Laurel Lake Villas

200 Laurel Lake Drive
Hudson, Ohio

Prepared for

Laurel Lake Retirement Community
200 Laurel Lake Drive
Hudson, Ohio 44236

Storm Water Management Report

6/10/2024

Introduction & Background Data

This storm water management report is prepared for the construction of 7 new villas for a total of 14 units at the Laurel Lake Retirement Community in Hudson, Ohio. Laurel Lake Retirement Community is located off of Boston Mills Road and is on over 141.9 acres of land. This land is partially developed with villas, apartments, parking, drives, sidewalks. Other parts of the site are undeveloped with woods and lakes. Development on site will occur in the areas of the site that are already developed. The new villas will be placed strategically on site near the existing buildings. 2 units will require the construction of a new driveway which will include a hammerhead turnaround for fire department access. There are two lakes on the property Lake Forest on the north end of the site and extends under Boston Mills Road further to the north and discharges to Brandywine Creek. There is a smaller lake southwest of the villas that discharges to a tributary to Mud Brook. The topographic survey for this project was provided to The Riverstone Company for our use.

Soils Conditions

There are several soils found on site. The Natural Resources Conservation Service Web Soil Survey has identified these soils on site to be Caneadea Silt Loam (CcB), Fitchville Silt Loam (FcB), Geeburg Silt Loam (GbC2), and Canadice Silty Loam (Ca), which are classified as hydrological group D soil. Soils on site also include Bogart-Haskins Loams (BhB), which is classified as a hydrological group B soil.

Existing Conditions and Storm Water

The storm water from the developed portion of the existing site is collected in storm sewers and discharged to either of the two lakes. There are several small detention basins located on site that collects storm water from smaller areas before being discharged to the lakes.

Proposed Development and Storm Water

The City of Hudson uses the Critical Storm to determine peak post development discharge. The construction of the 7 villas will increase impervious area on the site by 1.204 acres.

Critical Storm Analysis

Predevelopment

Surface	Area	CN	AxCN
Impervious	23.18	98	2271.64
Open	118.72	84	9972.48
Total	141.9		12244.12

Weighted CN = 12244.12 / 141.9 = 86
Runoff for 1 year storm = ([2.04 – (0.2*((1000/86)-10))] / [2.04 + (0.8*((1000/86)-10))] = 0.879

Post development

Surface	Area	CN	AxCN
Impervious	24.38	98	2389.24
Open	117.52	84	9871.68
Total	141.9		12260.92

Weighted CN = 12260.92 / 141.9 = 86
Runoff for 1 year storm = ([2.04 – (0.2*((1000/86)-10))] / [2.04 + (0.8*((1000/86)-10))] = 0.879

Percent increase = (0.879 – 0.879) / 0.879 = 0%
Therefore a 1 year critical storm

This increase in runoff from the site is negligible. As the development is occurring within the footprint of the existing developed site all storm water will be discharged to either Lake Forest or the Rider lake in the southwest corner of the site. Runoff from villa 1 (units 111 and 112) will be discharged directly to Lake Forest. Runoff from villa 2 (units 109 and 110) will be discharged to the small stormwater detention basin immediately east of the villa. This detention basin will be modified, increasing the volume of the detention basin by about 3,194 cf. A new smaller detention basin will be added for the storm water for villa 4 (units 40A and 40B). This basin is used to reduce the peak runoff of storm water from the villa into the small sewer it connects to. This basin has a capacity of about 1,700 cf. Stormwater from the remaining villas will be discharged to larger sewers that convey the stormwater to either of the two lakes.

Storm Water Detention
Villa 1.
    Storm water from villa 1 will be discharged directly to Lake Forest. Storm water from the roof is collected in sewers and discharged to a new discharge sewer to the Lake. The 100 year storm increases runoff from 9,290 cf to 10,371 cf or a net increase of 1,082 cf. The detention basin near villa 2 has been modified to include extra volume to site that do not discharge to detention basin before being discharged to the lake.

Villa 2.
    Stormwater from villa 2 (units 109 and 110) will be discharged directly into the small modified detention basin. The basin was modified to maximize the area without disturbing the outlet structure. The new villa will generate an additional 795 cubic feet of storm water for the 100 year storm. The basin was modified increasing the capacity of the basin from 17,086 cf to 20,280 for an additional volume of total of 3,194 cf. The increase in volume of the detention basin is larger than the increase in runoff. This also allows for additional detention for site that are not able to be discharged to a detention basin before being discharged to the Lake. The existing outlet structure will not be modified.

Villa 3.
    Stormwater from villa 3 is discharged to a small swale northwest of the proposed building. Storm water will discharge over land to the existing system before being discharged to rider lake.

Villa 4.

Stormwater from villa 4 (units 40A and 40B) will be discharged to a small depression behind the villa. This depression has the capacity of about 1,797 cf. The use of this basin reduces the runoff from the villa into the existing storm system.

Villa 4 Summary Table

	1-year	2-year	5-year	10-year	25-year	50-year	100-year
Pre- Developed Runoff (a)	0.514	0.731	1.073	1.362	1.790	2.148	2.535
Post-Developed runoff to the basin. (b)	0.443	0.536	0.672	0.783	0.942	1.073	1.214
Maximum Storage in detention basin. (c)	565	694	892	1,056	1,301	1,508	1,735
Maximum elevation in the detention basin. (d)	1012.95	1013.08	1013.27	1013.42	1013.63	1013.79	1013.96
Discharge from the detention basin. (e)	0.082	0.091	0.102	0.109	0.119	0.127	0.134

Explanation of Summary Table Rows
   (a) Pre-developed site runoff (cfs), hydrograph 10.
   (b) Post development discharge to the detention basin, (cfs), hydrograph 11.
   (c) Maximum storage in detention basin, (cf), hydrograph 12.
   (d) Maximum elevation of stormwater in detention basin, hydrograph 12.
   (e) Post development discharge from the detention basin, hydrograph 12.

Villa 5.

Storm water from Villa 5 is discharged directly to Lake Forest. The increase in runoff from villa 5 for the 100 year storm is 904 cf. This increase in volume is handled in the modified basin near Villa 2.

Villa 8 and Villa 9

Stormwater runoff from villas 8 and 9 and the road are collected in the stormsewers and discharged directly to Rider Lake. The runoff from the development increases the runoff from 15,486 cf to 18,094 cf, or 2,608 cf.

Lake Forest

Runoff From Villas 1, 2 and 5 will be discharged to Lake Forest. For the 100 year storm that is an increase in runoff of 2,780 cf. The basin near building 2 was modified and the total capacity of the basin was increased by 3,194 cf, cover the increase in runoff to Lake Forest.

Rider Lake

Runoff From Villas 3, 4, 8, 9 and the new roadway discharged to Rider Lake southwest of the development. For the 100 year storm that is an increase in volume of 5,953 cf. The surface area of Rider Lake is approximately 2.2 acres or about 95,832 sf. The increase in volume equals a change in elevation of the lake by 0.06 feet or about ¾ of an inch.

Storm Water Explanation and Post Construction Water Quality

The Ohio EPA allows storm water to be discharged directly to bodies of water without water quality treatment if the area of the discharge is less than 5% of the drainage area. Using the stream stats website the drainage area for Lake Forest is approximately 3,392 acres. The new development is occurring on approximately 1.9 acres which is less than 5% of the 3,392 acre drainage area. (3,392 acres x 5% = 169.6 acres). Using the stream stats website the drainage area for Rider Lake is approximately 63.2 acres. The new development is occurring on approximately 2.3 acres which is less than 5% of the 63.2 acre drainage area. (63.2 acres x 5% = 3.16 acres). Both work limits are less than 5% of the receiving drainage area and therefore storm water quality treatment is not required.

Conclusion

The installation of the large detention basin and will provide storage volume to reduce the post-development storm water peak flows. The table below shows the results of the storm water analysis for the site. Calculations were computed by using the Rational Method and the Hydraflow Hydrographs computer program. Modeling was done for the 1, 2, 5, 10, 25, 50, and 100-year frequency storm events. Hydrographs were generated for each storm event. Discharge rates are shown in cubic feet per second (cfs) and detention elevation is shown in feet and decimal parts thereof.
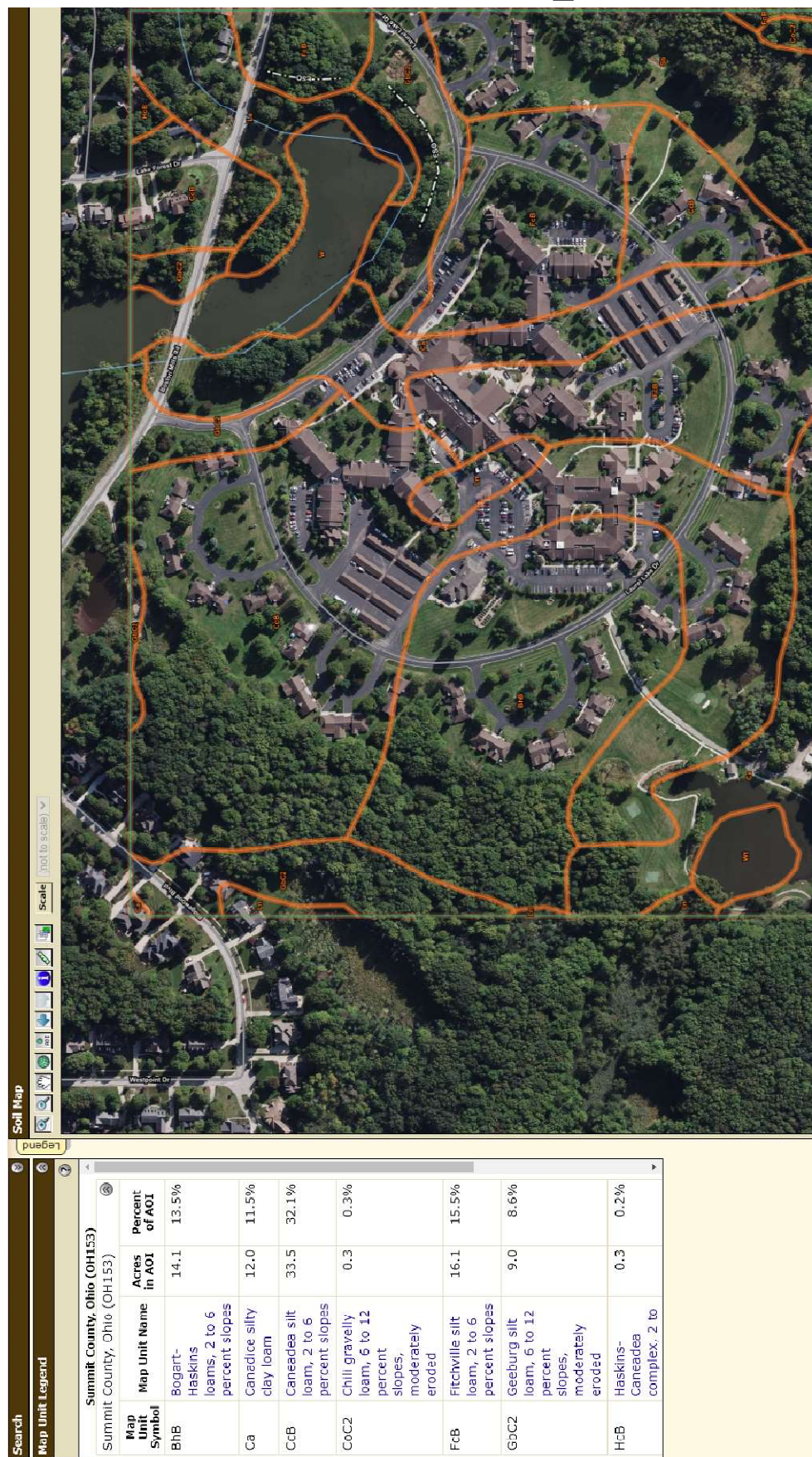
Appendix

- Soils Map
- Hydraflow Hydrograph Data Sheets
- Lake Forest Stream Stats
- Rider Lake Stream Stats

Soils Map

Summit County, Ohio (OH153)

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
BhB	Bogart-Haskins loams, 2 to 6 percent slopes	14.1	13.5%
Ca	Canadice silty clay loam	12.0	11.5%
CcB	Caneadea silt loam, 2 to 6 percent slopes	33.5	32.1%
CoC2	Chili gravelly loam, 6 to 12 percent slopes, moderately eroded	0.3	0.3%
FcB	Fitchville silt loam, 2 to 6 percent slopes	16.1	15.5%
GbC2	Geeburg silt loam, 6 to 12 percent slopes, moderately eroded	9.0	8.6%
HcB	Haskins-Caneadea complex, 2 to	0.3	0.2%

Hydraflow Hydrographs
Data Sheets

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	------	0.665	0.945	-------	1.388	1.761	2.315	2.778	3.278	Villa 1 PRE
2	SCS Runoff	------	0.889	1.196	-------	1.667	2.056	2.623	3.092	3.593	Villa 1 POST
4	SCS Runoff	------	0.656	0.932	-------	1.369	1.738	2.284	2.741	3.234	Villa 2 PRE
5	SCS Runoff	------	0.819	1.116	-------	1.575	1.956	2.513	2.975	3.470	Villa 2 Post
7	SCS Runoff	------	0.319	0.453	-------	0.666	0.845	1.111	1.333	1.573	Villa 3 PRE
8	SCS Runoff	------	0.517	0.671	-------	0.903	1.091	1.364	1.588	1.827	Villa 3 Post
10	SCS Runoff	------	0.514	0.731	-------	1.073	1.362	1.790	2.148	2.535	Villa 4 PRE
11	SCS Runoff	------	0.319	0.453	-------	0.666	0.845	1.111	1.333	1.573	Villa 4 Post Runoff
12	SCS Runoff	------	0.443	0.536	-------	0.672	0.783	0.942	1.073	1.214	Villa 4 Post Detention
13	Reservoir	12	0.082	0.091	-------	0.102	0.109	0.119	0.127	0.134	Villa 4
14	Combine	11, 12,	0.762	0.989	-------	1.338	1.628	2.054	2.407	2.787	Total Villa 4 Post
16	SCS Runoff	------	0.426	0.605	-------	0.888	1.127	1.482	1.778	2.098	Villa 5 PRE
17	SCS Runoff	------	0.634	0.833	-------	1.134	1.380	1.736	2.029	2.342	Villa 5 Post
19	SCS Runoff	------	1.158	1.622	-------	2.349	2.960	3.861	4.611	5.419	Villa 8 & 9 & road PRE
20	SCS Runoff	------	1.736	2.254	-------	3.034	3.668	4.585	5.337	6.140	Villa 8 & 9 Road Post
22	Combine	1, 4, 16,	1.746	2.481	-------	3.645	4.626	6.081	7.297	8.609	Lake Forest PRE
23	Combine	2, 5, 17,	2.341	3.144	-------	4.376	5.392	6.873	8.096	9.406	Lake Forest POST
25	Combine	7, 10, 19,	1.991	2.806	-------	4.088	5.167	6.762	8.093	9.527	Southwest PRE
26	Combine	8, 13, 20,	2.319	2.999	-------	4.020	4.849	6.047	7.030	8.077	Southwest POST
28	Combine	22, 25,	3.738	5.287	-------	7.733	9.793	12.84	15.39	18.14	TOTAL
29	Combine	23, 26,	4.661	6.143	-------	8.396	10.24	12.92	15.13	17.48	Total Post

Hydrograph Summary Report

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	0.665	2	722	1,918	------	------	------	Villa 1 PRE
2	SCS Runoff	0.889	2	722	2,498	------	------	------	Villa 1 POST
4	SCS Runoff	0.656	2	722	1,893	------	------	------	Villa 2 PRE
5	SCS Runoff	0.819	2	722	2,311	------	------	------	Villa 2 Post
7	SCS Runoff	0.319	2	722	921	------	------	------	Villa 3 PRE
8	SCS Runoff	0.517	2	722	1,449	------	------	------	Villa 3 Post
10	SCS Runoff	0.514	2	722	1,484	------	------	------	Villa 4 PRE
11	SCS Runoff	0.319	2	722	921	------	------	------	Villa 4 Post Runoff
12	SCS Runoff	0.443	2	722	1,358	------	------	------	Villa 4 Post Detention
13	Reservoir	0.082	2	740	1,343	12	1012.95	565	Villa 4
14	Combine	0.762	2	722	2,279	11, 12,	------	------	Total Villa 4 Post
16	SCS Runoff	0.426	2	722	1,228	------	------	------	Villa 5 PRE
17	SCS Runoff	0.634	2	722	1,777	------	------	------	Villa 5 Post
19	SCS Runoff	1.158	2	722	3,311	------	------	------	Villa 8 & 9 & road PRE
20	SCS Runoff	1.736	2	722	4,871	------	------	------	Villa 8 & 9 Road Post
22	Combine	1.746	2	722	5,039	1, 4, 16,	------	------	Lake Forest PRE
23	Combine	2.341	2	722	6,586	2, 5, 17,	------	------	Lake Forest POST
25	Combine	1.991	2	722	5,716	7, 10, 19,	------	------	Southwest PRE
26	Combine	2.319	2	722	7,663	8, 13, 20,	------	------	Southwest POST
28	Combine	3.738	2	722	10,755	22, 25,	------	------	TOTAL
29	Combine	4.661	2	722	14,249	23, 26,	------	------	Total Post

Hydrograph Report

Monday, 06 / 10 / 2024

Hyd. No. 1

Villa 1 PRE

Hydrograph type	= SCS Runoff		Peak discharge	= 0.665 cfs
Storm frequency	= 1 yrs		Time to peak	= 722 min
Time interval	= 2 min		Hyd. volume	= 1,918 cuft
Drainage area	= 0.750 ac		Curve number	= 84
Basin Slope	= 0.0 %		Hydraulic length	= 0 ft
Tc method	= User		Time of conc. (Tc)	= 15.00 min
Total precip.	= 1.97 in		Distribution	= Type II
Storm duration	= 24 hrs		Shape factor	= 484

Villa 1 PRE

Hyd. No. 1 -- 1 Year

— Hyd No. 1

Hydrograph Report

Monday, 06 / 10 / 2024
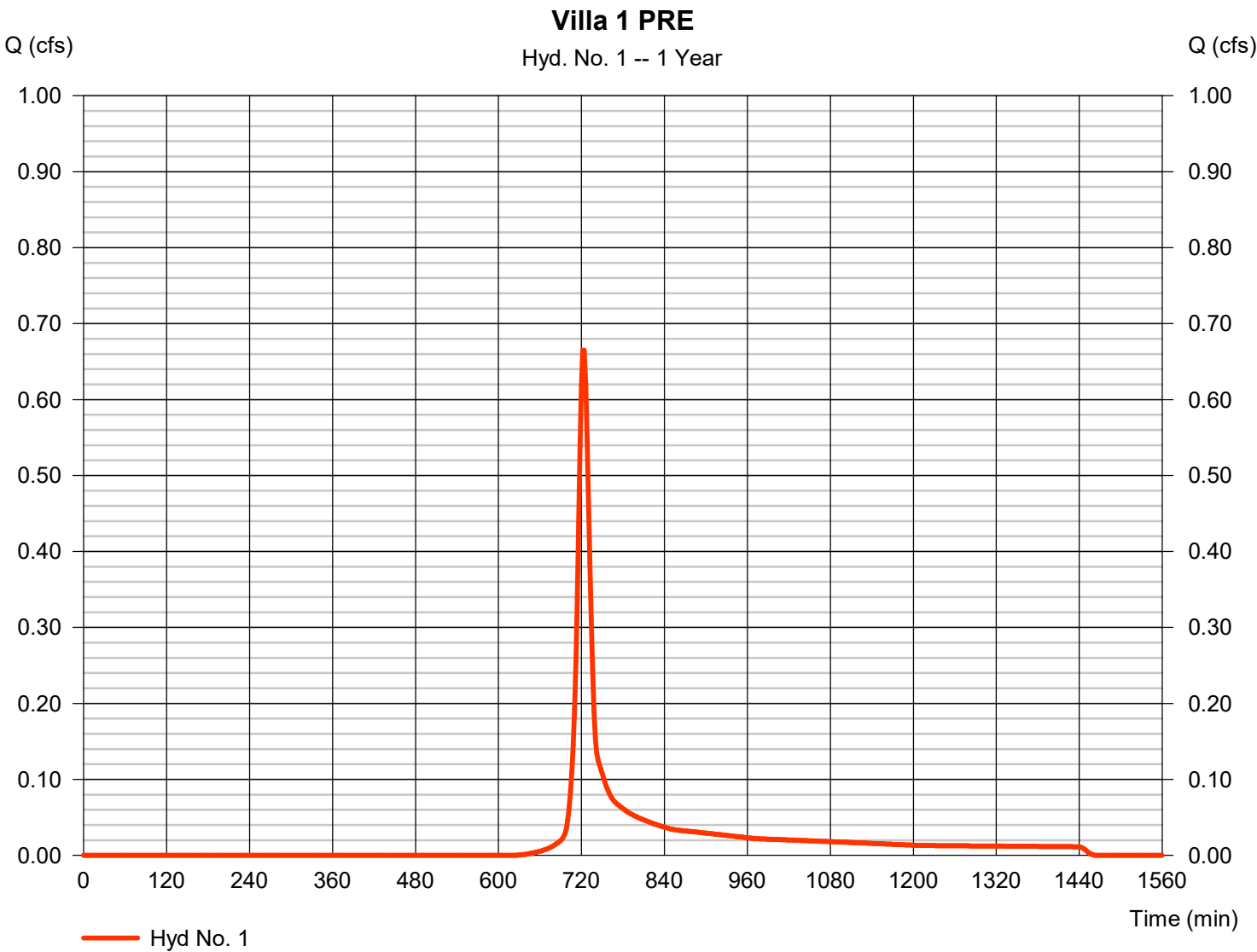
Hyd. No. 2

Villa 1 POST

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.889 cfs
Storm frequency	=	1 yrs	Time to peak	=	722 min
Time interval	=	2 min	Hyd. volume	=	2,498 cuft
Drainage area	=	0.750 ac	Curve number	=	88*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	15.00 min
Total precip.	=	1.97 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.220 x 98) + (0.530 x 84)] / 0.750

Villa 1 POST
Hyd. No. 2 -- 1 Year

Hyd No. 2

Hydrograph Report

Monday, 06 / 10 / 2024
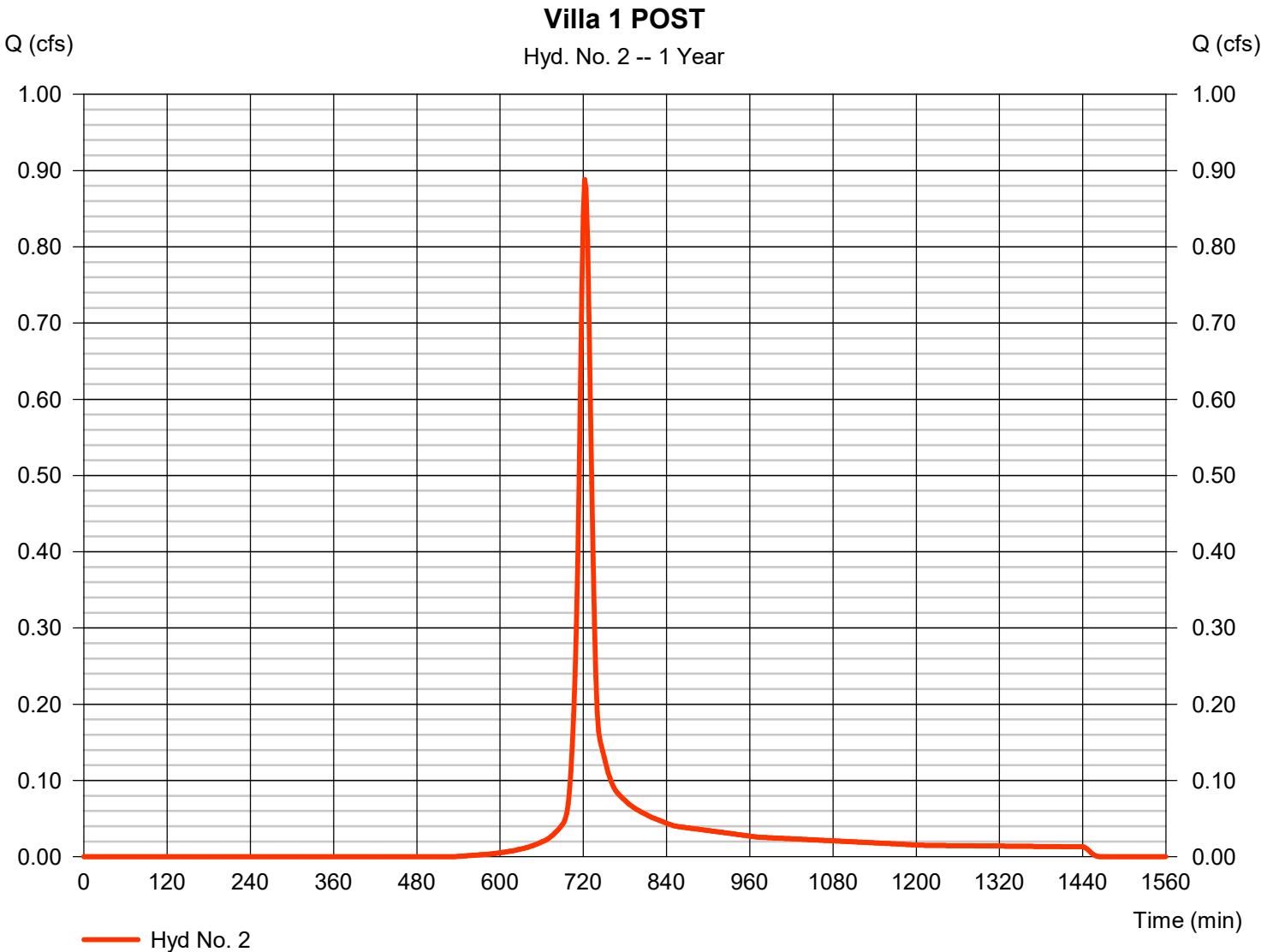
Hyd. No. 4

Villa 2 PRE

Hydrograph type	= SCS Runoff	Peak discharge	= 0.656 cfs
Storm frequency	= 1 yrs	Time to peak	= 722 min
Time interval	= 2 min	Hyd. volume	= 1,893 cuft
Drainage area	= 0.740 ac	Curve number	= 84
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 15.00 min
Total precip.	= 1.97 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

Villa 2 PRE

Hyd. No. 4 -- 1 Year
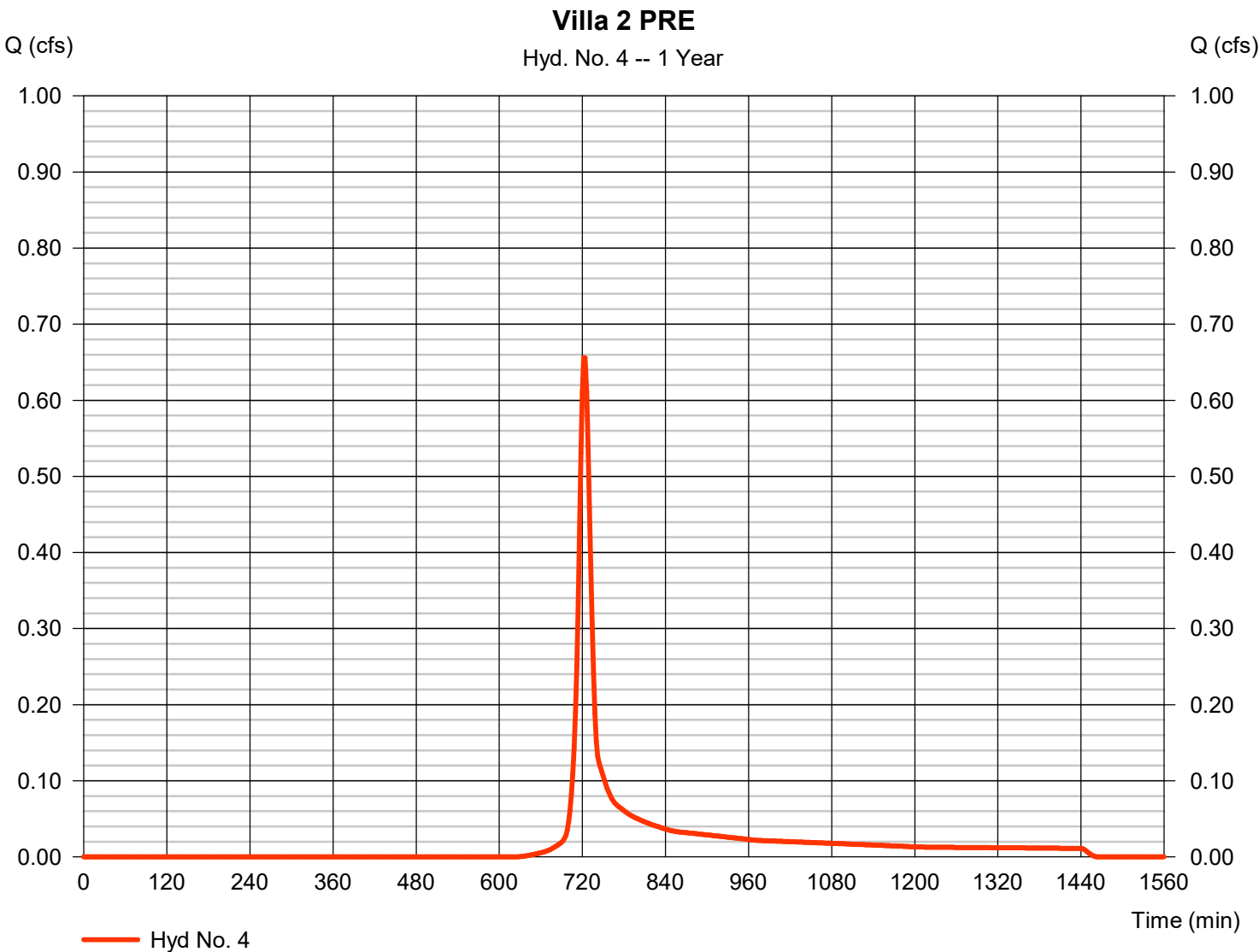
Hyd No. 4

Hydrograph Report

Hyd. No. 5

Villa 2 Post

Hydrograph type	= SCS Runoff	Peak discharge	= 0.819 cfs
Storm frequency	= 1 yrs	Time to peak	= 722 min
Time interval	= 2 min	Hyd. volume	= 2,311 cuft
Drainage area	= 0.740 ac	Curve number	= 87*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 15.00 min
Total precip.	= 1.97 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

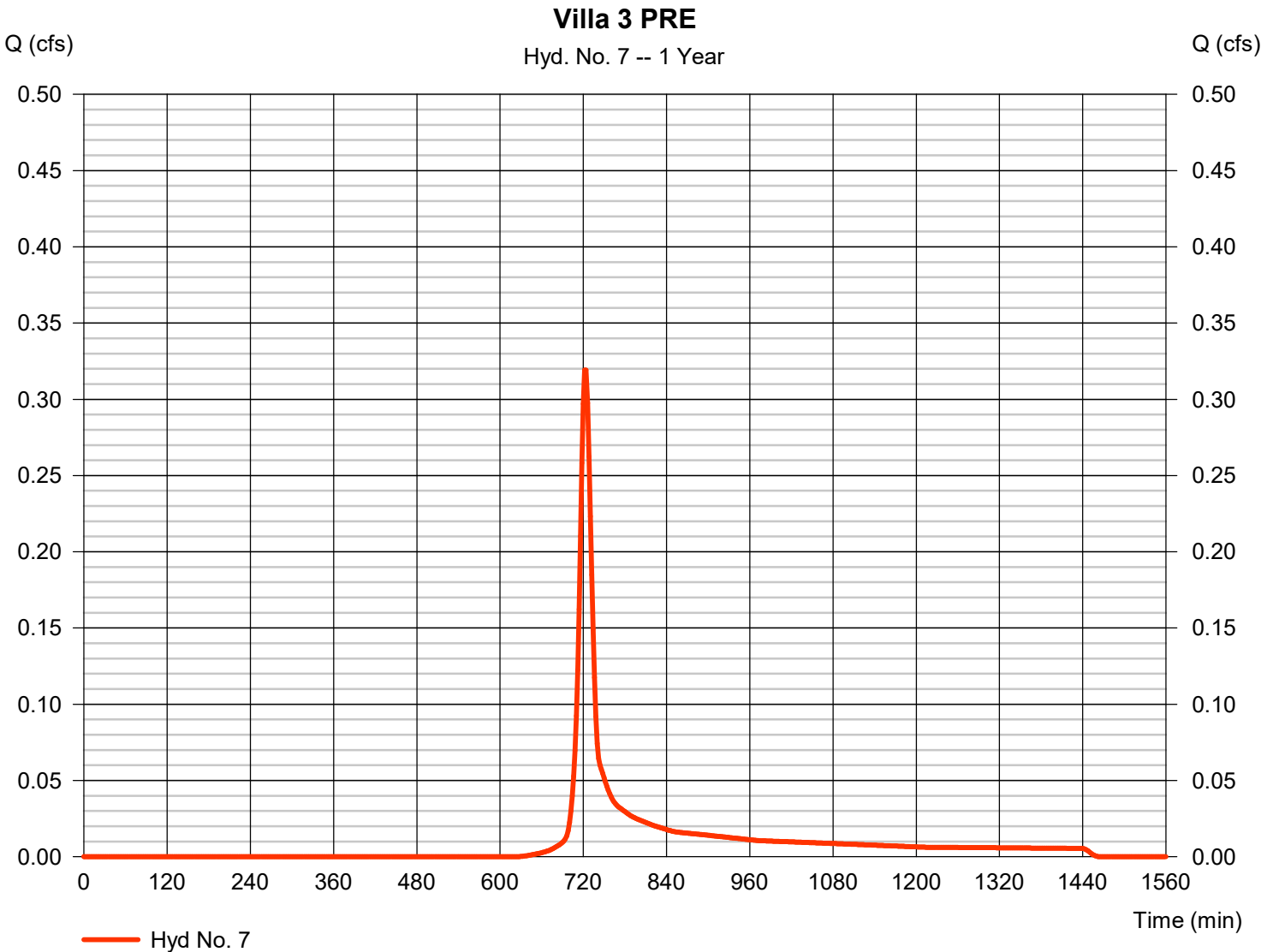* Composite (Area/CN) = [(0.180 x 98) + (0.560 x 84)] / 0.740

Villa 2 Post
Hyd. No. 5 -- 1 Year

Hyd No. 5

Hydrograph Report

Monday, 06 / 10 / 2024

Hyd. No. 7

Villa 3 PRE

Hydrograph type	= SCS Runoff		Peak discharge	= 0.319 cfs
Storm frequency	= 1 yrs		Time to peak	= 722 min
Time interval	= 2 min		Hyd. volume	= 921 cuft
Drainage area	= 0.360 ac		Curve number	= 84
Basin Slope	= 0.0 %		Hydraulic length	= 0 ft
Tc method	= User		Time of conc. (Tc)	= 15.00 min
Total precip.	= 1.97 in		Distribution	= Type II
Storm duration	= 24 hrs		Shape factor	= 484

Villa 3 PRE

Hyd. No. 7 -- 1 Year

Hyd No. 7

Hydrograph Report

Hyd. No. 8

Villa 3 Post

Hydrograph type	= SCS Runoff	Peak discharge	= 0.517 cfs
Storm frequency	= 1 yrs	Time to peak	= 722 min
Time interval	= 2 min	Hyd. volume	= 1,449 cuft
Drainage area	= 0.360 ac	Curve number	= 91*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 15.00 min
Total precip.	= 1.97 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

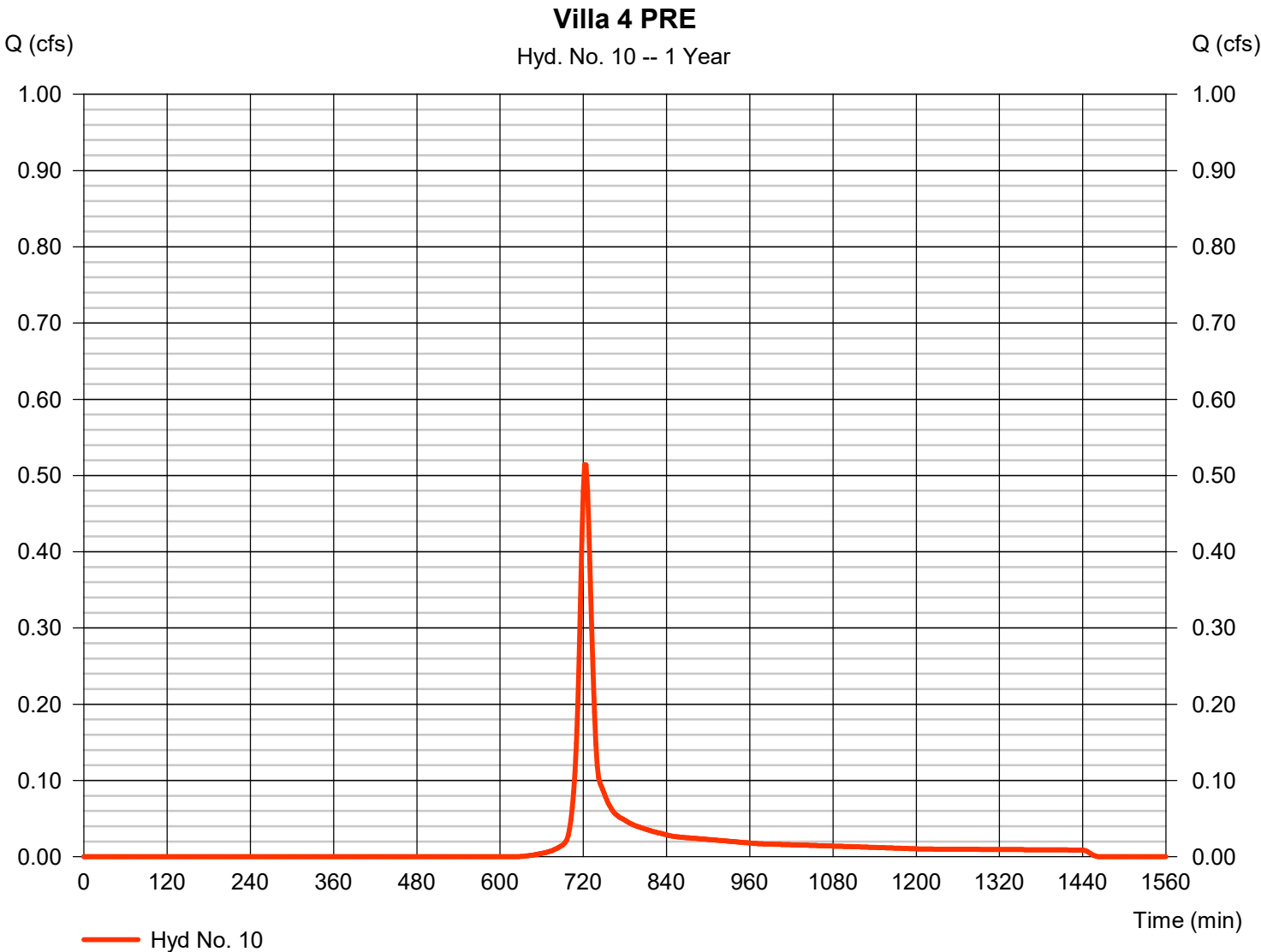* Composite (Area/CN) = [(0.180 x 98) + (0.180 x 84)] / 0.360

Villa 3 Post

Hyd. No. 8 -- 1 Year

Hyd No. 8

Hydrograph Report

Monday, 06 / 10 / 2024
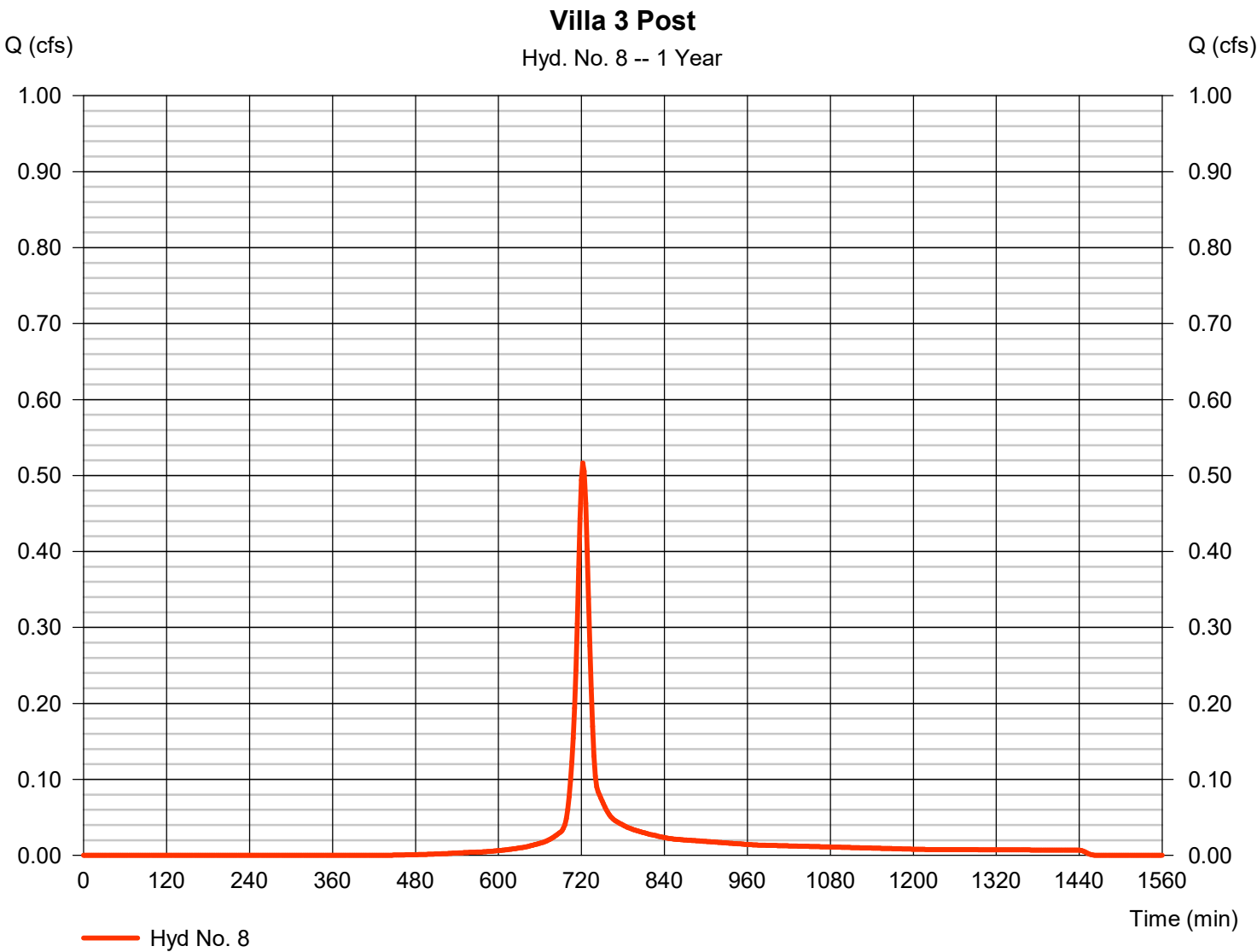
Hyd. No. 10

Villa 4 PRE

Hydrograph type	= SCS Runoff		Peak discharge	= 0.514 cfs
Storm frequency	= 1 yrs		Time to peak	= 722 min
Time interval	= 2 min		Hyd. volume	= 1,484 cuft
Drainage area	= 0.580 ac		Curve number	= 84
Basin Slope	= 0.0 %		Hydraulic length	= 0 ft
Tc method	= User		Time of conc. (Tc)	= 15.00 min
Total precip.	= 1.97 in		Distribution	= Type II
Storm duration	= 24 hrs		Shape factor	= 484

Villa 4 PRE

Hyd. No. 10 -- 1 Year

Hyd No. 10

Hydrograph Report

Monday, 06 / 10 / 2024

Hyd. No. 11

Villa 4 Post Runoff

Hydrograph type	= SCS Runoff		Peak discharge	= 0.319 cfs
Storm frequency	= 1 yrs		Time to peak	= 722 min
Time interval	= 2 min		Hyd. volume	= 921 cuft
Drainage area	= 0.360 ac		Curve number	= 84*
Basin Slope	= 0.0 %		Hydraulic length	= 0 ft
Tc method	= User		Time of conc. (Tc)	= 15.00 min
Total precip.	= 1.97 in		Distribution	= Type II
Storm duration	= 24 hrs		Shape factor	= 484

* Composite (Area/CN) = + (0.360 x 84)] / 0.360

Villa 4 Post Runoff

Hyd. No. 11 -- 1 Year

Hydrograph Report

Hyd. No. 12

Villa 4 Post Detention

Hydrograph type	= SCS Runoff		Peak discharge	= 0.443 cfs
Storm frequency	= 1 yrs		Time to peak	= 722 min
Time interval	= 2 min		Hyd. volume	= 1,358 cuft
Drainage area	= 0.220 ac		Curve number	= 98*
Basin Slope	= 0.0 %		Hydraulic length	= 0 ft
Tc method	= User		Time of conc. (Tc)	= 15.00 min
Total precip.	= 1.97 in		Distribution	= Type II
Storm duration	= 24 hrs		Shape factor	= 484

* Composite (Area/CN) = [(0.220 x 98)] / 0.220

Villa 4 Post Detention
Hyd. No. 12 -- 1 Year
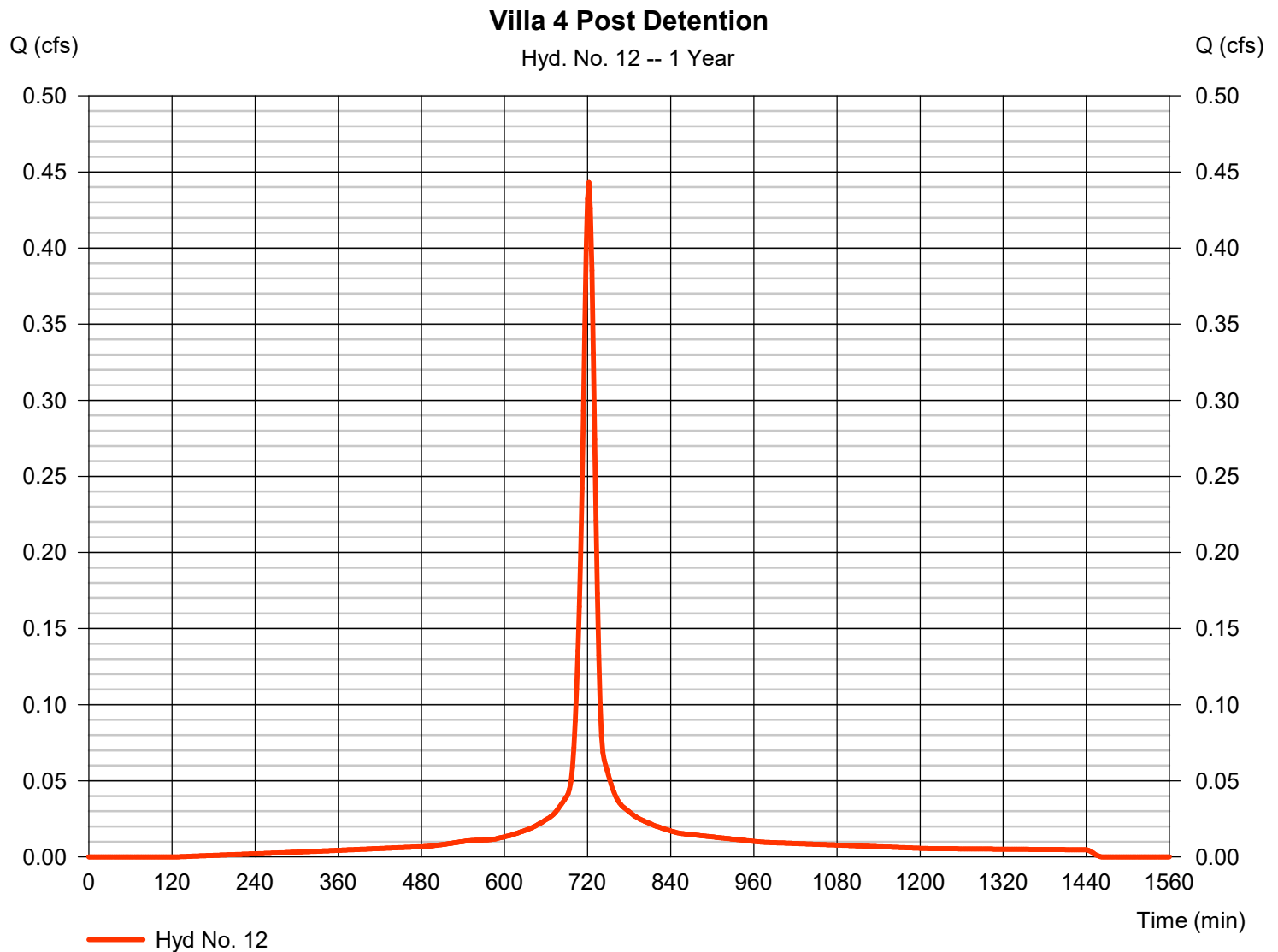
Hyd No. 12

Hydrograph Report

Hyd. No. 13

Villa 4

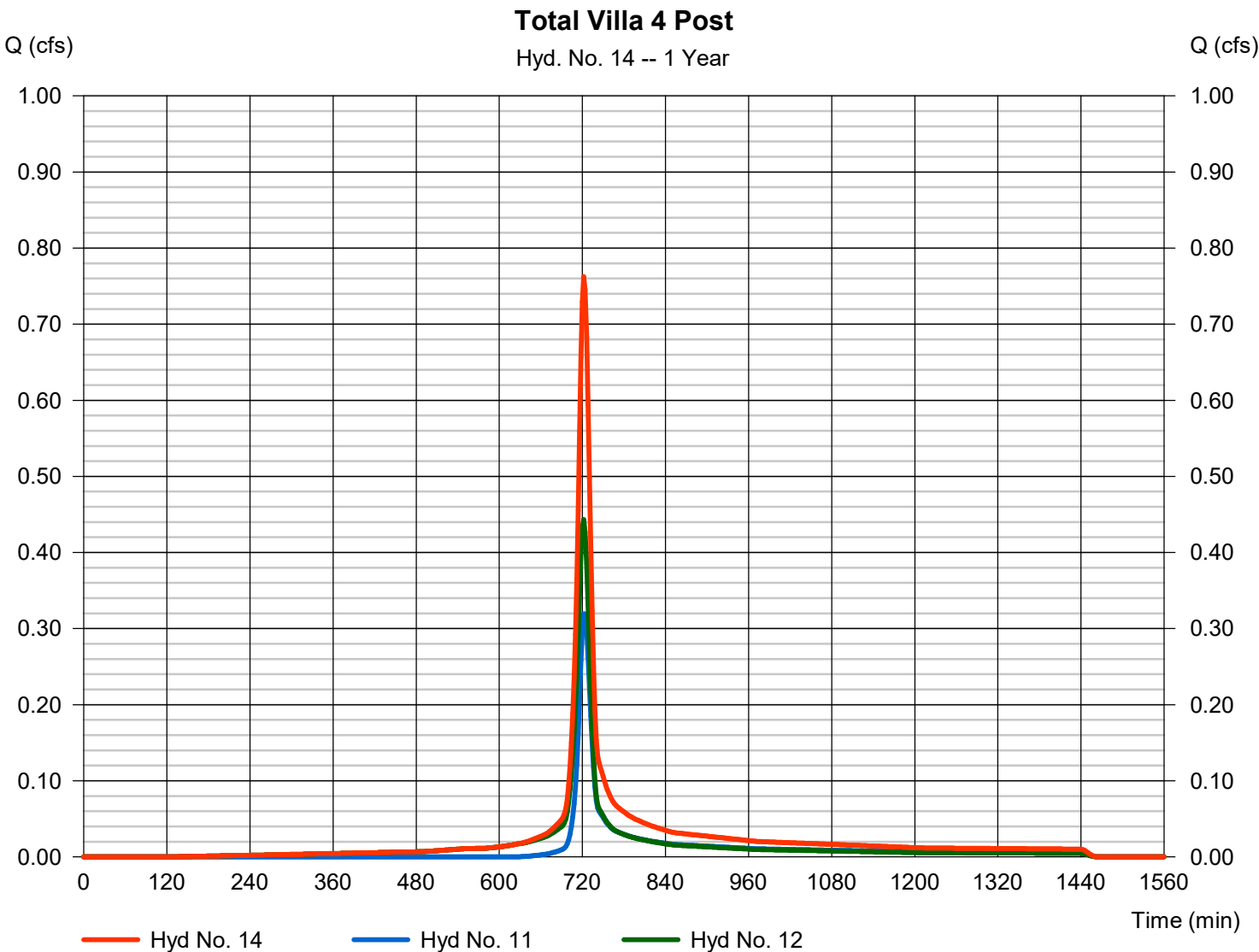|				
Hydrograph type	= Reservoir		Peak discharge	= 0.082 cfs
Storm frequency	= 1 yrs		Time to peak	= 740 min
Time interval	= 2 min		Hyd. volume	= 1,343 cuft
Inflow hyd. No.	= 12 - Villa 4 Post Detention		Max. Elevation	= 1012.95 ft
Reservoir name	= Villa 4		Max. Storage	= 565 cuft

Storage Indication method used.

Villa 4
Hyd. No. 13 -- 1 Year

Hydrograph Report

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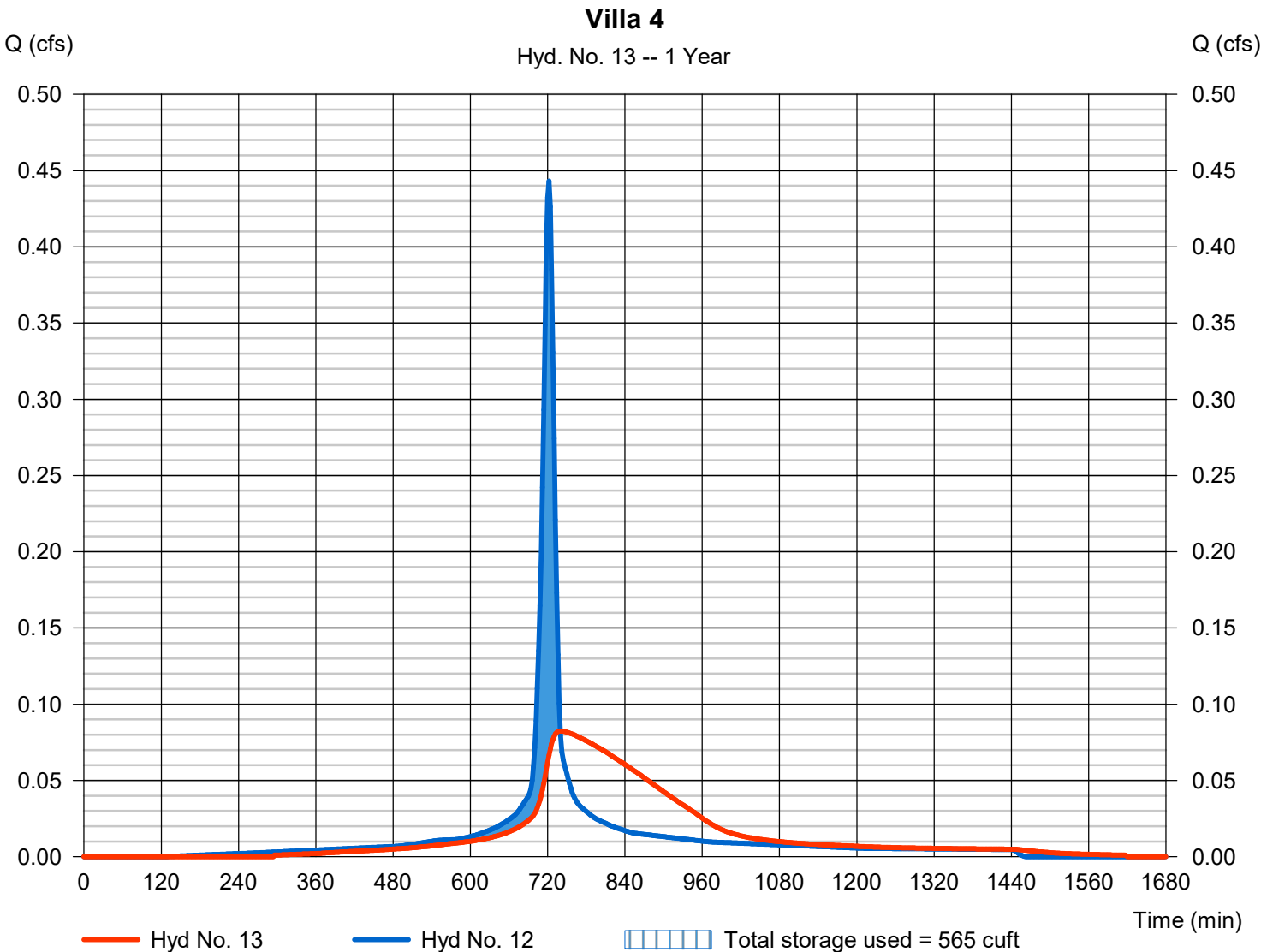
Hyd. No. 14

Total Villa 4 Post

Hydrograph type	= Combine	Peak discharge	= 0.762 cfs
Storm frequency	= 1 yrs	Time to peak	= 722 min
Time interval	= 2 min	Hyd. volume	= 2,279 cuft
Inflow hyds.	= 11, 12	Contrib. drain. area	= 0.580 ac

Total Villa 4 Post

Hyd. No. 14 -- 1 Year

Legend: — Hyd No. 14   — Hyd No. 11   — Hyd No. 12

Hydrograph Report

Monday, 06 / 10 / 2024

Hyd. No. 16

Villa 5 PRE

Hydrograph type	= SCS Runoff		Peak discharge	= 0.426 cfs
Storm frequency	= 1 yrs		Time to peak	= 722 min
Time interval	= 2 min		Hyd. volume	= 1,228 cuft
Drainage area	= 0.480 ac		Curve number	= 84
Basin Slope	= 0.0 %		Hydraulic length	= 0 ft
Tc method	= User		Time of conc. (Tc)	= 15.00 min
Total precip.	= 1.97 in		Distribution	= Type II
Storm duration	= 24 hrs		Shape factor	= 484

Villa 5 PRE

Hyd. No. 16 -- 1 Year

Hydrograph Report

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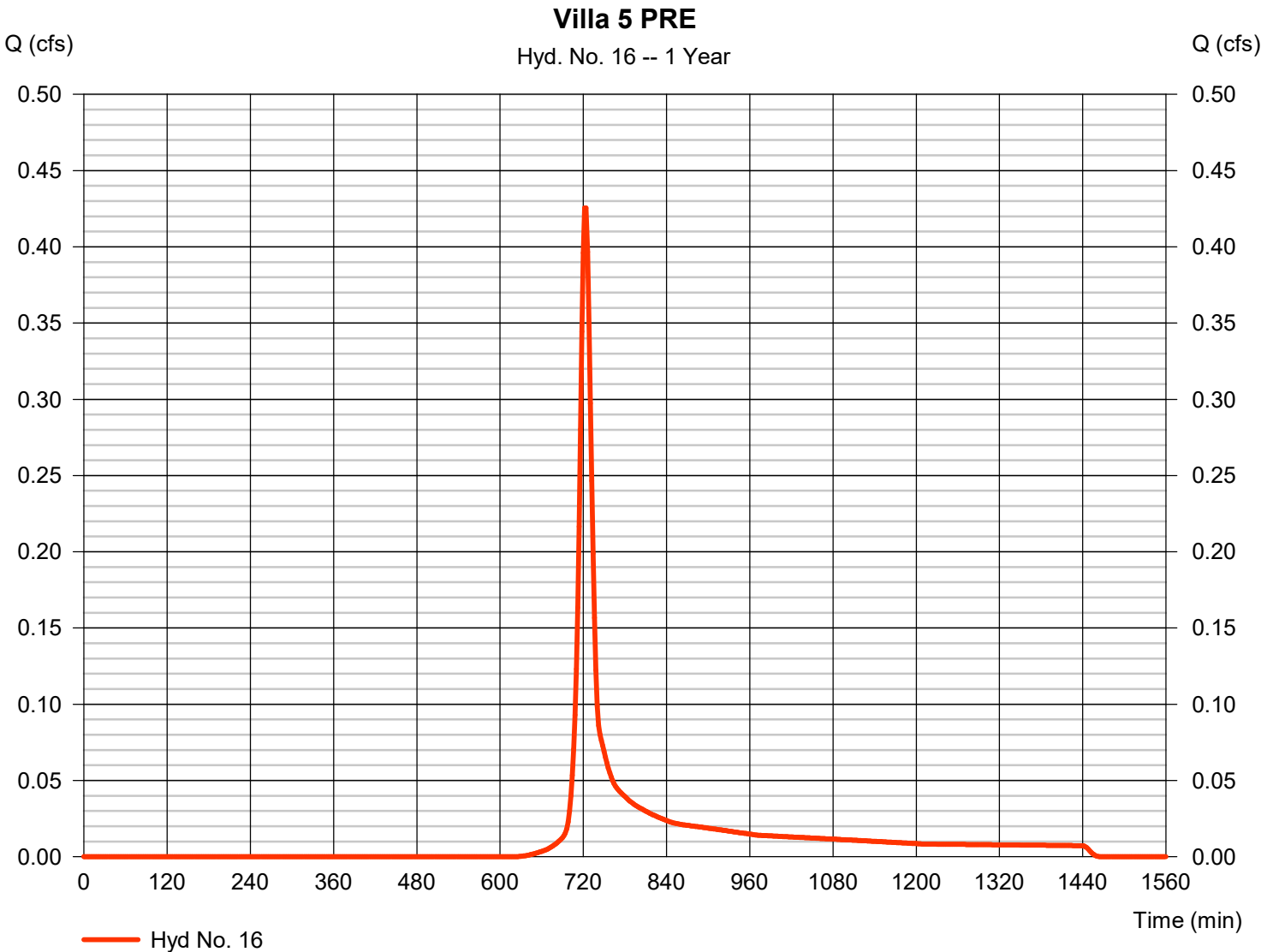
Hyd. No. 17

Villa 5 Post

Hydrograph type	= SCS Runoff		Peak discharge	= 0.634 cfs
Storm frequency	= 1 yrs		Time to peak	= 722 min
Time interval	= 2 min		Hyd. volume	= 1,777 cuft
Drainage area	= 0.470 ac		Curve number	= 90*
Basin Slope	= 0.0 %		Hydraulic length	= 0 ft
Tc method	= User		Time of conc. (Tc)	= 15.00 min
Total precip.	= 1.97 in		Distribution	= Type II
Storm duration	= 24 hrs		Shape factor	= 484

* Composite (Area/CN) = [(0.200 x 98) + (0.270 x 84)] / 0.470

Villa 5 Post

Hyd. No. 17 -- 1 Year

Hyd No. 17

Hydrograph Report

Monday, 06 / 10 / 2024
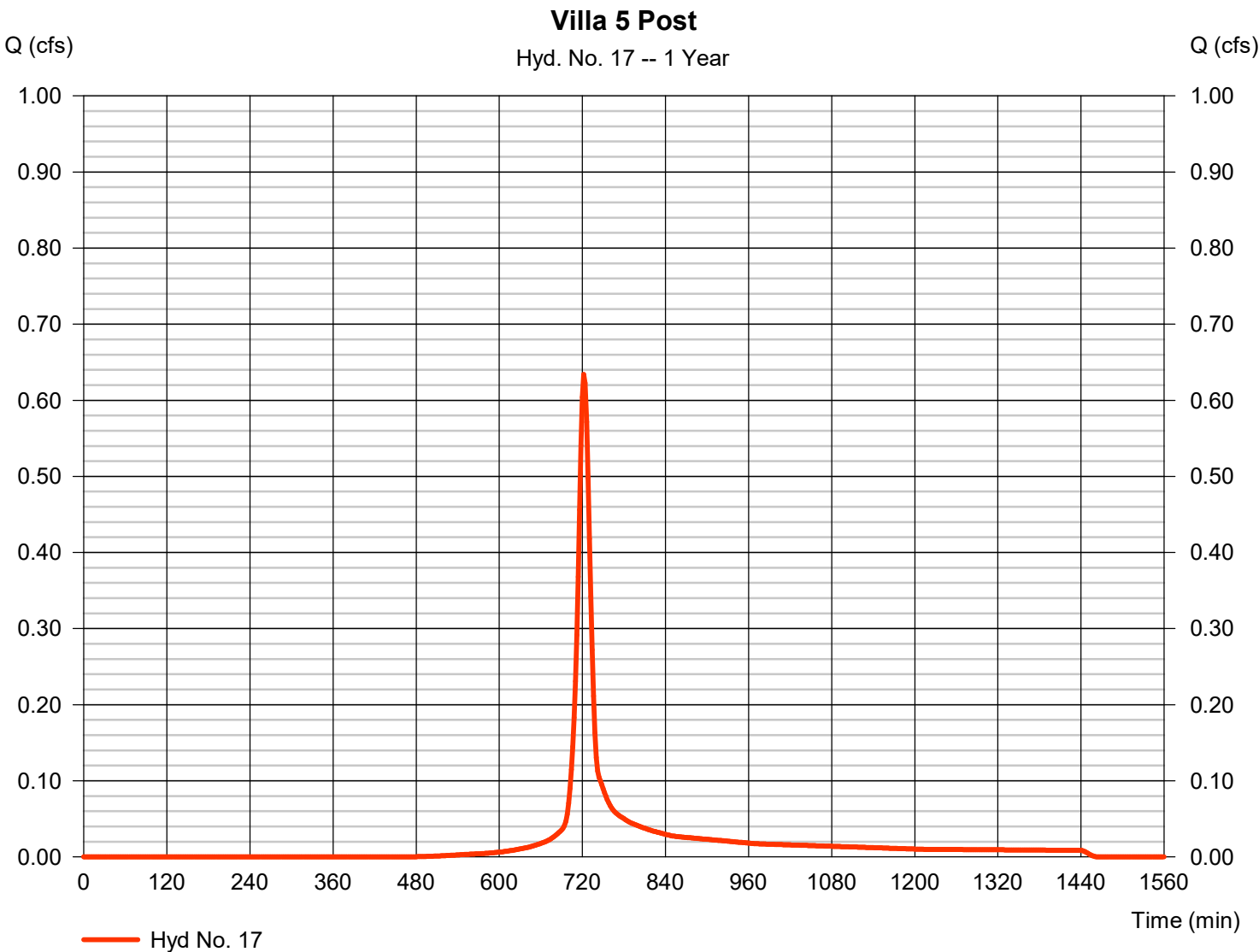
Hyd. No. 19

Villa 8 & 9 & road PRE

Hydrograph type	= SCS Runoff	Peak discharge	= 1.158 cfs
Storm frequency	= 1 yrs	Time to peak	= 722 min
Time interval	= 2 min	Hyd. volume	= 3,311 cuft
Drainage area	= 1.210 ac	Curve number	= 85*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 15.00 min
Total precip.	= 1.97 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.360 x 98) + (0.850 x 84)] / 1.210

Villa 8 & 9 & road PRE

Hyd. No. 19 -- 1 Year

Q (cfs)

—	Hyd No. 19

Time (min)
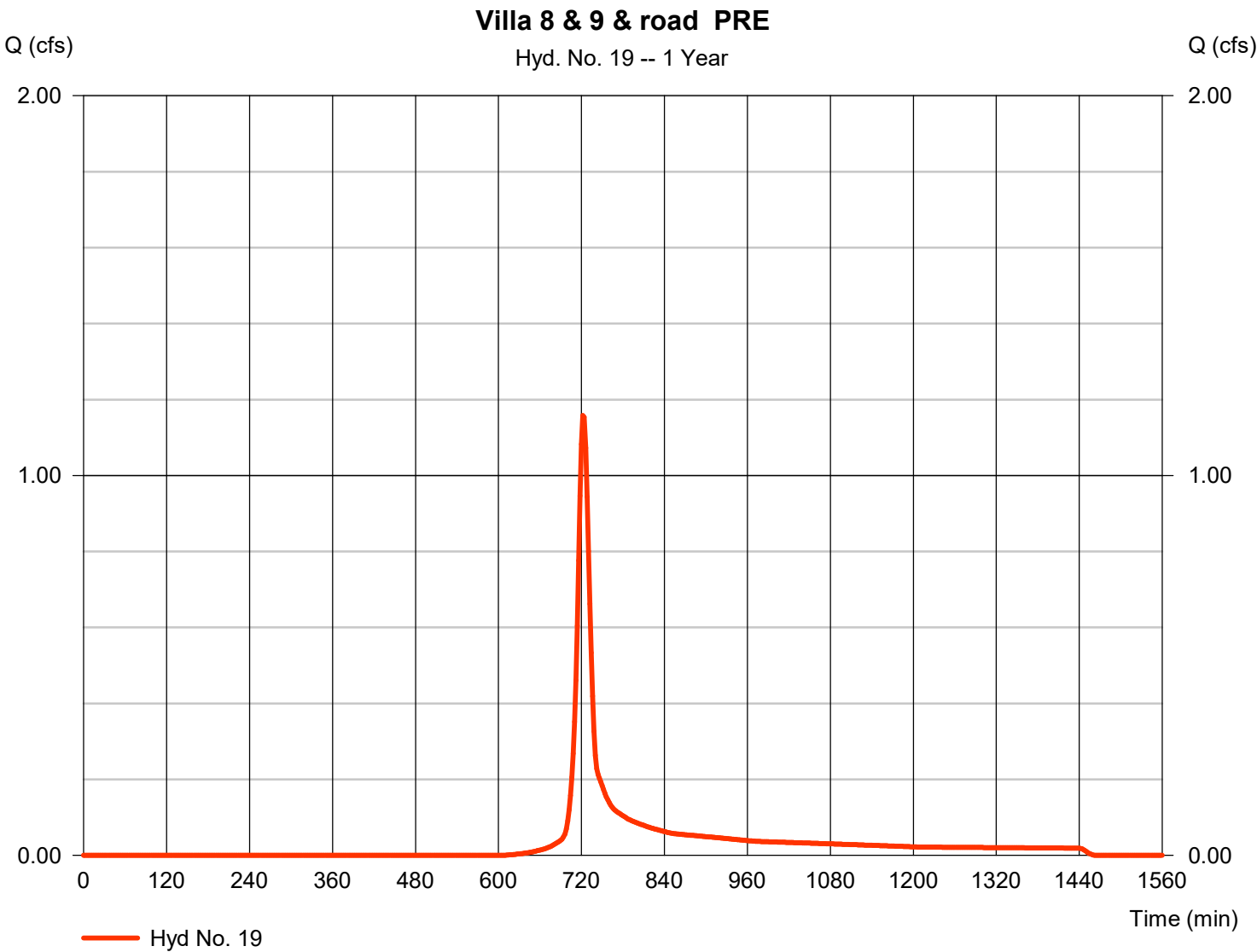
Hydrograph Report

Hyd. No. 20

Villa 8 & 9 Road Post

Hydrograph type	= SCS Runoff		Peak discharge	= 1.736 cfs
Storm frequency	= 1 yrs		Time to peak	= 722 min
Time interval	= 2 min		Hyd. volume	= 4,871 cuft
Drainage area	= 1.210 ac		Curve number	= 91*
Basin Slope	= 0.0 %		Hydraulic length	= 0 ft
Tc method	= User		Time of conc. (Tc)	= 15.00 min
Total precip.	= 1.97 in		Distribution	= Type II
Storm duration	= 24 hrs		Shape factor	= 484

* Composite (Area/CN) = [(0.590 x 98) + (0.620 x 84)] / 1.210

Villa 8 & 9 Road Post

Hyd. No. 20 -- 1 Year
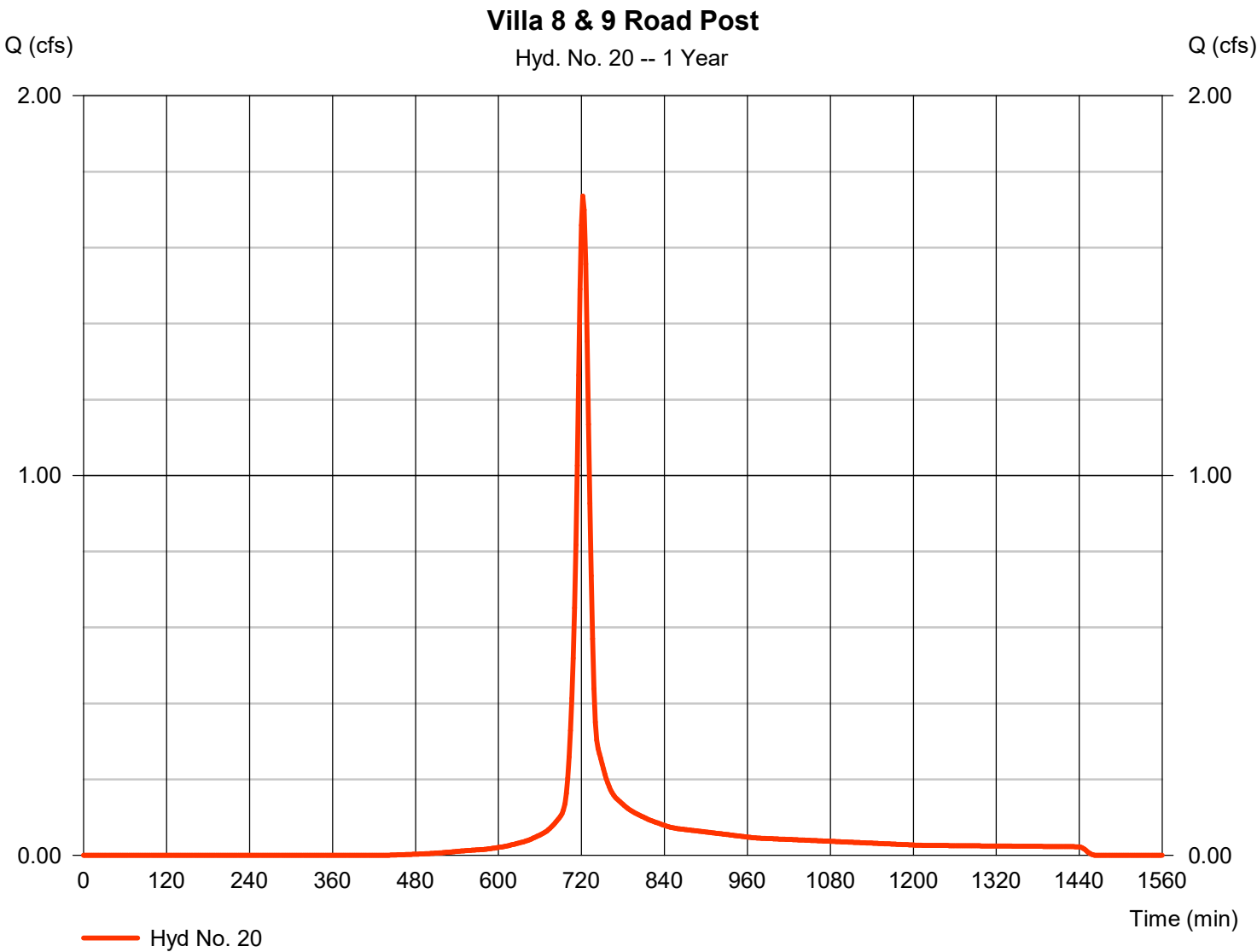
Hydrograph Report

Hyd. No. 22

Lake Forest PRE

Hydrograph type	= Combine	Peak discharge	= 1.746 cfs
Storm frequency	= 1 yrs	Time to peak	= 722 min
Time interval	= 2 min	Hyd. volume	= 5,039 cuft
Inflow hyds.	= 1, 4, 16	Contrib. drain. area	= 1.970 ac

Lake Forest PRE

Hyd. No. 22 -- 1 Year

Q (cfs)

Time (min)

Hyd No. 22   Hyd No. 1   Hyd No. 4   Hyd No. 16
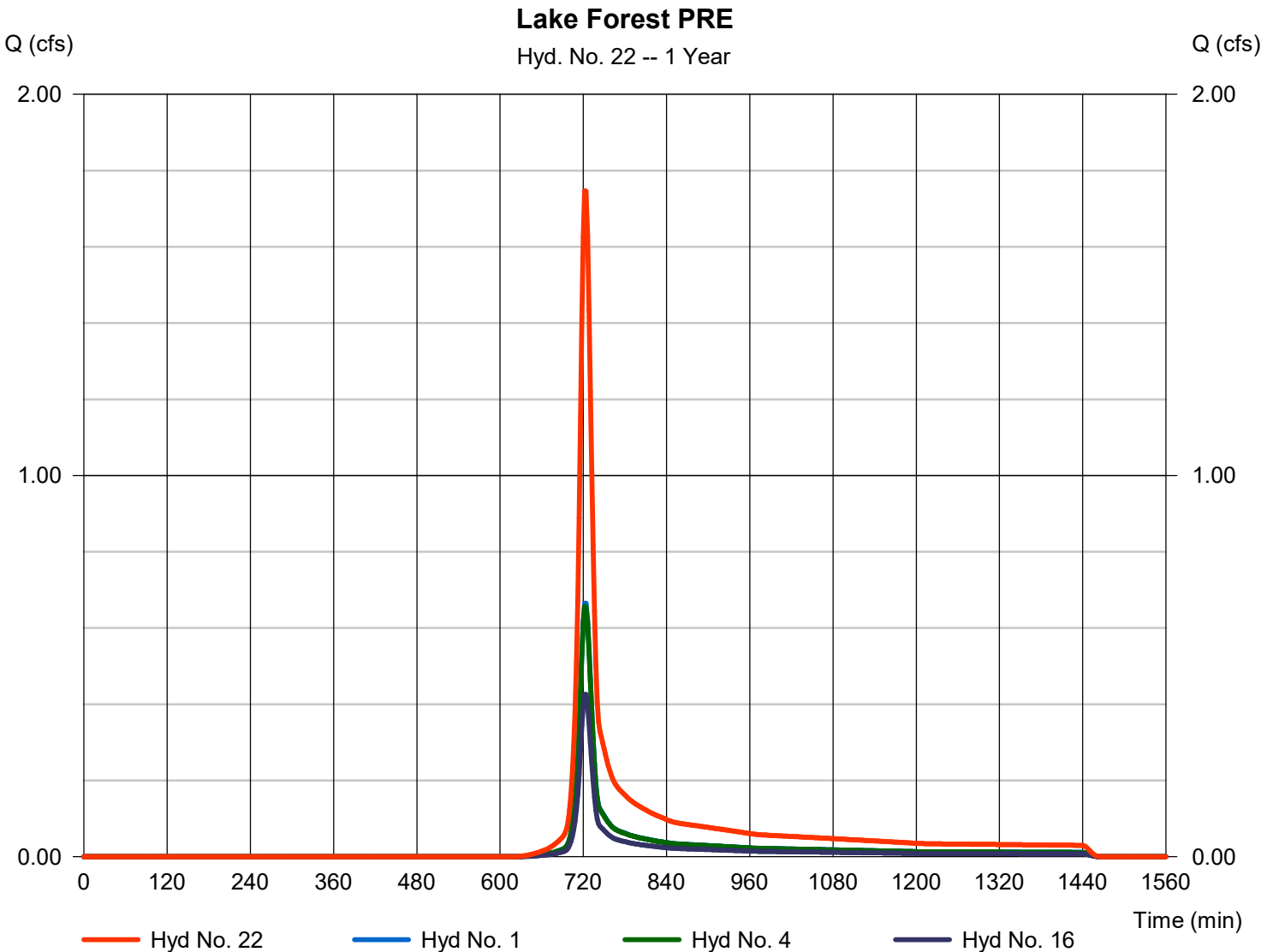
Hydrograph Report

Hyd. No. 23

Lake Forest POST

Hydrograph type	= Combine		Peak discharge	= 2.341 cfs
Storm frequency	= 1 yrs		Time to peak	= 722 min
Time interval	= 2 min		Hyd. volume	= 6,586 cuft
Inflow hyds.	= 2, 5, 17		Contrib. drain. area	= 1.960 ac

Lake Forest POST

Hyd. No. 23 -- 1 Year
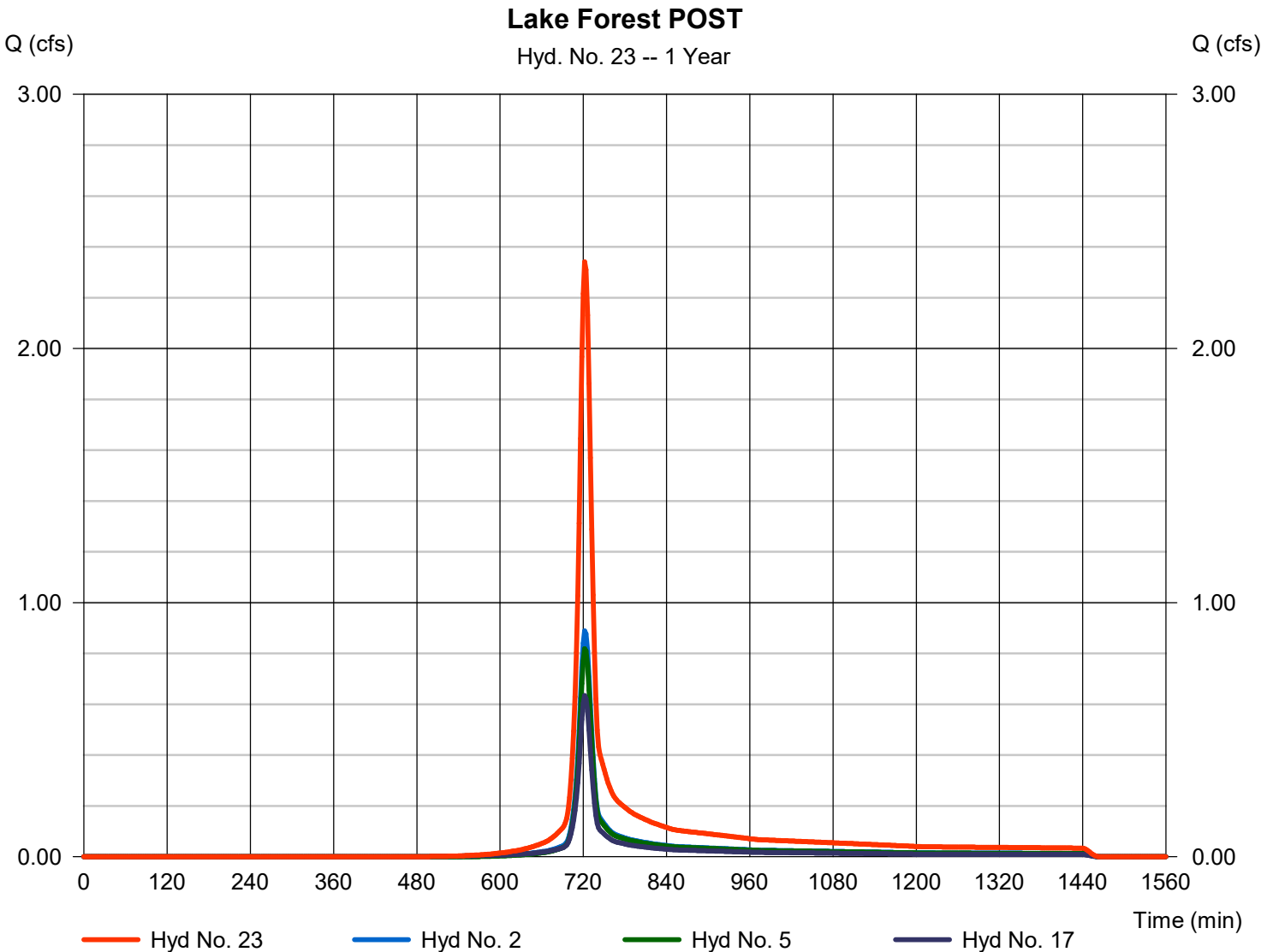
Hydrograph Report

Hyd. No. 25

Southwest PRE

Hydrograph type	= Combine	Peak discharge	= 1.991 cfs
Storm frequency	= 1 yrs	Time to peak	= 722 min
Time interval	= 2 min	Hyd. volume	= 5,716 cuft
Inflow hyds.	= 7, 10, 19	Contrib. drain. area	= 2.150 ac
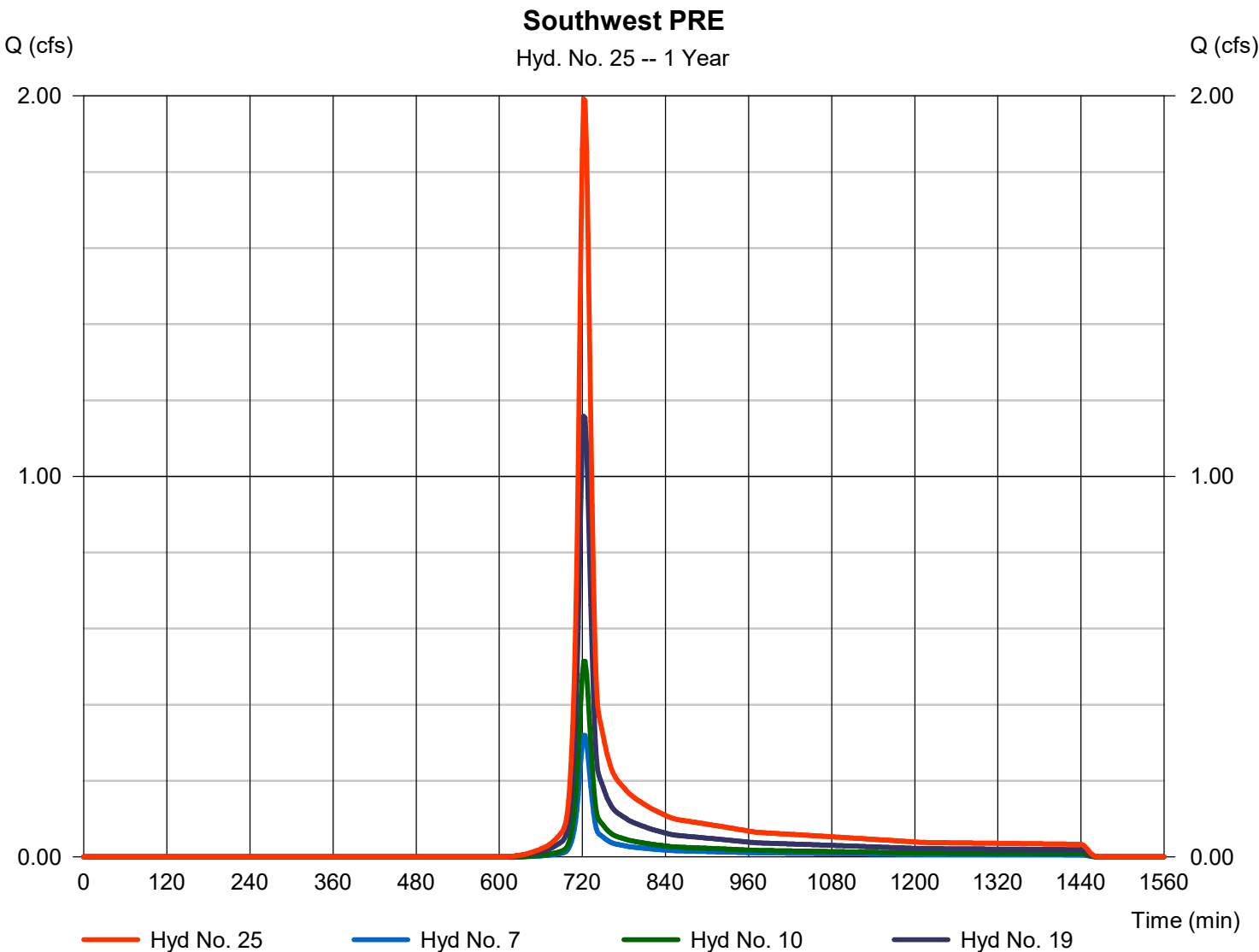
Southwest PRE

Hyd. No. 25 -- 1 Year

Hydrograph Report

Hyd. No. 26

Southwest POST

Hydrograph type	= Combine		Peak discharge	= 2.319 cfs
Storm frequency	= 1 yrs		Time to peak	= 722 min
Time interval	= 2 min		Hyd. volume	= 7,663 cuft
Inflow hyds.	= 8, 13, 20		Contrib. drain. area	= 1.570 ac

Southwest POST

Hyd. No. 26 -- 1 Year

— Hyd No. 26   — Hyd No. 8   — Hyd No. 13   — Hyd No. 20
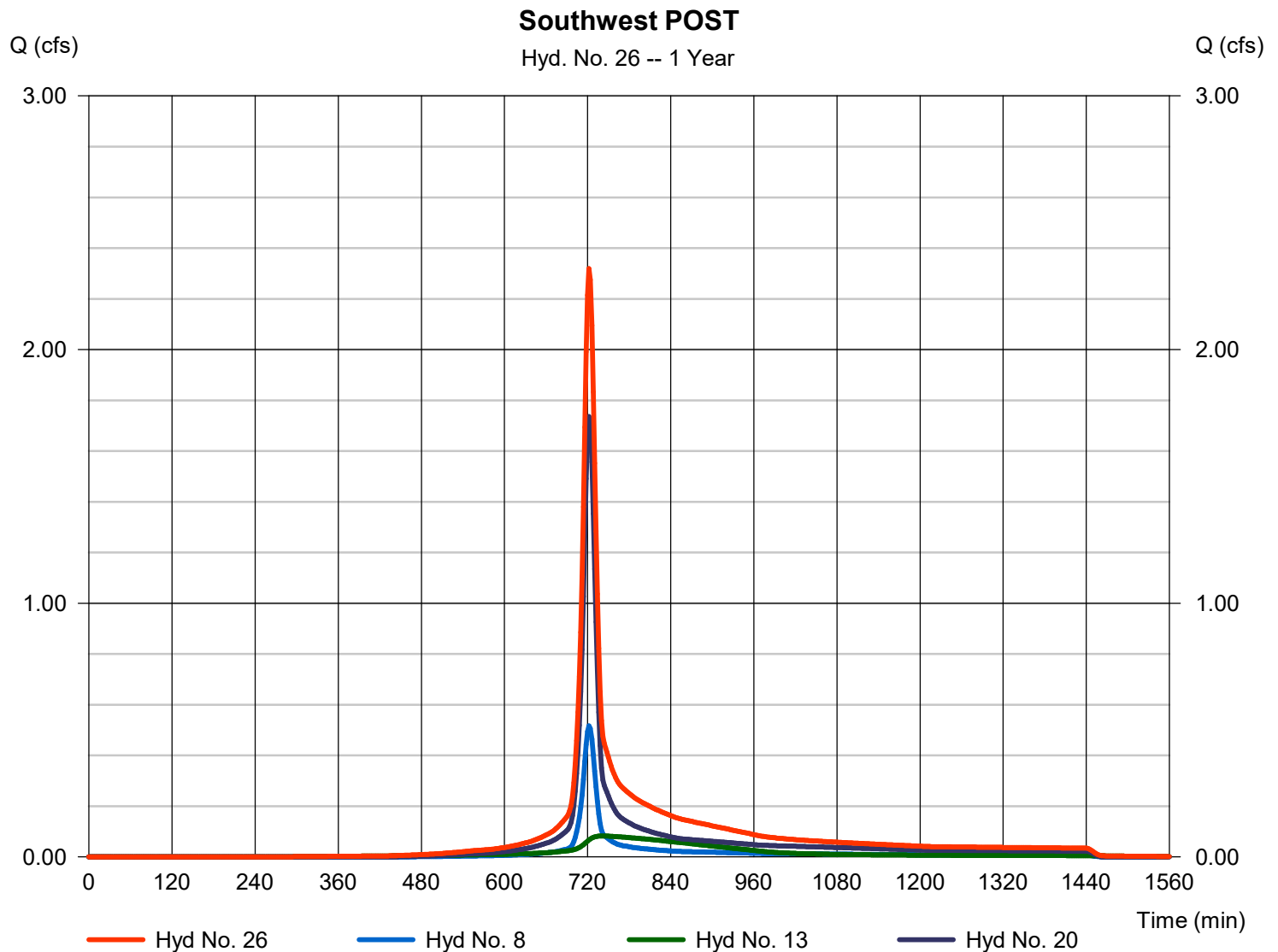
Hydrograph Report

Hyd. No. 28

TOTAL

Hydrograph type	= Combine	Peak discharge	= 3.738 cfs
Storm frequency	= 1 yrs	Time to peak	= 722 min
Time interval	= 2 min	Hyd. volume	= 10,755 cuft
Inflow hyds.	= 22, 25	Contrib. drain. area	= 0.000 ac

TOTAL

Hyd. No. 28 -- 1 Year

Legend: Hyd No. 28 — Hyd No. 22 — Hyd No. 25

Hydrograph Report

Monday, 06 / 10 / 2024
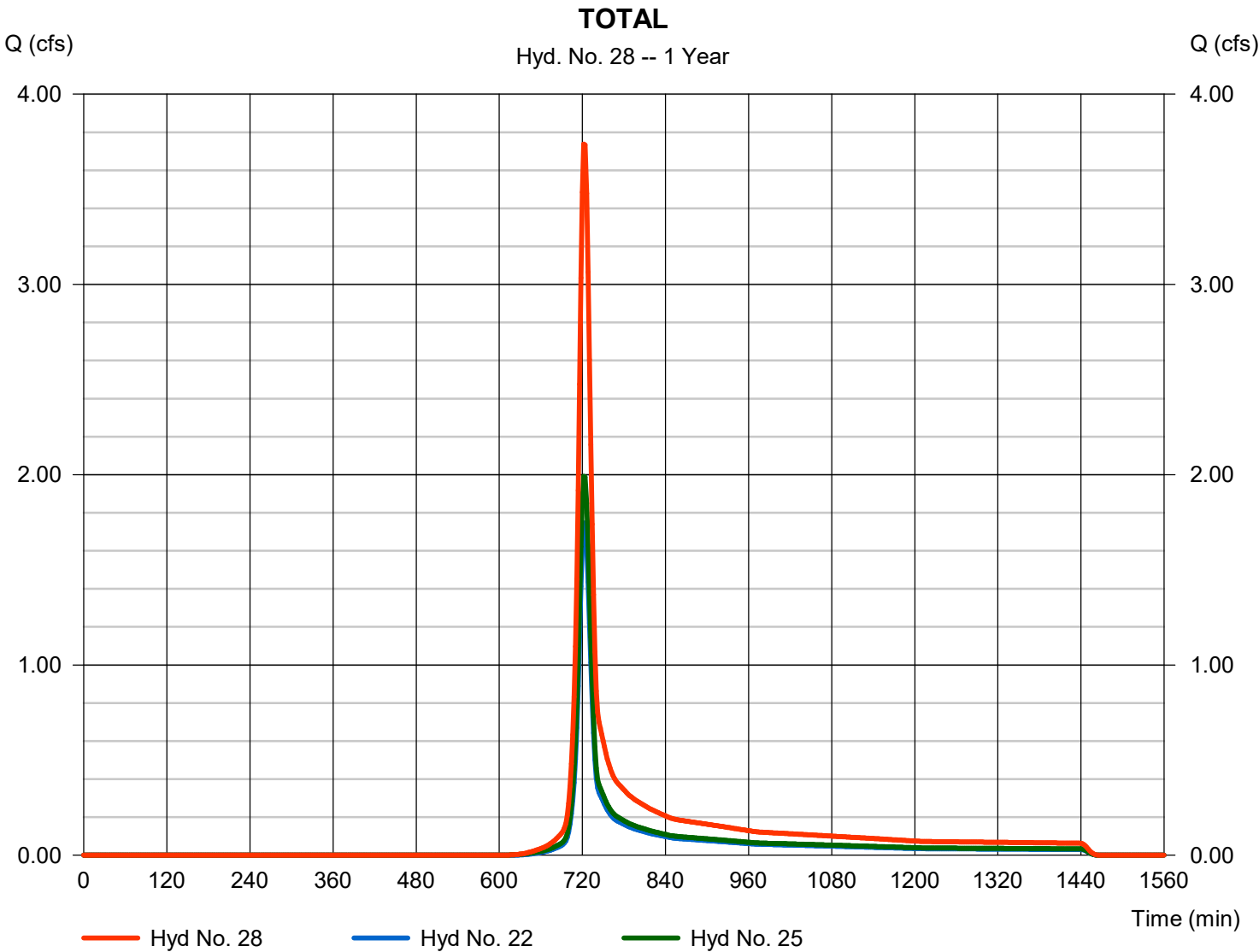
Hyd. No. 29

Total Post

Hydrograph type	= Combine	Peak discharge	= 4.661 cfs
Storm frequency	= 1 yrs	Time to peak	= 722 min
Time interval	= 2 min	Hyd. volume	= 14,249 cuft
Inflow hyds.	= 23, 26	Contrib. drain. area	= 0.000 ac
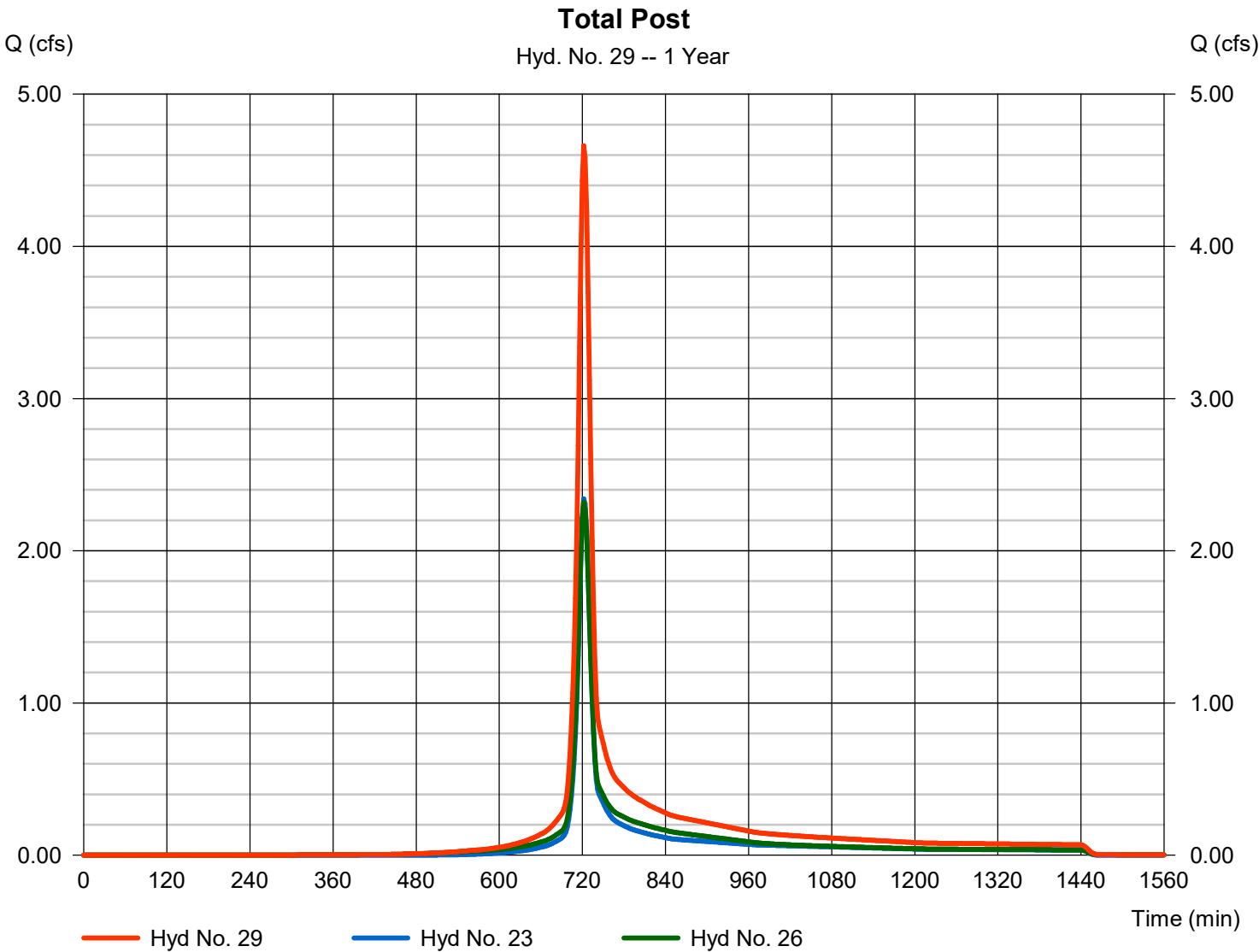
Total Post

Hyd. No. 29 -- 1 Year

Q (cfs)

Time (min)

Hyd No. 29   Hyd No. 23   Hyd No. 26

Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 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	0.945	2	722	2,677	------	------	------	Villa 1 PRE
2	SCS Runoff	1.196	2	722	3,351	------	------	------	Villa 1 POST
4	SCS Runoff	0.932	2	722	2,641	------	------	------	Villa 2 PRE
5	SCS Runoff	1.116	2	722	3,129	------	------	------	Villa 2 Post
7	SCS Runoff	0.453	2	722	1,285	------	------	------	Villa 3 PRE
8	SCS Runoff	0.671	2	722	1,890	------	------	------	Villa 3 Post
10	SCS Runoff	0.731	2	722	2,070	------	------	------	Villa 4 PRE
11	SCS Runoff	0.453	2	722	1,285	------	------	------	Villa 4 Post Runoff
12	SCS Runoff	0.536	2	722	1,660	------	------	------	Villa 4 Post Detention
13	Reservoir	0.091	2	740	1,644	12	1013.08	694	Villa 4
14	Combine	0.989	2	722	2,945	11, 12,	------	------	Total Villa 4 Post
16	SCS Runoff	0.605	2	722	1,713	------	------	------	Villa 5 PRE
17	SCS Runoff	0.833	2	722	2,340	------	------	------	Villa 5 Post
19	SCS Runoff	1.622	2	722	4,574	------	------	------	Villa 8 & 9 & road PRE
20	SCS Runoff	2.254	2	722	6,353	------	------	------	Villa 8 & 9 Road Post
22	Combine	2.481	2	722	7,031	1, 4, 16,	------	------	Lake Forest PRE
23	Combine	3.144	2	722	8,821	2, 5, 17,	------	------	Lake Forest POST
25	Combine	2.806	2	722	7,929	7, 10, 19,	------	------	Southwest PRE
26	Combine	2.999	2	722	9,888	8, 13, 20,	------	------	Southwest POST
28	Combine	5.287	2	722	14,960	22, 25,	------	------	TOTAL
29	Combine	6.143	2	722	18,708	23, 26,	------	------	Total Post

| 2023-186-Ponds.gpw | Return Period: 2 Year | Monday, 06 / 10 / 2024 |

Hydrograph Report

Hyd. No. 1

Villa 1 PRE

Hydrograph type	= SCS Runoff		Peak discharge	= 0.945 cfs
Storm frequency	= 2 yrs		Time to peak	= 722 min
Time interval	= 2 min		Hyd. volume	= 2,677 cuft
Drainage area	= 0.750 ac		Curve number	= 84
Basin Slope	= 0.0 %		Hydraulic length	= 0 ft
Tc method	= User		Time of conc. (Tc)	= 15.00 min
Total precip.	= 2.36 in		Distribution	= Type II
Storm duration	= 24 hrs		Shape factor	= 484

Villa 1 PRE
Hyd. No. 1 -- 2 Year
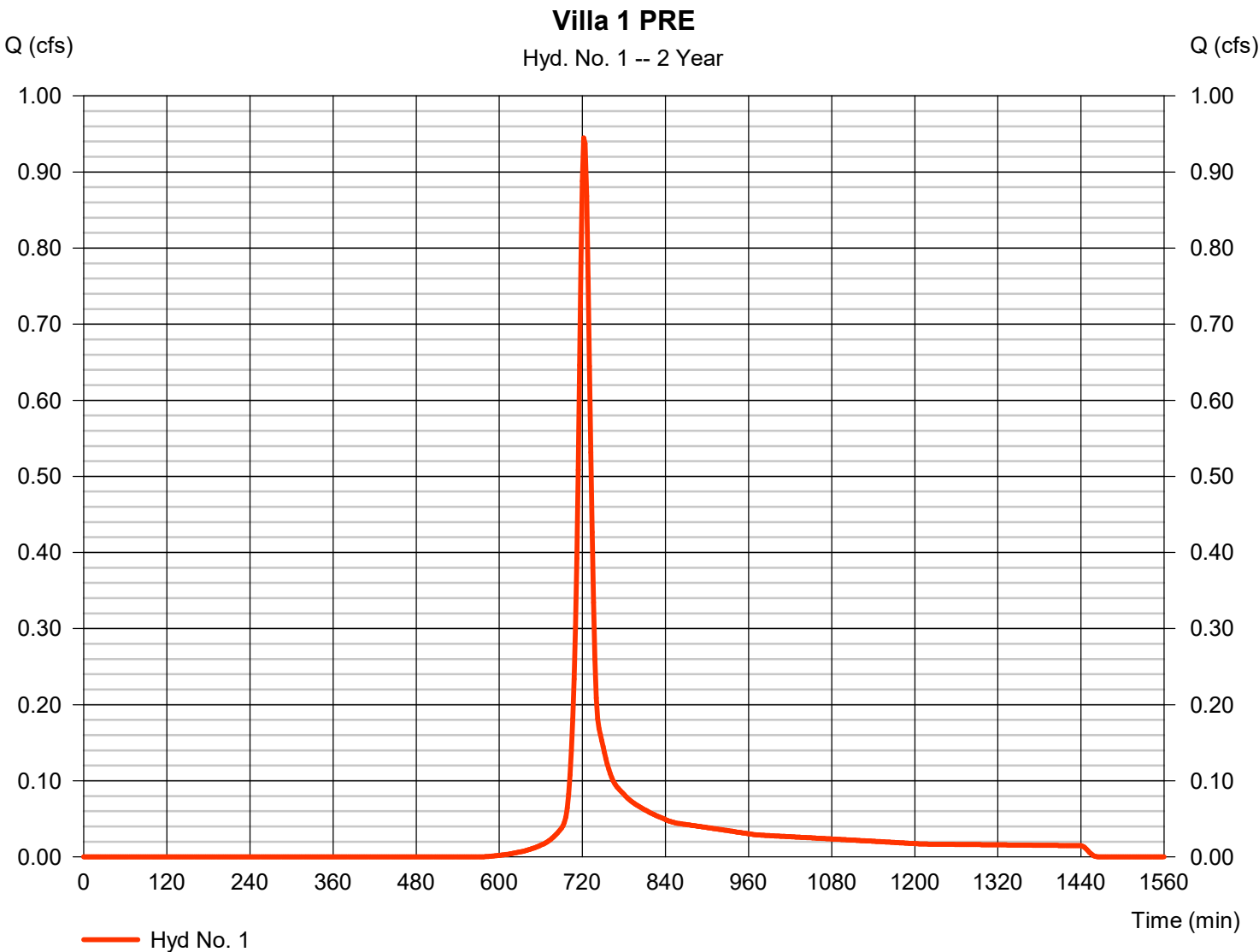
Hyd No. 1

Hydrograph Report

Hyd. No. 2

Villa 1 POST

Hydrograph type	= SCS Runoff		Peak discharge	= 1.196 cfs
Storm frequency	= 2 yrs		Time to peak	= 722 min
Time interval	= 2 min		Hyd. volume	= 3,351 cuft
Drainage area	= 0.750 ac		Curve number	= 88*
Basin Slope	= 0.0 %		Hydraulic length	= 0 ft
Tc method	= User		Time of conc. (Tc)	= 15.00 min
Total precip.	= 2.36 in		Distribution	= Type II
Storm duration	= 24 hrs		Shape factor	= 484

* Composite (Area/CN) = [(0.220 x 98) + (0.530 x 84)] / 0.750

Villa 1 POST

Hyd. No. 2 -- 2 Year

Hyd No. 2

Hydrograph Report

Monday, 06 / 10 / 2024
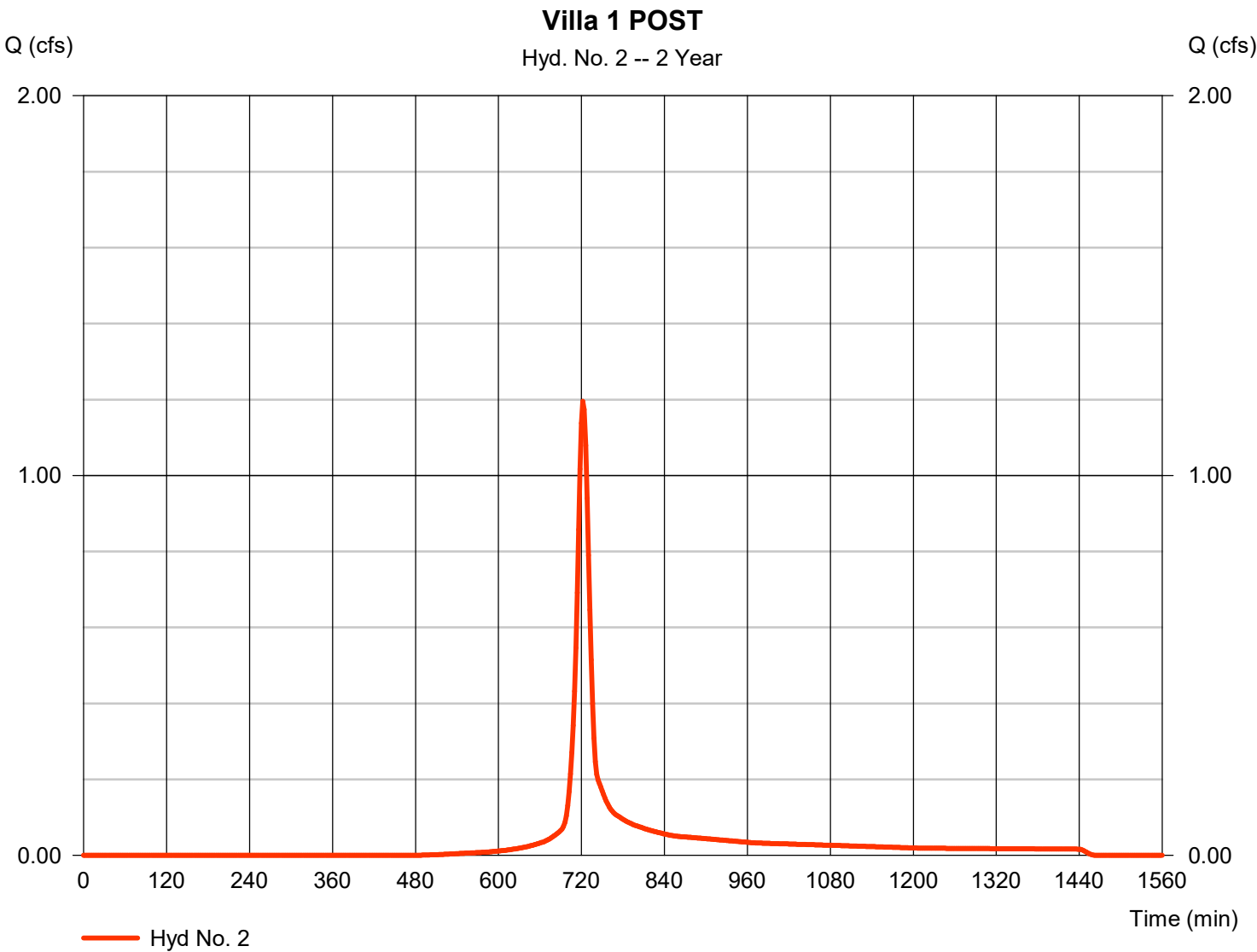
Hyd. No. 4

Villa 2 PRE

Hydrograph type	= SCS Runoff	Peak discharge	= 0.932 cfs
Storm frequency	= 2 yrs	Time to peak	= 722 min
Time interval	= 2 min	Hyd. volume	= 2,641 cuft
Drainage area	= 0.740 ac	Curve number	= 84
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 15.00 min
Total precip.	= 2.36 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

Villa 2 PRE

Hyd. No. 4 -- 2 Year
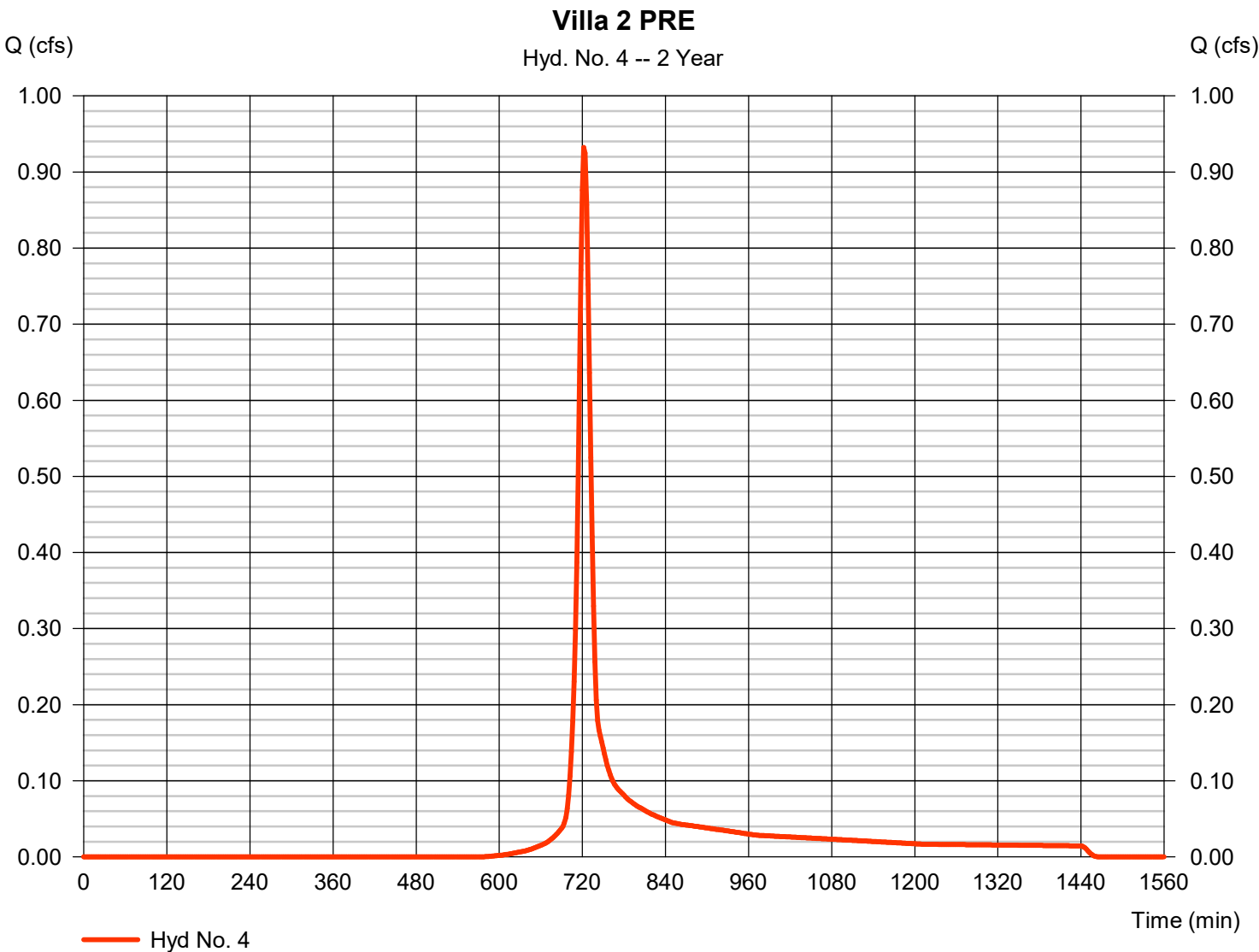
Hyd No. 4

Hydrograph Report

Hyd. No. 5

Villa 2 Post

Hydrograph type	= SCS Runoff		Peak discharge	= 1.116 cfs
Storm frequency	= 2 yrs		Time to peak	= 722 min
Time interval	= 2 min		Hyd. volume	= 3,129 cuft
Drainage area	= 0.740 ac		Curve number	= 87*
Basin Slope	= 0.0 %		Hydraulic length	= 0 ft
Tc method	= User		Time of conc. (Tc)	= 15.00 min
Total precip.	= 2.36 in		Distribution	= Type II
Storm duration	= 24 hrs		Shape factor	= 484

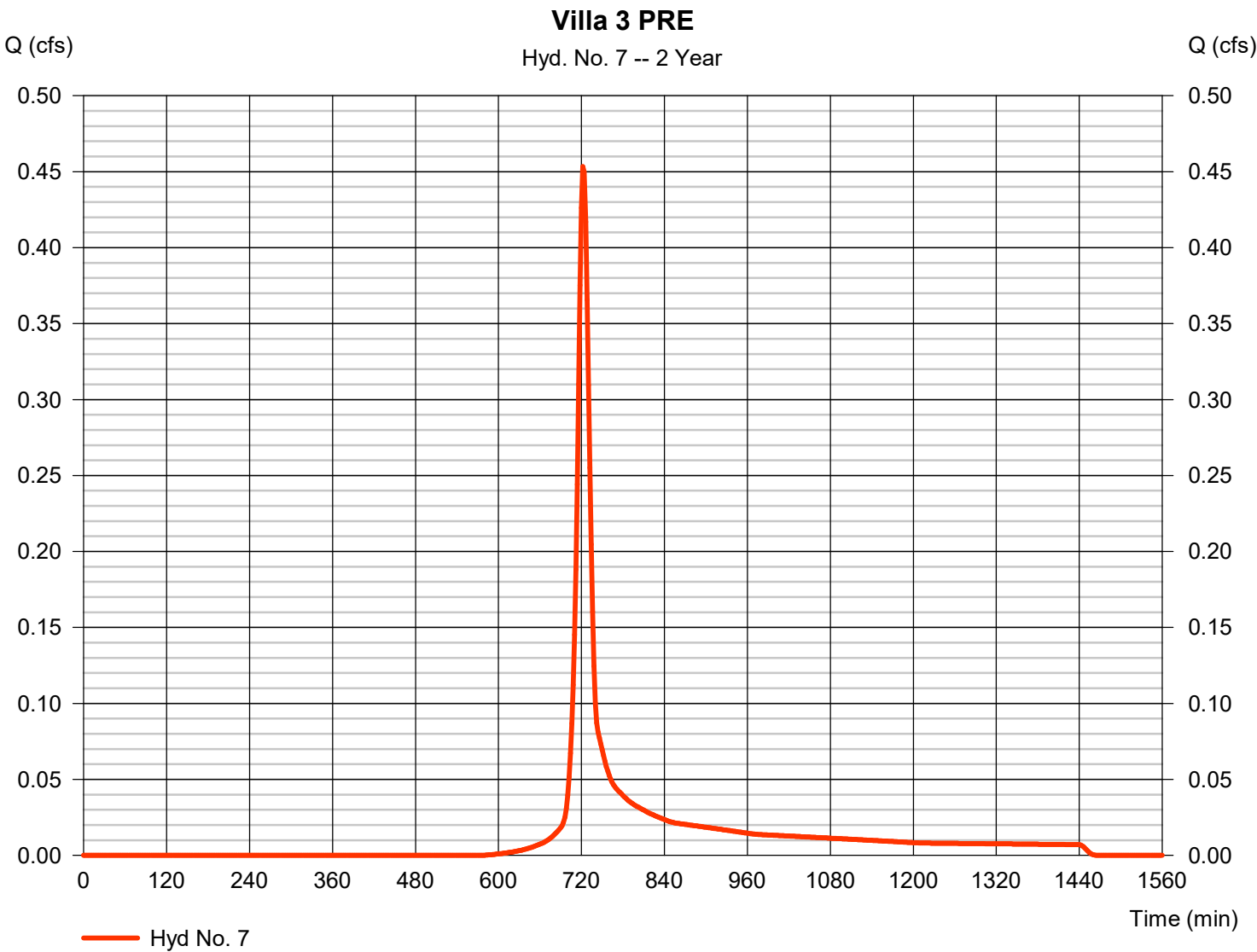* Composite (Area/CN) = [(0.180 x 98) + (0.560 x 84)] / 0.740

Villa 2 Post

Hyd. No. 5 -- 2 Year

Hydrograph Report

Hyd. No. 7

Villa 3 PRE

Hydrograph type	= SCS Runoff		Peak discharge	= 0.453 cfs
Storm frequency	= 2 yrs		Time to peak	= 722 min
Time interval	= 2 min		Hyd. volume	= 1,285 cuft
Drainage area	= 0.360 ac		Curve number	= 84
Basin Slope	= 0.0 %		Hydraulic length	= 0 ft
Tc method	= User		Time of conc. (Tc)	= 15.00 min
Total precip.	= 2.36 in		Distribution	= Type II
Storm duration	= 24 hrs		Shape factor	= 484

Villa 3 PRE

Hyd. No. 7 -- 2 Year

Q (cfs)

Hyd No. 7

Time (min)

Hydrograph Report

Monday, 06 / 10 / 2024

Hyd. No. 8

Villa 3 Post

Hydrograph type	= SCS Runoff		Peak discharge	= 0.671 cfs
Storm frequency	= 2 yrs		Time to peak	= 722 min
Time interval	= 2 min		Hyd. volume	= 1,890 cuft
Drainage area	= 0.360 ac		Curve number	= 91*
Basin Slope	= 0.0 %		Hydraulic length	= 0 ft
Tc method	= User		Time of conc. (Tc)	= 15.00 min
Total precip.	= 2.36 in		Distribution	= Type II
Storm duration	= 24 hrs		Shape factor	= 484

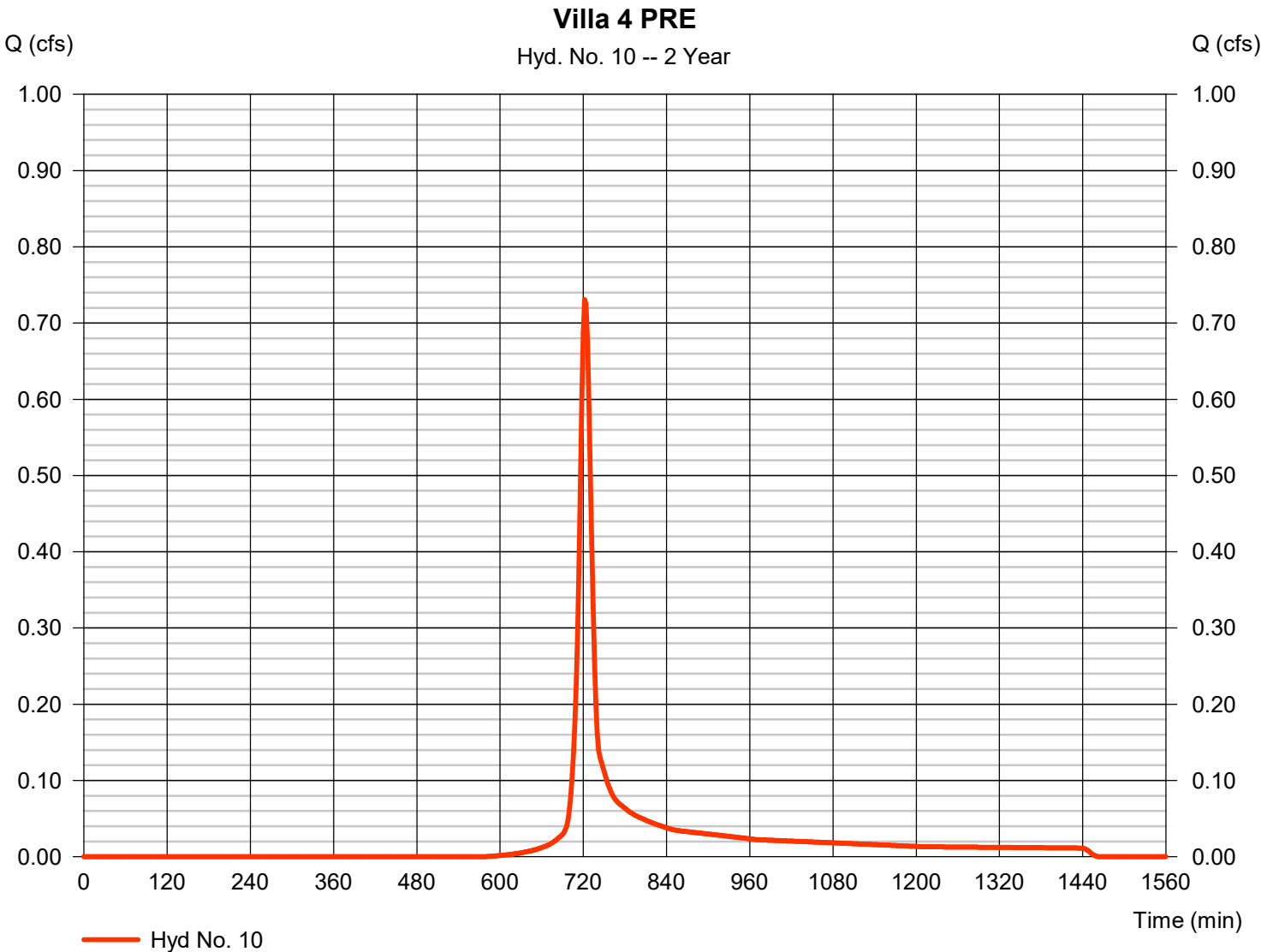* Composite (Area/CN) = [(0.180 x 98) + (0.180 x 84)] / 0.360

Villa 3 Post

Hyd. No. 8 -- 2 Year
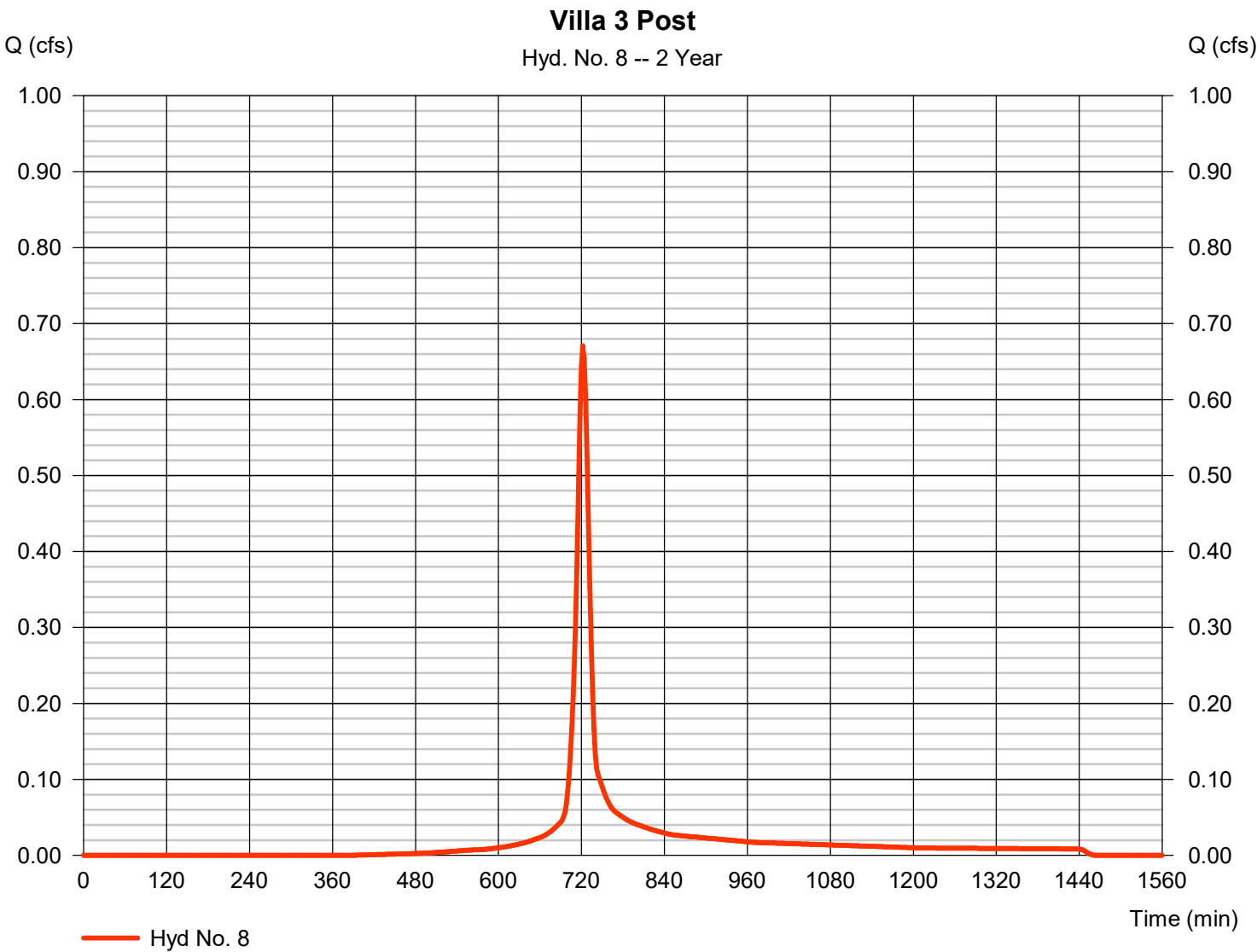
Hyd No. 8

Hydrograph Report

Hyd. No. 10

Villa 4 PRE

Hydrograph type	= SCS Runoff		Peak discharge	= 0.731 cfs
Storm frequency	= 2 yrs		Time to peak	= 722 min
Time interval	= 2 min		Hyd. volume	= 2,070 cuft
Drainage area	= 0.580 ac		Curve number	= 84
Basin Slope	= 0.0 %		Hydraulic length	= 0 ft
Tc method	= User		Time of conc. (Tc)	= 15.00 min
Total precip.	= 2.36 in		Distribution	= Type II
Storm duration	= 24 hrs		Shape factor	= 484

Villa 4 PRE

Hyd. No. 10 -- 2 Year

Q (cfs)

Time (min)

Hyd No. 10

Hydrograph Report

Monday, 06 / 10 / 2024

Hyd. No. 11

Villa 4 Post Runoff

Hydrograph type	= SCS Runoff		Peak discharge	= 0.453 cfs
Storm frequency	= 2 yrs		Time to peak	= 722 min
Time interval	= 2 min		Hyd. volume	= 1,285 cuft
Drainage area	= 0.360 ac		Curve number	= 84*
Basin Slope	= 0.0 %		Hydraulic length	= 0 ft
Tc method	= User		Time of conc. (Tc)	= 15.00 min
Total precip.	= 2.36 in		Distribution	= Type II
Storm duration	= 24 hrs		Shape factor	= 484

* Composite (Area/CN) = + (0.360 x 84)] / 0.360

Villa 4 Post Runoff

Hyd. No. 11 -- 2 Year

Hydrograph Report

Monday, 06 / 10 / 2024

Hyd. No. 12

Villa 4 Post Detention

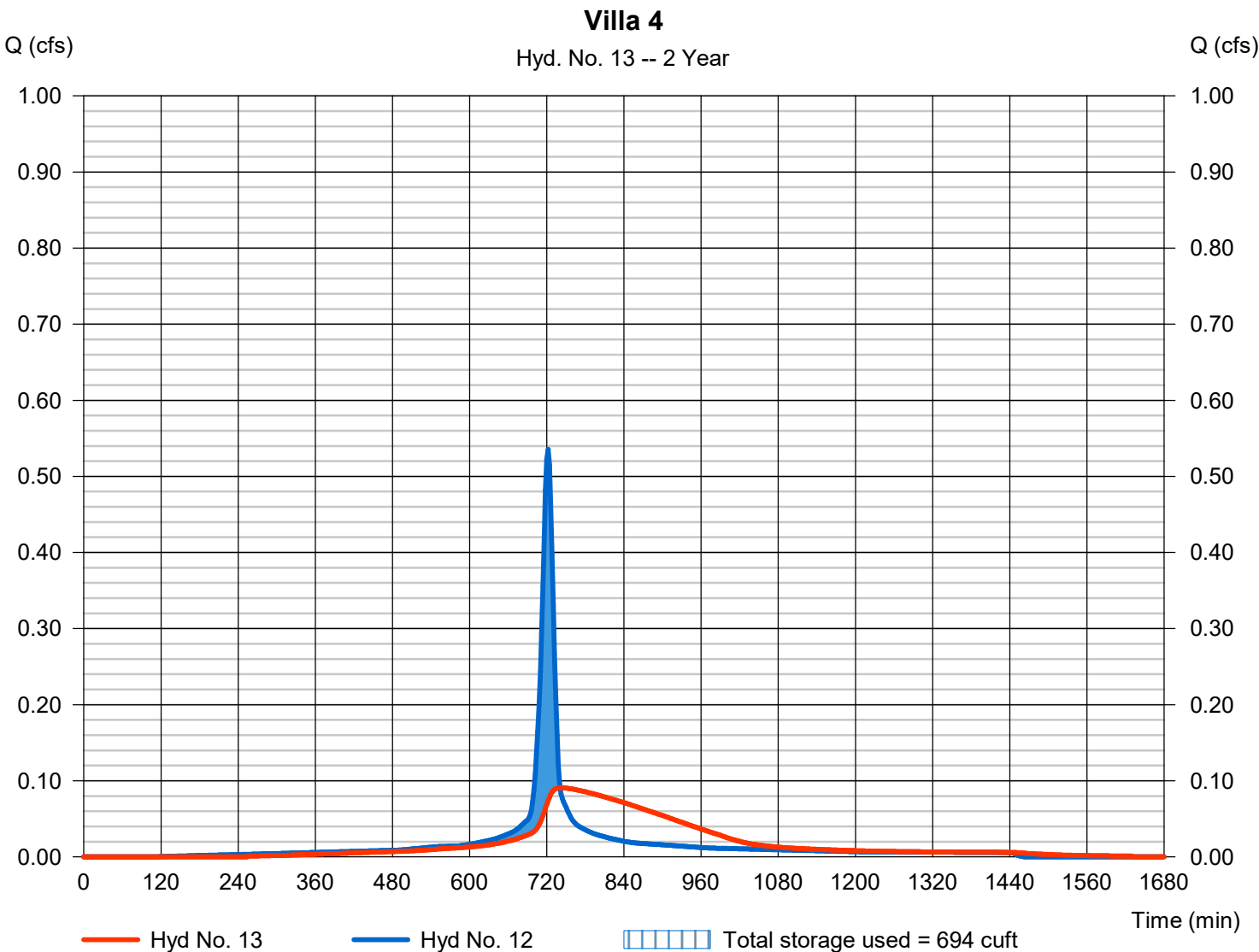|				
Hydrograph type	= SCS Runoff	Peak discharge	= 0.536 cfs
Storm frequency	= 2 yrs	Time to peak	= 722 min
Time interval	= 2 min	Hyd. volume	= 1,660 cuft
Drainage area	= 0.220 ac	Curve number	= 98*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 15.00 min
Total precip.	= 2.36 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.220 x 98)] / 0.220

Villa 4 Post Detention
Hyd. No. 12 -- 2 Year

Legend: Hyd No. 12
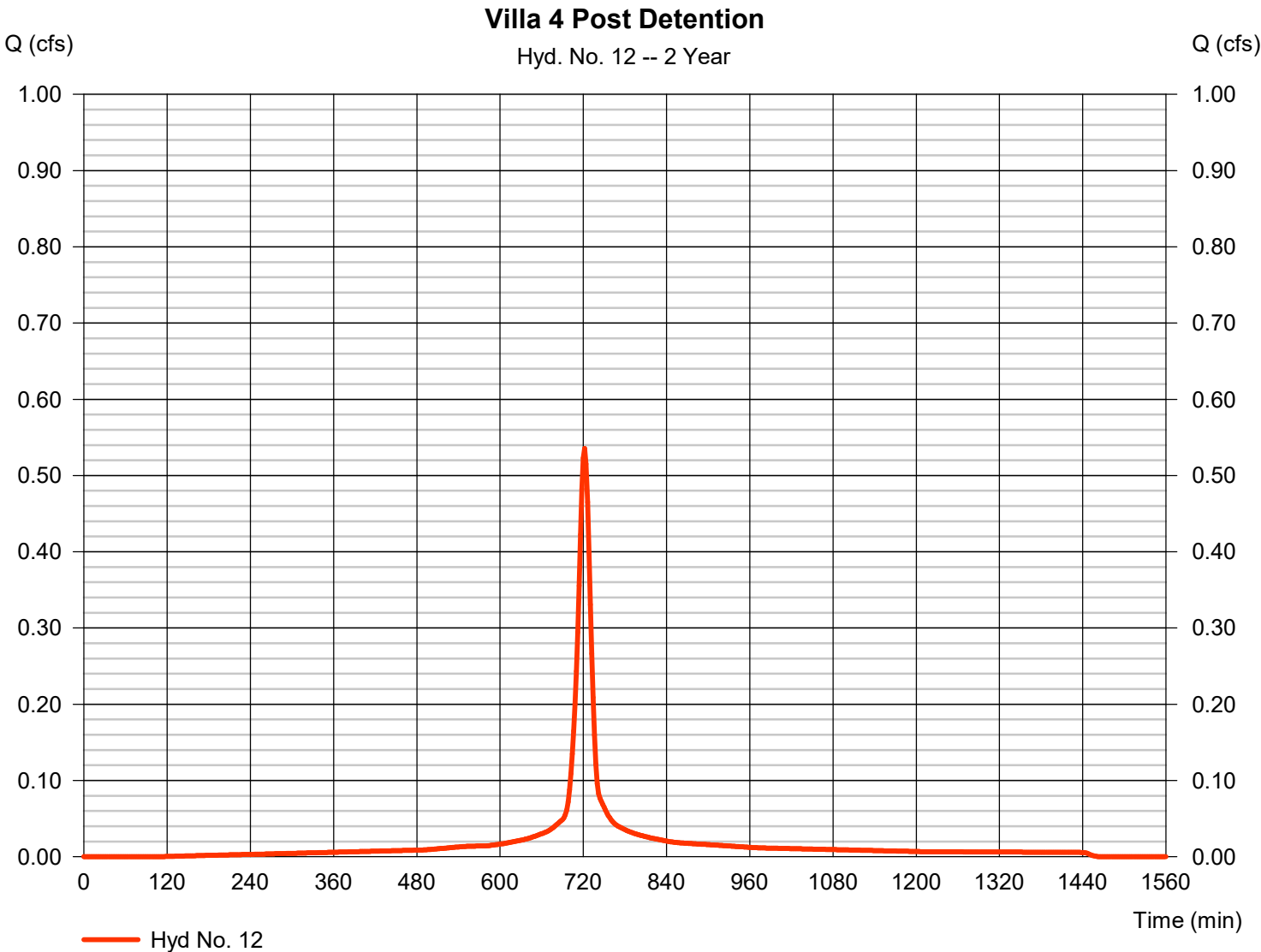
Hydrograph Report

Hyd. No. 13

Villa 4

|				
Hydrograph type	= Reservoir	Peak discharge	= 0.091 cfs
Storm frequency	= 2 yrs	Time to peak	= 740 min
Time interval	= 2 min	Hyd. volume	= 1,644 cuft
Inflow hyd. No.	= 12 - Villa 4 Post Detention	Max. Elevation	= 1013.08 ft
Reservoir name	= Villa 4	Max. Storage	= 694 cuft

Storage Indication method used.

Villa 4

Hyd. No. 13 -- 2 Year

Hyd No. 13   Hyd No. 12   Total storage used = 694 cuft

Hydrograph Report

Monday, 06 / 10 / 2024

Hyd. No. 14

Total Villa 4 Post

Hydrograph type	= Combine		Peak discharge	= 0.989 cfs
Storm frequency	= 2 yrs		Time to peak	= 722 min
Time interval	= 2 min		Hyd. volume	= 2,945 cuft
Inflow hyds.	= 11, 12		Contrib. drain. area	= 0.580 ac

Total Villa 4 Post

Hyd. No. 14 -- 2 Year

Q (cfs) — Time (min)

Hyd No. 14   Hyd No. 11   Hyd No. 12
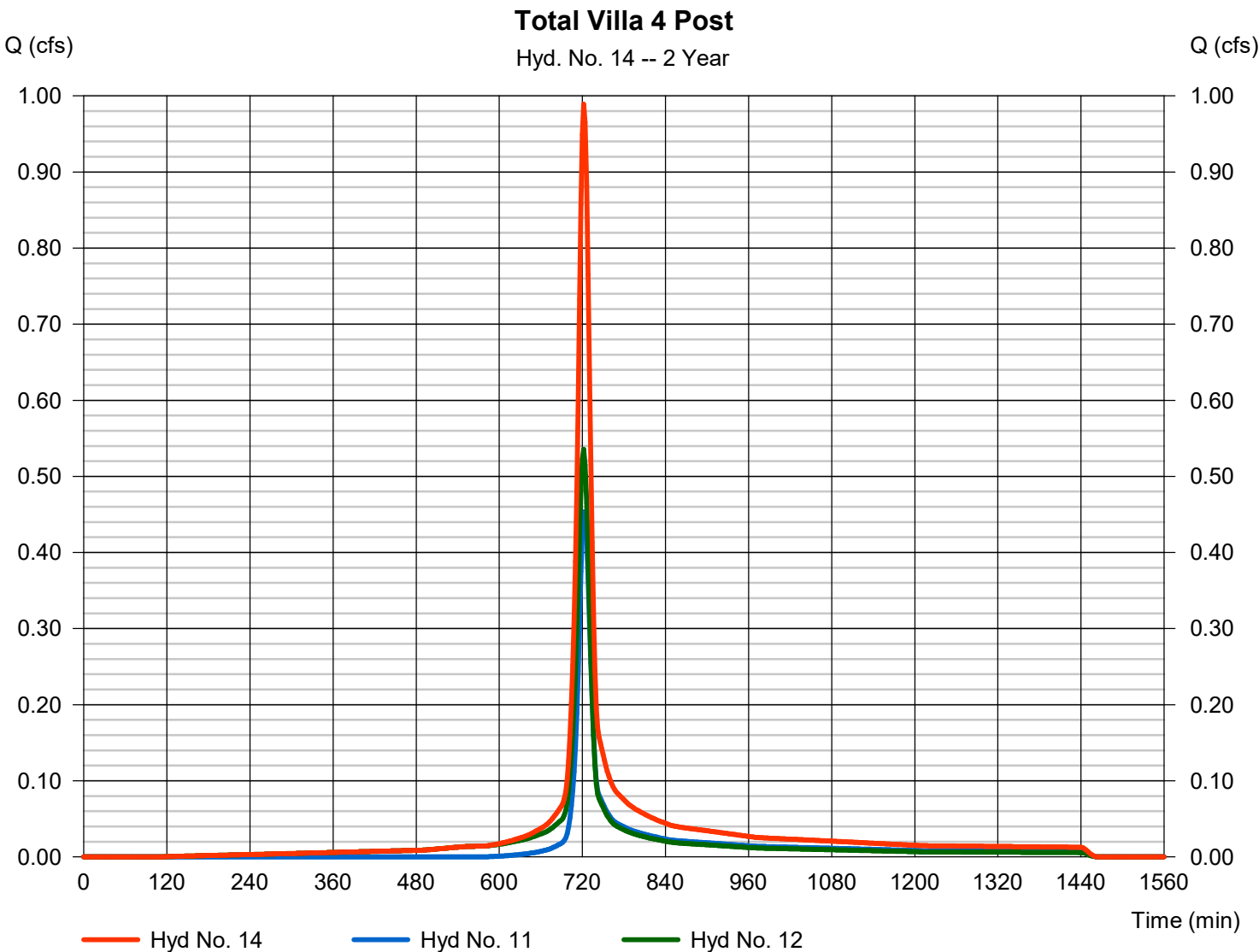
Hydrograph Report

Hyd. No. 16

Villa 5 PRE

Hydrograph type	= SCS Runoff	Peak discharge	= 0.605 cfs
Storm frequency	= 2 yrs	Time to peak	= 722 min
Time interval	= 2 min	Hyd. volume	= 1,713 cuft
Drainage area	= 0.480 ac	Curve number	= 84
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 15.00 min
Total precip.	= 2.36 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

Villa 5 PRE

Hyd. No. 16 -- 2 Year
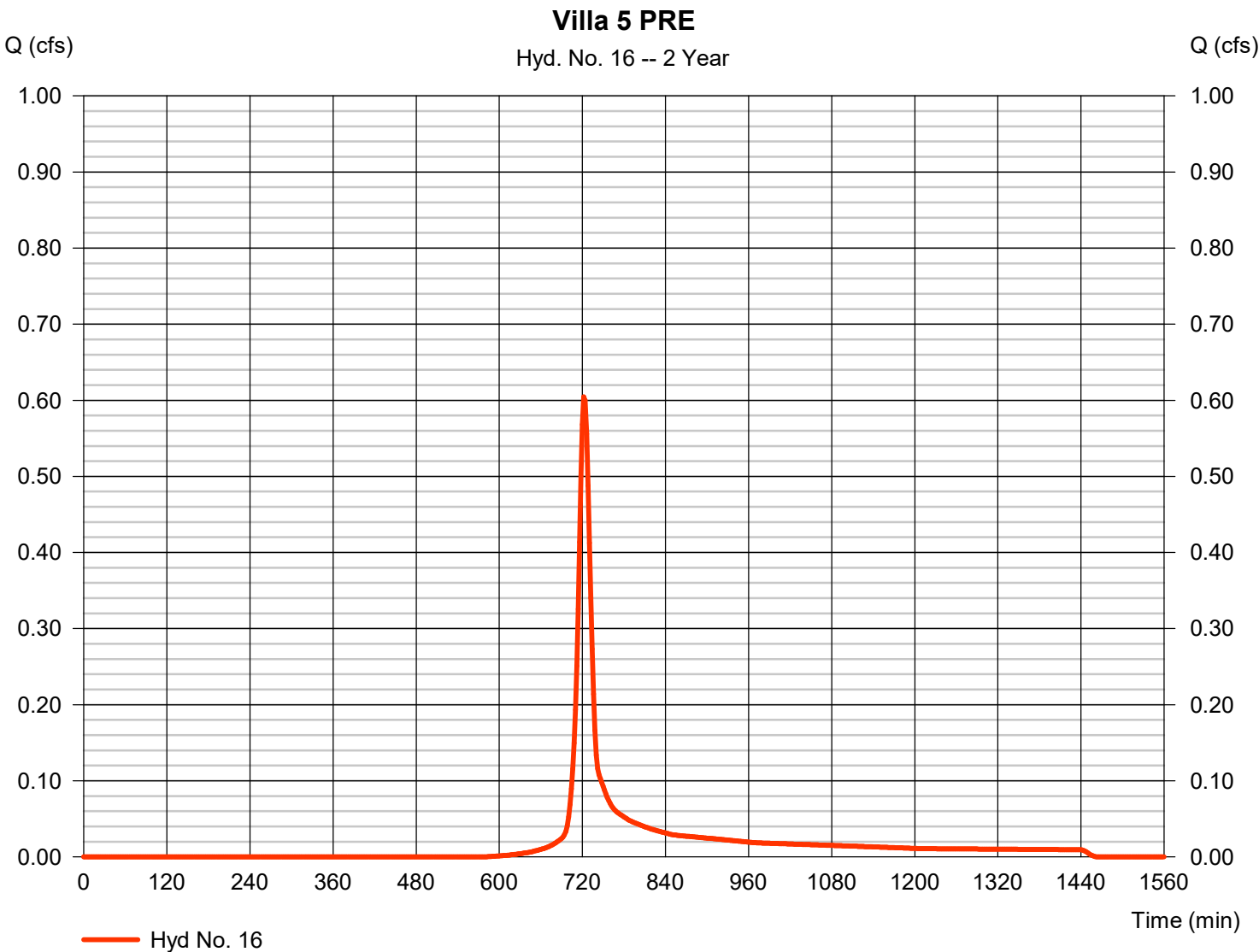
Hydrograph Report

Hyd. No. 17

Villa 5 Post

Hydrograph type	= SCS Runoff		Peak discharge	=	0.833 cfs
Storm frequency	= 2 yrs		Time to peak	=	722 min
Time interval	= 2 min		Hyd. volume	=	2,340 cuft
Drainage area	= 0.470 ac		Curve number	=	90*
Basin Slope	= 0.0 %		Hydraulic length	=	0 ft
Tc method	= User		Time of conc. (Tc)	=	15.00 min
Total precip.	= 2.36 in		Distribution	=	Type II
Storm duration	= 24 hrs		Shape factor	=	484

* Composite (Area/CN) = [(0.200 x 98) + (0.270 x 84)] / 0.470

Villa 5 Post

Hyd. No. 17 -- 2 Year

Q (cfs)

Time (min)

Hyd No. 17

Hydrograph Report

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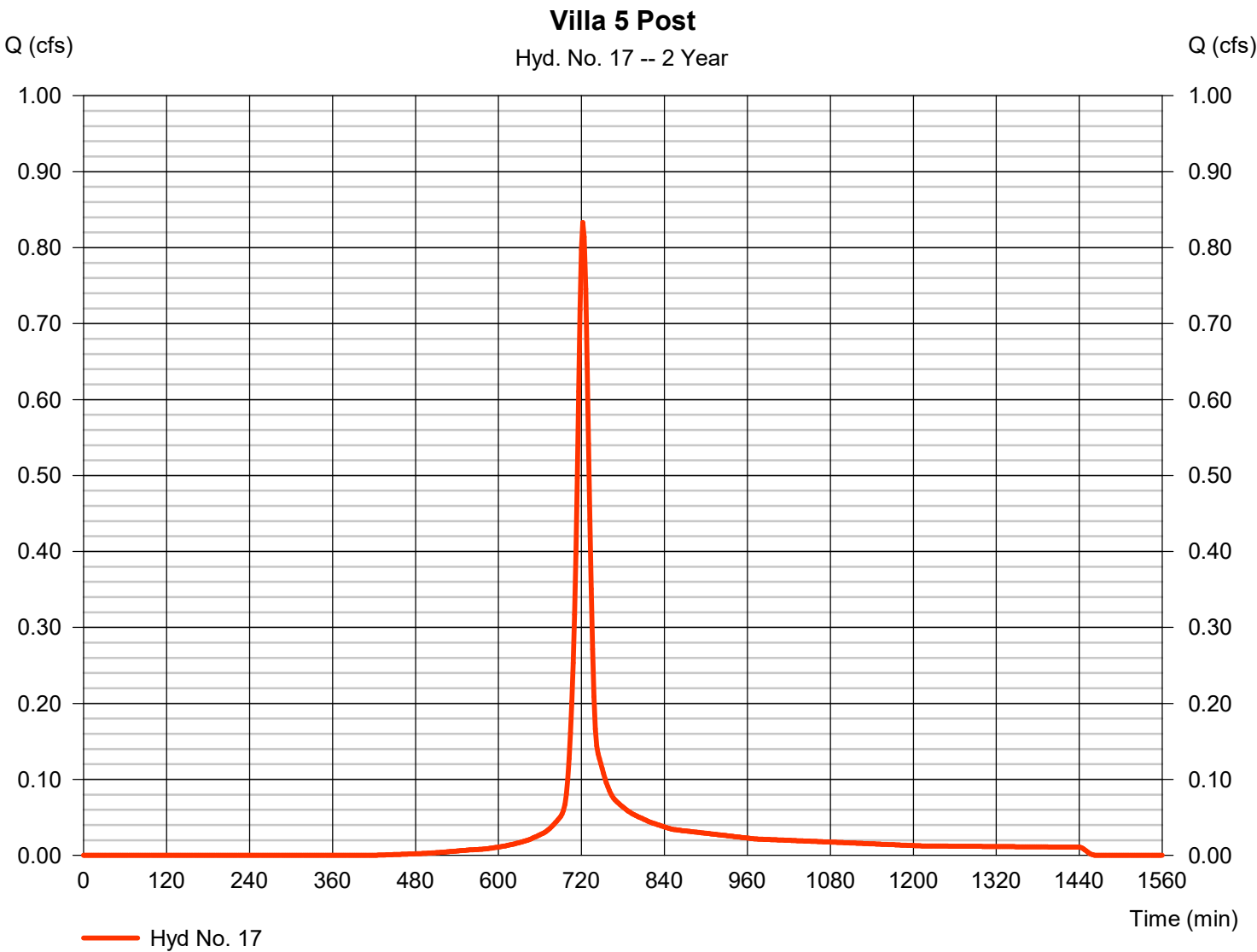
Hyd. No. 19

Villa 8 & 9 & road PRE

Hydrograph type	= SCS Runoff	Peak discharge	= 1.622 cfs
Storm frequency	= 2 yrs	Time to peak	= 722 min
Time interval	= 2 min	Hyd. volume	= 4,574 cuft
Drainage area	= 1.210 ac	Curve number	= 85*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 15.00 min
Total precip.	= 2.36 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.360 x 98) + (0.850 x 84)] / 1.210

Villa 8 & 9 & road PRE
Hyd. No. 19 -- 2 Year

Hyd No. 19
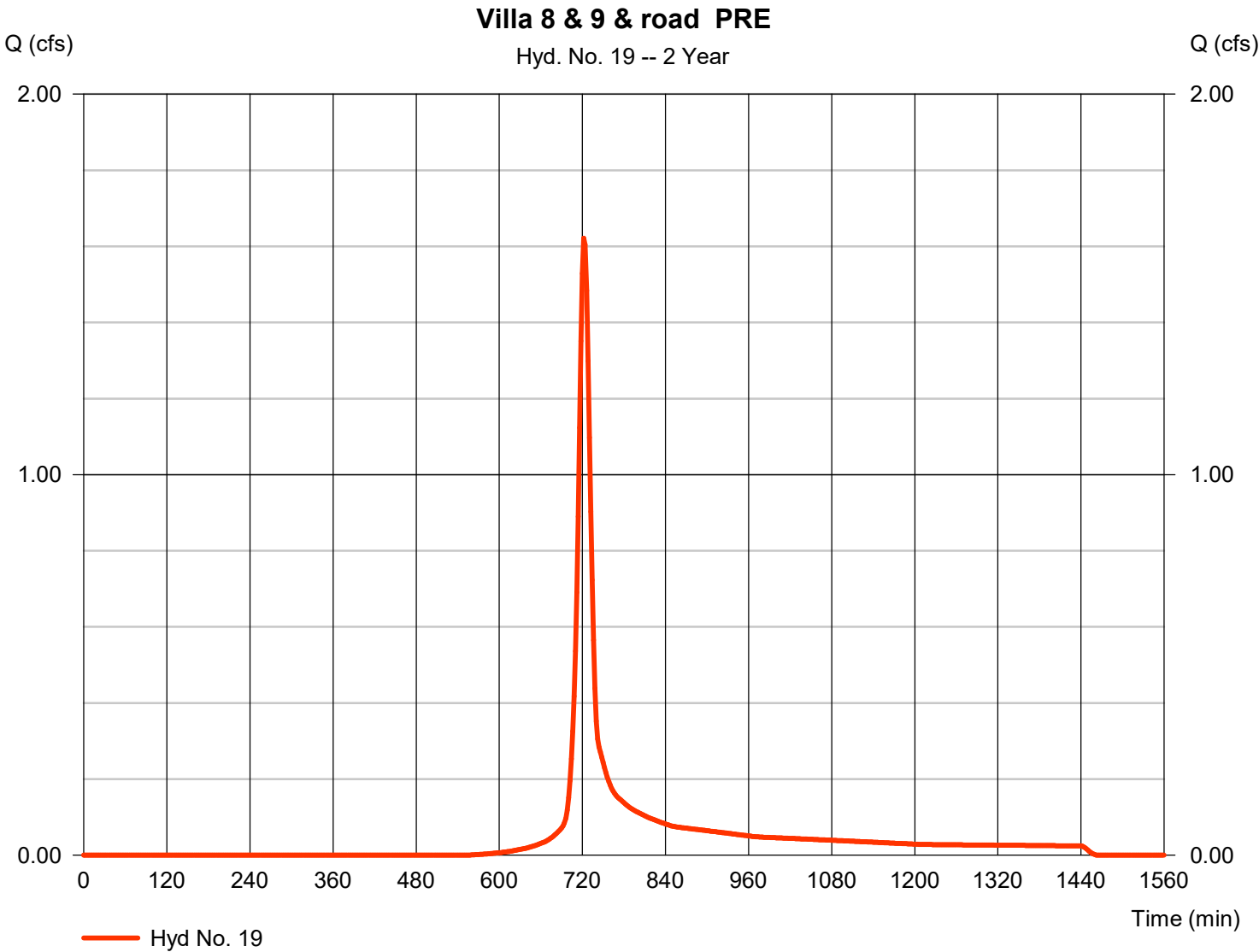
Hydrograph Report

Hyd. No. 20

Villa 8 & 9 Road Post

Hydrograph type	=	SCS Runoff	Peak discharge	=	2.254 cfs
Storm frequency	=	2 yrs	Time to peak	=	722 min
Time interval	=	2 min	Hyd. volume	=	6,353 cuft
Drainage area	=	1.210 ac	Curve number	=	91*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	15.00 min
Total precip.	=	2.36 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

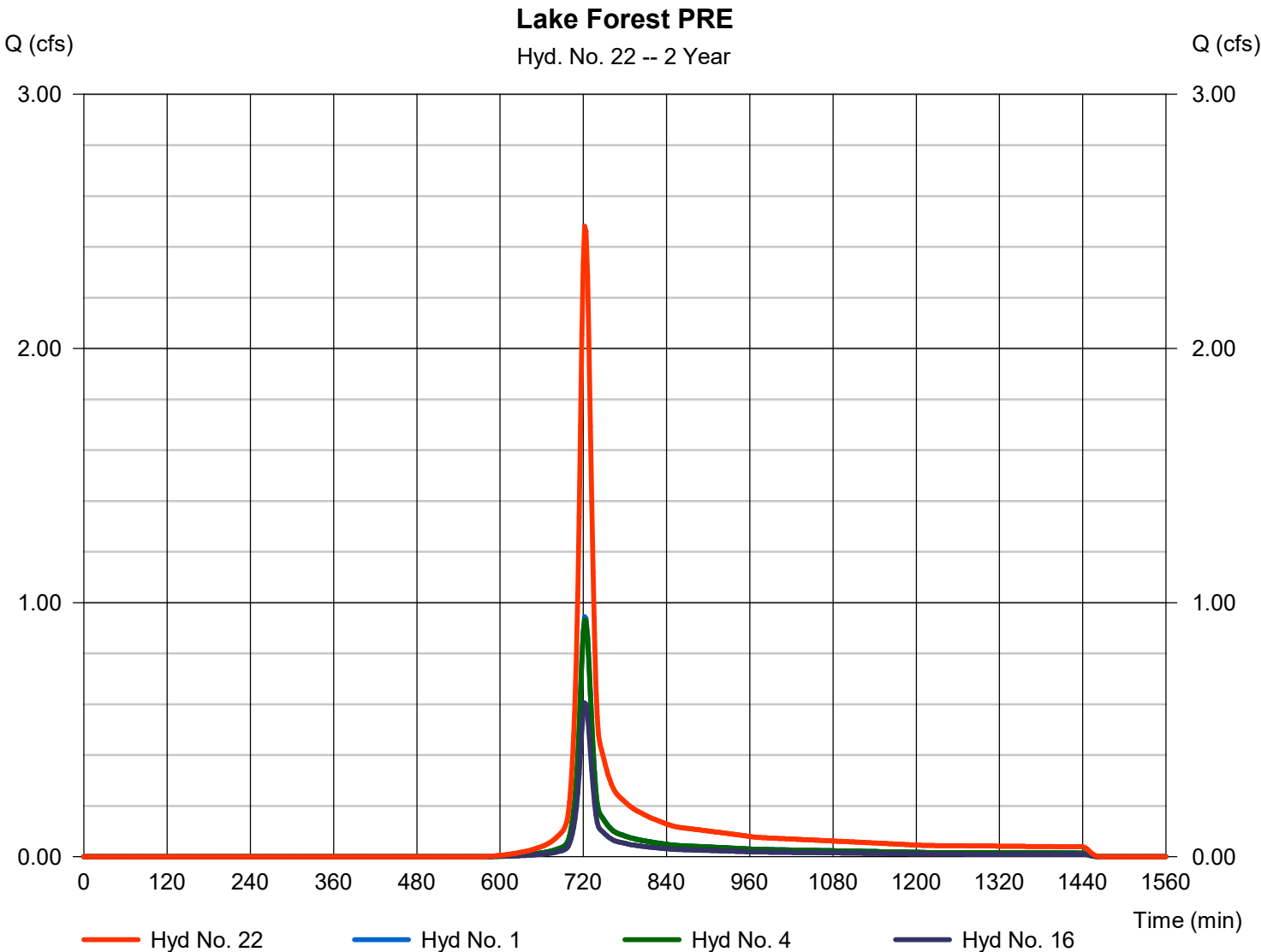* Composite (Area/CN) = [(0.590 x 98) + (0.620 x 84)] / 1.210

Villa 8 & 9 Road Post

Hyd. No. 20 -- 2 Year

Hydrograph Report

Monday, 06 / 10 / 2024
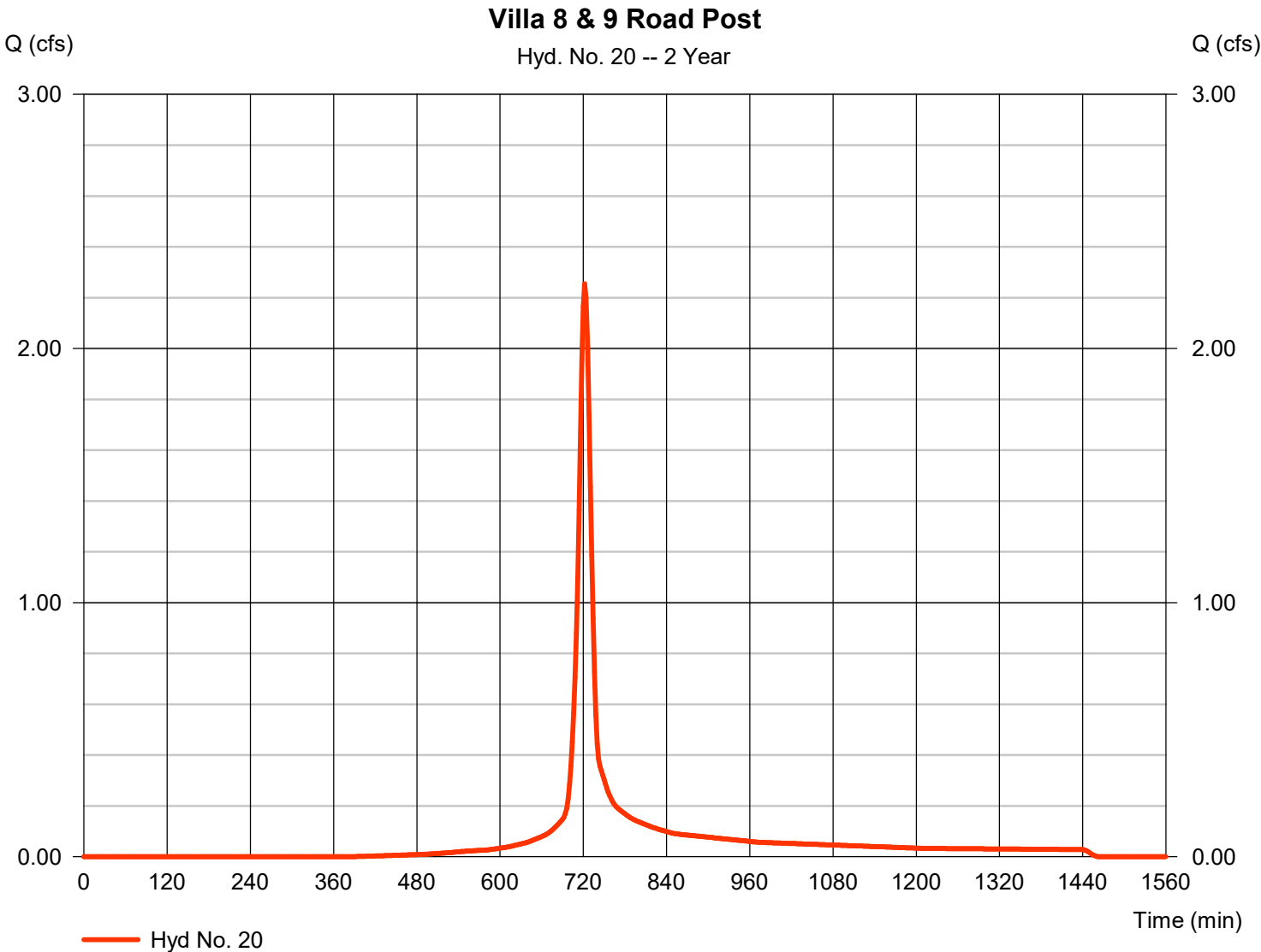
Hyd. No. 22

Lake Forest PRE

Hydrograph type	= Combine	Peak discharge	= 2.481 cfs
Storm frequency	= 2 yrs	Time to peak	= 722 min
Time interval	= 2 min	Hyd. volume	= 7,031 cuft
Inflow hyds.	= 1, 4, 16	Contrib. drain. area	= 1.970 ac

Lake Forest PRE

Hyd. No. 22 -- 2 Year

Q (cfs)

Q (cfs)

Time (min)

Hyd No. 22   Hyd No. 1   Hyd No. 4   Hyd No. 16

Hydrograph Report

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Hyd. No. 23

Lake Forest POST

Hydrograph type	= Combine	Peak discharge	= 3.144 cfs
Storm frequency	= 2 yrs	Time to peak	= 722 min
Time interval	= 2 min	Hyd. volume	= 8,821 cuft
Inflow hyds.	= 2, 5, 17	Contrib. drain. area	= 1.960 ac

Lake Forest POST

Hyd. No. 23 -- 2 Year
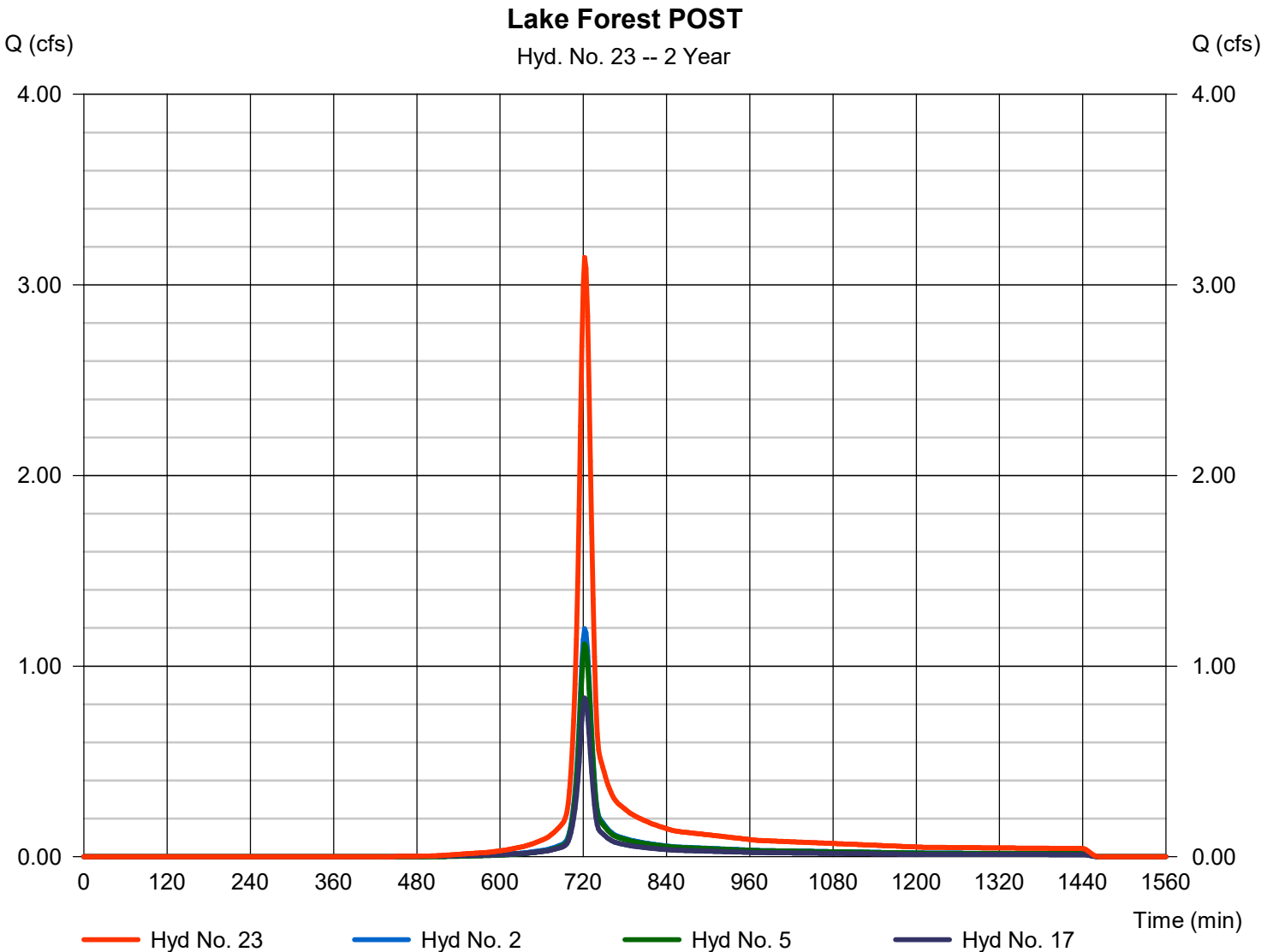
Hydrograph Report

Hyd. No. 25

Southwest PRE

Hydrograph type	= Combine	Peak discharge	= 2.806 cfs
Storm frequency	= 2 yrs	Time to peak	= 722 min
Time interval	= 2 min	Hyd. volume	= 7,929 cuft
Inflow hyds.	= 7, 10, 19	Contrib. drain. area	= 2.150 ac

Southwest PRE

Hyd. No. 25 -- 2 Year

Legend: Hyd No. 25   Hyd No. 7   Hyd No. 10   Hyd No. 19

Hydrograph Report

Monday, 06 / 10 / 2024
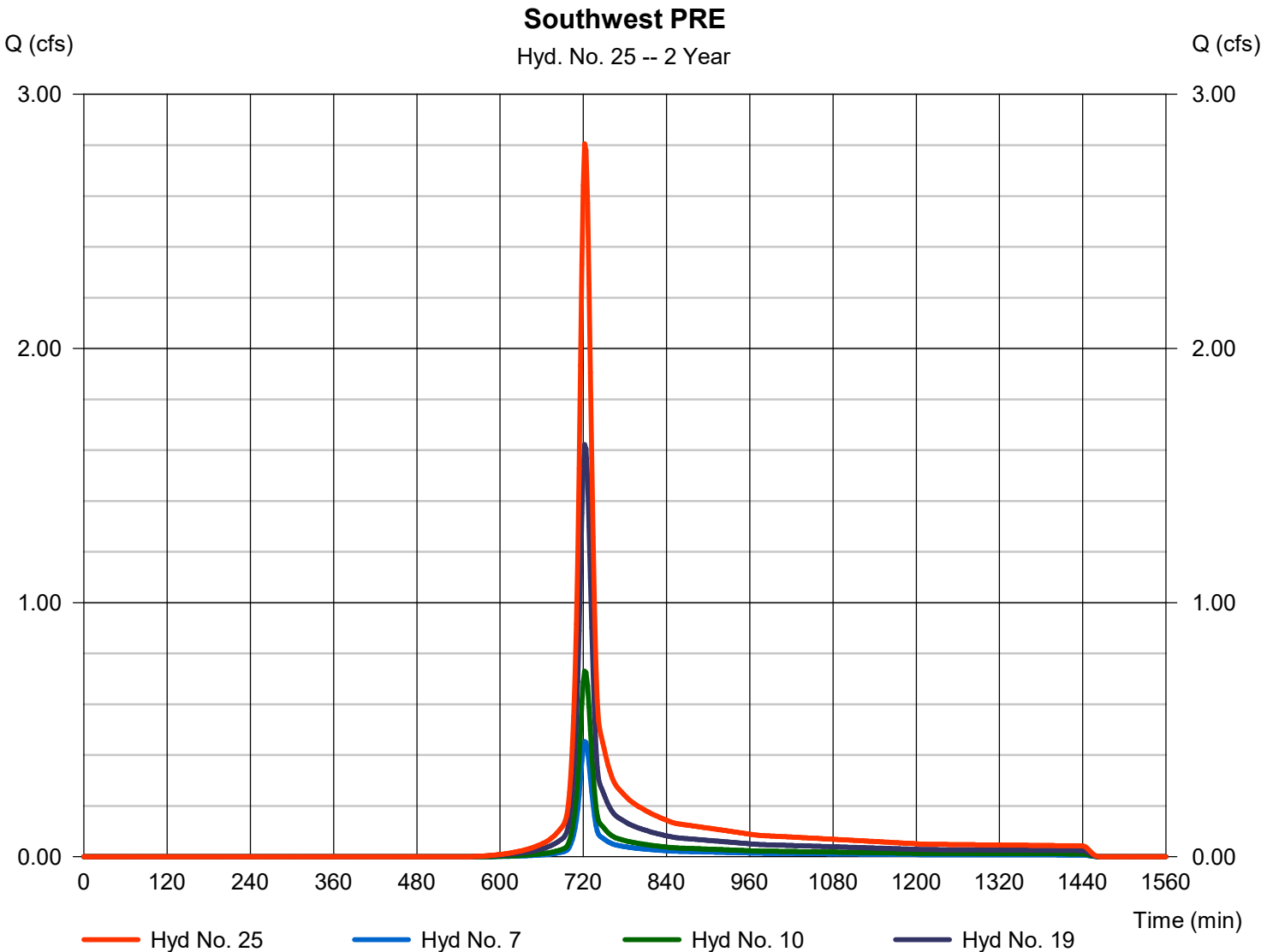
Hyd. No. 26

Southwest POST

Hydrograph type	= Combine	Peak discharge	= 2.999 cfs
Storm frequency	= 2 yrs	Time to peak	= 722 min
Time interval	= 2 min	Hyd. volume	= 9,888 cuft
Inflow hyds.	= 8, 13, 20	Contrib. drain. area	= 1.570 ac

Southwest POST
Hyd. No. 26 -- 2 Year
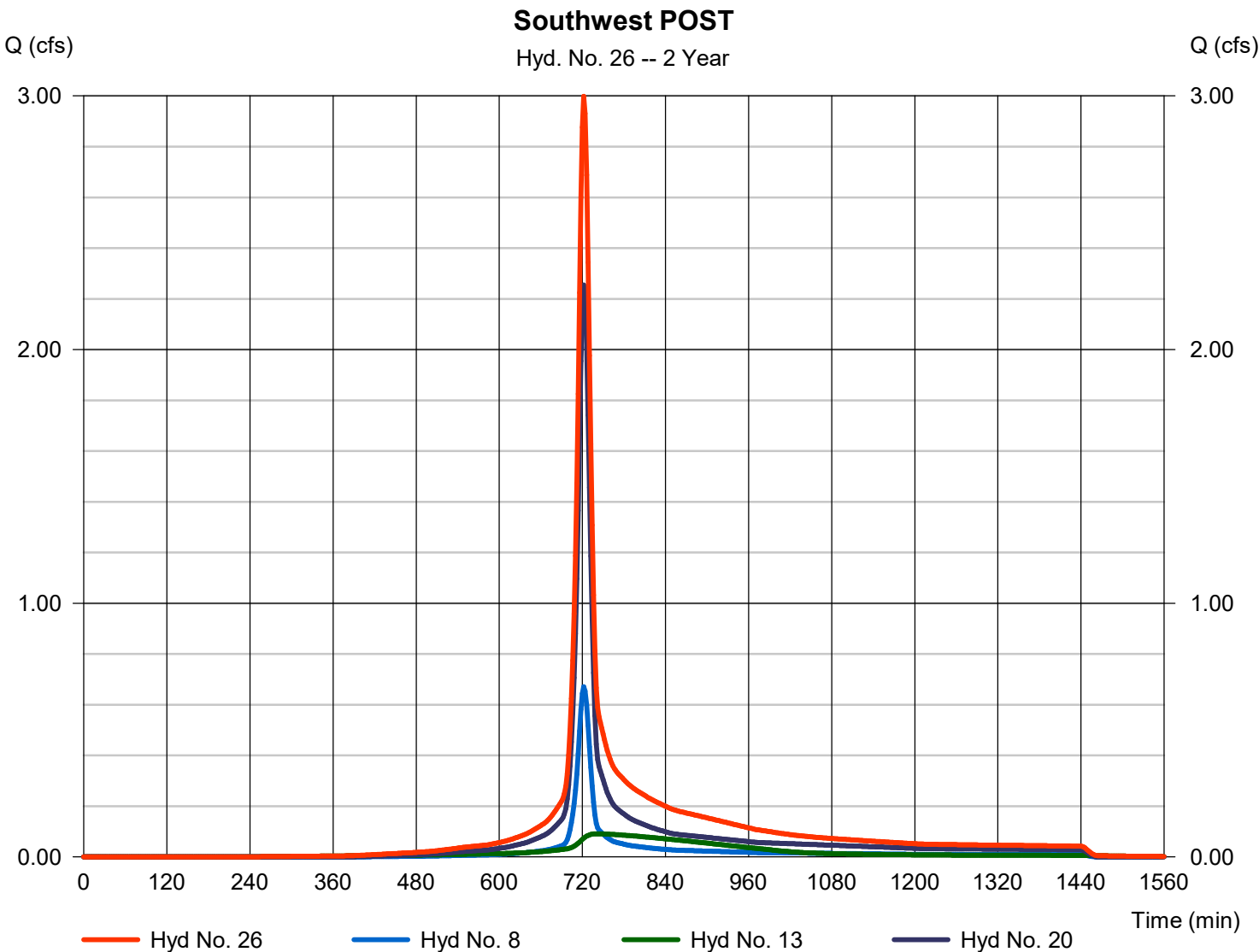
Hydrograph Report

Hyd. No. 28

TOTAL

Hydrograph type	= Combine	Peak discharge	= 5.287 cfs
Storm frequency	= 2 yrs	Time to peak	= 722 min
Time interval	= 2 min	Hyd. volume	= 14,960 cuft
Inflow hyds.	= 22, 25	Contrib. drain. area	= 0.000 ac

TOTAL

Hyd. No. 28 -- 2 Year

Legend: Hyd No. 28 — Hyd No. 22 — Hyd No. 25

Hydrograph Report

Monday, 06 / 10 / 2024
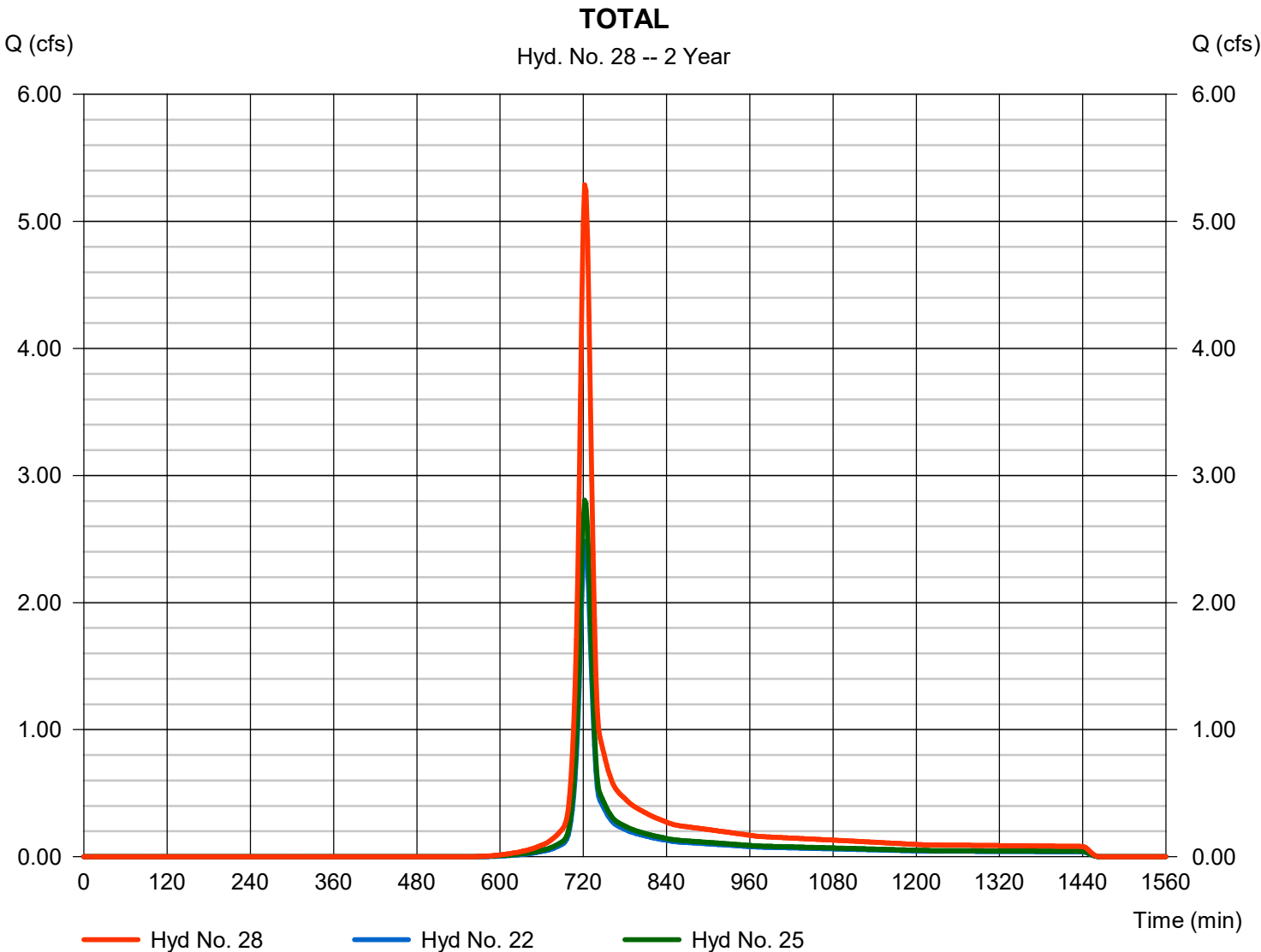
Hyd. No. 29

Total Post

Hydrograph type	= Combine		Peak discharge	= 6.143 cfs
Storm frequency	= 2 yrs		Time to peak	= 722 min
Time interval	= 2 min		Hyd. volume	= 18,708 cuft
Inflow hyds.	= 23, 26		Contrib. drain. area	= 0.000 ac
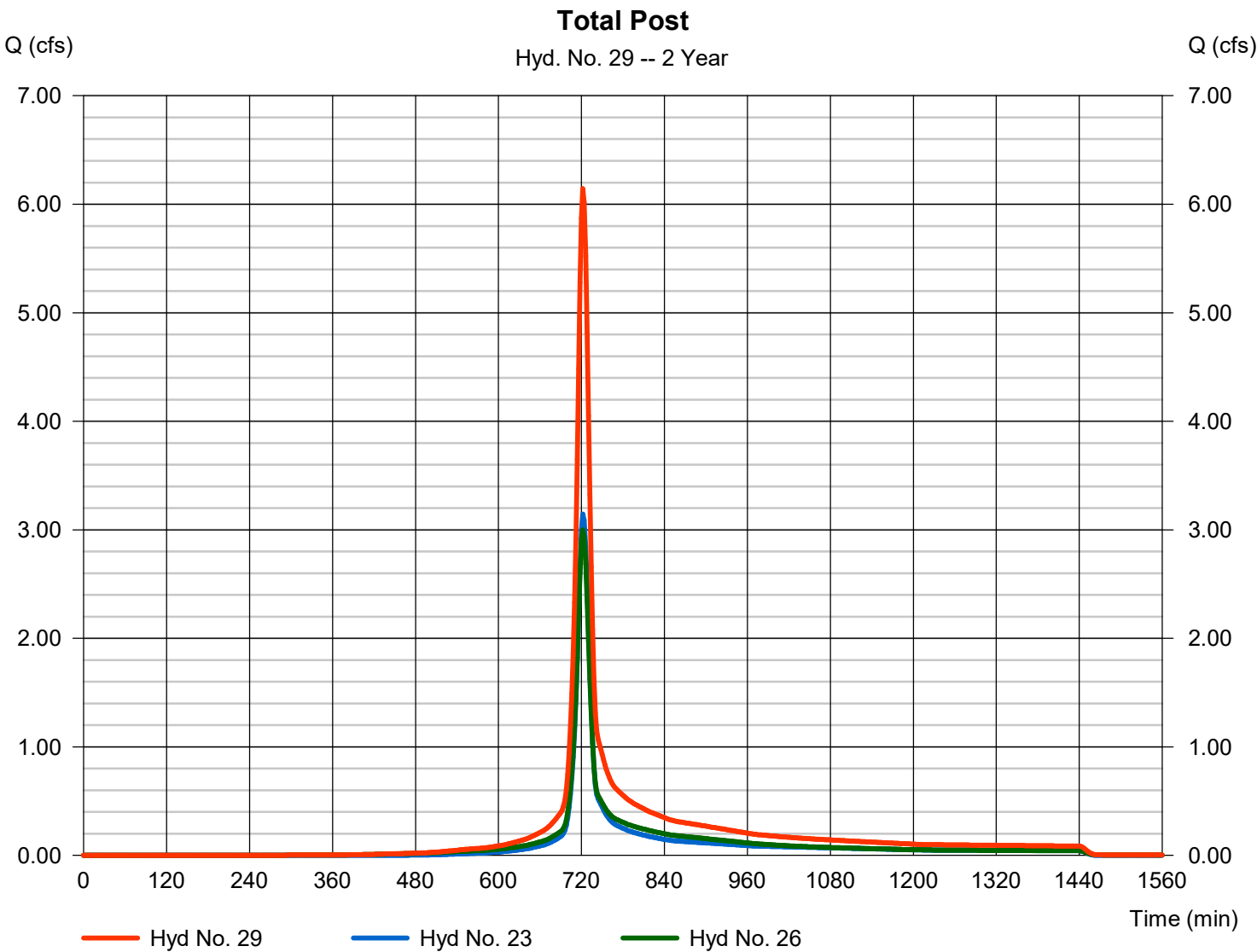
Total Post
Hyd. No. 29 -- 2 Year

Hydrograph Summary Report

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	1.388	2	722	3,894	------	------	------	Villa 1 PRE
2	SCS Runoff	1.667	2	722	4,685	------	------	------	Villa 1 POST
4	SCS Runoff	1.369	2	722	3,842	------	------	------	Villa 2 PRE
5	SCS Runoff	1.575	2	722	4,418	------	------	------	Villa 2 Post
7	SCS Runoff	0.666	2	722	1,869	------	------	------	Villa 3 PRE
8	SCS Runoff	0.903	2	722	2,568	------	------	------	Villa 3 Post
10	SCS Runoff	1.073	2	722	3,012	------	------	------	Villa 4 PRE
11	SCS Runoff	0.666	2	722	1,869	------	------	------	Villa 4 Post Runoff
12	SCS Runoff	0.672	2	722	2,109	------	------	------	Villa 4 Post Detention
13	Reservoir	0.102	2	742	2,093	12	1013.27	892	Villa 4
14	Combine	1.338	2	722	3,978	11, 12,	------	------	Total Villa 4 Post
16	SCS Runoff	0.888	2	722	2,492	------	------	------	Villa 5 PRE
17	SCS Runoff	1.134	2	722	3,209	------	------	------	Villa 5 Post
19	SCS Runoff	2.349	2	722	6,586	------	------	------	Villa 8 & 9 & road PRE
20	SCS Runoff	3.034	2	722	8,631	------	------	------	Villa 8 & 9 Road Post
22	Combine	3.645	2	722	10,229	1, 4, 16,	------	------	Lake Forest PRE
23	Combine	4.376	2	722	12,312	2, 5, 17,	------	------	Lake Forest POST
25	Combine	4.088	2	722	11,467	7, 10, 19,	------	------	Southwest PRE
26	Combine	4.020	2	722	13,292	8, 13, 20,	------	------	Southwest POST
28	Combine	7.733	2	722	21,696	22, 25,	------	------	TOTAL
29	Combine	8.396	2	722	25,604	23, 26,	------	------	Total Post

2023-186-Ponds.gpw	Return Period: 5 Year	Monday, 06 / 10 / 2024

Hydrograph Report

　　　　　Monday, 06 / 10 / 2024

Hyd. No. 1

Villa 1 PRE

Hydrograph type	= SCS Runoff		Peak discharge	= 1.388 cfs
Storm frequency	= 5 yrs		Time to peak	= 722 min
Time interval	= 2 min		Hyd. volume	= 3,894 cuft
Drainage area	= 0.750 ac		Curve number	= 84
Basin Slope	= 0.0 %		Hydraulic length	= 0 ft
Tc method	= User		Time of conc. (Tc)	= 15.00 min
Total precip.	= 2.94 in		Distribution	= Type II
Storm duration	= 24 hrs		Shape factor	= 484

Villa 1 PRE

Hyd. No. 1 -- 5 Year

Q (cfs)

Time (min)

— Hyd No. 1

Hydrograph Report

Monday, 06 / 10 / 2024
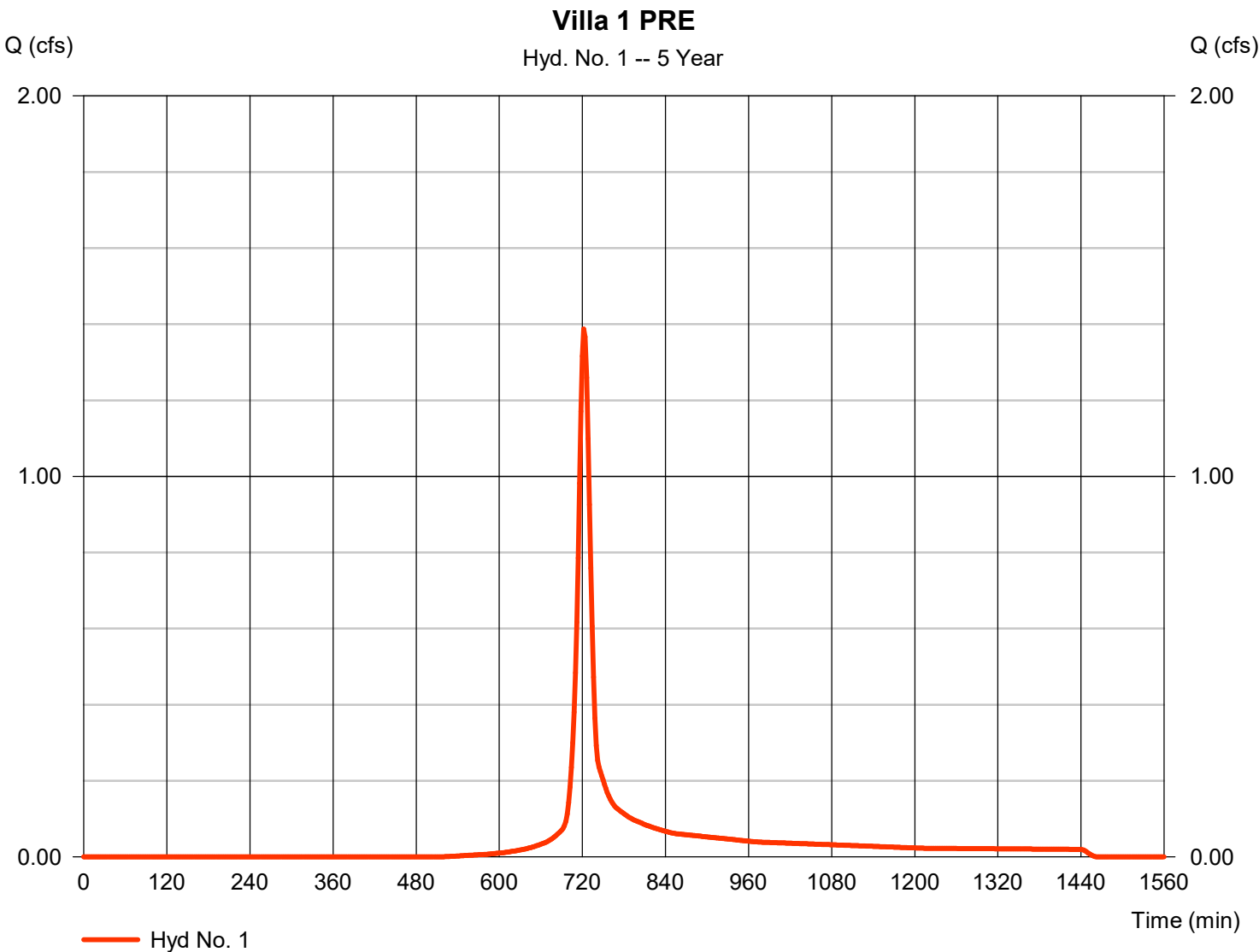
Hyd. No. 2

Villa 1 POST

Hydrograph type	= SCS Runoff		Peak discharge	= 1.667 cfs
Storm frequency	= 5 yrs		Time to peak	= 722 min
Time interval	= 2 min		Hyd. volume	= 4,685 cuft
Drainage area	= 0.750 ac		Curve number	= 88*
Basin Slope	= 0.0 %		Hydraulic length	= 0 ft
Tc method	= User		Time of conc. (Tc)	= 15.00 min
Total precip.	= 2.94 in		Distribution	= Type II
Storm duration	= 24 hrs		Shape factor	= 484

* Composite (Area/CN) = [(0.220 x 98) + (0.530 x 84)] / 0.750

Villa 1 POST

Hyd. No. 2 -- 5 Year

Q (cfs)

Q (cfs)

Time (min)

Hyd No. 2

Hydrograph Report

Monday, 06 / 10 / 2024
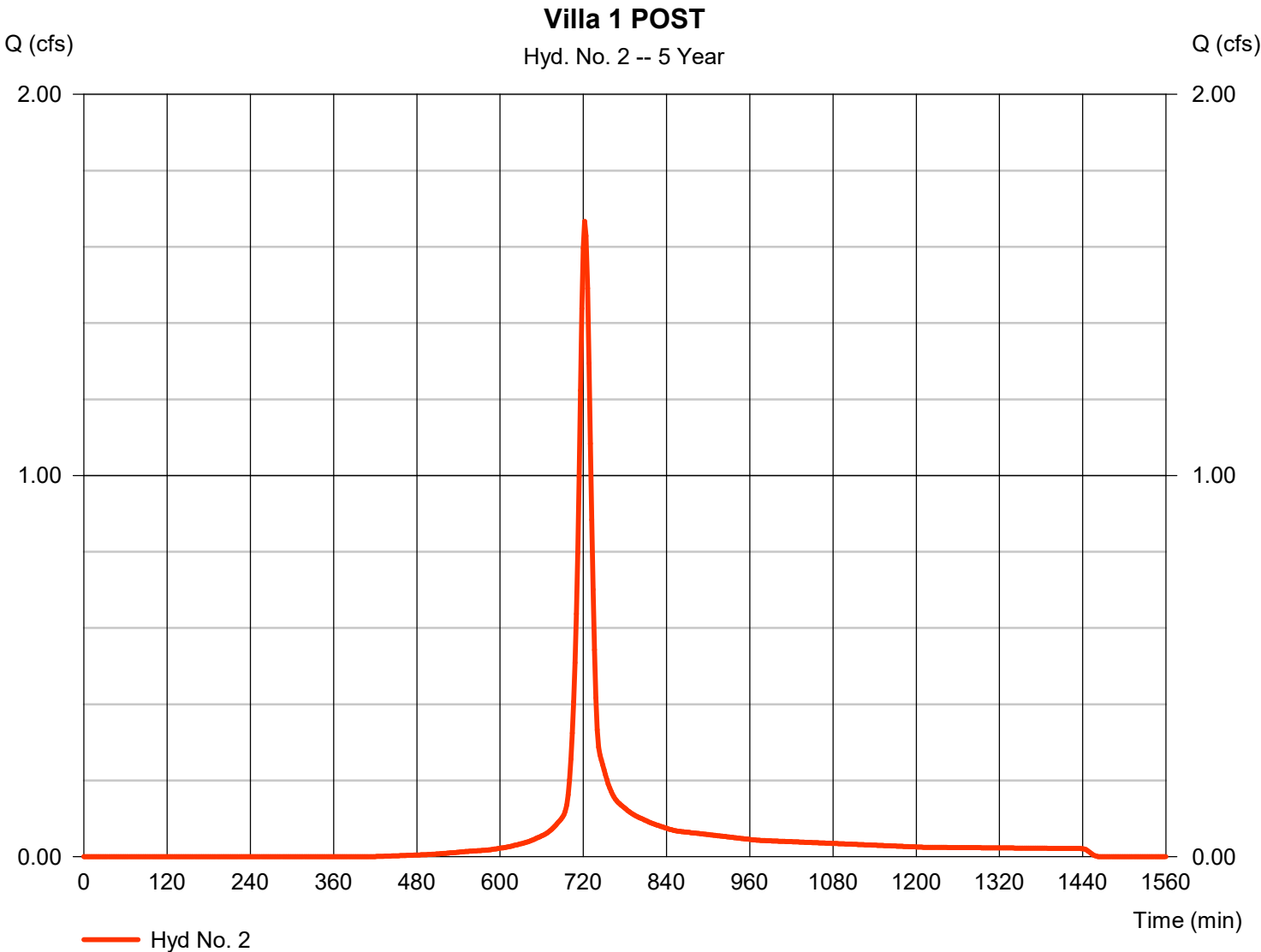
Hyd. No. 4

Villa 2 PRE

Hydrograph type	= SCS Runoff		Peak discharge	= 1.369 cfs
Storm frequency	= 5 yrs		Time to peak	= 722 min
Time interval	= 2 min		Hyd. volume	= 3,842 cuft
Drainage area	= 0.740 ac		Curve number	= 84
Basin Slope	= 0.0 %		Hydraulic length	= 0 ft
Tc method	= User		Time of conc. (Tc)	= 15.00 min
Total precip.	= 2.94 in		Distribution	= Type II
Storm duration	= 24 hrs		Shape factor	= 484

Villa 2 PRE

Hyd. No. 4 -- 5 Year

Hyd No. 4

Hydrograph Report

Monday, 06 / 10 / 2024
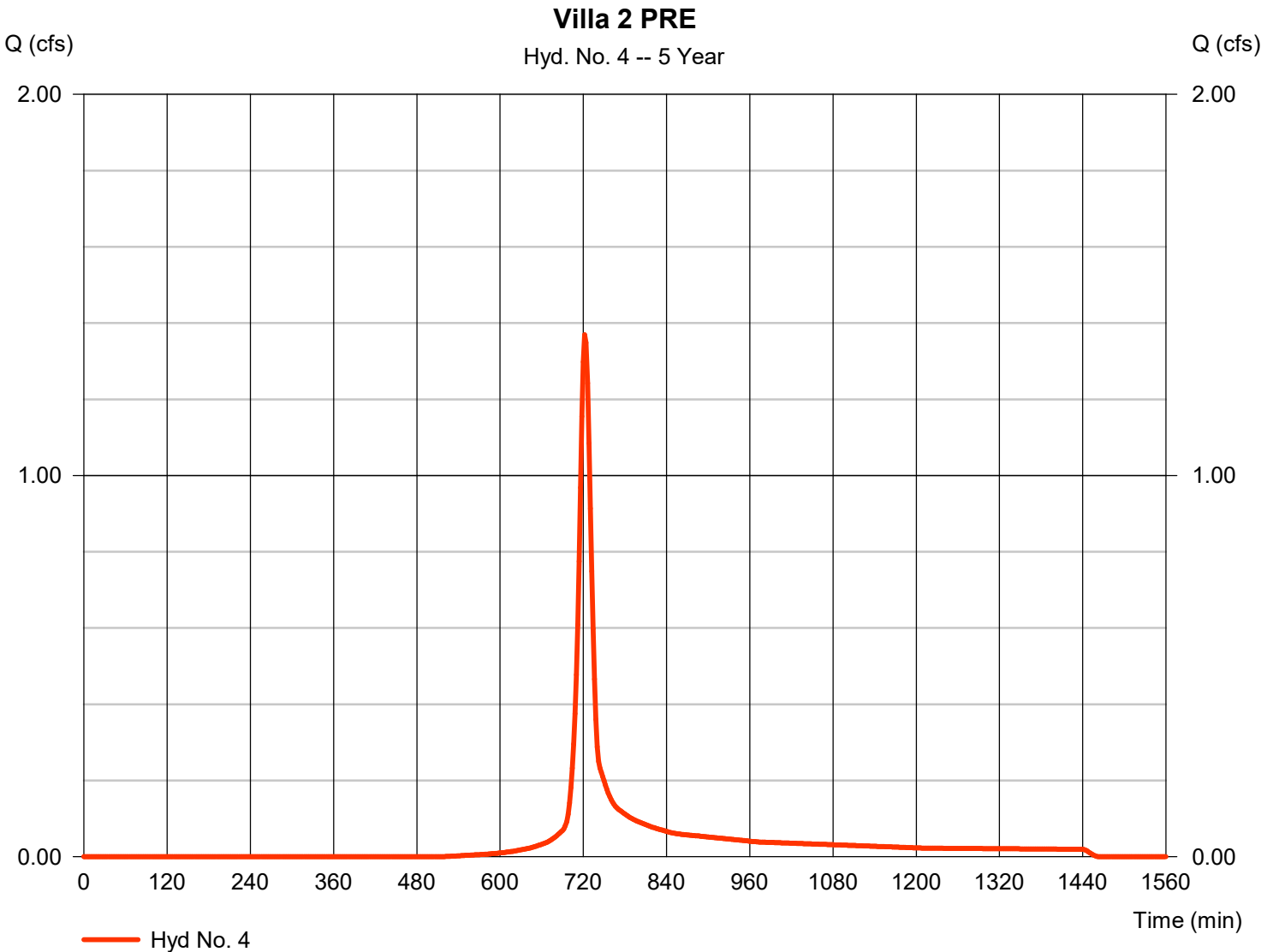
Hyd. No. 5

Villa 2 Post

Hydrograph type	= SCS Runoff	Peak discharge	= 1.575 cfs
Storm frequency	= 5 yrs	Time to peak	= 722 min
Time interval	= 2 min	Hyd. volume	= 4,418 cuft
Drainage area	= 0.740 ac	Curve number	= 87*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 15.00 min
Total precip.	= 2.94 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

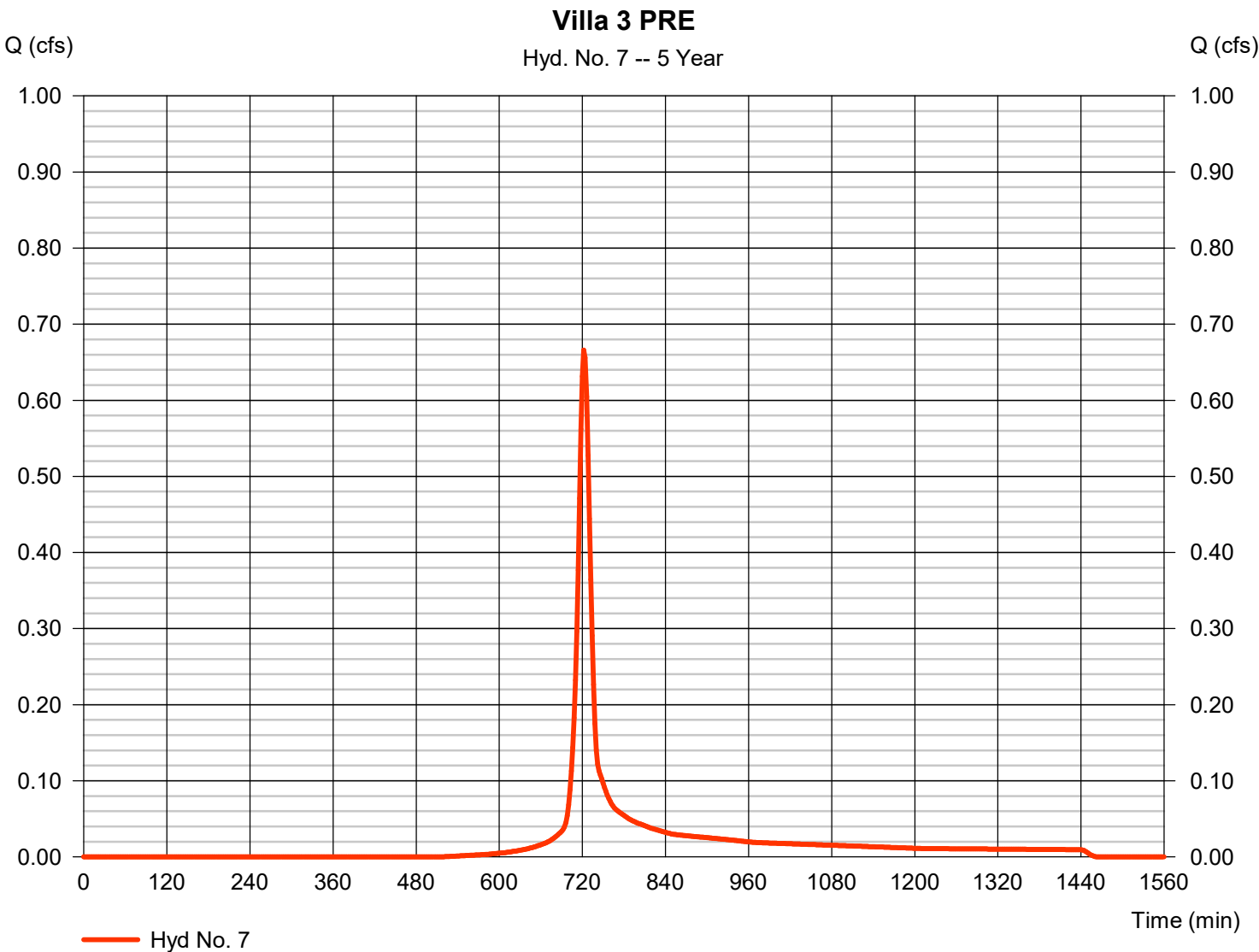* Composite (Area/CN) = [(0.180 x 98) + (0.560 x 84)] / 0.740

Villa 2 Post

Hyd. No. 5 -- 5 Year

Hyd No. 5

Hydrograph Report

Monday, 06 / 10 / 2024

Hyd. No. 7

Villa 3 PRE

Hydrograph type	= SCS Runoff		Peak discharge	= 0.666 cfs
Storm frequency	= 5 yrs		Time to peak	= 722 min
Time interval	= 2 min		Hyd. volume	= 1,869 cuft
Drainage area	= 0.360 ac		Curve number	= 84
Basin Slope	= 0.0 %		Hydraulic length	= 0 ft
Tc method	= User		Time of conc. (Tc)	= 15.00 min
Total precip.	= 2.94 in		Distribution	= Type II
Storm duration	= 24 hrs		Shape factor	= 484

Villa 3 PRE

Hyd. No. 7 -- 5 Year

Hyd No. 7

Hydrograph Report

Hyd. No. 8

Villa 3 Post

Hydrograph type	= SCS Runoff		Peak discharge	= 0.903 cfs
Storm frequency	= 5 yrs		Time to peak	= 722 min
Time interval	= 2 min		Hyd. volume	= 2,568 cuft
Drainage area	= 0.360 ac		Curve number	= 91*
Basin Slope	= 0.0 %		Hydraulic length	= 0 ft
Tc method	= User		Time of conc. (Tc)	= 15.00 min
Total precip.	= 2.94 in		Distribution	= Type II
Storm duration	= 24 hrs		Shape factor	= 484

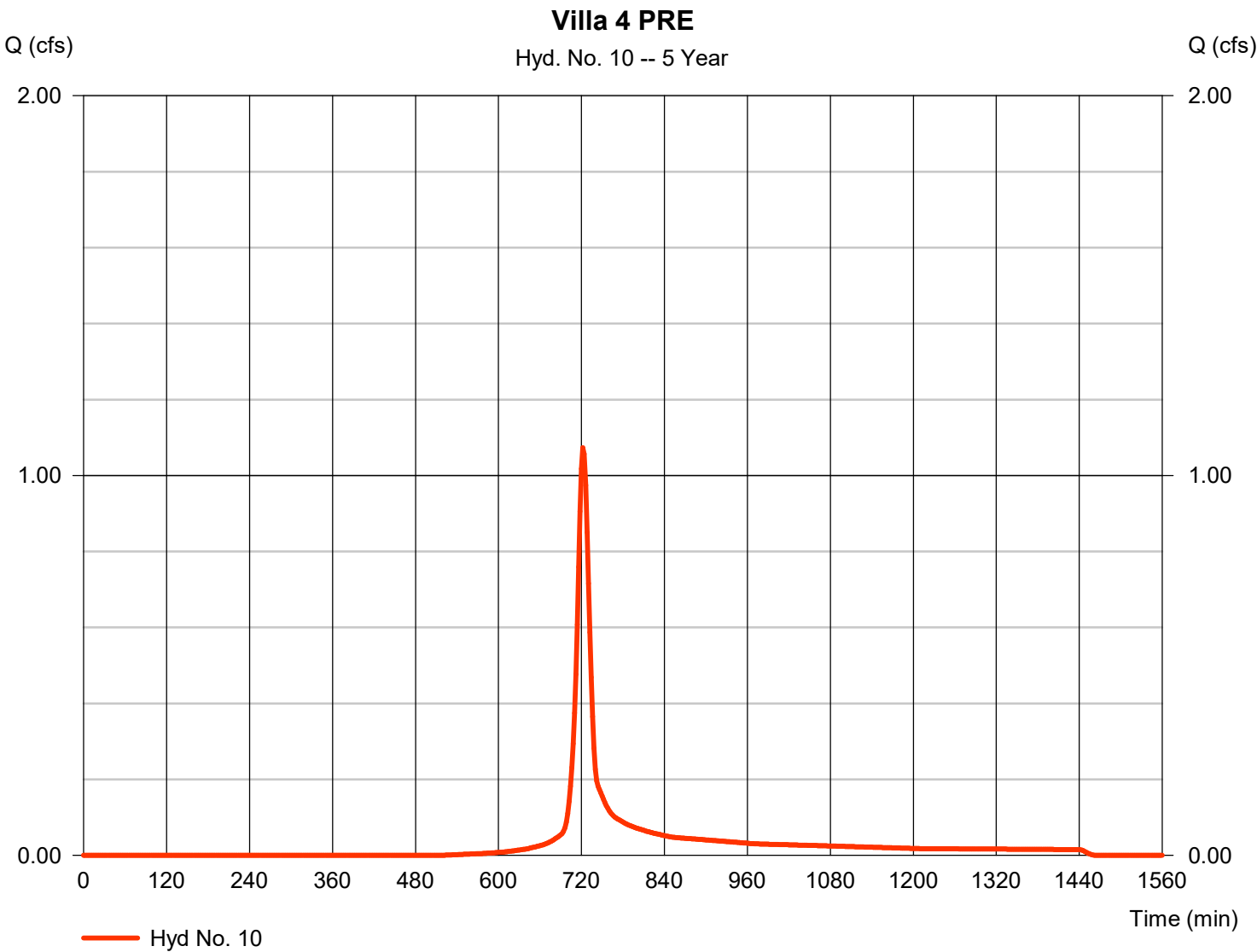* Composite (Area/CN) = [(0.180 x 98) + (0.180 x 84)] / 0.360

Villa 3 Post

Hyd. No. 8 -- 5 Year

Hyd No. 8

Hydrograph Report

Monday, 06 / 10 / 2024
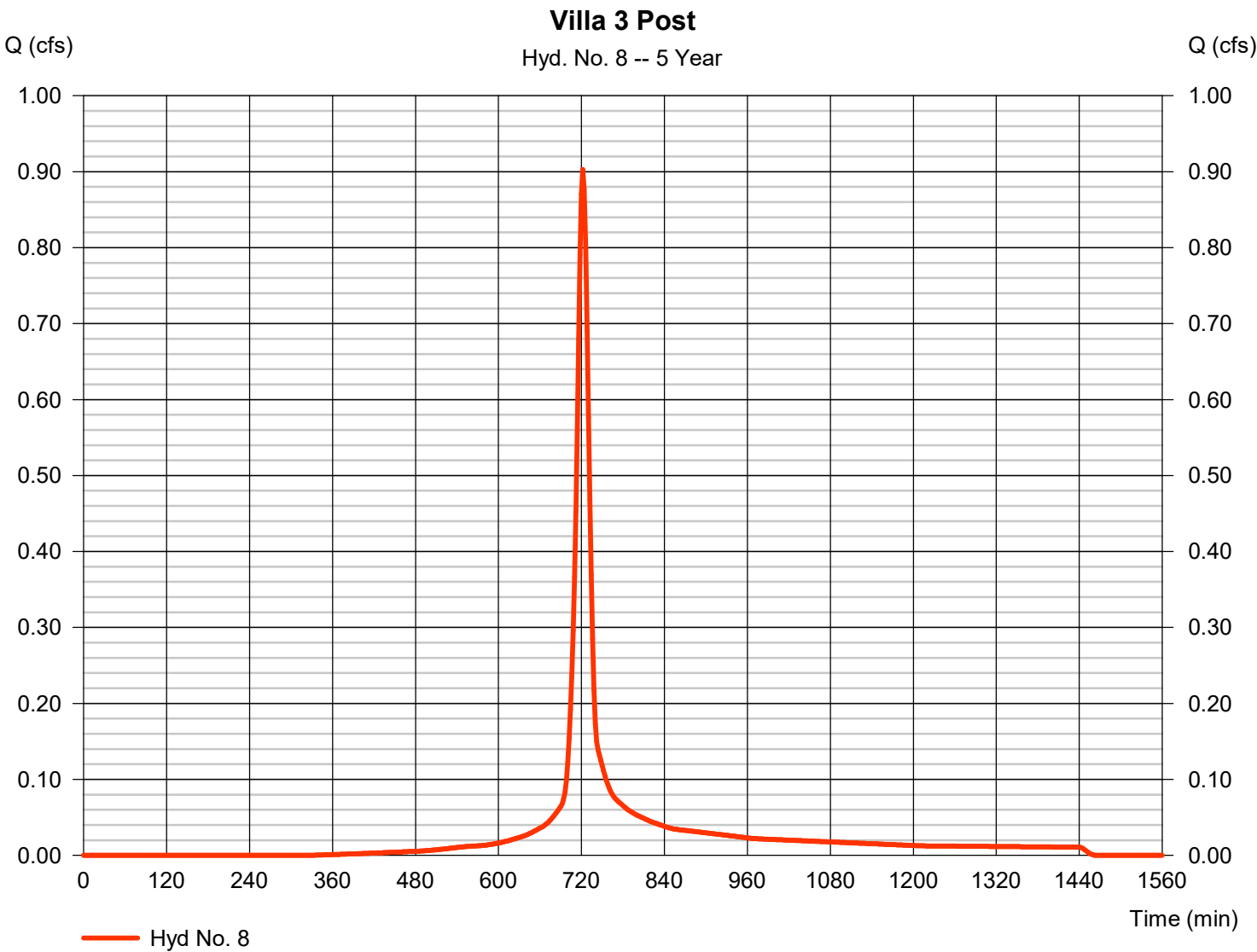
Hyd. No. 10

Villa 4 PRE

Hydrograph type	= SCS Runoff		Peak discharge	= 1.073 cfs
Storm frequency	= 5 yrs		Time to peak	= 722 min
Time interval	= 2 min		Hyd. volume	= 3,012 cuft
Drainage area	= 0.580 ac		Curve number	= 84
Basin Slope	= 0.0 %		Hydraulic length	= 0 ft
Tc method	= User		Time of conc. (Tc)	= 15.00 min
Total precip.	= 2.94 in		Distribution	= Type II
Storm duration	= 24 hrs		Shape factor	= 484

Villa 4 PRE

Hyd. No. 10 -- 5 Year

Hydrograph Report

Monday, 06 / 10 / 2024

Hyd. No. 11

Villa 4 Post Runoff

Hydrograph type	= SCS Runoff		Peak discharge	= 0.666 cfs
Storm frequency	= 5 yrs		Time to peak	= 722 min
Time interval	= 2 min		Hyd. volume	= 1,869 cuft
Drainage area	= 0.360 ac		Curve number	= 84*
Basin Slope	= 0.0 %		Hydraulic length	= 0 ft
Tc method	= User		Time of conc. (Tc)	= 15.00 min
Total precip.	= 2.94 in		Distribution	= Type II
Storm duration	= 24 hrs		Shape factor	= 484

* Composite (Area/CN) = + (0.360 x 84)] / 0.360

Villa 4 Post Runoff

Hyd. No. 11 -- 5 Year

Hyd No. 11

Hydrograph Report

Monday, 06 / 10 / 2024

Hyd. No. 12

Villa 4 Post Detention

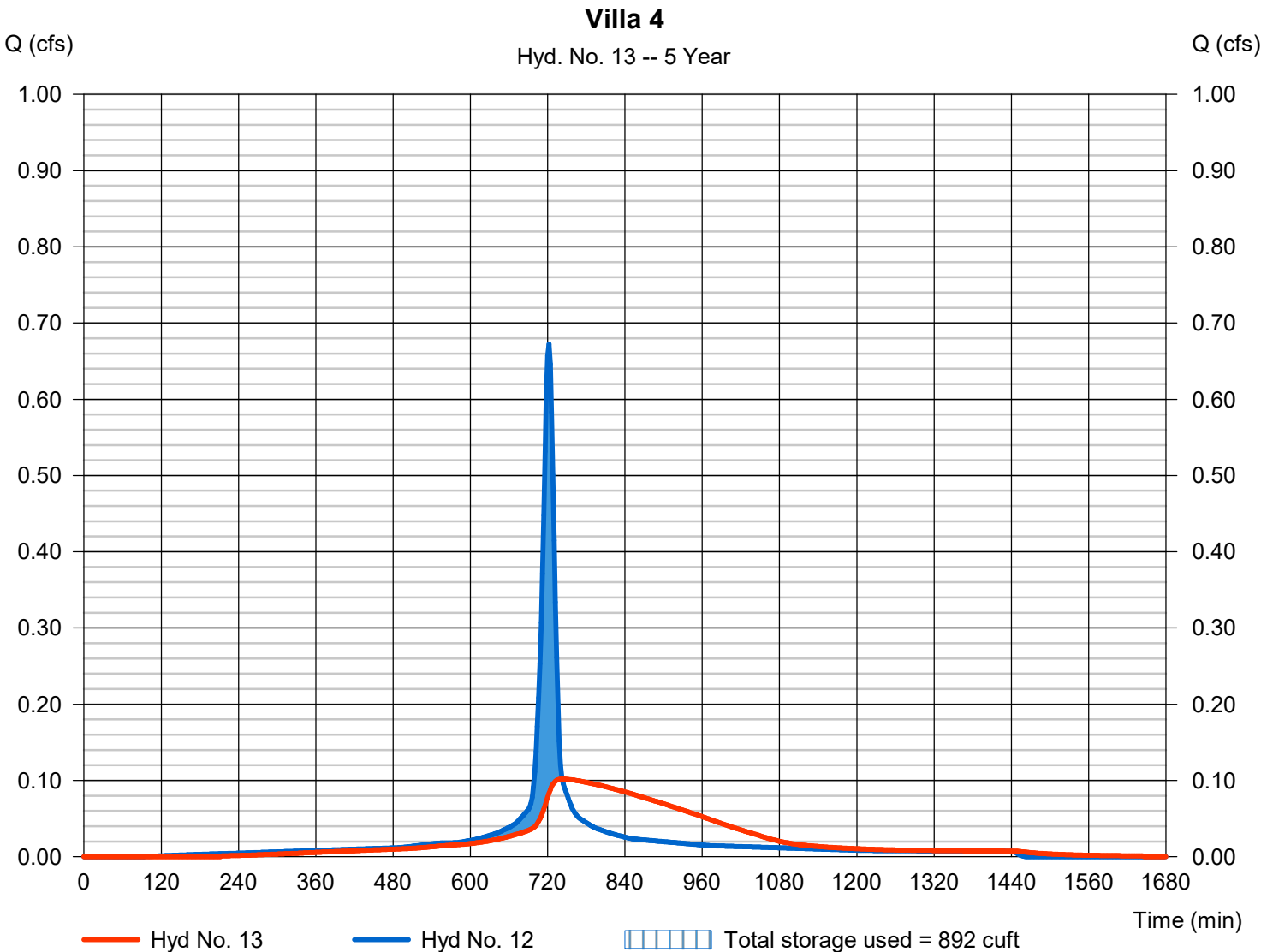|				
Hydrograph type	= SCS Runoff		Peak discharge	= 0.672 cfs
Storm frequency	= 5 yrs		Time to peak	= 722 min
Time interval	= 2 min		Hyd. volume	= 2,109 cuft
Drainage area	= 0.220 ac		Curve number	= 98*
Basin Slope	= 0.0 %		Hydraulic length	= 0 ft
Tc method	= User		Time of conc. (Tc)	= 15.00 min
Total precip.	= 2.94 in		Distribution	= Type II
Storm duration	= 24 hrs		Shape factor	= 484

* Composite (Area/CN) = [(0.220 x 98)] / 0.220

Villa 4 Post Detention
Hyd. No. 12 -- 5 Year
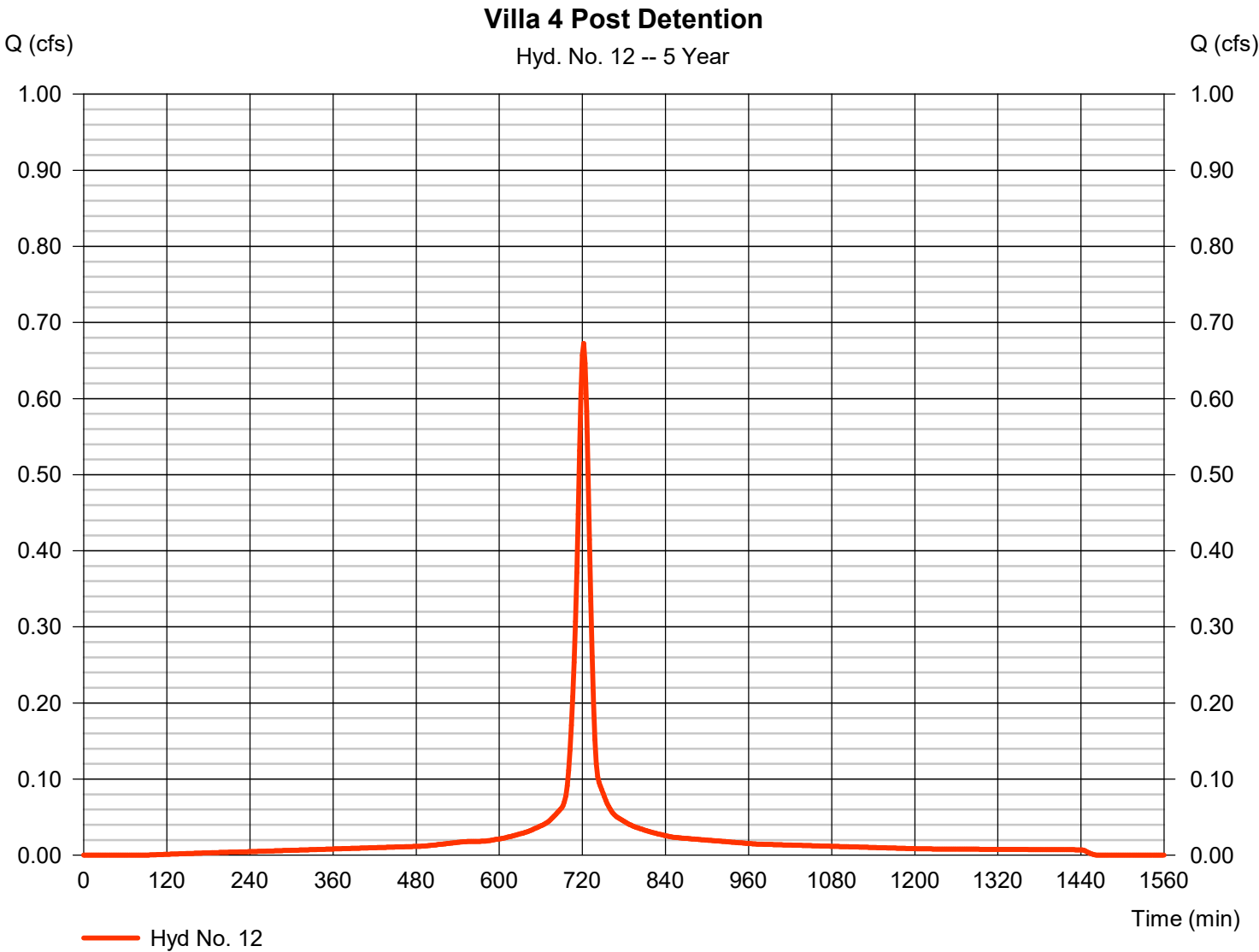
Hyd No. 12

Hydrograph Report

Hyd. No. 13

Villa 4

|					
Hydrograph type	=	Reservoir	Peak discharge	=	0.102 cfs
Storm frequency	=	5 yrs	Time to peak	=	742 min
Time interval	=	2 min	Hyd. volume	=	2,093 cuft
Inflow hyd. No.	=	12 - Villa 4 Post Detention	Max. Elevation	=	1013.27 ft
Reservoir name	=	Villa 4	Max. Storage	=	892 cuft

Storage Indication method used.

Villa 4

Hyd. No. 13 -- 5 Year

Legend: Hyd No. 13   Hyd No. 12   Total storage used = 892 cuft

Hydrograph Report

Hyd. No. 14

Total Villa 4 Post

Hydrograph type	= Combine	Peak discharge	= 1.338 cfs
Storm frequency	= 5 yrs	Time to peak	= 722 min
Time interval	= 2 min	Hyd. volume	= 3,978 cuft
Inflow hyds.	= 11, 12	Contrib. drain. area	= 0.580 ac

Total Villa 4 Post

Hyd. No. 14 -- 5 Year

Hyd No. 14   Hyd No. 11   Hyd No. 12

Hydrograph Report

Monday, 06 / 10 / 2024
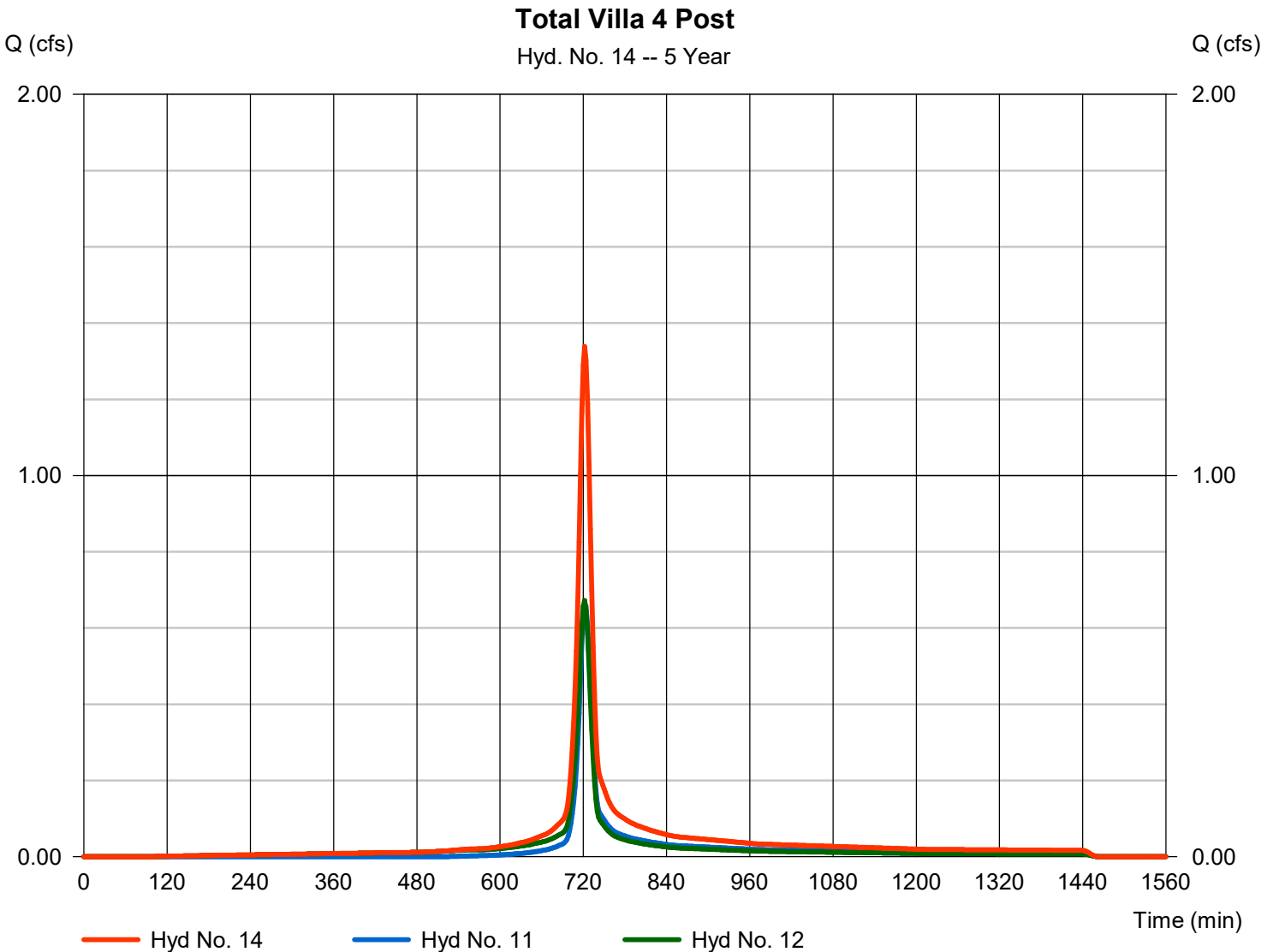
Hyd. No. 16

Villa 5 PRE

Hydrograph type	= SCS Runoff	Peak discharge	= 0.888 cfs
Storm frequency	= 5 yrs	Time to peak	= 722 min
Time interval	= 2 min	Hyd. volume	= 2,492 cuft
Drainage area	= 0.480 ac	Curve number	= 84
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 15.00 min
Total precip.	= 2.94 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

Villa 5 PRE

Hyd. No. 16 -- 5 Year

Q (cfs)

Time (min)
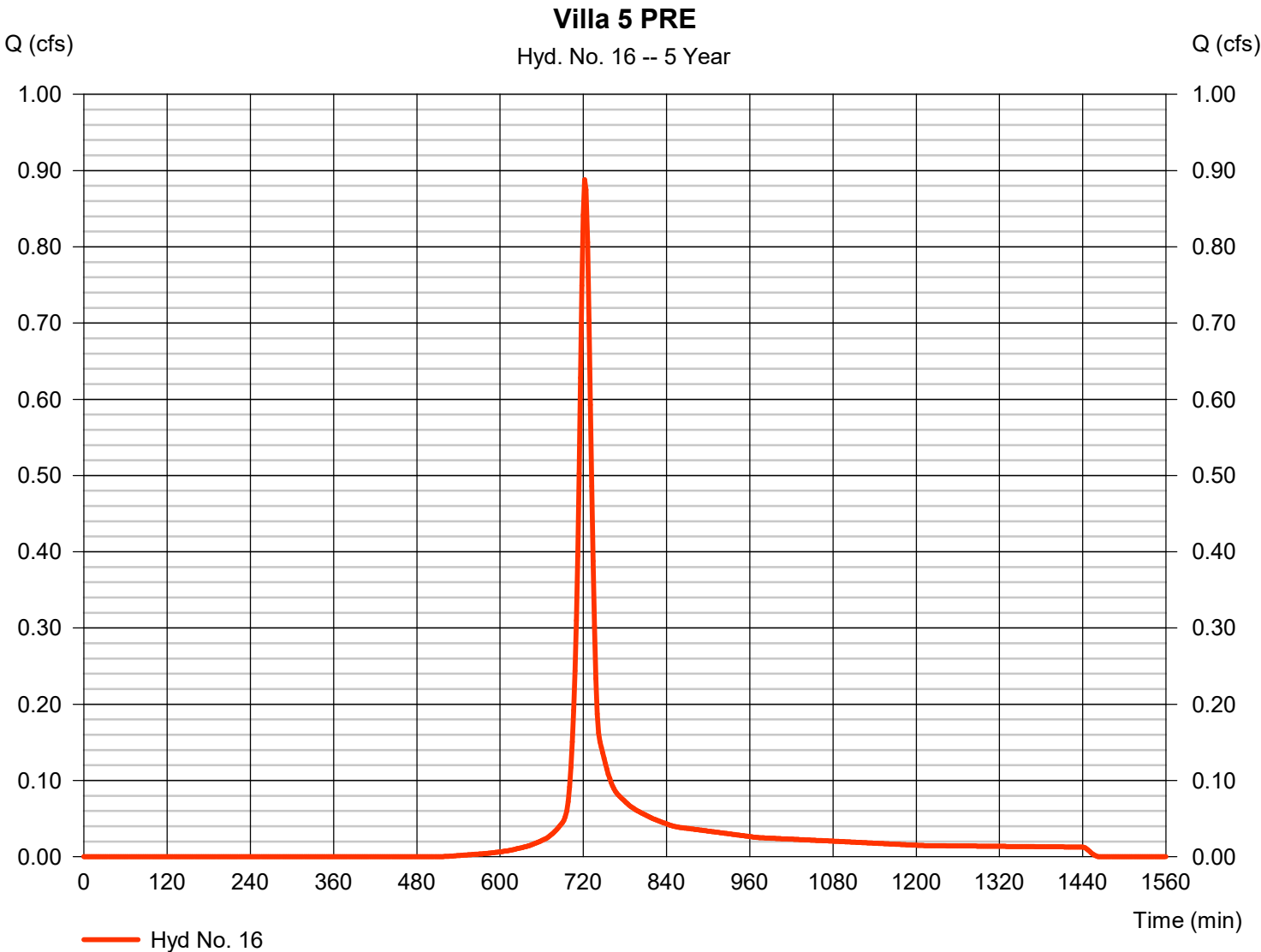
Hyd No. 16

Hydrograph Report

Hyd. No. 17

Villa 5 Post

Hydrograph type	= SCS Runoff	Peak discharge	= 1.134 cfs
Storm frequency	= 5 yrs	Time to peak	= 722 min
Time interval	= 2 min	Hyd. volume	= 3,209 cuft
Drainage area	= 0.470 ac	Curve number	= 90*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 15.00 min
Total precip.	= 2.94 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

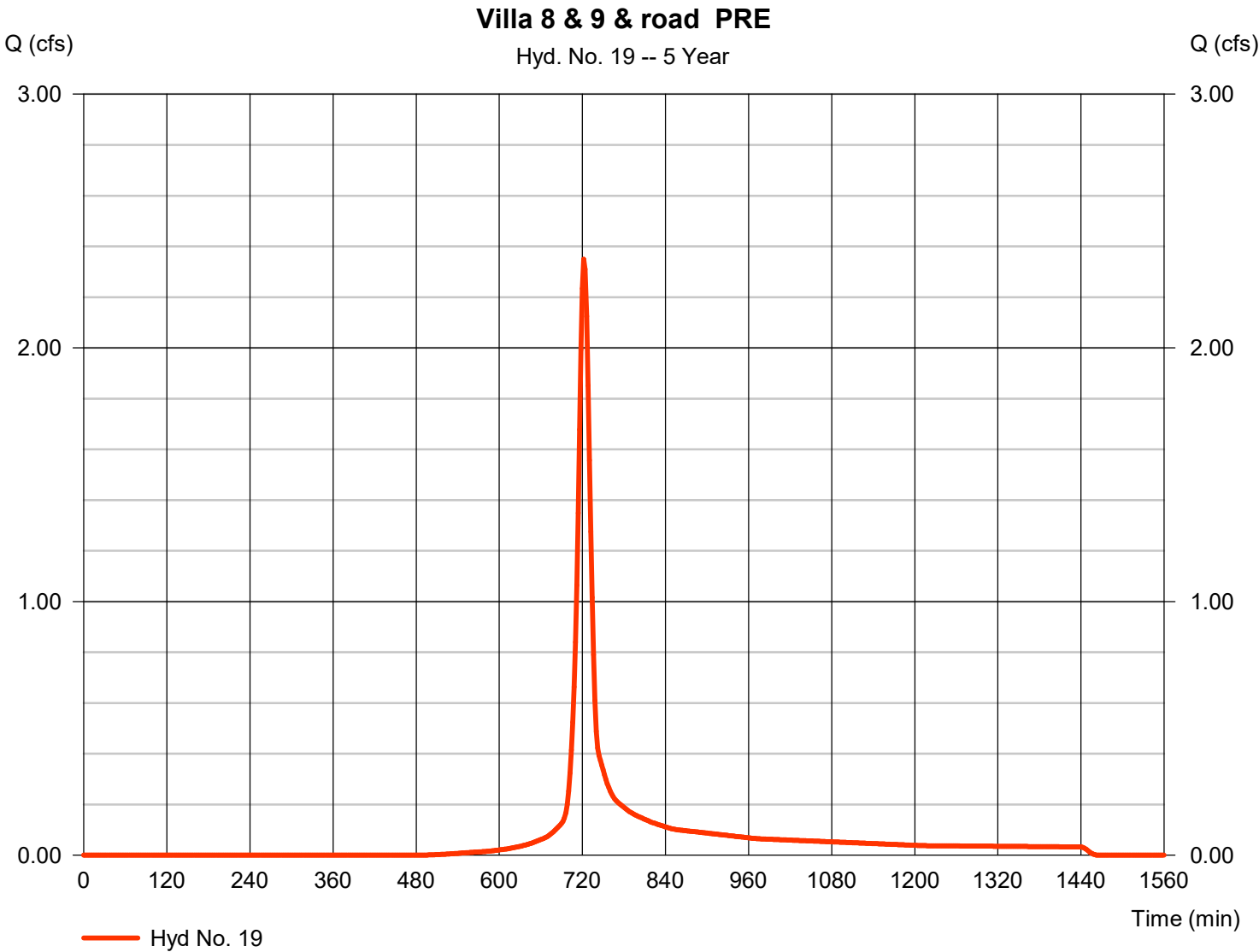* Composite (Area/CN) = [(0.200 x 98) + (0.270 x 84)] / 0.470

Villa 5 Post

Hyd. No. 17 -- 5 Year

Hydrograph Report

Monday, 06 / 10 / 2024
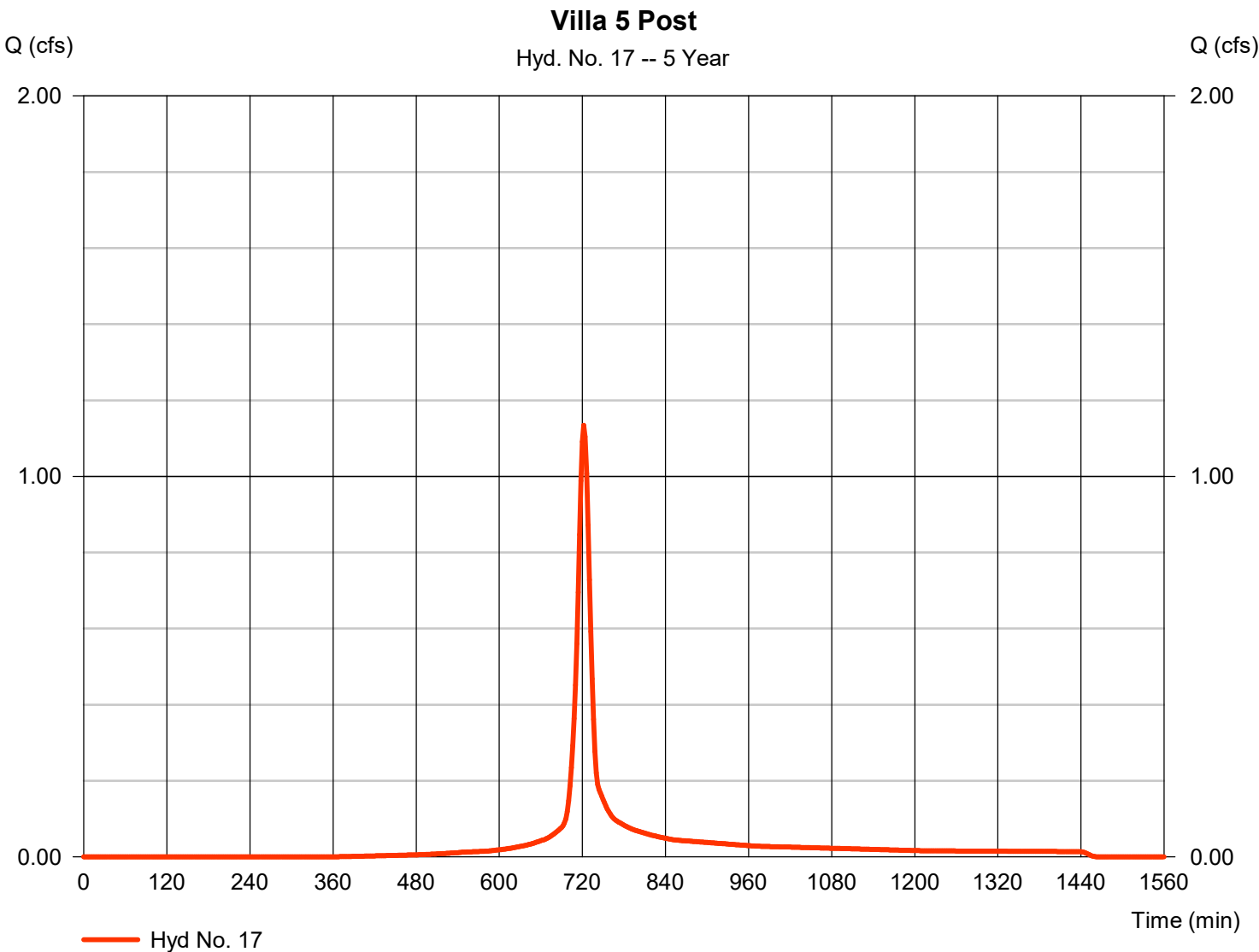
Hyd. No. 19

Villa 8 & 9 & road PRE

Hydrograph type	= SCS Runoff		Peak discharge	= 2.349 cfs
Storm frequency	= 5 yrs		Time to peak	= 722 min
Time interval	= 2 min		Hyd. volume	= 6,586 cuft
Drainage area	= 1.210 ac		Curve number	= 85*
Basin Slope	= 0.0 %		Hydraulic length	= 0 ft
Tc method	= User		Time of conc. (Tc)	= 15.00 min
Total precip.	= 2.94 in		Distribution	= Type II
Storm duration	= 24 hrs		Shape factor	= 484

* Composite (Area/CN) = [(0.360 x 98) + (0.850 x 84)] / 1.210

Villa 8 & 9 & road PRE

Hyd. No. 19 -- 5 Year

Legend: Hyd No. 19

Hydrograph Report

Monday, 06 / 10 / 2024

Hyd. No. 20

Villa 8 & 9 Road Post

Hydrograph type	= SCS Runoff		Peak discharge	= 3.034 cfs	
Storm frequency	= 5 yrs		Time to peak	= 722 min	
Time interval	= 2 min		Hyd. volume	= 8,631 cuft	
Drainage area	= 1.210 ac		Curve number	= 91*	
Basin Slope	= 0.0 %		Hydraulic length	= 0 ft	
Tc method	= User		Time of conc. (Tc)	= 15.00 min	
Total precip.	= 2.94 in		Distribution	= Type II	
Storm duration	= 24 hrs		Shape factor	= 484	

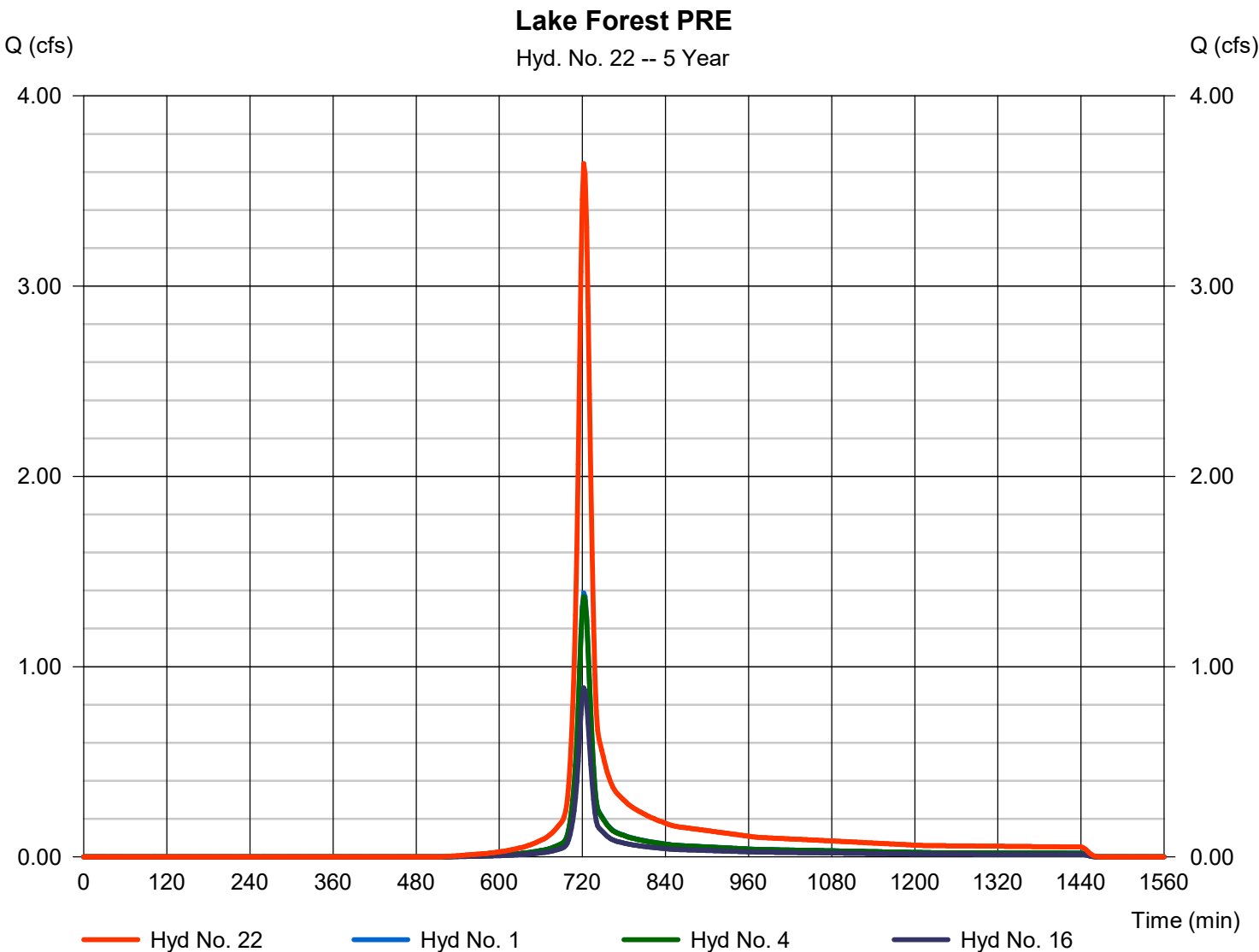* Composite (Area/CN) = [(0.590 x 98) + (0.620 x 84)] / 1.210

Villa 8 & 9 Road Post

Hyd. No. 20 -- 5 Year
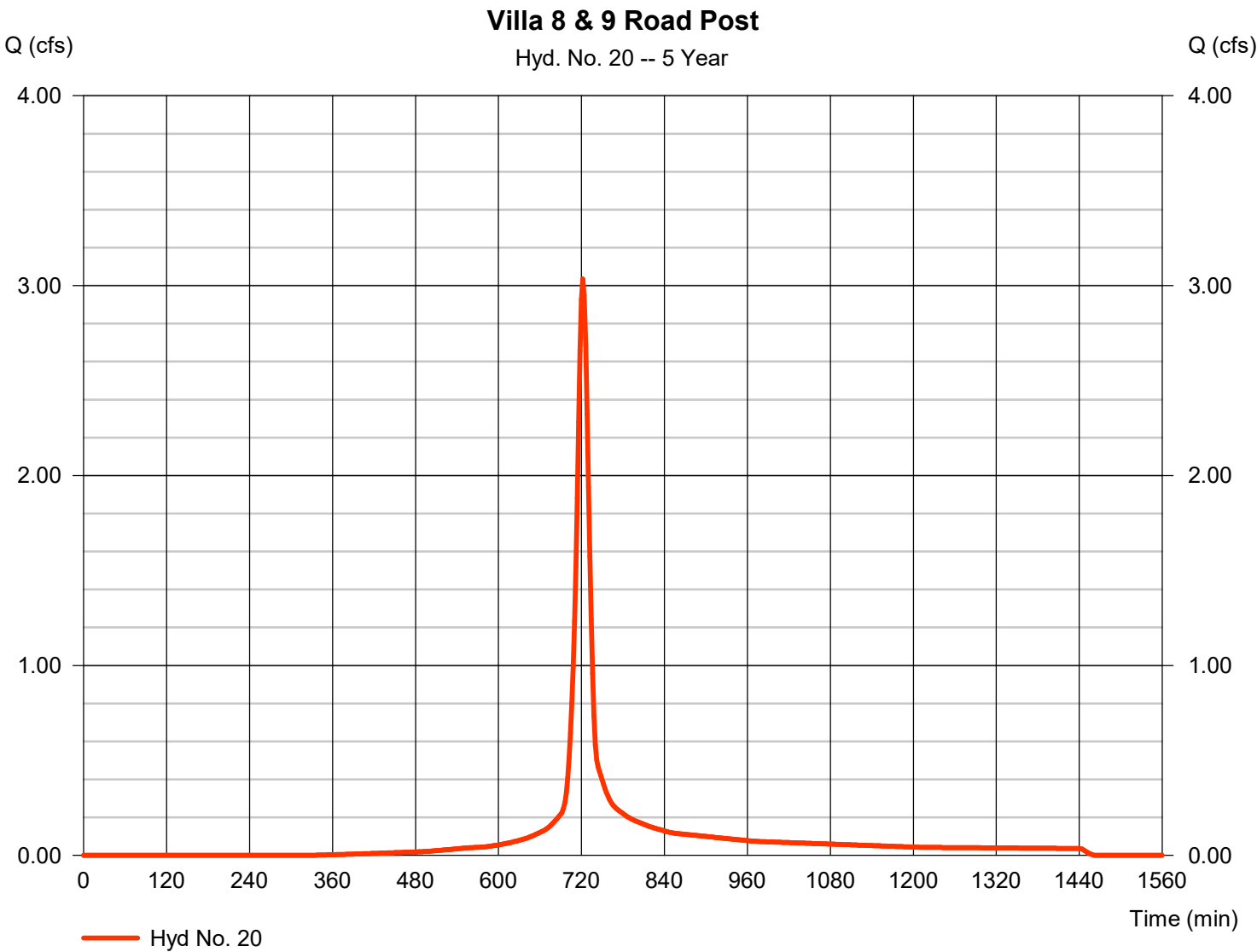
Hyd No. 20

Hydrograph Report

Hyd. No. 22

Lake Forest PRE

Hydrograph type	= Combine	Peak discharge	= 3.645 cfs
Storm frequency	= 5 yrs	Time to peak	= 722 min
Time interval	= 2 min	Hyd. volume	= 10,229 cuft
Inflow hyds.	= 1, 4, 16	Contrib. drain. area	= 1.970 ac

Lake Forest PRE

Hyd. No. 22 -- 5 Year

Hydrograph Report

Hyd. No. 23

Lake Forest POST

Hydrograph type	= Combine		Peak discharge	= 4.376 cfs
Storm frequency	= 5 yrs		Time to peak	= 722 min
Time interval	= 2 min		Hyd. volume	= 12,312 cuft
Inflow hyds.	= 2, 5, 17		Contrib. drain. area	= 1.960 ac

Lake Forest POST

Hyd. No. 23 -- 5 Year

Legend: Hyd No. 23   Hyd No. 2   Hyd No. 5   Hyd No. 17
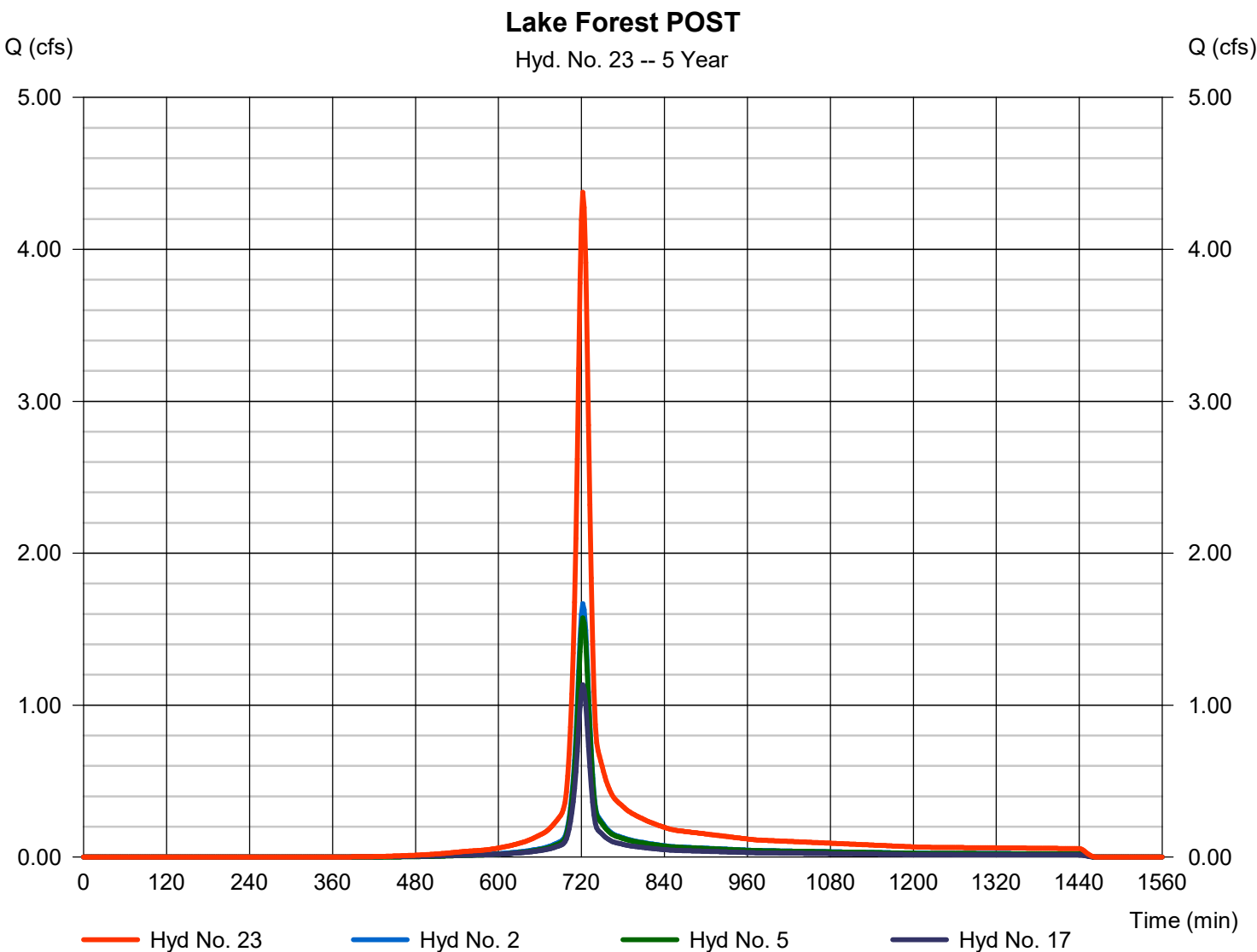
Hydrograph Report

Hyd. No. 25

Southwest PRE

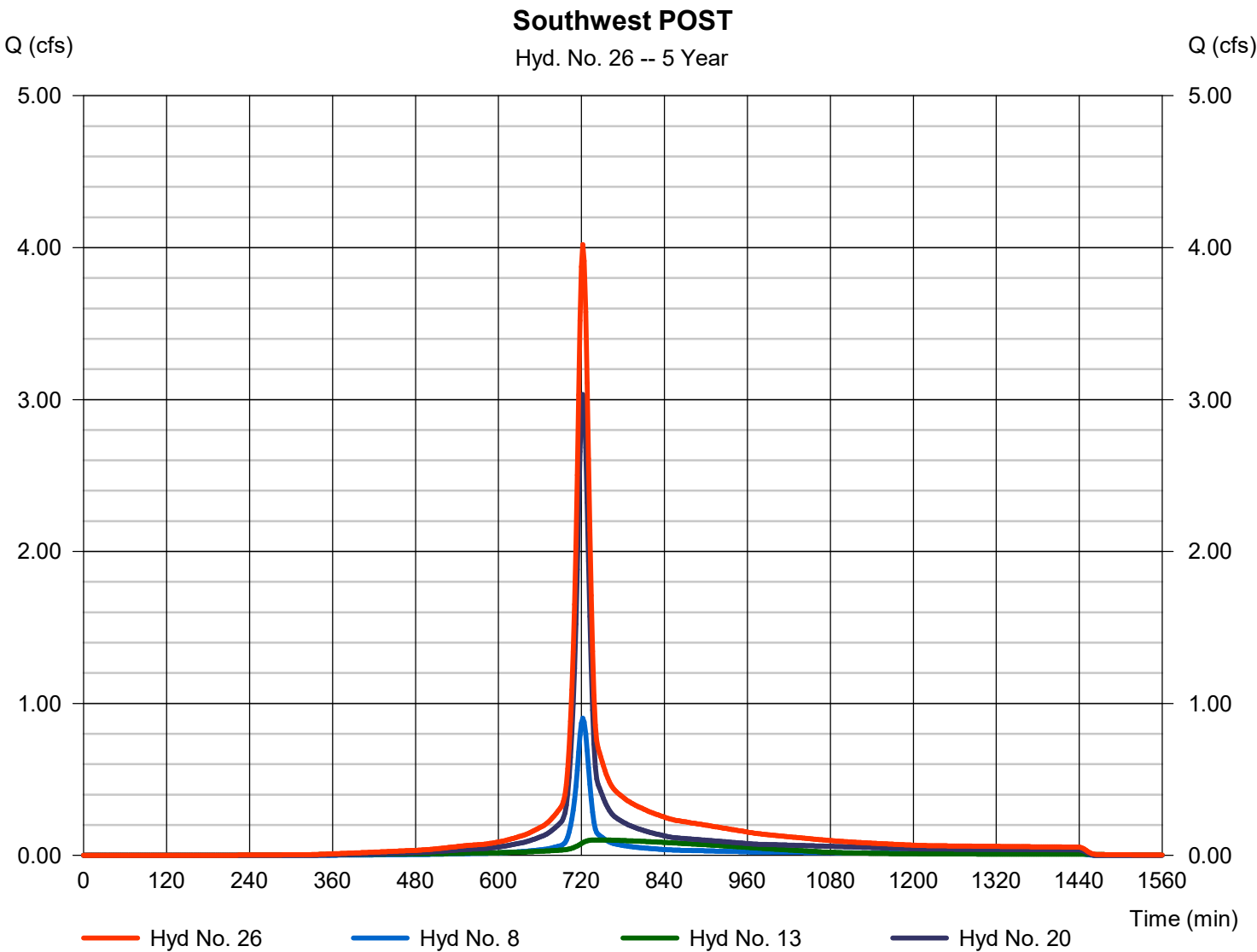|				
Hydrograph type	= Combine	Peak discharge	= 4.088 cfs
Storm frequency	= 5 yrs	Time to peak	= 722 min
Time interval	= 2 min	Hyd. volume	= 11,467 cuft
Inflow hyds.	= 7, 10, 19	Contrib. drain. area	= 2.150 ac

Southwest PRE

Hyd. No. 25 -- 5 Year

Hyd No. 25   Hyd No. 7   Hyd No. 10   Hyd No. 19
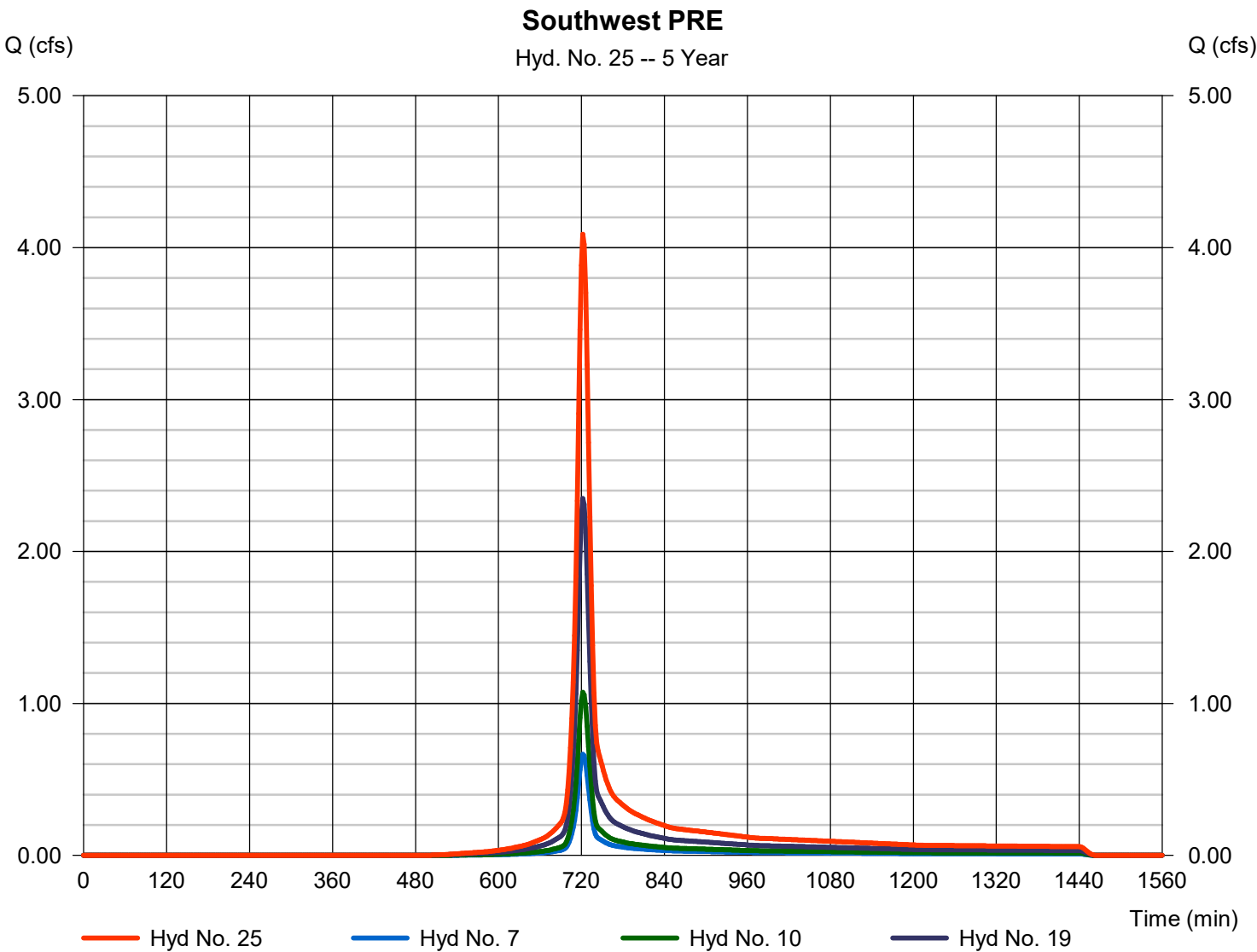
Hydrograph Report

Hyd. No. 26

Southwest POST

Hydrograph type	= Combine		Peak discharge	= 4.020 cfs
Storm frequency	= 5 yrs		Time to peak	= 722 min
Time interval	= 2 min		Hyd. volume	= 13,292 cuft
Inflow hyds.	= 8, 13, 20		Contrib. drain. area	= 1.570 ac

Southwest POST

Hyd. No. 26 -- 5 Year

Hydrograph Report

Monday, 06 / 10 / 2024

Hyd. No. 28

TOTAL

Hydrograph type	= Combine	Peak discharge	= 7.733 cfs
Storm frequency	= 5 yrs	Time to peak	= 722 min
Time interval	= 2 min	Hyd. volume	= 21,696 cuft
Inflow hyds.	= 22, 25	Contrib. drain. area	= 0.000 ac

TOTAL
Hyd. No. 28 -- 5 Year

Hyd No. 28   Hyd No. 22   Hyd No. 25

Hydrograph Report

Monday, 06 / 10 / 2024
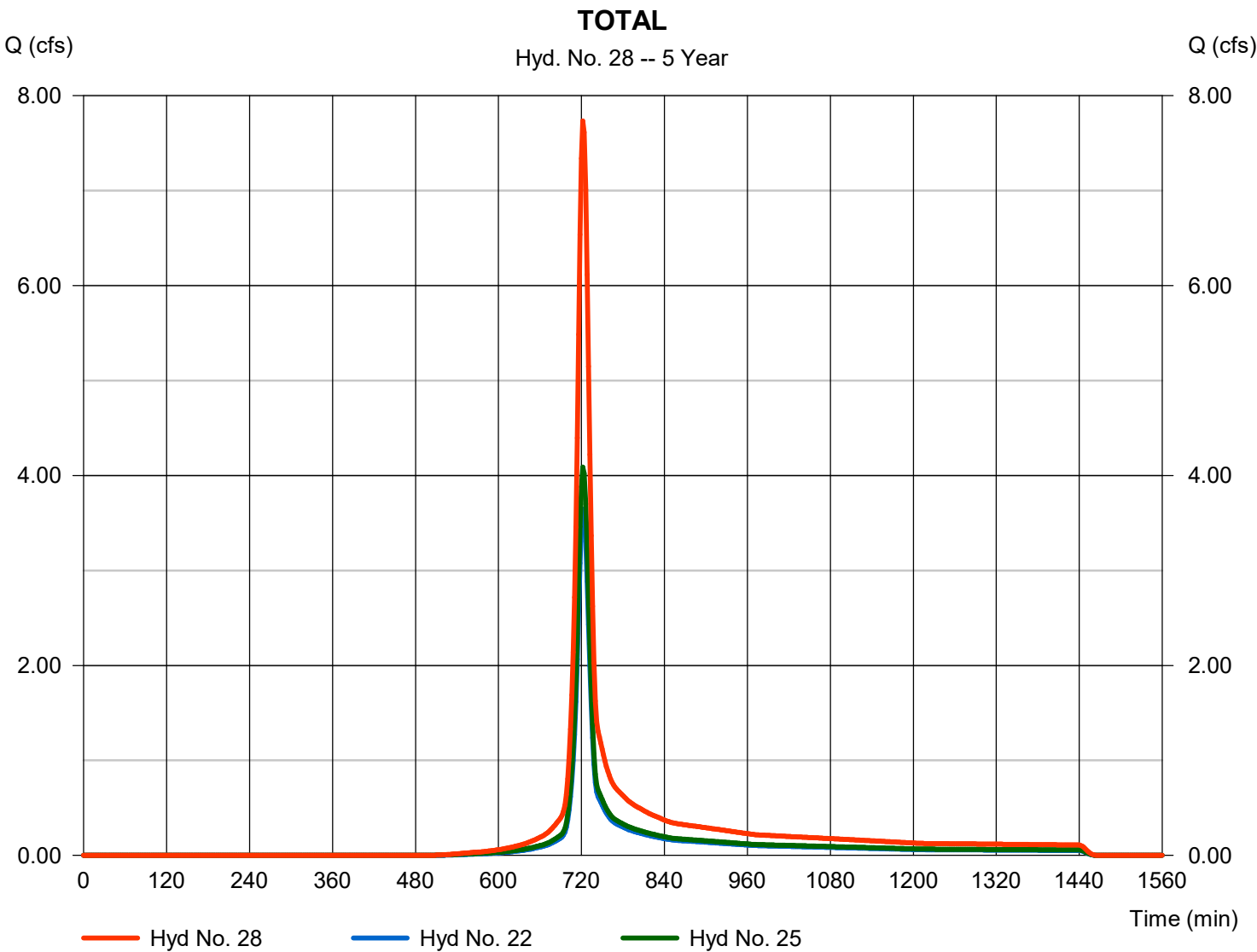
Hyd. No. 29

Total Post

Hydrograph type	= Combine	Peak discharge	= 8.396 cfs
Storm frequency	= 5 yrs	Time to peak	= 722 min
Time interval	= 2 min	Hyd. volume	= 25,604 cuft
Inflow hyds.	= 23, 26	Contrib. drain. area	= 0.000 ac
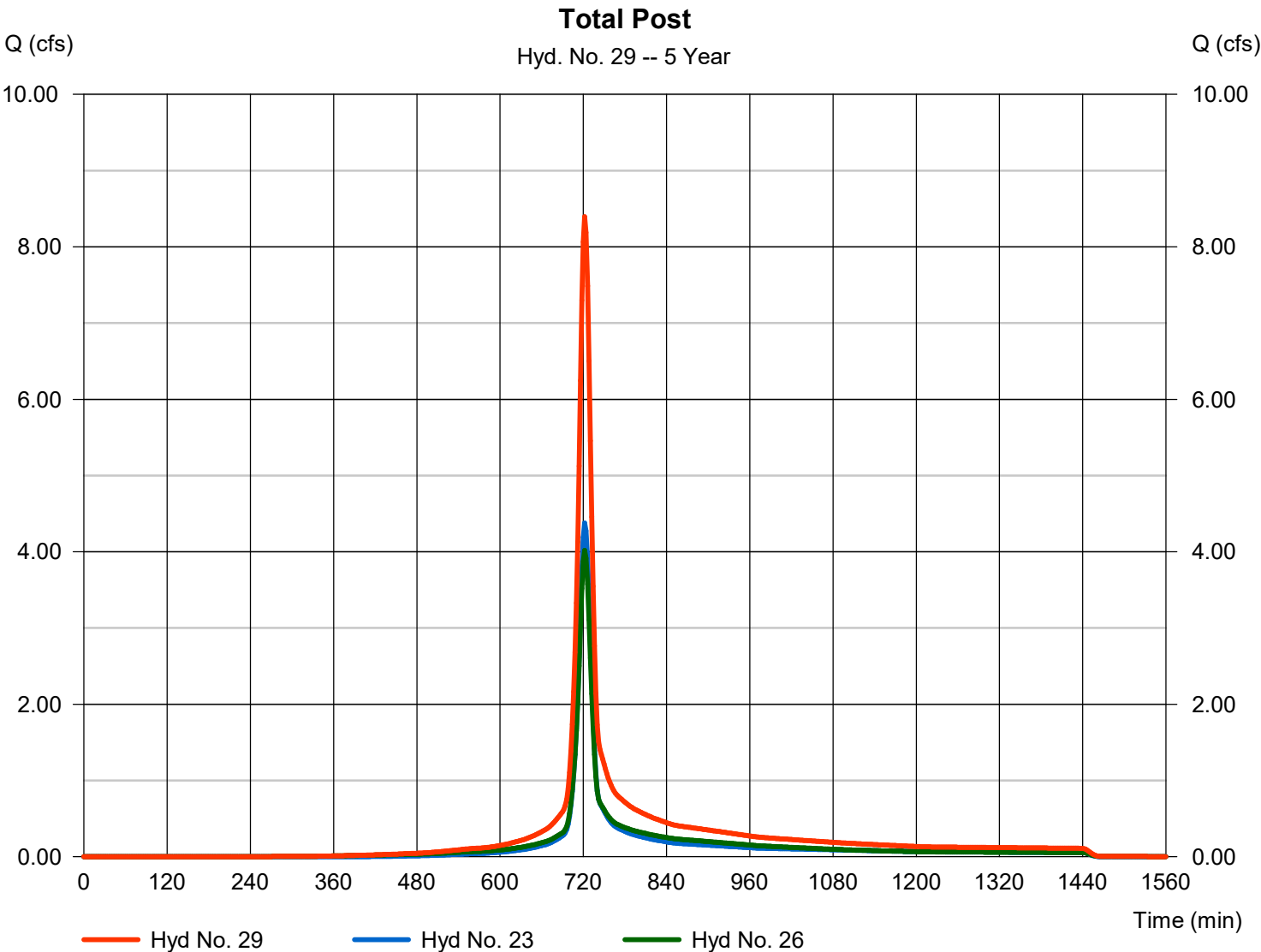
Total Post

Hyd. No. 29 -- 5 Year

— Hyd No. 29   — Hyd No. 23   — Hyd No. 26

Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 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	1.761	2	722	4,936	------	------	------	Villa 1 PRE
2	SCS Runoff	2.056	2	722	5,805	------	------	------	Villa 1 POST
4	SCS Runoff	1.738	2	722	4,870	------	------	------	Villa 2 PRE
5	SCS Runoff	1.956	2	722	5,504	------	------	------	Villa 2 Post
7	SCS Runoff	0.845	2	722	2,369	------	------	------	Villa 3 PRE
8	SCS Runoff	1.091	2	722	3,129	------	------	------	Villa 3 Post
10	SCS Runoff	1.362	2	722	3,817	------	------	------	Villa 4 PRE
11	SCS Runoff	0.845	2	722	2,369	------	------	------	Villa 4 Post Runoff
12	SCS Runoff	0.783	2	722	2,474	------	------	------	Villa 4 Post Detention
13	Reservoir	0.109	2	744	2,458	12	1013.42	1,056	Villa 4
14	Combine	1.628	2	722	4,843	11, 12,	------	------	Total Villa 4 Post
16	SCS Runoff	1.127	2	722	3,159	------	------	------	Villa 5 PRE
17	SCS Runoff	1.380	2	722	3,932	------	------	------	Villa 5 Post
19	SCS Runoff	2.960	2	722	8,300	------	------	------	Villa 8 & 9 & road PRE
20	SCS Runoff	3.668	2	722	10,518	------	------	------	Villa 8 & 9 Road Post
22	Combine	4.626	2	722	12,966	1, 4, 16,	------	------	Lake Forest PRE
23	Combine	5.392	2	722	15,241	2, 5, 17,	------	------	Lake Forest POST
25	Combine	5.167	2	722	14,487	7, 10, 19,	------	------	Southwest PRE
26	Combine	4.849	2	722	16,105	8, 13, 20,	------	------	Southwest POST
28	Combine	9.793	2	722	27,453	22, 25,	------	------	TOTAL
29	Combine	10.24	2	722	31,346	23, 26,	------	------	Total Post

2023-186-Ponds.gpw	Return Period: 10 Year	Monday, 06 / 10 / 2024

Hydrograph Report

Monday, 06 / 10 / 2024

Hyd. No. 1

Villa 1 PRE

Hydrograph type	= SCS Runoff	Peak discharge	= 1.761 cfs
Storm frequency	= 10 yrs	Time to peak	= 722 min
Time interval	= 2 min	Hyd. volume	= 4,936 cuft
Drainage area	= 0.750 ac	Curve number	= 84
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 15.00 min
Total precip.	= 3.41 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

Villa 1 PRE

Hyd. No. 1 -- 10 Year

Hydrograph Report

Monday, 06 / 10 / 2024
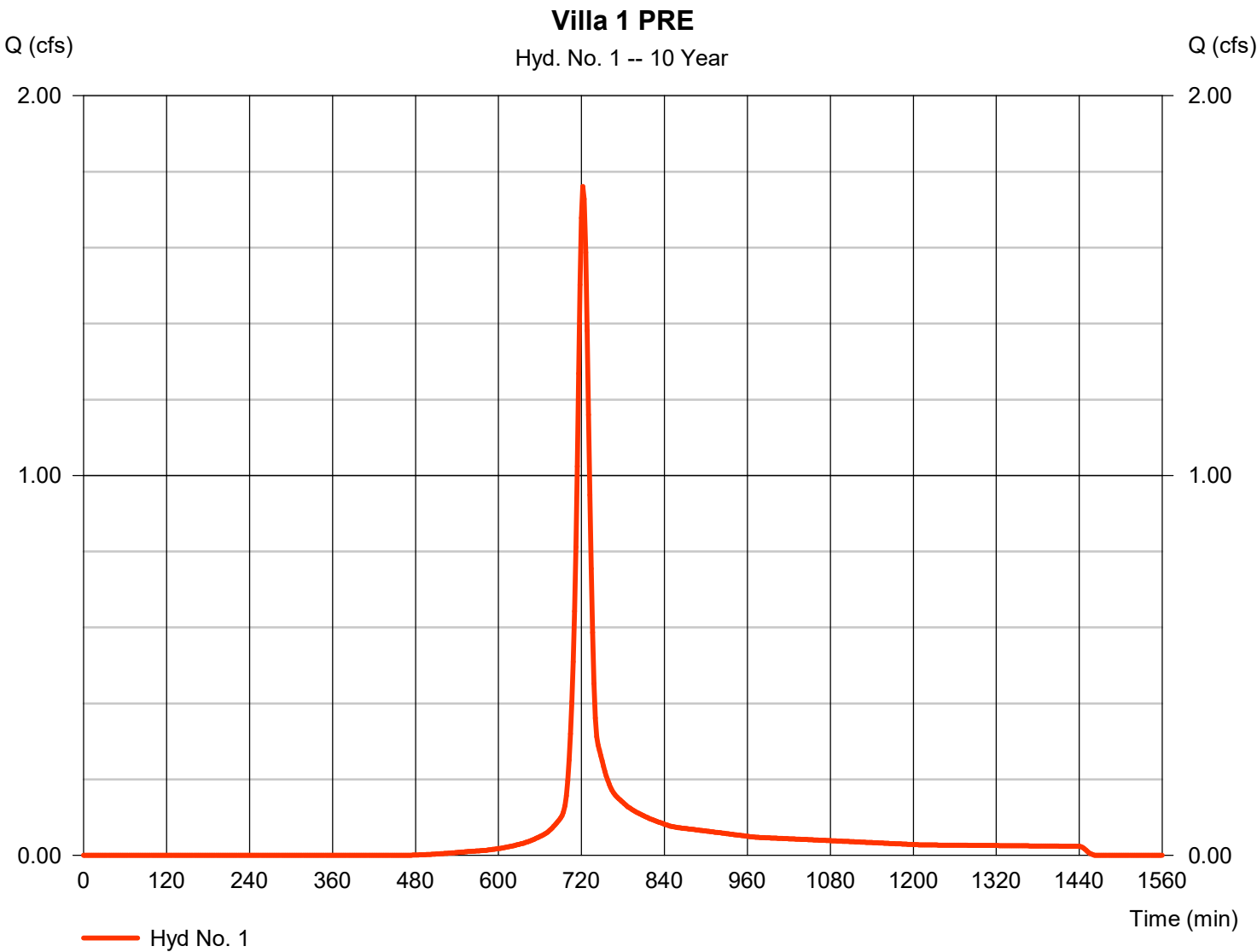
Hyd. No. 2

Villa 1 POST

Hydrograph type	= SCS Runoff		Peak discharge	= 2.056 cfs
Storm frequency	= 10 yrs		Time to peak	= 722 min
Time interval	= 2 min		Hyd. volume	= 5,805 cuft
Drainage area	= 0.750 ac		Curve number	= 88*
Basin Slope	= 0.0 %		Hydraulic length	= 0 ft
Tc method	= User		Time of conc. (Tc)	= 15.00 min
Total precip.	= 3.41 in		Distribution	= Type II
Storm duration	= 24 hrs		Shape factor	= 484

* Composite (Area/CN) = [(0.220 x 98) + (0.530 x 84)] / 0.750

Villa 1 POST

Hyd. No. 2 -- 10 Year

Legend: — Hyd No. 2

Hydrograph Report

Monday, 06 / 10 / 2024
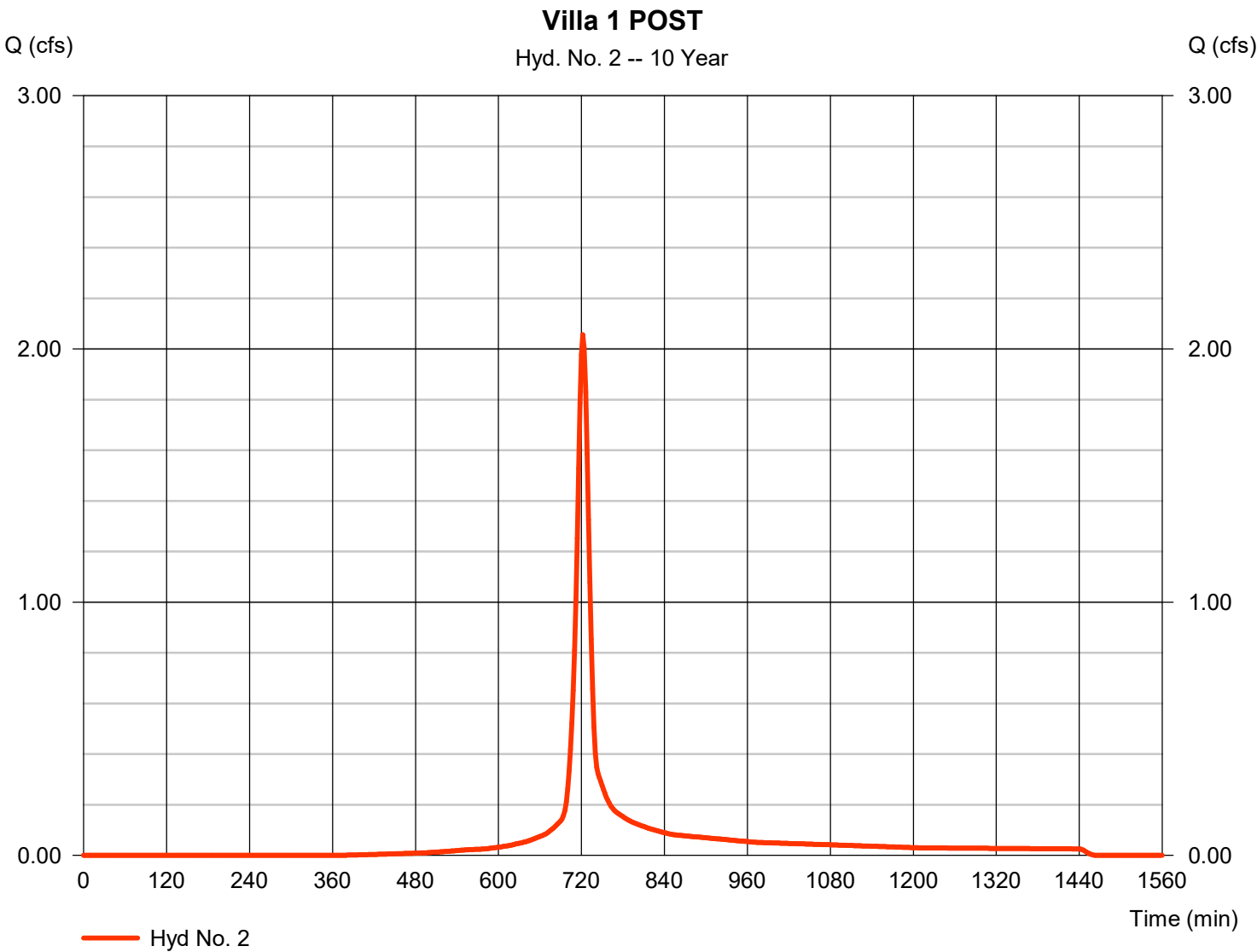
Hyd. No. 4

Villa 2 PRE

Hydrograph type	= SCS Runoff	Peak discharge	= 1.738 cfs
Storm frequency	= 10 yrs	Time to peak	= 722 min
Time interval	= 2 min	Hyd. volume	= 4,870 cuft
Drainage area	= 0.740 ac	Curve number	= 84
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 15.00 min
Total precip.	= 3.41 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

Villa 2 PRE

Hyd. No. 4 -- 10 Year

Q (cfs)

—— Hyd No. 4

Time (min)
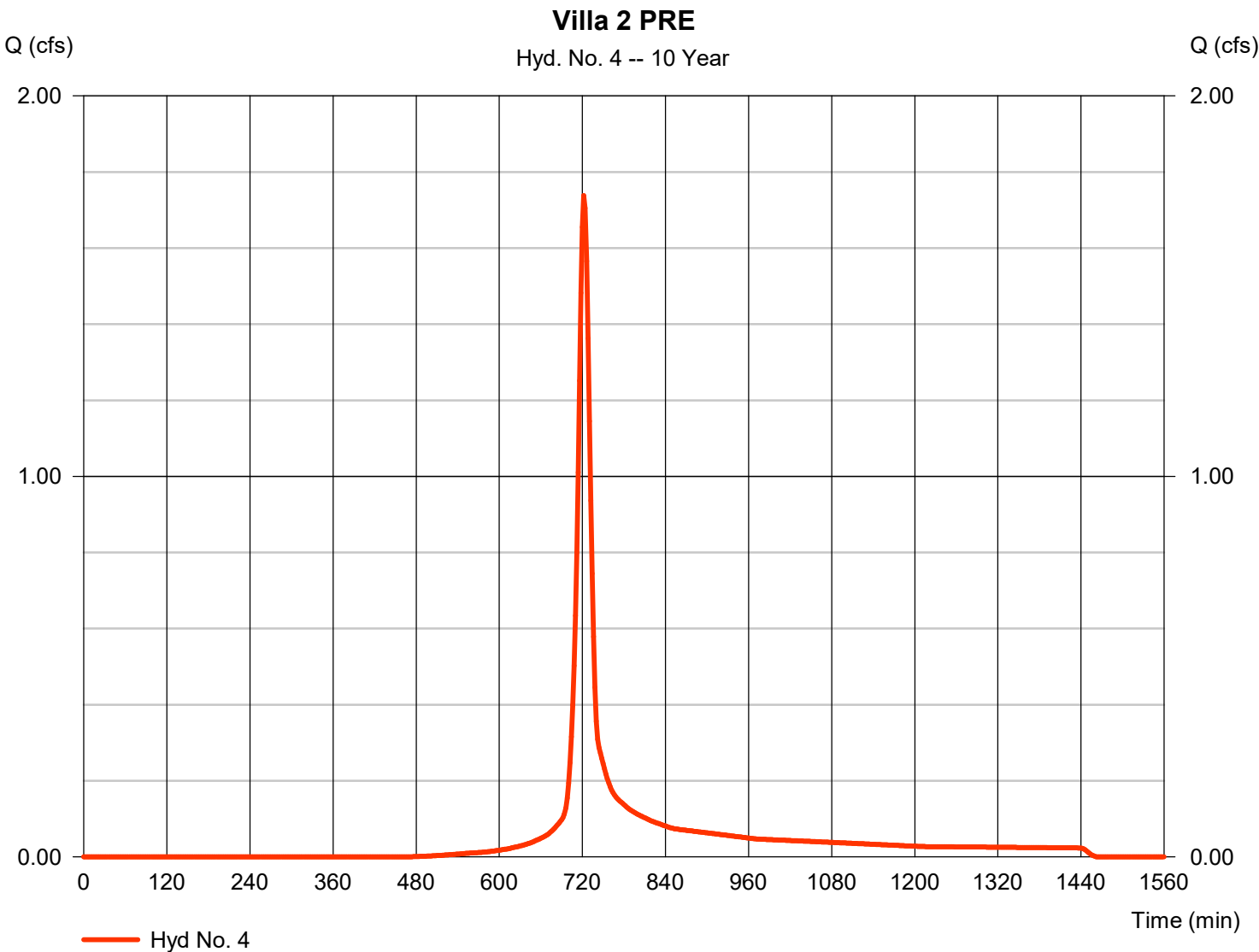
Hydrograph Report

Hyd. No. 5

Villa 2 Post

Hydrograph type	= SCS Runoff		Peak discharge	= 1.956 cfs	
Storm frequency	= 10 yrs		Time to peak	= 722 min	
Time interval	= 2 min		Hyd. volume	= 5,504 cuft	
Drainage area	= 0.740 ac		Curve number	= 87*	
Basin Slope	= 0.0 %		Hydraulic length	= 0 ft	
Tc method	= User		Time of conc. (Tc)	= 15.00 min	
Total precip.	= 3.41 in		Distribution	= Type II	
Storm duration	= 24 hrs		Shape factor	= 484	

* Composite (Area/CN) = [(0.180 x 98) + (0.560 x 84)] / 0.740

Villa 2 Post

Hyd. No. 5 -- 10 Year

Hyd No. 5

Hydrograph Report

Hyd. No. 7

Villa 3 PRE

Hydrograph type	= SCS Runoff	Peak discharge	= 0.845 cfs
Storm frequency	= 10 yrs	Time to peak	= 722 min
Time interval	= 2 min	Hyd. volume	= 2,369 cuft
Drainage area	= 0.360 ac	Curve number	= 84
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 15.00 min
Total precip.	= 3.41 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

Villa 3 PRE

Hyd. No. 7 -- 10 Year

Q (cfs)

Time (min)

Hyd No. 7

Hydrograph Report

Hyd. No. 8

Villa 3 Post

Hydrograph type	= SCS Runoff	Peak discharge	= 1.091 cfs
Storm frequency	= 10 yrs	Time to peak	= 722 min
Time interval	= 2 min	Hyd. volume	= 3,129 cuft
Drainage area	= 0.360 ac	Curve number	= 91*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 15.00 min
Total precip.	= 3.41 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.180 x 98) + (0.180 x 84)] / 0.360

Villa 3 Post

Hyd. No. 8 -- 10 Year

Hydrograph Report

Monday, 06 / 10 / 2024
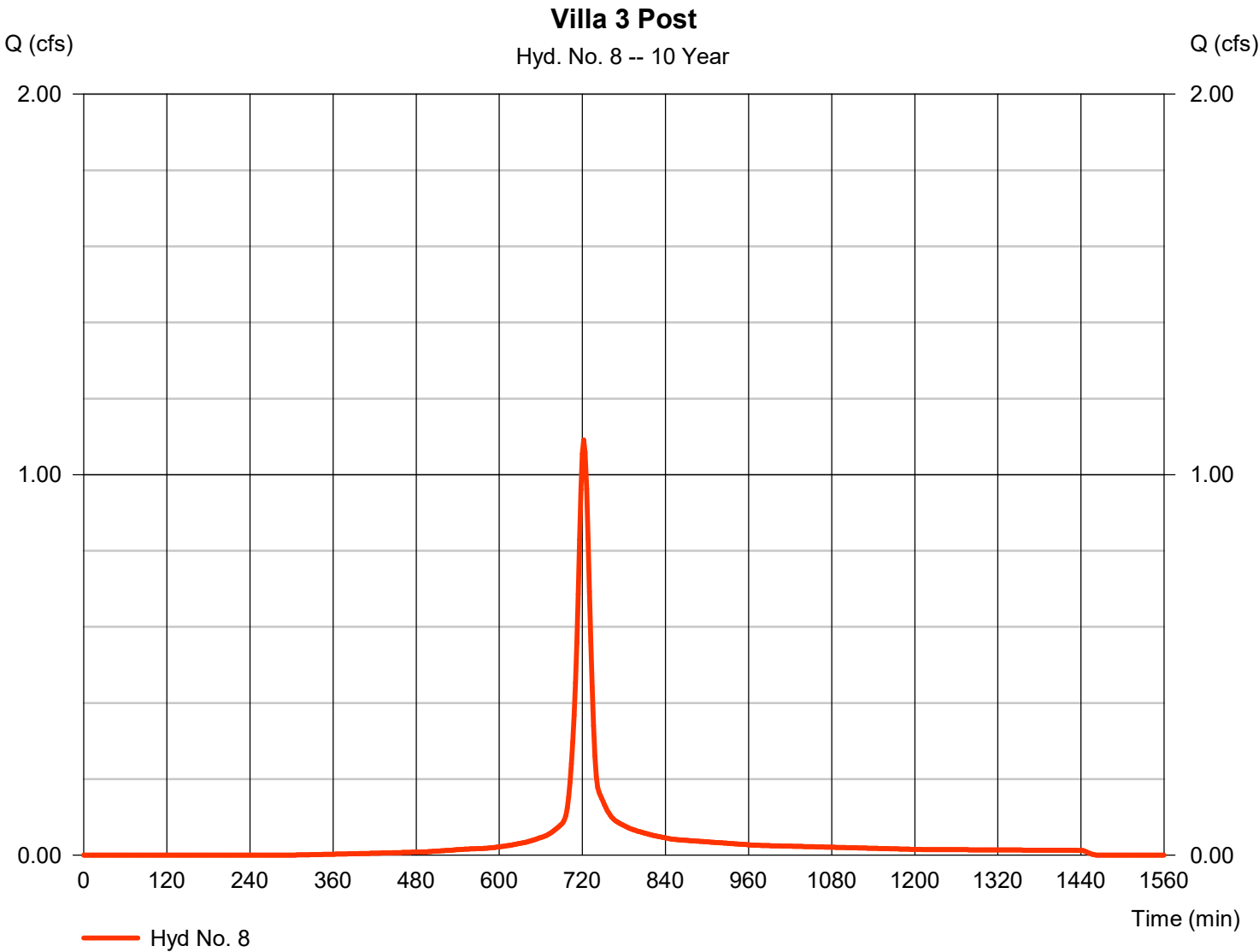
Hyd. No. 10

Villa 4 PRE

Hydrograph type	= SCS Runoff	Peak discharge	= 1.362 cfs
Storm frequency	= 10 yrs	Time to peak	= 722 min
Time interval	= 2 min	Hyd. volume	= 3,817 cuft
Drainage area	= 0.580 ac	Curve number	= 84
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 15.00 min
Total precip.	= 3.41 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

Villa 4 PRE

Hyd. No. 10 -- 10 Year

Hydrograph Report

Monday, 06 / 10 / 2024

Hyd. No. 11

Villa 4 Post Runoff

Hydrograph type	= SCS Runoff	Peak discharge	= 0.845 cfs
Storm frequency	= 10 yrs	Time to peak	= 722 min
Time interval	= 2 min	Hyd. volume	= 2,369 cuft
Drainage area	= 0.360 ac	Curve number	= 84*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 15.00 min
Total precip.	= 3.41 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = + (0.360 x 84)] / 0.360

Villa 4 Post Runoff

Hyd. No. 11 -- 10 Year

Hyd No. 11

Hydrograph Report

Hyd. No. 12

Villa 4 Post Detention

Hydrograph type	= SCS Runoff	Peak discharge	= 0.783 cfs
Storm frequency	= 10 yrs	Time to peak	= 722 min
Time interval	= 2 min	Hyd. volume	= 2,474 cuft
Drainage area	= 0.220 ac	Curve number	= 98*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 15.00 min
Total precip.	= 3.41 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.220 x 98)] / 0.220

Villa 4 Post Detention

Hyd. No. 12 -- 10 Year
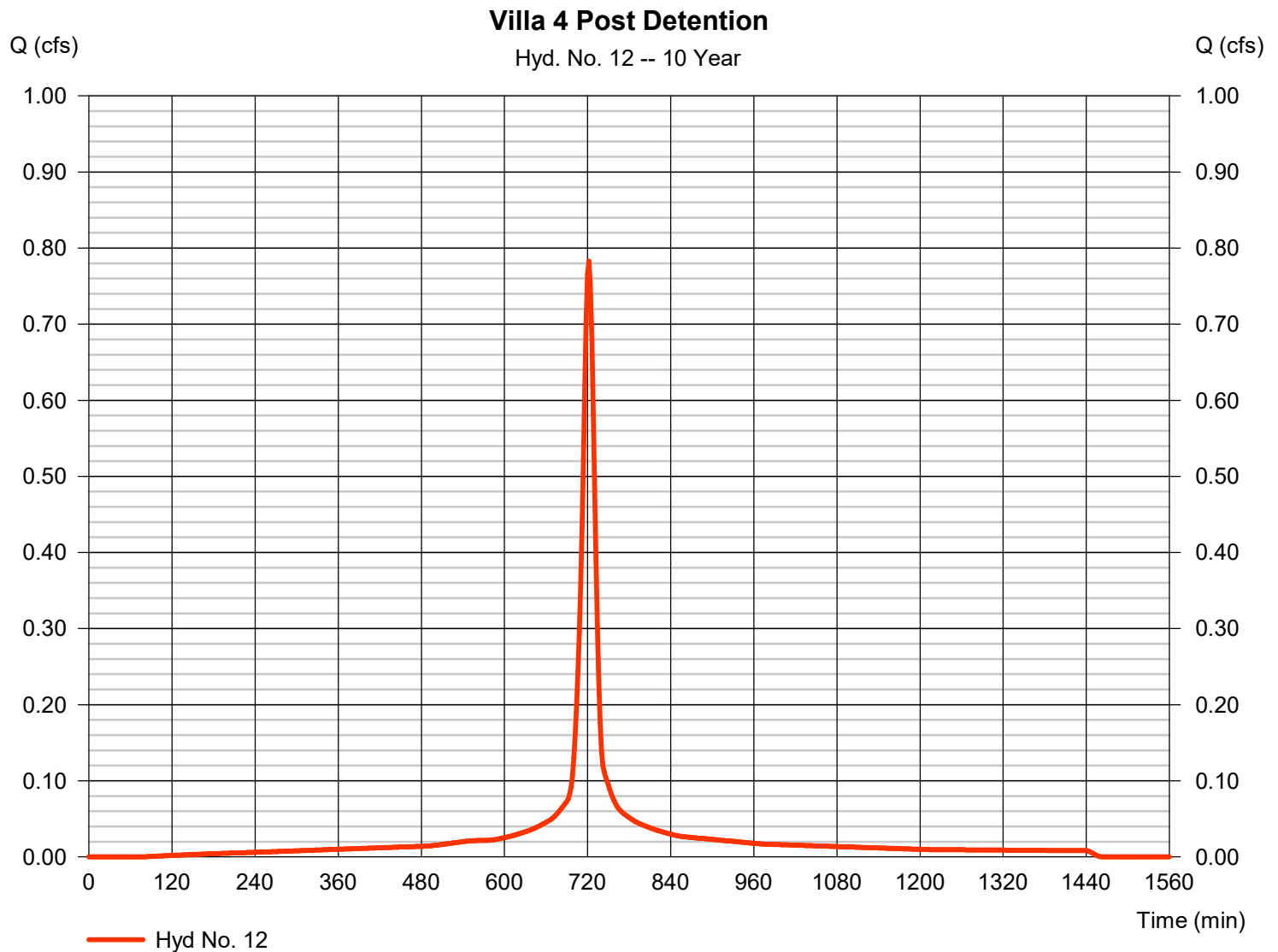
— Hyd No. 12

Hydrograph Report

Hyd. No. 13

Villa 4

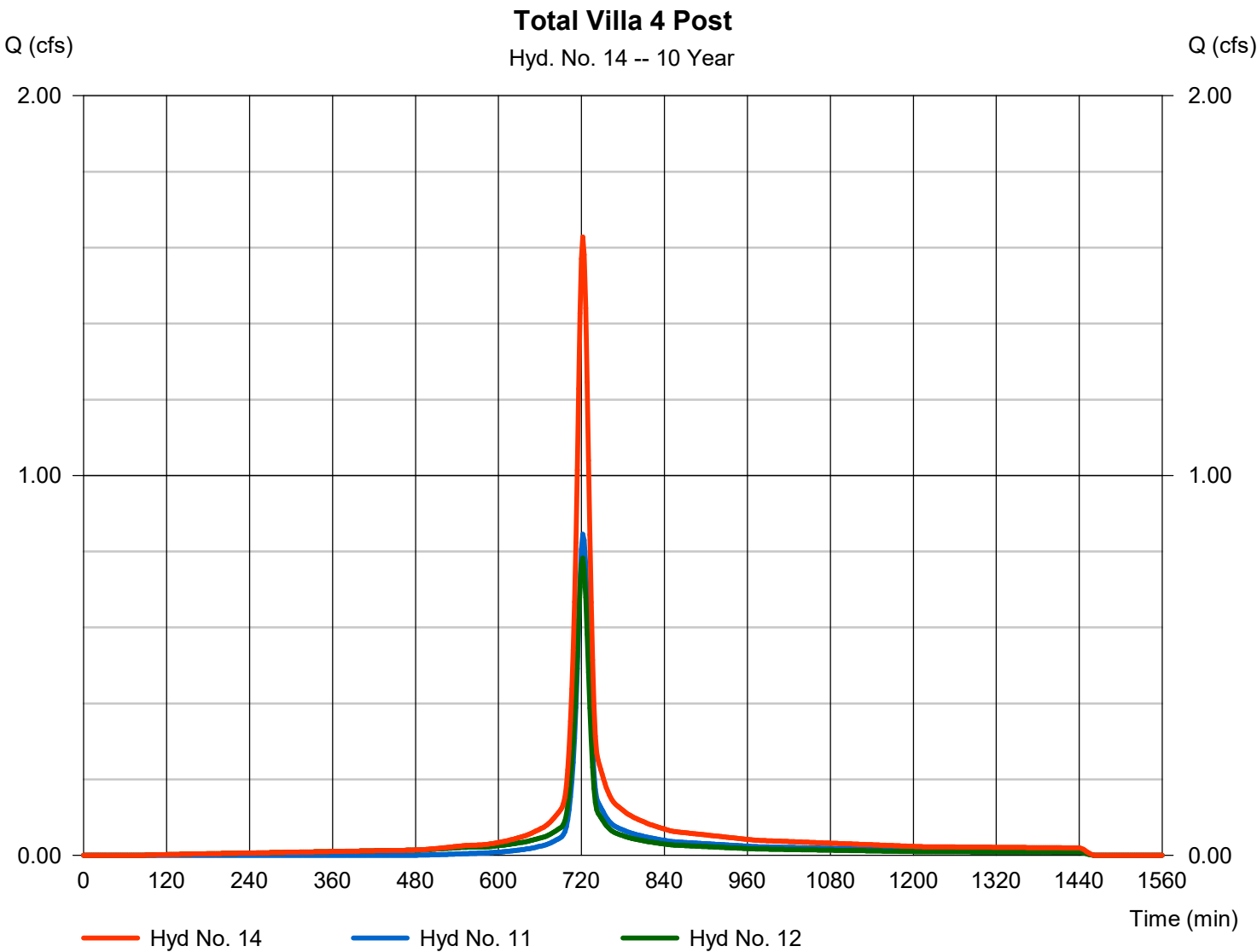|				
Hydrograph type	= Reservoir		Peak discharge	= 0.109 cfs
Storm frequency	= 10 yrs		Time to peak	= 744 min
Time interval	= 2 min		Hyd. volume	= 2,458 cuft
Inflow hyd. No.	= 12 - Villa 4 Post Detention		Max. Elevation	= 1013.42 ft
Reservoir name	= Villa 4		Max. Storage	= 1,056 cuft

Storage Indication method used.

Villa 4

Hyd. No. 13 -- 10 Year

Legend: Hyd No. 13 — Hyd No. 12 — Total storage used = 1,056 cuft

Hydrograph Report

Monday, 06 / 10 / 2024
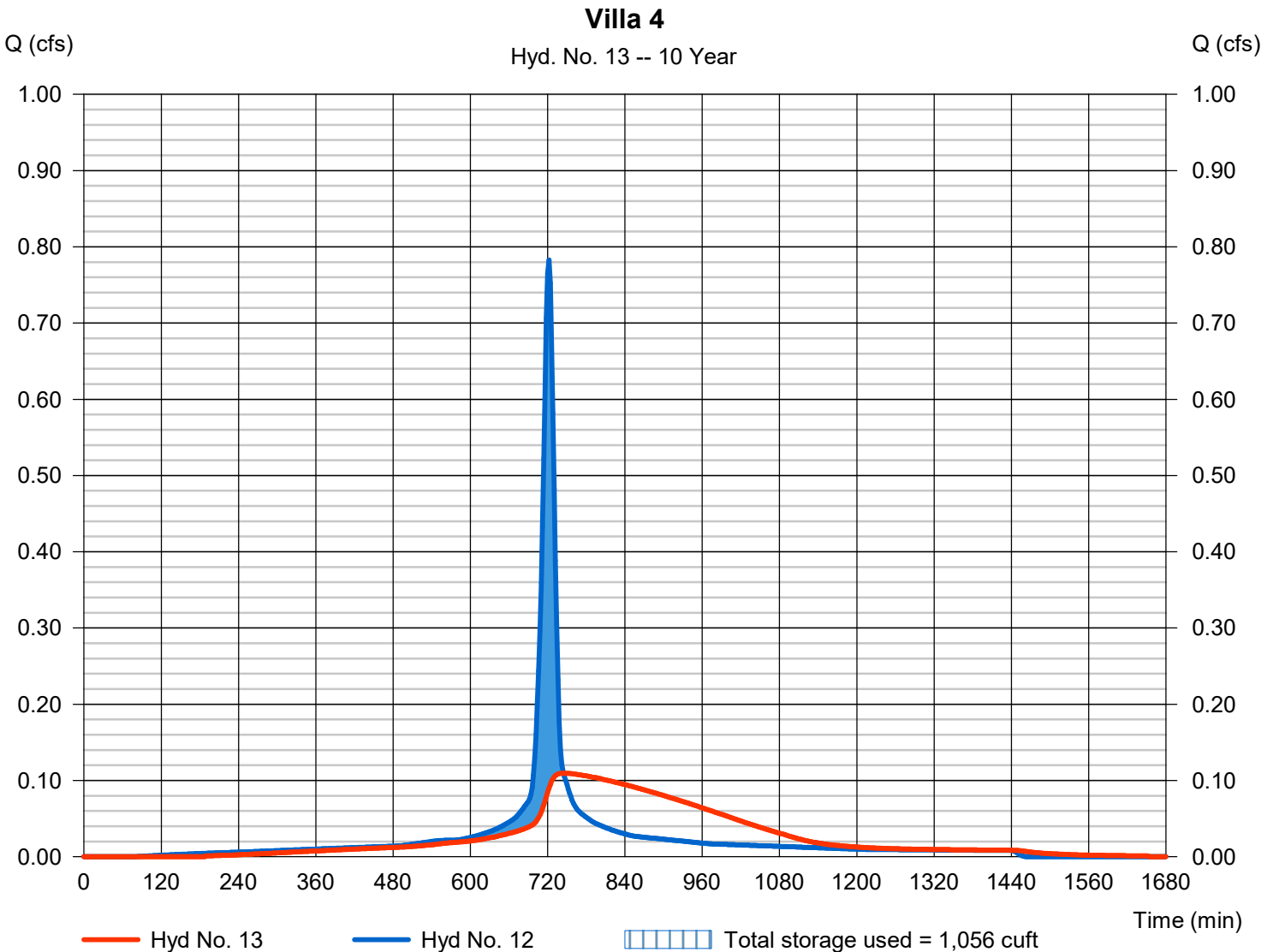
Hyd. No. 14

Total Villa 4 Post

Hydrograph type	= Combine		Peak discharge	= 1.628 cfs
Storm frequency	= 10 yrs		Time to peak	= 722 min
Time interval	= 2 min		Hyd. volume	= 4,843 cuft
Inflow hyds.	= 11, 12		Contrib. drain. area	= 0.580 ac

Total Villa 4 Post

Hyd. No. 14 -- 10 Year

Q (cfs)

— Hyd No. 14   — Hyd No. 11   — Hyd No. 12

Hydrograph Report

Monday, 06 / 10 / 2024

Hyd. No. 16

Villa 5 PRE

Hydrograph type	= SCS Runoff		Peak discharge	= 1.127 cfs
Storm frequency	= 10 yrs		Time to peak	= 722 min
Time interval	= 2 min		Hyd. volume	= 3,159 cuft
Drainage area	= 0.480 ac		Curve number	= 84
Basin Slope	= 0.0 %		Hydraulic length	= 0 ft
Tc method	= User		Time of conc. (Tc)	= 15.00 min
Total precip.	= 3.41 in		Distribution	= Type II
Storm duration	= 24 hrs		Shape factor	= 484

Villa 5 PRE

Hyd. No. 16 -- 10 Year

Hyd No. 16

Hydrograph Report

Monday, 06 / 10 / 2024
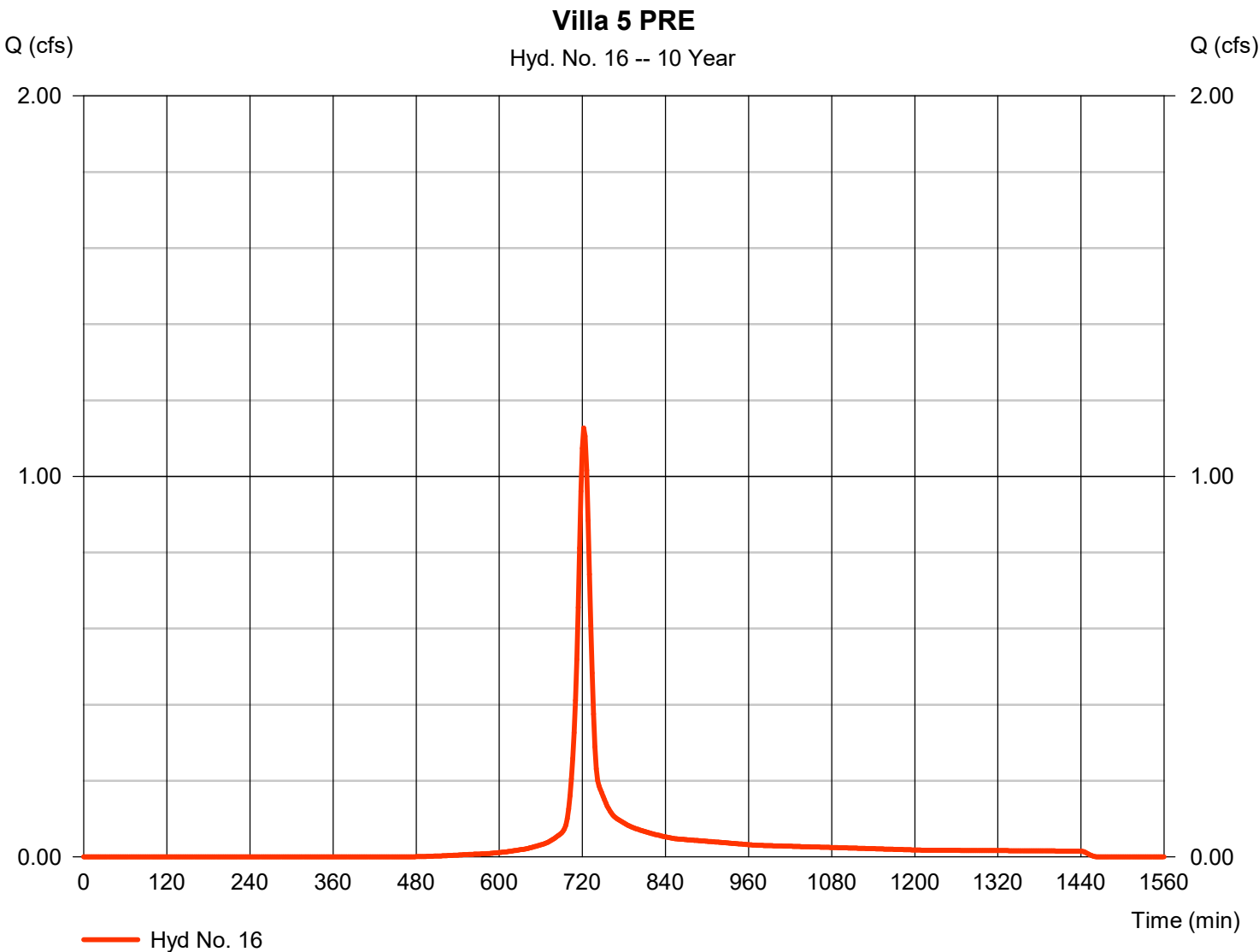
Hyd. No. 17

Villa 5 Post

Hydrograph type	= SCS Runoff		Peak discharge	= 1.380 cfs
Storm frequency	= 10 yrs		Time to peak	= 722 min
Time interval	= 2 min		Hyd. volume	= 3,932 cuft
Drainage area	= 0.470 ac		Curve number	= 90*
Basin Slope	= 0.0 %		Hydraulic length	= 0 ft
Tc method	= User		Time of conc. (Tc)	= 15.00 min
Total precip.	= 3.41 in		Distribution	= Type II
Storm duration	= 24 hrs		Shape factor	= 484

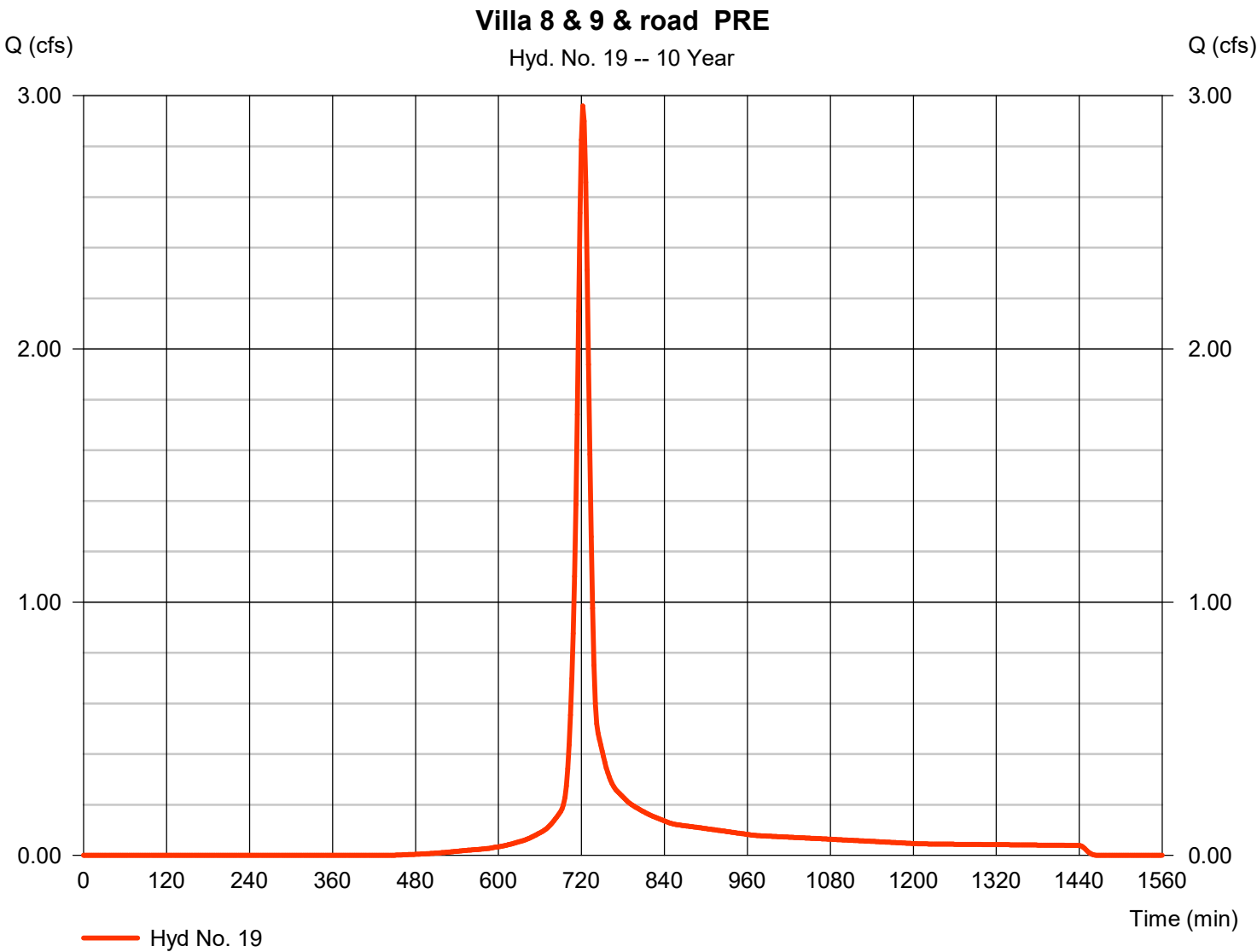* Composite (Area/CN) = [(0.200 x 98) + (0.270 x 84)] / 0.470

Villa 5 Post

Hyd. No. 17 -- 10 Year

Hydrograph Report

Monday, 06 / 10 / 2024
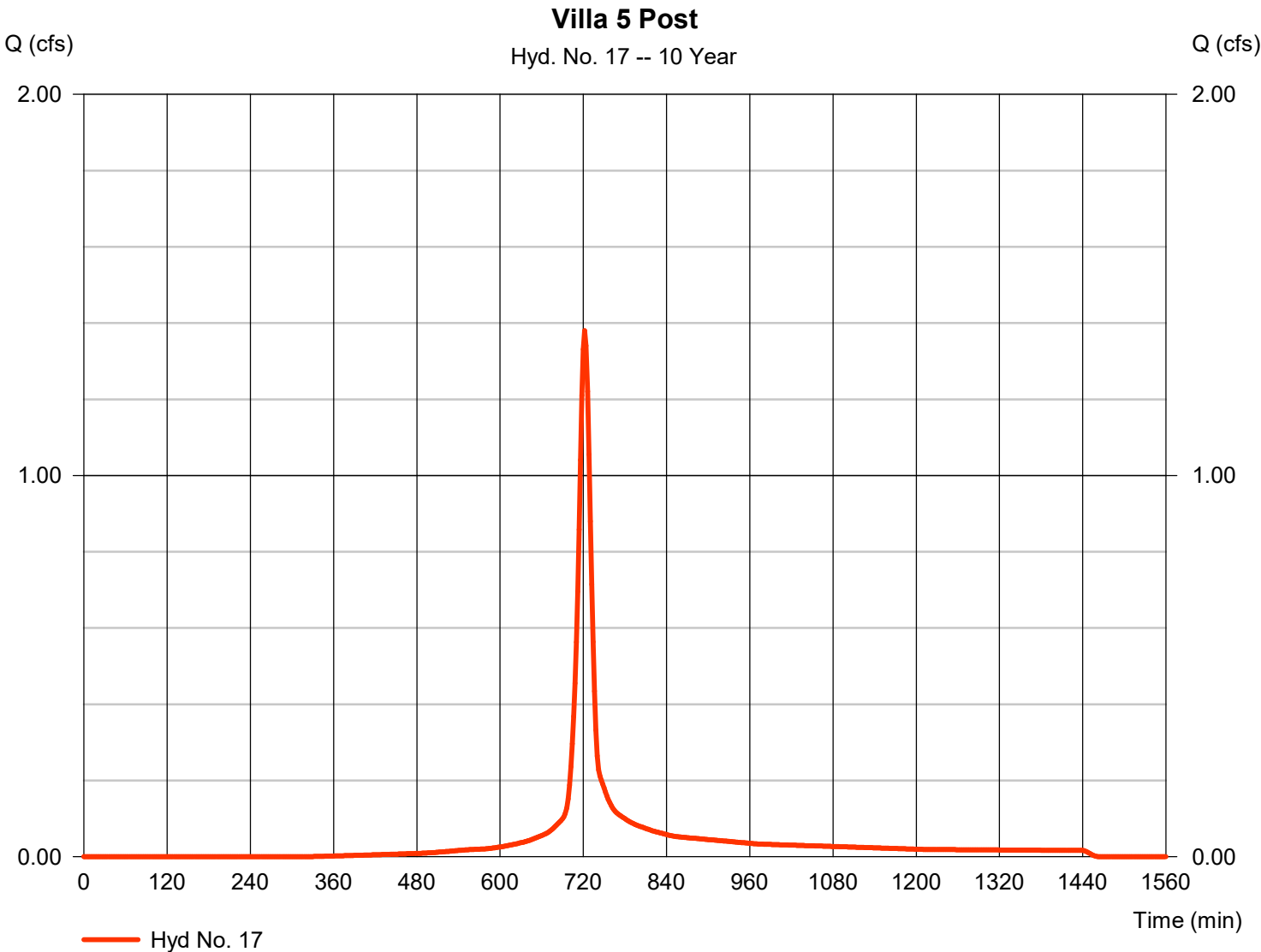
Hyd. No. 19

Villa 8 & 9 & road PRE

Hydrograph type	= SCS Runoff		Peak discharge	= 2.960 cfs
Storm frequency	= 10 yrs		Time to peak	= 722 min
Time interval	= 2 min		Hyd. volume	= 8,300 cuft
Drainage area	= 1.210 ac		Curve number	= 85*
Basin Slope	= 0.0 %		Hydraulic length	= 0 ft
Tc method	= User		Time of conc. (Tc)	= 15.00 min
Total precip.	= 3.41 in		Distribution	= Type II
Storm duration	= 24 hrs		Shape factor	= 484

* Composite (Area/CN) = [(0.360 x 98) + (0.850 x 84)] / 1.210

Villa 8 & 9 & road PRE
Hyd. No. 19 -- 10 Year

Hyd No. 19

Hydrograph Report

Monday, 06 / 10 / 2024

Hyd. No. 20

Villa 8 & 9 Road Post

Hydrograph type	= SCS Runoff		Peak discharge	= 3.668 cfs
Storm frequency	= 10 yrs		Time to peak	= 722 min
Time interval	= 2 min		Hyd. volume	= 10,518 cuft
Drainage area	= 1.210 ac		Curve number	= 91*
Basin Slope	= 0.0 %		Hydraulic length	= 0 ft
Tc method	= User		Time of conc. (Tc)	= 15.00 min
Total precip.	= 3.41 in		Distribution	= Type II
Storm duration	= 24 hrs		Shape factor	= 484

* Composite (Area/CN) = [(0.590 x 98) + (0.620 x 84)] / 1.210

Villa 8 & 9 Road Post
Hyd. No. 20 -- 10 Year

Legend: Hyd No. 20

Hydrograph Report

Monday, 06 / 10 / 2024
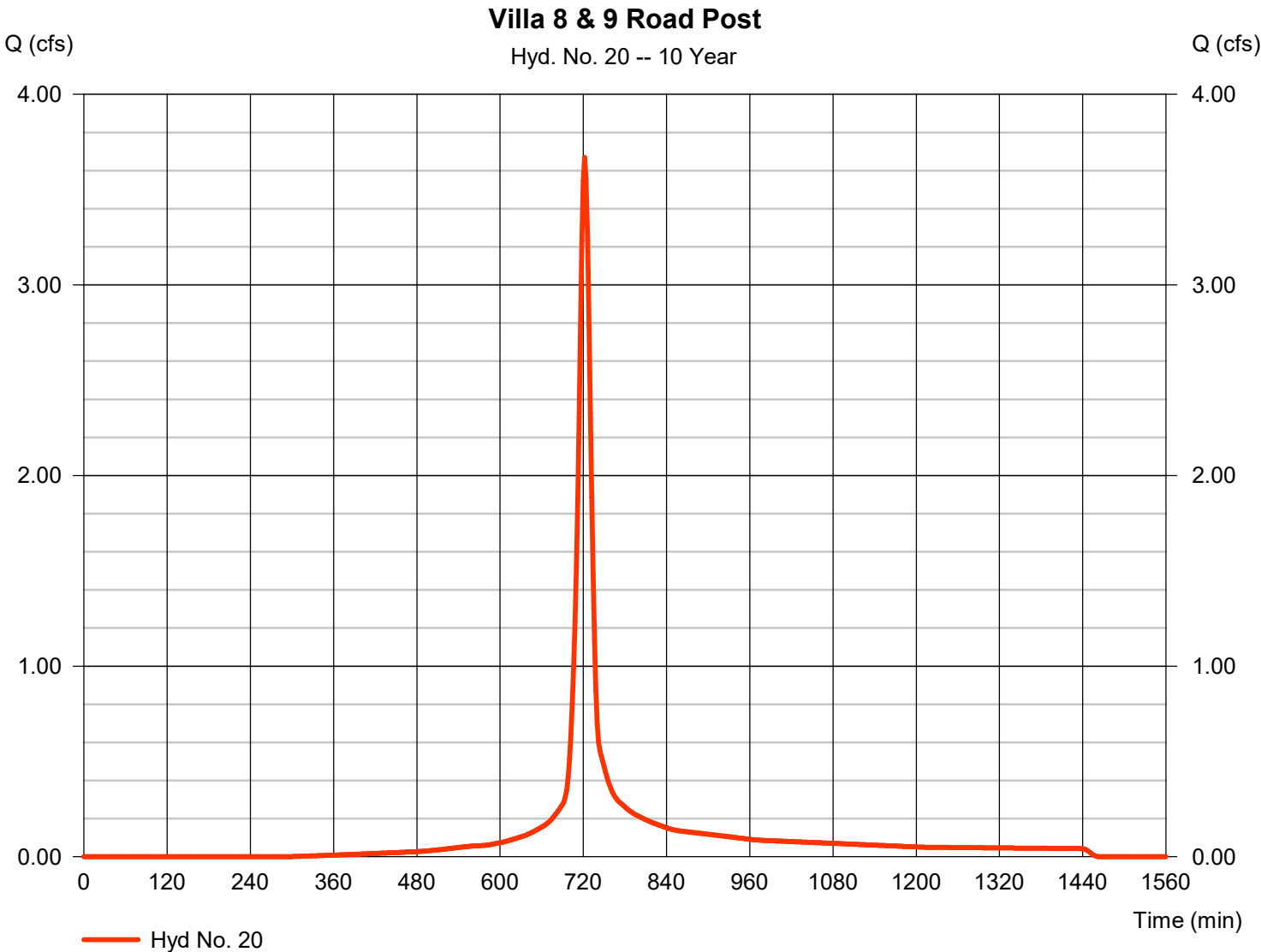
Hyd. No. 22

Lake Forest PRE

Hydrograph type	= Combine	Peak discharge	= 4.626 cfs
Storm frequency	= 10 yrs	Time to peak	= 722 min
Time interval	= 2 min	Hyd. volume	= 12,966 cuft
Inflow hyds.	= 1, 4, 16	Contrib. drain. area	= 1.970 ac

Lake Forest PRE
Hyd. No. 22 -- 10 Year

Hyd No. 22 — Hyd No. 1 — Hyd No. 4 — Hyd No. 16

Hydrograph Report

Monday, 06 / 10 / 2024
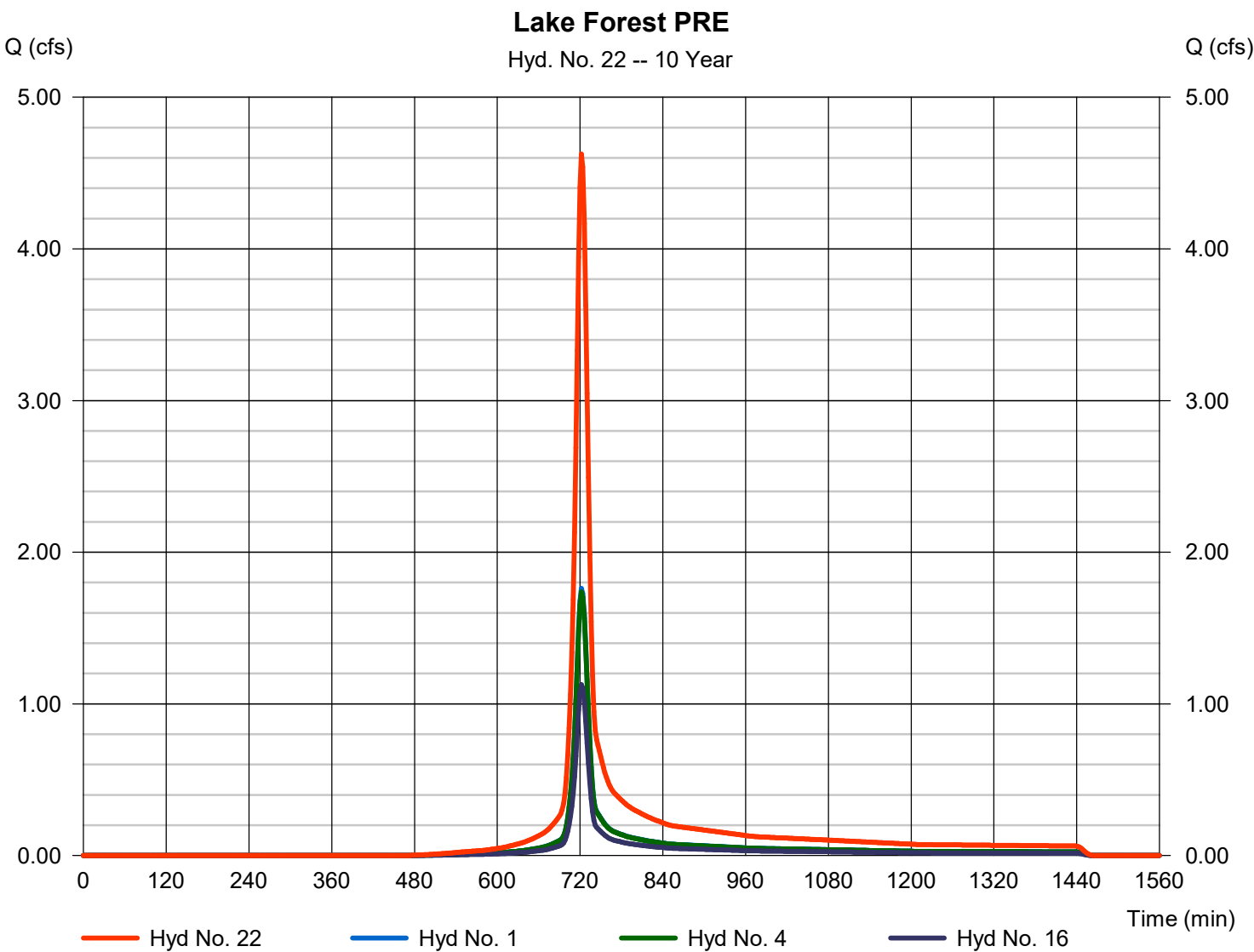
Hyd. No. 23

Lake Forest POST

Hydrograph type	= Combine	Peak discharge	= 5.392 cfs
Storm frequency	= 10 yrs	Time to peak	= 722 min
Time interval	= 2 min	Hyd. volume	= 15,241 cuft
Inflow hyds.	= 2, 5, 17	Contrib. drain. area	= 1.960 ac

Lake Forest POST

Hyd. No. 23 -- 10 Year

Q (cfs) ... Q (cfs) ... Time (min)

Hyd No. 23 — Hyd No. 2 — Hyd No. 5 — Hyd No. 17

Hydrograph Report

Monday, 06 / 10 / 2024
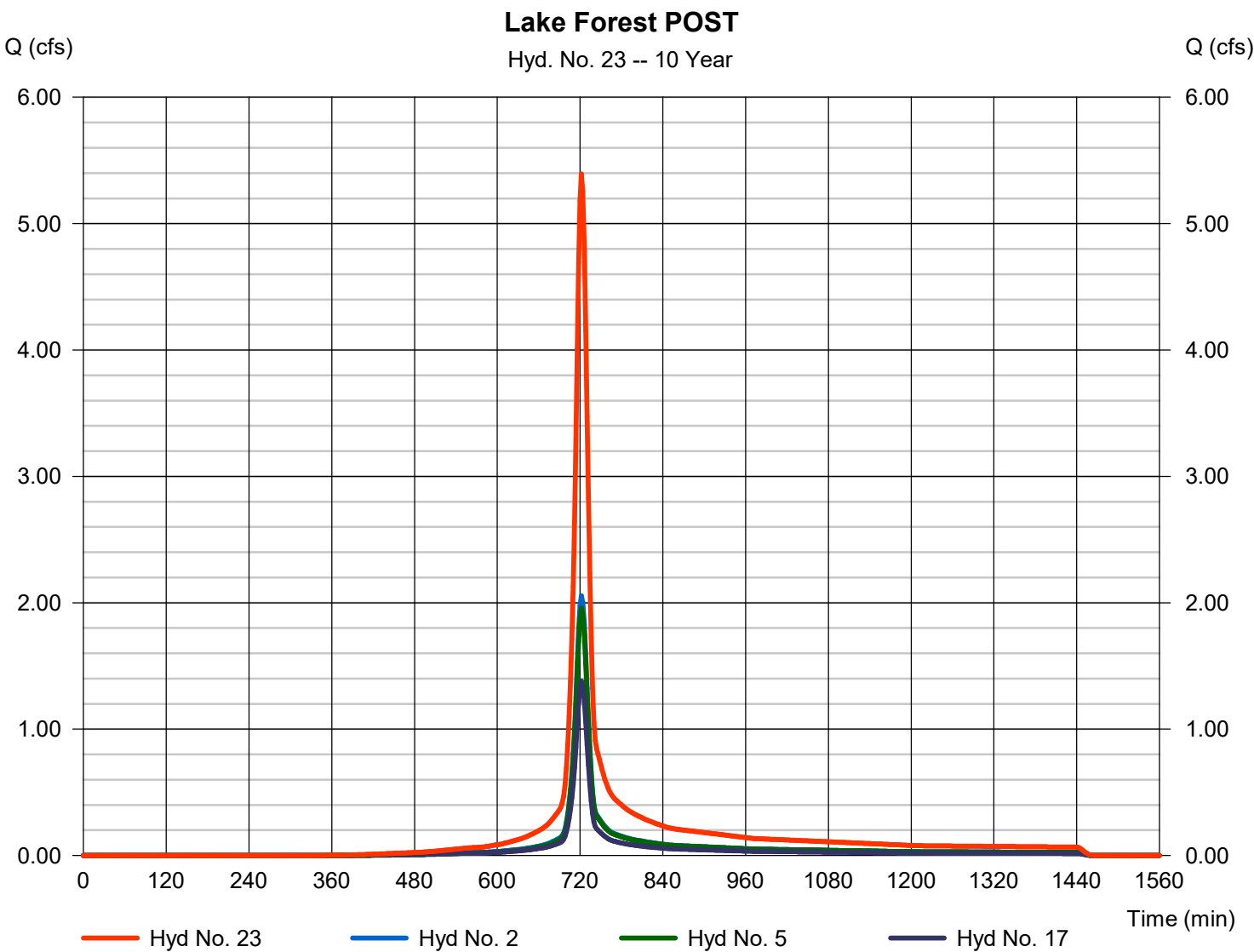
Hyd. No. 25

Southwest PRE

Hydrograph type	= Combine		Peak discharge	= 5.167 cfs
Storm frequency	= 10 yrs		Time to peak	= 722 min
Time interval	= 2 min		Hyd. volume	= 14,487 cuft
Inflow hyds.	= 7, 10, 19		Contrib. drain. area	= 2.150 ac

Southwest PRE

Hyd. No. 25 -- 10 Year

Q (cfs)

Q (cfs)

Time (min)

Hyd No. 25   Hyd No. 7   Hyd No. 10   Hyd No. 19
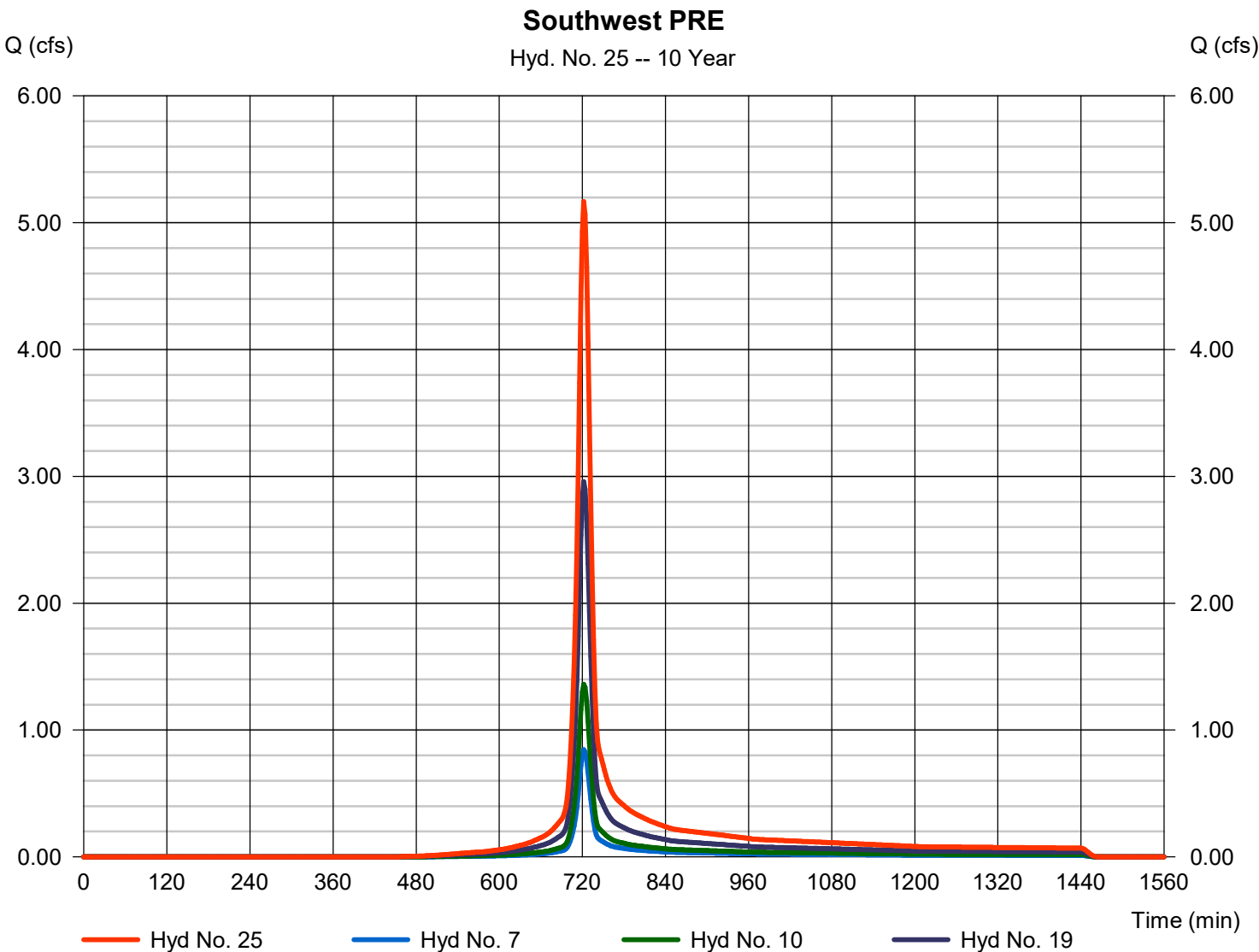
Hydrograph Report

Hyd. No. 26

Southwest POST

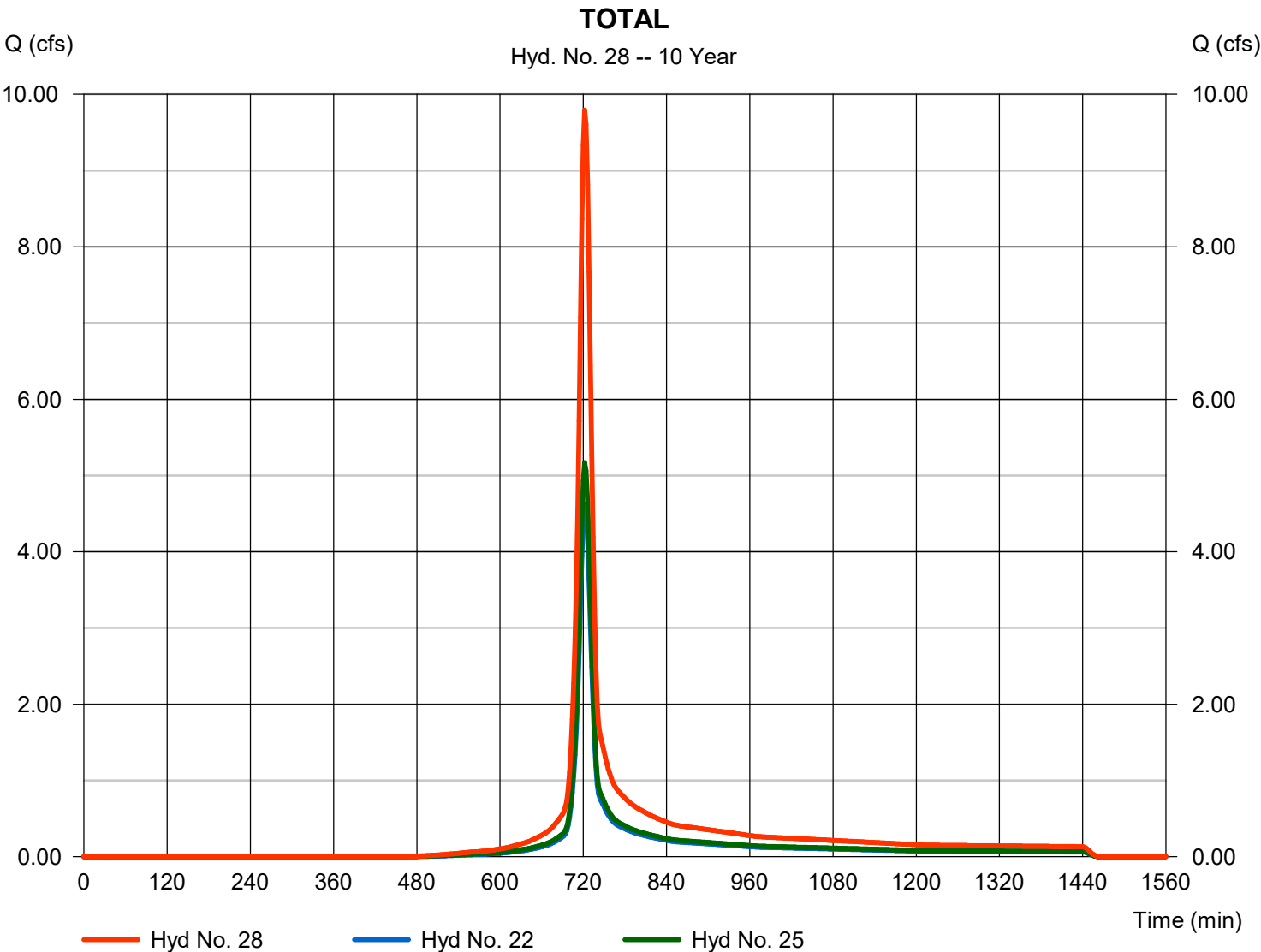|			
Hydrograph type	= Combine	Peak discharge	= 4.849 cfs
Storm frequency	= 10 yrs	Time to peak	= 722 min
Time interval	= 2 min	Hyd. volume	= 16,105 cuft
Inflow hyds.	= 8, 13, 20	Contrib. drain. area	= 1.570 ac

Southwest POST

Hyd. No. 26 -- 10 Year

Legend: Hyd No. 26, Hyd No. 8, Hyd No. 13, Hyd No. 20
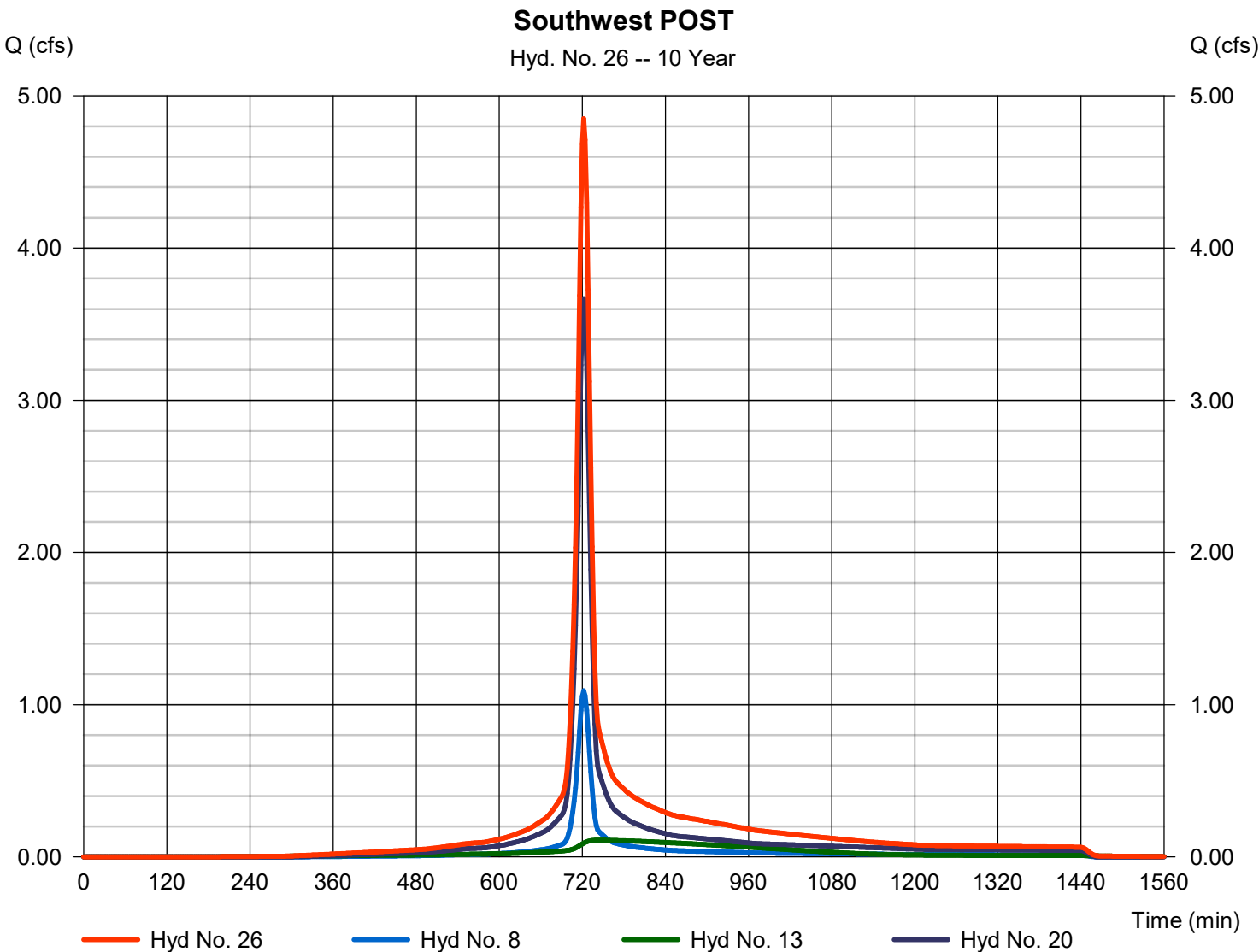
Hydrograph Report

Hyd. No. 28

TOTAL

Hydrograph type	=	Combine	Peak discharge	=	9.793 cfs
Storm frequency	=	10 yrs	Time to peak	=	722 min
Time interval	=	2 min	Hyd. volume	=	27,453 cuft
Inflow hyds.	=	22, 25	Contrib. drain. area	=	0.000 ac

TOTAL
Hyd. No. 28 -- 10 Year

Hydrograph Report

Monday, 06 / 10 / 2024

Hyd. No. 29

Total Post

Hydrograph type	= Combine	Peak discharge	= 10.24 cfs
Storm frequency	= 10 yrs	Time to peak	= 722 min
Time interval	= 2 min	Hyd. volume	= 31,346 cuft
Inflow hyds.	= 23, 26	Contrib. drain. area	= 0.000 ac
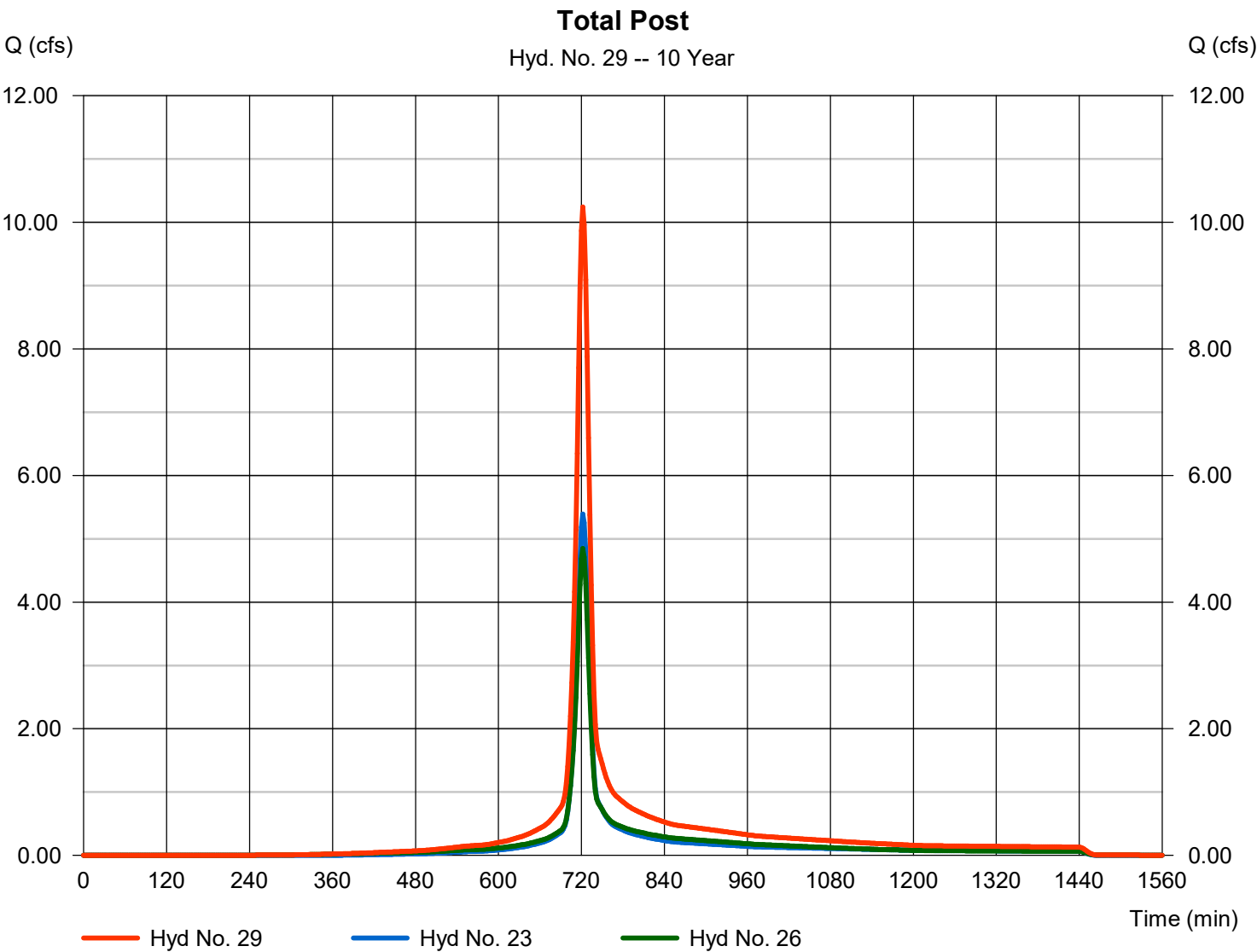
Total Post

Hyd. No. 29 -- 10 Year

Q (cfs)

Time (min)

Hyd No. 29   Hyd No. 23   Hyd No. 26

Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 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	2.315	2	722	6,505	------	------	------	Villa 1 PRE
2	SCS Runoff	2.623	2	722	7,466	------	------	------	Villa 1 POST
4	SCS Runoff	2.284	2	722	6,418	------	------	------	Villa 2 PRE
5	SCS Runoff	2.513	2	722	7,122	------	------	------	Villa 2 Post
7	SCS Runoff	1.111	2	722	3,122	------	------	------	Villa 3 PRE
8	SCS Runoff	1.364	2	722	3,954	------	------	------	Villa 3 Post
10	SCS Runoff	1.790	2	722	5,030	------	------	------	Villa 4 PRE
11	SCS Runoff	1.111	2	722	3,122	------	------	------	Villa 4 Post Runoff
12	SCS Runoff	0.942	2	722	3,002	------	------	------	Villa 4 Post Detention
13	Reservoir	0.119	2	748	2,986	12	1013.63	1,301	Villa 4
14	Combine	2.054	2	722	6,124	11, 12,	------	------	Total Villa 4 Post
16	SCS Runoff	1.482	2	722	4,163	------	------	------	Villa 5 PRE
17	SCS Runoff	1.736	2	722	4,998	------	------	------	Villa 5 Post
19	SCS Runoff	3.861	2	722	10,871	------	------	------	Villa 8 & 9 & road PRE
20	SCS Runoff	4.585	2	722	13,291	------	------	------	Villa 8 & 9 Road Post
22	Combine	6.081	2	722	17,086	1, 4, 16,	------	------	Lake Forest PRE
23	Combine	6.873	2	722	19,586	2, 5, 17,	------	------	Lake Forest POST
25	Combine	6.762	2	722	19,023	7, 10, 19,	------	------	Southwest PRE
26	Combine	6.047	2	722	20,231	8, 13, 20,	------	------	Southwest POST
28	Combine	12.84	2	722	36,110	22, 25,	------	------	TOTAL
29	Combine	12.92	2	722	39,817	23, 26,	------	------	Total Post

2023-186-Ponds.gpw	Return Period: 25 Year	Monday, 06 / 10 / 2024

Hydrograph Report

Monday, 06 / 10 / 2024

Hyd. No. 1

Villa 1 PRE

Hydrograph type	= SCS Runoff	Peak discharge	= 2.315 cfs
Storm frequency	= 25 yrs	Time to peak	= 722 min
Time interval	= 2 min	Hyd. volume	= 6,505 cuft
Drainage area	= 0.750 ac	Curve number	= 84
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 15.00 min
Total precip.	= 4.09 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

Villa 1 PRE

Hyd. No. 1 -- 25 Year

Hydrograph Report

Monday, 06 / 10 / 2024
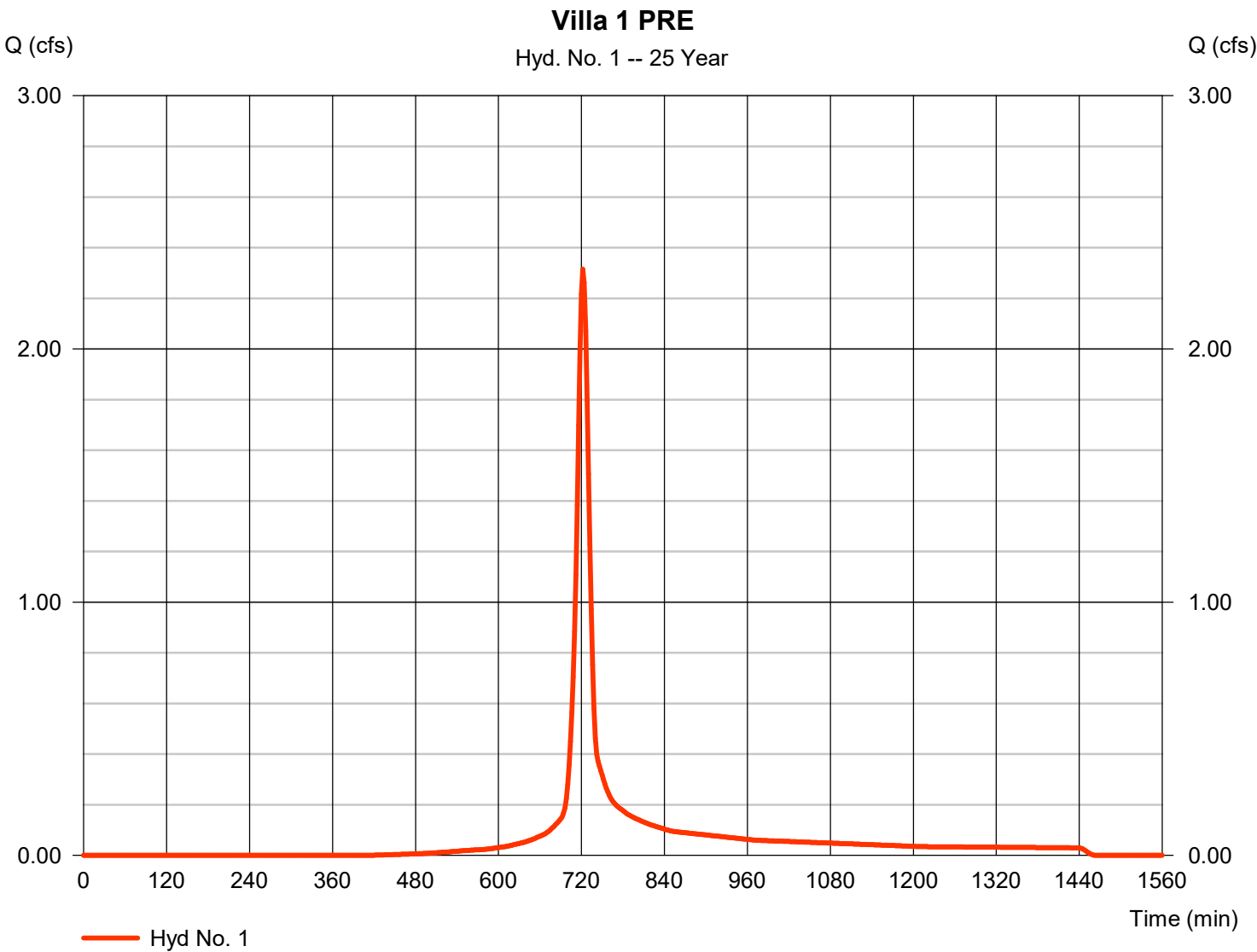
Hyd. No. 2

Villa 1 POST

Hydrograph type	= SCS Runoff		Peak discharge	= 2.623 cfs
Storm frequency	= 25 yrs		Time to peak	= 722 min
Time interval	= 2 min		Hyd. volume	= 7,466 cuft
Drainage area	= 0.750 ac		Curve number	= 88*
Basin Slope	= 0.0 %		Hydraulic length	= 0 ft
Tc method	= User		Time of conc. (Tc)	= 15.00 min
Total precip.	= 4.09 in		Distribution	= Type II
Storm duration	= 24 hrs		Shape factor	= 484

* Composite (Area/CN) = [(0.220 x 98) + (0.530 x 84)] / 0.750

Villa 1 POST

Hyd. No. 2 -- 25 Year

Q (cfs)

Time (min)
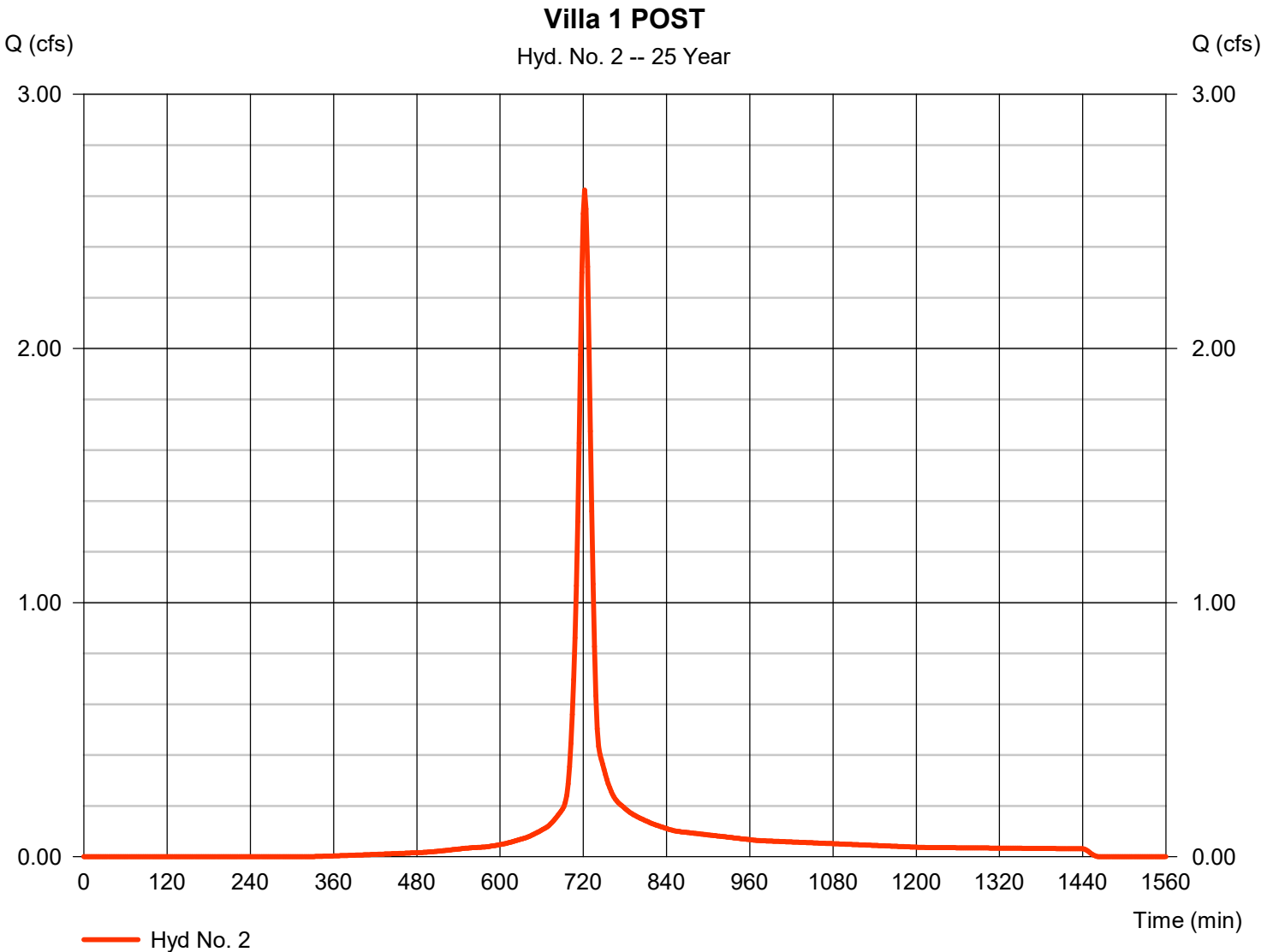
— Hyd No. 2

Hydrograph Report

Hyd. No. 4

Villa 2 PRE

Hydrograph type	= SCS Runoff		Peak discharge	= 2.284 cfs
Storm frequency	= 25 yrs		Time to peak	= 722 min
Time interval	= 2 min		Hyd. volume	= 6,418 cuft
Drainage area	= 0.740 ac		Curve number	= 84
Basin Slope	= 0.0 %		Hydraulic length	= 0 ft
Tc method	= User		Time of conc. (Tc)	= 15.00 min
Total precip.	= 4.09 in		Distribution	= Type II
Storm duration	= 24 hrs		Shape factor	= 484

Villa 2 PRE
Hyd. No. 4 -- 25 Year

— Hyd No. 4

Hydrograph Report

Monday, 06 / 10 / 2024
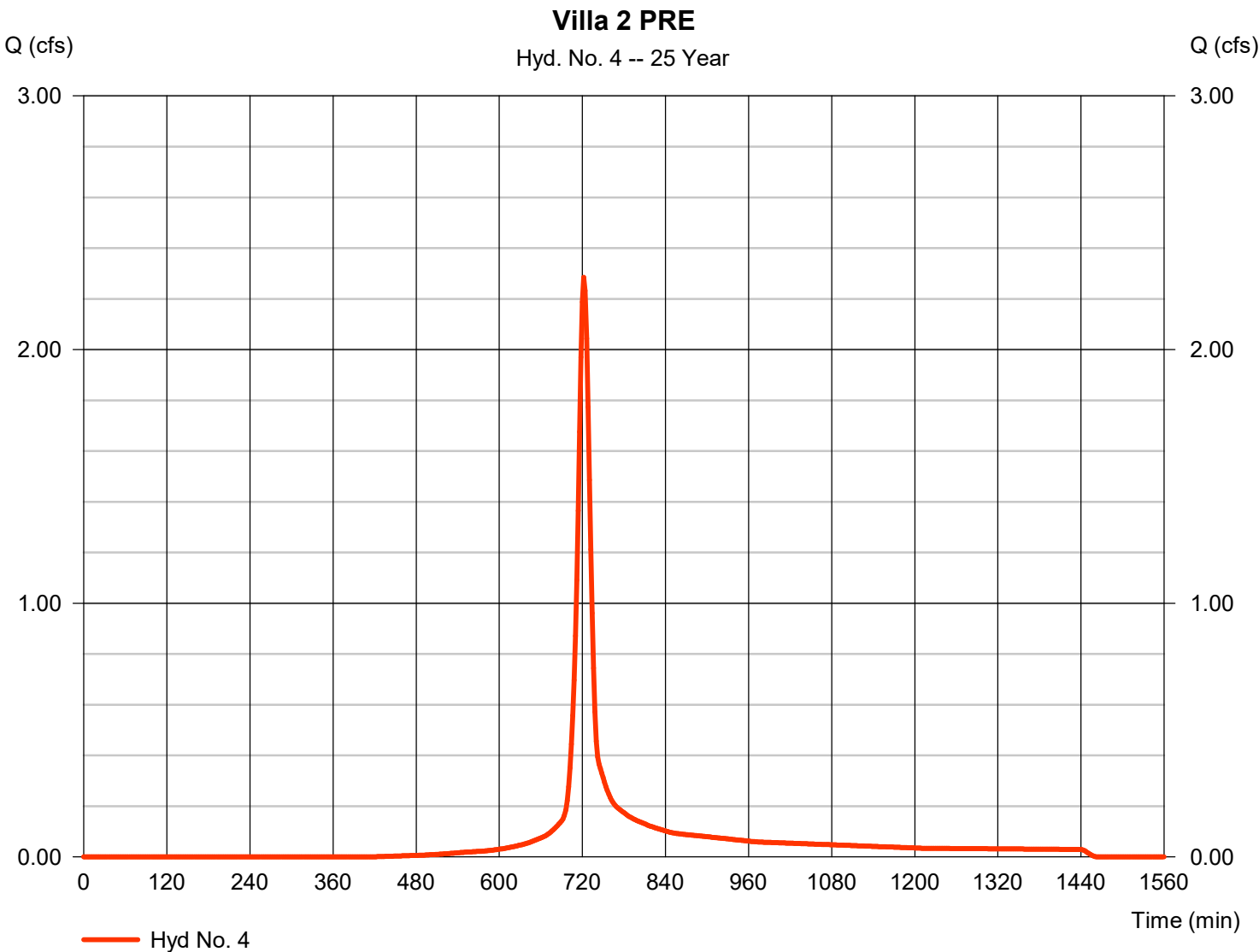
Hyd. No. 5

Villa 2 Post

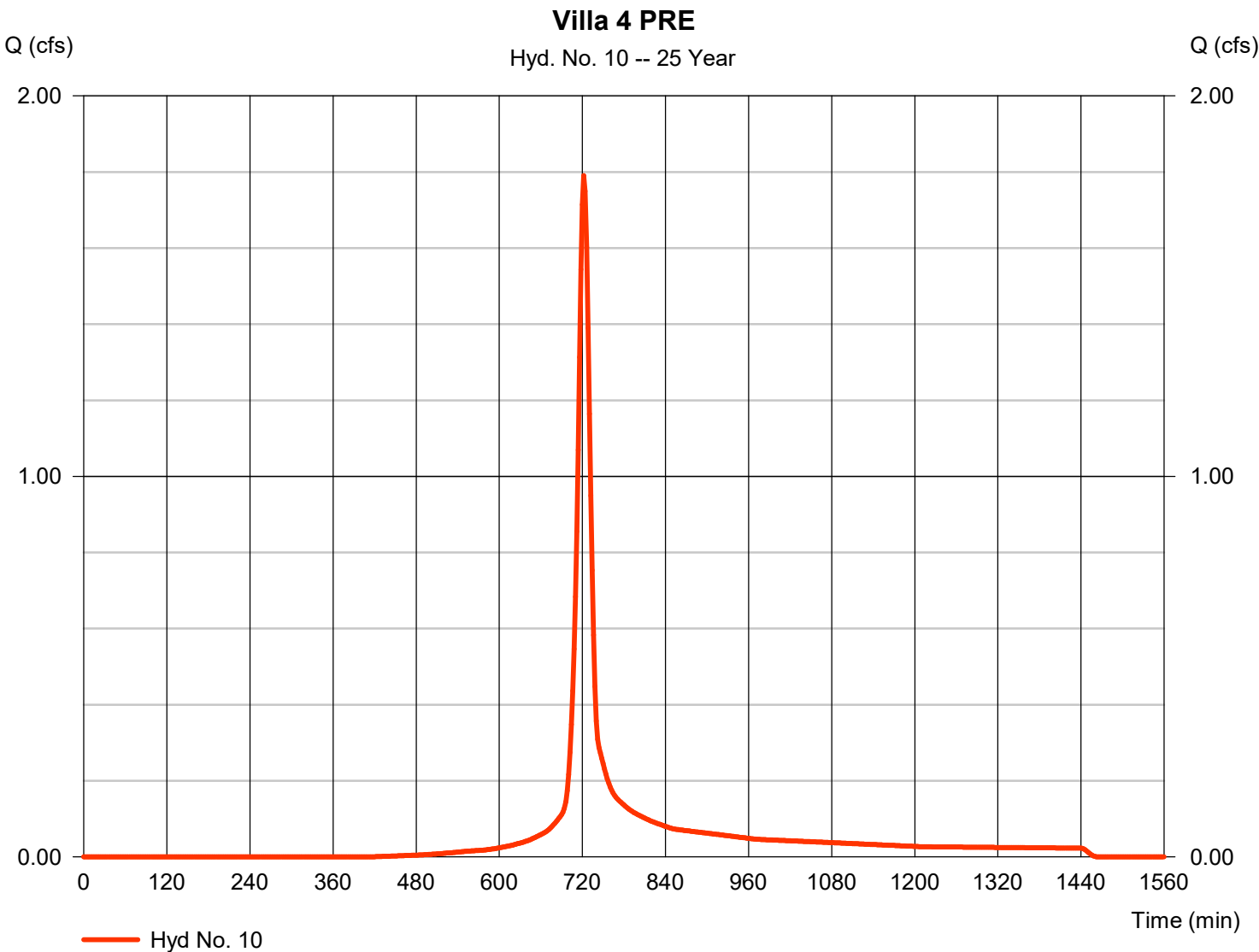|				
Hydrograph type	= SCS Runoff		Peak discharge	= 2.513 cfs
Storm frequency	= 25 yrs		Time to peak	= 722 min
Time interval	= 2 min		Hyd. volume	= 7,122 cuft
Drainage area	= 0.740 ac		Curve number	= 87*
Basin Slope	= 0.0 %		Hydraulic length	= 0 ft
Tc method	= User		Time of conc. (Tc)	= 15.00 min
Total precip.	= 4.09 in		Distribution	= Type II
Storm duration	= 24 hrs		Shape factor	= 484

* Composite (Area/CN) = [(0.180 x 98) + (0.560 x 84)] / 0.740

Villa 2 Post

Hyd. No. 5 -- 25 Year

Hyd No. 5

Hydrograph Report

Hyd. No. 7

Villa 3 PRE

Hydrograph type	= SCS Runoff	Peak discharge	= 1.111 cfs
Storm frequency	= 25 yrs	Time to peak	= 722 min
Time interval	= 2 min	Hyd. volume	= 3,122 cuft
Drainage area	= 0.360 ac	Curve number	= 84
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 15.00 min
Total precip.	= 4.09 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

Villa 3 PRE
Hyd. No. 7 -- 25 Year

Legend: Hyd No. 7

Hydrograph Report

Hyd. No. 8

Villa 3 Post

Hydrograph type	= SCS Runoff		Peak discharge	= 1.364 cfs
Storm frequency	= 25 yrs		Time to peak	= 722 min
Time interval	= 2 min		Hyd. volume	= 3,954 cuft
Drainage area	= 0.360 ac		Curve number	= 91*
Basin Slope	= 0.0 %		Hydraulic length	= 0 ft
Tc method	= User		Time of conc. (Tc)	= 15.00 min
Total precip.	= 4.09 in		Distribution	= Type II
Storm duration	= 24 hrs		Shape factor	= 484

* Composite (Area/CN) = [(0.180 x 98) + (0.180 x 84)] / 0.360

Villa 3 Post

Hyd. No. 8 -- 25 Year

— Hyd No. 8

Hydrograph Report

Monday, 06 / 10 / 2024
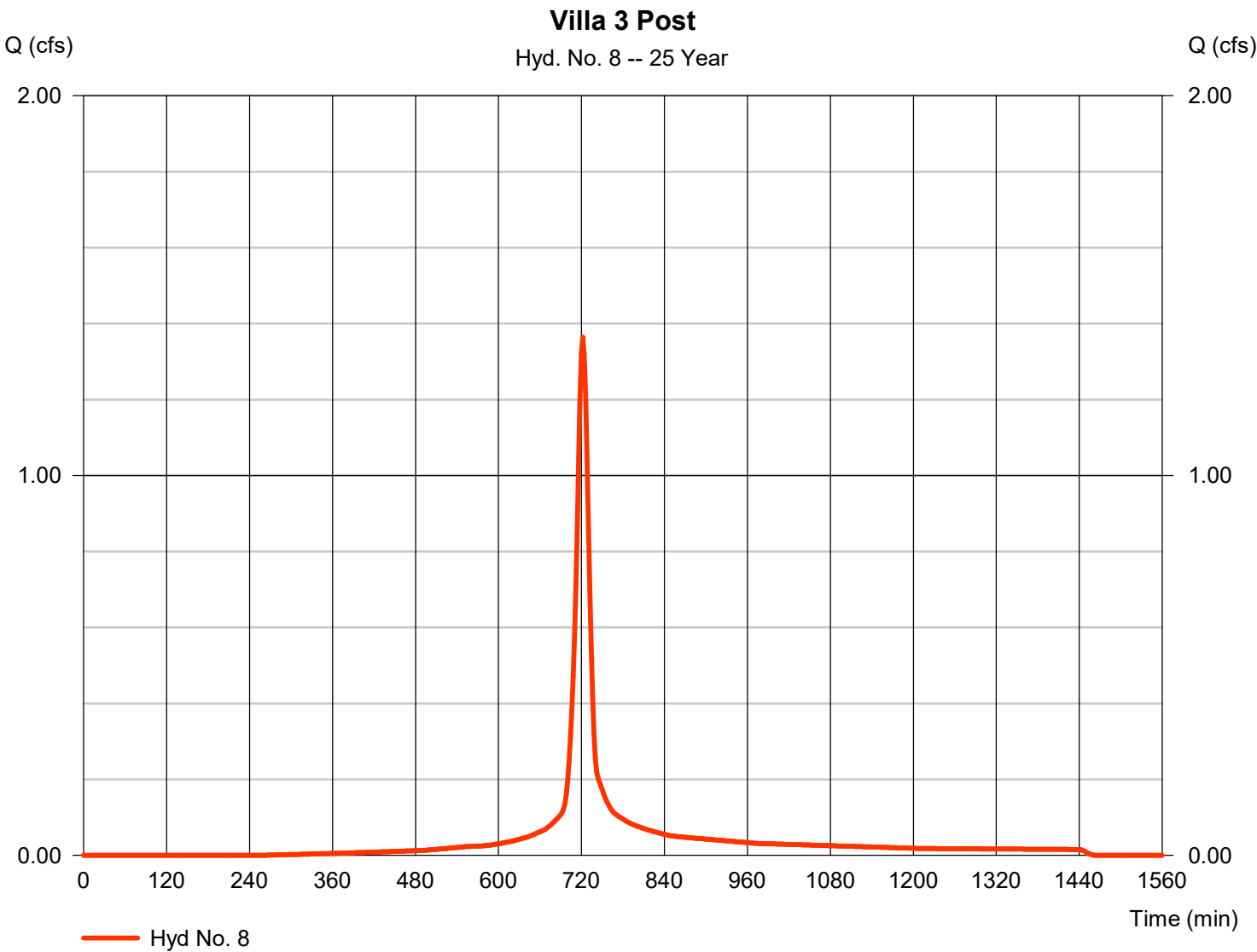
Hyd. No. 10

Villa 4 PRE

Hydrograph type	= SCS Runoff		Peak discharge	= 1.790 cfs
Storm frequency	= 25 yrs		Time to peak	= 722 min
Time interval	= 2 min		Hyd. volume	= 5,030 cuft
Drainage area	= 0.580 ac		Curve number	= 84
Basin Slope	= 0.0 %		Hydraulic length	= 0 ft
Tc method	= User		Time of conc. (Tc)	= 15.00 min
Total precip.	= 4.09 in		Distribution	= Type II
Storm duration	= 24 hrs		Shape factor	= 484

Villa 4 PRE

Hyd. No. 10 -- 25 Year

Hydrograph Report

Monday, 06 / 10 / 2024

Hyd. No. 11

Villa 4 Post Runoff

Hydrograph type	= SCS Runoff		Peak discharge	= 1.111 cfs
Storm frequency	= 25 yrs		Time to peak	= 722 min
Time interval	= 2 min		Hyd. volume	= 3,122 cuft
Drainage area	= 0.360 ac		Curve number	= 84*
Basin Slope	= 0.0 %		Hydraulic length	= 0 ft
Tc method	= User		Time of conc. (Tc)	= 15.00 min
Total precip.	= 4.09 in		Distribution	= Type II
Storm duration	= 24 hrs		Shape factor	= 484

* Composite (Area/CN) = + (0.360 x 84)] / 0.360

Villa 4 Post Runoff

Hyd. No. 11 -- 25 Year

Hydrograph Report

Monday, 06 / 10 / 2024

Hyd. No. 12

Villa 4 Post Detention

Hydrograph type	= SCS Runoff		Peak discharge	= 0.942 cfs
Storm frequency	= 25 yrs		Time to peak	= 722 min
Time interval	= 2 min		Hyd. volume	= 3,002 cuft
Drainage area	= 0.220 ac		Curve number	= 98*
Basin Slope	= 0.0 %		Hydraulic length	= 0 ft
Tc method	= User		Time of conc. (Tc)	= 15.00 min
Total precip.	= 4.09 in		Distribution	= Type II
Storm duration	= 24 hrs		Shape factor	= 484

* Composite (Area/CN) = [(0.220 x 98)] / 0.220

Villa 4 Post Detention
Hyd. No. 12 -- 25 Year

Hyd No. 12

Hydrograph Report

Monday, 06 / 10 / 2024
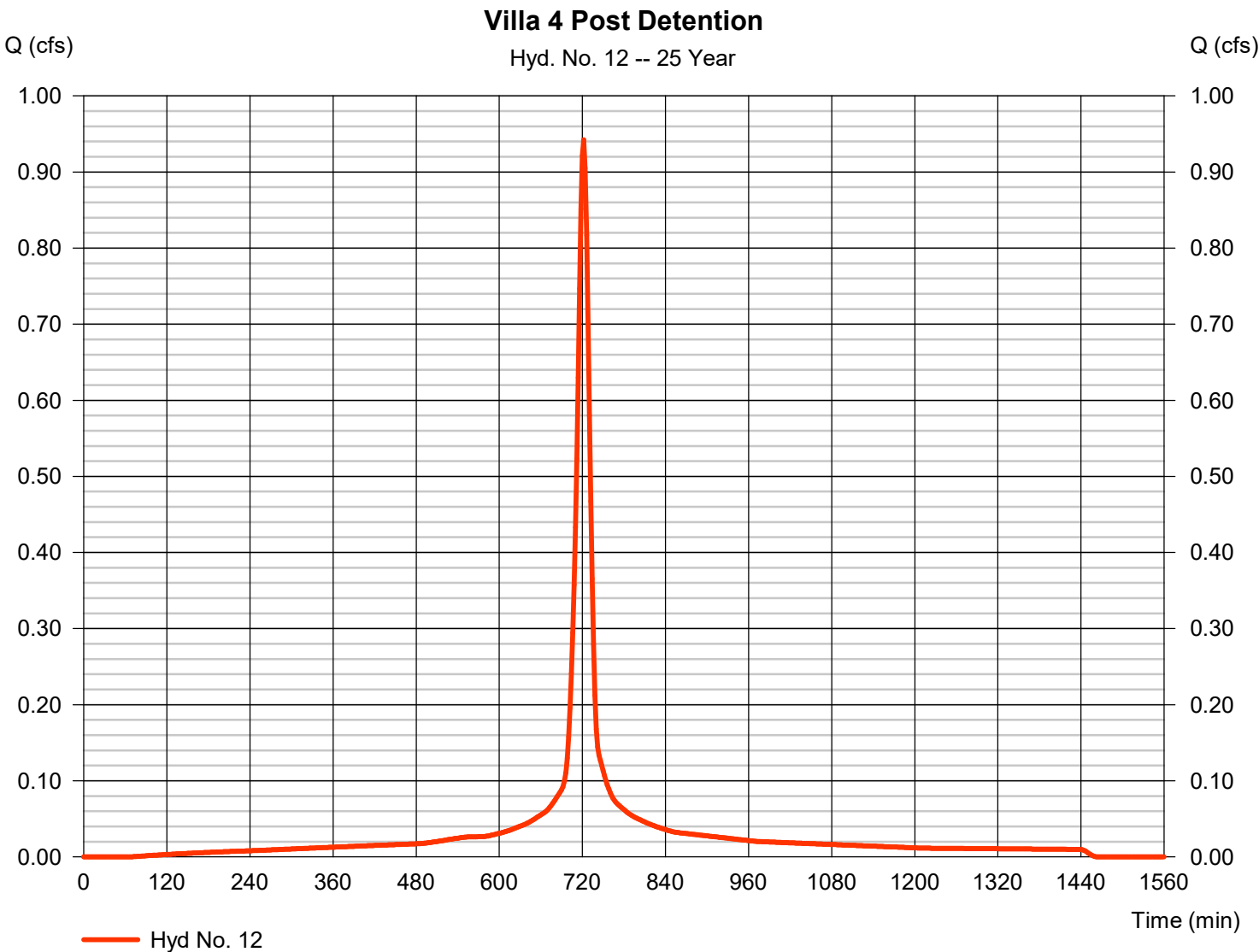
Hyd. No. 13

Villa 4

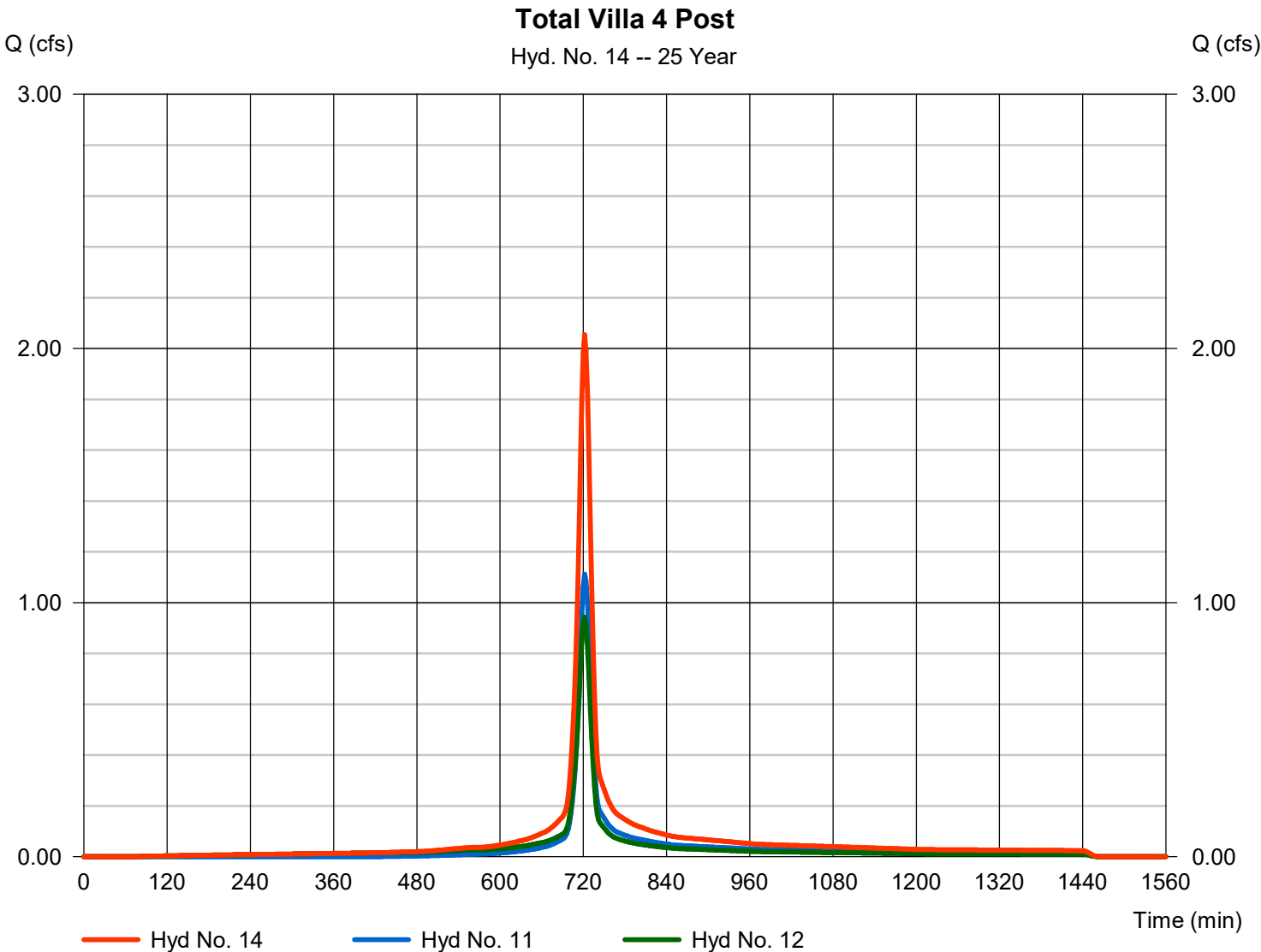|				
Hydrograph type	= Reservoir		Peak discharge	= 0.119 cfs
Storm frequency	= 25 yrs		Time to peak	= 748 min
Time interval	= 2 min		Hyd. volume	= 2,986 cuft
Inflow hyd. No.	= 12 - Villa 4 Post Detention		Max. Elevation	= 1013.63 ft
Reservoir name	= Villa 4		Max. Storage	= 1,301 cuft

Storage Indication method used.

Villa 4

Hyd. No. 13 -- 25 Year

Legend: Hyd No. 13 — Hyd No. 12 — Total storage used = 1,301 cuft
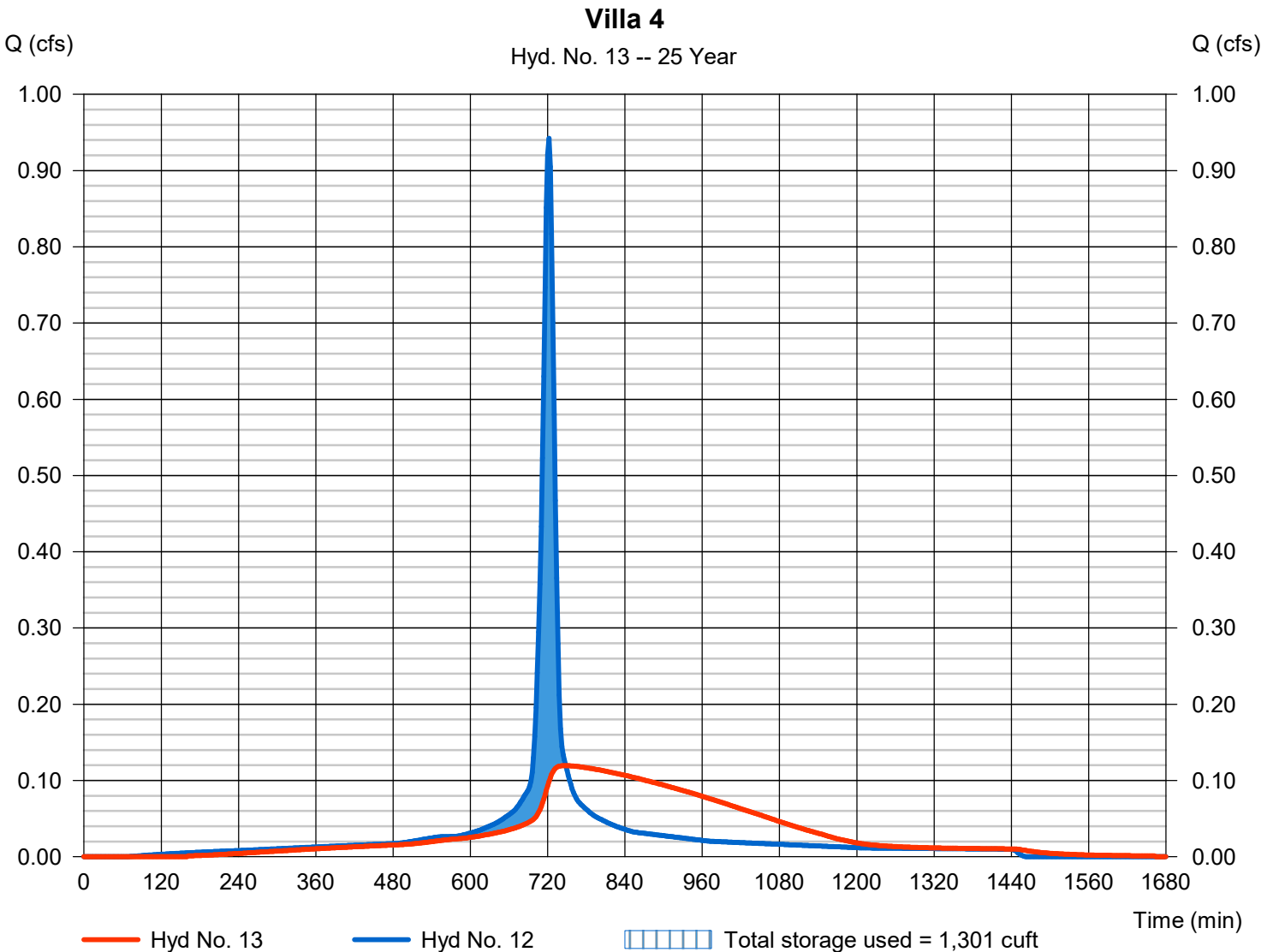
Hydrograph Report

Hyd. No. 14

Total Villa 4 Post

Hydrograph type	= Combine		Peak discharge	= 2.054 cfs
Storm frequency	= 25 yrs		Time to peak	= 722 min
Time interval	= 2 min		Hyd. volume	= 6,124 cuft
Inflow hyds.	= 11, 12		Contrib. drain. area	= 0.580 ac

Total Villa 4 Post

Hyd. No. 14 -- 25 Year

Legend: —— Hyd No. 14   —— Hyd No. 11   —— Hyd No. 12

Hydrograph Report

Monday, 06 / 10 / 2024

Hyd. No. 16

Villa 5 PRE

Hydrograph type	= SCS Runoff	Peak discharge	= 1.482 cfs
Storm frequency	= 25 yrs	Time to peak	= 722 min
Time interval	= 2 min	Hyd. volume	= 4,163 cuft
Drainage area	= 0.480 ac	Curve number	= 84
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 15.00 min
Total precip.	= 4.09 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

Villa 5 PRE

Hyd. No. 16 -- 25 Year

Hydrograph Report

Monday, 06 / 10 / 2024
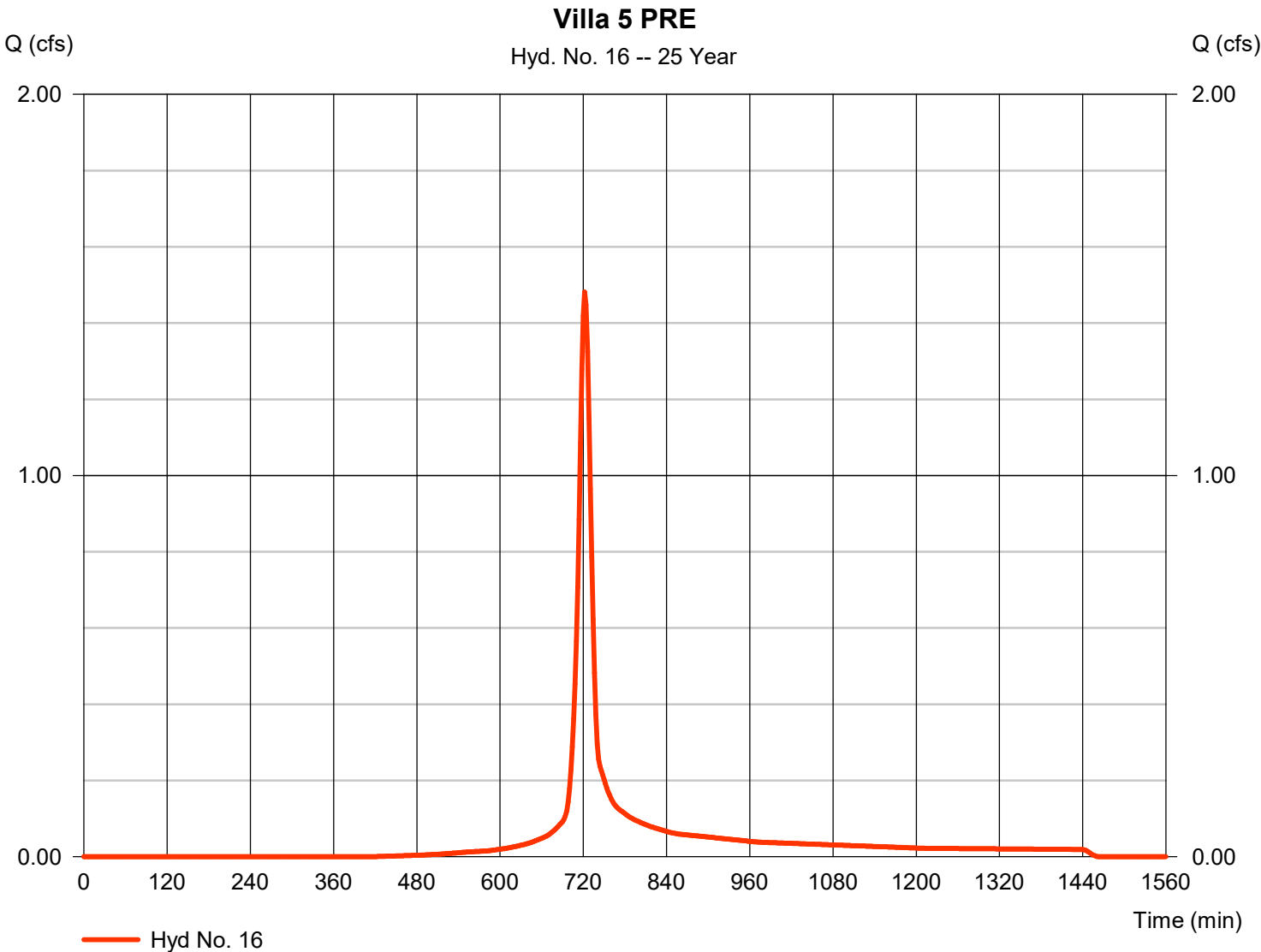
Hyd. No. 17

Villa 5 Post

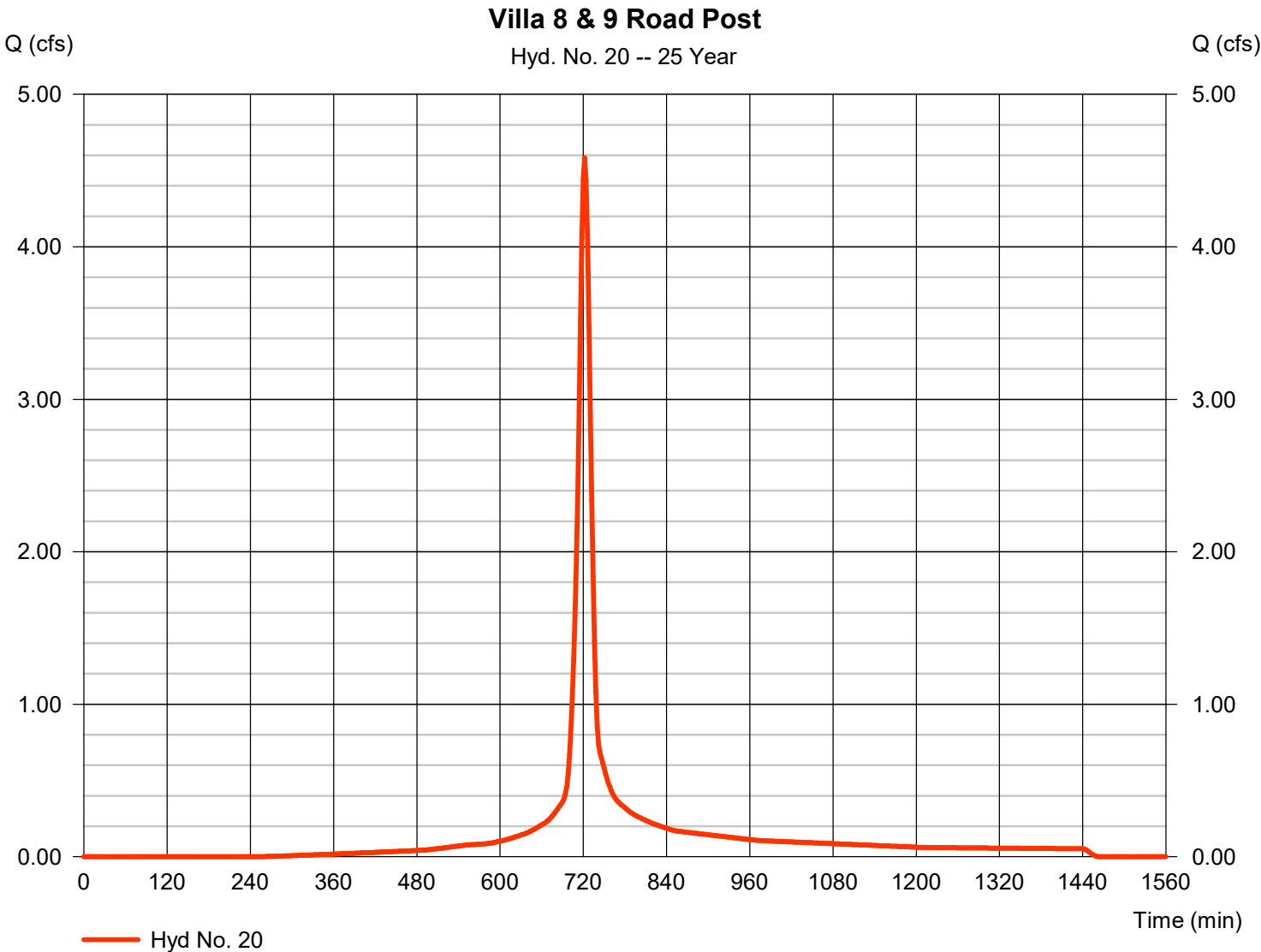|				
Hydrograph type	= SCS Runoff	Peak discharge	= 1.736 cfs
Storm frequency	= 25 yrs	Time to peak	= 722 min
Time interval	= 2 min	Hyd. volume	= 4,998 cuft
Drainage area	= 0.470 ac	Curve number	= 90*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 15.00 min
Total precip.	= 4.09 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.200 x 98) + (0.270 x 84)] / 0.470

Villa 5 Post
Hyd. No. 17 -- 25 Year

Hydrograph Report

Monday, 06 / 10 / 2024
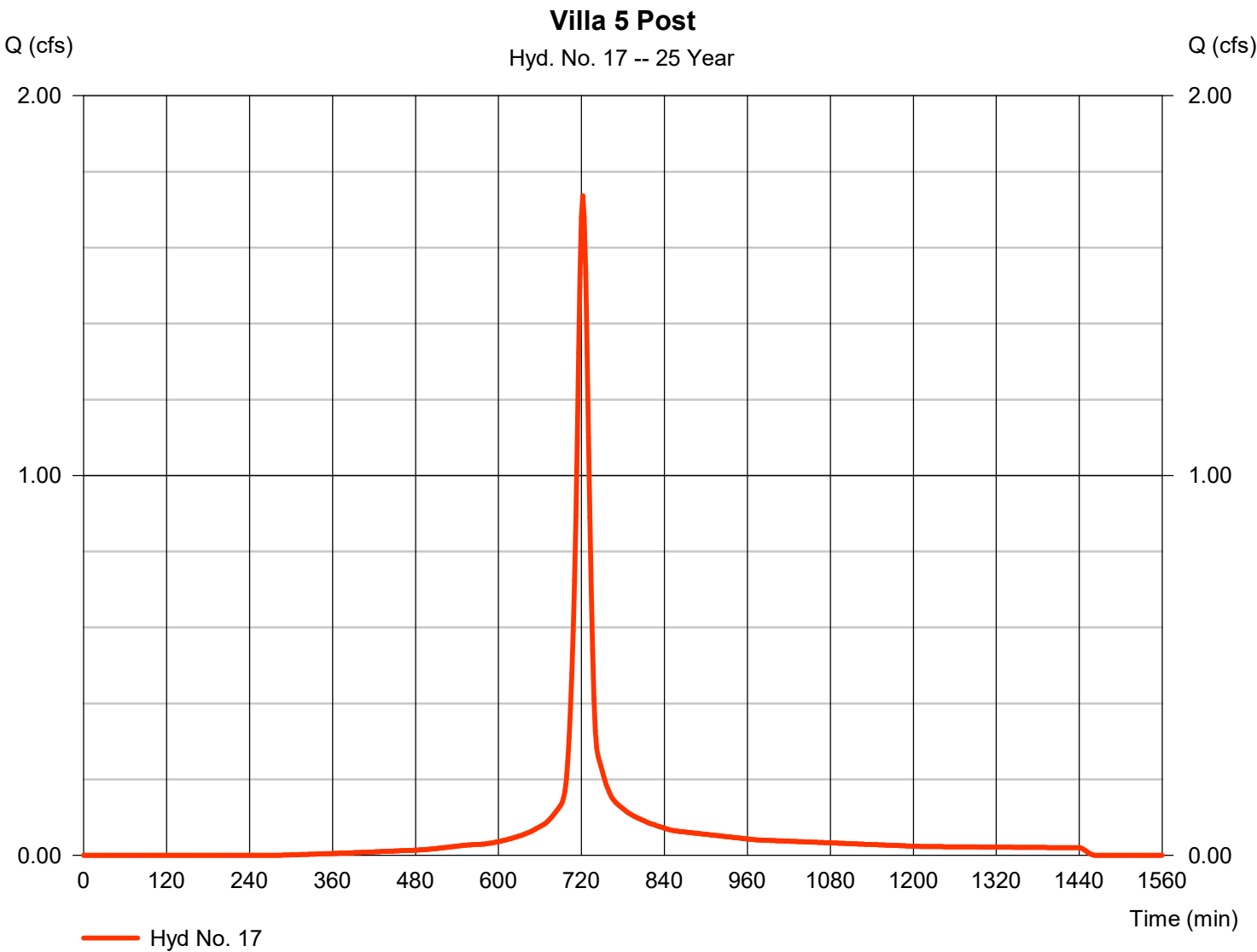
Hyd. No. 19

Villa 8 & 9 & road PRE

Hydrograph type	= SCS Runoff		Peak discharge	= 3.861 cfs
Storm frequency	= 25 yrs		Time to peak	= 722 min
Time interval	= 2 min		Hyd. volume	= 10,871 cuft
Drainage area	= 1.210 ac		Curve number	= 85*
Basin Slope	= 0.0 %		Hydraulic length	= 0 ft
Tc method	= User		Time of conc. (Tc)	= 15.00 min
Total precip.	= 4.09 in		Distribution	= Type II
Storm duration	= 24 hrs		Shape factor	= 484

* Composite (Area/CN) = [(0.360 x 98) + (0.850 x 84)] / 1.210

Villa 8 & 9 & road PRE

Hyd. No. 19 -- 25 Year

Hyd No. 19

Hydrograph Report

Monday, 06 / 10 / 2024
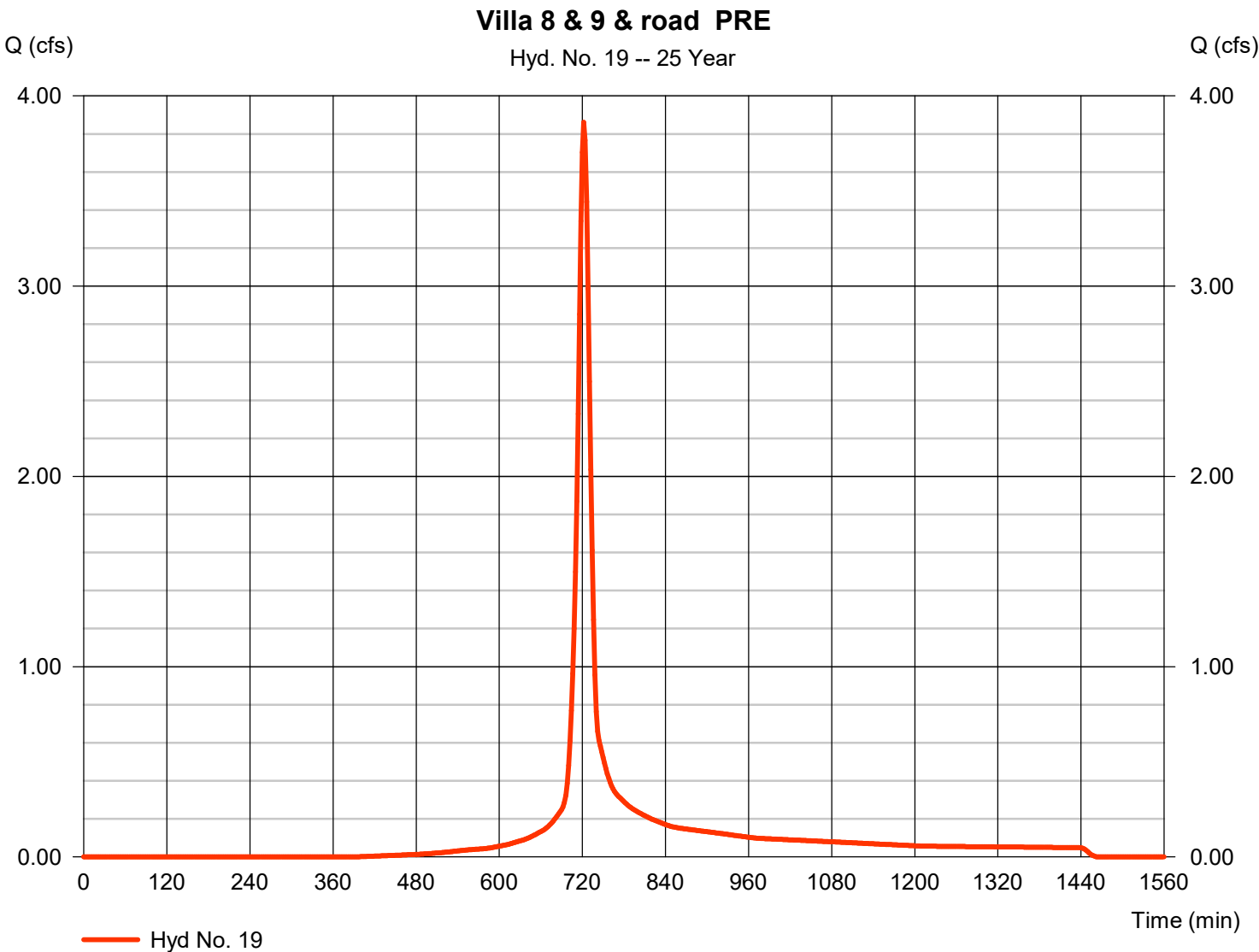
Hyd. No. 20

Villa 8 & 9 Road Post

Hydrograph type	= SCS Runoff	Peak discharge	= 4.585 cfs
Storm frequency	= 25 yrs	Time to peak	= 722 min
Time interval	= 2 min	Hyd. volume	= 13,291 cuft
Drainage area	= 1.210 ac	Curve number	= 91*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 15.00 min
Total precip.	= 4.09 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.590 x 98) + (0.620 x 84)] / 1.210

Villa 8 & 9 Road Post

Hyd. No. 20 -- 25 Year

Hyd No. 20

Hydrograph Report

Hyd. No. 22

Lake Forest PRE

Hydrograph type	= Combine	Peak discharge	= 6.081 cfs
Storm frequency	= 25 yrs	Time to peak	= 722 min
Time interval	= 2 min	Hyd. volume	= 17,086 cuft
Inflow hyds.	= 1, 4, 16	Contrib. drain. area	= 1.970 ac

Lake Forest PRE

Hyd. No. 22 -- 25 Year

Q (cfs)

Q (cfs)

Time (min)

Legend: Hyd No. 22 — Hyd No. 1 — Hyd No. 4 — Hyd No. 16

Hydrograph Report

Monday, 06 / 10 / 2024
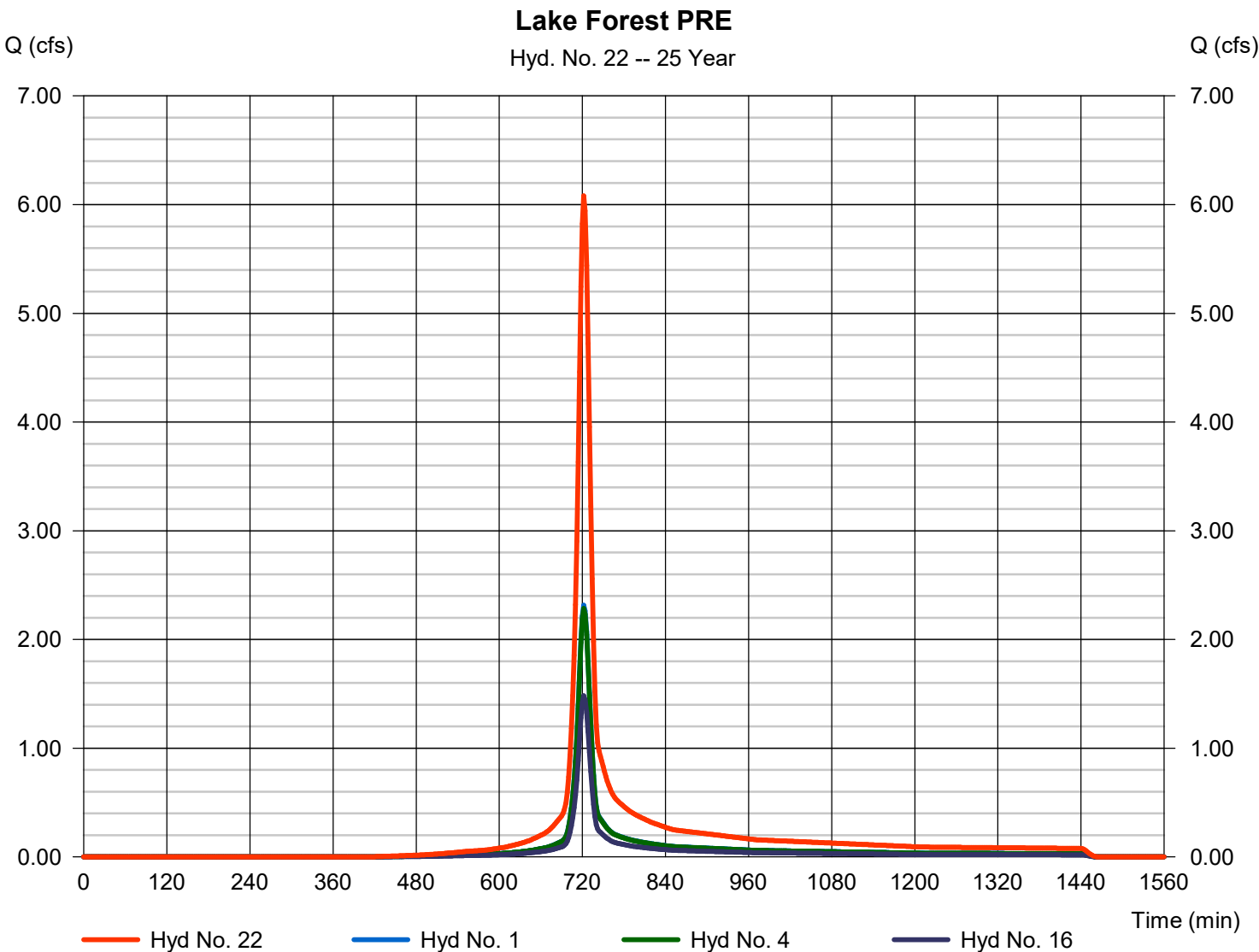
Hyd. No. 23

Lake Forest POST

Hydrograph type	= Combine		Peak discharge	= 6.873 cfs
Storm frequency	= 25 yrs		Time to peak	= 722 min
Time interval	= 2 min		Hyd. volume	= 19,586 cuft
Inflow hyds.	= 2, 5, 17		Contrib. drain. area	= 1.960 ac

Lake Forest POST

Hyd. No. 23 -- 25 Year

Legend: Hyd No. 23 — Hyd No. 2 — Hyd No. 5 — Hyd No. 17
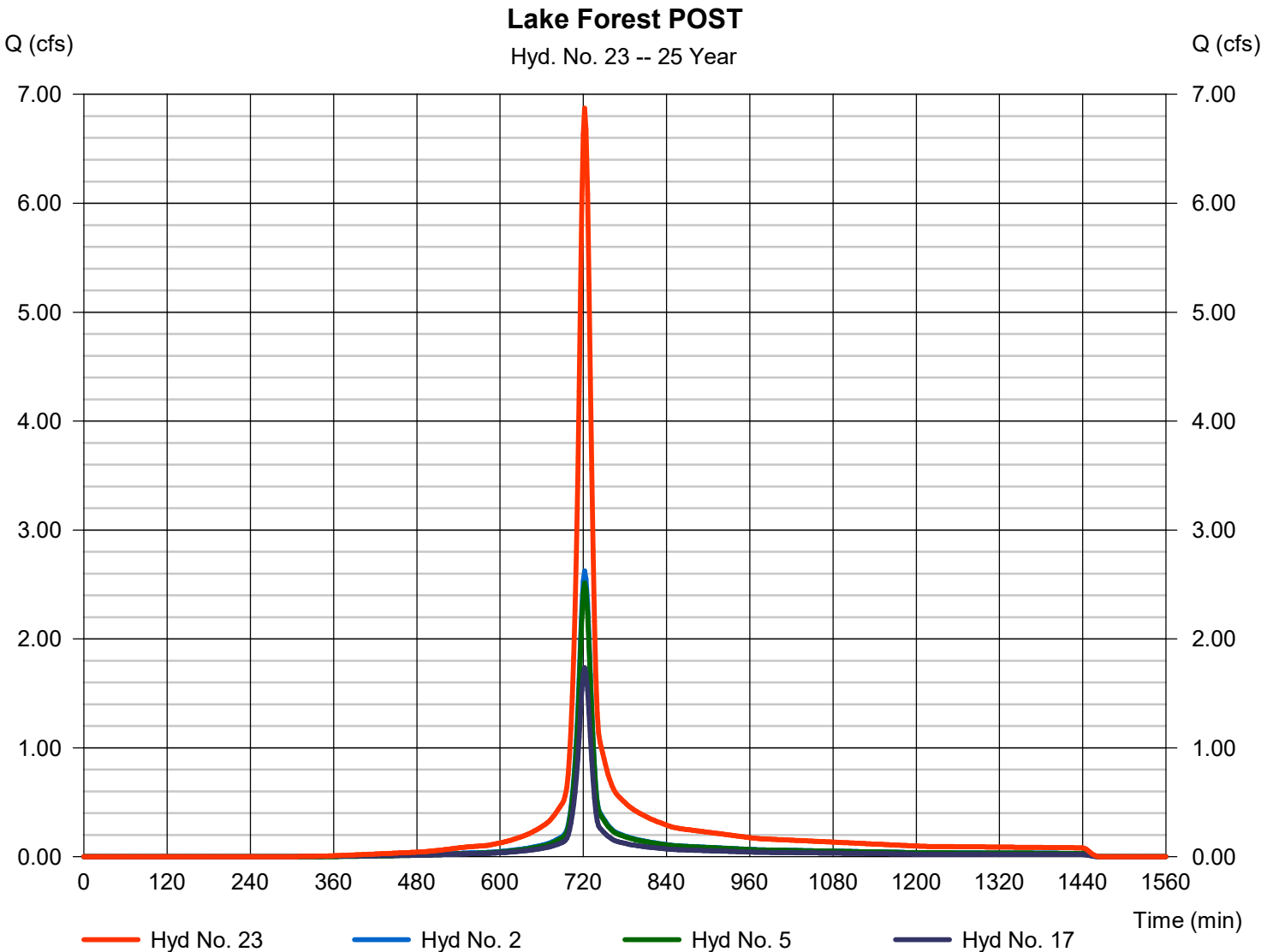
Hydrograph Report

Hyd. No. 25

Southwest PRE

Hydrograph type	= Combine	Peak discharge	= 6.762 cfs
Storm frequency	= 25 yrs	Time to peak	= 722 min
Time interval	= 2 min	Hyd. volume	= 19,023 cuft
Inflow hyds.	= 7, 10, 19	Contrib. drain. area	= 2.150 ac

Southwest PRE

Hyd. No. 25 -- 25 Year

Q (cfs)

Hyd No. 25   Hyd No. 7   Hyd No. 10   Hyd No. 19

Hydrograph Report

Monday, 06 / 10 / 2024
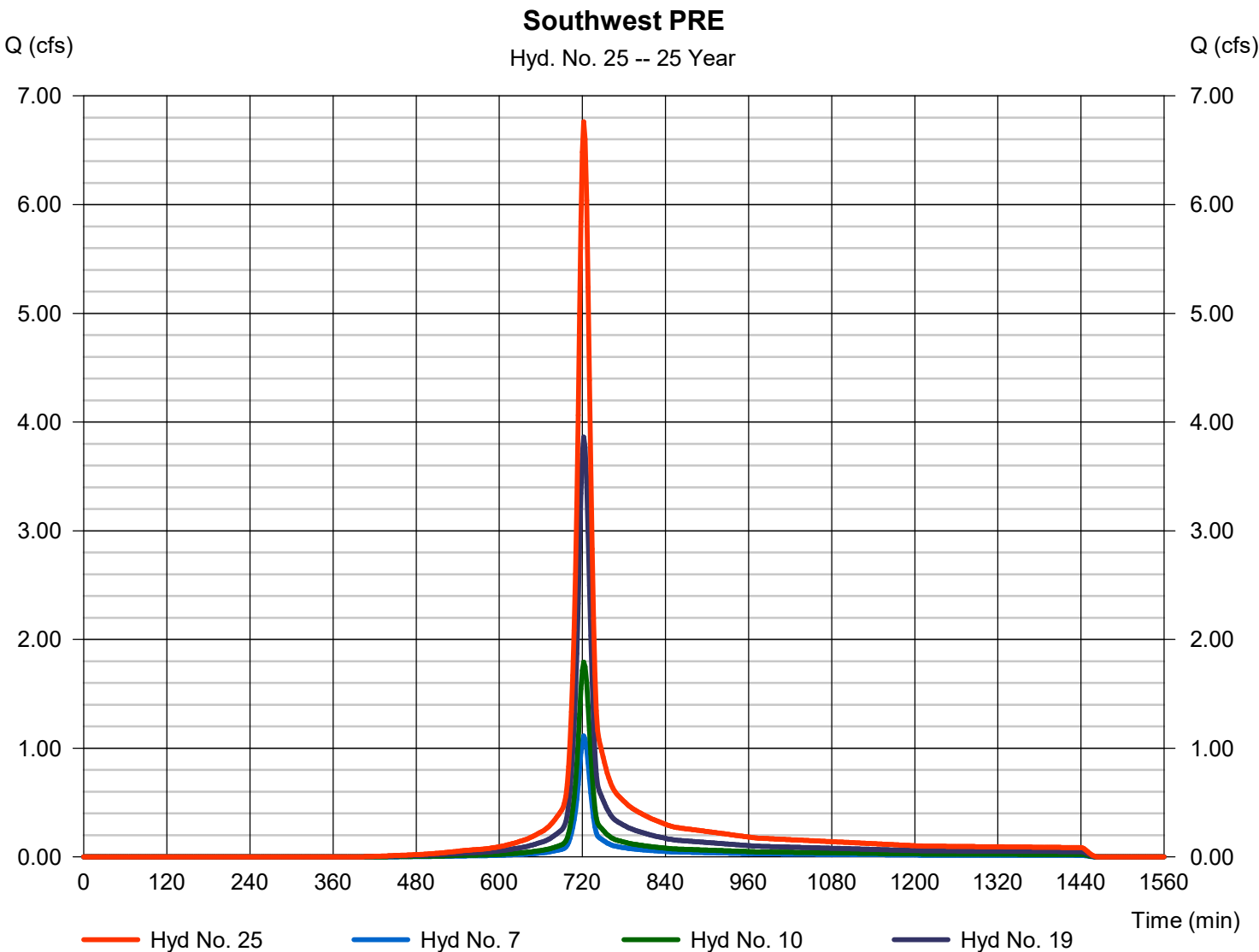
Hyd. No. 26

Southwest POST

Hydrograph type	= Combine		Peak discharge	= 6.047 cfs
Storm frequency	= 25 yrs		Time to peak	= 722 min
Time interval	= 2 min		Hyd. volume	= 20,231 cuft
Inflow hyds.	= 8, 13, 20		Contrib. drain. area	= 1.570 ac

Southwest POST
Hyd. No. 26 -- 25 Year

Legend: Hyd No. 26   Hyd No. 8   Hyd No. 13   Hyd No. 20

Hydrograph Report

Monday, 06 / 10 / 2024
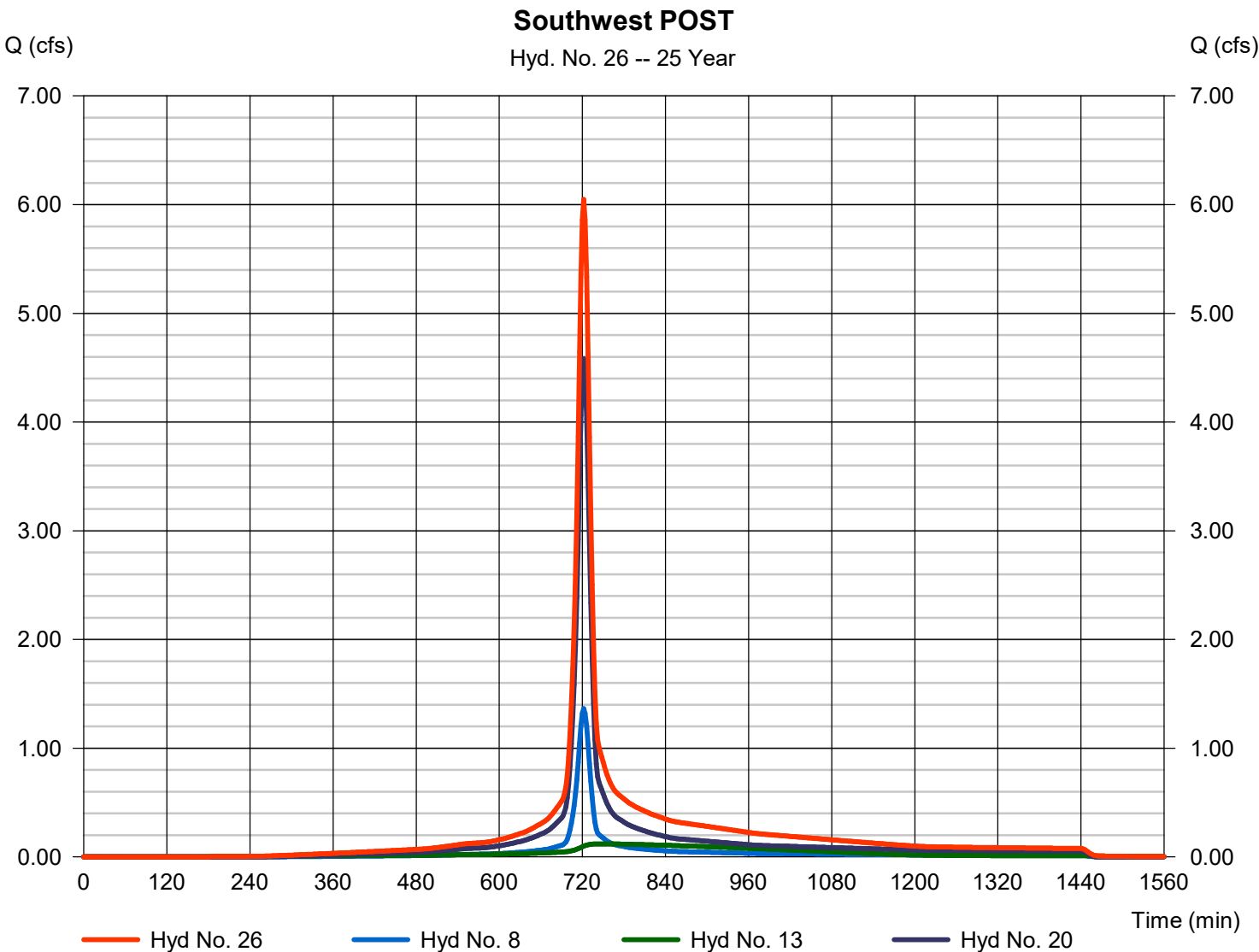
Hyd. No. 28

TOTAL

Hydrograph type	= Combine		Peak discharge	= 12.84 cfs
Storm frequency	= 25 yrs		Time to peak	= 722 min
Time interval	= 2 min		Hyd. volume	= 36,110 cuft
Inflow hyds.	= 22, 25		Contrib. drain. area	= 0.000 ac

TOTAL
Hyd. No. 28 -- 25 Year

Hydrograph Report

Monday, 06 / 10 / 2024
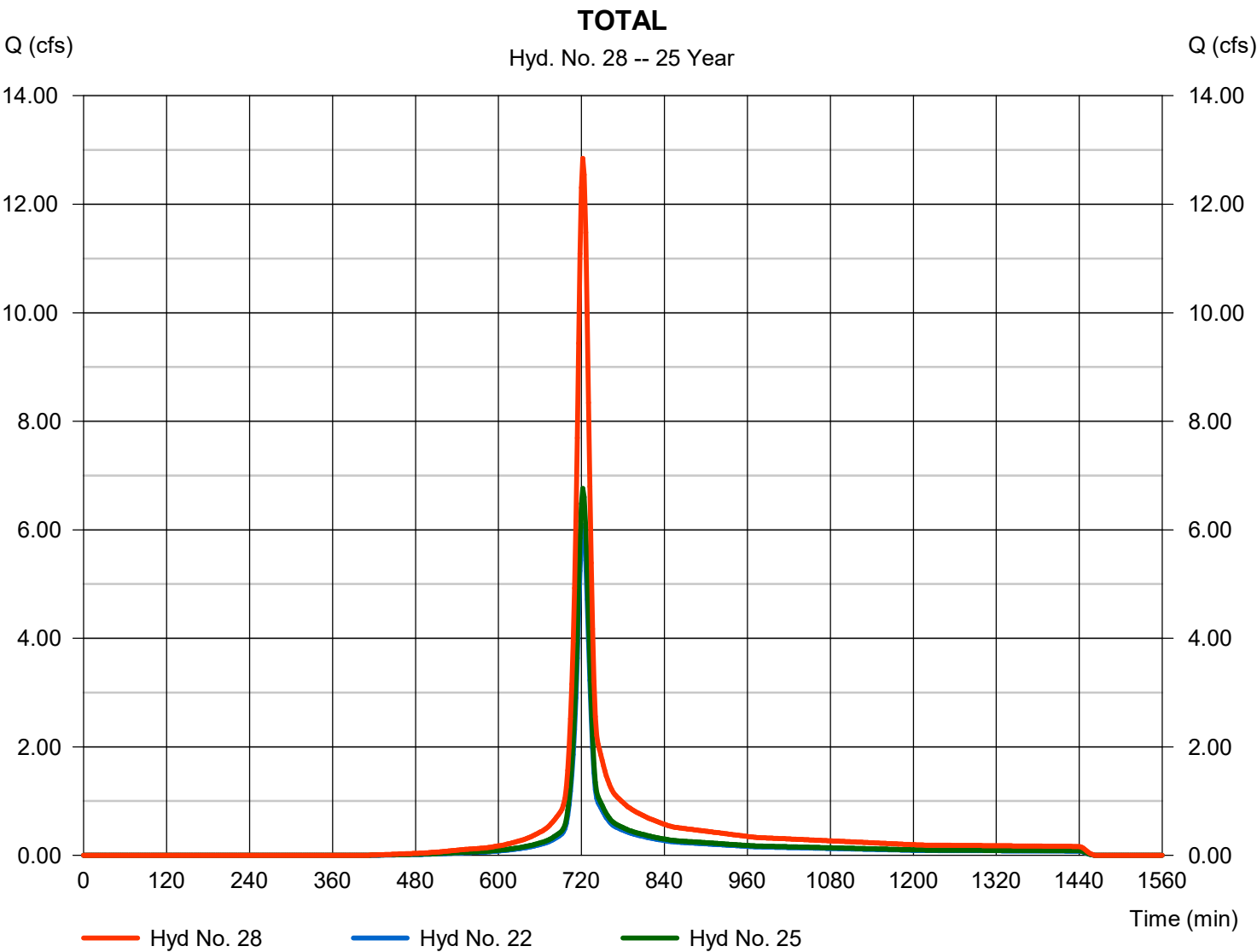
Hyd. No. 29

Total Post

Hydrograph type	= Combine	Peak discharge	= 12.92 cfs
Storm frequency	= 25 yrs	Time to peak	= 722 min
Time interval	= 2 min	Hyd. volume	= 39,817 cuft
Inflow hyds.	= 23, 26	Contrib. drain. area	= 0.000 ac
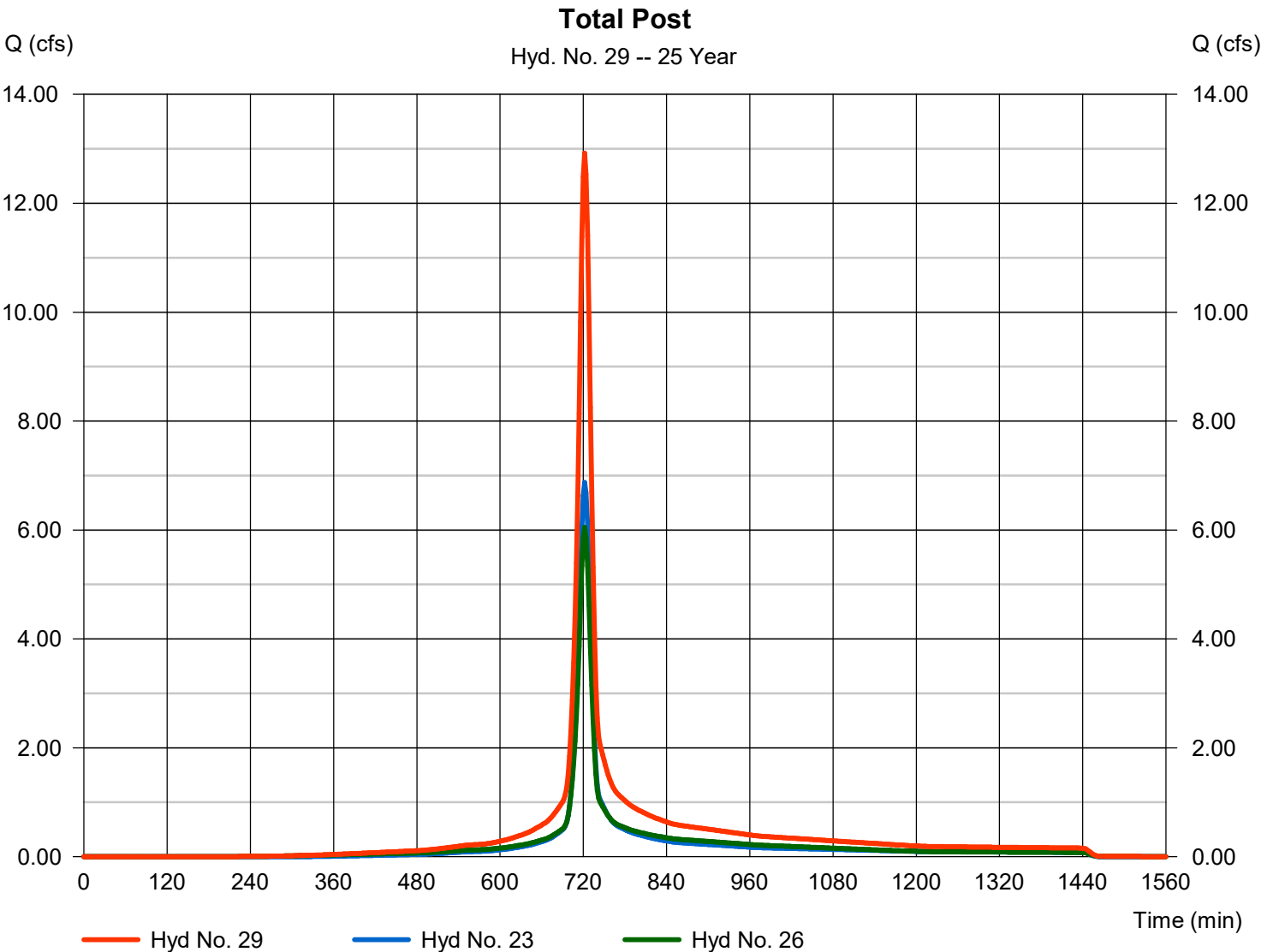
Total Post

Hyd. No. 29 -- 25 Year

Q (cfs)

Legend: Hyd No. 29, Hyd No. 23, Hyd No. 26

Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 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	2.778	2	722	7,836	------	------	------	Villa 1 PRE
2	SCS Runoff	3.092	2	722	8,859	------	------	------	Villa 1 POST
4	SCS Runoff	2.741	2	722	7,731	------	------	------	Villa 2 PRE
5	SCS Runoff	2.975	2	722	8,483	------	------	------	Villa 2 Post
7	SCS Runoff	1.333	2	722	3,761	------	------	------	Villa 3 PRE
8	SCS Runoff	1.588	2	722	4,642	------	------	------	Villa 3 Post
10	SCS Runoff	2.148	2	722	6,060	------	------	------	Villa 4 PRE
11	SCS Runoff	1.333	2	722	3,761	------	------	------	Villa 4 Post Runoff
12	SCS Runoff	1.073	2	722	3,437	------	------	------	Villa 4 Post Detention
13	Reservoir	0.127	2	750	3,421	12	1013.79	1,508	Villa 4
14	Combine	2.407	2	722	7,198	11, 12,	------	------	Total Villa 4 Post
16	SCS Runoff	1.778	2	722	5,015	------	------	------	Villa 5 PRE
17	SCS Runoff	2.029	2	722	5,888	------	------	------	Villa 5 Post
19	SCS Runoff	4.611	2	722	13,045	------	------	------	Villa 8 & 9 & road PRE
20	SCS Runoff	5.337	2	722	15,601	------	------	------	Villa 8 & 9 Road Post
22	Combine	7.297	2	722	20,582	1, 4, 16,	------	------	Lake Forest PRE
23	Combine	8.096	2	722	23,230	2, 5, 17,	------	------	Lake Forest POST
25	Combine	8.093	2	722	22,866	7, 10, 19,	------	------	Southwest PRE
26	Combine	7.030	2	722	23,664	8, 13, 20,	------	------	Southwest POST
28	Combine	15.39	2	722	43,448	22, 25,	------	------	TOTAL
29	Combine	15.13	2	722	46,894	23, 26,	------	------	Total Post

2023-186-Ponds.gpw	Return Period: 50 Year	Monday, 06 / 10 / 2024

Hydrograph Report

Monday, 06 / 10 / 2024

Hyd. No. 1

Villa 1 PRE

Hydrograph type	= SCS Runoff		Peak discharge	= 2.778 cfs
Storm frequency	= 50 yrs		Time to peak	= 722 min
Time interval	= 2 min		Hyd. volume	= 7,836 cuft
Drainage area	= 0.750 ac		Curve number	= 84
Basin Slope	= 0.0 %		Hydraulic length	= 0 ft
Tc method	= User		Time of conc. (Tc)	= 15.00 min
Total precip.	= 4.65 in		Distribution	= Type II
Storm duration	= 24 hrs		Shape factor	= 484

Villa 1 PRE
Hyd. No. 1 -- 50 Year

Hyd No. 1

Hydrograph Report

Monday, 06 / 10 / 2024
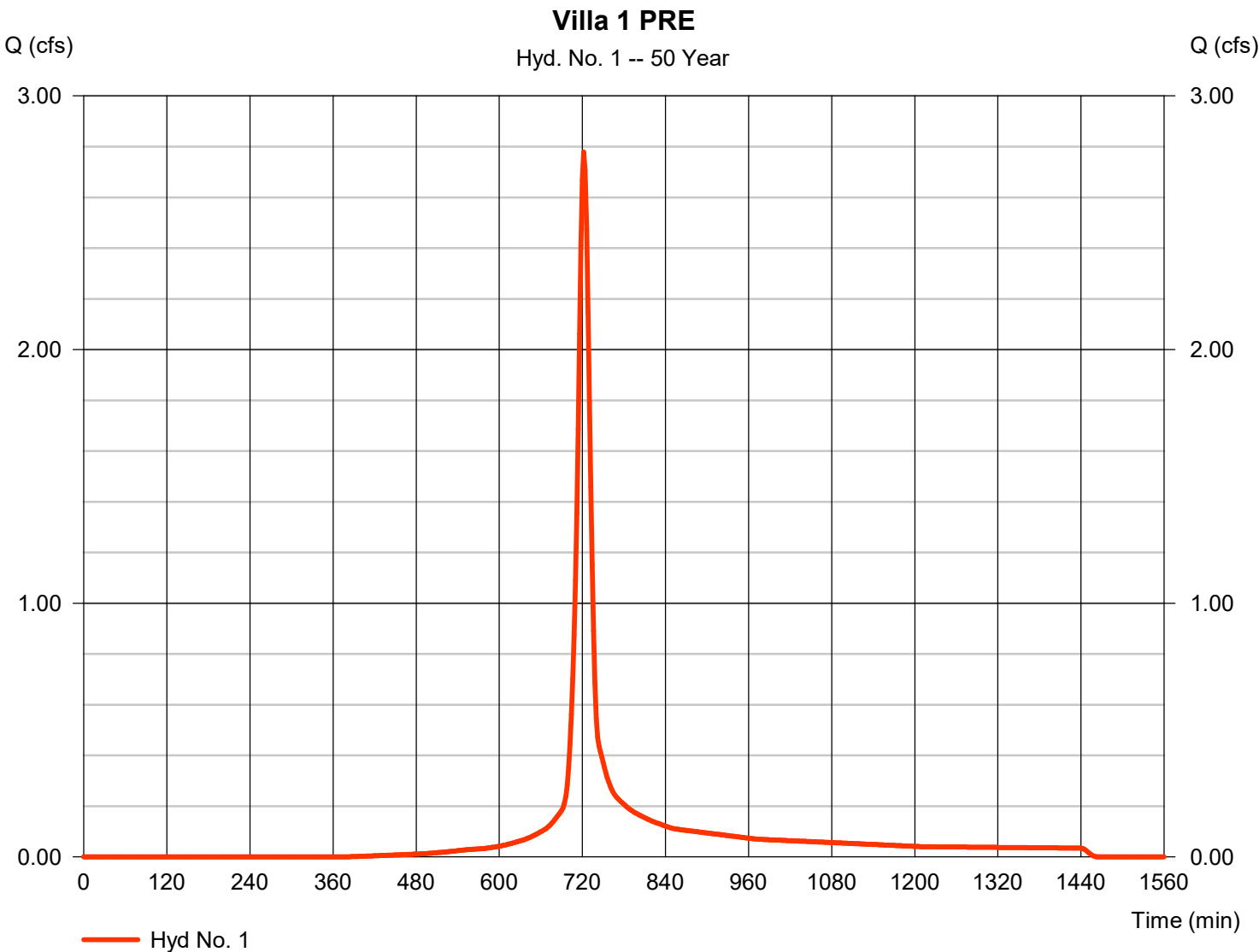
Hyd. No. 2

Villa 1 POST

Hydrograph type	= SCS Runoff		Peak discharge	= 3.092 cfs
Storm frequency	= 50 yrs		Time to peak	= 722 min
Time interval	= 2 min		Hyd. volume	= 8,859 cuft
Drainage area	= 0.750 ac		Curve number	= 88*
Basin Slope	= 0.0 %		Hydraulic length	= 0 ft
Tc method	= User		Time of conc. (Tc)	= 15.00 min
Total precip.	= 4.65 in		Distribution	= Type II
Storm duration	= 24 hrs		Shape factor	= 484

* Composite (Area/CN) = [(0.220 x 98) + (0.530 x 84)] / 0.750

Villa 1 POST

Hyd. No. 2 -- 50 Year

Q (cfs)   Q (cfs)

Time (min)

Hyd No. 2

Hydrograph Report

　　　　　　　　Monday, 06 / 10 / 2024
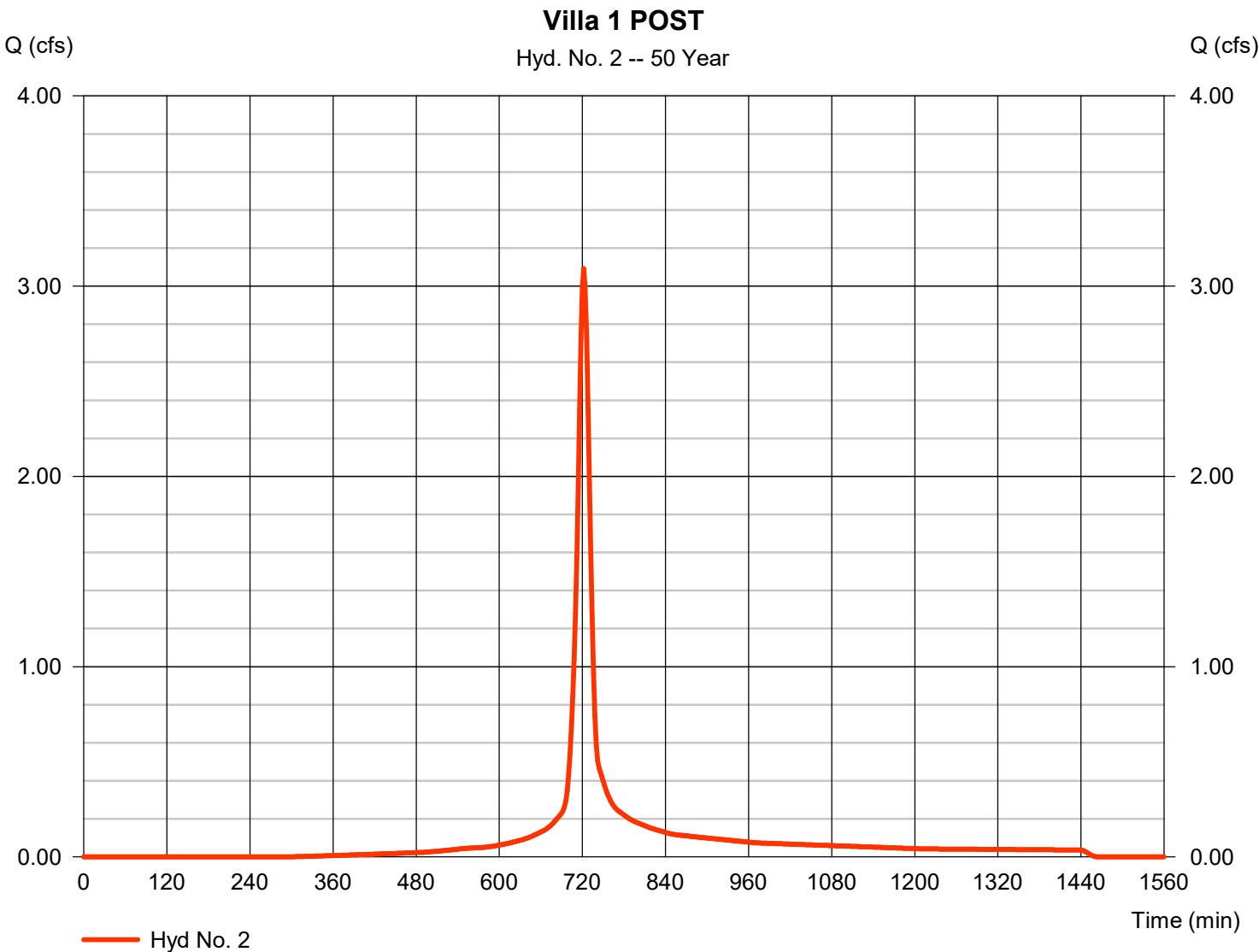
Hyd. No. 4

Villa 2 PRE

Hydrograph type	= SCS Runoff		Peak discharge	= 2.741 cfs
Storm frequency	= 50 yrs		Time to peak	= 722 min
Time interval	= 2 min		Hyd. volume	= 7,731 cuft
Drainage area	= 0.740 ac		Curve number	= 84
Basin Slope	= 0.0 %		Hydraulic length	= 0 ft
Tc method	= User		Time of conc. (Tc)	= 15.00 min
Total precip.	= 4.65 in		Distribution	= Type II
Storm duration	= 24 hrs		Shape factor	= 484

Villa 2 PRE
Hyd. No. 4 -- 50 Year

Hydrograph Report

Monday, 06 / 10 / 2024
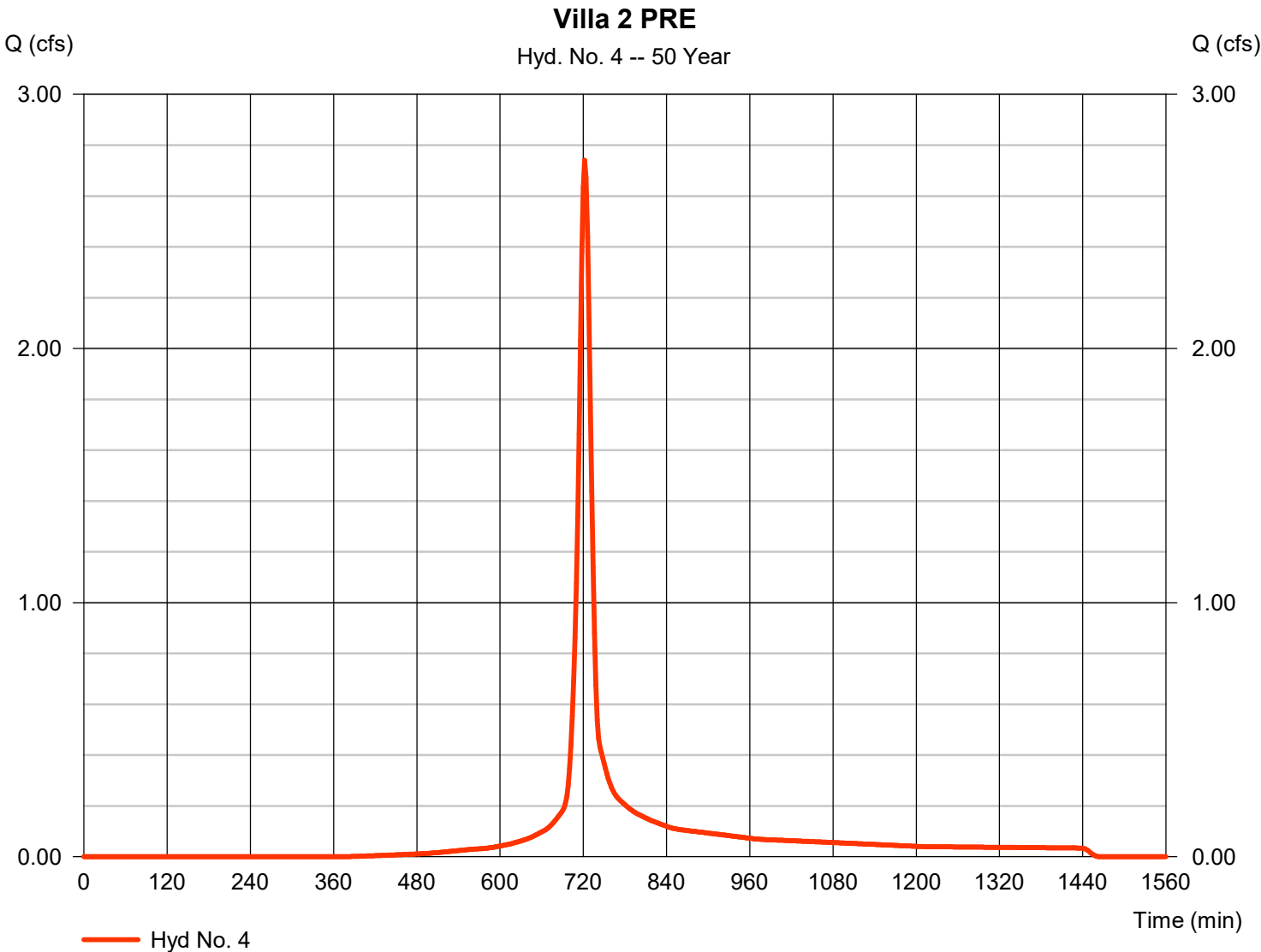
Hyd. No. 5

Villa 2 Post

Hydrograph type	= SCS Runoff	Peak discharge	= 2.975 cfs
Storm frequency	= 50 yrs	Time to peak	= 722 min
Time interval	= 2 min	Hyd. volume	= 8,483 cuft
Drainage area	= 0.740 ac	Curve number	= 87*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 15.00 min
Total precip.	= 4.65 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

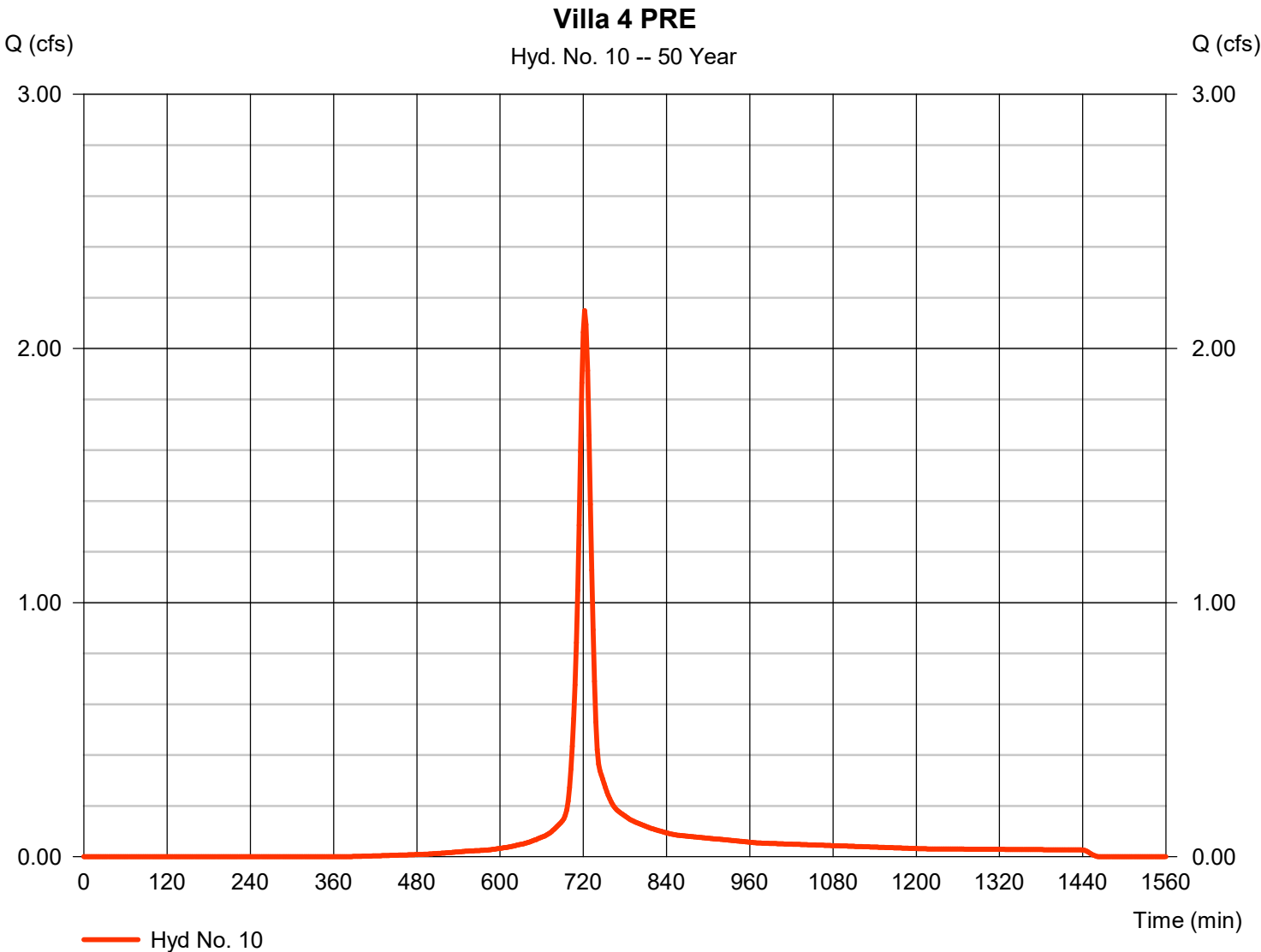* Composite (Area/CN) = [(0.180 x 98) + (0.560 x 84)] / 0.740

Villa 2 Post

Hyd. No. 5 -- 50 Year

Hydrograph Report

　　　　　　　　　　　　Monday, 06 / 10 / 2024

Hyd. No. 7

Villa 3 PRE

Hydrograph type	= SCS Runoff		Peak discharge	= 1.333 cfs
Storm frequency	= 50 yrs		Time to peak	= 722 min
Time interval	= 2 min		Hyd. volume	= 3,761 cuft
Drainage area	= 0.360 ac		Curve number	= 84
Basin Slope	= 0.0 %		Hydraulic length	= 0 ft
Tc method	= User		Time of conc. (Tc)	= 15.00 min
Total precip.	= 4.65 in		Distribution	= Type II
Storm duration	= 24 hrs		Shape factor	= 484

Villa 3 PRE

Hyd. No. 7 -- 50 Year

Q (cfs)

Hyd No. 7

Hydrograph Report

Monday, 06 / 10 / 2024

Hyd. No. 8

Villa 3 Post

Hydrograph type	= SCS Runoff		Peak discharge	= 1.588 cfs
Storm frequency	= 50 yrs		Time to peak	= 722 min
Time interval	= 2 min		Hyd. volume	= 4,642 cuft
Drainage area	= 0.360 ac		Curve number	= 91*
Basin Slope	= 0.0 %		Hydraulic length	= 0 ft
Tc method	= User		Time of conc. (Tc)	= 15.00 min
Total precip.	= 4.65 in		Distribution	= Type II
Storm duration	= 24 hrs		Shape factor	= 484

* Composite (Area/CN) = [(0.180 x 98) + (0.180 x 84)] / 0.360

Villa 3 Post

Hyd. No. 8 -- 50 Year

— Hyd No. 8

Hydrograph Report

Monday, 06 / 10 / 2024
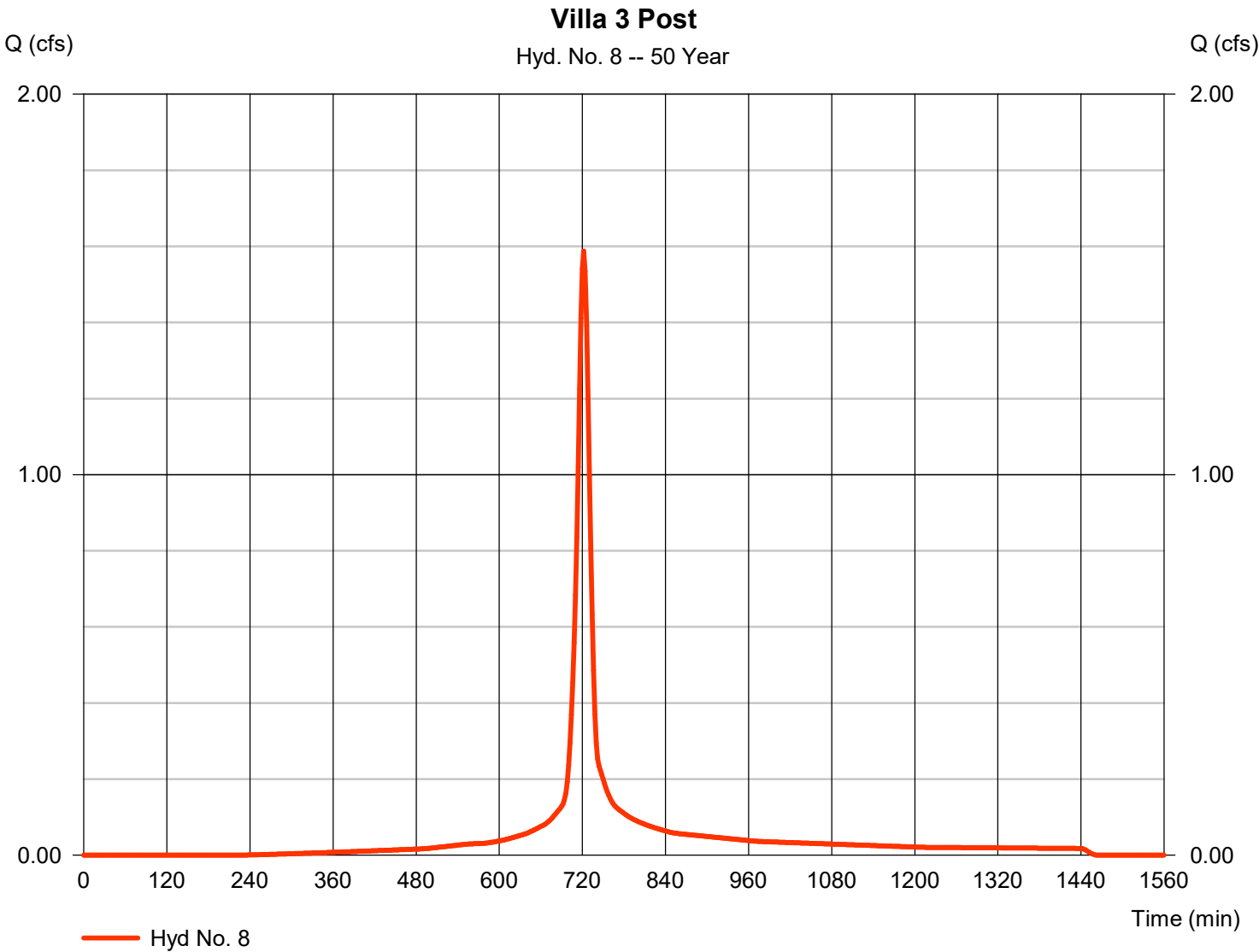
Hyd. No. 10

Villa 4 PRE

Hydrograph type	= SCS Runoff	Peak discharge	= 2.148 cfs
Storm frequency	= 50 yrs	Time to peak	= 722 min
Time interval	= 2 min	Hyd. volume	= 6,060 cuft
Drainage area	= 0.580 ac	Curve number	= 84
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 15.00 min
Total precip.	= 4.65 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

Villa 4 PRE

Hyd. No. 10 -- 50 Year

Hyd No. 10

Hydrograph Report

Monday, 06 / 10 / 2024

Hyd. No. 11

Villa 4 Post Runoff

Hydrograph type	= SCS Runoff		Peak discharge	= 1.333 cfs
Storm frequency	= 50 yrs		Time to peak	= 722 min
Time interval	= 2 min		Hyd. volume	= 3,761 cuft
Drainage area	= 0.360 ac		Curve number	= 84*
Basin Slope	= 0.0 %		Hydraulic length	= 0 ft
Tc method	= User		Time of conc. (Tc)	= 15.00 min
Total precip.	= 4.65 in		Distribution	= Type II
Storm duration	= 24 hrs		Shape factor	= 484

* Composite (Area/CN) = + (0.360 x 84)] / 0.360

Villa 4 Post Runoff

Hyd. No. 11 -- 50 Year

Hydrograph Report

Monday, 06 / 10 / 2024

Hyd. No. 12

Villa 4 Post Detention

Hydrograph type	= SCS Runoff		Peak discharge	= 1.073 cfs
Storm frequency	= 50 yrs		Time to peak	= 722 min
Time interval	= 2 min		Hyd. volume	= 3,437 cuft
Drainage area	= 0.220 ac		Curve number	= 98*
Basin Slope	= 0.0 %		Hydraulic length	= 0 ft
Tc method	= User		Time of conc. (Tc)	= 15.00 min
Total precip.	= 4.65 in		Distribution	= Type II
Storm duration	= 24 hrs		Shape factor	= 484

* Composite (Area/CN) = [(0.220 x 98)] / 0.220

Villa 4 Post Detention

Hyd. No. 12 -- 50 Year

Hydrograph Report

Monday, 06 / 10 / 2024
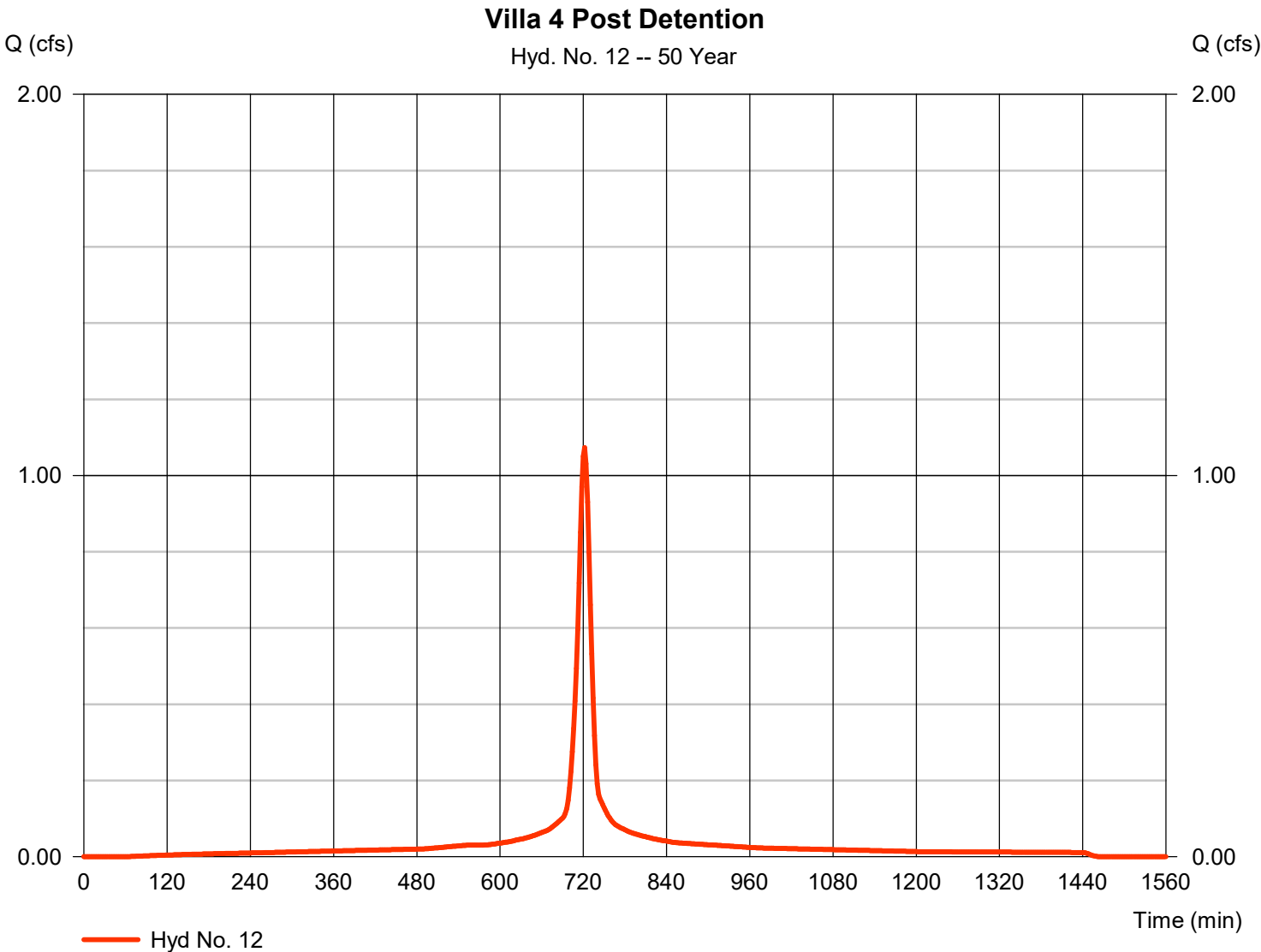
Hyd. No. 13

Villa 4

Hydrograph type	= Reservoir		Peak discharge	= 0.127 cfs
Storm frequency	= 50 yrs		Time to peak	= 750 min
Time interval	= 2 min		Hyd. volume	= 3,421 cuft
Inflow hyd. No.	= 12 - Villa 4 Post Detention		Max. Elevation	= 1013.79 ft
Reservoir name	= Villa 4		Max. Storage	= 1,508 cuft

Storage Indication method used.

Villa 4
Hyd. No. 13 -- 50 Year

Legend: Hyd No. 13 — Hyd No. 12 — Total storage used = 1,508 cuft
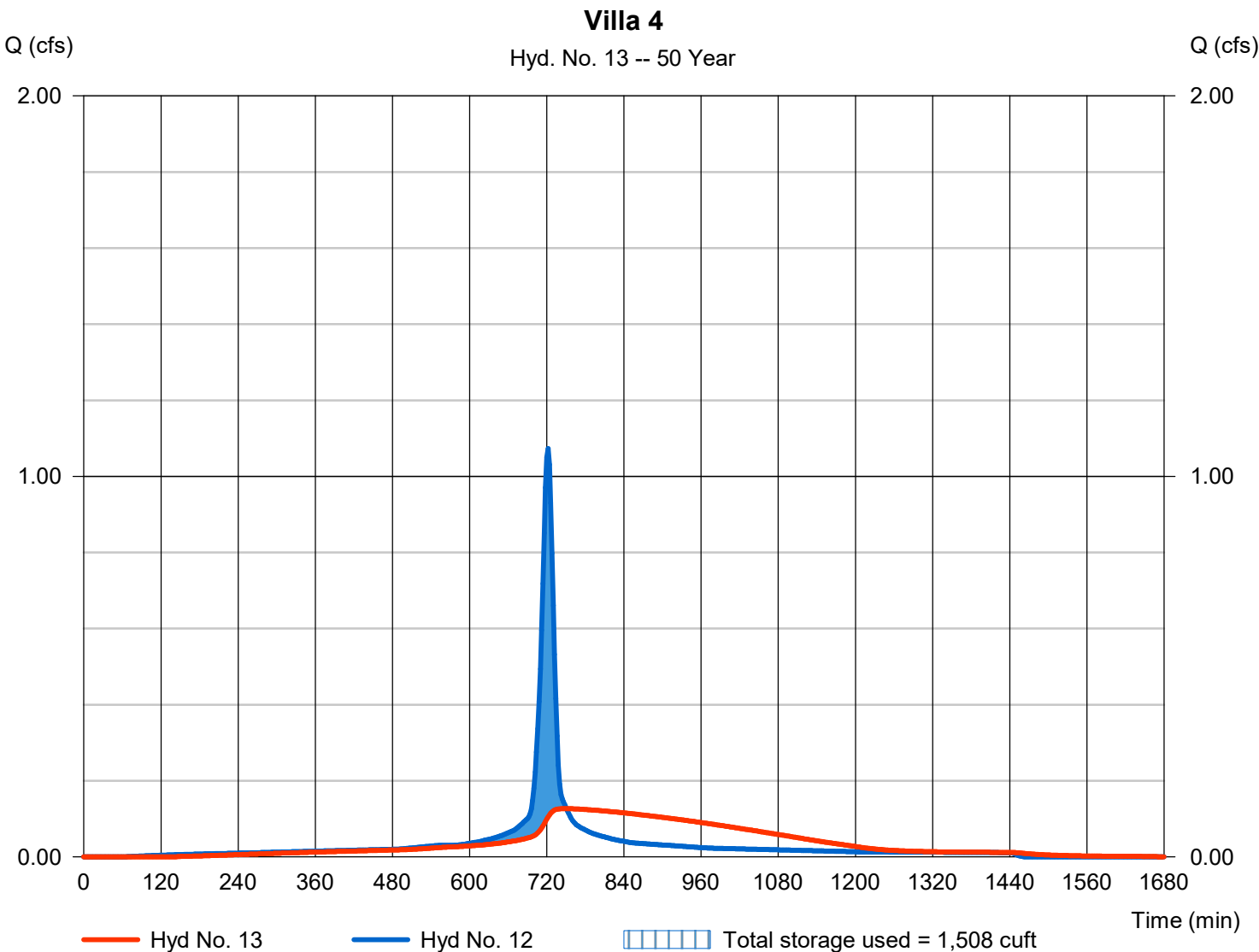
Hydrograph Report

Hyd. No. 14

Total Villa 4 Post

Hydrograph type	= Combine	Peak discharge	= 2.407 cfs
Storm frequency	= 50 yrs	Time to peak	= 722 min
Time interval	= 2 min	Hyd. volume	= 7,198 cuft
Inflow hyds.	= 11, 12	Contrib. drain. area	= 0.580 ac

Total Villa 4 Post

Hyd. No. 14 -- 50 Year

Hydrograph Report

Monday, 06 / 10 / 2024
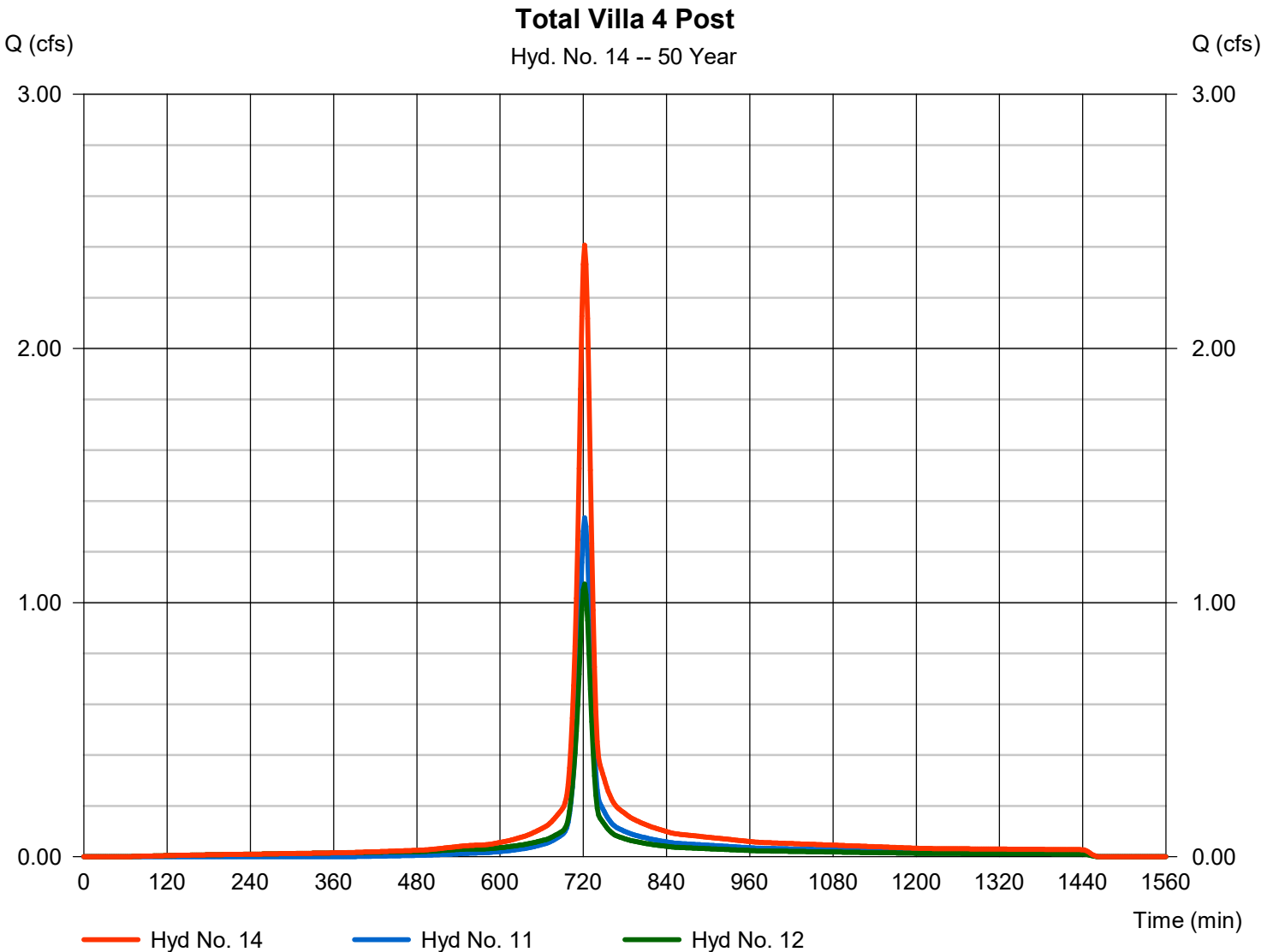
Hyd. No. 16

Villa 5 PRE

Hydrograph type	= SCS Runoff	Peak discharge	= 1.778 cfs
Storm frequency	= 50 yrs	Time to peak	= 722 min
Time interval	= 2 min	Hyd. volume	= 5,015 cuft
Drainage area	= 0.480 ac	Curve number	= 84
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 15.00 min
Total precip.	= 4.65 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

Villa 5 PRE

Hyd. No. 16 -- 50 Year

Hyd No. 16

Hydrograph Report

Monday, 06 / 10 / 2024
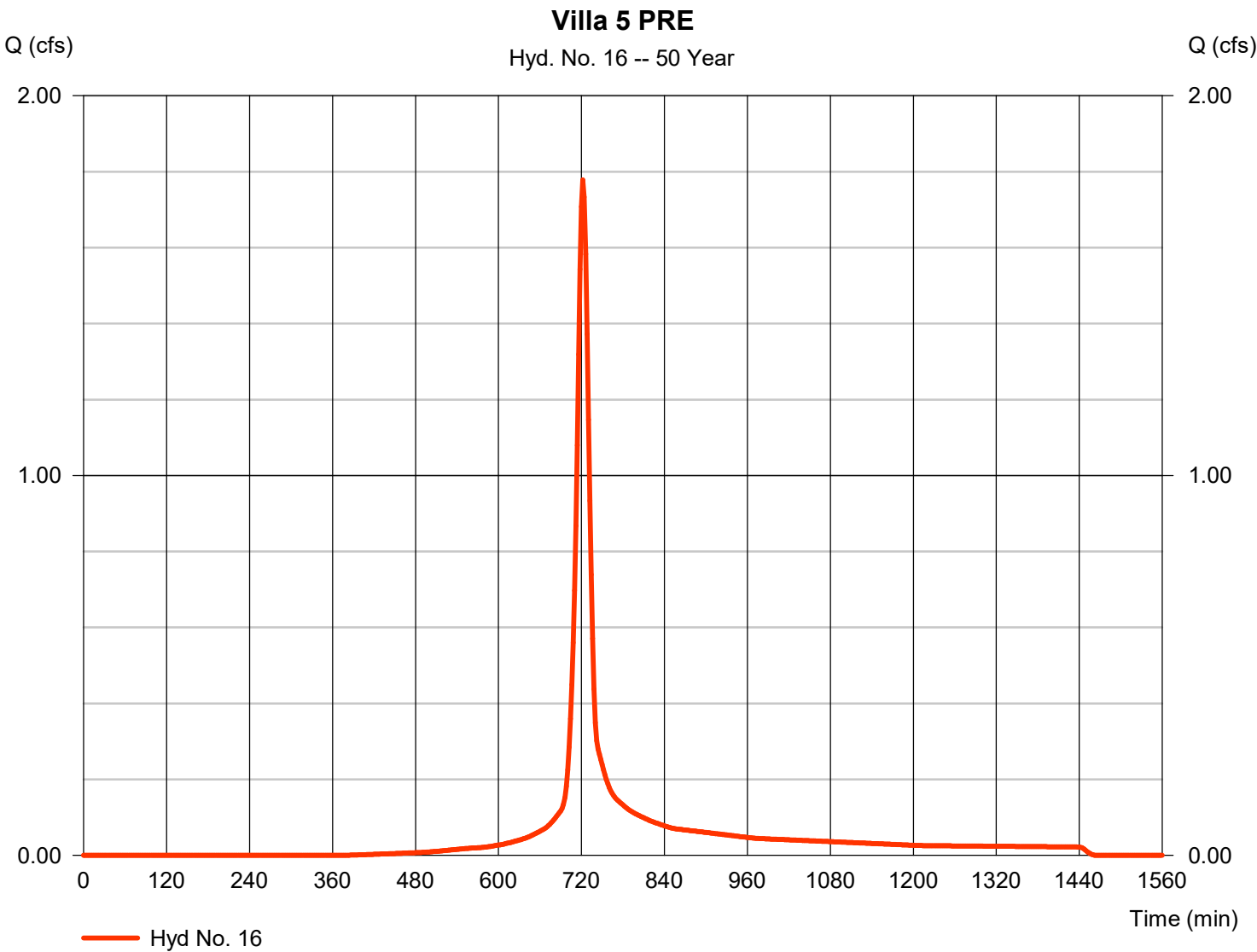
Hyd. No. 17

Villa 5 Post

Hydrograph type	= SCS Runoff		Peak discharge	= 2.029 cfs
Storm frequency	= 50 yrs		Time to peak	= 722 min
Time interval	= 2 min		Hyd. volume	= 5,888 cuft
Drainage area	= 0.470 ac		Curve number	= 90*
Basin Slope	= 0.0 %		Hydraulic length	= 0 ft
Tc method	= User		Time of conc. (Tc)	= 15.00 min
Total precip.	= 4.65 in		Distribution	= Type II
Storm duration	= 24 hrs		Shape factor	= 484

* Composite (Area/CN) = [(0.200 x 98) + (0.270 x 84)] / 0.470

Villa 5 Post
Hyd. No. 17 -- 50 Year
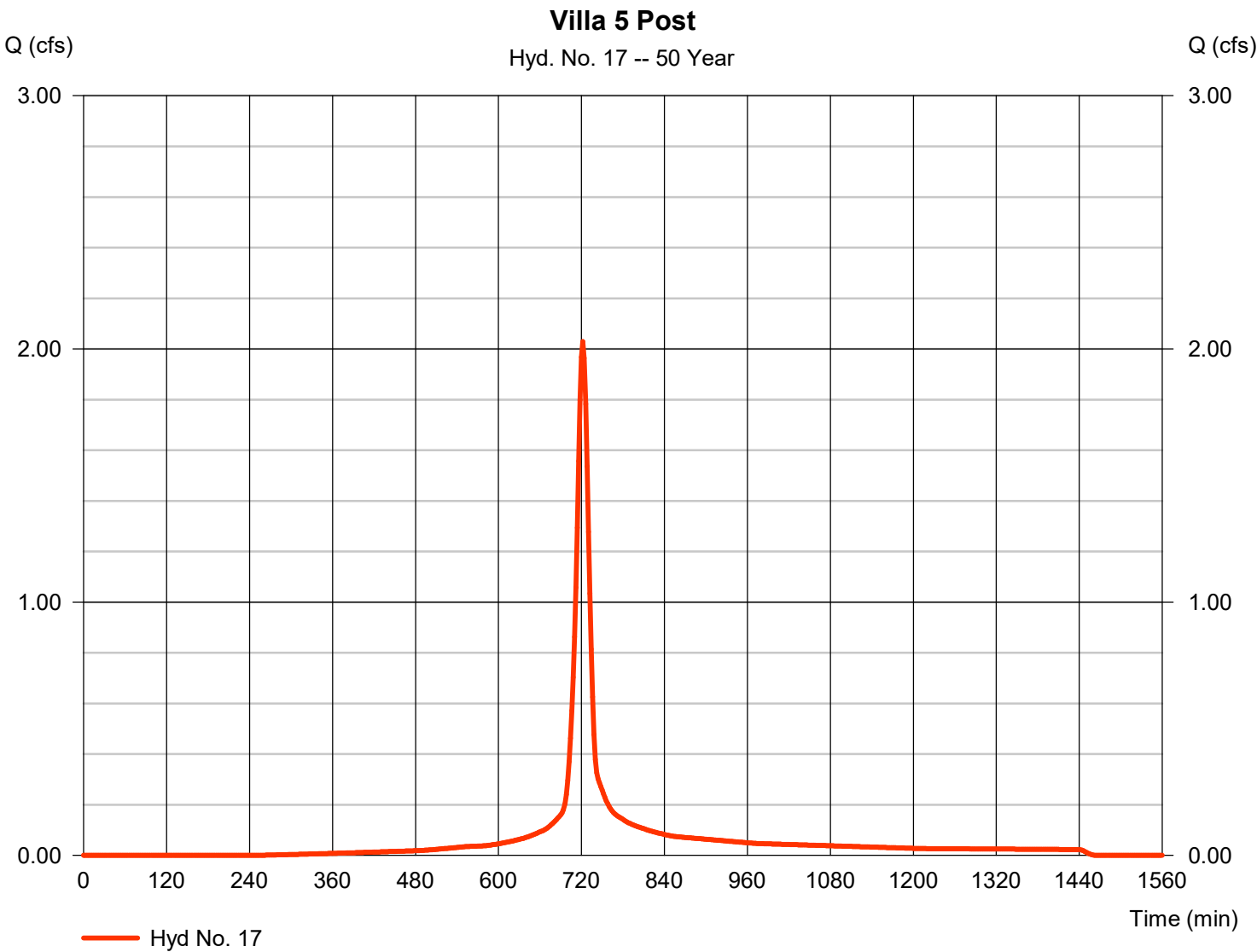
— Hyd No. 17

Hydrograph Report

Hyd. No. 19

Villa 8 & 9 & road PRE

Hydrograph type	= SCS Runoff		Peak discharge	= 4.611 cfs
Storm frequency	= 50 yrs		Time to peak	= 722 min
Time interval	= 2 min		Hyd. volume	= 13,045 cuft
Drainage area	= 1.210 ac		Curve number	= 85*
Basin Slope	= 0.0 %		Hydraulic length	= 0 ft
Tc method	= User		Time of conc. (Tc)	= 15.00 min
Total precip.	= 4.65 in		Distribution	= Type II
Storm duration	= 24 hrs		Shape factor	= 484

* Composite (Area/CN) = [(0.360 x 98) + (0.850 x 84)] / 1.210

Villa 8 & 9 & road PRE

Hyd. No. 19 -- 50 Year

Hyd No. 19

Hydrograph Report

Monday, 06 / 10 / 2024
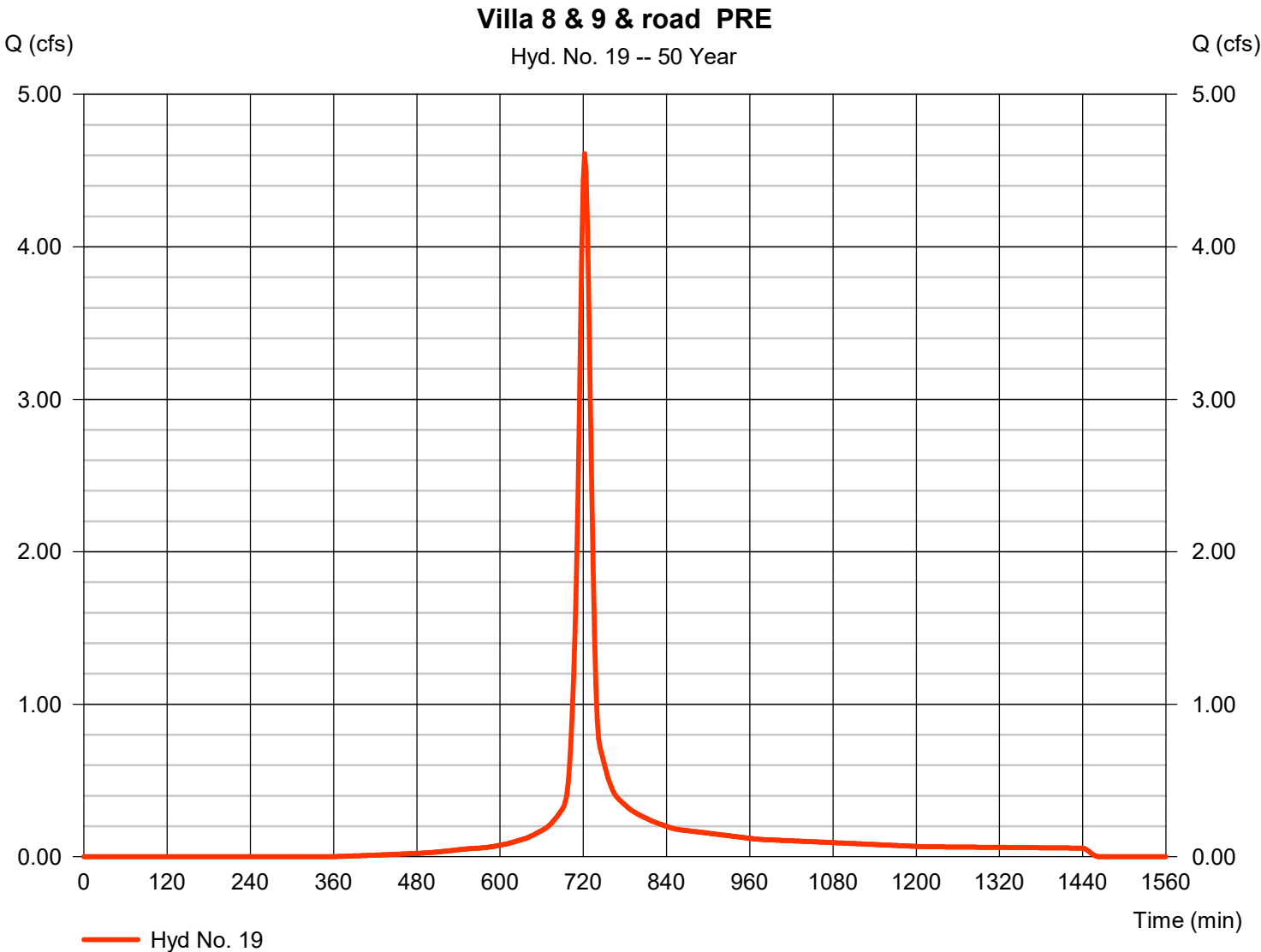
Hyd. No. 20

Villa 8 & 9 Road Post

Hydrograph type	= SCS Runoff	Peak discharge	= 5.337 cfs
Storm frequency	= 50 yrs	Time to peak	= 722 min
Time interval	= 2 min	Hyd. volume	= 15,601 cuft
Drainage area	= 1.210 ac	Curve number	= 91*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 15.00 min
Total precip.	= 4.65 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.590 x 98) + (0.620 x 84)] / 1.210

Villa 8 & 9 Road Post

Hyd. No. 20 -- 50 Year

Q (cfs)

Q (cfs)

Time (min)

—— Hyd No. 20

Hydrograph Report

Monday, 06 / 10 / 2024
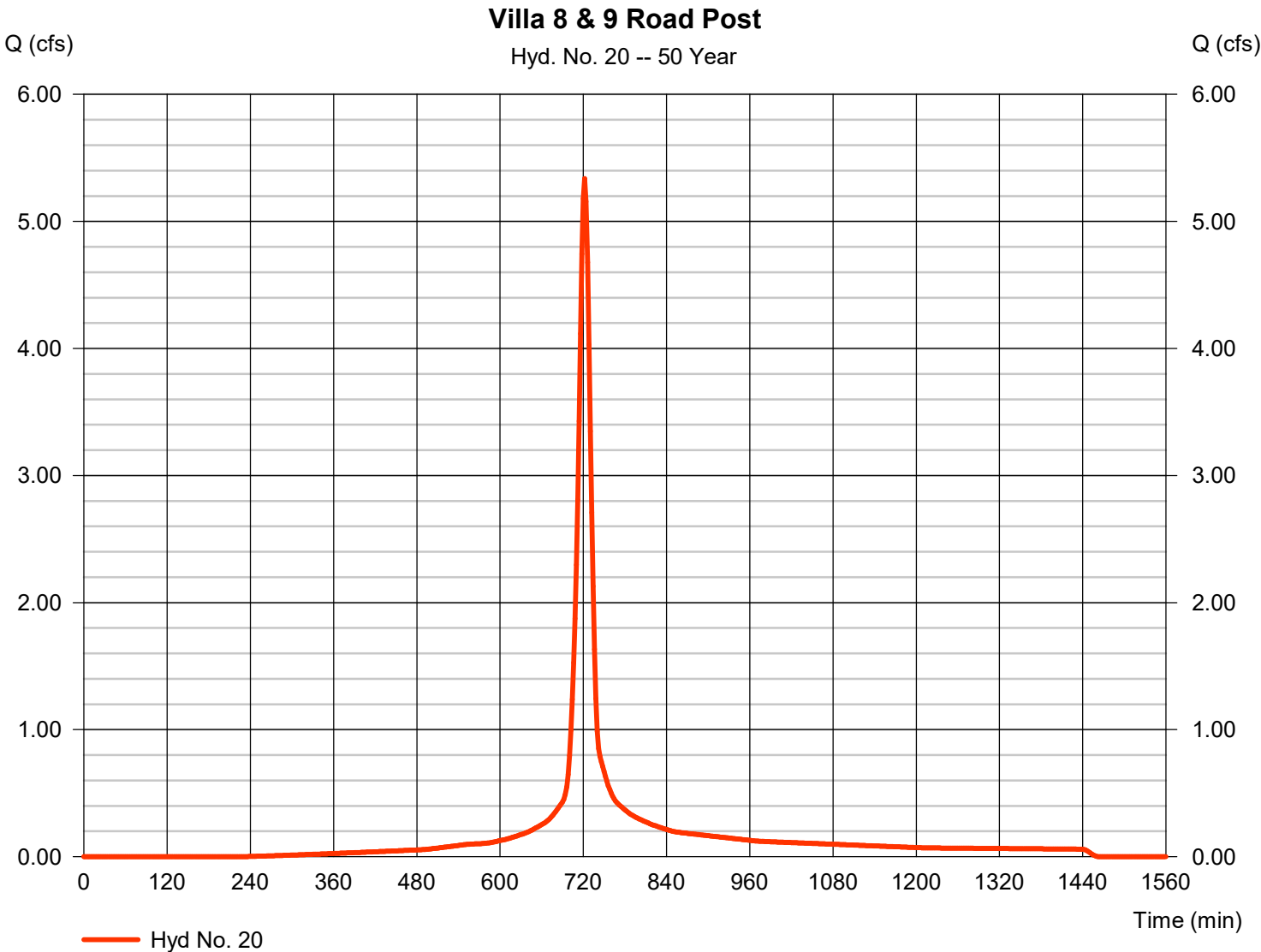
Hyd. No. 22

Lake Forest PRE

Hydrograph type	= Combine	Peak discharge	= 7.297 cfs
Storm frequency	= 50 yrs	Time to peak	= 722 min
Time interval	= 2 min	Hyd. volume	= 20,582 cuft
Inflow hyds.	= 1, 4, 16	Contrib. drain. area	= 1.970 ac

Lake Forest PRE

Hyd. No. 22 -- 50 Year

Hyd No. 22 — Hyd No. 1 — Hyd No. 4 — Hyd No. 16

Hydrograph Report

Monday, 06 / 10 / 2024
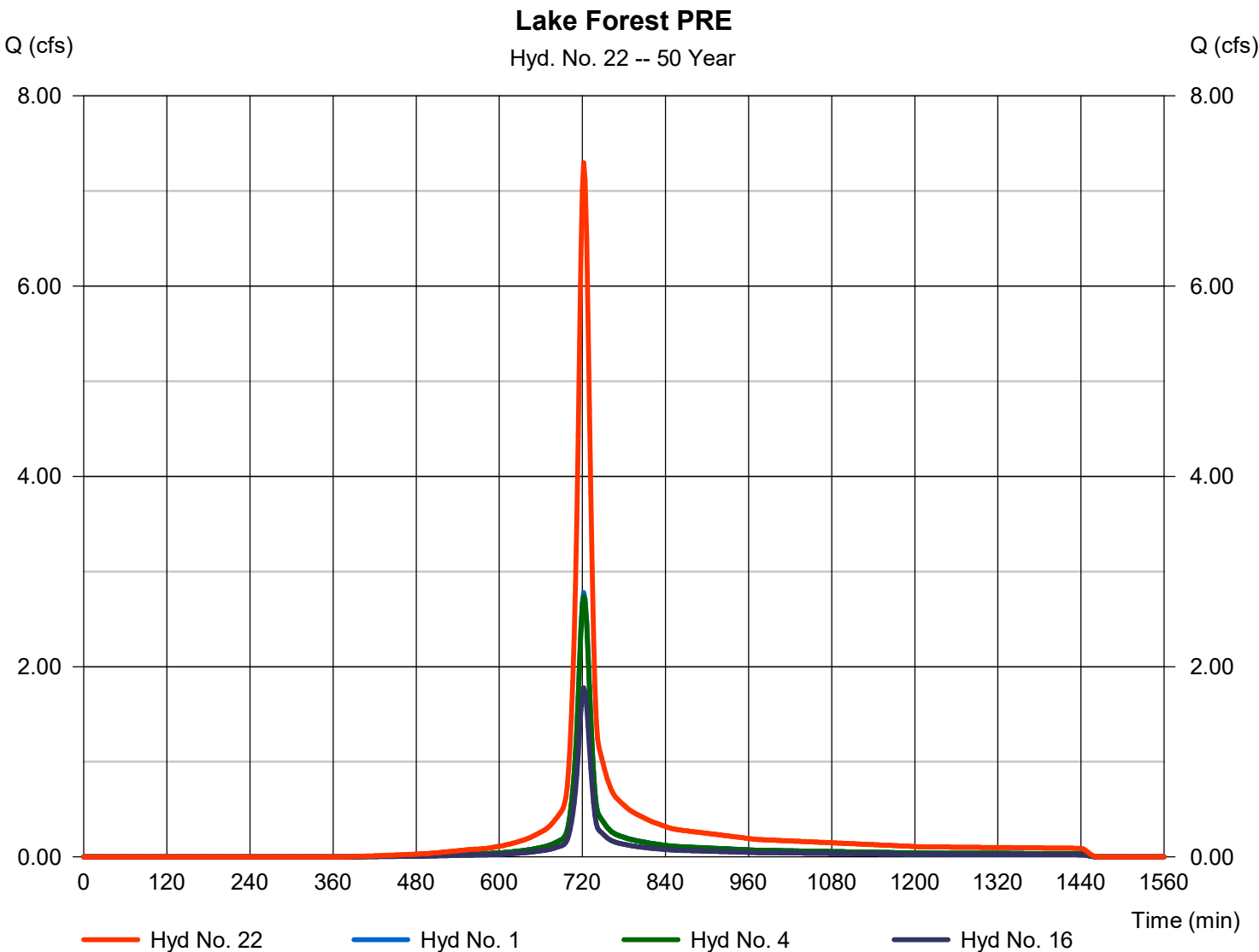
Hyd. No. 23

Lake Forest POST

Hydrograph type	= Combine	Peak discharge	= 8.096 cfs
Storm frequency	= 50 yrs	Time to peak	= 722 min
Time interval	= 2 min	Hyd. volume	= 23,230 cuft
Inflow hyds.	= 2, 5, 17	Contrib. drain. area	= 1.960 ac

Lake Forest POST

Hyd. No. 23 -- 50 Year

Hyd No. 23 — Hyd No. 2 — Hyd No. 5 — Hyd No. 17

Hydrograph Report

Monday, 06 / 10 / 2024
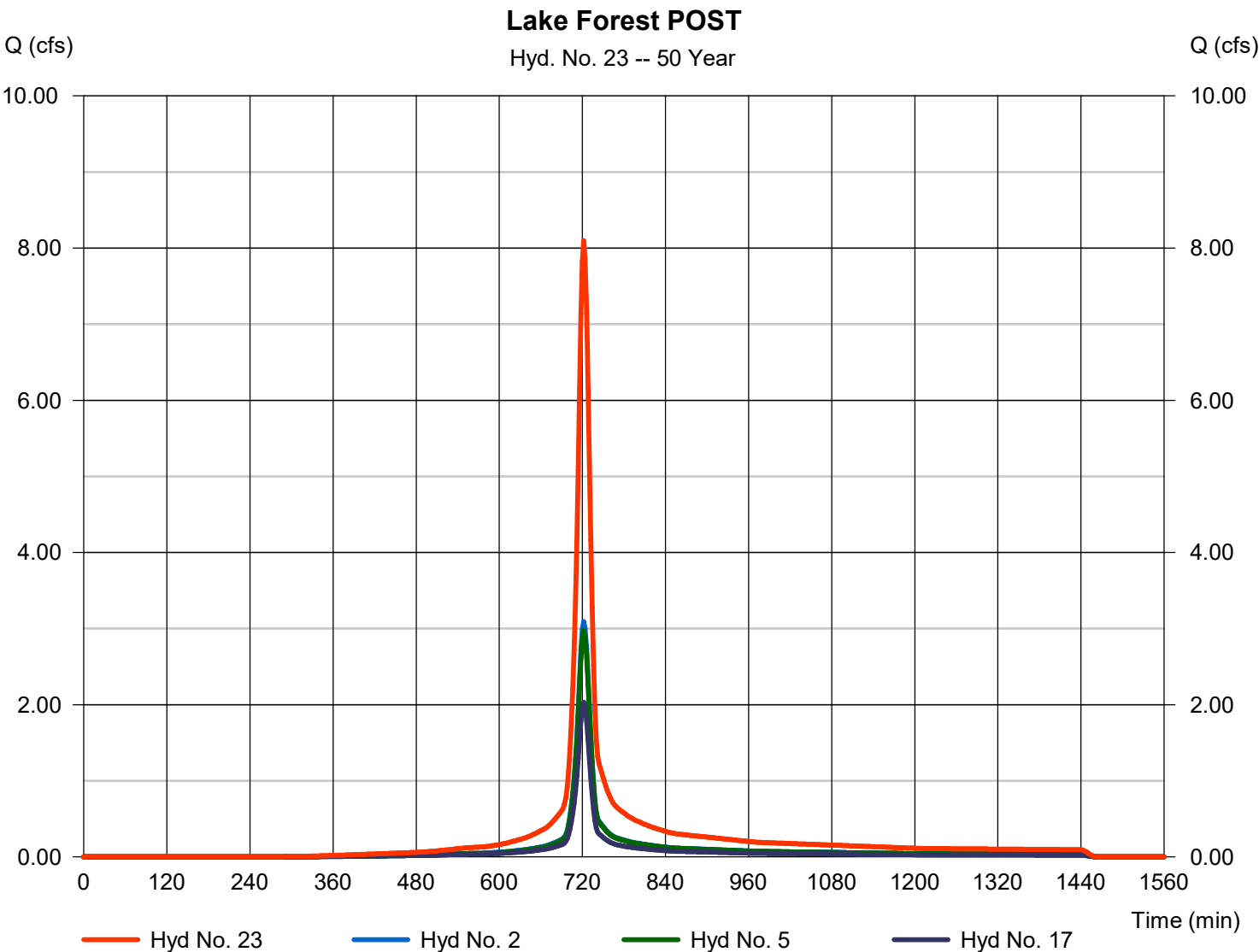
Hyd. No. 25

Southwest PRE

Hydrograph type	= Combine	Peak discharge	= 8.093 cfs
Storm frequency	= 50 yrs	Time to peak	= 722 min
Time interval	= 2 min	Hyd. volume	= 22,866 cuft
Inflow hyds.	= 7, 10, 19	Contrib. drain. area	= 2.150 ac

Southwest PRE
Hyd. No. 25 -- 50 Year
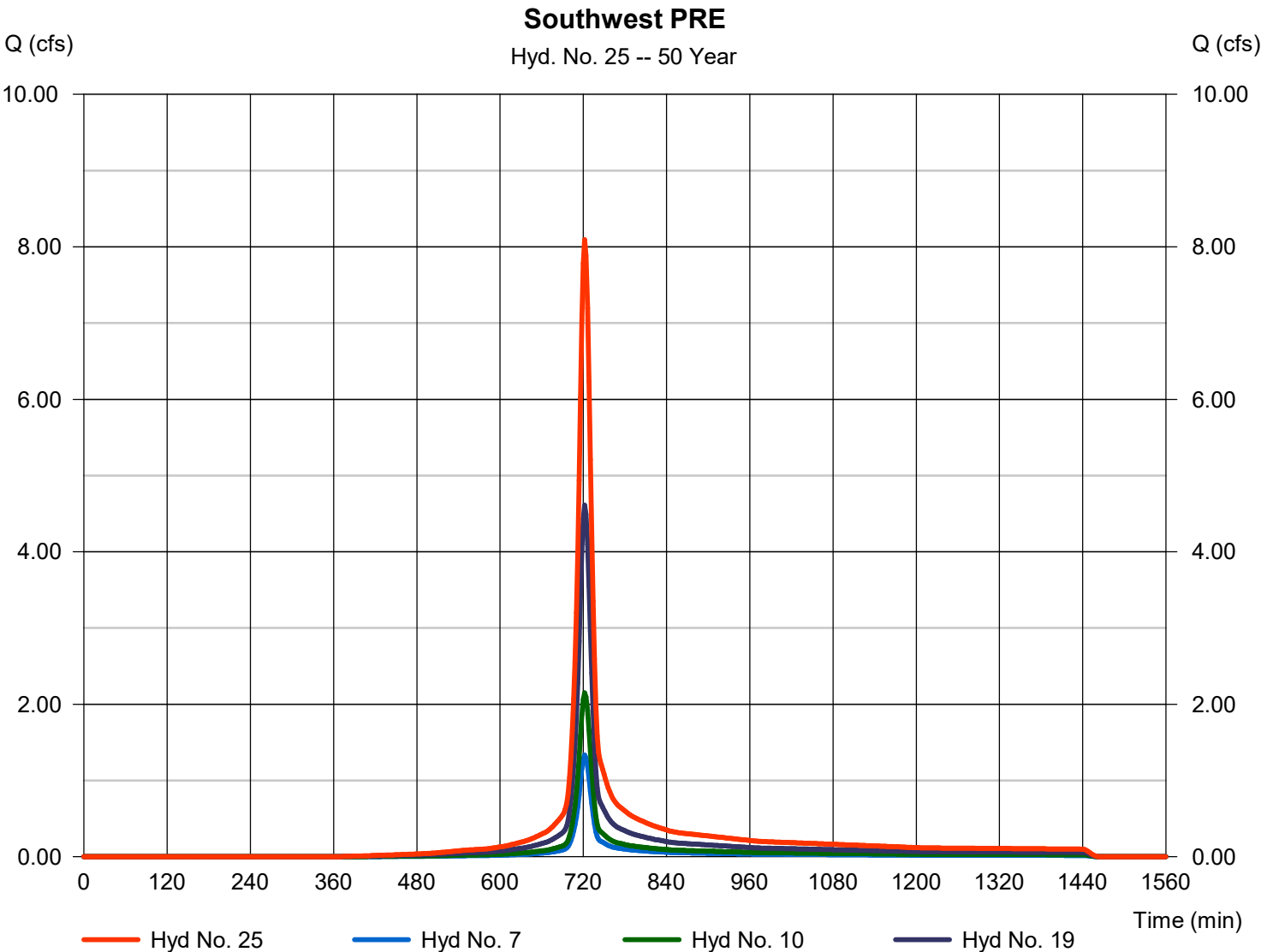
Hydrograph Report

Hyd. No. 26

Southwest POST

Hydrograph type	= Combine	Peak discharge	= 7.030 cfs
Storm frequency	= 50 yrs	Time to peak	= 722 min
Time interval	= 2 min	Hyd. volume	= 23,664 cuft
Inflow hyds.	= 8, 13, 20	Contrib. drain. area	= 1.570 ac

Southwest POST

Hyd. No. 26 -- 50 Year

Legend:
Hyd No. 26 — Hyd No. 8 — Hyd No. 13 — Hyd No. 20

Hydrograph Report

Monday, 06 / 10 / 2024
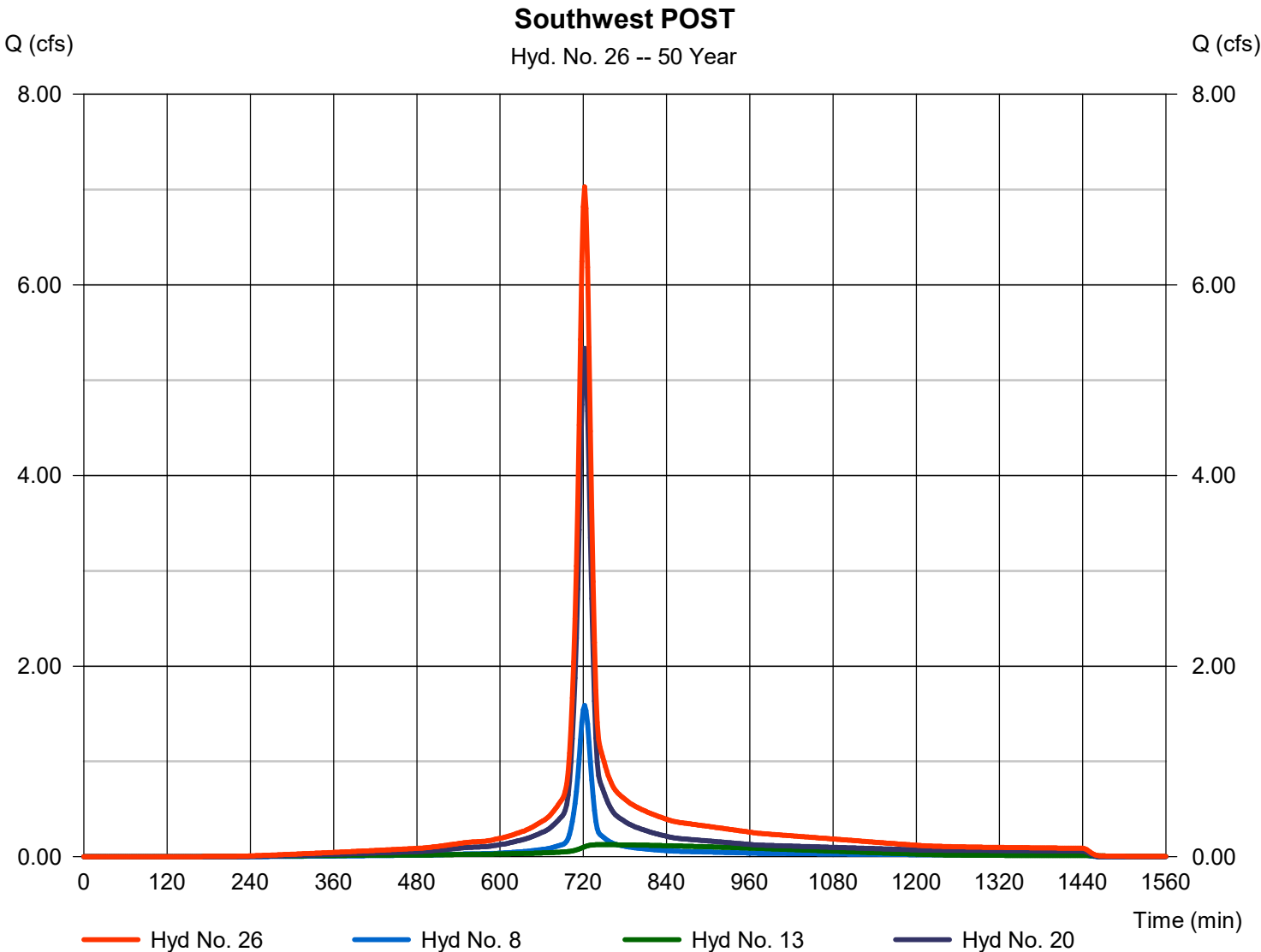
Hyd. No. 28

TOTAL

Hydrograph type	= Combine	Peak discharge	= 15.39 cfs
Storm frequency	= 50 yrs	Time to peak	= 722 min
Time interval	= 2 min	Hyd. volume	= 43,448 cuft
Inflow hyds.	= 22, 25	Contrib. drain. area	= 0.000 ac

TOTAL
Hyd. No. 28 -- 50 Year

— Hyd No. 28   — Hyd No. 22   — Hyd No. 25

Hydrograph Report

Monday, 06 / 10 / 2024
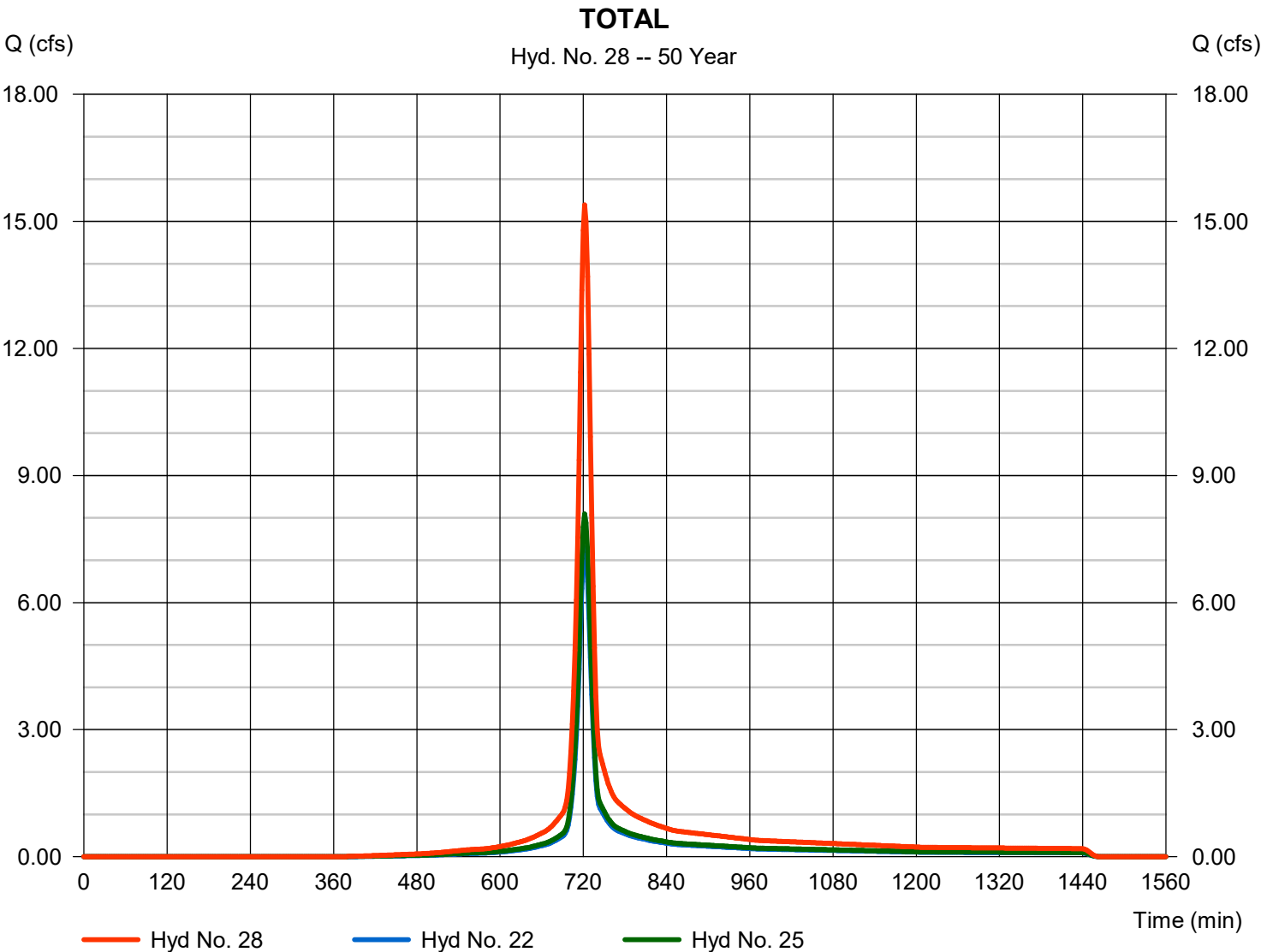
Hyd. No. 29

Total Post

Hydrograph type	= Combine	Peak discharge	= 15.13 cfs
Storm frequency	= 50 yrs	Time to peak	= 722 min
Time interval	= 2 min	Hyd. volume	= 46,894 cuft
Inflow hyds.	= 23, 26	Contrib. drain. area	= 0.000 ac
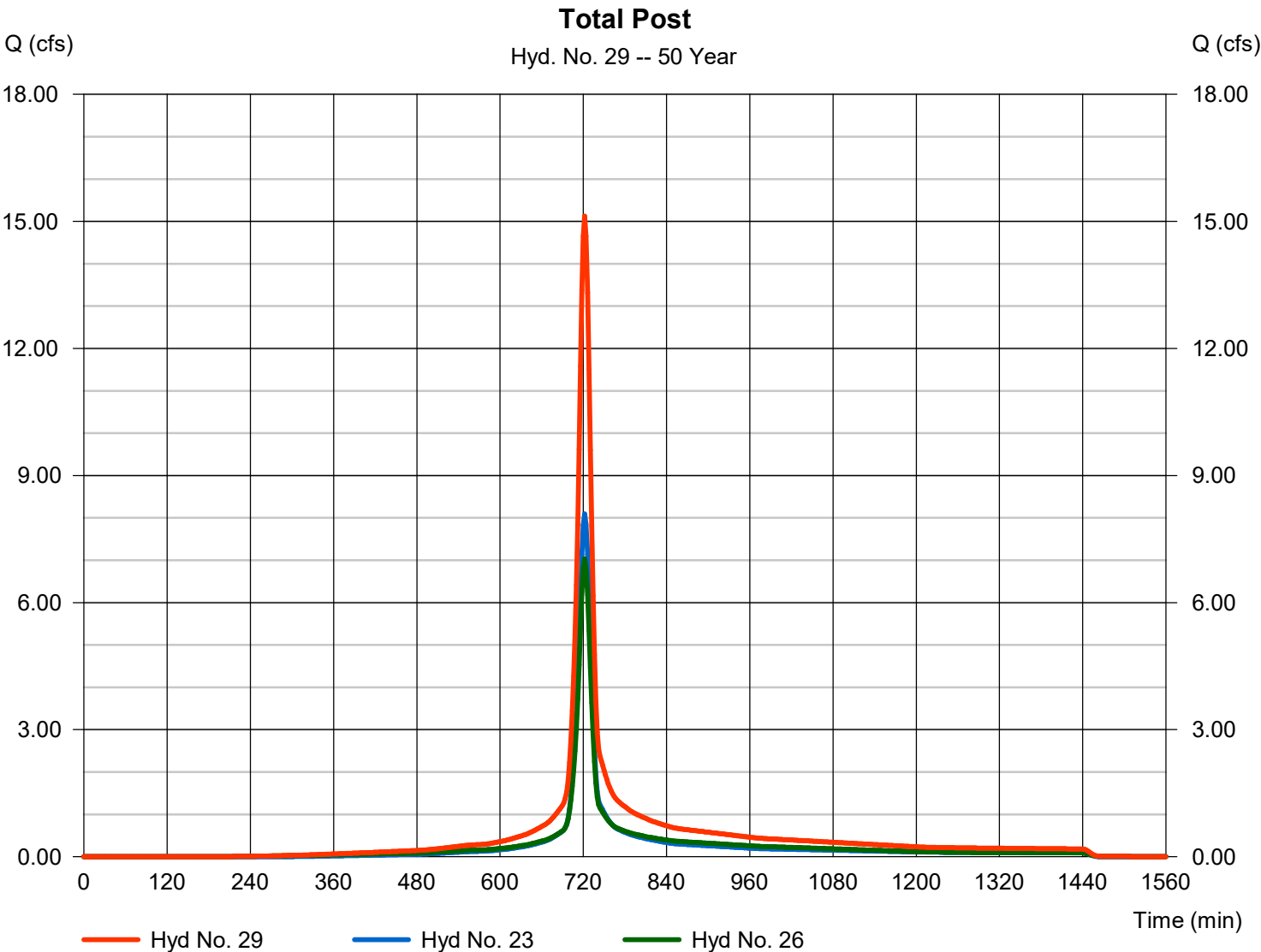
Total Post

Hyd. No. 29 -- 50 Year

Q (cfs)

Time (min)

Hyd No. 29 ——— Hyd No. 23 ——— Hyd No. 26

Hydrograph Summary Report

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	3.278	2	722	9,290	------	------	------	Villa 1 PRE
2	SCS Runoff	3.593	2	722	10,371	------	------	------	Villa 1 POST
4	SCS Runoff	3.234	2	722	9,166	------	------	------	Villa 2 PRE
5	SCS Runoff	3.470	2	722	9,961	------	------	------	Villa 2 Post
7	SCS Runoff	1.573	2	722	4,459	------	------	------	Villa 3 PRE
8	SCS Runoff	1.827	2	722	5,383	------	------	------	Villa 3 Post
10	SCS Runoff	2.535	2	722	7,184	------	------	------	Villa 4 PRE
11	SCS Runoff	1.573	2	722	4,459	------	------	------	Villa 4 Post Runoff
12	SCS Runoff	1.214	2	722	3,903	------	------	------	Villa 4 Post Detention
13	Reservoir	0.134	2	752	3,887	12	1013.96	1,735	Villa 4
14	Combine	2.787	2	722	8,362	11, 12,	------	------	Total Villa 4 Post
16	SCS Runoff	2.098	2	722	5,946	------	------	------	Villa 5 PRE
17	SCS Runoff	2.342	2	722	6,850	------	------	------	Villa 5 Post
19	SCS Runoff	5.419	2	722	15,416	------	------	------	Villa 8 & 9 & road PRE
20	SCS Runoff	6.140	2	722	18,094	------	------	------	Villa 8 & 9 Road Post
22	Combine	8.609	2	722	24,402	1, 4, 16,	------	------	Lake Forest PRE
23	Combine	9.406	2	722	27,181	2, 5, 17,	------	------	Lake Forest POST
25	Combine	9.527	2	722	27,060	7, 10, 19,	------	------	Southwest PRE
26	Combine	8.077	2	722	27,365	8, 13, 20,	------	------	Southwest POST
28	Combine	18.14	2	722	51,462	22, 25,	------	------	TOTAL
29	Combine	17.48	2	722	54,546	23, 26,	------	------	Total Post

2023-186-Ponds.gpw	Return Period: 100 Year	Monday, 06 / 10 / 2024

Hydrograph Report

Monday, 06 / 10 / 2024

Hyd. No. 1

Villa 1 PRE

Hydrograph type	= SCS Runoff		Peak discharge	= 3.278 cfs
Storm frequency	= 100 yrs		Time to peak	= 722 min
Time interval	= 2 min		Hyd. volume	= 9,290 cuft
Drainage area	= 0.750 ac		Curve number	= 84
Basin Slope	= 0.0 %		Hydraulic length	= 0 ft
Tc method	= User		Time of conc. (Tc)	= 15.00 min
Total precip.	= 5.25 in		Distribution	= Type II
Storm duration	= 24 hrs		Shape factor	= 484

Villa 1 PRE

Hyd. No. 1 -- 100 Year

Hydrograph Report

Monday, 06 / 10 / 2024
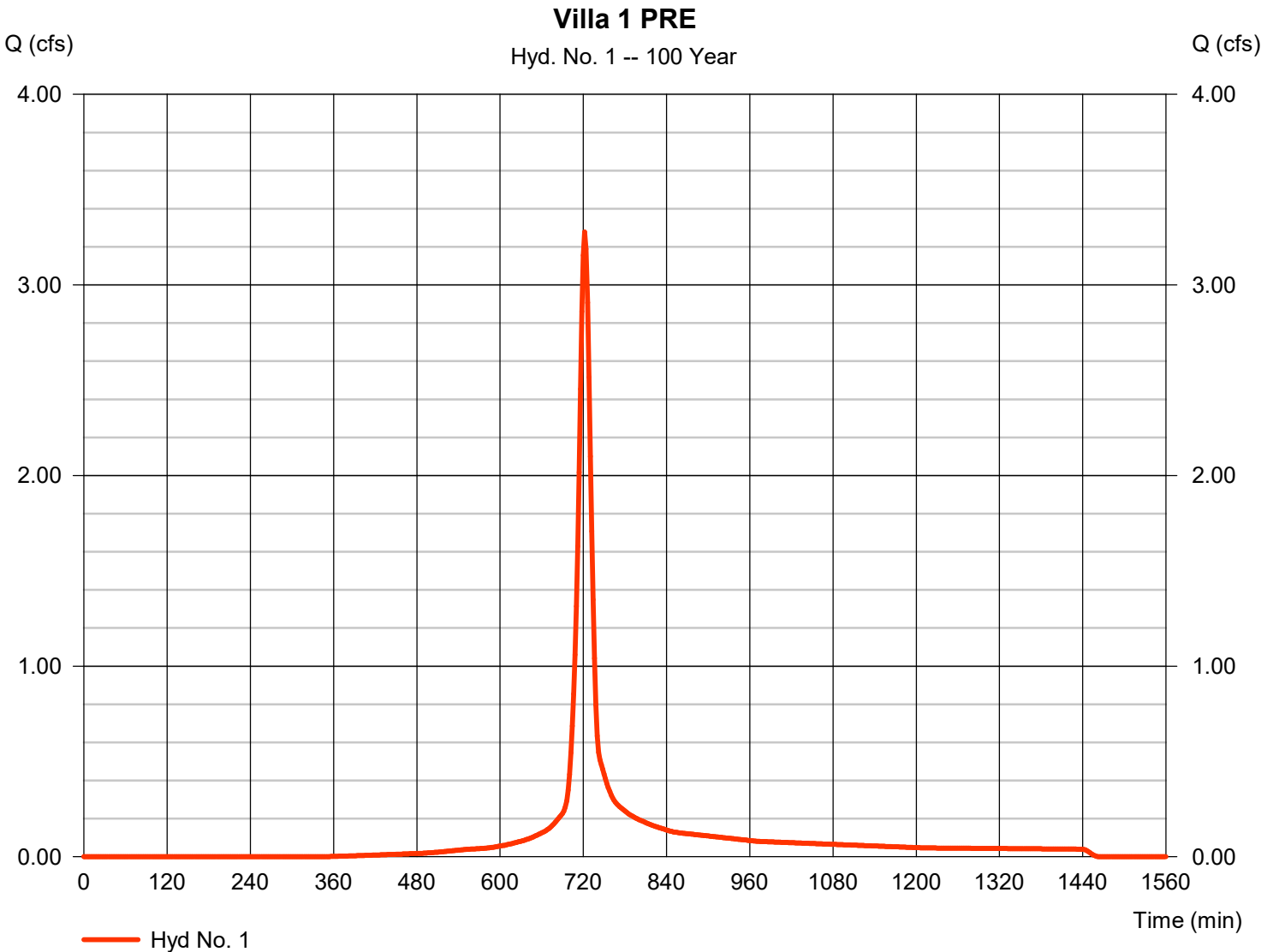
Hyd. No. 2

Villa 1 POST

Hydrograph type	= SCS Runoff		Peak discharge	= 3.593 cfs
Storm frequency	= 100 yrs		Time to peak	= 722 min
Time interval	= 2 min		Hyd. volume	= 10,371 cuft
Drainage area	= 0.750 ac		Curve number	= 88*
Basin Slope	= 0.0 %		Hydraulic length	= 0 ft
Tc method	= User		Time of conc. (Tc)	= 15.00 min
Total precip.	= 5.25 in		Distribution	= Type II
Storm duration	= 24 hrs		Shape factor	= 484

* Composite (Area/CN) = [(0.220 x 98) + (0.530 x 84)] / 0.750

Villa 1 POST

Hyd. No. 2 -- 100 Year

Q (cfs)

Time (min)

Hyd No. 2

Hydrograph Report

Monday, 06 / 10 / 2024
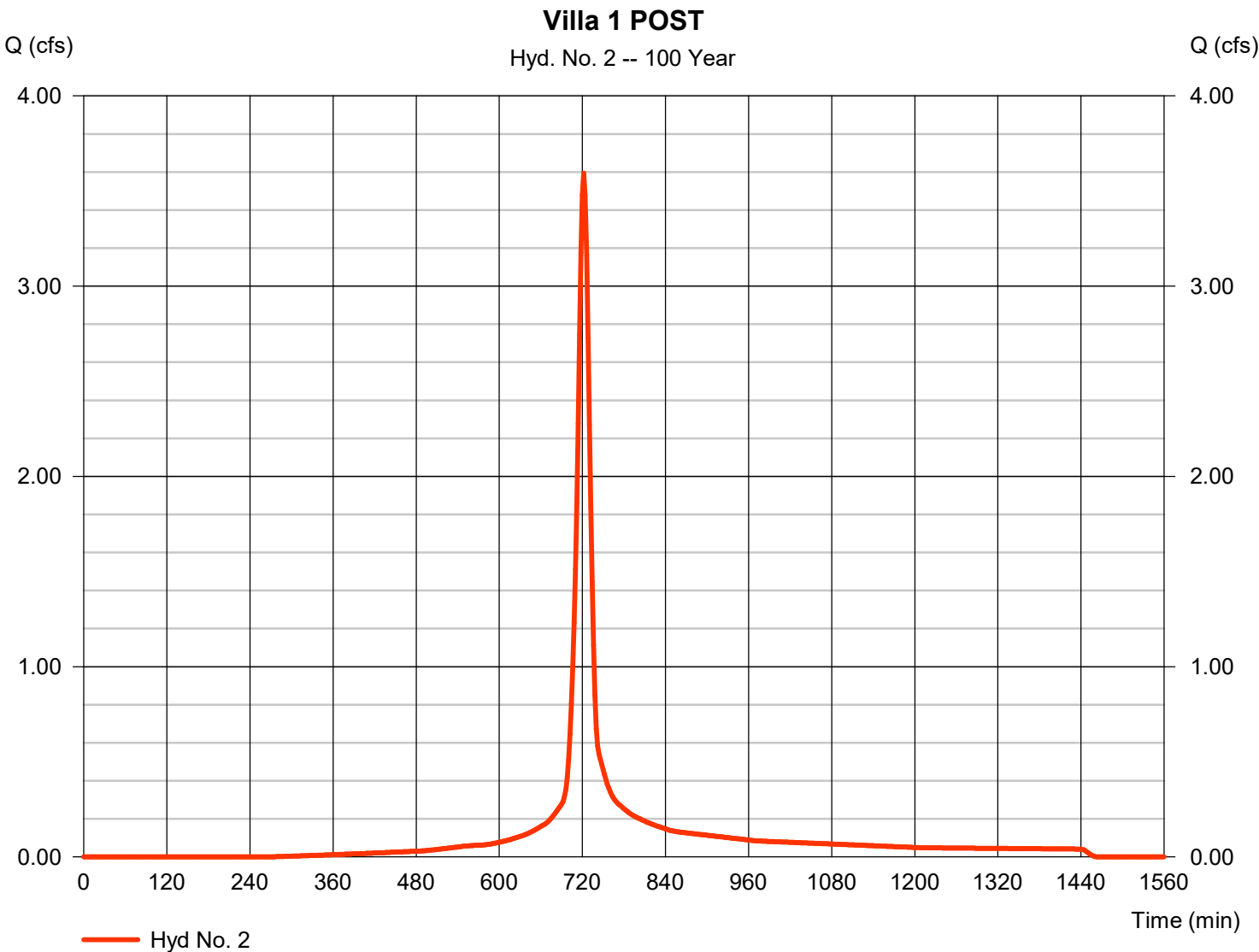
Hyd. No. 4

Villa 2 PRE

Hydrograph type	=	SCS Runoff	Peak discharge	=	3.234 cfs
Storm frequency	=	100 yrs	Time to peak	=	722 min
Time interval	=	2 min	Hyd. volume	=	9,166 cuft
Drainage area	=	0.740 ac	Curve number	=	84
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	15.00 min
Total precip.	=	5.25 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

Villa 2 PRE

Hyd. No. 4 -- 100 Year

— Hyd No. 4

Hydrograph Report

Monday, 06 / 10 / 2024
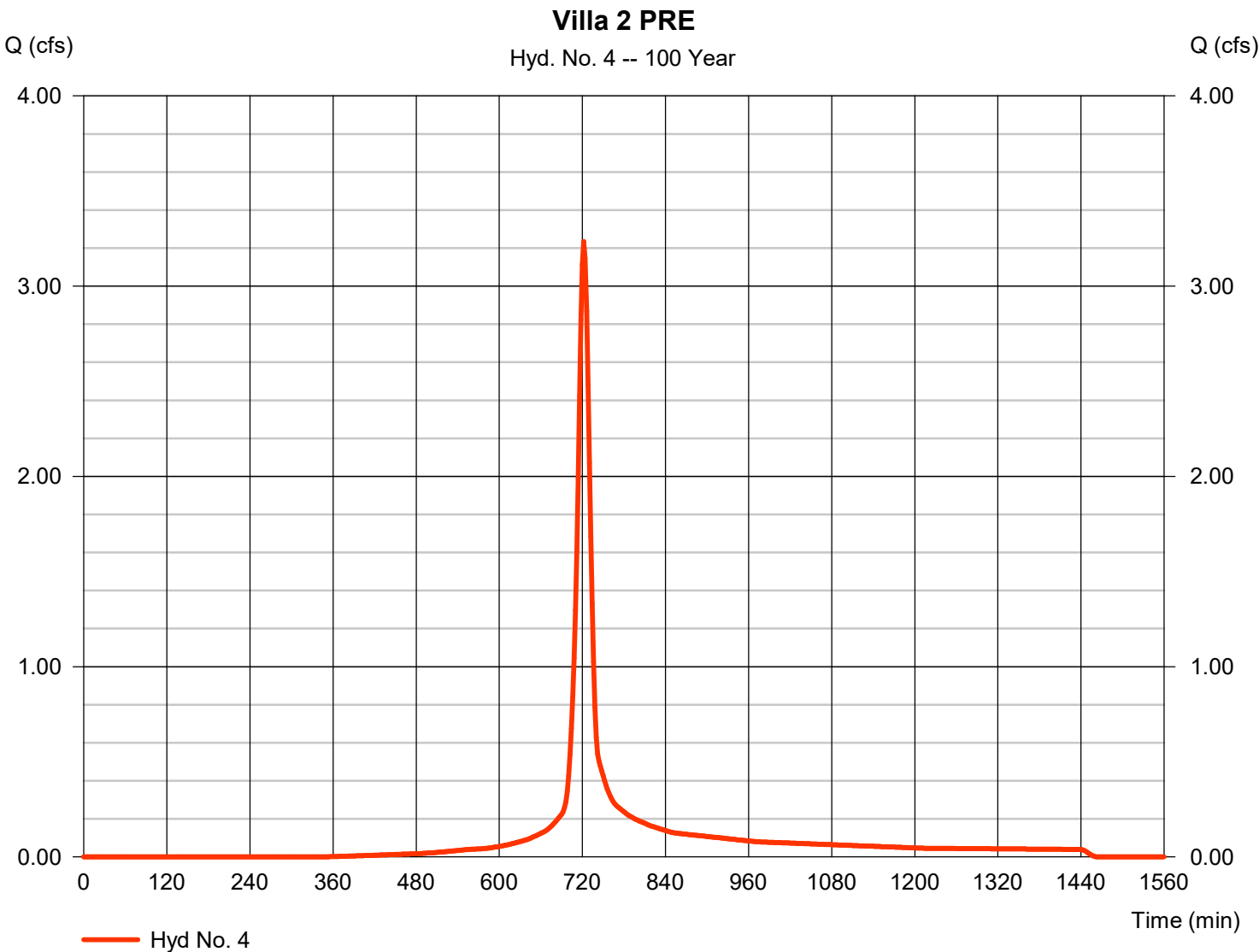
Hyd. No. 5

Villa 2 Post

Hydrograph type	= SCS Runoff	Peak discharge	= 3.470 cfs
Storm frequency	= 100 yrs	Time to peak	= 722 min
Time interval	= 2 min	Hyd. volume	= 9,961 cuft
Drainage area	= 0.740 ac	Curve number	= 87*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 15.00 min
Total precip.	= 5.25 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.180 x 98) + (0.560 x 84)] / 0.740

Villa 2 Post

Hyd. No. 5 -- 100 Year

— Hyd No. 5

Hydrograph Report

Monday, 06 / 10 / 2024

Hyd. No. 7

Villa 3 PRE

Hydrograph type	= SCS Runoff	Peak discharge	= 1.573 cfs
Storm frequency	= 100 yrs	Time to peak	= 722 min
Time interval	= 2 min	Hyd. volume	= 4,459 cuft
Drainage area	= 0.360 ac	Curve number	= 84
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 15.00 min
Total precip.	= 5.25 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

Villa 3 PRE
Hyd. No. 7 -- 100 Year

Hydrograph Report

Hyd. No. 8

Villa 3 Post

Hydrograph type	= SCS Runoff		Peak discharge	= 1.827 cfs
Storm frequency	= 100 yrs		Time to peak	= 722 min
Time interval	= 2 min		Hyd. volume	= 5,383 cuft
Drainage area	= 0.360 ac		Curve number	= 91*
Basin Slope	= 0.0 %		Hydraulic length	= 0 ft
Tc method	= User		Time of conc. (Tc)	= 15.00 min
Total precip.	= 5.25 in		Distribution	= Type II
Storm duration	= 24 hrs		Shape factor	= 484

* Composite (Area/CN) = [(0.180 x 98) + (0.180 x 84)] / 0.360

Villa 3 Post

Hyd. No. 8 -- 100 Year
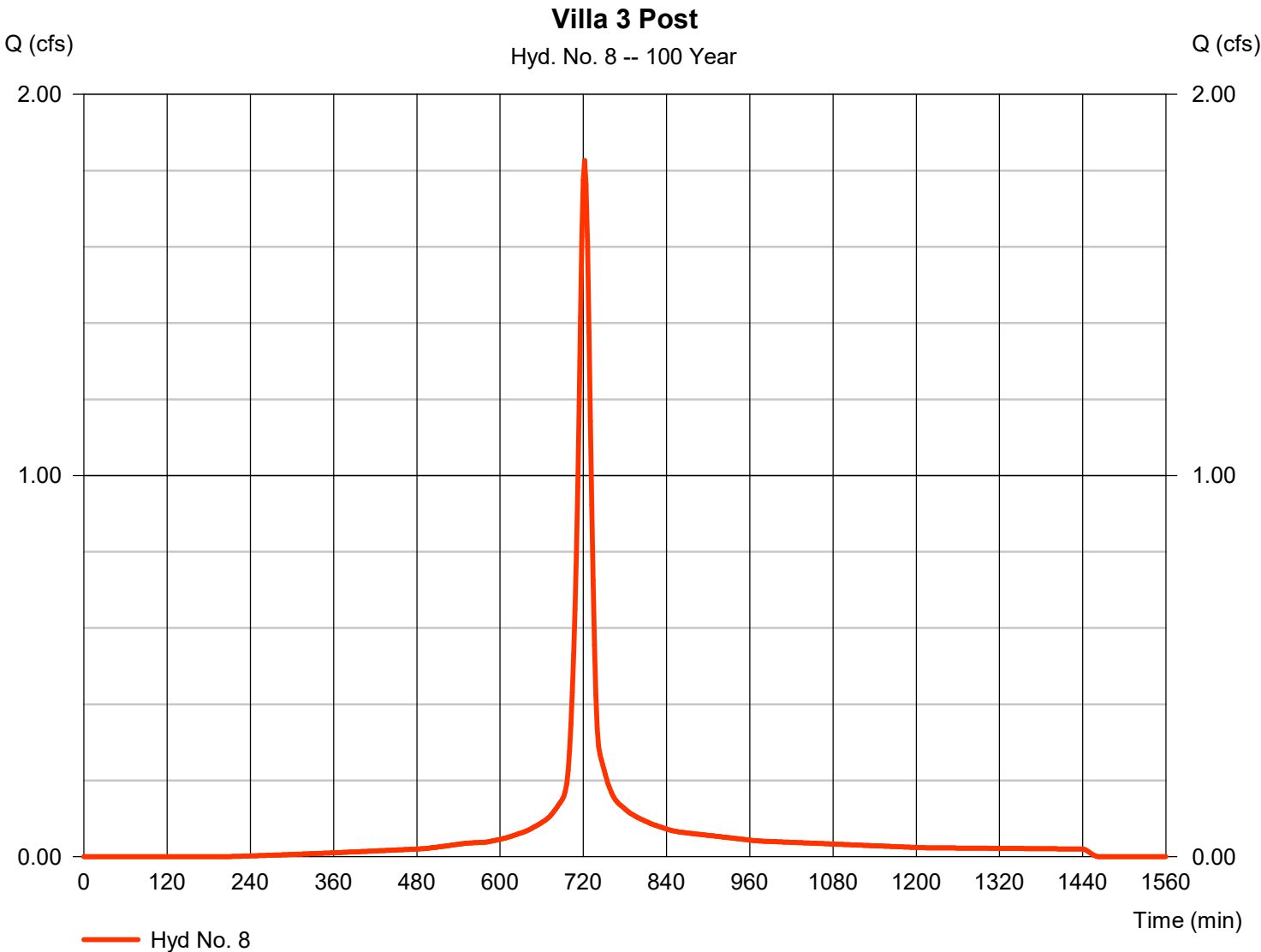
Hyd No. 8

Hydrograph Report

Hyd. No. 10

Villa 4 PRE

Hydrograph type	= SCS Runoff		Peak discharge	= 2.535 cfs
Storm frequency	= 100 yrs		Time to peak	= 722 min
Time interval	= 2 min		Hyd. volume	= 7,184 cuft
Drainage area	= 0.580 ac		Curve number	= 84
Basin Slope	= 0.0 %		Hydraulic length	= 0 ft
Tc method	= User		Time of conc. (Tc)	= 15.00 min
Total precip.	= 5.25 in		Distribution	= Type II
Storm duration	= 24 hrs		Shape factor	= 484

Villa 4 PRE

Hyd. No. 10 -- 100 Year
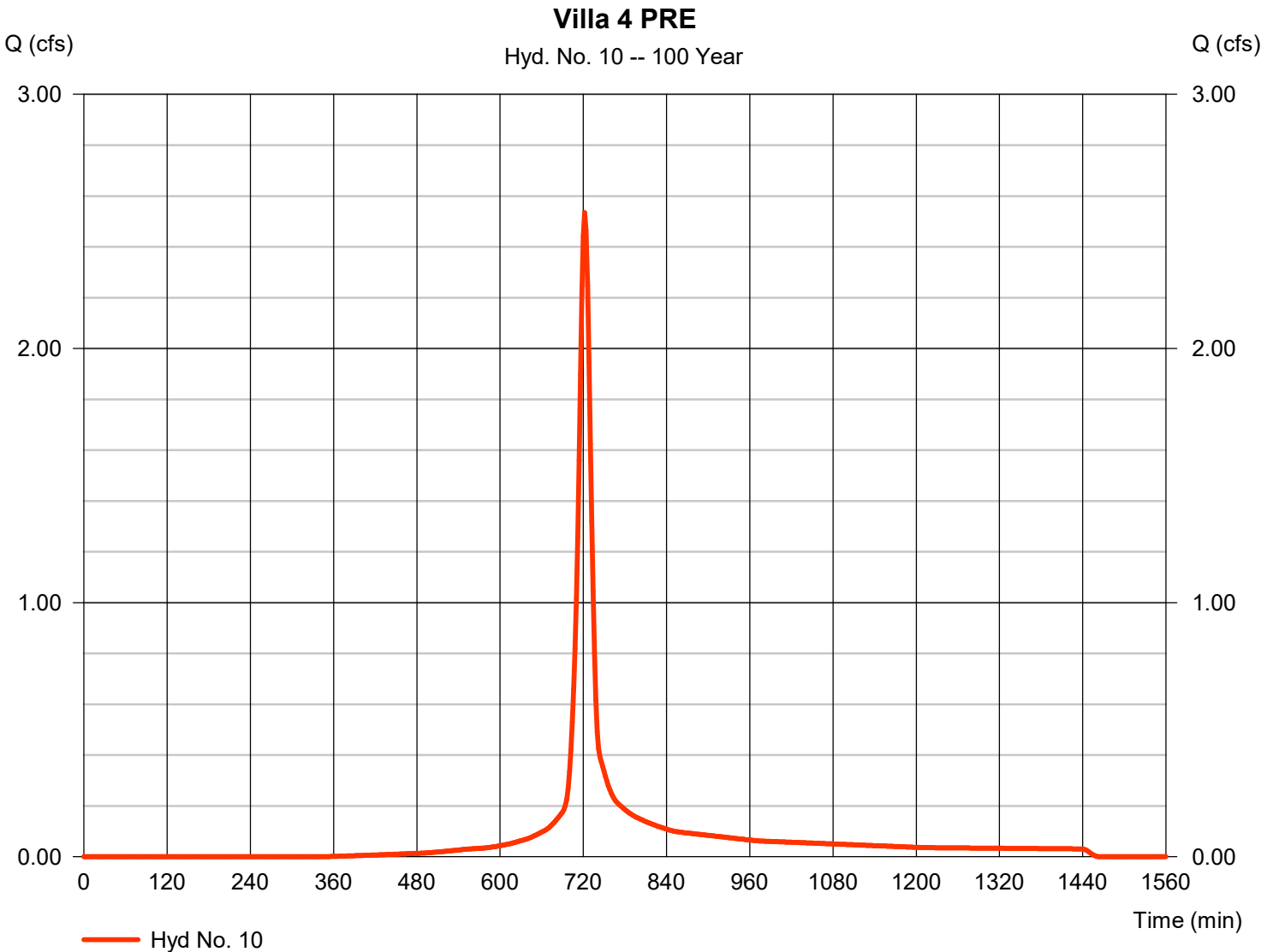
Hyd No. 10

Hydrograph Report

Hyd. No. 11

Villa 4 Post Runoff

Hydrograph type	= SCS Runoff	Peak discharge	= 1.573 cfs
Storm frequency	= 100 yrs	Time to peak	= 722 min
Time interval	= 2 min	Hyd. volume	= 4,459 cuft
Drainage area	= 0.360 ac	Curve number	= 84*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 15.00 min
Total precip.	= 5.25 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = + (0.360 x 84)] / 0.360

Villa 4 Post Runoff

Hyd. No. 11 -- 100 Year

Hyd No. 11

Hydrograph Report

Hyd. No. 12

Villa 4 Post Detention

Hydrograph type	= SCS Runoff		Peak discharge	= 1.214 cfs
Storm frequency	= 100 yrs		Time to peak	= 722 min
Time interval	= 2 min		Hyd. volume	= 3,903 cuft
Drainage area	= 0.220 ac		Curve number	= 98*
Basin Slope	= 0.0 %		Hydraulic length	= 0 ft
Tc method	= User		Time of conc. (Tc)	= 15.00 min
Total precip.	= 5.25 in		Distribution	= Type II
Storm duration	= 24 hrs		Shape factor	= 484

* Composite (Area/CN) = [(0.220 x 98)] / 0.220

Villa 4 Post Detention

Hyd. No. 12 -- 100 Year
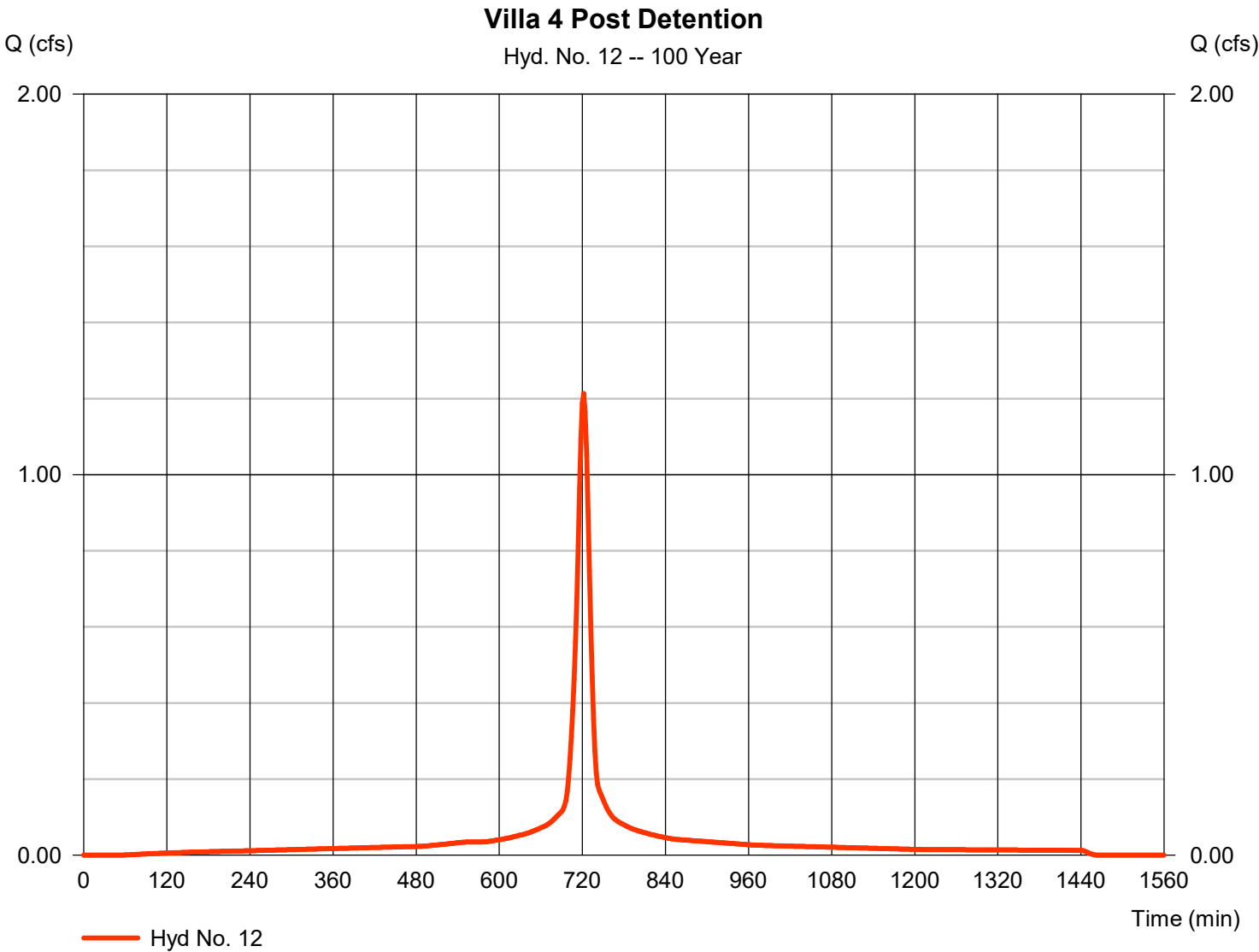
Hyd No. 12

Hydrograph Report

Hyd. No. 13

Villa 4

Hydrograph type	= Reservoir		Peak discharge	= 0.134 cfs
Storm frequency	= 100 yrs		Time to peak	= 752 min
Time interval	= 2 min		Hyd. volume	= 3,887 cuft
Inflow hyd. No.	= 12 - Villa 4 Post Detention		Max. Elevation	= 1013.96 ft
Reservoir name	= Villa 4		Max. Storage	= 1,735 cuft

Storage Indication method used.

Villa 4
Hyd. No. 13 -- 100 Year
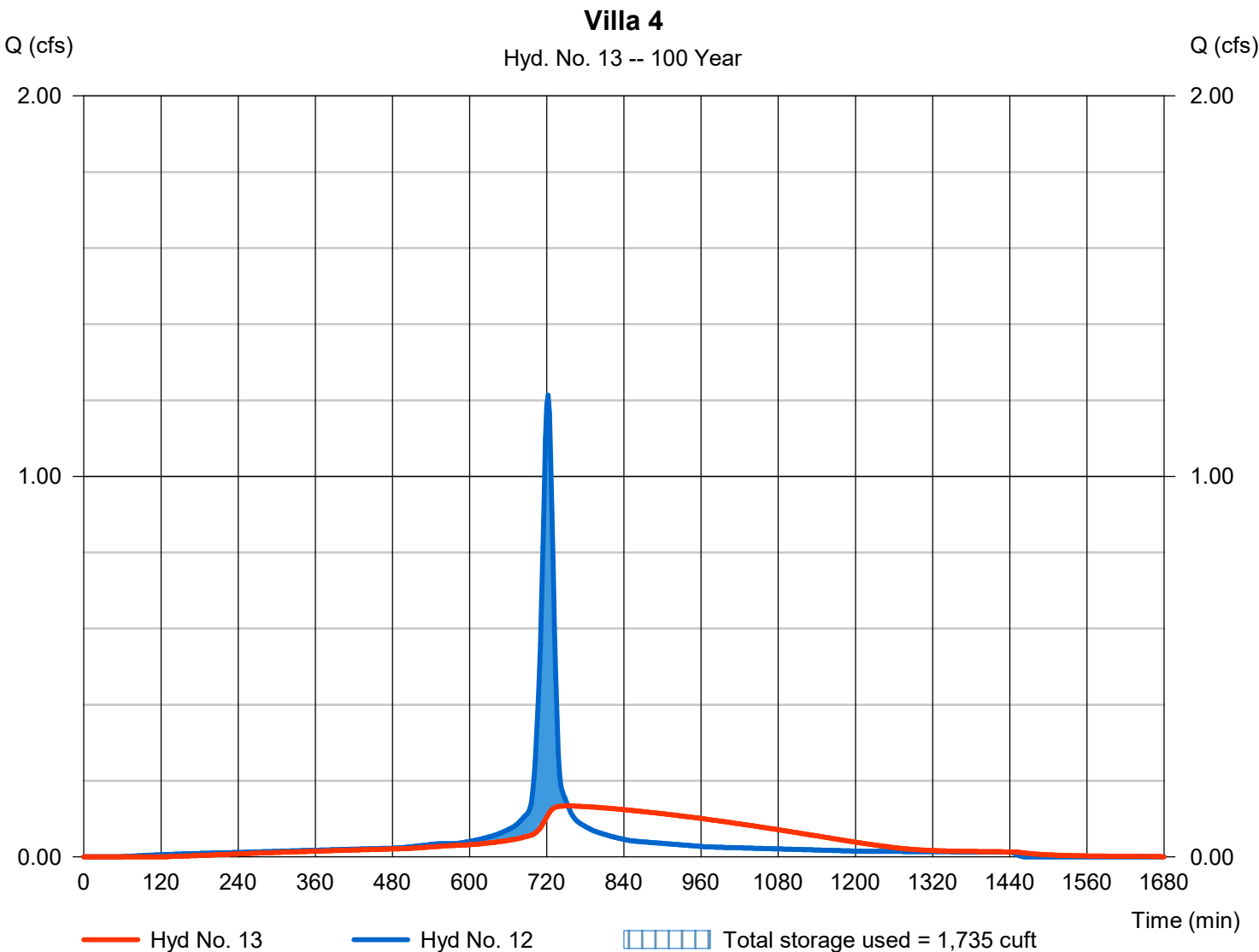
Hydrograph Report

Hyd. No. 14

Total Villa 4 Post

Hydrograph type	= Combine		Peak discharge	= 2.787 cfs
Storm frequency	= 100 yrs		Time to peak	= 722 min
Time interval	= 2 min		Hyd. volume	= 8,362 cuft
Inflow hyds.	= 11, 12		Contrib. drain. area	= 0.580 ac

Total Villa 4 Post

Hyd. No. 14 -- 100 Year

Q (cfs)

Time (min)

Hyd No. 14   Hyd No. 11   Hyd No. 12
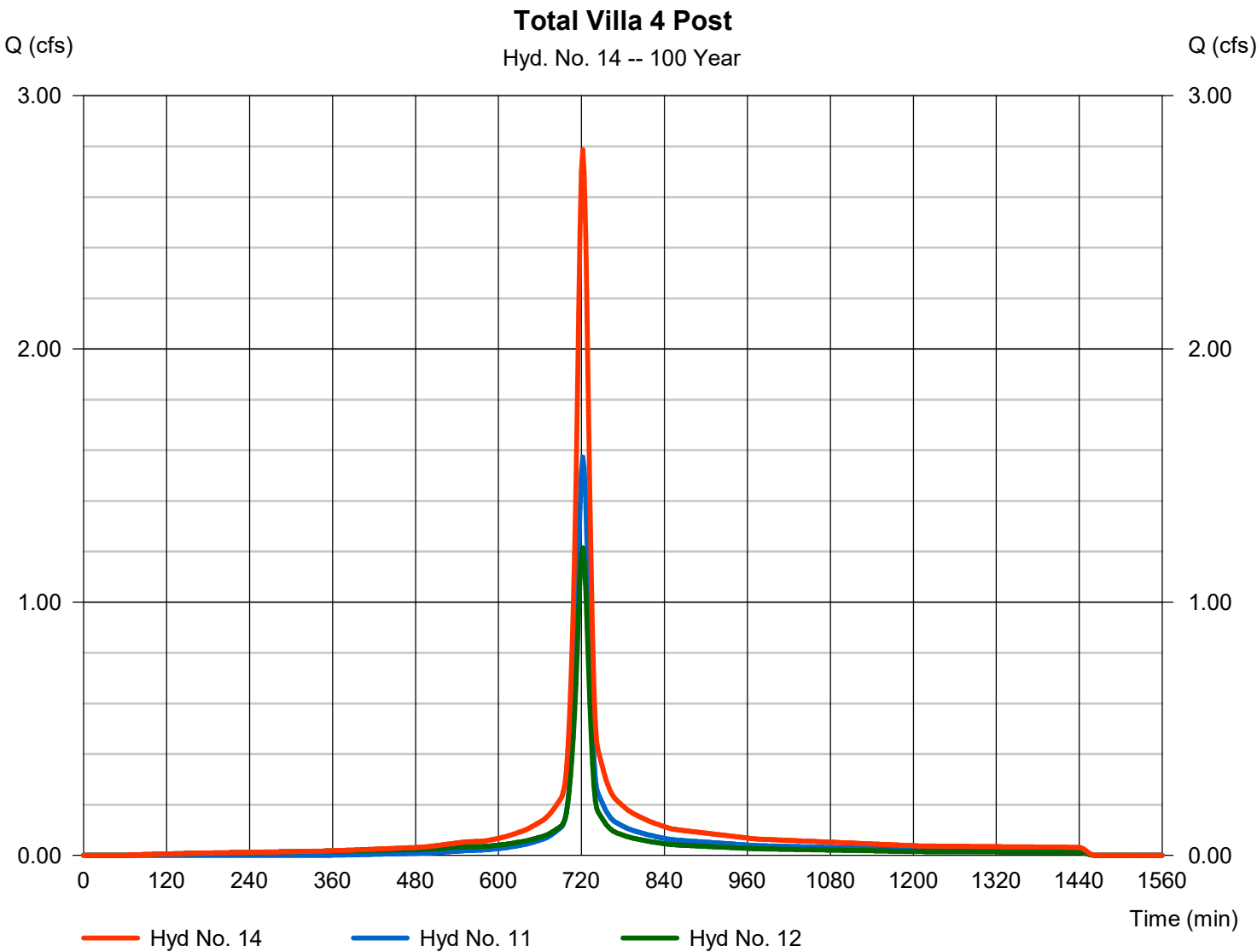
Hydrograph Report

Hyd. No. 16

Villa 5 PRE

Hydrograph type	= SCS Runoff		Peak discharge	= 2.098 cfs
Storm frequency	= 100 yrs		Time to peak	= 722 min
Time interval	= 2 min		Hyd. volume	= 5,946 cuft
Drainage area	= 0.480 ac		Curve number	= 84
Basin Slope	= 0.0 %		Hydraulic length	= 0 ft
Tc method	= User		Time of conc. (Tc)	= 15.00 min
Total precip.	= 5.25 in		Distribution	= Type II
Storm duration	= 24 hrs		Shape factor	= 484

Villa 5 PRE

Hyd. No. 16 -- 100 Year
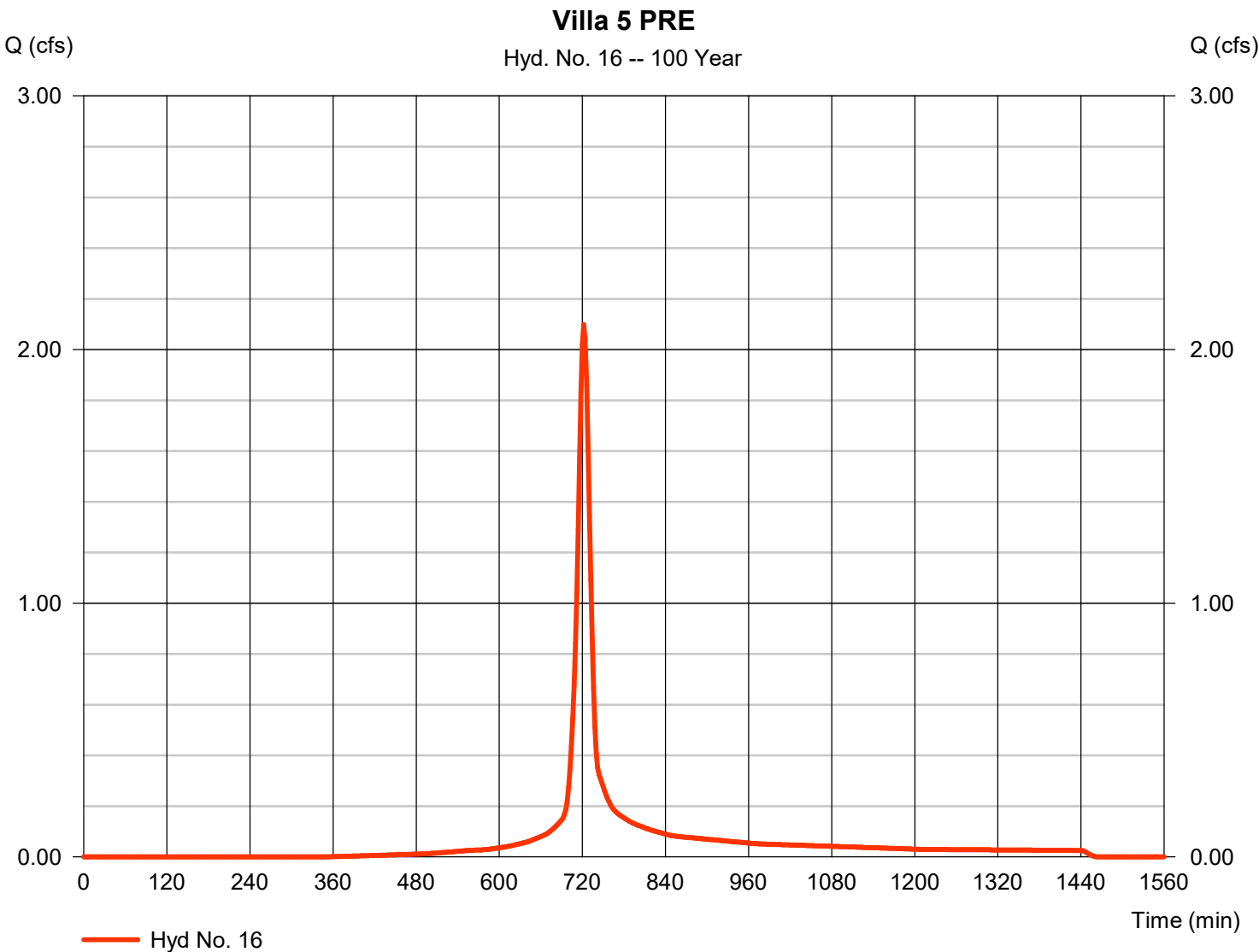
— Hyd No. 16

Hydrograph Report

Hyd. No. 17

Villa 5 Post

Hydrograph type	= SCS Runoff		Peak discharge	= 2.342 cfs
Storm frequency	= 100 yrs		Time to peak	= 722 min
Time interval	= 2 min		Hyd. volume	= 6,850 cuft
Drainage area	= 0.470 ac		Curve number	= 90*
Basin Slope	= 0.0 %		Hydraulic length	= 0 ft
Tc method	= User		Time of conc. (Tc)	= 15.00 min
Total precip.	= 5.25 in		Distribution	= Type II
Storm duration	= 24 hrs		Shape factor	= 484

* Composite (Area/CN) = [(0.200 x 98) + (0.270 x 84)] / 0.470

Villa 5 Post

Hyd. No. 17 -- 100 Year

Hyd No. 17

Hydrograph Report

     Monday, 06 / 10 / 2024
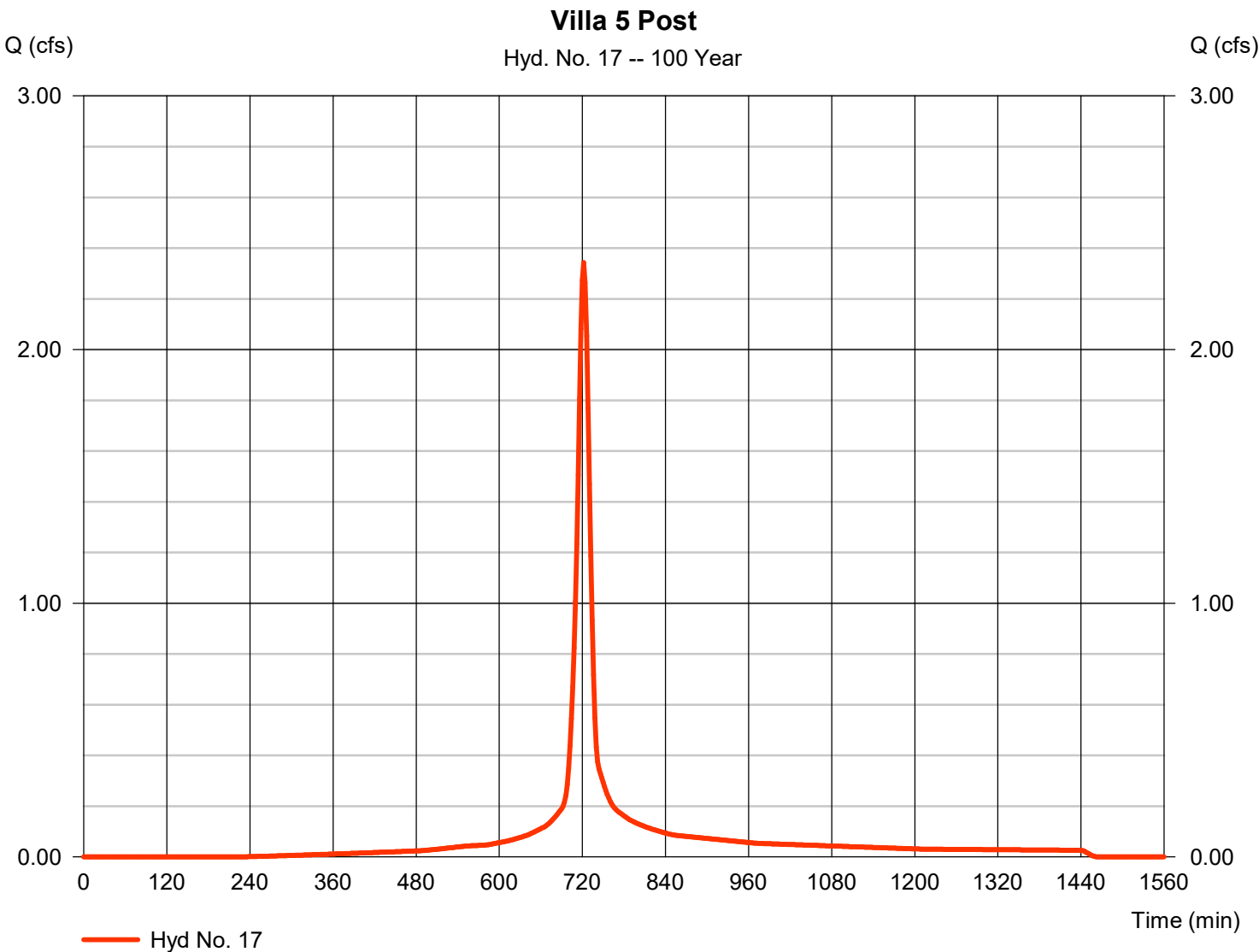
Hyd. No. 19

Villa 8 & 9 & road PRE

Hydrograph type	= SCS Runoff		Peak discharge	= 5.419 cfs
Storm frequency	= 100 yrs		Time to peak	= 722 min
Time interval	= 2 min		Hyd. volume	= 15,416 cuft
Drainage area	= 1.210 ac		Curve number	= 85*
Basin Slope	= 0.0 %		Hydraulic length	= 0 ft
Tc method	= User		Time of conc. (Tc)	= 15.00 min
Total precip.	= 5.25 in		Distribution	= Type II
Storm duration	= 24 hrs		Shape factor	= 484

* Composite (Area/CN) = [(0.360 x 98) + (0.850 x 84)] / 1.210

Villa 8 & 9 & road PRE

Hyd. No. 19 -- 100 Year

Hydrograph Report

Monday, 06 / 10 / 2024
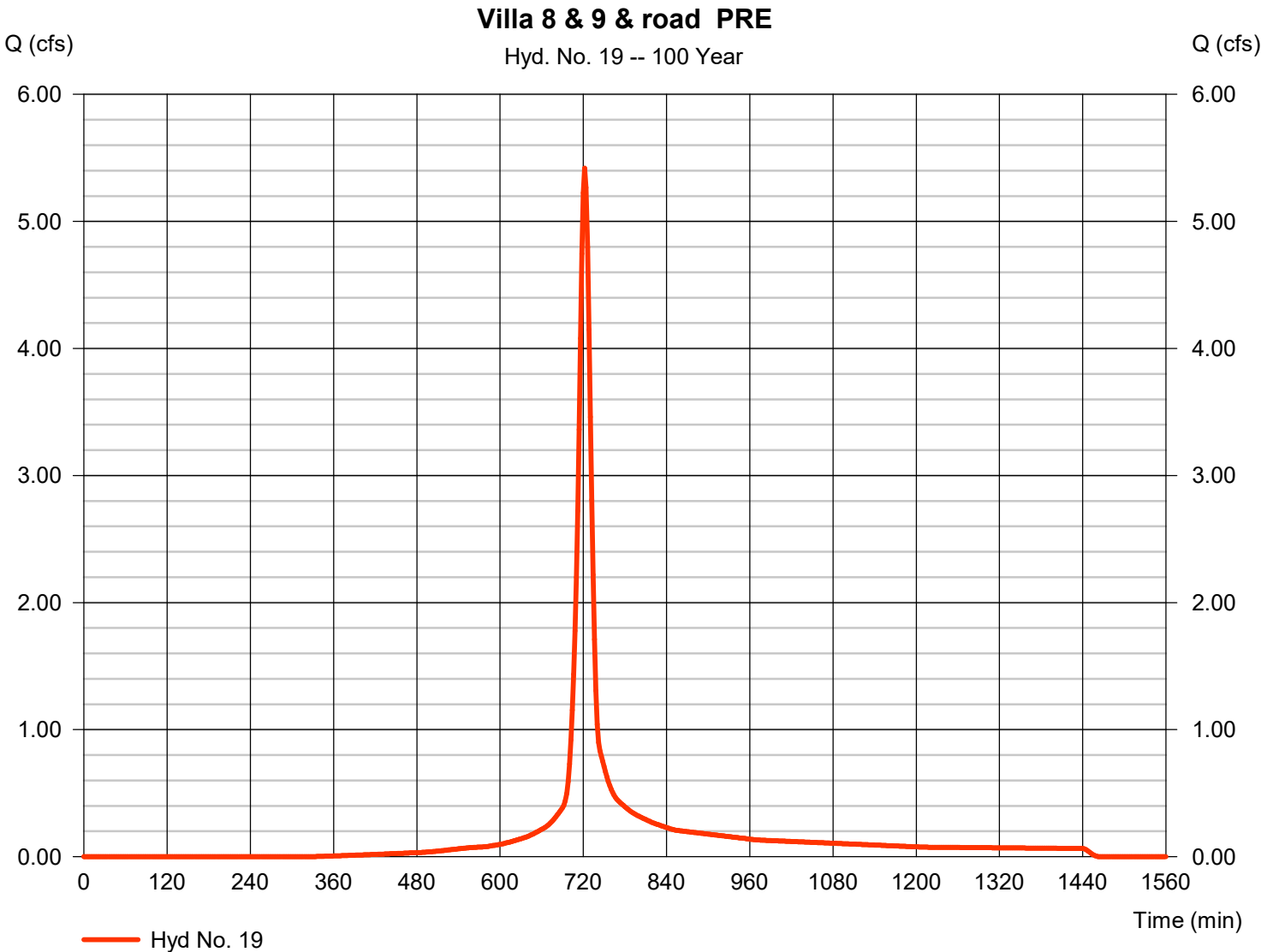
Hyd. No. 20

Villa 8 & 9 Road Post

Hydrograph type	= SCS Runoff		Peak discharge	= 6.140 cfs
Storm frequency	= 100 yrs		Time to peak	= 722 min
Time interval	= 2 min		Hyd. volume	= 18,094 cuft
Drainage area	= 1.210 ac		Curve number	= 91*
Basin Slope	= 0.0 %		Hydraulic length	= 0 ft
Tc method	= User		Time of conc. (Tc)	= 15.00 min
Total precip.	= 5.25 in		Distribution	= Type II
Storm duration	= 24 hrs		Shape factor	= 484

* Composite (Area/CN) = [(0.590 x 98) + (0.620 x 84)] / 1.210

Villa 8 & 9 Road Post

Hyd. No. 20 -- 100 Year
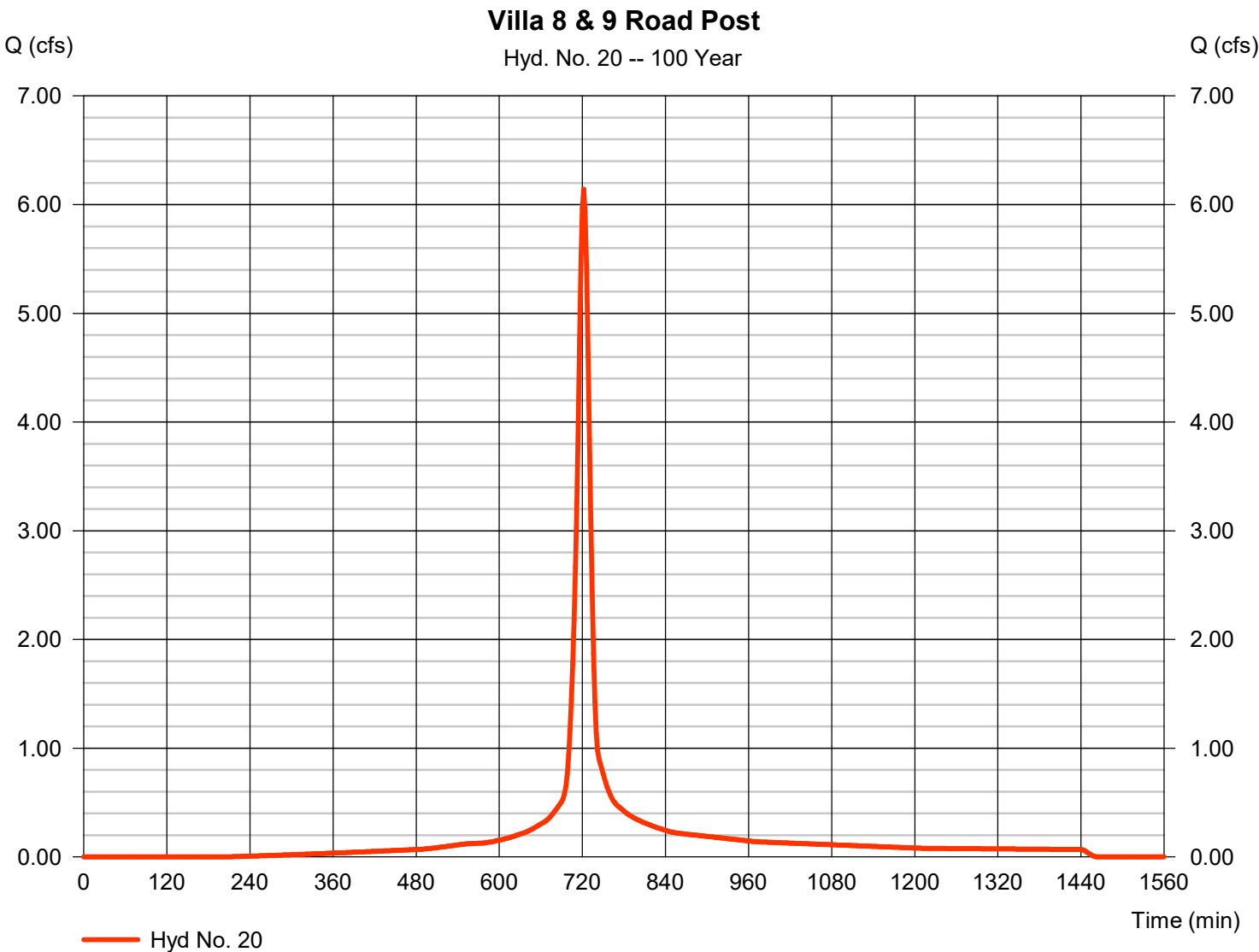
Hydrograph Report

Hyd. No. 22

Lake Forest PRE

Hydrograph type	= Combine	Peak discharge	= 8.609 cfs
Storm frequency	= 100 yrs	Time to peak	= 722 min
Time interval	= 2 min	Hyd. volume	= 24,402 cuft
Inflow hyds.	= 1, 4, 16	Contrib. drain. area	= 1.970 ac

Lake Forest PRE

Hyd. No. 22 -- 100 Year

Legend: Hyd No. 22 — Hyd No. 1 — Hyd No. 4 — Hyd No. 16
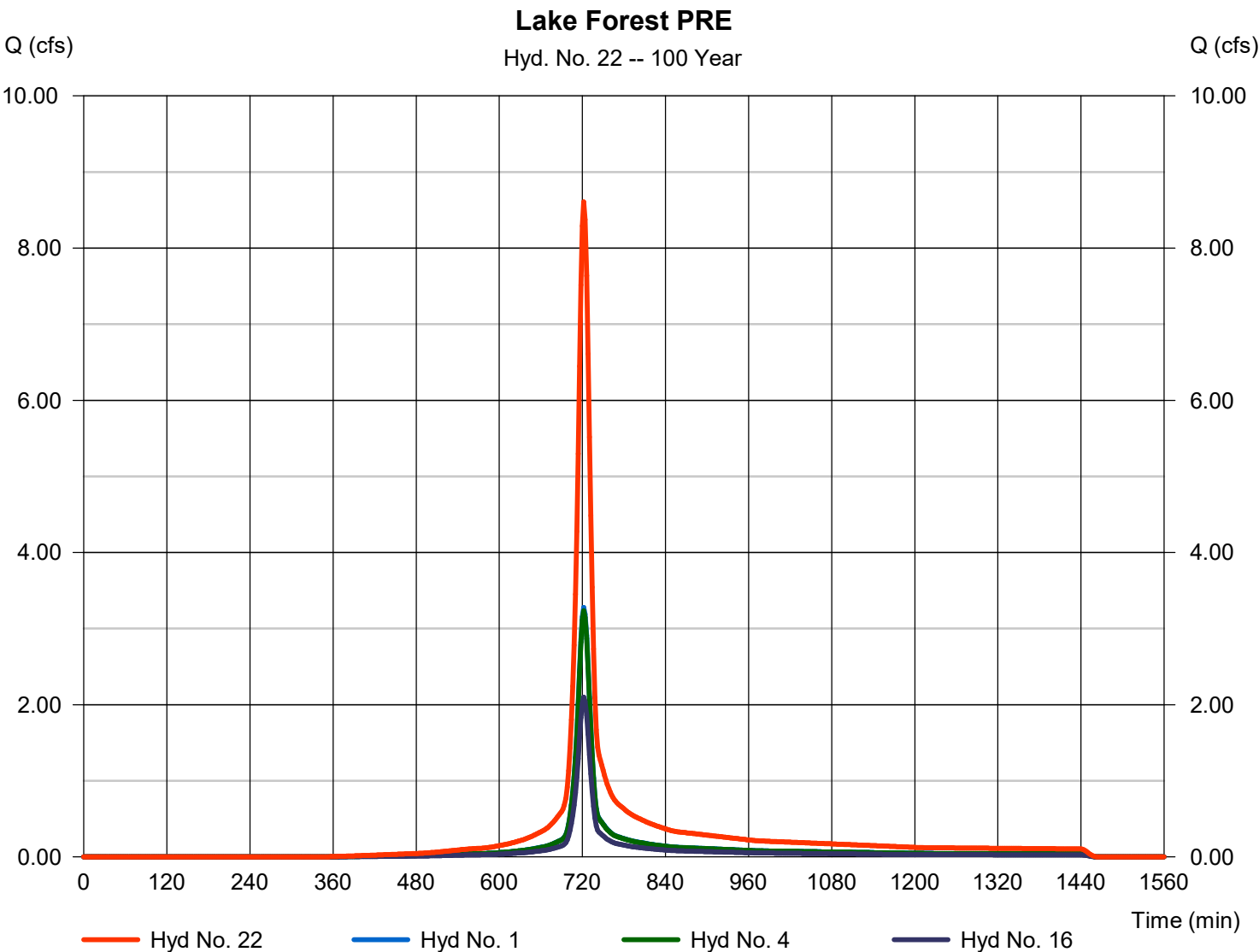
Hydrograph Report

Hyd. No. 23

Lake Forest POST

Hydrograph type	= Combine	Peak discharge	= 9.406 cfs
Storm frequency	= 100 yrs	Time to peak	= 722 min
Time interval	= 2 min	Hyd. volume	= 27,181 cuft
Inflow hyds.	= 2, 5, 17	Contrib. drain. area	= 1.960 ac
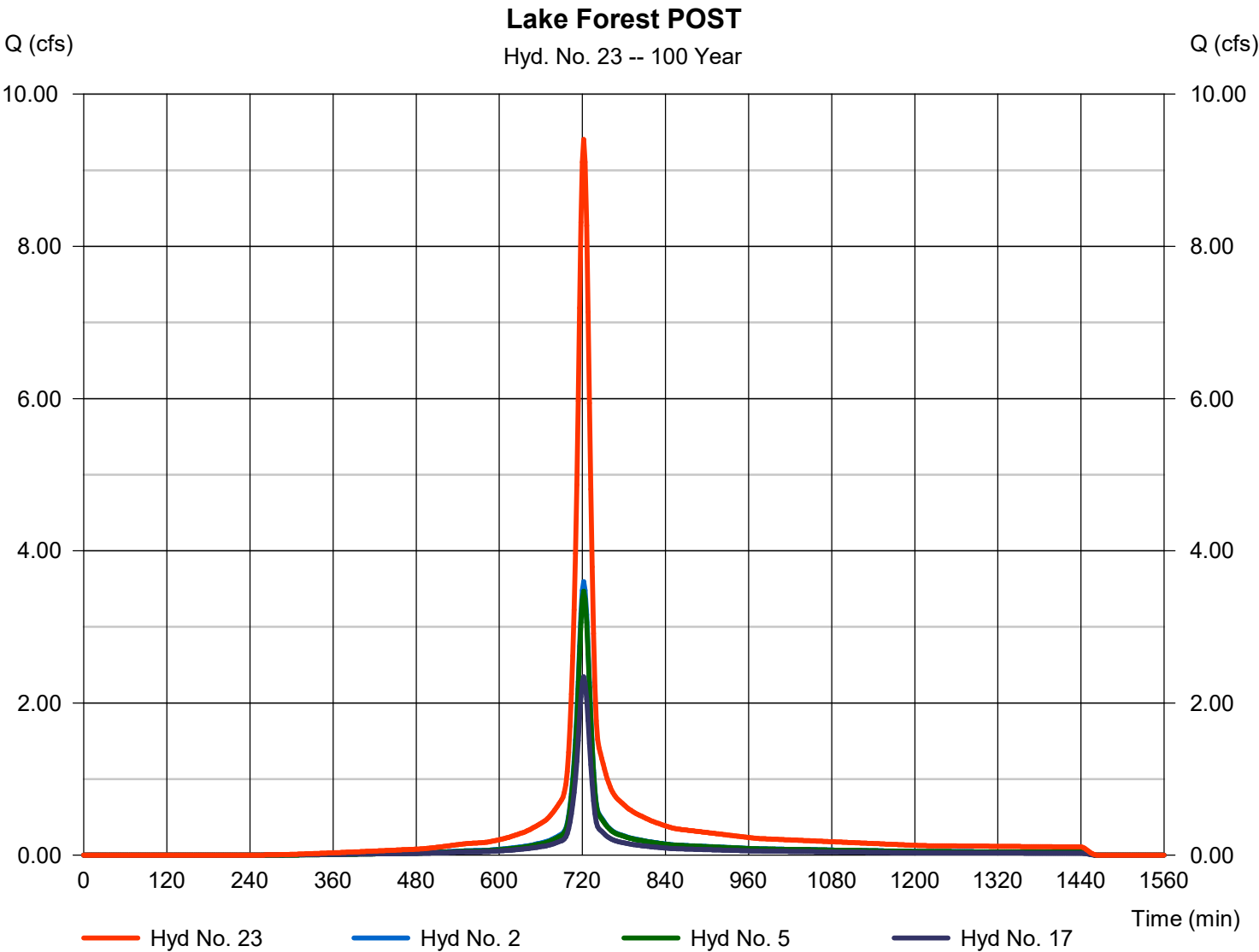
Lake Forest POST

Hyd. No. 23 -- 100 Year

Q (cfs) — Time (min)

Hyd No. 23   Hyd No. 2   Hyd No. 5   Hyd No. 17

Hydrograph Report

Monday, 06 / 10 / 2024

Hyd. No. 25

Southwest PRE

Hydrograph type	= Combine	Peak discharge	= 9.527 cfs
Storm frequency	= 100 yrs	Time to peak	= 722 min
Time interval	= 2 min	Hyd. volume	= 27,060 cuft
Inflow hyds.	= 7, 10, 19	Contrib. drain. area	= 2.150 ac

Southwest PRE
Hyd. No. 25 -- 100 Year
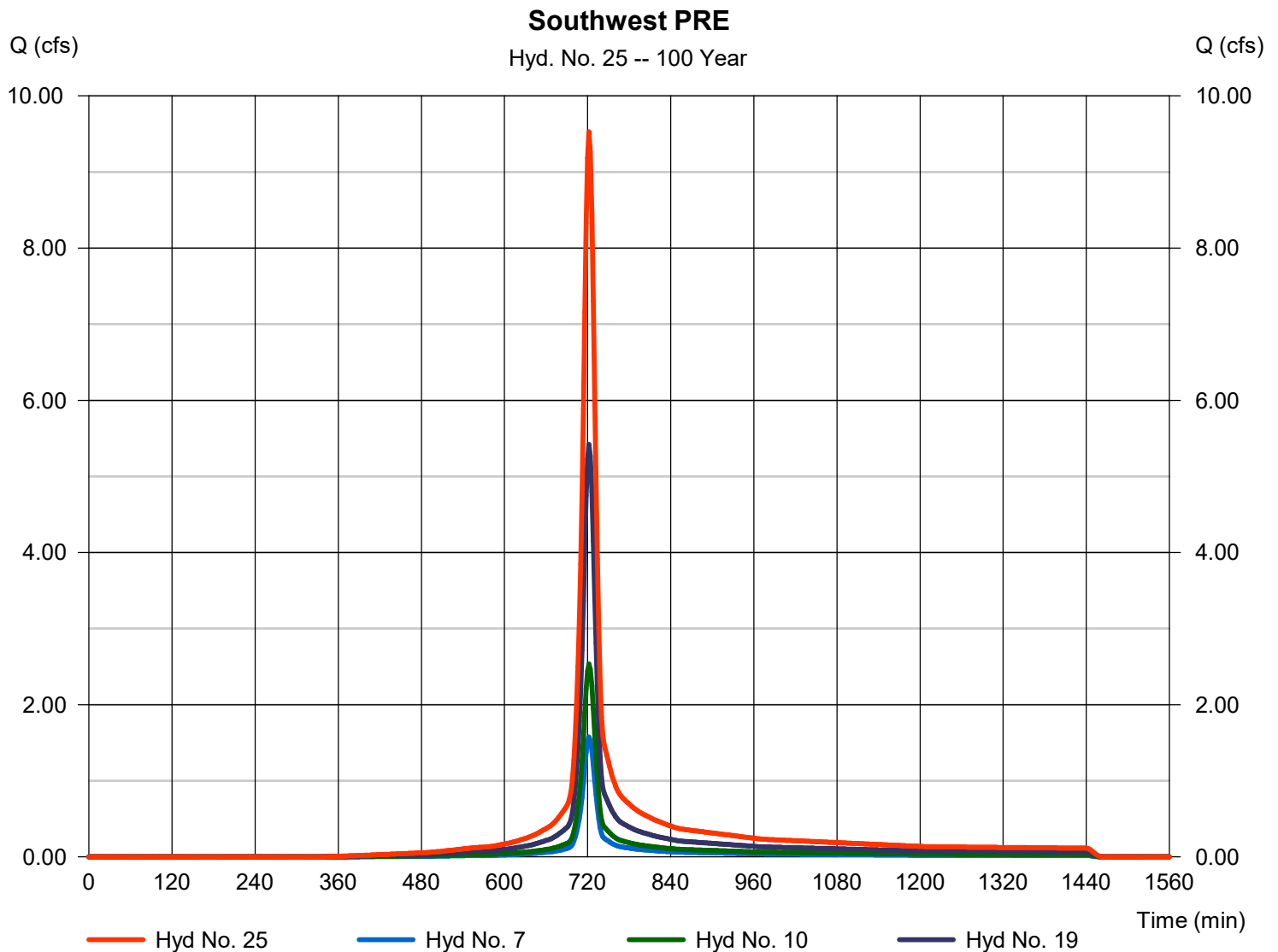
Hydrograph Report

Hyd. No. 26

Southwest POST

Hydrograph type	= Combine	Peak discharge	= 8.077 cfs
Storm frequency	= 100 yrs	Time to peak	= 722 min
Time interval	= 2 min	Hyd. volume	= 27,365 cuft
Inflow hyds.	= 8, 13, 20	Contrib. drain. area	= 1.570 ac

Southwest POST
Hyd. No. 26 -- 100 Year

Legend:
- Hyd No. 26
- Hyd No. 8
- Hyd No. 13
- Hyd No. 20
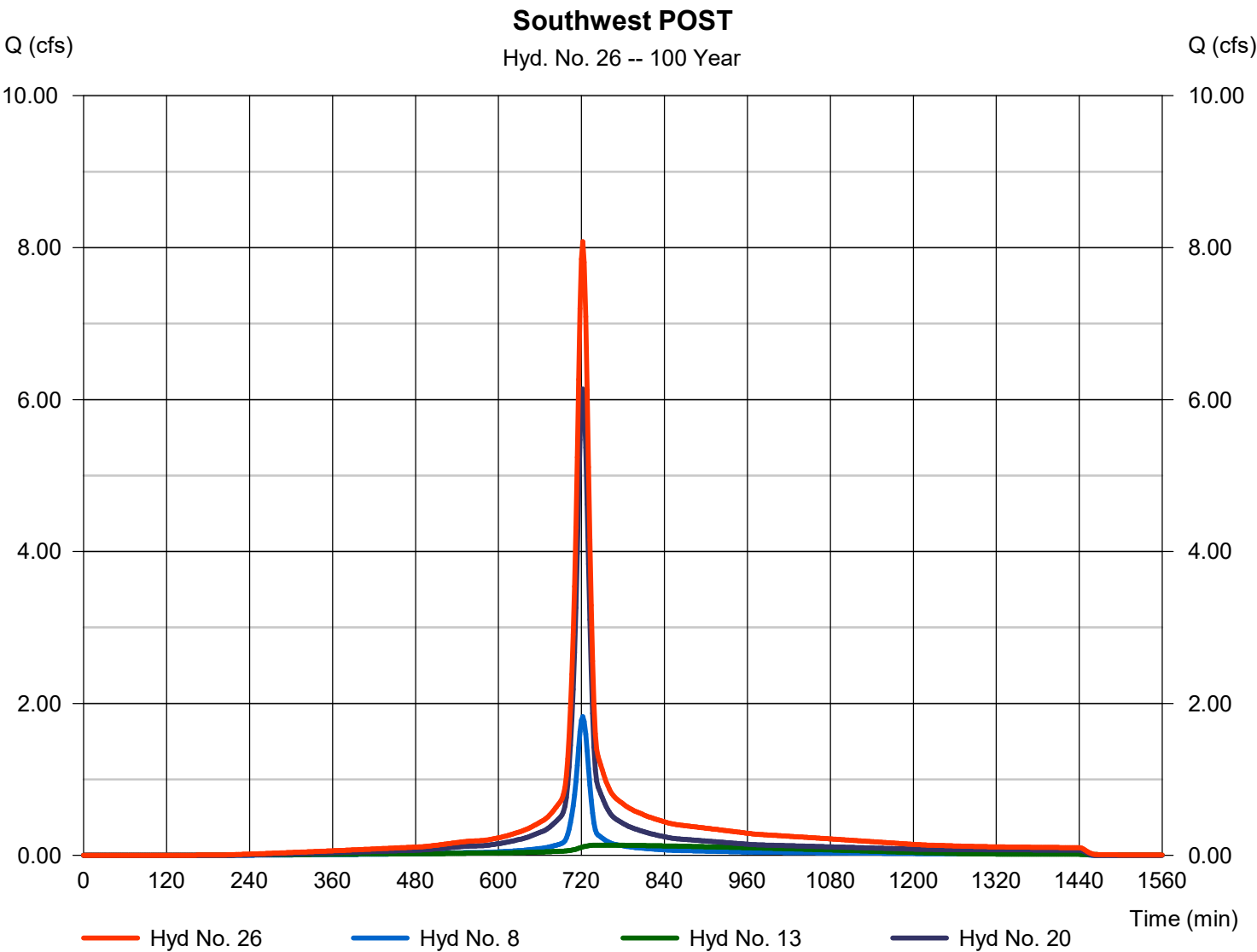
Hydrograph Report

Hyd. No. 28

TOTAL

Hydrograph type	= Combine	Peak discharge	= 18.14 cfs
Storm frequency	= 100 yrs	Time to peak	= 722 min
Time interval	= 2 min	Hyd. volume	= 51,462 cuft
Inflow hyds.	= 22, 25	Contrib. drain. area	= 0.000 ac

TOTAL

Hyd. No. 28 -- 100 Year

Hydrograph Report

Monday, 06 / 10 / 2024

Hyd. No. 29

Total Post

Hydrograph type	= Combine	Peak discharge	= 17.48 cfs
Storm frequency	= 100 yrs	Time to peak	= 722 min
Time interval	= 2 min	Hyd. volume	= 54,546 cuft
Inflow hyds.	= 23, 26	Contrib. drain. area	= 0.000 ac

Total Post

Hyd. No. 29 -- 100 Year

Q (cfs)

Q (cfs)

Time (min)

—— Hyd No. 29   —— Hyd No. 23   —— Hyd No. 26

Lake Forest

StreamStats Report

➕ Collapse All

❯ Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
CSL1085LFP	Change in elevation divided by length between points 10 and 85 percent of distance along the longest flow path to the basin divide, LFP from 2D grid	24	feet per mi
DRNAREA	Area that drains to a point on a stream	5.3	square miles
FOREST	Percentage of area covered by forest	30.1	percent
LAT_CENT	Latitude of Basin Centroid	41.2501	decimal degrees
LC92STOR	Percentage of water bodies and wetlands determined from the NLCD	4.68	percent
LONG_CENT	Longitude Basin Centroid	81.4437	decimal degrees
OHREGA	Ohio Region A Indicator	1	dimensionless
OHREGC	Ohio Region C Indicator	0	dimensionless
PRECIPCENT	Mean Annual Precip at Basin Centroid	39.9	inches
STREAM_VARG	Streamflow variability index as defined in WRIR 02-4068, computed from regional grid	0.54	dimensionless

❯ Peak-Flow Statistics

Peak-Flow Statistics Parameters [Peak Flow Full Model Reg A SIR2019 5018]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	5.3	square miles	0.04	5989
OHREGC	Ohio Region C Indicator 1 if in C else 0	0	dimensionless	0	1
OHREGA	Ohio Region A Indicator 1 if in A else 0	1	dimensionless	0	1
CSL1085LFP	Stream Slope 10 and 85 Longest Flow Path	24	feet per mi	1.53	516
LC92STOR	Percent Storage from NLCD1992	4.68	percent	0	25.35

Peak-Flow Statistics Flow Report [Peak Flow Full Model Reg A SIR2019 5018]

PIL: Lower 90% Prediction Interval, PIU: Upper 90% Prediction Interval, ASEp: Average Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	PIL	PIU	ASEp
50-percent AEP flood	307	ft^3/s	162	581	40.1
20-percent AEP flood	494	ft^3/s	273	894	37.2
10-percent AEP flood	635	ft^3/s	349	1160	37.6
4-percent AEP flood	834	ft^3/s	455	1530	38.1
2-percent AEP flood	993	ft^3/s	536	1840	37.8
1-percent AEP flood	1160	ft^3/s	619	2170	39.6
0.2-percent AEP flood	1590	ft^3/s	840	3010	40.3

Peak-Flow Statistics Citations

Koltun, G.F.,2019, Flood-frequency estimates for Ohio streamgages based on data through water year 2015 and techniques for estimating flood-frequency characteristics of rural, unregulated Ohio streams: U.S. Geological Survey Scientific Investigations Report 2019−5018, 25 p. (https://dx.doi.org/10.3133/sir20195018)

❯ Annual Flow Statistics

Annual Flow Statistics Parameters [Low Flow LatGT 41.2 wri02 4068]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	5.3	square miles	0.12	7422
LAT_CENT	Latitude of Basin Centroid	41.2501	decimal degrees	41.2	41.59
PRECIPCENT	Mean Annual Precip at Basin Centroid	39.9	inches	34	43.2

Annual Flow Statistics Flow Report [Low Flow LatGT 41.2 wri02 4068]

PIL: Lower 90% Prediction Interval, PIU: Upper 90% Prediction Interval, ASEp: Average Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	SE	ASEp
Mean Annual Flow	6.52	ft^3/s	11.4	11.4

Annual Flow Statistics Citations

Koltun, G. F., and Whitehead, M. T.,2002, Techniques for Estimating Selected Streamflow Characteristics of Rural, Unregulated Streams in Ohio: U. S. Geological Survey Water-Resources Investigations Report 02-4068, 50 p

❯ Low-Flow Statistics

Low-Flow Statistics Parameters [Low Flow Region A 2012 5138]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	5.3	square miles	1	1250
STREAM_VARG	Streamflow Variability Index from Grid	0.54	dimensionless	0.24	1.12

Low-Flow Statistics Flow Report [Low Flow Region A 2012 5138]

PIL: Lower 90% Prediction Interval, PIU: Upper 90% Prediction Interval, ASEp: Average Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	SE
1 Day 10 Year Low Flow	0.0881	ft^3/s	53.1
7 Day 10 Year Low Flow	0.111	ft^3/s	40
30 Day 10 Year Low Flow	0.169	ft^3/s	35.7
90 Day 10 Year Low Flow	0.256	ft^3/s	29.8

Low-Flow Statistics Citations

Koltun, G.F., and Kula, S.P.,2013, Methods for estimating selected low-flow statistics and development of annual flow-duration statistics for Ohio: U.S. Geological Survey Scientific Investigations Report 2012−5138, 195 p. (http://pubs.usgs.gov/sir/2012/5138/)

❯ Flow-Duration Statistics

Flow-Duration Statistics Parameters [Low Flow Region A 2012 5138]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	5.3	square miles	1	1250
STREAM_VARG	Streamflow Variability Index from Grid	0.54	dimensionless	0.24	1.12

Flow-Duration Statistics Flow Report [Low Flow Region A 2012 5138]

PIL: Lower 90% Prediction Interval, PIU: Upper 90% Prediction Interval, ASEp: Average Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	SE
80 Percent Duration	0.518	ft^3/s	29.1

Flow-Duration Statistics Citations

Koltun, G.F., and Kula, S.P.,2013, Methods for estimating selected low-flow statistics and development of annual flow-duration statistics for Ohio: U.S. Geological Survey Scientific Investigations Report 2012−5138, 195 p. (http://pubs.usgs.gov/sir/2012/5138/)

❯ Monthly Flow Statistics

Monthly Flow Statistics Parameters [Low Flow LatGT 41.2 wri02 4068]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	5.3	square miles	0.12	7422
LC92STOR	Percent Storage from NLCD1992	4.68	percent	0	19
PRECIPCENT	Mean Annual Precip at Basin Centroid	39.9	inches	34	43.2
FOREST	Percent Forest	30.1	percent	0	99.1
LAT_CENT	Latitude of Basin Centroid	41.2501	decimal degrees	41.2	41.59
STREAM_VARG	Streamflow Variability Index from Grid	0.54	dimensionless	0.25	1.13

Monthly Flow Statistics Flow Report [Low Flow LatGT 41.2 wri02 4068]

PIL: Lower 90% Prediction Interval, PIU: Upper 90% Prediction Interval, ASEp: Average Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	SE	ASEp
January Mean Flow	9.42	ft^3/s	16.6	16.6
February Mean Flow	12.9	ft^3/s	11.9	11.9
March Mean Flow	14	ft^3/s	14	14
April Mean Flow	11.7	ft^3/s	11.2	11.2
May Mean Flow	6.99	ft^3/s	19.5	19.5
June Mean Flow	3.74	ft^3/s	27	27
July Mean Flow	2.21	ft^3/s	28.2	28.2
August Mean Flow	2.04	ft^3/s	36.8	36.8
September Mean Flow	1.35	ft^3/s	43.6	43.6
October Mean Flow	3.02	ft^3/s	50.8	50.8
November Mean Flow	5.55	ft^3/s	37.5	37.5
December Mean Flow	9.34	ft^3/s	21.8	21.8

Monthly Flow Statistics Citations

Koltun, G. F., and Whitehead, M. T.,2002, Techniques for Estimating Selected Streamflow Characteristics of Rural, Unregulated Streams in Ohio: U. S. Geological Survey Water-Resources Investigations Report 02-4068, 50 p (https://pubs.er.usgs.gov/publication/wri024068)

❯ General Flow Statistics

General Flow Statistics Parameters [Low Flow LatGT 41.2 wri02 4068]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	5.3	square miles	0.12	7422
LC92STOR	Percent Storage from NLCD1992	4.68	percent	0	19
STREAM_VARG	Streamflow Variability Index from Grid	0.54	dimensionless	0.25	1.13
LAT_CENT	Latitude of Basin Centroid	41.2501	decimal degrees	41.2	41.59

General Flow Statistics Flow Report [Low Flow LatGT 41.2 wri02 4068]

PIL: Lower 90% Prediction Interval, PIU: Upper 90% Prediction Interval, ASEp: Average Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	SE	ASEp
Harmonic Mean Streamflow	0.938	ft^3/s	65.9	65.9

General Flow Statistics Citations

Koltun, G. F., and Whitehead, M. T.,2002, Techniques for Estimating Selected Streamflow Characteristics of Rural, Unregulated Streams in Ohio: U. S. Geological Survey Water-Resources Investigations Report 02-4068, 50 p (https://pubs.er.usgs.gov/publication/wri024068)

> **Flow Percentile Statistics**

Flow Percentile Statistics Parameters [Low Flow LatGT 41.2 wri02 4068]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	5.3	square miles	0.12	7422
LC92STOR	Percent Storage from NLCD1992	4.68	percent	0	19
STREAM_VARG	Streamflow Variability Index from Grid	0.54	dimensionless	0.25	1.13
LAT_CENT	Latitude of Basin Centroid	41.2501	decimal degrees	41.2	41.59
LONG_CENT	Longitude of Basin Centroid	81.4437	decimal degrees	80.53	84.6

Flow Percentile Statistics Flow Report [Low Flow LatGT 41.2 wri02 4068]

PIL: Lower 90% Prediction Interval, PIU: Upper 90% Prediction Interval, ASEp: Average Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	SE	ASEp
25th Percentile Flow	1.13	ft^3/s	29.2	29.2
50th Percentile Flow Median	2.68	ft^3/s	40.3	40.3
75th Percentile Flow	6.27	ft^3/s	47.9	47.9

Flow Percentile Statistics Citations

Koltun, G. F., and Whitehead, M. T.,2002, Techniques for Estimating Selected Streamflow Characteristics of Rural, Unregulated Streams in Ohio: U. S. Geological Survey Water-Resources Investigations Report 02-4068, 50 p (https://pubs.er.usgs.gov/publication/wri024068)

> **Bankfull Statistics**

Bankfull Statistics Parameters [Appalachian Highlands D Bieger 2015]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	5.3	square miles	0.07722	940.1535

Bankfull Statistics Parameters [Appalachian Plateaus P Bieger 2015]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	5.3	square miles	0.081081	536.995602

Bankfull Statistics Parameters [USA Bieger 2015]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	5.3	square miles	0.07722	59927.7393

Bankfull Statistics Flow Report [Appalachian Highlands D Bieger 2015]

Statistic	Value	Unit
Bieger_D_channel_width	30.4	ft
Bieger_D_channel_depth	1.81	ft
Bieger_D_channel_cross_sectional_area	55.8	ft^2

Bankfull Statistics Flow Report [Appalachian Plateaus P Bieger 2015]

Statistic	Value	Unit
Bieger_P_channel_width	32.2	ft
Bieger_P_channel_depth	1.82	ft
Bieger_P_channel_cross_sectional_area	58.2	ft^2

Bankfull Statistics Flow Report [USA Bieger 2015]

Statistic	Value	Unit
Bieger_USA_channel_width	22.3	ft
Bieger_USA_channel_depth	1.72	ft
Bieger_USA_channel_cross_sectional_area	42.1	ft^2

Bankfull Statistics Flow Report [Area-Averaged]

Statistic	Value	Unit
Bieger_D_channel_width	30.4	ft
Bieger_D_channel_depth	1.81	ft
Bieger_D_channel_cross_sectional_area	55.8	ft^2
Bieger_P_channel_width	32.2	ft
Bieger_P_channel_depth	1.82	ft
Bieger_P_channel_cross_sectional_area	58.2	ft^2
Bieger_USA_channel_width	22.3	ft
Bieger_USA_channel_depth	1.72	ft
Bieger_USA_channel_cross_sectional_area	42.1	ft^2

Bankfull Statistics Citations

Bieger, Katrin; Rathjens, Hendrik; Allen, Peter M.; and Arnold, Jeffrey G.,2015, Development and Evaluation of Bankfull Hydraulic Geometry Relationships for the Physiographic Regions of the United States, Publications from USDA-ARS / UNL Faculty, 17p. (https://digitalcommons.unl.edu/usdaarsfacpub/1515? utm_source=digitalcommons.unl.edu%2Fusdaarsfacpub%2F1515&utm_medium=PDF&utm_campaign=PDFCoverPages)

❯ Probability Statistics

Probability Statistics Parameters [P zero Flow 2012 5138]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	5.3	square miles	1	1250
STREAM_VARG	Streamflow Variability Index from Grid	0.54	dimensionless	0.24	1.12

Probability Statistics Flow Report [P zero Flow 2012 5138]

PIL: Lower 90% Prediction Interval, PIU: Upper 90% Prediction Interval, ASEp: Average Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	PC
Probability zero flow 1Day	0.0282	dim	91
Probability zero flow 7Day	0.012	dim	94
Probability zero flow 30Day	0.000505	dim	97

Probability Statistics Citations

Koltun, G.F., and Kula, S.P.,2013, Methods for estimating selected low-flow statistics and development of annual flow-duration statistics for Ohio: U.S. Geological Survey Scientific Investigations Report 2012−5138, 195 p. (http://pubs.usgs.gov/sir/2012/5138/)

❯ Maximum Probable Flood Statistics

Maximum Probable Flood Statistics Parameters [Crippen Bue Region 6]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	5.3	square miles	0.1	10000

Maximum Probable Flood Statistics Flow Report [Crippen Bue Region 6]

Statistic	Value	Unit
Maximum Flood Crippen Bue Regional	25500	ft^3/s

Maximum Probable Flood Statistics Citations

Crippen, J.R. and Bue, Conrad D.1977, Maximum Floodflows in the Conterminous United States, Geological Survey Water-Supply Paper 1887, 52p. (https://pubs.usgs.gov/wsp/1887/report.pdf)

Application Version: 4.19.4
StreamStats Services Version: 1.2.22
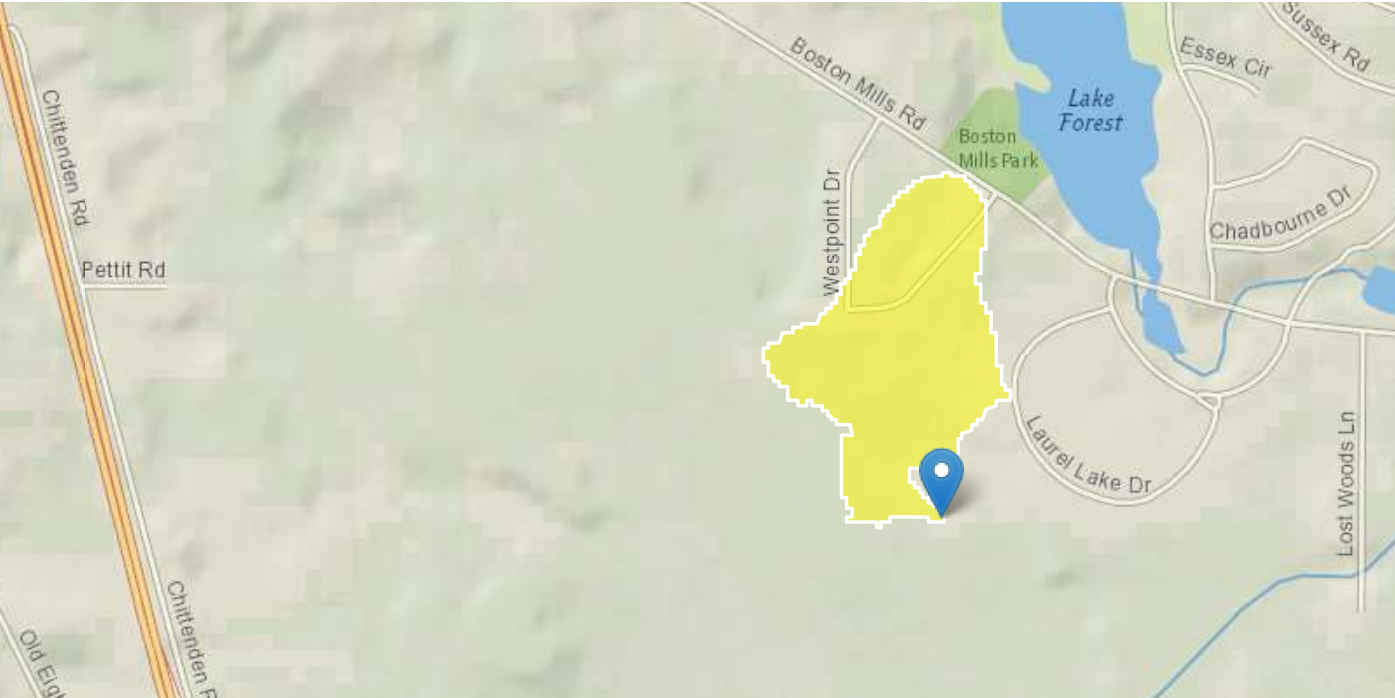NSS Services Version: 2.2.1

Rider Lake

StreamStats Report - Rider Lake

Region ID: OH
Workspace ID: OH20240610182556219000
Clicked Point (Latitude, Longitude): 41.24172, -81.47542
Time: 2024-06-10 14:26:17 -0400

➕ Collapse All

❯ Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
CSL1085LFP	Change in elevation divided by length between points 10 and 85 percent of distance along the longest flow path to the basin divide, LFP from 2D grid	26.8	feet per mi
DRNAREA	Area that drains to a point on a stream	0.0781	square miles
FOREST	Percentage of area covered by forest	63.7	percent
LAT_CENT	Latitude of Basin Centroid	41.2449	decimal degrees
LC92STOR	Percentage of water bodies and wetlands determined from the NLCD	31.2	percent
LONG_CENT	Longitude Basin Centroid	81.4764	decimal degrees
OHREGA	Ohio Region A Indicator	1	dimensionless
OHREGC	Ohio Region C Indicator	0	dimensionless

Parameter Code	Parameter Description	Value	Unit
PRECIPCENT	Mean Annual Precip at Basin Centroid	39.9	inches
STREAM_VARG	Streamflow variability index as defined in WRIR 02-4068, computed from regional grid	0.54	dimensionless

❯ Peak-Flow Statistics

Peak-Flow Statistics Parameters   [Peak Flow Full Model Reg A SIR2019 5018]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.0781	square miles	0.04	5989
OHREGC	Ohio Region C Indicator 1 if in C else 0	0	dimensionless	0	1
OHREGA	Ohio Region A Indicator 1 if in A else 0	1	dimensionless	0	1
CSL1085LFP	Stream Slope 10 and 85 Longest Flow Path	26.8	feet per mi	1.53	516
LC92STOR	Percent Storage from NLCD1992	31.2	percent	0	25.35

Peak-Flow Statistics Disclaimers   [Peak Flow Full Model Reg A SIR2019 5018]

> One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors.

Peak-Flow Statistics Flow Report   [Peak Flow Full Model Reg A SIR2019 5018]

Statistic	Value	Unit
50-percent AEP flood	9.25	ft^3/s
20-percent AEP flood	14.7	ft^3/s
10-percent AEP flood	18.8	ft^3/s
4-percent AEP flood	24.4	ft^3/s
2-percent AEP flood	28.9	ft^3/s
1-percent AEP flood	33.7	ft^3/s
0.2-percent AEP flood	46	ft^3/s

Peak-Flow Statistics Citations

 Koltun, G.F.,2019, Flood-frequency estimates for Ohio streamgages based on data through water year 2015 and techniques for estimating flood-frequency characteristics of rural, unregulated Ohio streams: U.S. Geological Survey Scientific Investigations Report 2019−5018, 25 p. (https://dx.doi.org/10.3133/sir20195018)

Low-Flow Statistics

Low-Flow Statistics Parameters [Low Flow Region A 2012 5138]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.0781	square miles	1	1250
STREAM_VARG	Streamflow Variability Index from Grid	0.54	dimensionless	0.24	1.12

Low-Flow Statistics Disclaimers [Low Flow Region A 2012 5138]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors.

Low-Flow Statistics Flow Report [Low Flow Region A 2012 5138]

Statistic	Value	Unit
1 Day 10 Year Low Flow	0.0013	ft^3/s
7 Day 10 Year Low Flow	0.00163	ft^3/s
30 Day 10 Year Low Flow	0.00249	ft^3/s
90 Day 10 Year Low Flow	0.00377	ft^3/s

Low-Flow Statistics Citations

Koltun, G.F., and Kula, S.P.,2013, Methods for estimating selected low-flow statistics and development of annual flow-duration statistics for Ohio: U.S. Geological Survey Scientific Investigations Report 2012−5138, 195 p. (http://pubs.usgs.gov/sir/2012/5138/)

Flow-Duration Statistics

Flow-Duration Statistics Parameters [Low Flow Region A 2012 5138]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.0781	square miles	1	1250
STREAM_VARG	Streamflow Variability Index from Grid	0.54	dimensionless	0.24	1.12

Flow-Duration Statistics Disclaimers [Low Flow Region A 2012 5138]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors.

Flow-Duration Statistics Flow Report [Low Flow Region A 2012 5138]

Statistic	Value	Unit
80 Percent Duration	0.00764	ft^3/s

Flow-Duration Statistics Citations

Koltun, G.F., and Kula, S.P.,2013, Methods for estimating selected low-flow statistics and development of annual flow-duration statistics for Ohio: U.S. Geological Survey Scientific Investigations Report 2012–5138, 195 p. (http://pubs.usgs.gov/sir/2012/5138/)

❯ Annual Flow Statistics

Annual Flow Statistics Parameters   [Low Flow LatGT 41.2 wri02 4068]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.0781	square miles	0.12	7422
LAT_CENT	Latitude of Basin Centroid	41.2449	decimal degrees	41.2	41.59
PRECIPCENT	Mean Annual Precip at Basin Centroid	39.9	inches	34	43.2

Annual Flow Statistics Disclaimers   [Low Flow LatGT 41.2 wri02 4068]

> One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors.

Annual Flow Statistics Flow Report   [Low Flow LatGT 41.2 wri02 4068]

Statistic	Value	Unit
Mean Annual Flow	0.092	ft^3/s

Annual Flow Statistics Citations

Koltun, G. F., and Whitehead, M. T.,2002, Techniques for Estimating Selected Streamflow Characteristics of Rural, Unregulated Streams in Ohio: U. S. Geological Survey Water-Resources Investigations Report 02-4068, 50 p (https://pubs.er.usgs.gov/publication/wri024068)

❯ Monthly Flow Statistics

Monthly Flow Statistics Parameters   [Low Flow LatGT 41.2 wri02 4068]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.0781	square miles	0.12	7422
LC92STOR	Percent Storage from NLCD1992	31.2	percent	0	19
PRECIPCENT	Mean Annual Precip at Basin Centroid	39.9	inches	34	43.2
FOREST	Percent Forest	63.7	percent	0	99.1

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
LAT_CENT	Latitude of Basin Centroid	41.2449	decimal degrees	41.2	41.59
STREAM_VARG	Streamflow Variability Index from Grid	0.54	dimensionless	0.25	1.13

Monthly Flow Statistics Disclaimers [Low Flow LatGT 41.2 wri02 4068]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors.

Monthly Flow Statistics Flow Report [Low Flow LatGT 41.2 wri02 4068]

Statistic	Value	Unit
January Mean Flow	0.158	ft^3/s
February Mean Flow	0.213	ft^3/s
March Mean Flow	0.214	ft^3/s
April Mean Flow	0.193	ft^3/s
May Mean Flow	0.108	ft^3/s
June Mean Flow	0.0529	ft^3/s
July Mean Flow	0.0256	ft^3/s
August Mean Flow	0.0288	ft^3/s
September Mean Flow	0.0188	ft^3/s
October Mean Flow	0.0376	ft^3/s
November Mean Flow	0.069	ft^3/s
December Mean Flow	0.138	ft^3/s

Monthly Flow Statistics Citations

Koltun, G. F., and Whitehead, M. T.,2002, Techniques for Estimating Selected Streamflow Characteristics of Rural, Unregulated Streams in Ohio: U. S. Geological Survey Water-Resources Investigations Report 02-4068, 50 p (https://pubs.er.usgs.gov/publication/wri024068)

> General Flow Statistics

General Flow Statistics Parameters [Low Flow LatGT 41.2 wri02 4068]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.0781	square miles	0.12	7422
LC92STOR	Percent Storage from NLCD1992	31.2	percent	0	19

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
STREAM_VARG	Streamflow Variability Index from Grid	0.54	dimensionless	0.25	1.13
LAT_CENT	Latitude of Basin Centroid	41.2449	decimal degrees	41.2	41.59

General Flow Statistics Disclaimers   [Low Flow LatGT 41.2 wri02 4068]

> One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors.

General Flow Statistics Flow Report   [Low Flow LatGT 41.2 wri02 4068]

Statistic	Value	Unit
Harmonic Mean Streamflow	0.0288	ft^3/s

General Flow Statistics Citations

Koltun, G. F., and Whitehead, M. T.,2002, Techniques for Estimating Selected Streamflow Characteristics of Rural, Unregulated Streams in Ohio: U. S. Geological Survey Water-Resources Investigations Report 02-4068, 50 p (https://pubs.er.usgs.gov/publication/wri024068)

❯ Flow Percentile Statistics

Flow Percentile Statistics Parameters   [Low Flow LatGT 41.2 wri02 4068]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.0781	square miles	0.12	7422
LC92STOR	Percent Storage from NLCD1992	31.2	percent	0	19
STREAM_VARG	Streamflow Variability Index from Grid	0.54	dimensionless	0.25	1.13
LAT_CENT	Latitude of Basin Centroid	41.2449	decimal degrees	41.2	41.59
LONG_CENT	Longitude of Basin Centroid	81.4764	decimal degrees	80.53	84.6

Flow Percentile Statistics Disclaimers   [Low Flow LatGT 41.2 wri02 4068]

> One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors.

Flow Percentile Statistics Flow Report   [Low Flow LatGT 41.2 wri02 4068]

Statistic	Value	Unit
25th Percentile Flow	0.0528	ft^3/s

Statistic	Value	Unit
50th Percentile Flow Median	0.0789	ft^3/s
75th Percentile Flow	0.156	ft^3/s

Flow Percentile Statistics Citations

Koltun, G. F., and Whitehead, M. T.,2002, Techniques for Estimating Selected Streamflow Characteristics of Rural, Unregulated Streams in Ohio: U. S. Geological Survey Water-Resources Investigations Report 02-4068, 50 p (https://pubs.er.usgs.gov/publication/wri024068)

❯ Bankfull Statistics

Bankfull Statistics Parameters   [Appalachian Highlands D Bieger 2015]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.0781	square miles	0.07722	940.1535

Bankfull Statistics Parameters   [Appalachian Plateaus P Bieger 2015]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.0781	square miles	0.081081	536.995602

Bankfull Statistics Parameters   [USA Bieger 2015]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.0781	square miles	0.07722	59927.7393

Bankfull Statistics Flow Report   [Appalachian Highlands D Bieger 2015]

Statistic	Value	Unit
Bieger_D_channel_width	5.27	ft
Bieger_D_channel_depth	0.539	ft
Bieger_D_channel_cross_sectional_area	2.86	ft^2

Bankfull Statistics Disclaimers   [Appalachian Plateaus P Bieger 2015]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors.

Bankfull Statistics Flow Report   [Appalachian Plateaus P Bieger 2015]

Statistic	Value	Unit
Bieger_P_channel_width	5.25	ft
Bieger_P_channel_depth	0.537	ft
Bieger_P_channel_cross_sectional_area	2.79	ft^2

Bankfull Statistics Flow Report [USA Bieger 2015]

Statistic	Value	Unit
Bieger_USA_channel_width	5.05	ft
Bieger_USA_channel_depth	0.7	ft
Bieger_USA_channel_cross_sectional_area	4.31	ft^2

Bankfull Statistics Flow Report [Area-Averaged]

Statistic	Value	Unit
Bieger_D_channel_width	5.27	ft
Bieger_D_channel_depth	0.539	ft
Bieger_D_channel_cross_sectional_area	2.86	ft^2
Bieger_P_channel_width	5.25	ft
Bieger_P_channel_depth	0.537	ft
Bieger_P_channel_cross_sectional_area	2.79	ft^2
Bieger_USA_channel_width	5.05	ft
Bieger_USA_channel_depth	0.7	ft
Bieger_USA_channel_cross_sectional_area	4.31	ft^2

Bankfull Statistics Citations

Bieger, Katrin; Rathjens, Hendrik; Allen, Peter M.; and Arnold, Jeffrey G.,2015, Development and Evaluation of Bankfull Hydraulic Geometry Relationships for the Physiographic Regions of the United States, Publications from USDA-ARS / UNL Faculty, 17p. (https://digitalcommons.unl.edu/usdaarsfacpub/1515? utm_source=digitalcommons.unl.edu%2Fusdaarsfacpub%2F1515&utm_medium=PDF&utm_campaign=PDF

❯ Probability Statistics

Probability Statistics Parameters [P zero Flow 2012 5138]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.0781	square miles	1	1250
STREAM_VARG	Streamflow Variability Index from Grid	0.54	dimensionless	0.24	1.12

Probability Statistics Disclaimers [P zero Flow 2012 5138]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors.

Probability Statistics Flow Report [P zero Flow 2012 5138]

Statistic	Value	Unit
Probability zero flow 1Day	0.029	dim
Probability zero flow 7Day	0.0123	dim
Probability zero flow 30Day	0.000505	dim

Probability Statistics Citations

Koltun, G.F., and Kula, S.P.,2013, Methods for estimating selected low-flow statistics and development of annual flow-duration statistics for Ohio: U.S. Geological Survey Scientific Investigations Report 2012−5138, 195 p. (http://pubs.usgs.gov/sir/2012/5138/)

❯ Maximum Probable Flood Statistics

Maximum Probable Flood Statistics Parameters [Crippen Bue Region 6]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.0781	square miles	0.1	10000

Maximum Probable Flood Statistics Disclaimers [Crippen Bue Region 6]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors.

Maximum Probable Flood Statistics Flow Report [Crippen Bue Region 6]

Statistic	Value	Unit
Maximum Flood Crippen Bue Regional	747	ft^3/s

Maximum Probable Flood Statistics Citations

Crippen, J.R. and Bue, Conrad D.1977, Maximum Floodflows in the Conterminous United States, Geological Survey Water-Supply Paper 1887, 52p. (https://pubs.usgs.gov/wsp/1887/report.pdf)

Application Version: 4.20.1

StreamStats Services Version: 1.2.22

NSS Services Version: 2.2.1