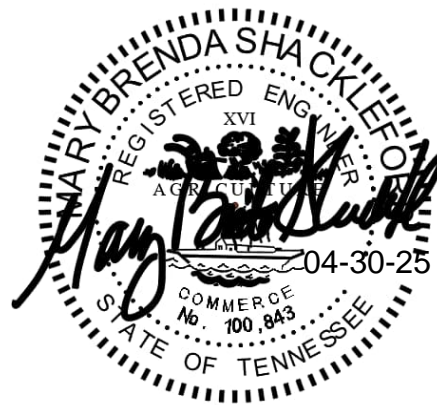


DRAINAGE REPORT

BOBBY-RAY PARK

CITY OF MCMINNVILLE
WARREN COUNTY
TENNESSEE

APRIL 30, 2025



Prepared by:



CSDG

Planning | Engineering
Landscape Architecture

2305 Kline Avenue, Suite 300
Nashville, TN 37211 | 615.248.9999

2305 Kline Avenue, Suite 300
Nashville, Tennessee 37211
Phone: (615) 248-9999
Fax: (615) 251-9575
Contact: Brenda Shackleford, P.E.

PROJECT DESCRIPTION

The Bobby-Ray Park project is located on a parcel of approximately 5.00 acres at 504 North Chancery Street in Warren County, McMinnville, Tennessee. This project is proposed as a public park. While the project includes park infrastructure, main goals for this project are enhancing stormwater management, conserving land, integrating green infrastructure practices, and promoting community outreach and education. To support these goals, the proposed improvements include runoff detention systems with delayed release to reduce downstream peak flows, wetlands enhancements, permeable walking paths and pavement, and educational signage throughout the site.

EXISTING SITE CONDITIONS

The existing 5.01-acre site is an undeveloped lot and has slopes ranging from 0-20%. The Hydrologic Features Report, prepared by MRW Environmental LLC (MRW), dated October 2, 2024, identified and delineated a wetland area within the subject property. MRW additionally provided an assessment of the wetland and indicated a low score demonstrating the low quality of the wetland area.

To evaluate the post-development impacts, two points of interest are considered. The site drains overland to a concrete swale which conveys runoff into an existing karst formation. The point at the karst formation is considered the first Point of Interest (POI#1). The point just before the concrete swale located at the site outfall is considered the second point of interest (POI#2), which is slightly upstream from POI#1. Note that the drainage area for POI#2 is entirely contained within the drainage area for POI#1.

The overall drainage basins to both POI's are summarized below.

- Predeveloped Basin – Point of Interest #1 (Hydrograph 1) = ±75.2 acres
 - Curve Number (CN) = 78
 - 14.8 acres of impervious surface (CN = 98)
 - 43.5 acres of B soil with short grass (CN = 69)
 - 1.0 acres of C soil with short grass (CN = 79)
 - 15.9 acres of D soil with short grass (CN = 84)
 - Time of Concentration = 32.4 mins

- Predeveloped Basin – Point of Interest #2 (Hydrograph 3) = ±52.5 acres
 - Curve Number (CN) = 81
 - 14.0 acres of impervious surface (CN = 98)
 - 21.6 acres of B soil with short grass (CN = 69)
 - 1.0 acres of C soil with short grass (CN = 79)
 - 15.9 acres of D soil with short grass (CN = 84)
 - Time of Concentration = 28.5 mins

PROPOSED DEVELOPMENT

To reduce calculated peak flow in the downstream drainage basin, two detention ponds are proposed on the Bobby-Ray site. The proposed ponds capture drainage from two delineated basins, 5.1 acres and 3.9 acres, which make up approximately 12% of the overall drainage basin to POI#1. The remaining 66.2 acres are treated as bypass which flows along the existing drainage pattern.

The three post-developed basins to POI#1 are detailed below.

- Post Developed Basin – Pond 1 (Hydrograph 5) = ± 5.10 acres
 - Curve Number (CN) = 78
 - 1.6 acres of impervious surface (CN = 98)
 - 3.5 acres of B soil with short grass (CN = 69)
 - Time of Concentration = 5 minutes (minimum)
- Post Developed Basin – Pond 2 (Hydrograph 8) = ± 3.9 acres
 - Curve Number (CN) = 83
 - 1.9 acres of impervious surface (CN = 98)
 - 2.0 acres of B soil with short grass (CN = 69)
 - Time of Concentration = 5 minutes (minimum)
- Post Developed Basin – Point of Interest #1 Karst Feature Bypass (Hydrograph 14) = ± 66.2 acres
 - Curve Number (CN) = 78
 - 11.3 acres of impervious surface (CN = 98)
 - 38.0 acres of B soil with short grass (CN = 69)
 - 1.0 acres of C soil with short grass (CN = 79)
 - 15.9 acres of D soil with short grass (CN = 84)
 - Time of Concentration = 32.4 minutes

The three post-developed basins to POI#2 are detailed below.

- Post Developed Basin – Pond 1 (Hydrograph 5)
 - See above for information
- Post Developed Basin – Pond 2 (Hydrograph 8)
 - See above for information
- Post Developed Basin – Point of Interest #2 Bypass Site Outfall (Hydrograph 11) = ± 43.5 acres
 - Curve Number (CN) = 82
 - 10.5 acres of impervious surface (CN = 98)
 - 16.1 acres of B soil with short grass (CN = 69)
 - 1.0 acres of C soil with short grass (CN = 79)
 - 15.9 acres of D soil with short grass (CN = 84)
 - Time of Concentration = 28.5 minutes

Both outfalls for pond 1 and pond 2 consist of 15" RCP pipes, headwalls, and broad crested weirs in the berm of the proposed pond. The discharge of the ponds flows onto the site and then overland to the existing concrete channel at POI#2.

To evaluate the potential impact of the proposed ponds, hydrographs were developed using the SCS method to determine the peak flows at each POI.

POI#1

- **Hydrograph #1** represents the “pre-developed” condition for the 75.2-acre basin to POI#1.
- **Hydrograph #5** is the portion of the basin (5.1 acres) in Hydrograph #1 which is routed to pond 1
- Hydrograph #5 is routed through pond 1 resulting in **Hydrograph #6**, pond 1 outflow.
- **Hydrograph #8** is the portion of the basin (3.9 acres) in Hydrograph #1 which is routed to pond 2.
- Hydrograph #8 is routed through pond 2 resulting in **Hydrograph #9**, pond 2 outflow.
- **Hydrograph #14** is the bypass area (66.2 acres) which is the remainder of Hydrograph #1 not routed to ponds.
- The pond outflows are then combined with the bypass creating **Hydrograph #15** which provides the “post-developed” condition for the entire 75.2-acre basin. A summary table of the calculated peak flows for each storm event is provided below.

	PEAK FLOW (POINT OF INTEREST #1)		
	<u>Pre-Condition</u>	<u>Post-Condition</u>	<u>Difference</u>
	<u>Hydrograph 1</u>	<u>Hydrograph 15</u>	
2-year	103.9 cfs	97.5 cfs	-6.4 cfs (6%)
5-year	145.8 cfs	136.4 cfs	-9.4 cfs (6%)
10-year	180.7 cfs	168.8 cfs	-11.9 cfs (7%)
25-year	229.0 cfs	213.0 cfs	-16.0 cfs (7%)
50-year	268.3 cfs	249.0 cfs	-19.3 cfs (7%)
100-year	307.9 cfs	285.3 cfs	-22.6 cfs (7%)

POI#2

- **Hydrograph #3** represents the “pre-developed” condition for the 52.5-acre basin to POI#2.
- **Hydrograph #5** is the portion of the basin (5.1 acres) in Hydrograph #3 which is routed to pond 1
- Hydrograph #5 is routed through pond 1 resulting in **Hydrograph #6**, pond 1 outflow.
- **Hydrograph #8** is the portion of the basin (3.9 acres) in Hydrograph #3 which is routed to pond 2.
- Hydrograph #8 is routed through pond 2 resulting in **Hydrograph #9**, pond 2 outflow.
- **Hydrograph #11** is the bypass area (43.5 acres) which is the remainder of Hydrograph #3 not routed to ponds.

- The pond outflows are then combined with the bypass creating **Hydrograph #12** which provides the “post-developed” condition for the entire 52.5-acre basin to POI#2. A summary table of the calculated peak flows for each storm event is provided below

PEAK FLOW (POINT OF INTEREST #2)			
	<u>Pre-Condition</u>	<u>Post-Condition</u>	<u>Difference</u>
	<u>Hydrograph 3</u>	<u>Hydrograph 12</u>	
2-year	88.7 cfs	83.0 cfs	-8.3 cfs (6%)
5-year	121.5 cfs	112.5 cfs	-9.0 cfs (7%)
10-year	148.3 cfs	136.3 cfs	-12.0 cfs (8%)
25-year	184.9 cfs	168.5 cfs	-16.4 cfs (9%)
50-year	214.5 cfs	194.6 cfs	-19.9 cfs (9%)
100-year	244.2 cfs	220.6 cfs	-23.6 cfs (10%)

Calculated peak flows at each POI are reduced by 6% to 10% typically analyzed storm events. These reductions in peak flows should have a beneficial impact on existing storm challenges near and downstream from the park.

ATTACHMENTS:

Maps

- Warren County Parcel Map
- National Flood Hazard Layer FIRMette (FEMA) Map
- Hydrological Soil Group for drainage area to POI

Detention Calculations

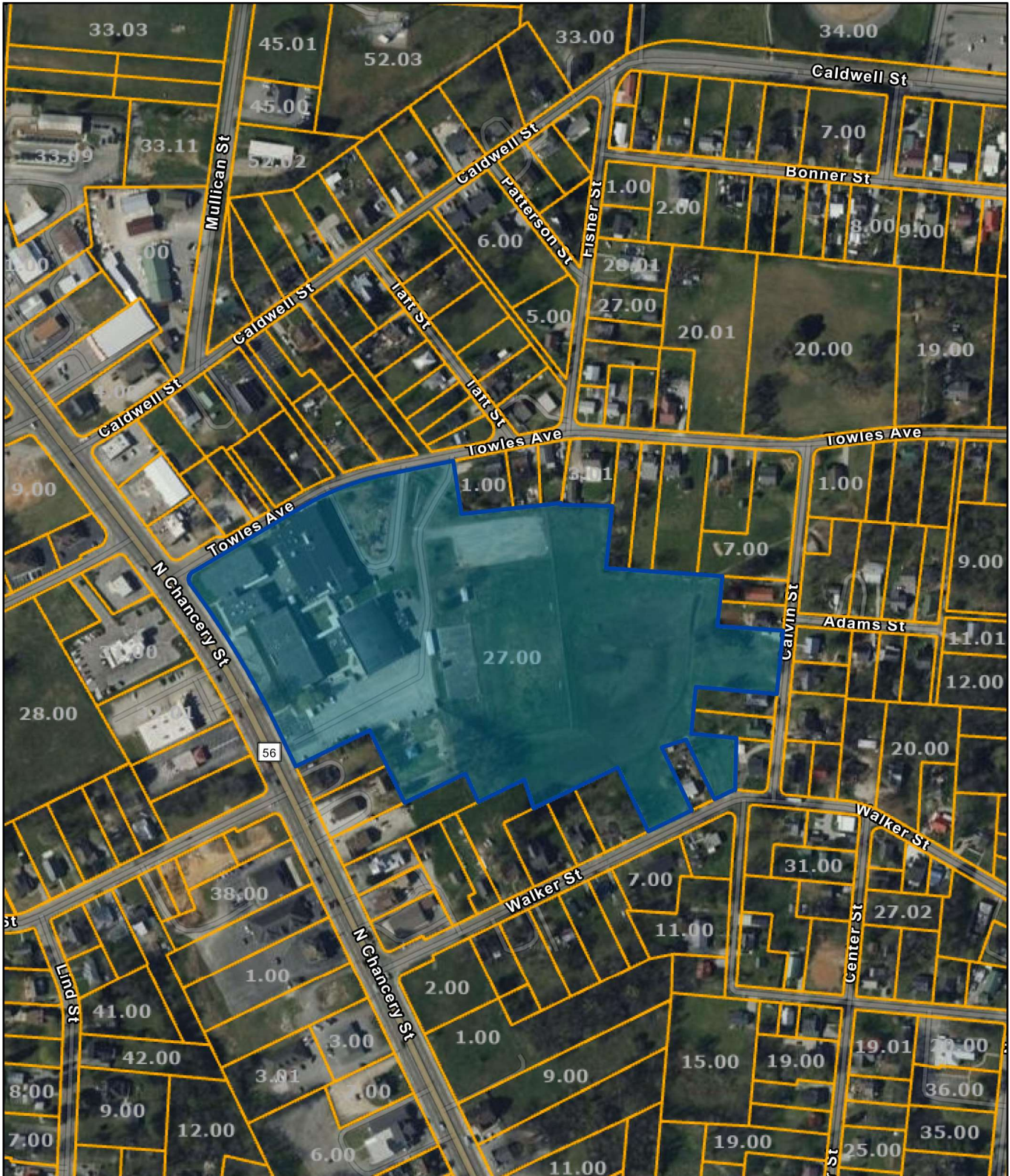
- Watershed Model Schematic
- Hydrograph Return Period Recap
- For each return period (2-, 5-, 10-, 25-, 50-, 100-year)
 - Hydrograph Summary Report
 - Hydrograph Reports
 - TR55 Tc Worksheets
 - Pond Report

Drainage Maps

- Drainage Area Map – Pre-developed Basin
- Drainage Area Map – Pre-developed Basin – Aerial
- Drainage Area Map – Post-developed Basin
- Drainage Area Map – Post-developed Basin – Aerial

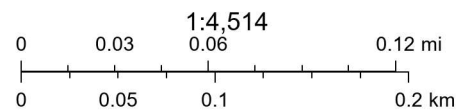
MAPS

Warren County - Parcel: 059M H 027.00



Date: April 9, 2025

County: WARREN
Owner: SCHOOL BOBBY RAY ELEM
Address: N CHANCERY ST 504
Parcel ID: 059M H 027.00
Deeded Acreage: 0
Calculated Acreage: 14.8
Vexcel Imagery Date: 2023



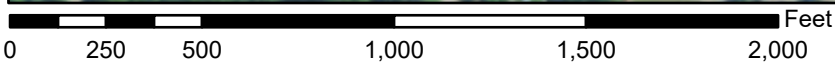
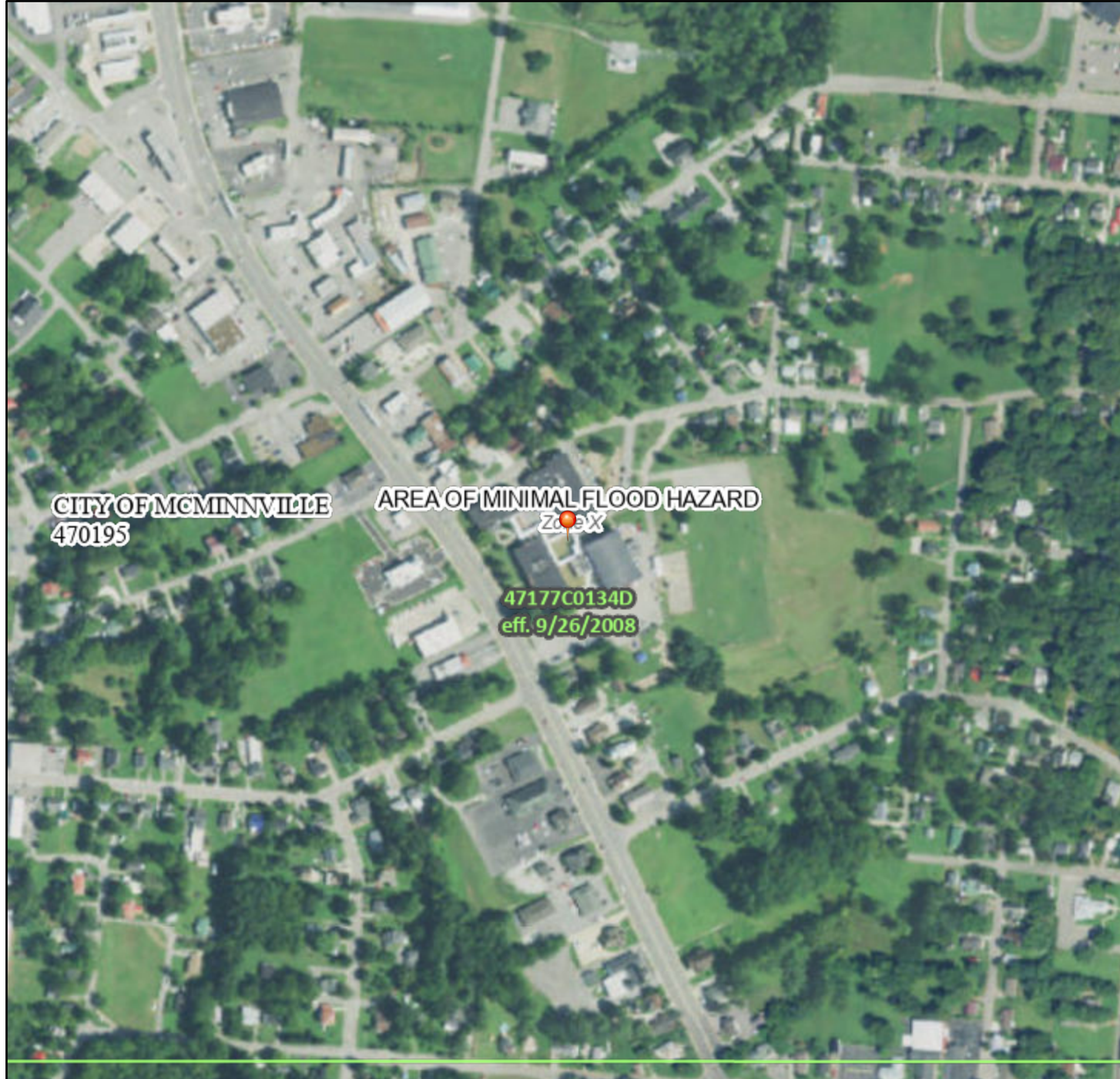
State of Tennessee, Comptroller of the Treasury, Division of Property Assessments (DPA), Esri Community Maps Contributors, © OpenStreetMap, Microsoft, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METI/ NASA, USGS, EPA, NPS, US Census Bureau, USDA, USFWS

The property lines are compiled from information maintained by your local county Assessor's office but are not conclusive evidence of property ownership in any court of law.

National Flood Hazard Layer FIRMMette



85°46'52"W 35°41'44"N

























1:6,000

85°46'14"W 35°41'15"N

Basemap Imagery Source: USGS National Map 2023

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

- | | | |
|---|--|--|
| SPECIAL FLOOD HAZARD AREAS |  | Without Base Flood Elevation (BFE)
<i>Zone A, V, A99</i> |
| |  | With BFE or Depth <i>Zone AE, AO, AH, VE, AR</i>
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 <i>Zone X</i> |
| |  | Future Conditions 1% Annual Chance Flood Hazard <i>Zone X</i> |
| |  | Area with Reduced Flood Risk due to Levee. See Notes. <i>Zone X</i> |
| |  | Area with Flood Risk due to Levee <i>Zone D</i> |
| OTHER AREAS |  | NO SCREEN Area of Minimal Flood Hazard <i>Zone X</i> |
| |  | Effective LOMRs |
| GENERAL STRUCTURES |  | Area of Undetermined Flood Hazard <i>Zone D</i> |
| |  | Channel, Culvert, or Storm Sewer |
| OTHER FEATURES |  | Levee, Dike, or Floodwall |
| |  | Cross Sections with 1% Annual Chance Water Surface Elevation |
| MAP PANELS |  | Coastal Transect |
| |  | Base Flood Elevation Line (BFE) |
| |  | Limit of Study |
| |  | Jurisdiction Boundary |
| |  | Coastal Transect Baseline |
| |  | Profile Baseline |
| MAP PANELS |  | Digital Data Available |
| |  | No Digital Data Available |
| |  | Unmapped |
|  | The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location. | |

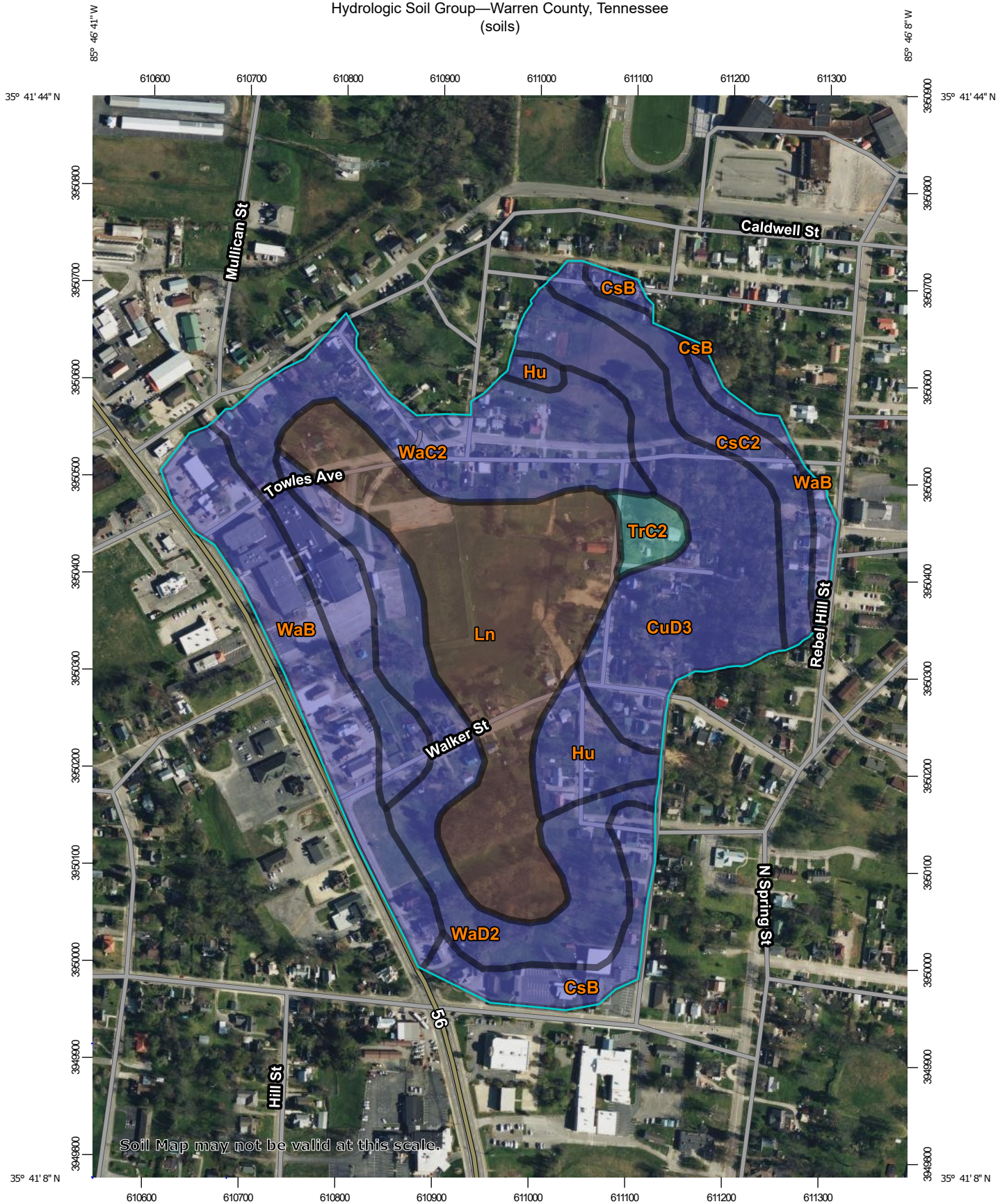


This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

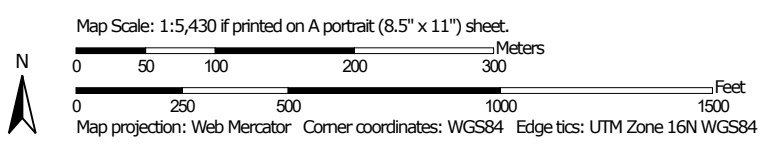
The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on **1/3/2024 at 12:17 PM** and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

Hydrologic Soil Group—Warren County, Tennessee
(soils)




Soil Map may not be valid at this scale.



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: Warren County, Tennessee
 Survey Area Data: Version 16, Sep 12, 2024

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

Date(s) aerial images were photographed: Mar 20, 2021—Apr 27, 2021

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
CsB	Cumberland silt loam, 2 to 5 percent slopes	B	3.7	4.9%
CsC2	Cumberland silt loam, 5 to 12 percent slopes, eroded	B	4.2	5.5%
CuD3	Cumberland silty clay loam, 12 to 20 percent slopes, severely eroded	B	12.5	16.6%
Hu	Huntington silt loam	B	3.1	4.1%
Ln	Lindell silt loam, 0 to 2 percent slopes, occasionally flooded	B/D	17.0	22.6%
TrC2	Talbott very rocky complex, 5 to 20 percent slopes	C	1.2	1.6%
WaB	Waynesboro loam, 2 to 5 percent slopes	B	9.8	13.0%
WaC2	Waynesboro loam, 5 to 12 percent slopes, eroded	B	13.5	17.9%
WaD2	Waynesboro loam, 12 to 20 percent slopes, eroded	B	10.2	13.6%
Totals for Area of Interest			75.2	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

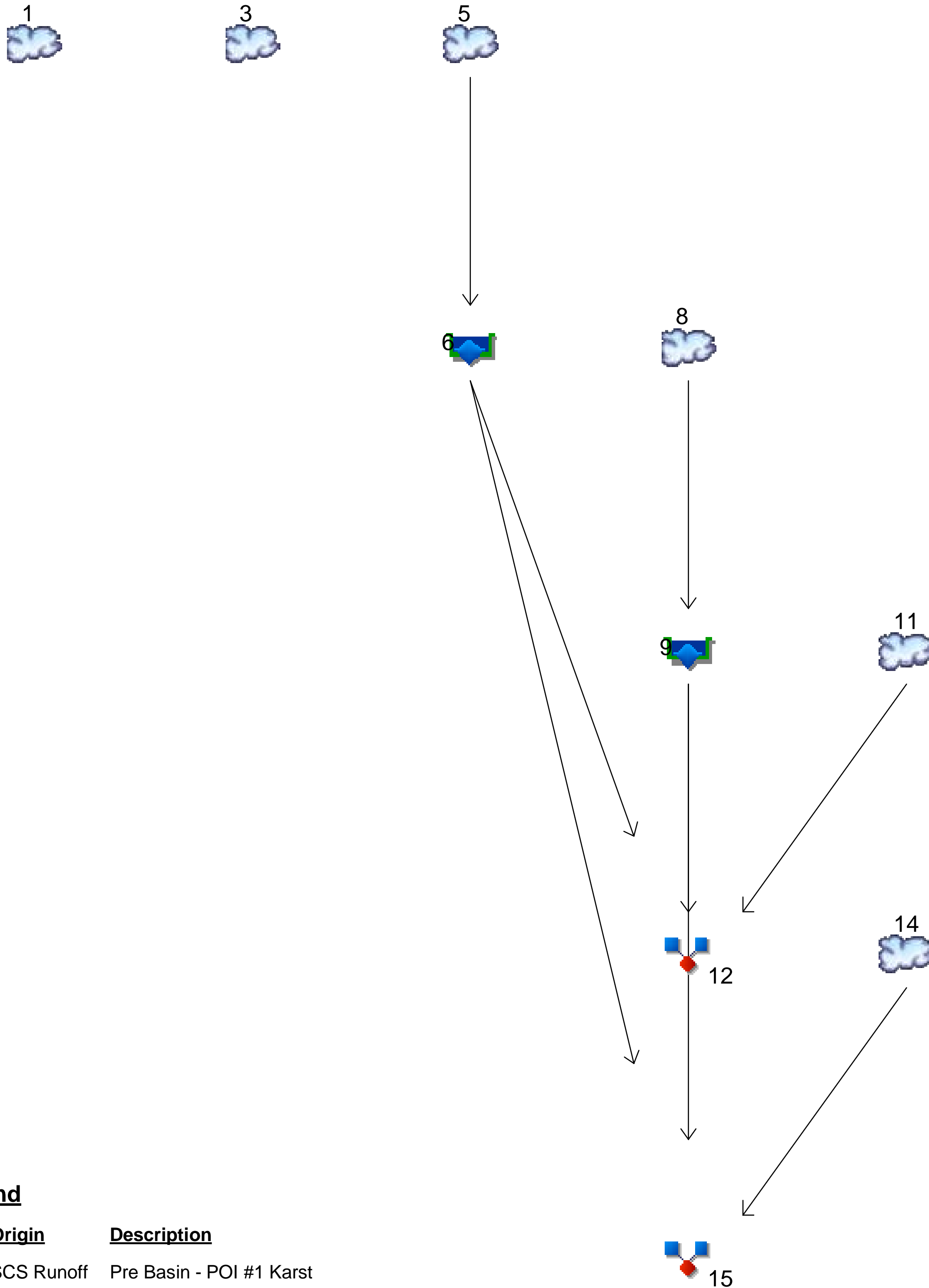
Component Percent Cutoff: None Specified

Tie-break Rule: Higher

STORM CALCULATIONS

Watershed Model Schematic

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024



Legend

Hyd.	Origin	Description
1	SCS Runoff	Pre Basin - POI #1 Karst
3	SCS Runoff	Pre Basin - POI #2 - site outfall
5	SCS Runoff	Post Basin to Pond 1
6	Reservoir	Pond 1 outflow
8	SCS Runoff	Post Basin to Pond 2
9	Reservoir	Pond 2 outflow
11	SCS Runoff	Post Basin - POI #2 - (Bypassing ponds)
12	Combine	Post Basin POI #2 - compare to hyd 3
14	SCS Runoff	Pre Basin - POI #1 Karst (bypass ponds)
15	Combine	Post Basin - POI #1 - compare to hyd 1

Hydrograph Return Period Recap

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024

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	-----	-----	103.90	-----	145.79	180.73	228.97	268.27	307.90	Pre Basin - POI #1 Karst
3	SCS Runoff	-----	-----	88.72	-----	121.45	148.29	184.88	214.47	244.18	Pre Basin - POI #2 - site outfall
5	SCS Runoff	-----	-----	14.25	-----	19.69	24.24	30.45	35.49	40.56	Post Basin to Pond 1
6	Reservoir	5	-----	4.633	-----	6.009	6.981	7.728	8.238	8.734	Pond 1 outflow
8	SCS Runoff	-----	-----	13.28	-----	17.71	21.29	26.13	30.02	33.90	Post Basin to Pond 2
9	Reservoir	8	-----	1.894	-----	2.599	3.044	3.870	4.858	5.726	Pond 2 outflow
11	SCS Runoff	-----	-----	76.74	-----	104.17	126.57	157.03	181.61	206.25	Post Basin - POI #2 - (Bypassing pon
12	Combine	6, 9, 11	-----	82.99	-----	112.50	136.33	168.50	194.58	220.55	Post Basin POI #2 - compare to hyd 3
14	SCS Runoff	-----	-----	91.46	-----	128.35	159.10	201.56	236.16	271.05	Pre Basin - POI #1 Karst (bypass pon
15	Combine	6, 9, 14	-----	97.45	-----	136.44	168.75	212.96	249.05	285.26	Post Basin - POI #1 - compare to hyd

Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024

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	103.90	2	734	456,308	-----	-----	-----	Pre Basin - POI #1 Karst	
3	SCS Runoff	88.72	2	730	356,729	-----	-----	-----	Pre Basin - POI #2 - site outfall	
5	SCS Runoff	14.25	2	718	28,654	-----	-----	-----	Post Basin to Pond 1	
6	Reservoir	4.633	2	724	28,654	5	944.36	8,414	Pond 1 outflow	
8	SCS Runoff	13.28	2	716	26,916	-----	-----	-----	Post Basin to Pond 2	
9	Reservoir	1.894	2	728	26,825	8	943.52	11,961	Pond 2 outflow	
11	SCS Runoff	76.74	2	730	307,757	-----	-----	-----	Post Basin - POI #2 - (Bypassing pon	
12	Combine	82.99	2	730	363,237	6, 9, 11	-----	-----	Post Basin POI #2 - compare to hyd 3	
14	SCS Runoff	91.46	2	734	401,697	-----	-----	-----	Pre Basin - POI #1 Karst (bypass pon	
15	Combine	97.45	2	734	457,177	6, 9, 14	-----	-----	Post Basin - POI #1 - compare to hyd	
24-018-01 2025-04-29 Bobby Ray.gpw					Return Period: 2 Year			Wednesday, 04 / 30 / 2025		

Hydrograph Report

Hyd. No. 1

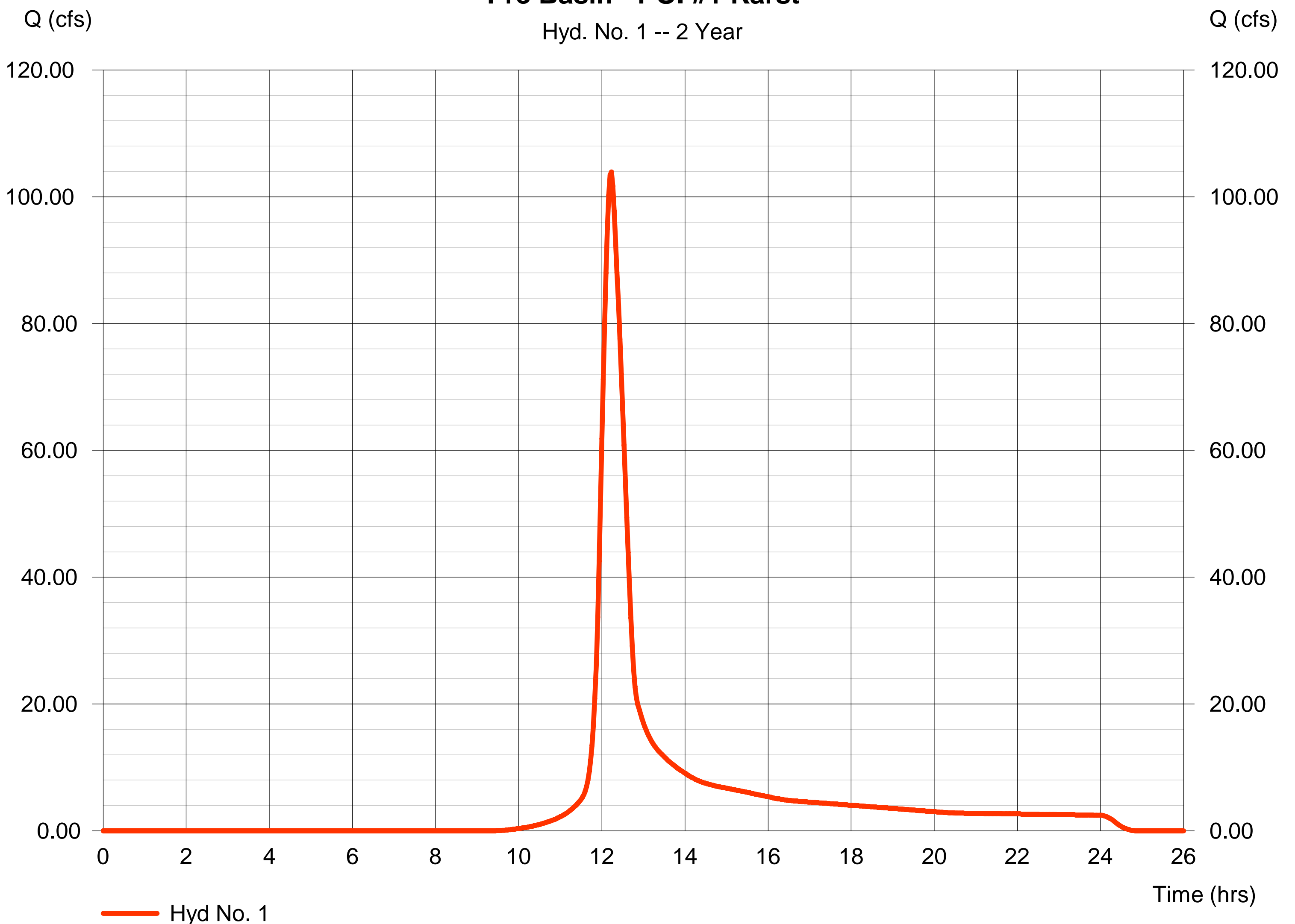
Pre Basin - POI #1 Karst

Hydrograph type	= SCS Runoff	Peak discharge	= 103.90 cfs
Storm frequency	= 2 yrs	Time to peak	= 12.23 hrs
Time interval	= 2 min	Hyd. volume	= 456,308 cuft
Drainage area	= 75.200 ac	Curve number	= 78*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 32.40 min
Total precip.	= 3.70 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(14.800 x 98) + (15.900 x 84) + (1.000 x 79) + (43.500 x 69)] / 75.200

Pre Basin - POI #1 Karst

Hyd. No. 1 -- 2 Year



TR55 Tc Worksheet

Hyd. No. 1

Pre Basin - POI #1 Karst

<u>Description</u>	<u>A</u>	<u>B</u>	<u>C</u>	<u>Totals</u>
Sheet Flow				
Manning's n-value	= 0.150	0.011	0.011	
Flow length (ft)	= 300.0	0.0	0.0	
Two-year 24-hr precip. (in)	= 3.70	0.00	0.00	
Land slope (%)	= 8.80	0.00	0.00	
Travel Time (min)	= 12.13	+ 0.00	+ 0.00	= 12.13
Shallow Concentrated Flow				
Flow length (ft)	= 1759.00	0.00	0.00	
Watercourse slope (%)	= 0.80	0.00	0.00	
Surface description	= Unpaved	Paved	Paved	
Average velocity (ft/s)	=1.44	0.00	0.00	
Travel Time (min)	= 20.31	+ 0.00	+ 0.00	= 20.31
Channel Flow				
X sectional flow area (sqft)	= 0.00	0.00	0.00	
Wetted perimeter (ft)	= 0.00	0.00	0.00	
Channel slope (%)	= 0.00	0.00	0.00	
Manning's n-value	= 0.015	0.015	0.015	
Velocity (ft/s)	=0.00	0.00	0.00	
Flow length (ft)	{{0}}0.0	0.0	0.0	
Travel Time (min)	= 0.00	+ 0.00	+ 0.00	= 0.00
Total Travel Time, Tc				32.40 min

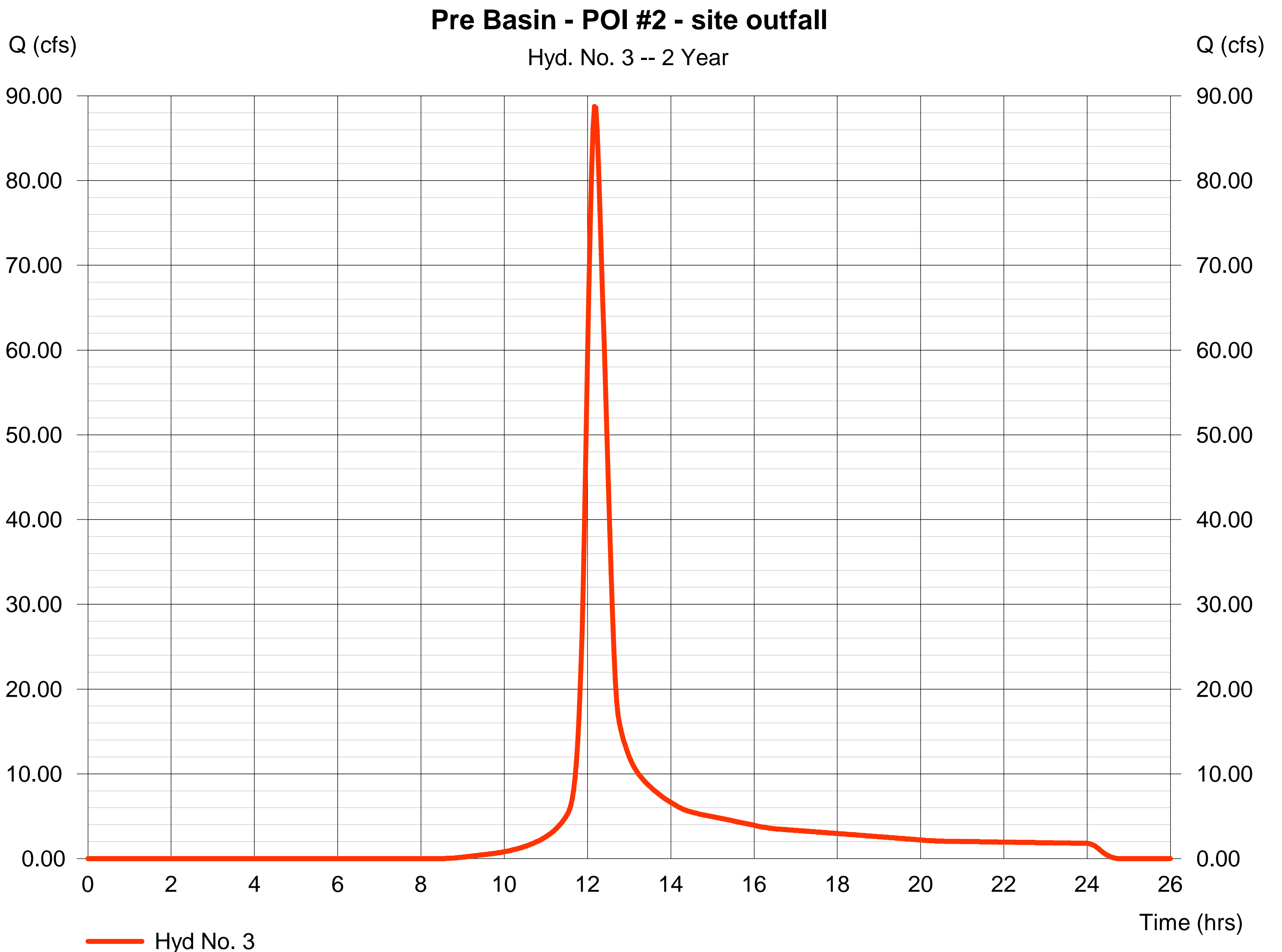
Hydrograph Report

Hyd. No. 3

Pre Basin - POI #2 - site outfall

Hydrograph type	= SCS Runoff	Peak discharge	= 88.72 cfs
Storm frequency	= 2 yrs	Time to peak	= 12.17 hrs
Time interval	= 2 min	Hyd. volume	= 356,729 cuft
Drainage area	= 52.500 ac	Curve number	= 81*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 28.50 min
Total precip.	= 3.70 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(14.000 x 98) + (21.600 x 69) + (1.000 x 79) + (15.900 x 84)] / 52.500



TR55 Tc Worksheet

Hyd. No. 3

Pre Basin - POI #2 - site outfall

<u>Description</u>	<u>A</u>		<u>B</u>		<u>C</u>		<u>Totals</u>
Sheet Flow							
Manning's n-value	= 0.150		0.011		0.011		
Flow length (ft)	= 300.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 3.70		0.00		0.00		
Land slope (%)	= 8.80		0.00		0.00		
Travel Time (min)	= 12.13	+	0.00	+	0.00	=	12.13
Shallow Concentrated Flow							
Flow length (ft)	= 1503.00		0.00		0.00		
Watercourse slope (%)	= 0.90		0.00		0.00		
Surface description	= Unpaved		Paved		Paved		
Average velocity (ft/s)	=1.53		0.00		0.00		
Travel Time (min)	= 16.37	+	0.00	+	0.00	=	16.37
Channel Flow							
X sectional flow area (sqft)	= 0.00		0.00		0.00		
Wetted perimeter (ft)	= 0.00		0.00		0.00		
Channel slope (%)	= 0.00		0.00		0.00		
Manning's n-value	= 0.015		0.015		0.015		
Velocity (ft/s)	=0.00		0.00		0.00		
Flow length (ft)	{{0}}0.0		0.0		0.0		
Travel Time (min)	= 0.00	+	0.00	+	0.00	=	0.00
Total Travel Time, Tc							28.50 min

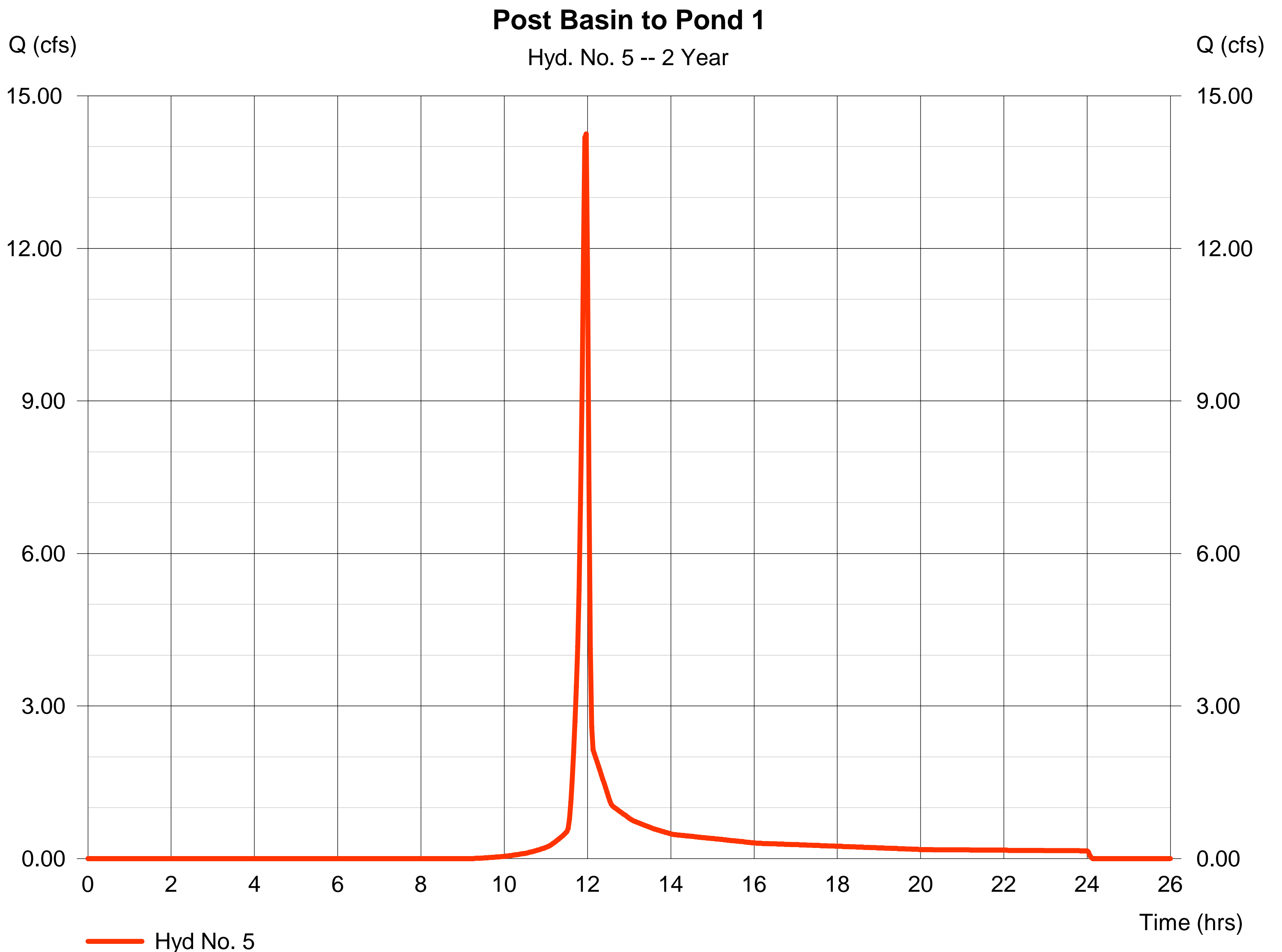
Hydrograph Report

Hyd. No. 5

Post Basin to Pond 1

Hydrograph type	= SCS Runoff	Peak discharge	= 14.25 cfs
Storm frequency	= 2 yrs	Time to peak	= 11.97 hrs
Time interval	= 2 min	Hyd. volume	= 28,654 cuft
Drainage area	= 5.100 ac	Curve number	= 78*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 3.70 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(1.600 x 98) + (3.500 x 69)] / 5.100



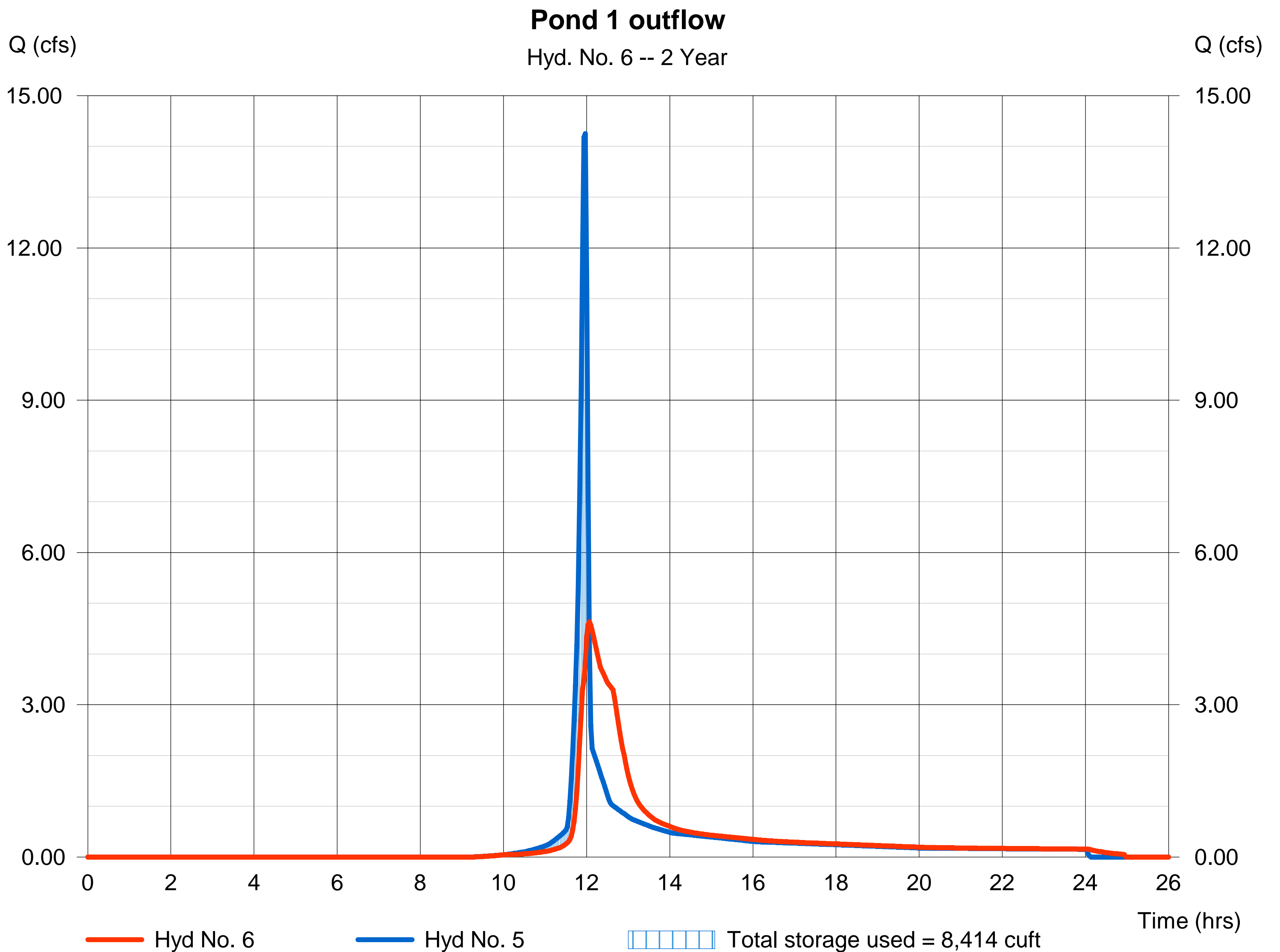
Hydrograph Report

Hyd. No. 6

Pond 1 outflow

Hydrograph type	= Reservoir	Peak discharge	= 4.633 cfs
Storm frequency	= 2 yrs	Time to peak	= 12.07 hrs
Time interval	= 2 min	Hyd. volume	= 28,654 cuft
Inflow hyd. No.	= 5 - Post Basin to Pond 1	Max. Elevation	= 944.36 ft
Reservoir name	= Pond 1	Max. Storage	= 8,414 cuft

Storage Indication method used.



Pond Report

Pond No. 3 - Pond 1

Pond Data

Contours -User-defined contour areas. Average end area method used for volume calculation. Begining Elevation = 942.90 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	942.90	00	0	0
0.10	943.00	50	3	3
1.10	944.00	7,870	3,960	3,963
2.10	945.00	16,800	12,335	16,298
2.85	945.75	18,275	13,153	29,451
3.10	946.00	18,850	4,641	34,091
3.85	946.75	20,580	14,786	48,878

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 15.00	Inactive	Inactive	0.00
Span (in)	= 15.00	0.00	0.00	0.00
No. Barrels	= 1	0	0	0
Invert El. (ft)	= 942.90	0.00	0.00	0.00
Length (ft)	= 25.00	0.00	0.00	0.00
Slope (%)	= 1.00	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	No	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	Inactive	Inactive	Inactive	20.00
Crest El. (ft)	= 0.00	0.00	0.00	945.75
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= ---	---	---	Broad
Multi-Stage	= No	No	No	No
Exfil.(in/hr)	= 0.000 (by Wet area)			
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).

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0	942.90	0.00	---	---	---	---	---	---	0.00	---	---	0.000
0.01	0	942.91	0.00 ic	---	---	---	---	---	---	0.00	---	---	0.001
0.02	1	942.92	0.00 ic	---	---	---	---	---	---	0.00	---	---	0.002
0.03	1	942.93	0.00 ic	---	---	---	---	---	---	0.00	---	---	0.005
0.04	1	942.94	0.01 ic	---	---	---	---	---	---	0.00	---	---	0.008
0.05	1	942.95	0.01 ic	---	---	---	---	---	---	0.00	---	---	0.013
0.06	2	942.96	0.02 ic	---	---	---	---	---	---	0.00	---	---	0.018
0.07	2	942.97	0.02 ic	---	---	---	---	---	---	0.00	---	---	0.025
0.08	2	942.98	0.03 ic	---	---	---	---	---	---	0.00	---	---	0.032
0.09	2	942.99	0.04 ic	---	---	---	---	---	---	0.00	---	---	0.041
0.10	3	943.00	0.05 ic	---	---	---	---	---	---	0.00	---	---	0.050
0.20	399	943.10	0.19 ic	---	---	---	---	---	---	0.00	---	---	0.193
0.30	795	943.20	0.42 ic	---	---	---	---	---	---	0.00	---	---	0.423
0.40	1,191	943.30	0.73 ic	---	---	---	---	---	---	0.00	---	---	0.730
0.50	1,587	943.40	1.10 ic	---	---	---	---	---	---	0.00	---	---	1.104
0.60	1,983	943.50	1.54 ic	---	---	---	---	---	---	0.00	---	---	1.537
0.70	2,379	943.60	2.00 oc	---	---	---	---	---	---	0.00	---	---	1.995
0.80	2,775	943.70	2.37 oc	---	---	---	---	---	---	0.00	---	---	2.366
0.90	3,171	943.80	2.71 oc	---	---	---	---	---	---	0.00	---	---	2.715
1.00	3,567	943.90	3.03 oc	---	---	---	---	---	---	0.00	---	---	3.030
1.10	3,963	944.00	3.29 oc	---	---	---	---	---	---	0.00	---	---	3.287
1.20	5,196	944.10	3.45 oc	---	---	---	---	---	---	0.00	---	---	3.445
1.30	6,430	944.20	3.74 oc	---	---	---	---	---	---	0.00	---	---	3.743
1.40	7,663	944.30	4.32 oc	---	---	---	---	---	---	0.00	---	---	4.322
1.50	8,897	944.40	4.83 oc	---	---	---	---	---	---	0.00	---	---	4.832
1.60	10,130	944.50	5.29 oc	---	---	---	---	---	---	0.00	---	---	5.294
1.70	11,364	944.60	5.72 oc	---	---	---	---	---	---	0.00	---	---	5.718
1.80	12,597	944.70	6.11 oc	---	---	---	---	---	---	0.00	---	---	6.112
1.90	13,831	944.80	6.48 oc	---	---	---	---	---	---	0.00	---	---	6.483
2.00	15,064	944.90	6.83 oc	---	---	---	---	---	---	0.00	---	---	6.834
2.10	16,298	945.00	7.17 oc	---	---	---	---	---	---	0.00	---	---	7.168
2.17	17,613	945.08	7.36 ic	---	---	---	---	---	---	0.00	---	---	7.356
2.25	18,928	945.15	7.53 ic	---	---	---	---	---	---	0.00	---	---	7.531
2.33	20,243	945.22	7.70 ic	---	---	---	---	---	---	0.00	---	---	7.703
2.40	21,559	945.30	7.87 ic	---	---	---	---	---	---	0.00	---	---	7.871
2.47	22,874	945.38	8.04 ic	---	---	---	---	---	---	0.00	---	---	8.036

Continues on next page...

Pond 1

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
2.55	24,189	945.45	8.20 ic	---	---	---	---	---	---	0.00	---	---	8.197
2.63	25,505	945.53	8.36 ic	---	---	---	---	---	---	0.00	---	---	8.355
2.70	26,820	945.60	8.51 ic	---	---	---	---	---	---	0.00	---	---	8.511
2.78	28,135	945.68	8.66 ic	---	---	---	---	---	---	0.00	---	---	8.663
2.85	29,451	945.75	8.81 ic	---	---	---	---	---	---	0.00	---	---	8.813
2.88	29,915	945.78	8.86 ic	---	---	---	---	---	---	0.26	---	---	9.126
2.90	30,379	945.80	8.91 ic	---	---	---	---	---	---	0.74	---	---	9.656
2.92	30,843	945.83	8.96 ic	---	---	---	---	---	---	1.37	---	---	10.33
2.95	31,307	945.85	9.01 ic	---	---	---	---	---	---	2.11	---	---	11.12
2.97	31,771	945.88	9.06 ic	---	---	---	---	---	---	2.95	---	---	12.00
3.00	32,235	945.90	9.11 ic	---	---	---	---	---	---	3.87	---	---	12.98
3.03	32,699	945.93	9.15 ic	---	---	---	---	---	---	4.88	---	---	14.04
3.05	33,163	945.95	9.20 ic	---	---	---	---	---	---	5.97	---	---	15.17
3.08	33,627	945.98	9.25 ic	---	---	---	---	---	---	7.12	---	---	16.37
3.10	34,091	946.00	9.29 ic	---	---	---	---	---	---	8.32	---	---	17.62
3.17	35,570	946.08	9.43 ic	---	---	---	---	---	---	12.34	---	---	21.77
3.25	37,049	946.15	9.57 ic	---	---	---	---	---	---	16.85	---	---	26.42
3.33	38,527	946.22	9.71 ic	---	---	---	---	---	---	21.80	---	---	31.51
3.40	40,006	946.30	9.84 ic	---	---	---	---	---	---	27.16	---	---	37.01
3.47	41,484	946.38	9.97 ic	---	---	---	---	---	---	32.92	---	---	42.89
3.55	42,963	946.45	10.10 ic	---	---	---	---	---	---	39.01	---	---	49.12
3.63	44,442	946.53	10.23 ic	---	---	---	---	---	---	45.45	---	---	55.68
3.70	45,920	946.60	10.36 ic	---	---	---	---	---	---	52.20	---	---	62.56
3.78	47,399	946.68	10.49 ic	---	---	---	---	---	---	59.26	---	---	69.75
3.85	48,878	946.75	10.61 ic	---	---	---	---	---	---	66.60	---	---	77.21

...End

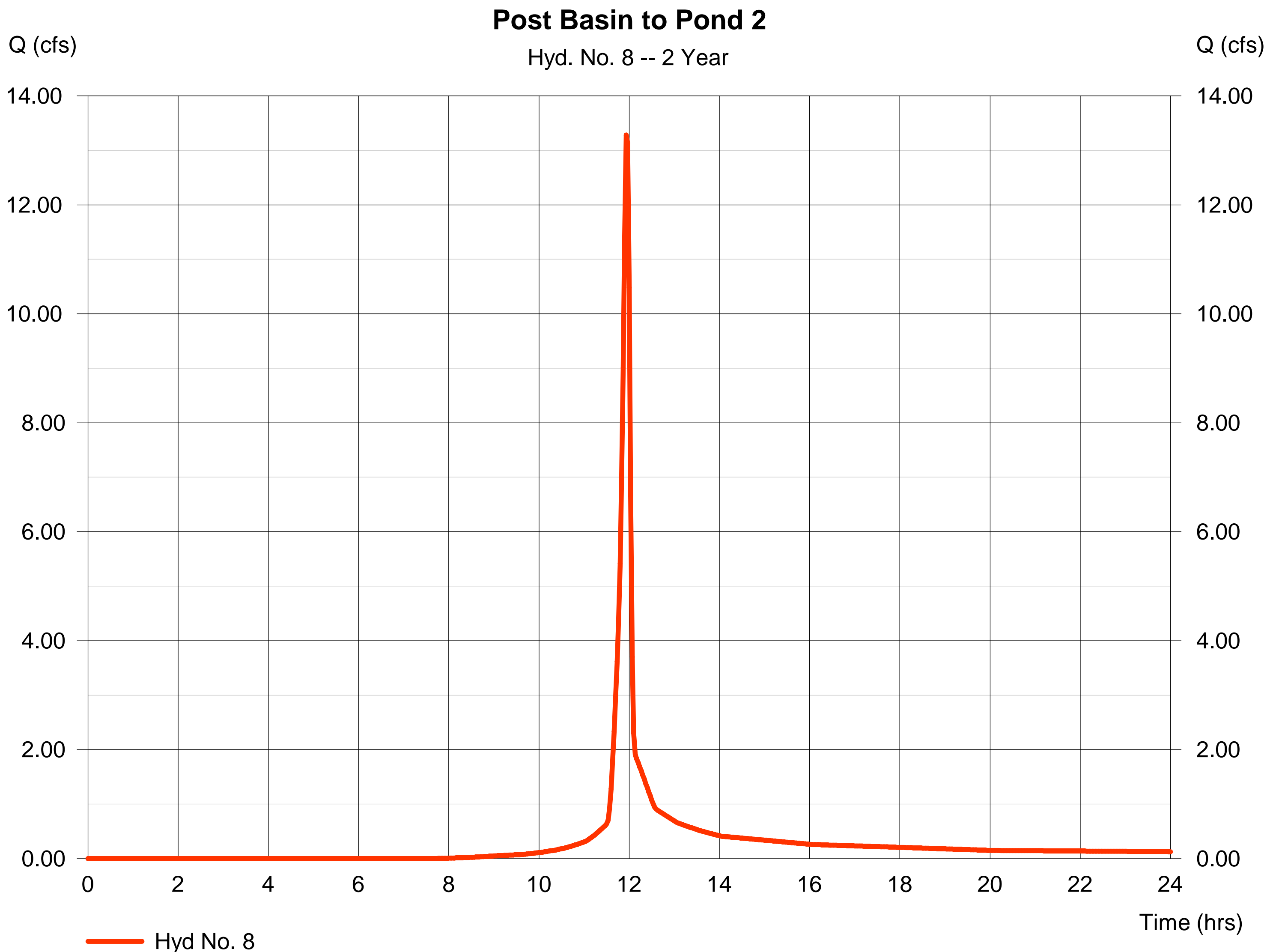
Hydrograph Report

Hyd. No. 8

Post Basin to Pond 2

Hydrograph type	= SCS Runoff	Peak discharge	= 13.28 cfs
Storm frequency	= 2 yrs	Time to peak	= 11.93 hrs
Time interval	= 2 min	Hyd. volume	= 26,916 cuft
Drainage area	= 3.900 ac	Curve number	= 83*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 3.70 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(1.900 x 98) + (2.000 x 69)] / 3.900



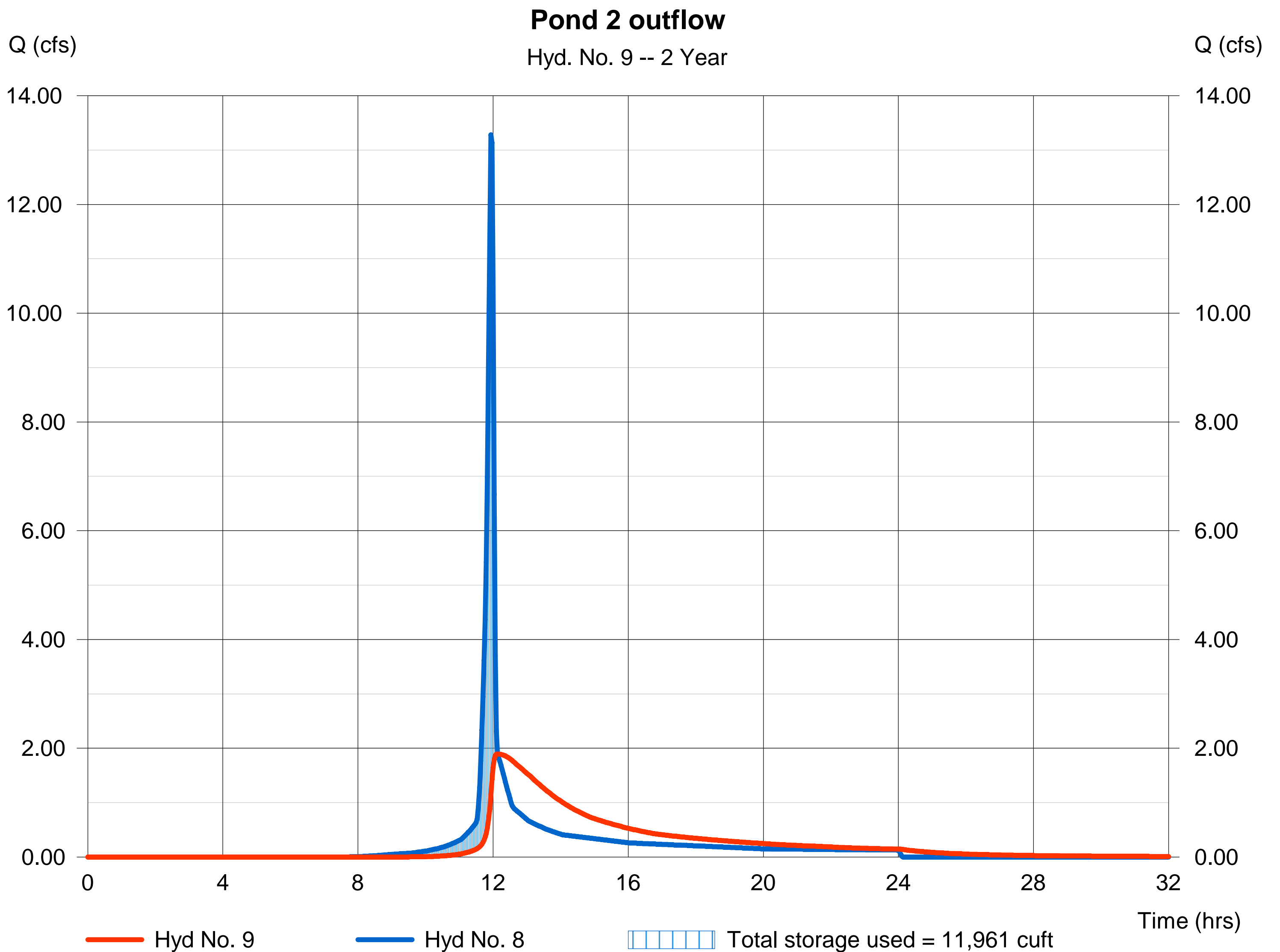
Hydrograph Report

Hyd. No. 9

Pond 2 outflow

Hydrograph type	= Reservoir	Peak discharge	= 1.894 cfs
Storm frequency	= 2 yrs	Time to peak	= 12.13 hrs
Time interval	= 2 min	Hyd. volume	= 26,825 cuft
Inflow hyd. No.	= 8 - Post Basin to Pond 2	Max. Elevation	= 943.52 ft
Reservoir name	= Pond 2	Max. Storage	= 11,961 cuft

Storage Indication method used.



Pond Report

Pond No. 5 - Pond 2

Pond Data

Contours -User-defined contour areas. Average end area method used for volume calculation. Begining Elevation = 942.80 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	942.80	00	0	0
0.20	943.00	18,450	1,845	1,845
1.20	944.00	20,600	19,525	21,370
2.20	945.00	22,900	21,750	43,120

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 15.00	Inactive	Inactive	0.00
Span (in)	= 15.00	0.00	0.00	0.00
No. Barrels	= 1	0	0	0
Invert El. (ft)	= 942.80	0.00	0.00	0.00
Length (ft)	= 20.00	0.00	0.00	0.00
Slope (%)	= 1.00	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	No	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	Inactive	Inactive	Inactive	20.00
Crest El. (ft)	= 0.00	0.00	0.00	944.50
Weir Coeff.	= 3.33	3.33	3.33	2.60
Weir Type	= ---	---	---	Broad
Multi-Stage	= No	No	No	No
Exfil.(in/hr)	= 0.000 (by Wet area)			
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).

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0	942.80	0.00	---	---	---	---	---	---	0.00	---	---	0.000
0.02	185	942.82	0.00 ic	---	---	---	---	---	---	0.00	---	---	0.002
0.04	369	942.84	0.01 ic	---	---	---	---	---	---	0.00	---	---	0.008
0.06	554	942.86	0.02 ic	---	---	---	---	---	---	0.00	---	---	0.018
0.08	738	942.88	0.03 ic	---	---	---	---	---	---	0.00	---	---	0.032
0.10	923	942.90	0.05 ic	---	---	---	---	---	---	0.00	---	---	0.050
0.12	1,107	942.92	0.07 ic	---	---	---	---	---	---	0.00	---	---	0.071
0.14	1,292	942.94	0.10 ic	---	---	---	---	---	---	0.00	---	---	0.096
0.16	1,476	942.96	0.12 ic	---	---	---	---	---	---	0.00	---	---	0.125
0.18	1,661	942.98	0.16 ic	---	---	---	---	---	---	0.00	---	---	0.158
0.20	1,845	943.00	0.19 ic	---	---	---	---	---	---	0.00	---	---	0.193
0.30	3,798	943.10	0.42 ic	---	---	---	---	---	---	0.00	---	---	0.423
0.40	5,750	943.20	0.73 ic	---	---	---	---	---	---	0.00	---	---	0.730
0.50	7,703	943.30	1.10 ic	---	---	---	---	---	---	0.00	---	---	1.104
0.60	9,655	943.40	1.49 oc	---	---	---	---	---	---	0.00	---	---	1.488
0.70	11,608	943.50	1.83 oc	---	---	---	---	---	---	0.00	---	---	1.833
0.80	13,560	943.60	2.17 oc	---	---	---	---	---	---	0.00	---	---	2.170
0.90	15,513	943.70	2.49 oc	---	---	---	---	---	---	0.00	---	---	2.487
1.00	17,465	943.80	2.77 oc	---	---	---	---	---	---	0.00	---	---	2.774
1.10	19,418	943.90	3.01 oc	---	---	---	---	---	---	0.00	---	---	3.010
1.20	21,370	944.00	3.16 oc	---	---	---	---	---	---	0.00	---	---	3.160
1.30	23,545	944.10	3.52 oc	---	---	---	---	---	---	0.00	---	---	3.516
1.40	25,720	944.20	4.16 oc	---	---	---	---	---	---	0.00	---	---	4.161
1.50	27,895	944.30	4.72 oc	---	---	---	---	---	---	0.00	---	---	4.717
1.60	30,070	944.40	5.22 oc	---	---	---	---	---	---	0.00	---	---	5.215
1.70	32,245	944.50	5.67 oc	---	---	---	---	---	---	0.00	---	---	5.669
1.80	34,420	944.60	6.09 oc	---	---	---	---	---	---	1.64	---	---	7.732
1.90	36,595	944.70	6.48 oc	---	---	---	---	---	---	4.65	---	---	11.13
2.00	38,770	944.80	6.85 oc	---	---	---	---	---	---	8.54	---	---	15.39
2.10	40,945	944.90	7.17 ic	---	---	---	---	---	---	13.14	---	---	20.32
2.20	43,120	945.00	7.41 ic	---	---	---	---	---	---	18.38	---	---	25.80

Hydrograph Report

Hyd. No. 11

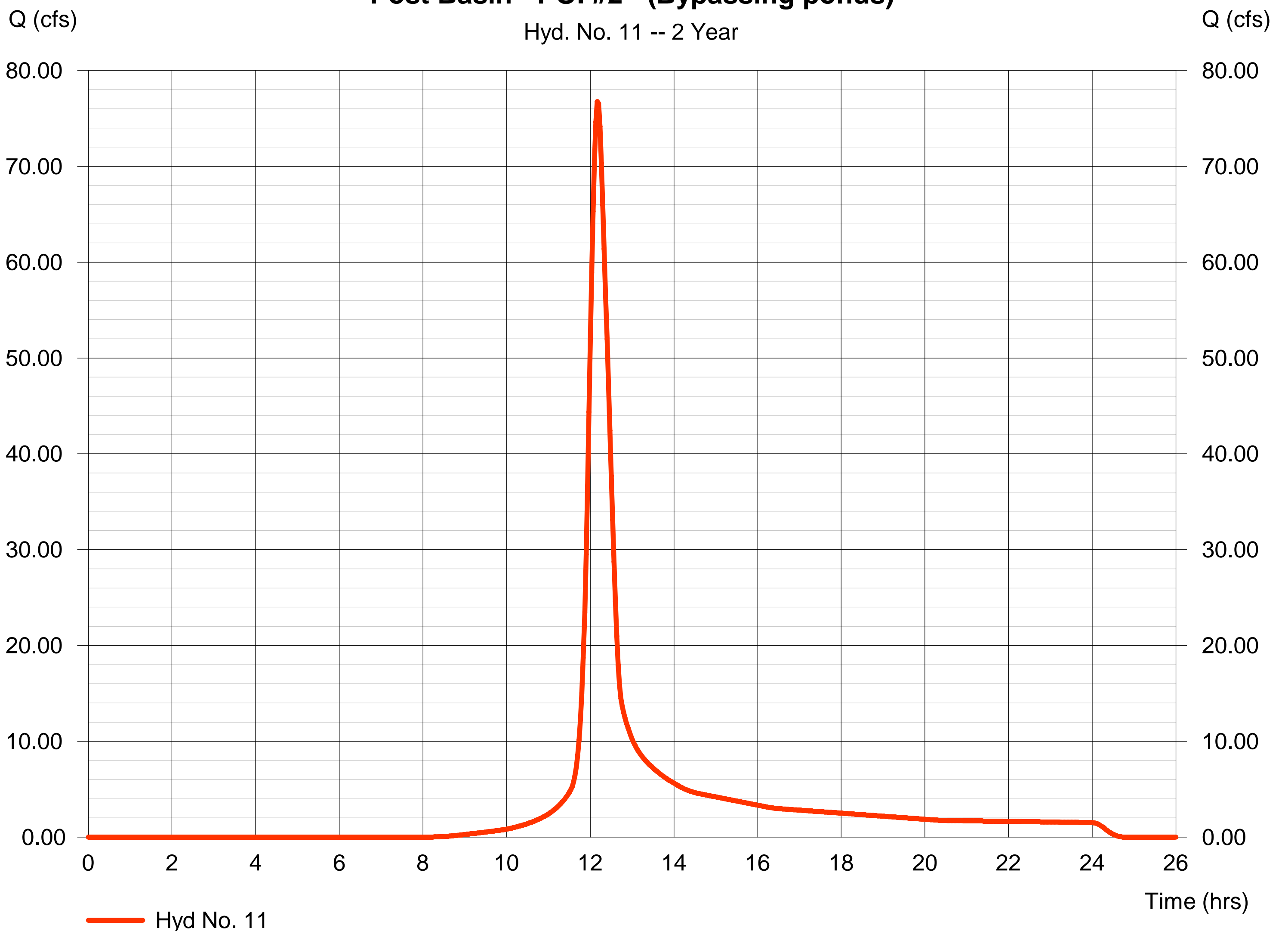
Post Basin - POI #2 - (Bypassing ponds)

Hydrograph type	= SCS Runoff	Peak discharge	= 76.74 cfs
Storm frequency	= 2 yrs	Time to peak	= 12.17 hrs
Time interval	= 2 min	Hyd. volume	= 307,757 cuft
Drainage area	= 43.500 ac	Curve number	= 82*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 28.50 min
Total precip.	= 3.70 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(10.500 x 98) + (16.100 x 69) + (1.000 x 79) + (15.900 x 84)] / 43.500

Post Basin - POI #2 - (Bypassing ponds)

Hyd. No. 11 -- 2 Year



TR55 Tc Worksheet

Hyd. No. 11

Post Basin - POI #2 - (Bypassing ponds)

<u>Description</u>	<u>A</u>		<u>B</u>		<u>C</u>		<u>Totals</u>
Sheet Flow							
Manning's n-value	= 0.150		0.011		0.011		
Flow length (ft)	= 300.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 3.70		0.00		0.00		
Land slope (%)	= 8.80		0.00		0.00		
Travel Time (min)	= 12.13	+	0.00	+	0.00	=	12.13
Shallow Concentrated Flow							
Flow length (ft)	= 1503.00		0.00		0.00		
Watercourse slope (%)	= 0.90		0.00		0.00		
Surface description	= Unpaved		Paved		Paved		
Average velocity (ft/s)	=1.53		0.00		0.00		
Travel Time (min)	= 16.37	+	0.00	+	0.00	=	16.37
Channel Flow							
X sectional flow area (sqft)	= 0.00		0.00		0.00		
Wetted perimeter (ft)	= 0.00		0.00		0.00		
Channel slope (%)	= 0.00		0.00		0.00		
Manning's n-value	= 0.015		0.015		0.015		
Velocity (ft/s)	=0.00		0.00		0.00		
Flow length (ft)	{{0}}0.0		0.0		0.0		
Travel Time (min)	= 0.00	+	0.00	+	0.00	=	0.00
Total Travel Time, Tc							28.50 min

Hydrograph Report

Hyd. No. 12

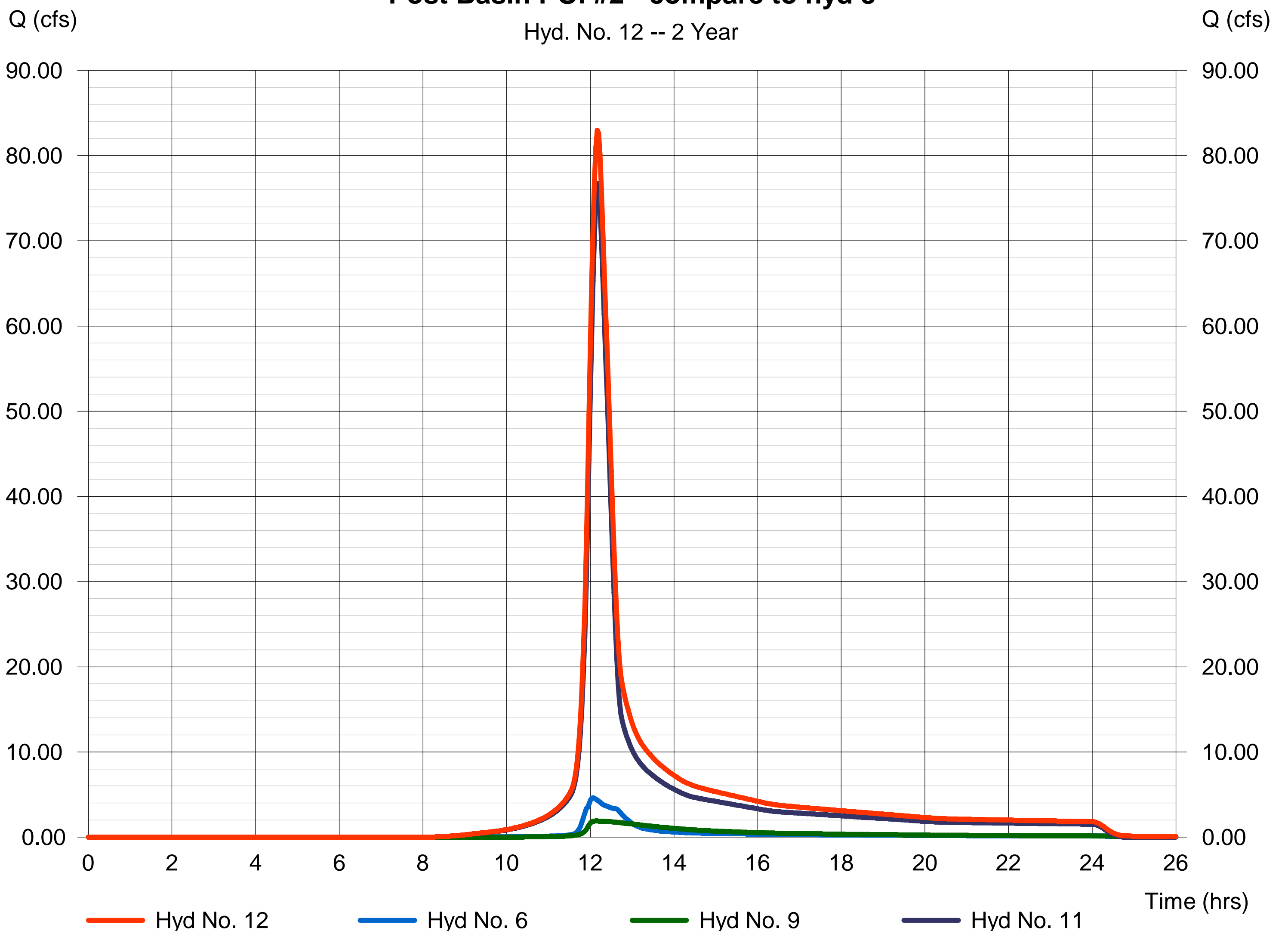
Post Basin POI #2 - compare to hyd 3

Hydrograph type = Combine
Storm frequency = 2 yrs
Time interval = 2 min
Inflow hyds. = 6, 9, 11

Peak discharge = 82.99 cfs
Time to peak = 12.17 hrs
Hyd. volume = 363,237 cuft
Contrib. drain. area = 43.500 ac

Post Basin POI #2 - compare to hyd 3

Hyd. No. 12 -- 2 Year



Hydrograph Report

Hyd. No. 14

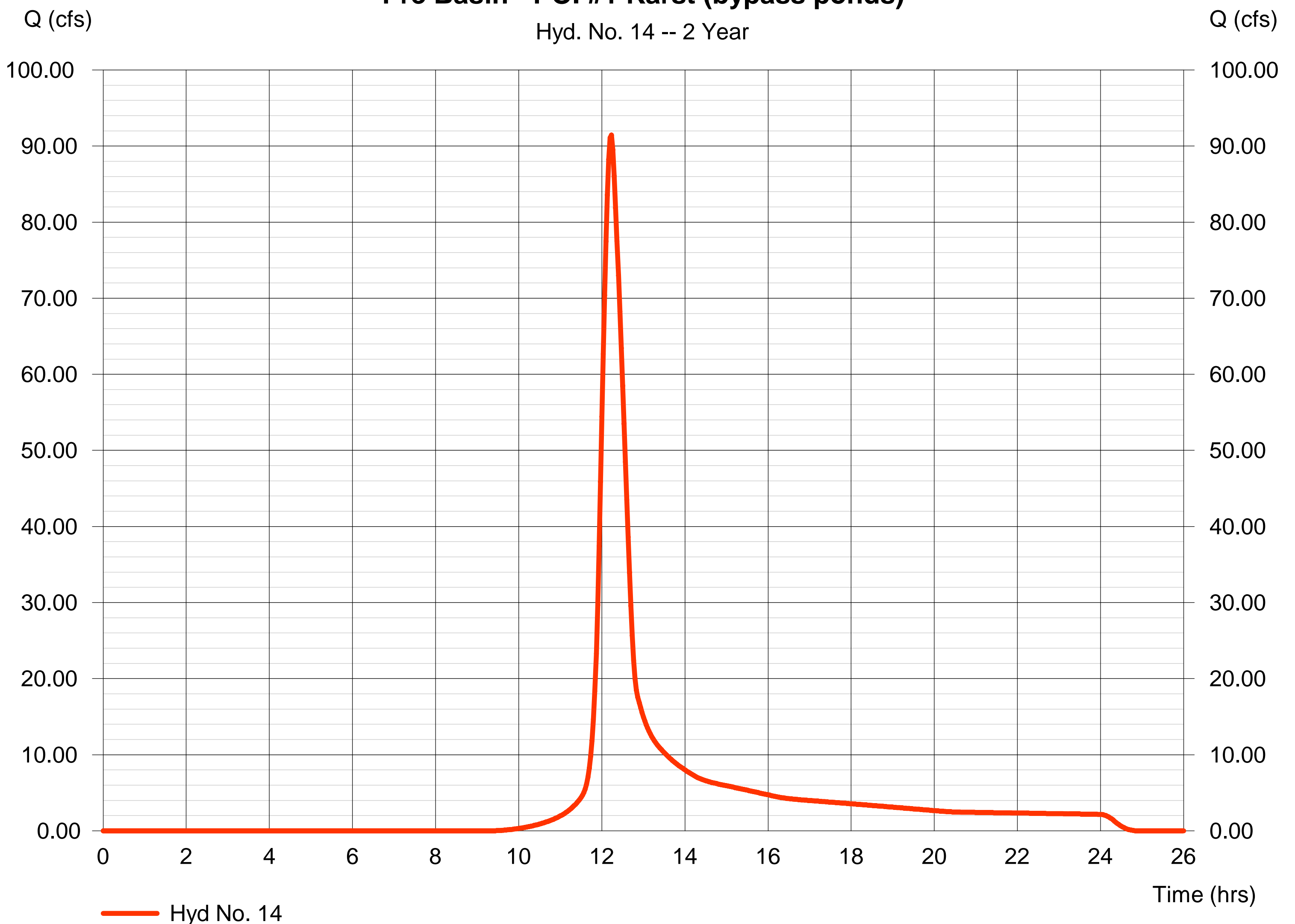
Pre Basin - POI #1 Karst (bypass ponds)

Hydrograph type	= SCS Runoff	Peak discharge	= 91.46 cfs
Storm frequency	= 2 yrs	Time to peak	= 12.23 hrs
Time interval	= 2 min	Hyd. volume	= 401,697 cuft
Drainage area	= 66.200 ac	Curve number	= 78*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 32.40 min
Total precip.	= 3.70 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(11.300 x 98) + (15.900 x 84) + (1.000 x 79) + (38.000 x 69)] / 66.200

Pre Basin - POI #1 Karst (bypass ponds)

Hyd. No. 14 -- 2 Year



TR55 Tc Worksheet

Hyd. No. 14

Pre Basin - POI #1 Karst (bypass ponds)

<u>Description</u>	<u>A</u>		<u>B</u>		<u>C</u>		<u>Totals</u>
Sheet Flow							
Manning's n-value	= 0.150		0.011		0.011		
Flow length (ft)	= 300.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 3.70		0.00		0.00		
Land slope (%)	= 8.80		0.00		0.00		
Travel Time (min)	= 12.13	+	0.00	+	0.00	=	12.13
Shallow Concentrated Flow							
Flow length (ft)	= 1759.00		0.00		0.00		
Watercourse slope (%)	= 0.80		0.00		0.00		
Surface description	= Unpaved		Paved		Paved		
Average velocity (ft/s)	=1.44		0.00		0.00		
Travel Time (min)	= 20.31	+	0.00	+	0.00	=	20.31
Channel Flow							
X sectional flow area (sqft)	= 0.00		0.00		0.00		
Wetted perimeter (ft)	= 0.00		0.00		0.00		
Channel slope (%)	= 0.00		0.00		0.00		
Manning's n-value	= 0.015		0.015		0.015		
Velocity (ft/s)	=0.00		0.00		0.00		
Flow length (ft)	{{0}}0.0		0.0		0.0		
Travel Time (min)	= 0.00	+	0.00	+	0.00	=	0.00
Total Travel Time, Tc							32.40 min

Hydrograph Report

Hyd. No. 15

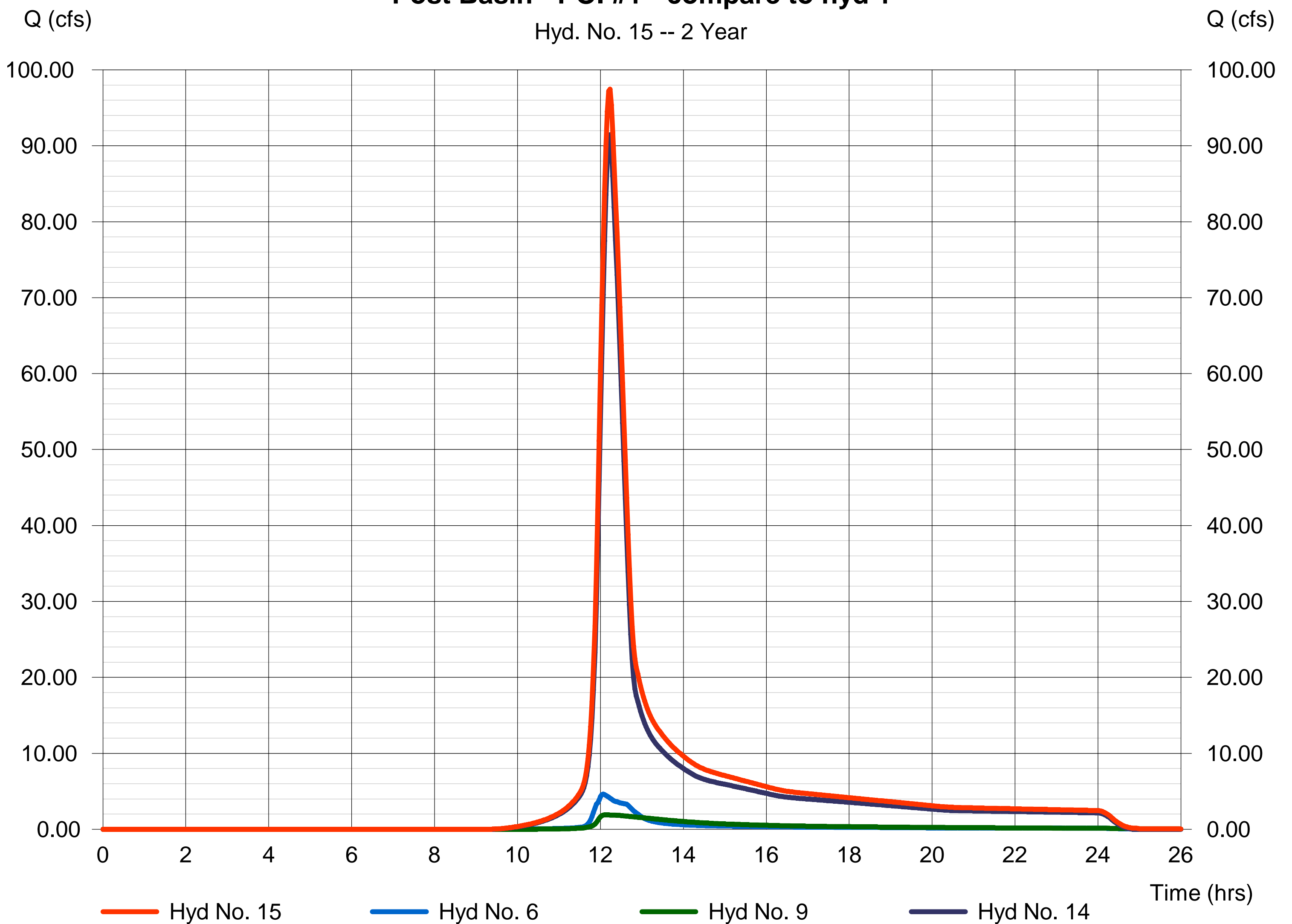
Post Basin - POI #1 - compare to hyd 1

Hydrograph type = Combine
Storm frequency = 2 yrs
Time interval = 2 min
Inflow hyds. = 6, 9, 14

Peak discharge = 97.45 cfs
Time to peak = 12.23 hrs
Hyd. volume = 457,177 cuft
Contrib. drain. area = 66.200 ac

Post Basin - POI #1 - compare to hyd 1

Hyd. No. 15 -- 2 Year



Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024

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	145.79	2	734	633,711	-----	-----	-----	Pre Basin - POI #1 Karst
3	SCS Runoff	121.45	2	730	485,598	-----	-----	-----	Pre Basin - POI #2 - site outfall
5	SCS Runoff	19.69	2	716	39,794	-----	-----	-----	Post Basin to Pond 1
6	Reservoir	6.009	2	724	39,794	5	944.67	12,275	Pond 1 outflow
8	SCS Runoff	17.71	2	716	36,174	-----	-----	-----	Post Basin to Pond 2
9	Reservoir	2.599	2	728	36,084	8	943.74	16,271	Pond 2 outflow
11	SCS Runoff	104.17	2	730	416,249	-----	-----	-----	Post Basin - POI #2 - (Bypassing pon
12	Combine	112.50	2	730	492,126	6, 9, 11	-----	-----	Post Basin POI #2 - compare to hyd 3
14	SCS Runoff	128.35	2	734	557,868	-----	-----	-----	Pre Basin - POI #1 Karst (bypass pon
15	Combine	136.44	2	732	633,745	6, 9, 14	-----	-----	Post Basin - POI #1 - compare to hyd
24-018-01 2025-04-29 Bobby Ray.gpw					Return Period: 5 Year			Wednesday, 04 / 30 / 2025	

Hydrograph Report

Hyd. No. 1

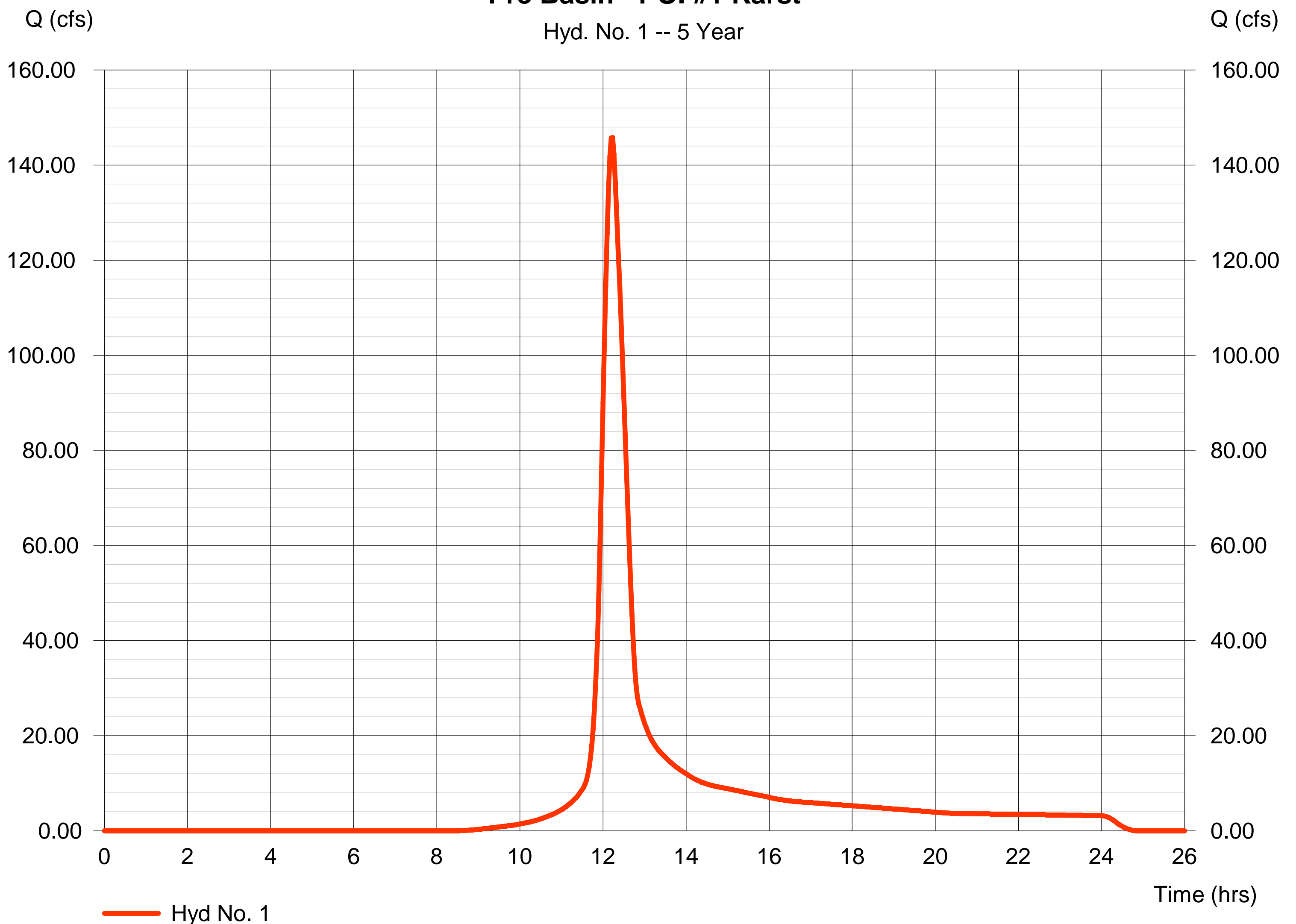
Pre Basin - POI #1 Karst

Hydrograph type	= SCS Runoff	Peak discharge	= 145.79 cfs
Storm frequency	= 5 yrs	Time to peak	= 12.23 hrs
Time interval	= 2 min	Hyd. volume	= 633,711 cuft
Drainage area	= 75.200 ac	Curve number	= 78*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 32.40 min
Total precip.	= 4.50 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(14.800 x 98) + (15.900 x 84) + (1.000 x 79) + (43.500 x 69)] / 75.200

Pre Basin - POI #1 Karst

Hyd. No. 1 -- 5 Year



Hydrograph Report

Hyd. No. 3

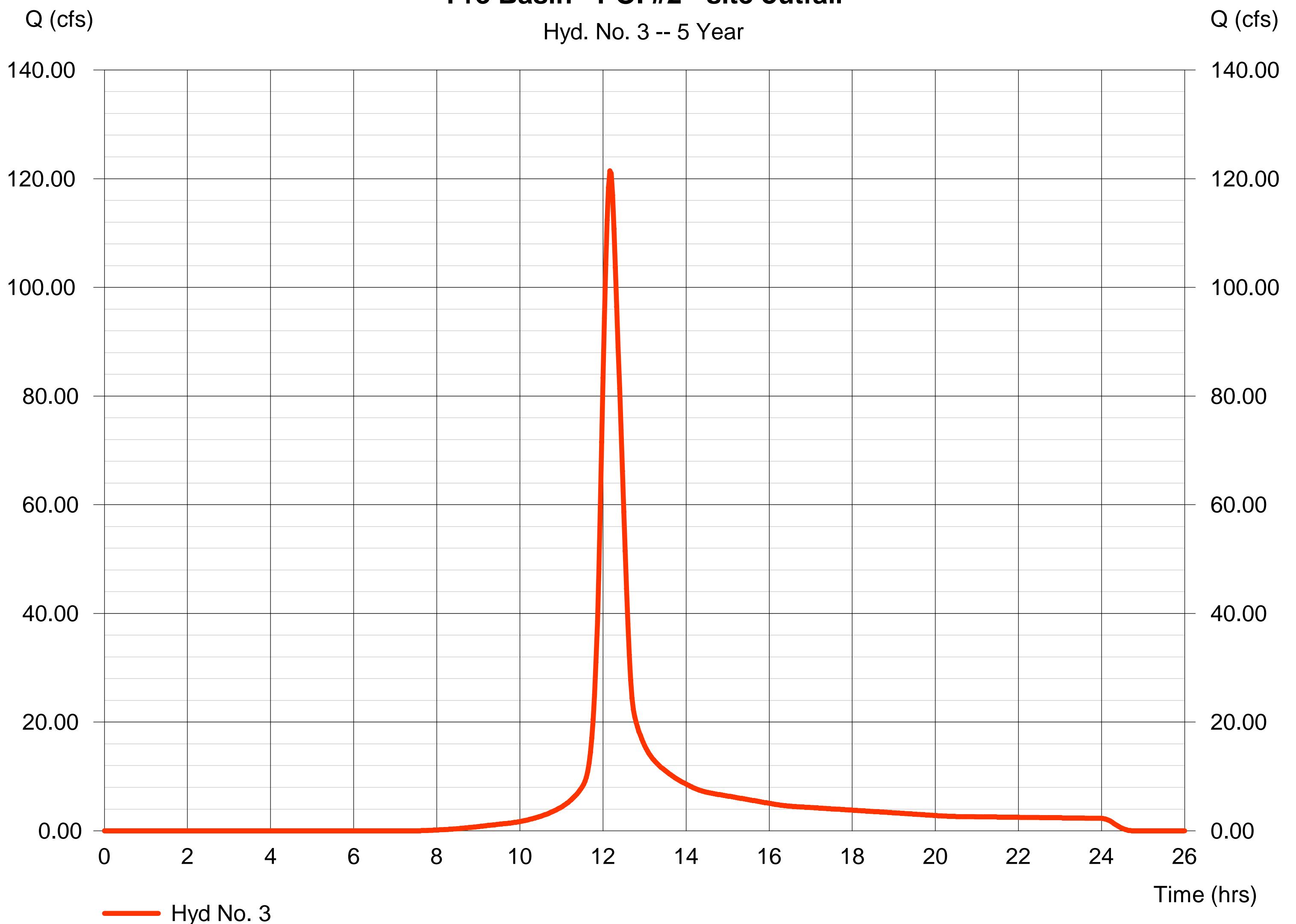
Pre Basin - POI #2 - site outfall

Hydrograph type	= SCS Runoff	Peak discharge	= 121.45 cfs
Storm frequency	= 5 yrs	Time to peak	= 12.17 hrs
Time interval	= 2 min	Hyd. volume	= 485,598 cuft
Drainage area	= 52.500 ac	Curve number	= 81*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 28.50 min
Total precip.	= 4.50 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(14.000 x 98) + (21.600 x 69) + (1.000 x 79) + (15.900 x 84)] / 52.500

Pre Basin - POI #2 - site outfall

Hyd. No. 3 -- 5 Year



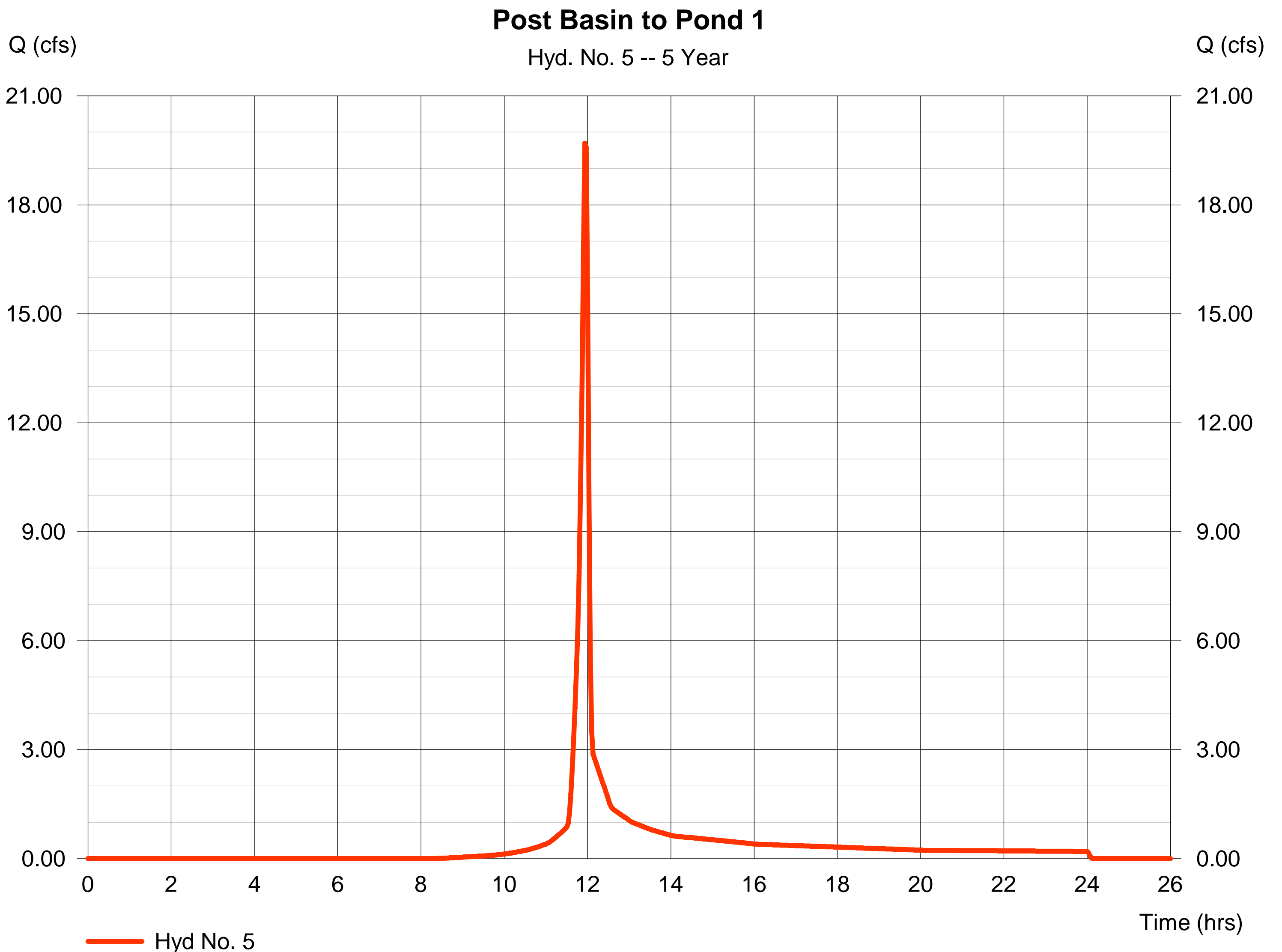
Hydrograph Report

Hyd. No. 5

Post Basin to Pond 1

Hydrograph type	= SCS Runoff	Peak discharge	= 19.69 cfs
Storm frequency	= 5 yrs	Time to peak	= 11.93 hrs
Time interval	= 2 min	Hyd. volume	= 39,794 cuft
Drainage area	= 5.100 ac	Curve number	= 78*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 4.50 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(1.600 x 98) + (3.500 x 69)] / 5.100



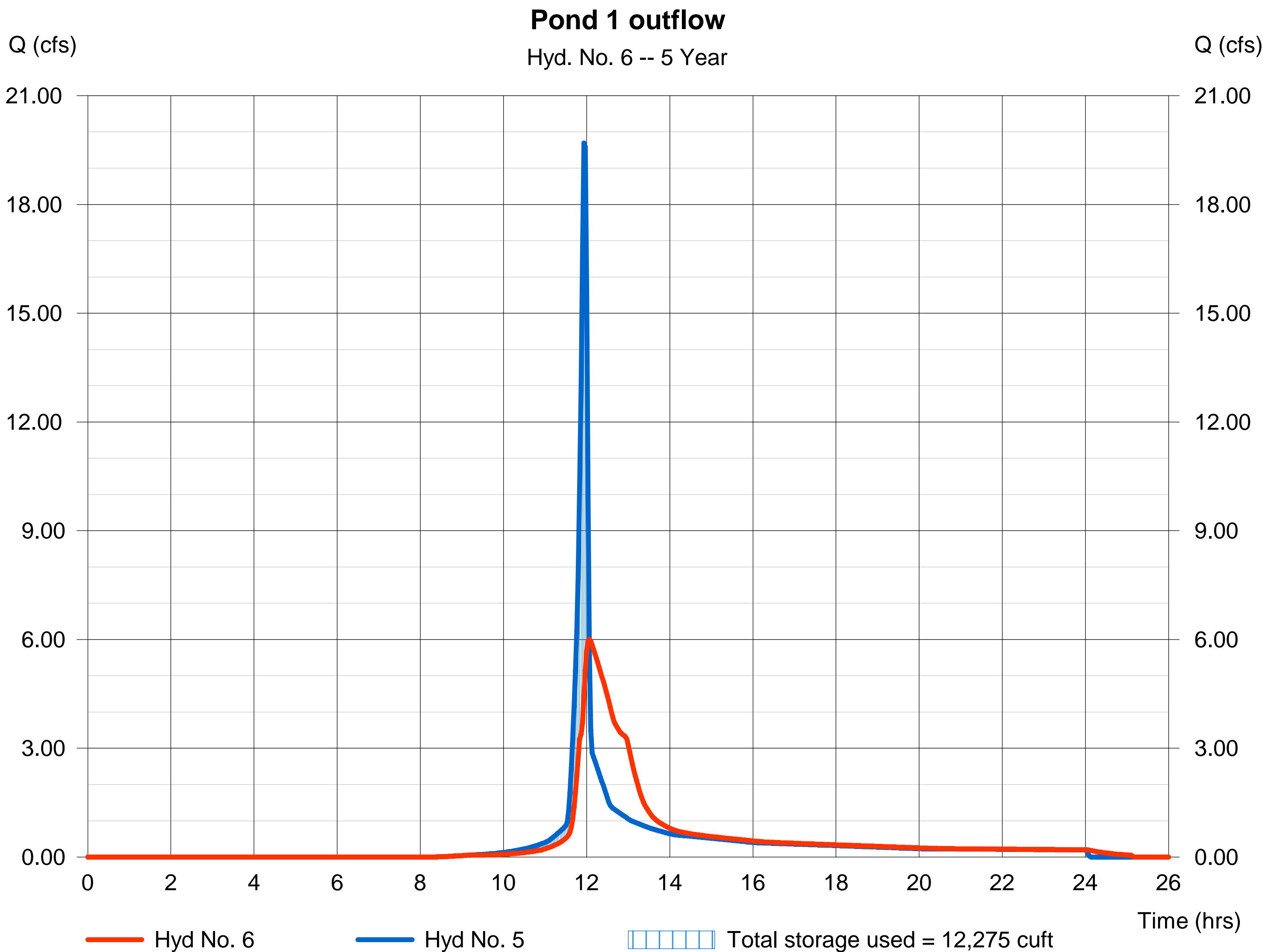
Hydrograph Report

Hyd. No. 6

Pond 1 outflow

Hydrograph type	= Reservoir	Peak discharge	= 6.009 cfs
Storm frequency	= 5 yrs	Time to peak	= 12.07 hrs
Time interval	= 2 min	Hyd. volume	= 39,794 cuft
Inflow hyd. No.	= 5 - Post Basin to Pond 1	Max. Elevation	= 944.67 ft
Reservoir name	= Pond 1	Max. Storage	= 12,275 cuft

Storage Indication method used.



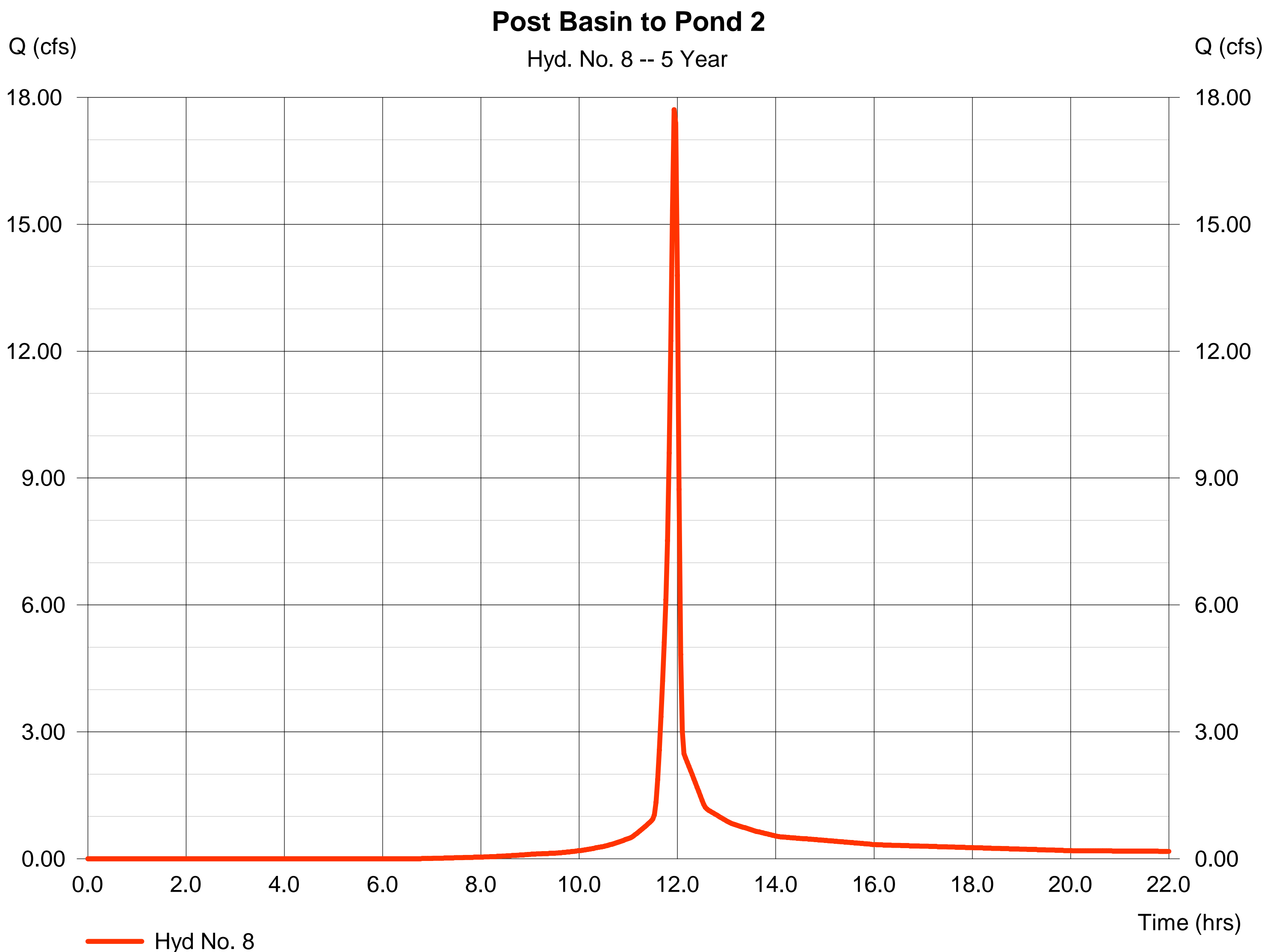
Hydrograph Report

Hyd. No. 8

Post Basin to Pond 2

Hydrograph type	= SCS Runoff	Peak discharge	= 17.71 cfs
Storm frequency	= 5 yrs	Time to peak	= 11.93 hrs
Time interval	= 2 min	Hyd. volume	= 36,174 cuft
Drainage area	= 3.900 ac	Curve number	= 83*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 4.50 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(1.900 x 98) + (2.000 x 69)] / 3.900



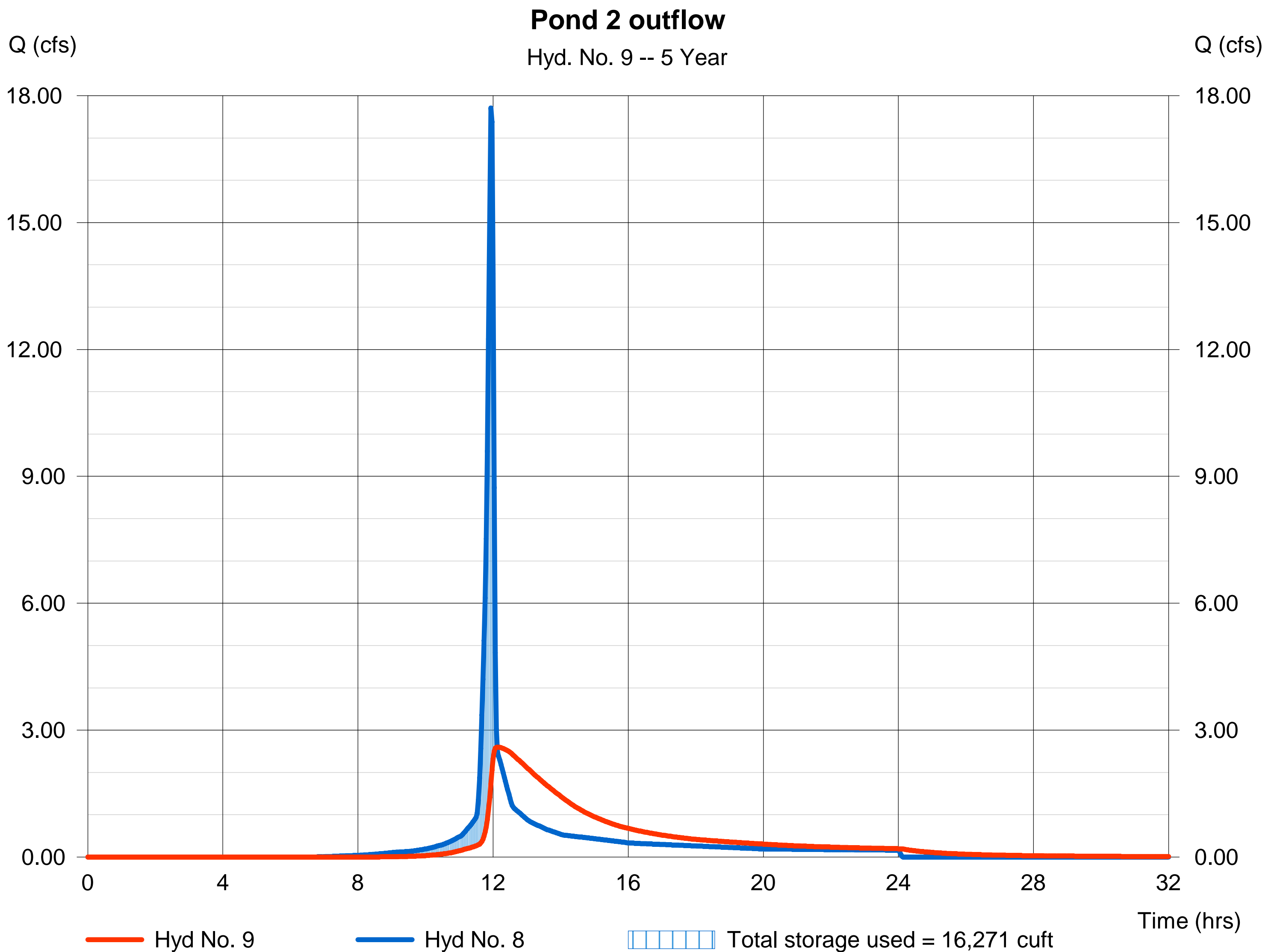
Hydrograph Report

Hyd. No. 9

Pond 2 outflow

Hydrograph type	= Reservoir	Peak discharge	= 2.599 cfs
Storm frequency	= 5 yrs	Time to peak	= 12.13 hrs
Time interval	= 2 min	Hyd. volume	= 36,084 cuft
Inflow hyd. No.	= 8 - Post Basin to Pond 2	Max. Elevation	= 943.74 ft
Reservoir name	= Pond 2	Max. Storage	= 16,271 cuft

Storage Indication method used.



Hydrograph Report

Hyd. No. 11

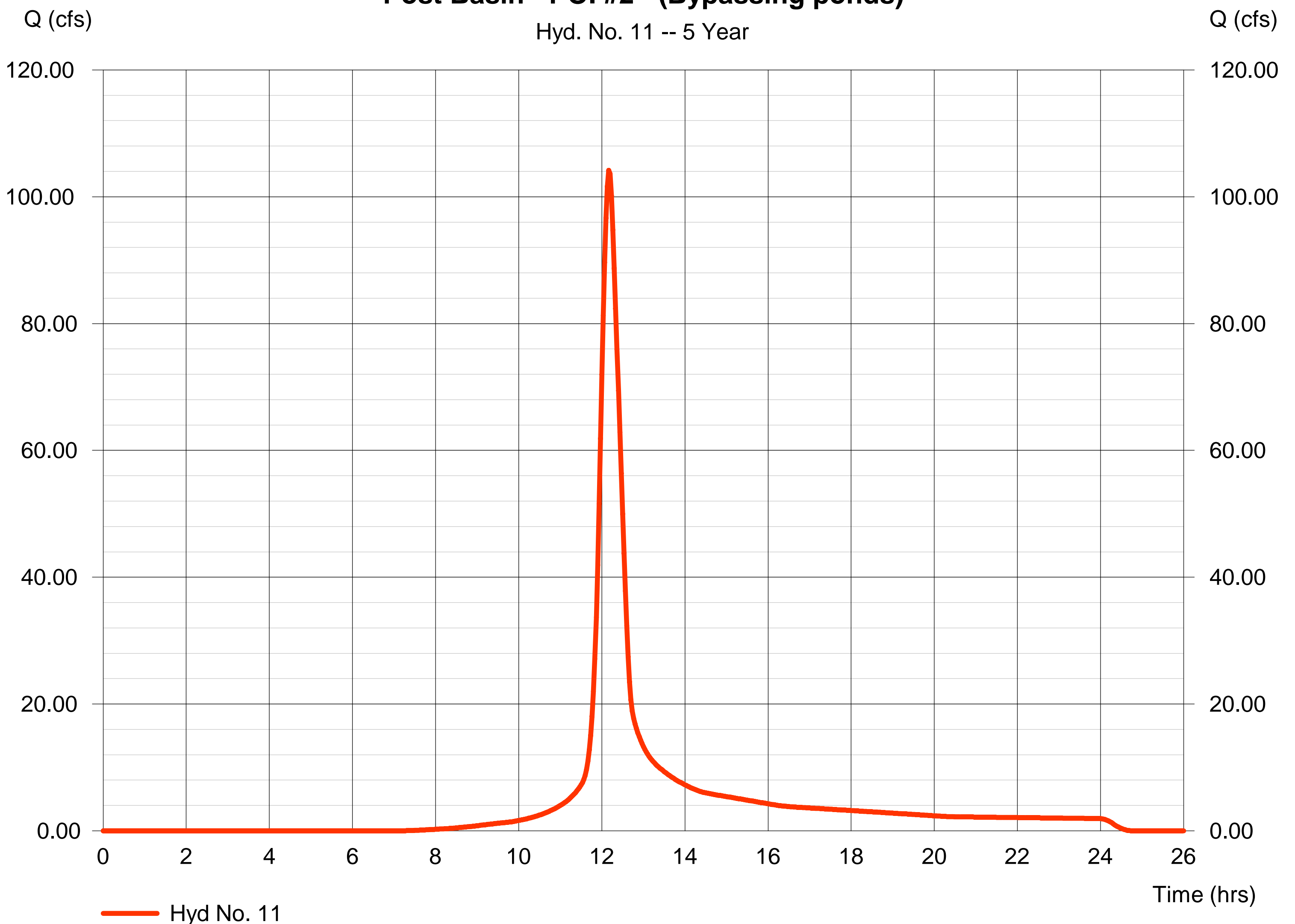
Post Basin - POI #2 - (Bypassing ponds)

Hydrograph type	= SCS Runoff	Peak discharge	= 104.17 cfs
Storm frequency	= 5 yrs	Time to peak	= 12.17 hrs
Time interval	= 2 min	Hyd. volume	= 416,249 cuft
Drainage area	= 43.500 ac	Curve number	= 82*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 28.50 min
Total precip.	= 4.50 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(10.500 x 98) + (16.100 x 69) + (1.000 x 79) + (15.900 x 84)] / 43.500

Post Basin - POI #2 - (Bypassing ponds)

Hyd. No. 11 -- 5 Year



Hydrograph Report

Hyd. No. 12

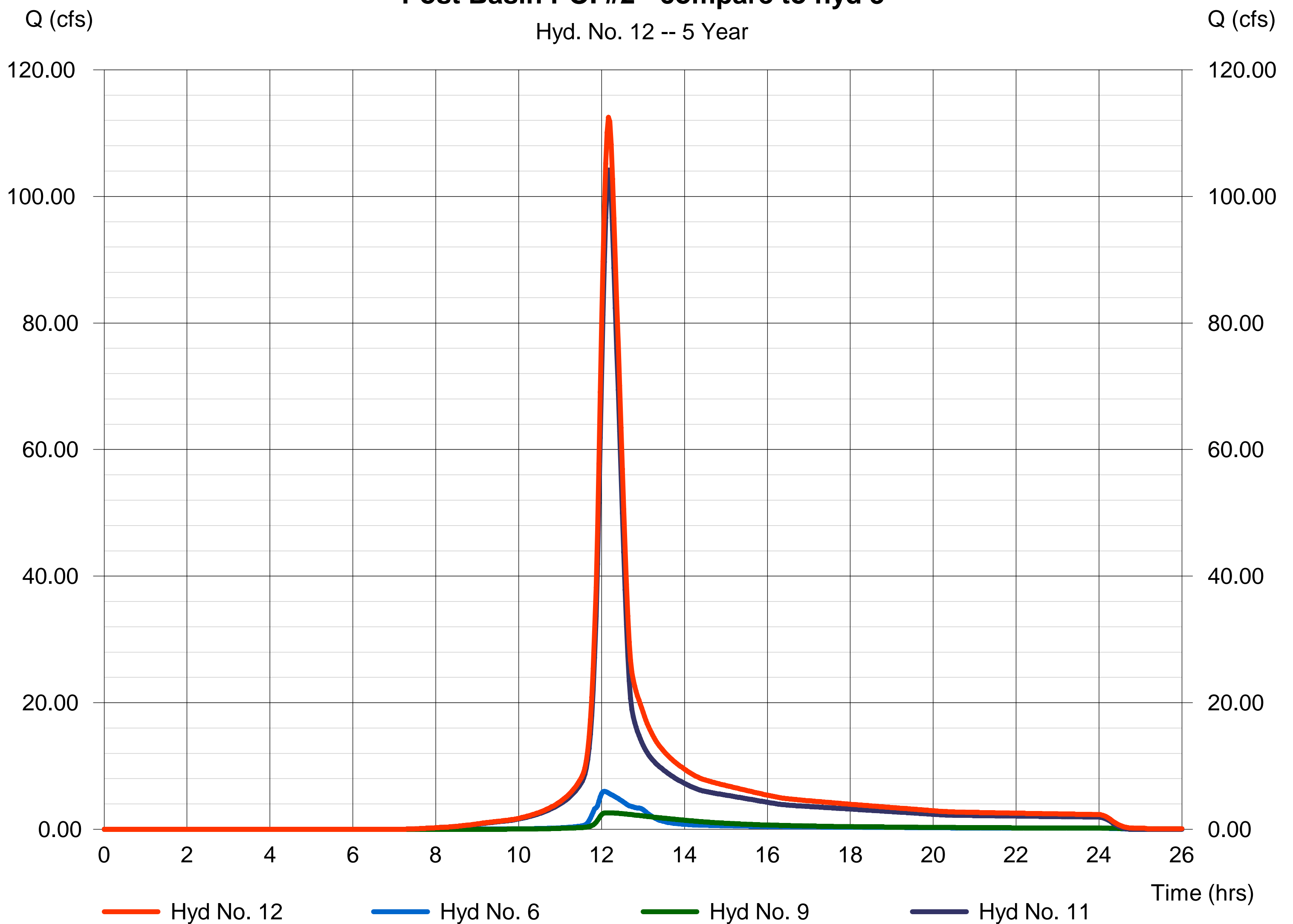
Post Basin POI #2 - compare to hyd 3

Hydrograph type = Combine
Storm frequency = 5 yrs
Time interval = 2 min
Inflow hyds. = 6, 9, 11

Peak discharge = 112.50 cfs
Time to peak = 12.17 hrs
Hyd. volume = 492,126 cuft
Contrib. drain. area = 43.500 ac

Post Basin POI #2 - compare to hyd 3

Hyd. No. 12 -- 5 Year



Hydrograph Report

Hyd. No. 14

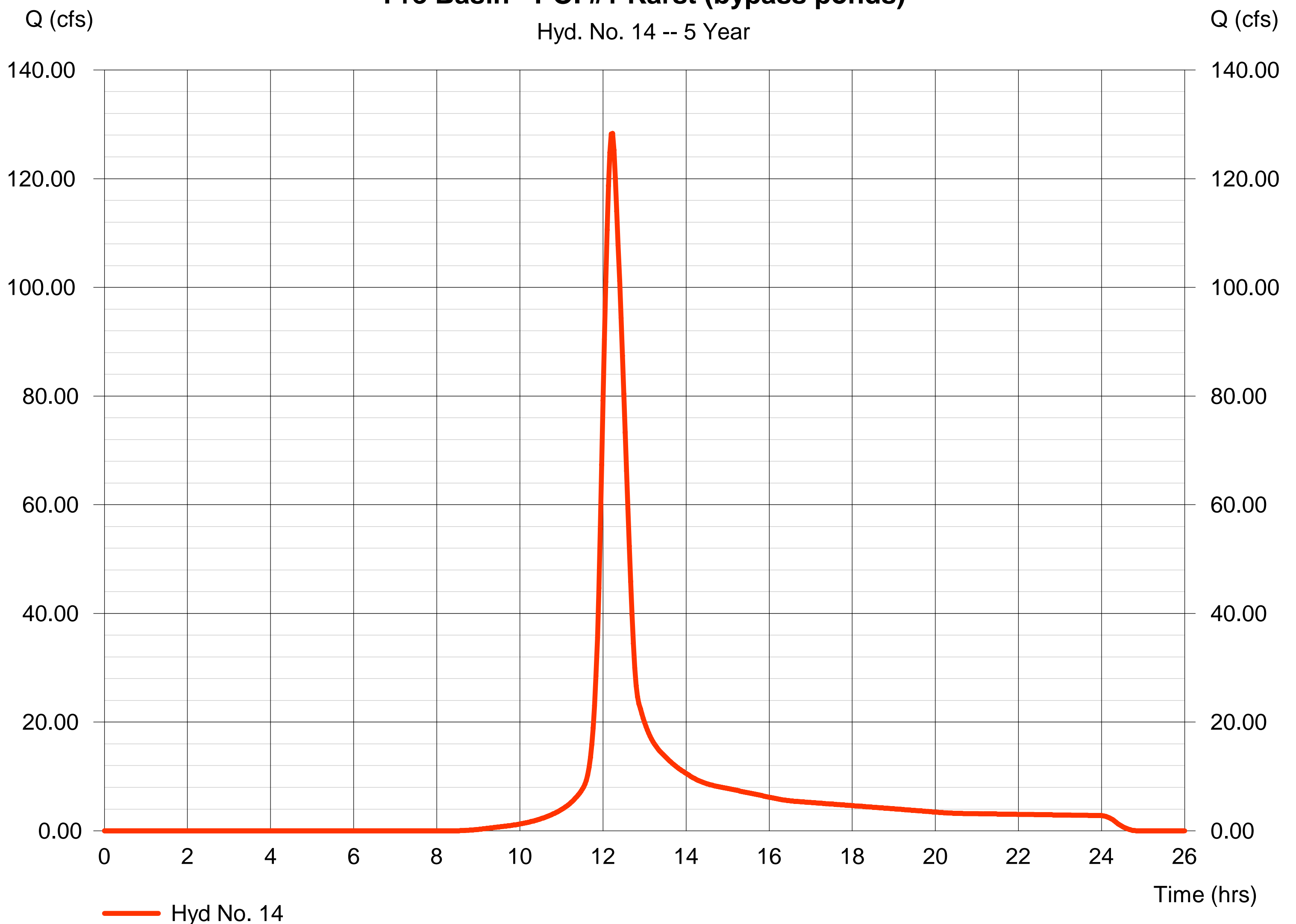
Pre Basin - POI #1 Karst (bypass ponds)

Hydrograph type	= SCS Runoff	Peak discharge	= 128.35 cfs
Storm frequency	= 5 yrs	Time to peak	= 12.23 hrs
Time interval	= 2 min	Hyd. volume	= 557,868 cuft
Drainage area	= 66.200 ac	Curve number	= 78*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 32.40 min
Total precip.	= 4.50 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(11.300 x 98) + (15.900 x 84) + (1.000 x 79) + (38.000 x 69)] / 66.200

Pre Basin - POI #1 Karst (bypass ponds)

Hyd. No. 14 -- 5 Year



Hydrograph Report

Hyd. No. 15

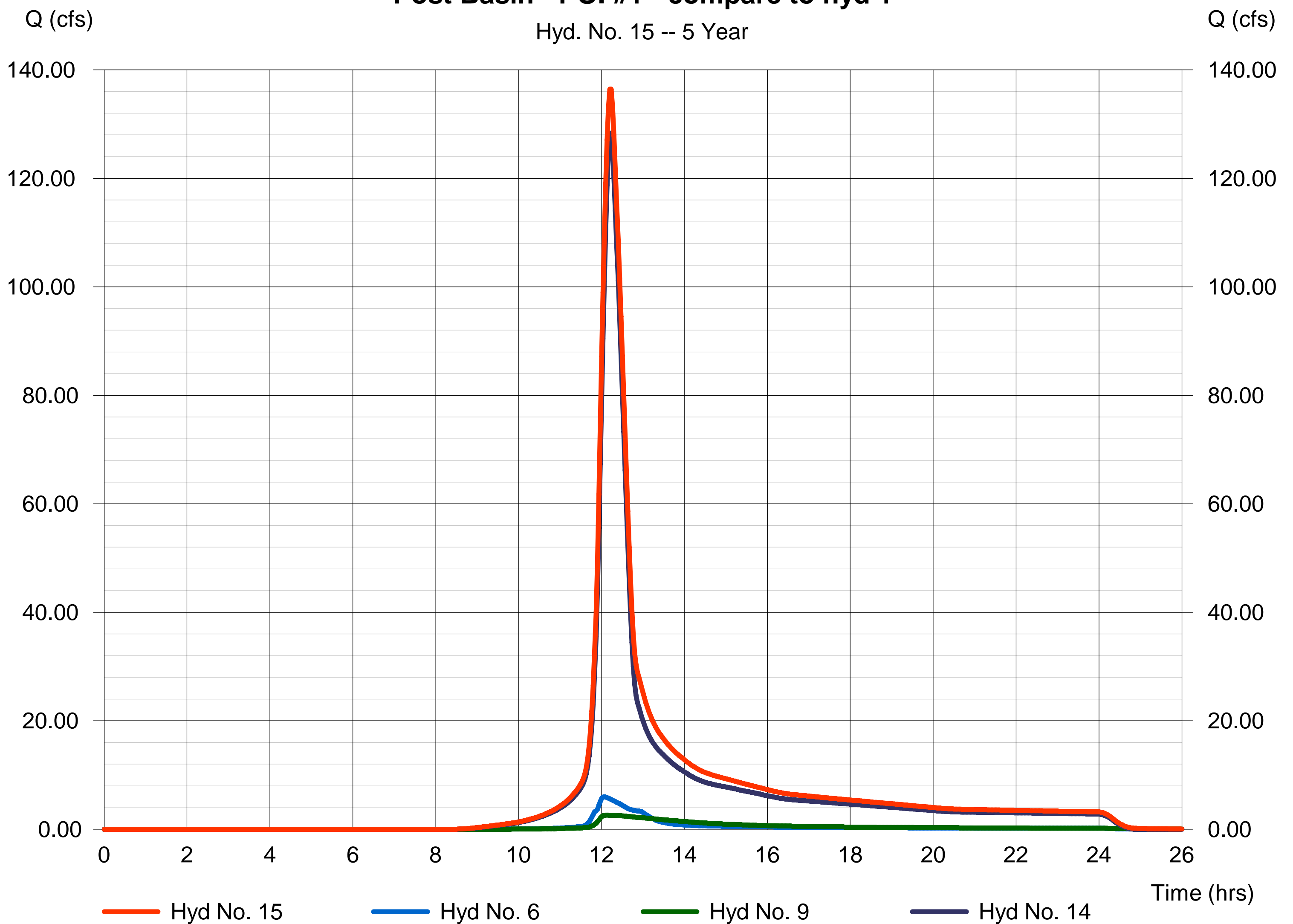
Post Basin - POI #1 - compare to hyd 1

Hydrograph type = Combine
Storm frequency = 5 yrs
Time interval = 2 min
Inflow hyds. = 6, 9, 14

Peak discharge = 136.44 cfs
Time to peak = 12.20 hrs
Hyd. volume = 633,745 cuft
Contrib. drain. area = 66.200 ac

Post Basin - POI #1 - compare to hyd 1

Hyd. No. 15 -- 5 Year



Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024

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	180.73	2	732	782,441	-----	-----	-----	Pre Basin - POI #1 Karst
3	SCS Runoff	148.29	2	730	592,567	-----	-----	-----	Pre Basin - POI #2 - site outfall
5	SCS Runoff	24.24	2	716	49,134	-----	-----	-----	Post Basin to Pond 1
6	Reservoir	6.981	2	724	49,134	5	944.94	15,607	Pond 1 outflow
8	SCS Runoff	21.29	2	716	43,812	-----	-----	-----	Post Basin to Pond 2
9	Reservoir	3.044	2	728	43,722	8	943.92	19,860	Pond 2 outflow
11	SCS Runoff	126.57	2	730	506,021	-----	-----	-----	Post Basin - POI #2 - (Bypassing pon
12	Combine	136.33	2	730	598,876	6, 9, 11	-----	-----	Post Basin POI #2 - compare to hyd 3
14	SCS Runoff	159.10	2	732	688,797	-----	-----	-----	Pre Basin - POI #1 Karst (bypass pon
15	Combine	168.75	2	732	781,652	6, 9, 14	-----	-----	Post Basin - POI #1 - compare to hyd
24-018-01 2025-04-29 Bobby Ray.gpw					Return Period: 10 Year			Wednesday, 04 / 30 / 2025	

Hydrograph Report

Hyd. No. 1

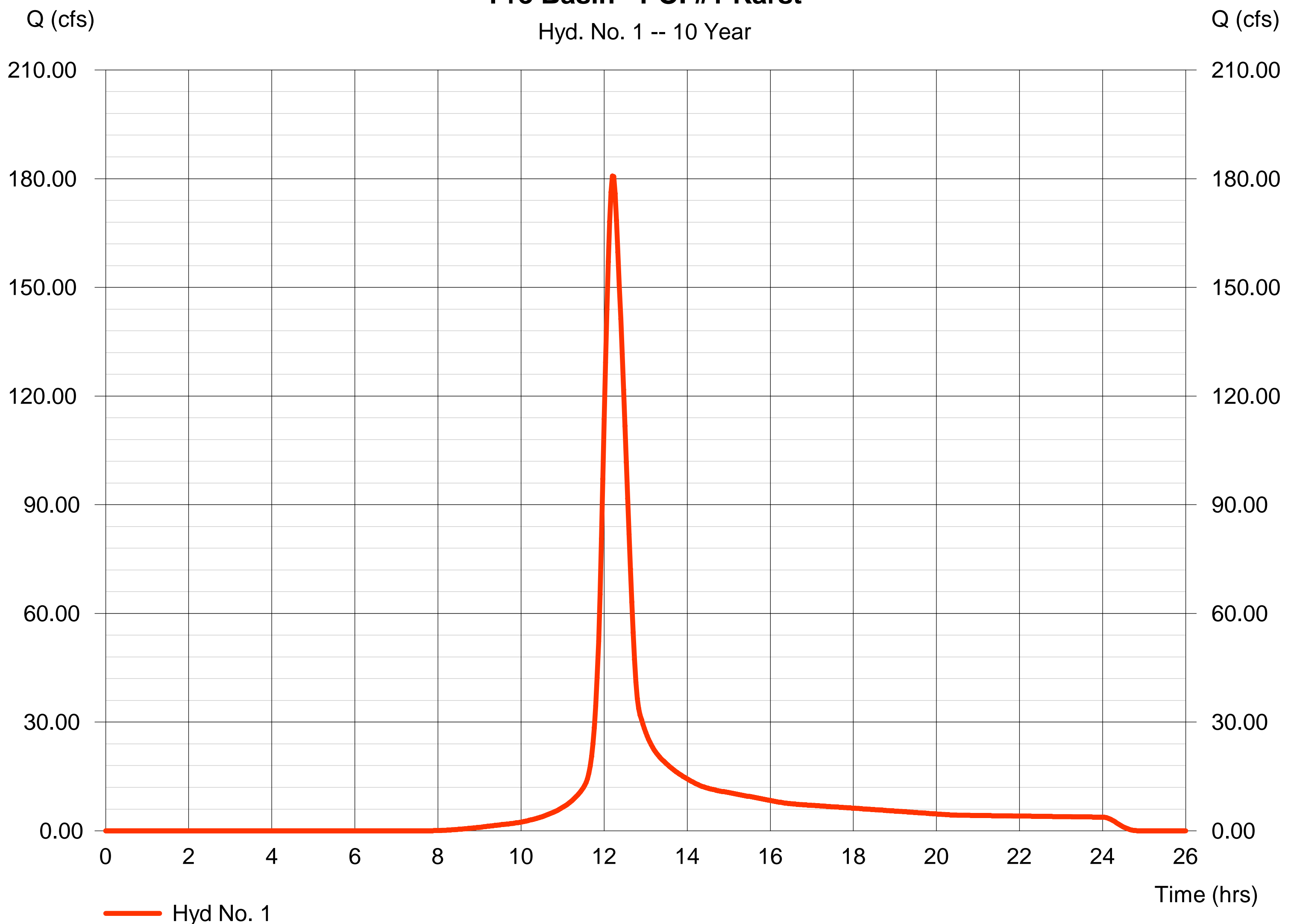
Pre Basin - POI #1 Karst

Hydrograph type	= SCS Runoff	Peak discharge	= 180.73 cfs
Storm frequency	= 10 yrs	Time to peak	= 12.20 hrs
Time interval	= 2 min	Hyd. volume	= 782,441 cuft
Drainage area	= 75.200 ac	Curve number	= 78*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 32.40 min
Total precip.	= 5.14 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(14.800 x 98) + (15.900 x 84) + (1.000 x 79) + (43.500 x 69)] / 75.200

Pre Basin - POI #1 Karst

Hyd. No. 1 -- 10 Year



Hydrograph Report

Hyd. No. 3

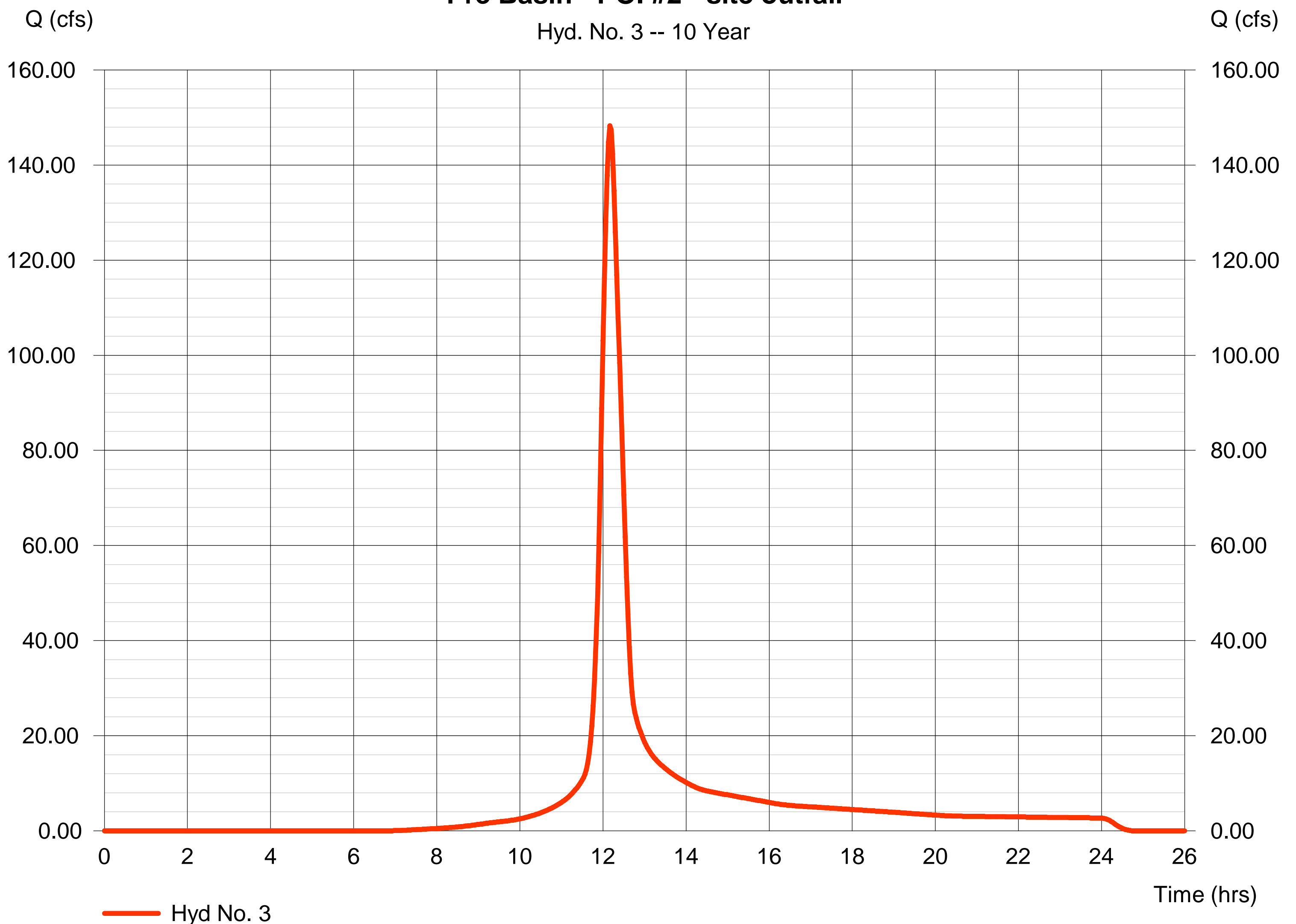
Pre Basin - POI #2 - site outfall

Hydrograph type	= SCS Runoff	Peak discharge	= 148.29 cfs
Storm frequency	= 10 yrs	Time to peak	= 12.17 hrs
Time interval	= 2 min	Hyd. volume	= 592,567 cuft
Drainage area	= 52.500 ac	Curve number	= 81*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 28.50 min
Total precip.	= 5.14 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(14.000 x 98) + (21.600 x 69) + (1.000 x 79) + (15.900 x 84)] / 52.500

Pre Basin - POI #2 - site outfall

Hyd. No. 3 -- 10 Year



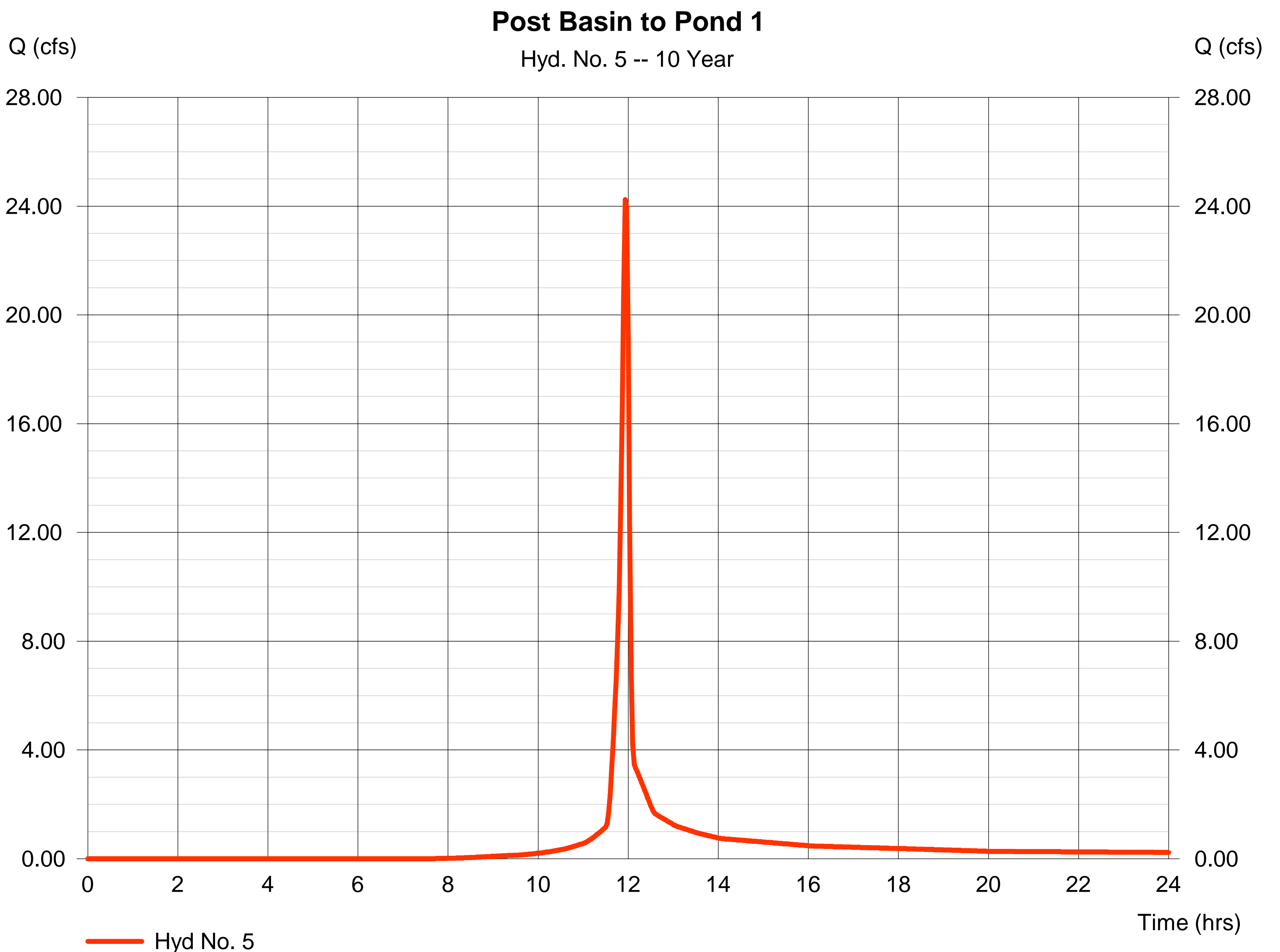
Hydrograph Report

Hyd. No. 5

Post Basin to Pond 1

Hydrograph type	= SCS Runoff	Peak discharge	= 24.24 cfs
Storm frequency	= 10 yrs	Time to peak	= 11.93 hrs
Time interval	= 2 min	Hyd. volume	= 49,134 cuft
Drainage area	= 5.100 ac	Curve number	= 78*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 5.14 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(1.600 x 98) + (3.500 x 69)] / 5.100



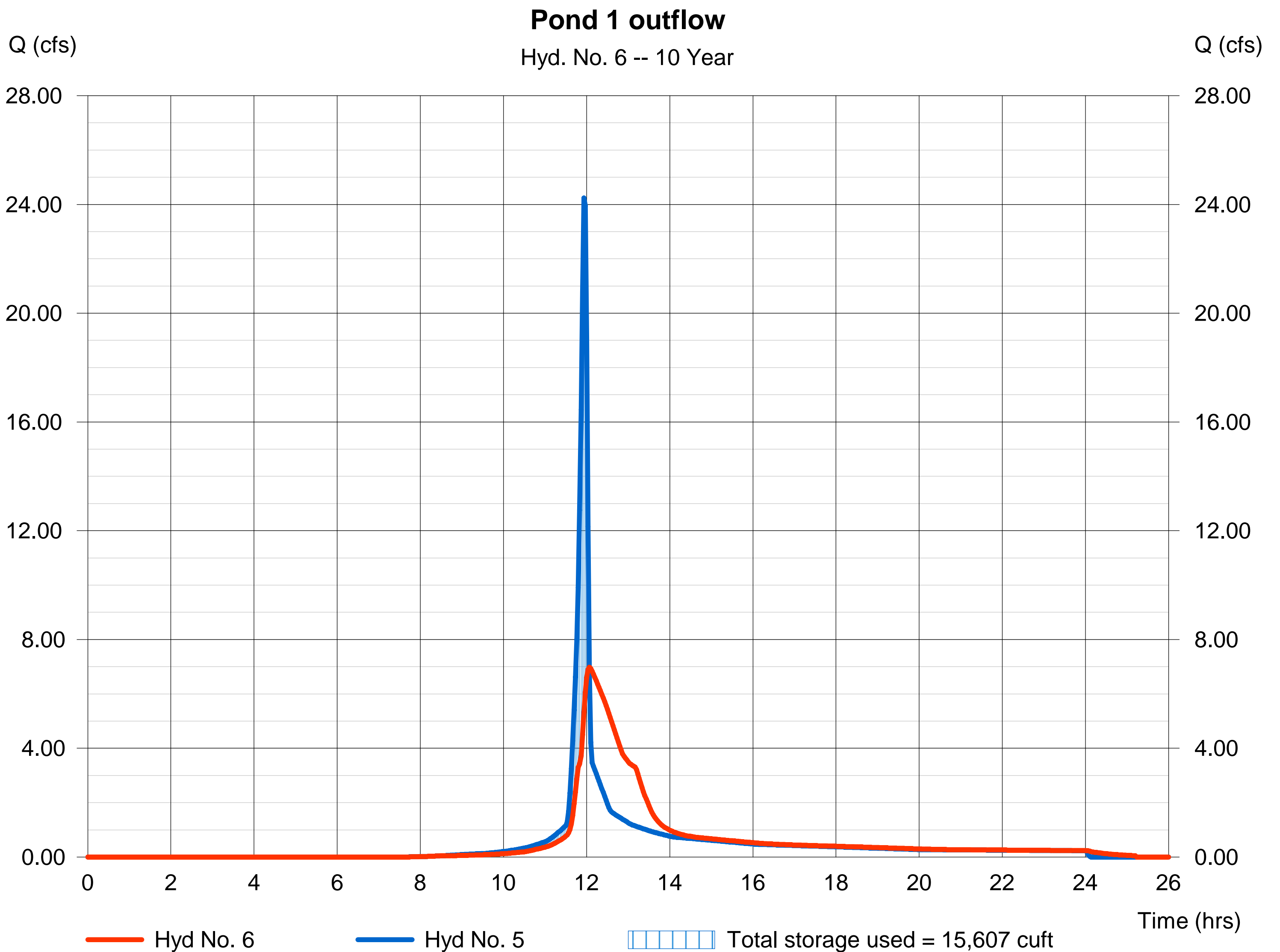
Hydrograph Report

Hyd. No. 6

Pond 1 outflow

Hydrograph type	= Reservoir	Peak discharge	= 6.981 cfs
Storm frequency	= 10 yrs	Time to peak	= 12.07 hrs
Time interval	= 2 min	Hyd. volume	= 49,134 cuft
Inflow hyd. No.	= 5 - Post Basin to Pond 1	Max. Elevation	= 944.94 ft
Reservoir name	= Pond 1	Max. Storage	= 15,607 cuft

Storage Indication method used.



Hydrograph Report

Hyd. No. 8

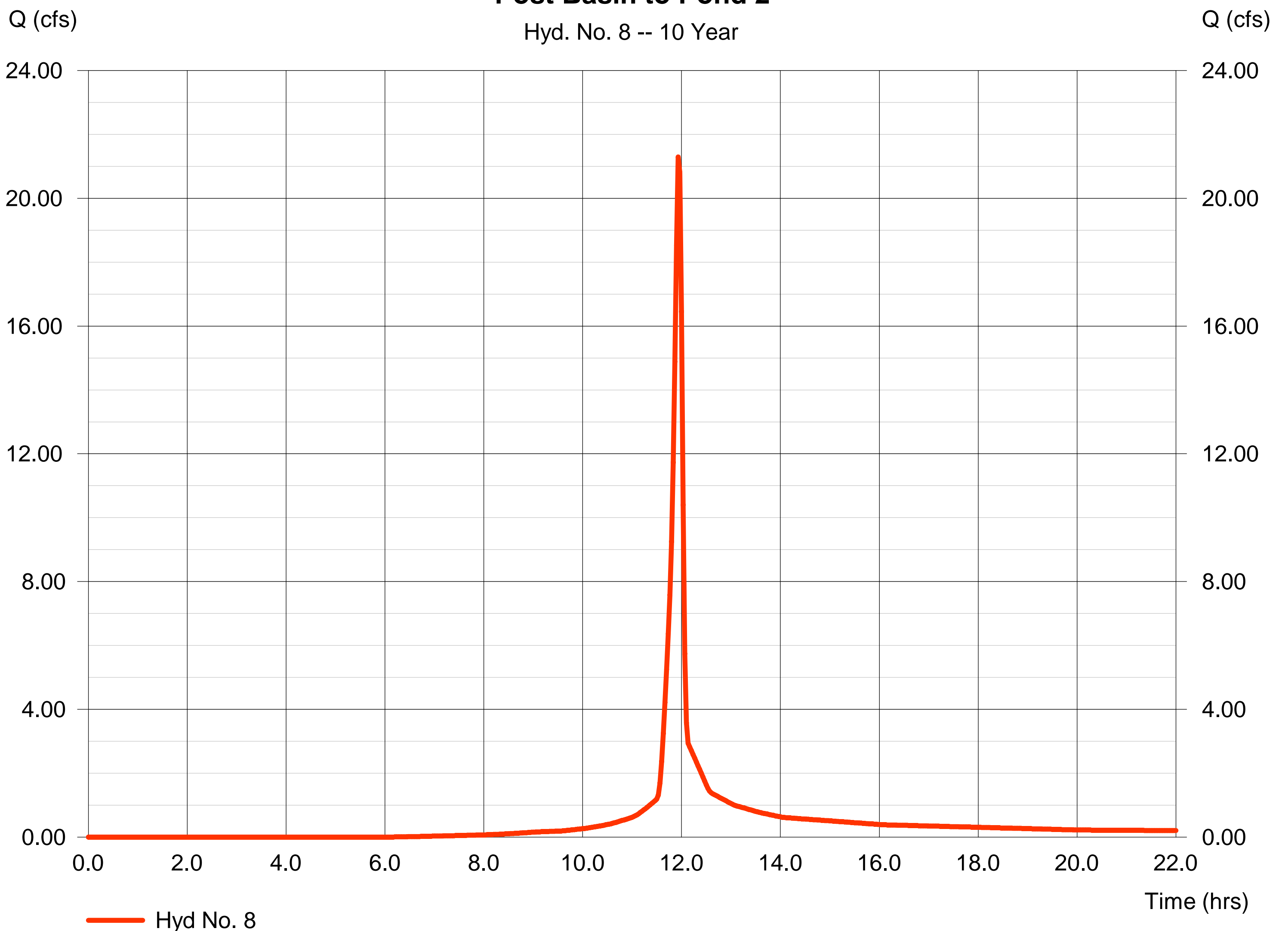
Post Basin to Pond 2

Hydrograph type	= SCS Runoff	Peak discharge	= 21.29 cfs
Storm frequency	= 10 yrs	Time to peak	= 11.93 hrs
Time interval	= 2 min	Hyd. volume	= 43,812 cuft
Drainage area	= 3.900 ac	Curve number	= 83*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 5.14 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(1.900 x 98) + (2.000 x 69)] / 3.900

Post Basin to Pond 2

Hyd. No. 8 -- 10 Year



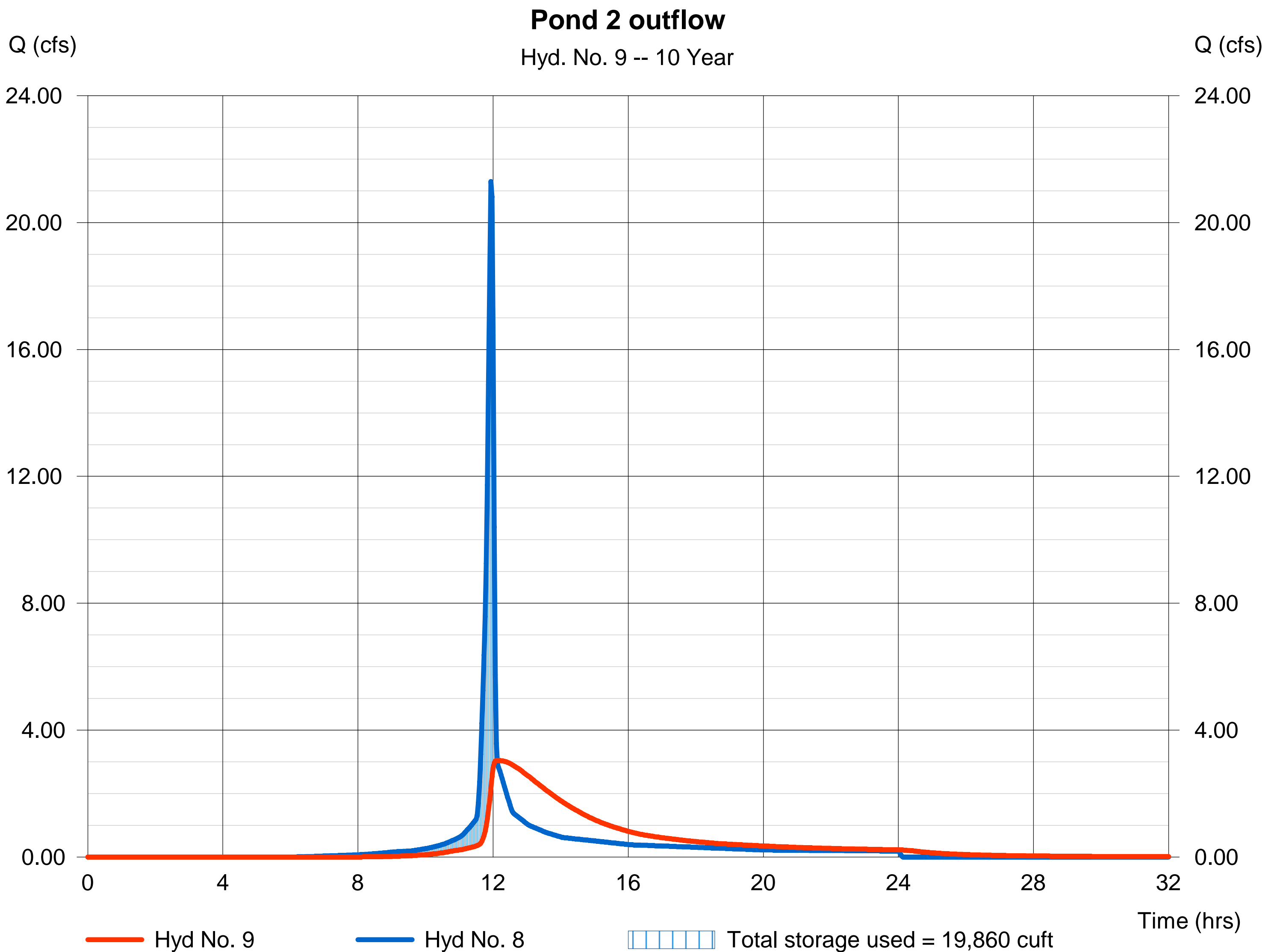
Hydrograph Report

Hyd. No. 9

Pond 2 outflow

Hydrograph type	= Reservoir	Peak discharge	= 3.044 cfs
Storm frequency	= 10 yrs	Time to peak	= 12.13 hrs
Time interval	= 2 min	Hyd. volume	= 43,722 cuft
Inflow hyd. No.	= 8 - Post Basin to Pond 2	Max. Elevation	= 943.92 ft
Reservoir name	= Pond 2	Max. Storage	= 19,860 cuft

Storage Indication method used.



Hydrograph Report

Hyd. No. 11

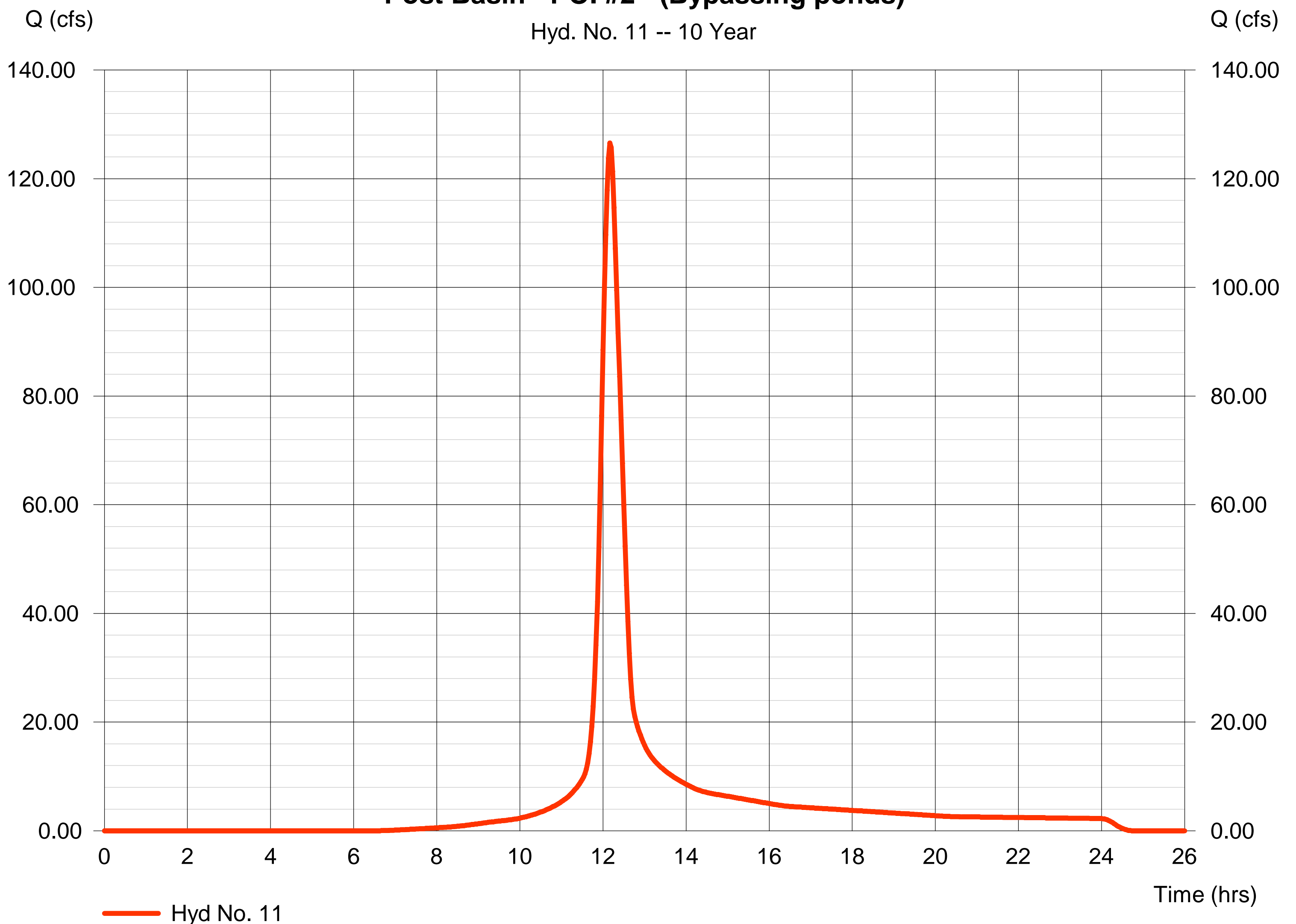
Post Basin - POI #2 - (Bypassing ponds)

Hydrograph type	= SCS Runoff	Peak discharge	= 126.57 cfs
Storm frequency	= 10 yrs	Time to peak	= 12.17 hrs
Time interval	= 2 min	Hyd. volume	= 506,021 cuft
Drainage area	= 43.500 ac	Curve number	= 82*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 28.50 min
Total precip.	= 5.14 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(10.500 x 98) + (16.100 x 69) + (1.000 x 79) + (15.900 x 84)] / 43.500

Post Basin - POI #2 - (Bypassing ponds)

Hyd. No. 11 -- 10 Year



Hydrograph Report

Hyd. No. 12

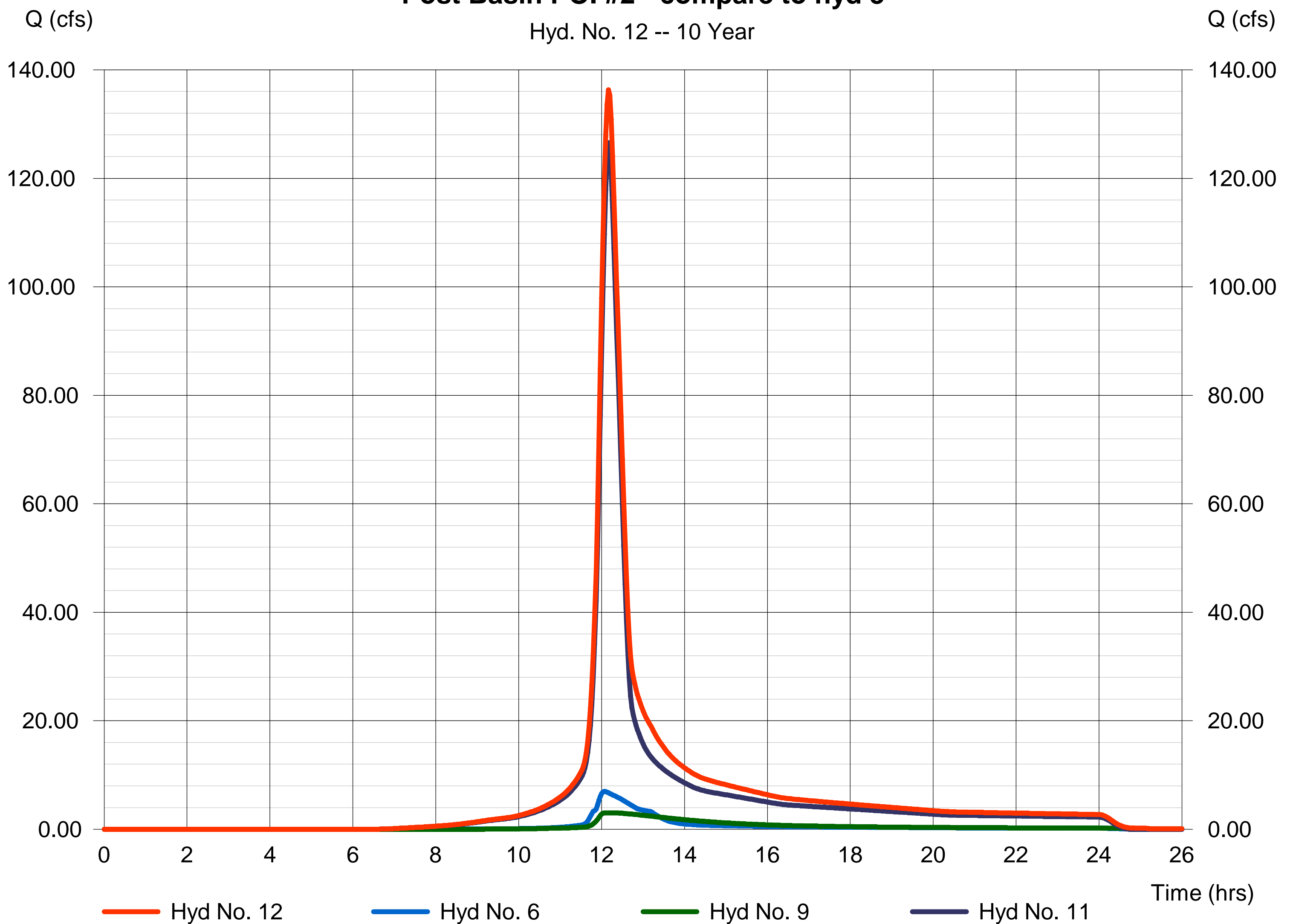
Post Basin POI #2 - compare to hyd 3

Hydrograph type = Combine
Storm frequency = 10 yrs
Time interval = 2 min
Inflow hyds. = 6, 9, 11

Peak discharge = 136.33 cfs
Time to peak = 12.17 hrs
Hyd. volume = 598,876 cuft
Contrib. drain. area = 43.500 ac

Post Basin POI #2 - compare to hyd 3

Hyd. No. 12 -- 10 Year



Hydrograph Report

Hyd. No. 14

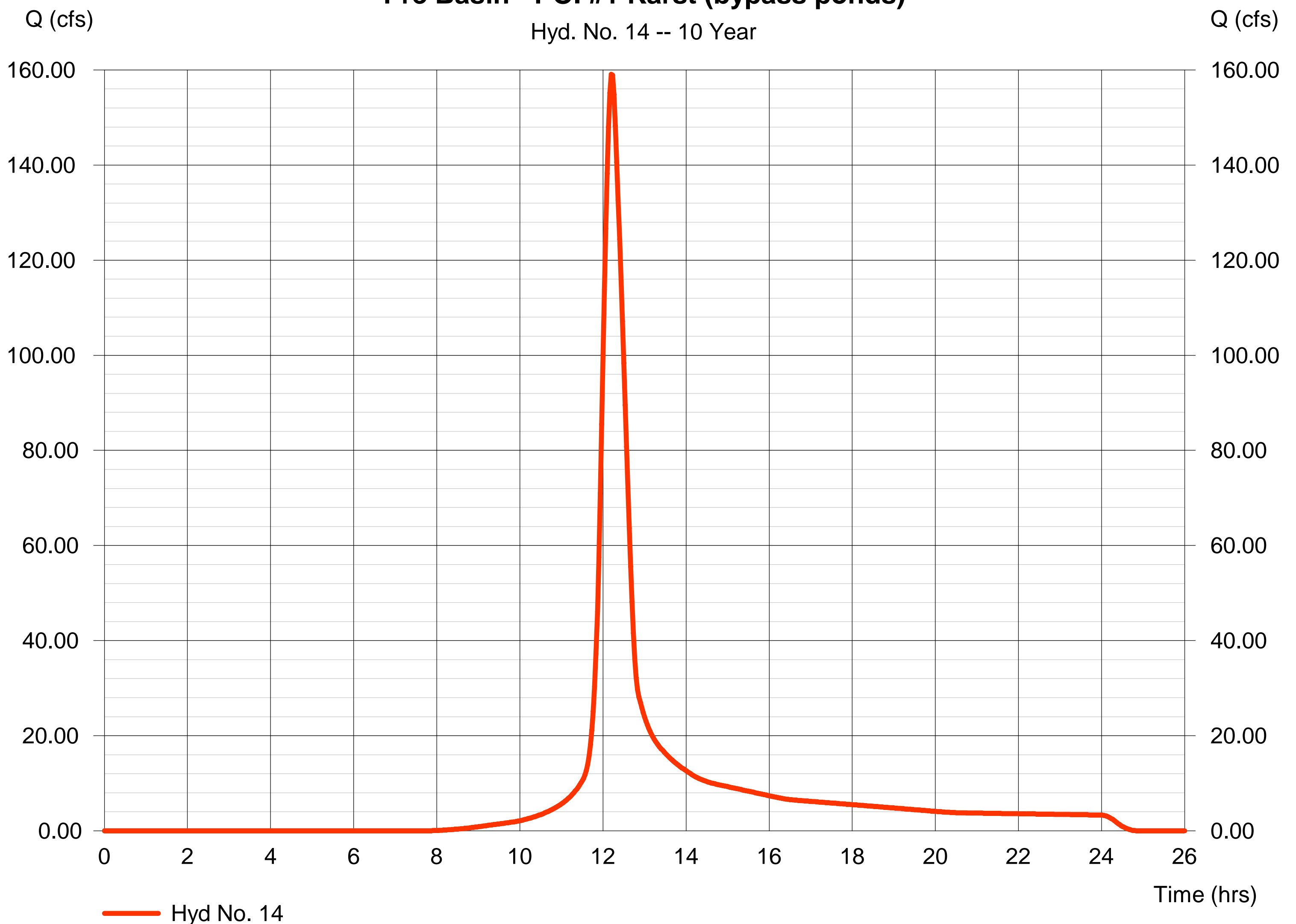
Pre Basin - POI #1 Karst (bypass ponds)

Hydrograph type	= SCS Runoff	Peak discharge	= 159.10 cfs
Storm frequency	= 10 yrs	Time to peak	= 12.20 hrs
Time interval	= 2 min	Hyd. volume	= 688,797 cuft
Drainage area	= 66.200 ac	Curve number	= 78*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 32.40 min
Total precip.	= 5.14 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(11.300 x 98) + (15.900 x 84) + (1.000 x 79) + (38.000 x 69)] / 66.200

Pre Basin - POI #1 Karst (bypass ponds)

Hyd. No. 14 -- 10 Year



Hydrograph Report

Hyd. No. 15

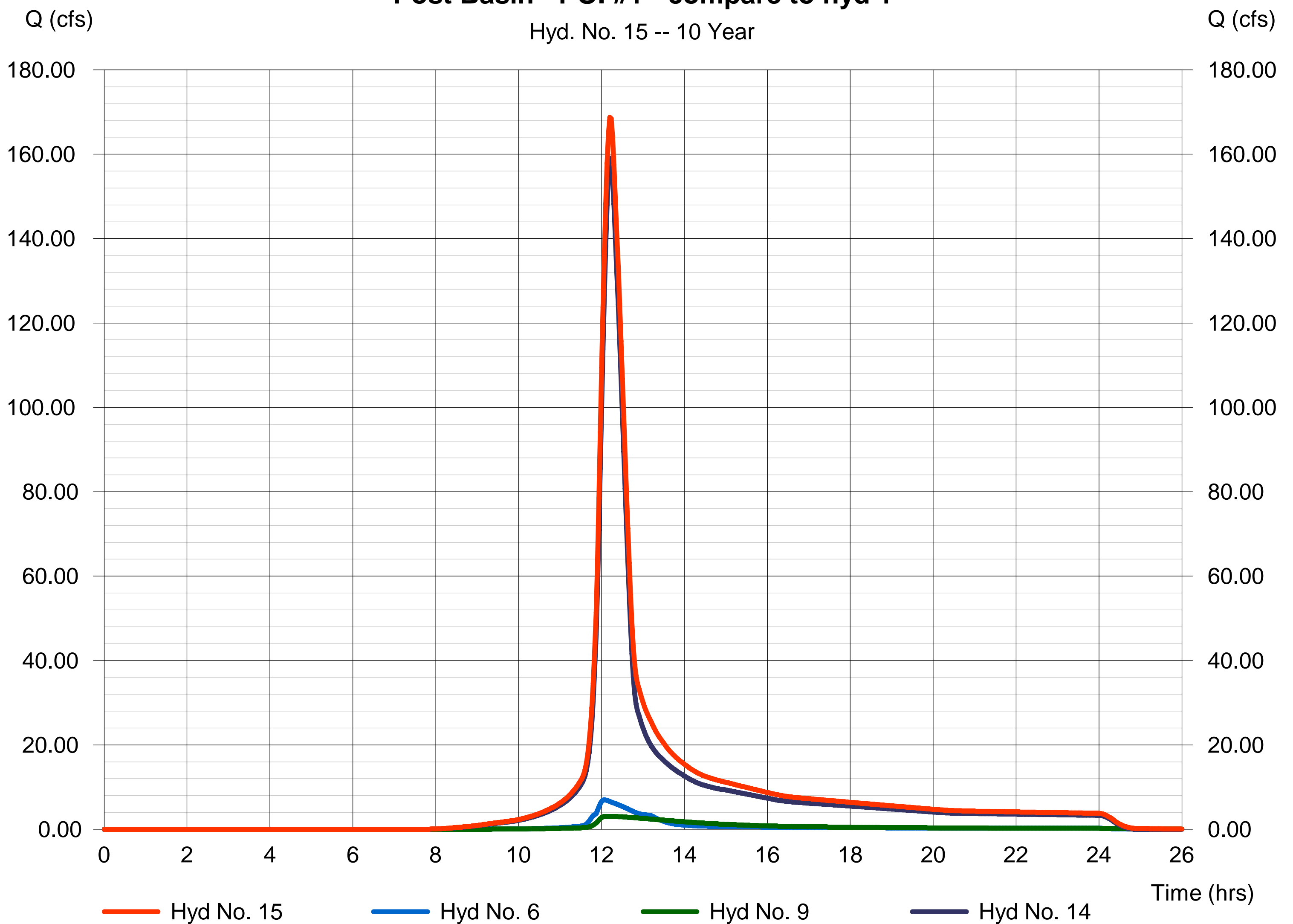
Post Basin - POI #1 - compare to hyd 1

Hydrograph type = Combine
Storm frequency = 10 yrs
Time interval = 2 min
Inflow hyds. = 6, 9, 14

Peak discharge = 168.75 cfs
Time to peak = 12.20 hrs
Hyd. volume = 781,652 cuft
Contrib. drain. area = 66.200 ac

Post Basin - POI #1 - compare to hyd 1

Hyd. No. 15 -- 10 Year



Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024

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	228.97	2	732	989,169	-----	-----	-----	Pre Basin - POI #1 Karst	
3	SCS Runoff	184.88	2	730	740,144	-----	-----	-----	Pre Basin - POI #2 - site outfall	
5	SCS Runoff	30.45	2	716	62,115	-----	-----	-----	Post Basin to Pond 1	
6	Reservoir	7.728	2	724	62,115	5	945.24	20,437	Pond 1 outflow	
8	SCS Runoff	26.13	2	716	54,301	-----	-----	-----	Post Basin to Pond 2	
9	Reservoir	3.870	2	728	54,211	8	944.15	24,737	Pond 2 outflow	
11	SCS Runoff	157.03	2	730	629,585	-----	-----	-----	Post Basin - POI #2 - (Bypassing pon	
12	Combine	168.50	2	730	745,911	6, 9, 11	-----	-----	Post Basin POI #2 - compare to hyd 3	
14	SCS Runoff	201.56	2	732	870,785	-----	-----	-----	Pre Basin - POI #1 Karst (bypass pon	
15	Combine	212.96	2	732	987,111	6, 9, 14	-----	-----	Post Basin - POI #1 - compare to hyd	
24-018-01 2025-04-29 Bobby Ray.gpw					Return Period: 25 Year			Wednesday, 04 / 30 / 2025		

Hydrograph Report

Hyd. No. 1

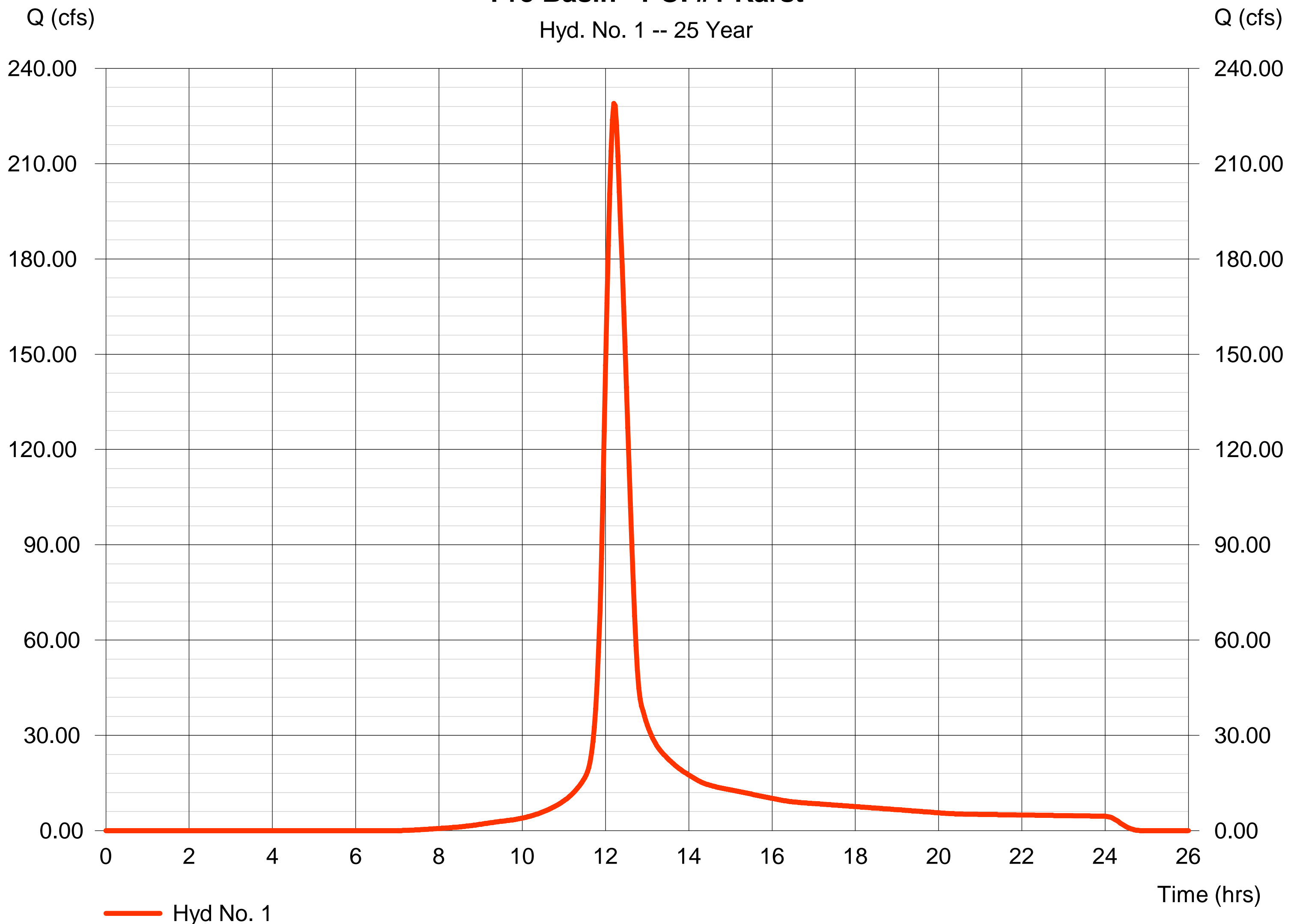
Pre Basin - POI #1 Karst

Hydrograph type	= SCS Runoff	Peak discharge	= 228.97 cfs
Storm frequency	= 25 yrs	Time to peak	= 12.20 hrs
Time interval	= 2 min	Hyd. volume	= 989,169 cuft
Drainage area	= 75.200 ac	Curve number	= 78*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 32.40 min
Total precip.	= 6.00 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(14.800 x 98) + (15.900 x 84) + (1.000 x 79) + (43.500 x 69)] / 75.200

Pre Basin - POI #1 Karst

Hyd. No. 1 -- 25 Year



Hydrograph Report

Hyd. No. 3

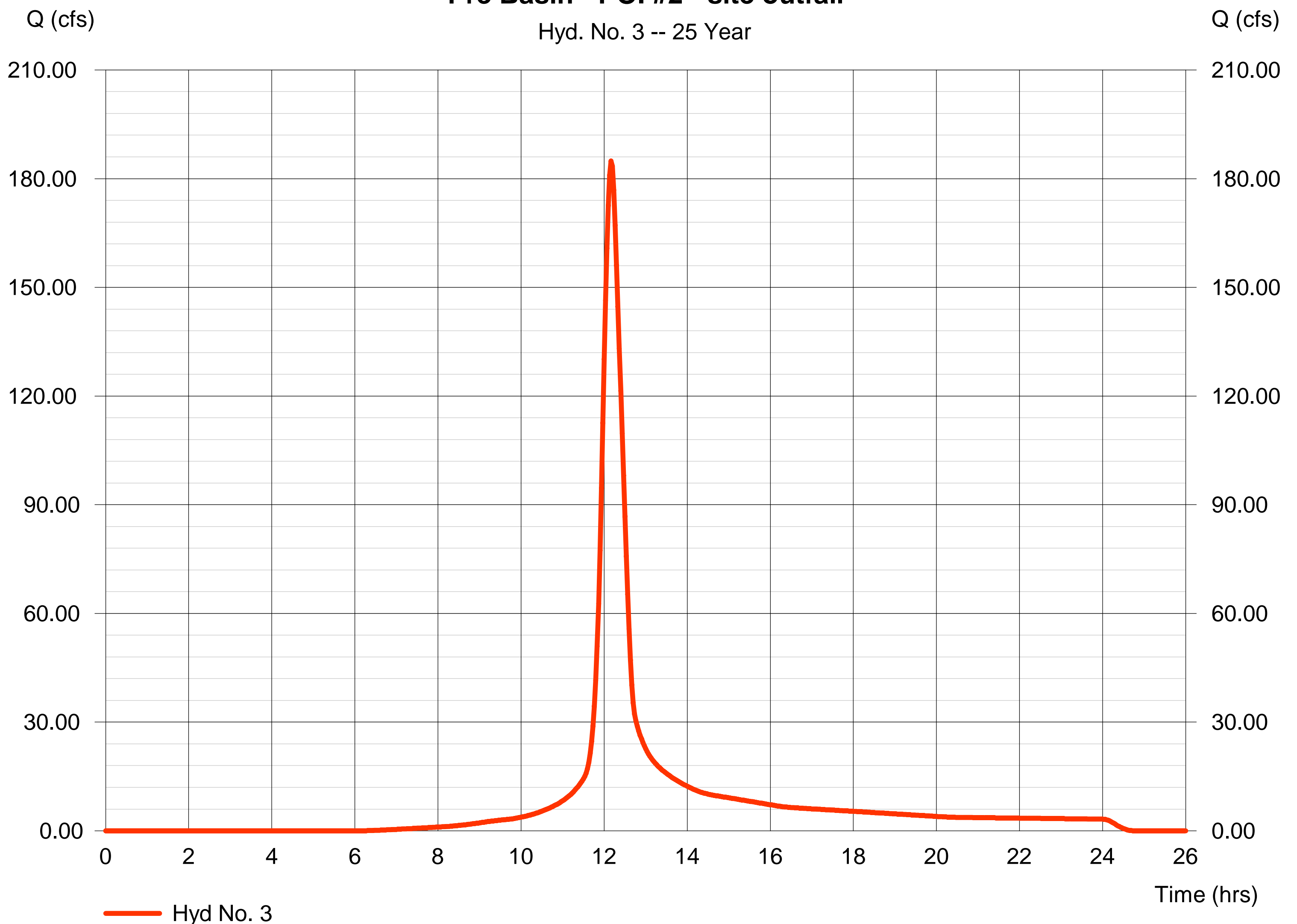
Pre Basin - POI #2 - site outfall

Hydrograph type	= SCS Runoff	Peak discharge	= 184.88 cfs
Storm frequency	= 25 yrs	Time to peak	= 12.17 hrs
Time interval	= 2 min	Hyd. volume	= 740,144 cuft
Drainage area	= 52.500 ac	Curve number	= 81*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 28.50 min
Total precip.	= 6.00 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(14.000 x 98) + (21.600 x 69) + (1.000 x 79) + (15.900 x 84)] / 52.500

Pre Basin - POI #2 - site outfall

Hyd. No. 3 -- 25 Year



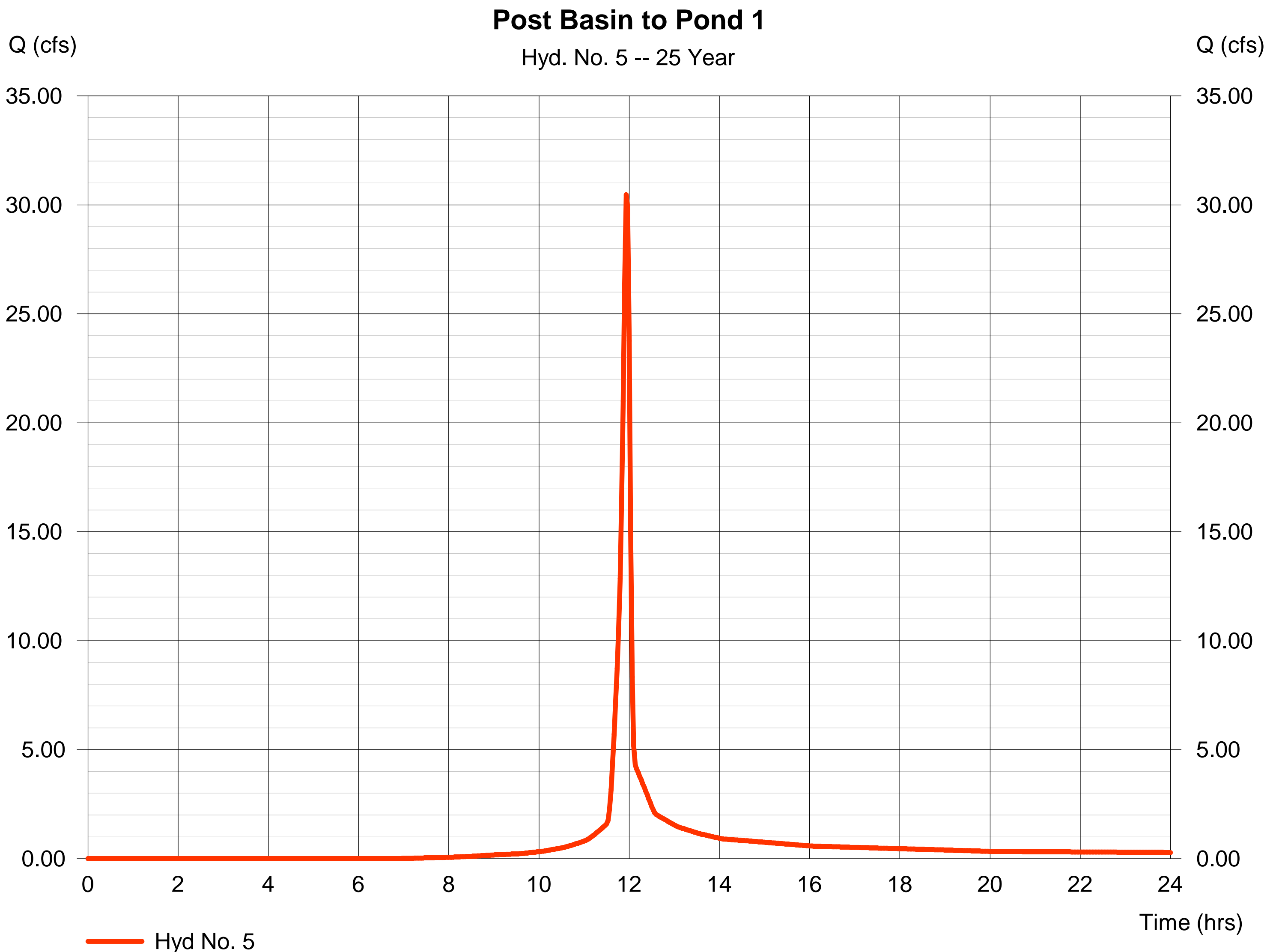
Hydrograph Report

Hyd. No. 5

Post Basin to Pond 1

Hydrograph type	= SCS Runoff	Peak discharge	= 30.45 cfs
Storm frequency	= 25 yrs	Time to peak	= 11.93 hrs
Time interval	= 2 min	Hyd. volume	= 62,115 cuft
Drainage area	= 5.100 ac	Curve number	= 78*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 6.00 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(1.600 x 98) + (3.500 x 69)] / 5.100



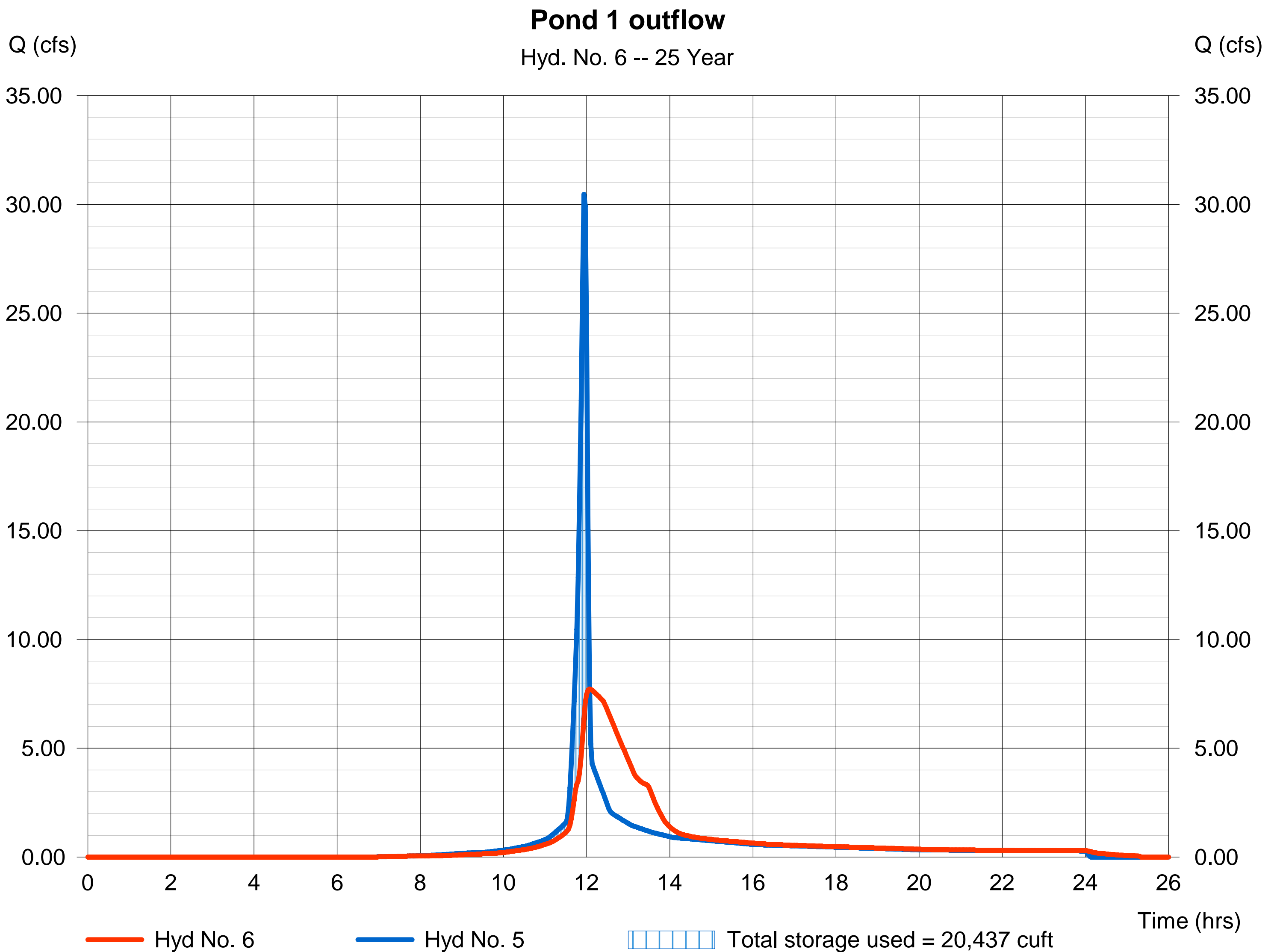
Hydrograph Report

Hyd. No. 6

Pond 1 outflow

Hydrograph type	= Reservoir	Peak discharge	= 7.728 cfs
Storm frequency	= 25 yrs	Time to peak	= 12.07 hrs
Time interval	= 2 min	Hyd. volume	= 62,115 cuft
Inflow hyd. No.	= 5 - Post Basin to Pond 1	Max. Elevation	= 945.24 ft
Reservoir name	= Pond 1	Max. Storage	= 20,437 cuft

Storage Indication method used.



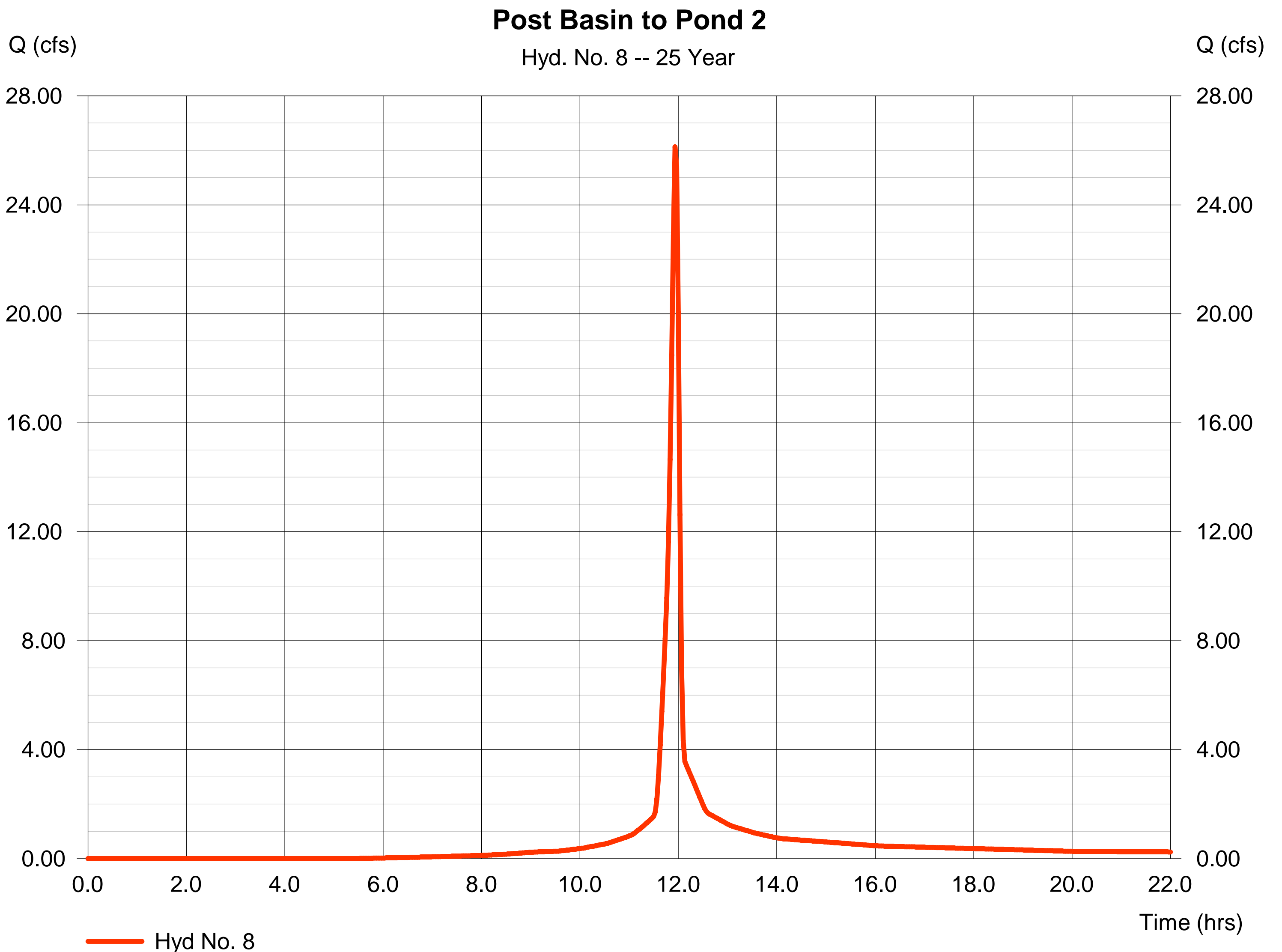
Hydrograph Report

Hyd. No. 8

Post Basin to Pond 2

Hydrograph type	= SCS Runoff	Peak discharge	= 26.13 cfs
Storm frequency	= 25 yrs	Time to peak	= 11.93 hrs
Time interval	= 2 min	Hyd. volume	= 54,301 cuft
Drainage area	= 3.900 ac	Curve number	= 83*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 6.00 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(1.900 x 98) + (2.000 x 69)] / 3.900



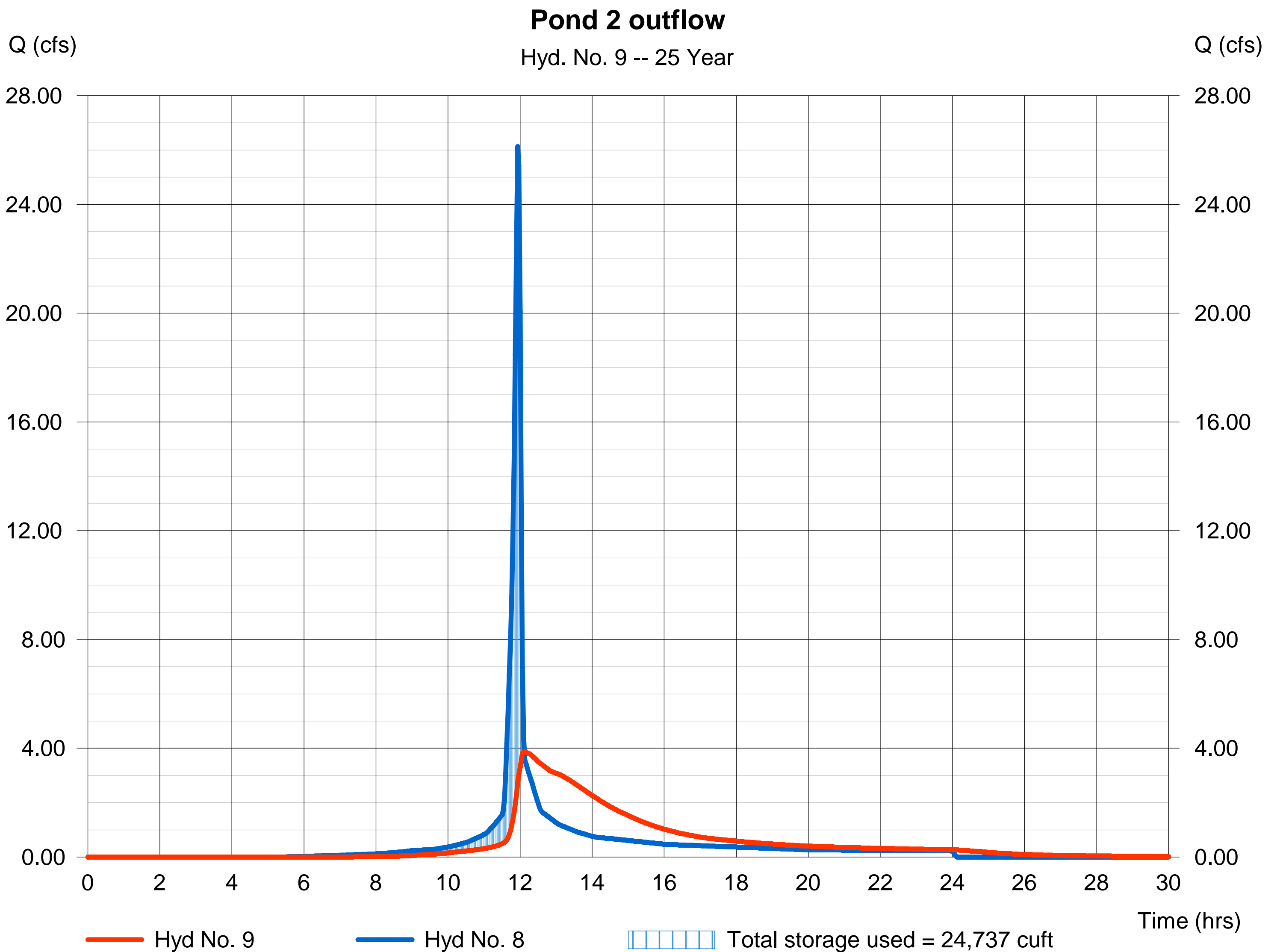
Hydrograph Report

Hyd. No. 9

Pond 2 outflow

Hydrograph type	= Reservoir	Peak discharge	= 3.870 cfs
Storm frequency	= 25 yrs	Time to peak	= 12.13 hrs
Time interval	= 2 min	Hyd. volume	= 54,211 cuft
Inflow hyd. No.	= 8 - Post Basin to Pond 2	Max. Elevation	= 944.15 ft
Reservoir name	= Pond 2	Max. Storage	= 24,737 cuft

Storage Indication method used.



Hydrograph Report

Hyd. No. 11

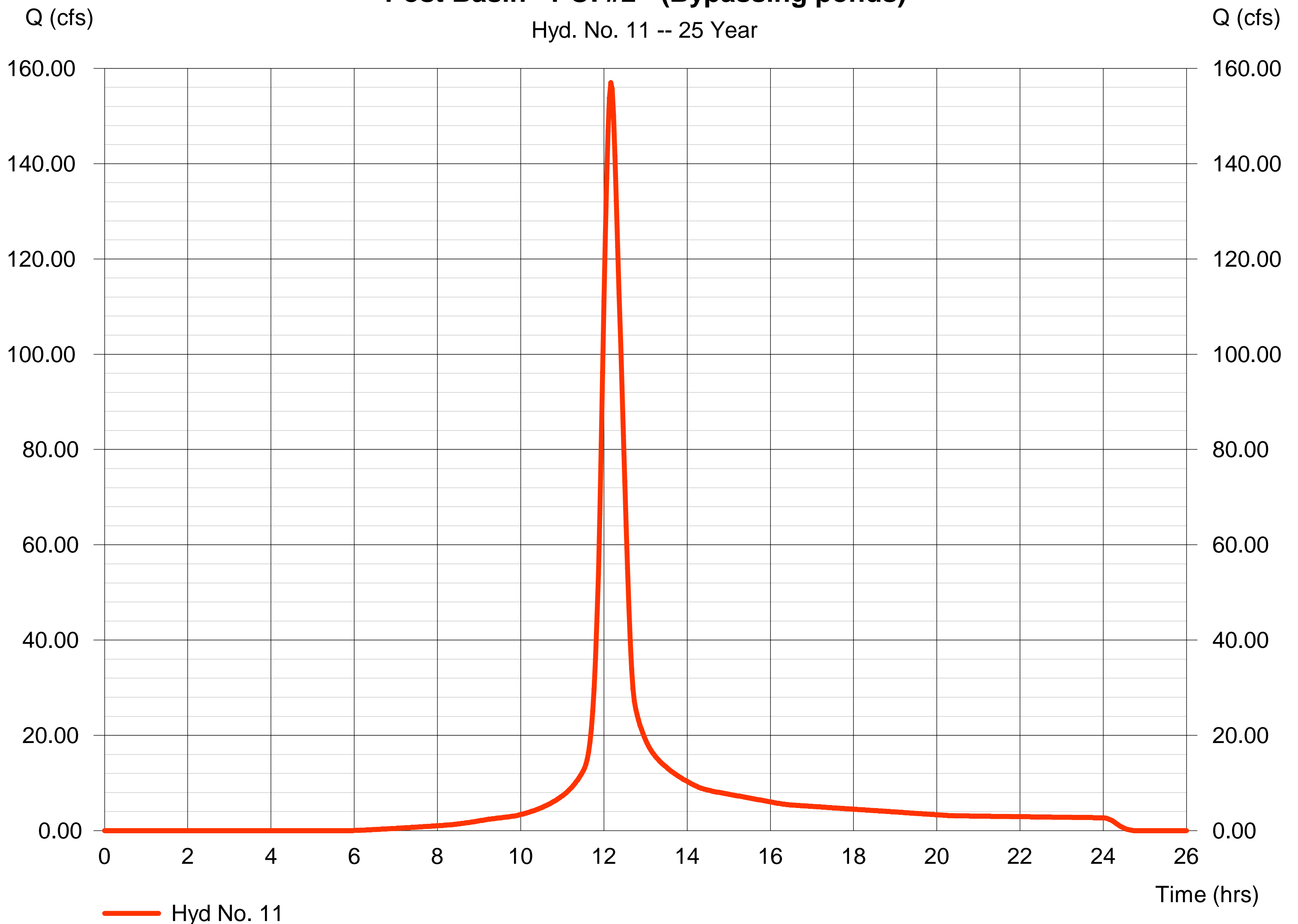
Post Basin - POI #2 - (Bypassing ponds)

Hydrograph type	= SCS Runoff	Peak discharge	= 157.03 cfs
Storm frequency	= 25 yrs	Time to peak	= 12.17 hrs
Time interval	= 2 min	Hyd. volume	= 629,585 cuft
Drainage area	= 43.500 ac	Curve number	= 82*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 28.50 min
Total precip.	= 6.00 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(10.500 x 98) + (16.100 x 69) + (1.000 x 79) + (15.900 x 84)] / 43.500

Post Basin - POI #2 - (Bypassing ponds)

Hyd. No. 11 -- 25 Year



Hydrograph Report

Hyd. No. 12

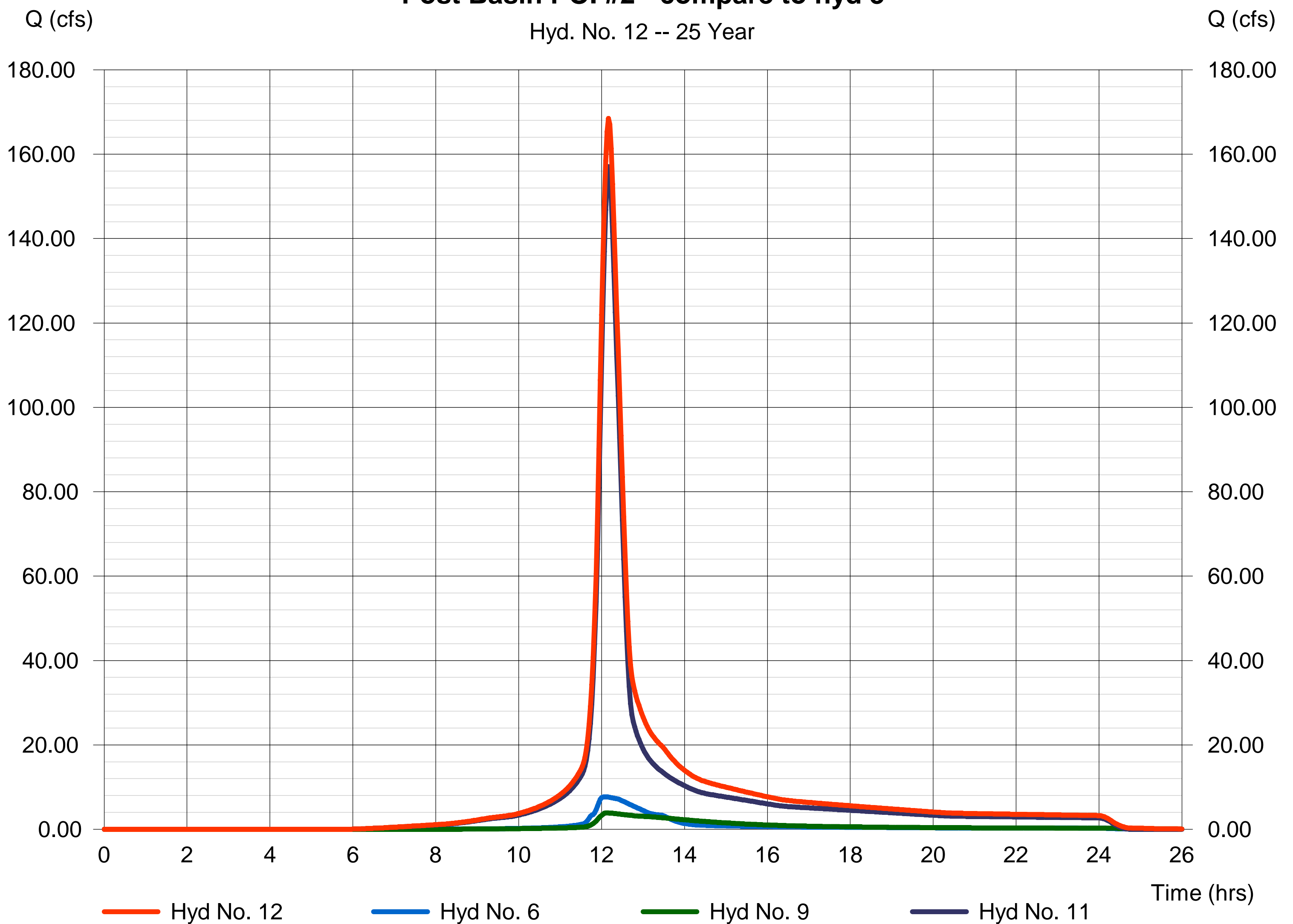
Post Basin POI #2 - compare to hyd 3

Hydrograph type = Combine
Storm frequency = 25 yrs
Time interval = 2 min
Inflow hyds. = 6, 9, 11

Peak discharge = 168.50 cfs
Time to peak = 12.17 hrs
Hyd. volume = 745,911 cuft
Contrib. drain. area = 43.500 ac

Post Basin POI #2 - compare to hyd 3

Hyd. No. 12 -- 25 Year



Hydrograph Report

Hyd. No. 14

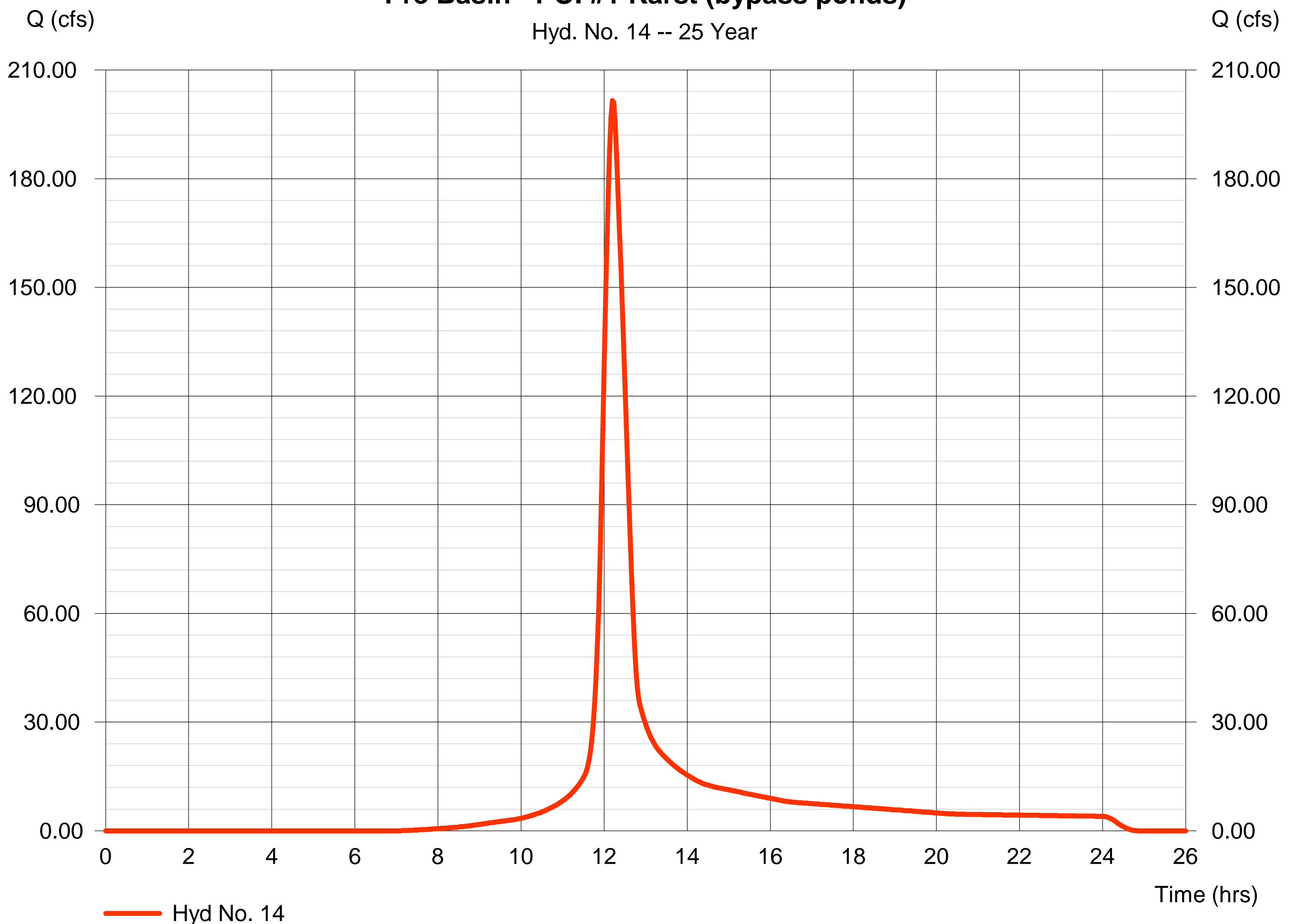
Pre Basin - POI #1 Karst (bypass ponds)

Hydrograph type	= SCS Runoff	Peak discharge	= 201.56 cfs
Storm frequency	= 25 yrs	Time to peak	= 12.20 hrs
Time interval	= 2 min	Hyd. volume	= 870,785 cuft
Drainage area	= 66.200 ac	Curve number	= 78*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 32.40 min
Total precip.	= 6.00 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(11.300 x 98) + (15.900 x 84) + (1.000 x 79) + (38.000 x 69)] / 66.200

Pre Basin - POI #1 Karst (bypass ponds)

Hyd. No. 14 -- 25 Year



Hydrograph Report

Hyd. No. 15

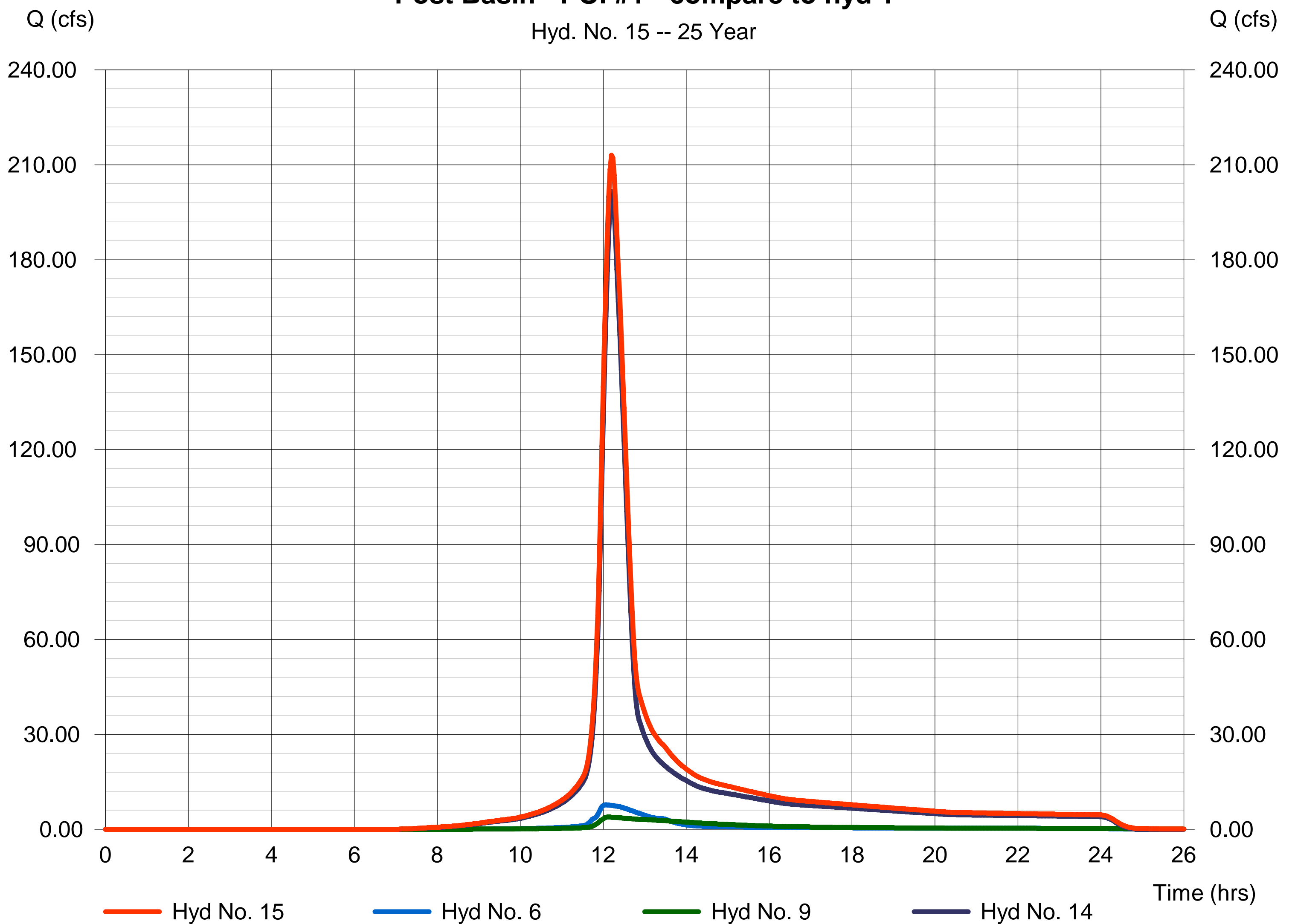
Post Basin - POI #1 - compare to hyd 1

Hydrograph type = Combine
Storm frequency = 25 yrs
Time interval = 2 min
Inflow hyds. = 6, 9, 14

Peak discharge = 212.96 cfs
Time to peak = 12.20 hrs
Hyd. volume = 987,111 cuft
Contrib. drain. area = 66.200 ac

Post Basin - POI #1 - compare to hyd 1

Hyd. No. 15 -- 25 Year



Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024

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	268.27	2	732	1,159,339	-----	-----	-----	Pre Basin - POI #1 Karst	
3	SCS Runoff	214.47	2	730	860,919	-----	-----	-----	Pre Basin - POI #2 - site outfall	
5	SCS Runoff	35.49	2	716	72,801	-----	-----	-----	Post Basin to Pond 1	
6	Reservoir	8.238	2	724	72,801	5	945.47	24,532	Pond 1 outflow	
8	SCS Runoff	30.02	2	716	62,855	-----	-----	-----	Post Basin to Pond 2	
9	Reservoir	4.858	2	726	62,765	8	944.33	28,509	Pond 2 outflow	
11	SCS Runoff	181.61	2	730	730,525	-----	-----	-----	Post Basin - POI #2 - (Bypassing pon	
12	Combine	194.58	2	730	866,091	6, 9, 11	-----	-----	Post Basin POI #2 - compare to hyd 3	
14	SCS Runoff	236.16	2	732	1,020,588	-----	-----	-----	Pre Basin - POI #1 Karst (bypass pon	
15	Combine	249.05	2	732	1,156,151	6, 9, 14	-----	-----	Post Basin - POI #1 - compare to hyd	
24-018-01 2025-04-29 Bobby Ray.gpw					Return Period: 50 Year			Wednesday, 04 / 30 / 2025		

Hydrograph Report

Hyd. No. 1

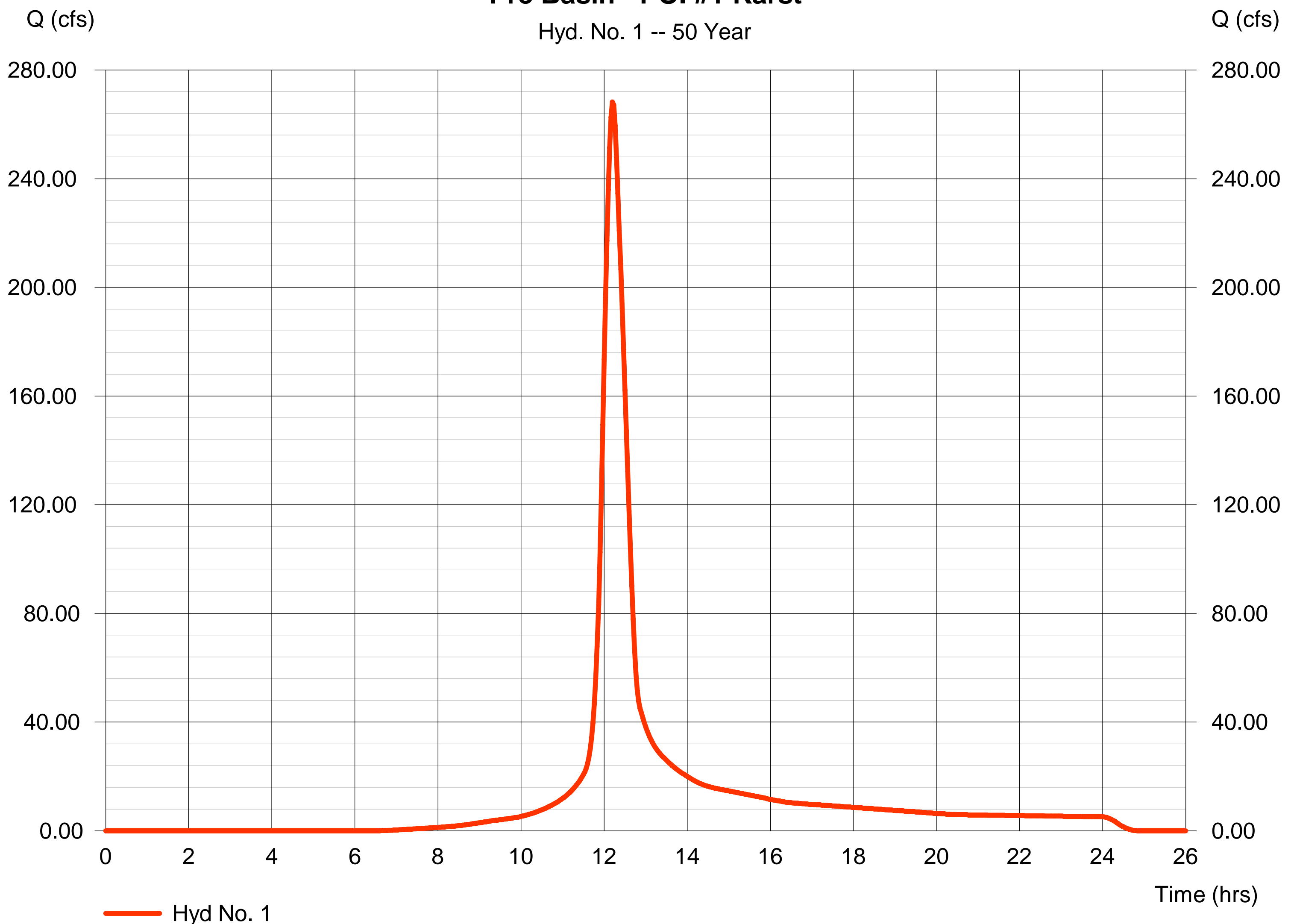
Pre Basin - POI #1 Karst

Hydrograph type	= SCS Runoff	Peak discharge	= 268.27 cfs
Storm frequency	= 50 yrs	Time to peak	= 12.20 hrs
Time interval	= 2 min	Hyd. volume	= 1,159,339 cuft
Drainage area	= 75.200 ac	Curve number	= 78*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 32.40 min
Total precip.	= 6.69 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(14.800 x 98) + (15.900 x 84) + (1.000 x 79) + (43.500 x 69)] / 75.200

Pre Basin - POI #1 Karst

Hyd. No. 1 -- 50 Year



Hydrograph Report

Hyd. No. 3

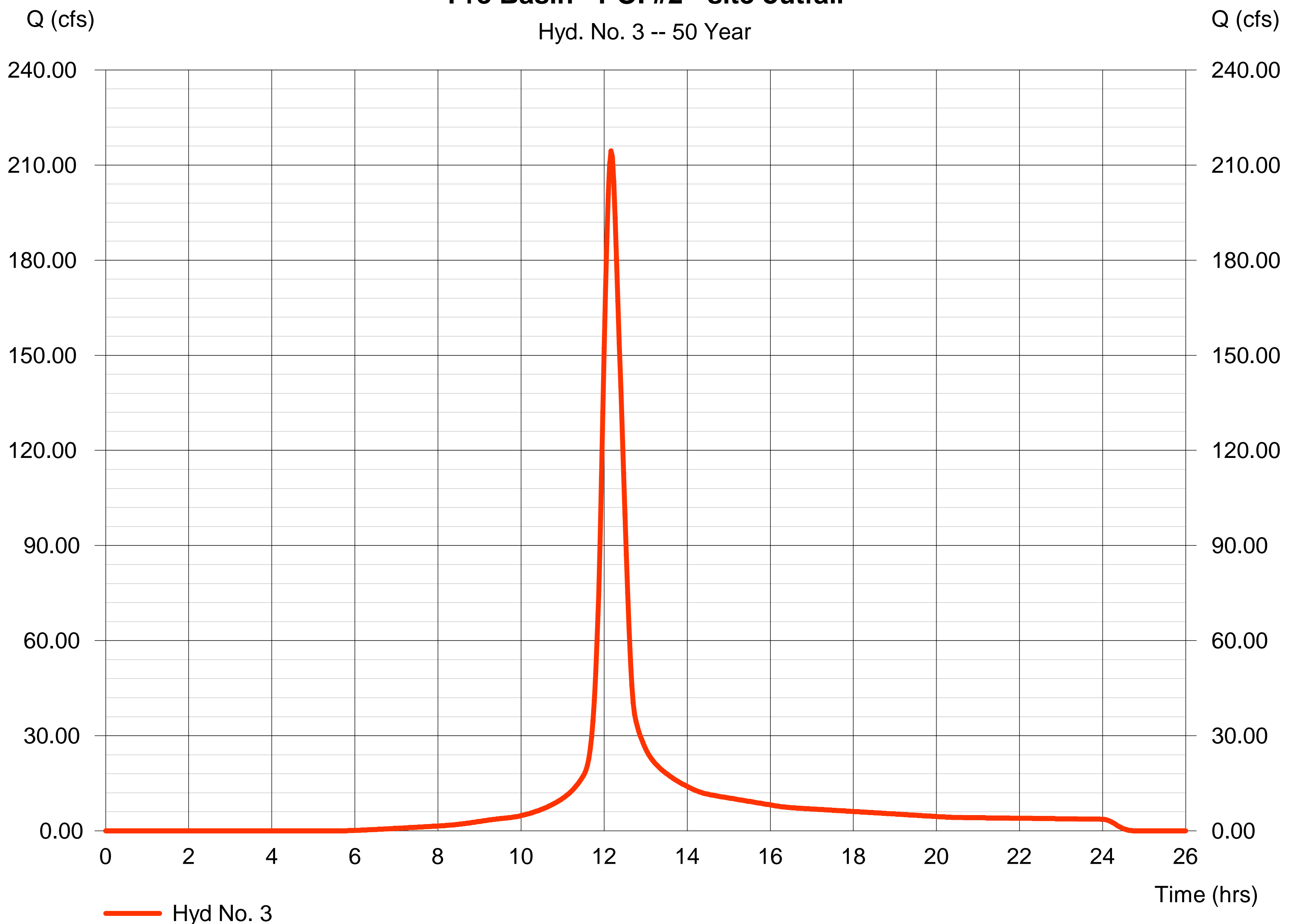
Pre Basin - POI #2 - site outfall

Hydrograph type	= SCS Runoff	Peak discharge	= 214.47 cfs
Storm frequency	= 50 yrs	Time to peak	= 12.17 hrs
Time interval	= 2 min	Hyd. volume	= 860,919 cuft
Drainage area	= 52.500 ac	Curve number	= 81*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 28.50 min
Total precip.	= 6.69 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(14.000 x 98) + (21.600 x 69) + (1.000 x 79) + (15.900 x 84)] / 52.500

Pre Basin - POI #2 - site outfall

Hyd. No. 3 -- 50 Year



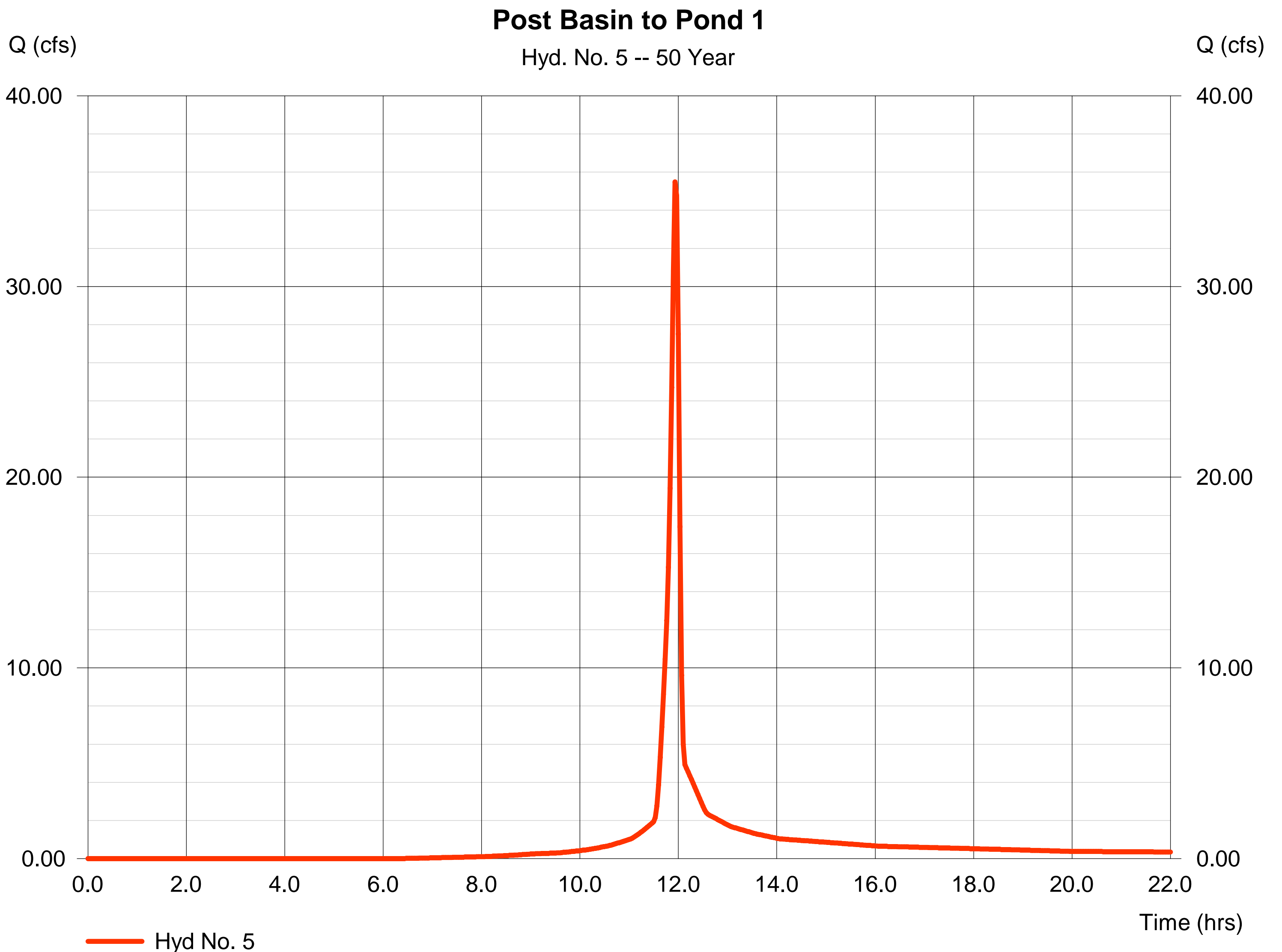
Hydrograph Report

Hyd. No. 5

Post Basin to Pond 1

Hydrograph type	= SCS Runoff	Peak discharge	= 35.49 cfs
Storm frequency	= 50 yrs	Time to peak	= 11.93 hrs
Time interval	= 2 min	Hyd. volume	= 72,801 cuft
Drainage area	= 5.100 ac	Curve number	= 78*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 6.69 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(1.600 x 98) + (3.500 x 69)] / 5.100



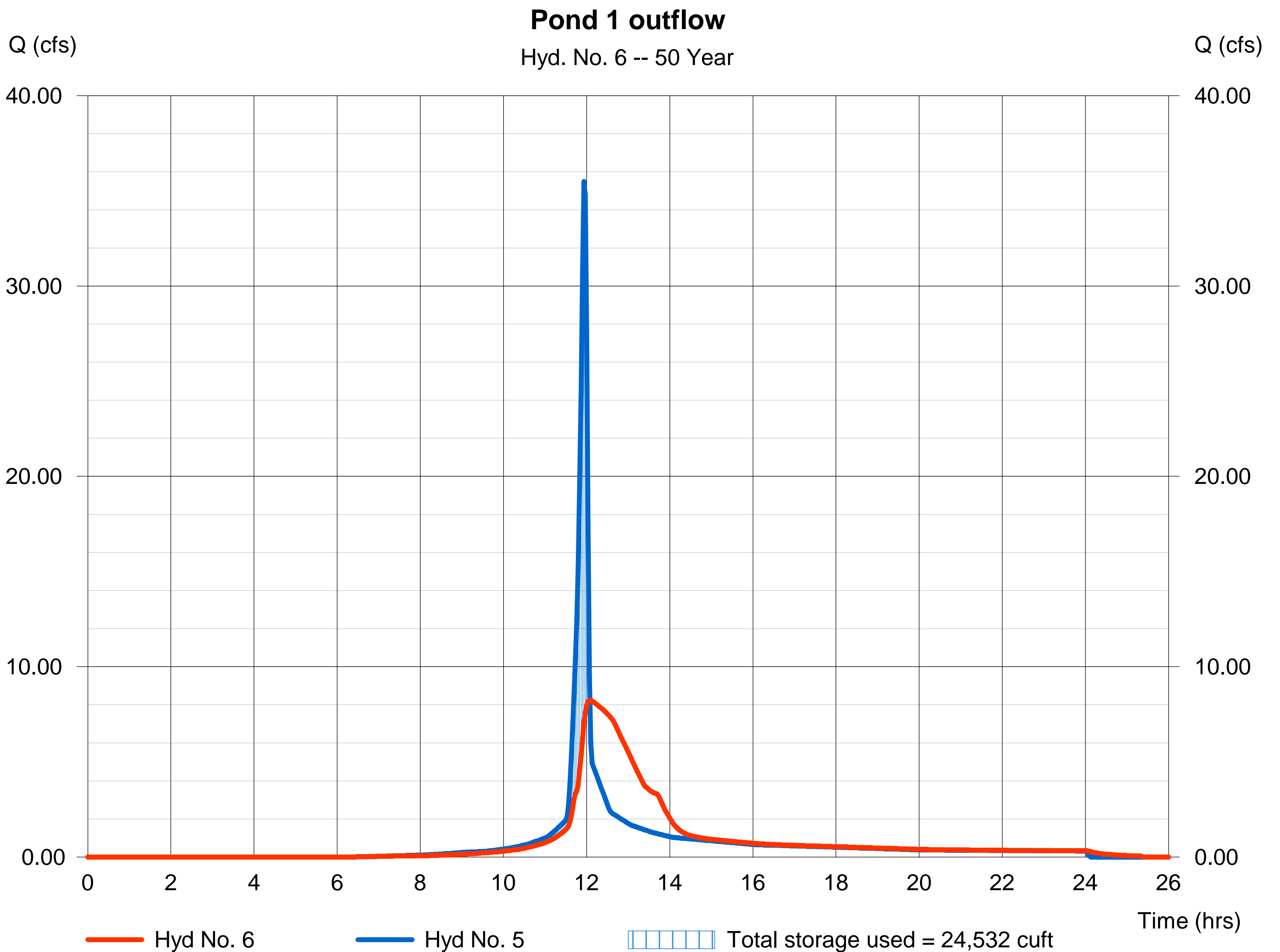
Hydrograph Report

Hyd. No. 6

Pond 1 outflow

Hydrograph type	= Reservoir	Peak discharge	= 8.238 cfs
Storm frequency	= 50 yrs	Time to peak	= 12.07 hrs
Time interval	= 2 min	Hyd. volume	= 72,801 cuft
Inflow hyd. No.	= 5 - Post Basin to Pond 1	Max. Elevation	= 945.47 ft
Reservoir name	= Pond 1	Max. Storage	= 24,532 cuft

Storage Indication method used.



Hydrograph Report

Hyd. No. 8

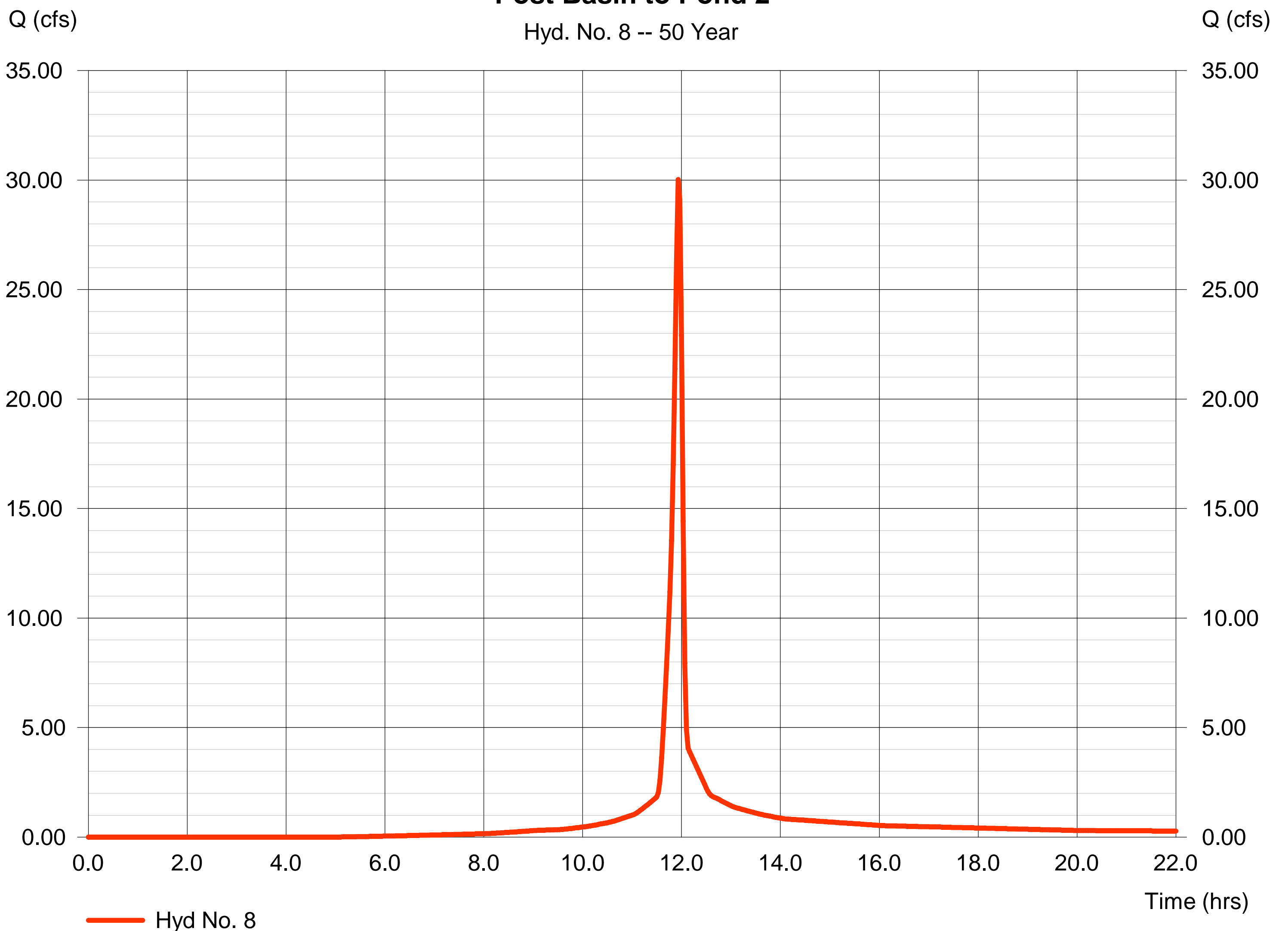
Post Basin to Pond 2

Hydrograph type	= SCS Runoff	Peak discharge	= 30.02 cfs
Storm frequency	= 50 yrs	Time to peak	= 11.93 hrs
Time interval	= 2 min	Hyd. volume	= 62,855 cuft
Drainage area	= 3.900 ac	Curve number	= 83*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 6.69 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(1.900 x 98) + (2.000 x 69)] / 3.900

Post Basin to Pond 2

Hyd. No. 8 -- 50 Year



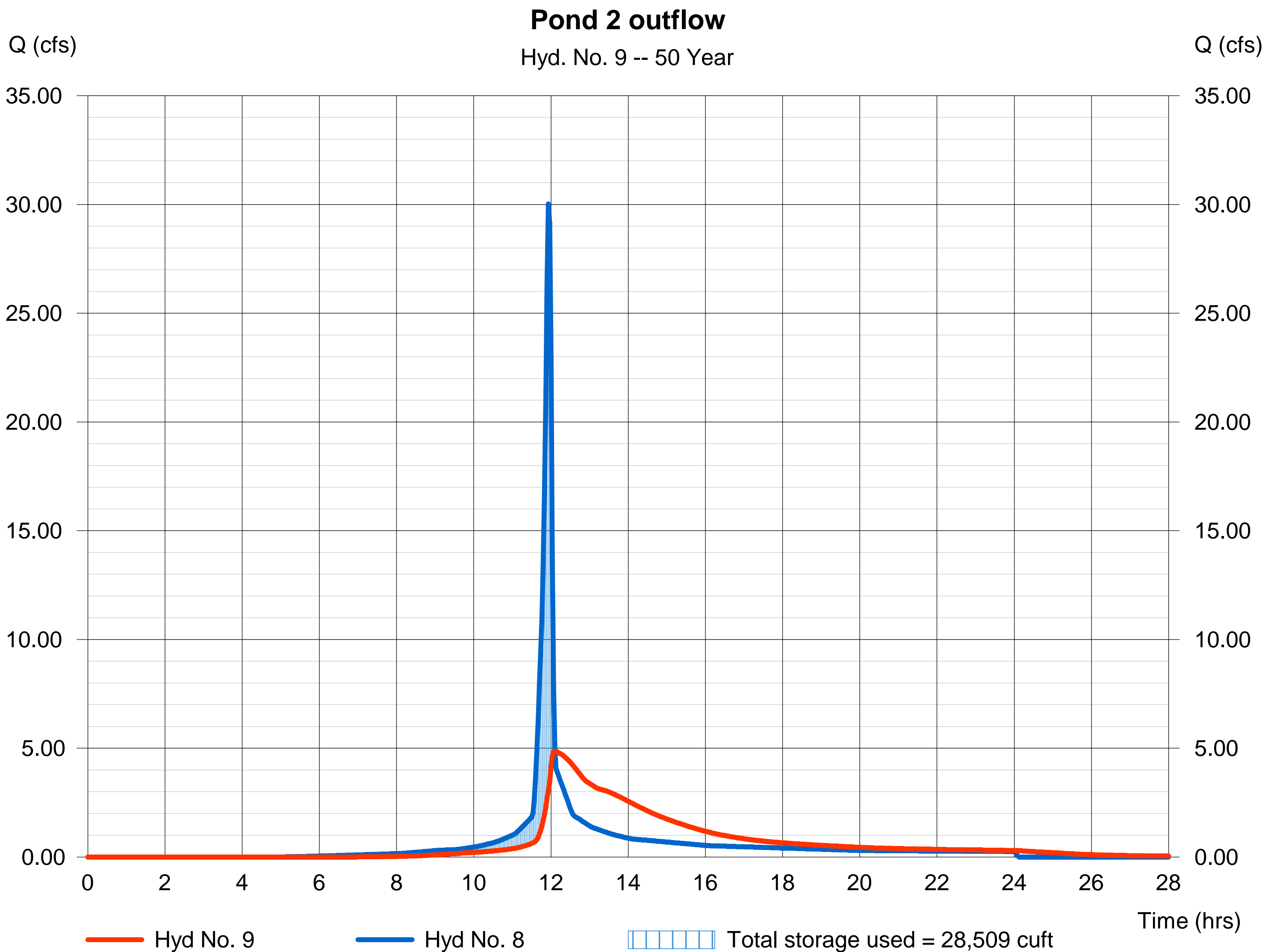
Hydrograph Report

Hyd. No. 9

Pond 2 outflow

Hydrograph type	= Reservoir	Peak discharge	= 4.858 cfs
Storm frequency	= 50 yrs	Time to peak	= 12.10 hrs
Time interval	= 2 min	Hyd. volume	= 62,765 cuft
Inflow hyd. No.	= 8 - Post Basin to Pond 2	Max. Elevation	= 944.33 ft
Reservoir name	= Pond 2	Max. Storage	= 28,509 cuft

Storage Indication method used.



Hydrograph Report

Hyd. No. 11

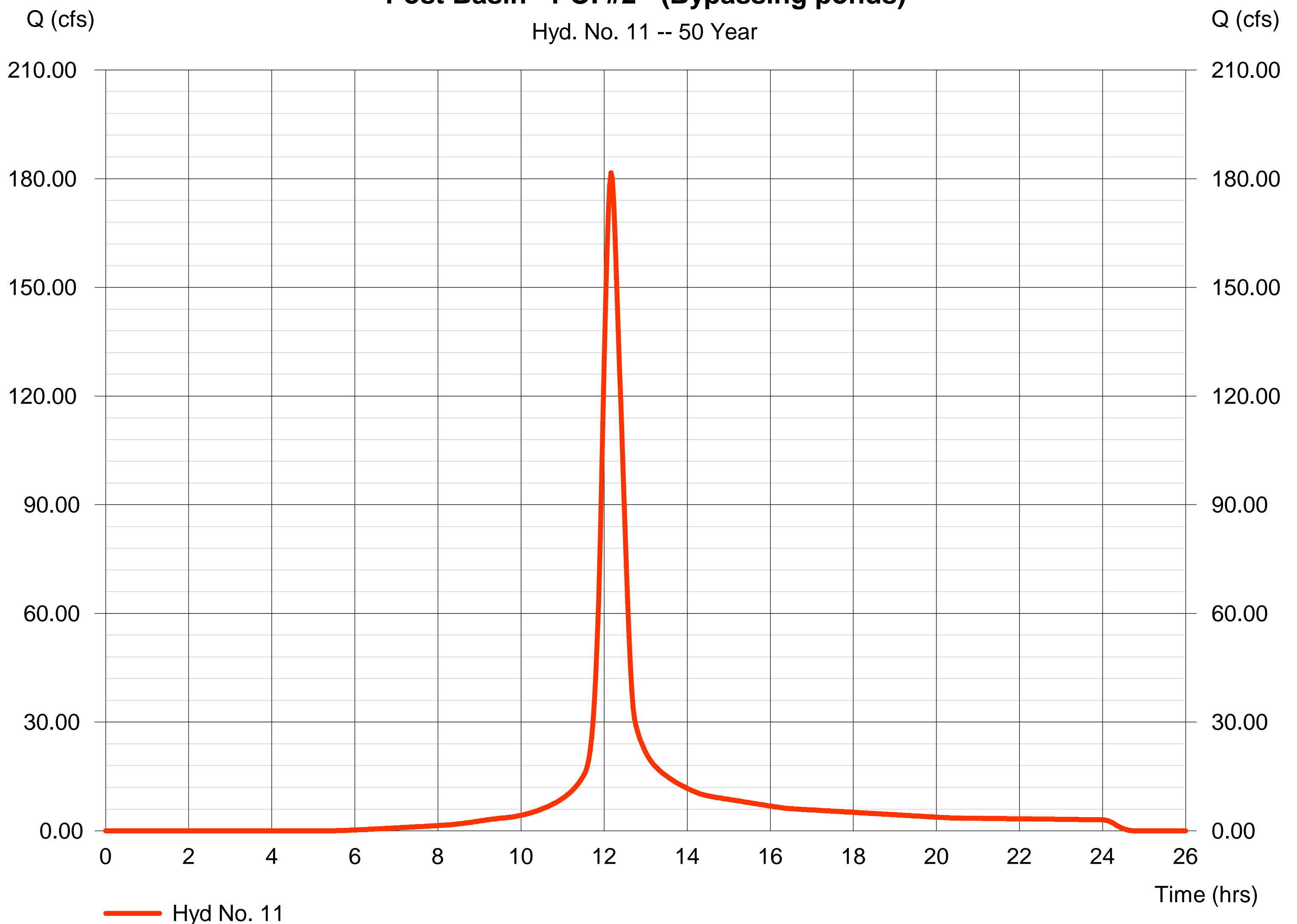
Post Basin - POI #2 - (Bypassing ponds)

Hydrograph type	= SCS Runoff	Peak discharge	= 181.61 cfs
Storm frequency	= 50 yrs	Time to peak	= 12.17 hrs
Time interval	= 2 min	Hyd. volume	= 730,525 cuft
Drainage area	= 43.500 ac	Curve number	= 82*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 28.50 min
Total precip.	= 6.69 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(10.500 x 98) + (16.100 x 69) + (1.000 x 79) + (15.900 x 84)] / 43.500

Post Basin - POI #2 - (Bypassing ponds)

Hyd. No. 11 -- 50 Year



Hydrograph Report

Hyd. No. 12

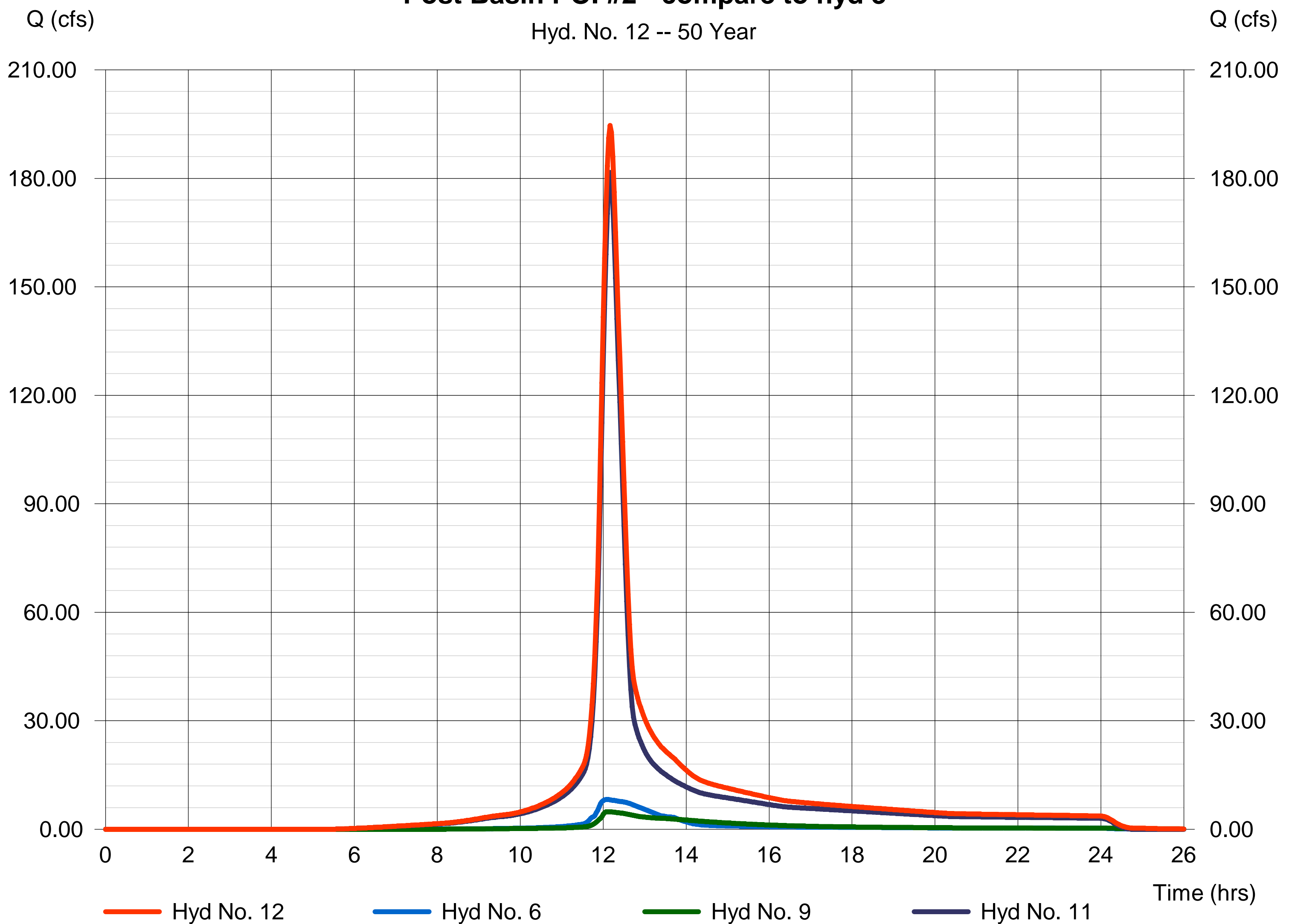
Post Basin POI #2 - compare to hyd 3

Hydrograph type = Combine
Storm frequency = 50 yrs
Time interval = 2 min
Inflow hyds. = 6, 9, 11

Peak discharge = 194.58 cfs
Time to peak = 12.17 hrs
Hyd. volume = 866,091 cuft
Contrib. drain. area = 43.500 ac

Post Basin POI #2 - compare to hyd 3

Hyd. No. 12 -- 50 Year



Hydrograph Report

Hyd. No. 14

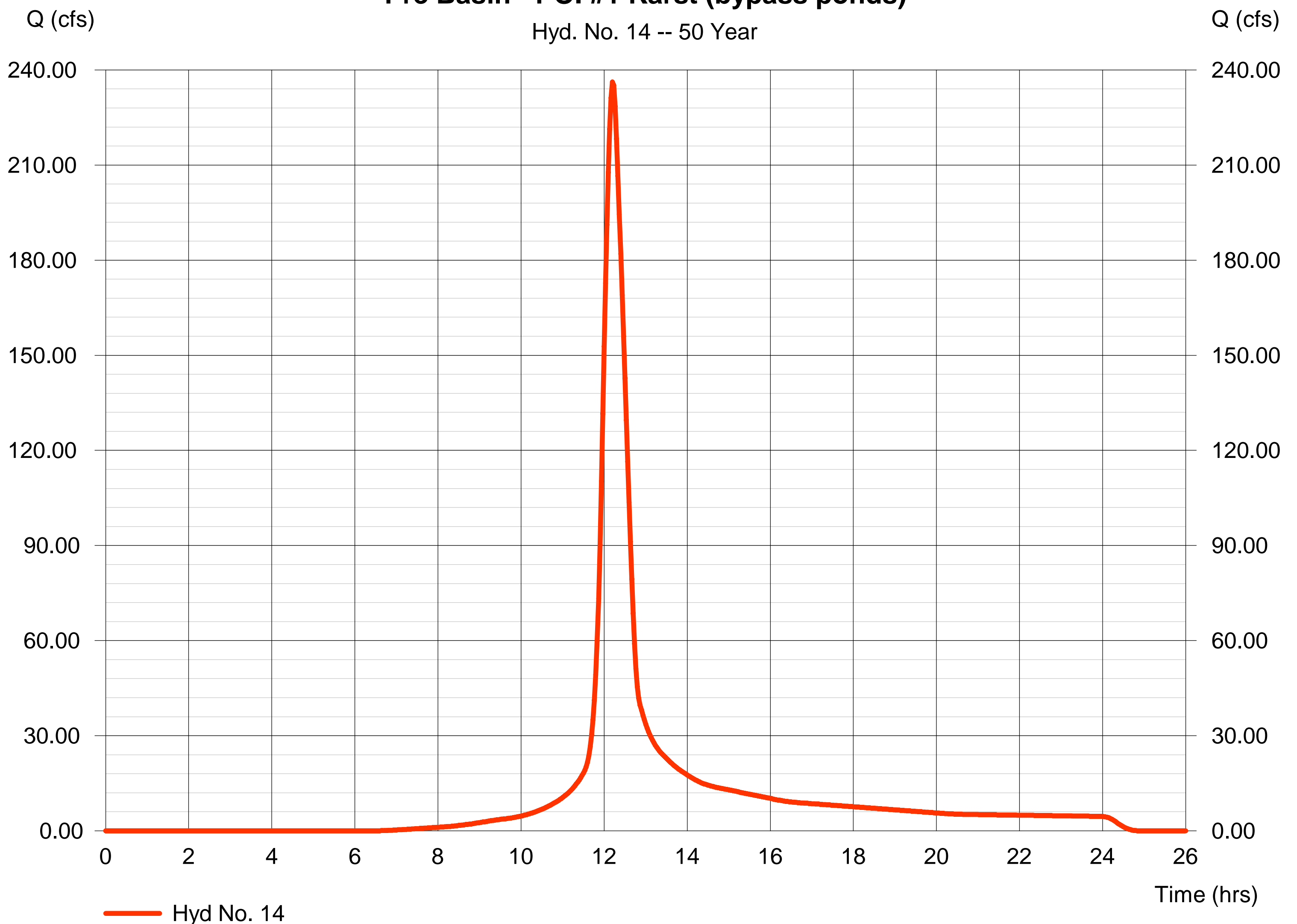
Pre Basin - POI #1 Karst (bypass ponds)

Hydrograph type	= SCS Runoff	Peak discharge	= 236.16 cfs
Storm frequency	= 50 yrs	Time to peak	= 12.20 hrs
Time interval	= 2 min	Hyd. volume	= 1,020,588 cuft
Drainage area	= 66.200 ac	Curve number	= 78*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 32.40 min
Total precip.	= 6.69 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(11.300 x 98) + (15.900 x 84) + (1.000 x 79) + (38.000 x 69)] / 66.200

Pre Basin - POI #1 Karst (bypass ponds)

Hyd. No. 14 -- 50 Year



Hydrograph Report

Hyd. No. 15

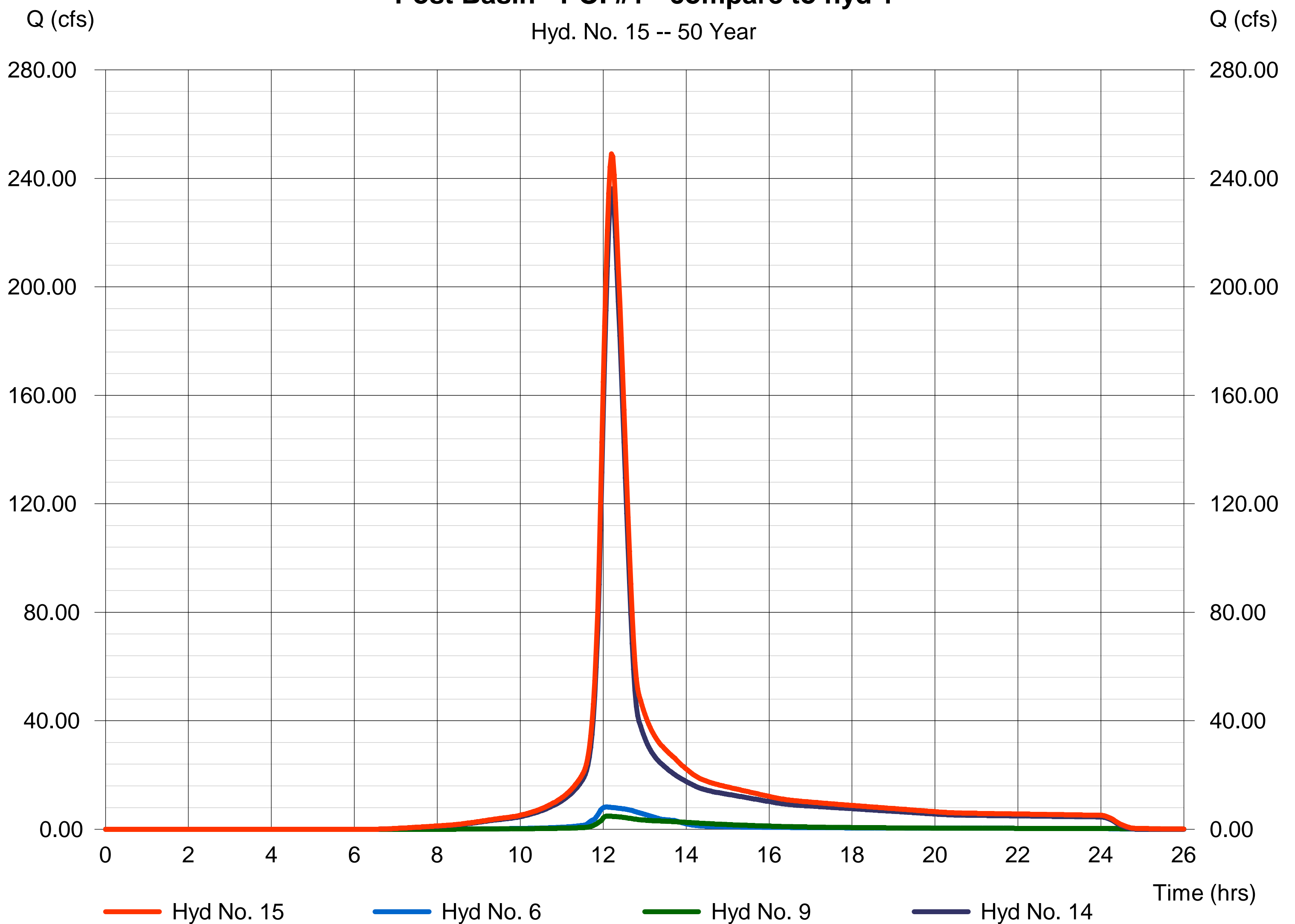
Post Basin - POI #1 - compare to hyd 1

Hydrograph type = Combine
Storm frequency = 50 yrs
Time interval = 2 min
Inflow hyds. = 6, 9, 14

Peak discharge = 249.05 cfs
Time to peak = 12.20 hrs
Hyd. volume = 1,156,151 cuft
Contrib. drain. area = 66.200 ac

Post Basin - POI #1 - compare to hyd 1

Hyd. No. 15 -- 50 Year



Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024

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	307.90	2	732	1,332,448	-----	-----	-----	Pre Basin - POI #1 Karst	
3	SCS Runoff	244.18	2	730	983,290	-----	-----	-----	Pre Basin - POI #2 - site outfall	
5	SCS Runoff	40.56	2	716	83,672	-----	-----	-----	Post Basin to Pond 1	
6	Reservoir	8.734	2	726	83,671	5	945.71	28,762	Pond 1 outflow	
8	SCS Runoff	33.90	2	716	71,502	-----	-----	-----	Post Basin to Pond 2	
9	Reservoir	5.726	2	726	71,411	8	944.50	32,305	Pond 2 outflow	
11	SCS Runoff	206.25	2	730	832,676	-----	-----	-----	Post Basin - POI #2 - (Bypassing pon	
12	Combine	220.55	2	730	987,759	6, 9, 11	-----	-----	Post Basin POI #2 - compare to hyd 3	
14	SCS Runoff	271.05	2	732	1,172,979	-----	-----	-----	Pre Basin - POI #1 Karst (bypass pon	
15	Combine	285.26	2	732	1,328,059	6, 9, 14	-----	-----	Post Basin - POI #1 - compare to hyd	
24-018-01 2025-04-29 Bobby Ray.gpw					Return Period: 100 Year			Wednesday, 04 / 30 / 2025		

Hydrograph Report

Hyd. No. 1

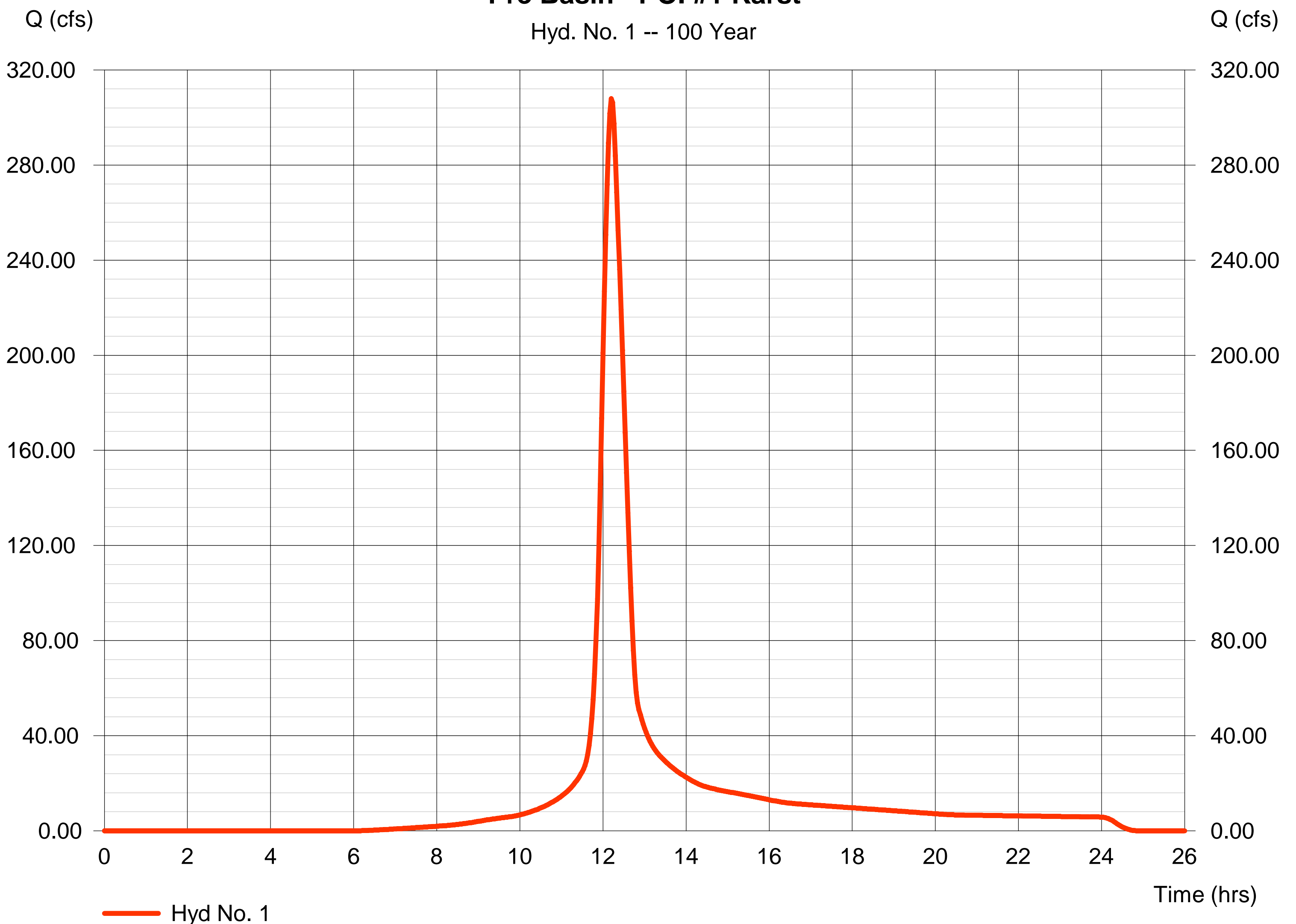
Pre Basin - POI #1 Karst

Hydrograph type	= SCS Runoff	Peak discharge	= 307.90 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.20 hrs
Time interval	= 2 min	Hyd. volume	= 1,332,448 cuft
Drainage area	= 75.200 ac	Curve number	= 78*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 32.40 min
Total precip.	= 7.38 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(14.800 x 98) + (15.900 x 84) + (1.000 x 79) + (43.500 x 69)] / 75.200

Pre Basin - POI #1 Karst

Hyd. No. 1 -- 100 Year



Hydrograph Report

Hyd. No. 3

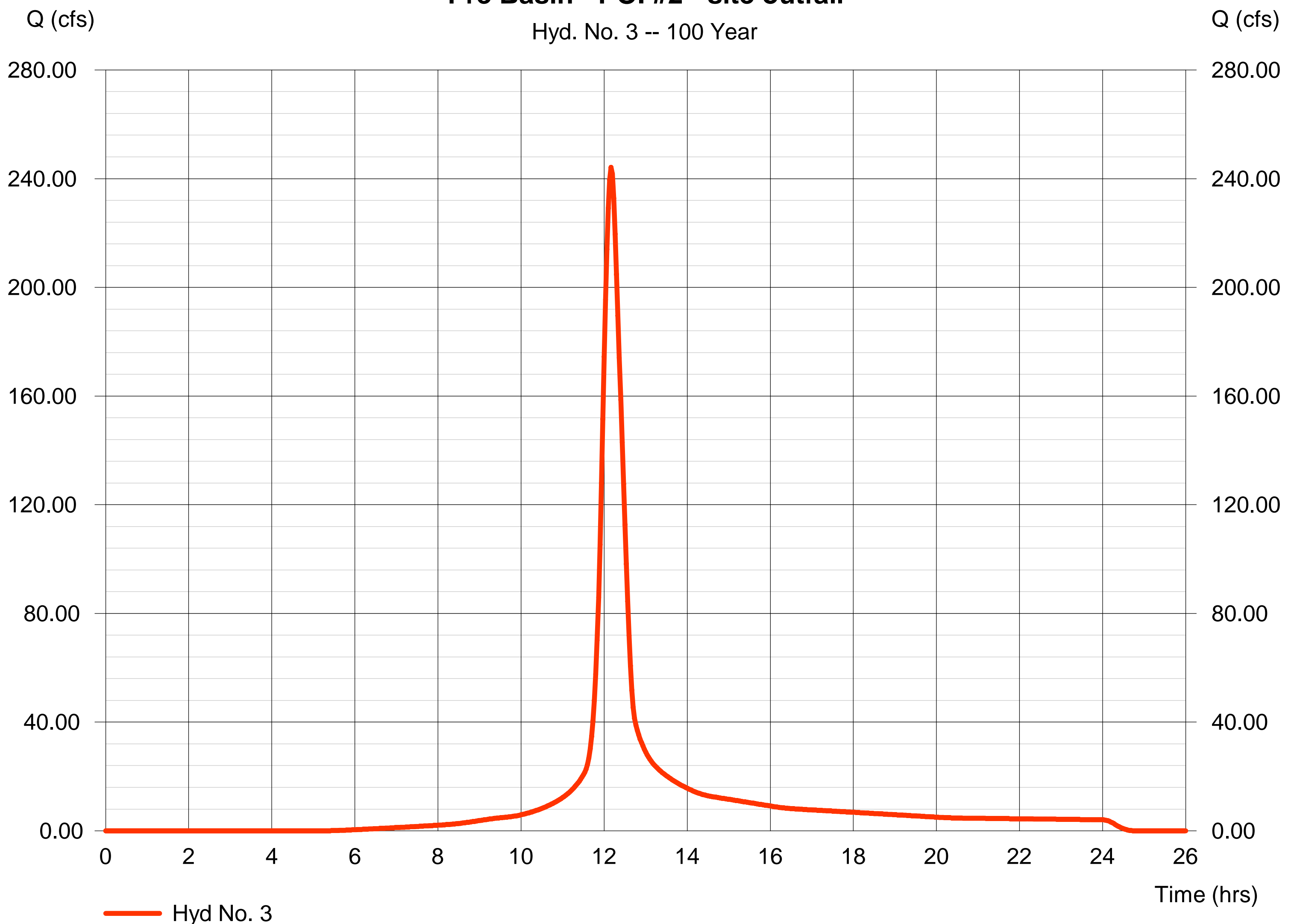
Pre Basin - POI #2 - site outfall

Hydrograph type	= SCS Runoff	Peak discharge	= 244.18 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.17 hrs
Time interval	= 2 min	Hyd. volume	= 983,290 cuft
Drainage area	= 52.500 ac	Curve number	= 81*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 28.50 min
Total precip.	= 7.38 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(14.000 x 98) + (21.600 x 69) + (1.000 x 79) + (15.900 x 84)] / 52.500

Pre Basin - POI #2 - site outfall

Hyd. No. 3 -- 100 Year



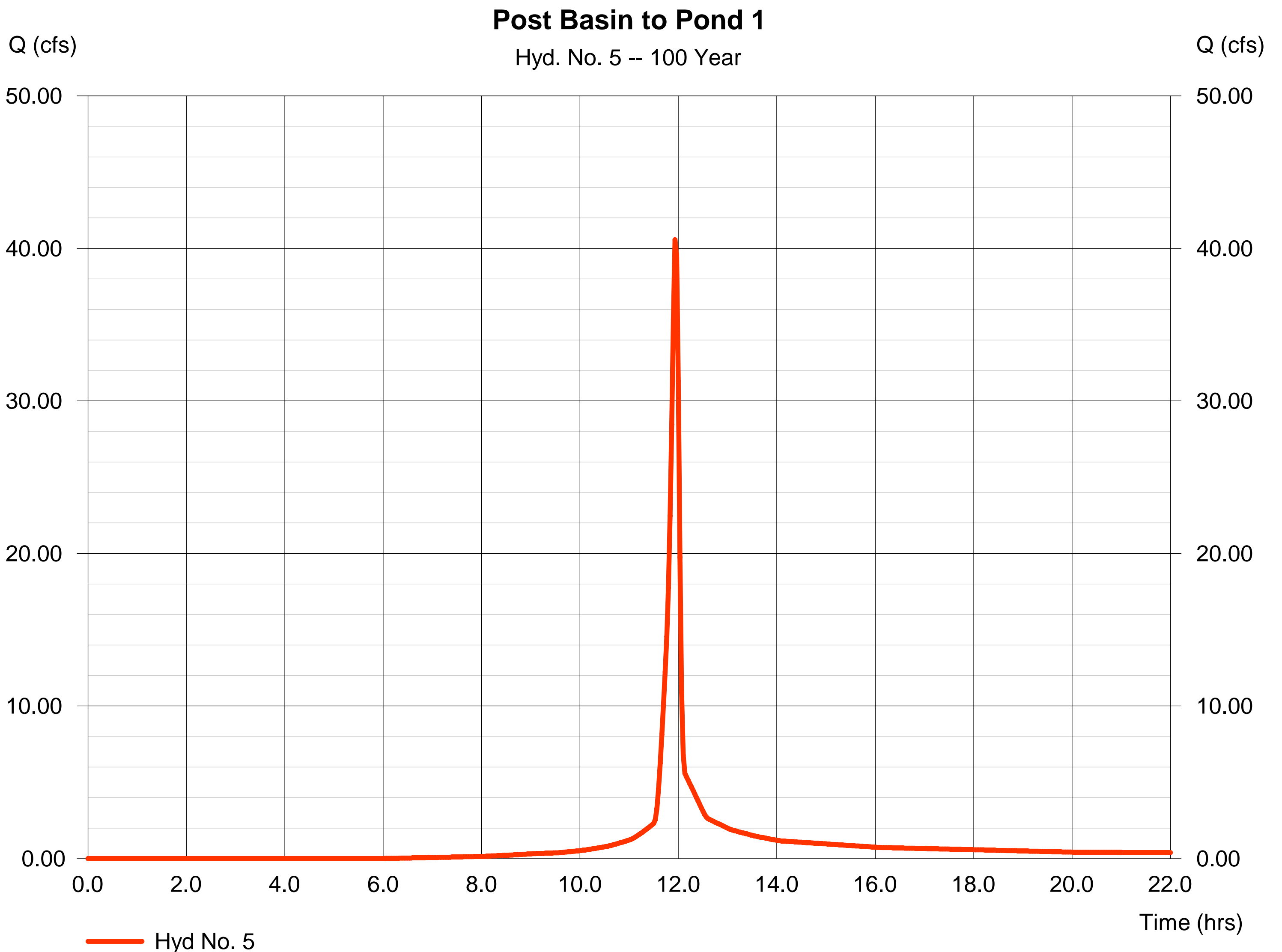
Hydrograph Report

Hyd. No. 5

Post Basin to Pond 1

Hydrograph type	= SCS Runoff	Peak discharge	= 40.56 cfs
Storm frequency	= 100 yrs	Time to peak	= 11.93 hrs
Time interval	= 2 min	Hyd. volume	= 83,672 cuft
Drainage area	= 5.100 ac	Curve number	= 78*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 7.38 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(1.600 x 98) + (3.500 x 69)] / 5.100



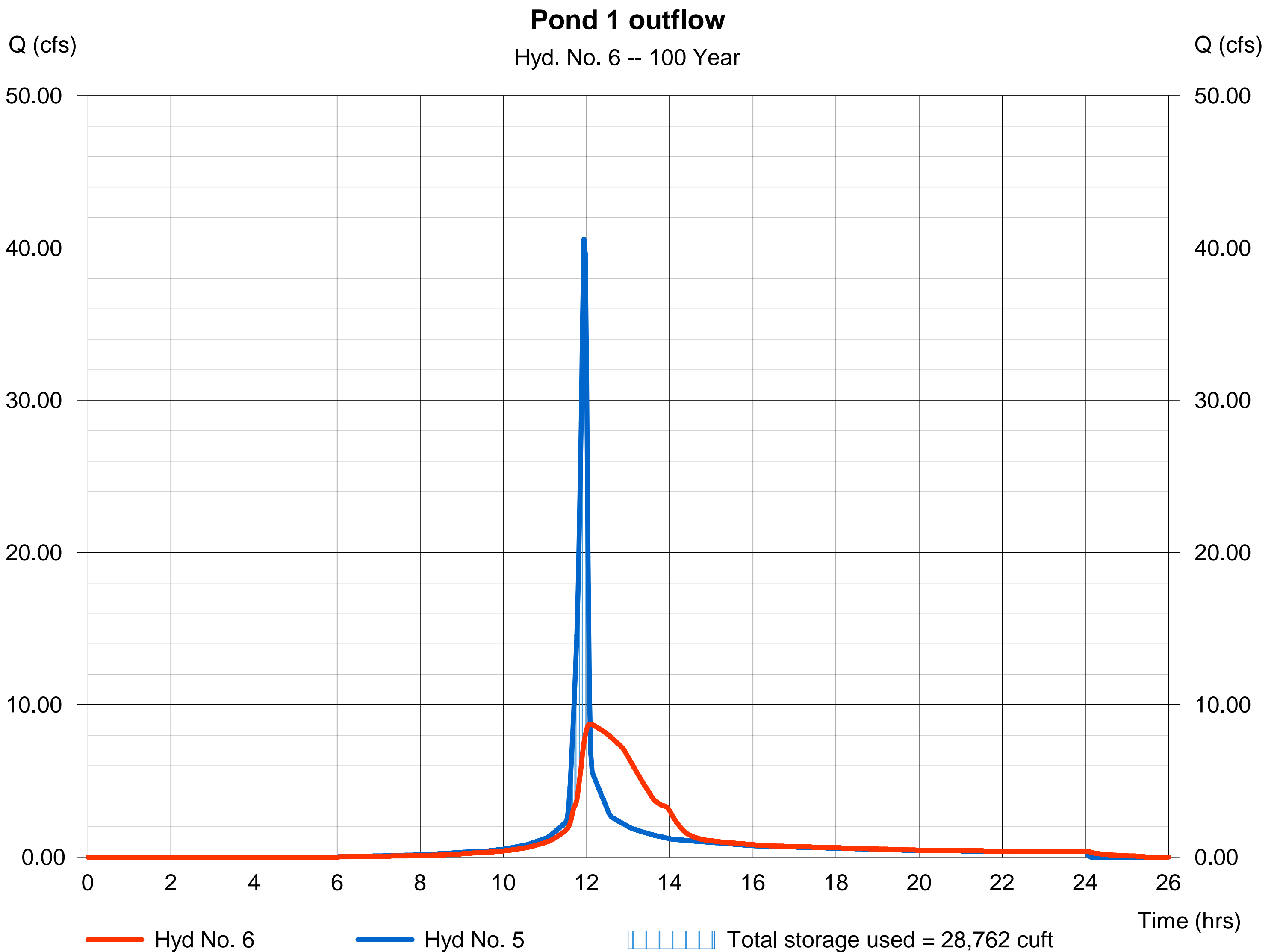
Hydrograph Report

Hyd. No. 6

Pond 1 outflow

Hydrograph type	= Reservoir	Peak discharge	= 8.734 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.10 hrs
Time interval	= 2 min	Hyd. volume	= 83,671 cuft
Inflow hyd. No.	= 5 - Post Basin to Pond 1	Max. Elevation	= 945.71 ft
Reservoir name	= Pond 1	Max. Storage	= 28,762 cuft

Storage Indication method used.



Hydrograph Report

Hyd. No. 8

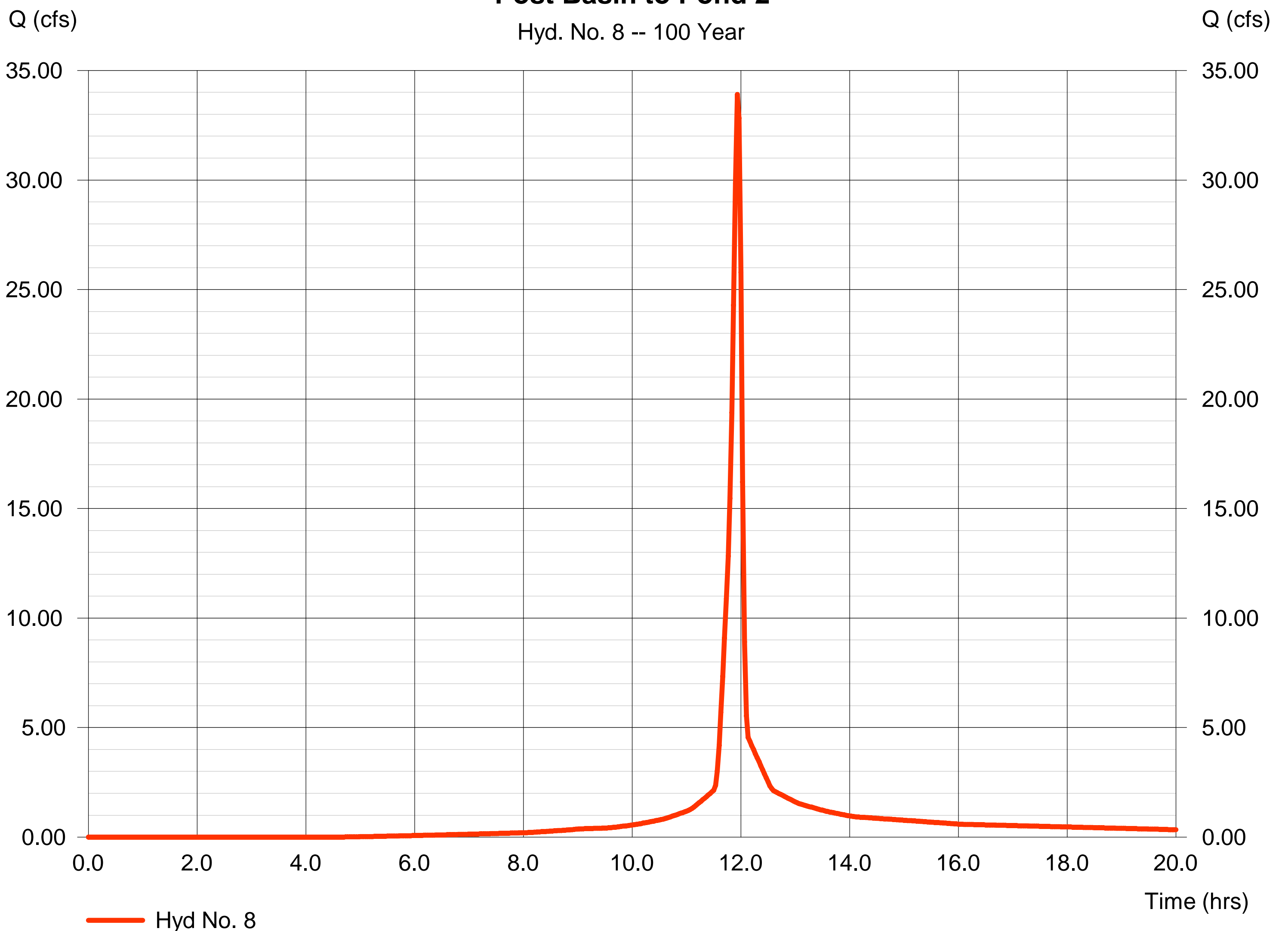
Post Basin to Pond 2

Hydrograph type	= SCS Runoff	Peak discharge	= 33.90 cfs
Storm frequency	= 100 yrs	Time to peak	= 11.93 hrs
Time interval	= 2 min	Hyd. volume	= 71,502 cuft
Drainage area	= 3.900 ac	Curve number	= 83*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 7.38 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(1.900 x 98) + (2.000 x 69)] / 3.900

Post Basin to Pond 2

Hyd. No. 8 -- 100 Year



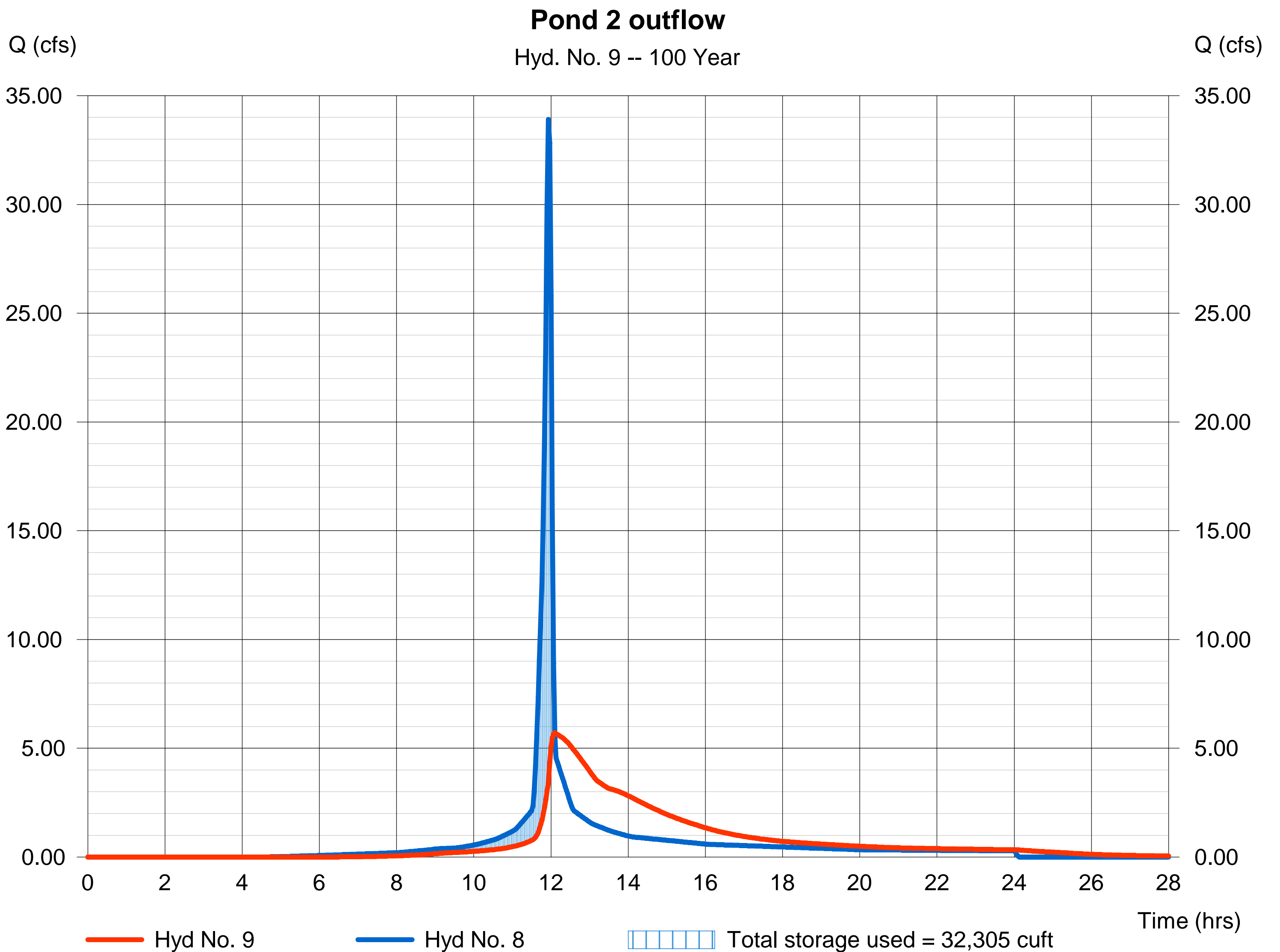
Hydrograph Report

Hyd. No. 9

Pond 2 outflow

Hydrograph type	= Reservoir	Peak discharge	= 5.726 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.10 hrs
Time interval	= 2 min	Hyd. volume	= 71,411 cuft
Inflow hyd. No.	= 8 - Post Basin to Pond 2	Max. Elevation	= 944.50 ft
Reservoir name	= Pond 2	Max. Storage	= 32,305 cuft

Storage Indication method used.



Hydrograph Report

Hyd. No. 11

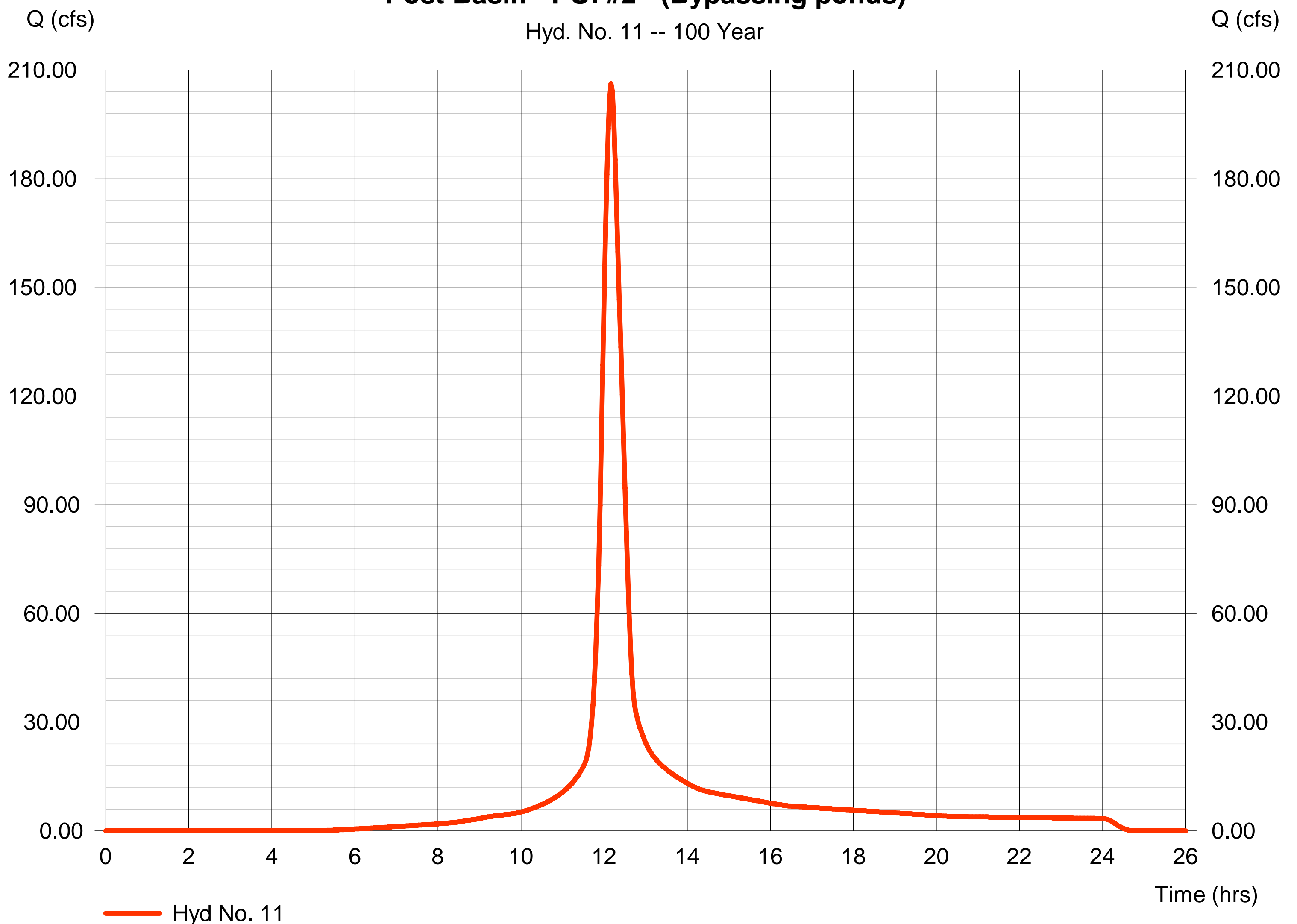
Post Basin - POI #2 - (Bypassing ponds)

Hydrograph type	= SCS Runoff	Peak discharge	= 206.25 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.17 hrs
Time interval	= 2 min	Hyd. volume	= 832,676 cuft
Drainage area	= 43.500 ac	Curve number	= 82*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 28.50 min
Total precip.	= 7.38 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(10.500 x 98) + (16.100 x 69) + (1.000 x 79) + (15.900 x 84)] / 43.500

Post Basin - POI #2 - (Bypassing ponds)

Hyd. No. 11 -- 100 Year



Hydrograph Report

Hyd. No. 12

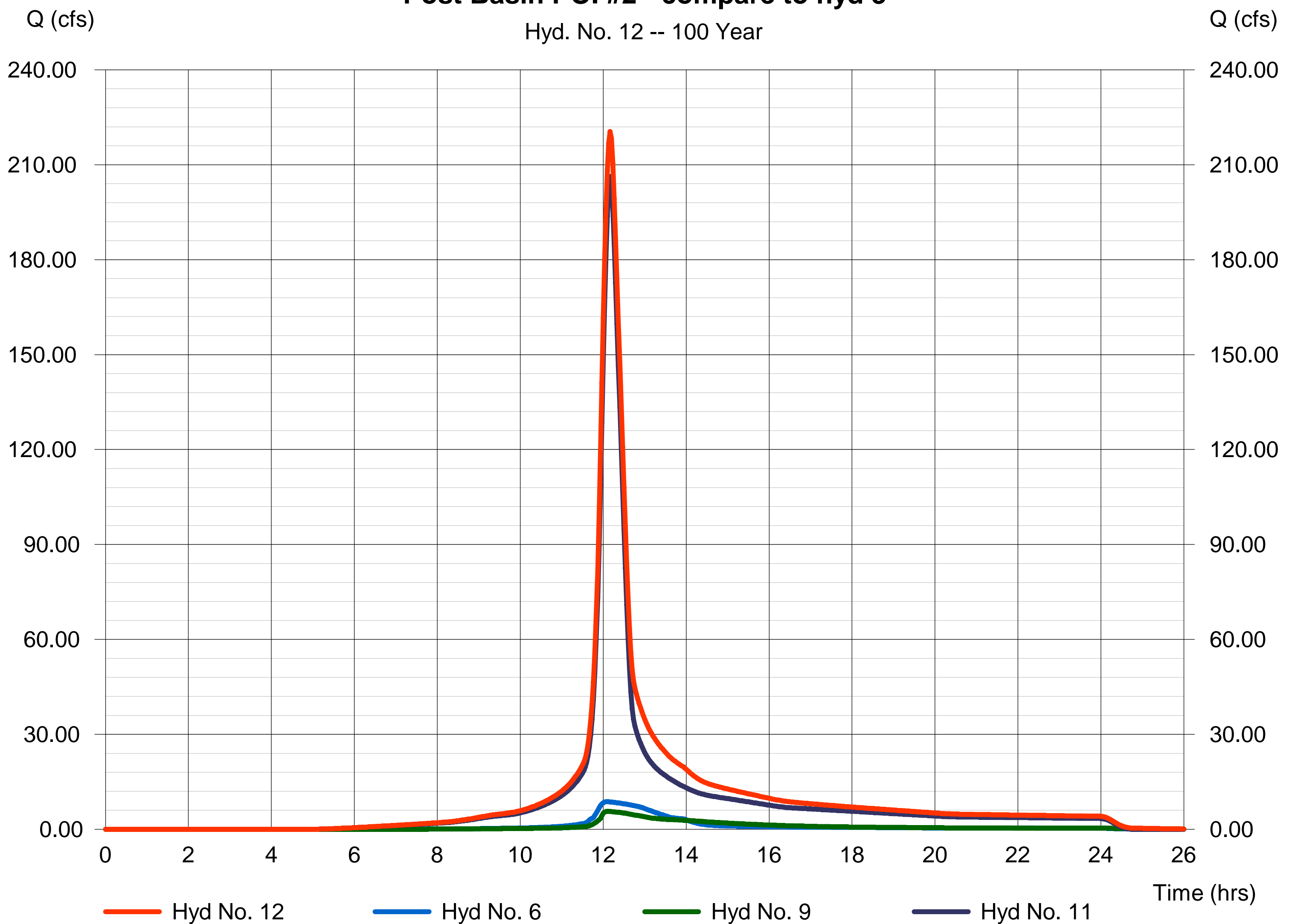
Post Basin POI #2 - compare to hyd 3

Hydrograph type = Combine
Storm frequency = 100 yrs
Time interval = 2 min
Inflow hyds. = 6, 9, 11

Peak discharge = 220.55 cfs
Time to peak = 12.17 hrs
Hyd. volume = 987,759 cuft
Contrib. drain. area = 43.500 ac

Post Basin POI #2 - compare to hyd 3

Hyd. No. 12 -- 100 Year



Hydrograph Report

Hyd. No. 14

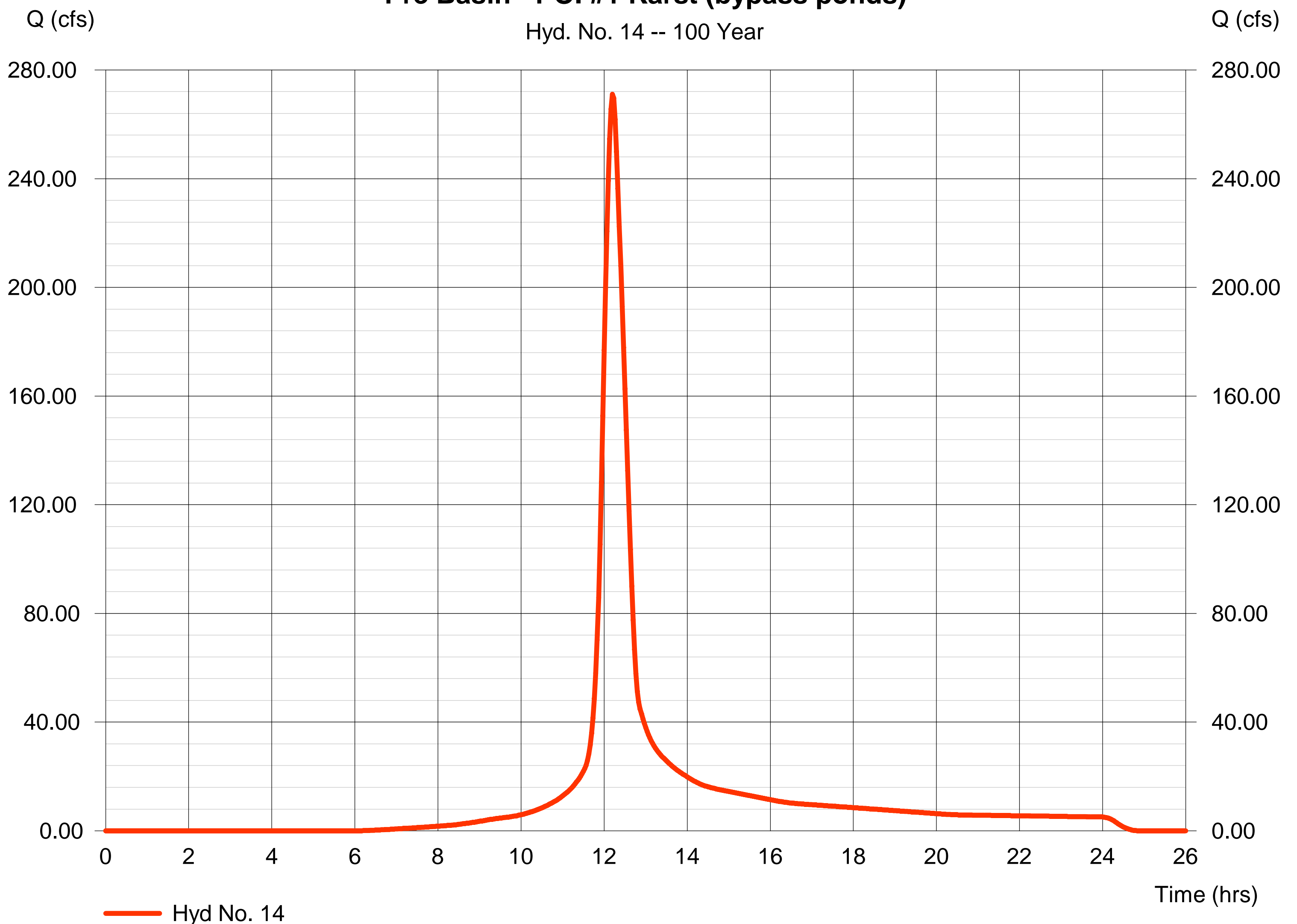
Pre Basin - POI #1 Karst (bypass ponds)

Hydrograph type	= SCS Runoff	Peak discharge	= 271.05 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.20 hrs
Time interval	= 2 min	Hyd. volume	= 1,172,979 cuft
Drainage area	= 66.200 ac	Curve number	= 78*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 32.40 min
Total precip.	= 7.38 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(11.300 x 98) + (15.900 x 84) + (1.000 x 79) + (38.000 x 69)] / 66.200

Pre Basin - POI #1 Karst (bypass ponds)

Hyd. No. 14 -- 100 Year



Hydrograph Report

Hyd. No. 15

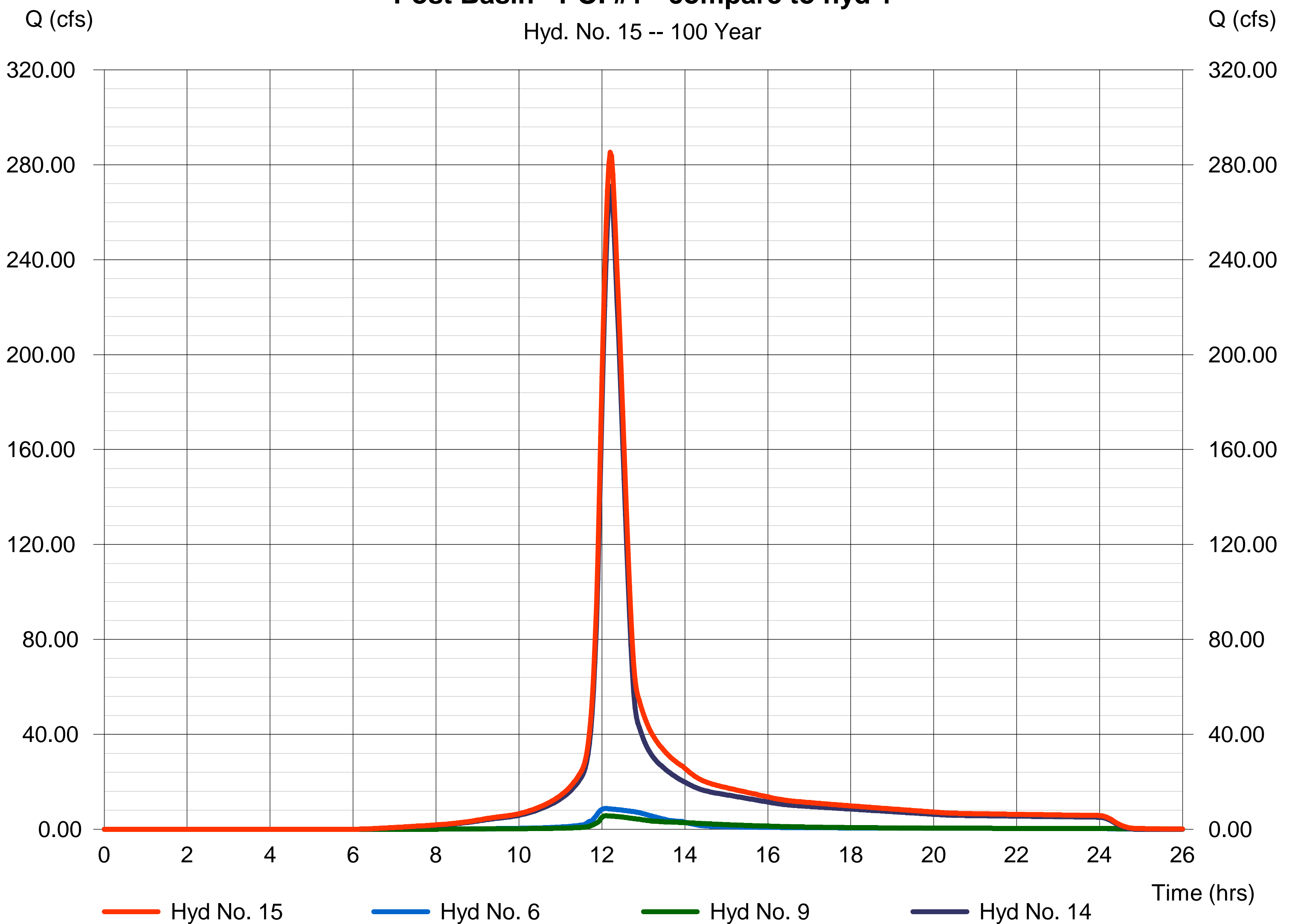
Post Basin - POI #1 - compare to hyd 1

Hydrograph type = Combine
Storm frequency = 100 yrs
Time interval = 2 min
Inflow hyds. = 6, 9, 14

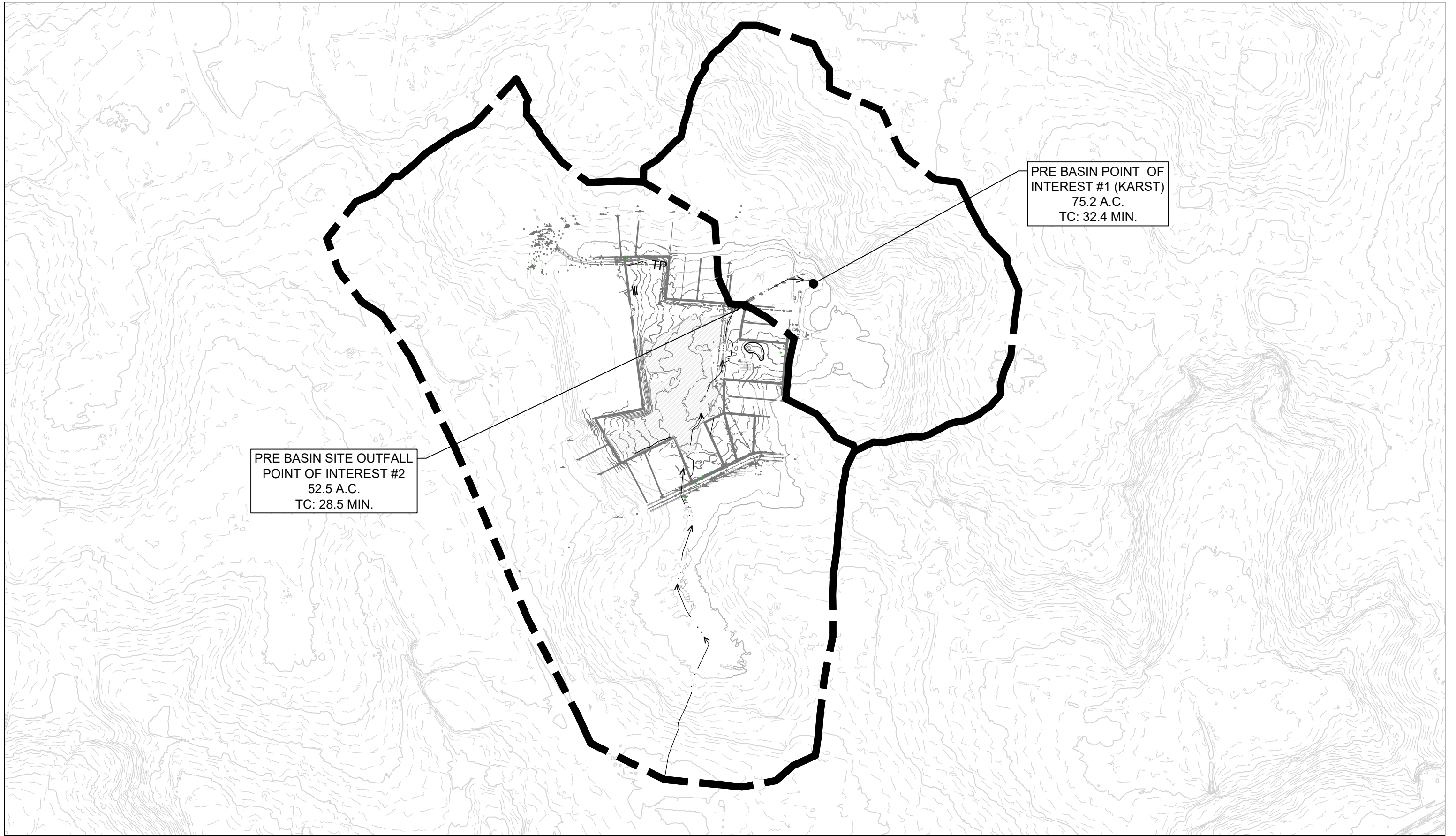
Peak discharge = 285.26 cfs
Time to peak = 12.20 hrs
Hyd. volume = 1,328,059 cuft
Contrib. drain. area = 66.200 ac

Post Basin - POI #1 - compare to hyd 1

Hyd. No. 15 -- 100 Year

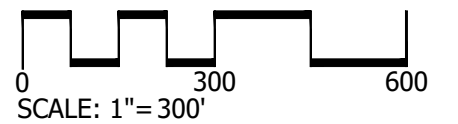
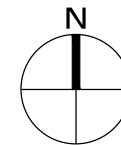


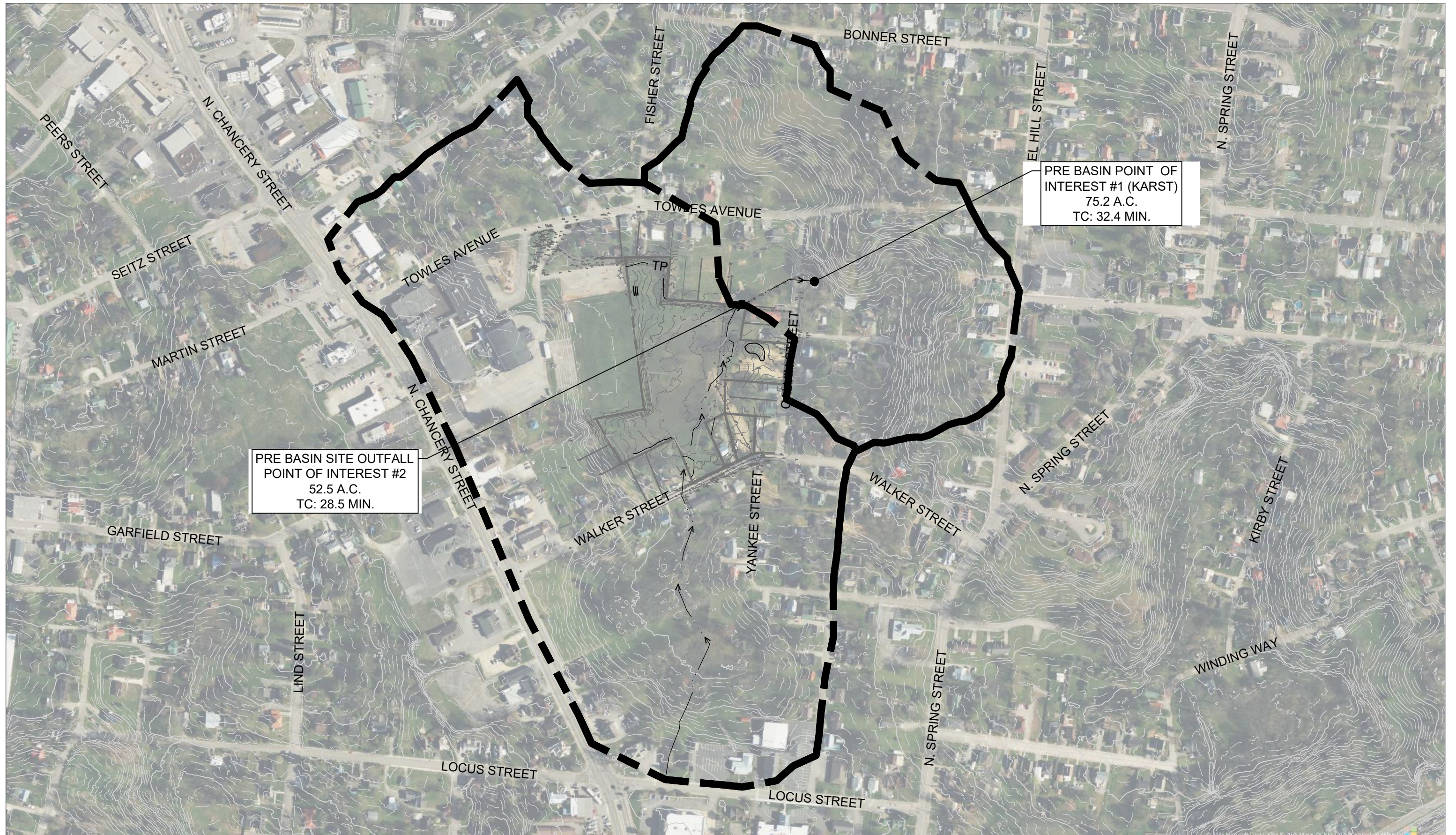
DRAINAGE MAPS



PRE BASIN SITE OUTFALL
POINT OF INTEREST #2
52.5 A.C.
TC: 28.5 MIN.

PRE BASIN POINT OF
INTEREST #1 (KARST)
75.2 A.C.
TC: 32.4 MIN.





PRE BASIN SITE OUTFALL
POINT OF INTEREST #2
52.5 A.C.
TC: 28.5 MIN.

PRE BASIN POINT OF
INTEREST #1 (KARST)
75.2 A.C.
TC: 32.4 MIN.

