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November 13, 2020

Re: Proposed Church / Religious Institution  
North Bride Brook Road – Map 24 Lot 76  
East Lyme, CT 06333

### **DRAINAGE REPORT**

This project involves the construction of a 8,450 s.f. church / religious institution, installation of a paved driveway and parking area, construction of stormwater basins and implementation of other low impact development measures as shown and other associated improvements. The subject property was previously cultivated and used for growing crops. There is an existing gravel driveway along the existing overhead utilities. Approximately 12.2 acres of the 21+ acre site consists of wooded inland wetlands.

The topography generally slopes from east to west from the building and toward the proposed stormwater basins. The underlying soils within the watershed consist of Hinckley loamy sand, Sutton fine sandy loam, Canton & Charlton fine sandy loam, Paxton & Montauk fine sandy loams and Haven silt loam. The wetlands area within the watershed was assumed to be NRCS hydrologic soil group 'D' for design due to its saturated condition.

The proposed project includes several BMP and LID techniques and measures to mitigate impacts of stormwater runoff and reduce the pollutant content of stormwater discharge. The proposed methods include, but are not limited to: breaking up areas of impervious surfaces and avoiding or limiting concentrated point discharges, encouraging overland flow by using open swales and curbsless driveway and parking areas, inhibiting erosion by using pre-formed scour holes at pipe outfalls, minimizing the removal of existing trees and introducing new landscaping, maintaining existing topography and flow paths and promoting infiltration and groundwater recharge by utilizing stone aprons along the downgradient edges of the parking lot.

The NRCS TR-55 methodology was utilized to evaluate existing and proposed stormwater runoff conditions with the AutoCAD embedded HydraFlow Hydrographs computer program. All times of concentration were computed using the TR-55 methodology as recommended by the ConnDOT Drainage Manual. The Town of East Lyme recommends using the 24-hour NRCS Type III rainfall distribution up to the 100-year storm for designing the drainage system. All rainfall amounts used in this analysis were taken from the Hydrometeorological Design Studies Center of the National Oceanic and Atmospheric Administration (NOAA) National Weather Service and published in NOAA Atlas 14 Volume 10: Precipitation-Frequency Atlas of the United States, Northeastern States, last revised on September 30, 2015. Refer to the plan entitled "Drainage Area Maps" enclosed within this report for all watershed information.

Included with this report are HydraFlow supporting computations and hydrographs for the existing conditions and proposed conditions. Detailed summaries of the computational results for the 2, 5, 10, 25, 50 and 100-year storms are also included. The design points used were the eastern edge of the western wetlands and the upper catch basins within Woodrow Drive. For both design points, the results indicate that the peak rate of runoff will be significantly reduced for the 2 through 100-year storm events. The volume of runoff to the western wetlands will increase slightly for the 2 through 100-year storm events and the volume of runoff to the upper catch basins in Woodrow Drive will decrease slightly for the 2 through 100-year storm events. Cumulatively, the net peak rate of runoff and volume of runoff will be reduced overall for all storm events. Due to shallow groundwater on site, all excess stormwater volume cannot be feasibly infiltrated on site however we have included LID measures to offset and mitigate increased volumes such as promoting overland flow, use of grassed swales and pavement edge aprons, and minimizing use of curbing, pipe, and drainage structures. Also, the drainage computational model conservatively assumes that there will be no exfiltration from the stormwater management basins.

The stormwater management basins are proposed to capture, attenuate and enhance the runoff generated from the proposed site improvements. The outlet control structures for the major basin is 12" below the spillway. The outlet control structures will meter the rate of runoff to equal to or less than the existing conditions. Both basins will have 12 inches or more of freeboard (from the top of the berm) for the 100-year storm event. Refer to the attached summary tables for tabulated results for peak rates of runoff, volume, and water surface elevations for the pre- and post-development conditions.

In summary, the cumulative peak rates of runoff and runoff volumes for the post-development condition are equal to or less than the pre-development conditions. Additionally, several measures have been implemented to reduce runoff and enhance stormwater quality such as pavement edge aprons, grassed swales, catch basin sumps, pre-formed scour holes, stormwater management basins planted with herbaceous wetland plants, etc. Overall, the stormwater runoff condition and stormwater quality will be enhanced as a result of this project.

DESIGN POINT: EASTERN EDGE OF WESTERN WETLANDS

DESIGN POINT: UPPER CATCH BASINS IN WOODROW DR.

**PEAK RATE OF RUNOFF**

STORM	PEAK RATE OF RUNOFF (CFS)	
	EXISTING	PROPOSED
2-YEAR	8.2	4.9
5-YEAR	14.5	9.1
10-YEAR	20.3	13.1
25-YEAR	28.7	19.1
50-YEAR	35.3	24.2
100-YEAR	42.5	31.6

**PEAK RATE OF RUNOFF**

STORM	PEAK RATE OF RUNOFF (CFS)	
	EXISTING	PROPOSED
2-YEAR	3.4	1.0
5-YEAR	5.3	1.6
10-YEAR	7.0	2.2
25-YEAR	9.4	3.3
50-YEAR	11.2	4.6
100-YEAR	13.2	5.7

**VOLUME OF RUNOFF**

STORM	VOLUME OF RUNOFF (CF)	
	EXISTING	PROPOSED
2-YEAR	36,264	37,986
5-YEAR	59,912	63,409
10-YEAR	81,690	86,781
25-YEAR	113,844	121,268
50-YEAR	139,177	148,441
100-YEAR	167,351	178,671

**VOLUME OF RUNOFF**

STORM	VOLUME OF RUNOFF (CF)	
	EXISTING	PROPOSED
2-YEAR	11,580	6,503
5-YEAR	17,793	10,094
10-YEAR	23,315	13,296
25-YEAR	31,259	17,917
50-YEAR	37,400	21,496
100-YEAR	40,144	25,432

COMBINED RESULTS FROM AUTOCAD HYDRAFLOW

**PEAK RATE OF RUNOFF**

STORM	PEAK RATE OF RUNOFF (CFS)	
	EXISTING	PROPOSED
2-YEAR	11.3	5.8 (-5.5)
5-YEAR	19.2	10.7 (-8.5)
10-YEAR	26.4	15.2 (-11.2)
25-YEAR	36.9	22.2 (-14.7)
50-YEAR	45.0	28.6 (-16.4)
100-YEAR	53.9	35.9 (-18.0)

**VOLUME OF RUNOFF**

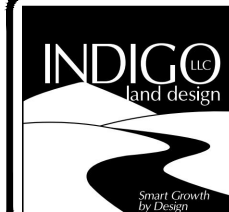
STORM	VOLUME OF RUNOFF (CF)	
	EXISTING	PROPOSED
2-YEAR	47,843	44,489 (-3,354)
5-YEAR	77,705	73,503 (-4,202)
10-YEAR	105,006	100,077 (-4,929)
25-YEAR	145,104	139,184 (-5,920)
50-YEAR	176,578	169,936 (-6,642)
100-YEAR	211,495	204,103 (-7,392)

#	DATE	DESCRIPTION	RG	BY
			GENERAL REVISIONS	
1	11/13/2020			

DATE: SEPT. 8, 2020	SCALE: N/A
DRAWN BY: RG	CHKD BY: JW
DWG. NO.: DS-1	SHEET NO.: 1 of 3

**DRAINAGE SUMMARY**

PREPARED FOR HARVEST CHRISTIAN  
FELLOWSHIP OF NIAN TIC, INC.  
N. BRIDE BROOK RD. -- MAP 24 LOT 76  
EAST LYME, CONNECTICUT



PLAN PREPARED BY:  
INDIGO LAND DESIGN, LLC  
JOSEPH WREN, P.E.  
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MAJOR DRAINAGE BASIN

WATER SURFACE ELEV. IN BASIN	
STORM	ELEVATION
2-YEAR	91.04
5-YEAR	91.28
10-YEAR	91.56
25-YEAR	92.08
50-YEAR	92.21
100-YEAR	92.31

BASIN GRADE ELEVATIONS:  
 BASIN TOP OF BERM ELEV. = 93.5  
 BASIN SPILLWAY/WEIR ELEV. = 93.0  
 BASIN BOTTOM ELEV. = 87.0

OUTLET CONTROL STRUCTURE ELEVATIONS:  
 TOP OF GRATE ELEV. = 92.00  
 4"x8" ORIFICE INV. ELEV. = 91.00  
 3/4" DIAMETER ORIFICE INV. ELEV. = 88.00  
 15" HDPE INV. ELEV. = 88.00

NOTE:

- FOR DESIGN, THE BOTTOM OF THE BASIN WAS ASSUMED TO BE EQUAL TO THE INVERT ELEVATION OF THE 3/4" DIAMETER ORIFICE (ELEV. 88.00).

MINOR DRAINAGE BASIN

WATER SURFACE ELEV. IN BASIN	
STORM	ELEVATION
2-YEAR	82.70
5-YEAR	83.00
10-YEAR	83.01
25-YEAR	83.05
50-YEAR	83.08
100-YEAR	83.10

BASIN GRADE ELEVATIONS:  
 BASIN TOP OF BERM ELEV. = 84.5  
 BASIN SPILLWAY/WEIR ELEV. = 84.0  
 BASIN BOTTOM ELEV. = 81.0

OUTLET CONTROL STRUCTURE ELEVATIONS:  
 TOP OF GRATE ELEV. = 83.00  
 3/4" DIAMETER ORIFICE INV. ELEV. = 82.00  
 15" HDPE INV. ELEV. = 78.70

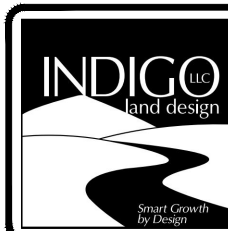
NOTE:

- FOR DESIGN, THE BOTTOM OF THE BASIN WAS ASSUMED TO BE EQUAL TO THE INVERT ELEVATION OF THE 3/4" DIAMETER ORIFICE (ELEV. 82.00).

1	11/13/2020	GENERAL REVISIONS	
		DESCRIPTION	RG BY
#	DATE		

DATE: SEPT. 8, 2020	SCALE: N/A
DRAWN BY: RG	CHKD BY: JW
DWG. NO.: DS-1	SHEET NO.: 2 of 3

<h3>DRAINAGE SUMMARY</h3> <p>PREPARED FOR HARVEST CHRISTIAN FELLOWSHIP OF NIAN TIC, INC. N. BRIDE BROOK RD. -- MAP 24 LOT 76 EAST LYME, CONNECTICUT</p>
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PLAN PREPARED BY:  
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 PHONE: (860) 388-9343  
 FAX: (860) 391-8854

REFERENCE: "SECTION 7.4.1: WATER QUALITY VOLUME (WQV)" OF  
 THE 2004 CONNECTICUT STORMWATER QUALITY MANUAL BY THE  
 CONNECTICUT DEPARTMENT OF ENVIRONMENTAL PROTECTION

FIRST INCH OF RAINFALL  
 $WQV = (1")(R)(A) / 12$   
 WHERE: R = 0.05 + 0.009 x % IMPERVIOUS  
 A = DRAINAGE AREA IN ACRES

WQV DATA FOR PROPOSED WATERSHED AREA "B"					
SUB-WATERSHED	AREA (AC.)	I (%)	R (IN.)	WQV (AC.-FT.)	WQV (CU. FT.)
B	2.07	40.9	0.4181	0.0721	3,141
WQV REQUIRED (MIN.) =					3,141
WQV PROVIDED (WITHIN BASIN FOREBAY) =					3,500±

NOTE: THE WQV PROVIDED WITHIN THE BASIN FOREBAY EXCEEDS THE MINIMUM WQV REQUIRED.

WQV DATA FOR PROPOSED WATERSHED AREA "C"					
SUB-WATERSHED	AREA (AC.)	I (%)	R (IN.)	WQV (AC.-FT.)	WQV (CU. FT.)
C	0.33	34.8	0.3632	0.0010	436
WQV REQUIRED (MIN.) =					436
WQV PROVIDED (WITHIN BASIN FOREBAY) =					500±

NOTE: THE WQV PROVIDED WITHIN THE BASIN FOREBAY EXCEEDS THE MINIMUM WQV REQUIRED.

#	DATE	DESCRIPTION	RG	BY
1	11/13/2020	GENERAL REVISIONS		

DATE: SEPT. 8, 2020	SCALE: N/A
DRAWN BY: RG	CHKD BY: JW
DWG. NO.: DS-1	SHEET NO.: 3 of 3

**DRAINAGE WQV**

PREPARED FOR HARVEST CHRISTIAN  
 FELLOWSHIP OF NIAN TIC, INC.  
 N. BRIDE BROOK RD. -- MAP 24 LOT 76  
 EAST LYME, CONNECTICUT



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PREPARED FOR HARVEST CHRISTIAN  
FELLOWSHIP OF NIAHTIC, INC.  
NORTH BRIDE BROOK ROAD  
MAP 24 LOT 76  
EAST LYME, CONNECTICUT

EXISTING DRAINAGE  
COMPUTATIONS  
9-9-2020

#	DATE	DESCRIPTION	BY
1	11/13/2020	GENERAL REVISIONS	RG

 <p>INDIGO<sup>LLC</sup> land design</p> <p><i>Smart Growth by Design</i></p>	PLAN PREPARED BY: INDIGO LAND DESIGN, LLC JOSEPH WREN, P.E. CT REG. NO. 21090 40 ELM STREET, 2ND FLOOR OLD SAYBROOK, CT 06475 PHONE: (860) 388-9343 FAX: (860) 391-8854
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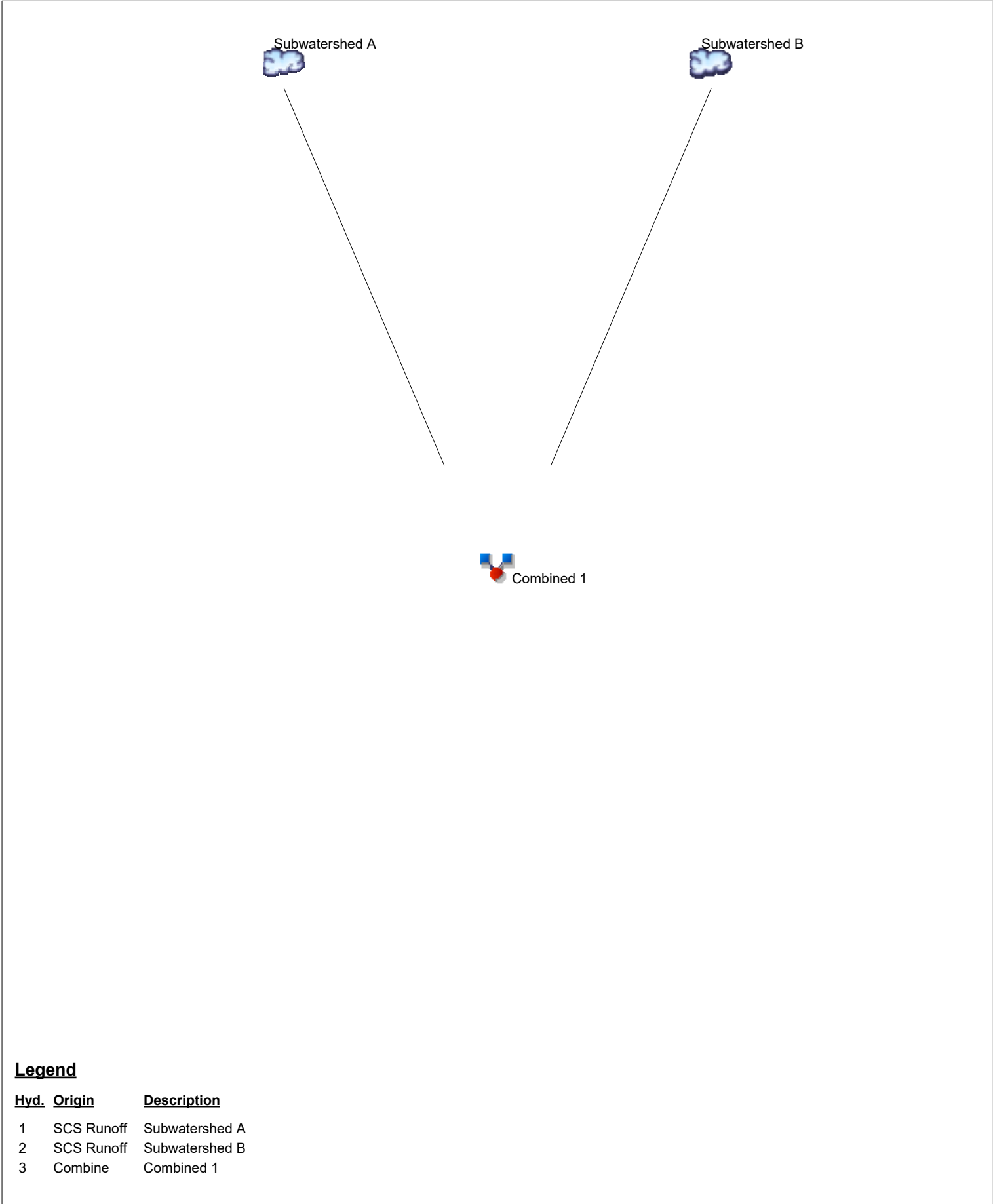
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# Watershed Model Schematic

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



**Legend**

<u>Hyd.</u>	<u>Origin</u>	<u>Description</u>
1	SCS Runoff	Subwatershed A
2	SCS Runoff	Subwatershed B
3	Combine	Combined 1

# Hydrograph Return Period Recap

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

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	-----	-----	8.248	-----	14.51	20.28	28.71	35.29	42.54	Subwatershed A
2	SCS Runoff	-----	-----	3.406	-----	5.328	7.010	9.391	11.20	13.17	Subwatershed B
3	Combine	1, 2	-----	11.25	-----	19.22	26.42	36.89	45.01	53.92	Combined 1

# Hydrograph Summary Report

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

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description	
1	SCS Runoff	8.248	3	732	36,264	----	----	----	Subwatershed A	
2	SCS Runoff	3.406	3	726	11,580	----	----	----	Subwatershed B	
3	Combine	11.25	3	729	47,843	1, 2	----	----	Combined 1	
Existing (REV1 FINAL 11-13-2020).gpw					Return Period: 2 Year			Friday, 11 / 13 / 2020		

# Hydrograph Report

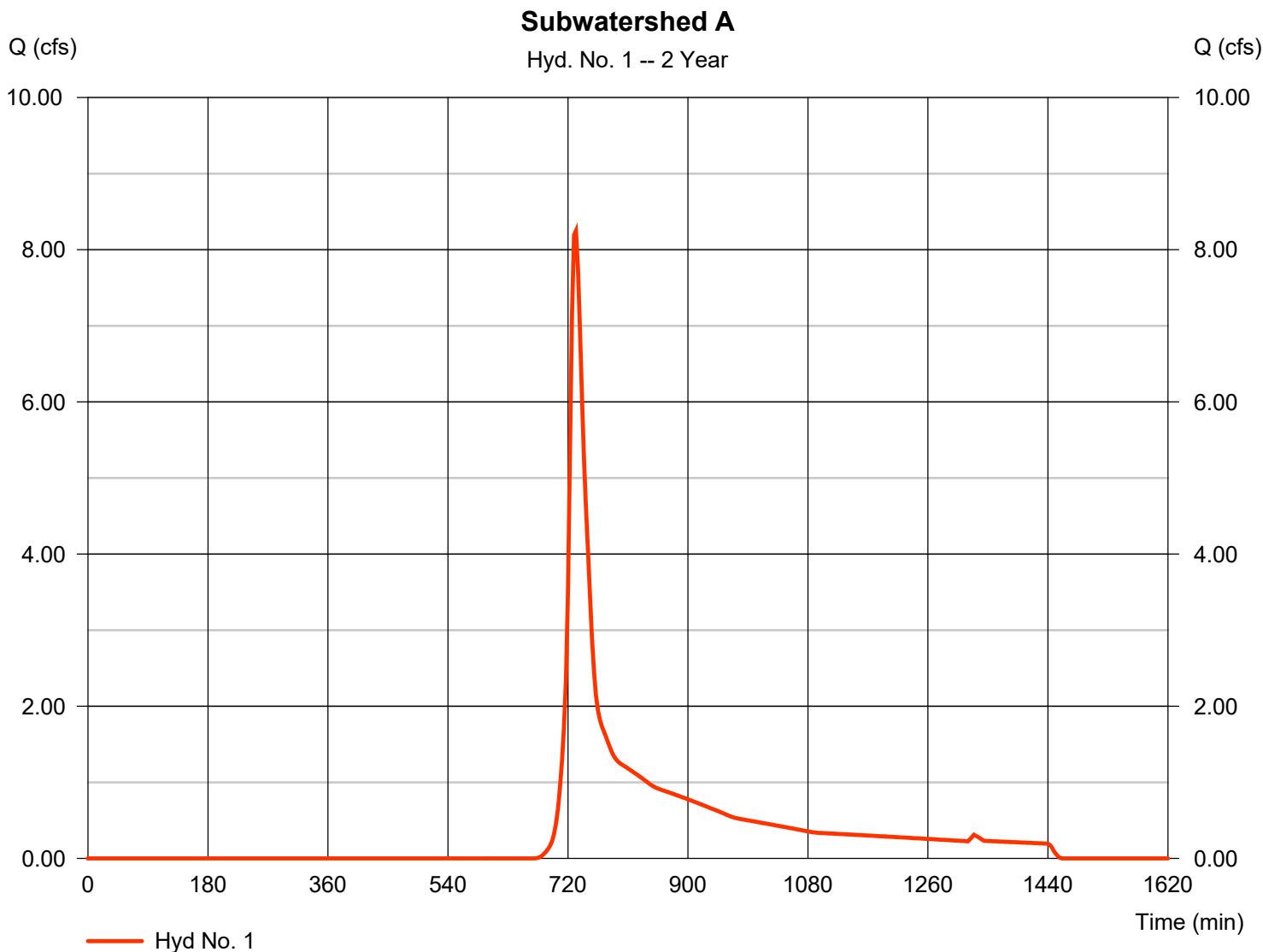
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

Friday, 11 / 13 / 2020

## Hyd. No. 1

Subwatershed A

Hydrograph type	= SCS Runoff	Peak discharge	= 8.248 cfs
Storm frequency	= 2 yrs	Time to peak	= 732 min
Time interval	= 3 min	Hyd. volume	= 36,264 cuft
Drainage area	= 10.810 ac	Curve number	= 69
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 9.90 min
Total precip.	= 3.45 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



# TR55 Tc Worksheet

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

## Hyd. No. 1

Subwatershed A

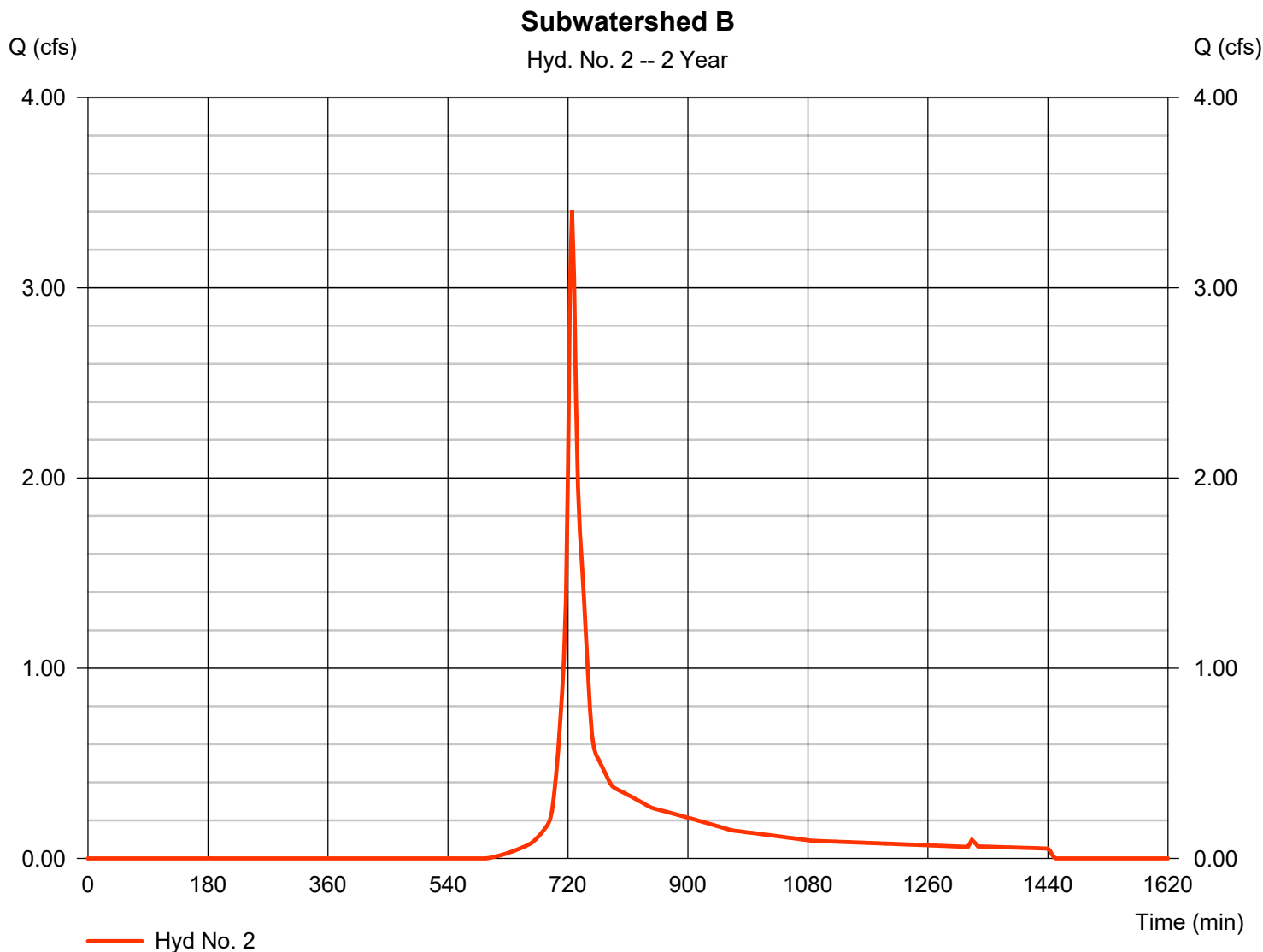
<u>Description</u>	<u>A</u>		<u>B</u>		<u>C</u>	<u>Totals</u>
<b>Sheet Flow</b>						
Manning's n-value	= 0.060		0.011		0.011	
Flow length (ft)	= 150.0		0.0		0.0	
Two-year 24-hr precip. (in)	= 3.45		0.00		0.00	
Land slope (%)	= 5.10		0.00		0.00	
<b>Travel Time (min)</b>	<b>= 4.31</b>	<b>+</b>	<b>0.00</b>	<b>+</b>	<b>0.00</b>	<b>= 4.31</b>
<b>Shallow Concentrated Flow</b>						
Flow length (ft)	= 1038.00		0.00		0.00	
Watercourse slope (%)	= 3.70		0.00		0.00	
Surface description	= Unpaved		Unpaved		Paved	
Average velocity (ft/s)	=3.10		0.00		0.00	
<b>Travel Time (min)</b>	<b>= 5.57</b>	<b>+</b>	<b>0.00</b>	<b>+</b>	<b>0.00</b>	<b>= 5.57</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		0.0	
<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>9.90 min</b>

# Hydrograph Report

## Hyd. No. 2

Subwatershed B

Hydrograph type	= SCS Runoff	Peak discharge	= 3.406 cfs
Storm frequency	= 2 yrs	Time to peak	= 726 min
Time interval	= 3 min	Hyd. volume	= 11,580 cuft
Drainage area	= 2.560 ac	Curve number	= 76
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 8.20 min
Total precip.	= 3.45 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



# TR55 Tc Worksheet

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

## Hyd. No. 2

Subwatershed B

<u>Description</u>	<u>A</u>		<u>B</u>		<u>C</u>		<u>Totals</u>
<b>Sheet Flow</b>							
Manning's n-value	= 0.060		0.011		0.011		
Flow length (ft)	= 150.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 3.45		0.00		0.00		
Land slope (%)	= 5.70		0.00		0.00		
<b>Travel Time (min)</b>	<b>= 4.12</b>	<b>+</b>	<b>0.00</b>	<b>+</b>	<b>0.00</b>	<b>=</b>	<b>4.12</b>
<b>Shallow Concentrated Flow</b>							
Flow length (ft)	= 639.00		91.00		0.00		
Watercourse slope (%)	= 3.40		2.40		0.00		
Surface description	= Unpaved		Paved		Paved		
Average velocity (ft/s)	=2.98		3.15		0.00		
<b>Travel Time (min)</b>	<b>= 3.58</b>	<b>+</b>	<b>0.48</b>	<b>+</b>	<b>0.00</b>	<b>=</b>	<b>4.06</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		0.0		
<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>8.20 min</b>

# Hydrograph Report

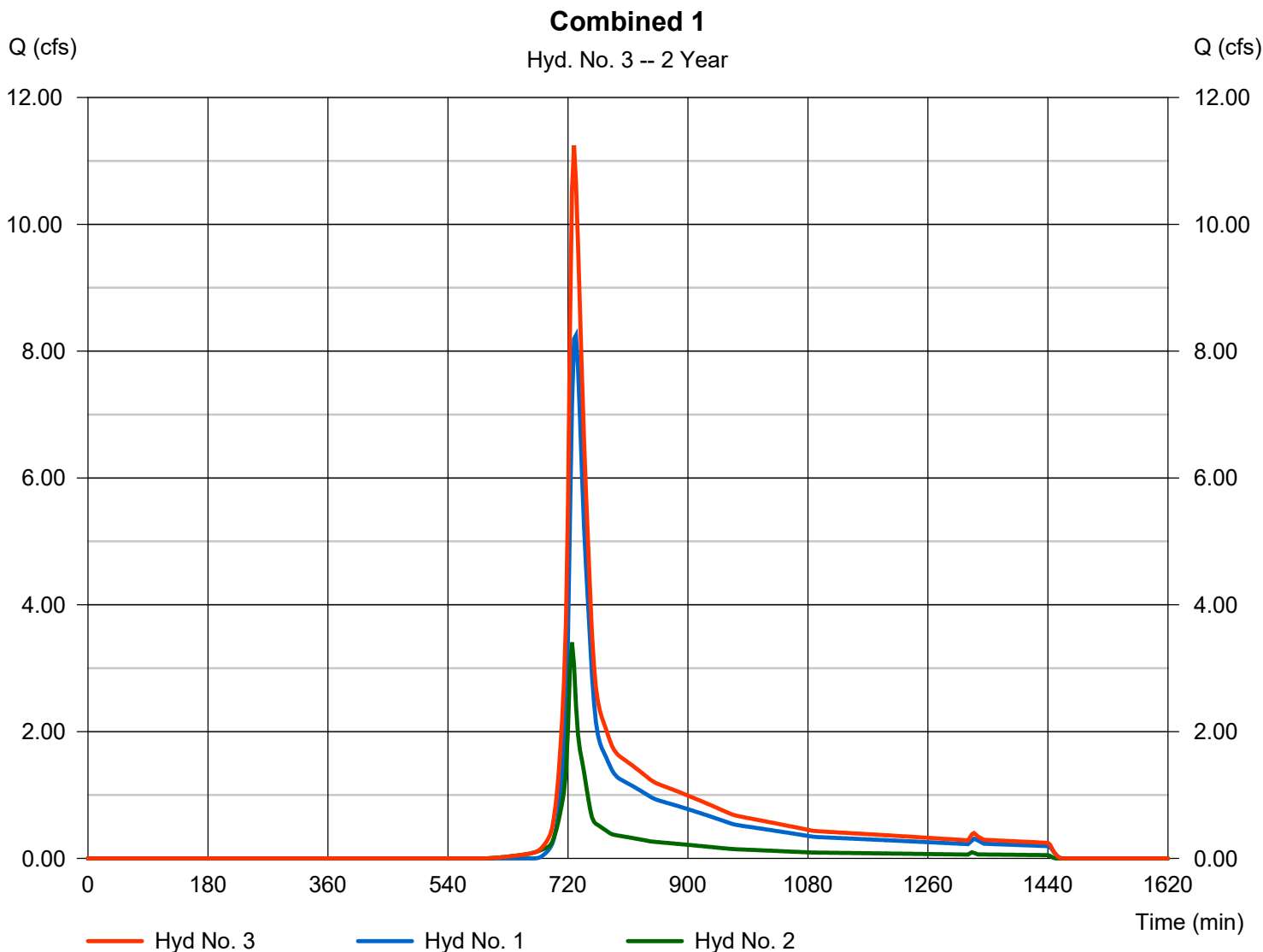
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

Friday, 11 / 13 / 2020

## Hyd. No. 3

Combined 1

Hydrograph type	= Combine	Peak discharge	= 11.25 cfs
Storm frequency	= 2 yrs	Time to peak	= 729 min
Time interval	= 3 min	Hyd. volume	= 47,843 cuft
Inflow hyds.	= 1, 2	Contrib. drain. area	= 13.370 ac





# Hydrograph Summary Report

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

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	14.51	3	729	59,912	----	----	----	Subwatershed A
2	SCS Runoff	5.328	3	726	17,793	----	----	----	Subwatershed B
3	Combine	19.22	3	729	77,705	1, 2	----	----	Combined 1

# Hydrograph Report

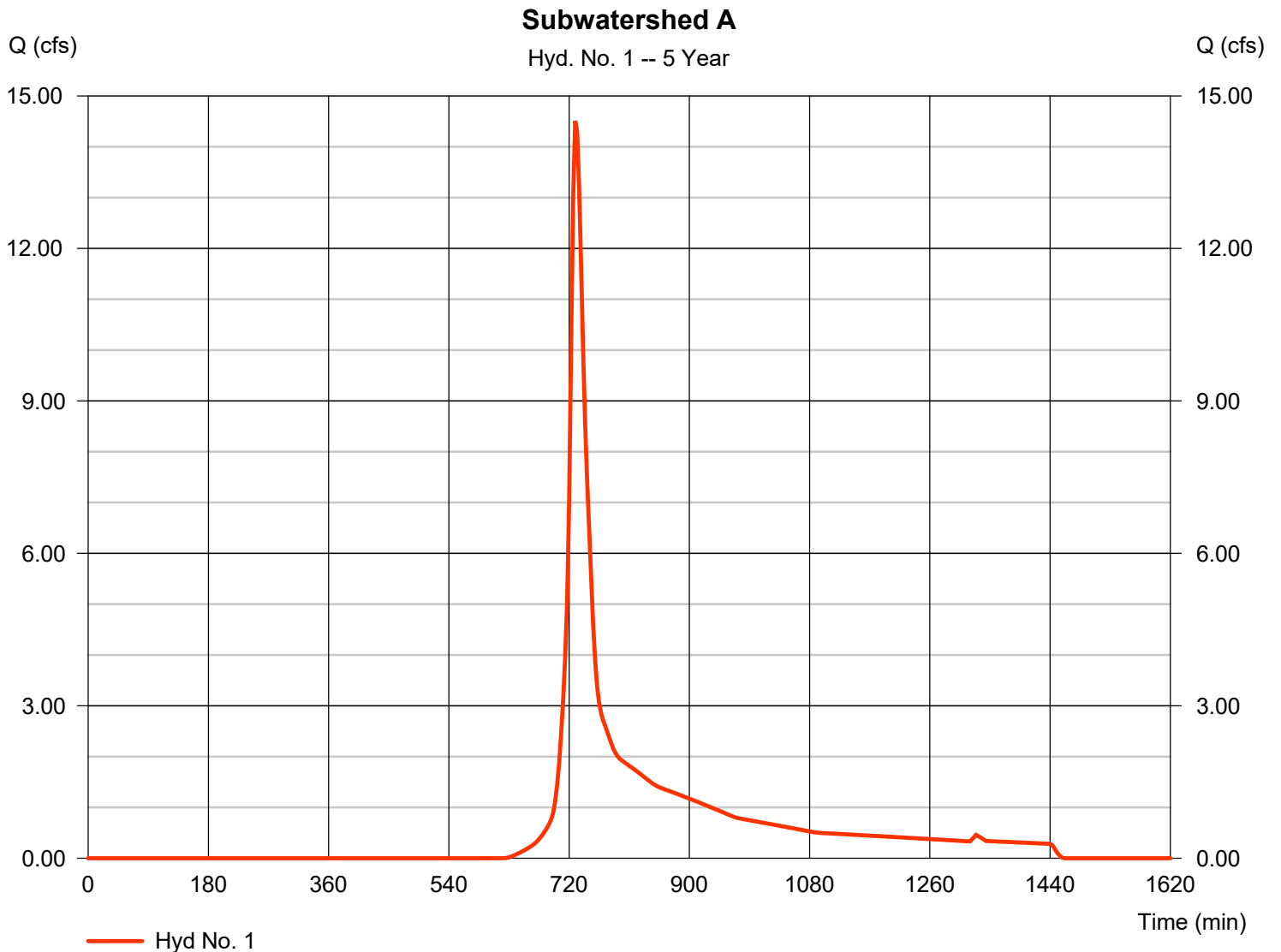
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

Friday, 11 / 13 / 2020

## Hyd. No. 1

Subwatershed A

Hydrograph type	= SCS Runoff	Peak discharge	= 14.51 cfs
Storm frequency	= 5 yrs	Time to peak	= 729 min
Time interval	= 3 min	Hyd. volume	= 59,912 cuft
Drainage area	= 10.810 ac	Curve number	= 69
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 9.90 min
Total precip.	= 4.39 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



# Hydrograph Report

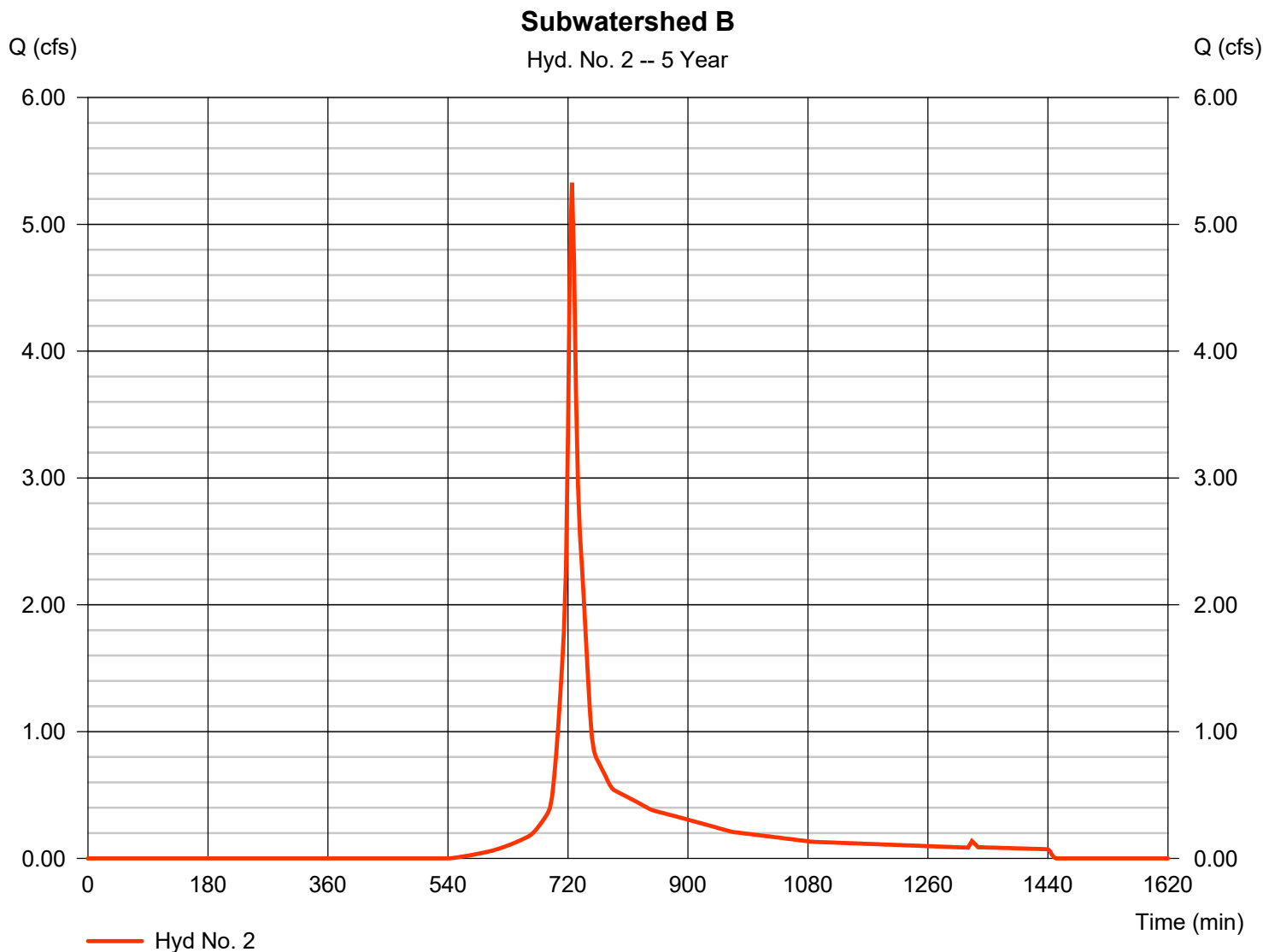
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

Friday, 11 / 13 / 2020

## Hyd. No. 2

Subwatershed B

Hydrograph type	= SCS Runoff	Peak discharge	= 5.328 cfs
Storm frequency	= 5 yrs	Time to peak	= 726 min
Time interval	= 3 min	Hyd. volume	= 17,793 cuft
Drainage area	= 2.560 ac	Curve number	= 76
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 8.20 min
Total precip.	= 4.39 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



# Hydrograph Report

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

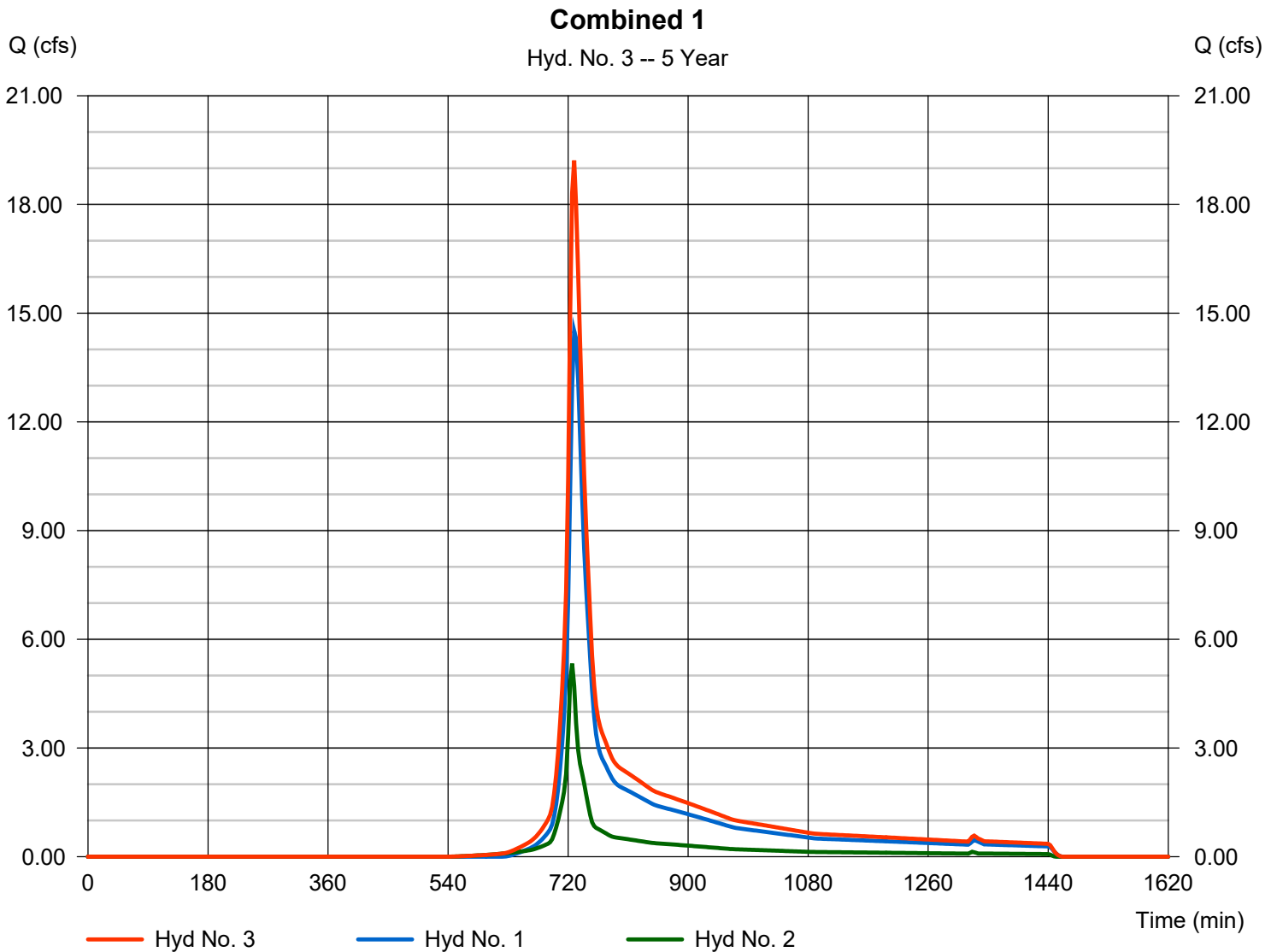
Friday, 11 / 13 / 2020

## Hyd. No. 3

Combined 1

Hydrograph type = Combine  
Storm frequency = 5 yrs  
Time interval = 3 min  
Inflow hyds. = 1, 2

Peak discharge = 19.22 cfs  
Time to peak = 729 min  
Hyd. volume = 77,705 cuft  
Contrib. drain. area = 13.370 ac



# Hydrograph Summary Report

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

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description	
1	SCS Runoff	20.28	3	729	81,690	----	----	----	Subwatershed A	
2	SCS Runoff	7.010	3	726	23,315	----	----	----	Subwatershed B	
3	Combine	26.42	3	729	105,006	1, 2	----	----	Combined 1	
Existing (REV1 FINAL 11-13-2020).gpw					Return Period: 10 Year			Friday, 11 / 13 / 2020		

# Hydrograph Report

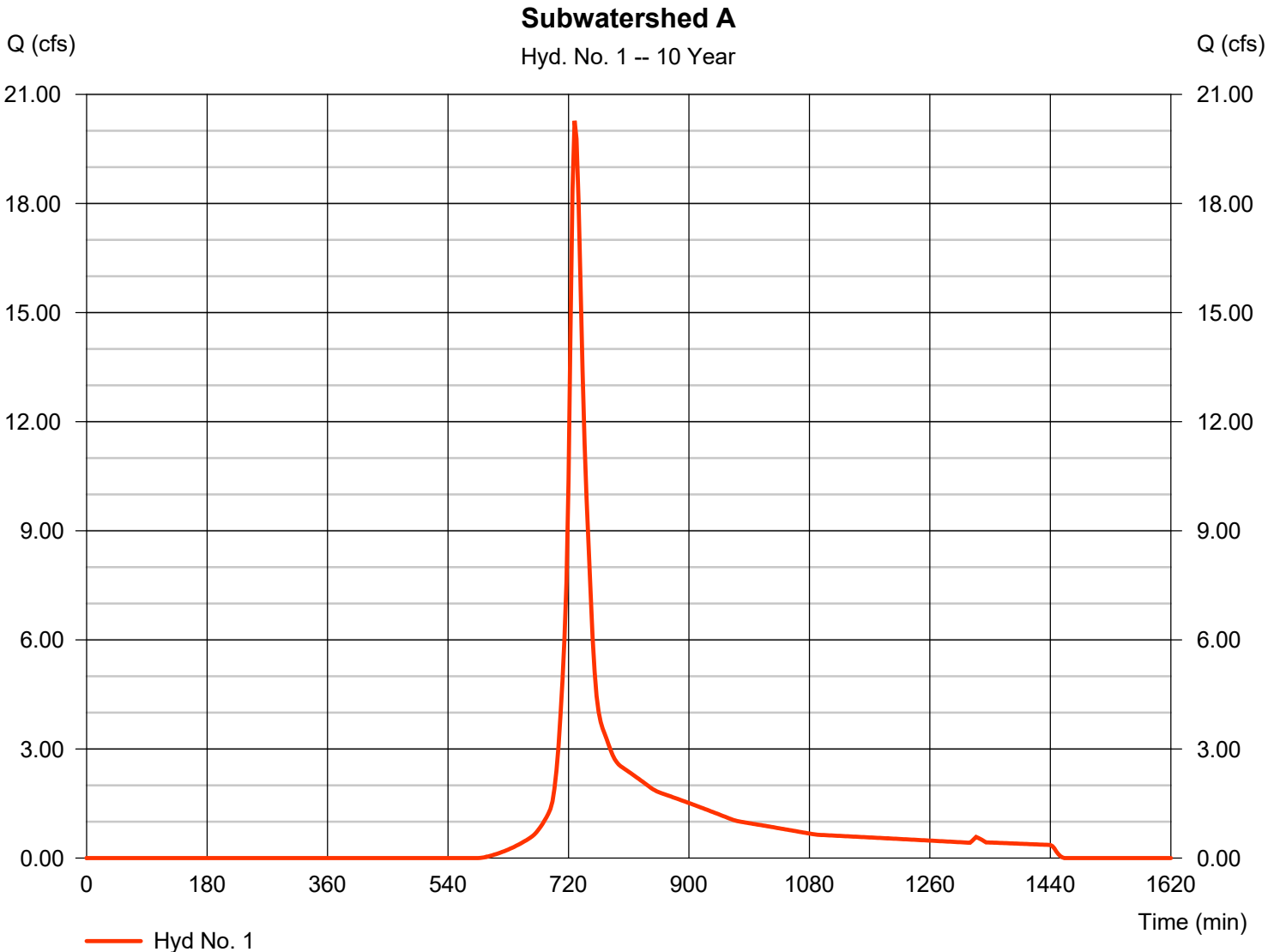
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

Friday, 11 / 13 / 2020

## Hyd. No. 1

Subwatershed A

Hydrograph type	= SCS Runoff	Peak discharge	= 20.28 cfs
Storm frequency	= 10 yrs	Time to peak	= 729 min
Time interval	= 3 min	Hyd. volume	= 81,690 cuft
Drainage area	= 10.810 ac	Curve number	= 69
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 9.90 min
Total precip.	= 5.17 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



# Hydrograph Report

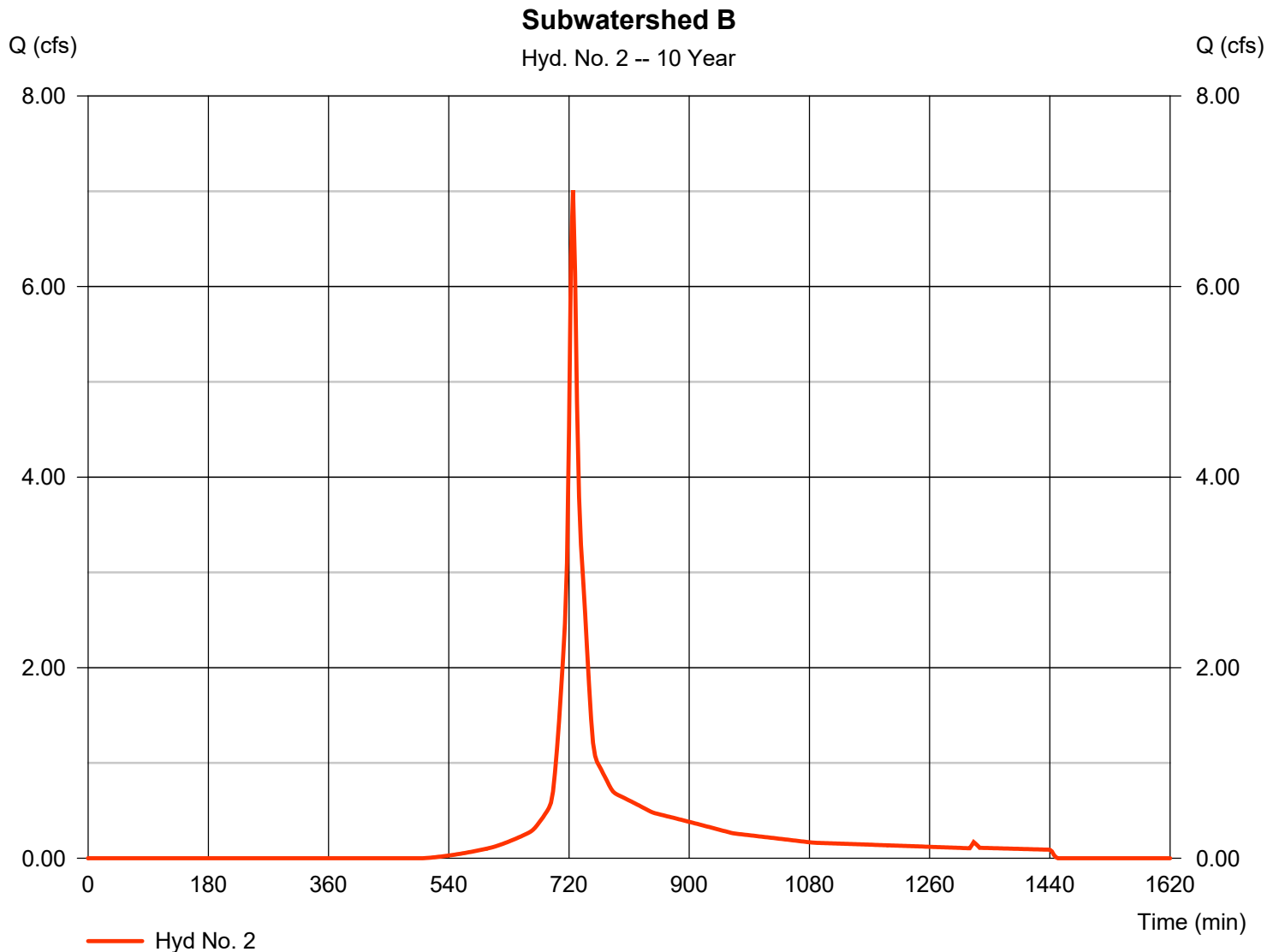
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

Friday, 11 / 13 / 2020

## Hyd. No. 2

Subwatershed B

Hydrograph type	= SCS Runoff	Peak discharge	= 7.010 cfs
Storm frequency	= 10 yrs	Time to peak	= 726 min
Time interval	= 3 min	Hyd. volume	= 23,315 cuft
Drainage area	= 2.560 ac	Curve number	= 76
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 8.20 min
Total precip.	= 5.17 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



# Hydrograph Report

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

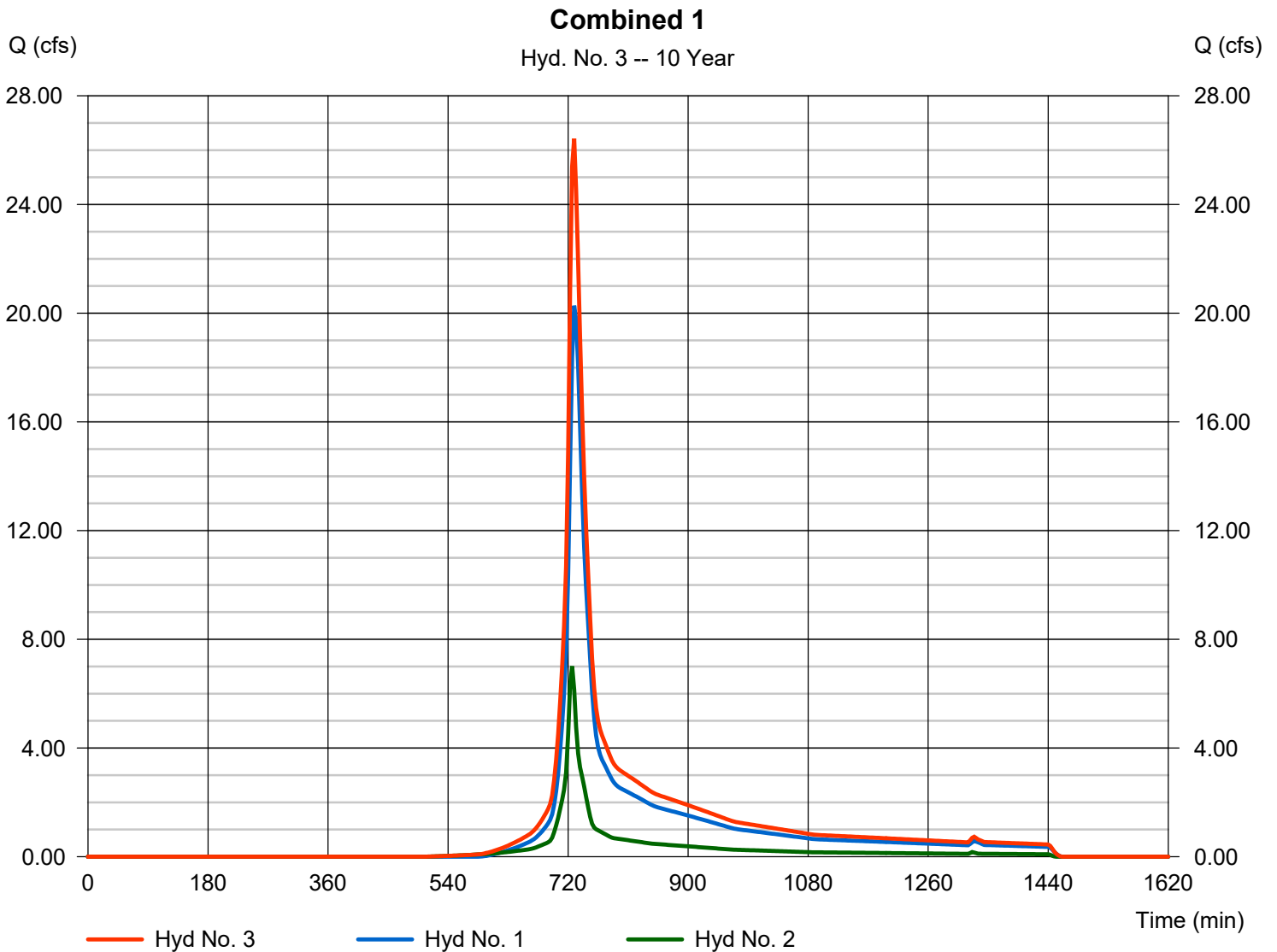
Friday, 11 / 13 / 2020

## Hyd. No. 3

Combined 1

Hydrograph type = Combine  
 Storm frequency = 10 yrs  
 Time interval = 3 min  
 Inflow hyds. = 1, 2

Peak discharge = 26.42 cfs  
 Time to peak = 729 min  
 Hyd. volume = 105,006 cuft  
 Contrib. drain. area = 13.370 ac





# Hydrograph Summary Report

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

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	28.71	3	729	113,844	----	----	----	Subwatershed A
2	SCS Runoff	9.391	3	726	31,259	----	----	----	Subwatershed B
3	Combine	36.89	3	729	145,104	1, 2	----	----	Combined 1
Existing (REV1 FINAL 11-13-2020).gpw					Return Period: 25 Year			Friday, 11 / 13 / 2020	

# Hydrograph Report

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

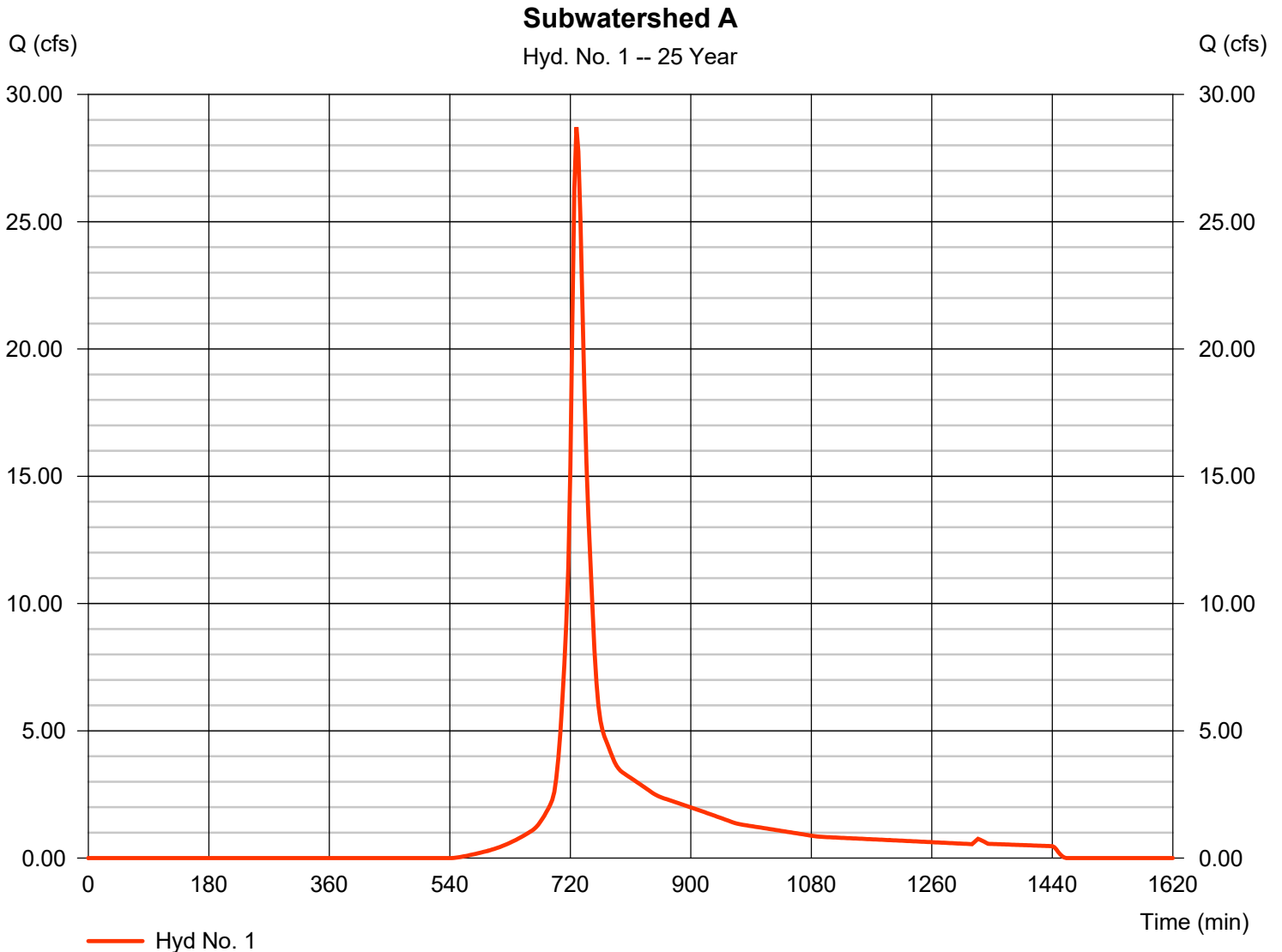
Friday, 11 / 13 / 2020

## Hyd. No. 1

Subwatershed A

Hydrograph type = SCS Runoff  
 Storm frequency = 25 yrs  
 Time interval = 3 min  
 Drainage area = 10.810 ac  
 Basin Slope = 0.0 %  
 Tc method = TR55  
 Total precip. = 6.24 in  
 Storm duration = 24 hrs

Peak discharge = 28.71 cfs  
 Time to peak = 729 min  
 Hyd. volume = 113,844 cuft  
 Curve number = 69  
 Hydraulic length = 0 ft  
 Time of conc. (Tc) = 9.90 min  
 Distribution = Type III  
 Shape factor = 484



# Hydrograph Report

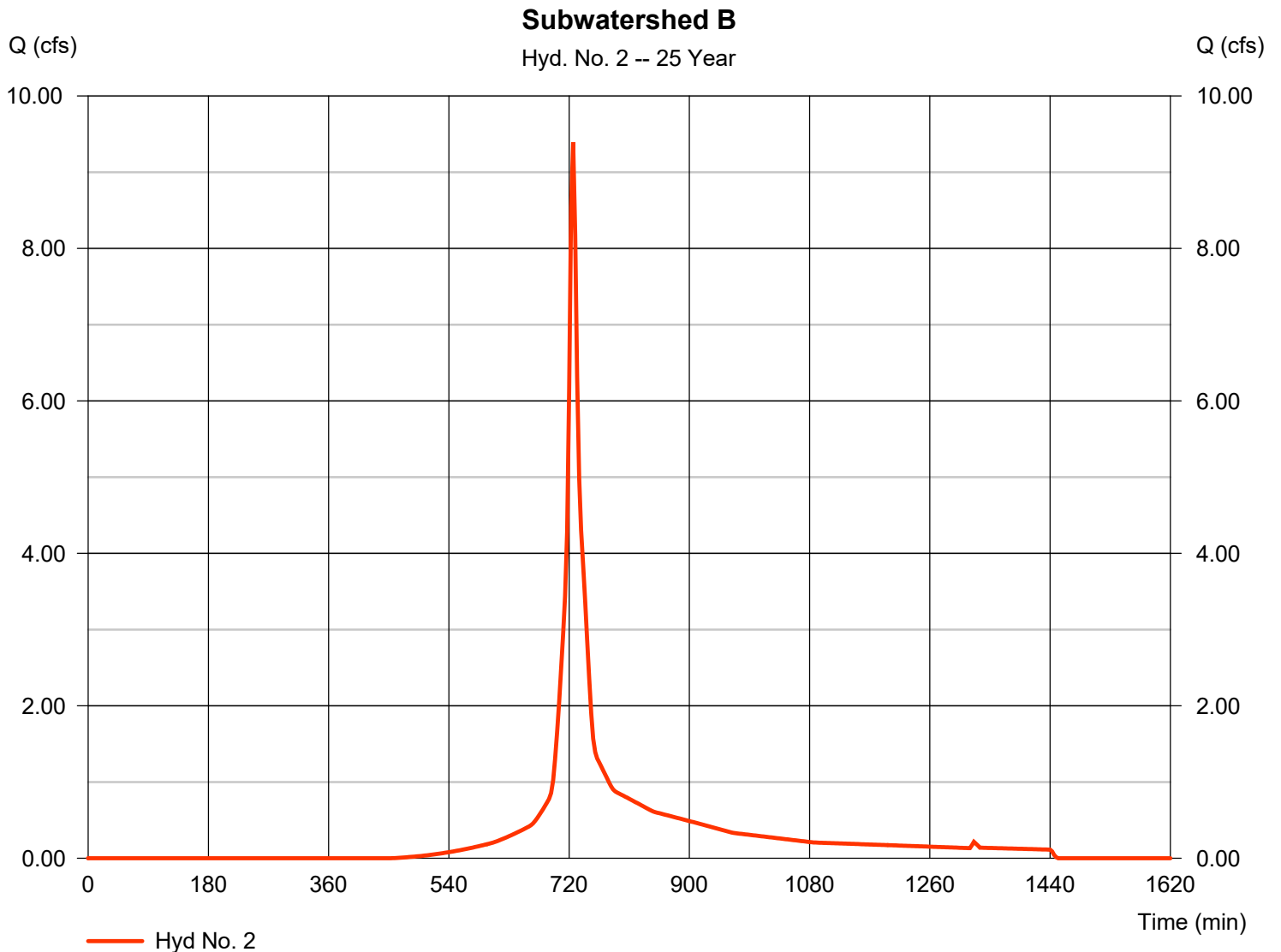
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

Friday, 11 / 13 / 2020

## Hyd. No. 2

Subwatershed B

Hydrograph type	= SCS Runoff	Peak discharge	= 9.391 cfs
Storm frequency	= 25 yrs	Time to peak	= 726 min
Time interval	= 3 min	Hyd. volume	= 31,259 cuft
Drainage area	= 2.560 ac	Curve number	= 76
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 8.20 min
Total precip.	= 6.24 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



# Hydrograph Report

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

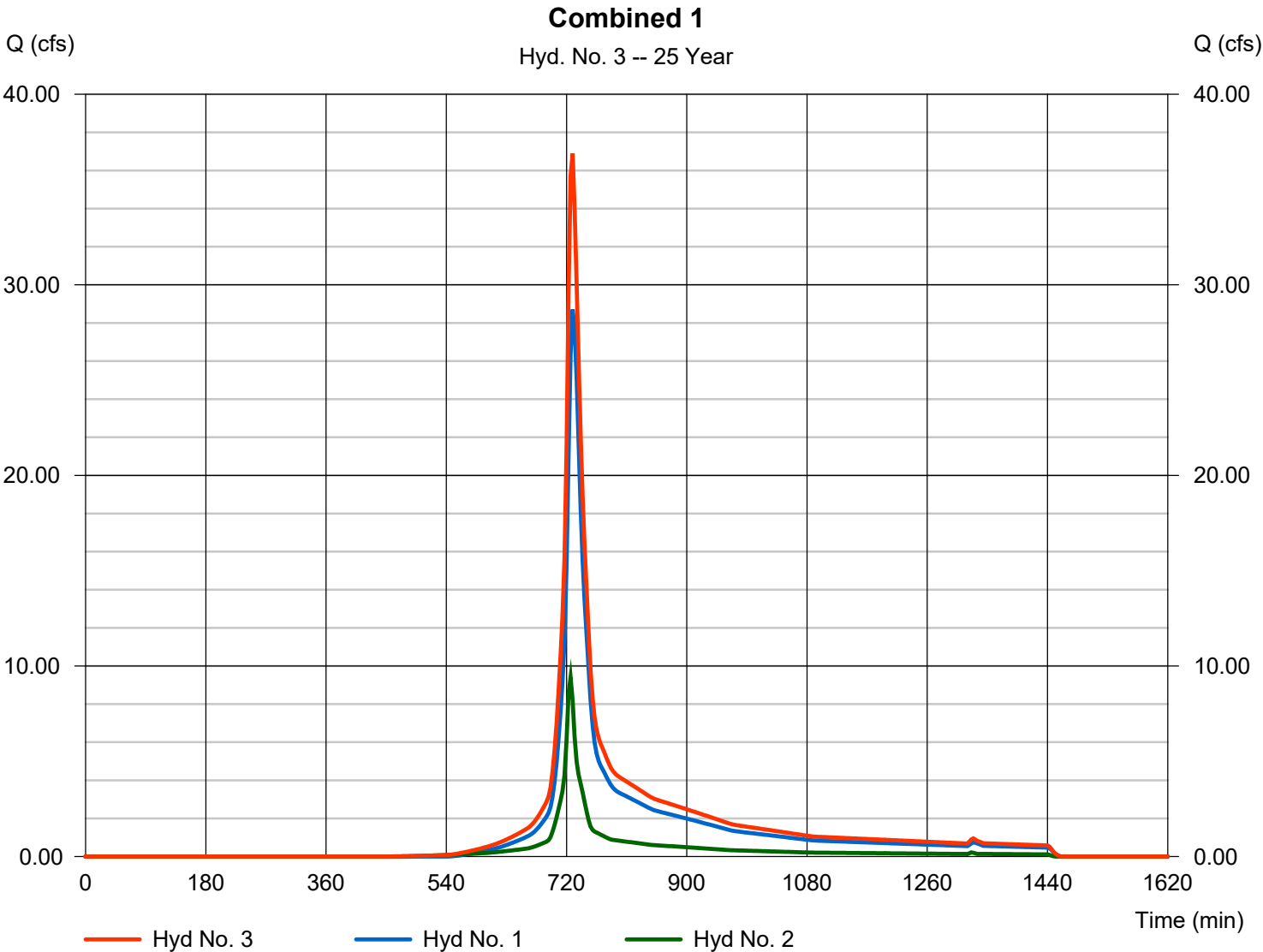
Friday, 11 / 13 / 2020

## Hyd. No. 3

Combined 1

Hydrograph type = Combine  
Storm frequency = 25 yrs  
Time interval = 3 min  
Inflow hyds. = 1, 2

Peak discharge = 36.89 cfs  
Time to peak = 729 min  
Hyd. volume = 145,104 cuft  
Contrib. drain. area = 13.370 ac



# Hydrograph Summary Report

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

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	35.29	3	729	139,177	----	----	----	Subwatershed A
2	SCS Runoff	11.20	3	726	37,400	----	----	----	Subwatershed B
3	Combine	45.01	3	729	176,578	1, 2	----	----	Combined 1
Existing (REV1 FINAL 11-13-2020).gpw					Return Period: 50 Year			Friday, 11 / 13 / 2020	

# Hydrograph Report

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

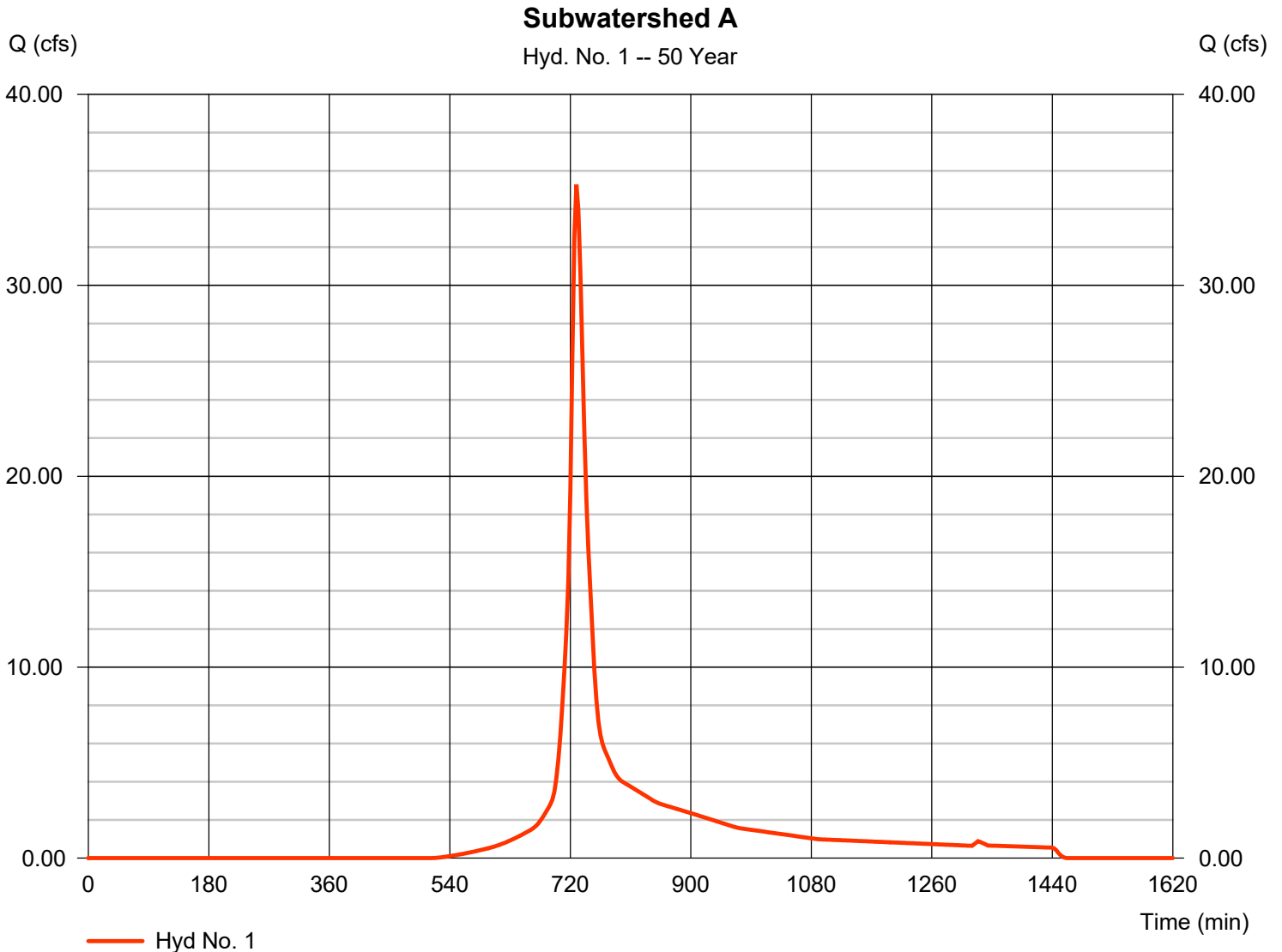
Friday, 11 / 13 / 2020

## Hyd. No. 1

Subwatershed A

Hydrograph type = SCS Runoff  
 Storm frequency = 50 yrs  
 Time interval = 3 min  
 Drainage area = 10.810 ac  
 Basin Slope = 0.0 %  
 Tc method = TR55  
 Total precip. = 7.04 in  
 Storm duration = 24 hrs

Peak discharge = 35.29 cfs  
 Time to peak = 729 min  
 Hyd. volume = 139,177 cuft  
 Curve number = 69  
 Hydraulic length = 0 ft  
 Time of conc. (Tc) = 9.90 min  
 Distribution = Type III  
 Shape factor = 484



# Hydrograph Report

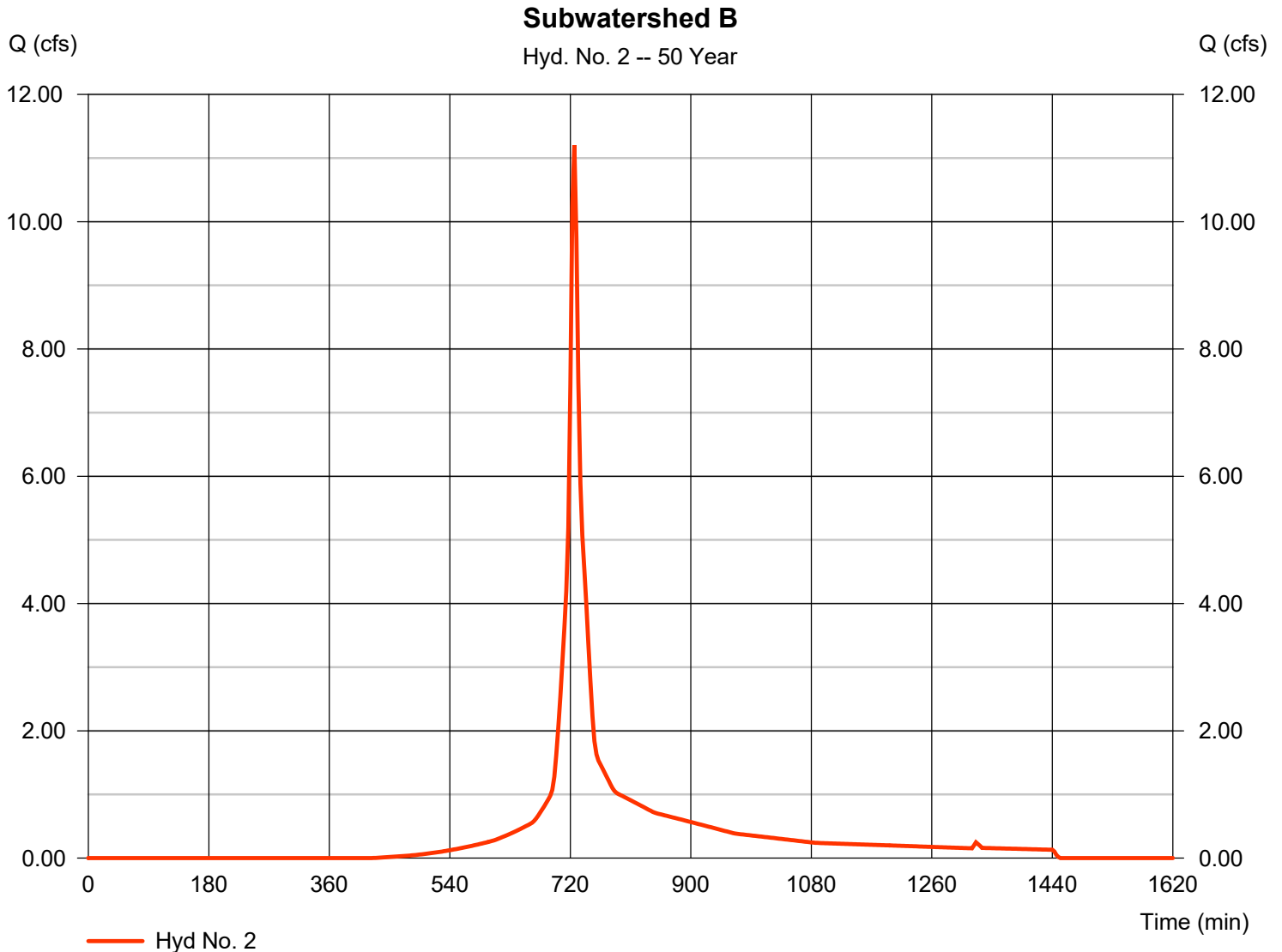
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

Friday, 11 / 13 / 2020

## Hyd. No. 2

Subwatershed B

Hydrograph type	= SCS Runoff	Peak discharge	= 11.20 cfs
Storm frequency	= 50 yrs	Time to peak	= 726 min
Time interval	= 3 min	Hyd. volume	= 37,400 cuft
Drainage area	= 2.560 ac	Curve number	= 76
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 8.20 min
Total precip.	= 7.04 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



# Hydrograph Report

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

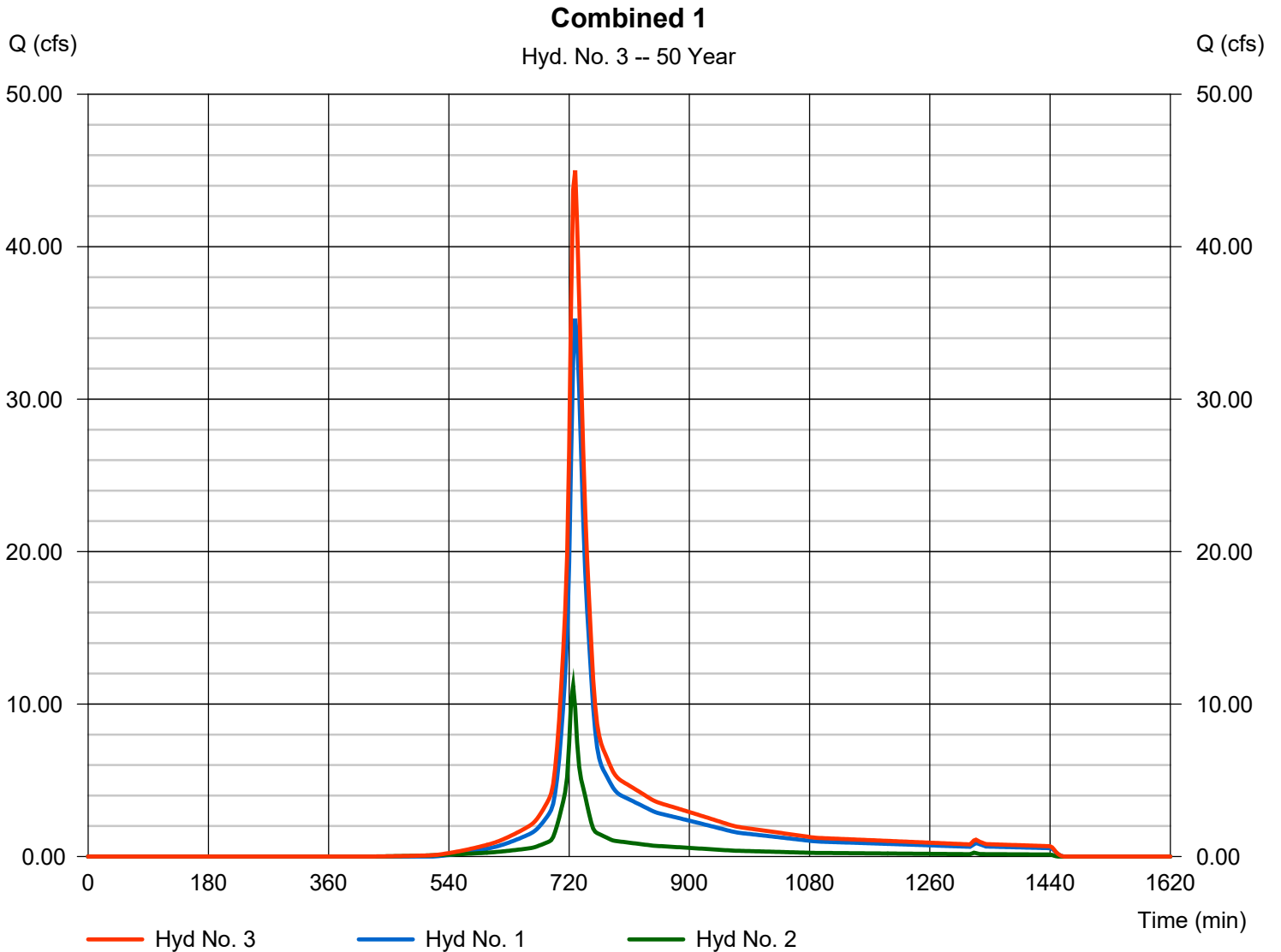
Friday, 11 / 13 / 2020

## Hyd. No. 3

Combined 1

Hydrograph type = Combine  
Storm frequency = 50 yrs  
Time interval = 3 min  
Inflow hyds. = 1, 2

Peak discharge = 45.01 cfs  
Time to peak = 729 min  
Hyd. volume = 176,578 cuft  
Contrib. drain. area = 13.370 ac





# Hydrograph Summary Report

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

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description	
1	SCS Runoff	42.54	3	729	167,351	-----	-----	-----	Subwatershed A	
2	SCS Runoff	13.17	3	726	44,144	-----	-----	-----	Subwatershed B	
3	Combine	53.92	3	729	211,495	1, 2	-----	-----	Combined 1	
Existing (REV1 FINAL 11-13-2020).gpw					Return Period: 100 Year			Friday, 11 / 13 / 2020		

# Hydrograph Report

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

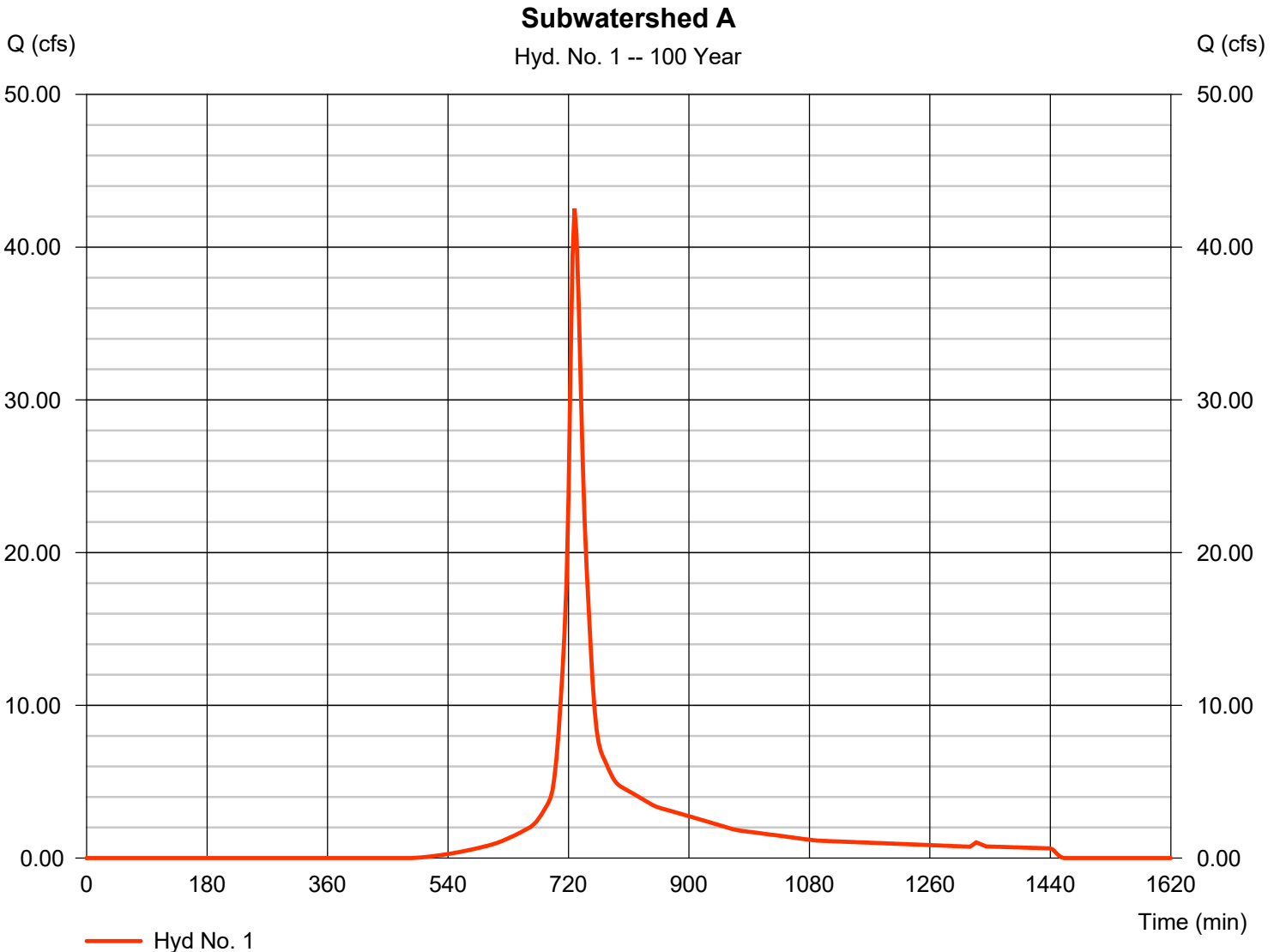
Friday, 11 / 13 / 2020

## Hyd. No. 1

Subwatershed A

Hydrograph type = SCS Runoff  
 Storm frequency = 100 yrs  
 Time interval = 3 min  
 Drainage area = 10.810 ac  
 Basin Slope = 0.0 %  
 Tc method = TR55  
 Total precip. = 7.90 in  
 Storm duration = 24 hrs

Peak discharge = 42.54 cfs  
 Time to peak = 729 min  
 Hyd. volume = 167,351 cuft  
 Curve number = 69  
 Hydraulic length = 0 ft  
 Time of conc. (Tc) = 9.90 min  
 Distribution = Type III  
 Shape factor = 484



# Hydrograph Report

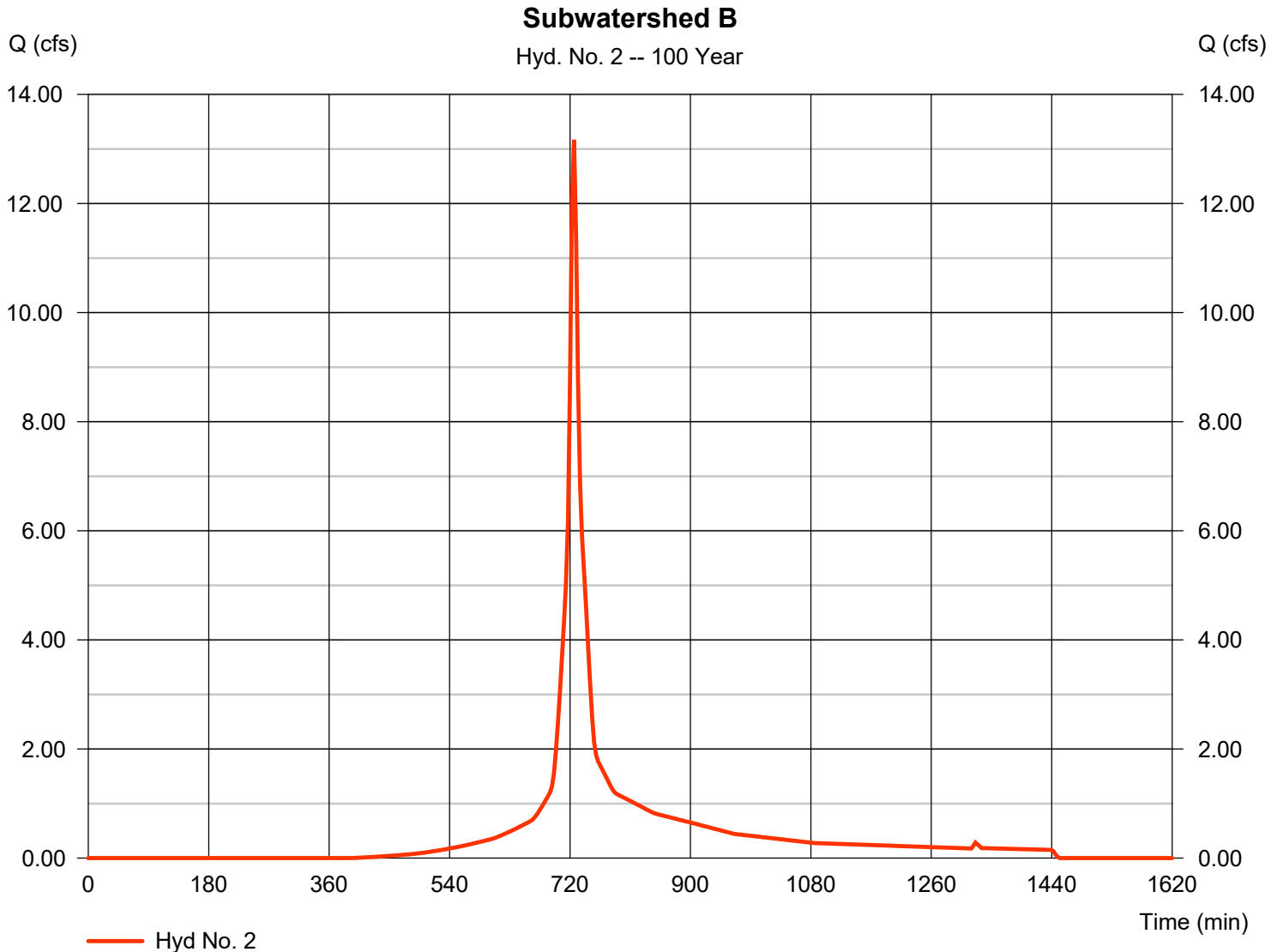
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

Friday, 11 / 13 / 2020

## Hyd. No. 2

Subwatershed B

Hydrograph type	= SCS Runoff	Peak discharge	= 13.17 cfs
Storm frequency	= 100 yrs	Time to peak	= 726 min
Time interval	= 3 min	Hyd. volume	= 44,144 cuft
Drainage area	= 2.560 ac	Curve number	= 76
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 8.20 min
Total precip.	= 7.90 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



# Hydrograph Report

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

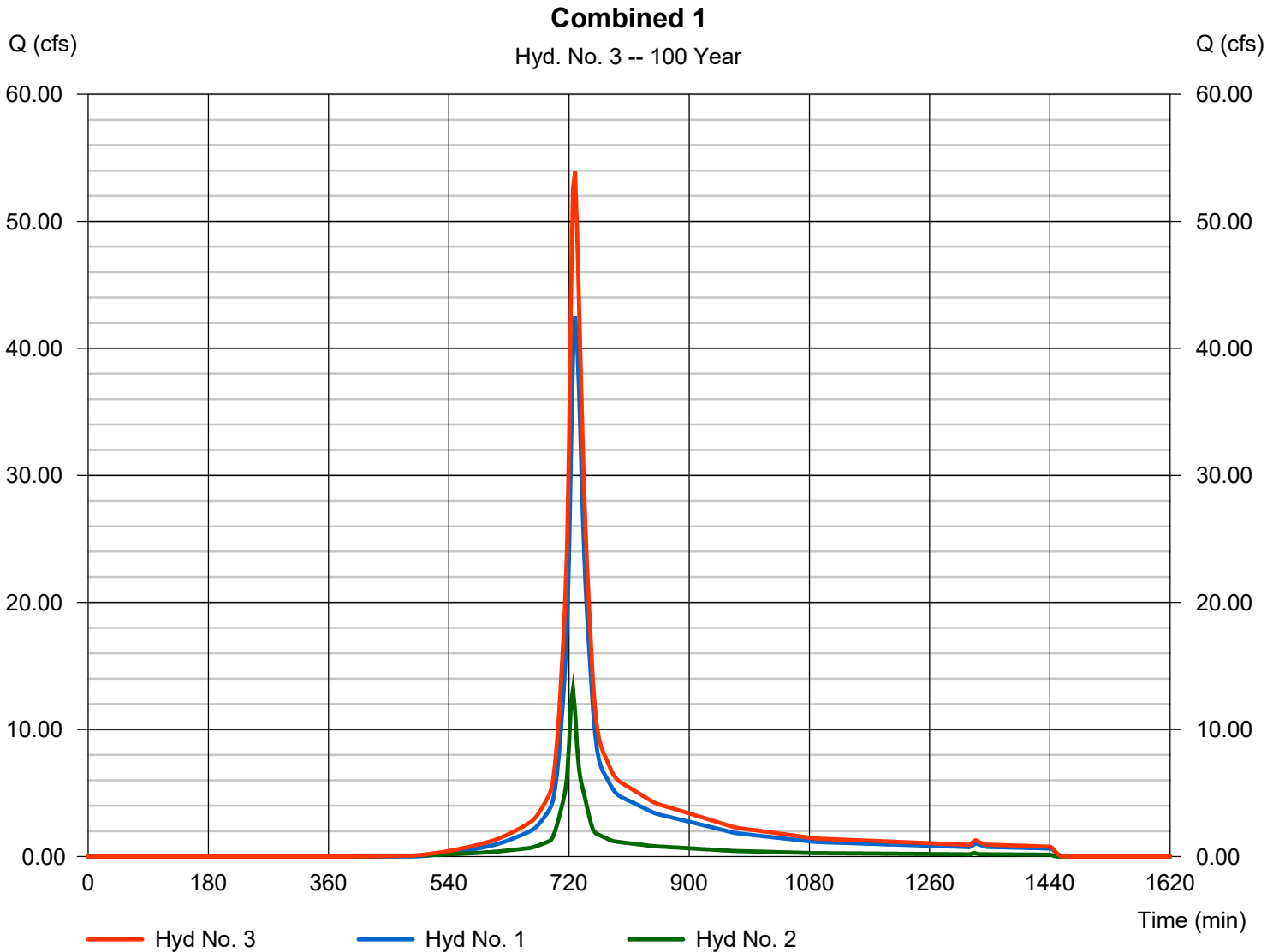
Friday, 11 / 13 / 2020

## Hyd. No. 3

Combined 1

Hydrograph type = Combine  
Storm frequency = 100 yrs  
Time interval = 3 min  
Inflow hyds. = 1, 2

Peak discharge = 53.92 cfs  
Time to peak = 729 min  
Hyd. volume = 211,495 cuft  
Contrib. drain. area = 13.370 ac





PREPARED FOR HARVEST CHRISTIAN  
FELLOWSHIP OF NIAHTIC, INC.  
NORTH BRIDE BROOK ROAD  
MAP 24 LOT 76  
EAST LYME, CONNECTICUT

PROPOSED DRAINAGE  
COMPUTATIONS  
9-9-2020

#	DATE	DESCRIPTION	BY
1	11/13/2020	GENERAL REVISIONS	RG

 <p>INDIGO<sup>LLC</sup> land design</p> <p><i>Smart Growth by Design</i></p>	PLAN PREPARED BY: INDIGO LAND DESIGN, LLC JOSEPH WREN, P.E. CT REG. NO. 21090 40 ELM STREET, 2ND FLOOR OLD SAYBROOK, CT 06475 PHONE: (860) 388-9343 FAX: (860) 391-8854
--	--

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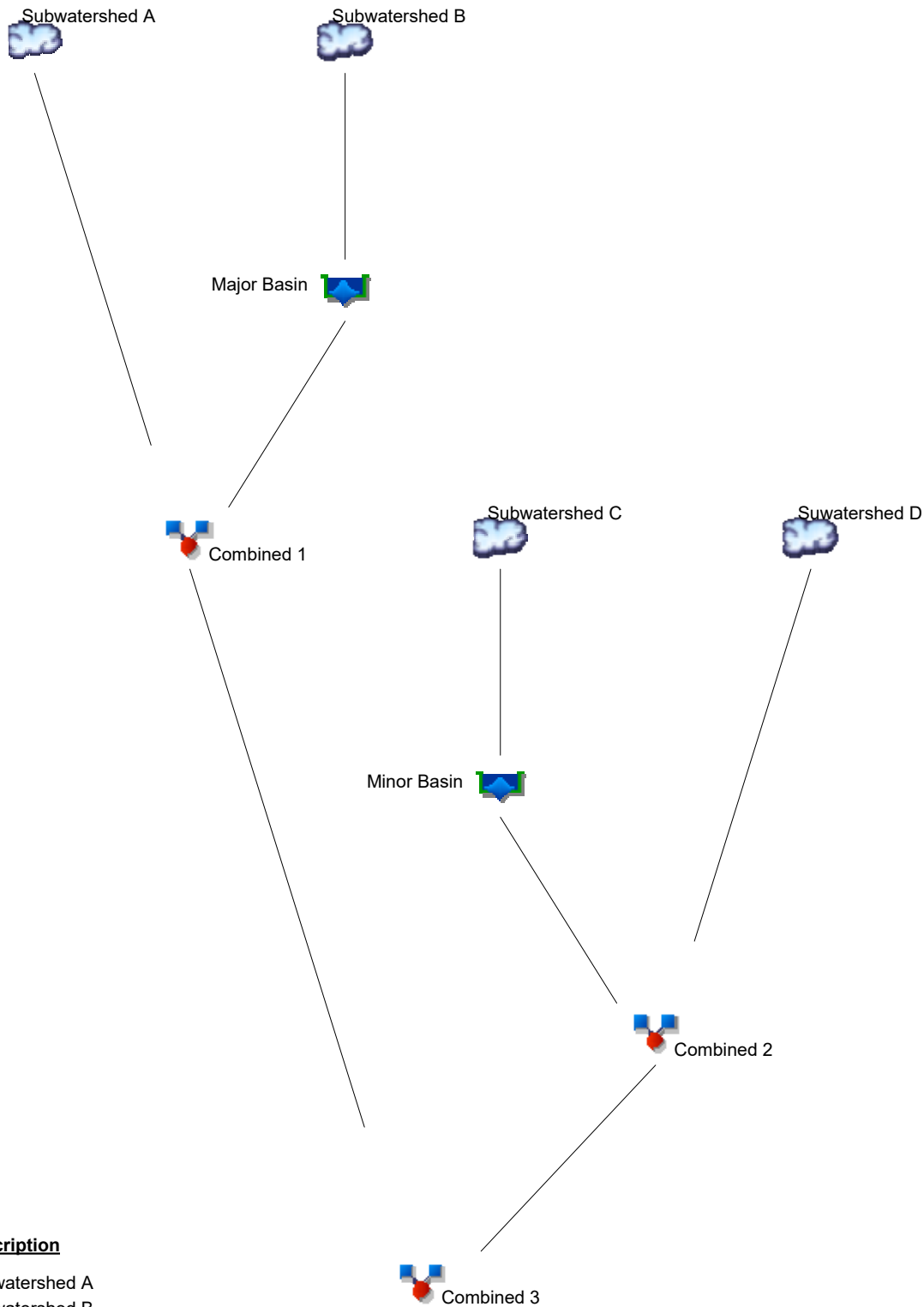
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# Watershed Model Schematic

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



## Legend

Hyd.	Origin	Description
1	SCS Runoff	Subwatershed A
2	SCS Runoff	Subwatershed B
3	Reservoir	Major Basin
4	Combine	Combined 1
5	SCS Runoff	Subwatershed C
6	SCS Runoff	Suwatershed D
7	Reservoir	Minor Basin
8	Combine	Combined 2
9	Combine	Combined 3

# Hydrograph Return Period Recap

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

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	-----	-----	4.877	-----	9.104	13.06	18.91	23.51	28.72	Subwatershed A
2	SCS Runoff	-----	-----	2.906	-----	4.170	5.238	6.711	7.815	8.999	Subwatershed B
3	Reservoir	2	-----	0.070	-----	0.348	0.687	1.799	4.212	6.541	Major Basin
4	Combine	1, 3	-----	4.895	-----	9.125	13.08	19.05	24.20	31.59	Combined 1
5	SCS Runoff	-----	-----	0.459	-----	0.695	0.898	1.183	1.399	1.631	Subwatershed C
6	SCS Runoff	-----	-----	1.014	-----	1.627	2.182	2.977	3.587	4.253	Suwatershed D
7	Reservoir	5	-----	0.012	-----	0.041	0.149	0.685	1.091	1.478	Minor Basin
8	Combine	6, 7	-----	1.022	-----	1.637	2.193	3.250	4.610	5.731	Combined 2
9	Combine	4, 8	-----	5.846	-----	10.69	15.15	22.16	28.62	35.89	Combined 3

# Hydrograph Summary Report

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

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	4.877	3	741	27,151	-----	-----	-----	Subwatershed A
2	SCS Runoff	2.906	3	735	13,874	-----	-----	-----	Subwatershed B
3	Reservoir	0.070	3	1263	10,835	2	91.04	12,012	Major Basin
4	Combine	4.895	3	741	37,986	1, 3	-----	-----	Combined 1
5	SCS Runoff	0.459	3	729	1,829	-----	-----	-----	Subwatershed C
6	SCS Runoff	1.014	3	735	4,738	-----	-----	-----	Suwatershed D
7	Reservoir	0.012	3	1179	1,765	5	82.70	1,360	Minor Basin
8	Combine	1.022	3	735	6,503	6, 7	-----	-----	Combined 2
9	Combine	5.846	3	738	44,489	4, 8	-----	-----	Combined 3
Proposed (REV1 FINAL 11-13-2020).gpw					Return Period: 2 Year			Friday, 11 / 13 / 2020	

# Hydrograph Report

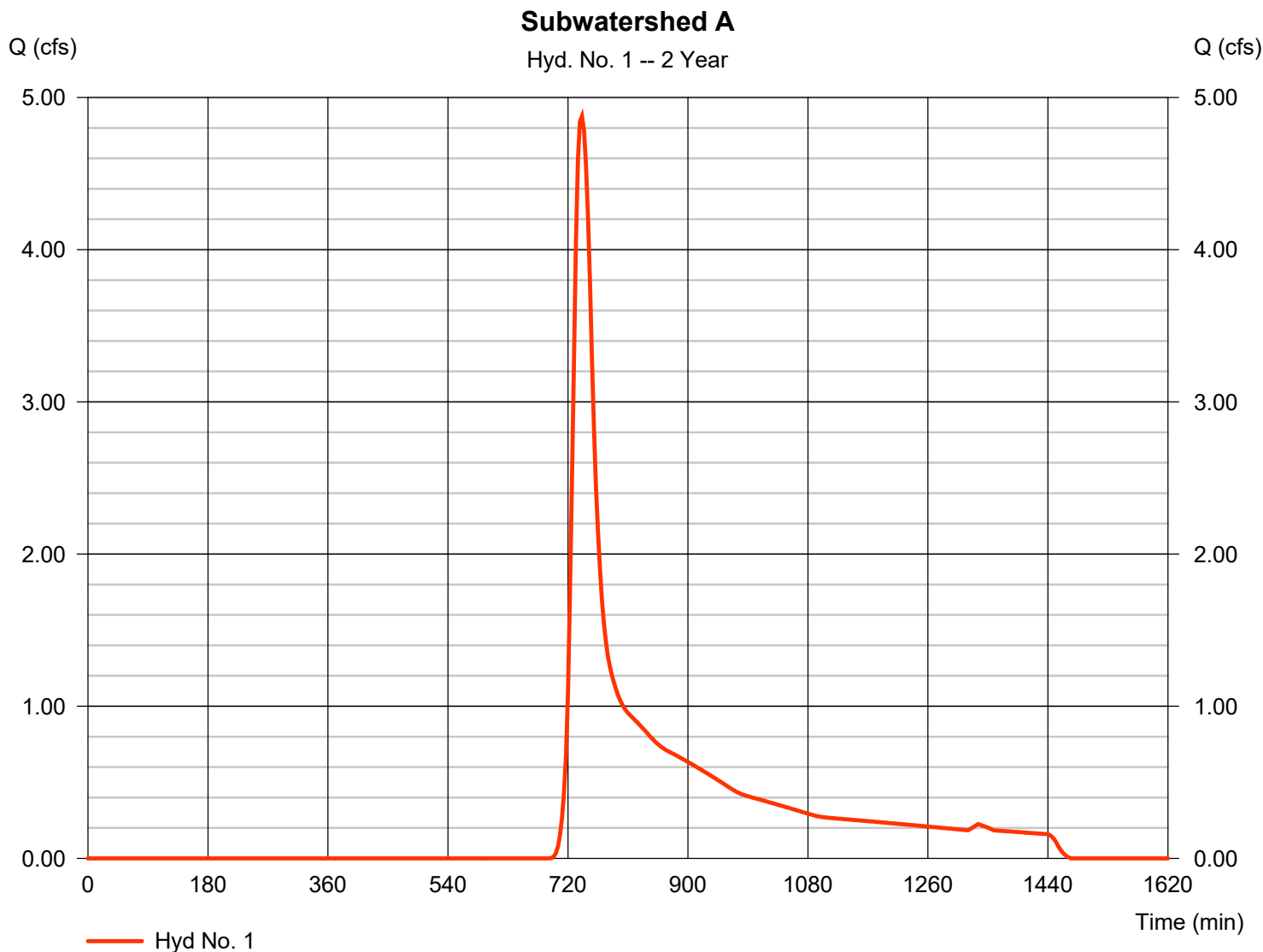
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

Friday, 11 / 13 / 2020

## Hyd. No. 1

Subwatershed A

Hydrograph type	= SCS Runoff	Peak discharge	= 4.877 cfs
Storm frequency	= 2 yrs	Time to peak	= 741 min
Time interval	= 3 min	Hyd. volume	= 27,151 cuft
Drainage area	= 9.920 ac	Curve number	= 66
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 23.80 min
Total precip.	= 3.45 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



# TR55 Tc Worksheet

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

## Hyd. No. 1

Subwatershed A

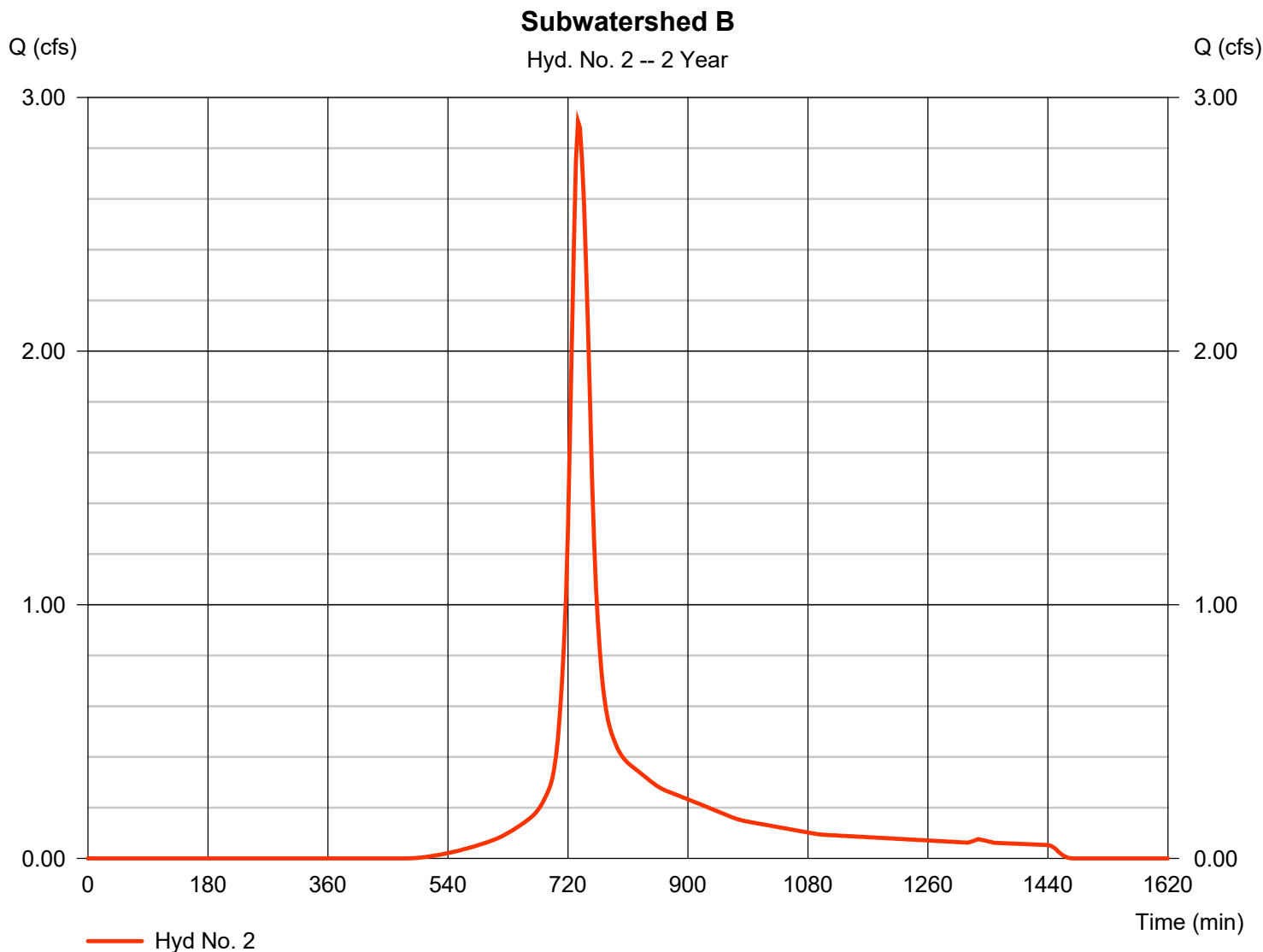
<u>Description</u>	<u>A</u>	<u>B</u>	<u>C</u>	<u>Totals</u>
<b>Sheet Flow</b>				
Manning's n-value	= 0.240	0.600	0.011	
Flow length (ft)	= 71.0	79.0	0.0	
Two-year 24-hr precip. (in)	= 3.45	3.45	3.45	
Land slope (%)	= 8.20	7.50	0.00	
<b>Travel Time (min)</b>	<b>= 5.94</b>	<b>+ 13.96</b>	<b>+ 0.00</b>	<b>= 19.90</b>
<b>Shallow Concentrated Flow</b>				
Flow length (ft)	= 579.00	0.00	0.00	
Watercourse slope (%)	= 2.40	0.00	0.00	
Surface description	= Unpaved	Paved	Paved	
Average velocity (ft/s)	=2.50	0.00	0.00	
<b>Travel Time (min)</b>	<b>= 3.86</b>	<b>+ 0.00</b>	<b>+ 0.00</b>	<b>= 3.86</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>+ 0.00</b>	<b>+ 0.00</b>	<b>= 0.00</b>
<b>Total Travel Time, Tc .....</b>				<b>23.80 min</b>

# Hydrograph Report

## Hyd. No. 2

Subwatershed B

Hydrograph type	= SCS Runoff	Peak discharge	= 2.906 cfs
Storm frequency	= 2 yrs	Time to peak	= 735 min
Time interval	= 3 min	Hyd. volume	= 13,874 cuft
Drainage area	= 2.070 ac	Curve number	= 84
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 20.30 min
Total precip.	= 3.45 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



# TR55 Tc Worksheet

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

## Hyd. No. 2

Subwatershed B

<u>Description</u>	<u>A</u>	<u>B</u>	<u>C</u>	<u>Totals</u>
<b>Sheet Flow</b>				
Manning's n-value	= 0.240	0.011	0.011	
Flow length (ft)	= 150.0	0.0	0.0	
Two-year 24-hr precip. (in)	= 3.45	0.00	0.00	
Land slope (%)	= 2.90	0.00	0.00	
<b>Travel Time (min)</b>	<b>= 16.38</b>	<b>+ 0.00</b>	<b>+ 0.00</b>	<b>= 16.38</b>
<b>Shallow Concentrated Flow</b>				
Flow length (ft)	= 395.00	0.00	0.00	
Watercourse slope (%)	= 1.10	0.00	0.00	
Surface description	= Unpaved	Unpaved	Unpaved	
Average velocity (ft/s)	=1.69	0.00	0.00	
<b>Travel Time (min)</b>	<b>= 3.89</b>	<b>+ 0.00</b>	<b>+ 0.00</b>	<b>= 3.89</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	0.0	
<b>Travel Time (min)</b>	<b>= 0.00</b>	<b>+ 0.00</b>	<b>+ 0.00</b>	<b>= 0.00</b>
<b>Total Travel Time, Tc .....</b>				<b>20.30 min</b>

# Hydrograph Report

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

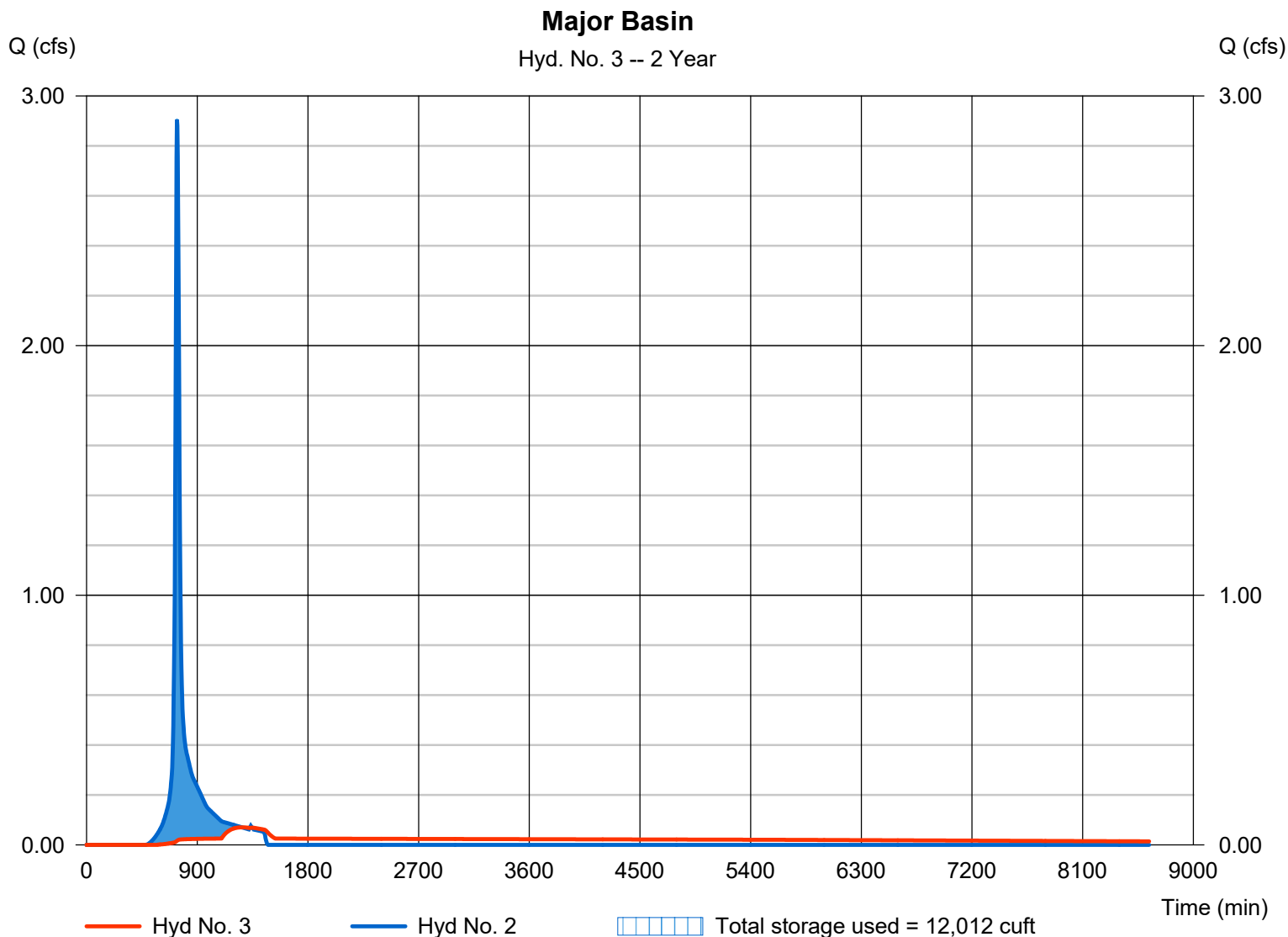
Friday, 11 / 13 / 2020

## Hyd. No. 3

Major Basin

Hydrograph type	= Reservoir	Peak discharge	= 0.070 cfs
Storm frequency	= 2 yrs	Time to peak	= 1263 min
Time interval	= 3 min	Hyd. volume	= 10,835 cuft
Inflow hyd. No.	= 2 - Subwatershed B	Max. Elevation	= 91.04 ft
Reservoir name	= Major Basin	Max. Storage	= 12,012 cuft

Storage Indication method used.





# Pond Report

## Pond No. 1 - Major Basin

### Pond Data

Contours -User-defined contour areas. Average end area method used for volume calculation. Beginning Elevation = 88.00 ft

### Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	88.00	1,486	0	0
2.00	90.00	4,793	6,279	6,279
4.00	92.00	6,187	10,980	17,259
5.00	93.00	6,923	6,555	23,814
5.50	93.50	8,345	3,817	27,631

### Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 15.00	0.75	4.00	Inactive
Span (in)	= 15.00	0.75	8.00	0.00
No. Barrels	= 1	1	1	0
Invert El. (ft)	= 88.00	88.00	91.00	0.00
Length (ft)	= 99.00	1.00	1.00	0.00
Slope (%)	= 1.00	0.10	0.10	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	Yes	Yes	No

### Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 12.00	10.00	Inactive	Inactive
Crest El. (ft)	= 92.00	93.00	0.00	0.00
Weir Coeff.	= 2.60	2.60	3.33	3.33
Weir Type	= Broad	Broad	---	---
Multi-Stage	= Yes	No	No	No
Exfil.(in/hr)	= 0.000 (by Contour)			
TW Elev. (ft)	= 0.00			

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

### Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0	88.00	0.00	0.00	0.00	---	0.00	0.00	---	---	---	---	0.000
0.20	628	88.20	0.01 ic	0.01 ic	0.00	---	0.00	0.00	---	---	---	---	0.006
0.40	1,256	88.40	0.01 ic	0.01 ic	0.00	---	0.00	0.00	---	---	---	---	0.009
0.60	1,884	88.60	0.01 ic	0.01 ic	0.00	---	0.00	0.00	---	---	---	---	0.011
0.80	2,512	88.80	0.01 ic	0.01 ic	0.00	---	0.00	0.00	---	---	---	---	0.013
1.00	3,140	89.00	0.01 ic	0.01 ic	0.00	---	0.00	0.00	---	---	---	---	0.014
1.20	3,767	89.20	0.02 ic	0.02 ic	0.00	---	0.00	0.00	---	---	---	---	0.016
1.40	4,395	89.40	0.02 ic	0.02 ic	0.00	---	0.00	0.00	---	---	---	---	0.017
1.60	5,023	89.60	0.02 ic	0.02 ic	0.00	---	0.00	0.00	---	---	---	---	0.018
1.80	5,651	89.80	0.02 ic	0.02 ic	0.00	---	0.00	0.00	---	---	---	---	0.019
2.00	6,279	90.00	0.02 ic	0.02 ic	0.00	---	0.00	0.00	---	---	---	---	0.021
2.20	7,377	90.20	0.02 ic	0.02 ic	0.00	---	0.00	0.00	---	---	---	---	0.022
2.40	8,475	90.40	0.02 ic	0.02 ic	0.00	---	0.00	0.00	---	---	---	---	0.023
2.60	9,573	90.60	0.03 ic	0.02 ic	0.00	---	0.00	0.00	---	---	---	---	0.024
2.80	10,671	90.80	0.03 ic	0.02 ic	0.00	---	0.00	0.00	---	---	---	---	0.024
3.00	11,769	91.00	0.03 ic	0.03 ic	0.00	---	0.00	0.00	---	---	---	---	0.025
3.20	12,867	91.20	0.23 ic	0.03 ic	0.20 ic	---	0.00	0.00	---	---	---	---	0.229
3.40	13,965	91.40	0.56 ic	0.03 ic	0.52 ic	---	0.00	0.00	---	---	---	---	0.543
3.60	15,063	91.60	0.73 ic	0.03 ic	0.70 ic	---	0.00	0.00	---	---	---	---	0.731
3.80	16,161	91.80	0.90 ic	0.03 ic	0.85 ic	---	0.00	0.00	---	---	---	---	0.879
4.00	17,259	92.00	1.01 ic	0.03 ic	0.98 ic	---	0.00	0.00	---	---	---	---	1.005
4.10	17,915	92.10	2.07 ic	0.03 ic	1.03 ic	---	0.99	0.00	---	---	---	---	2.048
4.20	18,570	92.20	3.91 ic	0.03 ic	1.09 ic	---	2.79	0.00	---	---	---	---	3.904
4.30	19,226	92.30	6.29 oc	0.02 ic	1.14 ic	---	5.13	0.00	---	---	---	---	6.289
4.40	19,881	92.40	8.98 oc	0.01 ic	1.07 ic	---	7.89	0.00	---	---	---	---	8.977
4.50	20,537	92.50	10.09 oc	0.01 ic	0.55 ic	---	9.53 s	0.00	---	---	---	---	10.09
4.60	21,192	92.60	10.35 oc	0.01 ic	0.43 ic	---	9.92 s	0.00	---	---	---	---	10.35
4.70	21,848	92.70	10.54 oc	0.00 ic	0.35 ic	---	10.19 s	0.00	---	---	---	---	10.54
4.80	22,503	92.80	10.70 oc	0.00 ic	0.29 ic	---	10.40 s	0.00	---	---	---	---	10.70
4.90	23,159	92.90	10.84 oc	0.00 ic	0.25 ic	---	10.59 s	0.00	---	---	---	---	10.84
5.00	23,814	93.00	10.98 oc	0.00 ic	0.22 ic	---	10.75 s	0.00	---	---	---	---	10.97
5.05	24,196	93.05	11.04 oc	0.00 ic	0.21 ic	---	10.83 s	0.29	---	---	---	---	11.33
5.10	24,577	93.10	11.10 oc	0.00 ic	0.20 ic	---	10.90 s	0.82	---	---	---	---	11.92
5.15	24,959	93.15	11.17 oc	0.00 ic	0.18 ic	---	10.97 s	1.51	---	---	---	---	12.67
5.20	25,341	93.20	11.23 oc	0.00 ic	0.17 ic	---	11.04 s	2.33	---	---	---	---	13.54
5.25	25,723	93.25	11.29 oc	0.00 ic	0.17 ic	---	11.11 s	3.25	---	---	---	---	14.53
5.30	26,104	93.30	11.35 oc	0.00 ic	0.16 ic	---	11.17 s	4.27	---	---	---	---	15.60
5.35	26,486	93.35	11.40 oc	0.00 ic	0.15 ic	---	11.25 s	5.38	---	---	---	---	16.79

Continues on next page...

Major Basin

**Stage / Storage / Discharge Table**

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
5.40	26,868	93.40	11.46 oc	0.00 ic	0.14 ic	---	11.29 s	6.58	---	---	---	---	18.02
5.45	27,249	93.45	11.52 oc	0.00 ic	0.14 ic	---	11.36 s	7.85	---	---	---	---	19.35
5.50	27,631	93.50	11.58 oc	0.00 ic	0.13 ic	---	11.43 s	9.19	---	---	---	---	20.75

...End

# Hydrograph Report

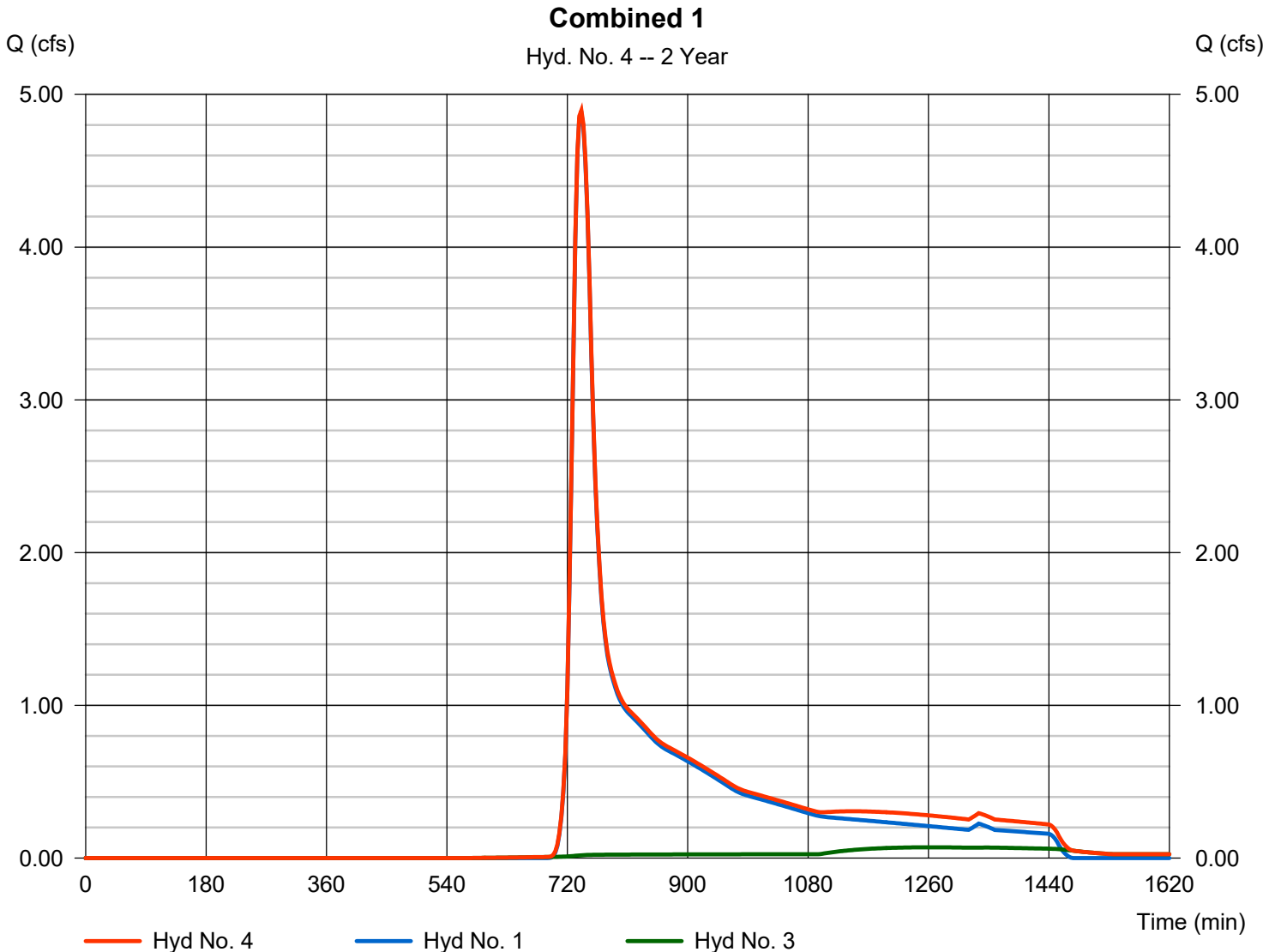
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

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## Hyd. No. 4

Combined 1

Hydrograph type	= Combine	Peak discharge	= 4.895 cfs
Storm frequency	= 2 yrs	Time to peak	= 741 min
Time interval	= 3 min	Hyd. volume	= 37,986 cuft
Inflow hyds.	= 1, 3	Contrib. drain. area	= 9.920 ac



# Hydrograph Report

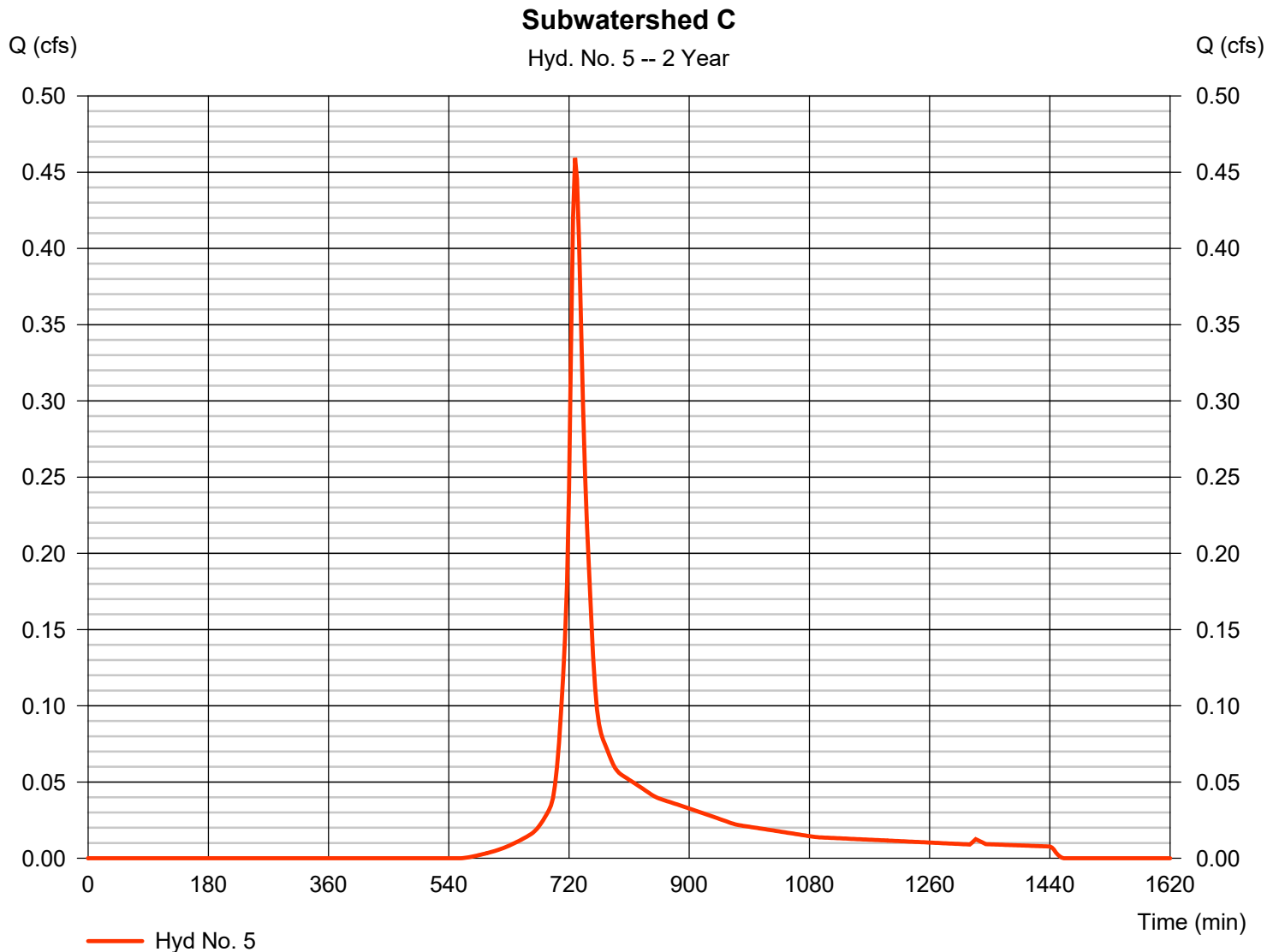
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## Hyd. No. 5

Subwatershed C

Hydrograph type	= SCS Runoff	Peak discharge	= 0.459 cfs
Storm frequency	= 2 yrs	Time to peak	= 729 min
Time interval	= 3 min	Hyd. volume	= 1,829 cuft
Drainage area	= 0.330 ac	Curve number	= 79
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 13.20 min
Total precip.	= 3.45 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



# TR55 Tc Worksheet

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

## Hyd. No. 5

Subwatershed C

<u>Description</u>	<u>A</u>	<u>B</u>	<u>C</u>	<u>Totals</u>
<b>Sheet Flow</b>				
Manning's n-value	= 0.240	0.011	0.011	
Flow length (ft)	= 150.0	0.0	0.0	
Two-year 24-hr precip. (in)	= 3.45	0.00	0.00	
Land slope (%)	= 6.10	0.00	0.00	
<b>Travel Time (min)</b>	<b>= 12.17</b>	<b>+ 0.00</b>	<b>+ 0.00</b>	<b>= 12.17</b>
<b>Shallow Concentrated Flow</b>				
Flow length (ft)	= 57.00	45.00	79.00	
Watercourse slope (%)	= 2.50	5.00	1.90	
Surface description	= Unpaved	Paved	Paved	
Average velocity (ft/s)	=2.55	4.55	2.80	
<b>Travel Time (min)</b>	<b>= 0.37</b>	<b>+ 0.16</b>	<b>+ 0.47</b>	<b>= 1.01</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>+ 0.00</b>	<b>+ 0.00</b>	<b>= 0.00</b>
<b>Total Travel Time, Tc .....</b>				<b>13.20 min</b>

# Hydrograph Report

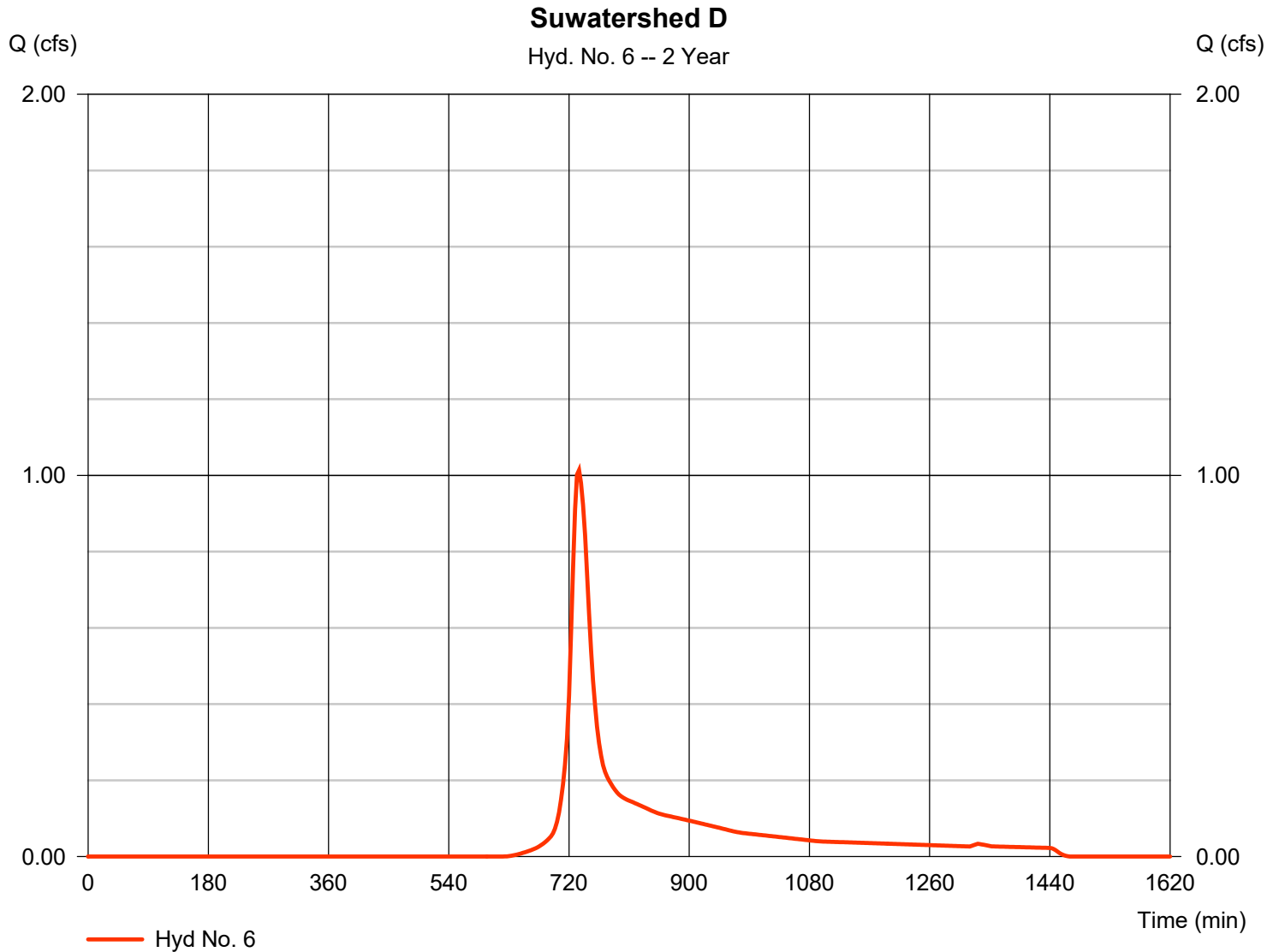
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## Hyd. No. 6

Suwatershed D

Hydrograph type	= SCS Runoff	Peak discharge	= 1.014 cfs
Storm frequency	= 2 yrs	Time to peak	= 735 min
Time interval	= 3 min	Hyd. volume	= 4,738 cuft
Drainage area	= 1.050 ac	Curve number	= 74
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 18.40 min
Total precip.	= 3.45 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



# TR55 Tc Worksheet

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

## Hyd. No. 6

Suwatershed D

<u>Description</u>	<u>A</u>	<u>B</u>	<u>C</u>	<u>Totals</u>
<b>Sheet Flow</b>				
Manning's n-value	= 0.240	0.011	0.011	
Flow length (ft)	= 150.0	0.0	0.0	
Two-year 24-hr precip. (in)	= 3.45	0.00	0.00	
Land slope (%)	= 3.70	0.00	0.00	
<b>Travel Time (min)</b>	<b>= 14.86</b>	<b>+ 0.00</b>	<b>+ 0.00</b>	<b>= 14.86</b>
<b>Shallow Concentrated Flow</b>				
Flow length (ft)	= 488.00	151.00	0.00	
Watercourse slope (%)	= 3.30	3.00	0.00	
Surface description	= Unpaved	Paved	Paved	
Average velocity (ft/s)	=2.93	3.52	0.00	
<b>Travel Time (min)</b>	<b>= 2.77</b>	<b>+ 0.71</b>	<b>+ 0.00</b>	<b>= 3.49</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>+ 0.00</b>	<b>+ 0.00</b>	<b>= 0.00</b>
<b>Total Travel Time, Tc .....</b>				<b>18.40 min</b>

# Hydrograph Report

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

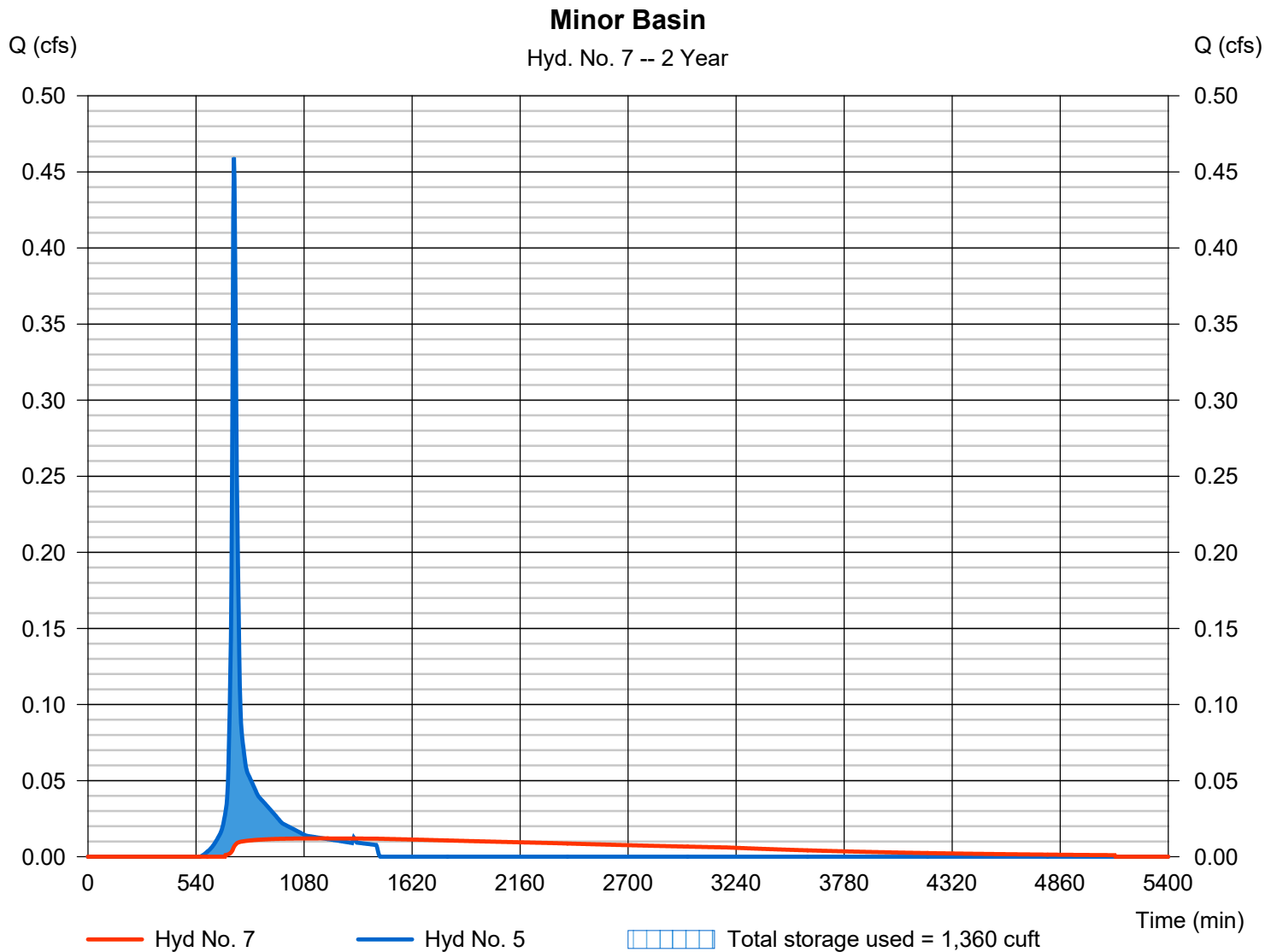
Friday, 11 / 13 / 2020

## Hyd. No. 7

Minor Basin

Hydrograph type	= Reservoir	Peak discharge	= 0.012 cfs
Storm frequency	= 2 yrs	Time to peak	= 1179 min
Time interval	= 3 min	Hyd. volume	= 1,765 cuft
Inflow hyd. No.	= 5 - Subwatershed C	Max. Elevation	= 82.70 ft
Reservoir name	= Minor Basin	Max. Storage	= 1,360 cuft

Storage Indication method used.





# Pond Report

## Pond No. 2 - Minor Basin

### Pond Data

Contours -User-defined contour areas. Average end area method used for volume calculation. Beginning Elevation = 82.00 ft

### Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	82.00	1,278	0	0
2.00	84.00	2,635	3,913	3,913
2.50	84.50	3,034	1,417	5,330

### Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 15.00	0.75	Inactive	Inactive
Span (in)	= 15.00	0.75	12.00	0.00
No. Barrels	= 1	1	1	0
Invert El. (ft)	= 78.70	82.00	90.00	0.00
Length (ft)	= 57.00	1.00	1.00	0.00
Slope (%)	= 1.00	0.10	0.10	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	Yes	Yes	No

### Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 12.00	10.00	Inactive	Inactive
Crest El. (ft)	= 83.00	84.00	0.00	0.00
Weir Coeff.	= 2.60	2.60	3.33	3.33
Weir Type	= Broad	Broad	---	---
Multi-Stage	= Yes	No	No	No
Exfil.(in/hr)	= 0.000 (by Contour)			
TW Elev. (ft)	= 0.00			

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

### Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Civ A cfs	Civ B cfs	Civ C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0	82.00	0.00	0.00	0.00	---	0.00	0.00	---	---	---	---	0.000
0.20	391	82.20	9.50 oc	0.01 ic	0.00	---	0.00	0.00	---	---	---	---	0.006
0.40	783	82.40	9.50 oc	0.01 ic	0.00	---	0.00	0.00	---	---	---	---	0.009
0.60	1,174	82.60	9.50 oc	0.01 ic	0.00	---	0.00	0.00	---	---	---	---	0.011
0.80	1,565	82.80	9.50 oc	0.01 ic	0.00	---	0.00	0.00	---	---	---	---	0.013
1.00	1,957	83.00	9.50 oc	0.01 ic	0.00	---	0.00	0.00	---	---	---	---	0.015
1.20	2,348	83.20	9.50 oc	0.02 ic	0.00	---	2.79	0.00	---	---	---	---	2.806
1.40	2,739	83.40	9.50 oc	0.02 ic	0.00	---	7.89	0.00	---	---	---	---	7.910
1.60	3,130	83.60	11.69 oc	0.01 ic	0.00	---	11.68 s	0.00	---	---	---	---	11.69
1.80	3,522	83.80	12.18 oc	0.01 ic	0.00	---	12.18 s	0.00	---	---	---	---	12.18
2.00	3,913	84.00	12.53 oc	0.00 ic	0.00	---	12.53 s	0.00	---	---	---	---	12.53
2.05	4,055	84.05	12.61 oc	0.00 ic	0.00	---	12.60 s	0.29	---	---	---	---	12.90
2.10	4,196	84.10	12.69 oc	0.00 ic	0.00	---	12.68 s	0.82	---	---	---	---	13.50
2.15	4,338	84.15	12.76 oc	0.00 ic	0.00	---	12.76 s	1.51	---	---	---	---	14.27
2.20	4,480	84.20	12.84 oc	0.00 ic	0.00	---	12.83 s	2.33	---	---	---	---	15.16
2.25	4,622	84.25	12.91 oc	0.00 ic	0.00	---	12.91 s	3.25	---	---	---	---	16.16
2.30	4,763	84.30	12.98 oc	0.00 ic	0.00	---	12.97 s	4.27	---	---	---	---	17.25
2.35	4,905	84.35	13.05 oc	0.00 ic	0.00	---	13.03 s	5.38	---	---	---	---	18.42
2.40	5,047	84.40	13.12 oc	0.00 ic	0.00	---	13.11 s	6.58	---	---	---	---	19.70
2.45	5,189	84.45	13.19 oc	0.00 ic	0.00	---	13.18 s	7.85	---	---	---	---	21.03
2.50	5,330	84.50	13.26 oc	0.00 ic	0.00	---	13.24 s	9.19	---	---	---	---	22.43

# Hydrograph Report

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

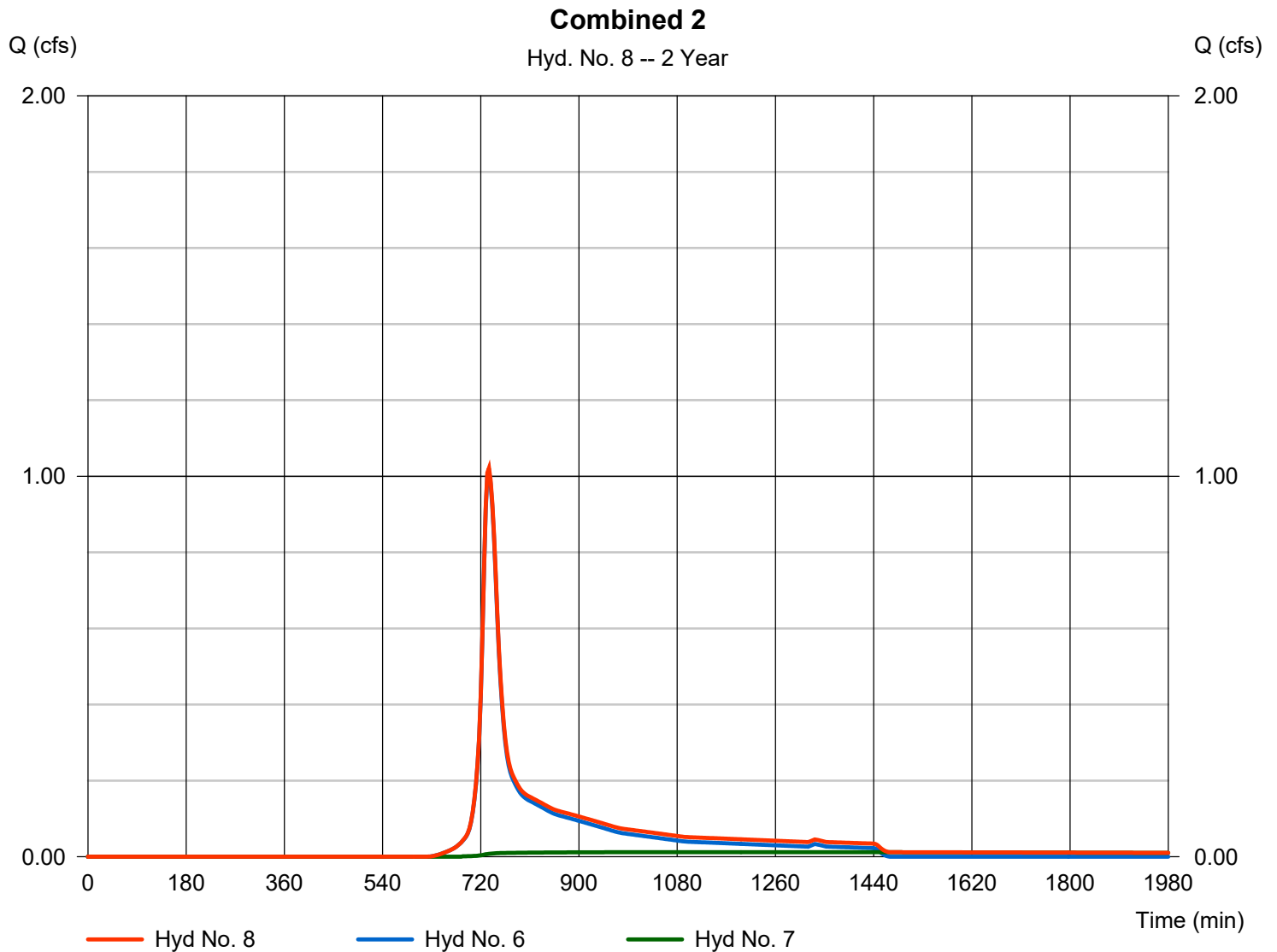
Friday, 11 / 13 / 2020

## Hyd. No. 8

Combined 2

Hydrograph type = Combine  
Storm frequency = 2 yrs  
Time interval = 3 min  
Inflow hyds. = 6, 7

Peak discharge = 1.022 cfs  
Time to peak = 735 min  
Hyd. volume = 6,503 cuft  
Contrib. drain. area = 1.050 ac



# Hydrograph Report

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

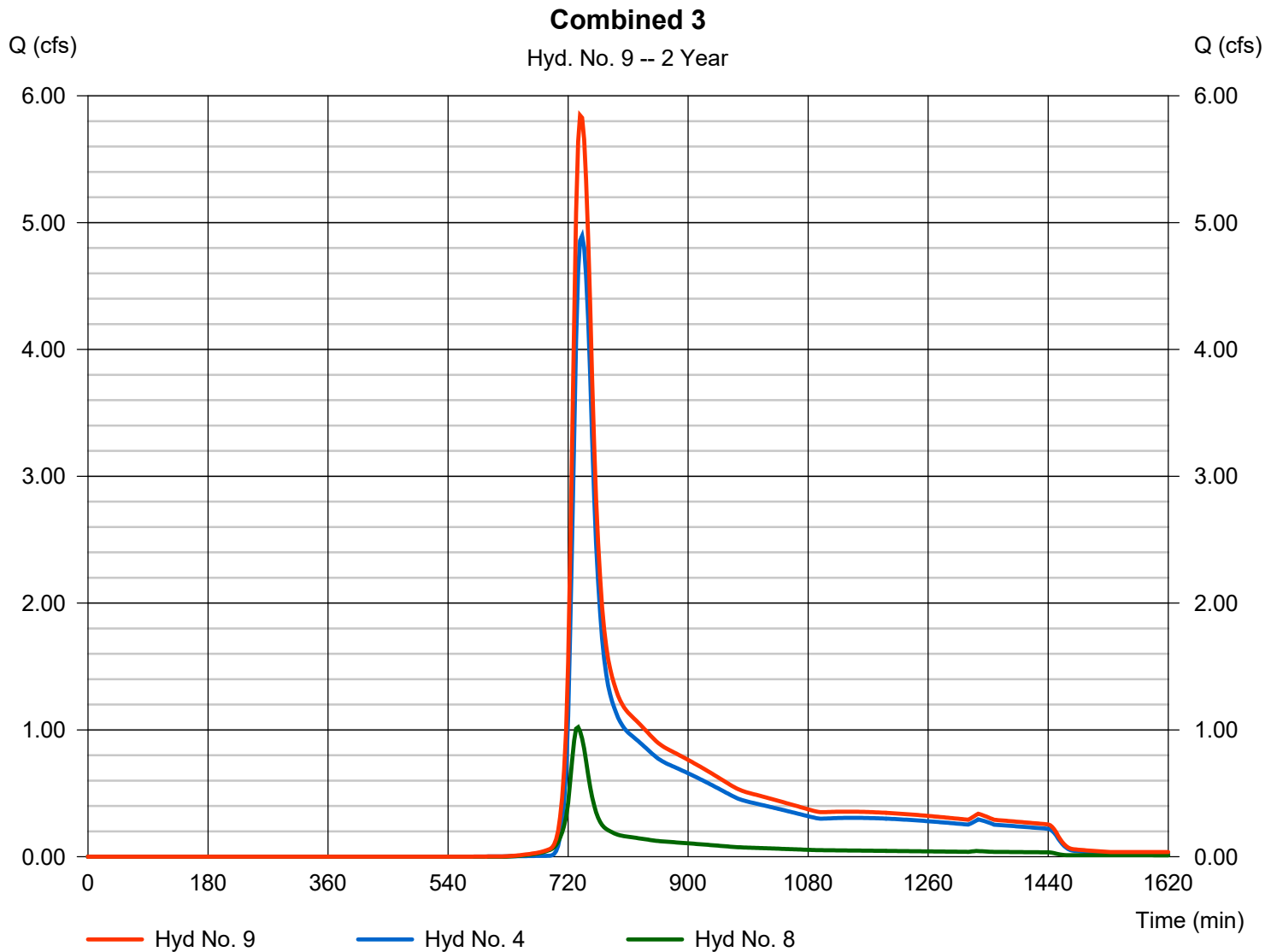
Friday, 11 / 13 / 2020

## Hyd. No. 9

Combined 3

Hydrograph type = Combine  
Storm frequency = 2 yrs  
Time interval = 3 min  
Inflow hyds. = 4, 8

Peak discharge = 5.846 cfs  
Time to peak = 738 min  
Hyd. volume = 44,489 cuft  
Contrib. drain. area = 0.000 ac



# Hydrograph Summary Report

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

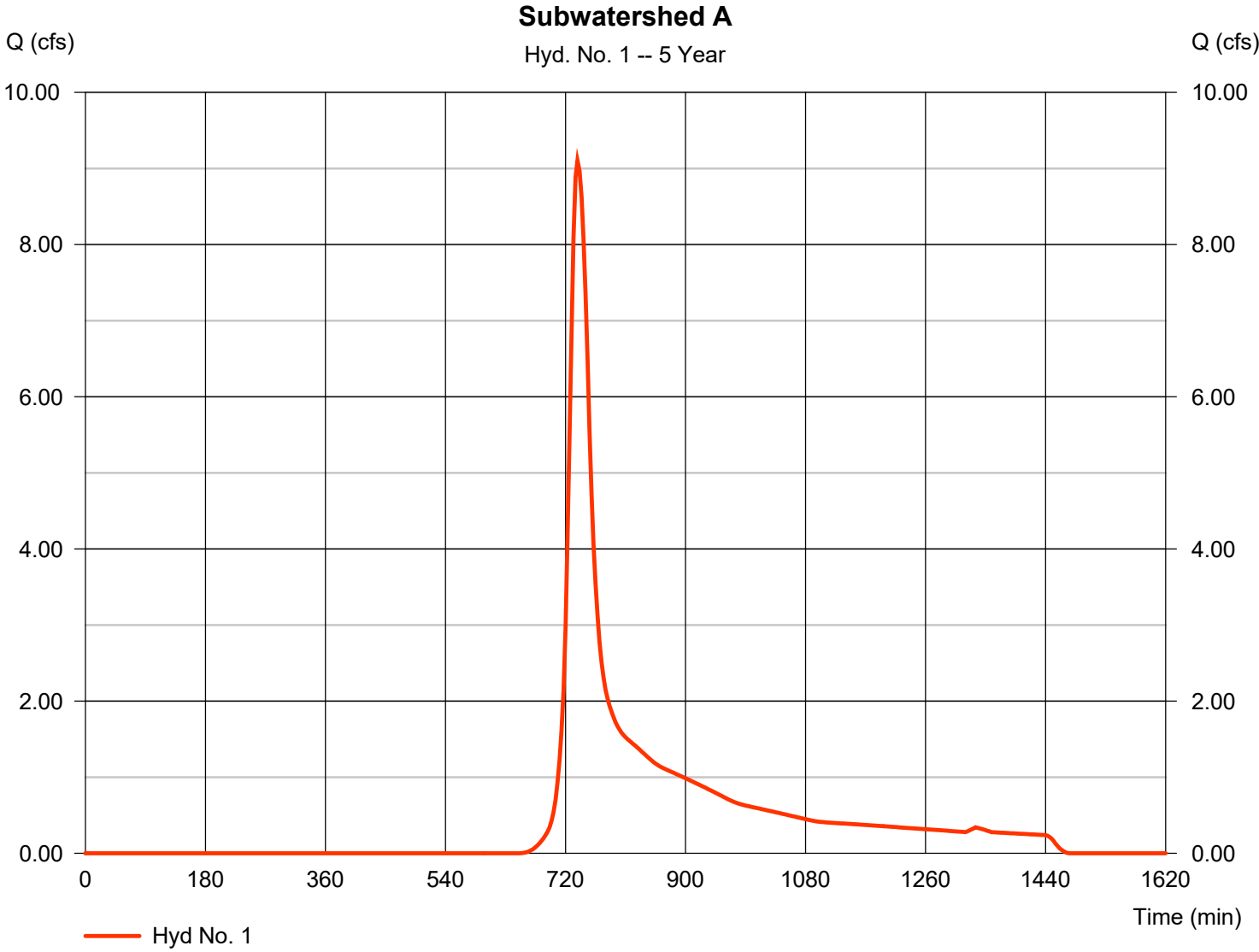
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	9.104	3	738	46,562	----	----	----	Subwatershed A
2	SCS Runoff	4.170	3	735	19,911	----	----	----	Subwatershed B
3	Reservoir	0.348	3	876	16,848	2	91.28	13,284	Major Basin
4	Combine	9.125	3	738	63,409	1, 3	----	----	Combined 1
5	SCS Runoff	0.695	3	729	2,737	----	----	----	Subwatershed C
6	SCS Runoff	1.627	3	732	7,422	----	----	----	Suwatershed D
7	Reservoir	0.041	3	921	2,672	5	83.00	1,960	Minor Basin
8	Combine	1.637	3	732	10,094	6, 7	----	----	Combined 2
9	Combine	10.69	3	738	73,503	4, 8	----	----	Combined 3
Proposed (REV1 FINAL 11-13-2020).gpw					Return Period: 5 Year			Friday, 11 / 13 / 2020	

# Hydrograph Report

## Hyd. No. 1

Subwatershed A

Hydrograph type	= SCS Runoff	Peak discharge	= 9.104 cfs
Storm frequency	= 5 yrs	Time to peak	= 738 min
Time interval	= 3 min	Hyd. volume	= 46,562 cuft
Drainage area	= 9.920 ac	Curve number	= 66
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 23.80 min
Total precip.	= 4.39 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



# Hydrograph Report

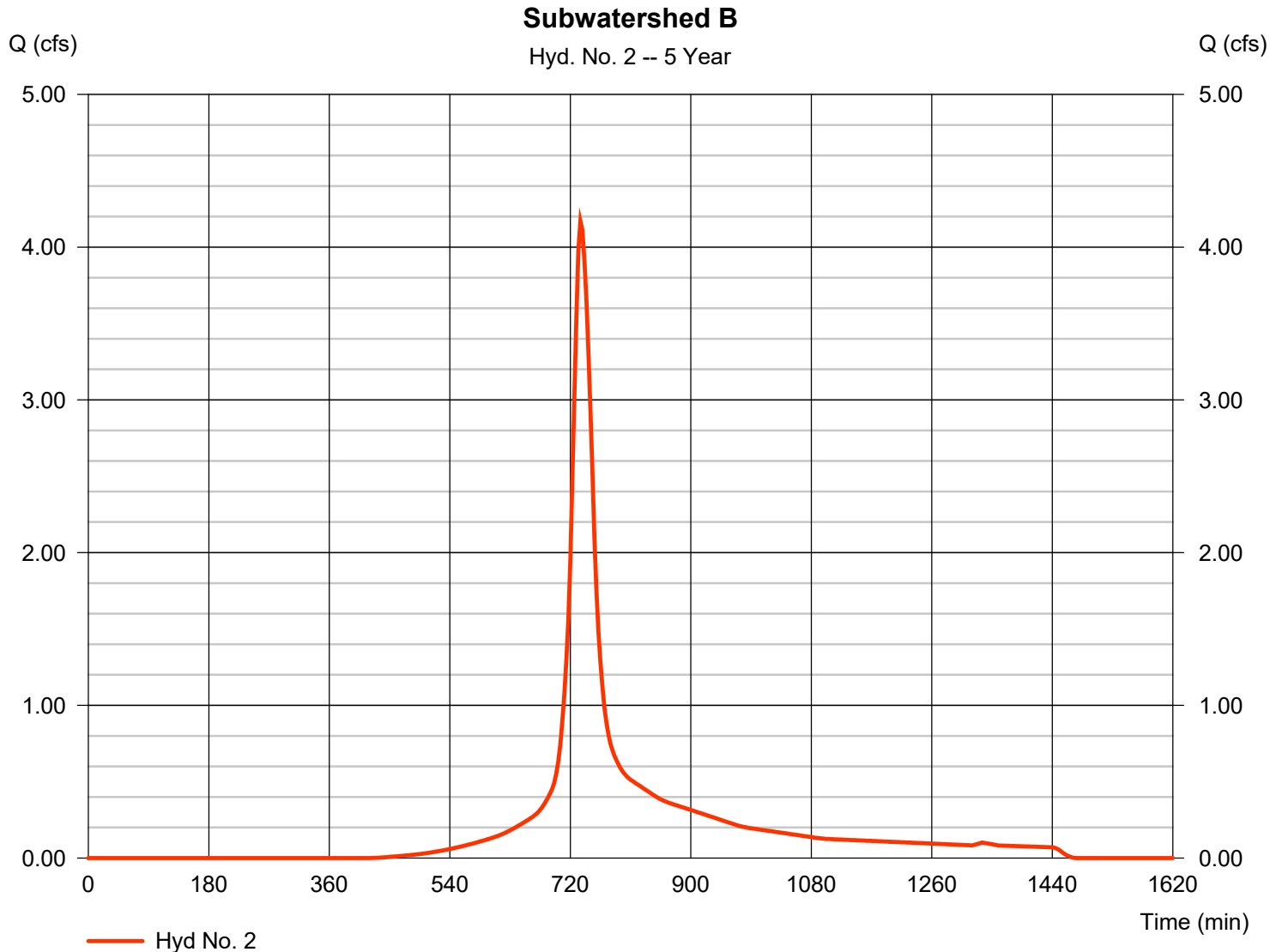
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

Friday, 11 / 13 / 2020

## Hyd. No. 2

Subwatershed B

Hydrograph type	= SCS Runoff	Peak discharge	= 4.170 cfs
Storm frequency	= 5 yrs	Time to peak	= 735 min
Time interval	= 3 min	Hyd. volume	= 19,911 cuft
Drainage area	= 2.070 ac	Curve number	= 84
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 20.30 min
Total precip.	= 4.39 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



# Hydrograph Report

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

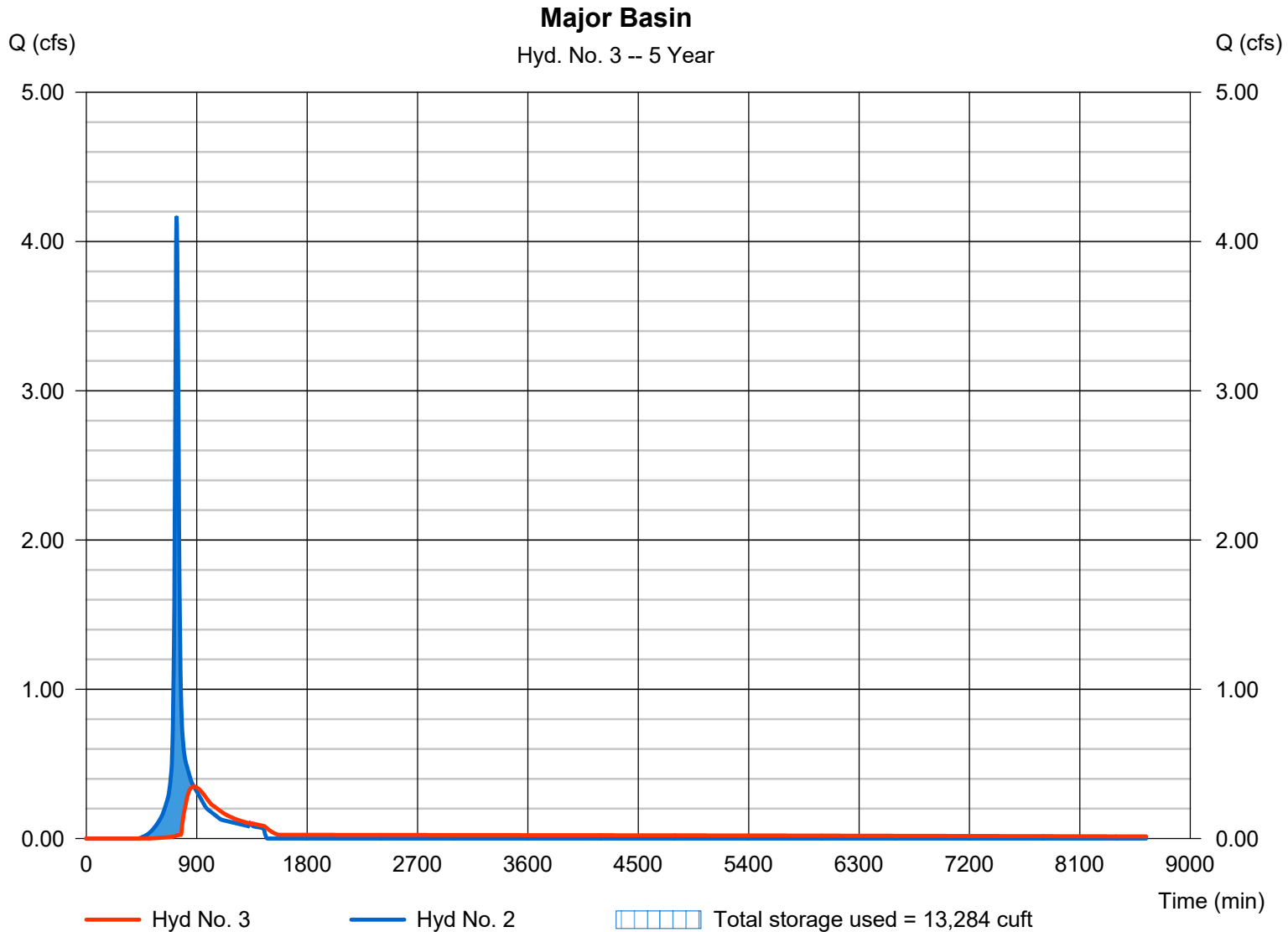
Friday, 11 / 13 / 2020

## Hyd. No. 3

Major Basin

Hydrograph type	= Reservoir	Peak discharge	= 0.348 cfs
Storm frequency	= 5 yrs	Time to peak	= 876 min
Time interval	= 3 min	Hyd. volume	= 16,848 cuft
Inflow hyd. No.	= 2 - Subwatershed B	Max. Elevation	= 91.28 ft
Reservoir name	= Major Basin	Max. Storage	= 13,284 cuft

Storage Indication method used.



# Hydrograph Report

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

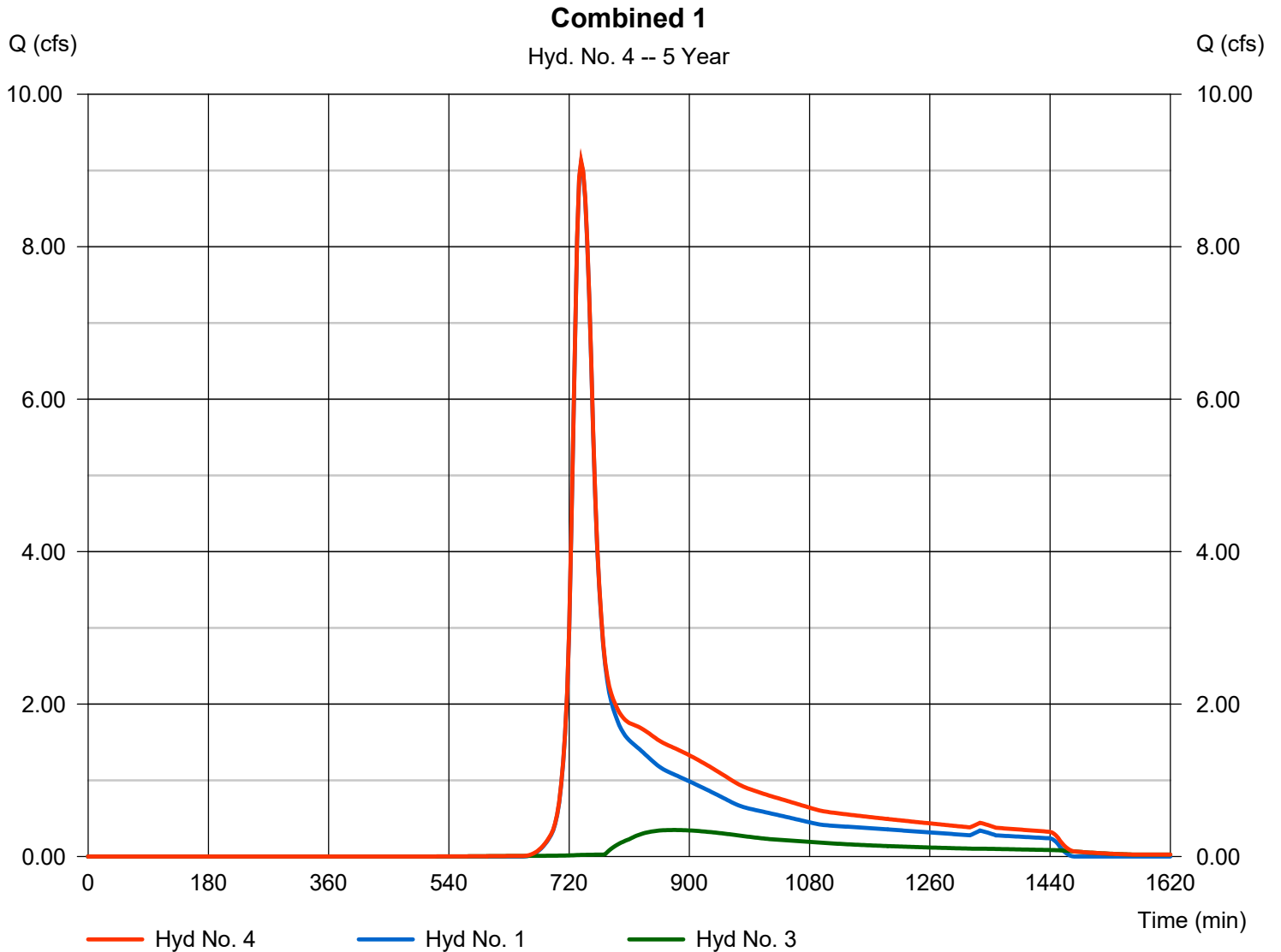
Friday, 11 / 13 / 2020

## Hyd. No. 4

Combined 1

Hydrograph type = Combine  
Storm frequency = 5 yrs  
Time interval = 3 min  
Inflow hyds. = 1, 3

Peak discharge = 9.125 cfs  
Time to peak = 738 min  
Hyd. volume = 63,409 cuft  
Contrib. drain. area = 9.920 ac





# Hydrograph Report

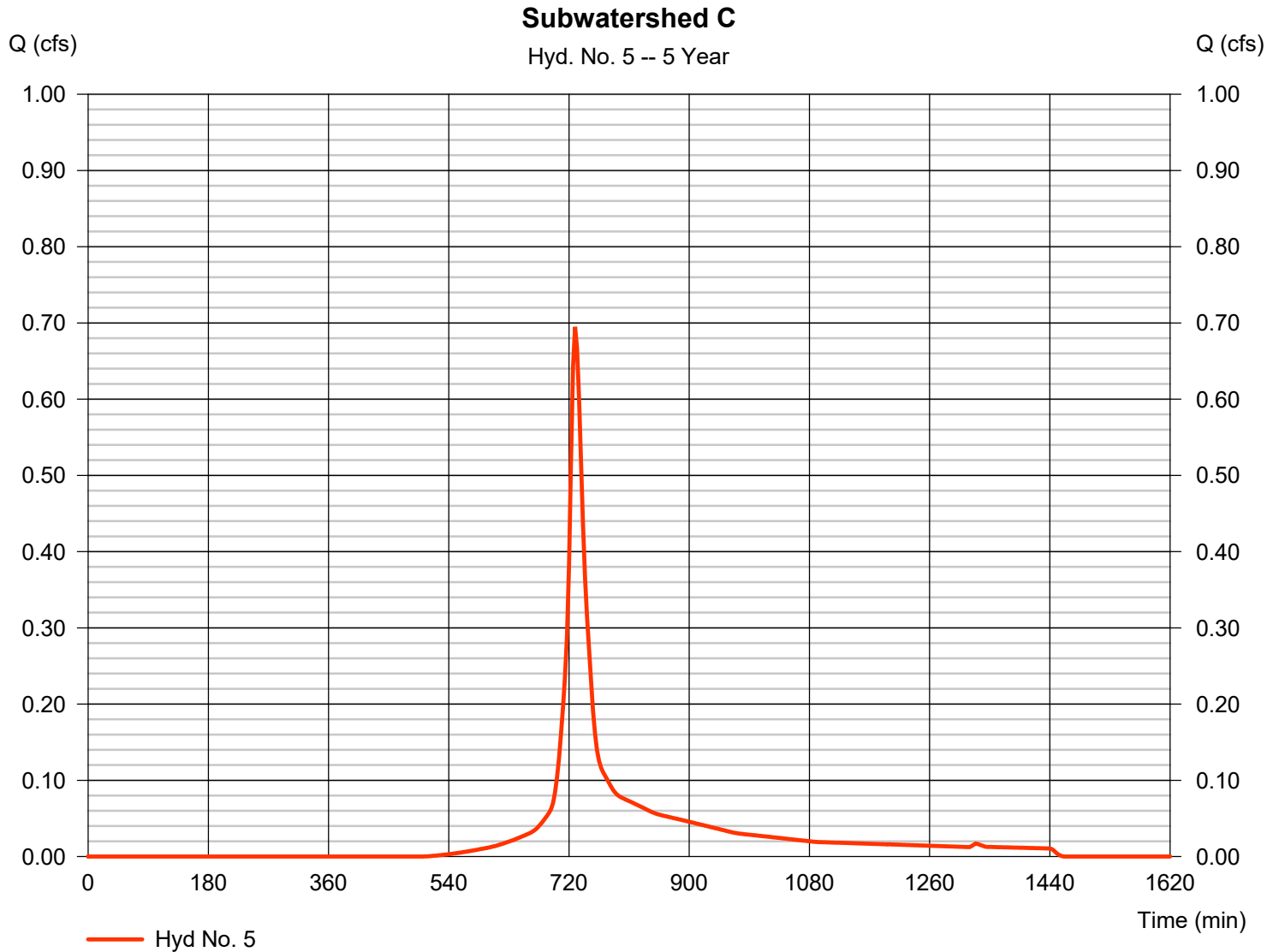
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

Friday, 11 / 13 / 2020

## Hyd. No. 5

Subwatershed C

Hydrograph type	= SCS Runoff	Peak discharge	= 0.695 cfs
Storm frequency	= 5 yrs	Time to peak	= 729 min
Time interval	= 3 min	Hyd. volume	= 2,737 cuft
Drainage area	= 0.330 ac	Curve number	= 79
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 13.20 min
Total precip.	= 4.39 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



# Hydrograph Report

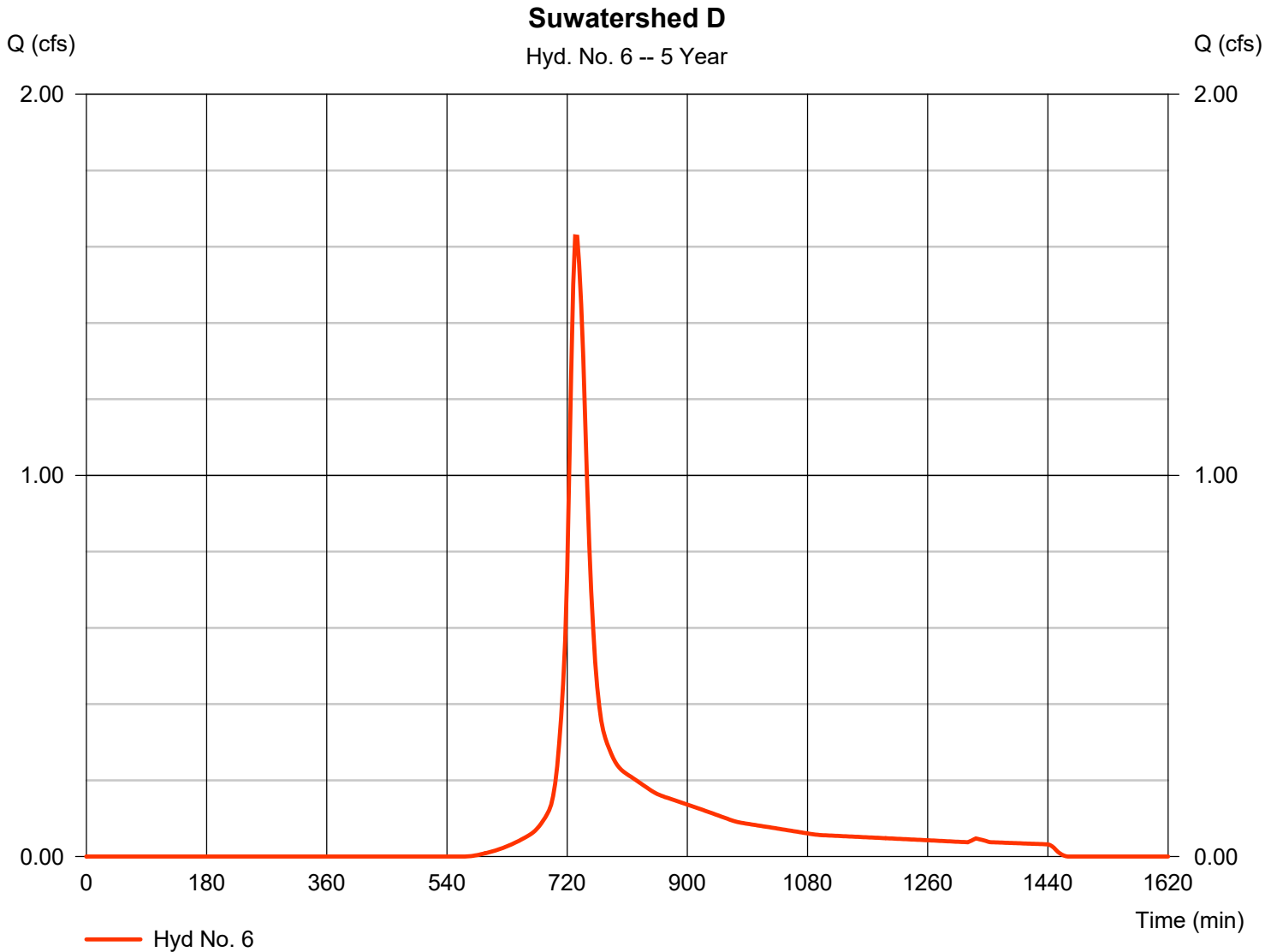
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

Friday, 11 / 13 / 2020

## Hyd. No. 6

Suwatershed D

Hydrograph type	= SCS Runoff	Peak discharge	= 1.627 cfs
Storm frequency	= 5 yrs	Time to peak	= 732 min
Time interval	= 3 min	Hyd. volume	= 7,422 cuft
Drainage area	= 1.050 ac	Curve number	= 74
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 18.40 min
Total precip.	= 4.39 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



# Hydrograph Report

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

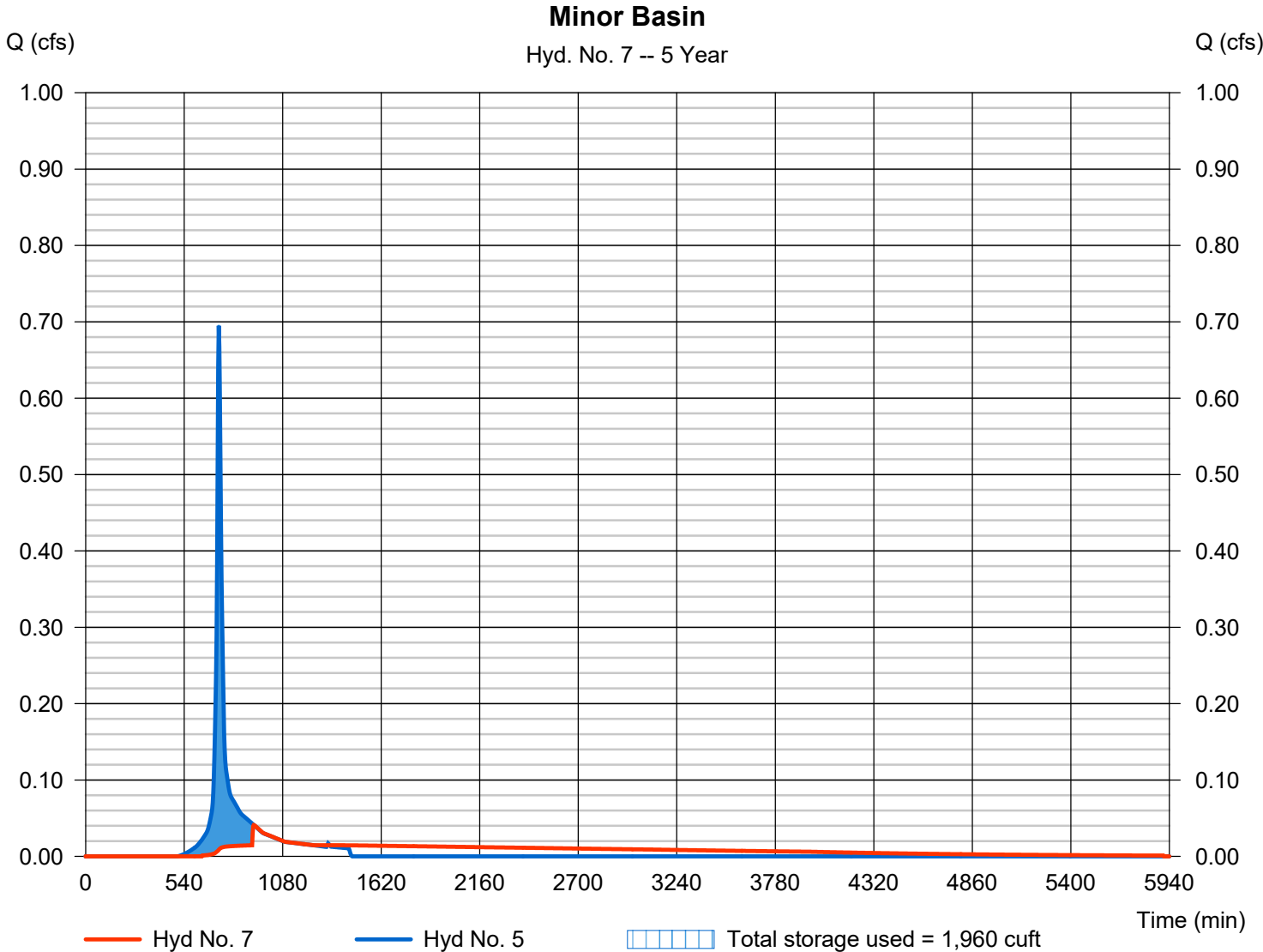
Friday, 11 / 13 / 2020

## Hyd. No. 7

Minor Basin

Hydrograph type	= Reservoir	Peak discharge	= 0.041 cfs
Storm frequency	= 5 yrs	Time to peak	= 921 min
Time interval	= 3 min	Hyd. volume	= 2,672 cuft
Inflow hyd. No.	= 5 - Subwatershed C	Max. Elevation	= 83.00 ft
Reservoir name	= Minor Basin	Max. Storage	= 1,960 cuft

Storage Indication method used.



# Hydrograph Report

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

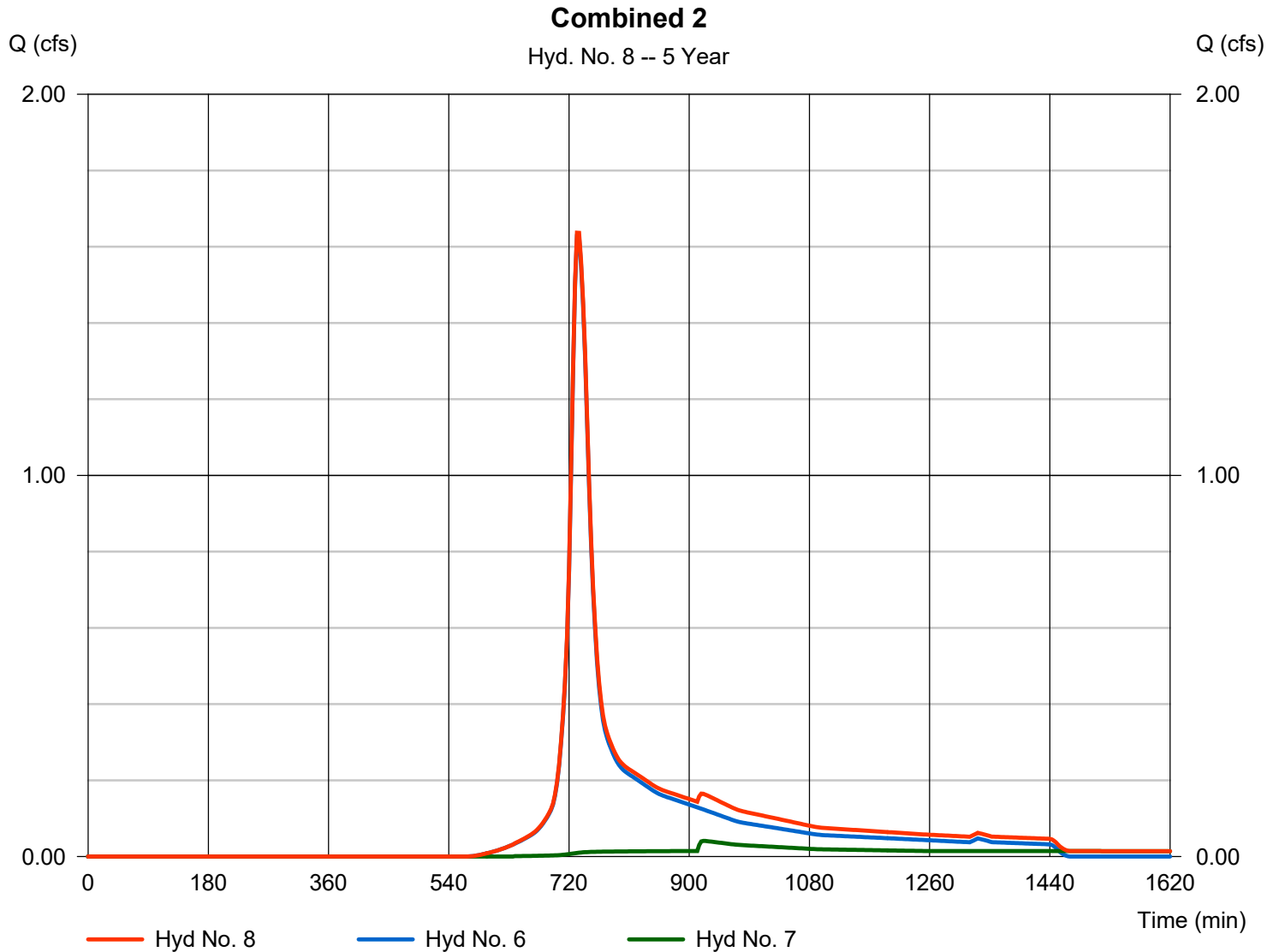
Friday, 11 / 13 / 2020

## Hyd. No. 8

Combined 2

Hydrograph type = Combine  
Storm frequency = 5 yrs  
Time interval = 3 min  
Inflow hyds. = 6, 7

Peak discharge = 1.637 cfs  
Time to peak = 732 min  
Hyd. volume = 10,094 cuft  
Contrib. drain. area = 1.050 ac



# Hydrograph Report

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

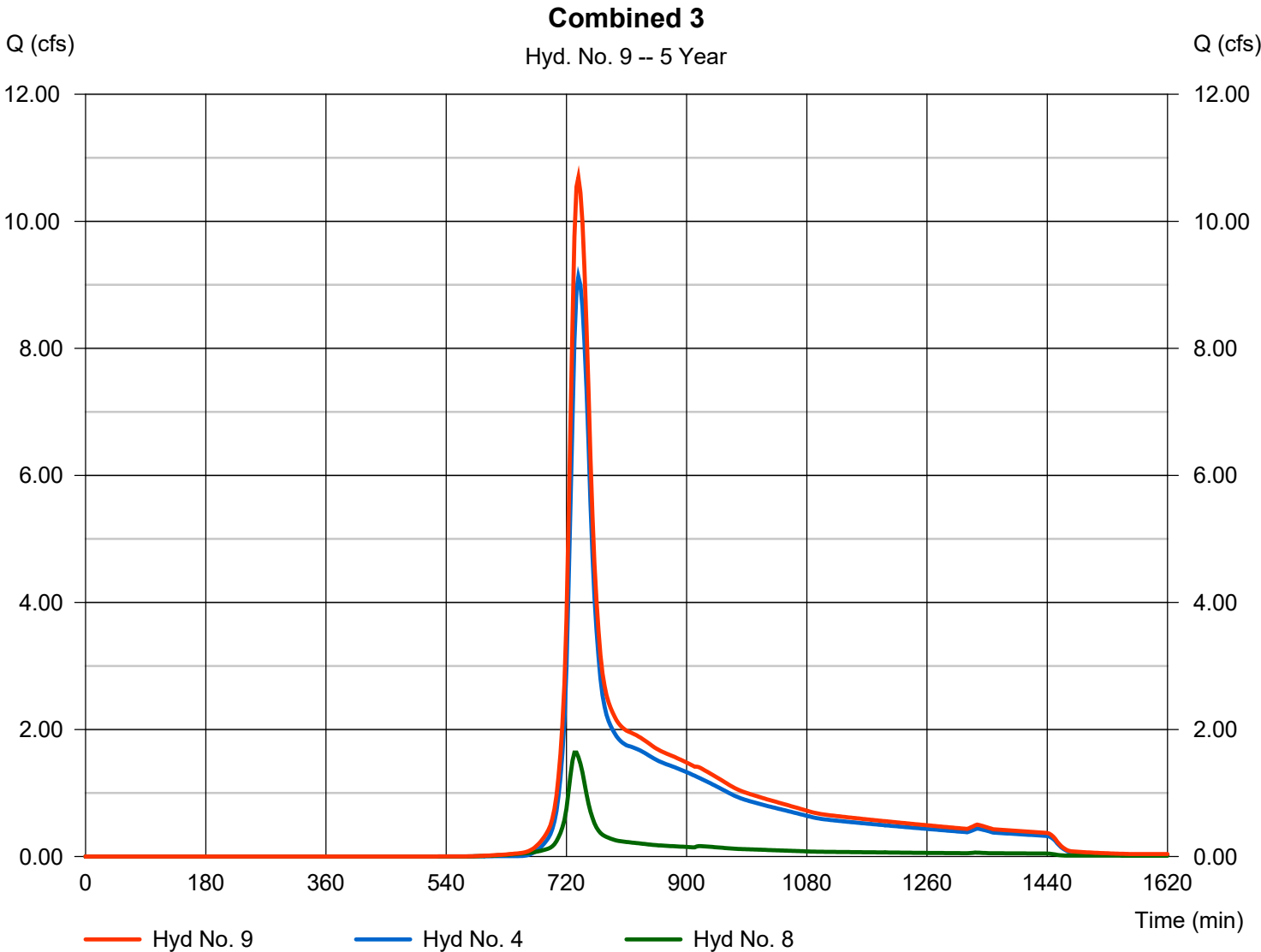
Friday, 11 / 13 / 2020

## Hyd. No. 9

Combined 3

Hydrograph type = Combine  
Storm frequency = 5 yrs  
Time interval = 3 min  
Inflow hyds. = 4, 8

Peak discharge = 10.69 cfs  
Time to peak = 738 min  
Hyd. volume = 73,503 cuft  
Contrib. drain. area = 0.000 ac



# Hydrograph Summary Report

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

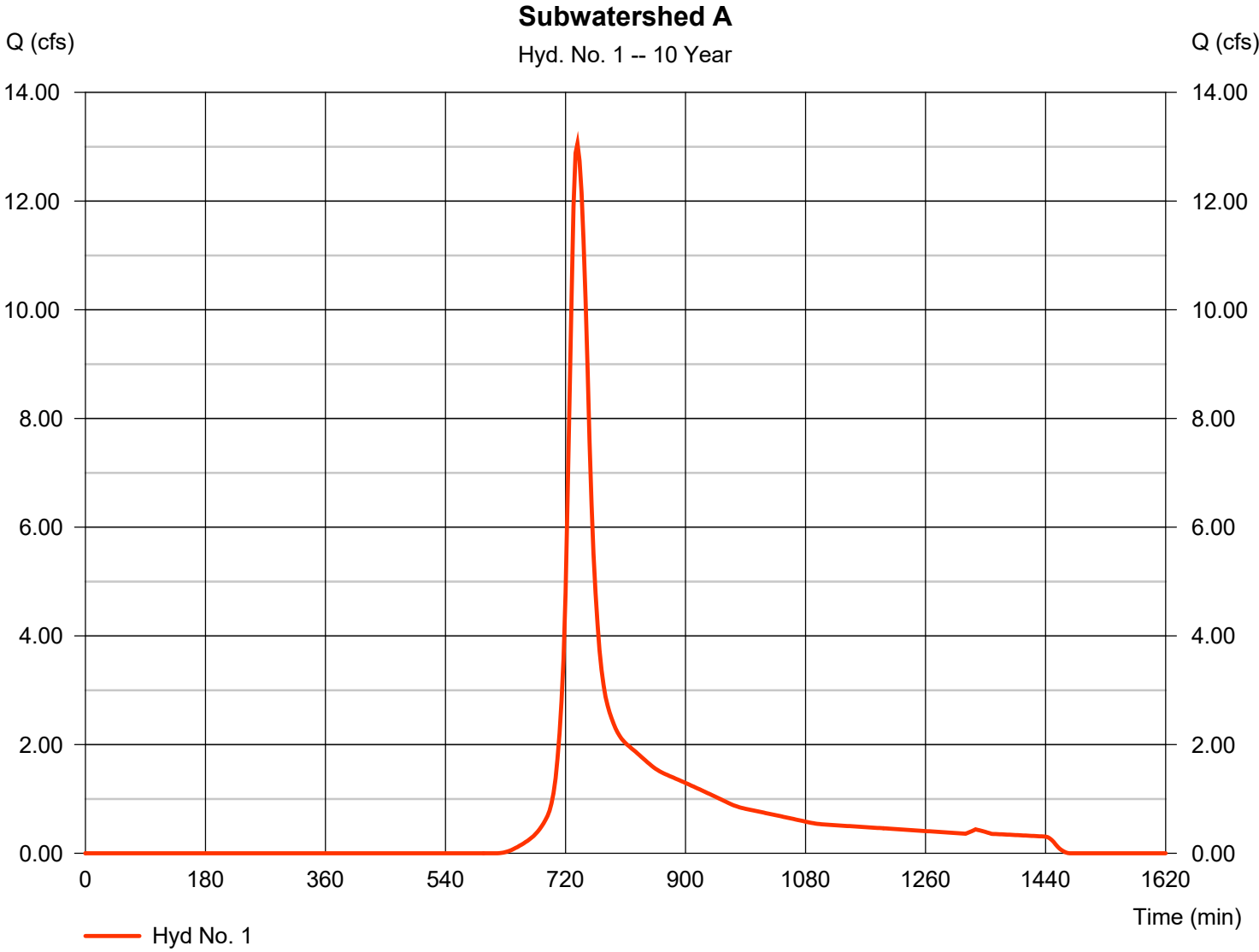
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	13.06	3	738	64,757	-----	-----	-----	Subwatershed A
2	SCS Runoff	5.238	3	735	25,102	-----	-----	-----	Subwatershed B
3	Reservoir	0.687	3	798	22,024	2	91.55	14,809	Major Basin
4	Combine	13.08	3	738	86,781	1, 3	-----	-----	Combined 1
5	SCS Runoff	0.898	3	729	3,532	-----	-----	-----	Subwatershed C
6	SCS Runoff	2.182	3	732	9,829	-----	-----	-----	Suwatershed D
7	Reservoir	0.149	3	768	3,468	5	83.01	1,975	Minor Basin
8	Combine	2.193	3	732	13,296	6, 7	-----	-----	Combined 2
9	Combine	15.15	3	738	100,077	4, 8	-----	-----	Combined 3
Proposed (REV1 FINAL 11-13-2020).gpw					Return Period: 10 Year			Friday, 11 / 13 / 2020	

# Hydrograph Report

## Hyd. No. 1

Subwatershed A

Hydrograph type	= SCS Runoff	Peak discharge	= 13.06 cfs
Storm frequency	= 10 yrs	Time to peak	= 738 min
Time interval	= 3 min	Hyd. volume	= 64,757 cuft
Drainage area	= 9.920 ac	Curve number	= 66
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 23.80 min
Total precip.	= 5.17 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



# Hydrograph Report

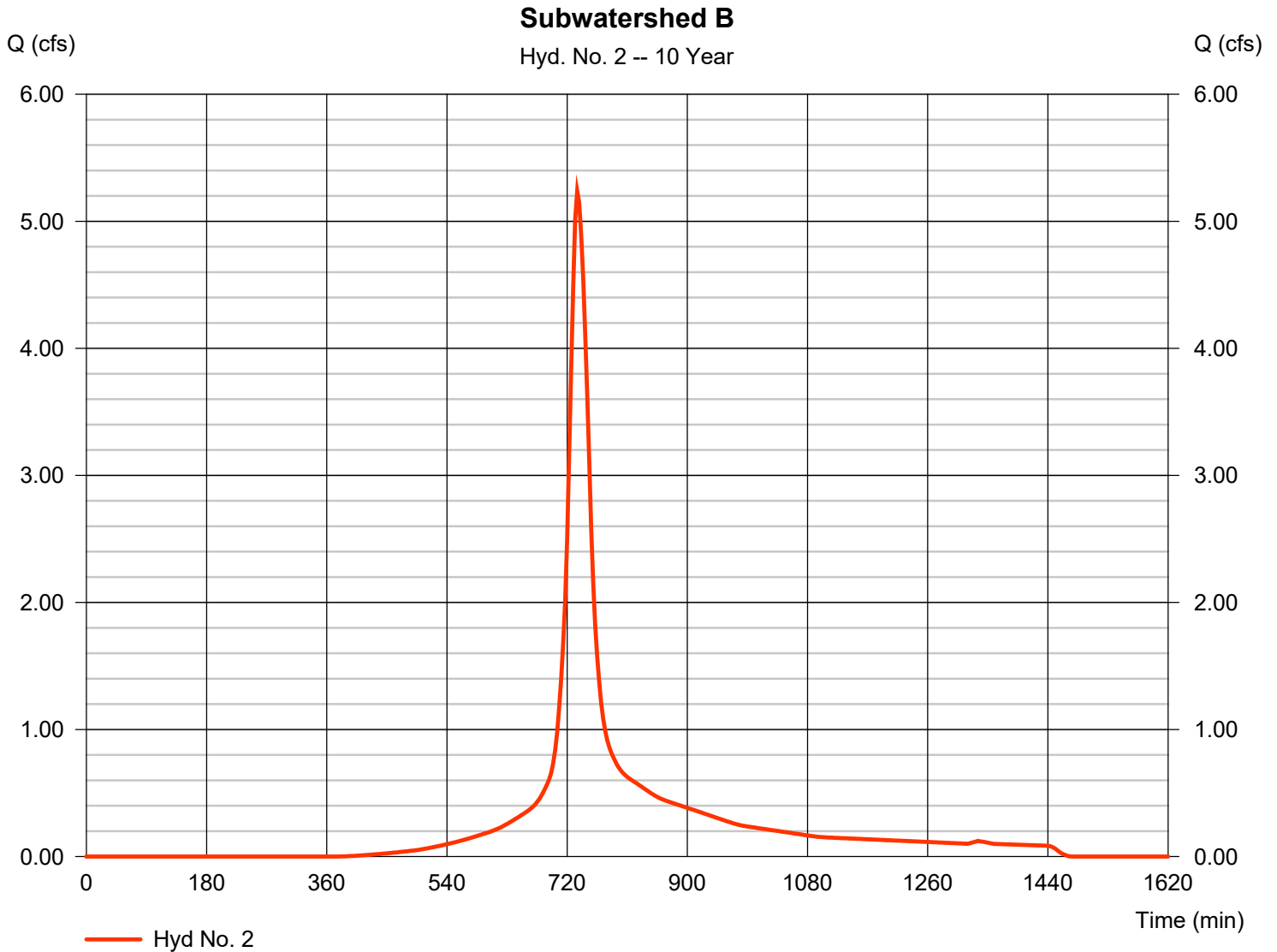
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

Friday, 11 / 13 / 2020

## Hyd. No. 2

Subwatershed B

Hydrograph type	= SCS Runoff	Peak discharge	= 5.238 cfs
Storm frequency	= 10 yrs	Time to peak	= 735 min
Time interval	= 3 min	Hyd. volume	= 25,102 cuft
Drainage area	= 2.070 ac	Curve number	= 84
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 20.30 min
Total precip.	= 5.17 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484





# Hydrograph Report

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

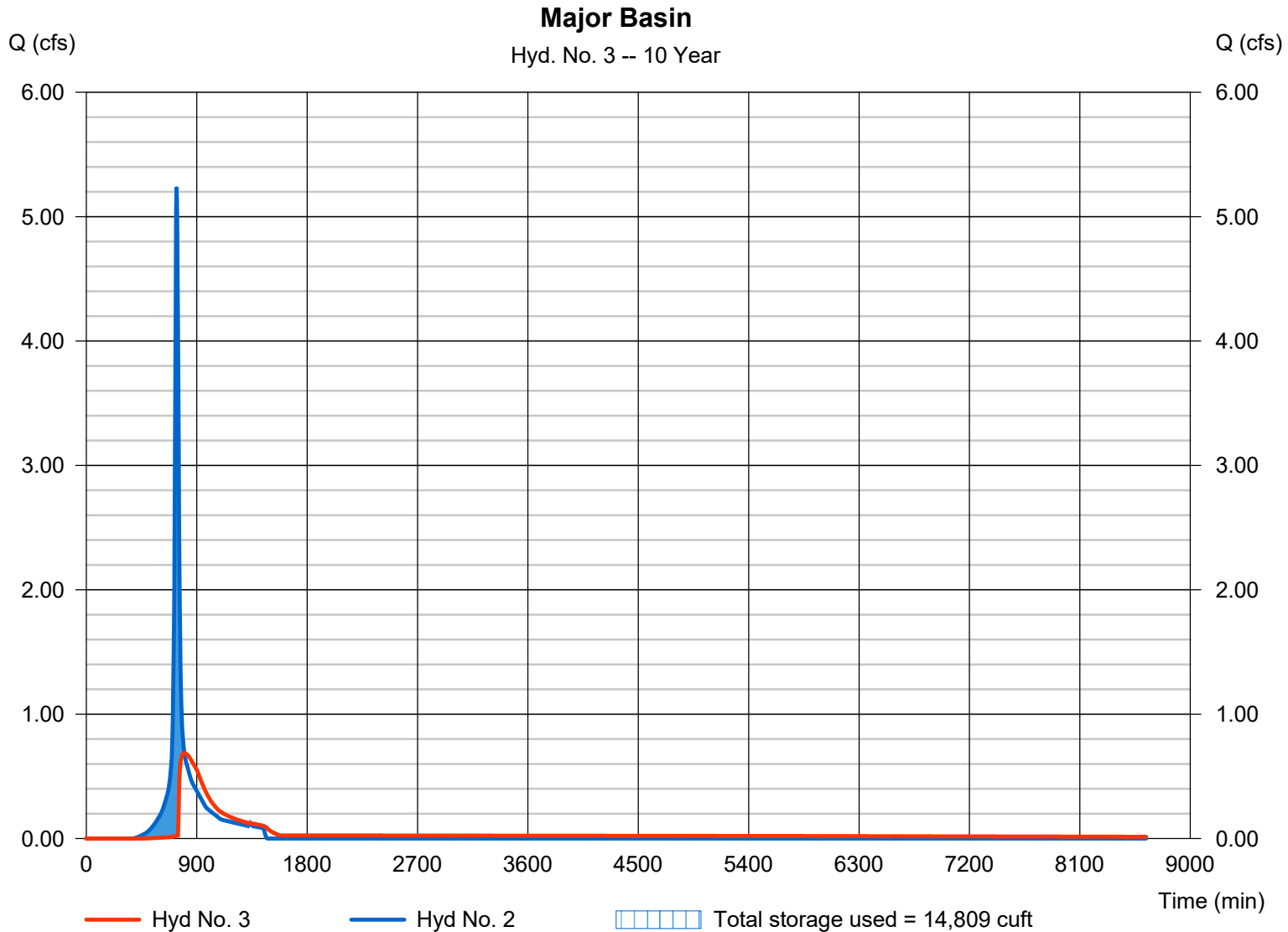
Friday, 11 / 13 / 2020

## Hyd. No. 3

Major Basin

Hydrograph type	= Reservoir	Peak discharge	= 0.687 cfs
Storm frequency	= 10 yrs	Time to peak	= 798 min
Time interval	= 3 min	Hyd. volume	= 22,024 cuft
Inflow hyd. No.	= 2 - Subwatershed B	Max. Elevation	= 91.55 ft
Reservoir name	= Major Basin	Max. Storage	= 14,809 cuft

Storage Indication method used.



# Hydrograph Report

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

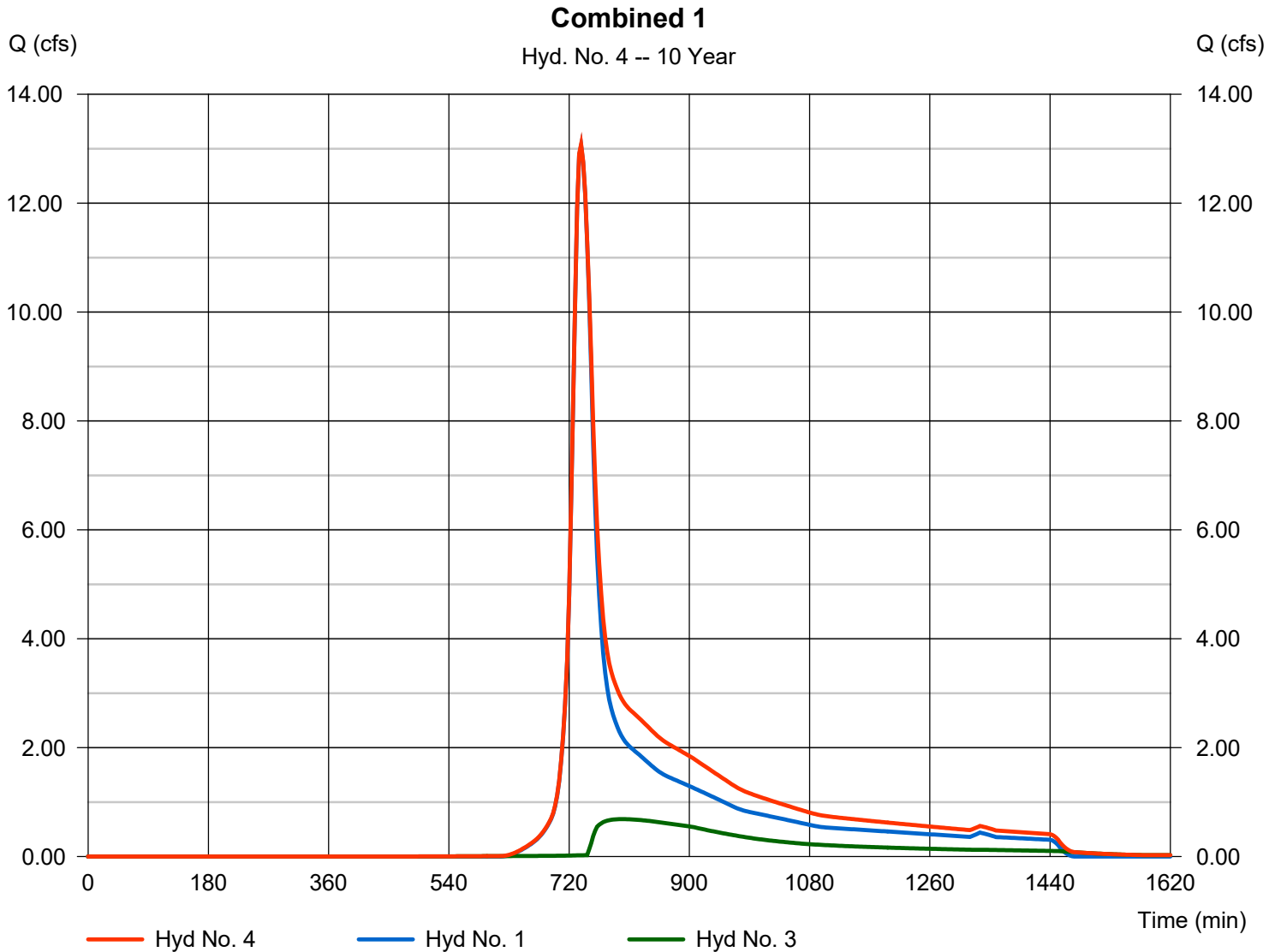
Friday, 11 / 13 / 2020

## Hyd. No. 4

Combined 1

Hydrograph type = Combine  
Storm frequency = 10 yrs  
Time interval = 3 min  
Inflow hyds. = 1, 3

Peak discharge = 13.08 cfs  
Time to peak = 738 min  
Hyd. volume = 86,781 cuft  
Contrib. drain. area = 9.920 ac



# Hydrograph Report

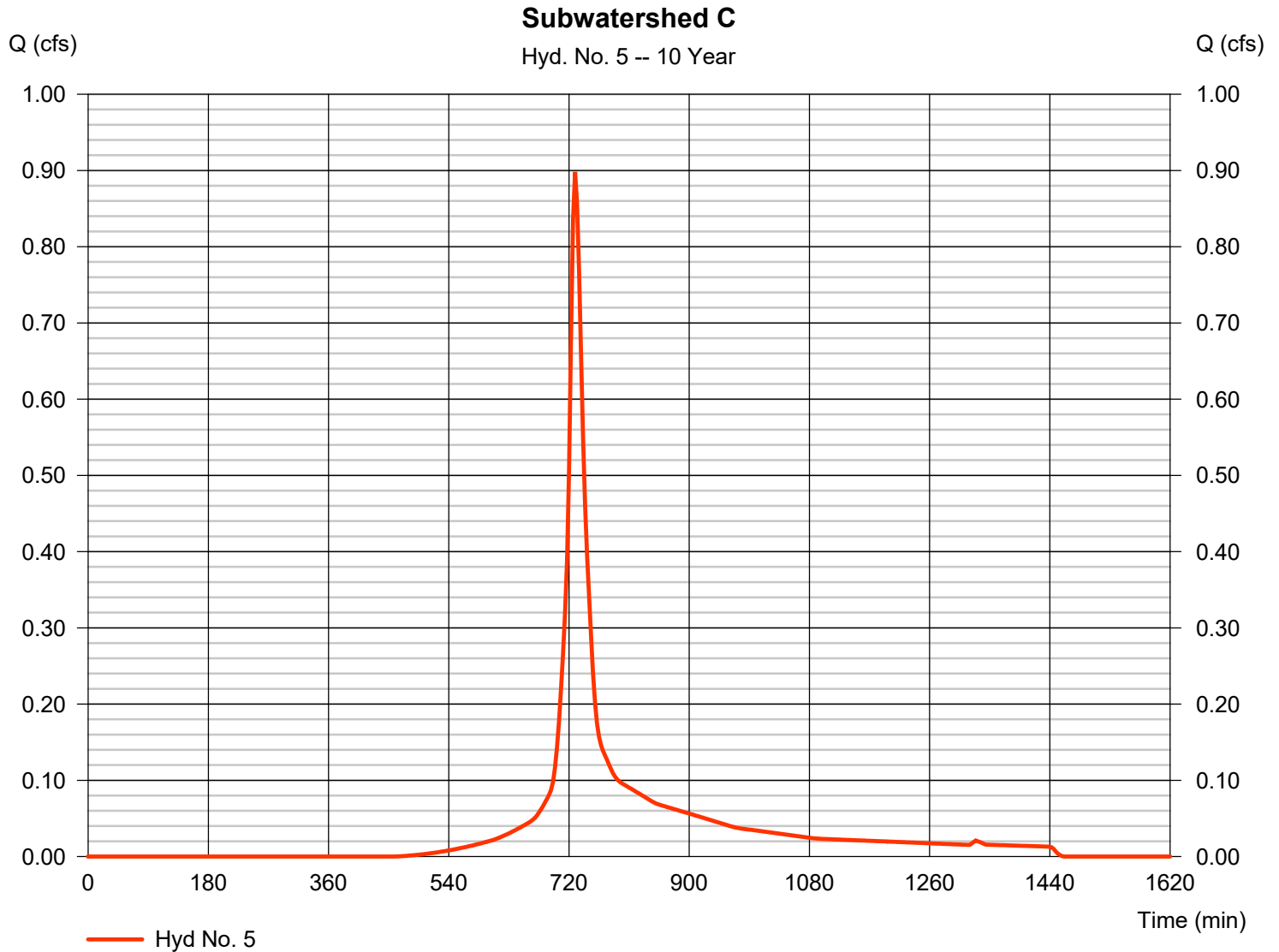
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

Friday, 11 / 13 / 2020

## Hyd. No. 5

Subwatershed C

Hydrograph type	= SCS Runoff	Peak discharge	= 0.898 cfs
Storm frequency	= 10 yrs	Time to peak	= 729 min
Time interval	= 3 min	Hyd. volume	= 3,532 cuft
Drainage area	= 0.330 ac	Curve number	= 79
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 13.20 min
Total precip.	= 5.17 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



# Hydrograph Report

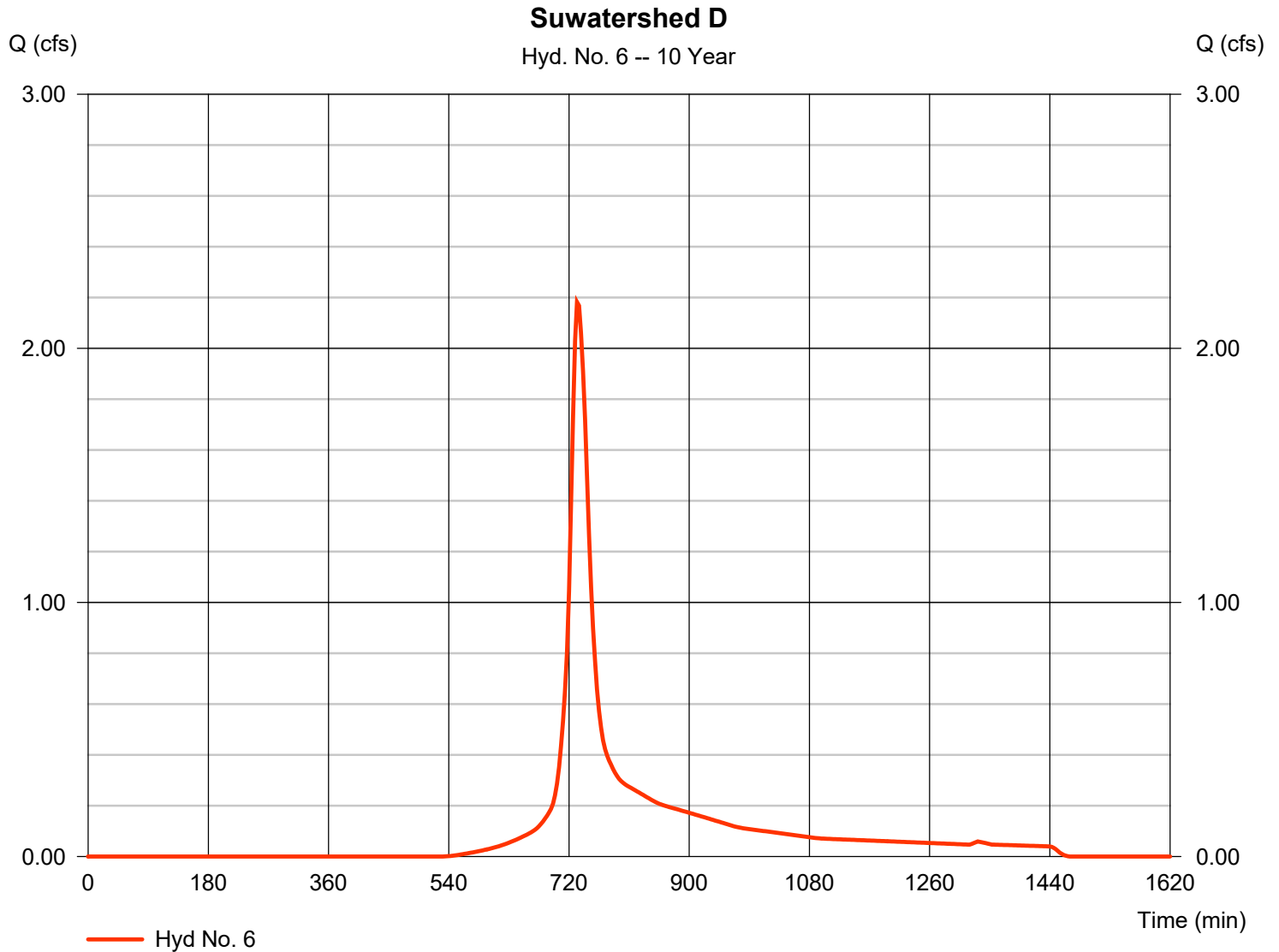
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

Friday, 11 / 13 / 2020

## Hyd. No. 6

Suwatershed D

Hydrograph type	= SCS Runoff	Peak discharge	= 2.182 cfs
Storm frequency	= 10 yrs	Time to peak	= 732 min
Time interval	= 3 min	Hyd. volume	= 9,829 cuft
Drainage area	= 1.050 ac	Curve number	= 74
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 18.40 min
Total precip.	= 5.17 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



# Hydrograph Report

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

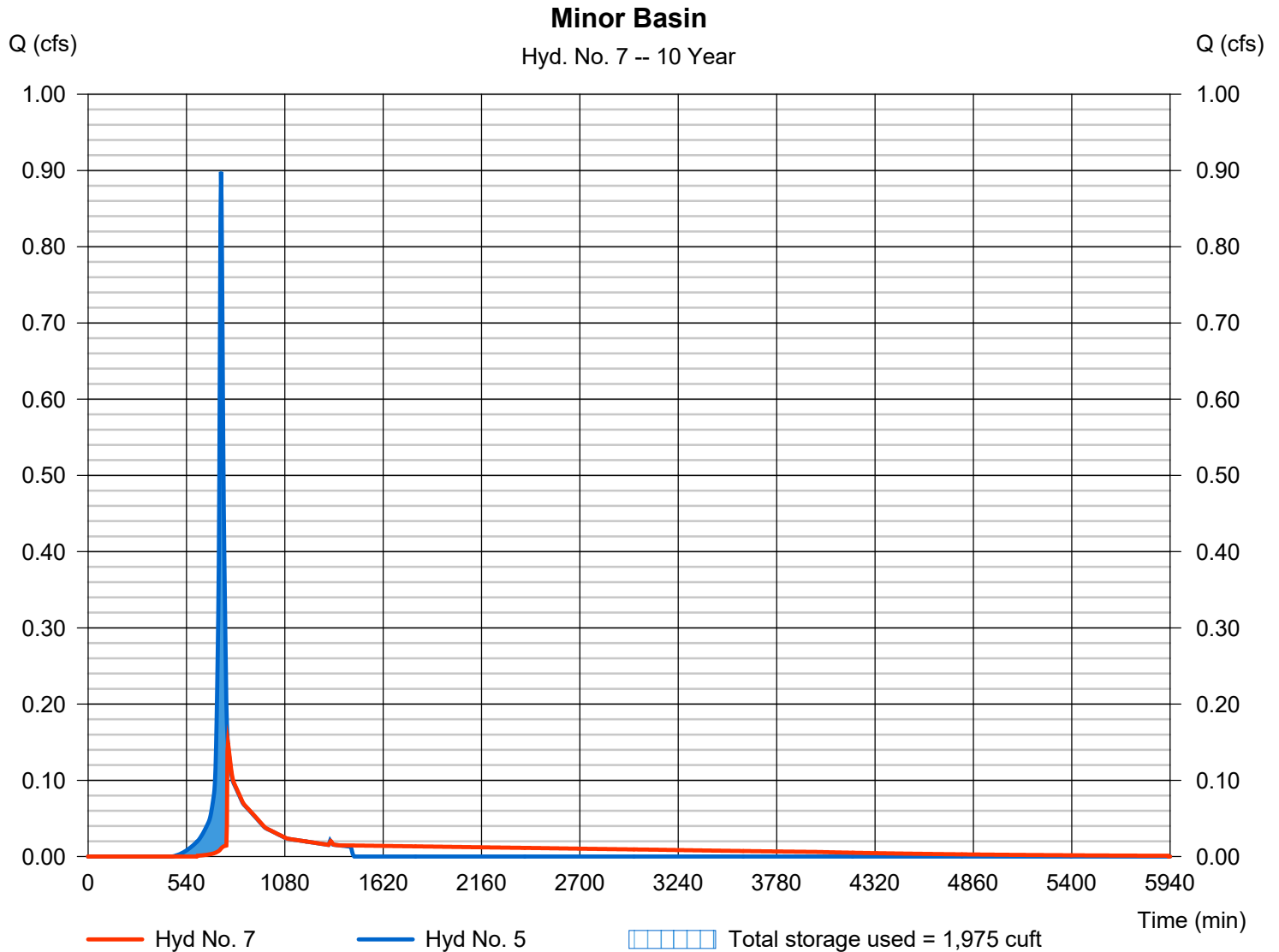
Friday, 11 / 13 / 2020

## Hyd. No. 7

Minor Basin

Hydrograph type	= Reservoir	Peak discharge	= 0.149 cfs
Storm frequency	= 10 yrs	Time to peak	= 768 min
Time interval	= 3 min	Hyd. volume	= 3,468 cuft
Inflow hyd. No.	= 5 - Subwatershed C	Max. Elevation	= 83.01 ft
Reservoir name	= Minor Basin	Max. Storage	= 1,975 cuft

Storage Indication method used.



# Hydrograph Report

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

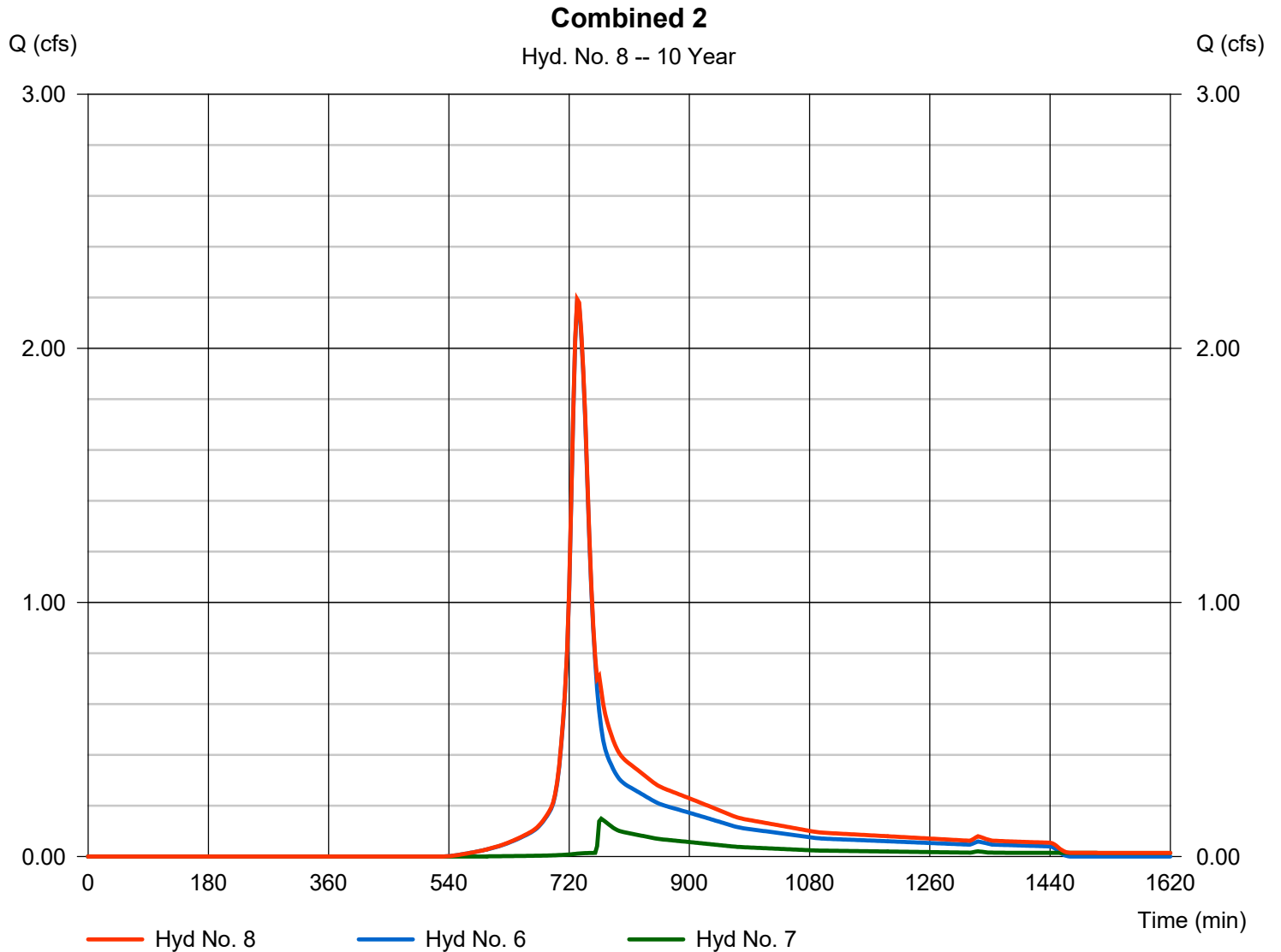
Friday, 11 / 13 / 2020

## Hyd. No. 8

Combined 2

Hydrograph type = Combine  
 Storm frequency = 10 yrs  
 Time interval = 3 min  
 Inflow hyds. = 6, 7

Peak discharge = 2.193 cfs  
 Time to peak = 732 min  
 Hyd. volume = 13,296 cuft  
 Contrib. drain. area = 1.050 ac



# Hydrograph Report

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

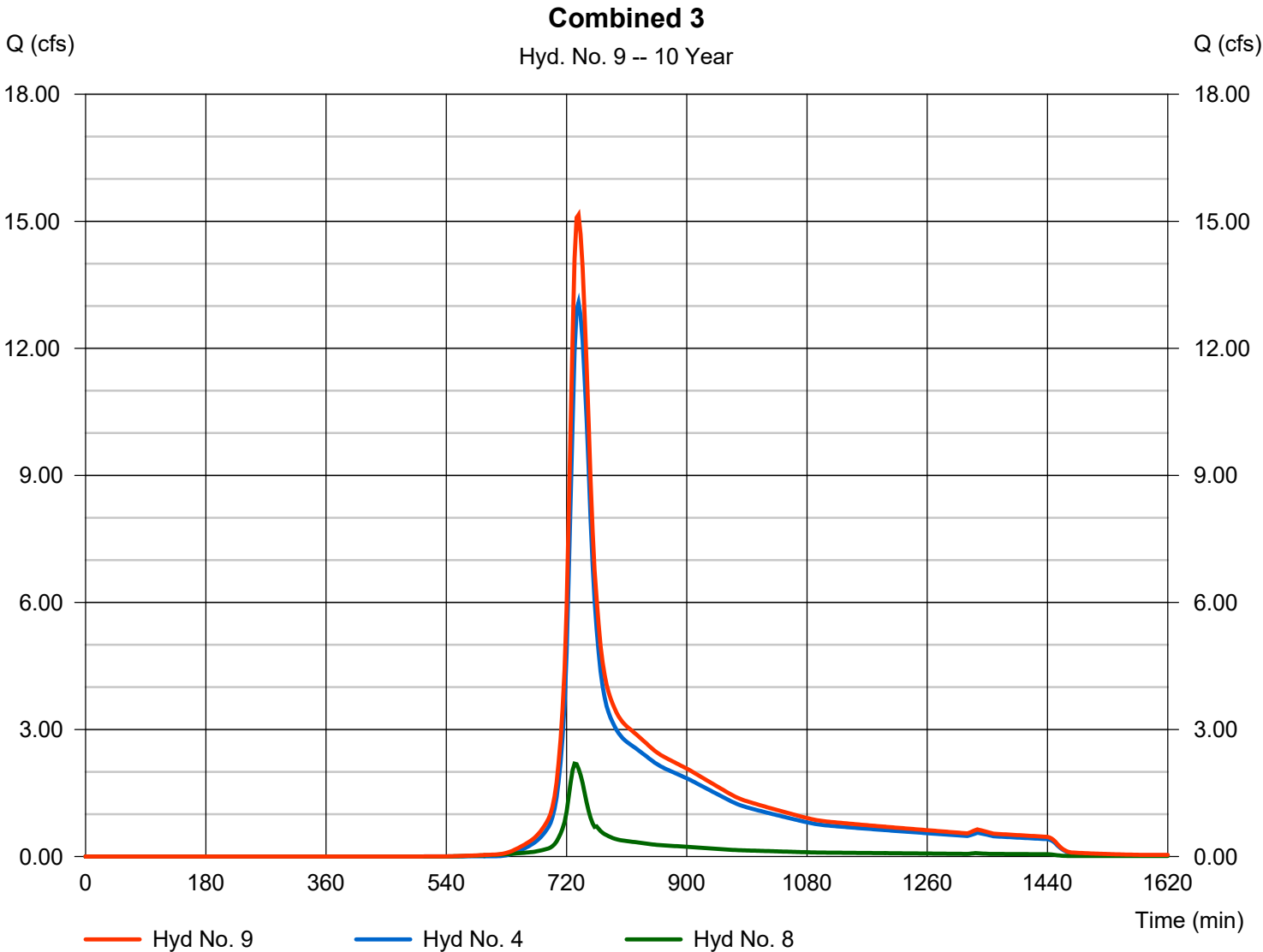
Friday, 11 / 13 / 2020

## Hyd. No. 9

Combined 3

Hydrograph type = Combine  
Storm frequency = 10 yrs  
Time interval = 3 min  
Inflow hyds. = 4, 8

Peak discharge = 15.15 cfs  
Time to peak = 738 min  
Hyd. volume = 100,077 cuft  
Contrib. drain. area = 0.000 ac



# Hydrograph Summary Report

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

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	18.91	3	738	91,968	-----	-----	-----	Subwatershed A
2	SCS Runoff	6.711	3	735	32,394	-----	-----	-----	Subwatershed B
3	Reservoir	1.799	3	768	29,300	2	92.08	17,759	Major Basin
4	Combine	19.05	3	738	121,268	1, 3	-----	-----	Combined 1
5	SCS Runoff	1.183	3	729	4,665	-----	-----	-----	Subwatershed C
6	SCS Runoff	2.977	3	732	13,316	-----	-----	-----	Suwatershed D
7	Reservoir	0.685	3	741	4,601	5	83.05	2,051	Minor Basin
8	Combine	3.250	3	741	17,917	6, 7	-----	-----	Combined 2
9	Combine	22.16	3	738	139,184	4, 8	-----	-----	Combined 3
Proposed (REV1 FINAL 11-13-2020).gpw					Return Period: 25 Year			Friday, 11 / 13 / 2020	

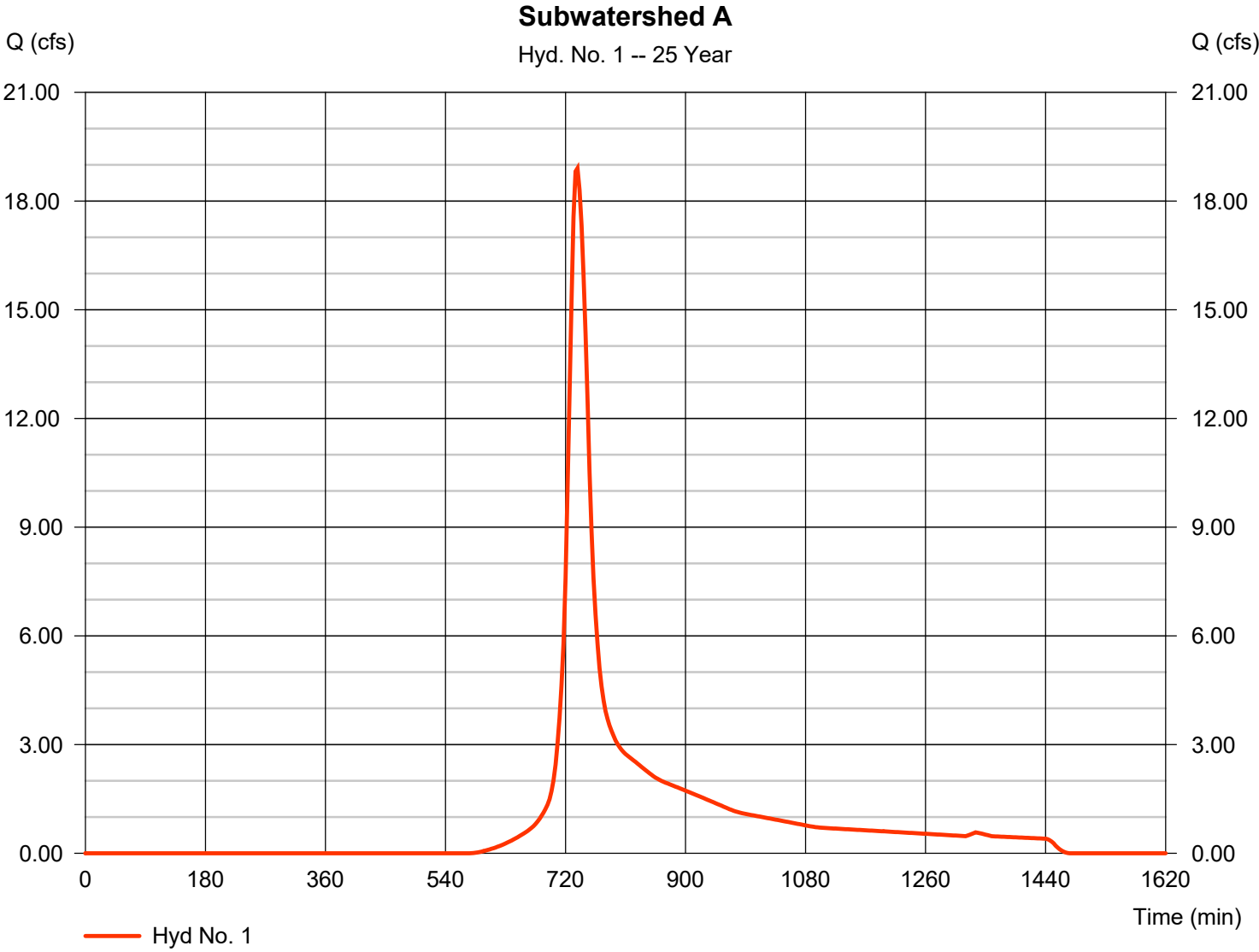


# Hydrograph Report

## Hyd. No. 1

Subwatershed A

Hydrograph type	= SCS Runoff	Peak discharge	= 18.91 cfs
Storm frequency	= 25 yrs	Time to peak	= 738 min
Time interval	= 3 min	Hyd. volume	= 91,968 cuft
Drainage area	= 9.920 ac	Curve number	= 66
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 23.80 min
Total precip.	= 6.24 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



# Hydrograph Report

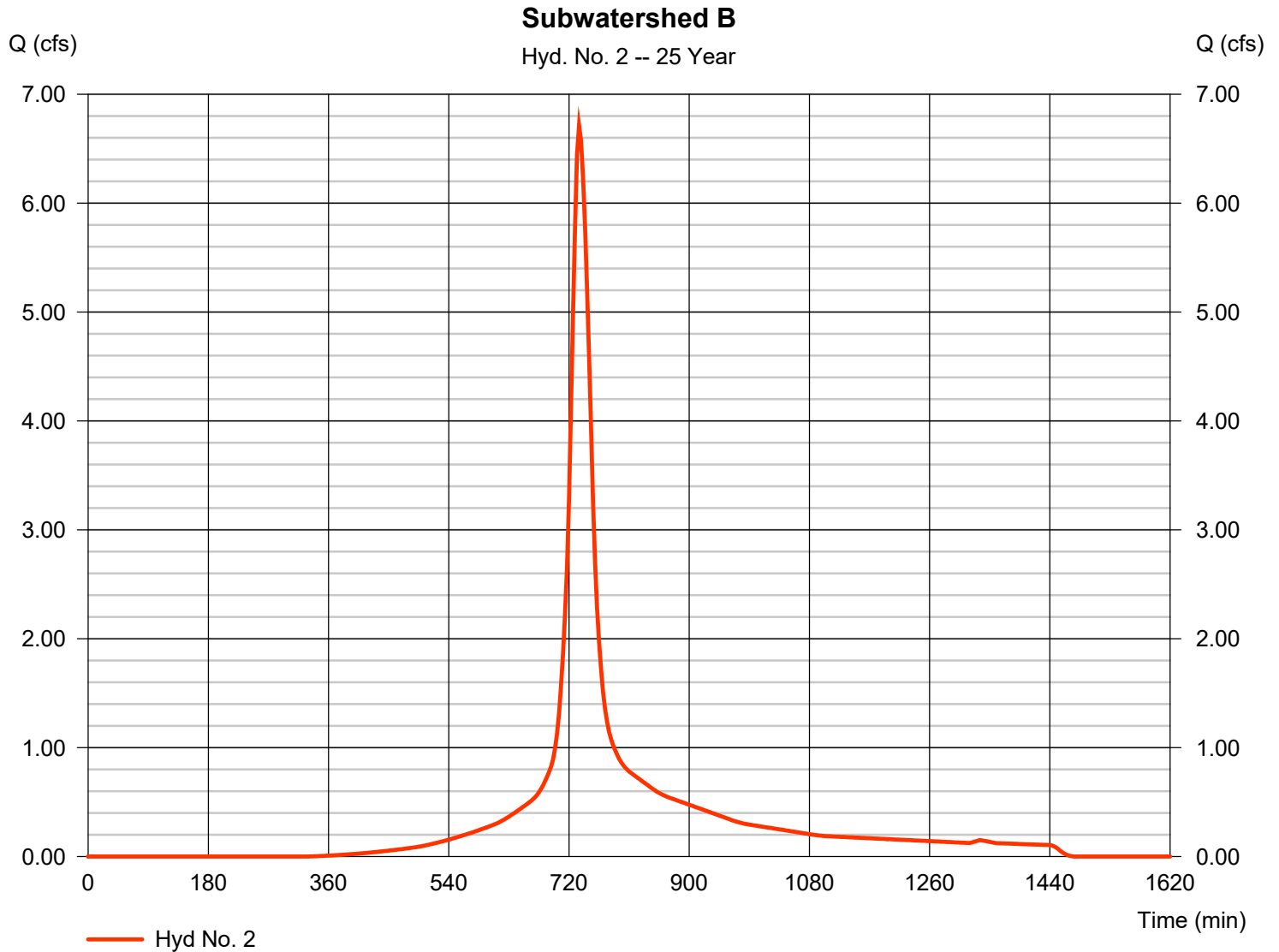
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

Friday, 11 / 13 / 2020

## Hyd. No. 2

Subwatershed B

Hydrograph type	= SCS Runoff	Peak discharge	= 6.711 cfs
Storm frequency	= 25 yrs	Time to peak	= 735 min
Time interval	= 3 min	Hyd. volume	= 32,394 cuft
Drainage area	= 2.070 ac	Curve number	= 84
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 20.30 min
Total precip.	= 6.24 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



# Hydrograph Report

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

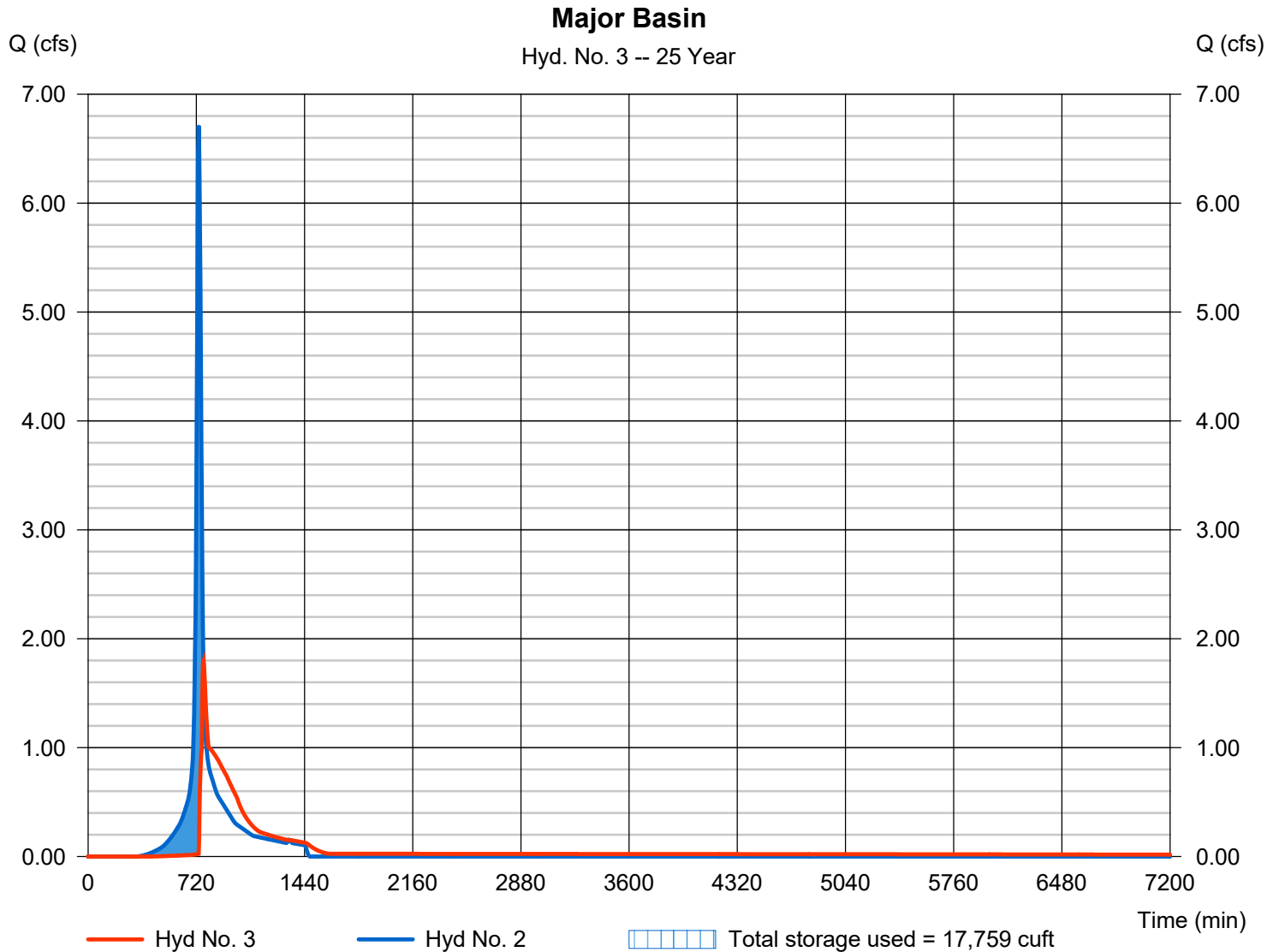
Friday, 11 / 13 / 2020

## Hyd. No. 3

Major Basin

Hydrograph type	= Reservoir	Peak discharge	= 1.799 cfs
Storm frequency	= 25 yrs	Time to peak	= 768 min
Time interval	= 3 min	Hyd. volume	= 29,300 cuft
Inflow hyd. No.	= 2 - Subwatershed B	Max. Elevation	= 92.08 ft
Reservoir name	= Major Basin	Max. Storage	= 17,759 cuft

Storage Indication method used.



# Hydrograph Report

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

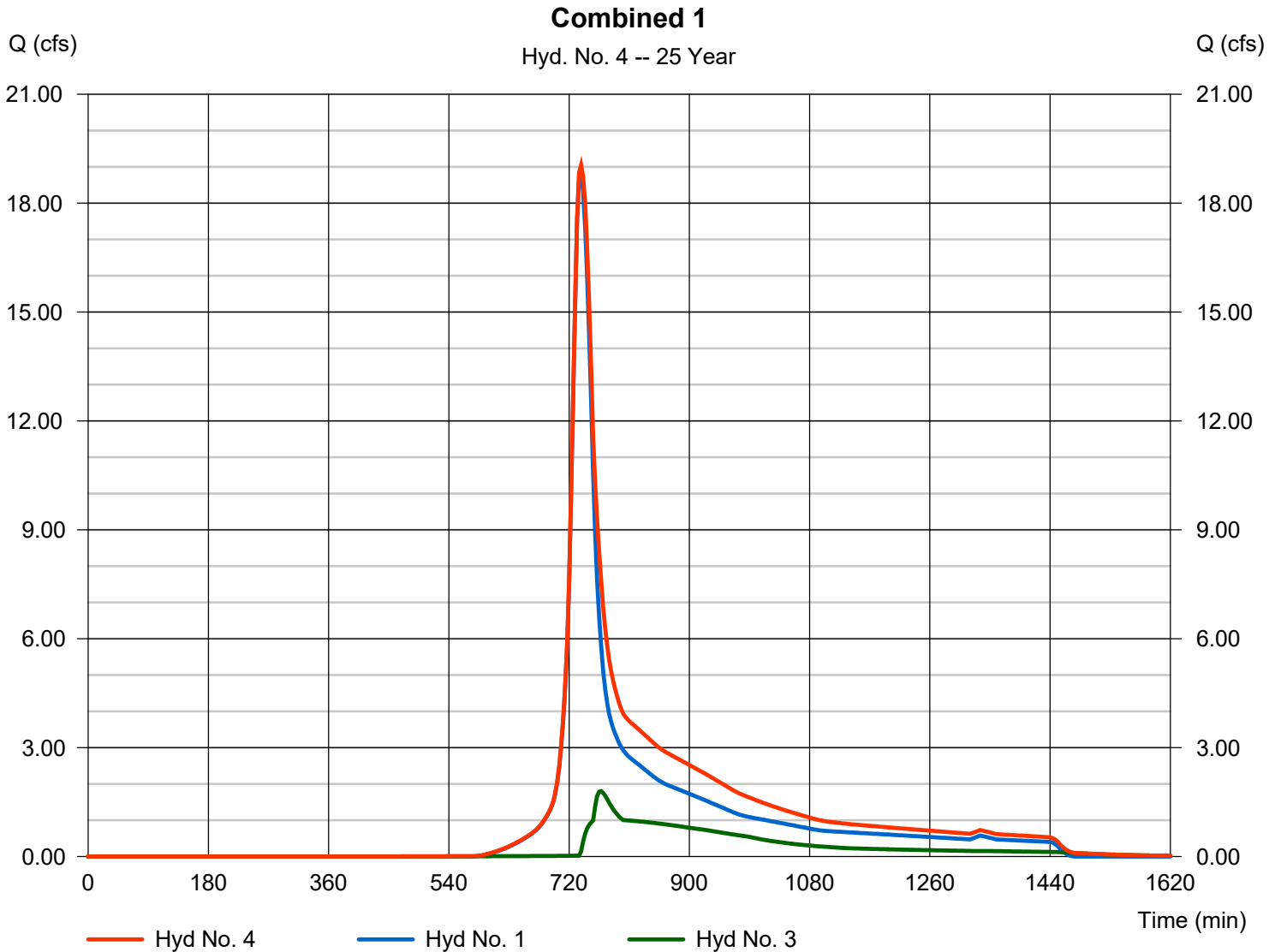
Friday, 11 / 13 / 2020

## Hyd. No. 4

Combined 1

Hydrograph type = Combine  
Storm frequency = 25 yrs  
Time interval = 3 min  
Inflow hyds. = 1, 3

Peak discharge = 19.05 cfs  
Time to peak = 738 min  
Hyd. volume = 121,268 cuft  
Contrib. drain. area = 9.920 ac



# Hydrograph Report

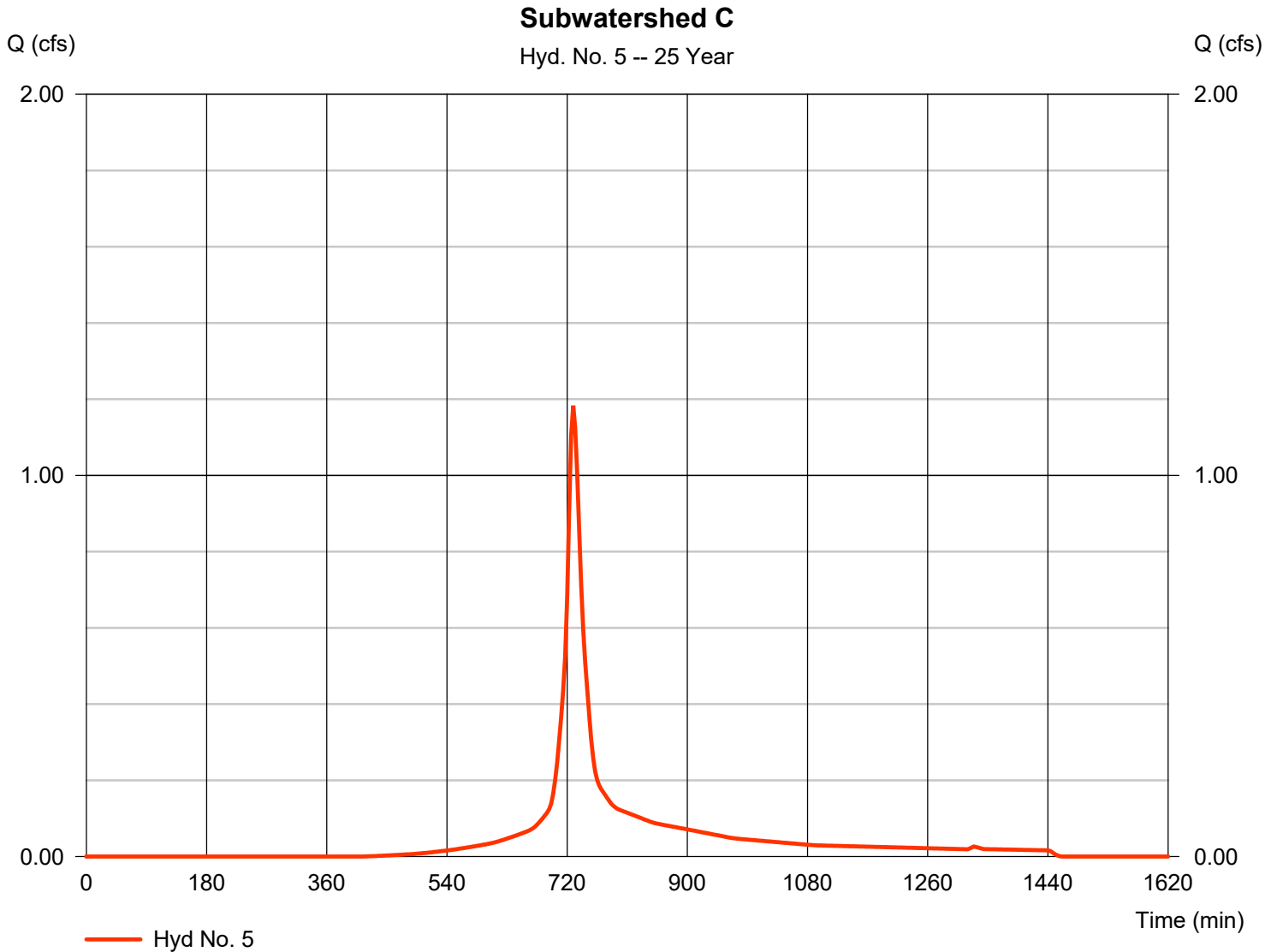
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

Friday, 11 / 13 / 2020

## Hyd. No. 5

Subwatershed C

Hydrograph type	= SCS Runoff	Peak discharge	= 1.183 cfs
Storm frequency	= 25 yrs	Time to peak	= 729 min
Time interval	= 3 min	Hyd. volume	= 4,665 cuft
Drainage area	= 0.330 ac	Curve number	= 79
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 13.20 min
Total precip.	= 6.24 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



# Hydrograph Report

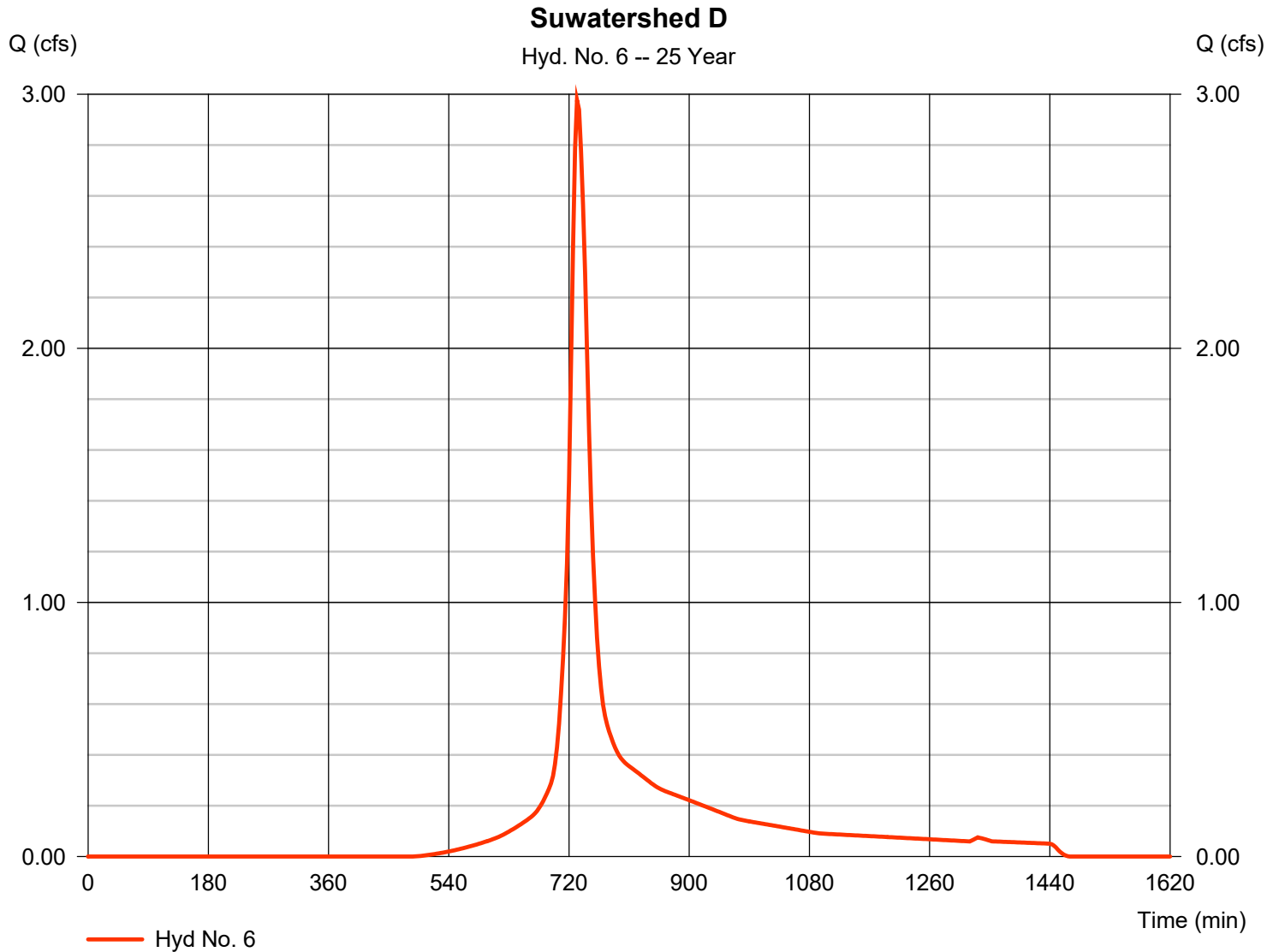
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

Friday, 11 / 13 / 2020

## Hyd. No. 6

Suwatershed D

Hydrograph type	= SCS Runoff	Peak discharge	= 2.977 cfs
Storm frequency	= 25 yrs	Time to peak	= 732 min
Time interval	= 3 min	Hyd. volume	= 13,316 cuft
Drainage area	= 1.050 ac	Curve number	= 74
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 18.40 min
Total precip.	= 6.24 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



# Hydrograph Report

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

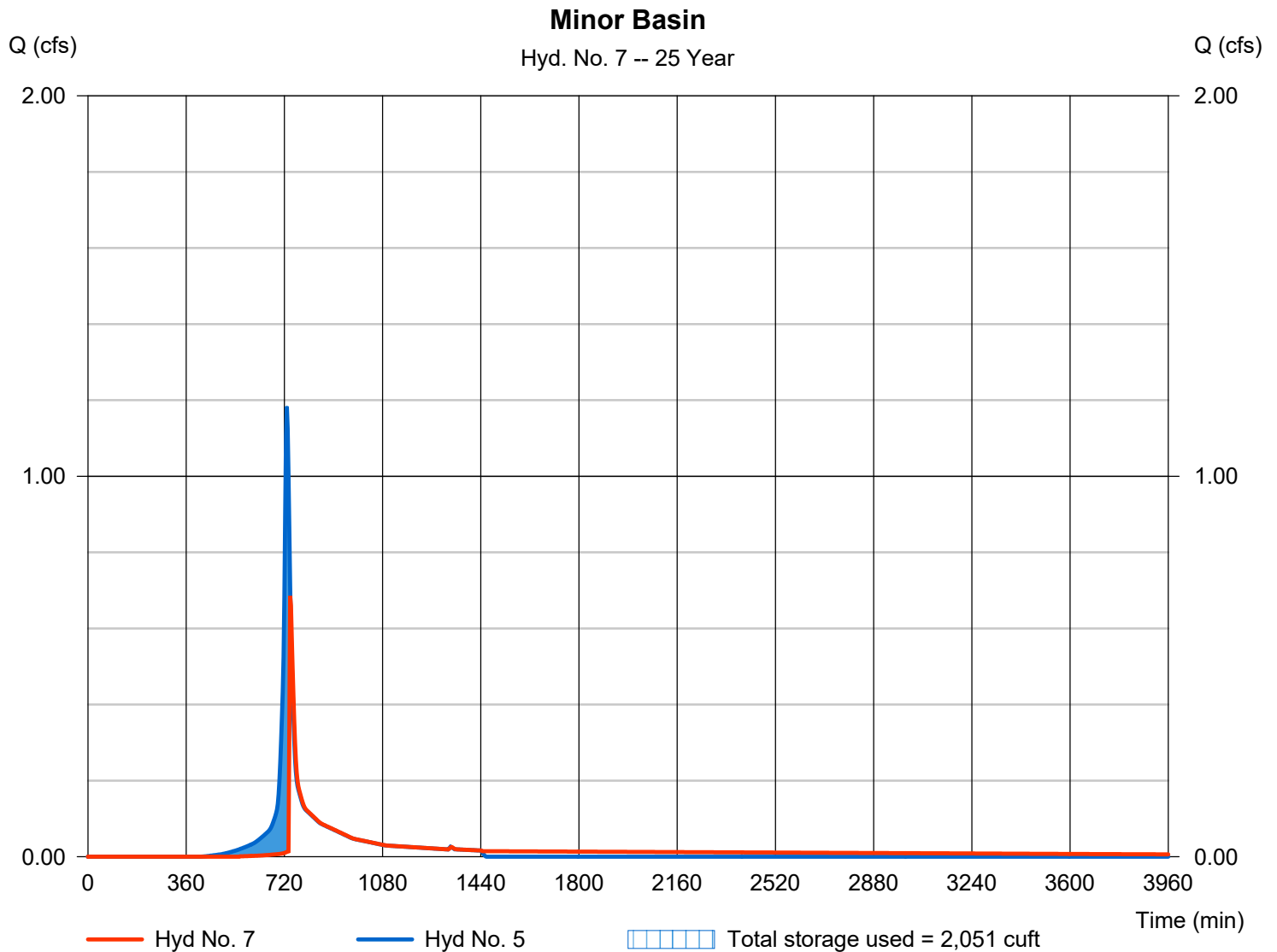
Friday, 11 / 13 / 2020

## Hyd. No. 7

Minor Basin

Hydrograph type	= Reservoir	Peak discharge	= 0.685 cfs
Storm frequency	= 25 yrs	Time to peak	= 741 min
Time interval	= 3 min	Hyd. volume	= 4,601 cuft
Inflow hyd. No.	= 5 - Subwatershed C	Max. Elevation	= 83.05 ft
Reservoir name	= Minor Basin	Max. Storage	= 2,051 cuft

Storage Indication method used.



# Hydrograph Report

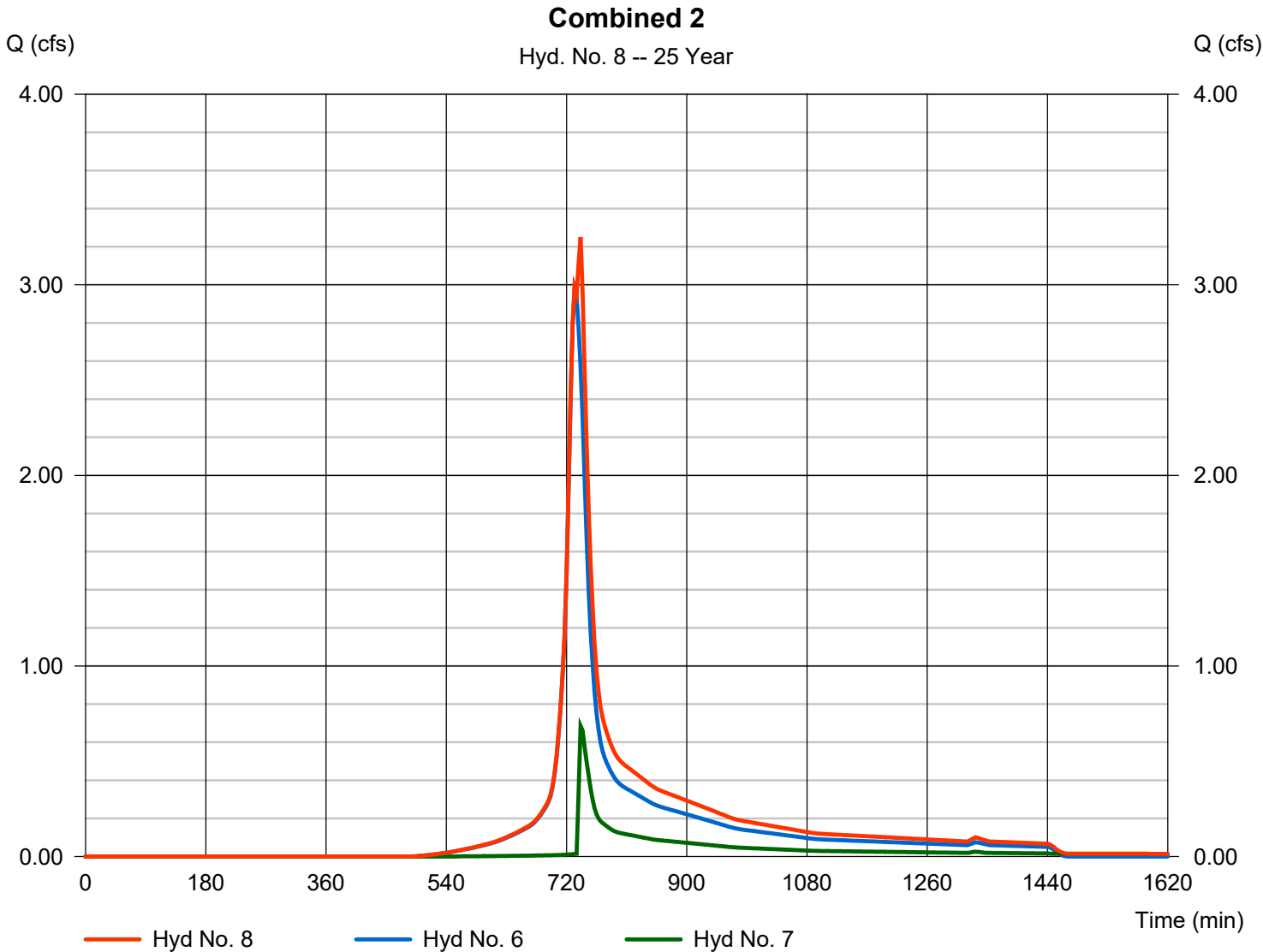
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

Friday, 11 / 13 / 2020

## Hyd. No. 8

Combined 2

Hydrograph type	= Combine	Peak discharge	= 3.250 cfs
Storm frequency	= 25 yrs	Time to peak	= 741 min
Time interval	= 3 min	Hyd. volume	= 17,917 cuft
Inflow hyds.	= 6, 7	Contrib. drain. area	= 1.050 ac





# Hydrograph Report

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

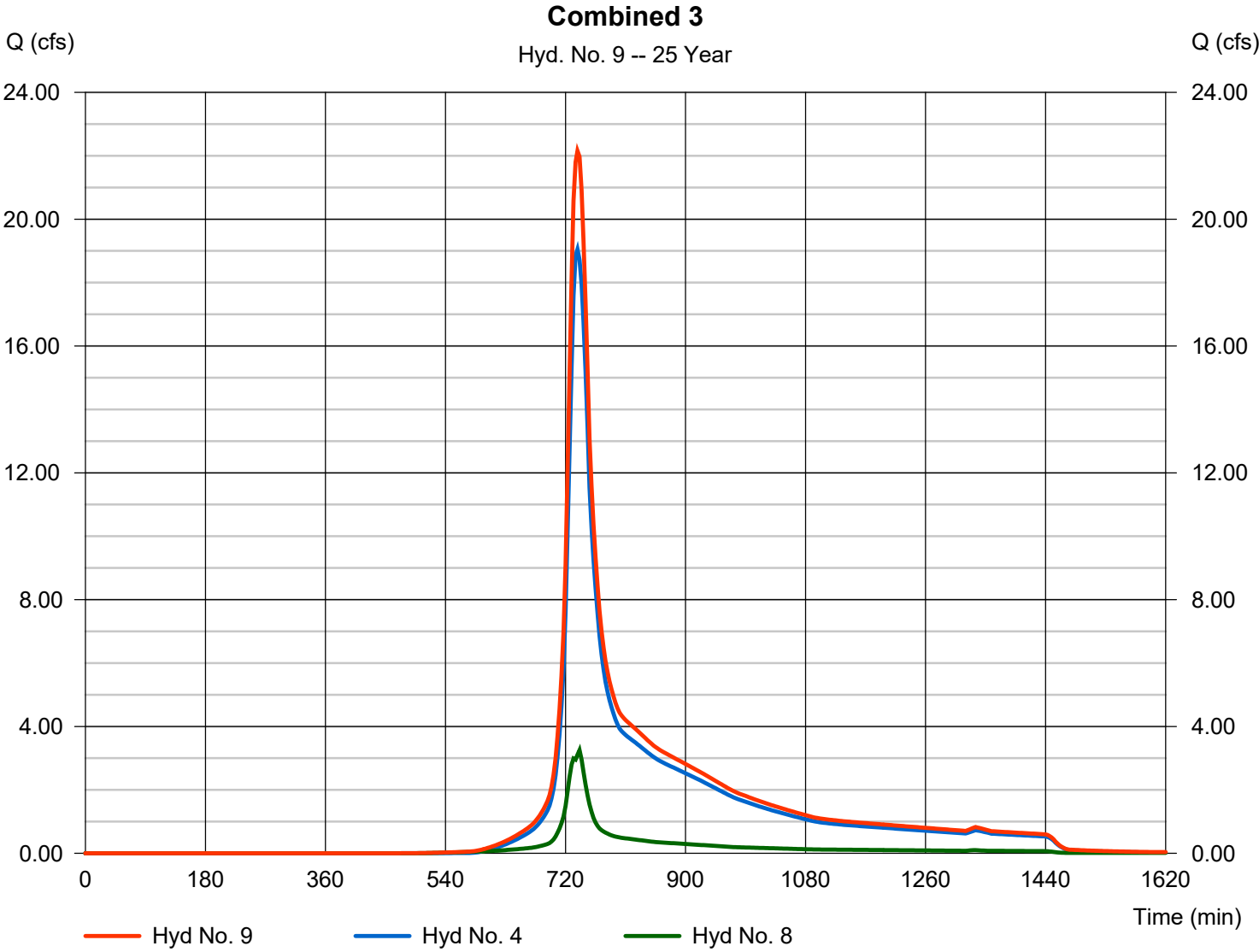
Friday, 11 / 13 / 2020

## Hyd. No. 9

Combined 3

Hydrograph type = Combine  
Storm frequency = 25 yrs  
Time interval = 3 min  
Inflow hyds. = 4, 8

Peak discharge = 22.16 cfs  
Time to peak = 738 min  
Hyd. volume = 139,184 cuft  
Contrib. drain. area = 0.000 ac



# Hydrograph Summary Report

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

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	23.51	3	735	113,610	-----	-----	-----	Subwatershed A
2	SCS Runoff	7.815	3	735	37,935	-----	-----	-----	Subwatershed B
3	Reservoir	4.212	3	753	34,831	2	92.21	18,655	Major Basin
4	Combine	24.20	3	738	148,441	1, 3	-----	-----	Combined 1
5	SCS Runoff	1.399	3	729	5,535	-----	-----	-----	Subwatershed C
6	SCS Runoff	3.587	3	732	16,025	-----	-----	-----	Suwatershed D
7	Reservoir	1.091	3	738	5,471	5	83.08	2,107	Minor Basin
8	Combine	4.610	3	735	21,496	6, 7	-----	-----	Combined 2
9	Combine	28.62	3	738	169,936	4, 8	-----	-----	Combined 3
Proposed (REV1 FINAL 11-13-2020).gpw					Return Period: 50 Year			Friday, 11 / 13 / 2020	

# Hydrograph Report

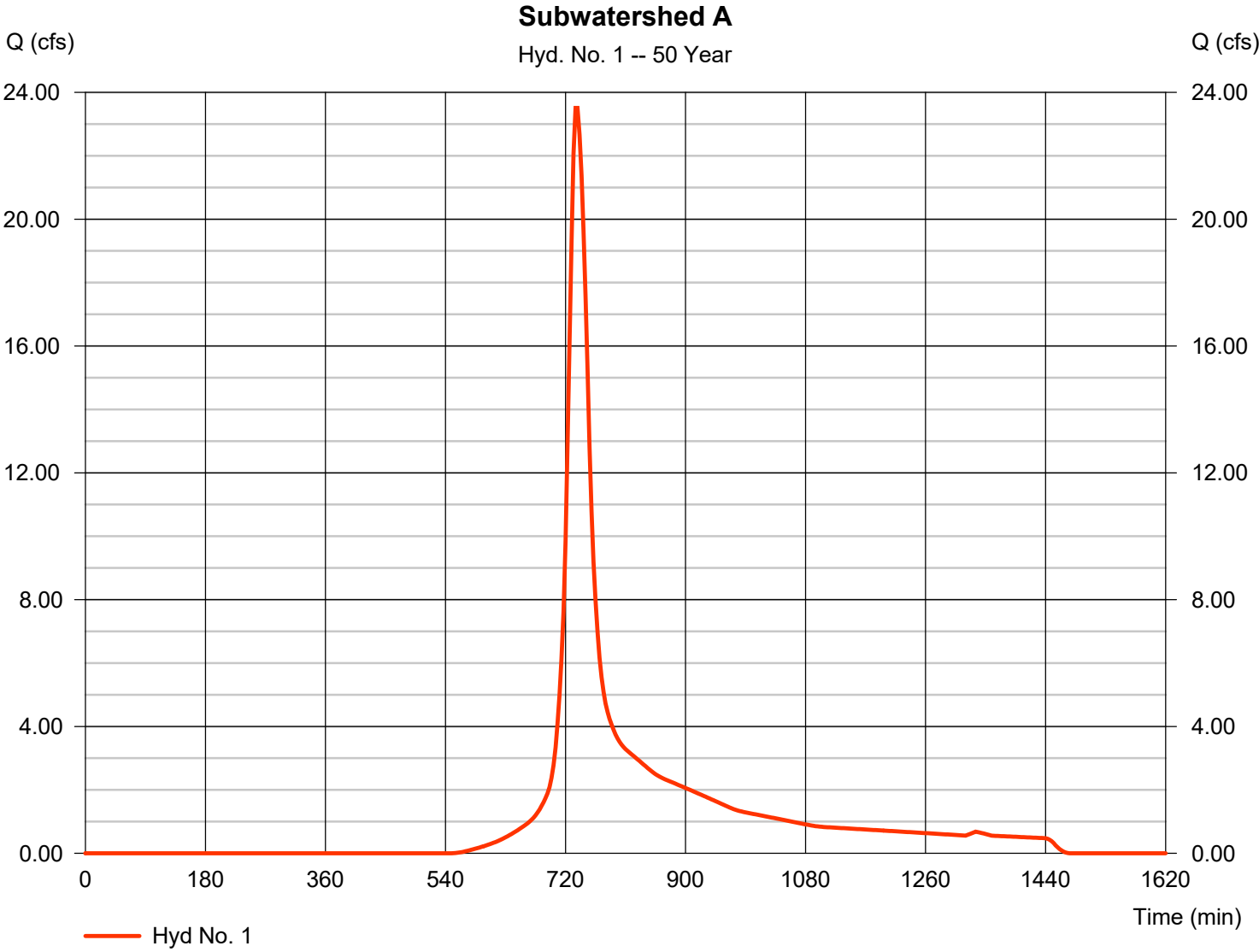
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

Friday, 11 / 13 / 2020

## Hyd. No. 1

Subwatershed A

Hydrograph type	= SCS Runoff	Peak discharge	= 23.51 cfs
Storm frequency	= 50 yrs	Time to peak	= 735 min
Time interval	= 3 min	Hyd. volume	= 113,610 cuft
Drainage area	= 9.920 ac	Curve number	= 66
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 23.80 min
Total precip.	= 7.04 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



# Hydrograph Report

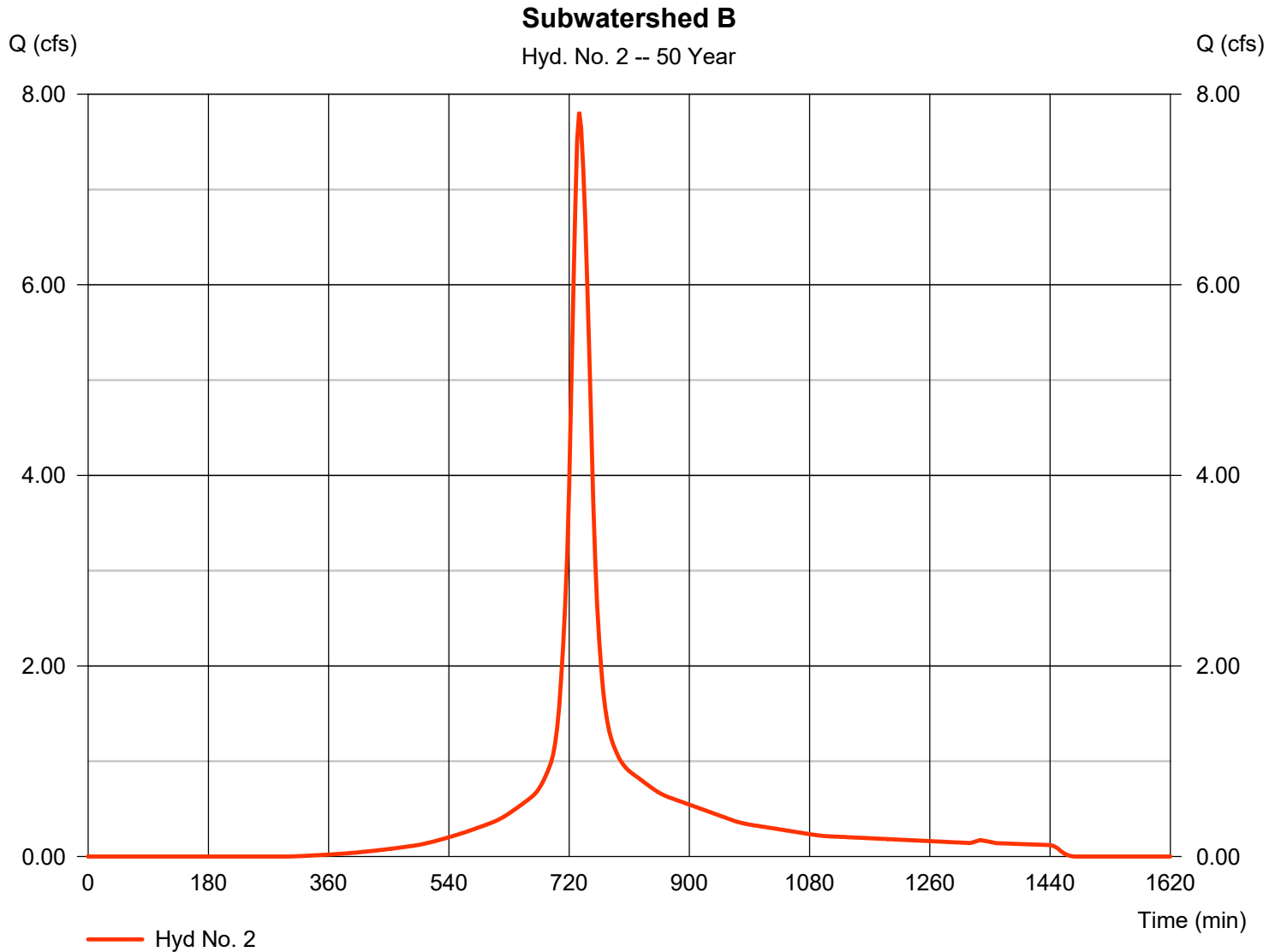
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

Friday, 11 / 13 / 2020

## Hyd. No. 2

Subwatershed B

Hydrograph type	= SCS Runoff	Peak discharge	= 7.815 cfs
Storm frequency	= 50 yrs	Time to peak	= 735 min
Time interval	= 3 min	Hyd. volume	= 37,935 cuft
Drainage area	= 2.070 ac	Curve number	= 84
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 20.30 min
Total precip.	= 7.04 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



# Hydrograph Report

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

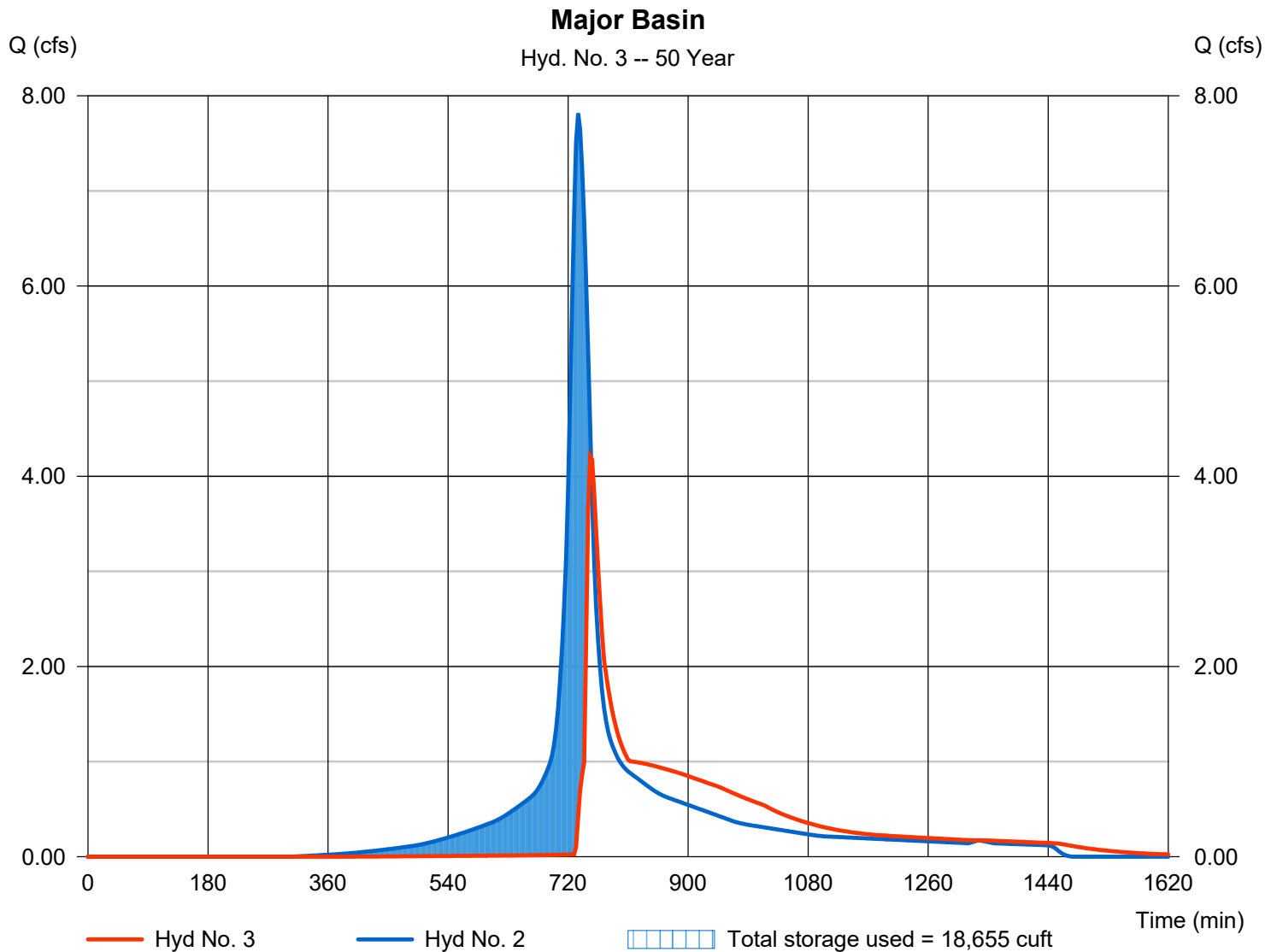
Friday, 11 / 13 / 2020

## Hyd. No. 3

### Major Basin

Hydrograph type	= Reservoir	Peak discharge	= 4.212 cfs
Storm frequency	= 50 yrs	Time to peak	= 753 min
Time interval	= 3 min	Hyd. volume	= 34,831 cuft
Inflow hyd. No.	= 2 - Subwatershed B	Max. Elevation	= 92.21 ft
Reservoir name	= Major Basin	Max. Storage	= 18,655 cuft

Storage Indication method used.



# Hydrograph Report

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

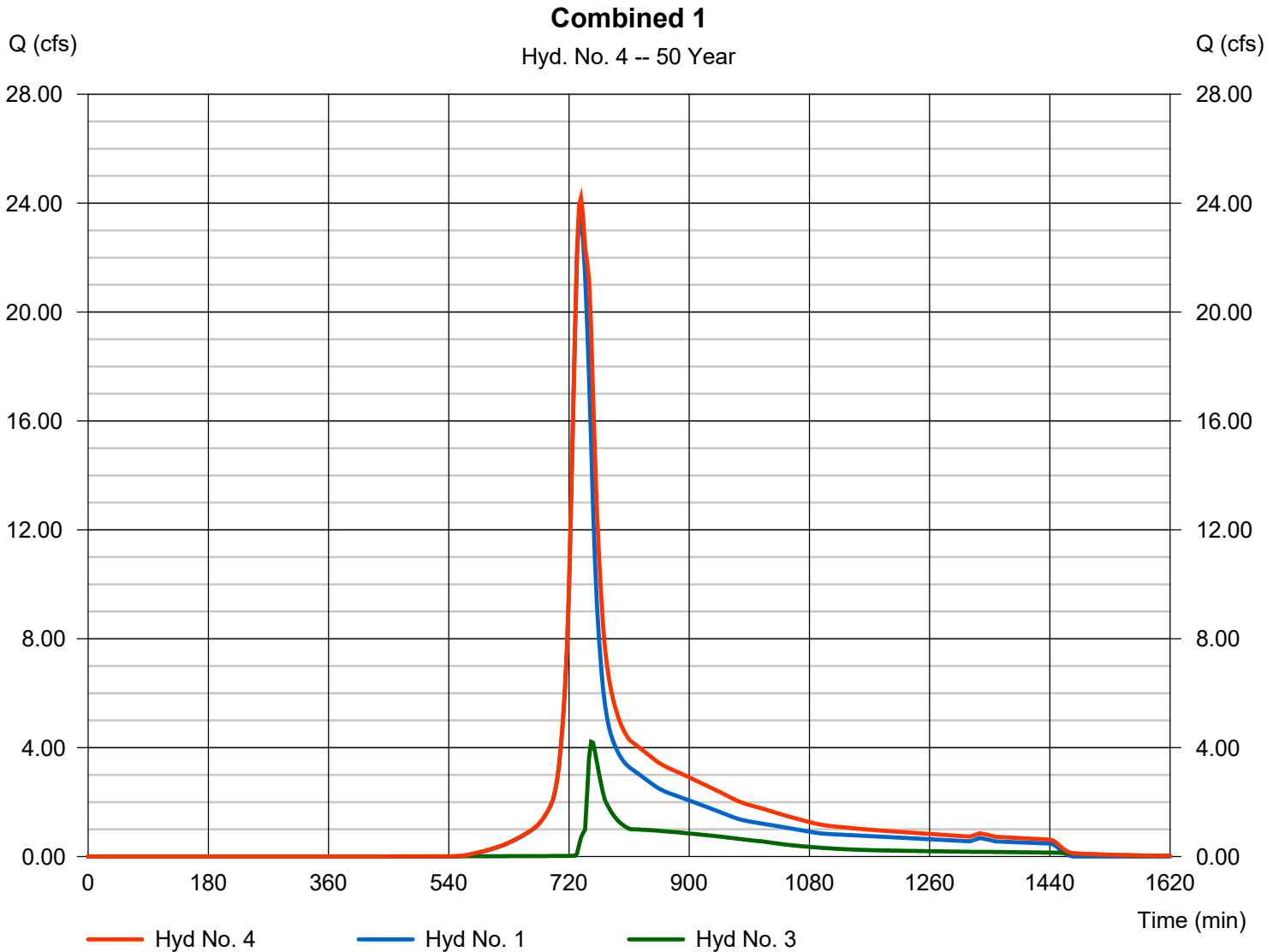
Friday, 11 / 13 / 2020

## Hyd. No. 4

Combined 1

Hydrograph type = Combine  
Storm frequency = 50 yrs  
Time interval = 3 min  
Inflow hyds. = 1, 3

Peak discharge = 24.20 cfs  
Time to peak = 738 min  
Hyd. volume = 148,441 cuft  
Contrib. drain. area = 9.920 ac



# Hydrograph Report

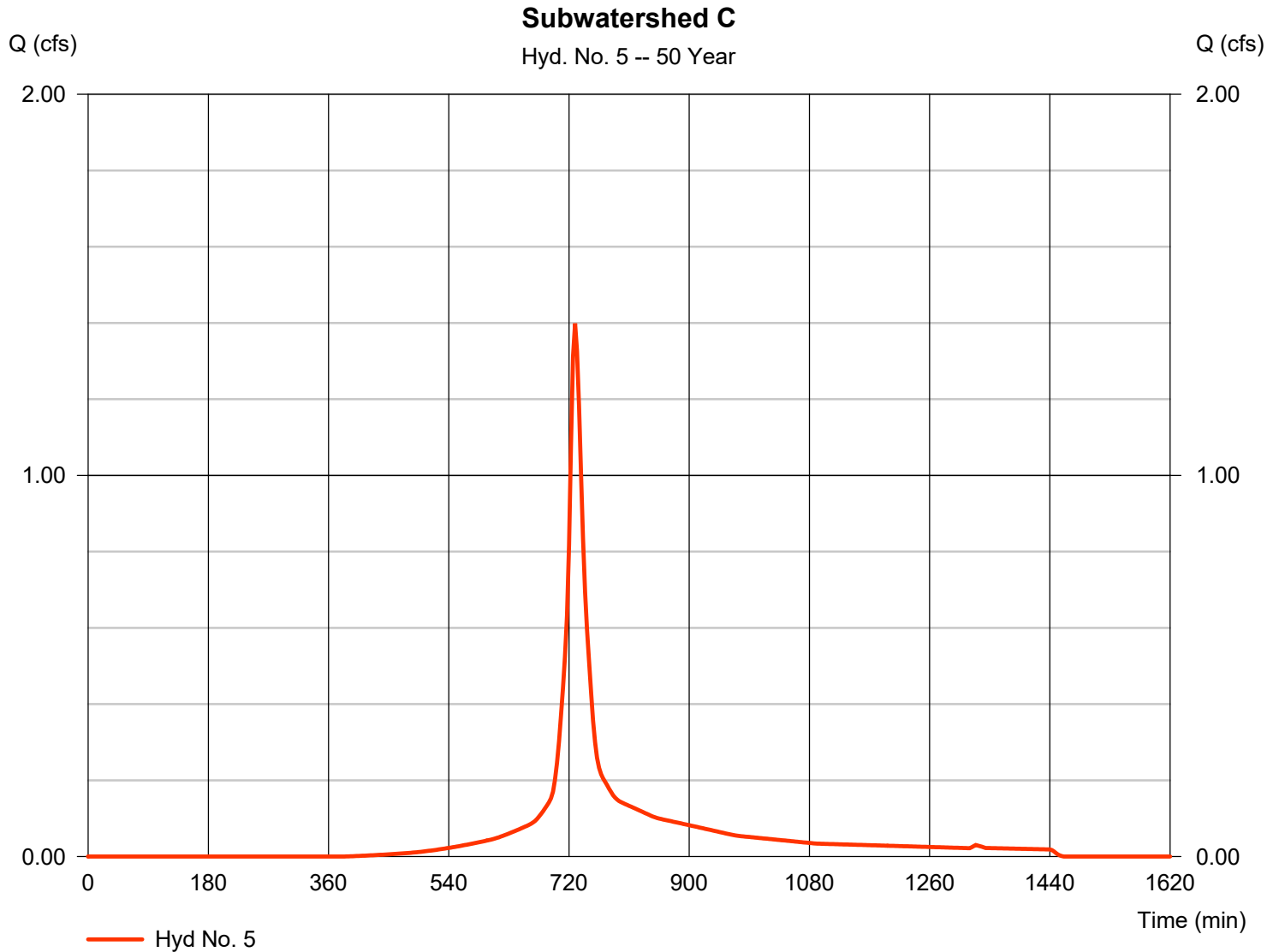
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

Friday, 11 / 13 / 2020

## Hyd. No. 5

Subwatershed C

Hydrograph type	= SCS Runoff	Peak discharge	= 1.399 cfs
Storm frequency	= 50 yrs	Time to peak	= 729 min
Time interval	= 3 min	Hyd. volume	= 5,535 cuft
Drainage area	= 0.330 ac	Curve number	= 79
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 13.20 min
Total precip.	= 7.04 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



# Hydrograph Report

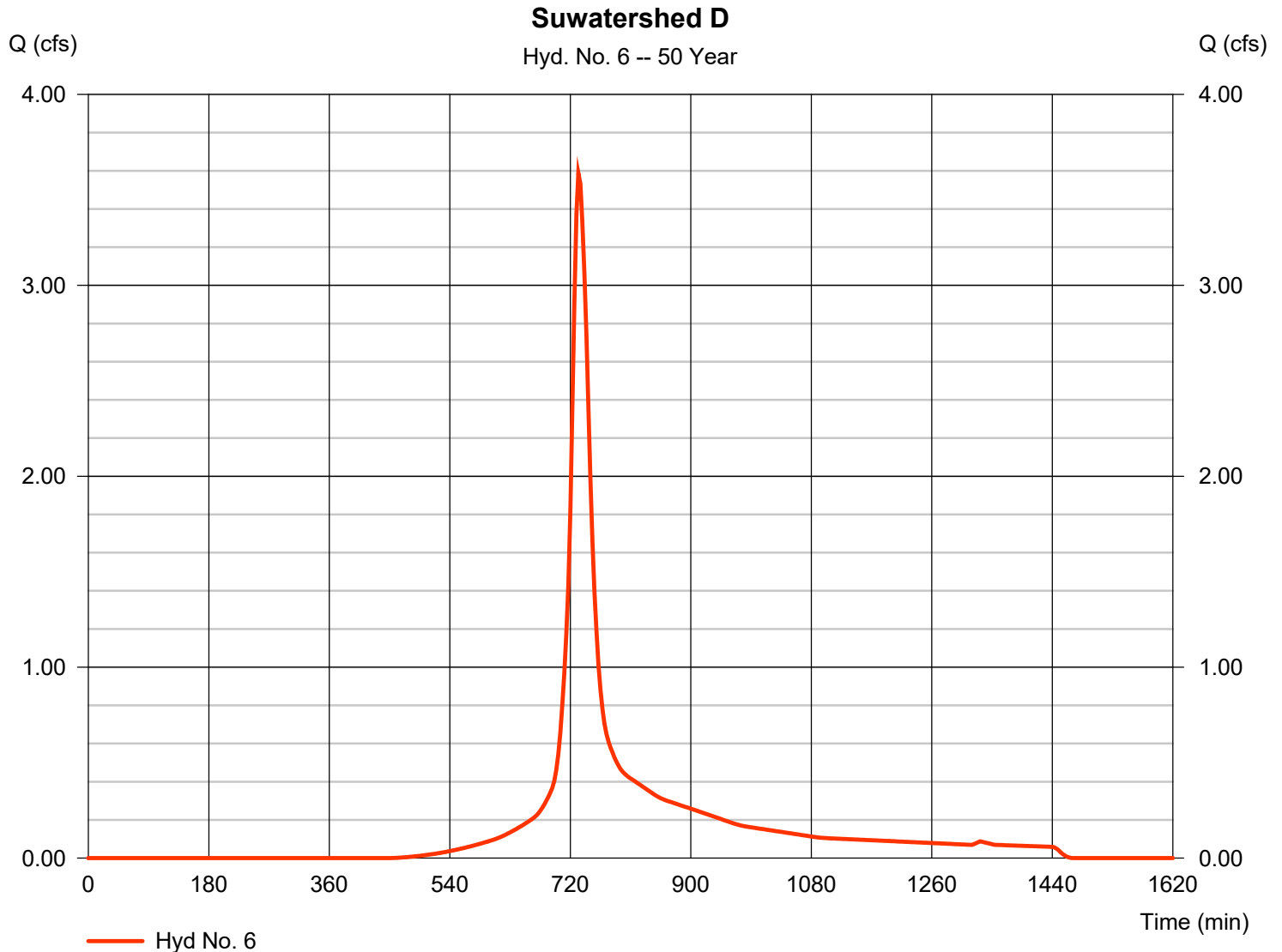
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

Friday, 11 / 13 / 2020

## Hyd. No. 6

Suwatershed D

Hydrograph type	= SCS Runoff	Peak discharge	= 3.587 cfs
Storm frequency	= 50 yrs	Time to peak	= 732 min
Time interval	= 3 min	Hyd. volume	= 16,025 cuft
Drainage area	= 1.050 ac	Curve number	= 74
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 18.40 min
Total precip.	= 7.04 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484





# Hydrograph Report

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

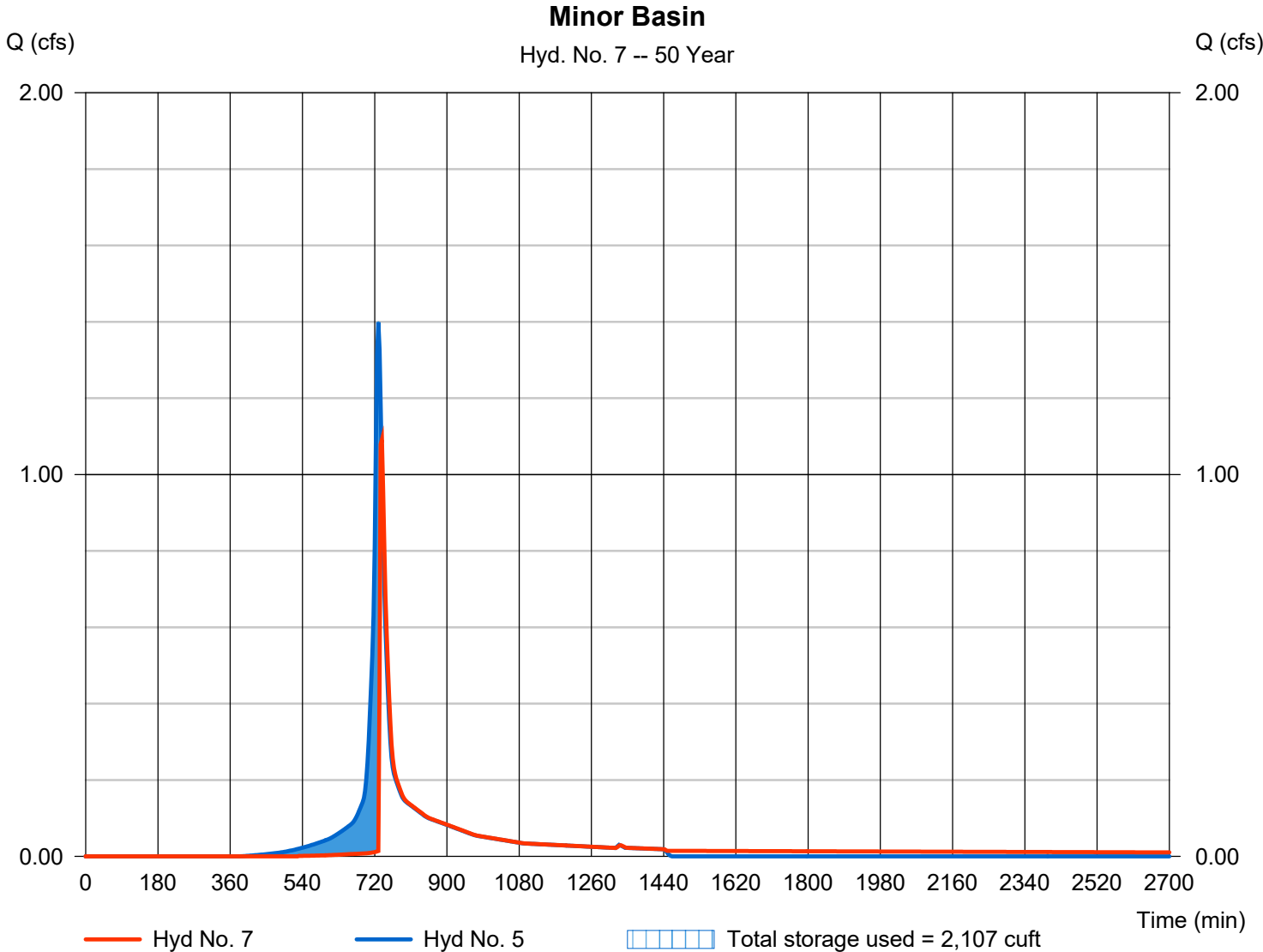
Friday, 11 / 13 / 2020

## Hyd. No. 7

Minor Basin

Hydrograph type	= Reservoir	Peak discharge	= 1.091 cfs
Storm frequency	= 50 yrs	Time to peak	= 738 min
Time interval	= 3 min	Hyd. volume	= 5,471 cuft
Inflow hyd. No.	= 5 - Subwatershed C	Max. Elevation	= 83.08 ft
Reservoir name	= Minor Basin	Max. Storage	= 2,107 cuft

Storage Indication method used.



# Hydrograph Report

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

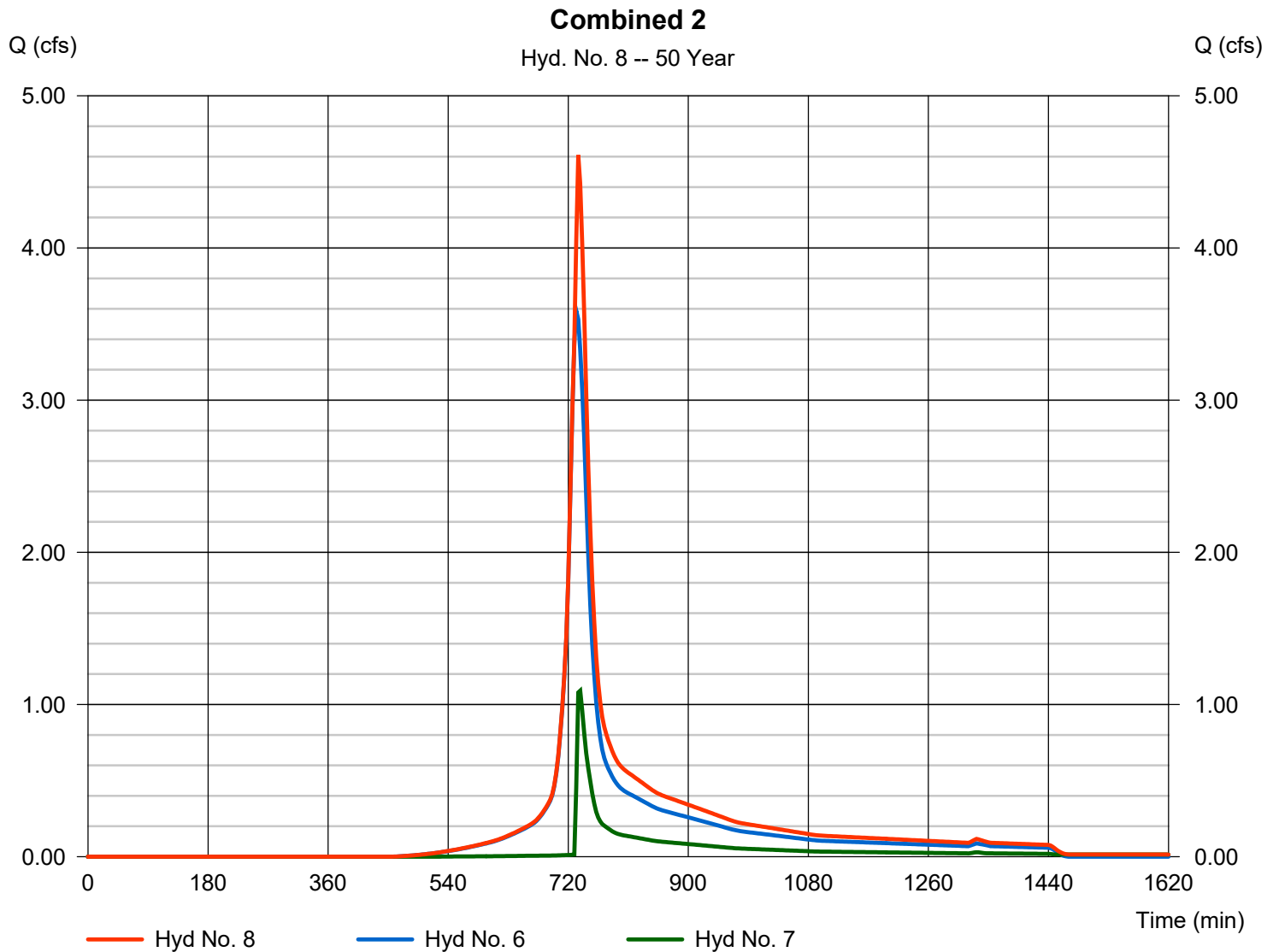
Friday, 11 / 13 / 2020

## Hyd. No. 8

Combined 2

Hydrograph type = Combine  
Storm frequency = 50 yrs  
Time interval = 3 min  
Inflow hyds. = 6, 7

Peak discharge = 4.610 cfs  
Time to peak = 735 min  
Hyd. volume = 21,496 cuft  
Contrib. drain. area = 1.050 ac



# Hydrograph Report

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

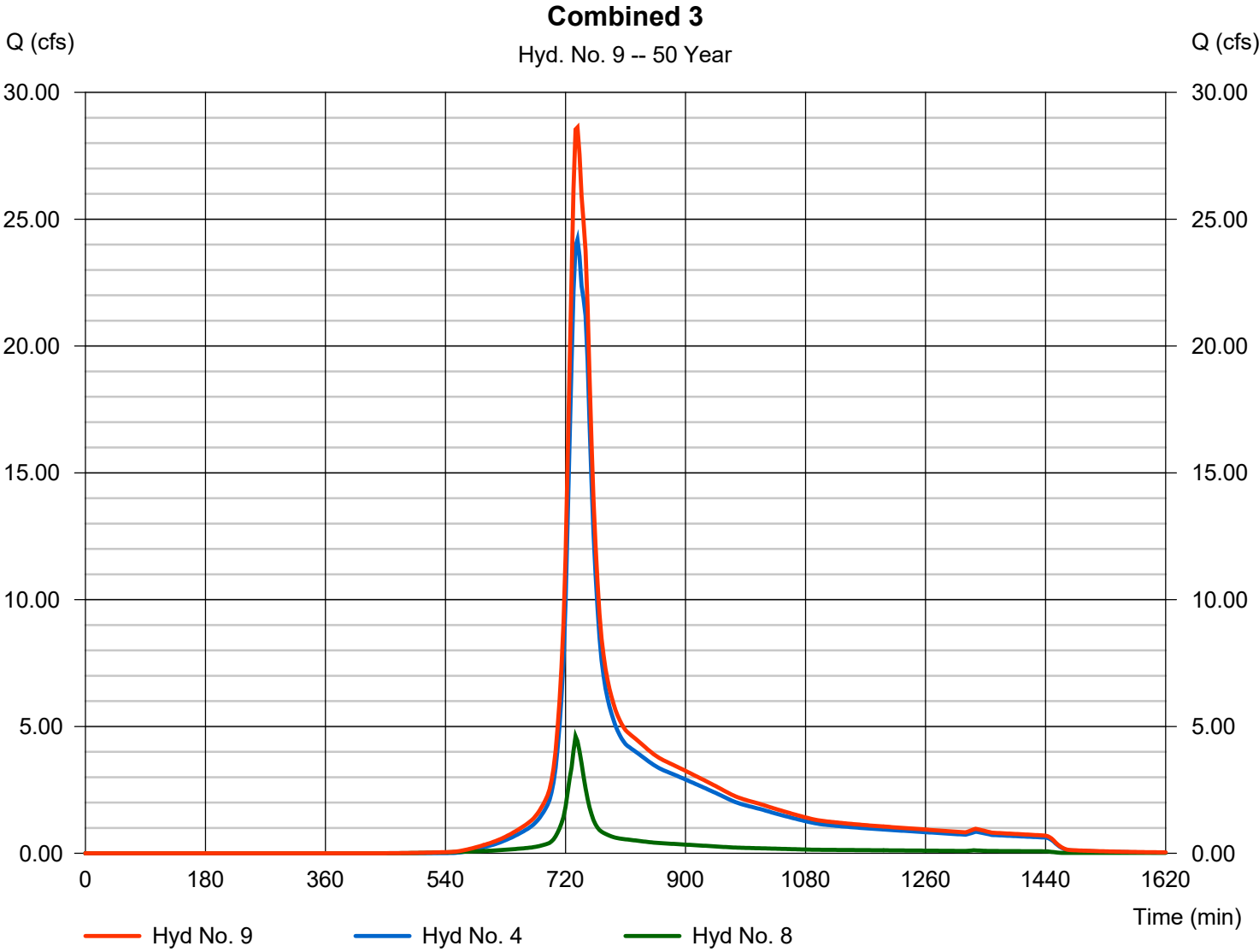
Friday, 11 / 13 / 2020

## Hyd. No. 9

Combined 3

Hydrograph type = Combine  
Storm frequency = 50 yrs  
Time interval = 3 min  
Inflow hyds. = 4, 8

Peak discharge = 28.62 cfs  
Time to peak = 738 min  
Hyd. volume = 169,936 cuft  
Contrib. drain. area = 0.000 ac



# Hydrograph Summary Report

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

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	28.72	3	735	137,832	-----	-----	-----	Subwatershed A
2	SCS Runoff	8.999	3	735	43,952	-----	-----	-----	Subwatershed B
3	Reservoir	6.541	3	747	40,839	2	92.31	19,287	Major Basin
4	Combine	31.59	3	744	178,671	1, 3	-----	-----	Combined 1
5	SCS Runoff	1.631	3	729	6,486	-----	-----	-----	Subwatershed C
6	SCS Runoff	4.253	3	732	19,010	-----	-----	-----	Suwatershed D
7	Reservoir	1.478	3	732	6,422	5	83.10	2,162	Minor Basin
8	Combine	5.731	3	732	25,432	6, 7	-----	-----	Combined 2
9	Combine	35.89	3	741	204,103	4, 8	-----	-----	Combined 3
Proposed (REV1 FINAL 11-13-2020).gpw					Return Period: 100 Year			Friday, 11 / 13 / 2020	

# Hydrograph Report

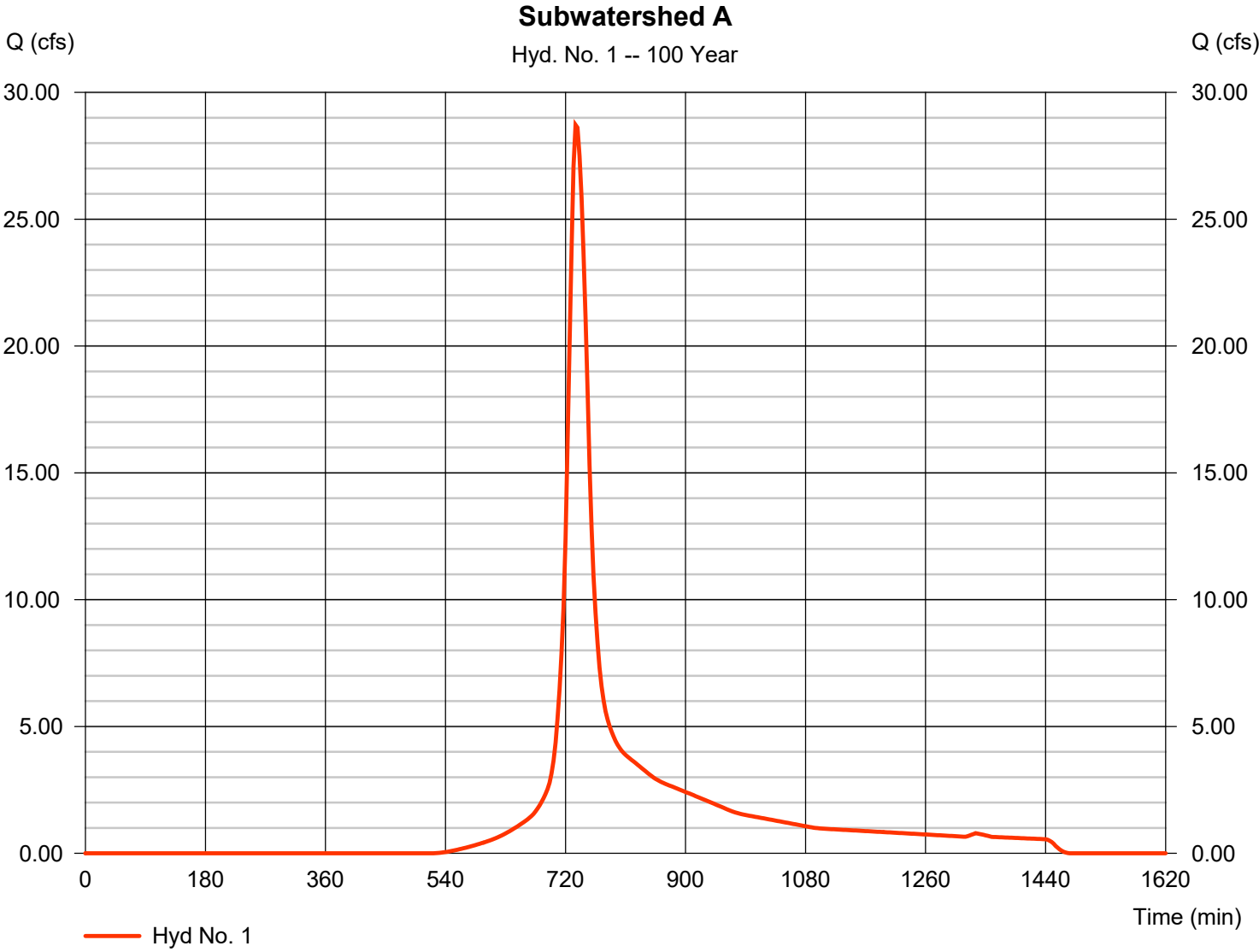
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

Friday, 11 / 13 / 2020

## Hyd. No. 1

Subwatershed A

Hydrograph type	= SCS Runoff	Peak discharge	= 28.72 cfs
Storm frequency	= 100 yrs	Time to peak	= 735 min
Time interval	= 3 min	Hyd. volume	= 137,832 cuft
Drainage area	= 9.920 ac	Curve number	= 66
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 23.80 min
Total precip.	= 7.90 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



# Hydrograph Report

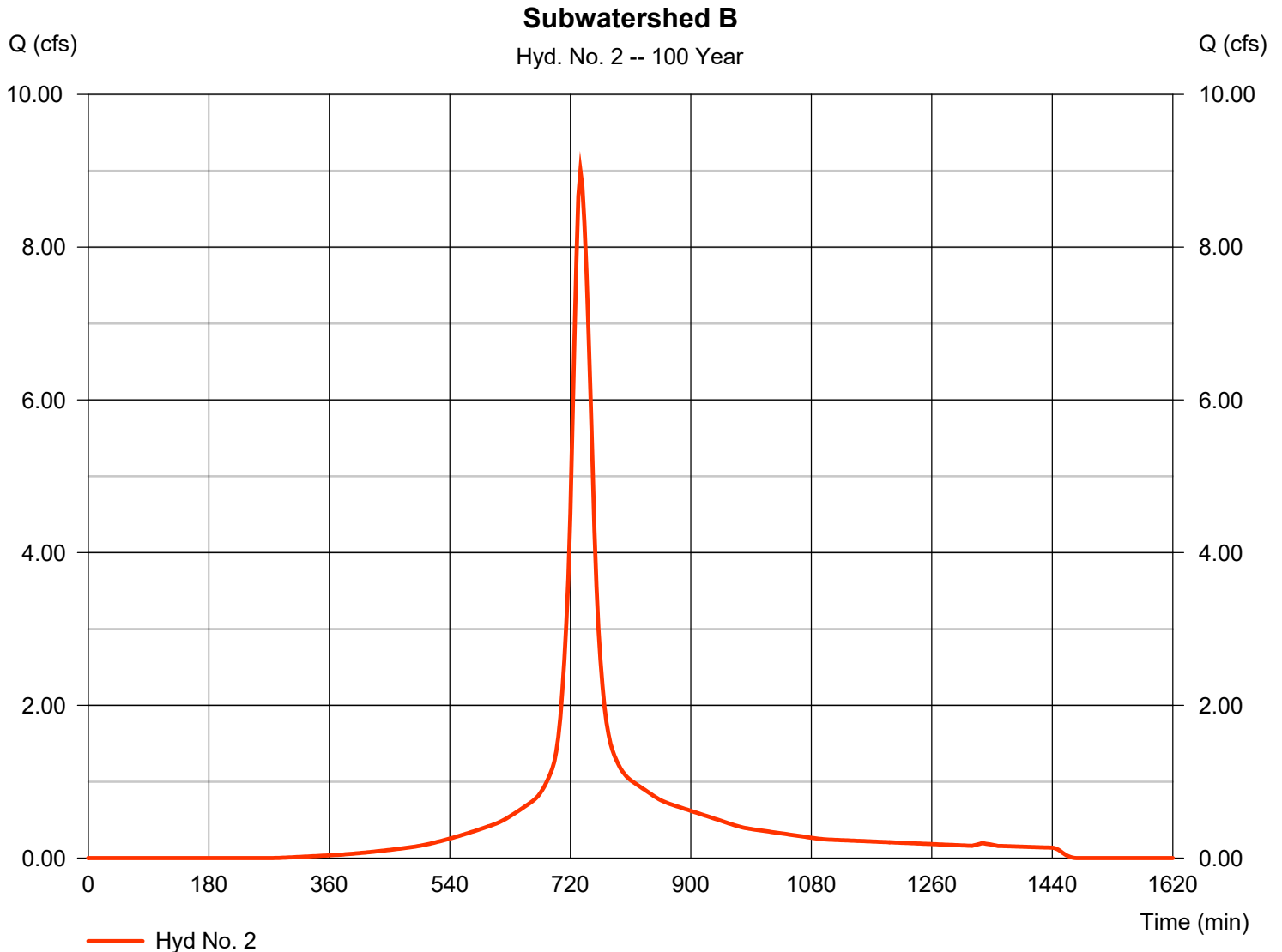
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

Friday, 11 / 13 / 2020

## Hyd. No. 2

Subwatershed B

Hydrograph type	= SCS Runoff	Peak discharge	= 8.999 cfs
Storm frequency	= 100 yrs	Time to peak	= 735 min
Time interval	= 3 min	Hyd. volume	= 43,952 cuft
Drainage area	= 2.070 ac	Curve number	= 84
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 20.30 min
Total precip.	= 7.90 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



# Hydrograph Report

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

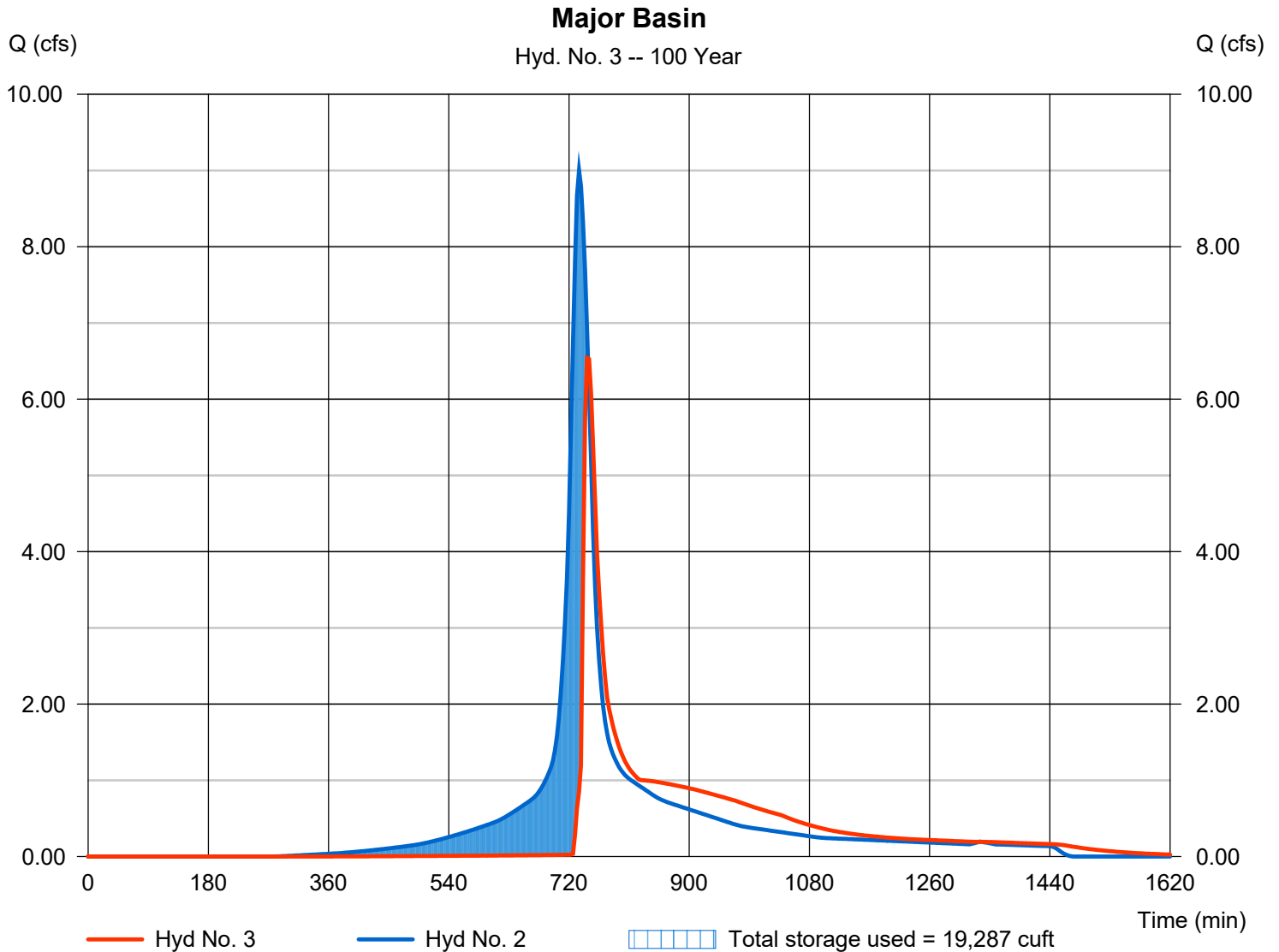
Friday, 11 / 13 / 2020

## Hyd. No. 3

### Major Basin

Hydrograph type	= Reservoir	Peak discharge	= 6.541 cfs
Storm frequency	= 100 yrs	Time to peak	= 747 min
Time interval	= 3 min	Hyd. volume	= 40,839 cuft
Inflow hyd. No.	= 2 - Subwatershed B	Max. Elevation	= 92.31 ft
Reservoir name	= Major Basin	Max. Storage	= 19,287 cuft

Storage Indication method used.



# Hydrograph Report

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

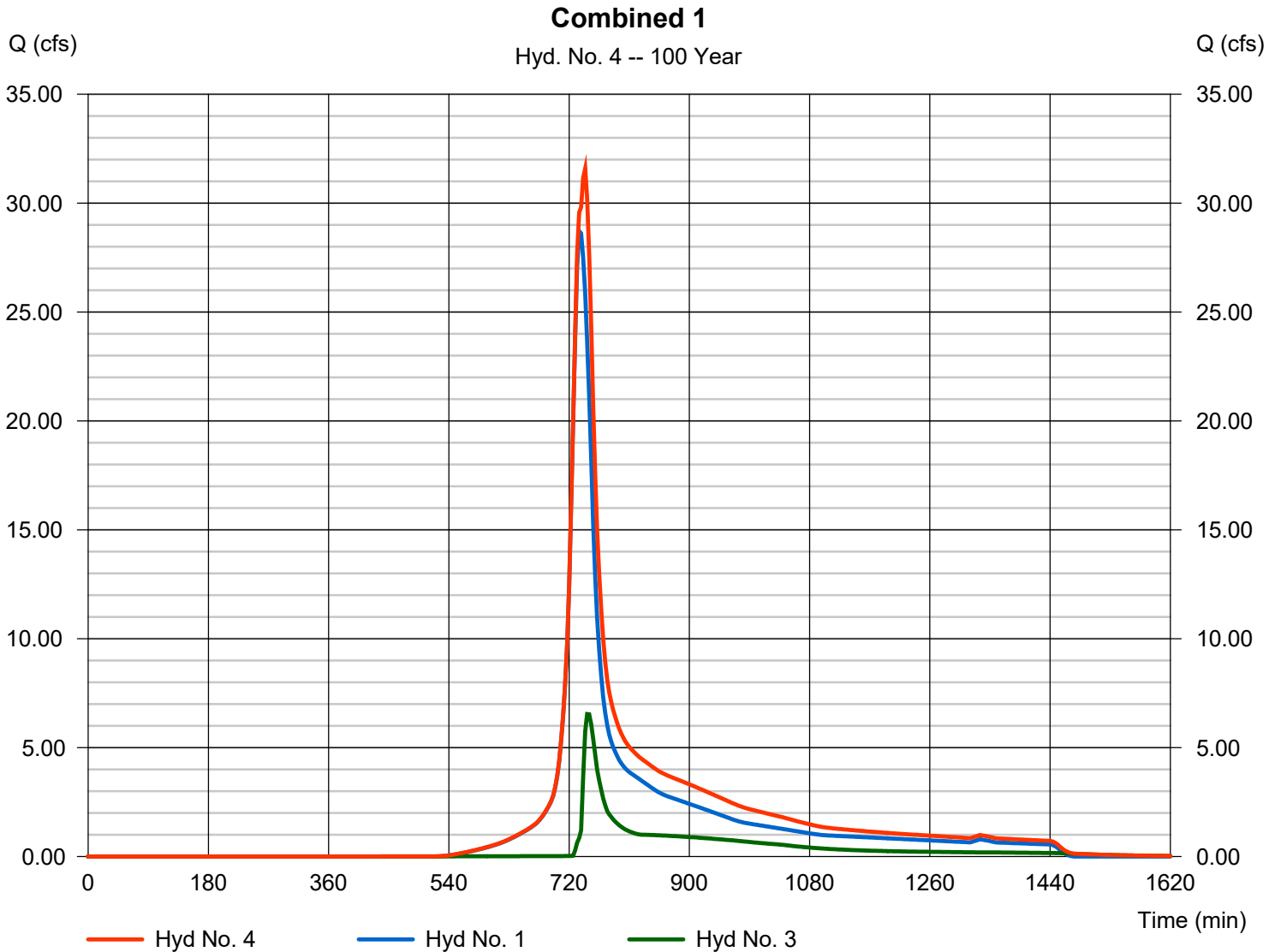
Friday, 11 / 13 / 2020

## Hyd. No. 4

Combined 1

Hydrograph type = Combine  
Storm frequency = 100 yrs  
Time interval = 3 min  
Inflow hyds. = 1, 3

Peak discharge = 31.59 cfs  
Time to peak = 744 min  
Hyd. volume = 178,671 cuft  
Contrib. drain. area = 9.920 ac





# Hydrograph Report

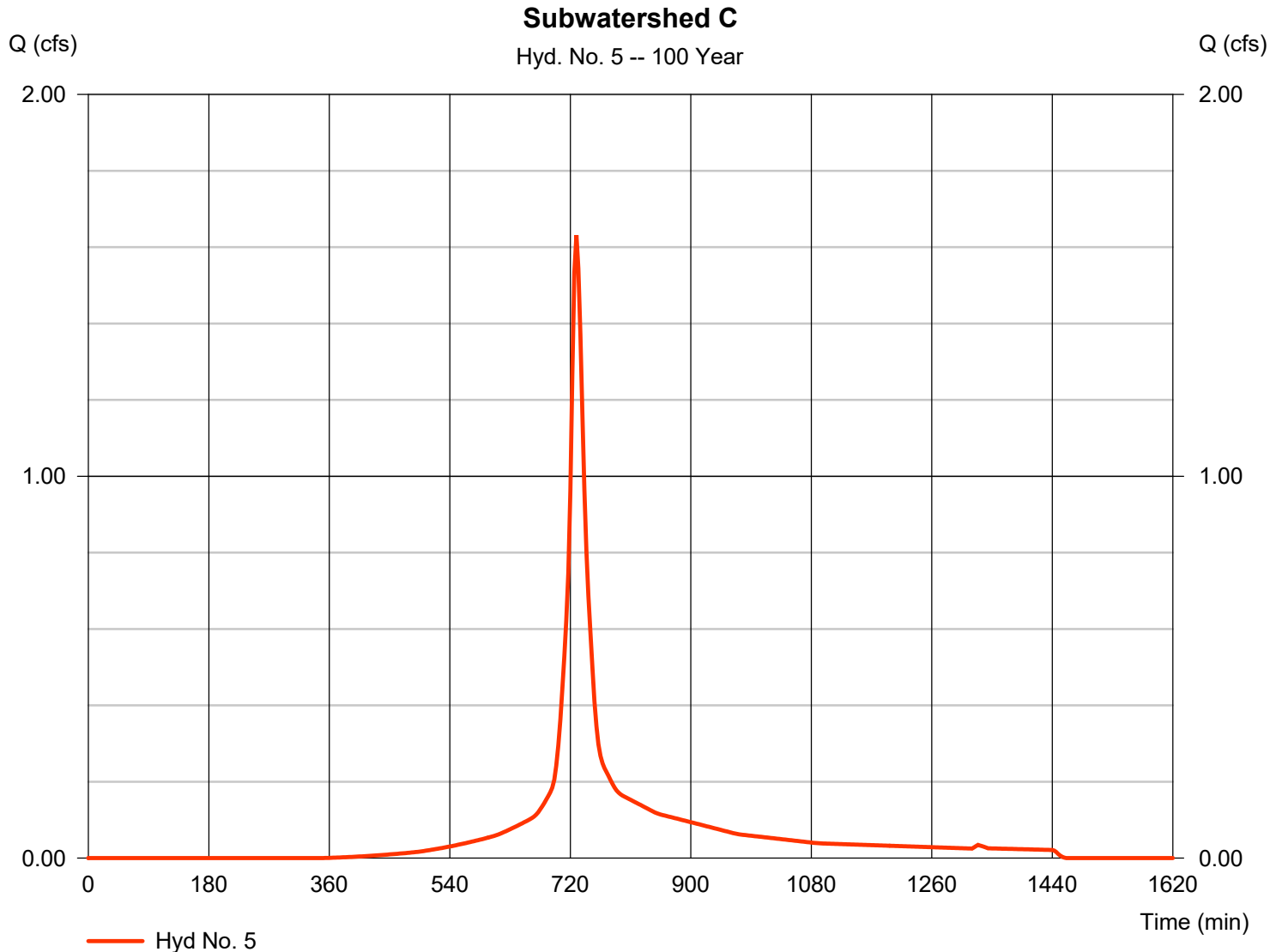
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

Friday, 11 / 13 / 2020

## Hyd. No. 5

Subwatershed C

Hydrograph type	= SCS Runoff	Peak discharge	= 1.631 cfs
Storm frequency	= 100 yrs	Time to peak	= 729 min
Time interval	= 3 min	Hyd. volume	= 6,486 cuft
Drainage area	= 0.330 ac	Curve number	= 79
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 13.20 min
Total precip.	= 7.90 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



# Hydrograph Report

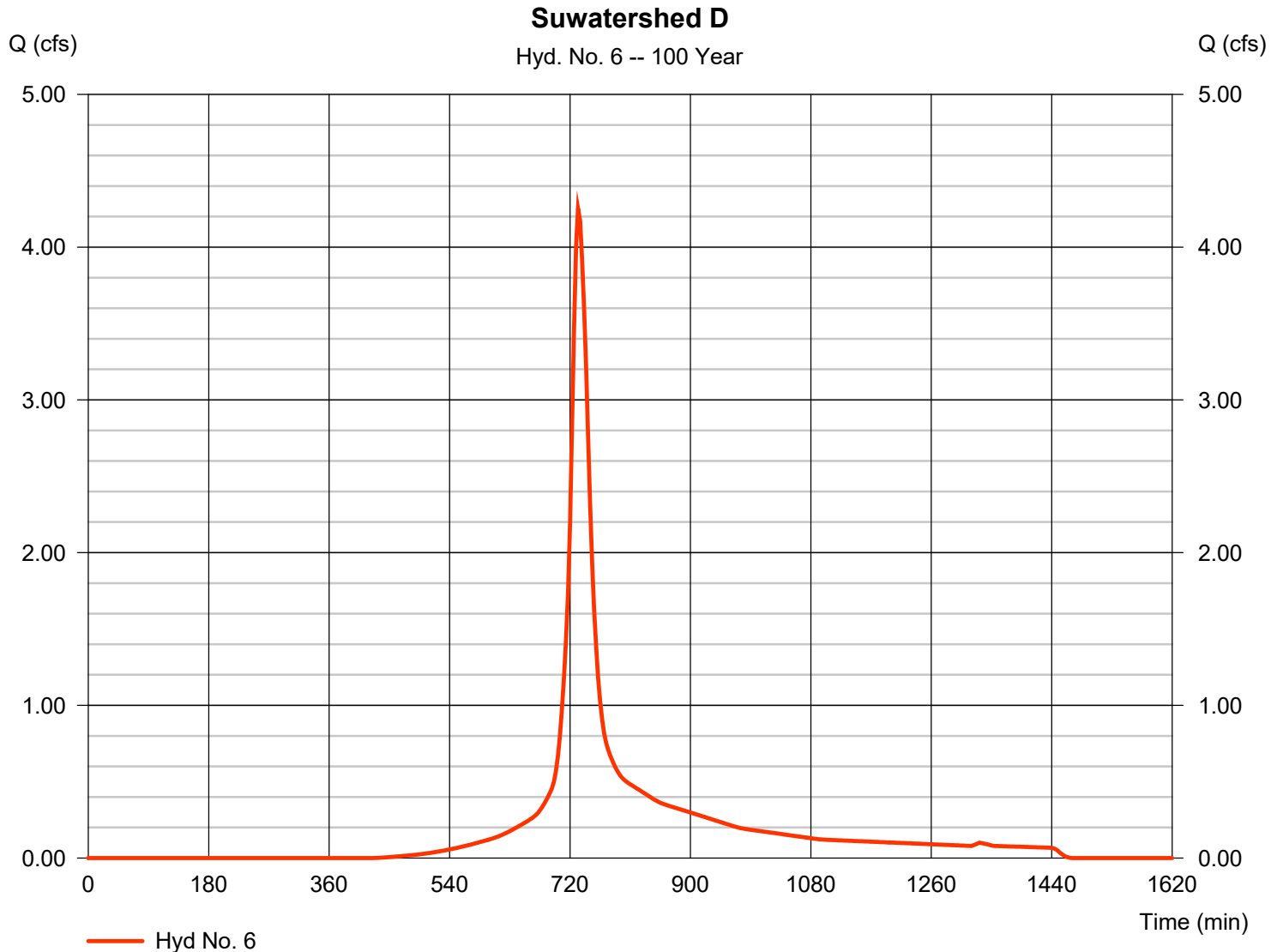
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

Friday, 11 / 13 / 2020

## Hyd. No. 6

Suwatershed D

Hydrograph type	= SCS Runoff	Peak discharge	= 4.253 cfs
Storm frequency	= 100 yrs	Time to peak	= 732 min
Time interval	= 3 min	Hyd. volume	= 19,010 cuft
Drainage area	= 1.050 ac	Curve number	= 74
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 18.40 min
Total precip.	= 7.90 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



# Hydrograph Report

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

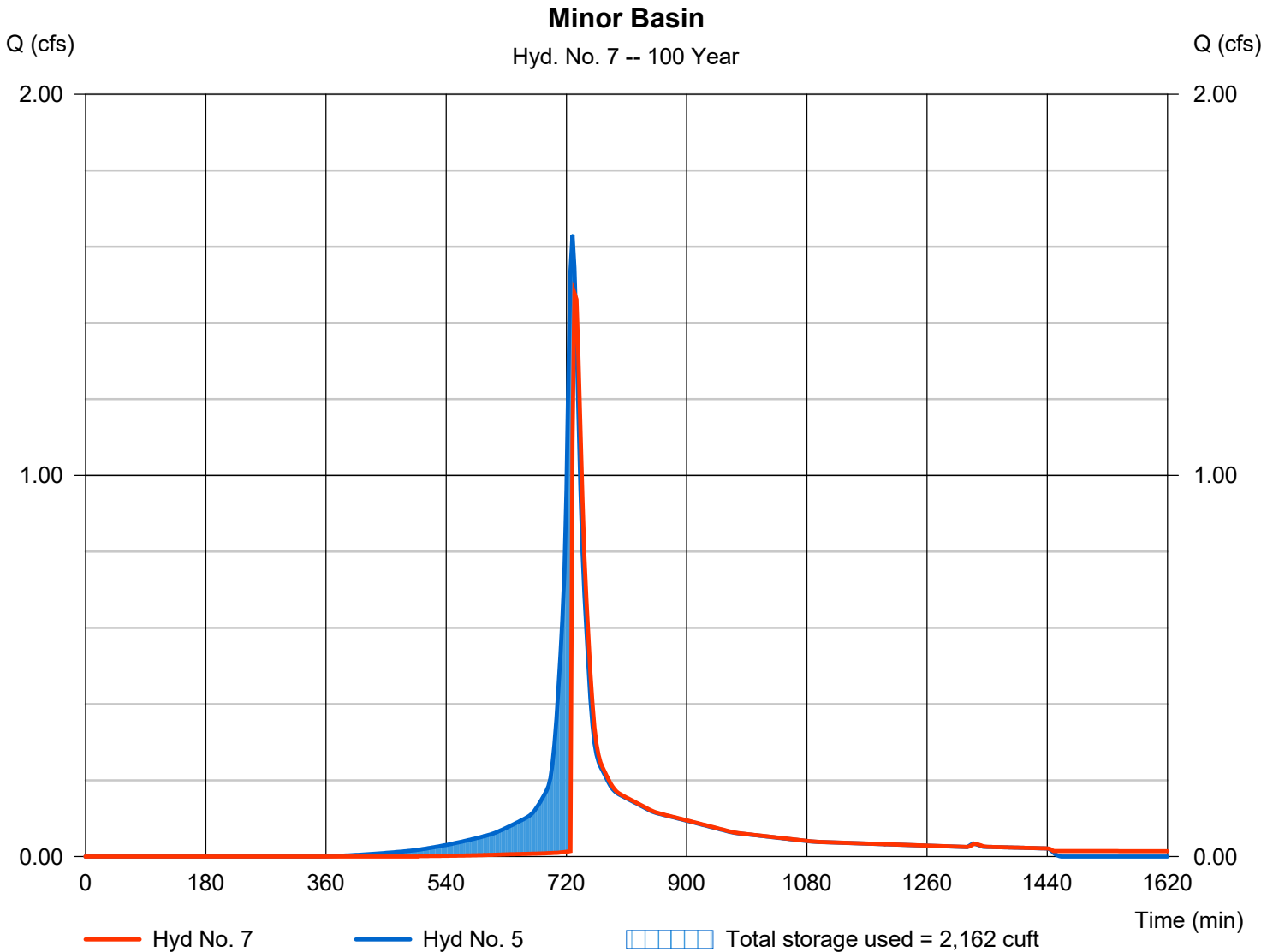
Friday, 11 / 13 / 2020

## Hyd. No. 7

Minor Basin

Hydrograph type	= Reservoir	Peak discharge	= 1.478 cfs
Storm frequency	= 100 yrs	Time to peak	= 732 min
Time interval	= 3 min	Hyd. volume	= 6,422 cuft
Inflow hyd. No.	= 5 - Subwatershed C	Max. Elevation	= 83.10 ft
Reservoir name	= Minor Basin	Max. Storage	= 2,162 cuft

Storage Indication method used.



# Hydrograph Report

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

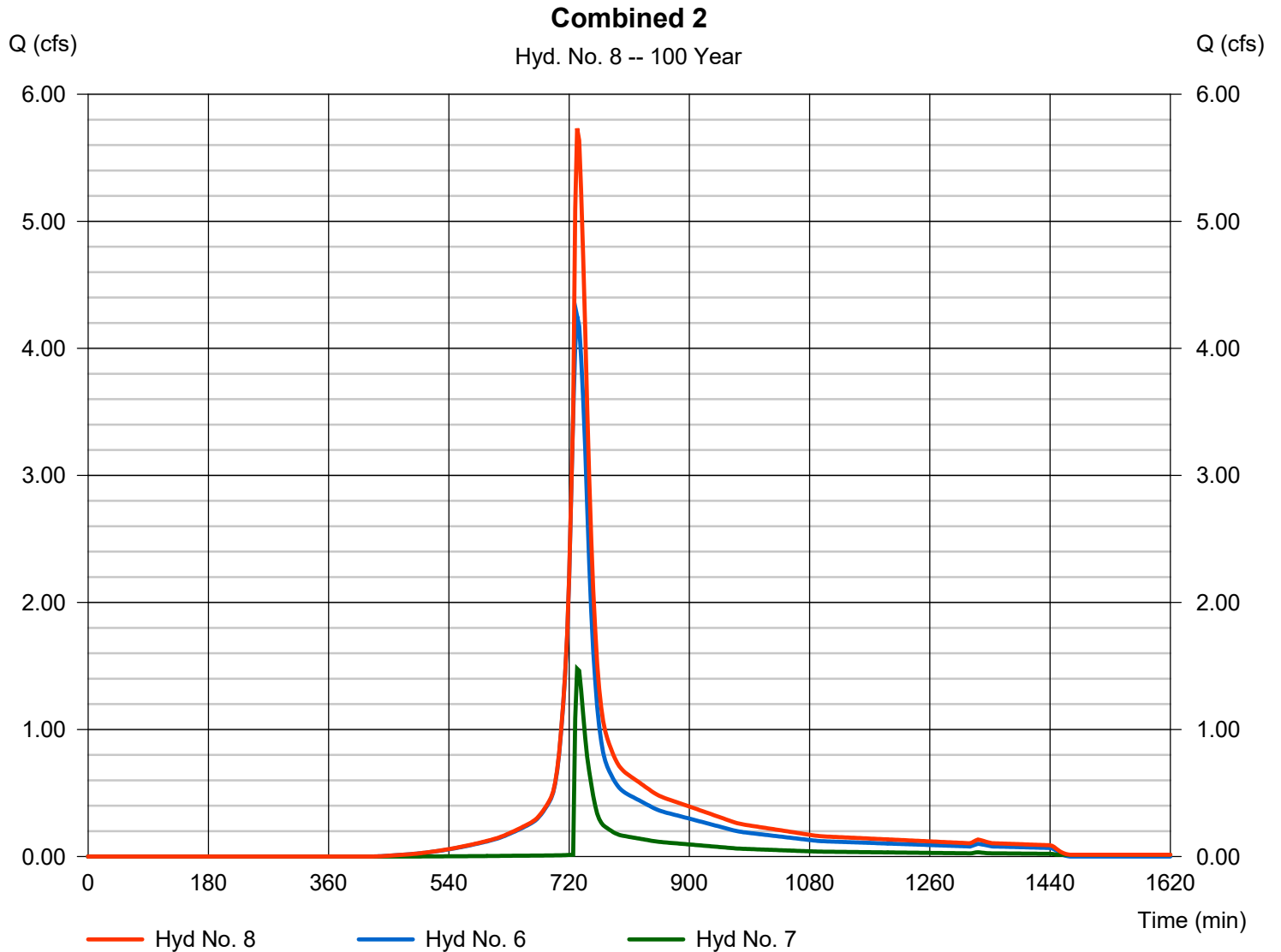
Friday, 11 / 13 / 2020

## Hyd. No. 8

Combined 2

Hydrograph type = Combine  
Storm frequency = 100 yrs  
Time interval = 3 min  
Inflow hyds. = 6, 7

Peak discharge = 5.731 cfs  
Time to peak = 732 min  
Hyd. volume = 25,432 cuft  
Contrib. drain. area = 1.050 ac



# Hydrograph Report

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

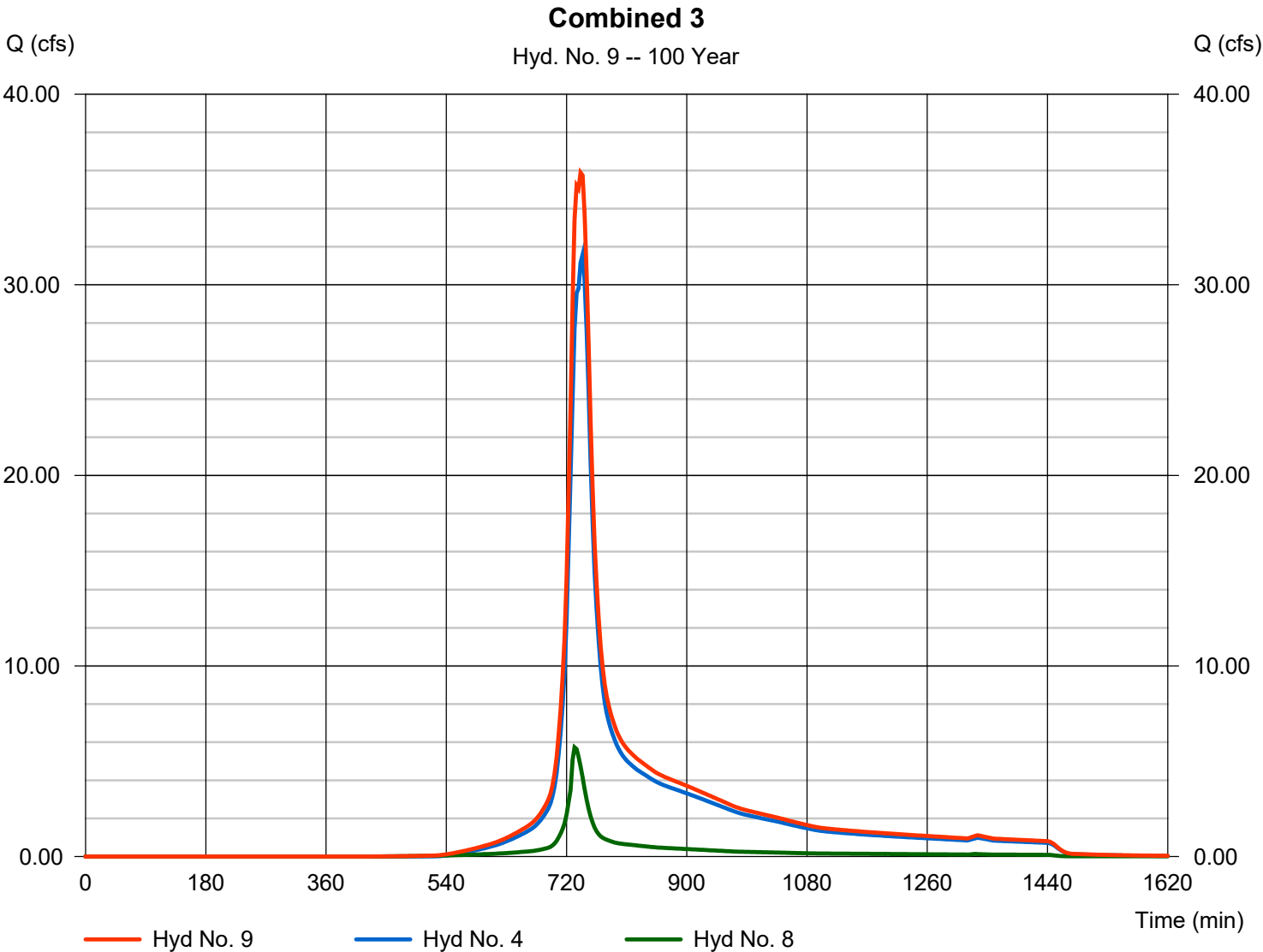
Friday, 11 / 13 / 2020

## Hyd. No. 9

Combined 3

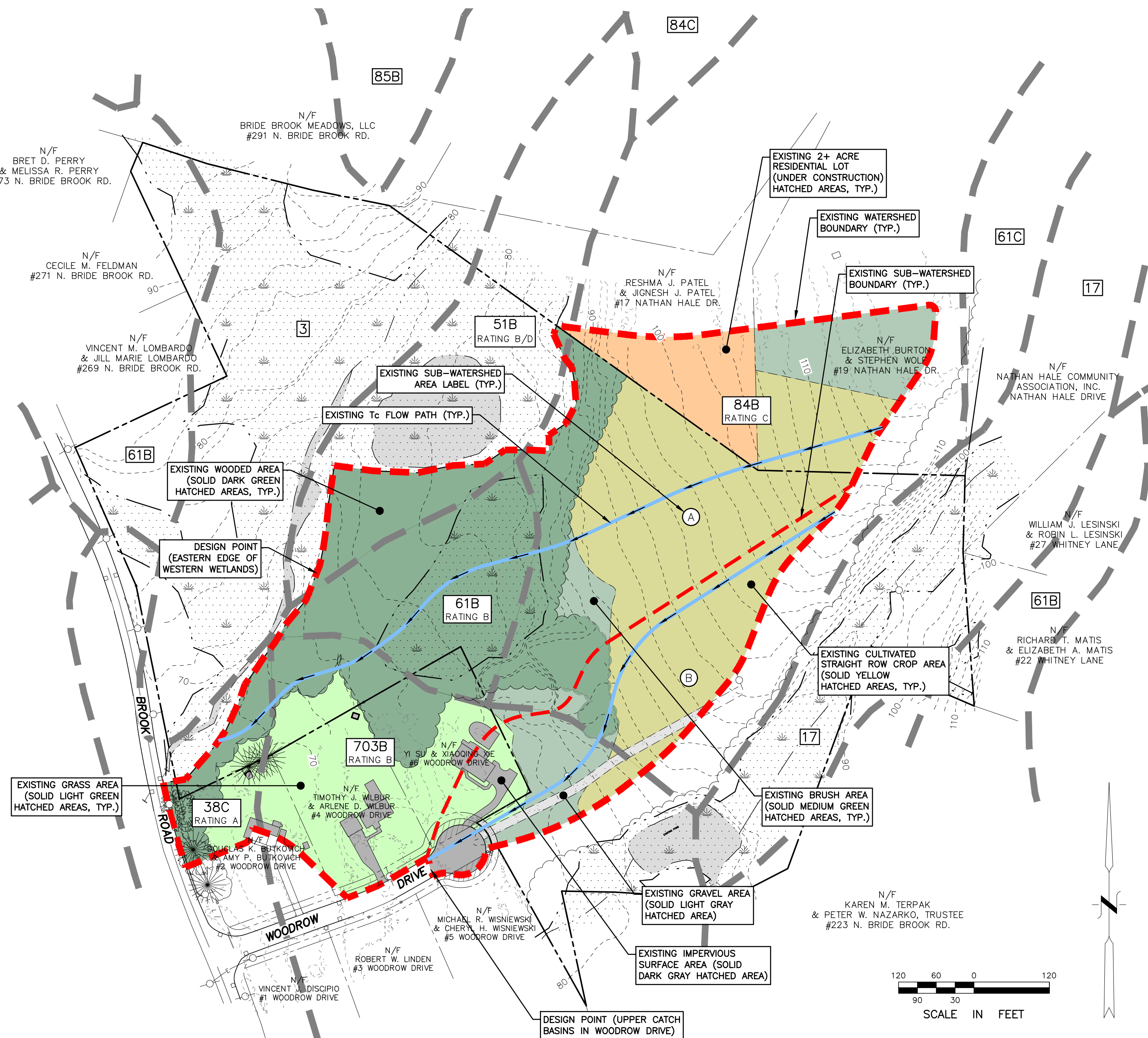
Hydrograph type = Combine  
Storm frequency = 100 yrs  
Time interval = 3 min  
Inflow hyds. = 4, 8

Peak discharge = 35.89 cfs  
Time to peak = 741 min  
Hyd. volume = 204,103 cuft  
Contrib. drain. area = 0.000 ac

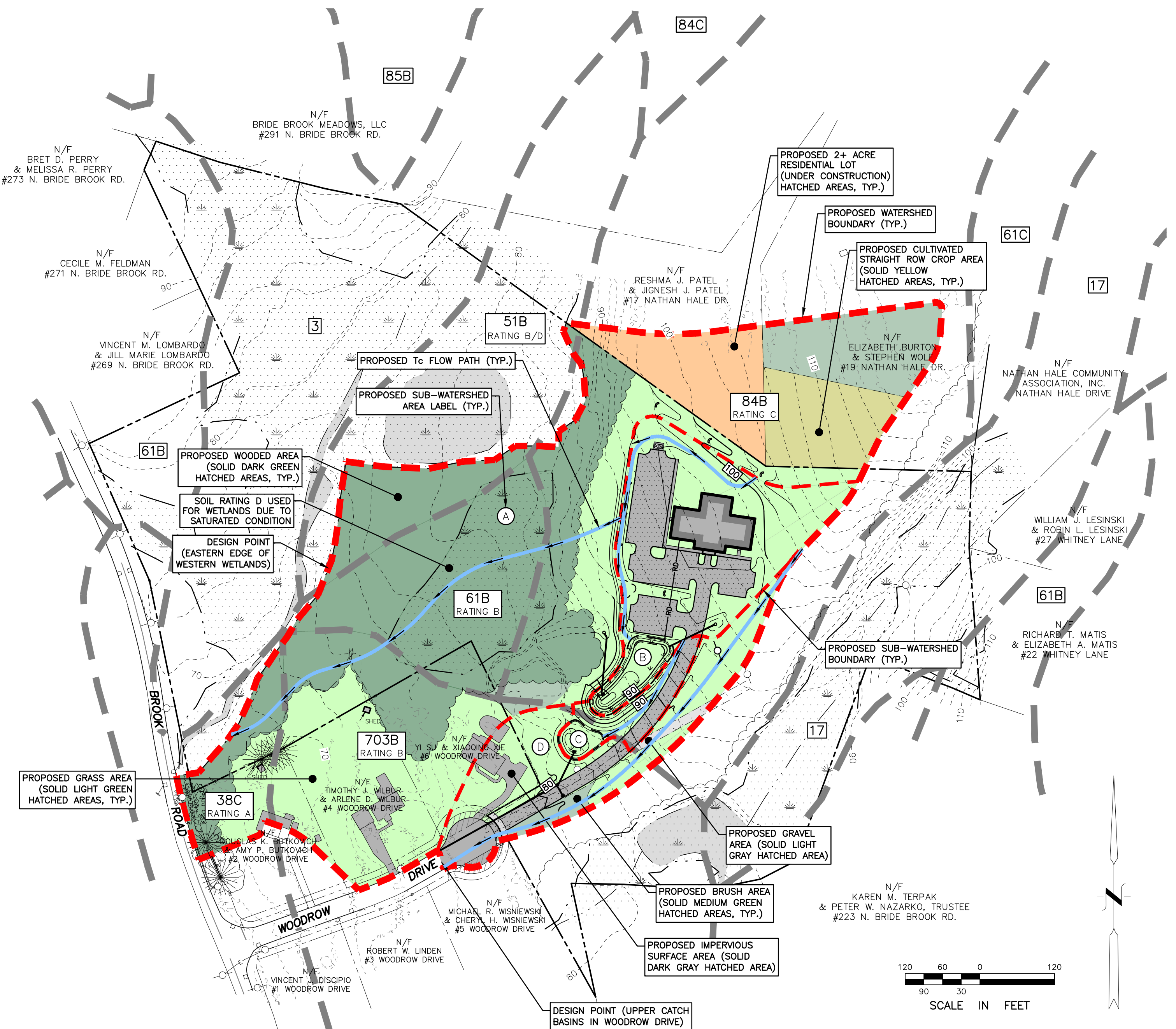




EXISTING DRAINAGE AREA MAP



PROPOSED DRAINAGE AREA MAP



EXISTING DRAINAGE AREA CURVE NUMBERS

PROPOSED TR-55 CURVE NUMBERS WATERSHED AREA 'A'				
CURVE NUMBER	GROUND COVER	SOIL RATING	CN (SQ. FT.)	CN (ACRES)
98	IMPERVIOUS	N/A	8,121	0.19
85	STRAIGHT ROW CROP (GOOD)	C	112,735	2.59
77	2 ACRE RESIDENTIAL LOT (GOOD)	C	32,511	0.75
82	2 ACRE RESIDENTIAL LOT (GOOD)	D	155	0.00
39	GRASS (GOOD)	A	10,342	0.24
61	GRASS (GOOD)	B	67,743	1.56
30	WOODS (GOOD)	A	17,711	0.41
55	WOODS (GOOD)	B	84,289	1.94
70	WOODS (GOOD)	C	39,624	0.91
77	WOODS (GOOD)	D	55,569	1.28
48	BRUSH (GOOD)	B	349	0.01
65	BRUSH (GOOD)	C	41,696	0.96
TOTAL			470,845	10.81

THE WEIGHTED CURVE NUMBER (CN) VALUE IS: 69

PROPOSED TR-55 CURVE NUMBERS WATERSHED AREA 'B'				
CURVE NUMBER	GROUND COVER	SOIL RATING	CN (SQ. FT.)	CN (ACRES)
98	IMPERVIOUS	N/A	10,896	0.25
85	GRAVEL ROAD	B	3,666	0.08
89	GRAVEL ROAD	C	2,029	0.05
78	STRAIGHT ROW CROP (GOOD)	B	3,886	0.09
85	STRAIGHT ROW CROP (GOOD)	C	52,570	1.21
61	GRASS (GOOD)	B	10,298	0.24
55	WOODS (GOOD)	B	197	0.00
70	WOODS (GOOD)	C	6,758	0.16
48	BRUSH (GOOD)	B	19,706	0.45
65	BRUSH (GOOD)	C	1,613	0.04
TOTAL			111,619	2.56

THE WEIGHTED CURVE NUMBER (CN) VALUE IS: 76

SOILS LEGEND		
UNIT NUMBER	SOIL TYPE	SOIL RATING
3	RIDGEBURY, LEICESTER, & WHITMAN SOILS, 0-3% SLOPES, EXTREMELY STONY	D
17	TIMAKWA & NATCHAUG SOILS, 0-2% SLOPES	B/D
38C	HINCKLEY LOAMY SAND, 3-15% SLOPES	A
51B	SUTTON FINE SANDY LOAM, 0-8% SLOPES, VERY STONY	B/D
61B	CANTON & CHARLTON FINE SANDY LOAMS, 0-8% SLOPES, VERY STONY	B
61C	CANTON & CHARLTON FINE SANDY LOAMS, 8-15% SLOPES, VERY STONY	B
84B	PAXTON & MONTAUK FINE SANDY LOAMS, 3-8% SLOPES	C
84C	PAXTON & MONTAUK FINE SANDY LOAMS, 8-15% SLOPES	C
703B	HAVEN SILT LOAM, 3-8% SLOPES	B

PROPOSED DRAINAGE AREA CURVE NUMBERS

PROPOSED TR-55 CURVE NUMBERS WATERSHED AREA 'A'				
CURVE NUMBER	GROUND COVER	SOIL RATING	CN (SQ. FT.)	CN (ACRES)
98	IMPERVIOUS	N/A	8,121	0.19
85	STRAIGHT ROW CROP (GOOD)	C	27,241	0.63
77	2 ACRE RESIDENTIAL LOT (GOOD)	C	32,511	0.75
82	2 ACRE RESIDENTIAL LOT (GOOD)	D	155	0.004
39	GRASS (GOOD)	A	10,342	0.24
61	GRASS (GOOD)	B	67,790	1.56
74	GRASS (GOOD)	C	46,064	1.06
30	WOODS (GOOD)	A	17,711	0.41
55	WOODS (GOOD)	B	87,263	2.00
70	WOODS (GOOD)	C	44,395	1.02
77	WOODS (GOOD)	D	55,569	1.28
48	BRUSH (GOOD)	B	1,206	0.03
65	BRUSH (GOOD)	C	33,713	0.77
TOTAL			432,081	9.92

THE WEIGHTED CURVE NUMBER (CN) VALUE IS: 66

PROPOSED TR-55 CURVE NUMBERS WATERSHED AREA 'B'				
CURVE NUMBER	GROUND COVER	SOIL RATING	CN (SQ. FT.)	CN (ACRES)
98	IMPERVIOUS	N/A	36,929	0.85
74	GRASS (GOOD)	C	53,453	1.23
TOTAL			90,382	2.07

THE WEIGHTED CURVE NUMBER (CN) VALUE IS: 84

PROPOSED TR-55 CURVE NUMBERS WATERSHED AREA 'C'				
CURVE NUMBER	GROUND COVER	SOIL RATING	CN (SQ. FT.)	CN (ACRES)
98	IMPERVIOUS	N/A	4,951	0.11
61	GRASS (GOOD)	B	3,888	0.09
74	GRASS (GOOD)	C	5,382	0.12
TOTAL			14,221	0.33

THE WEIGHTED CURVE NUMBER (CN) VALUE IS: 79

PROPOSED TR-55 CURVE NUMBERS WATERSHED AREA 'D'				
CURVE NUMBER	GROUND COVER	SOIL RATING	CN (SQ. FT.)	CN (ACRES)
98	IMPERVIOUS	N/A	16,161	0.37
85	GRAVEL ROAD	B	1,947	0.04
89	GRAVEL ROAD	C	59	0.001
61	GRASS (GOOD)	B	23,383	0.54
48	BRUSH (GOOD)	B	4,230	0.10
TOTAL			45,780	1.05

THE WEIGHTED CURVE NUMBER (CN) VALUE IS: 74

PLAN PREPARED BY:  
INDIGO LAND DESIGN, LLC  
INDIGO LAND DESIGN, LLC  
40 ELM STREET, 2ND FLOOR  
OLD SAYBROOK, CT 06475  
PHONE: (860) 388-9343  
FAX: (860) 391-8854

THE EMPLOYED SEAL OF THE PROFESSIONAL ENGINEER IS AFFIXED HERE FOR THIS MAP TO BE VALID

#	DATE	BY	DESCRIPTION
1	11/13/2020	RG	GENERAL REVISIONS

DRAINAGE AREA MAPS  
PREPARED FOR #1 EAST LYME 144, LLC  
144 BOSTON POST ROAD -- MAP 13.1 LOT 8  
EAST LYME, CONNECTICUT

DATE: SEPTEMBER 8, 2020  
SCALE: 1"=120'  
DRAWN BY: RG  
CHECKED BY: JW  
DWG. NO.: DAM-1  
SHEET NO.: 1 of 1  
JOB NO.: 2019-545