Baughman

January 25, 2011

Scott Lindebak, P.E. CFM
Public Works, Stormwater Division
City of Wichita, Kansas

RE: Lillie 2ND Addition
Assisted Living Facility
Reserve C Detention Pond
WQv and CPv Calculations

Mr. Lindebak,

The following is a summary of the existing, conditions, proposed conditions, and the Water Quality (WQv) and Channel Protection (CPv) calculations for the above referenced project.

As you know, the overall stormwater controls have previously been installed including the two retention ponds, their respective outfalls, as well as the street that serves this property. Currently, plans have been submitted to the City for review of the next phase of this development (Lot 2, Block A, Lillie 2nd Addition). The plans portray an Assisted Living Facility which, when developed, will primarily utilize stormwater sewer to directly discharge developed runoff into the pond facility in Reserve C.

The original Drainage Plan, approved in March of 2007, shows the west retention pond (Reserve C) serving all of Lot 2 for detention purposes. This pond consisted of an RCP outfall with an emergency overflow weir structure. The pond is currently configured this way with a Static Pool elevation of a 1313.5. The pond, as currently configured, does not address the current WQ or CP requirements as required as of January 1, 2011.

To meet these requirements we propose a re-configuration of the existing outlet structure. We anticipate the structure to be similar to a 2x2 grated box inlet structure with a 2" orifice located at the static water surface in order to meet the 24-hour extended detention time for the CPv. This outlet will allow the CPv to be achieved as well as still provide detention for the storm series as originally designed. However, it appears that the ponds discharge in the larger storms in the series (50, 100, etc) actually increase in peak discharge as originally intended. This is due primarily to the effects of the box structure and raising the outlet (grated structure on the box). However, we do not think that this is of concern as the pond discharges directly into the Calfskin Creek. The backwater effect on the creek during these events will outweigh the discharge of the pond regardless.

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Baughman Company, P.A.
315 Ellis Street
Wichita, Kansas 67203
P 316.262.7271
F 316.262.0149

The WQv can be achieved within the pond under the static pool surface. As it is exists today, the pond has approximately 60,000 cu-ft of storage under the static pool. The WQv was calculated using two methods in order to ensure accuracy. First, the volume was calculated using volume of the hydrograph as modeled with a CN of 92 and a Tc of 15 min for the 1.2" rainfall. This method gave us a WQv of 16,000 cu-ft generated from the developed site. When using the R values and equations as provided in the Manual, the volume was calculated to be approximately 23,000 cu-ft generated from the developed site. Since both of these volumes are under the already provided pond volume of 60,000, the existing pond should meet the WQv requirements as set forth in the Storm Water Manual.

Attached is the HydraFlow Hydrographs model which shows the hydrographs and discharges for the above described scenario(s). Please note, the 3-yr event is actually setup for the 1.2" WQ precipitation for all time intervals.

We anticipate that with the re-configuration of the existing outlet structure the new WQ and CP volumes will be met. The final outlet design will be proposed and engineered with the site plan package, and will be as similar (hydraulically) to what is described above.

Please review and let us know of any questions or concerns by phone at 316.262.7271 or by email at tkurth@baughmanco.com.

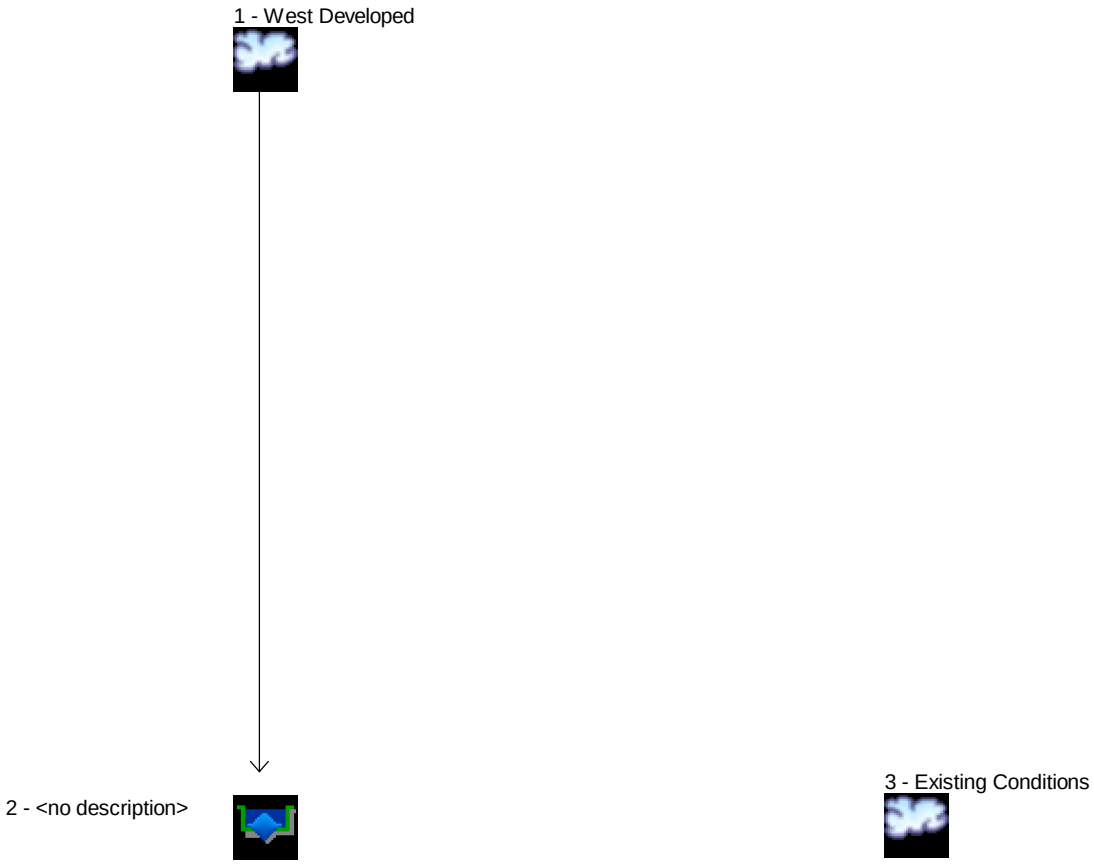
Sincerely,

Trevor R. Kurth, P.E. CFM
Water Resources Engineer

Cc: File

Attachments

Watershed Model Schematic



Legend

Hyd.	Origin	Description
1	SCS Runoff	West Developed
2	Reservoir	<no description>
3	SCS Runoff	Existing Conditions

Hydrograph Return Period Recap

Hyd. No.	Hydrograph type (origin)	Inflow Hyd(s)	Peak Outflow (cfs)								Hydrograph description
			1-Yr	2-Yr	3-Yr	5-Yr	10-Yr	25-Yr	50-Yr	100-Yr	
1	SCS Runoff	------	20.29	26.76	5.792	35.96	42.36	50.54	57.78	65.89	West Developed
2	Reservoir	1	0.659	2.806	0.091	12.52	21.35	31.94	40.81	50.23	<no description>
3	SCS Runoff	------	5.021	9.282	0.016	16.26	21.69	29.08	35.91	43.80	Existing Conditions

Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066

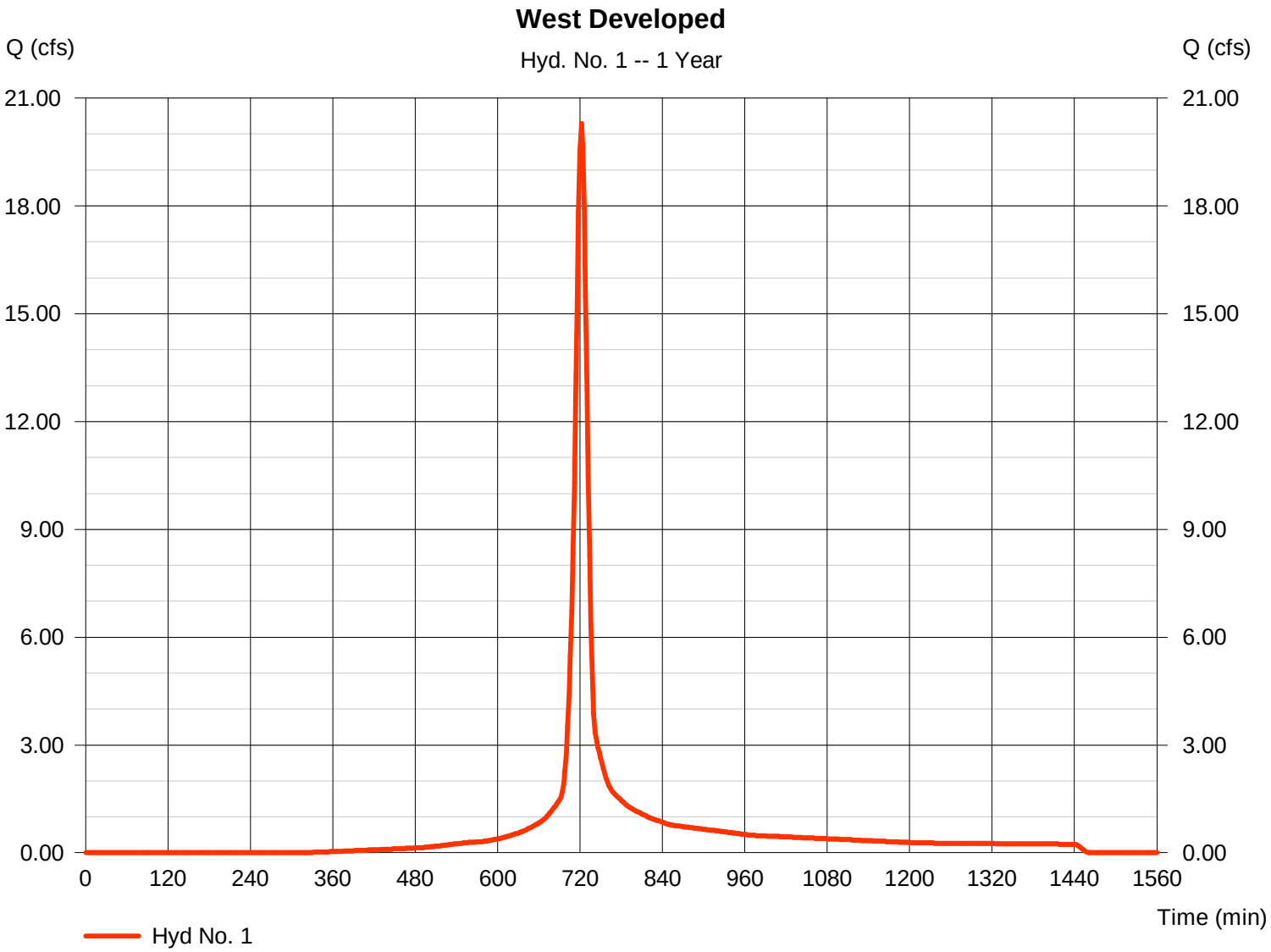
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph description
1	SCS Runoff	20.29	2	722	57,953	------	------	------	West Developed
2	Reservoir	0.659	2	900	49,199	1	1316.22	42,017	<no description>
3	SCS Runoff	5.021	2	724	16,610	------	------	------	Existing Conditions

Hydrograph Report

Hyd. No. 1

West Developed

Hydrograph type	= SCS Runoff	Peak discharge	= 20.29 cfs
Storm frequency	= 1 yrs	Time to peak	= 722 min
Time interval	= 2 min	Hyd. volume	= 57,953 cuft
Drainage area	= 8.300 ac	Curve number	= 92
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 15.00 min
Total precip.	= 2.80 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



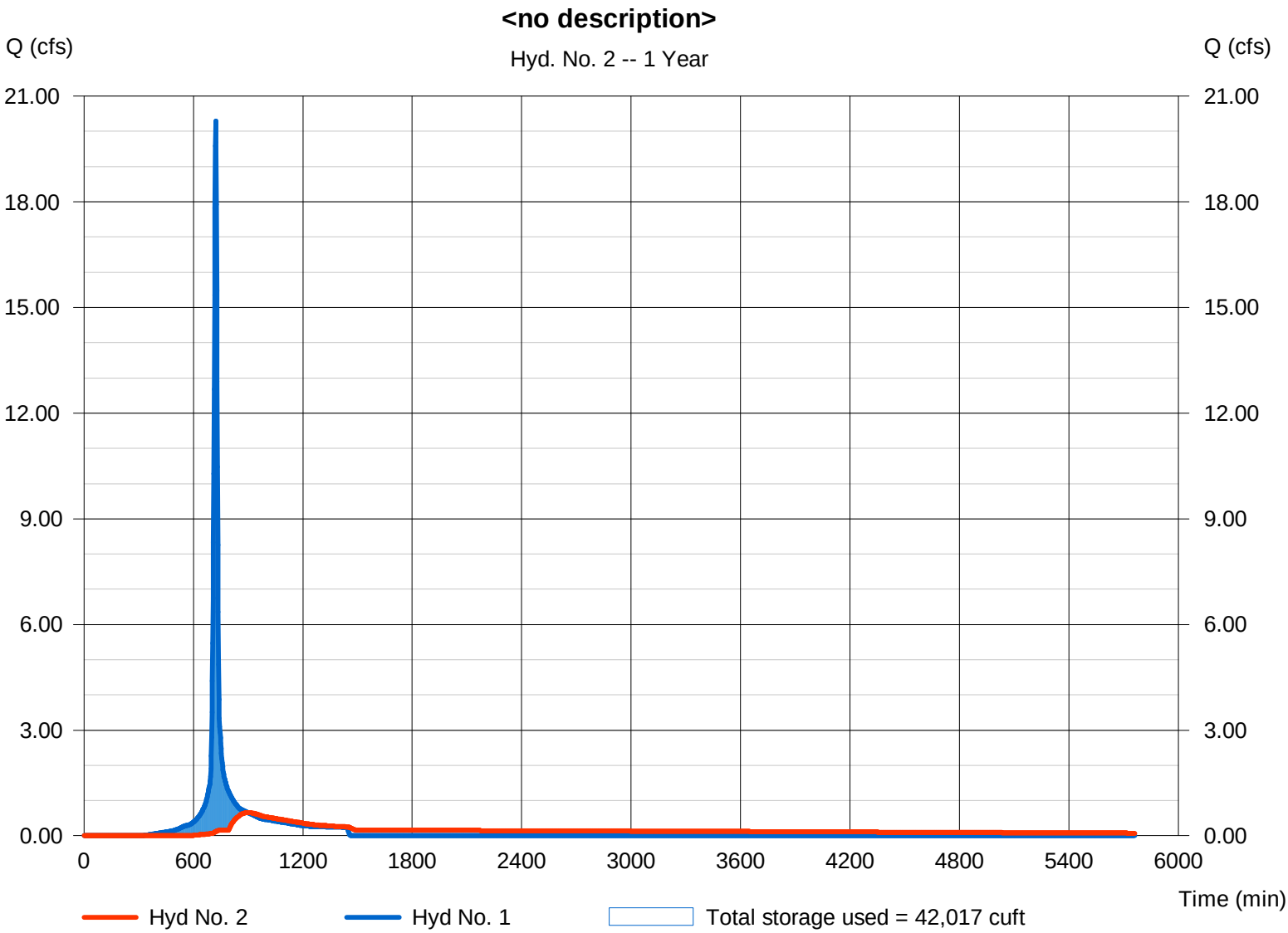
Hydrograph Report

Hyd. No. 2

<no description>

Hydrograph type	=	Reservoir	Peak discharge	=	0.659 cfs
Storm frequency	=	1 yrs	Time to peak	=	900 min
Time interval	=	2 min	Hyd. volume	=	49,199 cuft
Inflow hyd. No.	=	1 - West Developed	Max. Elevation	=	1316.22 ft
Reservoir name	=	<New Pond>	Max. Storage	=	42,017 cuft

Storage Indication method used.



Hydrograph Report

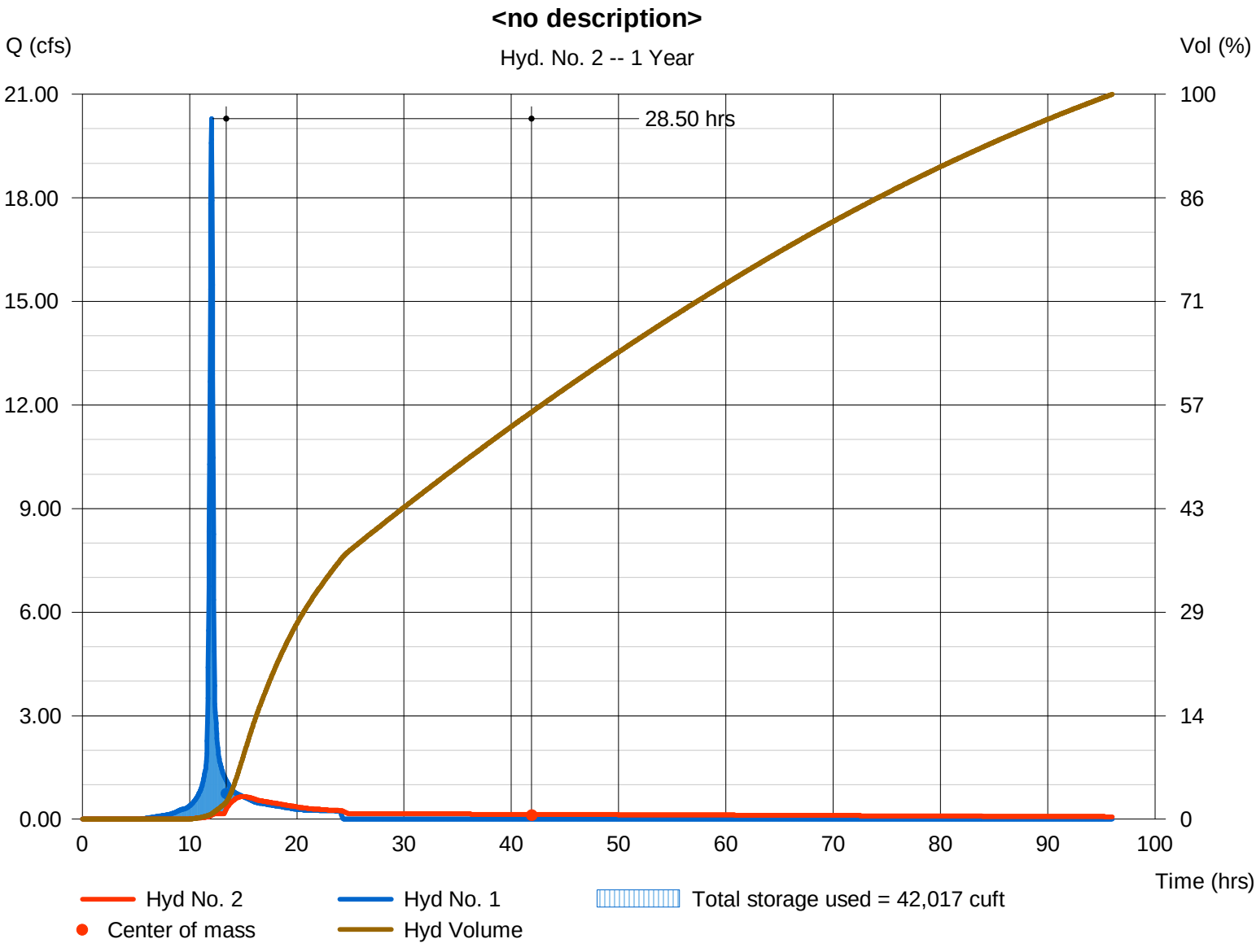
Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Wednesday, Jan 26, 2011

Hyd. No. 2

<no description>

Hydrograph type	=	Reservoir	Peak discharge	=	0.659 cfs
Storm frequency	=	1 yrs	Time to peak	=	900 min
Time interval	=	2 min	Hyd. volume	=	49,199 cuft
Inflow hyd. No.	=	1 - West Developed	Max. Elevation	=	1316.22 ft
Reservoir name	=	<New Pond>	Max. Storage	=	42,017 cuft

Storage Indication method used.



Pond Report

Pond No. 1 - <New Pond>

Pond Data

Contours - User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 1313.50 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	1313.50	11,500	0	0
0.50	1314.00	13,000	6,121	6,121
1.50	1315.00	15,850	14,400	20,521
2.50	1316.00	18,820	17,312	37,833
3.50	1317.00	20,000	19,405	57,238
4.50	1318.00	20,000	19,998	77,236

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 18.00	2.00	0.00	0.00
Span (in)	= 18.00	2.00	0.00	0.00
No. Barrels	= 1	1	0	0
Invert El. (ft)	= 1313.50	1313.60	0.00	0.00
Length (ft)	= 65.00	0.50	0.00	0.00
Slope (%)	= 0.80	0.01	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	Yes	No	No

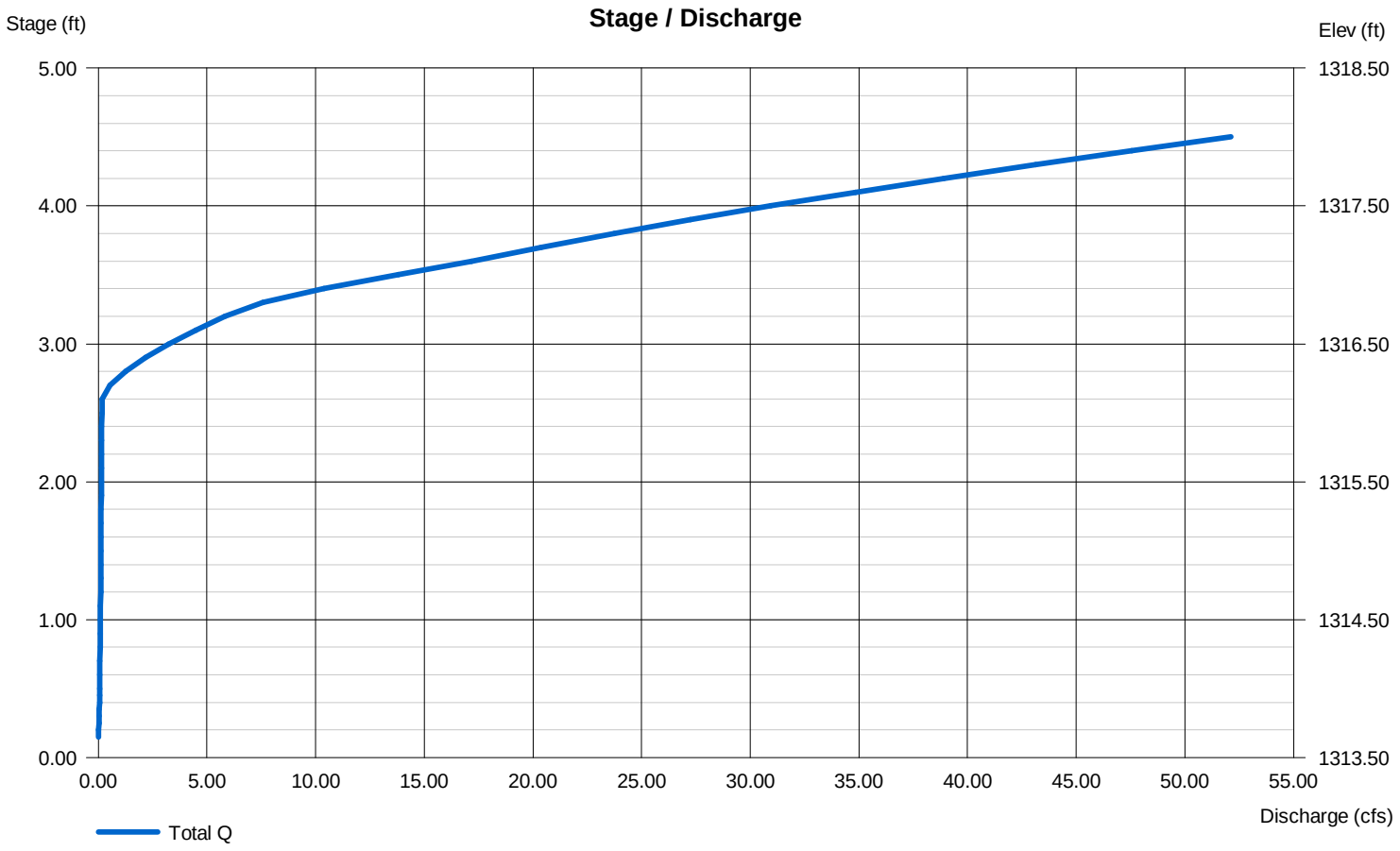
Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 4.70	10.00	0.00	0.00
Crest El. (ft)	= 1316.10	1316.75	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).

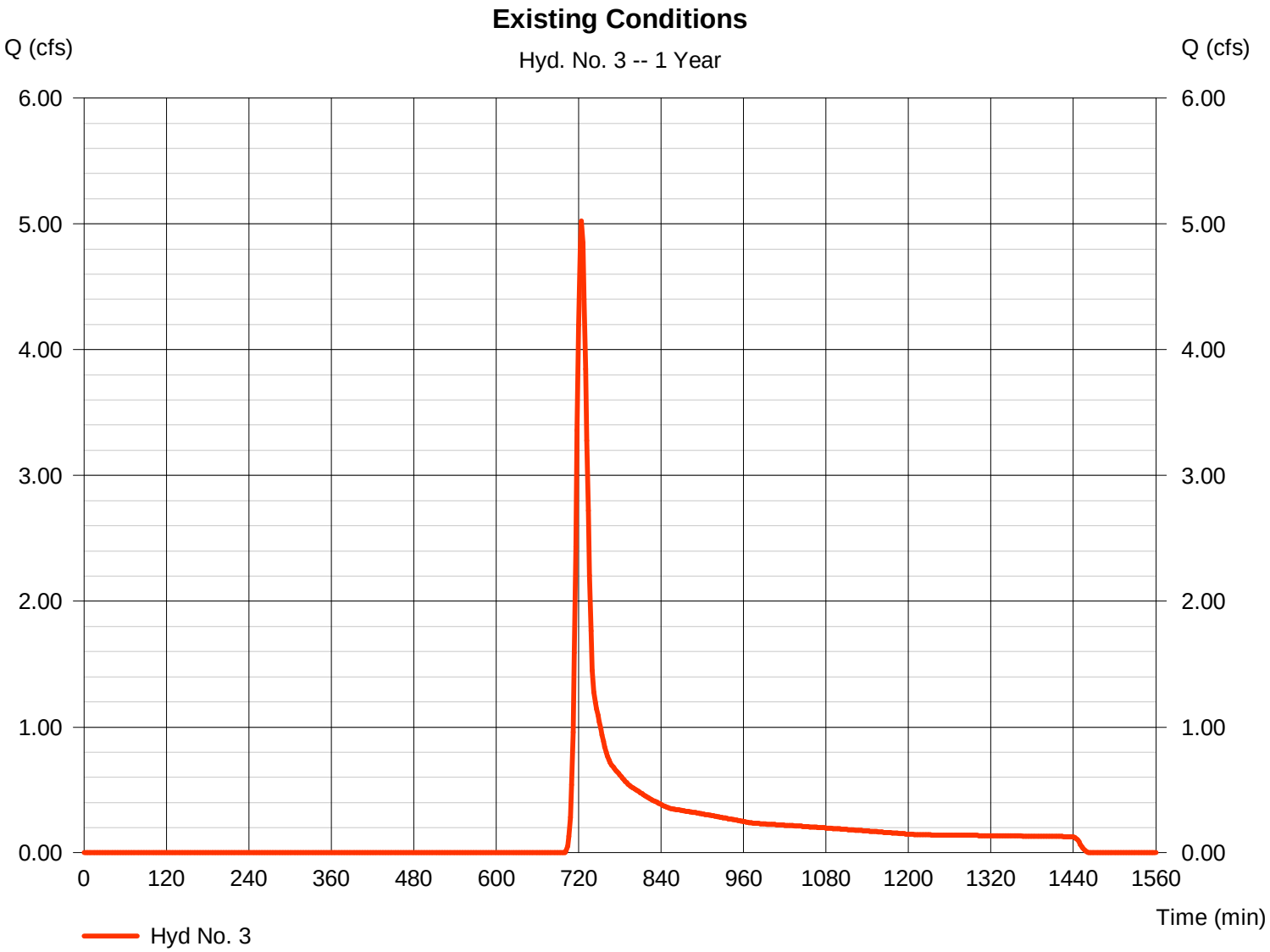


Hydrograph Report

Hyd. No. 3

Existing Conditions

Hydrograph type	=	SCS Runoff	Peak discharge	=	5.021 cfs
Storm frequency	=	1 yrs	Time to peak	=	724 min
Time interval	=	2 min	Hyd. volume	=	16,610 cuft
Drainage area	=	8.300 ac	Curve number	=	69
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	15.00 min
Total precip.	=	2.80 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484



Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066

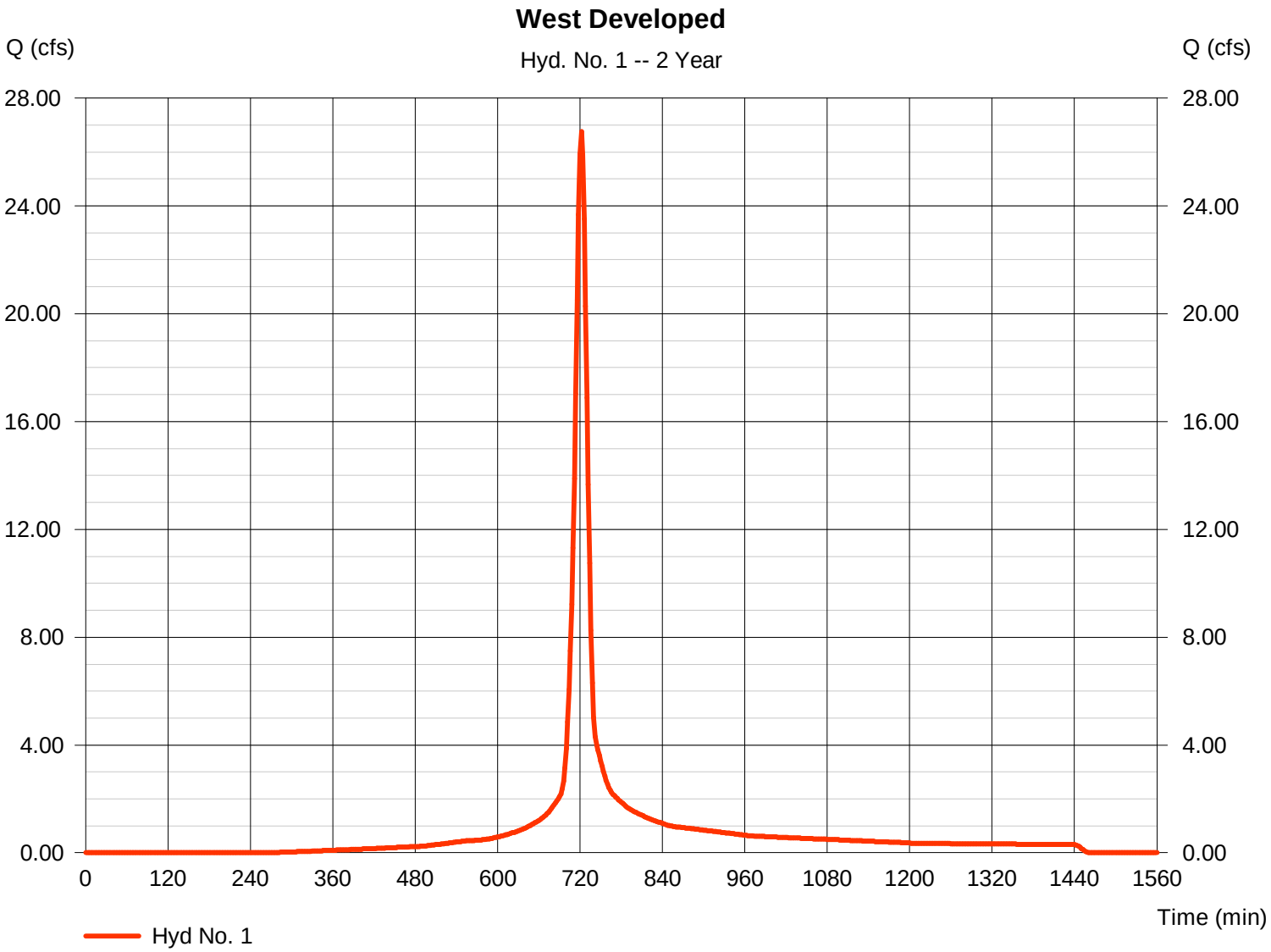
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph description
1	SCS Runoff	26.76	2	722	77,456	------	------	------	West Developed
2	Reservoir	2.806	2	756	68,611	1	1316.46	46,745	<no description>
3	SCS Runoff	9.282	2	724	28,023	------	------	------	Existing Conditions

Hydrograph Report

Hyd. No. 1

West Developed

Hydrograph type	=	SCS Runoff	Peak discharge	=	26.76 cfs
Storm frequency	=	2 yrs	Time to peak	=	722 min
Time interval	=	2 min	Hyd. volume	=	77,456 cuft
Drainage area	=	8.300 ac	Curve number	=	92
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	15.00 min
Total precip.	=	3.50 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484



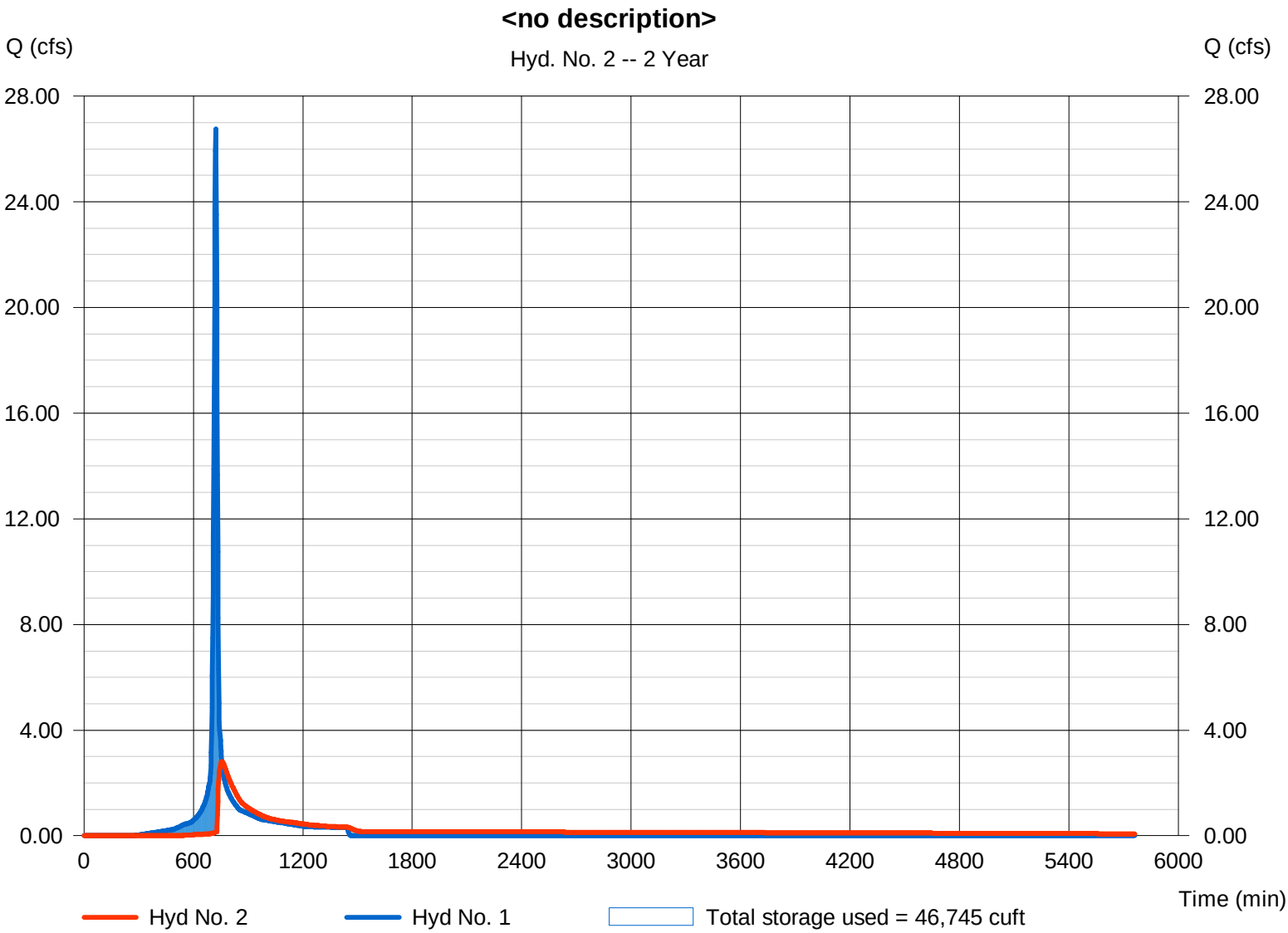
Hydrograph Report

Hyd. No. 2

<no description>

Hydrograph type	=	Reservoir	Peak discharge	=	2.806 cfs
Storm frequency	=	2 yrs	Time to peak	=	756 min
Time interval	=	2 min	Hyd. volume	=	68,611 cuft
Inflow hyd. No.	=	1 - West Developed	Max. Elevation	=	1316.46 ft
Reservoir name	=	<New Pond>	Max. Storage	=	46,745 cuft

Storage Indication method used.

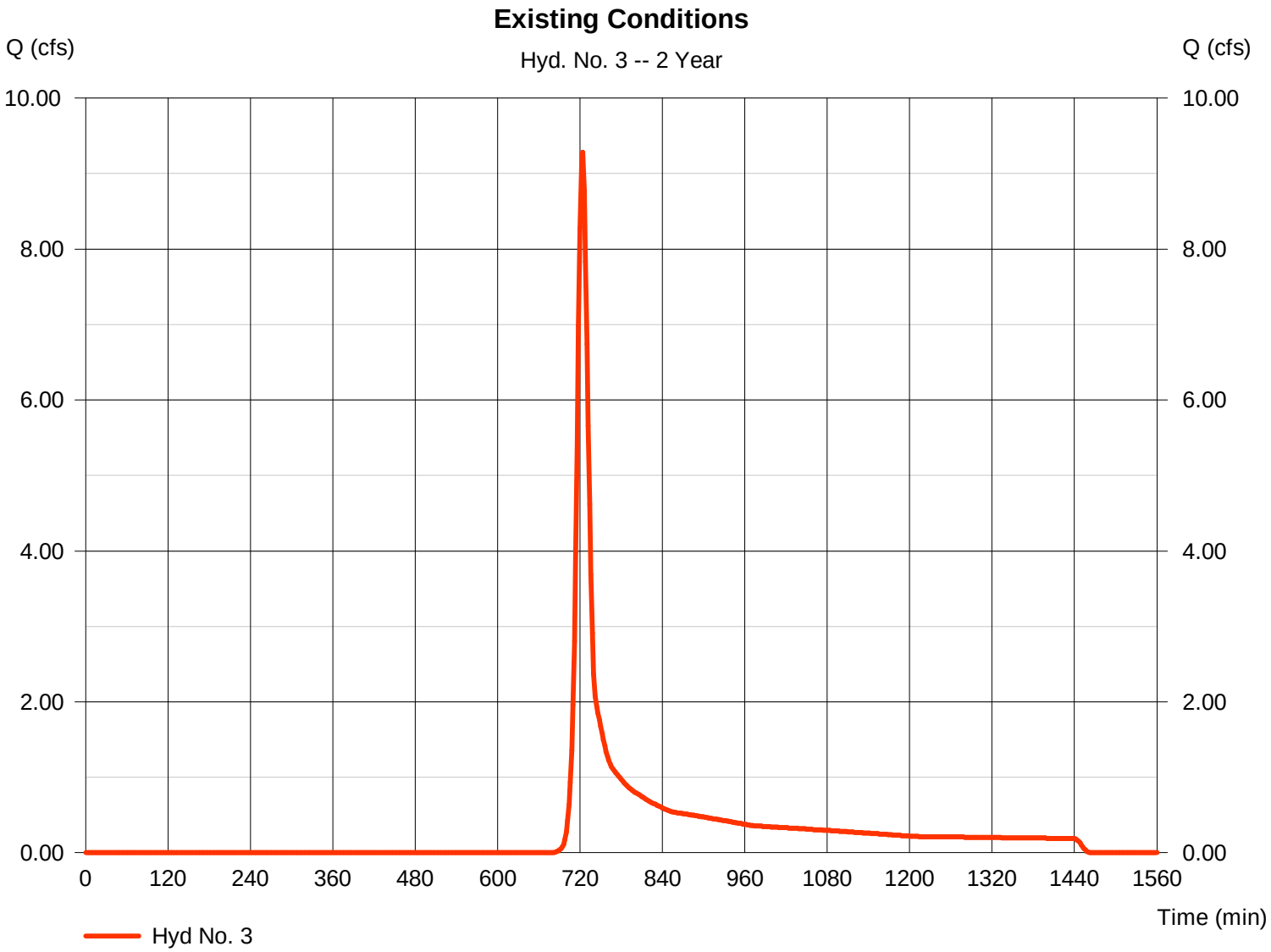


Hydrograph Report

Hyd. No. 3

Existing Conditions

Hydrograph type	=	SCS Runoff	Peak discharge	=	9.282 cfs
Storm frequency	=	2 yrs	Time to peak	=	724 min
Time interval	=	2 min	Hyd. volume	=	28,023 cuft
Drainage area	=	8.300 ac	Curve number	=	69
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	15.00 min
Total precip.	=	3.50 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484



Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066

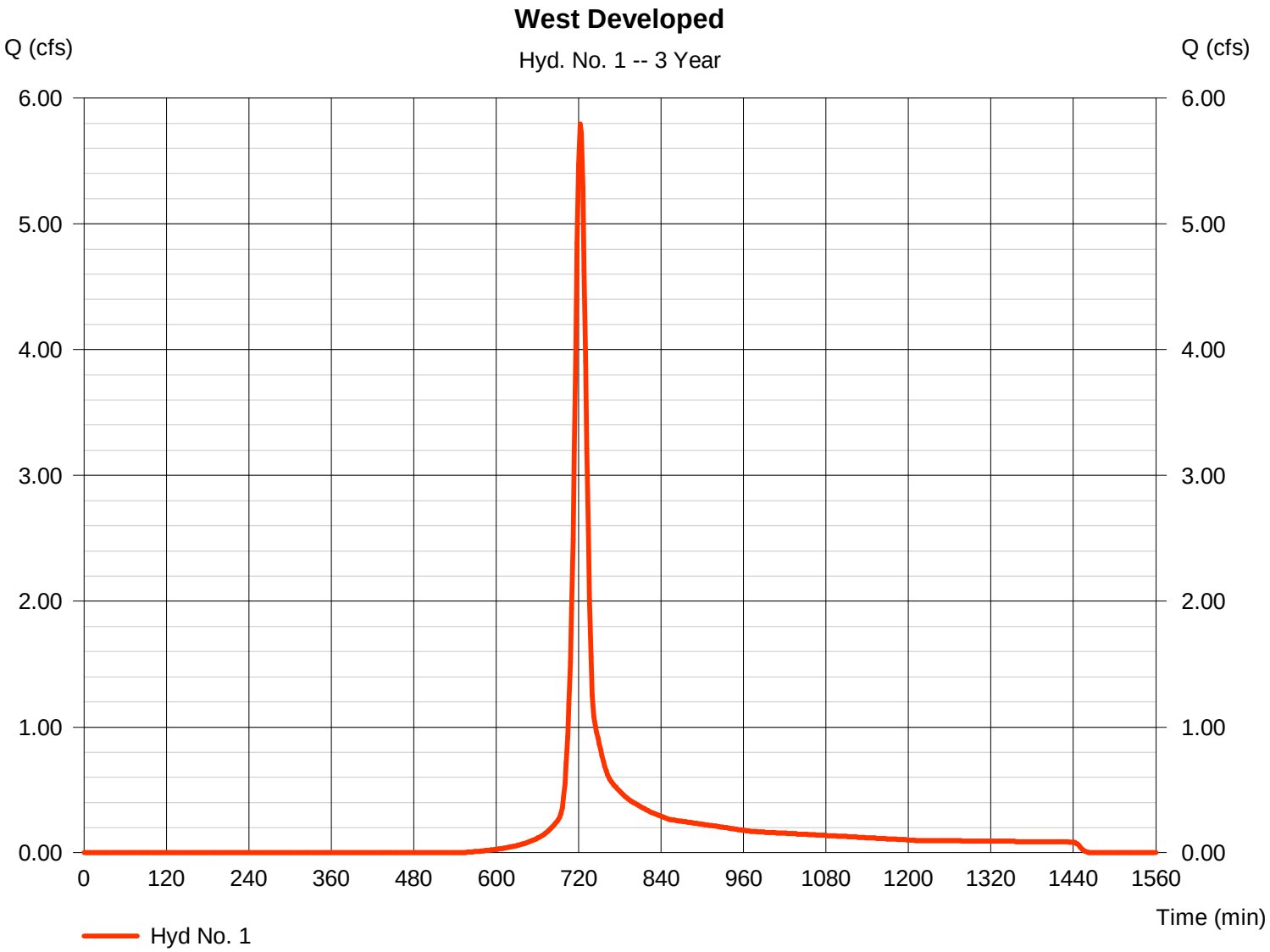
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph description
1	SCS Runoff	5.792	2	722	16,315	------	------	------	West Developed
2	Reservoir	0.091	2	1342	14,481	1	1314.44	12,483	<no description>
3	SCS Runoff	0.016	2	924	557	------	------	------	Existing Conditions

Hydrograph Report

Hyd. No. 1

West Developed

Hydrograph type	=	SCS Runoff	Peak discharge	=	5.792 cfs
Storm frequency	=	3 yrs	Time to peak	=	722 min
Time interval	=	2 min	Hyd. volume	=	16,315 cuft
Drainage area	=	8.300 ac	Curve number	=	92
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	15.00 min
Total precip.	=	1.20 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484



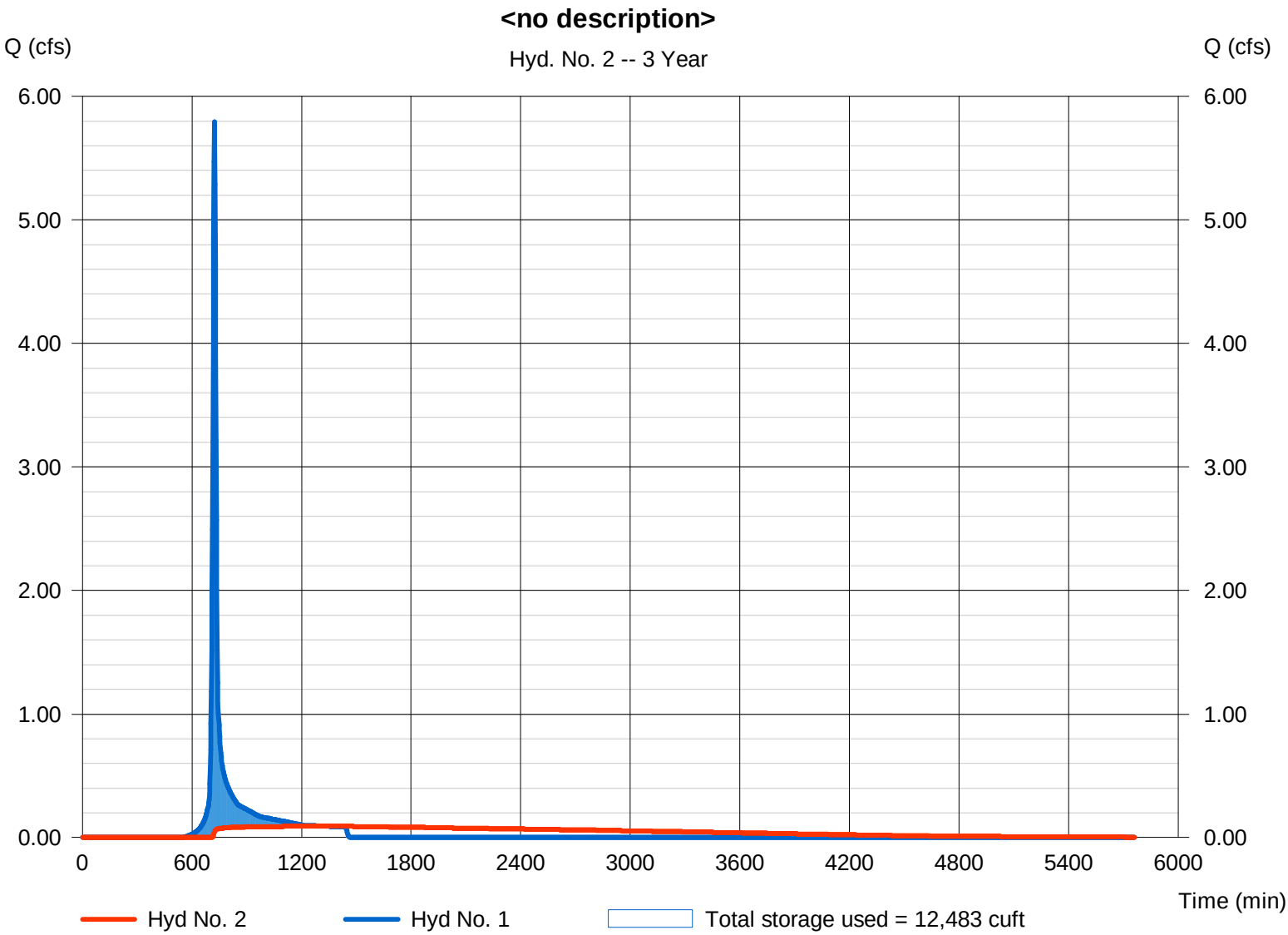
Hydrograph Report

Hyd. No. 2

<no description>

Hydrograph type	=	Reservoir	Peak discharge	=	0.091 cfs
Storm frequency	=	3 yrs	Time to peak	=	1342 min
Time interval	=	2 min	Hyd. volume	=	14,481 cuft
Inflow hyd. No.	=	1 - West Developed	Max. Elevation	=	1314.44 ft
Reservoir name	=	<New Pond>	Max. Storage	=	12,483 cuft

Storage Indication method used.



Hydrograph Report

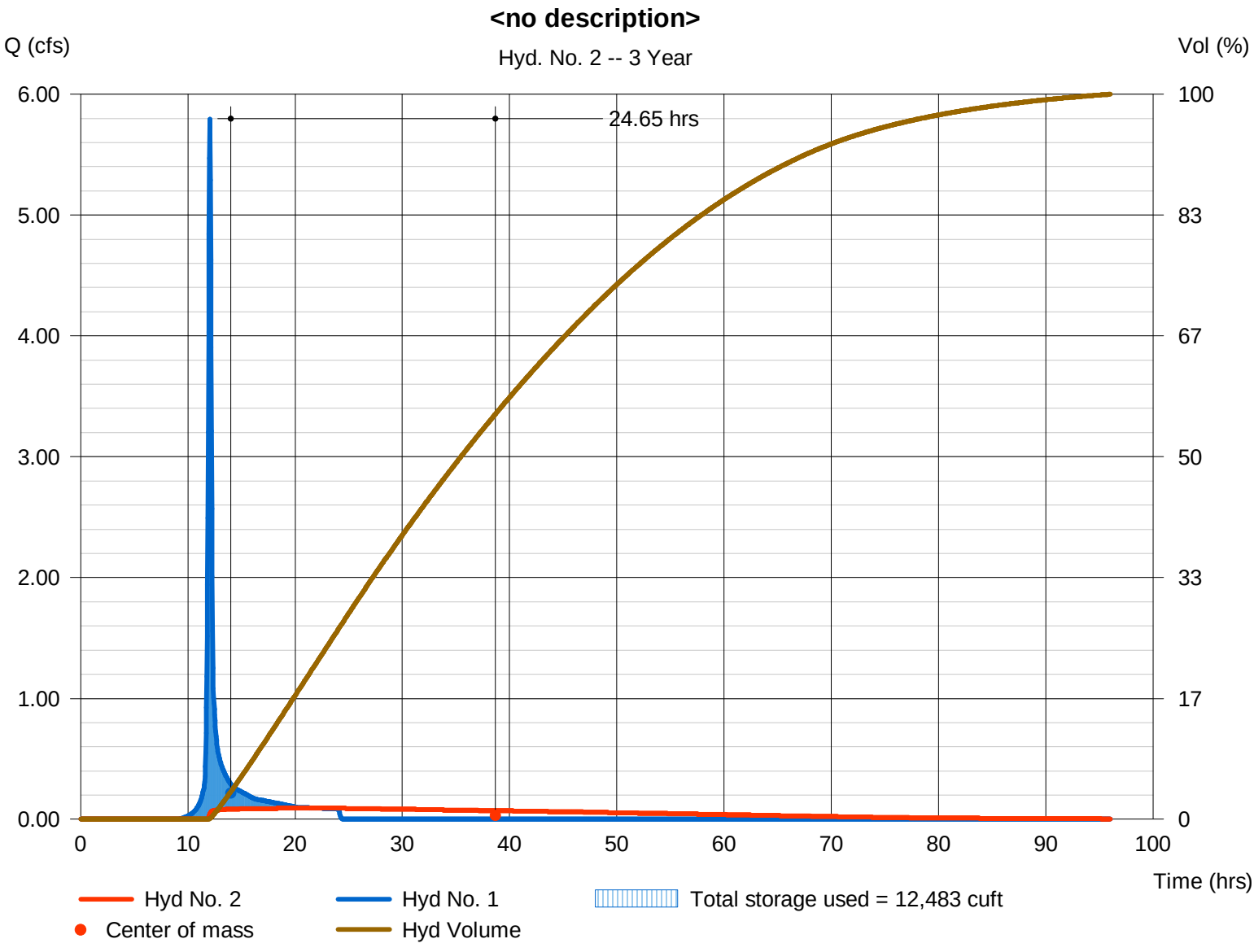
Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Wednesday, Jan 26, 2011

Hyd. No. 2

<no description>

Hydrograph type	=	Reservoir	Peak discharge	=	0.091 cfs
Storm frequency	=	3 yrs	Time to peak	=	22.37 hrs
Time interval	=	2 min	Hyd. volume	=	14,481 cuft
Inflow hyd. No.	=	1 - West Developed	Max. Elevation	=	1314.44 ft
Reservoir name	=	<New Pond>	Max. Storage	=	12,483 cuft

Storage Indication method used.

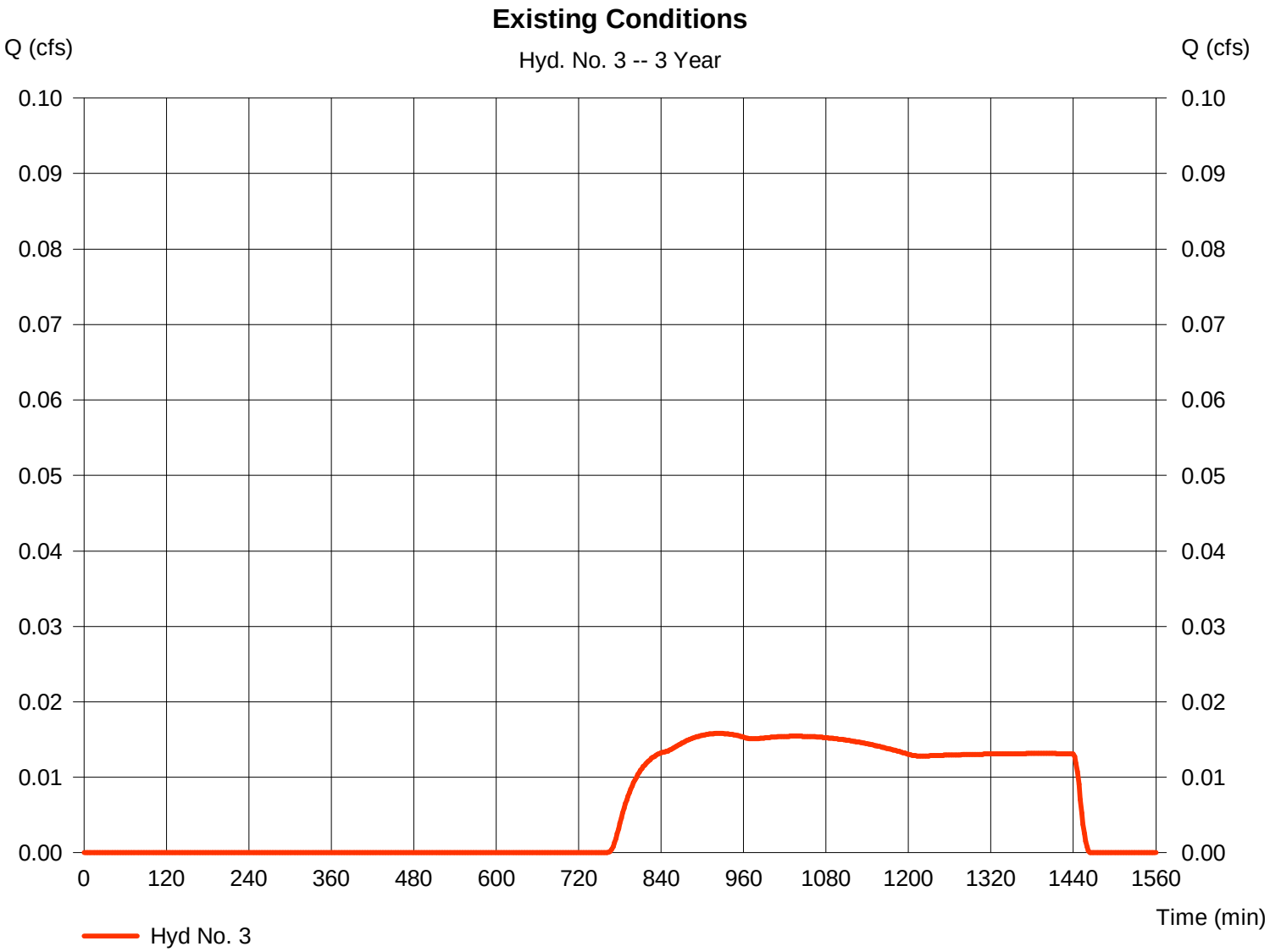


Hydrograph Report

Hyd. No. 3

Existing Conditions

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.016 cfs
Storm frequency	=	3 yrs	Time to peak	=	924 min
Time interval	=	2 min	Hyd. volume	=	557 cuft
Drainage area	=	8.300 ac	Curve number	=	69
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	15.00 min
Total precip.	=	1.20 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484



Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066

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	35.96	2	722	105,813	------	------	------	West Developed
2	Reservoir	12.52	2	736	96,869	1	1316.97	56,517	<no description>
3	SCS Runoff	16.26	2	724	47,073	------	------	------	Existing Conditions

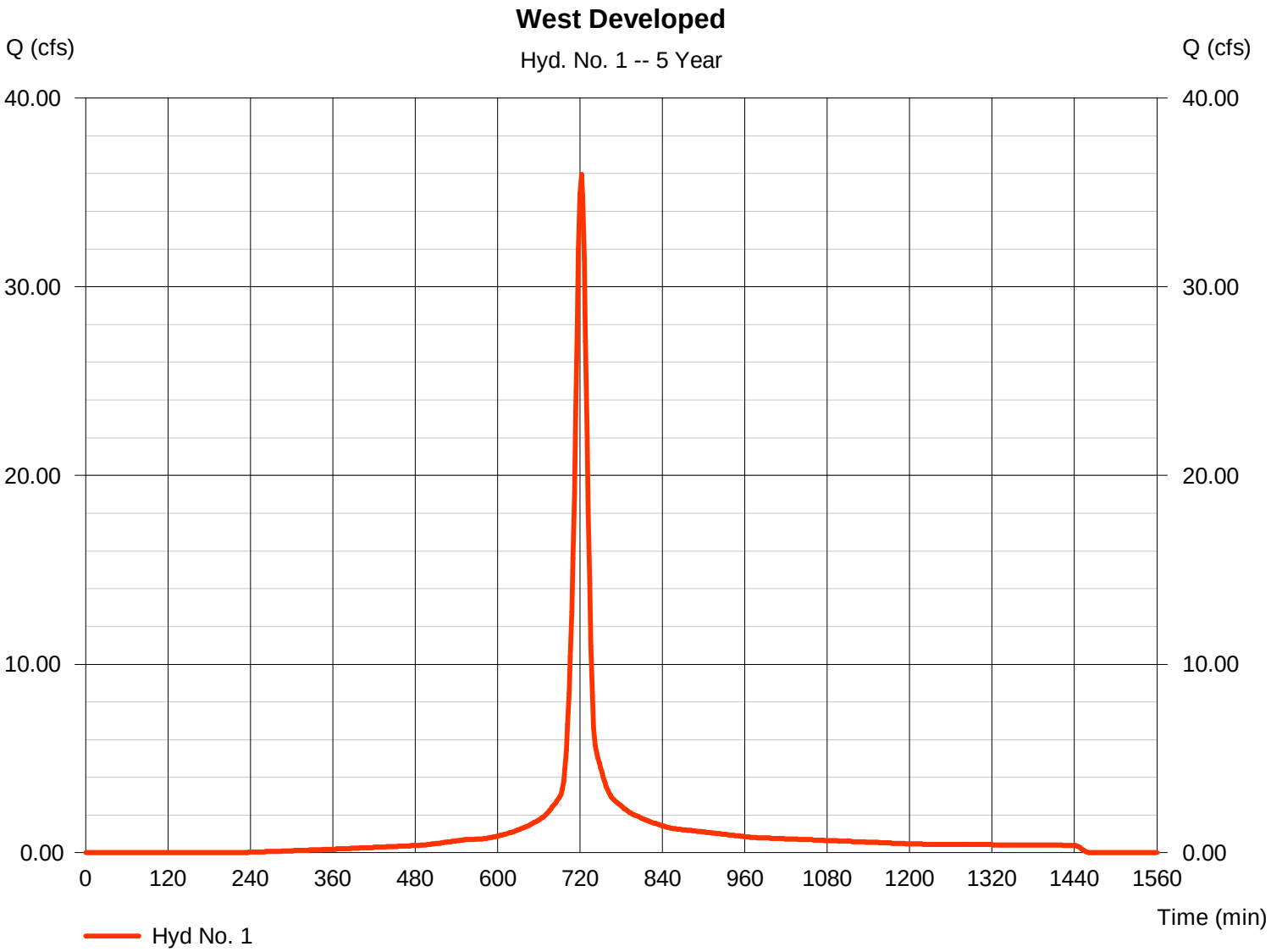
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Wednesday, Jan 26, 2011

Hyd. No. 1

West Developed

Hydrograph type	=	SCS Runoff	Peak discharge	=	35.96 cfs
Storm frequency	=	5 yrs	Time to peak	=	722 min
Time interval	=	2 min	Hyd. volume	=	105,813 cuft
Drainage area	=	8.300 ac	Curve number	=	92
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	15.00 min
Total precip.	=	4.50 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484



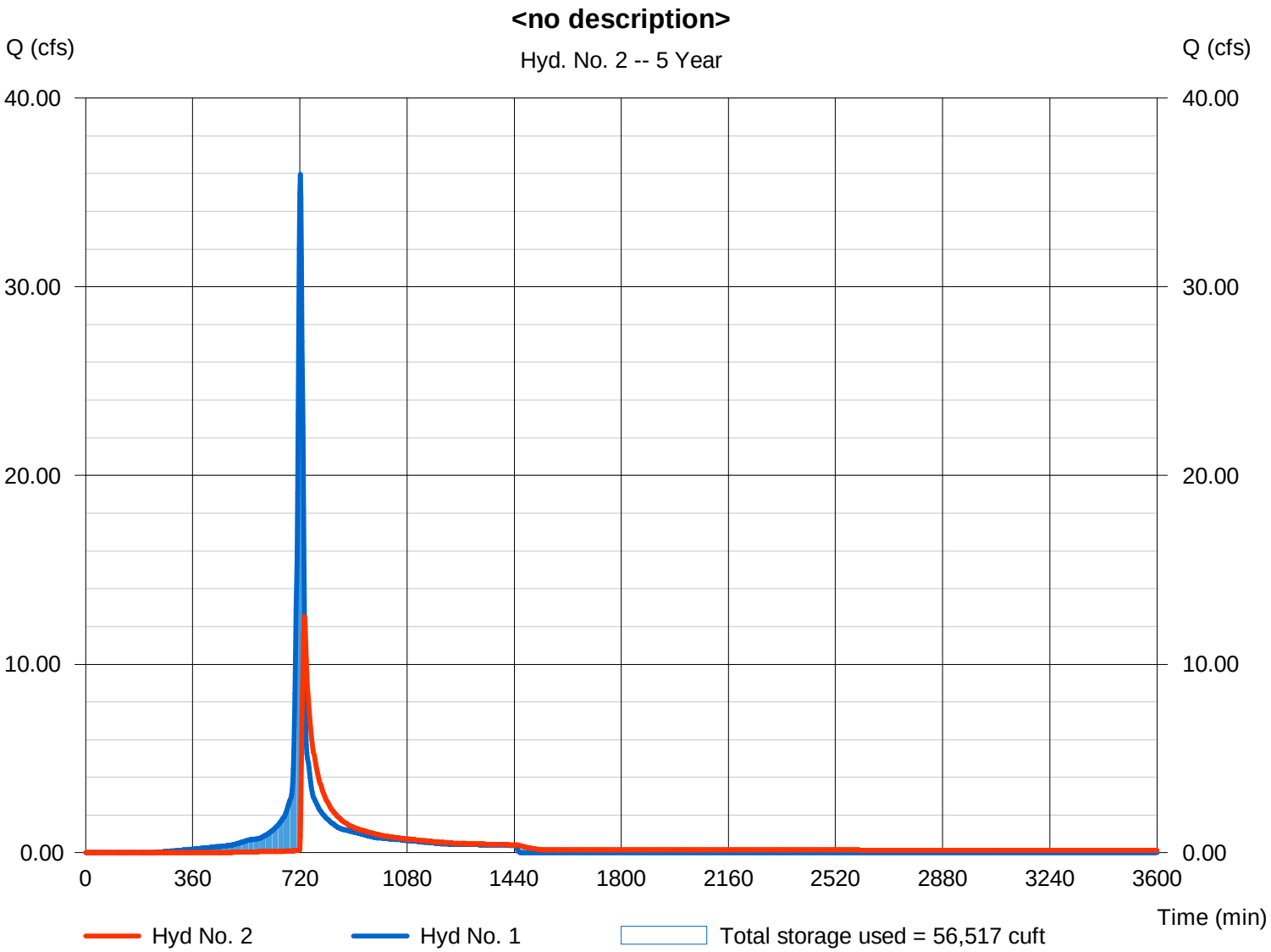
Hydrograph Report

Hyd. No. 2

<no description>

Hydrograph type	=	Reservoir	Peak discharge	=	12.52 cfs
Storm frequency	=	5 yrs	Time to peak	=	736 min
Time interval	=	2 min	Hyd. volume	=	96,869 cuft
Inflow hyd. No.	=	1 - West Developed	Max. Elevation	=	1316.97 ft
Reservoir name	=	<New Pond>	Max. Storage	=	56,517 cuft

Storage Indication method used.

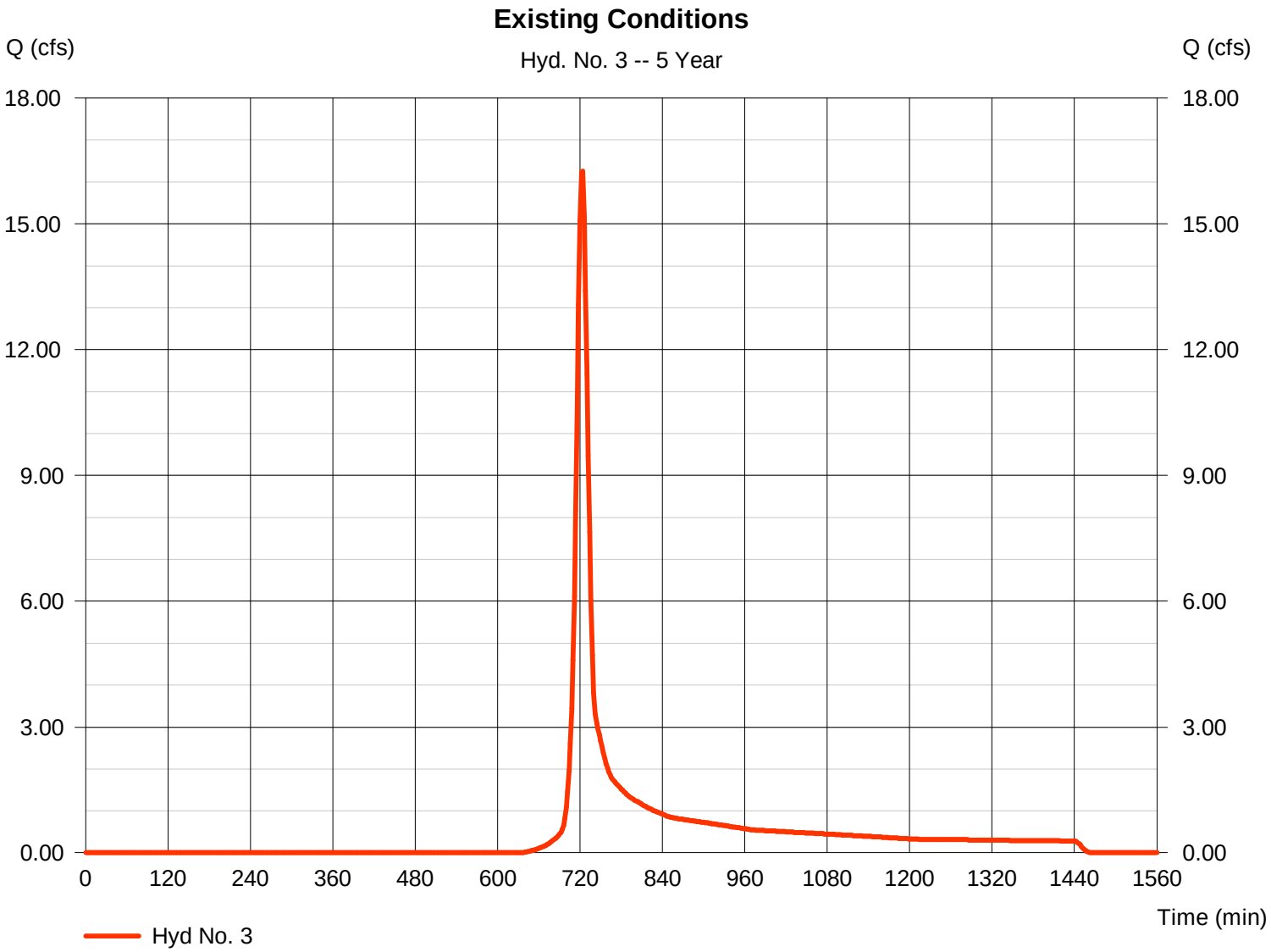


Hydrograph Report

Hyd. No. 3

Existing Conditions

Hydrograph type	=	SCS Runoff	Peak discharge	=	16.26 cfs
Storm frequency	=	5 yrs	Time to peak	=	724 min
Time interval	=	2 min	Hyd. volume	=	47,073 cuft
Drainage area	=	8.300 ac	Curve number	=	69
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	15.00 min
Total precip.	=	4.50 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484



Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066

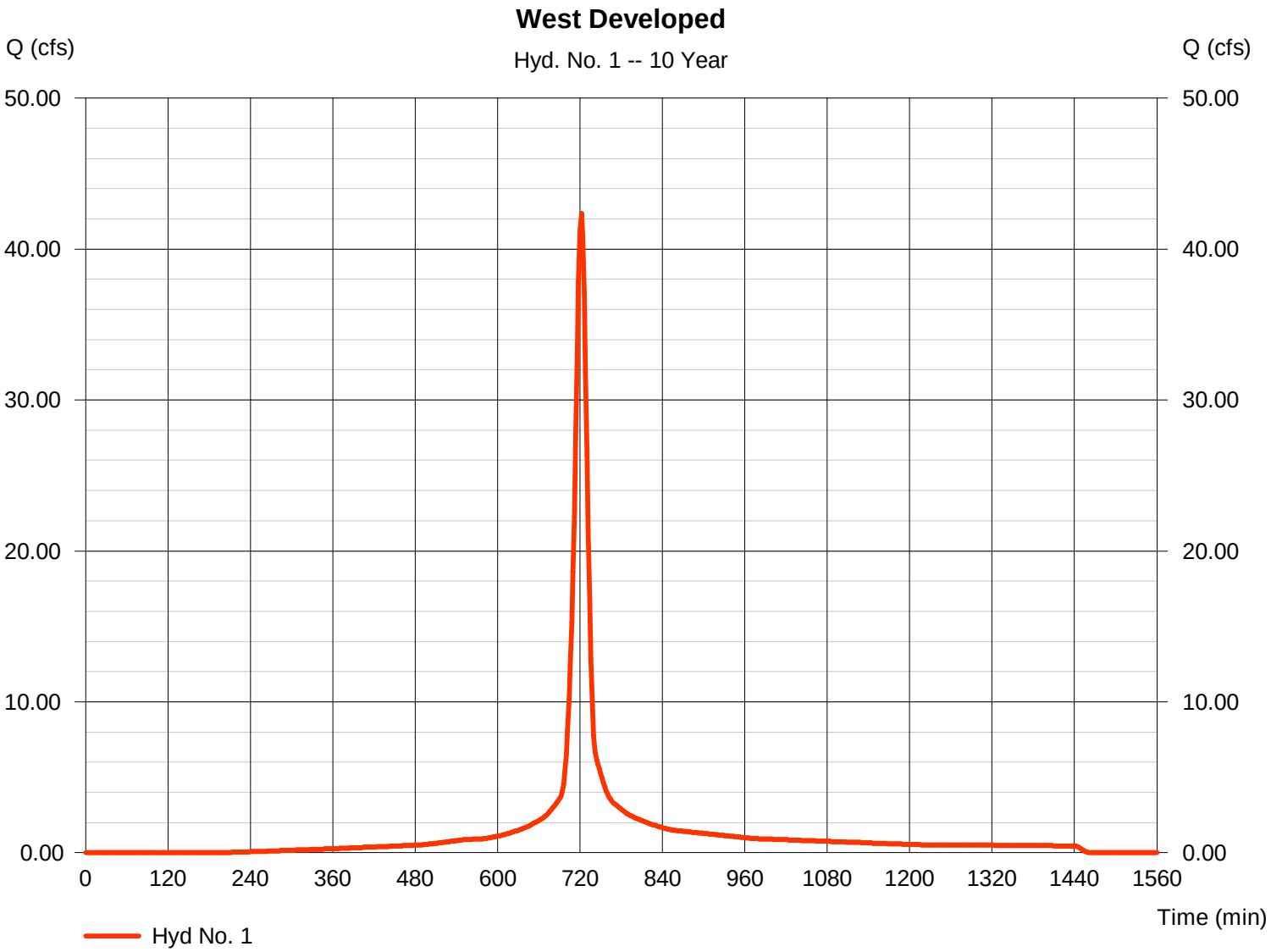
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph description
1	SCS Runoff	42.36	2	722	125,869	------	------	------	West Developed
2	Reservoir	21.35	2	732	116,869	1	1317.23	61,818	<no description>
3	SCS Runoff	21.69	2	722	61,805	------	------	------	Existing Conditions

Hydrograph Report

Hyd. No. 1

West Developed

Hydrograph type	=	SCS Runoff	Peak discharge	=	42.36 cfs
Storm frequency	=	10 yrs	Time to peak	=	722 min
Time interval	=	2 min	Hyd. volume	=	125,869 cuft
Drainage area	=	8.300 ac	Curve number	=	92
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	15.00 min
Total precip.	=	5.20 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484



Hydrograph Report

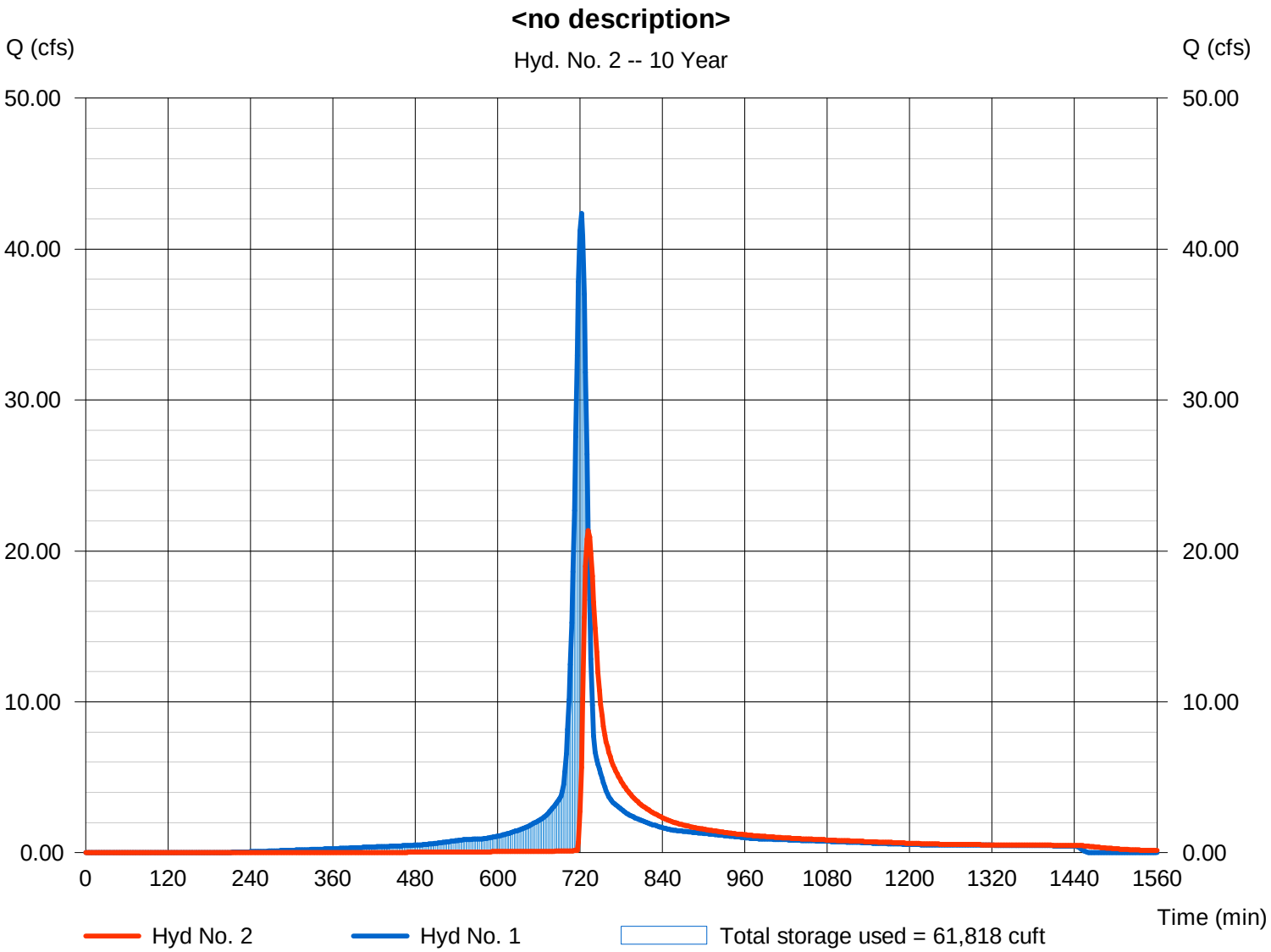
Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Wednesday, Jan 26, 2011

Hyd. No. 2

<no description>

Hydrograph type	=	Reservoir	Peak discharge	=	21.35 cfs
Storm frequency	=	10 yrs	Time to peak	=	732 min
Time interval	=	2 min	Hyd. volume	=	116,869 cuft
Inflow hyd. No.	=	1 - West Developed	Max. Elevation	=	1317.23 ft
Reservoir name	=	<New Pond>	Max. Storage	=	61,818 cuft

Storage Indication method used.

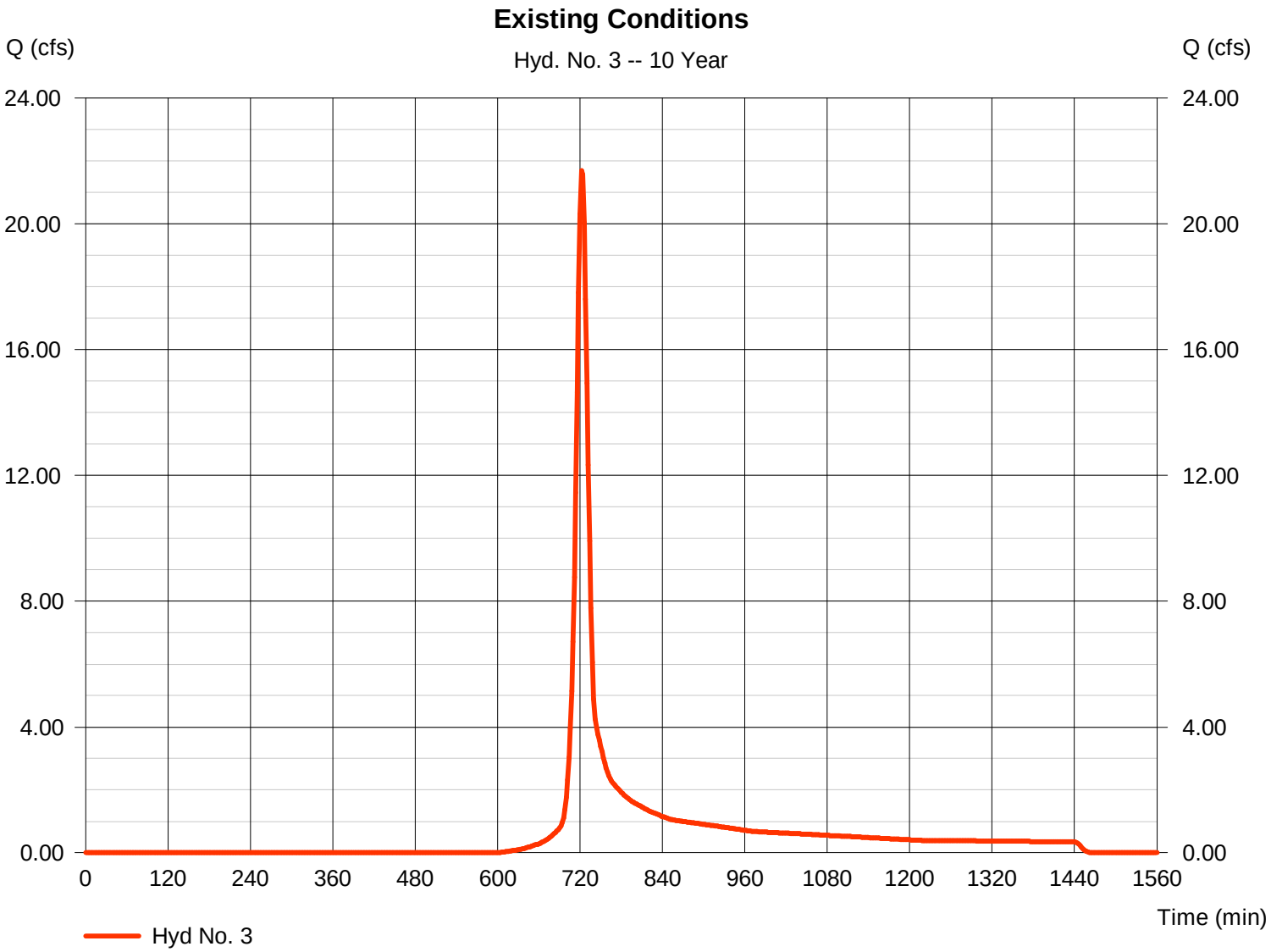


Hydrograph Report

Hyd. No. 3

Existing Conditions

Hydrograph type	=	SCS Runoff	Peak discharge	=	21.69 cfs
Storm frequency	=	10 yrs	Time to peak	=	722 min
Time interval	=	2 min	Hyd. volume	=	61,805 cuft
Drainage area	=	8.300 ac	Curve number	=	69
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	15.00 min
Total precip.	=	5.20 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484



Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066

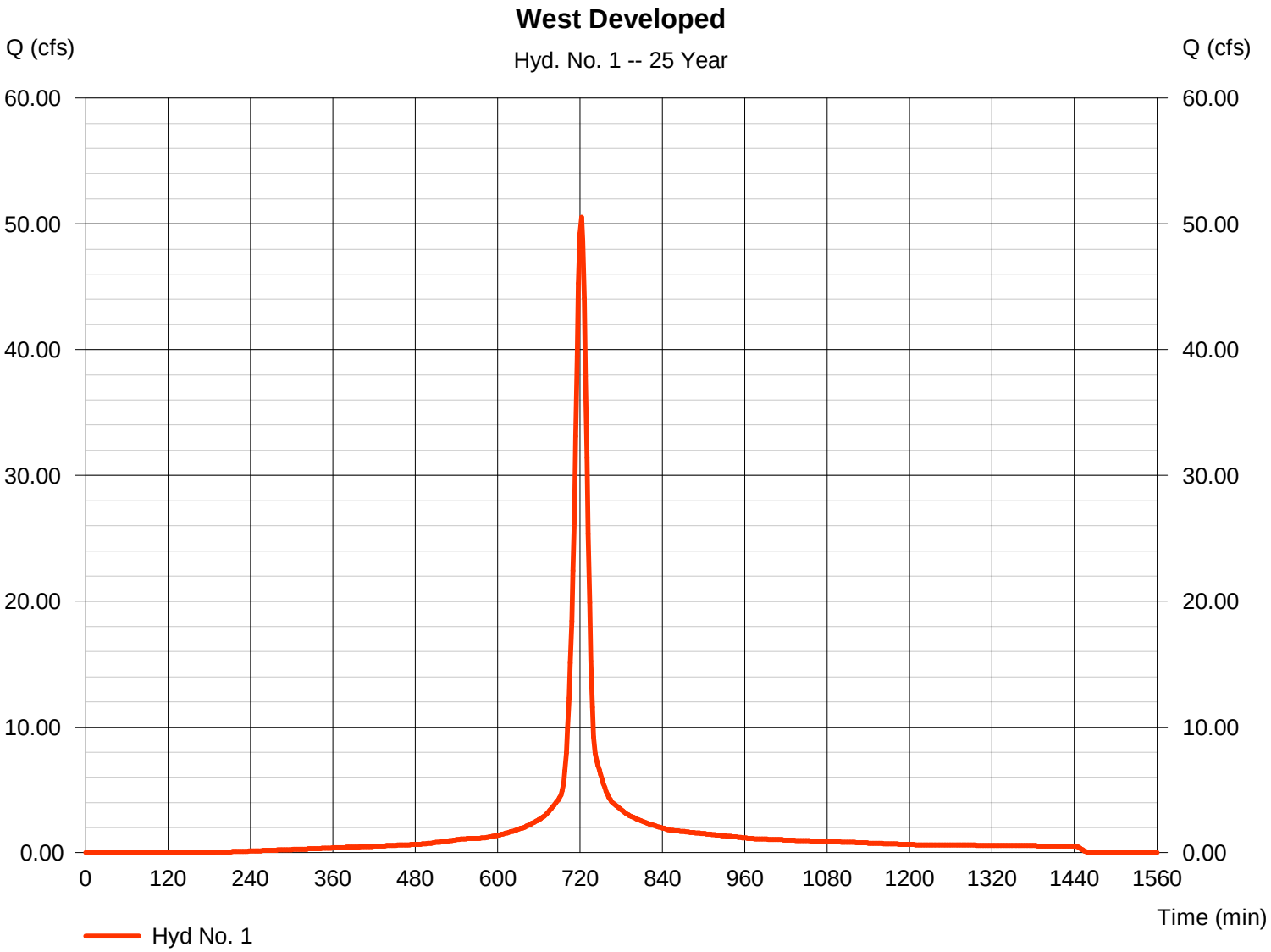
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph description
1	SCS Runoff	50.54	2	722	151,808	------	------	------	West Developed
2	Reservoir	31.94	2	730	142,759	1	1317.53	67,741	<no description>
3	SCS Runoff	29.08	2	722	81,983	------	------	------	Existing Conditions

Hydrograph Report

Hyd. No. 1

West Developed

Hydrograph type	=	SCS Runoff	Peak discharge	=	50.54 cfs
Storm frequency	=	25 yrs	Time to peak	=	722 min
Time interval	=	2 min	Hyd. volume	=	151,808 cuft
Drainage area	=	8.300 ac	Curve number	=	92
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	15.00 min
Total precip.	=	6.10 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484



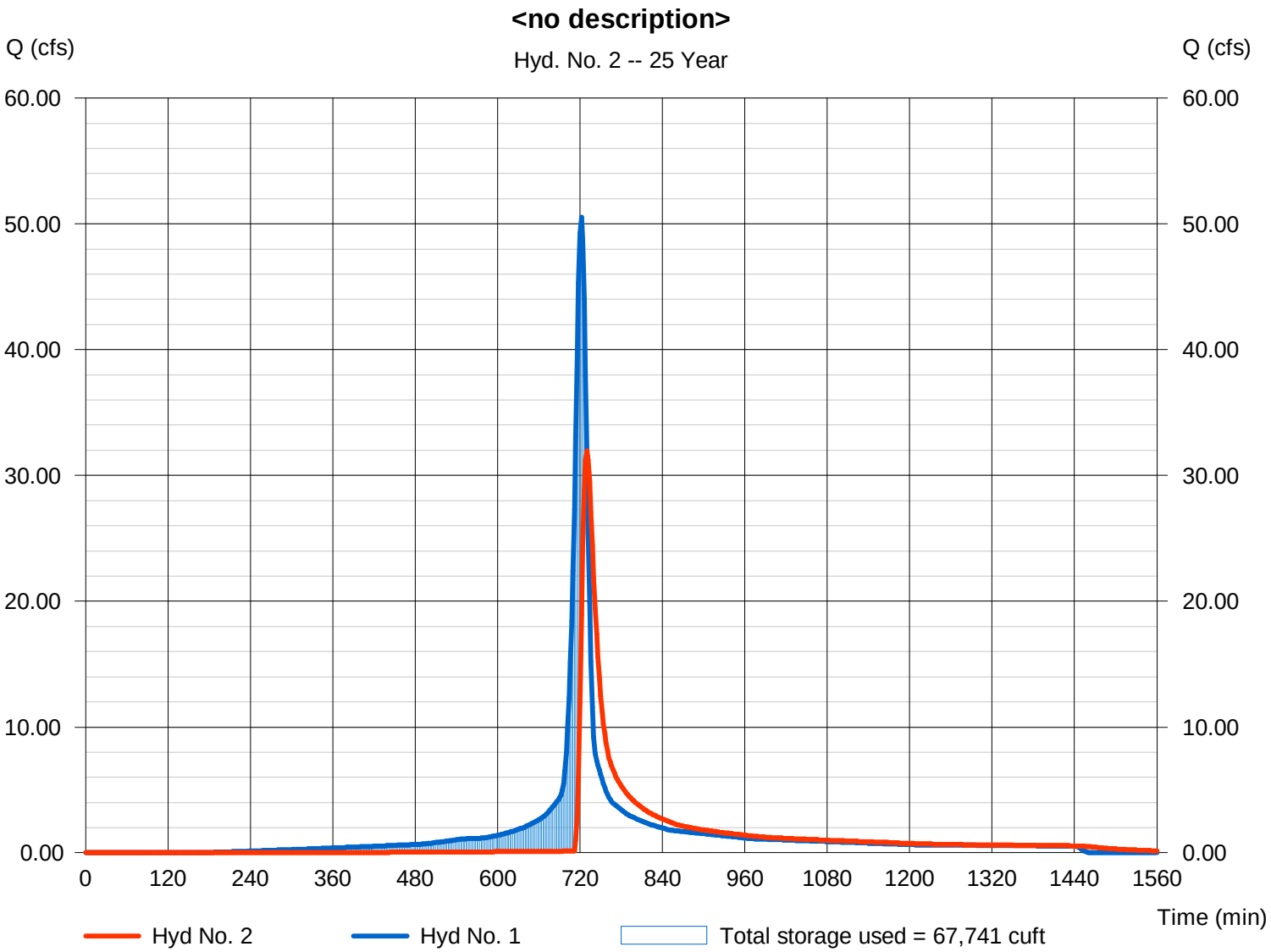
Hydrograph Report

Hyd. No. 2

<no description>

Hydrograph type	=	Reservoir	Peak discharge	=	31.94 cfs
Storm frequency	=	25 yrs	Time to peak	=	730 min
Time interval	=	2 min	Hyd. volume	=	142,759 cuft
Inflow hyd. No.	=	1 - West Developed	Max. Elevation	=	1317.53 ft
Reservoir name	=	<New Pond>	Max. Storage	=	67,741 cuft

Storage Indication method used.

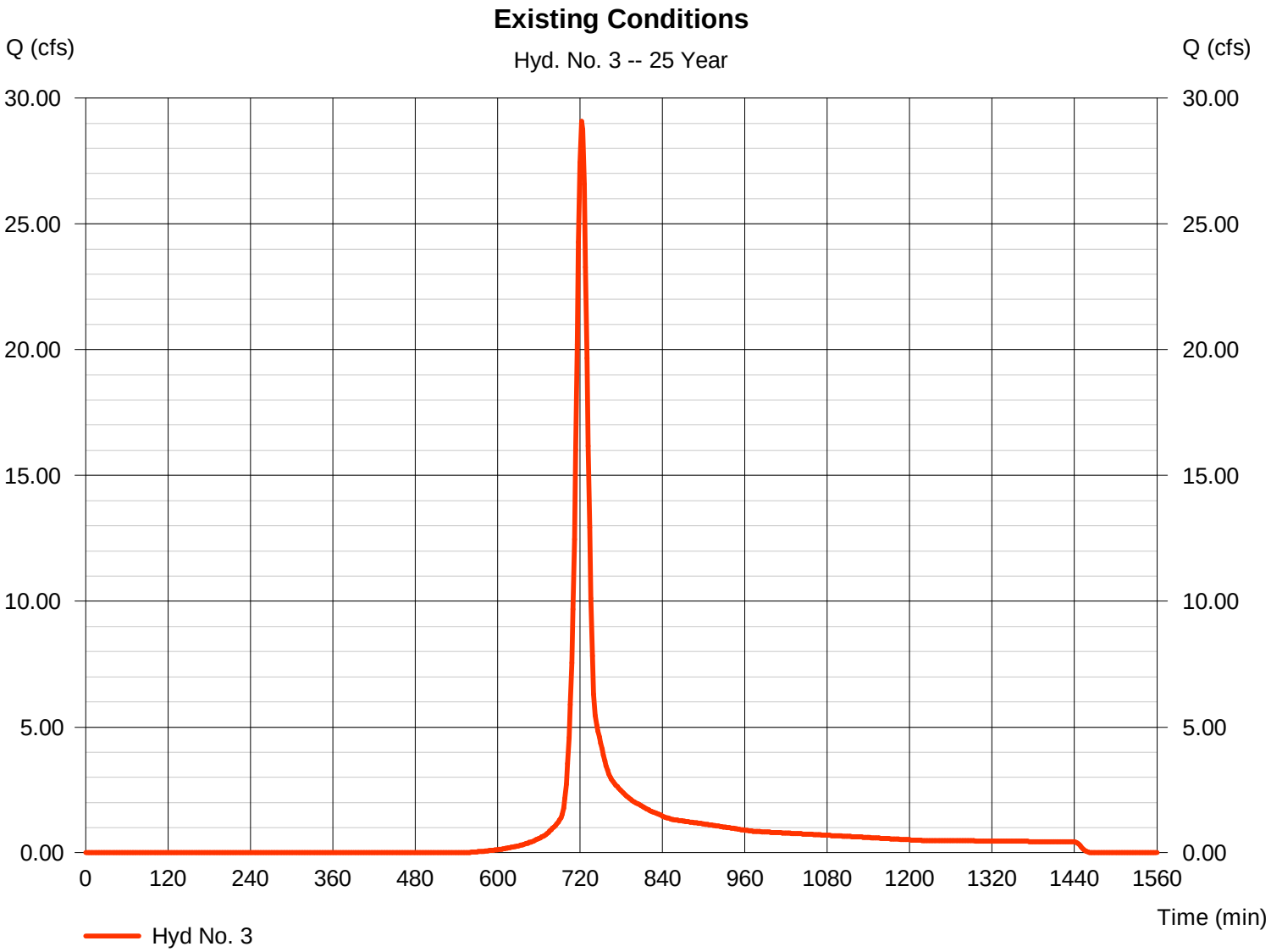


Hydrograph Report

Hyd. No. 3

Existing Conditions

Hydrograph type	=	SCS Runoff	Peak discharge	=	29.08 cfs
Storm frequency	=	25 yrs	Time to peak	=	722 min
Time interval	=	2 min	Hyd. volume	=	81,983 cuft
Drainage area	=	8.300 ac	Curve number	=	69
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	15.00 min
Total precip.	=	6.10 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484



Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066

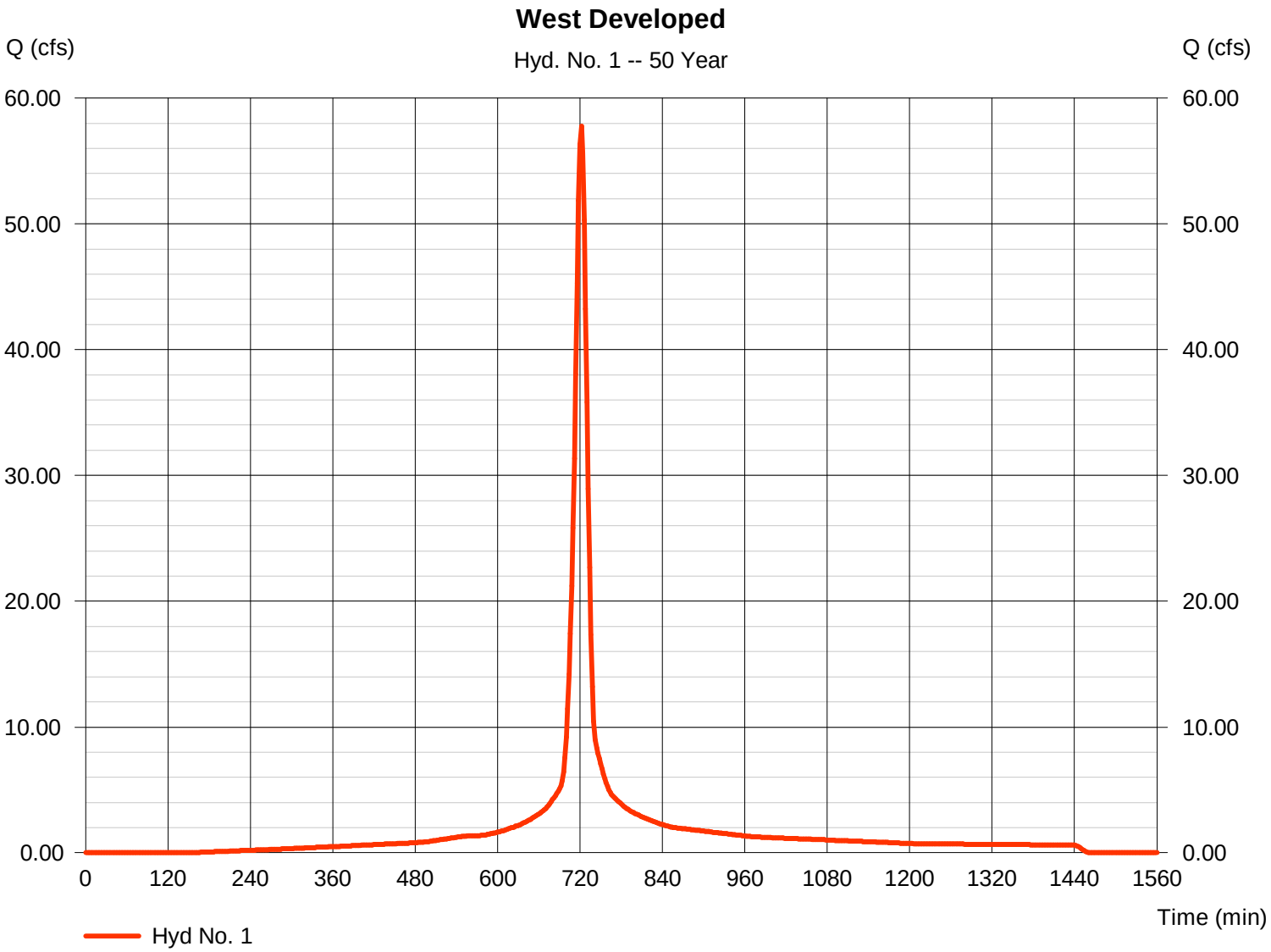
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph description
1	SCS Runoff	57.78	2	722	174,964	------	------	------	West Developed
2	Reservoir	40.81	2	728	165,888	1	1317.75	72,135	<no description>
3	SCS Runoff	35.91	2	722	100,821	------	------	------	Existing Conditions

Hydrograph Report

Hyd. No. 1

West Developed

Hydrograph type	=	SCS Runoff	Peak discharge	=	57.78 cfs
Storm frequency	=	50 yrs	Time to peak	=	722 min
Time interval	=	2 min	Hyd. volume	=	174,964 cuft
Drainage area	=	8.300 ac	Curve number	=	92
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	15.00 min
Total precip.	=	6.90 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484



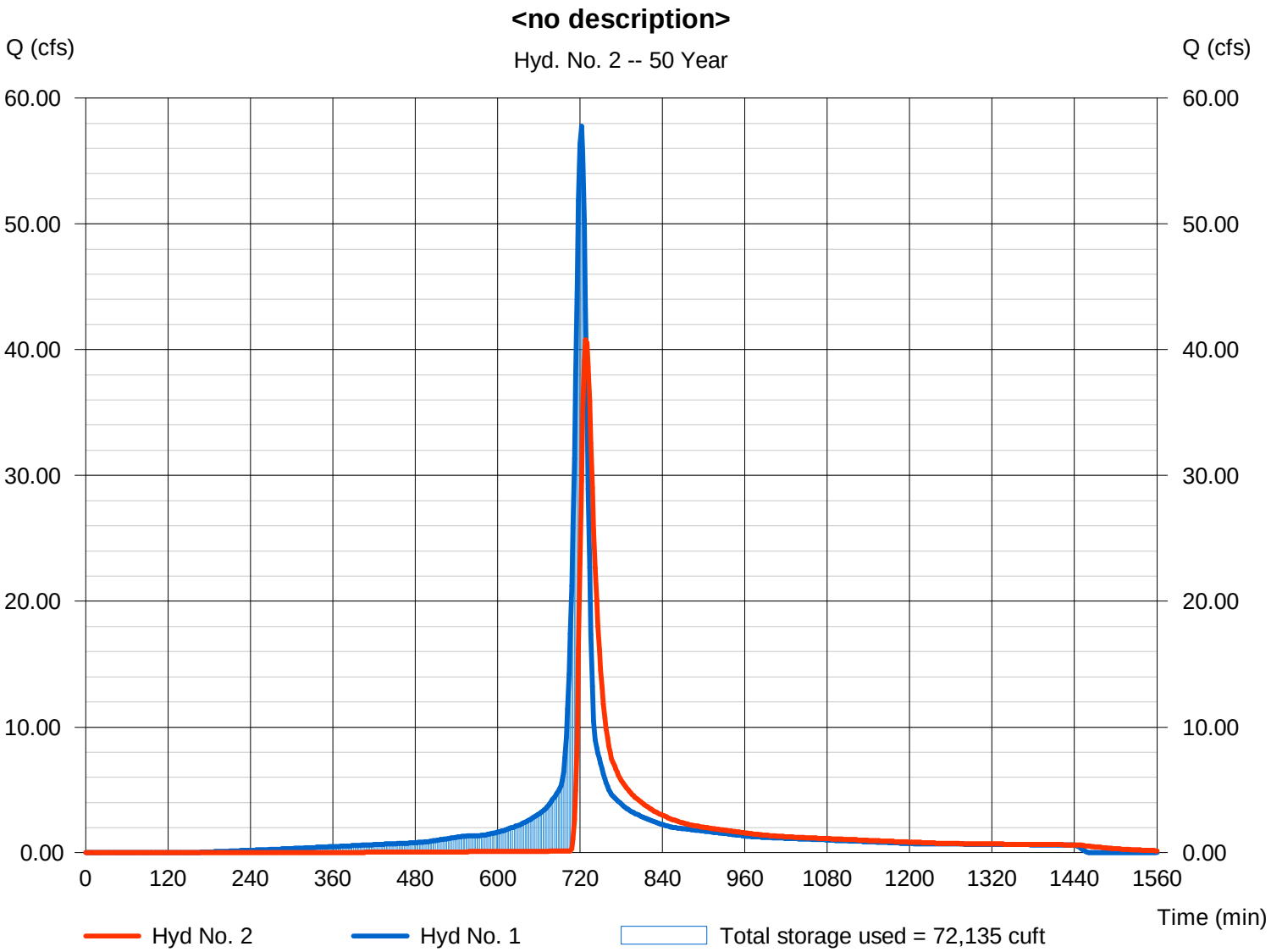
Hydrograph Report

Hyd. No. 2

<no description>

Hydrograph type	=	Reservoir	Peak discharge	=	40.81 cfs
Storm frequency	=	50 yrs	Time to peak	=	728 min
Time interval	=	2 min	Hyd. volume	=	165,888 cuft
Inflow hyd. No.	=	1 - West Developed	Max. Elevation	=	1317.75 ft
Reservoir name	=	<New Pond>	Max. Storage	=	72,135 cuft

Storage Indication method used.

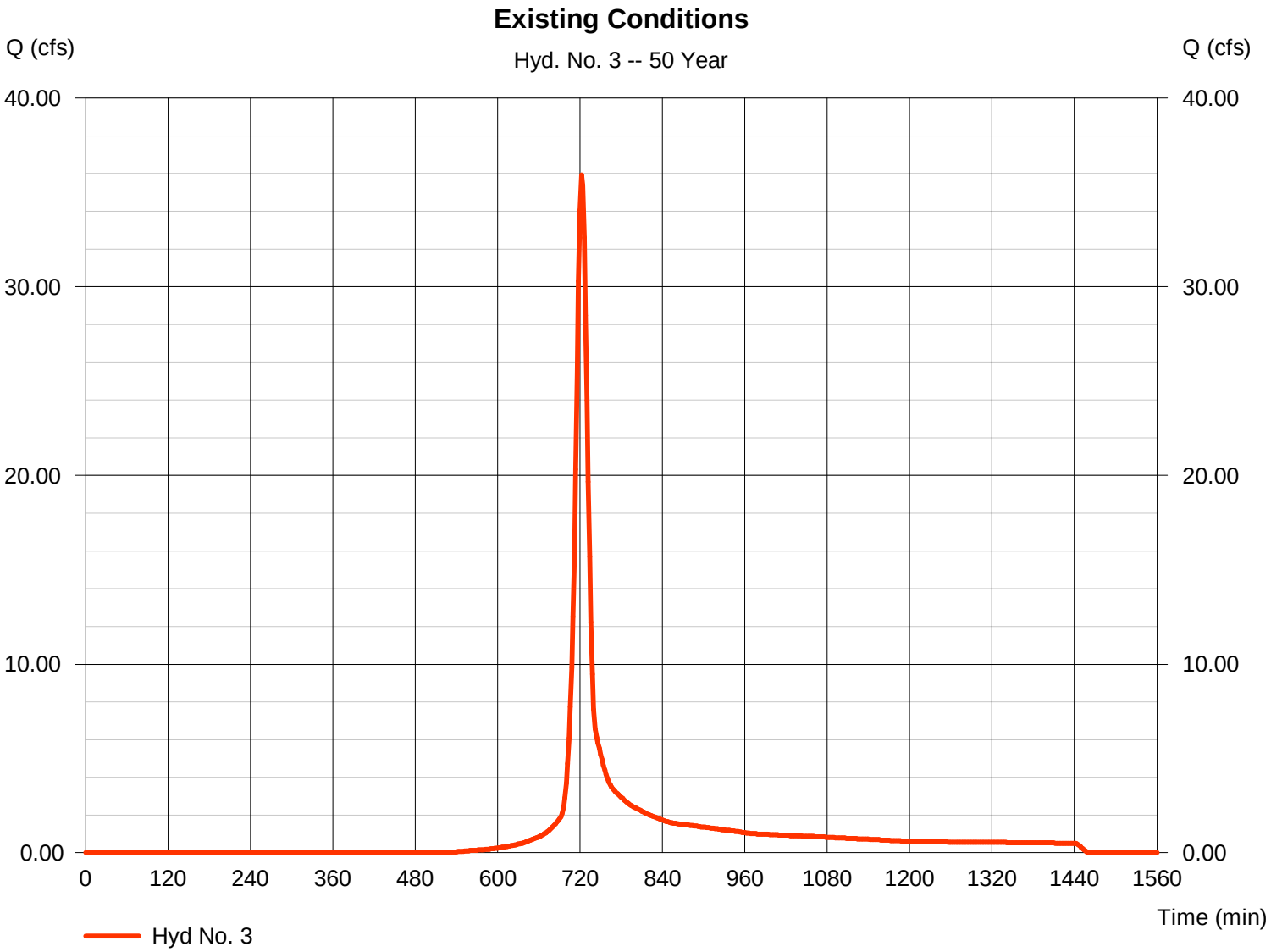


Hydrograph Report

Hyd. No. 3

Existing Conditions

Hydrograph type	=	SCS Runoff	Peak discharge	=	35.91 cfs
Storm frequency	=	50 yrs	Time to peak	=	722 min
Time interval	=	2 min	Hyd. volume	=	100,821 cuft
Drainage area	=	8.300 ac	Curve number	=	69
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	15.00 min
Total precip.	=	6.90 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484



Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066

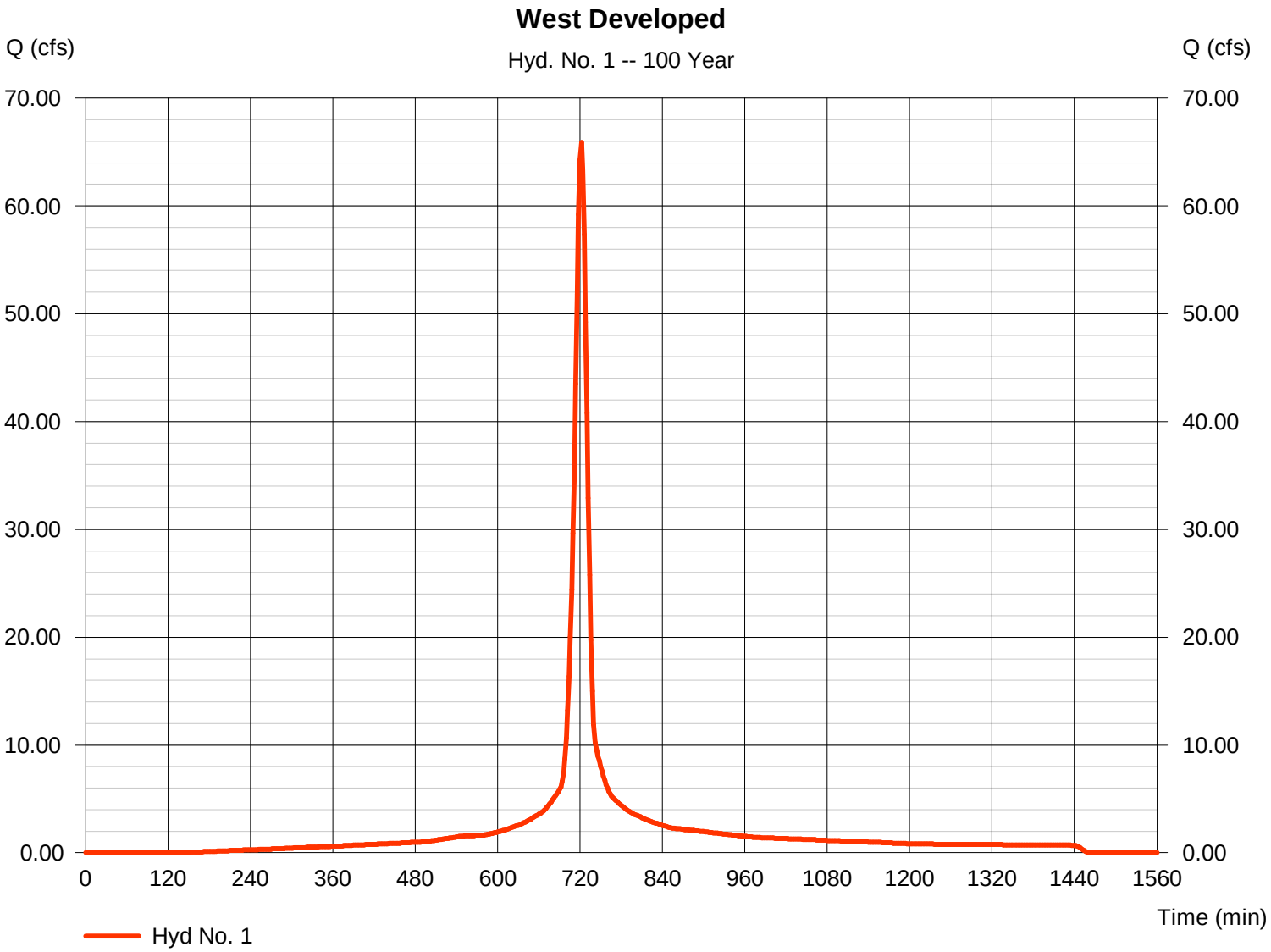
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph description
1	SCS Runoff	65.89	2	722	201,093	------	------	------	West Developed
2	Reservoir	50.23	2	728	191,990	1	1317.96	76,411	<no description>
3	SCS Runoff	43.80	2	722	122,797	------	------	------	Existing Conditions

Hydrograph Report

Hyd. No. 1

West Developed

Hydrograph type	=	SCS Runoff	Peak discharge	=	65.89 cfs
Storm frequency	=	100 yrs	Time to peak	=	722 min
Time interval	=	2 min	Hyd. volume	=	201,093 cuft
Drainage area	=	8.300 ac	Curve number	=	92
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	15.00 min
Total precip.	=	7.80 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484



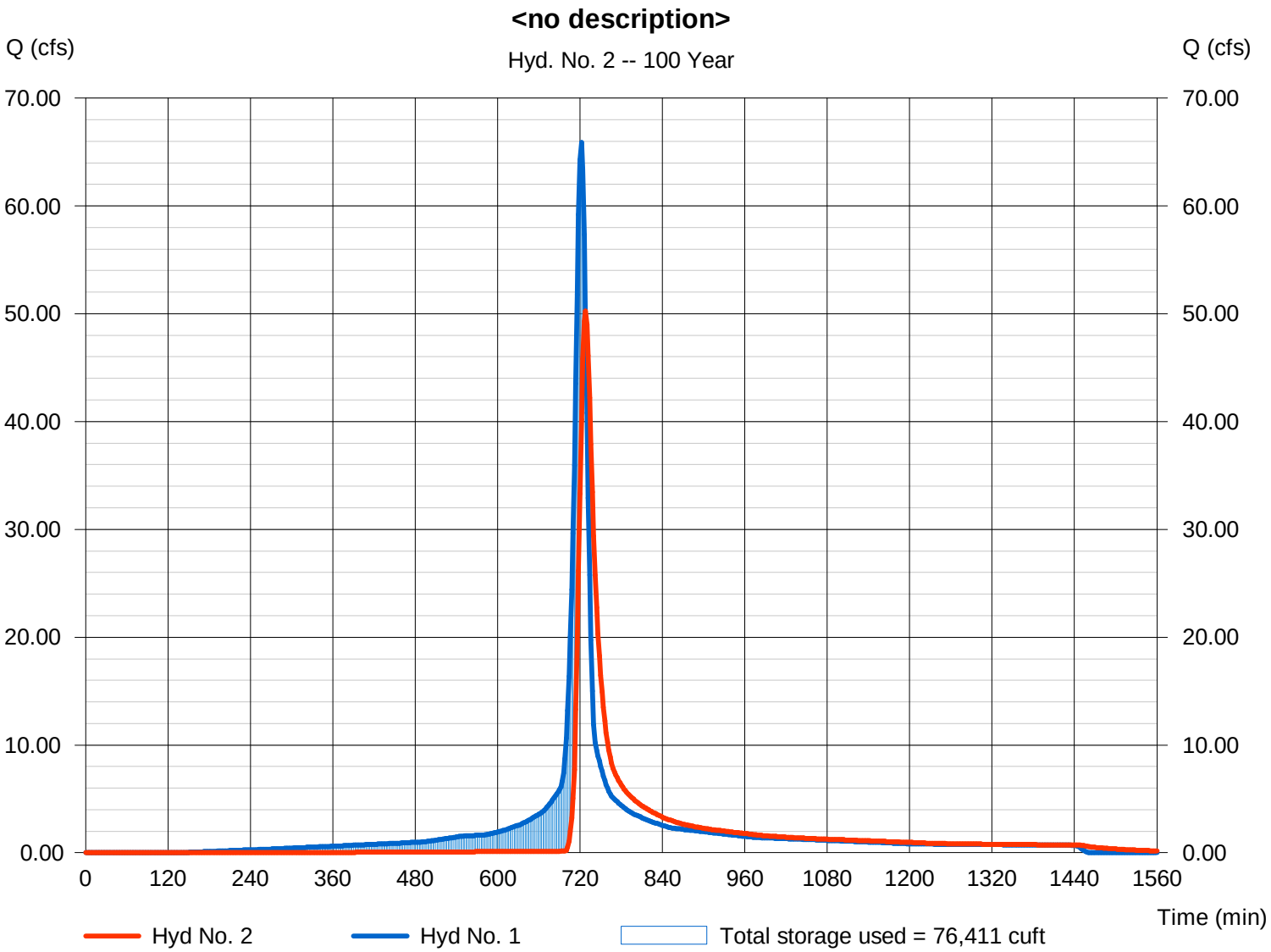
Hydrograph Report

Hyd. No. 2

<no description>

Hydrograph type	=	Reservoir	Peak discharge	=	50.23 cfs
Storm frequency	=	100 yrs	Time to peak	=	728 min
Time interval	=	2 min	Hyd. volume	=	191,990 cuft
Inflow hyd. No.	=	1 - West Developed	Max. Elevation	=	1317.96 ft
Reservoir name	=	<New Pond>	Max. Storage	=	76,411 cuft

Storage Indication method used.

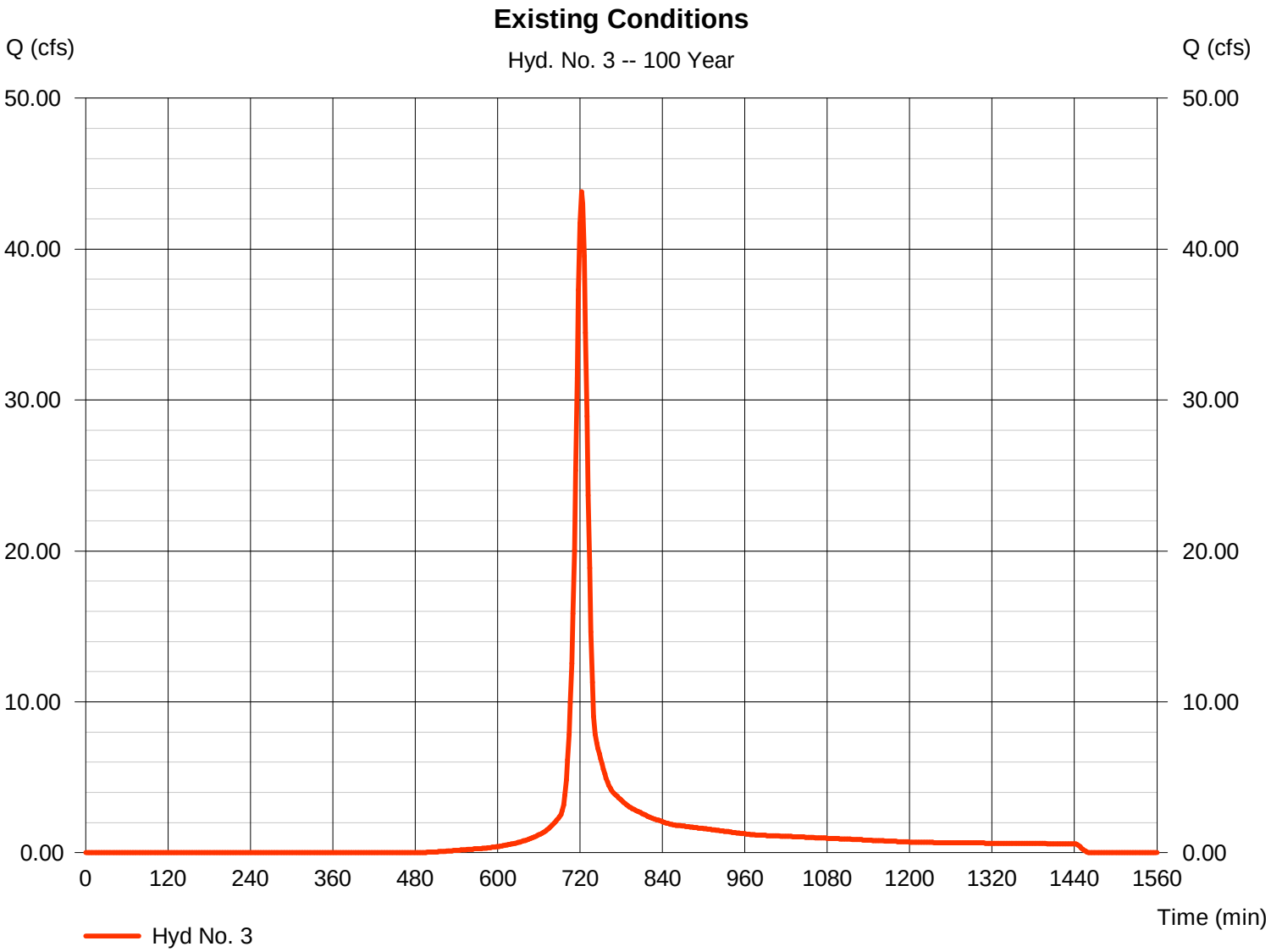


Hydrograph Report

Hyd. No. 3

Existing Conditions

Hydrograph type	=	SCS Runoff	Peak discharge	=	43.80 cfs
Storm frequency	=	100 yrs	Time to peak	=	722 min
Time interval	=	2 min	Hyd. volume	=	122,797 cuft
Drainage area	=	8.300 ac	Curve number	=	69
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	15.00 min
Total precip.	=	7.80 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484



Hydraflow Rainfall Report

Return Period (Yrs)	Intensity-Duration-Frequency Equation Coefficients (FHA)			
	B	D	E	(N/A)
1	27.8967	9.8000	0.7047	--------
2	76.3137	14.3000	0.8844	--------
3	1.2000	0.1000	0.0000	--------
5	52.6224	11.2000	0.7497	--------
10	55.1841	11.1000	0.7229	--------
25	60.7012	11.1000	0.7068	--------
50	66.9222	11.3000	0.7004	--------
100	62.2794	10.1000	0.6624	--------

File name: wich_IDF.IDF

Intensity = B / (Tc + D)^E

Return Period (Yrs)	Intensity Values (in/hr)											
	5 min	10	15	20	25	30	35	40	45	50	55	60
1	4.18	3.40	2.90	2.55	2.29	2.08	1.91	1.78	1.66	1.56	1.48	1.40
2	5.57	4.54	3.85	3.35	2.97	2.67	2.43	2.23	2.06	1.92	1.80	1.69
3	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20
5	6.52	5.33	4.55	3.99	3.57	3.24	2.97	2.75	2.57	2.41	2.27	2.15
10	7.40	6.09	5.22	4.60	4.13	3.76	3.46	3.21	3.00	2.82	2.67	2.53
25	8.51	7.03	6.05	5.35	4.81	4.39	4.05	3.76	3.52	3.32	3.14	2.98
50	9.47	7.86	6.78	6.00	5.41	4.94	4.56	4.24	3.98	3.75	3.55	3.37
100	10.31	8.53	7.37	6.53	5.90	5.40	5.00	4.66	4.37	4.13	3.92	3.73

Tc = time in minutes. Values may exceed 60.

Precip. file name: SCS_24HR.pcp

Storm Distribution	Rainfall Precipitation Table (in)							
	1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr
SCS 24-hour	2.80	3.50	1.20	4.50	5.20	6.10	6.90	7.80
SCS 6-Hr	0.00	1.80	0.00	0.00	2.60	0.00	0.00	4.00
Huff-1st	0.00	1.55	0.00	2.75	4.00	5.38	6.50	8.00
Huff-2nd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-3rd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-4th	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-Indy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Custom	0.00	1.75	0.00	2.80	3.90	5.25	6.00	7.10

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