V3-SDP-23-07

Stormwater Impact Analysis

The Learning Center Rolesville
302 South Main St.

Rolesville, North Carolina
KHA Project ID No. 013031004

Prepared for:
Rolesville, LLC
Submitted: March 2024

STORMWATER IMPACT ANALYSIS

THE LEARNING CENTER ROLESVILLE
302 SOUTH MAIN STREET
ROLESVILLE, NORTH CAROLINA 27571

PREPARED FOR:

ROLESVILLE, LLC
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PREPARED BY:

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NC CERT. OF AUTH: F-0102

SUBMITTED: MARCH 2024

KHA #013031004

Disclosure Statement:

This document, together with the concepts and designs presented herein, as an instrument of service, is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written authorization and adaptation by Kimley-Horn and Associates, Inc. shall be without liability to Kimley-Horn and Associates, Inc.

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OVERVIEW

This report contains the approach and results of a stormwater impact analysis conducted for the proposed The Learning Center Rolesville project. The project site consists of the parcel located at 302 South Main Street in Rolesville, North Carolina. The parcel is currently vacant. The stormwater study area encompasses approximately 1.25 acres.

From the NRCS Soil Survey, the near surface soils are classified as 100% Urban Land. Ground cover was assumed to be in good condition for both the pre- and post-development calculations.

The property is not within a defined floodplain area and is not identified under a special flood hazard per FEMA FIRM presented within Appendix A. Per the USGS Quadrangle Map (Appendix B) there is not a "blue line" stream present. There are no streams and wetlands onsite.

Proposed Development

This project proposes the development of a child learning center and associated infrastructure. The proposed development increases the existing impervious coverage in the study area from 0.17 acres to 0.82 acres. Due to the increase in impervious area, detention and water quality treatment are required.

Stormwater Analysis

Stormwater management measures shall be designed in accordance with the Town of Rolesville, Wake County, and NCDEQ Stormwater Guidelines. Per the Town of Rolesville stormwater quantity requirements, the post-development stormwater runoff rate leaving the site shall not exceed pre-development conditions for the local 1-year, 24-hour storm events.

Per the Town of Rolesville stormwater quality requirements, all development projects required to manage storm water shall provide permanent on-site BMPs to lower the nitrogen export amounts. The code further states the measures shall control and treat runoff from the first inch of rain with a runoff volume drawdown time between 48 and 120 hours.

Water Quantity

Three points of analysis (POA-1, POA-2, and POA-3) encompass the impacted site area. The flow rates at the POAs were evaluated using the SCM Method. The calculations for POA-2 and POA-3 indicate that the post-development peak runoff rates will not exceed pre-development rates for the 1-year 24-hour storm event, therefore detention is not required. The calculations for POA-1 indicate that the post-development peak runoff rates will exceed pre-development rates for the 1-year 24-hour storm event, therefore detention is required. An underground detention system is proposed to achieve the peak-flow attenuation of the 1-year 24-hour storm at POA-1. The time of concentration was assumed to be 5 minutes for the pre-development condition due to the small site area. Post-development areas were assumed to have a time of concentration of 5 minutes. See below for flow summary to POA-1.

Pre-Development 1 year flow- 1.13 cfs Post Development 1 year flow- 1.12 cfs

Pre-Development 10 year flow- 2.78 cfs Post Development 10 year flow- 4.59 cfs

Pre-Development 25 year flow – 3.54 cfs Post Development 25 year flow- 5.61 cfs

Pre-Development 100-year flow- 4.80 cfs Post Development 100 year flow- 7.20 cfs

Water Quality

The one (1) proposed bio-retention cell will be used as a water quality BMP, treating the 1-inch storm. The proposed BMP is in accordance with the NCDEQ Design Manual. Refer to Appendix E for stormwater quality calculations.

Conclusion

The calculations indicate that the proposed development will comply with local and state stormwater requirements. To meet Town of Rolesville stormwater quantity requirements, this site will incorporate an underground detention system for detention. The proposed bio-retention cell be utilized as a water quality BMP. Water quality regulation measures are required based on the increase in impervious area to the proposed development.

APPENDIX A

This digital Flood Insurance Rate Map (FIRM) was produced through a unique cooperative partnership between the State of North Carolina and the Federal Emergency Management Agency (FEMA). The State of North Carolina has implemented a long term approach to floodplain management to decrease the costs associated with flooding. This is demonstrated by the State's commitment to map flood hazard areas at the local level. As a part of this effort, the State of North Carolina has joined in a Cooperating Technical State agreement with FEMA to produce and maintain this digital FIRM.

FLOOD HAZARD INFORMATION

SEE FIS REPORT FOR ZONE DESCRIPTIONS AND INDEX MAP FOR FIRM PANEL LAYOUT

THE INFORMATION DEPICTED ON THIS MAP AND SUPPORTING DOCUMENTATION ARE ALSO AVAILABLE IN DIGITAL FORMAT AT

HTTPS://FRIS.NC.GOV/FRIS

HTTPS://MSC.FEMA.GOV

SPECIAL FLOOD HAZARD AREAS

- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD

- 0.2% Annual Chance Flood Hazard, Areas of 1% Annual Chance Flood with Average Depth Less Than One Foot or With Drainage Areas of Less Than One Square Mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee See Notes *Zone X*

OTHER AREAS

- Areas Determined to be Outside the 0.2% Annual Chance Floodplain *Zone X*

GENERAL STRUCTURES

- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall
- 012 — 18.2 — Cross Sections with 1% Annual Chance Water Surface Elevation (BFE)
- 8 — Coastal Transect
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

OTHER FEATURES

- Limit of Study
- Jurisdiction Boundary

NOTES TO USERS

For information and questions about this map, available products associated with this FIRM including historic versions of this FIRM, how to order products or the National Flood Insurance Program in general, please call the FEMA Map Information eXchange at 1-877-FEMA-MAP (1-877-336-2627) or visit the FEMA Map Service Center website at https://msc.fema.gov. An accompanying Flood Insurance Study report, Letter of Map Revision (LOMR) or Letter of Map Amendment (LOMA) revising portions of this panel, and digital versions of this FIRM may be available. Visit the North Carolina Floodplain Mapping Program website at https://flood.nc.gov/ncflood, or contact the FEMA Map Service Center.

Communities annexing land on adjacent FIRM panels must obtain a current copy of the adjacent panel as well as the current FIRM Index. These may be ordered directly from the Map Service Center at the number listed above.

For community and countywide map dates refer to the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in the community, contact your Insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

Flood Insurance Study (FIS) means an examination, evaluation, and determination of flood hazards, corresponding water surface elevations, flood hazard risk zones, and other flood data in a community issued by the North Carolina Floodplain Mapping Program (NCFMP). The Flood Insurance Study (FIS) is comprised of the following products used together: the Digital Flood Hazard Database, the Water Surface Elevation Rasters, the digitally derived, autogenerated Flood Insurance Rate Map and the Flood Insurance Survey Report. A Flood Insurance Survey is a compilation and presentation of flood risk data for specific watercourses, lakes, and coastal flood hazard areas within a community. This report contains detailed flood elevation data, data tables and FIRM indices. When a flood study is completed for the NFIP, the digital information, reports and maps are assembled into an FIS. Information shown on this FIRM is provided in digital format by the NCFMP. Base map information shown on this FIRM was provided in digital format by the NCFMP. The source of this information can be determined from the metadata available in the digital FLOOD database and in the Technical Support Data Notebook (TSDN).

ACCREDITED LEVEE NOTES TO USERS: If an accredited levee note appears on this panel check with your local community to obtain more information, such as the estimated level of protection provided (which may exceed the 1-percent-annual-chance level) and Emergency Action Plan, on the levee system(s) shown as providing protection for areas on this panel. To mitigate flood risk in residual risk areas, property owners and residents are encouraged to consider flood insurance and floodproofing or other protective measures. For more information on flood insurance, interested parties should visit the FEMA Website at https://www.fema.gov/national-flood-insurance-program.

PROVISIONALLY ACCREDITED LEVEE NOTES TO USERS: If a Provisionally Accredited Levee (PAL) note appears on this panel, check with your local community to obtain more information, such as the estimated level of protection provided (which may exceed the 1-percent-annual-chance level) and Emergency Action Plan, on the levee system(s) shown as providing protection for areas on this panel. To maintain accreditation, the levee owner or community is required to submit the data and documentation necessary to comply with Section 65.10 of the NFIP regulations. If the community or owner does not provide the necessary data and documentation or if the data and documentation provided indicate the levee system does not comply with Section 65.10 requirements, FEMA will revise the flood hazard and risk information for this area to reflect de-accreditation of the levee system. To mitigate flood risk in residual risk areas, property owners and residents are encouraged to consider flood insurance and floodproofing or other protective measures. For more information on flood insurance, interested parties should visit the FEMA Website at https://www.fema.gov/national-flood-insurance-program.

LIMIT OF MODERATE WAVE ACTION NOTES TO USERS: For some coastal flooding zones the AE Zone category has been divided by a Limit of Moderate Wave Action (LiMWA). The LiMWA represents the approximate landward limit of the 1.5-foot breaking wave. The effects of wave hazards between the VE Zone and the LiMWA (or between the shoreline and the LiMWA for areas where VE Zones are not identified) will be similar to, but less severe than those in the VE Zone.

Limit of Moderate Wave Action (LiMWA)

SCALE

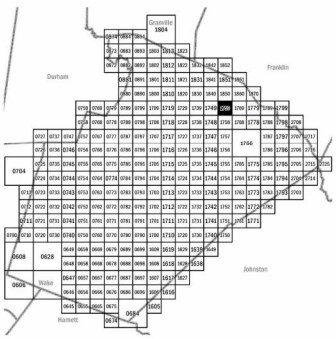
Map Projection:
North Carolina State Plane Projection Feet (Zone 3200)
Datum: NAD 1983 (Horizontal), NAVD 1988 (Vertical)

1 inch = 500 feet 1:6,000

0 250 500 1,000 Feet

0 75 150 300 Meters

PANEL LOCATOR



National Flood Insurance Program

NORTH CAROLINA FLOODPLAIN MAPPING PROGRAM
NATIONAL FLOOD INSURANCE PROGRAM
FLOOD INSURANCE RATE MAP

NORTH CAROLINA

PANEL 1759

FEMA

Panel Contains:

COMMUNITY	CID	PANEL	SUFFIX
ROLESVILLE, TOWN OF	370468	1759	K
WAKE COUNTY	370368	1759	K
WAKE FOREST, TOWN OF	370244	1759	K

VERSION NUMBER
2.3.3.2

MAP NUMBER
3720175900K

MAP REVISED
July 19, 2022

APPENDIX B

U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

The National Map
US Topo

ROLESVILLE QUADRANGLE
NORTH CAROLINA
7.5-MINUTE SERIES

Produced by the United States Geological Survey
North American Datum of 1983 (NAD83)
World Geodetic System of 1984 (WGS84). Projection and 1 000-meter grid:Universal Transverse Mercator, Zone 17S
This map is not a legal document. Boundaries may be generalized for this map scale. Private lands within government reservations may not be shown. Obtain permission before entering private lands.

Imagery....................NAIP, July 2020 - July 2020
Roads.................U.S. Census Bureau, 2016
Names.........................GNIS, 1980 - 2022
Hydrography..........National Hydrography Dataset, 2001 - 2021
Contours..............National Elevation Dataset, 2008
Boundaries.......Multiple sources; see metadata file 2019 - 2021

Wetlands.........FWS National Wetlands Inventory Not Available

MN GN
9°23′ 167 MILS
1½° 27 MILS
UTM GRID AND 2019 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

U.S. National Grid
100,000 - m Square ID
QV
Grid Zone Designation
17S

SCALE 1:24 000
KILOMETERS 1 0.5 0 1 2
METERS 1000 500 0 1000 2000
MILES 1 0.5 0 1
FEET 1000 0 1000 2000 3000 4000 5000 6000 7000 8000 9000 10000

CONTOUR INTERVAL 10 FEET
NORTH AMERICAN VERTICAL DATUM OF 1988

This map was produced to conform with the National Geospatial Program US Topo Product Standard.

NORTH CAROLINA
QUADRANGLE LOCATION

1	2	3
4		5
6	7	8

1 Grissom
2 Franklinton
3 Louisburg
4 Wake Forest
5 Bunn West
6 Raleigh East
7 Knightdale
8 Zebulon

ADJOINING QUADRANGLES

ROAD CLASSIFICATION
Expressway
Secondary Hwy
Ramp
Local Connector
Local Road
4WD
Interstate Route
US Route
State Route

ROLESVILLE, NC
2022

NSN. 7643016379170
NGA REF NO. USGSX24K38453

APPENDIX C

WAKE COUNTY, NORTH CAROLINA — SHEET NUMBER 22

22

N

Scale 1:15840

1 Mile

5000 Feet

(Joins sheet 15)

(Joins sheet 21)

(Joins sheet 23)

(Joins sheet 31)

Walkers Crossroads

Rolesville

Rolesville Church

PROJECT SITE

Mill Creek

Custom Soil Resource Report
Soil Map

Map Scale: 1:839 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 10 20 40 60

Feet
0 40 80 160 240

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 17N WGS84

MAP LEGEND

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

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

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

Water Features
- Streams and Canals

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

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

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: Wake County, North Carolina
Survey Area Data: Version 25, Oct 2, 2023

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

Date(s) aerial images were photographed: Apr 24, 2022—May 9, 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
Ur	Urban land	1.3	100.0%
Totals for Area of Interest		**1.3**	**100.0%**

Map Unit Descriptions

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

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

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

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

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

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

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

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

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

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

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

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

Wake County, North Carolina

Ur—Urban land

Map Unit Setting

National map unit symbol: 2qwpc
Elevation: 70 to 1,400 feet
Mean annual precipitation: 39 to 51 inches
Mean annual air temperature: 54 to 63 degrees F
Frost-free period: 190 to 250 days
Farmland classification: Not prime farmland

Map Unit Composition

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

Description of Urban Land

Setting

Parent material: Impervious layers over human-transported material

Interpretive groups

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

APPENDIX D

ROLESVILLE LEARNING CENTER

DRAINAGE AREA TABLE					
DRAINAGE AREA	PERVIOUS (AC)	IMPERVIOUS (AC)	TOTAL (AC)	T_c (MIN)	OUTFALL NOTES
1	0.50	0.09	0.59	5.0	–
2	0.09	0.00	0.09	5.0	
3	0.49	0.08	0.57	5.0	
TOTAL	1.08	0.17	1.25		

NOTES
1. ASSUMED MINIMUM TIME OF CONCENTRATION = 5 MINUTES

NORTH

GRAPHIC SCALE IN FEET
0 20 40 80

LEGEND

- DRAINAGE AREA OUTLINE
- PROPERTY LINE
- 3 — POINT OF ANALYSIS
- X AC — SUBAREA ID, SUBAREA SIZE

PRE-DEVELOPMENT DRAINAGE AREA MAP

KHA PROJECT NO: 013031004
DATE: 02/29/2024

Kimley»Horn

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WWW.KIMLEY-HORN.COM

ROLESVILLE LEARNING CENTER

DRAINAGE AREA TABLE					
DRAINAGE AREA	PERVIOUS (AC)	IMPERVIOUS (AC)	TOTAL (AC)	T_C (MIN)	OUTFALL NOTES
1	0.24	0.57	0.81	5.0	–
2	0.06	0.02	0.08	5.0	
3	0.13	0.23	0.36	5.0	
TOTAL	0.43	0.82	1.25		

NOTES
1. ASSUMED MINIMUM TIME OF CONCENTRATION = 5 MINUTES

NORTH

GRAPHIC SCALE IN FEET
0 20 40 80

LEGEND

- DRAINAGE AREA OUTLINE
- PROPERTY LINE
- 3 — POINT OF ANALYSIS
- X / AC — SUBAREA ID / SUBAREA SIZE

POST-DEVELOPMENT DRAINAGE AREA MAP

KHA PROJECT NO: 013031004

DATE: 02/29/2024

Kimley»Horn

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APPENDIX E

Subsection: Master Network Summary

Catchments Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (ft^3/s)
PRE-POA 1 DA	1-year 24-hour	1	0.062	11.950	1.13
PRE-POA 1 DA	1 inch	1	0.006	12.000	0.08
PRE-POA 1 DA	10 Year	10	0.153	11.900	2.78
PRE-POA 1 DA	25 Year	25	0.196	11.900	3.54
PRE-POA 1 DA	100 Year	100	0.267	11.900	4.80
POST-POA 1	1-year 24-hour	1	0.143	11.900	2.55
POST-POA 1	1 inch	1	0.030	11.950	0.55
POST-POA 1	10 Year	10	0.286	11.900	4.93
POST-POA 1	25 Year	25	0.350	11.900	5.97
POST-POA 1	100 Year	100	0.454	11.900	7.64
PRE-POA 2 DA	1-year 24-hour	1	0.009	11.950	0.16
PRE-POA 2 DA	1 inch	1	0.001	12.000	0.01
PRE-POA 2 DA	10 Year	10	0.022	11.900	0.40
PRE-POA 2 DA	25 Year	25	0.028	11.900	0.51
PRE-POA 2 DA	100 Year	100	0.039	11.900	0.70
PRE-POA 3 DA	1-year 24-hour	1	0.060	11.950	1.09
PRE-POA 3 DA	1 inch	1	0.005	12.000	0.07
PRE-POA 3 DA	10 Year	10	0.148	11.900	2.68
PRE-POA 3 DA	25 Year	25	0.189	11.900	3.42
PRE-POA 3 DA	100 Year	100	0.258	11.900	4.63
POST-POA 2 DA	1-year 24-hour	1	0.009	11.950	0.16
POST-POA 2 DA	1 inch	1	0.001	12.000	0.02
POST-POA 2 DA	10 Year	10	0.021	11.900	0.39
POST-POA 2 DA	25 Year	25	0.027	11.900	0.49
POST-POA 2 DA	100 Year	100	0.037	11.900	0.66
POST-POA 3 DA	1-year 24-hour	1	0.061	11.900	1.09
POST-POA 3 DA	1 inch	1	0.012	11.950	0.22
POST-POA 3 DA	10 Year	10	0.124	11.900	2.16
POST-POA 3 DA	25 Year	25	0.152	11.900	2.62
POST-POA 3 DA	100 Year	100	0.198	11.900	3.36

Node Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (ft^3/s)
PRE- POA 1	1-year 24-hour	1	0.062	11.950	1.13
PRE- POA 1	1 inch	1	0.006	12.000	0.08
PRE- POA 1	10 Year	10	0.153	11.900	2.78
PRE- POA 1	25 Year	25	0.196	11.900	3.54
PRE- POA 1	100 Year	100	0.267	11.900	4.80
POST-POA 1	1-year 24-hour	1	0.140	12.050	1.12
POST-POA 1	1 inch	1	0.030	12.150	0.12
POST-POA 1	10 Year	10	0.281	11.950	4.59
POST-POA 1	25 Year	25	0.344	11.950	5.61

Subsection: Master Network Summary

Node Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (ft^3/s)
POST-POA 1	100 Year	100	0.447	11.950	7.20
PRE-POA 2	1-year 24-hour	1	0.009	11.950	0.16
PRE-POA 2	1 inch	1	0.001	12.000	0.01
PRE-POA 2	10 Year	10	0.022	11.900	0.40
PRE-POA 2	25 Year	25	0.028	11.900	0.51
PRE-POA 2	100 Year	100	0.039	11.900	0.70
PRE-POA 3	1-year 24-hour	1	0.060	11.950	1.09
PRE-POA 3	1 inch	1	0.005	12.000	0.07
PRE-POA 3	10 Year	10	0.148	11.900	2.68
PRE-POA 3	25 Year	25	0.189	11.900	3.42
PRE-POA 3	100 Year	100	0.258	11.900	4.63
POST-POA 2	1-year 24-hour	1	0.009	11.950	0.16
POST-POA 2	1 inch	1	0.001	12.000	0.02
POST-POA 2	10 Year	10	0.021	11.900	0.39
POST-POA 2	25 Year	25	0.027	11.900	0.49
POST-POA 2	100 Year	100	0.037	11.900	0.66
POST-POA 3	1-year 24-hour	1	0.061	11.900	1.09
POST-POA 3	1 inch	1	0.012	11.950	0.22
POST-POA 3	10 Year	10	0.124	11.900	2.16
POST-POA 3	25 Year	25	0.152	11.900	2.62
POST-POA 3	100 Year	100	0.198	11.900	3.36

Pond Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (ft^3/s)	Maximum Water Surface Elevation (ft)	Maximum Pond Storage (ac-ft)
UNDERGROUND DETENTION (IN)	1-year 24-hour	1	0.143	11.900	2.55	(N/A)	(N/A)
UNDERGROUND DETENTION (OUT)	1-year 24-hour	1	0.140	12.050	1.12	428.31	0.047
UNDERGROUND DETENTION (IN)	1 inch	1	0.030	11.950	0.55	(N/A)	(N/A)
UNDERGROUND DETENTION (OUT)	1 inch	1	0.030	12.150	0.12	427.50	0.011

Subsection: Master Network Summary

Pond Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (ft^3/s)	Maximum Water Surface Elevation (ft)	Maximum Pond Storage (ac-ft)
UNDERGROUND DETENTION (IN)	10 Year	10	0.286	11.900	4.93	(N/A)	(N/A)
UNDERGROUND DETENTION (OUT)	10 Year	10	0.281	11.950	4.59	428.55	0.057
UNDERGROUND DETENTION (IN)	25 Year	25	0.350	11.900	5.97	(N/A)	(N/A)
UNDERGROUND DETENTION (OUT)	25 Year	25	0.344	11.950	5.61	428.62	0.060
UNDERGROUND DETENTION (IN)	100 Year	100	0.454	11.900	7.64	(N/A)	(N/A)
UNDERGROUND DETENTION (OUT)	100 Year	100	0.447	11.950	7.20	428.73	0.065

Time-Depth Curve: 1 inch	
Label	1 inch
Start Time	0.000 hours
Increment	0.100 hours
End Time	24.000 hours
Return Event	1 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	0.0	0.0	0.0	0.0
1.500	0.0	0.0	0.0	0.0	0.0
2.000	0.0	0.0	0.0	0.0	0.0
2.500	0.0	0.0	0.0	0.0	0.0
3.000	0.0	0.0	0.0	0.0	0.0
3.500	0.0	0.0	0.0	0.0	0.0
4.000	0.0	0.0	0.1	0.1	0.1
4.500	0.1	0.1	0.1	0.1	0.1
5.000	0.1	0.1	0.1	0.1	0.1
5.500	0.1	0.1	0.1	0.1	0.1
6.000	0.1	0.1	0.1	0.1	0.1
6.500	0.1	0.1	0.1	0.1	0.1
7.000	0.1	0.1	0.1	0.1	0.1
7.500	0.1	0.1	0.1	0.1	0.1
8.000	0.1	0.1	0.1	0.1	0.1
8.500	0.1	0.1	0.1	0.1	0.1
9.000	0.1	0.2	0.2	0.2	0.2
9.500	0.2	0.2	0.2	0.2	0.2
10.000	0.2	0.2	0.2	0.2	0.2
10.500	0.2	0.2	0.2	0.2	0.2
11.000	0.2	0.2	0.3	0.3	0.3
11.500	0.3	0.3	0.4	0.4	0.6
12.000	0.7	0.7	0.7	0.7	0.7
12.500	0.7	0.7	0.8	0.8	0.8
13.000	0.8	0.8	0.8	0.8	0.8
13.500	0.8	0.8	0.8	0.8	0.8
14.000	0.8	0.8	0.8	0.8	0.8
14.500	0.8	0.8	0.8	0.8	0.9
15.000	0.9	0.9	0.9	0.9	0.9
15.500	0.9	0.9	0.9	0.9	0.9
16.000	0.9	0.9	0.9	0.9	0.9
16.500	0.9	0.9	0.9	0.9	0.9
17.000	0.9	0.9	0.9	0.9	0.9

Subsection: Time-Depth Curve
Label: Rolesville
Scenario: 1 inch

Return Event: 1 years
Storm Event: 1 inch

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)
17.500	0.9	0.9	0.9	0.9	0.9
18.000	0.9	0.9	0.9	0.9	0.9
18.500	0.9	0.9	0.9	0.9	0.9
19.000	0.9	0.9	0.9	0.9	0.9
19.500	0.9	0.9	0.9	0.9	1.0
20.000	1.0	1.0	1.0	1.0	1.0
20.500	1.0	1.0	1.0	1.0	1.0
21.000	1.0	1.0	1.0	1.0	1.0
21.500	1.0	1.0	1.0	1.0	1.0
22.000	1.0	1.0	1.0	1.0	1.0
22.500	1.0	1.0	1.0	1.0	1.0
23.000	1.0	1.0	1.0	1.0	1.0
23.500	1.0	1.0	1.0	1.0	1.0
24.000	1.0	(N/A)	(N/A)	(N/A)	(N/A)

Subsection: Time-Depth Curve
Label: Rolesville
Scenario: 10 Year

Return Event: 10 years
Storm Event: 10 Year

Time-Depth Curve: 10 Year	
Label	10 Year
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	0.0	0.0	0.0
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	0.1	0.1	0.1	0.1	0.1
2.500	0.1	0.1	0.2	0.2	0.2
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	0.3	0.3	0.3
4.500	0.3	0.3	0.3	0.3	0.3
5.000	0.3	0.3	0.3	0.3	0.4
5.500	0.4	0.4	0.4	0.4	0.4
6.000	0.4	0.4	0.4	0.4	0.4
6.500	0.4	0.5	0.5	0.5	0.5
7.000	0.5	0.5	0.5	0.5	0.5
7.500	0.6	0.6	0.6	0.6	0.6
8.000	0.6	0.6	0.6	0.6	0.7
8.500	0.7	0.7	0.7	0.7	0.7
9.000	0.7	0.8	0.8	0.8	0.8
9.500	0.8	0.8	0.9	0.9	0.9
10.000	0.9	0.9	1.0	1.0	1.0
10.500	1.0	1.1	1.1	1.1	1.1
11.000	1.2	1.2	1.3	1.3	1.4
11.500	1.4	1.5	1.8	2.2	2.9
12.000	3.3	3.4	3.5	3.6	3.7
12.500	3.7	3.7	3.8	3.8	3.9
13.000	3.9	3.9	3.9	4.0	4.0
13.500	4.0	4.1	4.1	4.1	4.1
14.000	4.1	4.2	4.2	4.2	4.2
14.500	4.2	4.2	4.3	4.3	4.3
15.000	4.3	4.3	4.3	4.3	4.4
15.500	4.4	4.4	4.4	4.4	4.4
16.000	4.4	4.4	4.5	4.5	4.5
16.500	4.5	4.5	4.5	4.5	4.5
17.000	4.5	4.6	4.6	4.6	4.6

Subsection: Time-Depth Curve
Label: Rolesville
Scenario: 10 Year

Return Event: 10 years
Storm Event: 10 Year

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)
17.500	4.6	4.6	4.6	4.6	4.6
18.000	4.6	4.7	4.7	4.7	4.7
18.500	4.7	4.7	4.7	4.7	4.7
19.000	4.7	4.7	4.7	4.7	4.8
19.500	4.8	4.8	4.8	4.8	4.8
20.000	4.8	4.8	4.8	4.8	4.8
20.500	4.8	4.8	4.8	4.8	4.9
21.000	4.9	4.9	4.9	4.9	4.9
21.500	4.9	4.9	4.9	4.9	4.9
22.000	4.9	4.9	4.9	4.9	4.9
22.500	5.0	5.0	5.0	5.0	5.0
23.000	5.0	5.0	5.0	5.0	5.0
23.500	5.0	5.0	5.0	5.0	5.0
24.000	5.0	(N/A)	(N/A)	(N/A)	(N/A)

Subsection: Time-Depth Curve
Label: Rolesville
Scenario: 100 Year

Return Event: 100 years
Storm Event: 100 Year

Time-Depth Curve: 100 Year	
Label	100 Year
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	0.0
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	0.2
2.000	0.2	0.2	0.2	0.2	0.2
2.500	0.2	0.2	0.2	0.2	0.3
3.000	0.3	0.3	0.3	0.3	0.3
3.500	0.3	0.3	0.3	0.3	0.4
4.000	0.4	0.4	0.4	0.4	0.4
4.500	0.4	0.4	0.4	0.5	0.5
5.000	0.5	0.5	0.5	0.5	0.5
5.500	0.5	0.6	0.6	0.6	0.6
6.000	0.6	0.6	0.6	0.6	0.7
6.500	0.7	0.7	0.7	0.7	0.7
7.000	0.7	0.8	0.8	0.8	0.8
7.500	0.8	0.8	0.9	0.9	0.9
8.000	0.9	0.9	0.9	1.0	1.0
8.500	1.0	1.0	1.0	1.1	1.1
9.000	1.1	1.1	1.2	1.2	1.2
9.500	1.2	1.3	1.3	1.3	1.3
10.000	1.4	1.4	1.4	1.5	1.5
10.500	1.5	1.6	1.6	1.7	1.7
11.000	1.8	1.8	1.9	2.0	2.1
11.500	2.1	2.3	2.7	3.3	4.3
12.000	5.0	5.2	5.3	5.4	5.5
12.500	5.6	5.6	5.7	5.7	5.8
13.000	5.8	5.9	5.9	6.0	6.0
13.500	6.0	6.1	6.1	6.1	6.2
14.000	6.2	6.2	6.3	6.3	6.3
14.500	6.3	6.4	6.4	6.4	6.4
15.000	6.5	6.5	6.5	6.5	6.5
15.500	6.6	6.6	6.6	6.6	6.6
16.000	6.7	6.7	6.7	6.7	6.7
16.500	6.7	6.8	6.8	6.8	6.8
17.000	6.8	6.8	6.8	6.9	6.9

Subsection: Time-Depth Curve
Label: Rolesville
Scenario: 100 Year

Return Event: 100 years
Storm Event: 100 Year

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)
17.500	6.9	6.9	6.9	6.9	6.9
18.000	7.0	7.0	7.0	7.0	7.0
18.500	7.0	7.0	7.1	7.1	7.1
19.000	7.1	7.1	7.1	7.1	7.1
19.500	7.1	7.2	7.2	7.2	7.2
20.000	7.2	7.2	7.2	7.2	7.2
20.500	7.2	7.3	7.3	7.3	7.3
21.000	7.3	7.3	7.3	7.3	7.3
21.500	7.3	7.3	7.4	7.4	7.4
22.000	7.4	7.4	7.4	7.4	7.4
22.500	7.4	7.4	7.4	7.5	7.5
23.000	7.5	7.5	7.5	7.5	7.5
23.500	7.5	7.5	7.5	7.5	7.6
24.000	7.6	(N/A)	(N/A)	(N/A)	(N/A)

Subsection: Time-Depth Curve
Label: Rolesville
Scenario: 1-year 24-hour

Return Event: 1 years
Storm Event: 1-year 24- Hour

Time-Depth Curve: 1-year 24- Hour	
Label	1-year 24- Hour
Start Time	0.000 hours
Increment	0.100 hours
End Time	24.000 hours
Return Event	1 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	0.0	0.0	0.0	0.0
1.500	0.0	0.0	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	0.1	0.1	0.1	0.1	0.1
3.500	0.1	0.1	0.1	0.1	0.1
4.000	0.1	0.1	0.1	0.1	0.2
4.500	0.2	0.2	0.2	0.2	0.2
5.000	0.2	0.2	0.2	0.2	0.2
5.500	0.2	0.2	0.2	0.2	0.2
6.000	0.2	0.2	0.2	0.2	0.2
6.500	0.3	0.3	0.3	0.3	0.3
7.000	0.3	0.3	0.3	0.3	0.3
7.500	0.3	0.3	0.3	0.3	0.3
8.000	0.3	0.3	0.4	0.4	0.4
8.500	0.4	0.4	0.4	0.4	0.4
9.000	0.4	0.4	0.4	0.4	0.5
9.500	0.5	0.5	0.5	0.5	0.5
10.000	0.5	0.5	0.5	0.6	0.6
10.500	0.6	0.6	0.6	0.6	0.7
11.000	0.7	0.7	0.7	0.7	0.8
11.500	0.8	0.9	1.0	1.2	1.6
12.000	1.9	2.0	2.0	2.0	2.1
12.500	2.1	2.1	2.1	2.2	2.2
13.000	2.2	2.2	2.2	2.3	2.3
13.500	2.3	2.3	2.3	2.3	2.3
14.000	2.3	2.4	2.4	2.4	2.4
14.500	2.4	2.4	2.4	2.4	2.4
15.000	2.4	2.4	2.5	2.5	2.5
15.500	2.5	2.5	2.5	2.5	2.5
16.000	2.5	2.5	2.5	2.5	2.5
16.500	2.5	2.6	2.6	2.6	2.6
17.000	2.6	2.6	2.6	2.6	2.6

Subsection: Time-Depth Curve
Label: Rolesville
Scenario: 1-year 24-hour

Return Event: 1 years
Storm Event: 1-year 24- Hour

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)
17.500	2.6	2.6	2.6	2.6	2.6
18.000	2.6	2.6	2.6	2.6	2.7
18.500	2.7	2.7	2.7	2.7	2.7
19.000	2.7	2.7	2.7	2.7	2.7
19.500	2.7	2.7	2.7	2.7	2.7
20.000	2.7	2.7	2.7	2.7	2.7
20.500	2.7	2.7	2.7	2.8	2.8
21.000	2.8	2.8	2.8	2.8	2.8
21.500	2.8	2.8	2.8	2.8	2.8
22.000	2.8	2.8	2.8	2.8	2.8
22.500	2.8	2.8	2.8	2.8	2.8
23.000	2.8	2.8	2.8	2.8	2.8
23.500	2.8	2.8	2.9	2.9	2.9
24.000	2.9	(N/A)	(N/A)	(N/A)	(N/A)

Subsection: Time-Depth Curve
Label: Rolesville
Scenario: 25 Year

Return Event: 25 years
Storm Event: 25 Year

Time-Depth Curve: 25 Year	
Label	25 Year
Start Time	0.000 hours
Increment	0.100 hours
End Time	24.000 hours
Return Event	25 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	0.1
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	0.1	0.1	0.1	0.2	0.2
2.500	0.2	0.2	0.2	0.2	0.2
3.000	0.2	0.2	0.2	0.2	0.2
3.500	0.2	0.3	0.3	0.3	0.3
4.000	0.3	0.3	0.3	0.3	0.3
4.500	0.3	0.3	0.3	0.4	0.4
5.000	0.4	0.4	0.4	0.4	0.4
5.500	0.4	0.4	0.4	0.5	0.5
6.000	0.5	0.5	0.5	0.5	0.5
6.500	0.5	0.5	0.6	0.6	0.6
7.000	0.6	0.6	0.6	0.6	0.6
7.500	0.7	0.7	0.7	0.7	0.7
8.000	0.7	0.7	0.7	0.8	0.8
8.500	0.8	0.8	0.8	0.8	0.9
9.000	0.9	0.9	0.9	0.9	1.0
9.500	1.0	1.0	1.0	1.0	1.1
10.000	1.1	1.1	1.1	1.2	1.2
10.500	1.2	1.3	1.3	1.3	1.4
11.000	1.4	1.5	1.5	1.6	1.6
11.500	1.7	1.8	2.1	2.6	3.4
12.000	4.0	4.1	4.2	4.3	4.4
12.500	4.4	4.5	4.5	4.6	4.6
13.000	4.6	4.7	4.7	4.7	4.8
13.500	4.8	4.8	4.8	4.9	4.9
14.000	4.9	4.9	5.0	5.0	5.0
14.500	5.0	5.0	5.1	5.1	5.1
15.000	5.1	5.1	5.2	5.2	5.2
15.500	5.2	5.2	5.2	5.3	5.3
16.000	5.3	5.3	5.3	5.3	5.3
16.500	5.3	5.4	5.4	5.4	5.4
17.000	5.4	5.4	5.4	5.4	5.5

Subsection: Time-Depth Curve
Label: Rolesville
Scenario: 25 Year

Return Event: 25 years
Storm Event: 25 Year

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)
17.500	5.5	5.5	5.5	5.5	5.5
18.000	5.5	5.5	5.5	5.6	5.6
18.500	5.6	5.6	5.6	5.6	5.6
19.000	5.6	5.6	5.6	5.7	5.7
19.500	5.7	5.7	5.7	5.7	5.7
20.000	5.7	5.7	5.7	5.7	5.7
20.500	5.8	5.8	5.8	5.8	5.8
21.000	5.8	5.8	5.8	5.8	5.8
21.500	5.8	5.8	5.8	5.8	5.9
22.000	5.9	5.9	5.9	5.9	5.9
22.500	5.9	5.9	5.9	5.9	5.9
23.000	5.9	5.9	5.9	6.0	6.0
23.500	6.0	6.0	6.0	6.0	6.0
24.000	6.0	(N/A)	(N/A)	(N/A)	(N/A)

Subsection: Time of Concentration Calculations
Label: POST-POA 1
Scenario: 1-year 24-hour

Return Event: 1 years
Storm Event: 1-year 24- Hour

Time of Concentration Results

Segment #1: User Defined Tc	
Time of Concentration	0.083 hours

Time of Concentration (Composite)	
Time of Concentration (Composite)	0.083 hours

Subsection: Time of Concentration Calculations
Label: POST-POA 1
Scenario: 1-year 24-hour

Return Event: 1 years
Storm Event: 1-year 24- Hour

= = = = User Defined

Tc =	Value entered by user
Where:	Tc= Time of concentration, hours

Subsection: Time of Concentration Calculations
Label: POST-POA 2 DA
Scenario: 1-year 24-hour

Return Event: 1 years
Storm Event: 1-year 24- Hour

Time of Concentration Results

Segment #1: User Defined Tc	
Time of Concentration	0.083 hours

Time of Concentration (Composite)	
Time of Concentration (Composite)	0.083 hours

Subsection: Time of Concentration Calculations
Label: POST-POA 2 DA
Scenario: 1-year 24-hour

Return Event: 1 years
Storm Event: 1-year 24- Hour

= = = = User Defined

Tc =	Value entered by user
Where:	Tc= Time of concentration, hours

Subsection: Time of Concentration Calculations
Label: POST-POA 3 DA
Scenario: 1-year 24-hour

Return Event: 1 years
Storm Event: 1-year 24- Hour

Time of Concentration Results

Segment #1: User Defined Tc	
Time of Concentration	0.083 hours

Time of Concentration (Composite)	
Time of Concentration (Composite)	0.083 hours

Subsection: Time of Concentration Calculations
Label: POST-POA 3 DA
Scenario: 1-year 24-hour

Return Event: 1 years
Storm Event: 1-year 24- Hour

= = = = User Defined

Tc =	Value entered by user
Where:	Tc= Time of concentration, hours

Subsection: Time of Concentration Calculations
Label: PRE-POA 1 DA
Scenario: 1-year 24-hour

Return Event: 1 years
Storm Event: 1-year 24- Hour

Time of Concentration Results

Segment #1: User Defined Tc	
Time of Concentration	0.083 hours

Time of Concentration (Composite)	
Time of Concentration (Composite)	0.083 hours

Subsection: Time of Concentration Calculations
Label: PRE-POA 1 DA
Scenario: 1-year 24-hour

Return Event: 1 years
Storm Event: 1-year 24- Hour

= = = = User Defined

Tc =	Value entered by user
Where:	Tc= Time of concentration, hours

Subsection: Time of Concentration Calculations
Label: PRE-POA 2 DA
Scenario: 1-year 24-hour

Return Event: 1 years
Storm Event: 1-year 24- Hour

Time of Concentration Results

Segment #1: User Defined Tc	
Time of Concentration	0.083 hours

Time of Concentration (Composite)	
Time of Concentration (Composite)	0.083 hours

Subsection: Time of Concentration Calculations
Label: PRE-POA 2 DA
Scenario: 1-year 24-hour

Return Event: 1 years
Storm Event: 1-year 24- Hour

= = = = User Defined

Tc =	Value entered by user
Where:	Tc= Time of concentration, hours

Subsection: Time of Concentration Calculations
Label: PRE-POA 3 DA
Scenario: 1-year 24-hour

Return Event: 1 years
Storm Event: 1-year 24- Hour

Time of Concentration Results

Segment #1: User Defined Tc	
Time of Concentration	0.083 hours

Time of Concentration (Composite)	
Time of Concentration (Composite)	0.083 hours

Subsection: Time of Concentration Calculations
Label: PRE-POA 3 DA
Scenario: 1-year 24-hour

Return Event: 1 years
Storm Event: 1-year 24- Hour

= = = = User Defined

Tc =	Value entered by user
Where:	Tc= Time of concentration, hours

Subsection: Runoff CN-Area
Label: POST-POA 1
Scenario: 1-year 24-hour

Return Event: 1 years
Storm Event: 1-year 24- Hour

Runoff Curve Number Data

Soil/Surface Description	CN	Area (ft^2)	C (%)	UC (%)	Adjusted CN
Impervious Areas - Paved parking lots, roofs, driveways, Streets and roads - Soil D	98.000	24,829.200	0.0	0.0	98.000
Open space (Lawns,parks etc.) - Good condition; grass cover > 75% - Soil D	80.000	10,454.400	0.0	0.0	80.000
COMPOSITE AREA & WEIGHTED CN --->	(N/A)	35,283.600	(N/A)	(N/A)	92.667

Subsection: Runoff CN-Area
Label: POST-POA 2 DA
Scenario: 1-year 24-hour

Return Event: 1 years
Storm Event: 1-year 24- Hour

Runoff Curve Number Data

Soil/Surface Description	CN	Area (ft²)	C (%)	UC (%)	Adjusted CN
Impervious Areas - Paved parking lots, roofs, driveways, Streets and roads - Soil D	98.000	784.080	0.0	0.0	98.000
Open space (Lawns,parks etc.) - Good condition; grass cover > 75% - Soil D	80.000	2,613.600	0.0	0.0	80.000
COMPOSITE AREA & WEIGHTED CN --->	(N/A)	3,397.680	(N/A)	(N/A)	84.154

Subsection: Runoff CN-Area
Label: POST-POA 3 DA
Scenario: 1-year 24-hour

Return Event: 1 years
Storm Event: 1-year 24- Hour

Runoff Curve Number Data

Soil/Surface Description	CN	Area (ft²)	C (%)	UC (%)	Adjusted CN
Impervious Areas - Paved parking lots, roofs, driveways, Streets and roads - Soil D	98.000	10,018.800	0.0	0.0	98.000
Open space (Lawns,parks etc.) - Good condition; grass cover > 75% - Soil D	80.000	5,662.800	0.0	0.0	80.000
COMPOSITE AREA & WEIGHTED CN --->	(N/A)	15,681.600	(N/A)	(N/A)	91.500

Subsection: Runoff CN-Area
Label: PRE-POA 1 DA
Scenario: 1-year 24-hour

Return Event: 1 years
Storm Event: 1-year 24- Hour

Runoff Curve Number Data

Soil/Surface Description	CN	Area (ft²)	C (%)	UC (%)	Adjusted CN
Open space (Lawns,parks etc.) - Good condition; grass cover > 75% - Soil D	80.000	21,780.000	0.0	0.0	80.000
Impervious Areas - Gravel (w/ right-of-way) - Soil D	91.000	3,920.400	0.0	0.0	91.000
COMPOSITE AREA & WEIGHTED CN --->	(N/A)	25,700.400	(N/A)	(N/A)	81.678

Subsection: Runoff CN-Area
Label: PRE-POA 2 DA
Scenario: 1-year 24-hour

Return Event: 1 years
Storm Event: 1-year 24- Hour

Runoff Curve Number Data

Soil/Surface Description	CN	Area (ft^2)	C (%)	UC (%)	Adjusted CN
Open space (Lawns,parks etc.) - Good condition; grass cover > 75% - Soil D	80.000	3,920.400	0.0	0.0	80.000
COMPOSITE AREA & WEIGHTED CN --->	(N/A)	3,920.400	(N/A)	(N/A)	80.000

Subsection: Runoff CN-Area
Label: PRE-POA 3 DA
Scenario: 1-year 24-hour

Return Event: 1 years
Storm Event: 1-year 24- Hour

Runoff Curve Number Data

Soil/Surface Description	CN	Area (ft^2)	C (%)	UC (%)	Adjusted CN
Open space (Lawns,parks etc.) - Good condition; grass cover > 75% - Soil D	80.000	21,344.400	0.0	0.0	80.000
Impervious Areas - Gravel (w/ right-of-way) - Soil D	91.000	3,484.800	0.0	0.0	91.000
COMPOSITE AREA & WEIGHTED CN --->	(N/A)	24,829.200	(N/A)	(N/A)	81.544

Subsection: Time vs. Elevation
Label: UNDERGROUND DETENTION (OUT)
Scenario: 1 inch

Return Event: 1 years
Storm Event: 1 inch

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	427.24	427.24	427.24	427.24	427.24
0.250	427.24	427.24	427.24	427.24	427.24
0.500	427.24	427.24	427.24	427.24	427.24
0.750	427.24	427.24	427.24	427.24	427.24
1.000	427.24	427.24	427.24	427.24	427.24
1.250	427.24	427.24	427.24	427.24	427.24
1.500	427.24	427.24	427.24	427.24	427.24
1.750	427.24	427.24	427.24	427.24	427.24
2.000	427.24	427.24	427.24	427.24	427.24
2.250	427.24	427.24	427.24	427.24	427.24
2.500	427.24	427.24	427.24	427.24	427.24
2.750	427.24	427.24	427.24	427.24	427.24
3.000	427.24	427.24	427.24	427.24	427.24
3.250	427.24	427.24	427.24	427.24	427.24
3.500	427.24	427.24	427.24	427.24	427.24
3.750	427.24	427.24	427.24	427.24	427.24
4.000	427.24	427.24	427.24	427.24	427.24
4.250	427.24	427.24	427.24	427.24	427.24
4.500	427.24	427.24	427.24	427.24	427.24
4.750	427.24	427.24	427.24	427.24	427.24
5.000	427.24	427.24	427.24	427.24	427.24
5.250	427.24	427.24	427.24	427.24	427.24
5.500	427.24	427.24	427.24	427.24	427.24
5.750	427.25	427.25	427.25	427.25	427.25
6.000	427.25	427.25	427.25	427.25	427.25
6.250	427.25	427.25	427.25	427.25	427.25
6.500	427.25	427.25	427.25	427.25	427.25
6.750	427.25	427.25	427.25	427.25	427.26
7.000	427.26	427.26	427.26	427.26	427.26
7.250	427.26	427.26	427.26	427.26	427.26
7.500	427.26	427.26	427.26	427.26	427.26
7.750	427.26	427.26	427.27	427.27	427.27
8.000	427.27	427.27	427.27	427.27	427.27
8.250	427.27	427.27	427.27	427.27	427.27
8.500	427.27	427.27	427.28	427.28	427.28
8.750	427.28	427.28	427.28	427.28	427.28
9.000	427.28	427.29	427.29	427.29	427.29
9.250	427.29	427.29	427.29	427.29	427.30
9.500	427.30	427.30	427.30	427.30	427.30
9.750	427.30	427.30	427.30	427.31	427.31
10.000	427.31	427.31	427.31	427.31	427.32
10.250	427.32	427.32	427.32	427.33	427.33

Subsection: Time vs. Elevation
Label: UNDERGROUND DETENTION (OUT)
Scenario: 1 inch

Return Event: 1 years
Storm Event: 1 inch

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)
10.500	427.33	427.33	427.34	427.34	427.34
10.750	427.35	427.35	427.35	427.36	427.36
11.000	427.37	427.37	427.38	427.38	427.39
11.250	427.39	427.40	427.41	427.42	427.42
11.500	427.43	427.45	427.47	427.50	427.55
11.750	427.62	427.70	427.81	427.96	428.12
12.000	428.25	428.31	428.30	428.25	428.20
12.250	428.14	428.09	428.04	427.99	427.95
12.500	427.91	427.87	427.84	427.81	427.78
12.750	427.75	427.73	427.71	427.69	427.67
13.000	427.65	427.64	427.62	427.61	427.60
13.250	427.59	427.58	427.57	427.56	427.55
13.500	427.55	427.54	427.53	427.53	427.52
13.750	427.52	427.52	427.51	427.51	427.50
14.000	427.50	427.50	427.49	427.49	427.49
14.250	427.48	427.48	427.48	427.47	427.47
14.500	427.47	427.47	427.46	427.46	427.46
14.750	427.46	427.45	427.45	427.45	427.45
15.000	427.44	427.44	427.44	427.44	427.43
15.250	427.43	427.43	427.43	427.42	427.42
15.500	427.42	427.42	427.42	427.41	427.41
15.750	427.41	427.41	427.41	427.40	427.40
16.000	427.40	427.40	427.40	427.39	427.39
16.250	427.39	427.39	427.39	427.38	427.38
16.500	427.38	427.38	427.38	427.38	427.38
16.750	427.37	427.37	427.37	427.37	427.37
17.000	427.37	427.37	427.37	427.36	427.36
17.250	427.36	427.36	427.36	427.36	427.36
17.500	427.36	427.36	427.35	427.35	427.35
17.750	427.35	427.35	427.35	427.35	427.35
18.000	427.35	427.35	427.35	427.35	427.34
18.250	427.34	427.34	427.34	427.34	427.34
18.500	427.34	427.34	427.34	427.34	427.34
18.750	427.34	427.34	427.33	427.33	427.33
19.000	427.33	427.33	427.33	427.33	427.33
19.250	427.33	427.33	427.33	427.33	427.33
19.500	427.33	427.32	427.32	427.32	427.32
19.750	427.32	427.32	427.32	427.32	427.32
20.000	427.32	427.32	427.32	427.32	427.32
20.250	427.32	427.32	427.31	427.31	427.31
20.500	427.31	427.31	427.31	427.31	427.31
20.750	427.31	427.31	427.31	427.31	427.31

Subsection: Time vs. Elevation
Label: UNDERGROUND DETENTION (OUT)
Scenario: 1 inch

Return Event: 1 years
Storm Event: 1 inch

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)
21.000	427.31	427.31	427.31	427.31	427.31
21.250	427.31	427.31	427.31	427.31	427.31
21.500	427.31	427.31	427.31	427.31	427.30
21.750	427.30	427.30	427.30	427.30	427.30
22.000	427.30	427.30	427.30	427.30	427.30
22.250	427.30	427.30	427.30	427.30	427.30
22.500	427.30	427.30	427.30	427.30	427.30
22.750	427.30	427.30	427.30	427.30	427.30
23.000	427.30	427.30	427.30	427.30	427.30
23.250	427.30	427.30	427.30	427.30	427.30
23.500	427.30	427.30	427.30	427.30	427.30
23.750	427.30	427.30	427.30	427.30	427.30
24.000	427.30	(N/A)	(N/A)	(N/A)	(N/A)

Subsection: Time vs. Elevation
Label: UNDERGROUND DETENTION (OUT)
Scenario: 1-year 24-hour

Return Event: 1 years
Storm Event: 1-year 24- Hour

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	427.24	427.24	427.24	427.24	427.24
0.250	427.24	427.24	427.24	427.24	427.24
0.500	427.24	427.24	427.24	427.24	427.24
0.750	427.24	427.24	427.24	427.24	427.24
1.000	427.24	427.24	427.24	427.24	427.24
1.250	427.24	427.24	427.24	427.24	427.24
1.500	427.24	427.24	427.24	427.24	427.24
1.750	427.24	427.24	427.24	427.24	427.24
2.000	427.24	427.24	427.24	427.24	427.24
2.250	427.24	427.24	427.24	427.24	427.24
2.500	427.24	427.24	427.24	427.24	427.24
2.750	427.24	427.24	427.24	427.24	427.24
3.000	427.24	427.24	427.24	427.24	427.24
3.250	427.24	427.24	427.24	427.24	427.24
3.500	427.24	427.24	427.24	427.24	427.24
3.750	427.24	427.24	427.24	427.24	427.24
4.000	427.24	427.24	427.24	427.24	427.24
4.250	427.24	427.24	427.24	427.24	427.24
4.500	427.24	427.24	427.24	427.24	427.24
4.750	427.24	427.24	427.24	427.24	427.24
5.000	427.24	427.24	427.24	427.24	427.24
5.250	427.24	427.24	427.24	427.24	427.24
5.500	427.24	427.24	427.24	427.24	427.24
5.750	427.25	427.25	427.25	427.25	427.25
6.000	427.25	427.25	427.25	427.25	427.25
6.250	427.25	427.25	427.25	427.25	427.25
6.500	427.25	427.25	427.25	427.25	427.25
6.750	427.25	427.25	427.25	427.25	427.26
7.000	427.26	427.26	427.26	427.26	427.26
7.250	427.26	427.26	427.26	427.26	427.26
7.500	427.26	427.26	427.26	427.26	427.26
7.750	427.26	427.26	427.27	427.27	427.27
8.000	427.27	427.27	427.27	427.27	427.27
8.250	427.27	427.27	427.27	427.27	427.27
8.500	427.27	427.27	427.28	427.28	427.28
8.750	427.28	427.28	427.28	427.28	427.28
9.000	427.28	427.29	427.29	427.29	427.29
9.250	427.29	427.29	427.29	427.29	427.30
9.500	427.30	427.30	427.30	427.30	427.30
9.750	427.30	427.30	427.30	427.31	427.31
10.000	427.31	427.31	427.31	427.31	427.32
10.250	427.32	427.32	427.32	427.33	427.33

Subsection: Time vs. Elevation
Label: UNDERGROUND DETENTION (OUT)
Scenario: 1-year 24-hour

Return Event: 1 years
Storm Event: 1-year 24- Hour

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)
10.500	427.33	427.33	427.34	427.34	427.34
10.750	427.35	427.35	427.35	427.36	427.36
11.000	427.37	427.37	427.38	427.38	427.39
11.250	427.39	427.40	427.41	427.42	427.42
11.500	427.43	427.45	427.47	427.50	427.55
11.750	427.62	427.70	427.81	427.96	428.12
12.000	428.25	428.31	428.30	428.25	428.20
12.250	428.14	428.09	428.04	427.99	427.95
12.500	427.91	427.87	427.84	427.81	427.78
12.750	427.75	427.73	427.71	427.69	427.67
13.000	427.65	427.64	427.62	427.61	427.60
13.250	427.59	427.58	427.57	427.56	427.55
13.500	427.55	427.54	427.53	427.53	427.52
13.750	427.52	427.52	427.51	427.51	427.50
14.000	427.50	427.50	427.49	427.49	427.49
14.250	427.48	427.48	427.48	427.47	427.47
14.500	427.47	427.47	427.46	427.46	427.46
14.750	427.46	427.45	427.45	427.45	427.45
15.000	427.44	427.44	427.44	427.44	427.43
15.250	427.43	427.43	427.43	427.42	427.42
15.500	427.42	427.42	427.42	427.41	427.41
15.750	427.41	427.41	427.41	427.40	427.40
16.000	427.40	427.40	427.40	427.39	427.39
16.250	427.39	427.39	427.39	427.38	427.38
16.500	427.38	427.38	427.38	427.38	427.38
16.750	427.37	427.37	427.37	427.37	427.37
17.000	427.37	427.37	427.37	427.36	427.36
17.250	427.36	427.36	427.36	427.36	427.36
17.500	427.36	427.36	427.35	427.35	427.35
17.750	427.35	427.35	427.35	427.35	427.35
18.000	427.35	427.35	427.35	427.35	427.34
18.250	427.34	427.34	427.34	427.34	427.34
18.500	427.34	427.34	427.34	427.34	427.34
18.750	427.34	427.34	427.33	427.33	427.33
19.000	427.33	427.33	427.33	427.33	427.33
19.250	427.33	427.33	427.33	427.33	427.33
19.500	427.33	427.32	427.32	427.32	427.32
19.750	427.32	427.32	427.32	427.32	427.32
20.000	427.32	427.32	427.32	427.32	427.32
20.250	427.32	427.32	427.31	427.31	427.31
20.500	427.31	427.31	427.31	427.31	427.31
20.750	427.31	427.31	427.31	427.31	427.31

Subsection: Time vs. Elevation
Label: UNDERGROUND DETENTION (OUT)
Scenario: 1-year 24-hour

Return Event: 1 years
Storm Event: 1-year 24- Hour

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)
21.000	427.31	427.31	427.31	427.31	427.31
21.250	427.31	427.31	427.31	427.31	427.31
21.500	427.31	427.31	427.31	427.31	427.30
21.750	427.30	427.30	427.30	427.30	427.30
22.000	427.30	427.30	427.30	427.30	427.30
22.250	427.30	427.30	427.30	427.30	427.30
22.500	427.30	427.30	427.30	427.30	427.30
22.750	427.30	427.30	427.30	427.30	427.30
23.000	427.30	427.30	427.30	427.30	427.30
23.250	427.30	427.30	427.30	427.30	427.30
23.500	427.30	427.30	427.30	427.30	427.30
23.750	427.30	427.30	427.30	427.30	427.30
24.000	427.30	(N/A)	(N/A)	(N/A)	(N/A)

Subsection: Time vs. Elevation
Label: UNDERGROUND DETENTION (OUT)
Scenario: 10 Year

Return Event: 10 years
Storm Event: 10 Year

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	427.24	427.24	427.24	427.24	427.24
0.250	427.24	427.24	427.24	427.24	427.24
0.500	427.24	427.24	427.24	427.24	427.24
0.750	427.24	427.24	427.24	427.24	427.24
1.000	427.24	427.24	427.24	427.24	427.24
1.250	427.24	427.24	427.24	427.24	427.24
1.500	427.24	427.24	427.24	427.24	427.24
1.750	427.24	427.24	427.24	427.24	427.24
2.000	427.24	427.24	427.24	427.24	427.24
2.250	427.24	427.24	427.24	427.24	427.24
2.500	427.24	427.24	427.24	427.24	427.24
2.750	427.24	427.24	427.24	427.24	427.24
3.000	427.24	427.24	427.24	427.24	427.24
3.250	427.24	427.24	427.24	427.24	427.24
3.500	427.24	427.24	427.25	427.25	427.25
3.750	427.25	427.25	427.25	427.25	427.25
4.000	427.25	427.25	427.25	427.25	427.25
4.250	427.25	427.25	427.25	427.26	427.26
4.500	427.26	427.26	427.26	427.26	427.26
4.750	427.26	427.26	427.26	427.26	427.26
5.000	427.27	427.27	427.27	427.27	427.27
5.250	427.27	427.27	427.27	427.27	427.27
5.500	427.27	427.28	427.28	427.28	427.28
5.750	427.28	427.28	427.28	427.28	427.28
6.000	427.29	427.29	427.29	427.29	427.29
6.250	427.29	427.29	427.29	427.29	427.29
6.500	427.30	427.30	427.30	427.30	427.30
6.750	427.30	427.30	427.30	427.31	427.31
7.000	427.31	427.31	427.31	427.31	427.31
7.250	427.31	427.31	427.32	427.32	427.32
7.500	427.32	427.32	427.32	427.32	427.32
7.750	427.33	427.33	427.33	427.33	427.33
8.000	427.33	427.33	427.33	427.34	427.34
8.250	427.34	427.34	427.34	427.34	427.35
8.500	427.35	427.35	427.35	427.35	427.36
8.750	427.36	427.36	427.36	427.37	427.37
9.000	427.37	427.37	427.38	427.38	427.38
9.250	427.38	427.39	427.39	427.39	427.39
9.500	427.40	427.40	427.40	427.40	427.40
9.750	427.41	427.41	427.41	427.42	427.42
10.000	427.42	427.43	427.43	427.43	427.44
10.250	427.44	427.45	427.45	427.46	427.46

Subsection: Time vs. Elevation
Label: UNDERGROUND DETENTION (OUT)
Scenario: 10 Year

Return Event: 10 years
Storm Event: 10 Year

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)
10.500	427.47	427.47	427.48	427.49	427.49
10.750	427.50	427.51	427.51	427.52	427.53
11.000	427.53	427.54	427.55	427.56	427.56
11.250	427.57	427.58	427.59	427.60	427.62
11.500	427.63	427.65	427.68	427.74	427.82
11.750	427.94	428.10	428.31	428.49	428.55
12.000	428.54	428.48	428.39	428.32	428.28
12.250	428.24	428.21	428.17	428.13	428.09
12.500	428.05	428.01	427.98	427.94	427.91
12.750	427.89	427.86	427.83	427.81	427.79
13.000	427.77	427.75	427.74	427.72	427.71
13.250	427.69	427.68	427.67	427.66	427.65
13.500	427.64	427.63	427.62	427.62	427.61
13.750	427.60	427.59	427.59	427.58	427.58
14.000	427.57	427.57	427.56	427.56	427.55
14.250	427.55	427.55	427.54	427.54	427.54
14.500	427.54	427.53	427.53	427.53	427.53
14.750	427.52	427.52	427.52	427.52	427.52
15.000	427.52	427.51	427.51	427.51	427.51
15.250	427.51	427.51	427.51	427.51	427.50
15.500	427.50	427.50	427.50	427.50	427.50
15.750	427.50	427.49	427.49	427.49	427.49
16.000	427.49	427.49	427.48	427.48	427.48
16.250	427.48	427.48	427.48	427.47	427.47
16.500	427.47	427.47	427.47	427.47	427.46
16.750	427.46	427.46	427.46	427.46	427.46
17.000	427.46	427.45	427.45	427.45	427.45
17.250	427.45	427.45	427.45	427.44	427.44
17.500	427.44	427.44	427.44	427.44	427.44
17.750	427.44	427.43	427.43	427.43	427.43
18.000	427.43	427.43	427.43	427.43	427.42
18.250	427.42	427.42	427.42	427.42	427.42
18.500	427.42	427.42	427.41	427.41	427.41
18.750	427.41	427.41	427.41	427.41	427.41
19.000	427.41	427.40	427.40	427.40	427.40
19.250	427.40	427.40	427.40	427.40	427.39
19.500	427.39	427.39	427.39	427.39	427.39
19.750	427.39	427.39	427.39	427.38	427.38
20.000	427.38	427.38	427.38	427.38	427.38
20.250	427.38	427.38	427.38	427.37	427.37
20.500	427.37	427.37	427.37	427.37	427.37
20.750	427.37	427.37	427.37	427.37	427.37

Subsection: Time vs. Elevation
Label: UNDERGROUND DETENTION (OUT)
Scenario: 10 Year

Return Event: 10 years
Storm Event: 10 Year

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)
21.000	427.37	427.36	427.36	427.36	427.36
21.250	427.36	427.36	427.36	427.36	427.36
21.500	427.36	427.36	427.36	427.36	427.36
21.750	427.36	427.36	427.36	427.36	427.36
22.000	427.36	427.36	427.35	427.35	427.35
22.250	427.35	427.35	427.35	427.35	427.35
22.500	427.35	427.35	427.35	427.35	427.35
22.750	427.35	427.35	427.35	427.35	427.35
23.000	427.35	427.35	427.35	427.35	427.35
23.250	427.35	427.35	427.35	427.35	427.35
23.500	427.35	427.35	427.35	427.35	427.35
23.750	427.34	427.34	427.34	427.34	427.34
24.000	427.34	(N/A)	(N/A)	(N/A)	(N/A)

Subsection: Time vs. Elevation
Label: UNDERGROUND DETENTION (OUT)
Scenario: 25 Year

Return Event: 25 years
Storm Event: 25 Year

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	427.24	427.24	427.24	427.24	427.24
0.250	427.24	427.24	427.24	427.24	427.24
0.500	427.24	427.24	427.24	427.24	427.24
0.750	427.24	427.24	427.24	427.24	427.24
1.000	427.24	427.24	427.24	427.24	427.24
1.250	427.24	427.24	427.24	427.24	427.24
1.500	427.24	427.24	427.24	427.24	427.24
1.750	427.24	427.24	427.24	427.24	427.24
2.000	427.24	427.24	427.24	427.24	427.24
2.250	427.24	427.24	427.24	427.24	427.24
2.500	427.24	427.24	427.24	427.24	427.24
2.750	427.24	427.24	427.24	427.24	427.24
3.000	427.24	427.24	427.25	427.25	427.25
3.250	427.25	427.25	427.25	427.25	427.25
3.500	427.25	427.25	427.25	427.25	427.25
3.750	427.26	427.26	427.26	427.26	427.26
4.000	427.26	427.26	427.26	427.26	427.26
4.250	427.26	427.27	427.27	427.27	427.27
4.500	427.27	427.27	427.27	427.27	427.27
4.750	427.28	427.28	427.28	427.28	427.28
5.000	427.28	427.28	427.28	427.28	427.29
5.250	427.29	427.29	427.29	427.29	427.29
5.500	427.29	427.29	427.30	427.30	427.30
5.750	427.30	427.30	427.30	427.30	427.31
6.000	427.31	427.31	427.31	427.31	427.31
6.250	427.31	427.31	427.32	427.32	427.32
6.500	427.32	427.32	427.32	427.32	427.33
6.750	427.33	427.33	427.33	427.33	427.33
7.000	427.33	427.34	427.34	427.34	427.34
7.250	427.34	427.34	427.34	427.35	427.35
7.500	427.35	427.35	427.35	427.35	427.35
7.750	427.36	427.36	427.36	427.36	427.36
8.000	427.36	427.37	427.37	427.37	427.37
8.250	427.37	427.37	427.38	427.38	427.38
8.500	427.38	427.39	427.39	427.39	427.39
8.750	427.40	427.40	427.40	427.41	427.41
9.000	427.41	427.41	427.42	427.42	427.42
9.250	427.43	427.43	427.43	427.44	427.44
9.500	427.44	427.44	427.45	427.45	427.45
9.750	427.46	427.46	427.46	427.47	427.47
10.000	427.48	427.48	427.48	427.49	427.49
10.250	427.50	427.51	427.51	427.52	427.52

Subsection: Time vs. Elevation
Label: UNDERGROUND DETENTION (OUT)
Scenario: 25 Year

Return Event: 25 years
Storm Event: 25 Year

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)
10.500	427.53	427.53	427.54	427.54	427.55
10.750	427.55	427.56	427.56	427.57	427.58
11.000	427.58	427.59	427.60	427.61	427.61
11.250	427.62	427.64	427.65	427.66	427.67
11.500	427.69	427.71	427.75	427.82	427.92
11.750	428.07	428.26	428.44	428.57	428.62
12.000	428.60	428.53	428.42	428.34	428.30
12.250	428.27	428.24	428.21	428.18	428.14
12.500	428.10	428.07	428.03	428.00	427.97
12.750	427.94	427.91	427.89	427.86	427.84
13.000	427.82	427.80	427.78	427.77	427.75
13.250	427.74	427.72	427.71	427.70	427.69
13.500	427.68	427.67	427.66	427.65	427.64
13.750	427.64	427.63	427.62	427.62	427.61
14.000	427.60	427.60	427.59	427.59	427.58
14.250	427.58	427.57	427.57	427.57	427.56
14.500	427.56	427.56	427.56	427.55	427.55
14.750	427.55	427.55	427.54	427.54	427.54
15.000	427.54	427.54	427.53	427.53	427.53
15.250	427.53	427.53	427.53	427.52	427.52
15.500	427.52	427.52	427.52	427.52	427.52
15.750	427.51	427.51	427.51	427.51	427.51
16.000	427.51	427.51	427.50	427.50	427.50
16.250	427.50	427.50	427.50	427.50	427.50
16.500	427.50	427.49	427.49	427.49	427.49
16.750	427.49	427.49	427.49	427.49	427.49
17.000	427.48	427.48	427.48	427.48	427.48
17.250	427.48	427.48	427.48	427.48	427.47
17.500	427.47	427.47	427.47	427.47	427.47
17.750	427.47	427.47	427.46	427.46	427.46
18.000	427.46	427.46	427.46	427.46	427.46
18.250	427.45	427.45	427.45	427.45	427.45
18.500	427.45	427.45	427.45	427.44	427.44
18.750	427.44	427.44	427.44	427.44	427.44
19.000	427.44	427.43	427.43	427.43	427.43
19.250	427.43	427.43	427.43	427.43	427.42
19.500	427.42	427.42	427.42	427.42	427.42
19.750	427.42	427.41	427.41	427.41	427.41
20.000	427.41	427.41	427.41	427.41	427.40
20.250	427.40	427.40	427.40	427.40	427.40
20.500	427.40	427.40	427.40	427.40	427.39
20.750	427.39	427.39	427.39	427.39	427.39

Subsection: Time vs. Elevation
Label: UNDERGROUND DETENTION (OUT)
Scenario: 25 Year

Return Event: 25 years
Storm Event: 25 Year

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)
21.000	427.39	427.39	427.39	427.39	427.39
21.250	427.39	427.39	427.38	427.38	427.38
21.500	427.38	427.38	427.38	427.38	427.38
21.750	427.38	427.38	427.38	427.38	427.38
22.000	427.38	427.38	427.38	427.38	427.38
22.250	427.38	427.38	427.38	427.37	427.37
22.500	427.37	427.37	427.37	427.37	427.37
22.750	427.37	427.37	427.37	427.37	427.37
23.000	427.37	427.37	427.37	427.37	427.37
23.250	427.37	427.37	427.37	427.37	427.37
23.500	427.37	427.37	427.37	427.37	427.37
23.750	427.37	427.37	427.36	427.36	427.36
24.000	427.36	(N/A)	(N/A)	(N/A)	(N/A)

Subsection: Time vs. Elevation
Label: UNDERGROUND DETENTION (OUT)
Scenario: 100 Year

Return Event: 100 years
Storm Event: 100 Year

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	427.24	427.24	427.24	427.24	427.24
0.250	427.24	427.24	427.24	427.24	427.24
0.500	427.24	427.24	427.24	427.24	427.24
0.750	427.24	427.24	427.24	427.24	427.24
1.000	427.24	427.24	427.24	427.24	427.24
1.250	427.24	427.24	427.24	427.24	427.24
1.500	427.24	427.24	427.24	427.24	427.24
1.750	427.24	427.24	427.24	427.24	427.24
2.000	427.24	427.24	427.24	427.24	427.24
2.250	427.24	427.24	427.24	427.24	427.24
2.500	427.25	427.25	427.25	427.25	427.25
2.750	427.25	427.25	427.25	427.25	427.25
3.000	427.25	427.26	427.26	427.26	427.26
3.250	427.26	427.26	427.26	427.26	427.27
3.500	427.27	427.27	427.27	427.27	427.27
3.750	427.27	427.27	427.28	427.28	427.28
4.000	427.28	427.28	427.28	427.28	427.29
4.250	427.29	427.29	427.29	427.29	427.29
4.500	427.29	427.30	427.30	427.30	427.30
4.750	427.30	427.30	427.31	427.31	427.31
5.000	427.31	427.31	427.31	427.32	427.32
5.250	427.32	427.32	427.32	427.32	427.33
5.500	427.33	427.33	427.33	427.33	427.33
5.750	427.34	427.34	427.34	427.34	427.34
6.000	427.34	427.35	427.35	427.35	427.35
6.250	427.35	427.36	427.36	427.36	427.36
6.500	427.36	427.36	427.37	427.37	427.37
6.750	427.37	427.37	427.38	427.38	427.38
7.000	427.38	427.38	427.38	427.39	427.39
7.250	427.39	427.39	427.39	427.40	427.40
7.500	427.40	427.40	427.40	427.41	427.41
7.750	427.41	427.41	427.41	427.41	427.42
8.000	427.42	427.42	427.42	427.42	427.43
8.250	427.43	427.43	427.43	427.44	427.44
8.500	427.44	427.45	427.45	427.45	427.46
8.750	427.46	427.46	427.47	427.47	427.48
9.000	427.48	427.48	427.49	427.49	427.50
9.250	427.50	427.51	427.51	427.51	427.51
9.500	427.52	427.52	427.52	427.52	427.53
9.750	427.53	427.53	427.53	427.54	427.54
10.000	427.54	427.55	427.55	427.55	427.56
10.250	427.56	427.56	427.57	427.57	427.58

Subsection: Time vs. Elevation
Label: UNDERGROUND DETENTION (OUT)
Scenario: 100 Year

Return Event: 100 years
Storm Event: 100 Year

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)
10.500	427.58	427.59	427.59	427.60	427.60
10.750	427.61	427.62	427.62	427.63	427.64
11.000	427.65	427.66	427.66	427.67	427.69
11.250	427.70	427.71	427.73	427.74	427.76
11.500	427.78	427.80	427.86	427.95	428.08
11.750	428.27	428.44	428.55	428.67	428.73
12.000	428.70	428.61	428.47	428.37	428.32
12.250	428.31	428.29	428.27	428.25	428.22
12.500	428.18	428.15	428.12	428.08	428.05
12.750	428.02	427.99	427.97	427.94	427.92
13.000	427.90	427.88	427.86	427.84	427.82
13.250	427.81	427.79	427.78	427.77	427.75
13.500	427.74	427.73	427.72	427.71	427.70
13.750	427.69	427.68	427.68	427.67	427.66
14.000	427.65	427.65	427.64	427.63	427.63
14.250	427.62	427.62	427.61	427.61	427.61
14.500	427.60	427.60	427.60	427.59	427.59
14.750	427.59	427.58	427.58	427.58	427.58
15.000	427.57	427.57	427.57	427.57	427.57
15.250	427.56	427.56	427.56	427.56	427.56
15.500	427.55	427.55	427.55	427.55	427.55
15.750	427.54	427.54	427.54	427.54	427.54
16.000	427.54	427.53	427.53	427.53	427.53
16.250	427.53	427.53	427.52	427.52	427.52
16.500	427.52	427.52	427.52	427.52	427.52
16.750	427.52	427.52	427.51	427.51	427.51
17.000	427.51	427.51	427.51	427.51	427.51
17.250	427.51	427.51	427.51	427.51	427.51
17.500	427.51	427.50	427.50	427.50	427.50
17.750	427.50	427.50	427.50	427.50	427.50
18.000	427.50	427.50	427.50	427.50	427.50
18.250	427.50	427.49	427.49	427.49	427.49
18.500	427.49	427.49	427.49	427.49	427.49
18.750	427.49	427.48	427.48	427.48	427.48
19.000	427.48	427.48	427.48	427.48	427.47
19.250	427.47	427.47	427.47	427.47	427.47
19.500	427.47	427.46	427.46	427.46	427.46
19.750	427.46	427.46	427.46	427.45	427.45
20.000	427.45	427.45	427.45	427.45	427.45
20.250	427.44	427.44	427.44	427.44	427.44
20.500	427.44	427.44	427.44	427.43	427.43
20.750	427.43	427.43	427.43	427.43	427.43

Subsection: Time vs. Elevation
Label: UNDERGROUND DETENTION (OUT)
Scenario: 100 Year

Return Event: 100 years
Storm Event: 100 Year

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)
21.000	427.43	427.43	427.43	427.43	427.42
21.250	427.42	427.42	427.42	427.42	427.42
21.500	427.42	427.42	427.42	427.42	427.42
21.750	427.42	427.42	427.42	427.42	427.41
22.000	427.41	427.41	427.41	427.41	427.41
22.250	427.41	427.41	427.41	427.41	427.41
22.500	427.41	427.41	427.41	427.41	427.41
22.750	427.41	427.41	427.41	427.41	427.40
23.000	427.40	427.40	427.40	427.40	427.40
23.250	427.40	427.40	427.40	427.40	427.40
23.500	427.40	427.40	427.40	427.40	427.40
23.750	427.40	427.40	427.40	427.40	427.40
24.000	427.40	(N/A)	(N/A)	(N/A)	(N/A)

Subsection: Time vs. Volume
Label: UNDERGROUND DETENTION
Scenario: 1 inch

Return Event: 1 years
Storm Event: 1 inch

Time vs. Volume (ac-ft)

Output Time increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)
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	0.000	0.000
1.500	0.000	0.000	0.000	0.000	0.000
1.750	0.000	0.000	0.000	0.000	0.000
2.000	0.000	0.000	0.000	0.000	0.000
2.250	0.000	0.000	0.000	0.000	0.000
2.500	0.000	0.000	0.000	0.000	0.000
2.750	0.000	0.000	0.000	0.000	0.000
3.000	0.000	0.000	0.000	0.000	0.000
3.250	0.000	0.000	0.000	0.000	0.000
3.500	0.000	0.000	0.000	0.000	0.000
3.750	0.000	0.000	0.000	0.000	0.000
4.000	0.000	0.000	0.000	0.000	0.000
4.250	0.000	0.000	0.000	0.000	0.000
4.500	0.000	0.000	0.000	0.000	0.000
4.750	0.000	0.000	0.000	0.000	0.000
5.000	0.000	0.000	0.000	0.000	0.000
5.250	0.000	0.000	0.000	0.000	0.000
5.500	0.000	0.000	0.000	0.000	0.000
5.750	0.000	0.000	0.000	0.000	0.000
6.000	0.000	0.000	0.000	0.000	0.000
6.250	0.000	0.000	0.000	0.000	0.000
6.500	0.000	0.001	0.001	0.001	0.001
6.750	0.001	0.001	0.001	0.001	0.001
7.000	0.001	0.001	0.001	0.001	0.001
7.250	0.001	0.001	0.001	0.001	0.001
7.500	0.001	0.001	0.001	0.001	0.001
7.750	0.001	0.001	0.001	0.001	0.001
8.000	0.001	0.001	0.001	0.001	0.001
8.250	0.001	0.001	0.001	0.001	0.001
8.500	0.001	0.002	0.002	0.002	0.002
8.750	0.002	0.002	0.002	0.002	0.002
9.000	0.002	0.002	0.002	0.002	0.002
9.250	0.002	0.002	0.002	0.002	0.002
9.500	0.002	0.003	0.003	0.003	0.003
9.750	0.003	0.003	0.003	0.003	0.003
10.000	0.003	0.003	0.003	0.003	0.003
10.250	0.003	0.004	0.004	0.004	0.004

Subsection: Time vs. Volume
Label: UNDERGROUND DETENTION
Scenario: 1 inch

Return Event: 1 years
Storm Event: 1 inch

Time vs. Volume (ac-ft)

Output Time increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)
10.500	0.004	0.004	0.004	0.004	0.004
10.750	0.005	0.005	0.005	0.005	0.005
11.000	0.006	0.006	0.006	0.006	0.006
11.250	0.007	0.007	0.007	0.008	0.008
11.500	0.008	0.009	0.010	0.011	0.014
11.750	0.016	0.020	0.025	0.032	0.039
12.000	0.044	0.047	0.047	0.044	0.042
12.250	0.039	0.037	0.035	0.033	0.031
12.500	0.029	0.028	0.026	0.025	0.024
12.750	0.022	0.021	0.020	0.020	0.019
13.000	0.018	0.017	0.017	0.016	0.016
13.250	0.015	0.015	0.014	0.014	0.014
13.500	0.013	0.013	0.013	0.013	0.012
13.750	0.012	0.012	0.012	0.012	0.012
14.000	0.011	0.011	0.011	0.011	0.011
14.250	0.011	0.011	0.010	0.010	0.010
14.500	0.010	0.010	0.010	0.010	0.010
14.750	0.009	0.009	0.009	0.009	0.009
15.000	0.009	0.009	0.009	0.009	0.008
15.250	0.008	0.008	0.008	0.008	0.008
15.500	0.008	0.008	0.008	0.008	0.008
15.750	0.007	0.007	0.007	0.007	0.007
16.000	0.007	0.007	0.007	0.007	0.007
16.250	0.007	0.006	0.006	0.006	0.006
16.500	0.006	0.006	0.006	0.006	0.006
16.750	0.006	0.006	0.006	0.006	0.006
17.000	0.006	0.006	0.005	0.005	0.005
17.250	0.005	0.005	0.005	0.005	0.005
17.500	0.005	0.005	0.005	0.005	0.005
17.750	0.005	0.005	0.005	0.005	0.005
18.000	0.005	0.005	0.005	0.005	0.005
18.250	0.005	0.004	0.004	0.004	0.004
18.500	0.004	0.004	0.004	0.004	0.004
18.750	0.004	0.004	0.004	0.004	0.004
19.000	0.004	0.004	0.004	0.004	0.004
19.250	0.004	0.004	0.004	0.004	0.004
19.500	0.004	0.004	0.004	0.004	0.004
19.750	0.004	0.004	0.004	0.004	0.003
20.000	0.003	0.003	0.003	0.003	0.003
20.250	0.003	0.003	0.003	0.003	0.003
20.500	0.003	0.003	0.003	0.003	0.003
20.750	0.003	0.003	0.003	0.003	0.003

Subsection: Time vs. Volume
Label: UNDERGROUND DETENTION
Scenario: 1 inch

Return Event: 1 years
Storm Event: 1 inch

Time vs. Volume (ac-ft)

Output Time increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)
21.000	0.003	0.003	0.003	0.003	0.003
21.250	0.003	0.003	0.003	0.003	0.003
21.500	0.003	0.003	0.003	0.003	0.003
21.750	0.003	0.003	0.003	0.003	0.003
22.000	0.003	0.003	0.003	0.003	0.003
22.250	0.003	0.003	0.003	0.003	0.003
22.500	0.003	0.003	0.003	0.003	0.003
22.750	0.003	0.003	0.003	0.003	0.003
23.000	0.003	0.003	0.003	0.003	0.003
23.250	0.003	0.003	0.003	0.003	0.003
23.500	0.003	0.003	0.003	0.003	0.003
23.750	0.003	0.003	0.003	0.003	0.003
24.000	0.003	(N/A)	(N/A)	(N/A)	(N/A)

Subsection: Time vs. Volume
Label: UNDERGROUND DETENTION
Scenario: 1-year 24-hour

Return Event: 1 years
Storm Event: 1-year 24- Hour

Time vs. Volume (ac-ft)

Output Time increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)
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	0.000	0.000
1.500	0.000	0.000	0.000	0.000	0.000
1.750	0.000	0.000	0.000	0.000	0.000
2.000	0.000	0.000	0.000	0.000	0.000
2.250	0.000	0.000	0.000	0.000	0.000
2.500	0.000	0.000	0.000	0.000	0.000
2.750	0.000	0.000	0.000	0.000	0.000
3.000	0.000	0.000	0.000	0.000	0.000
3.250	0.000	0.000	0.000	0.000	0.000
3.500	0.000	0.000	0.000	0.000	0.000
3.750	0.000	0.000	0.000	0.000	0.000
4.000	0.000	0.000	0.000	0.000	0.000
4.250	0.000	0.000	0.000	0.000	0.000
4.500	0.000	0.000	0.000	0.000	0.000
4.750	0.000	0.000	0.000	0.000	0.000
5.000	0.000	0.000	0.000	0.000	0.000
5.250	0.000	0.000	0.000	0.000	0.000
5.500	0.000	0.000	0.000	0.000	0.000
5.750	0.000	0.000	0.000	0.000	0.000
6.000	0.000	0.000	0.000	0.000	0.000
6.250	0.000	0.000	0.000	0.000	0.000
6.500	0.000	0.001	0.001	0.001	0.001
6.750	0.001	0.001	0.001	0.001	0.001
7.000	0.001	0.001	0.001	0.001	0.001
7.250	0.001	0.001	0.001	0.001	0.001
7.500	0.001	0.001	0.001	0.001	0.001
7.750	0.001	0.001	0.001	0.001	0.001
8.000	0.001	0.001	0.001	0.001	0.001
8.250	0.001	0.001	0.001	0.001	0.001
8.500	0.001	0.002	0.002	0.002	0.002
8.750	0.002	0.002	0.002	0.002	0.002
9.000	0.002	0.002	0.002	0.002	0.002
9.250	0.002	0.002	0.002	0.002	0.002
9.500	0.002	0.003	0.003	0.003	0.003
9.750	0.003	0.003	0.003	0.003	0.003
10.000	0.003	0.003	0.003	0.003	0.003
10.250	0.003	0.004	0.004	0.004	0.004

Subsection: Time vs. Volume
Label: UNDERGROUND DETENTION
Scenario: 1-year 24-hour

Return Event: 1 years
Storm Event: 1-year 24- Hour

Time vs. Volume (ac-ft)

Output Time increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)
10.500	0.004	0.004	0.004	0.004	0.004
10.750	0.005	0.005	0.005	0.005	0.005
11.000	0.006	0.006	0.006	0.006	0.006
11.250	0.007	0.007	0.007	0.008	0.008
11.500	0.008	0.009	0.010	0.011	0.014
11.750	0.016	0.020	0.025	0.032	0.039
12.000	0.044	0.047	0.047	0.044	0.042
12.250	0.039	0.037	0.035	0.033	0.031
12.500	0.029	0.028	0.026	0.025	0.024
12.750	0.022	0.021	0.020	0.020	0.019
13.000	0.018	0.017	0.017	0.016	0.016
13.250	0.015	0.015	0.014	0.014	0.014
13.500	0.013	0.013	0.013	0.013	0.012
13.750	0.012	0.012	0.012	0.012	0.012
14.000	0.011	0.011	0.011	0.011	0.011
14.250	0.011	0.011	0.010	0.010	0.010
14.500	0.010	0.010	0.010	0.010	0.010
14.750	0.009	0.009	0.009	0.009	0.009
15.000	0.009	0.009	0.009	0.009	0.008
15.250	0.008	0.008	0.008	0.008	0.008
15.500	0.008	0.008	0.008	0.008	0.008
15.750	0.007	0.007	0.007	0.007	0.007
16.000	0.007	0.007	0.007	0.007	0.007
16.250	0.007	0.006	0.006	0.006	0.006
16.500	0.006	0.006	0.006	0.006	0.006
16.750	0.006	0.006	0.006	0.006	0.006
17.000	0.006	0.006	0.005	0.005	0.005
17.250	0.005	0.005	0.005	0.005	0.005
17.500	0.005	0.005	0.005	0.005	0.005
17.750	0.005	0.005	0.005	0.005	0.005
18.000	0.005	0.005	0.005	0.005	0.005
18.250	0.005	0.004	0.004	0.004	0.004
18.500	0.004	0.004	0.004	0.004	0.004
18.750	0.004	0.004	0.004	0.004	0.004
19.000	0.004	0.004	0.004	0.004	0.004
19.250	0.004	0.004	0.004	0.004	0.004
19.500	0.004	0.004	0.004	0.004	0.004
19.750	0.004	0.004	0.004	0.004	0.003
20.000	0.003	0.003	0.003	0.003	0.003
20.250	0.003	0.003	0.003	0.003	0.003
20.500	0.003	0.003	0.003	0.003	0.003
20.750	0.003	0.003	0.003	0.003	0.003

Subsection: Time vs. Volume
Label: UNDERGROUND DETENTION
Scenario: 1-year 24-hour

Return Event: 1 years
Storm Event: 1-year 24- Hour

Time vs. Volume (ac-ft)

Output Time increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)
21.000	0.003	0.003	0.003	0.003	0.003
21.250	0.003	0.003	0.003	0.003	0.003
21.500	0.003	0.003	0.003	0.003	0.003
21.750	0.003	0.003	0.003	0.003	0.003
22.000	0.003	0.003	0.003	0.003	0.003
22.250	0.003	0.003	0.003	0.003	0.003
22.500	0.003	0.003	0.003	0.003	0.003
22.750	0.003	0.003	0.003	0.003	0.003
23.000	0.003	0.003	0.003	0.003	0.003
23.250	0.003	0.003	0.003	0.003	0.003
23.500	0.003	0.003	0.003	0.003	0.003
23.750	0.003	0.003	0.003	0.003	0.003
24.000	0.003	(N/A)	(N/A)	(N/A)	(N/A)

Subsection: Time vs. Volume
Label: UNDERGROUND DETENTION
Scenario: 10 Year

Return Event: 10 years
Storm Event: 10 Year

Time vs. Volume (ac-ft)

Output Time increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)
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	0.000	0.000
1.500	0.000	0.000	0.000	0.000	0.000
1.750	0.000	0.000	0.000	0.000	0.000
2.000	0.000	0.000	0.000	0.000	0.000
2.250	0.000	0.000	0.000	0.000	0.000
2.500	0.000	0.000	0.000	0.000	0.000
2.750	0.000	0.000	0.000	0.000	0.000
3.000	0.000	0.000	0.000	0.000	0.000
3.250	0.000	0.000	0.000	0.000	0.000
3.500	0.000	0.000	0.000	0.000	0.000
3.750	0.000	0.000	0.000	0.000	0.000
4.000	0.000	0.000	0.000	0.001	0.001
4.250	0.001	0.001	0.001	0.001	0.001
4.500	0.001	0.001	0.001	0.001	0.001
4.750	0.001	0.001	0.001	0.001	0.001
5.000	0.001	0.001	0.001	0.001	0.001
5.250	0.001	0.001	0.001	0.001	0.001
5.500	0.002	0.002	0.002	0.002	0.002
5.750	0.002	0.002	0.002	0.002	0.002
6.000	0.002	0.002	0.002	0.002	0.002
6.250	0.002	0.002	0.002	0.002	0.002
6.500	0.002	0.003	0.003	0.003	0.003
6.750	0.003	0.003	0.003	0.003	0.003
7.000	0.003	0.003	0.003	0.003	0.003
7.250	0.003	0.003	0.003	0.003	0.003
7.500	0.003	0.004	0.004	0.004	0.004
7.750	0.004	0.004	0.004	0.004	0.004
8.000	0.004	0.004	0.004	0.004	0.004
8.250	0.004	0.004	0.004	0.005	0.005
8.500	0.005	0.005	0.005	0.005	0.005
8.750	0.005	0.005	0.005	0.005	0.006
9.000	0.006	0.006	0.006	0.006	0.006
9.250	0.006	0.006	0.006	0.007	0.007
9.500	0.007	0.007	0.007	0.007	0.007
9.750	0.007	0.007	0.008	0.008	0.008
10.000	0.008	0.008	0.008	0.008	0.009
10.250	0.009	0.009	0.009	0.010	0.010

Subsection: Time vs. Volume
Label: UNDERGROUND DETENTION
Scenario: 10 Year

Return Event: 10 years
Storm Event: 10 Year

Time vs. Volume (ac-ft)

Output Time increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)
10.500	0.010	0.010	0.010	0.011	0.011
10.750	0.011	0.012	0.012	0.012	0.013
11.000	0.013	0.013	0.014	0.014	0.014
11.250	0.015	0.015	0.015	0.016	0.016
11.500	0.017	0.018	0.019	0.022	0.026
11.750	0.031	0.038	0.047	0.055	0.057
12.000	0.057	0.054	0.050	0.047	0.046
12.250	0.044	0.042	0.041	0.039	0.037
12.500	0.036	0.034	0.032	0.031	0.029
12.750	0.028	0.027	0.026	0.025	0.024
13.000	0.023	0.023	0.022	0.021	0.020
13.250	0.020	0.019	0.019	0.018	0.018
13.500	0.018	0.017	0.017	0.016	0.016
13.750	0.016	0.016	0.015	0.015	0.015
14.000	0.015	0.014	0.014	0.014	0.014
14.250	0.014	0.013	0.013	0.013	0.013
14.500	0.013	0.013	0.013	0.013	0.013
14.750	0.012	0.012	0.012	0.012	0.012
15.000	0.012	0.012	0.012	0.012	0.012
15.250	0.012	0.012	0.012	0.012	0.012
15.500	0.012	0.011	0.011	0.011	0.011
15.750	0.011	0.011	0.011	0.011	0.011
16.000	0.011	0.011	0.011	0.011	0.011
16.250	0.010	0.010	0.010	0.010	0.010
16.500	0.010	0.010	0.010	0.010	0.010
16.750	0.010	0.010	0.010	0.010	0.010
17.000	0.009	0.009	0.009	0.009	0.009
17.250	0.009	0.009	0.009	0.009	0.009
17.500	0.009	0.009	0.009	0.009	0.009
17.750	0.009	0.008	0.008	0.008	0.008
18.000	0.008	0.008	0.008	0.008	0.008
18.250	0.008	0.008	0.008	0.008	0.008
18.500	0.008	0.008	0.008	0.008	0.008
18.750	0.008	0.007	0.007	0.007	0.007
19.000	0.007	0.007	0.007	0.007	0.007
19.250	0.007	0.007	0.007	0.007	0.007
19.500	0.007	0.007	0.007	0.007	0.007
19.750	0.006	0.006	0.006	0.006	0.006
20.000	0.006	0.006	0.006	0.006	0.006
20.250	0.006	0.006	0.006	0.006	0.006
20.500	0.006	0.006	0.006	0.006	0.006
20.750	0.006	0.006	0.006	0.006	0.006

Subsection: Time vs. Volume
Label: UNDERGROUND DETENTION
Scenario: 10 Year

Return Event: 10 years
Storm Event: 10 Year

Time vs. Volume (ac-ft)

Output Time increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)
21.000	0.005	0.005	0.005	0.005	0.005
21.250	0.005	0.005	0.005	0.005	0.005
21.500	0.005	0.005	0.005	0.005	0.005
21.750	0.005	0.005	0.005	0.005	0.005
22.000	0.005	0.005	0.005	0.005	0.005
22.250	0.005	0.005	0.005	0.005	0.005
22.500	0.005	0.005	0.005	0.005	0.005
22.750	0.005	0.005	0.005	0.005	0.005
23.000	0.005	0.005	0.005	0.005	0.005
23.250	0.005	0.005	0.005	0.005	0.005
23.500	0.005	0.005	0.005	0.005	0.005
23.750	0.005	0.005	0.005	0.005	0.005
24.000	0.005	(N/A)	(N/A)	(N/A)	(N/A)

Subsection: Time vs. Volume
Label: UNDERGROUND DETENTION
Scenario: 25 Year

Return Event: 25 years
Storm Event: 25 Year

Time vs. Volume (ac-ft)

Output Time increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)
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	0.000	0.000
1.500	0.000	0.000	0.000	0.000	0.000
1.750	0.000	0.000	0.000	0.000	0.000
2.000	0.000	0.000	0.000	0.000	0.000
2.250	0.000	0.000	0.000	0.000	0.000
2.500	0.000	0.000	0.000	0.000	0.000
2.750	0.000	0.000	0.000	0.000	0.000
3.000	0.000	0.000	0.000	0.000	0.000
3.250	0.000	0.000	0.000	0.000	0.000
3.500	0.000	0.001	0.001	0.001	0.001
3.750	0.001	0.001	0.001	0.001	0.001
4.000	0.001	0.001	0.001	0.001	0.001
4.250	0.001	0.001	0.001	0.001	0.001
4.500	0.001	0.001	0.001	0.001	0.001
4.750	0.002	0.002	0.002	0.002	0.002
5.000	0.002	0.002	0.002	0.002	0.002
5.250	0.002	0.002	0.002	0.002	0.002
5.500	0.002	0.002	0.002	0.003	0.003
5.750	0.003	0.003	0.003	0.003	0.003
6.000	0.003	0.003	0.003	0.003	0.003
6.250	0.003	0.003	0.003	0.003	0.003
6.500	0.004	0.004	0.004	0.004	0.004
6.750	0.004	0.004	0.004	0.004	0.004
7.000	0.004	0.004	0.004	0.004	0.004
7.250	0.004	0.005	0.005	0.005	0.005
7.500	0.005	0.005	0.005	0.005	0.005
7.750	0.005	0.005	0.005	0.005	0.005
8.000	0.005	0.005	0.006	0.006	0.006
8.250	0.006	0.006	0.006	0.006	0.006
8.500	0.006	0.006	0.006	0.007	0.007
8.750	0.007	0.007	0.007	0.007	0.007
9.000	0.008	0.008	0.008	0.008	0.008
9.250	0.008	0.008	0.008	0.009	0.009
9.500	0.009	0.009	0.009	0.009	0.009
9.750	0.010	0.010	0.010	0.010	0.010
10.000	0.010	0.011	0.011	0.011	0.011
10.250	0.011	0.012	0.012	0.012	0.012

Subsection: Time vs. Volume
Label: UNDERGROUND DETENTION
Scenario: 25 Year

Return Event: 25 years
Storm Event: 25 Year

Time vs. Volume (ac-ft)

Output Time increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)
10.500	0.013	0.013	0.013	0.013	0.013
10.750	0.014	0.014	0.014	0.014	0.015
11.000	0.015	0.015	0.016	0.016	0.016
11.250	0.017	0.017	0.018	0.018	0.019
11.500	0.020	0.021	0.022	0.025	0.030
11.750	0.036	0.045	0.052	0.058	0.060
12.000	0.060	0.056	0.052	0.048	0.046
12.250	0.045	0.044	0.042	0.041	0.039
12.500	0.038	0.036	0.035	0.033	0.032
12.750	0.031	0.029	0.028	0.027	0.026
13.000	0.025	0.025	0.024	0.023	0.022
13.250	0.022	0.021	0.021	0.020	0.020
13.500	0.019	0.019	0.018	0.018	0.018
13.750	0.017	0.017	0.017	0.016	0.016
14.000	0.016	0.016	0.015	0.015	0.015
14.250	0.015	0.015	0.014	0.014	0.014
14.500	0.014	0.014	0.014	0.014	0.014
14.750	0.013	0.013	0.013	0.013	0.013
15.000	0.013	0.013	0.013	0.013	0.013
15.250	0.013	0.013	0.013	0.012	0.012
15.500	0.012	0.012	0.012	0.012	0.012
15.750	0.012	0.012	0.012	0.012	0.012
16.000	0.012	0.012	0.012	0.012	0.011
16.250	0.011	0.011	0.011	0.011	0.011
16.500	0.011	0.011	0.011	0.011	0.011
16.750	0.011	0.011	0.011	0.011	0.011
17.000	0.011	0.011	0.011	0.011	0.011
17.250	0.010	0.010	0.010	0.010	0.010
17.500	0.010	0.010	0.010	0.010	0.010
17.750	0.010	0.010	0.010	0.010	0.010
18.000	0.010	0.010	0.010	0.010	0.009
18.250	0.009	0.009	0.009	0.009	0.009
18.500	0.009	0.009	0.009	0.009	0.009
18.750	0.009	0.009	0.009	0.009	0.009
19.000	0.009	0.009	0.008	0.008	0.008
19.250	0.008	0.008	0.008	0.008	0.008
19.500	0.008	0.008	0.008	0.008	0.008
19.750	0.008	0.008	0.008	0.008	0.007
20.000	0.007	0.007	0.007	0.007	0.007
20.250	0.007	0.007	0.007	0.007	0.007
20.500	0.007	0.007	0.007	0.007	0.007
20.750	0.007	0.007	0.007	0.007	0.007

Subsection: Time vs. Volume
Label: UNDERGROUND DETENTION
Scenario: 25 Year

Return Event: 25 years
Storm Event: 25 Year

Time vs. Volume (ac-ft)

Output Time increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)
21.000	0.007	0.007	0.006	0.006	0.006
21.250	0.006	0.006	0.006	0.006	0.006
21.500	0.006	0.006	0.006	0.006	0.006
21.750	0.006	0.006	0.006	0.006	0.006
22.000	0.006	0.006	0.006	0.006	0.006
22.250	0.006	0.006	0.006	0.006	0.006
22.500	0.006	0.006	0.006	0.006	0.006
22.750	0.006	0.006	0.006	0.006	0.006
23.000	0.006	0.006	0.006	0.006	0.006
23.250	0.006	0.006	0.006	0.006	0.006
23.500	0.006	0.006	0.006	0.006	0.006
23.750	0.005	0.005	0.005	0.005	0.005
24.000	0.005	(N/A)	(N/A)	(N/A)	(N/A)

Subsection: Time vs. Volume
Label: UNDERGROUND DETENTION
Scenario: 100 Year

Return Event: 100 years
Storm Event: 100 Year

Time vs. Volume (ac-ft)

Output Time increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)
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	0.000	0.000
1.500	0.000	0.000	0.000	0.000	0.000
1.750	0.000	0.000	0.000	0.000	0.000
2.000	0.000	0.000	0.000	0.000	0.000
2.250	0.000	0.000	0.000	0.000	0.000
2.500	0.000	0.000	0.000	0.000	0.000
2.750	0.000	0.000	0.000	0.001	0.001
3.000	0.001	0.001	0.001	0.001	0.001
3.250	0.001	0.001	0.001	0.001	0.001
3.500	0.001	0.001	0.001	0.001	0.001
3.750	0.001	0.002	0.002	0.002	0.002
4.000	0.002	0.002	0.002	0.002	0.002
4.250	0.002	0.002	0.002	0.002	0.002
4.500	0.002	0.002	0.003	0.003	0.003
4.750	0.003	0.003	0.003	0.003	0.003
5.000	0.003	0.003	0.003	0.003	0.003
5.250	0.003	0.004	0.004	0.004	0.004
5.500	0.004	0.004	0.004	0.004	0.004
5.750	0.004	0.004	0.004	0.004	0.005
6.000	0.005	0.005	0.005	0.005	0.005
6.250	0.005	0.005	0.005	0.005	0.005
6.500	0.005	0.005	0.006	0.006	0.006
6.750	0.006	0.006	0.006	0.006	0.006
7.000	0.006	0.006	0.006	0.006	0.007
7.250	0.007	0.007	0.007	0.007	0.007
7.500	0.007	0.007	0.007	0.007	0.007
7.750	0.007	0.007	0.008	0.008	0.008
8.000	0.008	0.008	0.008	0.008	0.008
8.250	0.008	0.008	0.008	0.009	0.009
8.500	0.009	0.009	0.009	0.009	0.009
8.750	0.010	0.010	0.010	0.010	0.010
9.000	0.011	0.011	0.011	0.011	0.011
9.250	0.011	0.012	0.012	0.012	0.012
9.500	0.012	0.012	0.012	0.012	0.013
9.750	0.013	0.013	0.013	0.013	0.013
10.000	0.013	0.013	0.014	0.014	0.014
10.250	0.014	0.014	0.014	0.015	0.015

Subsection: Time vs. Volume
Label: UNDERGROUND DETENTION
Scenario: 100 Year

Return Event: 100 years
Storm Event: 100 Year

Time vs. Volume (ac-ft)

Output Time increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)
10.500	0.015	0.015	0.015	0.016	0.016
10.750	0.016	0.017	0.017	0.017	0.017
11.000	0.018	0.018	0.019	0.019	0.020
11.250	0.020	0.021	0.021	0.022	0.023
11.500	0.023	0.025	0.027	0.031	0.037
11.750	0.045	0.052	0.058	0.063	0.065
12.000	0.064	0.060	0.054	0.049	0.047
12.250	0.047	0.046	0.045	0.044	0.043
12.500	0.041	0.040	0.038	0.037	0.036
12.750	0.034	0.033	0.032	0.031	0.030
13.000	0.029	0.028	0.027	0.026	0.026
13.250	0.025	0.024	0.024	0.023	0.023
13.500	0.022	0.022	0.021	0.021	0.020
13.750	0.020	0.019	0.019	0.019	0.018
14.000	0.018	0.018	0.018	0.017	0.017
14.250	0.017	0.017	0.016	0.016	0.016
14.500	0.016	0.016	0.016	0.015	0.015
14.750	0.015	0.015	0.015	0.015	0.015
15.000	0.015	0.015	0.014	0.014	0.014
15.250	0.014	0.014	0.014	0.014	0.014
15.500	0.014	0.014	0.014	0.013	0.013
15.750	0.013	0.013	0.013	0.013	0.013
16.000	0.013	0.013	0.013	0.013	0.013
16.250	0.013	0.013	0.012	0.012	0.012
16.500	0.012	0.012	0.012	0.012	0.012
16.750	0.012	0.012	0.012	0.012	0.012
17.000	0.012	0.012	0.012	0.012	0.012
17.250	0.012	0.012	0.012	0.012	0.012
17.500	0.012	0.012	0.012	0.012	0.012
17.750	0.012	0.011	0.011	0.011	0.011
18.000	0.011	0.011	0.011	0.011	0.011
18.250	0.011	0.011	0.011	0.011	0.011
18.500	0.011	0.011	0.011	0.011	0.011
18.750	0.011	0.011	0.011	0.011	0.011
19.000	0.010	0.010	0.010	0.010	0.010
19.250	0.010	0.010	0.010	0.010	0.010
19.500	0.010	0.010	0.010	0.010	0.010
19.750	0.010	0.010	0.009	0.009	0.009
20.000	0.009	0.009	0.009	0.009	0.009
20.250	0.009	0.009	0.009	0.009	0.009
20.500	0.009	0.009	0.009	0.009	0.008
20.750	0.008	0.008	0.008	0.008	0.008

Subsection: Time vs. Volume
Label: UNDERGROUND DETENTION
Scenario: 100 Year

Return Event: 100 years
Storm Event: 100 Year

Time vs. Volume (ac-ft)

Output Time increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)
21.000	0.008	0.008	0.008	0.008	0.008
21.250	0.008	0.008	0.008	0.008	0.008
21.500	0.008	0.008	0.008	0.008	0.008
21.750	0.008	0.008	0.008	0.008	0.008
22.000	0.008	0.008	0.008	0.008	0.008
22.250	0.008	0.007	0.007	0.007	0.007
22.500	0.007	0.007	0.007	0.007	0.007
22.750	0.007	0.007	0.007	0.007	0.007
23.000	0.007	0.007	0.007	0.007	0.007
23.250	0.007	0.007	0.007	0.007	0.007
23.500	0.007	0.007	0.007	0.007	0.007
23.750	0.007	0.007	0.007	0.007	0.007
24.000	0.007	(N/A)	(N/A)	(N/A)	(N/A)

Subsection: Elevation-Area Volume Curve
Label: UNDERGROUND DETENTION
Scenario: 1 inch

Return Event: 1 years
Storm Event: 1 inch

Elevation (ft)	Planimeter (ft²)	Area (ft²)	A1+A2+sqr (A1*A2) (ft²)	Volume (ac-ft)	Volume (Total) (ac-ft)
427.24	0.0	1,908.000	0.000	0.000	0.000
427.74	0.0	1,908.000	5,724.000	0.022	0.022
428.24	0.0	1,908.000	5,724.000	0.022	0.044
428.74	0.0	1,908.000	5,724.000	0.022	0.066

Subsection: Elevation-Area Volume Curve
Label: UNDERGROUND DETENTION
Scenario: 1-year 24-hour

Return Event: 1 years
Storm Event: 1-year 24- Hour

Elevation (ft)	Planimeter (ft²)	Area (ft²)	A1+A2+sqr (A1*A2) (ft²)	Volume (ac-ft)	Volume (Total) (ac-ft)
427.24	0.0	1,908.000	0.000	0.000	0.000
427.74	0.0	1,908.000	5,724.000	0.022	0.022
428.24	0.0	1,908.000	5,724.000	0.022	0.044
428.74	0.0	1,908.000	5,724.000	0.022	0.066

Subsection: Elevation-Area Volume Curve
Label: UNDERGROUND DETENTION
Scenario: 10 Year

Return Event: 10 years
Storm Event: 10 Year

Elevation (ft)	Planimeter (ft²)	Area (ft²)	A1+A2+sqr (A1*A2) (ft²)	Volume (ac-ft)	Volume (Total) (ac-ft)
427.24	0.0	1,908.000	0.000	0.000	0.000
427.74	0.0	1,908.000	5,724.000	0.022	0.022
428.24	0.0	1,908.000	5,724.000	0.022	0.044
428.74	0.0	1,908.000	5,724.000	0.022	0.066

Subsection: Elevation-Area Volume Curve
Label: UNDERGROUND DETENTION
Scenario: 25 Year

Return Event: 25 years
Storm Event: 25 Year

Elevation (ft)	Planimeter (ft²)	Area (ft²)	A1+A2+sqr (A1*A2) (ft²)	Volume (ac-ft)	Volume (Total) (ac-ft)
427.24	0.0	1,908.000	0.000	0.000	0.000
427.74	0.0	1,908.000	5,724.000	0.022	0.022
428.24	0.0	1,908.000	5,724.000	0.022	0.044
428.74	0.0	1,908.000	5,724.000	0.022	0.066

Subsection: Elevation-Area Volume Curve
Label: UNDERGROUND DETENTION
Scenario: 100 Year

Return Event: 100 years
Storm Event: 100 Year

Elevation (ft)	Planimeter (ft²)	Area (ft²)	A1+A2+sqr (A1*A2) (ft²)	Volume (ac-ft)	Volume (Total) (ac-ft)
427.24	0.0	1,908.000	0.000	0.000	0.000
427.74	0.0	1,908.000	5,724.000	0.022	0.022
428.24	0.0	1,908.000	5,724.000	0.022	0.044
428.74	0.0	1,908.000	5,724.000	0.022	0.066

Requested Pond Water Surface Elevations	
Minimum (Headwater)	427.24 ft
Increment (Headwater)	0.50 ft
Maximum (Headwater)	428.74 ft

Outlet Connectivity

Structure Type	Outlet ID	Direction	Outfall	E1 (ft)	E2 (ft)
Orifice-Circular	Orifice - 1	Forward	TW	427.24	428.74
Orifice-Circular	Orifice - 2	Forward	TW	427.50	428.74
Rectangular Weir	Weir - 1	Forward	TW	428.31	428.74
Tailwater Settings	Tailwater			(N/A)	(N/A)

Structure ID: Orifice - 1 Structure Type: Orifice-Circular	
Number of Openings	1
Elevation	427.24 ft
Orifice Diameter	4.5 in
Orifice Coefficient	0.600

Structure ID: Orifice - 2 Structure Type: Orifice-Circular	
Number of Openings	1
Elevation	427.50 ft
Orifice Diameter	5.5 in
Orifice Coefficient	0.600

Structure ID: Weir - 1 Structure Type: Rectangular Weir	
Number of Openings	1
Elevation	428.31 ft
Weir Length	7.00 ft
Weir Coefficient	3.00 (ft^0.5)/s

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 ft³/s
Flow Tolerance (Maximum)	10.000 ft³/s

Subsection: Outlet Input Data
Label: Composite Outlet Structure - 1
Scenario: 1-year 24-hour

Return Event: 1 years
Storm Event: 1-year 24- Hour

Requested Pond Water Surface Elevations	
Minimum (Headwater)	427.24 ft
Increment (Headwater)	0.50 ft
Maximum (Headwater)	428.74 ft

Outlet Connectivity

Structure Type	Outlet ID	Direction	Outfall	E1 (ft)	E2 (ft)
Orifice-Circular	Orifice - 1	Forward	TW	427.24	428.74
Orifice-Circular	Orifice - 2	Forward	TW	427.50	428.74
Rectangular Weir	Weir - 1	Forward	TW	428.31	428.74
Tailwater Settings	Tailwater			(N/A)	(N/A)

Structure ID: Orifice - 1 Structure Type: Orifice-Circular	
Number of Openings	1
Elevation	427.24 ft
Orifice Diameter	4.5 in
Orifice Coefficient	0.600

Structure ID: Orifice - 2 Structure Type: Orifice-Circular	
Number of Openings	1
Elevation	427.50 ft
Orifice Diameter	5.5 in
Orifice Coefficient	0.600

Structure ID: Weir - 1 Structure Type: Rectangular Weir	
Number of Openings	1
Elevation	428.31 ft
Weir Length	7.00 ft
Weir Coefficient	3.00 (ft^0.5)/s

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 ft³/s
Flow Tolerance (Maximum)	10.000 ft³/s

Requested Pond Water Surface Elevations	
Minimum (Headwater)	427.24 ft
Increment (Headwater)	0.50 ft
Maximum (Headwater)	428.74 ft

Outlet Connectivity

Structure Type	Outlet ID	Direction	Outfall	E1 (ft)	E2 (ft)
Orifice-Circular	Orifice - 1	Forward	TW	427.24	428.74
Orifice-Circular	Orifice - 2	Forward	TW	427.50	428.74
Rectangular Weir	Weir - 1	Forward	TW	428.31	428.74
Tailwater Settings	Tailwater			(N/A)	(N/A)

Structure ID: Orifice - 1 Structure Type: Orifice-Circular	
Number of Openings	1
Elevation	427.24 ft
Orifice Diameter	4.5 in
Orifice Coefficient	0.600

Structure ID: Orifice - 2 Structure Type: Orifice-Circular	
Number of Openings	1
Elevation	427.50 ft
Orifice Diameter	5.5 in
Orifice Coefficient	0.600

Structure ID: Weir - 1 Structure Type: Rectangular Weir	
Number of Openings	1
Elevation	428.31 ft
Weir Length	7.00 ft
Weir Coefficient	3.00 (ft^0.5)/s

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 ft³/s
Flow Tolerance (Maximum)	10.000 ft³/s

Subsection: Outlet Input Data
Label: Composite Outlet Structure - 1
Scenario: 25 Year

Return Event: 25 years
Storm Event: 25 Year

Requested Pond Water Surface Elevations	
Minimum (Headwater)	427.24 ft
Increment (Headwater)	0.50 ft
Maximum (Headwater)	428.74 ft

Outlet Connectivity

Structure Type	Outlet ID	Direction	Outfall	E1 (ft)	E2 (ft)
Orifice-Circular	Orifice - 1	Forward	TW	427.24	428.74
Orifice-Circular	Orifice - 2	Forward	TW	427.50	428.74
Rectangular Weir	Weir - 1	Forward	TW	428.31	428.74
Tailwater Settings	Tailwater			(N/A)	(N/A)

Structure ID: Orifice - 1 Structure Type: Orifice-Circular	
Number of Openings	1
Elevation	427.24 ft
Orifice Diameter	4.5 in
Orifice Coefficient	0.600

Structure ID: Orifice - 2 Structure Type: Orifice-Circular	
Number of Openings	1
Elevation	427.50 ft
Orifice Diameter	5.5 in
Orifice Coefficient	0.600

Structure ID: Weir - 1 Structure Type: Rectangular Weir	
Number of Openings	1
Elevation	428.31 ft
Weir Length	7.00 ft
Weir Coefficient	3.00 (ft^0.5)/s

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 ft³/s
Flow Tolerance (Maximum)	10.000 ft³/s

Subsection: Outlet Input Data
Label: Composite Outlet Structure - 1
Scenario: 100 Year

Return Event: 100 years
Storm Event: 100 Year

Requested Pond Water Surface Elevations	
Minimum (Headwater)	427.24 ft
Increment (Headwater)	0.50 ft
Maximum (Headwater)	428.74 ft

Outlet Connectivity

Structure Type	Outlet ID	Direction	Outfall	E1 (ft)	E2 (ft)
Orifice-Circular	Orifice - 1	Forward	TW	427.24	428.74
Orifice-Circular	Orifice - 2	Forward	TW	427.50	428.74
Rectangular Weir	Weir - 1	Forward	TW	428.31	428.74
Tailwater Settings	Tailwater			(N/A)	(N/A)

Structure ID: Orifice - 1 Structure Type: Orifice-Circular	
Number of Openings	1
Elevation	427.24 ft
Orifice Diameter	4.5 in
Orifice Coefficient	0.600

Structure ID: Orifice - 2 Structure Type: Orifice-Circular	
Number of Openings	1
Elevation	427.50 ft
Orifice Diameter	5.5 in
Orifice Coefficient	0.600

Structure ID: Weir - 1 Structure Type: Rectangular Weir	
Number of Openings	1
Elevation	428.31 ft
Weir Length	7.00 ft
Weir Coefficient	3.00 (ft^0.5)/s

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 ft³/s
Flow Tolerance (Maximum)	10.000 ft³/s

Subsection: Elevation-Volume-Flow Table (Pond)
Label: UNDERGROUND DETENTION
Scenario: 1 inch

Return Event: 1 years
Storm Event: 1 inch

Infiltration	
Infiltration Method (Computed)	No Infiltration

Initial Conditions	
Elevation (Water Surface, Initial)	427.24 ft
Volume (Initial)	0.000 ac-ft
Flow (Initial Outlet)	0.00 ft³/s
Flow (Initial Infiltration)	0.00 ft³/s
Flow (Initial, Total)	0.00 ft³/s
Time Increment	0.050 hours

Elevation (ft)	Outflow (ft³/s)	Storage (ac-ft)	Area (ft²)	Infiltration (ft³/s)	Flow (Total) (ft³/s)	2S/t + O (ft³/s)
427.24	0.00	0.000	1,908.000	0.00	0.00	0.00
427.50	0.12	0.011	1,908.000	0.00	0.12	5.63
427.74	0.42	0.022	1,908.000	0.00	0.42	11.02
428.24	1.05	0.044	1,908.000	0.00	1.05	22.25
428.31	1.10	0.047	1,908.000	0.00	1.10	23.79
428.74	7.33	0.066	1,908.000	0.00	7.33	39.13

Subsection: Elevation-Volume-Flow Table (Pond)
Label: UNDERGROUND DETENTION
Scenario: 1-year 24-hour

Return Event: 1 years
Storm Event: 1-year 24- Hour

Infiltration	
Infiltration Method (Computed)	No Infiltration

Initial Conditions	
Elevation (Water Surface, Initial)	427.24 ft
Volume (Initial)	0.000 ac-ft
Flow (Initial Outlet)	0.00 ft³/s
Flow (Initial Infiltration)	0.00 ft³/s
Flow (Initial, Total)	0.00 ft³/s
Time Increment	0.050 hours

Elevation (ft)	Outflow (ft³/s)	Storage (ac-ft)	Area (ft²)	Infiltration (ft³/s)	Flow (Total) (ft³/s)	2S/t + O (ft³/s)
427.24	0.00	0.000	1,908.000	0.00	0.00	0.00
427.50	0.12	0.011	1,908.000	0.00	0.12	5.63
427.74	0.42	0.022	1,908.000	0.00	0.42	11.02
428.24	1.05	0.044	1,908.000	0.00	1.05	22.25
428.31	1.10	0.047	1,908.000	0.00	1.10	23.79
428.74	7.33	0.066	1,908.000	0.00	7.33	39.13

Subsection: Elevation-Volume-Flow Table (Pond)
Label: UNDERGROUND DETENTION
Scenario: 10 Year

Return Event: 10 years
Storm Event: 10 Year

Infiltration	
Infiltration Method (Computed)	No Infiltration

Initial Conditions	
Elevation (Water Surface, Initial)	427.24 ft
Volume (Initial)	0.000 ac-ft
Flow (Initial Outlet)	0.00 ft³/s
Flow (Initial Infiltration)	0.00 ft³/s
Flow (Initial, Total)	0.00 ft³/s
Time Increment	0.050 hours

Elevation (ft)	Outflow (ft³/s)	Storage (ac-ft)	Area (ft²)	Infiltration (ft³/s)	Flow (Total) (ft³/s)	2S/t + O (ft³/s)
427.24	0.00	0.000	1,908.000	0.00	0.00	0.00
427.50	0.12	0.011	1,908.000	0.00	0.12	5.63
427.74	0.42	0.022	1,908.000	0.00	0.42	11.02
428.24	1.05	0.044	1,908.000	0.00	1.05	22.25
428.31	1.10	0.047	1,908.000	0.00	1.10	23.79
428.74	7.33	0.066	1,908.000	0.00	7.33	39.13

Subsection: Elevation-Volume-Flow Table (Pond)
Label: UNDERGROUND DETENTION
Scenario: 25 Year

Return Event: 25 years
Storm Event: 25 Year

Infiltration	
Infiltration Method (Computed)	No Infiltration

Initial Conditions	
Elevation (Water Surface, Initial)	427.24 ft
Volume (Initial)	0.000 ac-ft
Flow (Initial Outlet)	0.00 ft³/s
Flow (Initial Infiltration)	0.00 ft³/s
Flow (Initial, Total)	0.00 ft³/s
Time Increment	0.050 hours

Elevation (ft)	Outflow (ft³/s)	Storage (ac-ft)	Area (ft²)	Infiltration (ft³/s)	Flow (Total) (ft³/s)	2S/t + O (ft³/s)
427.24	0.00	0.000	1,908.000	0.00	0.00	0.00
427.50	0.12	0.011	1,908.000	0.00	0.12	5.63
427.74	0.42	0.022	1,908.000	0.00	0.42	11.02
428.24	1.05	0.044	1,908.000	0.00	1.05	22.25
428.31	1.10	0.047	1,908.000	0.00	1.10	23.79
428.74	7.33	0.066	1,908.000	0.00	7.33	39.13

Subsection: Elevation-Volume-Flow Table (Pond)
Label: UNDERGROUND DETENTION
Scenario: 100 Year

Return Event: 100 years
Storm Event: 100 Year

Infiltration	
Infiltration Method (Computed)	No Infiltration

Initial Conditions	
Elevation (Water Surface, Initial)	427.24 ft
Volume (Initial)	0.000 ac-ft
Flow (Initial Outlet)	0.00 ft³/s
Flow (Initial Infiltration)	0.00 ft³/s
Flow (Initial, Total)	0.00 ft³/s
Time Increment	0.050 hours

Elevation (ft)	Outflow (ft³/s)	Storage (ac-ft)	Area (ft²)	Infiltration (ft³/s)	Flow (Total) (ft³/s)	2S/t + O (ft³/s)
427.24	0.00	0.000	1,908.000	0.00	0.00	0.00
427.50	0.12	0.011	1,908.000	0.00	0.12	5.63
427.74	0.42	0.022	1,908.000	0.00	0.42	11.02
428.24	1.05	0.044	1,908.000	0.00	1.05	22.25
428.31	1.10	0.047	1,908.000	0.00	1.10	23.79
428.74	7.33	0.066	1,908.000	0.00	7.33	39.13

Kimley»Horn

Bioretention Area 1 Water Quality Calculations

Project Information

Project Name:	Rolesville Learning Center		
KHA Project #:	013031004		
Designed by:	MBD	Date:	2/28/2024
Checked by:	COB	Date:	2/28/2024

Design Resource:

NCDENR - Stormwater Best Management Practices (July 2007)
NCDENR - Updated Draft Manual of Stormwater Best Management Practices (July 2007)

Site Information

Sub Area Location:	Drainage Area to Bioretention		
Drainage Area (DA) =	0.810	Acres	
Impervious Area (IA) =	0.570	Acres	
Percent Impervious (I) =	70.4	%	
		of	

Required Storage Volume (Water Quality):

Design Storm =	1.0	inch	
Determine Rv Value =	0.05 + .009 (I) =	0.68	in/in
Design Storm Storage Volume =	2,009	cf	
Storage Volume Required =	2,009	cf	

Total Wetland Storage Volume (Water Quality):

	Elevation	Contour Area	Incremental Volume	Accumulated Volume	Stage, Z
		sq ft	cu ft	cu ft	ft
Bottom Elevation =	427.11	2,084	0	0	0.00
Weir Elevation =	428.11	2,492	2,288	2,288	1.00
	429.11	2,939	2,716	5,004	2.00

2,288 **>** **2,009** **OK**

Total Bioretention Drawdown Time:

Soil Media Infiltration Rate (I_t)=	2.00	in/hr	
Drawdown Time of Ponded Volume (Depth/I_t) =	6.00	hr	(Max 12 hours, OK)
Drawdown Time 2' Below Surface (Depth/I_t)+(24/I_r)=	18.00	hr	(Min 12 hours, Max 48 hours, OK)

Underdrain Sizing:

Flow into Underdrains (Ir / 12) * (2492/60/60) =	0.12	cfs
Factor of Safety (SF=2-10) =	10	
Underdrain Design Flow (Q=Flow*SF) =	1.15	cfs
Pipe Slope (S) =	0.10	%
Diameter of Underdrain Pipes (D) =	4.79	in
# of 6" pipes =	2	

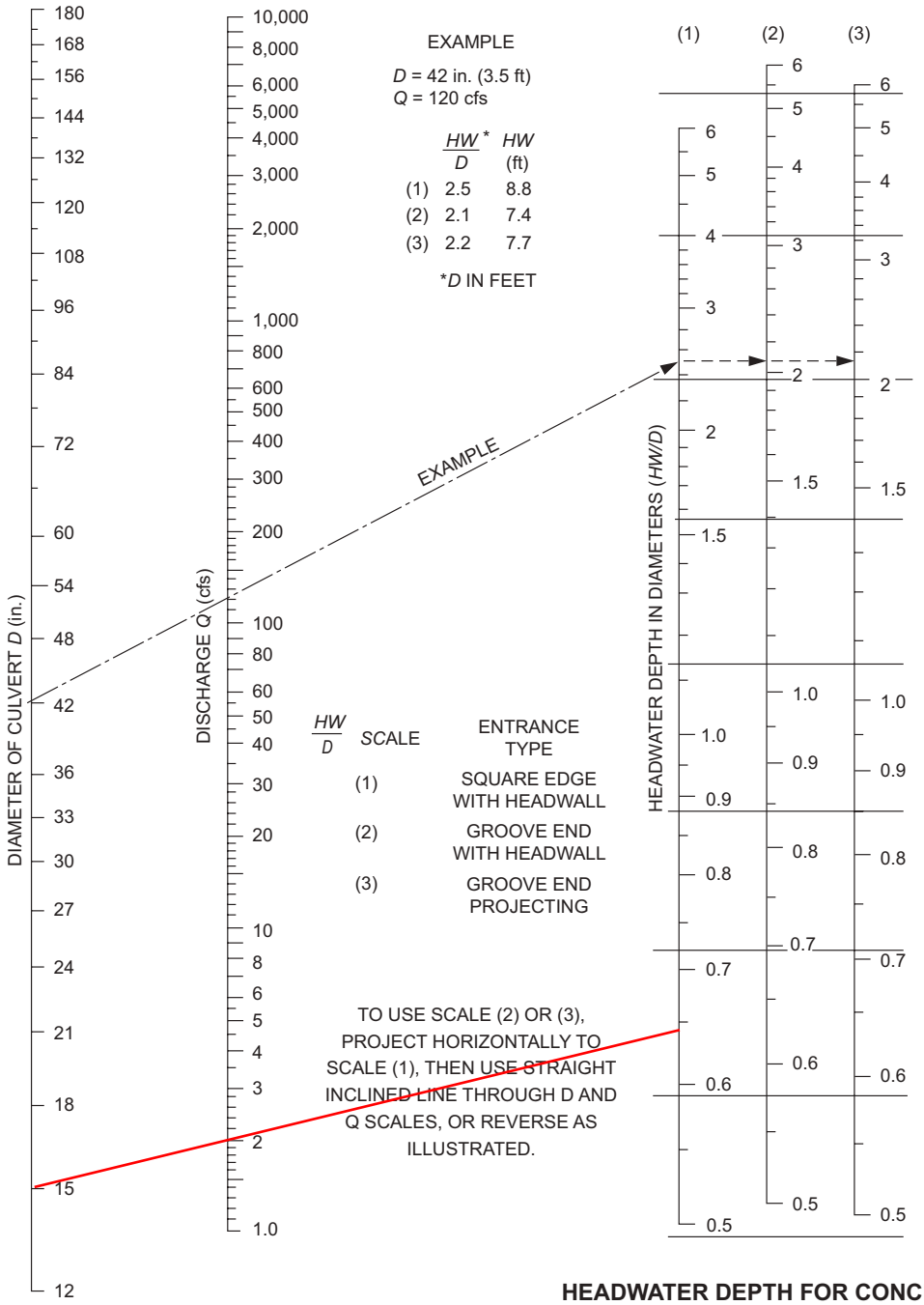
Table 5-1
Number of Pipes Required in the Underdrain
D = 16 * [(Q*0.011) / (S^0.5)]^3/8

If D is less than	# of 4" pipes	If D is less than	# of 6" pipes
5.13	2	7.84	2
5.95	3	9.11	3
6.66	4	10.13	4
7.22	5		
7.75	6		
8.20	7		

Summary of Proposed BMP

Bottom Elevation =	427.11	ft	
Outlet Elevation =	428.11	ft	
Storage Depth =	12.00	in	(Max Depth 12", OK)
Surface Cover (Grass or Brush)=	Grass		
Mulch Depth =	0.00	in	(Min Depth 2", Max Depth 4", No Mulch if Grassed, OK)
Fill Soil Media Depth =	3.00	ft	
Bottom of Media Elevation =	424.11	ft	
4" Washed Sand? (Y or N) =	N		
Washed Sand Elevation =	N/A	ft	
Underdrains? (Y or N) =	Y		
Underdrains Size =	6	in	(Recommend 4" or 6" pipes,OK)
Top of #57 Stone Elevation =	424.11	ft	
Bottom of Biorentention Elevation =	423.44	ft	
Water Table Elevation =	410.00	ft	(SHWT >12' below grade)
Distance to Water Table =	13.44	ft	(Min 2 ft., OK)

Flowrate
C = 0.70
i (25-yr, 5 min) = 7.98 in/hr
A = 0.37 ac
Q = CiA
= (0.70)(7.98 in/hr)(0.37 ac)
= 2.07 cfs



HW/D = 0.64
15" PIPE
HW = 0.64 * 1.25' = 0.81'

HEADWATER DEPTH FOR CONCRETE PIPE CULVERTS WITH INLET CONTROL

HEADWATER SCALES 283
REVISED MAY 1964

BUREAU OF PUBLIC ROADS
JANUARY 1963

Source: Federal Highway Administration. *Hydraulic Design of Highway Culverts: Hydraulic Design Series Number 5*. 3rd ed. FHWA-HIF-12-026. Washington, DC: U.S. Department of Transportation, April 2012, Chart 1B, p. C.9. https://www.fhwa.dot.gov/engineering/hydraulics/pubs/12026/hif12026.pdf.

APPENDIX F

NOAA Atlas 14, Volume 2, Version 3
Location name: Rolesville, North Carolina, USA*
Latitude: 35.9246°, Longitude: -78.4558°
Elevation: 432 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

G.M. Bonnin, D. Martin, B. Lin, T. Parzybok, M.Yekta, and D. Riley

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches/hour)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	4.84 (4.43-5.29)	5.62 (5.15-6.13)	6.40 (5.87-6.98)	7.19 (6.58-7.85)	7.98 (7.27-8.70)	8.62 (7.81-9.38)	9.18 (8.27-10.0)	9.67 (8.66-10.6)	10.2 (9.08-11.2)	10.7 (9.44-11.7)
10-min	3.86 (3.54-4.22)	4.49 (4.12-4.91)	5.12 (4.70-5.59)	5.75 (5.26-6.27)	6.36 (5.80-6.94)	6.86 (6.22-7.48)	7.29 (6.57-7.94)	7.67 (6.87-8.36)	8.09 (7.19-8.83)	8.44 (7.44-9.24)
15-min	3.22 (2.95-3.52)	3.77 (3.45-4.11)	4.32 (3.96-4.72)	4.85 (4.44-5.29)	5.38 (4.90-5.86)	5.79 (5.25-6.31)	6.14 (5.54-6.69)	6.45 (5.78-7.04)	6.78 (6.03-7.41)	7.06 (6.22-7.73)
30-min	2.21 (2.02-2.41)	2.60 (2.38-2.84)	3.07 (2.81-3.35)	3.51 (3.21-3.83)	3.98 (3.63-4.34)	4.36 (3.95-4.75)	4.70 (4.24-5.12)	5.02 (4.50-5.48)	5.40 (4.80-5.90)	5.72 (5.04-6.26)
60-min	1.38 (1.26-1.50)	1.63 (1.50-1.78)	1.97 (1.80-2.15)	2.29 (2.09-2.50)	2.65 (2.41-2.89)	2.95 (2.68-3.22)	3.24 (2.92-3.53)	3.52 (3.15-3.84)	3.87 (3.44-4.23)	4.18 (3.68-4.57)
2-hr	0.805 (0.732-0.887)	0.957 (0.874-1.05)	1.17 (1.06-1.28)	1.37 (1.24-1.50)	1.61 (1.46-1.76)	1.83 (1.64-2.00)	2.03 (1.81-2.22)	2.24 (1.98-2.45)	2.51 (2.20-2.74)	2.75 (2.40-3.02)
3-hr	0.568 (0.516-0.629)	0.676 (0.617-0.746)	0.827 (0.753-0.913)	0.979 (0.888-1.08)	1.16 (1.05-1.28)	1.33 (1.19-1.46)	1.49 (1.32-1.64)	1.66 (1.47-1.82)	1.89 (1.65-2.07)	2.10 (1.81-2.31)
6-hr	0.341 (0.311-0.377)	0.406 (0.372-0.448)	0.498 (0.454-0.548)	0.590 (0.537-0.648)	0.704 (0.636-0.771)	0.808 (0.725-0.883)	0.911 (0.810-0.995)	1.02 (0.898-1.11)	1.17 (1.02-1.27)	1.30 (1.12-1.42)
12-hr	0.200 (0.183-0.220)	0.238 (0.219-0.261)	0.293 (0.268-0.321)	0.349 (0.319-0.383)	0.420 (0.380-0.458)	0.485 (0.436-0.527)	0.550 (0.489-0.598)	0.621 (0.546-0.674)	0.718 (0.622-0.779)	0.808 (0.689-0.878)
24-hr	0.119 (0.110-0.128)	0.143 (0.134-0.155)	0.180 (0.168-0.194)	0.210 (0.195-0.226)	0.250 (0.231-0.269)	0.282 (0.260-0.303)	0.314 (0.289-0.339)	0.349 (0.319-0.376)	0.396 (0.360-0.427)	0.433 (0.393-0.468)
2-day	0.069 (0.064-0.074)	0.083 (0.077-0.089)	0.103 (0.096-0.111)	0.119 (0.111-0.129)	0.141 (0.131-0.152)	0.159 (0.147-0.171)	0.177 (0.163-0.191)	0.195 (0.179-0.211)	0.221 (0.201-0.239)	0.241 (0.219-0.261)
3-day	0.048 (0.045-0.052)	0.058 (0.054-0.062)	0.072 (0.067-0.078)	0.084 (0.078-0.090)	0.099 (0.092-0.106)	0.111 (0.103-0.119)	0.123 (0.114-0.132)	0.136 (0.125-0.146)	0.154 (0.140-0.166)	0.168 (0.152-0.181)
4-day	0.038 (0.036-0.041)	0.046 (0.043-0.049)	0.057 (0.053-0.061)	0.066 (0.061-0.070)	0.077 (0.072-0.083)	0.087 (0.080-0.093)	0.097 (0.089-0.103)	0.107 (0.098-0.114)	0.120 (0.110-0.129)	0.131 (0.119-0.141)
7-day	0.025 (0.024-0.027)	0.030 (0.028-0.032)	0.037 (0.034-0.039)	0.042 (0.039-0.045)	0.050 (0.046-0.053)	0.055 (0.051-0.059)	0.061 (0.057-0.066)	0.068 (0.062-0.072)	0.076 (0.070-0.082)	0.083 (0.076-0.089)
10-day	0.020 (0.019-0.021)	0.024 (0.022-0.025)	0.029 (0.027-0.031)	0.033 (0.031-0.035)	0.038 (0.035-0.041)	0.042 (0.039-0.045)	0.046 (0.043-0.050)	0.051 (0.047-0.054)	0.056 (0.052-0.061)	0.061 (0.056-0.066)
20-day	0.013 (0.012-0.014)	0.016 (0.015-0.017)	0.019 (0.018-0.020)	0.021 (0.020-0.022)	0.024 (0.023-0.026)	0.027 (0.025-0.029)	0.029 (0.027-0.031)	0.032 (0.030-0.034)	0.035 (0.033-0.038)	0.038 (0.035-0.041)
30-day	0.011 (0.010-0.012)	0.013 (0.012-0.014)	0.015 (0.014-0.016)	0.017 (0.016-0.018)	0.019 (0.018-0.020)	0.021 (0.019-0.022)	0.023 (0.021-0.024)	0.024 (0.023-0.026)	0.027 (0.025-0.028)	0.028 (0.026-0.030)
45-day	0.009 (0.009-0.010)	0.011 (0.010-0.011)	0.012 (0.012-0.013)	0.014 (0.013-0.015)	0.015 (0.015-0.016)	0.017 (0.016-0.018)	0.018 (0.017-0.019)	0.019 (0.018-0.020)	0.021 (0.019-0.022)	0.022 (0.020-0.023)
60-day	0.008 (0.008-0.009)	0.010 (0.009-0.010)	0.011 (0.010-0.012)	0.012 (0.011-0.013)	0.013 (0.013-0.014)	0.014 (0.014-0.015)	0.015 (0.014-0.016)	0.016 (0.015-0.017)	0.018 (0.016-0.019)	0.018 (0.017-0.020)

[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

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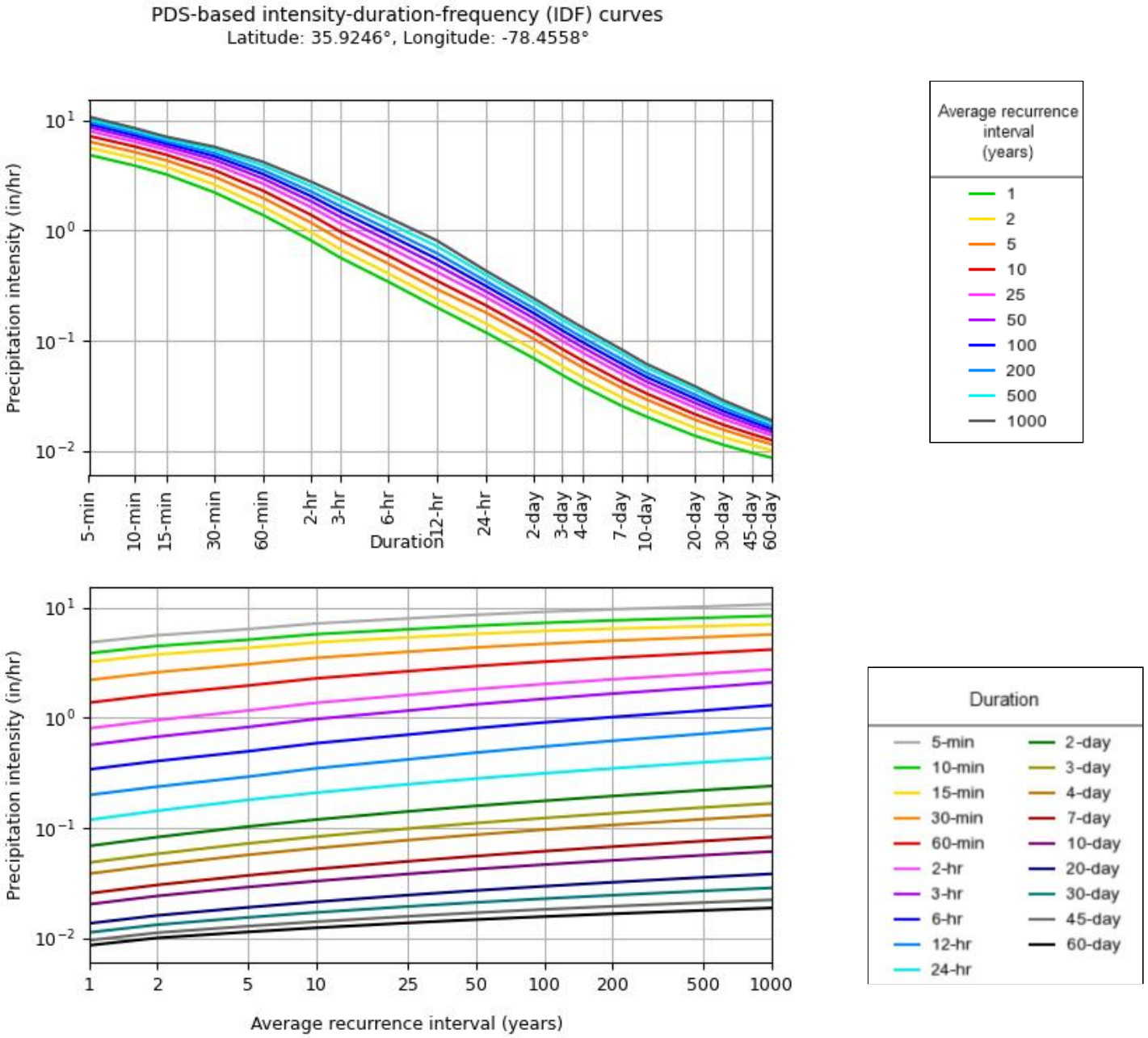
PF graphical



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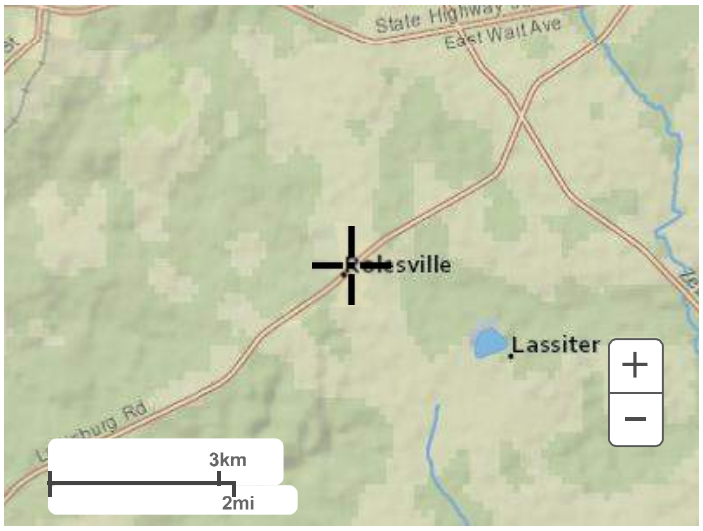
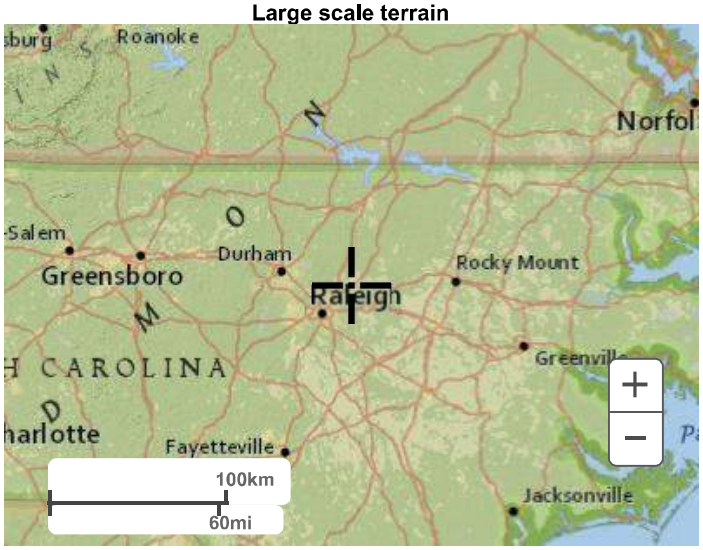
Maps & aerials

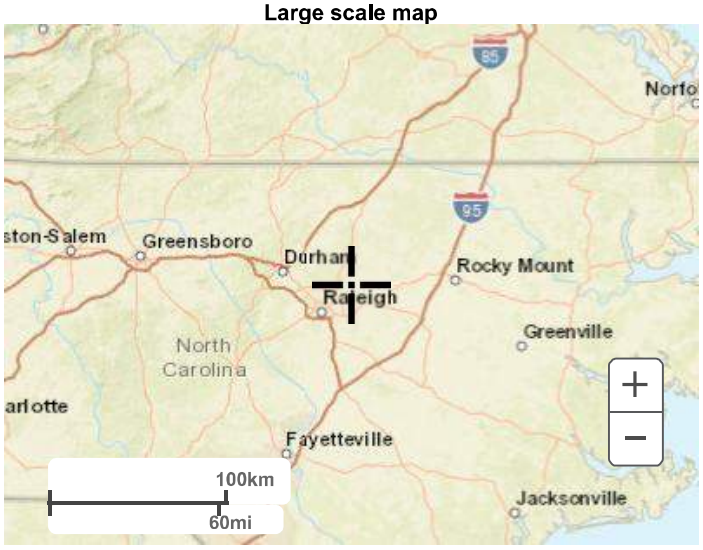
Small scale terrain



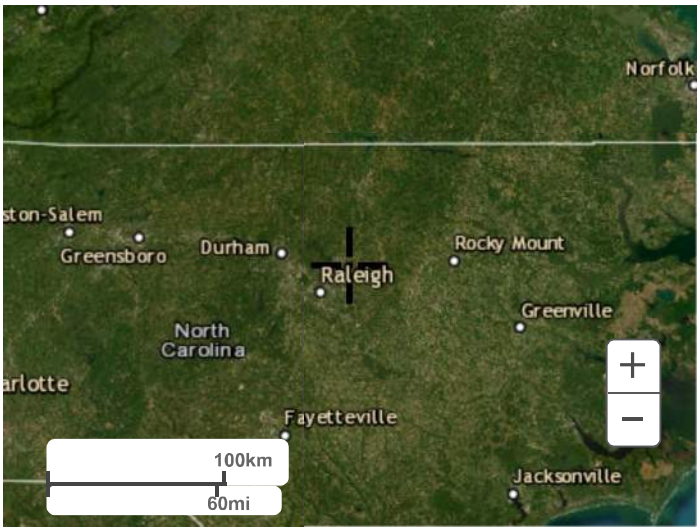
Large scale terrain



Large scale map



Large scale aerial



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National Oceanic and Atmospheric Administration
National Weather Service
National Water Center
1325 East West Highway
Silver Spring, MD 20910
Questions?: HDSC.Questions@noaa.gov

NOAA Atlas 14, Volume 2, Version 3
Location name: Rolesville, North Carolina, USA*
Latitude: 35.9246°, Longitude: -78.4558°
Elevation: 432 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

G.M. Bonnin, D. Martin, B. Lin, T. Parzybok, M.Yekta, and D. Riley

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.403 (0.369-0.441)	0.468 (0.429-0.511)	0.533 (0.489-0.582)	0.599 (0.548-0.654)	0.665 (0.606-0.725)	0.718 (0.651-0.782)	0.765 (0.689-0.833)	0.806 (0.722-0.880)	0.852 (0.757-0.931)	0.893 (0.787-0.978)
10-min	0.644 (0.590-0.704)	0.749 (0.687-0.818)	0.854 (0.783-0.932)	0.959 (0.877-1.04)	1.06 (0.966-1.16)	1.14 (1.04-1.25)	1.22 (1.10-1.32)	1.28 (1.14-1.39)	1.35 (1.20-1.47)	1.41 (1.24-1.54)
15-min	0.805 (0.738-0.880)	0.942 (0.863-1.03)	1.08 (0.990-1.18)	1.21 (1.11-1.32)	1.34 (1.22-1.46)	1.45 (1.31-1.58)	1.54 (1.38-1.67)	1.61 (1.44-1.76)	1.70 (1.51-1.85)	1.77 (1.56-1.93)
30-min	1.10 (1.01-1.21)	1.30 (1.19-1.42)	1.54 (1.41-1.68)	1.76 (1.61-1.92)	1.99 (1.81-2.17)	2.18 (1.98-2.38)	2.35 (2.12-2.56)	2.51 (2.25-2.74)	2.70 (2.40-2.95)	2.86 (2.52-3.13)
60-min	1.38 (1.26-1.50)	1.63 (1.50-1.78)	1.97 (1.80-2.15)	2.29 (2.09-2.50)	2.65 (2.41-2.89)	2.95 (2.68-3.22)	3.24 (2.92-3.53)	3.52 (3.15-3.84)	3.87 (3.44-4.23)	4.18 (3.68-4.57)
2-hr	1.61 (1.46-1.78)	1.91 (1.75-2.10)	2.34 (2.13-2.56)	2.74 (2.49-3.01)	3.23 (2.91-3.53)	3.65 (3.28-3.99)	4.06 (3.62-4.44)	4.48 (3.97-4.90)	5.03 (4.41-5.49)	5.51 (4.79-6.04)
3-hr	1.71 (1.55-1.89)	2.03 (1.85-2.24)	2.48 (2.26-2.74)	2.94 (2.67-3.24)	3.50 (3.15-3.84)	3.99 (3.57-4.38)	4.48 (3.98-4.91)	4.99 (4.40-5.47)	5.68 (4.95-6.22)	6.31 (5.44-6.93)
6-hr	2.05 (1.87-2.26)	2.44 (2.23-2.68)	2.99 (2.72-3.28)	3.54 (3.22-3.88)	4.22 (3.81-4.62)	4.84 (4.34-5.29)	5.46 (4.86-5.96)	6.11 (5.38-6.66)	6.99 (6.08-7.62)	7.81 (6.70-8.53)
12-hr	2.41 (2.21-2.66)	2.87 (2.64-3.15)	3.54 (3.24-3.88)	4.21 (3.84-4.62)	5.06 (4.59-5.53)	5.84 (5.25-6.36)	6.63 (5.90-7.21)	7.48 (6.58-8.12)	8.65 (7.49-9.40)	9.74 (8.31-10.6)
24-hr	2.86 (2.66-3.08)	3.45 (3.22-3.72)	4.34 (4.04-4.68)	5.04 (4.68-5.43)	6.00 (5.56-6.46)	6.77 (6.24-7.28)	7.56 (6.95-8.14)	8.38 (7.67-9.02)	9.50 (8.66-10.3)	10.4 (9.43-11.2)
2-day	3.32 (3.09-3.57)	3.99 (3.72-4.30)	4.98 (4.64-5.36)	5.76 (5.35-6.20)	6.81 (6.31-7.34)	7.65 (7.07-8.24)	8.52 (7.84-9.17)	9.41 (8.62-10.1)	10.6 (9.69-11.5)	11.6 (10.5-12.6)
3-day	3.52 (3.28-3.77)	4.23 (3.95-4.53)	5.24 (4.89-5.62)	6.05 (5.63-6.48)	7.15 (6.63-7.67)	8.02 (7.42-8.60)	8.92 (8.22-9.57)	9.84 (9.04-10.6)	11.1 (10.1-12.0)	12.1 (11.0-13.1)
4-day	3.72 (3.48-3.98)	4.46 (4.17-4.77)	5.51 (5.15-5.89)	6.34 (5.91-6.77)	7.48 (6.95-8.00)	8.39 (7.77-8.97)	9.32 (8.60-9.98)	10.3 (9.45-11.0)	11.6 (10.6-12.5)	12.7 (11.5-13.6)
7-day	4.31 (4.04-4.60)	5.15 (4.82-5.50)	6.28 (5.88-6.70)	7.18 (6.71-7.66)	8.41 (7.84-8.98)	9.40 (8.72-10.0)	10.4 (9.63-11.1)	11.4 (10.6-12.3)	12.9 (11.8-13.8)	14.0 (12.8-15.0)
10-day	4.91 (4.60-5.24)	5.84 (5.48-6.23)	7.04 (6.59-7.50)	7.97 (7.46-8.49)	9.24 (8.62-9.84)	10.2 (9.53-10.9)	11.2 (10.4-12.0)	12.3 (11.4-13.1)	13.7 (12.6-14.6)	14.8 (13.6-15.8)
20-day	6.59 (6.20-7.01)	7.78 (7.32-8.28)	9.21 (8.66-9.80)	10.3 (9.71-11.0)	11.9 (11.1-12.6)	13.1 (12.2-13.9)	14.3 (13.3-15.2)	15.5 (14.4-16.6)	17.2 (15.9-18.4)	18.5 (17.1-19.9)
30-day	8.18 (7.72-8.68)	9.62 (9.08-10.2)	11.2 (10.6-11.9)	12.4 (11.7-13.2)	14.1 (13.2-15.0)	15.3 (14.4-16.3)	16.6 (15.5-17.6)	17.8 (16.6-19.0)	19.5 (18.1-20.8)	20.8 (19.2-22.2)
45-day	10.4 (9.89-11.0)	12.2 (11.6-12.9)	14.0 (13.3-14.8)	15.4 (14.6-16.2)	17.2 (16.2-18.1)	18.5 (17.5-19.6)	19.9 (18.7-21.0)	21.2 (19.9-22.4)	22.9 (21.4-24.3)	24.2 (22.6-25.7)
60-day	12.5 (11.9-13.1)	14.6 (13.9-15.3)	16.5 (15.7-17.4)	18.0 (17.1-19.0)	20.0 (18.9-21.0)	21.4 (20.3-22.5)	22.8 (21.5-24.0)	24.2 (22.8-25.5)	25.9 (24.4-27.4)	27.3 (25.6-28.9)

[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

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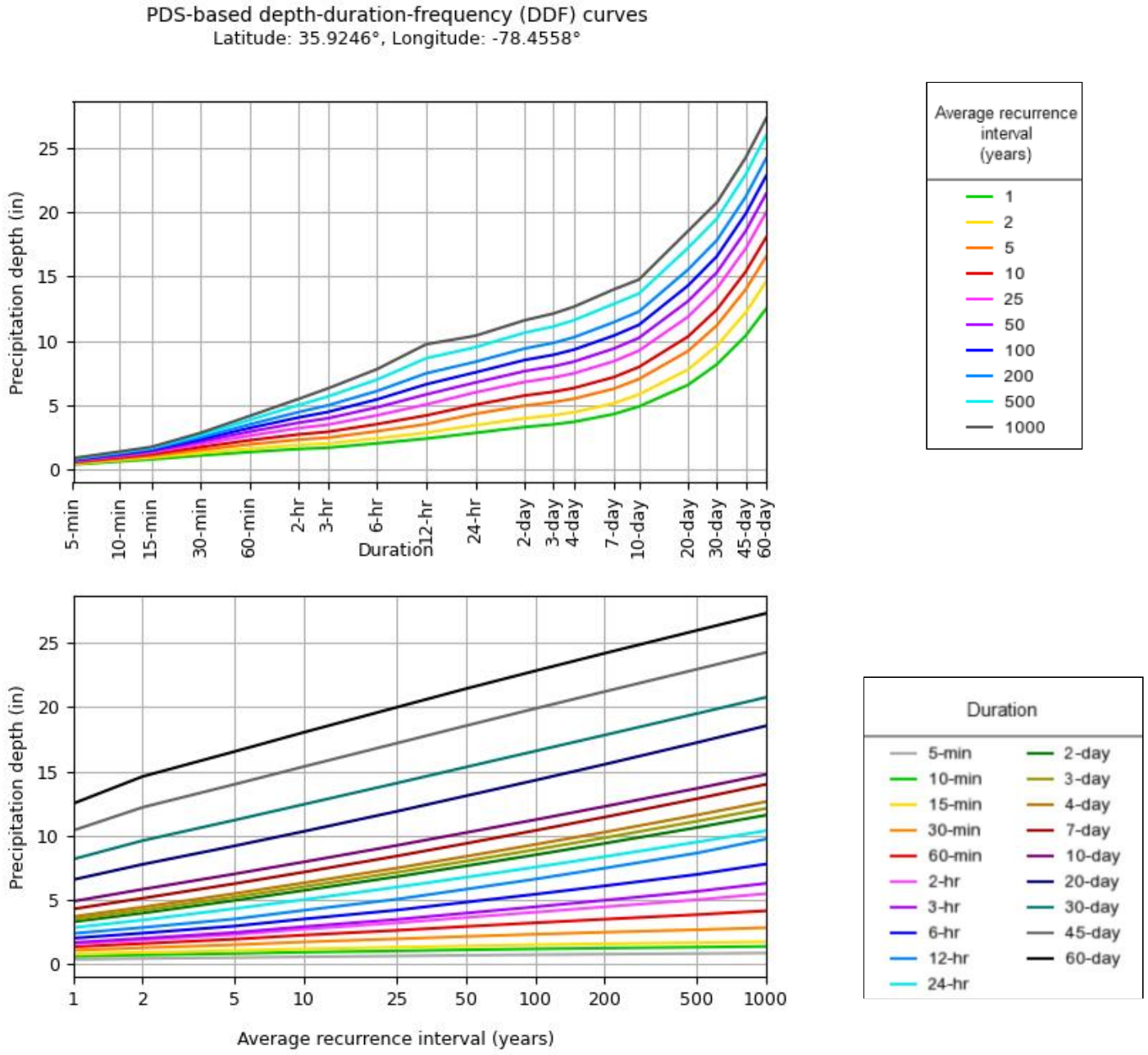
PF graphical



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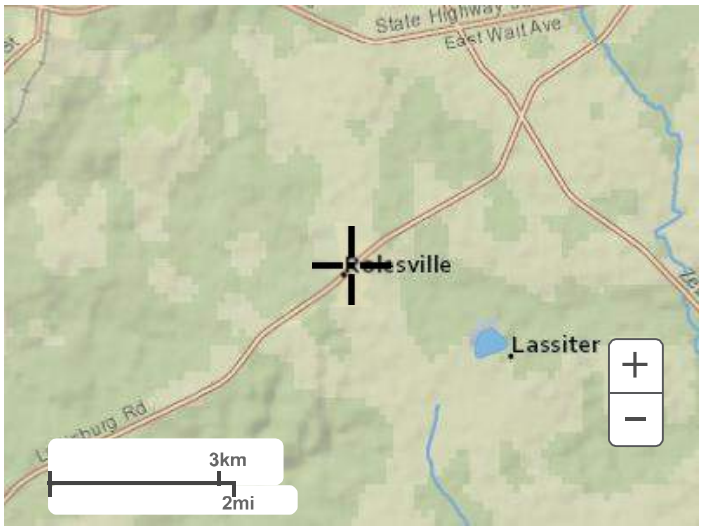
Maps & aerials

Small scale terrain



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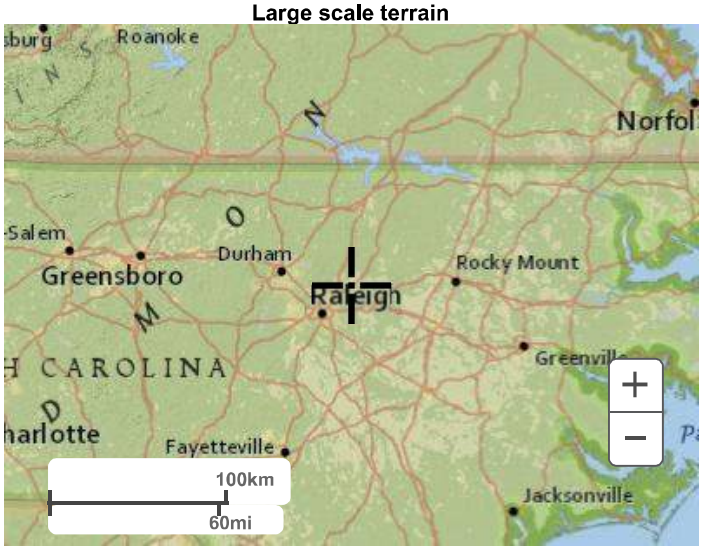

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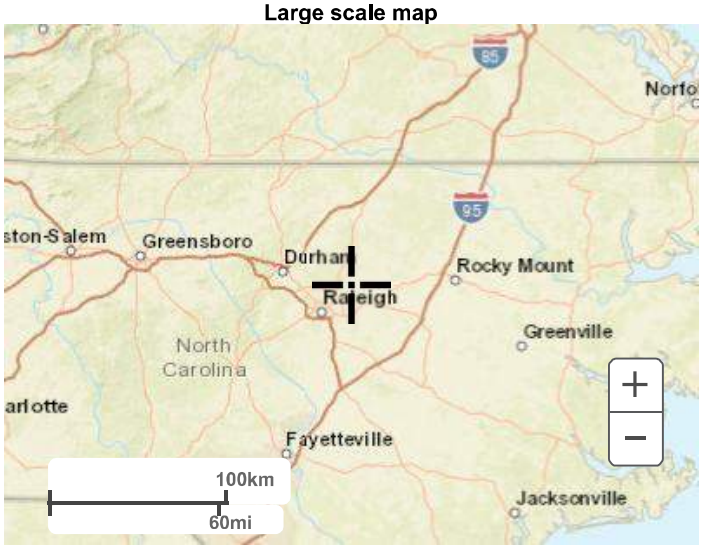

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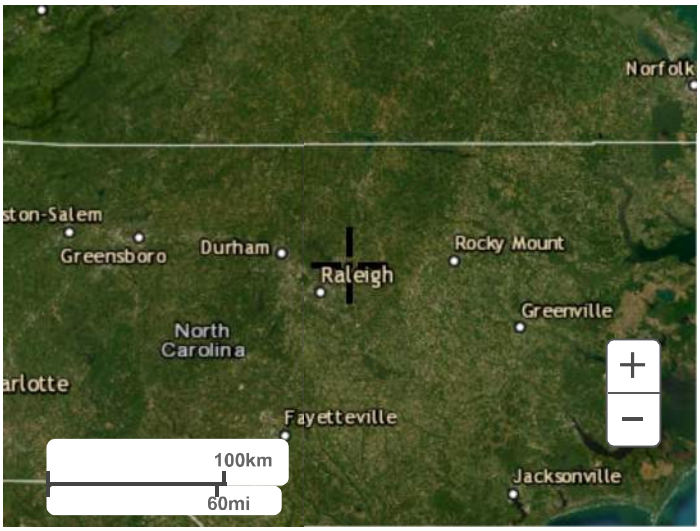

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