STORM WATER & EROSION CONTROL CALCULATIONS
FOR:

Montessori School

CITY OF WAUKESHA, WI
Excel Job #: 1818660

BASED ON SCS TR-55 METHOD, MANNINGS EQUATION, AND SLAMM
JULY 9, 2018

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OVERVIEW:

The proposed project is located on the northeast corner of University Avenue and Summit Avenue within the City of Waukesha, WI. This development involves the placement of a 18,500 sf school addition, parking lot reconfiguration and improvement to the existing parking lot on the east side of the site. The addition and parking area will be constructed over previously developed property. The project will combine the 3 existing lots into 1 overall property. The stormwater plan has accounted for all development shown on the plan. The existing site is being reconfigured and will meet city setback requirements. The existing zoning is I-1 Institutional – as part of City zoning code. The combined site is 8.42 acres and approximately 6 acres will be disturbed as part of the project.

The existing site generally drains from north to south into Summit Avenue's storm system. The post developed site will be routed with 100yr storm pipe to drain to the dry stormwater detention pond on the south side of the property and into the City storm system. A stormwater filter will be installed to treat the redeveloped site for TSS removal. The area consists of a portion of new and redevelopment, therefore the storm filter treats for the prorated amount. See the attached proposed stormwater calculations in Appendix E.

SOIL INFORMATION:

Existing Soils data: Soil Type: BsA: Brookston silt loam, 0-2% slopes, Hydro. Soil Rating C/D.
HmB: Hochheim loam, 2-6% slopes, Hydro Soil Rating D.
HmC2: Hochheim loam, 6-12% slopes, Hydro Soil Rating D.

Soil classifications for the proposed property were taken off of the USDA Web Soil Survey. Please see attached hydrologic soil group map showing the soils within the drainage areas in Appendix C.

DRAINAGE CALCULATIONS:

Rainfall depths used for the runoff calculations were referenced from The City of Waukesha Stormwater Ordinance Chapter 32.11(a)2. Calculations use Type II distribution.

1-year: 2.3 inches
2-year: 2.7 inches
10-year: 4.0 inches
100-year: 5.6 inches

Curve Numbers:
Impervious – 98
Lawn (B) – 61
Lawn (C) – 74
Lawn (D) – 80

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Lawn (D) – 80
Woods (C) – 70
Woods (D) – 77

WATER QUANTITY

City of Waukesha Requirements – New development shall maintain or reduce the 2, 10, & 100-Year/24 hour post construction peak runoff discharge rates to the 2, 10, & 100-Year /24 hour predevelopment peak runoff discharge rates respectively. Peak discharge rates as required will be maintained or reduced as part of the project.

Wisconsin Department of Natural Resources – Maintain or reduce the 1-Year/24 hour and the 2-Year/24 hour post construction peak runoff discharge rates to the 1-Year/24 hour and the 2-Year/24 hour predevelopment peak runoff discharge rates respectively.

The analysis has detained the 1, 2, 10, and 100year flows to predevelopment levels with the use of a dry detention pond. The stormwater pond(s) will hold and treat the 100 year storm in the pond and discharge to the storm system prior to Summit Avenue storm system. The pond will tie into the existing stormwater catchbasin for connection to this system (See Appendix E for information). The peak discharge from the site to the existing square grate is maintained or reduced. See below for modeled data.

SITE RUNOFF SUMMARY:

Runoff Summary Chart for Detention Pond and Offsite flows (in cfs)

Storm (24-hour)	Pre-Development Basin A Runoff (cfs)	Total Post Development Runoff (cfs)	Pond Elevation
1- yr.	3.37	3.26	137.88
2-yr	4.78	4.71	138.15
10yr	9.98	7.99	138.97
100yr	17.03	16.09	139.80

WATER QUALITY

City of Waukesha & Wisconsin DNR Requirements
– Reduce total suspended solids load by 80 percent for new impervious and 40 percent for redevelopment as compared to no controls.

Since a portion of the site was previously developed, a prorated quality requirement has been calculated for the site. In the proposed condition, 5.73 acres will be disturbed. 2.63 acres will be redeveloped and 3.10 acres will be new development. Based on this information, a prorated requirement of 61.6% of the TSS will be required to be removed on site. See SLAMM map table in Appendix B.

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	Particulate Solids For drainage Area (lbs)	Particulate Solids Yield after drainage and Controls (lbs)	Particulate Removed
Total Filter w/ offsite	1,595	573.20	1,021.80

SLAMM calculations show that the proposed development with offsite flows meets the quality requirement with a 15 filter UpfloFilter system. See Appendix F for calculations.
Results: 1,021.8/1,595 = 0.6406 => 64.06% Removed, therefore stormwater quality requirements are met.

INFILTRATION:
City of Waukesha, Wisconsin and DNR Requirements (Redevelopment) – site is exempt due to it being a redevelopment per NR 151.124(3)(b)3.

STORM SEWER PIPE DESIGN & 100-YEAR CONVEYANCE:

All storm pipes bringing water to the proposed pond were sized to convey the 100-year storm. See Appendix A, B, D, and E for calculations and basin map. The calculated 100-year storm event will be contained within the proposed stormwater management pond berm and will discharge over the banks after the 100year storm event to the south. Emergency overflows routes are provided on the north side of the site to convey runoff to the east and west of the building and ultimately overland to the pond.

EROSION AND SEDIMENT CONTROL:

The following are practices that will be used to control sediment during construction:
Silt Fence – Silt fence will be placed around the perimeter of the site for perimeter control as well as downhill of any disturbed areas where sheet flow will exist.
Tracking Pads – Stone tracking pads will be placed at all construction entrances to the site to ensure dirt and soil tracked onto public roads is limited.
Ditch Checks – Ditch checks will be provided to reduce the velocity of water flowing in ditch bottoms.
Erosion Matting – Erosion matting will be placed on any steep slopes as well as ditch bottoms to ensure that these areas are permanently stabilized over time.
The erosion control locations, specifications, construction sequence, site stabilization notes, and seeding notes can be seen on civil sheets C1.0 and C1.3.

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POST CONSTRUCTION OPERATION AND MAINTENANCE PLAN

FOR:
FAITH EVANGELICAL LUTHERAN CHURCH AND SCHOOL – 55 PRAIRIE ROAD

The owner of the property affected shall inspect and maintain the following stormwater management systems frequently, especially after heavy rainfalls, but at least on an annual basis unless otherwise specified.	
STORMWATER FACILITY	**TYPE OF ACTION**
1. Lawn and Landscaped Areas	All lawn areas shall be kept clear of any materials that block the flow of stormwater. Rills and small gullies shall immediately be filled and seeded or have sod placed in them. The lawn shall be kept mowed, tree seedlings shall be removed, and litter shall be removed from landscaped areas.
2. Swales	All grassed swales showing signs of erosion, scour, or channelization shall be repaired, reinforced, and revegetated immediately. All swales shall be repaired to the original plan requirements. Mowing shall take place no less than twice per year at a height of no less than three inches. Grasses shall not be allowed to grow to a height that permits branching or bending. Mowing shall only take place when the ground is dry and able to support machinery.
3. Catch Basin Grates	The grate openings to these structures must be cleared of any clogging or the blocking of stormwater flow from getting into the stormwater conveyance system of any kind.
4. Catch Basin Sumps	Sumps shall visually be inspected every 3 months. Siltation shall be removed and disposed of offsite when the sump depth is within 3" of the outlet pipe invert elevation. The removal of siltation should occur a minimum of once per year.

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5. Detention Basin	Outlet structures, inlet and outlet pipes shall be kept clear of debris. Non-structurally sound devices shall be replaced. Floating litter and algae shall be removed monthly. All grassed areas, embankments, and flow control devices showing signs of erosion shall be repaired, reinforced, and revegetated immediately to the original plan requirements. Grasses shall not be allowed to grow to a height that permits branching or bending. Mowing shall only take place when the ground is dry and able to support machinery. Every 5 years, beginning in the first summer following completion of the basin (to be completed after detention basin is constructed), the elevations of the pond bottom shall be surveyed to determine the permanent pool depth and sediment depth in the pond. Cleaning, removal, and deposit of silt from the detention pond shall be done by means and methods acceptable to the Wisconsin Department of Natural Resources.
6. Hydro International Up-Flo Filter Quality Structures	Inspection of the structure shall be completed annually at a minimum by qualified maintenance personnel. Sediment in the bottom of the structure shall be inspected to verify sediment is less than 16" deep. If sediment is greater than 16" deep, the sediment shall be removed per Hydro International requirements. Qualified maintenance personnel shall enter structure to remove a Media Bag to be weighed. Media Bags weighing more than 40 lbs are an indication that the bag is full and need to be replaced. Replace per manufacturer specifications. Qualified maintenance personnel shall inspect the oil layer on the water surface to oil being entrained in the Media Bags. If the oil accumulation is greater than 1.5", the structure shall be pumped per manufacturer's specifications. After storm events of greater than 1" of rainfall, the structure shall be inspected 48 hours after the rainfall even to verify the water level inside the structure has dropped to below the base of the filter modules. If the water level has not dropped, the filters are considered to be clogged and shall be replaced per manufacturer's specifications. For further information, obtain Hydro International's Up-Flo Filter Operation and Maintenance Manual for details.
7. Record of Maintenance	The operation and maintenance plan shall remain onsite and be available for inspection when requested by WDNR and the City of Waukesha. When requested, the owner shall make available for inspection all maintenance records to the department or agent for the life of the system.

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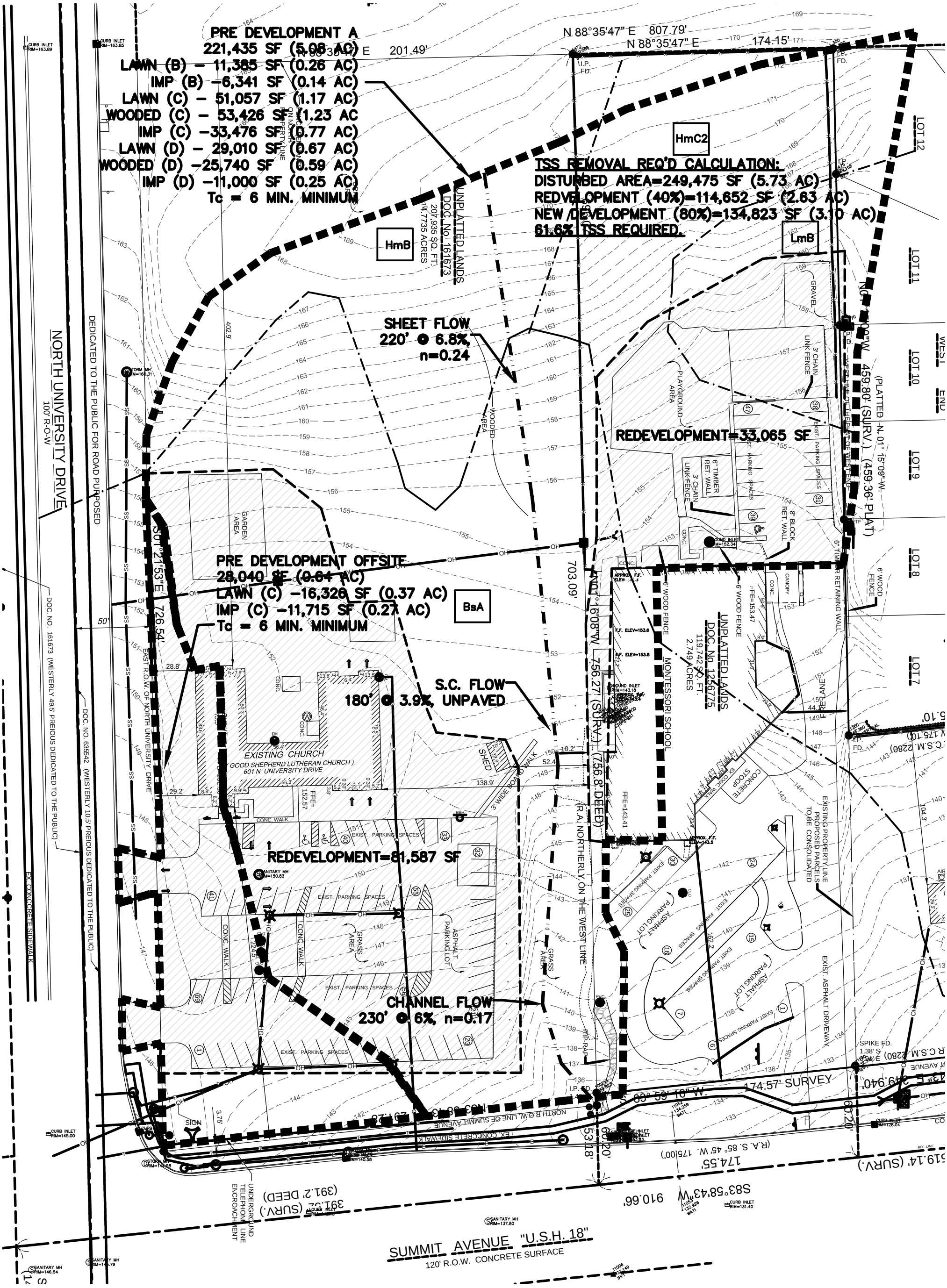
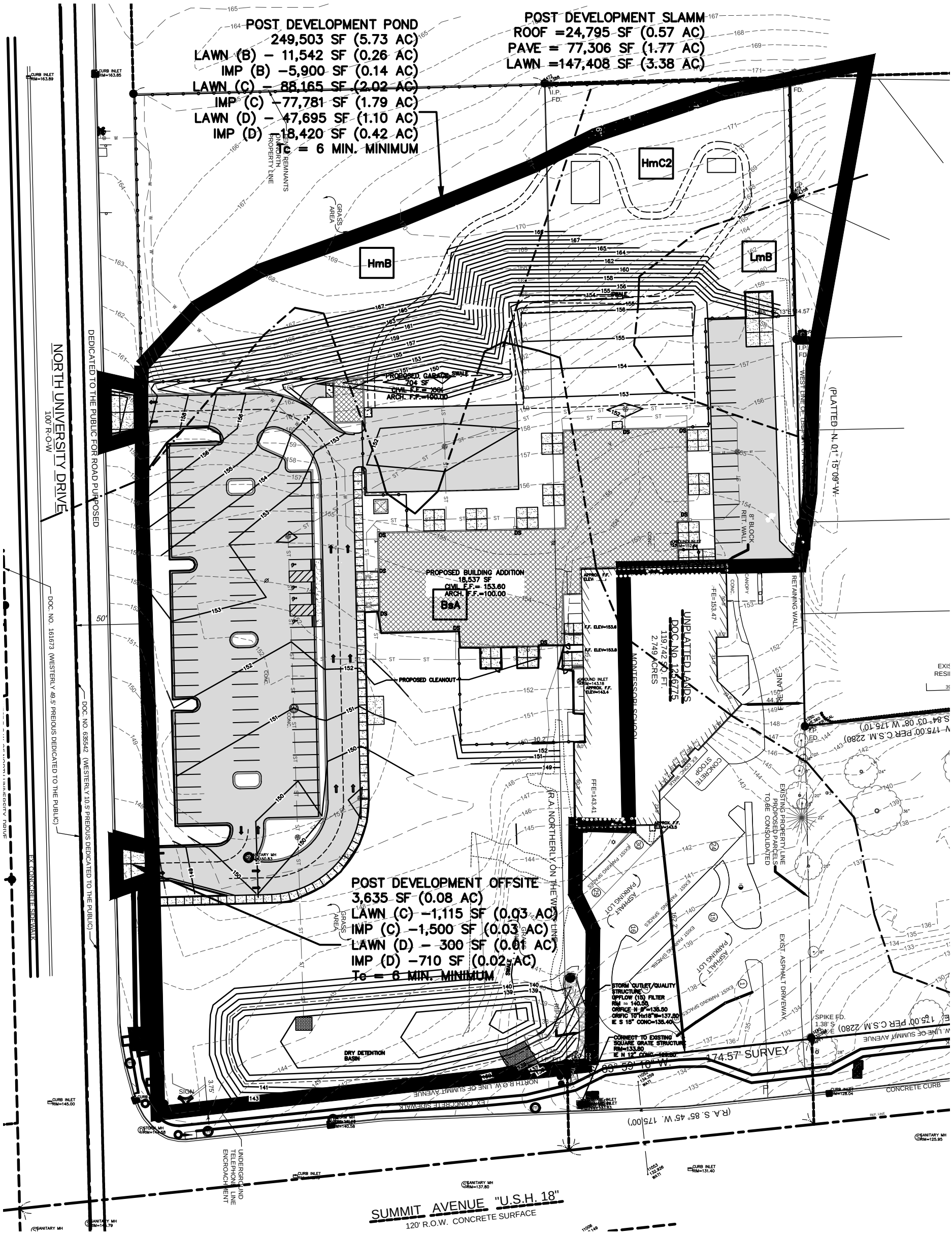
Appendix A
Pre-Development Area(s):



PREDEVELOPMENT MAP

Appendix B
Post Development Area(s):



NORTH

POST DEVELOPMENT MAP

SCALE (11"X17"): 1"=60'–0"

Appendix C
Soil Maps & Boring Data


88° 16' 10" W
88° 15' 57" W
396600
396640
396680
396720
396760
396800
396840
43° 1' 27" N
4764290
4764250
4764210
4764170
4764130
4764090
4764050
4764010
4763970
4763930
43° 1' 15" N
KIA
HmB
LmB
HmC2
BsA
N University Dr
Brentwood Dr
18
Soil Map may not be valid at this scale.
396560
Map Scale: 1:1,830 if printed on A portrait (8.5" x 11") sheet.
N
Meters
0 25 50 100 150
Feet
0 50 100 200 300
Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 16N 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 1:15,800.

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

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

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

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

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

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

Soil Survey Area: Milwaukee and Waukesha Counties, Wisconsin
Survey Area Data: Version 13, Oct 6, 2017

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

Date(s) aerial images were photographed: Sep 7, 2014—Sep 22, 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.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
BsA	Brookston silt loam, 0 to 2 percent slopes	C/D	5.9	41.0%
HmB	Hochheim loam, 2 to 6 percent slopes	D	2.7	18.8%
HmC2	Hochheim loam, 6 to 12 percent slopes, eroded	D	3.8	26.6%
KlA	Kendall silt loam, 1 to 3 percent slopes	C	0.6	4.4%
LmB	Lamartine silt loam, 0 to 3 percent slopes	B/D	1.3	9.2%
Totals for Area of Interest			**14.4**	**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.

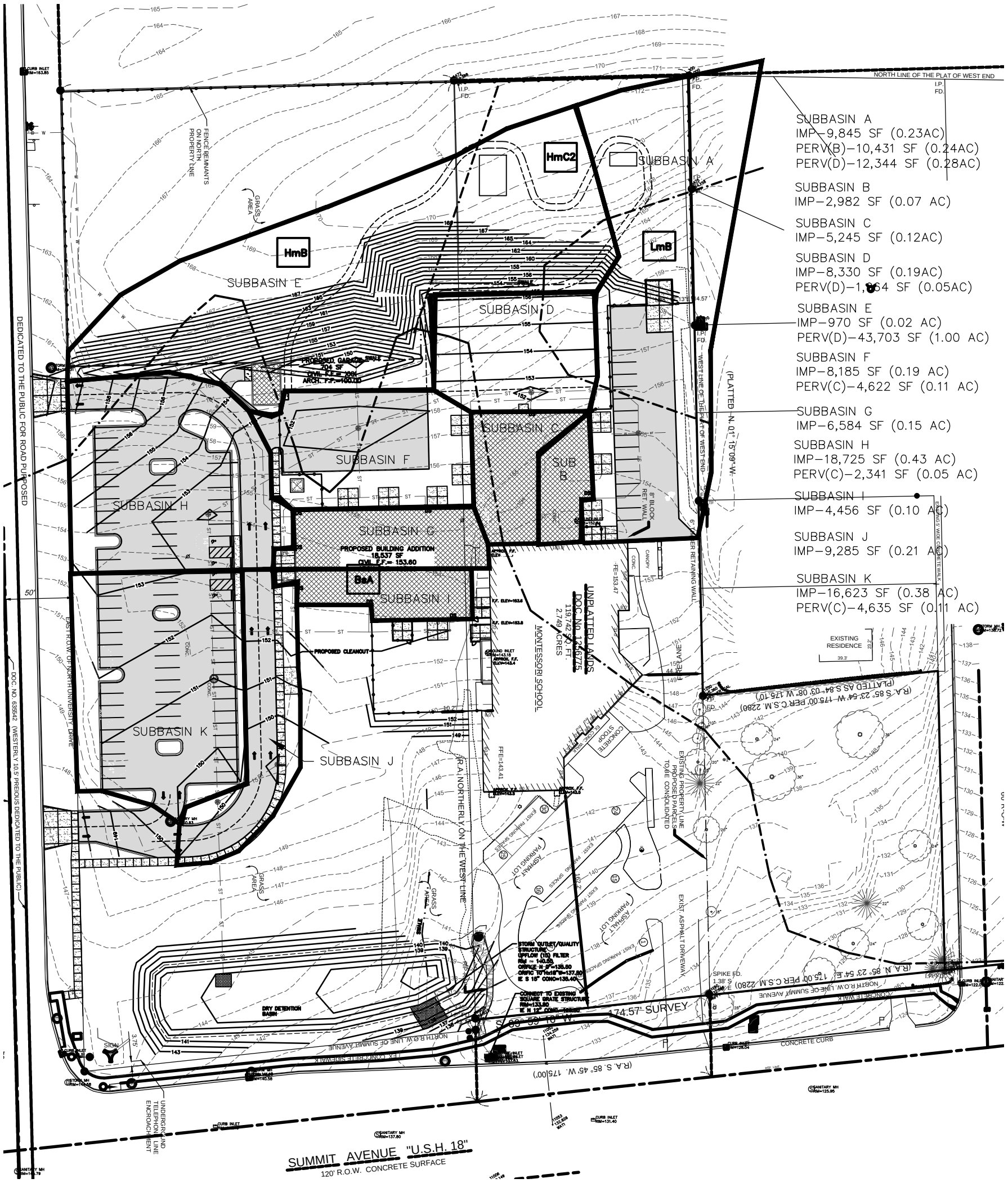
Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Appendix D
Pipe Capacity Calculations



PIPE SIZING MAP

NORTH

SCALE (11"X17"): 1"=80'–0"

Excel Engineering Project No. 1818660 Project Name Montessori School - Waukesha

Pipe Data				Pipe Capacity (100-yr)				
Pipe No.	Diameter (FT)	Slope (FT/FT)	Manning's n	Basin No.	Total Flow (cfs)	Total Flow (gpm)	Full Flow Capacity (cfs)	Full Flow Capacity (gpm)
1	0.67	0.005	0.012	B	0.49	220	0.94	422
2	1.25	0.005	0.012	A, B	4.23	1898	4.96	2227
3	0.67	0.005	0.012	C	0.83	373	0.94	422
4	1.5	0.005	0.012	A, B, C,D	6.67	2993	8.07	3621
5	0.67	0.010	0.012	G	1.04	467	1.33	597
6	1.25	0.015	0.012	E	5.23	2347	8.59	3857
7	2	0.005	0.012	A,B,C,D,E,F,G	14.82	6651	17.38	7798
8	0.67	0.010	0.012	I	0.69	310	1.33	597
9	2	0.008	0.012	A,B,C,D,E,F,G,I,H	18.80	8437	21.98	9864
10	0.83	0.014	0.012	J	1.46	655	2.79	1250
11	2	0.055	0.012	A,B,C,D,E,F,G,I,H,J,K	23.51	10551	57.63	25864

Full Flow Capacity based off Manning's Equation $Q = \frac{1.49}{n} R^{2/3} S^{1/2} a$

Where:
Q = Full Flow Capacity of Pipe (cfs)
n = manning's roughness coefficient
R = hydraulic radius (ft) (D/4)
s = hydraulic gradient, slope (ft/ft)
a = flow area (sq. ft.)

Typical Manning's n

HDPE	0.012
PVC	0.012
Concrete	0.013
CMP	0.024

*Total Flow calculated via TR-55 hydrologic calculations. Reference Storm Pipe Basin Map & TR-55 Calculations

Appendix E
SCS TR55
Stormwater Management
Calculations-Tail water:

- Hydrograph Return Period Recap
- Hydrograph Summary Reports
- Hydrograph Plots
- Hydrograph Tc Worksheets

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	------	3.370	4.778	-------	-------	9.980	-------	-------	17.03	Pre-Basin A
2	SCS Runoff	------	0.921	1.226	-------	-------	2.277	-------	-------	3.617	Pre-Offsite
3	Combine	1, 2	3.676	5.219	-------	-------	10.82	-------	-------	18.32	Total Predevelopment
5	SCS Runoff	------	8.247	10.98	-------	-------	20.39	-------	-------	32.38	Post- Pond
6	SCS Runoff	------	0.130	0.172	-------	-------	0.320	-------	-------	0.509	Post- Offsite
7	Reservoir	5	3.204	4.642	-------	-------	7.874	-------	-------	15.91	Pond Discharge
9	Combine	6, 7,	3.256	4.709	-------	-------	7.993	-------	-------	16.09	Total Post Discharge
12	SCS Runoff	------	0.780	1.083	-------	-------	2.218	-------	-------	3.742	SUBBASIN A
13	SCS Runoff	------	0.196	0.231	-------	-------	0.346	-------	-------	0.486	SUBBASIN B
14	SCS Runoff	------	0.336	0.396	-------	-------	0.592	-------	-------	0.833	SUBBASIN C
15	SCS Runoff	------	0.588	0.714	-------	-------	1.120	-------	-------	1.613	SUBBASIN D
16	SCS Runoff	------	1.135	1.558	-------	-------	3.138	-------	-------	5.227	SUBBASIN E
17	SCS Runoff	------	0.579	0.733	-------	-------	1.245	-------	-------	1.875	SUBBASIN F
18	SCS Runoff	------	0.419	0.495	-------	-------	0.741	-------	-------	1.041	SUBBASIN G
19	SCS Runoff	------	1.269	1.517	-------	-------	2.316	-------	-------	3.289	SUBBASIN H
20	SCS Runoff	------	0.280	0.330	-------	-------	0.494	-------	-------	0.694	SUBBASIN I
21	SCS Runoff	------	0.587	0.693	-------	-------	1.037	-------	-------	1.458	SUBBASIN J
22	SCS Runoff	------	1.150	1.408	-------	-------	2.241	-------	-------	3.254	SUBBASIN K

Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2016 by Autodesk, Inc. v11

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	3.370	3	729	12,701	------	------	------	Pre-Basin A
2	SCS Runoff	0.921	3	717	2,098	------	------	------	Pre-Offsite
3	Combine	3.676	3	726	14,799	1, 2	------	------	Total Predevelopment
5	SCS Runoff	8.247	3	717	18,781	------	------	------	Post- Pond
6	SCS Runoff	0.130	3	717	295	------	------	------	Post- Offsite
7	Reservoir	3.204	3	726	18,780	5	137.88	4,778	Pond Discharge
9	Combine	3.256	3	726	19,075	6, 7,	------	------	Total Post Discharge
12	SCS Runoff	0.780	3	720	1,803	------	------	------	SUBBASIN A
13	SCS Runoff	0.196	3	717	494	------	------	------	SUBBASIN B
14	SCS Runoff	0.336	3	717	846	------	------	------	SUBBASIN C
15	SCS Runoff	0.588	3	717	1,371	------	------	------	SUBBASIN D
16	SCS Runoff	1.135	3	720	2,615	------	------	------	SUBBASIN E
17	SCS Runoff	0.579	3	717	1,308	------	------	------	SUBBASIN F
18	SCS Runoff	0.419	3	717	1,058	------	------	------	SUBBASIN G
19	SCS Runoff	1.269	3	717	3,048	------	------	------	SUBBASIN H
20	SCS Runoff	0.280	3	717	705	------	------	------	SUBBASIN I
21	SCS Runoff	0.587	3	717	1,481	------	------	------	SUBBASIN J
22	SCS Runoff	1.150	3	717	2,655	------	------	------	SUBBASIN K

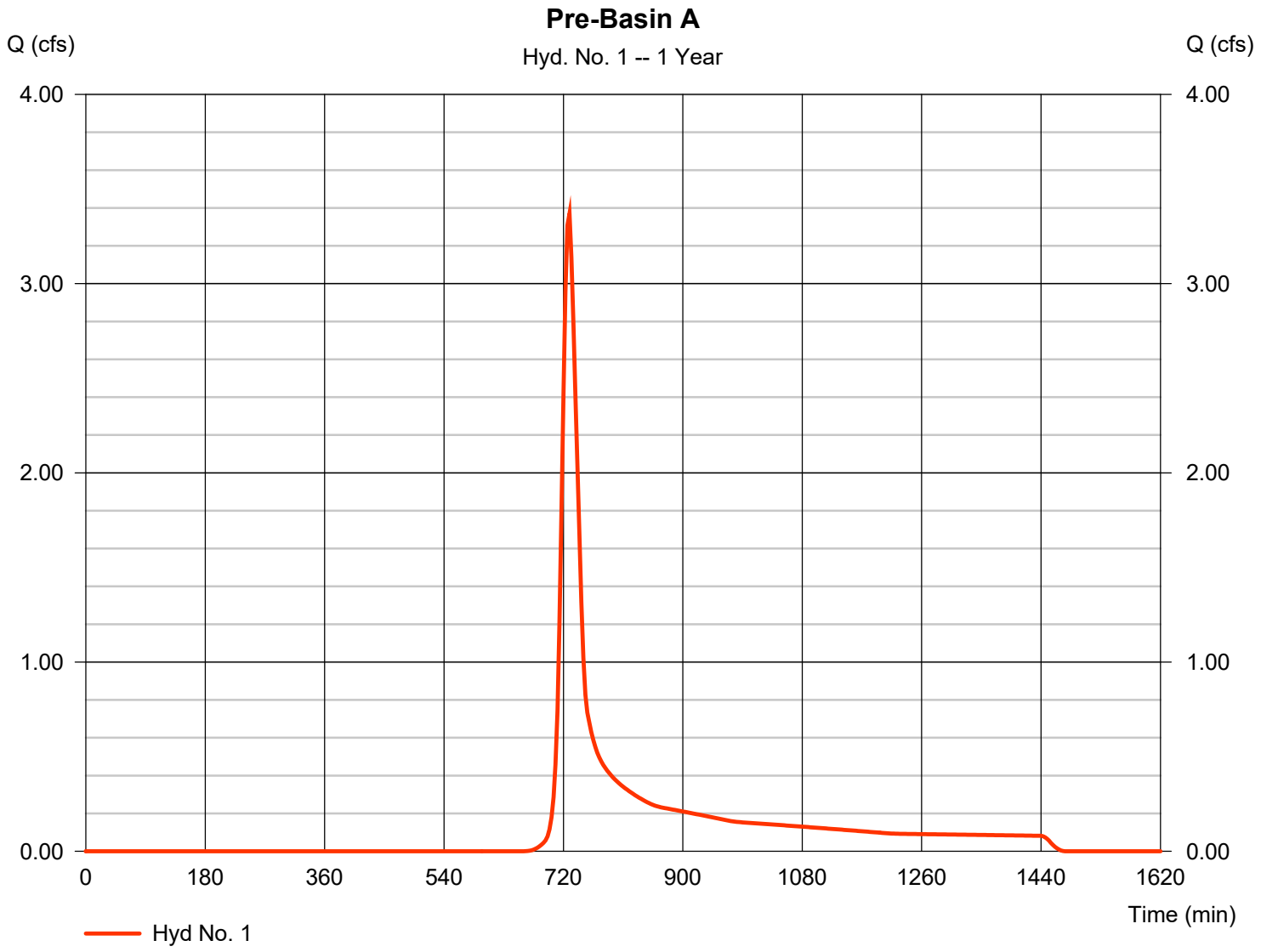
Hydrograph Report

Hyd. No. 1

Pre-Basin A

Hydrograph type	= SCS Runoff	Peak discharge	= 3.370 cfs
Storm frequency	= 1 yrs	Time to peak	= 729 min
Time interval	= 3 min	Hyd. volume	= 12,701 cuft
Drainage area	= 5.080 ac	Curve number	= 79*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 21.40 min
Total precip.	= 2.30 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.260 x 61) + (1.160 x 98) + (1.170 x 74) + (1.230 x 70) + (0.670 x 80) + (0.590 x 77)] / 5.080



TR55 Tc Worksheet

Hyd. No. 1

Pre-Basin A

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.240		0.011		0.011		
Flow length (ft)	= 220.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 2.54		0.00		0.00		
Land slope (%)	= 6.80		0.00		0.00		
Travel Time (min)	**= 18.45**	**+**	**0.00**	**+**	**0.00**	**=**	**18.45**
Shallow Concentrated Flow							
Flow length (ft)	= 180.00		0.00		0.00		
Watercourse slope (%)	= 3.90		0.00		0.00		
Surface description	= Unpaved		Paved		Paved		
Average velocity (ft/s)	=3.19		0.00		0.00		
Travel Time (min)	**= 0.94**	**+**	**0.00**	**+**	**0.00**	**=**	**0.94**
Channel Flow							
X sectional flow area (sqft)	= 20.00		0.00		0.00		
Wetted perimeter (ft)	= 24.00		0.00		0.00		
Channel slope (%)	= 6.00		0.00		0.00		
Manning's n-value	= 0.170		0.015		0.015		
Velocity (ft/s)	=1.90						
			0.00				
					0.00		
Flow length (ft)	({0})230.0		0.0		0.0		
Travel Time (min)	**= 2.02**	**+**	**0.00**	**+**	**0.00**	**=**	**2.02**

Total Travel Time, Tc ..... 21.40 min

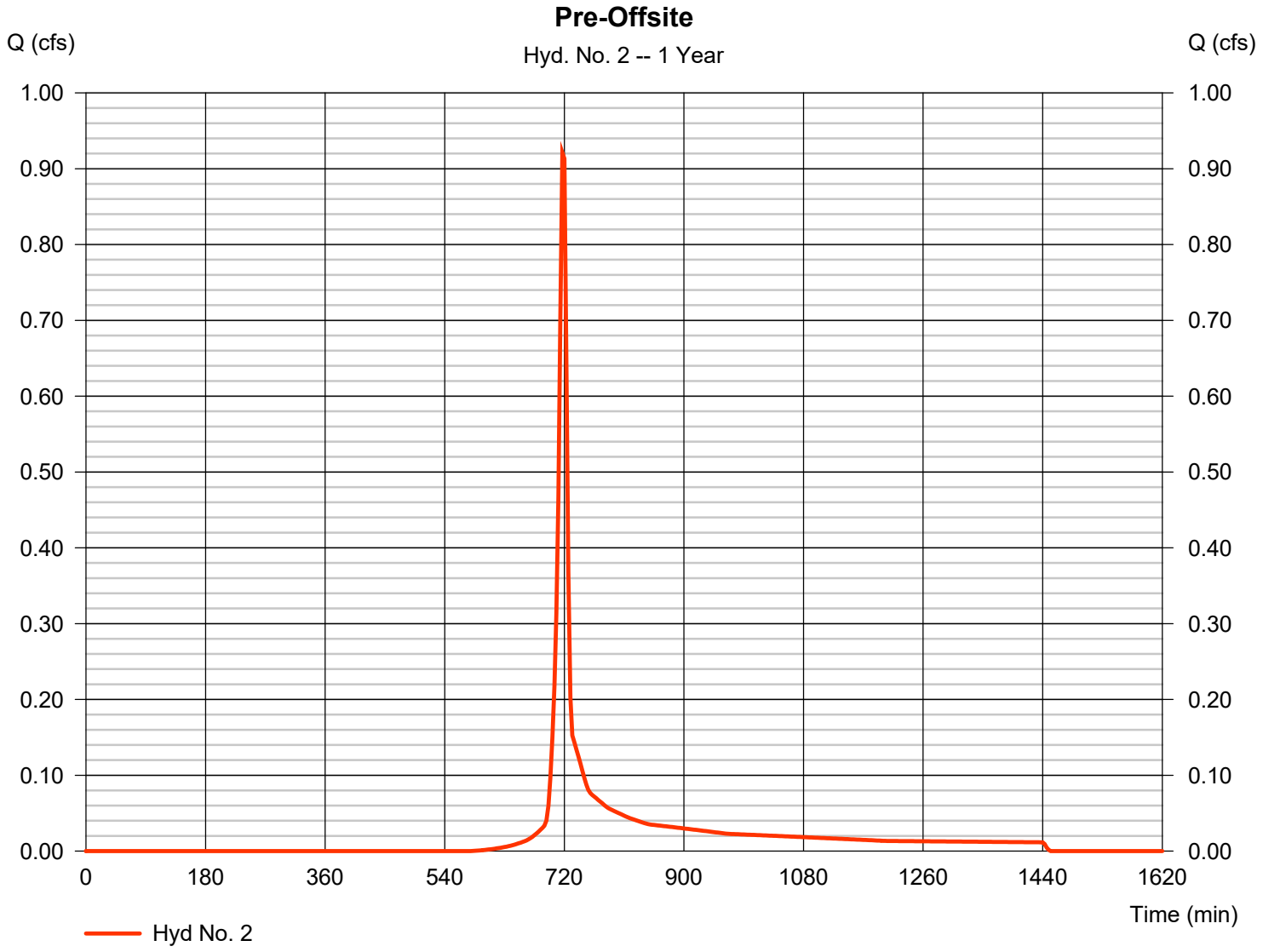
Hydrograph Report

Hyd. No. 2

Pre-Offsite

Hydrograph type	= SCS Runoff	Peak discharge	= 0.921 cfs
Storm frequency	= 1 yrs	Time to peak	= 717 min
Time interval	= 3 min	Hyd. volume	= 2,098 cuft
Drainage area	= 0.640 ac	Curve number	= 84*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 2.30 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.370 x 74) + (0.270 x 98)] / 0.640

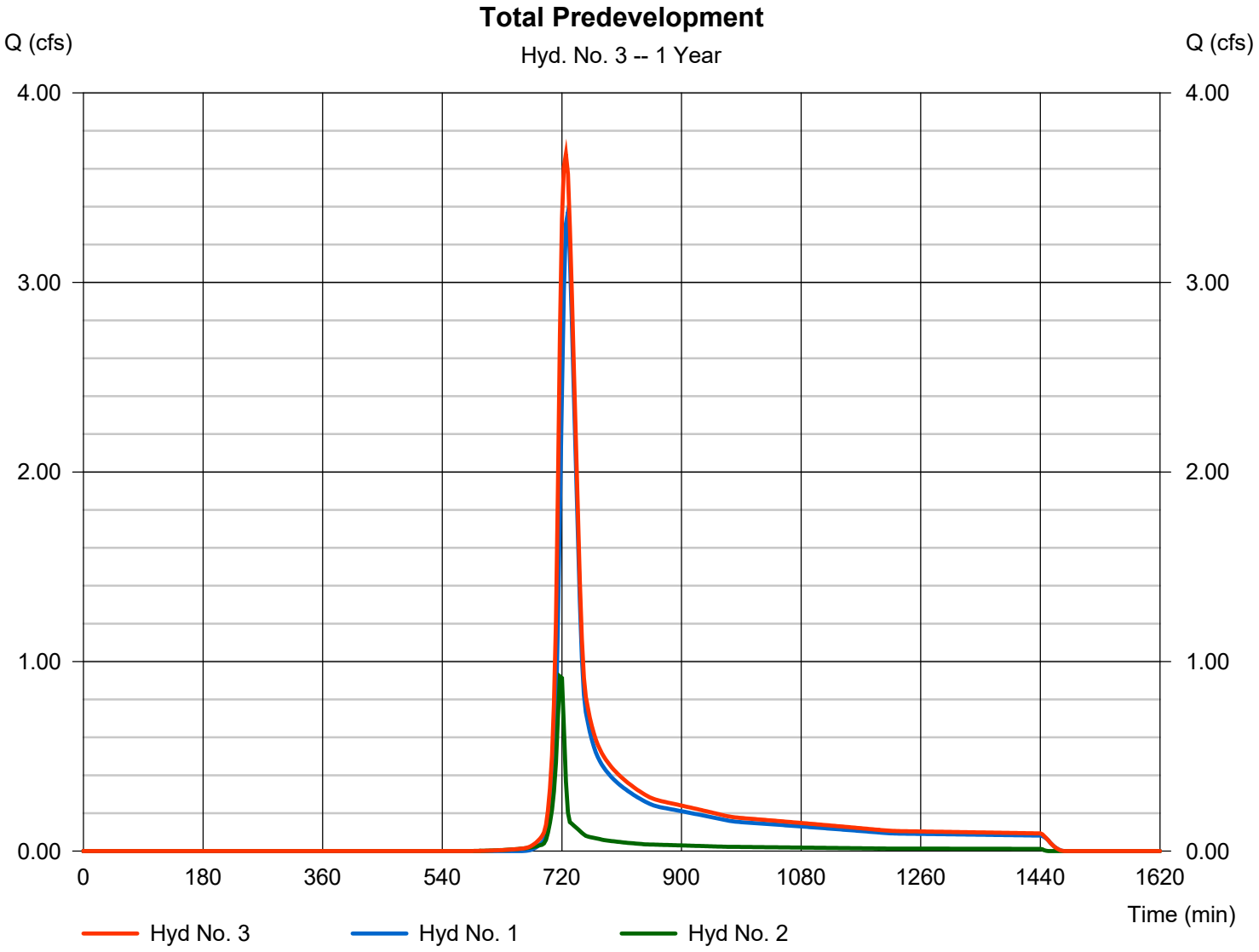


Hydrograph Report

Hyd. No. 3

Total Predevelopment

Hydrograph type	= Combine	Peak discharge	= 3.676 cfs
Storm frequency	= 1 yrs	Time to peak	= 726 min
Time interval	= 3 min	Hyd. volume	= 14,799 cuft
Inflow hyds.	= 1, 2	Contrib. drain. area	= 5.720 ac



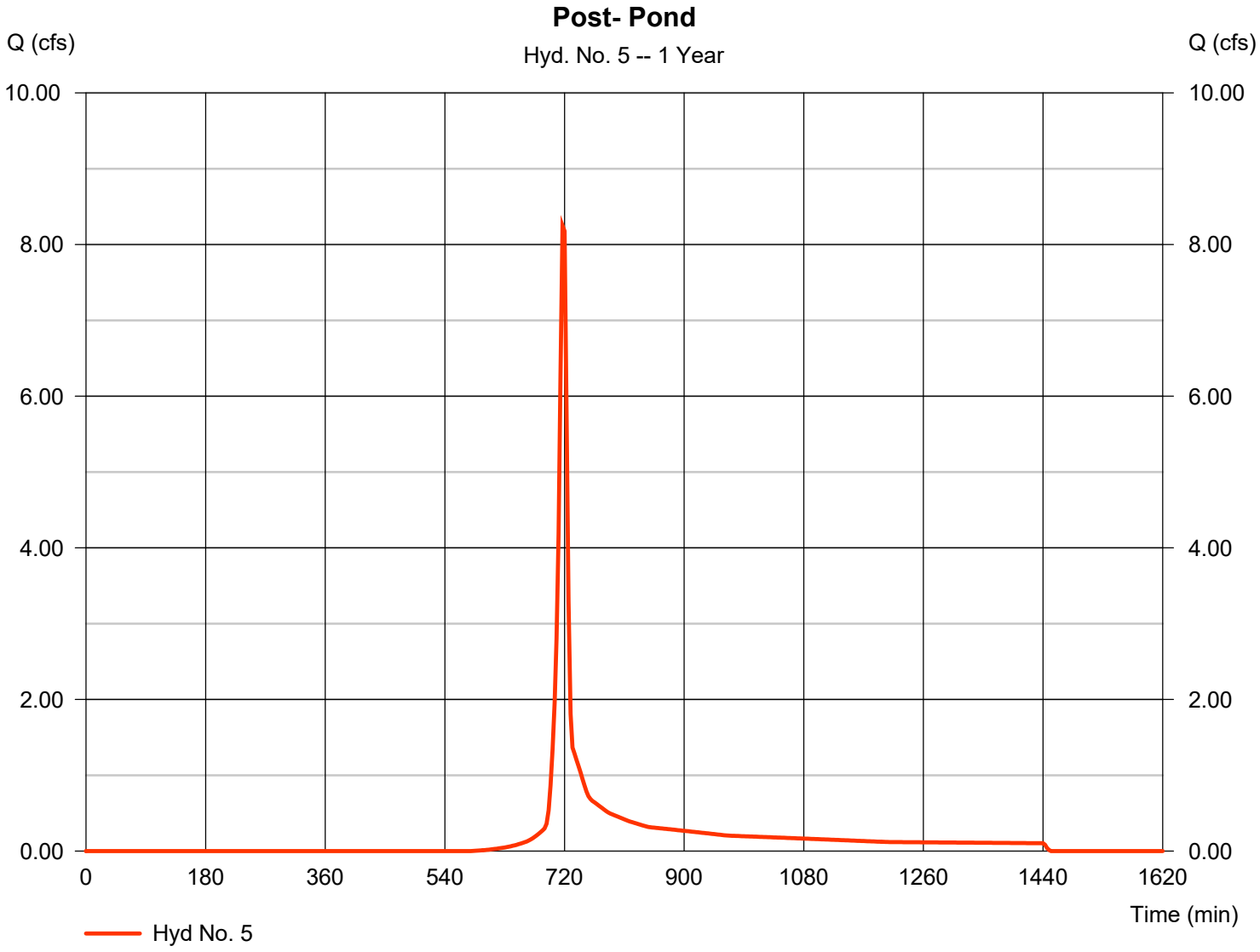
Hydrograph Report

Hyd. No. 5

Post- Pond

Hydrograph type	=	SCS Runoff	Peak discharge	=	8.247 cfs
Storm frequency	=	1 yrs	Time to peak	=	717 min
Time interval	=	3 min	Hyd. volume	=	18,781 cuft
Drainage area	=	5.730 ac	Curve number	=	84*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	6.00 min
Total precip.	=	2.30 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.260 x 61) + (2.350 x 98) + (2.020 x 74) + (1.100 x 80)] / 5.730



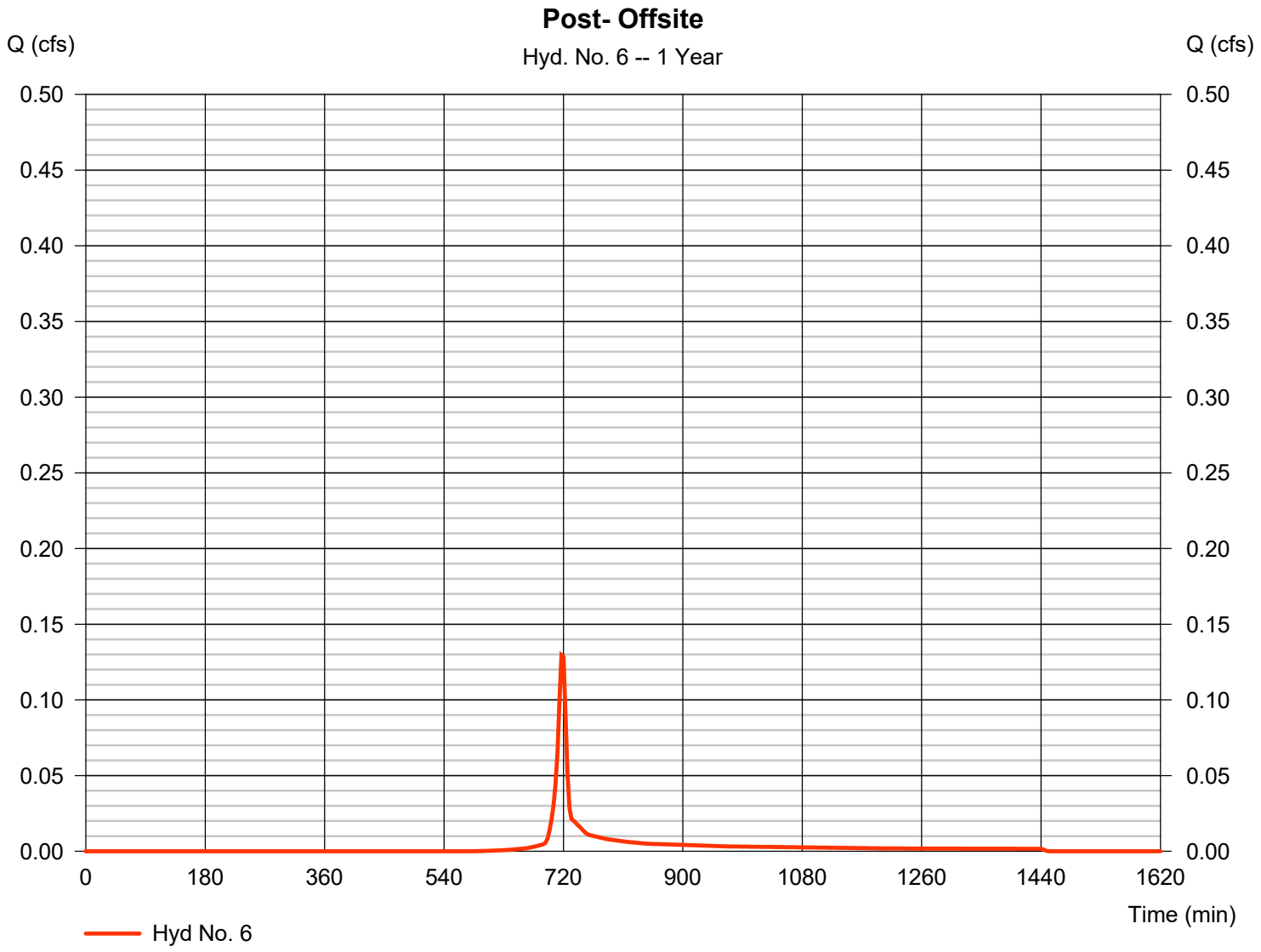
Hydrograph Report

Hyd. No. 6

Post- Offsite

Hydrograph type	= SCS Runoff	Peak discharge	= 0.130 cfs
Storm frequency	= 1 yrs	Time to peak	= 717 min
Time interval	= 3 min	Hyd. volume	= 295 cuft
Drainage area	= 0.090 ac	Curve number	= 84*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 2.30 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.030 x 61) + (0.050 x 98) + (0.010 x 80)] / 0.090



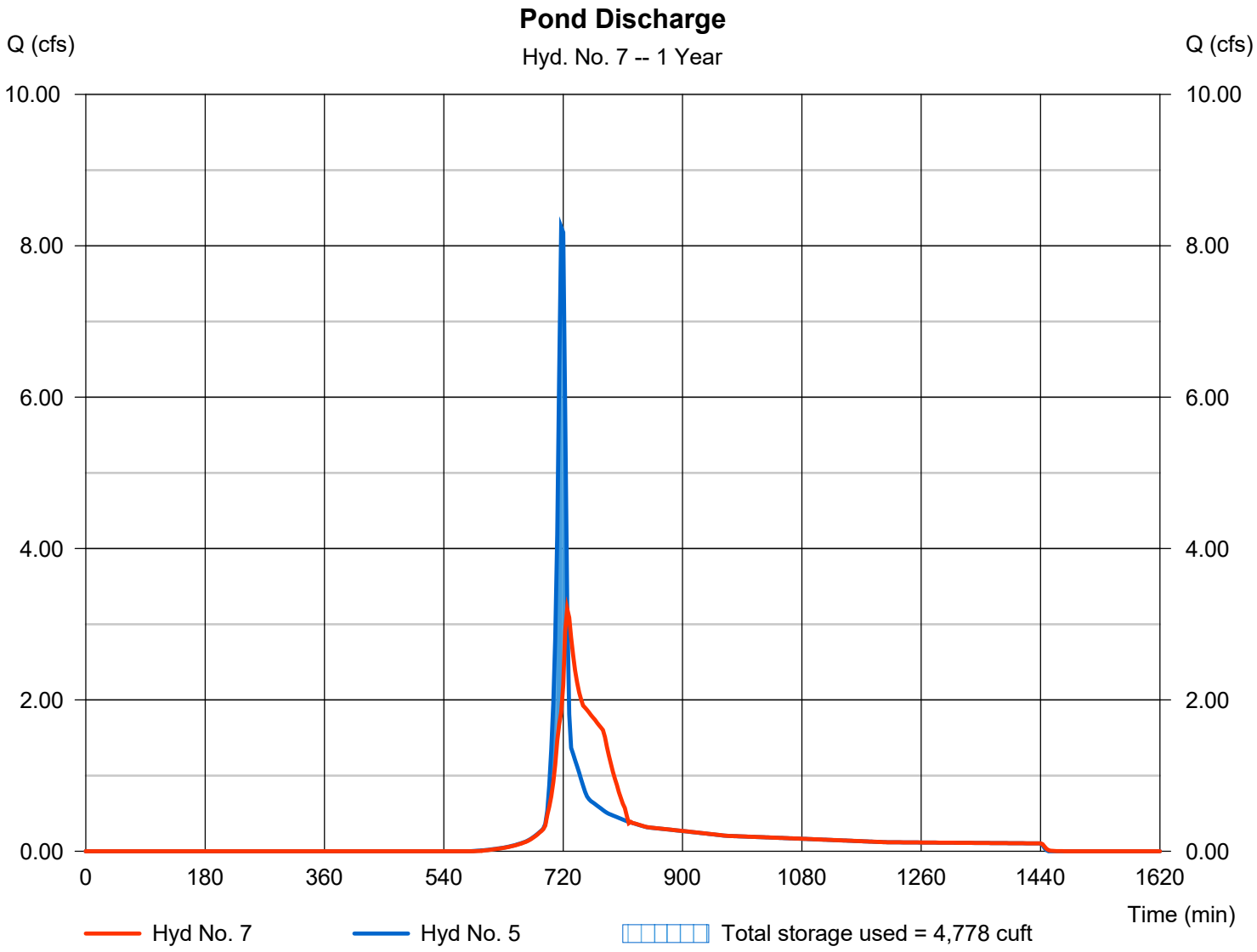
Hydrograph Report

Hyd. No. 7

Pond Discharge

Hydrograph type	=	Reservoir	Peak discharge	=	3.204 cfs
Storm frequency	=	1 yrs	Time to peak	=	726 min
Time interval	=	3 min	Hyd. volume	=	18,780 cuft
Inflow hyd. No.	=	5 - Post- Pond	Max. Elevation	=	137.88 ft
Reservoir name	=	South Detention	Max. Storage	=	4,778 cuft

Storage Indication method used.



Pond Report

Pond No. 1 - South Detention

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 135.50 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	135.50	10	0	0
0.50	136.00	188	40	40
1.50	137.00	2,340	1,064	1,104
2.50	138.00	6,390	4,199	5,302
3.50	139.00	9,411	7,851	13,154
4.50	140.00	11,707	10,537	23,691
5.00	140.50	13,070	6,191	29,881

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 15.00	8.00	10.00	0.00
Span (in)	= 15.00	8.00	18.00	0.00
No. Barrels	= 1	1	1	0
Invert El. (ft)	= 135.50	135.50	137.50	0.00
Length (ft)	= 55.00	0.00	0.00	0.00
Slope (%)	= 11.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	Yes	Yes	No

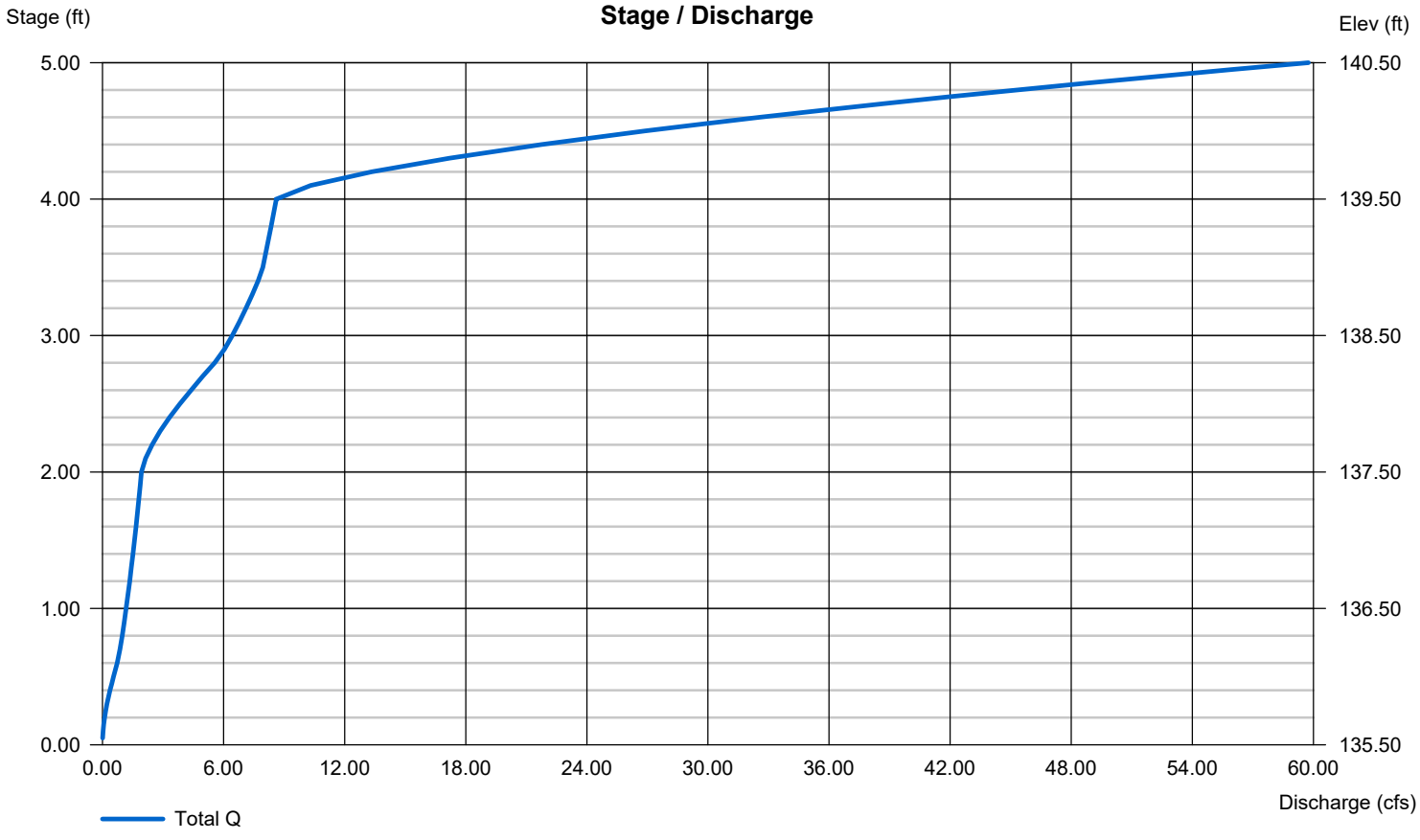
Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 15.00	0.00	0.00	0.00
Crest El. (ft)	= 139.50	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= Rect	---	---	---
Multi-Stage	= No	No	No	No

Exfil.(in/hr) = 0.000 (by Contour)

TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).

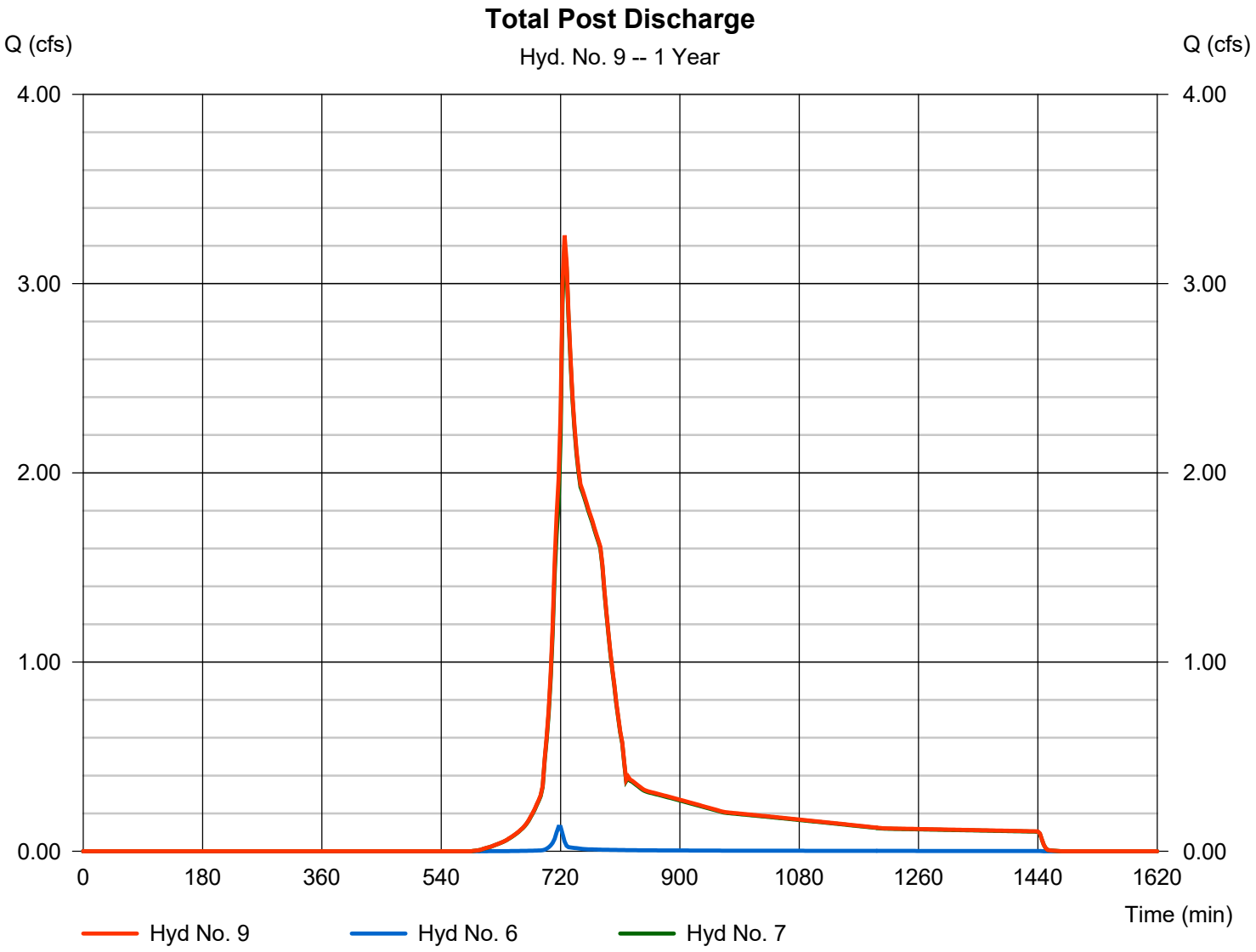


Hydrograph Report

Hyd. No. 9

Total Post Discharge

Hydrograph type	= Combine	Peak discharge	= 3.256 cfs
Storm frequency	= 1 yrs	Time to peak	= 726 min
Time interval	= 3 min	Hyd. volume	= 19,075 cuft
Inflow hyds.	= 6, 7	Contrib. drain. area	= 0.090 ac



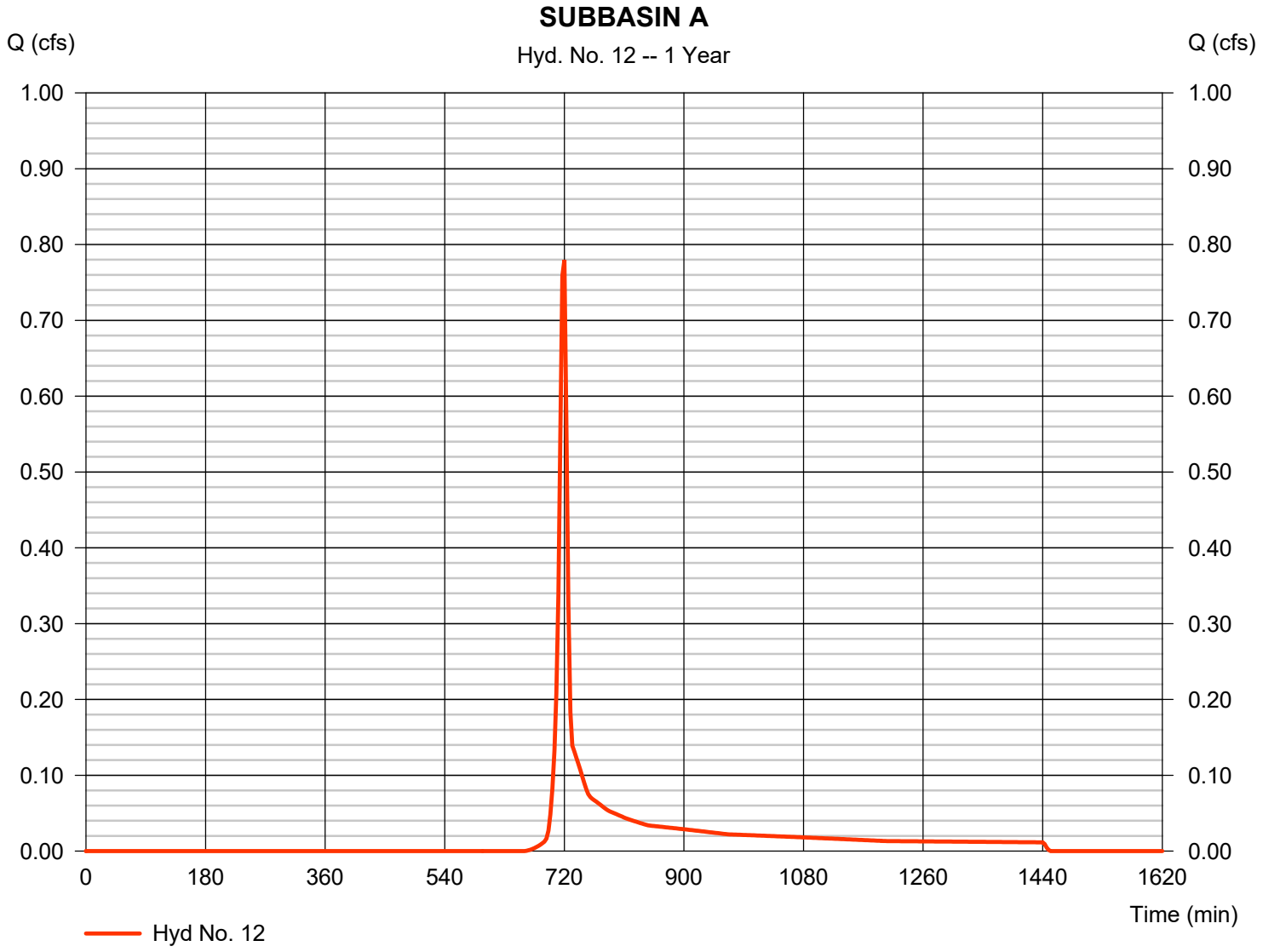
Hydrograph Report

Hyd. No. 12

SUBBASIN A

Hydrograph type	= SCS Runoff	Peak discharge	= 0.780 cfs
Storm frequency	= 1 yrs	Time to peak	= 720 min
Time interval	= 3 min	Hyd. volume	= 1,803 cuft
Drainage area	= 0.750 ac	Curve number	= 79*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 2.30 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.230 x 98) + (0.240 x 61) + (0.280 x 80)] / 0.750



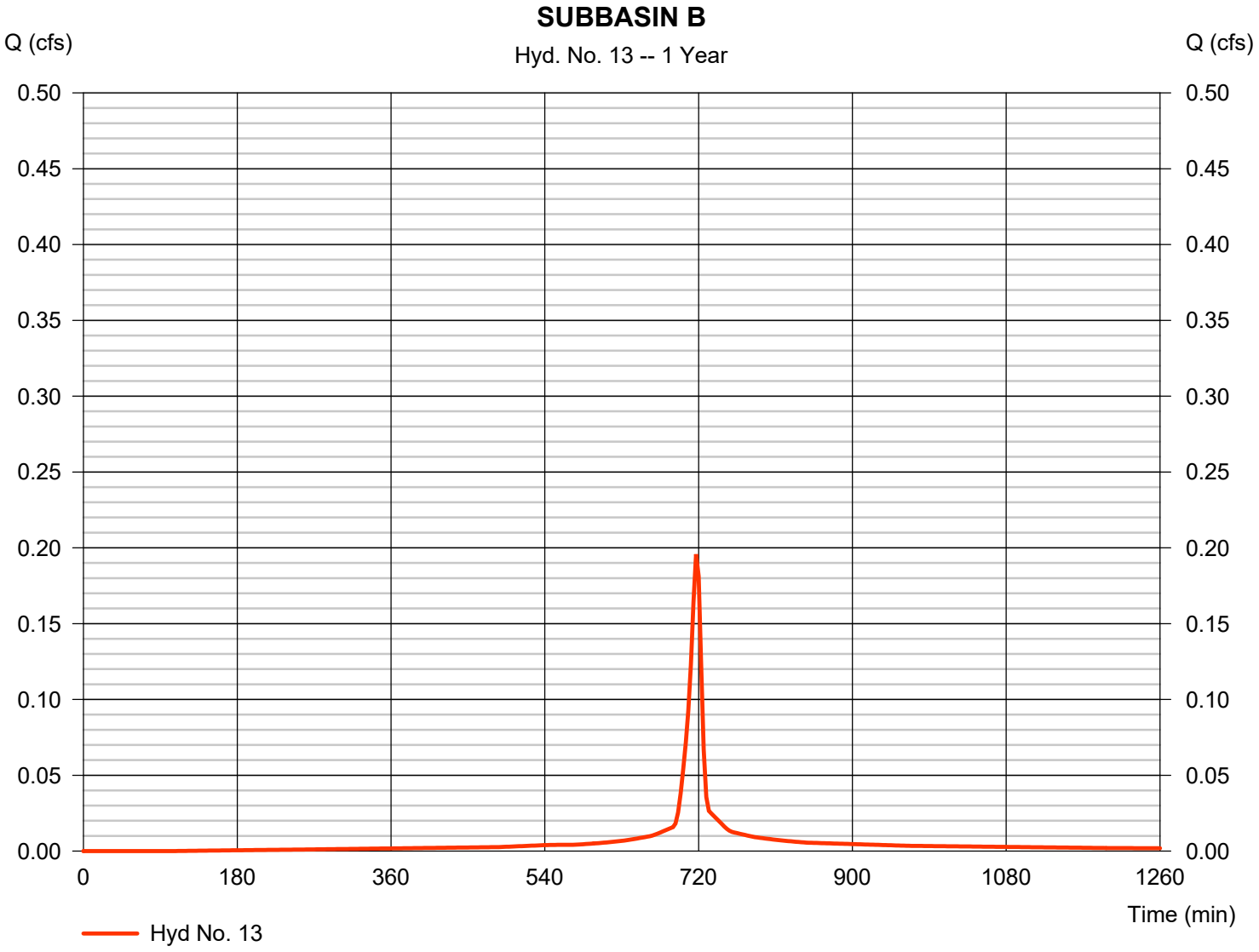
Hydrograph Report

Hyd. No. 13

SUBBASIN B

Hydrograph type	= SCS Runoff	Peak discharge	= 0.196 cfs
Storm frequency	= 1 yrs	Time to peak	= 717 min
Time interval	= 3 min	Hyd. volume	= 494 cuft
Drainage area	= 0.070 ac	Curve number	= 98*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 2.30 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.070 x 98)] / 0.070



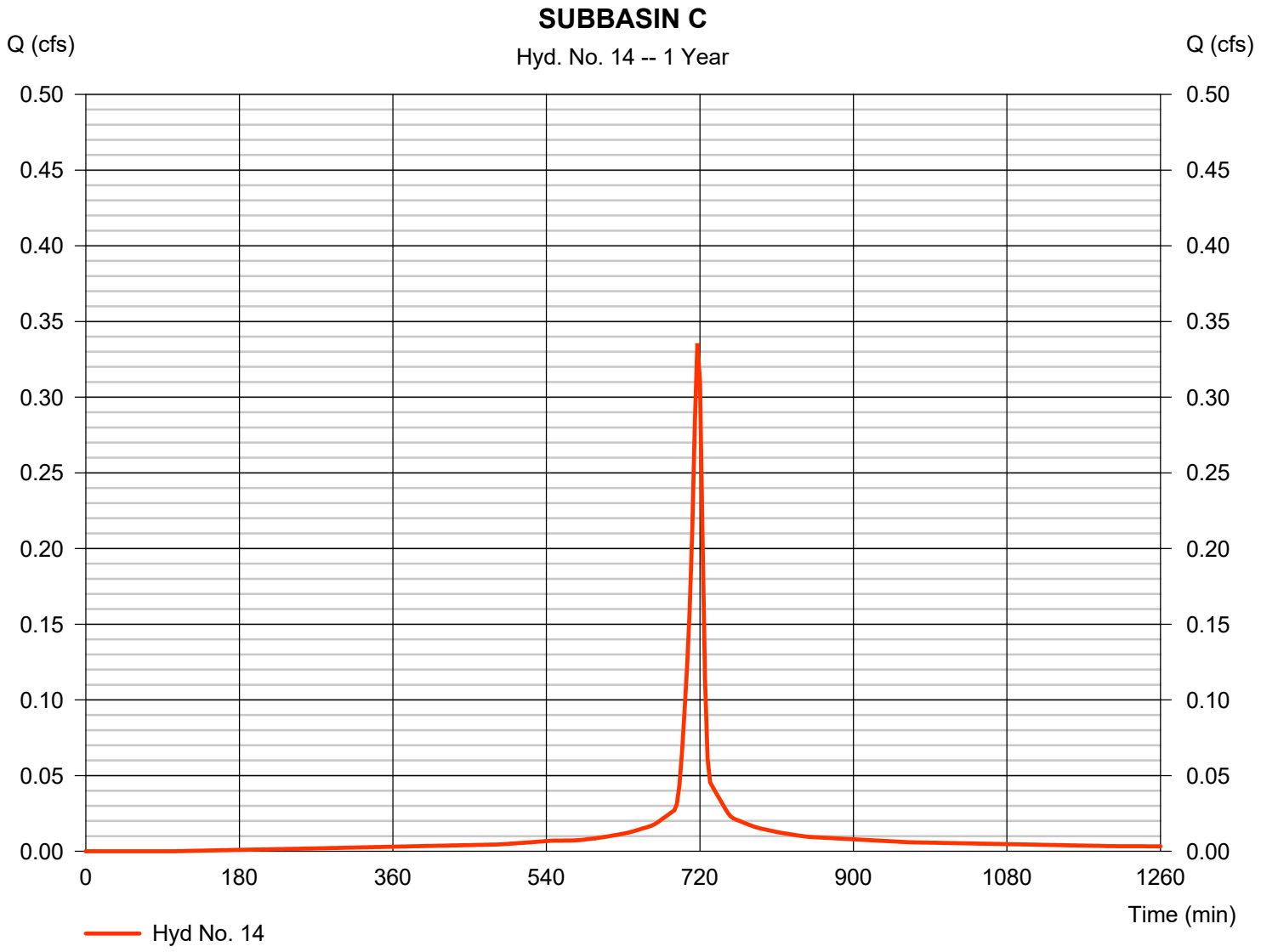
Hydrograph Report

Hyd. No. 14

SUBBASIN C

Hydrograph type	= SCS Runoff	Peak discharge	= 0.336 cfs
Storm frequency	= 1 yrs	Time to peak	= 717 min
Time interval	= 3 min	Hyd. volume	= 846 cuft
Drainage area	= 0.120 ac	Curve number	= 98*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 2.30 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.120 x 98)] / 0.120



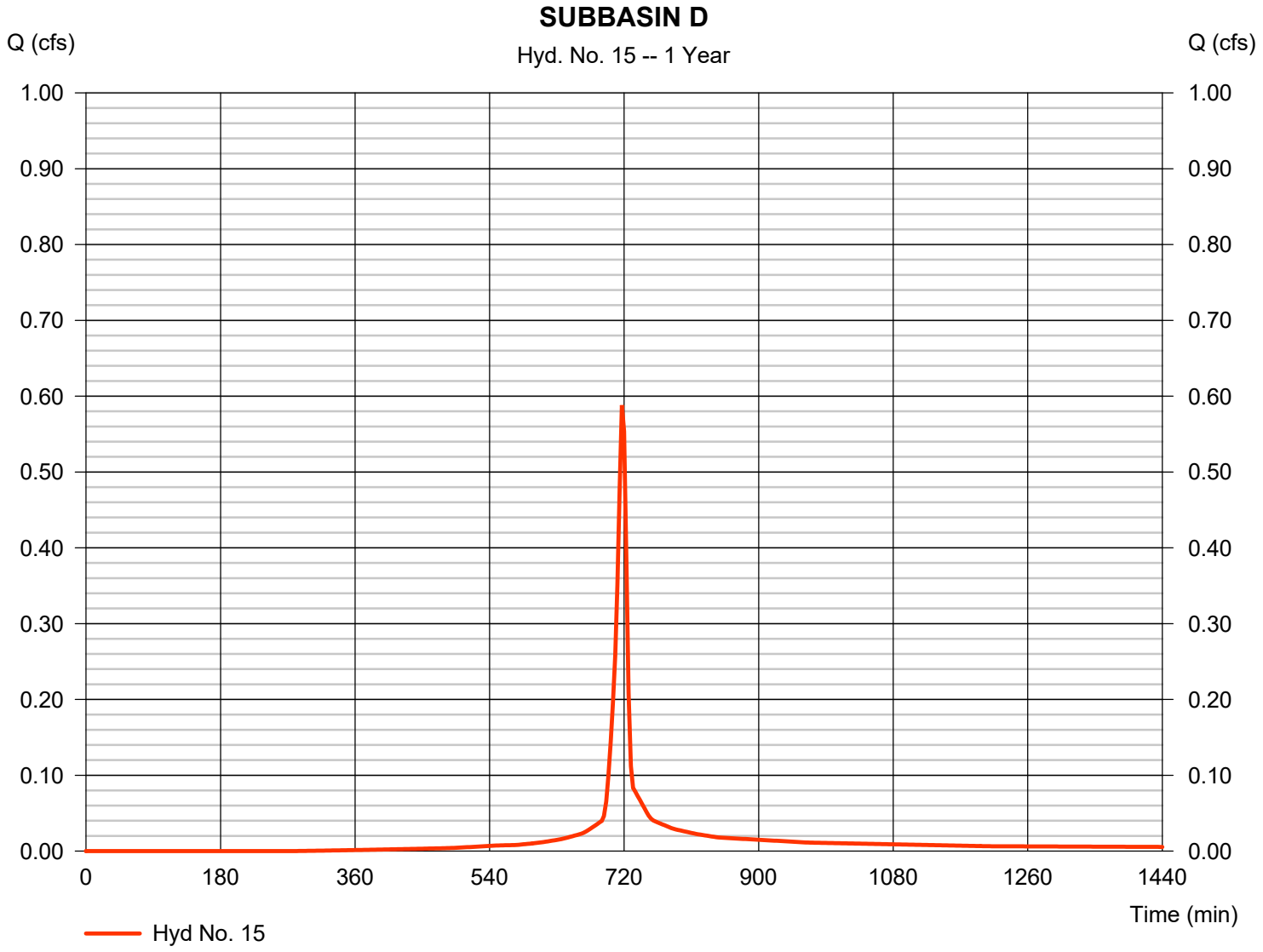
Hydrograph Report

Hyd. No. 15

SUBBASIN D

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.588 cfs
Storm frequency	=	1 yrs	Time to peak	=	717 min
Time interval	=	3 min	Hyd. volume	=	1,371 cuft
Drainage area	=	0.240 ac	Curve number	=	94*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	6.00 min
Total precip.	=	2.30 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.190 x 98) + (0.050 x 80)] / 0.240



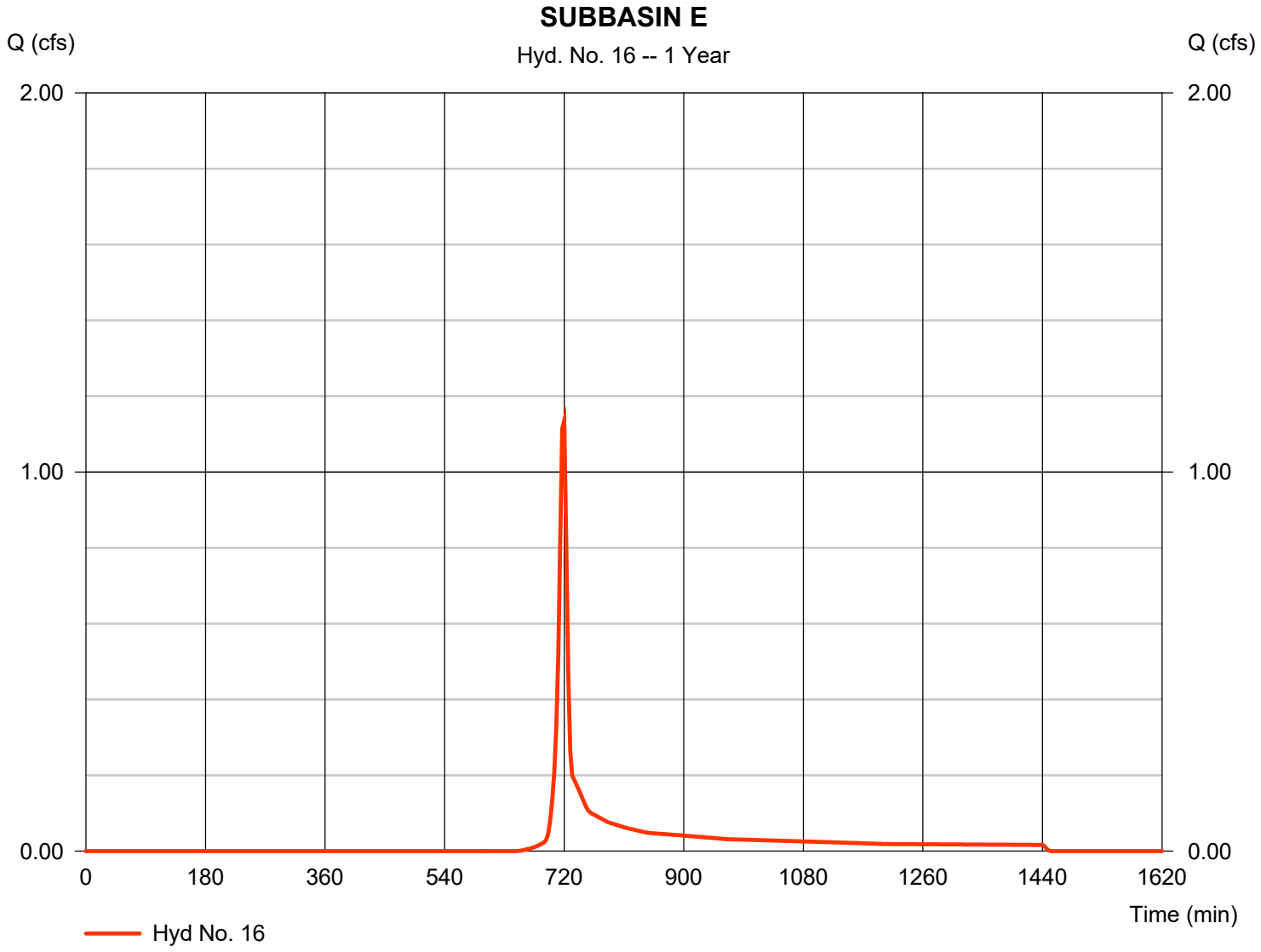
Hydrograph Report

Hyd. No. 16

SUBBASIN E

Hydrograph type	= SCS Runoff	Peak discharge	= 1.135 cfs
Storm frequency	= 1 yrs	Time to peak	= 720 min
Time interval	= 3 min	Hyd. volume	= 2,615 cuft
Drainage area	= 1.020 ac	Curve number	= 80*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 2.30 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.020 x 98) + (1.000 x 80)] / 1.020



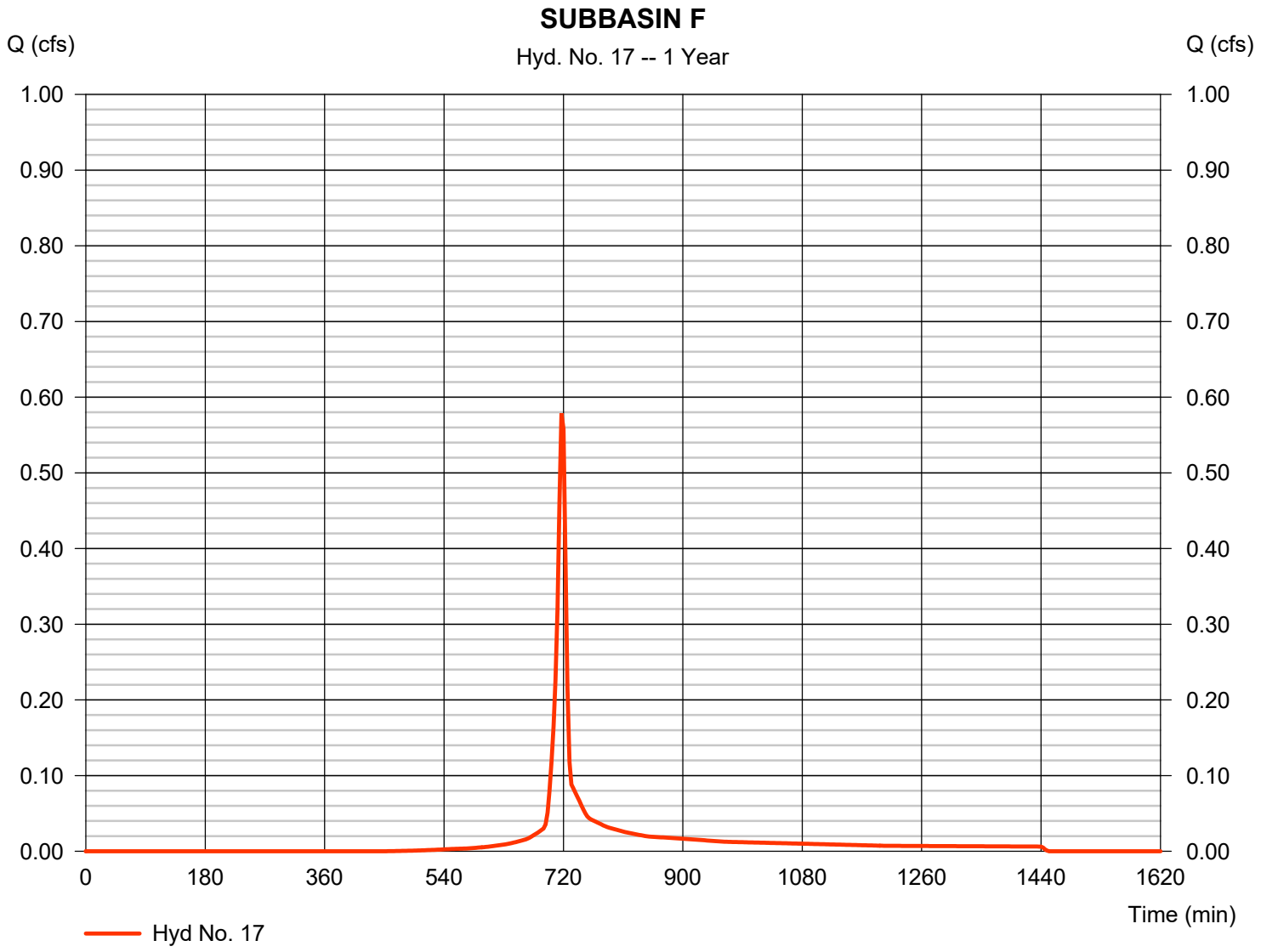
Hydrograph Report

Hyd. No. 17

SUBBASIN F

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.579 cfs
Storm frequency	=	1 yrs	Time to peak	=	717 min
Time interval	=	3 min	Hyd. volume	=	1,308 cuft
Drainage area	=	0.300 ac	Curve number	=	89*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	6.00 min
Total precip.	=	2.30 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.190 x 98) + (0.110 x 74)] / 0.300



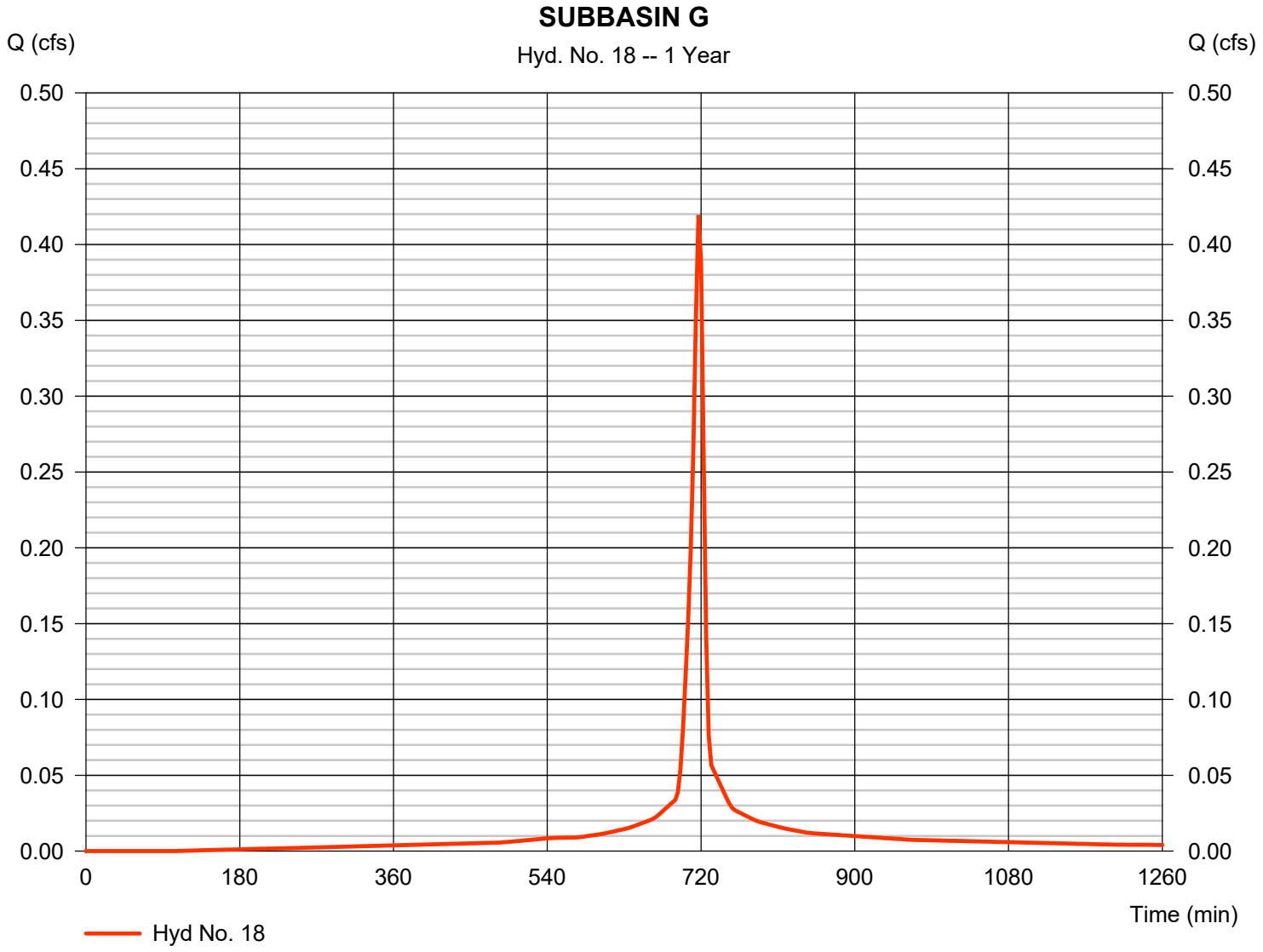
Hydrograph Report

Hyd. No. 18

SUBBASIN G

Hydrograph type	= SCS Runoff	Peak discharge	= 0.419 cfs
Storm frequency	= 1 yrs	Time to peak	= 717 min
Time interval	= 3 min	Hyd. volume	= 1,058 cuft
Drainage area	= 0.150 ac	Curve number	= 98*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 2.30 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.150 x 98)] / 0.150



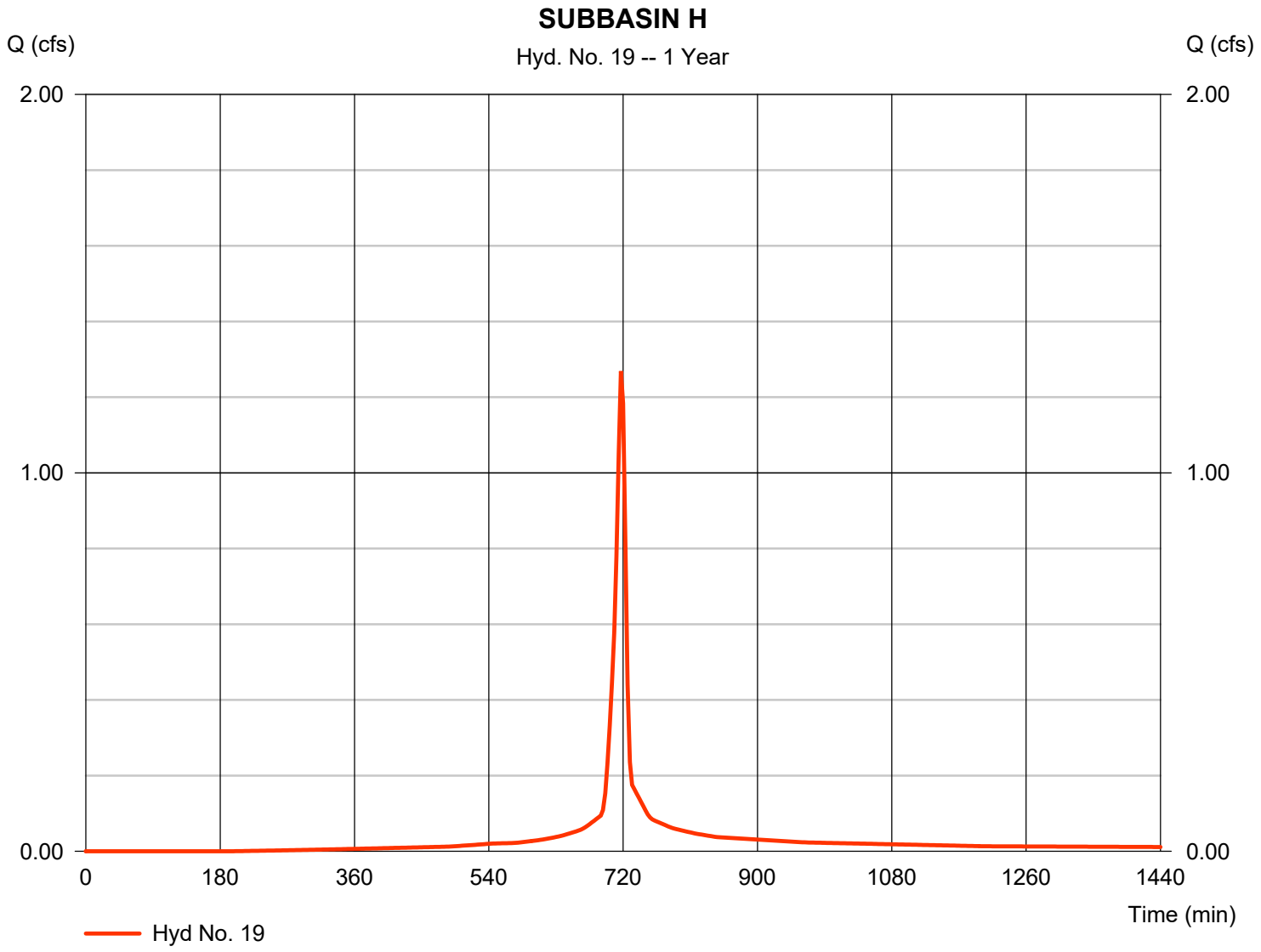
Hydrograph Report

Hyd. No. 19

SUBBASIN H

Hydrograph type	=	SCS Runoff	Peak discharge	=	1.269 cfs
Storm frequency	=	1 yrs	Time to peak	=	717 min
Time interval	=	3 min	Hyd. volume	=	3,048 cuft
Drainage area	=	0.480 ac	Curve number	=	96*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	6.00 min
Total precip.	=	2.30 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.430 x 98) + (0.050 x 74)] / 0.480



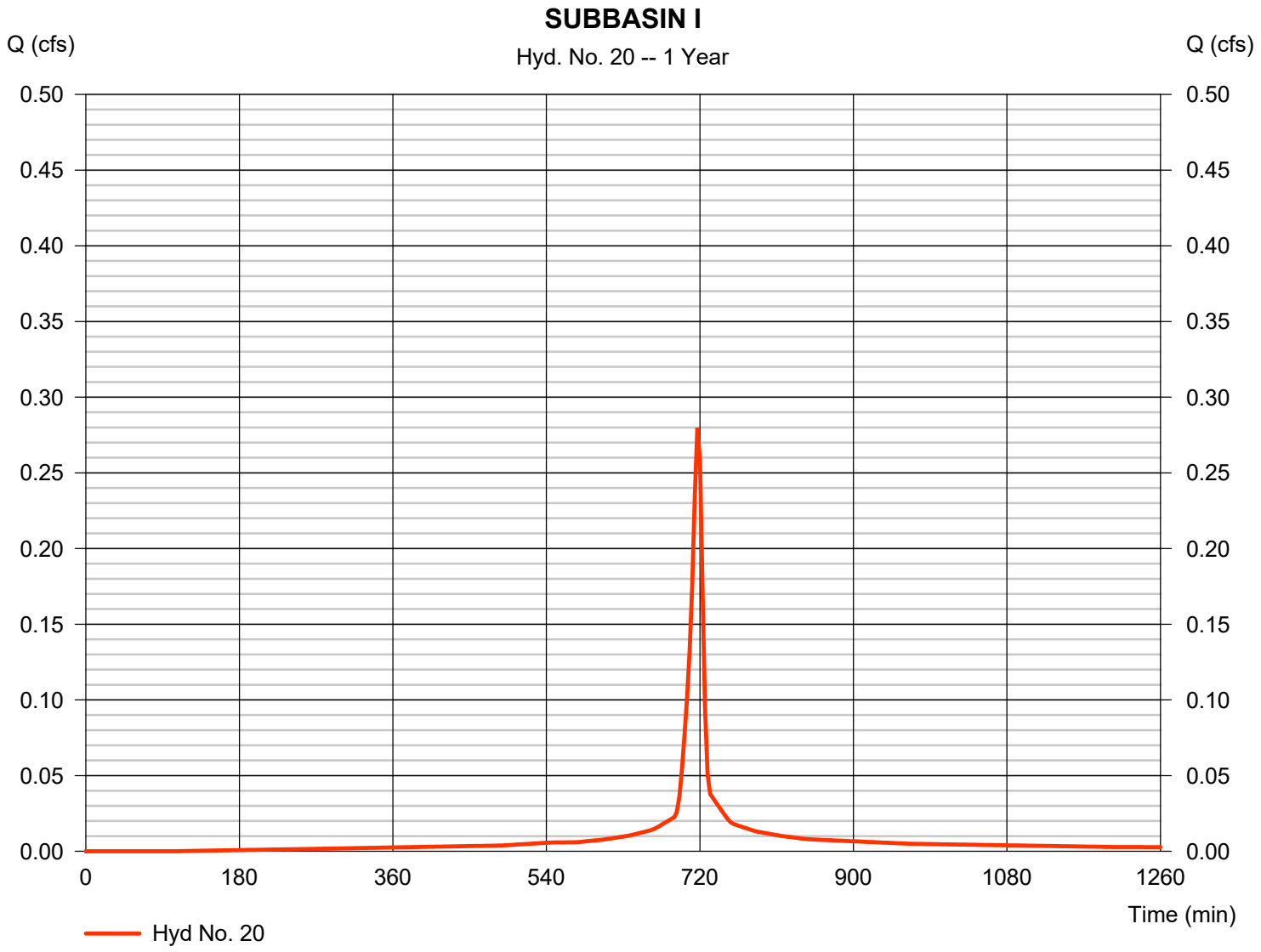
Hydrograph Report

Hyd. No. 20

SUBBASIN I

Hydrograph type	= SCS Runoff	Peak discharge	= 0.280 cfs
Storm frequency	= 1 yrs	Time to peak	= 717 min
Time interval	= 3 min	Hyd. volume	= 705 cuft
Drainage area	= 0.100 ac	Curve number	= 98*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 2.30 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.100 x 98)] / 0.100



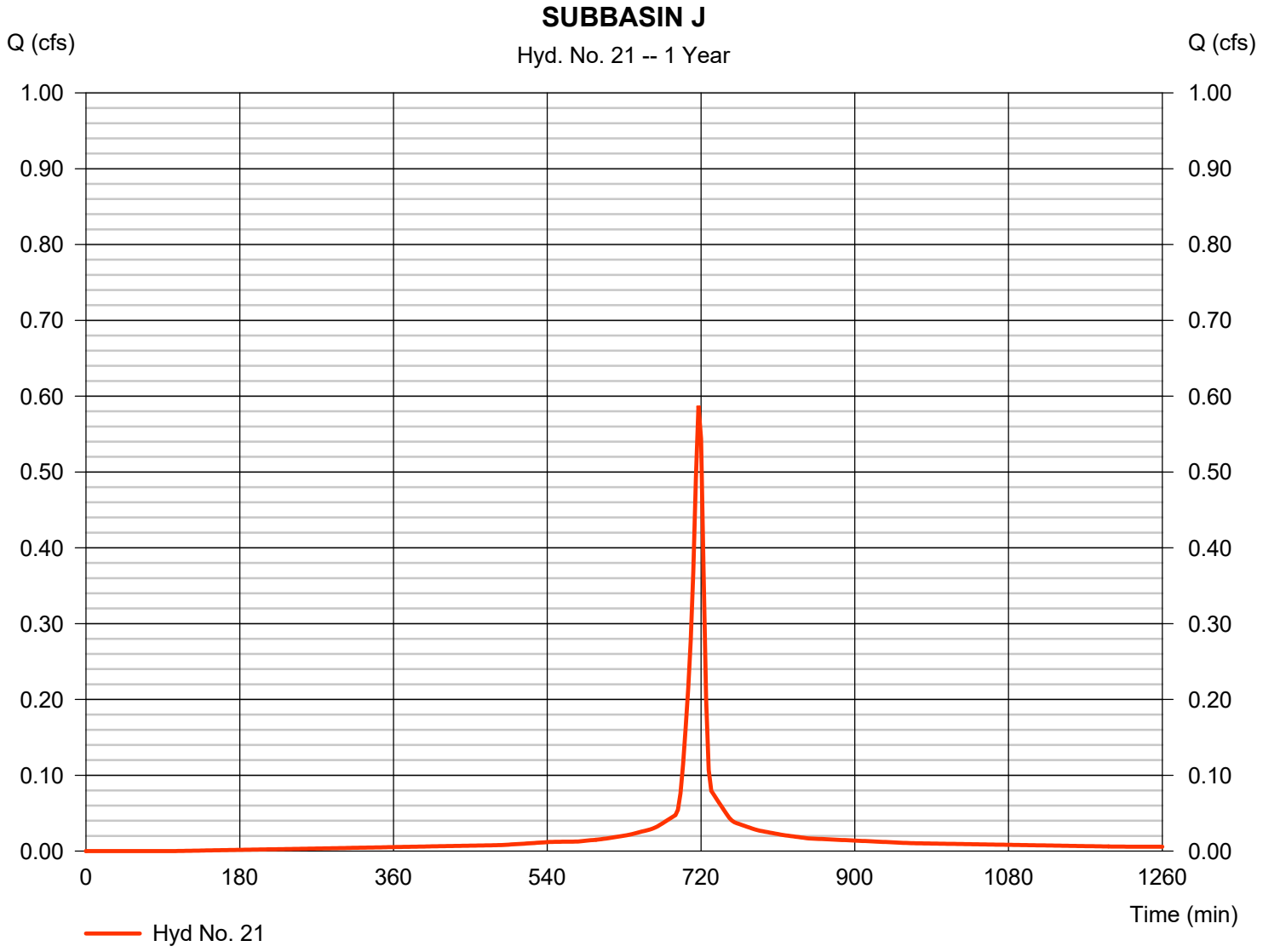
Hydrograph Report

Hyd. No. 21

SUBBASIN J

Hydrograph type	= SCS Runoff	Peak discharge	= 0.587 cfs
Storm frequency	= 1 yrs	Time to peak	= 717 min
Time interval	= 3 min	Hyd. volume	= 1,481 cuft
Drainage area	= 0.210 ac	Curve number	= 98*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 2.30 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.210 x 98)] / 0.210



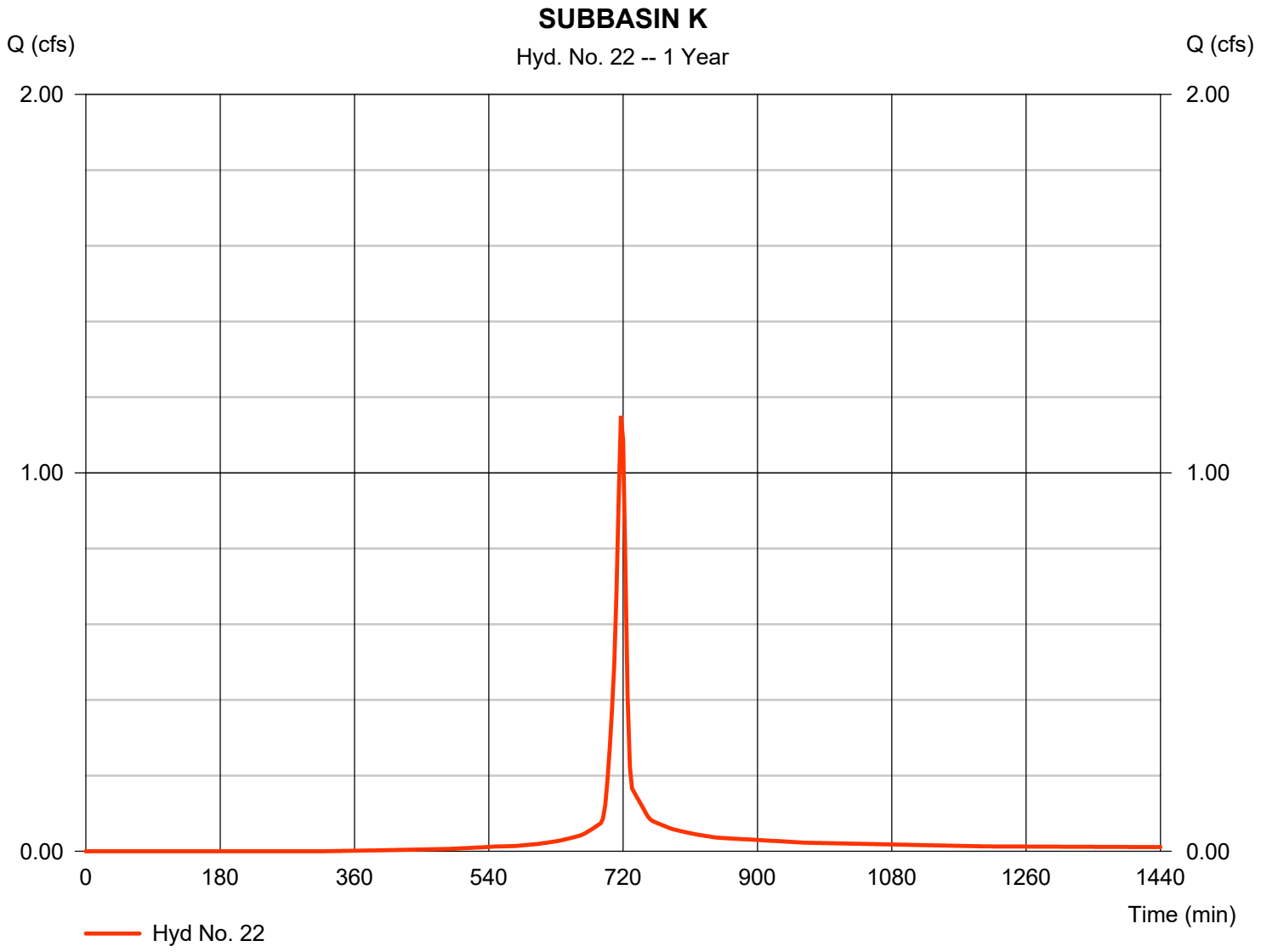
Hydrograph Report

Hyd. No. 22

SUBBASIN K

Hydrograph type	=	SCS Runoff	Peak discharge	=	1.150 cfs
Storm frequency	=	1 yrs	Time to peak	=	717 min
Time interval	=	3 min	Hyd. volume	=	2,655 cuft
Drainage area	=	0.490 ac	Curve number	=	93*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	6.00 min
Total precip.	=	2.30 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.380 x 98) + (0.110 x 74)] / 0.490



Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2016 by Autodesk, Inc. v11

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	4.778	3	729	17,514	------	------	------	Pre-Basin A
2	SCS Runoff	1.226	3	717	2,773	------	------	------	Pre-Offsite
3	Combine	5.219	3	726	20,288	1, 2	------	------	Total Predevelopment
5	SCS Runoff	10.98	3	717	24,828	------	------	------	Post- Pond
6	SCS Runoff	0.172	3	717	390	------	------	------	Post- Offsite
7	Reservoir	4.642	3	726	24,828	5	138.15	6,438	Pond Discharge
9	Combine	4.709	3	726	25,218	6, 7,	------	------	Total Post Discharge
12	SCS Runoff	1.083	3	720	2,486	------	------	------	SUBBASIN A
13	SCS Runoff	0.231	3	717	588	------	------	------	SUBBASIN B
14	SCS Runoff	0.396	3	717	1,009	------	------	------	SUBBASIN C
15	SCS Runoff	0.714	3	717	1,683	------	------	------	SUBBASIN D
16	SCS Runoff	1.558	3	720	3,575	------	------	------	SUBBASIN E
17	SCS Runoff	0.733	3	717	1,665	------	------	------	SUBBASIN F
18	SCS Runoff	0.495	3	717	1,261	------	------	------	SUBBASIN G
19	SCS Runoff	1.517	3	717	3,687	------	------	------	SUBBASIN H
20	SCS Runoff	0.330	3	717	840	------	------	------	SUBBASIN I
21	SCS Runoff	0.693	3	717	1,765	------	------	------	SUBBASIN J
22	SCS Runoff	1.408	3	717	3,282	------	------	------	SUBBASIN K

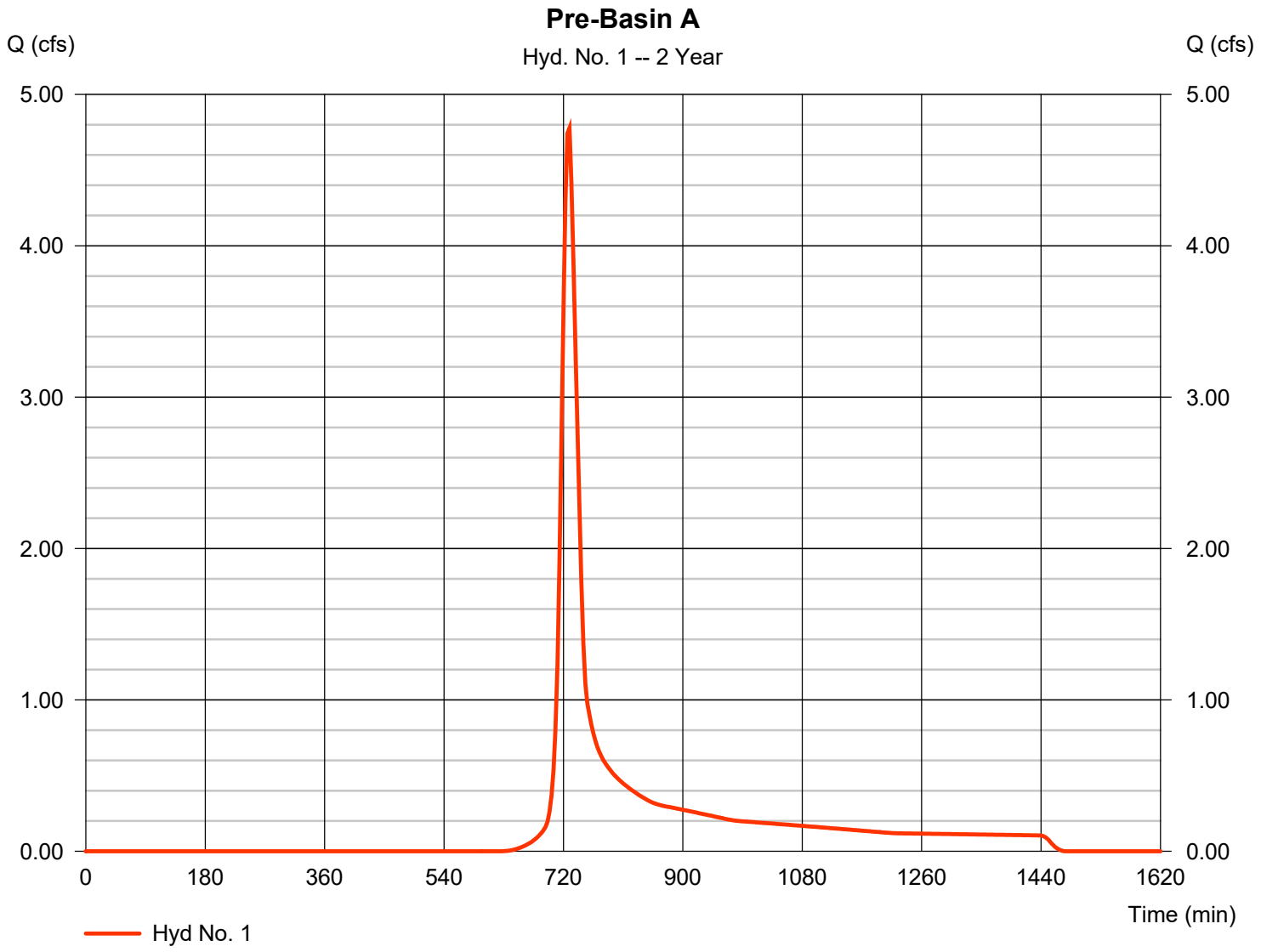
Hydrograph Report

Hyd. No. 1

Pre-Basin A

Hydrograph type	= SCS Runoff	Peak discharge	= 4.778 cfs
Storm frequency	= 2 yrs	Time to peak	= 729 min
Time interval	= 3 min	Hyd. volume	= 17,514 cuft
Drainage area	= 5.080 ac	Curve number	= 79*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 21.40 min
Total precip.	= 2.70 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.260 x 61) + (1.160 x 98) + (1.170 x 74) + (1.230 x 70) + (0.670 x 80) + (0.590 x 77)] / 5.080



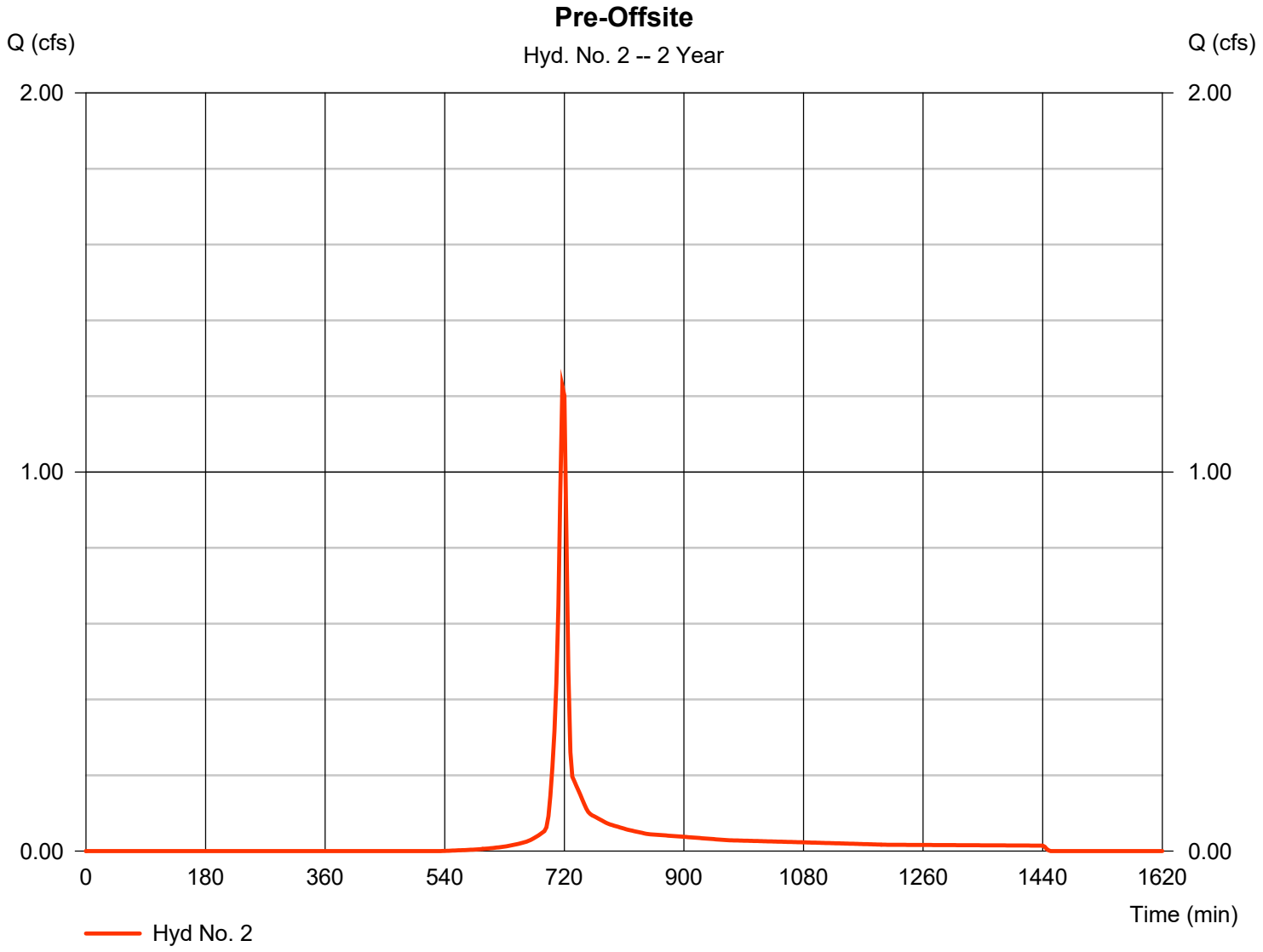
Hydrograph Report

Hyd. No. 2

Pre-Offsite

Hydrograph type	= SCS Runoff	Peak discharge	= 1.226 cfs
Storm frequency	= 2 yrs	Time to peak	= 717 min
Time interval	= 3 min	Hyd. volume	= 2,773 cuft
Drainage area	= 0.640 ac	Curve number	= 84*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 2.70 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.370 x 74) + (0.270 x 98)] / 0.640

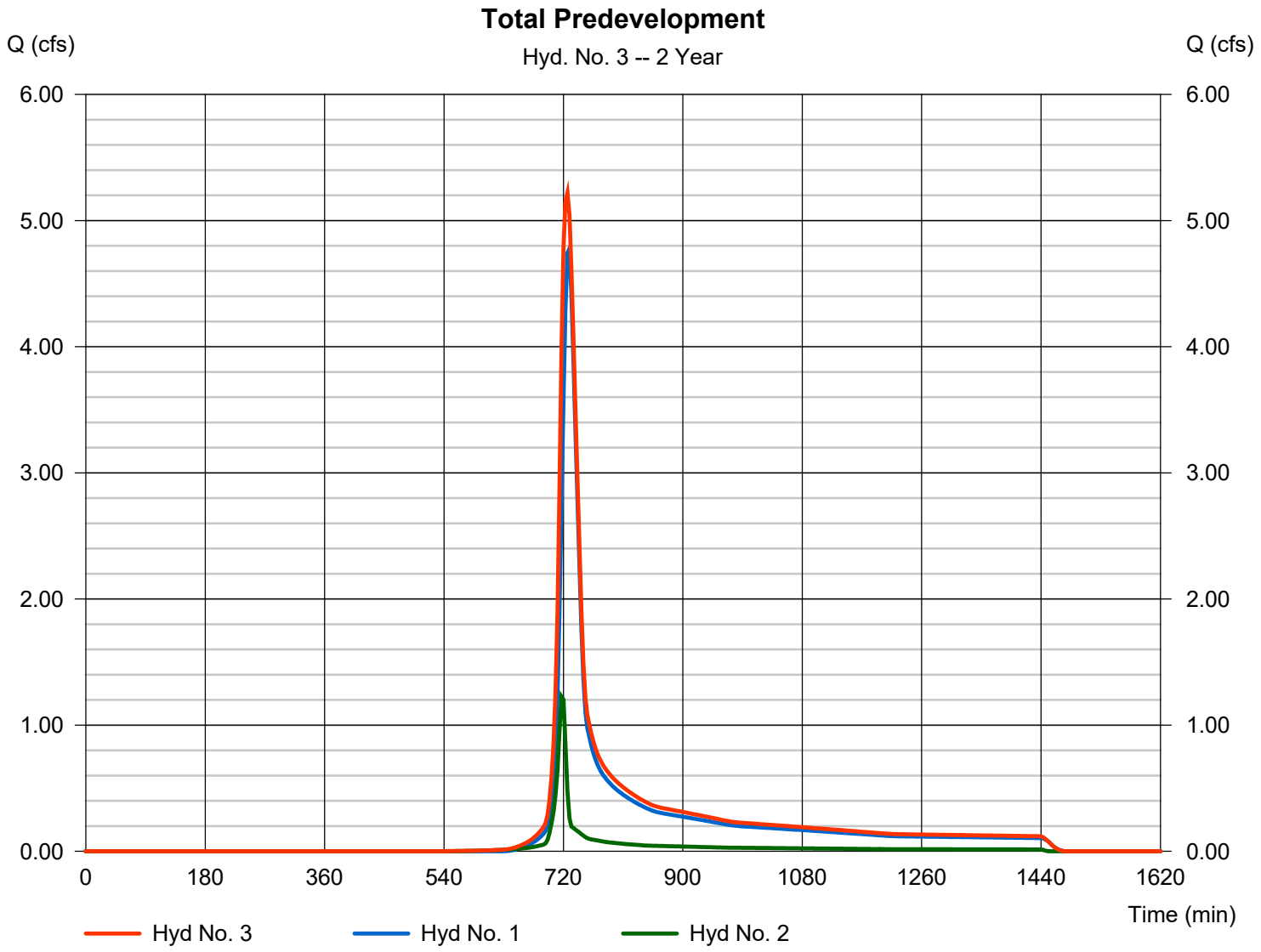


Hydrograph Report

Hyd. No. 3

Total Predevelopment

Hydrograph type	= Combine	Peak discharge	= 5.219 cfs
Storm frequency	= 2 yrs	Time to peak	= 726 min
Time interval	= 3 min	Hyd. volume	= 20,288 cuft
Inflow hyds.	= 1, 2	Contrib. drain. area	= 5.720 ac



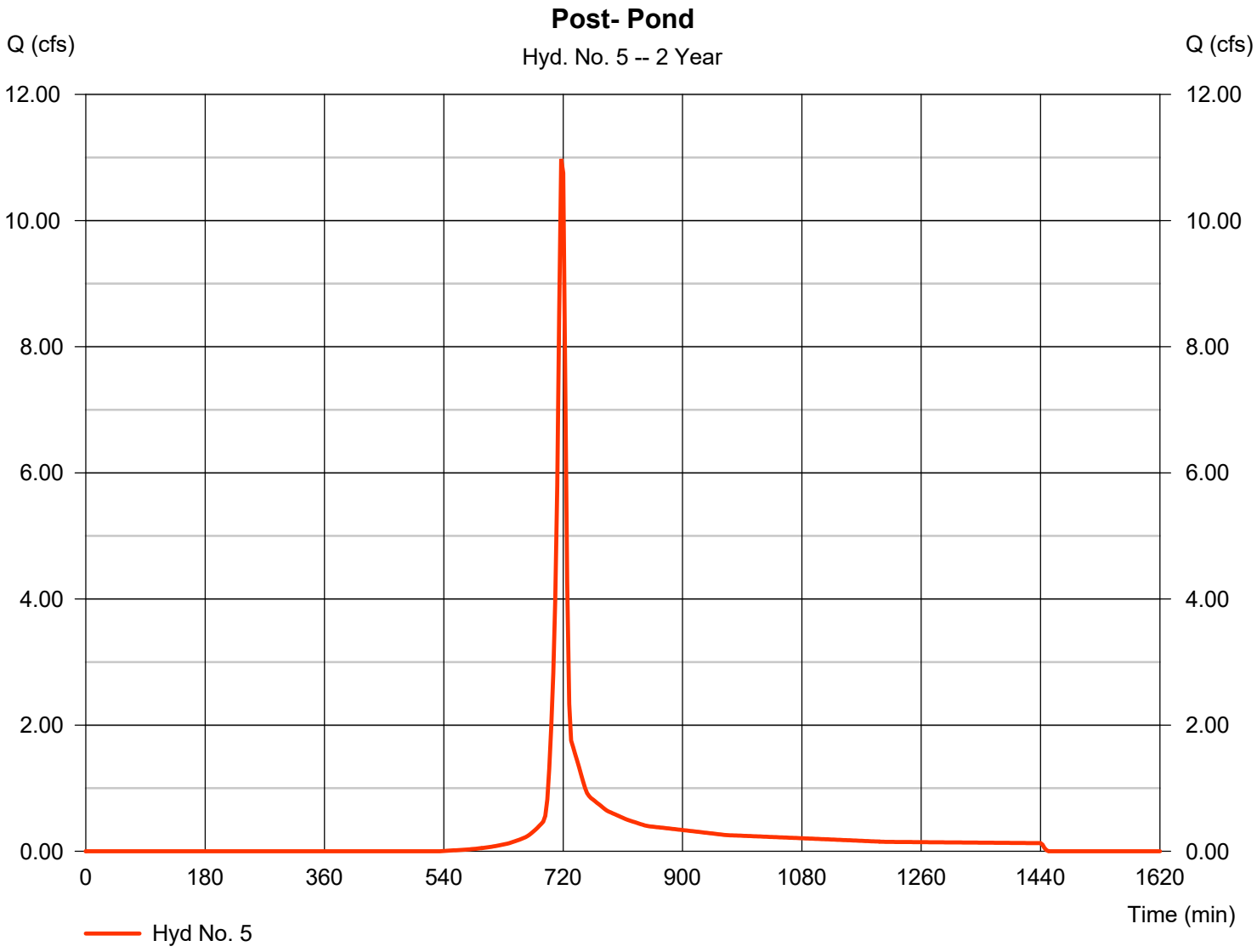
Hydrograph Report

Hyd. No. 5

Post- Pond

Hydrograph type	=	SCS Runoff	Peak discharge	=	10.98 cfs
Storm frequency	=	2 yrs	Time to peak	=	717 min
Time interval	=	3 min	Hyd. volume	=	24,828 cuft
Drainage area	=	5.730 ac	Curve number	=	84*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	6.00 min
Total precip.	=	2.70 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.260 x 61) + (2.350 x 98) + (2.020 x 74) + (1.100 x 80)] / 5.730



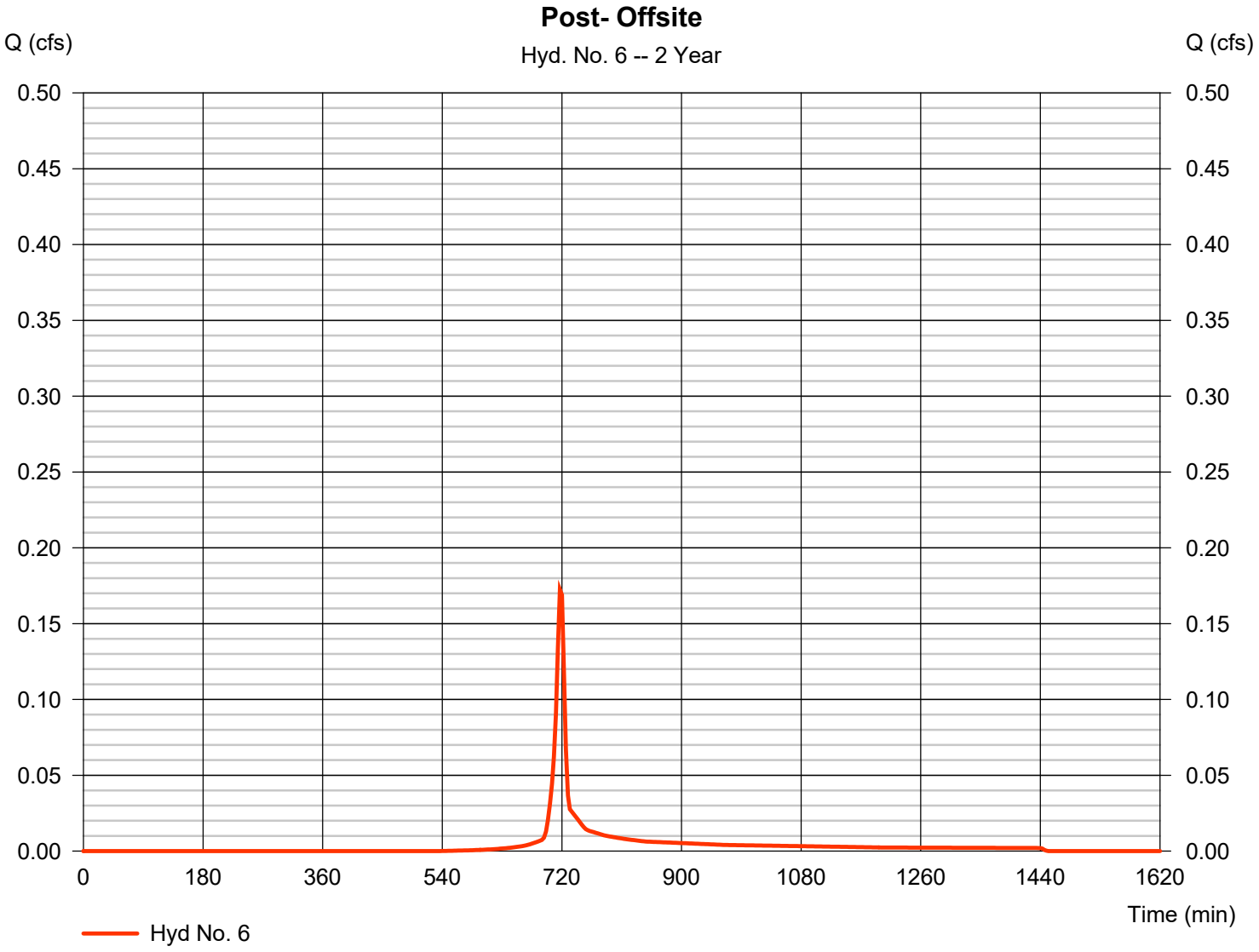
Hydrograph Report

Hyd. No. 6

Post- Offsite

Hydrograph type	= SCS Runoff	Peak discharge	= 0.172 cfs
Storm frequency	= 2 yrs	Time to peak	= 717 min
Time interval	= 3 min	Hyd. volume	= 390 cuft
Drainage area	= 0.090 ac	Curve number	= 84*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 2.70 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.030 x 61) + (0.050 x 98) + (0.010 x 80)] / 0.090



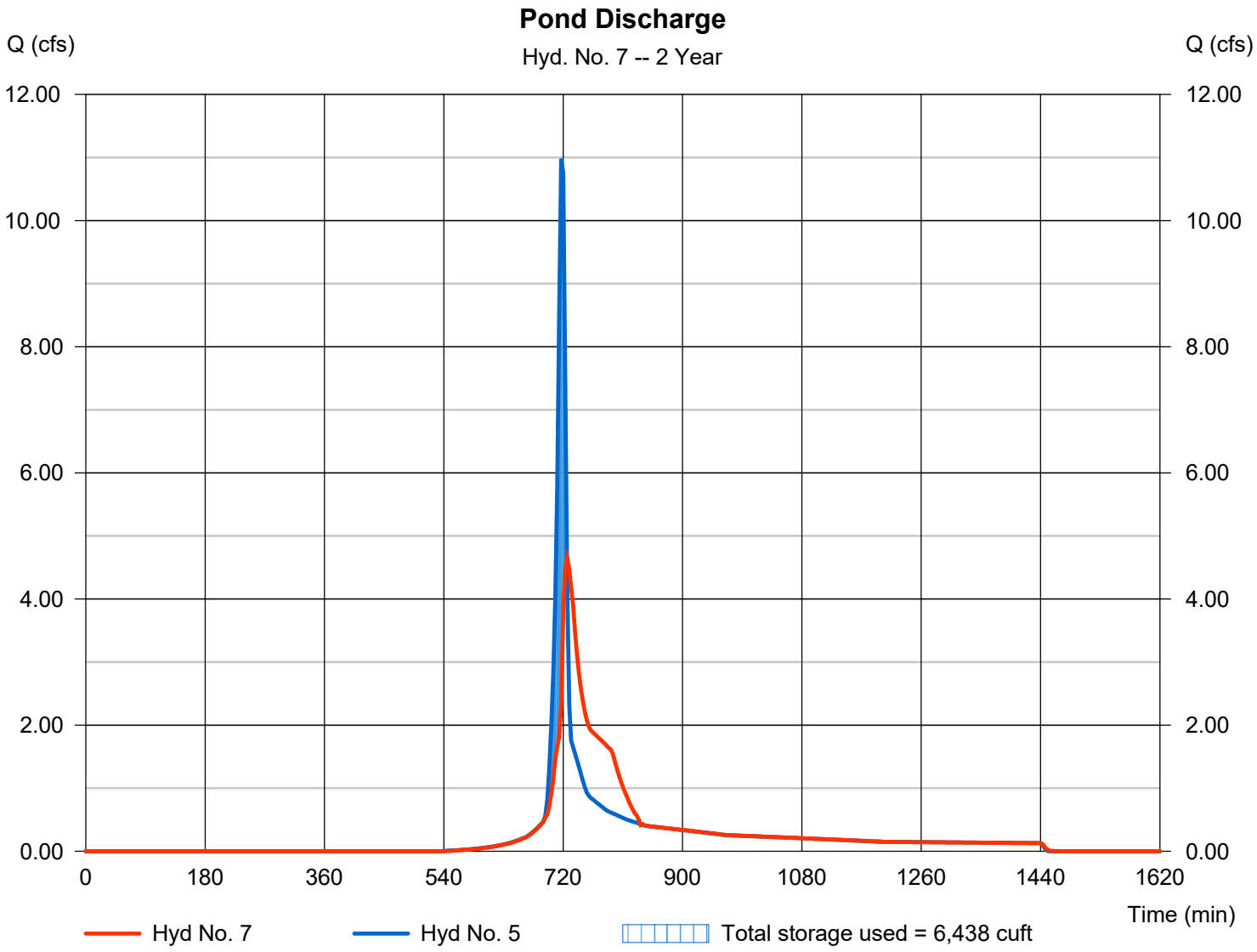
Hydrograph Report

Hyd. No. 7

Pond Discharge

Hydrograph type	= Reservoir	Peak discharge	= 4.642 cfs
Storm frequency	= 2 yrs	Time to peak	= 726 min
Time interval	= 3 min	Hyd. volume	= 24,828 cuft
Inflow hyd. No.	= 5 - Post- Pond	Max. Elevation	= 138.15 ft
Reservoir name	= South Detention	Max. Storage	= 6,438 cuft

Storage Indication method used.

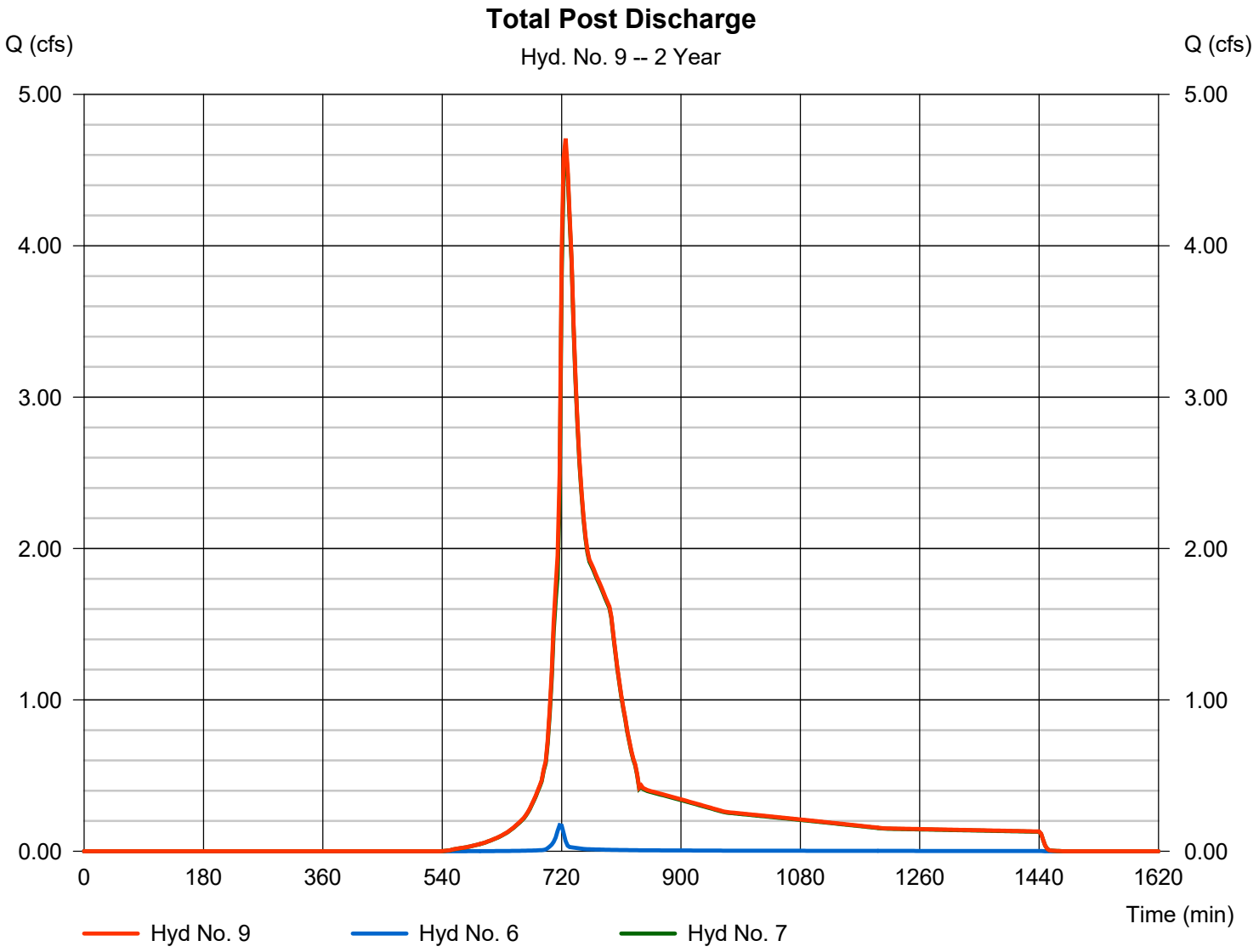


Hydrograph Report

Hyd. No. 9

Total Post Discharge

Hydrograph type	=	Combine	Peak discharge	=	4.709 cfs
Storm frequency	=	2 yrs	Time to peak	=	726 min
Time interval	=	3 min	Hyd. volume	=	25,218 cuft
Inflow hyds.	=	6, 7	Contrib. drain. area	=	0.090 ac



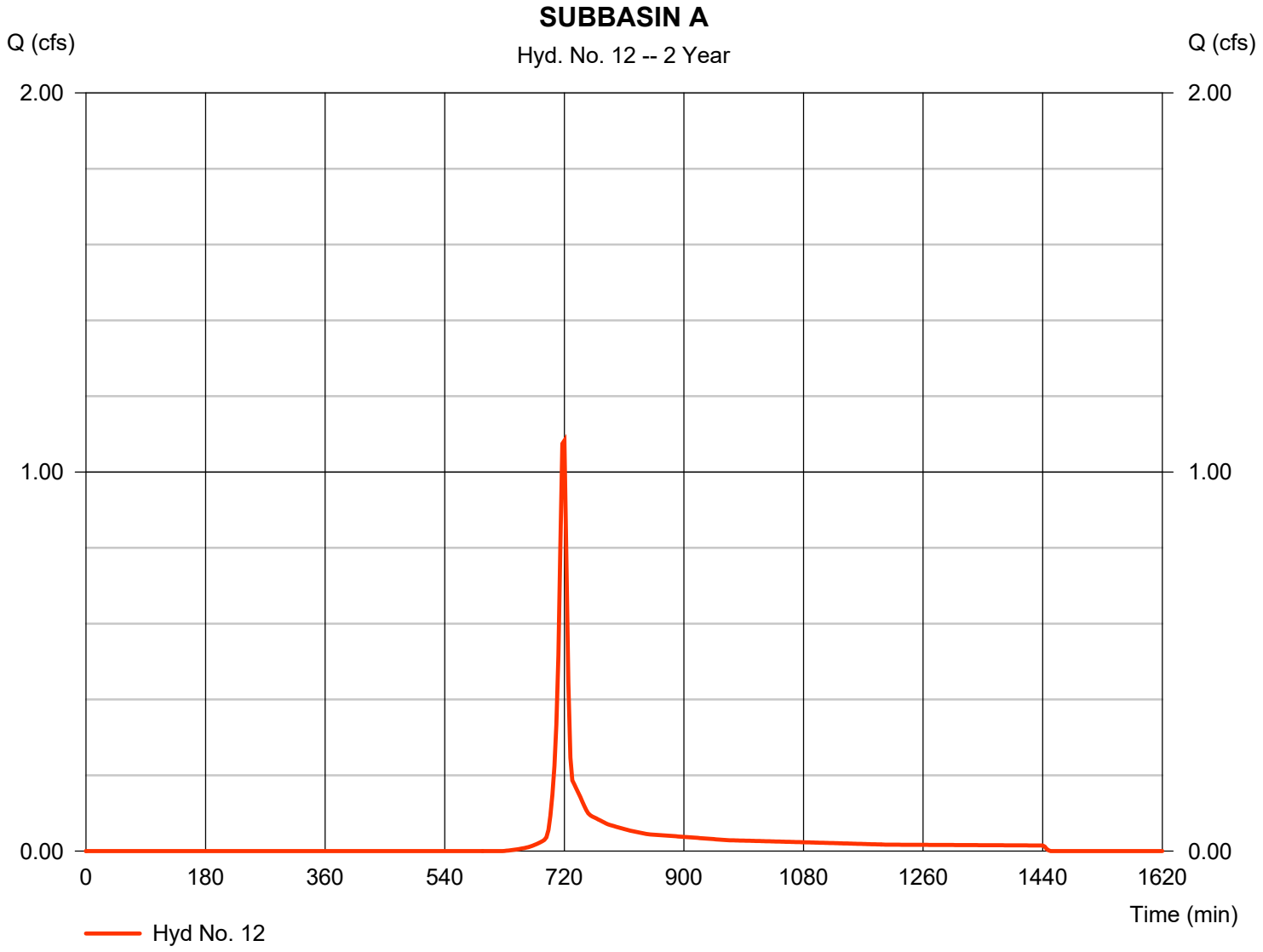
Hydrograph Report

Hyd. No. 12

SUBBASIN A

Hydrograph type	=	SCS Runoff	Peak discharge	=	1.083 cfs
Storm frequency	=	2 yrs	Time to peak	=	720 min
Time interval	=	3 min	Hyd. volume	=	2,486 cuft
Drainage area	=	0.750 ac	Curve number	=	79*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	6.00 min
Total precip.	=	2.70 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.230 x 98) + (0.240 x 61) + (0.280 x 80)] / 0.750



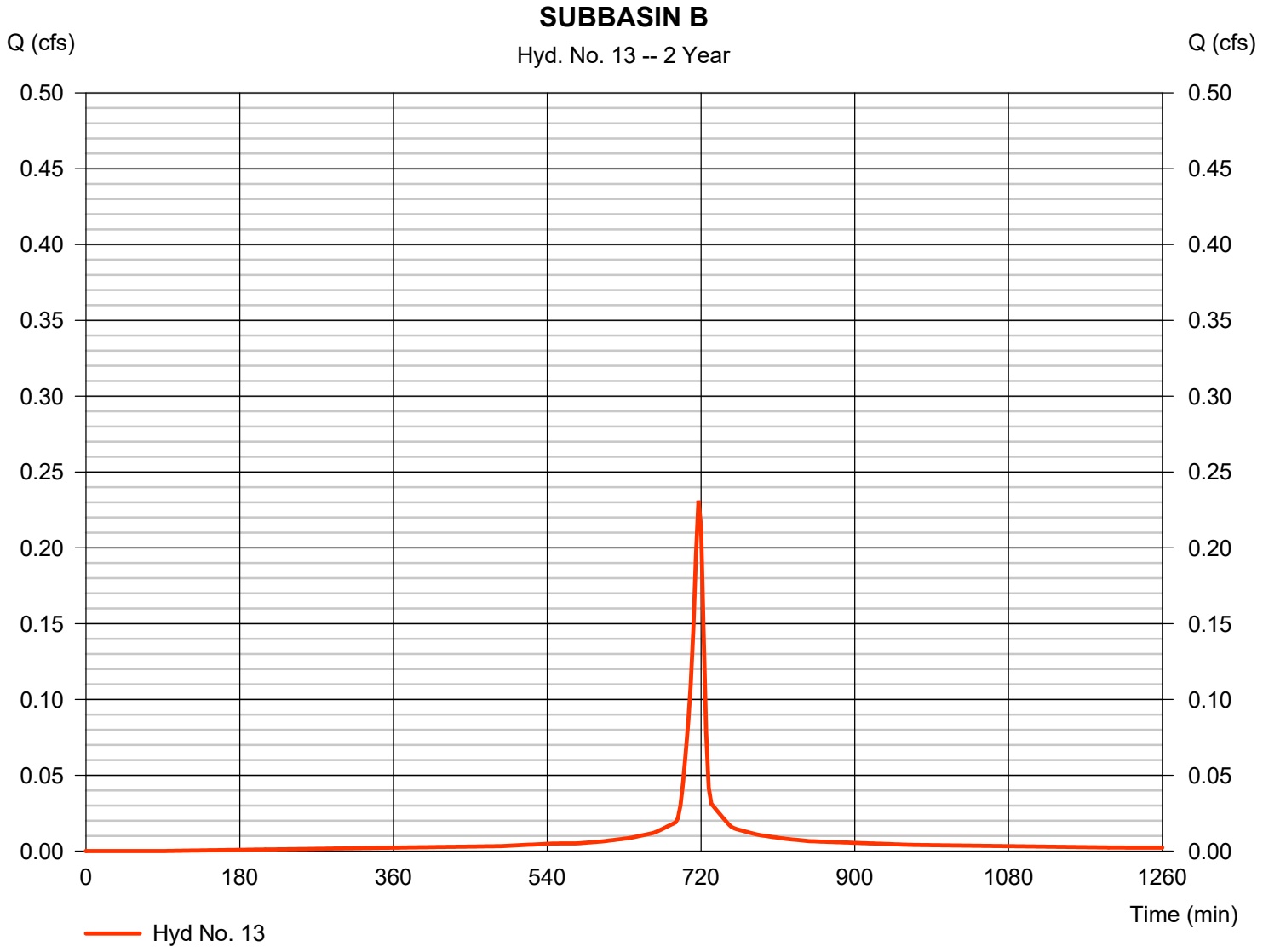
Hydrograph Report

Hyd. No. 13

SUBBASIN B

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.231 cfs
Storm frequency	=	2 yrs	Time to peak	=	717 min
Time interval	=	3 min	Hyd. volume	=	588 cuft
Drainage area	=	0.070 ac	Curve number	=	98*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	6.00 min
Total precip.	=	2.70 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.070 x 98)] / 0.070



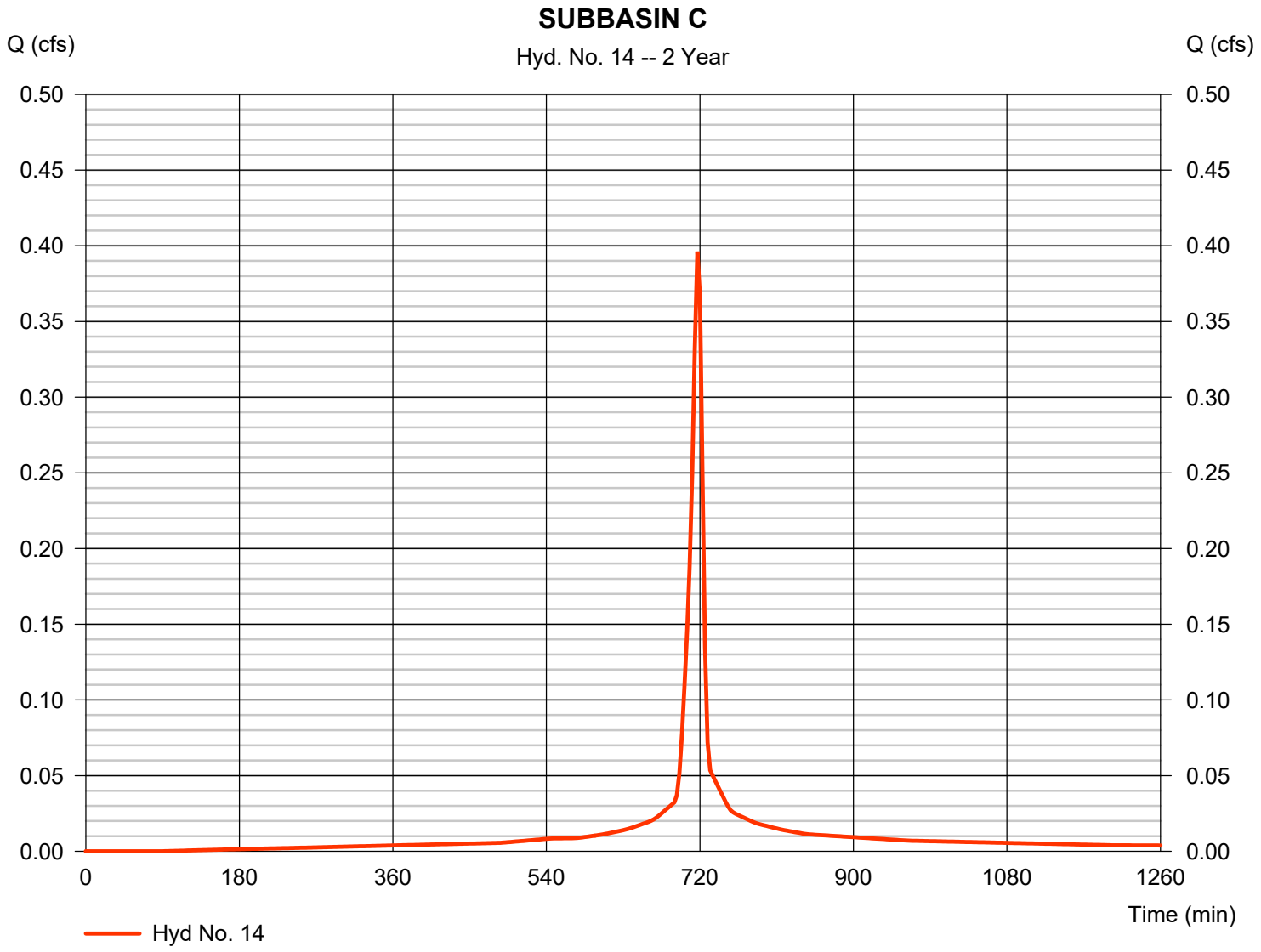
Hydrograph Report

Hyd. No. 14

SUBBASIN C

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.396 cfs
Storm frequency	=	2 yrs	Time to peak	=	717 min
Time interval	=	3 min	Hyd. volume	=	1,009 cuft
Drainage area	=	0.120 ac	Curve number	=	98*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	6.00 min
Total precip.	=	2.70 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.120 x 98)] / 0.120



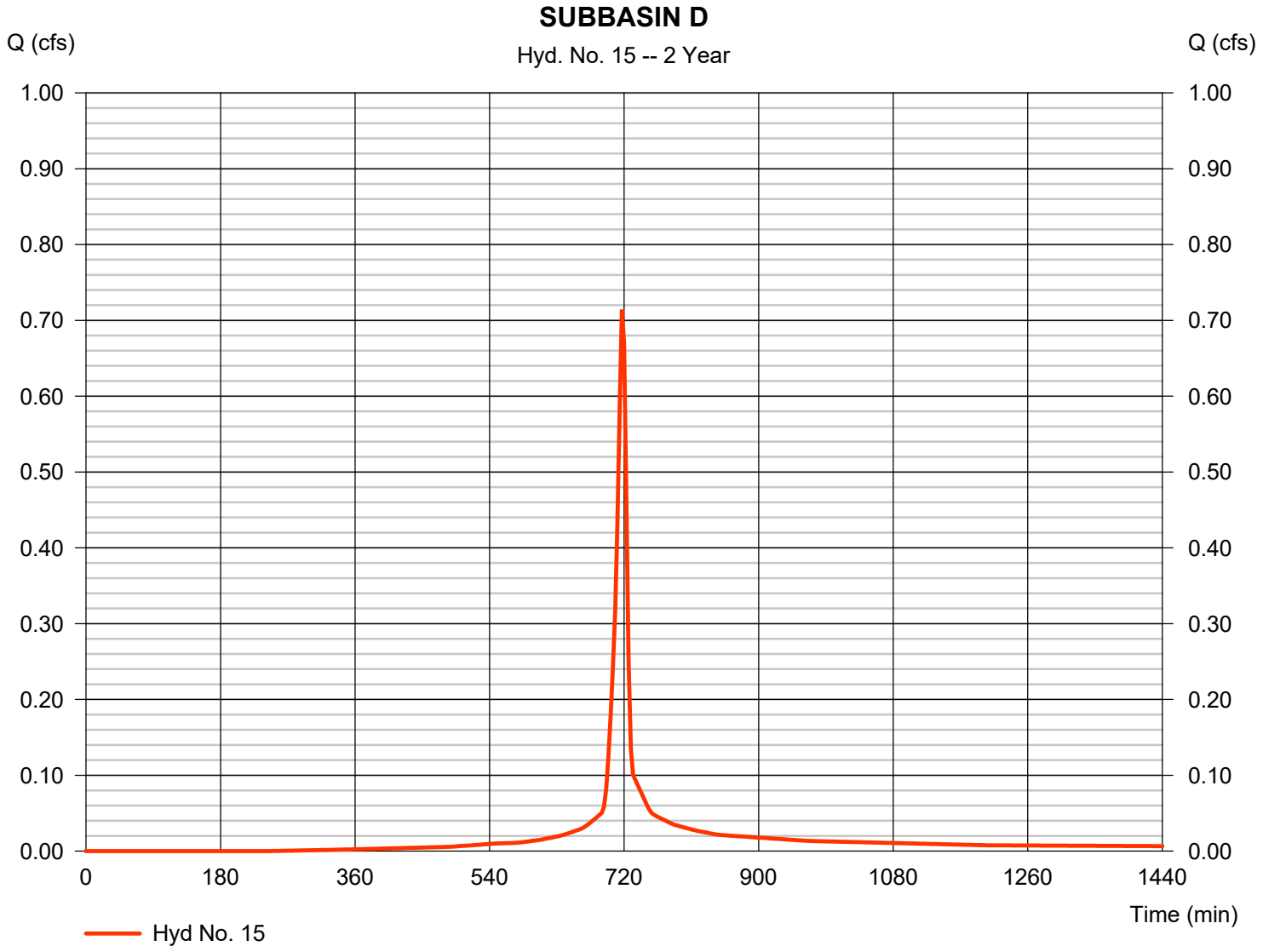
Hydrograph Report

Hyd. No. 15

SUBBASIN D

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.714 cfs
Storm frequency	=	2 yrs	Time to peak	=	717 min
Time interval	=	3 min	Hyd. volume	=	1,683 cuft
Drainage area	=	0.240 ac	Curve number	=	94*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	6.00 min
Total precip.	=	2.70 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.190 x 98) + (0.050 x 80)] / 0.240



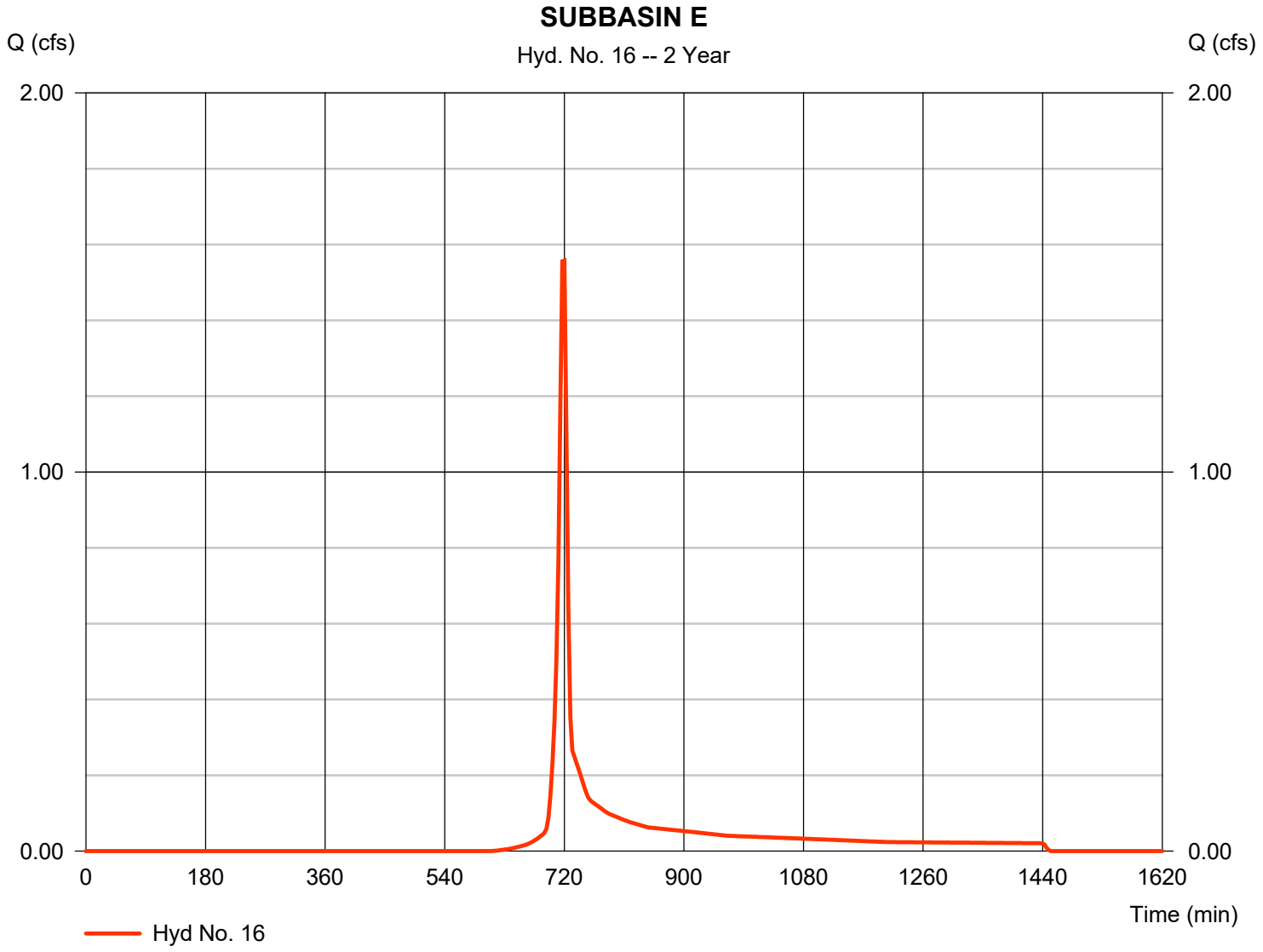
Hydrograph Report

Hyd. No. 16

SUBBASIN E

Hydrograph type	= SCS Runoff	Peak discharge	= 1.558 cfs
Storm frequency	= 2 yrs	Time to peak	= 720 min
Time interval	= 3 min	Hyd. volume	= 3,575 cuft
Drainage area	= 1.020 ac	Curve number	= 80*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 2.70 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.020 x 98) + (1.000 x 80)] / 1.020



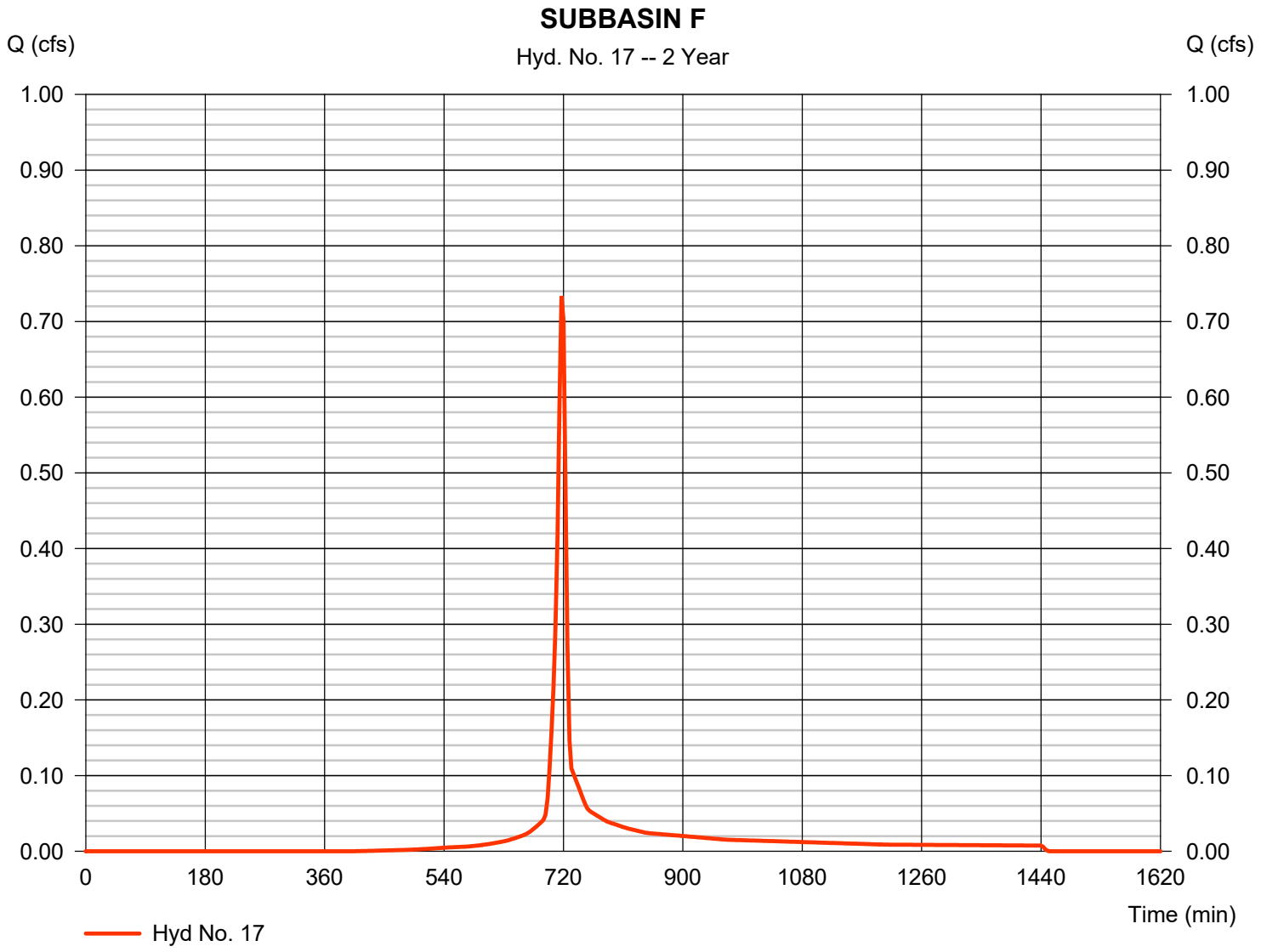
Hydrograph Report

Hyd. No. 17

SUBBASIN F

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.733 cfs
Storm frequency	=	2 yrs	Time to peak	=	717 min
Time interval	=	3 min	Hyd. volume	=	1,665 cuft
Drainage area	=	0.300 ac	Curve number	=	89*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	6.00 min
Total precip.	=	2.70 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.190 x 98) + (0.110 x 74)] / 0.300



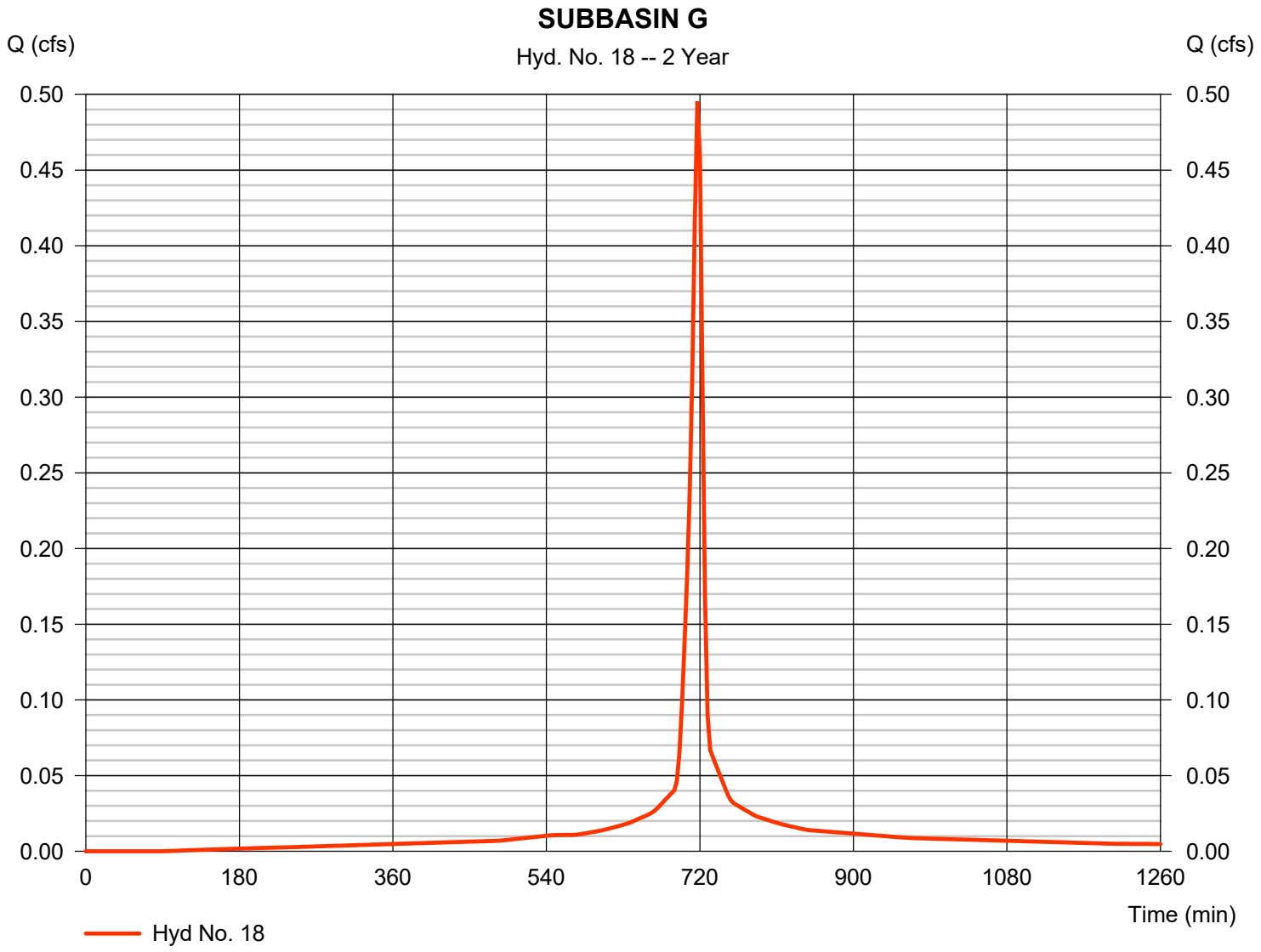
Hydrograph Report

Hyd. No. 18

SUBBASIN G

Hydrograph type	= SCS Runoff	Peak discharge	= 0.495 cfs
Storm frequency	= 2 yrs	Time to peak	= 717 min
Time interval	= 3 min	Hyd. volume	= 1,261 cuft
Drainage area	= 0.150 ac	Curve number	= 98*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 2.70 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.150 x 98)] / 0.150



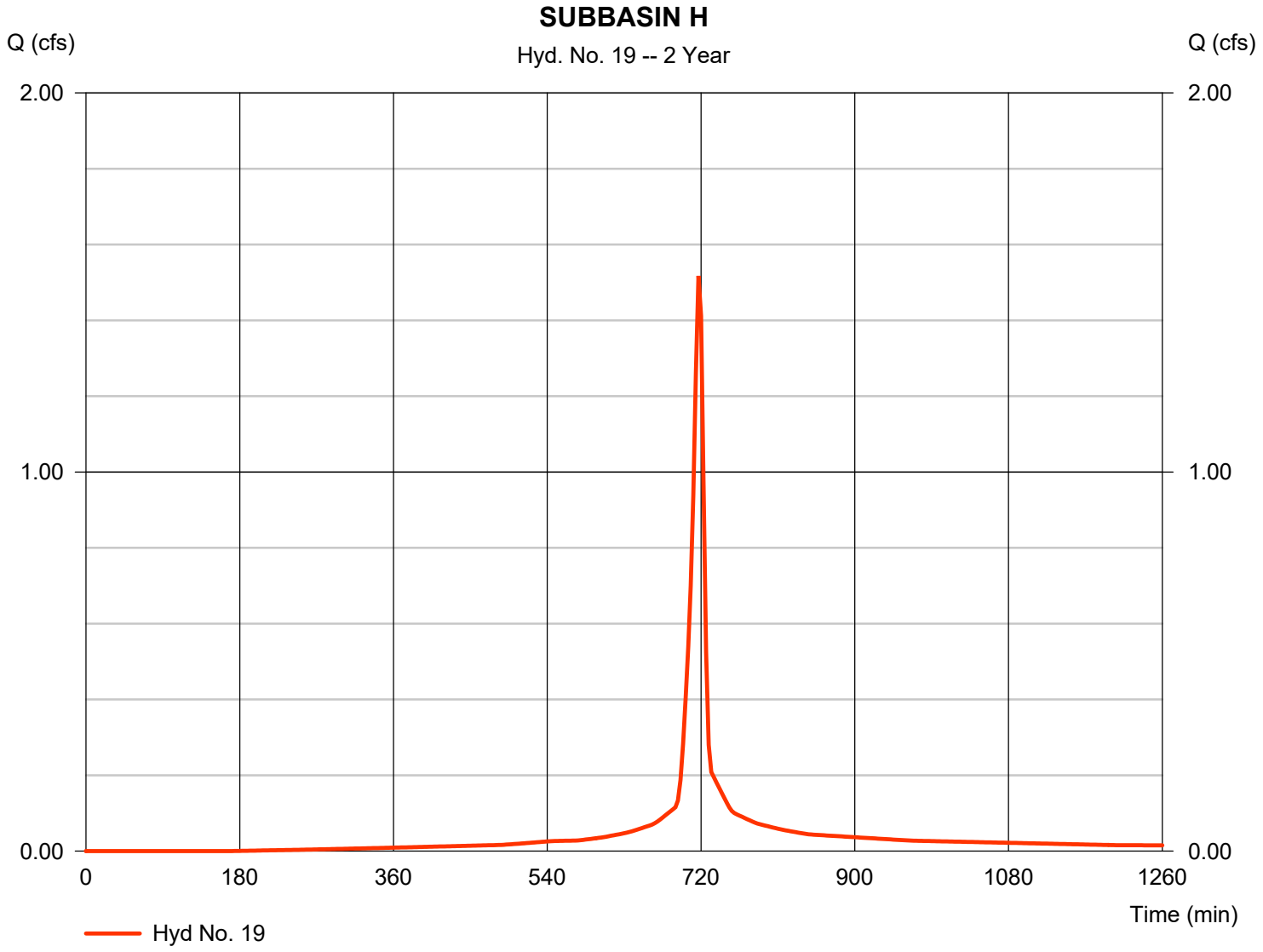
Hydrograph Report

Hyd. No. 19

SUBBASIN H

Hydrograph type	=	SCS Runoff	Peak discharge	=	1.517 cfs
Storm frequency	=	2 yrs	Time to peak	=	717 min
Time interval	=	3 min	Hyd. volume	=	3,687 cuft
Drainage area	=	0.480 ac	Curve number	=	96*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	6.00 min
Total precip.	=	2.70 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.430 x 98) + (0.050 x 74)] / 0.480



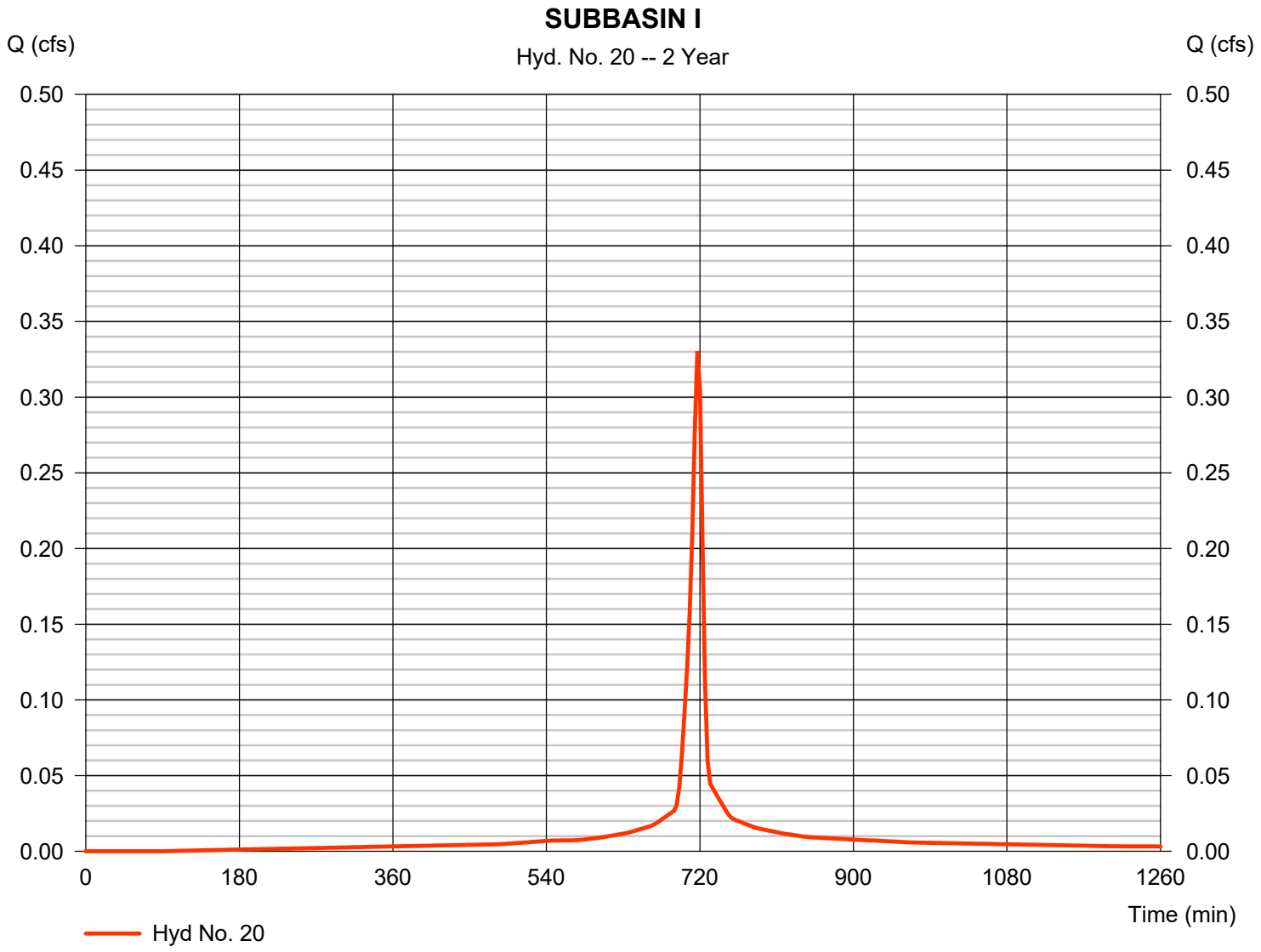
Hydrograph Report

Hyd. No. 20

SUBBASIN I

Hydrograph type	= SCS Runoff	Peak discharge	= 0.330 cfs
Storm frequency	= 2 yrs	Time to peak	= 717 min
Time interval	= 3 min	Hyd. volume	= 840 cuft
Drainage area	= 0.100 ac	Curve number	= 98*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 2.70 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.100 x 98)] / 0.100



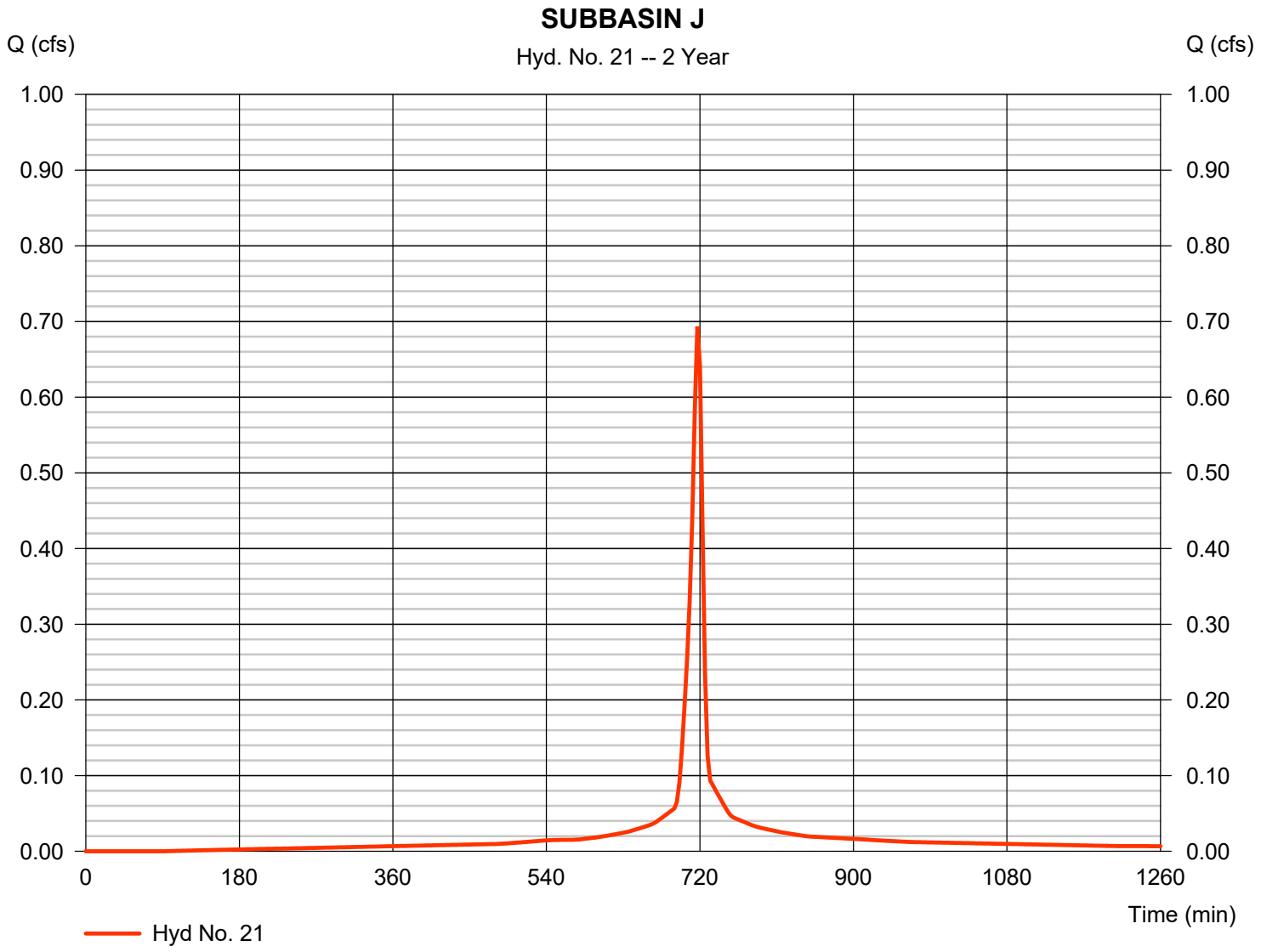
Hydrograph Report

Hyd. No. 21

SUBBASIN J

Hydrograph type	= SCS Runoff	Peak discharge	= 0.693 cfs
Storm frequency	= 2 yrs	Time to peak	= 717 min
Time interval	= 3 min	Hyd. volume	= 1,765 cuft
Drainage area	= 0.210 ac	Curve number	= 98*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 2.70 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.210 x 98)] / 0.210



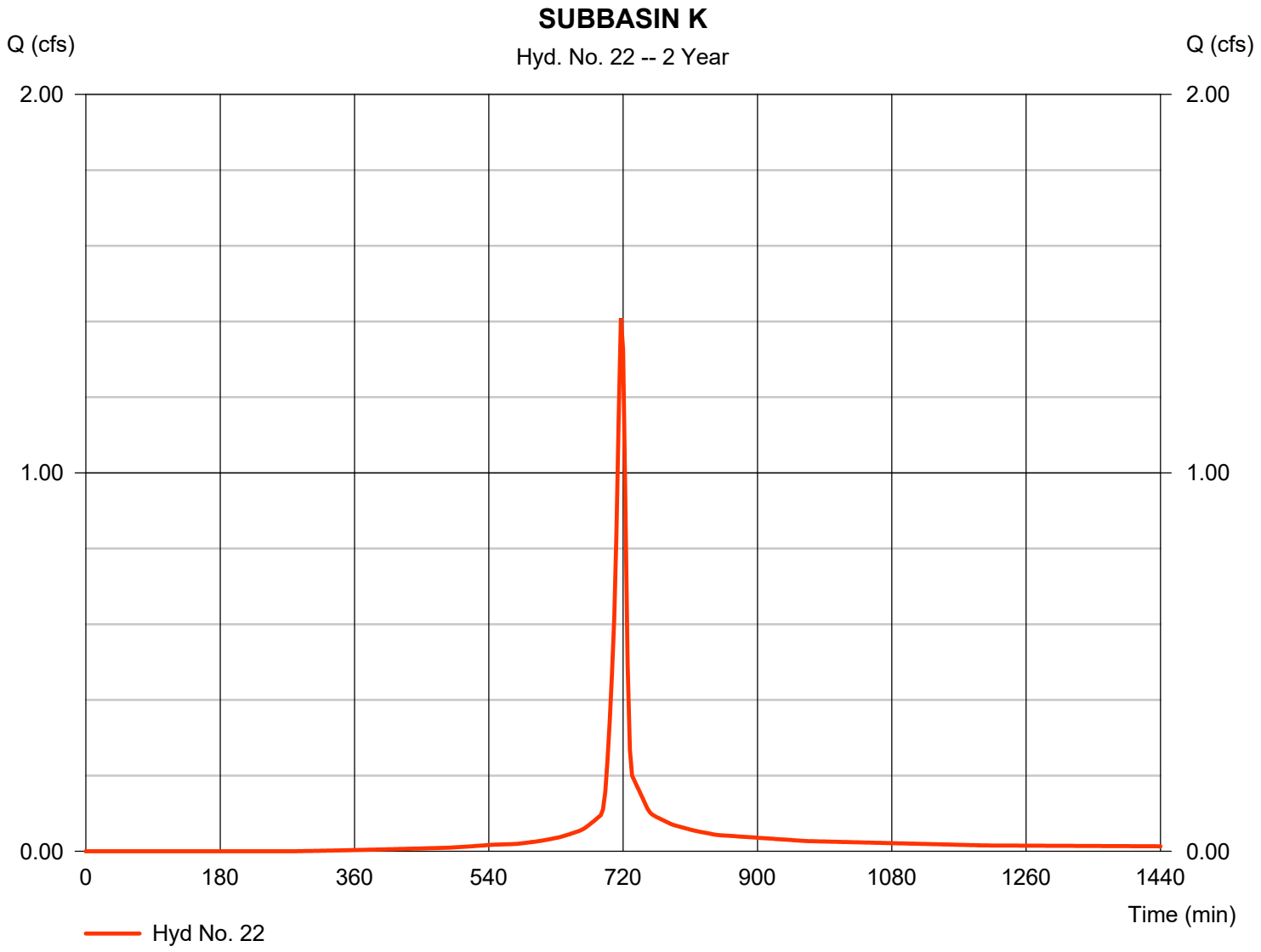
Hydrograph Report

Hyd. No. 22

SUBBASIN K

Hydrograph type	=	SCS Runoff	Peak discharge	=	1.408 cfs
Storm frequency	=	2 yrs	Time to peak	=	717 min
Time interval	=	3 min	Hyd. volume	=	3,282 cuft
Drainage area	=	0.490 ac	Curve number	=	93*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	6.00 min
Total precip.	=	2.70 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.380 x 98) + (0.110 x 74)] / 0.490



Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2016 by Autodesk, Inc. v11

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	9.980	3	726	35,302	------	------	------	Pre-Basin A
2	SCS Runoff	2.277	3	717	5,164	------	------	------	Pre-Offsite
3	Combine	10.82	3	726	40,467	1, 2	------	------	Total Predevelopment
5	SCS Runoff	20.39	3	717	46,236	------	------	------	Post- Pond
6	SCS Runoff	0.320	3	717	726	------	------	------	Post- Offsite
7	Reservoir	7.874	3	726	46,236	5	138.97	12,912	Pond Discharge
9	Combine	7.993	3	726	46,962	6, 7,	------	------	Total Post Discharge
12	SCS Runoff	2.218	3	717	5,011	------	------	------	SUBBASIN A
13	SCS Runoff	0.346	3	717	897	------	------	------	SUBBASIN B
14	SCS Runoff	0.592	3	717	1,538	------	------	------	SUBBASIN C
15	SCS Runoff	1.120	3	717	2,715	------	------	------	SUBBASIN D
16	SCS Runoff	3.138	3	717	7,087	------	------	------	SUBBASIN E
17	SCS Runoff	1.245	3	717	2,882	------	------	------	SUBBASIN F
18	SCS Runoff	0.741	3	717	1,922	------	------	------	SUBBASIN G
19	SCS Runoff	2.316	3	717	5,783	------	------	------	SUBBASIN H
20	SCS Runoff	0.494	3	717	1,281	------	------	------	SUBBASIN I
21	SCS Runoff	1.037	3	717	2,691	------	------	------	SUBBASIN J
22	SCS Runoff	2.241	3	717	5,369	------	------	------	SUBBASIN K

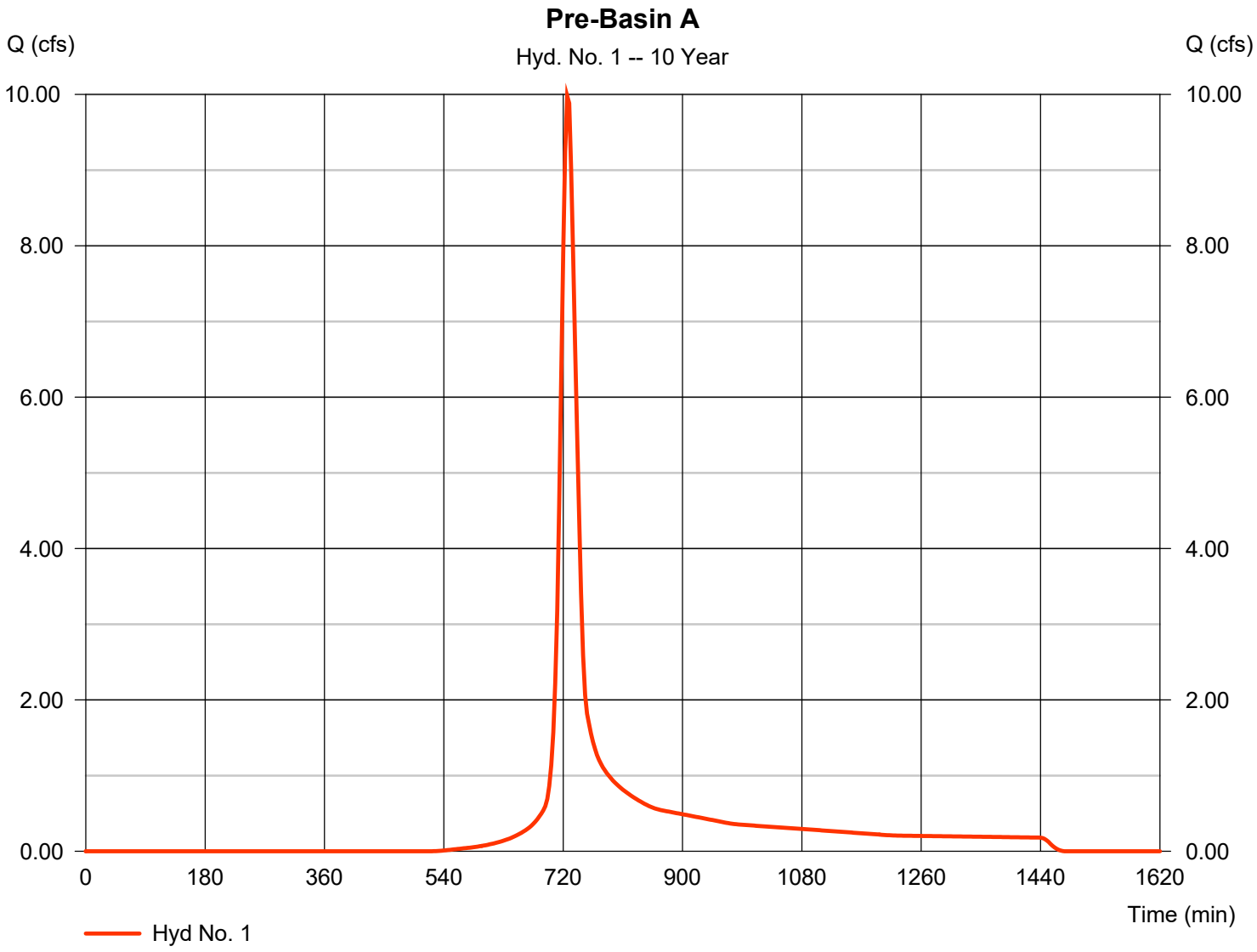
Hydrograph Report

Hyd. No. 1

Pre-Basin A

Hydrograph type	=	SCS Runoff	Peak discharge	=	9.980 cfs
Storm frequency	=	10 yrs	Time to peak	=	726 min
Time interval	=	3 min	Hyd. volume	=	35,302 cuft
Drainage area	=	5.080 ac	Curve number	=	79*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	21.40 min
Total precip.	=	4.00 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.260 x 61) + (1.160 x 98) + (1.170 x 74) + (1.230 x 70) + (0.670 x 80) + (0.590 x 77)] / 5.080



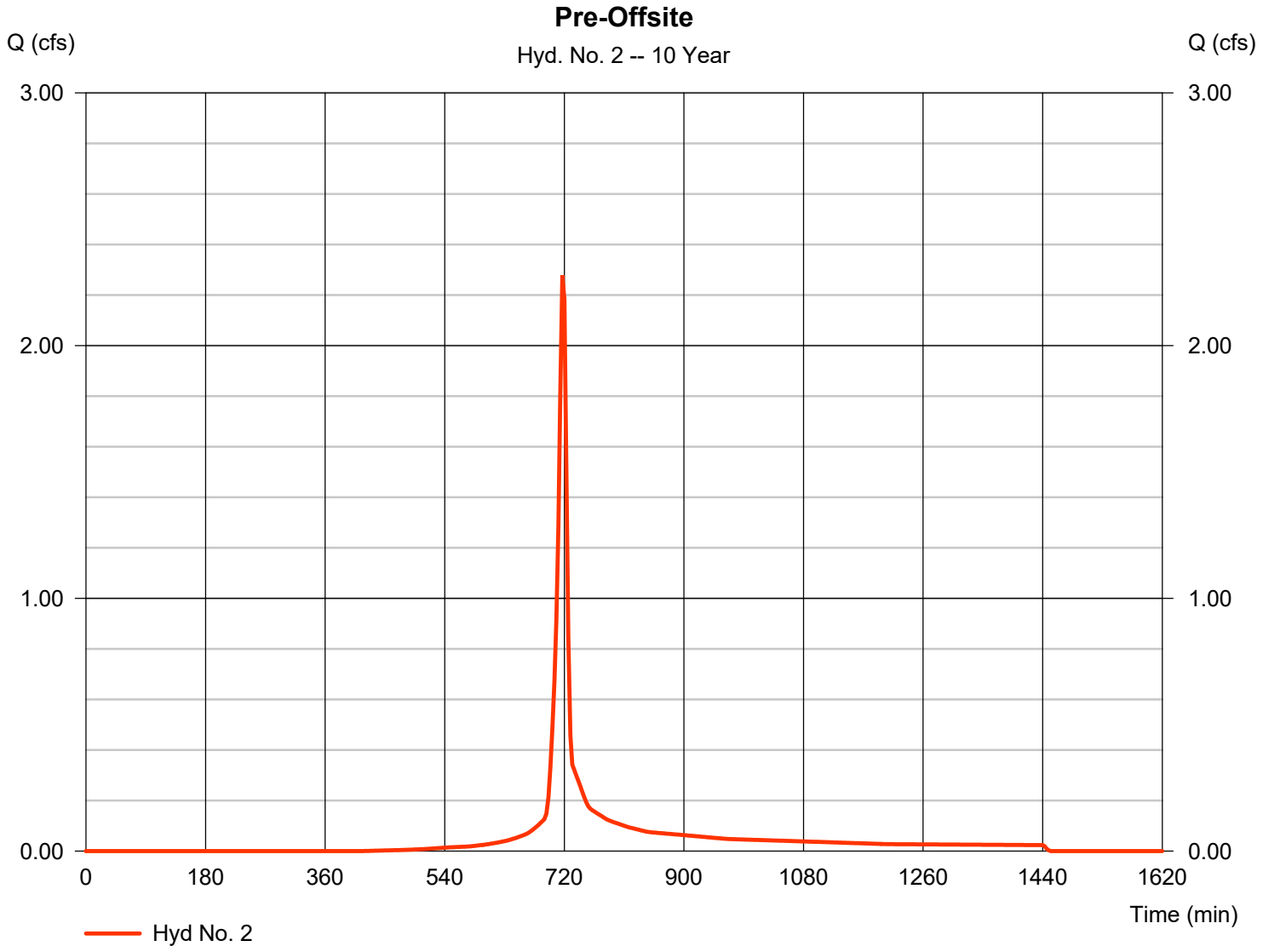
Hydrograph Report

Hyd. No. 2

Pre-Offsite

Hydrograph type	=	SCS Runoff	Peak discharge	=	2.277 cfs
Storm frequency	=	10 yrs	Time to peak	=	717 min
Time interval	=	3 min	Hyd. volume	=	5,164 cuft
Drainage area	=	0.640 ac	Curve number	=	84*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	6.00 min
Total precip.	=	4.00 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.370 x 74) + (0.270 x 98)] / 0.640

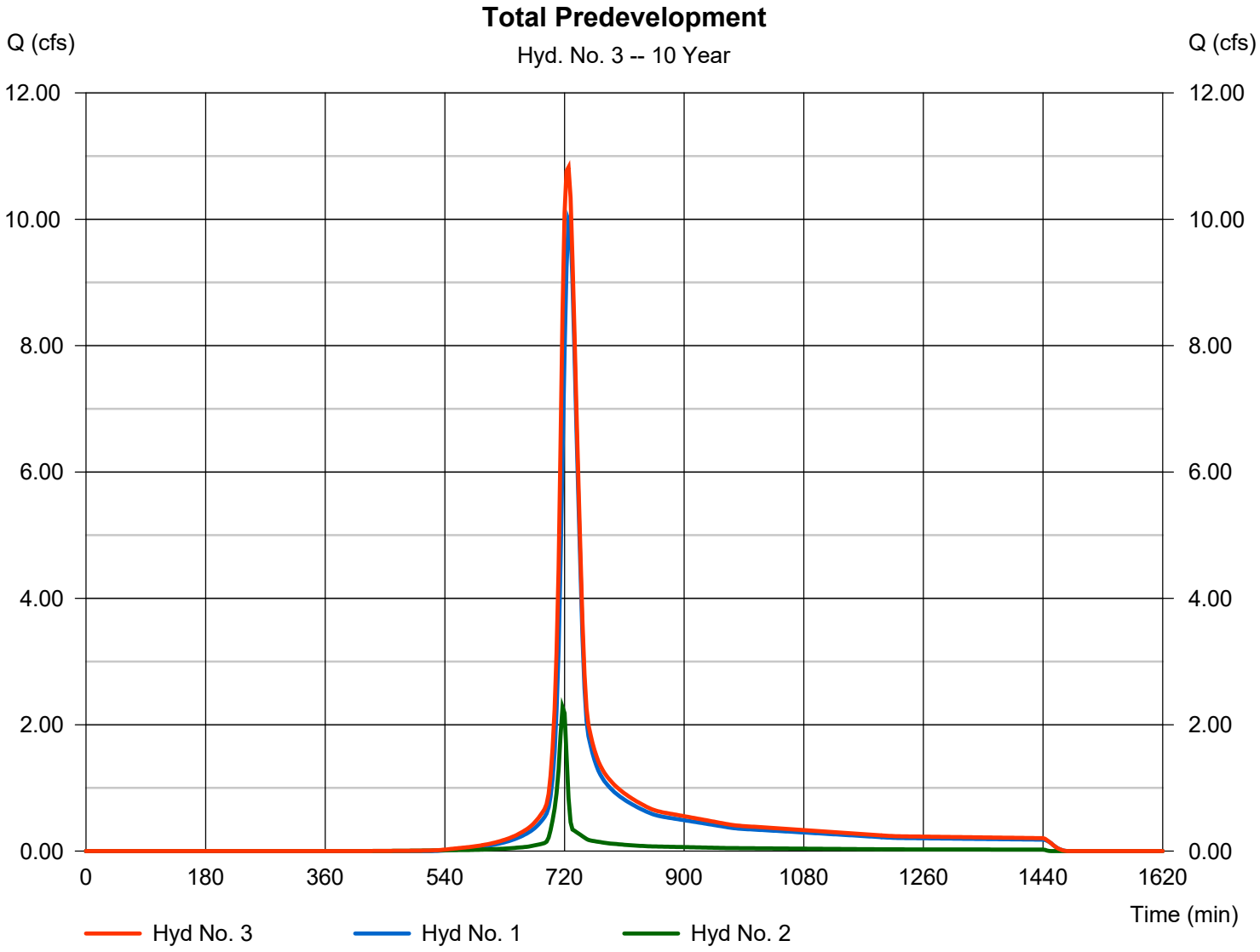


Hydrograph Report

Hyd. No. 3

Total Predevelopment

Hydrograph type	= Combine	Peak discharge	= 10.82 cfs
Storm frequency	= 10 yrs	Time to peak	= 726 min
Time interval	= 3 min	Hyd. volume	= 40,467 cuft
Inflow hyds.	= 1, 2	Contrib. drain. area	= 5.720 ac



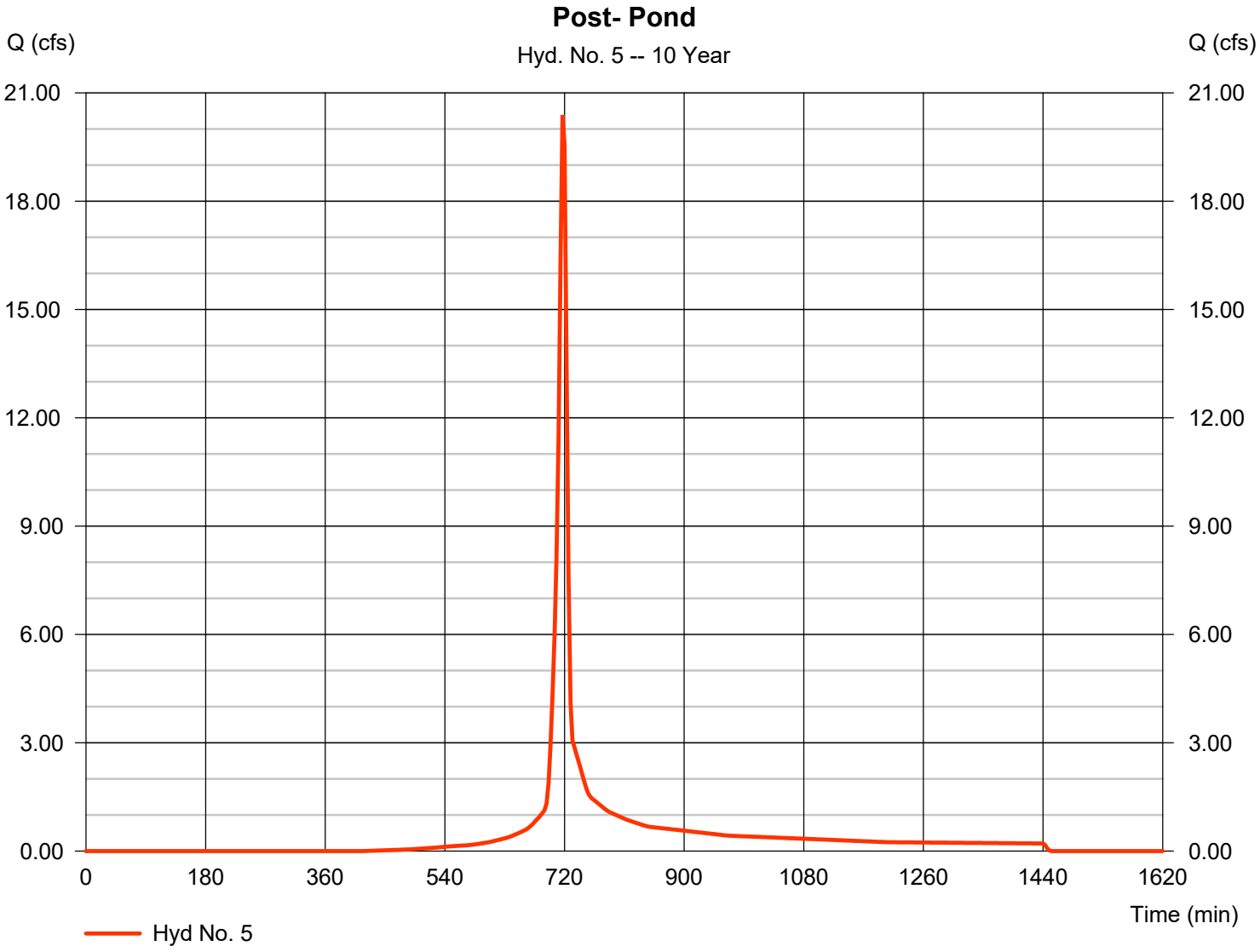
Hydrograph Report

Hyd. No. 5

Post- Pond

Hydrograph type	=	SCS Runoff	Peak discharge	=	20.39 cfs
Storm frequency	=	10 yrs	Time to peak	=	717 min
Time interval	=	3 min	Hyd. volume	=	46,236 cuft
Drainage area	=	5.730 ac	Curve number	=	84*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	6.00 min
Total precip.	=	4.00 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.260 x 61) + (2.350 x 98) + (2.020 x 74) + (1.100 x 80)] / 5.730



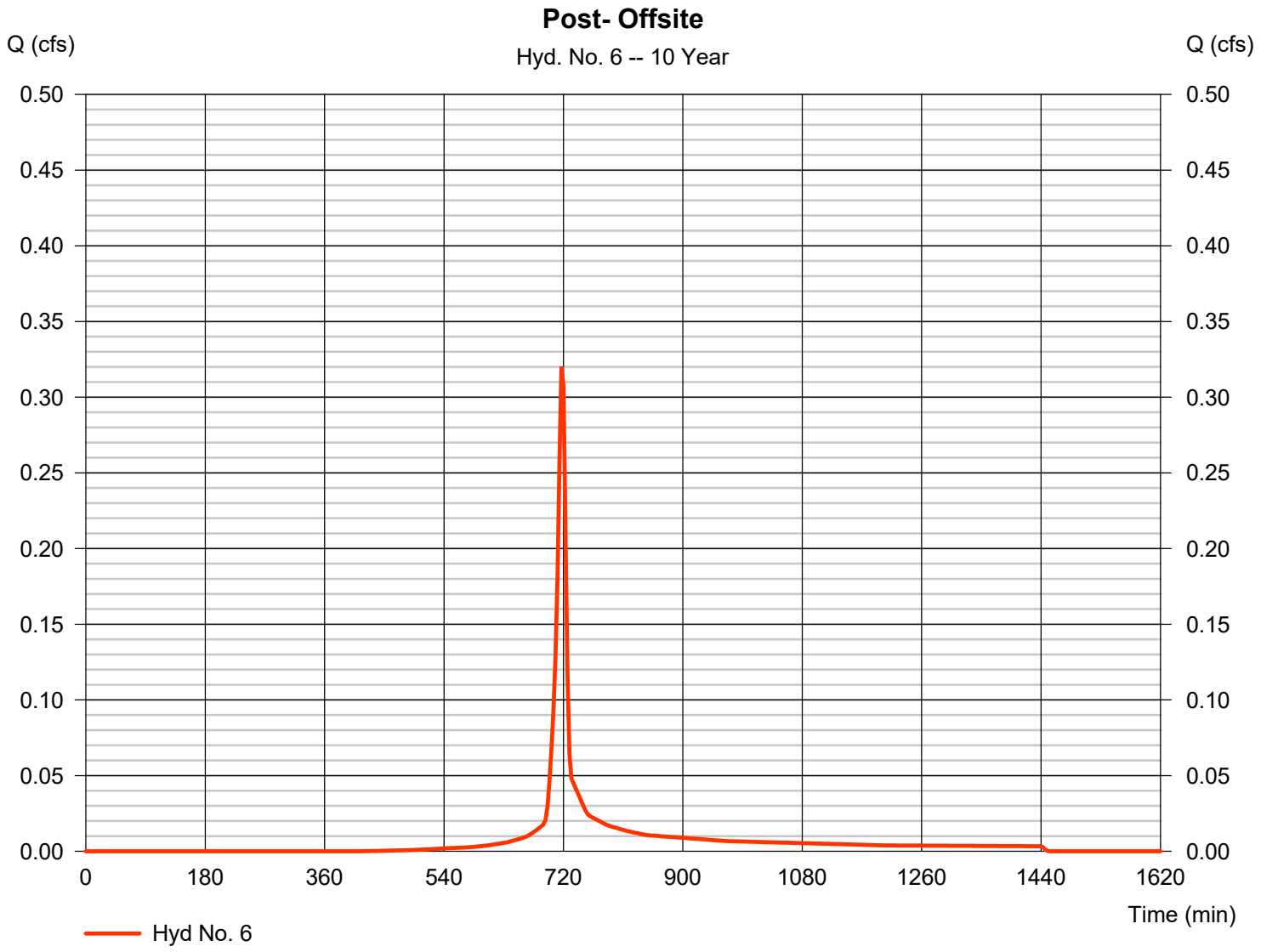
Hydrograph Report

Hyd. No. 6

Post- Offsite

Hydrograph type	= SCS Runoff	Peak discharge	= 0.320 cfs
Storm frequency	= 10 yrs	Time to peak	= 717 min
Time interval	= 3 min	Hyd. volume	= 726 cuft
Drainage area	= 0.090 ac	Curve number	= 84*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 4.00 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.030 x 61) + (0.050 x 98) + (0.010 x 80)] / 0.090



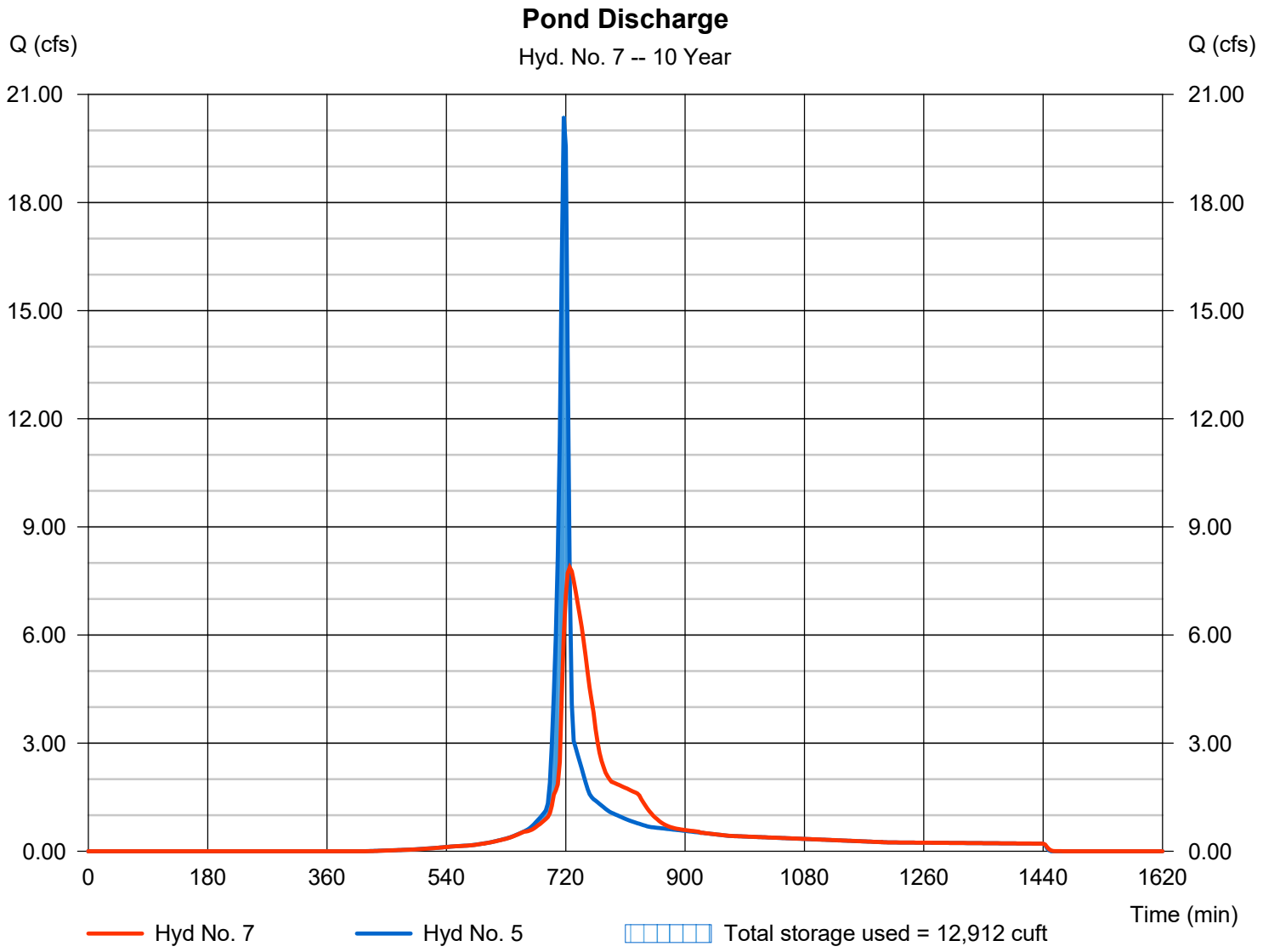
Hydrograph Report

Hyd. No. 7

Pond Discharge

Hydrograph type	=	Reservoir	Peak discharge	=	7.874 cfs
Storm frequency	=	10 yrs	Time to peak	=	726 min
Time interval	=	3 min	Hyd. volume	=	46,236 cuft
Inflow hyd. No.	=	5 - Post- Pond	Max. Elevation	=	138.97 ft
Reservoir name	=	South Detention	Max. Storage	=	12,912 cuft

Storage Indication method used.

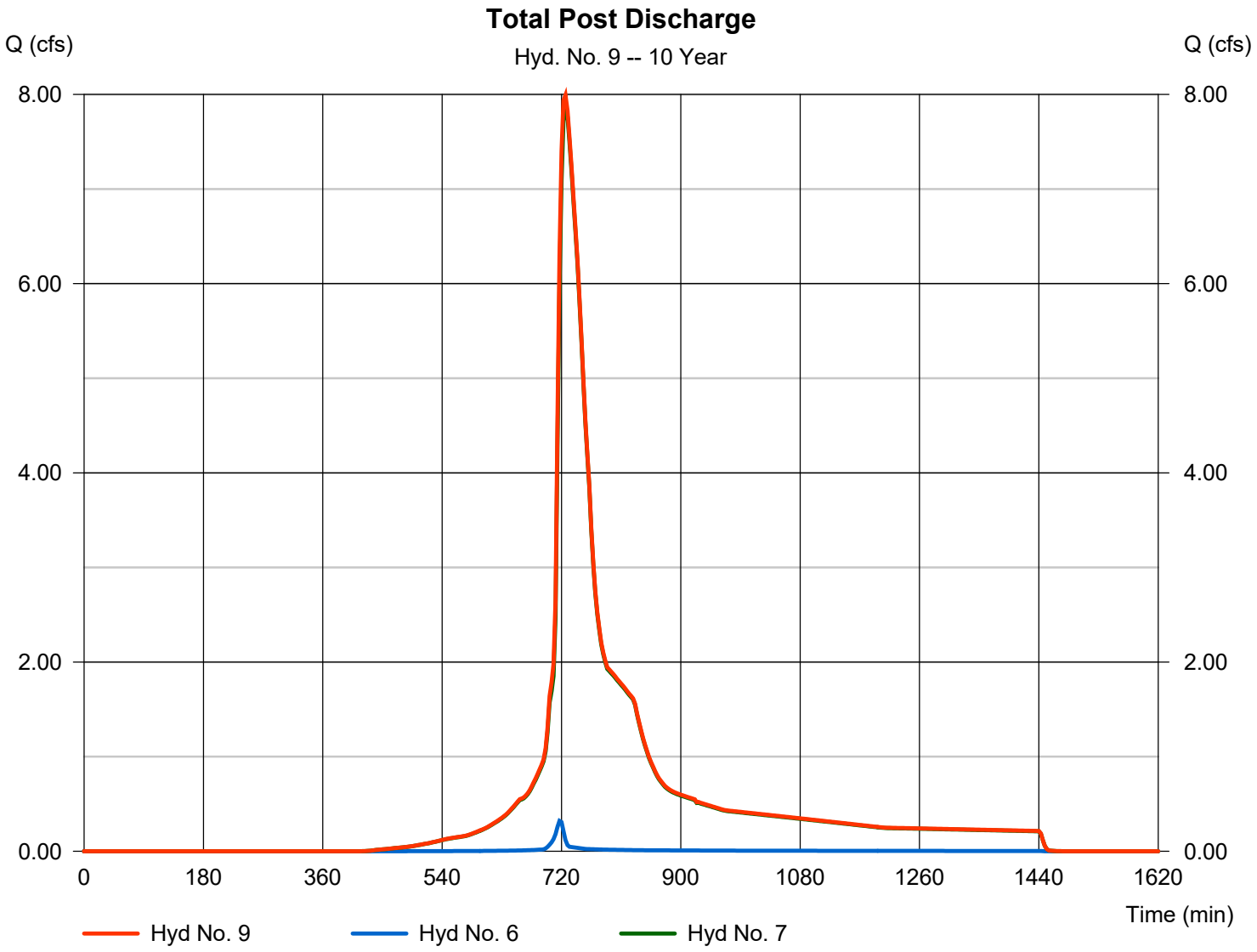


Hydrograph Report

Hyd. No. 9

Total Post Discharge

Hydrograph type	=	Combine	Peak discharge	=	7.993 cfs
Storm frequency	=	10 yrs	Time to peak	=	726 min
Time interval	=	3 min	Hyd. volume	=	46,962 cuft
Inflow hyds.	=	6, 7	Contrib. drain. area	=	0.090 ac



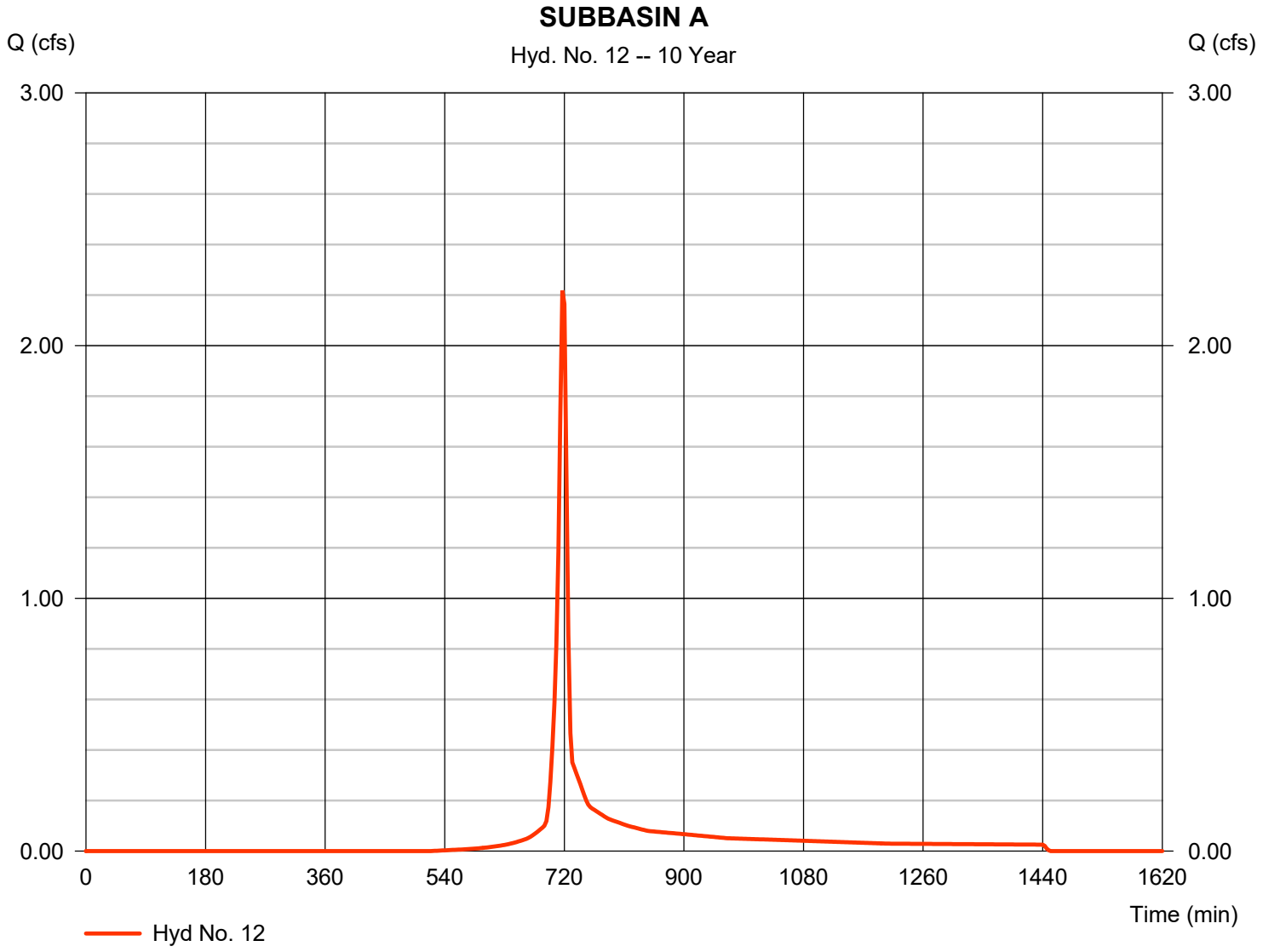
Hydrograph Report

Hyd. No. 12

SUBBASIN A

Hydrograph type	= SCS Runoff	Peak discharge	= 2.218 cfs
Storm frequency	= 10 yrs	Time to peak	= 717 min
Time interval	= 3 min	Hyd. volume	= 5,011 cuft
Drainage area	= 0.750 ac	Curve number	= 79*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 4.00 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.230 x 98) + (0.240 x 61) + (0.280 x 80)] / 0.750



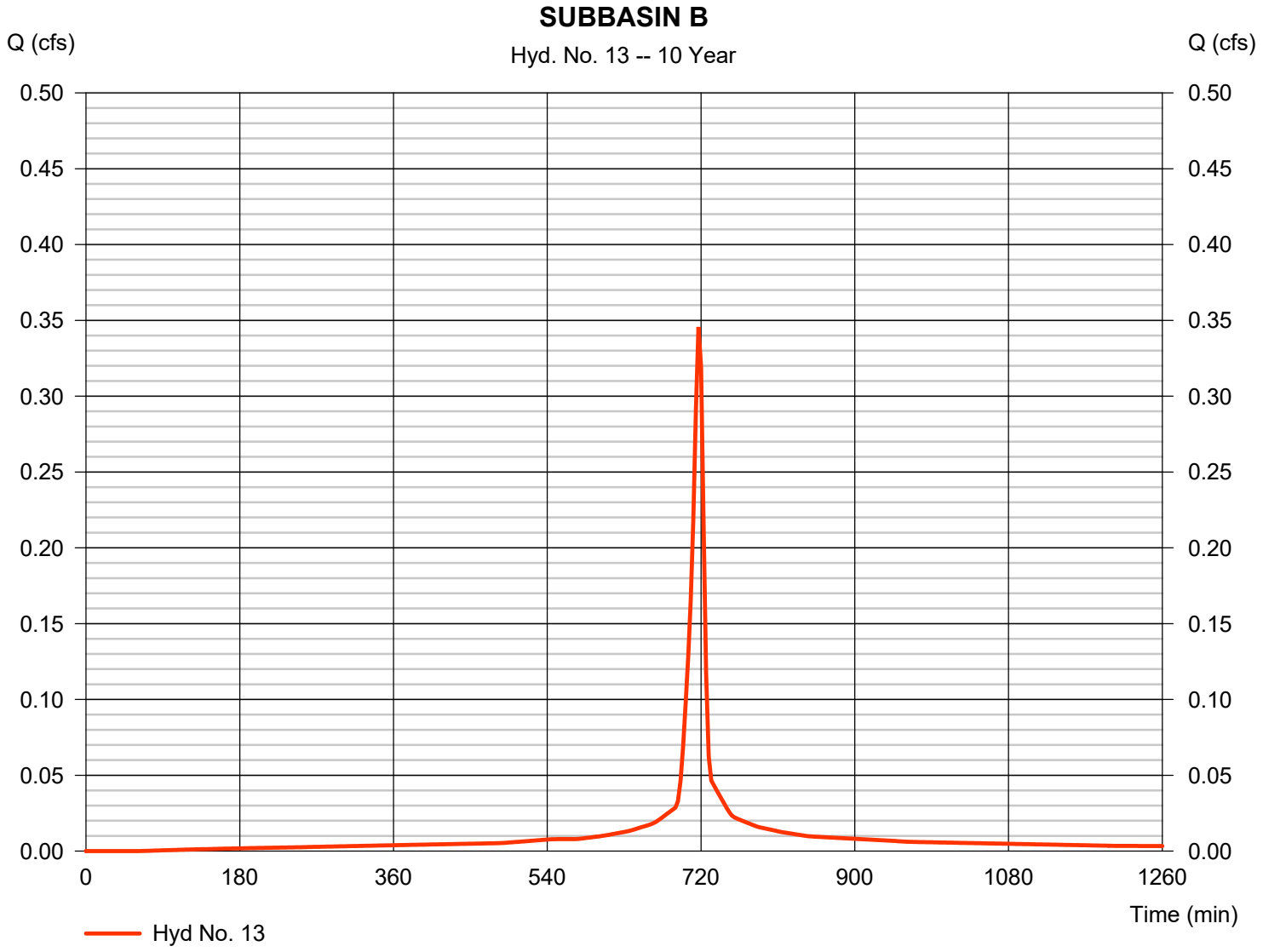
Hydrograph Report

Hyd. No. 13

SUBBASIN B

Hydrograph type	= SCS Runoff	Peak discharge	= 0.346 cfs
Storm frequency	= 10 yrs	Time to peak	= 717 min
Time interval	= 3 min	Hyd. volume	= 897 cuft
Drainage area	= 0.070 ac	Curve number	= 98*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 4.00 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.070 x 98)] / 0.070



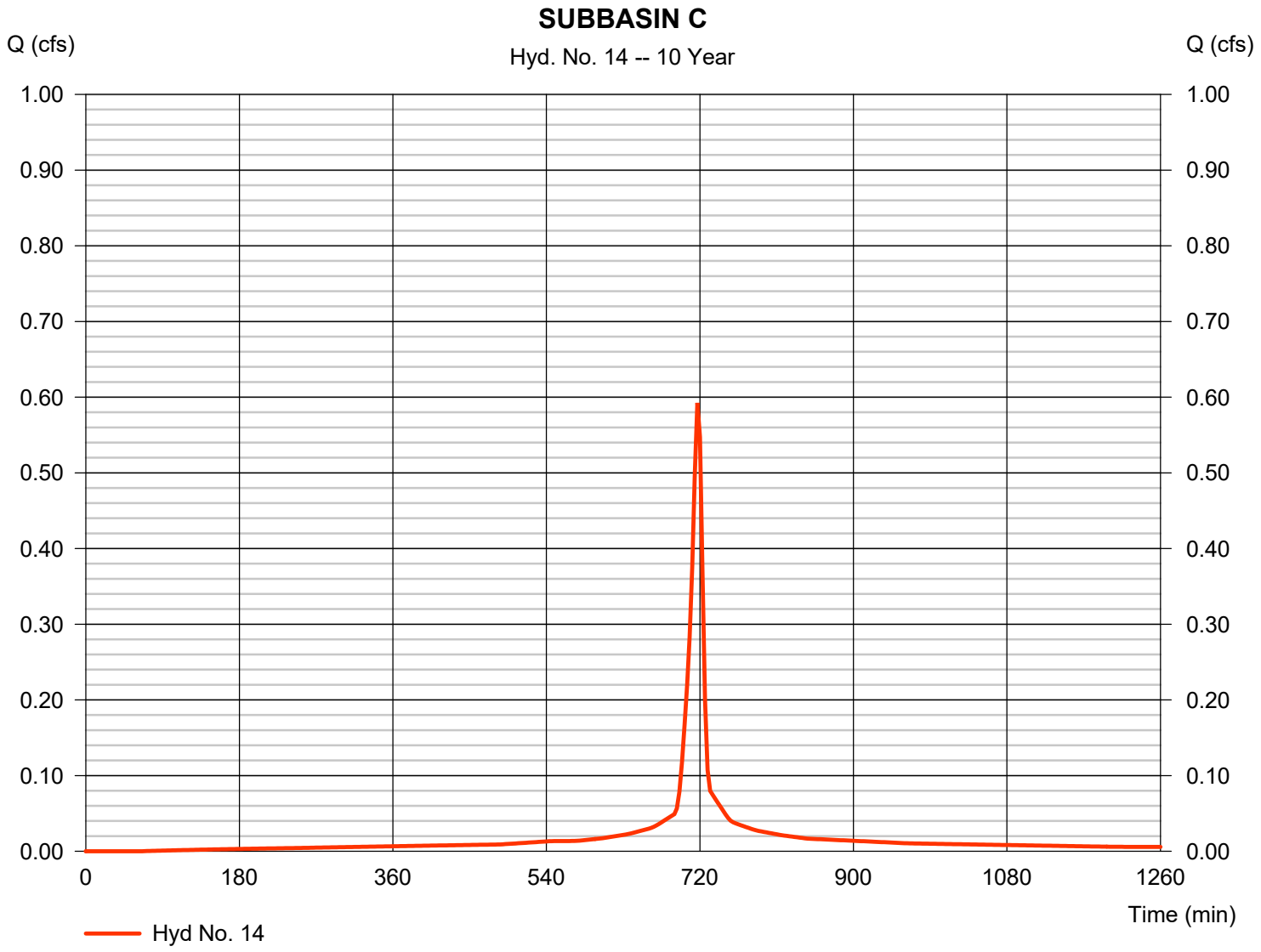
Hydrograph Report

Hyd. No. 14

SUBBASIN C

Hydrograph type	= SCS Runoff	Peak discharge	= 0.592 cfs
Storm frequency	= 10 yrs	Time to peak	= 717 min
Time interval	= 3 min	Hyd. volume	= 1,538 cuft
Drainage area	= 0.120 ac	Curve number	= 98*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 4.00 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.120 x 98)] / 0.120



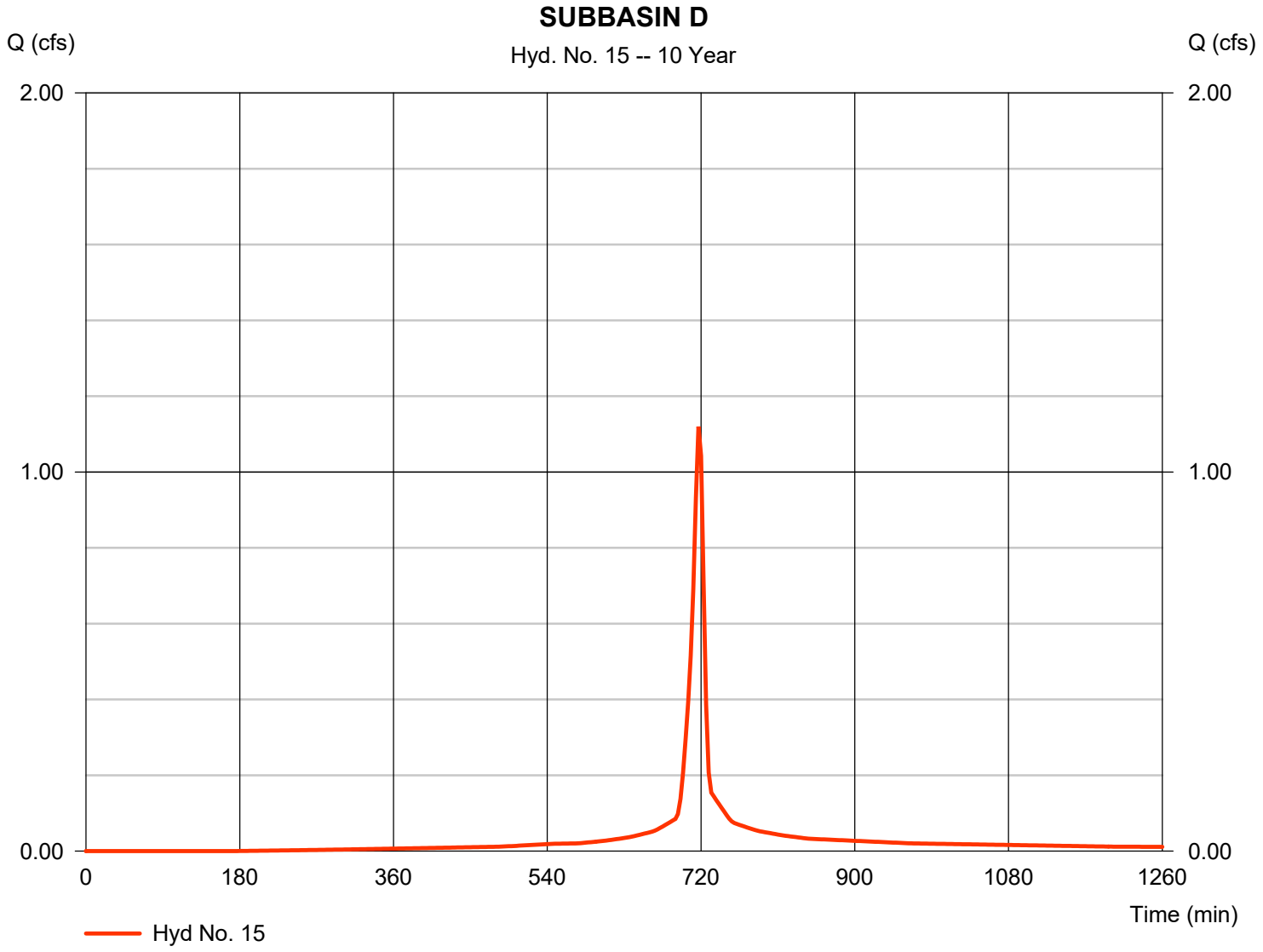
Hydrograph Report

Hyd. No. 15

SUBBASIN D

Hydrograph type	=	SCS Runoff	Peak discharge	=	1.120 cfs
Storm frequency	=	10 yrs	Time to peak	=	717 min
Time interval	=	3 min	Hyd. volume	=	2,715 cuft
Drainage area	=	0.240 ac	Curve number	=	94*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	6.00 min
Total precip.	=	4.00 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.190 x 98) + (0.050 x 80)] / 0.240



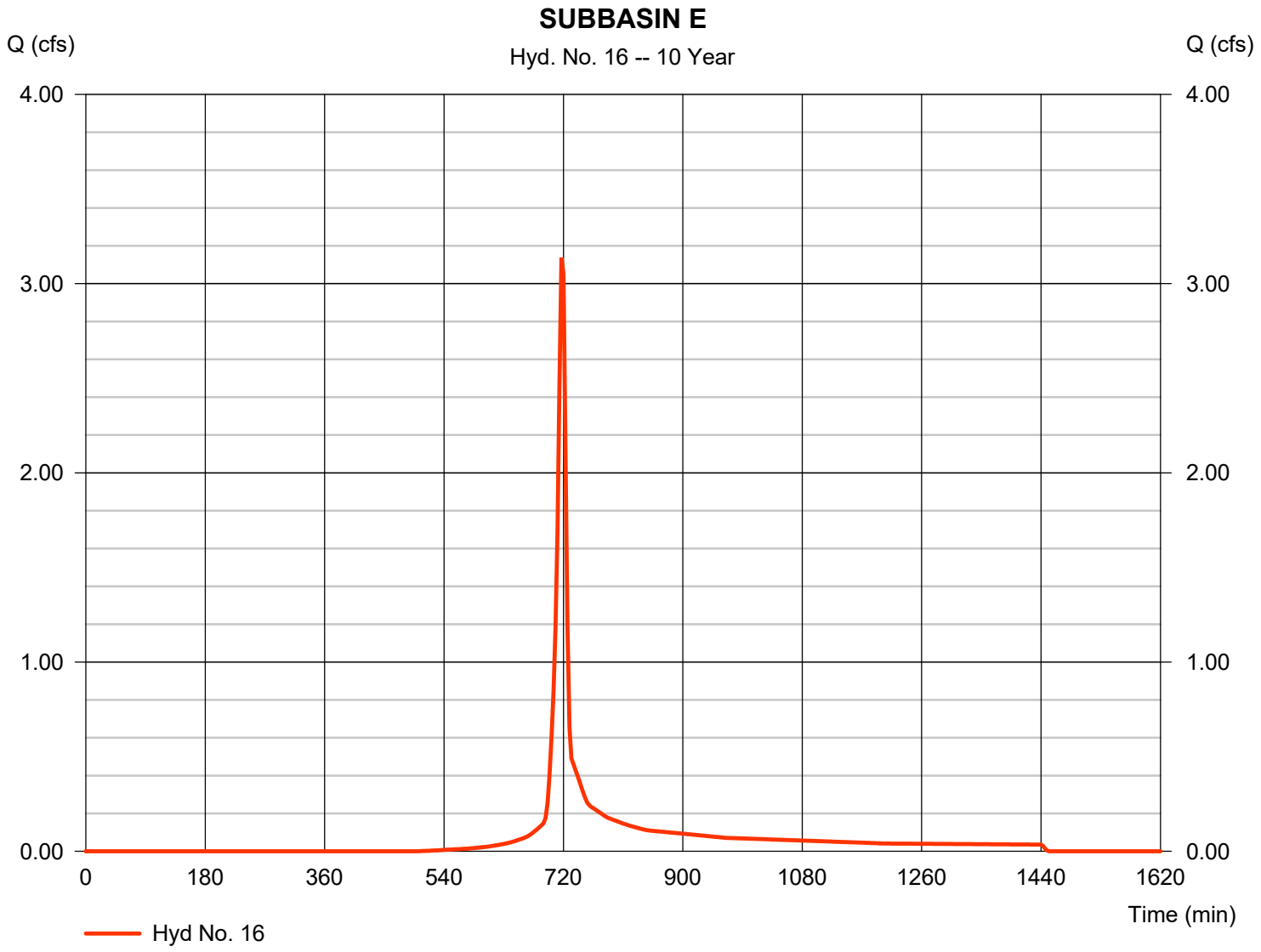
Hydrograph Report

Hyd. No. 16

SUBBASIN E

Hydrograph type	= SCS Runoff	Peak discharge	= 3.138 cfs
Storm frequency	= 10 yrs	Time to peak	= 717 min
Time interval	= 3 min	Hyd. volume	= 7,087 cuft
Drainage area	= 1.020 ac	Curve number	= 80*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 4.00 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.020 x 98) + (1.000 x 80)] / 1.020



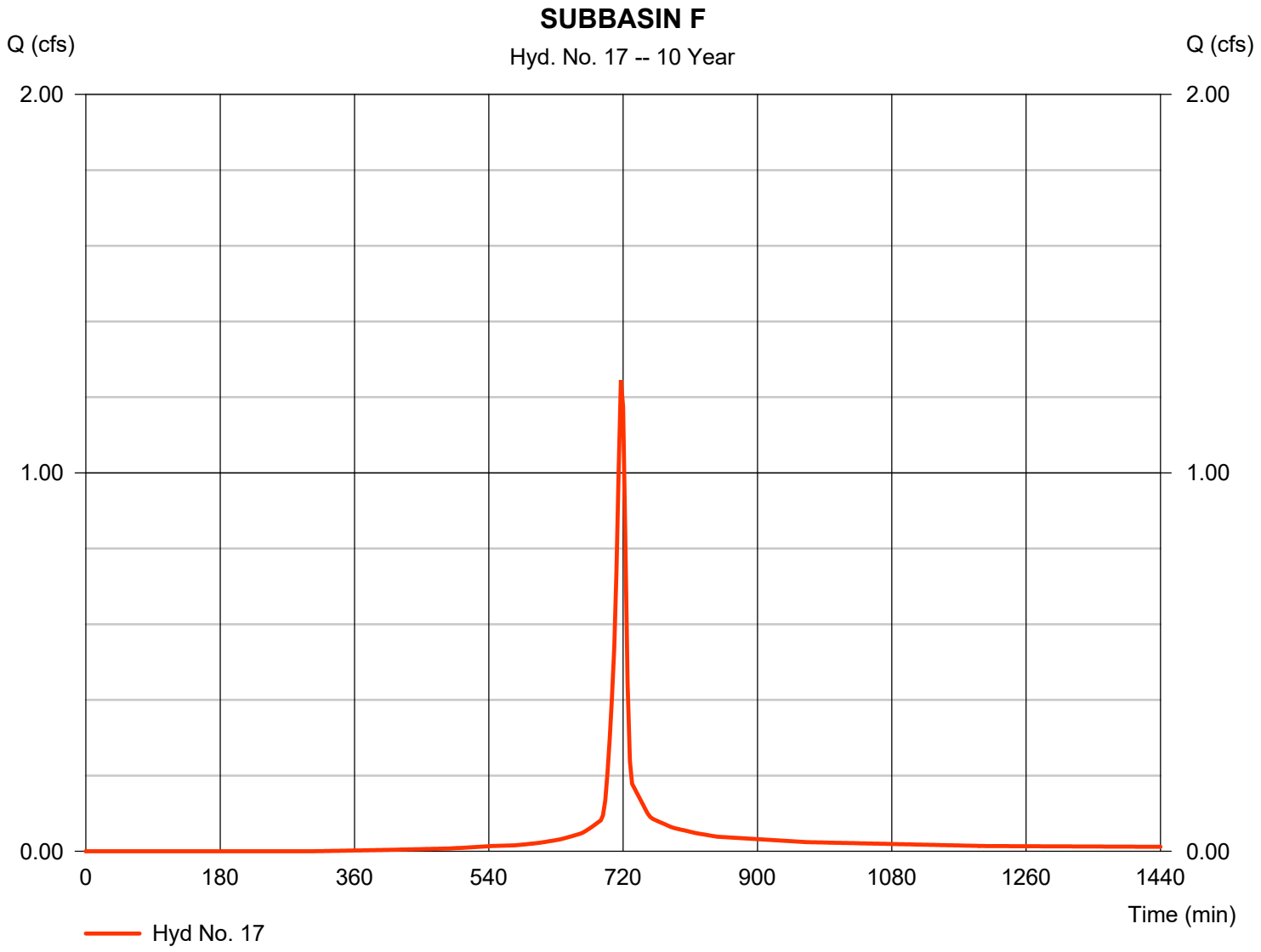
Hydrograph Report

Hyd. No. 17

SUBBASIN F

Hydrograph type	=	SCS Runoff	Peak discharge	=	1.245 cfs
Storm frequency	=	10 yrs	Time to peak	=	717 min
Time interval	=	3 min	Hyd. volume	=	2,882 cuft
Drainage area	=	0.300 ac	Curve number	=	89*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	6.00 min
Total precip.	=	4.00 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.190 x 98) + (0.110 x 74)] / 0.300



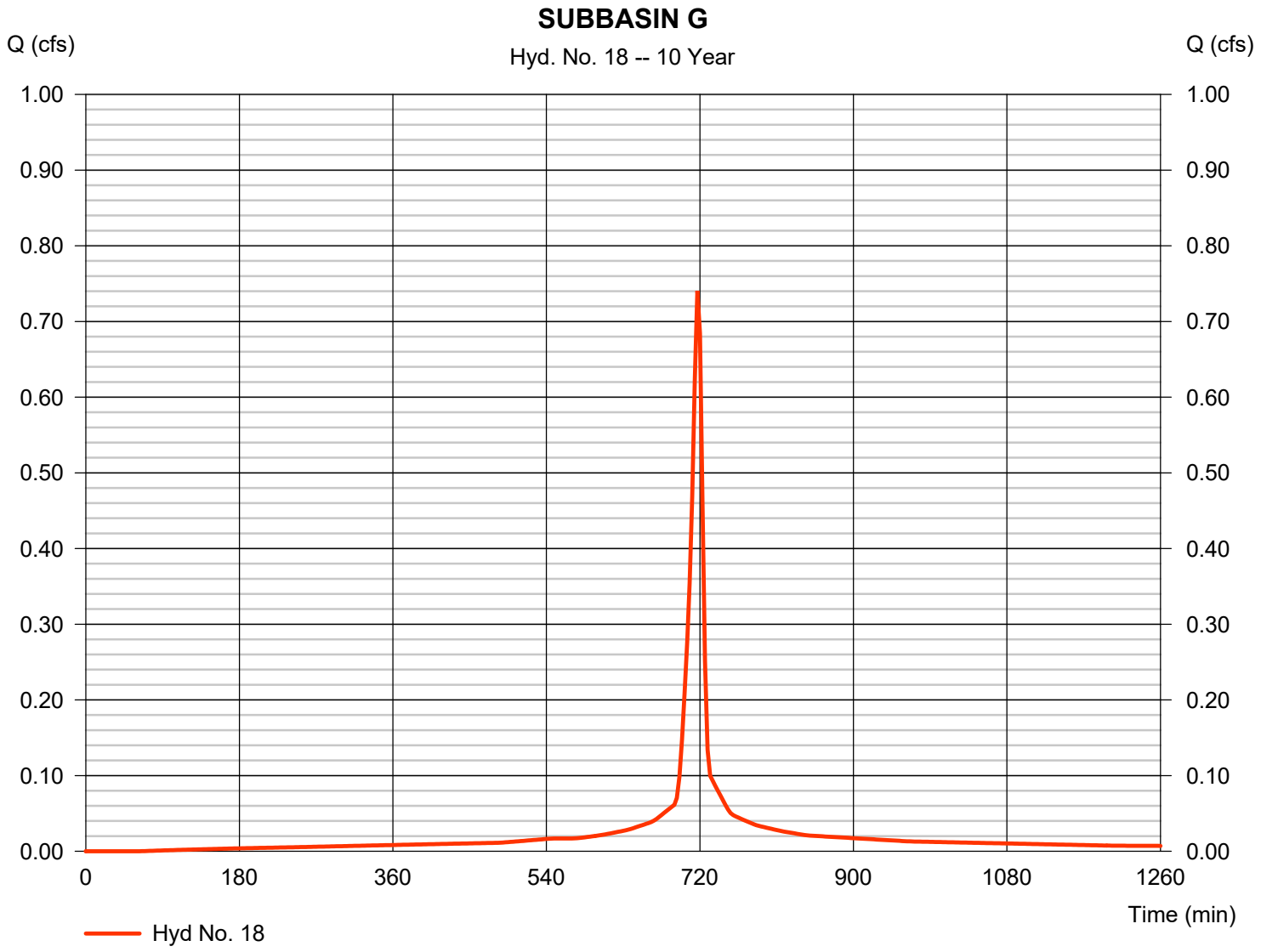
Hydrograph Report

Hyd. No. 18

SUBBASIN G

Hydrograph type	= SCS Runoff	Peak discharge	= 0.741 cfs
Storm frequency	= 10 yrs	Time to peak	= 717 min
Time interval	= 3 min	Hyd. volume	= 1,922 cuft
Drainage area	= 0.150 ac	Curve number	= 98*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 4.00 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.150 x 98)] / 0.150



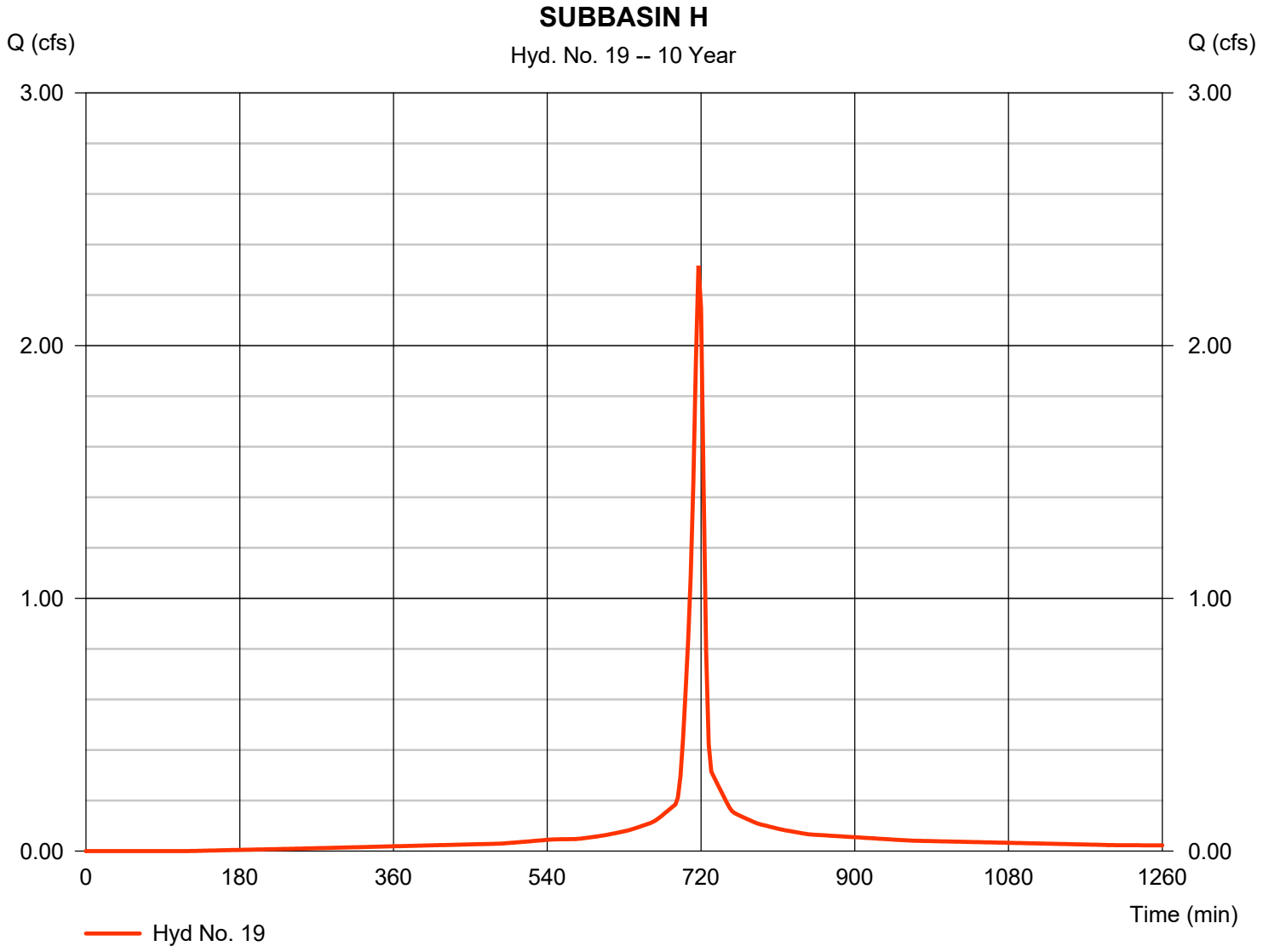
Hydrograph Report

Hyd. No. 19

SUBBASIN H

Hydrograph type	=	SCS Runoff	Peak discharge	=	2.316 cfs
Storm frequency	=	10 yrs	Time to peak	=	717 min
Time interval	=	3 min	Hyd. volume	=	5,783 cuft
Drainage area	=	0.480 ac	Curve number	=	96*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	6.00 min
Total precip.	=	4.00 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.430 x 98) + (0.050 x 74)] / 0.480



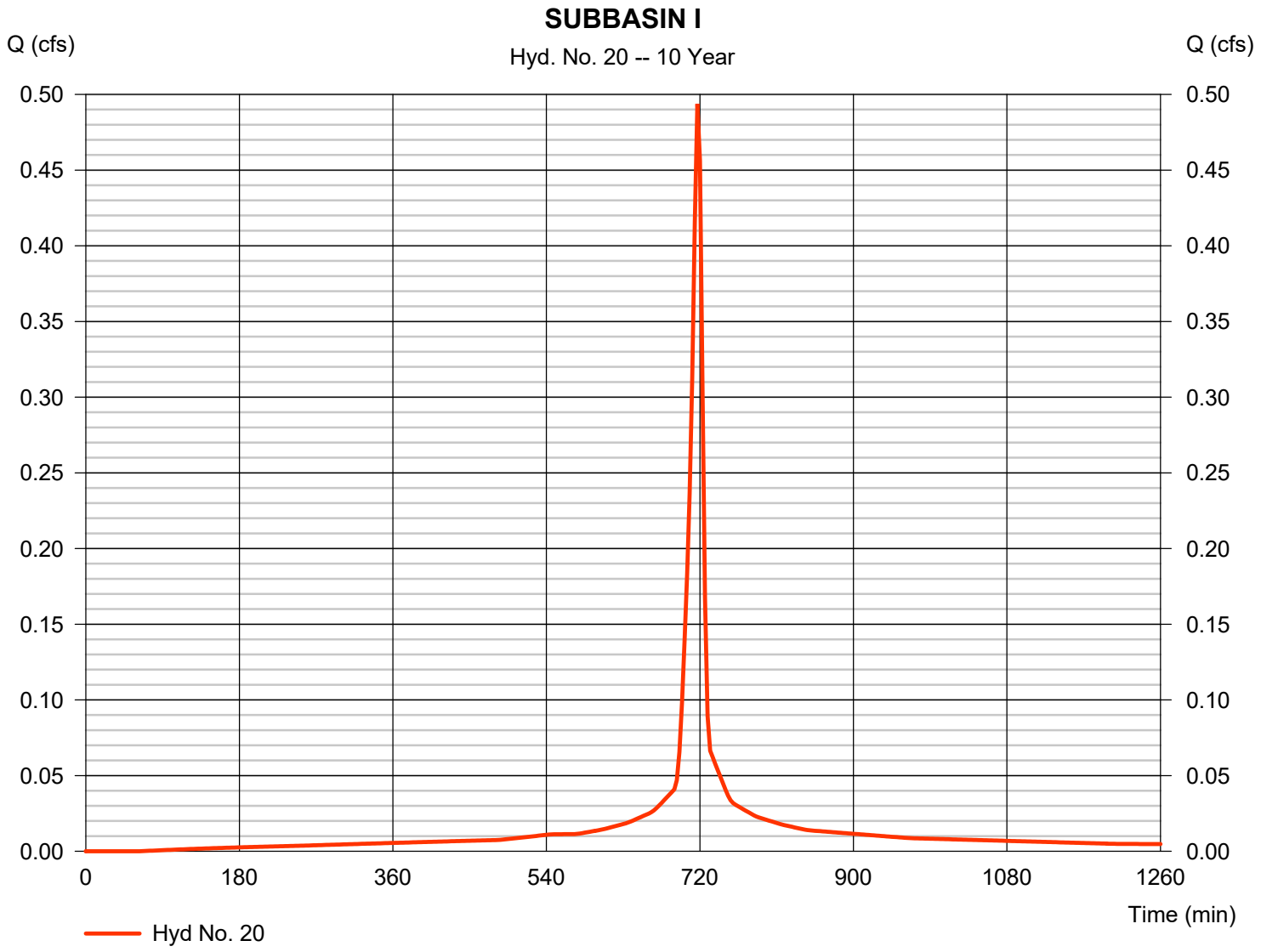
Hydrograph Report

Hyd. No. 20

SUBBASIN I

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.494 cfs
Storm frequency	=	10 yrs	Time to peak	=	717 min
Time interval	=	3 min	Hyd. volume	=	1,281 cuft
Drainage area	=	0.100 ac	Curve number	=	98*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	6.00 min
Total precip.	=	4.00 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.100 x 98)] / 0.100



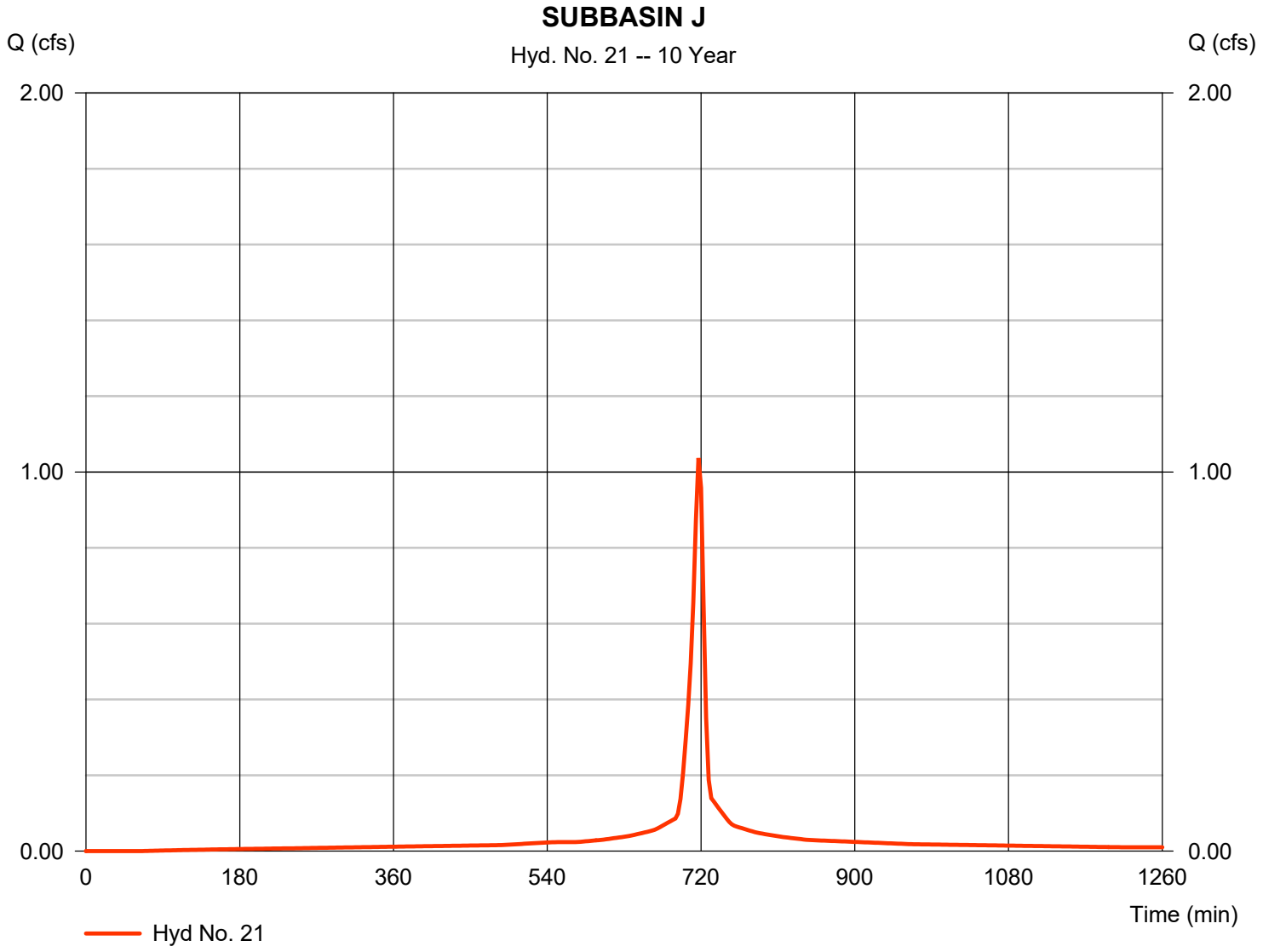
Hydrograph Report

Hyd. No. 21

SUBBASIN J

Hydrograph type	=	SCS Runoff	Peak discharge	=	1.037 cfs
Storm frequency	=	10 yrs	Time to peak	=	717 min
Time interval	=	3 min	Hyd. volume	=	2,691 cuft
Drainage area	=	0.210 ac	Curve number	=	98*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	6.00 min
Total precip.	=	4.00 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.210 x 98)] / 0.210



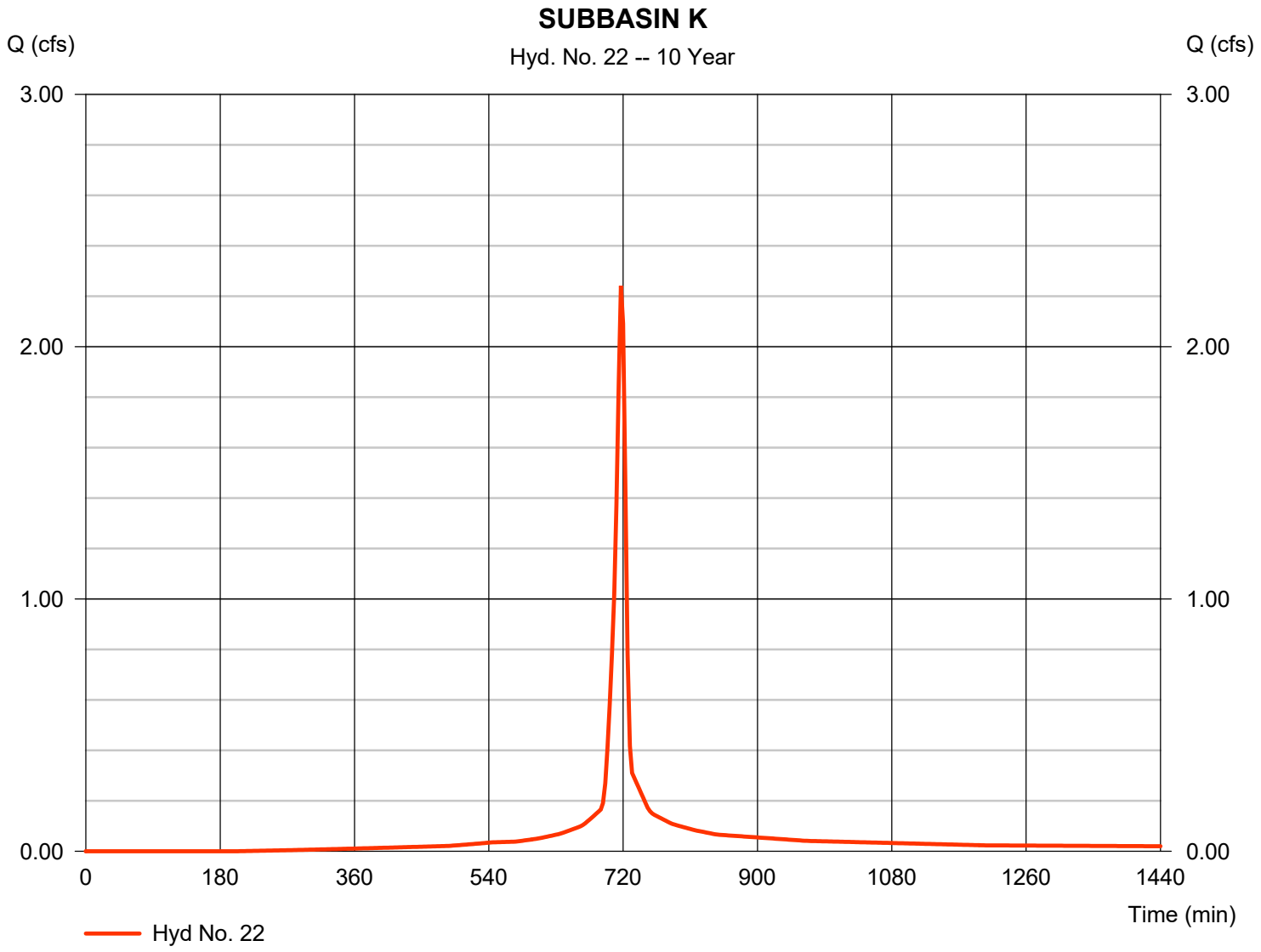
Hydrograph Report

Hyd. No. 22

SUBBASIN K

Hydrograph type	=	SCS Runoff	Peak discharge	=	2.241 cfs
Storm frequency	=	10 yrs	Time to peak	=	717 min
Time interval	=	3 min	Hyd. volume	=	5,369 cuft
Drainage area	=	0.490 ac	Curve number	=	93*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	6.00 min
Total precip.	=	4.00 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.380 x 98) + (0.110 x 74)] / 0.490



Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2016 by Autodesk, Inc. v11

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	17.03	3	726	59,775	------	------	------	Pre-Basin A
2	SCS Runoff	3.617	3	717	8,328	------	------	------	Pre-Offsite
3	Combine	18.32	3	726	68,103	1, 2	------	------	Total Predevelopment
5	SCS Runoff	32.38	3	717	74,559	------	------	------	Post- Pond
6	SCS Runoff	0.509	3	717	1,171	------	------	------	Post- Offsite
7	Reservoir	15.91	3	726	74,559	5	139.80	21,233	Pond Discharge
9	Combine	16.09	3	726	75,730	6, 7,	------	------	Total Post Discharge
12	SCS Runoff	3.742	3	717	8,486	------	------	------	SUBBASIN A
13	SCS Runoff	0.486	3	717	1,277	------	------	------	SUBBASIN B
14	SCS Runoff	0.833	3	717	2,190	------	------	------	SUBBASIN C
15	SCS Runoff	1.613	3	717	4,003	------	------	------	SUBBASIN D
16	SCS Runoff	5.227	3	717	11,880	------	------	------	SUBBASIN E
17	SCS Runoff	1.875	3	717	4,440	------	------	------	SUBBASIN F
18	SCS Runoff	1.041	3	717	2,737	------	------	------	SUBBASIN G
19	SCS Runoff	3.289	3	717	8,379	------	------	------	SUBBASIN H
20	SCS Runoff	0.694	3	717	1,825	------	------	------	SUBBASIN I
21	SCS Runoff	1.458	3	717	3,832	------	------	------	SUBBASIN J
22	SCS Runoff	3.254	3	717	7,984	------	------	------	SUBBASIN K

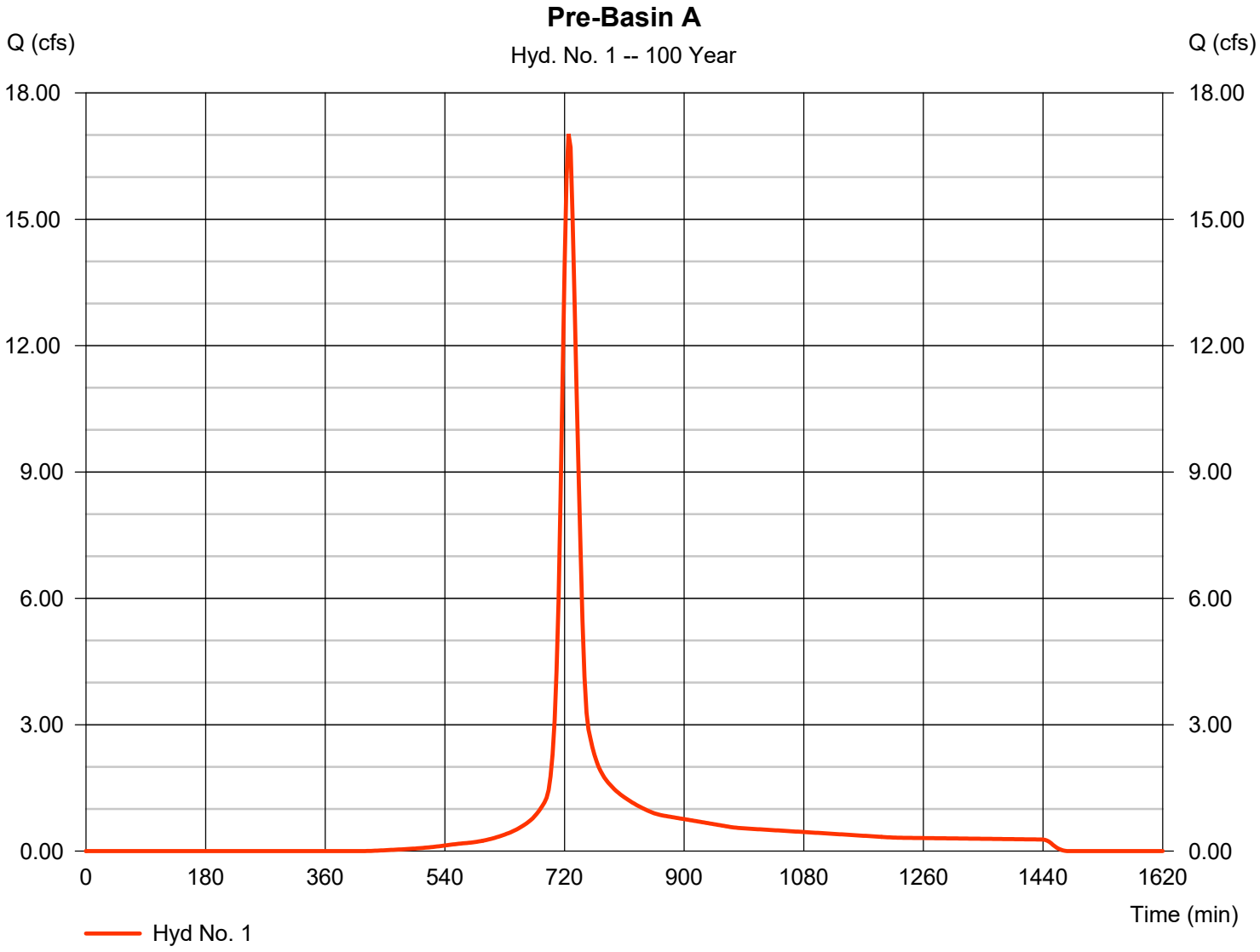
Hydrograph Report

Hyd. No. 1

Pre-Basin A

Hydrograph type	=	SCS Runoff	Peak discharge	=	17.03 cfs
Storm frequency	=	100 yrs	Time to peak	=	726 min
Time interval	=	3 min	Hyd. volume	=	59,775 cuft
Drainage area	=	5.080 ac	Curve number	=	79*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	21.40 min
Total precip.	=	5.60 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.260 x 61) + (1.160 x 98) + (1.170 x 74) + (1.230 x 70) + (0.670 x 80) + (0.590 x 77)] / 5.080



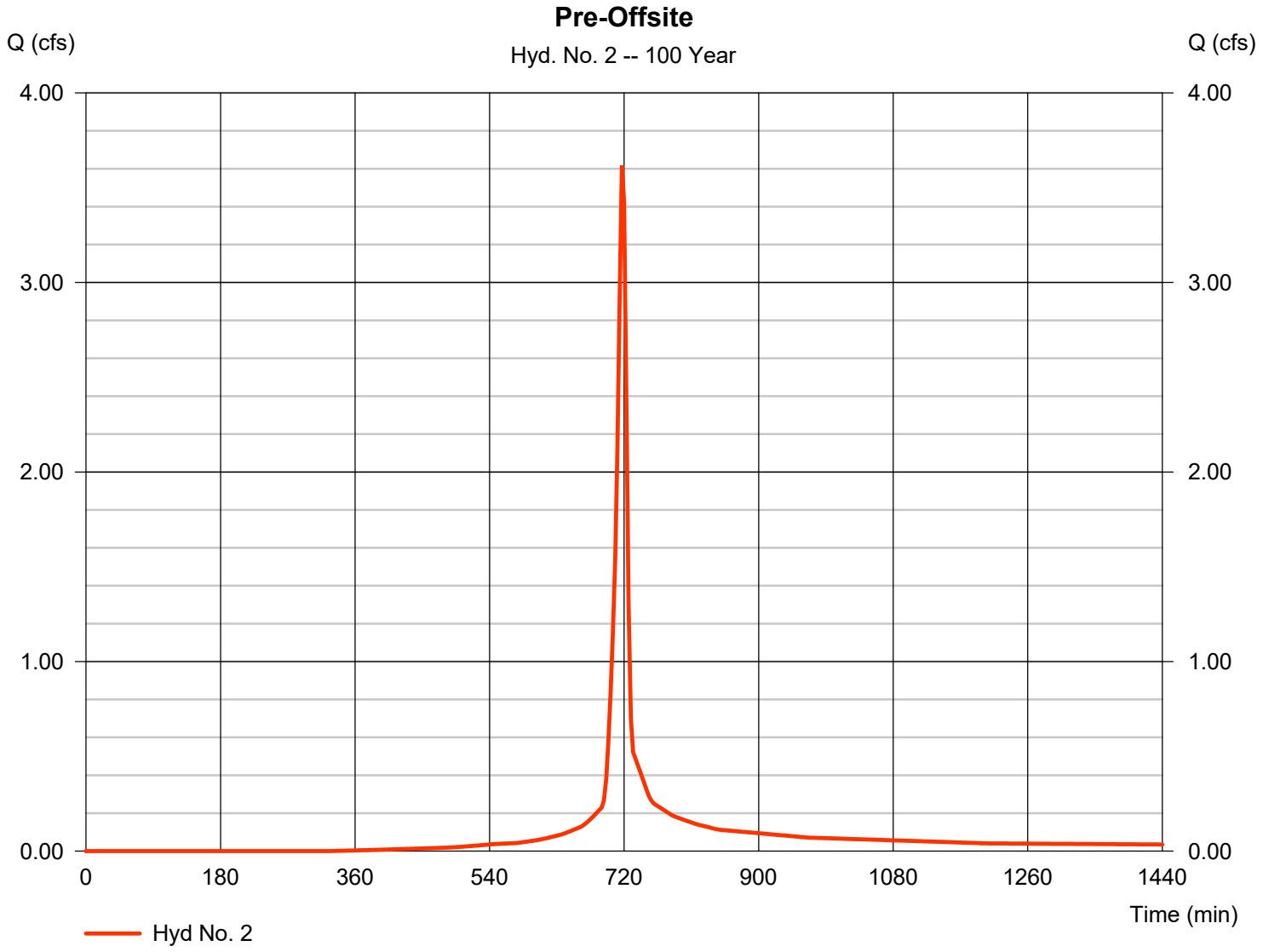
Hydrograph Report

Hyd. No. 2

Pre-Offsite

Hydrograph type	=	SCS Runoff	Peak discharge	=	3.617 cfs
Storm frequency	=	100 yrs	Time to peak	=	717 min
Time interval	=	3 min	Hyd. volume	=	8,328 cuft
Drainage area	=	0.640 ac	Curve number	=	84*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	6.00 min
Total precip.	=	5.60 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.370 x 74) + (0.270 x 98)] / 0.640

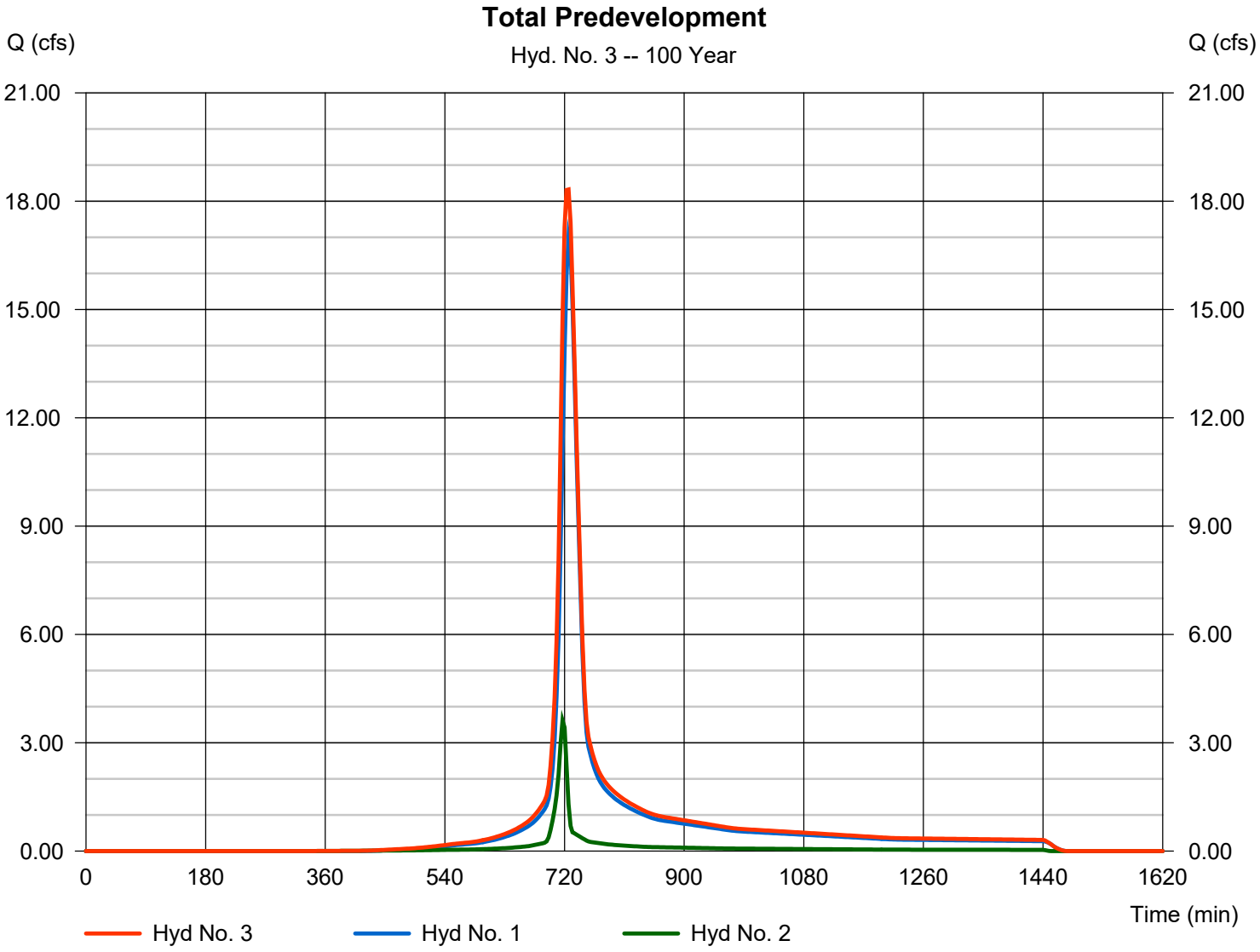


Hydrograph Report

Hyd. No. 3

Total Predevelopment

Hydrograph type	= Combine	Peak discharge	= 18.32 cfs
Storm frequency	= 100 yrs	Time to peak	= 726 min
Time interval	= 3 min	Hyd. volume	= 68,103 cuft
Inflow hyds.	= 1, 2	Contrib. drain. area	= 5.720 ac



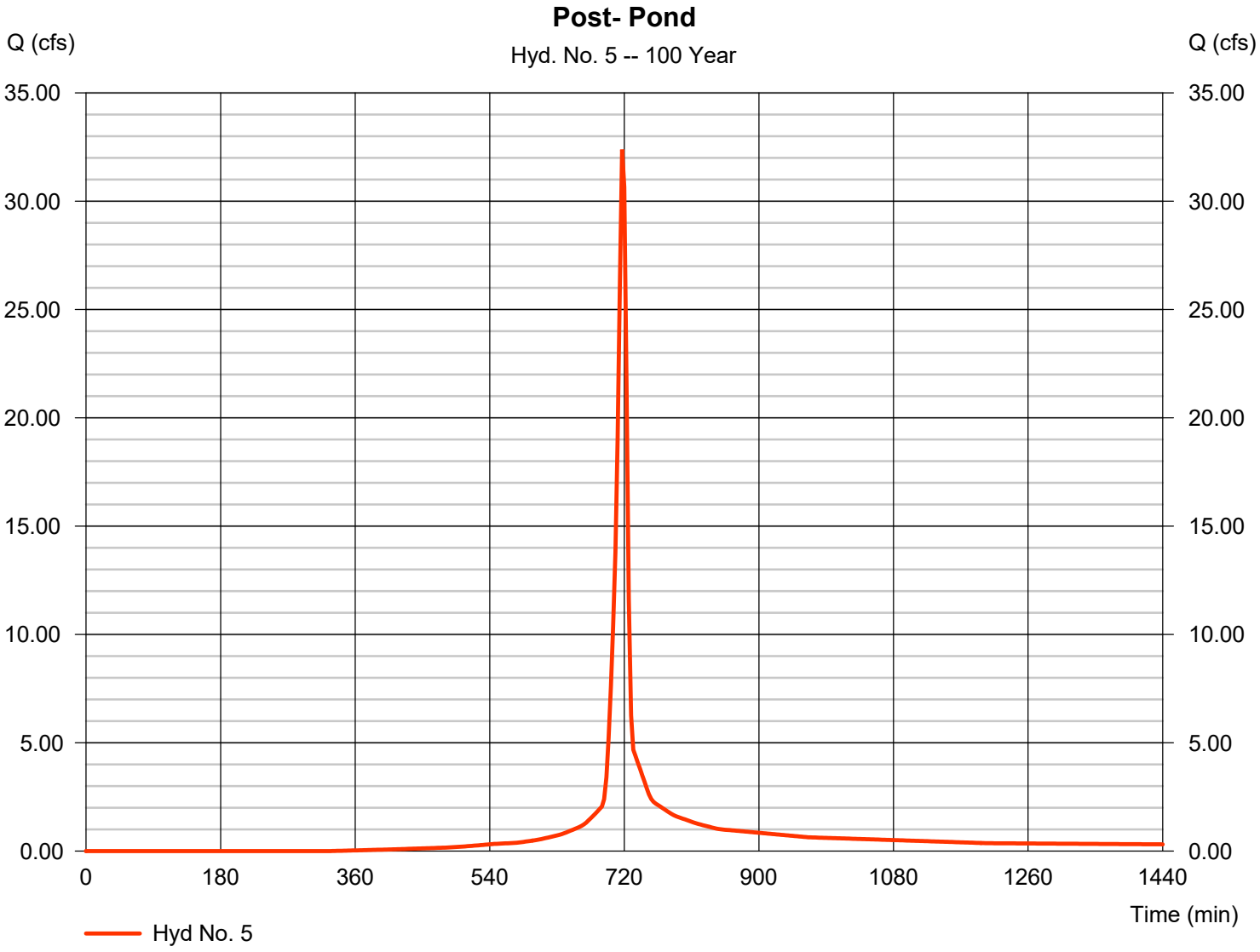
Hydrograph Report

Hyd. No. 5

Post- Pond

Hydrograph type	=	SCS Runoff	Peak discharge	=	32.38 cfs
Storm frequency	=	100 yrs	Time to peak	=	717 min
Time interval	=	3 min	Hyd. volume	=	74,559 cuft
Drainage area	=	5.730 ac	Curve number	=	84*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	6.00 min
Total precip.	=	5.60 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.260 x 61) + (2.350 x 98) + (2.020 x 74) + (1.100 x 80)] / 5.730



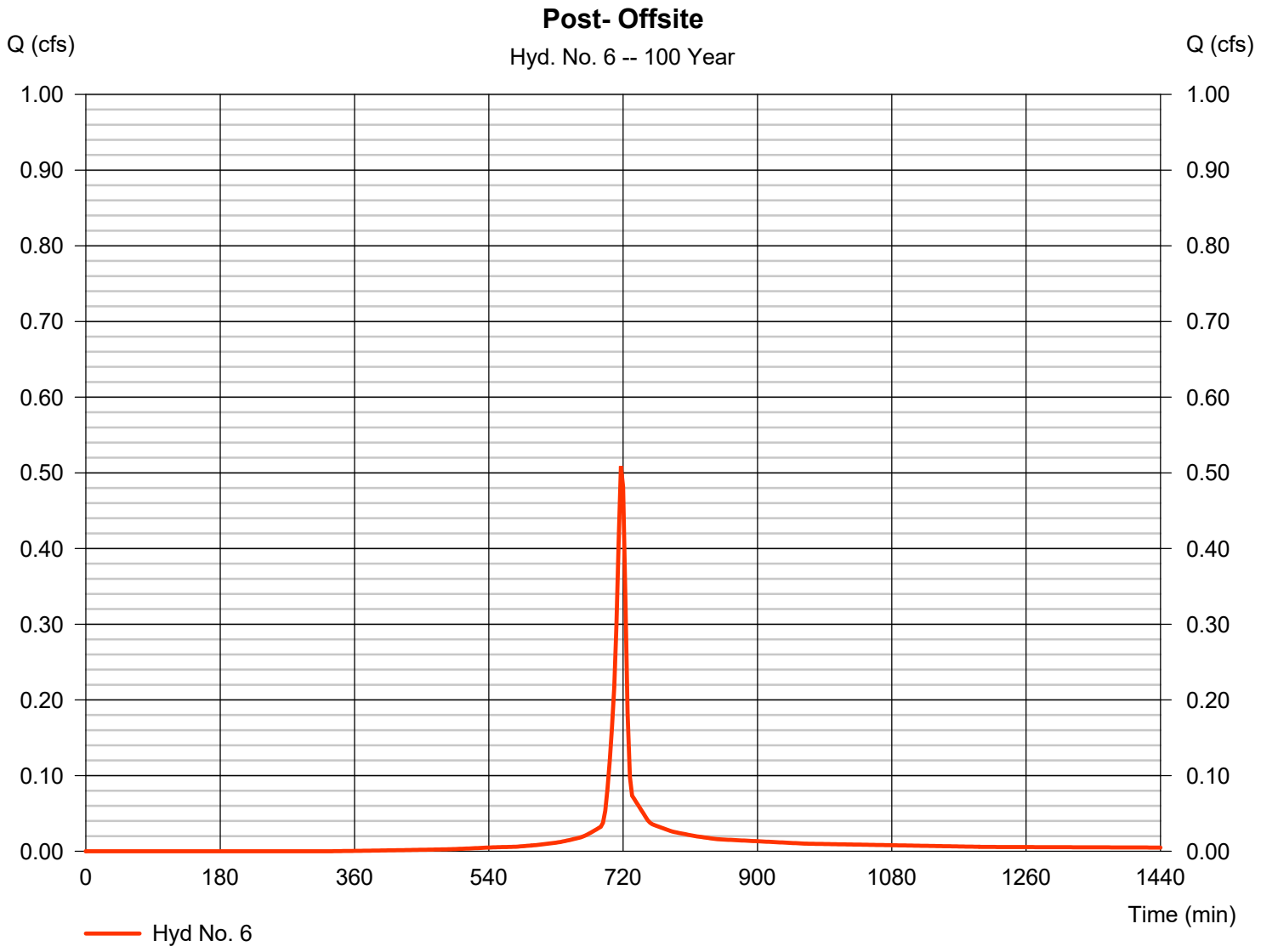
Hydrograph Report

Hyd. No. 6

Post- Offsite

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.509 cfs
Storm frequency	=	100 yrs	Time to peak	=	717 min
Time interval	=	3 min	Hyd. volume	=	1,171 cuft
Drainage area	=	0.090 ac	Curve number	=	84*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	6.00 min
Total precip.	=	5.60 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.030 x 61) + (0.050 x 98) + (0.010 x 80)] / 0.090



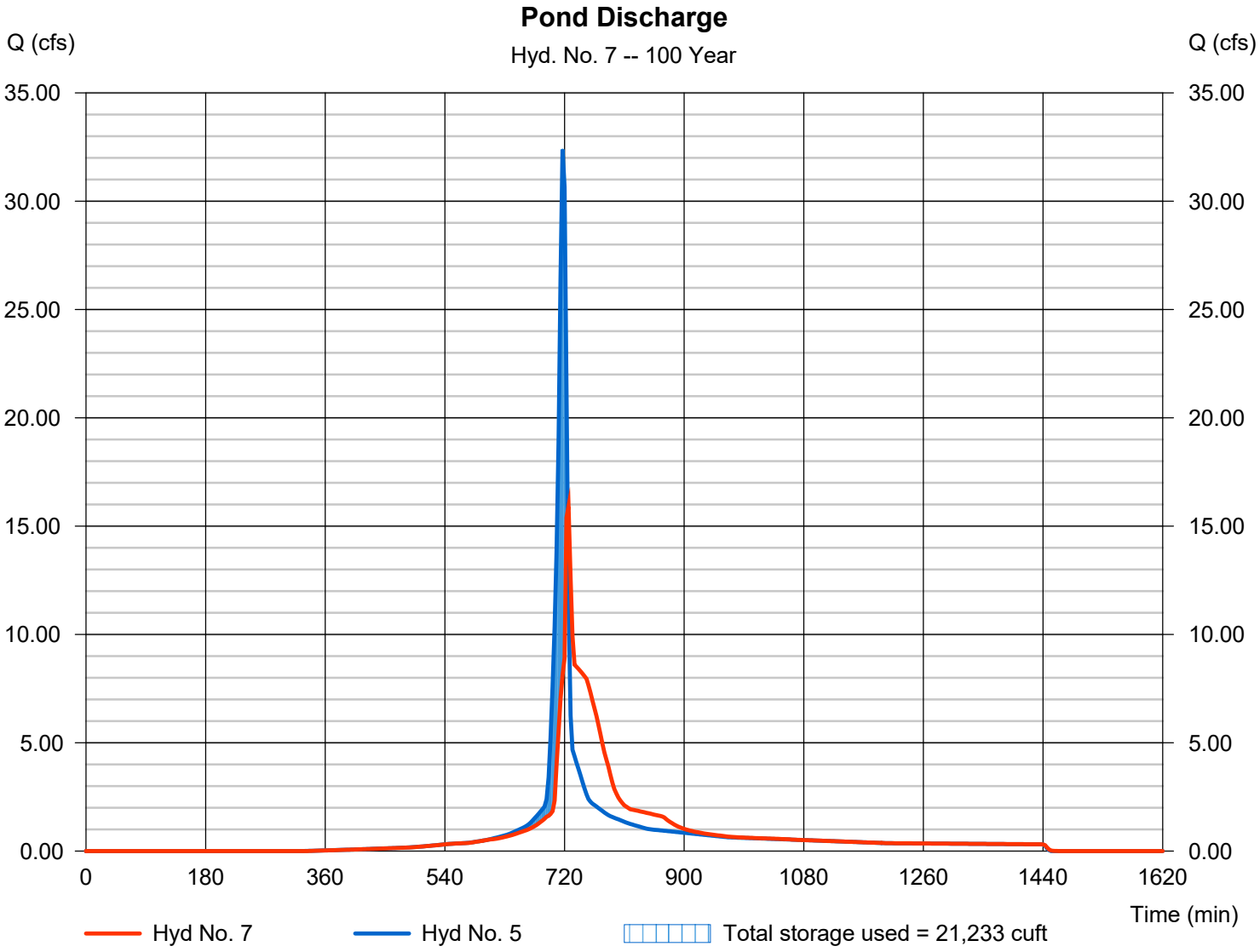
Hydrograph Report

Hyd. No. 7

Pond Discharge

Hydrograph type	=	Reservoir	Peak discharge	=	15.91 cfs
Storm frequency	=	100 yrs	Time to peak	=	726 min
Time interval	=	3 min	Hyd. volume	=	74,559 cuft
Inflow hyd. No.	=	5 - Post- Pond	Max. Elevation	=	139.80 ft
Reservoir name	=	South Detention	Max. Storage	=	21,233 cuft

Storage Indication method used.

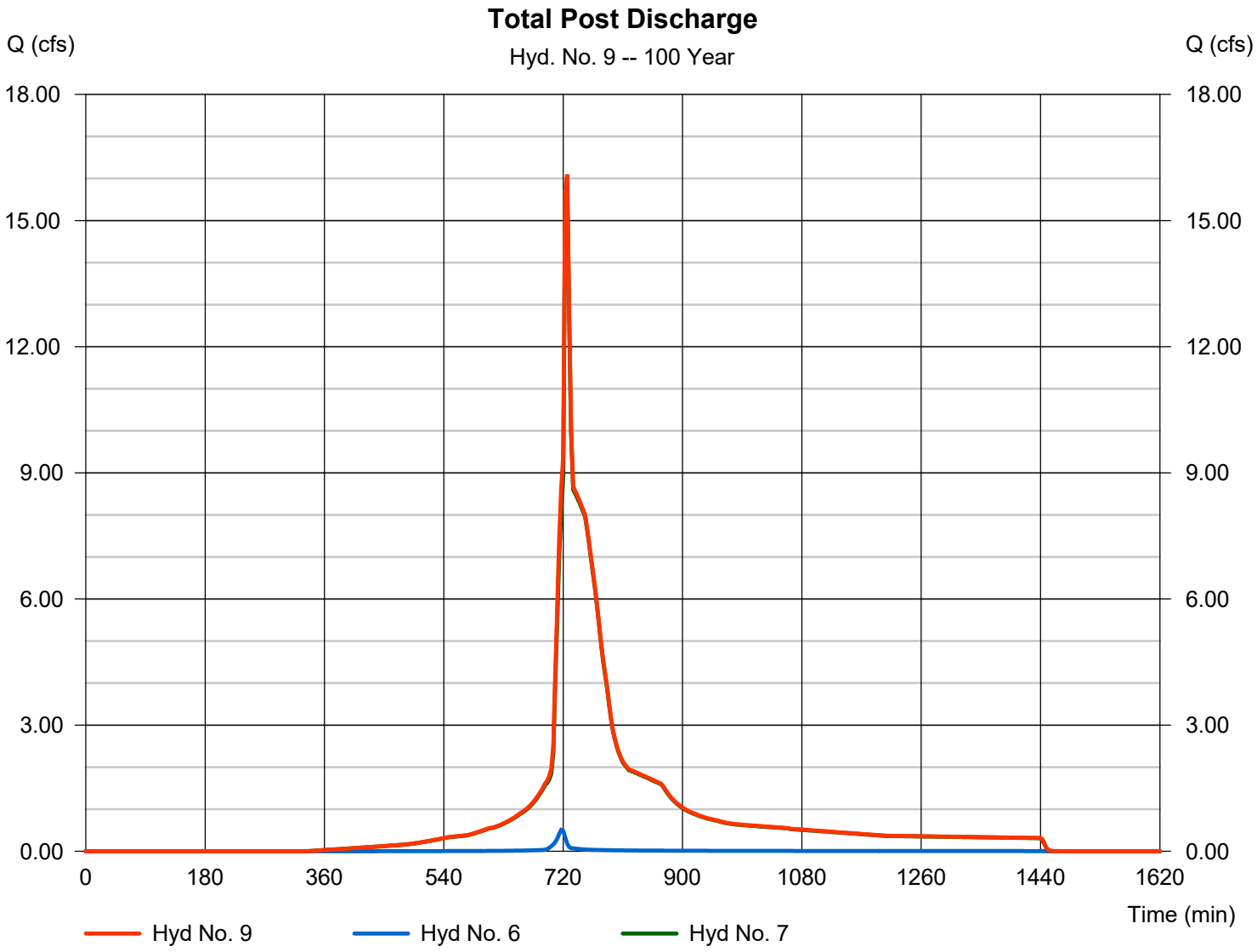


Hydrograph Report

Hyd. No. 9

Total Post Discharge

Hydrograph type	= Combine	Peak discharge	= 16.09 cfs
Storm frequency	= 100 yrs	Time to peak	= 726 min
Time interval	= 3 min	Hyd. volume	= 75,730 cuft
Inflow hyds.	= 6, 7	Contrib. drain. area	= 0.090 ac



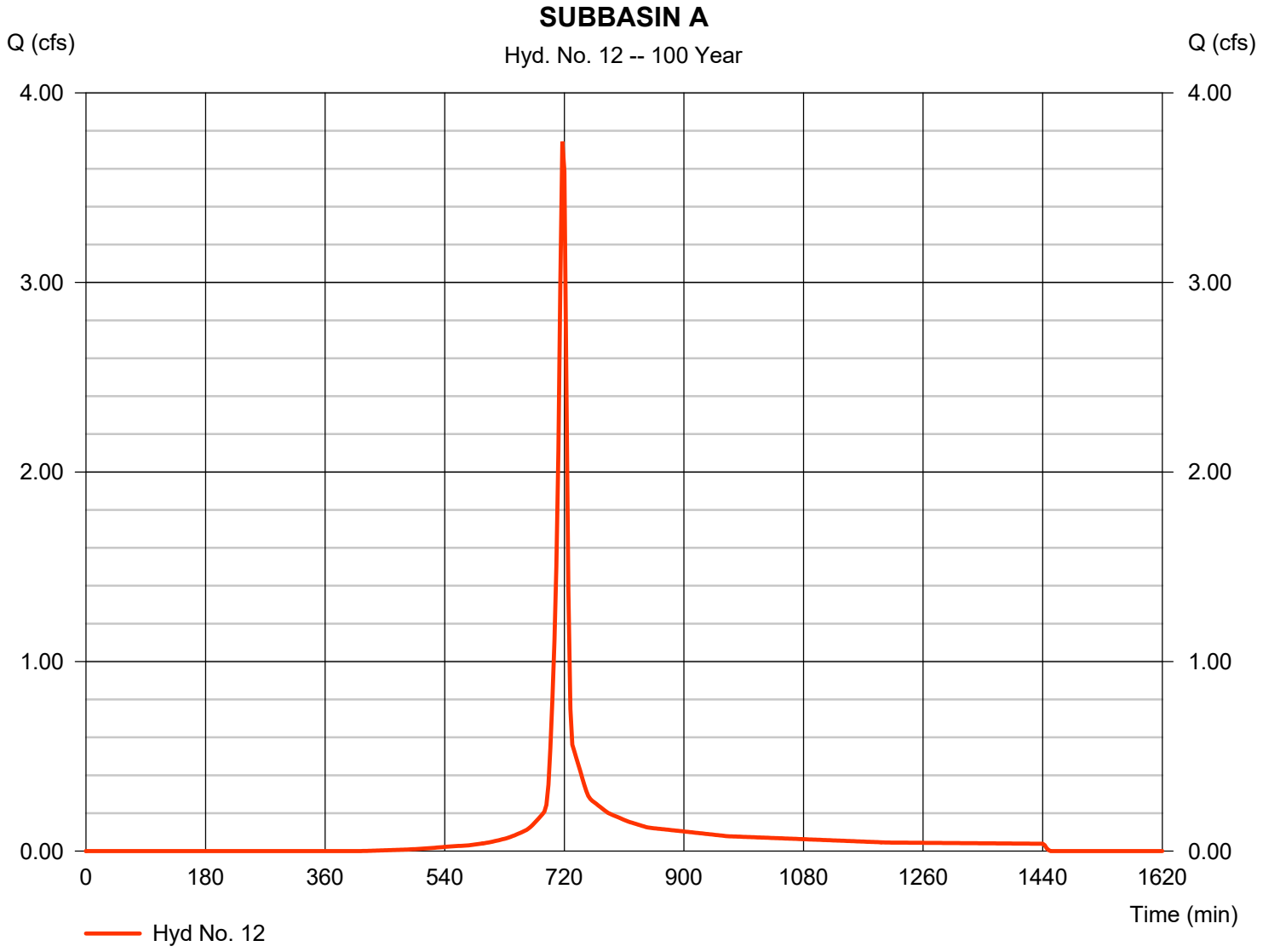
Hydrograph Report

Hyd. No. 12

SUBBASIN A

Hydrograph type	=	SCS Runoff	Peak discharge	=	3.742 cfs
Storm frequency	=	100 yrs	Time to peak	=	717 min
Time interval	=	3 min	Hyd. volume	=	8,486 cuft
Drainage area	=	0.750 ac	Curve number	=	79*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	6.00 min
Total precip.	=	5.60 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.230 x 98) + (0.240 x 61) + (0.280 x 80)] / 0.750



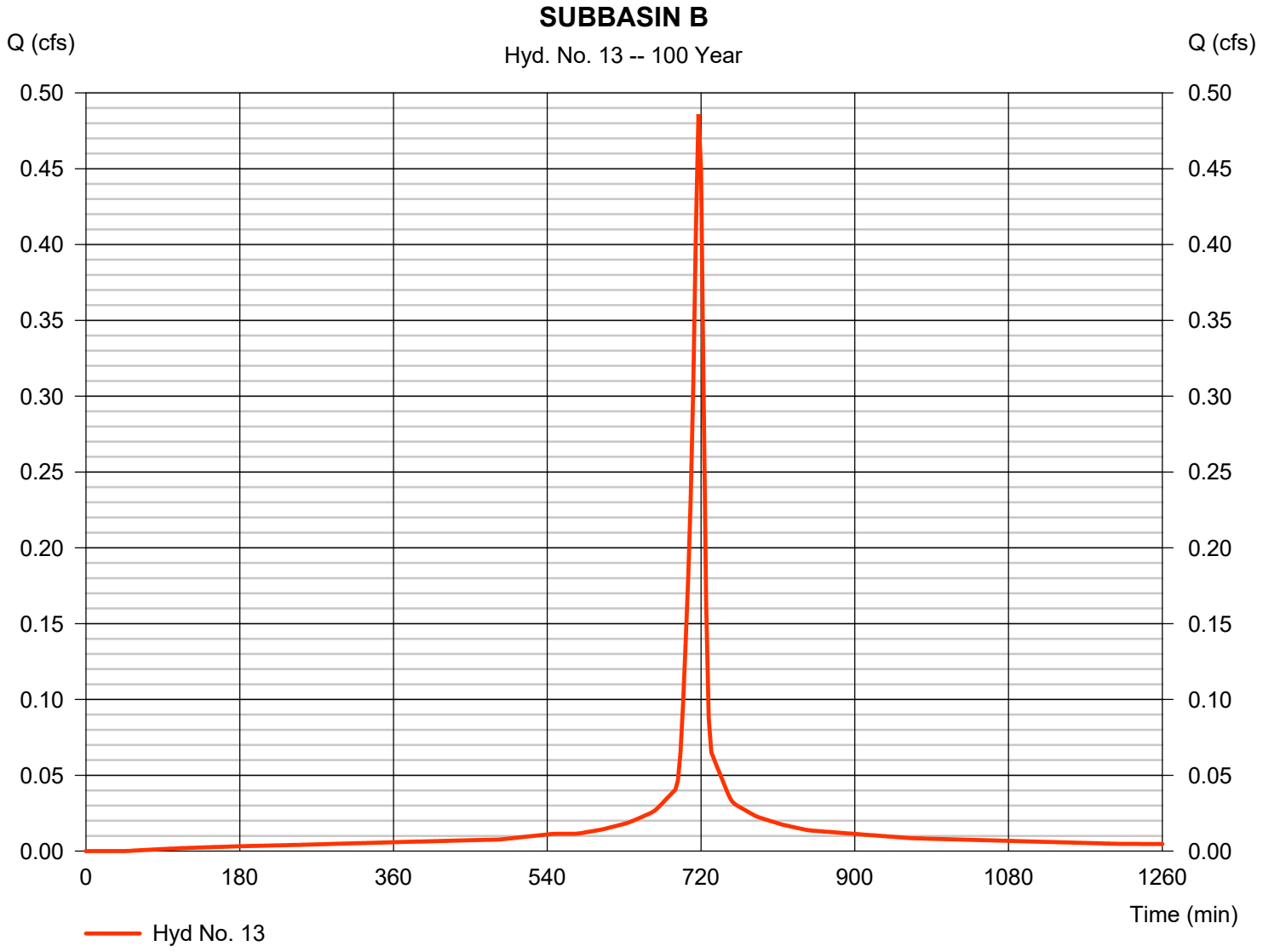
Hydrograph Report

Hyd. No. 13

SUBBASIN B

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.486 cfs
Storm frequency	=	100 yrs	Time to peak	=	717 min
Time interval	=	3 min	Hyd. volume	=	1,277 cuft
Drainage area	=	0.070 ac	Curve number	=	98*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	6.00 min
Total precip.	=	5.60 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.070 x 98)] / 0.070



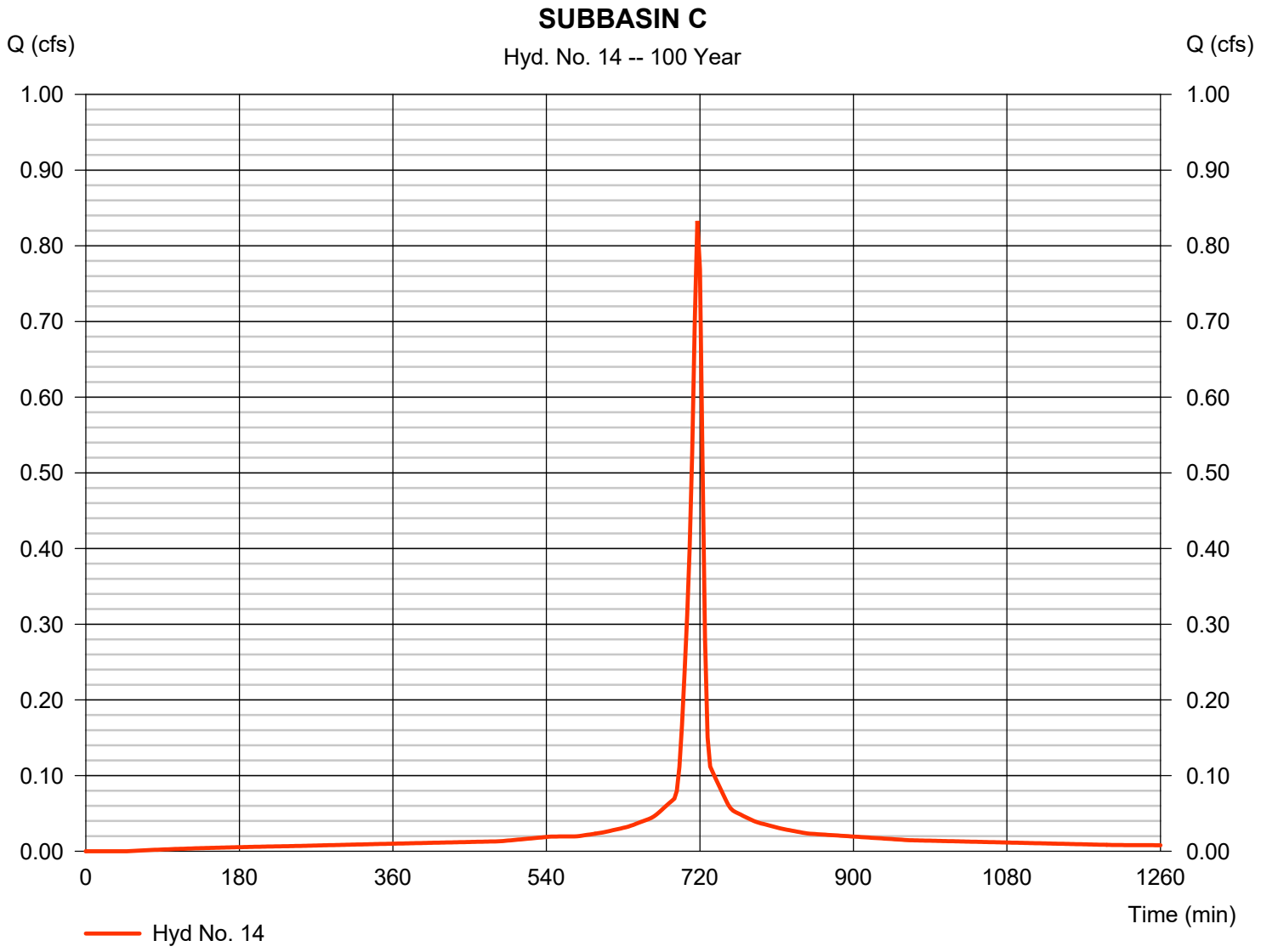
Hydrograph Report

Hyd. No. 14

SUBBASIN C

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.833 cfs
Storm frequency	=	100 yrs	Time to peak	=	717 min
Time interval	=	3 min	Hyd. volume	=	2,190 cuft
Drainage area	=	0.120 ac	Curve number	=	98*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	6.00 min
Total precip.	=	5.60 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.120 x 98)] / 0.120



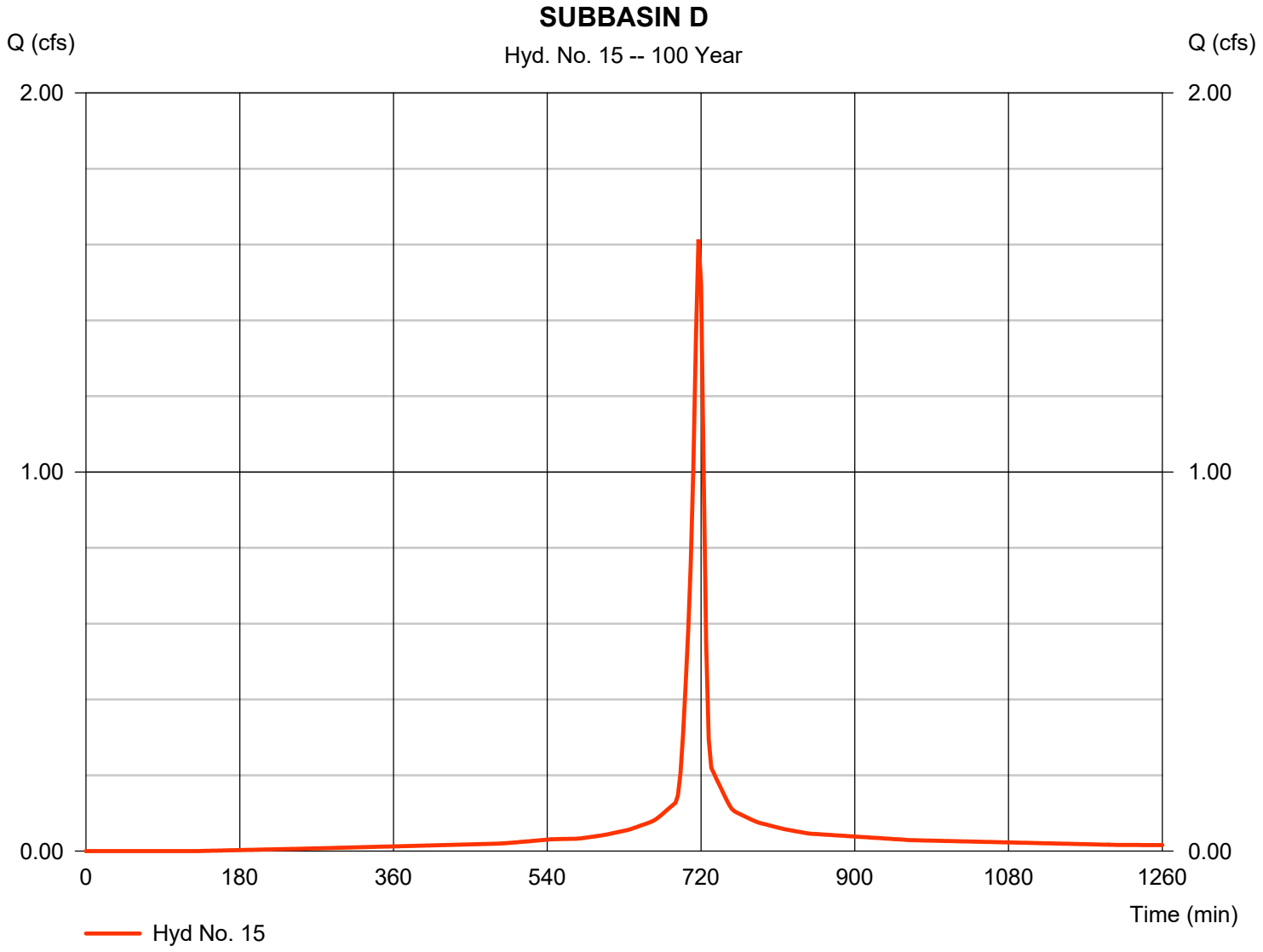
Hydrograph Report

Hyd. No. 15

SUBBASIN D

Hydrograph type	=	SCS Runoff	Peak discharge	=	1.613 cfs
Storm frequency	=	100 yrs	Time to peak	=	717 min
Time interval	=	3 min	Hyd. volume	=	4,003 cuft
Drainage area	=	0.240 ac	Curve number	=	94*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	6.00 min
Total precip.	=	5.60 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.190 x 98) + (0.050 x 80)] / 0.240



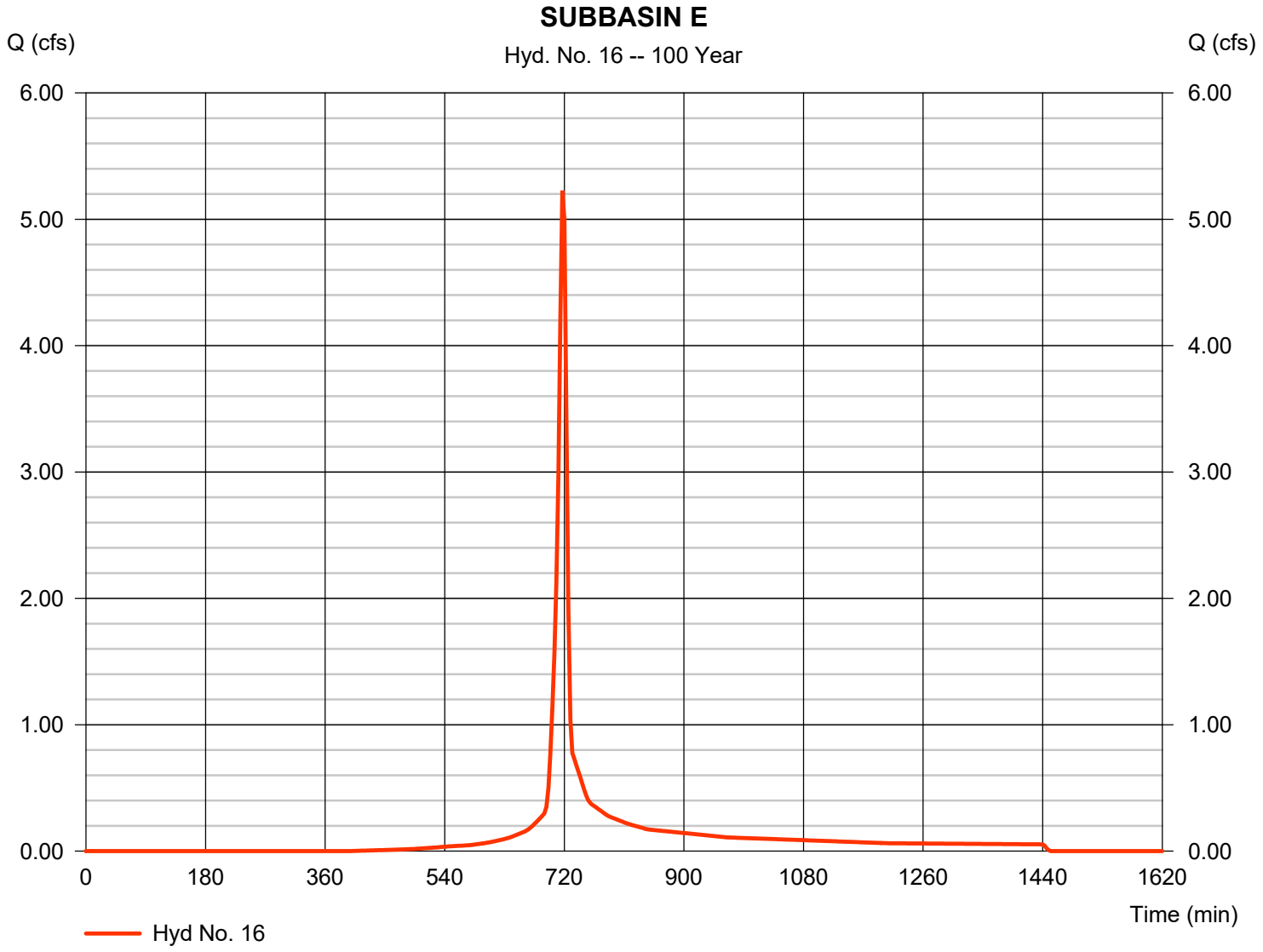
Hydrograph Report

Hyd. No. 16

SUBBASIN E

Hydrograph type	=	SCS Runoff	Peak discharge	=	5.227 cfs
Storm frequency	=	100 yrs	Time to peak	=	717 min
Time interval	=	3 min	Hyd. volume	=	11,880 cuft
Drainage area	=	1.020 ac	Curve number	=	80*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	6.00 min
Total precip.	=	5.60 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.020 x 98) + (1.000 x 80)] / 1.020



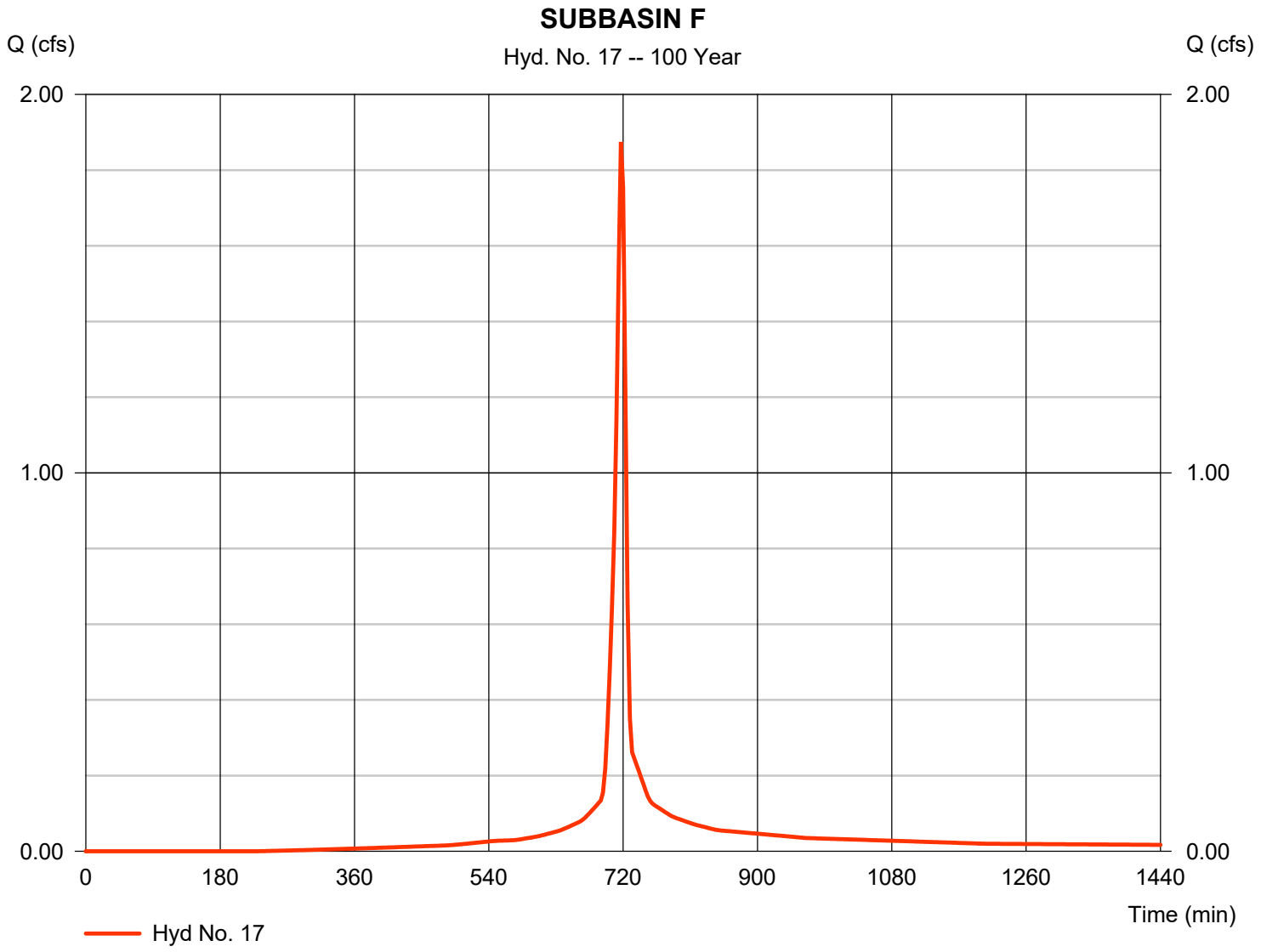
Hydrograph Report

Hyd. No. 17

SUBBASIN F

Hydrograph type	=	SCS Runoff	Peak discharge	=	1.875 cfs
Storm frequency	=	100 yrs	Time to peak	=	717 min
Time interval	=	3 min	Hyd. volume	=	4,440 cuft
Drainage area	=	0.300 ac	Curve number	=	89*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	6.00 min
Total precip.	=	5.60 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.190 x 98) + (0.110 x 74)] / 0.300



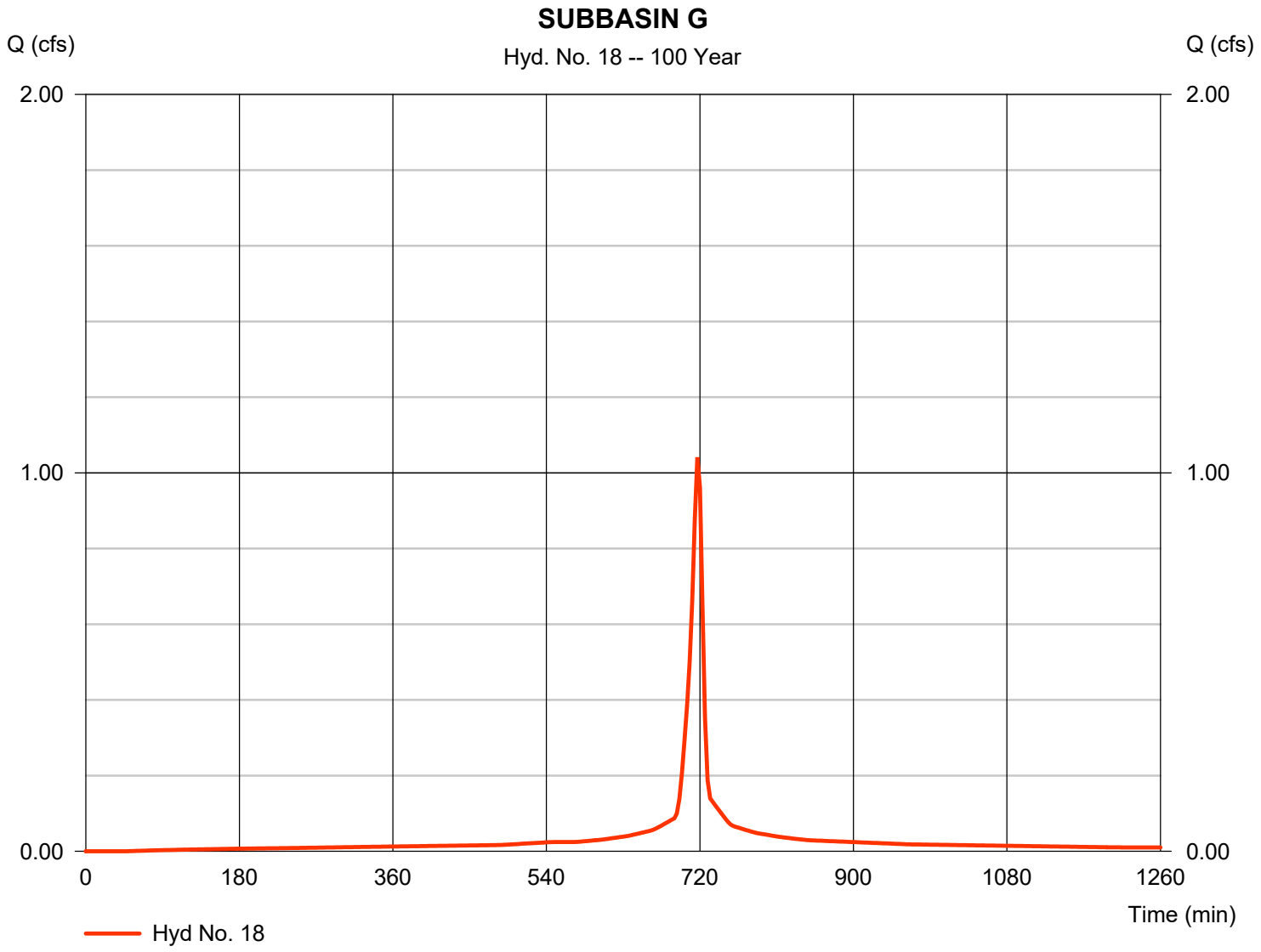
Hydrograph Report

Hyd. No. 18

SUBBASIN G

Hydrograph type	=	SCS Runoff	Peak discharge	=	1.041 cfs
Storm frequency	=	100 yrs	Time to peak	=	717 min
Time interval	=	3 min	Hyd. volume	=	2,737 cuft
Drainage area	=	0.150 ac	Curve number	=	98*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	6.00 min
Total precip.	=	5.60 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.150 x 98)] / 0.150



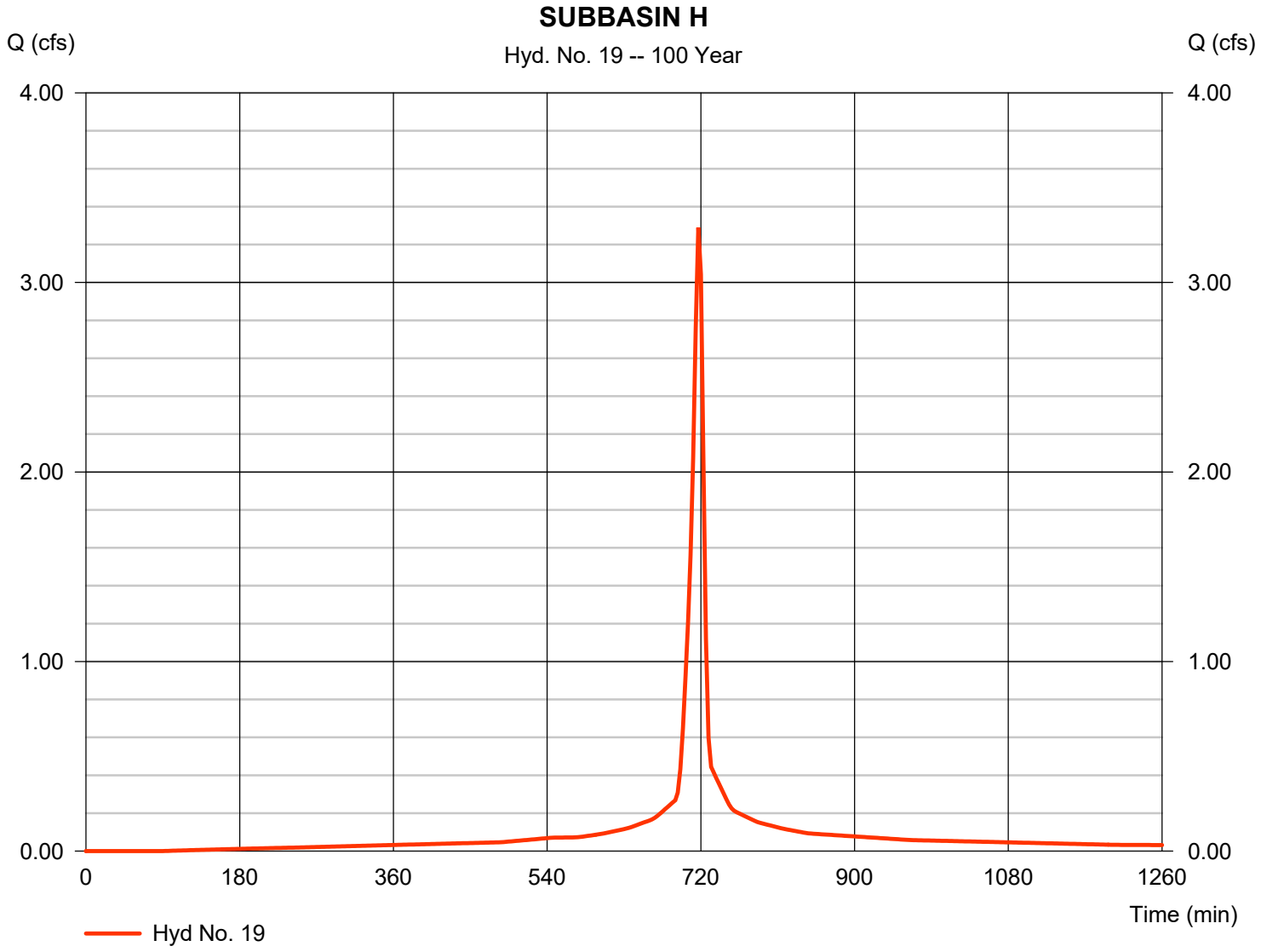
Hydrograph Report

Hyd. No. 19

SUBBASIN H

Hydrograph type	= SCS Runoff	Peak discharge	= 3.289 cfs
Storm frequency	= 100 yrs	Time to peak	= 717 min
Time interval	= 3 min	Hyd. volume	= 8,379 cuft
Drainage area	= 0.480 ac	Curve number	= 96*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 5.60 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.430 x 98) + (0.050 x 74)] / 0.480



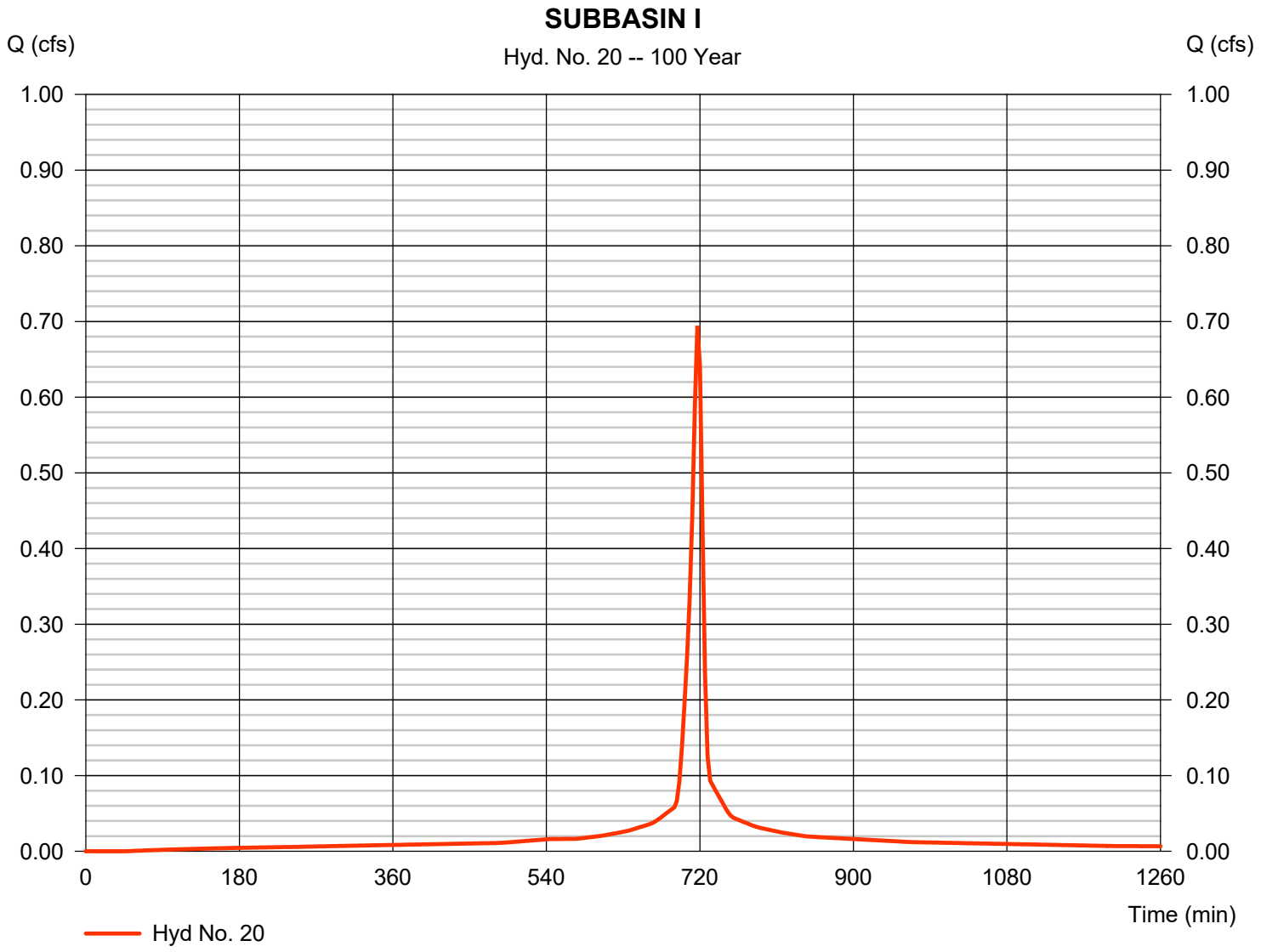
Hydrograph Report

Hyd. No. 20

SUBBASIN I

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.694 cfs
Storm frequency	=	100 yrs	Time to peak	=	717 min
Time interval	=	3 min	Hyd. volume	=	1,825 cuft
Drainage area	=	0.100 ac	Curve number	=	98*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	6.00 min
Total precip.	=	5.60 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.100 x 98)] / 0.100



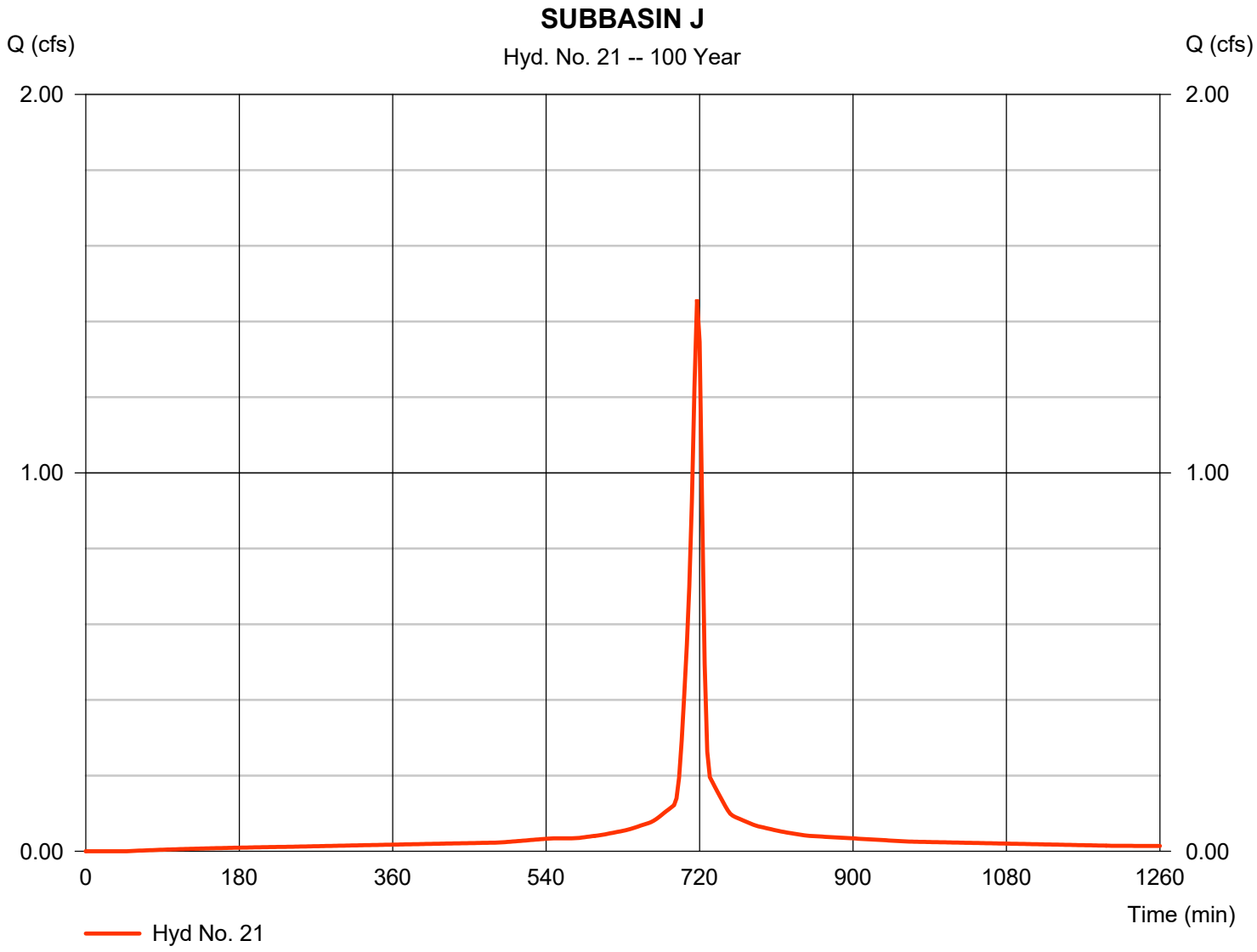
Hydrograph Report

Hyd. No. 21

SUBBASIN J

Hydrograph type	= SCS Runoff	Peak discharge	= 1.458 cfs
Storm frequency	= 100 yrs	Time to peak	= 717 min
Time interval	= 3 min	Hyd. volume	= 3,832 cuft
Drainage area	= 0.210 ac	Curve number	= 98*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 5.60 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.210 x 98)] / 0.210



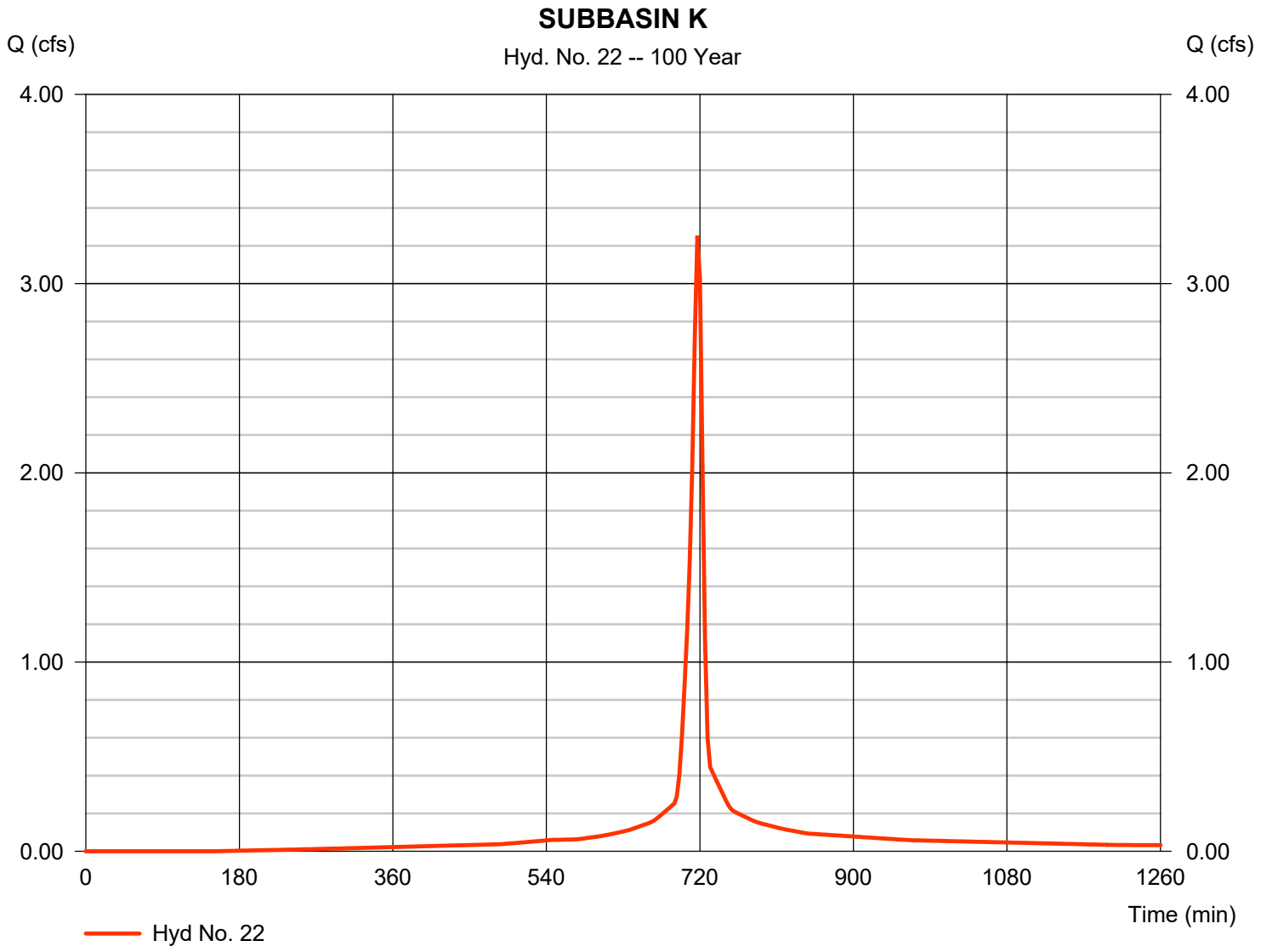
Hydrograph Report

Hyd. No. 22

SUBBASIN K

Hydrograph type	=	SCS Runoff	Peak discharge	=	3.254 cfs
Storm frequency	=	100 yrs	Time to peak	=	717 min
Time interval	=	3 min	Hyd. volume	=	7,984 cuft
Drainage area	=	0.490 ac	Curve number	=	93*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	6.00 min
Total precip.	=	5.60 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.380 x 98) + (0.110 x 74)] / 0.490



Appendix F
SLAMM Input / output Information:

Data file name: F:\Job Files\1818660 Montessori School of Waukesha-Waukesha, WI\1818664 Civil\storm water report and calculations\slamm.mdb
WinSLAMM Version 10.3.2
Rain file name: F:\Programs\civil\WinSLAMM\v10.3.2\Parameter Files\WisReg - Milwaukee WI 1969.RAN
Particulate Solids Concentration file name:
F:\Programs\Civil\WinSLAMM\v10.3.2\Parameter Files\v10.1 WI_AVG01.pscx
Runoff Coefficient file name: F:\Programs\Civil\WinSLAMM\v10.3.2\Parameter Files\WI_SL06 Dec06.rsvx
Residential Street Delivery file name:
F:\Programs\Civil\WinSLAMM\v10.3.2\Parameter Files\WI_Res and Other Urban Dec06.std
Institutional Street Delivery file name:
F:\Programs\Civil\WinSLAMM\v10.3.2\Parameter Files\WI_Com Inst Indust Dec06.std
Commercial Street Delivery file name: F:\Programs\Civil\WinSLAMM\v10.3.2\Parameter Files\WI_Com Inst Indust Dec06.std
Industrial Street Delivery file name: F:\Programs\Civil\WinSLAMM\v10.3.2\Parameter Files\WI_Com Inst Indust Dec06.std
Other Urban Street Delivery file name:
F:\Programs\Civil\WinSLAMM\v10.3.2\Parameter Files\WI_Res and Other Urban Dec06.std
Freeway Street Delivery file name: F:\Programs\Civil\WinSLAMM\v10.3.2\Parameter Files\Freeway Dec06.std
Apply Street Delivery Files to Adjust the After Event Load Street Dirt Mass Balance: False
Pollutant Relative Concentration file name:
F:\Programs\civil\WinSLAMM\v10.3.2\Parameter Files\WI_GEO03.ppdx
Source Area PSD and Peak to Average Flow Ratio File:
F:\Programs\Civil\WinSLAMM\v10.3.2\Parameter Files\NURP Source Area PSD Files.csv
Cost Data file name:
Seed for random number generator: -42
Study period starting date: 01/05/69 Study period ending date: 12/31/69
Start of Winter Season: 12/06 End of Winter Season: 03/28
Date: 07-05-2018 Time: 15:19:50
Site information:

LU# 1 - Institutional: Filter Total area (ac): 5.720
  1 - Roofs 1: 0.570 ac. Flat Connected Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
  13 - Paved Parking 1: 1.770 ac. Connected Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
  45 - Large Landscaped Areas 1: 3.380 ac. Normal Clayey Low Density Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

LU# 2 - Institutional: Offsite Total area (ac): 0.090
  13 - Paved Parking 1: 0.050 ac. Connected Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
  45 - Large Landscaped Areas 1: 0.040 ac. Normal Clayey Low Density Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

Control Practice 1: Upflo Filter CP# 1 (DS) - DS UpfloFilter # 1
Media Type: CPZ
Fraction of Area Served by Upflo Filters (0-1): 1.0
Height from Outlet Invert to Structure Top (ft): 4.0
Sump Depth (ft): 2.00
Sump Cleaning/Filter Replacement is not considered during the model run
Solve for Given Conditions
Number of filters: 15
Upflo Filter particle size distribution file name: Not needed - calculated by program

SLAMM for Windows Version 10.3.2

Data file name: F:\Job Files\1818660 Montessori School of Waukesha-Waukesha, WI\1818664 Civil\storm water report and calculations\slamm.mdb
Data file description:
Rain file name: F:\Programs\civil\WinSLAMM\v10.3.2\Parameter Files\WisReg - Milwaukee WI 1969.RAN
Particulate Solids Concentration file name: F:\Programs\Civil\WinSLAMM\v10.3.2\Parameter Files\v10.1 WI_AVG01.pscx
Runoff Coefficient file name: F:\Programs\Civil\WinSLAMM\v10.3.2\Parameter Files\WI_SL06 Dec06.rsvx
Residential Street Delivery file name: F:\Programs\Civil\WinSLAMM\v10.3.2\Parameter Files\WI_Res and Other Urban Dec06.std
Institutional Street Delivery file name: F:\Programs\Civil\WinSLAMM\v10.3.2\Parameter Files\WI_Com Inst Indust Dec06.std
Commercial Street Delivery file name: F:\Programs\Civil\WinSLAMM\v10.3.2\Parameter Files\WI_Com Inst Indust Dec06.std
Industrial Street Delivery file name: F:\Programs\Civil\WinSLAMM\v10.3.2\Parameter Files\WI_Com Inst Indust Dec06.std
Other Urban Street Delivery file name: F:\Programs\Civil\WinSLAMM\v10.3.2\Parameter Files\WI_Res and Other Urban Dec06.std
Freeway Street Delivery file name: F:\Programs\Civil\WinSLAMM\v10.3.2\Parameter Files\Freeway Dec06.std
Pollutant Relative Concentration file name: F:\Programs\civil\WinSLAMM\v10.3.2\Parameter Files\WI_GEO03.ppdx
Start of Winter Season: 12/06 End of Winter Season: 03/28
Model Run Start Date: 01/05/69 Model Run End Date: 12/31/69
Date of run: 07-05-2018 Time of run: 15:19:36
Total Area Modeled (acres): 5.810
Years in Model Run: 0.99

	Runoff Volume (cu ft)	Percent Runoff Volume Reduction	Particulate Solids Conc. (mg/L)	Particulate Solids Yield (lbs)	Percent Particulate Solids Reduction
Total of all Land Uses without Controls:	211986	-	120.5	1595	-
Outfall Total with Controls:	212211	-0.11%	43.27	573.2	64.06%
Annualized Total After Outfall Controls:	215158			581.2	