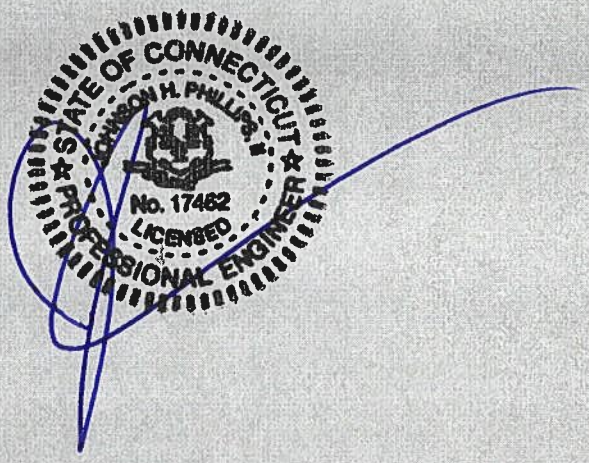
DRAINAGE REPORT

Valvoline

818 Sullivan Ave.
South Windsor, CT

August 11, 2020



PREPARED BY:

BORGHESI BUILDING & ENGINEERING CO.
2155 EAST MAIN STREET
TORRINGTON, CT 06790
(860) 482-7613

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SUMMARY

The applicant proposes to construct a two story 3,837 sf oil change facility at 818 Sullivan Ave., South Windsor. The existing site currently has a car wash and an office. Minor grading and limited land clearing is required for construction. The proposed drainage system is designed with detention basin to reduce post - development flows to pre-development levels for the 2-yr, 10-yr, 25-yr, 50-yr, and 100-year storms.

The proposed site grading will direct runoff from the proposed parking area into catch basins. The catch basins are equipped with 4' sumps to capture sediment in the runoff. The last catch basin before the detention basins has a hood to keep floatables from entering the detention basin. The detention basin reduces the post-development flows to pre-development levels prior to discharging into an existing drainage system in Sullivan Ave. A summary of the watershed analysis is found on the next page. Hydraflow Hydrographs software is used to evaluate the pre- and post- development conditions.

The proposed piping system is designed for a 25-year storm in accordance with CONNDOT methods. The rational method is used to estimate rates of runoff from the watershed. Watershed areas for the basins are determined using site plans prepared by Borghesi Building & Engineering Co. (BBE). A watershed map is presented in Appendix D.

"Hydraflow" software is used to evaluate the proposed drainage system. The software uses the Rational Method for hydrologic calculations and basic hydraulic principals to evaluate selected pipe sizes and inverts. The starting water surface elevation corresponds to the crown of the outlet pipe. All pipes are designed to convey the design flow while maintaining at least 1.0 feet of freeboard in each basin.

Drainage calculations for the proposed piping system are found in Appendix C.

BORGHESI BUILDING & ENGINEERING CO.
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818 Sullivan Ave., South Windsor, CT

SUMMARY OF DISCHARGES

STORM (YEAR)	EXISTING (CFS)	PROPOSED (CFS)	CHANGE (CFS)
2	0.62	0.46	-0.16
10	1.18	0.57	-0.61
25	1.50	0.61	-0.89
50	1.78	0.63	-1.15
100	2.06	0.65	-1.41

APPENDIX A:

HYDROLOGIC CALCULATIONS: EXISTING CONDITIONS

BORGHESI BUILDING & ENGINEERING CO.
2155 EAST MAIN ST., TORRINGTON, CT

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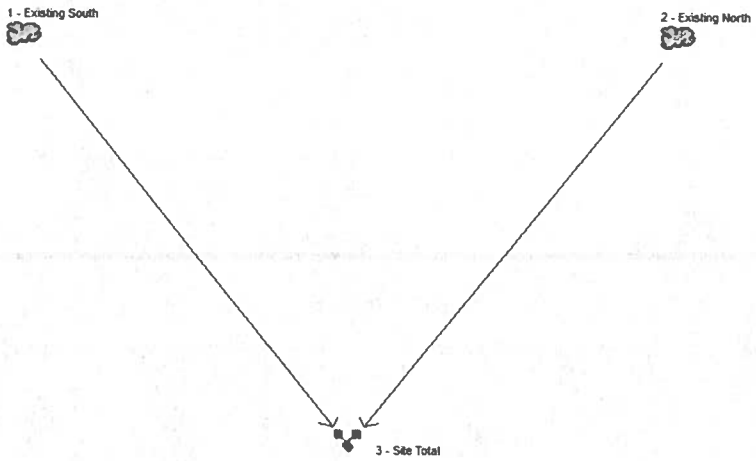
818 Sullivan Ave., South Windsor, CT

RUNOFF CURVE NUMBERS

LINE	AREA DESCRIPTION	AREA (ACRE)	C	CA	HSG	TC (MIN)
EXISTING SOUTH	PAVED, BLDG.	0.01	98	1	C	
	GRASS	0.11	74	8	C	
	GRAVEL	0.03	89	3	C	
	TOTAL	0.15	78.6	12		5
EXISTING NORTH	PAVED, BLDG.	0.01	98	1	C	
	GRASS	0.15	74	11	C	
	GRAVEL	0.09	89	8	C	
	TOTAL	0.25	80.4	20		5
PROPOSED SOUTH	PAVED, BLDG.	0.13	98	13	C	
	GRASS	0.12	74	9	C	
	GRAVEL	0.00	89	0	C	
	TOTAL	0.25	86.5	22		5
PROPOSED NORTH	PAVED, BLDG.	0.12	98	12	C	
	GRASS	0.03	74	2	C	
	GRAVEL	0.00	89	0	C	
	TOTAL	0.15	93.2	14		5

Watershed Model Schematic

Hydraflow Hydrographs by Intelisolve v9.1



Legend

Hyd.	Origin	Description
1	SCS Runoff	Existing South
2	SCS Runoff	Existing North
3	Combine	Site Total

Hydrograph Return Period Recap

Hydraflow Hydrographs by Intelisolve v9.1

Hyd. No.	Hydrograph type (origin)	Inflow Hyd(s)	Peak Outflow (cfs)								Hydrograph description
			1-Yr	2-Yr	3-Yr	5-Yr	10-Yr	25-Yr	50-Yr	100-Yr	
1	SCS Runoff	-------	-------	0.225	-------	-------	0.435	0.552	0.656	0.761	Existing South
2	SCS Runoff	-------	-------	0.396	-------	-------	0.749	0.946	1.120	1.295	Existing North
3	Combine	1, 2	-------	0.621	-------	-------	1.184	1.498	1.776	2.056	Site Total

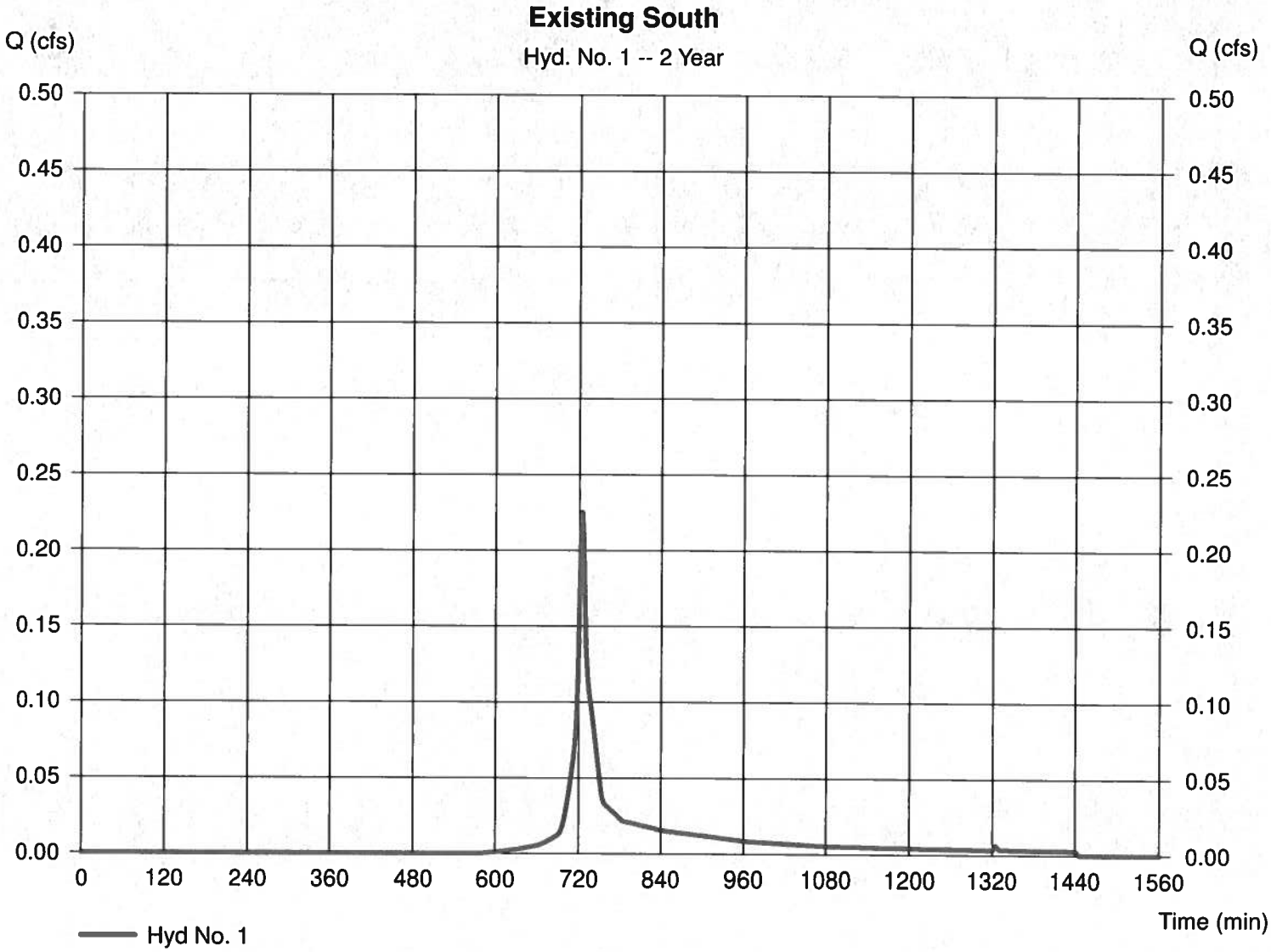
Hydrograph Report

Hyd. No. 1

Existing South

Hydrograph type	= SCS Runoff	Peak discharge	= 0.225 cfs
Storm frequency	= 2 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 682 cuft
Drainage area	= 0.150 ac	Curve number	= 79*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 5.00 min
Total precip.	= 3.20 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.010 x 98) + (0.030 x 89) + (0.110 x 74)] / 0.150



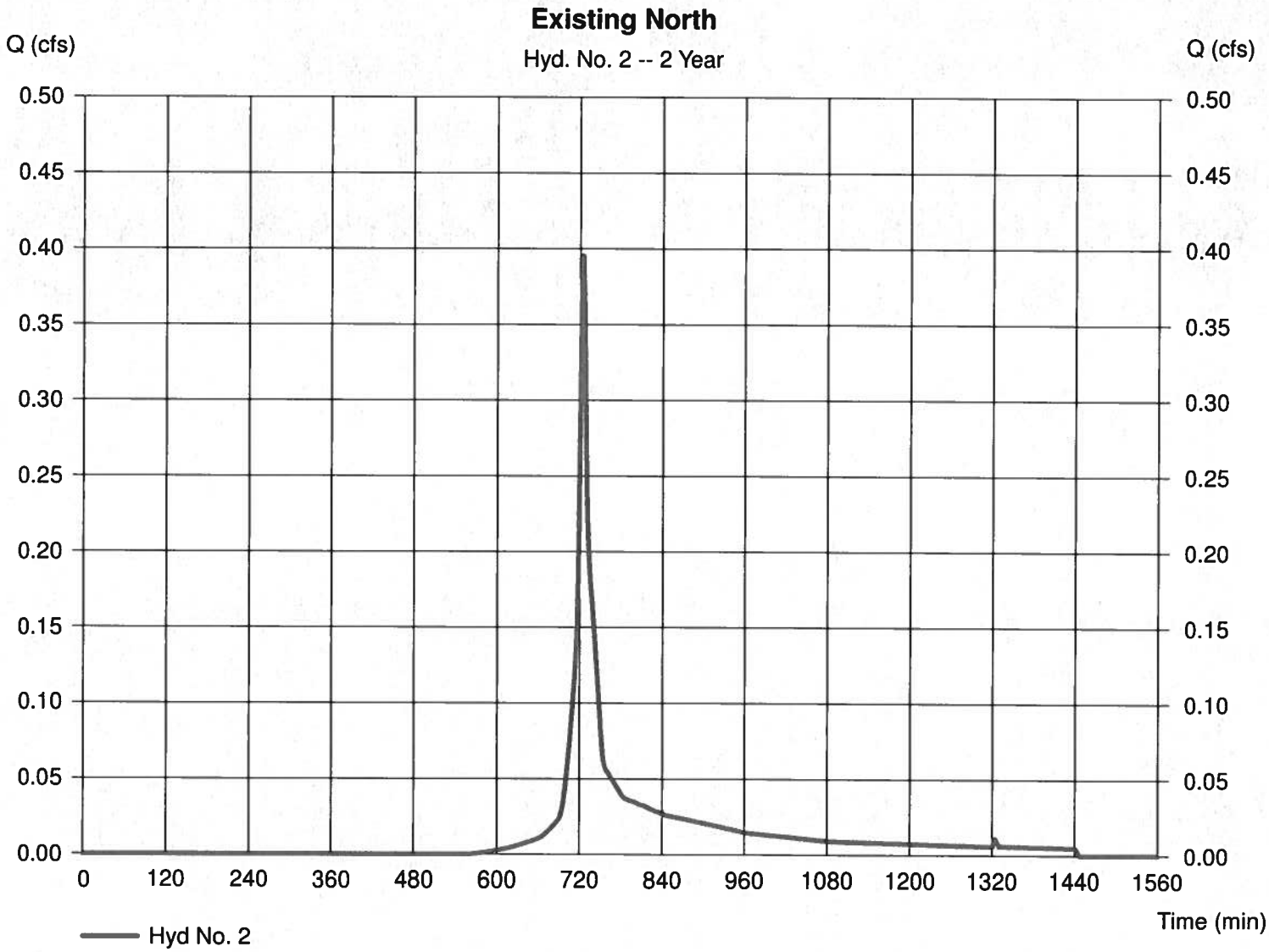
Hydrograph Report

Hyd. No. 2

Existing North

Hydrograph type	= SCS Runoff	Peak discharge	= 0.396 cfs
Storm frequency	= 2 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 1,193 cuft
Drainage area	= 0.250 ac	Curve number	= 80*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 5.00 min
Total precip.	= 3.20 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.010 x 98) + (0.090 x 89) + (0.150 x 74)] / 0.250

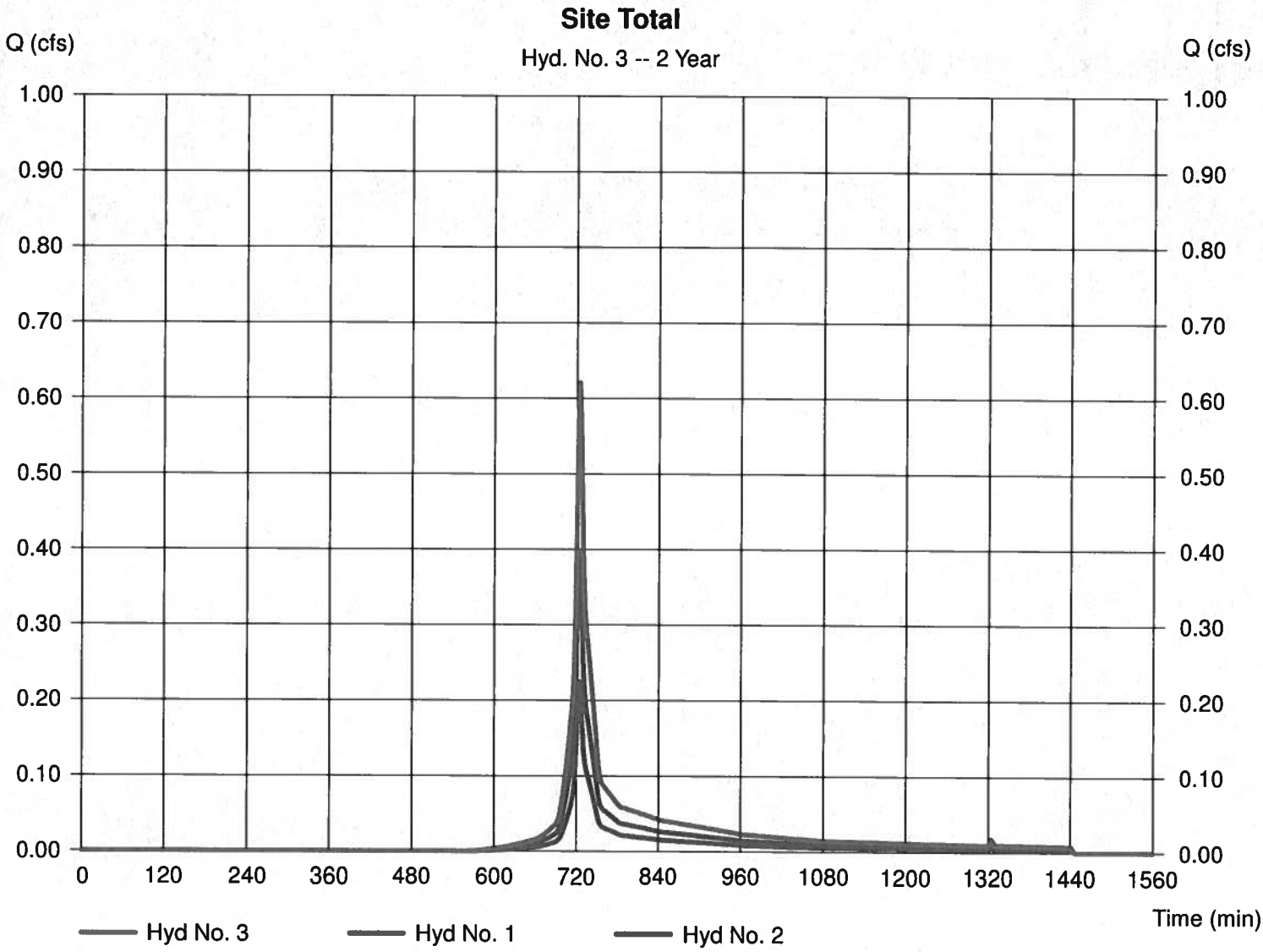


Hydrograph Report

Hyd. No. 3

Site Total

Hydrograph type	= Combine	Peak discharge	= 0.621 cfs
Storm frequency	= 2 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 1,875 cuft
Inflow hyds.	= 1, 2	Contrib. drain. area	= 0.400 ac



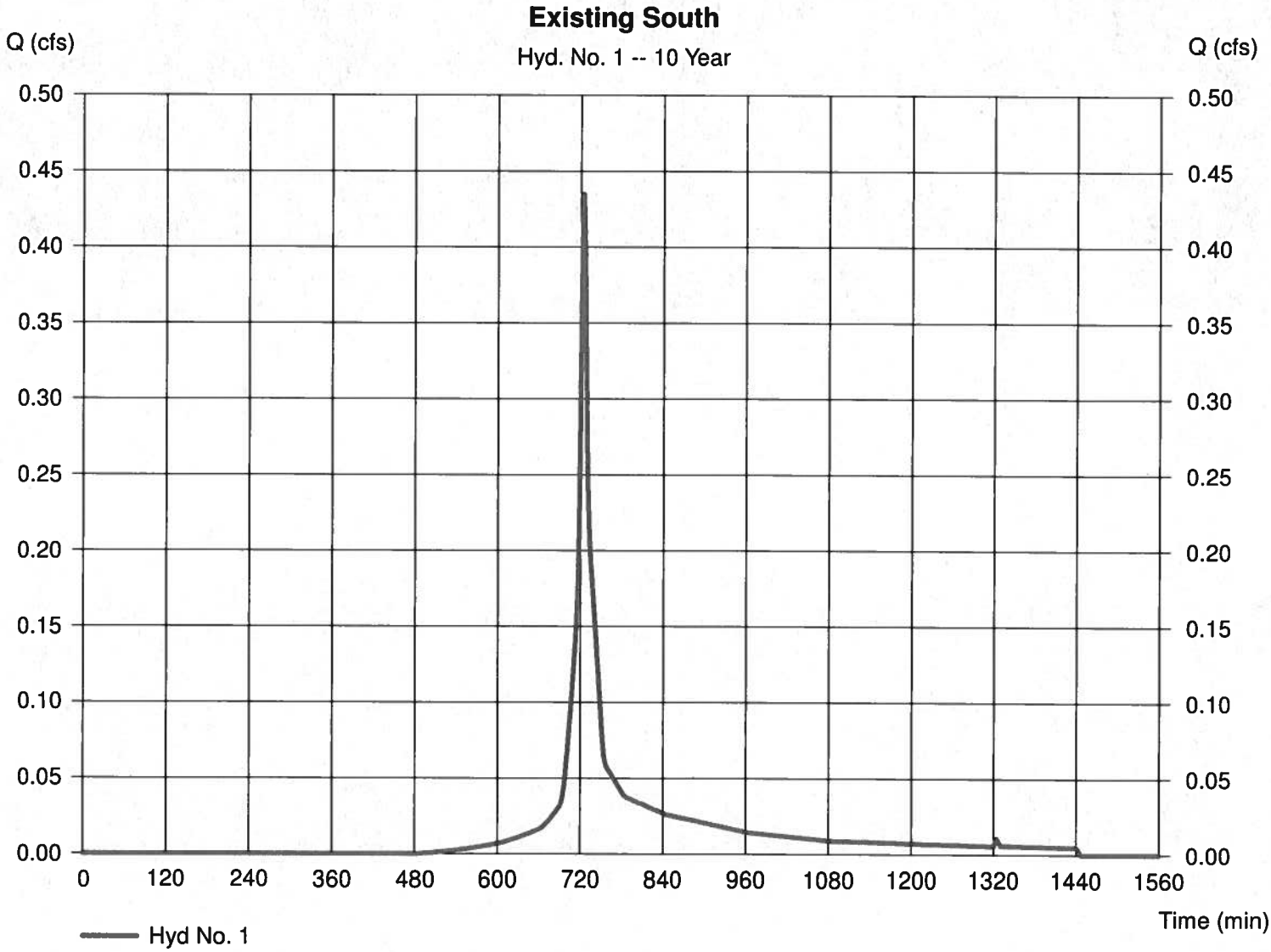
Hydrograph Report

Hyd. No. 1

Existing South

Hydrograph type	= SCS Runoff	Peak discharge	= 0.435 cfs
Storm frequency	= 10 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 1,299 cuft
Drainage area	= 0.150 ac	Curve number	= 79*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 5.00 min
Total precip.	= 4.70 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.010 x 98) + (0.030 x 89) + (0.110 x 74)] / 0.150



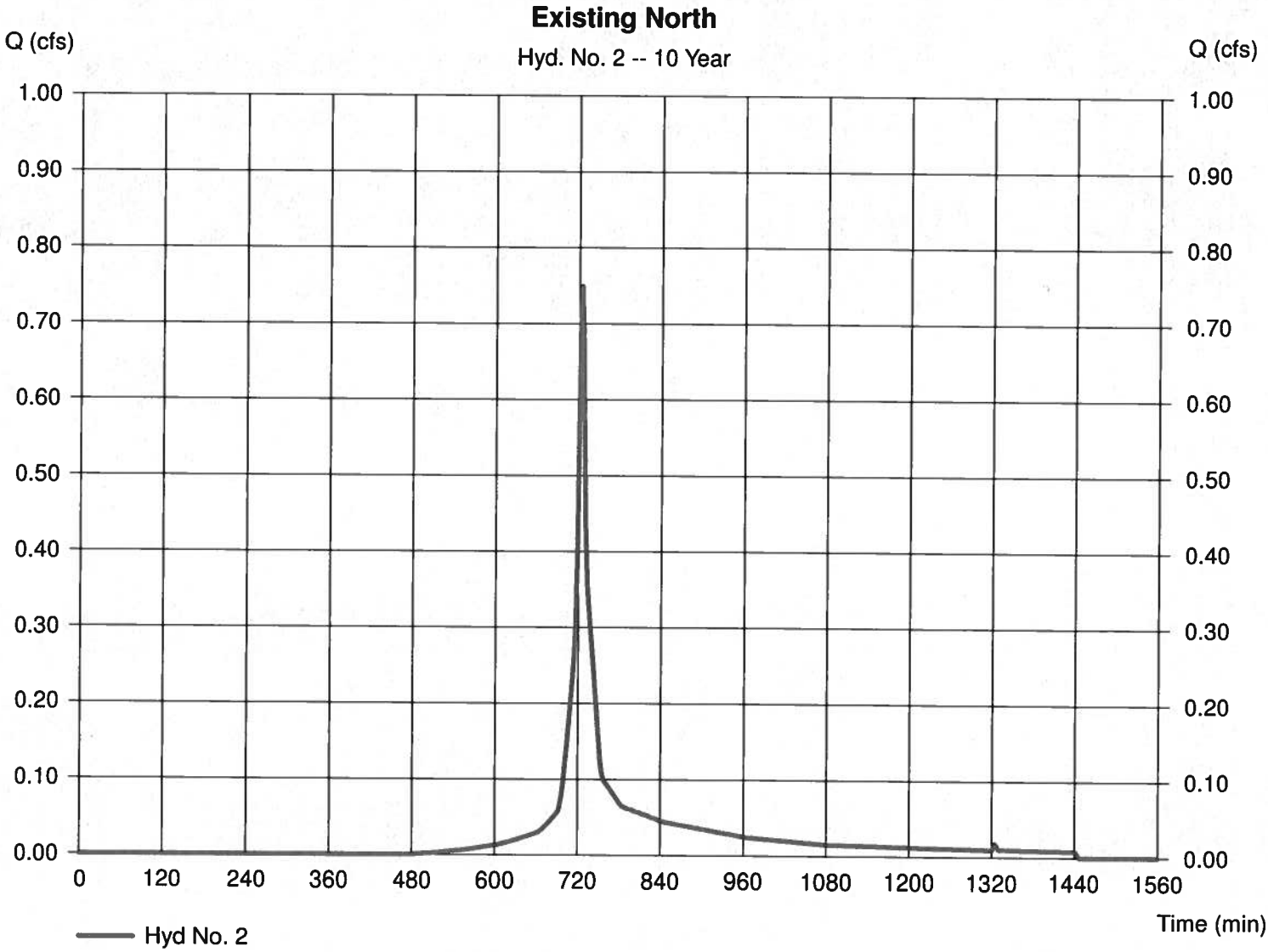
Hydrograph Report

Hyd. No. 2

Existing North

Hydrograph type	= SCS Runoff	Peak discharge	= 0.749 cfs
Storm frequency	= 10 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 2,240 cuft
Drainage area	= 0.250 ac	Curve number	= 80*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 5.00 min
Total precip.	= 4.70 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.010 x 98) + (0.090 x 89) + (0.150 x 74)] / 0.250

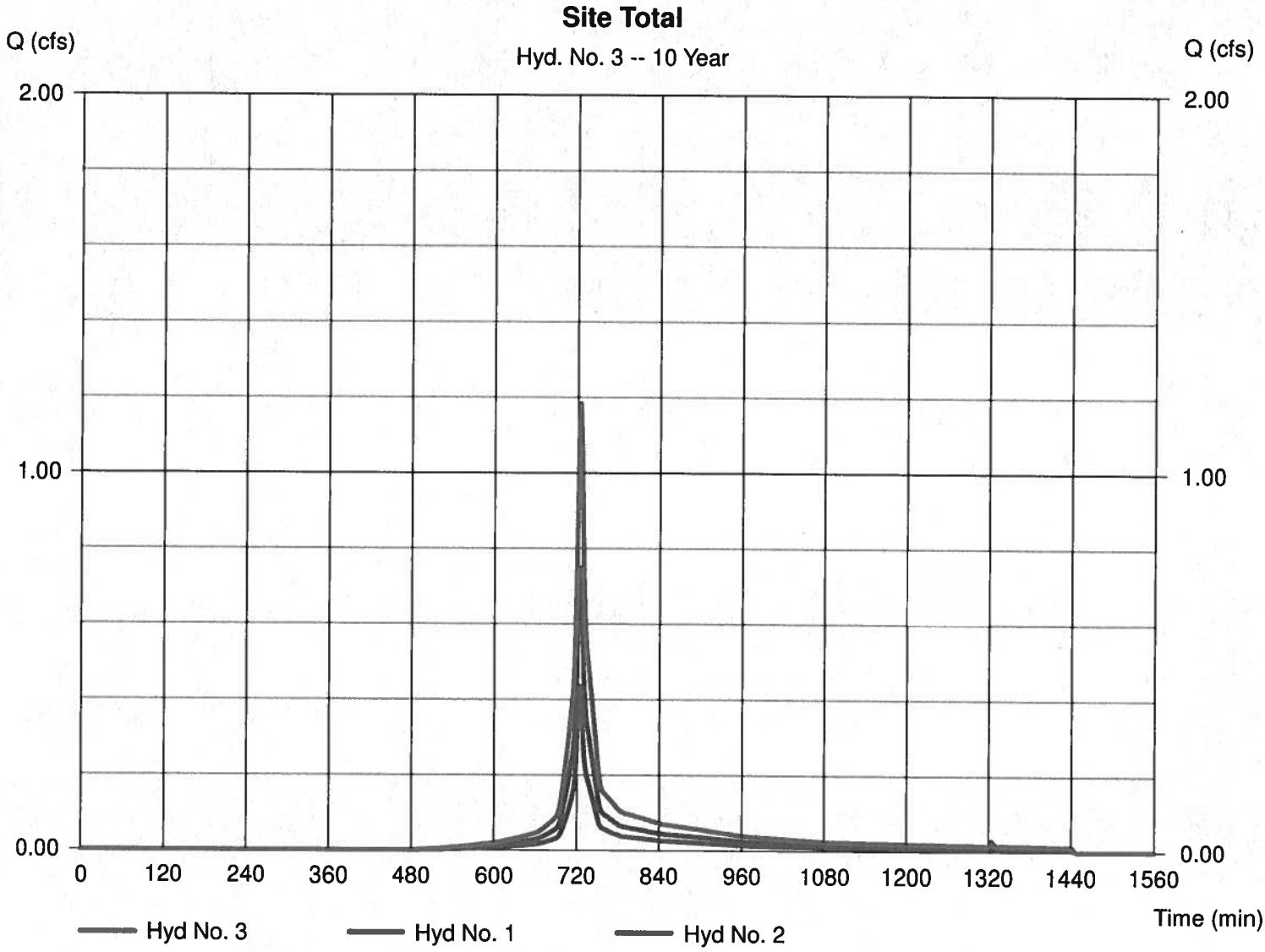


Hydrograph Report

Hyd. No. 3

Site Total

Hydrograph type	= Combine	Peak discharge	= 1.184 cfs
Storm frequency	= 10 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 3,539 cuft
Inflow hyds.	= 1, 2	Contrib. drain. area	= 0.400 ac



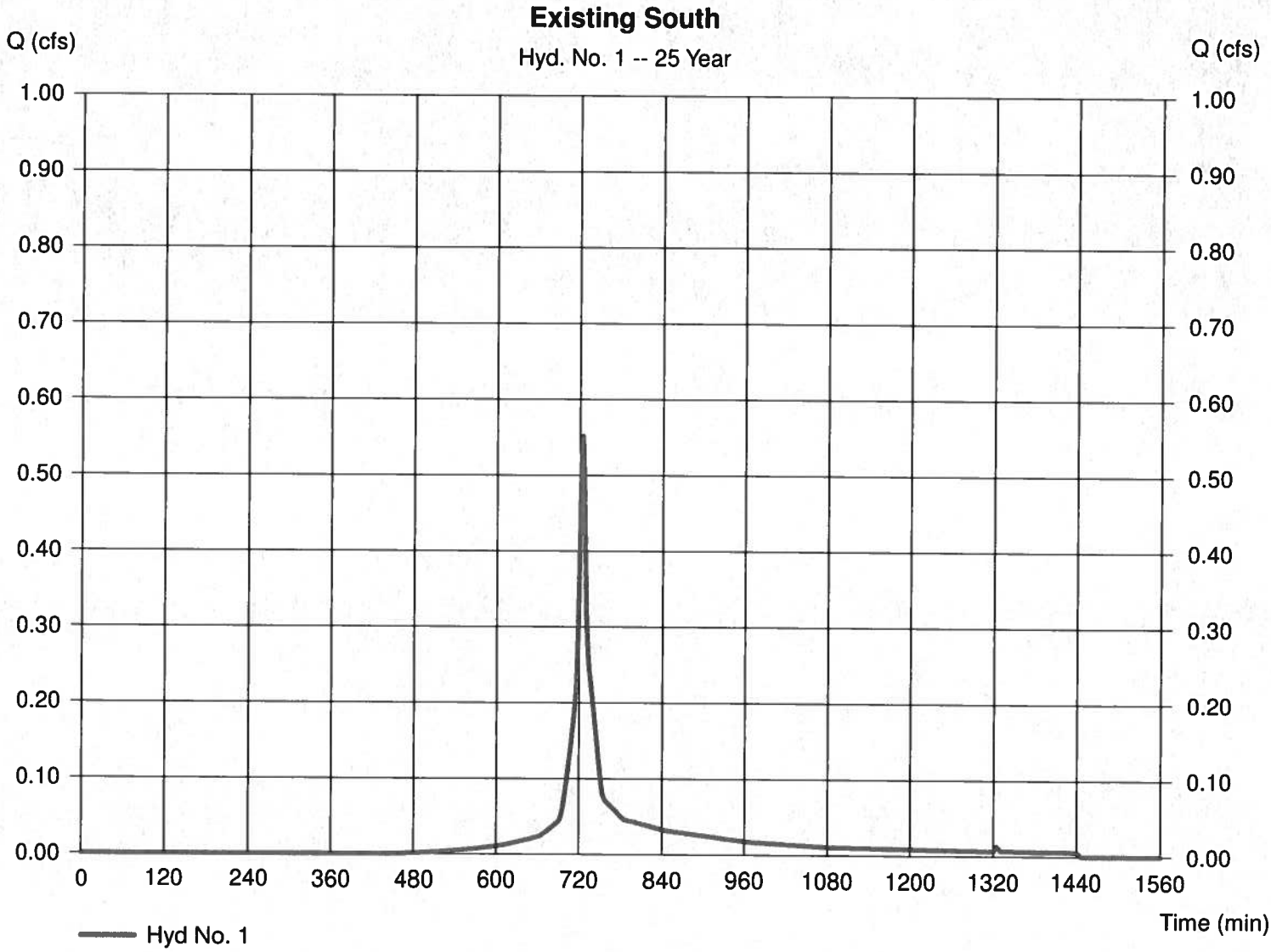
Hydrograph Report

Hyd. No. 1

Existing South

Hydrograph type	= SCS Runoff	Peak discharge	= 0.552 cfs
Storm frequency	= 25 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 1,652 cuft
Drainage area	= 0.150 ac	Curve number	= 79*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 5.00 min
Total precip.	= 5.50 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.010 x 98) + (0.030 x 89) + (0.110 x 74)] / 0.150



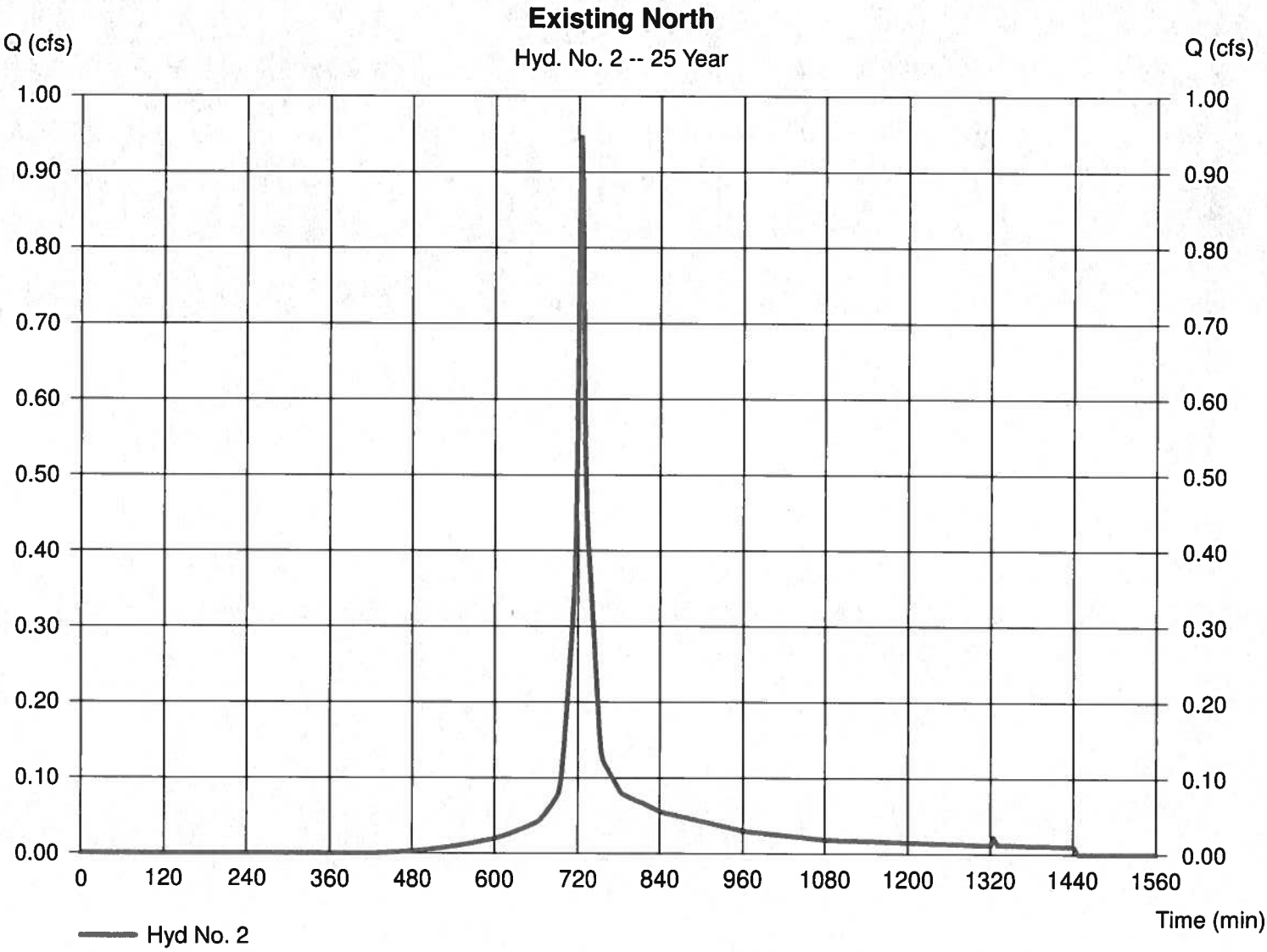
Hydrograph Report

Hyd. No. 2

Existing North

Hydrograph type	= SCS Runoff	Peak discharge	= 0.946 cfs
Storm frequency	= 25 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 2,836 cuft
Drainage area	= 0.250 ac	Curve number	= 80*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 5.00 min
Total precip.	= 5.50 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.010 x 98) + (0.090 x 89) + (0.150 x 74)] / 0.250

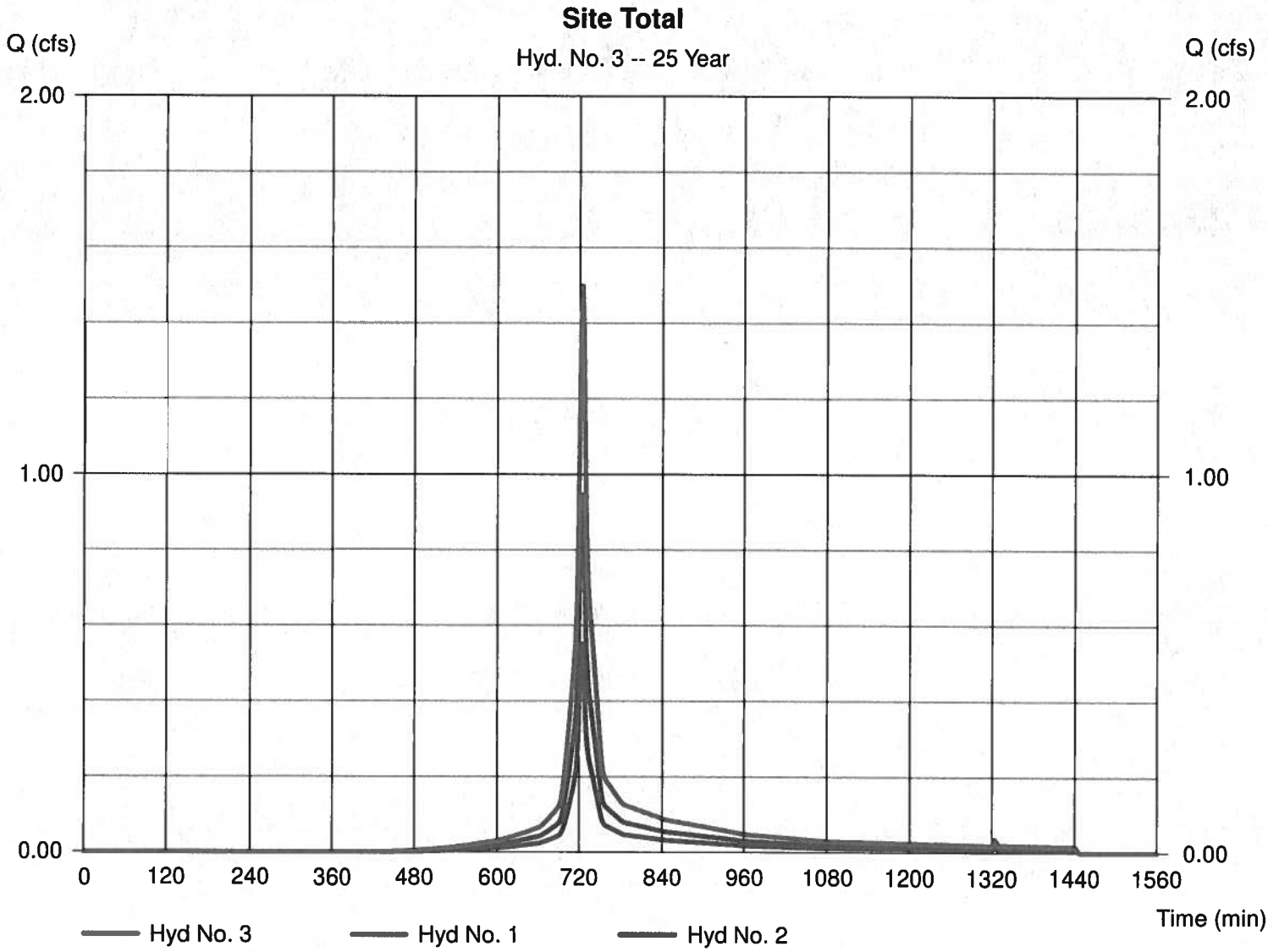


Hydrograph Report

Hyd. No. 3

Site Total

Hydrograph type	= Combine	Peak discharge	= 1.498 cfs
Storm frequency	= 25 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 4,488 cuft
Inflow hyds.	= 1, 2	Contrib. drain. area	= 0.400 ac



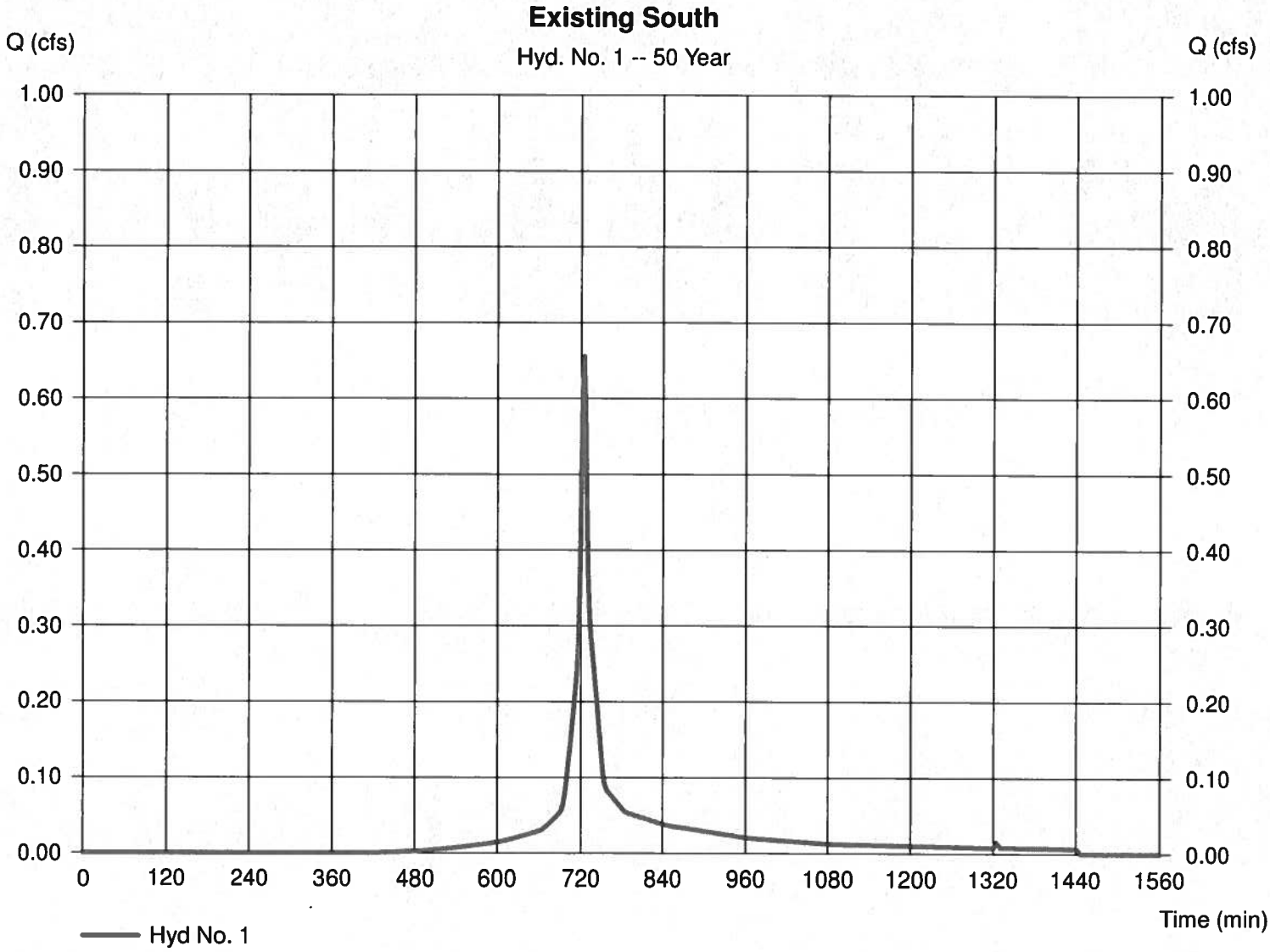
Hydrograph Report

Hyd. No. 1

Existing South

Hydrograph type	= SCS Runoff	Peak discharge	= 0.656 cfs
Storm frequency	= 50 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 1,970 cuft
Drainage area	= 0.150 ac	Curve number	= 79*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 5.00 min
Total precip.	= 6.20 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.010 x 98) + (0.030 x 89) + (0.110 x 74)] / 0.150



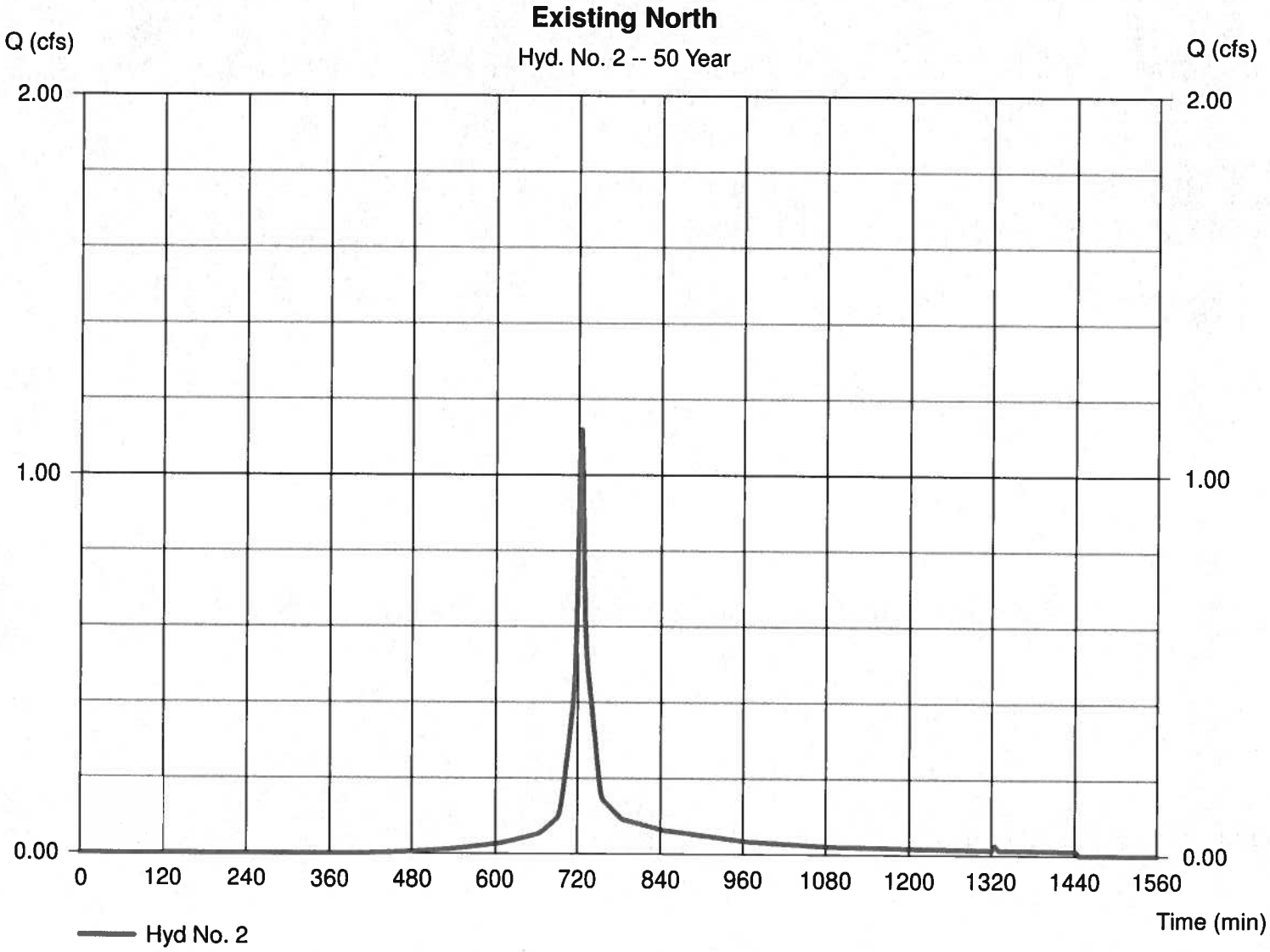
Hydrograph Report

Hyd. No. 2

Existing North

Hydrograph type	= SCS Runoff	Peak discharge	= 1.120 cfs
Storm frequency	= 50 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 3,371 cuft
Drainage area	= 0.250 ac	Curve number	= 80*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 5.00 min
Total precip.	= 6.20 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.010 x 98) + (0.090 x 89) + (0.150 x 74)] / 0.250

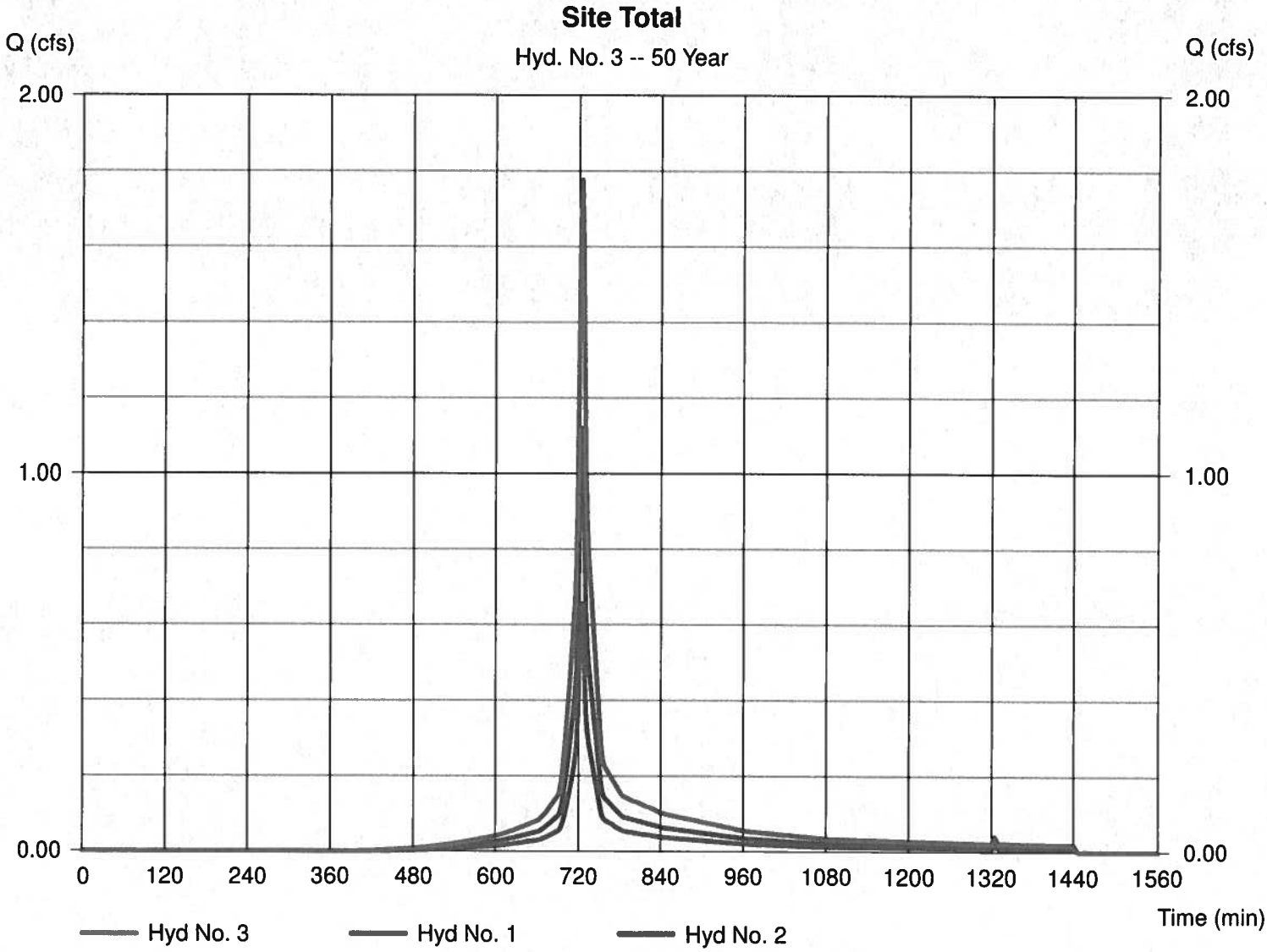


Hydrograph Report

Hyd. No. 3

Site Total

Hydrograph type	= Combine	Peak discharge	= 1.776 cfs
Storm frequency	= 50 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 5,341 cuft
Inflow hyds.	= 1, 2	Contrib. drain. area	= 0.400 ac



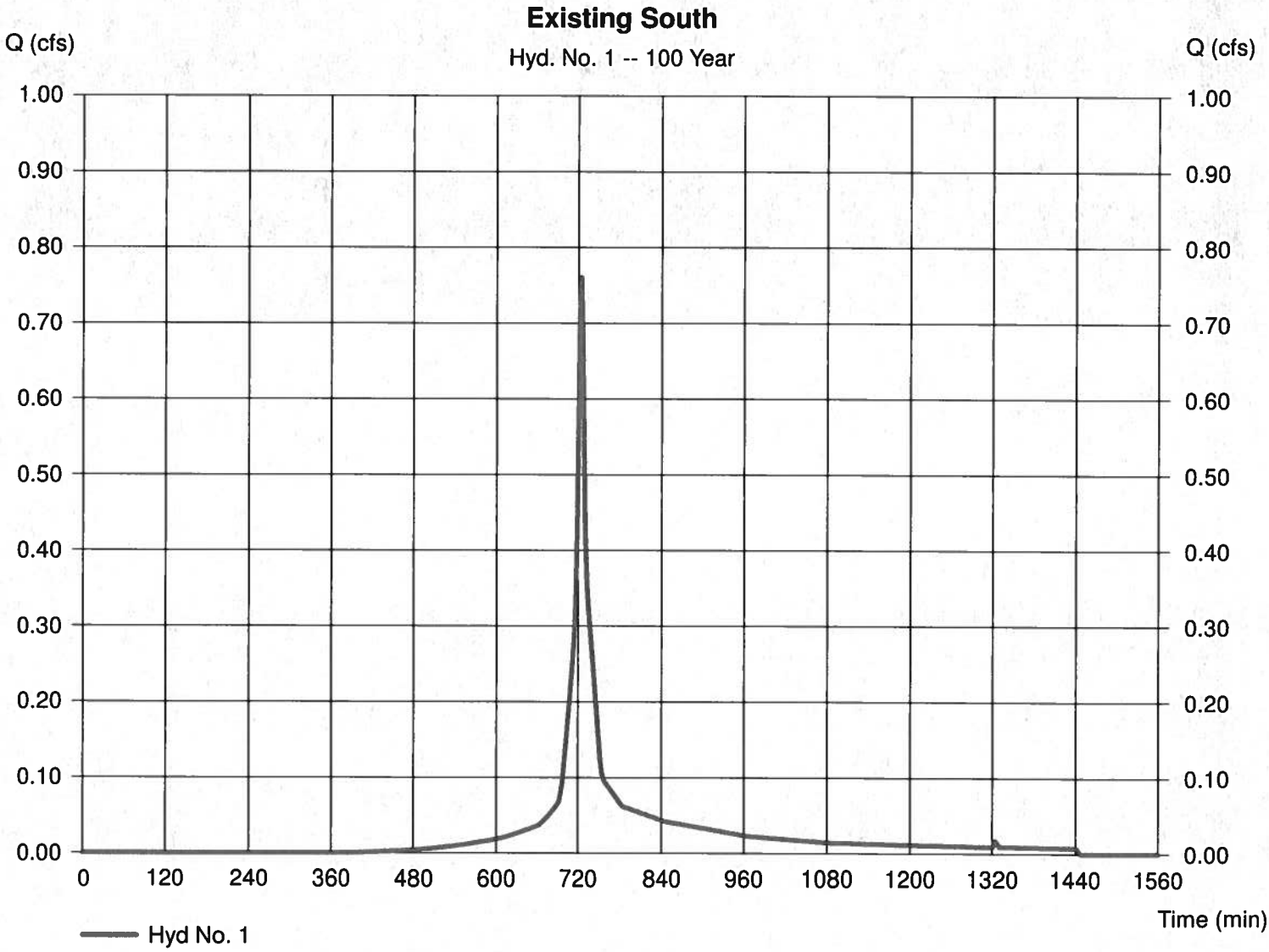
Hydrograph Report

Hyd. No. 1

Existing South

Hydrograph type	= SCS Runoff	Peak discharge	= 0.761 cfs
Storm frequency	= 100 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 2,294 cuft
Drainage area	= 0.150 ac	Curve number	= 79*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 5.00 min
Total precip.	= 6.90 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.010 x 98) + (0.030 x 89) + (0.110 x 74)] / 0.150



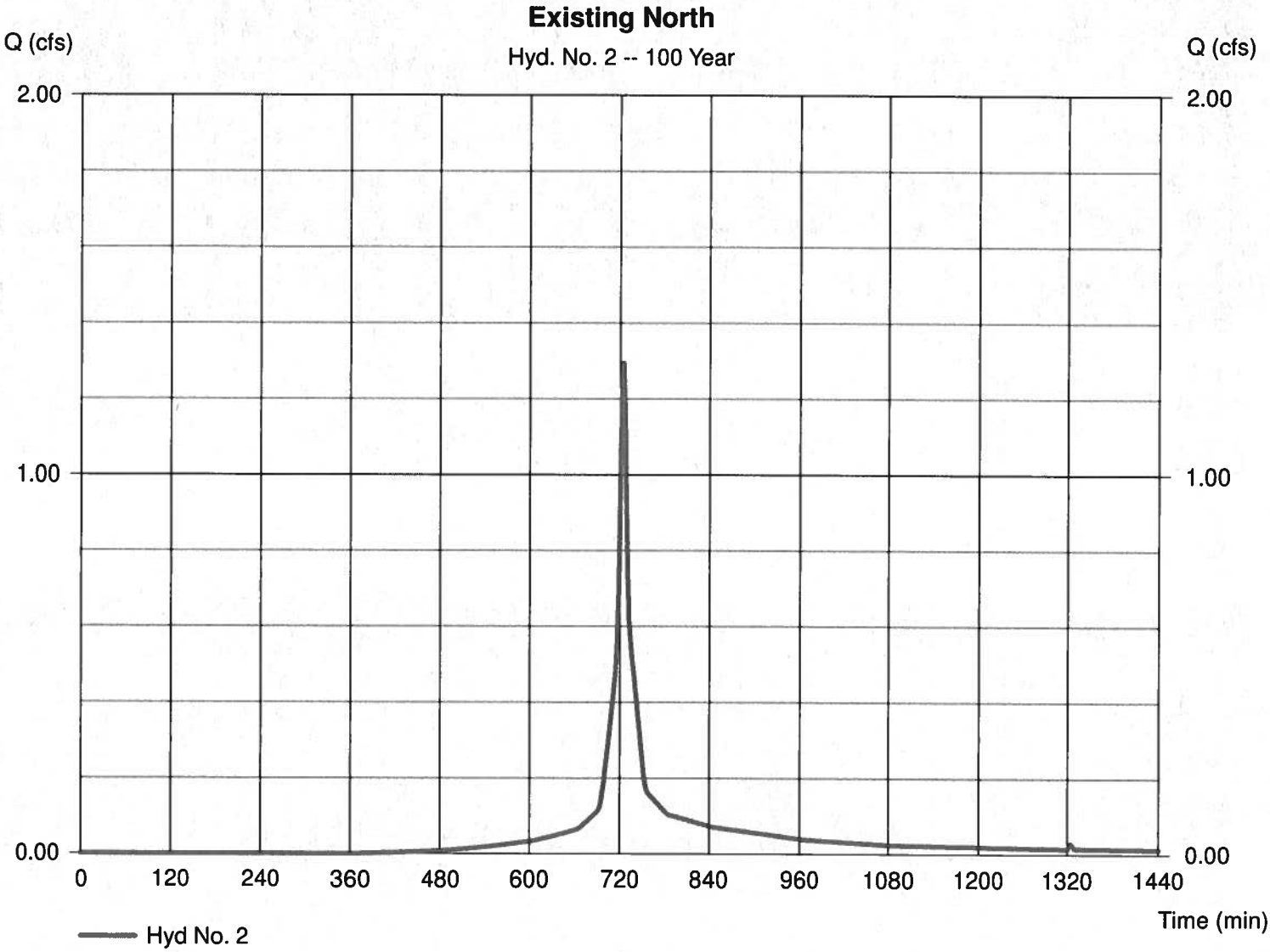
Hydrograph Report

Hyd. No. 2

Existing North

Hydrograph type	= SCS Runoff	Peak discharge	= 1.295 cfs
Storm frequency	= 100 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 3,916 cuft
Drainage area	= 0.250 ac	Curve number	= 80*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 5.00 min
Total precip.	= 6.90 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.010 x 98) + (0.090 x 89) + (0.150 x 74)] / 0.250

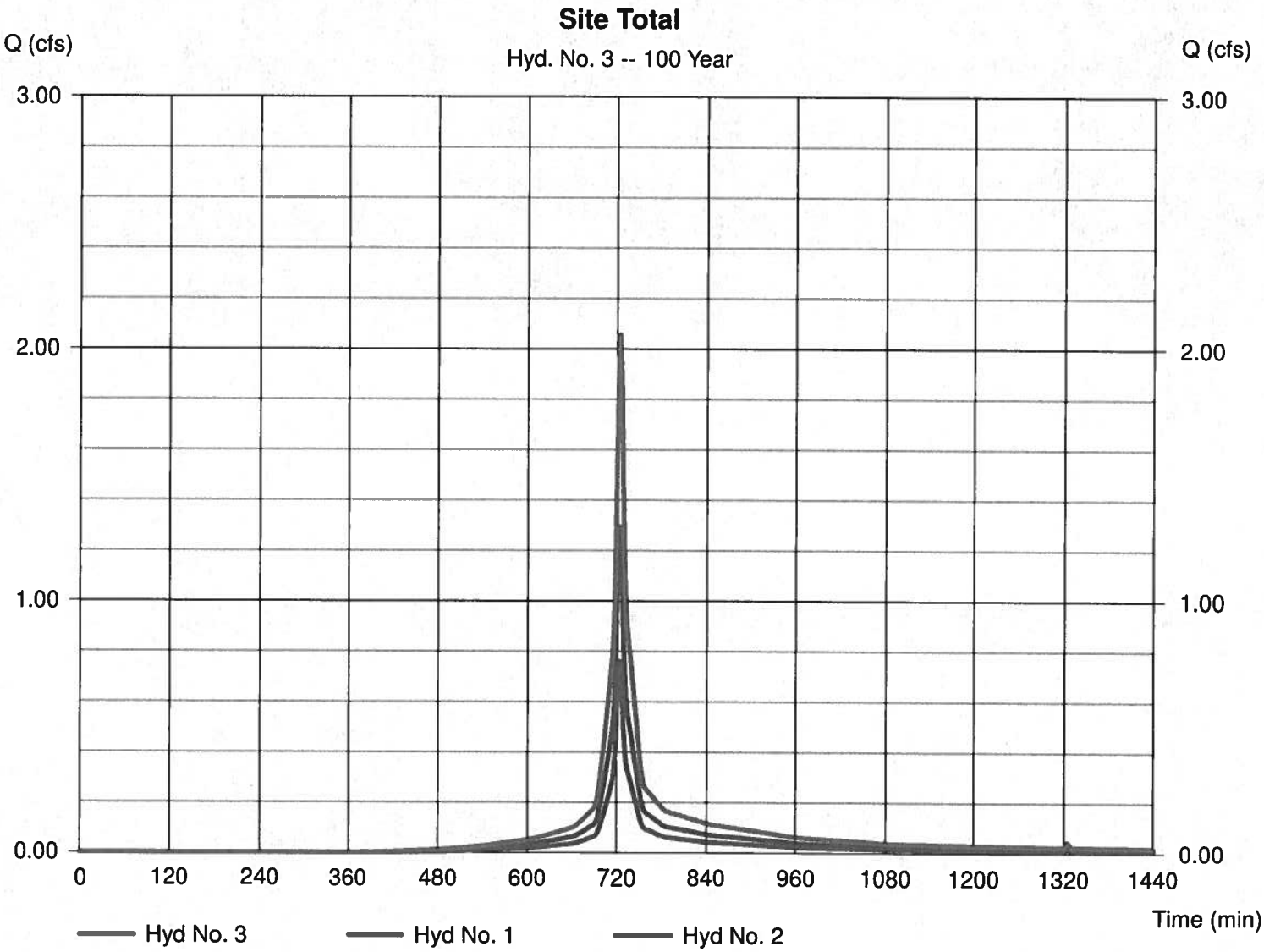


Hydrograph Report

Hyd. No. 3

Site Total

Hydrograph type	= Combine	Peak discharge	= 2.056 cfs
Storm frequency	= 100 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 6,209 cuft
Inflow hyds.	= 1, 2	Contrib. drain. area	= 0.400 ac



APPENDIX B:

HYDROLOGIC CALCULATIONS: PROPOSED CONDITIONS

BORGHESI BUILDING & ENGINEERING CO.
2155 EAST MAIN ST., TORRINGTON, CT

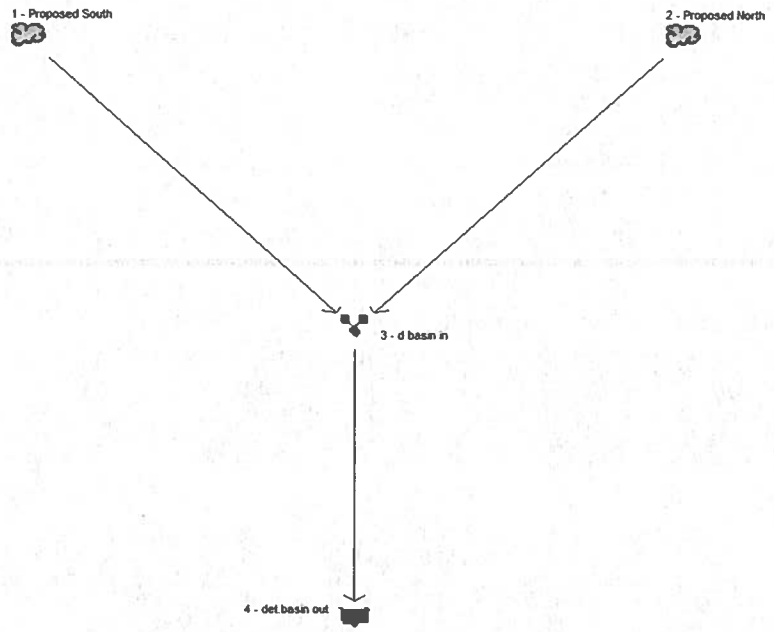
Valvoline
818 Sullivan Ave., South Windsor, CT

RUNOFF CURVE NUMBERS

LINE	AREA DESCRIPTION	AREA (ACRE)	C	CA	HSG	TC (MIN)
EXISTING SOUTH	PAVED, BLDG.	0.01	98	1	C	
	GRASS	0.11	74	8	C	
	GRAVEL	0.03	89	3	C	
	TOTAL	0.15	78.6	12		5
EXISTING NORTH	PAVED, BLDG.	0.01	98	1	C	
	GRASS	0.15	74	11	C	
	GRAVEL	0.09	89	8	C	
	TOTAL	0.25	80.4	20		5
PROPOSED SOUTH	PAVED, BLDG.	0.13	98	13	C	
	GRASS	0.12	74	9	C	
	GRAVEL	0.00	89	0	C	
	TOTAL	0.25	86.5	22		5
PROPOSED NORTH	PAVED, BLDG.	0.12	98	12	C	
	GRASS	0.03	74	2	C	
	GRAVEL	0.00	89	0	C	
	TOTAL	0.15	93.2	14		5

Watershed Model Schematic

Hydraflow Hydrographs by Intelisolve v9.1



Legend

Hyd.	Origin	Description
1	SCS Runoff	Proposed South
2	SCS Runoff	Proposed North
3	Combine	d basin in
4	Reservoir	det.basin out

Hydrograph Return Period Recap

Hydraflow Hydrographs by Intelisolve v9.1

Hyd. No.	Hydrograph type (origin)	Inflow Hyd(s)	Peak Outflow (cfs)								Hydrograph description
			1-Yr	2-Yr	3-Yr	5-Yr	10-Yr	25-Yr	50-Yr	100-Yr	
1	SCS Runoff	-------	-------	0.522	-------	-------	0.895	1.096	1.271	1.446	Proposed South
2	SCS Runoff	-------	-------	0.403	-------	-------	0.626	0.743	0.846	0.948	Proposed North
3	Combine	1, 2	-------	0.925	-------	-------	1.521	1.839	2.117	2.394	d basin in
4	Reservoir	3	-------	0.457	-------	-------	0.570	0.605	0.630	0.653	det.basin out

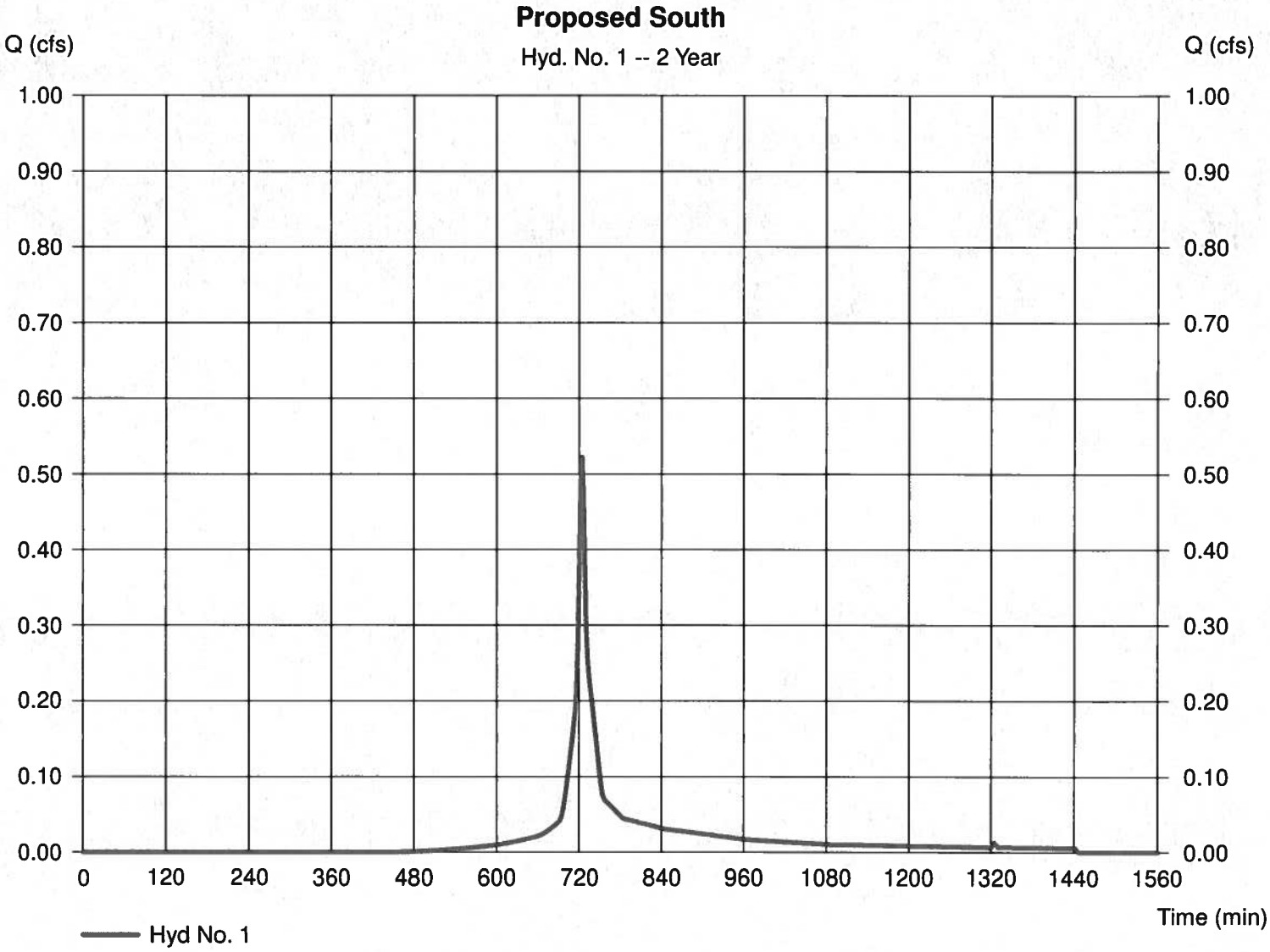
Hydrograph Report

Hyd. No. 1

Proposed South

Hydrograph type	= SCS Runoff	Peak discharge	= 0.522 cfs
Storm frequency	= 2 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 1,561 cuft
Drainage area	= 0.250 ac	Curve number	= 86*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 5.00 min
Total precip.	= 3.20 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.130 x 98) + (0.120 x 74)] / 0.250



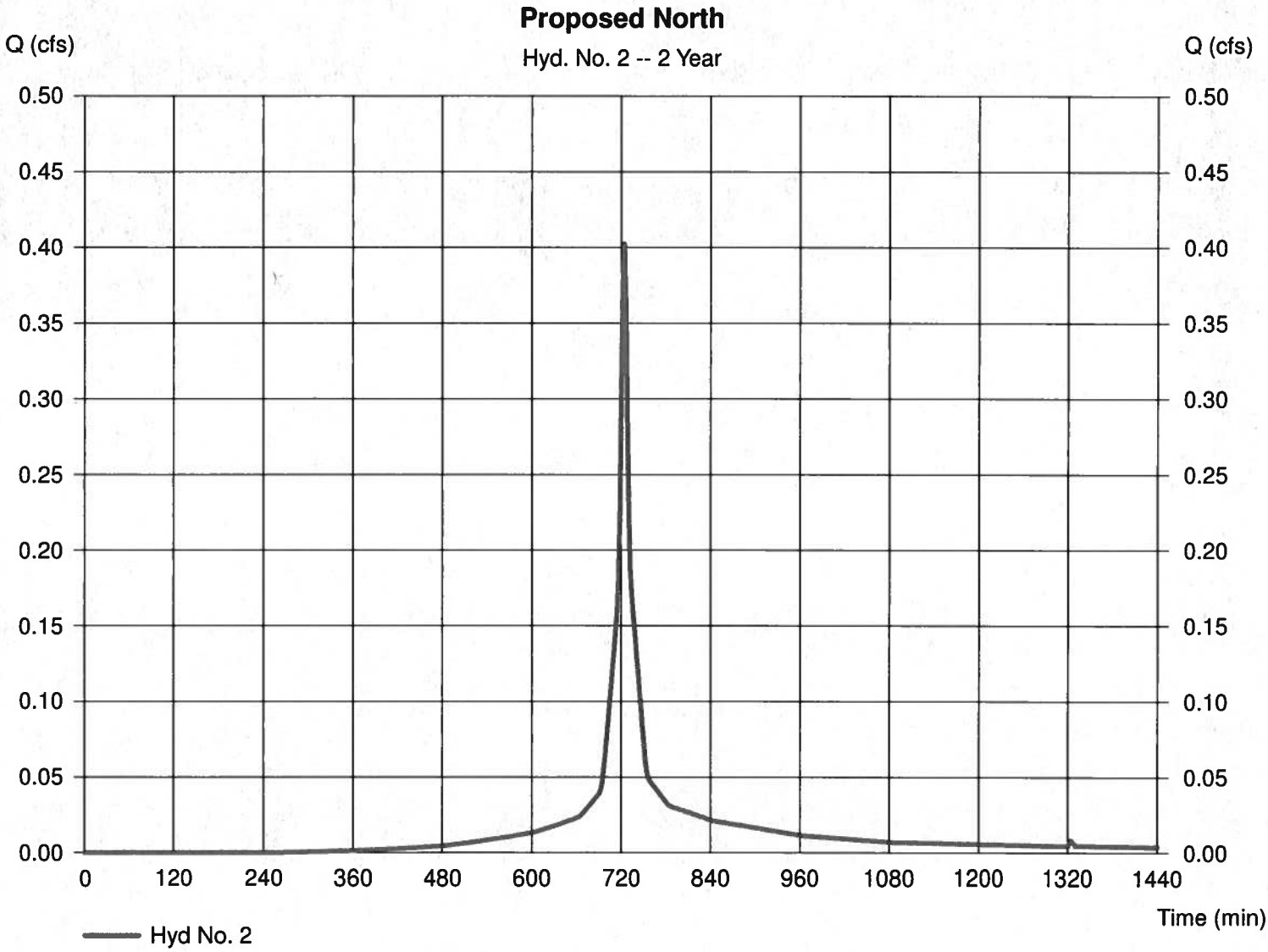
Hydrograph Report

Hyd. No. 2

Proposed North

Hydrograph type	= SCS Runoff	Peak discharge	= 0.403 cfs
Storm frequency	= 2 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 1,248 cuft
Drainage area	= 0.150 ac	Curve number	= 93*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 5.00 min
Total precip.	= 3.20 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.120 x 98) + (0.030 x 74)] / 0.150

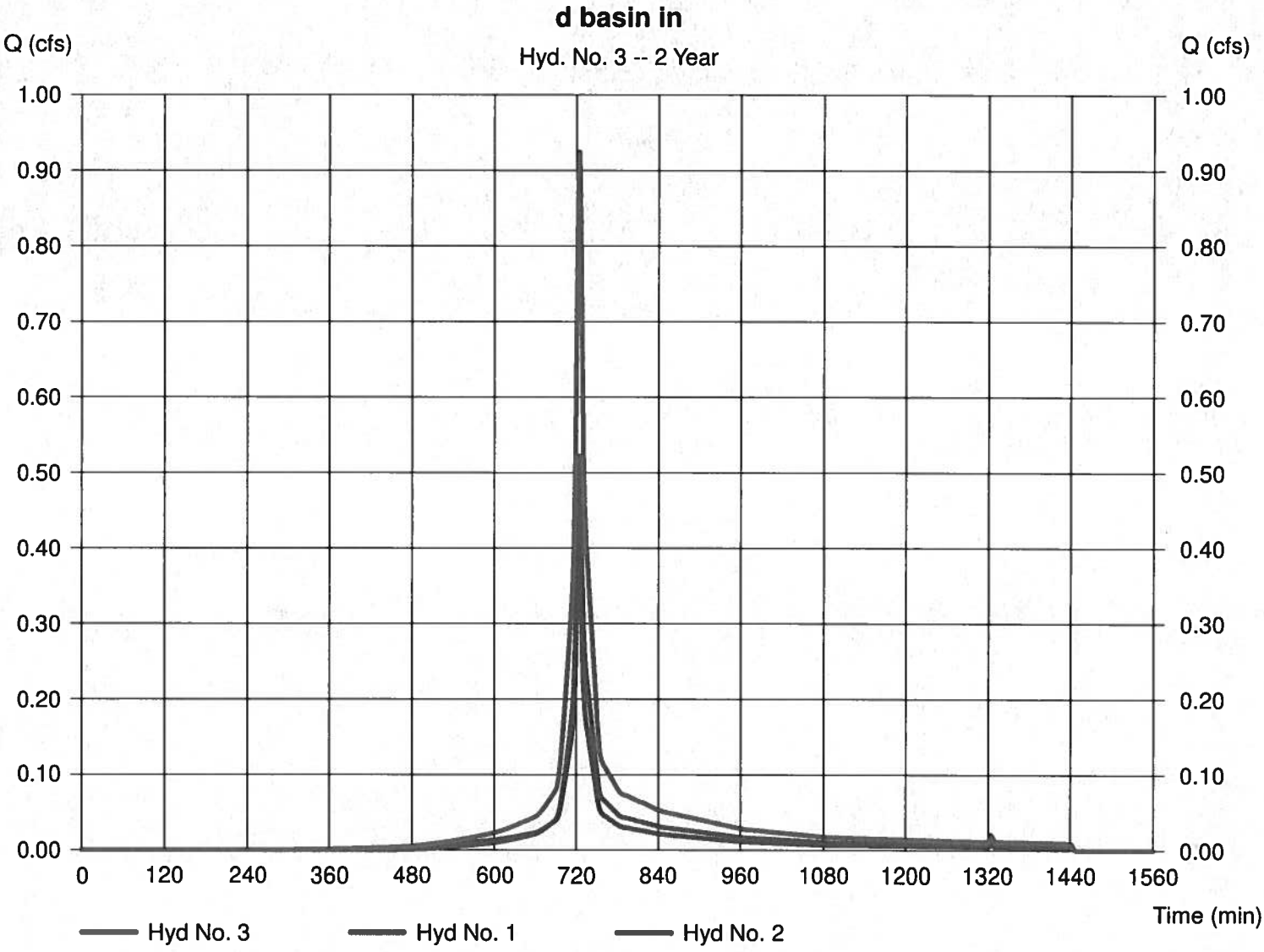


Hydrograph Report

Hyd. No. 3

d basin in

Hydrograph type	= Combine	Peak discharge	= 0.925 cfs
Storm frequency	= 2 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 2,810 cuft
Inflow hyds.	= 1, 2	Contrib. drain. area	= 0.400 ac



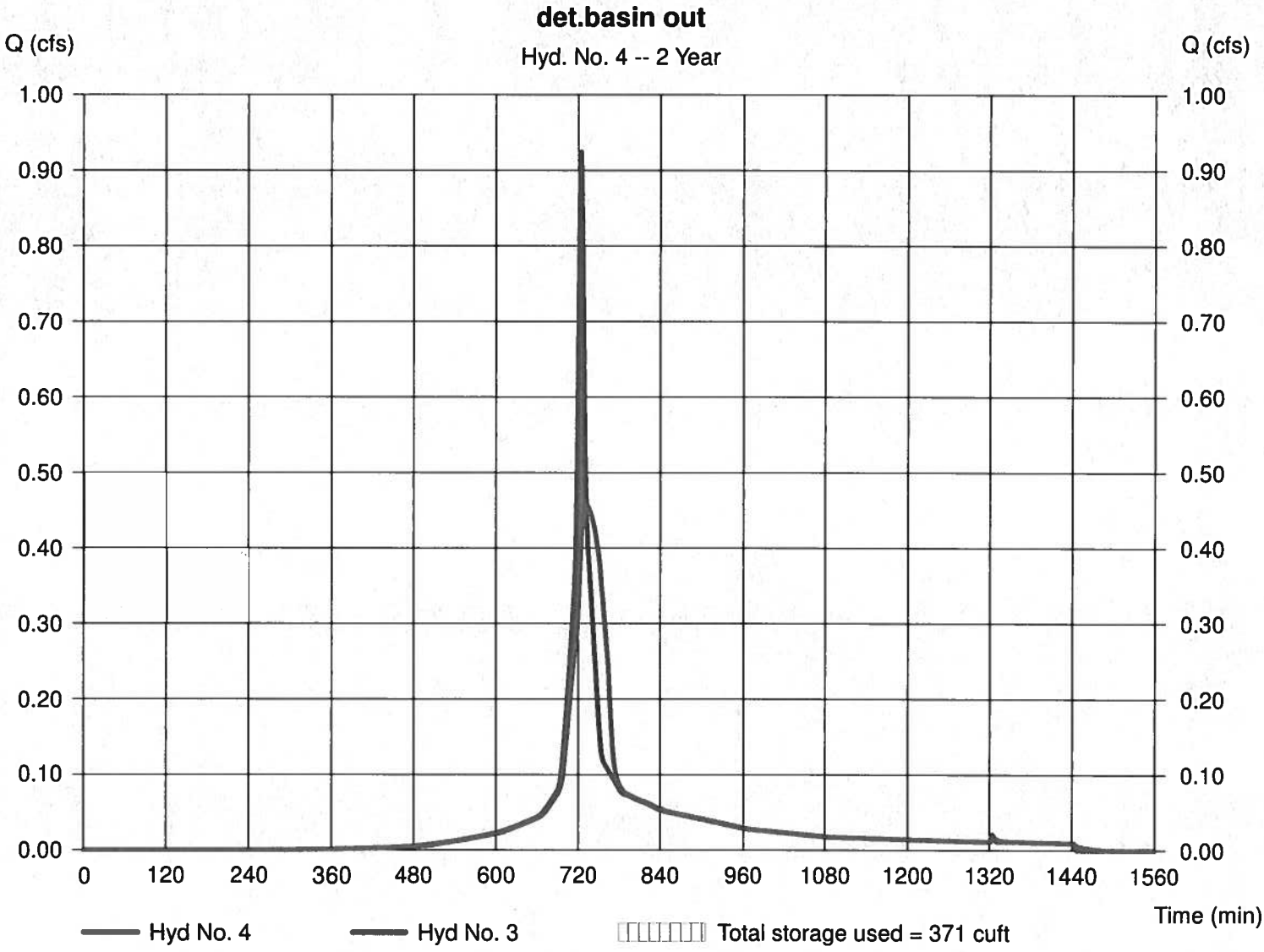
Hydrograph Report

Hyd. No. 4

det.basin out

Hydrograph type	= Reservoir	Peak discharge	= 0.457 cfs
Storm frequency	= 2 yrs	Time to peak	= 732 min
Time interval	= 2 min	Hyd. volume	= 2,809 cuft
Inflow hyd. No.	= 3 - d basin in	Max. Elevation	= 83.35 ft
Reservoir name	= <New Pond>	Max. Storage	= 371 cuft

Storage Indication method used.



Pond Report

Hydraflow Hydrographs by Intelisolve v9.1 — Tuesday, Aug 11, 2020

Pond No. 1 - <New Pond>

Pond Data

Contours - User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 82.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	82.00	70	0	0
0.50	82.50	220	69	69
1.00	83.00	370	146	215
1.50	83.50	530	224	439
2.00	84.00	700	306	745
2.50	84.50	1,025	429	1,174
3.00	85.00	1,350	592	1,766
3.50	85.50	1,675	755	2,520

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 4.00	0.00	0.00	0.00
Span (in)	= 4.00	0.00	0.00	0.00
No. Barrels	= 1	0	0	0
Invert El. (ft)	= 82.00	0.00	0.00	0.00
Length (ft)	= 20.00	0.00	0.00	0.00
Slope (%)	= 5.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

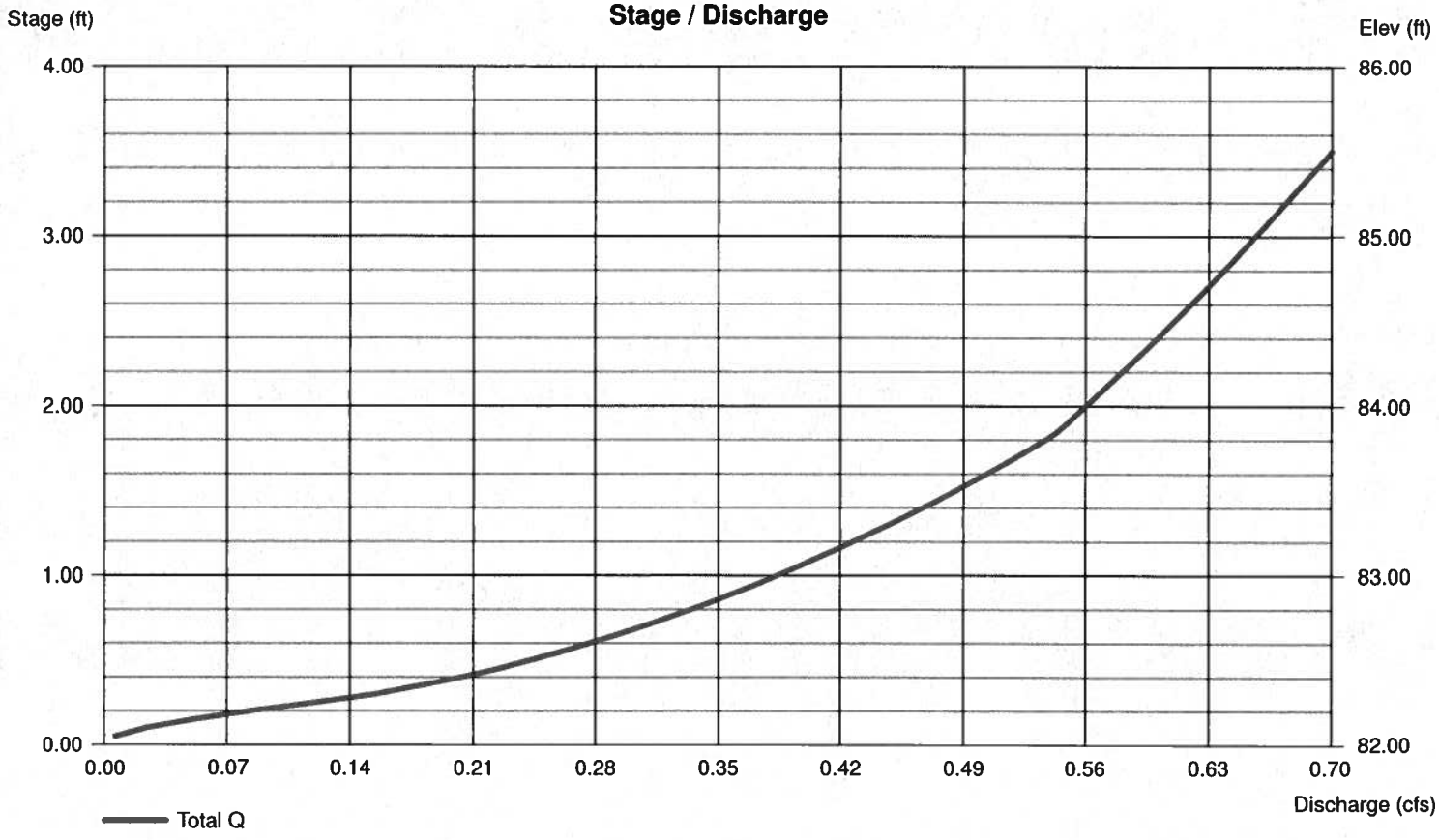
Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 0.00	0.00	0.00	0.00
Crest El. (ft)	= 0.00	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= ---	---	---	---
Multi-Stage	= No	No	No	No

Exfil.(in/hr) = 0.000 (by Contour)

TW Elev. (ft) = 0.00

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



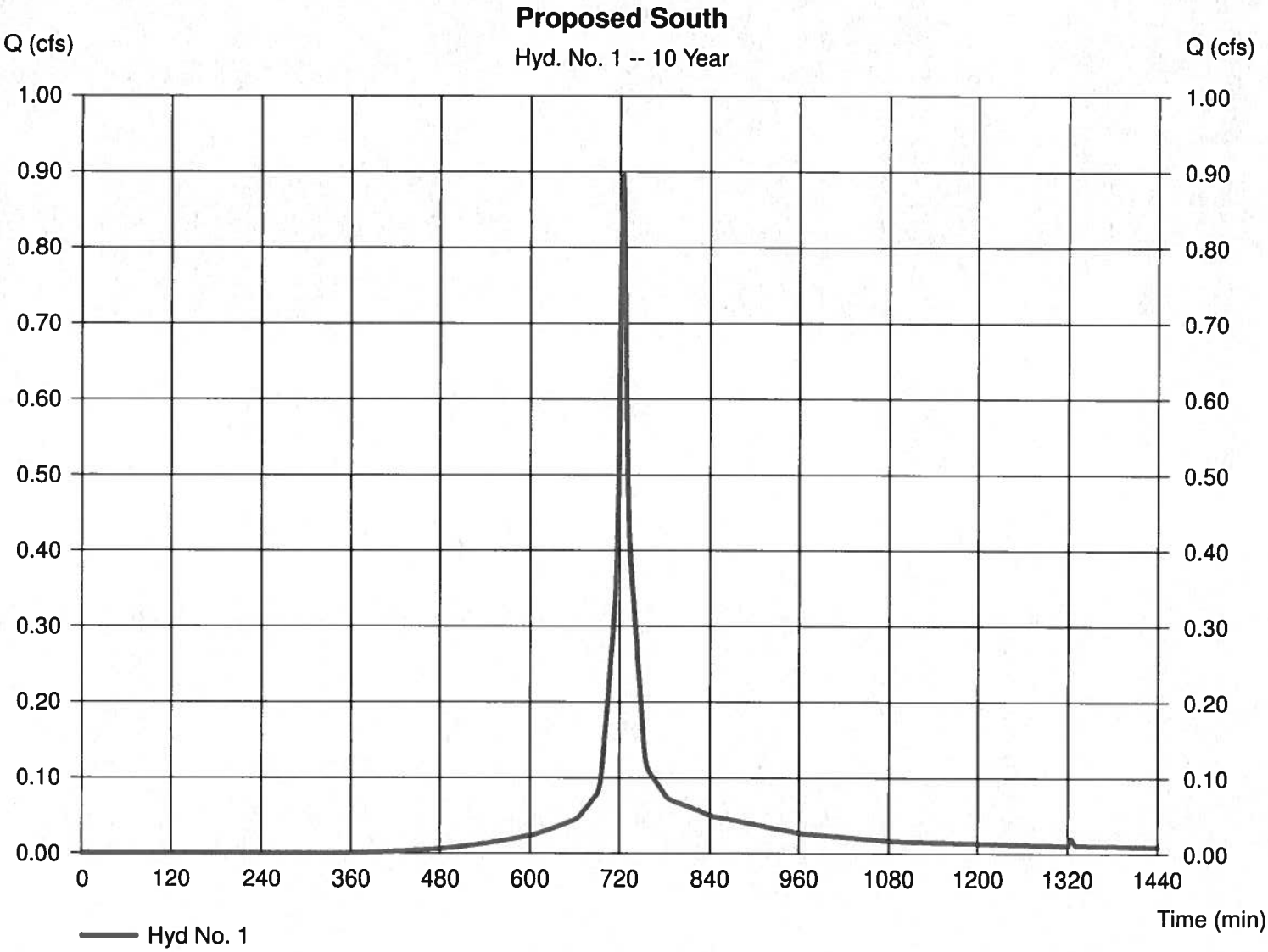
Hydrograph Report

Hyd. No. 1

Proposed South

Hydrograph type	= SCS Runoff	Peak discharge	= 0.895 cfs
Storm frequency	= 10 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 2,712 cuft
Drainage area	= 0.250 ac	Curve number	= 86*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 5.00 min
Total precip.	= 4.70 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.130 x 98) + (0.120 x 74)] / 0.250



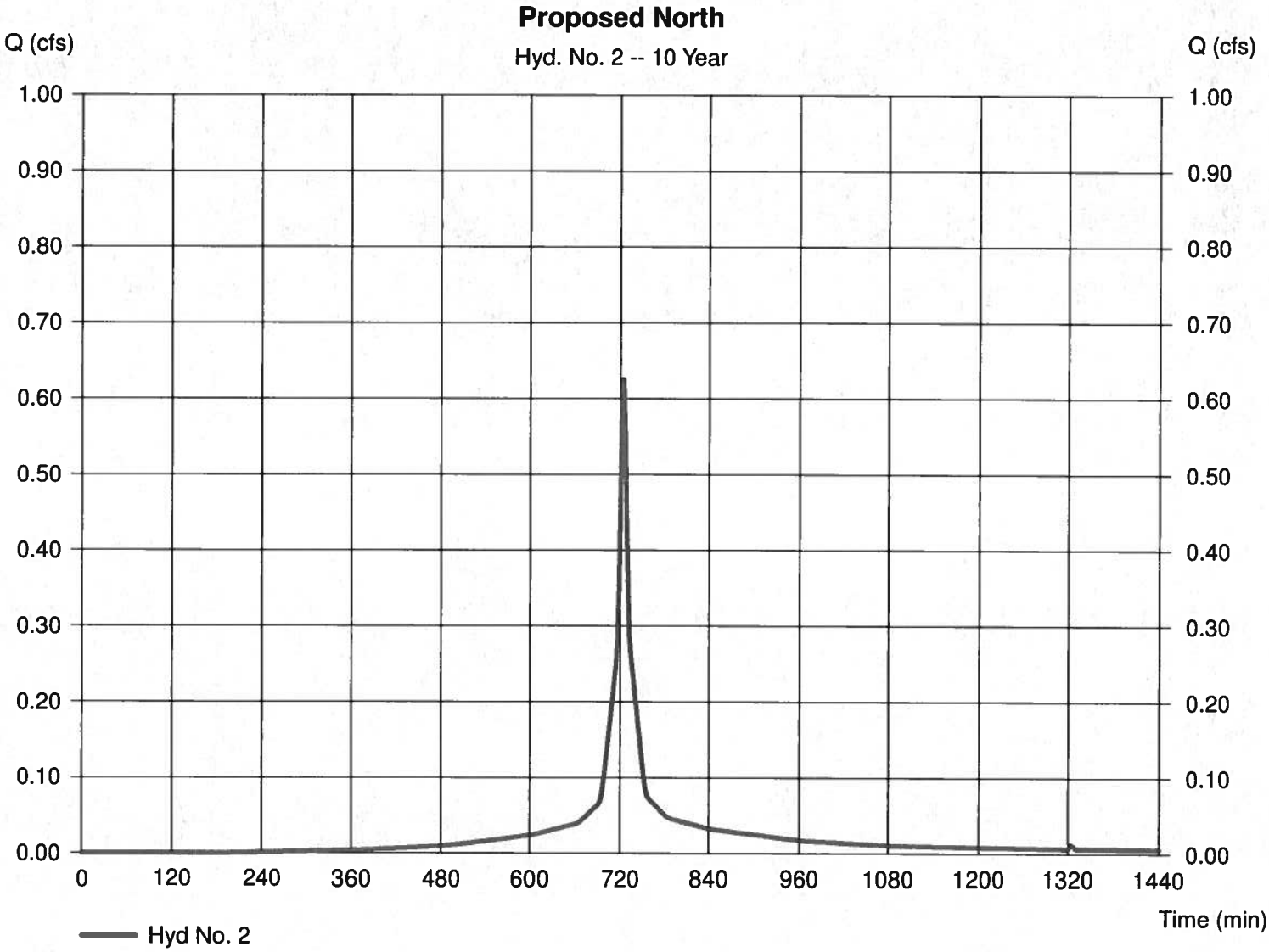
Hydrograph Report

Hyd. No. 2

Proposed North

Hydrograph type	= SCS Runoff	Peak discharge	= 0.626 cfs
Storm frequency	= 10 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 1,993 cuft
Drainage area	= 0.150 ac	Curve number	= 93*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 5.00 min
Total precip.	= 4.70 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.120 x 98) + (0.030 x 74)] / 0.150

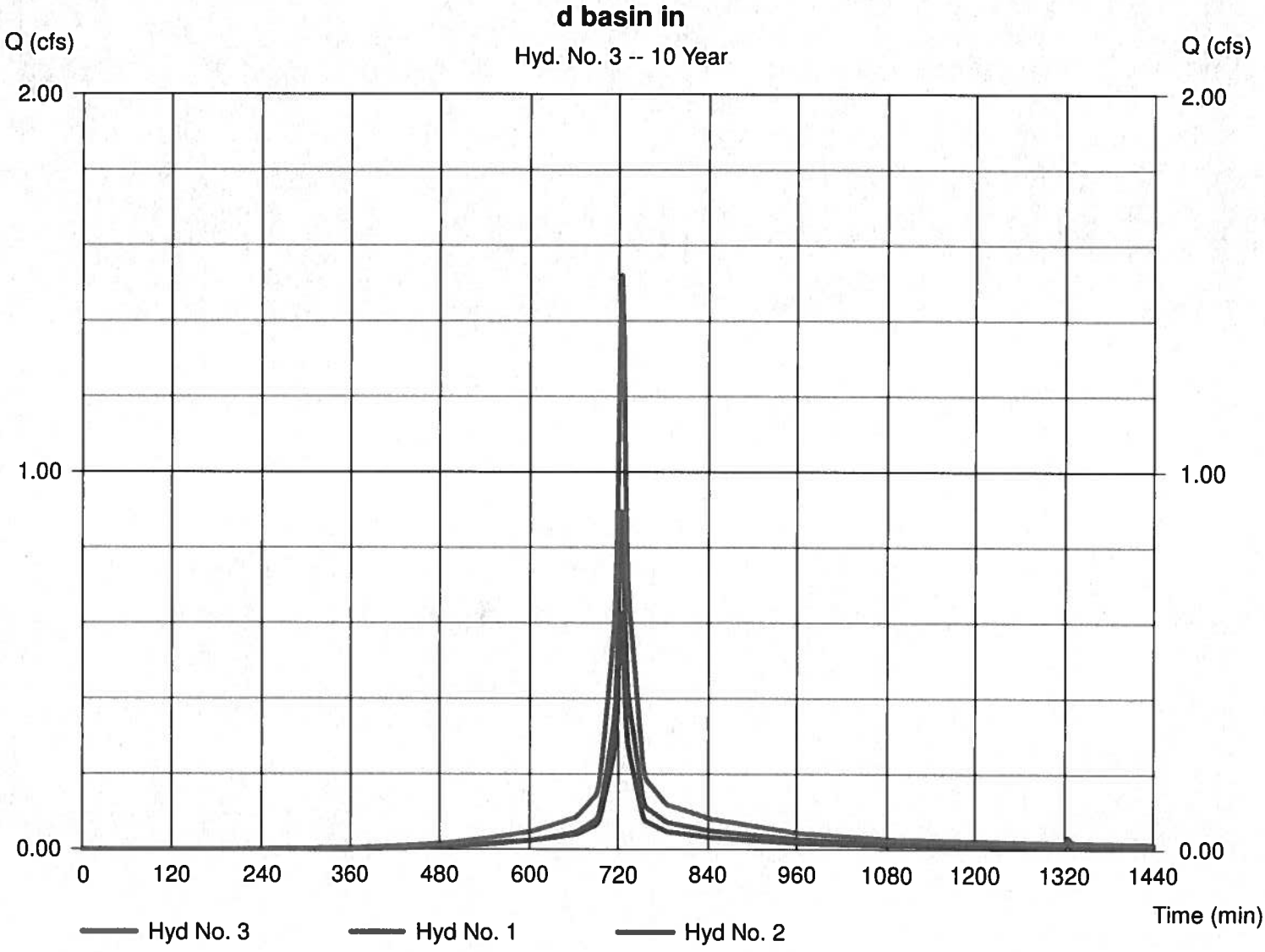


Hydrograph Report

Hyd. No. 3

d basin in

Hydrograph type	= Combine	Peak discharge	= 1.521 cfs
Storm frequency	= 10 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 4,705 cuft
Inflow hyds.	= 1, 2	Contrib. drain. area	= 0.400 ac



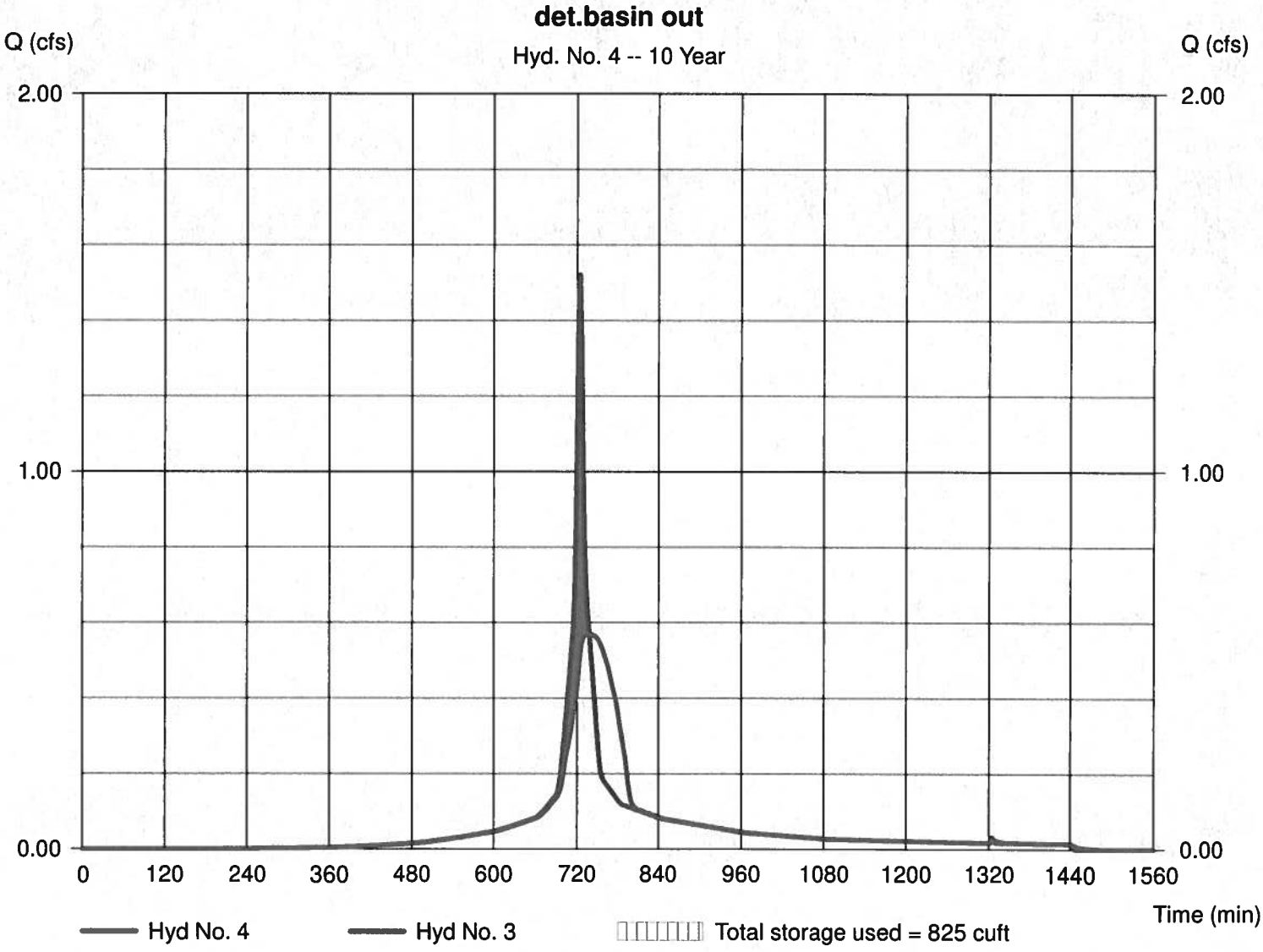
Hydrograph Report

Hyd. No. 4

det.basin out

Hydrograph type	= Reservoir	Peak discharge	= 0.570 cfs
Storm frequency	= 10 yrs	Time to peak	= 738 min
Time interval	= 2 min	Hyd. volume	= 4,704 cuft
Inflow hyd. No.	= 3 - d basin in	Max. Elevation	= 84.09 ft
Reservoir name	= <New Pond>	Max. Storage	= 825 cuft

Storage Indication method used.



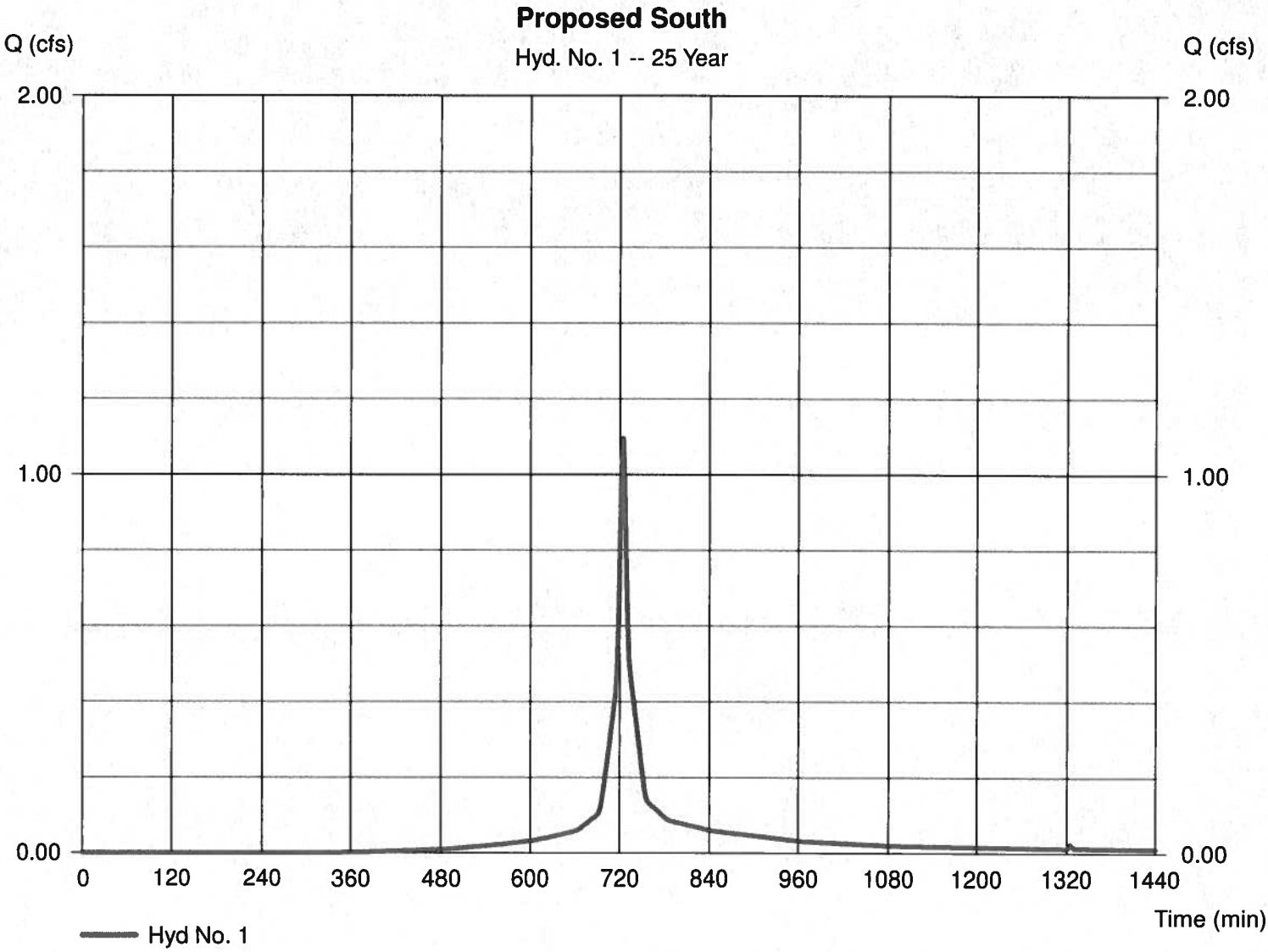
Hydrograph Report

Hyd. No. 1

Proposed South

Hydrograph type	= SCS Runoff	Peak discharge	= 1.096 cfs
Storm frequency	= 25 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 3,349 cuft
Drainage area	= 0.250 ac	Curve number	= 86*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 5.00 min
Total precip.	= 5.50 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.130 x 98) + (0.120 x 74)] / 0.250



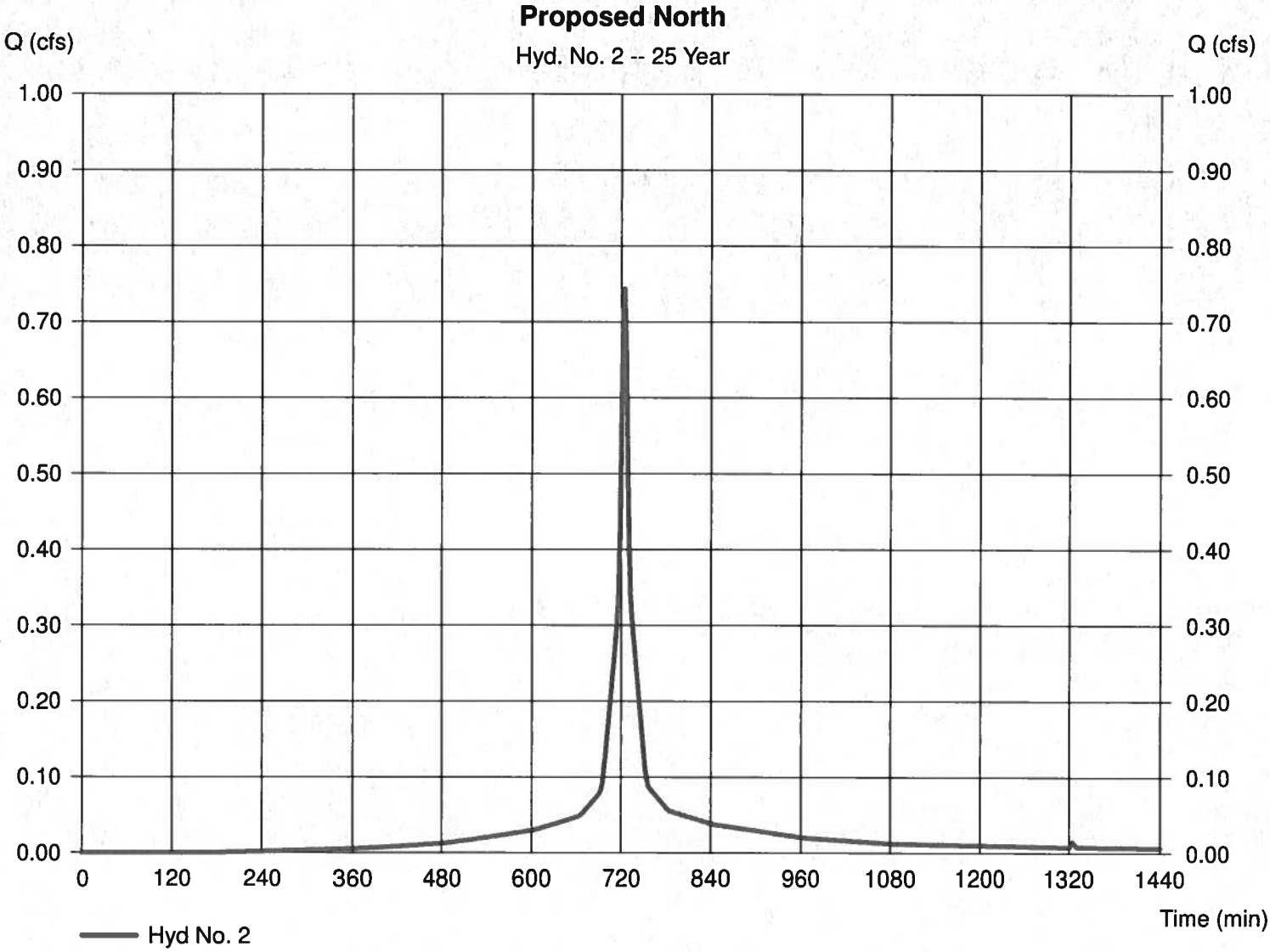
Hydrograph Report

Hyd. No. 2

Proposed North

Hydrograph type	= SCS Runoff	Peak discharge	= 0.743 cfs
Storm frequency	= 25 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 2,394 cuft
Drainage area	= 0.150 ac	Curve number	= 93*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 5.00 min
Total precip.	= 5.50 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.120 x 98) + (0.030 x 74)] / 0.150

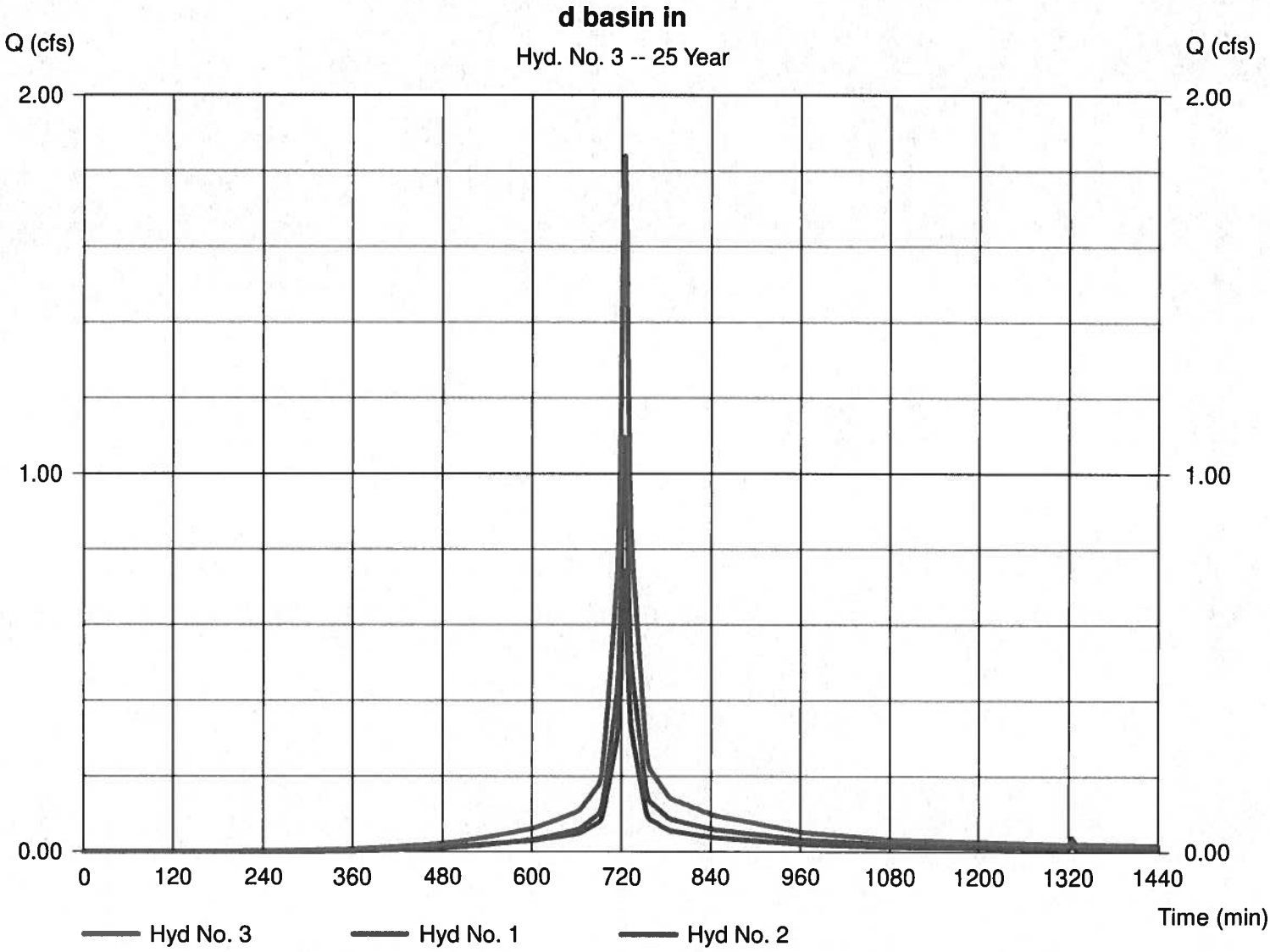


Hydrograph Report

Hyd. No. 3

d basin in

Hydrograph type	= Combine	Peak discharge	= 1.839 cfs
Storm frequency	= 25 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 5,743 cuft
Inflow hyds.	= 1, 2	Contrib. drain. area	= 0.400 ac



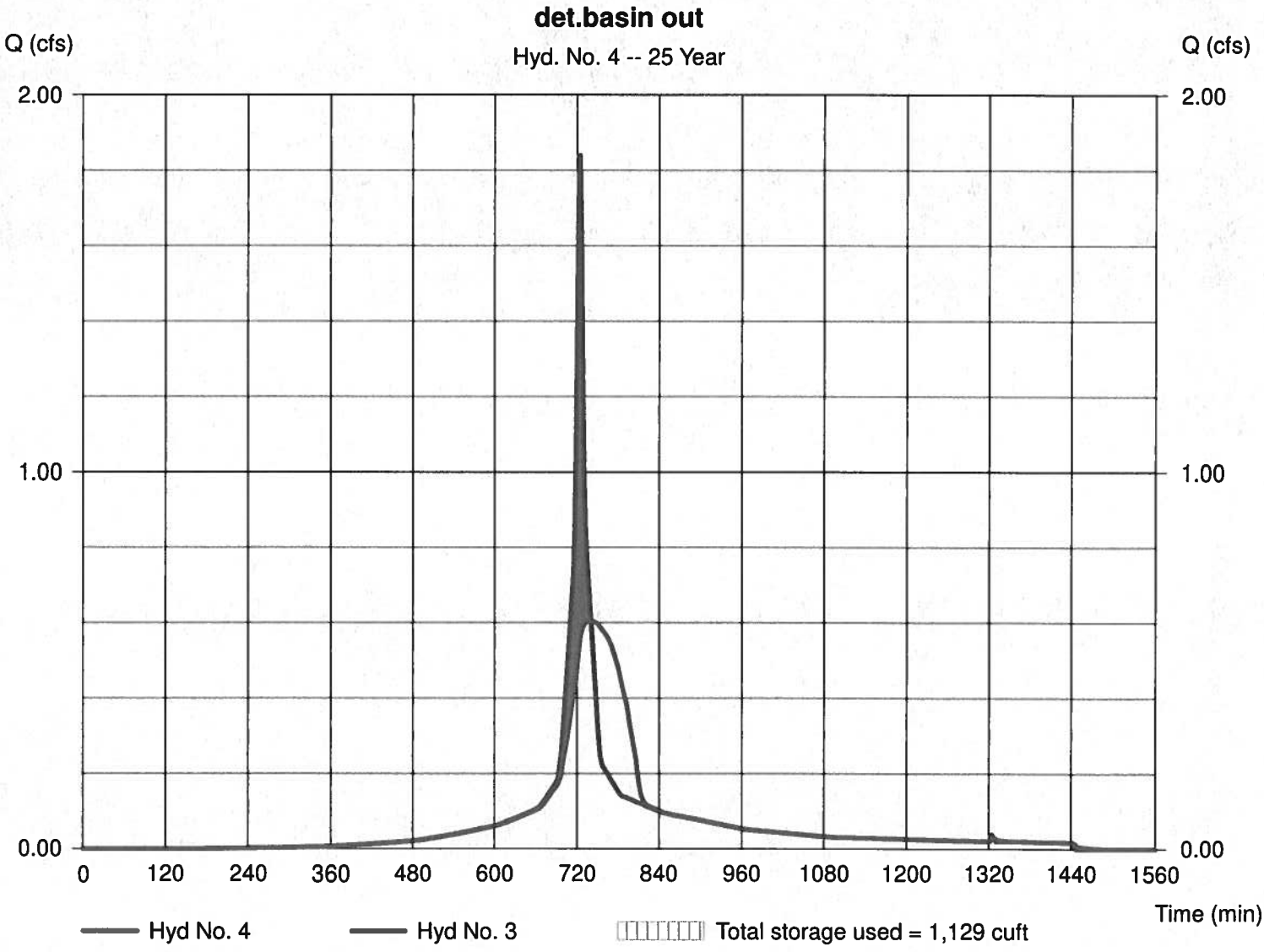
Hydrograph Report

Hyd. No. 4

det.basin out

Hydrograph type	= Reservoir	Peak discharge	= 0.605 cfs
Storm frequency	= 25 yrs	Time to peak	= 740 min
Time interval	= 2 min	Hyd. volume	= 5,742 cuft
Inflow hyd. No.	= 3 - d basin in	Max. Elevation	= 84.45 ft
Reservoir name	= <New Pond>	Max. Storage	= 1,129 cuft

Storage Indication method used.



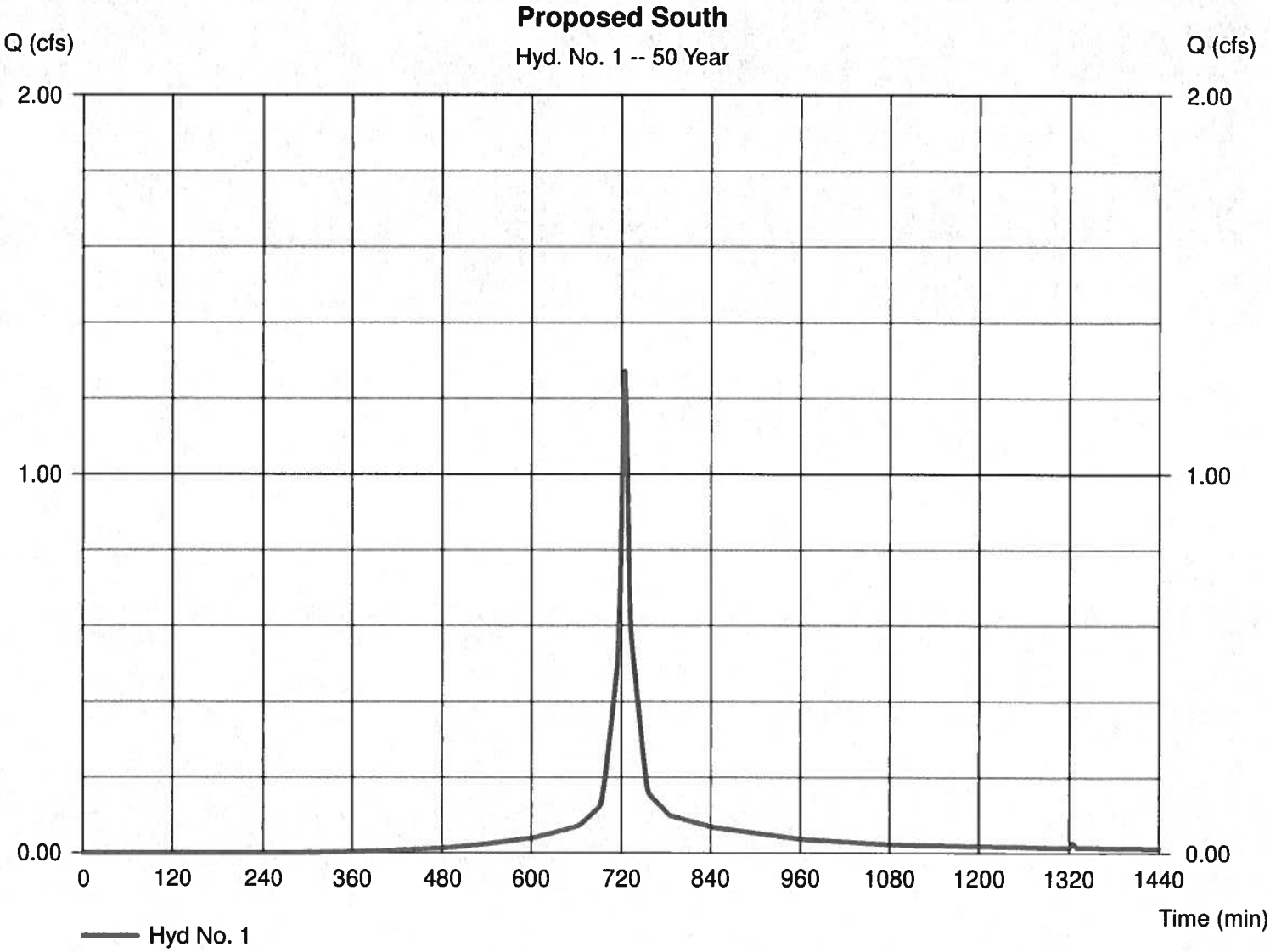
Hydrograph Report

Hyd. No. 1

Proposed South

Hydrograph type	= SCS Runoff	Peak discharge	= 1.271 cfs
Storm frequency	= 50 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 3,913 cuft
Drainage area	= 0.250 ac	Curve number	= 86*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 5.00 min
Total precip.	= 6.20 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.130 x 98) + (0.120 x 74)] / 0.250



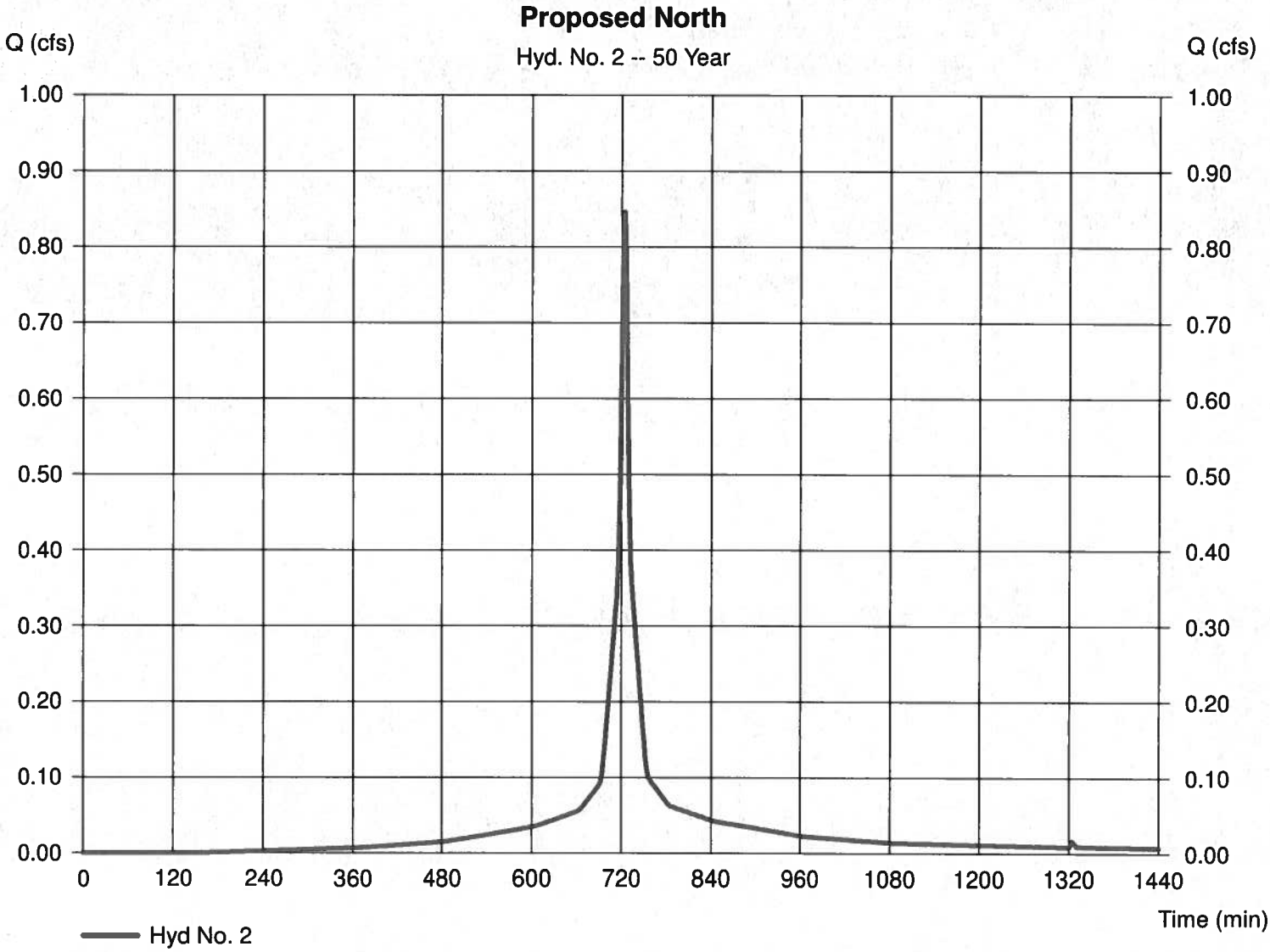
Hydrograph Report

Hyd. No. 2

Proposed North

Hydrograph type	= SCS Runoff	Peak discharge	= 0.846 cfs
Storm frequency	= 50 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 2,746 cuft
Drainage area	= 0.150 ac	Curve number	= 93*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 5.00 min
Total precip.	= 6.20 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.120 x 98) + (0.030 x 74)] / 0.150

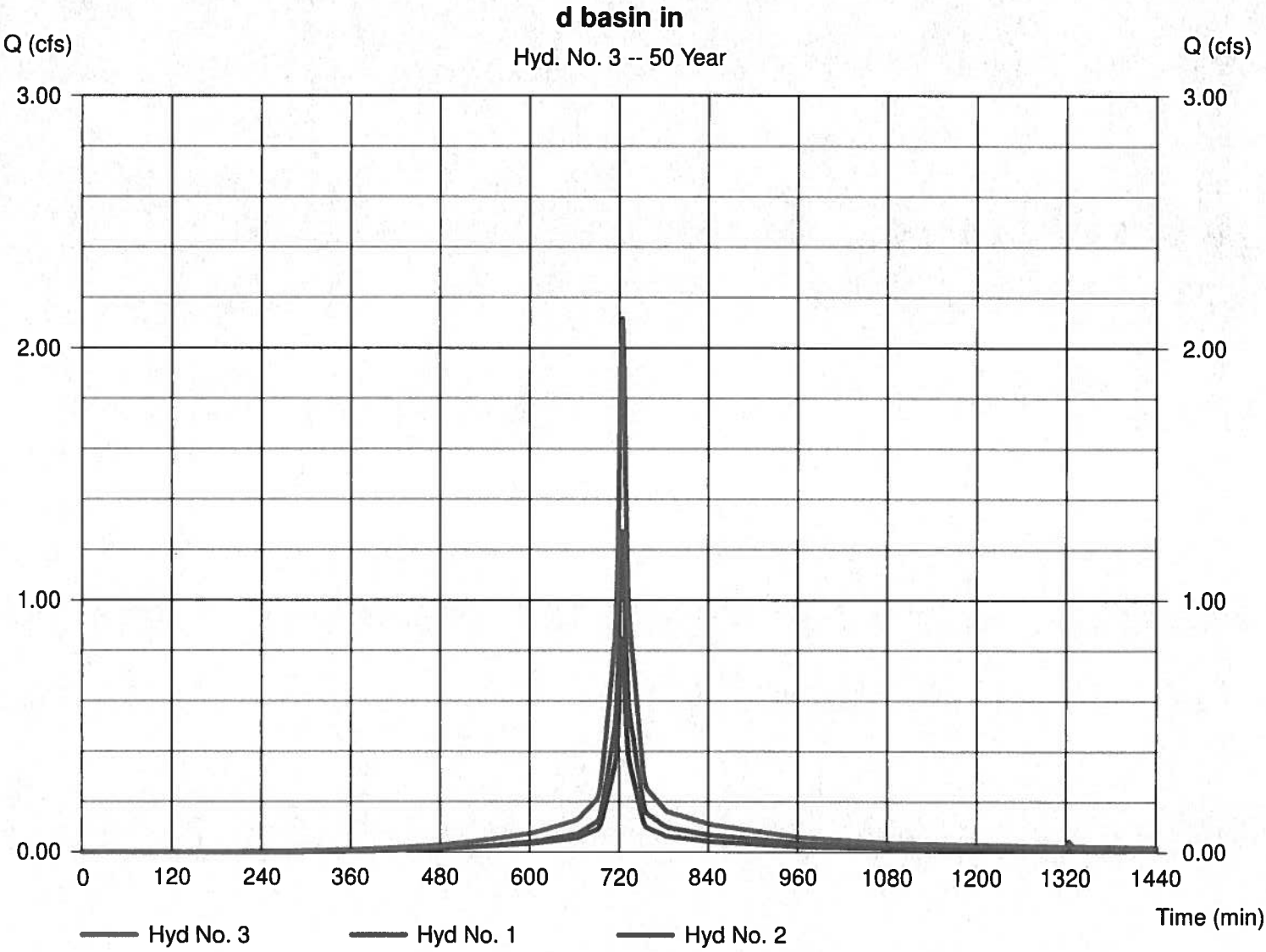


Hydrograph Report

Hyd. No. 3

d basin in

Hydrograph type	= Combine	Peak discharge	= 2.117 cfs
Storm frequency	= 50 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 6,660 cuft
Inflow hyds.	= 1, 2	Contrib. drain. area	= 0.400 ac



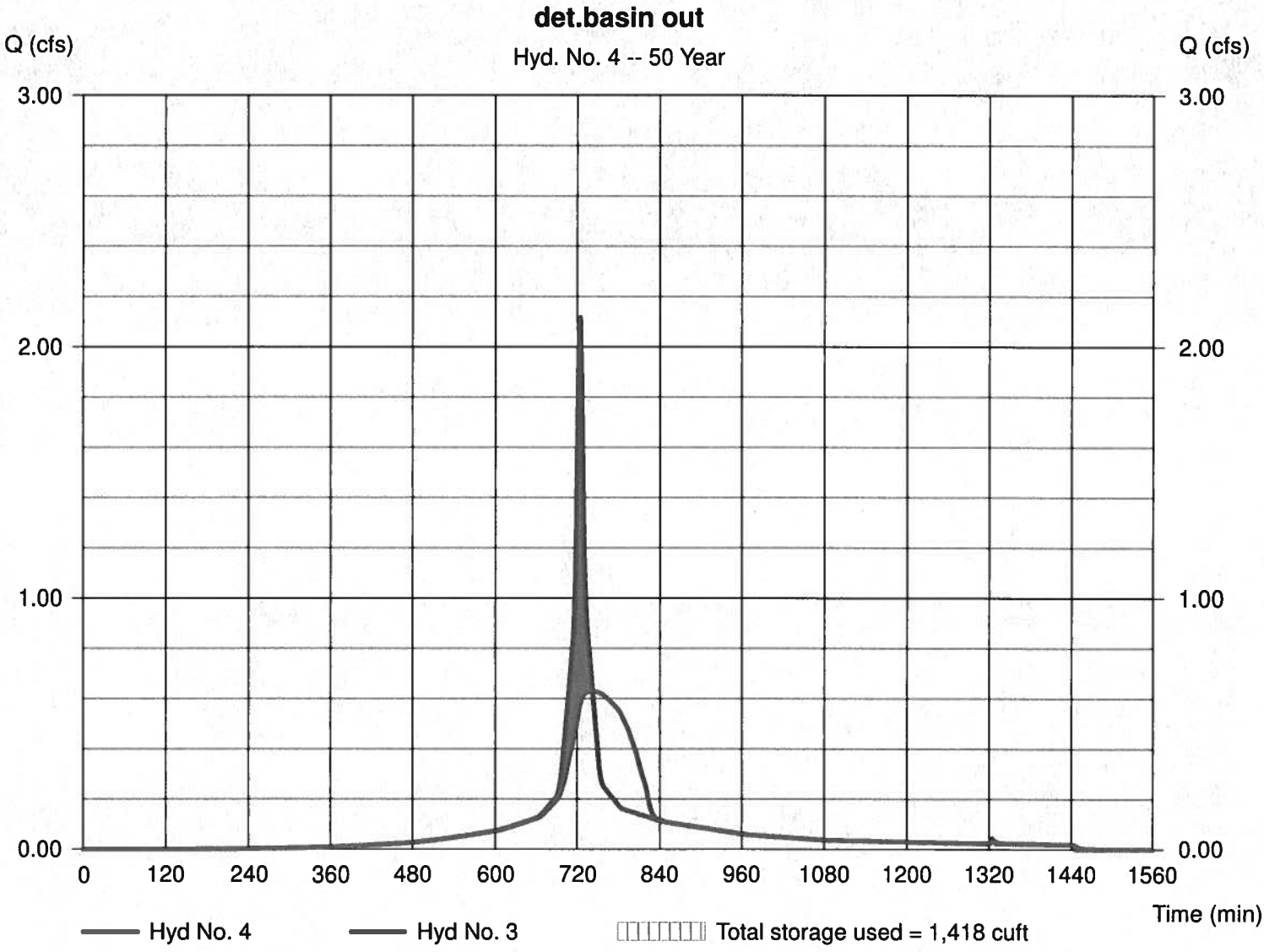
Hydrograph Report

Hyd. No. 4

det.basin out

Hydrograph type	= Reservoir	Peak discharge	= 0.630 cfs
Storm frequency	= 50 yrs	Time to peak	= 742 min
Time interval	= 2 min	Hyd. volume	= 6,659 cuft
Inflow hyd. No.	= 3 - d basin in	Max. Elevation	= 84.71 ft
Reservoir name	= <New Pond>	Max. Storage	= 1,418 cuft

Storage Indication method used.



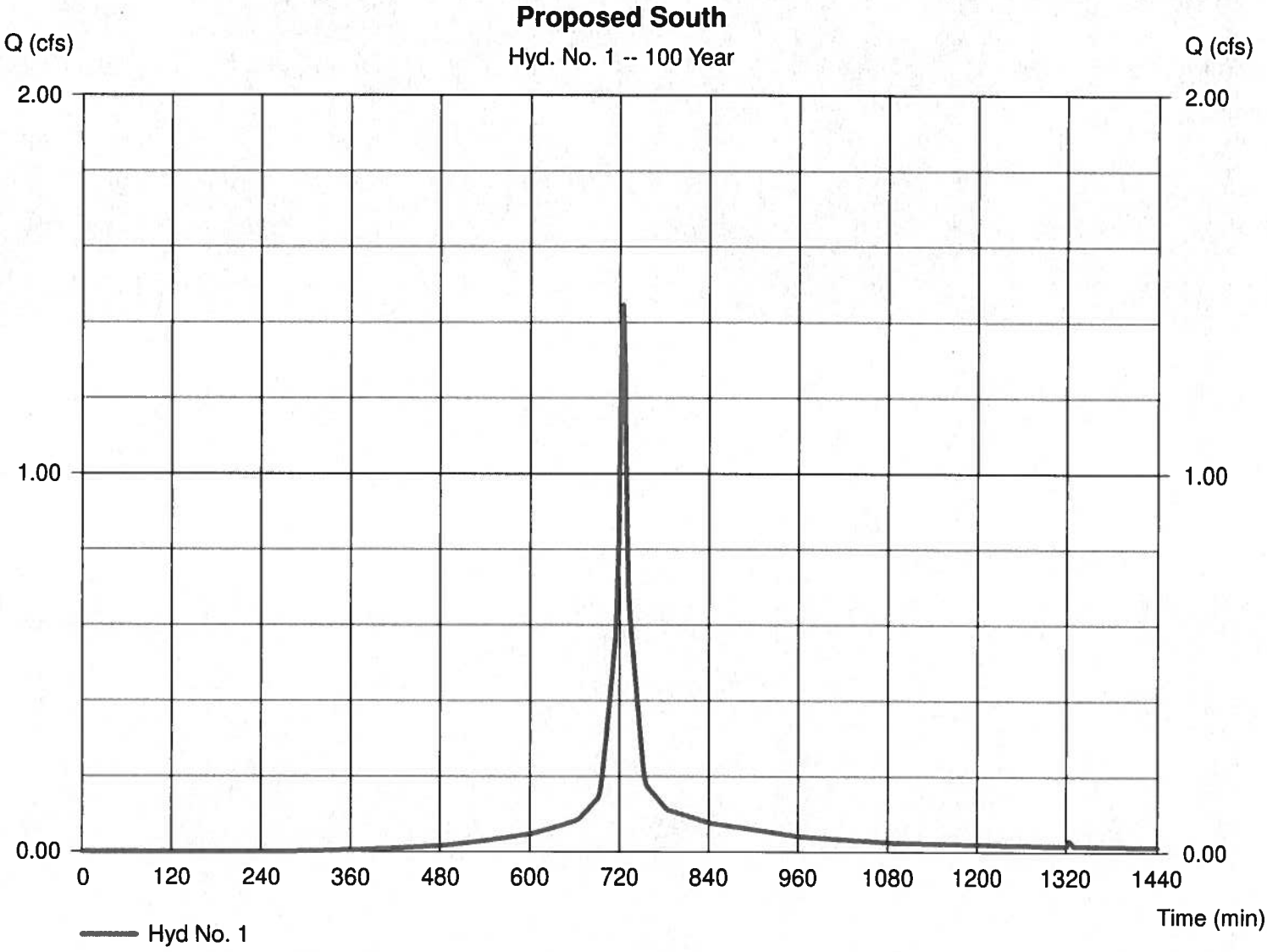
Hydrograph Report

Hyd. No. 1

Proposed South

Hydrograph type	= SCS Runoff	Peak discharge	= 1.446 cfs
Storm frequency	= 100 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 4,483 cuft
Drainage area	= 0.250 ac	Curve number	= 86*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 5.00 min
Total precip.	= 6.90 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.130 x 98) + (0.120 x 74)] / 0.250



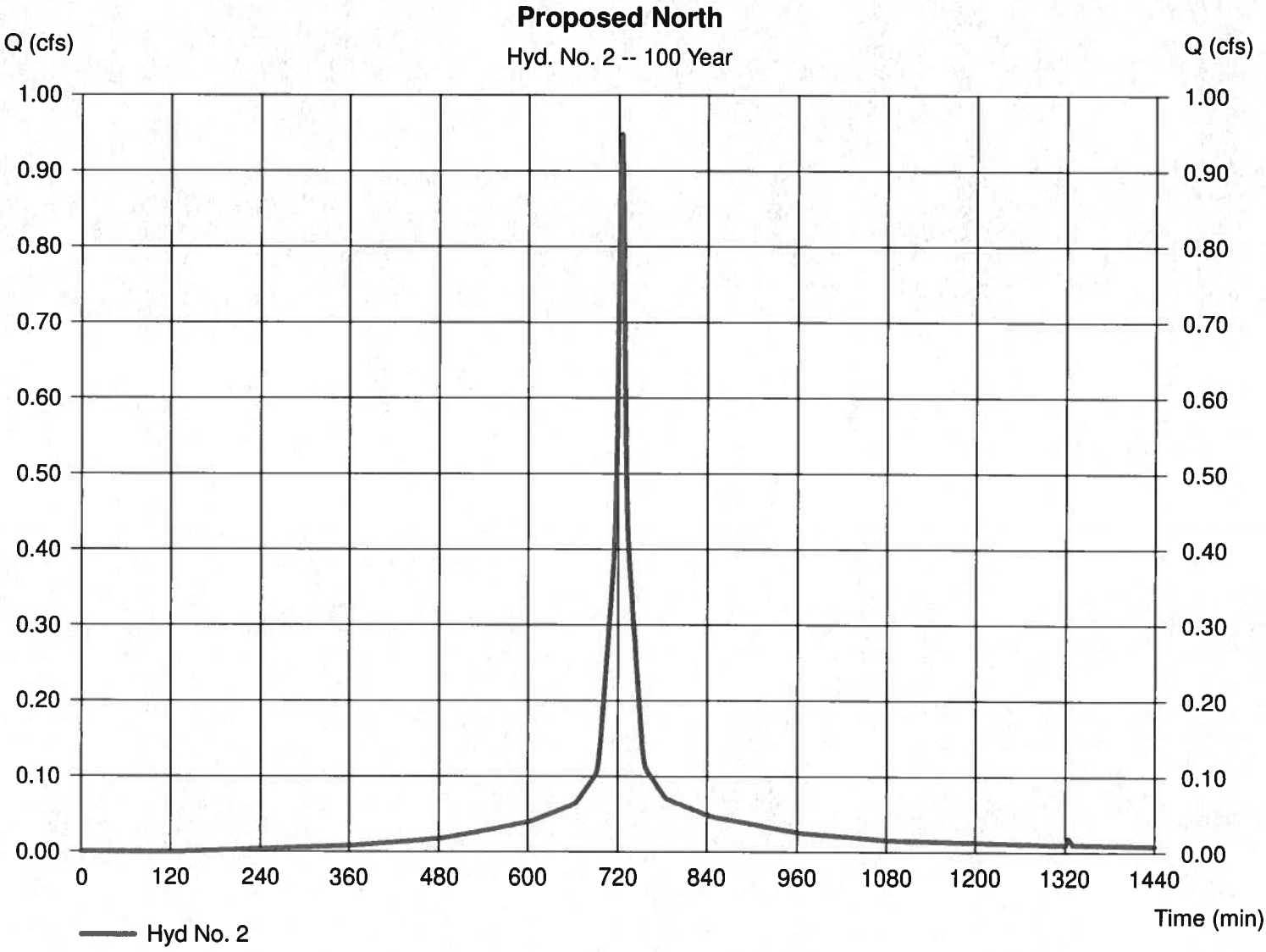
Hydrograph Report

Hyd. No. 2

Proposed North

Hydrograph type	= SCS Runoff	Peak discharge	= 0.948 cfs
Storm frequency	= 100 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 3,100 cuft
Drainage area	= 0.150 ac	Curve number	= 93*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 5.00 min
Total precip.	= 6.90 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.120 x 98) + (0.030 x 74)] / 0.150

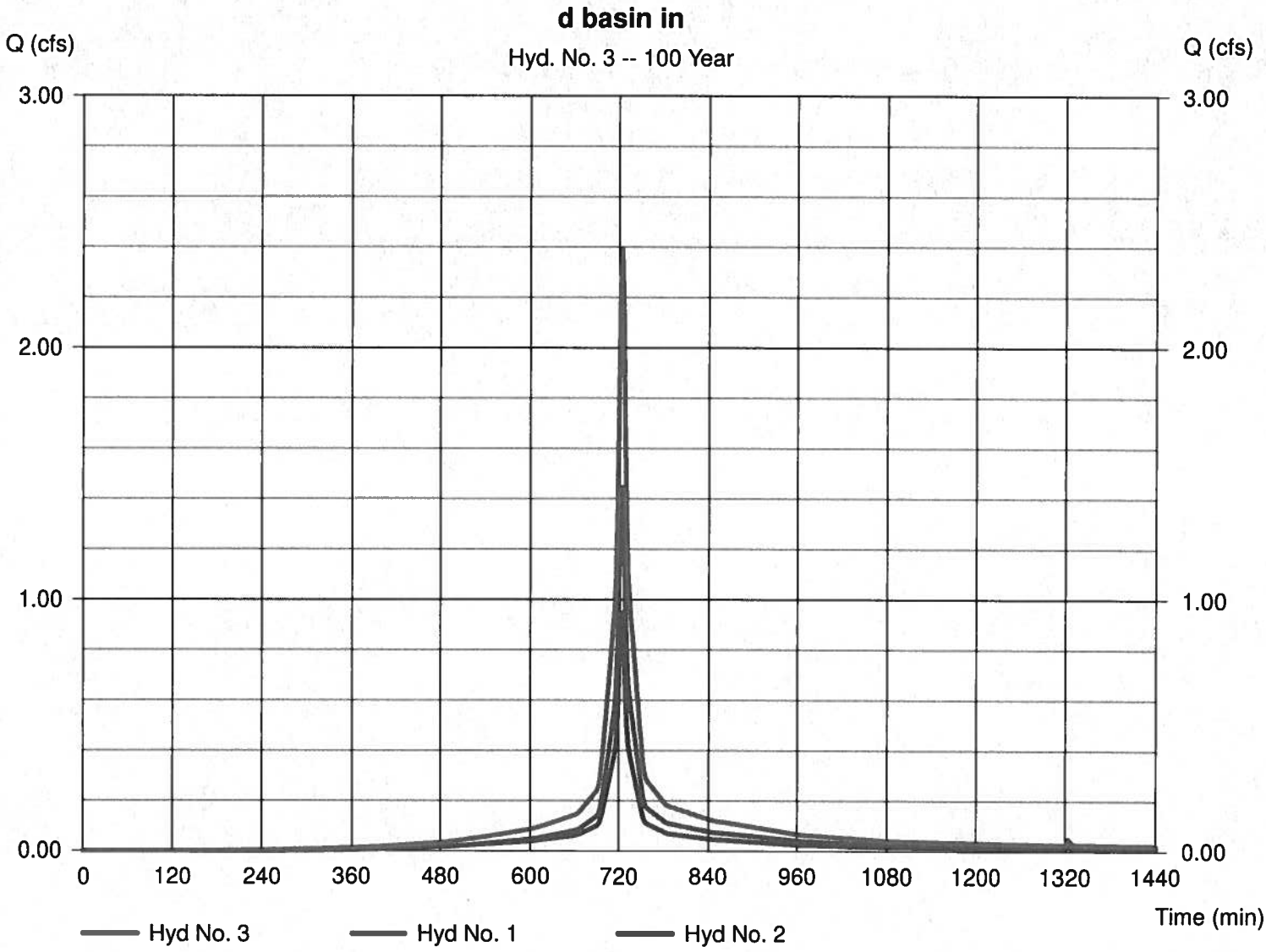


Hydrograph Report

Hyd. No. 3

d basin in

Hydrograph type	= Combine	Peak discharge	= 2.394 cfs
Storm frequency	= 100 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 7,583 cuft
Inflow hyds.	= 1, 2	Contrib. drain. area	= 0.400 ac



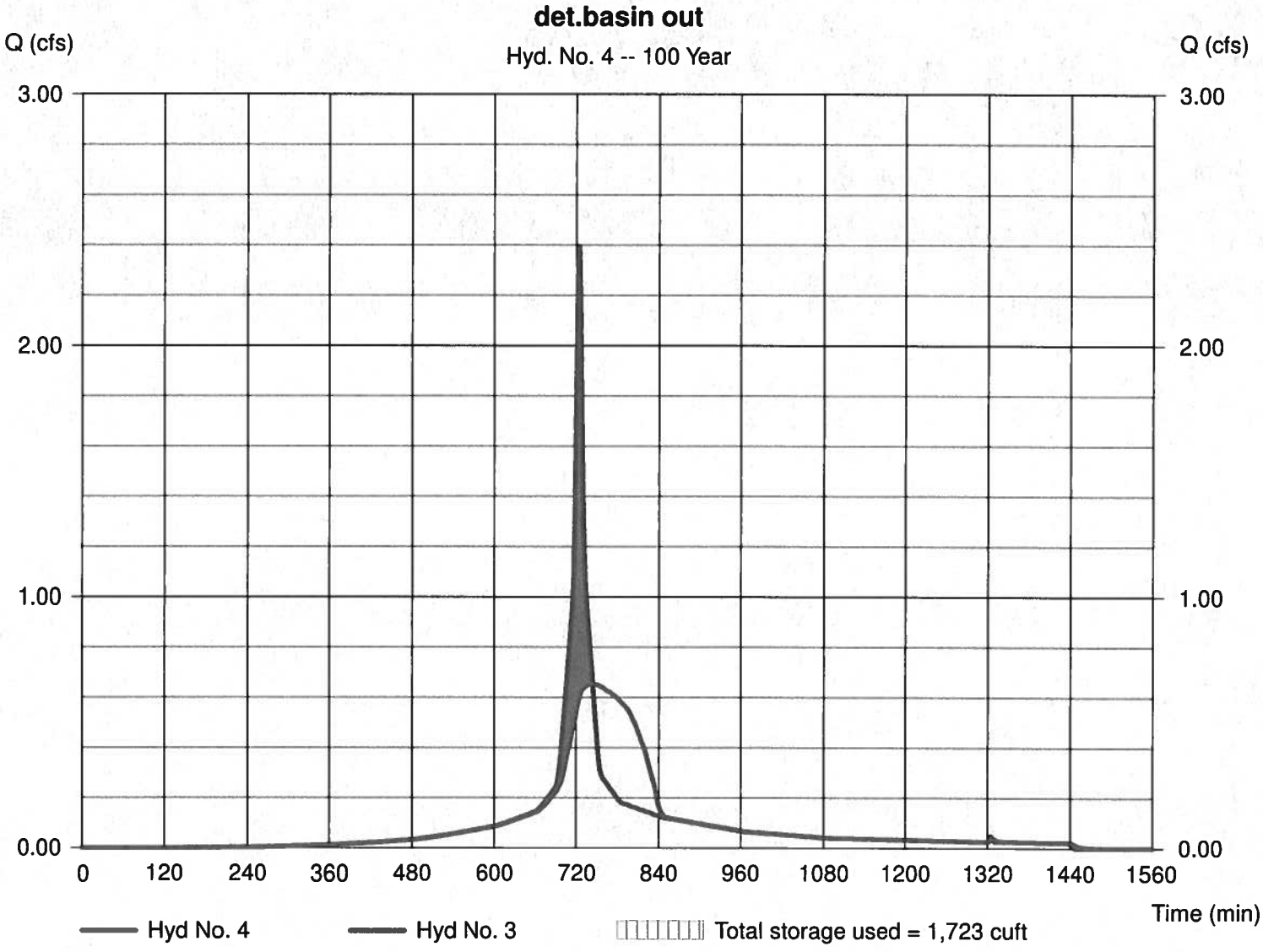
Hydrograph Report

Hyd. No. 4

det.basin out

Hydrograph type	= Reservoir	Peak discharge	= 0.653 cfs
Storm frequency	= 100 yrs	Time to peak	= 744 min
Time interval	= 2 min	Hyd. volume	= 7,582 cuft
Inflow hyd. No.	= 3 - d basin in	Max. Elevation	= 84.96 ft
Reservoir name	= <New Pond>	Max. Storage	= 1,723 cuft

Storage Indication method used.



APPENDIX C: DRAINAGE PIPING CALCULATIONS

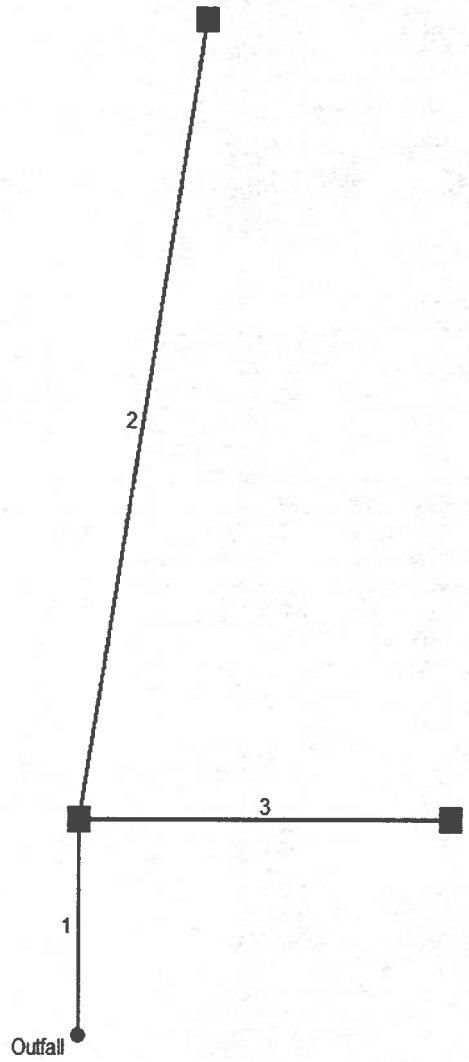
BORGHESI BUILDING & ENGINEERING CO.
2155 EAST MAIN ST., TORRINGTON, CT

Valvoline
818 Sullivan Ave., South Windsor, CT

RUNOFF COEFFICIENTS

LINE	AREA DESCRIPTION	AREA (ACRE)	C	CA	TC (MIN)
	WATERSHED ANALYSIS				
CB1	PAVED, BLDG.	0.03	0.95	0.03	
	GRASS	0.00	0.30	0.00	
	TOTAL	0.03	0.95	0.03	5
CB2	PAVED, BLDG.	0.12	0.95	0.11	
	GRASS	0.03	0.30	0.01	
	TOTAL	0.15	0.82	0.12	5
CB3	PAVED, BLDG.	0.10	0.95	0.10	
	GRASS	0.03	0.30	0.01	
	TOTAL	0.13	0.80	0.10	5

Hydraflow Plan View



Project File: Valvoline South Windsor.stm	No. Lines: 3	08-11-2020

Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	
1	End	20.0	0.03	0.31	0.95	0.03	0.26	5.0	6.2	6.4	1.63	2.52	3.40	12	0.50	82.10	82.00	82.69	82.59	85.50	86.00	CB1
2	1	75.0	0.15	0.15	0.82	0.12	0.12	5.0	5.0	6.7	0.82	2.60	1.34	12	0.53	82.50	82.10	83.12	83.08	85.00	85.50	CB2
3	1	38.0	0.13	0.13	0.80	0.10	0.10	5.0	5.0	6.7	0.70	3.65	1.15	12	1.05	82.50	82.10	83.10	83.10	85.50	85.50	CB3

Project File: Valvoline South Windsor.stm

Number of lines: 3

Run Date: 08-11-2020

NOTES: Intensity = 101.98 / (Inlet time + 15.80) ^ 0.90; Return period = 25 Yrs.

APPENDIX D: WATERSHED MAP

PODUNK RIVER
APPROX. LOCATION

622.14' (VOL. 1589 PG. 292)
N 57°18'10" E
622.10'

10' SY

APPROX. TREE LINE

PARCEL AREA
192828.1 SQ. FT.
4.43 ACRES

WOODS

LP

80' IWC REGULATED AREA

LIMIT OF WETLANDS
FIELD SURVEYED BY
DUFOUR SURVEYING LLC
SEPTEMBER 1, 2020

15' RY

CMS

150' (DEED)
149.59'
N 54°40'00" W
150' (VOL. 401 PG. 114)

200' (VOL. 401 PG.114)
S 32°36'34" W

100 YR. FLOODPLAIN BASED
ON FEMA ELEV=86.0

80' IWC REGULATED AREA

199.80'
200' (DEED)

N/F
VINCENT PRESTILEO
VOL.401 PG.114

PROPOSED ADDITION
530(±) SF GFA
(TO ACCOMMODATE
NEW EQUIPMENT)

PROPOSED BUILDING
3,837(±)SF GFA
FF=87.0

ATTENDANT KIOSK
FF=87.0

BITUMINOUS

VAC

CP

MH
TF=85.71
COULD NOT OPEN

MH
TF=85.78
COULD NOT OPEN

MH
TF=85.79

MH
TF=85.92
COULD NOT OPEN

LS

PROP. CB2
TYPE "C"
TF=85.0
INV.=82.5

FILTER FABRIC SILT
BARRIER @ CB (TYP.)

WOOD RAIL (TYP)

SEDIMENTATION CONTROL
FENCE (TYP.)

PROP.
T-PAD

GRAVEL

HC PARKING SIGN
(WALL MOUNTED)

WHEEL STOP

LAWN

PROP. CB1
TYPE "C"
w/ HOOD
TF=85.5
INV.=82.1

PROP. CONSTRUCTION
ENTRANCE

"ONE WAY
NOT ENTER"
SIGN

BENCHMARK
TOP OF CONCRETE MON.
ELEV.=89.32
NAVD 88

770(±) TO INTERSECTION WITH MORGAN FARMS DRIVE

530'(±) TO INTERSECTION WITH TROY ROAD

P.O.B.

CL&P
25002

SIGN
10'Hx9'W

292.82'
N 54°33'30" W

367.20'
N 54°33'30" W

74.38'

SNET
5218

MH
TF=86.47
FL=COULD NOT OPEN

12" SAN

STOP SIGN
62"Hx18"W

METAL BEAM GUIDERAIL

ISD=700'+

15" CMP

CB
TF=85.68
FL=81.67 N
FL=79.88 E/W

CB
TF=85.64
FL=81.61 E
FL=80.79 S/W

PROP. CB3
TYPE "C"
TF=85.5
INV.=82.5

CB
TF=86.42
FL=80.82 E
FL=79.30 W

CB
TF=85.35
FL=80.26

SULLIVAN AVENUE

CT ROUTE 194

N/F
LOTS AND MORE, LLC
VOL.1589 PG.291

BUILDING
FOOTPRINT AREA
4142.6 SF
FF=86.6

EXIT SIGNS
7"Hx10"W

EXIT SIGN
10"Hx14"W

CB
TF=85.75
FL=81.82

12" PLASTIC

50' FY

INV=82.0

RIPRAP

N/F
TOWN OF SOUTH WINDSOR
VOL.2015 PG.122

SNET
2014

SNET
2015

N/F
SOMERLARK PROPERTIES LLC
VOL.2311 PG.117

WATERSHED MAP

SCALE: 1"=20'

\\esclient\P\Drawings\MISC\Valvoline South Windsor\Valvoline South Windsor SP.dwg 9/8/2020 4:25:16 PM EDT

Borghesi
Building & Engineering Co., Inc.
2155 EAST MAIN STREET TORRINGTON, CT. 06790
860-482-7613/WEB: www.borghesibuilding.com

N E W S

SEAL

REVISIONS

PROJECT
Valvoline
VALVOLINE INSTANT OIL CHANGE
818 SULLIVAN AVENUE, SOUTH WINDSOR, CT.

DRAWN BY G.R.W.
APPROVED BY A.R.B.
DATE 09-09-20
SCALE AS NOTED

SHEET NO.
WATERSHED