

**F. A. HESKETH & ASSOCIATES, INC.**

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**MEMORANDUM**

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**To: Tom Grimaldi, P.E.**

**Date:** August 30, 2023

**From:** Guy Hesketh, P.E.

**Subject: Copart of Connecticut, Inc.  
Hydrologic Analysis**

**Our File: 22107**

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Tom:

Please find attached our hydrologic analysis of the proposed external vehicle storage areas at the Copart operation on 49 Russell Road. Copart is proposing to expand outside vehicle storage areas to include two gravel storage areas located west of the current operation on parcels owned by Copart. Access to the two gravels storage area will be via existing gravel drives that connect an existing gravel storage area at the northwest corner of the 49 Russell Road operation with two proposed vehicle storage areas.

The storage areas will be constructed with a crushed stone surface. Earthen berms are proposed on the up-gradient perimeters of the storage areas to prevent un-treated stormwater runoff from the storage areas entering these wetlands. Down-gradient perimeters of the storage areas will incorporate interceptor swales and/or water quality swales that will convey runoff to water quality basins for capture and treatment, prior to discharge.

This memorandum presents drainage analysis of both existing and proposed conditions using the SCS Methodology (TR-55) of peak flow analysis using the Hydraflow Hydrographs software. The analysis modeled both the existing conditions and proposed condition analysis, including inflow and outflow of stormwater through proposed water quality basins and water quality swales. Weighted Curve Numbers (CN) were based on soil groups and ground cover characteristics. (See [Attachment 1](#)). Rainfall intensity and depth data used in the model is current NOAA Atlas 14 rainfall data from on-line sources (See [Attachment 2](#)). Presented herein are a discussion and results of the hydrologic methodologies utilized in design of the stormwater management basins.

Tom Grimaldi, P.E.  
August 30, 2023  
Copart of Connecticut, Inc. – Hydrologic Analysis

*Hydrologic Analysis Methodology:*

Hydrologic analysis was conducted using the SCS Methodology in the Hydraflow Hydrographs program to compare pre- and post-conditions peak rates and volumes. Weighted Curve Numbers (CN) were based on soil groups and ground cover characteristics. Times of concentration were determined by the TR-55 flow path method for surface flow, shallow concentrated flow, and channel flow, where appropriate.

For the existing site condition, two watersheds were modeled, 1) WS A-Exist, which is the watershed encompassing External Storage Area A, and 2) WS B-Exist, which is the watershed encompassing External Storage Area B. The Design Point for each watershed (Design Point A, and Design Point B) are assumed to be the down-gradient point of discharge under the proposed condition. The existing-conditions watersheds and Design Points are depicted on Figure DA-EX (see [Attachment 3](#)).

For the proposed site condition, two watersheds for each external storage area were modeled and routed through the proposed water quality basin and water quality swales within the storage areas. Discharge was modeled to the same two design points, (Design Point A, and Design Point B). The proposed-condition watersheds and Design Points are depicted on Figure DA-PR (see [Attachment 3](#)).

Model input included the stage-storage parameters of each basin, and geometry of the outlet structure of each basin. Based on the outlet geometry, the model computes a stage-discharge relationship considering inlet and outlet control. The basins are proposed to have underdrains that will allow runoff to infiltrate into the gravel soils in the bottom of the basins for discharge into the outlet structures. The outlet pipes on the outlet structures are proposed to have flow line elevations equal to the elevations of the bottom of the basins, in order to maintain wet bottoms in both the basins and the water quality swales.

External Storage Area A is designed using two water quality basins, in series, to treat stormwater runoff from the storage area. Runoff from Watershed WS-A1 Prop is conveyed to and routed through Water Quality Basin A1, which discharges into Water Quality Basin (WQB). Additional peripheral direct runoff from areas adjacent to WQB A2 (Watershed WS-A2 Prop) is combined with the outflow from WQB A1 and routed through WQB A2 for subsequent discharge to Design Point A, adjacent to DeGreys Brook. For WQB A1 the flow from the basin into the outlet structure was modeled as three 8" orifices (8" underdrains) and a riser (inlet grate). Outflow was modeled as an 18" RCP pipe. For WQB A2 the flow from the basin into the outlet structure was modeled as three 6" orifices (6" underdrains) and a riser (inlet grate). Outflow was modeled as a 24" RCP pipe.

External Storage Area B is designed using a water quality basin and two water quality swales to treat stormwater runoff from the storage area. Runoff from Watershed WS-B1 Prop is conveyed to and routed through Water Quality Swale (WQS) B1, which discharges into WQB B2/WQS B2 for subsequent discharge to an adjacent wetland at Design Point B.

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Runoff from Watershed WS-B2 Prop is conveyed to and combined with outfall from WQS B1 and subsequently routed through (WQB B2/WQS B2). For WQS B1 the flow from the swale into the outlet structure was modeled as one 6” orifice and a riser (inlet grate). Outflow was modeled as a 12” RCP pipe. For WQB B2/WQS B2 the flow from the basin into the outlet structure was modeled as three 6” orifices (6” underdrains) and a riser (inlet grate). Outflow was modeled as an 18” RCP pipe.

The basins are designed to mitigate peak rates of runoff for up to and including the 100-year storm.

Results of analysis are summarized below:

External Storage Area A – Design Point A

Return Period	Existing-Conditions Peak Rate of Discharge (CFS)	Proposed-Conditions Peak Rate of Discharge (CFS)
2-Yr	7.7	2.4
5-Yr	13	3.2
10-Yr	19	3.8
25-Yr	26	4.5
50-Yr	31	5.8
100-Yr	38	5.5

External Storage Area B – Design Point B

Return Period	Existing-Conditions Peak Rate of Discharge (CFS)	Proposed-Conditions Peak Rate of Discharge (CFS)
2-Yr	2.7	2.0
5-Yr	5.0	2.7
10-Yr	7.0	3.2
25-Yr	9.9	3.8
50-Yr	12	4.1
100-Yr	15	5.0

The analysis indicates that there is no increase in peak rate of flow from the proposed re-development to either receiving watersheds from either of the proposed external storage areas.

The Hydrologic Model, including input and output data are attached as Attachment 4.

Tom Grimaldi, P.E.  
August 30, 2023  
Copart of Connecticut, Inc. – Hydrologic Analysis

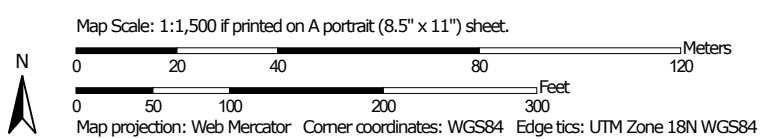
*Water Quality Volume:*

In addition to being designed to mitigate peak rates of flow from the storage areas, the basins are also designed to capture and treat a volume greater than the CT DEEP-minimum-recommended water quality volume. Water quality volume calculations are presented in Attachment 5.

## Attachment 1

Soils Hydrologic Group Data  
Curve Number (CN) Data

Soil Map—State of Connecticut  
(CoPart - Watershed A)



## MAP LEGEND

- Area of Interest (AOI)
- 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
- 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 1:12,000.

**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: State of Connecticut  
 Survey Area Data: Version 22, Sep 12, 2022

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

Date(s) aerial images were photographed: Jun 14, 2022—Oct 6, 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
28A	Elmridge fine sandy loam, 0 to 3 percent slopes	5.8	98.5%
108	Saco silt loam	0.1	1.5%
<b>Totals for Area of Interest</b>		<b>5.9</b>	<b>100.0%</b>



## State of Connecticut

### 28A—Elmridge fine sandy loam, 0 to 3 percent slopes

#### Map Unit Setting

*National map unit symbol:* 9lm0

*Elevation:* 0 to 1,200 feet

*Mean annual precipitation:* 43 to 54 inches

*Mean annual air temperature:* 45 to 55 degrees F

*Frost-free period:* 140 to 185 days

*Farmland classification:* All areas are prime farmland

#### Map Unit Composition

*Elmridge and similar soils:* 80 percent

*Minor components:* 20 percent

*Estimates are based on observations, descriptions, and transects of the mapunit.*

#### Description of Elmridge

##### Setting

*Landform:* Terraces

*Down-slope shape:* Concave

*Across-slope shape:* Linear

*Parent material:* Coarse-loamy eolian sands over clayey glaciolacustrine deposits

##### Typical profile

*Ap - 0 to 6 inches:* fine sandy loam

*Bw1 - 6 to 10 inches:* fine sandy loam

*Bw2 - 10 to 18 inches:* fine sandy loam

*Bw3 - 18 to 25 inches:* sandy loam

*2C - 25 to 65 inches:* silty clay

##### Properties and qualities

*Slope:* 0 to 3 percent

*Depth to restrictive feature:* More than 80 inches

*Drainage class:* Moderately well drained

*Runoff class:* Very low

*Capacity of the most limiting layer to transmit water (Ksat):* Very low to moderately low (0.00 to 0.06 in/hr)

*Depth to water table:* About 18 to 30 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Available water supply, 0 to 60 inches:* Moderate (about 9.0 inches)

##### Interpretive groups

*Land capability classification (irrigated):* None specified

*Land capability classification (nonirrigated):* 2w

*Hydrologic Soil Group:* C

*Ecological site:* F145XY006CT - Semi-Rich Moist Lake Plain

## State of Connecticut

### 108—Saco silt loam

#### Map Unit Setting

*National map unit symbol:* 9ljv  
*Elevation:* 0 to 1,200 feet  
*Mean annual precipitation:* 43 to 54 inches  
*Mean annual air temperature:* 45 to 55 degrees F  
*Frost-free period:* 140 to 185 days  
*Farmland classification:* Not prime farmland

#### Map Unit Composition

*Saco and similar soils:* 80 percent  
*Minor components:* 20 percent  
*Estimates are based on observations, descriptions, and transects of the mapunit.*

#### Description of Saco

##### Setting

*Landform:* Flood plains  
*Down-slope shape:* Concave  
*Across-slope shape:* Concave  
*Parent material:* Coarse-silty alluvium

##### Typical profile

*A - 0 to 12 inches:* silt loam  
*Cg1 - 12 to 32 inches:* silt loam  
*Cg2 - 32 to 48 inches:* silt loam  
*2Cg3 - 48 to 60 inches:* stratified very gravelly coarse sand to loamy fine sand

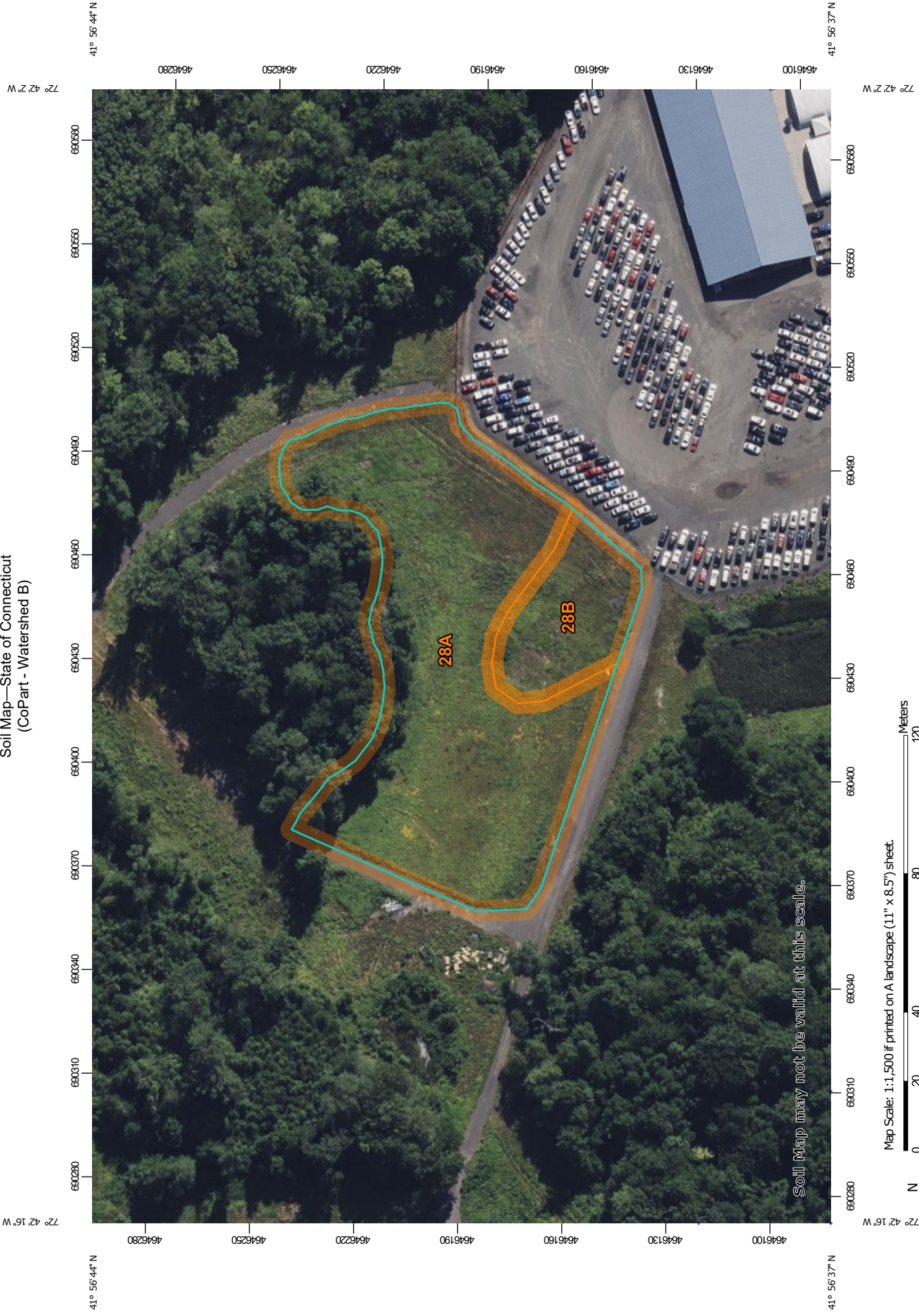
##### Properties and qualities

*Slope:* 0 to 2 percent  
*Depth to restrictive feature:* More than 80 inches  
*Drainage class:* Very poorly drained  
*Runoff class:* Low  
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately high to high (0.57 to 1.98 in/hr)  
*Depth to water table:* About 0 to 6 inches  
*Frequency of flooding:* NoneFrequent  
*Frequency of ponding:* Frequent  
*Available water supply, 0 to 60 inches:* High (about 10.1 inches)

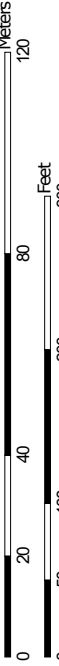
##### Interpretive groups

*Land capability classification (irrigated):* None specified  
*Land capability classification (nonirrigated):* 6w  
*Hydrologic Soil Group:* B/D  
*Ecological site:* F144AY016MA - Very Wet Low Floodplain  
*Hydric soil rating:* Yes

Soil Map—State of Connecticut  
(CoPart - Watershed B)



Map Scale: 1:1,500 if printed on A landscape (11" x 8.5") sheet.



Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N 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
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- Background**
- Aerial Photography

## MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:12,000.

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: State of Connecticut  
Survey Area Data: Version 22, Sep 12, 2022

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

Date(s) aerial images were photographed: Jun 14, 2022—Oct 6, 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
28A	Elmridge fine sandy loam, 0 to 3 percent slopes	1.9	84.1%
28B	Elmridge fine sandy loam, 3 to 8 percent slopes	0.4	15.9%
<b>Totals for Area of Interest</b>		<b>2.3</b>	<b>100.0%</b>

## State of Connecticut

### 28A—Elmridge fine sandy loam, 0 to 3 percent slopes

#### Map Unit Setting

*National map unit symbol:* 9lm0

*Elevation:* 0 to 1,200 feet

*Mean annual precipitation:* 43 to 54 inches

*Mean annual air temperature:* 45 to 55 degrees F

*Frost-free period:* 140 to 185 days

*Farmland classification:* All areas are prime farmland

#### Map Unit Composition

*Elmridge and similar soils:* 80 percent

*Minor components:* 20 percent

*Estimates are based on observations, descriptions, and transects of the mapunit.*

#### Description of Elmridge

##### Setting

*Landform:* Terraces

*Down-slope shape:* Concave

*Across-slope shape:* Linear

*Parent material:* Coarse-loamy eolian sands over clayey glaciolacustrine deposits

##### Typical profile

*Ap - 0 to 6 inches:* fine sandy loam

*Bw1 - 6 to 10 inches:* fine sandy loam

*Bw2 - 10 to 18 inches:* fine sandy loam

*Bw3 - 18 to 25 inches:* sandy loam

*2C - 25 to 65 inches:* silty clay

##### Properties and qualities

*Slope:* 0 to 3 percent

*Depth to restrictive feature:* More than 80 inches

*Drainage class:* Moderately well drained

*Runoff class:* Very low

*Capacity of the most limiting layer to transmit water (Ksat):* Very low to moderately low (0.00 to 0.06 in/hr)

*Depth to water table:* About 18 to 30 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Available water supply, 0 to 60 inches:* Moderate (about 9.0 inches)

##### Interpretive groups

*Land capability classification (irrigated):* None specified

*Land capability classification (nonirrigated):* 2w

*Hydrologic Soil Group:* C

*Ecological site:* F145XY006CT - Semi-Rich Moist Lake Plain

## State of Connecticut

### 28B—Elmridge fine sandy loam, 3 to 8 percent slopes

#### Map Unit Setting

*National map unit symbol:* 9lm1

*Elevation:* 0 to 1,200 feet

*Mean annual precipitation:* 43 to 54 inches

*Mean annual air temperature:* 45 to 55 degrees F

*Frost-free period:* 140 to 185 days

*Farmland classification:* All areas are prime farmland

#### Map Unit Composition

*Elmridge and similar soils:* 80 percent

*Minor components:* 20 percent

*Estimates are based on observations, descriptions, and transects of the mapunit.*

#### Description of Elmridge

##### Setting

*Landform:* Terraces

*Down-slope shape:* Concave

*Across-slope shape:* Linear

*Parent material:* Coarse-loamy eolian sands over clayey glaciolacustrine deposits

##### Typical profile

*Ap - 0 to 6 inches:* fine sandy loam

*Bw1 - 6 to 10 inches:* fine sandy loam

*Bw2 - 10 to 18 inches:* fine sandy loam

*Bw3 - 18 to 25 inches:* sandy loam

*2C - 25 to 65 inches:* silty clay

##### Properties and qualities

*Slope:* 3 to 8 percent

*Depth to restrictive feature:* More than 80 inches

*Drainage class:* Moderately well drained

*Runoff class:* Low

*Capacity of the most limiting layer to transmit water (Ksat):* Very low to moderately low (0.00 to 0.06 in/hr)

*Depth to water table:* About 18 to 30 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Available water supply, 0 to 60 inches:* Moderate (about 9.0 inches)

##### Interpretive groups

*Land capability classification (irrigated):* None specified

*Land capability classification (nonirrigated):* 2w

*Hydrologic Soil Group:* C

*Ecological site:* F145XY006CT - Semi-Rich Moist Lake Plain

## Runoff curve number and runoff

Project: CoPart                      By: DRT                      Date: 8/1/2023

Location: East Granby, CT                      Checked: GAH                      Date:

Check one                       Present                       Developed                      Watershed A1 - Exist

### 1. Runoff curve number

Soil name and hydrologic group <small>(appendix A)</small>	Cover description <small>(cover type, treatment, and hydrologic condition;percent impervious; unconnected/connected impervious area ratio)</small>	CN	Area <input type="checkbox"/> acres <input type="checkbox"/> mi <sup>2</sup> <input checked="" type="checkbox"/> SqFt	Area <input checked="" type="checkbox"/> acres <input type="checkbox"/> mi <sup>2</sup> <input type="checkbox"/> %	Product of CN x area
C	LANDSCHAPED (BRUSH)-GOOD CONDITIONS	70	184,560	4.23	296.10
C	WOODS -FAIR CONDITIONS	70	1,115	0.03	2.10
C	IMPERVIOUS(GRAVEL)-GOOD CONDITIONS	89	69,574	1.59	141.51
<b>Totals</b>					
				5.85	439.71

Use only one CN source per line

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{439.71}{5.85} = 75.16 \qquad \text{Use CN } \boxed{75}$$



## Runoff curve number and runoff

Project: CoPart By: DRT Date: 8/1/2023

Location: East Granby, CT Checked: GAH Date:

Check one  Present  Developed Watershed B1 - Exist

### 1. Runoff curve number

Soil name and hydrologic group <small>(appendix A)</small>	Cover description <small>(cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)</small>	CN	Area		Product of CN x area
			<input type="checkbox"/> acres <input type="checkbox"/> mi <sup>2</sup> <input checked="" type="checkbox"/> SqFt	<input checked="" type="checkbox"/> acres <input type="checkbox"/> mi <sup>2</sup> <input type="checkbox"/> %	
C	LANDSCHAPED (BRUSH)-GOOD CONDITIONS	70	88,881	2.04	142.80
C	IMPERVIOUS(GRAVEL)-GOOD CONDITIONS	89	13,949	0.32	28.48
<b>Totals</b>					

Use only one CN source per line Totals 2.36 171.28

**CN (weighted)** =  $\frac{\text{total product}}{\text{total area}} = \frac{171.28}{2.36} = 72.58$ 
Use CN 73

## Runoff curve number and runoff

Project: CoPart                      By: DRT                      Date: 8/1/2023

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Location: East Granby, CT                      Checked: GAH                      Date:

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Check one                       Present                       Developed                      Watershed A1-PRO

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### 1. Runoff curve number

Soil name and hydrologic group <small>(appendix A)</small>	Cover description  <small>(cover type, treatment, and hydrologic condition;percent impervious; unconnected/connected impervious area ratio)</small>	CN	Area		Product of CN x area
			<input type="checkbox"/> acres <input type="checkbox"/> mi <sup>2</sup> <input checked="" type="checkbox"/> SqFt	<input checked="" type="checkbox"/> acres <input type="checkbox"/> mi <sup>2</sup> <input type="checkbox"/> %	
C	LANDSCHAPED (BRUSH)-GOOD CONDITIONS	70	46,941	1.07	74.90
C	IMPERVIOUS(GRAVEL)-GOOD CONDITIONS	89	193,635	4.45	396.05
<b>Totals</b>				5.52	470.95

Use only one CN source per line

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{470.95}{5.52} = 85.32 \qquad \text{Use CN } \boxed{85}$$

## Runoff curve number and runoff

Project: CoPart                      By: DRT                      Date: 8/1/2023

Location: East Granby, CT                      Checked: GAH                      Date:

Check one                       Present                       Developed                      Watershed A2-PRO

### 1. Runoff curve number

Soil name and hydrologic group <small>(appendix A)</small>	Cover description  <small>(cover type, treatment, and hydrologic condition;percent impervious; unconnected/connected impervious area ratio)</small>	CN	Area		Product of CN x area
			<input type="checkbox"/> acres <input type="checkbox"/> mi <sup>2</sup> <input checked="" type="checkbox"/> SqFt	<input checked="" type="checkbox"/> acres <input type="checkbox"/> mi <sup>2</sup> <input type="checkbox"/> %	
C	LANDSCHAPED (BRUSH)-GOOD CONDITIONS	70	10,778	0.24	16.80
C	IMPERVIOUS(GRAVEL)-GOOD CONDITIONS	89	3,775	0.09	8.01
<b>Totals</b>				0.33	24.81

Use only one CN source per line

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{24.81}{0.33} = 75.18 \qquad \text{Use CN } \boxed{75}$$

## Runoff curve number and runoff

Project: CoPart                      By: DRT                      Date: 8/1/2023

Location: East Granby, CT                      Checked: GAH                      Date:

Check one                       Present                       Developed                      Watershed B1-PRO

### 1. Runoff curve number

Soil name and hydrologic group <small>(appendix A)</small>	Cover description  <small>(cover type, treatment, and hydrologic condition;percent impervious; unconnected/connected impervious area ratio)</small>	CN	Area		Product of CN x area
			<input type="checkbox"/> acres <input type="checkbox"/> mi <sup>2</sup> <input checked="" type="checkbox"/> SqFt	<input checked="" type="checkbox"/> acres <input type="checkbox"/> mi <sup>2</sup> <input type="checkbox"/> %	
C	LANDSCHAPED (BRUSH)-GOOD CONDITIONS	70	5,924	0.14	9.45
C	IMPERVIOUS(GRAVEL)-GOOD CONDITIONS	89	24,728	0.57	50.46
<b>Totals</b>				0.70	59.91

Use only one CN source per line

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{59.91}{0.70} = 85.35 \qquad \text{Use CN } \boxed{85}$$

## Runoff curve number and runoff

Project: CoPart                      By: DRT                      Date: 8/1/2023

Location: East Granby, CT                      Checked: GAH                      Date:

Check one                       Present                       Developed                      Watershed B2-PRO

### 1. Runoff curve number

Soil name and hydrologic group <small>(appendix A)</small>	Cover description  <small>(cover type, treatment, and hydrologic condition;percent impervious; unconnected/connected impervious area ratio)</small>	CN	Area		Product of CN x area
			<input type="checkbox"/> acres <input type="checkbox"/> mi <sup>2</sup> <input checked="" type="checkbox"/> SqFt	<input checked="" type="checkbox"/> acres <input type="checkbox"/> mi <sup>2</sup> <input type="checkbox"/> %	
C	LANDSCHAPED (BRUSH)-GOOD CONDITIONS	70	14,779	0.34	23.80
C	IMPERVIOUS(GRAVEL)-GOOD CONDITIONS	89	57,500	1.32	117.48
<b>Totals</b>				1.66	141.28

Use only one CN source per line

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{141.28}{1.66} = 85.11 \qquad \text{Use CN } \boxed{85}$$

## Attachment 2

### NOAA Atlas 14 Precipitation Data



**NOAA Atlas 14, Volume 10, Version 3**  
**Location name: East Granby, Connecticut, USA\***  
**Latitude: 41.9469°, Longitude: -72.7082°**  
**Elevation: 156 ft\*\***  
 \* source: ESRI Maps  
 \*\* source: USGS



**POINT PRECIPITATION FREQUENCY ESTIMATES**

Sanja Perica, Sandra Pavlovic, Michael St. Laurent, Carl Trypaluk, Dale Unruh, Orlan Wilhite

NOAA, National Weather Service, Silver Spring, Maryland

[PF\\_tabular](#) | [PF\\_graphical](#) | [Maps & aerials](#)

**PF tabular**

<b>PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)<sup>1</sup></b>										
Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.348 (0.266-0.453)	0.417 (0.319-0.543)	0.530 (0.403-0.693)	0.623 (0.473-0.819)	0.751 (0.553-1.03)	0.848 (0.613-1.19)	0.949 (0.668-1.38)	1.06 (0.712-1.59)	1.22 (0.791-1.89)	1.36 (0.858-2.14)
10-min	0.493 (0.377-0.641)	0.590 (0.452-0.769)	0.749 (0.571-0.979)	0.882 (0.669-1.16)	1.06 (0.784-1.46)	1.20 (0.868-1.69)	1.34 (0.947-1.96)	1.50 (1.01-2.25)	1.73 (1.12-2.68)	1.92 (1.22-3.03)
15-min	0.580 (0.444-0.754)	0.695 (0.531-0.905)	0.882 (0.672-1.15)	1.04 (0.787-1.36)	1.25 (0.922-1.72)	1.41 (1.02-1.98)	1.58 (1.11-2.30)	1.77 (1.19-2.64)	2.04 (1.32-3.16)	2.26 (1.43-3.57)
30-min	0.779 (0.597-1.01)	0.938 (0.718-1.22)	1.20 (0.913-1.57)	1.41 (1.07-1.86)	1.71 (1.26-2.35)	1.94 (1.40-2.72)	2.17 (1.53-3.16)	2.43 (1.63-3.63)	2.80 (1.81-4.34)	3.10 (1.96-4.90)
60-min	0.978 (0.749-1.27)	1.18 (0.904-1.54)	1.52 (1.16-1.98)	1.79 (1.36-2.36)	2.17 (1.60-2.99)	2.46 (1.78-3.45)	2.76 (1.94-4.02)	3.09 (2.07-4.62)	3.57 (2.31-5.52)	3.95 (2.50-6.24)
2-hr	1.26 (0.973-1.63)	1.52 (1.17-1.96)	1.94 (1.48-2.51)	2.28 (1.74-2.98)	2.76 (2.05-3.77)	3.11 (2.27-4.36)	3.49 (2.48-5.09)	3.93 (2.64-5.84)	4.58 (2.97-7.05)	5.12 (3.25-8.05)
3-hr	1.45 (1.12-1.87)	1.75 (1.35-2.25)	2.23 (1.72-2.88)	2.63 (2.01-3.42)	3.18 (2.37-4.34)	3.59 (2.63-5.02)	4.03 (2.88-5.87)	4.55 (3.07-6.74)	5.34 (3.47-8.19)	6.01 (3.82-9.40)
6-hr	1.82 (1.42-2.33)	2.21 (1.72-2.83)	2.84 (2.20-3.65)	3.37 (2.60-4.35)	4.09 (3.07-5.56)	4.62 (3.41-6.44)	5.20 (3.76-7.58)	5.92 (4.00-8.71)	7.02 (4.58-10.7)	7.98 (5.09-12.4)
12-hr	2.23 (1.74-2.83)	2.74 (2.15-3.49)	3.58 (2.80-4.57)	4.28 (3.32-5.50)	5.24 (3.96-7.10)	5.95 (4.42-8.27)	6.72 (4.90-9.78)	7.70 (5.22-11.3)	9.23 (6.04-14.0)	10.6 (6.76-16.4)
24-hr	2.58 (2.04-3.26)	3.24 (2.55-4.09)	4.30 (3.38-5.45)	5.19 (4.05-6.61)	6.40 (4.88-8.65)	7.29 (5.46-10.1)	8.28 (6.09-12.1)	9.56 (6.51-13.9)	11.6 (7.62-17.5)	13.4 (8.62-20.7)
2-day	2.88 (2.28-3.60)	3.66 (2.90-4.58)	4.93 (3.90-6.21)	5.99 (4.70-7.58)	7.44 (5.71-10.0)	8.50 (6.42-11.8)	9.69 (7.20-14.1)	11.3 (7.70-16.3)	13.9 (9.14-20.9)	16.3 (10.5-24.9)
3-day	3.14 (2.50-3.92)	4.00 (3.18-4.99)	5.40 (4.28-6.77)	6.56 (5.18-8.28)	8.16 (6.29-11.0)	9.32 (7.08-12.9)	10.6 (7.94-15.5)	12.4 (8.49-17.9)	15.4 (10.1-23.0)	18.0 (11.6-27.4)
4-day	3.39 (2.70-4.21)	4.31 (3.44-5.37)	5.81 (4.62-7.27)	7.06 (5.58-8.88)	8.78 (6.78-11.7)	10.0 (7.62-13.8)	11.4 (8.55-16.6)	13.3 (9.14-19.2)	16.5 (10.9-24.6)	19.4 (12.5-29.4)
7-day	4.08 (3.28-5.05)	5.13 (4.12-6.36)	6.85 (5.48-8.52)	8.28 (6.58-10.4)	10.2 (7.94-13.6)	11.7 (8.90-16.0)	13.3 (9.95-19.1)	15.4 (10.6-22.1)	19.0 (12.6-28.2)	22.2 (14.4-33.5)
10-day	4.76 (3.84-5.87)	5.88 (4.74-7.26)	7.71 (6.19-9.56)	9.23 (7.36-11.5)	11.3 (8.80-15.0)	12.8 (9.81-17.4)	14.5 (10.9-20.8)	16.8 (11.6-24.0)	20.5 (13.6-30.3)	23.8 (15.4-35.8)
20-day	6.88 (5.59-8.43)	8.06 (6.54-9.88)	9.99 (8.07-12.3)	11.6 (9.30-14.3)	13.8 (10.7-18.0)	15.4 (11.8-20.6)	17.2 (12.8-24.0)	19.4 (13.5-27.5)	22.9 (15.3-33.6)	26.0 (16.9-38.9)
30-day	8.68 (7.08-10.6)	9.88 (8.04-12.1)	11.8 (9.60-14.5)	13.5 (10.8-16.6)	15.7 (12.2-20.3)	17.4 (13.3-23.0)	19.1 (14.2-26.4)	21.3 (14.8-29.9)	24.4 (16.3-35.7)	27.1 (17.7-40.5)
45-day	10.9 (8.95-13.3)	12.2 (9.95-14.8)	14.2 (11.6-17.3)	15.9 (12.8-19.5)	18.2 (14.2-23.2)	19.9 (15.2-26.1)	21.7 (16.0-29.5)	23.7 (16.6-33.1)	26.3 (17.7-38.3)	28.5 (18.6-42.3)
60-day	12.8 (10.5-15.6)	14.1 (11.6-17.1)	16.2 (13.3-19.8)	18.0 (14.6-22.0)	20.4 (15.9-25.9)	22.3 (17.0-28.8)	24.1 (17.6-32.2)	25.9 (18.2-36.0)	28.1 (18.9-40.7)	29.7 (19.4-44.1)

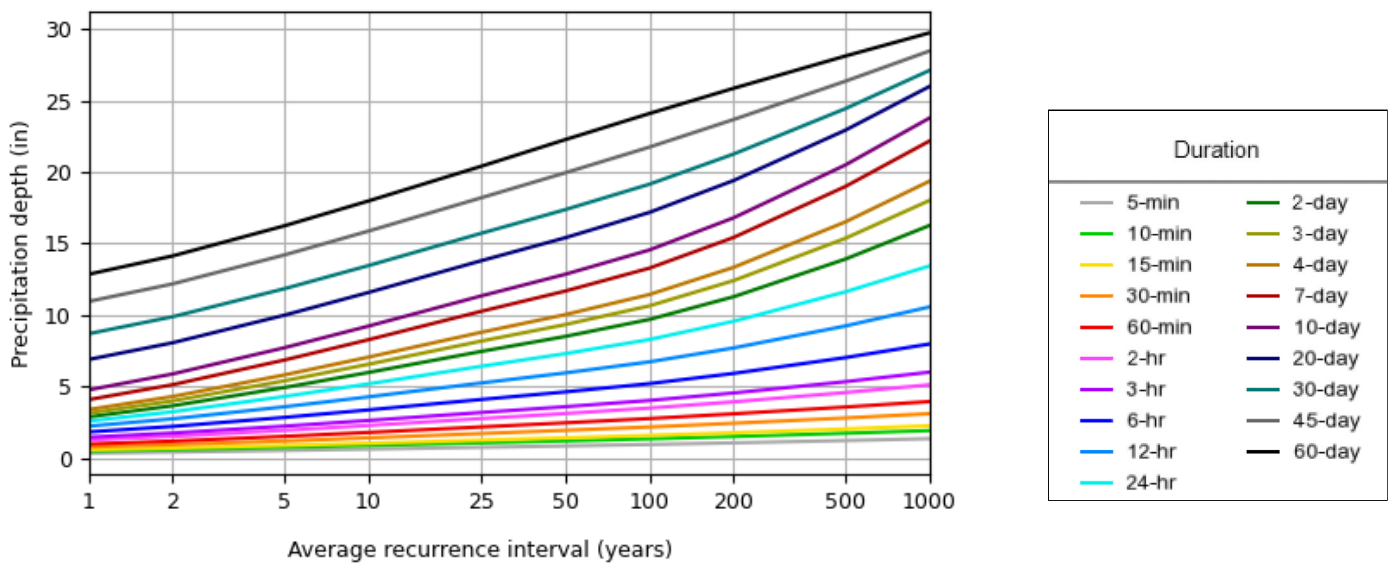
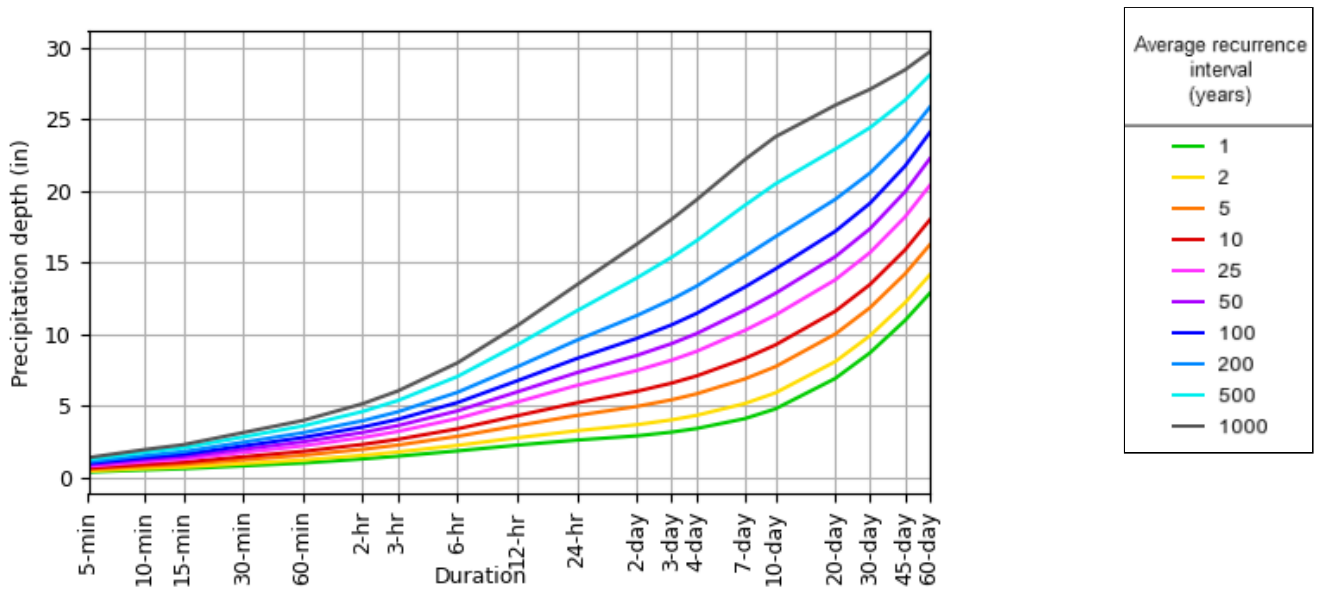
<sup>1</sup> Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS). Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values. Please refer to NOAA Atlas 14 document for more information.

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**PF graphical**

### PDS-based depth-duration-frequency (DDF) curves

Latitude: 41.9469°, Longitude: -72.7082°

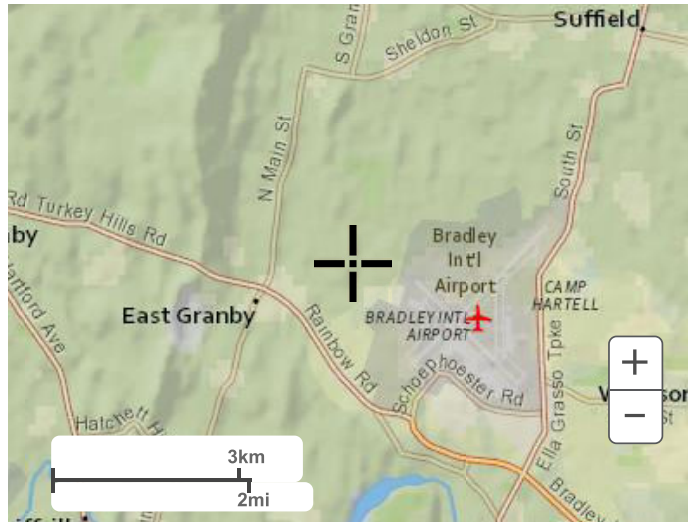


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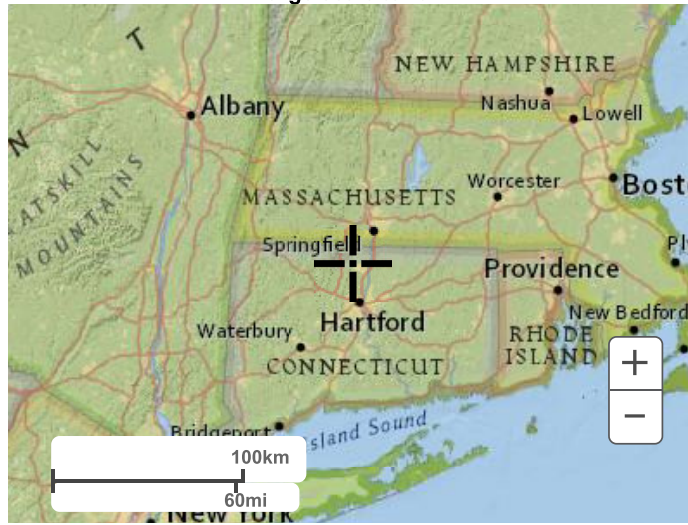
## Maps & aerials

Small scale terrain





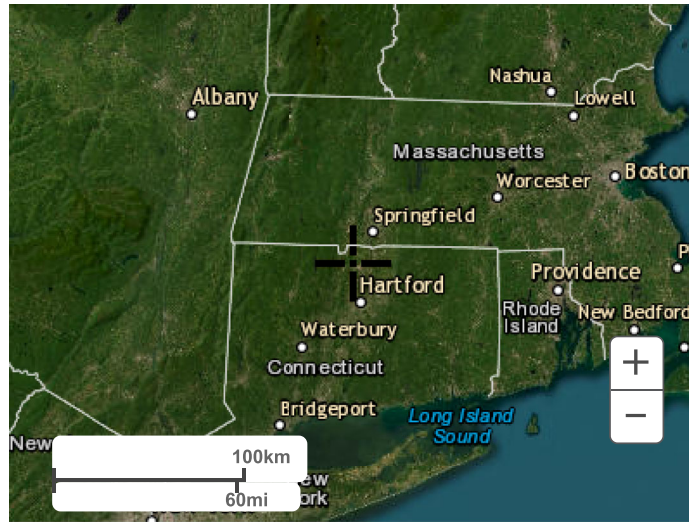
Large scale terrain



Large scale map



Large scale aerial



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**NOAA Atlas 14, Volume 10, Version 3**  
**Location name: East Granby, Connecticut, USA\***  
**Latitude: 41.9469°, Longitude: -72.7082°**  
**Elevation: 156 ft\*\***  
 \* source: ESRI Maps  
 \*\* source: USGS



**POINT PRECIPITATION FREQUENCY ESTIMATES**

Sanja Perica, Sandra Pavlovic, Michael St. Laurent, Carl Trypaluk, Dale Unruh, Orlan Wilhite

NOAA, National Weather Service, Silver Spring, Maryland

[PF\\_tabular](#) | [PF\\_graphical](#) | [Maps & aerials](#)

**PF tabular**

<b>PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches/hour)<sup>1</sup></b>										
<b>Duration</b>	<b>Average recurrence interval (years)</b>									
	<b>1</b>	<b>2</b>	<b>5</b>	<b>10</b>	<b>25</b>	<b>50</b>	<b>100</b>	<b>200</b>	<b>500</b>	<b>1000</b>
<b>5-min</b>	<b>4.18</b> (3.19-5.44)	<b>5.00</b> (3.83-6.52)	<b>6.36</b> (4.84-8.32)	<b>7.48</b> (5.68-9.83)	<b>9.01</b> (6.64-12.4)	<b>10.2</b> (7.36-14.3)	<b>11.4</b> (8.02-16.6)	<b>12.7</b> (8.54-19.0)	<b>14.7</b> (9.49-22.7)	<b>16.3</b> (10.3-25.7)
<b>10-min</b>	<b>2.96</b> (2.26-3.85)	<b>3.54</b> (2.71-4.61)	<b>4.49</b> (3.43-5.87)	<b>5.29</b> (4.01-6.95)	<b>6.38</b> (4.70-8.77)	<b>7.21</b> (5.21-10.1)	<b>8.06</b> (5.68-11.8)	<b>9.02</b> (6.05-13.5)	<b>10.4</b> (6.73-16.1)	<b>11.5</b> (7.29-18.2)
<b>15-min</b>	<b>2.32</b> (1.78-3.02)	<b>2.78</b> (2.12-3.62)	<b>3.53</b> (2.69-4.61)	<b>4.15</b> (3.15-5.46)	<b>5.00</b> (3.69-6.88)	<b>5.65</b> (4.08-7.94)	<b>6.32</b> (4.46-9.22)	<b>7.08</b> (4.74-10.6)	<b>8.16</b> (5.28-12.6)	<b>9.04</b> (5.72-14.3)
<b>30-min</b>	<b>1.56</b> (1.19-2.03)	<b>1.88</b> (1.44-2.44)	<b>2.40</b> (1.83-3.13)	<b>2.83</b> (2.15-3.72)	<b>3.42</b> (2.52-4.71)	<b>3.87</b> (2.80-5.44)	<b>4.34</b> (3.06-6.33)	<b>4.86</b> (3.26-7.26)	<b>5.60</b> (3.63-8.67)	<b>6.21</b> (3.93-9.81)
<b>60-min</b>	<b>0.978</b> (0.749-1.27)	<b>1.18</b> (0.904-1.54)	<b>1.52</b> (1.16-1.98)	<b>1.79</b> (1.36-2.36)	<b>2.17</b> (1.60-2.99)	<b>2.46</b> (1.78-3.45)	<b>2.76</b> (1.94-4.02)	<b>3.09</b> (2.07-4.62)	<b>3.57</b> (2.31-5.52)	<b>3.95</b> (2.50-6.24)
<b>2-hr</b>	<b>0.631</b> (0.486-0.815)	<b>0.759</b> (0.584-0.981)	<b>0.967</b> (0.742-1.26)	<b>1.14</b> (0.870-1.49)	<b>1.38</b> (1.02-1.89)	<b>1.56</b> (1.13-2.18)	<b>1.74</b> (1.24-2.54)	<b>1.96</b> (1.32-2.92)	<b>2.29</b> (1.48-3.52)	<b>2.56</b> (1.62-4.02)
<b>3-hr</b>	<b>0.484</b> (0.374-0.623)	<b>0.582</b> (0.449-0.750)	<b>0.742</b> (0.571-0.960)	<b>0.875</b> (0.670-1.14)	<b>1.06</b> (0.788-1.44)	<b>1.19</b> (0.874-1.67)	<b>1.34</b> (0.959-1.95)	<b>1.52</b> (1.02-2.24)	<b>1.78</b> (1.16-2.73)	<b>2.00</b> (1.27-3.13)
<b>6-hr</b>	<b>0.304</b> (0.236-0.389)	<b>0.369</b> (0.286-0.472)	<b>0.474</b> (0.367-0.610)	<b>0.562</b> (0.433-0.726)	<b>0.682</b> (0.512-0.928)	<b>0.771</b> (0.569-1.08)	<b>0.868</b> (0.627-1.27)	<b>0.988</b> (0.668-1.46)	<b>1.17</b> (0.764-1.79)	<b>1.33</b> (0.849-2.07)
<b>12-hr</b>	<b>0.184</b> (0.144-0.234)	<b>0.227</b> (0.178-0.289)	<b>0.297</b> (0.231-0.379)	<b>0.355</b> (0.275-0.456)	<b>0.435</b> (0.328-0.589)	<b>0.493</b> (0.366-0.686)	<b>0.558</b> (0.406-0.811)	<b>0.639</b> (0.433-0.935)	<b>0.766</b> (0.500-1.16)	<b>0.877</b> (0.561-1.36)
<b>24-hr</b>	<b>0.107</b> (0.084-0.135)	<b>0.134</b> (0.106-0.170)	<b>0.179</b> (0.140-0.227)	<b>0.216</b> (0.168-0.275)	<b>0.266</b> (0.203-0.360)	<b>0.303</b> (0.227-0.421)	<b>0.345</b> (0.253-0.502)	<b>0.398</b> (0.271-0.580)	<b>0.484</b> (0.317-0.730)	<b>0.559</b> (0.359-0.860)
<b>2-day</b>	<b>0.059</b> (0.047-0.075)	<b>0.076</b> (0.060-0.095)	<b>0.102</b> (0.081-0.129)	<b>0.124</b> (0.097-0.157)	<b>0.155</b> (0.118-0.208)	<b>0.176</b> (0.133-0.245)	<b>0.201</b> (0.149-0.294)	<b>0.234</b> (0.160-0.340)	<b>0.289</b> (0.190-0.434)	<b>0.338</b> (0.218-0.517)
<b>3-day</b>	<b>0.043</b> (0.034-0.054)	<b>0.055</b> (0.044-0.069)	<b>0.074</b> (0.059-0.094)	<b>0.091</b> (0.071-0.115)	<b>0.113</b> (0.087-0.152)	<b>0.129</b> (0.098-0.178)	<b>0.147</b> (0.110-0.215)	<b>0.172</b> (0.117-0.248)	<b>0.213</b> (0.140-0.319)	<b>0.250</b> (0.161-0.381)
<b>4-day</b>	<b>0.035</b> (0.028-0.043)	<b>0.044</b> (0.035-0.055)	<b>0.060</b> (0.048-0.075)	<b>0.073</b> (0.058-0.092)	<b>0.091</b> (0.070-0.122)	<b>0.104</b> (0.079-0.143)	<b>0.119</b> (0.089-0.172)	<b>0.138</b> (0.095-0.199)	<b>0.171</b> (0.113-0.256)	<b>0.201</b> (0.130-0.306)
<b>7-day</b>	<b>0.024</b> (0.019-0.030)	<b>0.030</b> (0.024-0.037)	<b>0.040</b> (0.032-0.050)	<b>0.049</b> (0.039-0.061)	<b>0.060</b> (0.047-0.081)	<b>0.069</b> (0.052-0.094)	<b>0.078</b> (0.059-0.113)	<b>0.091</b> (0.063-0.131)	<b>0.112</b> (0.074-0.167)	<b>0.131</b> (0.085-0.199)
<b>10-day</b>	<b>0.019</b> (0.015-0.024)	<b>0.024</b> (0.019-0.030)	<b>0.032</b> (0.025-0.039)	<b>0.038</b> (0.030-0.047)	<b>0.047</b> (0.036-0.062)	<b>0.053</b> (0.040-0.072)	<b>0.060</b> (0.045-0.086)	<b>0.069</b> (0.048-0.099)	<b>0.085</b> (0.056-0.126)	<b>0.099</b> (0.064-0.149)
<b>20-day</b>	<b>0.014</b> (0.011-0.017)	<b>0.016</b> (0.013-0.020)	<b>0.020</b> (0.016-0.025)	<b>0.024</b> (0.019-0.029)	<b>0.028</b> (0.022-0.037)	<b>0.032</b> (0.024-0.042)	<b>0.035</b> (0.026-0.050)	<b>0.040</b> (0.028-0.057)	<b>0.047</b> (0.031-0.070)	<b>0.054</b> (0.035-0.081)
<b>30-day</b>	<b>0.012</b> (0.009-0.014)	<b>0.013</b> (0.011-0.016)	<b>0.016</b> (0.013-0.020)	<b>0.018</b> (0.015-0.023)	<b>0.021</b> (0.017-0.028)	<b>0.024</b> (0.018-0.031)	<b>0.026</b> (0.019-0.036)	<b>0.029</b> (0.020-0.041)	<b>0.033</b> (0.022-0.049)	<b>0.037</b> (0.024-0.056)
<b>45-day</b>	<b>0.010</b> (0.008-0.012)	<b>0.011</b> (0.009-0.013)	<b>0.013</b> (0.010-0.016)	<b>0.014</b> (0.011-0.018)	<b>0.016</b> (0.013-0.021)	<b>0.018</b> (0.014-0.024)	<b>0.020</b> (0.014-0.027)	<b>0.021</b> (0.015-0.030)	<b>0.024</b> (0.016-0.035)	<b>0.026</b> (0.017-0.039)
<b>60-day</b>	<b>0.008</b> (0.007-0.010)	<b>0.009</b> (0.008-0.011)	<b>0.011</b> (0.009-0.013)	<b>0.012</b> (0.010-0.015)	<b>0.014</b> (0.011-0.017)	<b>0.015</b> (0.011-0.020)	<b>0.016</b> (0.012-0.022)	<b>0.017</b> (0.012-0.025)	<b>0.019</b> (0.013-0.028)	<b>0.020</b> (0.013-0.030)

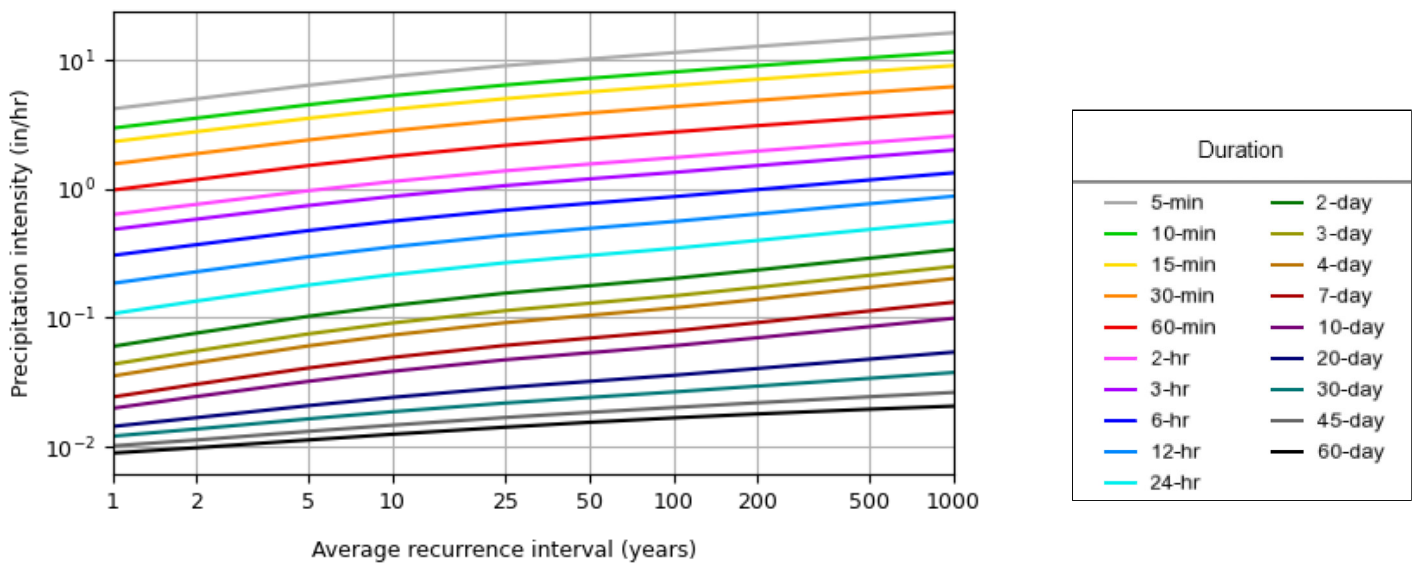
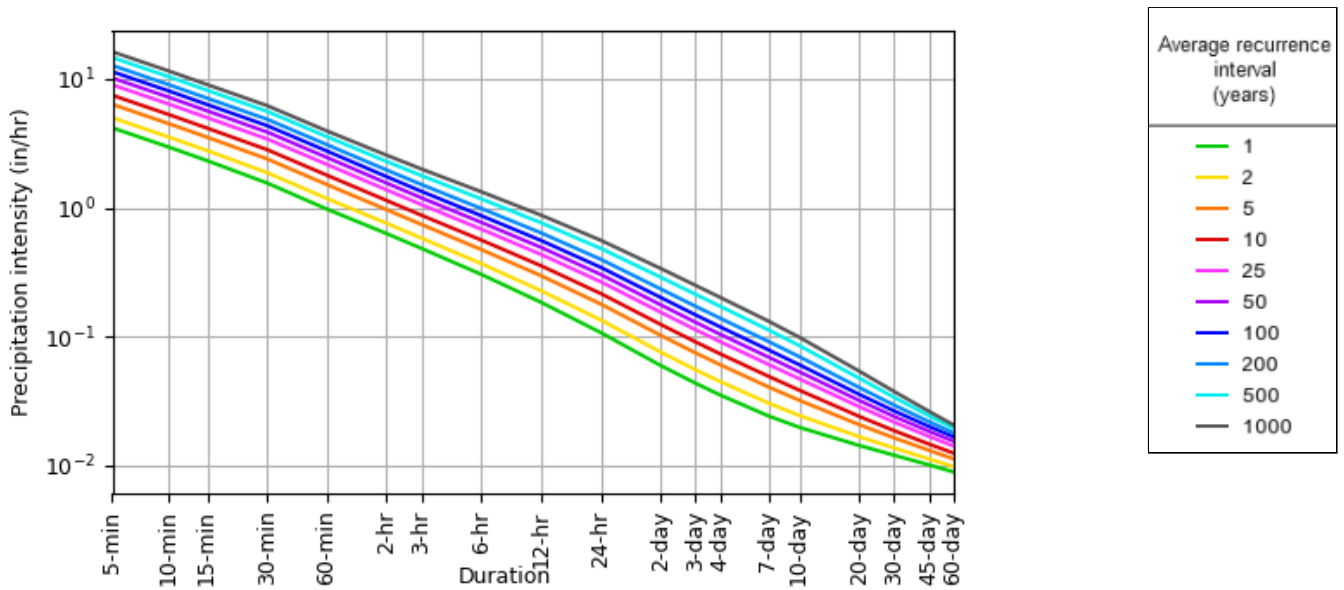
<sup>1</sup> Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS). Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values. Please refer to NOAA Atlas 14 document for more information.

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**PF graphical**

PDS-based intensity-duration-frequency (IDF) curves

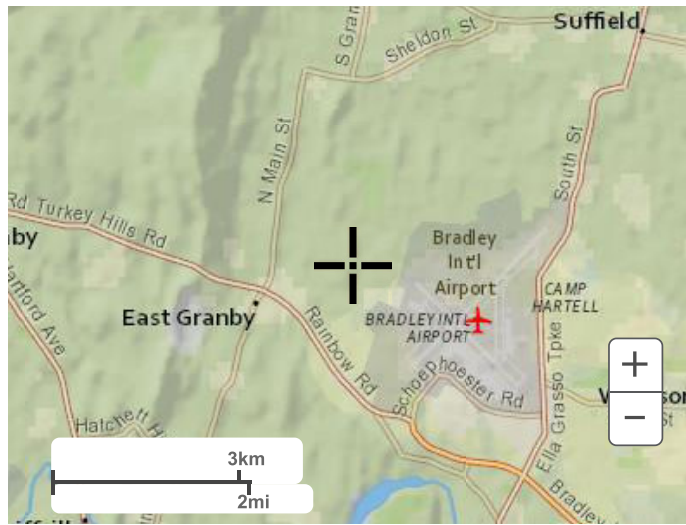
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**Maps & aerials**

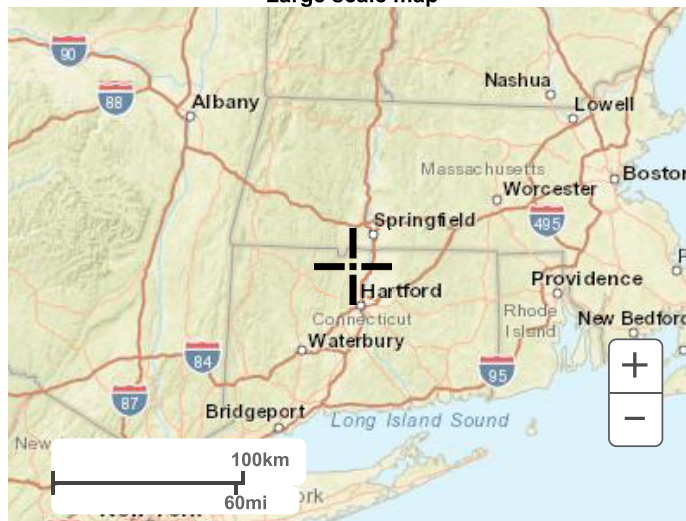
**Small scale terrain**



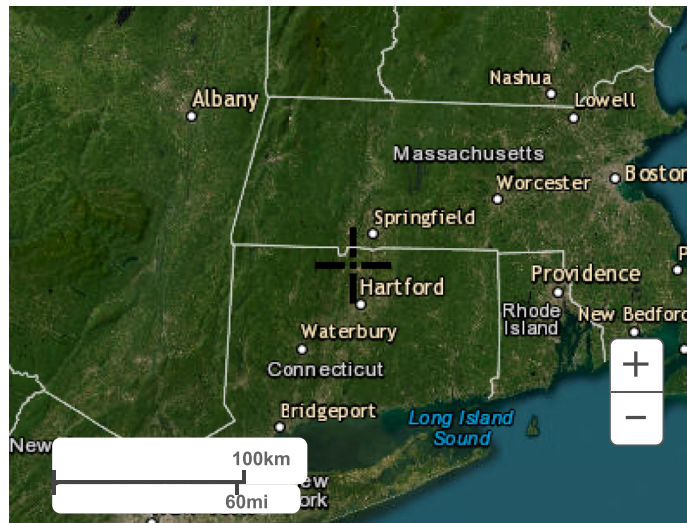
Large scale terrain



Large scale map



Large scale aerial



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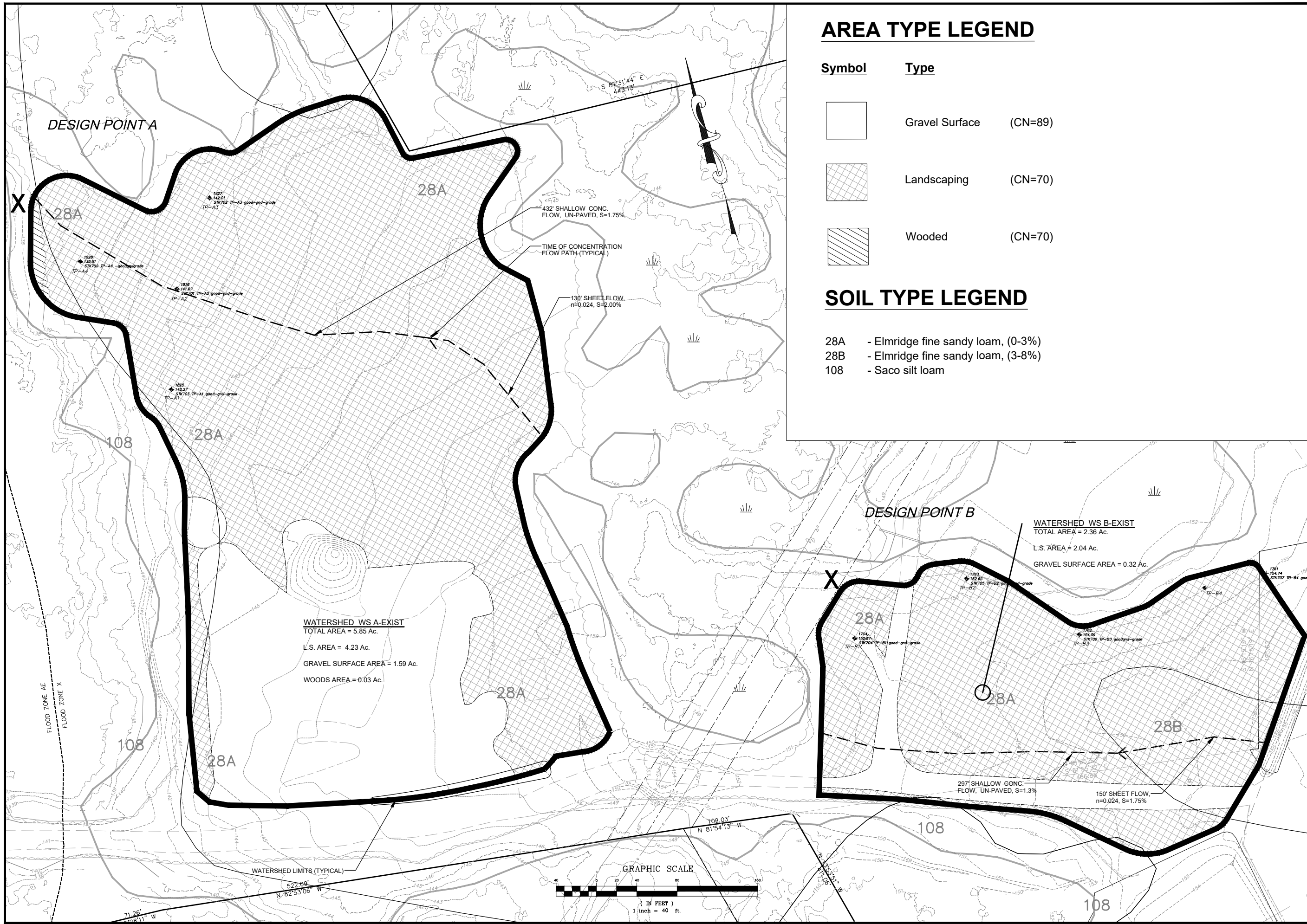
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[US Department of Commerce](#)  
[National Oceanic and Atmospheric Administration](#)  
[National Weather Service](#)  
[National Water Center](#)  
1325 East West Highway  
Silver Spring, MD 20910  
Questions?: [HDSC.Questions@noaa.gov](mailto:HDSC.Questions@noaa.gov)

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## Attachment 3

### Watershed Area Maps



**AREA TYPE LEGEND**

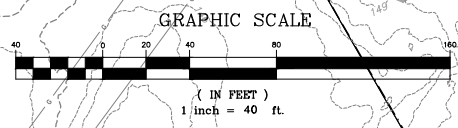
Symbol	Type	
	Gravel Surface	(CN=89)
	Landscaping	(CN=70)
	Wooded	(CN=70)

**SOIL TYPE LEGEND**

- 28A - Elmrige fine sandy loam, (0-3%)
- 28B - Elmrige fine sandy loam, (3-8%)
- 108 - Saco silt loam

**WATERSHED WS A-EXIST**  
 TOTAL AREA = 5.85 Ac.  
 L.S. AREA = 4.23 Ac.  
 GRAVEL SURFACE AREA = 1.59 Ac.  
 WOODS AREA = 0.03 Ac.

**WATERSHED WS B-EXIST**  
 TOTAL AREA = 2.36 Ac.  
 L.S. AREA = 2.04 Ac.  
 GRAVEL SURFACE AREA = 0.32 Ac.

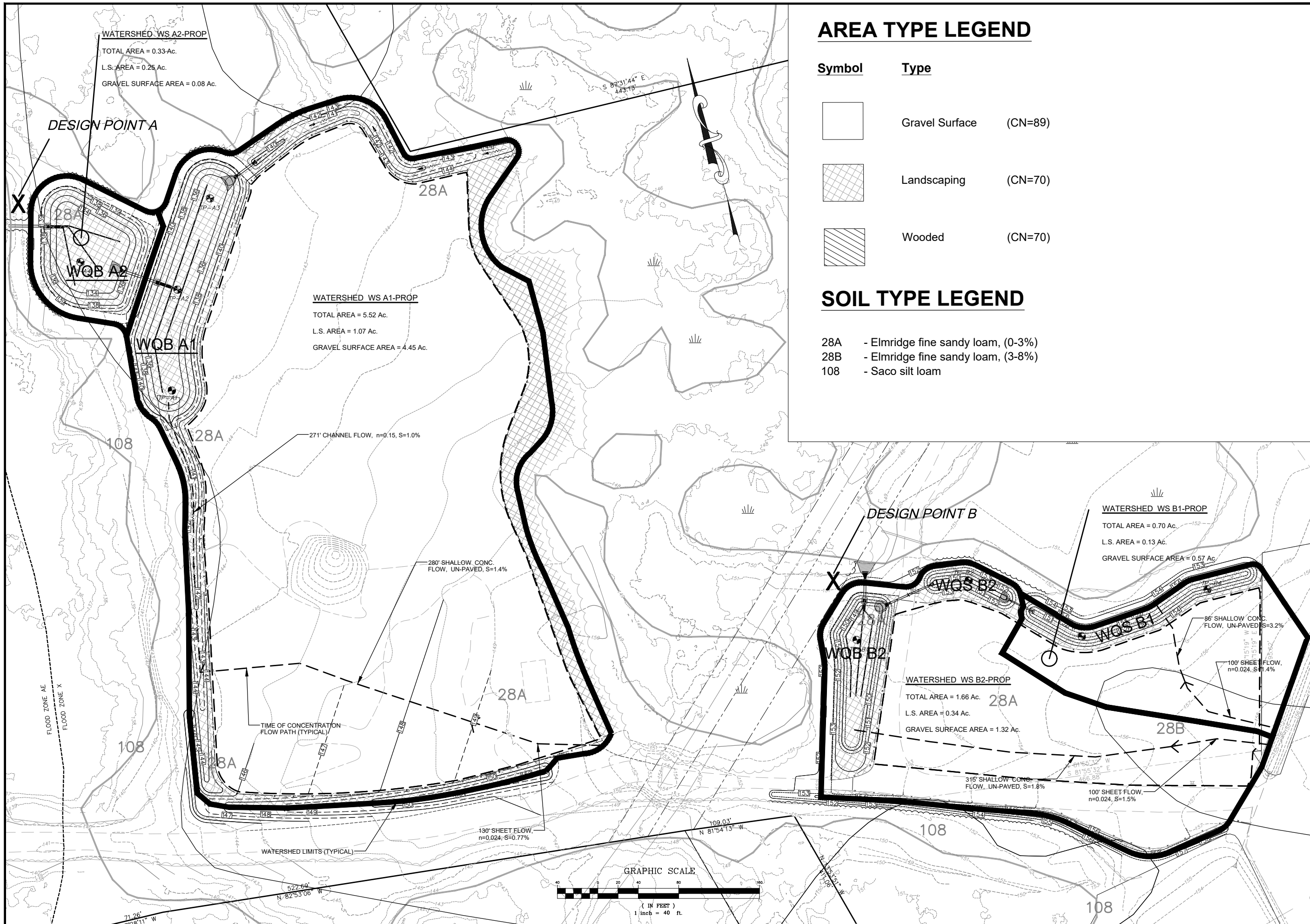


Revisions:	
No.	Description

DRAINAGE ANALYSIS PLAN EXISTING CONDITIONS	PREPARED FOR <b>COPART</b>
6 EAST ST, 13 RUSSELL ROAD & 49 RUSSELL ROAD EAST GRANBY, CONNECTICUT	Date: 08-04-2023 Drawn by: DRT Job no: 22107
Scale: 1" = 40'	Checked by: GAH Sheet no: 1 OF 1





### AREA TYPE LEGEND

Symbol	Type	
	Gravel Surface	(CN=89)
	Landscaping	(CN=70)
	Wooded	(CN=70)

### SOIL TYPE LEGEND

- 28A - ElmrIDGE fine sandy loam, (0-3%)
- 28B - ElmrIDGE fine sandy loam, (3-8%)
- 108 - Saco silt loam

No.	Date	Description

Revisions:  
 Description:  
 Date:  
 No.:

DRAINAGE ANALYSIS PLAN  
 PROPOSED CONDITIONS  
 PREPARED FOR  
**COPART**  
 6 EAST ST, 13 RUSSELL ROAD & 49 RUSSELL ROAD  
 EAST GRANBY, CONNECTICUT  
 Date: 08-04-2023 Drawn by: DRT Job no: 22107  
 Scale: 1" = 40' Checked by: GAH Sheet no: 1 OF 1  
 08/04/2023 10:09:18 AM

**DA-PR**

## Attachment 4

### Hydrologic Analysis

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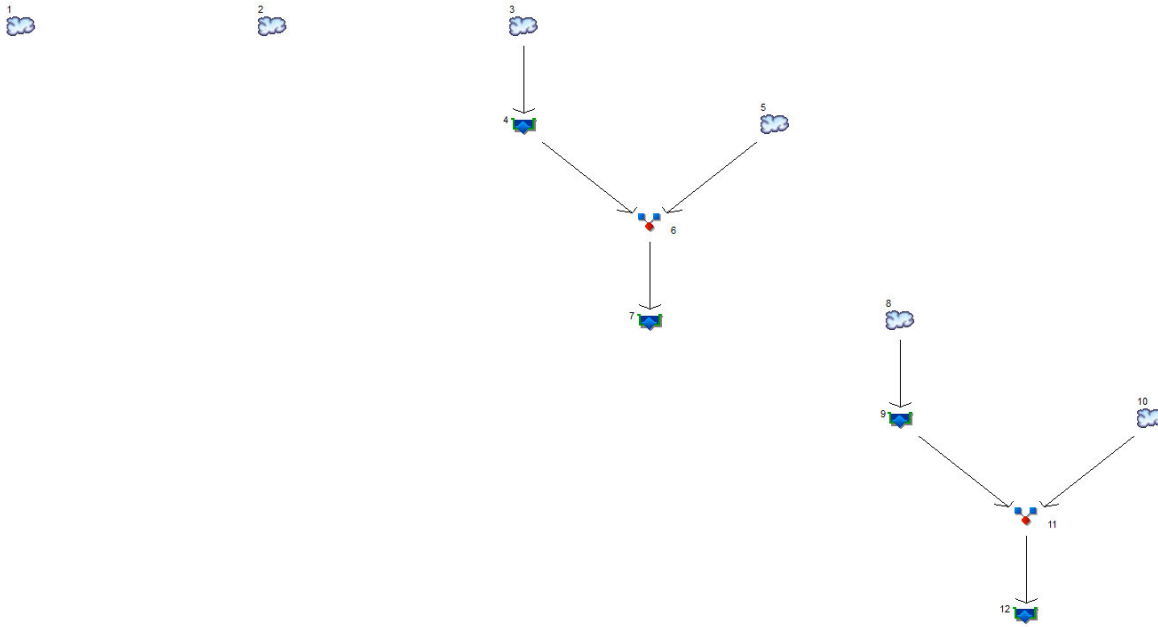
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# Watershed Model Schematic



## Legend

<u>Hyd.</u>	<u>Origin</u>	<u>Description</u>
1	SCS Runoff	WS A-EXIST
2	SCS Runoff	WS B-EXIST
3	SCS Runoff	WS A1-PROP
4	Reservoir	WQB A1
5	SCS Runoff	WS A2-PROP
6	Combine	INFLOW WQB A2
7	Reservoir	WS A TOTAL PROPOSED
8	SCS Runoff	WS B1-PROP
9	Reservoir	WQS B1
10	SCS Runoff	WS B2-PROP
11	Combine	INFLOW WQSB2 & WQBB2
12	Reservoir	WS B TOTAL PROPOSED

# Hydrograph Return Period Recap

Hydraflow Hydrographs by Intelisolve v9.1

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	-----	-----	7.677	-----	13.48	18.62	26.00	31.46	37.66	WS A-EXIST
2	SCS Runoff	-----	-----	2.729	-----	4.977	6.992	9.916	12.09	14.57	WS B-EXIST
3	SCS Runoff	-----	-----	10.89	-----	16.57	21.35	27.98	32.77	38.14	WS A1-PROP
4	Reservoir	3	-----	3.565	-----	4.966	5.881	6.960	9.453	13.58	WQB A1
5	SCS Runoff	-----	-----	0.444	-----	0.782	1.082	1.513	1.831	2.193	WS A2-PROP
6	Combine	4, 5	-----	3.690	-----	5.166	6.136	7.301	9.841	14.18	INFLOW WQB A2
7	Reservoir	6	-----	2.385	-----	3.266	3.848	4.528	5.807	7.922	WS A TOTAL PROPOSED
8	SCS Runoff	-----	-----	1.571	-----	2.393	3.080	4.031	4.718	5.487	WS B1-PROP
9	Reservoir	8	-----	0.609	-----	0.829	0.927	1.057	1.182	1.845	WQS B1
10	SCS Runoff	-----	-----	3.732	-----	5.694	7.334	9.608	11.25	13.09	WS B2-PROP
11	Combine	9, 10	-----	4.244	-----	6.408	8.171	10.54	12.25	14.16	INFLOW WQSB2 & WQBB2
12	Reservoir	11	-----	1.958	-----	2.681	3.187	3.791	4.156	4.988	WS B TOTAL PROPOSED

# Hydrograph Summary Report

Hydraflow Hydrographs by Intelisolve v9.1

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	7.677	1	725	24,551	----	-----	-----	WS A-EXIST	
2	SCS Runoff	2.729	1	725	8,909	----	-----	-----	WS B-EXIST	
3	SCS Runoff	10.89	1	726	35,006	----	-----	-----	WS A1-PROP	
4	Reservoir	3.565	1	745	34,992	3	137.39	11,106	WQB A1	
5	SCS Runoff	0.444	1	722	1,259	----	-----	-----	WS A2-PROP	
6	Combine	3.690	1	743	36,251	4, 5	-----	-----	INFLOW WQB A2	
7	Reservoir	2.385	1	793	36,242	6	135.35	7,492	WS A TOTAL PROPOSED	
8	SCS Runoff	1.571	1	722	4,268	----	-----	-----	WS B1-PROP	
9	Reservoir	0.609	1	734	4,263	8	151.67	1,058	WQS B1	
10	SCS Runoff	3.732	1	723	10,797	----	-----	-----	WS B2-PROP	
11	Combine	4.244	1	724	15,061	9, 10	-----	-----	INFLOW WQSB2 & WQBB2	
12	Reservoir	1.958	1	738	15,052	11	149.92	3,245	WS B TOTAL PROPOSED	
Macro Model 2023-08-01.gpw					Return Period: 2 Year			Friday, Aug 11, 2023		



# Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.1

Friday, Aug 11, 2023

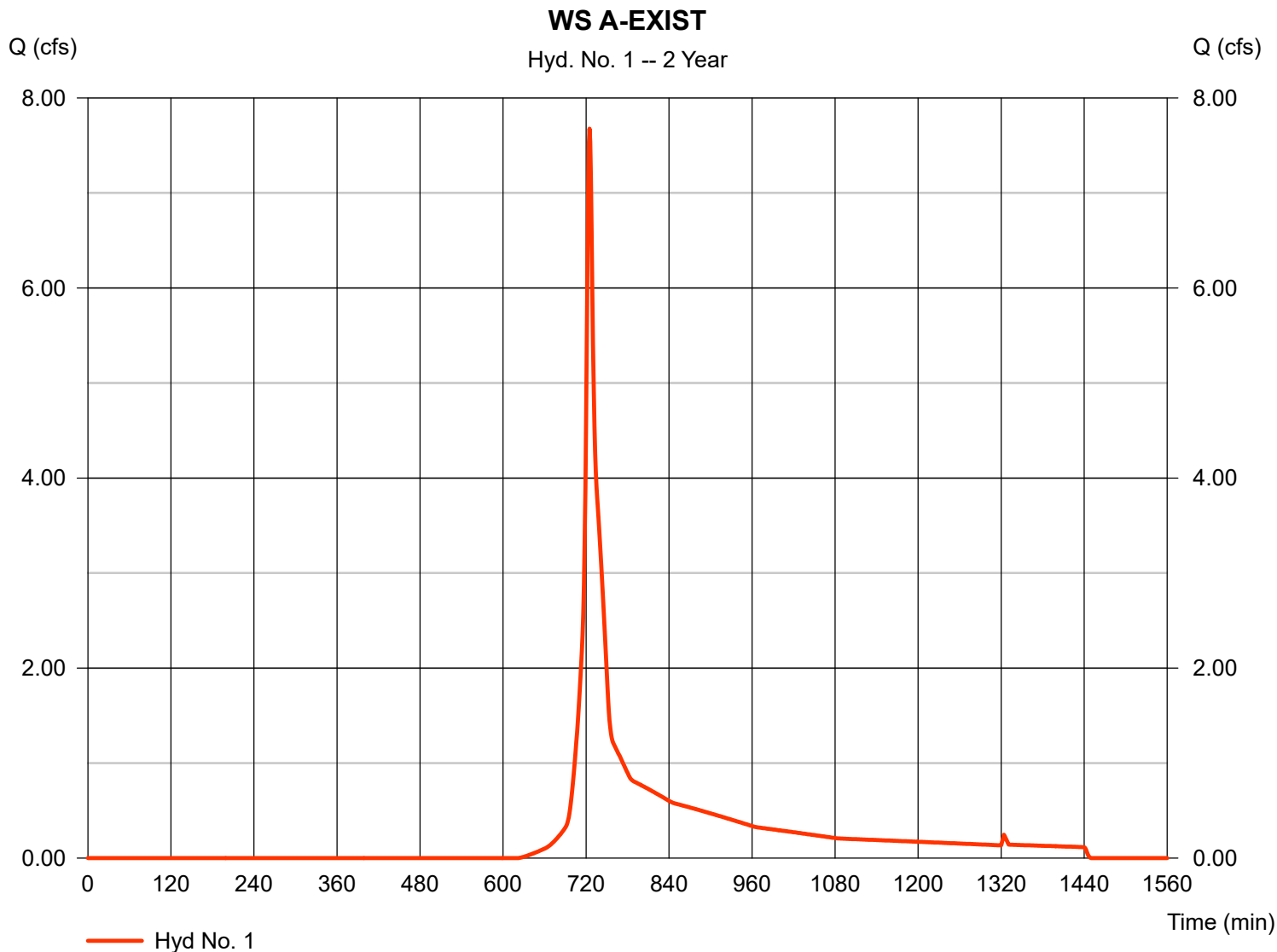
## Hyd. No. 1

WS A-EXIST

Hydrograph type = SCS Runoff  
 Storm frequency = 2 yrs  
 Time interval = 1 min  
 Drainage area = 5.850 ac  
 Basin Slope = 0.0 %  
 Tc method = TR55  
 Total precip. = 3.24 in  
 Storm duration = 24 hrs

Peak discharge = 7.677 cfs  
 Time to peak = 725 min  
 Hyd. volume = 24,551 cuft  
 Curve number = 75\*  
 Hydraulic length = 0 ft  
 Time of conc. (Tc) = 6.10 min  
 Distribution = Type III  
 Shape factor = 484

\* Composite (Area/CN) = [(4.230 x 70) + (1.590 x 89) + (0.030 x 70)] / 5.850



# TR55 Tc Worksheet

## Hyd. No. 1

WS A-EXIST

<u>Description</u>	<u>A</u>		<u>B</u>		<u>C</u>		<u>Totals</u>	
<b>Sheet Flow</b>								
Manning's n-value	= 0.024		0.016		0.011			
Flow length (ft)	= 130.0		0.0		0.0			
Two-year 24-hr precip. (in)	= 3.34		0.00		0.00			
Land slope (%)	= 2.00		0.00		0.00			
<b>Travel Time (min)</b>	<b>= 2.73</b>	<b>+</b>	<b>0.00</b>	<b>+</b>	<b>0.00</b>	<b>=</b>	<b>2.73</b>	
<b>Shallow Concentrated Flow</b>								
Flow length (ft)	= 432.00		0.00		0.00			
Watercourse slope (%)	= 1.75		0.00		0.00			
Surface description	= Unpaved		Paved		Paved			
Average velocity (ft/s)	= 2.13		0.00		0.00			
<b>Travel Time (min)</b>	<b>= 3.37</b>	<b>+</b>	<b>0.00</b>	<b>+</b>	<b>0.00</b>	<b>=</b>	<b>3.37</b>	
<b>Channel Flow</b>								
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			
<b>Travel Time (min)</b>	<b>= 0.00</b>	<b>+</b>	<b>0.00</b>	<b>+</b>	<b>0.00</b>	<b>=</b>	<b>0.00</b>	
<b>Total Travel Time, Tc .....</b>							<b>=</b>	<b>6.10 min</b>

# Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.1

Friday, Aug 11, 2023

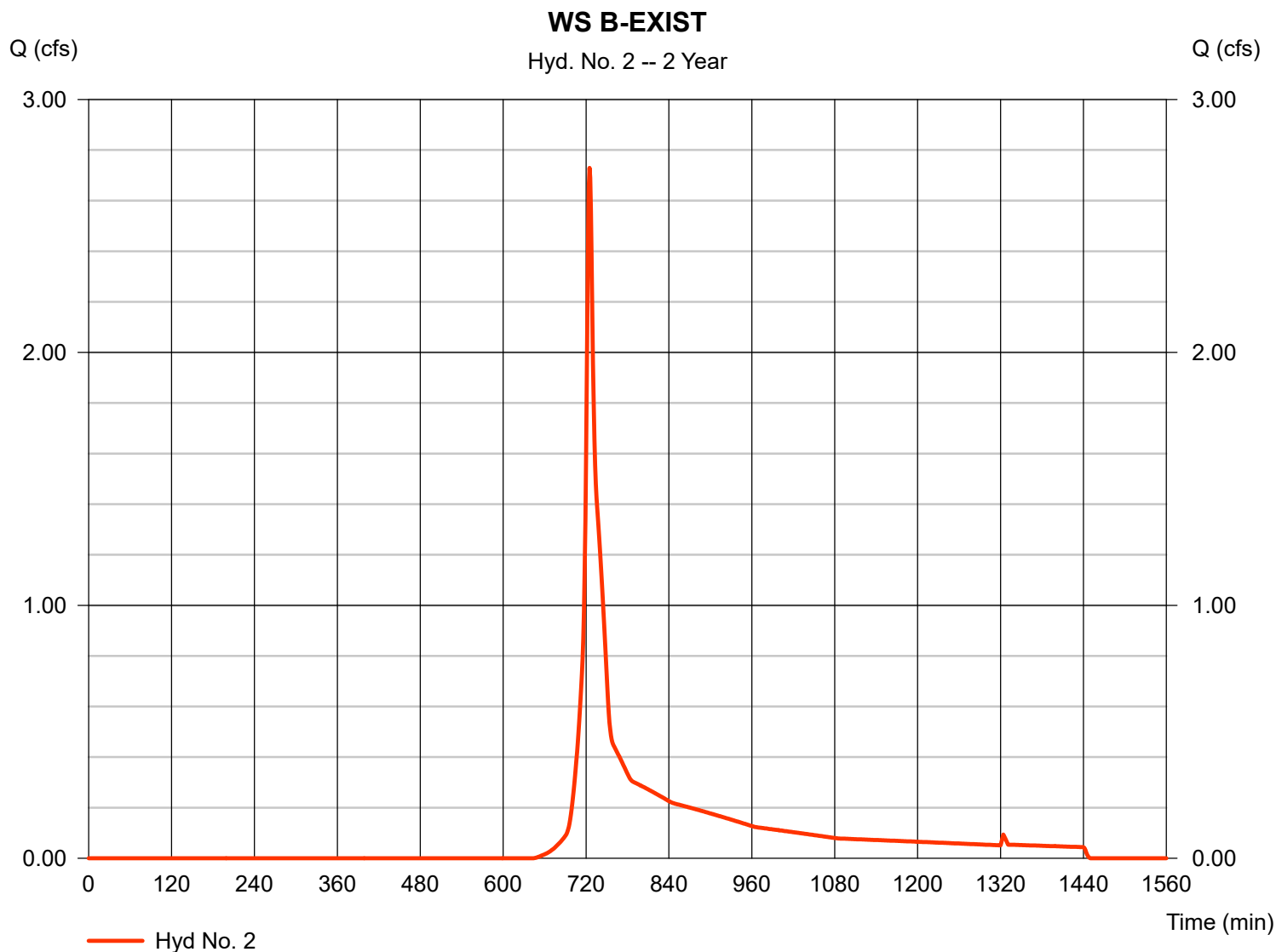
## Hyd. No. 2

WS B-EXIST

Hydrograph type = SCS Runoff  
 Storm frequency = 2 yrs  
 Time interval = 1 min  
 Drainage area = 2.360 ac  
 Basin Slope = 0.0 %  
 Tc method = TR55  
 Total precip. = 3.24 in  
 Storm duration = 24 hrs

Peak discharge = 2.729 cfs  
 Time to peak = 725 min  
 Hyd. volume = 8,909 cuft  
 Curve number = 73\*  
 Hydraulic length = 0 ft  
 Time of conc. (Tc) = 5.90 min  
 Distribution = Type III  
 Shape factor = 484

\* Composite (Area/CN) =  $[(2.040 \times 70) + (0.320 \times 89)] / 2.360$



# TR55 Tc Worksheet

Hydraflow Hydrographs by Intelisolve v9.1

## Hyd. No. 2

WS B-EXIST

<u>Description</u>	<u>A</u>	<u>B</u>	<u>C</u>	<u>Totals</u>
<b>Sheet Flow</b>				
Manning's n-value	= 0.024	0.011	0.011	
Flow length (ft)	= 150.0	0.0	0.0	
Two-year 24-hr precip. (in)	= 3.34	0.00	0.00	
Land slope (%)	= 1.75	0.00	0.00	
<b>Travel Time (min)</b>	<b>= 3.23</b>	<b>+</b>	<b>0.00</b>	<b>+</b>
				<b>0.00</b>
				<b>= 3.23</b>
<b>Shallow Concentrated Flow</b>				
Flow length (ft)	= 297.00	0.00	0.00	
Watercourse slope (%)	= 1.30	0.00	0.00	
Surface description	= Unpaved	Paved	Paved	
Average velocity (ft/s)	= 1.84	0.00	0.00	
<b>Travel Time (min)</b>	<b>= 2.69</b>	<b>+</b>	<b>0.00</b>	<b>+</b>
				<b>0.00</b>
				<b>= 2.69</b>
<b>Channel Flow</b>				
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	
<b>Travel Time (min)</b>	<b>= 0.00</b>	<b>+</b>	<b>0.00</b>	<b>+</b>
				<b>0.00</b>
				<b>= 0.00</b>
<b>Total Travel Time, Tc .....</b>				<b>5.90 min</b>

# Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.1

Friday, Aug 11, 2023

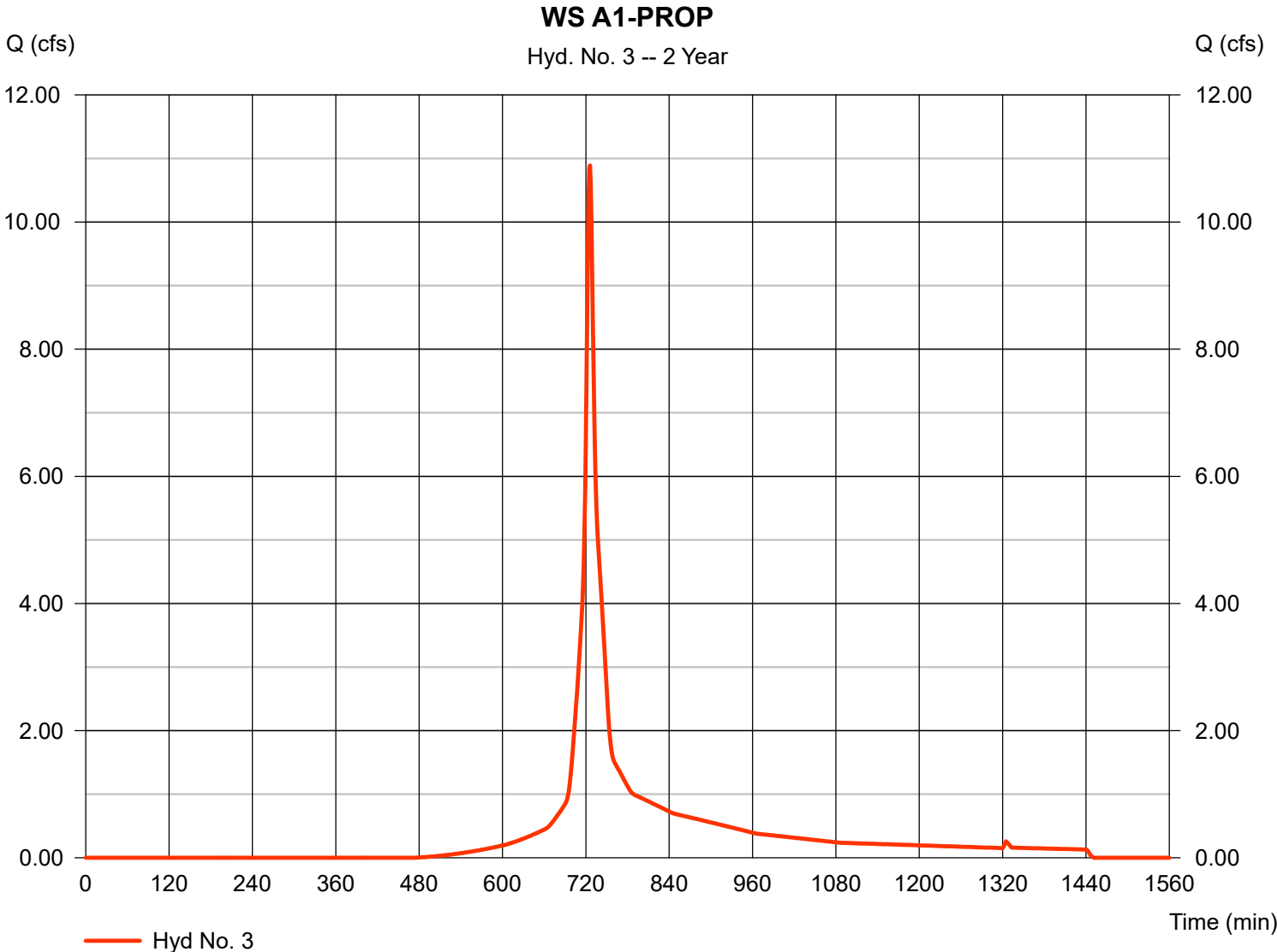
## Hyd. No. 3

WS A1-PROP

Hydrograph type = SCS Runoff  
Storm frequency = 2 yrs  
Time interval = 1 min  
Drainage area = 5.520 ac  
Basin Slope = 0.0 %  
Tc method = TR55  
Total precip. = 3.24 in  
Storm duration = 24 hrs

Peak discharge = 10.89 cfs  
Time to peak = 726 min  
Hyd. volume = 35,006 cuft  
Curve number = 85\*  
Hydraulic length = 0 ft  
Time of conc. (Tc) = 7.60 min  
Distribution = Type III  
Shape factor = 484

\* Composite (Area/CN) = [(1.070 x 70) + (4.450 x 89)] / 5.520



# TR55 Tc Worksheet

## Hyd. No. 3

WS A1-PROP

<u>Description</u>	<u>A</u>		<u>B</u>		<u>C</u>		<u>Totals</u>	
<b>Sheet Flow</b>								
Manning's n-value	= 0.024		0.011		0.011			
Flow length (ft)	= 130.0		0.0		0.0			
Two-year 24-hr precip. (in)	= 3.24		0.00		0.00			
Land slope (%)	= 0.77		0.00		0.00			
<b>Travel Time (min)</b>	<b>= 4.06</b>	<b>+</b>	<b>0.00</b>	<b>+</b>	<b>0.00</b>	<b>=</b>	<b>4.06</b>	
<b>Shallow Concentrated Flow</b>								
Flow length (ft)	= 280.00		0.00		0.00			
Watercourse slope (%)	= 1.40		0.00		0.00			
Surface description	= Unpaved		Paved		Paved			
Average velocity (ft/s)	= 1.91		0.00		0.00			
<b>Travel Time (min)</b>	<b>= 2.44</b>	<b>+</b>	<b>0.00</b>	<b>+</b>	<b>0.00</b>	<b>=</b>	<b>2.44</b>	
<b>Channel Flow</b>								
X sectional flow area (sqft)	= 3.50		0.00		0.00			
Wetted perimeter (ft)	= 6.80		0.00		0.00			
Channel slope (%)	= 1.00		0.00		0.00			
Manning's n-value	= 0.024		0.015		0.015			
Velocity (ft/s)	= 3.98		0.00		0.00			
Flow length (ft)	= 271.0		0.0		0.0			
<b>Travel Time (min)</b>	<b>= 1.14</b>	<b>+</b>	<b>0.00</b>	<b>+</b>	<b>0.00</b>	<b>=</b>	<b>1.14</b>	
<b>Total Travel Time, Tc .....</b>							<b>=</b>	<b>7.60 min</b>

# Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.1

Friday, Aug 11, 2023

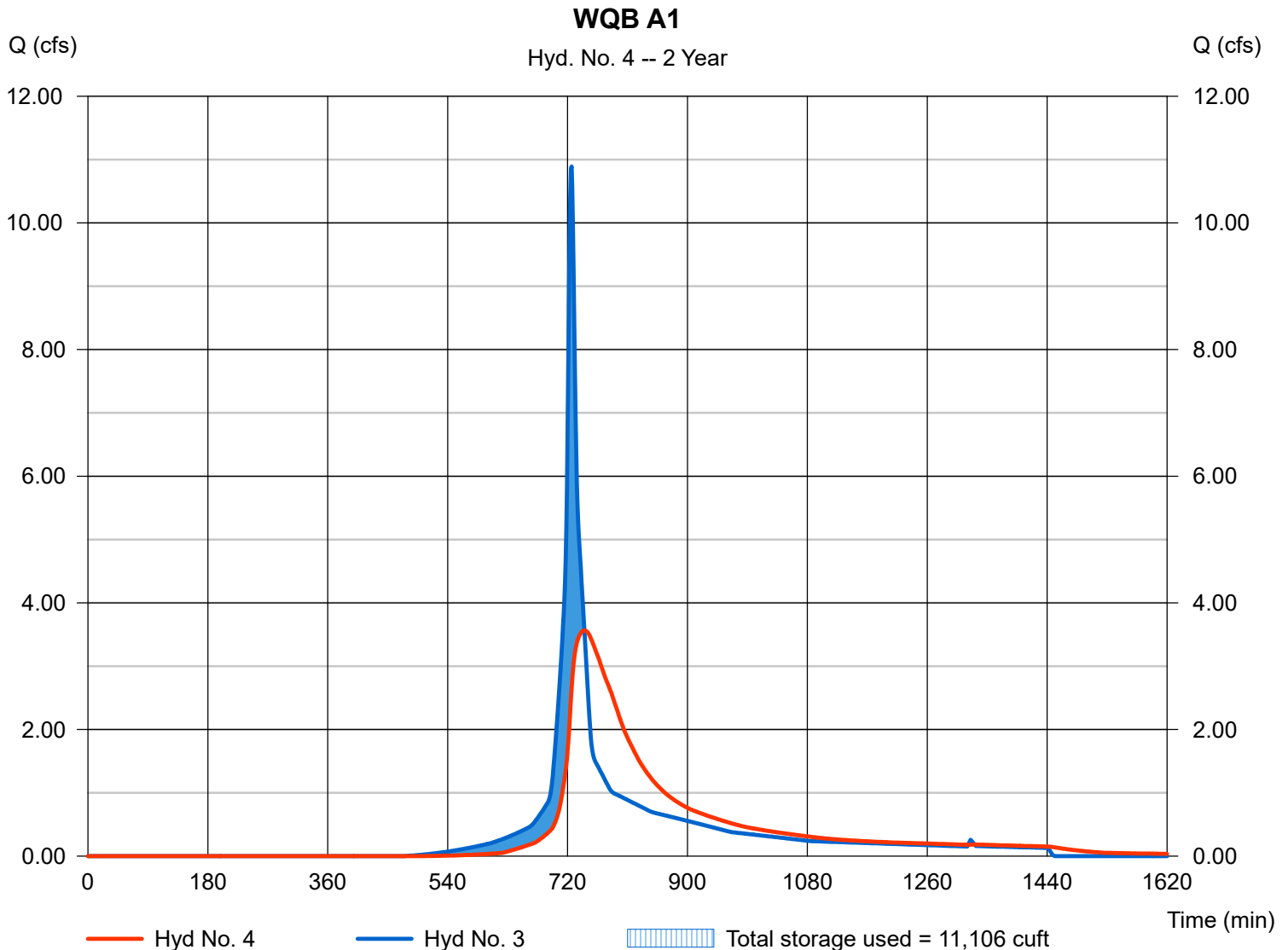
## Hyd. No. 4

WQB A1

Hydrograph type = Reservoir  
Storm frequency = 2 yrs  
Time interval = 1 min  
Inflow hyd. No. = 3 - WS A1-PROP  
Reservoir name = WQB A1

Peak discharge = 3.565 cfs  
Time to peak = 745 min  
Hyd. volume = 34,992 cuft  
Max. Elevation = 137.39 ft  
Max. Storage = 11,106 cuft

Storage Indication method used.







# Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.1

Friday, Aug 11, 2023

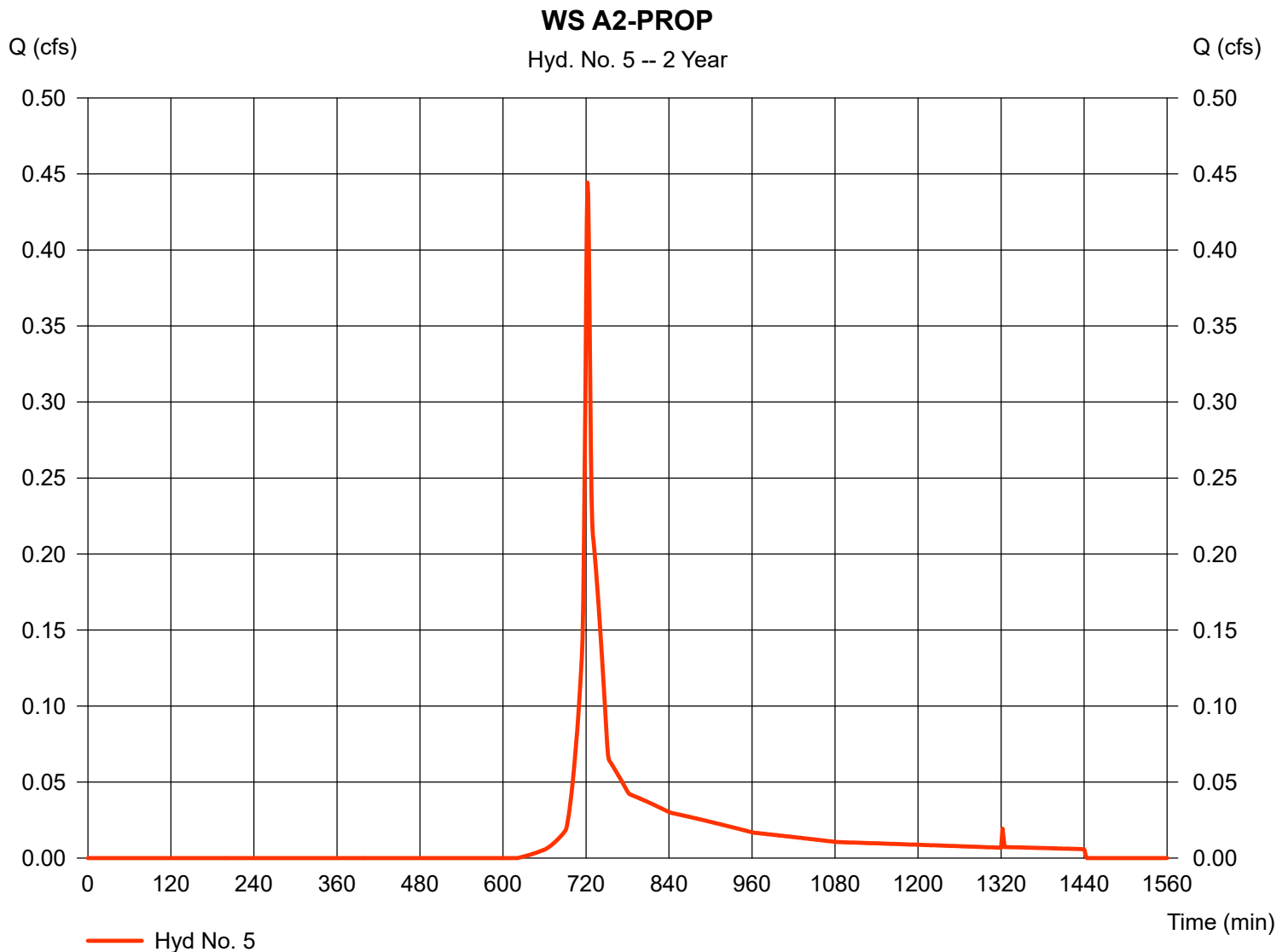
## Hyd. No. 5

WS A2-PROP

Hydrograph type = SCS Runoff  
 Storm frequency = 2 yrs  
 Time interval = 1 min  
 Drainage area = 0.330 ac  
 Basin Slope = 0.0 %  
 Tc method = TR55  
 Total precip. = 3.24 in  
 Storm duration = 24 hrs

Peak discharge = 0.444 cfs  
 Time to peak = 722 min  
 Hyd. volume = 1,259 cuft  
 Curve number = 75\*  
 Hydraulic length = 0 ft  
 Time of conc. (Tc) = 3.10 min  
 Distribution = Type III  
 Shape factor = 484

\* Composite (Area/CN) = [(0.240 x 70) + (0.090 x 89)] / 0.330



# TR55 Tc Worksheet

Hydraflow Hydrographs by Intelisolve v9.1

## Hyd. No. 5

WS A2-PROP

<u>Description</u>	<u>A</u>	<u>B</u>	<u>C</u>	<u>Totals</u>
<b>Sheet Flow</b>				
Manning's n-value	= 0.024	0.011	0.011	
Flow length (ft)	= 100.0	0.0	0.0	
Two-year 24-hr precip. (in)	= 3.24	0.00	0.00	
Land slope (%)	= 1.40	0.00	0.00	
<b>Travel Time (min)</b>	<b>= 2.59</b>	<b>+</b> <b>0.00</b>	<b>+</b> <b>0.00</b>	<b>= 2.59</b>
<b>Shallow Concentrated Flow</b>				
Flow length (ft)	= 86.00	0.00	0.00	
Watercourse slope (%)	= 3.20	0.00	0.00	
Surface description	= Unpaved	Paved	Paved	
Average velocity (ft/s)	= 2.89	0.00	0.00	
<b>Travel Time (min)</b>	<b>= 0.50</b>	<b>+</b> <b>0.00</b>	<b>+</b> <b>0.00</b>	<b>= 0.50</b>
<b>Channel Flow</b>				
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	
<b>Travel Time (min)</b>	<b>= 0.00</b>	<b>+</b> <b>0.00</b>	<b>+</b> <b>0.00</b>	<b>= 0.00</b>
<b>Total Travel Time, Tc .....</b>				<b>3.10 min</b>

# Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.1

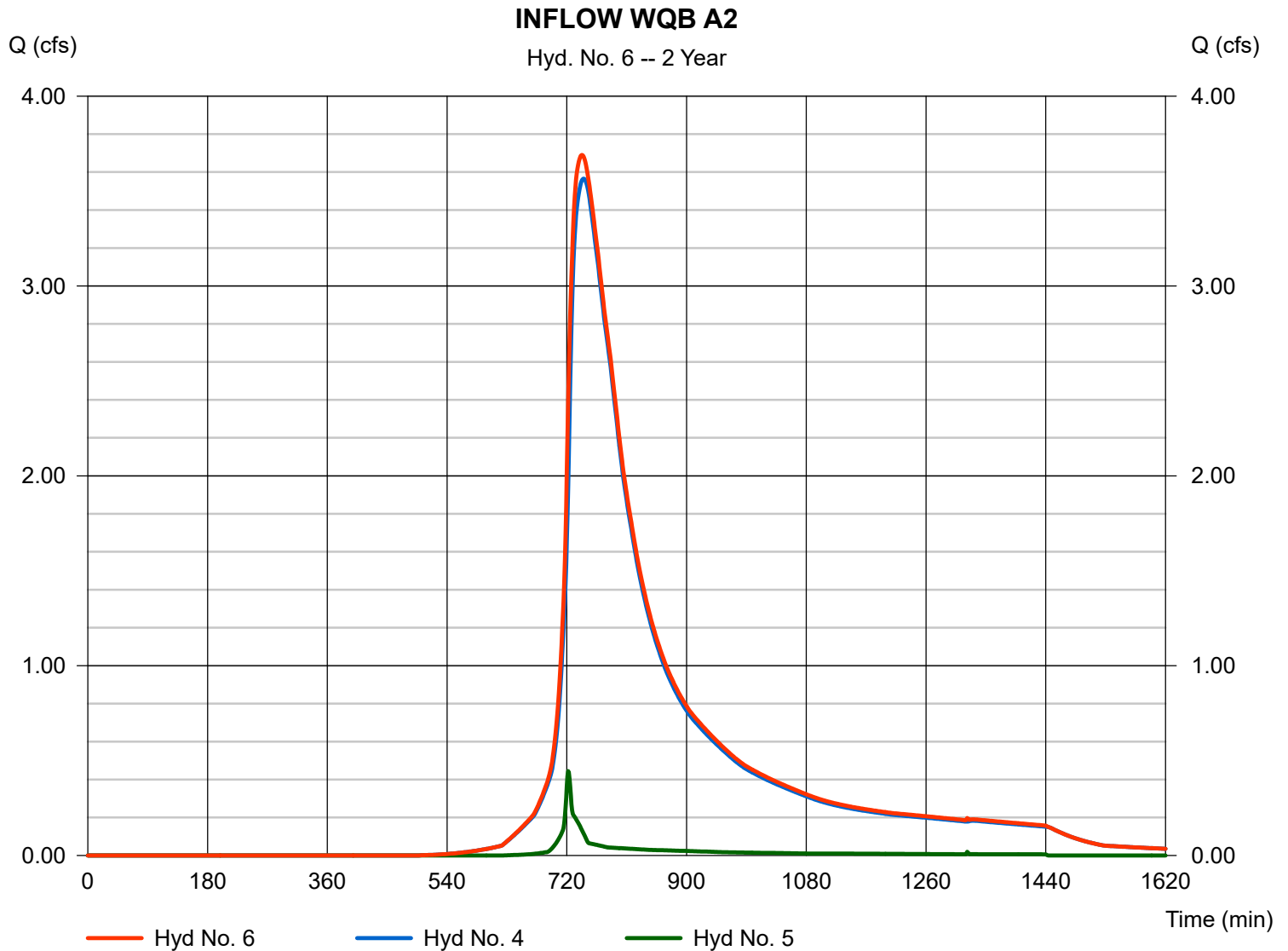
Friday, Aug 11, 2023

## Hyd. No. 6

INFLOW WQB A2

Hydrograph type = Combine  
Storm frequency = 2 yrs  
Time interval = 1 min  
Inflow hyds. = 4, 5

Peak discharge = 3.690 cfs  
Time to peak = 743 min  
Hyd. volume = 36,251 cuft  
Contrib. drain. area = 0.330 ac



# Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.1

Friday, Aug 11, 2023

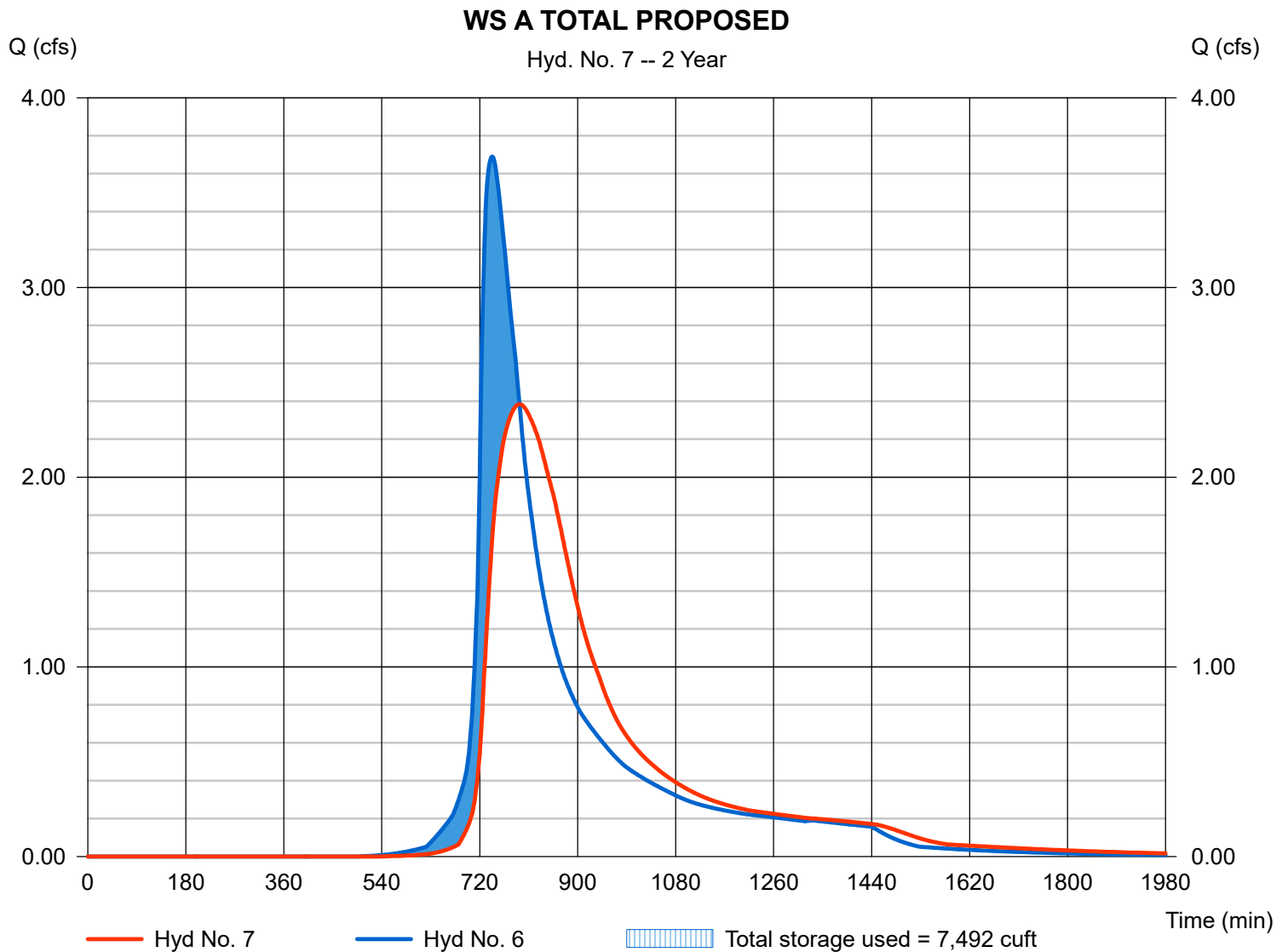
## Hyd. No. 7

### WS A TOTAL PROPOSED

Hydrograph type = Reservoir  
Storm frequency = 2 yrs  
Time interval = 1 min  
Inflow hyd. No. = 6 - INFLOW WQB A2  
Reservoir name = WQB A2

Peak discharge = 2.385 cfs  
Time to peak = 793 min  
Hyd. volume = 36,242 cuft  
Max. Elevation = 135.35 ft  
Max. Storage = 7,492 cuft

Storage Indication method used.





# Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.1

Friday, Aug 11, 2023

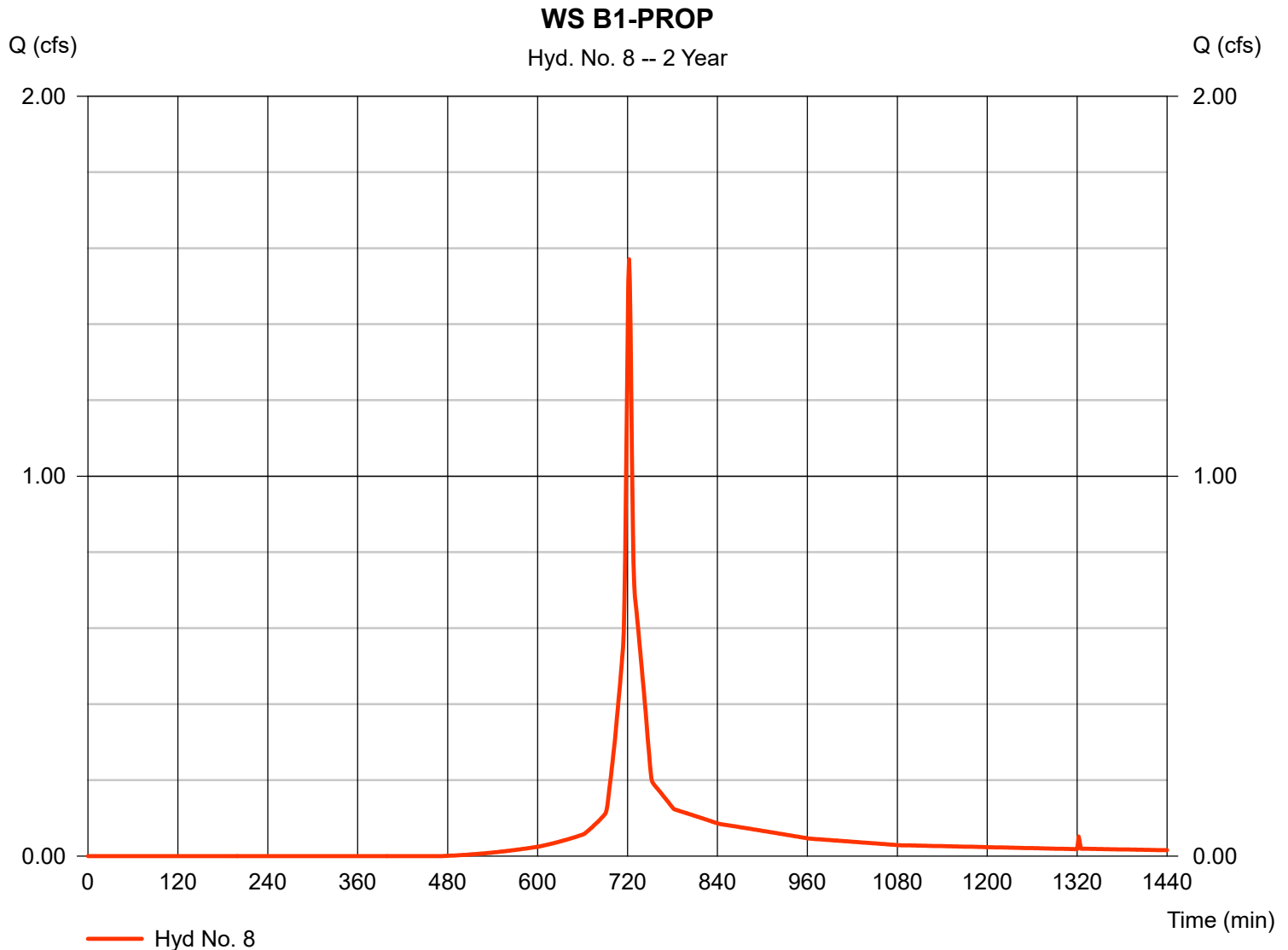
## Hyd. No. 8

WS B1-PROP

Hydrograph type = SCS Runoff  
 Storm frequency = 2 yrs  
 Time interval = 1 min  
 Drainage area = 0.700 ac  
 Basin Slope = 0.0 %  
 Tc method = TR55  
 Total precip. = 3.24 in  
 Storm duration = 24 hrs

Peak discharge = 1.571 cfs  
 Time to peak = 722 min  
 Hyd. volume = 4,268 cuft  
 Curve number = 85\*  
 Hydraulic length = 0 ft  
 Time of conc. (Tc) = 3.10 min  
 Distribution = Type III  
 Shape factor = 484

\* Composite (Area/CN) = [(0.130 x 70) + (0.570 x 89)] / 0.700



# TR55 Tc Worksheet

Hydraflow Hydrographs by Intelisolve v9.1

**Hyd. No. 8**

WS B1-PROP

<u>Description</u>	<u>A</u>	<u>B</u>	<u>C</u>	<u>Totals</u>
<b>Sheet Flow</b>				
Manning's n-value	= 0.024	0.011	0.011	
Flow length (ft)	= 100.0	0.0	0.0	
Two-year 24-hr precip. (in)	= 3.24	0.00	0.00	
Land slope (%)	= 1.40	0.00	0.00	
<b>Travel Time (min)</b>	<b>= 2.59</b>	<b>+</b>	<b>0.00</b>	<b>+</b>
				<b>0.00</b>
				<b>= 2.59</b>
<b>Shallow Concentrated Flow</b>				
Flow length (ft)	= 88.00	0.00	0.00	
Watercourse slope (%)	= 3.20	0.00	0.00	
Surface description	= Unpaved	Paved	Paved	
Average velocity (ft/s)	= 2.89	0.00	0.00	
<b>Travel Time (min)</b>	<b>= 0.51</b>	<b>+</b>	<b>0.00</b>	<b>+</b>
				<b>0.00</b>
				<b>= 0.51</b>
<b>Channel Flow</b>				
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	
<b>Travel Time (min)</b>	<b>= 0.00</b>	<b>+</b>	<b>0.00</b>	<b>+</b>
				<b>0.00</b>
				<b>= 0.00</b>
<b>Total Travel Time, Tc .....</b>				<b>3.10 min</b>

# Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.1

Friday, Aug 11, 2023

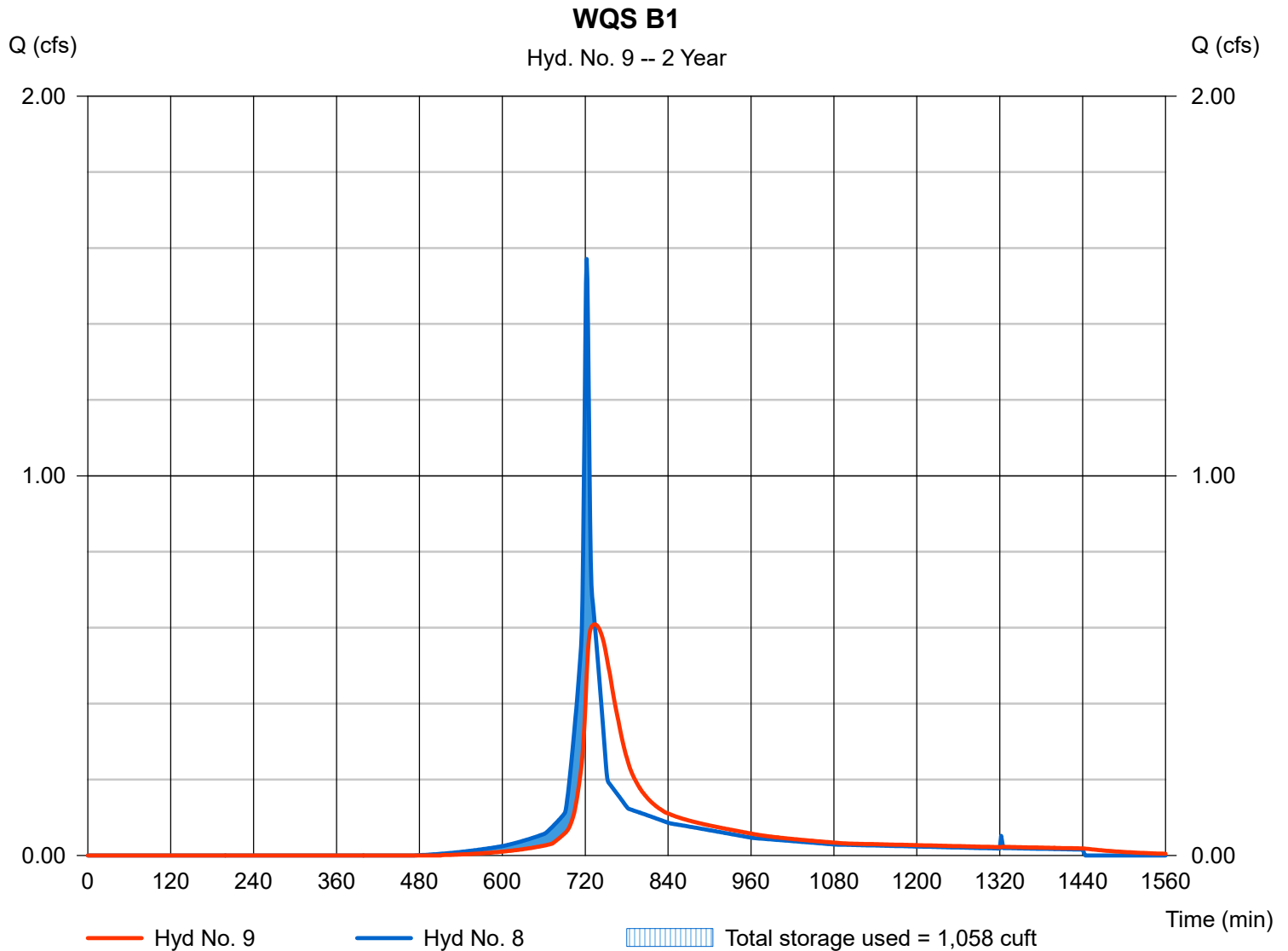
## Hyd. No. 9

WQS B1

Hydrograph type = Reservoir  
Storm frequency = 2 yrs  
Time interval = 1 min  
Inflow hyd. No. = 8 - WS B1-PROP  
Reservoir name = WQS B1

Peak discharge = 0.609 cfs  
Time to peak = 734 min  
Hyd. volume = 4,263 cuft  
Max. Elevation = 151.67 ft  
Max. Storage = 1,058 cuft

Storage Indication method used.







# Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.1

Friday, Aug 11, 2023

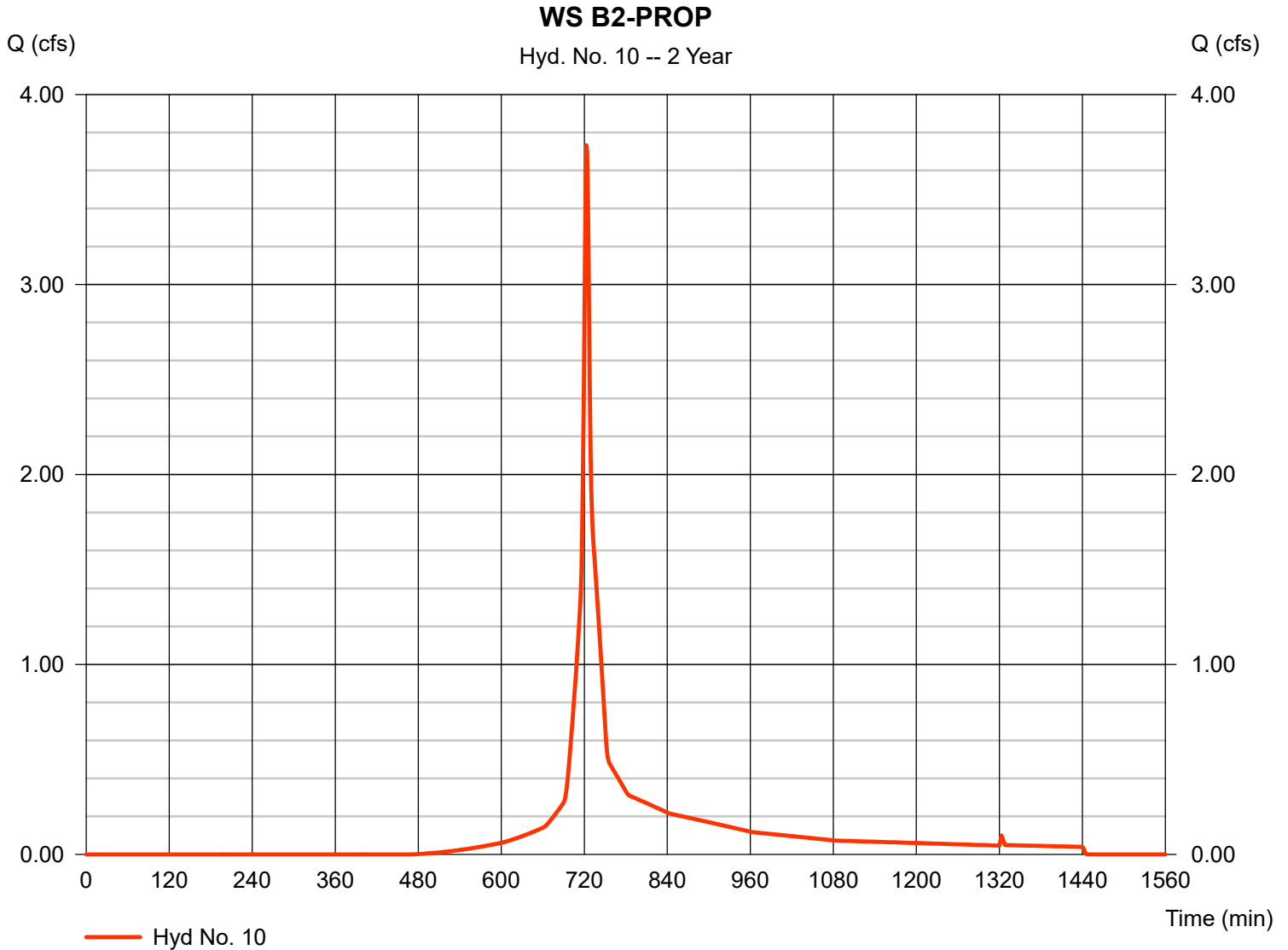
## Hyd. No. 10

WS B2-PROP

Hydrograph type = SCS Runoff  
Storm frequency = 2 yrs  
Time interval = 1 min  
Drainage area = 1.660 ac  
Basin Slope = 0.0 %  
Tc method = TR55  
Total precip. = 3.24 in  
Storm duration = 24 hrs

Peak discharge = 3.732 cfs  
Time to peak = 723 min  
Hyd. volume = 10,797 cuft  
Curve number = 85\*  
Hydraulic length = 0 ft  
Time of conc. (Tc) = 4.90 min  
Distribution = Type III  
Shape factor = 484

\* Composite (Area/CN) =  $[(0.340 \times 70) + (1.320 \times 89)] / 1.660$



# TR55 Tc Worksheet

**Hyd. No. 10**

WS B2-PROP

<u>Description</u>	<u>A</u>		<u>B</u>		<u>C</u>		<u>Totals</u>	
<b>Sheet Flow</b>								
Manning's n-value	= 0.024		0.011		0.011			
Flow length (ft)	= 100.0		0.0		0.0			
Two-year 24-hr precip. (in)	= 3.24		0.00		0.00			
Land slope (%)	= 1.50		0.00		0.00			
<b>Travel Time (min)</b>	<b>= 2.52</b>	<b>+</b>	<b>0.00</b>	<b>+</b>	<b>0.00</b>	<b>=</b>	<b>2.52</b>	
<b>Shallow Concentrated Flow</b>								
Flow length (ft)	= 315.00		0.00		0.00			
Watercourse slope (%)	= 1.80		0.00		0.00			
Surface description	= Unpaved		Paved		Paved			
Average velocity (ft/s)	= 2.16		0.00		0.00			
<b>Travel Time (min)</b>	<b>= 2.43</b>	<b>+</b>	<b>0.00</b>	<b>+</b>	<b>0.00</b>	<b>=</b>	<b>2.43</b>	
<b>Channel Flow</b>								
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			
<b>Travel Time (min)</b>	<b>= 0.00</b>	<b>+</b>	<b>0.00</b>	<b>+</b>	<b>0.00</b>	<b>=</b>	<b>0.00</b>	
<b>Total Travel Time, Tc .....</b>							<b>=</b>	<b>4.90 min</b>

# Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.1

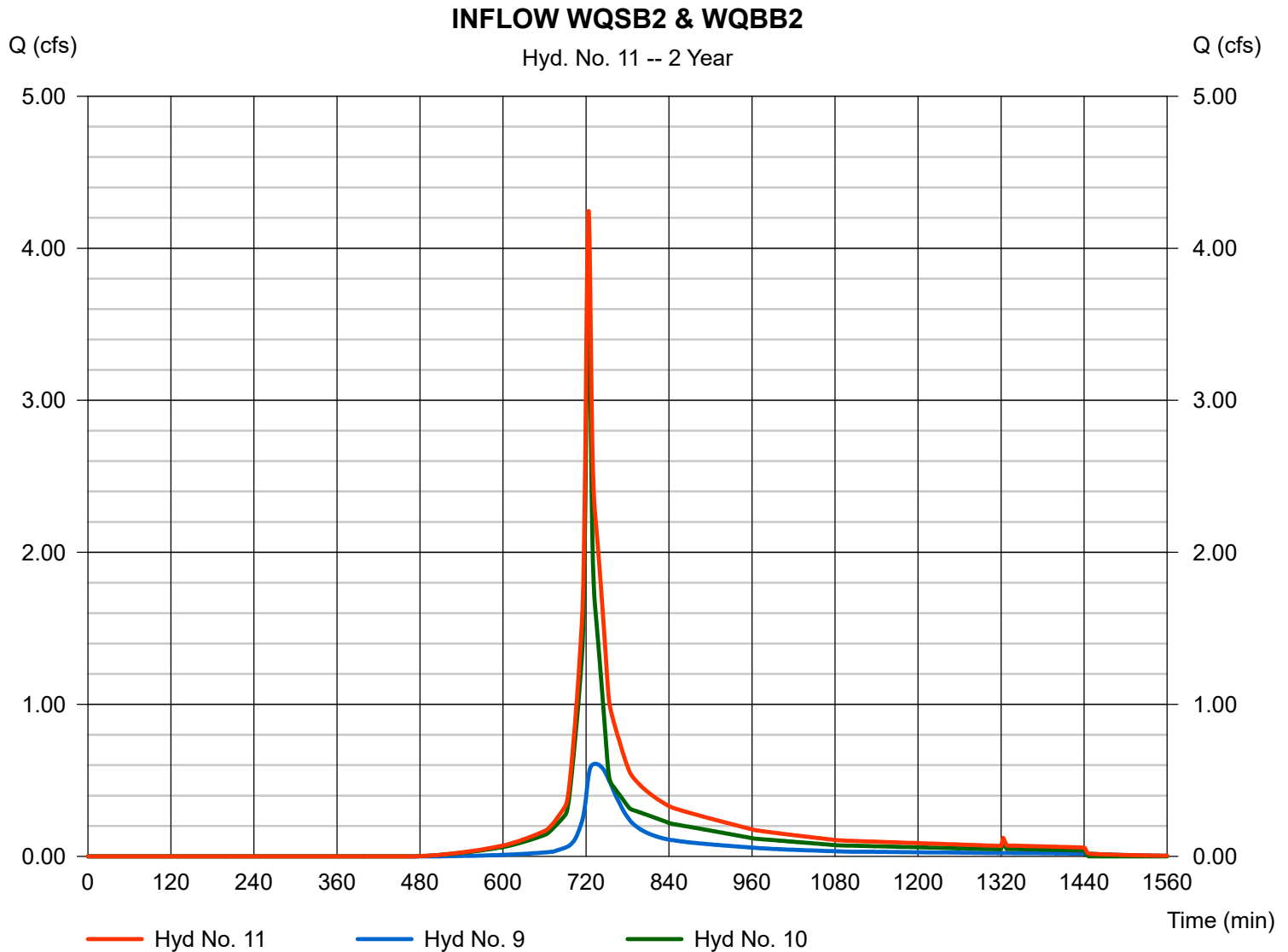
Friday, Aug 11, 2023

## Hyd. No. 11

INFLOW WQSB2 & WQBB2

Hydrograph type = Combine  
Storm frequency = 2 yrs  
Time interval = 1 min  
Inflow hyds. = 9, 10

Peak discharge = 4.244 cfs  
Time to peak = 724 min  
Hyd. volume = 15,061 cuft  
Contrib. drain. area = 1.660 ac



# Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.1

Friday, Aug 11, 2023

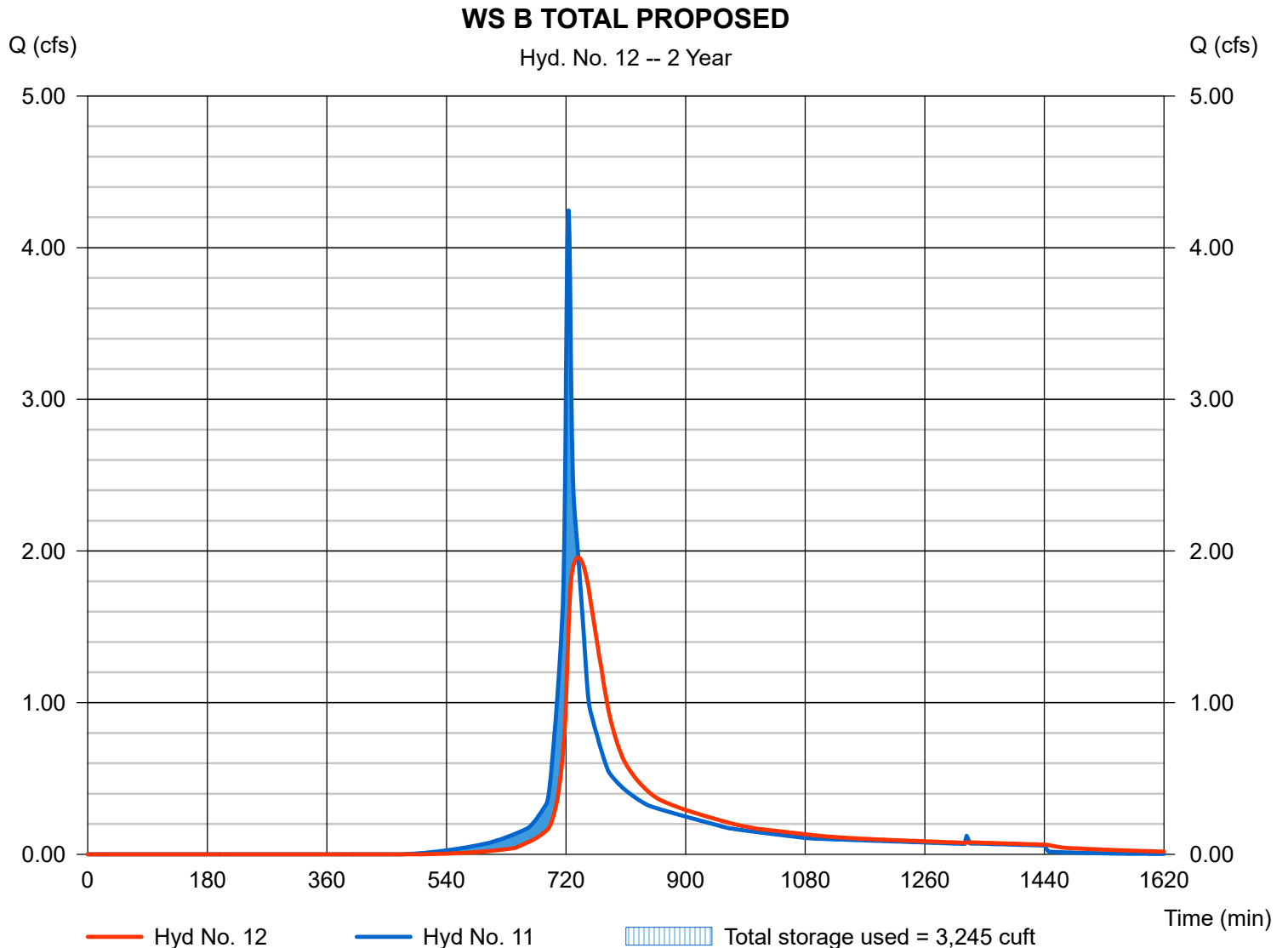
## Hyd. No. 12

### WS B TOTAL PROPOSED

Hydrograph type = Reservoir  
Storm frequency = 2 yrs  
Time interval = 1 min  
Inflow hyd. No. = 11 - INFLOW WQSB2 & WQBB2  
Reservoir name = WQB B2 &WQS B2

Peak discharge = 1.958 cfs  
Time to peak = 738 min  
Hyd. volume = 15,052 cuft  
Max. Elevation = 149.92 ft  
Max. Storage = 3,245 cuft

Storage Indication method used.





# Hydrograph Summary Report

Hydraflow Hydrographs by Intelisolve v9.1

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	13.48	1	725	41,835	---	-----	-----	WS A-EXIST	
2	SCS Runoff	4.977	1	725	15,558	---	-----	-----	WS B-EXIST	
3	SCS Runoff	16.57	1	726	53,641	---	-----	-----	WS A1-PROP	
4	Reservoir	4.966	1	746	53,627	3	138.07	17,348	WQB A1	
5	SCS Runoff	0.782	1	722	2,145	---	-----	-----	WS A2-PROP	
6	Combine	5.166	1	742	55,772	4, 5	-----	-----	INFLOW WQB A2	
7	Reservoir	3.266	1	806	55,764	6	136.08	12,136	WS A TOTAL PROPOSED	
8	SCS Runoff	2.393	1	722	6,541	---	-----	-----	WS B1-PROP	
9	Reservoir	0.829	1	736	6,536	8	152.02	1,647	WQS B1	
10	SCS Runoff	5.694	1	723	16,545	---	-----	-----	WS B2-PROP	
11	Combine	6.408	1	723	23,081	9, 10	-----	-----	INFLOW WQSB2 & WQBB2	
12	Reservoir	2.681	1	740	23,072	11	150.32	4,966	WS B TOTAL PROPOSED	
Macro Model 2023-08-01.gpw					Return Period: 5 Year			Friday, Aug 11, 2023		

# Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.1

Friday, Aug 11, 2023

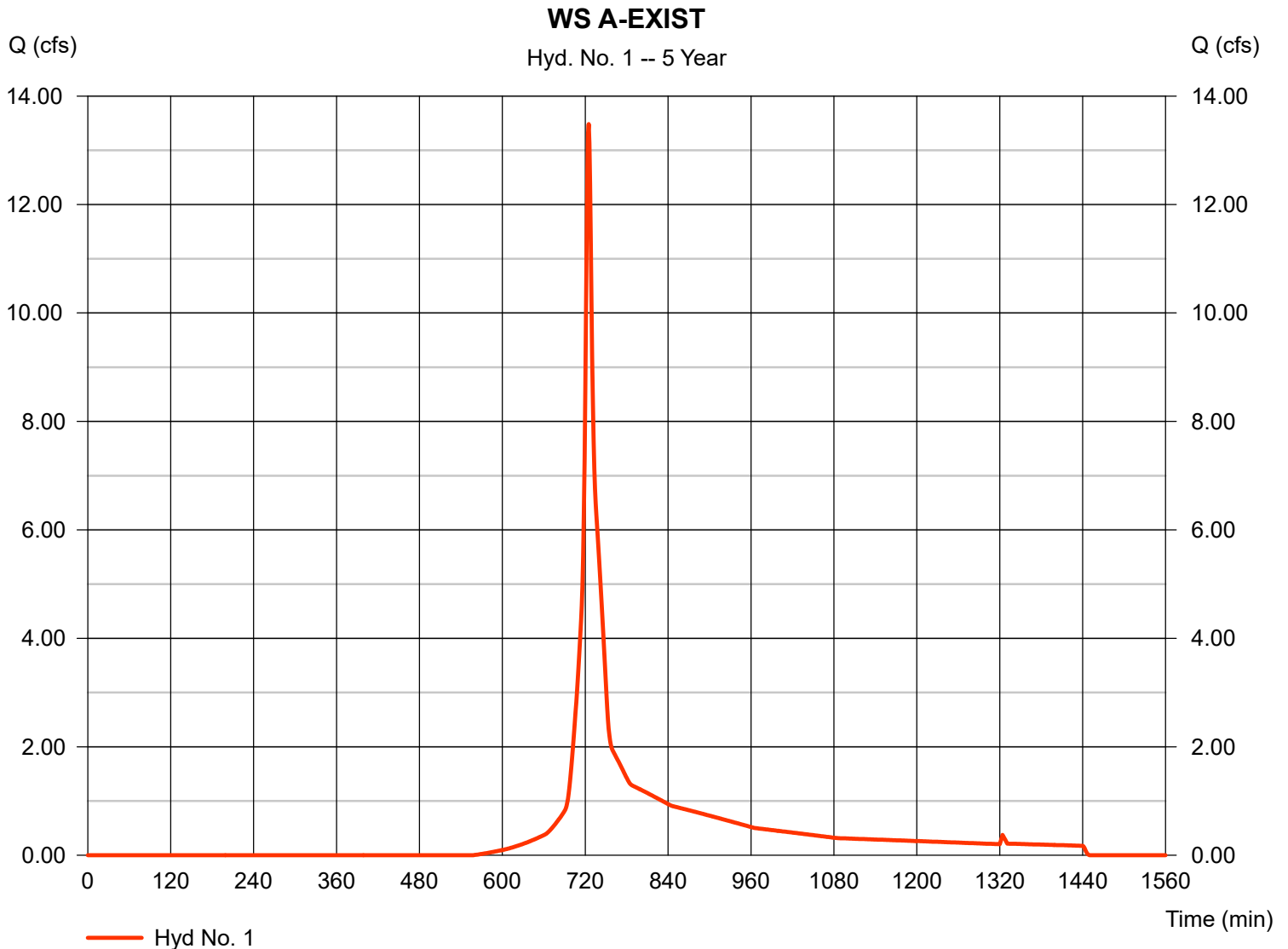
## Hyd. No. 1

WS A-EXIST

Hydrograph type = SCS Runoff  
 Storm frequency = 5 yrs  
 Time interval = 1 min  
 Drainage area = 5.850 ac  
 Basin Slope = 0.0 %  
 Tc method = TR55  
 Total precip. = 4.32 in  
 Storm duration = 24 hrs

Peak discharge = 13.48 cfs  
 Time to peak = 725 min  
 Hyd. volume = 41,835 cuft  
 Curve number = 75\*  
 Hydraulic length = 0 ft  
 Time of conc. (Tc) = 6.10 min  
 Distribution = Type III  
 Shape factor = 484

\* Composite (Area/CN) = [(4.230 x 70) + (1.590 x 89) + (0.030 x 70)] / 5.850





# Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.1

Friday, Aug 11, 2023

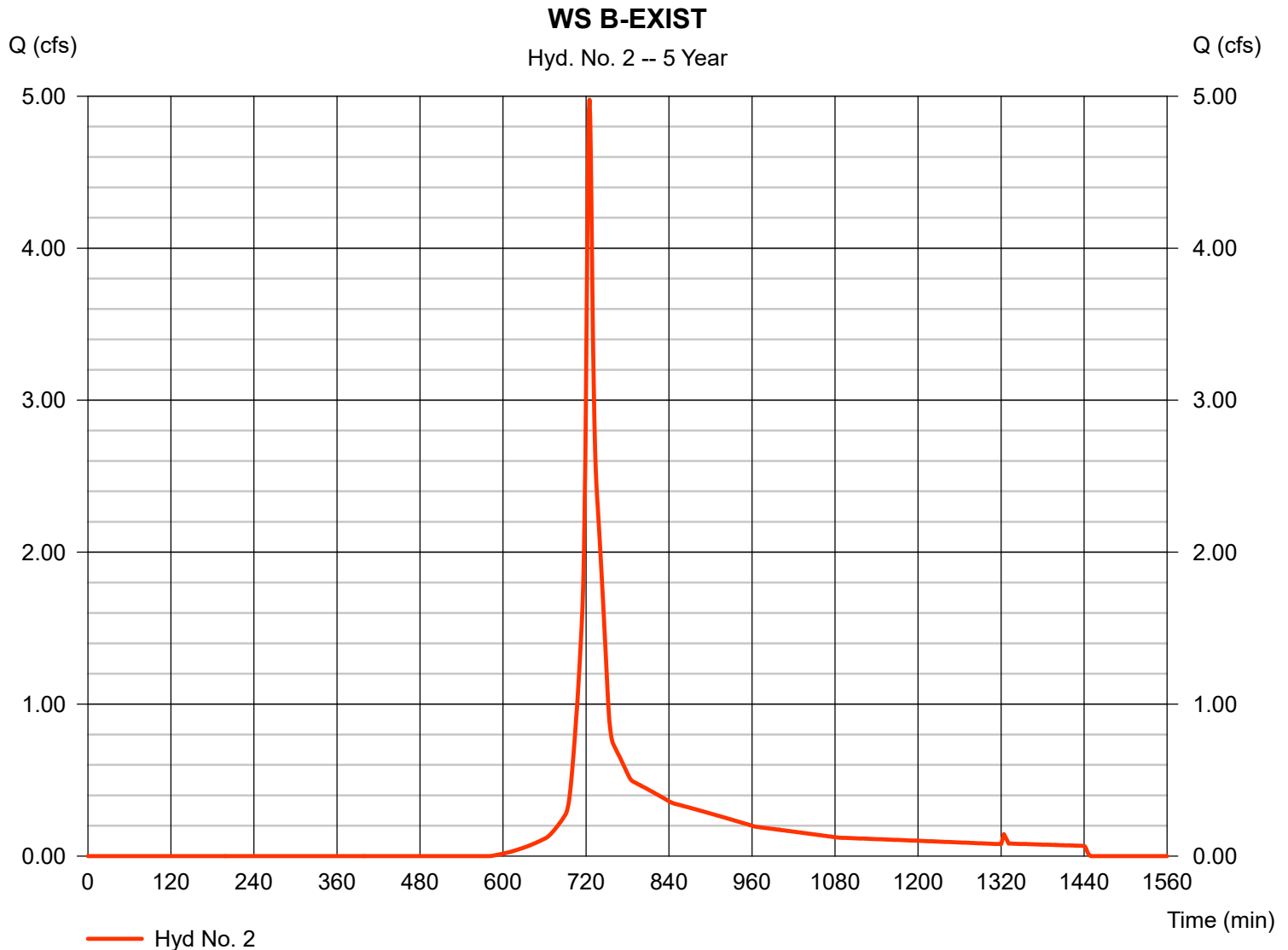
## Hyd. No. 2

WS B-EXIST

Hydrograph type = SCS Runoff  
 Storm frequency = 5 yrs  
 Time interval = 1 min  
 Drainage area = 2.360 ac  
 Basin Slope = 0.0 %  
 Tc method = TR55  
 Total precip. = 4.32 in  
 Storm duration = 24 hrs

Peak discharge = 4.977 cfs  
 Time to peak = 725 min  
 Hyd. volume = 15,558 cuft  
 Curve number = 73\*  
 Hydraulic length = 0 ft  
 Time of conc. (Tc) = 5.90 min  
 Distribution = Type III  
 Shape factor = 484

\* Composite (Area/CN) = [(2.040 x 70) + (0.320 x 89)] / 2.360



# Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.1

Friday, Aug 11, 2023

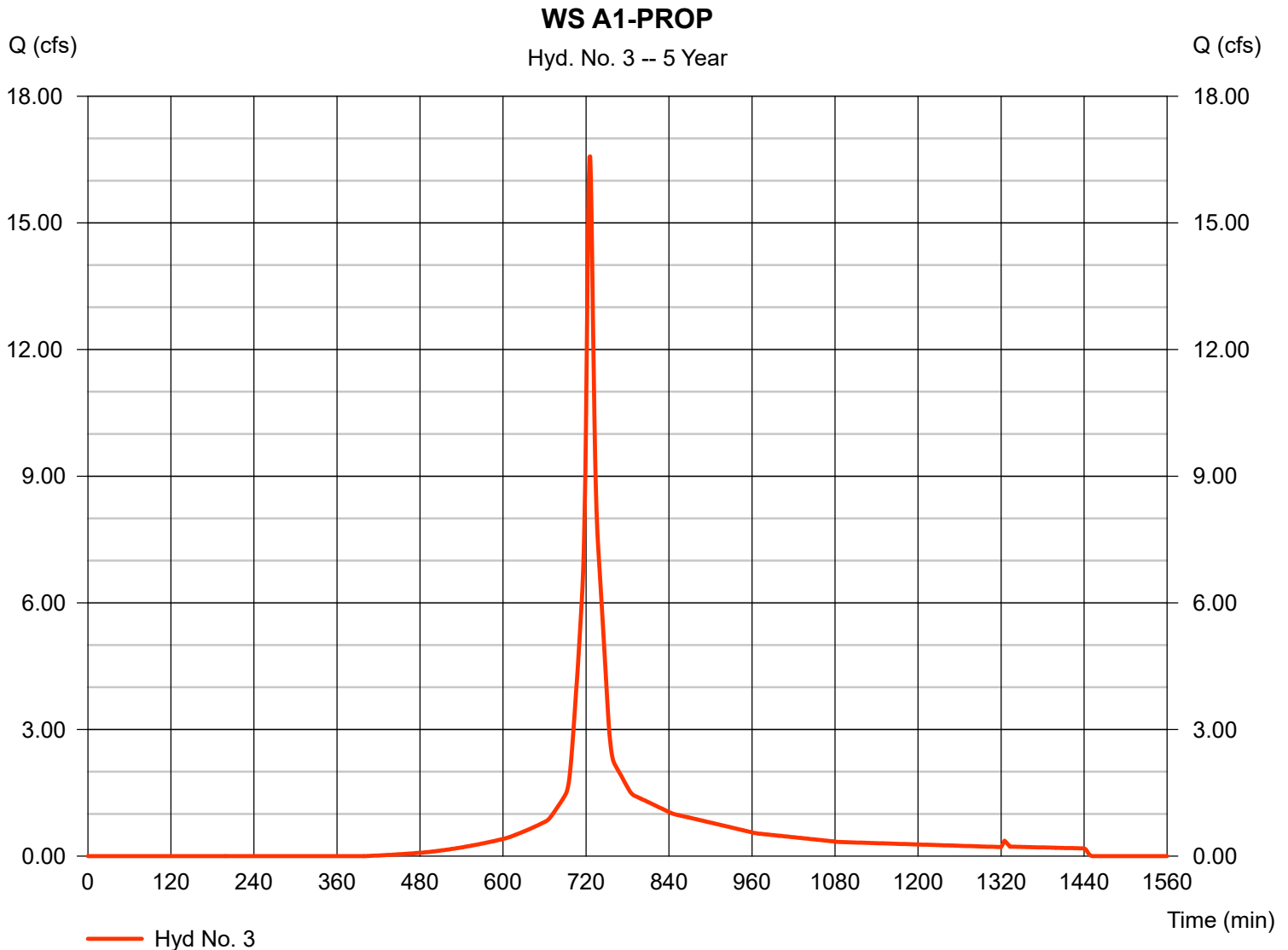
## Hyd. No. 3

WS A1-PROP

Hydrograph type = SCS Runoff  
 Storm frequency = 5 yrs  
 Time interval = 1 min  
 Drainage area = 5.520 ac  
 Basin Slope = 0.0 %  
 Tc method = TR55  
 Total precip. = 4.32 in  
 Storm duration = 24 hrs

Peak discharge = 16.57 cfs  
 Time to peak = 726 min  
 Hyd. volume = 53,641 cuft  
 Curve number = 85\*  
 Hydraulic length = 0 ft  
 Time of conc. (Tc) = 7.60 min  
 Distribution = Type III  
 Shape factor = 484

\* Composite (Area/CN) = [(1.070 x 70) + (4.450 x 89)] / 5.520



# Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.1

Friday, Aug 11, 2023

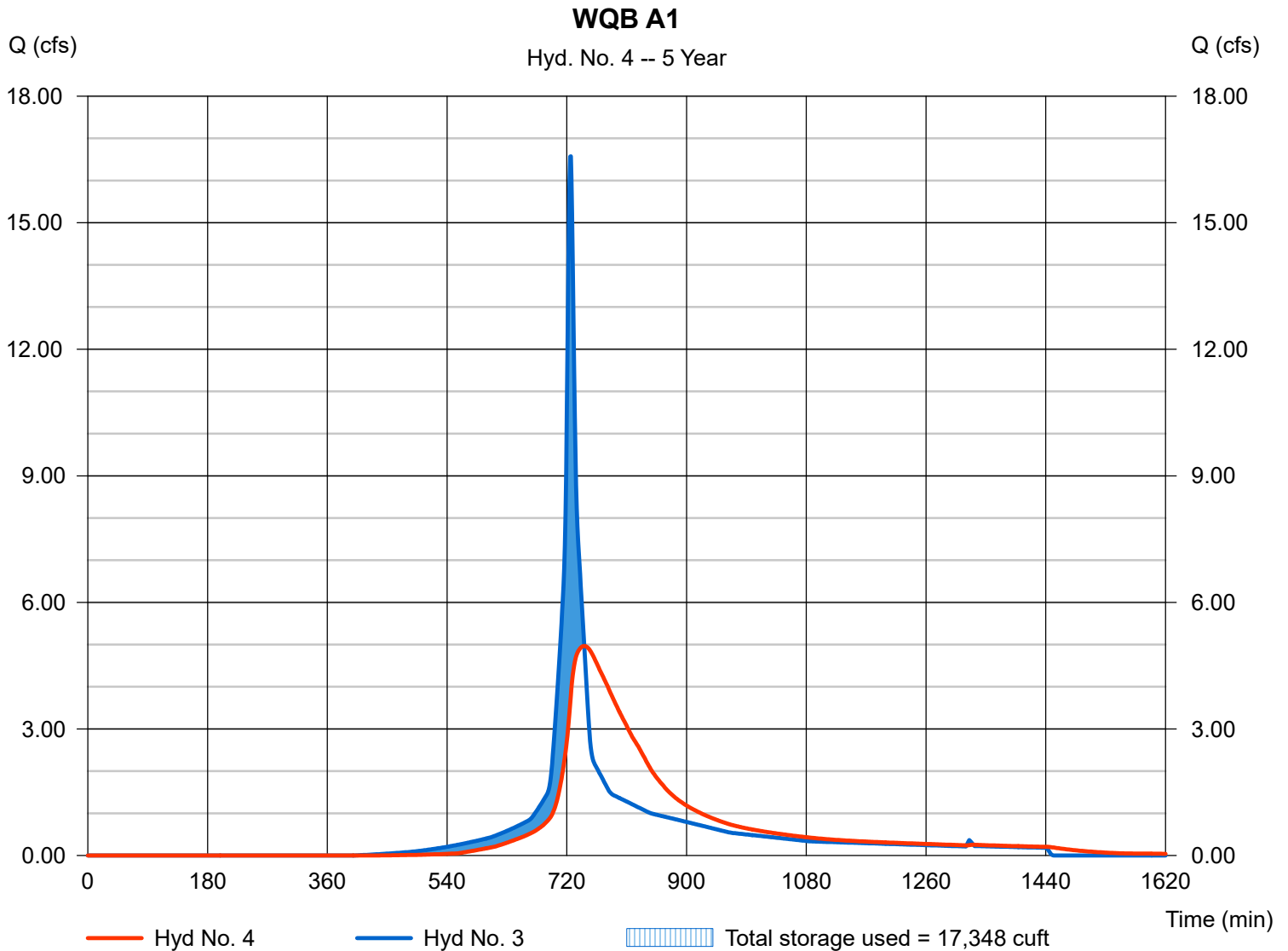
## Hyd. No. 4

WQB A1

Hydrograph type = Reservoir  
 Storm frequency = 5 yrs  
 Time interval = 1 min  
 Inflow hyd. No. = 3 - WS A1-PROP  
 Reservoir name = WQB A1

Peak discharge = 4.966 cfs  
 Time to peak = 746 min  
 Hyd. volume = 53,627 cuft  
 Max. Elevation = 138.07 ft  
 Max. Storage = 17,348 cuft

Storage Indication method used.



# Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.1

Friday, Aug 11, 2023

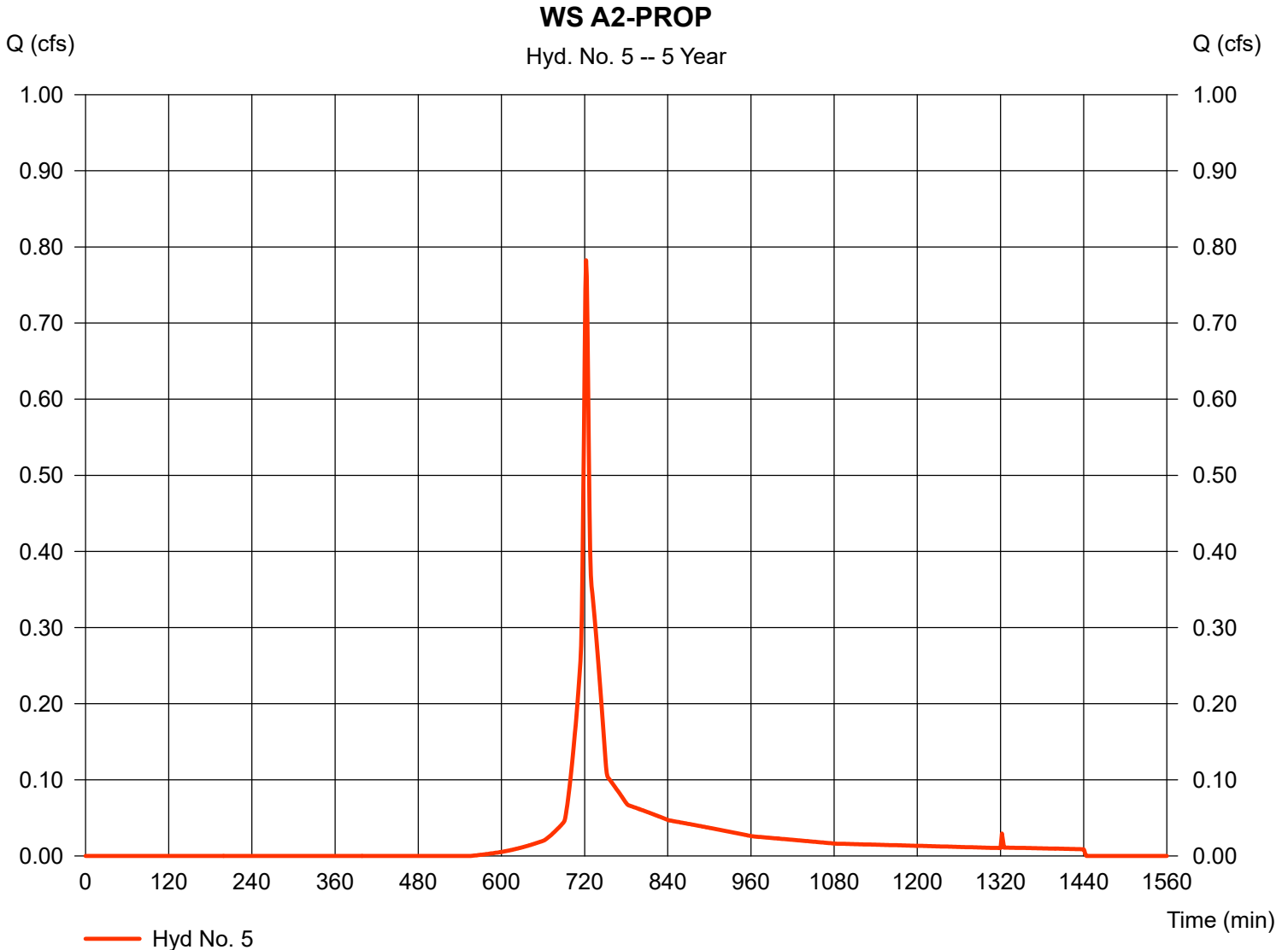
## Hyd. No. 5

WS A2-PROP

Hydrograph type = SCS Runoff  
Storm frequency = 5 yrs  
Time interval = 1 min  
Drainage area = 0.330 ac  
Basin Slope = 0.0 %  
Tc method = TR55  
Total precip. = 4.32 in  
Storm duration = 24 hrs

Peak discharge = 0.782 cfs  
Time to peak = 722 min  
Hyd. volume = 2,145 cuft  
Curve number = 75\*  
Hydraulic length = 0 ft  
Time of conc. (Tc) = 3.10 min  
Distribution = Type III  
Shape factor = 484

\* Composite (Area/CN) = [(0.240 x 70) + (0.090 x 89)] / 0.330



# Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.1

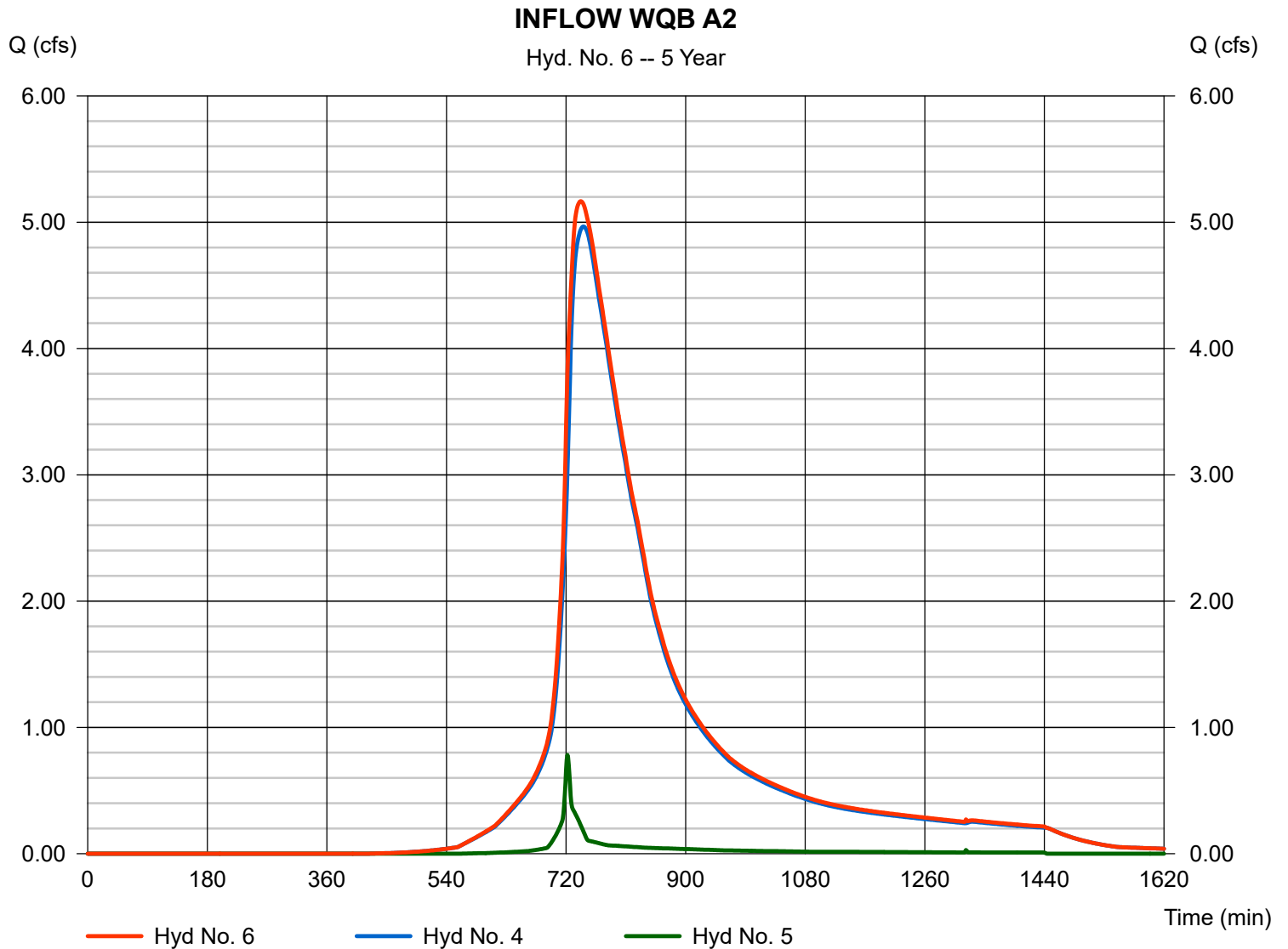
Friday, Aug 11, 2023

## Hyd. No. 6

INFLOW WQB A2

Hydrograph type = Combine  
 Storm frequency = 5 yrs  
 Time interval = 1 min  
 Inflow hyds. = 4, 5

Peak discharge = 5.166 cfs  
 Time to peak = 742 min  
 Hyd. volume = 55,772 cuft  
 Contrib. drain. area = 0.330 ac



# Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.1

Friday, Aug 11, 2023

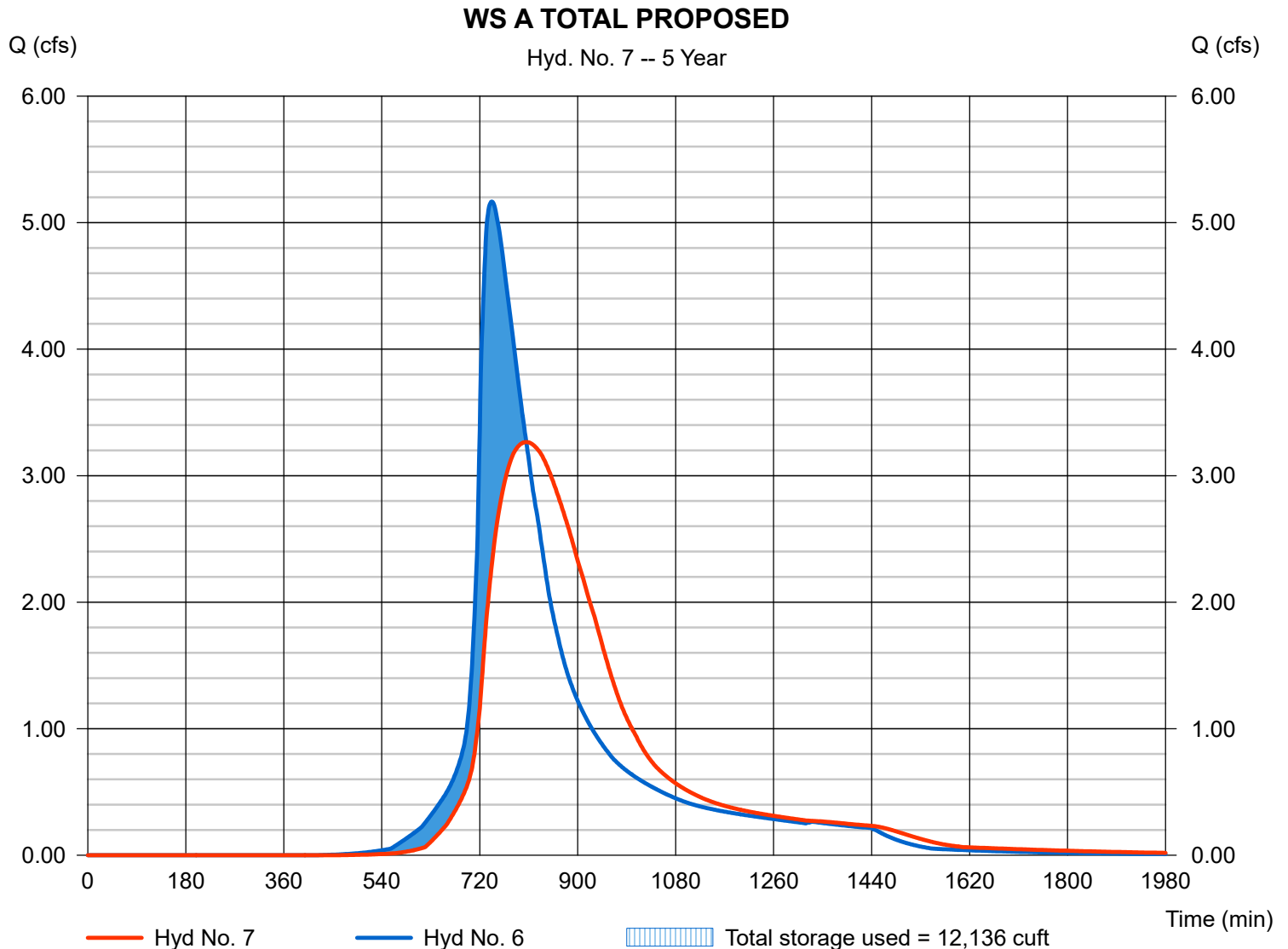
## Hyd. No. 7

### WS A TOTAL PROPOSED

Hydrograph type = Reservoir  
 Storm frequency = 5 yrs  
 Time interval = 1 min  
 Inflow hyd. No. = 6 - INFLOW WQB A2  
 Reservoir name = WQB A2

Peak discharge = 3.266 cfs  
 Time to peak = 806 min  
 Hyd. volume = 55,764 cuft  
 Max. Elevation = 136.08 ft  
 Max. Storage = 12,136 cuft

Storage Indication method used.



# Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.1

Friday, Aug 11, 2023

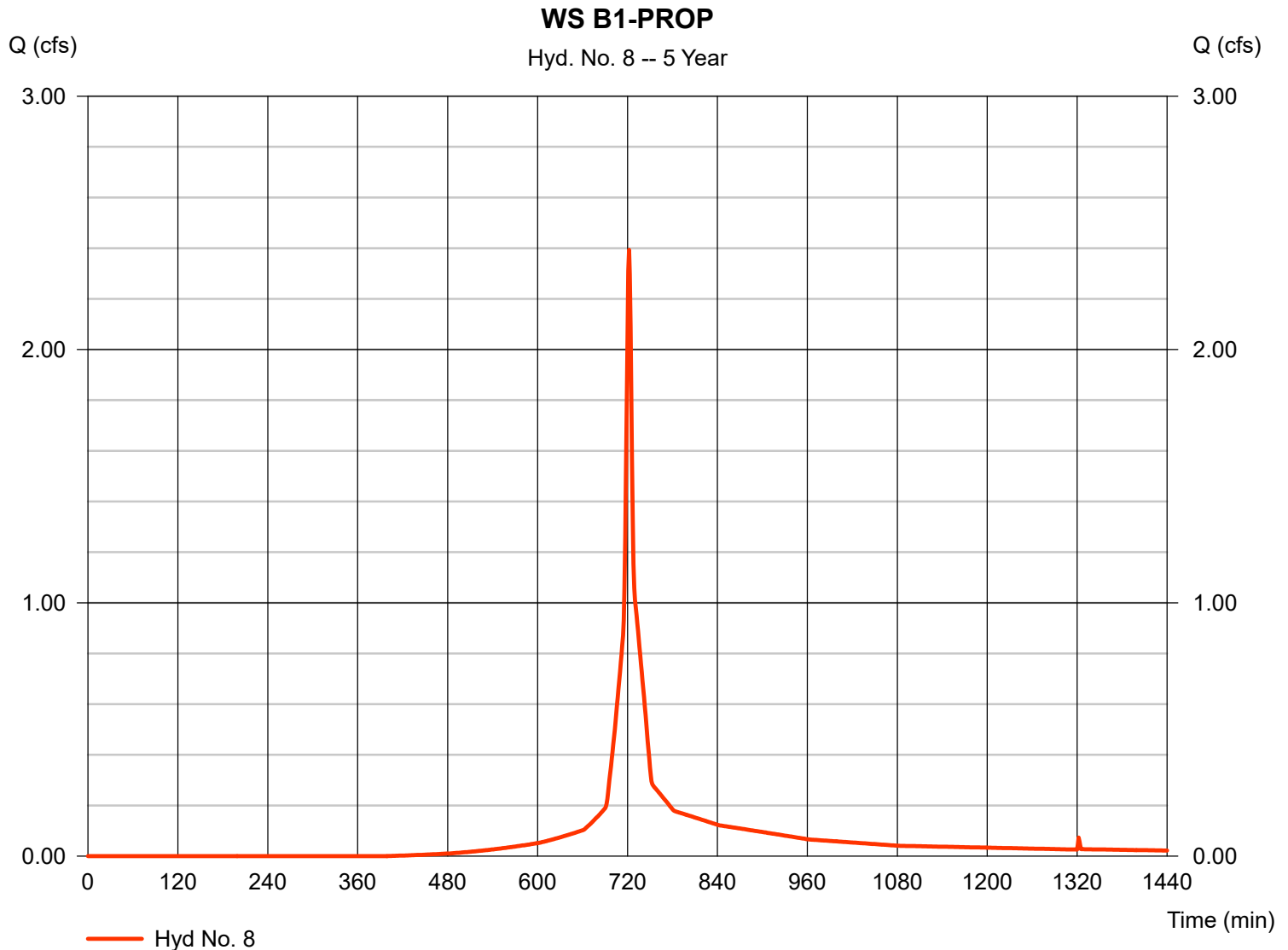
## Hyd. No. 8

WS B1-PROP

Hydrograph type = SCS Runoff  
Storm frequency = 5 yrs  
Time interval = 1 min  
Drainage area = 0.700 ac  
Basin Slope = 0.0 %  
Tc method = TR55  
Total precip. = 4.32 in  
Storm duration = 24 hrs

Peak discharge = 2.393 cfs  
Time to peak = 722 min  
Hyd. volume = 6,541 cuft  
Curve number = 85\*  
Hydraulic length = 0 ft  
Time of conc. (Tc) = 3.10 min  
Distribution = Type III  
Shape factor = 484

\* Composite (Area/CN) =  $[(0.130 \times 70) + (0.570 \times 89)] / 0.700$



# Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.1

Friday, Aug 11, 2023

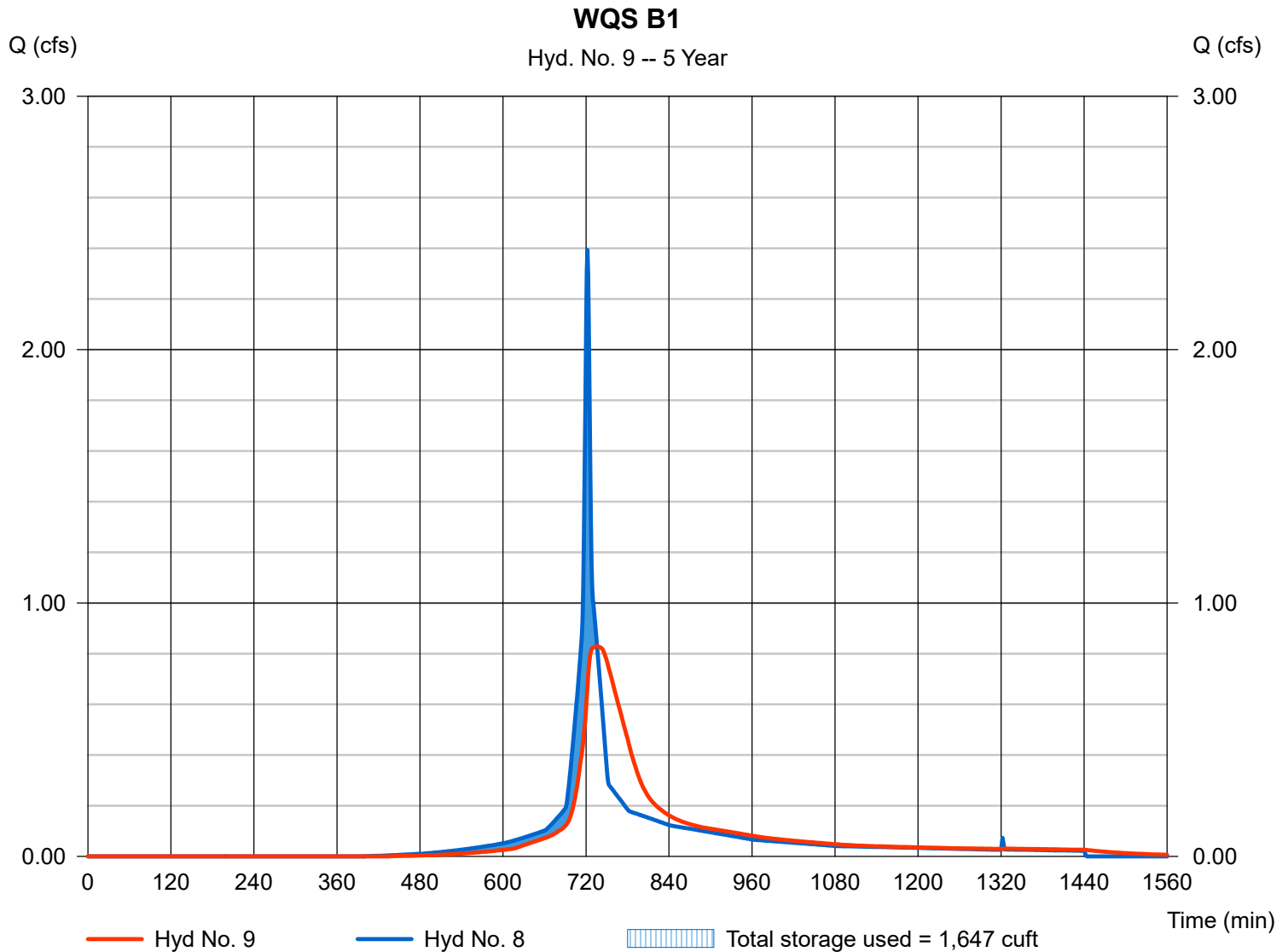
## Hyd. No. 9

WQS B1

Hydrograph type = Reservoir  
Storm frequency = 5 yrs  
Time interval = 1 min  
Inflow hyd. No. = 8 - WS B1-PROP  
Reservoir name = WQS B1

Peak discharge = 0.829 cfs  
Time to peak = 736 min  
Hyd. volume = 6,536 cuft  
Max. Elevation = 152.02 ft  
Max. Storage = 1,647 cuft

Storage Indication method used.





# Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.1

Friday, Aug 11, 2023

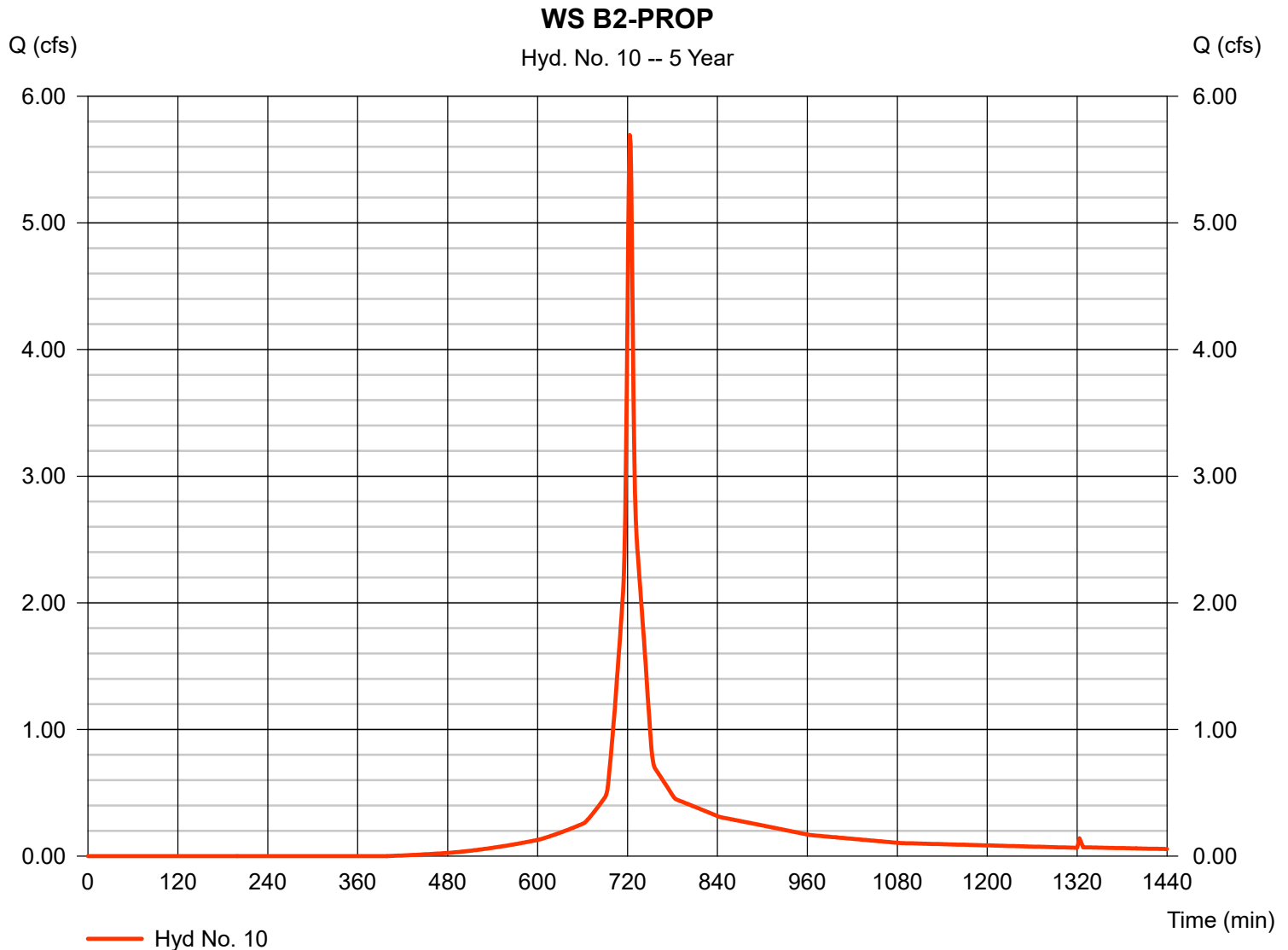
## Hyd. No. 10

WS B2-PROP

Hydrograph type = SCS Runoff  
 Storm frequency = 5 yrs  
 Time interval = 1 min  
 Drainage area = 1.660 ac  
 Basin Slope = 0.0 %  
 Tc method = TR55  
 Total precip. = 4.32 in  
 Storm duration = 24 hrs

Peak discharge = 5.694 cfs  
 Time to peak = 723 min  
 Hyd. volume = 16,545 cuft  
 Curve number = 85\*  
 Hydraulic length = 0 ft  
 Time of conc. (Tc) = 4.90 min  
 Distribution = Type III  
 Shape factor = 484

\* Composite (Area/CN) =  $[(0.340 \times 70) + (1.320 \times 89)] / 1.660$



# Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.1

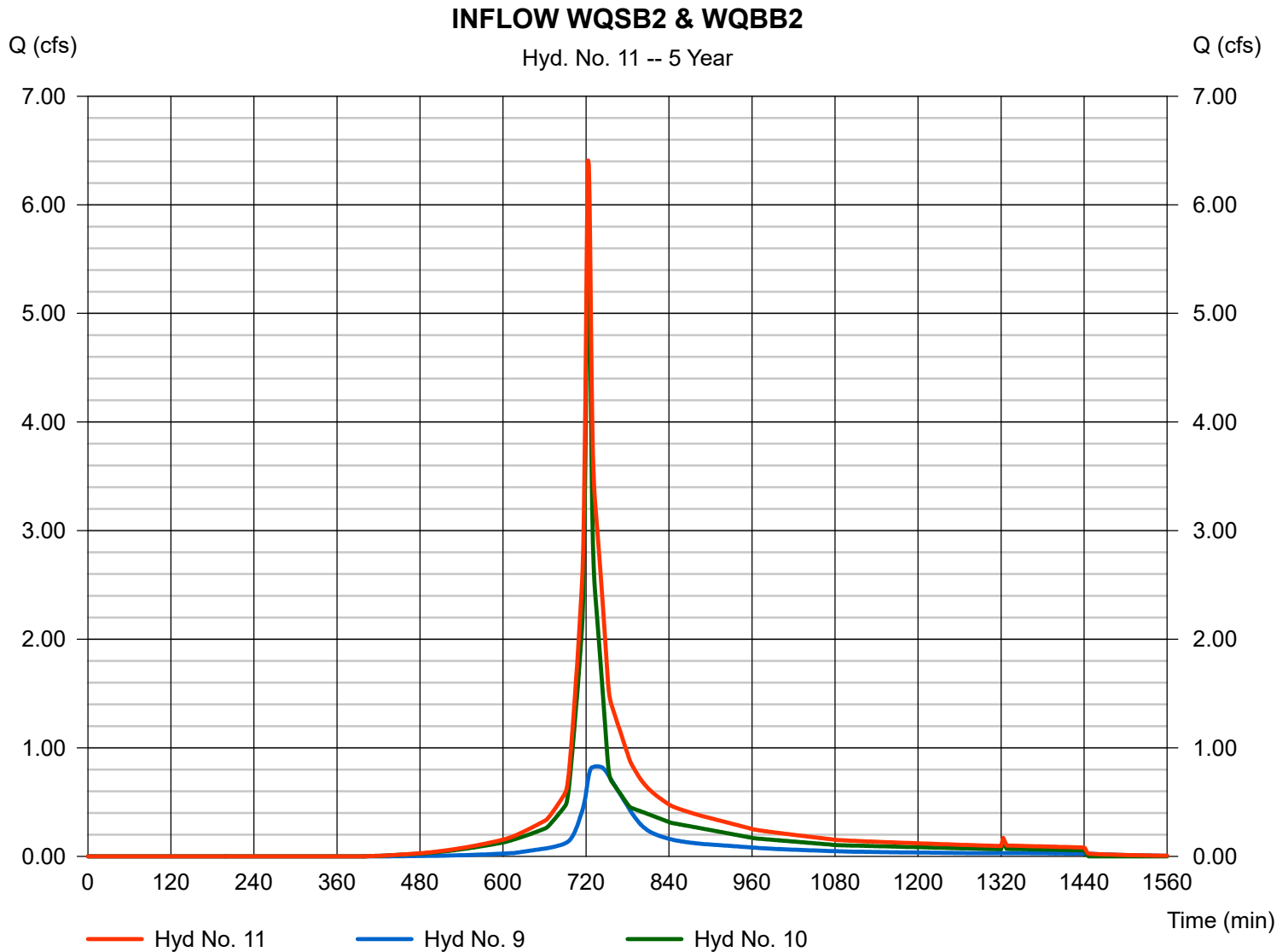
Friday, Aug 11, 2023

## Hyd. No. 11

INFLOW WQSB2 & WQBB2

Hydrograph type = Combine  
Storm frequency = 5 yrs  
Time interval = 1 min  
Inflow hyds. = 9, 10

Peak discharge = 6.408 cfs  
Time to peak = 723 min  
Hyd. volume = 23,081 cuft  
Contrib. drain. area = 1.660 ac



# Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.1

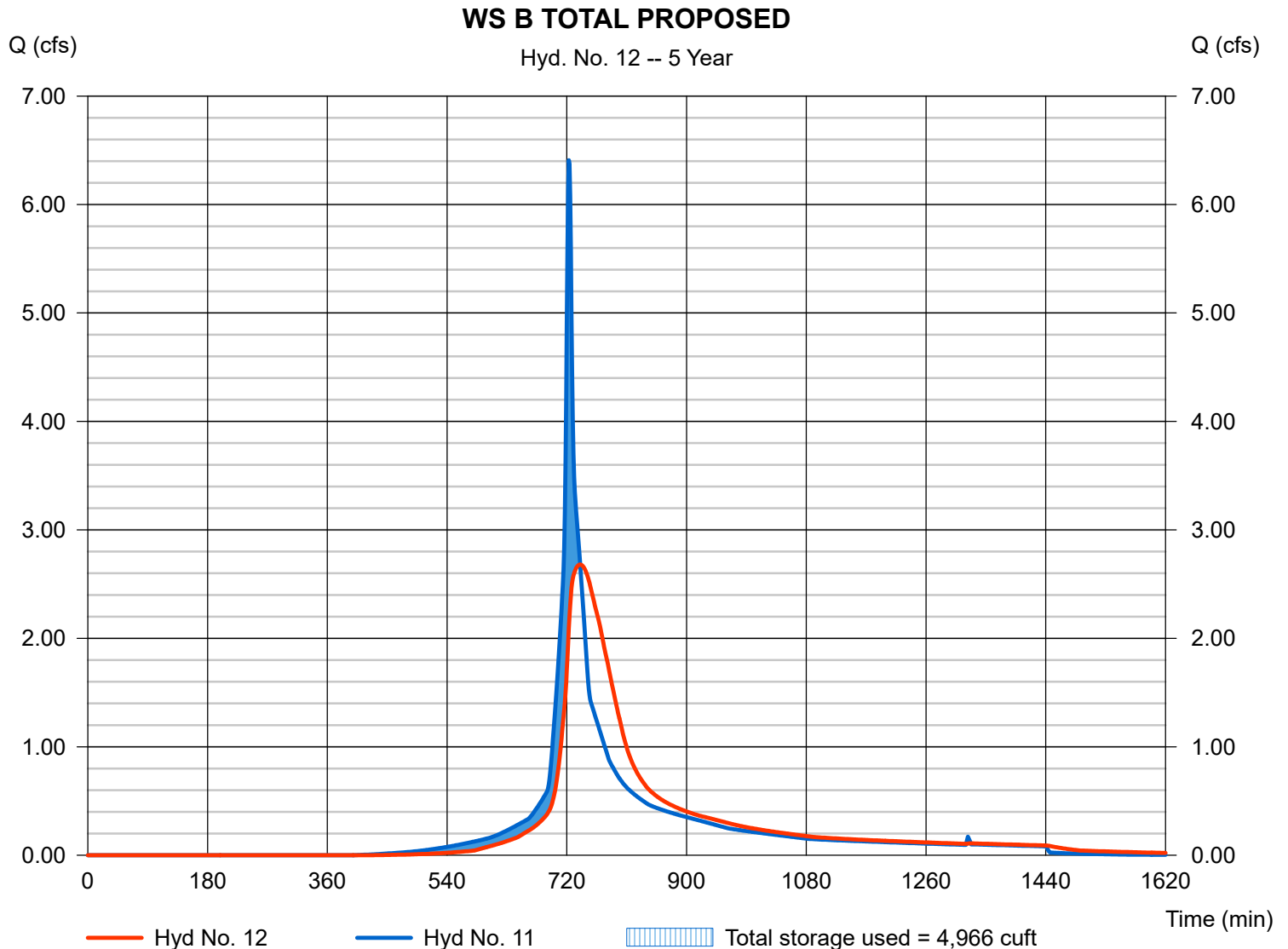
Friday, Aug 11, 2023

## Hyd. No. 12

### WS B TOTAL PROPOSED

Hydrograph type	= Reservoir	Peak discharge	= 2.681 cfs
Storm frequency	= 5 yrs	Time to peak	= 740 min
Time interval	= 1 min	Hyd. volume	= 23,072 cuft
Inflow hyd. No.	= 11 - INFLOW WQSB2 & WQBB2	Max. Elevation	= 150.32 ft
Reservoir name	= WQB B2 & WQS B2	Max. Storage	= 4,966 cuft

Storage Indication method used.



# Hydrograph Summary Report

Hydraflow Hydrographs by Intelisolve v9.1

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	18.62	1	725	57,390	----	-----	-----	WS A-EXIST
2	SCS Runoff	6.992	1	725	21,612	----	-----	-----	WS B-EXIST
3	SCS Runoff	21.35	1	725	69,602	----	-----	-----	WS A1-PROP
4	Reservoir	5.881	1	747	69,588	3	138.59	22,973	WQB A1
5	SCS Runoff	1.082	1	722	2,943	----	-----	-----	WS A2-PROP
6	Combine	6.136	1	743	72,531	4, 5	-----	-----	INFLOW WQB A2
7	Reservoir	3.848	1	817	72,522	6	136.67	16,303	WS A TOTAL PROPOSED
8	SCS Runoff	3.080	1	722	8,487	----	-----	-----	WS B1-PROP
9	Reservoir	0.927	1	739	8,482	8	152.21	2,237	WQS B1
10	SCS Runoff	7.334	1	723	21,468	----	-----	-----	WS B2-PROP
11	Combine	8.171	1	723	29,950	9, 10	-----	-----	INFLOW WQSB2 & WQBB2
12	Reservoir	3.187	1	741	29,941	11	150.64	6,448	WS B TOTAL PROPOSED
Macro Model 2023-08-01.gpw					Return Period: 10 Year			Friday, Aug 11, 2023	

# Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.1

Friday, Aug 11, 2023

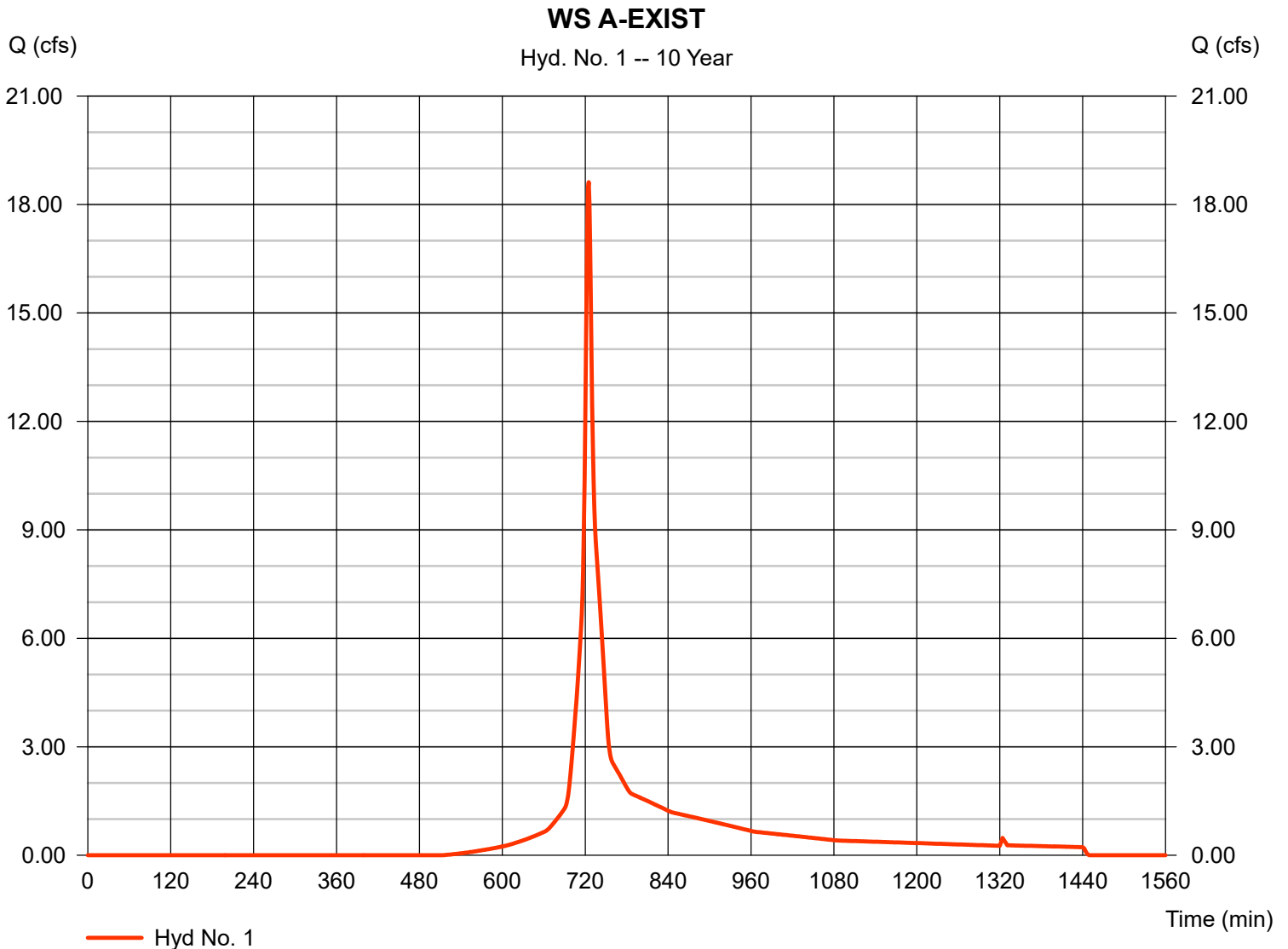
## Hyd. No. 1

WS A-EXIST

Hydrograph type = SCS Runoff  
 Storm frequency = 10 yrs  
 Time interval = 1 min  
 Drainage area = 5.850 ac  
 Basin Slope = 0.0 %  
 Tc method = TR55  
 Total precip. = 5.21 in  
 Storm duration = 24 hrs

Peak discharge = 18.62 cfs  
 Time to peak = 725 min  
 Hyd. volume = 57,390 cuft  
 Curve number = 75\*  
 Hydraulic length = 0 ft  
 Time of conc. (Tc) = 6.10 min  
 Distribution = Type III  
 Shape factor = 484

\* Composite (Area/CN) = [(4.230 x 70) + (1.590 x 89) + (0.030 x 70)] / 5.850



# Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.1

Friday, Aug 11, 2023

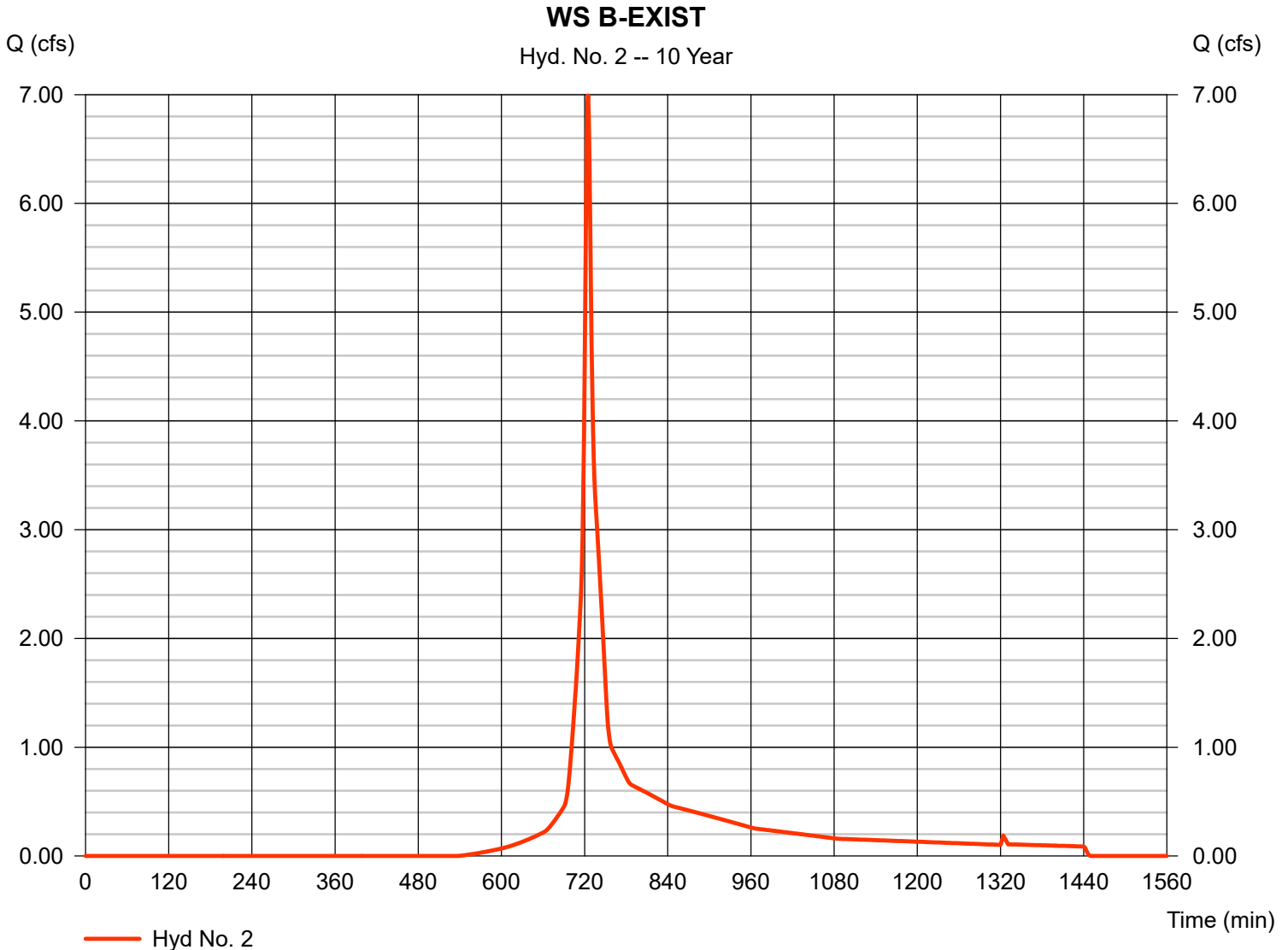
## Hyd. No. 2

WS B-EXIST

Hydrograph type = SCS Runoff  
Storm frequency = 10 yrs  
Time interval = 1 min  
Drainage area = 2.360 ac  
Basin Slope = 0.0 %  
Tc method = TR55  
Total precip. = 5.21 in  
Storm duration = 24 hrs

Peak discharge = 6.992 cfs  
Time to peak = 725 min  
Hyd. volume = 21,612 cuft  
Curve number = 73\*  
Hydraulic length = 0 ft  
Time of conc. (Tc) = 5.90 min  
Distribution = Type III  
Shape factor = 484

\* Composite (Area/CN) = [(2.040 x 70) + (0.320 x 89)] / 2.360



# Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.1

Friday, Aug 11, 2023

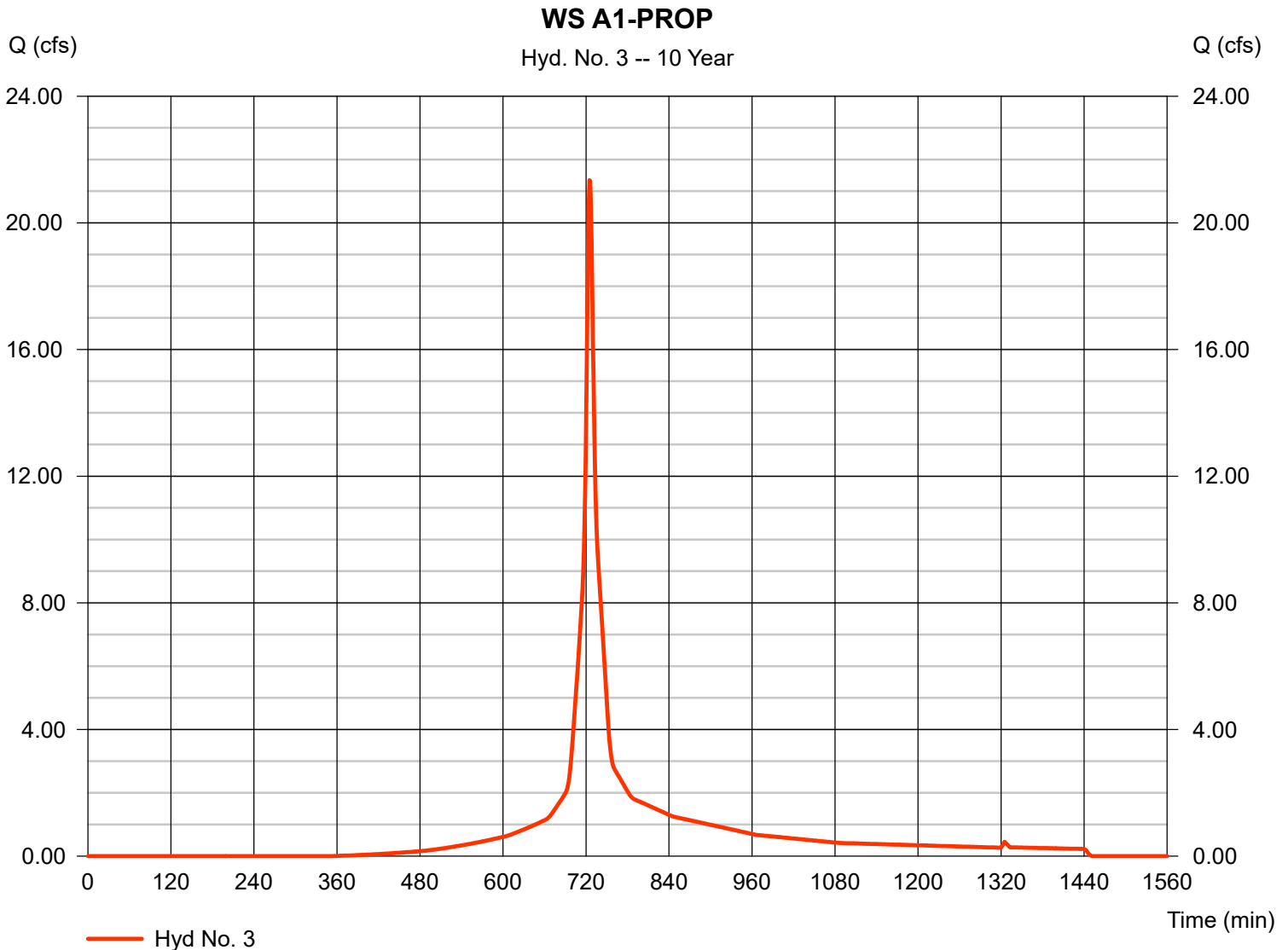
## Hyd. No. 3

WS A1-PROP

Hydrograph type = SCS Runoff  
 Storm frequency = 10 yrs  
 Time interval = 1 min  
 Drainage area = 5.520 ac  
 Basin Slope = 0.0 %  
 Tc method = TR55  
 Total precip. = 5.21 in  
 Storm duration = 24 hrs

Peak discharge = 21.35 cfs  
 Time to peak = 725 min  
 Hyd. volume = 69,602 cuft  
 Curve number = 85\*  
 Hydraulic length = 0 ft  
 Time of conc. (Tc) = 7.60 min  
 Distribution = Type III  
 Shape factor = 484

\* Composite (Area/CN) = [(1.070 x 70) + (4.450 x 89)] / 5.520



# Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.1

Friday, Aug 11, 2023

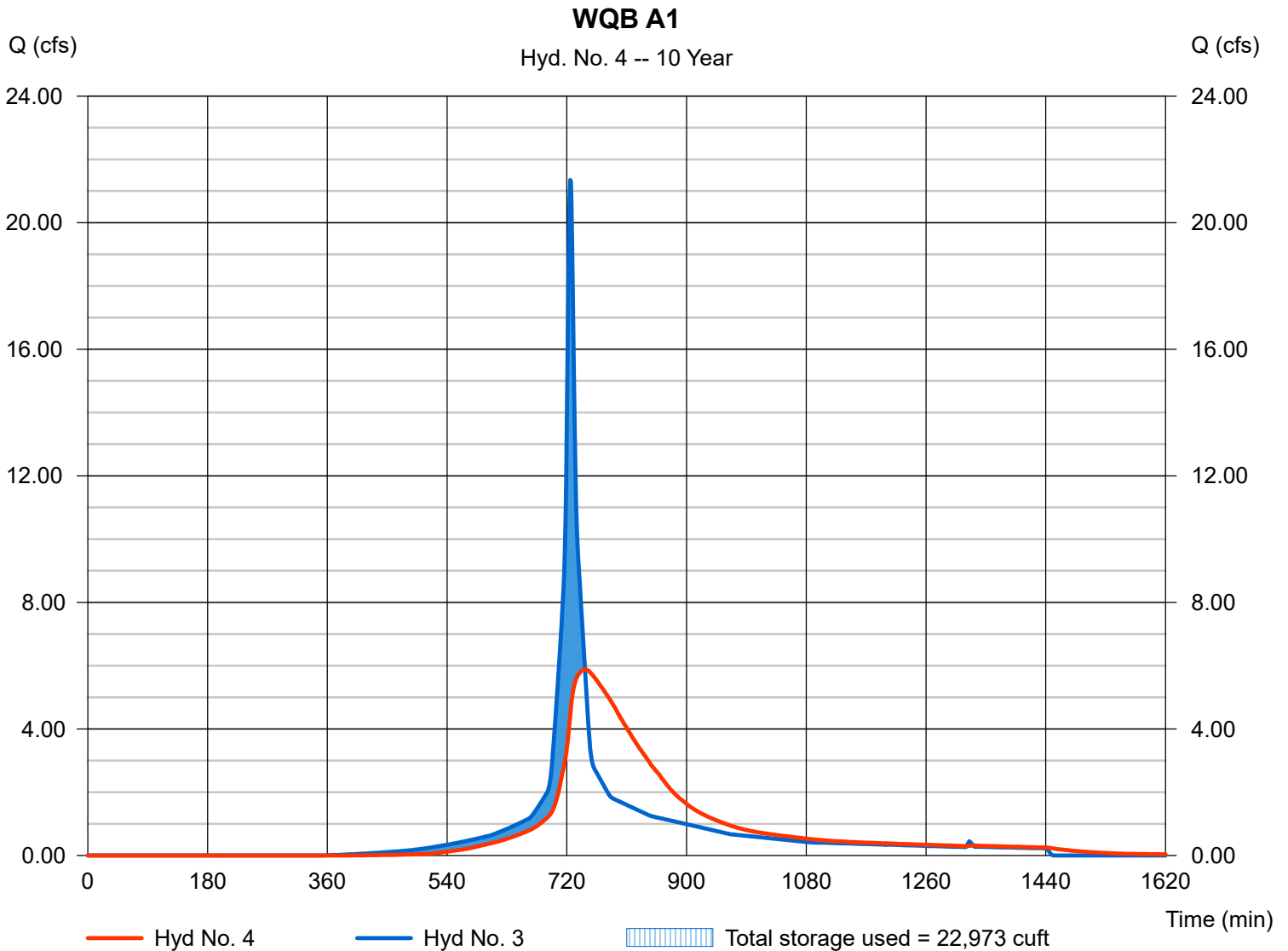
## Hyd. No. 4

WQB A1

Hydrograph type = Reservoir  
Storm frequency = 10 yrs  
Time interval = 1 min  
Inflow hyd. No. = 3 - WS A1-PROP  
Reservoir name = WQB A1

Peak discharge = 5.881 cfs  
Time to peak = 747 min  
Hyd. volume = 69,588 cuft  
Max. Elevation = 138.59 ft  
Max. Storage = 22,973 cuft

Storage Indication method used.





# Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.1

Friday, Aug 11, 2023

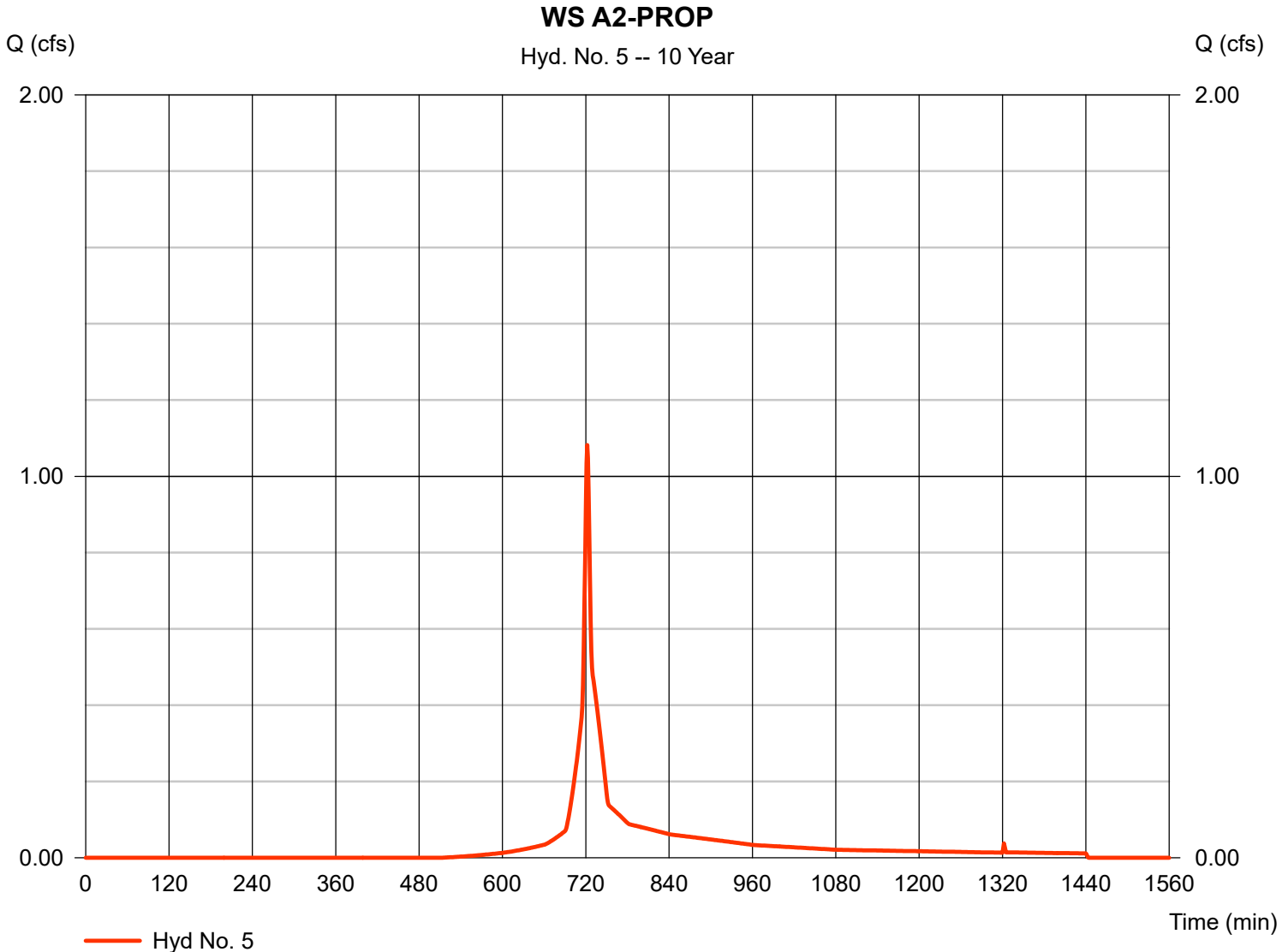
## Hyd. No. 5

WS A2-PROP

Hydrograph type = SCS Runoff  
 Storm frequency = 10 yrs  
 Time interval = 1 min  
 Drainage area = 0.330 ac  
 Basin Slope = 0.0 %  
 Tc method = TR55  
 Total precip. = 5.21 in  
 Storm duration = 24 hrs

Peak discharge = 1.082 cfs  
 Time to peak = 722 min  
 Hyd. volume = 2,943 cuft  
 Curve number = 75\*  
 Hydraulic length = 0 ft  
 Time of conc. (Tc) = 3.10 min  
 Distribution = Type III  
 Shape factor = 484

\* Composite (Area/CN) = [(0.240 x 70) + (0.090 x 89)] / 0.330



# Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.1

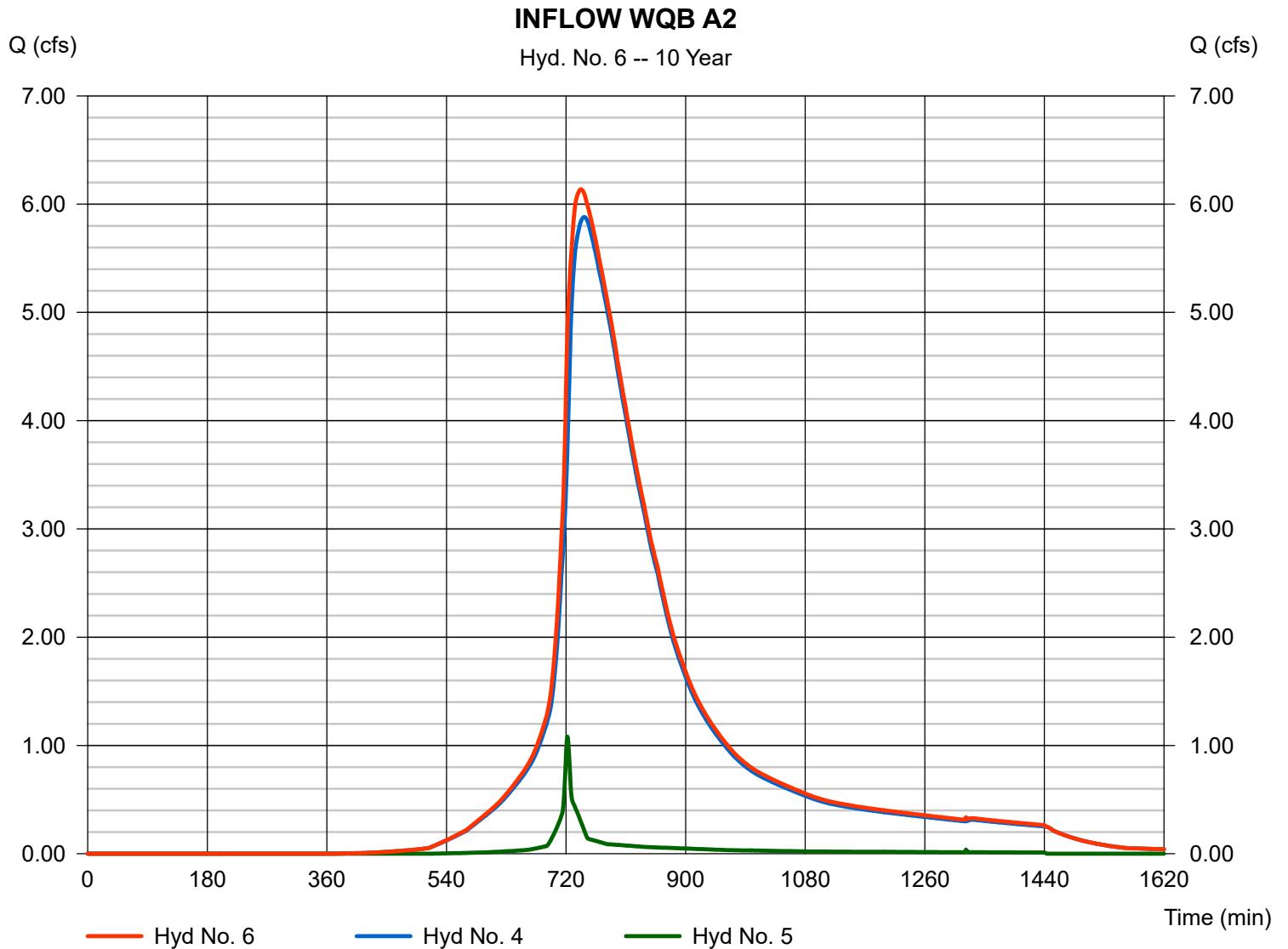
Friday, Aug 11, 2023

## Hyd. No. 6

INFLOW WQB A2

Hydrograph type = Combine  
Storm frequency = 10 yrs  
Time interval = 1 min  
Inflow hyds. = 4, 5

Peak discharge = 6.136 cfs  
Time to peak = 743 min  
Hyd. volume = 72,531 cuft  
Contrib. drain. area = 0.330 ac



# Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.1

Friday, Aug 11, 2023

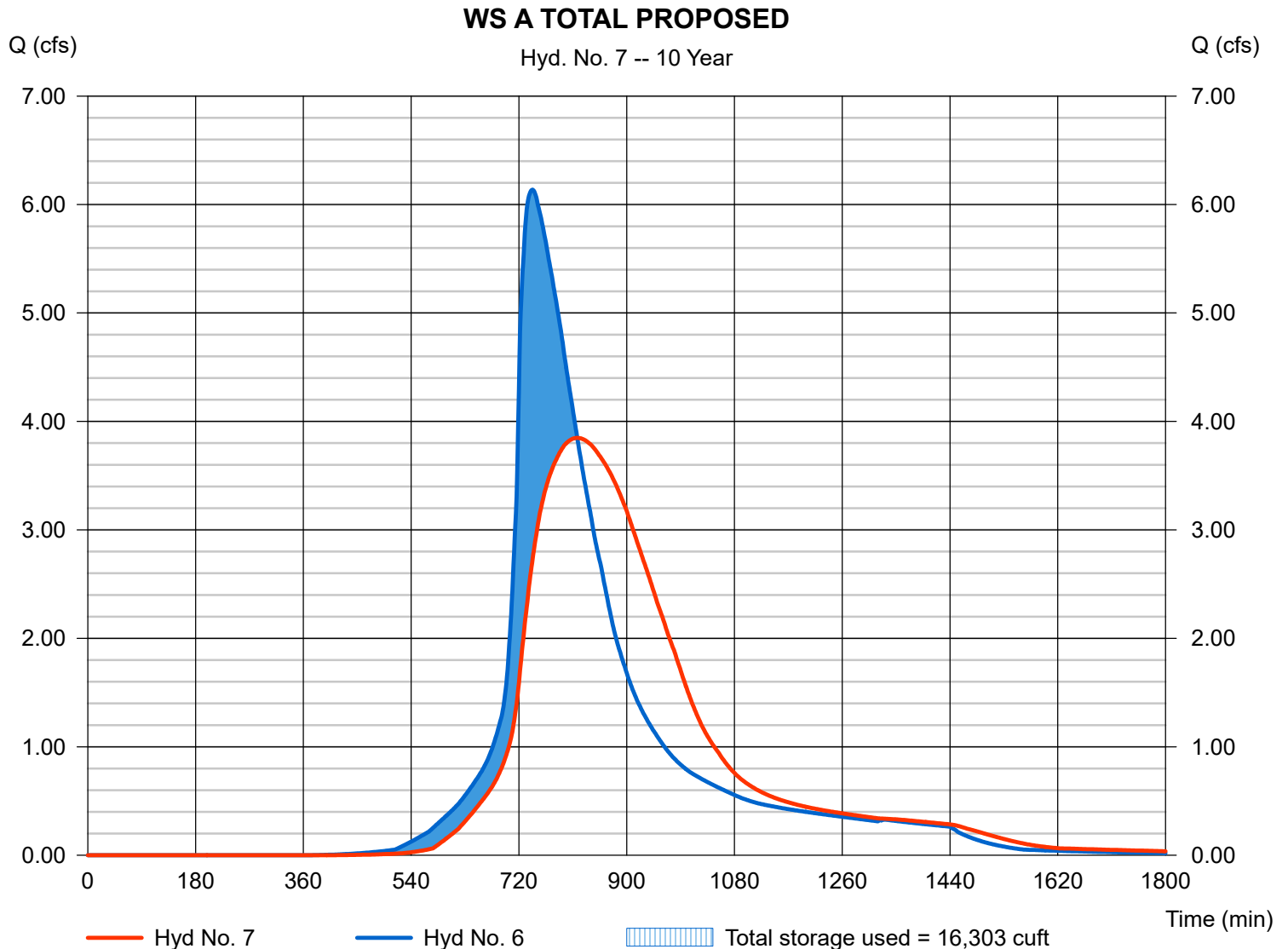
## Hyd. No. 7

### WS A TOTAL PROPOSED

Hydrograph type = Reservoir  
 Storm frequency = 10 yrs  
 Time interval = 1 min  
 Inflow hyd. No. = 6 - INFLOW WQB A2  
 Reservoir name = WQB A2

Peak discharge = 3.848 cfs  
 Time to peak = 817 min  
 Hyd. volume = 72,522 cuft  
 Max. Elevation = 136.67 ft  
 Max. Storage = 16,303 cuft

Storage Indication method used.



# Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.1

Friday, Aug 11, 2023

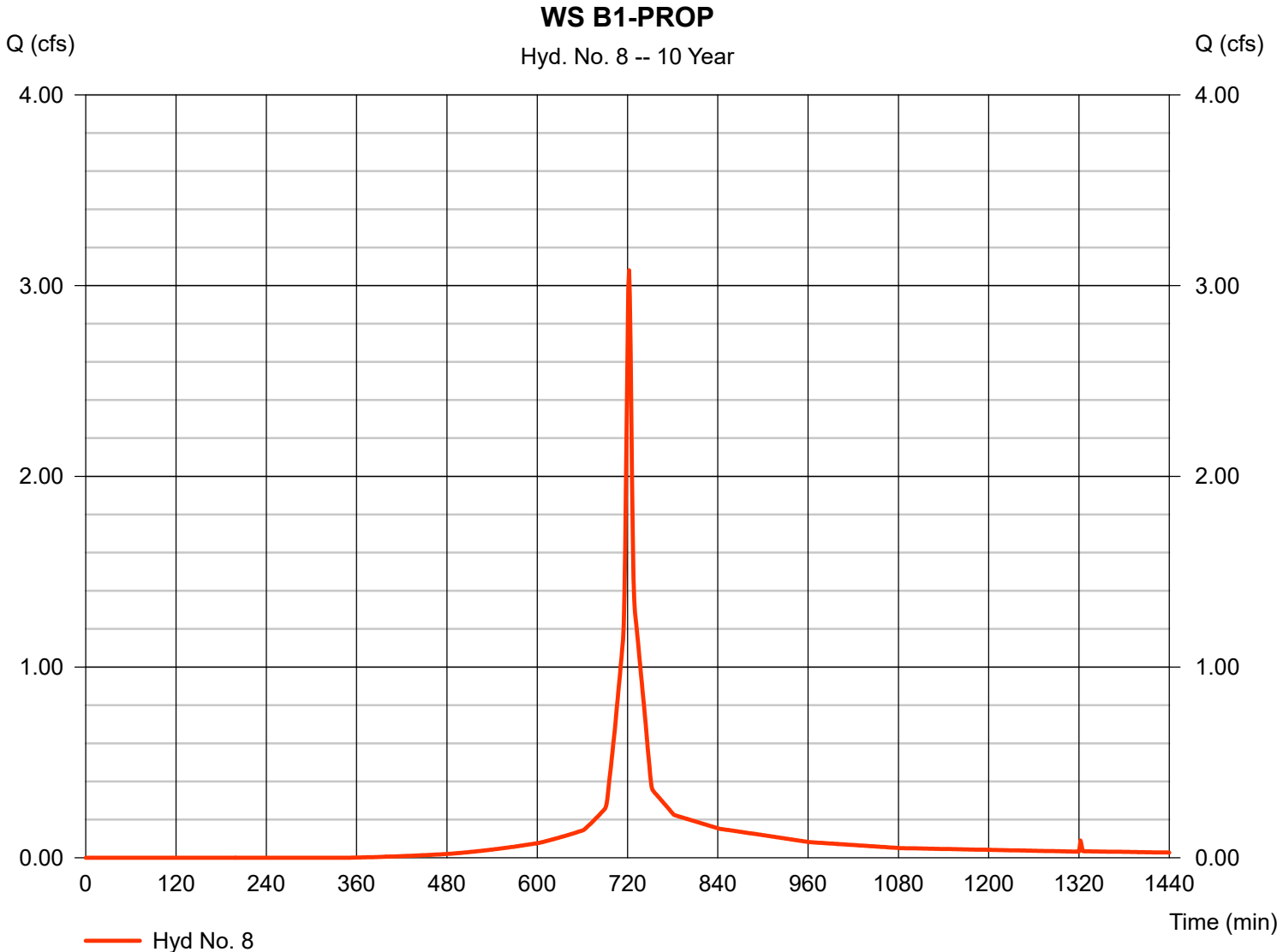
## Hyd. No. 8

WS B1-PROP

Hydrograph type = SCS Runoff  
Storm frequency = 10 yrs  
Time interval = 1 min  
Drainage area = 0.700 ac  
Basin Slope = 0.0 %  
Tc method = TR55  
Total precip. = 5.21 in  
Storm duration = 24 hrs

Peak discharge = 3.080 cfs  
Time to peak = 722 min  
Hyd. volume = 8,487 cuft  
Curve number = 85\*  
Hydraulic length = 0 ft  
Time of conc. (Tc) = 3.10 min  
Distribution = Type III  
Shape factor = 484

\* Composite (Area/CN) = [(0.130 x 70) + (0.570 x 89)] / 0.700



# Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.1

Friday, Aug 11, 2023

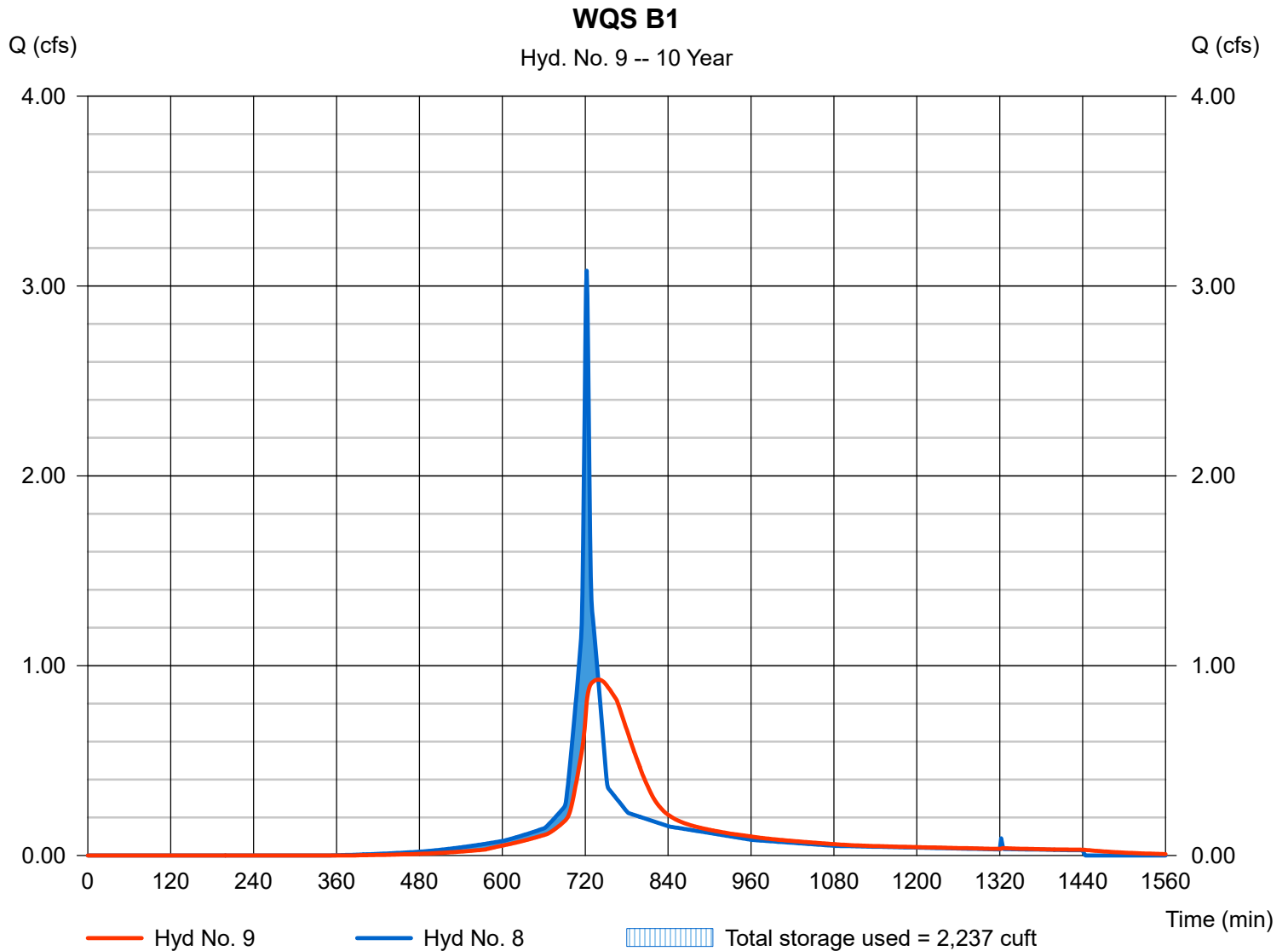
## Hyd. No. 9

WQS B1

Hydrograph type = Reservoir  
 Storm frequency = 10 yrs  
 Time interval = 1 min  
 Inflow hyd. No. = 8 - WS B1-PROP  
 Reservoir name = WQS B1

Peak discharge = 0.927 cfs  
 Time to peak = 739 min  
 Hyd. volume = 8,482 cuft  
 Max. Elevation = 152.21 ft  
 Max. Storage = 2,237 cuft

Storage Indication method used.



# Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.1

Friday, Aug 11, 2023

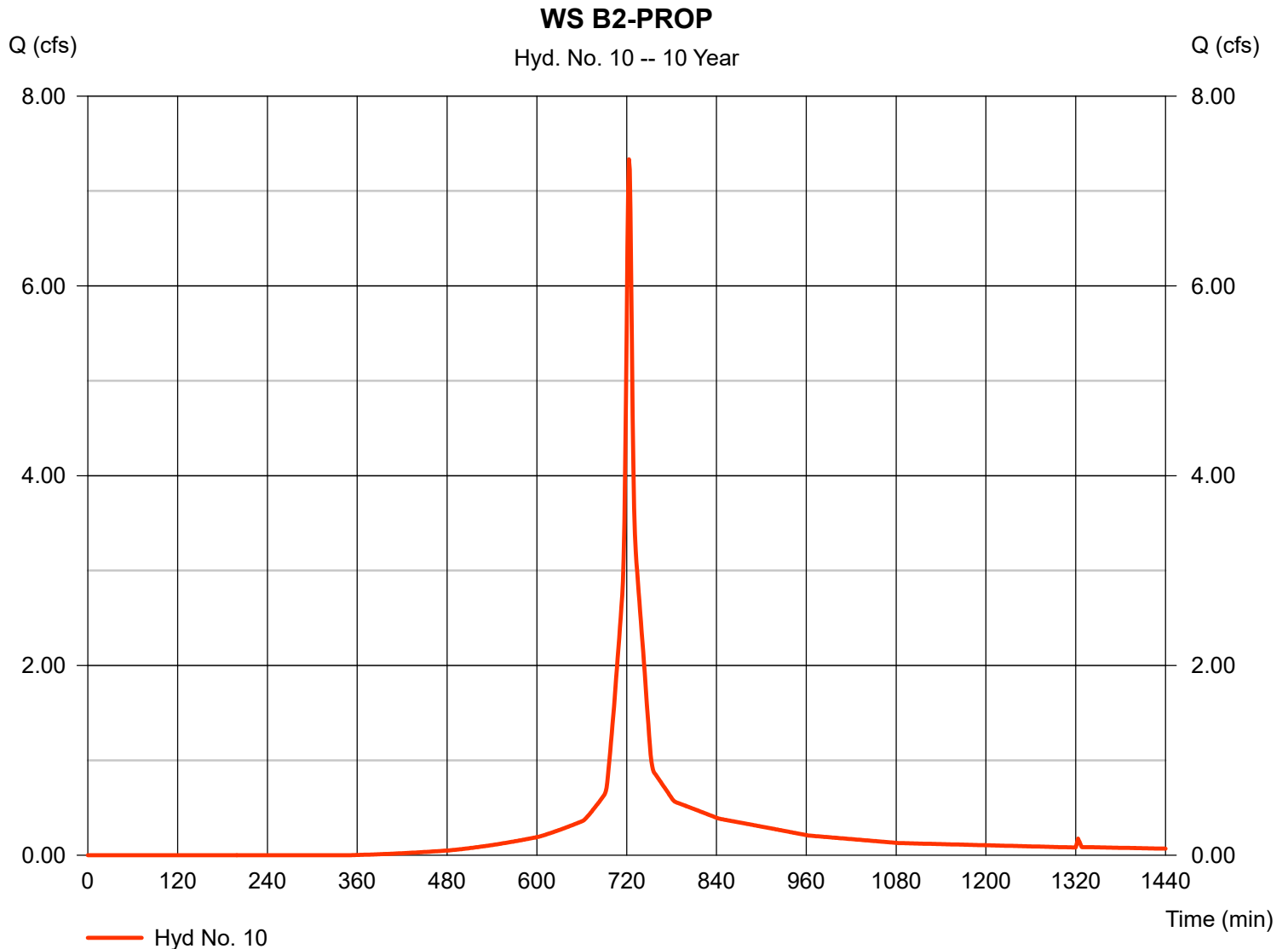
## Hyd. No. 10

WS B2-PROP

Hydrograph type = SCS Runoff  
 Storm frequency = 10 yrs  
 Time interval = 1 min  
 Drainage area = 1.660 ac  
 Basin Slope = 0.0 %  
 Tc method = TR55  
 Total precip. = 5.21 in  
 Storm duration = 24 hrs

Peak discharge = 7.334 cfs  
 Time to peak = 723 min  
 Hyd. volume = 21,468 cuft  
 Curve number = 85\*  
 Hydraulic length = 0 ft  
 Time of conc. (Tc) = 4.90 min  
 Distribution = Type III  
 Shape factor = 484

\* Composite (Area/CN) = [(0.340 x 70) + (1.320 x 89)] / 1.660



# Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.1

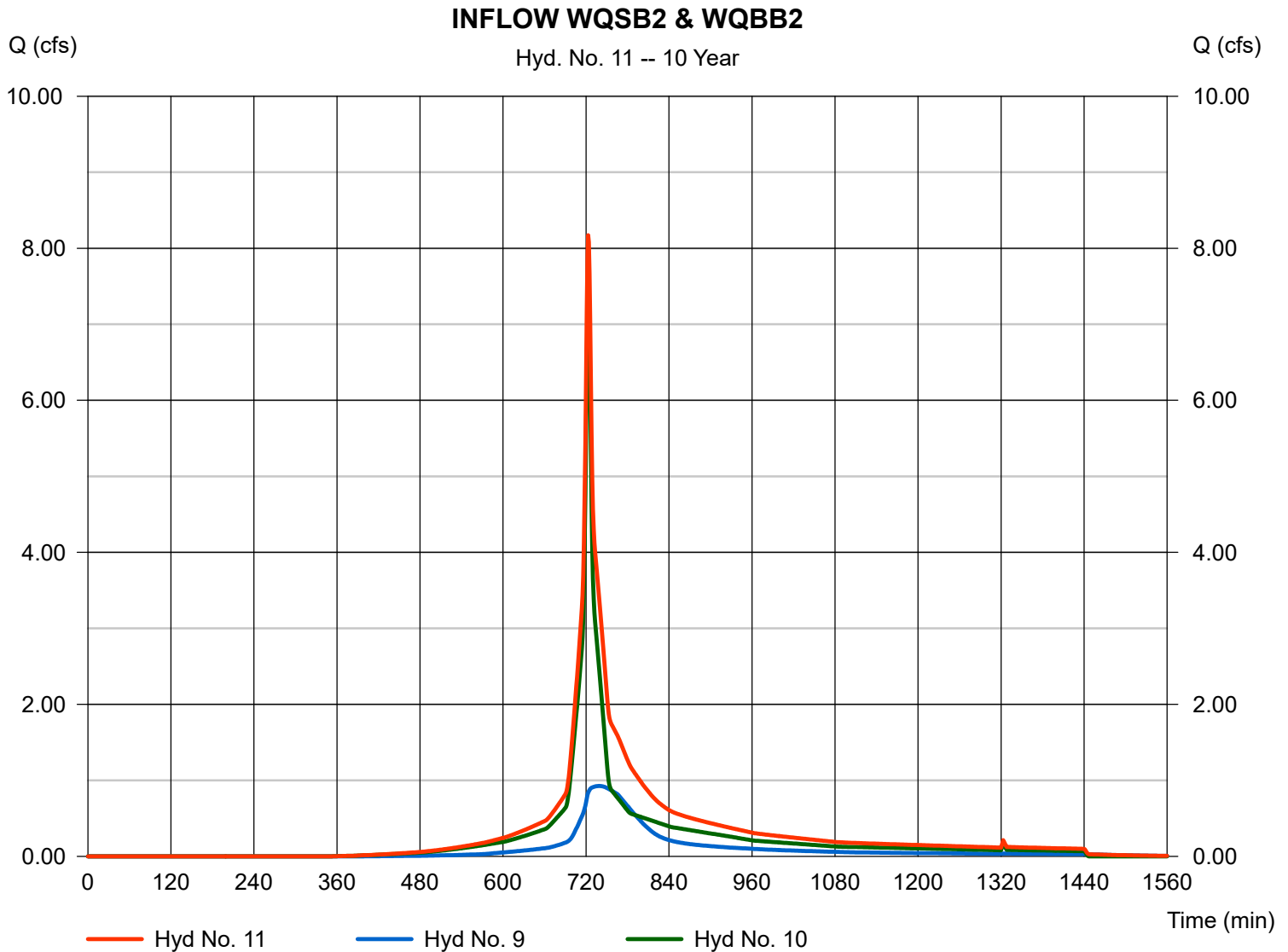
Friday, Aug 11, 2023

## Hyd. No. 11

INFLOW WQSB2 & WQBB2

Hydrograph type = Combine  
Storm frequency = 10 yrs  
Time interval = 1 min  
Inflow hyds. = 9, 10

Peak discharge = 8.171 cfs  
Time to peak = 723 min  
Hyd. volume = 29,950 cuft  
Contrib. drain. area = 1.660 ac



# Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.1

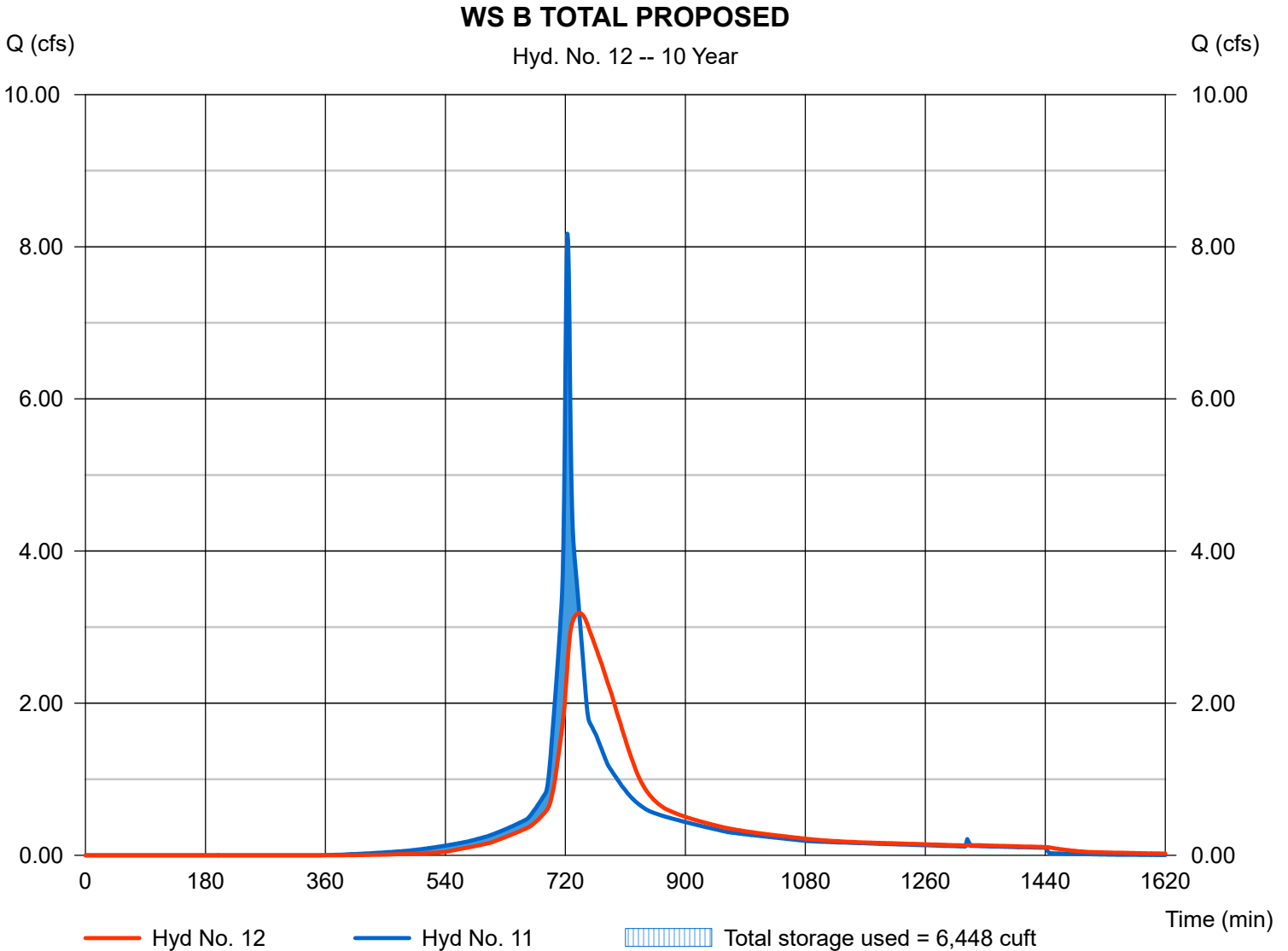
Friday, Aug 11, 2023

## Hyd. No. 12

### WS B TOTAL PROPOSED

Hydrograph type	= Reservoir	Peak discharge	= 3.187 cfs
Storm frequency	= 10 yrs	Time to peak	= 741 min
Time interval	= 1 min	Hyd. volume	= 29,941 cuft
Inflow hyd. No.	= 11 - INFLOW WQSB2 & WQBB2	Max. Elevation	= 150.64 ft
Reservoir name	= WQB B2 &WQS B2	Max. Storage	= 6,448 cuft

Storage Indication method used.





# Hydrograph Summary Report

Hydraflow Hydrographs by Intelisolve v9.1

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	26.00	1	725	80,153	----	-----	-----	WS A-EXIST
2	SCS Runoff	9.916	1	725	30,542	----	-----	-----	WS B-EXIST
3	SCS Runoff	27.98	1	725	92,193	----	-----	-----	WS A1-PROP
4	Reservoir	6.960	1	749	92,179	3	139.31	31,230	WQB A1
5	SCS Runoff	1.513	1	722	4,110	----	-----	-----	WS A2-PROP
6	Combine	7.301	1	742	96,289	4, 5	-----	-----	INFLOW WQB A2
7	Reservoir	4.528	1	835	96,281	6	137.46	22,371	WS A TOTAL PROPOSED
8	SCS Runoff	4.031	1	722	11,241	----	-----	-----	WS B1-PROP
9	Reservoir	1.057	1	741	11,236	8	152.50	3,128	WQS B1
10	SCS Runoff	9.608	1	723	28,436	----	-----	-----	WS B2-PROP
11	Combine	10.54	1	723	39,672	9, 10	-----	-----	INFLOW WQSB2 & WQBB2
12	Reservoir	3.791	1	742	39,664	11	151.10	8,619	WS B TOTAL PROPOSED
Macro Model 2023-08-01.gpw					Return Period: 25 Year			Friday, Aug 11, 2023	

# Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.1

Friday, Aug 11, 2023

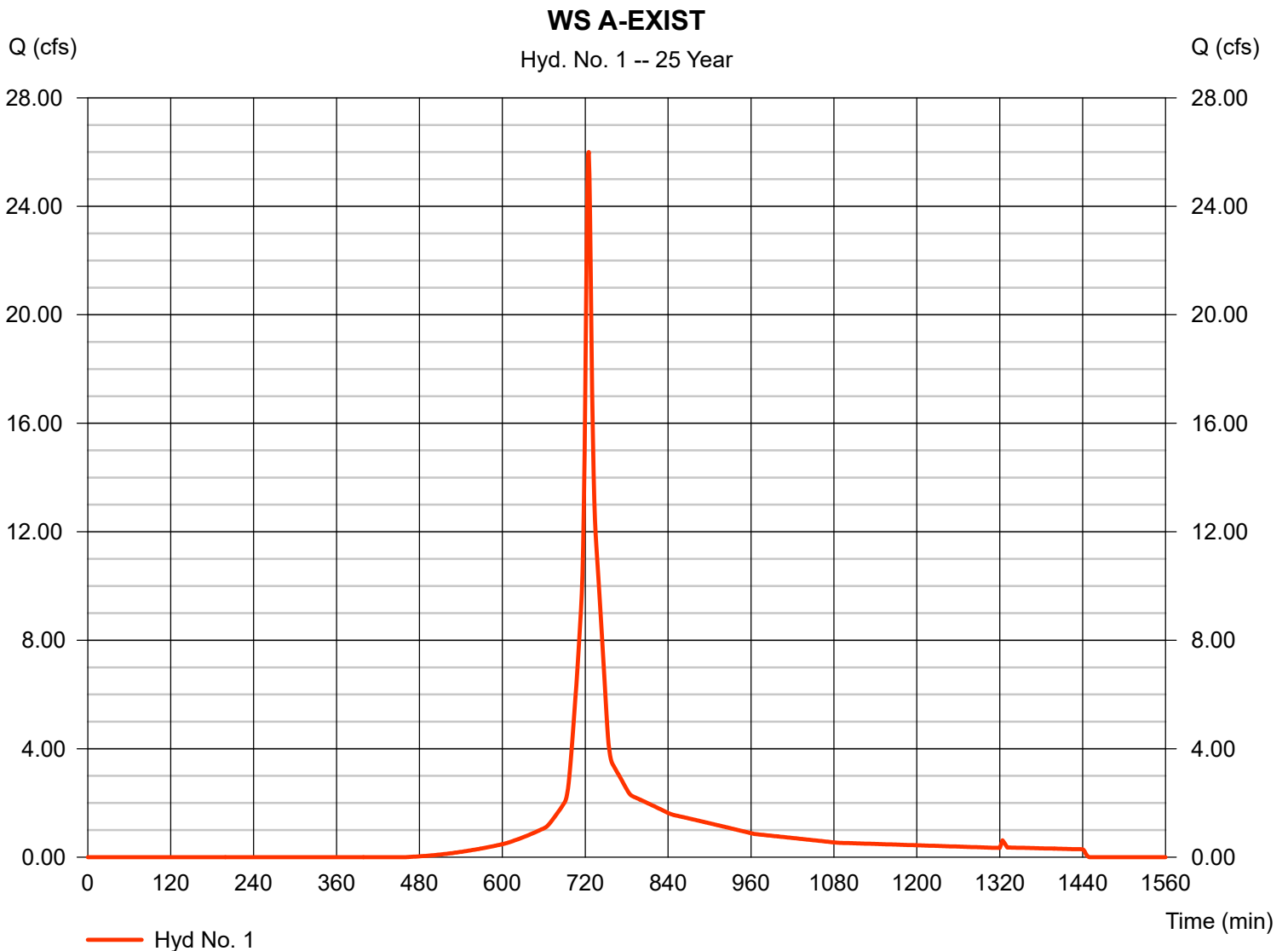
## Hyd. No. 1

WS A-EXIST

Hydrograph type = SCS Runoff  
 Storm frequency = 25 yrs  
 Time interval = 1 min  
 Drainage area = 5.850 ac  
 Basin Slope = 0.0 %  
 Tc method = TR55  
 Total precip. = 6.44 in  
 Storm duration = 24 hrs

Peak discharge = 26.00 cfs  
 Time to peak = 725 min  
 Hyd. volume = 80,153 cuft  
 Curve number = 75\*  
 Hydraulic length = 0 ft  
 Time of conc. (Tc) = 6.10 min  
 Distribution = Type III  
 Shape factor = 484

\* Composite (Area/CN) = [(4.230 x 70) + (1.590 x 89) + (0.030 x 70)] / 5.850



# Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.1

Friday, Aug 11, 2023

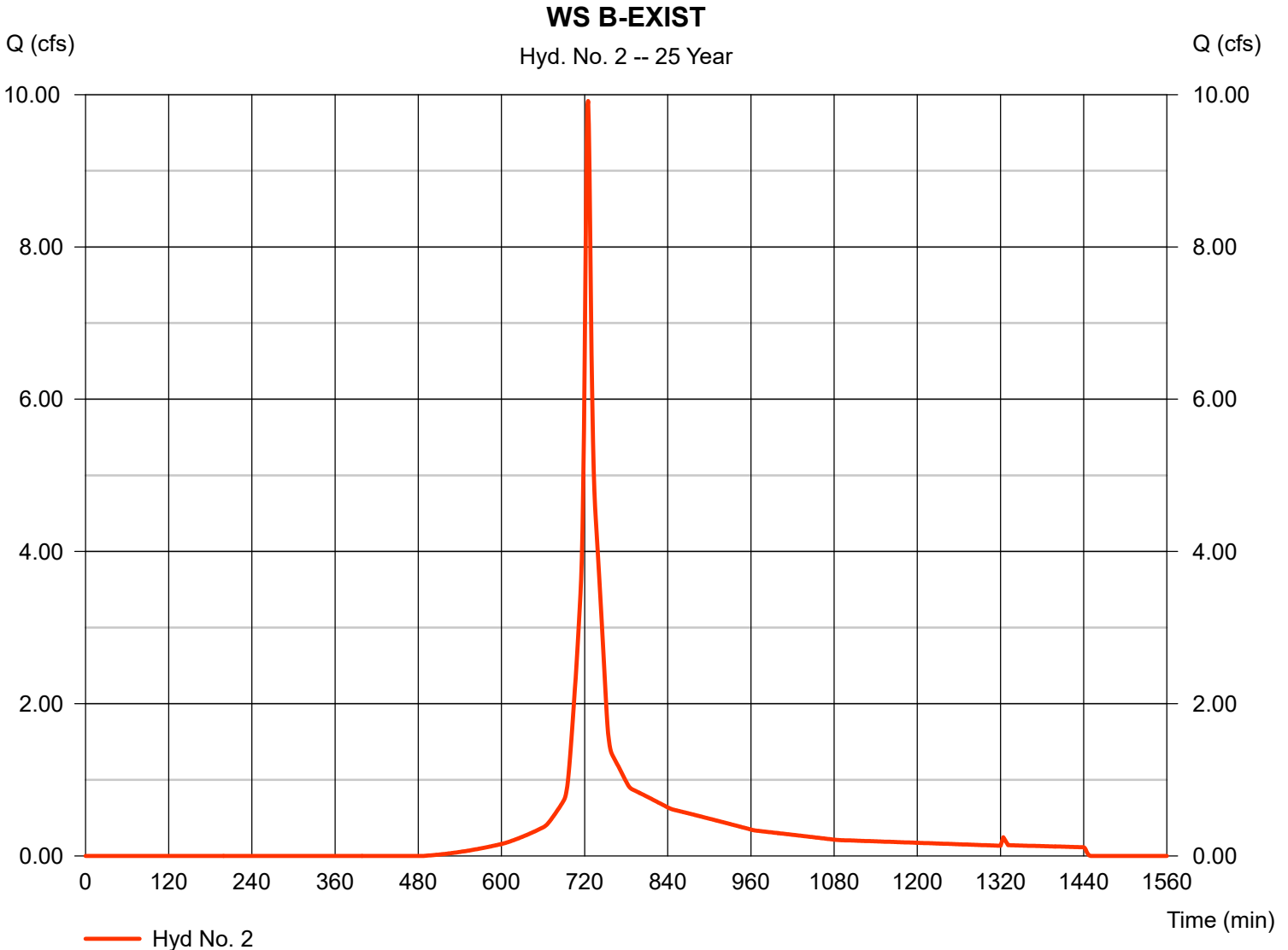
## Hyd. No. 2

WS B-EXIST

Hydrograph type = SCS Runoff  
Storm frequency = 25 yrs  
Time interval = 1 min  
Drainage area = 2.360 ac  
Basin Slope = 0.0 %  
Tc method = TR55  
Total precip. = 6.44 in  
Storm duration = 24 hrs

Peak discharge = 9.916 cfs  
Time to peak = 725 min  
Hyd. volume = 30,542 cuft  
Curve number = 73\*  
Hydraulic length = 0 ft  
Time of conc. (Tc) = 5.90 min  
Distribution = Type III  
Shape factor = 484

\* Composite (Area/CN) = [(2.040 x 70) + (0.320 x 89)] / 2.360



# Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.1

Friday, Aug 11, 2023

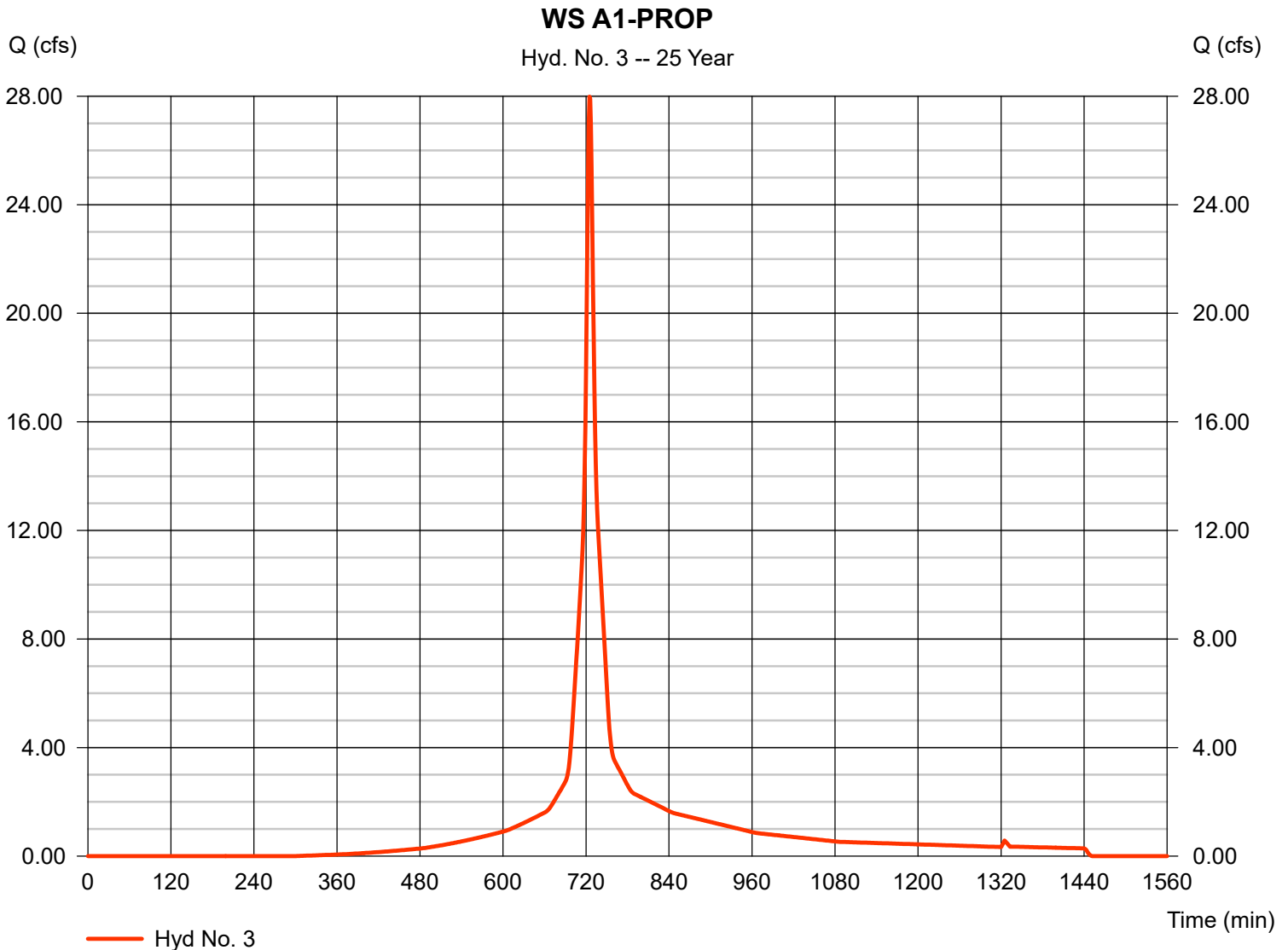
## Hyd. No. 3

WS A1-PROP

Hydrograph type = SCS Runoff  
 Storm frequency = 25 yrs  
 Time interval = 1 min  
 Drainage area = 5.520 ac  
 Basin Slope = 0.0 %  
 Tc method = TR55  
 Total precip. = 6.44 in  
 Storm duration = 24 hrs

Peak discharge = 27.98 cfs  
 Time to peak = 725 min  
 Hyd. volume = 92,193 cuft  
 Curve number = 85\*  
 Hydraulic length = 0 ft  
 Time of conc. (Tc) = 7.60 min  
 Distribution = Type III  
 Shape factor = 484

\* Composite (Area/CN) = [(1.070 x 70) + (4.450 x 89)] / 5.520



# Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.1

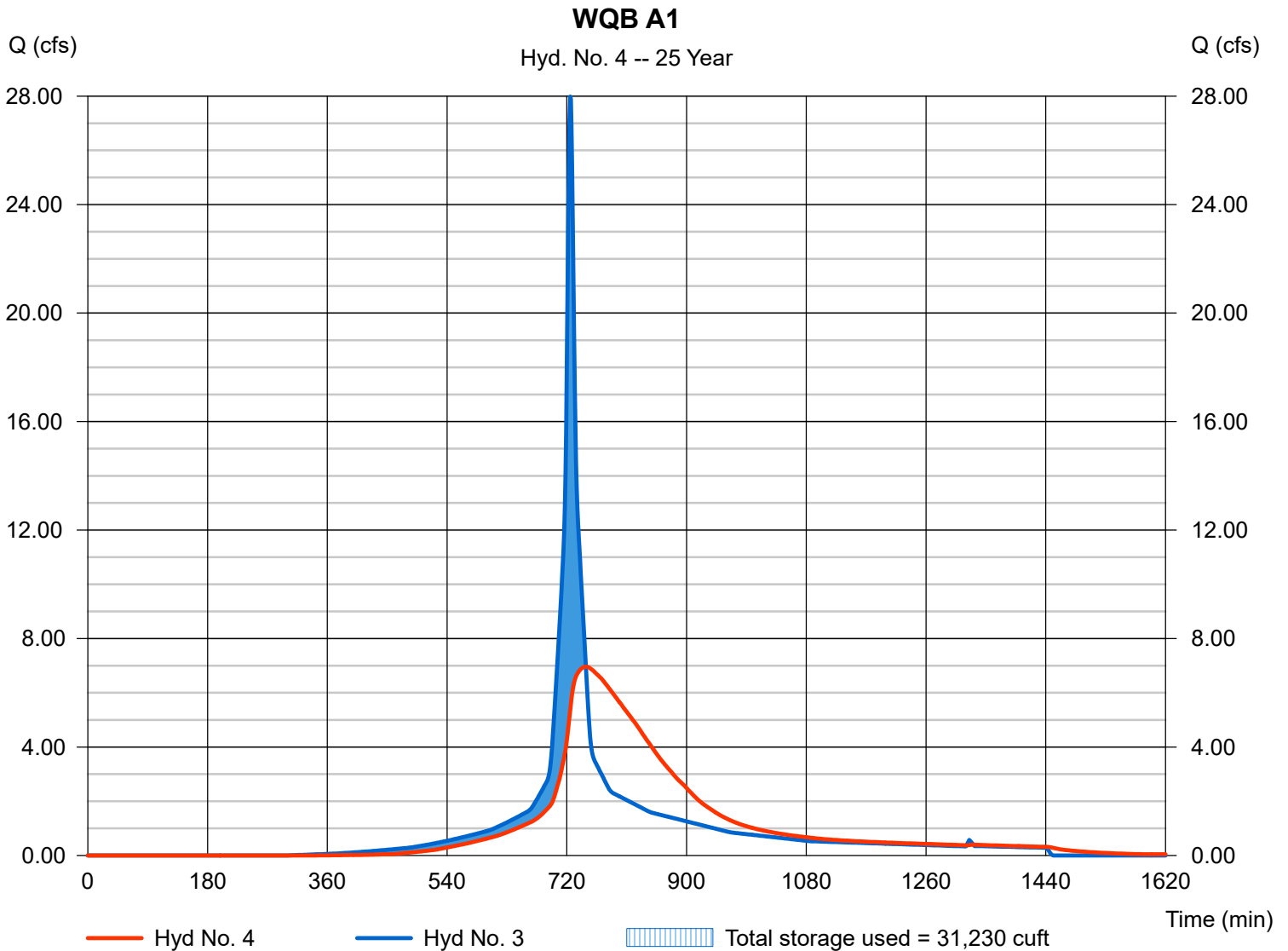
Friday, Aug 11, 2023

## Hyd. No. 4

WQB A1

Hydrograph type	= Reservoir	Peak discharge	= 6.960 cfs
Storm frequency	= 25 yrs	Time to peak	= 749 min
Time interval	= 1 min	Hyd. volume	= 92,179 cuft
Inflow hyd. No.	= 3 - WS A1-PROP	Max. Elevation	= 139.31 ft
Reservoir name	= WQB A1	Max. Storage	= 31,230 cuft

Storage Indication method used.



# Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.1

Friday, Aug 11, 2023

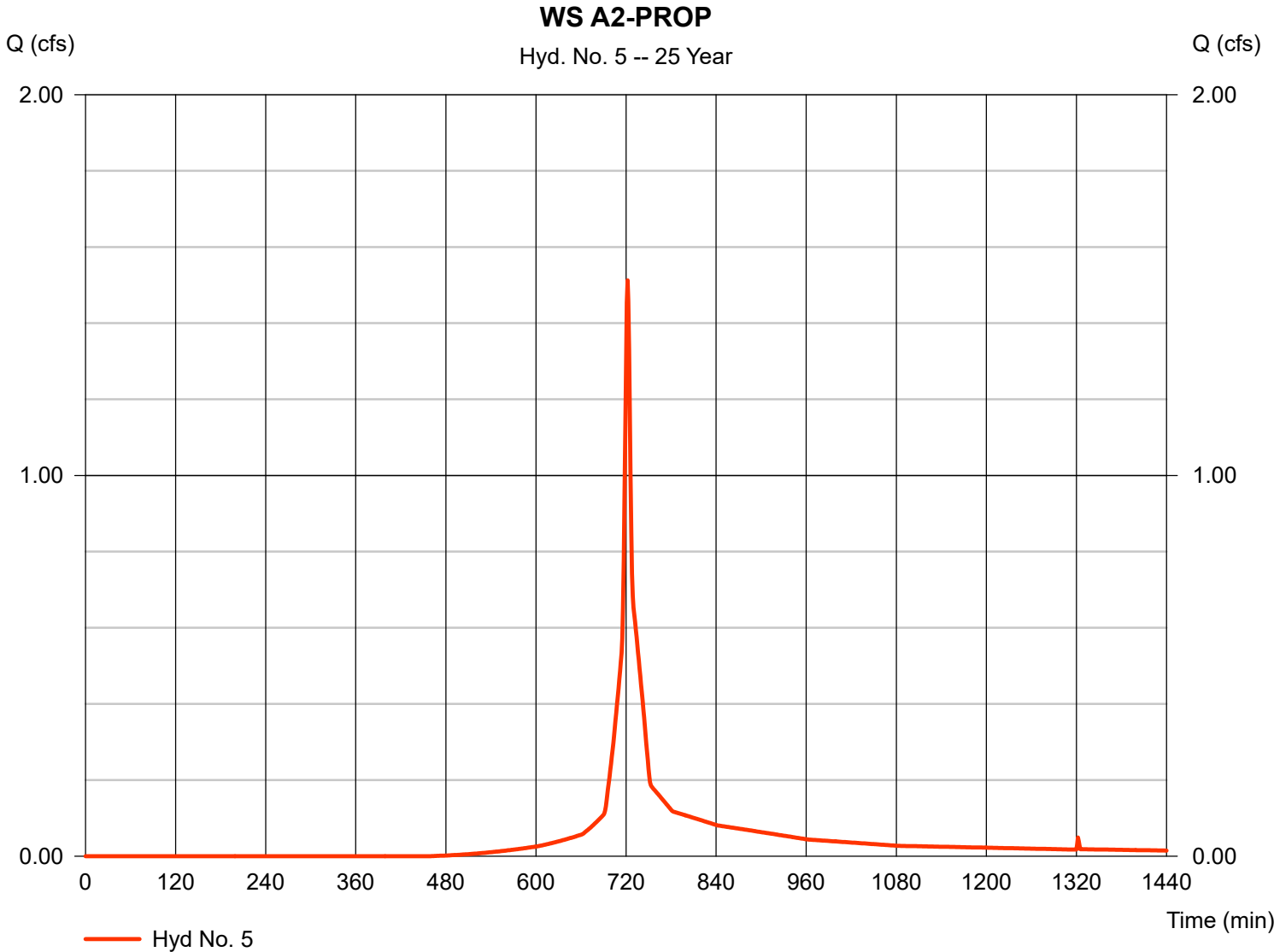
## Hyd. No. 5

WS A2-PROP

Hydrograph type = SCS Runoff  
Storm frequency = 25 yrs  
Time interval = 1 min  
Drainage area = 0.330 ac  
Basin Slope = 0.0 %  
Tc method = TR55  
Total precip. = 6.44 in  
Storm duration = 24 hrs

Peak discharge = 1.513 cfs  
Time to peak = 722 min  
Hyd. volume = 4,110 cuft  
Curve number = 75\*  
Hydraulic length = 0 ft  
Time of conc. (Tc) = 3.10 min  
Distribution = Type III  
Shape factor = 484

\* Composite (Area/CN) = [(0.240 x 70) + (0.090 x 89)] / 0.330



# Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.1

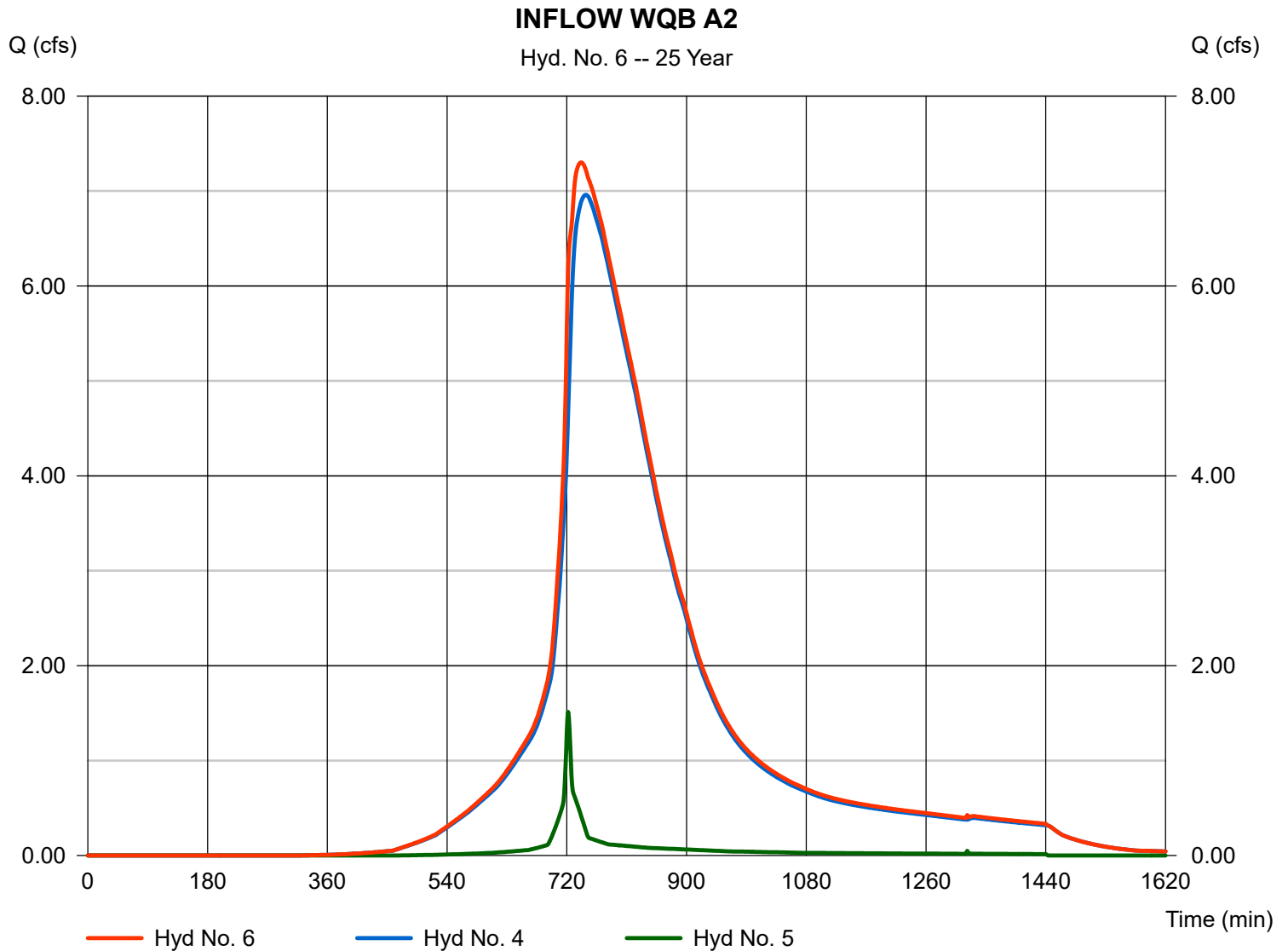
Friday, Aug 11, 2023

## Hyd. No. 6

INFLOW WQB A2

Hydrograph type = Combine  
 Storm frequency = 25 yrs  
 Time interval = 1 min  
 Inflow hyds. = 4, 5

Peak discharge = 7.301 cfs  
 Time to peak = 742 min  
 Hyd. volume = 96,289 cuft  
 Contrib. drain. area = 0.330 ac



# Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.1

Friday, Aug 11, 2023

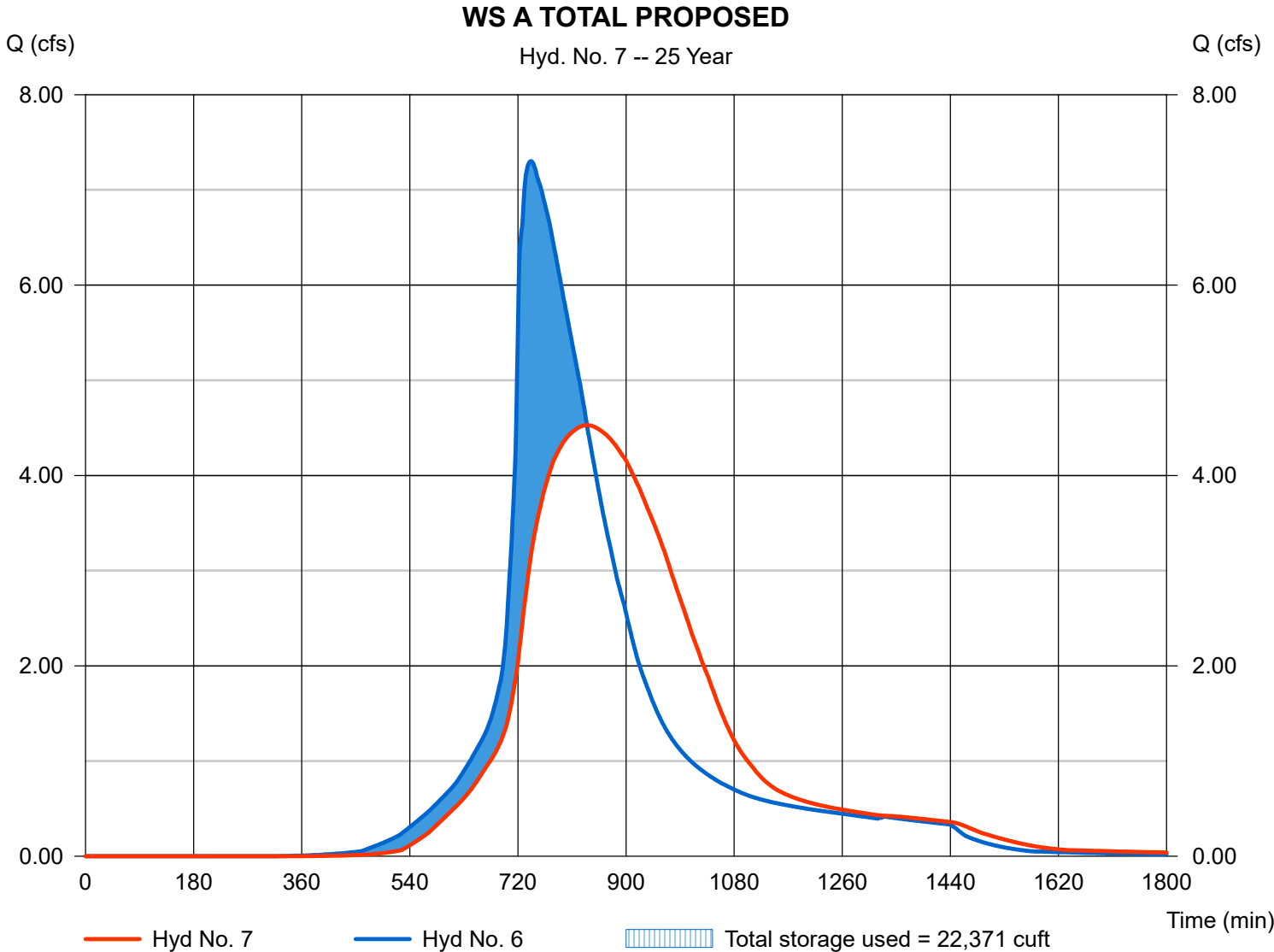
## Hyd. No. 7

### WS A TOTAL PROPOSED

Hydrograph type = Reservoir  
Storm frequency = 25 yrs  
Time interval = 1 min  
Inflow hyd. No. = 6 - INFLOW WQB A2  
Reservoir name = WQB A2

Peak discharge = 4.528 cfs  
Time to peak = 835 min  
Hyd. volume = 96,281 cuft  
Max. Elevation = 137.46 ft  
Max. Storage = 22,371 cuft

Storage Indication method used.





# Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.1

Friday, Aug 11, 2023

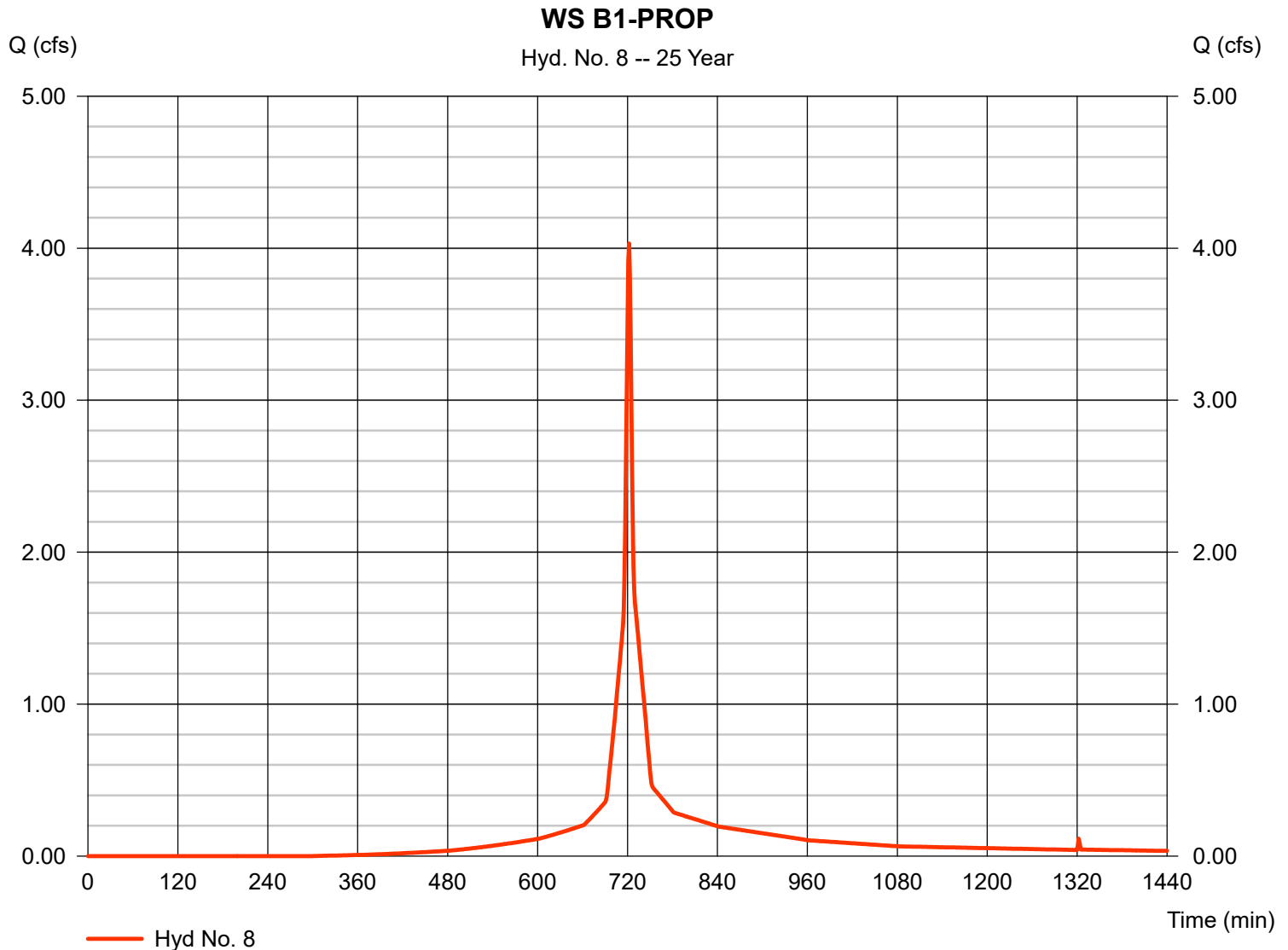
## Hyd. No. 8

WS B1-PROP

Hydrograph type = SCS Runoff  
 Storm frequency = 25 yrs  
 Time interval = 1 min  
 Drainage area = 0.700 ac  
 Basin Slope = 0.0 %  
 Tc method = TR55  
 Total precip. = 6.44 in  
 Storm duration = 24 hrs

Peak discharge = 4.031 cfs  
 Time to peak = 722 min  
 Hyd. volume = 11,241 cuft  
 Curve number = 85\*  
 Hydraulic length = 0 ft  
 Time of conc. (Tc) = 3.10 min  
 Distribution = Type III  
 Shape factor = 484

\* Composite (Area/CN) = [(0.130 x 70) + (0.570 x 89)] / 0.700



# Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.1

Friday, Aug 11, 2023

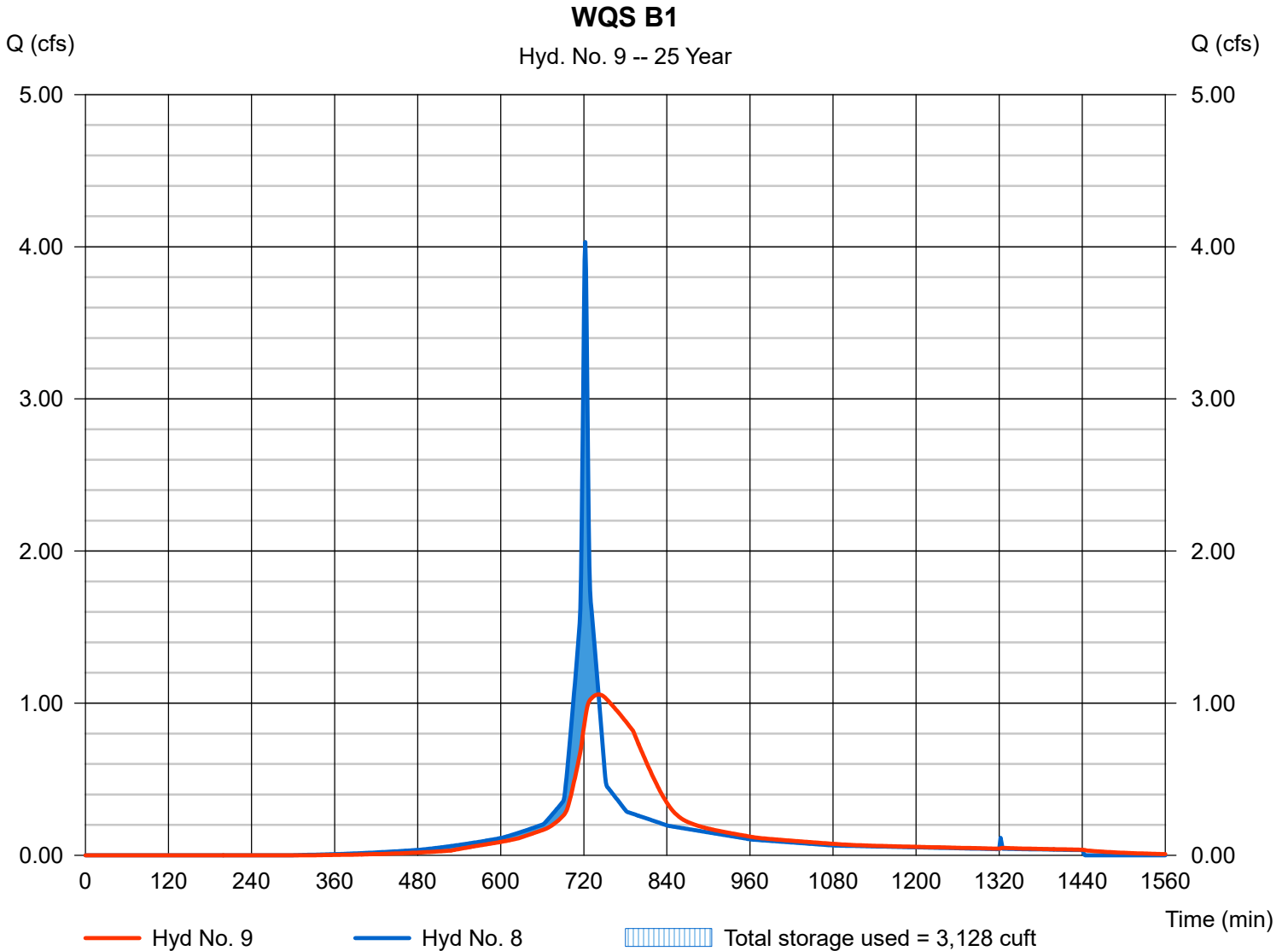
## Hyd. No. 9

WQS B1

Hydrograph type = Reservoir  
Storm frequency = 25 yrs  
Time interval = 1 min  
Inflow hyd. No. = 8 - WS B1-PROP  
Reservoir name = WQS B1

Peak discharge = 1.057 cfs  
Time to peak = 741 min  
Hyd. volume = 11,236 cuft  
Max. Elevation = 152.50 ft  
Max. Storage = 3,128 cuft

Storage Indication method used.



# Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.1

Friday, Aug 11, 2023

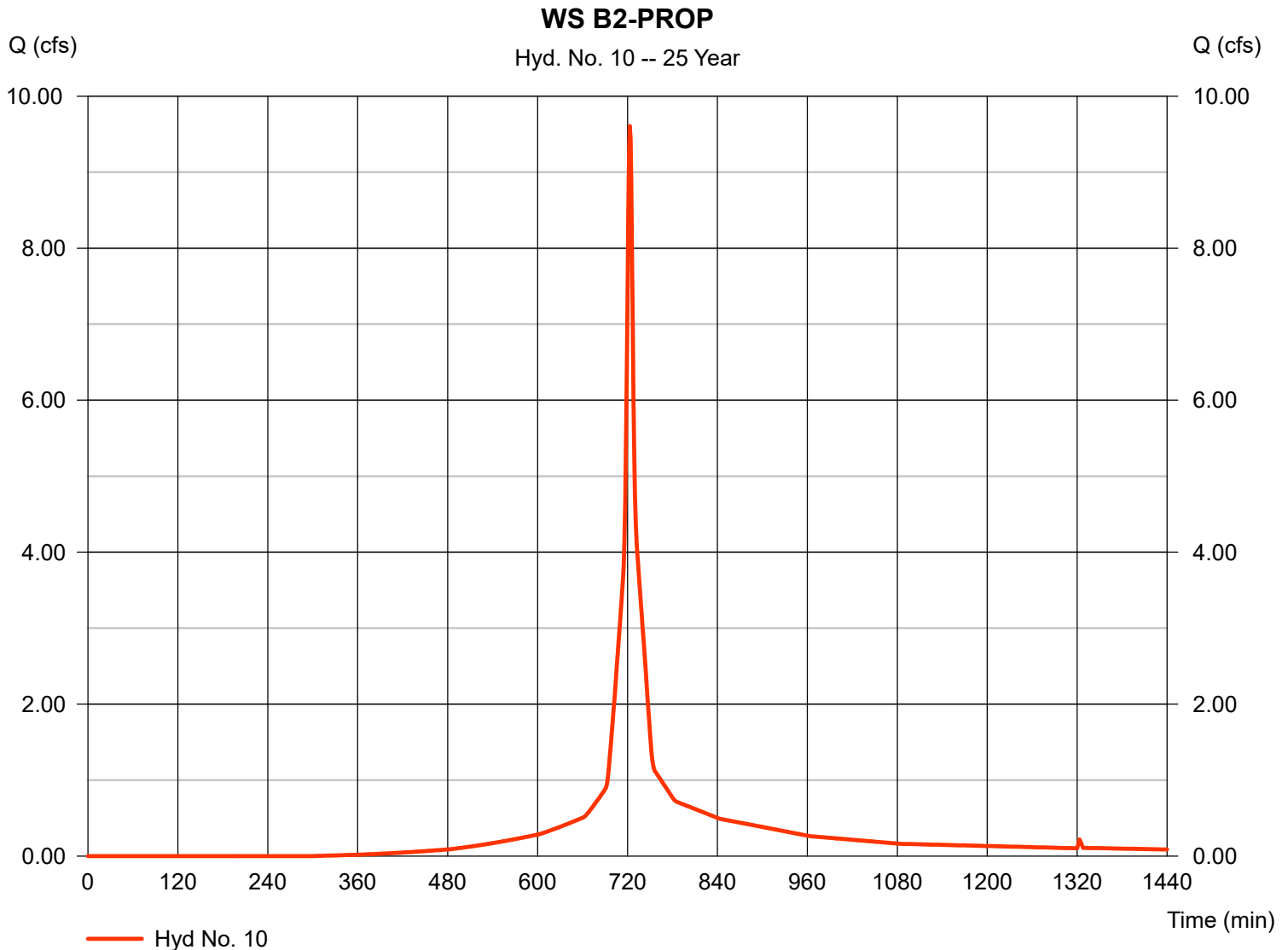
## Hyd. No. 10

WS B2-PROP

Hydrograph type = SCS Runoff  
 Storm frequency = 25 yrs  
 Time interval = 1 min  
 Drainage area = 1.660 ac  
 Basin Slope = 0.0 %  
 Tc method = TR55  
 Total precip. = 6.44 in  
 Storm duration = 24 hrs

Peak discharge = 9.608 cfs  
 Time to peak = 723 min  
 Hyd. volume = 28,436 cuft  
 Curve number = 85\*  
 Hydraulic length = 0 ft  
 Time of conc. (Tc) = 4.90 min  
 Distribution = Type III  
 Shape factor = 484

\* Composite (Area/CN) = [(0.340 x 70) + (1.320 x 89)] / 1.660



# Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.1

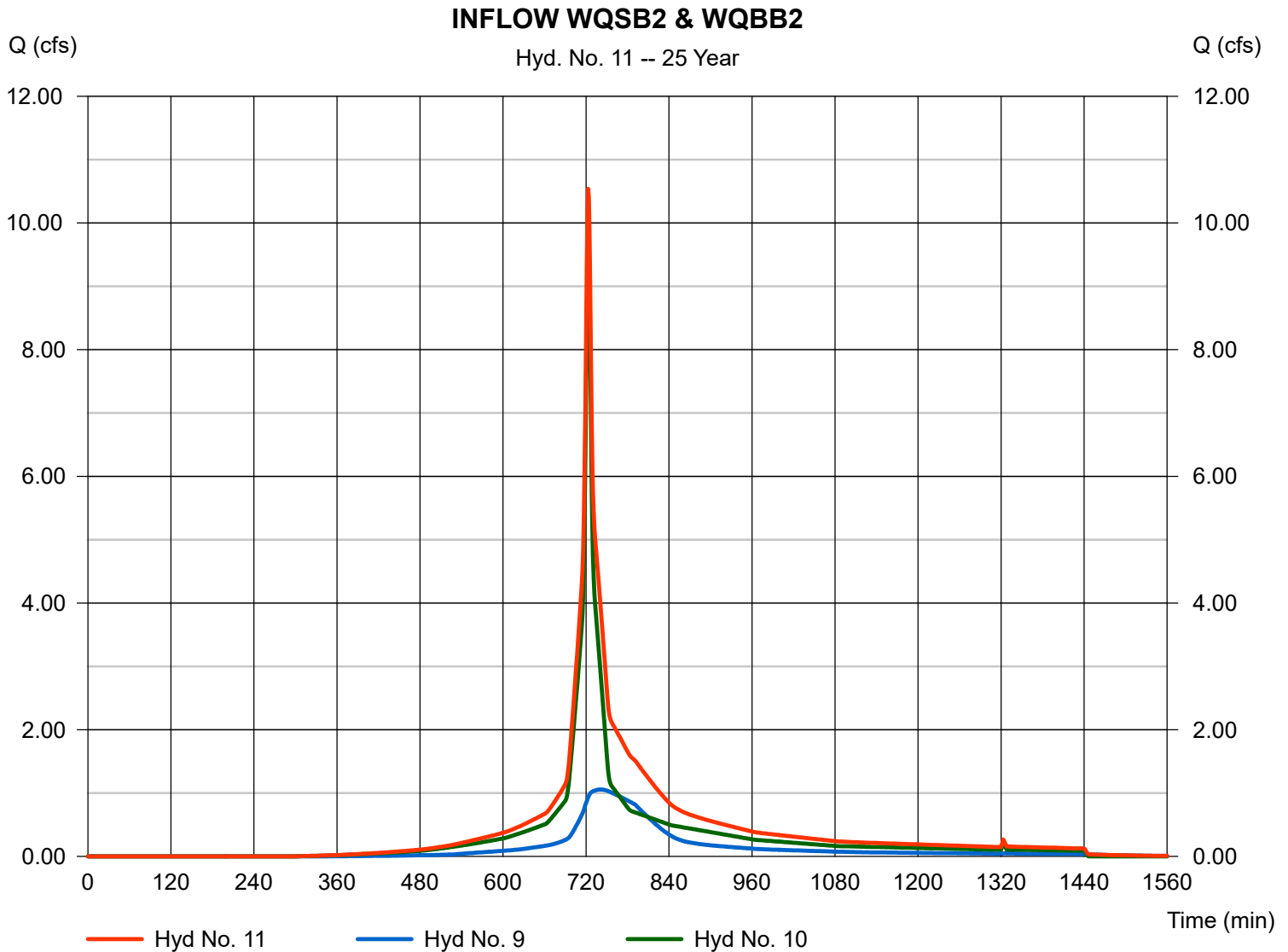
Friday, Aug 11, 2023

## Hyd. No. 11

INFLOW WQSB2 & WQBB2

Hydrograph type = Combine  
Storm frequency = 25 yrs  
Time interval = 1 min  
Inflow hyds. = 9, 10

Peak discharge = 10.54 cfs  
Time to peak = 723 min  
Hyd. volume = 39,672 cuft  
Contrib. drain. area = 1.660 ac



# Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.1

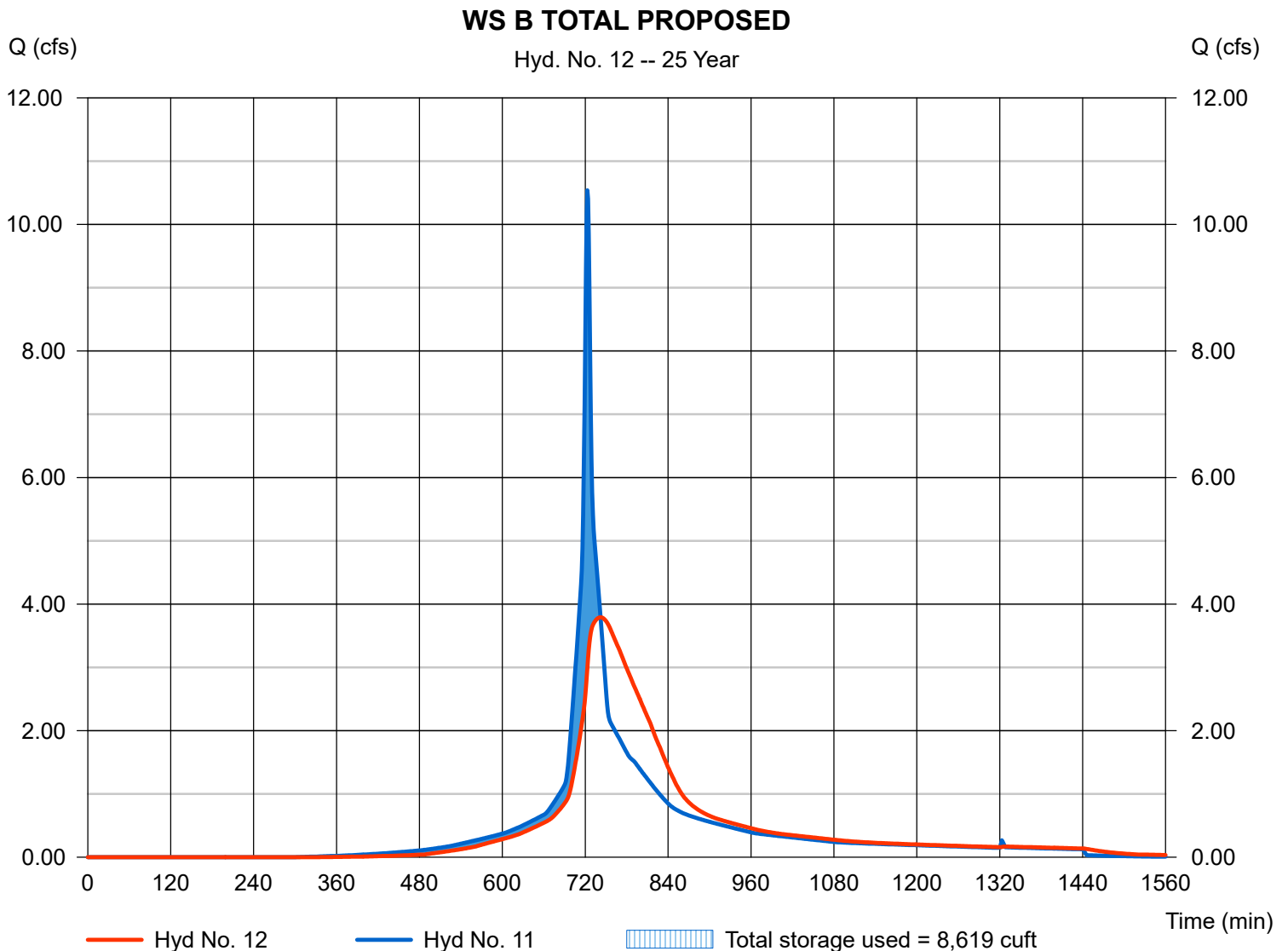
Friday, Aug 11, 2023

## Hyd. No. 12

### WS B TOTAL PROPOSED

Hydrograph type	= Reservoir	Peak discharge	= 3.791 cfs
Storm frequency	= 25 yrs	Time to peak	= 742 min
Time interval	= 1 min	Hyd. volume	= 39,664 cuft
Inflow hyd. No.	= 11 - INFLOW WQSB2 & WQBB2	Max. Elevation	= 151.10 ft
Reservoir name	= WQB B2 & WQS B2	Max. Storage	= 8,619 cuft

Storage Indication method used.



# Hydrograph Summary Report

Hydraflow Hydrographs by Intelisolve v9.1

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	31.46	1	725	97,264	----	-----	-----	WS A-EXIST	
2	SCS Runoff	12.09	1	725	37,292	----	-----	-----	WS B-EXIST	
3	SCS Runoff	32.77	1	725	108,792	----	-----	-----	WS A1-PROP	
4	Reservoir	9.453	1	746	108,777	3	139.73	36,490	WQB A1	
5	SCS Runoff	1.831	1	722	4,988	----	-----	-----	WS A2-PROP	
6	Combine	9.841	1	745	113,765	4, 5	-----	-----	INFLOW WQB A2	
7	Reservoir	5.807	1	817	113,757	6	137.87	25,714	WS A TOTAL PROPOSED	
8	SCS Runoff	4.718	1	722	13,265	----	-----	-----	WS B1-PROP	
9	Reservoir	1.182	1	742	13,260	8	152.72	3,798	WQS B1	
10	SCS Runoff	11.25	1	723	33,555	----	-----	-----	WS B2-PROP	
11	Combine	12.25	1	723	46,816	9, 10	-----	-----	INFLOW WQSB2 & WQBB2	
12	Reservoir	4.156	1	743	46,807	11	151.39	10,320	WS B TOTAL PROPOSED	
Macro Model 2023-08-01.gpw					Return Period: 50 Year			Friday, Aug 11, 2023		

# Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.1

Friday, Aug 11, 2023

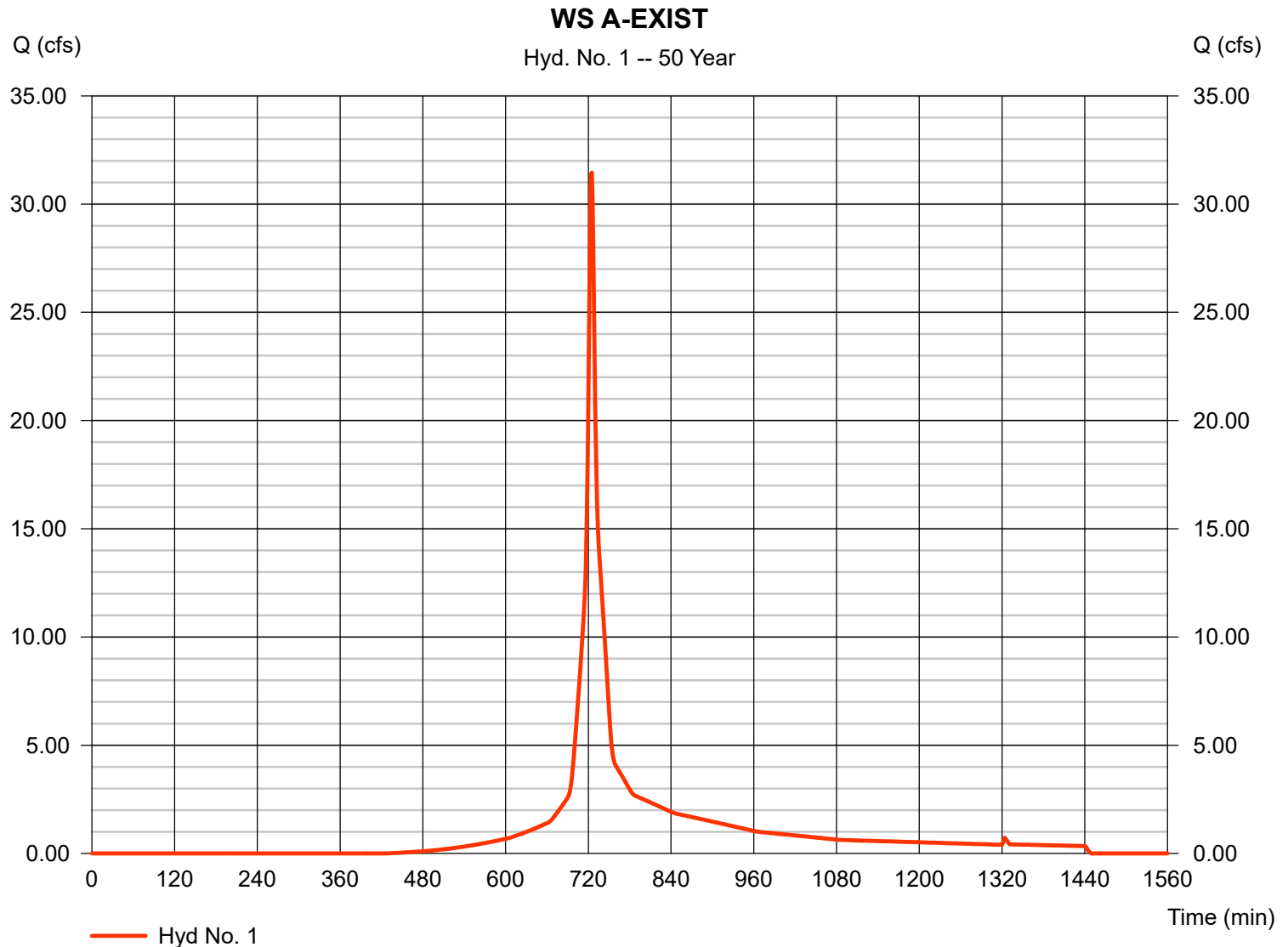
## Hyd. No. 1

WS A-EXIST

Hydrograph type = SCS Runoff  
 Storm frequency = 50 yrs  
 Time interval = 1 min  
 Drainage area = 5.850 ac  
 Basin Slope = 0.0 %  
 Tc method = TR55  
 Total precip. = 7.33 in  
 Storm duration = 24 hrs

Peak discharge = 31.46 cfs  
 Time to peak = 725 min  
 Hyd. volume = 97,264 cuft  
 Curve number = 75\*  
 Hydraulic length = 0 ft  
 Time of conc. (Tc) = 6.10 min  
 Distribution = Type III  
 Shape factor = 484

\* Composite (Area/CN) = [(4.230 x 70) + (1.590 x 89) + (0.030 x 70)] / 5.850



# Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.1

Friday, Aug 11, 2023

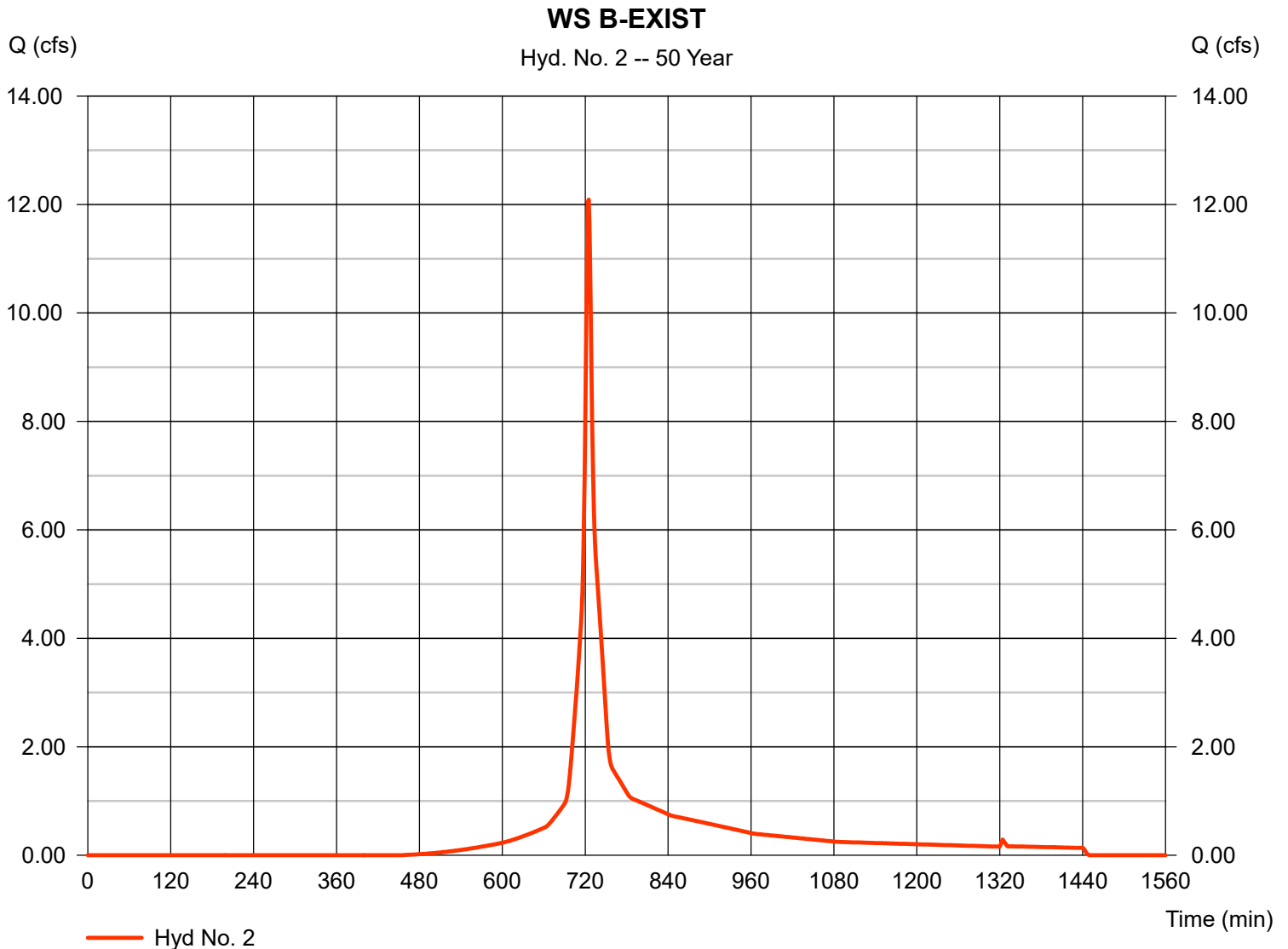
## Hyd. No. 2

WS B-EXIST

Hydrograph type = SCS Runoff  
 Storm frequency = 50 yrs  
 Time interval = 1 min  
 Drainage area = 2.360 ac  
 Basin Slope = 0.0 %  
 Tc method = TR55  
 Total precip. = 7.33 in  
 Storm duration = 24 hrs

Peak discharge = 12.09 cfs  
 Time to peak = 725 min  
 Hyd. volume = 37,292 cuft  
 Curve number = 73\*  
 Hydraulic length = 0 ft  
 Time of conc. (Tc) = 5.90 min  
 Distribution = Type III  
 Shape factor = 484

\* Composite (Area/CN) = [(2.040 x 70) + (0.320 x 89)] / 2.360





# Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.1

Friday, Aug 11, 2023

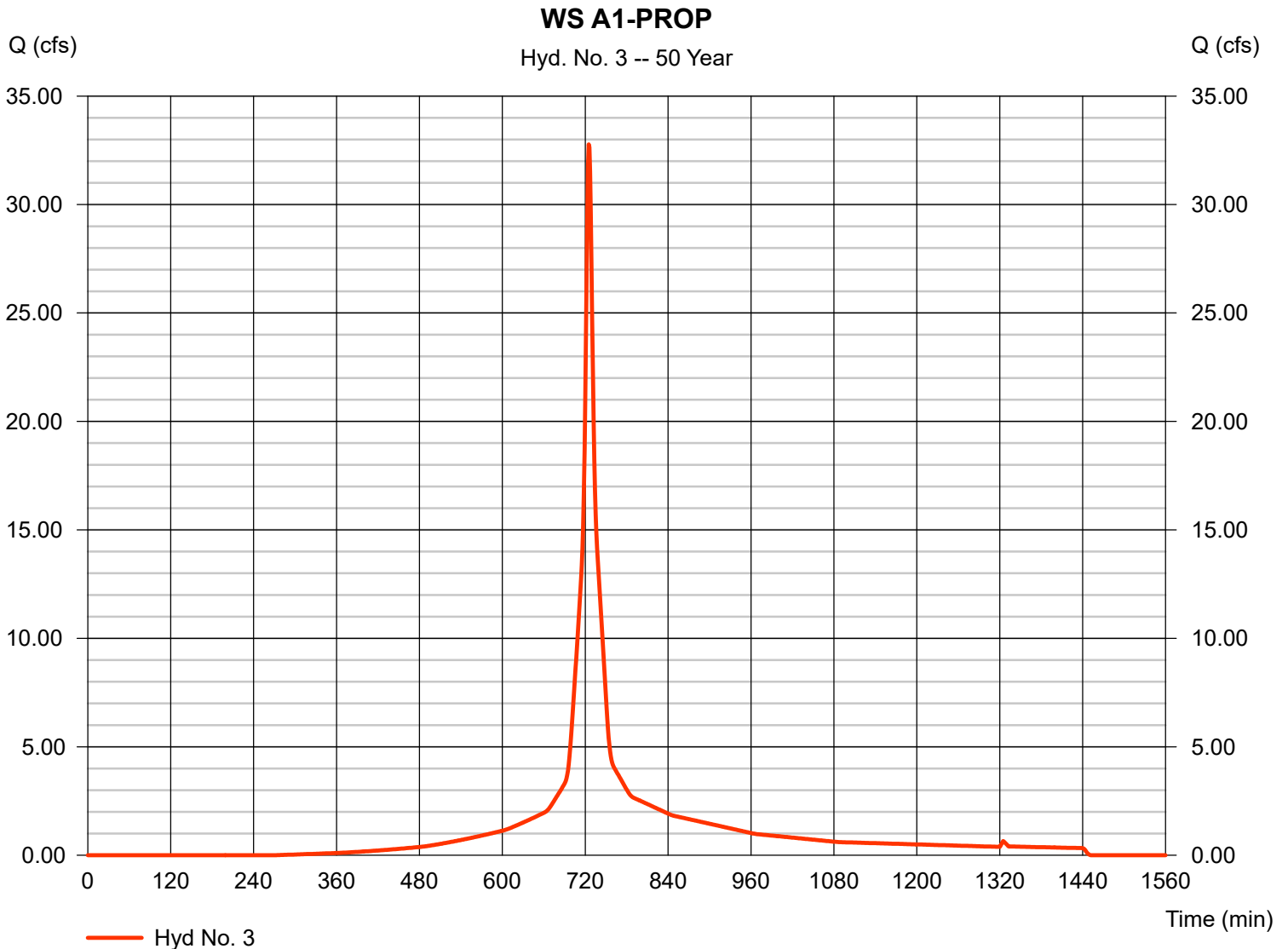
## Hyd. No. 3

WS A1-PROP

Hydrograph type = SCS Runoff  
 Storm frequency = 50 yrs  
 Time interval = 1 min  
 Drainage area = 5.520 ac  
 Basin Slope = 0.0 %  
 Tc method = TR55  
 Total precip. = 7.33 in  
 Storm duration = 24 hrs

Peak discharge = 32.77 cfs  
 Time to peak = 725 min  
 Hyd. volume = 108,792 cuft  
 Curve number = 85\*  
 Hydraulic length = 0 ft  
 Time of conc. (Tc) = 7.60 min  
 Distribution = Type III  
 Shape factor = 484

\* Composite (Area/CN) =  $[(1.070 \times 70) + (4.450 \times 89)] / 5.520$



# Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.1

Friday, Aug 11, 2023

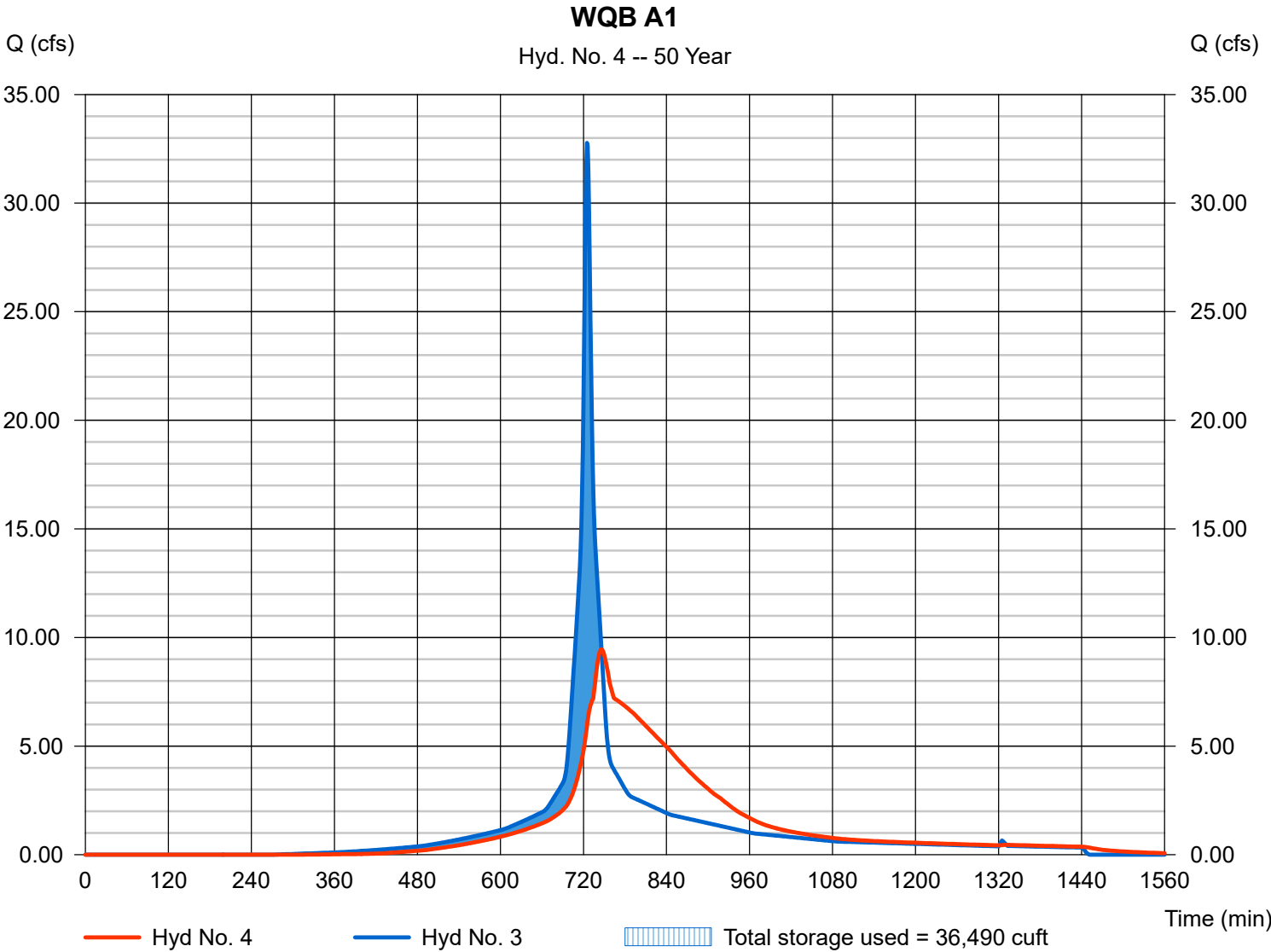
## Hyd. No. 4

WQB A1

Hydrograph type = Reservoir  
 Storm frequency = 50 yrs  
 Time interval = 1 min  
 Inflow hyd. No. = 3 - WS A1-PROP  
 Reservoir name = WQB A1

Peak discharge = 9.453 cfs  
 Time to peak = 746 min  
 Hyd. volume = 108,777 cuft  
 Max. Elevation = 139.73 ft  
 Max. Storage = 36,490 cuft

Storage Indication method used.



# Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.1

Friday, Aug 11, 2023

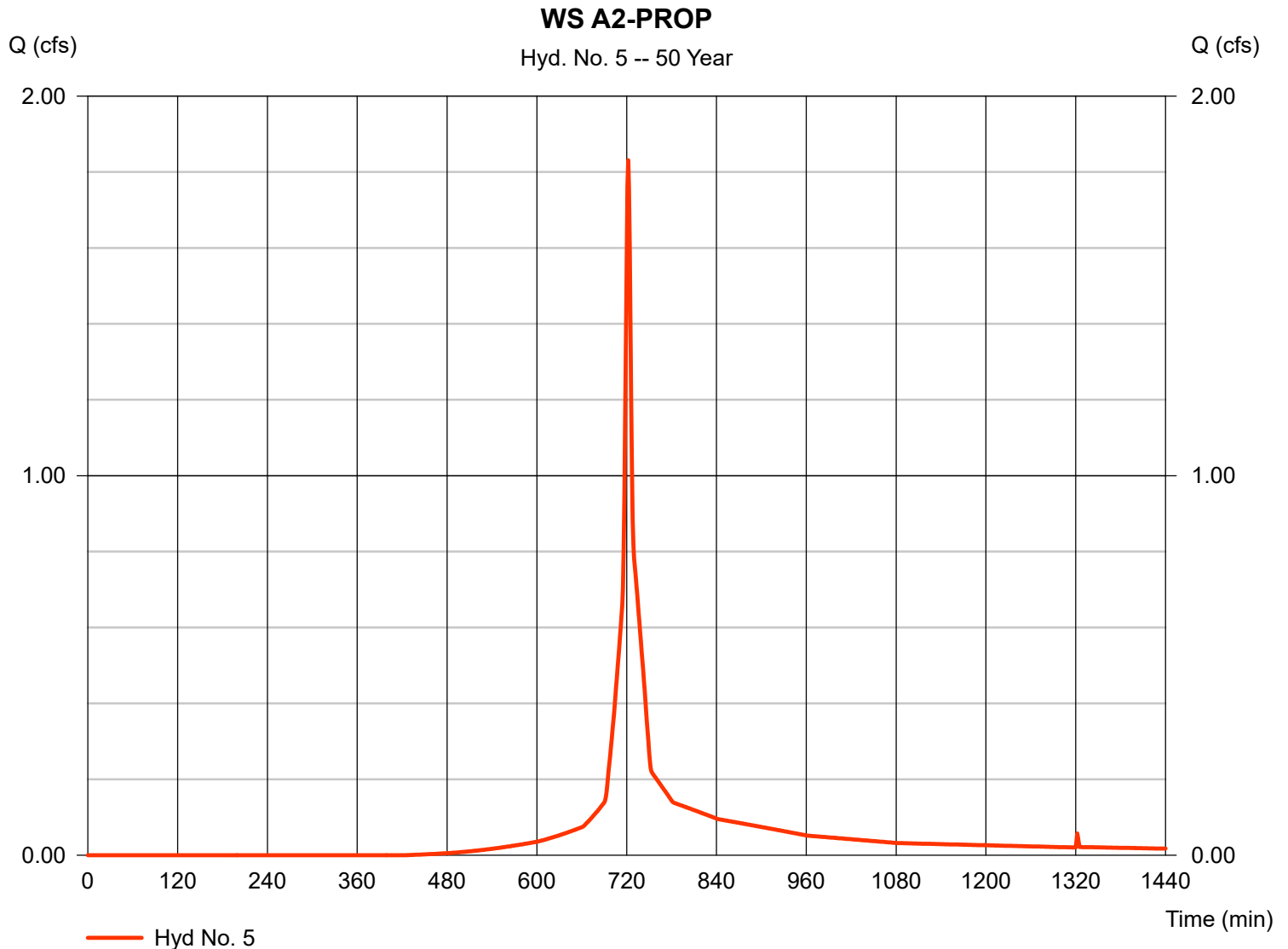
## Hyd. No. 5

WS A2-PROP

Hydrograph type = SCS Runoff  
 Storm frequency = 50 yrs  
 Time interval = 1 min  
 Drainage area = 0.330 ac  
 Basin Slope = 0.0 %  
 Tc method = TR55  
 Total precip. = 7.33 in  
 Storm duration = 24 hrs

Peak discharge = 1.831 cfs  
 Time to peak = 722 min  
 Hyd. volume = 4,988 cuft  
 Curve number = 75\*  
 Hydraulic length = 0 ft  
 Time of conc. (Tc) = 3.10 min  
 Distribution = Type III  
 Shape factor = 484

\* Composite (Area/CN) = [(0.240 x 70) + (0.090 x 89)] / 0.330



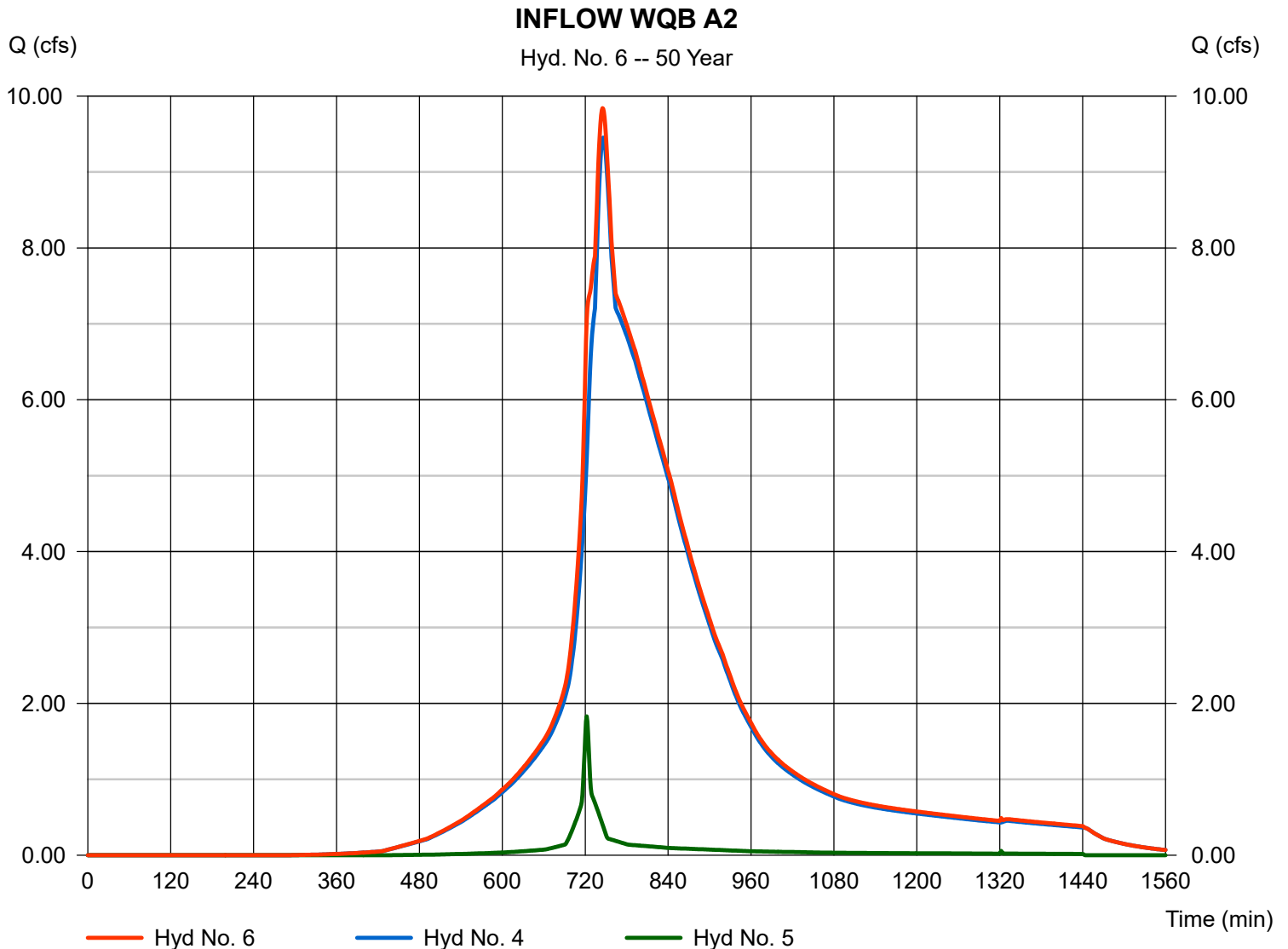
# Hydrograph Report

## Hyd. No. 6

### INFLOW WQB A2

Hydrograph type = Combine  
Storm frequency = 50 yrs  
Time interval = 1 min  
Inflow hyds. = 4, 5

Peak discharge = 9.841 cfs  
Time to peak = 745 min  
Hyd. volume = 113,765 cuft  
Contrib. drain. area = 0.330 ac



# Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.1

Friday, Aug 11, 2023

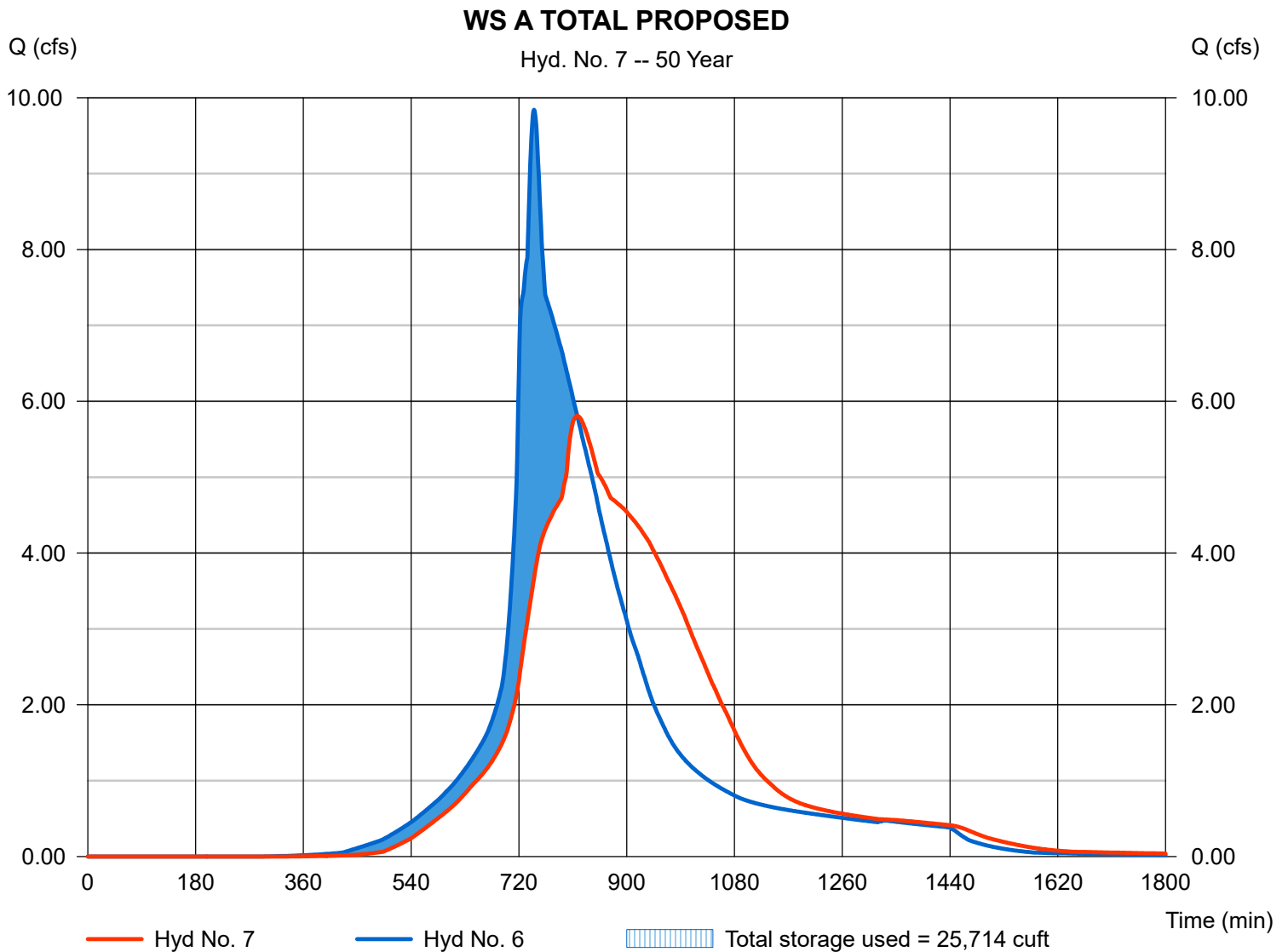
## Hyd. No. 7

### WS A TOTAL PROPOSED

Hydrograph type = Reservoir  
 Storm frequency = 50 yrs  
 Time interval = 1 min  
 Inflow hyd. No. = 6 - INFLOW WQB A2  
 Reservoir name = WQB A2

Peak discharge = 5.807 cfs  
 Time to peak = 817 min  
 Hyd. volume = 113,757 cuft  
 Max. Elevation = 137.87 ft  
 Max. Storage = 25,714 cuft

Storage Indication method used.



# Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.1

Friday, Aug 11, 2023

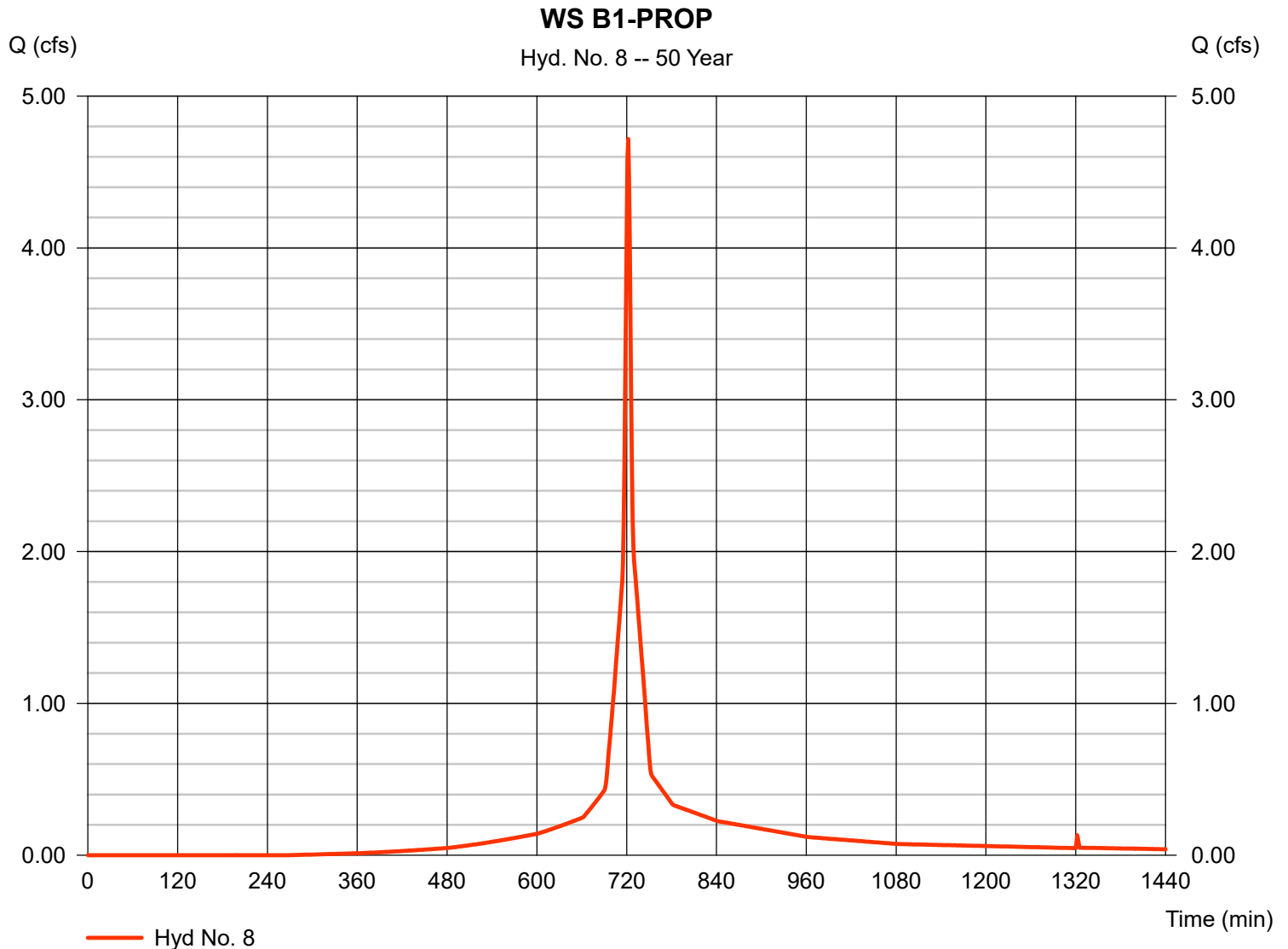
## Hyd. No. 8

WS B1-PROP

Hydrograph type = SCS Runoff  
 Storm frequency = 50 yrs  
 Time interval = 1 min  
 Drainage area = 0.700 ac  
 Basin Slope = 0.0 %  
 Tc method = TR55  
 Total precip. = 7.33 in  
 Storm duration = 24 hrs

Peak discharge = 4.718 cfs  
 Time to peak = 722 min  
 Hyd. volume = 13,265 cuft  
 Curve number = 85\*  
 Hydraulic length = 0 ft  
 Time of conc. (Tc) = 3.10 min  
 Distribution = Type III  
 Shape factor = 484

\* Composite (Area/CN) =  $[(0.130 \times 70) + (0.570 \times 89)] / 0.700$



# Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.1

Friday, Aug 11, 2023

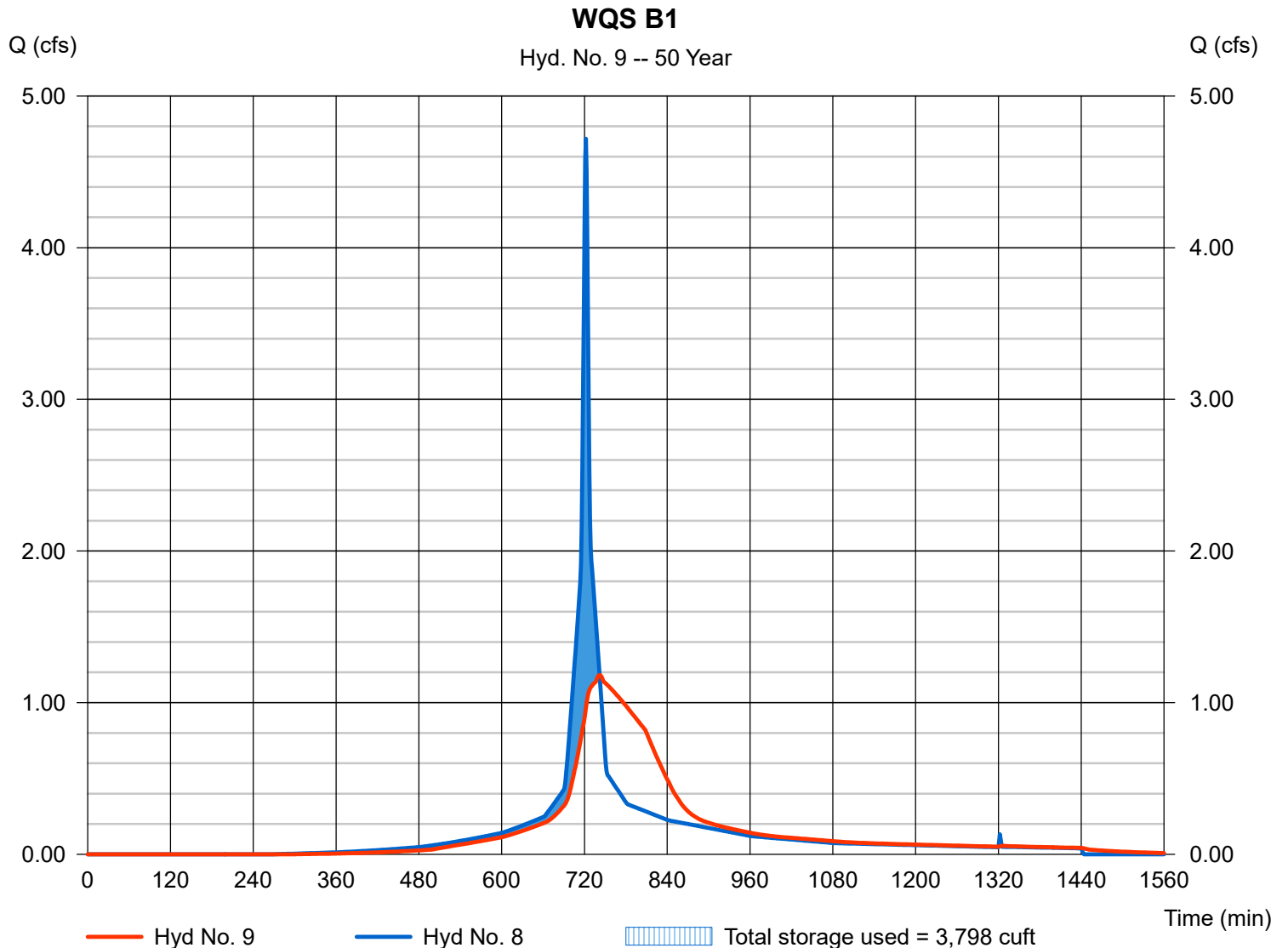
## Hyd. No. 9

WQS B1

Hydrograph type = Reservoir  
 Storm frequency = 50 yrs  
 Time interval = 1 min  
 Inflow hyd. No. = 8 - WS B1-PROP  
 Reservoir name = WQS B1

Peak discharge = 1.182 cfs  
 Time to peak = 742 min  
 Hyd. volume = 13,260 cuft  
 Max. Elevation = 152.72 ft  
 Max. Storage = 3,798 cuft

Storage Indication method used.



# Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.1

Friday, Aug 11, 2023

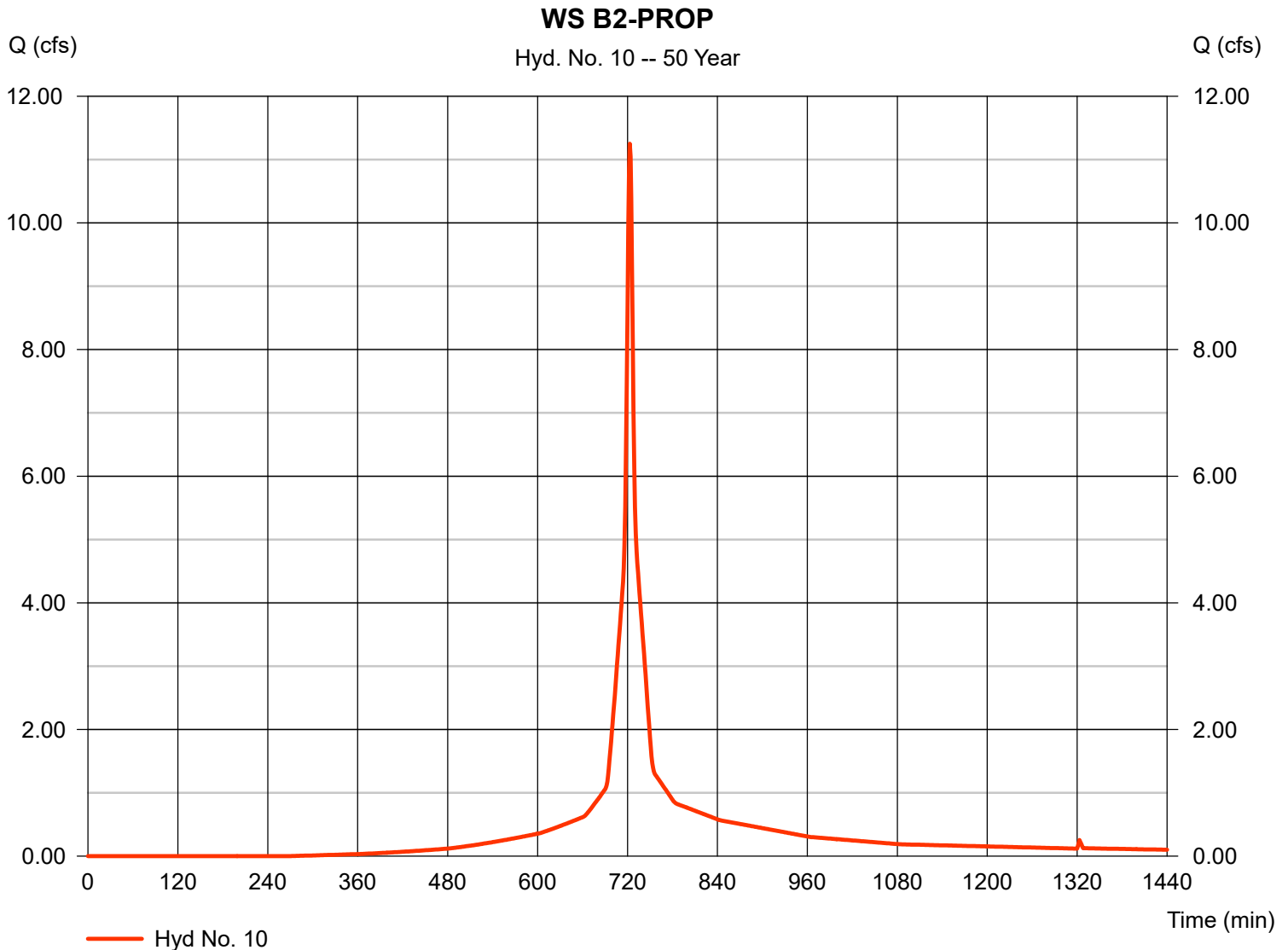
## Hyd. No. 10

WS B2-PROP

Hydrograph type = SCS Runoff  
 Storm frequency = 50 yrs  
 Time interval = 1 min  
 Drainage area = 1.660 ac  
 Basin Slope = 0.0 %  
 Tc method = TR55  
 Total precip. = 7.33 in  
 Storm duration = 24 hrs

Peak discharge = 11.25 cfs  
 Time to peak = 723 min  
 Hyd. volume = 33,555 cuft  
 Curve number = 85\*  
 Hydraulic length = 0 ft  
 Time of conc. (Tc) = 4.90 min  
 Distribution = Type III  
 Shape factor = 484

\* Composite (Area/CN) =  $[(0.340 \times 70) + (1.320 \times 89)] / 1.660$





# Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.1

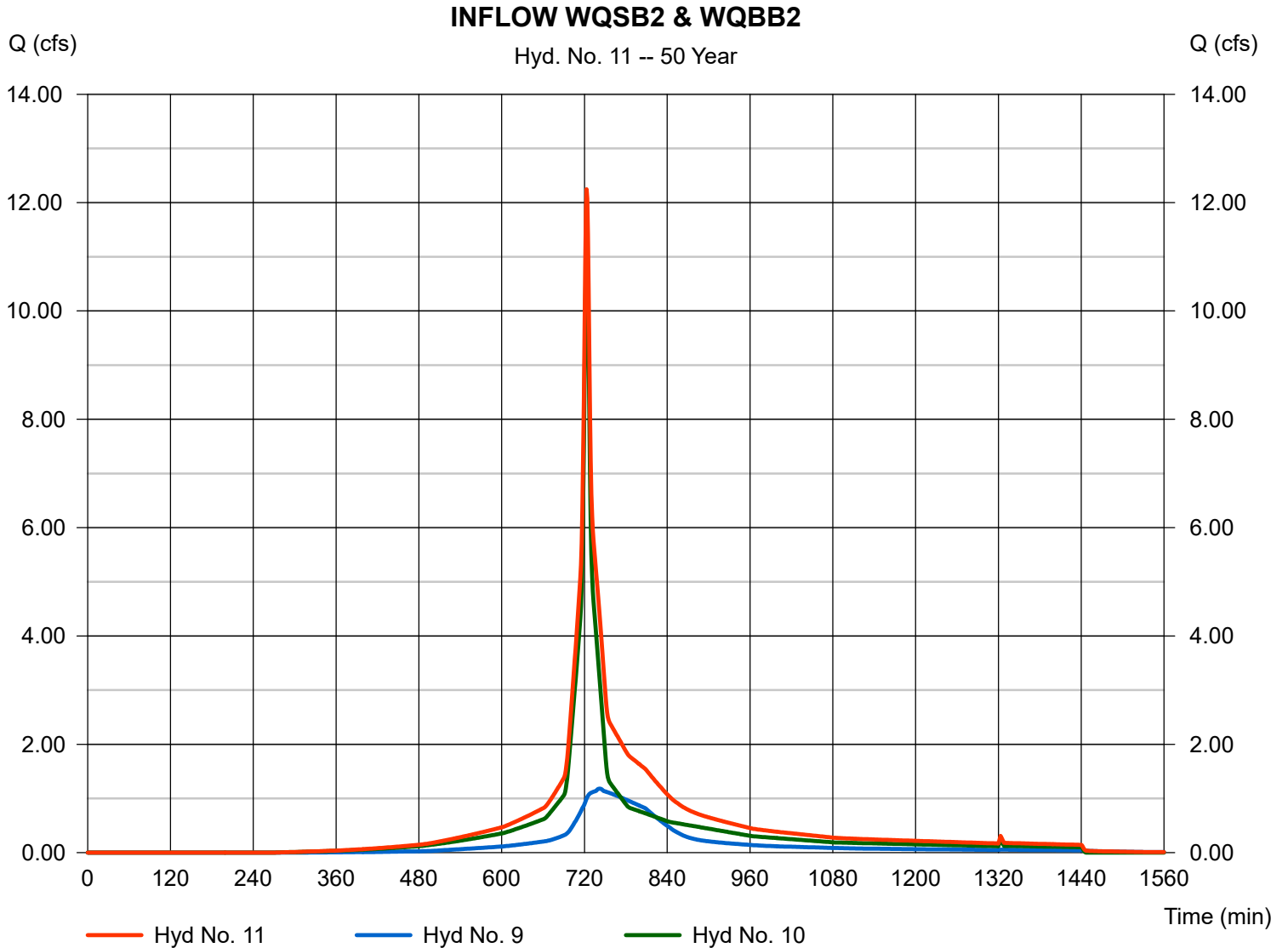
Friday, Aug 11, 2023

## Hyd. No. 11

INFLOW WQSB2 & WQBB2

Hydrograph type = Combine  
 Storm frequency = 50 yrs  
 Time interval = 1 min  
 Inflow hyds. = 9, 10

Peak discharge = 12.25 cfs  
 Time to peak = 723 min  
 Hyd. volume = 46,816 cuft  
 Contrib. drain. area = 1.660 ac



# Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.1

Friday, Aug 11, 2023

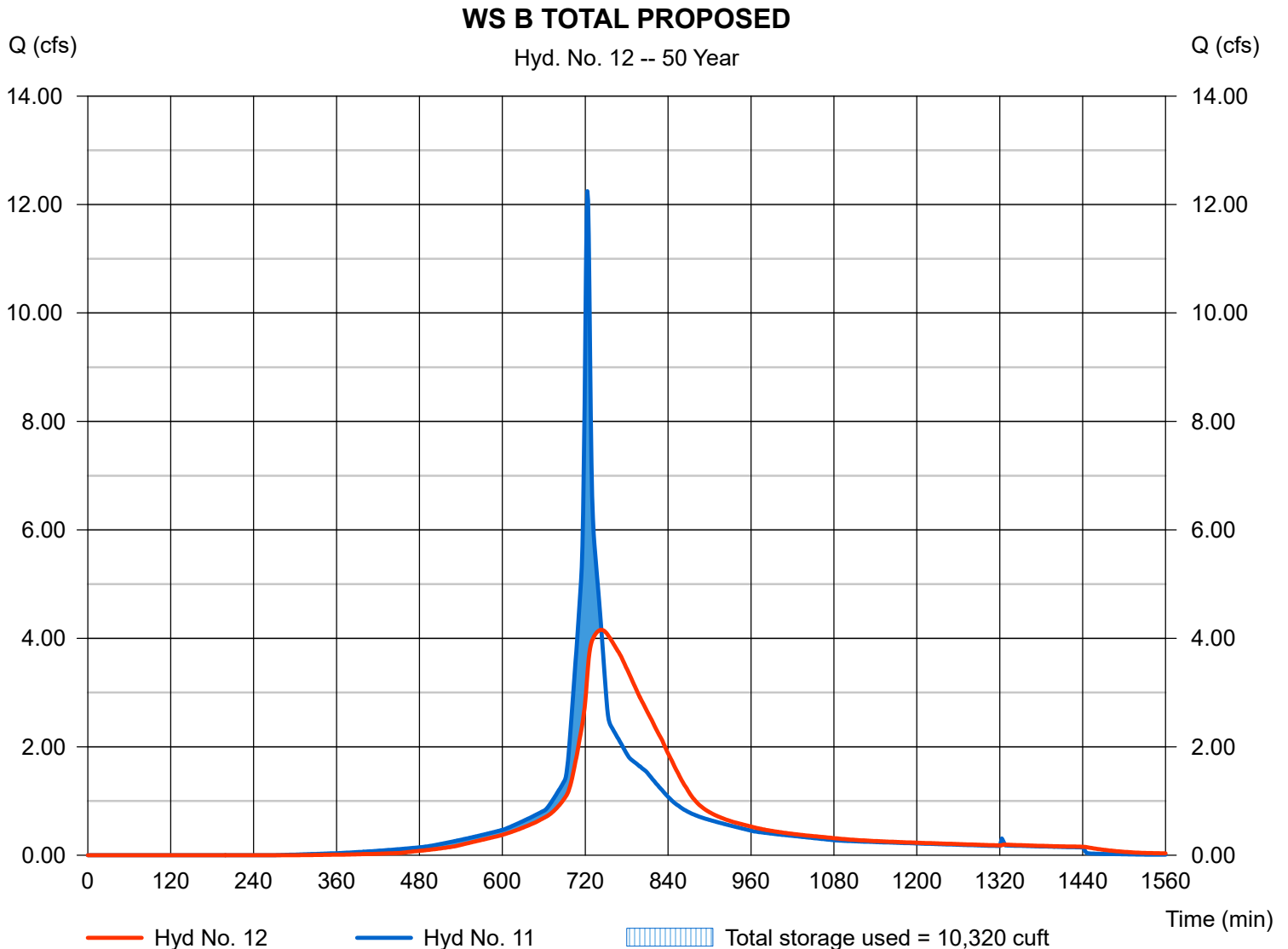
## Hyd. No. 12

### WS B TOTAL PROPOSED

Hydrograph type = Reservoir  
Storm frequency = 50 yrs  
Time interval = 1 min  
Inflow hyd. No. = 11 - INFLOW WQSB2 & WQBB2  
Reservoir name = WQB B2 &WQS B2

Peak discharge = 4.156 cfs  
Time to peak = 743 min  
Hyd. volume = 46,807 cuft  
Max. Elevation = 151.39 ft  
Max. Storage = 10,320 cuft

Storage Indication method used.



# Hydrograph Summary Report

Hydraflow Hydrographs by Intelisolve v9.1

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	37.66	1	725	116,950	---	-----	-----	WS A-EXIST	
2	SCS Runoff	14.57	1	725	45,086	---	-----	-----	WS B-EXIST	
3	SCS Runoff	38.14	1	725	127,614	---	-----	-----	WS A1-PROP	
4	Reservoir	13.58	1	742	127,600	3	140.03	40,244	WQB A1	
5	SCS Runoff	2.193	1	722	5,997	---	-----	-----	WS A2-PROP	
6	Combine	14.18	1	741	133,597	4, 5	-----	-----	INFLOW WQB A2	
7	Reservoir	7.922	1	768	133,589	6	138.01	26,869	WS A TOTAL PROPOSED	
8	SCS Runoff	5.487	1	722	15,561	---	-----	-----	WS B1-PROP	
9	Reservoir	1.845	1	735	15,555	8	152.85	4,215	WQS B1	
10	SCS Runoff	13.09	1	723	39,361	---	-----	-----	WS B2-PROP	
11	Combine	14.16	1	723	54,916	9, 10	-----	-----	INFLOW WQSB2 & WQBB2	
12	Reservoir	4.988	1	743	54,908	11	151.78	12,594	WS B TOTAL PROPOSED	
Macro Model 2023-08-01.gpw					Return Period: 100 Year			Friday, Aug 11, 2023		

# Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.1

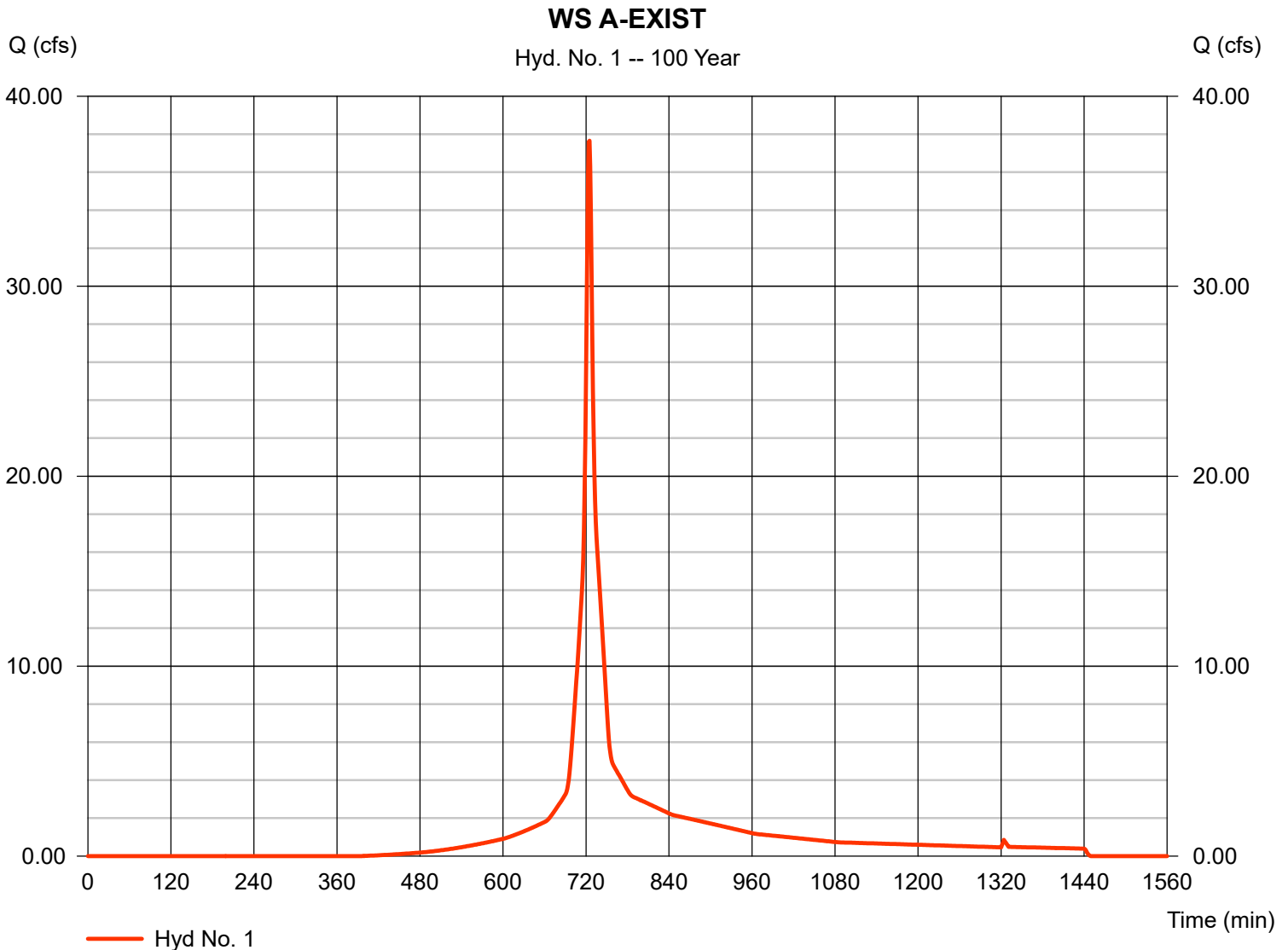
Friday, Aug 11, 2023

## Hyd. No. 1

WS A-EXIST

Hydrograph type	= SCS Runoff	Peak discharge	= 37.66 cfs
Storm frequency	= 100 yrs	Time to peak	= 725 min
Time interval	= 1 min	Hyd. volume	= 116,950 cuft
Drainage area	= 5.850 ac	Curve number	= 75*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 6.10 min
Total precip.	= 8.33 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

\* Composite (Area/CN) = [(4.230 x 70) + (1.590 x 89) + (0.030 x 70)] / 5.850



# Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.1

Friday, Aug 11, 2023

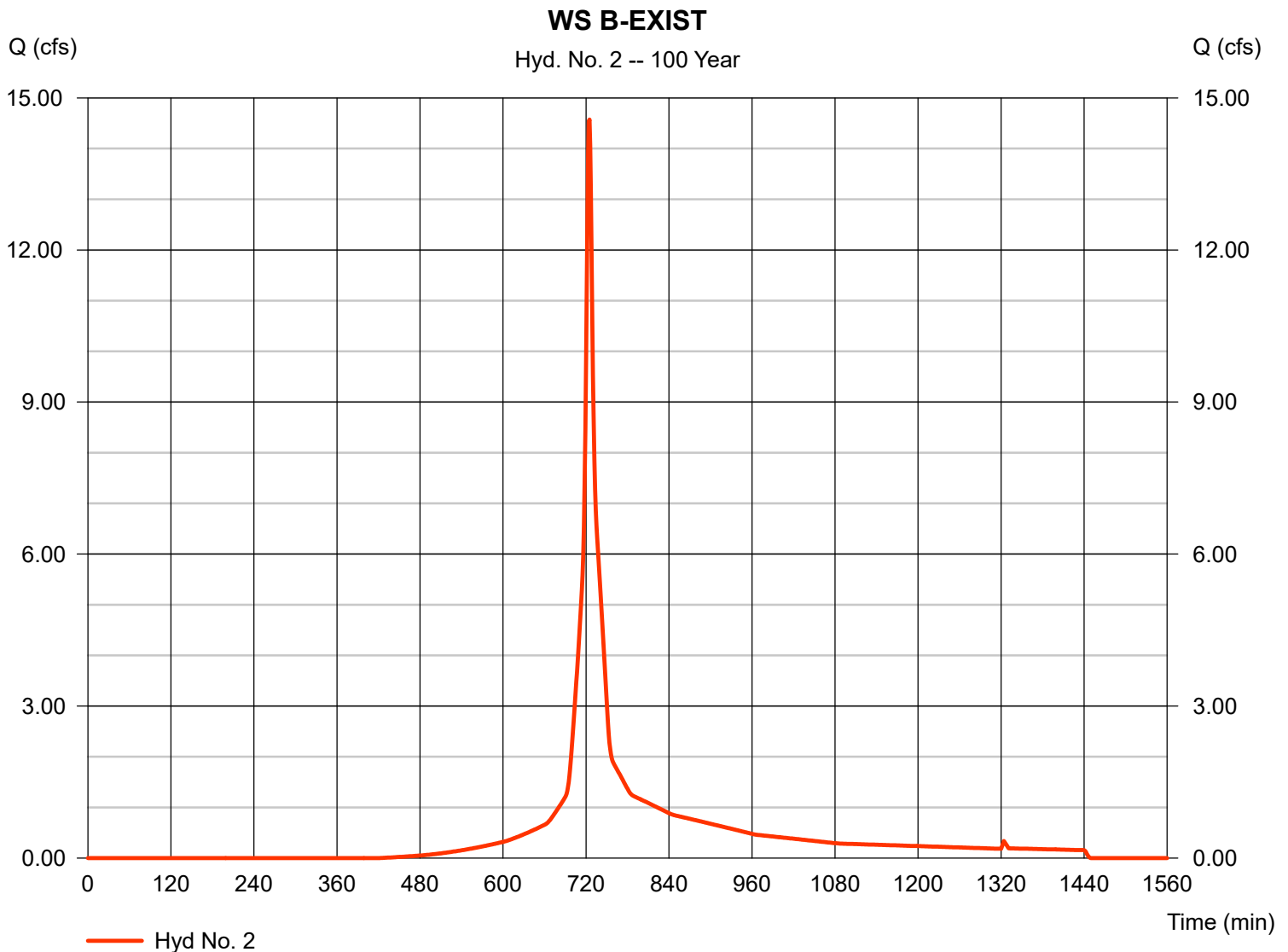
## Hyd. No. 2

WS B-EXIST

Hydrograph type = SCS Runoff  
 Storm frequency = 100 yrs  
 Time interval = 1 min  
 Drainage area = 2.360 ac  
 Basin Slope = 0.0 %  
 Tc method = TR55  
 Total precip. = 8.33 in  
 Storm duration = 24 hrs

Peak discharge = 14.57 cfs  
 Time to peak = 725 min  
 Hyd. volume = 45,086 cuft  
 Curve number = 73\*  
 Hydraulic length = 0 ft  
 Time of conc. (Tc) = 5.90 min  
 Distribution = Type III  
 Shape factor = 484

\* Composite (Area/CN) = [(2.040 x 70) + (0.320 x 89)] / 2.360



# Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.1

Friday, Aug 11, 2023

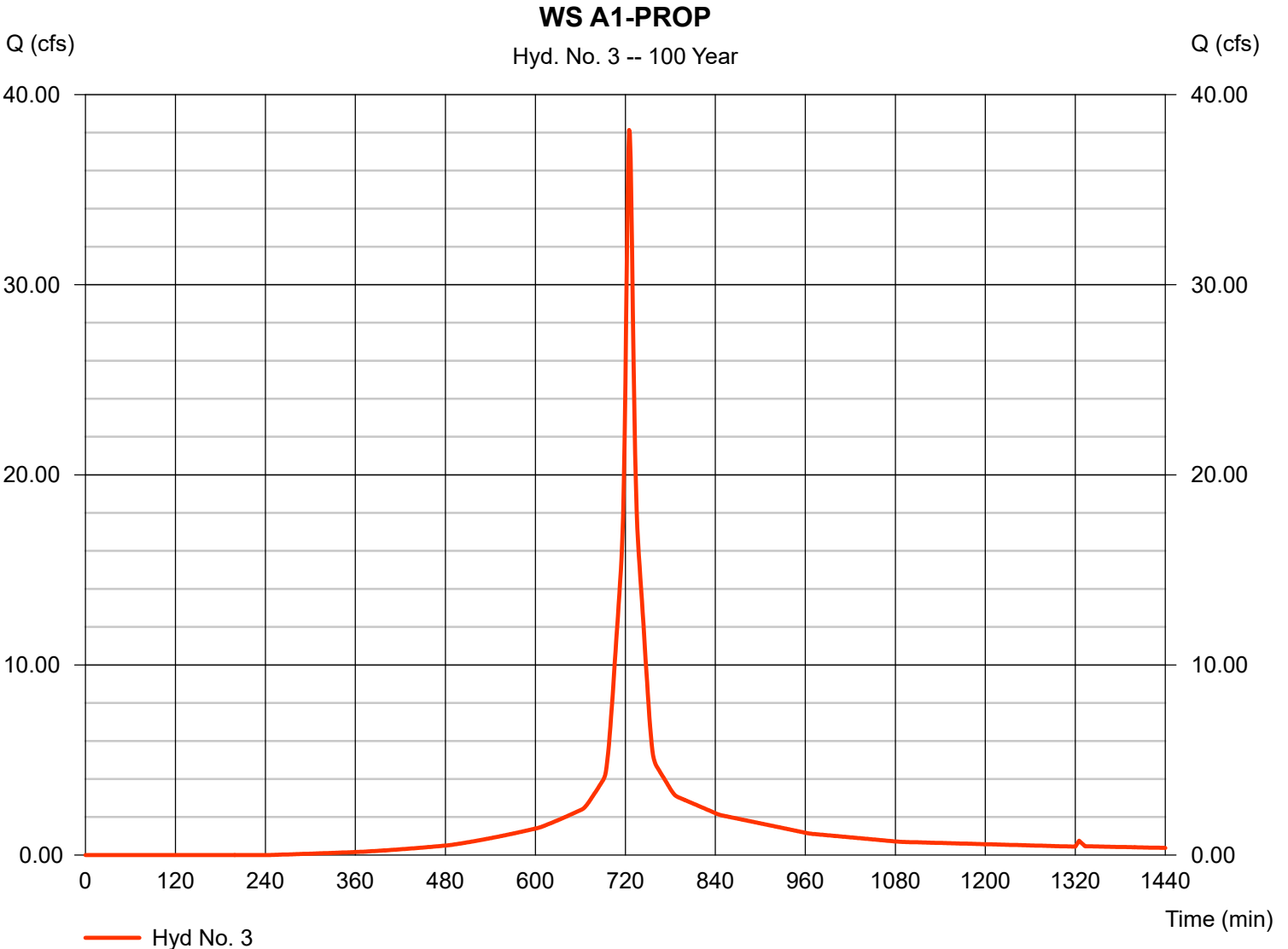
## Hyd. No. 3

WS A1-PROP

Hydrograph type = SCS Runoff  
Storm frequency = 100 yrs  
Time interval = 1 min  
Drainage area = 5.520 ac  
Basin Slope = 0.0 %  
Tc method = TR55  
Total precip. = 8.33 in  
Storm duration = 24 hrs

Peak discharge = 38.14 cfs  
Time to peak = 725 min  
Hyd. volume = 127,614 cuft  
Curve number = 85\*  
Hydraulic length = 0 ft  
Time of conc. (Tc) = 7.60 min  
Distribution = Type III  
Shape factor = 484

\* Composite (Area/CN) =  $[(1.070 \times 70) + (4.450 \times 89)] / 5.520$



# Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.1

Friday, Aug 11, 2023

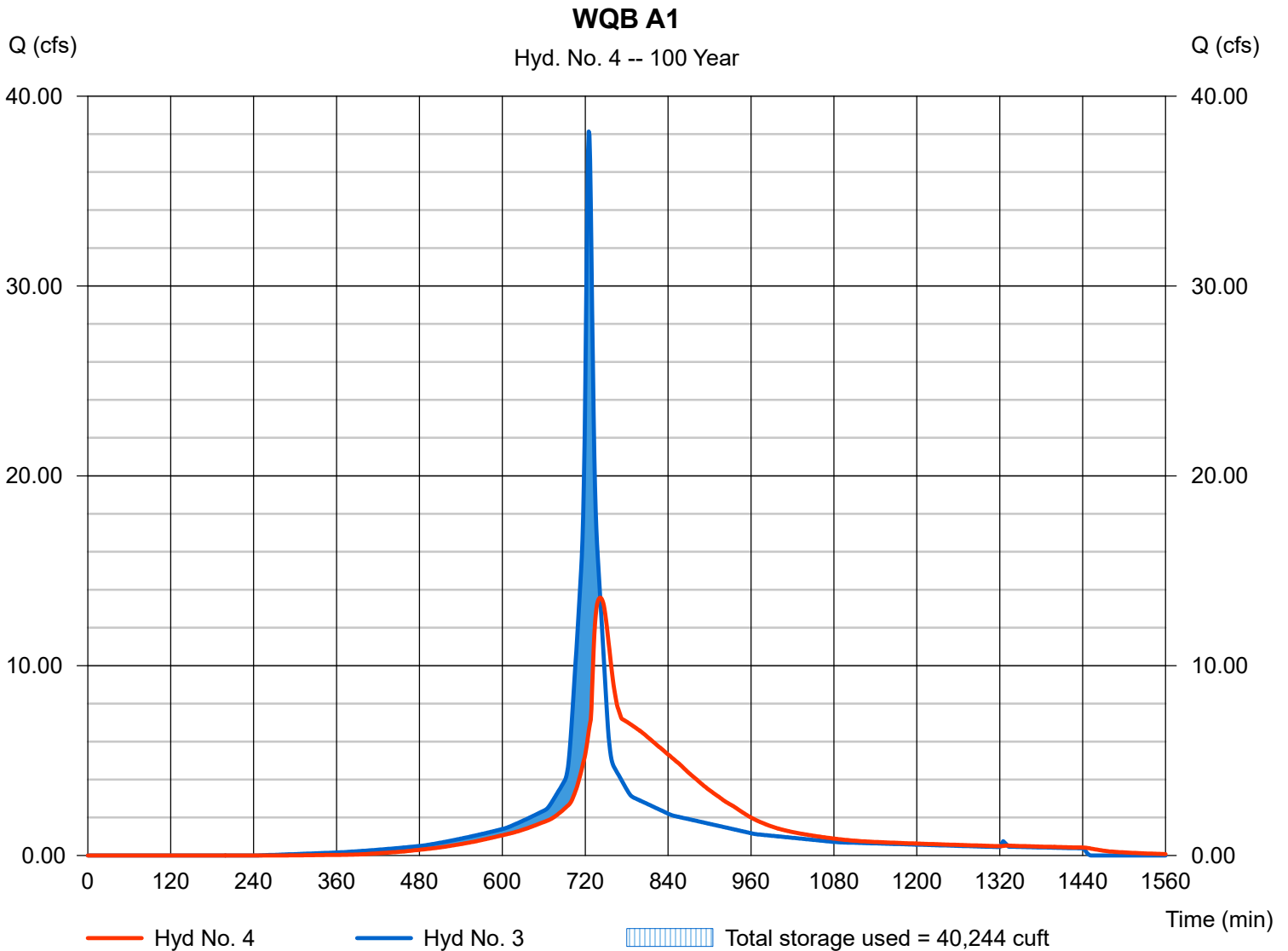
## Hyd. No. 4

WQB A1

Hydrograph type = Reservoir  
 Storm frequency = 100 yrs  
 Time interval = 1 min  
 Inflow hyd. No. = 3 - WS A1-PROP  
 Reservoir name = WQB A1

Peak discharge = 13.58 cfs  
 Time to peak = 742 min  
 Hyd. volume = 127,600 cuft  
 Max. Elevation = 140.03 ft  
 Max. Storage = 40,244 cuft

Storage Indication method used.



# Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.1

Friday, Aug 11, 2023

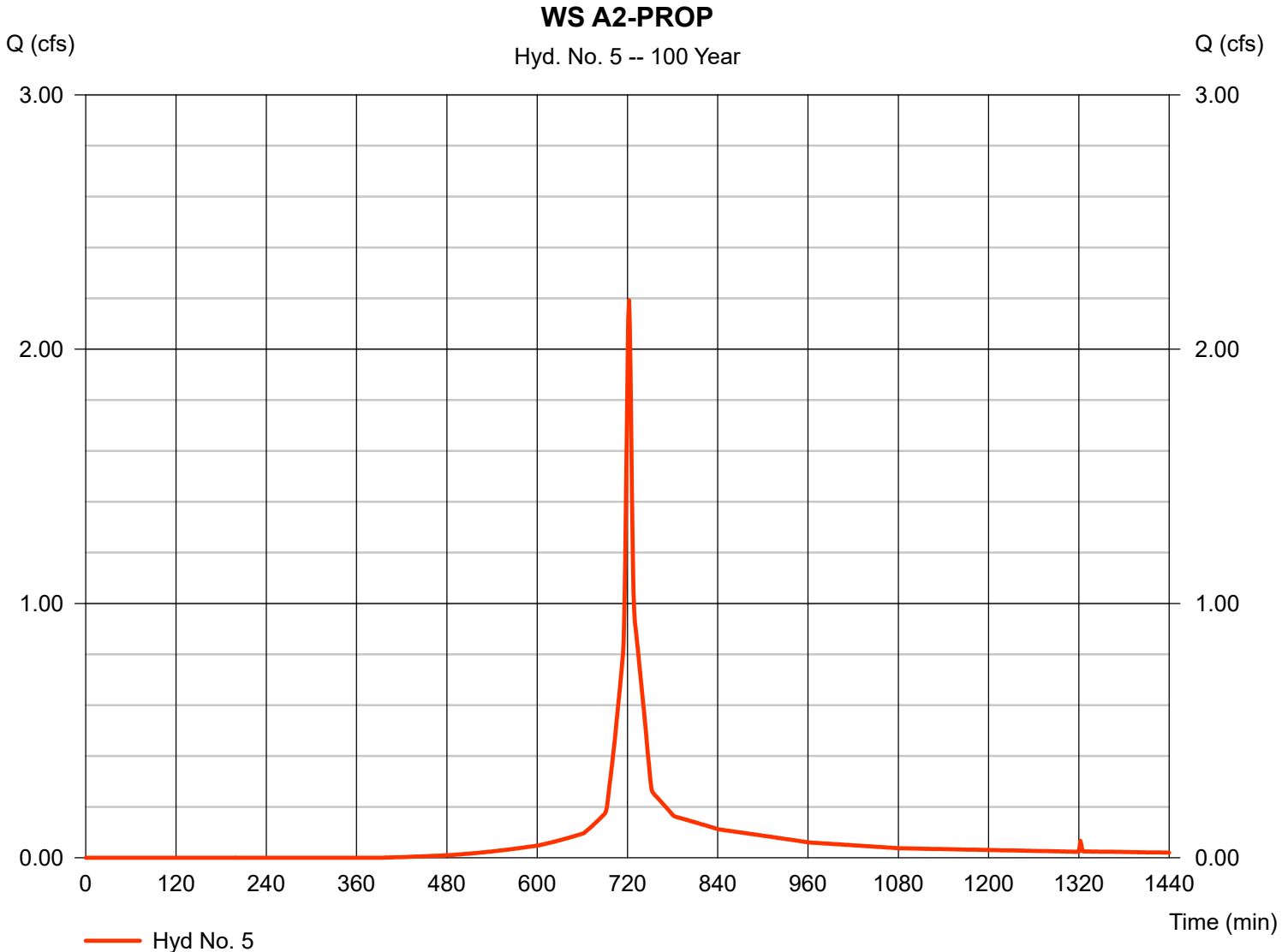
## Hyd. No. 5

WS A2-PROP

Hydrograph type = SCS Runoff  
Storm frequency = 100 yrs  
Time interval = 1 min  
Drainage area = 0.330 ac  
Basin Slope = 0.0 %  
Tc method = TR55  
Total precip. = 8.33 in  
Storm duration = 24 hrs

Peak discharge = 2.193 cfs  
Time to peak = 722 min  
Hyd. volume = 5,997 cuft  
Curve number = 75\*  
Hydraulic length = 0 ft  
Time of conc. (Tc) = 3.10 min  
Distribution = Type III  
Shape factor = 484

\* Composite (Area/CN) =  $[(0.240 \times 70) + (0.090 \times 89)] / 0.330$





# Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.1

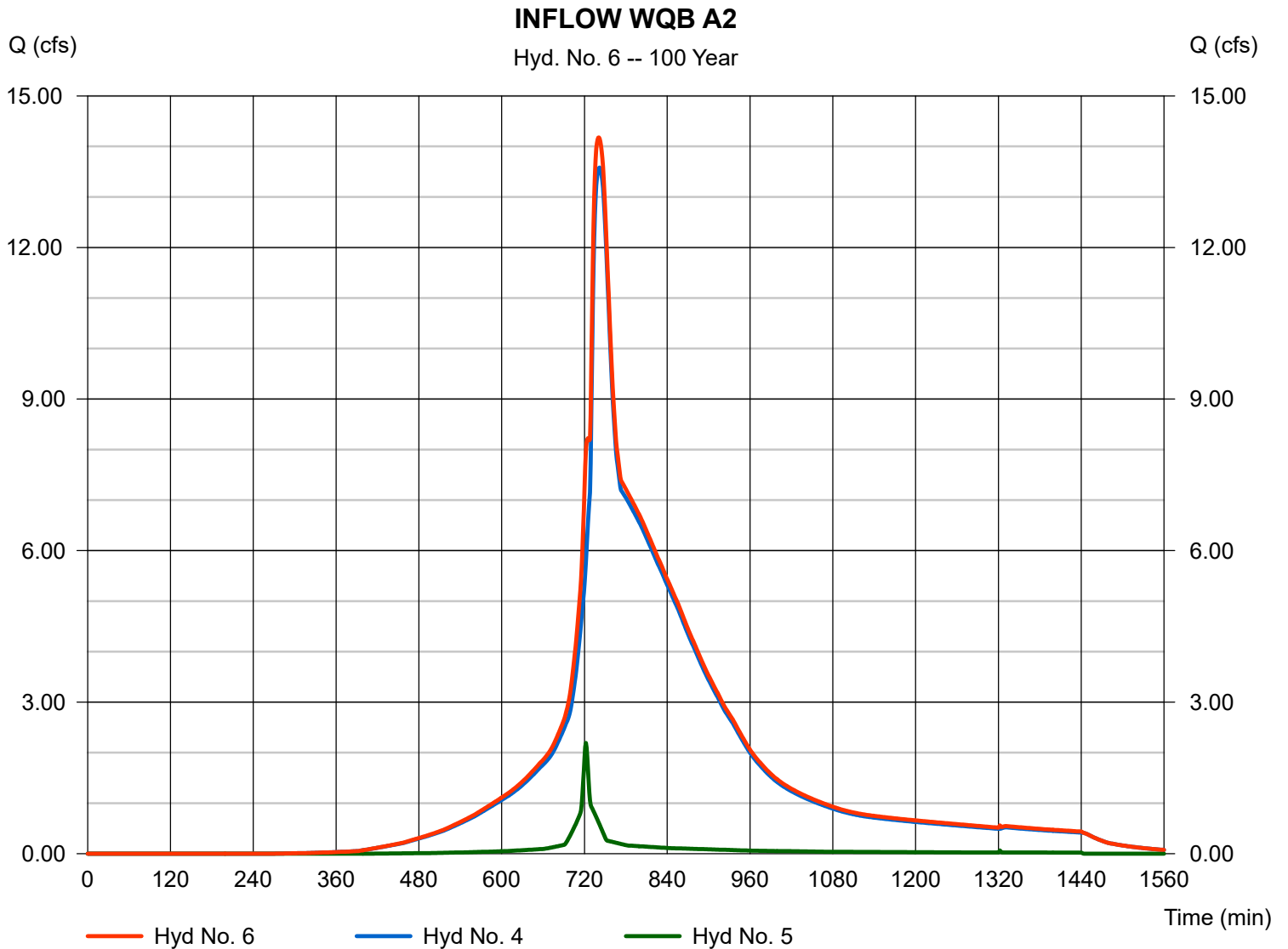
Friday, Aug 11, 2023

## Hyd. No. 6

INFLOW WQB A2

Hydrograph type = Combine  
Storm frequency = 100 yrs  
Time interval = 1 min  
Inflow hyds. = 4, 5

Peak discharge = 14.18 cfs  
Time to peak = 741 min  
Hyd. volume = 133,597 cuft  
Contrib. drain. area = 0.330 ac



# Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.1

Friday, Aug 11, 2023

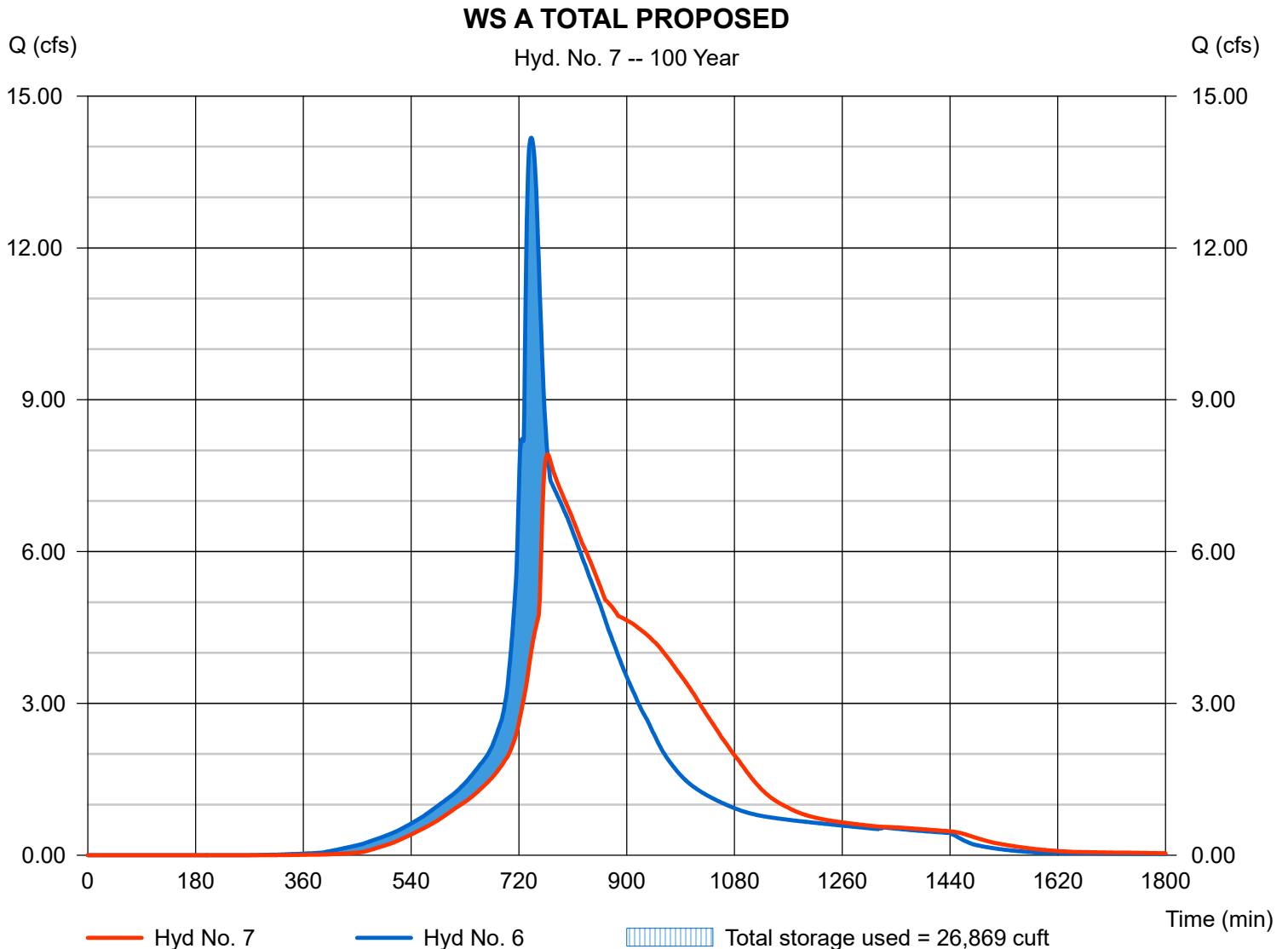
## Hyd. No. 7

### WS A TOTAL PROPOSED

Hydrograph type = Reservoir  
 Storm frequency = 100 yrs  
 Time interval = 1 min  
 Inflow hyd. No. = 6 - INFLOW WQB A2  
 Reservoir name = WQB A2

Peak discharge = 7.922 cfs  
 Time to peak = 768 min  
 Hyd. volume = 133,589 cuft  
 Max. Elevation = 138.01 ft  
 Max. Storage = 26,869 cuft

Storage Indication method used.



# Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.1

Friday, Aug 11, 2023

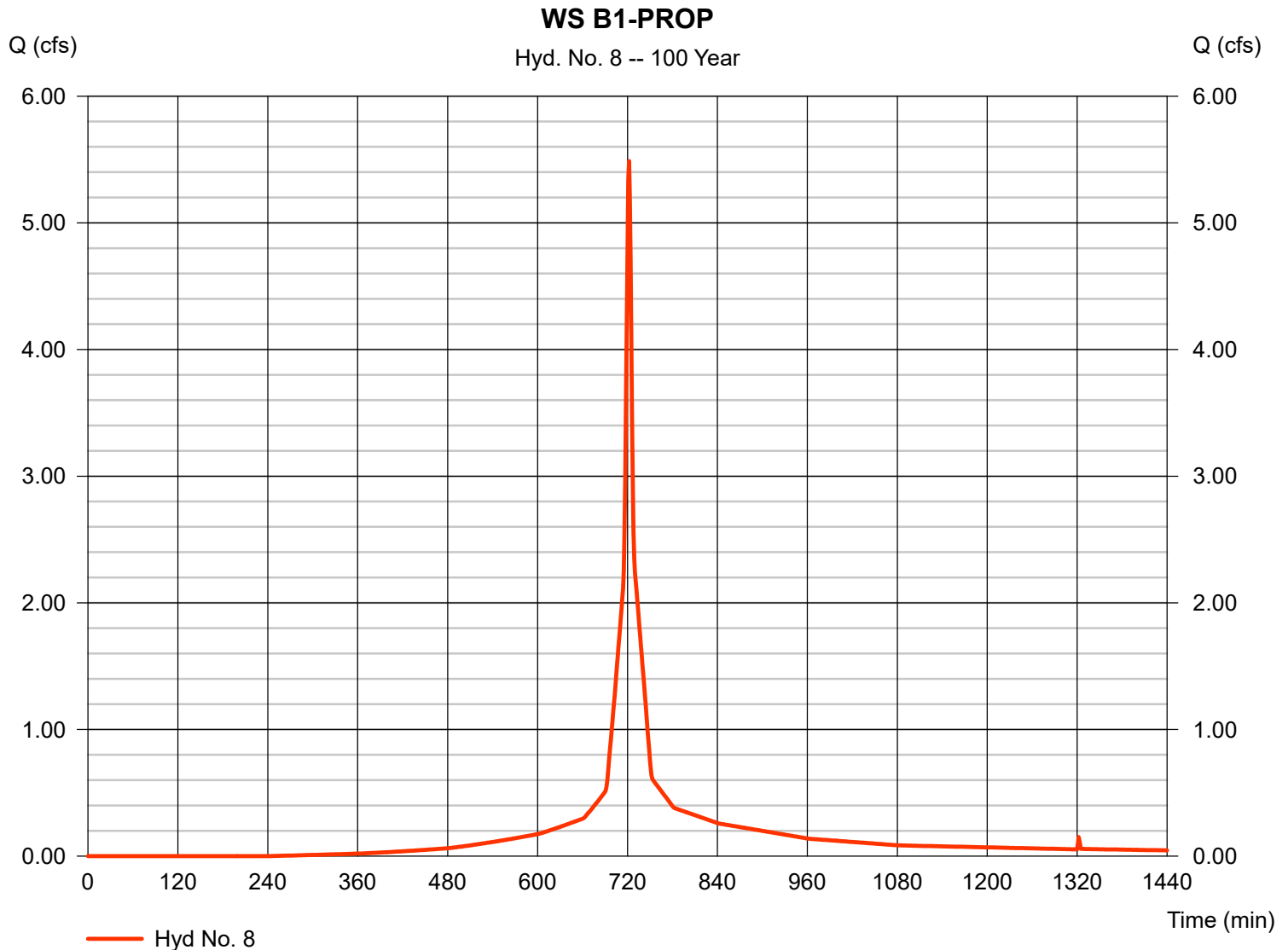
## Hyd. No. 8

WS B1-PROP

Hydrograph type = SCS Runoff  
 Storm frequency = 100 yrs  
 Time interval = 1 min  
 Drainage area = 0.700 ac  
 Basin Slope = 0.0 %  
 Tc method = TR55  
 Total precip. = 8.33 in  
 Storm duration = 24 hrs

Peak discharge = 5.487 cfs  
 Time to peak = 722 min  
 Hyd. volume = 15,561 cuft  
 Curve number = 85\*  
 Hydraulic length = 0 ft  
 Time of conc. (Tc) = 3.10 min  
 Distribution = Type III  
 Shape factor = 484

\* Composite (Area/CN) =  $[(0.130 \times 70) + (0.570 \times 89)] / 0.700$



# Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.1

Friday, Aug 11, 2023

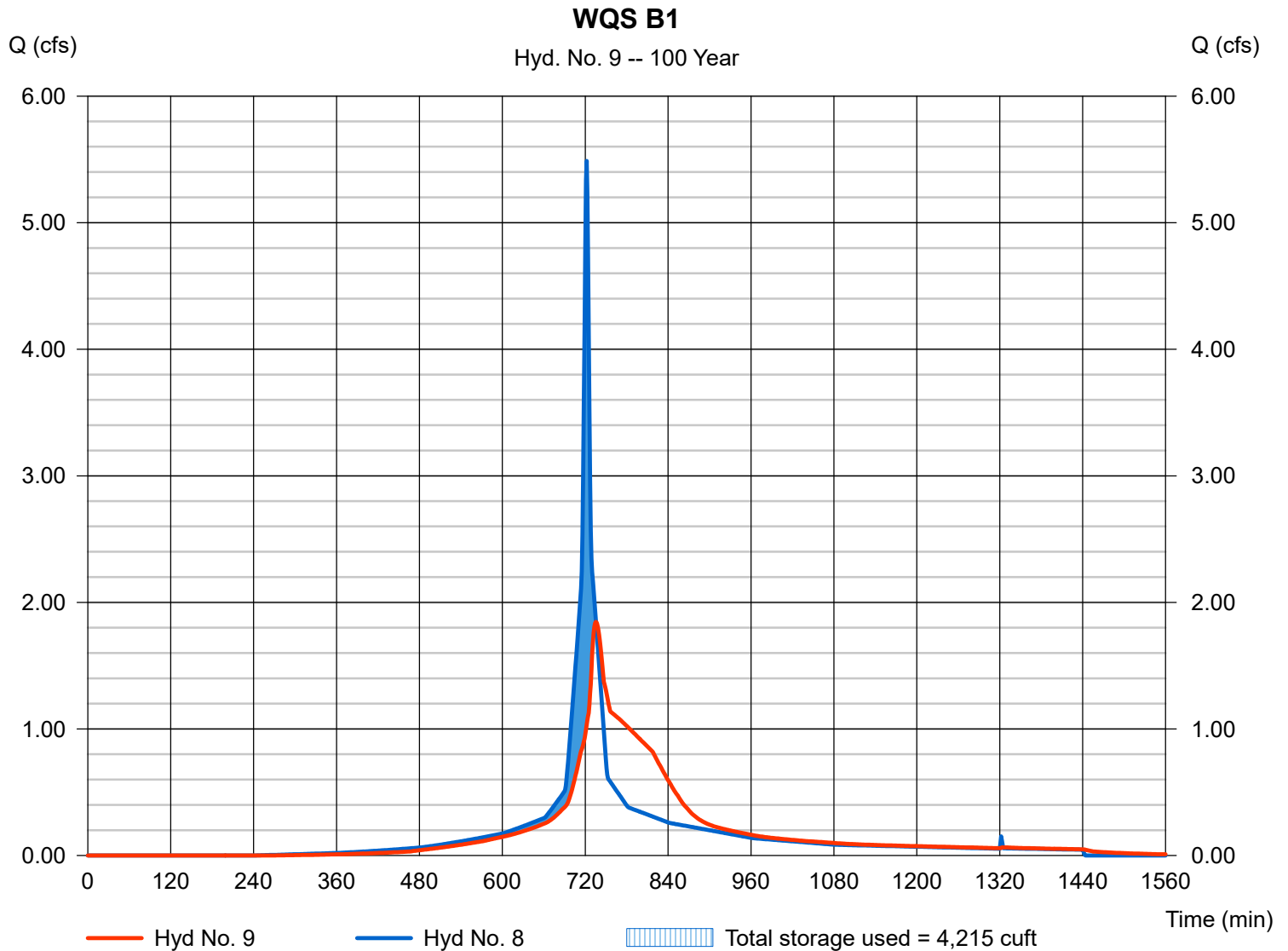
## Hyd. No. 9

WQS B1

Hydrograph type = Reservoir  
Storm frequency = 100 yrs  
Time interval = 1 min  
Inflow hyd. No. = 8 - WS B1-PROP  
Reservoir name = WQS B1

Peak discharge = 1.845 cfs  
Time to peak = 735 min  
Hyd. volume = 15,555 cuft  
Max. Elevation = 152.85 ft  
Max. Storage = 4,215 cuft

Storage Indication method used.



# Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.1

Friday, Aug 11, 2023

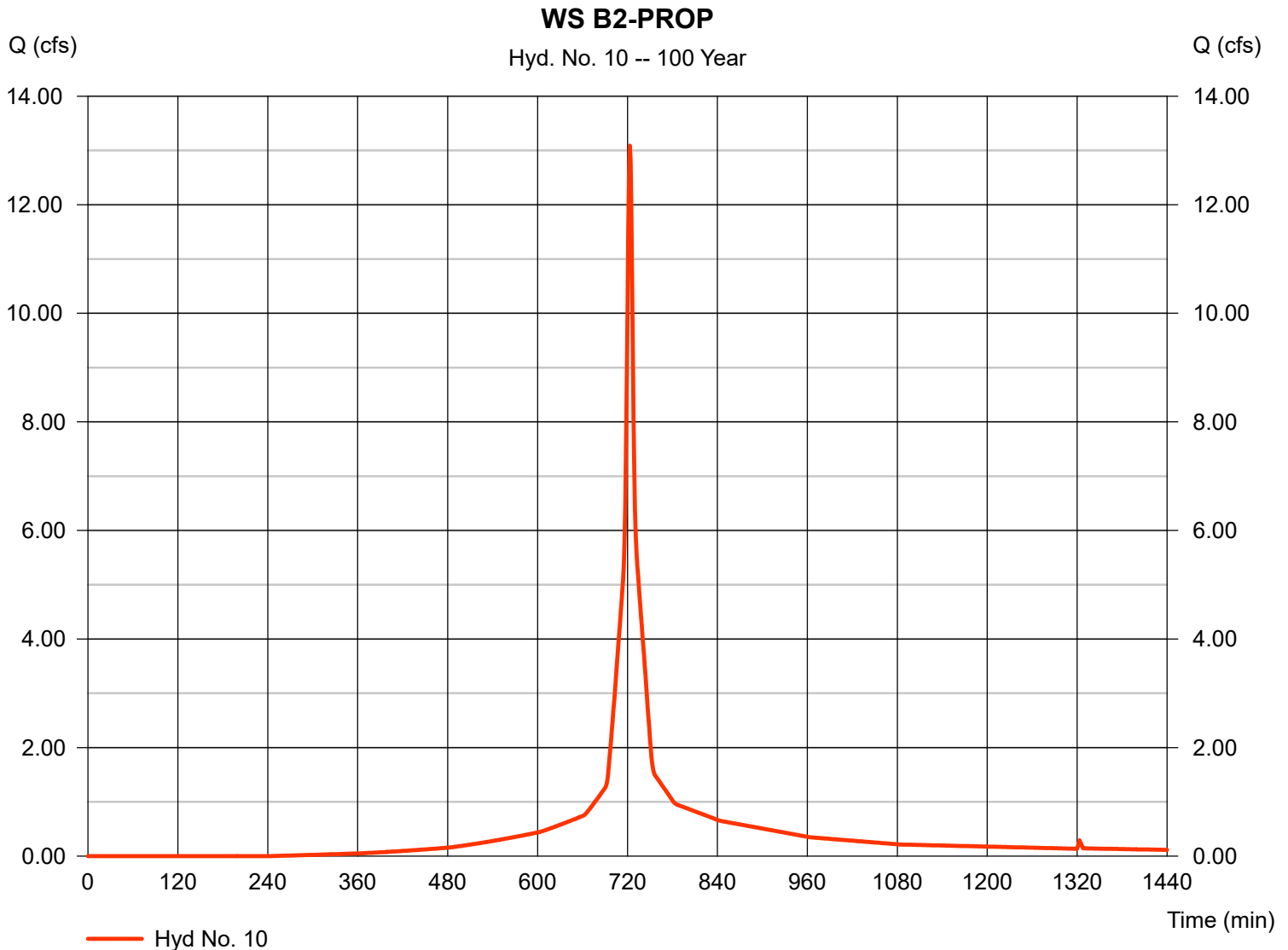
## Hyd. No. 10

WS B2-PROP

Hydrograph type = SCS Runoff  
 Storm frequency = 100 yrs  
 Time interval = 1 min  
 Drainage area = 1.660 ac  
 Basin Slope = 0.0 %  
 Tc method = TR55  
 Total precip. = 8.33 in  
 Storm duration = 24 hrs

Peak discharge = 13.09 cfs  
 Time to peak = 723 min  
 Hyd. volume = 39,361 cuft  
 Curve number = 85\*  
 Hydraulic length = 0 ft  
 Time of conc. (Tc) = 4.90 min  
 Distribution = Type III  
 Shape factor = 484

\* Composite (Area/CN) =  $[(0.340 \times 70) + (1.320 \times 89)] / 1.660$



# Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.1

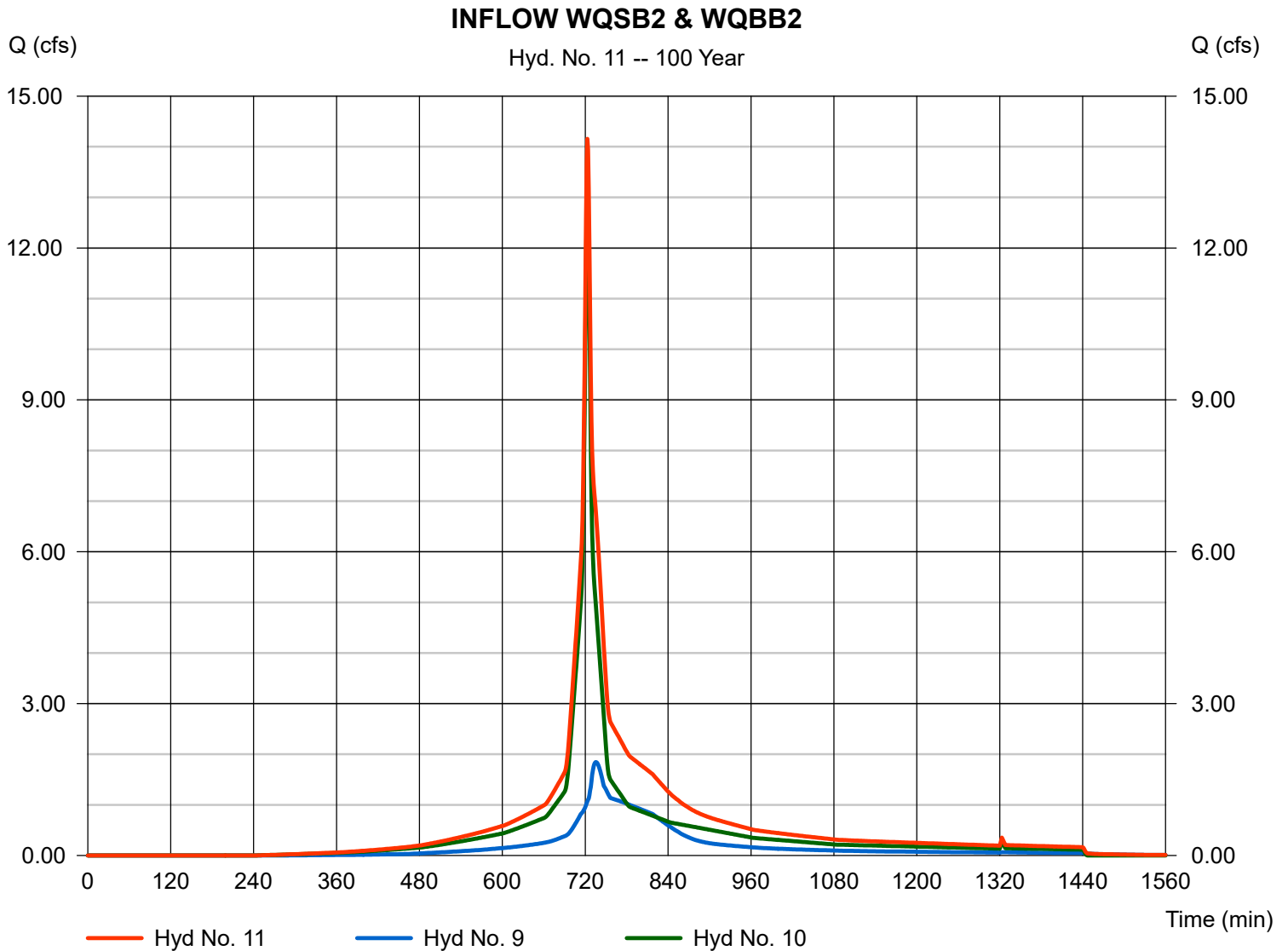
Friday, Aug 11, 2023

## Hyd. No. 11

INFLOW WQSB2 & WQBB2

Hydrograph type = Combine  
Storm frequency = 100 yrs  
Time interval = 1 min  
Inflow hyds. = 9, 10

Peak discharge = 14.16 cfs  
Time to peak = 723 min  
Hyd. volume = 54,916 cuft  
Contrib. drain. area = 1.660 ac



# Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.1

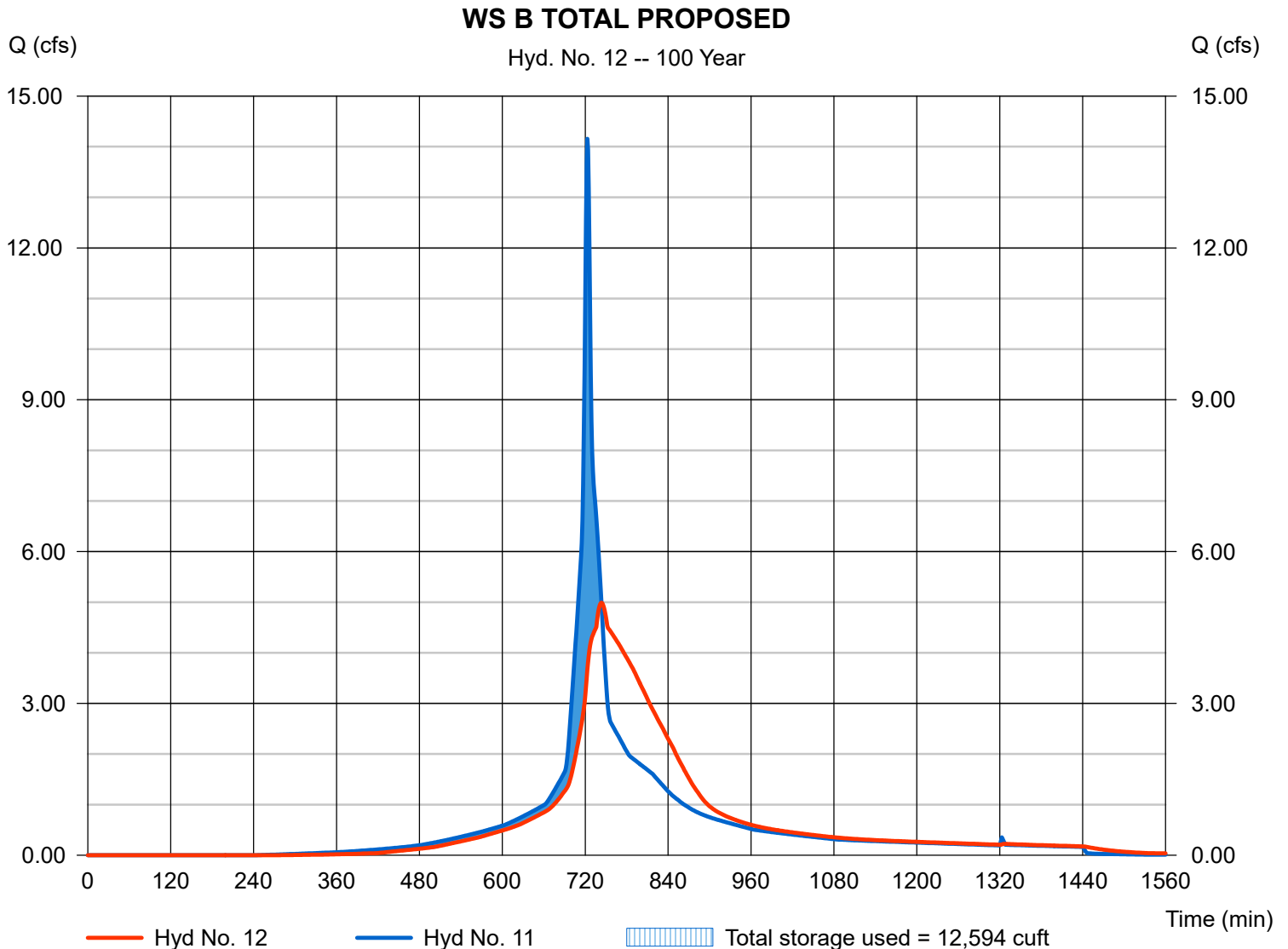
Friday, Aug 11, 2023

## Hyd. No. 12

### WS B TOTAL PROPOSED

Hydrograph type	= Reservoir	Peak discharge	= 4.988 cfs
Storm frequency	= 100 yrs	Time to peak	= 743 min
Time interval	= 1 min	Hyd. volume	= 54,908 cuft
Inflow hyd. No.	= 11 - INFLOW WQSB2 & WQBB2	Max. Elevation	= 151.78 ft
Reservoir name	= WQB B2 & WQS B2	Max. Storage	= 12,594 cuft

Storage Indication method used.







## Attachment 5

### Water Quality Volume Computations

# Water Quality Volume Size Calculations

AUGUST 10, 2023

## Minimum-Recommended Water Quality Volume (WQV)

Watershed	Total Area (Ac)	Impervious Area - I (Ac)	Impervious (%)	Runoff (R)	Min. Rec. WQV (ac-ft)	Min. Rec. WQV (Cu.Ft.)	Total Provided WQV (Cu.Ft.)
A1-PRO	5.52	4.45	80.6	0.7755	0.35675	15,540	
A2-PRO	0.33	0.09	27.3	0.2955	0.00813	354	
Total Area A	5.85	4.54	77.6	0.7485	0.36488	15,894	52,705
B1-PRO	0.70	0.57	80.8	0.7769	0.04545	1,980	
B2-PRO	1.66	1.32	79.5	0.7657	0.10592	4,614	
Total Area B	2.36	1.89	79.9	0.7690	0.15137	6,594	22,751

$$WQV = \frac{(1')(R)(A)}{12}$$

WQV = water quality volume (ac-ft)

R = volumetric runoff coefficient  
0.05+0.009(I)

I = percent impervious cover

**Provided Water Quality Volume  
Water Quality Basin/System**

Water Quality Basin/ Water Quality Swale	Elevation (Ft.)	Area (Sq. Ft.)	Avg. Area (Sq. Ft.)	Avg. Depth (FT)	Avg. Vol (Cu. Ft.)	Provided WQV (Cu. Ft.)
WQB A1	136.0	6,757				16,671
			8,336	2.00	16,671	
	138.0	9,914				
			11,627	2.00	23,253	
	140.0	13,339				
			14,514	1.00	14,514	
WQB A2	141.0	15,688				36,034
			5,797	2.00	11,593	
	136.0	6,662				
			7,643	2.00	15,285	
	138.0	8,623				
			9,156	1.00	9,156	
WQS B1*	139.0	9,688				9,432
			2,402	2.00	4,805	
	151.0	952				
			4,627	1.00	4,627	
	153.0	3,853				
			3,546	1.00	3,546	
WQS B2 & WQB B2	154.0	5,401				22,751
			4,544	1.00	4,544	
	149.0	3,060				
			5,821	1.00	5,821	
	150.0	4,031				
			8,841	1.00	8,841	