Storm Water Impact Analysis

For

Rosemary Street Parking Deck

125 East Rosemary Street

(PIN: 9788-37-4748 & 9788-37-6817)

Prepared by:

Ballentine Associates, P.A.
Consulting Engineers
221 Providence Road
Chapel Hill, NC 27514
(919) 929-0481

BA Project # 119016.02

Issue Dates	Description
04 Mar 2020	Conditional Zoning Submittal #1
08 Apr 2020	Conditional Zoning Submittal #2
22 May 2020	Conditional Zoning Submittal #3

Project Overview:

The Rosemary Street Parking Deck is located along East Rosemary in Chapel Hill, NC. The property PINs are 9788-37-4748 & 9788-37-6817. The project is 1.76 acres total. The proposed project consists of approximately seven parking levels with approximately 1,100 parking spaces, bicycle parking and potentially some limited office and enclosed storage space. The project will include utility relocation & removal, and relocation of an existing storm pipe. The project will result in a slight decrease in the total impervious cover on the site.

Existing Site Description:

The site is comprised of two parcels and totals approximately 1.6 acres. An existing parking deck is located on the western parcel and an asphalt and gravel surface parking lot is located on the eastern parcel. The site generally slopes from south to north, or from Rosemary Street toward North Street. There is a slight draw in the existing surface lot on the eastern parcel beneath which an existing 30" RCP storm system conveys runoff from Rosemary Street and points south. The existing parking deck on the western parcel drains into this existing 30" RCP system via pipe connections and the majority of surface lot on the eastern parcel drains into this system via surface flow to a raised-top yard inlet, which located at the north end of the site. The existing 30" RCP system discharges into an existing 48"wide x 27" deep stone drainage channel just beyond the northern property line of the project's eastern parcel.

There is 66,548 SF (1.53 AC) of existing impervious ground cover within the project property limits. All the existing impervious ground cover will be removed as the site is re-developed.

There are no stream features within 150 feet of the parcel boundaries, so a stream determination was not required as directed by The Town of Chapel Hill. The site lies in the Jordan Lake Watershed, which is part of the Cape Fear River Basin. A copy of FIRM panel 3710978800K is included in Appendix A, which confirms that the site is not within a special flood hazard area. The NRCS Soils Survey mapping included in Appendix A shows that the soils on the site are Appling-urban land complex "AuC" and Urban land "Ur" and the site is 26% HSG B and 74% of the site is unrated.

Proposed Project Description:

The redevelopment of the site includes the demolition of the existing deck and all other improvements on both parcels and the construction of a parking deck with associated features.

The project will result in a post-developed impervious cover of 65,500 SF, which includes an allowance of 1,004 SF and represents a net decrease of 1,048 SF from existing conditions within the site's net land area.

Stormwater Management Requirements:

This project must meet the town of Chapel Hill's current stormwater requirements, which include:

Water Quality Requirements:

- All post-development stormwater runoff resulting from the first one inch of precipitation shall be treated to remove 85% of total suspended solids for all new impervious surfaces resulting from the Development. Stormwater treatment facilities will be designed according to the North Carolina Department of Environment Quality (NCDEQ) "Stormwater Design Manual" as modified by the Town: and any future written design guidance approved by both the Town and NCDEQ.
- The increase in runoff volume ("Delta") for the 2-year, 24-hour storm (3.6" depth) must be managed (i.e. released over a 2-5 day period).

Water Quantity Requirements:

- Post-developed peak flows cannot exceed pre-developed peak flows during the 1, 2, and 25-year storms.

Proposed Stormwater Management:

The project as proposed removes 1,048 SF of impervious surface and therefore satisfies the Town's water quality requirements. Because there will be a slight increase in the project's runoff curve number due to the conversion of compacted gravel parking lot to impervious concrete and asphalt, there will be a slight increase in peak flows resulting from the project during the 1, 2, and 25-year storms. The following table summarizes the peak flows at each of the site's five study points, as shown in Appendix A.

Study Point	1-Year (cfs)			2-Year (cfs)			25-Year (cfs)		
	Pre	Post Un-detained	% change	Pre	Post Un-detained	% change	Pre	Post Un-detained	% change
1	0.04	0.02	-50.00%	0.07	0.03	-57.14%	0.19	0.09	-52.63%
2	5.48	5.89	7.48%	6.77	7.22	6.65%	11.93	12.60	5.62%
3	0.07	0.02	-71.43%	0.09	0.03	-66.67%	0.16	0.09	-43.75%
4	0.23	0.06	-73.91%	0.29	0.09	-68.97%	0.50	0.25	-50.00%
5	0.31	0.31	0.00%	0.38	0.38	0.00%	0.66	0.66	0.00%
Totals	6.14	6.29	2.44%	7.58	7.75	2.24%	13.43	13.69	1.94%

Refer to appendix A for site area mapping.

Proposed Pipe Replacement:

The old 30" storm pipe system that currently runs through the site will be relocated and replaced with a new 36" RCP system within an OWASA easement along the east side of the project site. Our calculations show that the existing pipe should be replaced with a new 36-inch RCP. Drainage inlet maps DA 5 and DA 6 located in Appendix A show the pre- and post-development drainage areas to each of the inlets in the existing and proposed systems, respectively. Hydraulic grade lines profiles (10-Yr and 25-Yr storms) for the storm network and pipe capacity calculations for the existing storm pipe coming into the site are located in Appendix B.

Analysis of Downstream Channel:

Appendix B of this report includes a preliminary calculation showing that the existing channel downstream of the site is adequate to handle the post-development peak flows discharged into it from the project site.

Conclusion:

This project as proposed, will comply with the Town of Chapel Hill's water quality requirements because the project will result in a slight decrease in impervious cover. However, the project will result in a minor increase in peak flows. It is our opinion that the projected minor increase in peak flows will not adversely impact the downstream conveyance system.

List of Appendices:

- Appendix A - Maps
  - DA-1 Pre-Developed Site Area Map
  - DA-2 Post-Developed Site Area Map
  - DA-3 Pre-Developed Drainage Area Map
  - DA-4 Post-Developed Drainage Area Map
  - DA-5 Pre-Developed Inlet Drainage Area Map
  - DA-6 Post-Developed Inlet Drainage Area Map
  - Soils Map –
    - Hardbound
    - NRCS Soils Map
    - NRCS Hydrologic Soil Groups
  - FIRM Panel 3710978800K
  - USGS Topographic Map
  - Aerial

- Appendix B – Stormwater Design Calculations
  - Pipe Capacity Calculations
  - Storm Sewers Schematic
  - NCDOT Conduit Pipe Table (10-Year)
  - Hydraulic Grade Line Profiles (10-Year)
  - NCDOT Conduit Pipe Table (25-Year)
  - Hydraulic Grade Line Profiles (25-Year)
  - Hydrographs Report
  - Hydraflow Channel Report (10-Year)
  - Hydraflow Channel Report (25-Year)

• Appendix A - Maps

- DA-1 Pre-Developed Site Area Map
- DA-2 Post-Developed Site Area Map
- DA-3 Pre-Developed Drainage Area Map
- DA-4 Post-Developed Drainage Area Map
- DA-5 Pre-Developed Inlet Drainage Area Map
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  - Hardbound
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  - NRCS Hydrologic Soil Groups
- FIRM Panel 3710978800K
- USGS Topographic Map
- Aerial

CONCRETE PARKING DECK

FRANKLIN OFFICE CHAPEL HILL LLC
(ROSEMARY PARKING DECK)
PIN# 9788-37-4748
DB 6603, PG 282
AREA: 37,785 SQ. FT. / 0.87 AC.

ASPHALT PARKING DECK

ASPHALT PARKING DECK

COMPACTED GRAVEL PARKING DECK

COMPACTED GRAVEL PARKING DECK

CENTURA BANK
PIN# 9788-37-2791
DB 1078, PG 74

INVESTORS TITLE COMPANY
PIN# 9788-37-6817
DB 778, PG 87
AREA: 35,312 SQ. FT. / 0.81 AC.

BRANCH BANKING AND TRUST CO
PIN# 9788-37-7911
DB 206, PG 486

E ROSEMARY ST 45' PUBLIC R/W
(PB 71, PG 124)

N C N B ALLEY
VARIABLE WIDTH PUBLIC R/W

136 EAST ROSEMARY

LANDSCAPED AREA

RESERVED

FIRE LANE

FIRE LANE

LEGEND:

SITE BOUNDARY

PRE-DEVELOPED IMPERVIOUS (STREET, DRIVEWAY, SIDEWALK, PARKING LOT)

PRE-DEVELOPED IMPERVIOUS (GRAVEL)

SITE AREA COVER SUMMARY:

IMP. AREAS (NON-GRAVEL)	45,254 SF (1.04 AC)
IMP. AREAS (GRAVEL)	21,310 SF (0.49 AC)
PERVIOUS AREAS (WOODS)	0 SF (0.00 AC)
PERVIOUS AREAS (GRASS)	6,533 SF (0.15 AC)
TOTAL ALL AREAS	73,097 SF (1.68 AC)

NC GRID NAD 83

0 20 40

GRAPHIC SCALE
(IN FEET)

E ROSEMARY DECK
PRE-DEVELOPED SITE AREA MAP
CHAPEL HILL, NC

ISSUED	DATE
TO TOWN OF CHAPEL HILL	08 APR 20
TO TOWN OF CHAPEL HILL	22 MAY 20

BALLENTINE ASSOCIATES, P.A
221 PROVIDENCE ROAD, CHAPEL HILL, N.C. 27514
(919) 929 - 0481 (919) 489 - 4789

SCALE:	AS NOTED
DATE:	02 MAR 20
JOB NUMBER:	119016.02
DRAWN BY:	GJR
REVIEWED BY:	GJR

DA
1

PROPOSED CONCRETE PARKING DECK

CENTURA BANK
PIN# 9788-37-2791
DB 1078, PG 74

BRANCH BANKING AND TRUST CO
PIN# 9788-37-7911
DB 206, PG 486

E ROSEMARY ST 45' PUBLIC R/W
(PB 71, PG 124)

N C N B ALLEY
VARIABLE WIDTH PUBLIC R/W

136 EAST ROSEMARY

RESERVED

FIRE LANE

LEGEND:

SITE BOUNDARY

POST-DEVELOPED IMPERVIOUS
(STREET, DRIVEWAY,
SIDEWALK, PARKING LOT)

SITE AREA COVER SUMMARY:

IMP. AREAS (NON-GRAVEL)	64,496 SF (1.48 AC)
IMP. AREAS (GRAVEL)	0 SF (0.00 AC)
PERVIOUS AREAS (WOODS)	0 SF (0.00 AC)
PERVIOUS AREAS (GRASS)	8,583 SF (0.20 AC)
TOTAL ALL AREAS	73,079 SF (1.68 AC)

NC GRID
NAD 83

0 20 40
GRAPHIC SCALE
(IN FEET)

E ROSEMARY DECK
POST-DEVELOPED SITE AREA MAP

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DA
2

PRE NORTHWEST SUBAREA

NON-GRAVEL IMP. (HSG 'B', 'C')	0	SF (0.00 AC)
GRAVEL IMP. (HSG 'B', 'C')	0	SF (0.00 AC)
GRASS (HSG 'B')	1,800	SF (0.04 AC)
GRASS (HSG 'C')	63	SF (0.00 AC)
TOTAL	1,863	SF (0.04 AC)

PRE TO RTYI #1

NON-GRAVEL IMP. (HSG 'B')	31,382	SF (0.72 AC)
NON-GRAVEL IMP. (HSG 'C')	8,755	SF (0.20 AC)
GRAVEL IMP. (HSG 'B')	2,705	SF (0.06 AC)
GRAVEL IMP. (HSG 'C')	17,414	SF (0.40 AC)
GRASS (HSG 'B')	1,509	SF (0.03 AC)
GRASS (HSG 'C')	2,263	SF (0.05 AC)
TOTAL	64,028	SF (1.47 AC)

PRE NORTHEAST SUBAREA

NON-GRAVEL IMP. (HSG 'B')	0	SF (0.00 AC)
GRAVEL IMP. (HSG 'B')	41	SF (0.00 AC)
GRASS (HSG 'B')	828	SF (0.02 AC)
TOTAL	869	SF (0.02 AC)

PRE TO RTYI #2

NON-GRAVEL IMP. (HSG 'B')	1,566	SF (0.04 AC)
NON-GRAVEL IMP. (HSG 'C')	541	SF (0.01 AC)
GRAVEL IMP. (HSG 'B')	537	SF (0.01 AC)
GRAVEL IMP. (HSG 'C')	207	SF (0.00 AC)
GRASS (HSG 'B')	27	SF (0.00 AC)
GRASS (HSG 'C')	0	SF (0.00 AC)
TOTAL	2,878	SF (0.07 AC)

PRE SOUTH SUBAREA

NON-GRAVEL IMP. (HSG 'C')	3,170	SF (0.07 AC)
GRAVEL IMP. (HSG 'C')	0	SF (0.00 AC)
GRASS (HSG 'C')	362	SF (0.01 AC)
TOTAL	3,532	SF (0.08 AC)

E ROSEMARY ST 45' PUBLIC R/W
(PB 71, PG 124)

DRAWING LEGEND

- DRAINAGE AREA
- SITE BOUNDARY
- SOIL TYPE DELINEATION (SEE SOIL TYPE LEGEND)
- IMPERVIOUS AREA (GRAVEL)
- IMPERVIOUS AREA (NON-GRAVEL)

SOIL TYPE LEGEND

MAP SYMBOL	SOIL NAME	HYDROLOGIC GROUP
AuC	APPLING-URBAN LAND COMPLEX (2% TO 10% SLOPE)	B
Ur	URBAN LAND	C

NC GRID NAD 83

0 20 40
GRAPHIC SCALE (IN FEET)

E ROSEMARY DECK
PRE-DEVELOPED DRAINAGE AREA MAP
CHAPEL HILL, NC

ISSUED	DATE
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DRAWN BY:	J.B.M.
REVIEWED BY:	G.J.R.

DA
3

POST NORTHWEST SUBAREA

NON-GRAVEL IMP. (HSG 'B', 'C')	150	SF (0.00 AC)
GRAVEL IMP. (HSG 'B', 'C')	0	SF (0.00 AC)
GRASS (HSG 'B')	924	SF (0.02 AC)
GRASS (HSG 'C')	33	SF (0.00 AC)
TOTAL	1,107	SF (0.03 AC)

POST TO RTYI #1

NON-GRAVEL IMP. (HSG 'B')	11,400	SF (0.26 AC)
NON-GRAVEL IMP. ALLOWANCE (HSG 'B')	1,004	SF (0.02 AC)
NON-GRAVEL IMP. (HSG 'C')	49,550	SF (1.14 AC)
GRAVEL IMP. (HSG 'B', 'C')	0	SF (0.00 AC)
GRASS. (HSG 'B')	2,173	SF (0.05 AC)
GRASS (HSG 'C')	2,436	SF (0.06 AC)
TOTAL	66,563	SF (1.53 AC)

POST NORTHEAST SUBAREA

NON-GRAVEL IMP. (HSG 'B')	36	SF (0.00 AC)
GRAVEL IMP. (HSG 'B')	0	SF (0.00 AC)
GRASS (HSG 'B')	841	SF (0.02 AC)
TOTAL	877	SF (0.02 AC)

POST TO RTYI #2

NON-GRAVEL IMP. (HSG 'B')	137	SF (0.00 AC)
NON-GRAVEL IMP. (HSG 'C')	0	SF (0.00 AC)
GRAVEL IMP. (HSG 'B', 'C')	0	SF (0.00 AC)
GRASS (HSG 'B')	1,532	SF (0.04 AC)
GRASS (HSG 'C')	477	SF (0.01 AC)
TOTAL	2,146	SF (0.05 AC)

POST SOUTH SUBAREA

NON-GRAVEL IMP. (HSG 'C')	3,222	SF (0.07 AC)
GRAVEL IMP. (HSG 'C')	0	SF (0.00 AC)
GRASS (HSG 'C')	260	SF (0.01 AC)
TOTAL	3,482	SF (0.08 AC)

E ROSEMARY ST 45' PUBLIC R/W
(PB 71, PG 124)

DRAWING LEGEND

- DRAINAGE AREA
- SITE BOUNDARY
- SOIL TYPE DELINEATION (SEE SOIL TYPE LEGEND)
- IMPERVIOUS AREA (NON-GRAVEL)

SOIL TYPE LEGEND

MAP SYMBOL	SOIL NAME	HYDROLOGIC GROUP
AuC	APPLING-URBAN LAND COMPLEX (2% TO 10% SLOPE)	B
Ur	URBAN LAND	C

NC GRID NAD 83

0 20 40
GRAPHIC SCALE (IN FEET)

E ROSEMARY DECK
POST-DEVELOPED DRAINAGE AREA MAP
CHAPEL HILL, NC

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DRAWN BY:	J.B.M.
REVIEWED BY:	G.J.R.

DA
4

EX DI
DA= 0.563 AC
IMP= 0.219 AC
GRASS= 0.344 AC

EX RAISED TOP YI
DA= 1.470 AC
IMP= 1.383 AC
GRASS= 0.087 AC

EX CB
DA= 0.510 AC
IMP= 0.484 AC
GRASS= 0.026 AC

EX JB
DA= 12.74 AC
C= 0.80 (BUSINESS DOWNTOWN AREA)
TIME OF CONCENTRATION= 10 MIN
Q10 = CIA = (0.80)(5.89)(12.74) = 58.47 CFS
Q25 = CIA = (0.80)(6.45)(12.74) = 64.03 CFS

LEGEND:

DRAINAGE AREA

PROPOSED IMPERVIOUS COVER

NC GRID NAD 83

0 50 100
GRAPHIC SCALE
(IN FEET)

E ROSEMARY DECK
PRE INLET DRAINAGE AREA MAP

CHAPEL HILL, NC

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REVIEWED BY:	G.J.R.

DA
5

EX DI
DA= 0.557 AC
IMP= 0.220 AC
GRASS= 0.337 AC

RAISED TOP YI (12)
DA= 0.058 AC
IMP= 0.005 AC
GRASS= 0.053 AC

DECK
DA= 1.328 AC
IMP= 1.328 AC
GRASS= 0.000 AC

DI (9)
DA= 0.032 AC
IMP= 0.004 AC
GRASS= 0.028 AC

DI (8)
DA= 0.029 AC
IMP= 0.004 AC
GRASS= 0.025 AC

CB (7)
DA= 0.334 AC
IMP= 0.294 AC
GRASS= 0.040 AC

CB (2)
DA= 0.134 AC
IMP= 0.133 AC
GRASS= 0.001 AC

EX CB
DA= 0.047 AC
IMP= 0.046 AC
GRASS= 0.001 AC

CB (4)
DA= 0.065 AC
IMP= 0.064 AC
GRASS= 0.001 AC

CB (5)
DA= 0.005 AC
IMP= 0.005 AC
GRASS= 0.000 AC

EX JB
DA= 12.74 AC
C= 0.80 (BUSINESS DOWNTOWN AREA)
TIME OF CONCENTRATION= 10 MIN
Q10 = CIA = (0.80)(5.89)(12.74) = 58.47 CFS
Q25 = CIA = (0.80)(6.45)(12.74) = 64.03 CFS

LEGEND:

DRAINAGE AREA

PROPOSED IMPERVIOUS COVER

NC GRID NAD 83

0 50 100
GRAPHIC SCALE
(IN FEET)

ROSEMARY DECK
POST INLET DRAINAGE AREA MAP

CHAPEL HILL, NC

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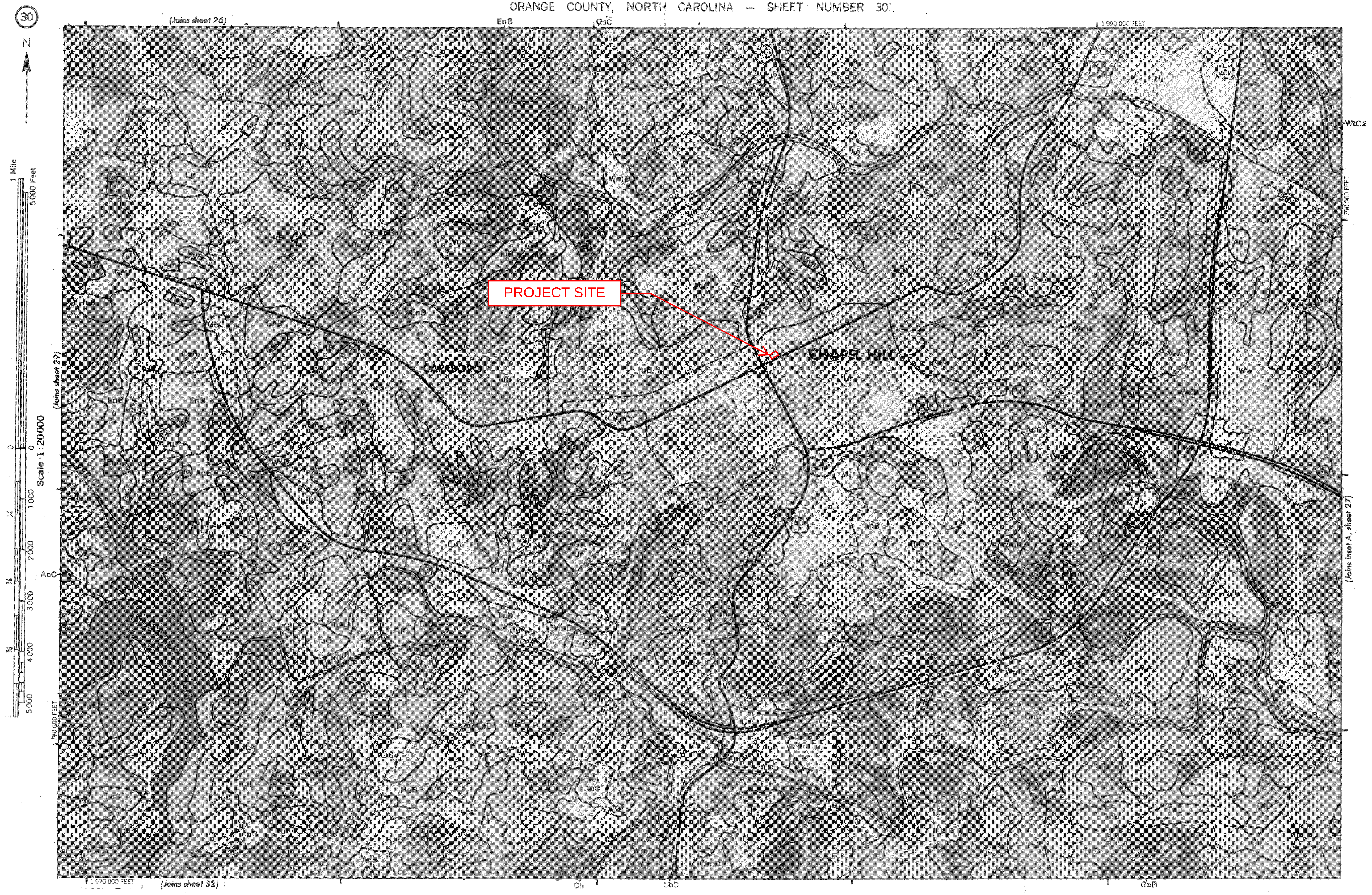
DA 6

ORANGE COUNTY, NORTH CAROLINA — SHEET NUMBER 30



Map Scale: 1:932 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 10 20 40 60

Feet: 0 45 90 180 270

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 1:20,000.

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: Orange County, North Carolina
Survey Area Data: Version 19, Sep 16, 2019

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

Date(s) aerial images were photographed: Apr 27, 2014—May 6, 2014

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
AuC	Appling-Urban land complex, 2 to 10 percent slopes	0.5	26.0%
Ur	Urban land	1.3	74.0%
Totals for Area of Interest		**1.8**	**100.0%**

Map Scale: 1:932 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 10 20 40 60

Feet: 0 45 90 180 270

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 Rating Polygons

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

Soil Rating Lines

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

Soil Rating Points

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

Water Features

- Streams and Canals

Transportation

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

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

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Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
AuC	Appling-Urban land complex, 2 to 10 percent slopes	B	0.5	26.0%
Ur	Urban land		1.3	74.0%
Totals for Area of Interest			**1.8**	**100.0%**

Description

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

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

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

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

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

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

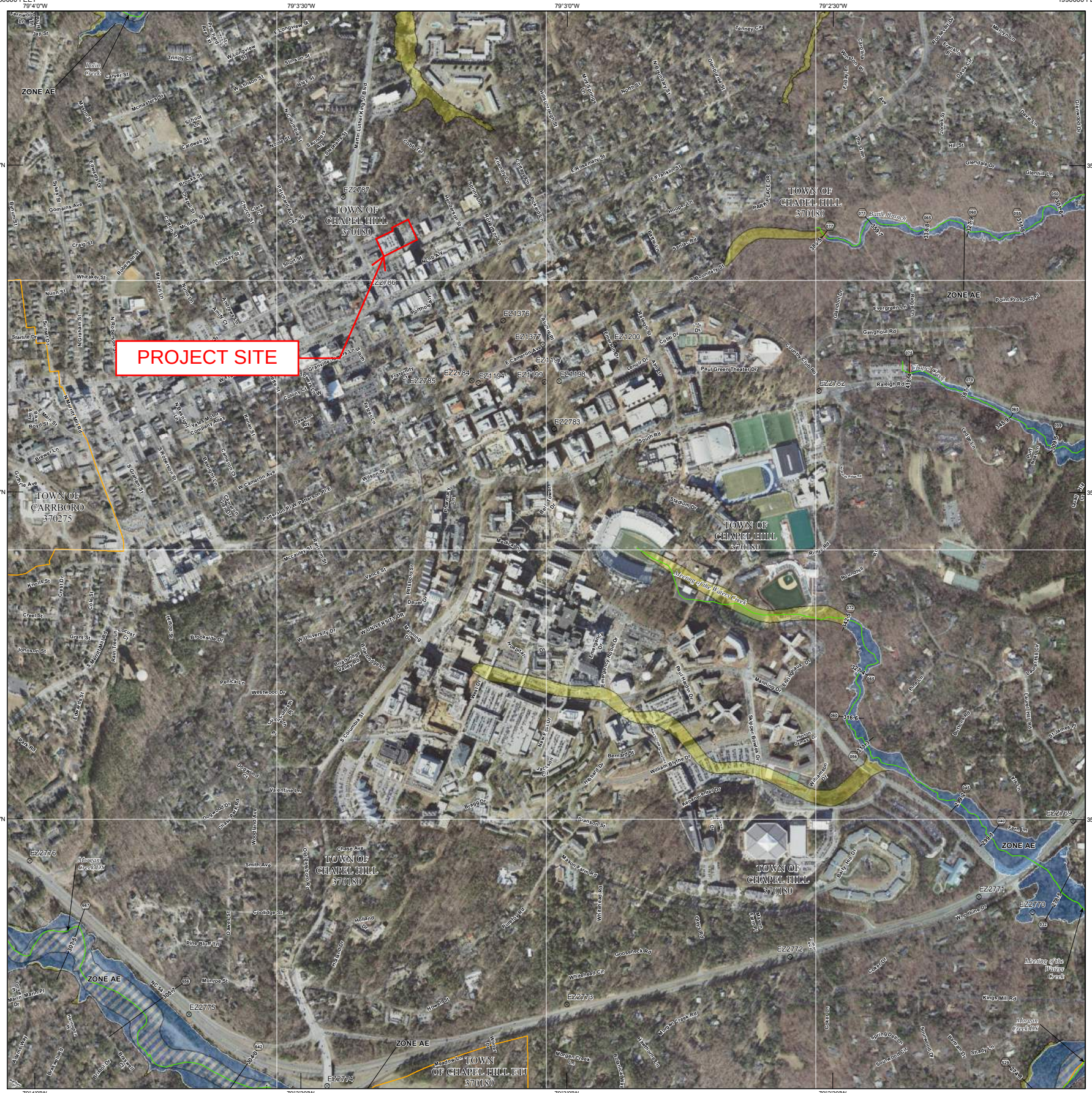
If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher



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

THE INFORMATION DEPICTED ON THIS MAP AND SUPPORTING DOCUMENTATION ARE ALSO AVAILABLE IN DIGITAL FORMAT AT HTTP://FRIS.NC.GOV/FRIS

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 Accredited or Provisionally Accredited Levee, Dike, or Floodwall Non-accredited Levee, Dike, or Floodwall
OTHER FEATURES	BM5510 North Carolina Geodetic Survey bench mark BM5510 National Geodetic Survey bench mark BM5510 Contractor Est. NCFMP Survey bench mark 012 18.2 Cross Sections with 1% Annual Chance Water Surface Elevation (BFE) 8 Coastal Transect Coastal Transect Baseline Profile Baseline Hydrographic Feature 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 http://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 http://www.ncfloodmaps.com 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. 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 http://www.fema.gov/business/nfip/index.shtm.

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. 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 indicates 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 http://www.fema.gov/business/nfip/index.shtm.

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)

COASTAL BARRIER RESOURCES SYSTEM (CBRS) NOTE

This map may include approximate boundaries of the CBRS for informational purposes only. Flood insurance is not available within CBRS areas for structures that are newly built or substantially improved on or after the date(s) indicated on the map. For more information see http://www.fws.gov/cbra, the FIS Report, or call the U.S. Fish and Wildlife Service Customer Service Center at 1-800-344-WILD.

CBRS Area Otherwise Protected Area

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 9788

Panel Contains:

COMMUNITY	CID	PANEL	SUFFIX
CARRBORO, TOWN OF	370275	9788	K
CHAPEL HILL, TOWN OF	370180	9788	K

VERSION NUMBER
2.3.3.2

MAP NUMBER
3710978800K

MAP REVISED
November 17, 2017

USGS
science for a changing world

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

The National Map
US Topo

CHAPEL HILL 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, May 2016 - November 2016
Roads.... U.S. Census Bureau, 2016
Names....GNIS, 1980 - 2019
Hydrography....National Hydrography Dataset, 2001 - 2018
Contours....National Elevation Dataset, 2008
Boundaries....Multiple sources; see metadata file 2017 - 2018

Wetlands....FWS National Wetlands Inventory 1983

MN
GN
9°5′
161 MILS
1°8′
20 MILS

UTM GRID AND 2019 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

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

SCALE 1:24 000

KILOMETERS
METERS
MILES
FEET

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, 2011.
A metadata file associated with this product is draft version 0.6.18

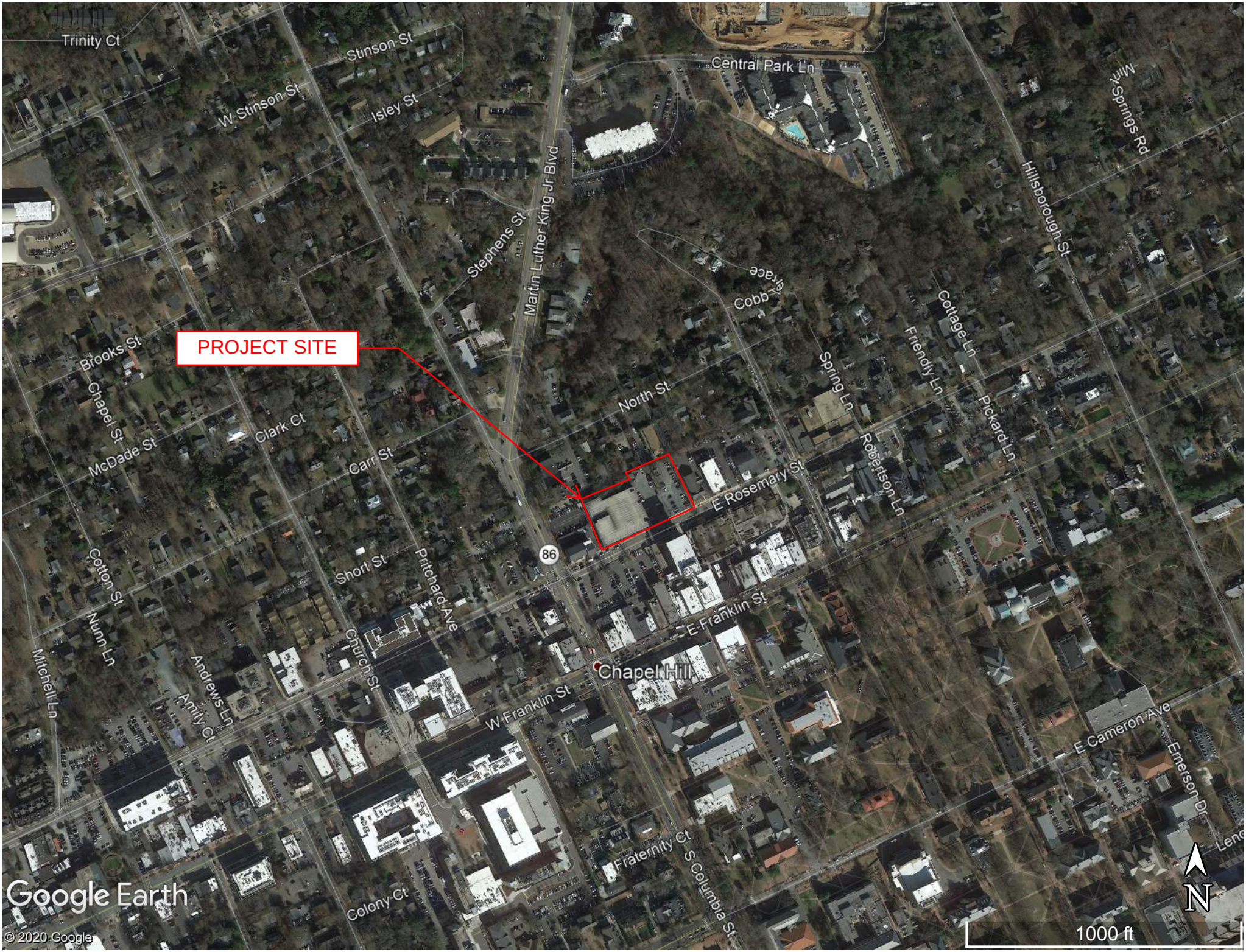
NORTH CAROLINA
QUADRANGLE LOCATION

1 Efland
2 Hillsborough
3 Northwest Durham
4 White Cross
5 Southwest Durham
6 Bynum
7 Farrington
8 Green Level

ADJOINING QUADRANGLES

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

CHAPEL HILL, NC
2019


PROJECT SITE
Trinity Ct
Stinson St
W Stinson St
Isley St
Central Park Ln
Mint Springs Rd
Hillsborough St
Martin Luther King Jr Blvd
Stephens St
Cobb Place
Cottage Ln
Friendly Ln
Spring Ln
Pickard Ln
Robertson Ln
Brooks St
Chapel St
McDade St
Clark Ct
Carr St
North St
E Rosemary St
86
Short St
Pritchard Ave
Cotton St
Nunn Ln
Mitchell Ln
Andrews Ln
Amity Ct
Church St
E Franklin St
Chapel Hill
W Franklin St
E Cameron Ave
Emerson Dr
Fraternity Ct
S Columbia St
Colony Ct
Google Earth
© 2020 Google
N
1000 ft

• Appendix B – Stormwater Design Calculations

- Pipe Capacity Calculations
- Storm Sewers Schematic
- NCDOT Conduit Pipe Table (10-Year)
- Hydraulic Grade Line Profiles (10-Year)
- NCDOT Conduit Pipe Table (25-Year)
- Hydraulic Grade Line Profiles (25-Year)
- Hydrographs Report
- Hydraflow Channel Report (10-Year)
- Hydraflow Channel Report (25-Year)

Pipe Capacity Calcs

Rational Method

Ballentine Associates, P.A.
Chapel Hill, NC 27514
(919) 929-0481 fax 489-2803

Project: Rosemary Deck
Proj. Number: 119006.02
Client: Grubb Properties
Date: 3/3/2020
Revised: 5/22/2020

Pipe Capacity

Total Drainage Area	540522.30	sf
	12.41	ac

	Runoff Coefficient	Water Shed area (acres)	Total
Business Downtown area	0.80	12.41	0.80
		12.41	**0.80**

		10 yr	
Drainage area	A	12.41	acres
Runoff Coefficient	C	0.80	
Time of Concentration	t	10.00	mins
Rainfall Intensity	I	6.13	in/hr
Peak discharge	**Q**	**60.85**	**cfs**

Sheet flow

$$Tc = \frac{0.007(nL)^{0.8}}{P_2^{0.5} s^{0.4}}$$

n	0.10	Grass + Pavement	
Length	196.00	ft	
Start Inv	495.00	ft	
End inv	487.00	ft	
Slope	0.041	ft/ft	
P	3.58	in	

Tc= 0.14 hours
Tc= **8.63** minutes

Pipe flow (assumed)

$$Tc = \frac{L}{60V}$$

Length	897.70	ft
Start Inv	484.00	ft
End inv	446.80	ft
Slope	0.04	ft/ft

Tc= **1.50** minutes

$$V = \frac{1.49A^{0.67}S^{0.5}}{nP^{0.67}}$$

V 10.00 ft/sec (assumed)

Time of Concentration	**10.12 minutes**
Use:	**10.00 minutes**

Pipe Capacity Calcs

Rational Method

Ballentine Associates, P.A.
Chapel Hill, NC 27514
(919) 929-0481 fax 489-2803

Project: Rosemary Deck
Proj. Number: 119006.02
Client: Grubb Properties
Date: 3/3/2020
Revised: 5/22/2020

Pipe Capacity

Total Drainage Area	540522.30	sf
	12.41	ac

	Runoff Coefficient	Water Shed area (acres)	Total
Business Downtown area	0.80	12.41	0.80
		12.41	**0.80**

		25 yr	
Drainage area	A	12.41	acres
Runoff Coefficient	C	0.80	
Time of Concentration	t	10.00	mins
Rainfall Intensity	I	7.01	in/hr
Peak discharge	**Q**	**69.59**	**cfs**

Sheet flow

$$Tc = \frac{0.007(nL)^{0.8}}{P_2^{0.5} s^{0.4}}$$

n	0.10	Grass + Pavement	
Length	196.00	ft	
Start Inv	495.00	ft	
End inv	487.00	ft	
Slope	0.041	ft/ft	
P	3.58	in	

Tc= 0.14 hours
8.63 minutes

Pipe flow (assumed)

$$Tc = \frac{L}{60V}$$

Length	897.70	ft
Start Inv	484.00	ft
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Slope	0.04	ft/ft

Tc= **1.50** minutes

$$V = \frac{1.49A^{0.67}S^{0.5}}{nP^{0.67}}$$

V 10.00 ft/sec (assumed)

Time of Concentration	**10.12 minutes**
Use:	**10.00 minutes**

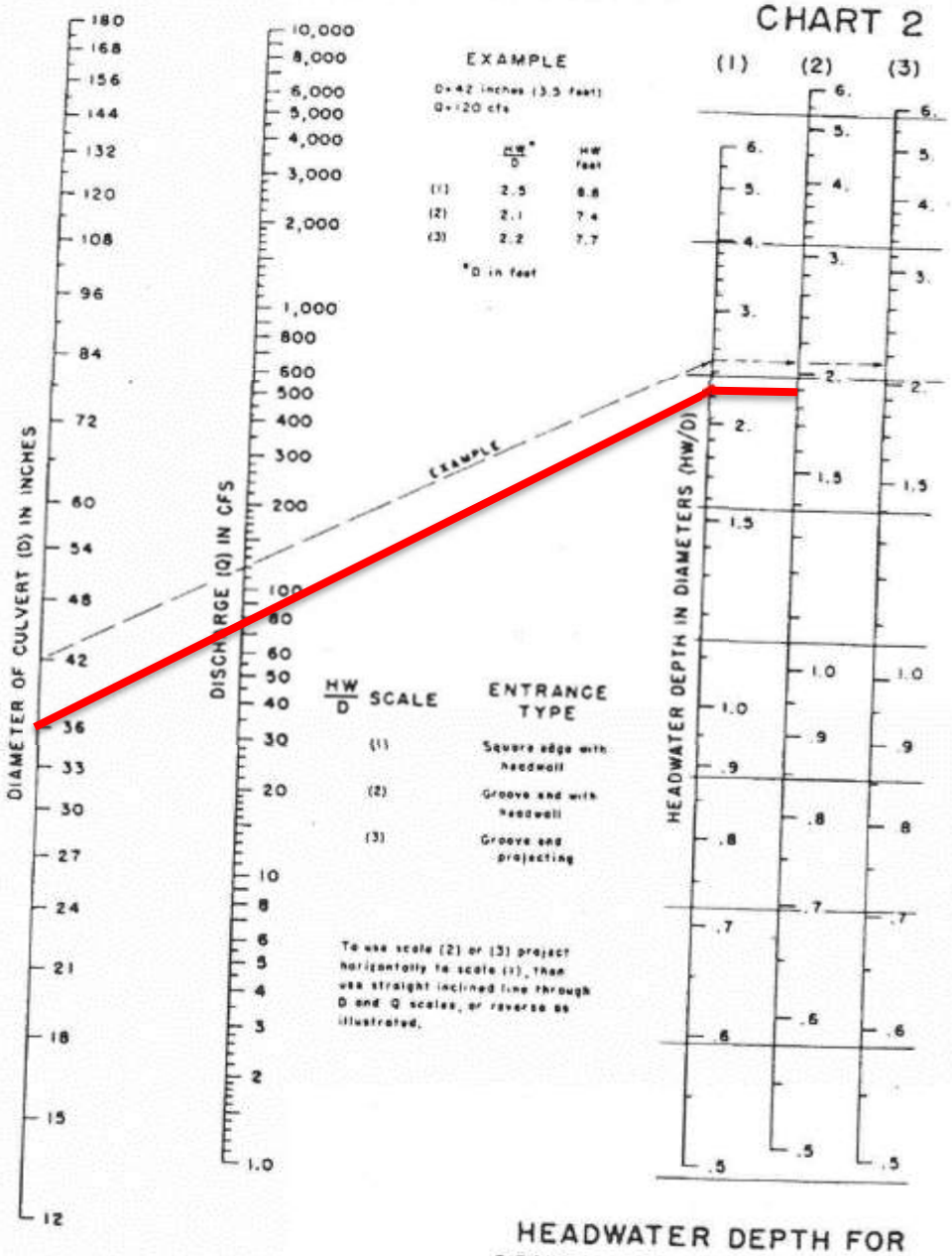
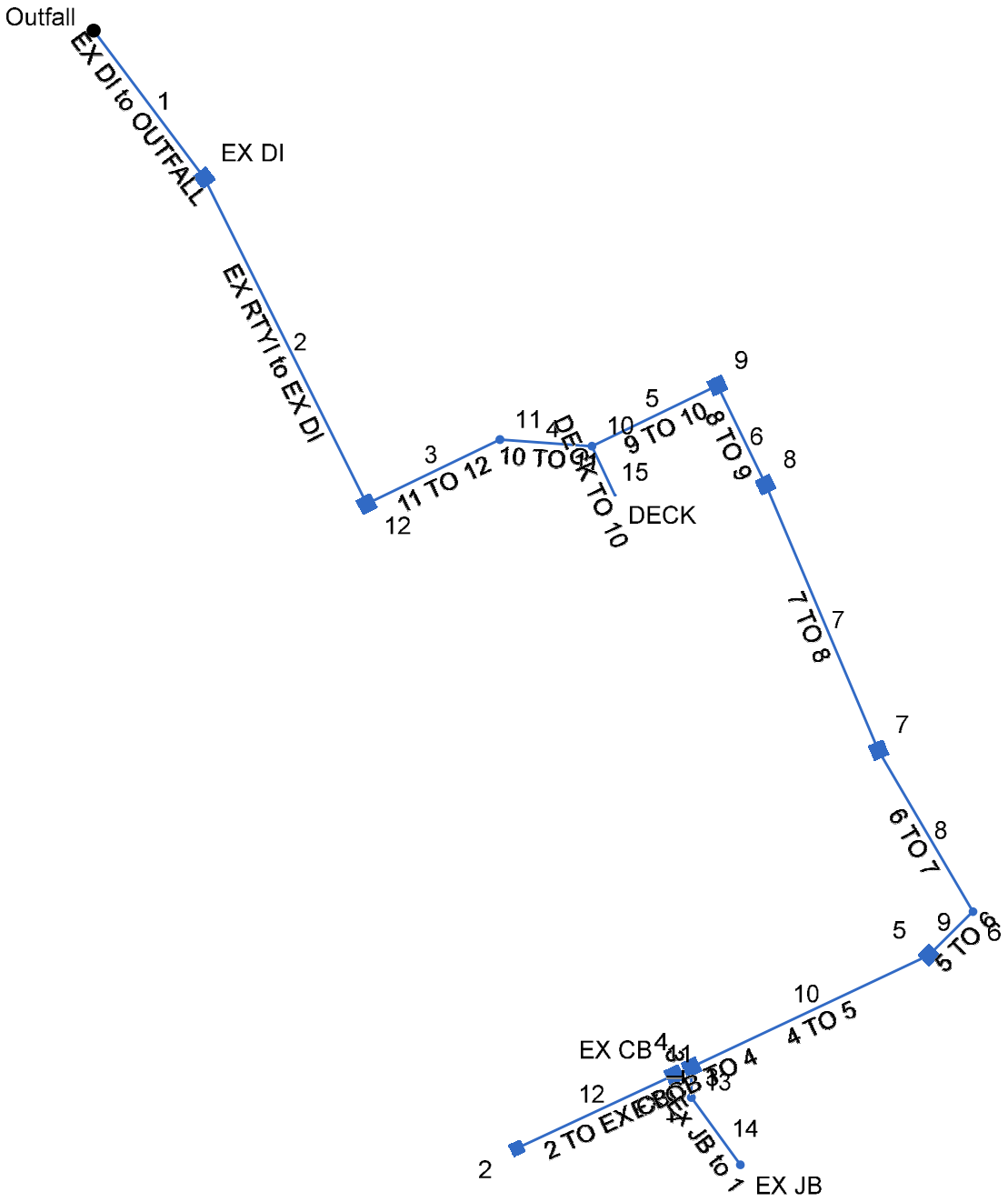


CHART 2
EXAMPLE
D=42 inches (3.5 feet)
Q=120 cfs
(1) 2.5 8.8
(2) 2.1 7.4
(3) 2.2 7.7
*D in feet
(1)
(2)
(3)
DIAMETER OF CULVERT (D) IN INCHES
DISCHARGE (Q) IN CFS
HEADWATER DEPTH IN DIAMETERS (HW/D)
EXAMPLE
HW/D SCALE
ENTRANCE TYPE
(1) Square edge with headwall
(2) Groove end with headwall
(3) Groove end projecting
To use scale (2) or (3) project horizontally to scale (1), then use straight inclined line through D and Q scales, or reverse as illustrated.
HEADWATER SCALES 283
REVISED MAY 1964
BUREAU OF PUBLIC ROADS JAN 1963
HEADWATER DEPTH FOR CONCRETE PIPE CULVERTS WITH INLET CONTROL

Hydraflow Storm Sewers Extension for Autodesk® AutoCAD® Civil 3D® Plan



Project File: Post System Rosemary Deck-10 Yr.stm	Number of lines: 15	Date: 5/22/2020

Storm Sewer Tabulation

10YR DOT Conduit Report

Line ID	Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev	
		Incr	Total		Incr	Total	Inlet	Syst					Size	Slope	Dn	Up	Dn	Up	Dn	Up
	(ft)	(ac)	(ac)	(C)			(min)	(min)	(in/hr)	(cfs)	(cfs)	(ft/s)	(in)	(%)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)
EX DI to OUTFAL	59.208	0.56	2.60	0.48	0.27	2.00	5.0	11.1	5.8	70.07	173.2	9.00	27 x 48 b	4.39	437.50	440.10	439.30	442.22	0.00	444.10
EX RTYI to EX DI	117.253	0.06	2.04	0.26	0.02	1.73	5.0	10.8	5.8	68.60	197.5	8.15	27 x 48 b	5.71	440.10	446.80	442.22	448.89	444.10	454.10
11 TO 12	47.572	0.00	1.98	0.00	0.00	1.72	0.0	10.8	5.9	68.54	104.8	12.09	36	2.10	446.90	447.90	448.89	450.54	454.10	455.36
10 TO 11	29.504	0.00	1.98	0.00	0.00	1.72	0.0	10.7	5.9	68.55	111.3	10.42	36	2.37	447.90	448.60	450.54	451.24	455.36	459.10
9 TO 10	44.748	0.03	0.65	0.29	0.01	0.52	5.0	10.6	5.9	61.53	118.3	9.52	36	2.68	448.60	449.80	451.24	452.33	459.10	459.50
8 TO 9	35.467	0.03	0.62	0.30	0.01	0.51	5.0	10.6	5.9	61.49	115.1	9.68	36	2.54	449.80	450.70	452.33	453.23	459.50	463.80
7 TO 8	92.886	0.33	0.59	0.82	0.27	0.50	5.0	10.4	5.9	61.45	118.5	9.68	36	2.69	450.70	453.20	453.23	455.73	463.80	464.80
6 TO 7	60.250	0.00	0.26	0.00	0.00	0.23	0.0	10.3	6.0	59.85	131.6	9.47	36	3.32	453.20	455.20	455.73	457.70	464.80	466.75
5 TO 6	19.966	0.01	0.26	0.90	0.01	0.23	5.0	10.2	6.0	59.85	125.2	9.52	36	3.00	455.20	455.80	457.70	458.30	466.75	466.48
4 TO 5	84.377	0.07	0.25	0.89	0.06	0.22	5.0	10.1	6.0	59.81	116.7	9.51	36	2.61	455.80	458.00	458.30	460.50	466.48	465.40
EX CB TO 4	5.948	0.05	0.18	0.89	0.04	0.16	5.0	6.3	7.0	1.11	14.75	0.63	18	1.68	458.20	458.30	460.50	460.50	465.40	464.80
2 TO EX CB	55.791	0.13	0.13	0.89	0.12	0.12	5.0	5.0	7.4	0.85	12.91	4.42	15	3.41	460.80	462.70	461.02	463.06	464.80	466.70
3 TO 4	9.767	0.00	0.00	0.00	0.00	0.00	0.0	10.0	0.0	58.47	73.11	9.34	36	1.02	458.00	458.10	460.50	460.57	465.40	465.30
Ex JB to 1	26.832	0.00	0.00	0.00	0.00	0.00	10.0	10.0	0.0	58.47	93.17	14.56	30	4.40	458.92	460.10	460.57	462.48	465.30	465.00
DECK TO 10	17.404	1.33	1.33	0.90	1.20	1.20	5.0	5.0	7.4	8.83	54.77	3.01	36	0.57	448.60	448.70	451.24	449.64	459.10	452.53

Project File: Post System Rosemary Deck-10 Yr.stm

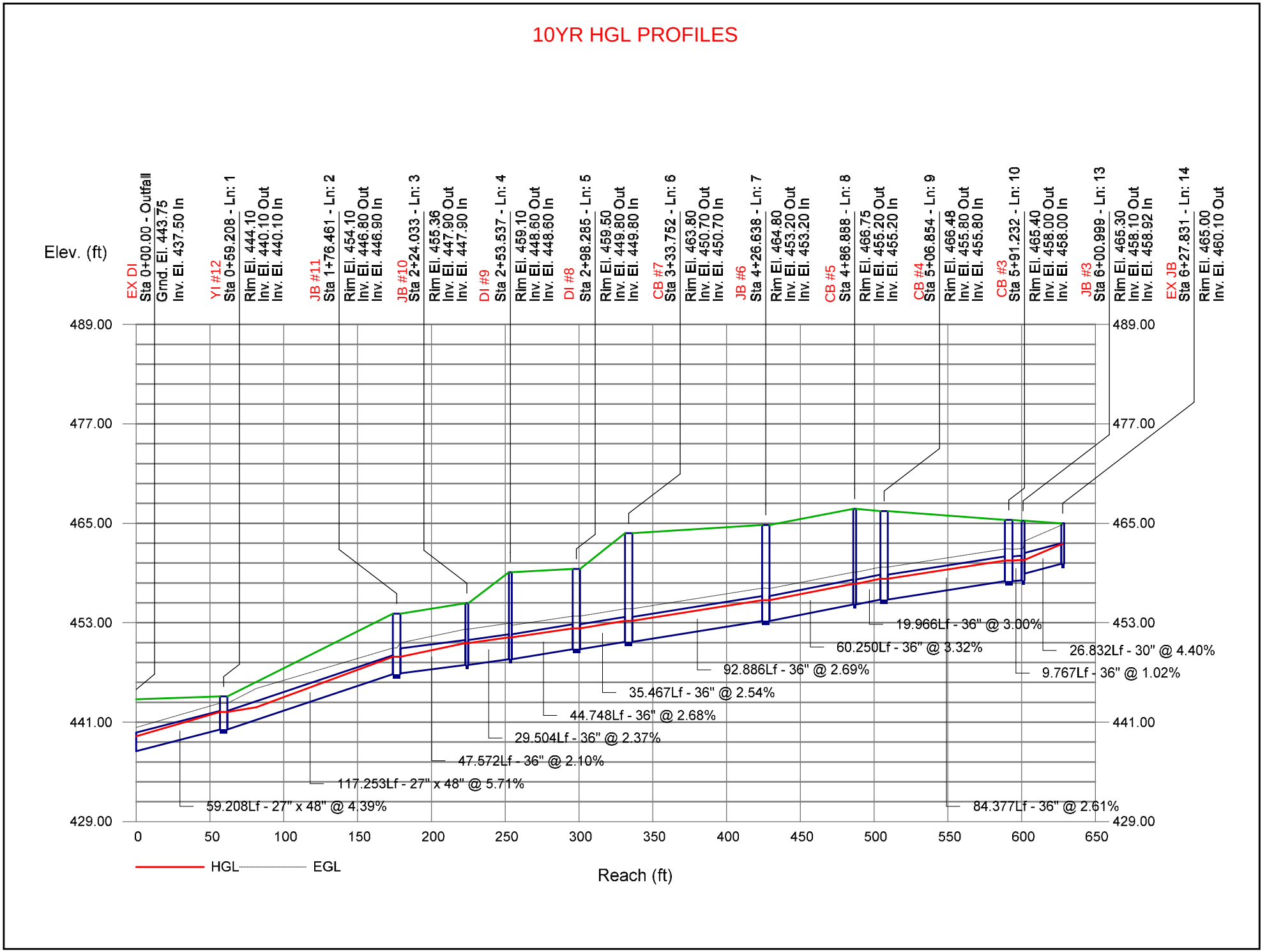
Number of lines: 15

Run Date: 5/22/2020

NOTES:Intensity = 72.98 / (Inlet time + 12.40) ^ 0.80; Return period =Yrs. 10 ; c = cir e = ellip b = box

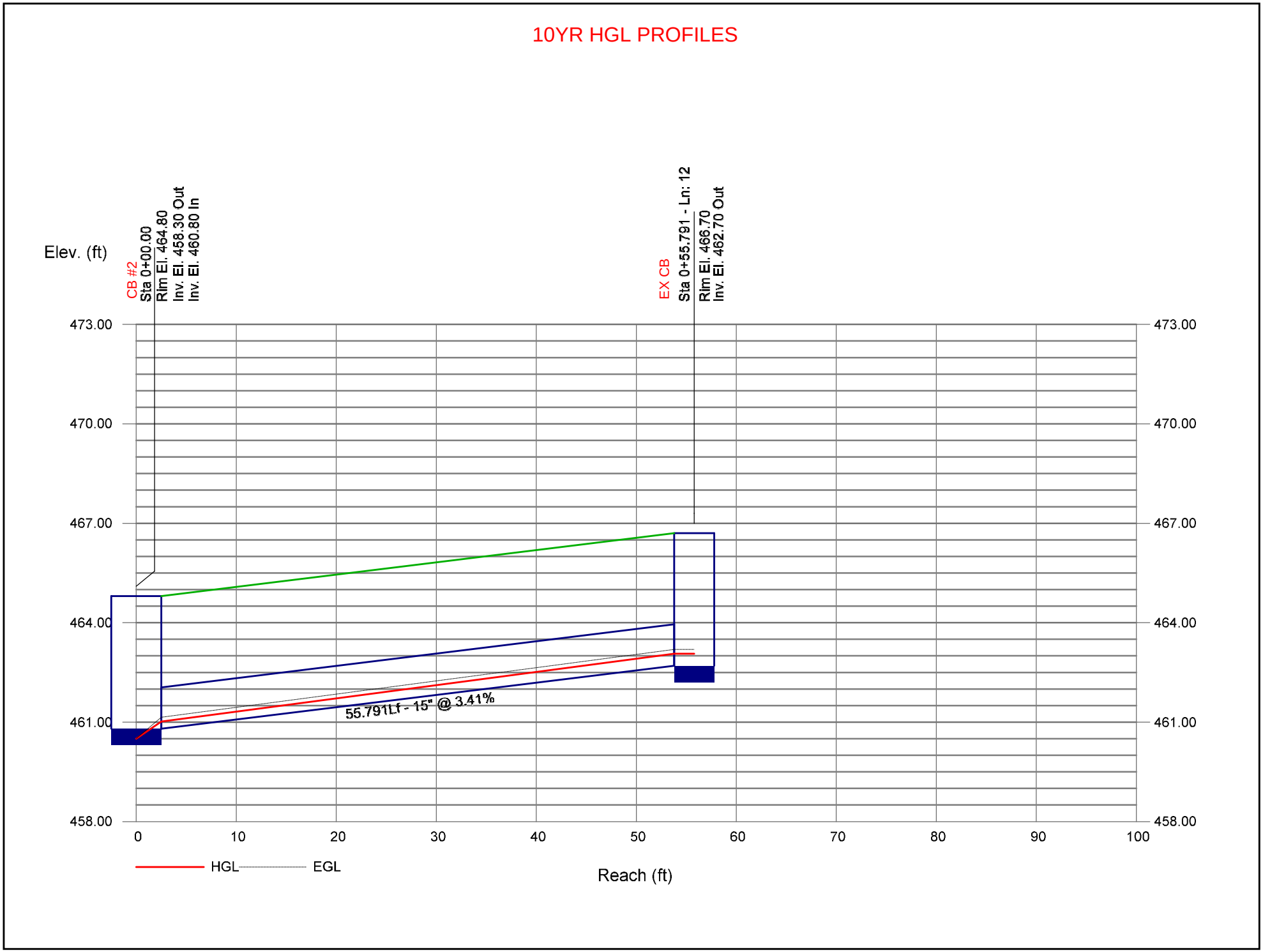
Storm Sewer Profile

Proj. file: Post System Rosemary Deck-10 Yr.stm



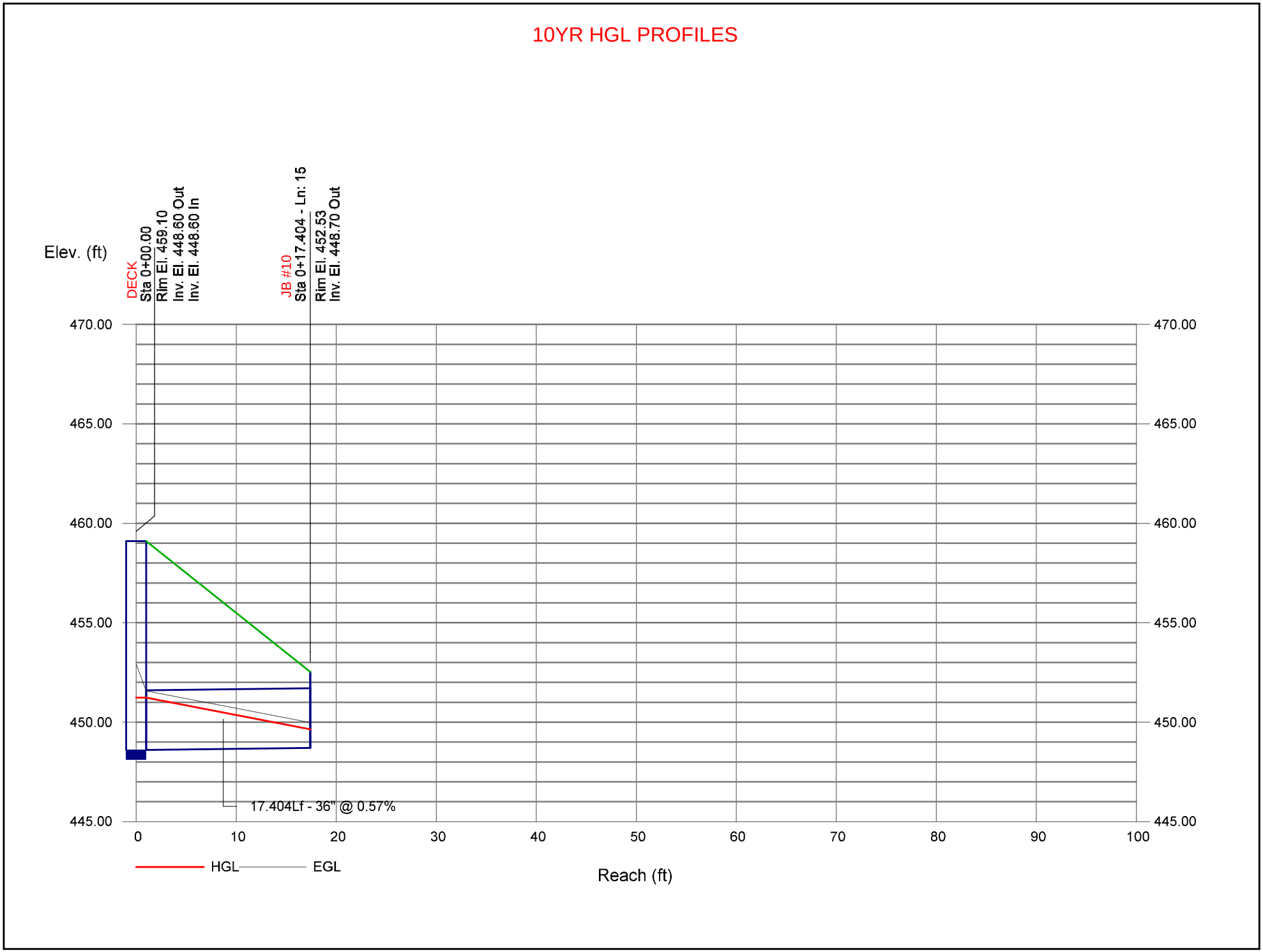
Storm Sewer Profile

Proj. file: Post System Rosemary Deck-10 Yr.stm



Storm Sewer Profile

Proj. file: Post System Rosemary Deck-10 Yr.stm



Storm Sewer Tabulation

25YR DOT Conduit Report

Line ID	Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev	
		Incr	Total		Incr	Total	Inlet	Syst					Size	Slope	Dn	Up	Dn	Up	Dn	Up
	(ft)	(ac)	(ac)	(C)			(min)	(min)	(in/hr)	(cfs)	(cfs)	(ft/s)	(in)	(%)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)
EX DI to OUTFAL	59.208	0.56	2.60	0.48	0.27	2.00	5.0	11.0	6.4	76.84	173.2	9.60	27 x 48 b	4.39	437.50	440.10	439.30	442.35	0.00	444.10
EX RTYI to EX DI	117.253	0.06	2.04	0.26	0.02	1.73	5.0	10.8	6.5	75.21	197.5	8.41	27 x 48 b	5.71	440.10	446.80	442.92	449.02	444.10	454.10
11 TO 12	47.572	0.00	1.98	0.00	0.00	1.72	0.0	10.7	6.5	75.13	104.8	12.61	36	2.10	446.90	447.90	449.02	450.62	454.10	455.36
10 TO 11	29.504	0.00	1.98	0.00	0.00	1.72	0.0	10.7	6.5	75.15	111.3	11.16	36	2.37	447.90	448.60	450.62	451.32	455.36	459.10
9 TO 10	44.748	0.03	0.65	0.29	0.01	0.52	5.0	10.6	6.5	67.41	118.3	10.15	36	2.68	448.60	449.80	451.32	452.42	459.10	459.50
8 TO 9	35.467	0.03	0.62	0.30	0.01	0.51	5.0	10.5	6.5	67.36	115.1	10.29	36	2.54	449.80	450.70	452.42	453.32	459.50	463.80
7 TO 8	92.886	0.33	0.59	0.82	0.27	0.50	5.0	10.3	6.5	67.32	118.5	10.28	36	2.69	450.70	453.20	453.32	455.82	463.80	464.80
6 TO 7	60.250	0.00	0.26	0.00	0.00	0.23	0.0	10.2	6.6	65.55	131.6	10.06	36	3.32	453.20	455.20	455.82	457.79	464.80	466.75
5 TO 6	19.966	0.01	0.26	0.90	0.01	0.23	5.0	10.2	6.6	65.55	125.2	10.10	36	3.00	455.20	455.80	457.79	458.39	466.75	466.48
4 TO 5	84.377	0.07	0.25	0.89	0.06	0.22	5.0	10.1	6.6	65.50	116.7	10.09	36	2.61	455.80	458.00	458.39	460.59	466.48	465.40
EX CB TO 4	5.948	0.05	0.18	0.89	0.04	0.16	5.0	6.2	7.7	1.23	14.75	0.70	18	1.68	458.20	458.30	460.59	460.59	465.40	464.80
2 TO EX CB	55.791	0.13	0.13	0.89	0.12	0.12	5.0	5.0	8.1	0.94	12.91	4.55	15	3.41	460.80	462.70	461.03	463.08	464.80	466.70
3 TO 4	9.767	0.00	0.00	0.00	0.00	0.00	0.0	10.0	0.0	64.03	73.11	9.90	36	1.02	458.00	458.10	460.59	460.67	465.40	465.30
Ex JB to 1	26.832	0.00	0.00	0.00	0.00	0.00	10.0	10.0	0.0	64.03	93.17	15.33	30	4.40	458.92	460.10	460.67	462.52	465.30	465.00
DECK TO 10	17.404	1.33	1.33	0.90	1.20	1.20	5.0	5.0	8.1	9.69	54.77	3.12	36	0.57	448.60	448.70	451.32	449.68	459.10	452.53

Project File: Post System Rosemary Deck-25 Yr.stm

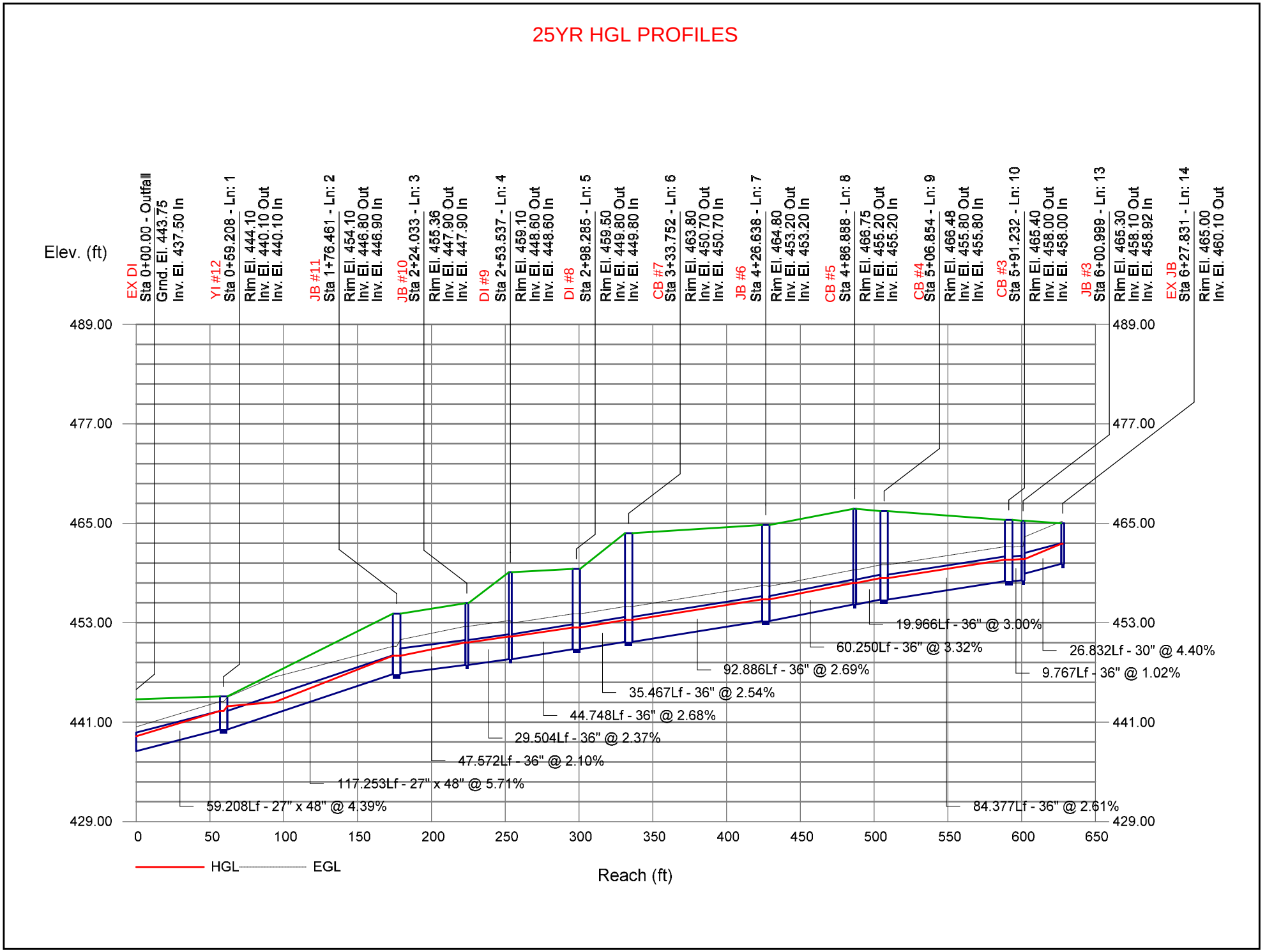
Number of lines: 15

Run Date: 5/22/2020

NOTES:Intensity = 63.67 / (Inlet time + 11.10) ^ 0.74; Return period =Yrs. 25 ; c = cir e = ellip b = box

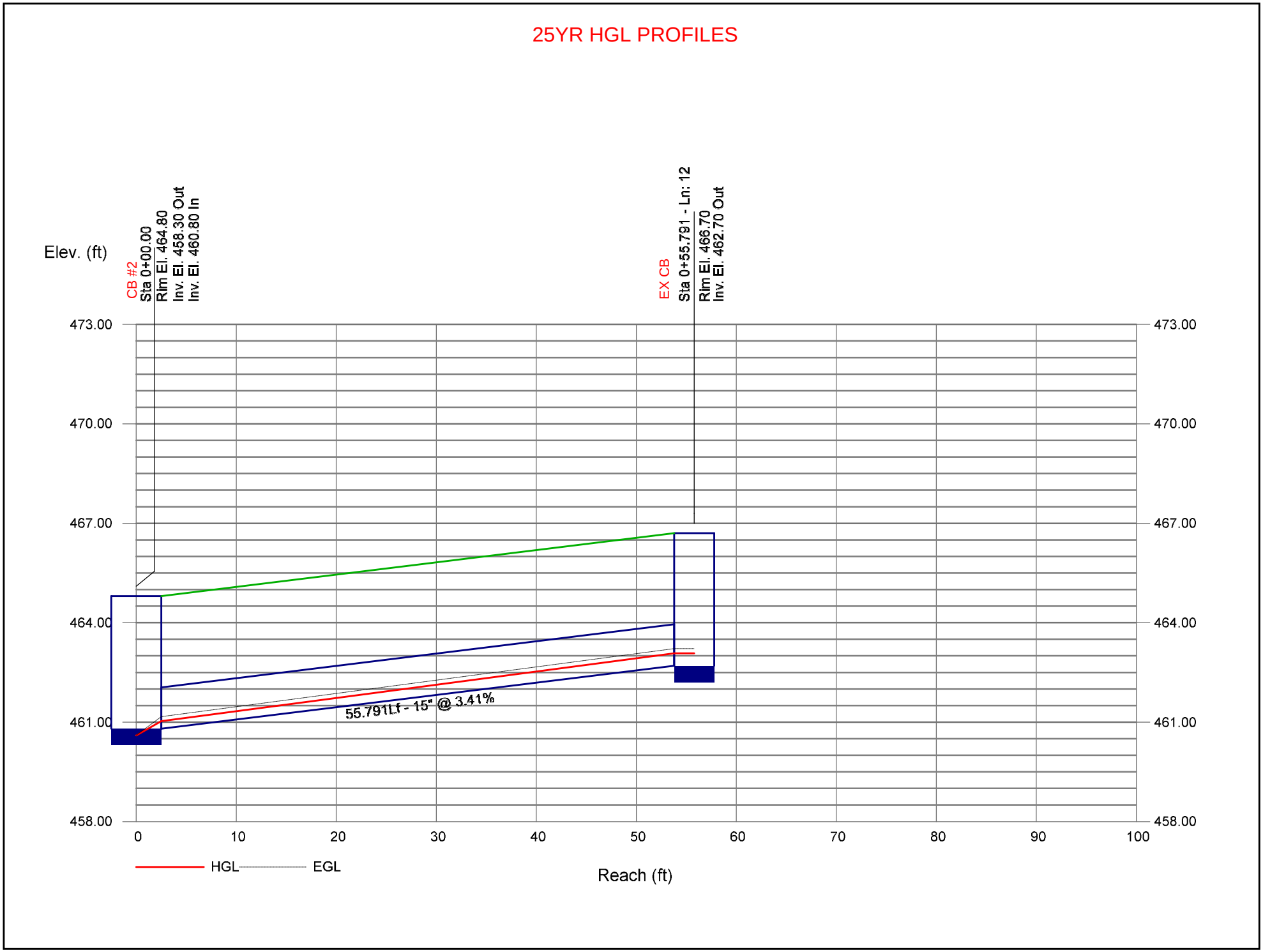
Storm Sewer Profile

Proj. file: Post System Rosemary Deck-25 Yr.stm



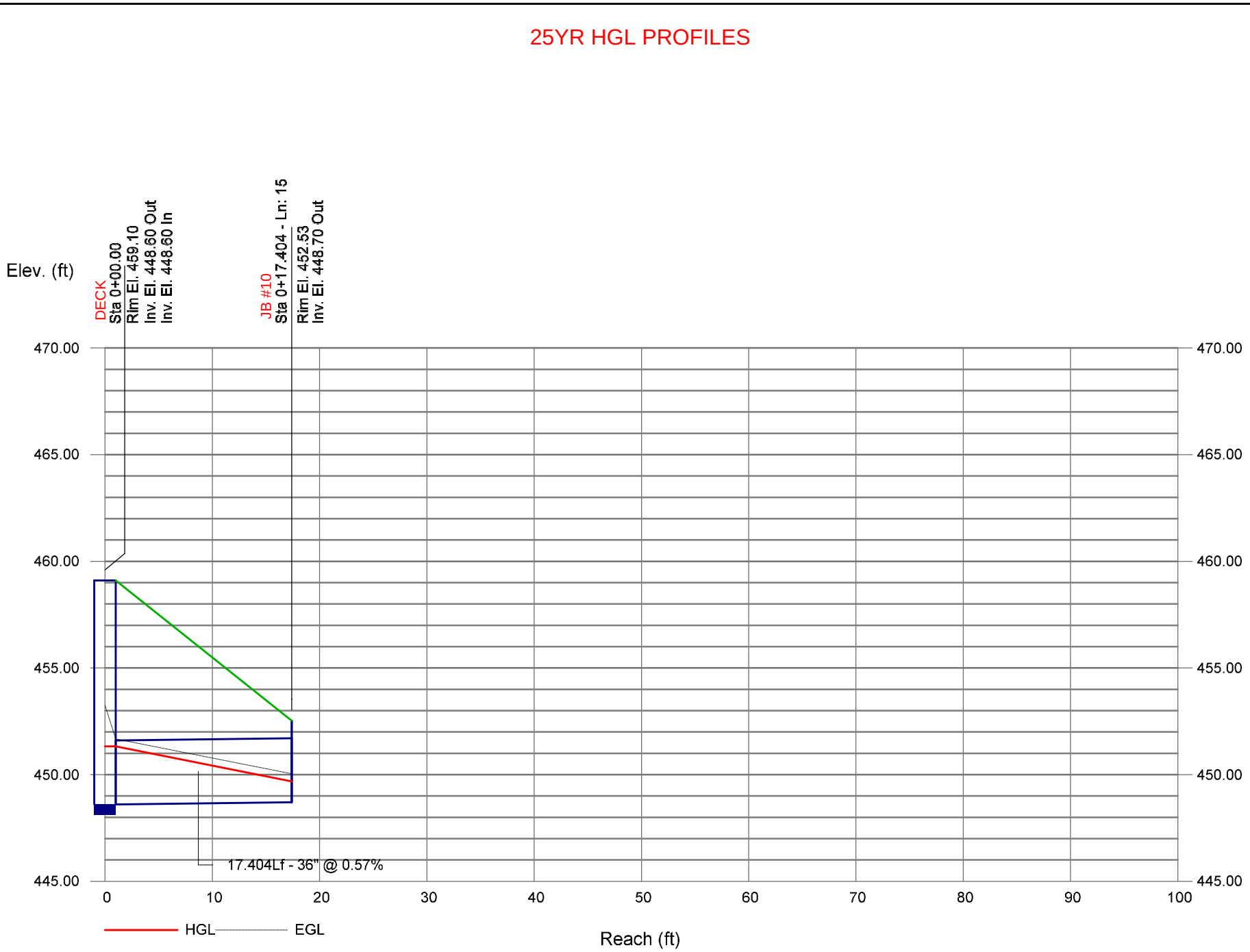
Storm Sewer Profile

Proj. file: Post System Rosemary Deck-25 Yr.stm



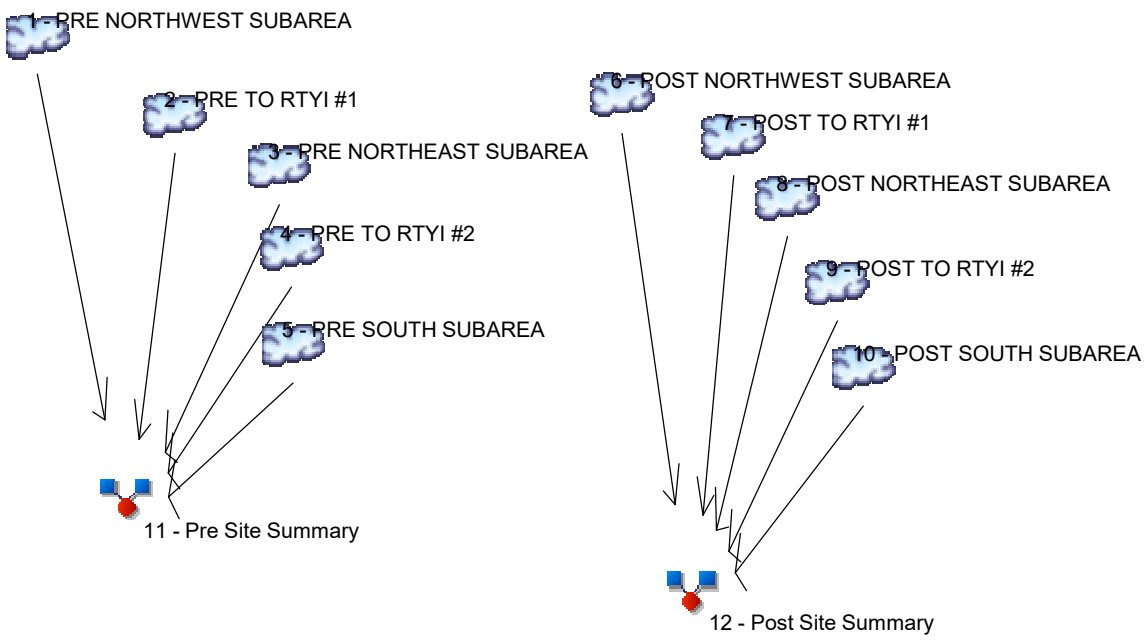
Storm Sewer Profile

Proj. file: Post System Rosemary Deck-25 Yr.stm



Watershed Model Schematic

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020



Legend

Hyd.	Origin	Description
1	SCS Runoff	PRE NORTHWEST SUBAREA
2	SCS Runoff	PRE TO RTYI #1
3	SCS Runoff	PRE NORTHEAST SUBAREA
4	SCS Runoff	PRE TO RTYI #2
5	SCS Runoff	PRE SOUTH SUBAREA
6	SCS Runoff	POST NORTHWEST SUBAREA
7	SCS Runoff	POST TO RTYI #1
8	SCS Runoff	POST NORTHEAST SUBAREA
9	SCS Runoff	POST TO RTYI #2
10	SCS Runoff	POST SOUTH SUBAREA
11	Combine	Pre Site Summary
12	Combine	Post Site Summary

Hydraflow Table of Contents

Rosemary Deck.gpw

Hydrograph Return Period Recap

Hyd. No.	Hydrograph type (origin)	Inflow hyd(s)	Peak Outflow (cfs)								Hydrograph Description
			1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr	
1	SCS Runoff	------	0.042	0.067	-------	-------	0.142	0.189	-------	0.271	PRE NORTHWEST SUBAREA
2	SCS Runoff	------	5.485	6.767	-------	-------	10.02	11.93	-------	14.99	PRE TO RTYI #1
3	SCS Runoff	------	0.069	0.087	-------	-------	0.132	0.159	-------	0.201	PRE NORTHEAST SUBAREA
4	SCS Runoff	------	0.235	0.287	-------	-------	0.419	0.497	-------	0.621	PRE TO RTYI #2
5	SCS Runoff	------	0.308	0.377	-------	-------	0.555	0.659	-------	0.825	PRE SOUTH SUBAREA
6	SCS Runoff	------	0.021	0.034	-------	-------	0.071	0.095	-------	0.136	POST NORTHWEST SUBAREA
7	SCS Runoff	------	5.886	7.218	-------	-------	10.61	12.60	-------	15.78	POST TO RTYI #1
8	SCS Runoff	------	0.021	0.034	-------	-------	0.071	0.095	-------	0.136	POST NORTHEAST SUBAREA
9	SCS Runoff	------	0.061	0.094	-------	-------	0.190	0.252	-------	0.357	POST TO RTYI #2
10	SCS Runoff	------	0.308	0.377	-------	-------	0.555	0.659	-------	0.825	POST SOUTH SUBAREA
11	Combine	1, 2, 3,	6.136	7.583	-------	-------	11.27	13.43	-------	16.90	Pre Site Summary
12	Combine	4, 5, 6, 7, 8, 9, 10,	6.290	7.751	-------	-------	11.49	13.69	-------	17.24	Post Site Summary

Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	0.042	2	718	88	------	------	------	PRE NORTHWEST SUBAREA
2	SCS Runoff	5.485	2	716	11,976	------	------	------	PRE TO RTYI #1
3	SCS Runoff	0.069	2	716	145	------	------	------	PRE NORTHEAST SUBAREA
4	SCS Runoff	0.235	2	716	535	------	------	------	PRE TO RTYI #2
5	SCS Runoff	0.308	2	716	684	------	------	------	PRE SOUTH SUBAREA
6	SCS Runoff	0.021	2	718	44	------	------	------	POST NORTHWEST SUBAREA
7	SCS Runoff	5.886	2	716	13,083	------	------	------	POST TO RTYI #1
8	SCS Runoff	0.021	2	718	44	------	------	------	POST NORTHEAST SUBAREA
9	SCS Runoff	0.061	2	718	125	------	------	------	POST TO RTYI #2
10	SCS Runoff	0.308	2	716	684	------	------	------	POST SOUTH SUBAREA
11	Combine	6.136	2	716	13,428	1, 2, 3, 4, 5,	------	------	Pre Site Summary
12	Combine	6.290	2	716	13,981	6, 7, 8, 9, 10,	------	------	Post Site Summary

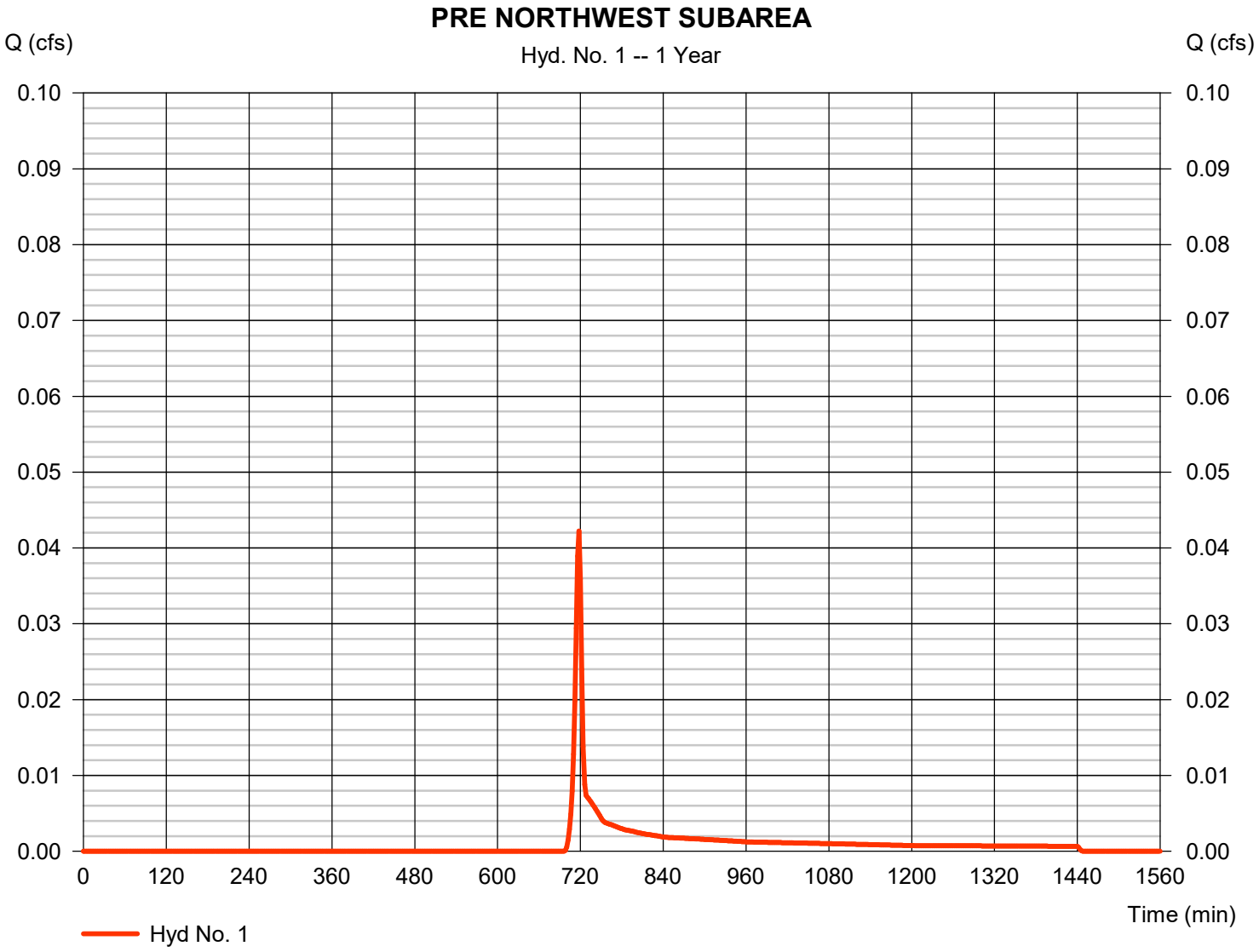
Hydrograph Report

Hyd. No. 1

PRE NORTHWEST SUBAREA

Hydrograph type	= SCS Runoff	Peak discharge	= 0.042 cfs
Storm frequency	= 1 yrs	Time to peak	= 718 min
Time interval	= 2 min	Hyd. volume	= 88 cuft
Drainage area	= 0.040 ac	Curve number	= 69*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 2.96 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.040 x 69)] / 0.040



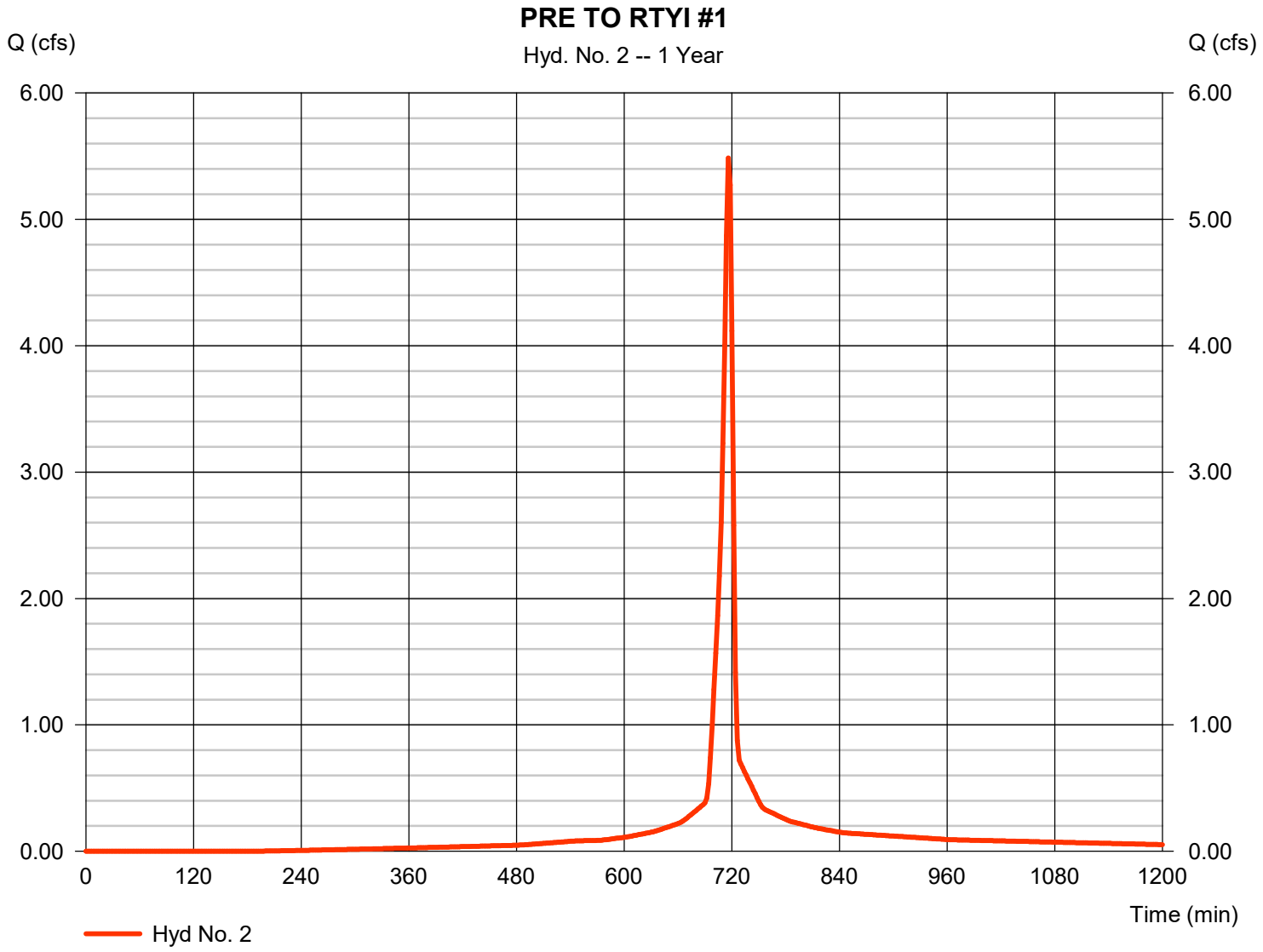
Hydrograph Report

Hyd. No. 2

PRE TO RTYI #1

Hydrograph type	= SCS Runoff	Peak discharge	= 5.485 cfs
Storm frequency	= 1 yrs	Time to peak	= 716 min
Time interval	= 2 min	Hyd. volume	= 11,976 cuft
Drainage area	= 1.460 ac	Curve number	= 95*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 2.96 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.720 x 98) + (0.200 x 98) + (0.060 x 92) + (0.400 x 92) + (0.030 x 69) + (0.050 x 79)] / 1.460



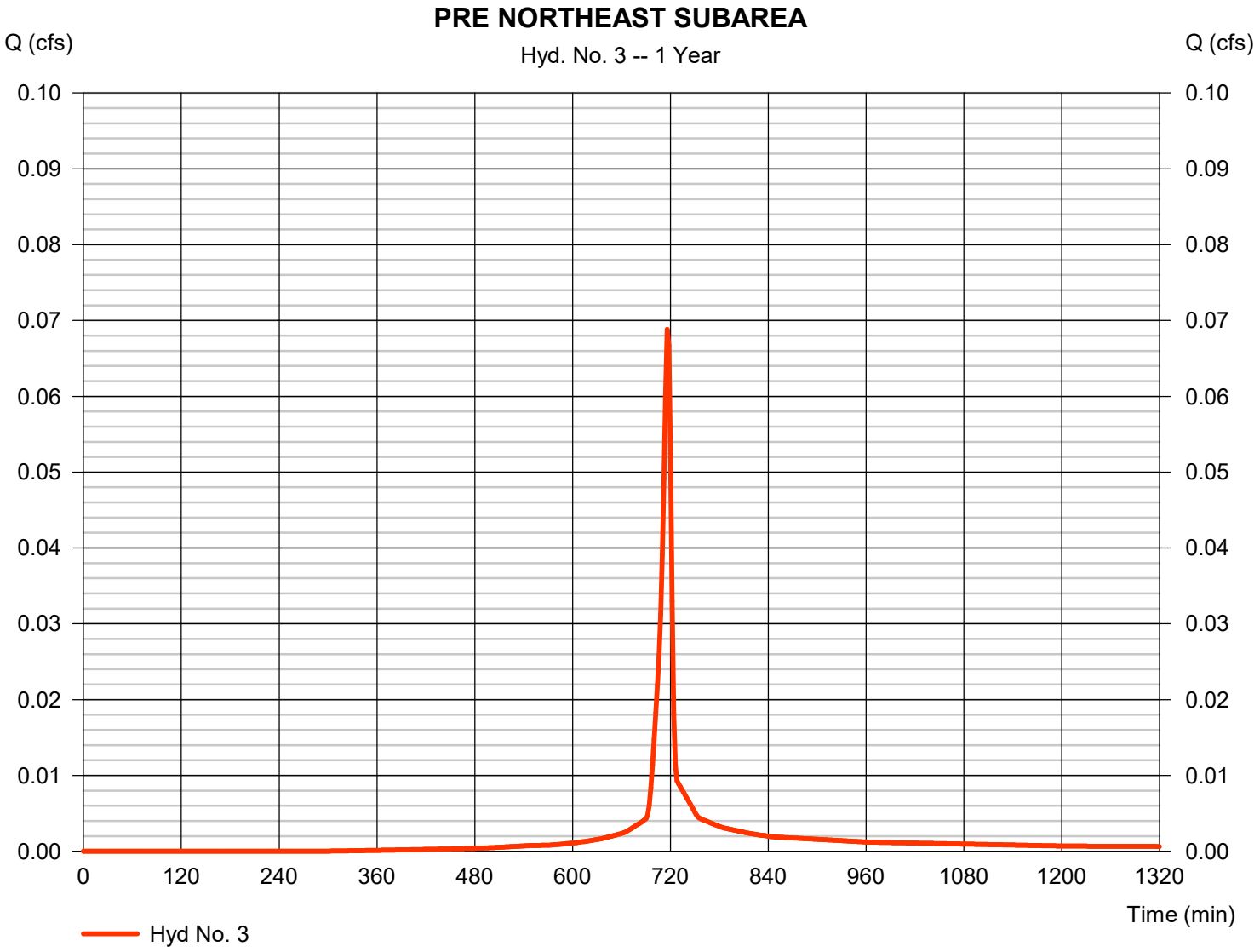
Hydrograph Report

Hyd. No. 3

PRE NORTHEAST SUBAREA

Hydrograph type	= SCS Runoff	Peak discharge	= 0.069 cfs
Storm frequency	= 1 yrs	Time to peak	= 716 min
Time interval	= 2 min	Hyd. volume	= 145 cuft
Drainage area	= 0.020 ac	Curve number	= 92*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 2.96 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.020 x 92)] / 0.020



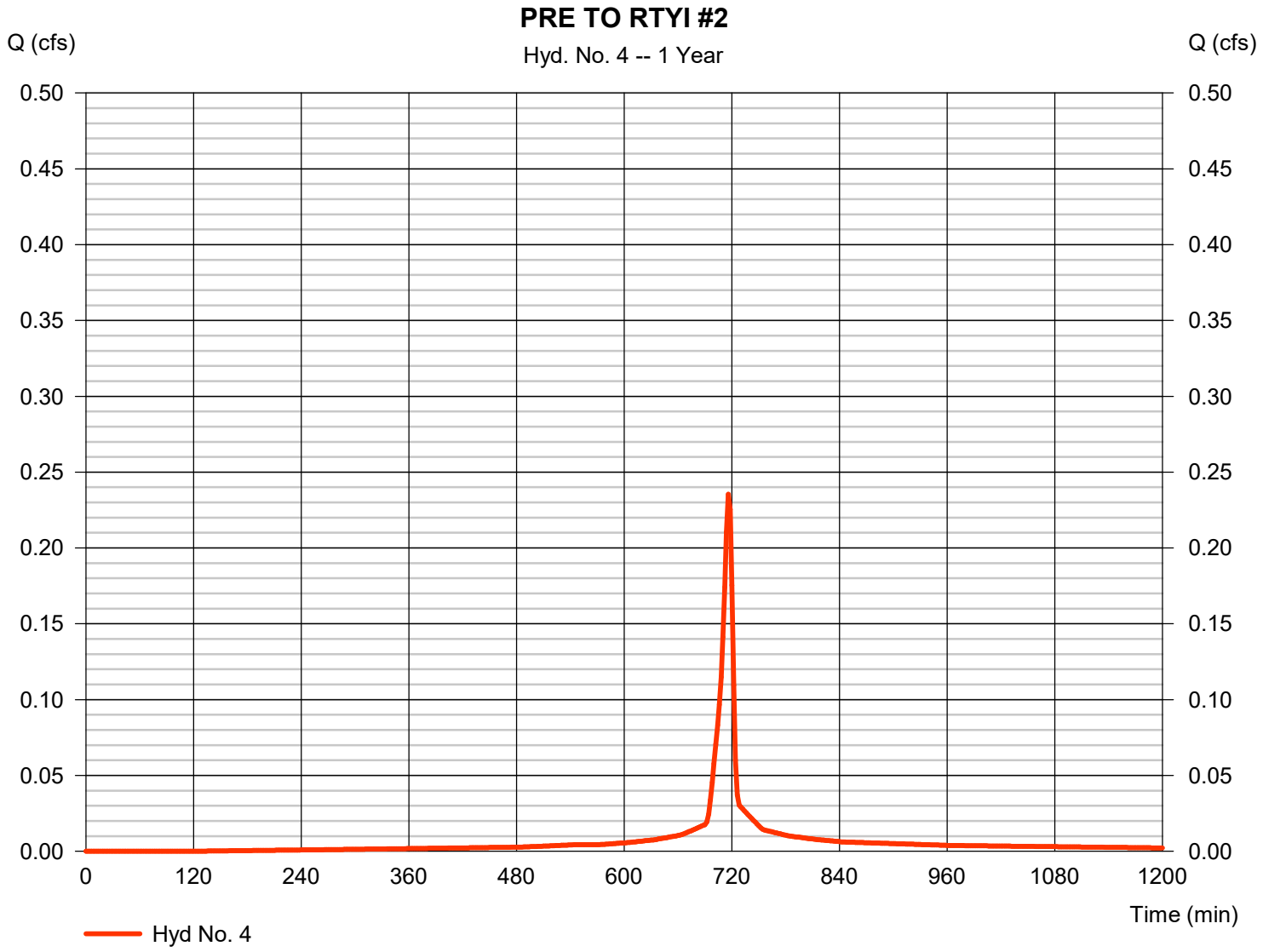
Hydrograph Report

Hyd. No. 4

PRE TO RTYI #2

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.235 cfs
Storm frequency	=	1 yrs	Time to peak	=	716 min
Time interval	=	2 min	Hyd. volume	=	535 cuft
Drainage area	=	0.060 ac	Curve number	=	97*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	2.96 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.040 x 98) + (0.010 x 98) + (0.010 x 92)] / 0.060



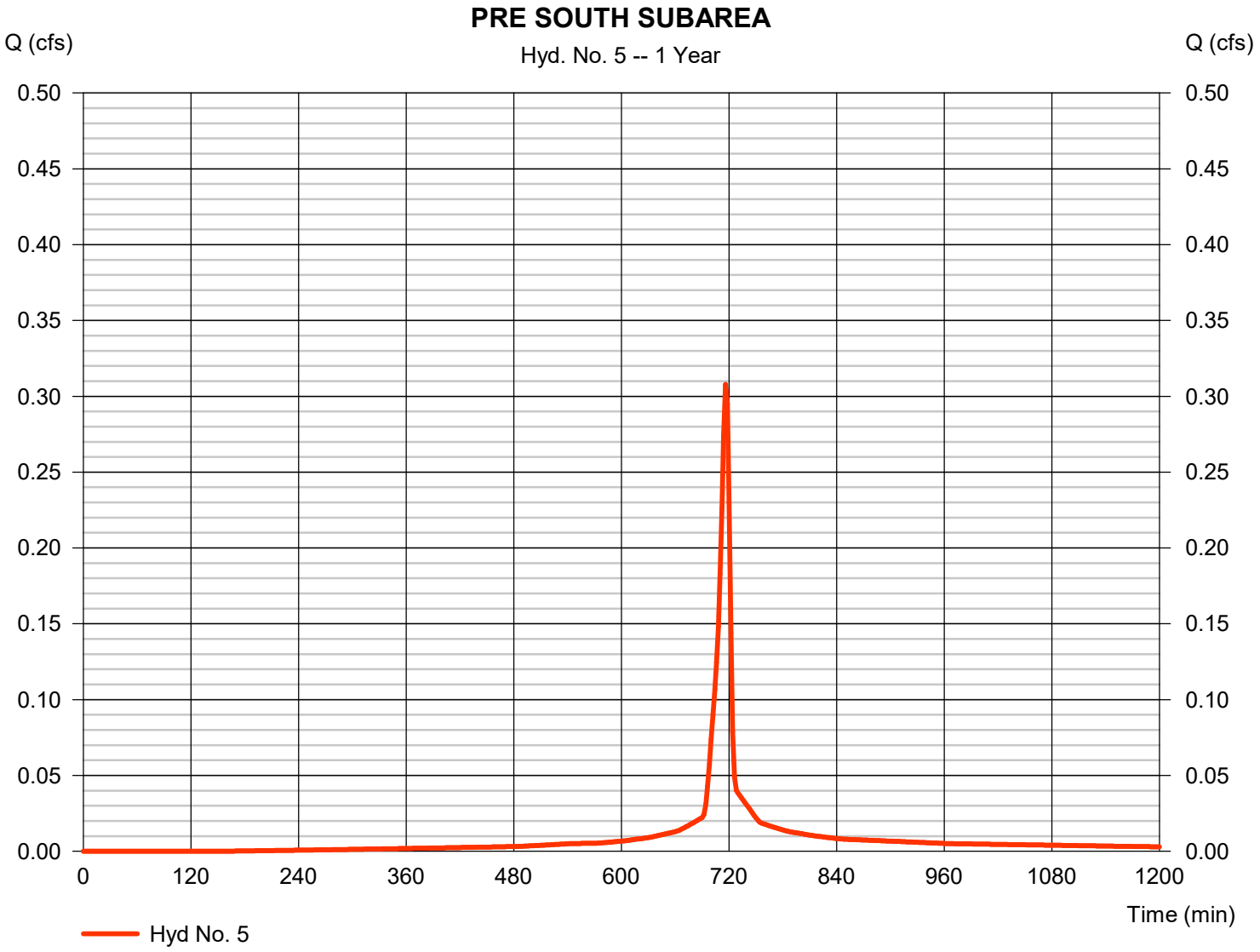
Hydrograph Report

Hyd. No. 5

PRE SOUTH SUBAREA

Hydrograph type	= SCS Runoff	Peak discharge	= 0.308 cfs
Storm frequency	= 1 yrs	Time to peak	= 716 min
Time interval	= 2 min	Hyd. volume	= 684 cuft
Drainage area	= 0.080 ac	Curve number	= 96*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 2.96 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.070 x 98) + (0.010 x 79)] / 0.080



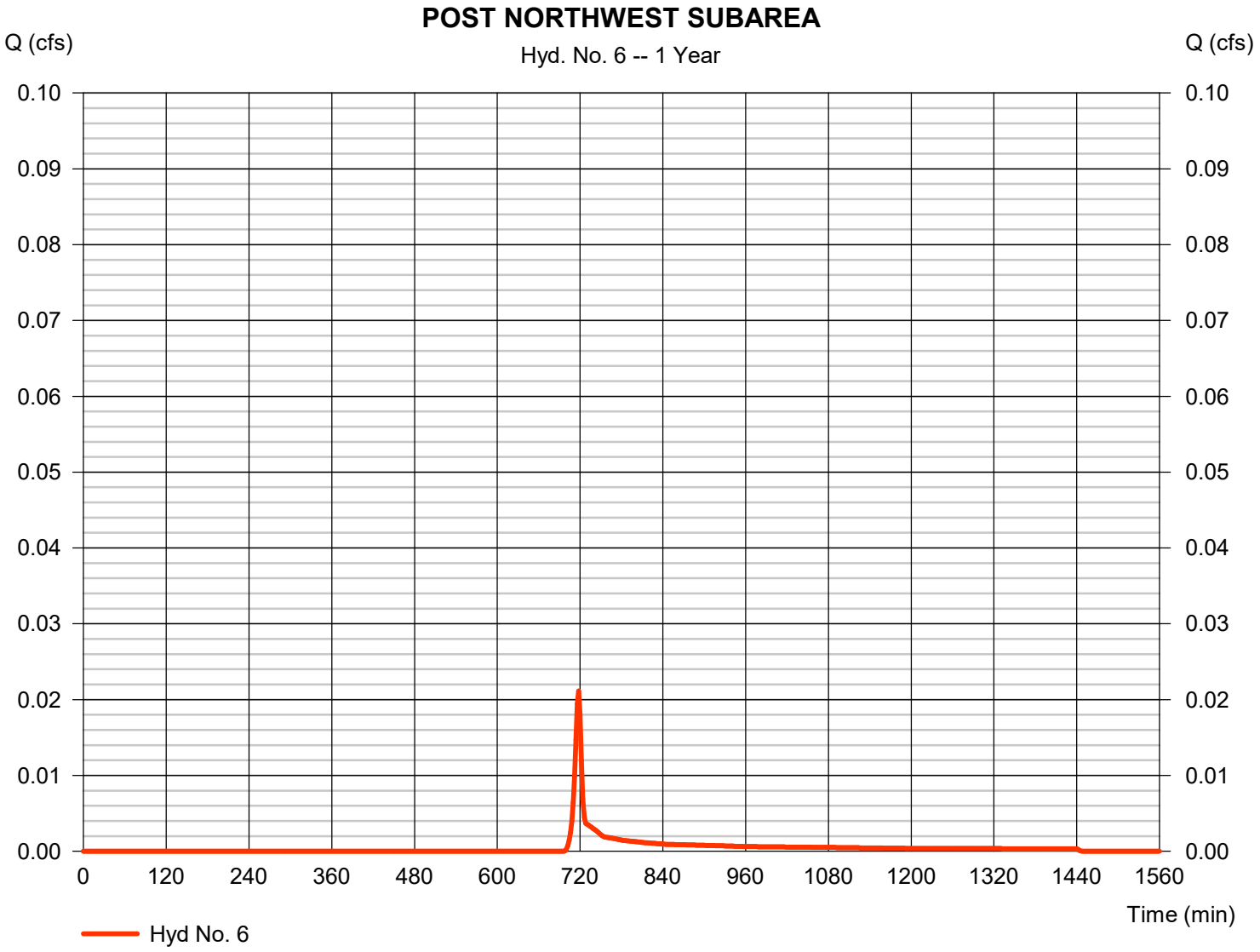
Hydrograph Report

Hyd. No. 6

POST NORTHWEST SUBAREA

Hydrograph type	= SCS Runoff	Peak discharge	= 0.021 cfs
Storm frequency	= 1 yrs	Time to peak	= 718 min
Time interval	= 2 min	Hyd. volume	= 44 cuft
Drainage area	= 0.020 ac	Curve number	= 69*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 2.96 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.020 x 69)] / 0.020



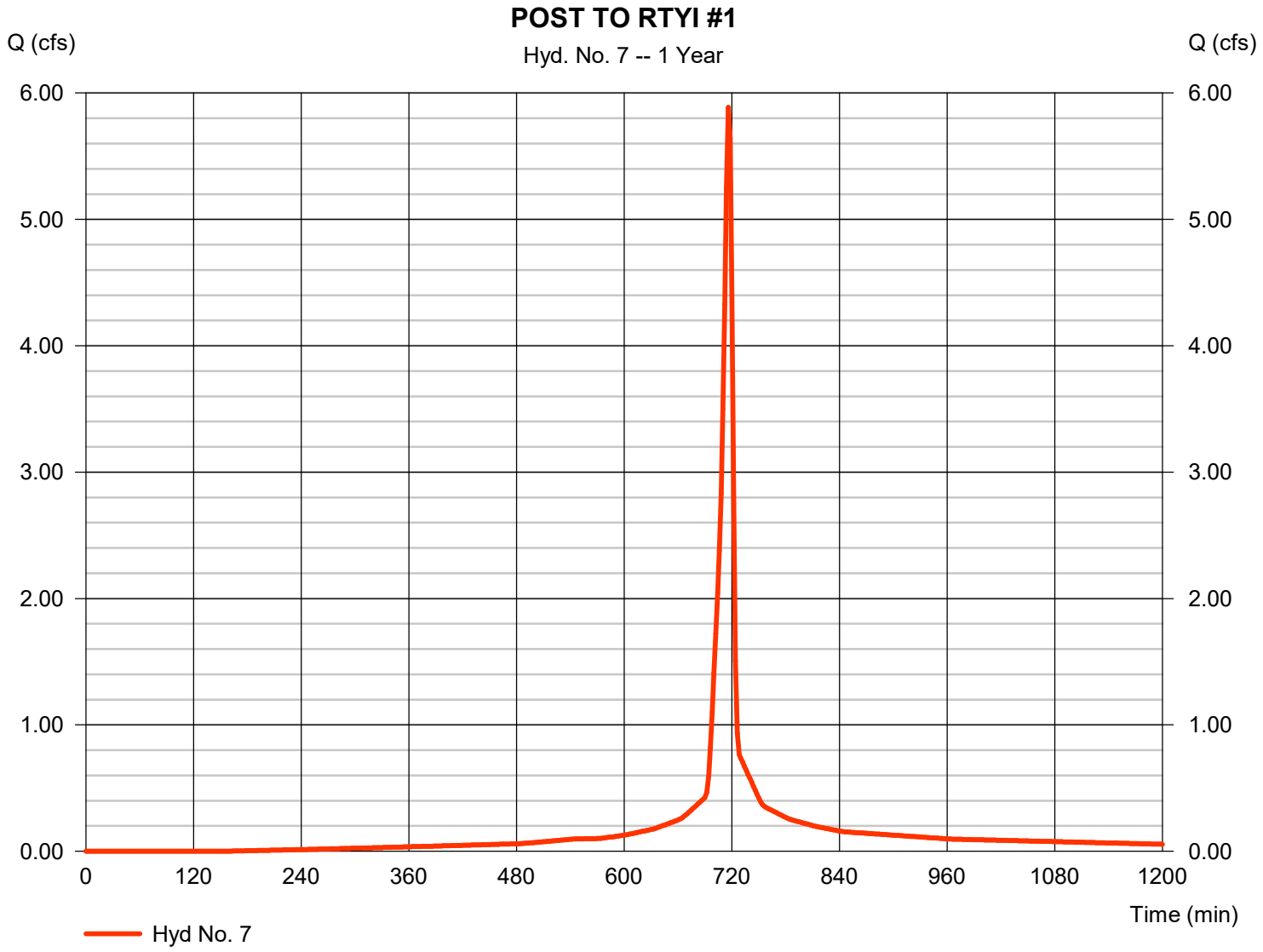
Hydrograph Report

Hyd. No. 7

POST TO RTYI #1

Hydrograph type	=	SCS Runoff	Peak discharge	=	5.886 cfs
Storm frequency	=	1 yrs	Time to peak	=	716 min
Time interval	=	2 min	Hyd. volume	=	13,083 cuft
Drainage area	=	1.530 ac	Curve number	=	96*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	2.96 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.260 x 98) + (0.023 x 98) + (1.140 x 98) + (0.050 x 69) + (0.060 x 79)] / 1.530



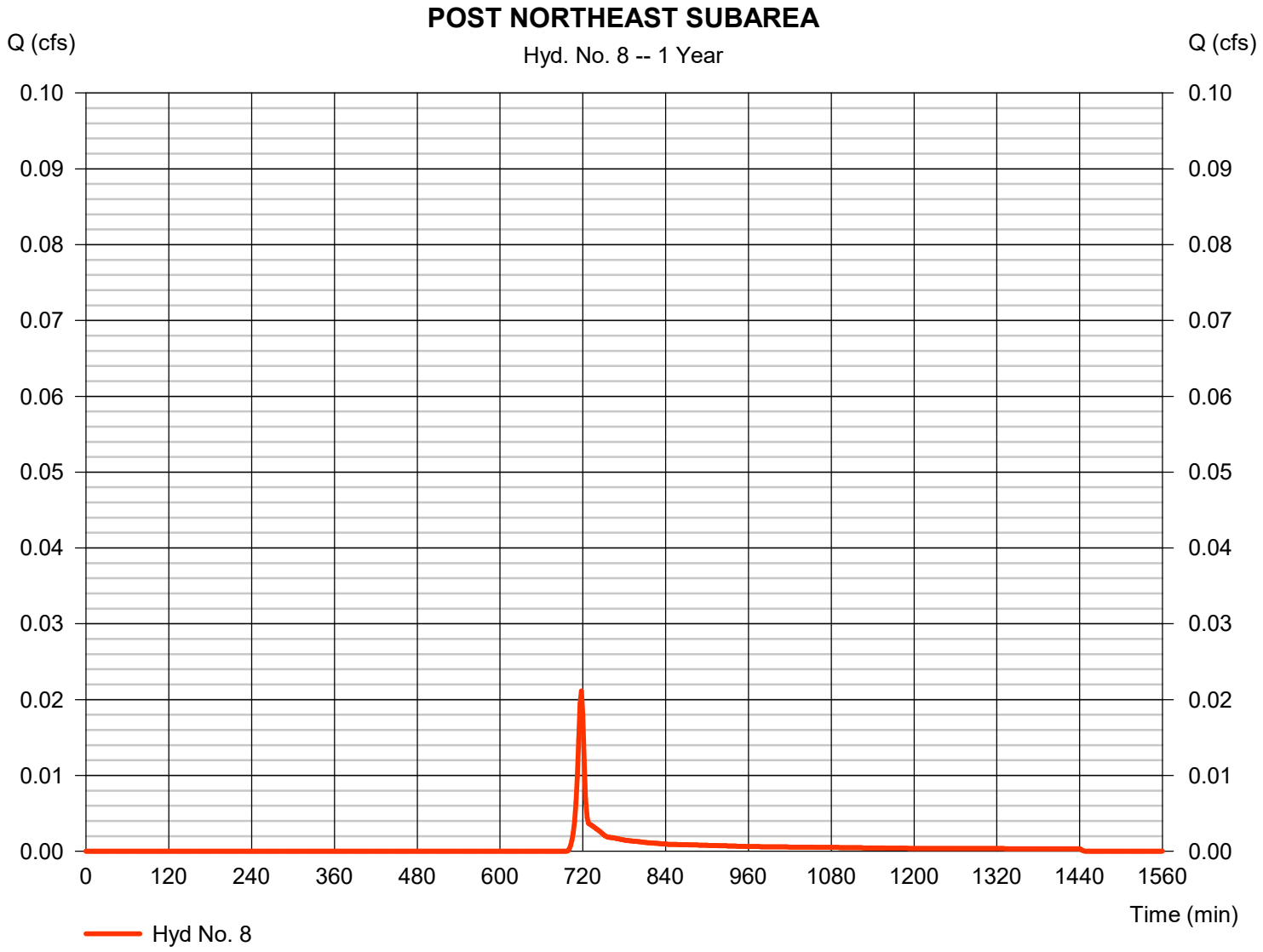
Hydrograph Report

Hyd. No. 8

POST NORTHEAST SUBAREA

Hydrograph type	= SCS Runoff	Peak discharge	= 0.021 cfs
Storm frequency	= 1 yrs	Time to peak	= 718 min
Time interval	= 2 min	Hyd. volume	= 44 cuft
Drainage area	= 0.020 ac	Curve number	= 69*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 2.96 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.020 x 69)] / 0.020



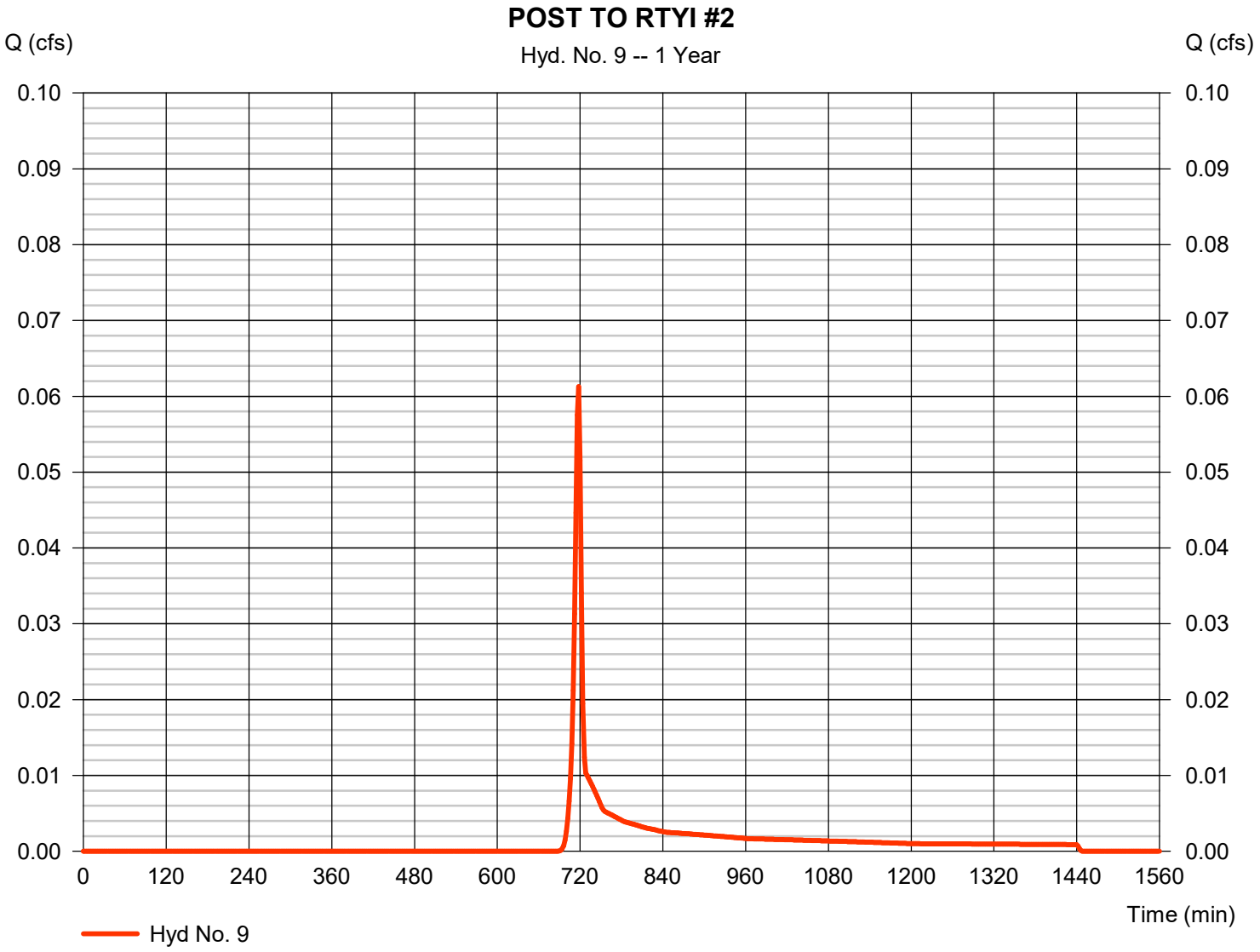
Hydrograph Report

Hyd. No. 9

POST TO RTYI #2

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.061 cfs
Storm frequency	=	1 yrs	Time to peak	=	718 min
Time interval	=	2 min	Hyd. volume	=	125 cuft
Drainage area	=	0.050 ac	Curve number	=	71*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	2.96 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.040 x 69) + (0.010 x 79)] / 0.050



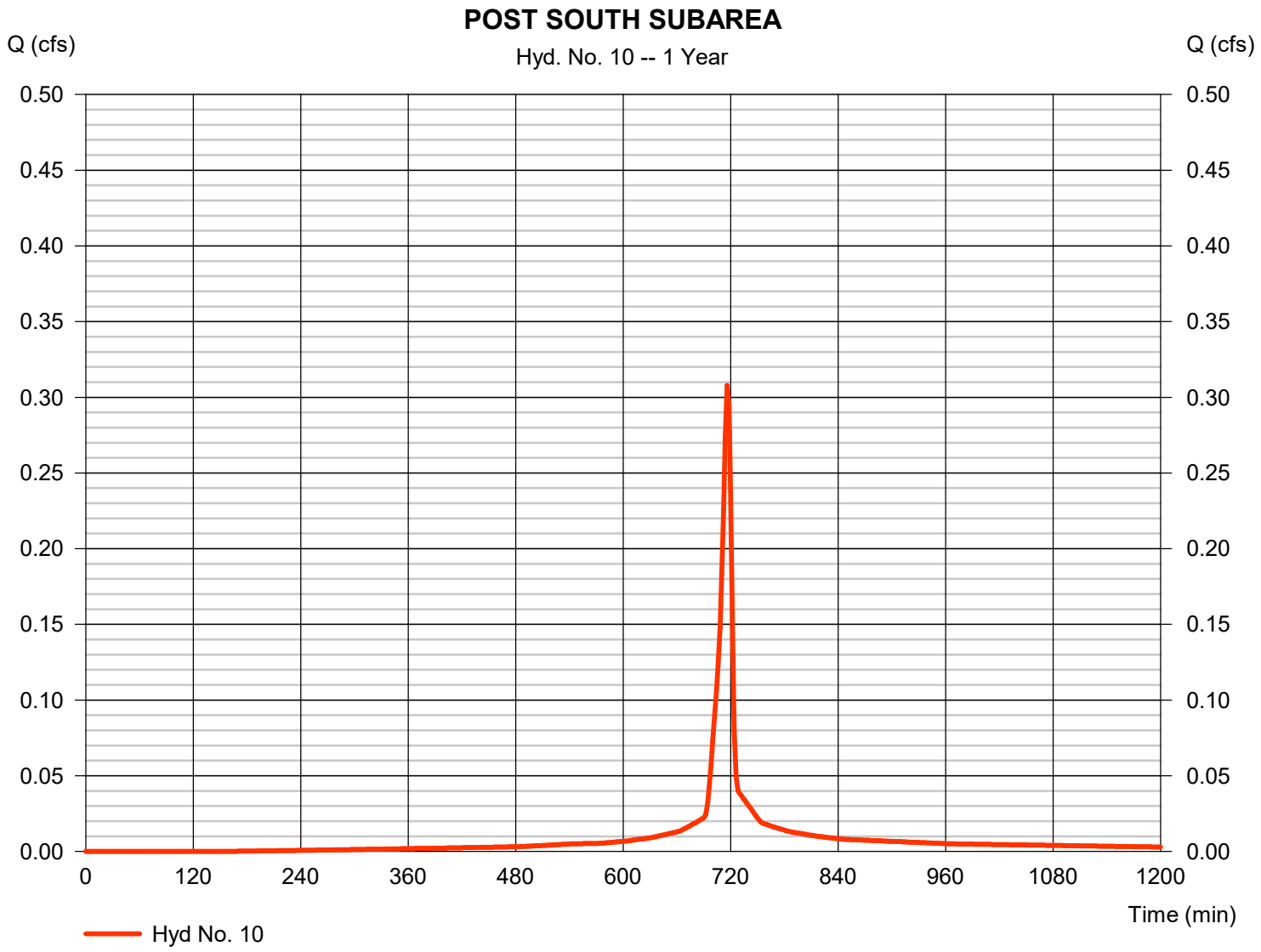
Hydrograph Report

Hyd. No. 10

POST SOUTH SUBAREA

Hydrograph type	= SCS Runoff	Peak discharge	= 0.308 cfs
Storm frequency	= 1 yrs	Time to peak	= 716 min
Time interval	= 2 min	Hyd. volume	= 684 cuft
Drainage area	= 0.080 ac	Curve number	= 96*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 2.96 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.070 x 98) + (0.010 x 79)] / 0.080

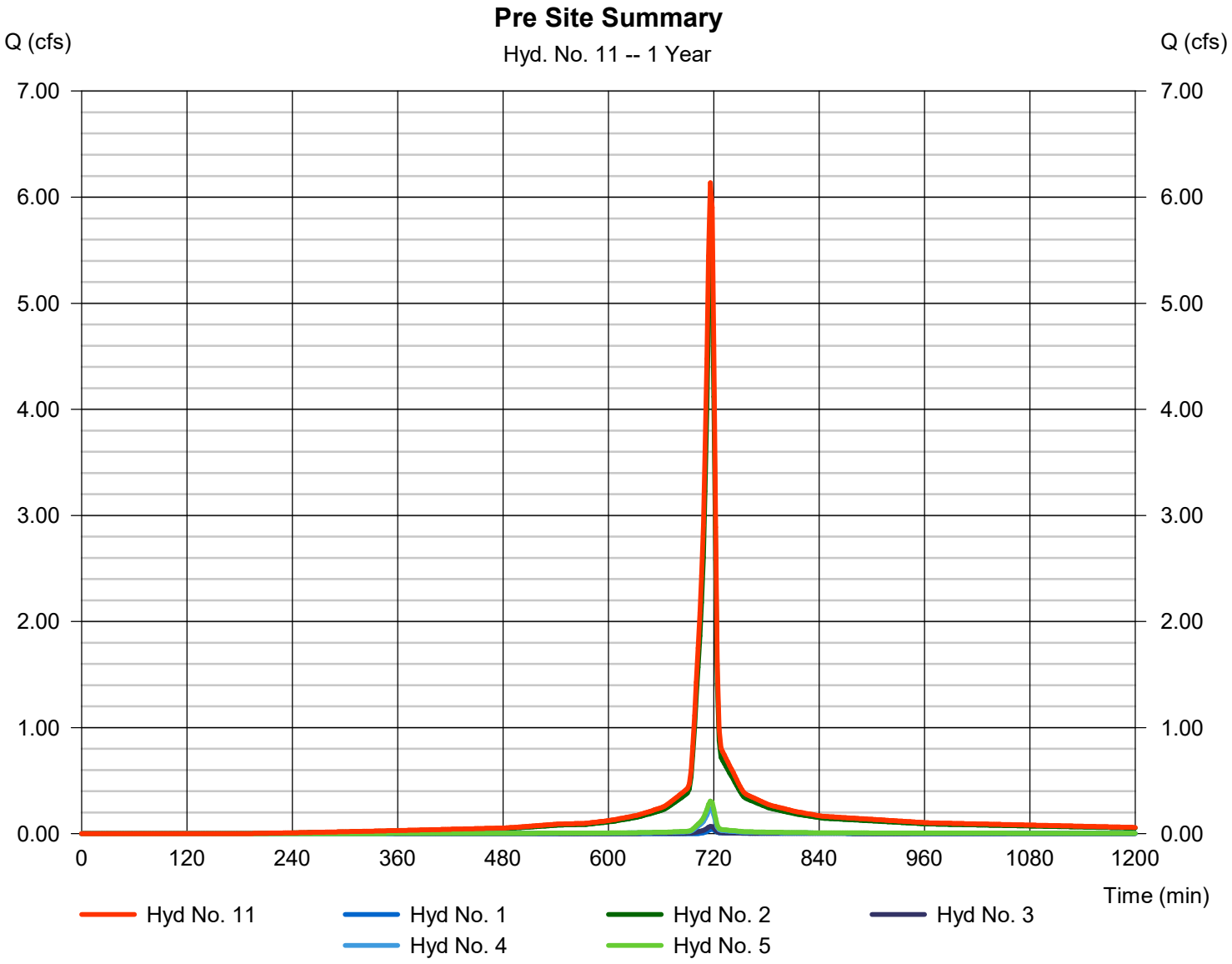


Hydrograph Report

Hyd. No. 11

Pre Site Summary

Hydrograph type	= Combine	Peak discharge	= 6.136 cfs
Storm frequency	= 1 yrs	Time to peak	= 716 min
Time interval	= 2 min	Hyd. volume	= 13,428 cuft
Inflow hyds.	= 1, 2, 3, 4, 5	Contrib. drain. area	= 1.660 ac

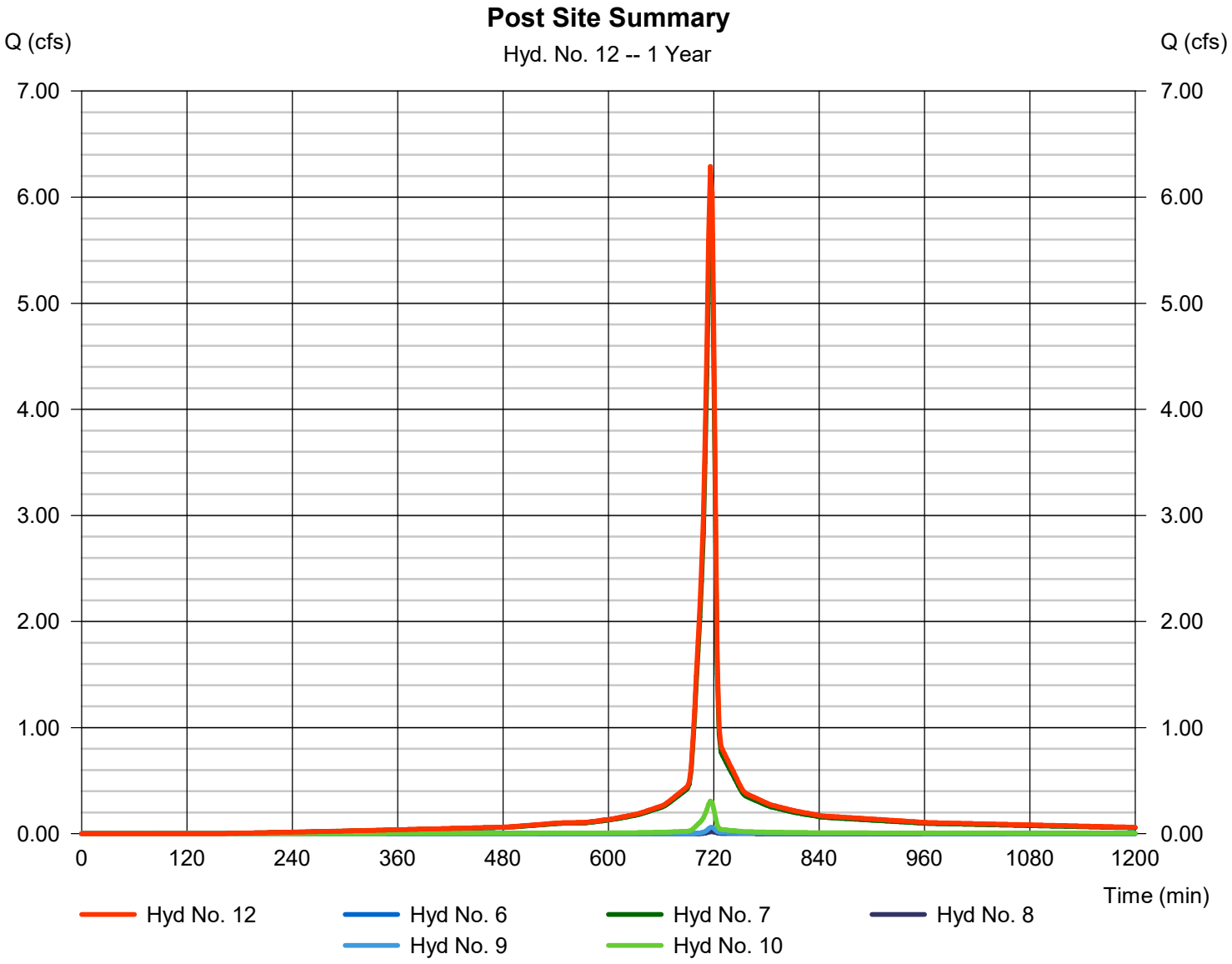


Hydrograph Report

Hyd. No. 12

Post Site Summary

Hydrograph type	= Combine	Peak discharge	= 6.290 cfs
Storm frequency	= 1 yrs	Time to peak	= 716 min
Time interval	= 2 min	Hyd. volume	= 13,981 cuft
Inflow hyds.	= 6, 7, 8, 9, 10	Contrib. drain. area	= 1.700 ac



Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	0.067	2	718	136	------	------	------	PRE NORTHWEST SUBAREA
2	SCS Runoff	6.767	2	716	14,993	------	------	------	PRE TO RTYI #1
3	SCS Runoff	0.087	2	716	185	------	------	------	PRE NORTHEAST SUBAREA
4	SCS Runoff	0.287	2	716	660	------	------	------	PRE TO RTYI #2
5	SCS Runoff	0.377	2	716	851	------	------	------	PRE SOUTH SUBAREA
6	SCS Runoff	0.034	2	718	68	------	------	------	POST NORTHWEST SUBAREA
7	SCS Runoff	7.218	2	716	16,268	------	------	------	POST TO RTYI #1
8	SCS Runoff	0.034	2	718	68	------	------	------	POST NORTHEAST SUBAREA
9	SCS Runoff	0.094	2	718	190	------	------	------	POST TO RTYI #2
10	SCS Runoff	0.377	2	716	851	------	------	------	POST SOUTH SUBAREA
11	Combine	7.583	2	716	16,825	1, 2, 3, 4, 5,	------	------	Pre Site Summary
12	Combine	7.751	2	716	17,445	6, 7, 8, 9, 10,	------	------	Post Site Summary

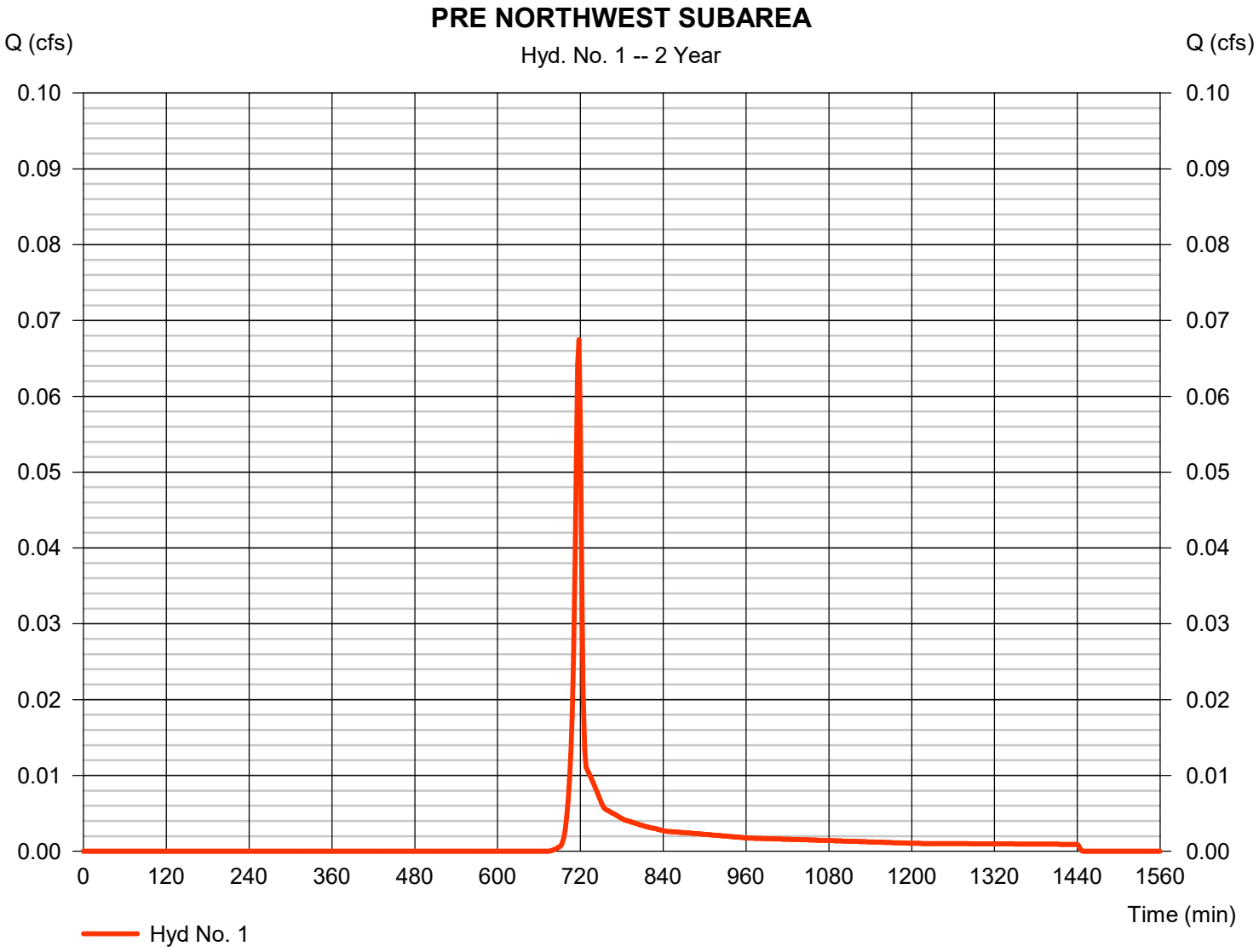
Hydrograph Report

Hyd. No. 1

PRE NORTHWEST SUBAREA

Hydrograph type	= SCS Runoff	Peak discharge	= 0.067 cfs
Storm frequency	= 2 yrs	Time to peak	= 718 min
Time interval	= 2 min	Hyd. volume	= 136 cuft
Drainage area	= 0.040 ac	Curve number	= 69*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 3.58 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.040 x 69)] / 0.040



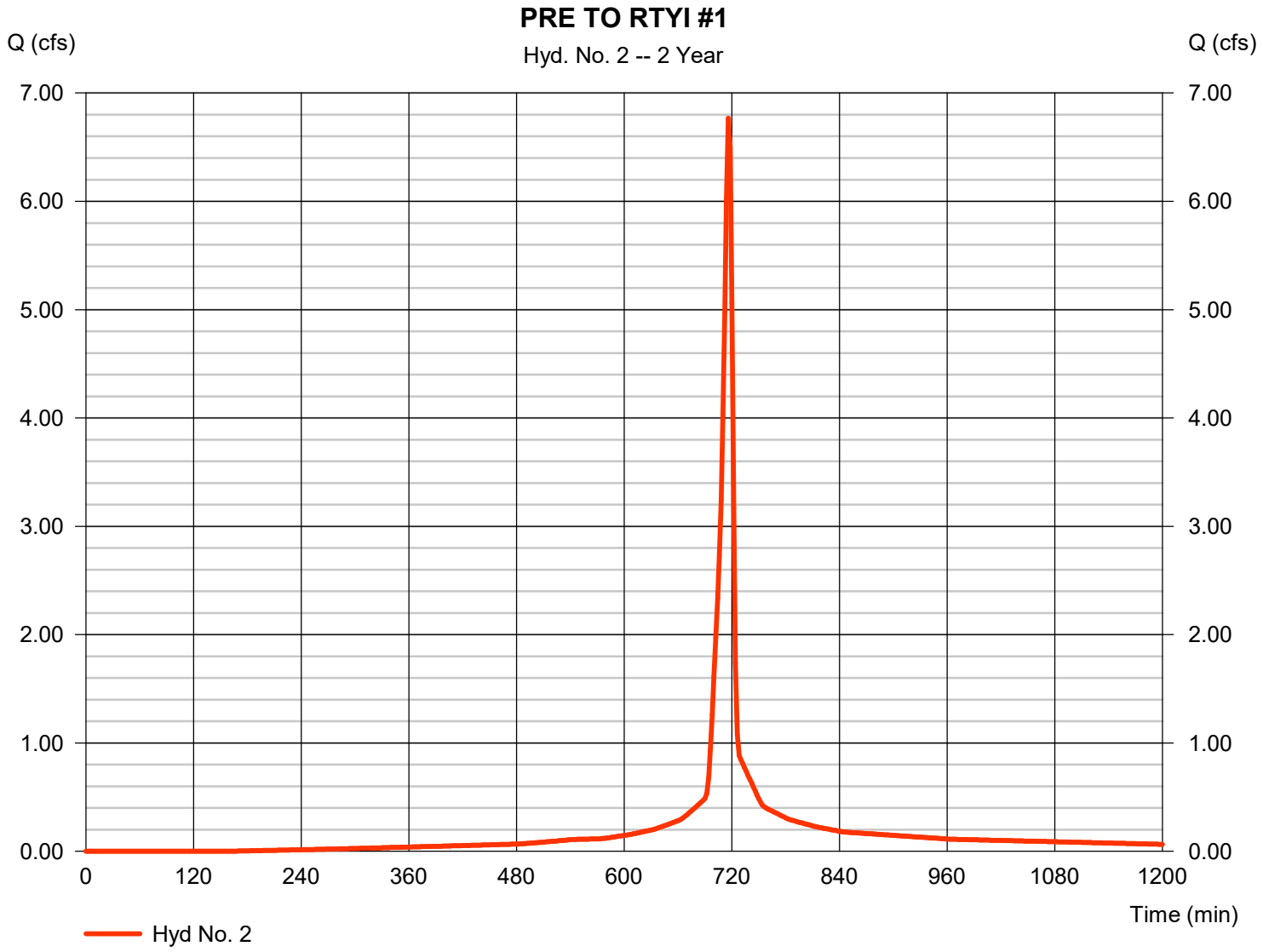
Hydrograph Report

Hyd. No. 2

PRE TO RTYI #1

Hydrograph type	=	SCS Runoff	Peak discharge	=	6.767 cfs
Storm frequency	=	2 yrs	Time to peak	=	716 min
Time interval	=	2 min	Hyd. volume	=	14,993 cuft
Drainage area	=	1.460 ac	Curve number	=	95*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	3.58 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.720 x 98) + (0.200 x 98) + (0.060 x 92) + (0.400 x 92) + (0.030 x 69) + (0.050 x 79)] / 1.460



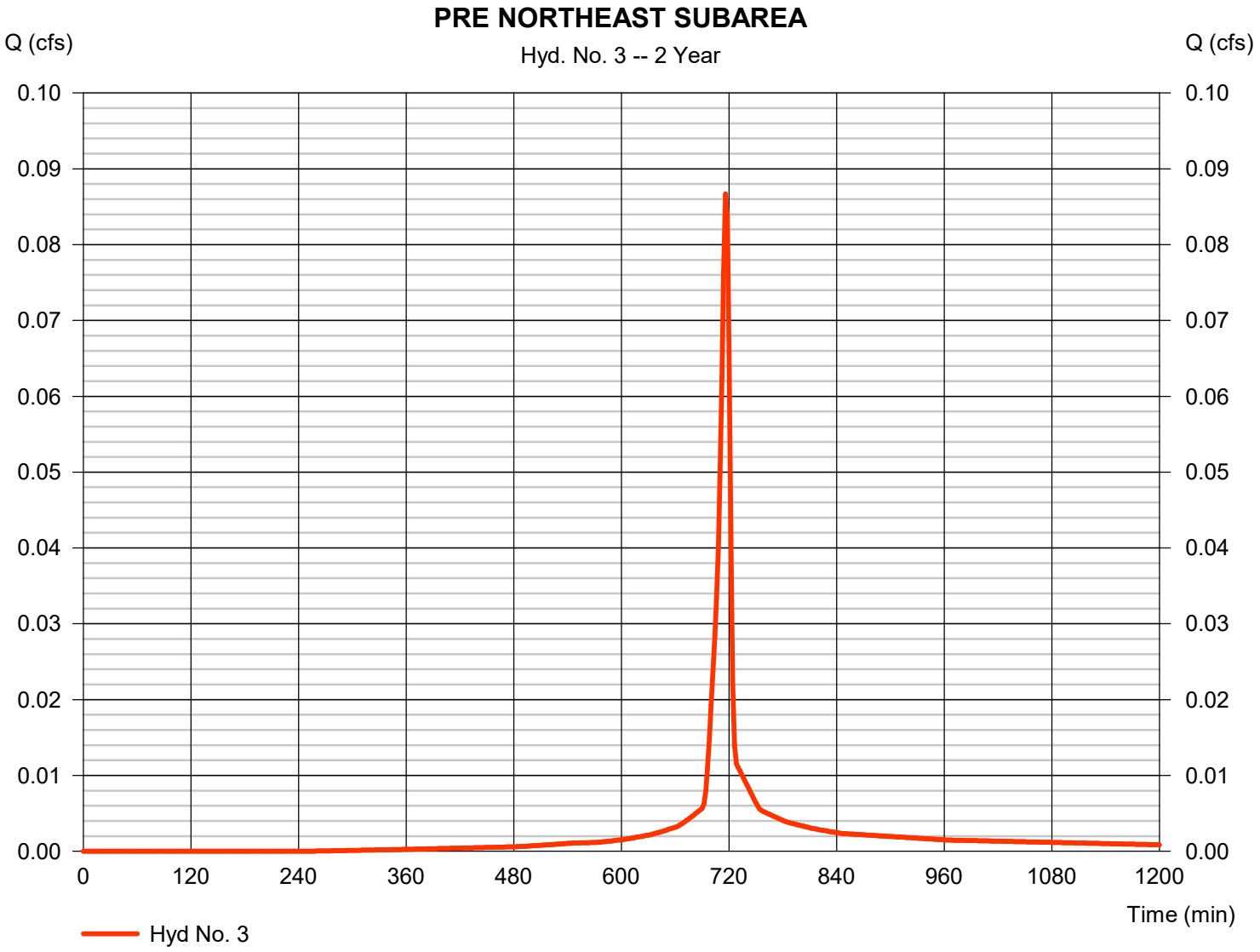
Hydrograph Report

Hyd. No. 3

PRE NORTHEAST SUBAREA

Hydrograph type	= SCS Runoff	Peak discharge	= 0.087 cfs
Storm frequency	= 2 yrs	Time to peak	= 716 min
Time interval	= 2 min	Hyd. volume	= 185 cuft
Drainage area	= 0.020 ac	Curve number	= 92*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 3.58 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.020 x 92)] / 0.020



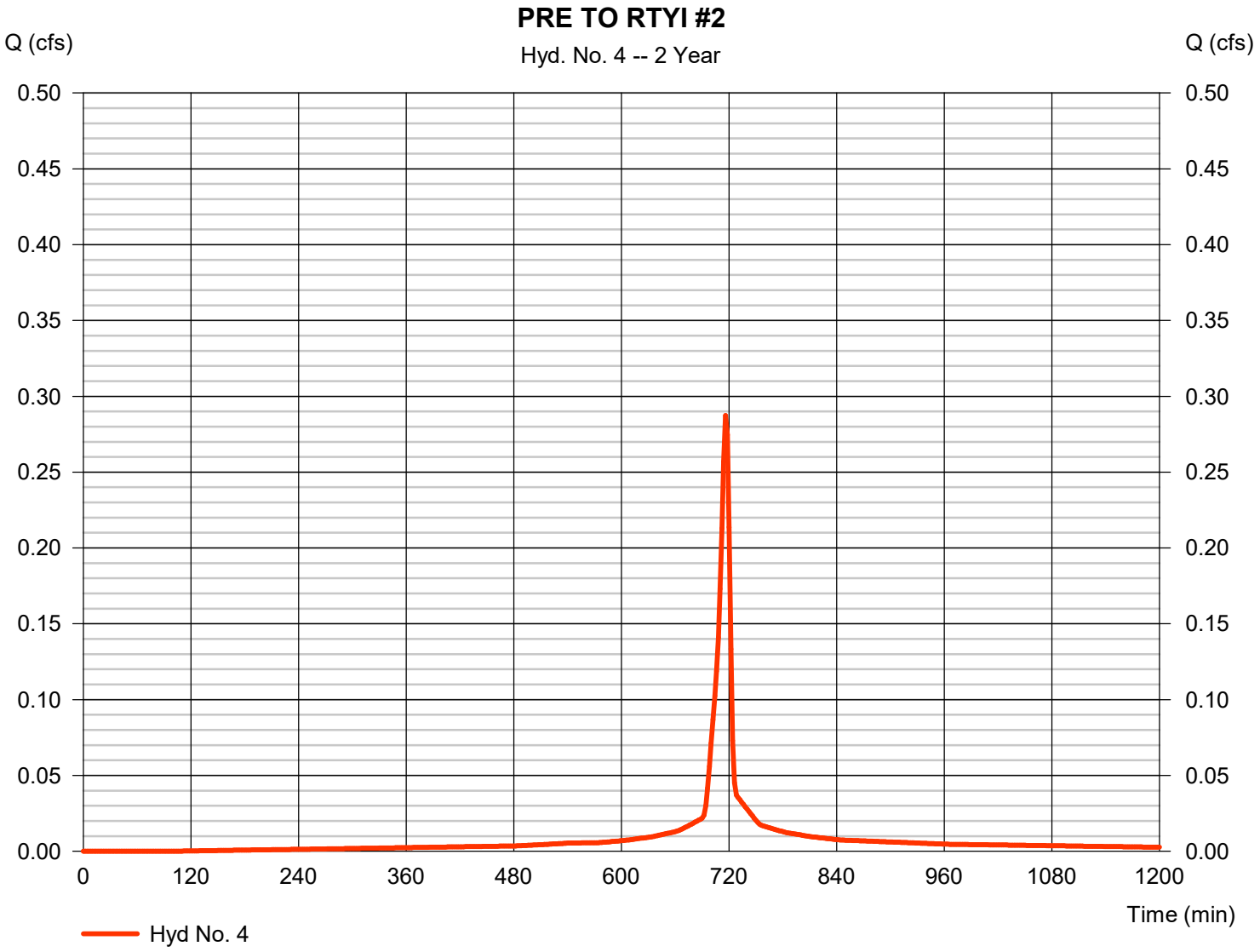
Hydrograph Report

Hyd. No. 4

PRE TO RTYI #2

Hydrograph type	= SCS Runoff	Peak discharge	= 0.287 cfs
Storm frequency	= 2 yrs	Time to peak	= 716 min
Time interval	= 2 min	Hyd. volume	= 660 cuft
Drainage area	= 0.060 ac	Curve number	= 97*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 3.58 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.040 x 98) + (0.010 x 98) + (0.010 x 92)] / 0.060



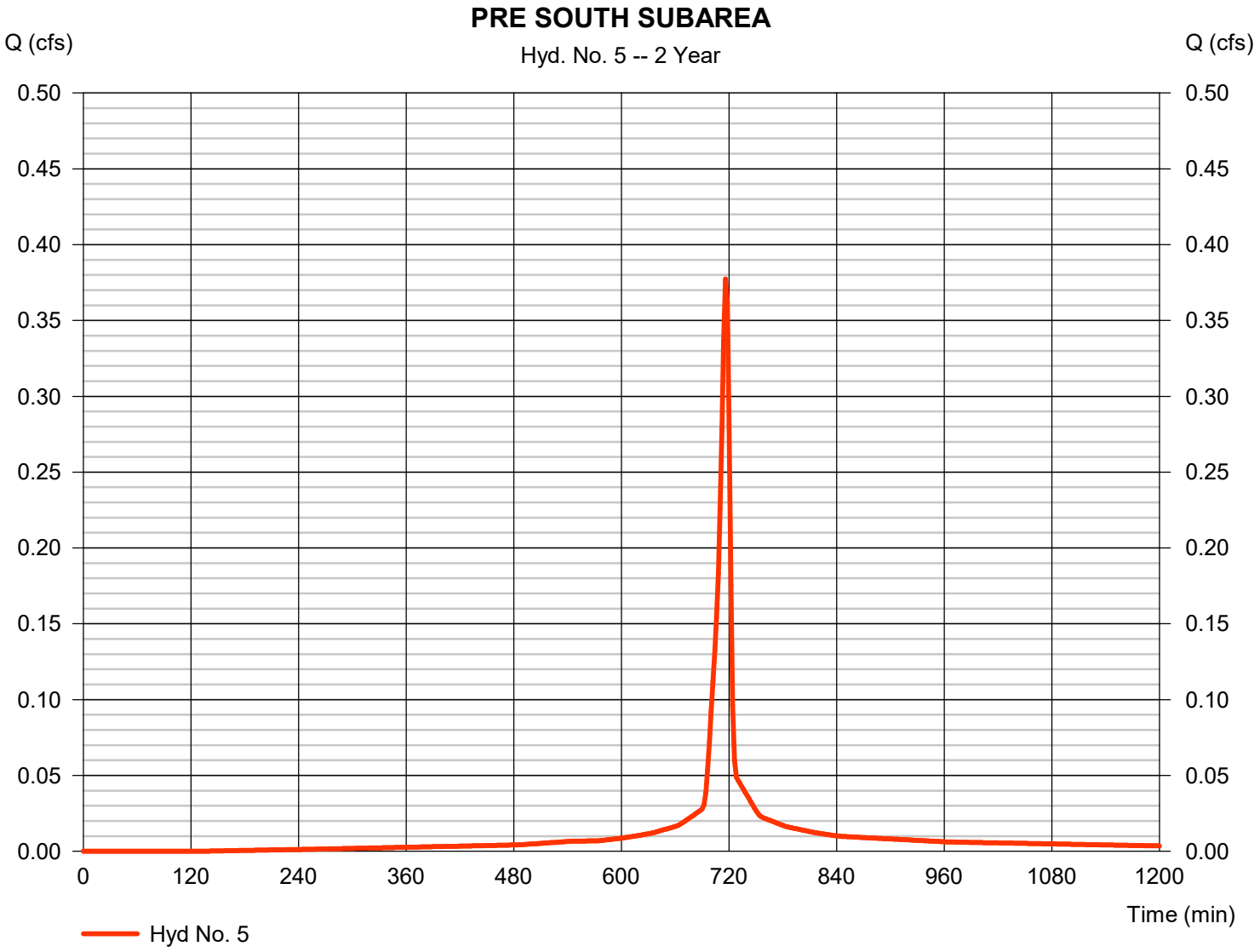
Hydrograph Report

Hyd. No. 5

PRE SOUTH SUBAREA

Hydrograph type	= SCS Runoff	Peak discharge	= 0.377 cfs
Storm frequency	= 2 yrs	Time to peak	= 716 min
Time interval	= 2 min	Hyd. volume	= 851 cuft
Drainage area	= 0.080 ac	Curve number	= 96*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 3.58 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.070 x 98) + (0.010 x 79)] / 0.080



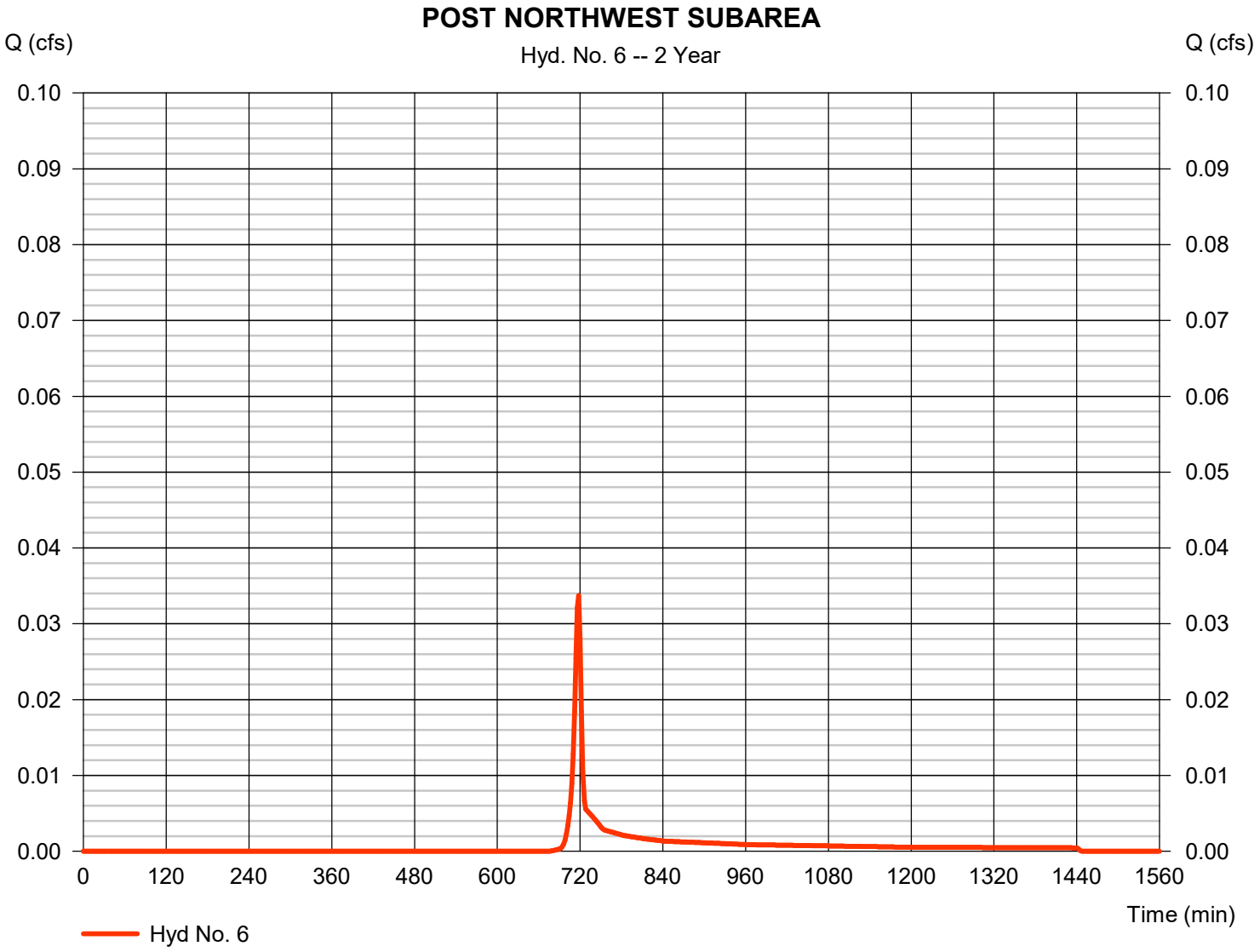
Hydrograph Report

Hyd. No. 6

POST NORTHWEST SUBAREA

Hydrograph type	= SCS Runoff	Peak discharge	= 0.034 cfs
Storm frequency	= 2 yrs	Time to peak	= 718 min
Time interval	= 2 min	Hyd. volume	= 68 cuft
Drainage area	= 0.020 ac	Curve number	= 69*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 3.58 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.020 x 69)] / 0.020



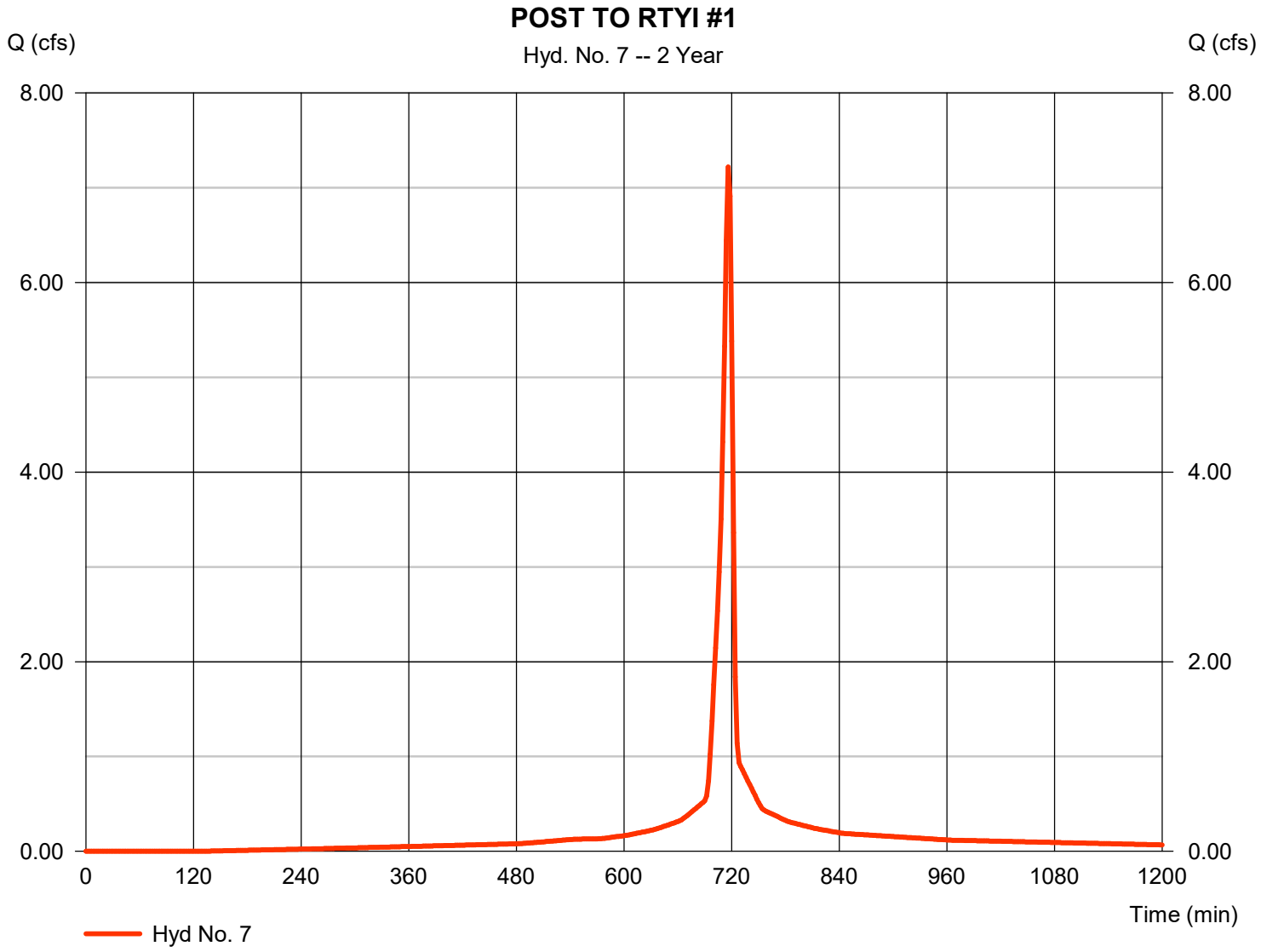
Hydrograph Report

Hyd. No. 7

POST TO RTYI #1

Hydrograph type	=	SCS Runoff	Peak discharge	=	7.218 cfs
Storm frequency	=	2 yrs	Time to peak	=	716 min
Time interval	=	2 min	Hyd. volume	=	16,268 cuft
Drainage area	=	1.530 ac	Curve number	=	96*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	3.58 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.260 x 98) + (0.023 x 98) + (1.140 x 98) + (0.050 x 69) + (0.060 x 79)] / 1.530



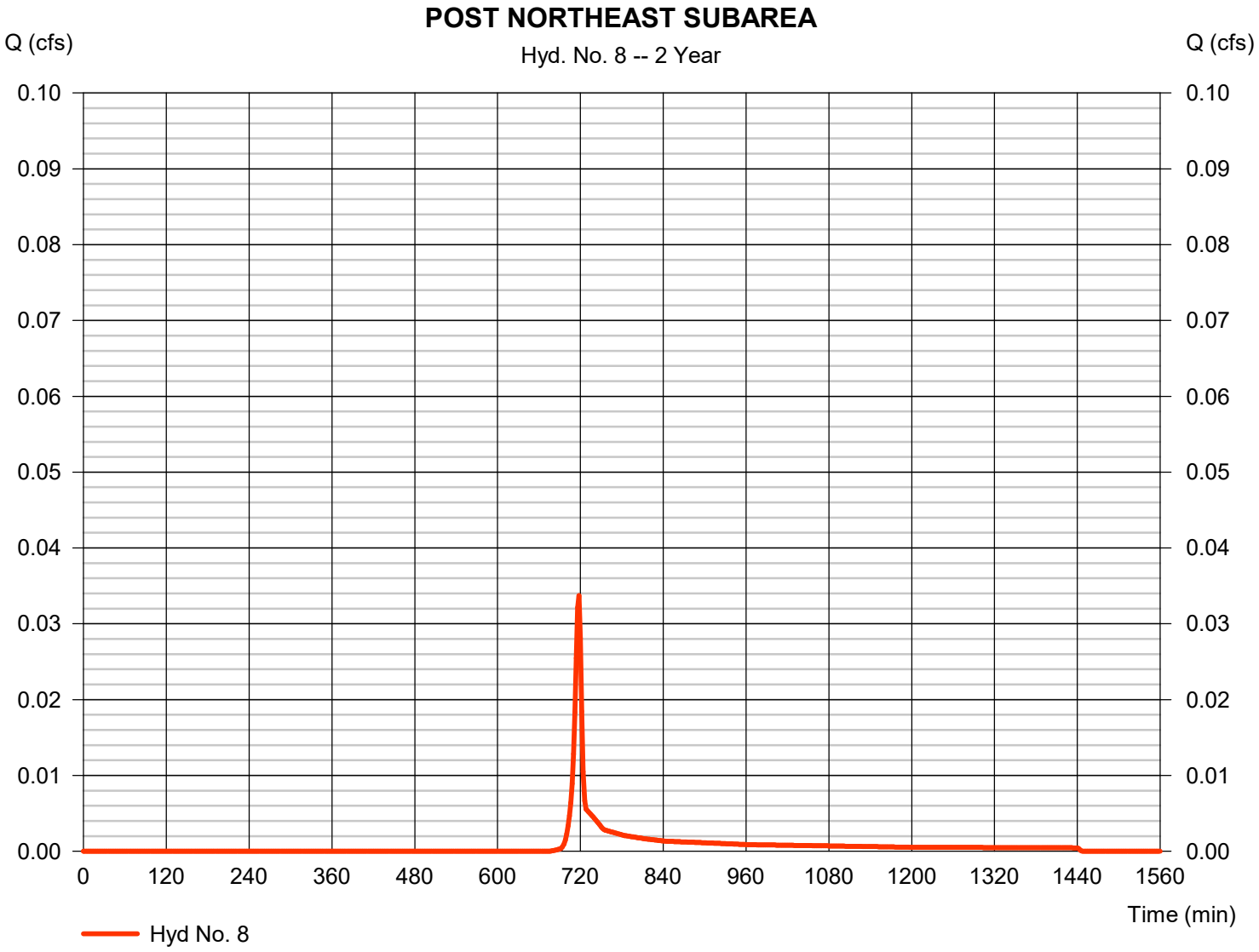
Hydrograph Report

Hyd. No. 8

POST NORTHEAST SUBAREA

Hydrograph type	= SCS Runoff	Peak discharge	= 0.034 cfs
Storm frequency	= 2 yrs	Time to peak	= 718 min
Time interval	= 2 min	Hyd. volume	= 68 cuft
Drainage area	= 0.020 ac	Curve number	= 69*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 3.58 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.020 x 69)] / 0.020



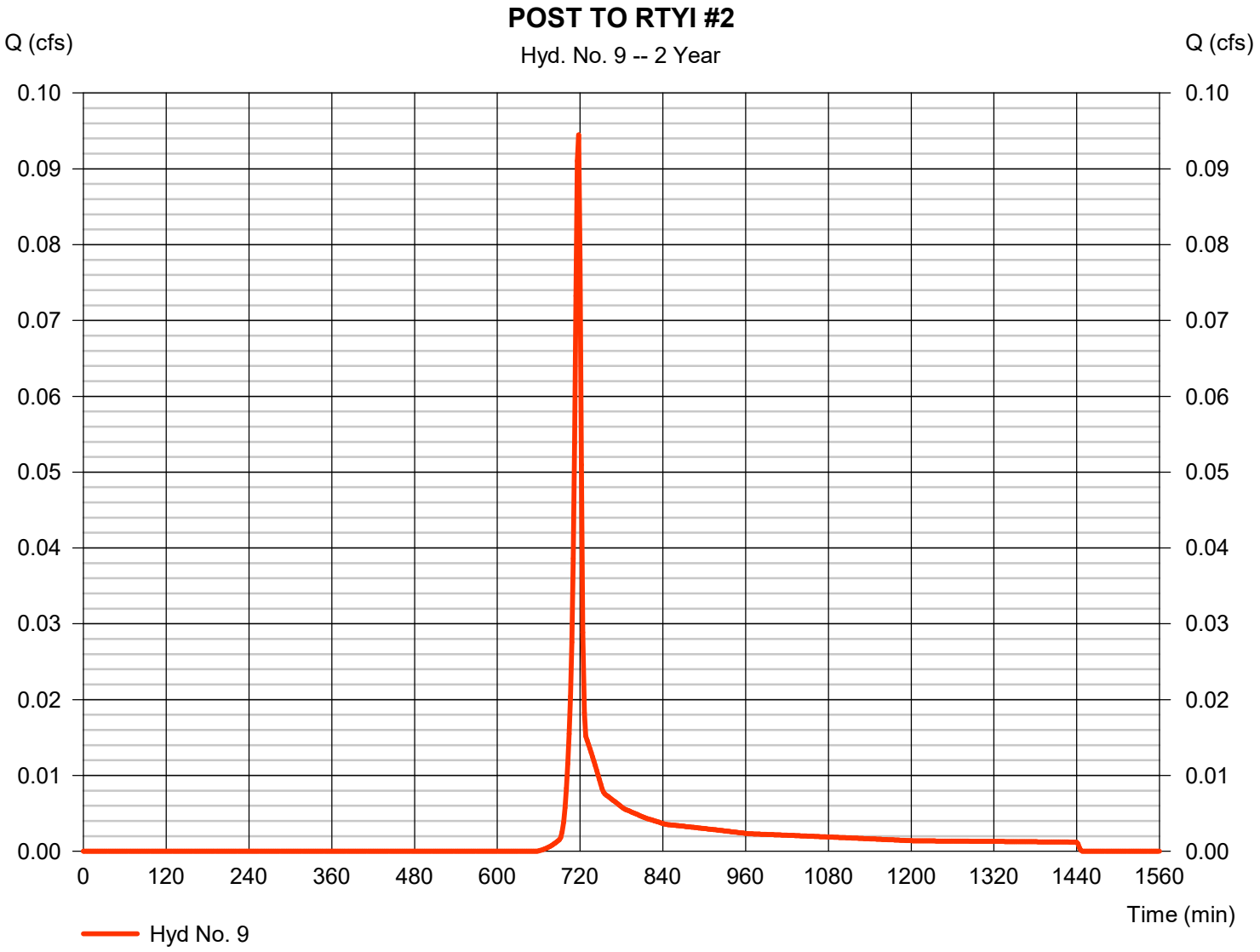
Hydrograph Report

Hyd. No. 9

POST TO RTYI #2

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.094 cfs
Storm frequency	=	2 yrs	Time to peak	=	718 min
Time interval	=	2 min	Hyd. volume	=	190 cuft
Drainage area	=	0.050 ac	Curve number	=	71*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	3.58 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.040 x 69) + (0.010 x 79)] / 0.050



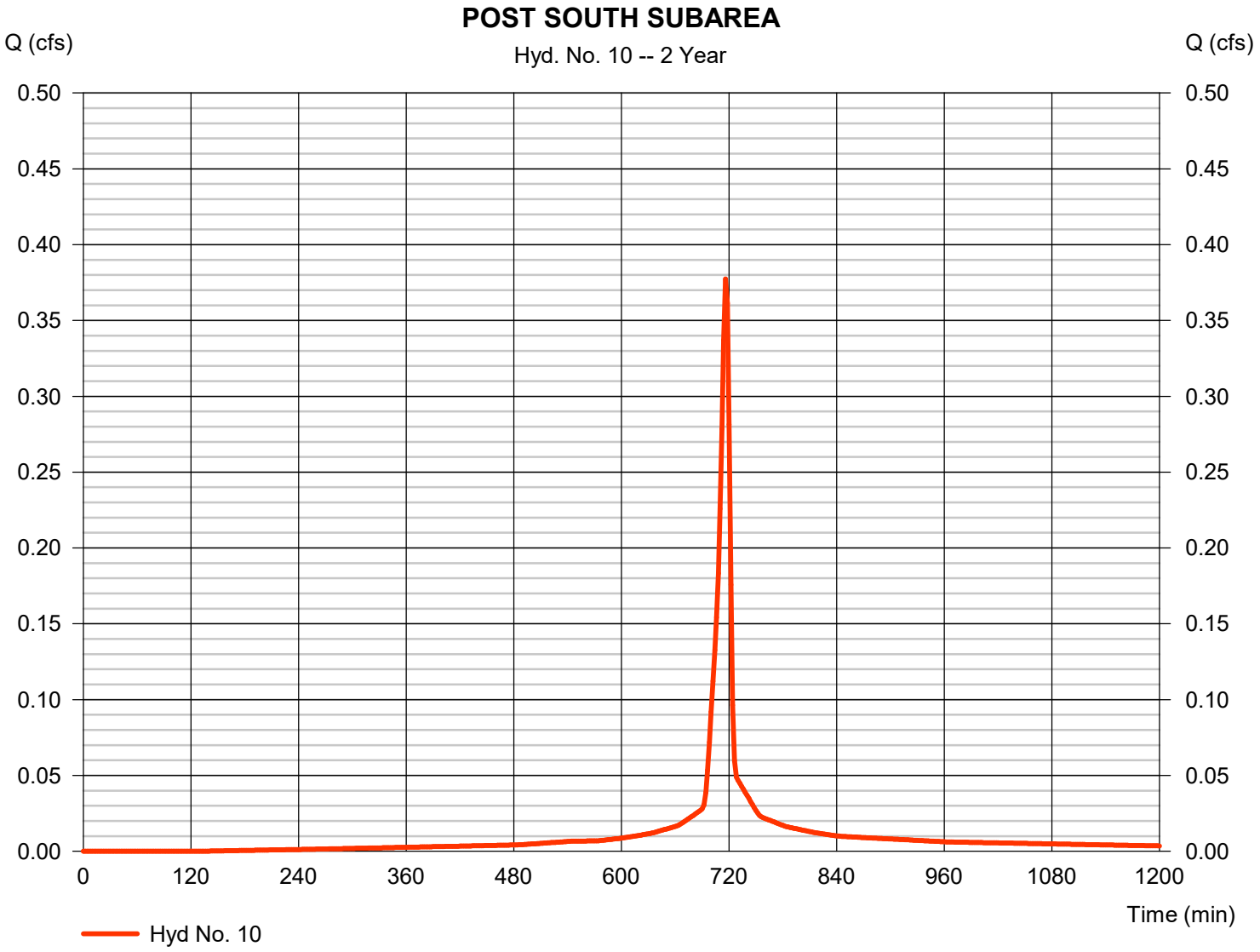
Hydrograph Report

Hyd. No. 10

POST SOUTH SUBAREA

Hydrograph type	= SCS Runoff	Peak discharge	= 0.377 cfs
Storm frequency	= 2 yrs	Time to peak	= 716 min
Time interval	= 2 min	Hyd. volume	= 851 cuft
Drainage area	= 0.080 ac	Curve number	= 96*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 3.58 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.070 x 98) + (0.010 x 79)] / 0.080

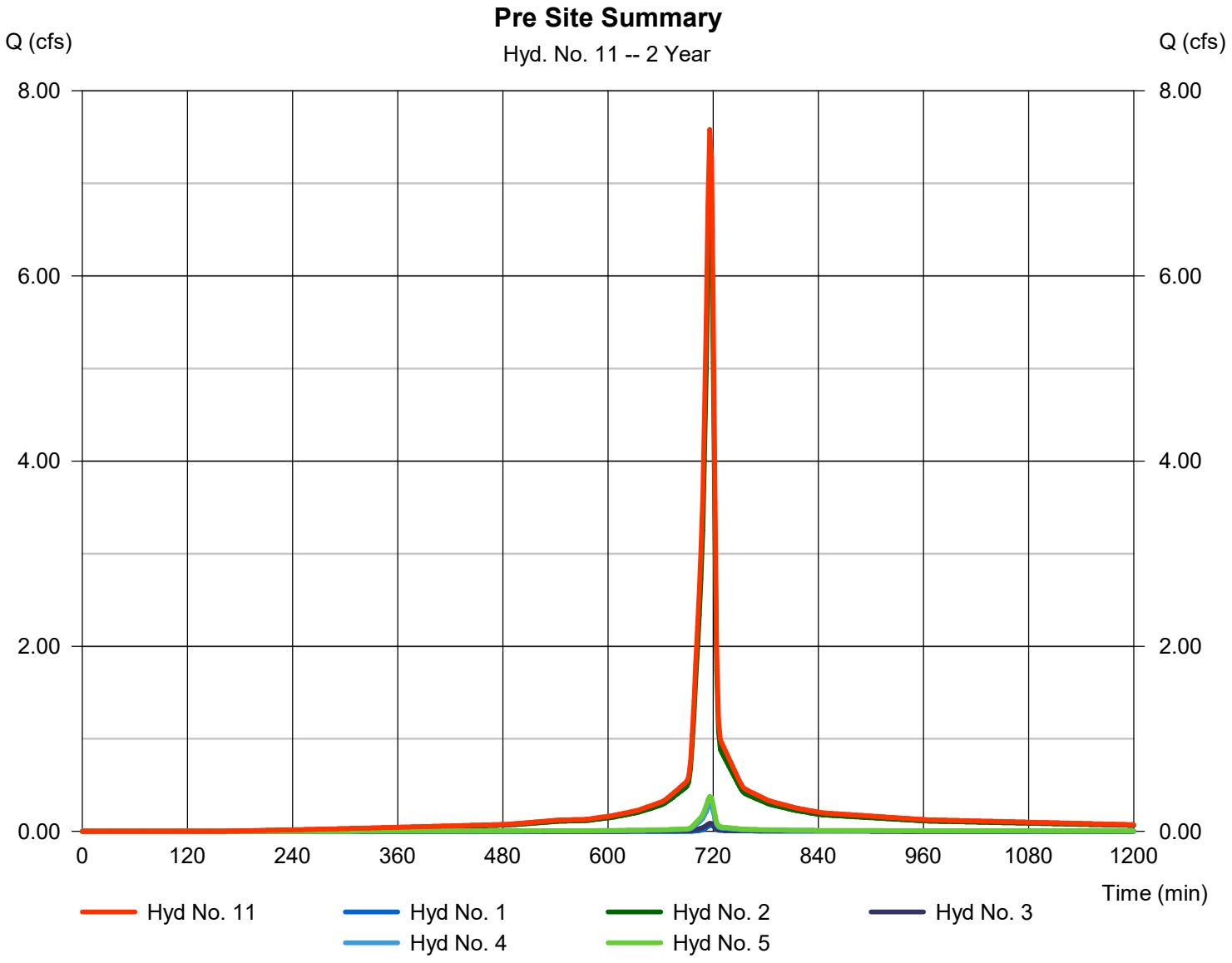


Hydrograph Report

Hyd. No. 11

Pre Site Summary

Hydrograph type	= Combine	Peak discharge	= 7.583 cfs
Storm frequency	= 2 yrs	Time to peak	= 716 min
Time interval	= 2 min	Hyd. volume	= 16,825 cuft
Inflow hyds.	= 1, 2, 3, 4, 5	Contrib. drain. area	= 1.660 ac

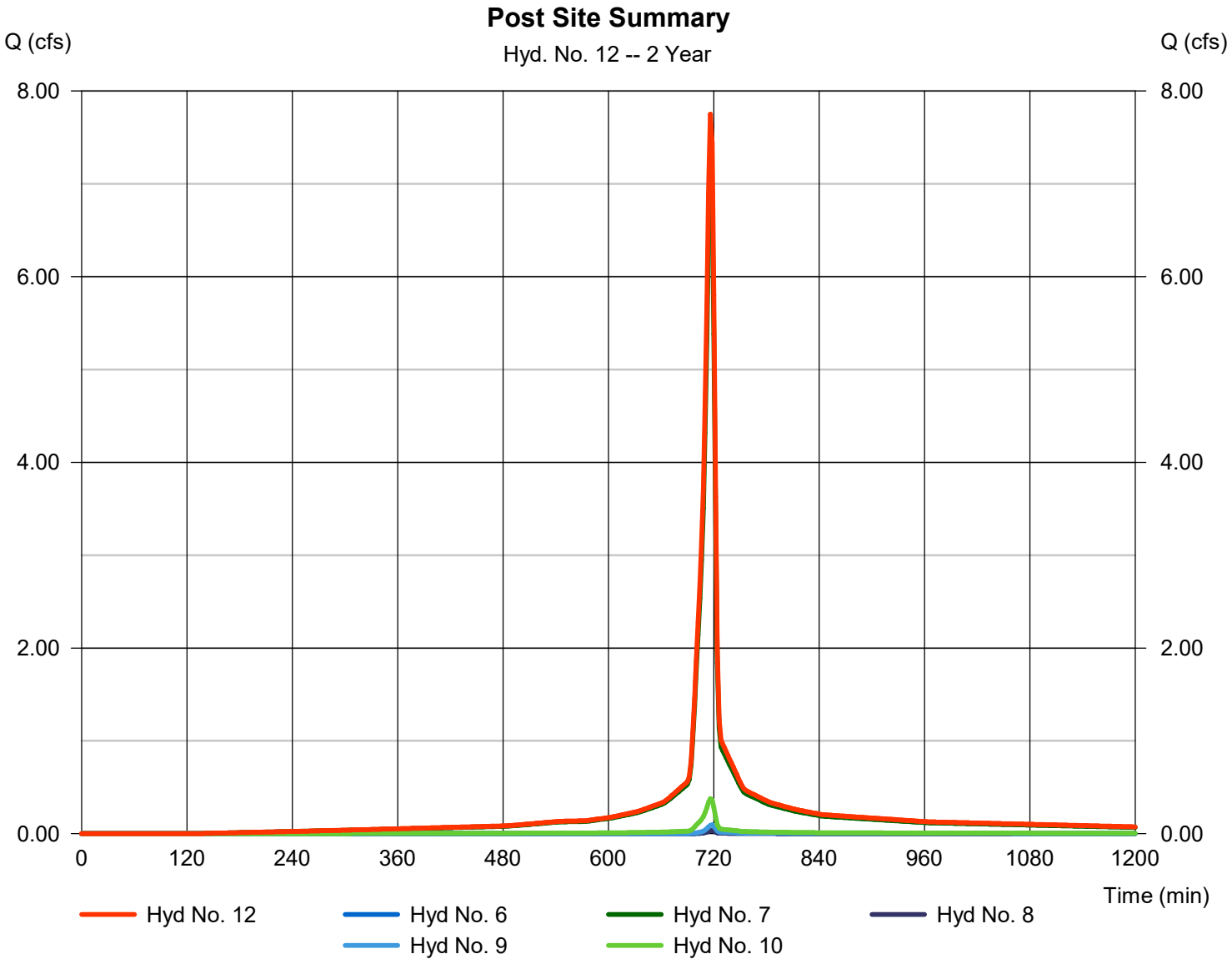


Hydrograph Report

Hyd. No. 12

Post Site Summary

Hydrograph type	= Combine	Peak discharge	= 7.751 cfs
Storm frequency	= 2 yrs	Time to peak	= 716 min
Time interval	= 2 min	Hyd. volume	= 17,445 cuft
Inflow hyds.	= 6, 7, 8, 9, 10	Contrib. drain. area	= 1.700 ac



Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	0.142	2	718	283	------	------	------	PRE NORTHWEST SUBAREA
2	SCS Runoff	10.02	2	716	22,796	------	------	------	PRE TO RTYI #1
3	SCS Runoff	0.132	2	716	290	------	------	------	PRE NORTHEAST SUBAREA
4	SCS Runoff	0.419	2	716	983	------	------	------	PRE TO RTYI #2
5	SCS Runoff	0.555	2	716	1,280	------	------	------	PRE SOUTH SUBAREA
6	SCS Runoff	0.071	2	718	142	------	------	------	POST NORTHWEST SUBAREA
7	SCS Runoff	10.61	2	716	24,480	------	------	------	POST TO RTYI #1
8	SCS Runoff	0.071	2	718	142	------	------	------	POST NORTHEAST SUBAREA
9	SCS Runoff	0.190	2	718	382	------	------	------	POST TO RTYI #2
10	SCS Runoff	0.555	2	716	1,280	------	------	------	POST SOUTH SUBAREA
11	Combine	11.27	2	716	25,632	1, 2, 3, 4, 5,	------	------	Pre Site Summary
12	Combine	11.49	2	716	26,425	6, 7, 8, 9, 10,	------	------	Post Site Summary

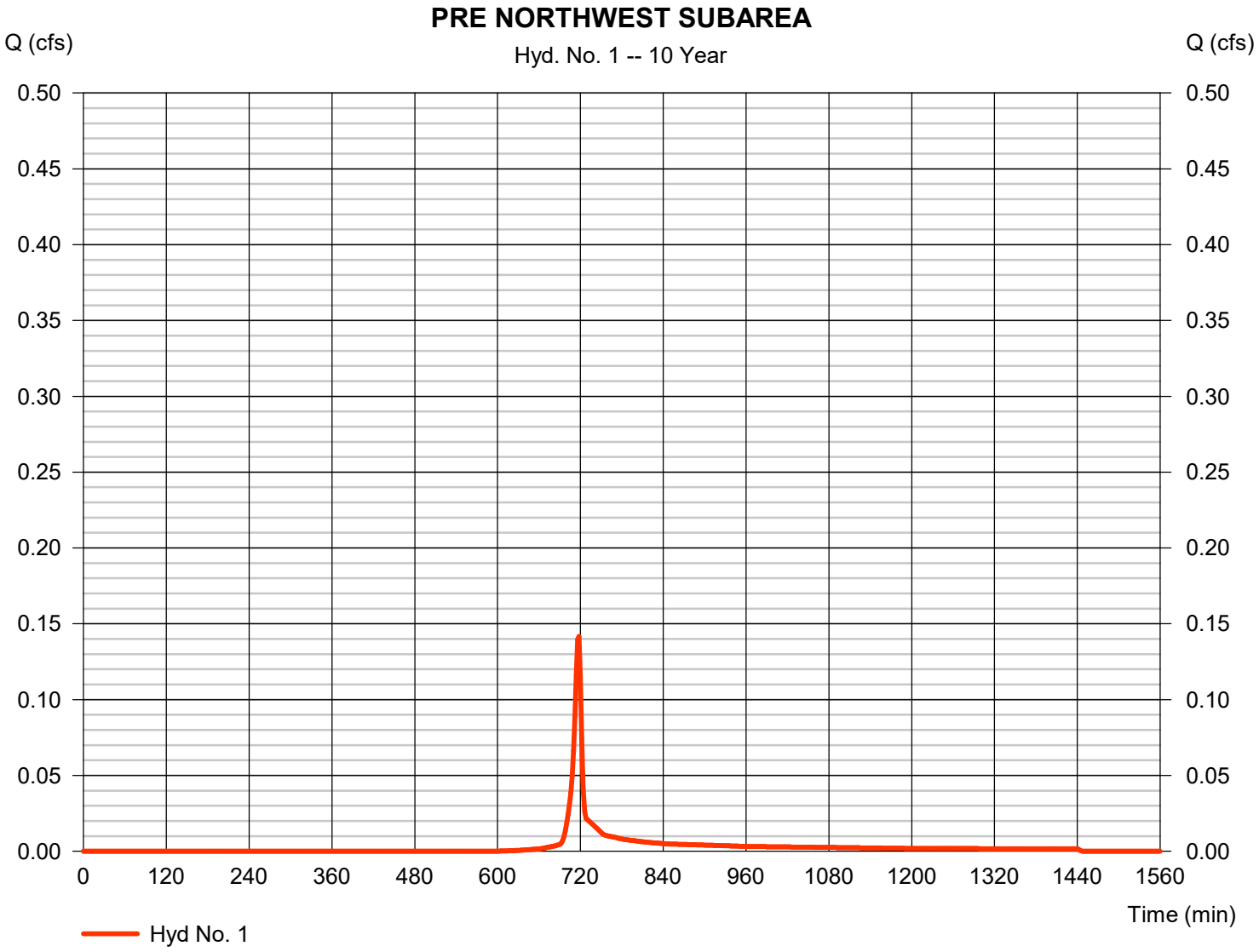
Hydrograph Report

Hyd. No. 1

PRE NORTHWEST SUBAREA

Hydrograph type	= SCS Runoff	Peak discharge	= 0.142 cfs
Storm frequency	= 10 yrs	Time to peak	= 718 min
Time interval	= 2 min	Hyd. volume	= 283 cuft
Drainage area	= 0.040 ac	Curve number	= 69*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 5.17 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.040 x 69)] / 0.040



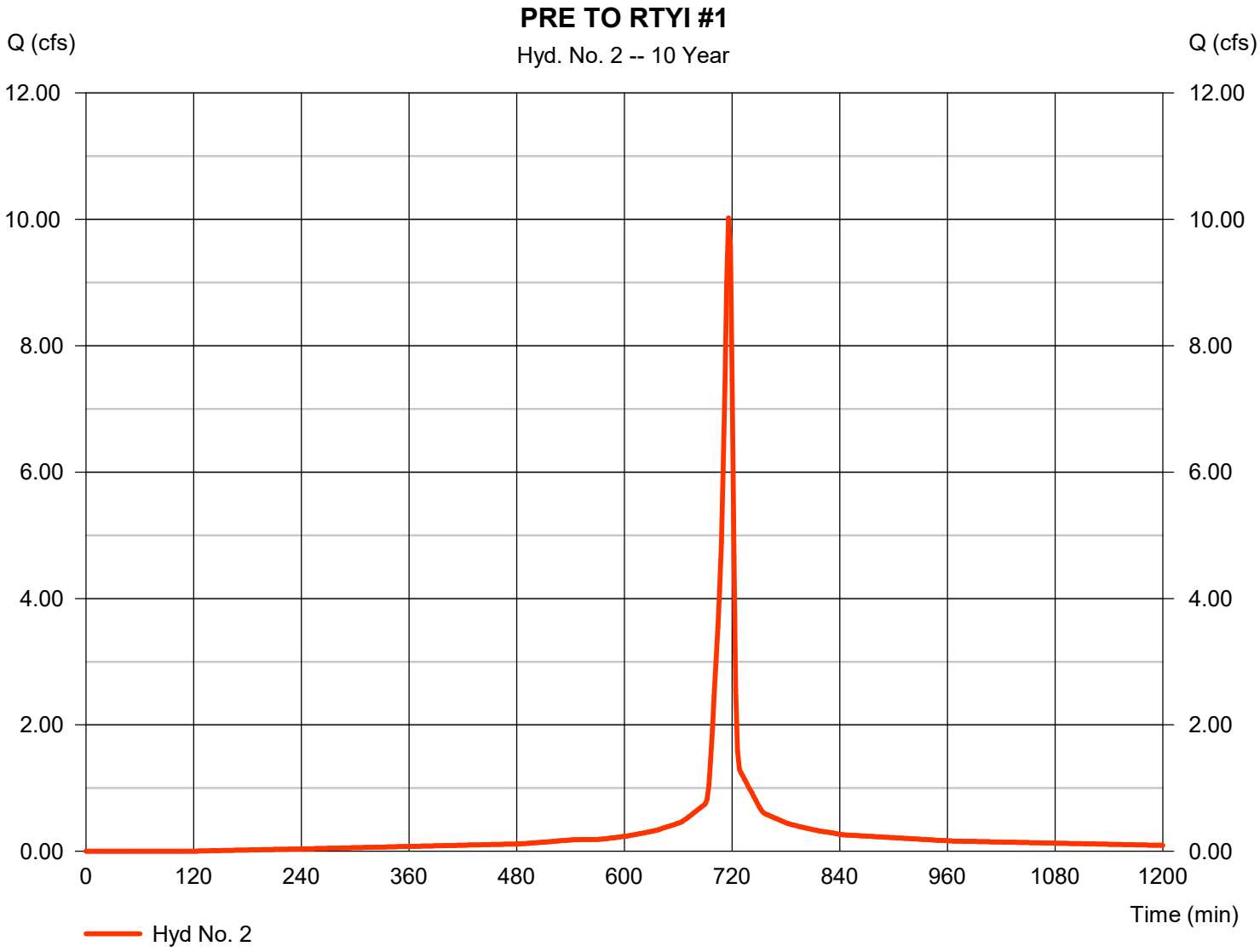
Hydrograph Report

Hyd. No. 2

PRE TO RTYI #1

Hydrograph type	= SCS Runoff	Peak discharge	= 10.02 cfs
Storm frequency	= 10 yrs	Time to peak	= 716 min
Time interval	= 2 min	Hyd. volume	= 22,796 cuft
Drainage area	= 1.460 ac	Curve number	= 95*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 5.17 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.720 x 98) + (0.200 x 98) + (0.060 x 92) + (0.400 x 92) + (0.030 x 69) + (0.050 x 79)] / 1.460



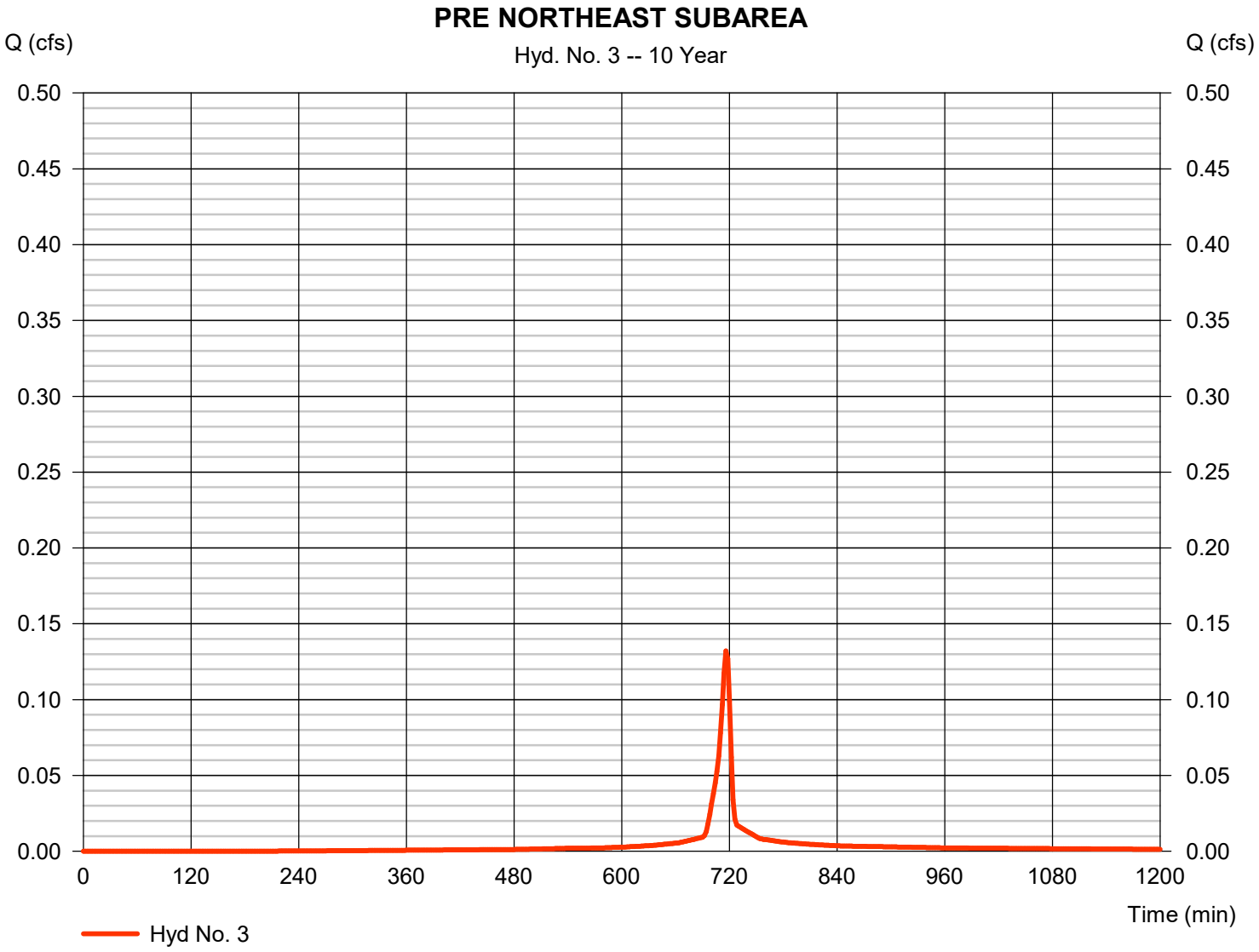
Hydrograph Report

Hyd. No. 3

PRE NORTHEAST SUBAREA

Hydrograph type	= SCS Runoff	Peak discharge	= 0.132 cfs
Storm frequency	= 10 yrs	Time to peak	= 716 min
Time interval	= 2 min	Hyd. volume	= 290 cuft
Drainage area	= 0.020 ac	Curve number	= 92*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 5.17 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.020 x 92)] / 0.020



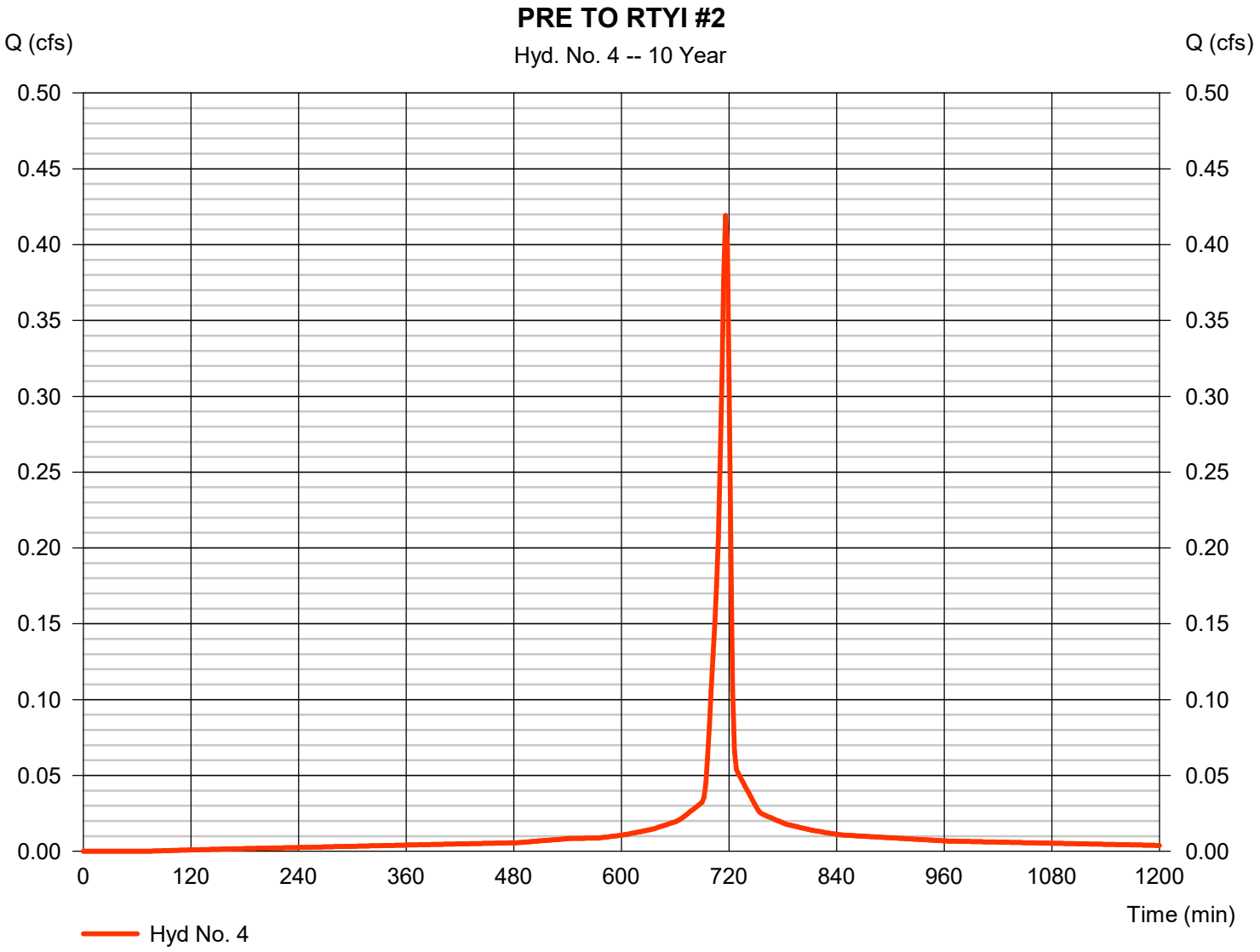
Hydrograph Report

Hyd. No. 4

PRE TO RTYI #2

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.419 cfs
Storm frequency	=	10 yrs	Time to peak	=	716 min
Time interval	=	2 min	Hyd. volume	=	983 cuft
Drainage area	=	0.060 ac	Curve number	=	97*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	5.17 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.040 x 98) + (0.010 x 98) + (0.010 x 92)] / 0.060



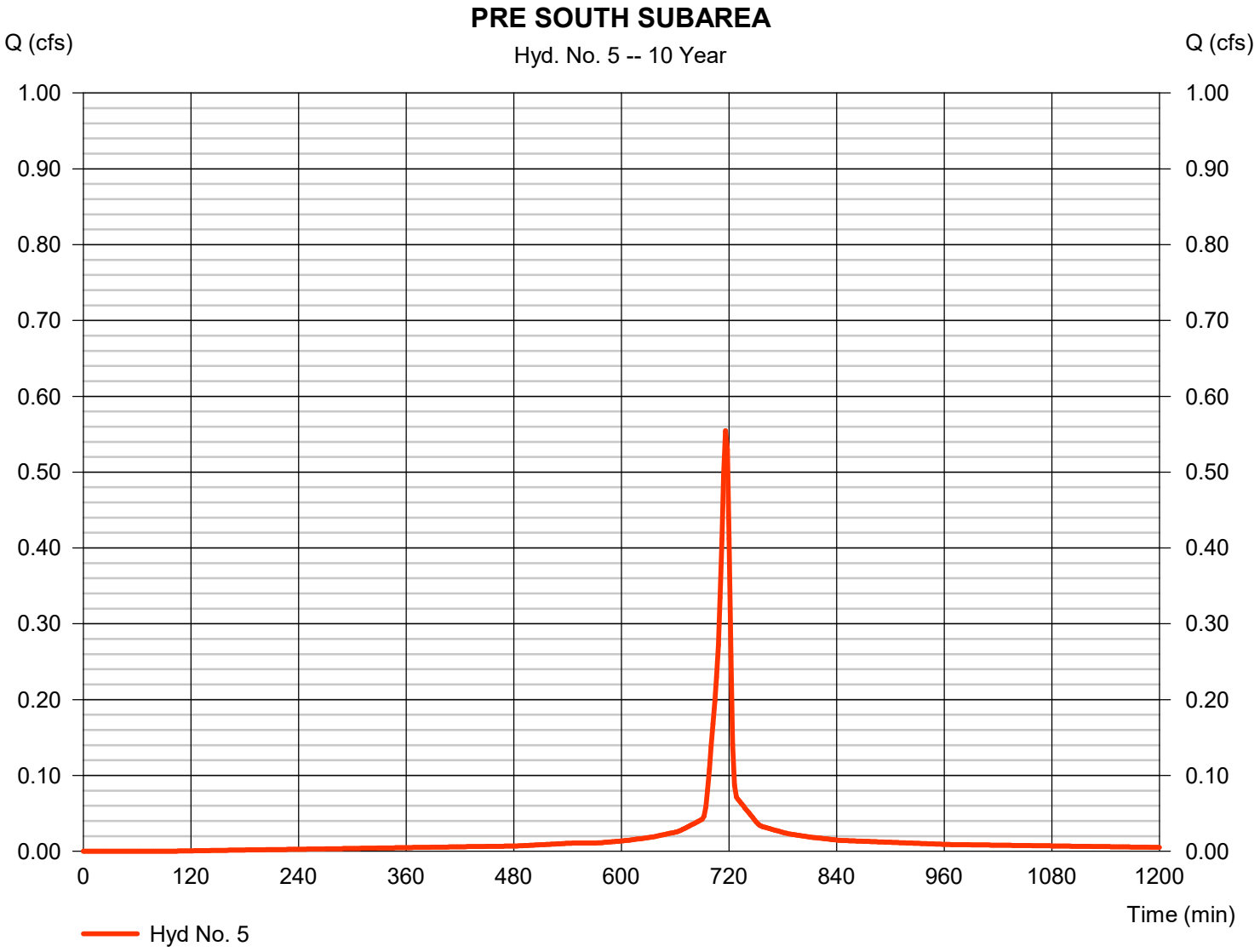
Hydrograph Report

Hyd. No. 5

PRE SOUTH SUBAREA

Hydrograph type	= SCS Runoff	Peak discharge	= 0.555 cfs
Storm frequency	= 10 yrs	Time to peak	= 716 min
Time interval	= 2 min	Hyd. volume	= 1,280 cuft
Drainage area	= 0.080 ac	Curve number	= 96*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 5.17 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.070 x 98) + (0.010 x 79)] / 0.080



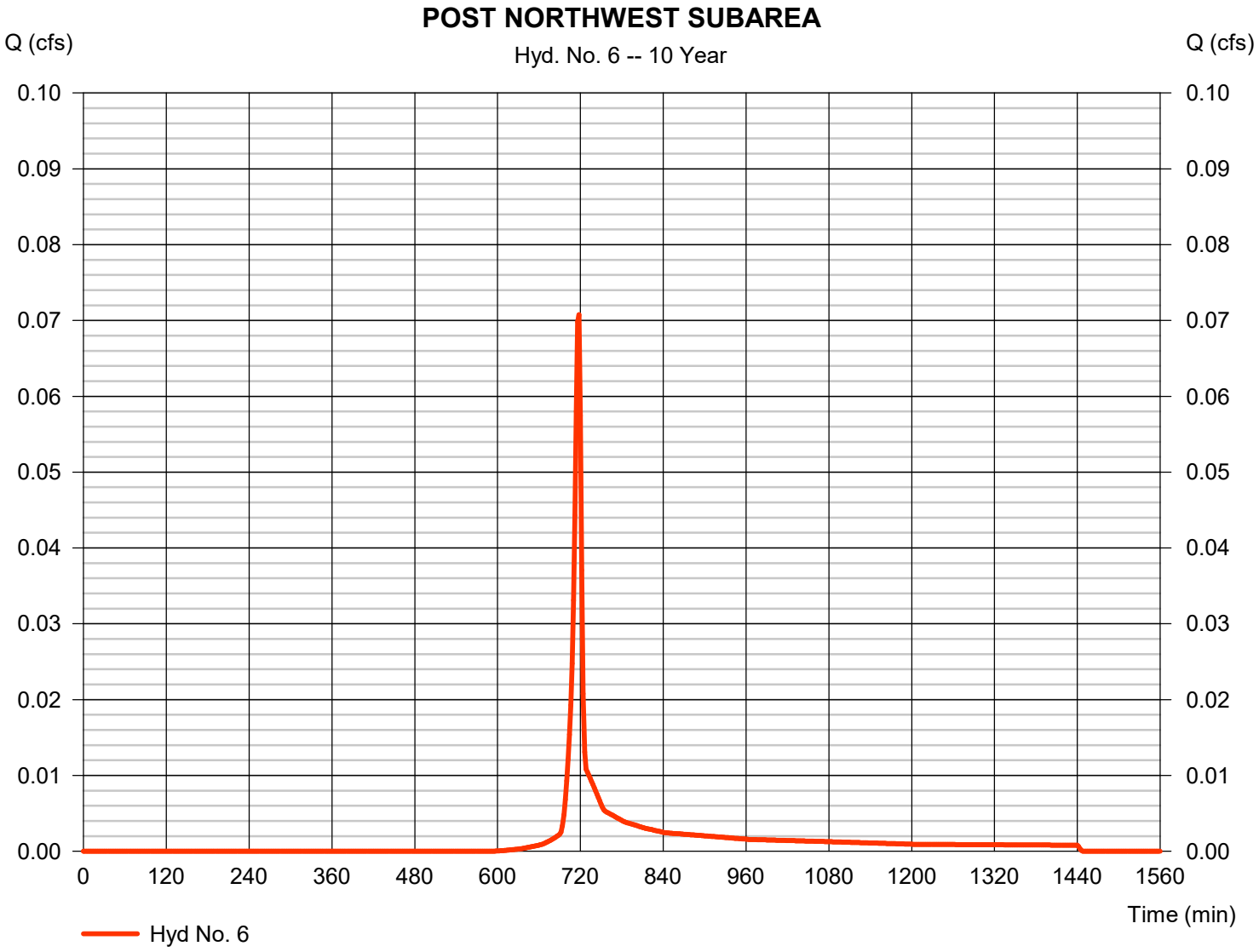
Hydrograph Report

Hyd. No. 6

POST NORTHWEST SUBAREA

Hydrograph type	= SCS Runoff	Peak discharge	= 0.071 cfs
Storm frequency	= 10 yrs	Time to peak	= 718 min
Time interval	= 2 min	Hyd. volume	= 142 cuft
Drainage area	= 0.020 ac	Curve number	= 69*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 5.17 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.020 x 69)] / 0.020



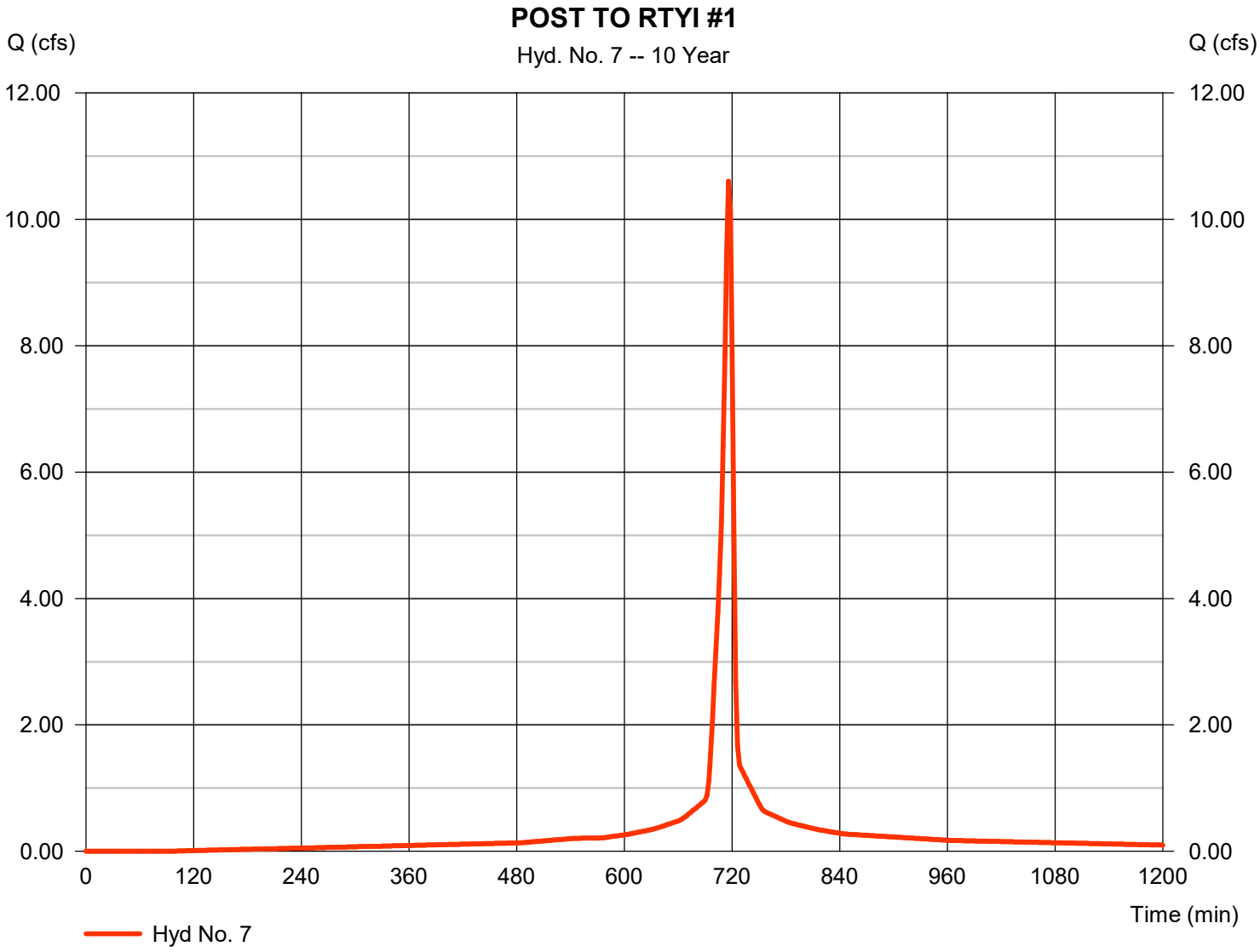
Hydrograph Report

Hyd. No. 7

POST TO RTYI #1

Hydrograph type	=	SCS Runoff	Peak discharge	=	10.61 cfs
Storm frequency	=	10 yrs	Time to peak	=	716 min
Time interval	=	2 min	Hyd. volume	=	24,480 cuft
Drainage area	=	1.530 ac	Curve number	=	96*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	5.17 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.260 x 98) + (0.023 x 98) + (1.140 x 98) + (0.050 x 69) + (0.060 x 79)] / 1.530



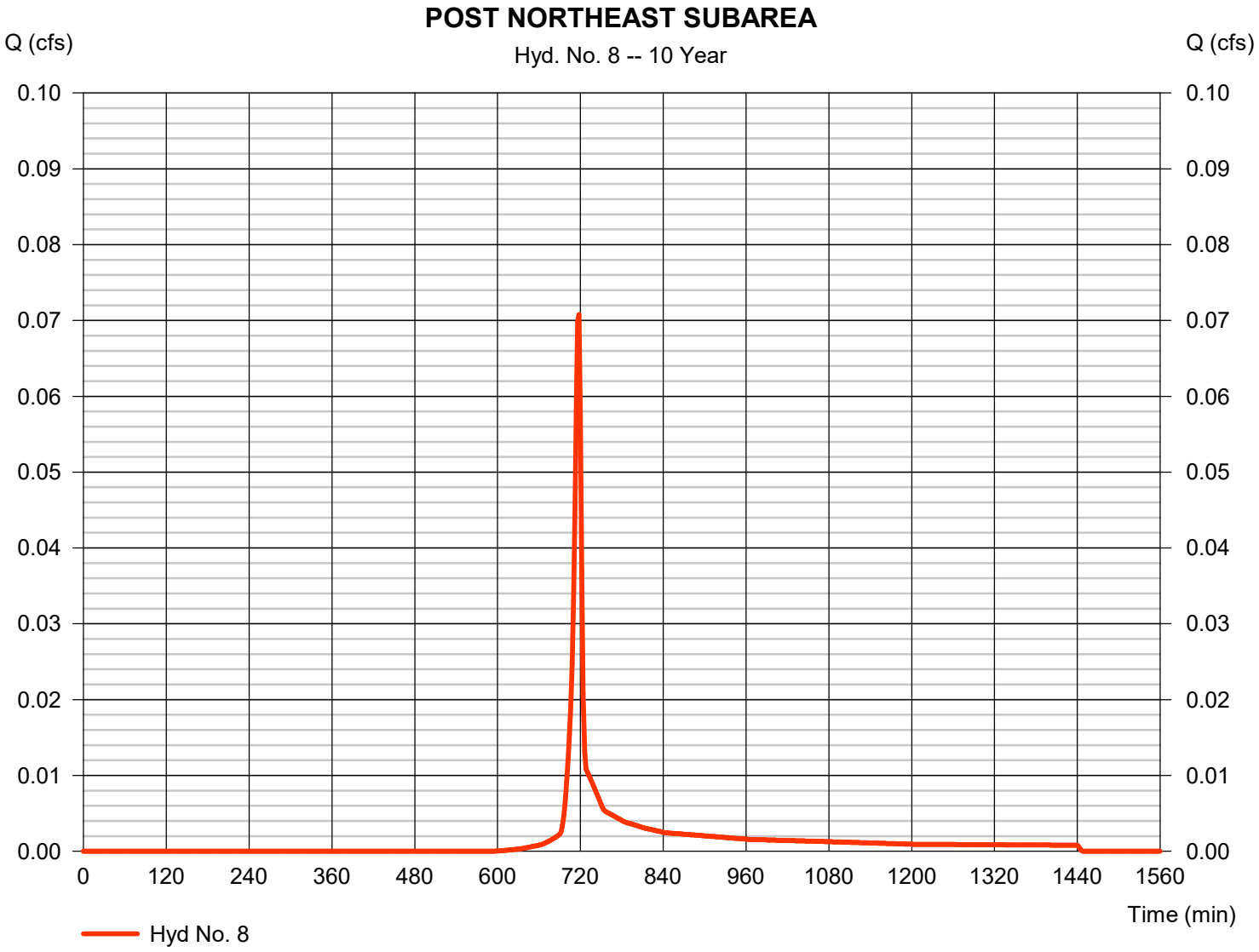
Hydrograph Report

Hyd. No. 8

POST NORTHEAST SUBAREA

Hydrograph type	= SCS Runoff	Peak discharge	= 0.071 cfs
Storm frequency	= 10 yrs	Time to peak	= 718 min
Time interval	= 2 min	Hyd. volume	= 142 cuft
Drainage area	= 0.020 ac	Curve number	= 69*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 5.17 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.020 x 69)] / 0.020



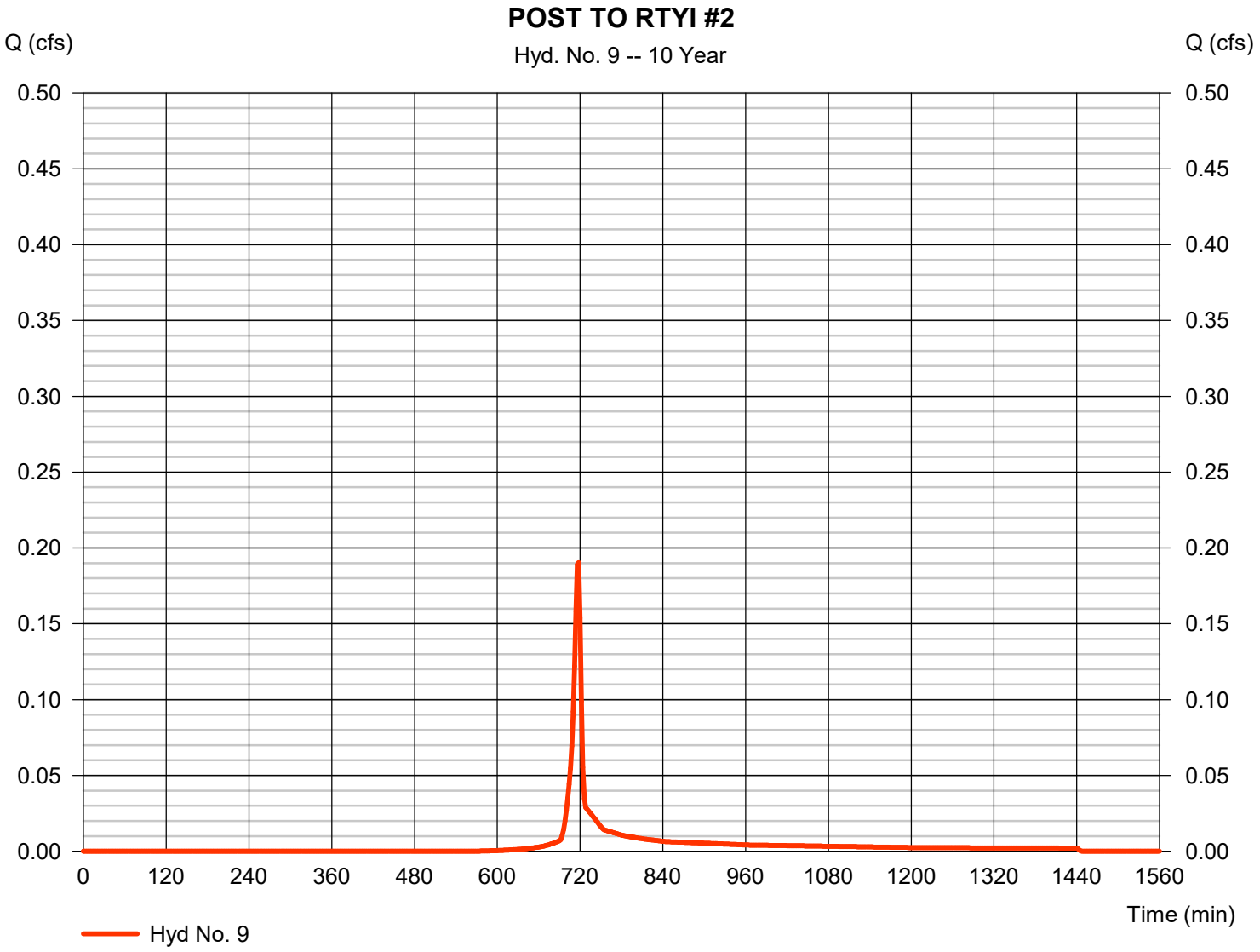
Hydrograph Report

Hyd. No. 9

POST TO RTYI #2

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.190 cfs
Storm frequency	=	10 yrs	Time to peak	=	718 min
Time interval	=	2 min	Hyd. volume	=	382 cuft
Drainage area	=	0.050 ac	Curve number	=	71*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	5.17 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.040 x 69) + (0.010 x 79)] / 0.050



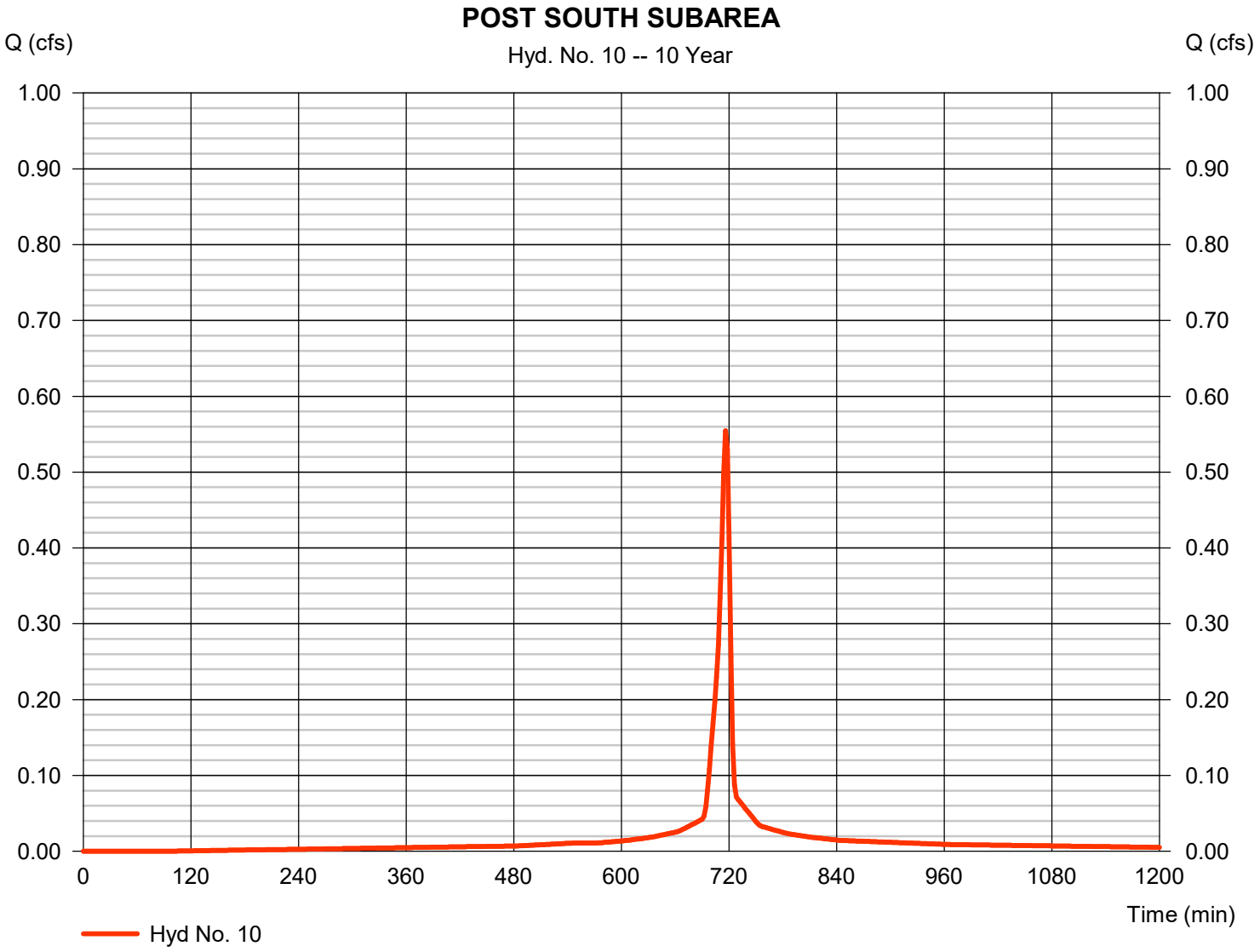
Hydrograph Report

Hyd. No. 10

POST SOUTH SUBAREA

Hydrograph type	= SCS Runoff	Peak discharge	= 0.555 cfs
Storm frequency	= 10 yrs	Time to peak	= 716 min
Time interval	= 2 min	Hyd. volume	= 1,280 cuft
Drainage area	= 0.080 ac	Curve number	= 96*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 5.17 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.070 x 98) + (0.010 x 79)] / 0.080

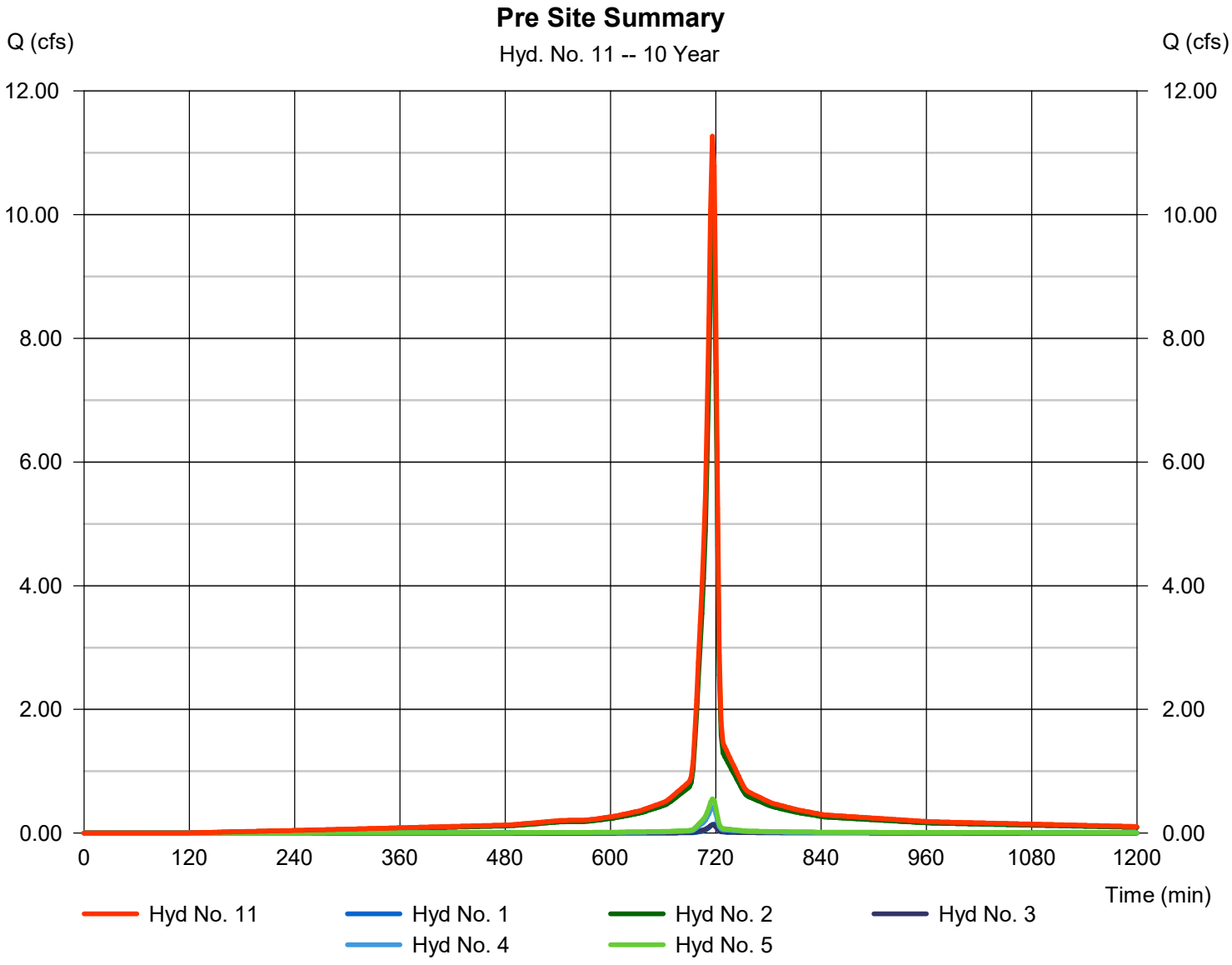


Hydrograph Report

Hyd. No. 11

Pre Site Summary

Hydrograph type	= Combine	Peak discharge	= 11.27 cfs
Storm frequency	= 10 yrs	Time to peak	= 716 min
Time interval	= 2 min	Hyd. volume	= 25,632 cuft
Inflow hyds.	= 1, 2, 3, 4, 5	Contrib. drain. area	= 1.660 ac

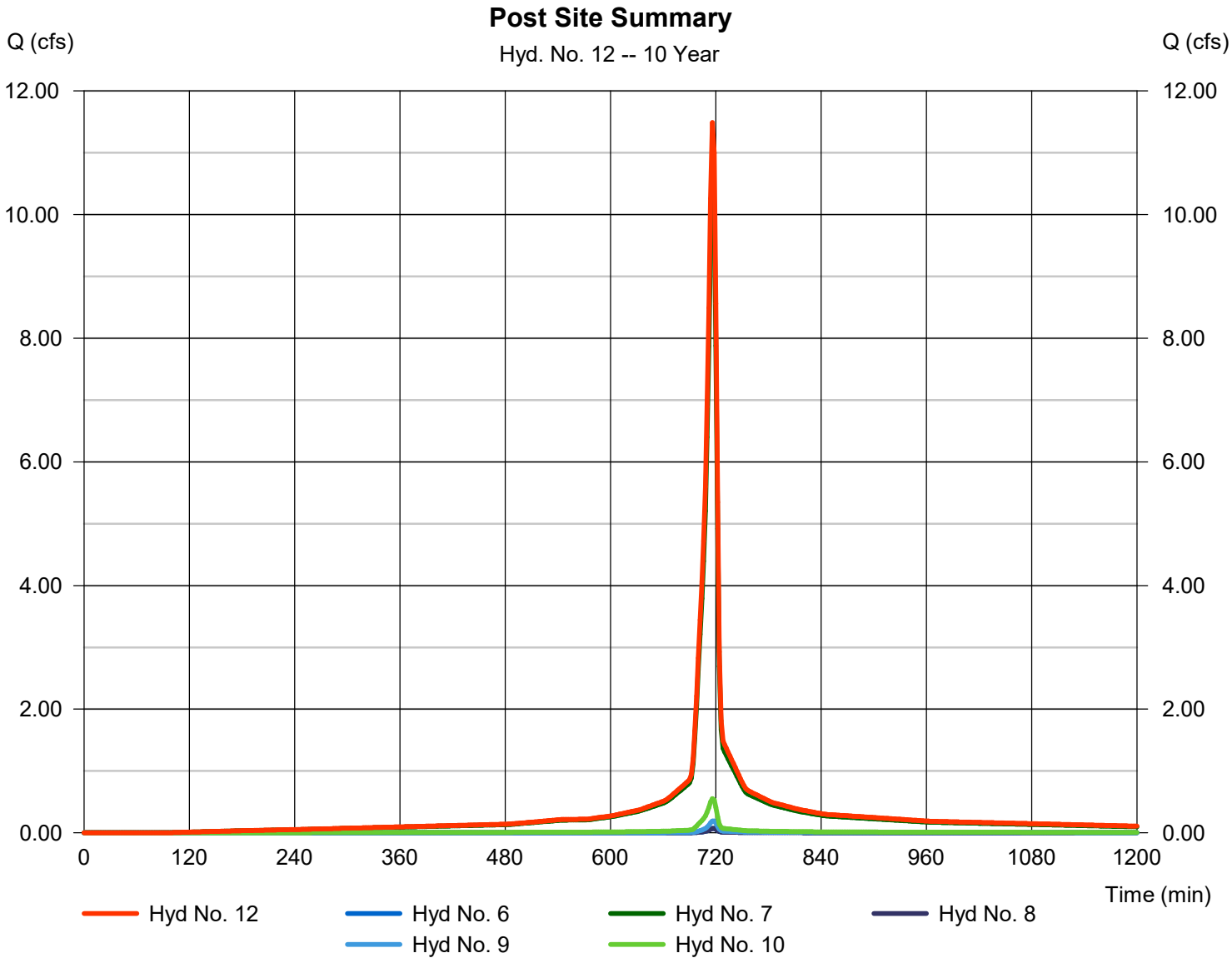


Hydrograph Report

Hyd. No. 12

Post Site Summary

Hydrograph type	= Combine	Peak discharge	= 11.49 cfs
Storm frequency	= 10 yrs	Time to peak	= 716 min
Time interval	= 2 min	Hyd. volume	= 26,425 cuft
Inflow hyds.	= 6, 7, 8, 9, 10	Contrib. drain. area	= 1.700 ac



Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	0.189	2	718	381	------	------	------	PRE NORTHWEST SUBAREA
2	SCS Runoff	11.93	2	716	27,431	------	------	------	PRE TO RTYI #1
3	SCS Runoff	0.159	2	716	352	------	------	------	PRE NORTHEAST SUBAREA
4	SCS Runoff	0.497	2	716	1,175	------	------	------	PRE TO RTYI #2
5	SCS Runoff	0.659	2	716	1,535	------	------	------	PRE SOUTH SUBAREA
6	SCS Runoff	0.095	2	718	190	------	------	------	POST NORTHWEST SUBAREA
7	SCS Runoff	12.60	2	716	29,350	------	------	------	POST TO RTYI #1
8	SCS Runoff	0.095	2	718	190	------	------	------	POST NORTHEAST SUBAREA
9	SCS Runoff	0.252	2	716	508	------	------	------	POST TO RTYI #2
10	SCS Runoff	0.659	2	716	1,535	------	------	------	POST SOUTH SUBAREA
11	Combine	13.43	2	716	30,874	1, 2, 3, 4, 5,	------	------	Pre Site Summary
12	Combine	13.69	2	716	31,774	6, 7, 8, 9, 10,	------	------	Post Site Summary

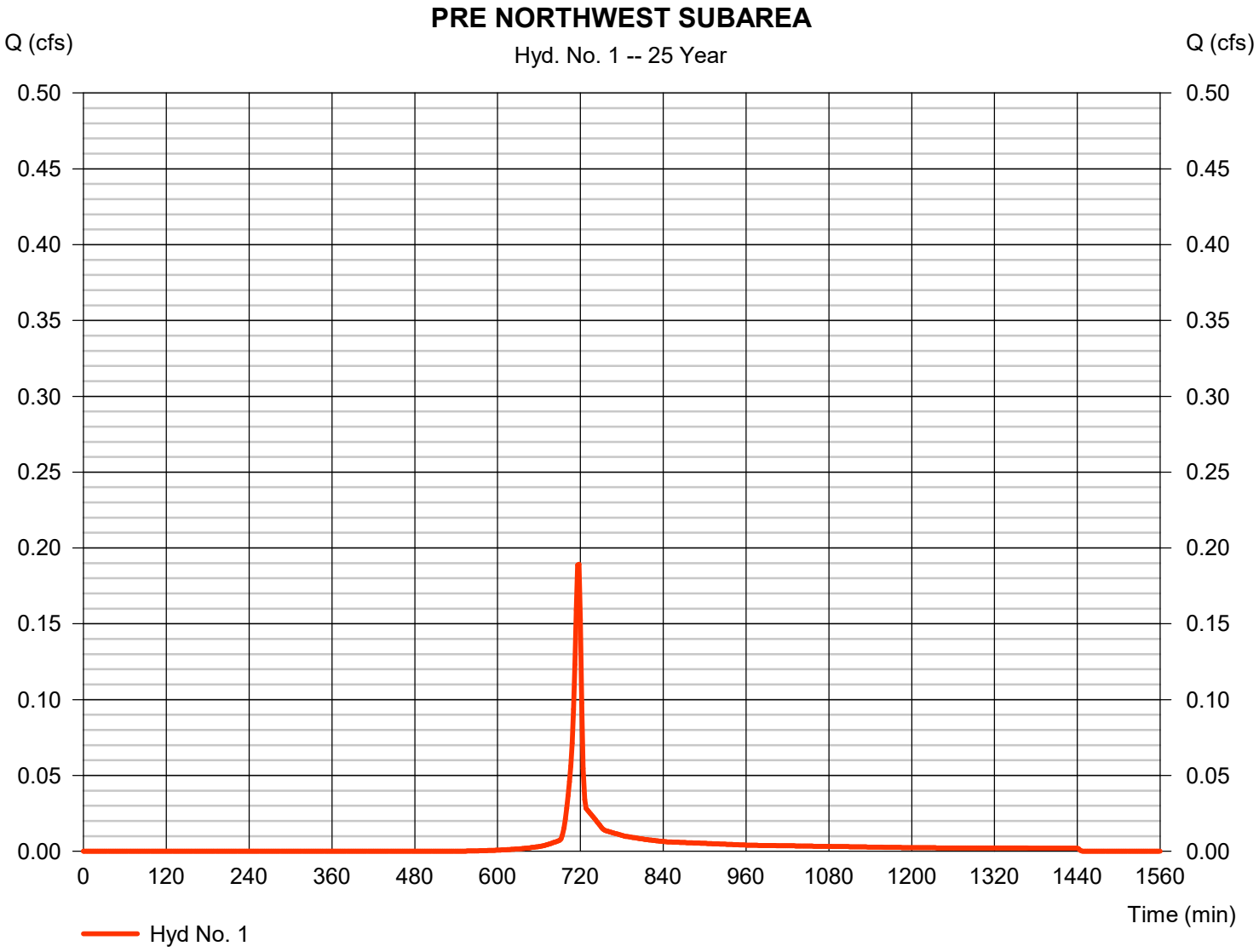
Hydrograph Report

Hyd. No. 1

PRE NORTHWEST SUBAREA

Hydrograph type	= SCS Runoff	Peak discharge	= 0.189 cfs
Storm frequency	= 25 yrs	Time to peak	= 718 min
Time interval	= 2 min	Hyd. volume	= 381 cuft
Drainage area	= 0.040 ac	Curve number	= 69*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 6.11 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.040 x 69)] / 0.040



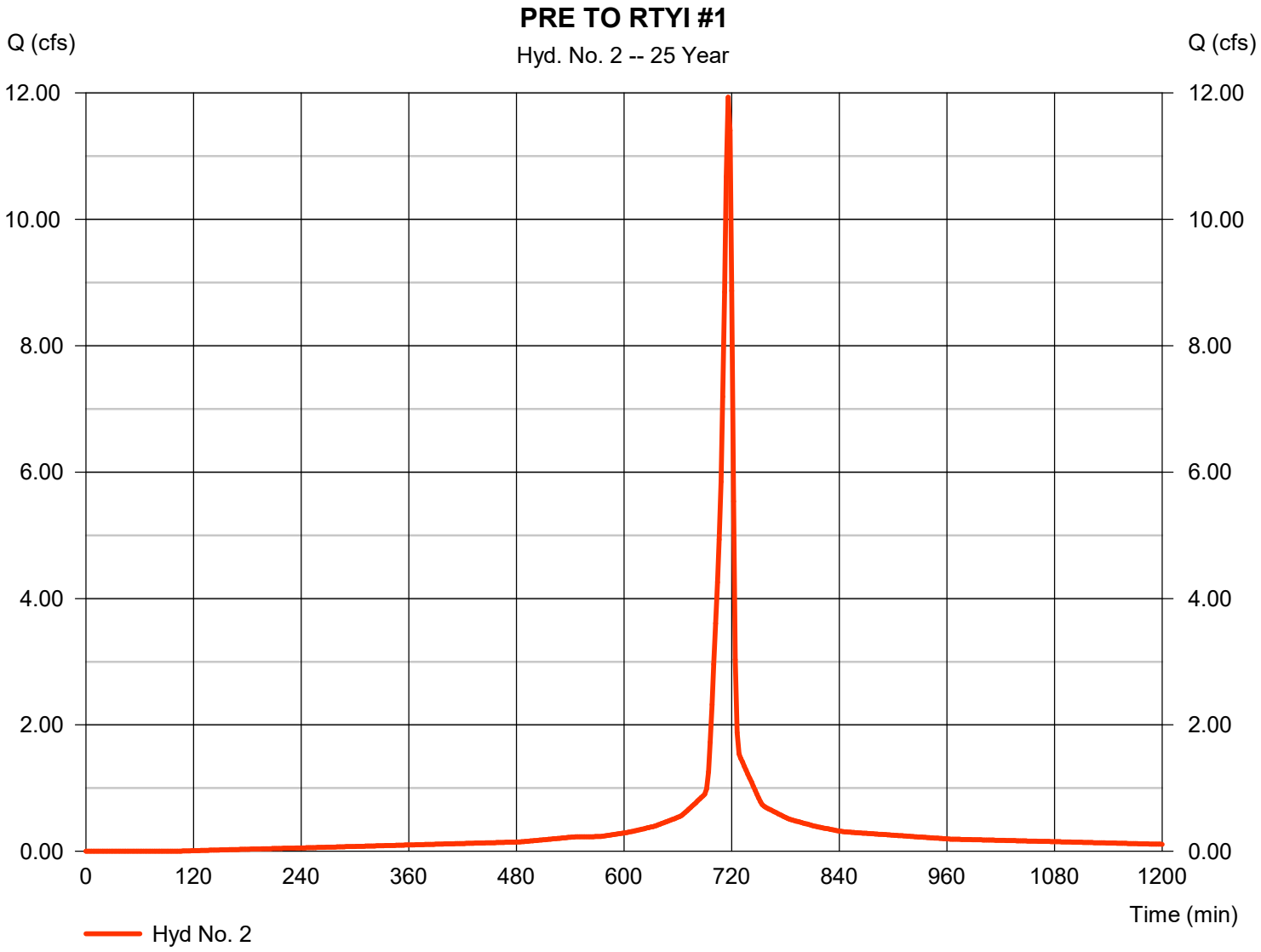
Hydrograph Report

Hyd. No. 2

PRE TO RTYI #1

Hydrograph type	= SCS Runoff	Peak discharge	= 11.93 cfs
Storm frequency	= 25 yrs	Time to peak	= 716 min
Time interval	= 2 min	Hyd. volume	= 27,431 cuft
Drainage area	= 1.460 ac	Curve number	= 95*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 6.11 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.720 x 98) + (0.200 x 98) + (0.060 x 92) + (0.400 x 92) + (0.030 x 69) + (0.050 x 79)] / 1.460



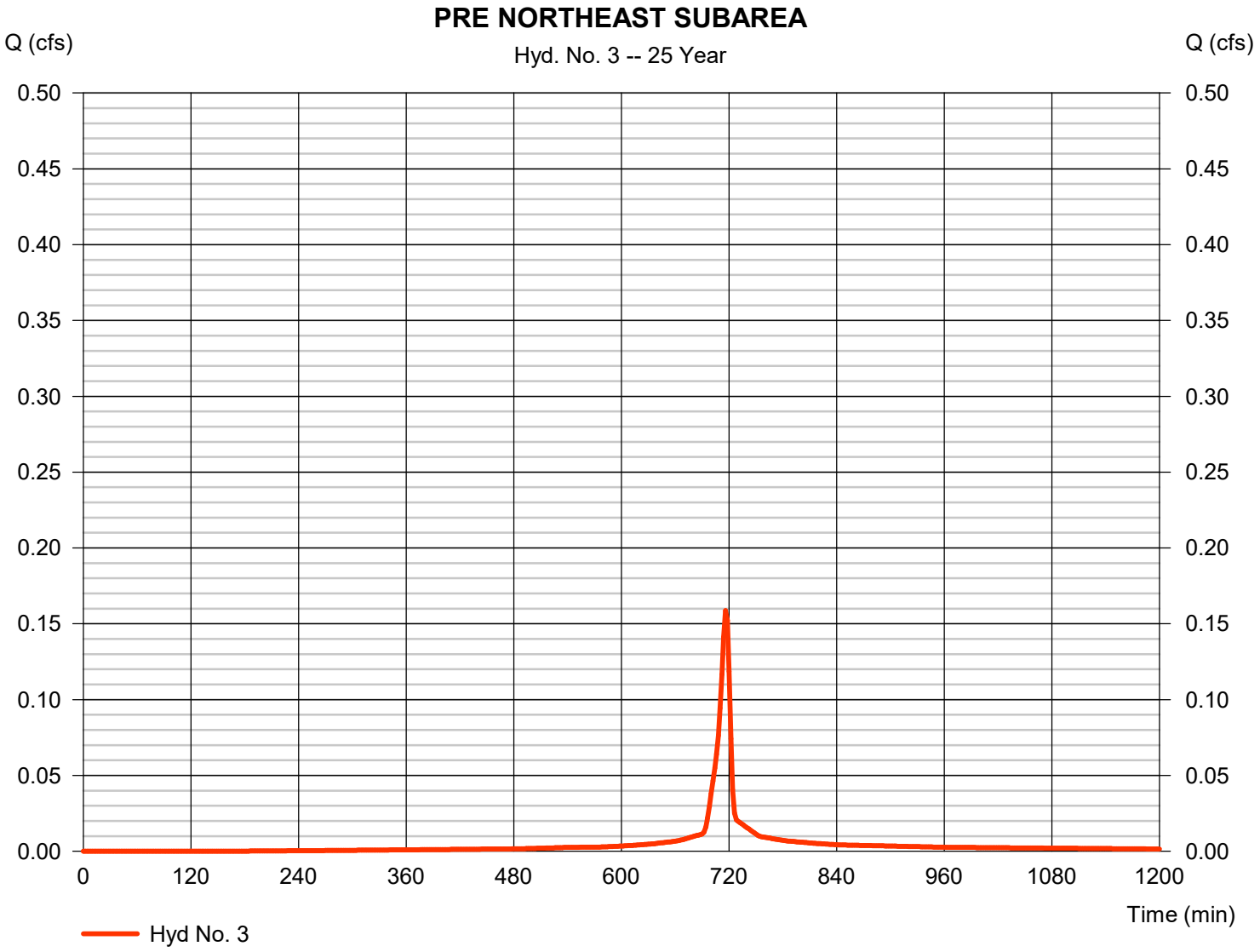
Hydrograph Report

Hyd. No. 3

PRE NORTHEAST SUBAREA

Hydrograph type	= SCS Runoff	Peak discharge	= 0.159 cfs
Storm frequency	= 25 yrs	Time to peak	= 716 min
Time interval	= 2 min	Hyd. volume	= 352 cuft
Drainage area	= 0.020 ac	Curve number	= 92*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 6.11 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.020 x 92)] / 0.020



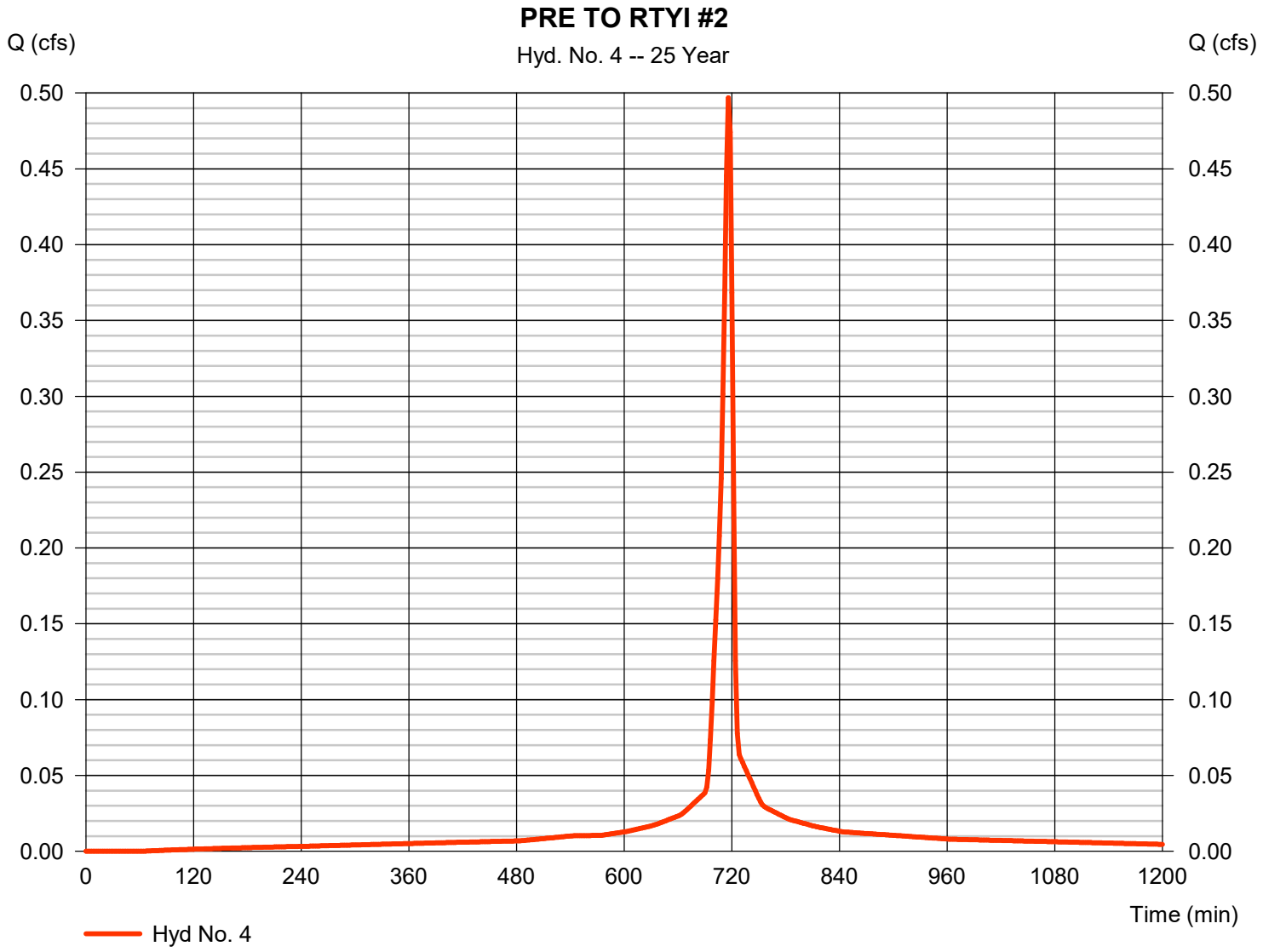
Hydrograph Report

Hyd. No. 4

PRE TO RTYI #2

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.497 cfs
Storm frequency	=	25 yrs	Time to peak	=	716 min
Time interval	=	2 min	Hyd. volume	=	1,175 cuft
Drainage area	=	0.060 ac	Curve number	=	97*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	6.11 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.040 x 98) + (0.010 x 98) + (0.010 x 92)] / 0.060



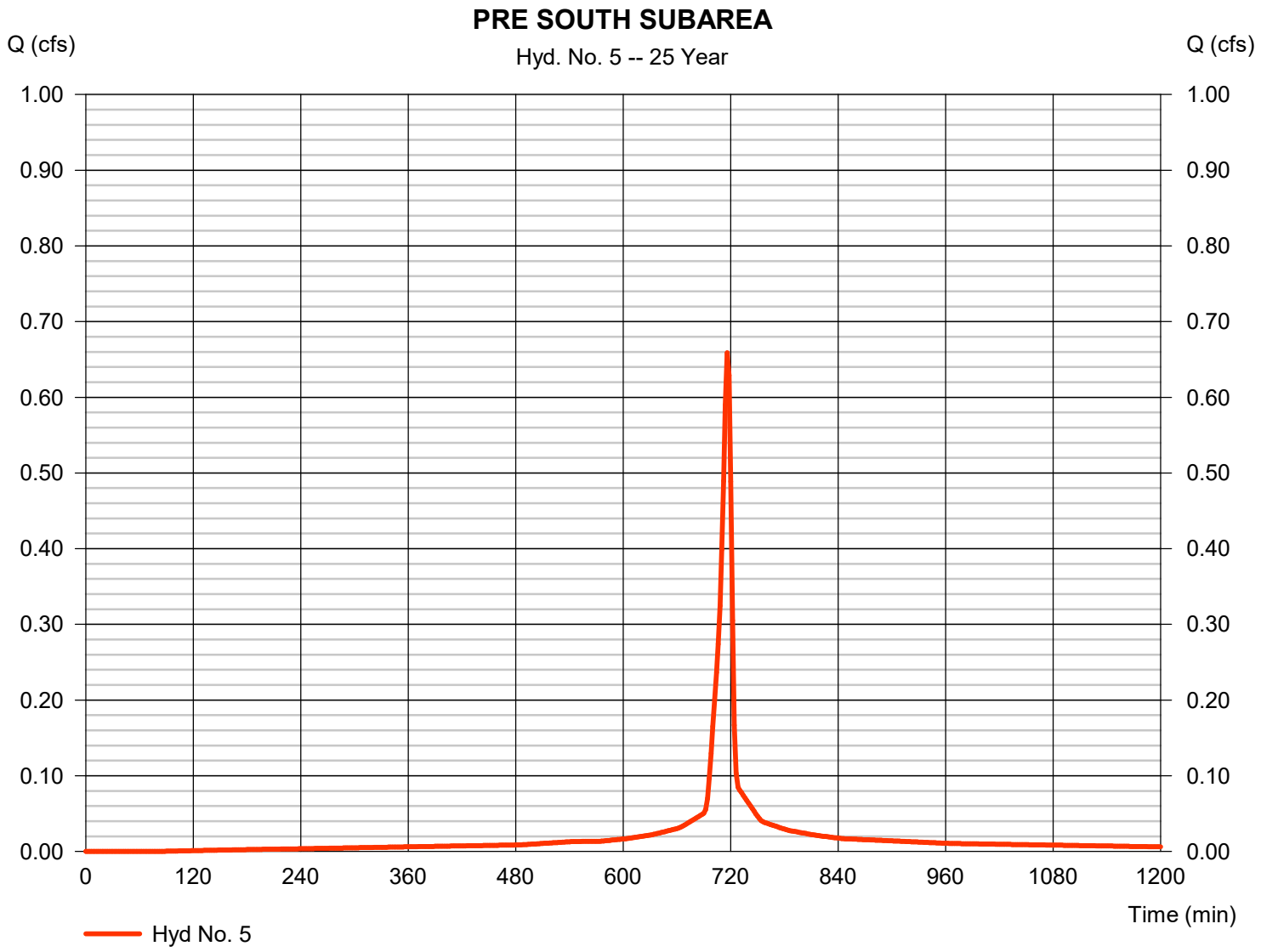
Hydrograph Report

Hyd. No. 5

PRE SOUTH SUBAREA

Hydrograph type	= SCS Runoff	Peak discharge	= 0.659 cfs
Storm frequency	= 25 yrs	Time to peak	= 716 min
Time interval	= 2 min	Hyd. volume	= 1,535 cuft
Drainage area	= 0.080 ac	Curve number	= 96*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 6.11 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.070 x 98) + (0.010 x 79)] / 0.080



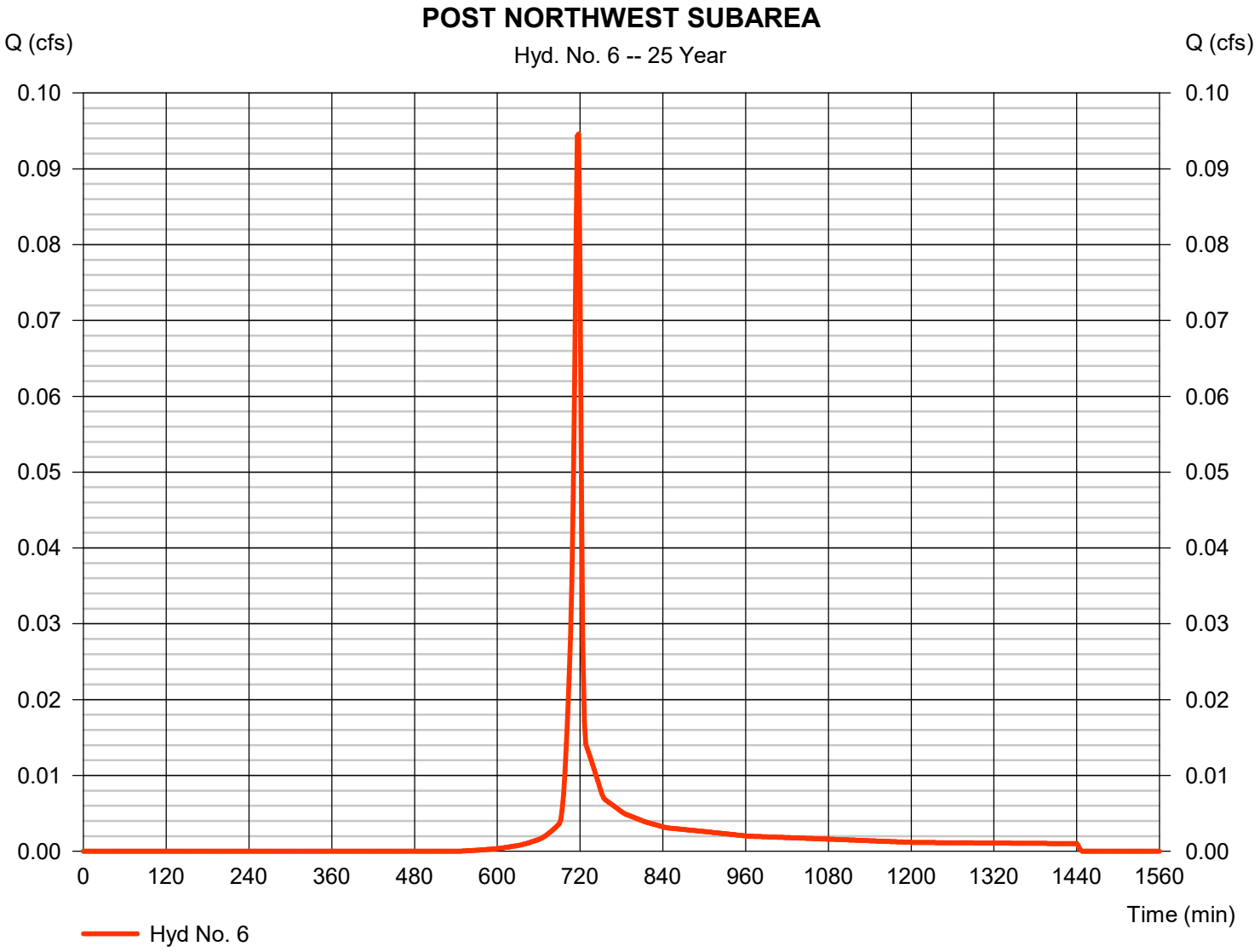
Hydrograph Report

Hyd. No. 6

POST NORTHWEST SUBAREA

Hydrograph type	= SCS Runoff	Peak discharge	= 0.095 cfs
Storm frequency	= 25 yrs	Time to peak	= 718 min
Time interval	= 2 min	Hyd. volume	= 190 cuft
Drainage area	= 0.020 ac	Curve number	= 69*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 6.11 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.020 x 69)] / 0.020



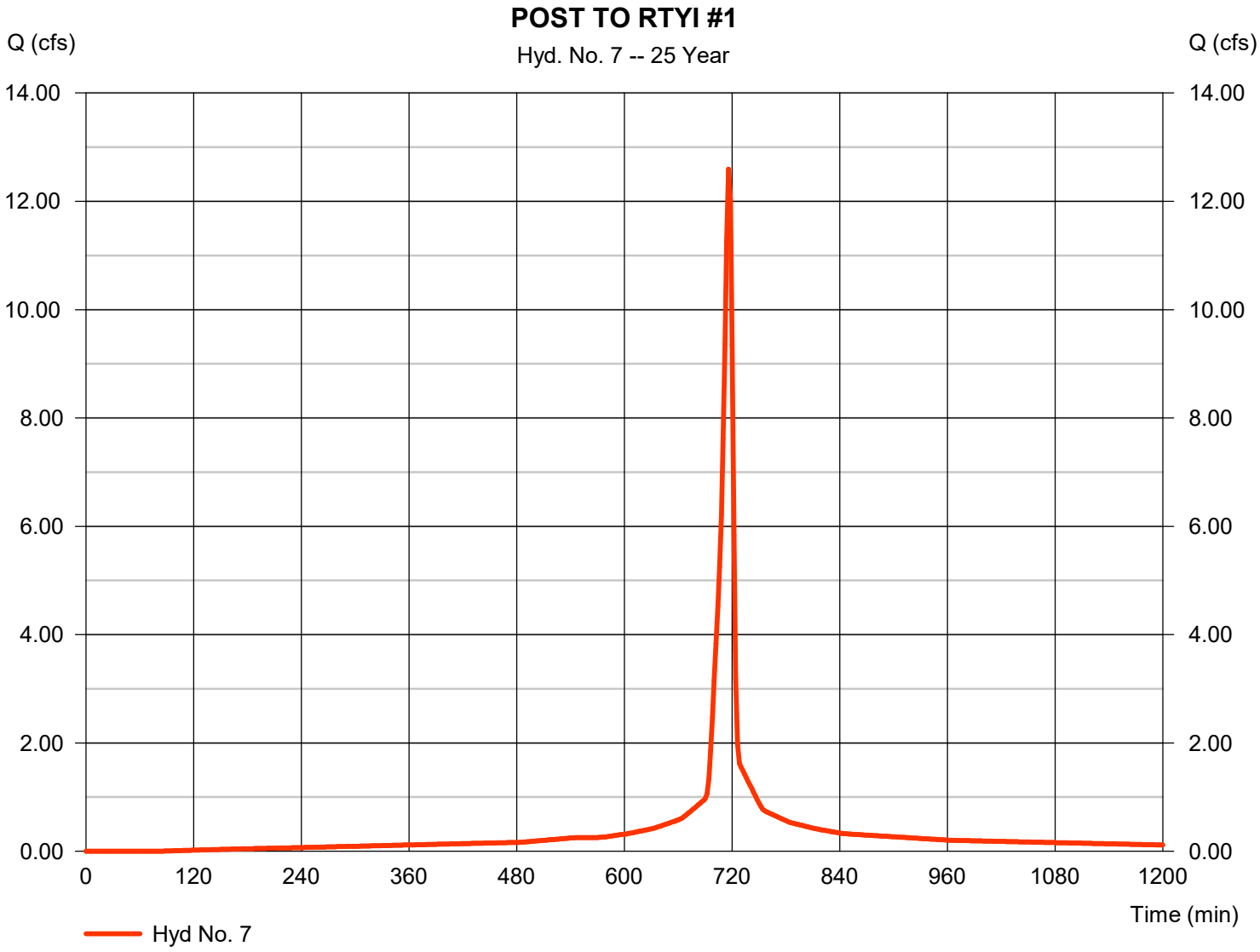
Hydrograph Report

Hyd. No. 7

POST TO RTYI #1

Hydrograph type	=	SCS Runoff	Peak discharge	=	12.60 cfs
Storm frequency	=	25 yrs	Time to peak	=	716 min
Time interval	=	2 min	Hyd. volume	=	29,350 cuft
Drainage area	=	1.530 ac	Curve number	=	96*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	6.11 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.260 x 98) + (0.023 x 98) + (1.140 x 98) + (0.050 x 69) + (0.060 x 79)] / 1.530



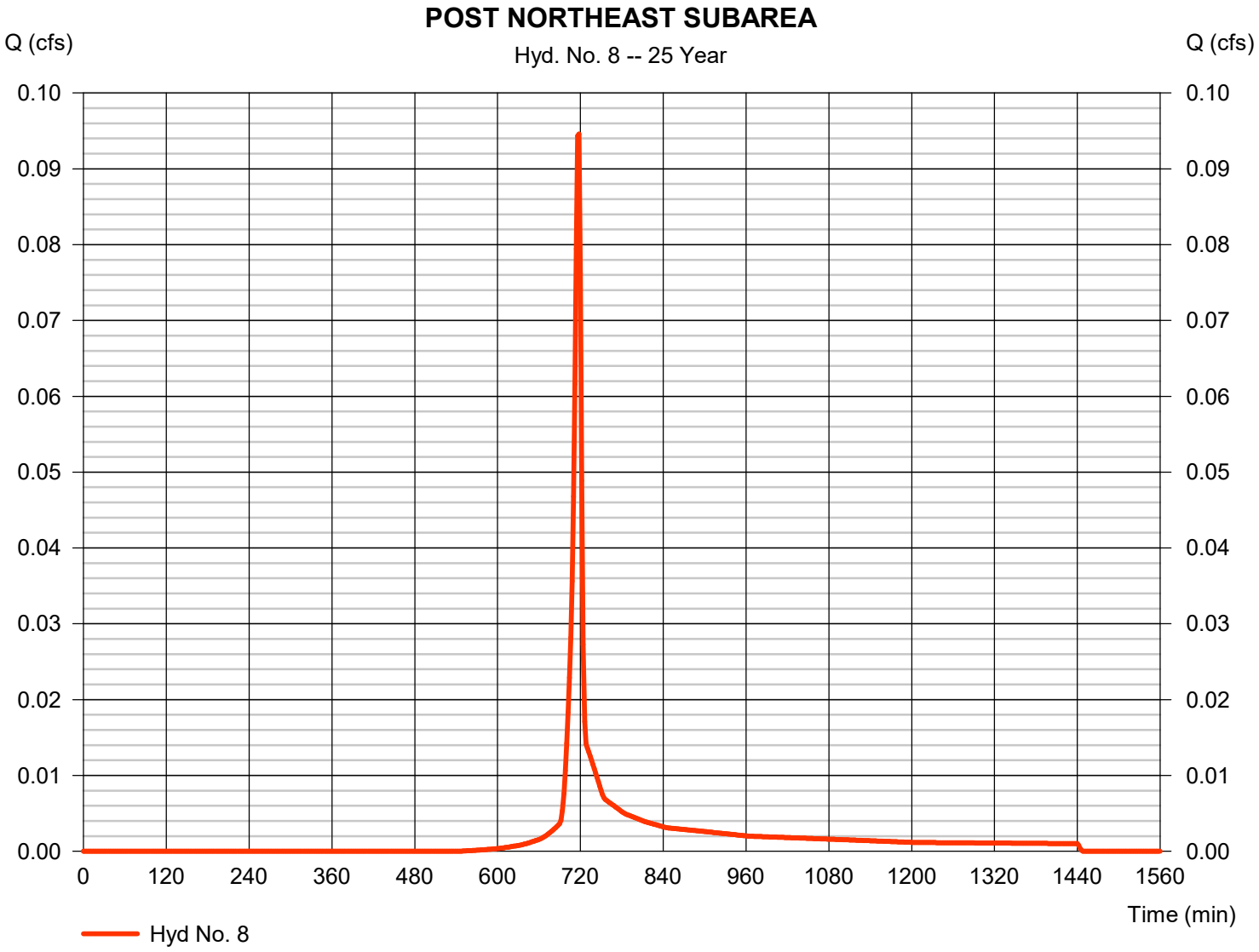
Hydrograph Report

Hyd. No. 8

POST NORTHEAST SUBAREA

Hydrograph type	= SCS Runoff	Peak discharge	= 0.095 cfs
Storm frequency	= 25 yrs	Time to peak	= 718 min
Time interval	= 2 min	Hyd. volume	= 190 cuft
Drainage area	= 0.020 ac	Curve number	= 69*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 6.11 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.020 x 69)] / 0.020



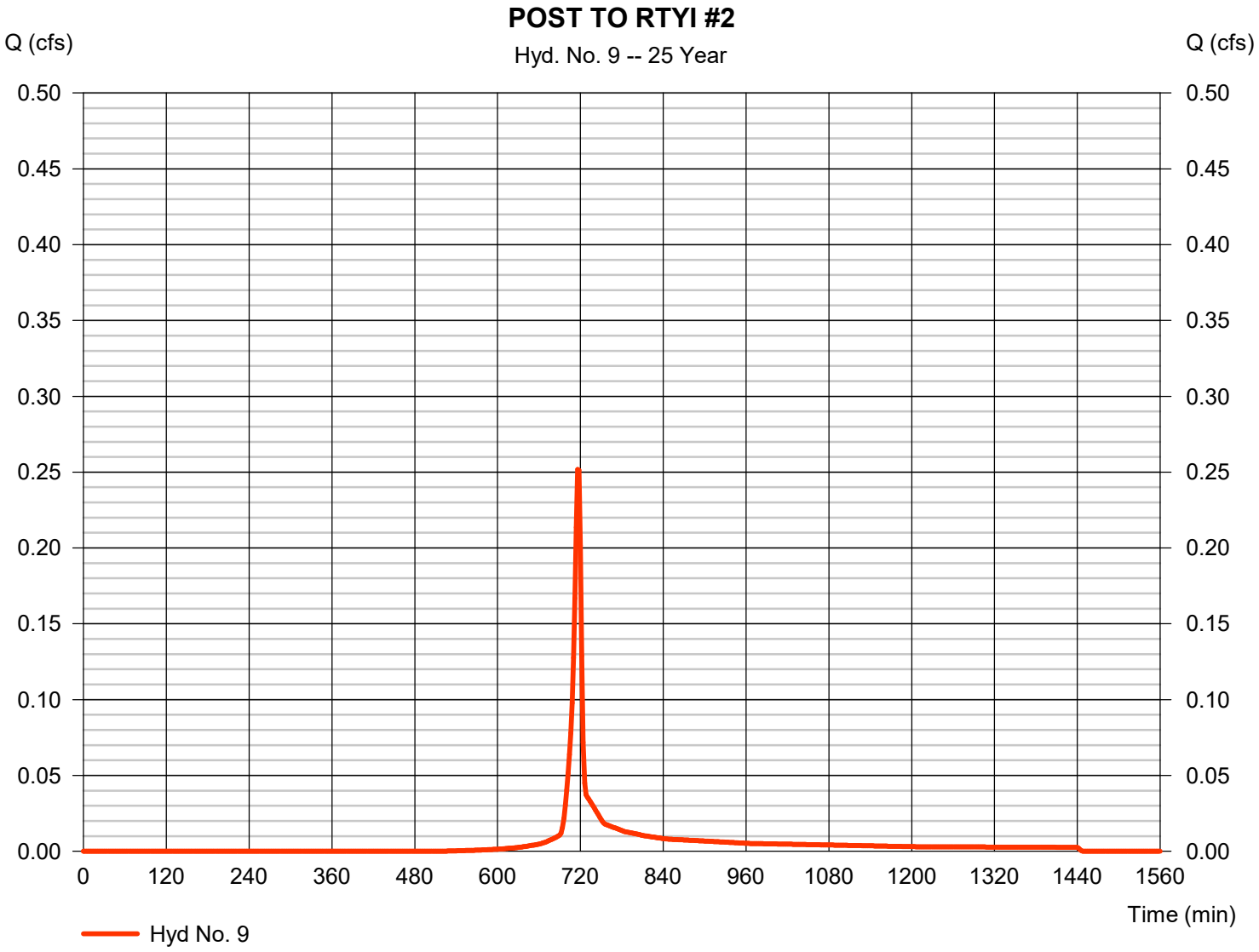
Hydrograph Report

Hyd. No. 9

POST TO RTYI #2

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.252 cfs
Storm frequency	=	25 yrs	Time to peak	=	716 min
Time interval	=	2 min	Hyd. volume	=	508 cuft
Drainage area	=	0.050 ac	Curve number	=	71*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	6.11 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.040 x 69) + (0.010 x 79)] / 0.050



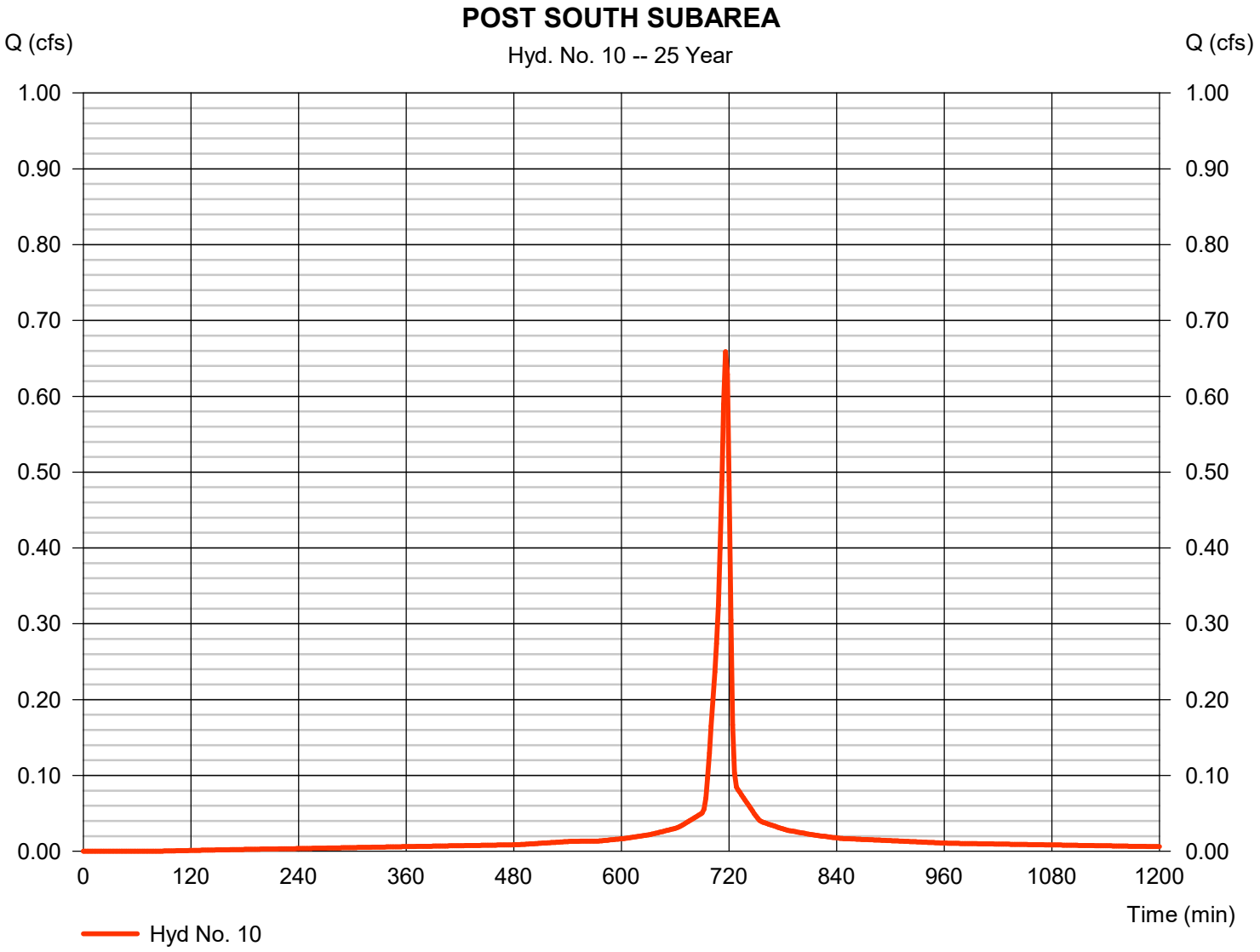
Hydrograph Report

Hyd. No. 10

POST SOUTH SUBAREA

Hydrograph type	= SCS Runoff	Peak discharge	= 0.659 cfs
Storm frequency	= 25 yrs	Time to peak	= 716 min
Time interval	= 2 min	Hyd. volume	= 1,535 cuft
Drainage area	= 0.080 ac	Curve number	= 96*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 6.11 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.070 x 98) + (0.010 x 79)] / 0.080

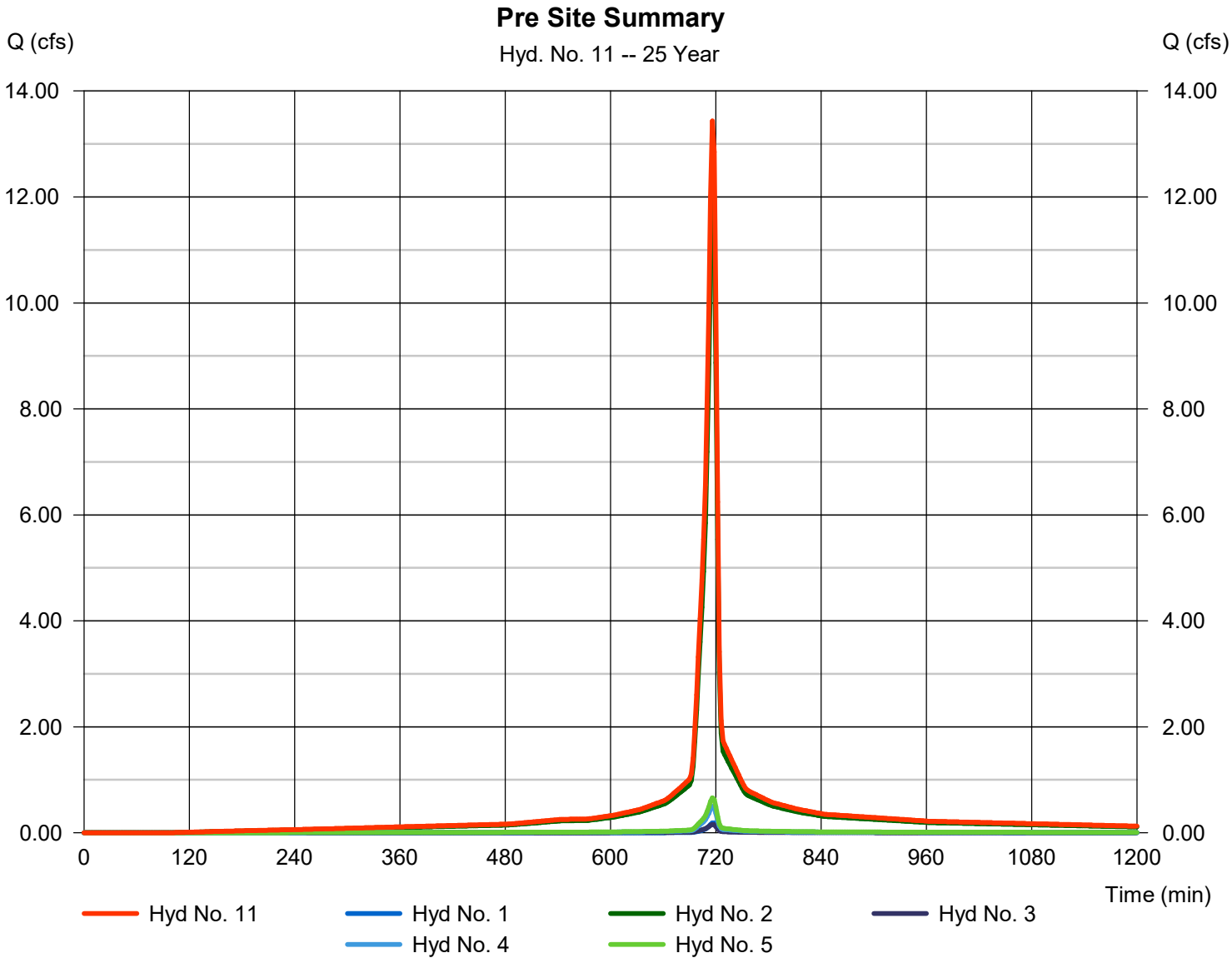


Hydrograph Report

Hyd. No. 11

Pre Site Summary

Hydrograph type	= Combine	Peak discharge	= 13.43 cfs
Storm frequency	= 25 yrs	Time to peak	= 716 min
Time interval	= 2 min	Hyd. volume	= 30,874 cuft
Inflow hyds.	= 1, 2, 3, 4, 5	Contrib. drain. area	= 1.660 ac

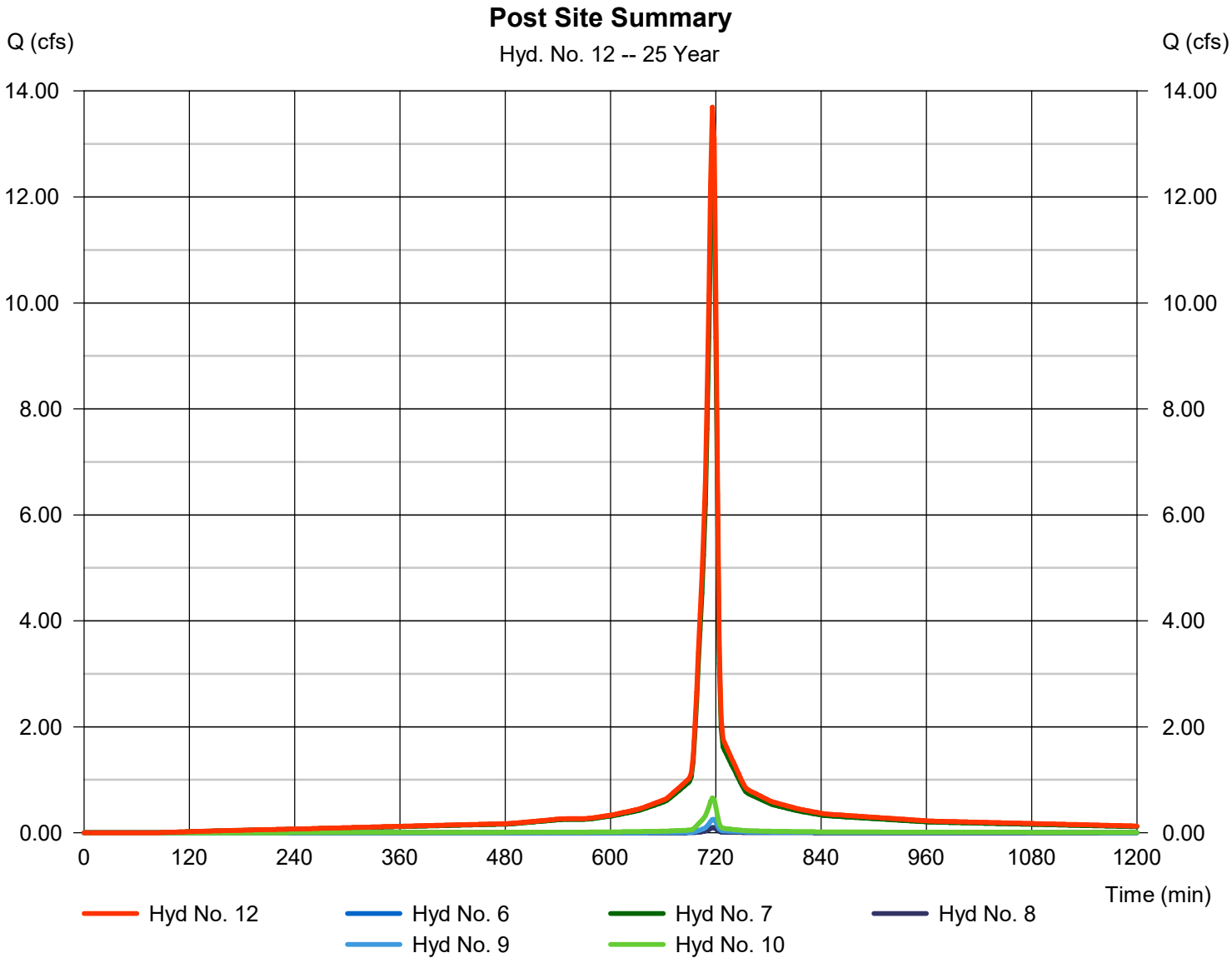


Hydrograph Report

Hyd. No. 12

Post Site Summary

Hydrograph type	= Combine	Peak discharge	= 13.69 cfs
Storm frequency	= 25 yrs	Time to peak	= 716 min
Time interval	= 2 min	Hyd. volume	= 31,774 cuft
Inflow hyds.	= 6, 7, 8, 9, 10	Contrib. drain. area	= 1.700 ac



Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	0.271	2	716	548	------	------	------	PRE NORTHWEST SUBAREA
2	SCS Runoff	14.99	2	716	34,894	------	------	------	PRE TO RTYI #1
3	SCS Runoff	0.201	2	716	454	------	------	------	PRE NORTHEAST SUBAREA
4	SCS Runoff	0.621	2	716	1,483	------	------	------	PRE TO RTYI #2
5	SCS Runoff	0.825	2	716	1,944	------	------	------	PRE SOUTH SUBAREA
6	SCS Runoff	0.136	2	716	274	------	------	------	POST NORTHWEST SUBAREA
7	SCS Runoff	15.78	2	716	37,186	------	------	------	POST TO RTYI #1
8	SCS Runoff	0.136	2	716	274	------	------	------	POST NORTHEAST SUBAREA
9	SCS Runoff	0.357	2	716	723	------	------	------	POST TO RTYI #2
10	SCS Runoff	0.825	2	716	1,944	------	------	------	POST SOUTH SUBAREA
11	Combine	16.90	2	716	39,323	1, 2, 3, 4, 5,	------	------	Pre Site Summary
12	Combine	17.24	2	716	40,402	6, 7, 8, 9, 10,	------	------	Post Site Summary

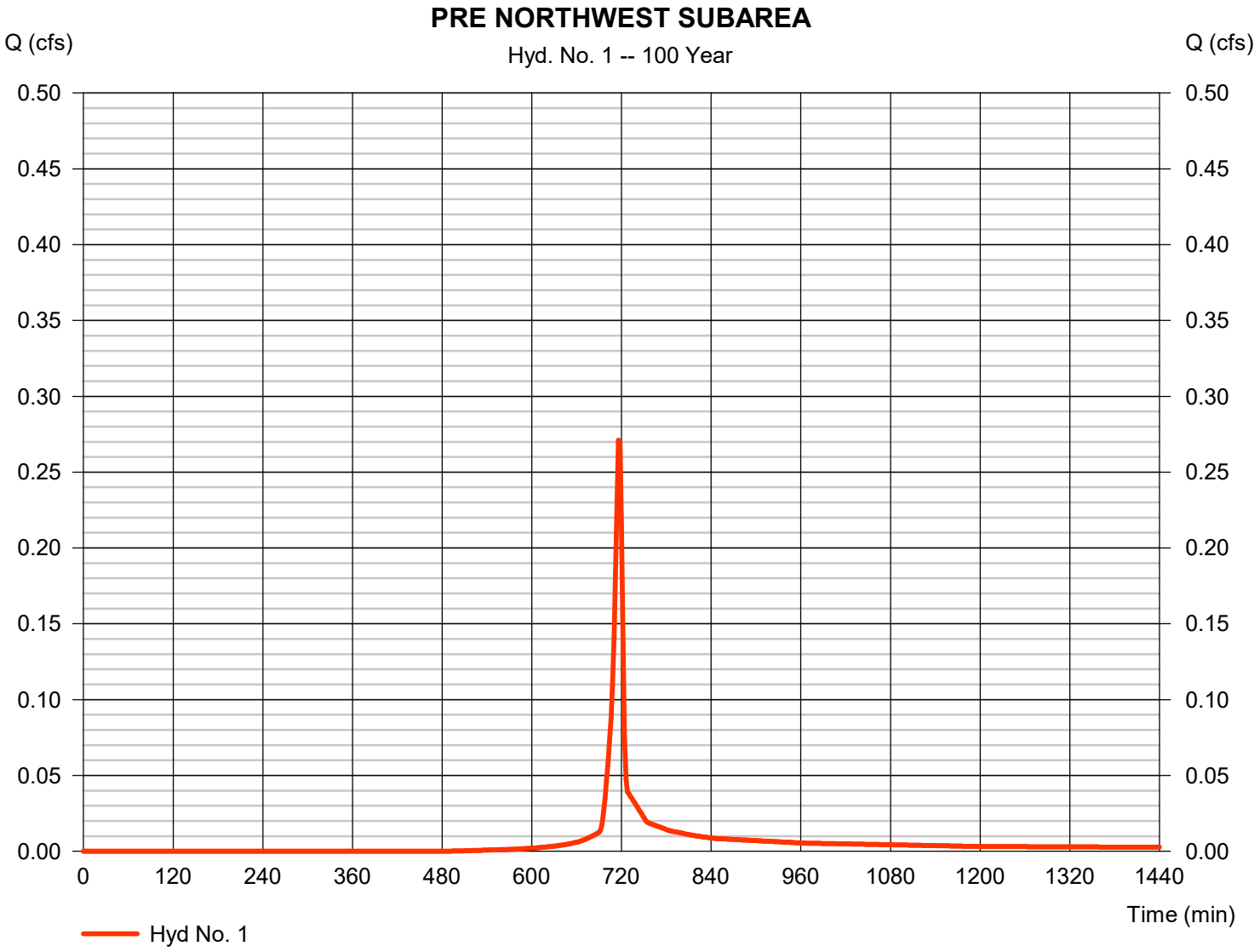
Hydrograph Report

Hyd. No. 1

PRE NORTHWEST SUBAREA

Hydrograph type	= SCS Runoff	Peak discharge	= 0.271 cfs
Storm frequency	= 100 yrs	Time to peak	= 716 min
Time interval	= 2 min	Hyd. volume	= 548 cuft
Drainage area	= 0.040 ac	Curve number	= 69*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 7.62 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.040 x 69)] / 0.040



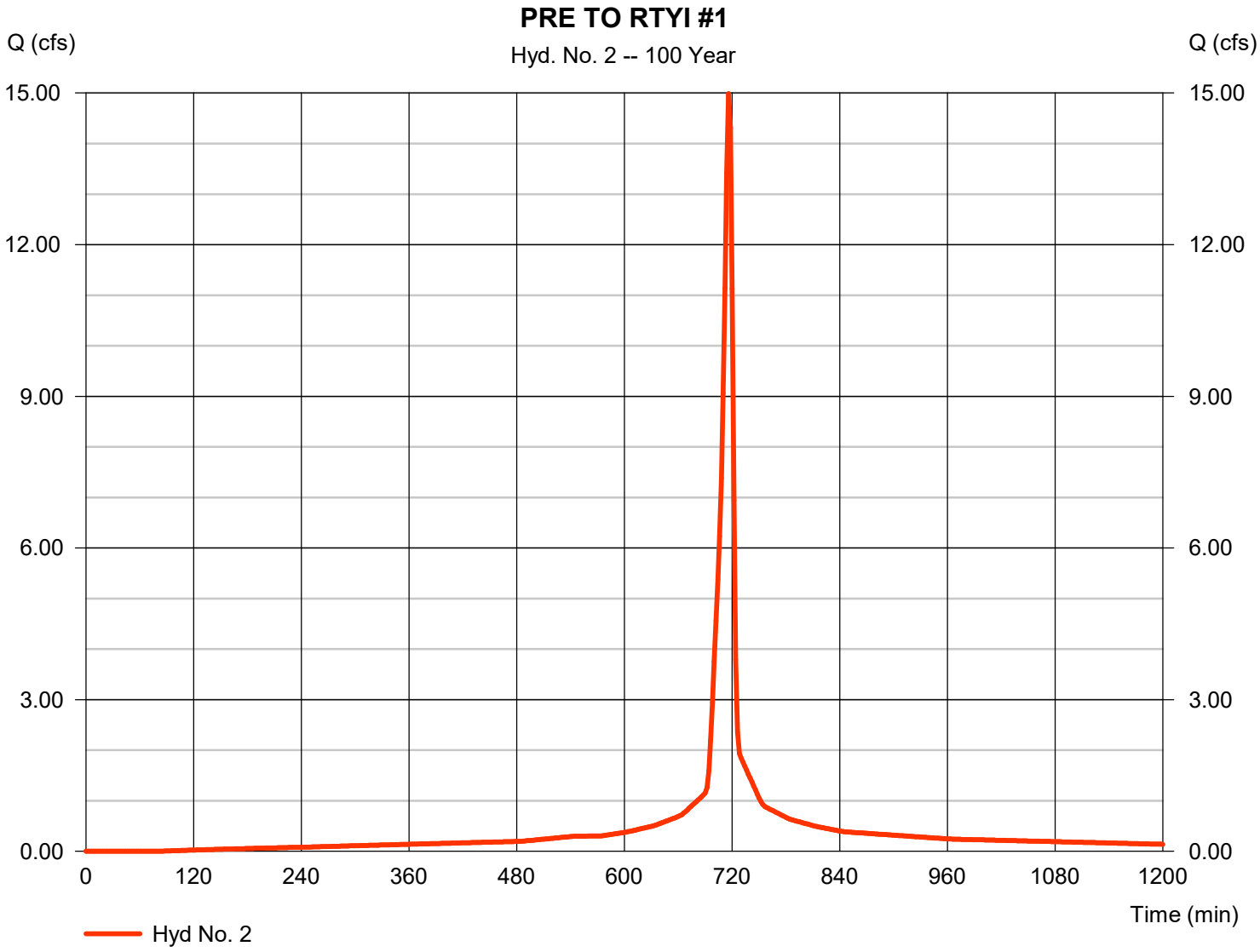
Hydrograph Report

Hyd. No. 2

PRE TO RTYI #1

Hydrograph type	=	SCS Runoff	Peak discharge	=	14.99 cfs
Storm frequency	=	100 yrs	Time to peak	=	716 min
Time interval	=	2 min	Hyd. volume	=	34,894 cuft
Drainage area	=	1.460 ac	Curve number	=	95*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	7.62 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.720 x 98) + (0.200 x 98) + (0.060 x 92) + (0.400 x 92) + (0.030 x 69) + (0.050 x 79)] / 1.460



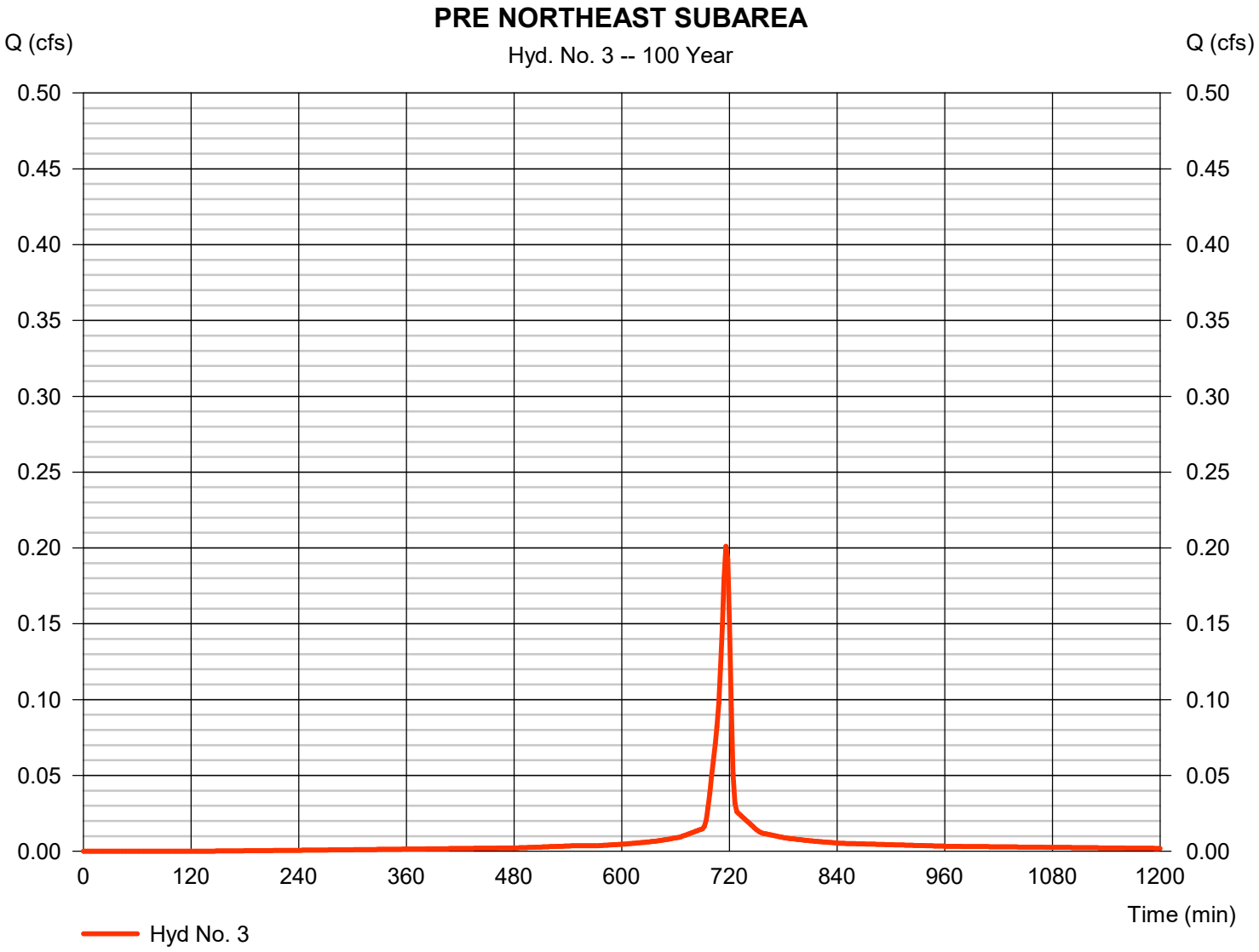
Hydrograph Report

Hyd. No. 3

PRE NORTHEAST SUBAREA

Hydrograph type	= SCS Runoff	Peak discharge	= 0.201 cfs
Storm frequency	= 100 yrs	Time to peak	= 716 min
Time interval	= 2 min	Hyd. volume	= 454 cuft
Drainage area	= 0.020 ac	Curve number	= 92*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 7.62 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.020 x 92)] / 0.020



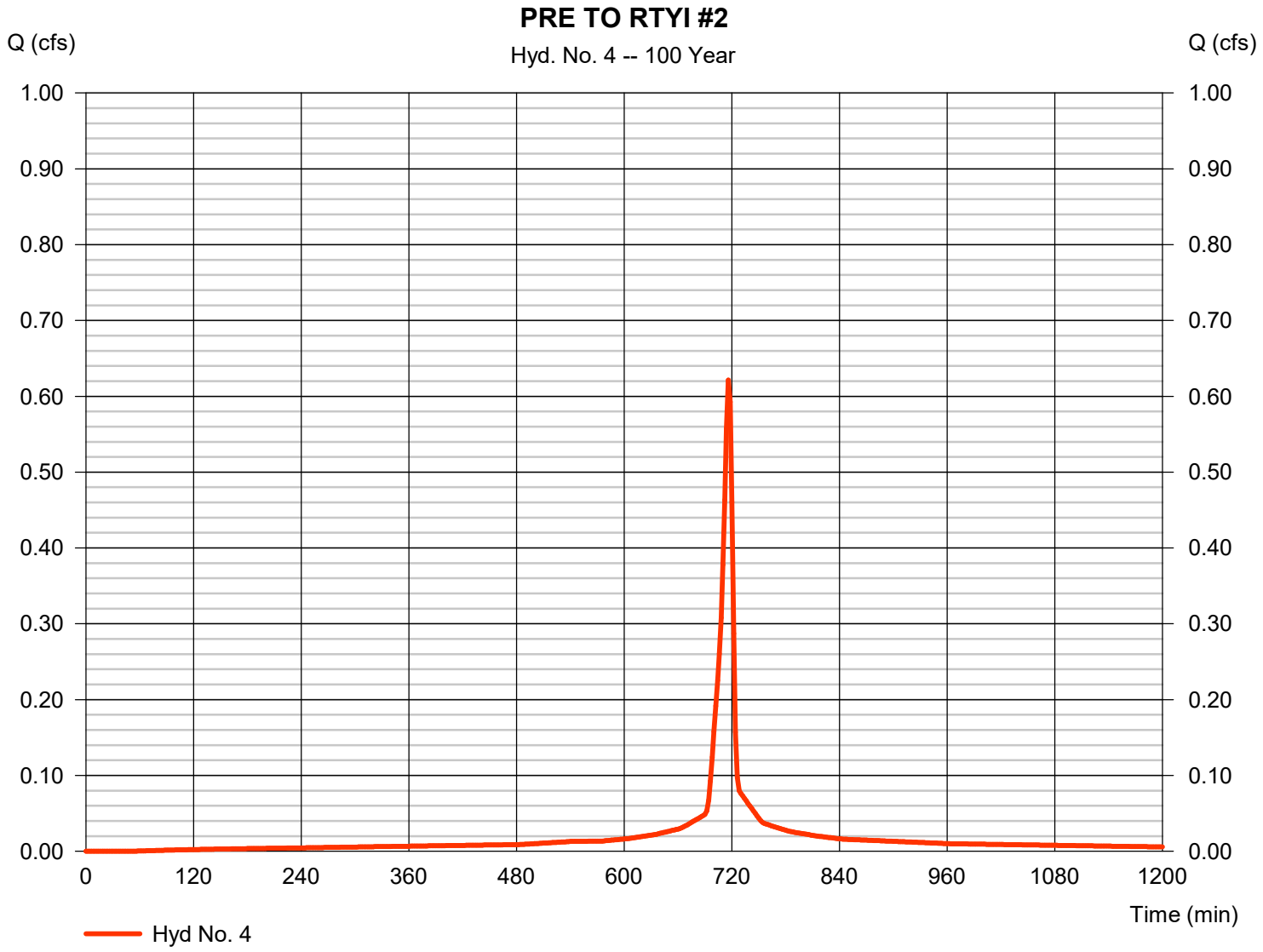
Hydrograph Report

Hyd. No. 4

PRE TO RTYI #2

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.621 cfs
Storm frequency	=	100 yrs	Time to peak	=	716 min
Time interval	=	2 min	Hyd. volume	=	1,483 cuft
Drainage area	=	0.060 ac	Curve number	=	97*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	7.62 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.040 x 98) + (0.010 x 98) + (0.010 x 92)] / 0.060



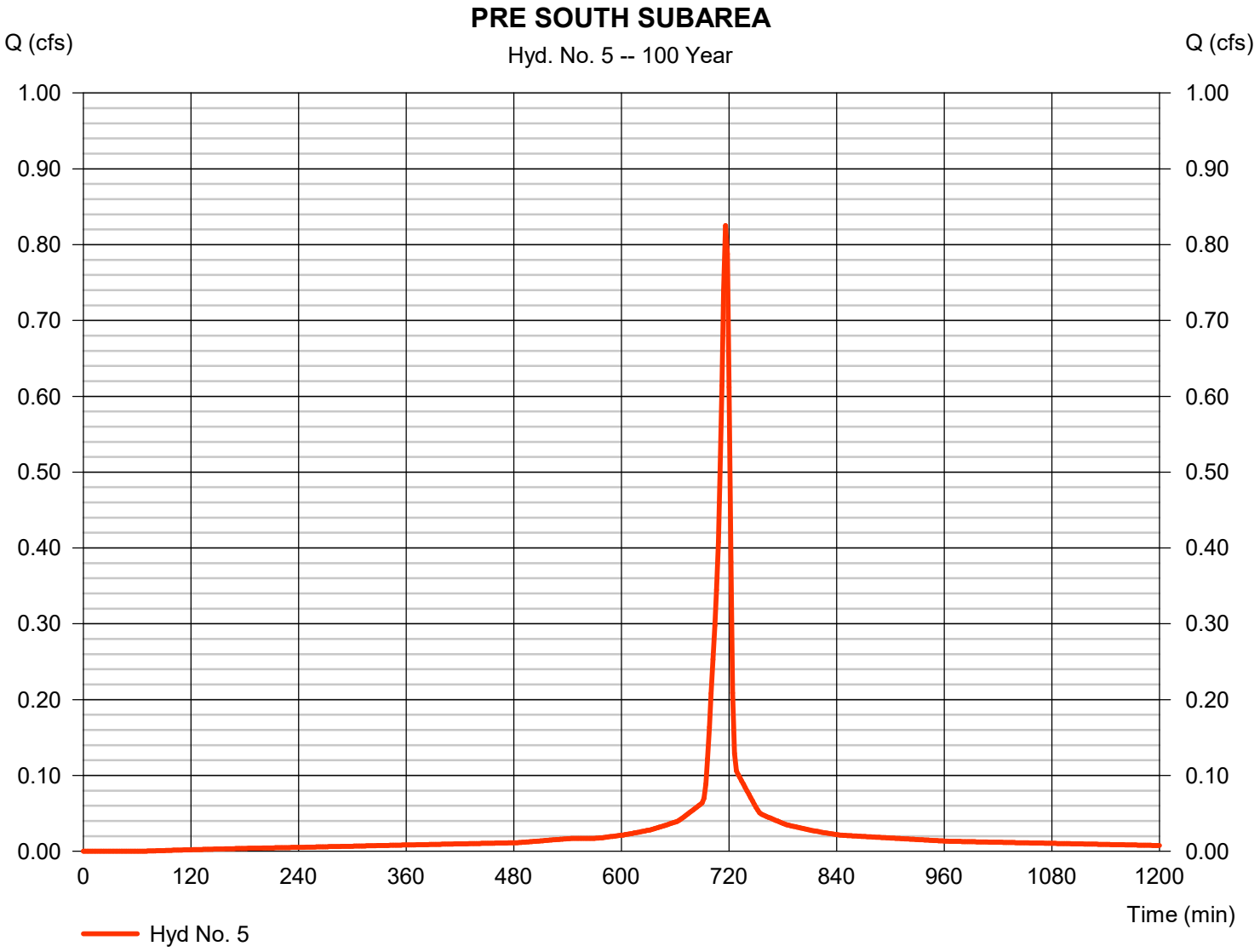
Hydrograph Report

Hyd. No. 5

PRE SOUTH SUBAREA

Hydrograph type	= SCS Runoff	Peak discharge	= 0.825 cfs
Storm frequency	= 100 yrs	Time to peak	= 716 min
Time interval	= 2 min	Hyd. volume	= 1,944 cuft
Drainage area	= 0.080 ac	Curve number	= 96*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 7.62 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.070 x 98) + (0.010 x 79)] / 0.080



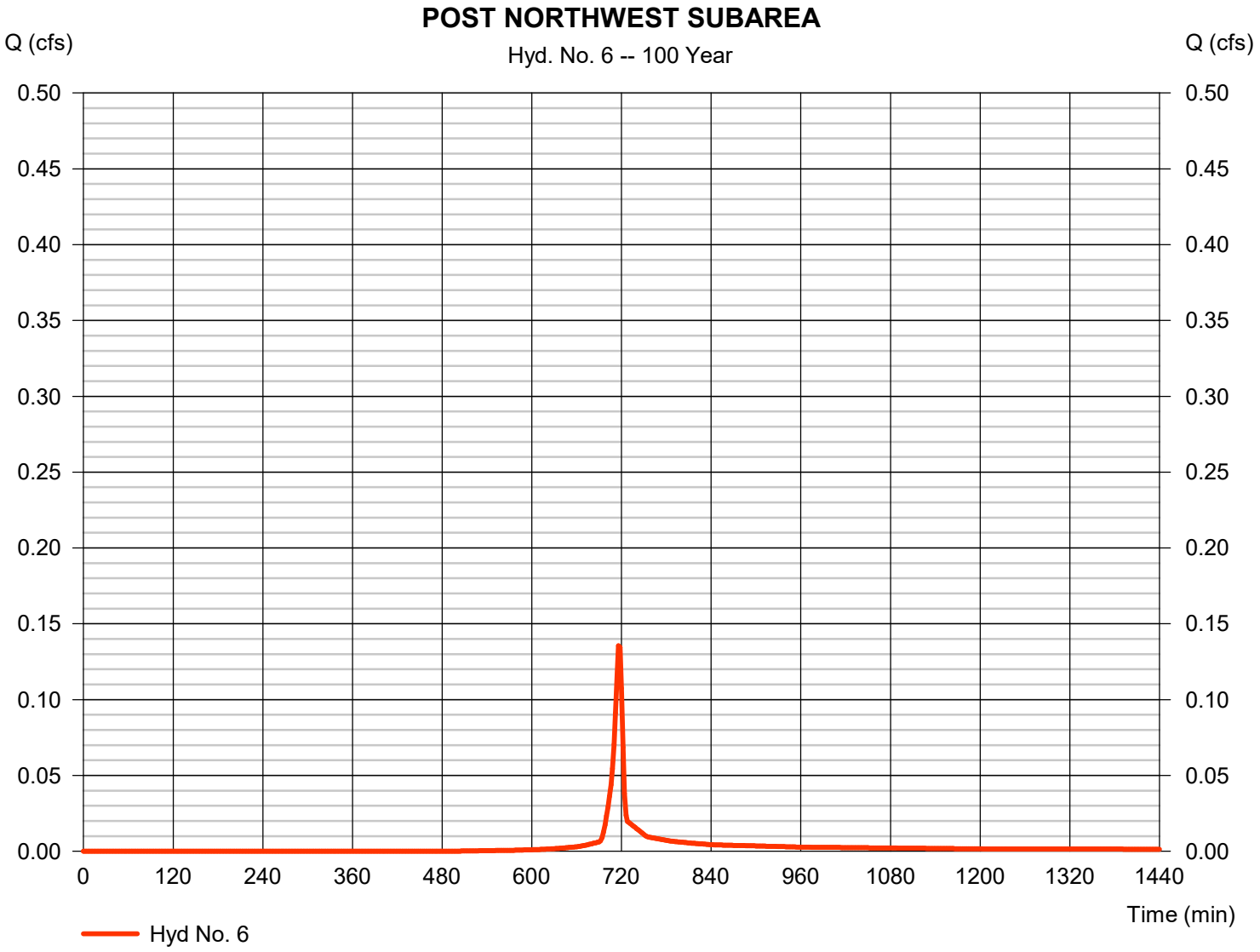
Hydrograph Report

Hyd. No. 6

POST NORTHWEST SUBAREA

Hydrograph type	= SCS Runoff	Peak discharge	= 0.136 cfs
Storm frequency	= 100 yrs	Time to peak	= 716 min
Time interval	= 2 min	Hyd. volume	= 274 cuft
Drainage area	= 0.020 ac	Curve number	= 69*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 7.62 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.020 x 69)] / 0.020



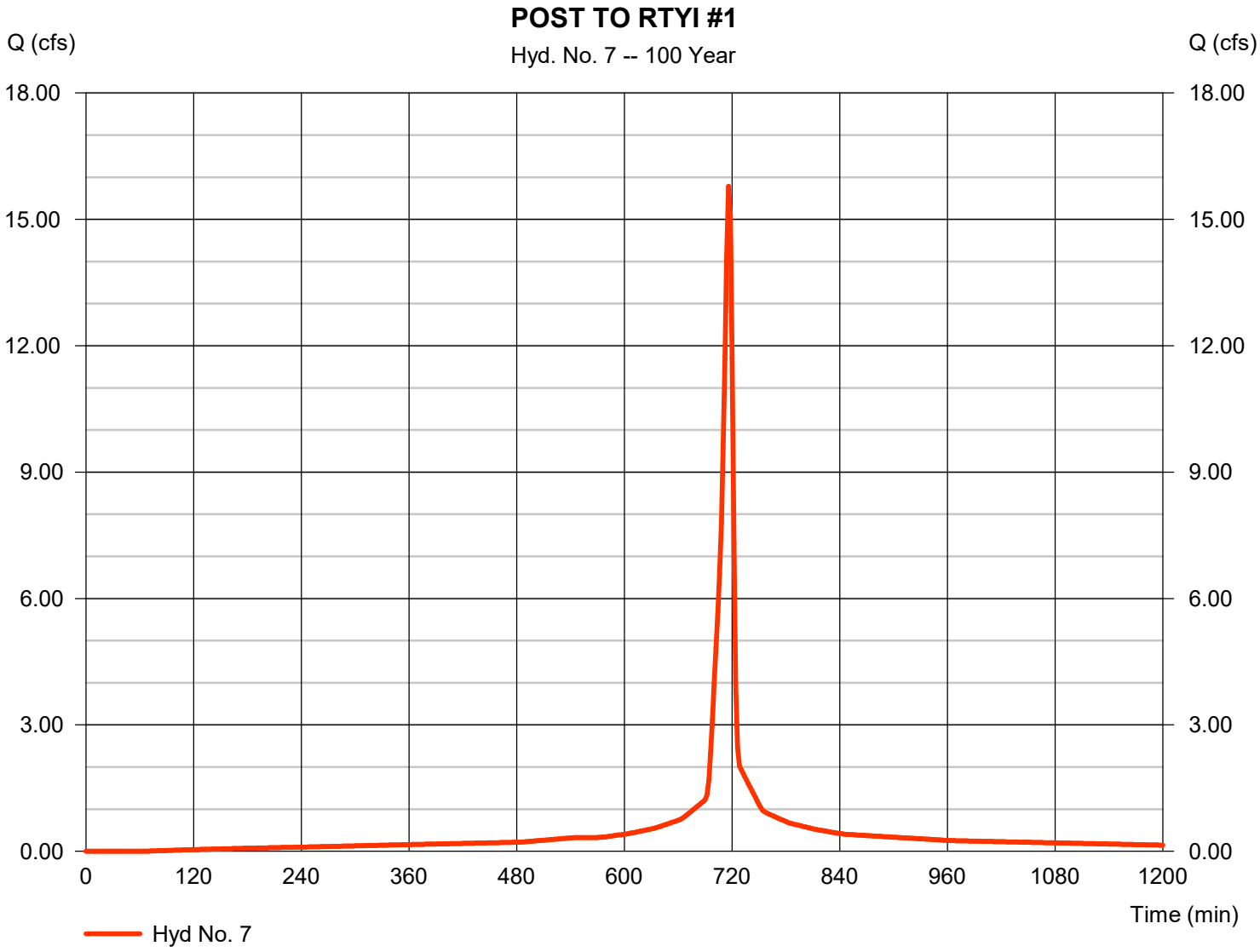
Hydrograph Report

Hyd. No. 7

POST TO RTYI #1

Hydrograph type	=	SCS Runoff	Peak discharge	=	15.78 cfs
Storm frequency	=	100 yrs	Time to peak	=	716 min
Time interval	=	2 min	Hyd. volume	=	37,186 cuft
Drainage area	=	1.530 ac	Curve number	=	96*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	7.62 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.260 x 98) + (0.023 x 98) + (1.140 x 98) + (0.050 x 69) + (0.060 x 79)] / 1.530



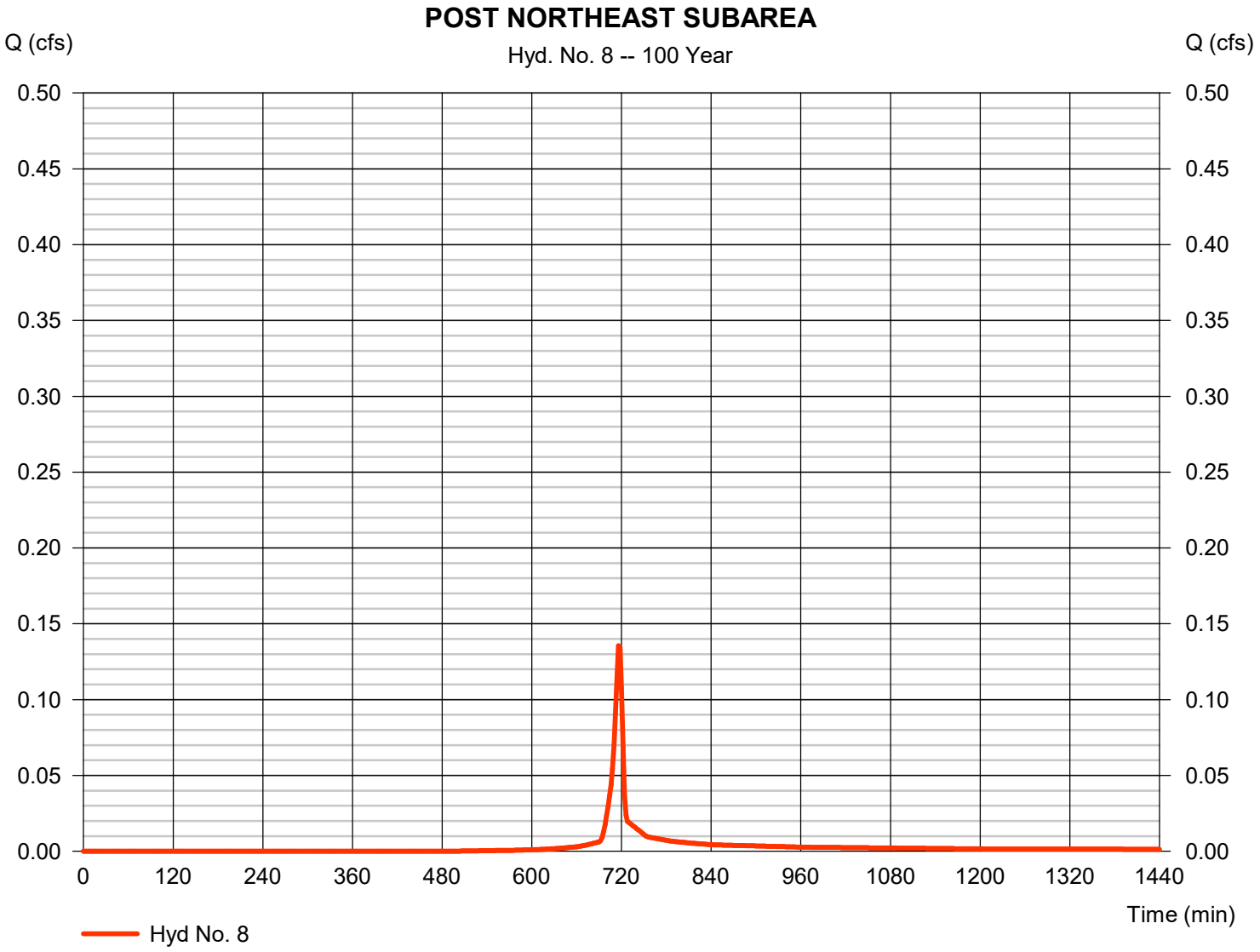
Hydrograph Report

Hyd. No. 8

POST NORTHEAST SUBAREA

Hydrograph type	= SCS Runoff	Peak discharge	= 0.136 cfs
Storm frequency	= 100 yrs	Time to peak	= 716 min
Time interval	= 2 min	Hyd. volume	= 274 cuft
Drainage area	= 0.020 ac	Curve number	= 69*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 7.62 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.020 x 69)] / 0.020



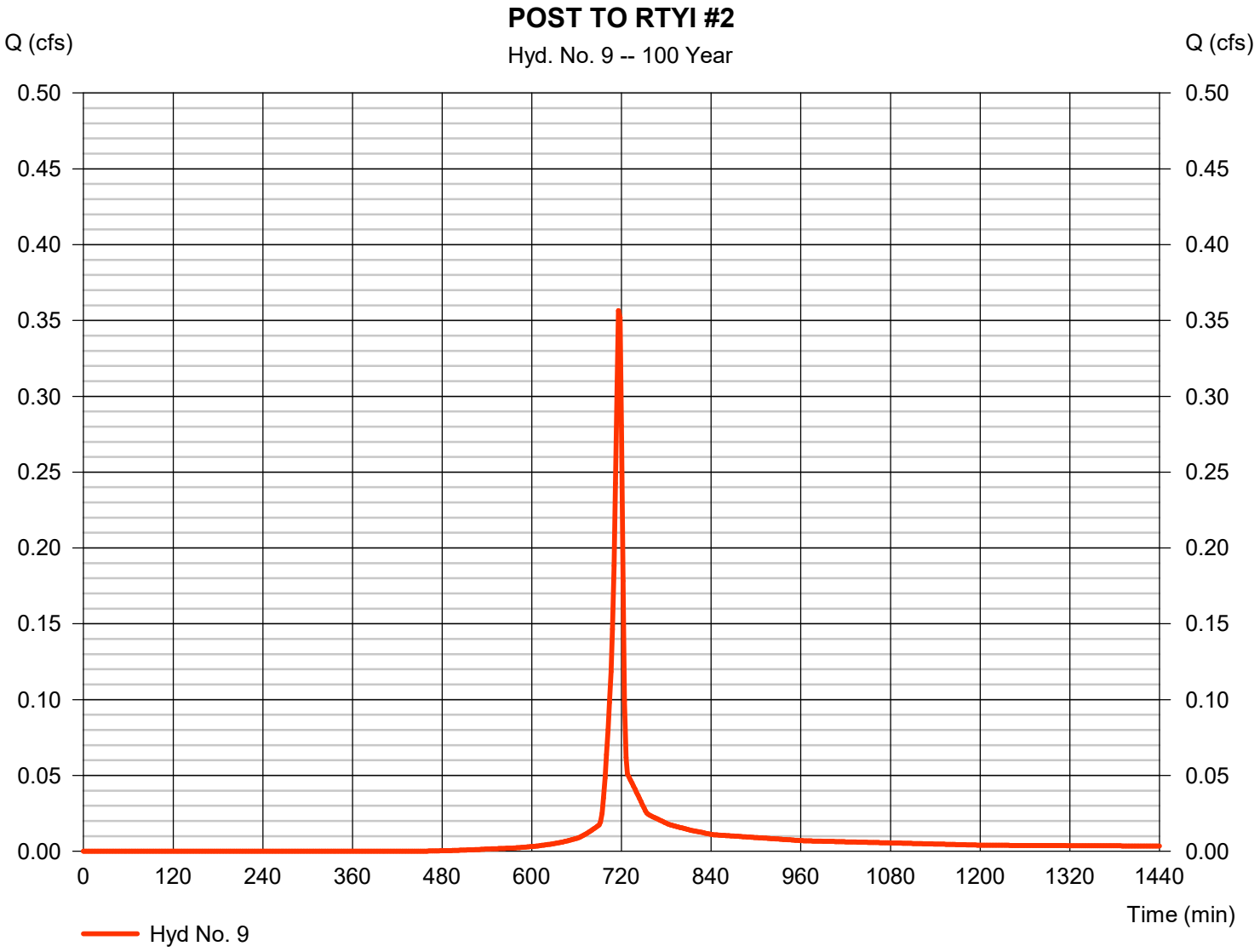
Hydrograph Report

Hyd. No. 9

POST TO RTYI #2

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.357 cfs
Storm frequency	=	100 yrs	Time to peak	=	716 min
Time interval	=	2 min	Hyd. volume	=	723 cuft
Drainage area	=	0.050 ac	Curve number	=	71*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	7.62 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.040 x 69) + (0.010 x 79)] / 0.050



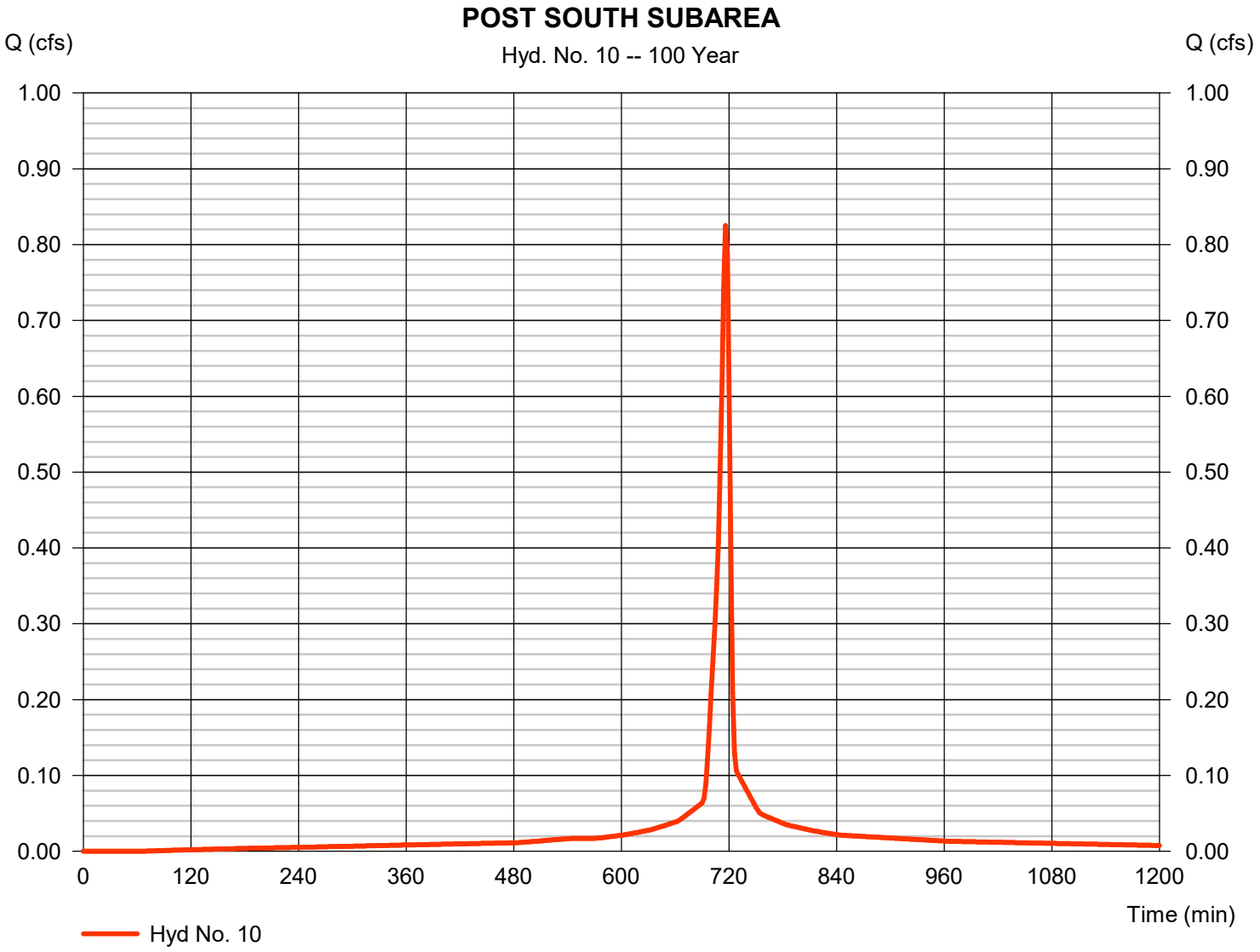
Hydrograph Report

Hyd. No. 10

POST SOUTH SUBAREA

Hydrograph type	= SCS Runoff	Peak discharge	= 0.825 cfs
Storm frequency	= 100 yrs	Time to peak	= 716 min
Time interval	= 2 min	Hyd. volume	= 1,944 cuft
Drainage area	= 0.080 ac	Curve number	= 96*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 7.62 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.070 x 98) + (0.010 x 79)] / 0.080

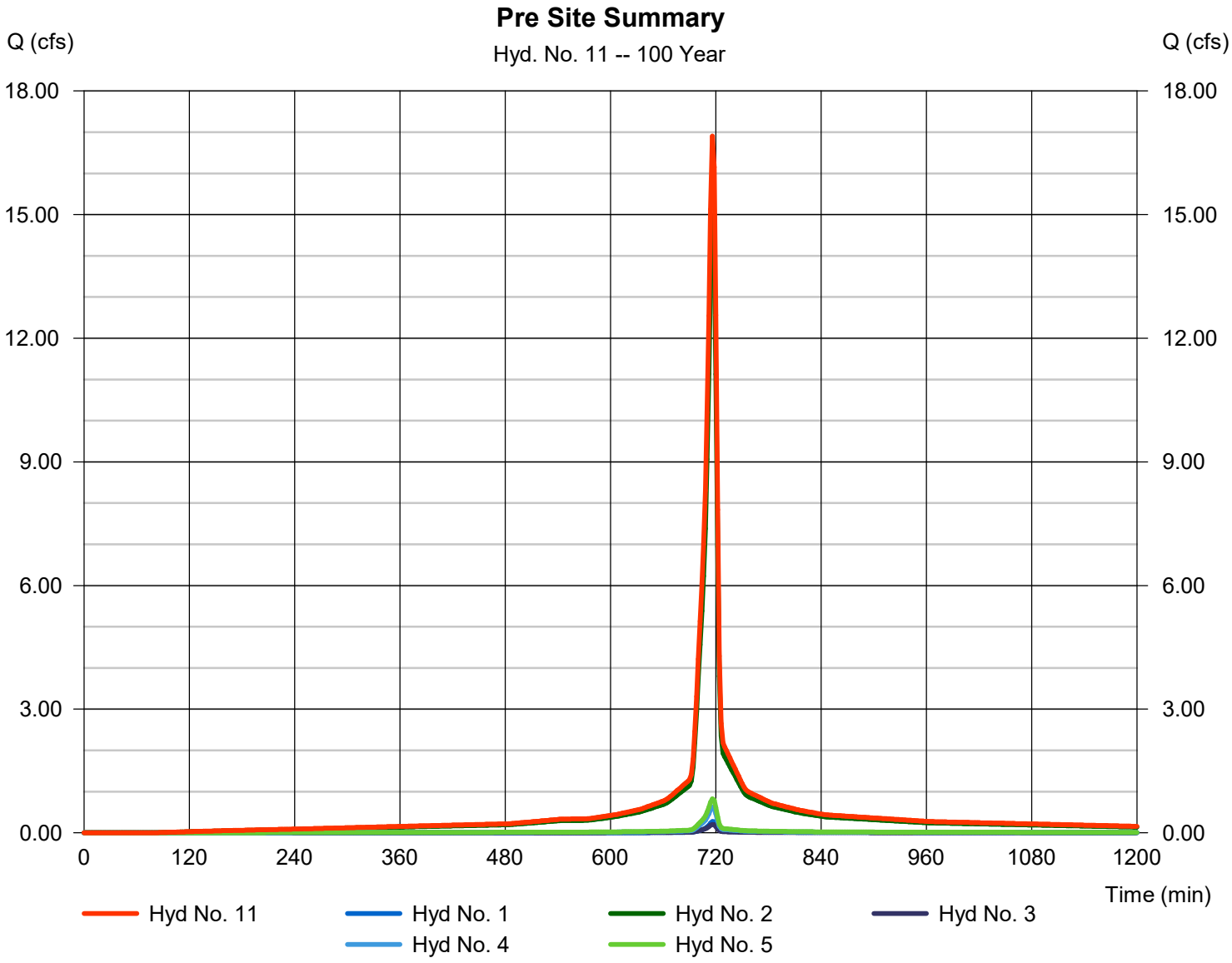


Hydrograph Report

Hyd. No. 11

Pre Site Summary

Hydrograph type	= Combine	Peak discharge	= 16.90 cfs
Storm frequency	= 100 yrs	Time to peak	= 716 min
Time interval	= 2 min	Hyd. volume	= 39,323 cuft
Inflow hyds.	= 1, 2, 3, 4, 5	Contrib. drain. area	= 1.660 ac

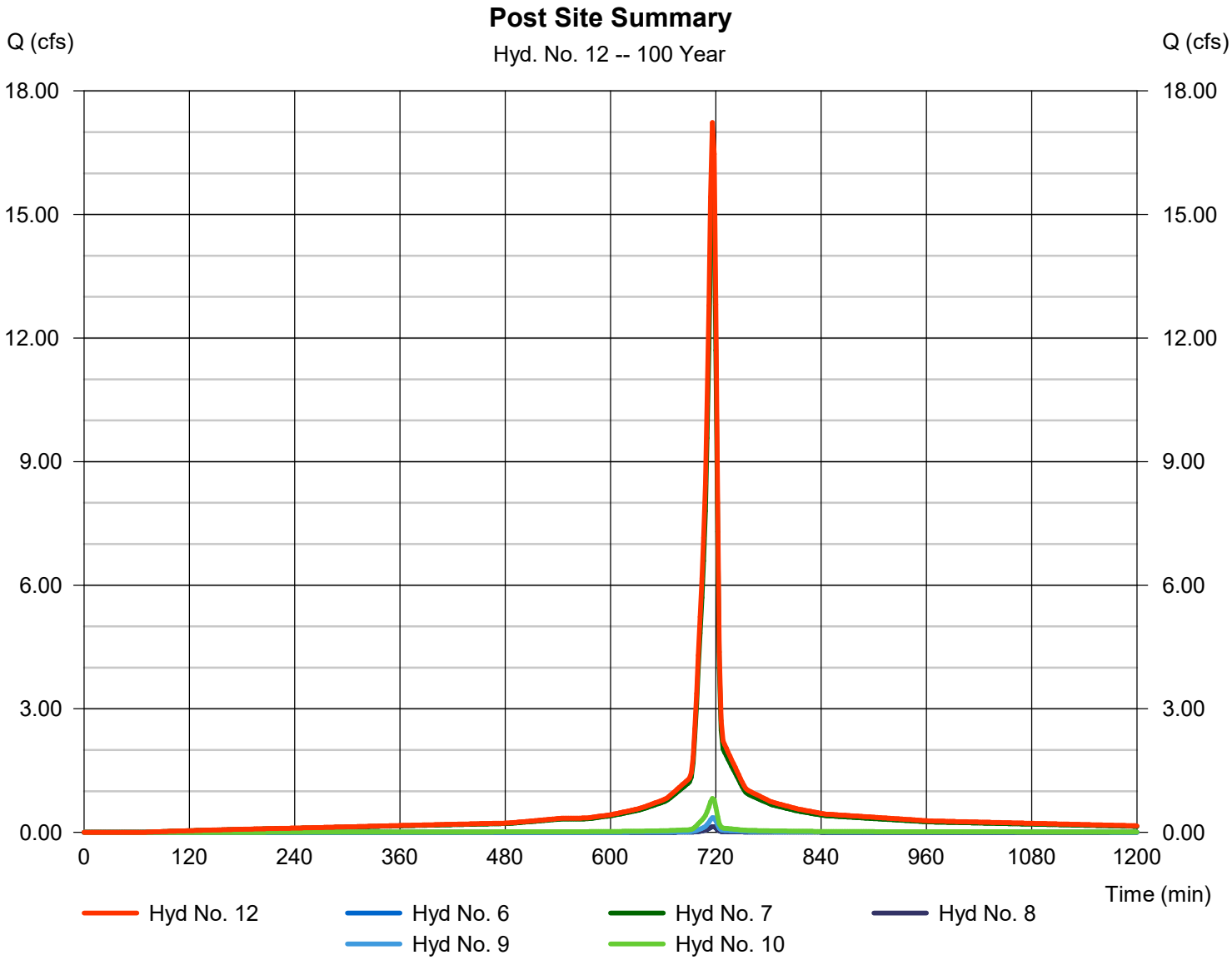


Hydrograph Report

Hyd. No. 12

Post Site Summary

Hydrograph type	= Combine	Peak discharge	= 17.24 cfs
Storm frequency	= 100 yrs	Time to peak	= 716 min
Time interval	= 2 min	Hyd. volume	= 40,402 cuft
Inflow hyds.	= 6, 7, 8, 9, 10	Contrib. drain. area	= 1.700 ac



Channel Report

Hydraflow Express Extension for Autodesk® AutoCAD® Civil 3D® by Autodesk, Inc. Friday, May 22 2020

10-YR Post Channel Analysis - Rosemary Deck

Rectangular

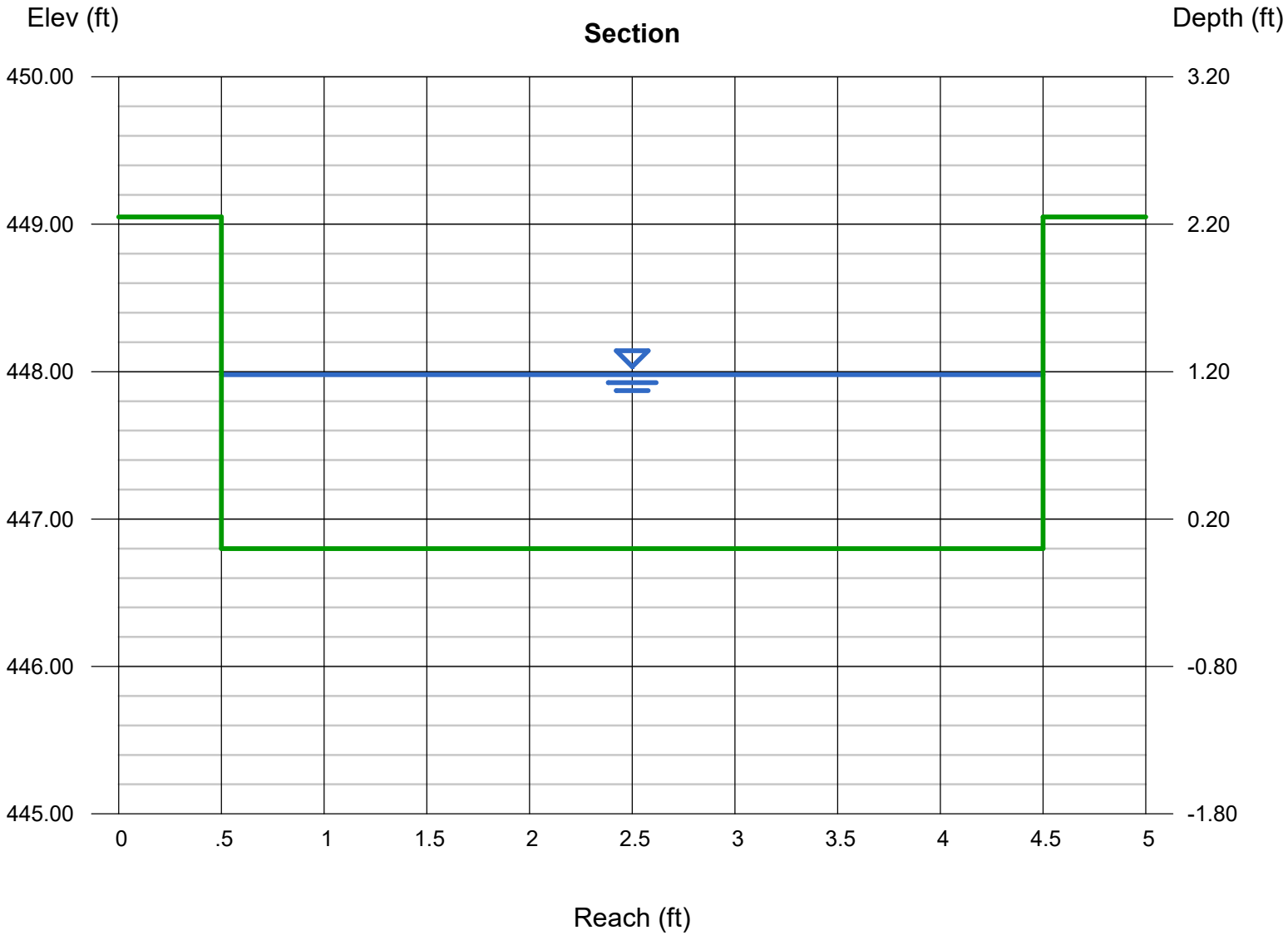
Bottom Width (ft)	= 4.00
Total Depth (ft)	= 2.25
Invert Elev (ft)	= 446.80
Slope (%)	= 5.71
N-Value	= 0.020

Calculations

Compute by:	Known Q
Known Q (cfs)	= 68.60

Highlighted

Depth (ft)	= 1.18
Q (cfs)	= 68.60
Area (sqft)	= 4.72
Velocity (ft/s)	= 14.53
Wetted Perim (ft)	= 6.36
Crit Depth, Yc (ft)	= 2.10
Top Width (ft)	= 4.00
EGL (ft)	= 4.46



Channel Report

Hydraflow Express Extension for Autodesk® AutoCAD® Civil 3D® by Autodesk, Inc. Friday, May 22 2020

25-YR Post Channel Analysis - Rosemary Deck

Rectangular

Bottom Width (ft)	= 4.00
Total Depth (ft)	= 2.25
Invert Elev (ft)	= 446.80
Slope (%)	= 5.71
N-Value	= 0.020

Calculations

Compute by:	Known Q
Known Q (cfs)	= 75.21

Highlighted

Depth (ft)	= 1.26
Q (cfs)	= 75.21
Area (sqft)	= 5.04
Velocity (ft/s)	= 14.92
Wetted Perim (ft)	= 6.52
Crit Depth, Yc (ft)	= 2.23
Top Width (ft)	= 4.00
EGL (ft)	= 4.72