)	0.39 ft ³ /s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	1.100 hours
Flow (Peak Interpolated Output)	0.38 ft ³ /s
Drainage Area	
SCS CN (Composite)	79.000
Area (User Defined)	20,783.00 ft ²
Maximum Retention (Pervious)	2.7 in
Maximum Retention (Pervious, 20 percent)	0.5 in
Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	0.3 in
Runoff Volume (Pervious)	447.814 ft ³
Hydrograph Volume (Area under Hydrograph curve)	
Volume	448.000 ft ³
SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.083 hours
Computational Time Increment	0.011 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	6.49 ft ³ /s

Subsection: Unit Hydrograph Summary
Label: PERV - POI-4
Scenario: NJDEP-WQ

Return Event: 1 years
Storm Event: NJ WQ DISTRIBUTION

SCS Unit Hydrograph Parameters	
Unit peak time, T_p	0.056 hours
Unit receding limb, T_r	0.222 hours
Total unit time, T_b	0.278 hours

Subsection: Unit Hydrograph (Hydrograph Table)
 Label: PERV - POI-4
 Scenario: NJDEP-WQ

Return Event: 1 years
 Storm Event: NJ WQ DISTRIBUTION

Storm Event	NJ WQ DISTRIBUTION
Return Event	1 years
Duration	24.000 hours
Depth	1.5 in
Time of Concentration (Composite)	0.083 hours
Area (User Defined)	20,783.00 ft ²

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.050 hours

Time on left represents time for first value in each row.

Time (hours)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
0.950	0.00	0.05	0.21	0.38	0.32
1.200	0.24	0.18	0.14	0.10	0.10
1.450	0.09	0.09	0.09	0.08	0.08
1.700	0.08	0.08	0.06	0.04	0.03
1.950	0.03	0.02	0.02	0.00	0.00

Subsection: Addition Summary
 Label: MTD -OUTFALL
 Scenario: NJDEP-WQ

Return Event: 1 years
 Storm Event: NJ WQ DISTRIBUTION

Summary for Hydrograph Addition at 'MTD -OUTFALL'

Upstream Link	Upstream Node
<Catchment to Outflow Node>	IMP - POI-4
<Catchment to Outflow Node>	PERV - POI-4

Node Inflows

Inflow Type	Element	Volume (ft ³)	Time to Peak (hours)	Flow (Peak) (ft ³ /s)
Flow (From)	IMP - POI-4	2,171.009	1.100	1.68
Flow (From)	PERV - POI-4	448.175	1.100	0.38
Flow (In)	MTD - OUTFALL	2,619.184	1.100	2.06

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Manufactured Treatment Device (MTD) Certifications



State of New Jersey

DEPARTMENT OF ENVIRONMENTAL PROTECTION
Bureau of Nonpoint Pollution Control
Division of Water Quality
Mail Code 401-02B
Post Office Box 420
Trenton, New Jersey 08625-0420
609-633-7021 Fax: 609-777-0432
http://www.state.nj.us/dep/dwq/bnpc_home.htm

CHRIS CHRISTIE
Governor

KIM GUADAGNO
Lt. Governor

BOB MARTIN
Commissioner

May 19, 2015

Derek M. Berg
CONTECH Engineered Solutions, LLC
71 US Route 1, Suite F
Scarborough, ME 04074

Re: MTD Lab Certification for the
Filterra Bioretention System
By CONTECH Engineered Solutions, LLC

TSS Removal Rate: 80%

Dear Mr. Berg:

This certification letter is being written to update the Filterra Bioretention System lab certification to reflect an ownership change from Filterra Bioretention System, A Division of Americast, Inc. to Contech Engineered Solutions, LLC.

The Stormwater Management rules under N.J.A.C. 7:8-5.5(b) and 5.7(c) allow the use of manufactured treatment devices (MTDs) for compliance with the design and performance standards at N.J.A.C. 7:8-5 if the pollutant removal rates have been verified by the New Jersey Corporation for Advanced Technology (NJCAT) and have been certified by the New Jersey Department of Environmental Protection (NJDEP). Filterra® Bioretention Systems has requested a Laboratory Certification for the Filterra Bioretention System.

This project falls under the "Procedure for Obtaining Verification of a Stormwater Manufactured Treatment Device from New Jersey Corporation for Advanced Technology" dated January 25, 2013. The applicable protocol is the "New Jersey Department of Environmental Protection Laboratory Protocol to Assess Total Suspended Solids Removal by a Filtration Manufactured Treatment Device" dated January 25, 2013.

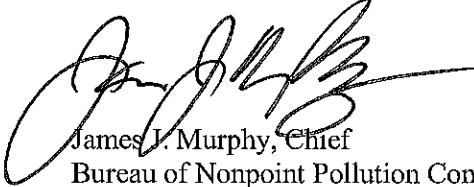
NJCAT verification documents submitted to the NJDEP indicate that the requirements of the aforementioned protocol have been met or exceeded. The NJCAT letter also included a recommended certification TSS removal rate and the required maintenance plan. The NJCAT Verification Report with the Verification Appendix for this device is published online at <http://www.njcat.org/verification-process/technology-verification-database.html>.

The NJDEP certifies the use of the Filterra Bioretention System by Contech Engineered Solutions, LLC at a TSS removal rate of 80%, when designed, operated and maintained in accordance with the information provided in the Verification Appendix.

Be advised a detailed maintenance plan is mandatory for any project with a Stormwater BMP subject to the Stormwater Management Rules, N.J.A.C. 7:8. The plan must include all of the items identified in Stormwater Management Rules, N.J.A.C. 7:8-5.8. Such items include, but are not limited to, the list of inspection and maintenance equipment and tools, specific corrective and preventative maintenance tasks, indication of problems in the system, and training of maintenance personnel. Additional information can be found in Chapter 8: Maintenance of the New Jersey Stormwater Best Management Manual.

If you have any questions regarding the above information, please contact Titus Magnanao, of my office at (609) 633-7021.

Sincerely,



James J. Murphy, Chief
Bureau of Nonpoint Pollution Control

C: Chron File
Richard Magee, NJCAT
Madhu Guru, DLUR
Elizabeth Dragon, BNPC
Lisa Schaefer, BNPC
Titus Magnanao, BNPC
Ravi Patraju, NJDEP

Operation & Maintenance (OM) Manual v01



filterterra[®]
Bioretention Systems

C NTECH[®]
ENGINEERED SOLUTIONS



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- Design

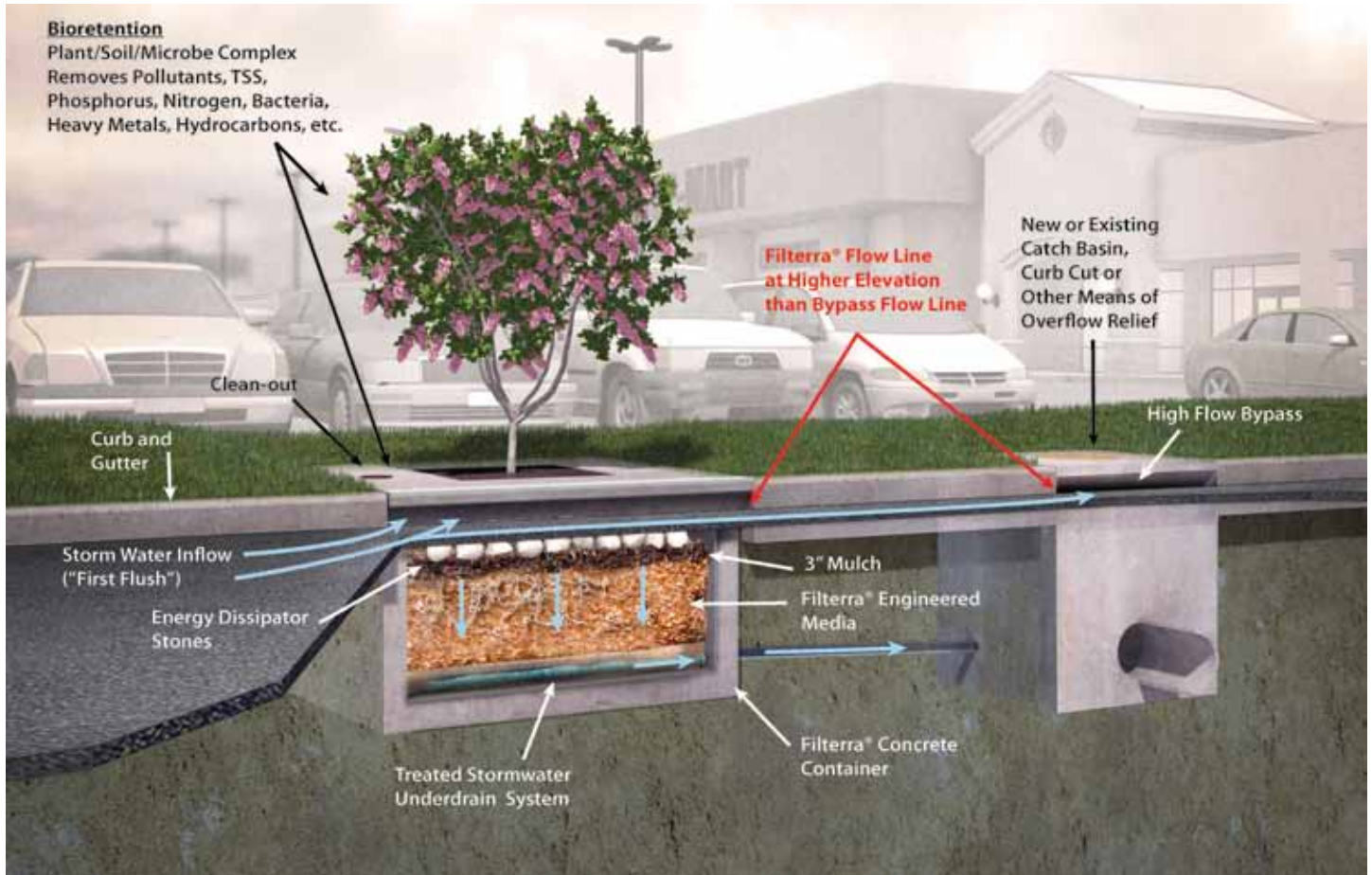
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General Description

The following general specifications describe the general operations and maintenance requirements for the Contech Engineered Solutions LLC stormwater bioretention filtration system, the Filterra®. The system utilizes physical, chemical and biological mechanisms of a soil, plant and microbe complex to remove pollutants typically found in urban stormwater runoff. The treatment system is a fully equipped, pre-constructed drop-in place unit designed for applications in the urban landscape to treat contaminated runoff.



Stormwater flows through a specially designed filter media mixture contained in a landscaped concrete container. The mixture immobilizes pollutants which are then decomposed, volatilized and incorporated into the biomass of the Filterra® system's micro/macro fauna and flora. Stormwater runoff flows through the media and into an underdrain system at the bottom of the container, where the treated water is discharged. Higher flows bypass the Filterra® to a downstream inlet or outfall. Maintenance is a simple, inexpensive and safe operation that does not require confined space access, pumping or vacuum equipment or specialized tools. Properly trained landscape personnel can effectively maintain Filterra® Stormwater systems by following instructions in this manual.

Basic Operations

Filtterra® is a bioretention system in a concrete box.

Contaminated stormwater runoff enters the filter box through the curb inlet spreading over the 3-inch layer of mulch on the surface of the filter media. As the water passes through the mulch layer, most of the larger sediment particles and heavy metals are removed through sedimentation and chemical reactions with the organic material in the mulch. Water passes through the soil media where the finer particles are removed and other chemical reactions take place to immobilize and capture pollutants in the soil media. The cleansed water passes into an underdrain and flows to a pipe system or other appropriate discharge point. Once the pollutants are in the soil, the bacteria begin to break down and metabolize the materials and the plants begin to uptake and metabolize the pollutants. Some pollutants such as heavy metals, which are chemically bound to organic particles in the mulch, are released over time as the organic matter decomposes to release the metals to the feeder roots of the plants and the cells of the bacteria in the soil where they remain and are recycled. Other pollutants such as phosphorus are chemically bound to the soil particles and released slowly back to the plants and bacteria and used in their metabolic processes. Nitrogen goes through a very complex variety of biochemical processes where it can ultimately end up in the plant/bacteria biomass, turned to nitrogen gas or dissolves back into the water column as nitrates depending on soil temperature, pH and the availability of oxygen. The pollutants ultimately are retained in the mulch, soil and biomass with some passing out of the system into the air or back into the water.

Design and Installation

Each project presents different scopes for the use of Filtterra® systems. To ensure the safe and specified function of the stormwater BMP, Contech reviews each application before supply. Information and help may be provided to the design engineer during the planning process. Correct Filtterra® box sizing (by rainfall region) is essential to predict pollutant removal rates for a given area. The engineer shall submit calculations for approval by the local jurisdiction. The contractor is responsible for the correct installation of Filtterra units as shown in approved plans. A comprehensive installation manual is available at www.conteches.com.

Maintenance

Why Maintain?

All stormwater treatment systems require maintenance for effective operation. This necessity is often incorporated in your property's permitting process as a legally binding BMP maintenance agreement.

- Avoid legal challenges from your jurisdiction's maintenance enforcement program.
- Prolong the expected lifespan of your Filtterra media.

- Avoid more costly media replacement.
- Help reduce pollutant loads leaving your property.

Simple maintenance of the Filtterra® is required to continue effective pollutant removal from stormwater runoff before discharge into downstream waters. This procedure will also extend the longevity of the living biofilter system. The unit will recycle and accumulate pollutants within the biomass, but is also subjected to other materials entering the throat. This may include trash, silt and leaves etc. which will be contained within the void below the top grate and above the mulch layer. Too much silt may inhibit the Filtterra's® flow rate, which is the reason for site stabilization before activation. Regular replacement of the mulch stops accumulation of such sediment.

When to Maintain?

Contech includes a 1-year maintenance plan with each system purchase. Annual included maintenance consists of a maximum of two (2) scheduled visits. Additional maintenance may be necessary depending on sediment and trash loading (by Owner or at additional cost). The start of the maintenance plan begins when the system is activated for full operation. Full operation is defined as the unit installed, curb and gutter and transitions in place and activation (by Supplier) when mulch and plant are added and temporary throat protection removed.

Activation cannot be carried out until the site is fully stabilized (full landscaping, grass cover, final paving and street sweeping completed). Maintenance visits are scheduled seasonally; the spring visit aims to clean up after winter loads including salts and sands while the fall visit helps the system by removing excessive leaf litter.

It has been found that in regions which receive between 30-50 inches of annual rainfall, (2) two visits are generally required; regions with less rainfall often only require (1) one visit per annum. Varying land uses can affect maintenance frequency; e.g. some fast food restaurants require more frequent trash removal. Contributing drainage areas which are subject to new development wherein the recommended erosion and sediment control measures have not been implemented may require additional maintenance visits.

Some sites may be subjected to extreme sediment or trash loads, requiring more frequent maintenance visits. This is the reason for detailed notes of maintenance actions per unit, helping the Supplier and Owner predict future maintenance frequencies, reflecting individual site conditions.

Owners must promptly notify the (maintenance) Supplier of any damage to the plant(s), which constitute(s) an integral part of the bioretention technology. Owners should also advise other landscape or maintenance contractors to leave all maintenance to the Supplier (i.e. no pruning or fertilizing).

Exclusion of Services

It is the responsibility of the owner to provide adequate irrigation when necessary to the plant of the Filterra® system.

Clean up due to major contamination such as oils, chemicals, toxic spills, etc. will result in additional costs and are not covered under the Supplier maintenance contract. Should a major contamination event occur the Owner must block off the outlet pipe of the Filterra® (where the cleaned runoff drains to, such as drop inlet) and block off the throat of the Filterra®. The Supplier should be informed immediately.

Maintenance Visit Summary

Each maintenance visit consists of the following simple tasks (detailed instructions below).

1. Inspection of Filterra® and surrounding area
2. Removal of tree grate and erosion control stones
3. Removal of debris, trash and mulch
4. Mulch replacement
5. Plant health evaluation and pruning or replacement as necessary
6. Clean area around Filterra®
7. Complete paperwork

Maintenance Tools, Safety Equipment and Supplies

Ideal tools include: camera, bucket, shovel, broom, pruners, hoe/rake, and tape measure. Appropriate Personal Protective Equipment (PPE) should be used in accordance with local or company procedures. This may include impervious gloves where the type of trash is unknown, high visibility clothing and barricades when working in close proximity to traffic and also safety hats and shoes. A T-Bar or crowbar should be used for moving the tree grates (up to 170 lbs ea.). Most visits require minor trash removal and a full replacement of mulch. See below for actual number of bagged mulch that is required in each unit size. Mulch should be a double shredded, hardwood variety; do not use colored or dyed mulch. Some visits may require additional Filterra® engineered soil media available from the Supplier.

Box Length	Box Width	Filter Surface Area (ft ²)	Volume at 3" (ft ³)	# of 2 ft ³ Mulch Bags
4	4	16	4	2
6	4	24	6	3
8	4	32	8	4
6	6	36	9	5
8	6	48	12	6
10	6	60	15	8
12	6	72	18	9
13	7	91	23	12

Maintenance Visit Procedure

Keep sufficient documentation of maintenance actions to predict location specific maintenance frequencies and needs. An example Maintenance Report is included in this manual.



1. Inspection of Filterra® and surrounding area

- Record individual unit before maintenance with photograph (numbered). Record on Maintenance Report (see example in this document) the following:

Record on Maintenance Report the following:

Standing Water	yes no
Damage to Box Structure	yes no
Damage to Grate	yes no
Is Bypass Clear	yes no

If yes answered to any of these observations, record with close-up photograph (numbered).



2. Removal of tree grate and erosion control stones

- Remove cast iron grates for access into Filterra® box.
- Dig out silt (if any) and mulch and remove trash & foreign items.

Record on Maintenance Report the following:

Silt/Clay	yes no
Cups/ Bags	yes no
Leaves	yes no
# of Buckets Removed	_____



3. Removal of debris, trash and mulch

- After removal of mulch and debris, measure distance from the top of the Filterra® engineered media soil to the bottom of the top slab. If this distance is greater than 12", add Filterra® media (not top soil or other) to recharge to a 9" distance

Record on Maintenance Report the following:

Distance of Bottom of Top Slab (inches)	_____
# of Buckets of Media Added	_____



4. Mulch replacement

- Please see mulch specifications.
- Add double shredded mulch evenly across the entire unit to a depth of 3".
- Ensure correct repositioning of erosion control stones by the Filterra® inlet to allow for entry of trash during a storm event.
- Replace Filterra® grates correctly using appropriate lifting or moving tools, taking care not to damage the plant.

5. Plant health evaluation and pruning or replacement as necessary

- Examine the plant's health and replace if dead.
- Prune as necessary to encourage growth in the correct directions

Record on Maintenance Report the following:

Height above Grate	_____ (ft)
Width at Widest Point	_____ (ft)
Health	alive dead
Damage to Plant	yes no
Plant Replaced	yes no



6. Clean area around Filterra®

- Clean area around unit and remove all refuse to be disposed of appropriately.



7. Complete paperwork

- Deliver Maintenance Report and photographs to appropriate location (normally Contech during maintenance contract period).
- Some jurisdictions may require submission of maintenance reports in accordance with approvals. It is the responsibility of the Owner to comply with local regulations.



Maintenance Checklist

Drainage System Failure	Problem	Conditions to Check	Condition that Should Exist	Actions
Inlet	Excessive sediment or trash accumulation.	Accumulated sediments or trash impair free flow of water into Filterra.	Inlet should be free of obstructions allowing free distributed flow of water into Filterra.	Sediments and/or trash should be removed.
Mulch Cover	Trash and floatable debris accumulation.	Excessive trash and/or debris accumulation.	Minimal trash or other debris on mulch cover.	Trash and debris should be removed and mulch cover raked level. Ensure bark nugget mulch is not used.
Mulch Cover	"Ponding" of water on mulch cover.	"Ponding" in unit could be indicative of clogging due to excessive fine sediment accumulation or spill of petroleum oils.	Stormwater should drain freely and evenly through mulch cover.	Recommend contact manufacturer and replace mulch as a minimum.
Vegetation	Plants not growing or in poor condition.	Soil/mulch too wet, evidence of spill. Incorrect plant selection. Pest infestation. Vandalism to plants.	Plants should be healthy and pest free.	Contact manufacturer for advice.
Vegetation	Plant growth excessive.	Plants should be appropriate to the species and location of Filterra.		Trim/prune plants in accordance with typical landscaping and safety needs.
Structure	Structure has visible cracks.	Cracks wider than 1/2 inch or evidence of soil particles entering the structure through the cracks.		Vault should be repaired.

Maintenance is ideally to be performed twice annually.





State of New Jersey

DEPARTMENT OF ENVIRONMENTAL PROTECTION
Bureau of Nonpoint Pollution Control
Division of Water Quality
Mail Code 401-02B
Post Office Box 420
Trenton, New Jersey 08625-0420
609-633-7021 Fax: 609-777-0432
http://www.state.nj.us/dep/dwq/bnpc_home.htm

CHRIS CHRISTIE
Governor

KIM GUADAGNO
Lt. Governor

BOB MARTIN
Commissioner

May 27, 2014

Chris French
Filtterra® Bioretention Systems,
A Division of Americast, Inc.
11352 Virginia Precast Road
Ashland, Virginia 23005

Re: MTD Lab Certification for the
Filtterra Bioretention System
by Americast, Inc.

TSS Removal Rate: 80%

Dear Mr. French:

The Stormwater Management rules under N.J.A.C. 7:8-5.5(b) and 5.7(c) allow the use of manufactured treatment devices (MTDs) for compliance with the design and performance standards at N.J.A.C. 7:8-5 if the pollutant removal rates have been verified by the New Jersey Corporation for Advanced Technology (NJCAT) and have been certified by the New Jersey Department of Environmental Protection (NJDEP). Filtterra® Bioretention Systems has requested a Laboratory Certification for the Filtterra Bioretention System.

This project falls under the "Procedure for Obtaining Verification of a Stormwater Manufactured Treatment Device from New Jersey Corporation for Advanced Technology" dated January 25, 2013. The applicable protocol is the "New Jersey Department of Environmental Protection Laboratory Protocol to Assess Total Suspended Solids Removal by a Filtration Manufactured Treatment Device" dated January 25, 2013.

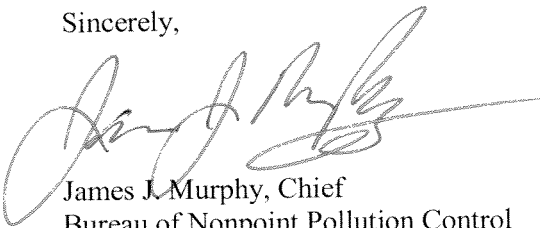
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The NJDEP certifies the use of the Filterra Bioretention System by Filterra Bioretention Systems, A Division of Americast, Inc. at a TSS removal rate of 80%, when designed, operated and maintained in accordance with the information provided in the Verification Appendix.

Be advised a detailed maintenance plan is mandatory for any project with a Stormwater BMP subject to the Stormwater Management Rules, N.J.A.C. 7:8. The plan must include all of the items identified in Stormwater Management Rules, N.J.A.C. 7:8-5.8. Such items include, but are not limited to, the list of inspection and maintenance equipment and tools, specific corrective and preventative maintenance tasks, indication of problems in the system, and training of maintenance personnel. Additional information can be found in Chapter 8: Maintenance of the New Jersey Stormwater Best Management Manual.

If you have any questions regarding the above information, please contact Ms. Lisa Schaefer of my office at (609) 633-7021.

Sincerely,



James J. Murphy, Chief
Bureau of Nonpoint Pollution Control

C: Chron File
Richard Magee, NJCAT
Madhu Guru, DLUR
Elizabeth Dragon, BNPC
Lisa Schaefer, BNPC

SECTION (____)
Filtterra® – Vault Configuration
Bioretention System Standard Specification

1.0 GENERAL

- 1.1 This item shall govern the furnishing and installation of the Filtterra® Bioretention System by Contech Engineered Solutions LLC, complete and operable as shown and as specified herein, in accordance with the requirements of the plans and contract documents.
- 1.2 Contractor shall furnish all labor, materials, equipment and incidentals necessary to install the bioretention system, appurtenances and incidentals in accordance with the Drawings and as specified herein.
- 1.3 Bioretention system shall utilize the physical, chemical and biological mechanisms of an engineered biofiltration media, plant and microbe complex to remove pollutants typically found in urban stormwater runoff. The treatment system shall be a fully equipped, pre-constructed, drop-in-place unit designed for applications in the urban landscape to treat contaminated runoff from impervious surfaces.
- 1.4 Bioretention system shall be capable of stand-alone stormwater treatment.
- 1.5 Bioretention plants shall be incorporated into the system with plant material extending into the treatment zone of the engineered media at time of Activation.
- 1.6 The bioretention system shall be of a type that has been installed and in use for a minimum of five (5) consecutive years preceding the date of installation of the system. The Manufacturer shall have been, during the same consecutive five (5) year period, engaged in the engineering design and production of systems deployed for the treatment of stormwater runoff and which have a history of successful production, acceptable to the Engineer of Record and/or the approving Jurisdiction. The Manufacturer of the Filtterra Bioretention System shall be, without exception:

Contech Engineered Solutions LLC
9100 Centre Pointe Drive
West Chester, OH, 45069
Tel: 1 800 338 1122

- 1.7 Applicable provisions of any Division shall govern work in this section.
- 1.8 American Society for Testing and Materials (ASTM) Reference Specifications
 - 1.8.1 ASTM C857: Standard Practice for Minimum Structural Design Loading for Underground Precast Concrete Utility Structures
 - 1.8.2 ASTM C858: Standard Specification of Underground Precast Concrete Utility Structures

- 1.8.3 ASTM C990: Standard Specification for Joints for Precast Box Sections Using Preformed Flexible Joint Sealants
 - 1.8.4 ASTM C109: Standard Test Method for Compressive Strength of Hydraulic Cement Mortars
- 1.9 Manufacturer or authorized supplier to submit shop drawings for bioretention System with the vault, engineered biofiltration media and accessory equipment. Drawings shall include principal dimensions, engineered biofiltration media placement, location of piping and unit foundation.
- 1.9.1 Manufacturer or authorized supplier shall submit installation instructions to the contractor.
 - 1.9.2 Manufacturer or authorized supplier shall submit Operations and Maintenance Manual to the contractor.
 - 1.9.3 Before installation of the bioretention system, Contractor shall obtain the written approval of the Engineer of Record for the system drawings.
- 1.10 No product substitutions shall be accepted unless submitted 10 days prior to project bid date, or as directed by the Engineer of Record. Submissions for substitutions require review and approval by the Engineer of Record, for hydraulic performance, impact to project designs, equivalent treatment performance, and any required project plan and report (hydrology/hydraulic, water quality, stormwater pollution) modifications that would be required by the approving jurisdictions/agencies. Contractor to coordinate with the Engineer of Record any applicable modifications to the project estimates of cost, bonding amount determinations, plan check fees for changes to approved documents, and/or any other regulatory requirements resulting from the product substitution.

2.0 MATERIALS

- 2.1 Internal components including engineered biofiltration media, underdrain stone, PVC underdrain piping, and mulch must be included as part of the bioretention system and shall be provided by Contech Engineered Solutions LLC. Note that vegetation is an essential component of bioretention systems, and shall be provided at time of Activation by the contractor.
- 2.1.1 Engineered biofiltration media shall consist of both organic and inorganic components. Stormwater shall be directed to flow vertically through the media profile, saturating the full media profile without downstream flow control.
 - 2.1.2 Underdrain stone shall be of size and shape to provide adequate bridging between the media and stone for the prevention of migration of fine particles. Underdrain stone must also be able to convey the design flow rate of the system without restriction and be approved for use in the Filterra Bioretention System by Contech Engineered Solutions LLC.
 - 2.1.3 PVC Underdrain Piping shall be SDR35 with perforation pattern designed to

convey system design flow rate without restriction.

- 2.1.4 Mulch shall be double shredded wood or bark mulch approved for use with the Filterra Bioretention System by Contech Engineered Solutions LLC.
- 2.2 Precast concrete vault shall be provided by Manufacturer or authorized supplier according to ASTM C857 and C858.
 - 2.2.1 Vault joint sealant shall be Conseal CS-101 or approved equal. Joints shall be sealed with preformed joint sealing compound conforming to ASTM C 990.
 - 2.2.2 If interior concrete baffle walls are provided, baffle walls shall be cast-in or sealed to the interior vault walls and floor with a polyurethane construction sealant rated for use below the waterline, SikaFlex 1a or equal. Contractor to provide sealant material and installation unless completed prior to shipment.
- 2.3 Tree grates and access covers shall be cast iron. Tree grate frames shall be galvanized steel.
- 2.4 Curb Nosing (where applicable) shall be galvanized steel and where specified shall be cast into a top slab designed to support a minimum of H5 loading at the curb.
- 2.5 All contractor-provided components shall meet the requirements of this section, the plans specifications and contract documents. In the case of conflict, the more stringent specification shall apply.
 - 2.5.1 Crushed rock base material shall be six-inch minimum layer of ¾-inch minus rock. Compact undisturbed sub-grade materials to 95% of maximum density at +/-2% of optimum moisture content. Unsuitable material below sub-grade shall be replaced to engineer's approval.
 - 2.5.2 Concrete shall have an unconfined compressive strength at 28 days of at least 3000 psi, with ¾-inch round rock, a 4-inch slump maximum, and shall be placed within 90 minutes of initial mixing.
 - 2.5.3 Silicone Sealant shall be pure RTV silicone conforming to Federal Specification Number TT S001543A or TT S00230C or Engineer approved.
 - 2.5.4 Grout shall be non-shrink grout meeting the requirements of Corps of Engineers CRD-C588. Specimens molded, cured and tested in accordance with ASTM C-109 shall have minimum compressive strength of 6,200 psi. Grout shall not exhibit visible bleeding.
 - 2.5.5 Backfill material shall be ¾-inch minus crushed rock, or approved equal.
 - 2.5.6 Vegetation shall comply with the type and size required by the approved drawings and shall be alive and free of obvious signs of disease. Vegetation shall be of species listed in approved Filterra Plant list or otherwise approved by Manufacturer. Vegetation shall be supplied by Contractor prior to Activation.

3.0 PERFORMANCE

3.1 Treatment Capabilities shall be verified via third-party report following either TAPE or TARP protocols.

3.1.1 Engineered biofiltration media minimum treatment flow rate shall be 140"/hr. The system shall be designed to ensure that high flow events shall bypass the engineered biofiltration media preventing erosion and resuspension of pollutants.

3.1.2 The system shall remove a minimum of 85% Total Suspended Solids (TSS).

3.1.3 The system shall remove a minimum of 62% Total Phosphorus (TP).

3.1.4 The system shall remove a minimum of 34% Total Nitrogen (TN).

3.2 The system shall have General Use Level Designation from Washington Department of Ecology for Basic (TSS), Phosphorus, Enhanced (Metals), and Oil/Grease and have Certification by New Jersey Department of Environment.

3.3 Quality Assurance and Quality Control procedures shall be followed for all batches of engineered biofiltration media produced. Engineered biofiltration media shall be certified by the Manufacturer for performance and composition.

3.3.1 Media particle size distribution and composition shall be verified as per relevant ASTM Standards.

3.3.2 Media pollutant removal performance shall be verified as per relevant ASTM Standards as well as a minimum of one scientific method approved by the USEPA.

3.3.3 Media hydraulic performance shall be verified as per relevant ASTM Standards.

3.3.4 Media fertility shall be verified as per a minimum of one published scientific method.

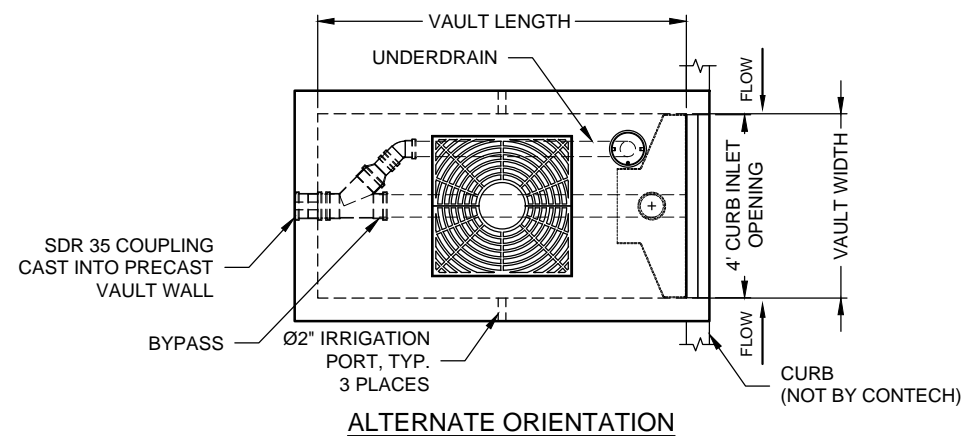
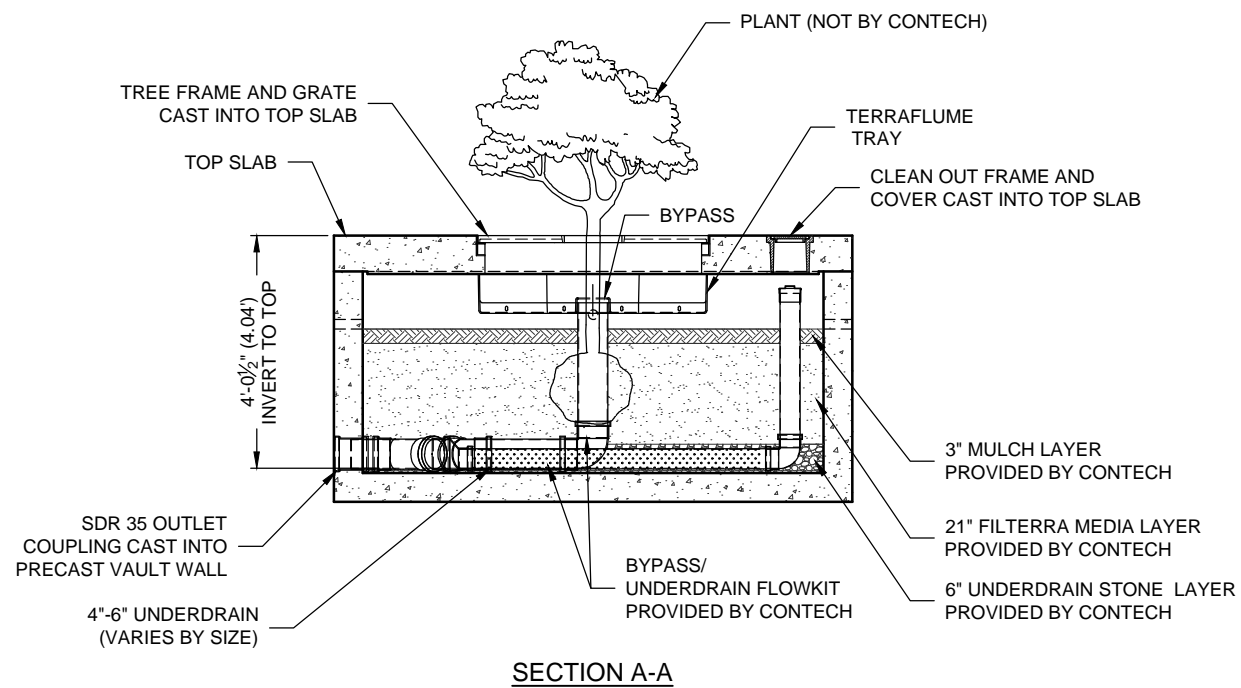
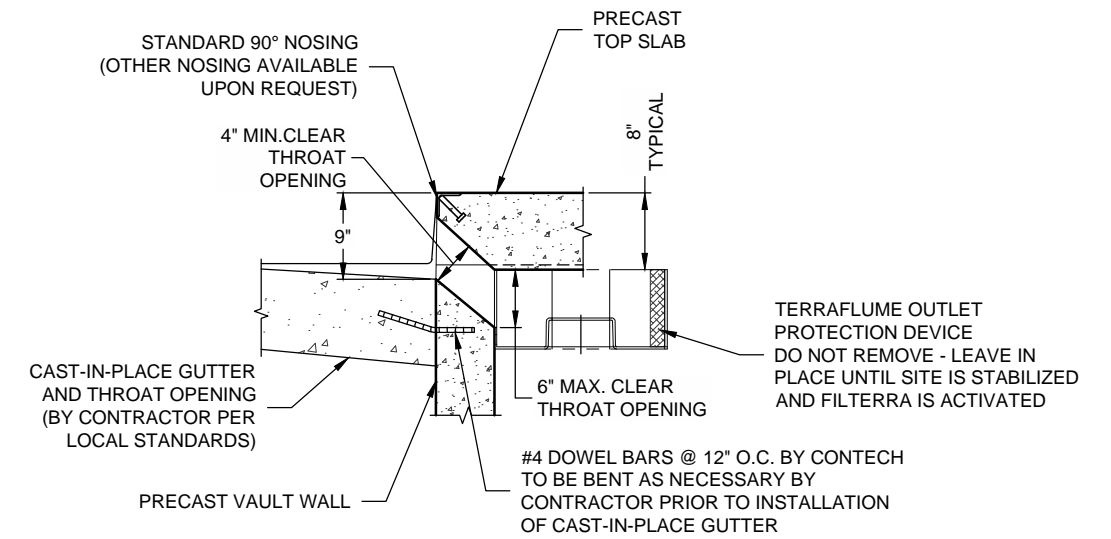
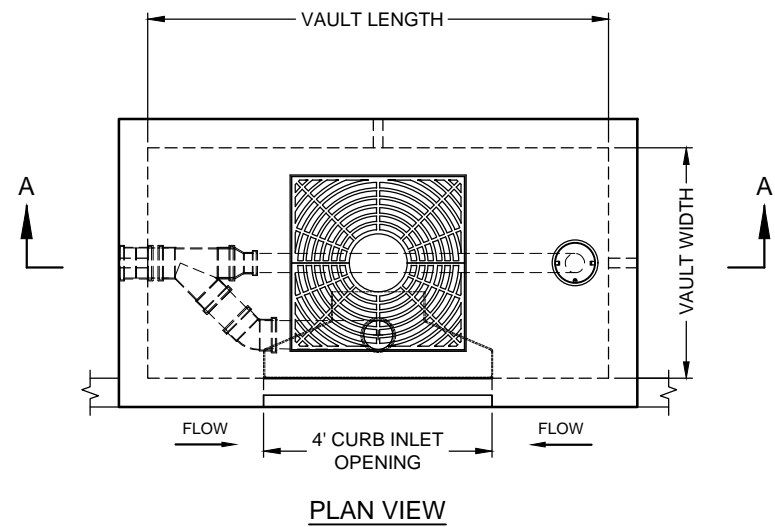
3.4 The Manufacturer shall ensure through third party full scale field testing of installed units that the design flow rate of the system is not reduced over time. Studies shall be performed on a minimum of 10 systems of various ages, maintenance frequencies, and land uses. At least 80% of the tested systems shall have been installed 2.5 or more years. At least 50% of the systems shall have previous maintenance intervals greater than 2 times the manufacturer's recommendation.

4.0 EXECUTION

4.1 Set precast vault on crushed rock base material that has been placed in maximum 6-inch lifts, loose thickness, and compacted to at least 95-percent of the maximum dry density as determined by the standard Proctor compaction test, ASTM D698, at moisture content of +/- 2% of optimum water content.

- 4.2 Inlet and outlet pipes shall be attached to provided couplers or grouted in and connected to precast concrete vault according to Engineer's requirements and specifications.
- 4.3 All throat and grate protection covers shall remain in place until the system is activated.
- 4.4 Contractor to cast-in-place throat inlet to convey stormwater into bioretention System according to Engineer's requirements and specifications.
- 4.5 Engineered biofiltration media shall be delivered installed in the vault, unless otherwise agreed upon with the Manufacturer. Contractor shall take appropriate action to protect the media from sediment and other debris during construction. The method ultimately selected shall be at Contractor's discretion and Contractor's risk.
 - 4.5.1 If media is shipped separately from vault, Manufacturer or a Manufacturer's certified representative shall install media into the vault or be present to supervise installation in order to ensure proper installation.
- 4.6 The bioretention system shall not be placed in operation (activated) until the project site is clean and stabilized (construction erosion control measures no longer required). The project site includes any surface that contributes storm drainage to the system. All impermeable surfaces shall be clean and free of dirt and debris. All catch basins, manholes and pipes shall be free of dirt and sediment. Activation shall be provided by Manufacturer or authorized supplier, and includes planting of the vegetation provided by the Contractor.
- 4.7 Each correctly installed system shall include a Final Inspection performed by Manufacturer or authorized supplier upon request between 6-12 months after Activation. The cost of this service shall be included in the price of the system and include the following.
 - 4.7.1 System inspection to help owner establish proper routine maintenance intervals.
 - 4.7.2 Routine maintenance: removal of foreign debris, silt, loose plant material and trash; mulch removal; engineered biofiltration media evaluation; plant health evaluation and pruning; replacement of mulch; disposal of all maintenance refuse items; and updating of maintenance records.
- 4.8 To ensure long term performance of the bioretention system, continuing annual maintenance programs should be performed or purchased by the owner per the latest Filterra Bioretention System Operation and Maintenance manual.

I:\COMMON\CAD\TREATMENT\64 FILTERRA\40 STANDARD DRAWINGS\FTIBC - INTERNAL BYPASS CURB INLET LAYOUT DETAILS\DWG\FTIBC - FILTERRA INTERNAL BYPASS CURB INLET CONFIG DTL.DWG 3/23/2023 3:32 PM



FTIBC CONFIGURATION								
VAULT SIZE (L x W)	MEDIA AREA (SF)	LONG SIDE INLET DESIG. / PART NO.	SHORT SIDE INLET DESIG. / PART NO.	AVAILABILITY	MAX. OUTLET/BYPASS PIPE DIA.	MAX. BYPASS FLOW (CFS)	UNDER-DRAIN PIPE DIA. (PERF)	TREE GRATE QTY. & SIZE
4 x 4	16	FTIBC0404	FTIBC0404	ALL	6" SDR 35	1.42	4" SDR 35	(1) 3' x 3'
6 x 4	24	FTIBC0604	FTIBC0406	ALL	8" SDR 35	1.89	4" SDR 35	(1) 3' x 3'
8 x 4	32	FTIBC0804	FTIBC0408	ALL (EXCEPT DE, MD, NJ, PA, VA, WV)	8" SDR 35	1.89	4" SDR 35	(1) 3' x 3'
7.83 x 4.5	35	FTIBC078045	FTIBC045078	DE, MD, NJ, PA, VA, WV ONLY	8" SDR 35	1.89	4" SDR 35	(1) 3' x 3'
6 x 6	36	FTIBC0606	FTIBC0606	ALL (EXCEPT CA, TX)	8" SDR 35	1.89	4" SDR 35	(1) 3' x 3'
8 x 6	48	FTIBC0806	FTIBC0608	ALL	10" SDR 35	2.37	4" SDR 35	(1) 4' x 4'
10 x 6	60	FTIBC1006	FTIBC0610	ALL (EXCEPT CA, TX)	10" SDR 35	2.37	6" SDR 35	(1) 4' x 4'
8 x 8	64	FTIBC0808	FTIBC0808	CA, TX ONLY	10" SDR 35	2.37	6" SDR 35	(1) 4' x 4'
12 x 6	72	FTIBC1206	FTIBC0612	ALL (EXCEPT TX)	10" SDR 35	2.37	6" SDR 35	(2) 4' x 4'
10 x 8	80	FTIBC1008	FTIBC0810	CA, TX ONLY	10" SDR 35	2.37	6" SDR 35	(1) 4' x 4'
13 x 7	91	FTIBC1307	FTIBC0713	ALL (EXCEPT CA, TX)	10" SDR 35	2.37	6" SDR 35	(2) 4' x 4'
12 x 8	96	FTIBC1208	FTIBC0812	CA, TX ONLY	10" SDR 35	2.37	6" SDR 35	(2) 4' x 4'
14 x 8	112	FTIBC1408	N/A	ALL	10" SDR 35	2.37	6" SDR 35	(2) 4' x 4'

INTERNAL PIPE CONFIGURATION MAY VARY DEPENDING ON VAULT SIZE



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FILTERRA INTERNAL BYPASS CURB (FTIBC) CONFIGURATION DETAIL

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Appendix - F:

**NEW JERSEY GROUNDWATER RECHARGE
SPREADSHEET**

New Jersey
Groundwater
Recharge
Spreadsheet
Version 2.0
November 2003

Annual Groundwater Recharge Analysis (based on GSR-32)

Select Township ↓	Average Annual P (in)	Climatic Factor
ESSEX CO., MONTCLAIR TOWN	49.0	1.64

Project Name:	KIMBERLEY ACADEMY
Description:	SELF-STORAGE BUILDING
Analysis Date:	08/31/23

Pre-Developed Conditions					
Land Segment	Area (acres)	TR-55 Land Cover	Soil	Annual Recharge (in)	Annual Recharge (cu.ft)
1	0.1226	Meadow, Pasture, Grassland or range	Boonton	14.9	6,625
2	0.2151	Meadow, Pasture, Grassland or range	Boonton	14.9	11,624
3	0.0315	Meadow, Pasture, Grassland or range	Boonton	14.9	1,702
4	0.8918	Meadow, Pasture, Grassland or range	Boonton	14.9	48,192
5	0.0877	Impervious areas	Boonton	0.0	-
6	0.046	Impervious areas	Boonton	0.0	-
7	0.0314	Impervious areas	Boonton	0.0	-
8	0.18	Impervious areas	Boonton	0.0	-
9					
10					
11					
12					
13					
14					
15					
Total =	1.6			Total Annual Recharge (in)	Total Annual Recharge (cu-ft)
				11.7	68,143

Post-Developed Conditions					
Land Segment	Area (acres)	TR-55 Land Cover	Soil	Annual Recharge (in)	Annual Recharge (cu.ft)
1	0.0787	Meadow, Pasture, Grassland or range	Boonton	14.9	4,253
2	0.2951	Meadow, Pasture, Grassland or range	Boonton	14.9	15,947
3	0.01568	Meadow, Pasture, Grassland or range	Boonton	14.9	847
4	0.4987	Meadow, Pasture, Grassland or range	Boonton	14.9	26,949
5	0.08346	Impervious areas	Boonton	0.0	-
6	0.1514	Impervious areas	Boonton	0.0	-
7	0.0297	Impervious areas	Boonton	0.0	-
8	0.4744	Impervious areas	Boonton	0.0	-
9					
10					
11	0				
12	0				
13	0				
14	0				
15	0				
Total =	1.6	Warning: make total area equal to Pre-Developed Conditions		Total Annual Recharge (in)	Total Annual Recharge (cu.ft)
				8.2	47,996

Procedure to fill the Pre-Development and Post-Development Conditions Tables

For each land segment, first enter the area, then select TR-55 Land Cover, then select Soil. Start from the top of the table and proceed downward. Don't leave blank rows (with A=0) in between your segment entries. Rows with A=0 will not be displayed or used in calculations. For impervious areas outside of standard lots select "Impervious Areas" as the Land Cover. Soil type for impervious areas are only required if an infiltration facility will be built within these areas.

Annual Recharge Requirements Calculation ↓			
% of Pre-Developed Annual Recharge to Preserve =	100%	Total Impervious Area (sq.ft)	32,189
Post-Development Annual Recharge Deficit=	20,147	(cubic feet)	
Recharge Efficiency Parameters Calculations (area averages)			
RWC= #N/A	(in)	DRWC= #N/A	(in)
ERWC= #N/A	(in)	EDRWC= #N/A	(in)

Project Name		Description		Analysis Date		BMP or LID Type					
KIMBERLEY ACADEMY		SELF-STORAGE BUILDING		08/31/23							
Recharge BMP Input Parameters				Root Zone Water capacity Calculated Parameters				Recharge Design Parameters			
Parameter	Symbol	Value	Unit	Parameter	Symbol	Value	Unit	Parameter	Symbol	Value	Unit
BMP Area	ABMP	586.0	sq.ft	Empty Portion of RWC under Post-D Natural Recharge	ERWC	0.66	in	Inches of Runoff to capture	Qdesign	1.32	in
BMP Effective Depth, this is the design variable	dBMP	15.0	in	ERWC Modified to consider dEXC	EDRWC	0.00	in	Inches of Rainfall to capture	Pdesign	1.54	in
Upper level of the BMP surface (negative if above ground)	dBMPu	6.0	in	Empty Portion of RWC under Infiltr. BMP	RERWC	0.00	in	Recharge Provided Avg. over Imp. Area		34.5	in
Depth of lower surface of BMP, must be >= dBMPu	dEXC	54.0	in					Runoff Captured Avg. over imp. Area		34.5	in
Post-development Land Segment Location of BMP, Input Zero if Location is distributed or undetermined	SegBMP	1	unitless								
				BMP Calculated Size Parameters				CALCULATION CHECK MESSAGES			
				ABMP/Aimp	Aratio	0.08	unitless	Volume Balance--> OK			
				BMP Volume	VBMP	731	cu.ft	dBMP Check--> OK			
								dEXC Check--> OK			
								BMP Location--> OK			
Parameters from Annual Recharge Worksheet				System Performance Calculated Parameters				OTHER NOTES			
Post-D Deficit Recharge (or desired recharge volume)	Vdef	20,147	cu.ft	Annual BMP Recharge Volume		20,147	cu.ft	Pdesign is accurate only after BMP dimensions are updated to make rech volume= deficit volume. The portion of BMP infiltration prior to filling and the area occupied by BMP are ignored in these calculations. Results are sensitive to dBMP, make sure dBMP selected is small enough for BMP to empty in less than 3 days. For land Segment Location of BMP if you select "impervious areas" RWC will be minimal but not zero as determined by the soil type and a shallow root zone for this Land Cover allowing consideration of lateral flow and other losses.			
Post-D Impervious Area (or target Impervious Area)	Aimp	7,000	sq.ft	Avg BMP Recharge Efficiency		100.0%	Represents % Infiltration Recharged				
Root Zone Water Capacity	RWC	3.69	in	%Rainfall became Runoff		78.5%	%				
RWC Modified to consider dEXC	DRWC	0.00	in	%Runoff Infiltrated		89.8%	%				
Climatic Factor	C-factor	1.64	no units	%Runoff Recharged		19.5%	%				
Average Annual P	Pavg	49.0	in	%Rainfall Recharged		15.3%	%				
Recharge Requirement over Imp. Area	dr	7.5	in								
<p>How to solve for different recharge volumes: By default the spreadsheet assigns the values of total deficit recharge volume "Vdef" and total proposed impervious area "Aimp" from the "Annual Recharge" sheet to "Vdef" and "Aimp" on this page. This allows solution for a single BMP to handle the entire recharge requirement assuming the runoff from entire impervious area is available to the BMP. To solve for a smaller BMP or a LID-IMP to recharge only part of the recharge requirement, set Vdef to your target value and Aimp to impervious area directly connected to your infiltration facility and then solve for ABMP or dBMP. To go back to the default configuration click the "Default Vdef & Aimp" button.</p>											

Appendix – G:

**INFILTRATION DESIGN (DARCY'S LAW) AND
DRAIN TIME CALCULATIONS**

Appendix – H:

GROUNDWATER MOUNDING ANALYSIS

Input Values

0.50
0.150
2.50
22.500
6.500
16.50
4.00

R Recharge rate (permeability rate) (in/hr)
Specific yield, Sy (dimensionless)
 default value is 0.15; max value is 0.2 provided that a lab test data is submitted
Horizontal hydraulic conductivity (in/hr)
 Kh = 5xRecharge Rate (R) in the costal plan; Kh=R outside the coastal plan
x 1/2 length of basin (x direction, in feet)
y 1/2 width of basin (y direction, in feet)
t Duration of infiltration period (hours)
hi(0) Initial thickness of saturated zone (feet)

6.280
2.280

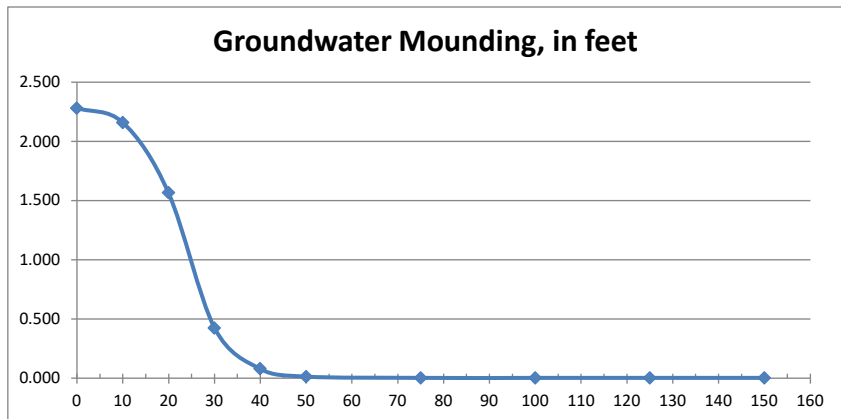
h(max) Maximum thickness of saturated zone (beneath center of basin at end of infiltration period)
Δh(max) Maximum groundwater mounding (beneath center of basin at end of infiltration period)

Distance from
 Ground-water center of basin in x
 Mounding, in feet direction, in feet

2.280	0
2.160	10
1.565	20
0.423	30
0.078	40
0.011	50
0.002	75
0.002	100
0.002	125
0.002	150



Re-Calculate Now



Disclaimer

This spreadsheet solving the Hantush (1967) equation for ground-water mounding beneath an infiltration basin is made available to the general public as a convenience for those wishing to replicate values documented in the USGS Scientific Investigations Report 2010-5102 "Groundwater mounding beneath hypothetical stormwater infiltration basins" or to calculate values based on user-specified site conditions. Any changes made to the spreadsheet (other than values identified as user-specified) after transmission from the USGS could have unintended, undesirable consequences. These consequences could include, but may not be limited to: erroneous output, numerical instabilities, and violations of underlying assumptions that are inherent in results presented in the accompanying USGS published report. The USGS assumes no responsibility for the consequences of any changes made to the spreadsheet. If changes are made to the spreadsheet, the user is responsible for documenting the changes and justifying the results and conclusions.

Appendix – I:

STORM SEWER CALCULATIONS



Storm Sewer Computations

Project: Montclair Kimberley Academy

Job No. VAMAX22004
Date: 9/1/2023

Design Storm: 100 Years

Notes: C = 0.99 (Impervious) C = 0.25 (Woods) C = 0.35 (Lawn)
*STORM PIPE INFORMATION SHOWN ON PLANS (LENGTH/SLOPE/INVERT) MAY VARY SLIGHTLY,
DUE TO ROUNDING, FROM THE INFORMATION PROVIDED ON THESE SHEETS. CALCULATIONS
SHOWN HEREON HAVE ACCOUNTED FOR THESE VARIATIONS.

LOCATION		Imp. Area	Runoff Coef.	Wooded Area	Runoff Coef.	Grass Area	Runoff Coef.	ACRES		RUNOFF			TIME CONC. (min)			Intensity	Flow, Q (cfs)		PIPE SUPPLIED																			
FROM	TO	(Acre)	C	(Acre)	C	(Acre)	C	"A"	Total	"C"	CxA	ΣCxA	INLET	PIPE	TOTAL	I (in/hr)	Design	Cap	Top Up	Inv. Up	Inv. Dn	Fall (ft)	L (ft)	Dia (in)	Type	"N"	S (%)	V (fps)										
Start Run																																						
UG-OS	MH-1	100-YEAR FLOW = 0.58 CFS (from Bentley, Pond Pack system)															0.58	48.70	470.00	465.50	460.10	5.40	6	12	HDPE	0.009	90.00	0.74										

Project: Montclair Kimberley Academy

**Hydraulic Grade Line Computations
VNHA# VAMAX22004**

Assumes Pipes Flowing Full

Q=Aci=As calculated in Pipe Calculations

Downstream Structure	Upstream Structure	100YR Q	Pipe Diameter (in)	Pipe Length (ft)	Mannings "n"	WP (ft.)	Cross Area (sf)	Kp	Velocity (ft/s)	Velocity Head (ft.)	Friction Slope sf	Friction Head Loss (ft.)	Inlet/Manhole Coeff (K)	Inlet/Manhole Loss (ft.)	Downstream HGL Elev.	Upstream HGL Elev.	Ups. Grate/Rim Elevation
MH-1	UG-OS	0.58	12	6	0.009	3.14	0.79	51.2	0.74	0.008	0.0001	0.001	0.7	0.01	461.10	461.11	470.50