COSTCO PRELIMINARY STORMWATER DETENTION REPORT

LEE'S SUMMIT, MO

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CEC Project 353-308

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1.0 INTRODUCTION AND METHODOLOGY

1.1 INTRODUCTION

Costco Wholesale is proposing to develop approximately 23.9-acres located at the southeast corner of Highway 50 and State Route 291 in Lee's Summit, Missouri. This 23.9-acres site is also part of the larger development of OLDHAM EAST is known as a tract of land being part of Section 8, Township 47 North, Range 31 West.

This existing site is vacant with minimal large vegetation and the existing topography is generally sloped from the Highway 50 to the South with discharges located near the SW and SE corners of the lot.

The development of this site will require satisfaction of Lee's Summit Stormwater Detention and Water Quality Volume (WQv) Best Management Practices (BMPs) requirements.

The development of this site will include an approx. 155,410 sq. ft. warehouse and 24 pump fueling station. Along with this building, there are 895 parking stalls including 17 ADA compliant parking stalls, a storm water management basin including 2 – Dry Detention Basins and a Wet Detention Basin. Water Quality will be handled with he 40 Hour Detention as defined in APWA Section 5600

1.2 METHODOLOGY

The storm water analysis and corresponding design contained within this report was performed in accordance with the current APWA Division V, Section 5600 Stormwater Drainage Systems & Facilities.

The site storm water runoff values were calculated using the SCS method with a Type II Distribution from the USDA TR-55 for the 2yr, 10yr, and 100yr-24hr storm events with AutoCAD Civil 3D Hydraflow Hydrographs extension, 2025. The Allowable release rates for each storm event was based on the rates provided by Lee's Summit (0.5 CFS/Ac for the 2yr, 2.0 CFS/Ac for the 10yr and 3.0 CFS/Ac for the 100yr). The 100yr-24hr storm event was calculated to verify maximum basin ponding in the 100yr-24hr scenario.

The proposed development has been designed to satisfy WQv requirements via the inclusion of a 40 hour detention in all three basins. This BMP and basin have been sized for the total area proposed to be tributary to them including offsite areas.

In this proposed development, the overall drainage patterns are directed to the North, West and East existing outfall locations, and are shown to be a decrease due to the detained flows leaving the detention basin.

2.0 DESIGN ASSUMPTIONS

1. The total site area is 23.9 acres and is located within Lee's Summit MO.

2. The total disturbed area is 23.9 acres.

3. All grading, improvements, and utilities included hereon shall be constructed per plan, prior to the commencement of the construction of this basin and bmp.

4. Based on the Natural Resources Conservation Service, the site is considered to have a hydrologic soil group "C" due to existing altered soils.

5. The proposed soil type has been selected as "D" as the proposed site will have been developed.

6. The starting hydraulic grade line (HGL) was assumed to be at the normal elevation of the proposed discharge pipe at the downstream daylight location.

7. Offsite runoff systems currently in place and employed by the existing condition will continue to accept flow from the site.

Note: Additional Calculation Assumptions Have Been Noted Throughout Report

3.0 CONCLUSIONS

The results from this report demonstrate the following:

1. This development must include WQv and Stormwater Detention.

2. The proposed development does not change and/or increase the overland flow offsite.

3. There are very few offsite flows tributary to the site and the small areas that are passing through the basin are not considered detained.

4. The detained peak differential storm water runoff as compared to the allowable discharge is a decrease in the 2yr-24hr 10yr-24hr and 100yr-24hr frequencies.

5. The proposed development provides 1 foot of freeboard within the proposed basin for the 100yr-24hr low flow blocked scenario.

6.

DETAINED STORM WATER RUNOFF SUMMARY OF VALUES NORTH			
	EXISTING (CFS)	PROPOSED (CFS)	BASIN PONDING
2YR PEAK	**3.10**	**2.10**	
10YR PEAK	**5.67**	**3.15**	
100YR PEAK	**10.55**	**4.96**	

DETAINED STORM WATER RUNOFF SUMMARY OF VALUES WEST			
	ALLOWABLE (CFS)	PROPOSED (CFS)	BASIN PONDING NW / SW
2YR PEAK	**7.88**	**11.80***	**1044.66/1040.99**
10YR PEAK	**31.52**	**17.42***	**1045.54/1042.68**
100YR PEAK	**47.28**	**33.72***	**1046.16/1044.25**
*This project IS required to provide detention and values shown above are detained			

DETAINED STORM WATER RUNOFF SUMMARY OF VALUES EAST			
	ALLOWABLE (CFS)	PROPOSED (CFS)	BASIN PONDING
2YR PEAK	**9.20**	**3.37***	**1042.61**
100YR PEAK	**36.80**	**4.96***	**1043.83**
100YR PEAK LFB	**55.20**	**44.44***	**1044.59**
*This project IS required to provide detention and values shown above are detained			

4.0 DESIGN ASSUMPTIONS

1. Web Soil Survey (http://websoilsurvey.nrcs.usda.gov); National Cooperative Soil Survey; USDA Natural Resources Conservation Service (NRCS).

2. AutoCAD Hydraflow® Hydrographs Extension, 2025.

APPENDIX A

United States Department of Agriculture

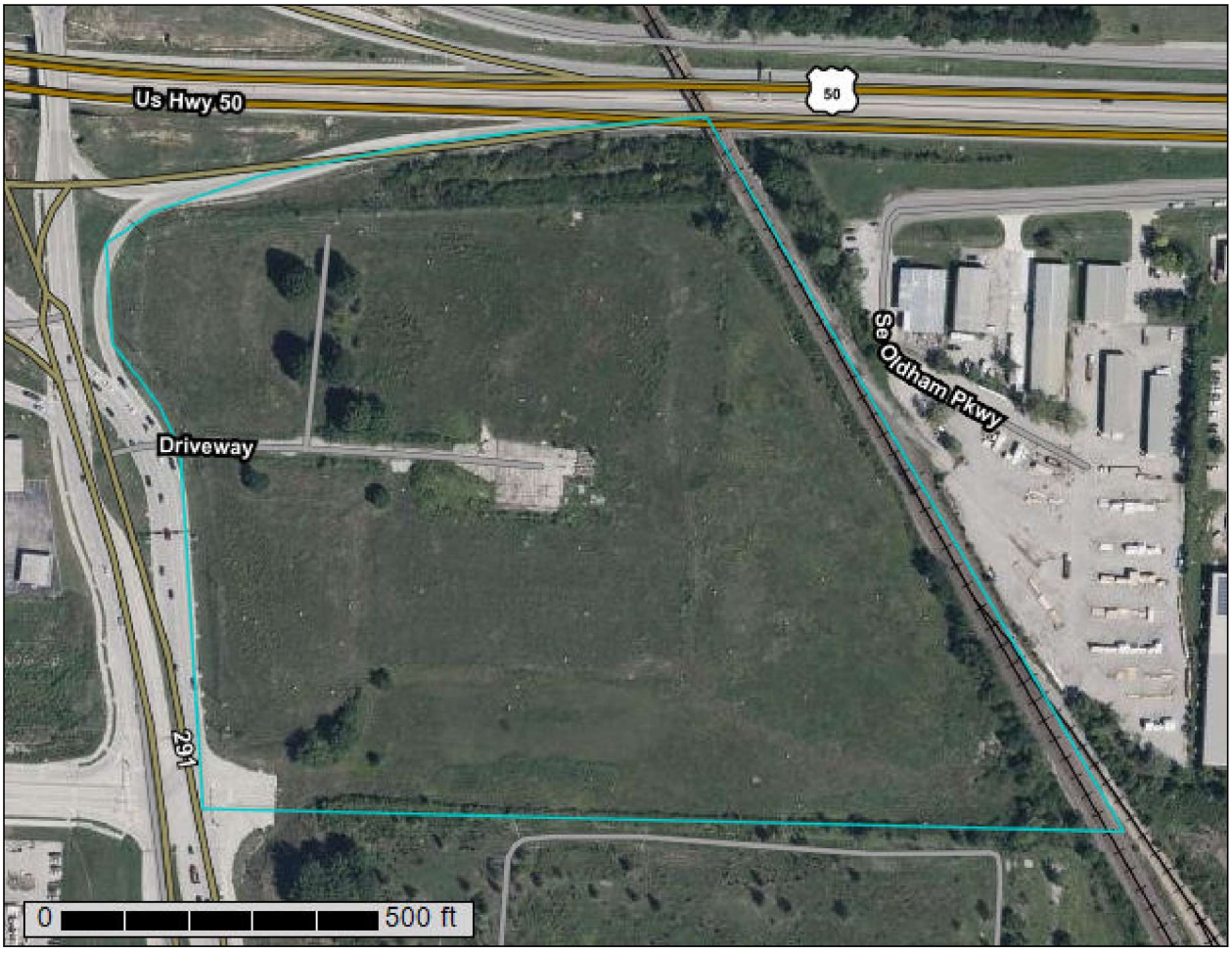
NRCS

Natural Resources Conservation Service

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

Custom Soil Resource Report for Jackson County, Missouri

Costco - Lees Summit



August 13, 2025

Preface

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

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

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

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

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

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

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Contents

How Soil Surveys Are Made

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

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

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

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

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

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

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

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

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

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

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

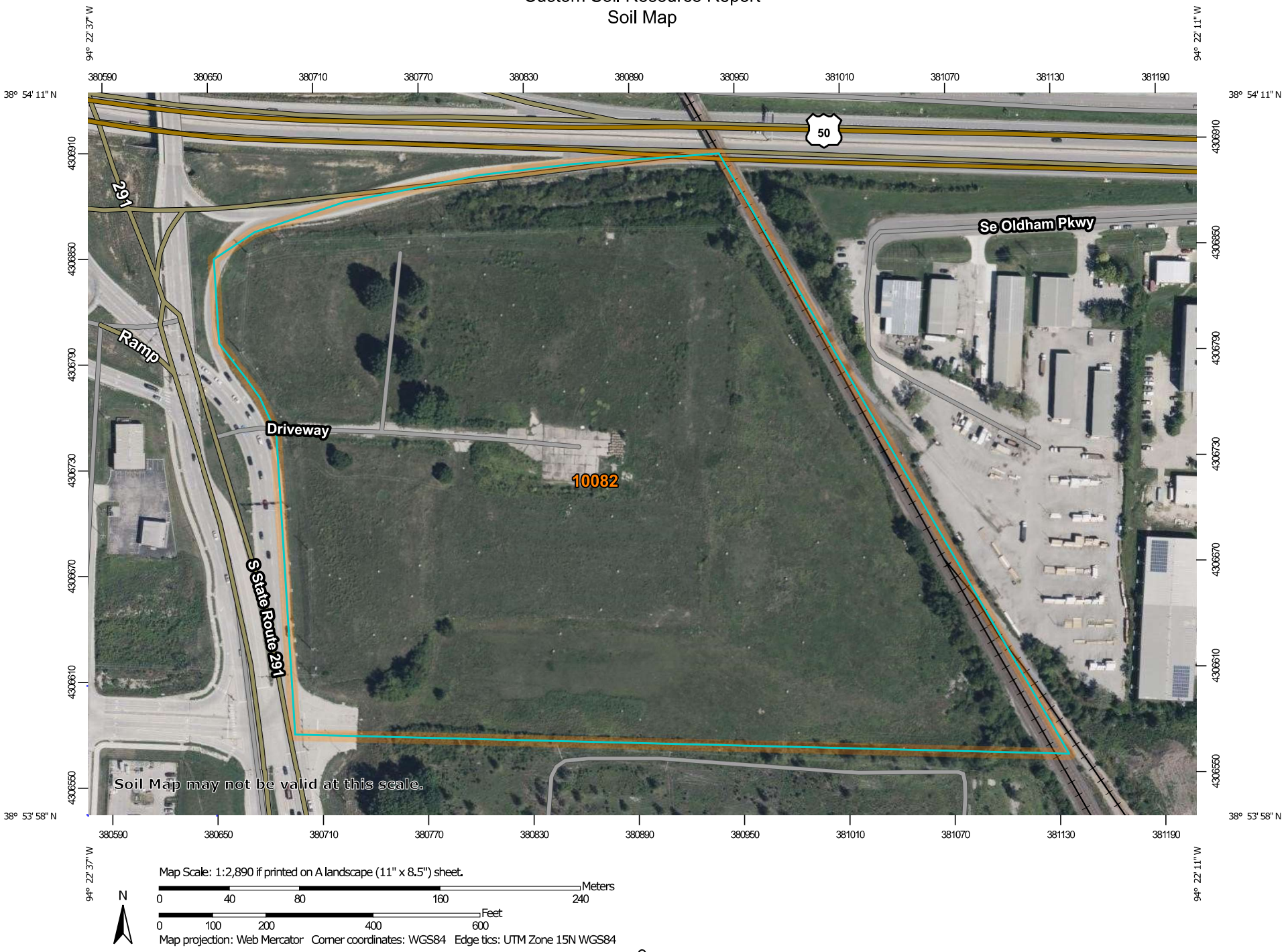
After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

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

Soil Map

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

Custom Soil Resource Report
Soil Map



Map Scale: 1:2,890 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 40 80 160 240

Feet: 0 100 200 400 600

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 15N WGS84

MAP LEGEND

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

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

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

Water Features
- Streams and Canals

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

Background
- Aerial Photography

MAP INFORMATION

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

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

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

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

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

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

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

Soil Survey Area: Jackson County, Missouri
Survey Area Data: Version 27, Aug 27, 2024

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

Date(s) aerial images were photographed: Aug 30, 2022—Sep 8, 2022

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

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
10082	Arisburg-Urban land complex, 1 to 5 percent slopes	28.7	100.0%
Totals for Area of Interest		**28.7**	**100.0%**

Map Unit Descriptions

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

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

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

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

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

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

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

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

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

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

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

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

Jackson County, Missouri

10082—Arisburg-Urban land complex, 1 to 5 percent slopes

Map Unit Setting

National map unit symbol: 2w7ld
Elevation: 750 to 1,130 feet
Mean annual precipitation: 39 to 45 inches
Mean annual air temperature: 50 to 55 degrees F
Frost-free period: 177 to 220 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Arisburg and similar soils: 61 percent
Urban land: 30 percent
Minor components: 9 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Arisburg

Setting

Landform: Interfluves
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loess

Typical profile

Ap - 0 to 6 inches: silt loam
A - 6 to 13 inches: silt loam
Bt - 13 to 19 inches: silty clay loam
Btg - 19 to 56 inches: silty clay loam
BCg - 56 to 79 inches: silty clay loam

Properties and qualities

Slope: 1 to 5 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: About 18 to 30 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 11.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C
Ecological site: R107XB007MO - Loess Upland Prairie
Hydric soil rating: No

Description of Urban Land

Interpretive groups

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

Minor Components

Sharpsburg

Percent of map unit: 3 percent
Landform: Ridges
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R109XY002MO - Loess Upland Prairie
Hydric soil rating: No

Sampsel

Percent of map unit: 3 percent
Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Concave
Ecological site: R109XY010MO - Interbedded Sedimentary Upland Savanna
Hydric soil rating: Yes

Greenton

Percent of map unit: 3 percent
Landform: Hillslopes
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Ecological site: R109XY002MO - Loess Upland Prairie
Hydric soil rating: No

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APPENDIX B

LEES SUMMIT - COSTCO

353-308

	NORTH			WEST			EAST	
Pre Developed Drainage Area	1.40	acres		15.76	acres		18.40	acres
Hydrological Group	C			C			C	
CN	74			74			74	
pre developed runoff 2 year	3.10	cfs		28.95	cfs		28.84	cfs
pre developed runoff 10 year	5.67	cfs		53.68	cfs		53.82	cfs
pre developed runoff 100 yr	10.55	cfs		100.49	cfs		101.31	cfs
Post Developed Drainage area	0.45	acres		9.88	Acres		14.61	Acres
Post Developed CN	90			90			90	
post developed runoff 2 year	2.10	cfs		37.17	cfs		57.26	cfs
post developed runoff 10 year	3.15	cfs		55.86	cfs		86.03	cfs
post developed runoff 100 yr	4.96	cfs		88.09	cfs		128.75	cfs
allowable runoff 2 year (0.5 cfs per Acre)				**7.88**	**cfs**		**9.20**	**cfs**
allowable runoff 10 year (2.0 cfs per Acre)				**31.52**	**cfs**		**36.80**	**cfs**
allowable runoff 100 year (3.0 cfs per Acre)				**47.28**	**cfs**		**55.20**	**cfs**
post developed runoff w/ det 2 year				**11.80**	**cfs**		**3.37**	**cfs**
post developed runoff w/ det 10 year				**17.42**	**cfs**		**4.96**	**cfs**
post developed runoff w/ det 100 yr				**33.72**	**cfs**		**44.44**	**cfs**

	NW BASIN			SW BASIN			SE BASIN	
detained runoff 2 year	**0.45**	**cfs**		**0.53**	**cfs**		**0.66**	**cfs**
2year high water	**1044.66**	**ft**		**1040.99**	**ft**		**1042.61**	**ft**
detained runoff 10 year	**1.09**	**cfs**		**0.61**	**cfs**		**2.29**	**cfs**
10 year high water	**1045.54**	**ft**		**1042.68**	**ft**		**1043.83**	**ft**
detained runoff 100 year	**14.84**	**cfs**		**4.08**	**cfs**		**42.13**	**cfs**
100 year high water	**1046.16**	**ft**		**1044.25**	**ft**		**1044.59**	**ft**
topof dam	1047.00	ft		1045.25	ft		1046.00	ft
freeboard	0.84	ft		1.00	ft		1.41	ft

NORTHWEST		
0	1041	0
1	1042	1,685
3	1044	8,650
5	1046	13,280
6	1047	14,780

SOUTHWEST		
0	1036	0
2	1038	3,705
4	1040	5,380
6	1042	7,330
8	1044	9,550
9	1045	10,660

SOUTHEAST		
0	1039.35	25,170
0.5	1039.85	29,370
0.65	1040	29,750
2.65	1042	35,035
4.65	1044	40,545
6.65	1046	46,280

OUTFALL STRUCTURE NW BASIN	
LOW FLOW ORIFICE	
DIA.	3" DIA
ELEVATION	1040.75
WEIR	
LENGTH	8
ELEVATION	1045.5
OVERFLOW WEIR	
LENGTH	50
ELEVATION	1046.25

OUTFALL STRUCTURE SW BASIN	
LOW FLOW ORIFICE	
DIA.	3" DIA
ELEVATION	1033.76
WEIR	
LENGTH	8
ELEVATION	1044
OVERFLOW WEIR	
LENGTH	50
ELEVATION	1044.25

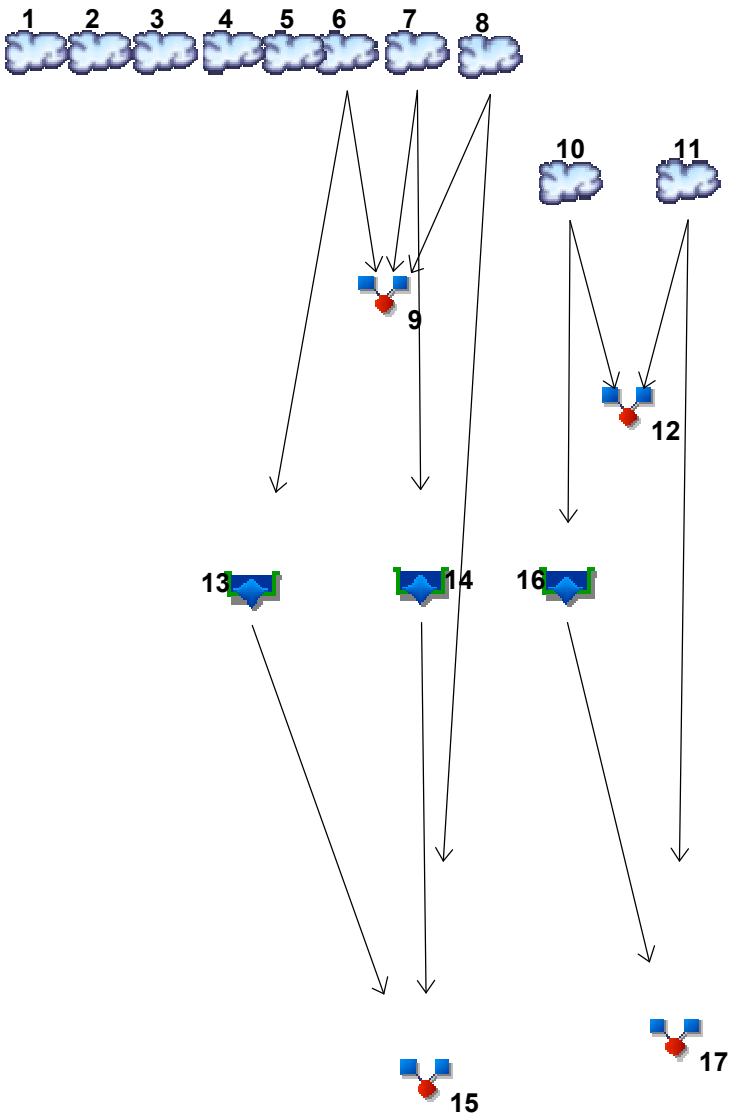
OUTFALL STRUCTURE SE BASIN	
LOW FLOW ORIFICE	
DIA.	3.8" DIA
ELEVATION	1039.25
WEIR	
LENGTH	16
ELEVATION	1043.75
OVERFLOW WEIR	
LENGTH	100
ELEVATION	1044.75

Hydraflow Table of Contents

353308 - East Village.gpw

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024 Thursday, 09 / 18 / 2025

Watershed Model Schematic



Legend

Hyd.	Origin	Description
1	SCS Runoff	EX NORTH
2	SCS Runoff	EX WEST
3	SCS Runoff	EX EAST
4	SCS Runoff	EX SOUTH
5	SCS Runoff	PROP NORTH
6	SCS Runoff	DETAINED NORTHWEST
7	SCS Runoff	DETAINED SOUTHWEST
8	SCS Runoff	WEST
9	Combine	POI WEST
10	SCS Runoff	DETAINED EAST
11	SCS Runoff	EAST
12	Combine	POI EAST
13	Reservoir	ROUTED DET NORTHWEST
14	Reservoir	ROUTED DET SOUTHWEST
15	Combine	POI WEST ATTENUATED
16	Reservoir	ROUTED DET SOUTH EAST
17	Combine	POI EAST ATTENUATED

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	------	-------	3.101	-------	-------	5.673	-------	-------	10.55	EX NORTH
2	SCS Runoff	------	-------	28.95	-------	-------	53.68	-------	-------	100.49	EX WEST
3	SCS Runoff	------	-------	28.84	-------	-------	53.82	-------	-------	101.31	EX EAST
4	SCS Runoff	------	-------	120.39	-------	-------	219.62	-------	-------	406.40	EX SOUTH
5	SCS Runoff	------	-------	2.104	-------	-------	3.153	-------	-------	4.959	PROP NORTH
6	SCS Runoff	------	-------	12.35	-------	-------	18.57	-------	-------	29.28	DETAINED NORTHWEST
7	SCS Runoff	------	-------	14.22	-------	-------	21.34	-------	-------	33.60	DETAINED SOUTHWEST
8	SCS Runoff	------	-------	10.94	-------	-------	16.44	-------	-------	25.92	WEST
9	Combine	6, 7, 8	-------	37.17	-------	-------	55.86	-------	-------	88.09	POI WEST
10	SCS Runoff	------	-------	54.36	-------	-------	81.67	-------	-------	128.75	DETAINED EAST
11	SCS Runoff	------	-------	2.900	-------	-------	4.358	-------	-------	6.869	EAST
12	Combine	10, 11	-------	57.26	-------	-------	86.03	-------	-------	135.62	POI EAST
13	Reservoir	6	-------	0.452	-------	-------	1.088	-------	-------	14.84	ROUTED DET NORTHWEST
14	Reservoir	7	-------	0.528	-------	-------	0.611	-------	-------	4.075	ROUTED DET SOUTHWEST
15	Combine	8, 13, 14	-------	11.80	-------	-------	17.42	-------	-------	33.72	POI WEST ATTENUATED
16	Reservoir	10	-------	0.663	-------	-------	2.293	-------	-------	42.13	ROUTED DET SOUTH EAST
17	Combine	11, 16	-------	3.365	-------	-------	4.955	-------	-------	44.44	POI EAST ATTENUATED

Hydrograph Summary Report

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

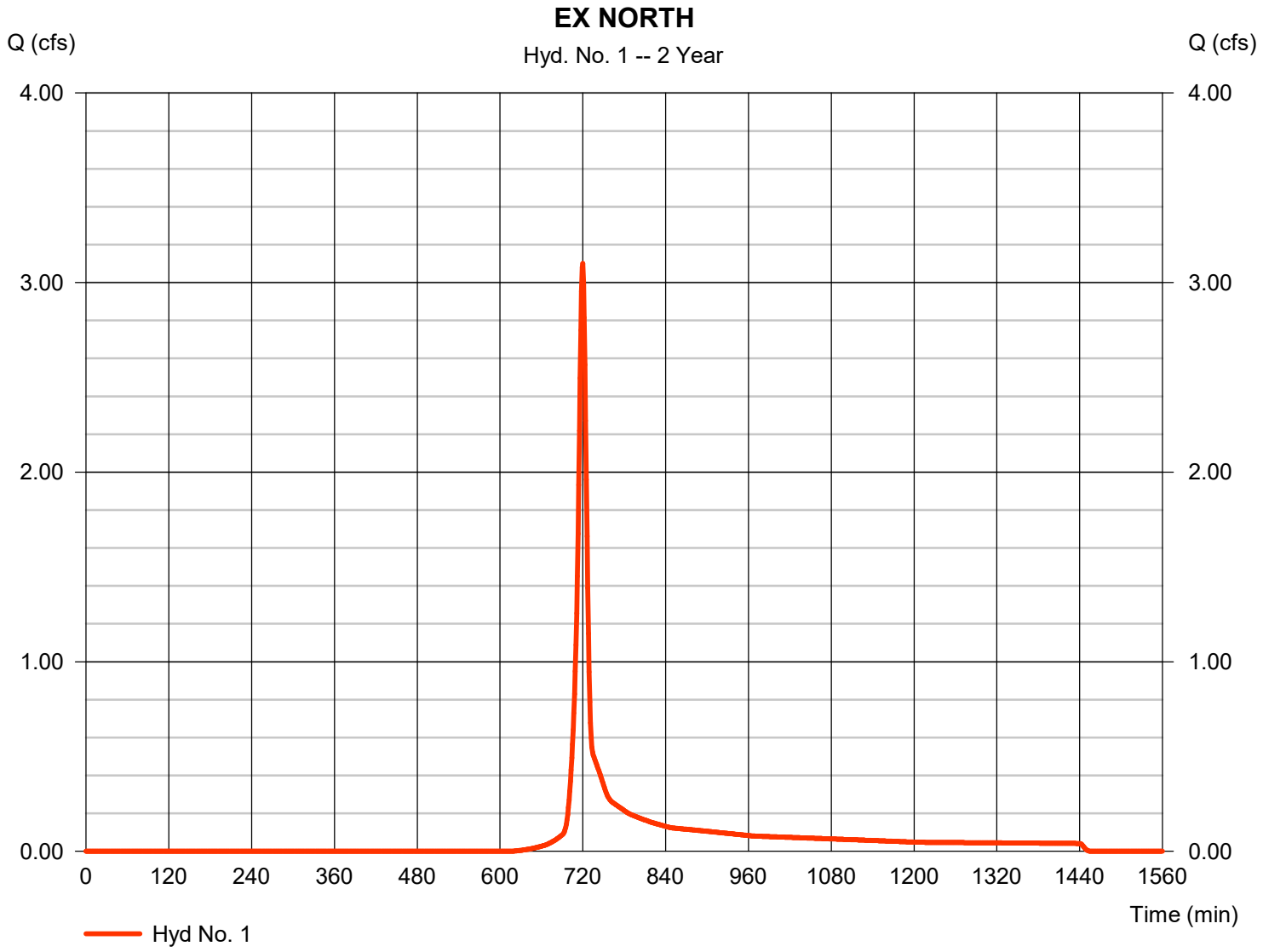
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	3.101	1	720	7,048	------	------	------	EX NORTH
2	SCS Runoff	28.95	1	723	79,344	------	------	------	EX WEST
3	SCS Runoff	28.84	1	726	92,635	------	------	------	EX EAST
4	SCS Runoff	120.39	1	739	620,286	------	------	------	EX SOUTH
5	SCS Runoff	2.104	1	717	4,456	------	------	------	PROP NORTH
6	SCS Runoff	12.35	1	721	32,136	------	------	------	DETAINED NORTHWEST
7	SCS Runoff	14.22	1	719	33,318	------	------	------	DETAINED SOUTHWEST
8	SCS Runoff	10.94	1	721	28,450	------	------	------	WEST
9	Combine	37.17	1	720	93,904	6, 7, 8	------	------	POI WEST
10	SCS Runoff	54.36	1	720	135,555	------	------	------	DETAINED EAST
11	SCS Runoff	2.900	1	720	7,232	------	------	------	EAST
12	Combine	57.26	1	720	142,787	10, 11	------	------	POI EAST
13	Reservoir	0.452	1	842	32,135	6	1044.66	18,391	ROUTED DET NORTHWEST
14	Reservoir	0.528	1	825	33,315	7	1040.99	19,065	ROUTED DET SOUTHWEST
15	Combine	11.80	1	721	93,899	8, 13, 14	------	------	POI WEST ATTENUATED
16	Reservoir	0.663	1	1199	80,203	10	1042.61	105,769	ROUTED DET SOUTH EAST
17	Combine	3.365	1	720	87,435	11, 16	------	------	POI EAST ATTENUATED

Hydrograph Report

Hyd. No. 1

EX NORTH

Hydrograph type	=	SCS Runoff	Peak discharge	=	3.101 cfs
Storm frequency	=	2 yrs	Time to peak	=	720 min
Time interval	=	1 min	Hyd. volume	=	7,048 cuft
Drainage area	=	1.400 ac	Curve number	=	74
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	8.70 min
Total precip.	=	3.71 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

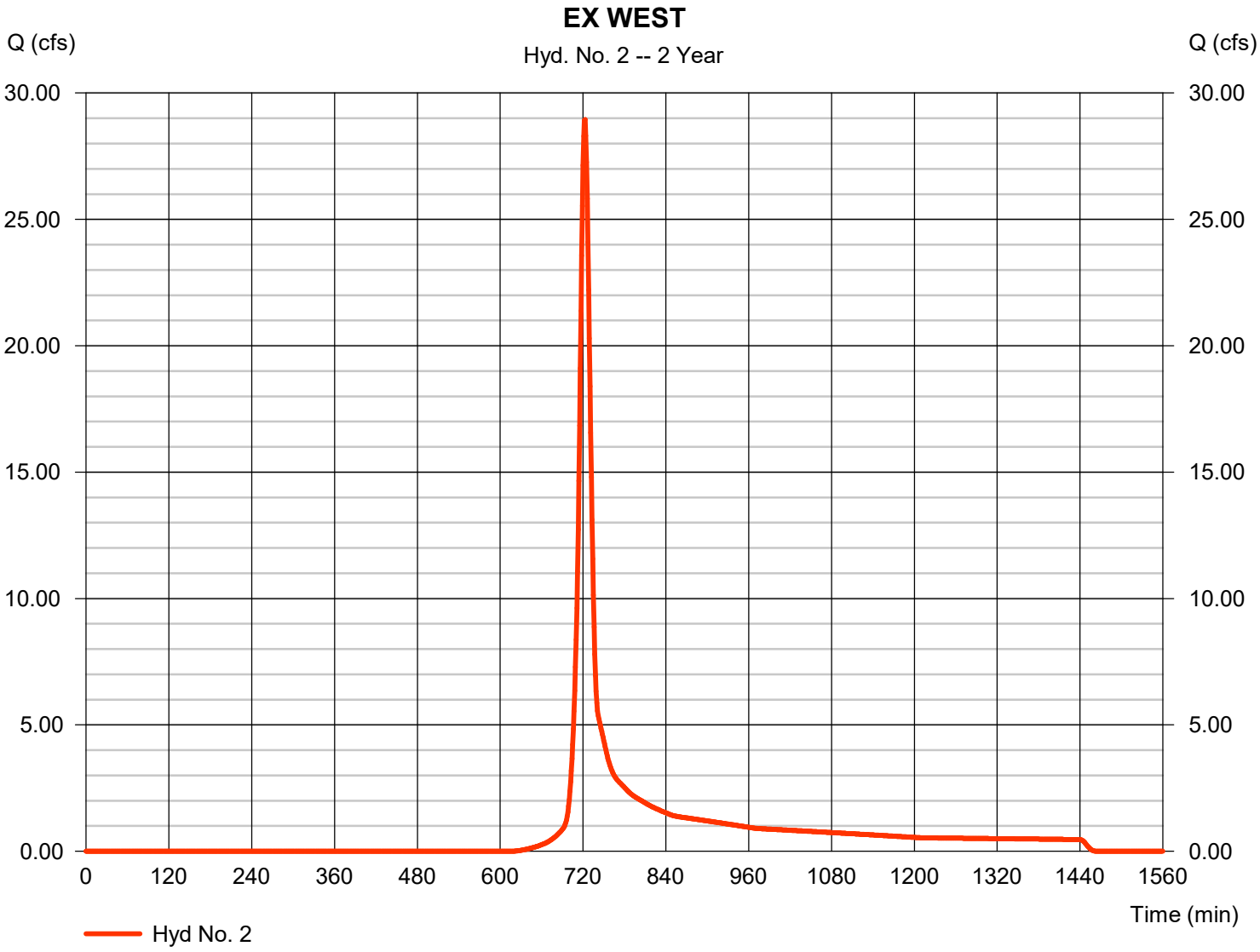


Hydrograph Report

Hyd. No. 2

EX WEST

Hydrograph type	=	SCS Runoff	Peak discharge	=	28.95 cfs
Storm frequency	=	2 yrs	Time to peak	=	723 min
Time interval	=	1 min	Hyd. volume	=	79,344 cuft
Drainage area	=	15.760 ac	Curve number	=	74
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	14.30 min
Total precip.	=	3.71 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

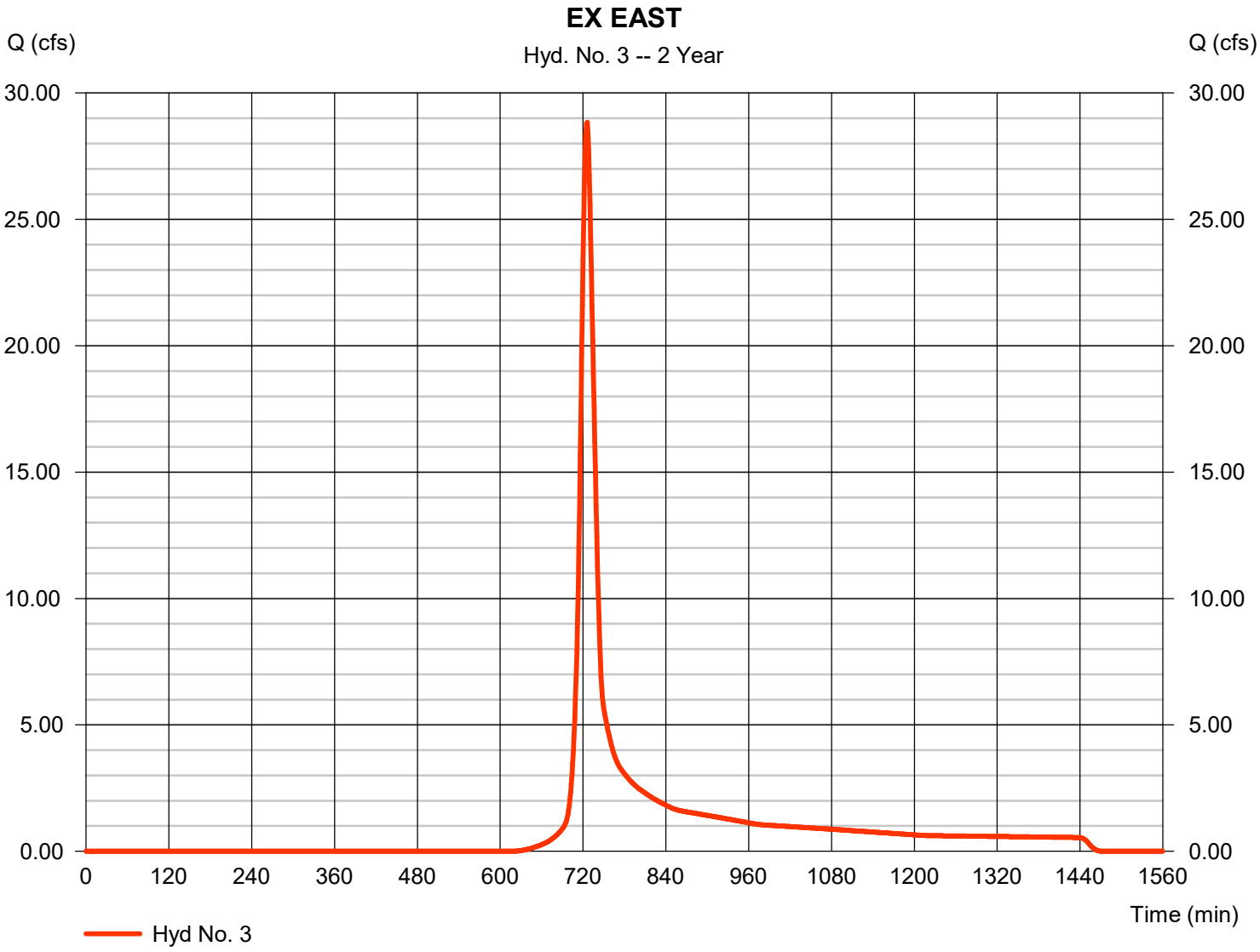


Hydrograph Report

Hyd. No. 3

EX EAST

Hydrograph type	=	SCS Runoff	Peak discharge	=	28.84 cfs
Storm frequency	=	2 yrs	Time to peak	=	726 min
Time interval	=	1 min	Hyd. volume	=	92,635 cuft
Drainage area	=	18.400 ac	Curve number	=	74
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	19.50 min
Total precip.	=	3.71 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

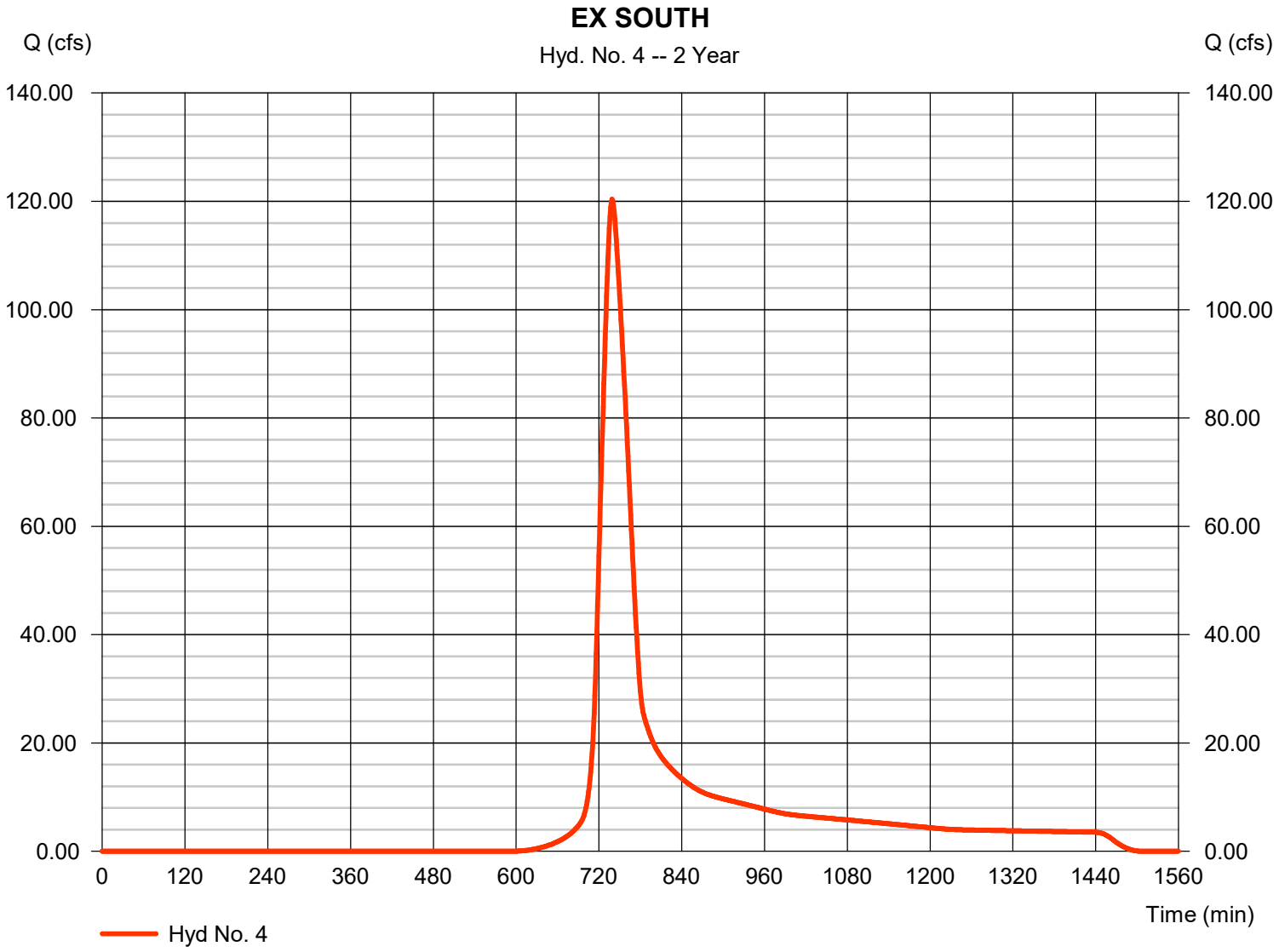


Hydrograph Report

Hyd. No. 4

EX SOUTH

Hydrograph type	=	SCS Runoff	Peak discharge	=	120.39 cfs
Storm frequency	=	2 yrs	Time to peak	=	739 min
Time interval	=	1 min	Hyd. volume	=	620,286 cuft
Drainage area	=	111.890 ac	Curve number	=	76
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	41.50 min
Total precip.	=	3.71 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

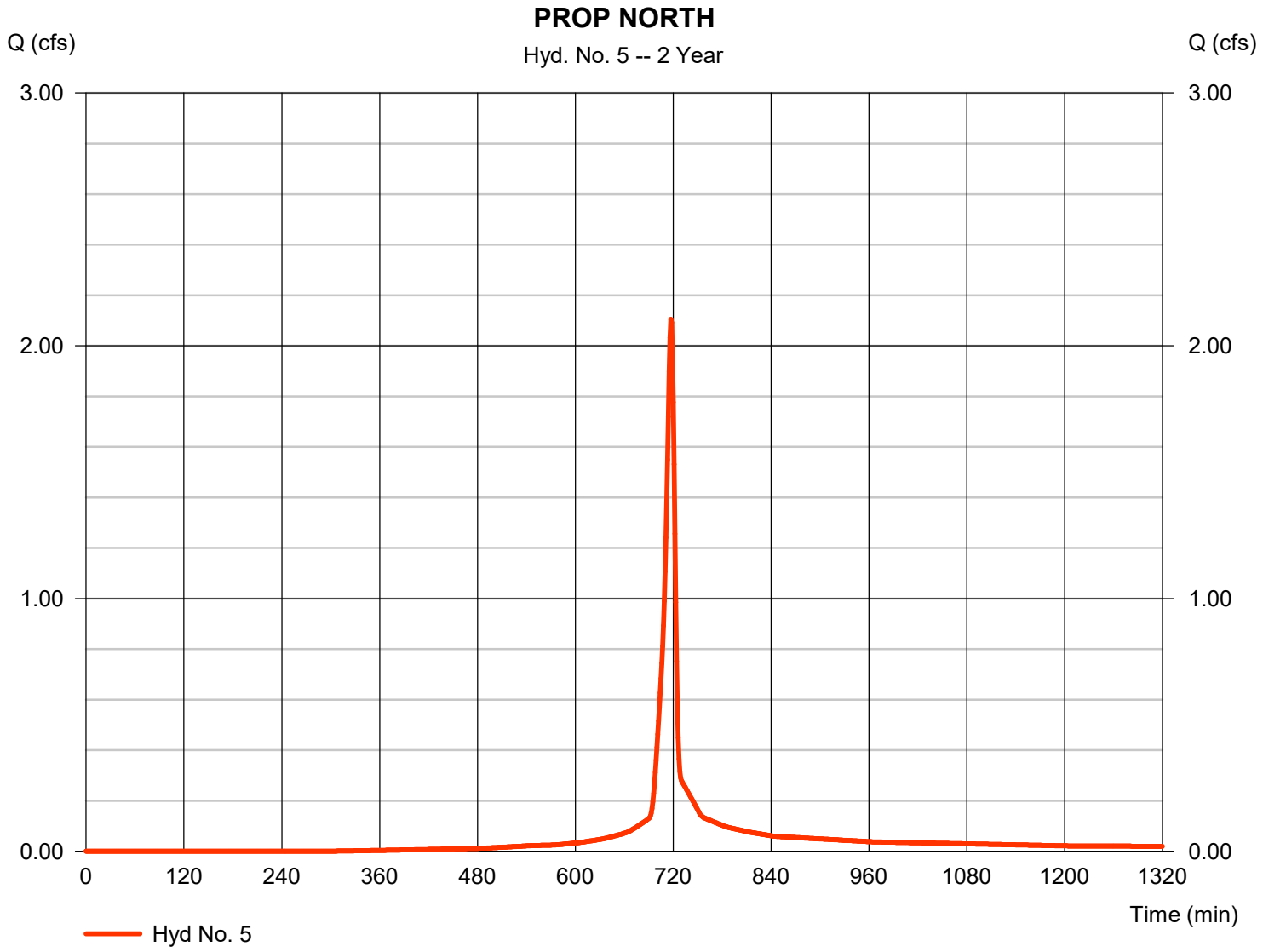


Hydrograph Report

Hyd. No. 5

PROP NORTH

Hydrograph type	=	SCS Runoff	Peak discharge	=	2.104 cfs
Storm frequency	=	2 yrs	Time to peak	=	717 min
Time interval	=	1 min	Hyd. volume	=	4,456 cuft
Drainage area	=	0.450 ac	Curve number	=	90
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	3.71 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

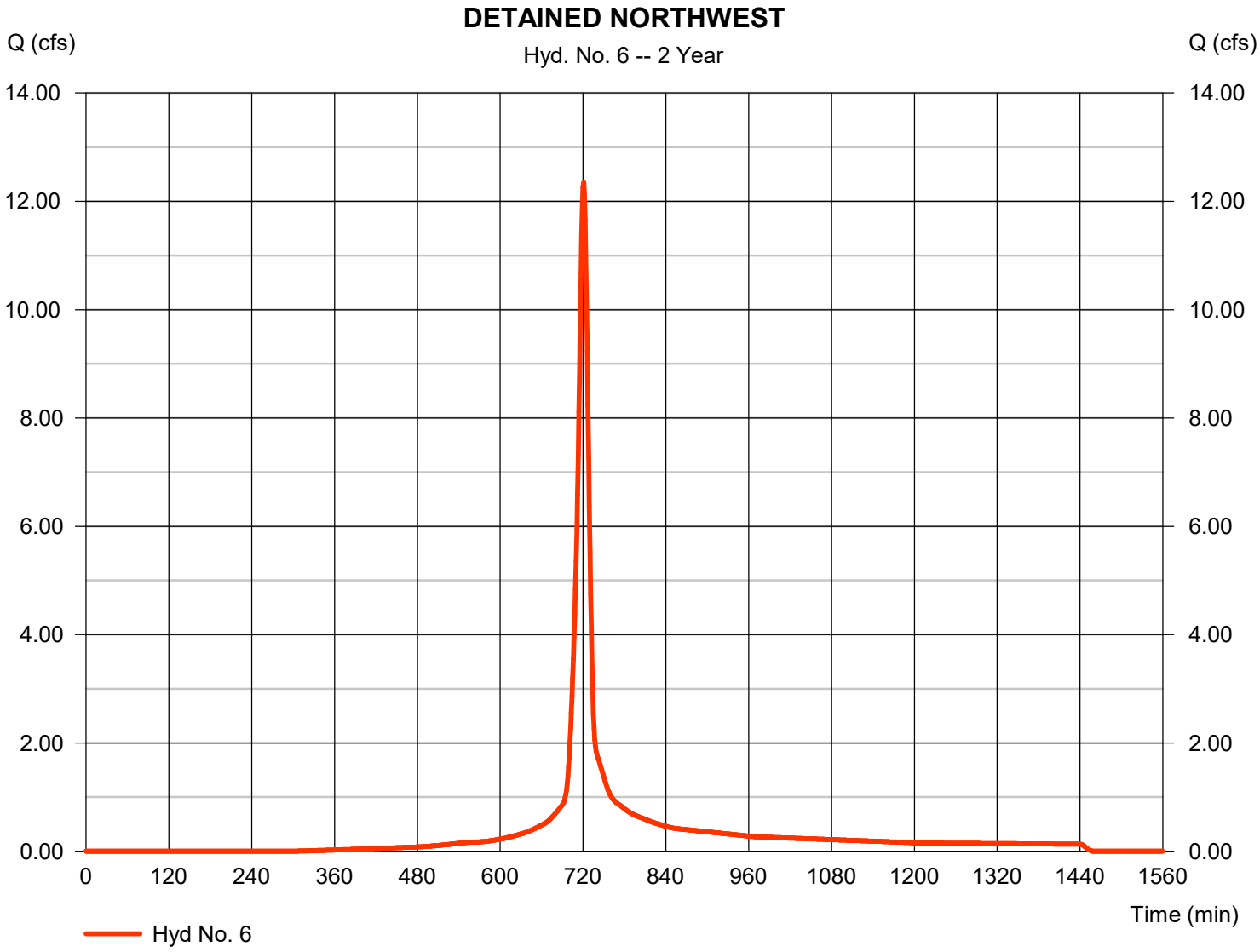


Hydrograph Report

Hyd. No. 6

DETAINED NORTHWEST

Hydrograph type	= SCS Runoff	Peak discharge	= 12.35 cfs
Storm frequency	= 2 yrs	Time to peak	= 721 min
Time interval	= 1 min	Hyd. volume	= 32,136 cuft
Drainage area	= 3.400 ac	Curve number	= 90
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 12.60 min
Total precip.	= 3.71 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

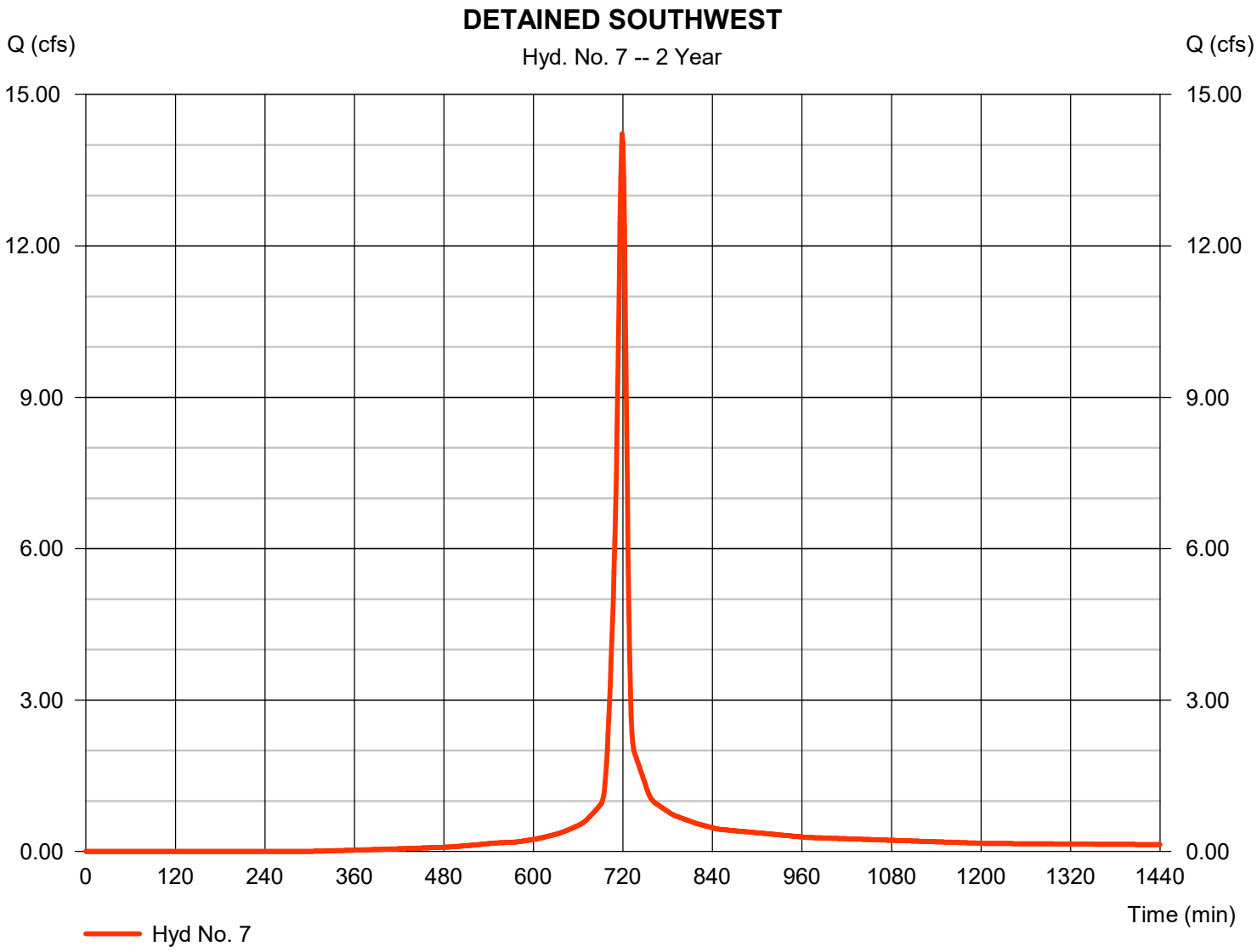


Hydrograph Report

Hyd. No. 7

DETAINED SOUTHWEST

Hydrograph type	=	SCS Runoff	Peak discharge	=	14.22 cfs
Storm frequency	=	2 yrs	Time to peak	=	719 min
Time interval	=	1 min	Hyd. volume	=	33,318 cuft
Drainage area	=	3.470 ac	Curve number	=	90
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	9.30 min
Total precip.	=	3.71 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

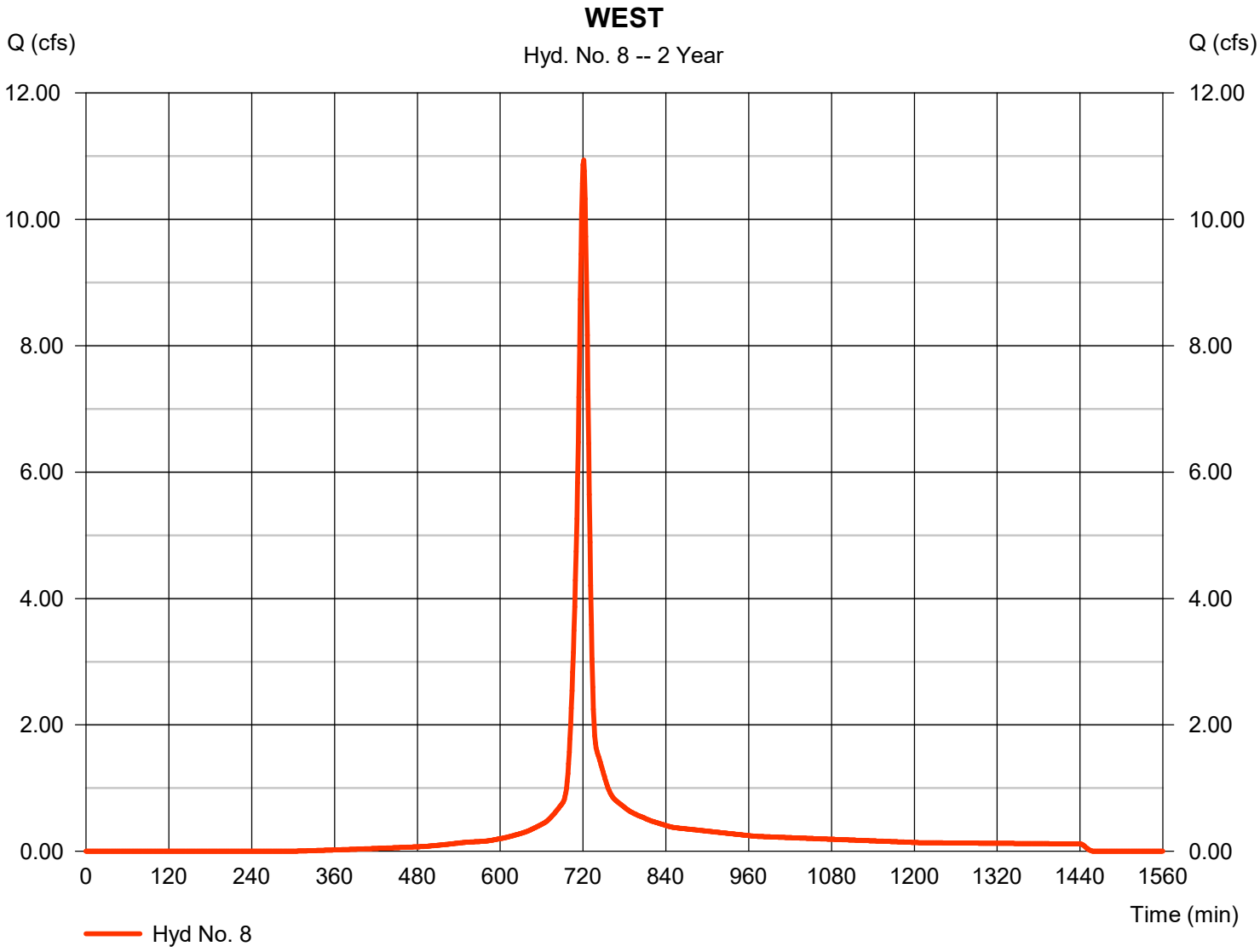


Hydrograph Report

Hyd. No. 8

WEST

Hydrograph type	=	SCS Runoff	Peak discharge	=	10.94 cfs
Storm frequency	=	2 yrs	Time to peak	=	721 min
Time interval	=	1 min	Hyd. volume	=	28,450 cuft
Drainage area	=	3.010 ac	Curve number	=	90
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	12.10 min
Total precip.	=	3.71 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

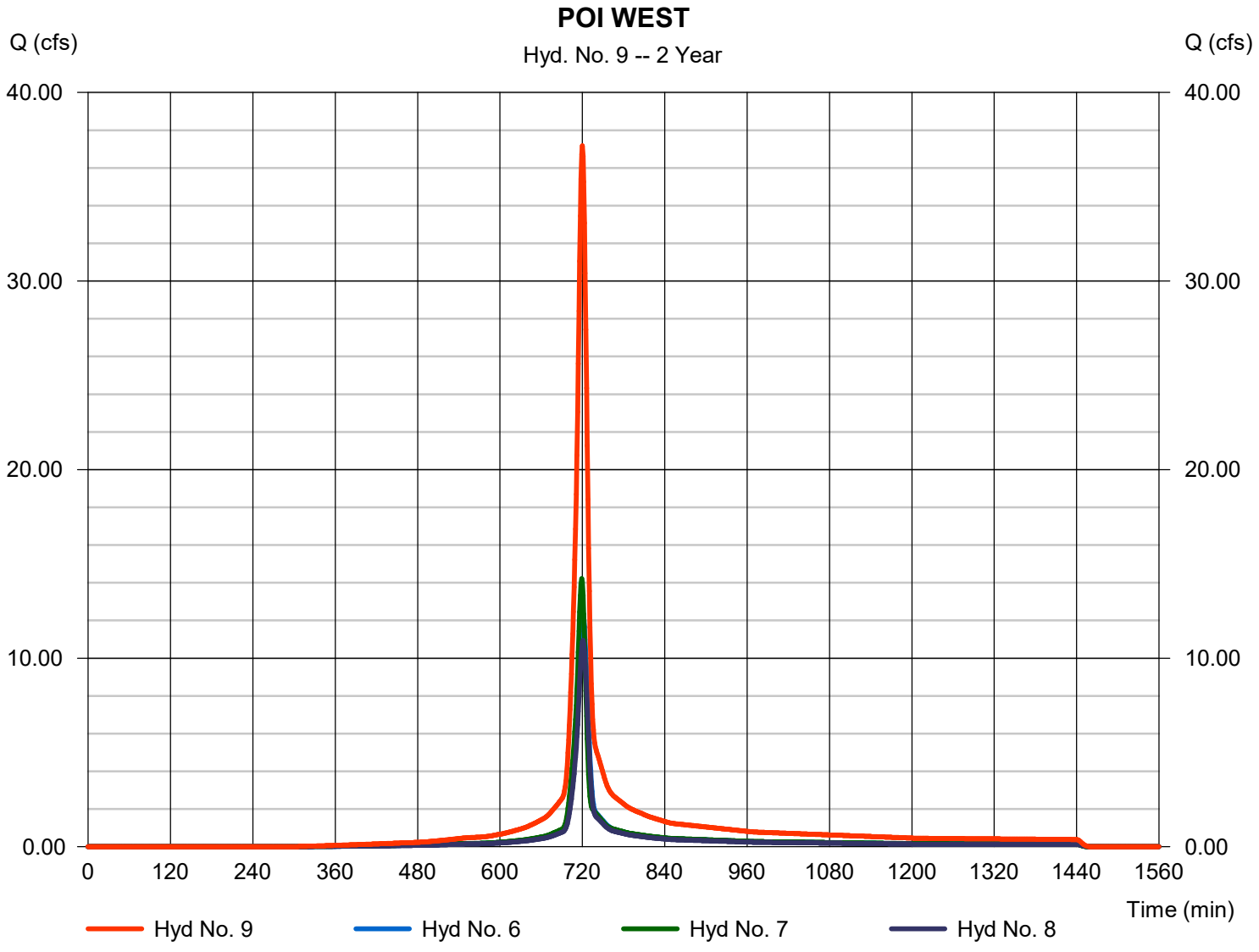


Hydrograph Report

Hyd. No. 9

POI WEST

Hydrograph type	=	Combine	Peak discharge	=	37.17 cfs
Storm frequency	=	2 yrs	Time to peak	=	720 min
Time interval	=	1 min	Hyd. volume	=	93,904 cuft
Inflow hyds.	=	6, 7, 8	Contrib. drain. area	=	9.880 ac

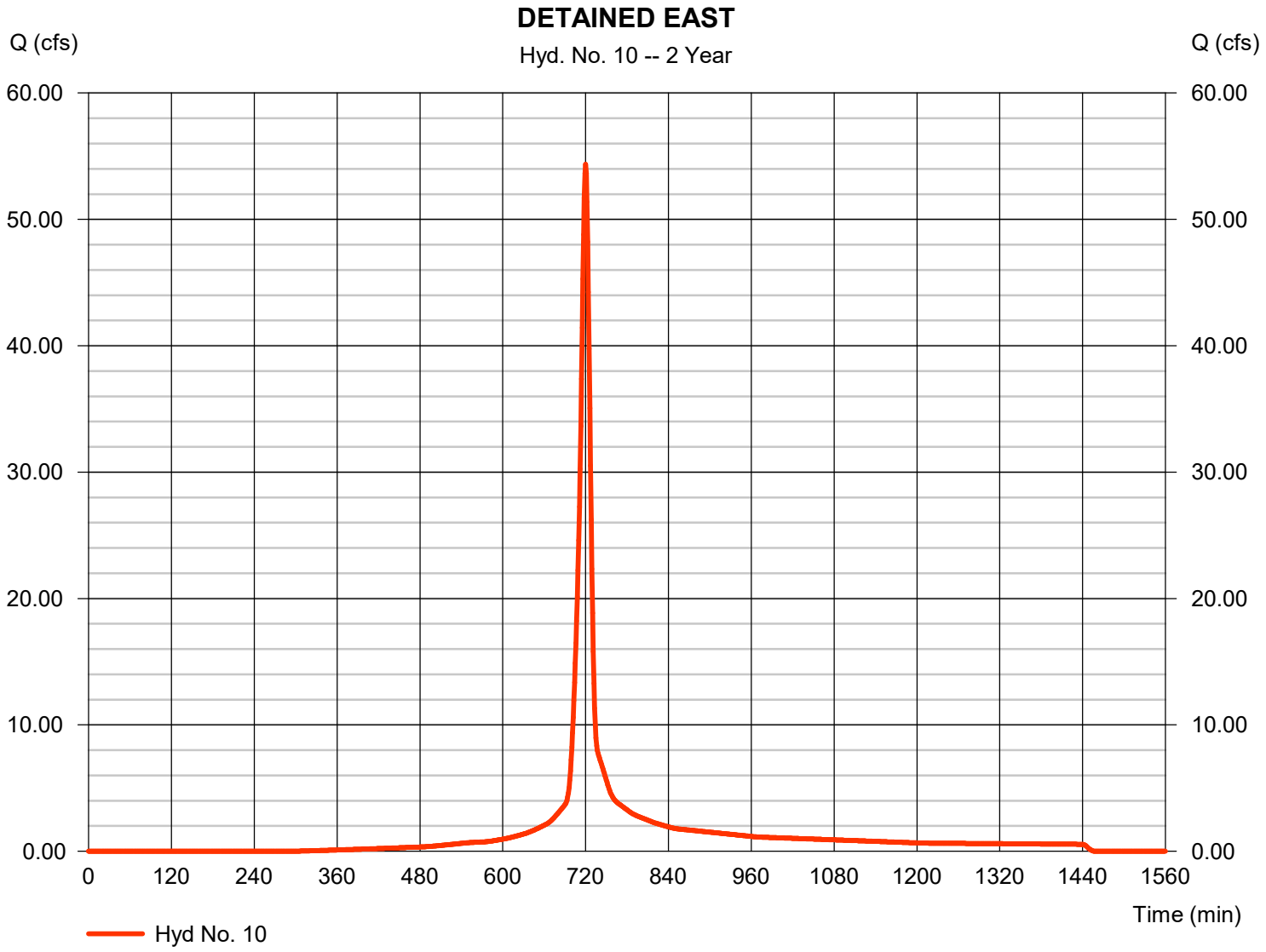


Hydrograph Report

Hyd. No. 10

DETAINED EAST

Hydrograph type	=	SCS Runoff	Peak discharge	=	54.36 cfs
Storm frequency	=	2 yrs	Time to peak	=	720 min
Time interval	=	1 min	Hyd. volume	=	135,555 cuft
Drainage area	=	13.870 ac	Curve number	=	90
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	10.70 min
Total precip.	=	3.71 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

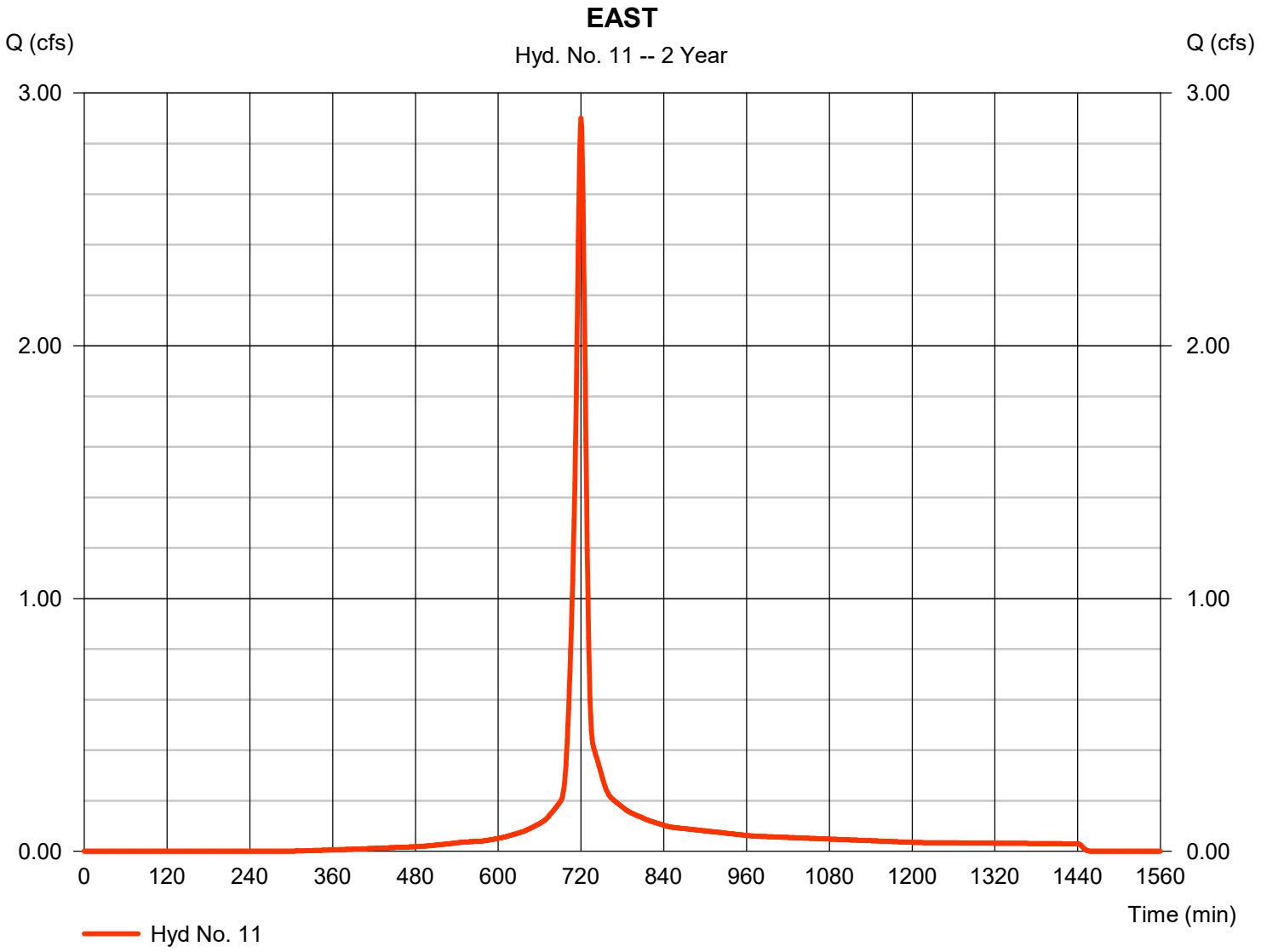


Hydrograph Report

Hyd. No. 11

EAST

Hydrograph type	=	SCS Runoff	Peak discharge	=	2.900 cfs
Storm frequency	=	2 yrs	Time to peak	=	720 min
Time interval	=	1 min	Hyd. volume	=	7,232 cuft
Drainage area	=	0.740 ac	Curve number	=	90
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	11.70 min
Total precip.	=	3.71 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

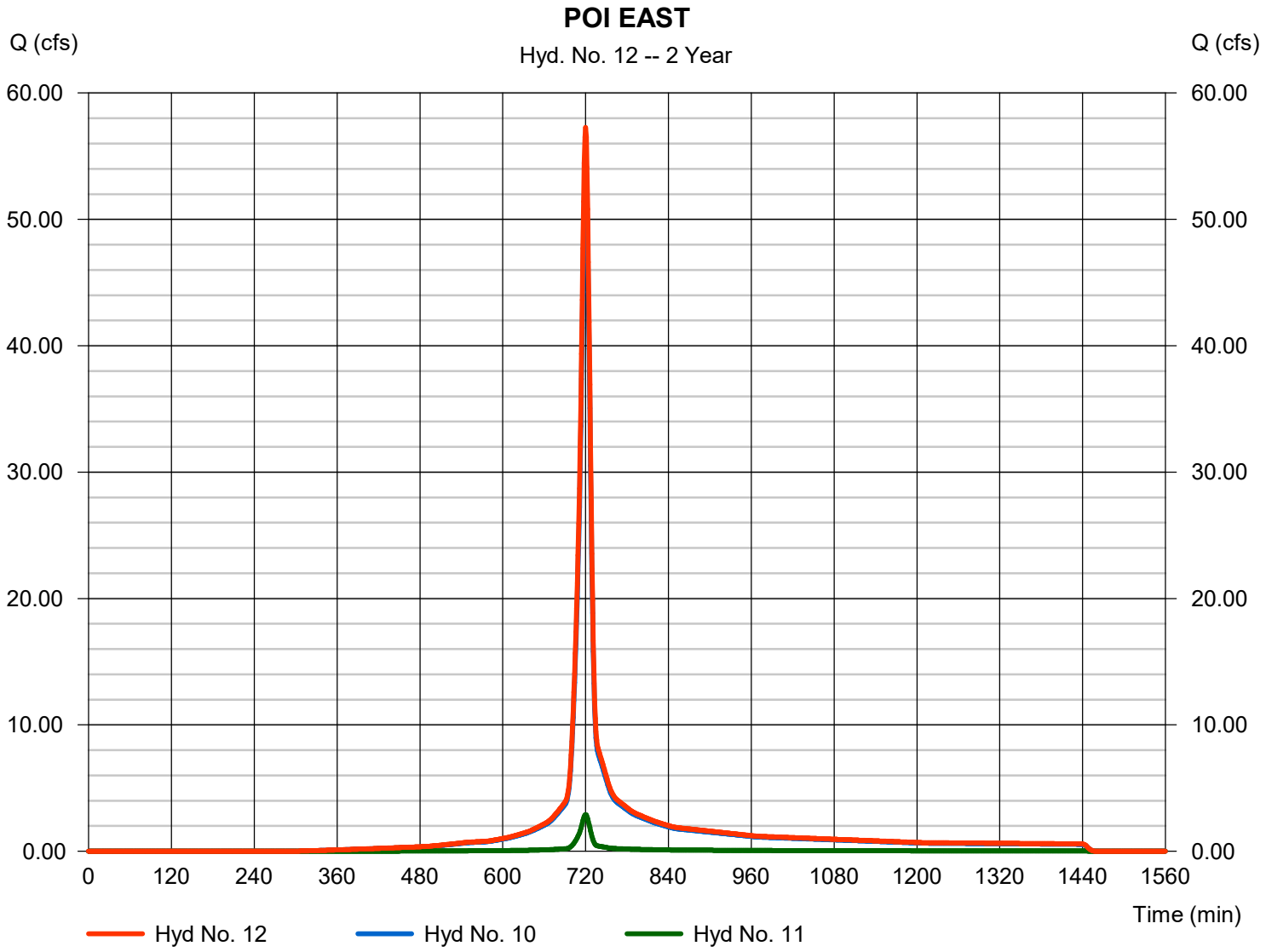


Hydrograph Report

Hyd. No. 12

POI EAST

Hydrograph type	=	Combine	Peak discharge	=	57.26 cfs
Storm frequency	=	2 yrs	Time to peak	=	720 min
Time interval	=	1 min	Hyd. volume	=	142,787 cuft
Inflow hyds.	=	10, 11	Contrib. drain. area	=	14.610 ac



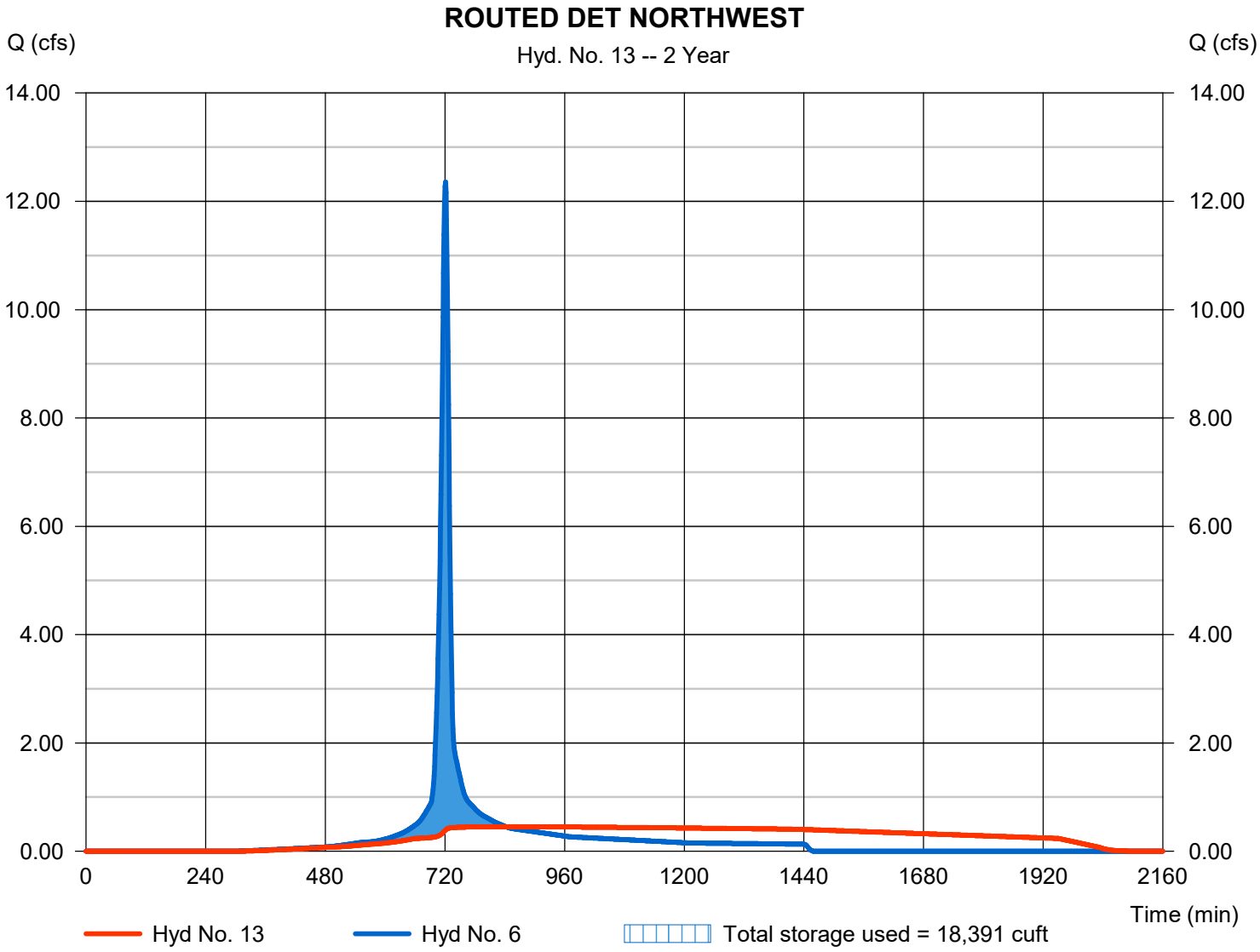
Hydrograph Report

Hyd. No. 13

ROUTED DET NORTHWEST

Hydrograph type	= Reservoir	Peak discharge	= 0.452 cfs
Storm frequency	= 2 yrs	Time to peak	= 842 min
Time interval	= 1 min	Hyd. volume	= 32,135 cuft
Inflow hyd. No.	= 6 - DETAINED NORTHWEST	Max. Elevation	= 1044.66 ft
Reservoir name	= NORTHWEST BASIN	Max. Storage	= 18,391 cuft

Storage Indication method used.



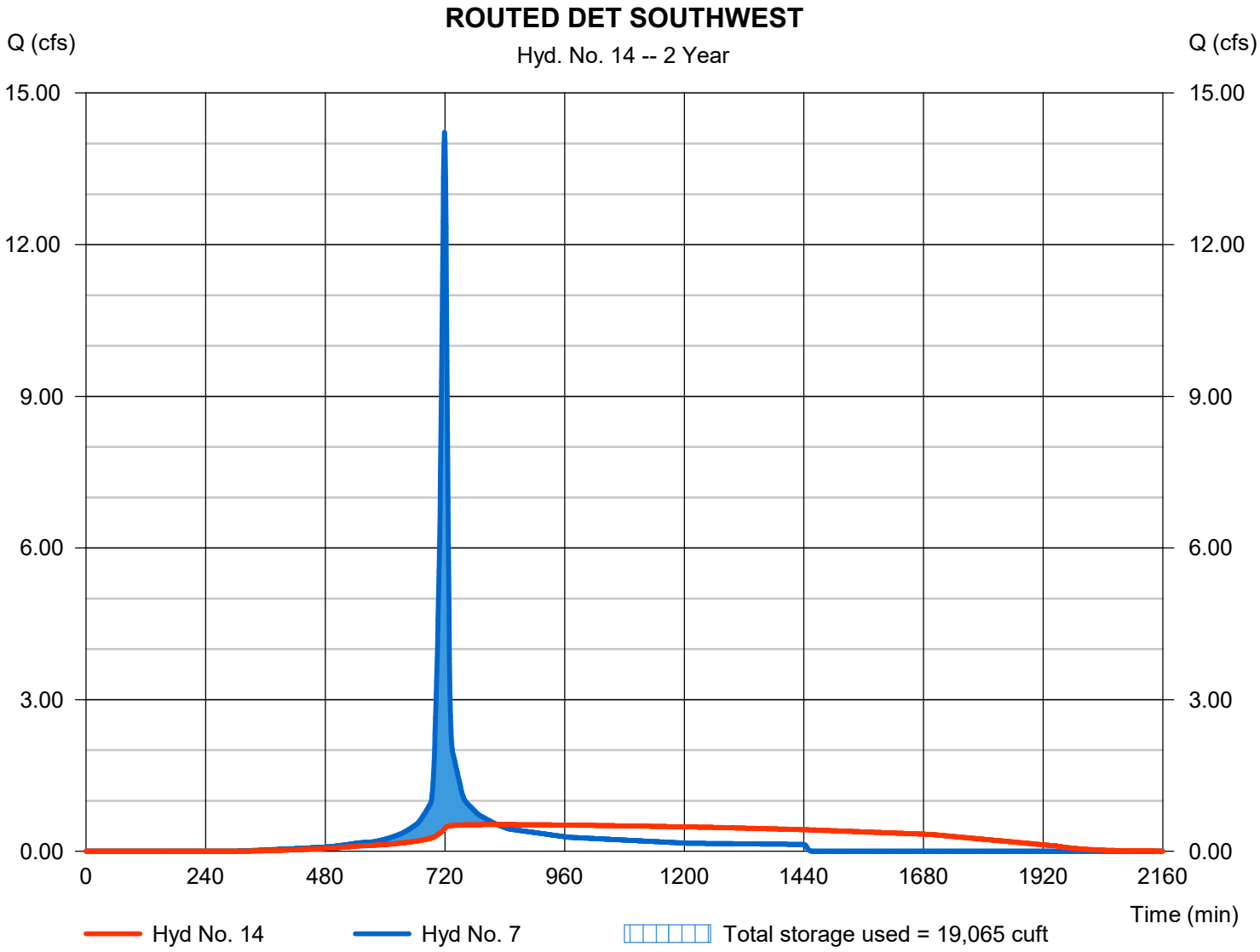
Hydrograph Report

Hyd. No. 14

ROUTED DET SOUTHWEST

Hydrograph type	= Reservoir	Peak discharge	= 0.528 cfs
Storm frequency	= 2 yrs	Time to peak	= 825 min
Time interval	= 1 min	Hyd. volume	= 33,315 cuft
Inflow hyd. No.	= 7 - DETAINED SOUTHWEST	Max. Elevation	= 1040.99 ft
Reservoir name	= SOUTHWEST BASIN	Max. Storage	= 19,065 cuft

Storage Indication method used.

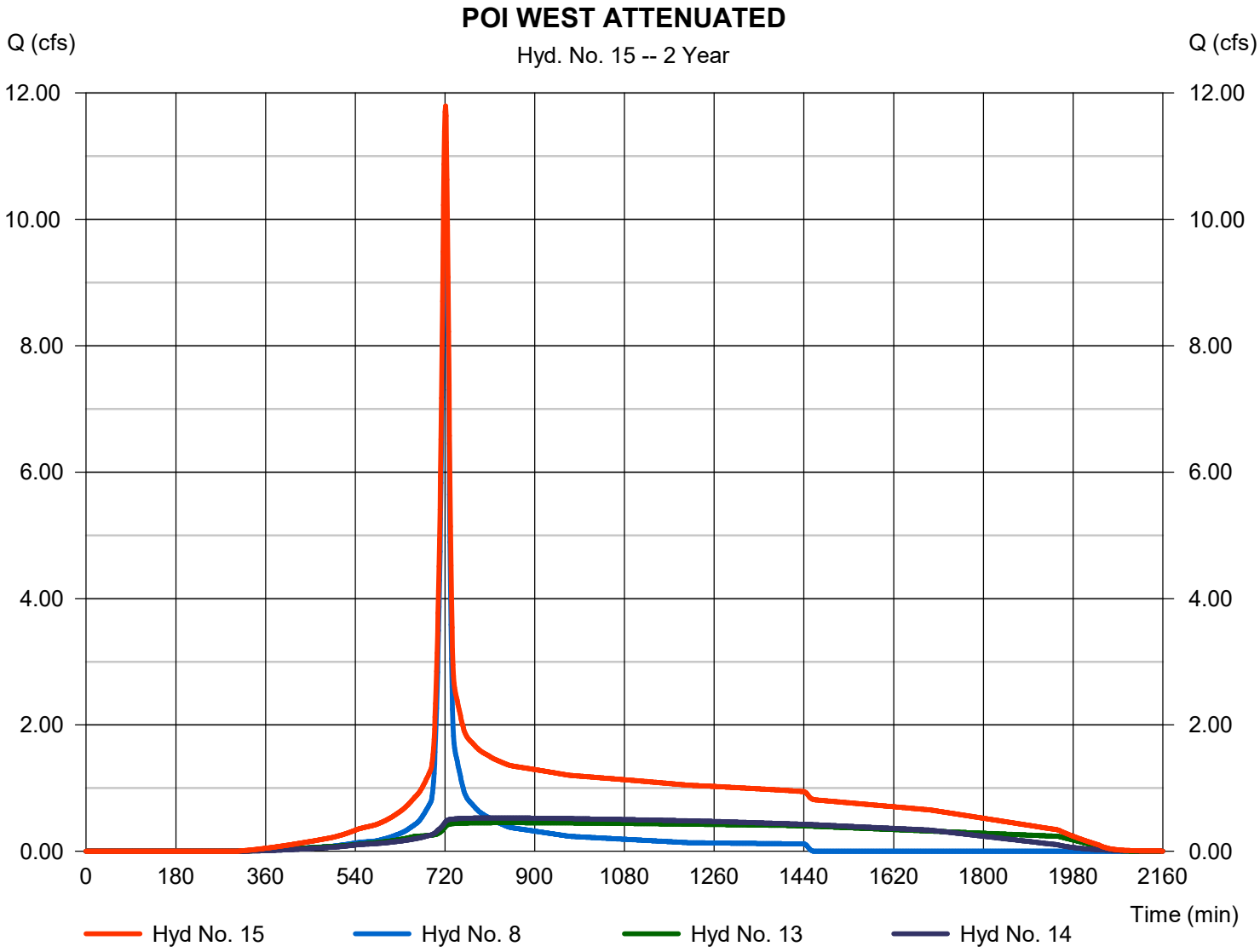


Hydrograph Report

Hyd. No. 15

POI WEST ATTENUATED

Hydrograph type	=	Combine	Peak discharge	=	11.80 cfs
Storm frequency	=	2 yrs	Time to peak	=	721 min
Time interval	=	1 min	Hyd. volume	=	93,899 cuft
Inflow hyds.	=	8, 13, 14	Contrib. drain. area	=	3.010 ac



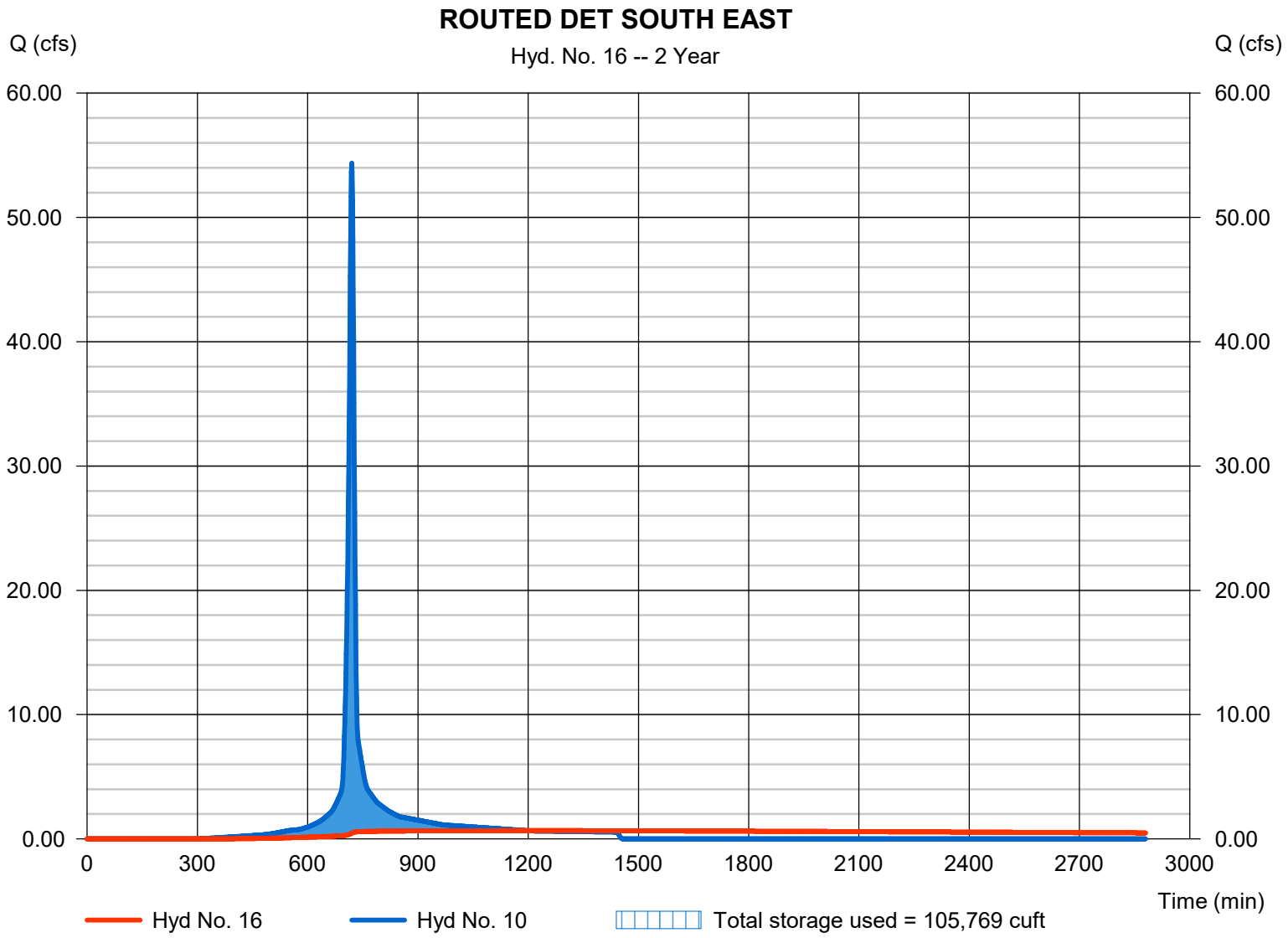
Hydrograph Report

Hyd. No. 16

ROUTED DET SOUTH EAST

Hydrograph type	=	Reservoir	Peak discharge	=	0.663 cfs
Storm frequency	=	2 yrs	Time to peak	=	1199 min
Time interval	=	1 min	Hyd. volume	=	80,203 cuft
Inflow hyd. No.	=	10 - DETAINED EAST	Max. Elevation	=	1042.61 ft
Reservoir name	=	SOUTHEAST BASIN	Max. Storage	=	105,769 cuft

Storage Indication method used.

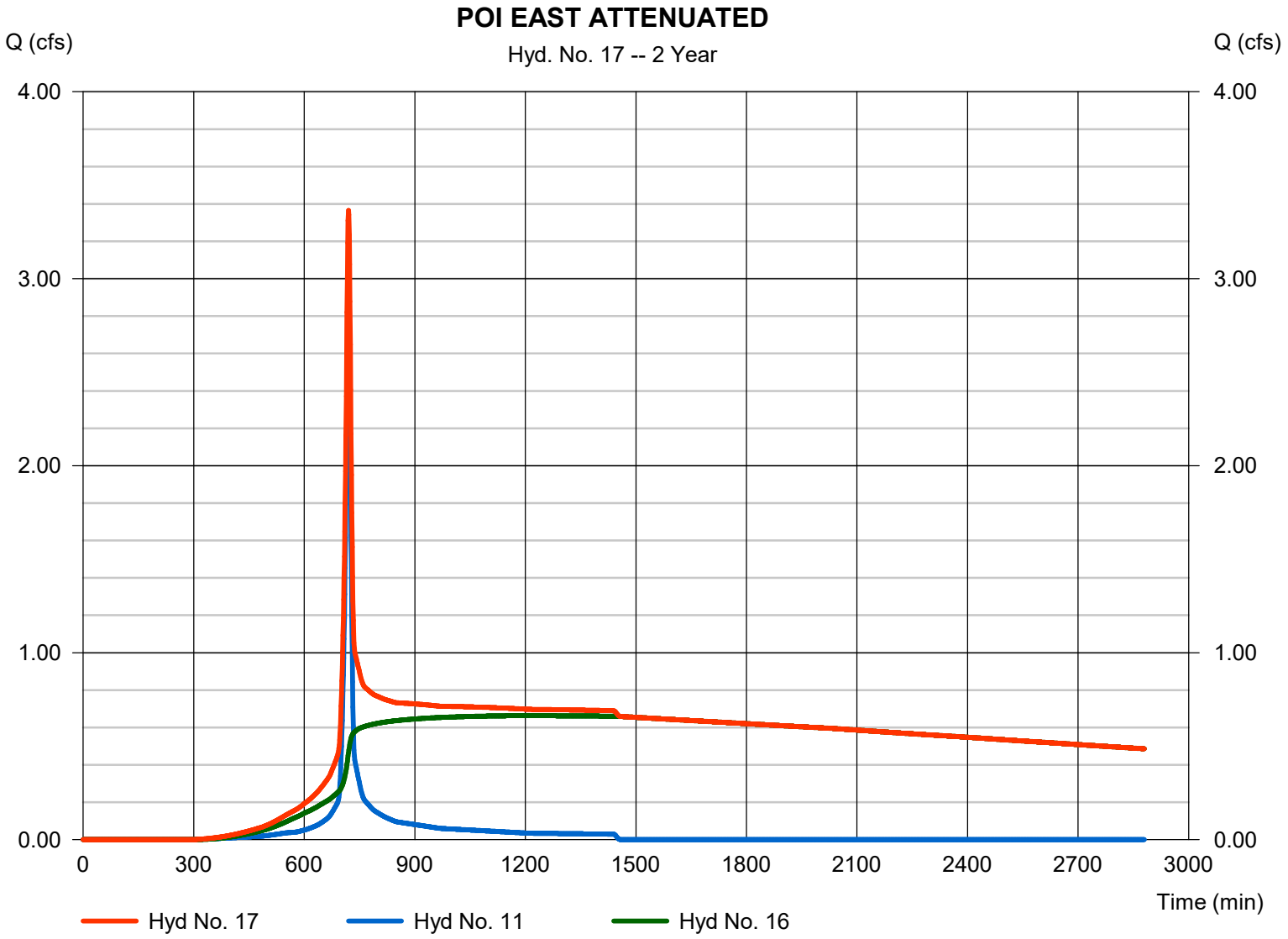


Hydrograph Report

Hyd. No. 17

POI EAST ATTENUATED

Hydrograph type	=	Combine	Peak discharge	=	3.365 cfs
Storm frequency	=	2 yrs	Time to peak	=	720 min
Time interval	=	1 min	Hyd. volume	=	87,435 cuft
Inflow hyds.	=	11, 16	Contrib. drain. area	=	0.740 ac



Hydrograph Summary Report

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

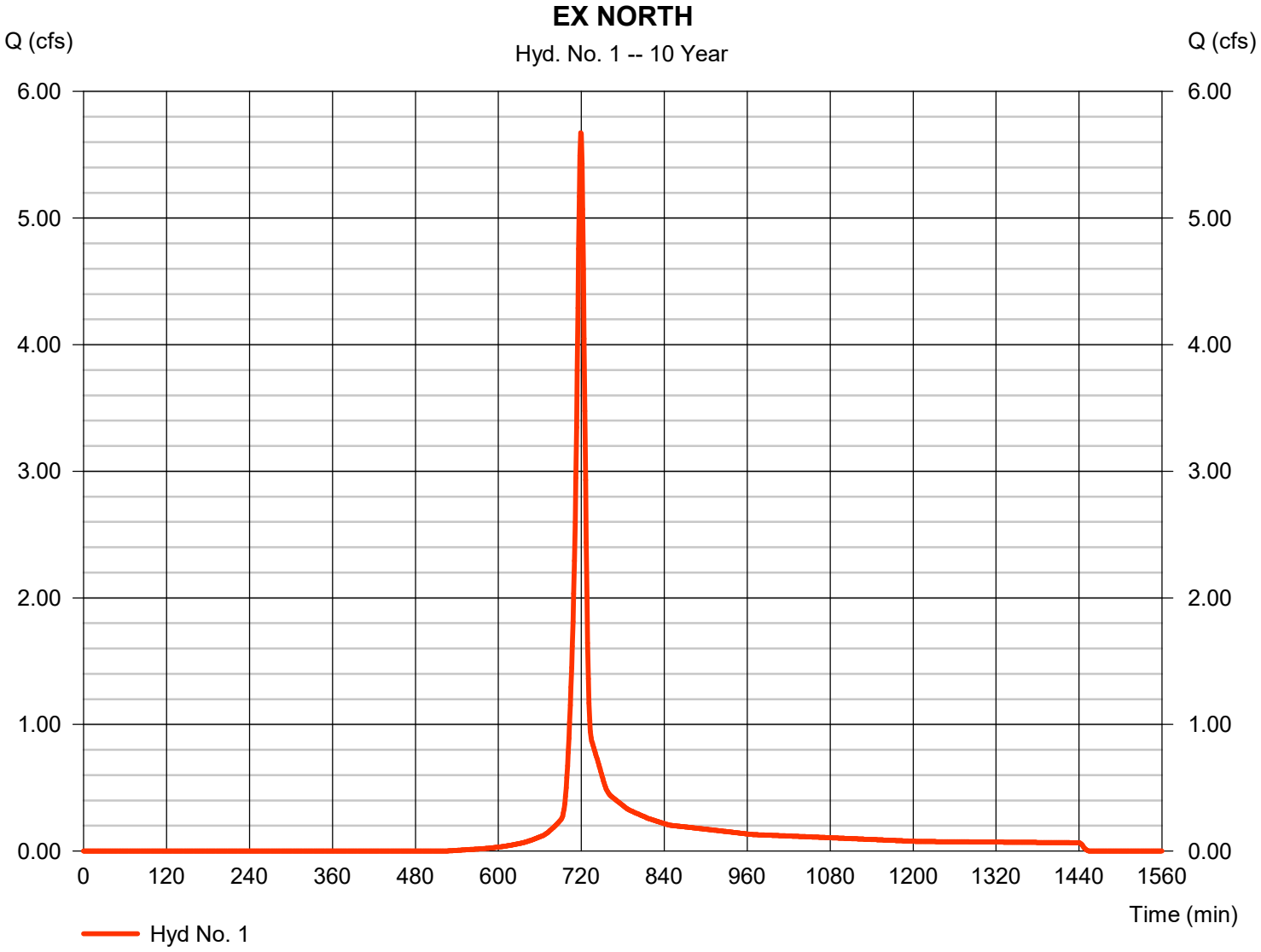
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	5.673	1	719	12,831	------	------	------	EX NORTH
2	SCS Runoff	53.68	1	722	144,441	------	------	------	EX WEST
3	SCS Runoff	53.82	1	725	168,636	------	------	------	EX EAST
4	SCS Runoff	219.62	1	739	1,102,615	------	------	------	EX SOUTH
5	SCS Runoff	3.153	1	717	6,855	------	------	------	PROP NORTH
6	SCS Runoff	18.57	1	721	49,440	------	------	------	DETAINED NORTHWEST
7	SCS Runoff	21.34	1	719	51,259	------	------	------	DETAINED SOUTHWEST
8	SCS Runoff	16.44	1	721	43,769	------	------	------	WEST
9	Combine	55.86	1	720	144,468	6, 7, 8	------	------	POI WEST
10	SCS Runoff	81.67	1	720	208,547	------	------	------	DETAINED EAST
11	SCS Runoff	4.358	1	720	11,126	------	------	------	EAST
12	Combine	86.03	1	720	219,673	10, 11	------	------	POI EAST
13	Reservoir	1.088	1	784	49,439	6	1045.54	28,052	ROUTED DET NORTHWEST
14	Reservoir	0.611	1	862	51,255	7	1042.68	31,255	ROUTED DET SOUTHWEST
15	Combine	17.42	1	721	144,464	8, 13, 14	------	------	POI WEST ATTENUATED
16	Reservoir	2.293	1	887	121,921	10	1043.83	152,016	ROUTED DET SOUTH EAST
17	Combine	4.955	1	720	133,047	11, 16	------	------	POI EAST ATTENUATED

Hydrograph Report

Hyd. No. 1

EX NORTH

Hydrograph type	=	SCS Runoff	Peak discharge	=	5.673 cfs
Storm frequency	=	10 yrs	Time to peak	=	719 min
Time interval	=	1 min	Hyd. volume	=	12,831 cuft
Drainage area	=	1.400 ac	Curve number	=	74
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	8.70 min
Total precip.	=	5.20 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

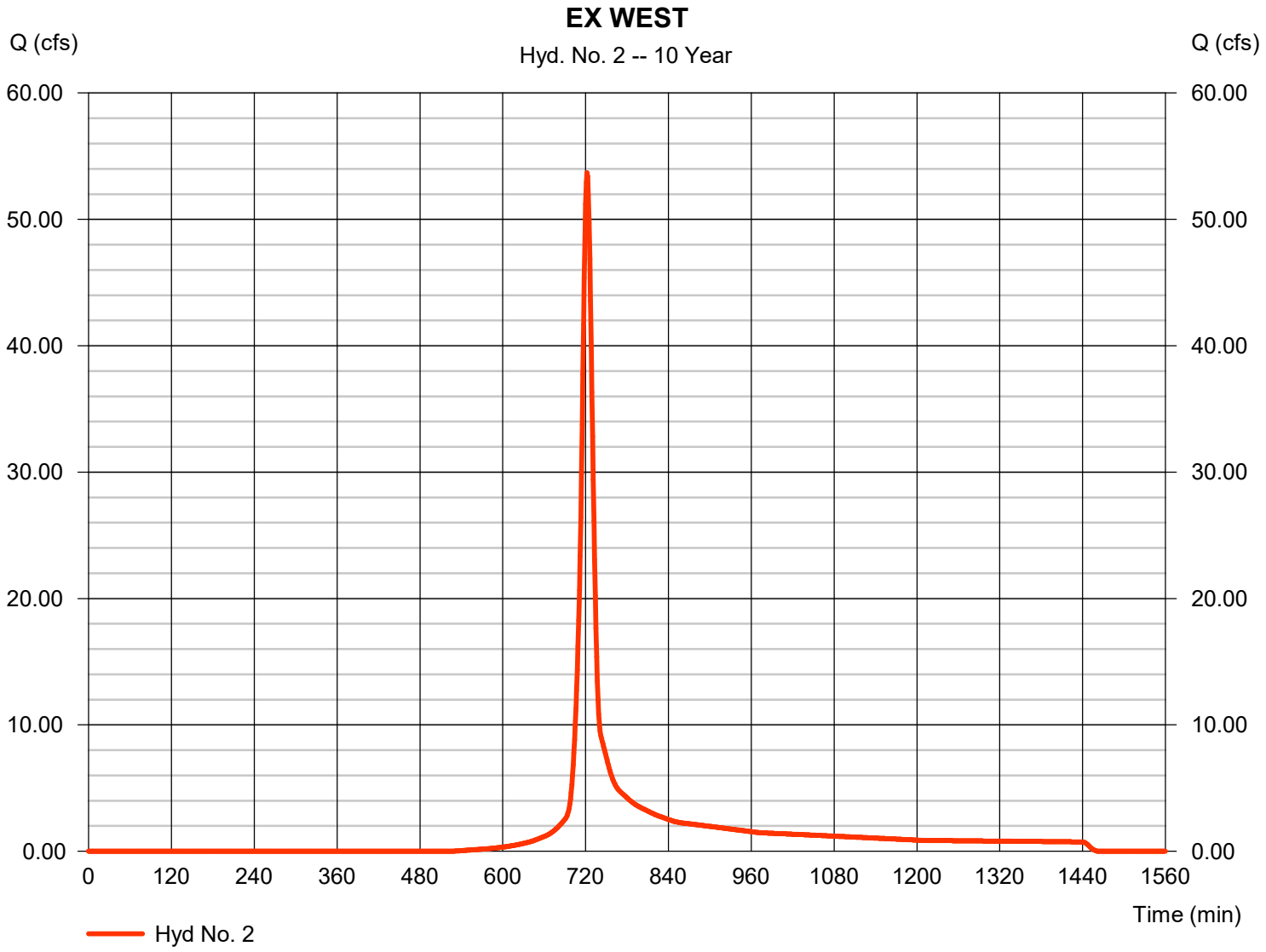


Hydrograph Report

Hyd. No. 2

EX WEST

Hydrograph type	=	SCS Runoff	Peak discharge	=	53.68 cfs
Storm frequency	=	10 yrs	Time to peak	=	722 min
Time interval	=	1 min	Hyd. volume	=	144,441 cuft
Drainage area	=	15.760 ac	Curve number	=	74
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	14.30 min
Total precip.	=	5.20 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

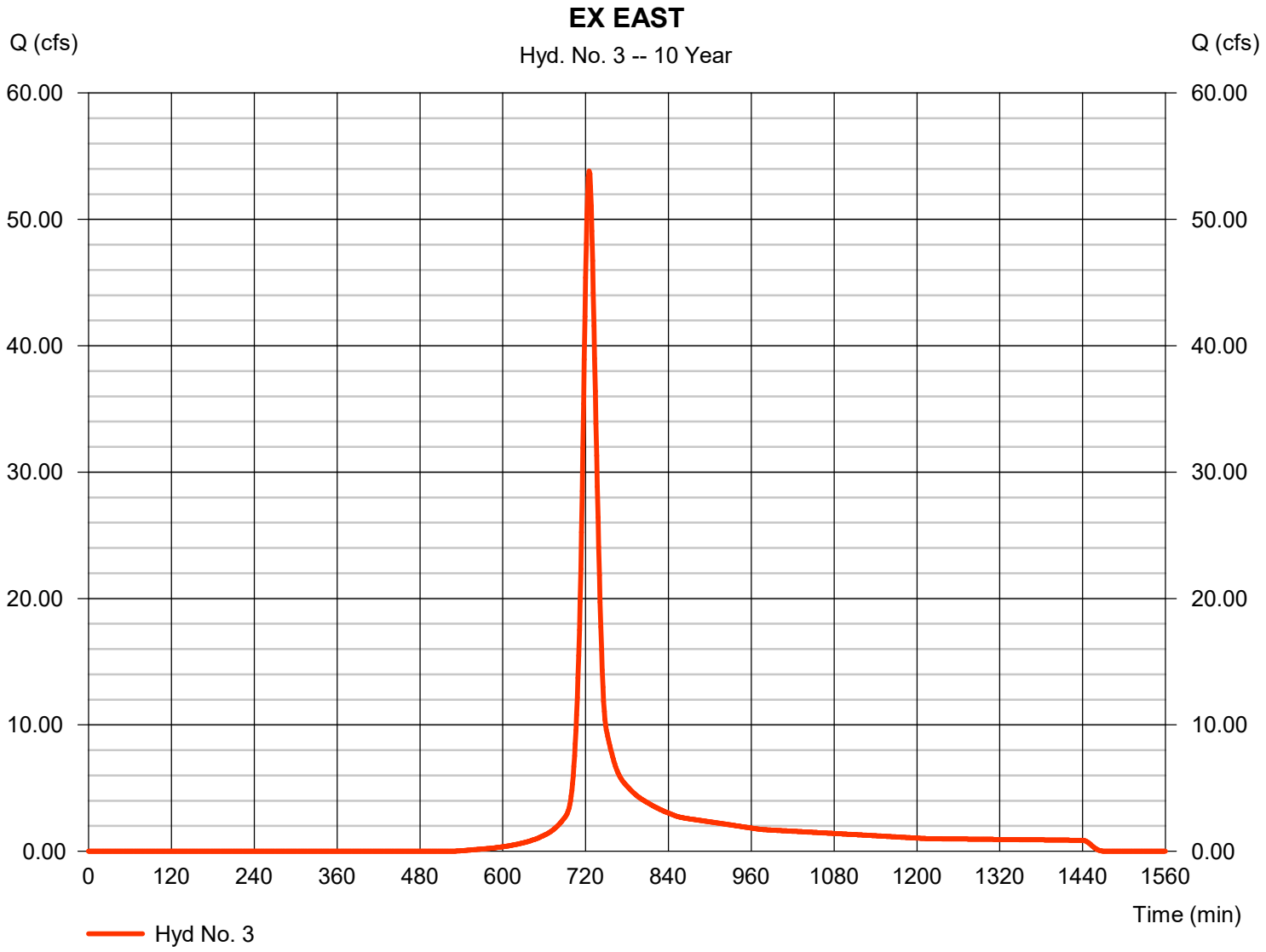


Hydrograph Report

Hyd. No. 3

EX EAST

Hydrograph type	=	SCS Runoff	Peak discharge	=	53.82 cfs
Storm frequency	=	10 yrs	Time to peak	=	725 min
Time interval	=	1 min	Hyd. volume	=	168,636 cuft
Drainage area	=	18.400 ac	Curve number	=	74
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	19.50 min
Total precip.	=	5.20 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

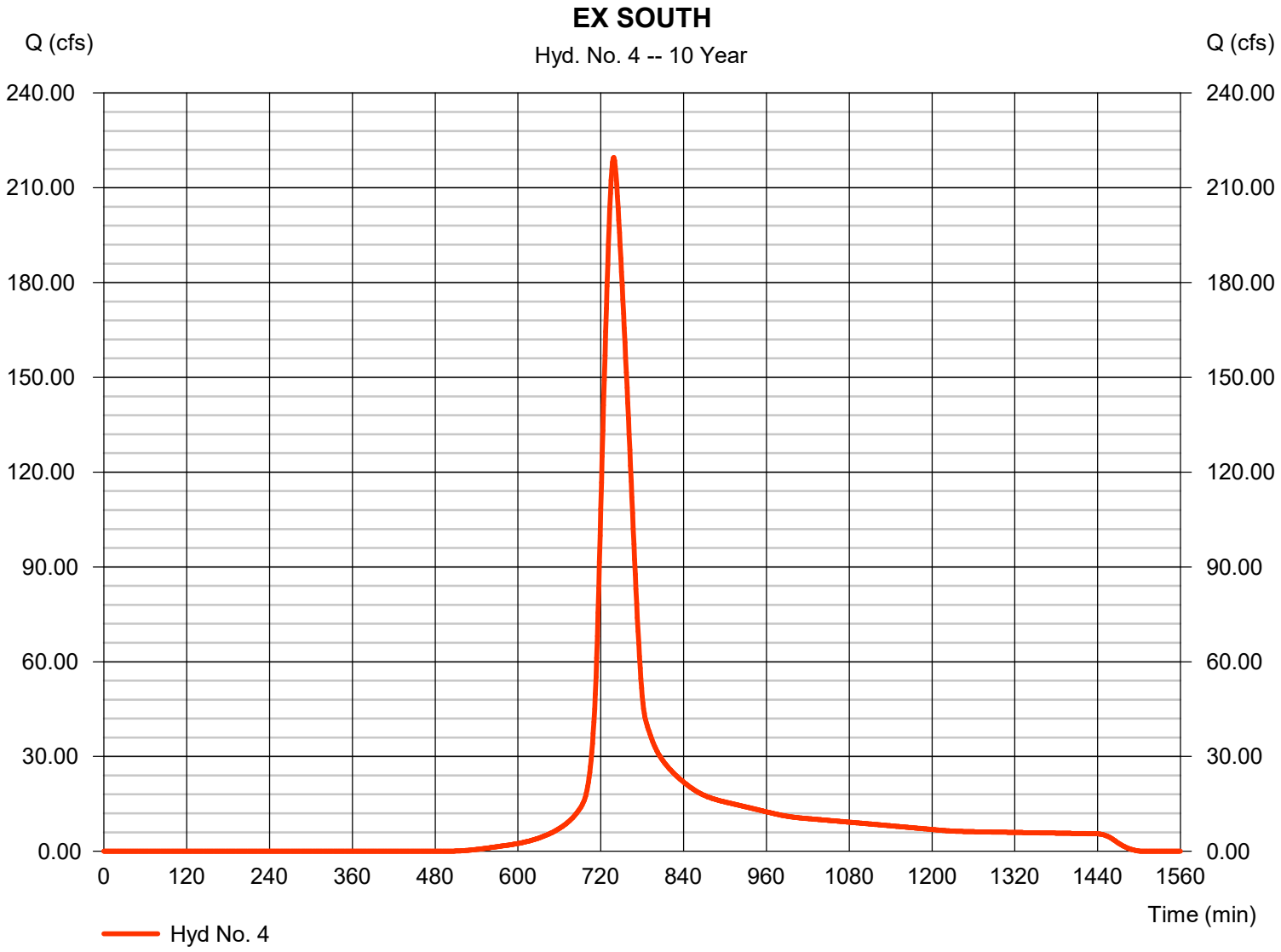


Hydrograph Report

Hyd. No. 4

EX SOUTH

Hydrograph type	=	SCS Runoff	Peak discharge	=	219.62 cfs
Storm frequency	=	10 yrs	Time to peak	=	739 min
Time interval	=	1 min	Hyd. volume	=	1,102,615 cuft
Drainage area	=	111.890 ac	Curve number	=	76
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	41.50 min
Total precip.	=	5.20 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

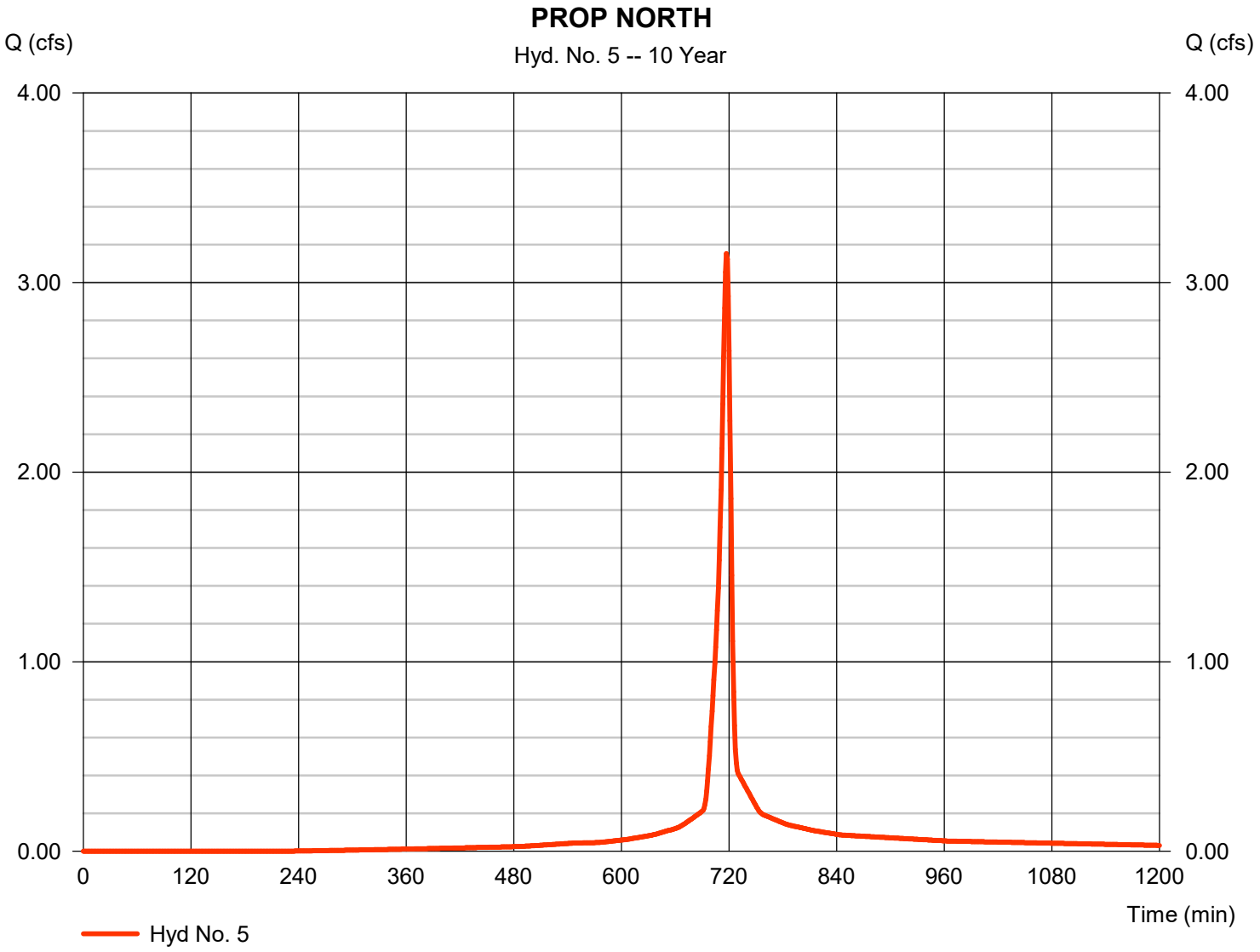


Hydrograph Report

Hyd. No. 5

PROP NORTH

Hydrograph type	=	SCS Runoff	Peak discharge	=	3.153 cfs
Storm frequency	=	10 yrs	Time to peak	=	717 min
Time interval	=	1 min	Hyd. volume	=	6,855 cuft
Drainage area	=	0.450 ac	Curve number	=	90
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	5.20 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

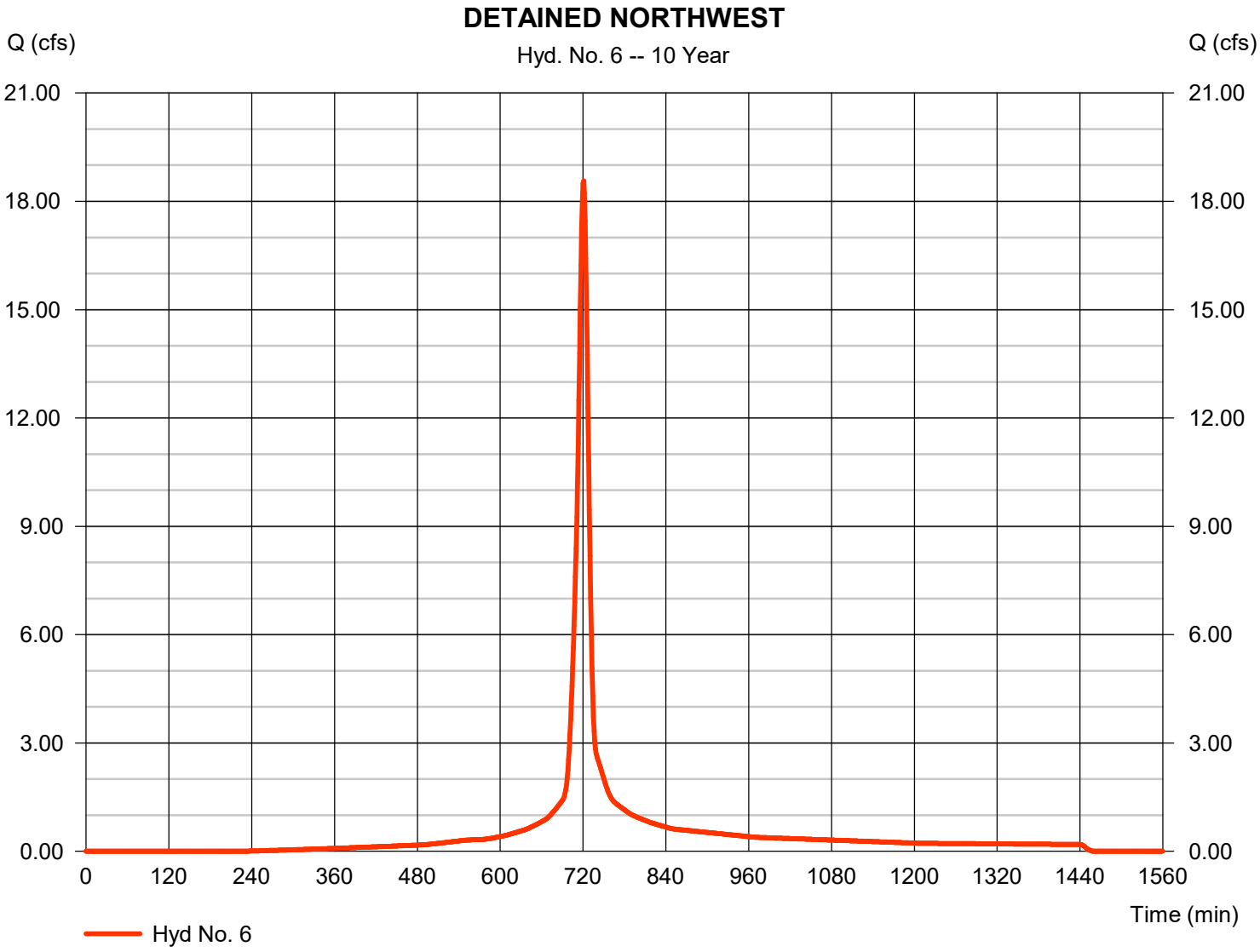


Hydrograph Report

Hyd. No. 6

DETAINED NORTHWEST

Hydrograph type	=	SCS Runoff	Peak discharge	=	18.57 cfs
Storm frequency	=	10 yrs	Time to peak	=	721 min
Time interval	=	1 min	Hyd. volume	=	49,440 cuft
Drainage area	=	3.400 ac	Curve number	=	90
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	12.60 min
Total precip.	=	5.20 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

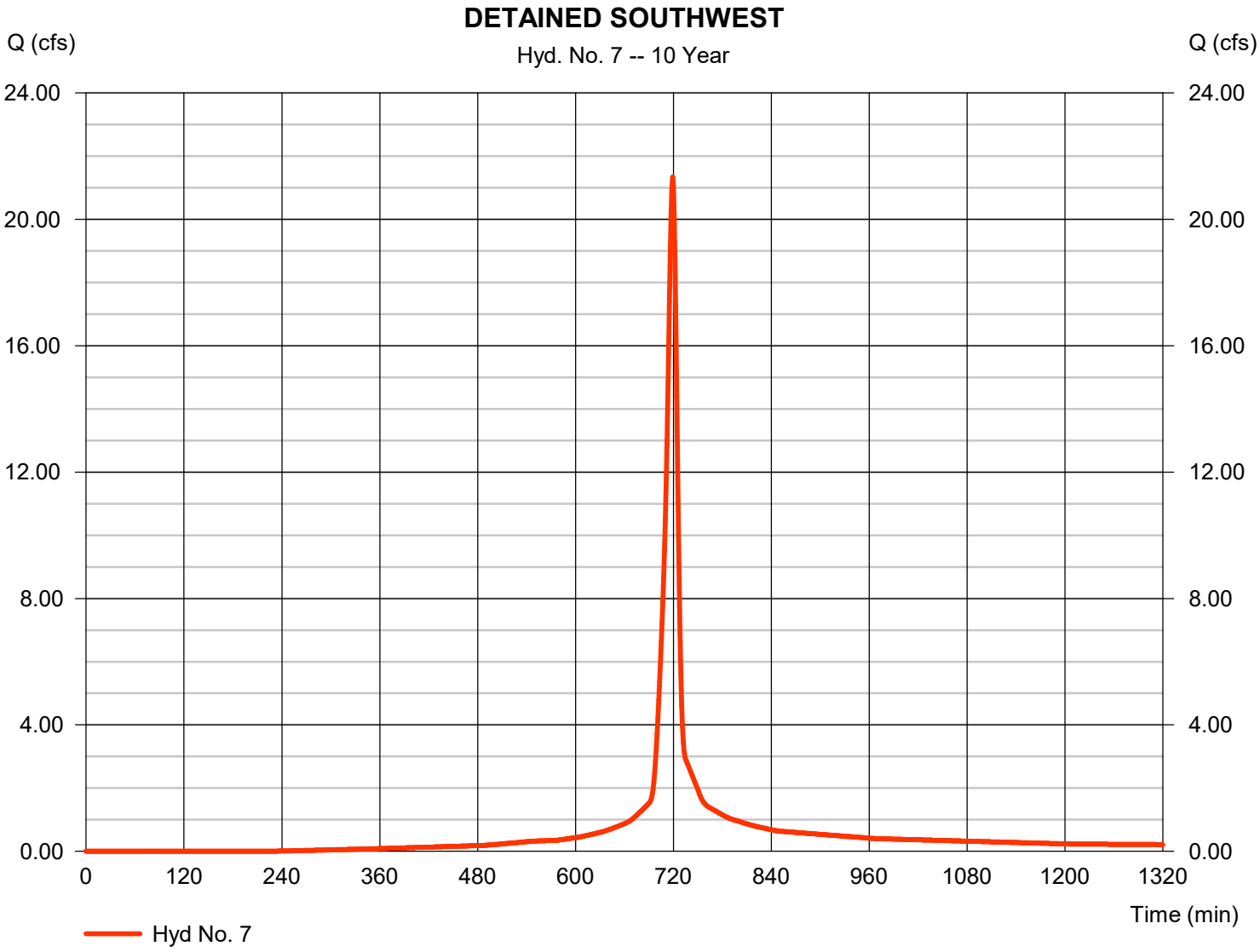


Hydrograph Report

Hyd. No. 7

DETAINED SOUTHWEST

Hydrograph type	=	SCS Runoff	Peak discharge	=	21.34 cfs
Storm frequency	=	10 yrs	Time to peak	=	719 min
Time interval	=	1 min	Hyd. volume	=	51,259 cuft
Drainage area	=	3.470 ac	Curve number	=	90
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	9.30 min
Total precip.	=	5.20 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

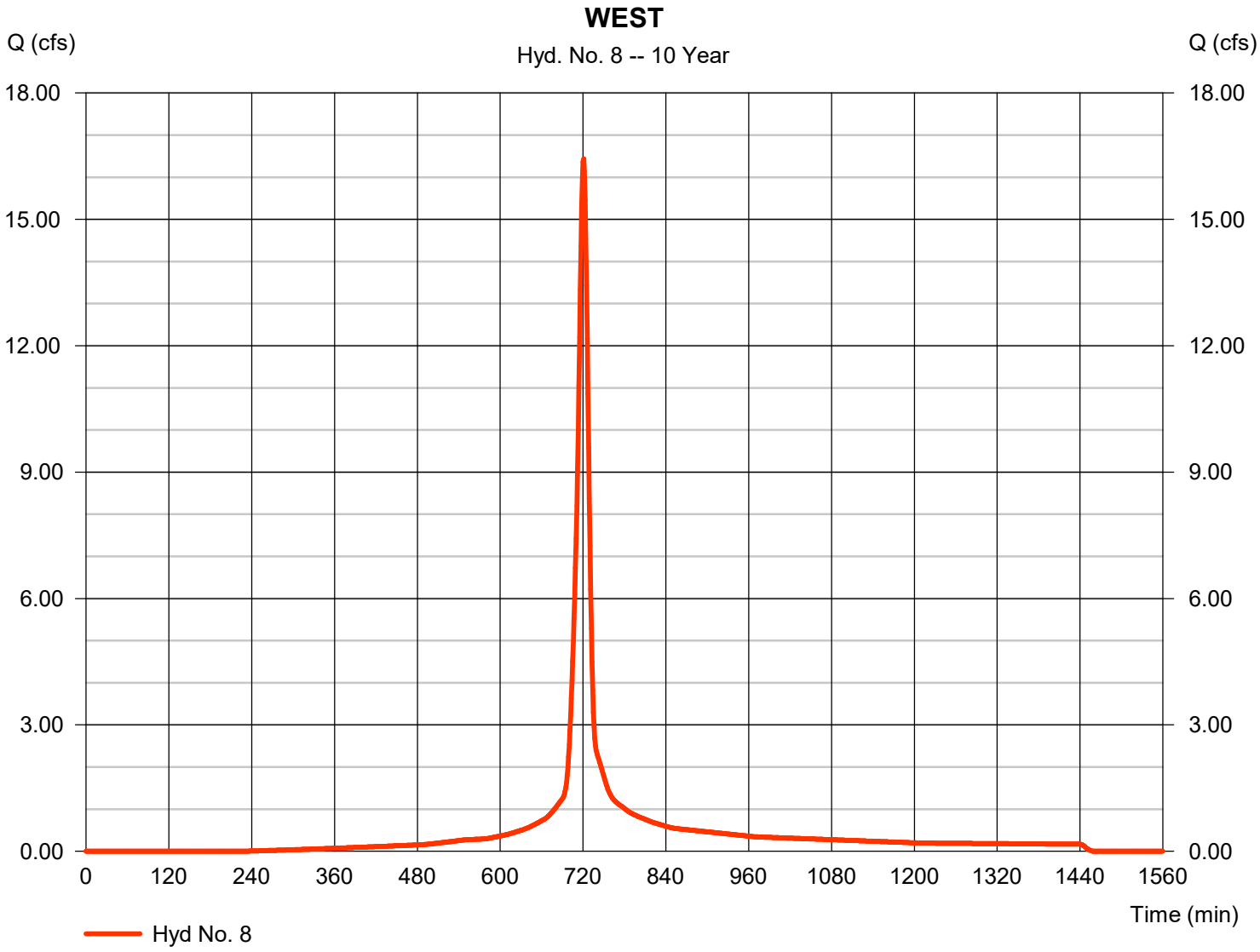


Hydrograph Report

Hyd. No. 8

WEST

Hydrograph type	=	SCS Runoff	Peak discharge	=	16.44 cfs
Storm frequency	=	10 yrs	Time to peak	=	721 min
Time interval	=	1 min	Hyd. volume	=	43,769 cuft
Drainage area	=	3.010 ac	Curve number	=	90
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	12.10 min
Total precip.	=	5.20 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

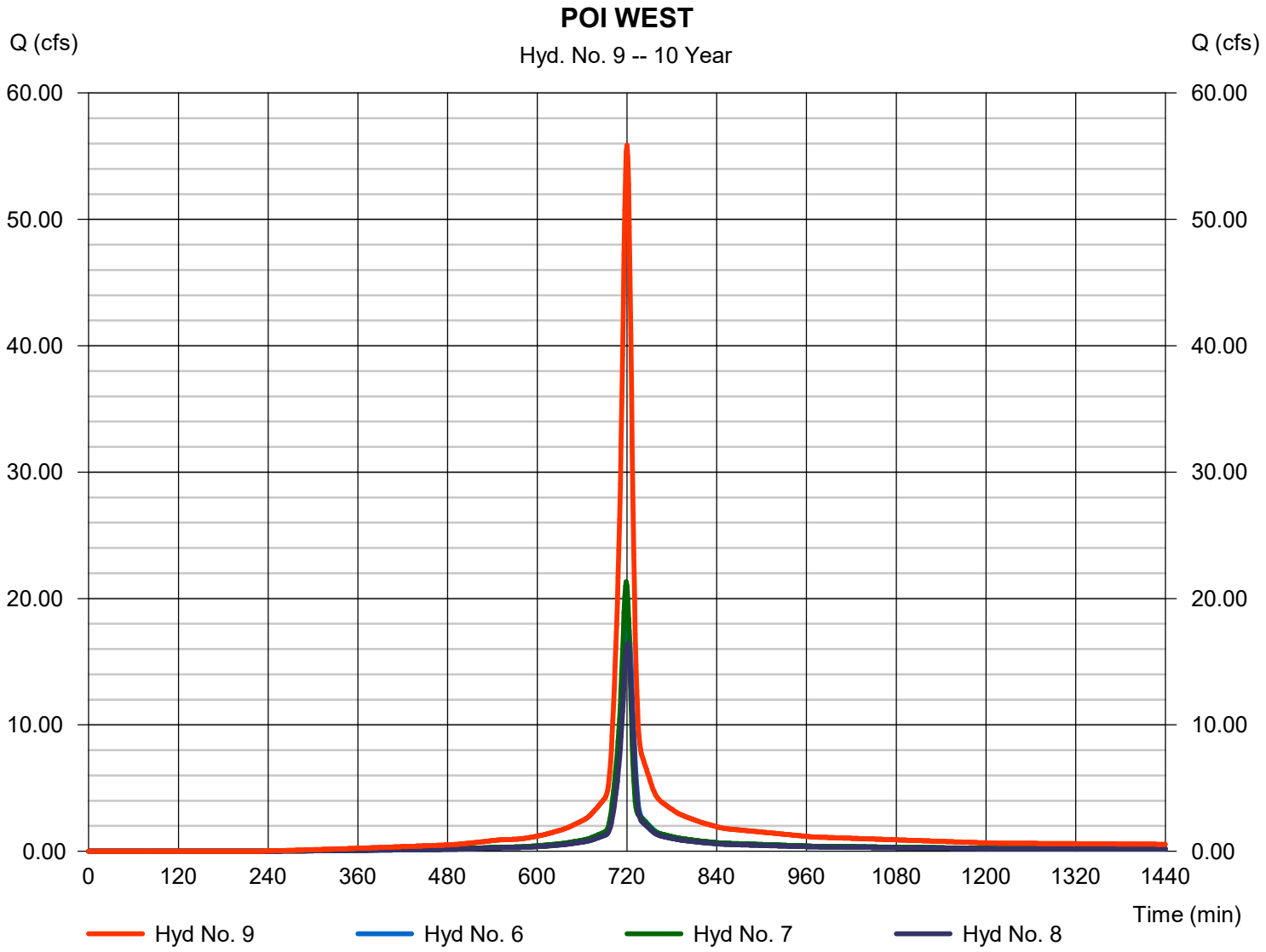


Hydrograph Report

Hyd. No. 9

POI WEST

Hydrograph type	=	Combine	Peak discharge	=	55.86 cfs
Storm frequency	=	10 yrs	Time to peak	=	720 min
Time interval	=	1 min	Hyd. volume	=	144,468 cuft
Inflow hyds.	=	6, 7, 8	Contrib. drain. area	=	9.880 ac

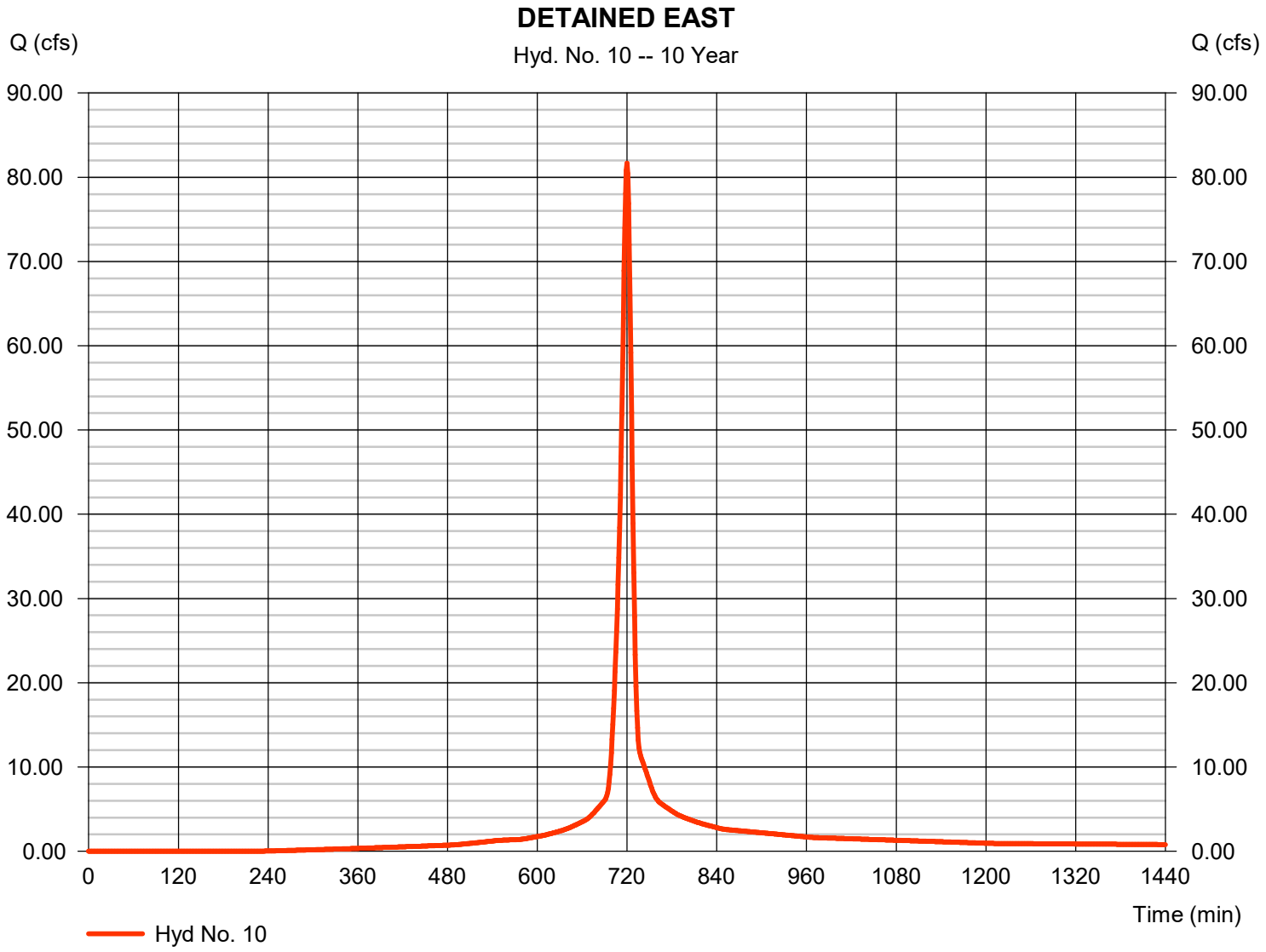


Hydrograph Report

Hyd. No. 10

DETAINED EAST

Hydrograph type	=	SCS Runoff	Peak discharge	=	81.67 cfs
Storm frequency	=	10 yrs	Time to peak	=	720 min
Time interval	=	1 min	Hyd. volume	=	208,547 cuft
Drainage area	=	13.870 ac	Curve number	=	90
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	10.70 min
Total precip.	=	5.20 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

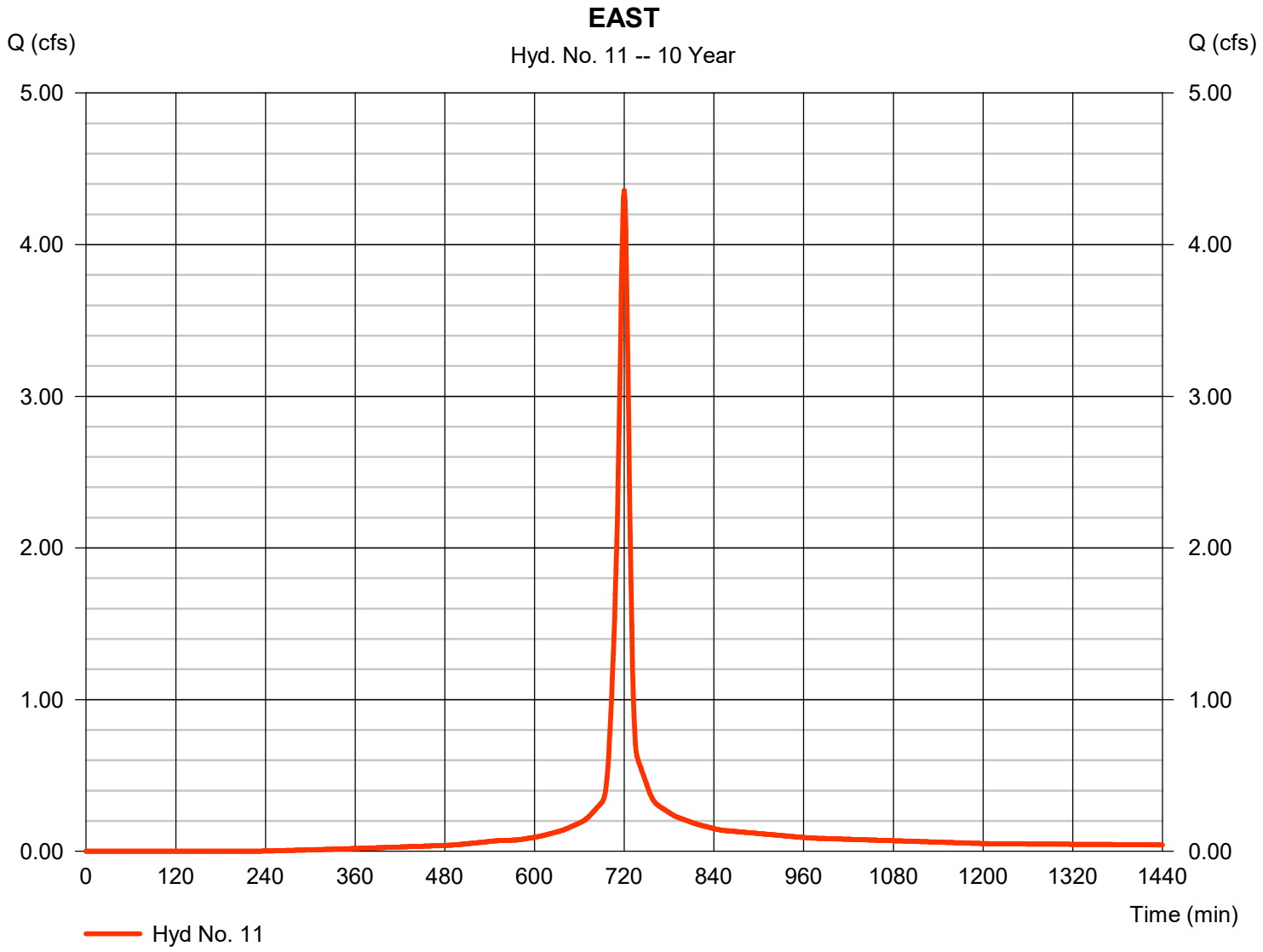


Hydrograph Report

Hyd. No. 11

EAST

Hydrograph type	=	SCS Runoff	Peak discharge	=	4.358 cfs
Storm frequency	=	10 yrs	Time to peak	=	720 min
Time interval	=	1 min	Hyd. volume	=	11,126 cuft
Drainage area	=	0.740 ac	Curve number	=	90
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	11.70 min
Total precip.	=	5.20 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

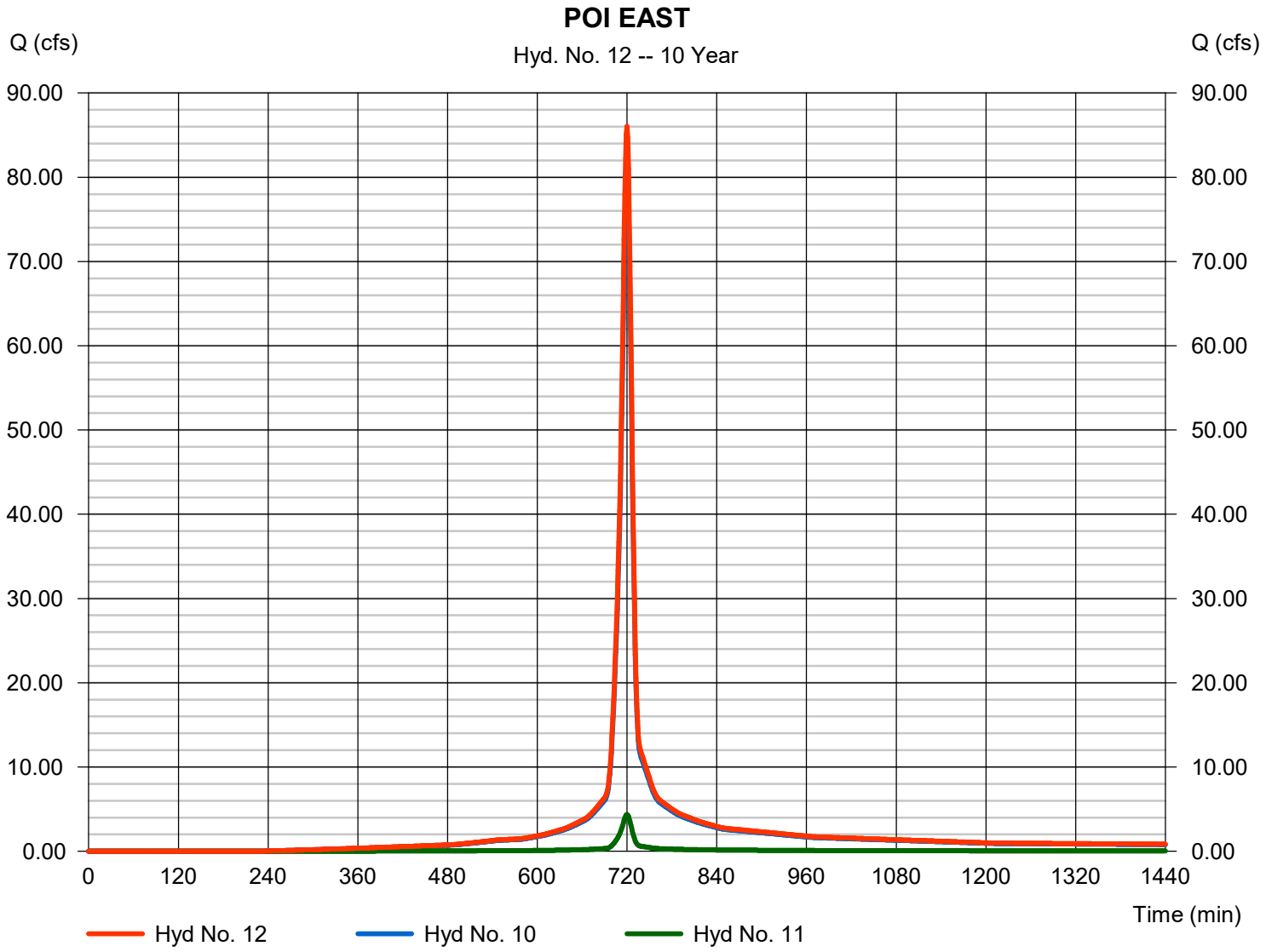


Hydrograph Report

Hyd. No. 12

POI EAST

Hydrograph type	=	Combine	Peak discharge	=	86.03 cfs
Storm frequency	=	10 yrs	Time to peak	=	720 min
Time interval	=	1 min	Hyd. volume	=	219,673 cuft
Inflow hyds.	=	10, 11	Contrib. drain. area	=	14.610 ac



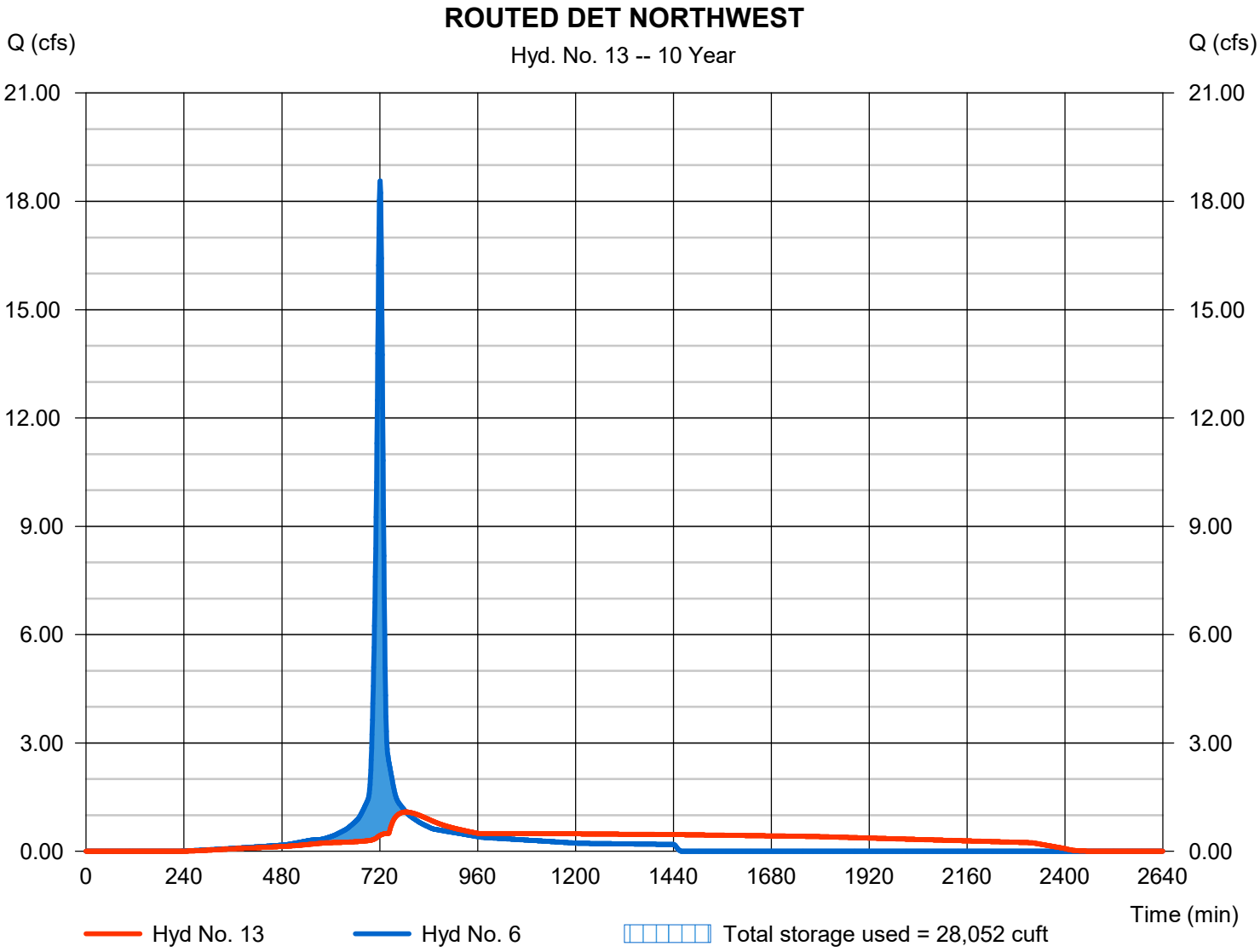
Hydrograph Report

Hyd. No. 13

ROUTED DET NORTHWEST

Hydrograph type	= Reservoir	Peak discharge	= 1.088 cfs
Storm frequency	= 10 yrs	Time to peak	= 784 min
Time interval	= 1 min	Hyd. volume	= 49,439 cuft
Inflow hyd. No.	= 6 - DETAINED NORTHWEST	Max. Elevation	= 1045.54 ft
Reservoir name	= NORTHWEST BASIN	Max. Storage	= 28,052 cuft

Storage Indication method used.



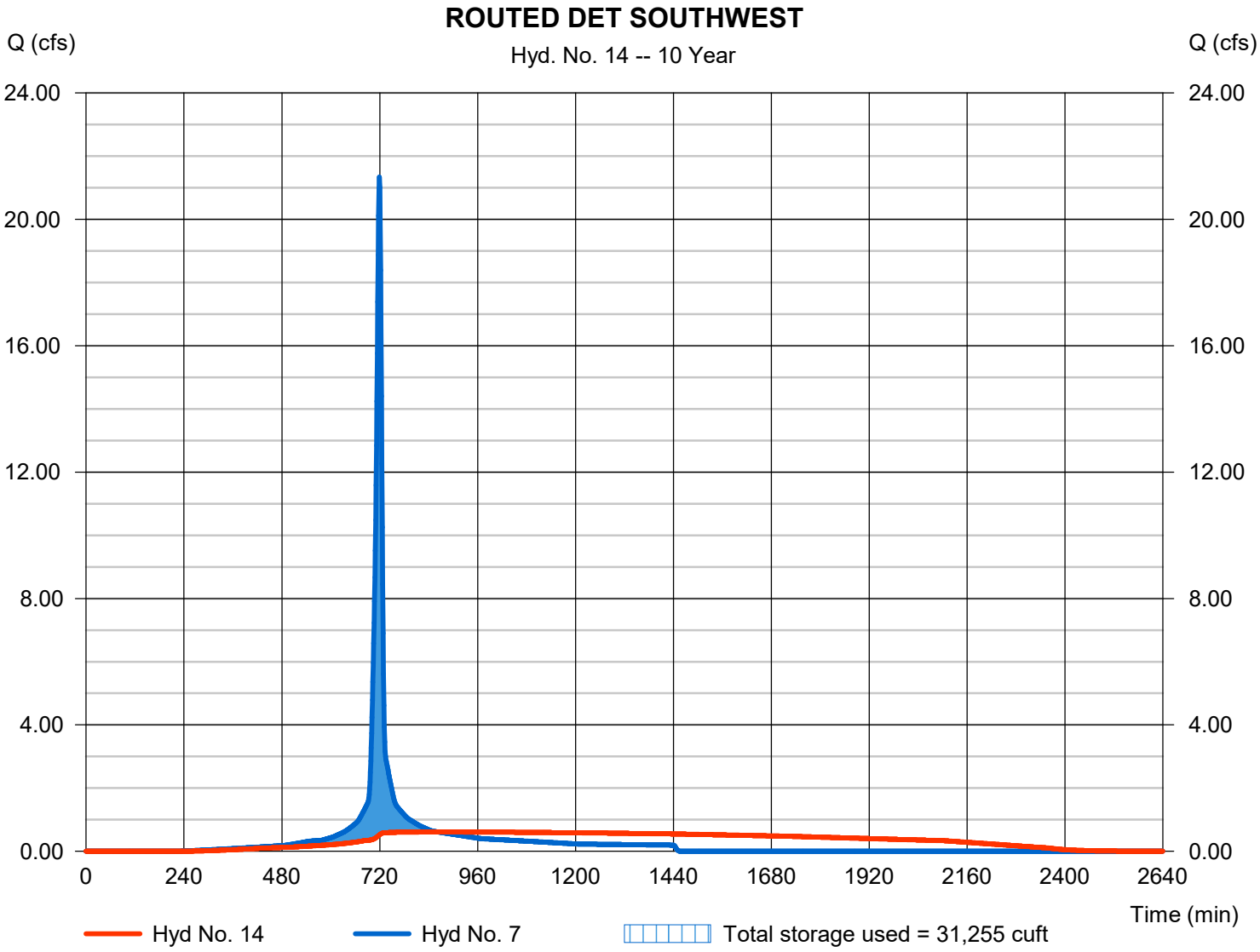
Hydrograph Report

Hyd. No. 14

ROUTED DET SOUTHWEST

Hydrograph type	=	Reservoir	Peak discharge	=	0.611 cfs
Storm frequency	=	10 yrs	Time to peak	=	862 min
Time interval	=	1 min	Hyd. volume	=	51,255 cuft
Inflow hyd. No.	=	7 - DETAINED SOUTHWEST	Max. Elevation	=	1042.68 ft
Reservoir name	=	SOUTHWEST BASIN	Max. Storage	=	31,255 cuft

Storage Indication method used.

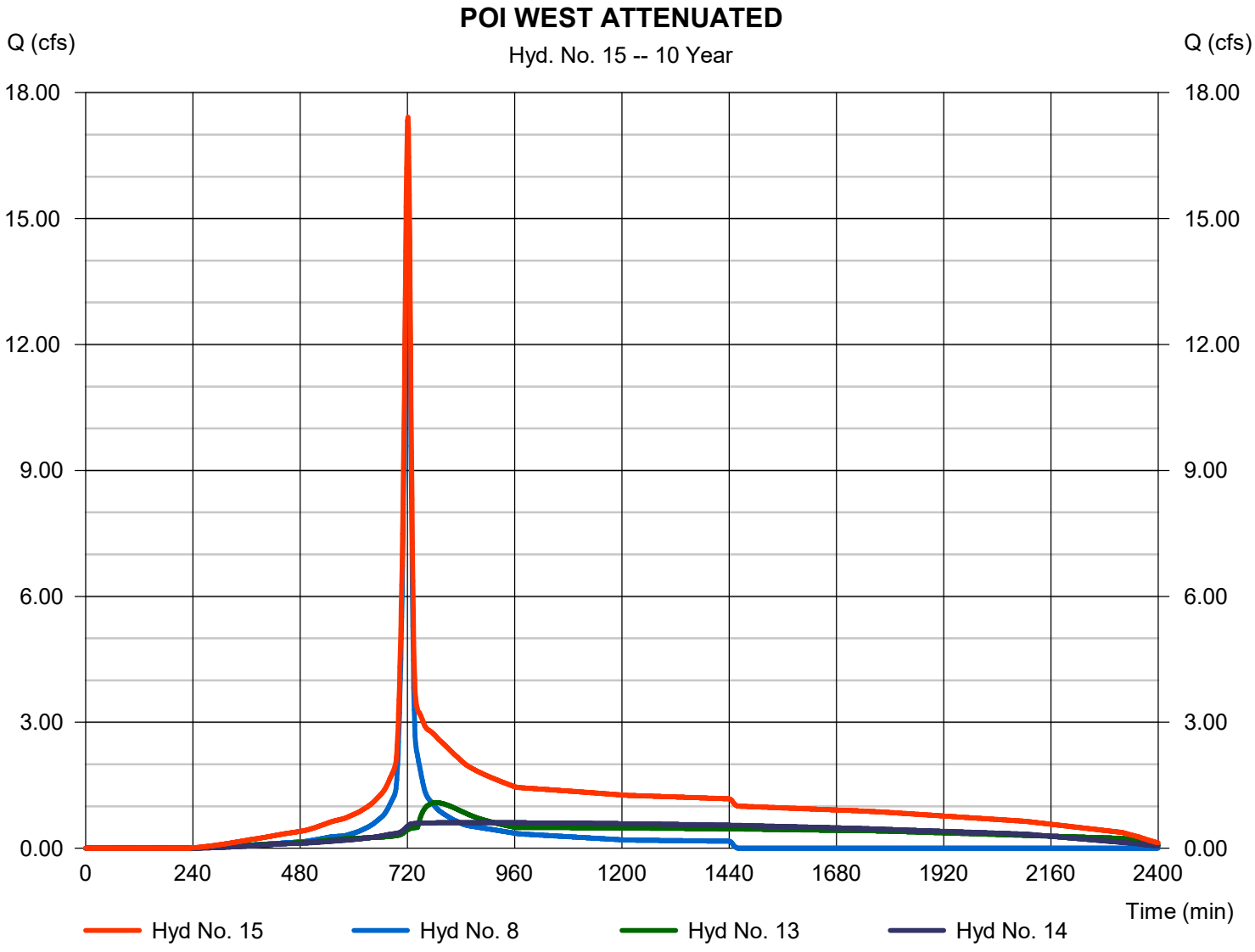


Hydrograph Report

Hyd. No. 15

POI WEST ATTENUATED

Hydrograph type	=	Combine	Peak discharge	=	17.42 cfs
Storm frequency	=	10 yrs	Time to peak	=	721 min
Time interval	=	1 min	Hyd. volume	=	144,464 cuft
Inflow hyds.	=	8, 13, 14	Contrib. drain. area	=	3.010 ac



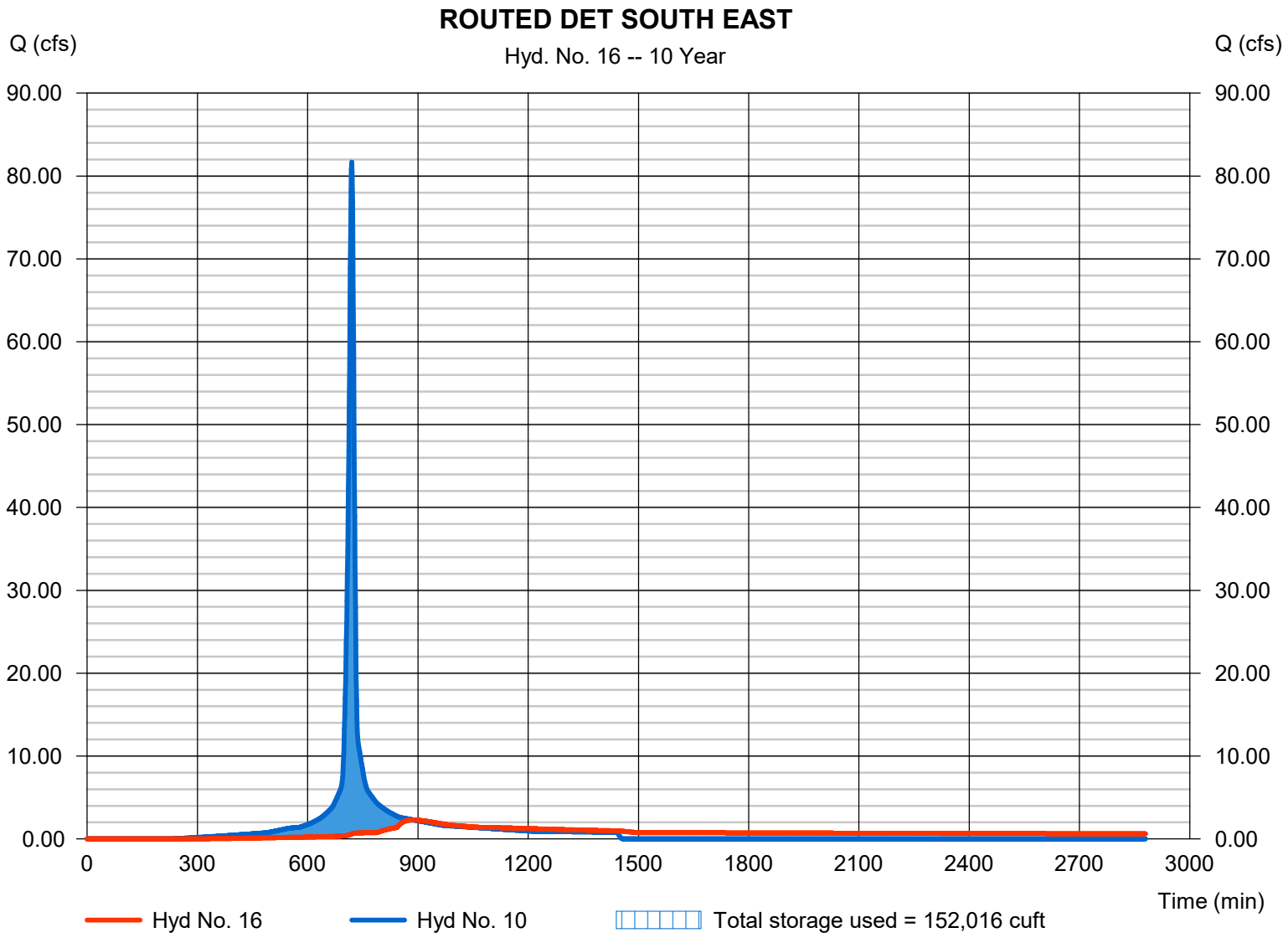
Hydrograph Report

Hyd. No. 16

ROUTED DET SOUTH EAST

Hydrograph type	=	Reservoir	Peak discharge	=	2.293 cfs
Storm frequency	=	10 yrs	Time to peak	=	887 min
Time interval	=	1 min	Hyd. volume	=	121,921 cuft
Inflow hyd. No.	=	10 - DETAINED EAST	Max. Elevation	=	1043.83 ft
Reservoir name	=	SOUTHEAST BASIN	Max. Storage	=	152,016 cuft

Storage Indication method used.

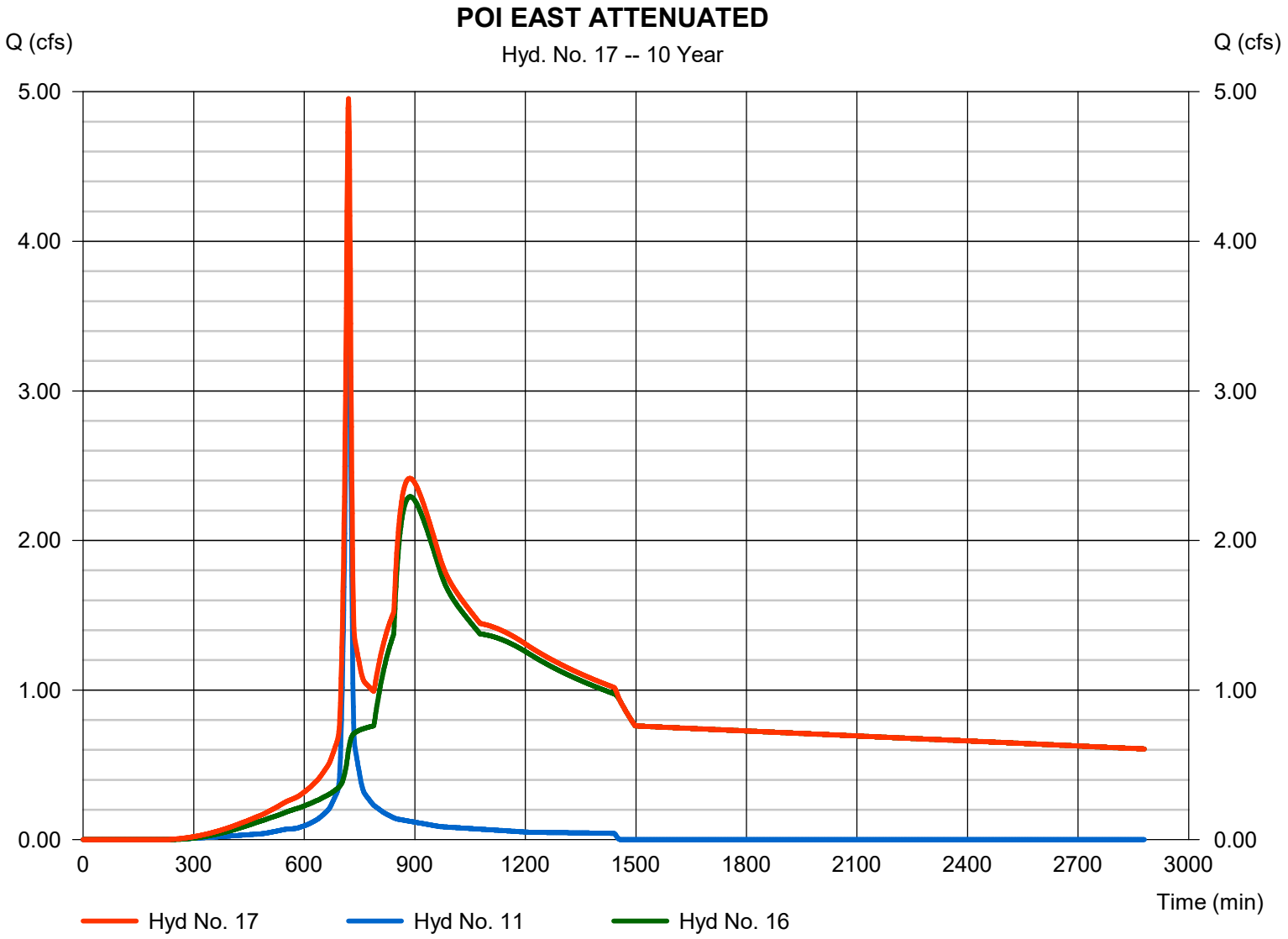


Hydrograph Report

Hyd. No. 17

POI EAST ATTENUATED

Hydrograph type	=	Combine	Peak discharge	=	4.955 cfs
Storm frequency	=	10 yrs	Time to peak	=	720 min
Time interval	=	1 min	Hyd. volume	=	133,047 cuft
Inflow hyds.	=	11, 16	Contrib. drain. area	=	0.740 ac



Hydrograph Summary Report

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

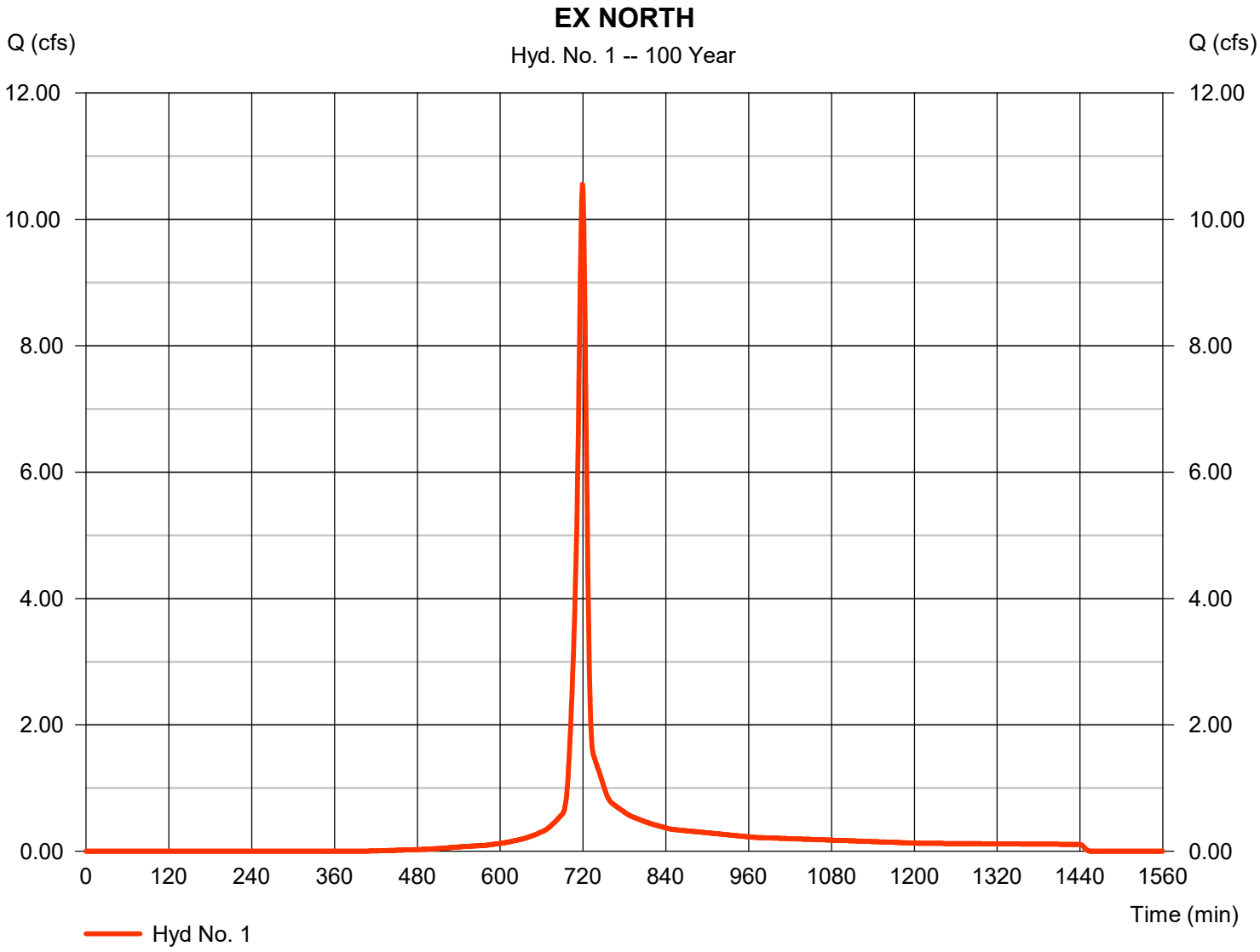
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	10.55	1	719	24,125	------	------	------	EX NORTH
2	SCS Runoff	100.49	1	722	271,582	------	------	------	EX WEST
3	SCS Runoff	101.31	1	725	317,075	------	------	------	EX EAST
4	SCS Runoff	406.40	1	738	2,031,258	------	------	------	EX SOUTH
5	SCS Runoff	4.959	1	717	11,133	------	------	------	PROP NORTH
6	SCS Runoff	29.28	1	721	80,291	------	------	------	DETAINED NORTHWEST
7	SCS Runoff	33.60	1	719	83,244	------	------	------	DETAINED SOUTHWEST
8	SCS Runoff	25.92	1	721	71,081	------	------	------	WEST
9	Combine	88.09	1	720	234,616	6, 7, 8	------	------	POI WEST
10	SCS Runoff	128.75	1	720	338,680	------	------	------	DETAINED EAST
11	SCS Runoff	6.869	1	720	18,069	------	------	------	EAST
12	Combine	135.62	1	720	356,749	10, 11	------	------	POI EAST
13	Reservoir	14.84	1	729	80,290	6	1046.16	35,347	ROUTED DET NORTHWEST
14	Reservoir	4.075	1	739	83,209	7	1044.25	44,914	ROUTED DET SOUTHWEST
15	Combine	33.72	1	724	234,579	8, 13, 14	------	------	POI WEST ATTENUATED
16	Reservoir	42.13	1	730	249,764	10	1044.59	184,188	ROUTED DET SOUTH EAST
17	Combine	44.44	1	730	267,833	11, 16	------	------	POI EAST ATTENUATED

Hydrograph Report

Hyd. No. 1

EX NORTH

Hydrograph type	=	SCS Runoff	Peak discharge	=	10.55 cfs
Storm frequency	=	100 yrs	Time to peak	=	719 min
Time interval	=	1 min	Hyd. volume	=	24,125 cuft
Drainage area	=	1.400 ac	Curve number	=	74
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	8.70 min
Total precip.	=	7.80 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

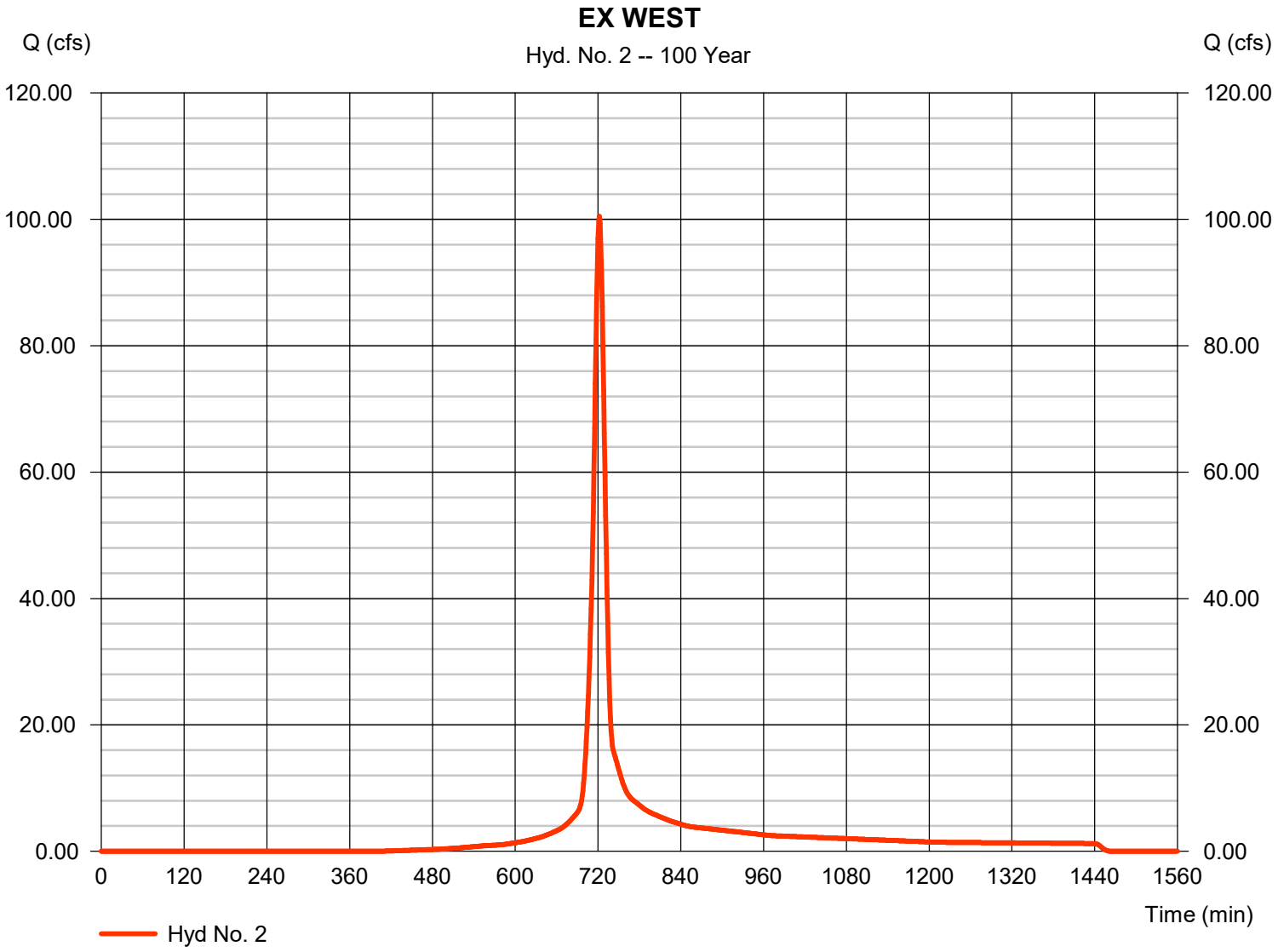


Hydrograph Report

Hyd. No. 2

EX WEST

Hydrograph type	=	SCS Runoff	Peak discharge	=	100.49 cfs
Storm frequency	=	100 yrs	Time to peak	=	722 min
Time interval	=	1 min	Hyd. volume	=	271,582 cuft
Drainage area	=	15.760 ac	Curve number	=	74
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	14.30 min
Total precip.	=	7.80 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

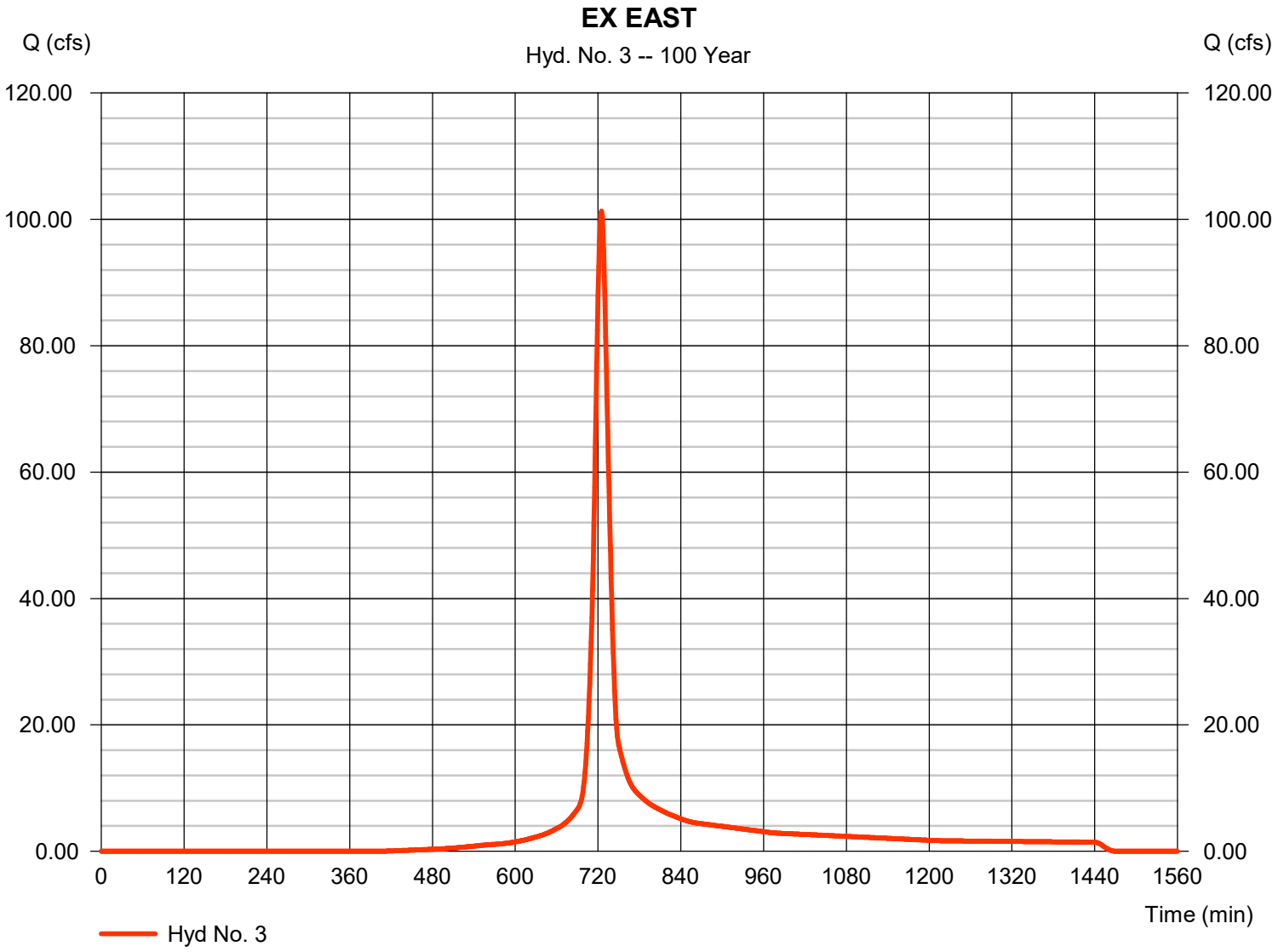


Hydrograph Report

Hyd. No. 3

EX EAST

Hydrograph type	=	SCS Runoff	Peak discharge	=	101.31 cfs
Storm frequency	=	100 yrs	Time to peak	=	725 min
Time interval	=	1 min	Hyd. volume	=	317,075 cuft
Drainage area	=	18.400 ac	Curve number	=	74
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	19.50 min
Total precip.	=	7.80 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

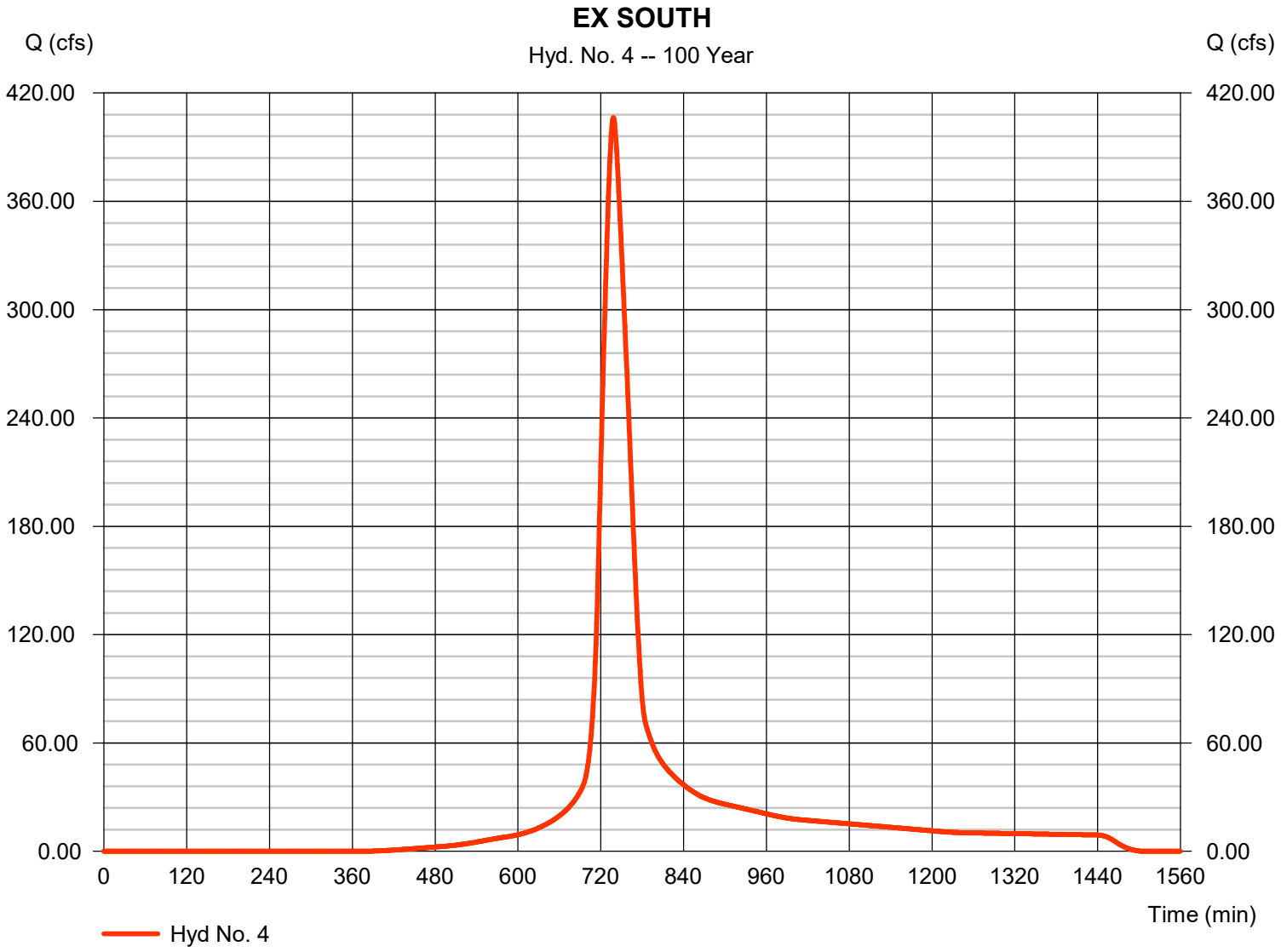


Hydrograph Report

Hyd. No. 4

EX SOUTH

Hydrograph type	=	SCS Runoff	Peak discharge	=	406.40 cfs
Storm frequency	=	100 yrs	Time to peak	=	738 min
Time interval	=	1 min	Hyd. volume	=	2,031,258 cuft
Drainage area	=	111.890 ac	Curve number	=	76
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	41.50 min
Total precip.	=	7.80 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

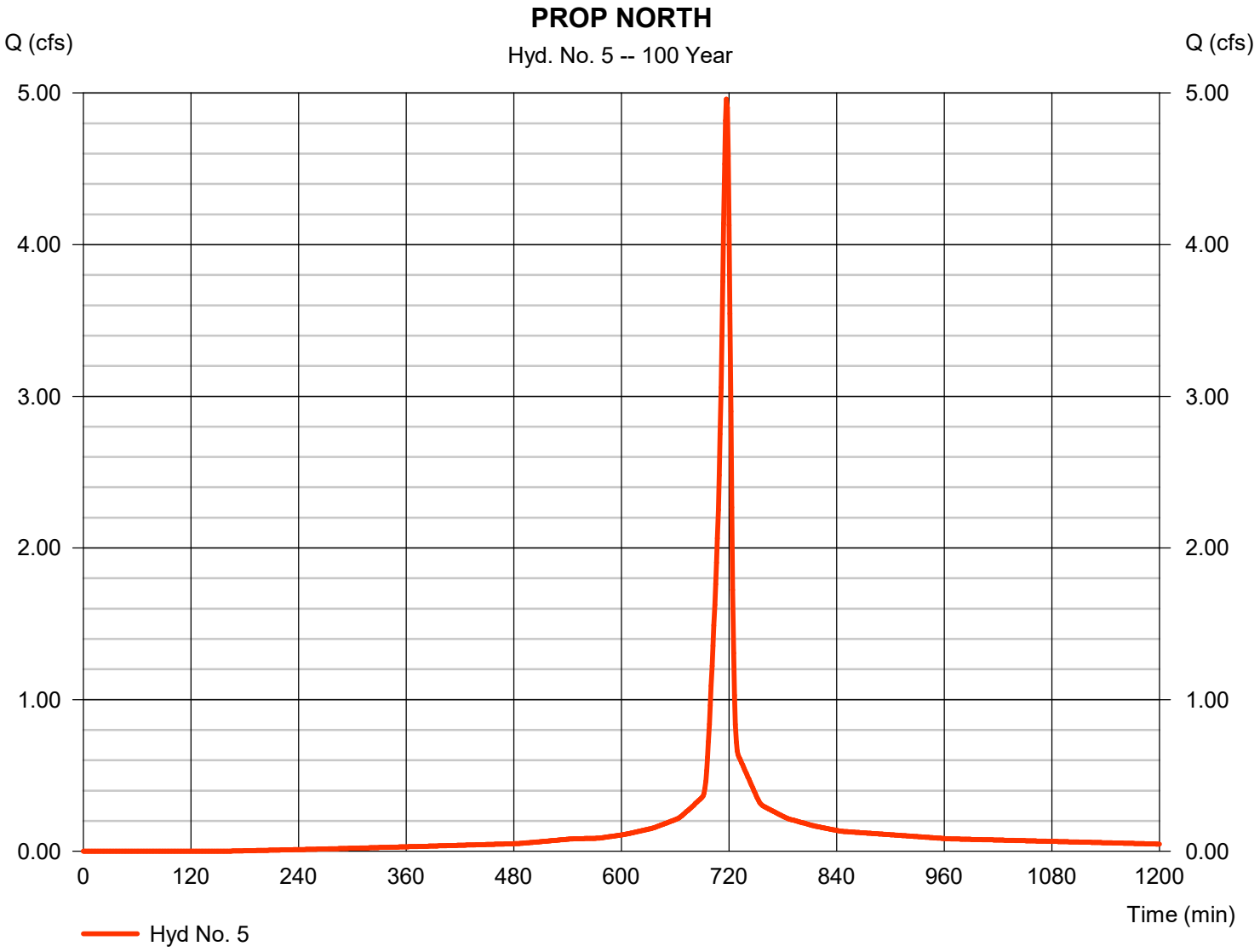


Hydrograph Report

Hyd. No. 5

PROP NORTH

Hydrograph type	=	SCS Runoff	Peak discharge	=	4.959 cfs
Storm frequency	=	100 yrs	Time to peak	=	717 min
Time interval	=	1 min	Hyd. volume	=	11,133 cuft
Drainage area	=	0.450 ac	Curve number	=	90
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	7.80 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

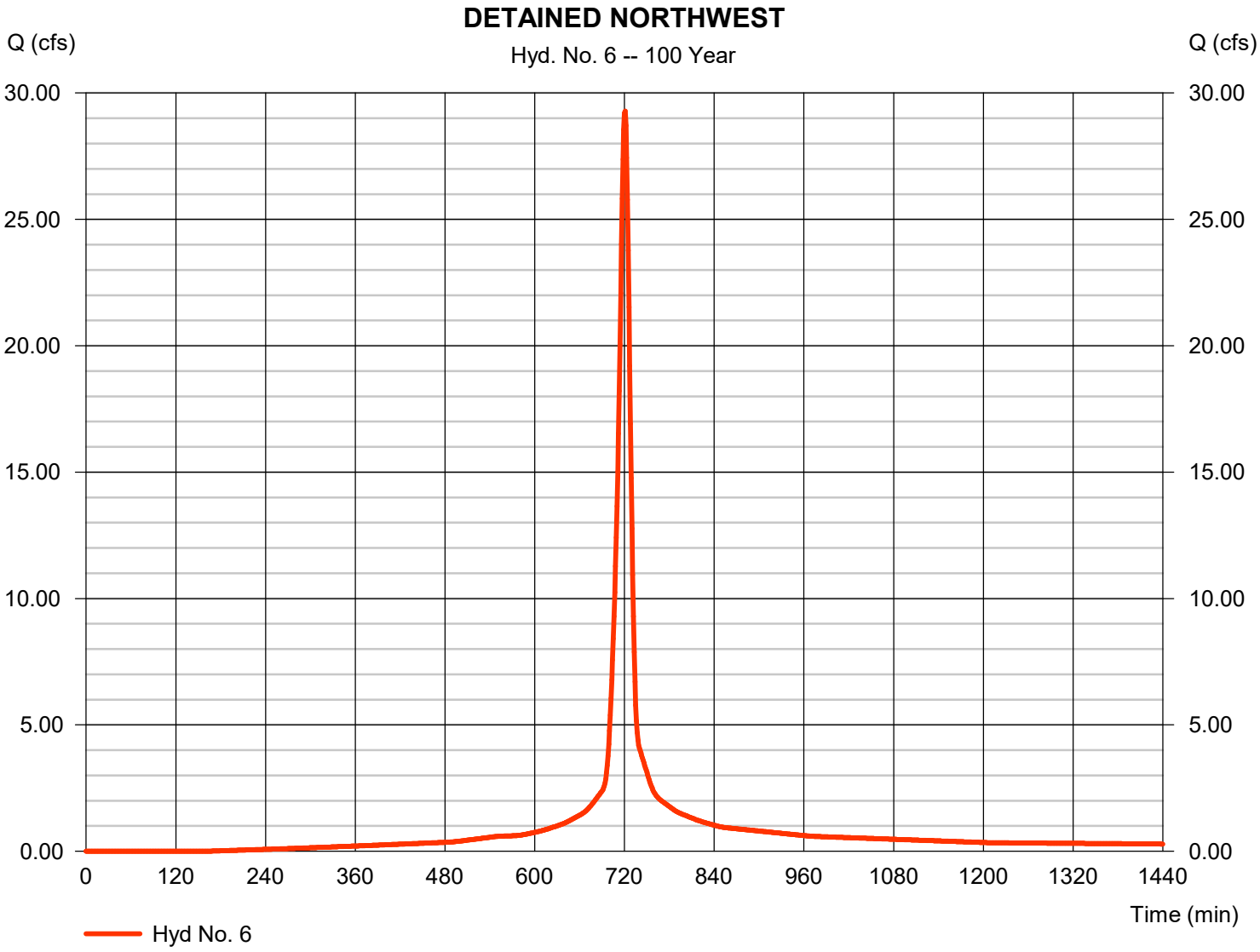


Hydrograph Report

Hyd. No. 6

DETAINED NORTHWEST

Hydrograph type	=	SCS Runoff	Peak discharge	=	29.28 cfs
Storm frequency	=	100 yrs	Time to peak	=	721 min
Time interval	=	1 min	Hyd. volume	=	80,291 cuft
Drainage area	=	3.400 ac	Curve number	=	90
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	12.60 min
Total precip.	=	7.80 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

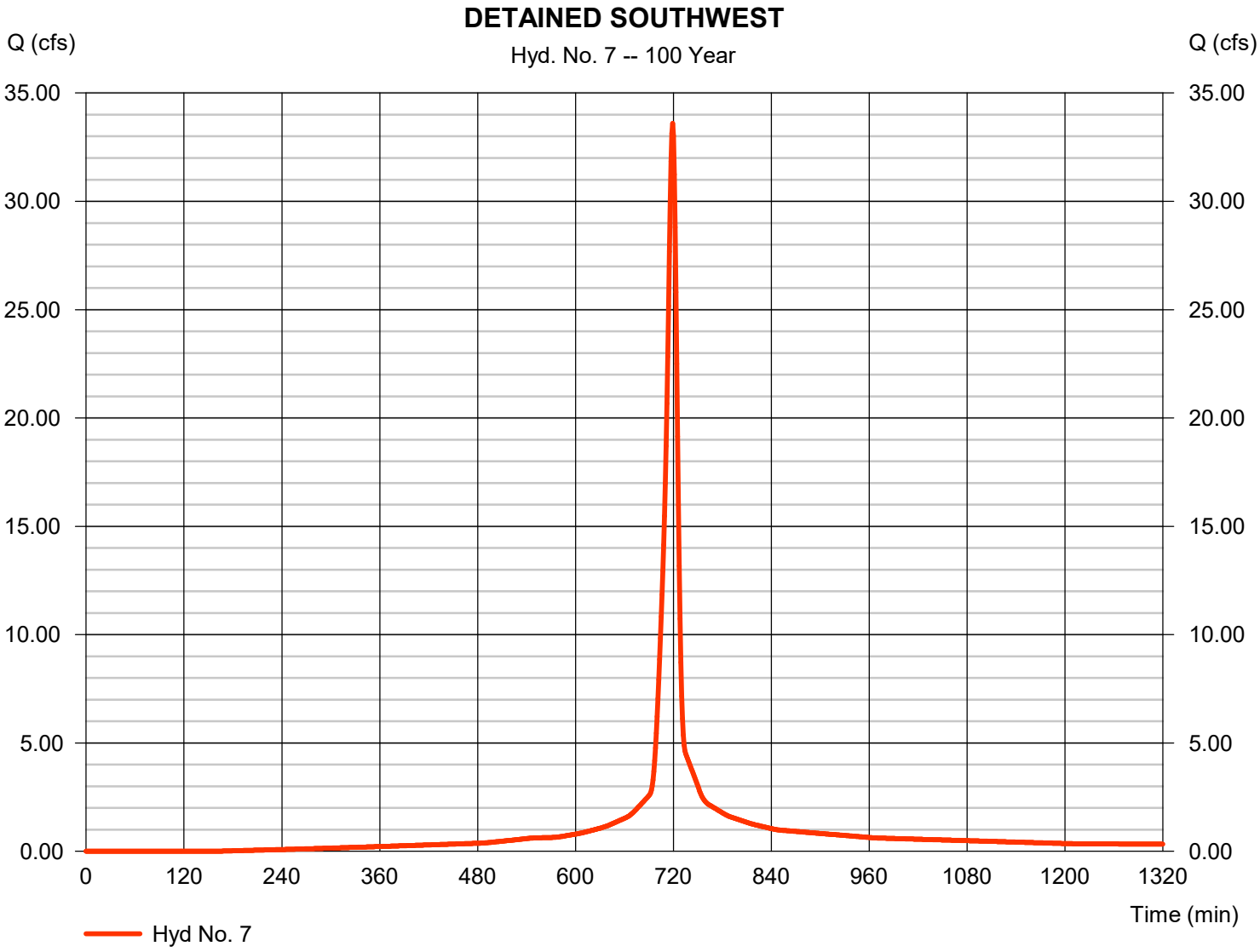


Hydrograph Report

Hyd. No. 7

DETAINED SOUTHWEST

Hydrograph type	=	SCS Runoff	Peak discharge	=	33.60 cfs
Storm frequency	=	100 yrs	Time to peak	=	719 min
Time interval	=	1 min	Hyd. volume	=	83,244 cuft
Drainage area	=	3.470 ac	Curve number	=	90
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	9.30 min
Total precip.	=	7.80 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

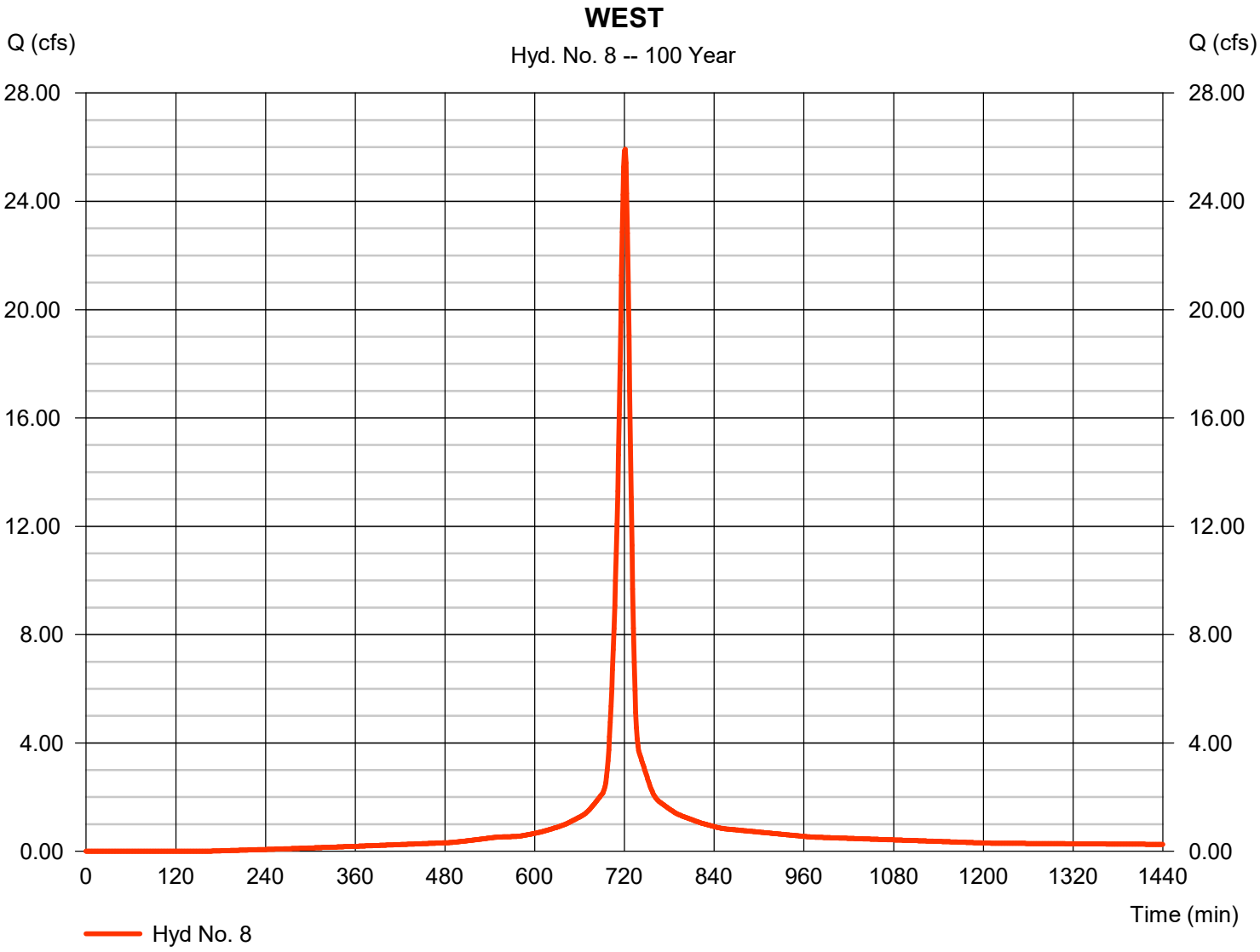


Hydrograph Report

Hyd. No. 8

WEST

Hydrograph type	=	SCS Runoff	Peak discharge	=	25.92 cfs
Storm frequency	=	100 yrs	Time to peak	=	721 min
Time interval	=	1 min	Hyd. volume	=	71,081 cuft
Drainage area	=	3.010 ac	Curve number	=	90
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	12.10 min
Total precip.	=	7.80 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

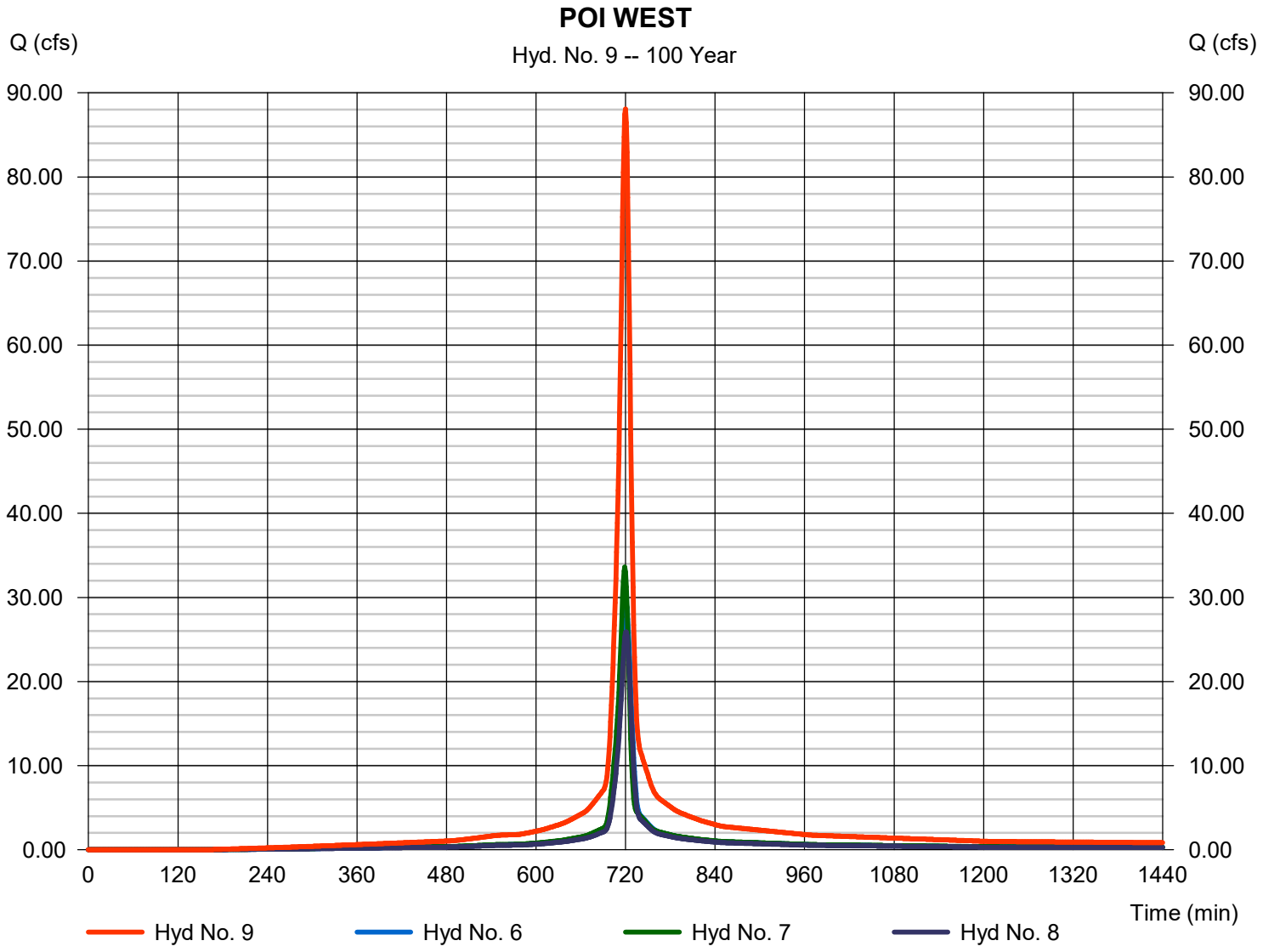


Hydrograph Report

Hyd. No. 9

POI WEST

Hydrograph type	=	Combine	Peak discharge	=	88.09 cfs
Storm frequency	=	100 yrs	Time to peak	=	720 min
Time interval	=	1 min	Hyd. volume	=	234,616 cuft
Inflow hyds.	=	6, 7, 8	Contrib. drain. area	=	9.880 ac

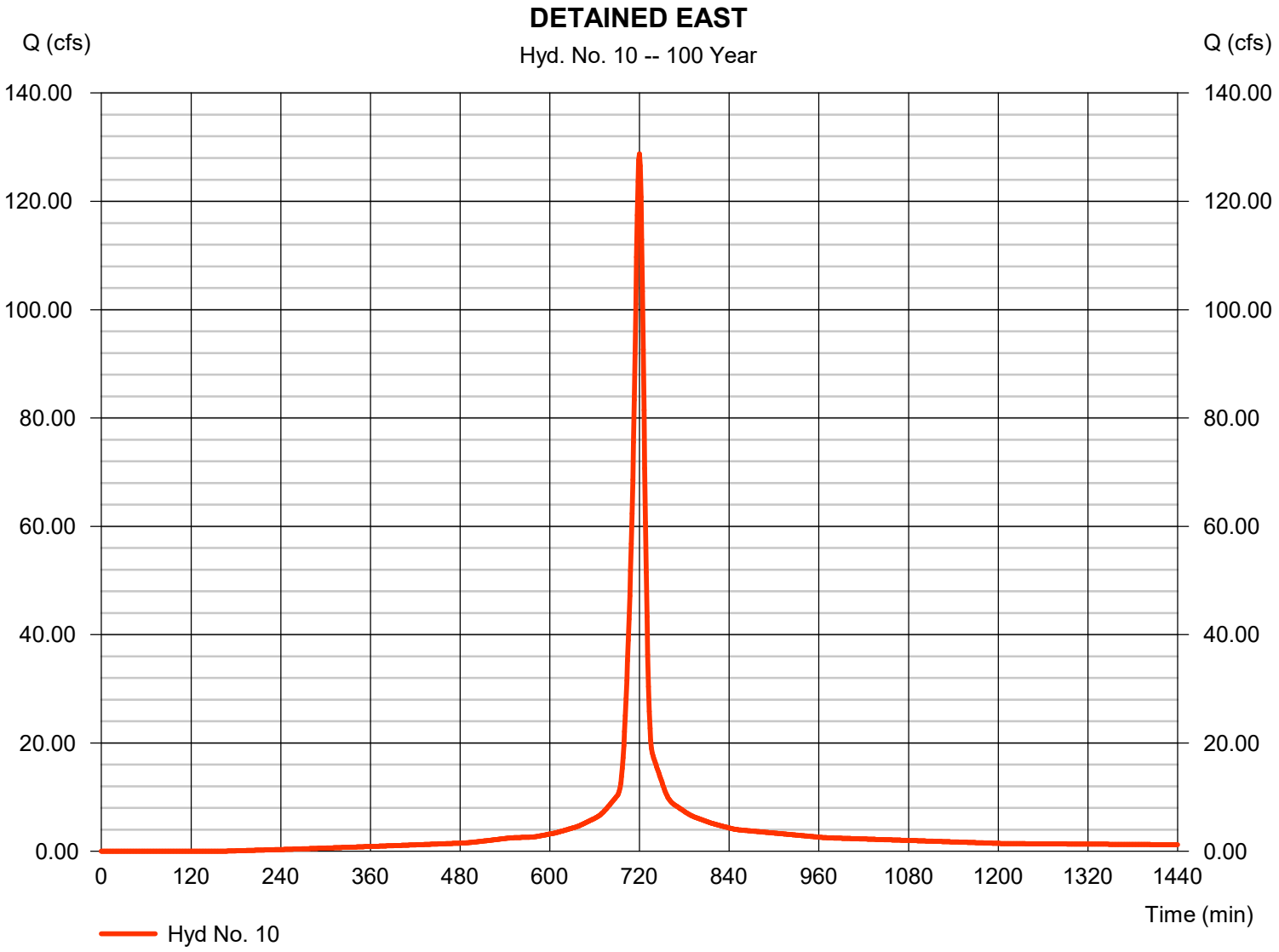


Hydrograph Report

Hyd. No. 10

DETAINED EAST

Hydrograph type	=	SCS Runoff	Peak discharge	=	128.75 cfs
Storm frequency	=	100 yrs	Time to peak	=	720 min
Time interval	=	1 min	Hyd. volume	=	338,680 cuft
Drainage area	=	13.870 ac	Curve number	=	90
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	10.70 min
Total precip.	=	7.80 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

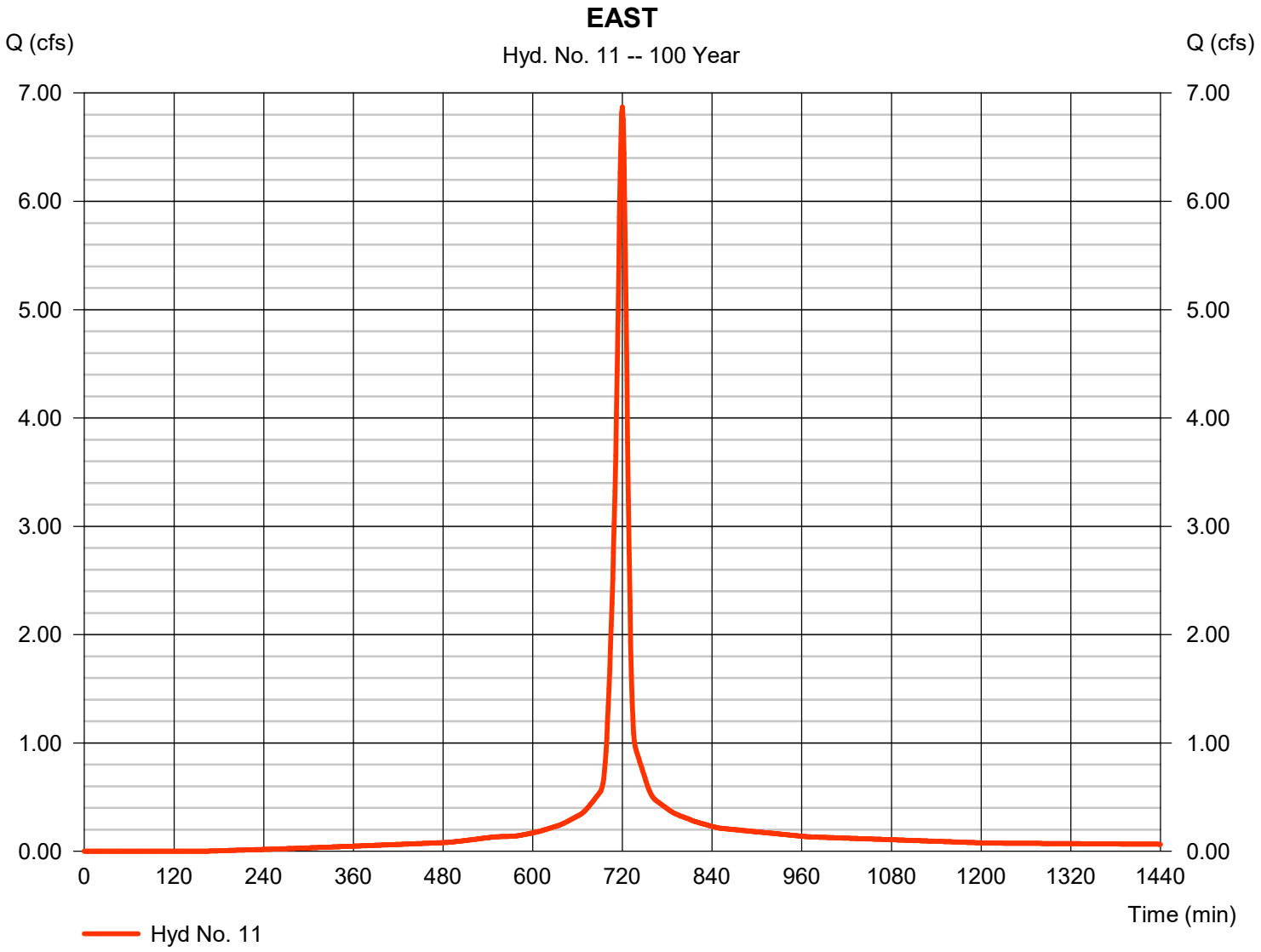


Hydrograph Report

Hyd. No. 11

EAST

Hydrograph type	=	SCS Runoff	Peak discharge	=	6.869 cfs
Storm frequency	=	100 yrs	Time to peak	=	720 min
Time interval	=	1 min	Hyd. volume	=	18,069 cuft
Drainage area	=	0.740 ac	Curve number	=	90
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	11.70 min
Total precip.	=	7.80 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

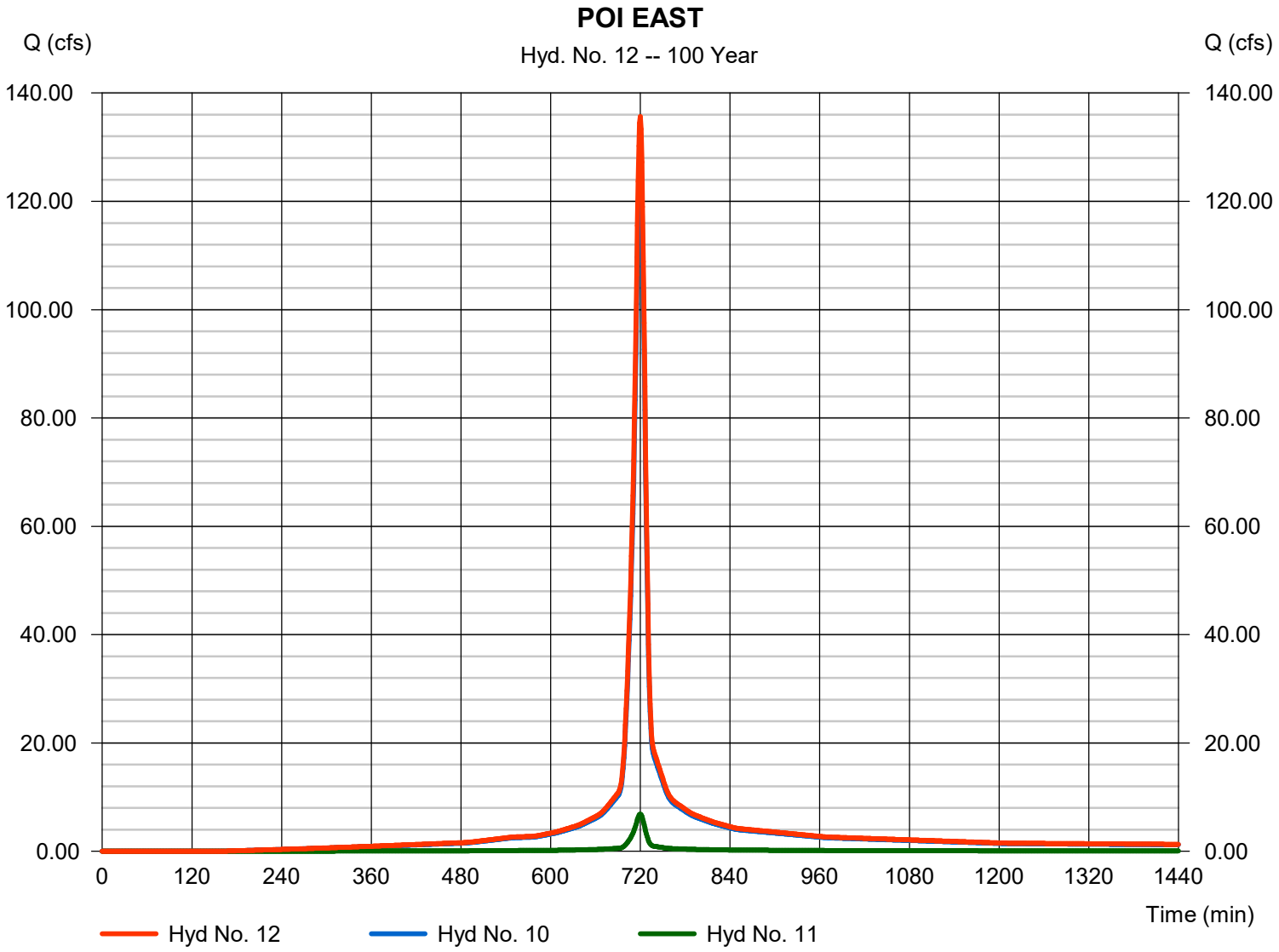


Hydrograph Report

Hyd. No. 12

POI EAST

Hydrograph type	=	Combine	Peak discharge	=	135.62 cfs
Storm frequency	=	100 yrs	Time to peak	=	720 min
Time interval	=	1 min	Hyd. volume	=	356,749 cuft
Inflow hyds.	=	10, 11	Contrib. drain. area	=	14.610 ac



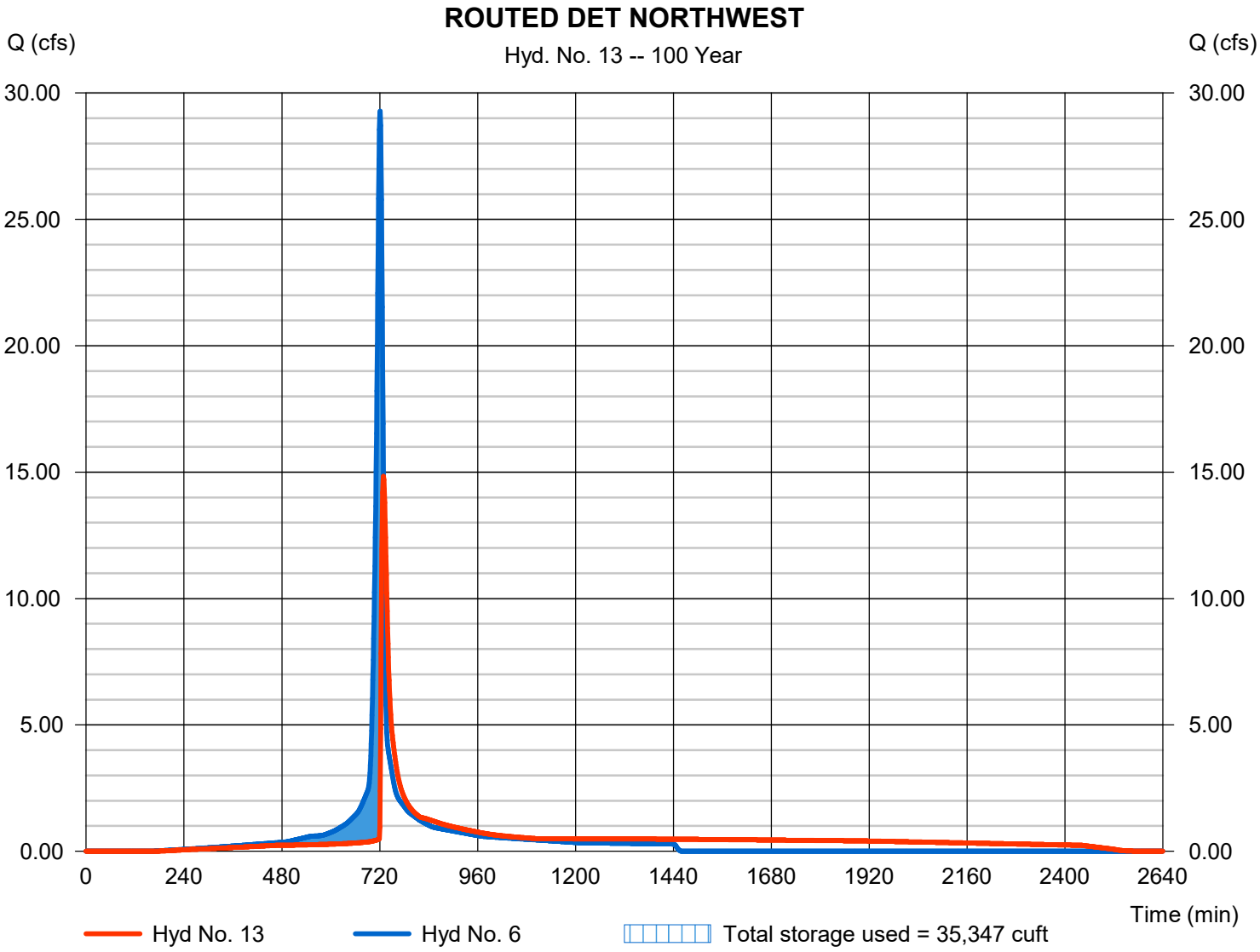
Hydrograph Report

Hyd. No. 13

ROUTED DET NORTHWEST

Hydrograph type	= Reservoir	Peak discharge	= 14.84 cfs
Storm frequency	= 100 yrs	Time to peak	= 729 min
Time interval	= 1 min	Hyd. volume	= 80,290 cuft
Inflow hyd. No.	= 6 - DETAINED NORTHWEST	Max. Elevation	= 1046.16 ft
Reservoir name	= NORTHWEST BASIN	Max. Storage	= 35,347 cuft

Storage Indication method used.



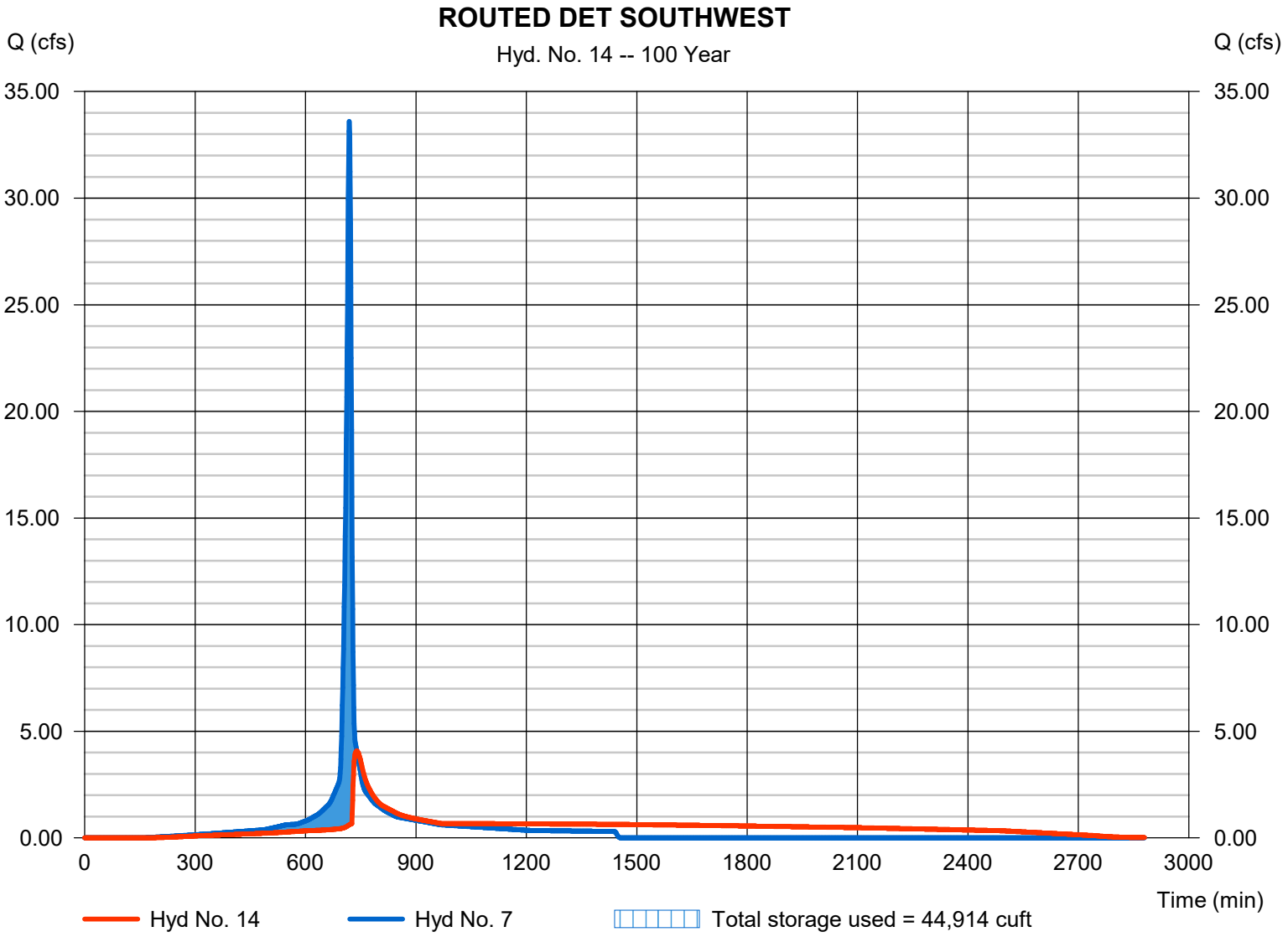
Hydrograph Report

Hyd. No. 14

ROUTED DET SOUTHWEST

Hydrograph type	= Reservoir	Peak discharge	= 4.075 cfs
Storm frequency	= 100 yrs	Time to peak	= 739 min
Time interval	= 1 min	Hyd. volume	= 83,209 cuft
Inflow hyd. No.	= 7 - DETAINED SOUTHWEST	Max. Elevation	= 1044.25 ft
Reservoir name	= SOUTHWEST BASIN	Max. Storage	= 44,914 cuft

Storage Indication method used.

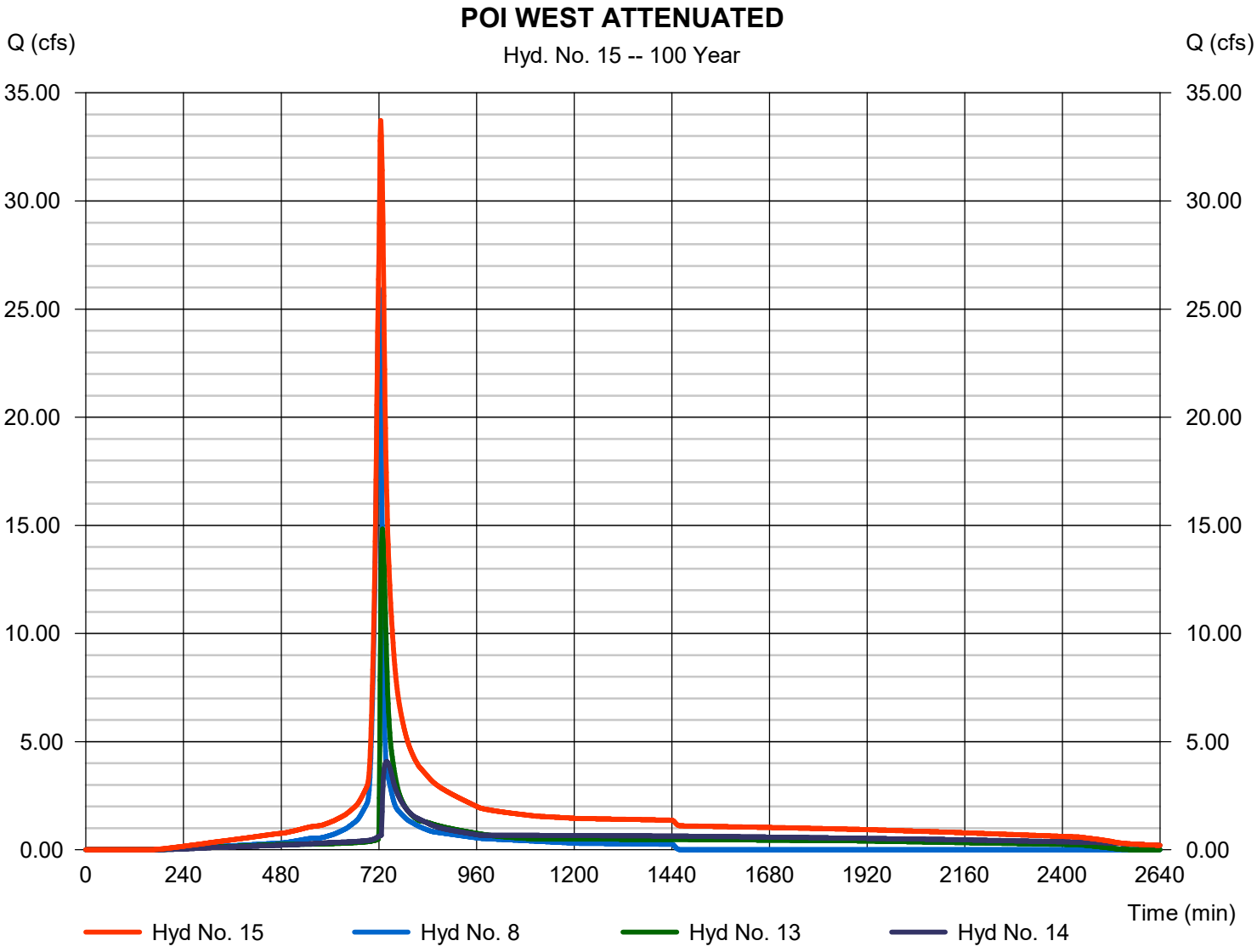


Hydrograph Report

Hyd. No. 15

POI WEST ATTENUATED

Hydrograph type	=	Combine	Peak discharge	=	33.72 cfs
Storm frequency	=	100 yrs	Time to peak	=	724 min
Time interval	=	1 min	Hyd. volume	=	234,579 cuft
Inflow hyds.	=	8, 13, 14	Contrib. drain. area	=	3.010 ac



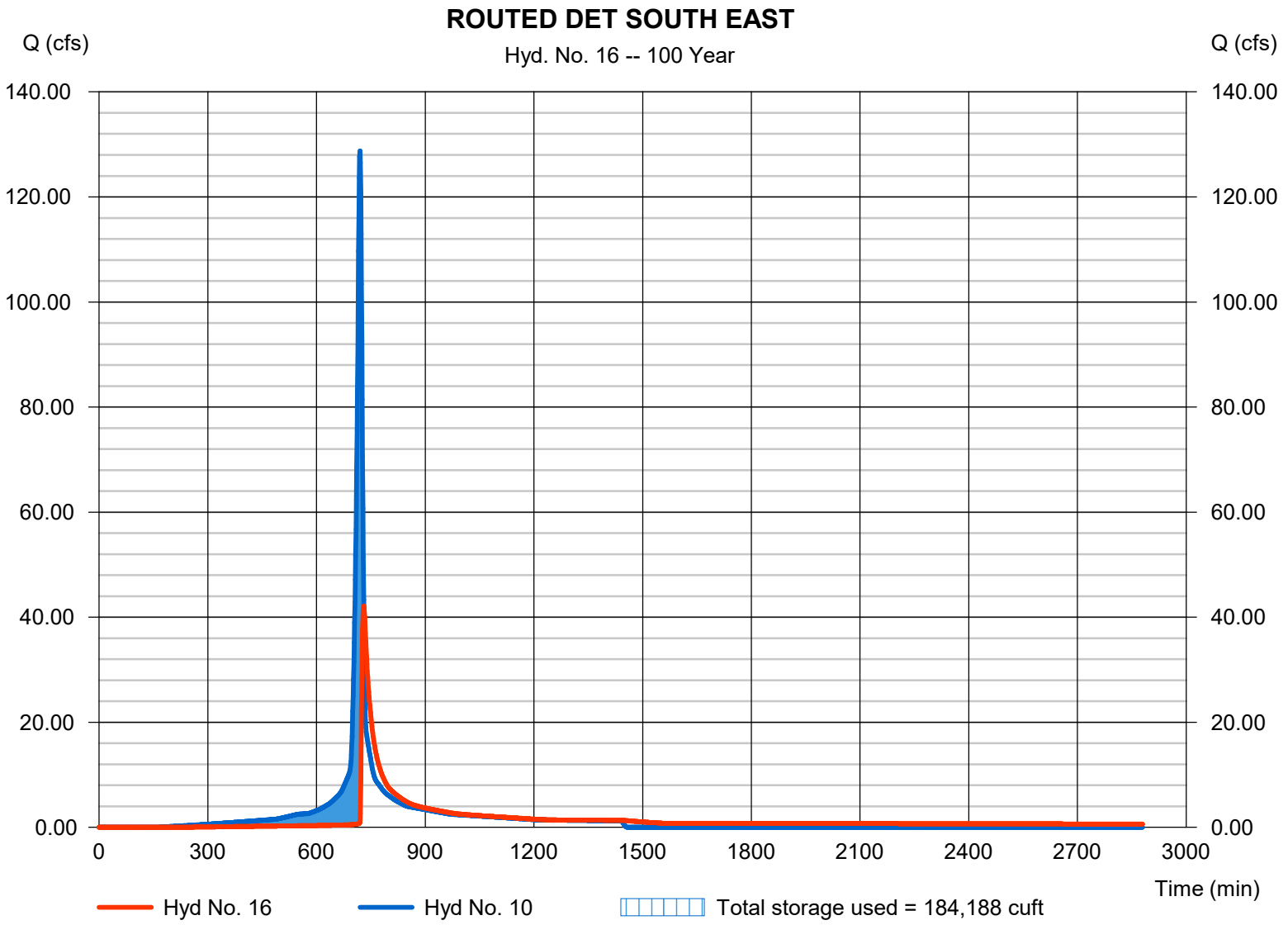
Hydrograph Report

Hyd. No. 16

ROUTED DET SOUTH EAST

Hydrograph type	=	Reservoir	Peak discharge	=	42.13 cfs
Storm frequency	=	100 yrs	Time to peak	=	730 min
Time interval	=	1 min	Hyd. volume	=	249,764 cuft
Inflow hyd. No.	=	10 - DETAINED EAST	Max. Elevation	=	1044.59 ft
Reservoir name	=	SOUTHEAST BASIN	Max. Storage	=	184,188 cuft

Storage Indication method used.

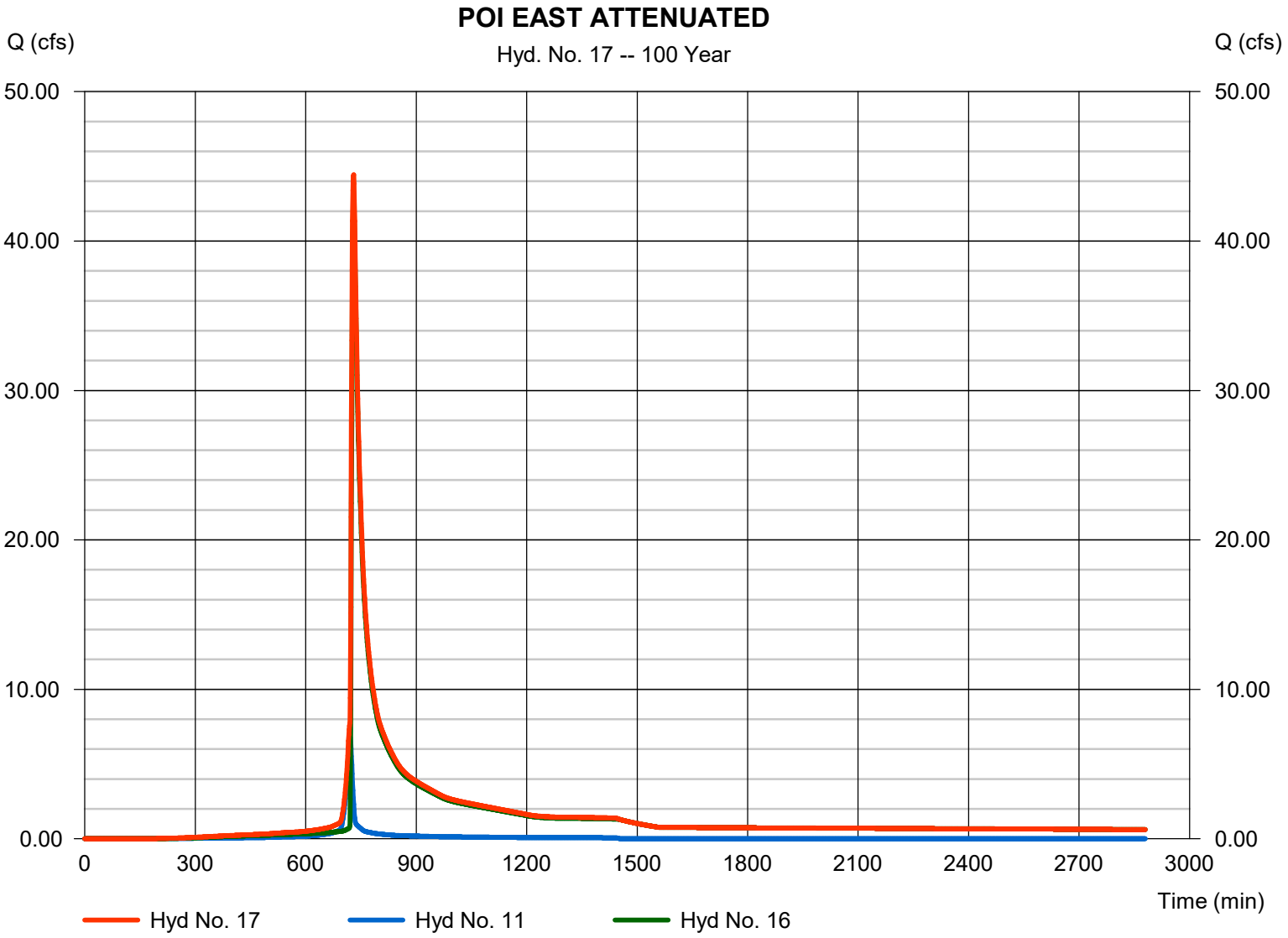


Hydrograph Report

Hyd. No. 17

POI EAST ATTENUATED

Hydrograph type	=	Combine	Peak discharge	=	44.44 cfs
Storm frequency	=	100 yrs	Time to peak	=	730 min
Time interval	=	1 min	Hyd. volume	=	267,833 cuft
Inflow hyds.	=	11, 16	Contrib. drain. area	=	0.740 ac



Hydraflow Rainfall Report

Return Period (Yrs)	Intensity-Duration-Frequency Equation Coefficients (FHA)			
	B	D	E	(N/A)
1	0.0000	0.0000	0.0000	--------
2	69.8703	13.1000	0.8658	--------
3	0.0000	0.0000	0.0000	--------
5	79.2597	14.6000	0.8369	--------
10	88.2351	15.5000	0.8279	--------
25	102.6072	16.5000	0.8217	--------
50	114.8193	17.2000	0.8199	--------
100	127.1596	17.8000	0.8186	--------

File name: SampleFHA.idf

Intensity = B / (Tc + D)^E

Return Period (Yrs)	Intensity Values (in/hr)											
	5 min	10	15	20	25	30	35	40	45	50	55	60
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	5.69	4.61	3.89	3.38	2.99	2.69	2.44	2.24	2.07	1.93	1.81	1.70
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	6.57	5.43	4.65	4.08	3.65	3.30	3.02	2.79	2.59	2.42	2.27	2.15
10	7.24	6.04	5.21	4.59	4.12	3.74	3.43	3.17	2.95	2.77	2.60	2.46
25	8.25	6.95	6.03	5.34	4.80	4.38	4.02	3.73	3.48	3.26	3.07	2.91
50	9.04	7.65	6.66	5.92	5.34	4.87	4.49	4.16	3.88	3.65	3.44	3.25
100	9.83	8.36	7.30	6.50	5.87	5.36	4.94	4.59	4.29	4.03	3.80	3.60

Tc = time in minutes. Values may exceed 60.

ecip. file name: P:\350-000\353-308\-Calculations\PRELIMINARY STORMWATER DETENTION\KansasCityPrecip.pcp

Storm Distribution	Rainfall Precipitation Table (in)							
	1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr
SCS 24-hour	1.37	3.71	0.00	0.00	5.20	0.00	0.00	7.80
SCS 6-Hr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-1st	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-2nd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-3rd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-4th	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-Indy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Custom	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

APPENDIX C

Calculate Water Quality for Storm Study - NW Basin

Project: Costco Lee's Summit (Southeast Basin) Date: 09/18/2025

To Calculate: WQc = P * Rv * A

P (in)	1.37
P (ft)	0.11
Impervious Area (Sq Ft)	118,500.00
Total Area (Sq Ft)	148,104.00
Impervious Area (Ac)	2.72
Total Area (Ac)	3.40

Rv = (0.05 * 0.009 (I))	0.77
Percent Impervious (I)	80.01
WQv (cu ft)	13,021.30
WQv (Ac. Ft)	0.299

Pond Volume

Elevation	Area (Sq Ft)	Volume (Cu FT)	Volume Cu Ft
1041	0		
1042	4,215	2,108	2,108
1044	11,040	15,255	17,363
1046	14,090	25,130	42,493
1047	15,630	14,860	57,353

40 HOUR DETENTION CALCULATION

To Calculate: 40 Hour Detention (EDDB)

I. Basin Water Storage Volume

Step 1) Tributary Area to EDDB, A (Ac)	At (Ac)=	3.40
Step 2) Calculate WQv, using Sec. 6 (Ac-Ft)	WQv (Ac-Ft) =	0.299
Step 3) Add 20 Percent to Step 2.	Vdesign (Ac-Ft) =	0.359

II.a. Water Quality Outlet Type

Step 1) Set Water Quality Outlet Type — Outlet Type = 1

Type 1 = single orifice

Type 2 = perforated riser or plate

Type 3 = v-notch weir

Step 2) Proceed to Step IIb, IIc, or IId based on selection

IId. Water Quality Outlet, Single Orifice

Step 1) Depth of Water Quality Volume at Outlet	Zwq (Ft)	2.77	See Below to Calc Zwq
Step 2) Average Head of Water Volume over invert of Orifice	Hwq (ft)	1.39	
Step 3) Average Water Quality Flow Rate	Qwq (CFS)	0.109	(Wqv / 40 Hr Converted to CFS)
Step 4) Orifice discharge coefficient	C (unitless)	0.66	
a) 0.66 when thickness of riser/weir plate < orifice dia			
b.) 0.80 when thickness of riser/weir plate > orifice dia			
Step 5) Water Quality Outlet Orifice Dia.	**D (in)**	**1.8**	
(if orifice dia. < 4 inches, use outlet type 2 or 3)			

To Calculate Zwq (ft) interpolate from Storm

Elevation 1 =	1,042.00	Storage 1 =	2,107.50
Elevation X =		Storage X =	15,625.56
Elevation 2 =	1,044.00	Storage 2 =	17,362.50

Elevation X =	1043.77

Lowest Elevation of Pond =	1,041.00
Elevation X =	1,043.77

Zwq (ft) =	2.77

Calculate Water Quality for Storm Study - SW Basin

Project: Costco Lee's Summit (Southeast Basin) Date: 09/18/2025

To Calculate: WQc = P * Rv * A

P (in)	1.37
P (ft)	0.11
Impervious Area (Sq Ft)	120,925.00
Total Area (Sq Ft)	151,153.00
Impervious Area (Ac)	2.78
Total Area (Ac)	3.47

Rv = (0.05 * 0.009 (I))	0.77
Percent Impervious (I)	80.00
WQv (cu ft)	13,287.88
WQv (Ac. Ft)	0.305

Pond Volume

Elevation	Area (Sq Ft)	Volume (Cu FT)	Volume Cu Ft
1036	0		
1038	3,920	3,920	3,920
1040	5,565	9,485	13,405
1042	7,460	13,025	26,430
1044	9,600	17,060	43,490
1045	10,710	10,155	53,645

40 HOUR DETENTION CALCULATION

To Calculate: 40 Hour Detention (EDDB)

I. Basin Water Storage Volume

Step 1) Tributary Area to EDDB, A (Ac)	At (Ac)=	3.47
Step 2) Calculate WQv, using Sec. 6 (Ac-Ft)	WQv (Ac-Ft) =	0.305
Step 3) Add 20 Percent to Step 2.	Vdesign (Ac-Ft) =	0.366

II.a. Water Quality Outlet Type

Step 1) Set Water Quality Outlet Type — Outlet Type = 1

Type 1 = single orifice

Type 2 = perforated riser or plate

Type 3 = v-notch weir

Step 2) Proceed to Step IIb, IIc, or IId based on selection

IId. Water Quality Outlet, Single Orifice

Step 1) Depth of Water Quality Volume at Outlet	Zwq (Ft)	4.39	See Below to Calc Zwq
Step 2) Average Head of Water Volume over invert of Orifice	Hwq (ft)	2.20	
Step 3) Average Water Quality Flow Rate	Qwq (CFS)	0.111	(Wqv / 40 Hr Converted to CFS)
Step 4) Orifice discharge coefficient	C (unitless)	0.66	
a) 0.66 when thickness of riser/weir plate < orifice dia			
b.) 0.80 when thickness of riser/weir plate > orifice dia			
Step 5) Water Quality Outlet Orifice Dia.	**D (in)**	**1.6**	
(if orifice dia. < 4 inches, use outlet type 2 or 3)			

To Calculate Zwq (ft) interpolate from Storm

Elevation 1 =	1,040.00	Storage 1 =	13,405.00
Elevation X =		Storage X =	15,945.45
Elevation 2 =	1,042.00	Storage 2 =	26,430.00

Elevation X =	1040.39

Lowest Elevation of Pond =	1,036.00
Elevation X =	1,040.39

Zwq (ft) =	4.39

Calculate Water Quality for Storm Study - SE Basin

Project: Costco Lee's Summit (Southeast Basin) Date: 09/18/2025

To Calculate: WQc = P * Rv * A

P (in)	1.37
P (ft)	0.11
Impervious Area (Sq Ft)	430,371.00
Total Area (Sq Ft)	542,322.00
Impervious Area (Ac)	9.88
Total Area (Ac)	12.45

Rv = (0.05 * 0.009 (I))	0.76
Percent Impervious (I)	79.36
WQv (cu ft)	47,316.38
WQv (Ac. Ft)	1.086

Pond Volume

Elevation	Area (Sq Ft)	Volume (Cu FT)	Volume Cu Ft
1039.35	25,170		
1039.85	29,370	13,635	13,635
1040	29,750	4,434	18,069
1041	32,365	31,058	49,127
1042	35,035	33,700	82,827
1044	40,545	75,580	158,407
1046	46,280	86,825	245,232

40 HOUR DETENTION CALCULATION

To Calculate: 40 Hour Detention (EDDB)

I. Basin Water Storage Volume

Step 1) Tributary Area to EDDB, A (Ac)	At (Ac)=	12.45
Step 2) Calculate WQv, using Sec. 6 (Ac-Ft)	WQv (Ac-Ft) =	1.086
Step 3) Add 20 Percent to Step 2.	Vdesign (Ac-Ft) =	1.303

II.a. Water Quality Outlet Type

Step 1) Set Water Quality Outlet Type — Outlet Type = 1

Type 1 = single orifice

Type 2 = perforated riser or plate

Type 3 = v-notch weir

Step 2) Proceed to Step IIb, IIc, or IId based on selection

IId. Water Quality Outlet, Single Orifice

Step 1) Depth of Water Quality Volume at Outlet	Zwq (Ft)	1.88	See Below to Calc Zwq
Step 2) Average Head of Water Volume over invert of Orifice	Hwq (ft)	0.94	
Step 3) Average Water Quality Flow Rate	Qwq (CFS)	0.394	(Wqv / 40 Hr Converted to CFS)
Step 4) Orifice discharge coefficient	C (unitless)	0.66	
a) 0.66 when thickness of riser/weir plate < orifice dia			
b.) 0.80 when thickness of riser/weir plate > orifice dia			
Step 5) Water Quality Outlet Orifice Dia.	**D (in)**	**3.8**	
(if orifice dia. < 4 inches, use outlet type 2 or 3)			

To Calculate Zwq (ft) interpolate from Storm

Elevation 1 =	1,041.00	Storage 1 =	49,126.50
Elevation X =		Storage X =	56,779.65
Elevation 2 =	1,042.00	Storage 2 =	82,826.50

Elevation X =	1041.23

Lowest Elevation of Pond =	1,039.35
Elevation X =	1,041.23

Zwq (ft) =	1.88