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STORMWATER MANAGEMENT REPORT

Delaware Avenue Subdivision
Long Hill Township, Morris County, New Jersey

Prepared For:
Mario Parisi, Jr.
8 Lower Overlook Drive
Gillette, New Jersey 07933

November 30, 2017
Last Revised June 5, 2020

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1. INTRODUCTION

Applicant Mario Parisi seeks to build a subdivision on the subject property, located along Delaware Avenue in Long Hill Township, New Jersey. He has asked Engineering and Land Planning Associates, Inc. to provide designs for said subdivision, which must include measures to mitigate the adverse effects on stormwater runoff quantity and quality resulting from the proposed development. This report details proposed design elements, describes best management practices, and provides evidence that the design meets NJDEP Phase II Stormwater Regulations for stormwater quantity, quality, and groundwater recharge.

This plan was prepared by Christopher Nusser, P.E., Engineering & Land Planning Assoc., Inc., 140 West Main Street, High Bridge, NJ. Mr. Nusser is a registered Professional Engineer in New Jersey. He has over 10 years of experience in both field and office positions and has developed stormwater management plans working closely with Soil Conservation Districts in New Jersey.

2. PROJECT DESCRIPTION

2.1 Existing Conditions

The site, identified as Block 13302, Lot 16.01, is located in Long Hill Township, Morris County, New Jersey. The lot area consists of approximately 10.44 acres of undeveloped, wooded land. The lot is bounded by multi-family residential properties in the north, east, and west, and land owned by the New Jersey Department of Transportation in the south. Delaware Avenue abuts the western and eastern property edges and is connected by an existing gravel road through the site. The southern edges of the property contain wetlands and Jersey Central Power and Light Company overhead wires. Lot 16.01 contains approximately 7.58 acres of land within residential zoning district R-2 and 2.86 acres of land within the Conservation District (C).

2.2 Proposed Conditions

The proposed subdivision will develop eight new residential single-family lots and conserve one lot as open space on the existing lot Block 13302, Lot 16.01. Associated site improvements will include roadways with sidewalks, underground utilities, stormwater detention facilities, and other incidental appurtenances associated thereto.

2.3 Soil Conditions

Per the United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) Web Soil Survey the site is underlain by a variety of silt loam soils including Minoa, Parsippany, Penn-Channery, Penn-Klinesville Channery, and Whippany. These soils range from Hydrologic Soil Group (HSG) 'B' to 'D' with moderate to low capacity to transmit water. A USDA NRCS Web Soil Survey map is included in Appendix A.

3. METHODOLOGY

3.1 Project Description

The project proposes subdividing the existing undeveloped 10.44-acre lot into eight residential lots and one lot to be conserved as open space. The subdivision includes regrading, changes in land cover, construction of roads and accompanying roadway improvements, utilities, and stormwater management infrastructure. Approximately 5.66 acres of land will be disturbed by these activities.

The project is considered a major project in accordance with the NJDEP Phase II Stormwater Regulations, as it will include greater than 1.0 acre of disturbance and creates greater than ¼ acre of new impervious surface. Stormwater management measures have been provided in accordance with NJDEP's Phase II Stormwater regulations.

3.2 Stormwater Runoff Calculation Methodology

The stormwater quantity runoff analysis has been performed utilizing the Soil Conservation Service (SCS) Technical Release 55 (TR-55) "Urban Hydrology for Small Watersheds," revised June 1986. The site runoff has been calculated for the 2-year, 10-year, and 100-year storm frequencies in accordance with NJDEP's storm water regulations for water quantity control (N.J.A.C. 7:8-5.4).

The analysis utilized the SCS Type-III 24-hour rainfall distribution. The time of concentration (Tc) calculations were calculated based on the TR-55 methodology. Several potential Tc flow paths were analyzed in order to determine the most appropriate flow path. CN values were calculated for each drainage area. The summary of results and supporting calculations for the existing and proposed stormwater quantity runoff analysis can be found in Appendices B-F of this report.

3.3 Stormwater Runoff Quality

The storm water runoff quality analysis has been performed in accordance with NJDEP's Storm Water Management Regulations (N.J.A.C. 7:8-5.5). This storm water management plan serves to reduce the post-construction load of Total Suspended Solids (TSS) generated from the water quality design storm by 80 percent, as an annual average. This reduction has been applied to all areas of new development on the site. The water quality design storm consists of 1.25 inches of rain falling in 2 hours with the NJDEP distribution as illustrated in N.J.A.C. 7:8-5.5 "Table 1 - Water Quality Design Storm Distribution" (refer to Appendix H).

Multiple infiltration basins have been proposed to obtain the required 80% TSS removal (see Appendix H). In additions to the infiltration basins, grass swales and vegetative strip buffers are also proposed to be utilized throughout the site.

3.4 Groundwater Recharge

A groundwater recharge analysis has been performed in accordance with NJDEP's Stormwater Management Rules (N.J.A.C. 7:8-5.4). The New Jersey Groundwater Recharge Spreadsheet (NJGRS) was utilized to determine the groundwater recharge associated with the site. Computations of the pre-development and post-development annual groundwater recharge rate and the annual recharge deficit was prepared based on the New Jersey Geological Survey Report GSR-32 "A Method for Evaluating Ground-Water Recharge Areas in New Jersey", which is incorporated into the NJGSR spreadsheet (Refer to Appendix H).

3.5 Non-Structural Stormwater Management Strategies

As per N.J.A.C. 7:8-5.3 requirements non-structural stormwater strategies have been incorporated into the design to the maximum extent practicable:

The impervious surfaces are minimized on the project site to meet current codes and the runoff over the impervious surfaces flow into the proposed stormwater systems.

Natural drainage features and vegetation are maintained and maximized where possible.

The proposed time of concentration is maximized in most locations to the minimize the effects from the existing to the proposed condition.

Land disturbance is being limited to locations with minimal environmental and physical constraints.

Soil compaction will be minimized and any areas of over compaction will be mediated.

Low maintenance trees and native grasses are proposed to encourage retention of all plantings.

The use of natural open channel swales is utilized to convey the stormwater runoff through portions of the site where it is feasible.

The stormwater control system was designed to prevent trash and debris from draining into the existing wetlands located to the south of the project site. This is accomplished through the use of trash racks, grates and stormwater filtration units. The stormwater system will be cleaned and trash/debris will be removed according the Stormwater Management Maintenance Plan.

3.6 Stormwater Conveyance

The storm sewer hydraulics is based upon the Manning Equation as defined in the "Handbook of Hydraulics," by Brater and King, Sixth Edition. Storm sewer capacity is based on full depth gravity flow. The project has designed to convey water via closed pipe systems to the detention basin. Refer to Appendix E for calculations.

4. STORMWATER ANALYSIS

4.1 Existing Conditions Stormwater Runoff Quantity

The Existing Drainage Area Plan (Appendix L) illustrates the existing drainage areas on site. The site has been analyzed as two distinct drainage areas.

EXDA-1 is located in the northern portion of the site. It is approximately 3.08 acres and is modeled as 100% wooded. The existing drainage area flows from a high point along the western site boundary to a location in the northeast which contains an existing low point along the eastern site boundary line. No existing stormwater runoff management is present.

EXDA-2 is the southern portion of the site. It is approximately 3.09 acres and is modeled with approximately 0.09 acres of existing gravel/impervious area. The remaining drainage area is modeled as wooded. The existing drainage area flows from a high point along the western site boundary to a location in the southeast which contains an existing low point near the southern site boundary line. No existing stormwater runoff management is present.

It should be noted that approximately 4.78 acres of the existing site area along the southern boundary, containing wetlands and other environmental constraints, was not included in the existing drainage areas. This area will not be disturbed by the proposed subdivision and does not require stormwater management.

The curve numbers (CN) and times of concentration (Tc) for the existing drainage areas have been calculated utilizing the TR-55 method for each drainage area (Appendices C and D). A runoff hydrograph has been calculated for the 2, 10, and 100-year storms. The peak runoff (Q cfs) has been obtained from the runoff hydrograph for each drainage area.

The pre-development runoff from the drainage areas (total runoff leaving the property) is listed in the following table:

Drainage Area	2-year Storm	10-year Storm	100-year Storm
EXDA-1 (Northern Site Area)	1.448 CFS	3.834 CFS	9.526 CFS
EXDA-2 (Southern Site Area)	0.392 CFS	1.911 CFS	6.468 CFS

Refer to Appendices B through F for a summary of the composite curve numbers (CN), pre-development peak discharge rates for the 2, 10, and 100 year storms, and the associated runoff hydrographs.

4.2 Proposed Conditions Stormwater Runoff Quantity

The Proposed Drainage Area Plan (Appendix L), illustrates the proposed drainage areas for the post-development condition.

To accommodate the proposed subdivision development, the site is divided into two (2) distinct drainage areas. Those drainage areas are conveyed to proposed on-site stormwater management systems through grading and stormwater pipe networks. Sub-drainage areas were created to illustrate paths to different systems and to clearly delineate area bypassing the systems.

PRDA-1 encompasses the northern portion of the site. It is approximately 2.52 acres and is subdivided into PRDA-1A (2.25 acres) and PRDA-1B (0.27 acres). PRDA-1A consists of land conveying water to proposed Stormwater Basin #1 (SWM-1). PRDA-1B consists of land where runoff bypasses all proposed systems. Within each area, impervious and pervious surfaces are modeled separately using their respective CN numbers before being combined.

PRDA-2 encompasses the southern portion of the site. It is approximately 3.66 acres and is subdivided into 3 areas. PRDA-2A (2.84 acres) encompasses land conveying water to proposed Stormwater Basin #2A (SWM-2A), which discharges towards the southern edge of the property. PRDA-2B contains 0.43 acres of area where runoff bypasses all proposed systems. PRDA-2C (0.39 acres) consists of undisturbed wooded area conveyed to SWM 2A and is located between PRDA #2A and SWM-2A.

Stormwater from the proposed dwellings' rooftops will be collected by proposed stormwater chambers, to be located on each lot and connected to roof leader systems. The chamber systems have been designed to collect runoff from the proposed dwelling roofs. Runoff exceeding infiltration capacity of the chambers will be routed to their associated drainage areas, as shown on the Drainage Plan (Appendix L).

The performance of the systems and the bypass area discharge are summarized in the table below:

PRDA-1A to SWM-1A			
Storm	Peak Basin Discharge	Water Surface Elevation	Max. Storage
2-year	0.538 CFS	254.78 FT	6,562 CF
10-year	2.121 CFS	255.35 FT	10,660 CF
100-year	6.408 CFS	256.08 FT	15,747 CF

PRDA-1B (Bypass)			
Storm	Peak Basin Discharge	Water Surface Elevation	Max. Storage
2-year	0.425 CFS	-	-
10-year	0.771 CFS	-	-
100-year	1.459 CFS	-	-

PRDA-2A to SWM-2			
Storm	Peak Basin Discharge	Water Surface Elevation	Max. Storage
2-year	0.171 CFS	225.59 FT	8,747 CF
10-year	0.514 CFS	226.14 FT	13,110 CF
100-year	4.196CFS	227.56 FT	24,535 CF

PRDA-2B (Bypass)			
Storm	Peak Basin Discharge	Water Surface Elevation	Max. Storage
2-year	0.187 CFS	-	-
10-year	0.439 CFS	-	-
100-year	1.000 CFS	-	-

PRDA-2C (Undisturbed to SWM-2)			
Storm	Peak Basin Discharge	Water Surface Elevation	Max. Storage
2-year	0.053 CFS	-	-
10-year	0.292 CFS	-	-
100-year	1.038 CFS	-	-

The subsurface storage systems provide the necessary detention to achieve the reduction factors required. A summary table has been provided below documenting the overall performance of the system:

Runoff Comparison Table 1 Comparing EXDA-1 to PRDA-1 TOTAL AREA				
Storm	EXDA-1	Reduction	Target Runoff	Proposed
2-year	1.448 CFS	50%	0.724 CFS	0.701 CFS
10-year	3.834 CFS	75%	2.876 CFS	2.439 CFS
100-year	9.526 CFS	80%	7.621 CFS	7.571 CFS

Runoff Comparison Table 2 Comparing EXDA-2 to PRDA-2 TOTAL AREA				
Storm	EXDA-2	Reduction	Target Runoff	Proposed
2-year	0.392 CFS	50%	0.196 CFS	0.187 CFS
10-year	1.911 CFS	75%	1.433 CFS	0.637CFS
100-year	6.468 CFS	80%	5.174 CFS	4.506 CFS

4.2 Stormwater Runoff Quality

Runoff quality has achieved the required TSS removal, in accordance with NJDEP standards. The water quality storm is contained and infiltrated within the Infiltration Basins SWM-1 and SWM-2. As noted NJDEP BMP manual, infiltration basins meet the 80% TSS removal rate in accordance with the NJDEP Phase II standards.

4.3 Groundwater Recharge

The existing site has a total recharge of 345,324 CF. The proposed development has a calculated recharge deficit of 114,231 CF. The applicant has proposed stormwater infiltration systems on site to recharge deficit created by development in accordance with NJDEP standards. These systems include 2 infiltration basins and 8 chamber systems.

The proposed infiltration basins and chamber systems offer opportunities for overcoming the recharge deficit. Through analysis of the chamber systems, a recharge volume of approximately 24,610 CF is calculated. Through modeling the water quality storm in SWM-1 and SWM-2, the outlet structures have been designed to allow for infiltration up to the water quality storm elevations in each basin. Therefore, SWM-1 supplies a recharge volume of approximately 42,511 CF, and SWM-2 supplies a recharge volume of 47,986 CF. Together, these stormwater management devices have a cumulative recharge volume of approximately 115,107 CF, which surpasses the required recharge volume by approximately 876 CF. The analysis has been performed based upon the approved NJDEP Recharge spreadsheet and can be found in Appendix H.

4.4 Stormwater Management Maintenance Plan

A recommended Stormwater Management Maintenance Plan has been established for this site in order to maintain the performance and efficiency of the proposed stormwater features. The plan is contained in Appendix K of this report.

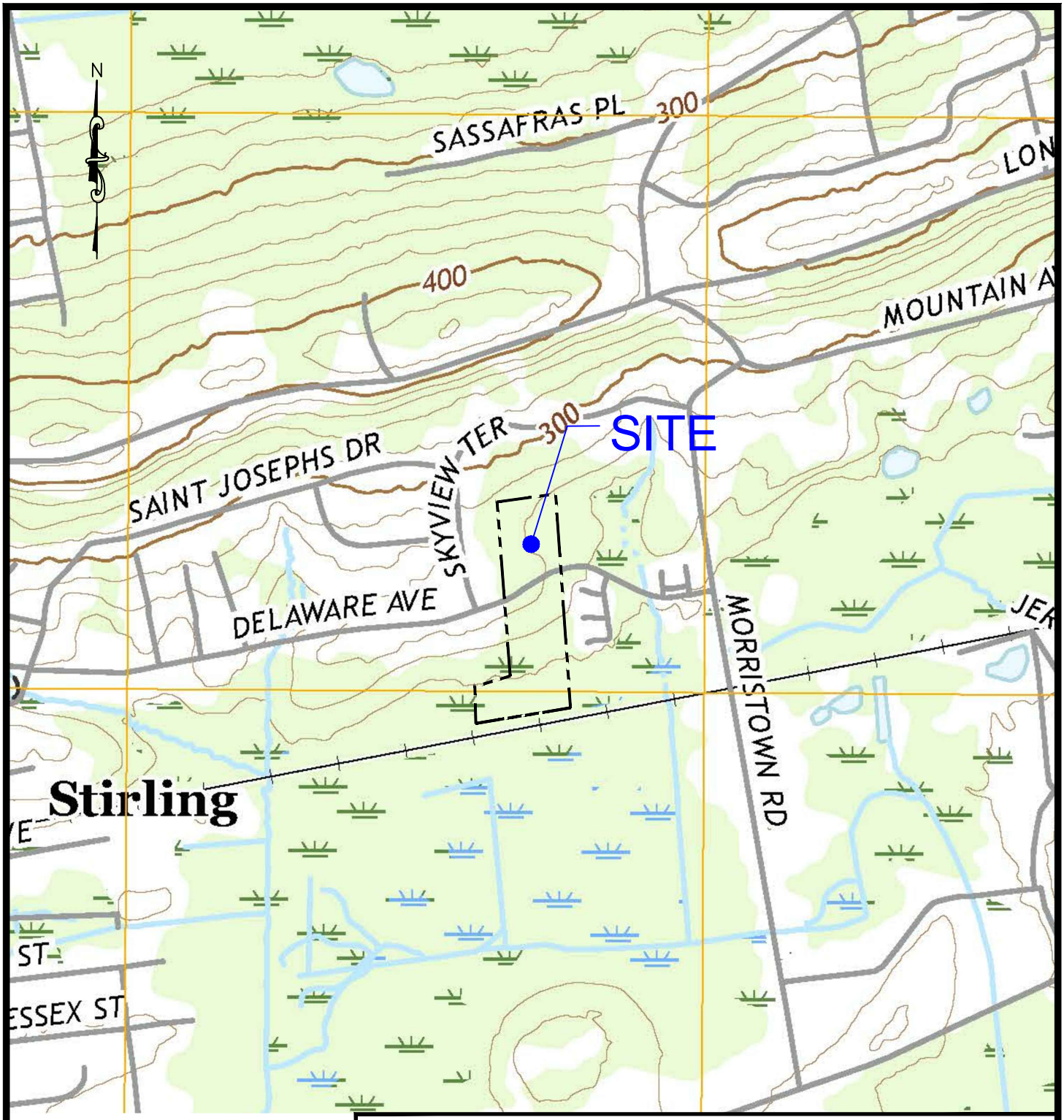
4.5 Soil Erosion and Sediment Control

Soil Erosion and Sediment Control measures have been designed for the stormwater management systems to ensure that water quality is maintained and that the systems can safely and adequately control runoff from the property. Design calculations for the conduit outlet protection can be found in Appendix J of this report. A soil erosion and sediment control certification is being sought by Morris County Soil Conservation District

5. CONCLUSIONS

In conclusion, the proposed design includes a proposed stormwater management system for the property that meets all of the quantity, quality and recharge requirements outlined in the Stormwater Management Rules of N.J.A.C. 7:8.

APPENDIX A- EXHIBITS



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Scale 1" = 800'

REFERENCES: UNITED STATES GEOLOGICAL SURVEY (USGS)
CHATHAM QUADRANGLE
TOPOGRAPHIC MAP

SITE LOCATION CENTER:
EASTING (X) = 27579.36
NORTHING (Y) = 6915.30
NAD1983 NEW JERSEY STATE PLANE (FEET)

TITLE:

FIGURE 1: USGS

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140 WEST MAIN STREET CLINTON TOWNSHIP, NJ 08829
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C.O.A. #: 24GA28021500
A PROFESSIONAL ASSOCIATION

LOCATION:

DELAWARE AVENUE
BLOCK 13302, LOT 16.01
LONG HILL TOWNSHIP
MORRIS COUNTY
NEW JERSEY

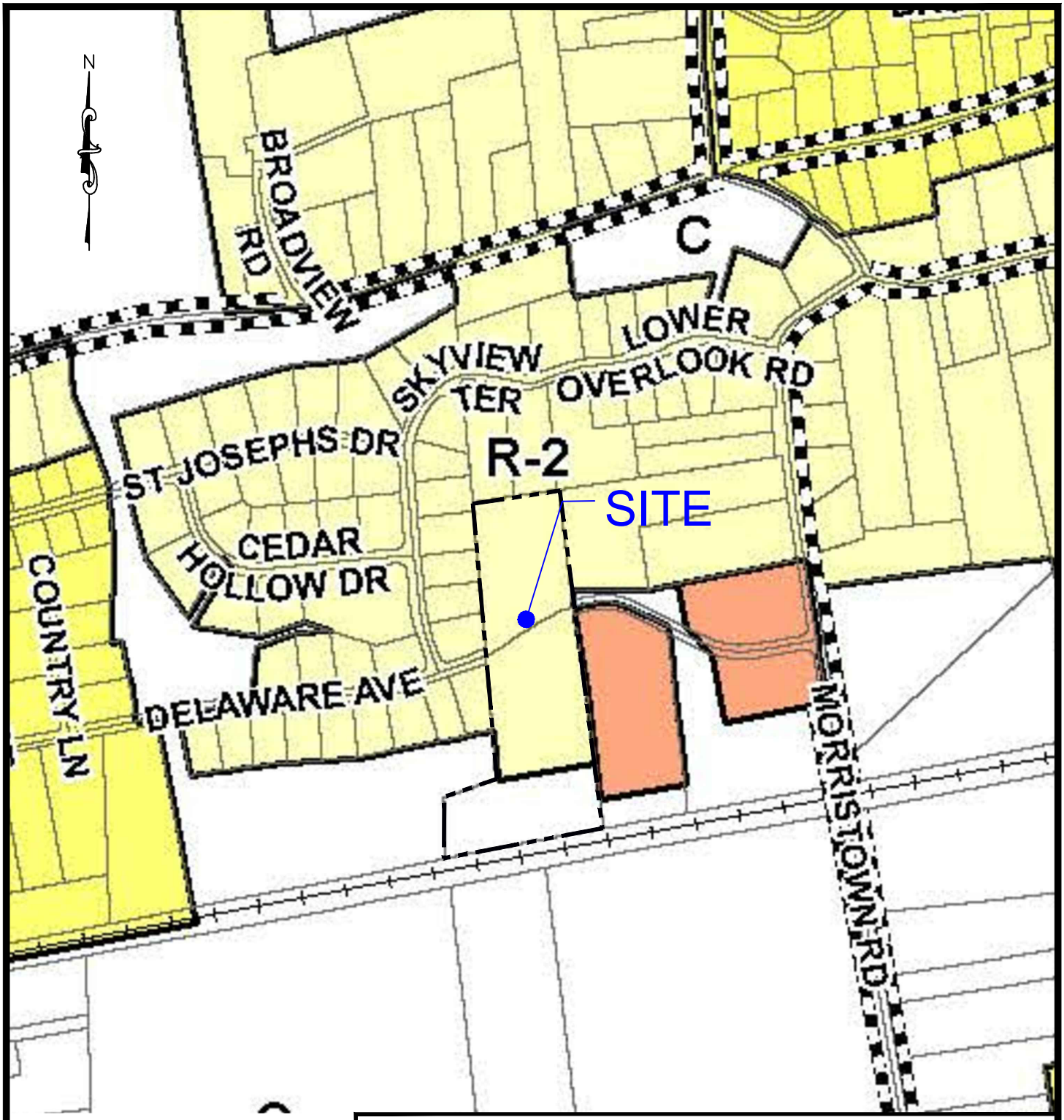
DATE: 09/06/17

PROJECT NO.: 0115210

FILENAME: 01_USGS

FIGURE No.

1



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TITLE:

FIGURE 2: ZONING

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MORRIS COUNTY
NEW JERSEY

DATE: 09/06/17

PROJECT NO.: 0115210

FILENAME: 02_ZONING

FIGURE No.

2

500 0 500

Scale 1" = 500'

TITLE:

FIGURE 3: SOIL MAP

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MORRIS COUNTY
NEW JERSEY

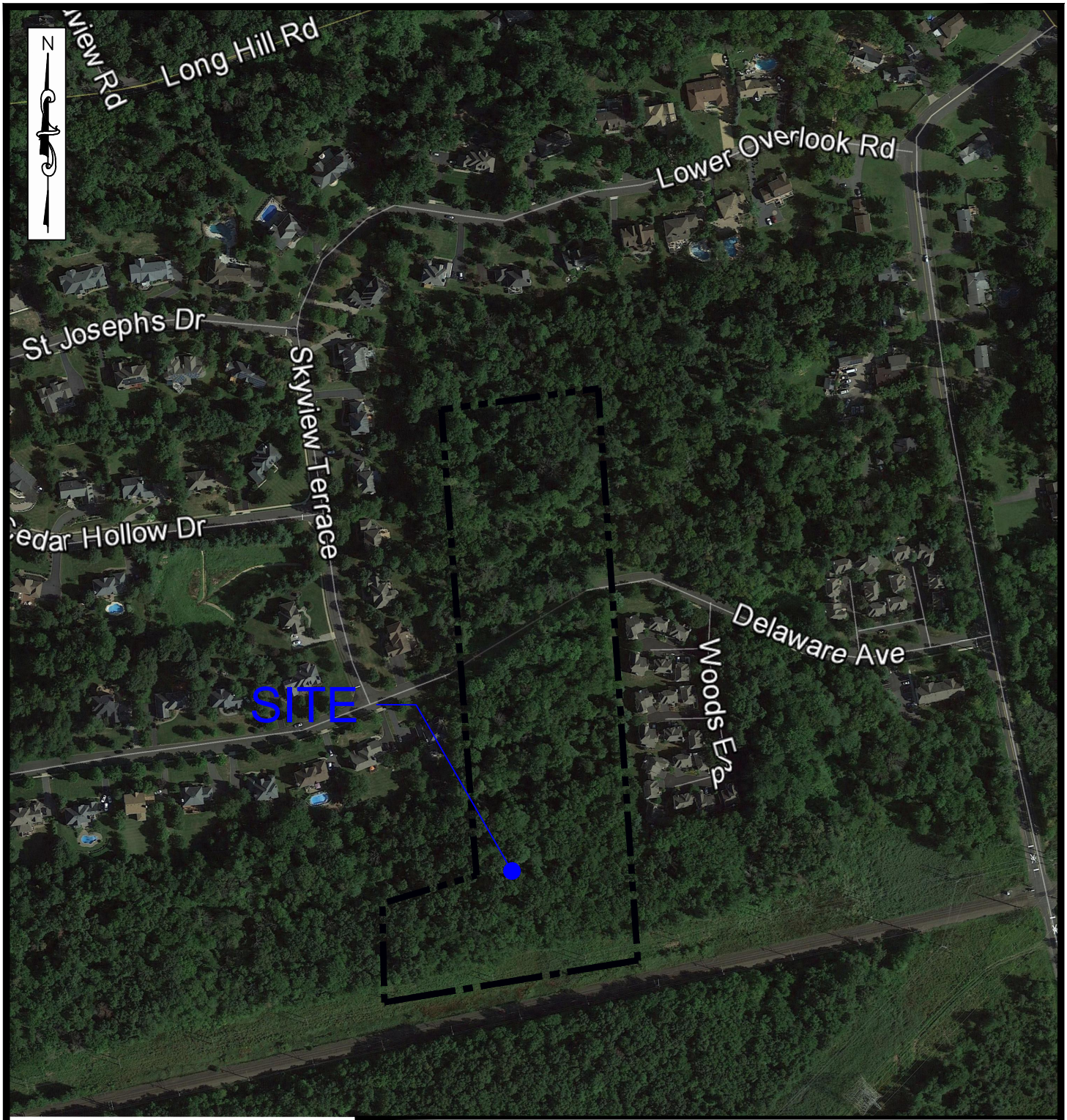
DATE: 09/06/17

PROJECT NO.: 0115210

FILENAME: 03_SOIL

FIGURE No.

3



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Scale 1" = 300'

SOURCE: GOOGLE EARTH PRO

TITLE:

FIGURE 4: ROAD MAP

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MORRIS COUNTY
NEW JERSEY

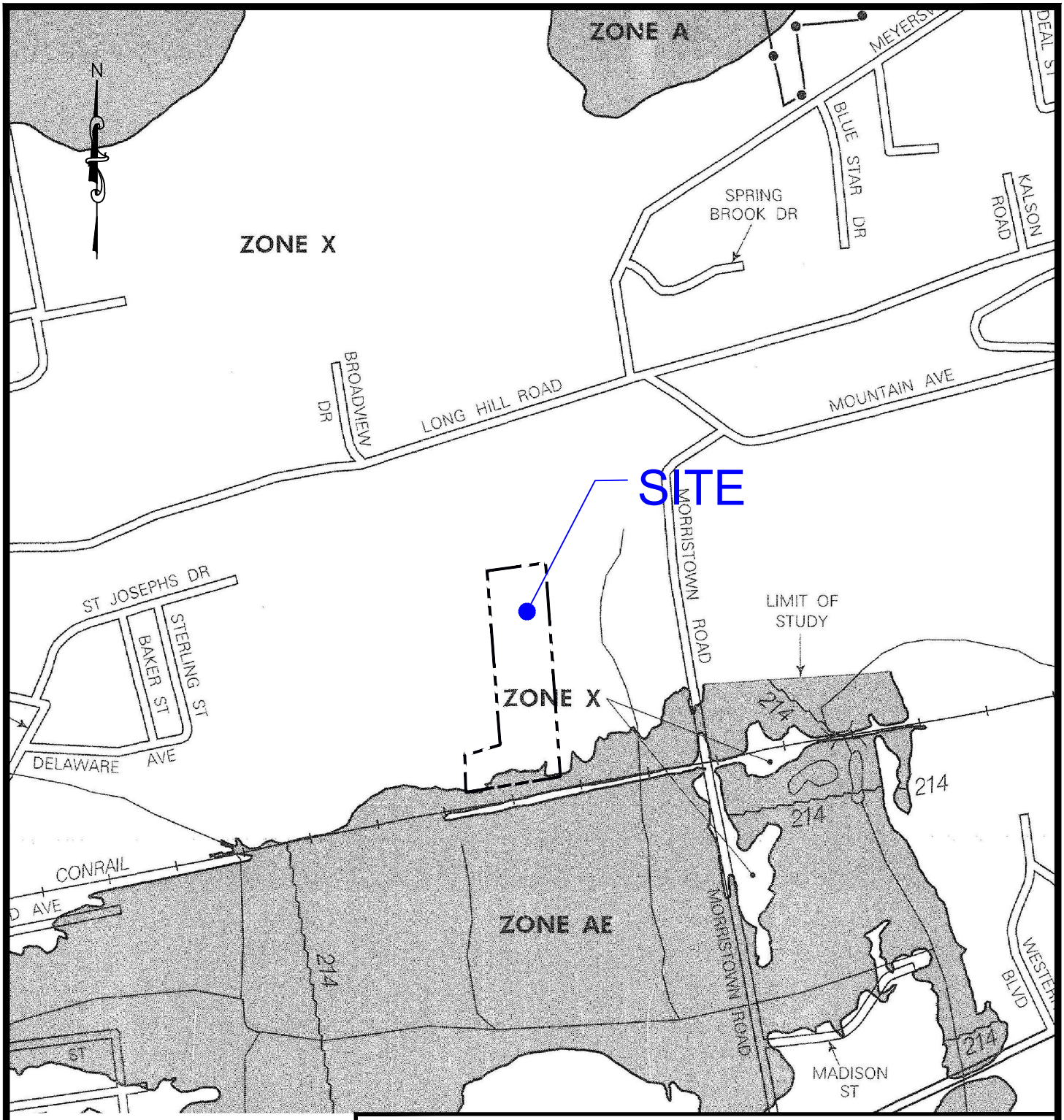
DATE: 09/06/17

PROJECT NO.: 0115210

FILENAME: 04_ROADMAP

FIGURE No.

4



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Scale 1" = 800'

REFERENCES: THIS MAP WAS CREATED USING A MAP ENTITLED "NATIONAL FLOOD INSURANCE PROGRAM FLOOD INSURANCE RATE MAP, TOWNSHIP OF LONGHILL, NEW JERSEY, MORRIS COUNTY", COMMUNITY PANEL NUMBER 340356 0005 B, REVISED ON SEPTEMBER 21, 2001.

TITLE:

FIGURE 5: FIRM

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LONG HILL TOWNSHIP
MORRIS COUNTY
NEW JERSEY

DATE: 09/06/17

PROJECT NO.: 0115210

FILENAME: 05_FIRM

FIGURE No.

5

300 0 300

Scale 1" = 300'

SOURCE: TAX MAP TOWNSHIP OF LONG HILL, MORRIS COUNTY, NEW JERSEY, SHEET 33

TITLE:

FIGURE 6: TAX MAP

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A PROFESSIONAL ASSOCIATION

LOCATION:

DELAWARE AVENUE
BLOCK 13302, LOT 16.01
LONG HILL TOWNSHIP
MORRIS COUNTY
NEW JERSEY

DATE: 09/06/17

PROJECT NO.: 0115210

FILENAME: 06_TAXMAP

FIGURE No.

6

APPENDIX B – SUMMARY OF HYDROLOGIC ANALYSIS AND RUNOFF QUANTITY CALCULATIONS

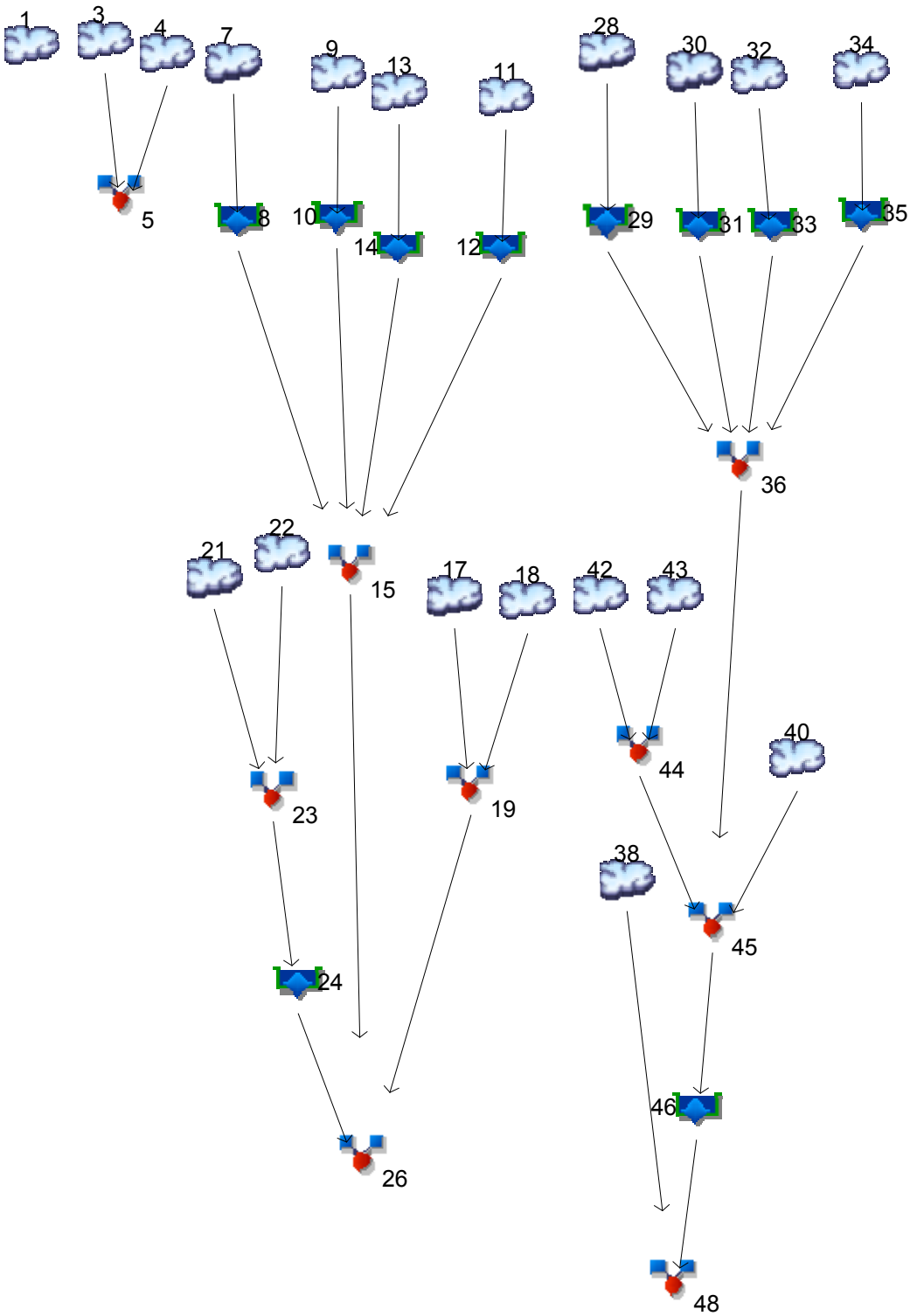
STORMWATER RUNOFF SUMMARY TABLE

Drainage Area	2 Year (cfs)	10 Year (cfs)	100 Year (cfs)
EXDA #1	1.448	3.834	9.526
Total	1.448	3.834	9.526
PRDA #1	0.701	2.439	7.571
Total	0.701	2.439	7.571
% OF EXISTING FLOWS	48%	64%	79%

Drainage Area	2 Year (cfs)	10 Year (cfs)	100 Year (cfs)
EXDA #2	0.392	1.911	6.468
Total	0.392	1.911	6.468
PRDA #2	0.187	0.637	4.506
Total	0.187	0.637	4.506
% OF EXISTING FLOWS	48%	33%	70%

Watershed Model Schematic

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020



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	------	-------	1.448	-------	-------	3.834	5.700	-------	9.526	EXDA 1
3	SCS Runoff	------	-------	0.217	-------	-------	0.330	0.407	-------	0.549	EXDA 2 IMPERVIOUS
4	SCS Runoff	------	-------	0.339	-------	-------	1.783	3.164	-------	6.191	EXDA 2 PERVIOUS
5	Combine	3, 4	-------	0.392	-------	-------	1.911	3.342	-------	6.468	EXDA 2
7	SCS Runoff	------	-------	0.118	-------	-------	0.180	0.221	-------	0.299	PRDA 1 LOT 5 HOUSE TO CHAMBE
8	Reservoir	7	-------	0.001	-------	-------	0.023	0.045	-------	0.061	LOT 5 CHAMBER DISCHARG
9	SCS Runoff	------	-------	0.118	-------	-------	0.180	0.221	-------	0.299	PRDA 1 LOT 6 HOUSE TO CHAMBE
10	Reservoir	9	-------	0.001	-------	-------	0.023	0.045	-------	0.060	LOT 6 CHAMBER DISCHARG
11	SCS Runoff	------	-------	0.118	-------	-------	0.180	0.221	-------	0.299	PRDA 1 LOT 7 HOUSE TO CHAMBE
12	Reservoir	11	-------	0.001	-------	-------	0.023	0.053	-------	0.097	LOT 7 CHAMBER DISCHARG
13	SCS Runoff	------	-------	0.118	-------	-------	0.180	0.221	-------	0.299	PRDA 1 LOT 8 HOUSE TO CHAMBE
14	Reservoir	13	-------	0.001	-------	-------	0.023	0.045	-------	0.060	LOT 8 CHAMBER DISCHAR
15	Combine	8, 10, 12, 14	-------	0.006	-------	-------	0.092	0.189	-------	0.277	PRDA 1 DRYWELL DISCHARGE
17	SCS Runoff	------	-------	0.072	-------	-------	0.110	0.136	-------	0.183	PRDA 1B BYPASS- IMPERVIOUS
18	SCS Runoff	------	-------	0.353	-------	-------	0.661	0.875	-------	1.276	PRDA 1B BYPASS- PERVIOUS
19	Combine	17, 18	-------	0.425	-------	-------	0.771	1.010	-------	1.459	PRDA 1B BYPASS
21	SCS Runoff	------	-------	0.988	-------	-------	1.503	1.852	-------	2.503	PRDA 1A IMPERVIOUS TO BASIN 1
22	SCS Runoff	------	-------	2.110	-------	-------	4.165	5.622	-------	8.376	PRDA 1A PERVIOUS TO BASIN 1
23	Combine	21, 22	-------	3.098	-------	-------	5.667	7.474	-------	10.88	PRDA 1A TO BASIN
24	Reservoir	23	-------	0.538	-------	-------	2.121	3.818	-------	6.408	BASIN 1 DISCHARGE
26	Combine	15, 19, 24,	-------	0.701	-------	-------	2.439	4.540	-------	7.571	PRDA 1 TOTAL
28	SCS Runoff	------	-------	0.120	-------	-------	0.183	0.226	-------	0.305	PRDA 2A LOT 1 HOUSE TO CHAMB
29	Reservoir	28	-------	0.002	-------	-------	0.026	0.046	-------	0.060	LOT 1 CHAMBER DISCHARG
30	SCS Runoff	------	-------	0.120	-------	-------	0.183	0.226	-------	0.305	PRDA 2A LOT 2 HOUSE TO CHAMB
31	Reservoir	30	-------	0.002	-------	-------	0.026	0.050	-------	0.080	LOT 2 CHAMBER DISCHARG
32	SCS Runoff	------	-------	0.120	-------	-------	0.183	0.226	-------	0.305	PRDA 2A LOT 3 HOUSE TO CHAMB
33	Reservoir	32	-------	0.002	-------	-------	0.026	0.054	-------	0.093	LOT 3 CHAMBER DISCHARG
34	SCS Runoff	------	-------	0.118	-------	-------	0.180	0.221	-------	0.299	PRDA 2A LOT 4 HOUSE TO CHAMB
35	Reservoir	34	-------	0.001	-------	-------	0.023	0.046	-------	0.066	LOT 4 CHAMBER DISCHARG
36	Combine	29, 31, 33, 35	-------	0.007	-------	-------	0.101	0.196	-------	0.299	PRDA 2A CHAMBER DISCHARGE

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	
38	SCS Runoff	------	-------	0.187	-------	-------	0.439	0.628	-------	1.000	PRDA 2B BYPASS-PERVIOUS
40	SCS Runoff	------	-------	0.053	-------	-------	0.292	0.528	-------	1.038	PRDA 2C PERVIOUS
42	SCS Runoff	------	-------	1.253	-------	-------	1.906	2.349	-------	3.174	PRDA 2A IMPERVIOUS
43	SCS Runoff	------	-------	1.528	-------	-------	3.810	5.554	-------	9.005	PRDA 2A PERVIOUS
44	Combine	42, 43	-------	2.780	-------	-------	5.716	7.903	-------	12.18	PRDA 2A COMBINE
45	Combine	36, 40, 44	-------	2.812	-------	-------	6.009	8.430	-------	13.43	PRDA 2 TO BASIN 2
46	Reservoir	45	-------	0.171	-------	-------	0.514	1.215	-------	4.196	BASIN 2 DISCHARGE
48	Combine	38, 46,	-------	0.187	-------	-------	0.637	1.296	-------	4.506	PRDA 2 TOTAL

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	1.448	5	745	9,287	------	------	------	EXDA 1
3	SCS Runoff	0.217	5	730	976	------	------	------	EXDA 2 IMPERVIOUS
4	SCS Runoff	0.339	5	760	3,578	------	------	------	EXDA 2 PERVIOUS
5	Combine	0.392	5	755	4,554	3, 4	------	------	EXDA 2
7	SCS Runoff	0.118	5	730	531	------	------	------	PRDA 1 LOT 5 HOUSE TO CHAMBE
8	Reservoir	0.001	5	1425	16	7	2.38	518	LOT 5 CHAMBER DISCHARG
9	SCS Runoff	0.118	5	730	531	------	------	------	PRDA 1 LOT 6 HOUSE TO CHAMBE
10	Reservoir	0.001	5	1425	16	9	2.38	518	LOT 6 CHAMBER DISCHARG
11	SCS Runoff	0.118	5	730	531	------	------	------	PRDA 1 LOT 7 HOUSE TO CHAMBE
12	Reservoir	0.001	5	1425	16	11	2.38	518	LOT 7 CHAMBER DISCHARG
13	SCS Runoff	0.118	5	730	531	------	------	------	PRDA 1 LOT 8 HOUSE TO CHAMBE
14	Reservoir	0.001	5	1425	16	13	2.38	518	LOT 8 CHAMBER DISCHAR
15	Combine	0.006	5	1425	65	8, 10, 12, 14	------	------	PRDA 1 DRYWELL DISCHARGE
17	SCS Runoff	0.072	5	730	325	------	------	------	PRDA 1B BYPASS- IMPERVIOUS
18	SCS Runoff	0.353	5	730	1,402	------	------	------	PRDA 1B BYPASS- PERVIOUS
19	Combine	0.425	5	730	1,728	17, 18	------	------	PRDA 1B BYPASS
21	SCS Runoff	0.988	5	730	4,446	------	------	------	PRDA 1A IMPERVIOUS TO BASIN 1
22	SCS Runoff	2.110	5	730	8,446	------	------	------	PRDA 1A PERVIOUS TO BASIN 1
23	Combine	3.098	5	730	12,892	21, 22	------	------	PRDA 1A TO BASIN
24	Reservoir	0.538	5	765	10,675	23	254.78	6,562	BASIN 1 DISCHARGE
26	Combine	0.701	5	740	12,467	15, 19, 24,	------	------	PRDA 1 TOTAL
28	SCS Runoff	0.120	5	730	542	------	------	------	PRDA 2A LOT 1 HOUSE TO CHAMB
29	Reservoir	0.002	5	1345	27	28	2.38	520	LOT 1 CHAMBER DISCHARG
30	SCS Runoff	0.120	5	730	542	------	------	------	PRDA 2A LOT 2 HOUSE TO CHAMB
31	Reservoir	0.002	5	1345	27	30	2.38	520	LOT 2 CHAMBER DISCHARG
32	SCS Runoff	0.120	5	730	542	------	------	------	PRDA 2A LOT 3 HOUSE TO CHAMB
33	Reservoir	0.002	5	1345	27	32	2.38	520	LOT 3 CHAMBER DISCHARG
34	SCS Runoff	0.118	5	730	531	------	------	------	PRDA 2A LOT 4 HOUSE TO CHAMB
35	Reservoir	0.001	5	1425	16	34	2.38	518	LOT 4 CHAMBER DISCHARG
36	Combine	0.007	5	1345	97	29, 31, 33, 35	------	------	PRDA 2A CHAMBER DISCHARGE

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
38	SCS Runoff	0.187	5	730	793	------	------	------	PRDA 2B BYPASS-PERVIOUS
40	SCS Runoff	0.053	5	740	423	------	------	------	PRDA 2C PERVIOUS
42	SCS Runoff	1.253	5	730	5,639	------	------	------	PRDA 2A IMPERVIOUS
43	SCS Runoff	1.528	5	730	6,694	------	------	------	PRDA 2A PERVIOUS
44	Combine	2.780	5	730	12,333	42, 43	------	------	PRDA 2A COMBINE
45	Combine	2.812	5	730	12,853	36, 40, 44	------	------	PRDA 2 TO BASIN 2
46	Reservoir	0.171	5	950	6,421	45	225.59	8,747	BASIN 2 DISCHARGE
48	Combine	0.187	5	730	7,214	38, 46,	------	------	PRDA 2 TOTAL

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	3.834	5	745	22,165	------	------	------	EXDA 1
3	SCS Runoff	0.330	5	730	1,511	------	------	------	EXDA 2 IMPERVIOUS
4	SCS Runoff	1.783	5	750	11,968	------	------	------	EXDA 2 PERVIOUS
5	Combine	1.911	5	745	13,479	3, 4	------	------	EXDA 2
7	SCS Runoff	0.180	5	730	823	------	------	------	PRDA 1 LOT 5 HOUSE TO CHAMBE
8	Reservoir	0.023	5	775	307	7	2.48	559	LOT 5 CHAMBER DISCHARG
9	SCS Runoff	0.180	5	730	823	------	------	------	PRDA 1 LOT 6 HOUSE TO CHAMBE
10	Reservoir	0.023	5	775	307	9	2.48	559	LOT 6 CHAMBER DISCHARG
11	SCS Runoff	0.180	5	730	823	------	------	------	PRDA 1 LOT 7 HOUSE TO CHAMBE
12	Reservoir	0.023	5	775	307	11	2.48	559	LOT 7 CHAMBER DISCHARG
13	SCS Runoff	0.180	5	730	823	------	------	------	PRDA 1 LOT 8 HOUSE TO CHAMBE
14	Reservoir	0.023	5	775	307	13	2.48	559	LOT 8 CHAMBER DISCHAR
15	Combine	0.092	5	775	1,228	8, 10, 12, 14	------	------	PRDA 1 DRYWELL DISCHARGE
17	SCS Runoff	0.110	5	730	504	------	------	------	PRDA 1B BYPASS- IMPERVIOUS
18	SCS Runoff	0.661	5	730	2,639	------	------	------	PRDA 1B BYPASS- PERVIOUS
19	Combine	0.771	5	730	3,143	17, 18	------	------	PRDA 1B BYPASS
21	SCS Runoff	1.503	5	730	6,883	------	------	------	PRDA 1A IMPERVIOUS TO BASIN 1
22	SCS Runoff	4.165	5	730	16,557	------	------	------	PRDA 1A PERVIOUS TO BASIN 1
23	Combine	5.667	5	730	23,439	21, 22	------	------	PRDA 1A TO BASIN
24	Reservoir	2.121	5	750	21,222	23	255.35	10,660	BASIN 1 DISCHARGE
26	Combine	2.439	5	750	25,593	15, 19, 24,	------	------	PRDA 1 TOTAL
28	SCS Runoff	0.183	5	730	839	------	------	------	PRDA 2A LOT 1 HOUSE TO CHAMB
29	Reservoir	0.026	5	770	324	28	2.50	563	LOT 1 CHAMBER DISCHARG
30	SCS Runoff	0.183	5	730	839	------	------	------	PRDA 2A LOT 2 HOUSE TO CHAMB
31	Reservoir	0.026	5	770	324	30	2.50	563	LOT 2 CHAMBER DISCHARG
32	SCS Runoff	0.183	5	730	839	------	------	------	PRDA 2A LOT 3 HOUSE TO CHAMB
33	Reservoir	0.026	5	770	324	32	2.50	563	LOT 3 CHAMBER DISCHARG
34	SCS Runoff	0.180	5	730	823	------	------	------	PRDA 2A LOT 4 HOUSE TO CHAMB
35	Reservoir	0.023	5	775	307	34	2.48	559	LOT 4 CHAMBER DISCHARG
36	Combine	0.101	5	770	1,279	29, 31, 33, 35	------	------	PRDA 2A CHAMBER DISCHARGE

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
38	SCS Runoff	0.439	5	730	1,758	------	------	------	PRDA 2B BYPASS-PERVIOUS
40	SCS Runoff	0.292	5	730	1,414	------	------	------	PRDA 2C PERVIOUS
42	SCS Runoff	1.906	5	730	8,729	------	------	------	PRDA 2A IMPERVIOUS
43	SCS Runoff	3.810	5	730	15,374	------	------	------	PRDA 2A PERVIOUS
44	Combine	5.716	5	730	24,103	42, 43	------	------	PRDA 2A COMBINE
45	Combine	6.009	5	730	26,797	36, 40, 44	------	------	PRDA 2 TO BASIN 2
46	Reservoir	0.514	5	875	20,365	45	226.42	15,367	BASIN 2 DISCHARGE
48	Combine	0.637	5	735	22,123	38, 46,	------	------	PRDA 2 TOTAL

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	9.526	5	740	53,119	------	------	------	EXDA 1
3	SCS Runoff	0.549	5	730	2,554	------	------	------	EXDA 2 IMPERVIOUS
4	SCS Runoff	6.191	5	745	35,798	------	------	------	EXDA 2 PERVIOUS
5	Combine	6.468	5	740	38,352	3, 4	------	------	EXDA 2
7	SCS Runoff	0.299	5	730	1,391	------	------	------	PRDA 1 LOT 5 HOUSE TO CHAMBE
8	Reservoir	0.061	5	760	875	7	3.61	840	LOT 5 CHAMBER DISCHARG
9	SCS Runoff	0.299	5	730	1,391	------	------	------	PRDA 1 LOT 6 HOUSE TO CHAMBE
10	Reservoir	0.060	5	760	875	9	3.62	841	LOT 6 CHAMBER DISCHARG
11	SCS Runoff	0.299	5	730	1,391	------	------	------	PRDA 1 LOT 7 HOUSE TO CHAMBE
12	Reservoir	0.097	5	750	875	11	3.39	791	LOT 7 CHAMBER DISCHARG
13	SCS Runoff	0.299	5	730	1,391	------	------	------	PRDA 1 LOT 8 HOUSE TO CHAMBE
14	Reservoir	0.060	5	760	875	13	3.62	841	LOT 8 CHAMBER DISCHAR
15	Combine	0.277	5	755	3,501	8, 10, 12, 14	------	------	PRDA 1 DRYWELL DISCHARGE
17	SCS Runoff	0.183	5	730	851	------	------	------	PRDA 1B BYPASS- IMPERVIOUS
18	SCS Runoff	1.276	5	730	5,237	------	------	------	PRDA 1B BYPASS- PERVIOUS
19	Combine	1.459	5	730	6,088	17, 18	------	------	PRDA 1B BYPASS
21	SCS Runoff	2.503	5	730	11,636	------	------	------	PRDA 1A IMPERVIOUS TO BASIN 1
22	SCS Runoff	8.376	5	730	33,972	------	------	------	PRDA 1A PERVIOUS TO BASIN 1
23	Combine	10.88	5	730	45,609	21, 22	------	------	PRDA 1A TO BASIN
24	Reservoir	6.408	5	740	43,391	23	256.08	15,747	BASIN 1 DISCHARGE
26	Combine	7.571	5	740	52,981	15, 19, 24,	------	------	PRDA 1 TOTAL
28	SCS Runoff	0.305	5	730	1,419	------	------	------	PRDA 2A LOT 1 HOUSE TO CHAMB
29	Reservoir	0.060	5	760	904	28	3.70	858	LOT 1 CHAMBER DISCHARG
30	SCS Runoff	0.305	5	730	1,419	------	------	------	PRDA 2A LOT 2 HOUSE TO CHAMB
31	Reservoir	0.080	5	755	904	30	3.57	830	LOT 2 CHAMBER DISCHARG
32	SCS Runoff	0.305	5	730	1,419	------	------	------	PRDA 2A LOT 3 HOUSE TO CHAMB
33	Reservoir	0.093	5	750	904	32	3.48	810	LOT 3 CHAMBER DISCHARG
34	SCS Runoff	0.299	5	730	1,391	------	------	------	PRDA 2A LOT 4 HOUSE TO CHAMB
35	Reservoir	0.066	5	755	875	34	3.58	832	LOT 4 CHAMBER DISCHARG
36	Combine	0.299	5	755	3,586	29, 31, 33, 35	------	------	PRDA 2A CHAMBER DISCHARGE

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
38	SCS Runoff	1.000	5	730	3,981	------	------	------	PRDA 2B BYPASS-PERVIOUS
40	SCS Runoff	1.038	5	730	4,231	------	------	------	PRDA 2C PERVIOUS
42	SCS Runoff	3.174	5	730	14,758	------	------	------	PRDA 2A IMPERVIOUS
43	SCS Runoff	9.005	5	730	35,792	------	------	------	PRDA 2A PERVIOUS
44	Combine	12.18	5	730	50,550	42, 43	------	------	PRDA 2A COMBINE
45	Combine	13.43	5	730	58,367	36, 40, 44	------	------	PRDA 2 TO BASIN 2
46	Reservoir	4.196	5	755	51,936	45	227.79	26,487	BASIN 2 DISCHARGE
48	Combine	4.506	5	750	55,917	38, 46,	------	------	PRDA 2 TOTAL

Hydraflow Rainfall Report

Return Period (Yrs)	Intensity-Duration-Frequency Equation Coefficients (FHA)			
	B	D	E	(N/A)
1	0.0000	0.0000	0.0000	--------
2	69.8703	13.1000	0.8658	--------
3	0.0000	0.0000	0.0000	--------
5	79.2597	14.6000	0.8369	--------
10	88.2351	15.5000	0.8279	--------
25	102.6072	16.5000	0.8217	--------
50	114.8193	17.2000	0.8199	--------
100	127.1596	17.8000	0.8186	--------

File name: SampleFHA.idf

Intensity = B / (Tc + D)^E

Return Period (Yrs)	Intensity Values (in/hr)											
	5 min	10	15	20	25	30	35	40	45	50	55	60
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	5.69	4.61	3.89	3.38	2.99	2.69	2.44	2.24	2.07	1.93	1.81	1.70
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	6.57	5.43	4.65	4.08	3.65	3.30	3.02	2.79	2.59	2.42	2.27	2.15
10	7.24	6.04	5.21	4.59	4.12	3.74	3.43	3.17	2.95	2.77	2.60	2.46
25	8.25	6.95	6.03	5.34	4.80	4.38	4.02	3.73	3.48	3.26	3.07	2.91
50	9.04	7.65	6.66	5.92	5.34	4.87	4.49	4.16	3.88	3.65	3.44	3.25
100	9.83	8.36	7.30	6.50	5.87	5.36	4.94	4.59	4.29	4.03	3.80	3.60

Tc = time in minutes. Values may exceed 60.

Precip. file name: F:\2015\0115210 - Parisi - Gillette\docs\Reports\Stormwater\Resources\Long Hill Twp.pcp

Storm Distribution	Rainfall Precipitation Table (in)							
	1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr
SCS 24-hour	0.00	3.42	0.00	4.46	5.17	6.36	7.31	8.58
SCS 6-Hr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-1st	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-2nd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-3rd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-4th	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-Indy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Custom	1.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00

APPENDIX C – CURVE NUMBER WORKSHEETS

Project: **Delaware Ave Subdivision**
Location: **Long Hill Twp.**
Morris County, NJ

By: KO
Date: Jan. 2019
Chk'd: CN
Revised:

Watershed: **EXDA 1 - Pre-Developed Watershed Pervious**

RUNOFF CURVE NUMBER CALCULATIONS:

(S.C.S. TR-55 method)

Soil name and hydrologic group	Cover Description	Cn	Area (sf)	Area (acres)	Product of CN x Area
PeoC (B)	Wooded	55	25,215	0.58	31.84
PeoB (B)	Wooded	55	36,720	0.84	46.36
MknB (D)	Wooded	77	72,369	1.66	127.93

'C' Soils:
PeoC - Penn

Totals = 3.08 206.13

Composite Cn = $\frac{206.13}{3.08}$ = 66.85

USE Cn = 67

Project: **Delaware Ave Subdivision**
Location: **Long Hill Twp.**
Morris County, NJ

By: KO
Date: Jan. 2019
Chk'd: CN
Revised:

Watershed: **EXDA 2 - Pre-Developed Watershed Pervious**

RUNOFF CURVE NUMBER CALCULATIONS:

(S.C.S. TR-55 method)

Soil name and hydrologic group	Cover Description	Cn	Area (sf)	Area (acres)	Product of CN x Area
PeoC (B)	Wooded	55	127,676	2.93	161.21
PgmD (C)	Wooded	70	1,579	0.04	2.54
MknB (D)	Wooded	77	1,474	0.03	2.61
PbpAt (D)	Wooded	77	0	0.00	0.00

'C' Soils:
PeoC - Penn

Totals = 3.00 166.35

Composite Cn = $\frac{166.35}{3.00}$ = 55.43

USE Cn = 55

Project: **Delaware Ave Subdivision**
Location: **Long Hill Twp.**
Morris County, NJ

By: KO
Date: Jan. 2019
Chk'd: CN
Revised:

Watershed: **EXDA 2 - Pre-Developed Impervious**

RUNOFF CURVE NUMBER CALCULATIONS:

(S.C.S. TR-55 method)

Soil name and hydrologic group	Cover Description	Cn	Area (sf)	Area (acres)	Product of CN x Area
MknB (D)	Impervious	98	368	0.01	0.83
PeoC (B)	Impervious	98	3,341	0.08	7.52

'B' Soils:
UR - Urban Land

Totals = 0.09 8.34

Composite Cn = 8.34 / 0.09 = 98.00

USE Cn = 98

Project: **Delaware Ave Subdivision**
Location: **Long Hill Twp.**
Morris County, NJ

By: KO
Date: Jan. 2019
Chk'd: CN
Revised:

Watershed: **PRDA 1A - Post-Developed Watershed SWM Basin 1 - Impervious**

RUNOFF CURVE NUMBER CALCULATIONS:

(S.C.S. TR-55 method)

Soil name and hydrologic group	Cover Description	Cn	Area (sf)	Area (acres)	Product of CN x Area
PeoC (B)	Impervious	98	2,983	0.07	6.71
PeoB (B)	Impervious	98	5,516	0.13	12.41
MknB (D)	Impervious	98	9,155	0.21	20.60

'B' Soils:
UR - Urban Land

Totals = 0.41 39.72

Composite Cn = $\frac{39.72}{0.41}$ = 98.00

USE Cn = 98

Project: **Delaware Ave Subdivision**
Location: **Long Hill Twp.**
Morris County, NJ

By: KO
Date: Jan. 2019
Chk'd: CN
Revised:

Watershed: **PRDA 1A - Post-Developed Watershed Basin 1 - Pervious**

RUNOFF CURVE NUMBER CALCULATIONS:

(S.C.S. TR-55 method)

Soil name and hydrologic group	Cover Description	Cn	Area (sf)	Area (acres)	Product of CN x Area
PeoC (B)	Open Space (Lawn)	69	8,154	0.19	12.92
PeoB (B)	Open Space (Lawn)	69	16,323	0.37	25.86
MknB (D)	Open Space (Lawn)	84	47,531	1.09	91.66
Totals =			1.65		130.43

'B' Soils:
UR - Urban Land

Composite Cn = $\frac{130.43}{1.65}$ = 78.90

USE Cn = 79

Project: **Delaware Ave Subdivision**
Location: **Long Hill Twp.**
Morris County, NJ

By: KO
Date: Jan. 2019
Chk'd: CN
Revised:

Watershed: **PRDA 1B - Post-Developed Watershed Basin 1 - Impervious**

RUNOFF CURVE NUMBER CALCULATIONS:

(S.C.S. TR-55 method)

Soil name and hydrologic group	Cover Description	Cn	Area (sf)	Area (acres)	Product of CN x Area
PeoB (B)	Impervious	98	1,067	0.02	2.40
MknB (D)	Impervious	98	208	0.00	0.47

'B' Soils:
UR - Urban Land

Totals = 0.03 2.87

Composite Cn = 2.87 / 0.03 = 98.00

USE Cn = 98

Project: **Delaware Ave Subdivision**
Location: **Long Hill Twp.**
Morris County, NJ

By: KO
Date: Jan. 2019
Chk'd: CN
Revised:

Watershed: **PRDA 1B - Post-Developed Watershed Basin 1 - Pervious**

RUNOFF CURVE NUMBER CALCULATIONS:

(S.C.S. TR-55 method)

Soil name and hydrologic group	Cover Description	Cn	Area (sf)	Area (acres)	Product of CN x Area
PeoB (B)	Open Space (Lawn)	69	1,428	0.03	2.26
MknB (D)	Open Space (Lawn)	84	8,867	0.20	17.10

'B' Soils:
UR - Urban Land

Totals = 0.24 19.36

Composite Cn = 19.36 / 0.24 = 81.92

USE Cn = 82

Project: **Delaware Ave Subdivision**
Location: **Long Hill Twp.**
Morris County, NJ

By: KO
Date: Jan. 2019
Chk'd: CN
Revised:

Watershed: **PRDA 2A - Post-Developed Watershed Basin 2 - Impervious**

RUNOFF CURVE NUMBER CALCULATIONS:

(S.C.S. TR-55 method)

Soil name and hydrologic group	Cover Description	Cn	Area (sf)	Area (acres)	Product of CN x Area
PeoC (B)	Impervious	98	20,440	0.47	45.99
MknB (D)	Impervious	98	840	0.02	1.89
PeoB (B)	Impervious	98	1,225	0.03	2.76

'B' Soils:
UR - Urban Land

Totals = 0.52 50.63

Composite Cn = $\frac{50.63}{0.52}$ = 98.00

USE Cn = 98

Project: **Delaware Ave Subdivision**
Location: **Long Hill Twp.**
Morris County, NJ

By: KO
Date: Jan. 2019
Chk'd: CN
Revised:

Watershed: **PRDA 2A - Post-Developed Watershed Basin 2 - Pervious**

RUNOFF CURVE NUMBER CALCULATIONS:

(S.C.S. TR-55 method)

Soil name and hydrologic group	Cover Description	Cn	Area (sf)	Area (acres)	Product of CN x Area
PeoC (B)	Open Space (Lawn)	69	82,245	1.93	133.17
MknB (D)	Open Space (Lawn)	84	983	0.02	1.90
PeoB (B)	Open Space (Lawn)	69	9,286	0.21	14.71

'B' Soils:
UR - Urban Land

Totals = 2.17 149.77

Composite Cn = $\frac{149.77}{2.17}$ = 69.16

USE Cn = 69

Project: **Delaware Ave Subdivision**
Location: **Long Hill Twp.**
Morris County, NJ

By: KO
Date: Jan. 2019
Chk'd: CN
Revised:

Watershed: **PRDA 2B - Post-Developed Watershed Bypass - Pervious**

RUNOFF CURVE NUMBER CALCULATIONS:

(S.C.S. TR-55 method)

Soil name and hydrologic group	Cover Description	Cn	Area (sf)	Area (acres)	Product of CN x Area
PeoC (B)	Open Space (Lawn)	69	8,339	0.19	13.11
PgmD (C)	Open Space (Lawn)	84	1,579	0.04	3.04

'B' Soils:
UR - Urban Land

Totals = 0.23 16.15

Composite Cn = 16.15 / 0.23 = 71.40

USE Cn = 71

Project: **Delaware Ave Subdivision**
Location: **Long Hill Twp.**
Morris County, NJ

By: KO
Date: Jan. 2019
Chk'd: CN
Revised:

Watershed: **PRDA 2C - Post-Developed Wooded Area - Pervious**

RUNOFF CURVE NUMBER CALCULATIONS:

(S.C.S. TR-55 method)

Soil name and hydrologic group	Cover Description	Cn	Area (sf)	Area (acres)	Product of CN x Area
PeoC (B)	Wooded	55	16,875	0.39	21.31

'B' Soils:
UR - Urban Land

Totals = 0.39 21.31

Composite Cn = 21.31 / 0.39 = 55.00

USE Cn = 55

APPENDIX D – TIME OF CONCENTRATION WORKSHEETS

TR 55 Worksheet 3: Time of Concentration (T_c) or Travel Time (T_t)

Project: PARISI-GILLETTE Designed By: MEGAN SCHMIDT Date: 9/05/18

Location: DELAWARE AVENUE, LONG HILL, NJ Checked By: CHRIS NUSSER Date: 9/05/18

Check one: ✓ Present Developed

Check one: ✓ T_c T_t through subarea DA #1

NOTES: Space for as many as two segments per flow type can be used for each worksheet. Include a map, schematic, or description of flow segments.

Sheet Flow (Applicable to T_c only)	Segment ID	A				
1. Surface description (Table 3-1)		WOODS				
2. Manning's roughness coeff., n (Table 3-1)		0.80				
3. Flow length, L (total L ≤ 100 ft) ft		100				
4. Two-year 24-hour rainfall, P_2 in		3.4				
5. Land slope, s ft/ft		0.077				
6. $T_t = \frac{0.007\,(nL)^{0.8}}{P_2^{0.5}\,s^{0.4}}$ Compute T_t hr		0.35	+		=	0.35
Shallow Concetrated Flow	Segment ID	B	C			
7. Surface description (paved or unpaved)		UNPAVED	UNPAVED			
8. Flow length, L ft		200	170			
9. Watercourse slope, s ft/ft		0.058	0.096			
10. Average velocity, V (Figure 3-1) ft/s		3.8	4.8			
11. $T_t = \frac{L}{3600\,V}$ Compute T_t hr		0.01	+	0.01	=	0.02
Channel Flow	Segment ID					
12. Cross sectional flow area, a ft^2						
13. Wetted perimeter, P_w ft						
14. Hydraulic radius, $r = \frac{a}{P_w}$ Compute r ft						
15. Channel Slope, s ft/ft						
16. Manning's Roughness Coeff., n						
17. $V = \frac{1.49\,r^{2/3}\,s^{1/2}}{n}$ Compute V ft/s						
18. Flow length, L ft						
19. $T_t = \frac{L}{3600\,V}$ Compute T_t hr			+		=	

20. Watershed or subarea T_c or T_t (add T_t in steps 6, 11, and 19 hr: 0.38

TR 55 Worksheet 3: Time of Concentration (T_c) or Travel Time (T_t)

Project: PARISI-GILLETTE Designed By: MEGAN SCHMIDT Date: 9/05/18

Location: DELAWARE AVE, LONG HILL, NJ Checked By: CHRIS NUSSER Date: 9/05/18

Check one: ✓ Present Developed

Check one: ✓ T_c T_t through subarea DA #2

NOTES: Space for as many as two segments per flow type can be used for each worksheet. Include a map, schematic, or description of flow segments.

Sheet Flow (Applicable to T_c only)	Segment ID	A				
1. Surface description (Table 3-1)		WOODS				
2. Manning's roughness coeff., n (Table 3-1)		0.80				
3. Flow length, L (total L ≤ 100 ft) ft		100				
4. Two-year 24-hour rainfall, P_2 in		3.4				
5. Land slope, s ft/ft		0.071				
6. $T_t = \frac{0.007\,(nL)^{0.8}}{P_2^{0.5}\,s^{0.4}}$ Compute T_t hr		0.36	+		=	0.36
Shallow Concetrated Flow	Segment ID	B	C			
7. Surface description (paved or unpaved)		UNPAVED	UNPAVED			
8. Flow length, L ft		94	407			
9. Watercourse slope, s ft/ft		0.033	0.130			
10. Average velocity, V (Figure 3-1) ft/s		1.7	5.9			
11. $T_t = \frac{L}{3600\,V}$ Compute T_t hr		0.02	+	0.02	=	0.03
Channel Flow	Segment ID					
12. Cross sectional flow area, a ft^2						
13. Wetted perimeter, P_w ft						
14. Hydraulic radius, $r = \frac{a}{P_w}$ Compute r ft						
15. Channel Slope, s ft/ft						
16. Manning's Roughness Coeff., n						
17. $V = \frac{1.49\,r^{2/3}\,s^{1/2}}{n}$ Compute V ft/s						
18. Flow length, L ft						
19. $T_t = \frac{L}{3600\,V}$ Compute T_t hr			+		=	

20. Watershed or subarea T_c or T_t (add T_t in steps 6, 11, and 19 hr: 0.40

TR 55 Worksheet 3: Time of Concentration (T_c) or Travel Time (T_t)

Project: PARISI-GILLETTE Designed By: MEGAN SCHMIDT Date: 9/5/18

Location: DELAWARE AVE, LONG HILL, NJ Checked By: CHRIS NUSSER Date: 9/5/18

Check one: Present ✓ Developed

Check one: ✓ T_c T_t through subarea PDA #1

NOTES: Space for as many as two segments per flow type can be used for each worksheet. Include a map, schematic, or description of flow segments.

Sheet Flow (Applicable to T_c only)	Segment ID	A	B		
1. Surface description (Table 3-1)		LAWN	LAWN		
2. Manning's roughness coeff., n (Table 3-1)		0.24	0.24		
3. Flow length, L (total L ≤ 100 ft)	ft	55	45		
4. Two-year 24-hour rainfall, P_2	in	3.4	3.4		
5. Land slope, s	ft/ft	0.027	0.033		
6. $T_t = \frac{0.007\,(nL)^{0.8}}{P_2^{0.5}\, s^{0.4}}$ Compute T_t	hr	0.13	+ 0.10	=	0.23

Shallow Concetrated Flow	Segment ID	C			
7. Surface description (paved or unpaved)		PAVED			
8. Flow length, L	ft	230			
9. Watercourse slope, s	ft/ft	0.039			
10. Average velocity, V (Figure 3-1)	ft/s	4.0			
11. $T_t = \frac{L}{3600\, V}$ Compute T_t	hr	0.02	+	=	0.02

Channel Flow	Segment ID	D	E		
12. Cross sectional flow area, a	ft^2	3.1	3.1		
13. Wetted perimeter, P_w	ft	3.1	3.1		
14. Hydraulic radius, $r = \frac{a}{P_w}$ Compute r	ft	1.0	1.0		
15. Channel Slope, s	ft/ft	0.031	0.012		
16. Manning's Roughness Coeff., n		0.01	0.01		
17. $V = \frac{1.49\, r^{2/3}\, s^{1/2}}{n}$ Compute V	ft/s	29.3	18.1		
18. Flow length, L	ft	42	88		
19. $T_t = \frac{L}{3600\, V}$ Compute T_t	hr	0.00	+ 0.00	=	0.00

20. Watershed or subarea T_c or T_t (add T_t in steps 6, 11, and 19 ..... hr 0.24

TR 55 Worksheet 3: Time of Concentration (T_c) or Travel Time (T_t)

Project: PARISI-GILLETTE Designed By: MEGAN SCHMIDT Date: 9/5/18

Location: DELAWARE AVE, LONG HILL TWP Checked By: CHRIS NUSSER Date: 9/5/18

Check one: Present ✓ Developed

Check one: ✓ T_c T_t through subarea PDA #1B

NOTES: Space for as many as two segments per flow type can be used for each worksheet. Include a map, schematic, or description of flow segments.

Sheet Flow (Applicable to T_c only)	Segment ID	A	B			
1. Surface description (Table 3-1)		LAWN	ASPHALT			
2. Manning's roughness coeff., n (Table 3-1)		0.24	0.01			
3. Flow length, L (total L ≤ 100 ft)	ft	97	30			
4. Two-year 24-hour rainfall, P_2	in	3.4	3.4			
5. Land slope, s	ft/ft	0.040	0.020			
6. $T_t = \frac{0.007\,(nL)^{0.8}}{P_2^{0.5}\, s^{0.4}}$ Compute T_t	hr	0.17	+ 0.01	=	0.18	
Shallow Concetrated Flow	Segment ID	C				
7. Surface description (paved or unpaved)		UNPAVED				
8. Flow length, L	ft	38				
9. Watercourse slope, s	ft/ft	0.090				
10. Average velocity, V (Figure 3-1)	ft/s	4.9				
11. $T_t = \frac{L}{3600\, V}$ Compute T_t	hr	0.00	+	=	0.00	
Channel Flow	Segment ID					
12. Cross sectional flow area, a	ft^2					
13. Wetted perimeter, P_w	ft					
14. Hydraulic radius, $r = \frac{a}{P_w}$ Compute r	ft					
15. Channel Slope, s	ft/ft					
16. Manning's Roughness Coeff., n						
17. $V = \frac{1.49\, r^{2/3}\, s^{1/2}}{n}$ Compute V	ft/s					
18. Flow length, L	ft					
19. $T_t = \frac{L}{3600\, V}$ Compute T_t	hr		+	=		

20. Watershed or subarea T_c or T_t (add T_t in steps 6, 11, and 19 ..... hr 0.18

TR 55 Worksheet 3: Time of Concentration (T_c) or Travel Time (T_t)

Project: PARISI-GILLETTE Designed By: MEGAN SCHMIDT Date: 9/5/18

Location: DELAWARE AVE, LONG HILL, NJ Checked By: CHRIS NUSSER Date: 9/5/18

Check one: Present ✓ Developed

Check one: ✓ T_c T_t through subarea PDA #2A

NOTES: Space for as many as two segments per flow type can be used for each worksheet. Include a map, schematic, or description of flow segments.

Sheet Flow (Applicable to T_c only)	Segment ID	A	B			
1. Surface description (Table 3-1)		LAWN	LAWN			
2. Manning's roughness coeff., n (Table 3-1)		0.24	0.24			
3. Flow length, L (total L ≤ 100 ft)	ft	53	58			
4. Two-year 24-hour rainfall, P_2	in	3.4	3.4			
5. Land slope, s	ft/ft	0.020	0.090			
6. $T_t = \frac{0.007\ (nL)^{0.8}}{P_2^{0.5}\ s^{0.4}}$ Compute T_t	hr	0.14	+ 0.08	=	0.22	
Shallow Concetrated Flow	Segment ID	C				
7. Surface description (paved or unpaved)		PAVED				
8. Flow length, L	ft	313				
9. Watercourse slope, s	ft/ft	0.100				
10. Average velocity, V (Figure 3-1)	ft/s	6.2				
11. $T_t = \frac{L}{3600\ V}$ Compute T_t	hr	0.01	+	=	0.01	
Channel Flow	Segment ID					
12. Cross sectional flow area, a	ft^2					
13. Wetted perimeter, P_w	ft					
14. Hydraulic radius, $r = \frac{a}{P_w}$ Compute r	ft					
15. Channel Slope, s	ft/ft					
16. Manning's Roughness Coeff., n						
17. $V = \frac{1.49\ r^{2/3}\ s^{1/2}}{n}$ Compute V	ft/s					
18. Flow length, L	ft					
19. $T_t = \frac{L}{3600\ V}$ Compute T_t	hr		+	=		

20. Watershed or subarea T_c or T_t (add T_t in steps 6, 11, and 19 ..... hr 0.23

TR 55 Worksheet 3: Time of Concentration (T_c) or Travel Time (T_t)

Project: PARISI-GILLETTE Designed By: MEGAN SCHMIDT Date: 9/5/18

Location: DELAWARE AVE, LONG HILL, NJ Checked By: CHRIS NUSSER Date: 9/5/18

Check one: Present ✓ Developed

Check one: ✓ T_c T_t through subarea PDA #2B

NOTES: Space for as many as two segments per flow type can be used for each worksheet. Include a map, schematic, or description of flow segments.

Sheet Flow (Applicable to T_c only)	Segment ID	A	B			
1. Surface description (Table 3-1)		LAWN	LAWN			
2. Manning's roughness coeff., n (Table 3-1)		0.24	0.24			
3. Flow length, L (total L ≤ 100 ft)	ft	81	97			
4. Two-year 24-hour rainfall, P_2	in	3.4	3.4			
5. Land slope, s	ft/ft	0.200	0.020			
6. $T_t = \frac{0.007\,(nL)^{0.8}}{P_2^{0.5}\,s^{0.4}}$	Compute T_t hr	0.08	+ 0.23	=	0.30	
Shallow Concetrated Flow	Segment ID					
7. Surface description (paved or unpaved)						
8. Flow length, L	ft					
9. Watercourse slope, s	ft/ft					
10. Average velocity, V (Figure 3-1)	ft/s					
11. $T_t = \frac{L}{3600\,V}$	Compute T_t hr		+	=		
Channel Flow	Segment ID					
12. Cross sectional flow area, a	ft^2					
13. Wetted perimeter, P_w	ft					
14. Hydraulic radius, $r = \frac{a}{P_w}$	Compute r ft					
15. Channel Slope, s	ft/ft					
16. Manning's Roughness Coeff., n						
17. $V = \frac{1.49\,r^{2/3}\,s^{1/2}}{n}$	Compute V ft/s					
18. Flow length, L	ft					
19. $T_t = \frac{L}{3600\,V}$	Compute T_t hr		+	=		

20. Watershed or subarea T_c or T_t (add T_t in steps 6, 11, and 19 ..... hr 0.30

TR 55 Worksheet 3: Time of Concentration (T_c) or Travel Time (T_t)

Project: PARISI-GILLETTE Designed By: MEGAN SCHMIDT Date: 9/5/18

Location: DELAWARE AVE, LONG HILL, NJ Checked By: CHRIS NUSSER Date: 9/5/18

Check one: Present ✓ Developed

Check one: ✓ T_c T_t through subarea PDA #2C

NOTES: Space for as many as two segments per flow type can be used for each worksheet. Include a map, schematic, or description of flow segments.

Sheet Flow (Applicable to T_c only)	Segment ID	A				
1. Surface description (Table 3-1)		WOODED				
2. Manning's roughness coeff., n (Table 3-1)		0.80				
3. Flow length, L (total L ≤ 100 ft) ft		97				
4. Two-year 24-hour rainfall, P_2 in		3.4				
5. Land slope, s ft/ft		0.167				
6. $T_t = \frac{0.007\,(nL)^{0.8}}{P_2^{0.5}\,s^{0.4}}$ Compute T_t hr		0.25	+		=	0.25
Shallow Concetrated Flow	Segment ID					
7. Surface description (paved or unpaved)						
8. Flow length, L ft						
9. Watercourse slope, s ft/ft						
10. Average velocity, V (Figure 3-1) ft/s						
11. $T_t = \frac{L}{3600\,V}$ Compute T_t hr			+		=	
Channel Flow	Segment ID					
12. Cross sectional flow area, a ft^2						
13. Wetted perimeter, P_w ft						
14. Hydraulic radius, $r = \frac{a}{P_w}$ Compute r ft						
15. Channel Slope, s ft/ft						
16. Manning's Roughness Coeff., n						
17. $V = \frac{1.49\,r^{2/3}\,s^{1/2}}{n}$ Compute V ft/s						
18. Flow length, L ft						
19. $T_t = \frac{L}{3600\,V}$ Compute T_t hr			+		=	

20. Watershed or subarea T_c or T_t (add T_t in steps 6, 11, and 19 hr 0.25

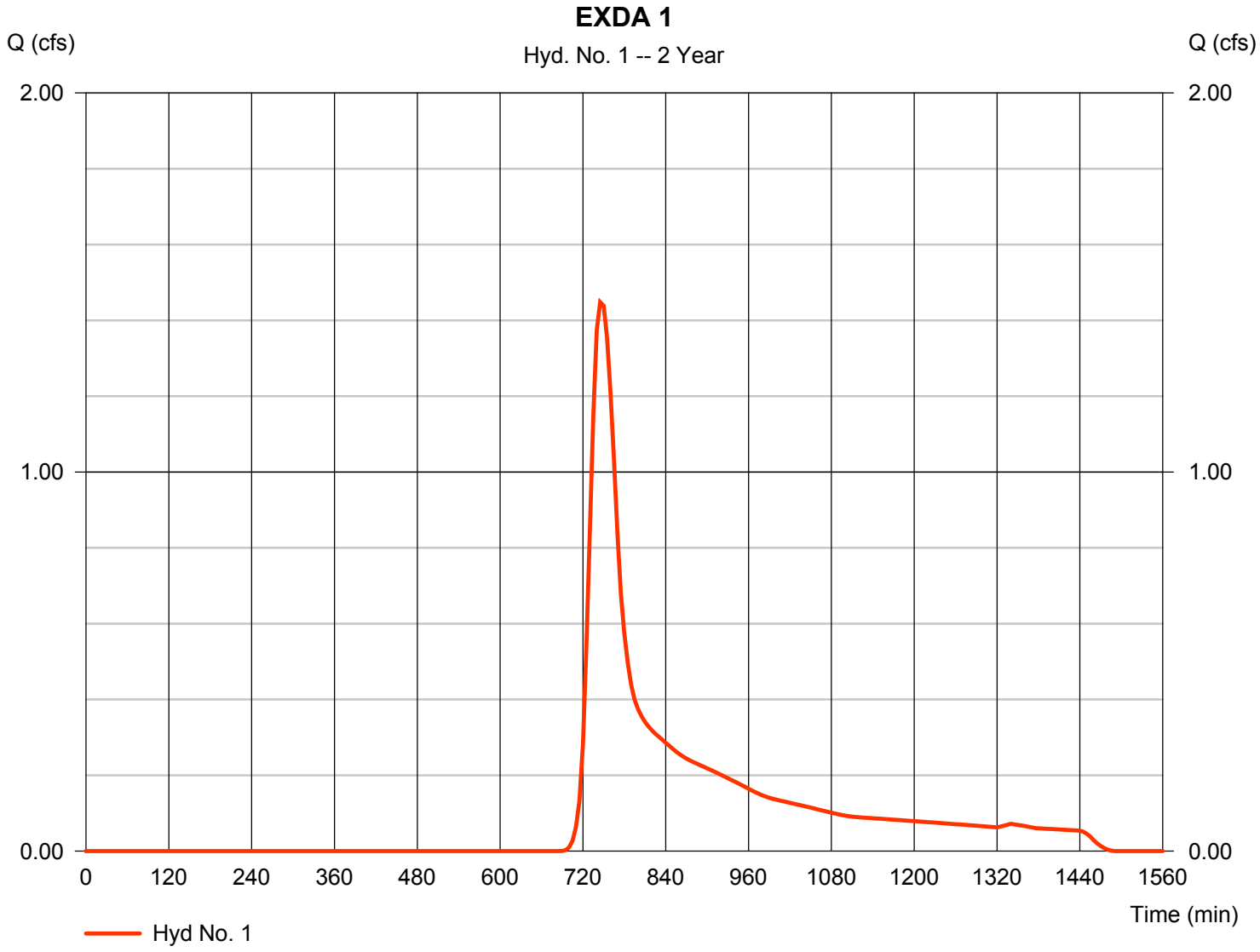
APPENDIX E – EXISTING HYDRLOGIC ANALYSIS AND RUNOFF QUANTITY CALCULATIONS

Hydrograph Report

Hyd. No. 1

EXDA 1

Hydrograph type	= SCS Runoff	Peak discharge	= 1.448 cfs
Storm frequency	= 2 yrs	Time to peak	= 745 min
Time interval	= 5 min	Hyd. volume	= 9,287 cuft
Drainage area	= 3.080 ac	Curve number	= 67
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 25.00 min
Total precip.	= 3.42 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

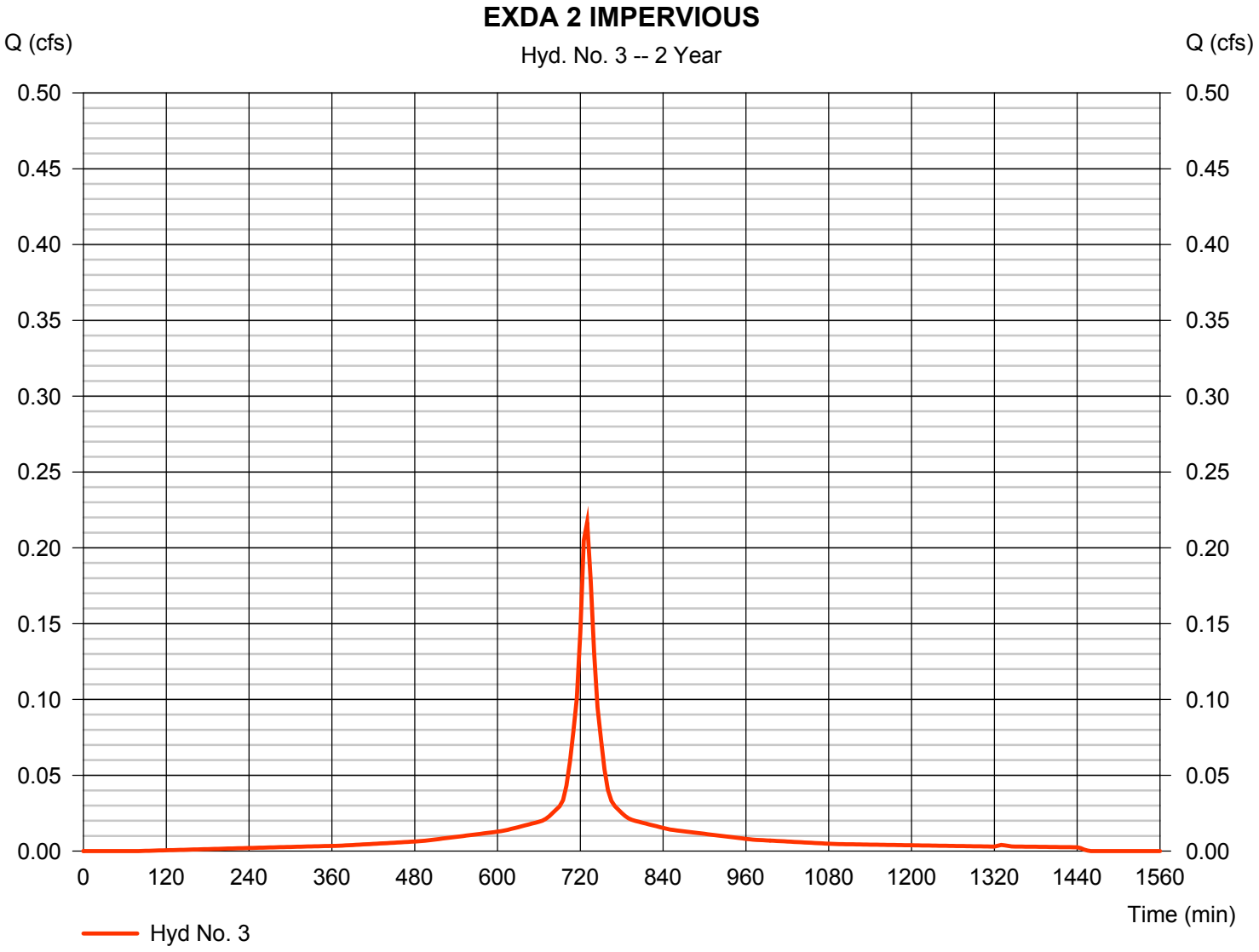


Hydrograph Report

Hyd. No. 3

EXDA 2 IMPERVIOUS

Hydrograph type	= SCS Runoff	Peak discharge	= 0.217 cfs
Storm frequency	= 2 yrs	Time to peak	= 730 min
Time interval	= 5 min	Hyd. volume	= 976 cuft
Drainage area	= 0.090 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.00 min
Total precip.	= 3.42 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

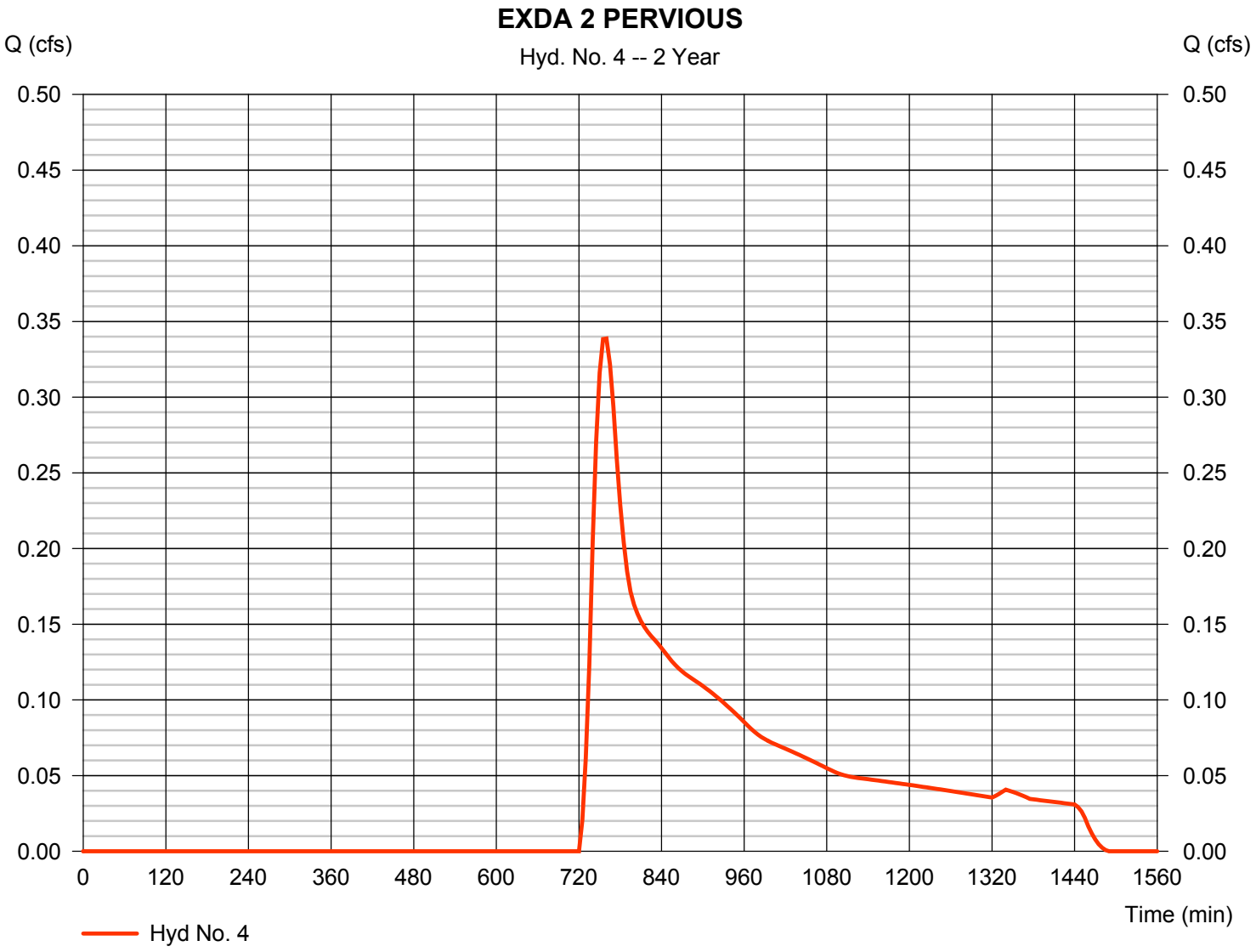


Hydrograph Report

Hyd. No. 4

EXDA 2 PERVIOUS

Hydrograph type	= SCS Runoff	Peak discharge	= 0.339 cfs
Storm frequency	= 2 yrs	Time to peak	= 760 min
Time interval	= 5 min	Hyd. volume	= 3,578 cuft
Drainage area	= 3.000 ac	Curve number	= 55
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 25.00 min
Total precip.	= 3.42 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

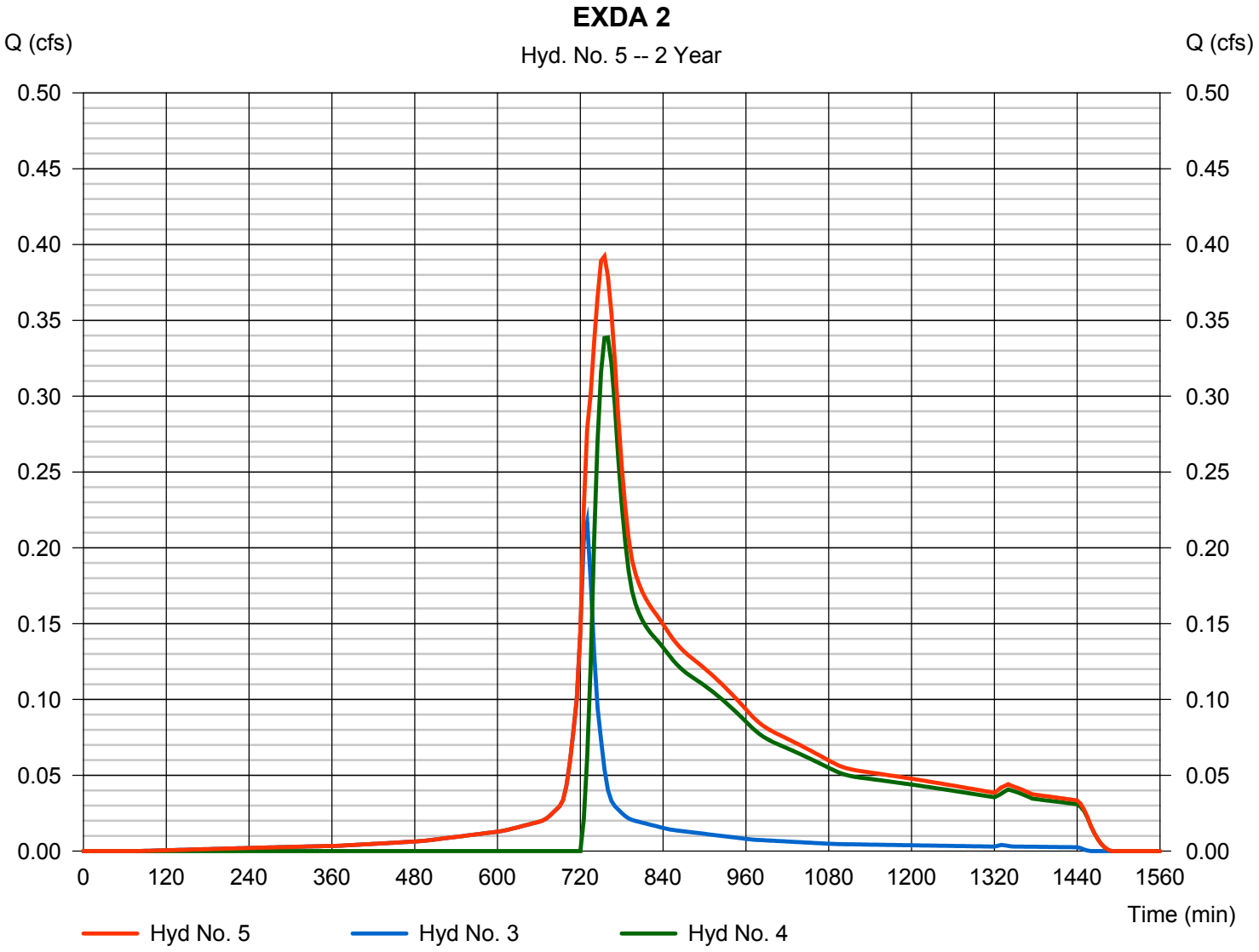


Hydrograph Report

Hyd. No. 5

EXDA 2

Hydrograph type	= Combine	Peak discharge	= 0.392 cfs
Storm frequency	= 2 yrs	Time to peak	= 755 min
Time interval	= 5 min	Hyd. volume	= 4,554 cuft
Inflow hyds.	= 3, 4	Contrib. drain. area	= 3.090 ac

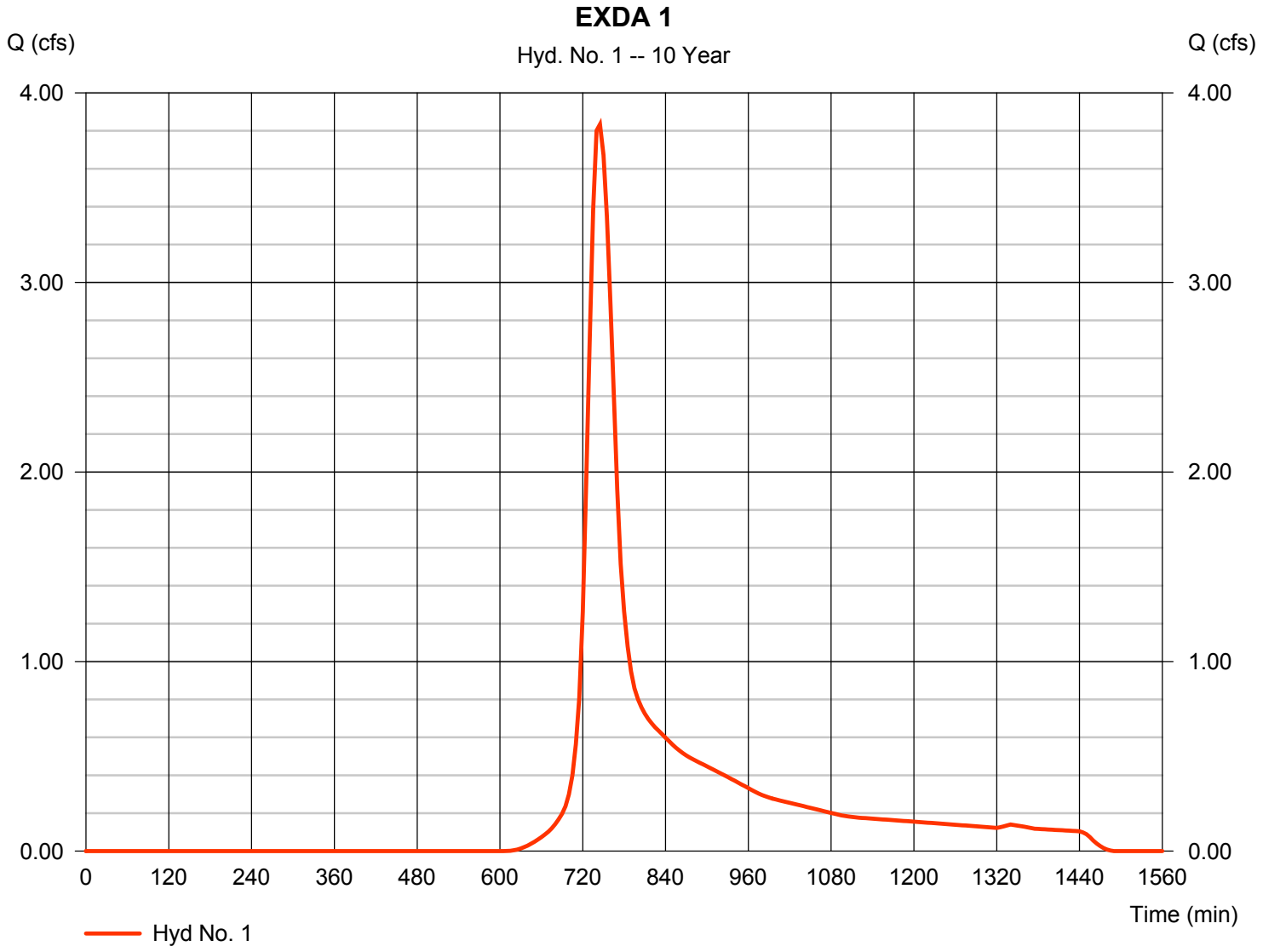


Hydrograph Report

Hyd. No. 1

EXDA 1

Hydrograph type	=	SCS Runoff	Peak discharge	=	3.834 cfs
Storm frequency	=	10 yrs	Time to peak	=	745 min
Time interval	=	5 min	Hyd. volume	=	22,165 cuft
Drainage area	=	3.080 ac	Curve number	=	67
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	25.00 min
Total precip.	=	5.17 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

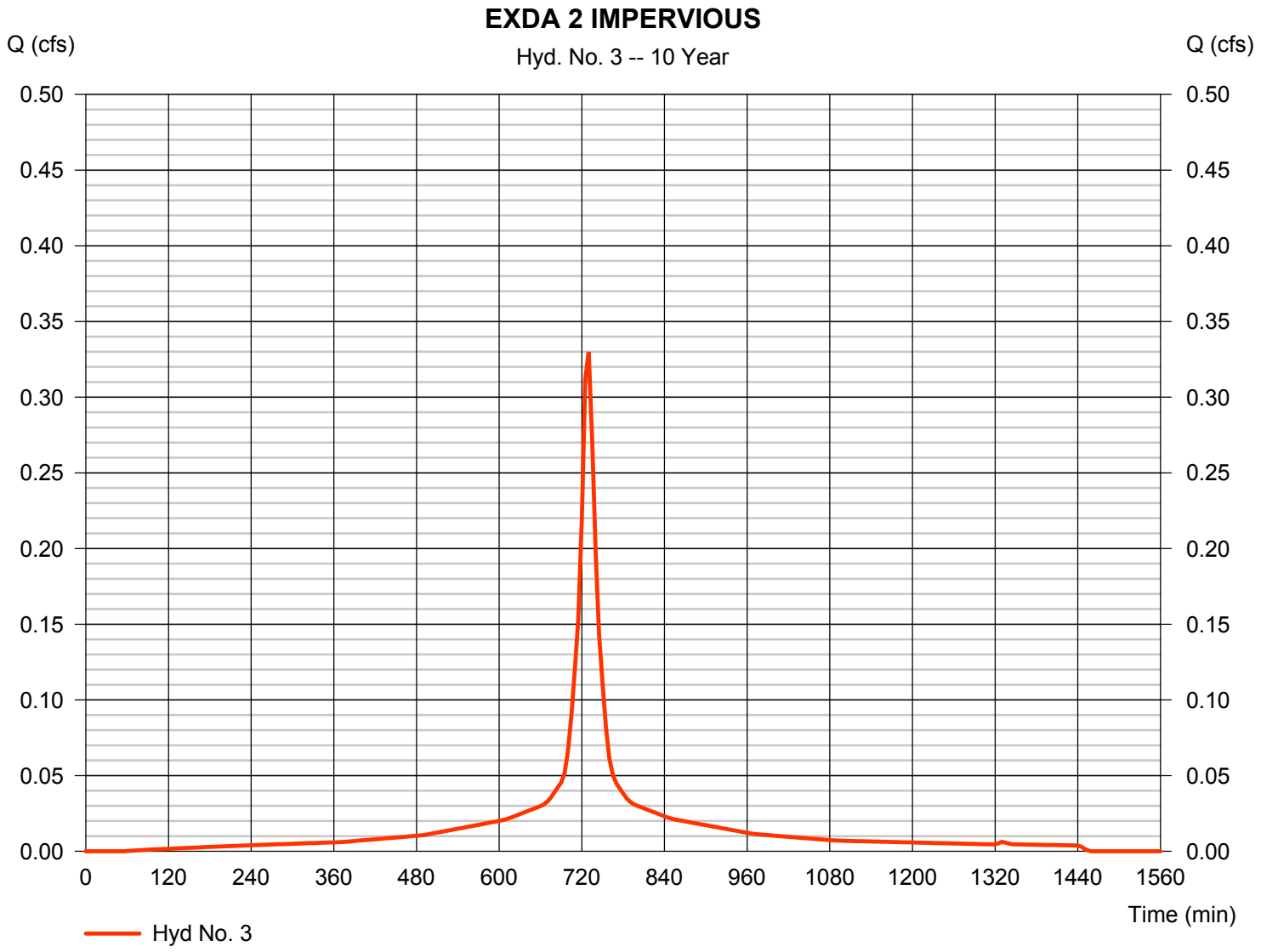


Hydrograph Report

Hyd. No. 3

EXDA 2 IMPERVIOUS

Hydrograph type	= SCS Runoff	Peak discharge	= 0.330 cfs
Storm frequency	= 10 yrs	Time to peak	= 730 min
Time interval	= 5 min	Hyd. volume	= 1,511 cuft
Drainage area	= 0.090 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.00 min
Total precip.	= 5.17 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

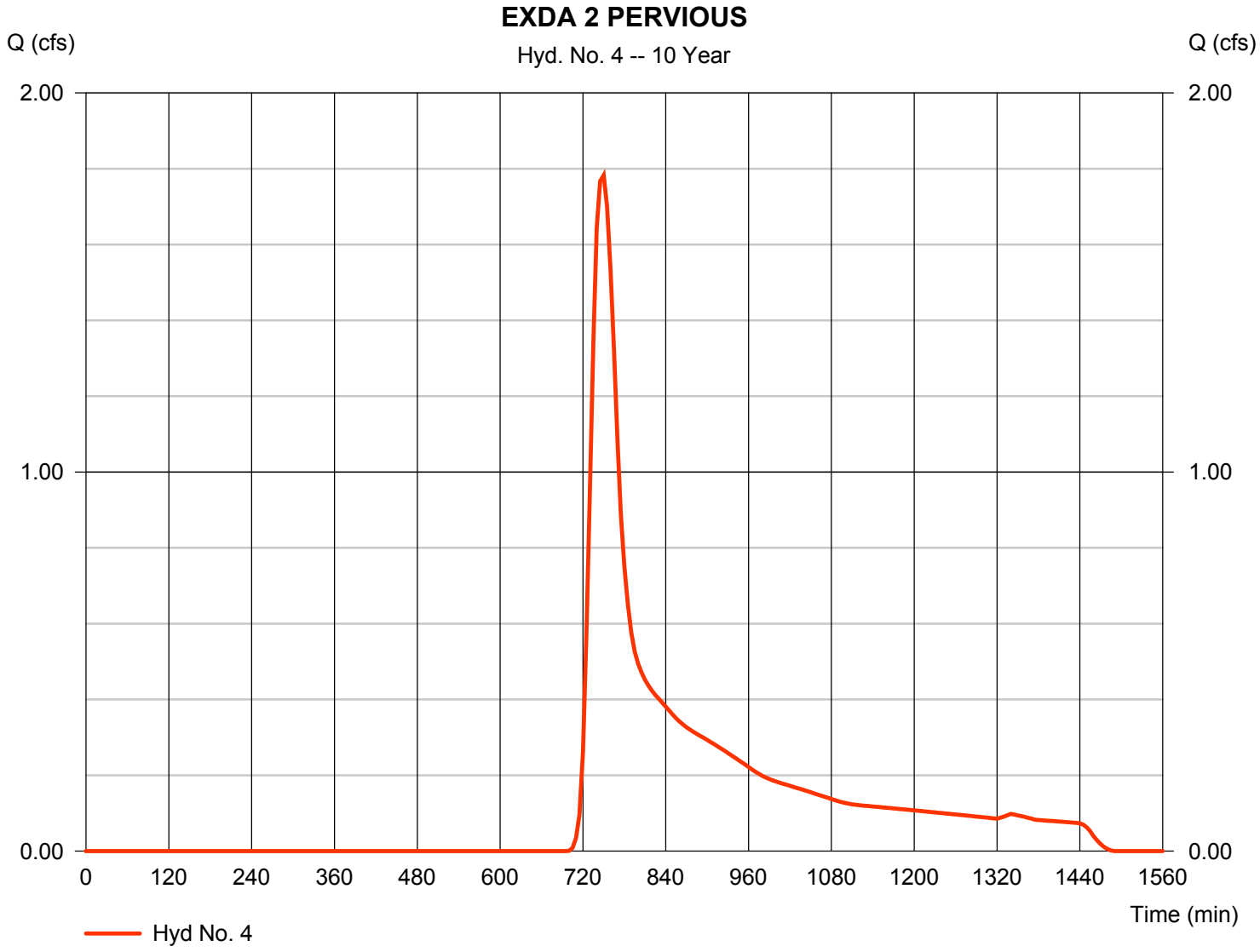


Hydrograph Report

Hyd. No. 4

EXDA 2 PERVIOUS

Hydrograph type	= SCS Runoff	Peak discharge	= 1.783 cfs
Storm frequency	= 10 yrs	Time to peak	= 750 min
Time interval	= 5 min	Hyd. volume	= 11,968 cuft
Drainage area	= 3.000 ac	Curve number	= 55
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 25.00 min
Total precip.	= 5.17 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

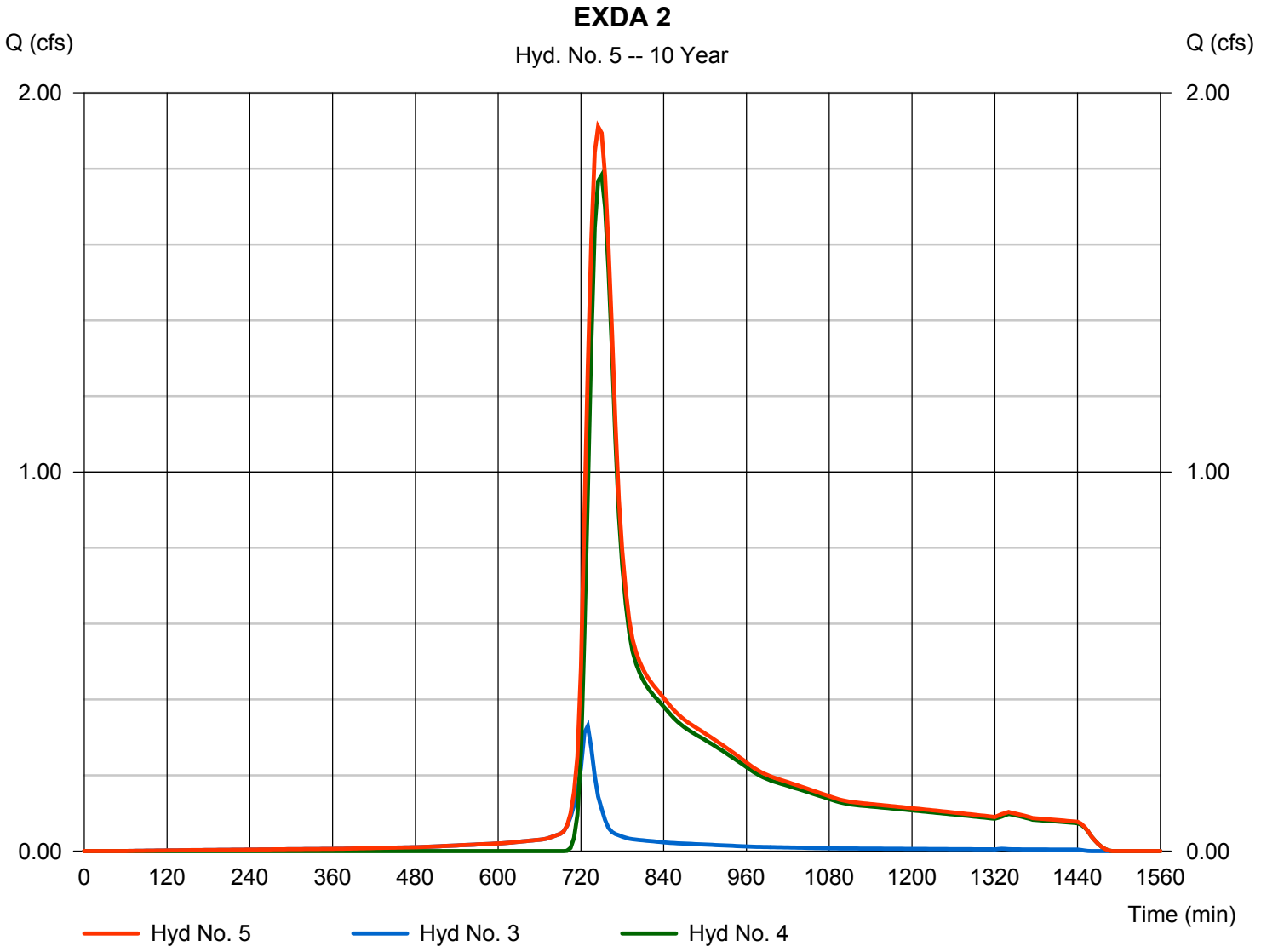


Hydrograph Report

Hyd. No. 5

EXDA 2

Hydrograph type	= Combine	Peak discharge	= 1.911 cfs
Storm frequency	= 10 yrs	Time to peak	= 745 min
Time interval	= 5 min	Hyd. volume	= 13,479 cuft
Inflow hyds.	= 3, 4	Contrib. drain. area	= 3.090 ac

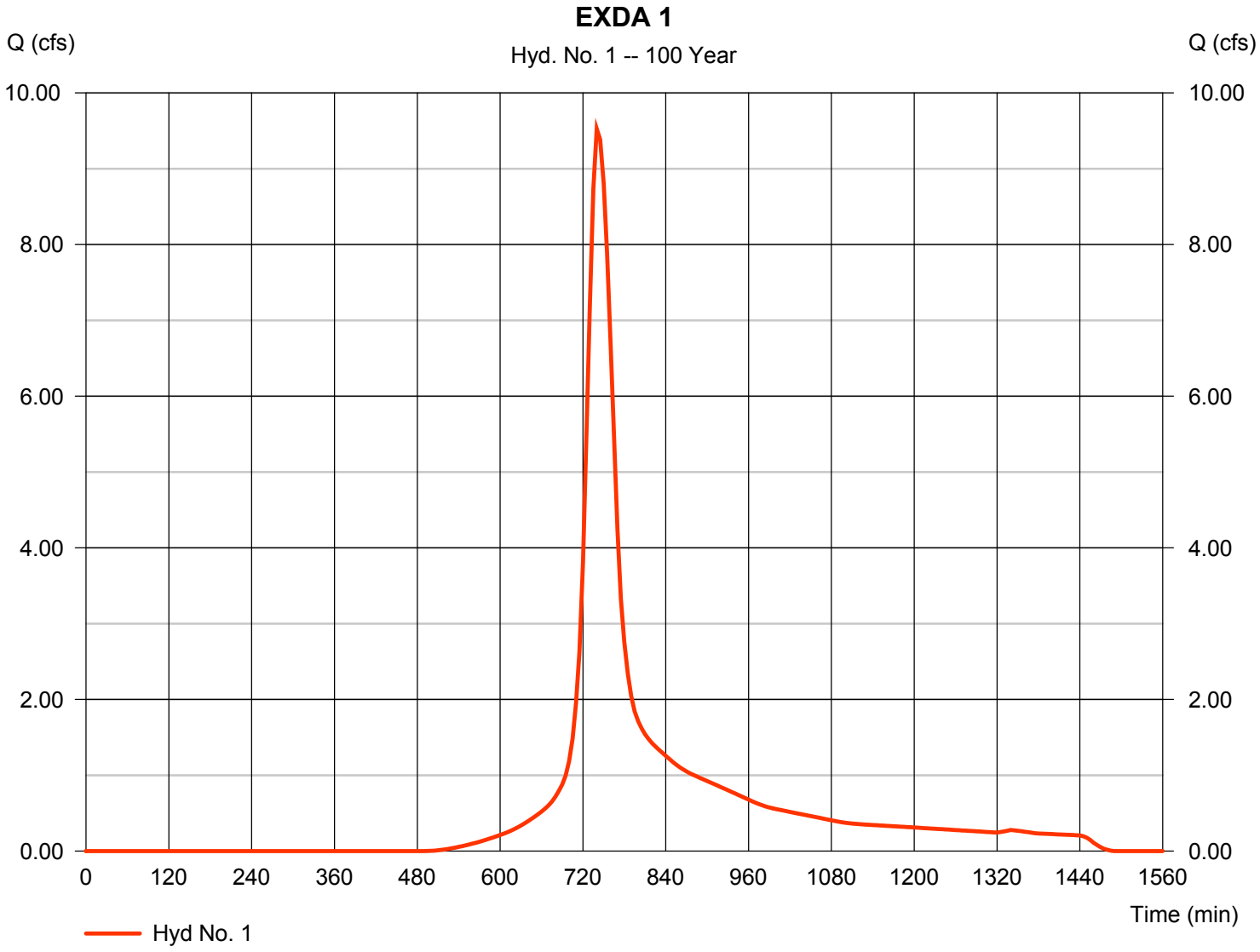


Hydrograph Report

Hyd. No. 1

EXDA 1

Hydrograph type	=	SCS Runoff	Peak discharge	=	9.526 cfs
Storm frequency	=	100 yrs	Time to peak	=	740 min
Time interval	=	5 min	Hyd. volume	=	53,119 cuft
Drainage area	=	3.080 ac	Curve number	=	67
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	25.00 min
Total precip.	=	8.58 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

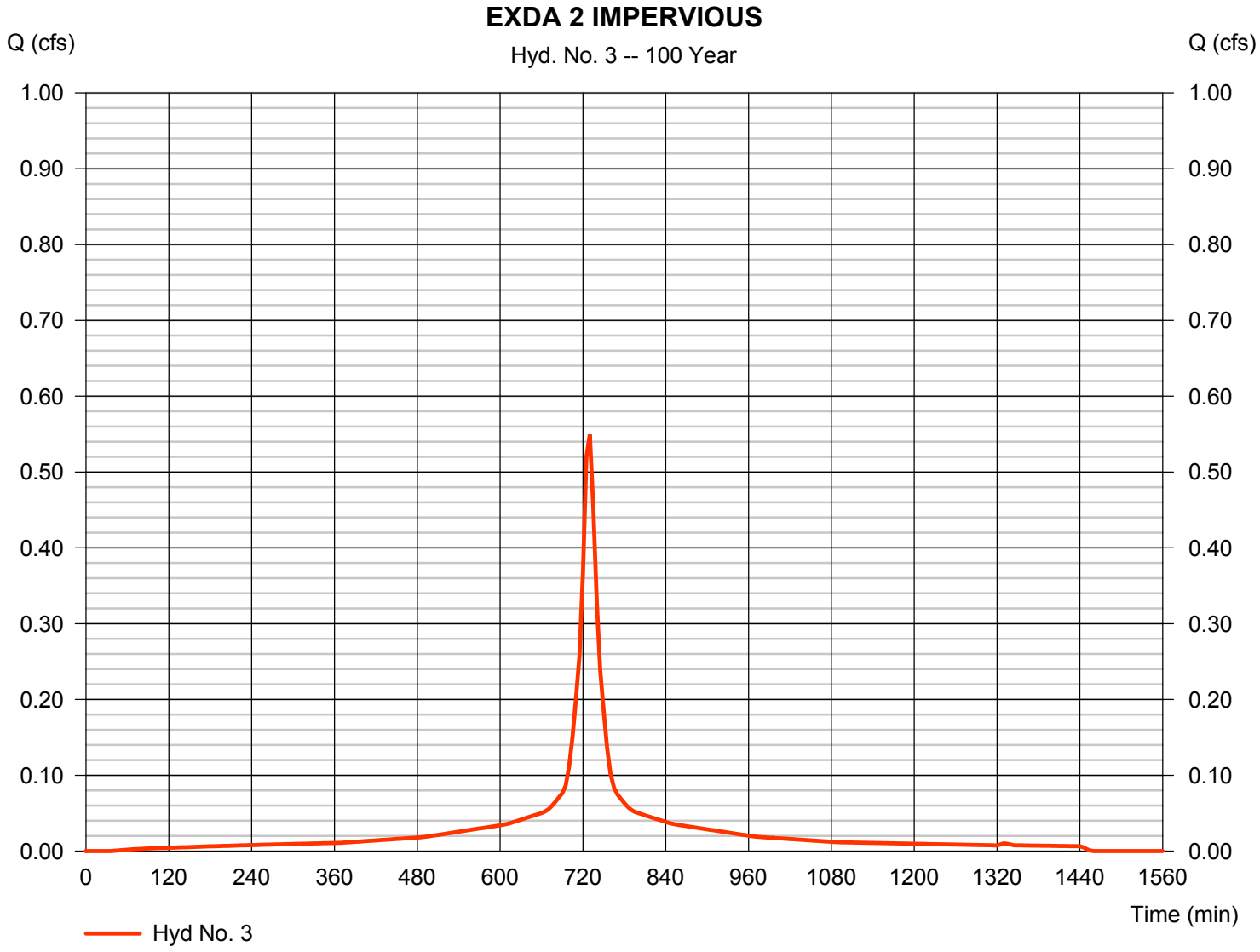


Hydrograph Report

Hyd. No. 3

EXDA 2 IMPERVIOUS

Hydrograph type	= SCS Runoff	Peak discharge	= 0.549 cfs
Storm frequency	= 100 yrs	Time to peak	= 730 min
Time interval	= 5 min	Hyd. volume	= 2,554 cuft
Drainage area	= 0.090 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.00 min
Total precip.	= 8.58 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

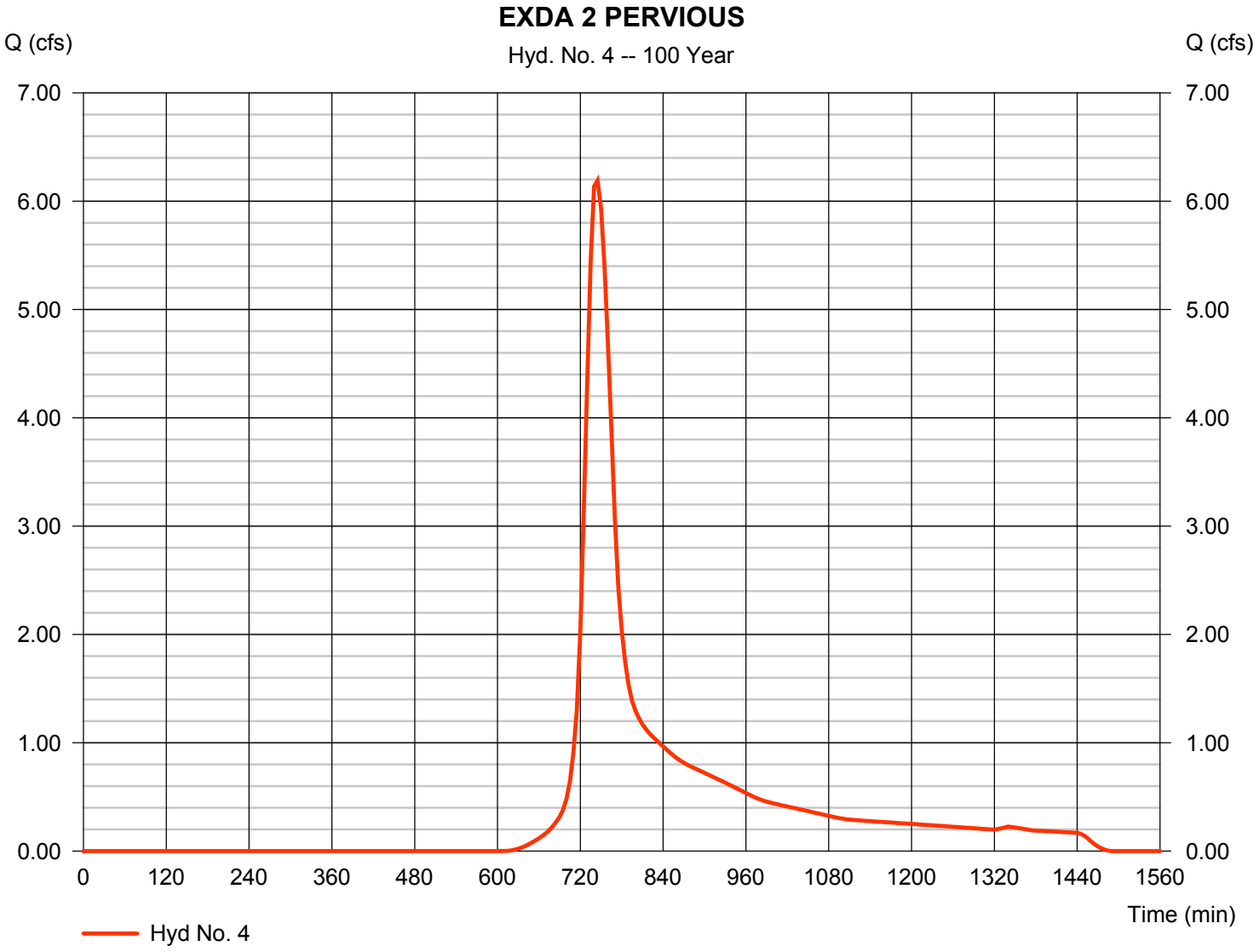


Hydrograph Report

Hyd. No. 4

EXDA 2 PERVIOUS

Hydrograph type	= SCS Runoff	Peak discharge	= 6.191 cfs
Storm frequency	= 100 yrs	Time to peak	= 745 min
Time interval	= 5 min	Hyd. volume	= 35,798 cuft
Drainage area	= 3.000 ac	Curve number	= 55
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 25.00 min
Total precip.	= 8.58 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

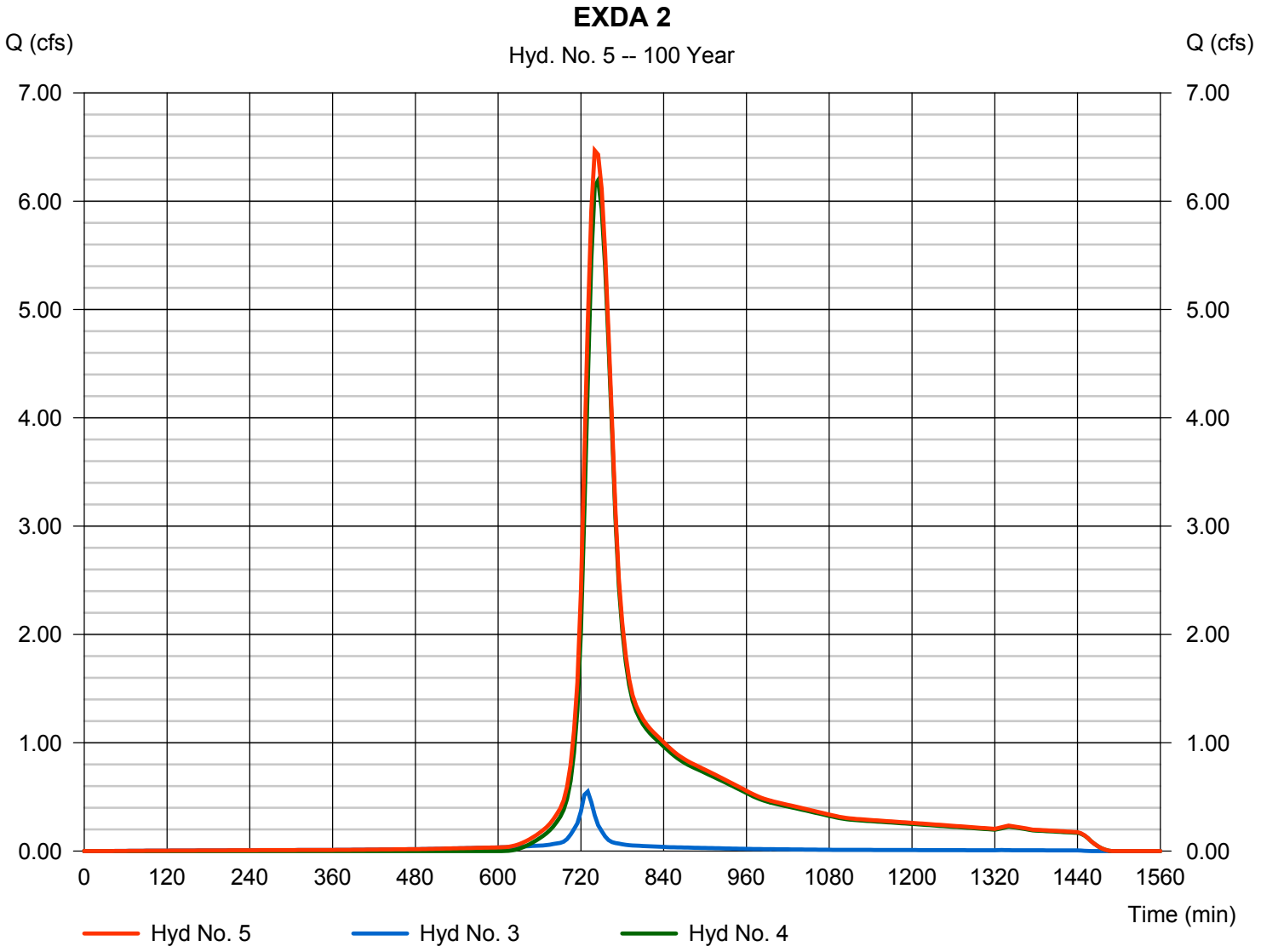


Hydrograph Report

Hyd. No. 5

EXDA 2

Hydrograph type	= Combine	Peak discharge	= 6.468 cfs
Storm frequency	= 100 yrs	Time to peak	= 740 min
Time interval	= 5 min	Hyd. volume	= 38,352 cuft
Inflow hyds.	= 3, 4	Contrib. drain. area	= 3.090 ac



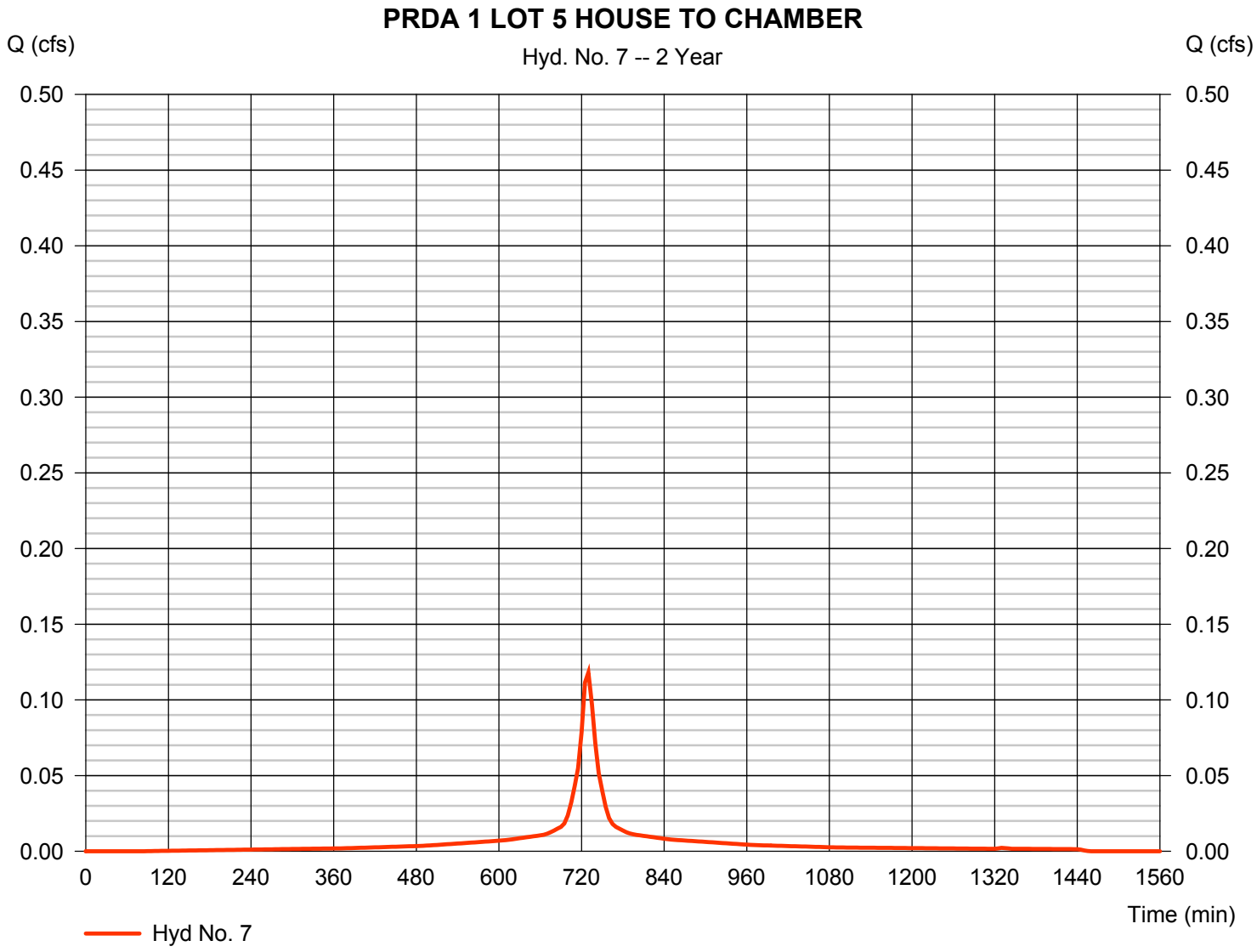
APPENDIX F – PROPOSED HYDROLOGIC ANALYSIS AND RUNOFF QUANTITY CALCULATIONS

Hydrograph Report

Hyd. No. 7

PRDA 1 LOT 5 HOUSE TO CHAMBER

Hydrograph type	= SCS Runoff	Peak discharge	= 0.118 cfs
Storm frequency	= 2 yrs	Time to peak	= 730 min
Time interval	= 5 min	Hyd. volume	= 531 cuft
Drainage area	= 0.049 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.00 min
Total precip.	= 3.42 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



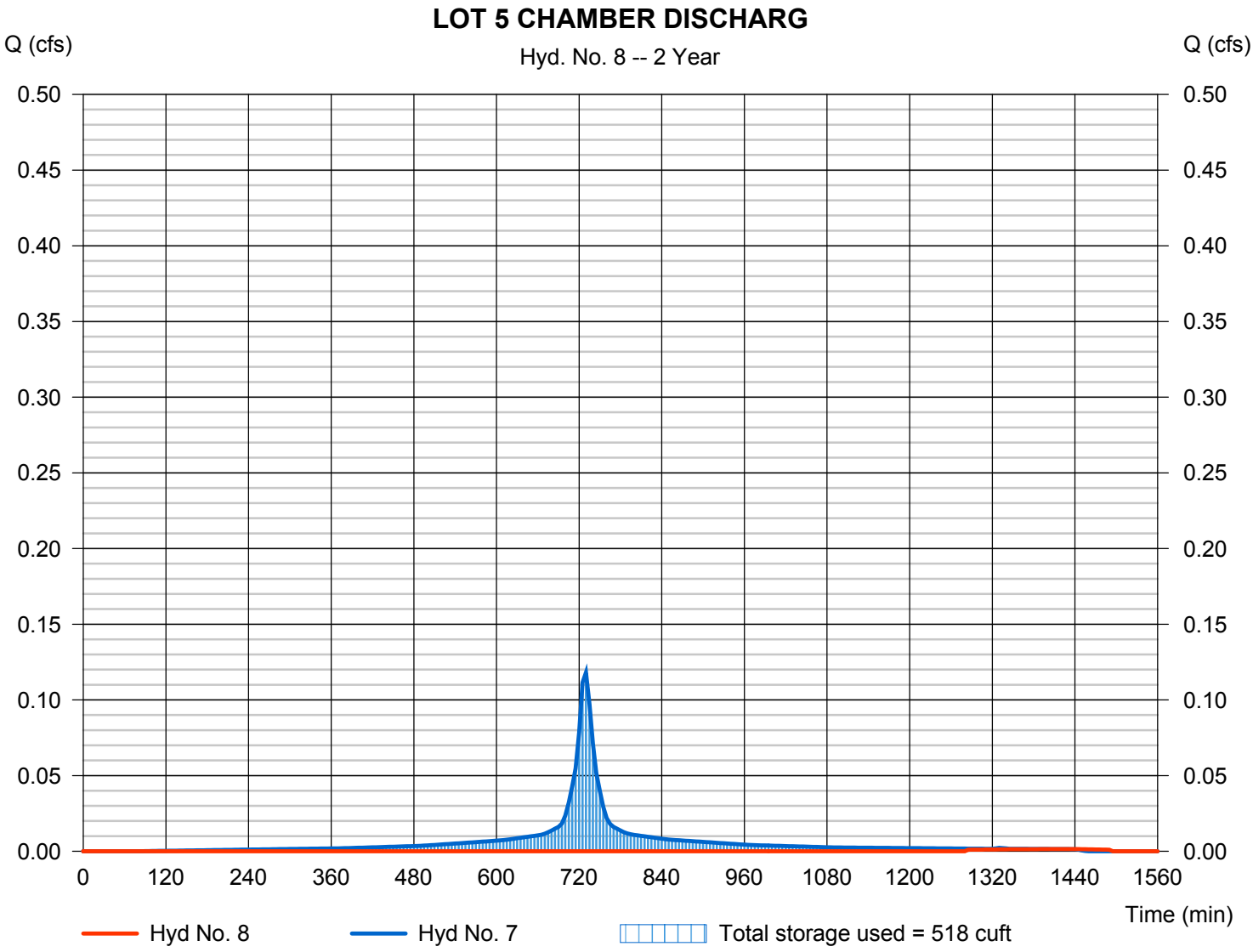
Hydrograph Report

Hyd. No. 8

LOT 5 CHAMBER DISCHARG

Hydrograph type	=	Reservoir	Peak discharge	=	0.001 cfs
Storm frequency	=	2 yrs	Time to peak	=	1425 min
Time interval	=	5 min	Hyd. volume	=	16 cuft
Inflow hyd. No.	=	7 - PRDA 1 LOT 5 HOUSE TO CHAMBER	Max. Elevation	=	2.38 ft
Reservoir name	=	CHAMBERS LOT 5	Max. Storage	=	518 cuft

Storage Indication method used.



Pond Report

Pond No. 8 - CHAMBERS LOT 5

Pond Data

UG Chambers -Invert elev. = 1.30 ft, Rise x Span = 1.54 x 2.75 ft, Barrel Len = 60.00 ft, No. Barrels = 2, Slope = 0.00%, Headers = Yes
Encasement -Invert elev. = 1.00 ft, Width = 4.00 ft, Height = 3.00 ft, Voids = 40.00%

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	1.00	n/a	0	0
0.30	1.30	n/a	65	65
0.60	1.60	n/a	132	197
0.90	1.90	n/a	130	327
1.20	2.20	n/a	124	451
1.50	2.50	n/a	114	565
1.80	2.80	n/a	97	662
2.10	3.10	n/a	67	729
2.40	3.40	n/a	65	794
2.70	3.70	n/a	65	859
3.00	4.00	n/a	65	924

Culvert / Orifice Structures

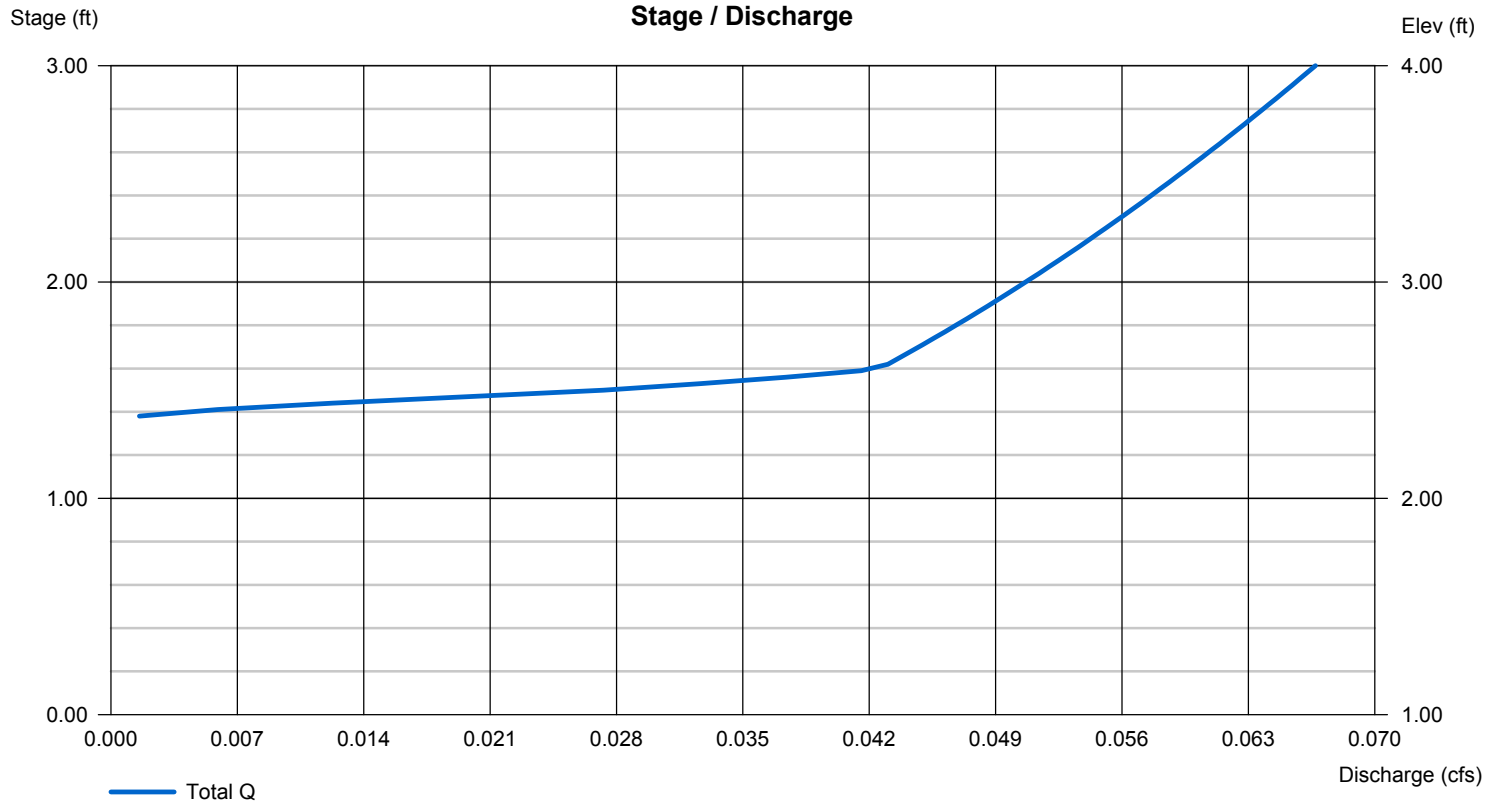
	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 2.00	0.00	0.00	0.00
Span (in)	= 2.00	0.00	0.00	0.00
No. Barrels	= 1	0	0	0
Invert El. (ft)	= 2.35	0.00	0.00	0.00
Length (ft)	= 44.00	0.00	0.00	0.00
Slope (%)	= 2.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	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 Wet area)
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).

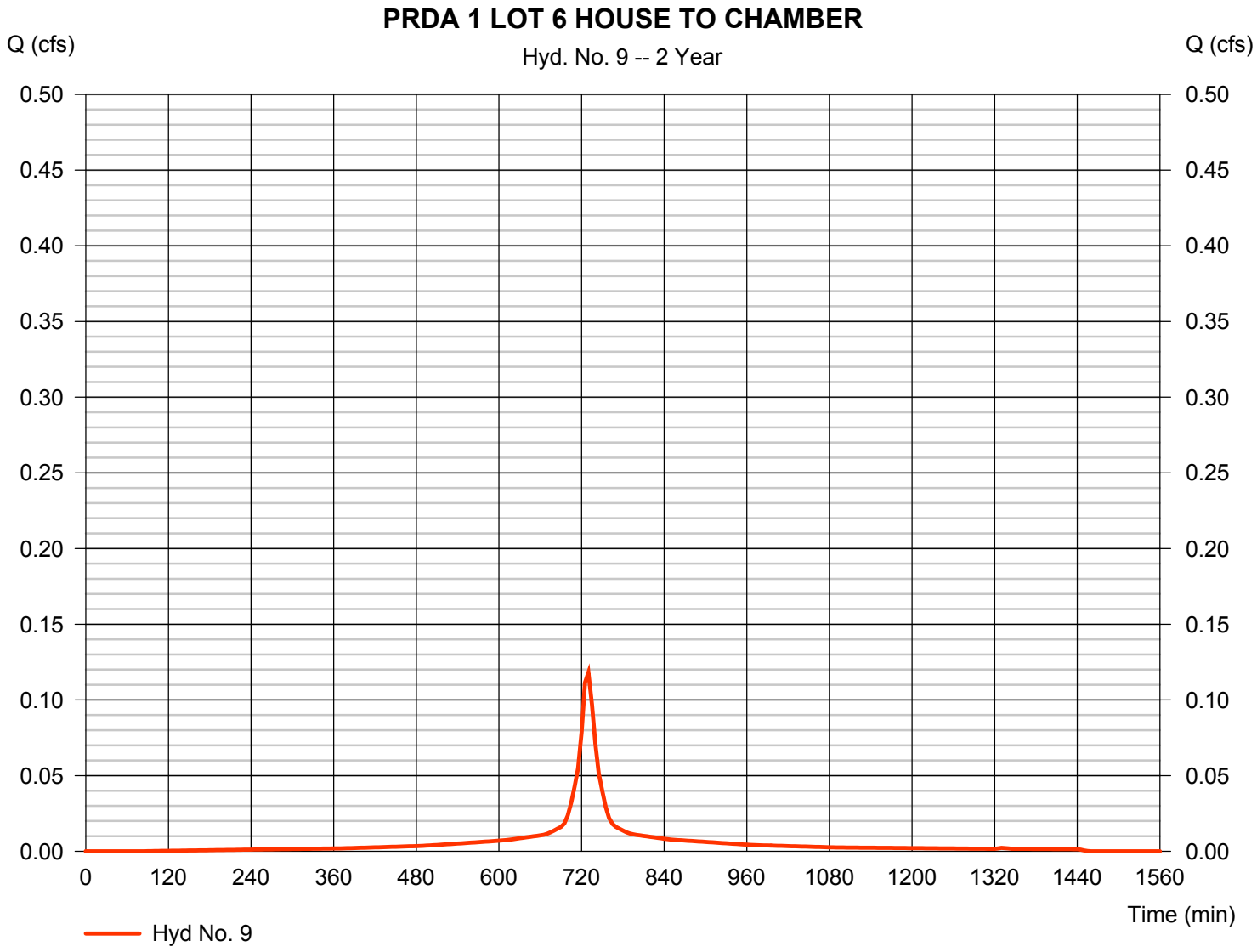


Hydrograph Report

Hyd. No. 9

PRDA 1 LOT 6 HOUSE TO CHAMBER

Hydrograph type	= SCS Runoff	Peak discharge	= 0.118 cfs
Storm frequency	= 2 yrs	Time to peak	= 730 min
Time interval	= 5 min	Hyd. volume	= 531 cuft
Drainage area	= 0.049 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.00 min
Total precip.	= 3.42 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



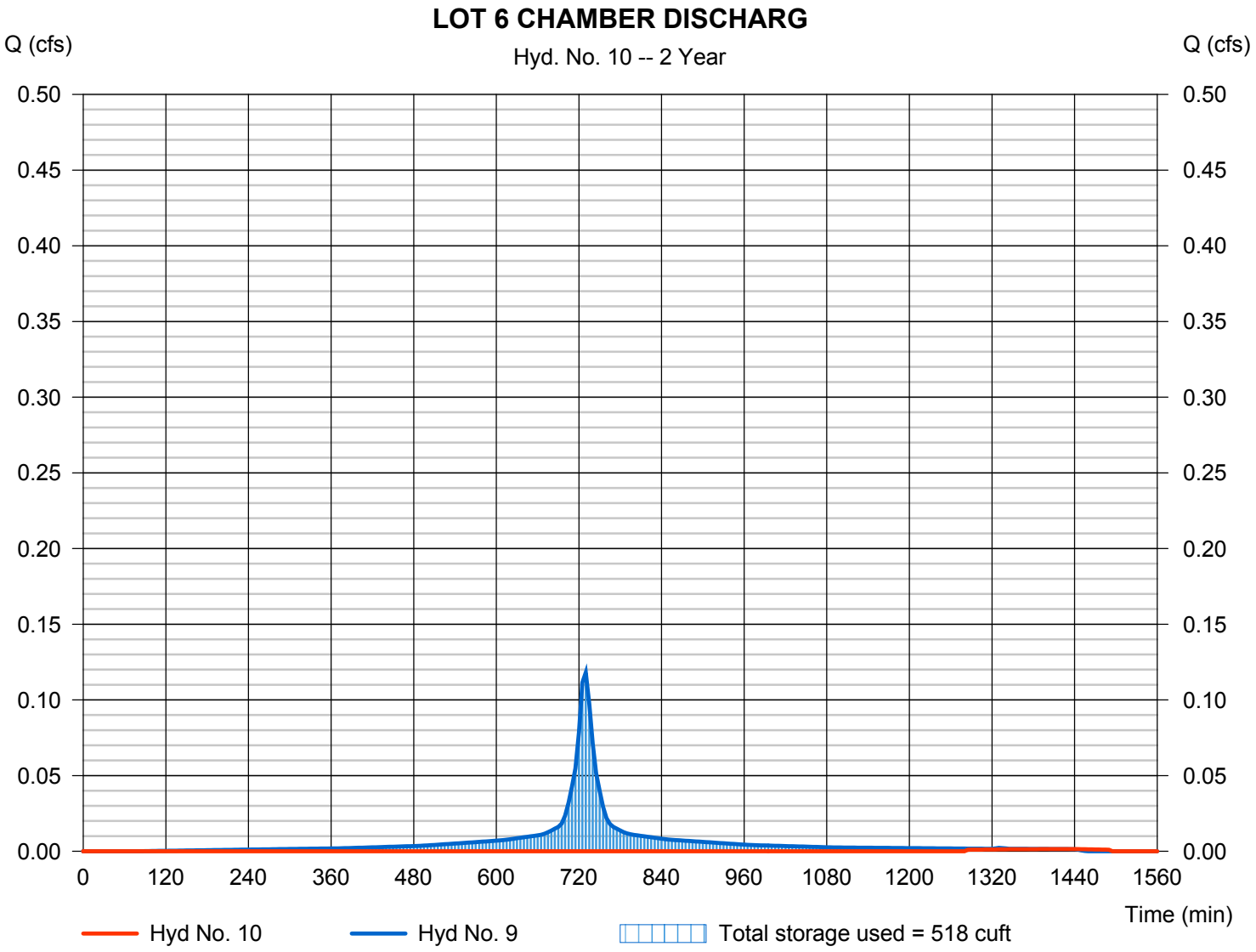
Hydrograph Report

Hyd. No. 10

LOT 6 CHAMBER DISCHARG

Hydrograph type	=	Reservoir	Peak discharge	=	0.001 cfs
Storm frequency	=	2 yrs	Time to peak	=	1425 min
Time interval	=	5 min	Hyd. volume	=	16 cuft
Inflow hyd. No.	=	9 - PRDA 1 LOT 6 HOUSE TO CHAMBER	Max. Elevation	=	2.38 ft
Reservoir name	=	CHAMBERS LOT 6	Max. Storage	=	518 cuft

Storage Indication method used.



Pond Report

Pond No. 9 - CHAMBERS LOT 6

Pond Data

UG Chambers -Invert elev. = 1.30 ft, Rise x Span = 1.54 x 2.75 ft, Barrel Len = 60.00 ft, No. Barrels = 2, Slope = 0.00%, Headers = Yes
Encasement -Invert elev. = 1.00 ft, Width = 4.00 ft, Height = 3.00 ft, Voids = 40.00%

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	1.00	n/a	0	0
0.30	1.30	n/a	65	65
0.60	1.60	n/a	132	197
0.90	1.90	n/a	130	327
1.20	2.20	n/a	124	451
1.50	2.50	n/a	114	565
1.80	2.80	n/a	97	662
2.10	3.10	n/a	67	729
2.40	3.40	n/a	65	794
2.70	3.70	n/a	65	859
3.00	4.00	n/a	65	924

Culvert / Orifice Structures

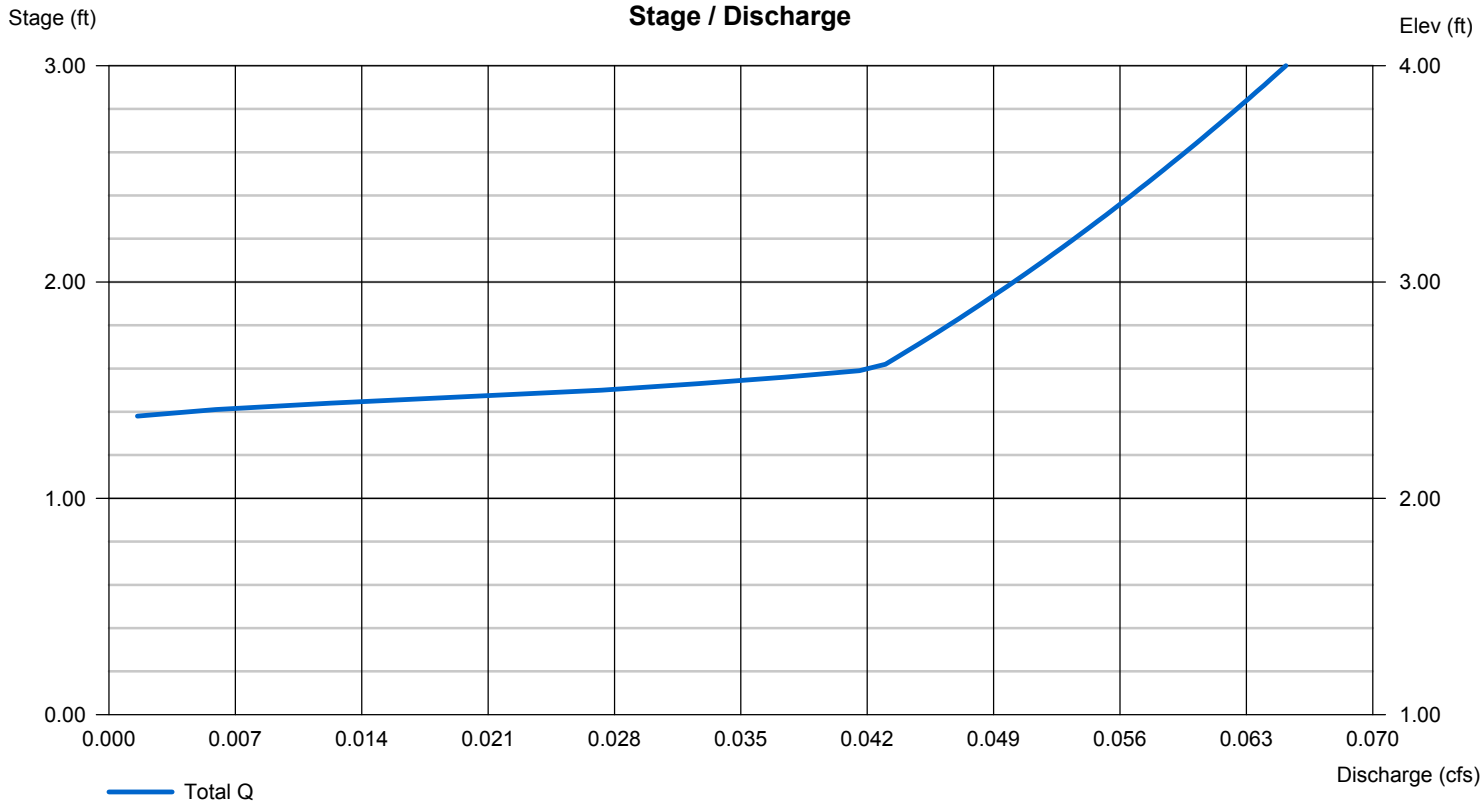
	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 2.00	0.00	0.00	0.00
Span (in)	= 2.00	0.00	0.00	0.00
No. Barrels	= 1	0	0	0
Invert El. (ft)	= 2.35	0.00	0.00	0.00
Length (ft)	= 48.00	0.00	0.00	0.00
Slope (%)	= 2.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	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 Wet area)
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).

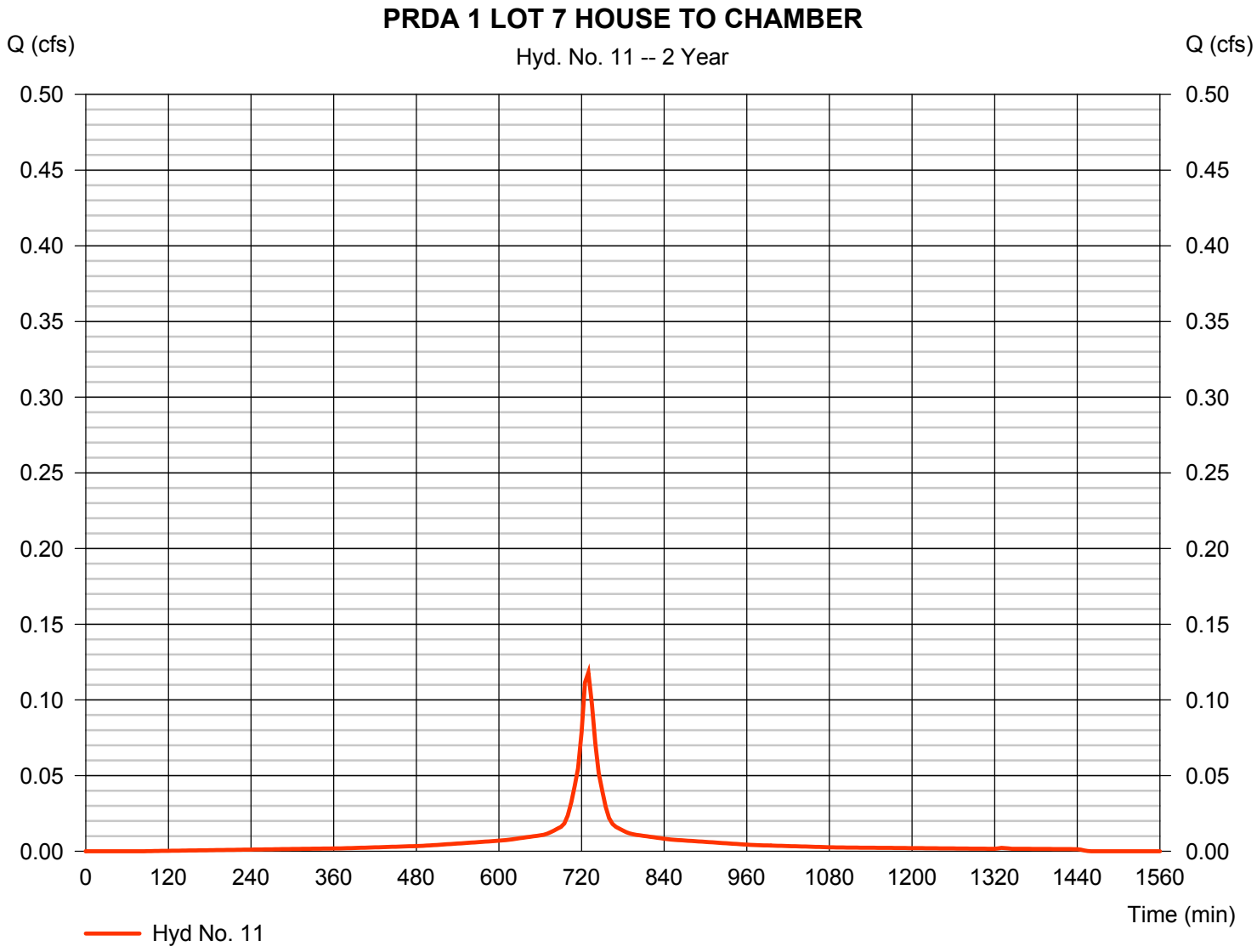


Hydrograph Report

Hyd. No. 11

PRDA 1 LOT 7 HOUSE TO CHAMBER

Hydrograph type	= SCS Runoff	Peak discharge	= 0.118 cfs
Storm frequency	= 2 yrs	Time to peak	= 730 min
Time interval	= 5 min	Hyd. volume	= 531 cuft
Drainage area	= 0.049 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.00 min
Total precip.	= 3.42 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



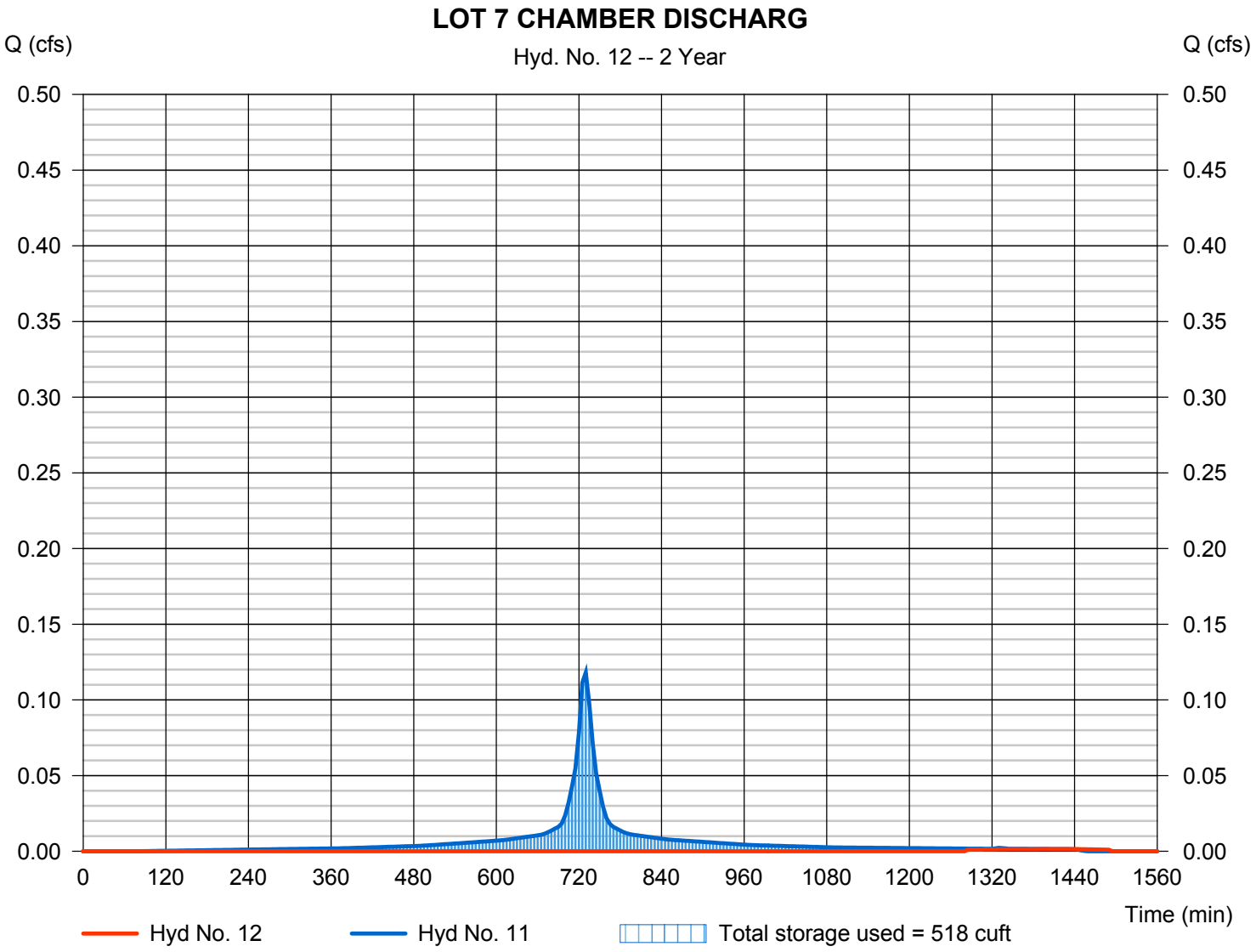
Hydrograph Report

Hyd. No. 12

LOT 7 CHAMBER DISCHARG

Hydrograph type	=	Reservoir	Peak discharge	=	0.001 cfs
Storm frequency	=	2 yrs	Time to peak	=	1425 min
Time interval	=	5 min	Hyd. volume	=	16 cuft
Inflow hyd. No.	=	11 - PRDA 1 LOT 7 HOUSE TO CHAMBER	Max. Elevation	=	2.38 ft
Reservoir name	=	CHAMBERS LOT 7	Max. Storage	=	518 cuft

Storage Indication method used.



Pond Report

Pond No. 11 - CHAMBERS LOT 7

Pond Data

UG Chambers -Invert elev. = 1.30 ft, Rise x Span = 1.54 x 2.75 ft, Barrel Len = 60.00 ft, No. Barrels = 2, Slope = 0.00%, Headers = Yes
Encasement -Invert elev. = 1.00 ft, Width = 4.00 ft, Height = 3.00 ft, Voids = 40.00%

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	1.00	n/a	0	0
0.30	1.30	n/a	65	65
0.60	1.60	n/a	132	197
0.90	1.90	n/a	130	327
1.20	2.20	n/a	124	451
1.50	2.50	n/a	114	565
1.80	2.80	n/a	97	662
2.10	3.10	n/a	67	729
2.40	3.40	n/a	65	794
2.70	3.70	n/a	65	859
3.00	4.00	n/a	65	924

Culvert / Orifice Structures

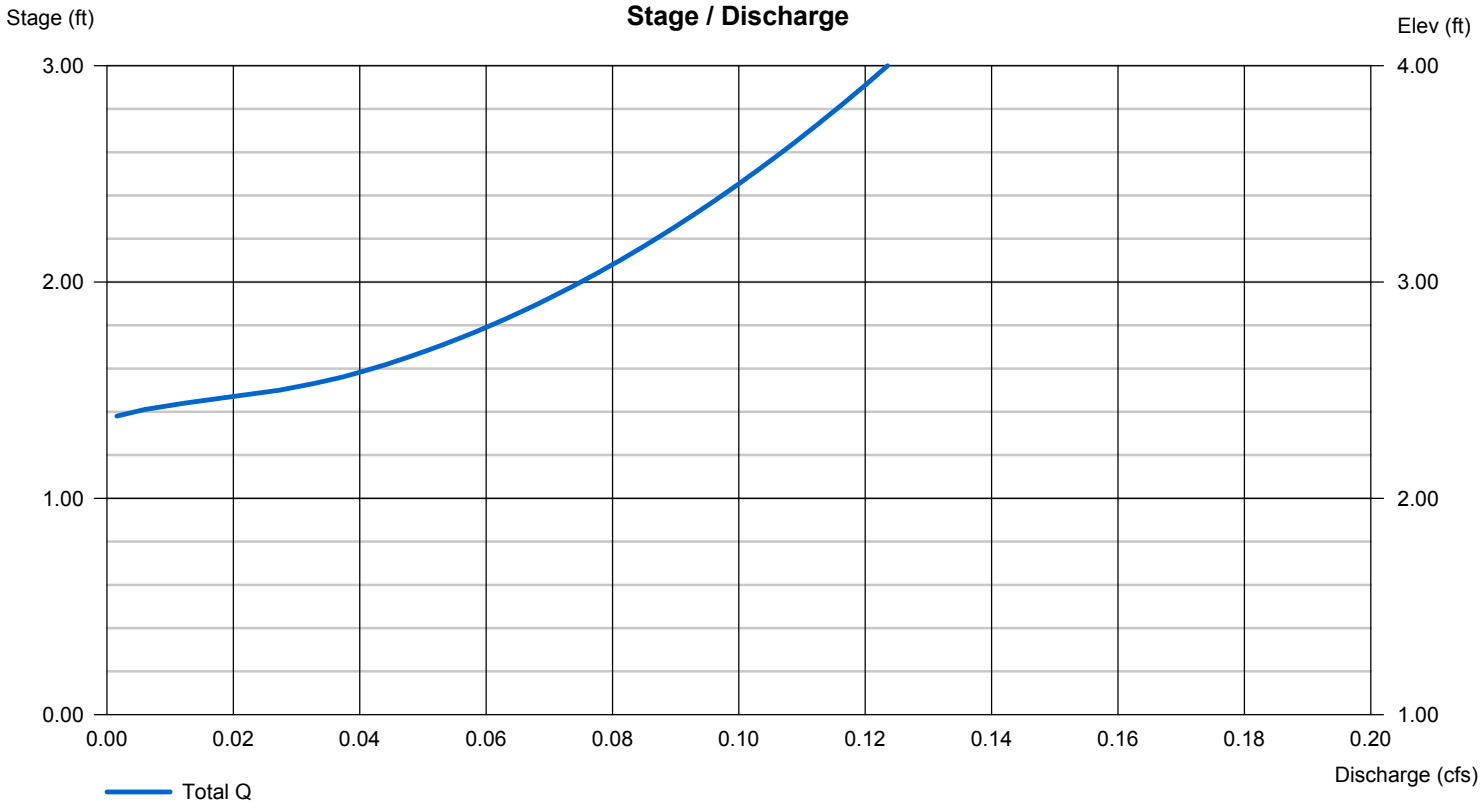
	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 2.00	0.00	0.00	0.00
Span (in)	= 2.00	0.00	0.00	0.00
No. Barrels	= 1	0	0	0
Invert El. (ft)	= 2.35	0.00	0.00	0.00
Length (ft)	= 5.00	0.00	0.00	0.00
Slope (%)	= 2.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

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 Wet area)
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).

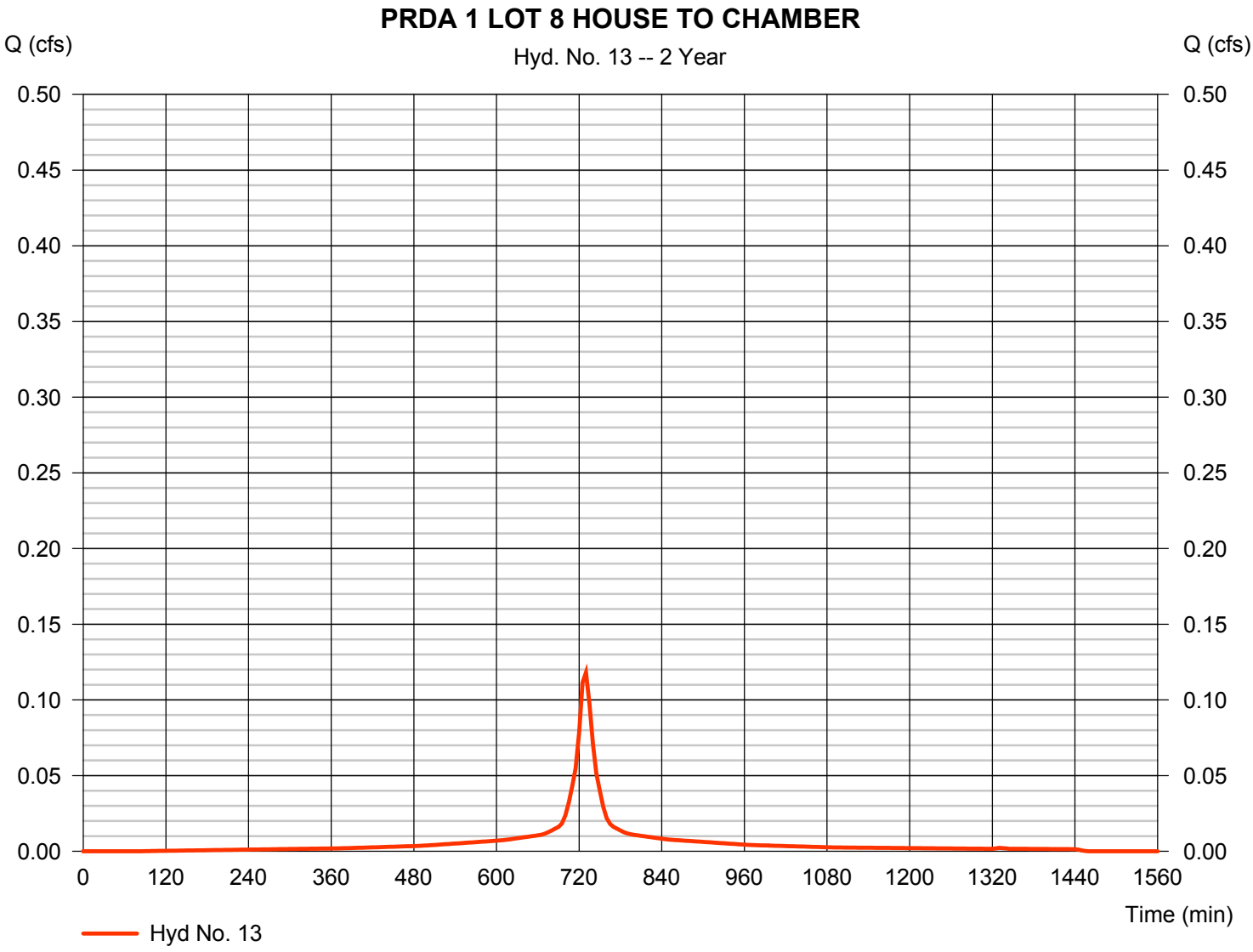


Hydrograph Report

Hyd. No. 13

PRDA 1 LOT 8 HOUSE TO CHAMBER

Hydrograph type	= SCS Runoff	Peak discharge	= 0.118 cfs
Storm frequency	= 2 yrs	Time to peak	= 730 min
Time interval	= 5 min	Hyd. volume	= 531 cuft
Drainage area	= 0.049 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.00 min
Total precip.	= 3.42 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



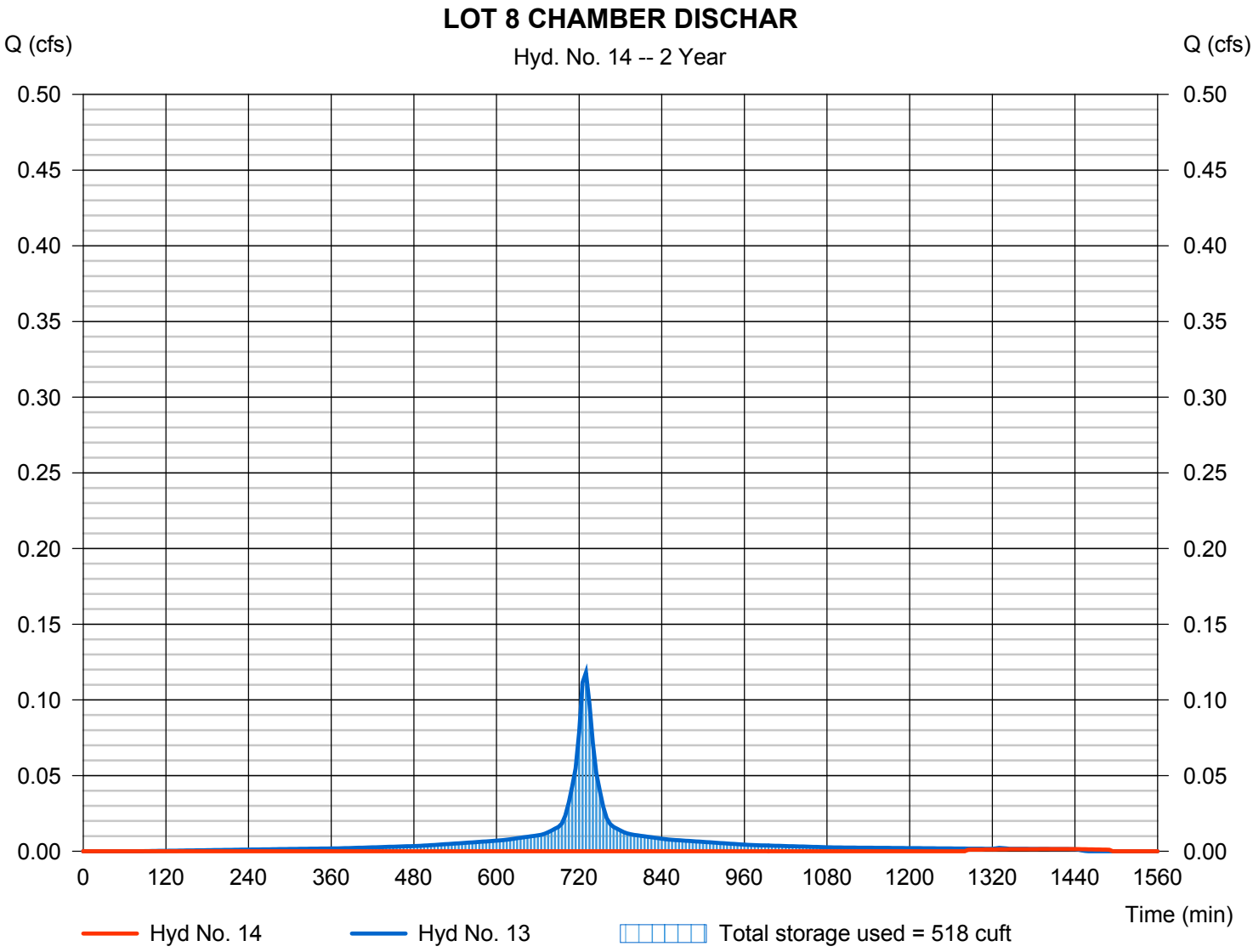
Hydrograph Report

Hyd. No. 14

LOT 8 CHAMBER DISCHAR

Hydrograph type	=	Reservoir	Peak discharge	=	0.001 cfs
Storm frequency	=	2 yrs	Time to peak	=	1425 min
Time interval	=	5 min	Hyd. volume	=	16 cuft
Inflow hyd. No.	=	13 - PRDA 1 LOT 8 HOUSE TO CHAMBER	Max. Elevation	=	2.38 ft
Reservoir name	=	CHAMBERS LOT 8	Max. Storage	=	518 cuft

Storage Indication method used.



Pond Report

Pond No. 12 - CHAMBERS LOT 8

Pond Data

UG Chambers -Invert elev. = 1.30 ft, Rise x Span = 1.54 x 2.75 ft, Barrel Len = 60.00 ft, No. Barrels = 2, Slope = 0.00%, Headers = Yes
Encasement -Invert elev. = 1.00 ft, Width = 4.00 ft, Height = 3.00 ft, Voids = 40.00%

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	1.00	n/a	0	0
0.30	1.30	n/a	65	65
0.60	1.60	n/a	132	197
0.90	1.90	n/a	130	327
1.20	2.20	n/a	124	451
1.50	2.50	n/a	114	565
1.80	2.80	n/a	97	662
2.10	3.10	n/a	67	729
2.40	3.40	n/a	65	794
2.70	3.70	n/a	65	859
3.00	4.00	n/a	65	924

Culvert / Orifice Structures

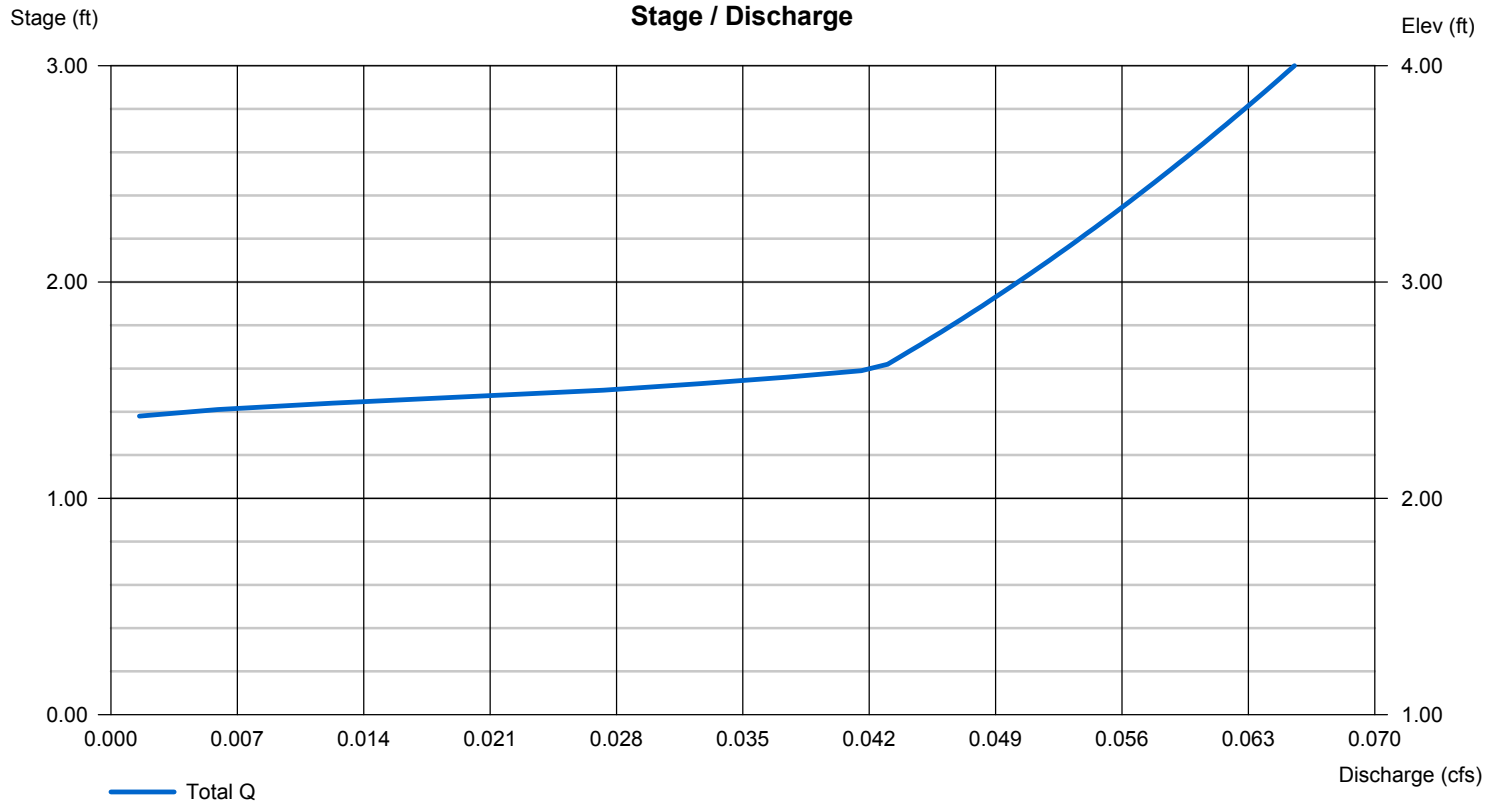
	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 2.00	0.00	0.00	0.00
Span (in)	= 2.00	0.00	0.00	0.00
No. Barrels	= 1	0	0	0
Invert El. (ft)	= 2.35	0.00	0.00	0.00
Length (ft)	= 47.00	0.00	0.00	0.00
Slope (%)	= 2.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	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 Wet area)
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).

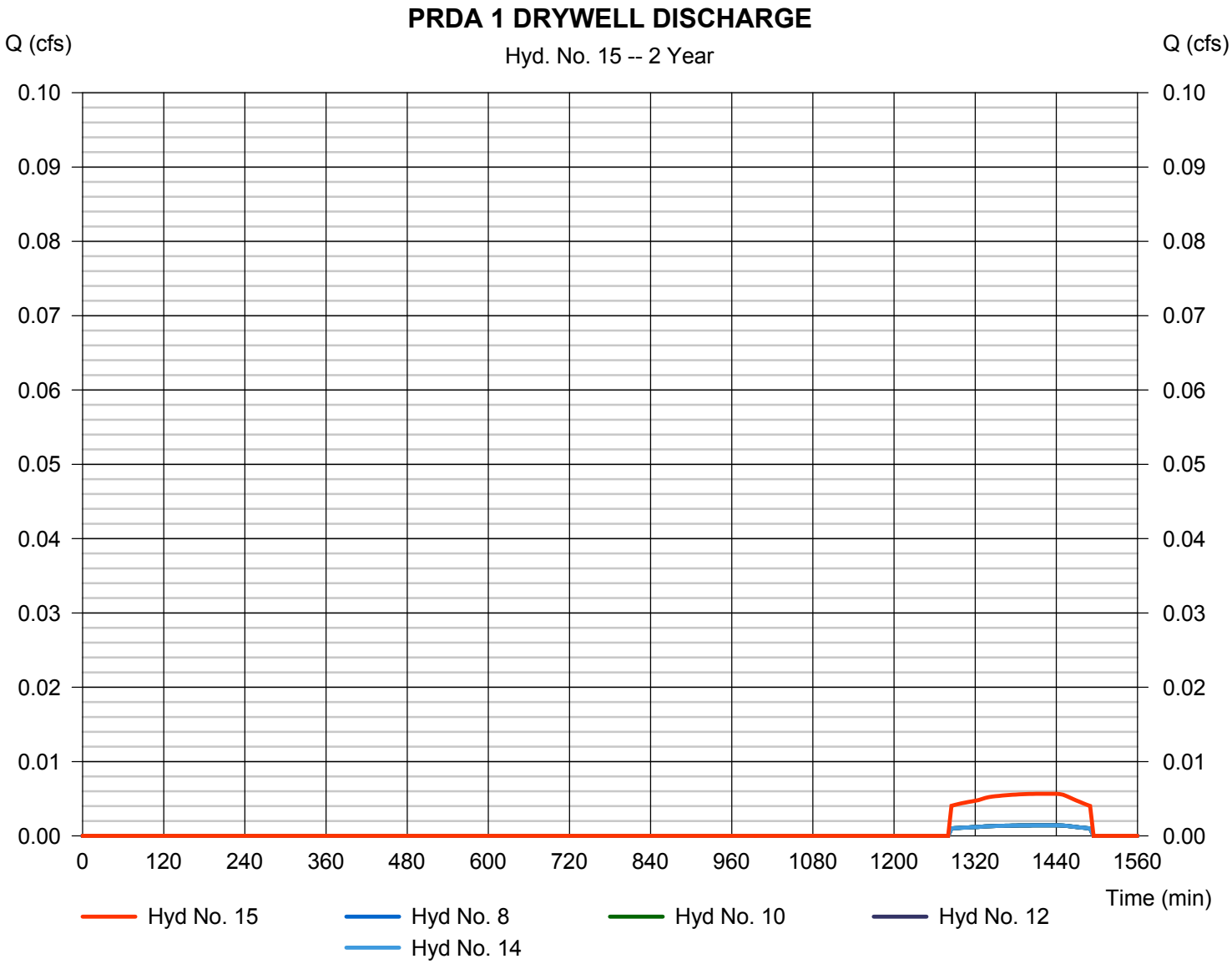


Hydrograph Report

Hyd. No. 15

PRDA 1 DRYWELL DISCHARGE

Hydrograph type	= Combine	Peak discharge	= 0.006 cfs
Storm frequency	= 2 yrs	Time to peak	= 1425 min
Time interval	= 5 min	Hyd. volume	= 65 cuft
Inflow hyds.	= 8, 10, 12, 14	Contrib. drain. area	= 0.000 ac

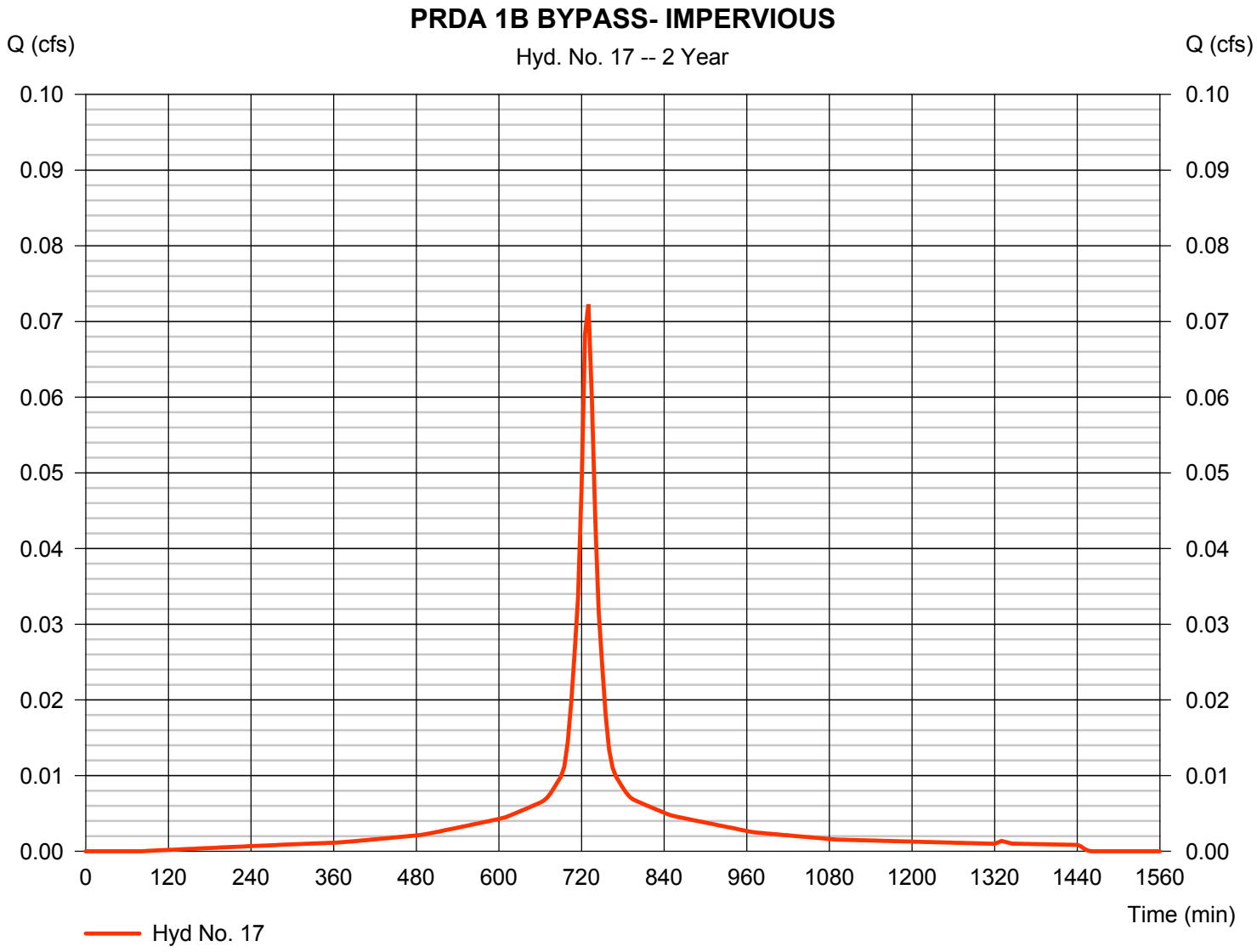


Hydrograph Report

Hyd. No. 17

PRDA 1B BYPASS- IMPERVIOUS

Hydrograph type	= SCS Runoff	Peak discharge	= 0.072 cfs
Storm frequency	= 2 yrs	Time to peak	= 730 min
Time interval	= 5 min	Hyd. volume	= 325 cuft
Drainage area	= 0.030 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.00 min
Total precip.	= 3.42 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

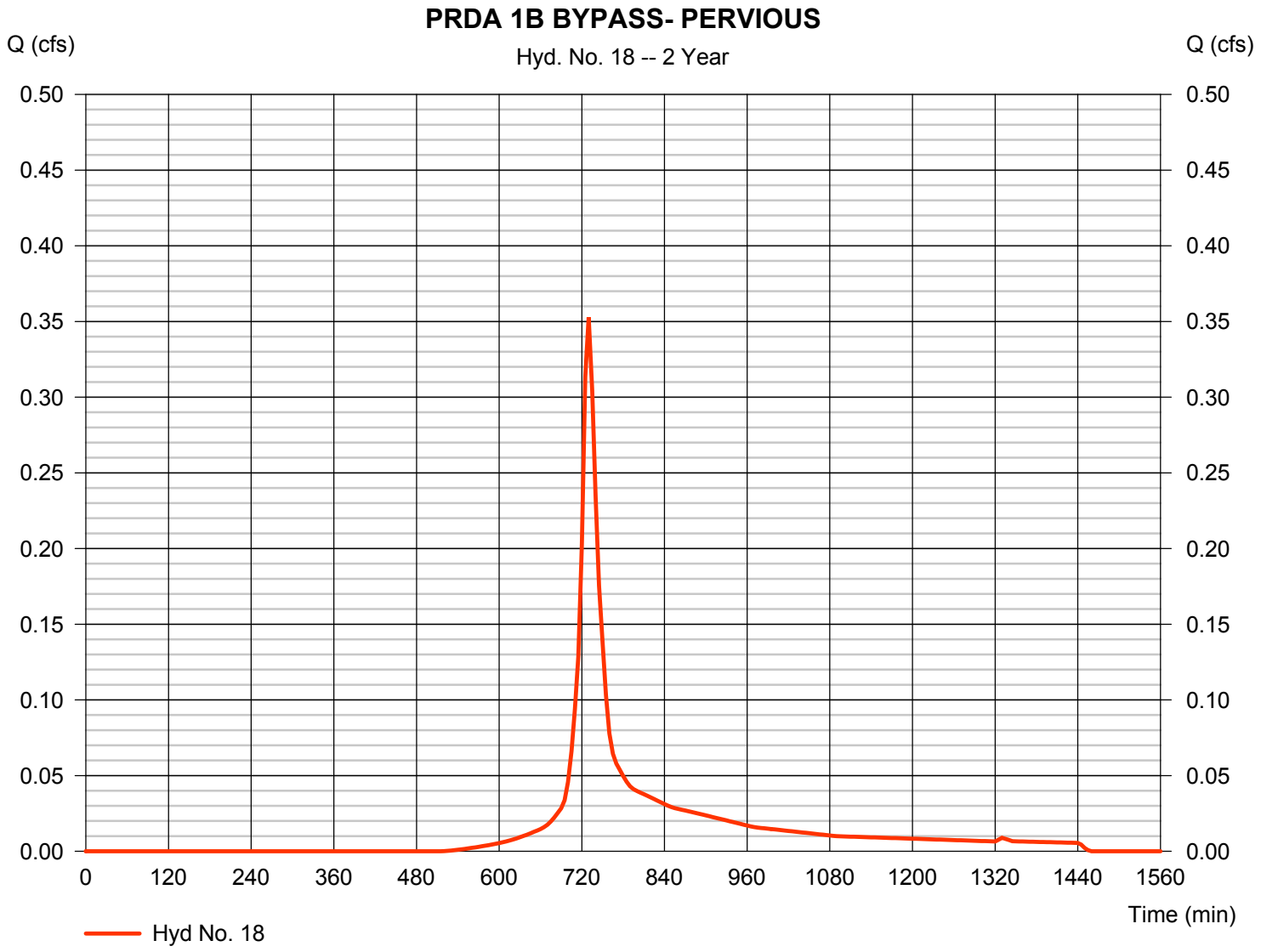


Hydrograph Report

Hyd. No. 18

PRDA 1B BYPASS- PERVIOUS

Hydrograph type	= SCS Runoff	Peak discharge	= 0.353 cfs
Storm frequency	= 2 yrs	Time to peak	= 730 min
Time interval	= 5 min	Hyd. volume	= 1,402 cuft
Drainage area	= 0.240 ac	Curve number	= 82
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.00 min
Total precip.	= 3.42 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

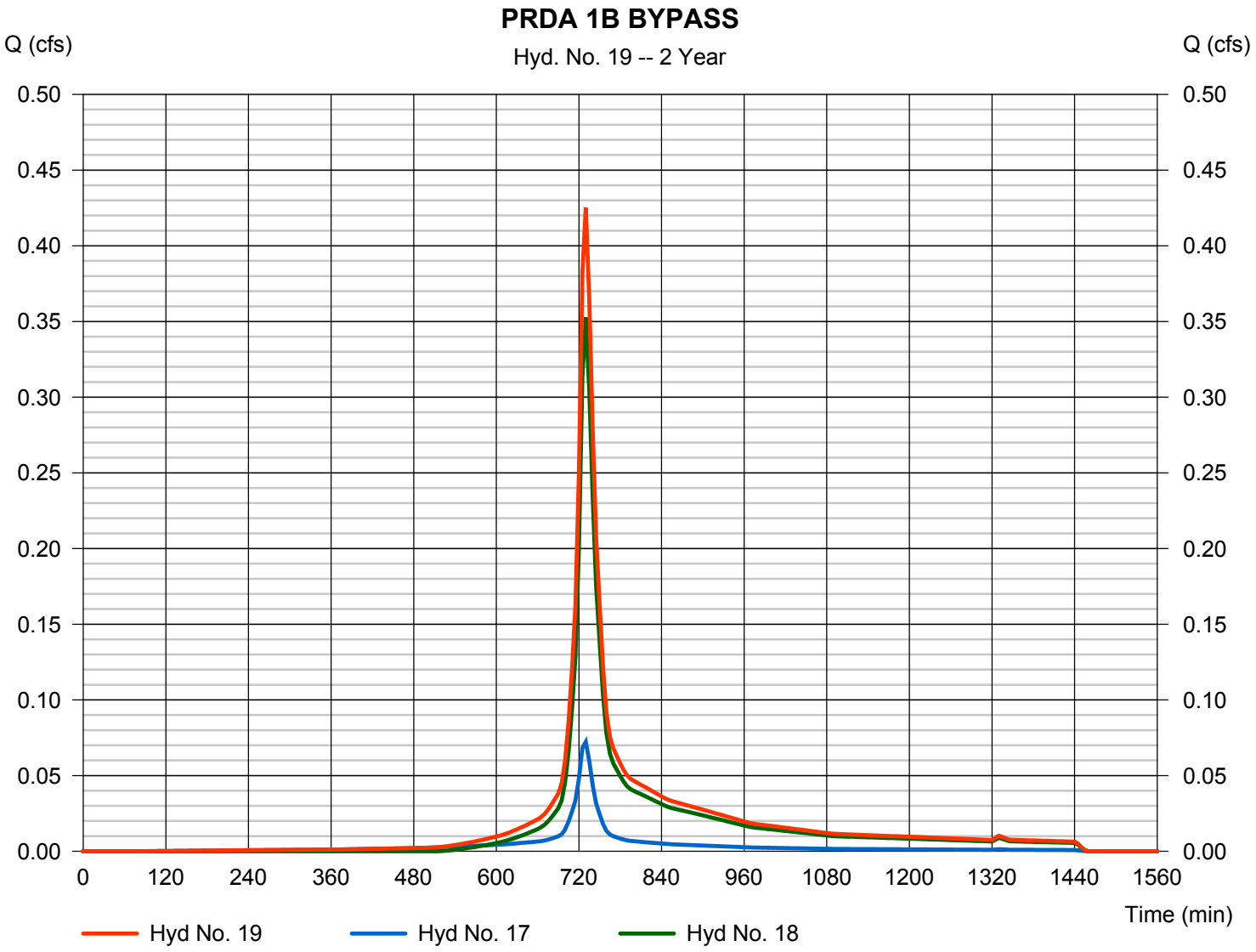


Hydrograph Report

Hyd. No. 19

PRDA 1B BYPASS

Hydrograph type	= Combine	Peak discharge	= 0.425 cfs
Storm frequency	= 2 yrs	Time to peak	= 730 min
Time interval	= 5 min	Hyd. volume	= 1,728 cuft
Inflow hyds.	= 17, 18	Contrib. drain. area	= 0.270 ac

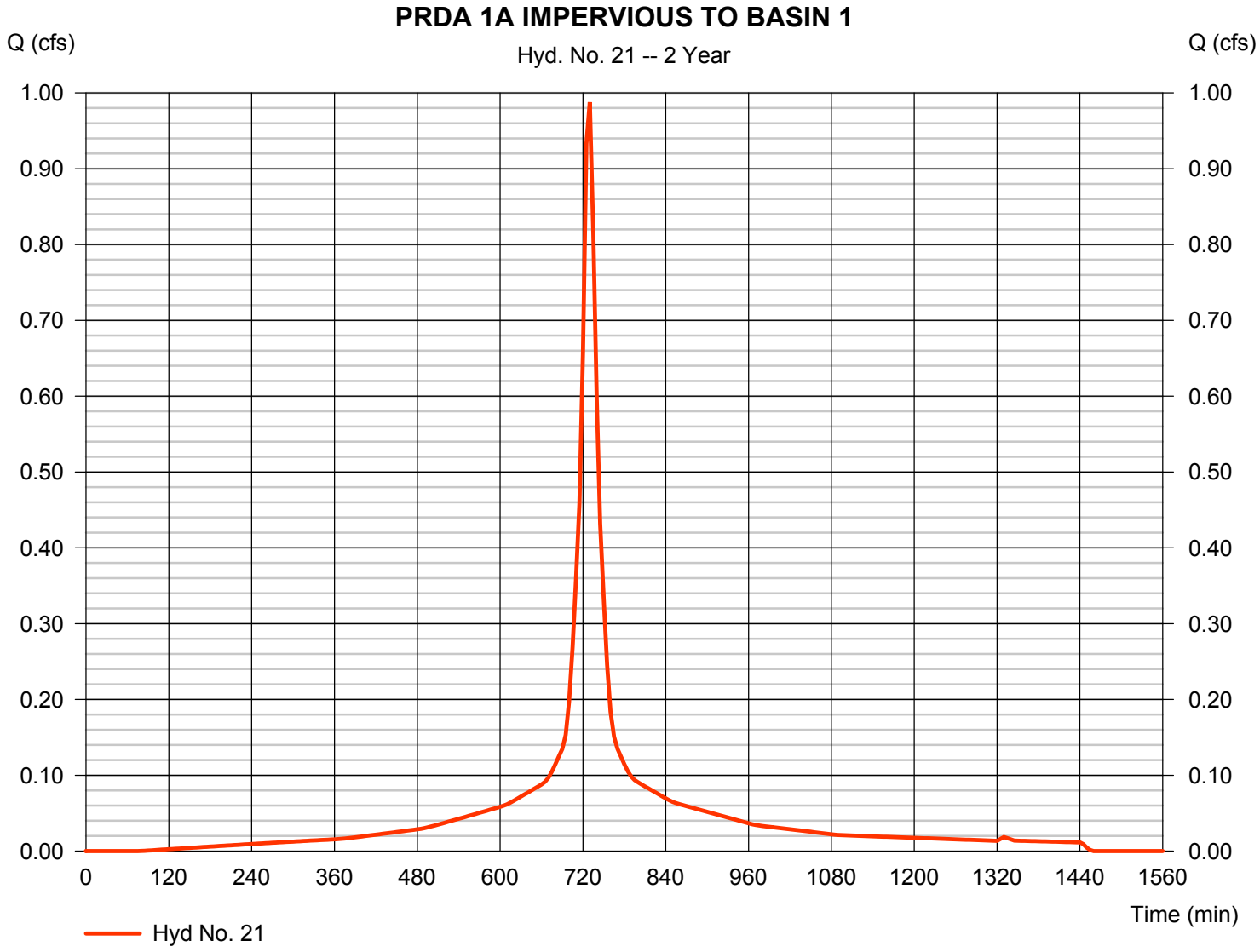


Hydrograph Report

Hyd. No. 21

PRDA 1A IMPERVIOUS TO BASIN 1

Hydrograph type	= SCS Runoff	Peak discharge	= 0.988 cfs
Storm frequency	= 2 yrs	Time to peak	= 730 min
Time interval	= 5 min	Hyd. volume	= 4,446 cuft
Drainage area	= 0.410 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.00 min
Total precip.	= 3.42 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

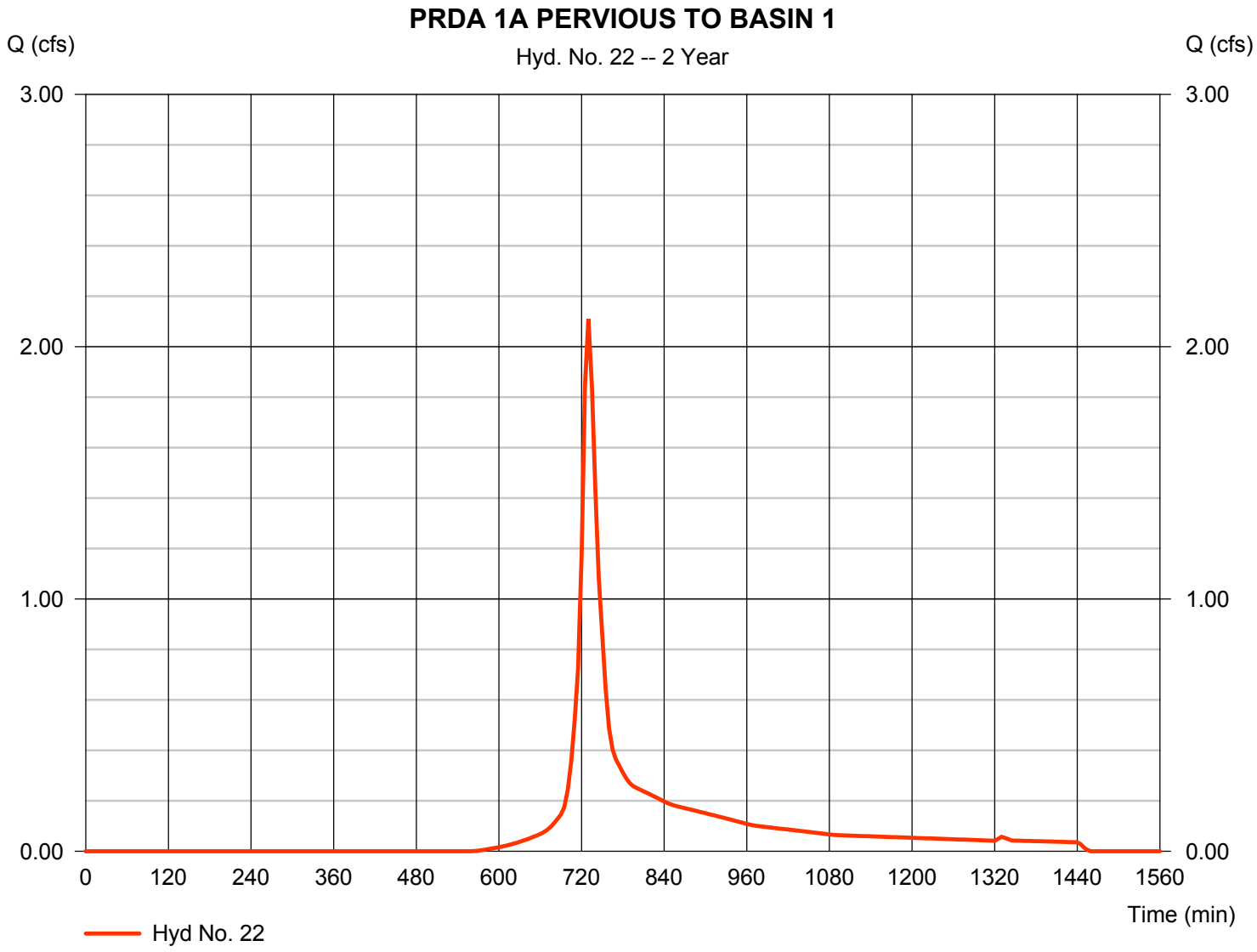


Hydrograph Report

Hyd. No. 22

PRDA 1A PERVIOUS TO BASIN 1

Hydrograph type	= SCS Runoff	Peak discharge	= 2.110 cfs
Storm frequency	= 2 yrs	Time to peak	= 730 min
Time interval	= 5 min	Hyd. volume	= 8,446 cuft
Drainage area	= 1.650 ac	Curve number	= 79
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.00 min
Total precip.	= 3.42 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

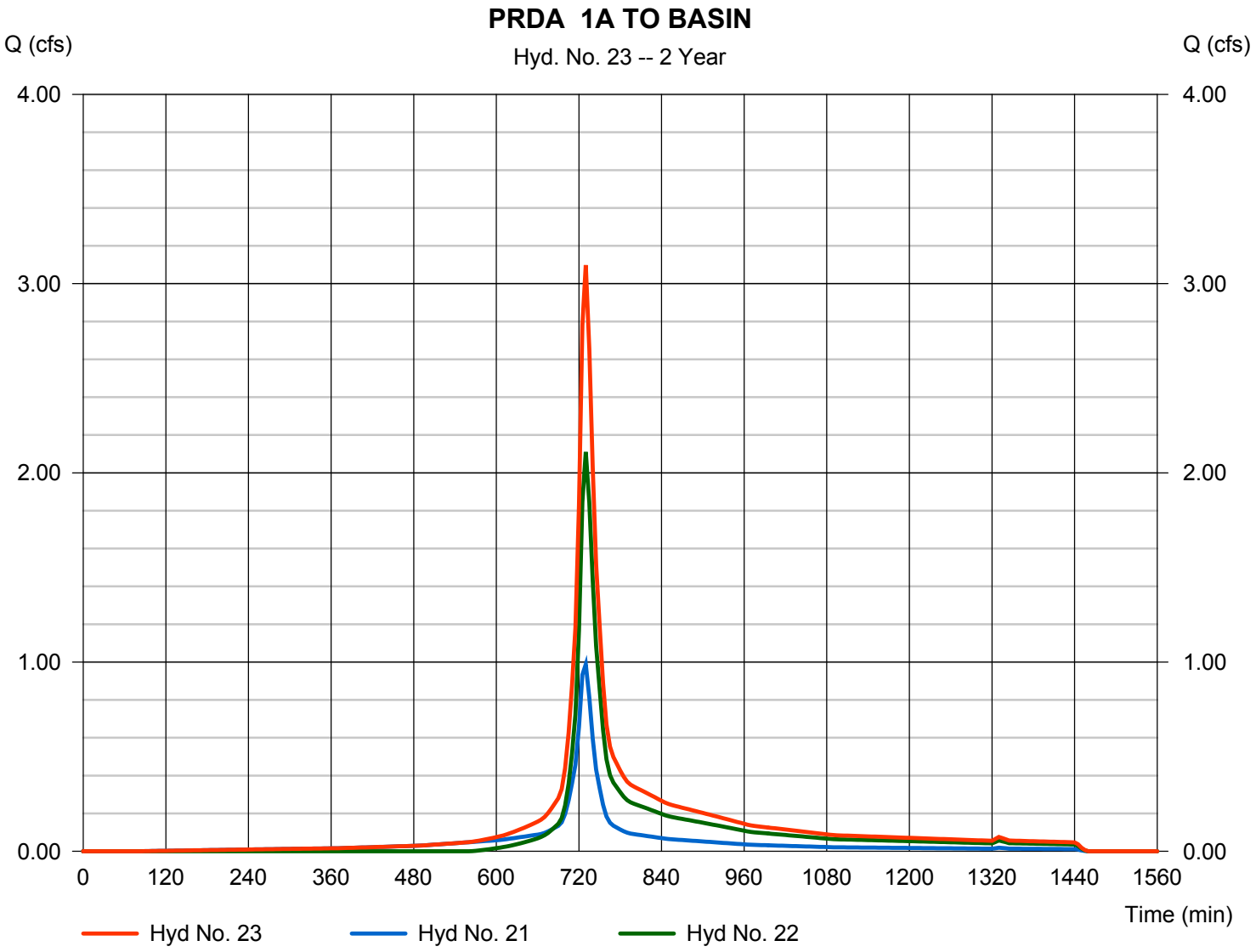


Hydrograph Report

Hyd. No. 23

PRDA 1A TO BASIN

Hydrograph type	= Combine	Peak discharge	= 3.098 cfs
Storm frequency	= 2 yrs	Time to peak	= 730 min
Time interval	= 5 min	Hyd. volume	= 12,892 cuft
Inflow hyds.	= 21, 22	Contrib. drain. area	= 2.060 ac



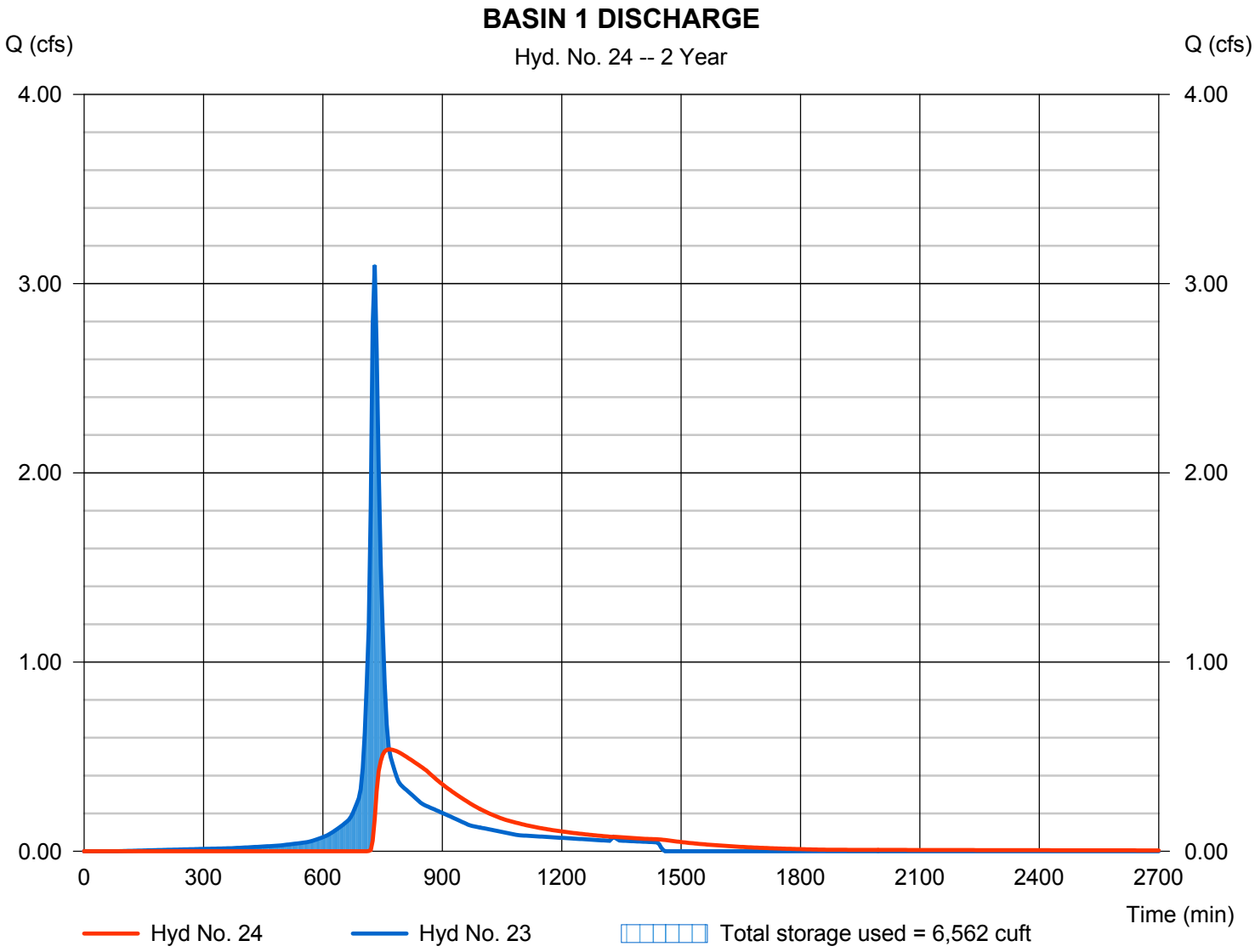
Hydrograph Report

Hyd. No. 24

BASIN 1 DISCHARGE

Hydrograph type	= Reservoir	Peak discharge	= 0.538 cfs
Storm frequency	= 2 yrs	Time to peak	= 765 min
Time interval	= 5 min	Hyd. volume	= 10,675 cuft
Inflow hyd. No.	= 23 - PRDA 1A TO BASIN	Max. Elevation	= 254.78 ft
Reservoir name	= SWM BASIN 1	Max. Storage	= 6,562 cuft

Storage Indication method used.



Pond Report

Pond No. 1 - SWM BASIN 1

Pond Data

Contours -User-defined contour areas. Average end area method used for volume calculation. Begining Elevation = 253.85 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	253.85	7,089	0	0
1.00	254.85	7,089	7,089	7,089
2.00	255.85	7,089	7,089	14,178
2.15	256.00	7,089	1,063	15,241
2.50	256.35	7,089	2,481	17,723
3.50	257.35	7,089	7,089	24,812

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 15.00	6.00	Inactive	0.00
Span (in)	= 15.00	6.00	7.00	0.00
No. Barrels	= 1	1	1	0
Invert El. (ft)	= 253.85	254.20	254.30	0.00
Length (ft)	= 27.00	1.00	1.00	0.00
Slope (%)	= 1.00	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	Yes	Yes	No

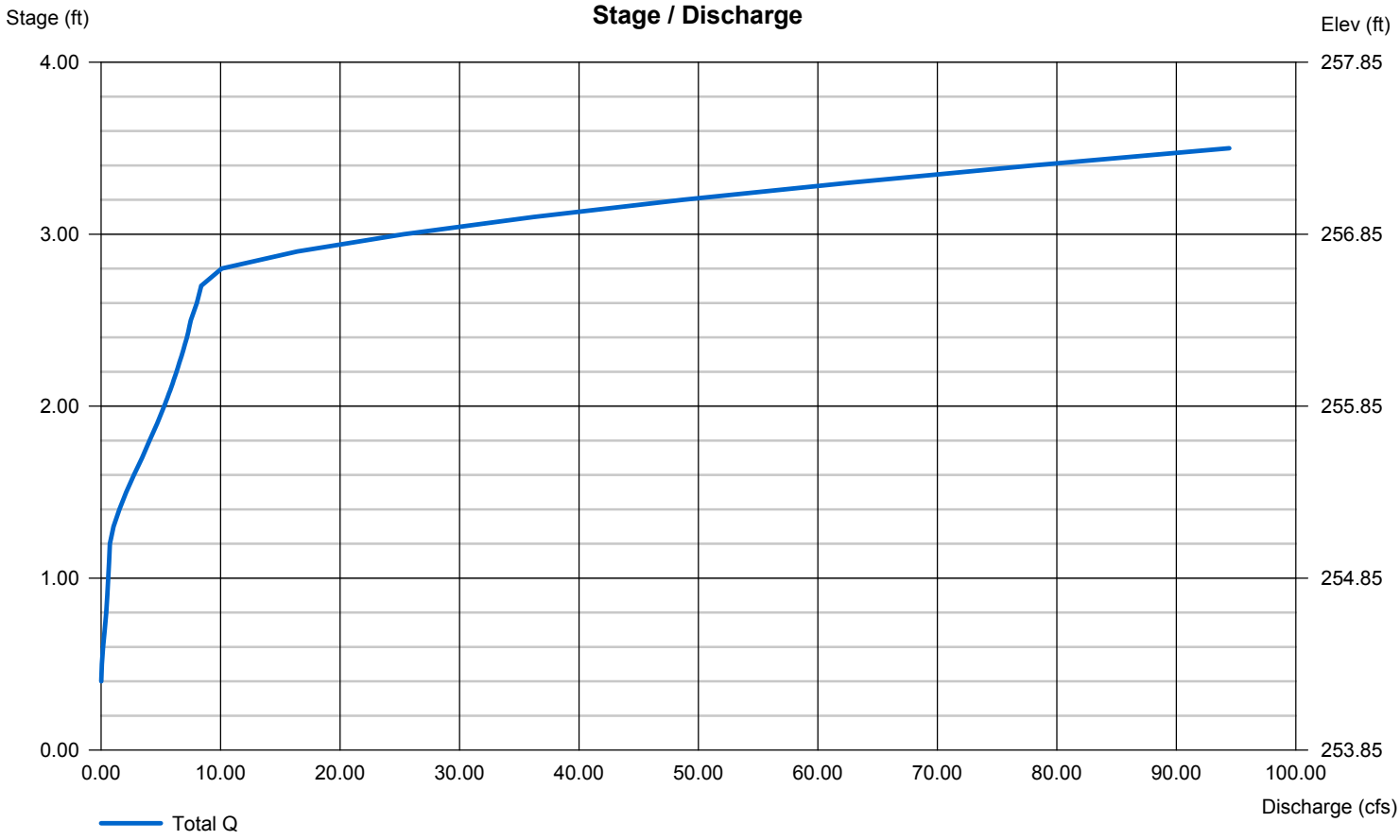
Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 16.00	2.30	50.00	0.00
Crest El. (ft)	= 256.35	255.05	256.60	0.00
Weir Coeff.	= 3.33	3.33	2.60	3.33
Weir Type	= 1	Rect	Broad	---
Multi-Stage	= Yes	Yes	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).

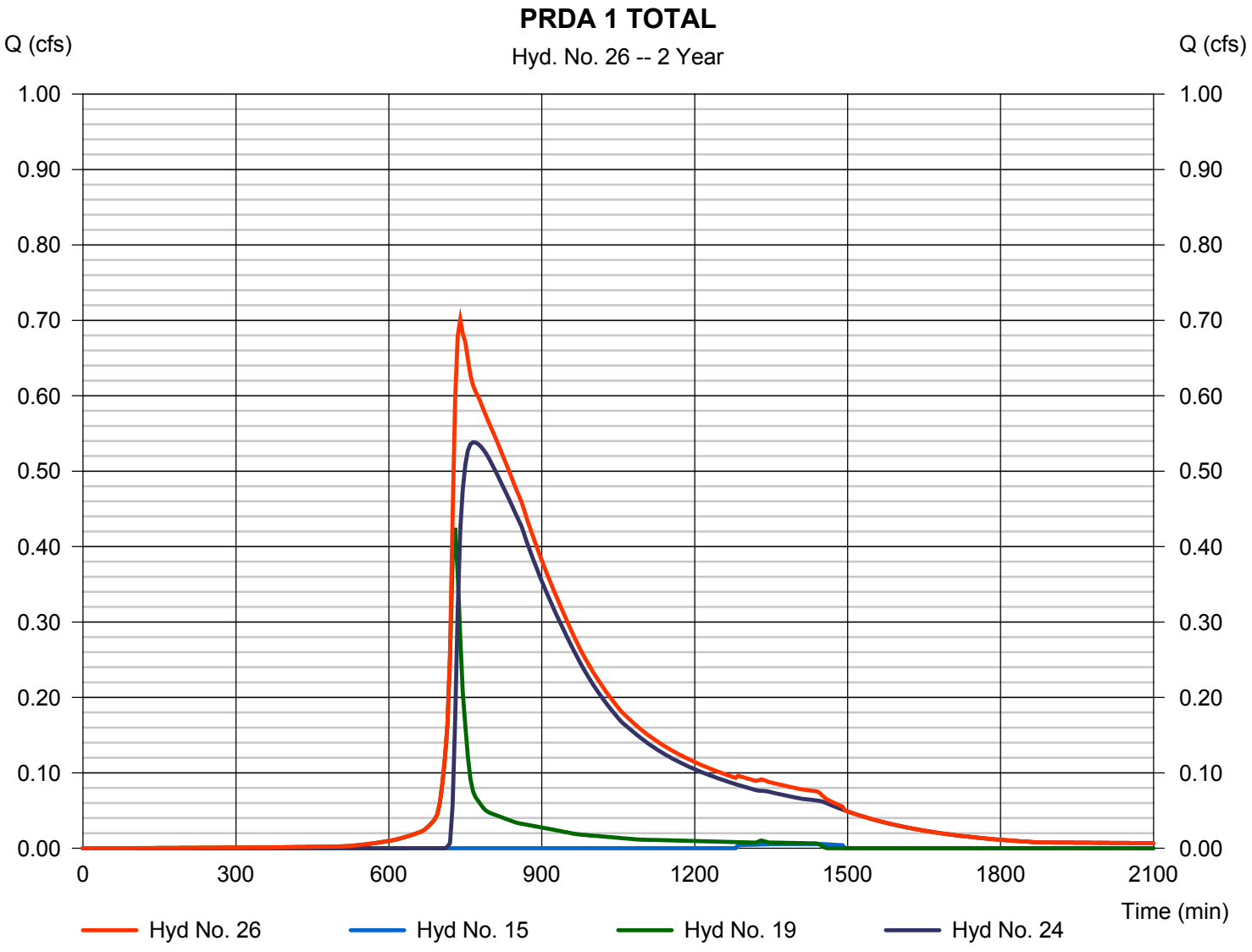


Hydrograph Report

Hyd. No. 26

PRDA 1 TOTAL

Hydrograph type	= Combine	Peak discharge	= 0.701 cfs
Storm frequency	= 2 yrs	Time to peak	= 740 min
Time interval	= 5 min	Hyd. volume	= 12,467 cuft
Inflow hyds.	= 15, 19, 24	Contrib. drain. area	= 0.000 ac

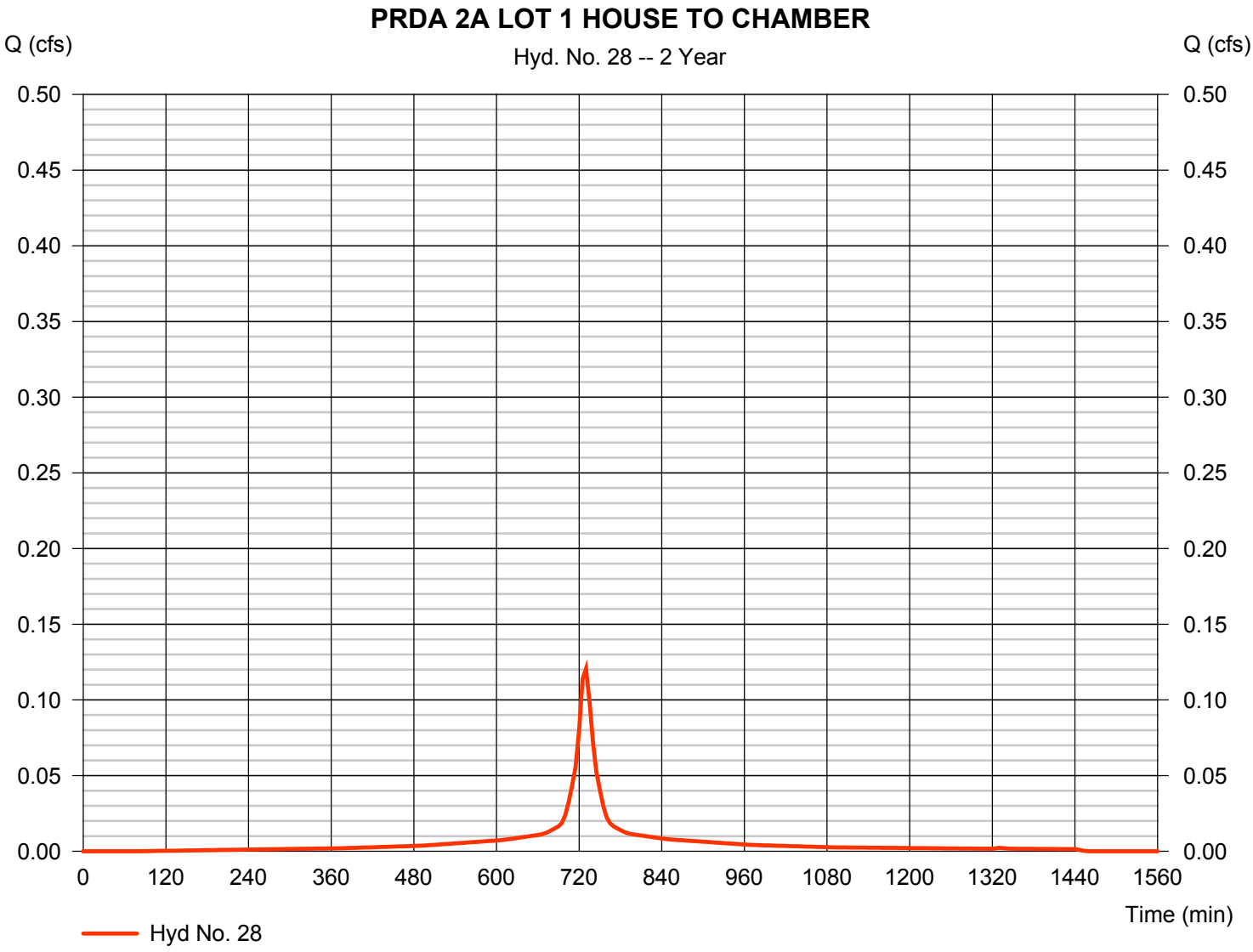


Hydrograph Report

Hyd. No. 28

PRDA 2A LOT 1 HOUSE TO CHAMBER

Hydrograph type	= SCS Runoff	Peak discharge	= 0.120 cfs
Storm frequency	= 2 yrs	Time to peak	= 730 min
Time interval	= 5 min	Hyd. volume	= 542 cuft
Drainage area	= 0.050 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.00 min
Total precip.	= 3.42 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



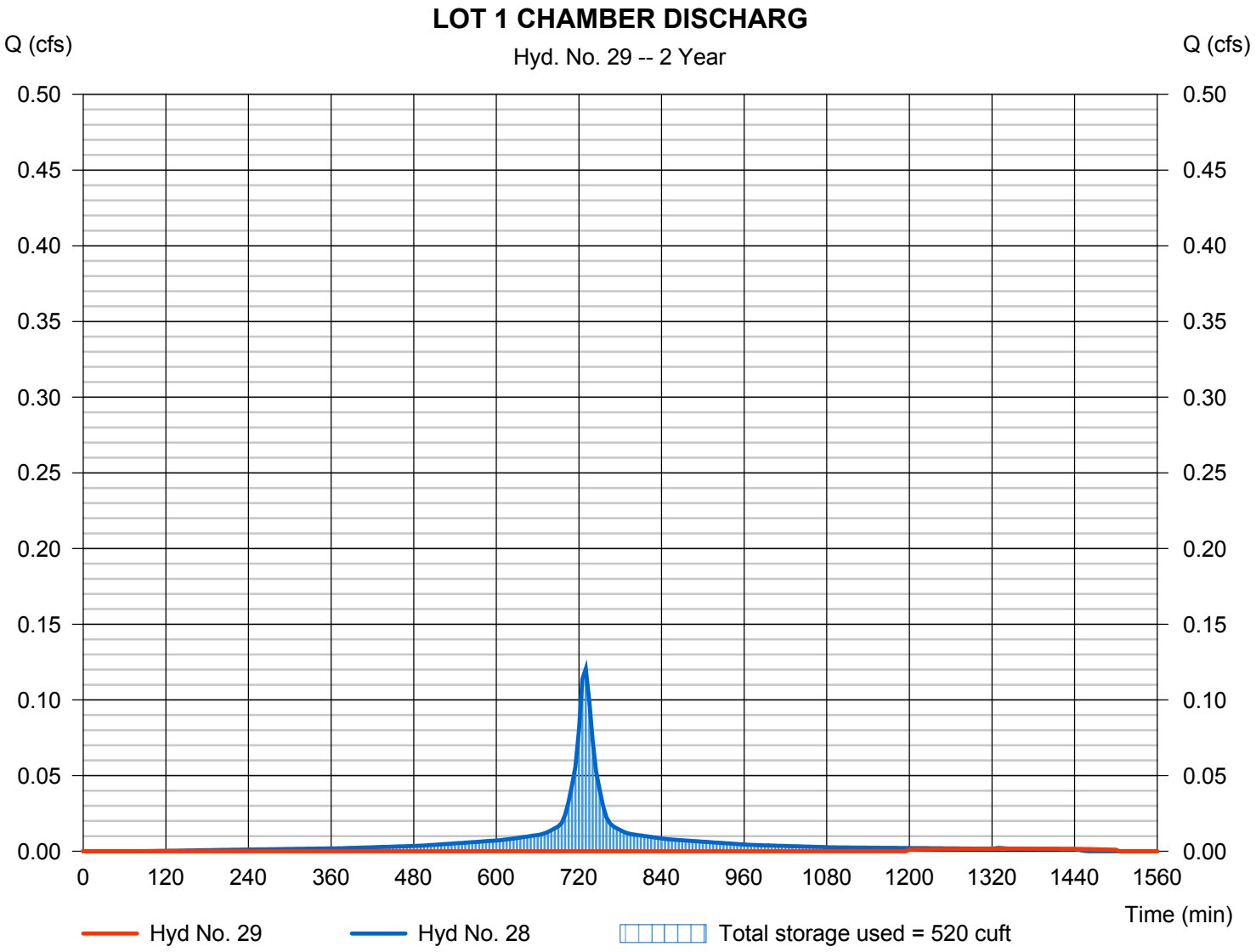
Hydrograph Report

Hyd. No. 29

LOT 1 CHAMBER DISCHARG

Hydrograph type	=	Reservoir	Peak discharge	=	0.002 cfs
Storm frequency	=	2 yrs	Time to peak	=	1345 min
Time interval	=	5 min	Hyd. volume	=	27 cuft
Inflow hyd. No.	=	28 - PRDA 2A LOT 1 HOUSE TO CHAMBER	Max. Elevation	=	2.38 ft
Reservoir name	=	CHAMBERS LOT 1	Max. Storage	=	520 cuft

Storage Indication method used.



Pond Report

Pond No. 4 - CHAMBERS LOT 1

Pond Data

UG Chambers -Invert elev. = 1.30 ft, Rise x Span = 1.54 x 2.75 ft, Barrel Len = 60.00 ft, No. Barrels = 2, Slope = 0.00%, Headers = Yes
Encasement -Invert elev. = 1.00 ft, Width = 4.00 ft, Height = 3.00 ft, Voids = 40.00%

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	1.00	n/a	0	0
0.30	1.30	n/a	65	65
0.60	1.60	n/a	132	197
0.90	1.90	n/a	130	327
1.20	2.20	n/a	124	451
1.50	2.50	n/a	114	565
1.80	2.80	n/a	97	662
2.10	3.10	n/a	67	729
2.40	3.40	n/a	65	794
2.70	3.70	n/a	65	859
3.00	4.00	n/a	65	924

Culvert / Orifice Structures

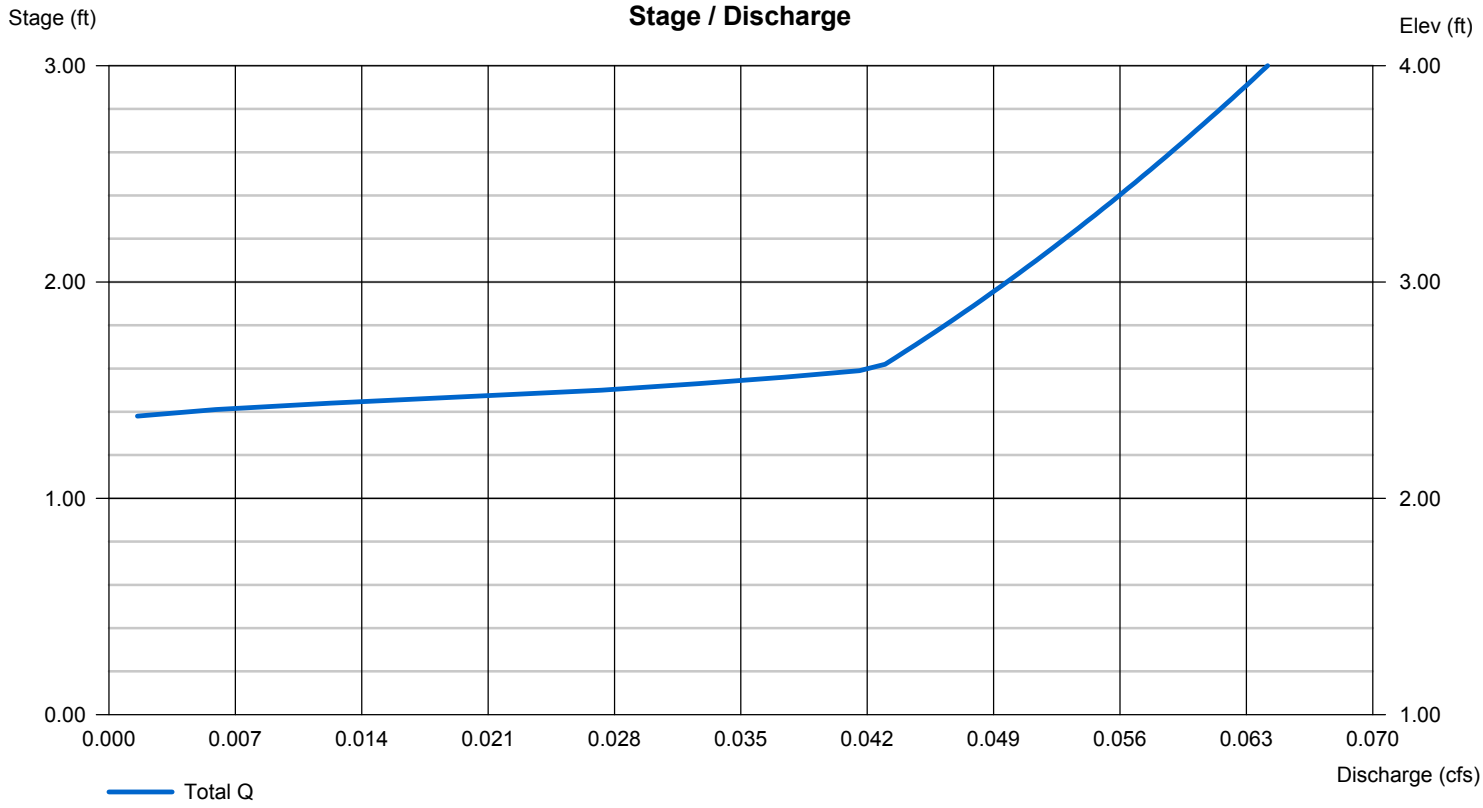
	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 2.00	0.00	0.00	0.00
Span (in)	= 2.00	0.00	0.00	0.00
No. Barrels	= 1	0	0	0
Invert El. (ft)	= 2.35	0.00	0.00	0.00
Length (ft)	= 51.00	0.00	0.00	0.00
Slope (%)	= 2.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	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 Wet area)
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).

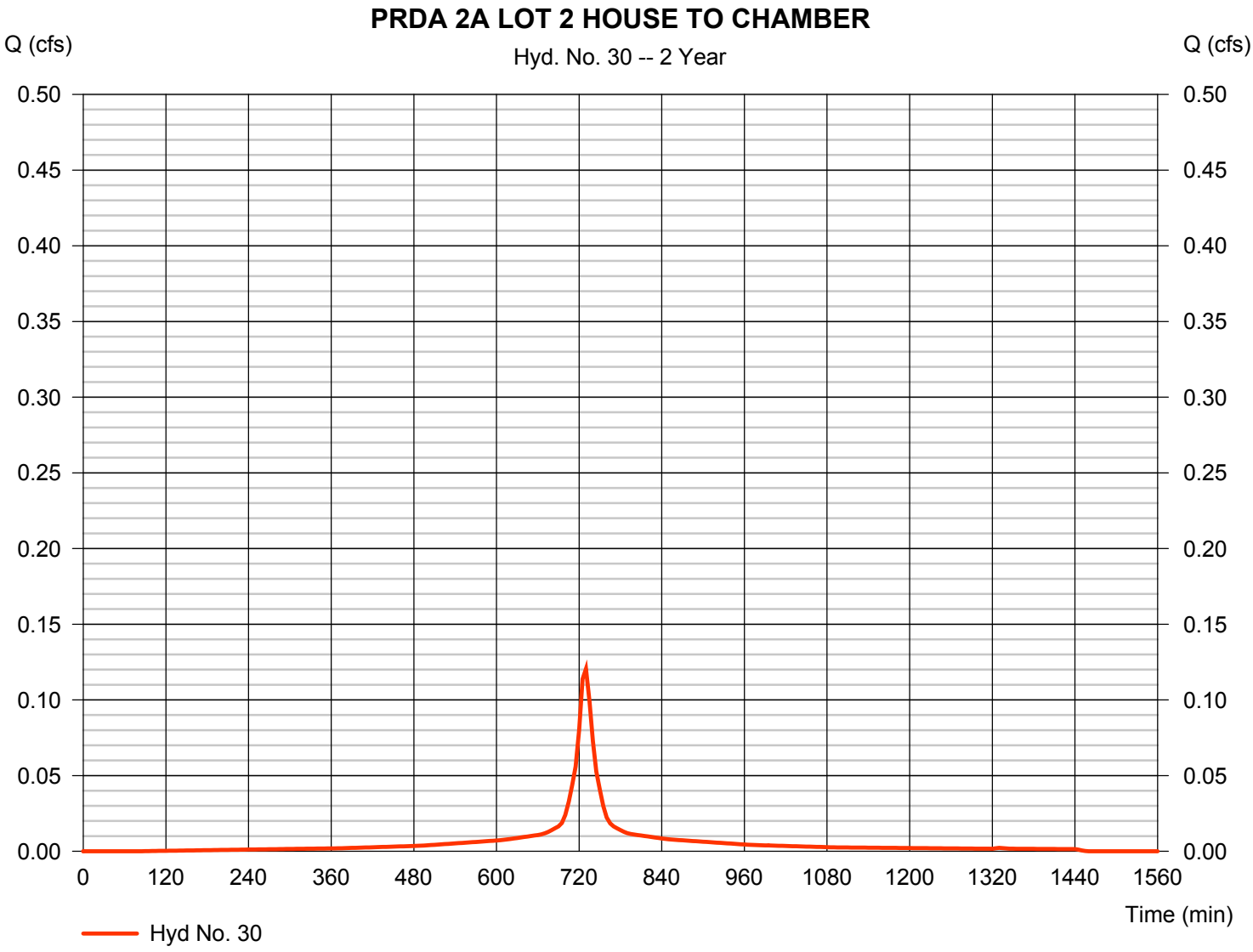


Hydrograph Report

Hyd. No. 30

PRDA 2A LOT 2 HOUSE TO CHAMBER

Hydrograph type	= SCS Runoff	Peak discharge	= 0.120 cfs
Storm frequency	= 2 yrs	Time to peak	= 730 min
Time interval	= 5 min	Hyd. volume	= 542 cuft
Drainage area	= 0.050 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.00 min
Total precip.	= 3.42 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



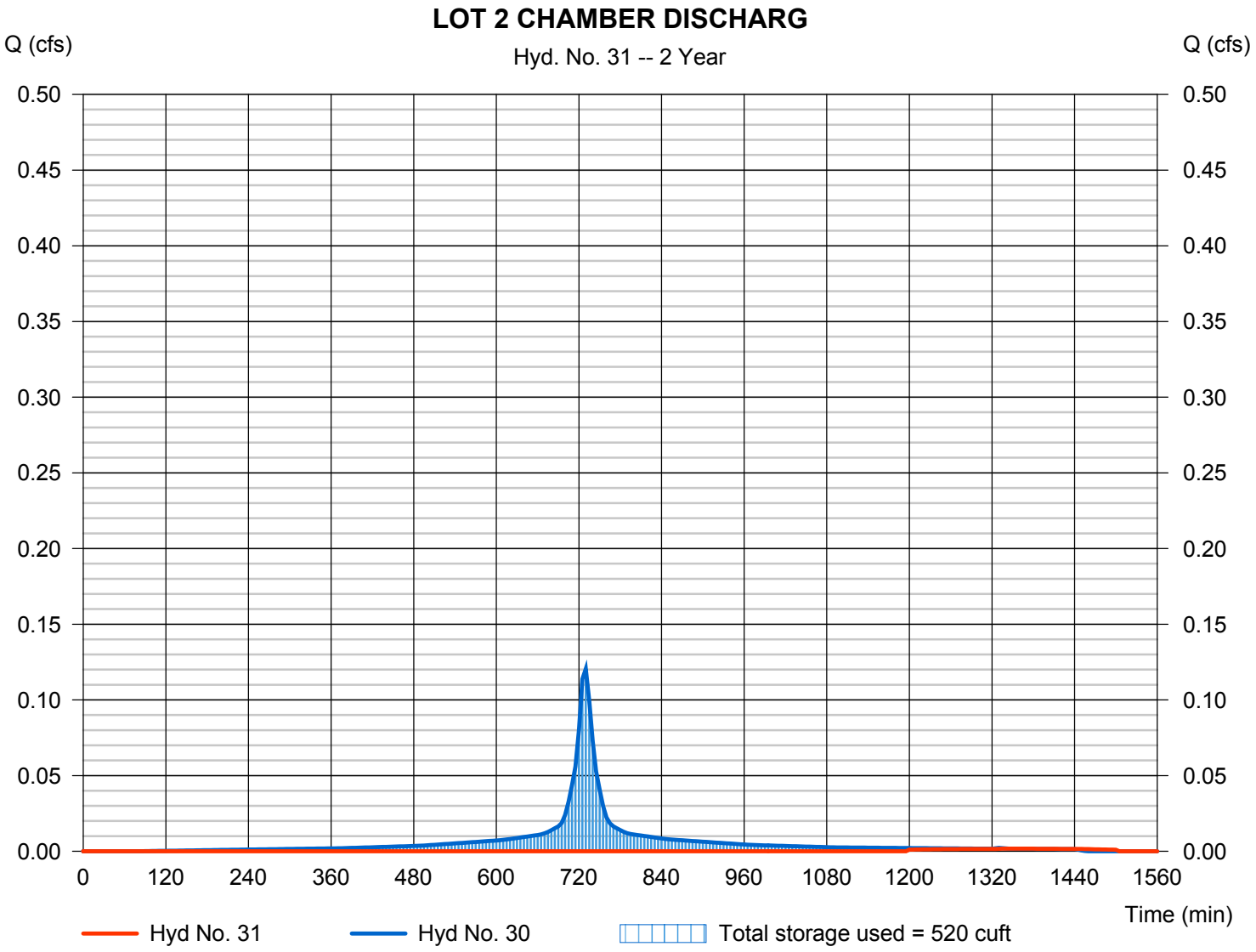
Hydrograph Report

Hyd. No. 31

LOT 2 CHAMBER DISCHARG

Hydrograph type	=	Reservoir	Peak discharge	=	0.002 cfs
Storm frequency	=	2 yrs	Time to peak	=	1345 min
Time interval	=	5 min	Hyd. volume	=	27 cuft
Inflow hyd. No.	=	30 - PRDA 2A LOT 2 HOUSE TO CHAMBER	Max. Elevation	=	2.38 ft
Reservoir name	=	CHAMBERS LOT 2	Max. Storage	=	520 cuft

Storage Indication method used.



Pond Report

Pond No. 5 - CHAMBERS LOT 2

Pond Data

UG Chambers -Invert elev. = 1.30 ft, Rise x Span = 1.54 x 2.75 ft, Barrel Len = 60.00 ft, No. Barrels = 2, Slope = 0.00%, Headers = Yes
Encasement -Invert elev. = 1.00 ft, Width = 4.00 ft, Height = 3.00 ft, Voids = 40.00%

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	1.00	n/a	0	0
0.30	1.30	n/a	65	65
0.60	1.60	n/a	132	197
0.90	1.90	n/a	130	327
1.20	2.20	n/a	124	451
1.50	2.50	n/a	114	565
1.80	2.80	n/a	97	662
2.10	3.10	n/a	67	729
2.40	3.40	n/a	65	794
2.70	3.70	n/a	65	859
3.00	4.00	n/a	65	924

Culvert / Orifice Structures

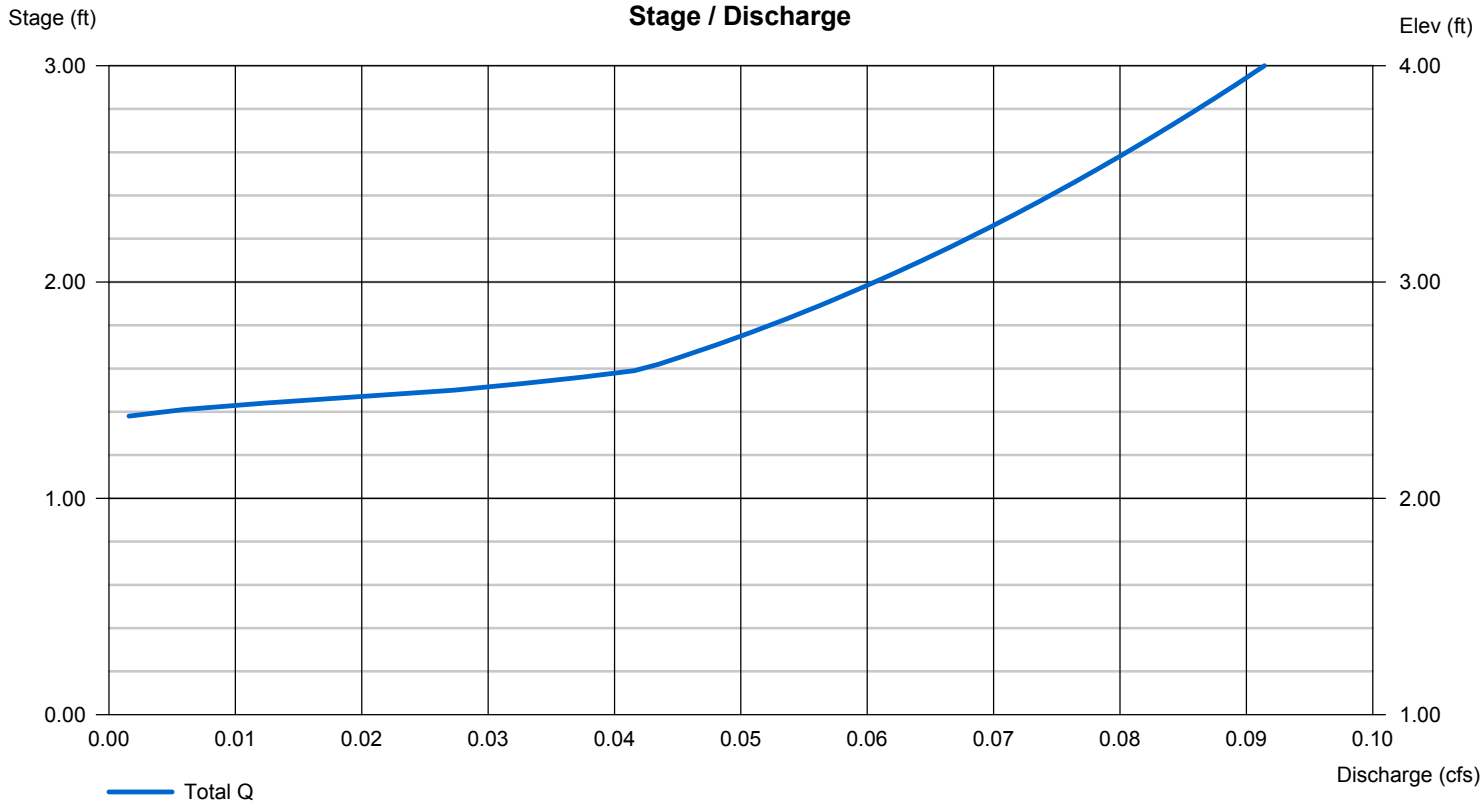
	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 2.00	0.00	0.00	0.00
Span (in)	= 2.00	0.00	0.00	0.00
No. Barrels	= 1	0	0	0
Invert El. (ft)	= 2.35	0.00	0.00	0.00
Length (ft)	= 15.00	0.00	0.00	0.00
Slope (%)	= 2.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	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 Wet area)
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).

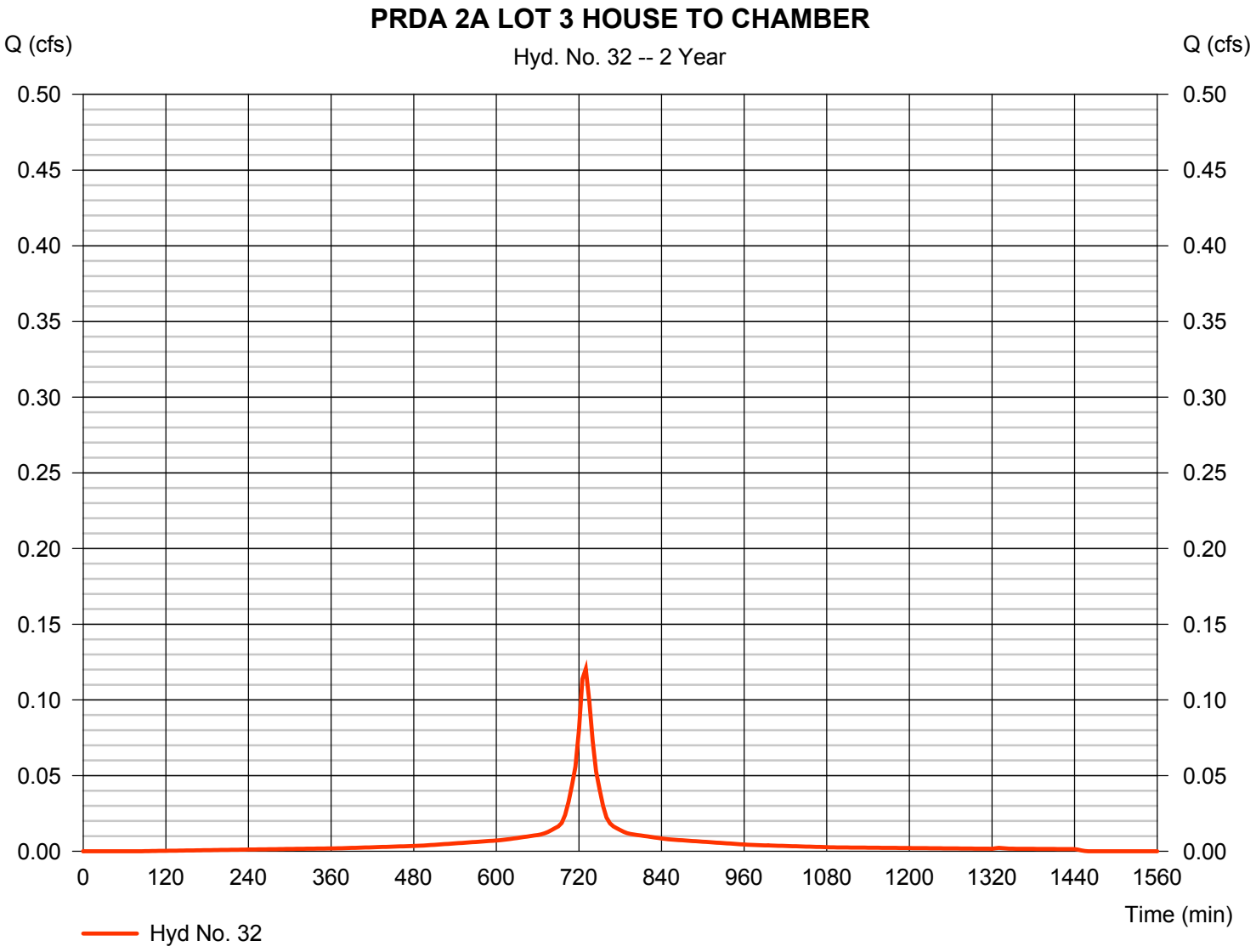


Hydrograph Report

Hyd. No. 32

PRDA 2A LOT 3 HOUSE TO CHAMBER

Hydrograph type	= SCS Runoff	Peak discharge	= 0.120 cfs
Storm frequency	= 2 yrs	Time to peak	= 730 min
Time interval	= 5 min	Hyd. volume	= 542 cuft
Drainage area	= 0.050 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.00 min
Total precip.	= 3.42 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



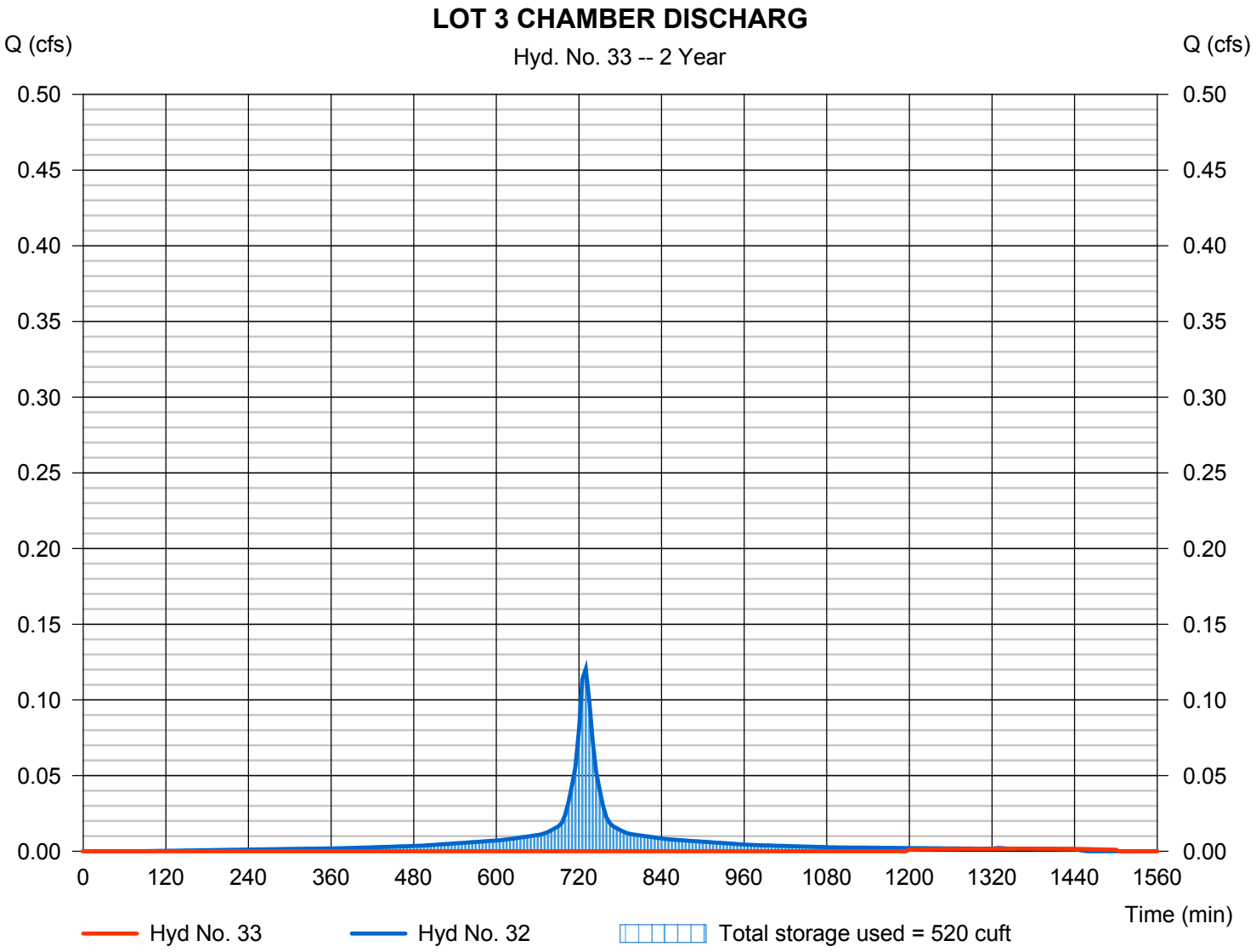
Hydrograph Report

Hyd. No. 33

LOT 3 CHAMBER DISCHARG

Hydrograph type	=	Reservoir	Peak discharge	=	0.002 cfs
Storm frequency	=	2 yrs	Time to peak	=	1345 min
Time interval	=	5 min	Hyd. volume	=	27 cuft
Inflow hyd. No.	=	32 - PRDA 2A LOT 3 HOUSE TO CHAMBER	Max. Elevation	=	2.38 ft
Reservoir name	=	CHAMBERS LOT 3	Max. Storage	=	520 cuft

Storage Indication method used.



Pond Report

Pond No. 6 - CHAMBERS LOT 3

Pond Data

UG Chambers -Invert elev. = 1.30 ft, Rise x Span = 1.54 x 2.75 ft, Barrel Len = 60.00 ft, No. Barrels = 2, Slope = 0.00%, Headers = Yes
Encasement -Invert elev. = 1.00 ft, Width = 4.00 ft, Height = 3.00 ft, Voids = 40.00%

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	1.00	n/a	0	0
0.30	1.30	n/a	65	65
0.60	1.60	n/a	132	197
0.90	1.90	n/a	130	327
1.20	2.20	n/a	124	451
1.50	2.50	n/a	114	565
1.80	2.80	n/a	97	662
2.10	3.10	n/a	67	729
2.40	3.40	n/a	65	794
2.70	3.70	n/a	65	859
3.00	4.00	n/a	65	924

Culvert / Orifice Structures

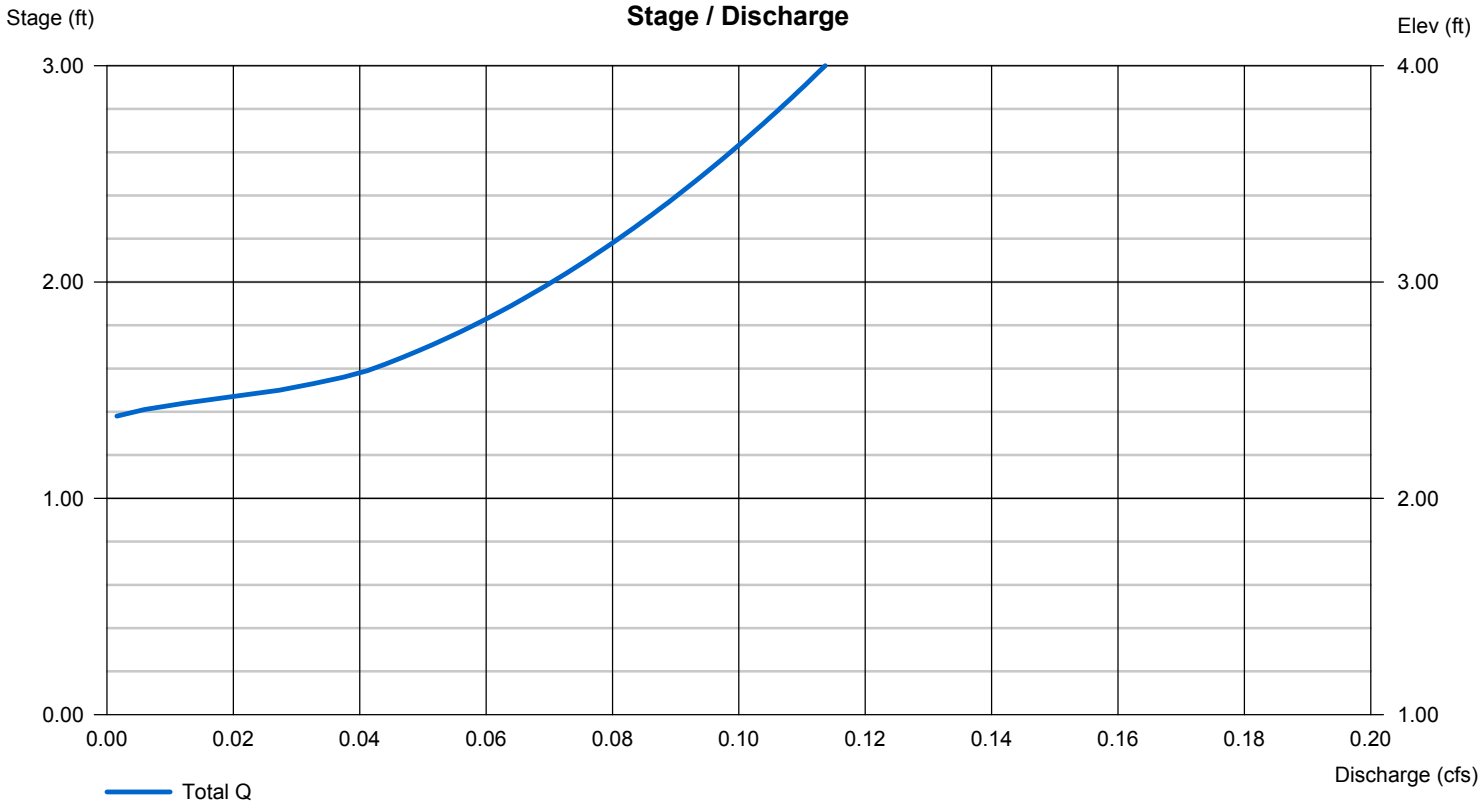
	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 2.00	0.00	0.00	0.00
Span (in)	= 2.00	0.00	0.00	0.00
No. Barrels	= 1	0	0	0
Invert El. (ft)	= 2.35	0.00	0.00	0.00
Length (ft)	= 7.00	0.00	0.00	0.00
Slope (%)	= 2.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

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 Wet area)
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).

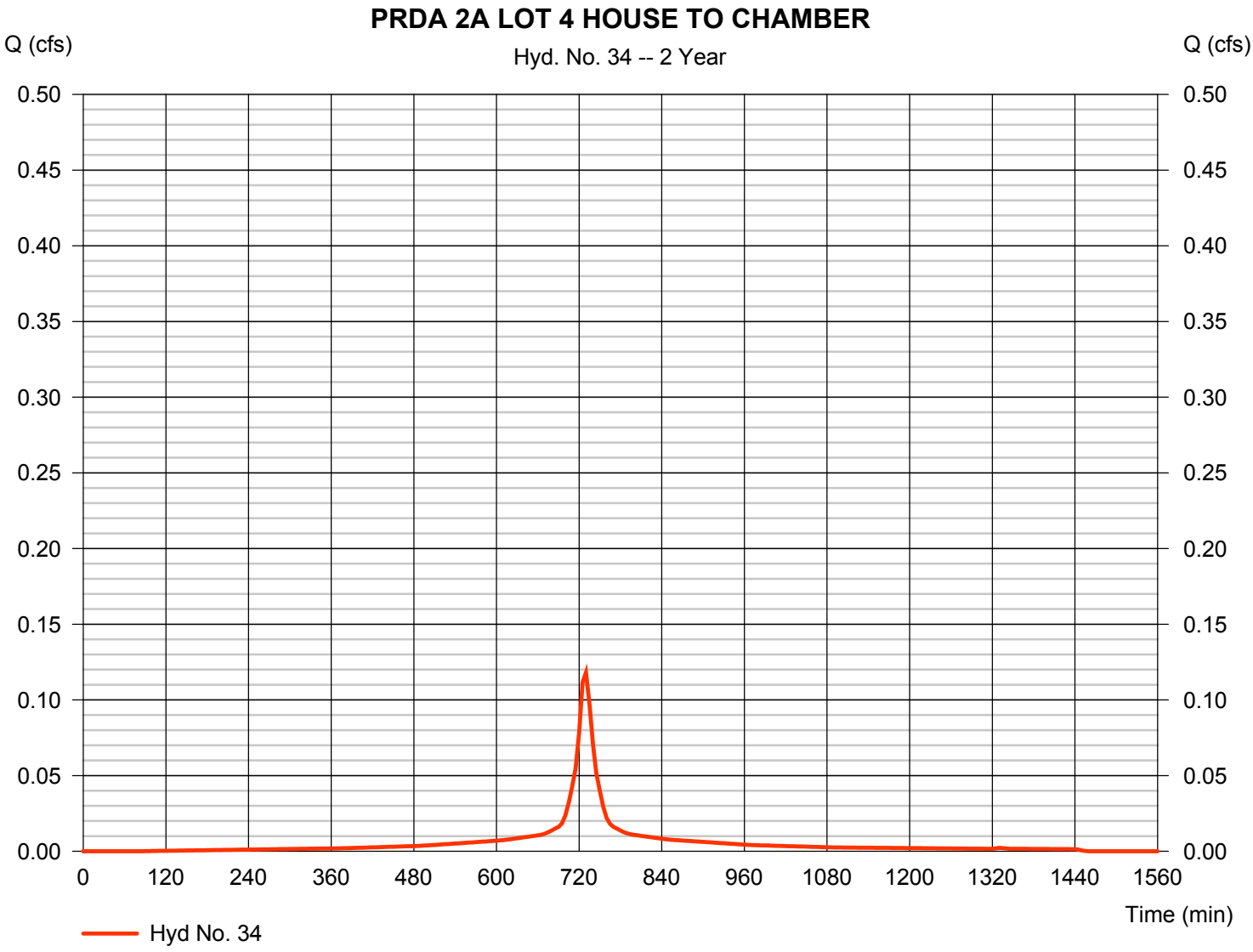


Hydrograph Report

Hyd. No. 34

PRDA 2A LOT 4 HOUSE TO CHAMBER

Hydrograph type	= SCS Runoff	Peak discharge	= 0.118 cfs
Storm frequency	= 2 yrs	Time to peak	= 730 min
Time interval	= 5 min	Hyd. volume	= 531 cuft
Drainage area	= 0.049 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.00 min
Total precip.	= 3.42 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



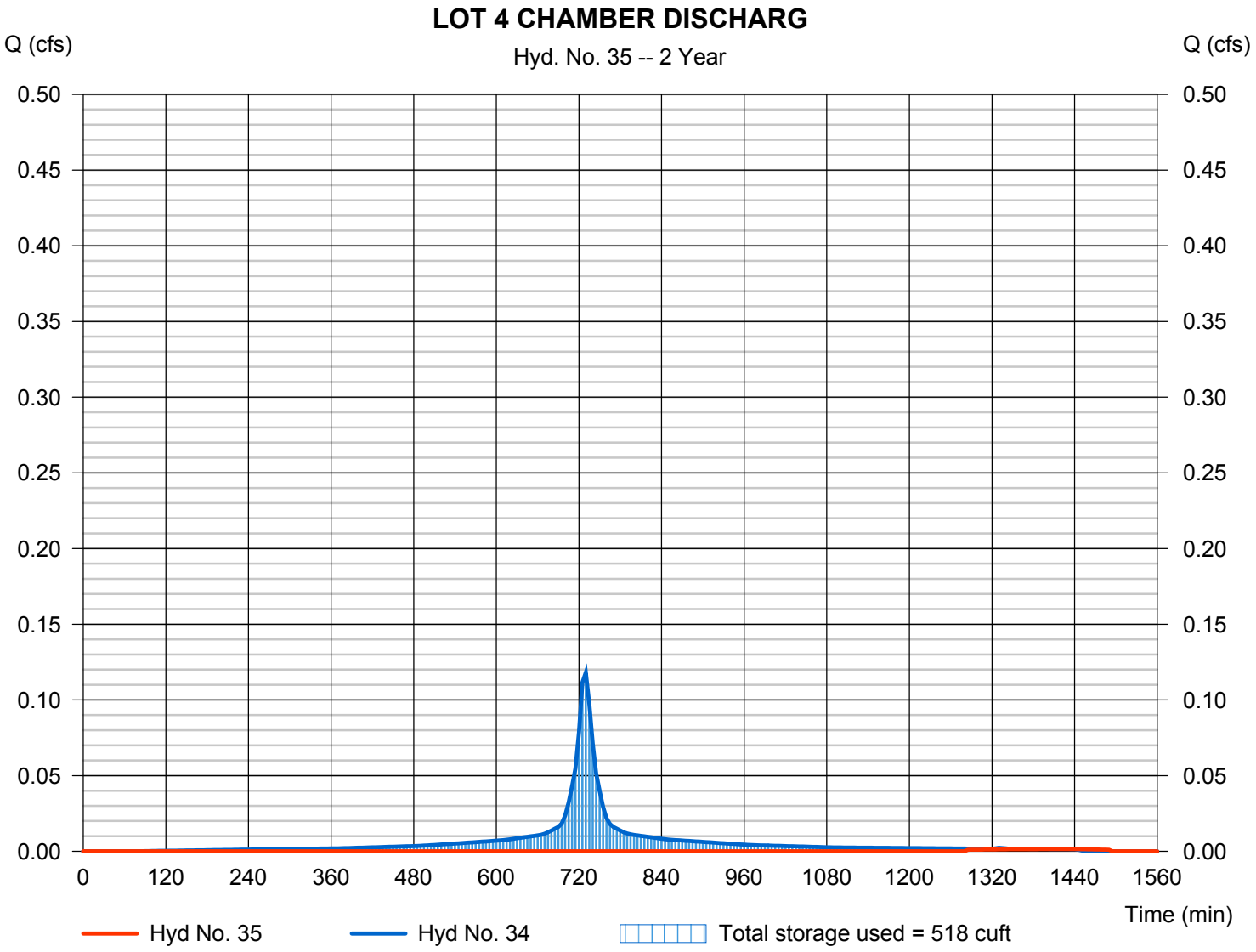
Hydrograph Report

Hyd. No. 35

LOT 4 CHAMBER DISCHARG

Hydrograph type	=	Reservoir	Peak discharge	=	0.001 cfs
Storm frequency	=	2 yrs	Time to peak	=	1425 min
Time interval	=	5 min	Hyd. volume	=	16 cuft
Inflow hyd. No.	=	34 - PRDA 2A LOT 4 HOUSE TO CHAMBER	Max. Elevation	=	2.38 ft
Reservoir name	=	CHAMBERS LOT 4	Max. Storage	=	518 cuft

Storage Indication method used.



Pond Report

Pond No. 7 - CHAMBERS LOT 4

Pond Data

UG Chambers -Invert elev. = 1.30 ft, Rise x Span = 1.54 x 2.75 ft, Barrel Len = 60.00 ft, No. Barrels = 2, Slope = 0.00%, Headers = Yes
Encasement -Invert elev. = 1.00 ft, Width = 4.00 ft, Height = 3.00 ft, Voids = 40.00%

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	1.00	n/a	0	0
0.30	1.30	n/a	65	65
0.60	1.60	n/a	132	197
0.90	1.90	n/a	130	327
1.20	2.20	n/a	124	451
1.50	2.50	n/a	114	565
1.80	2.80	n/a	97	662
2.10	3.10	n/a	67	729
2.40	3.40	n/a	65	794
2.70	3.70	n/a	65	859
3.00	4.00	n/a	65	924

Culvert / Orifice Structures

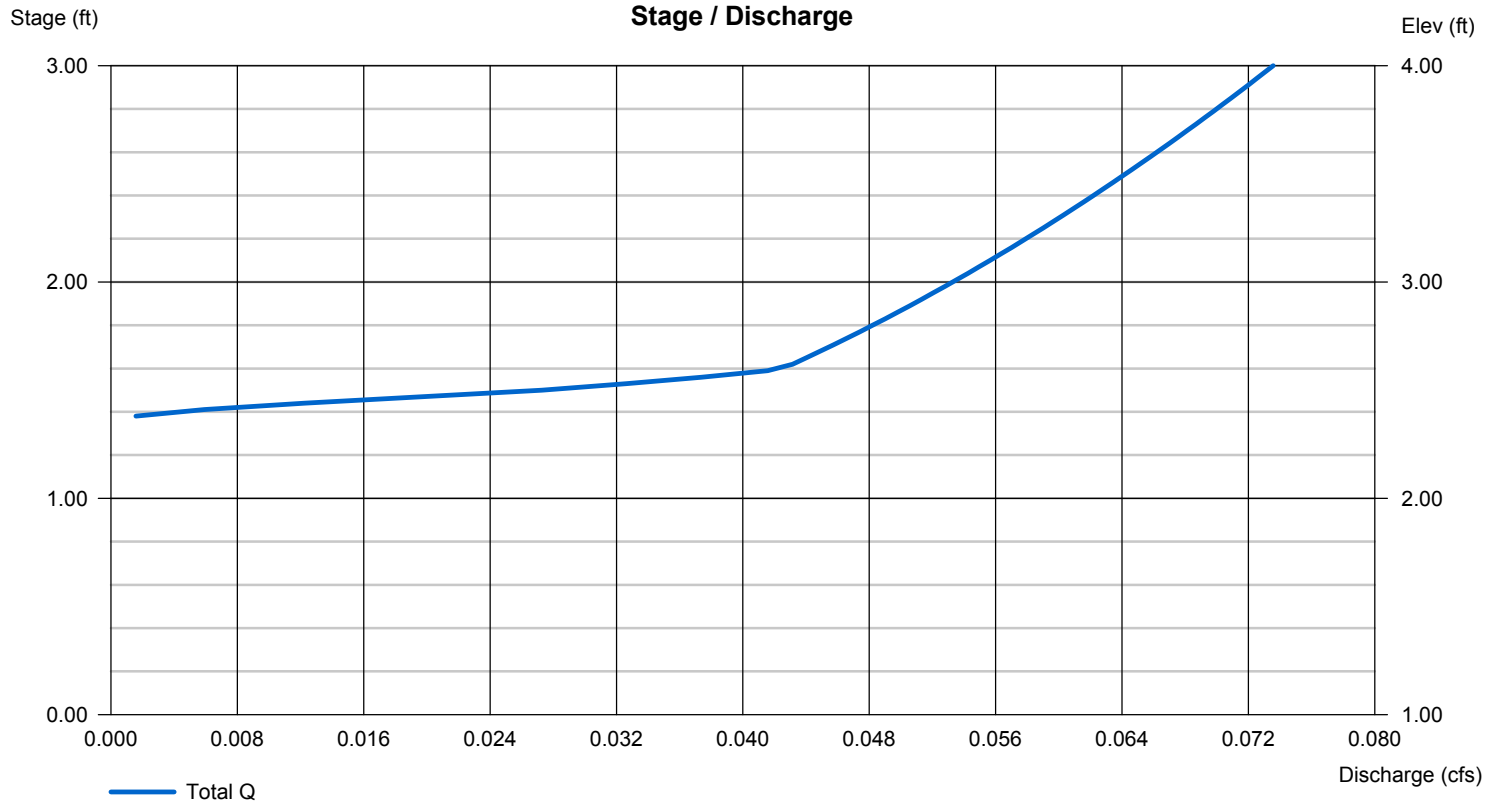
	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 2.00	0.00	0.00	0.00
Span (in)	= 2.00	0.00	0.00	0.00
No. Barrels	= 1	0	0	0
Invert El. (ft)	= 2.35	0.00	0.00	0.00
Length (ft)	= 31.00	0.00	0.00	0.00
Slope (%)	= 2.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	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 Wet area)
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).

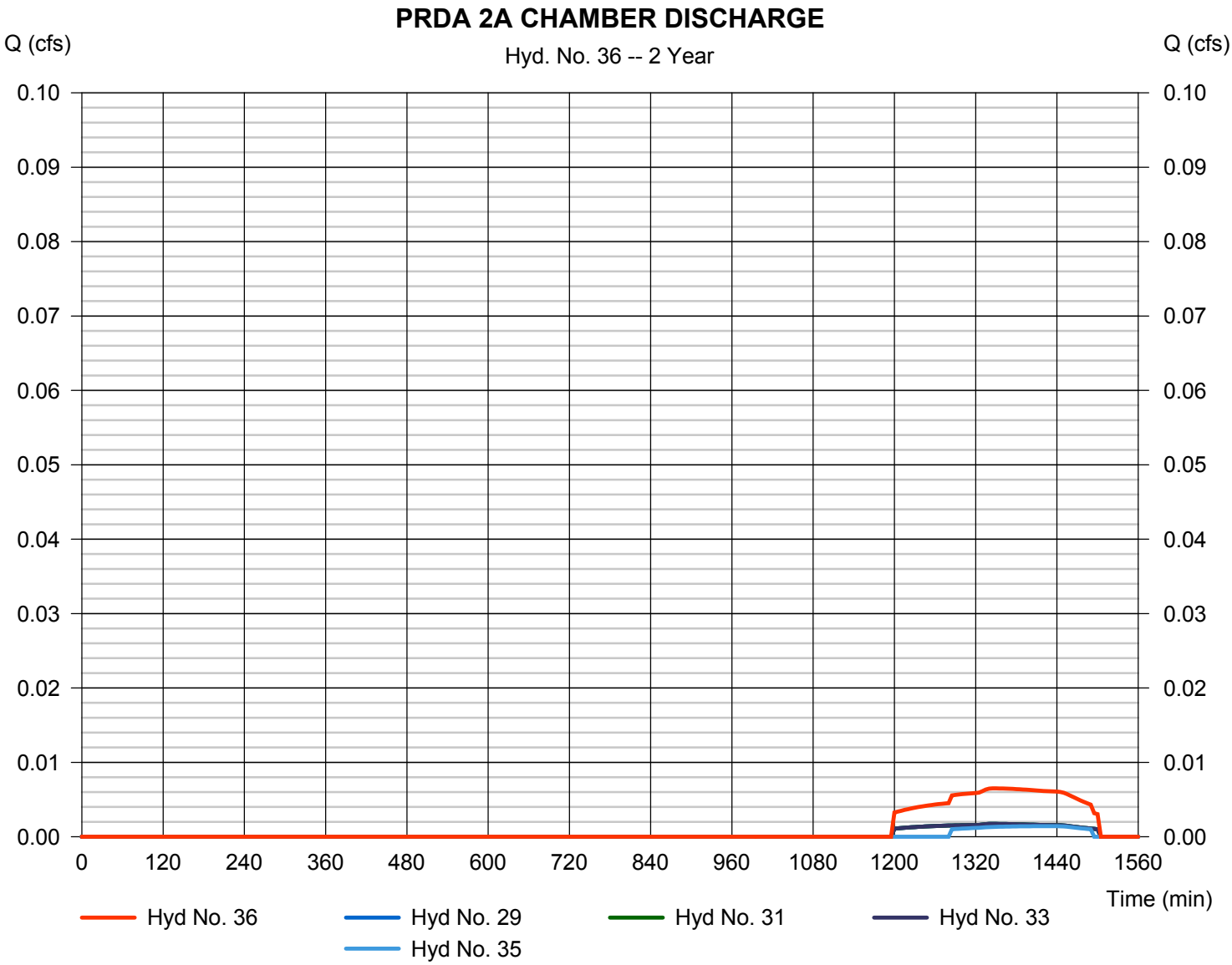


Hydrograph Report

Hyd. No. 36

PRDA 2A CHAMBER DISCHARGE

Hydrograph type	=	Combine	Peak discharge	=	0.007 cfs
Storm frequency	=	2 yrs	Time to peak	=	1345 min
Time interval	=	5 min	Hyd. volume	=	97 cuft
Inflow hyds.	=	29, 31, 33, 35	Contrib. drain. area	=	0.000 ac

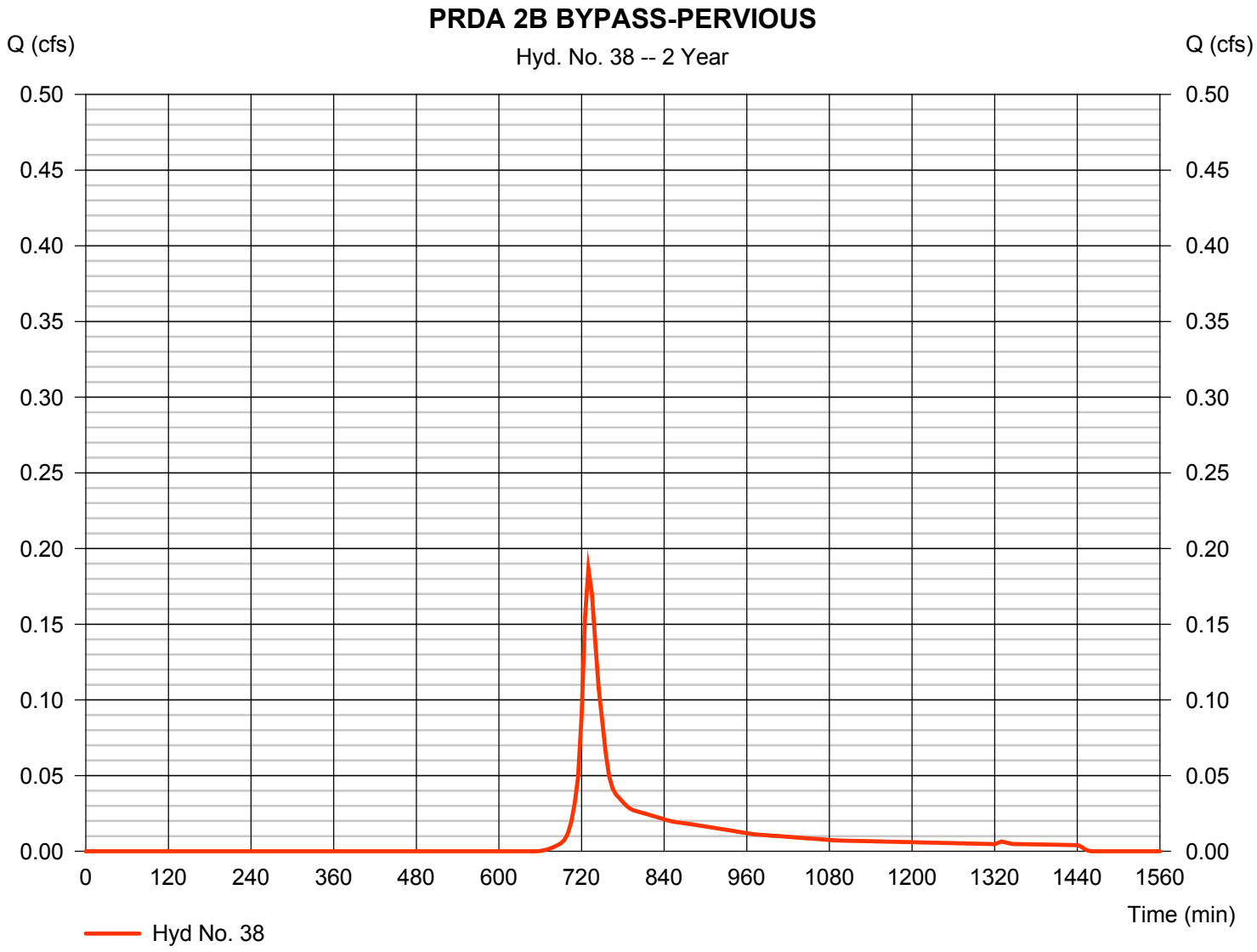


Hydrograph Report

Hyd. No. 38

PRDA 2B BYPASS-PERVIOUS

Hydrograph type	= SCS Runoff	Peak discharge	= 0.187 cfs
Storm frequency	= 2 yrs	Time to peak	= 730 min
Time interval	= 5 min	Hyd. volume	= 793 cuft
Drainage area	= 0.230 ac	Curve number	= 71
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.00 min
Total precip.	= 3.42 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

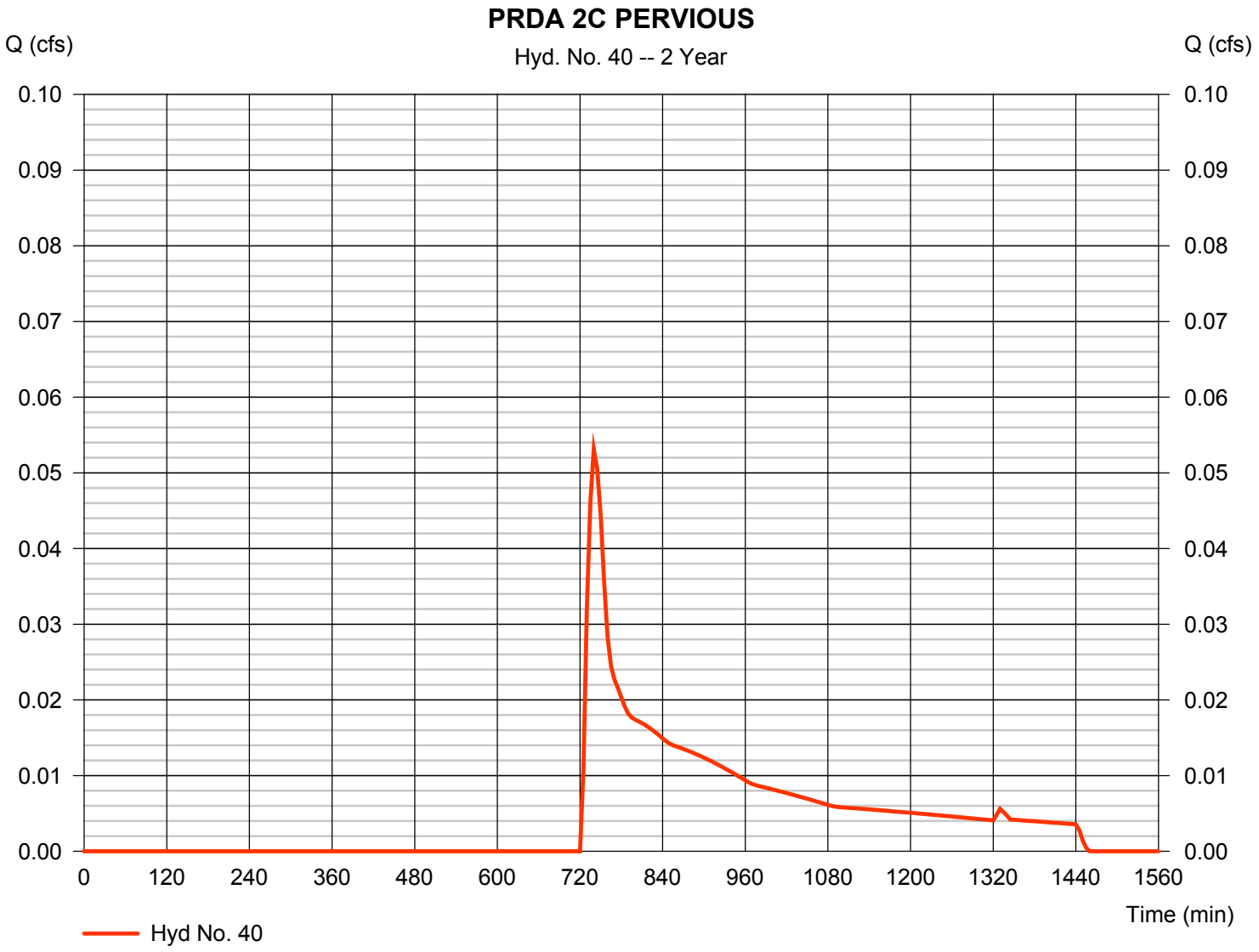


Hydrograph Report

Hyd. No. 40

PRDA 2C PERVIOUS

Hydrograph type	= SCS Runoff	Peak discharge	= 0.053 cfs
Storm frequency	= 2 yrs	Time to peak	= 740 min
Time interval	= 5 min	Hyd. volume	= 423 cuft
Drainage area	= 0.390 ac	Curve number	= 55
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.00 min
Total precip.	= 3.42 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

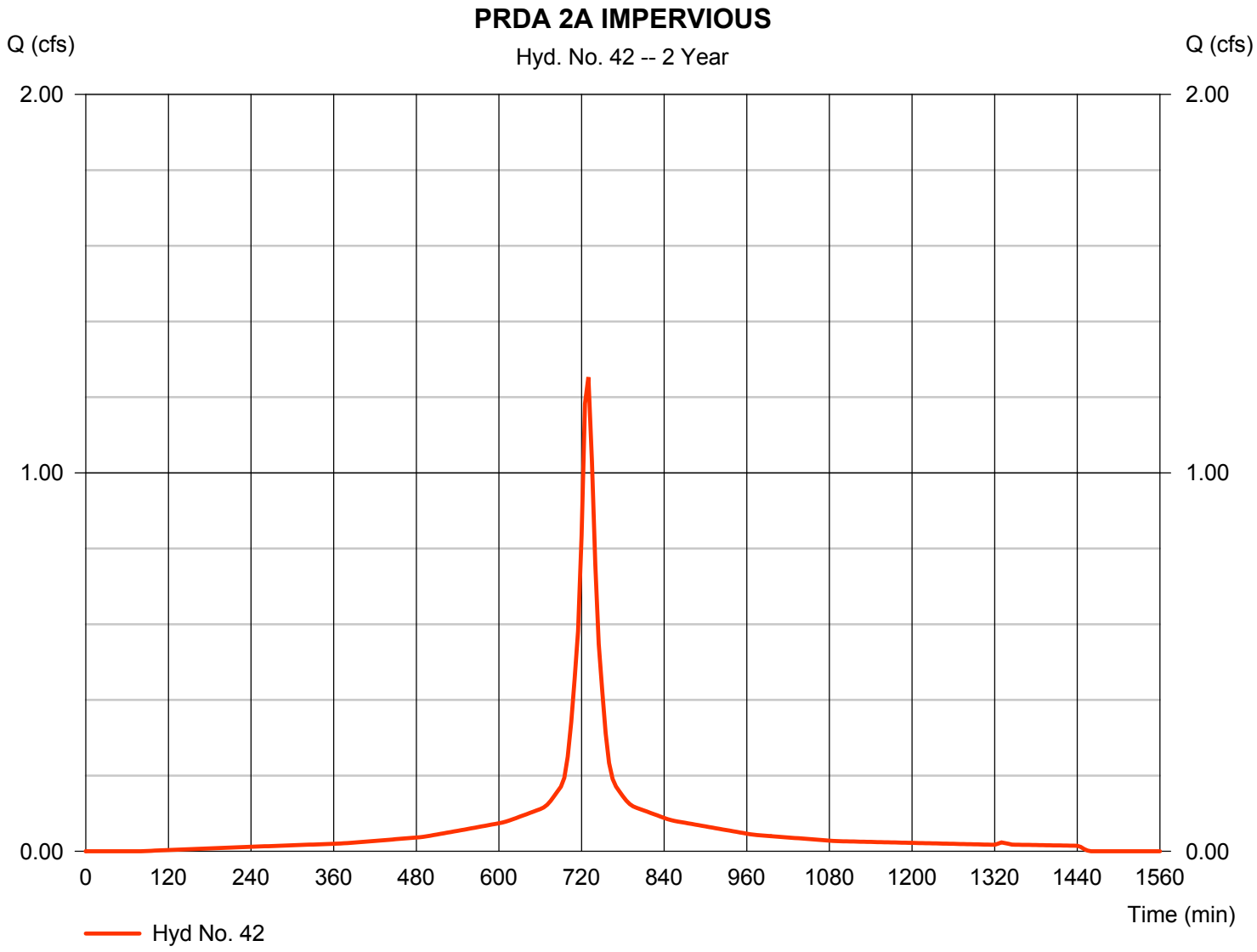


Hydrograph Report

Hyd. No. 42

PRDA 2A IMPERVIOUS

Hydrograph type	= SCS Runoff	Peak discharge	= 1.253 cfs
Storm frequency	= 2 yrs	Time to peak	= 730 min
Time interval	= 5 min	Hyd. volume	= 5,639 cuft
Drainage area	= 0.520 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.00 min
Total precip.	= 3.42 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

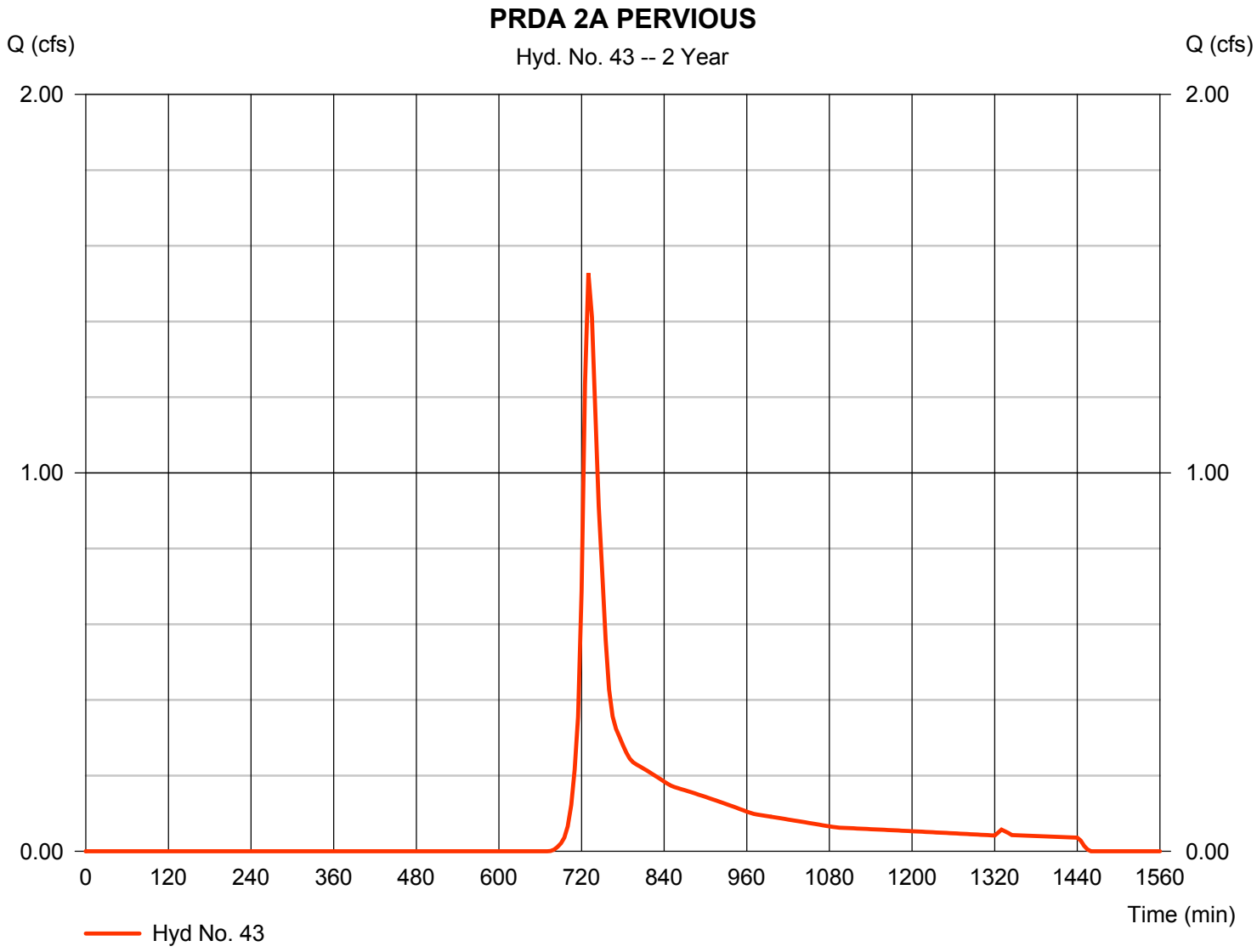


Hydrograph Report

Hyd. No. 43

PRDA 2A PERVIOUS

Hydrograph type	= SCS Runoff	Peak discharge	= 1.528 cfs
Storm frequency	= 2 yrs	Time to peak	= 730 min
Time interval	= 5 min	Hyd. volume	= 6,694 cuft
Drainage area	= 2.170 ac	Curve number	= 69
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.00 min
Total precip.	= 3.42 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

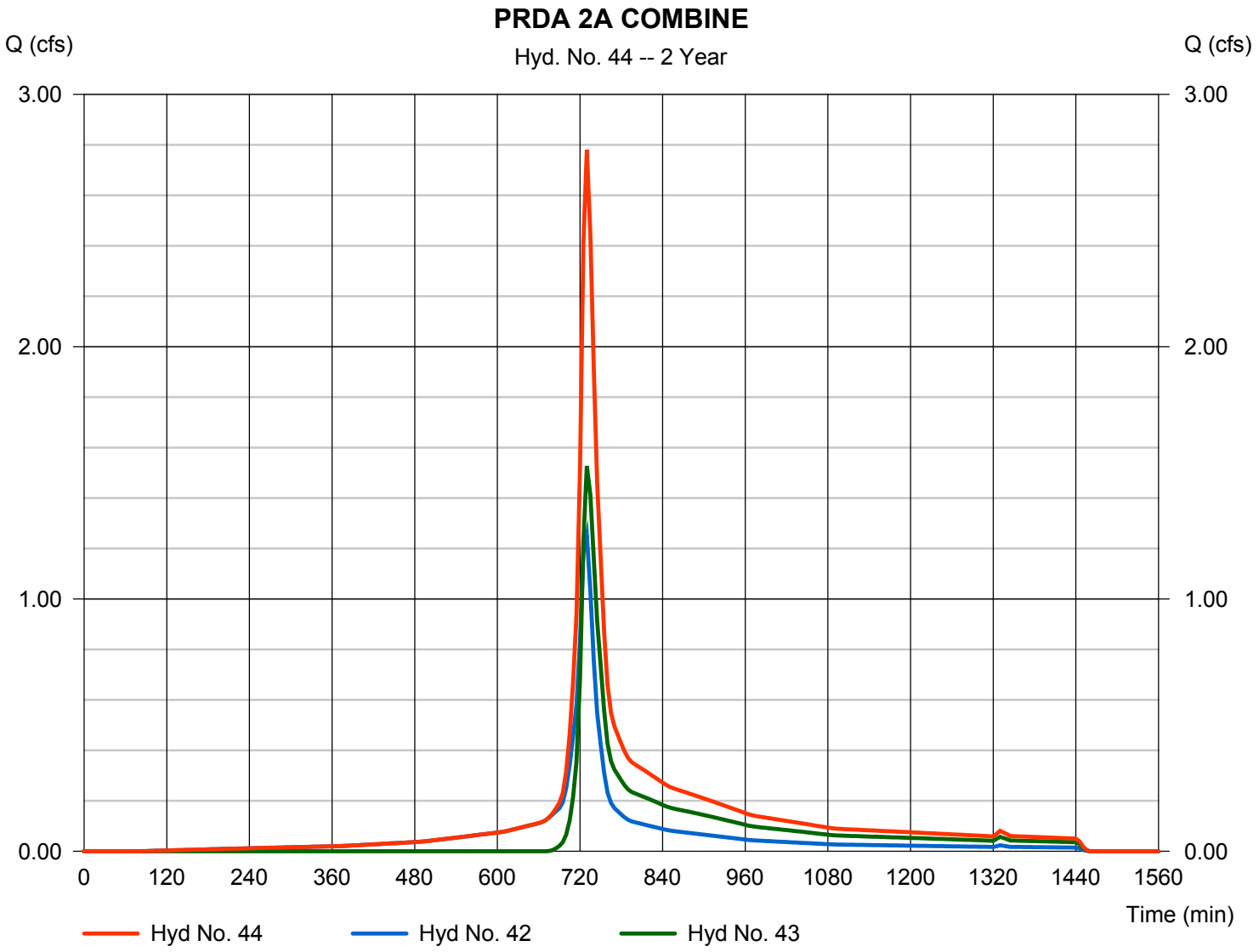


Hydrograph Report

Hyd. No. 44

PRDA 2A COMBINE

Hydrograph type	=	Combine	Peak discharge	=	2.780 cfs
Storm frequency	=	2 yrs	Time to peak	=	730 min
Time interval	=	5 min	Hyd. volume	=	12,333 cuft
Inflow hyds.	=	42, 43	Contrib. drain. area	=	2.690 ac

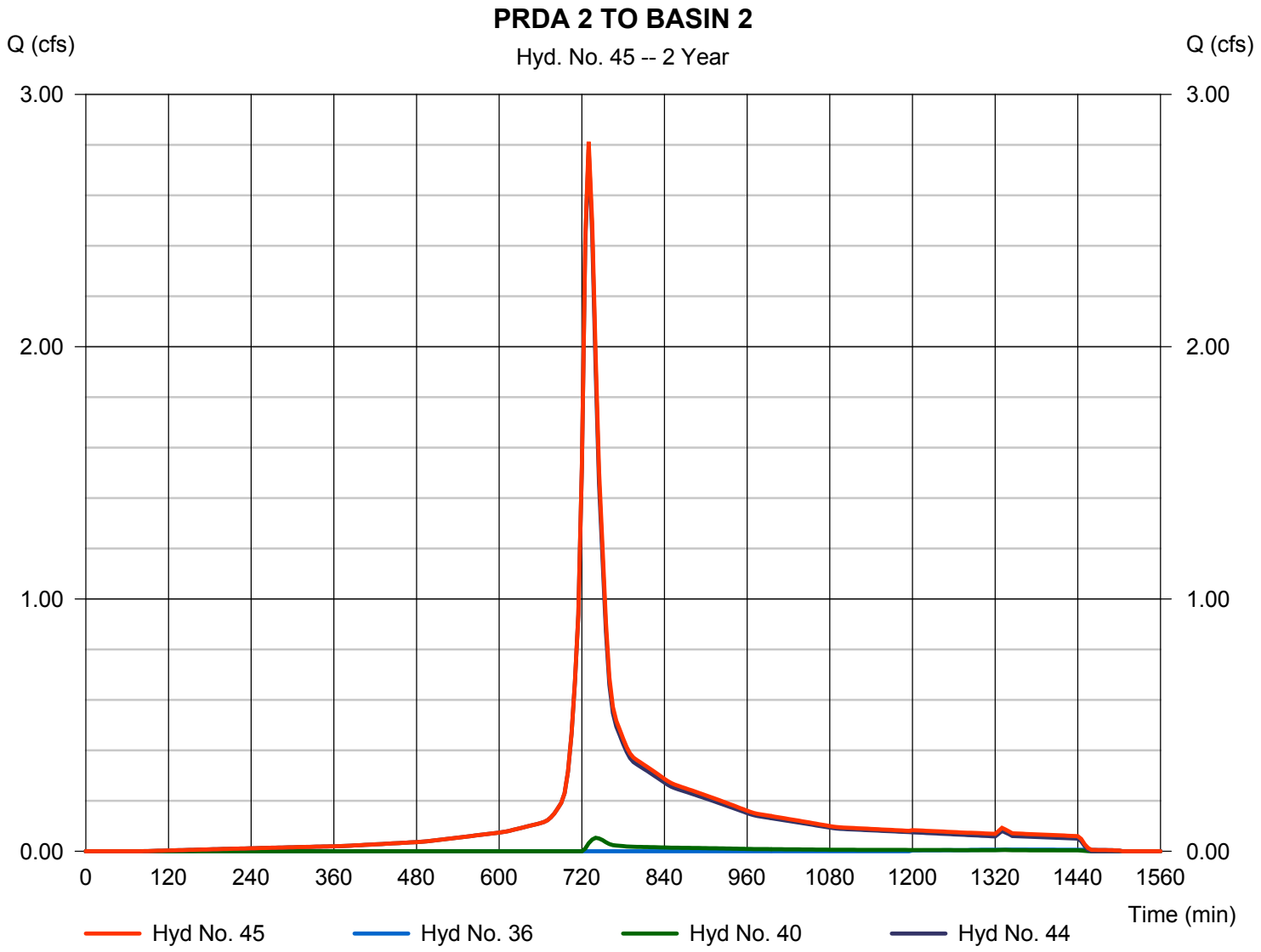


Hydrograph Report

Hyd. No. 45

PRDA 2 TO BASIN 2

Hydrograph type	= Combine	Peak discharge	= 2.812 cfs
Storm frequency	= 2 yrs	Time to peak	= 730 min
Time interval	= 5 min	Hyd. volume	= 12,853 cuft
Inflow hyds.	= 36, 40, 44	Contrib. drain. area	= 0.390 ac



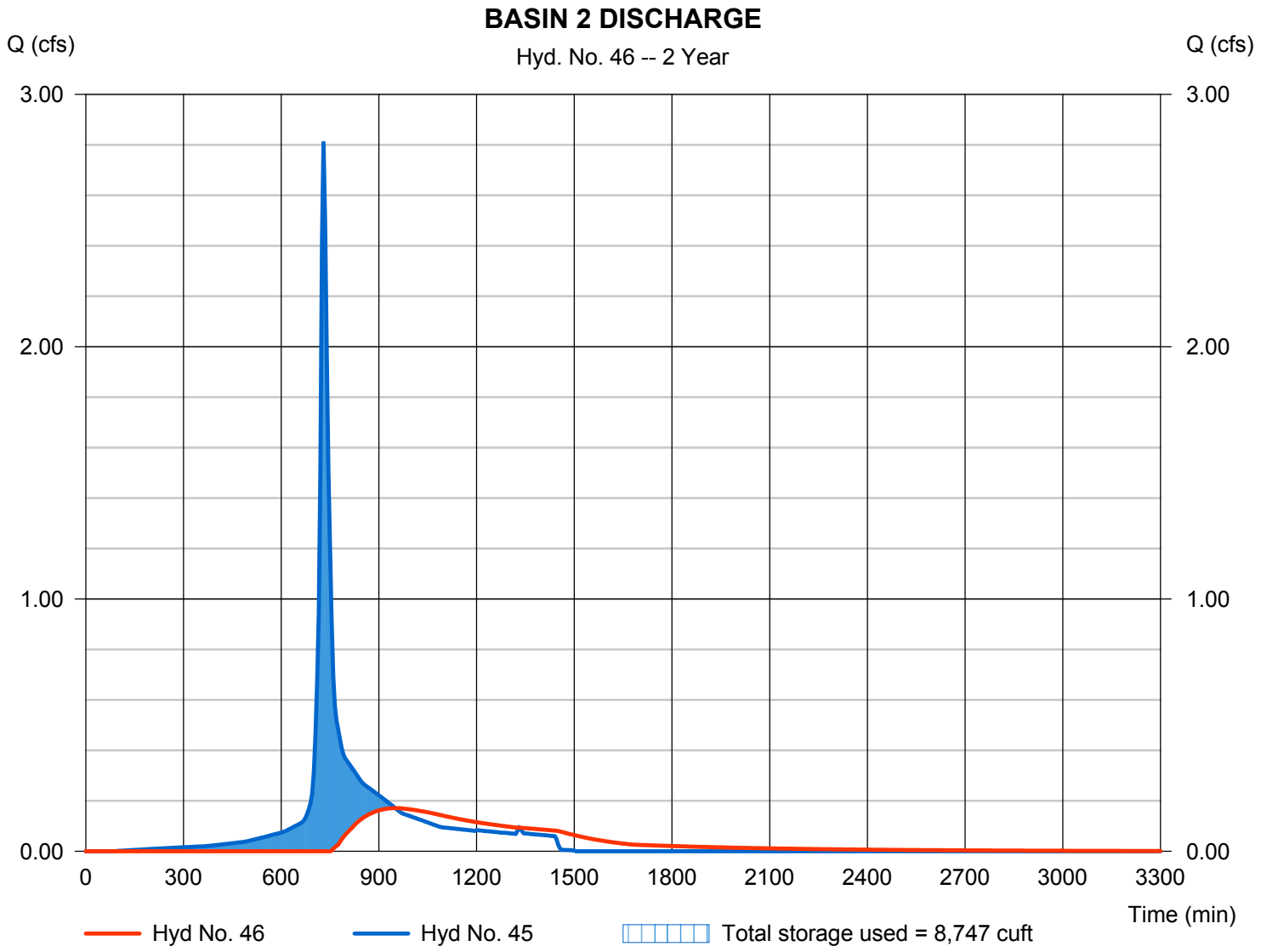
Hydrograph Report

Hyd. No. 46

BASIN 2 DISCHARGE

Hydrograph type	= Reservoir	Peak discharge	= 0.171 cfs
Storm frequency	= 2 yrs	Time to peak	= 950 min
Time interval	= 5 min	Hyd. volume	= 6,421 cuft
Inflow hyd. No.	= 45 - PRDA 2 TO BASIN 2	Max. Elevation	= 225.59 ft
Reservoir name	= SWM BASIN 2	Max. Storage	= 8,747 cuft

Storage Indication method used.



Pond Report

Pond No. 2 - SWM BASIN 2

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 224.50 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	224.50	8,002	0	0
1.00	225.50	8,002	8,001	8,001
2.00	226.50	8,002	8,001	16,002
3.00	227.50	8,002	8,001	24,004
4.00	228.50	9,187	8,587	32,590

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 15.00	4.50	0.00	0.00
Span (in)	= 15.00	4.50	0.00	0.00
No. Barrels	= 1	1	0	0
Invert El. (ft)	= 224.50	225.30	0.00	0.00
Length (ft)	= 25.00	0.00	0.00	0.00
Slope (%)	= 1.00	0.00	0.00	n/a
N-Value	= .011	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	Yes	No	No

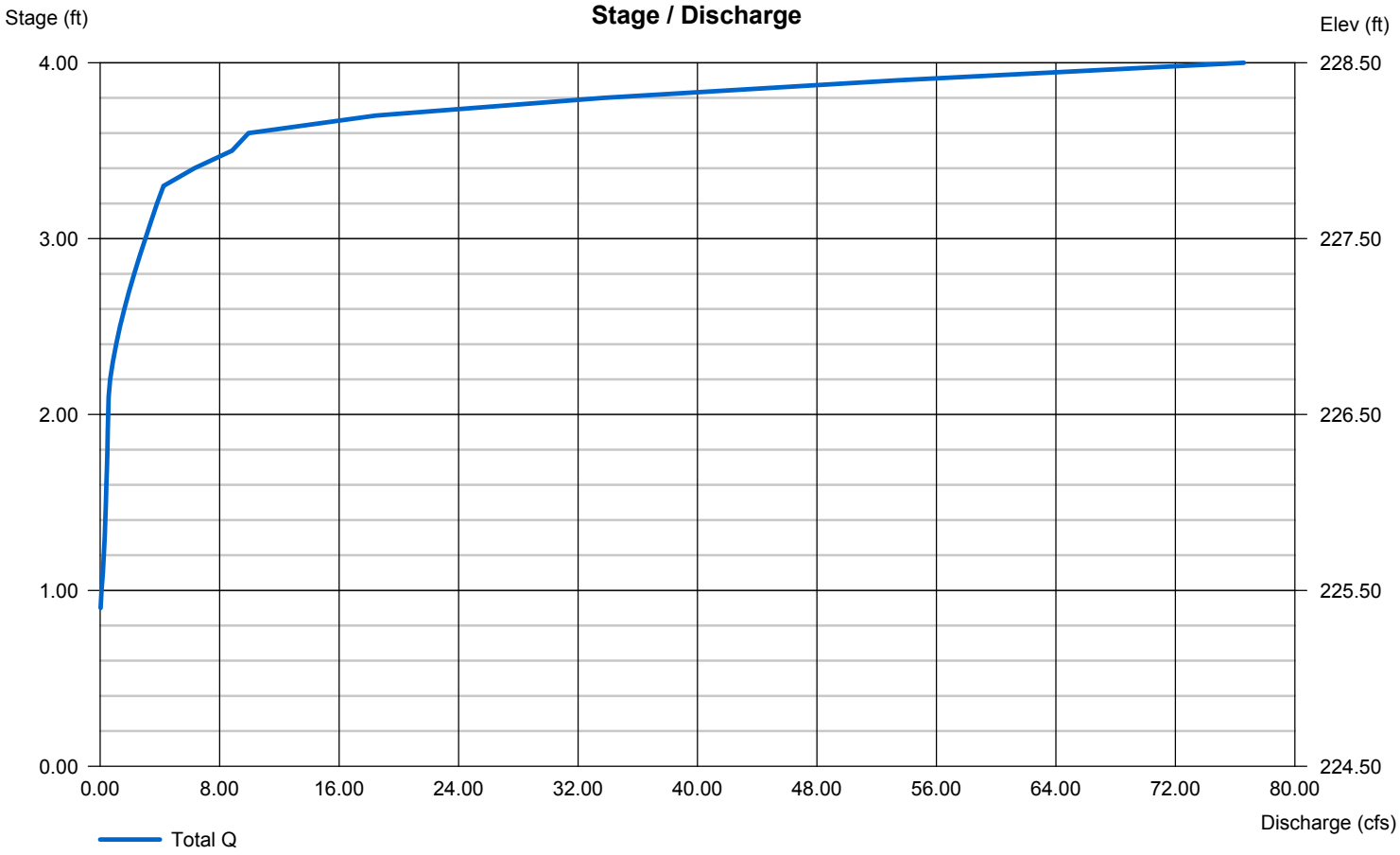
Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 16.00	0.80	100.00	0.00
Crest El. (ft)	= 227.80	226.60	228.10	0.00
Weir Coeff.	= 3.33	3.33	2.60	3.33
Weir Type	= 1	Rect	Broad	---
Multi-Stage	= Yes	Yes	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).

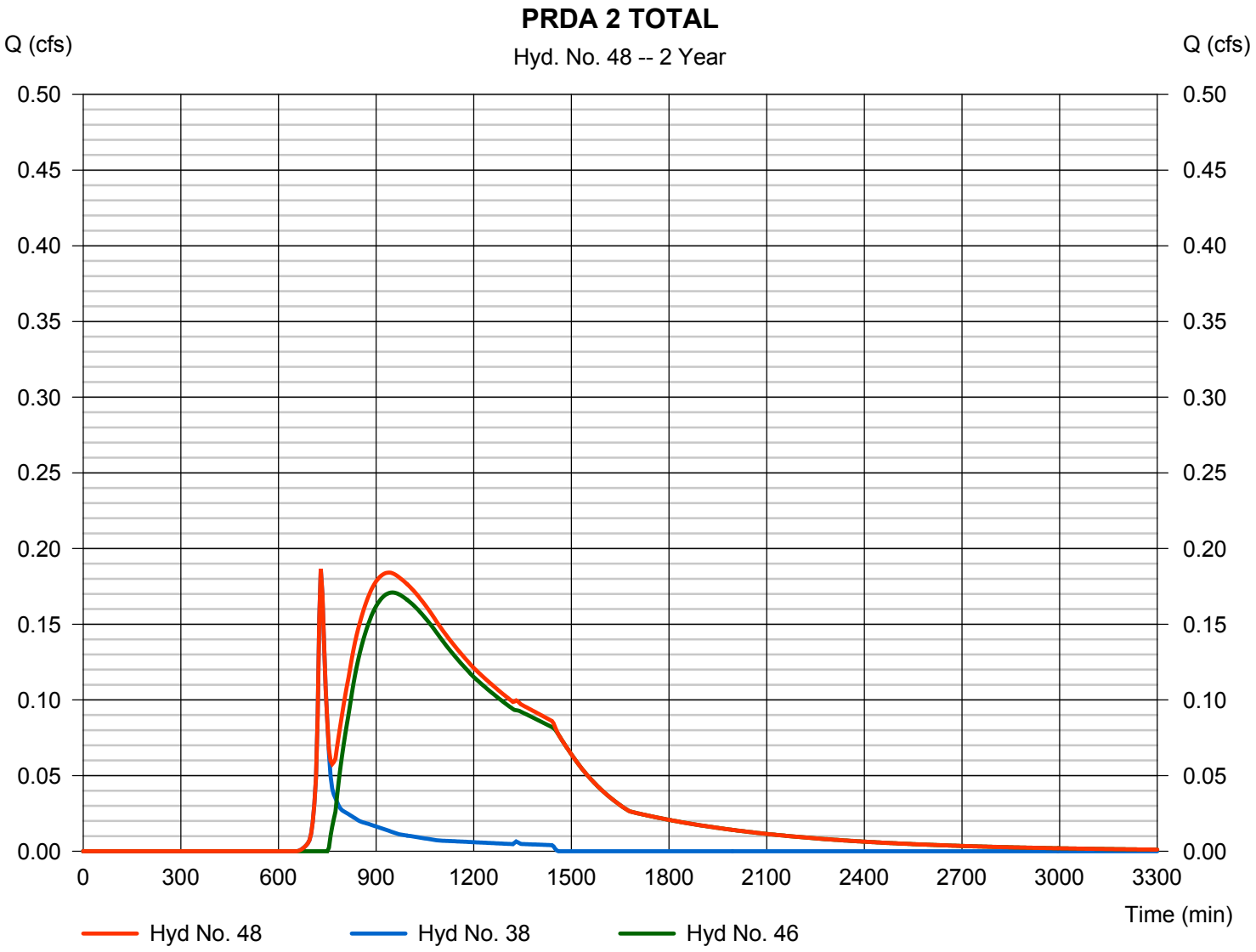


Hydrograph Report

Hyd. No. 48

PRDA 2 TOTAL

Hydrograph type	= Combine	Peak discharge	= 0.187 cfs
Storm frequency	= 2 yrs	Time to peak	= 730 min
Time interval	= 5 min	Hyd. volume	= 7,214 cuft
Inflow hyds.	= 38, 46	Contrib. drain. area	= 0.230 ac

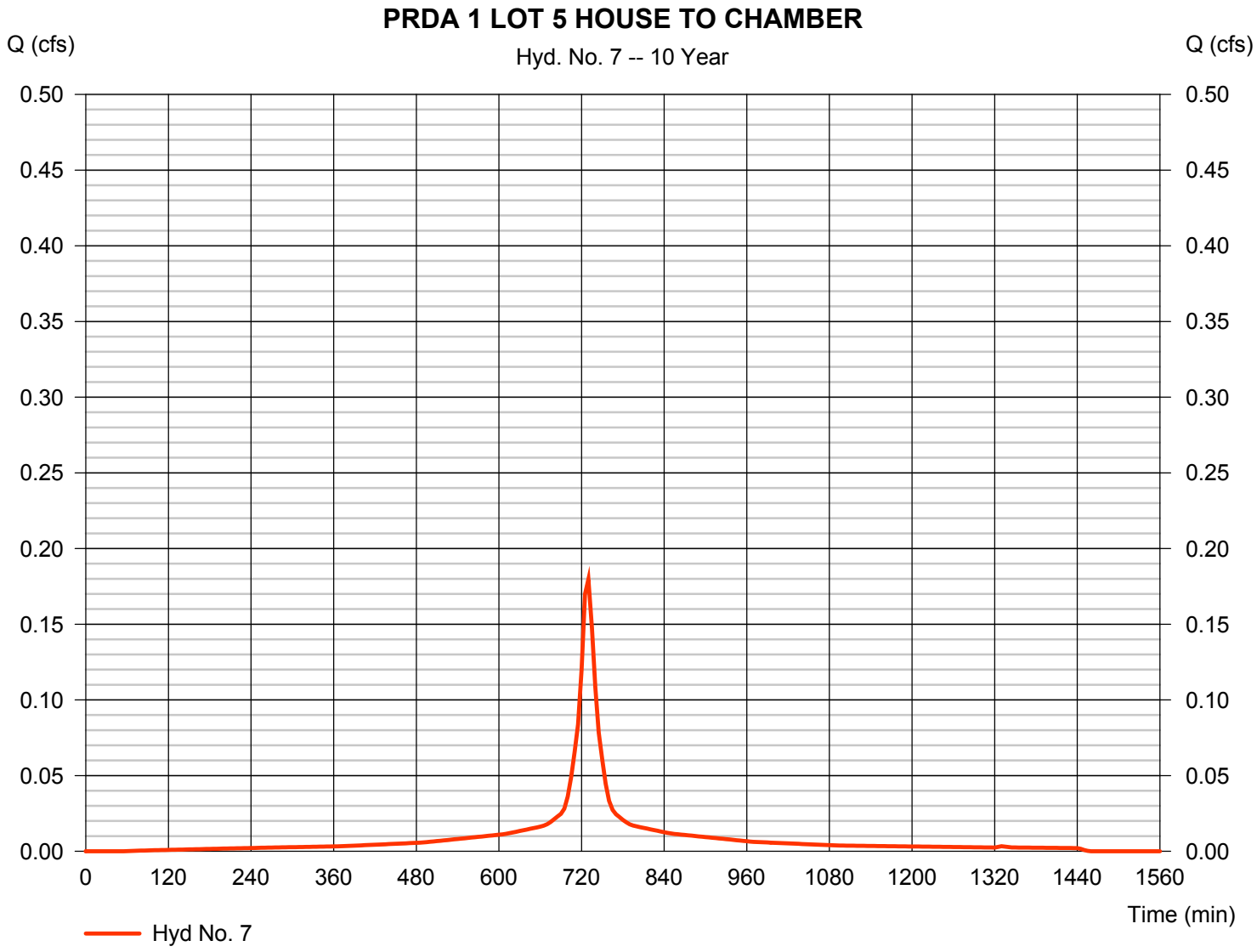


Hydrograph Report

Hyd. No. 7

PRDA 1 LOT 5 HOUSE TO CHAMBER

Hydrograph type	= SCS Runoff	Peak discharge	= 0.180 cfs
Storm frequency	= 10 yrs	Time to peak	= 730 min
Time interval	= 5 min	Hyd. volume	= 823 cuft
Drainage area	= 0.049 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.00 min
Total precip.	= 5.17 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



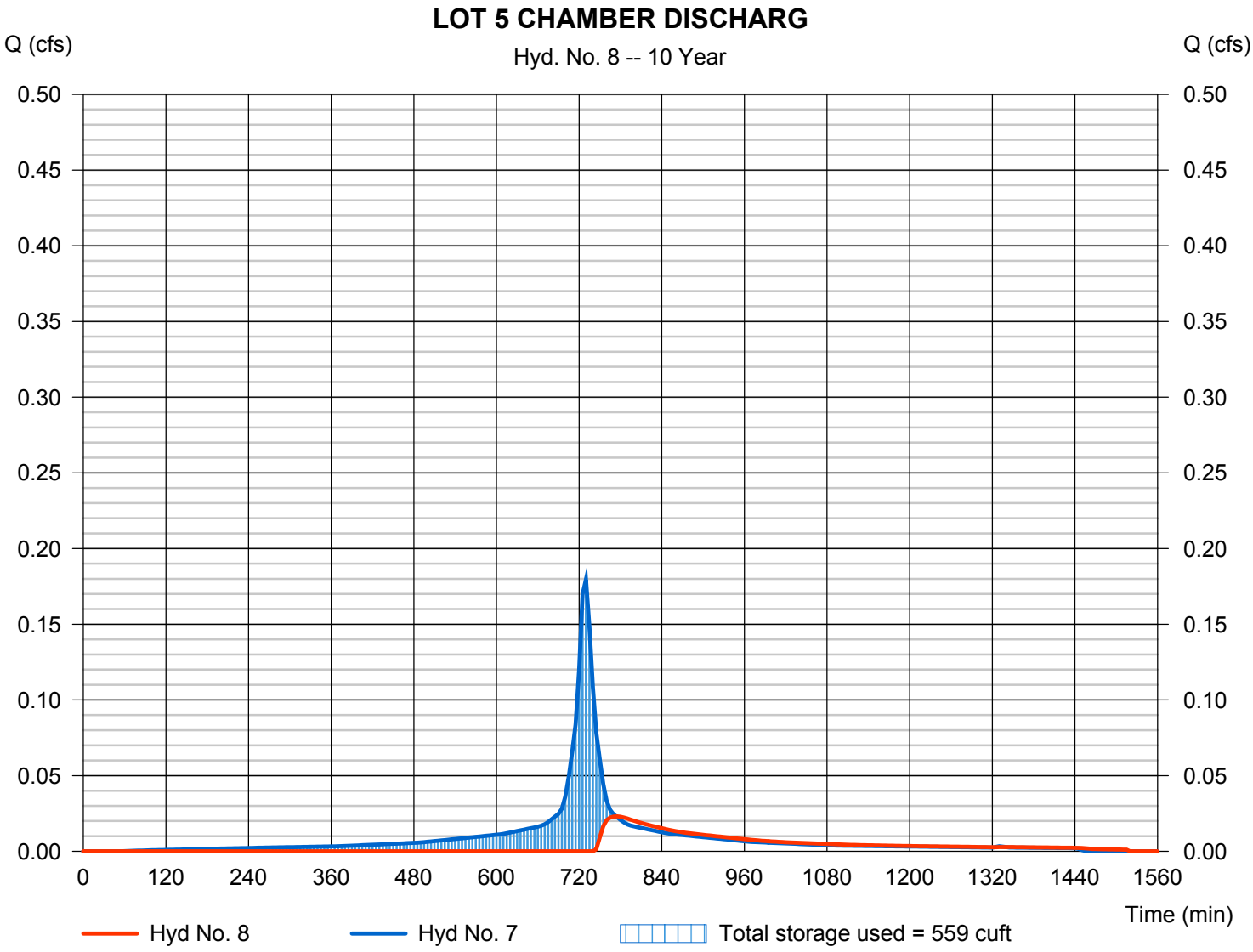
Hydrograph Report

Hyd. No. 8

LOT 5 CHAMBER DISCHARG

Hydrograph type	=	Reservoir	Peak discharge	=	0.023 cfs
Storm frequency	=	10 yrs	Time to peak	=	775 min
Time interval	=	5 min	Hyd. volume	=	307 cuft
Inflow hyd. No.	=	7 - PRDA 1 LOT 5 HOUSE TO CHAMBER	Max. Elevation	=	2.48 ft
Reservoir name	=	CHAMBERS LOT 5	Max. Storage	=	559 cuft

Storage Indication method used.

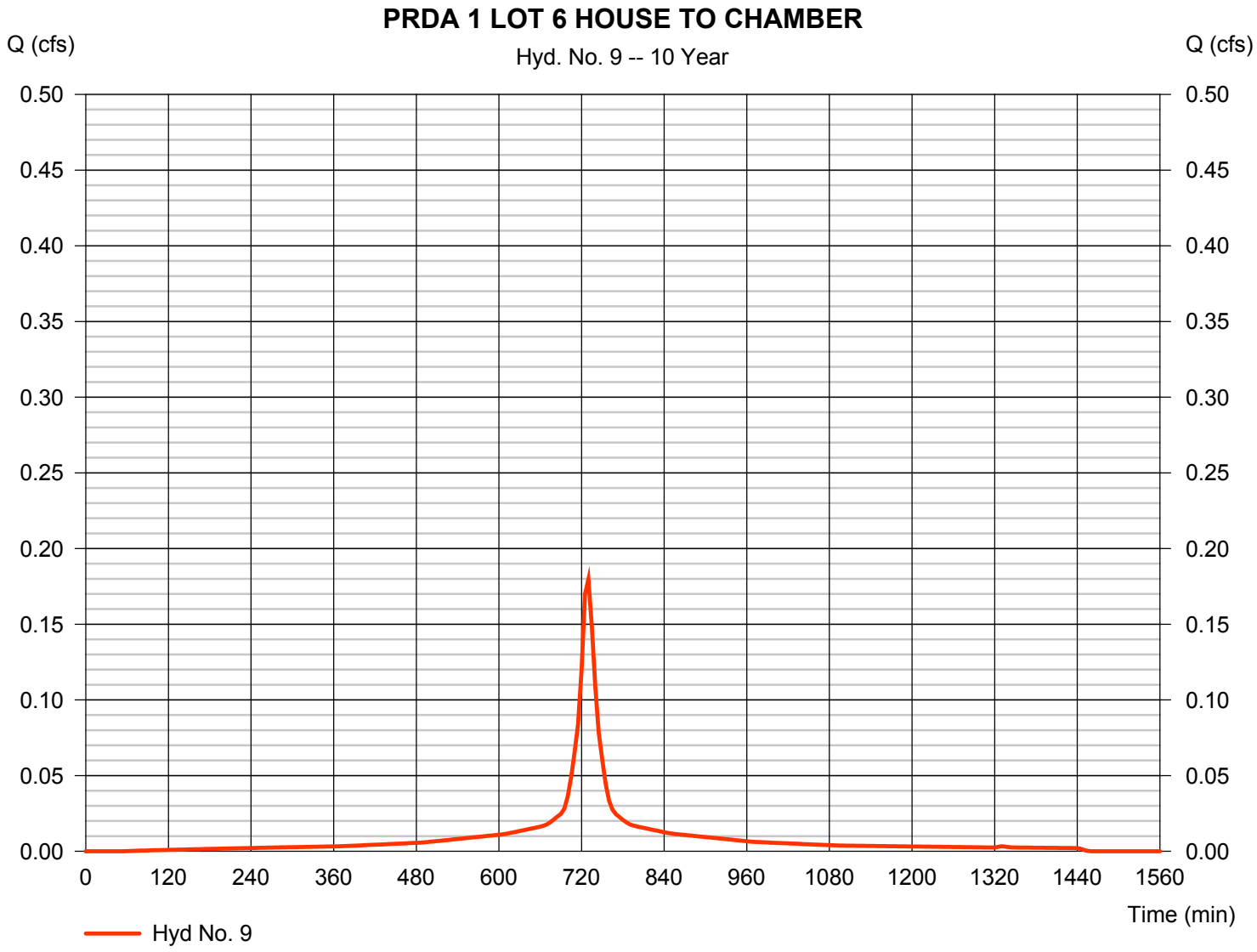


Hydrograph Report

Hyd. No. 9

PRDA 1 LOT 6 HOUSE TO CHAMBER

Hydrograph type	= SCS Runoff	Peak discharge	= 0.180 cfs
Storm frequency	= 10 yrs	Time to peak	= 730 min
Time interval	= 5 min	Hyd. volume	= 823 cuft
Drainage area	= 0.049 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.00 min
Total precip.	= 5.17 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



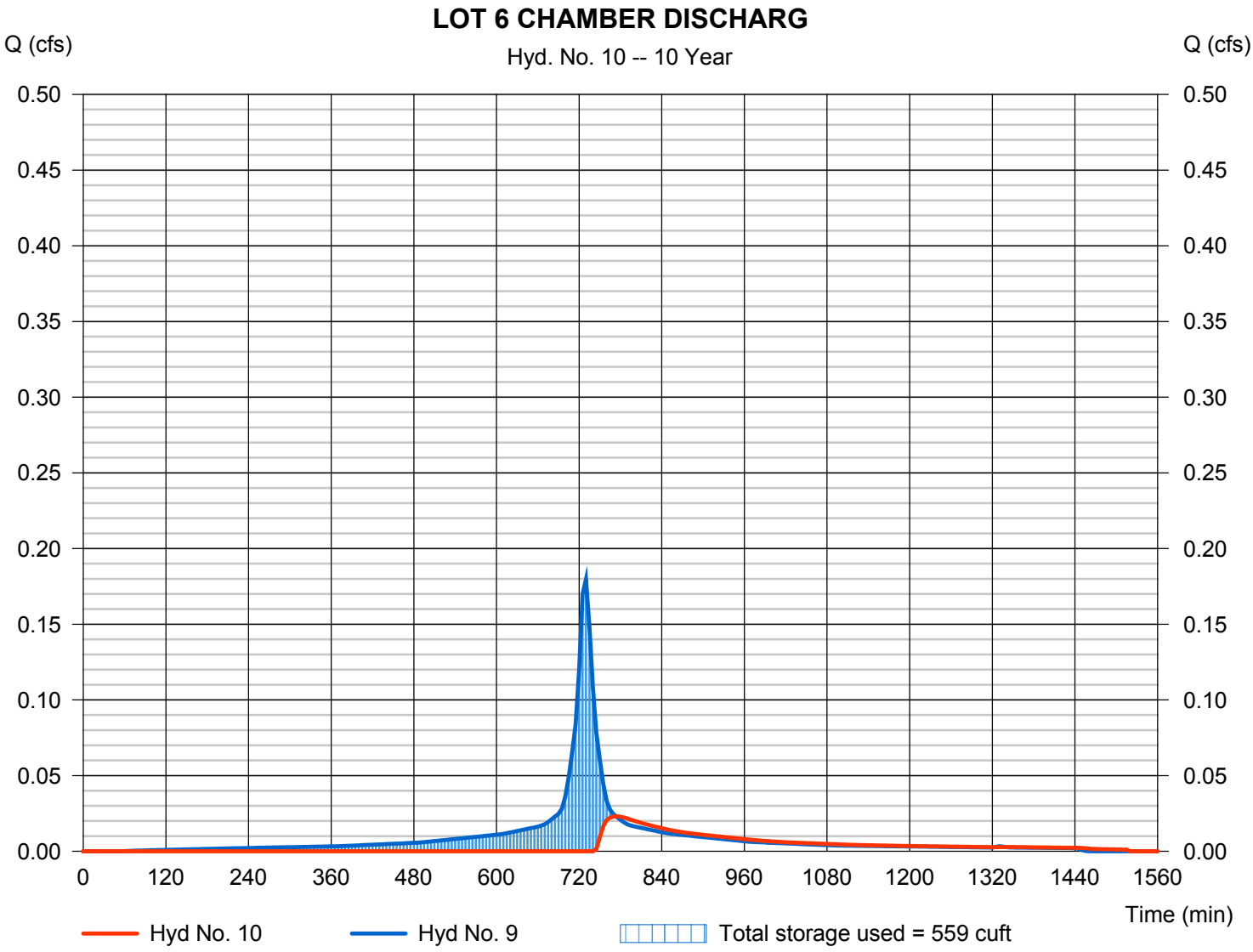
Hydrograph Report

Hyd. No. 10

LOT 6 CHAMBER DISCHARG

Hydrograph type	=	Reservoir	Peak discharge	=	0.023 cfs
Storm frequency	=	10 yrs	Time to peak	=	775 min
Time interval	=	5 min	Hyd. volume	=	307 cuft
Inflow hyd. No.	=	9 - PRDA 1 LOT 6 HOUSE TO CHAMBER	Max. Elevation	=	2.48 ft
Reservoir name	=	CHAMBERS LOT 6	Max. Storage	=	559 cuft

Storage Indication method used.

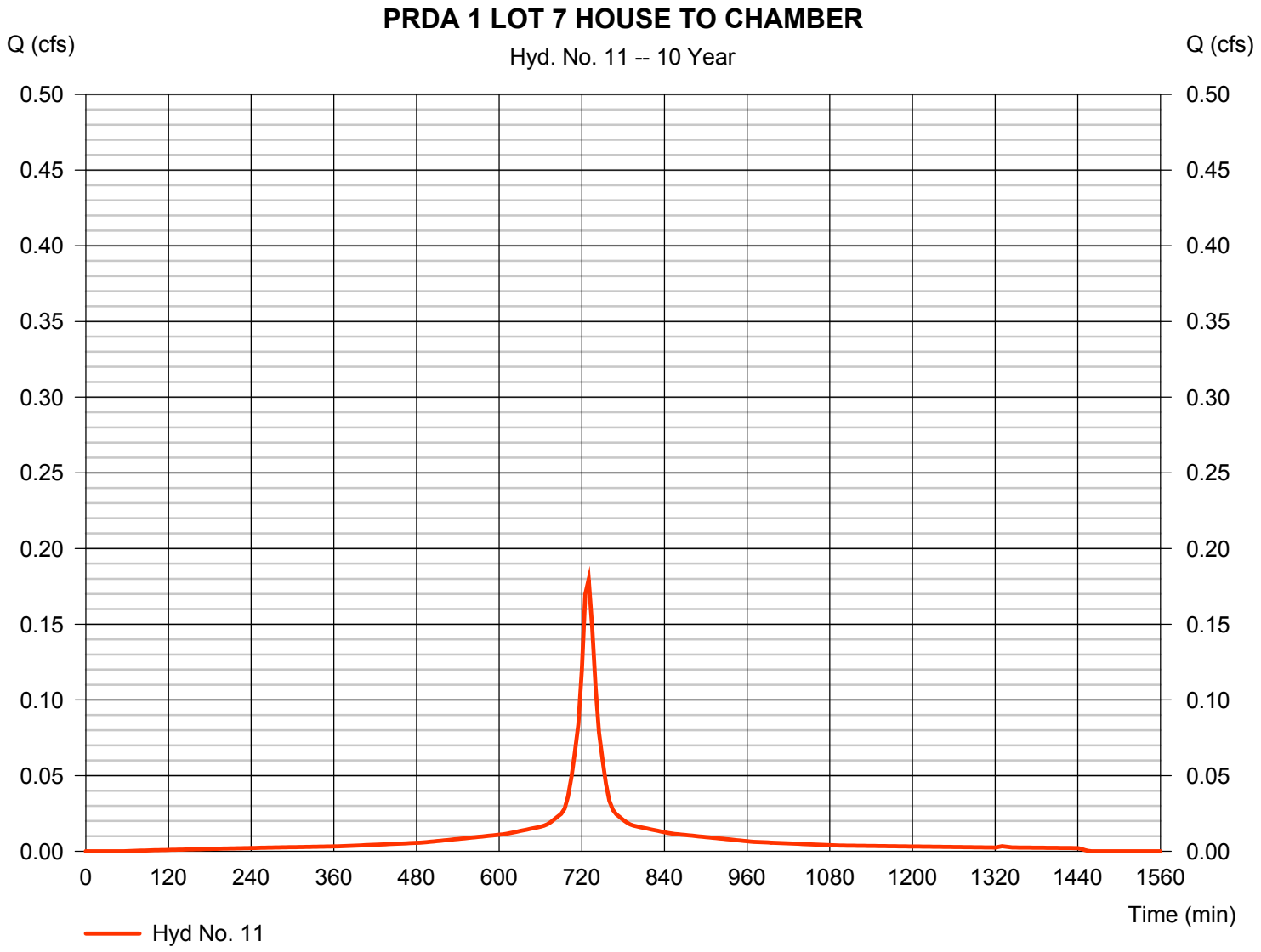


Hydrograph Report

Hyd. No. 11

PRDA 1 LOT 7 HOUSE TO CHAMBER

Hydrograph type	= SCS Runoff	Peak discharge	= 0.180 cfs
Storm frequency	= 10 yrs	Time to peak	= 730 min
Time interval	= 5 min	Hyd. volume	= 823 cuft
Drainage area	= 0.049 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.00 min
Total precip.	= 5.17 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



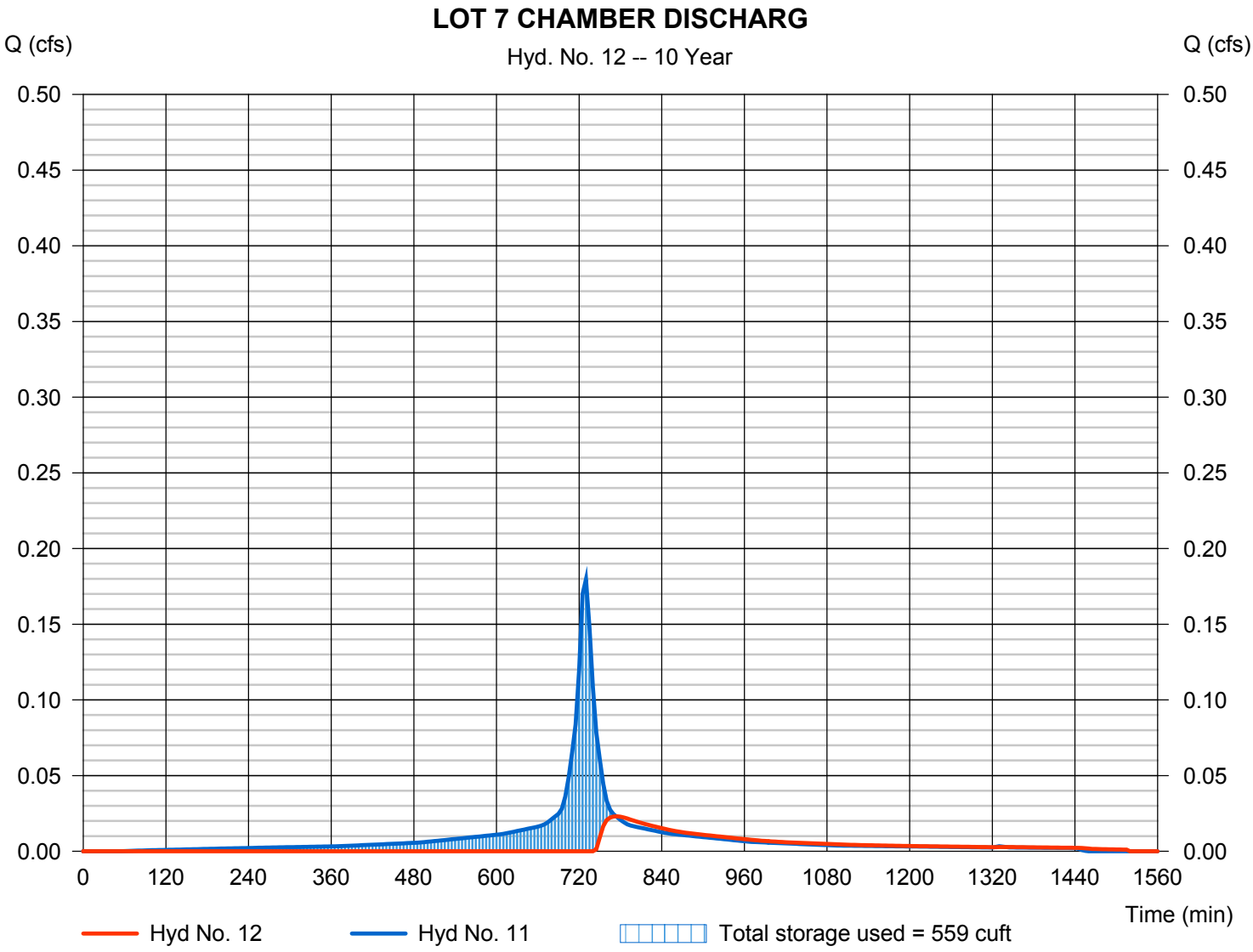
Hydrograph Report

Hyd. No. 12

LOT 7 CHAMBER DISCHARG

Hydrograph type	=	Reservoir	Peak discharge	=	0.023 cfs
Storm frequency	=	10 yrs	Time to peak	=	775 min
Time interval	=	5 min	Hyd. volume	=	307 cuft
Inflow hyd. No.	=	11 - PRDA 1 LOT 7 HOUSE TO CHAMBER	Max. Elevation	=	2.48 ft
Reservoir name	=	CHAMBERS LOT 7	Max. Storage	=	559 cuft

Storage Indication method used.

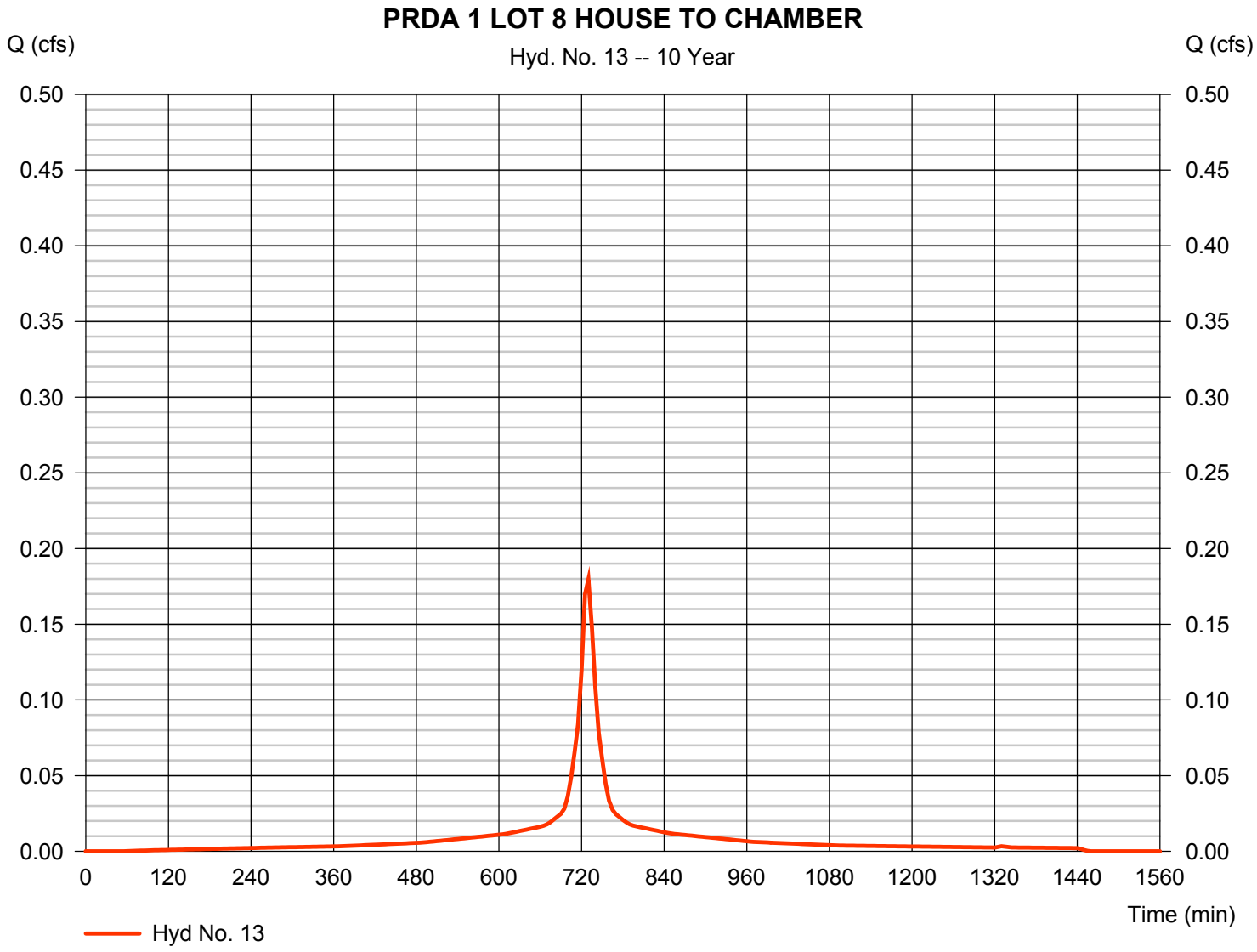


Hydrograph Report

Hyd. No. 13

PRDA 1 LOT 8 HOUSE TO CHAMBER

Hydrograph type	= SCS Runoff	Peak discharge	= 0.180 cfs
Storm frequency	= 10 yrs	Time to peak	= 730 min
Time interval	= 5 min	Hyd. volume	= 823 cuft
Drainage area	= 0.049 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.00 min
Total precip.	= 5.17 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



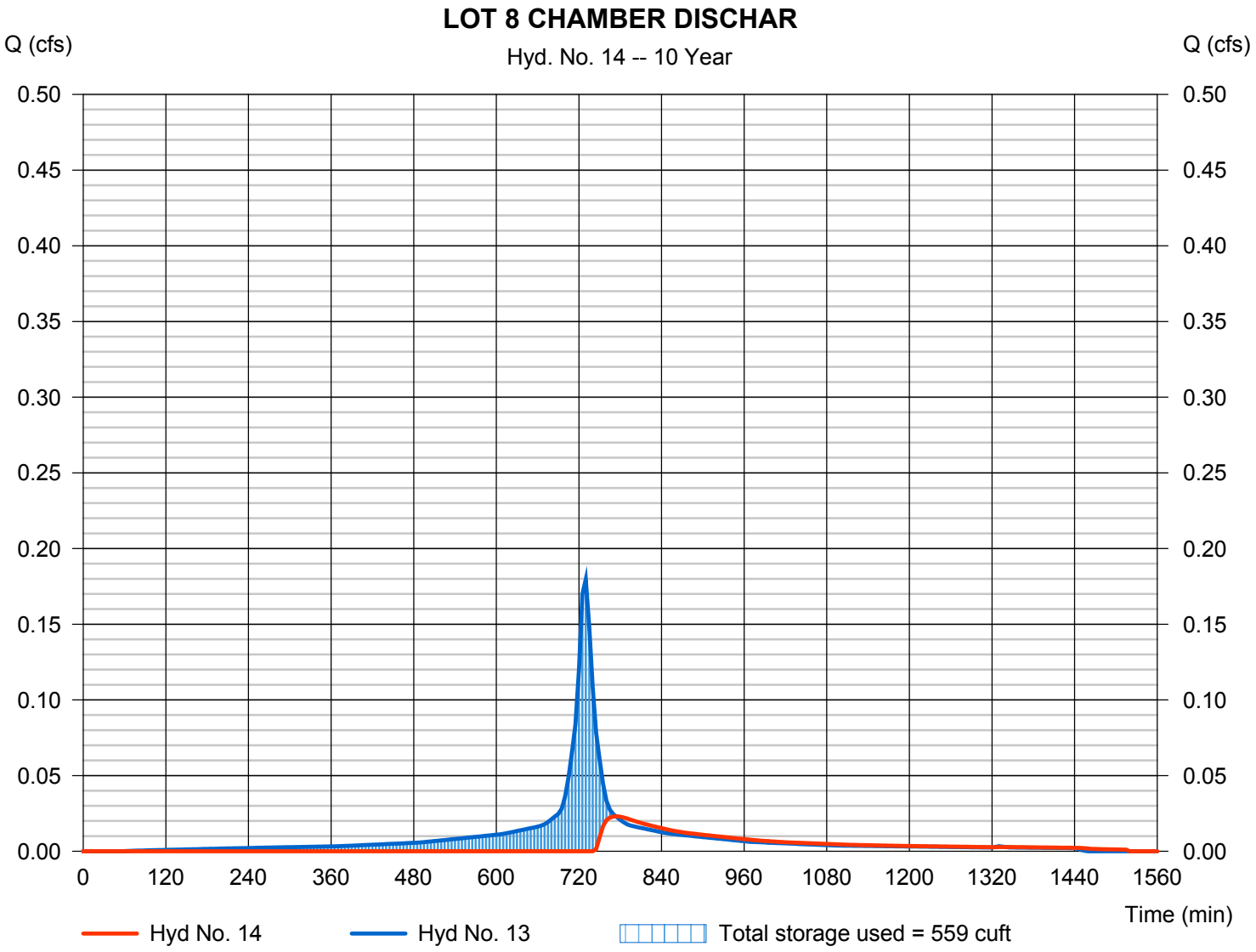
Hydrograph Report

Hyd. No. 14

LOT 8 CHAMBER DISCHAR

Hydrograph type	=	Reservoir	Peak discharge	=	0.023 cfs
Storm frequency	=	10 yrs	Time to peak	=	775 min
Time interval	=	5 min	Hyd. volume	=	307 cuft
Inflow hyd. No.	=	13 - PRDA 1 LOT 8 HOUSE TO CHAMBER	Max. Elevation	=	2.48 ft
Reservoir name	=	CHAMBERS LOT 8	Max. Storage	=	559 cuft

Storage Indication method used.

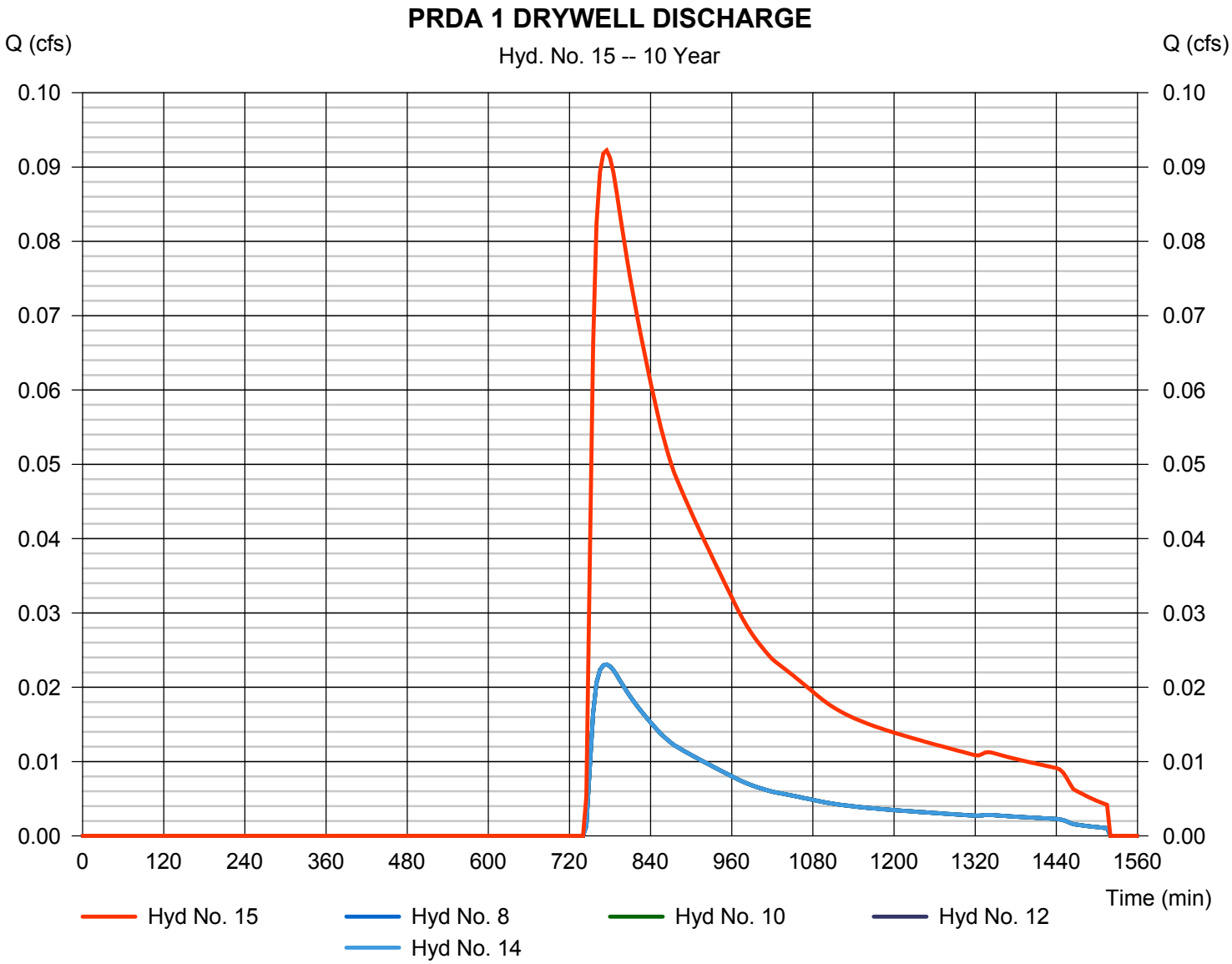


Hydrograph Report

Hyd. No. 15

PRDA 1 DRYWELL DISCHARGE

Hydrograph type	=	Combine	Peak discharge	=	0.092 cfs
Storm frequency	=	10 yrs	Time to peak	=	775 min
Time interval	=	5 min	Hyd. volume	=	1,228 cuft
Inflow hyds.	=	8, 10, 12, 14	Contrib. drain. area	=	0.000 ac

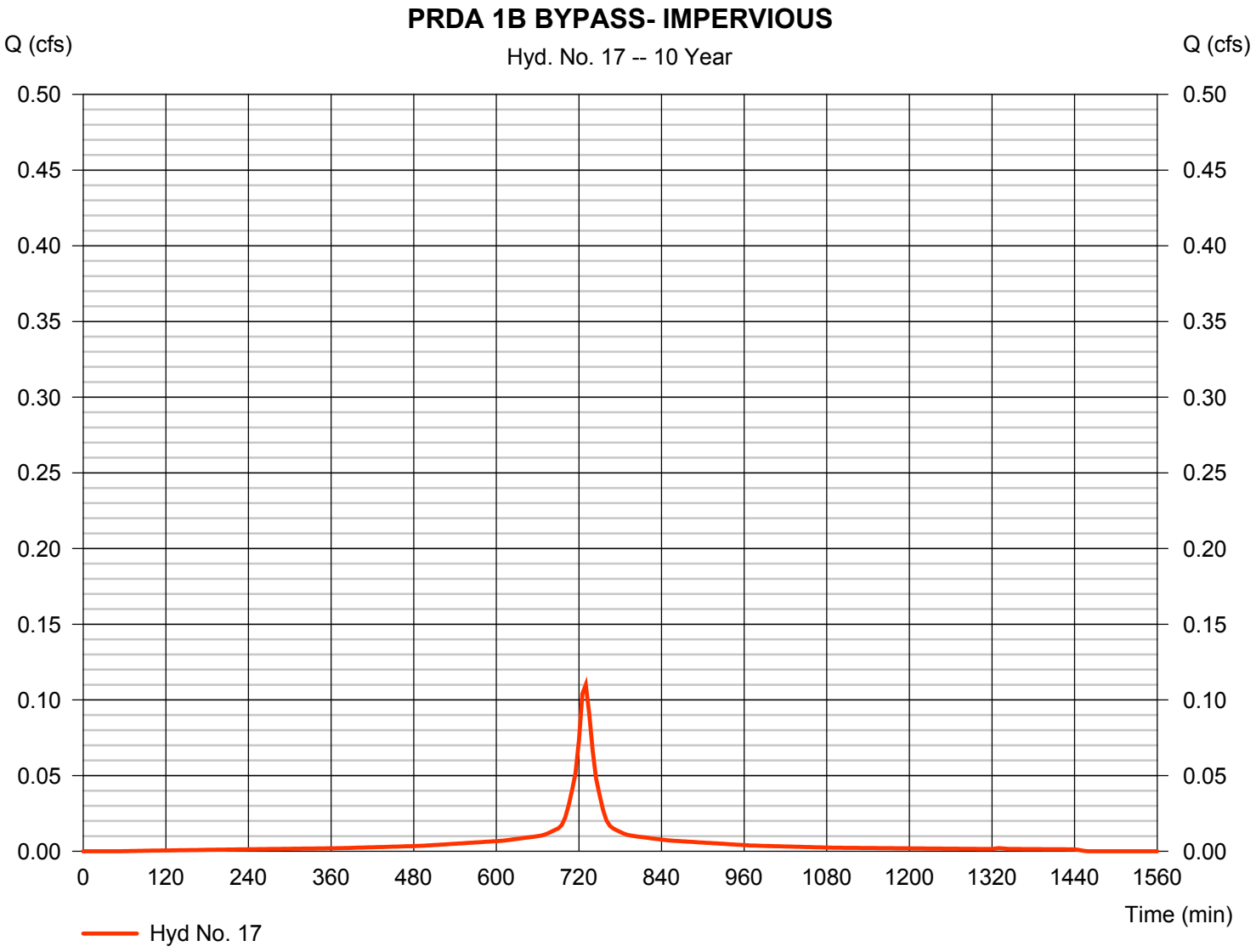


Hydrograph Report

Hyd. No. 17

PRDA 1B BYPASS- IMPERVIOUS

Hydrograph type	= SCS Runoff	Peak discharge	= 0.110 cfs
Storm frequency	= 10 yrs	Time to peak	= 730 min
Time interval	= 5 min	Hyd. volume	= 504 cuft
Drainage area	= 0.030 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.00 min
Total precip.	= 5.17 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

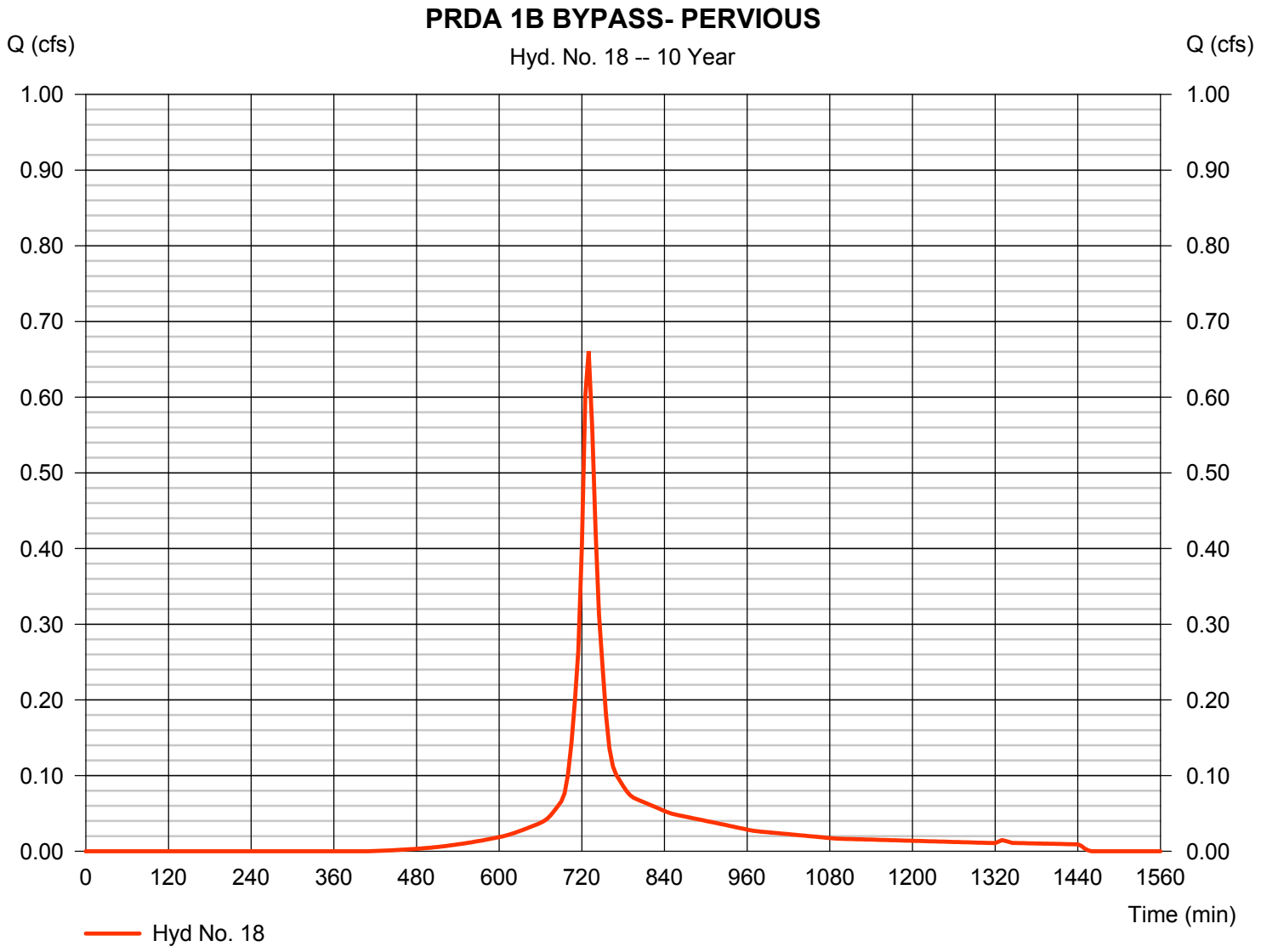


Hydrograph Report

Hyd. No. 18

PRDA 1B BYPASS- PERVIOUS

Hydrograph type	= SCS Runoff	Peak discharge	= 0.661 cfs
Storm frequency	= 10 yrs	Time to peak	= 730 min
Time interval	= 5 min	Hyd. volume	= 2,639 cuft
Drainage area	= 0.240 ac	Curve number	= 82
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.00 min
Total precip.	= 5.17 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

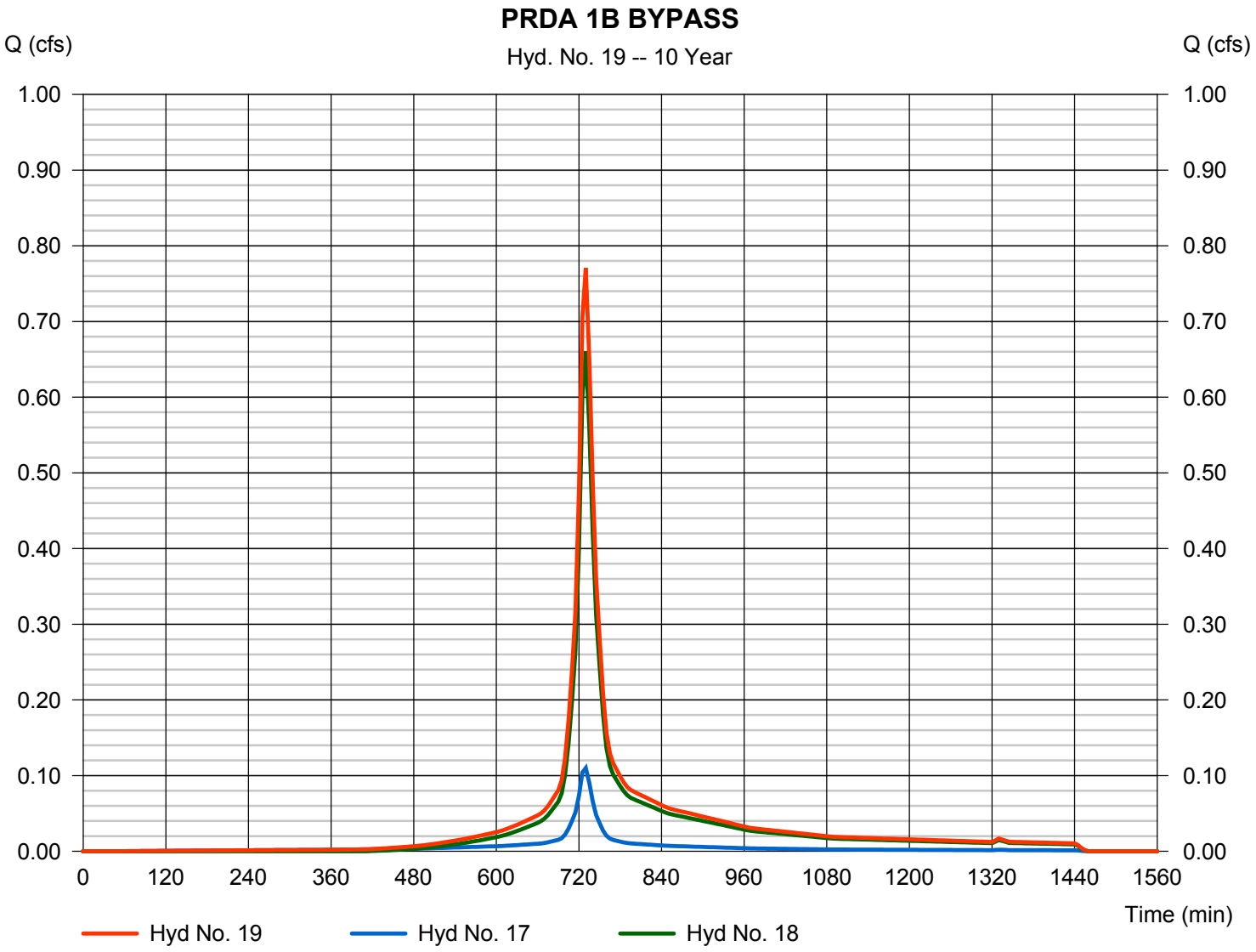


Hydrograph Report

Hyd. No. 19

PRDA 1B BYPASS

Hydrograph type	=	Combine	Peak discharge	=	0.771 cfs
Storm frequency	=	10 yrs	Time to peak	=	730 min
Time interval	=	5 min	Hyd. volume	=	3,143 cuft
Inflow hyds.	=	17, 18	Contrib. drain. area	=	0.270 ac

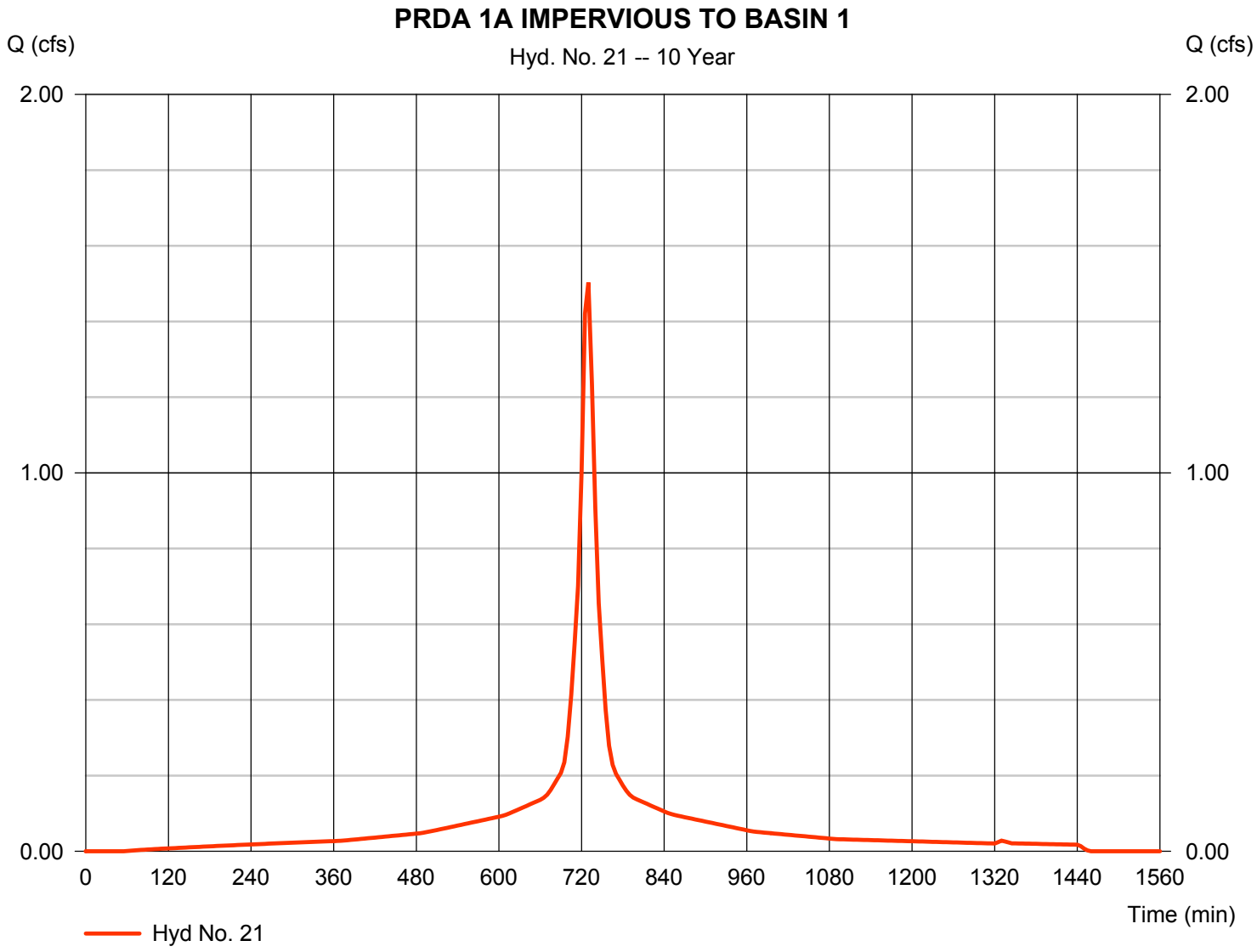


Hydrograph Report

Hyd. No. 21

PRDA 1A IMPERVIOUS TO BASIN 1

Hydrograph type	= SCS Runoff	Peak discharge	= 1.503 cfs
Storm frequency	= 10 yrs	Time to peak	= 730 min
Time interval	= 5 min	Hyd. volume	= 6,883 cuft
Drainage area	= 0.410 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.00 min
Total precip.	= 5.17 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

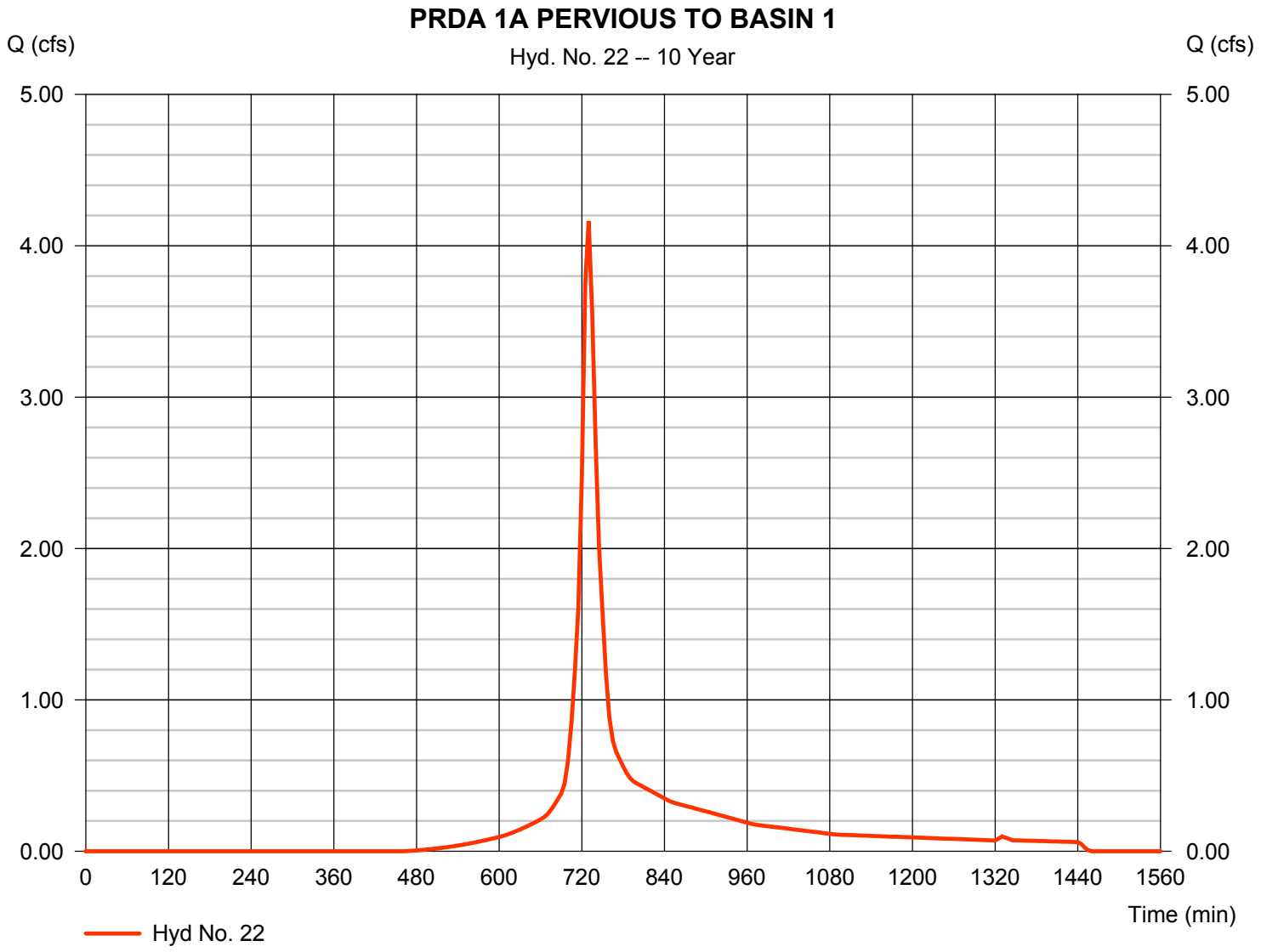


Hydrograph Report

Hyd. No. 22

PRDA 1A PERVIOUS TO BASIN 1

Hydrograph type	= SCS Runoff	Peak discharge	= 4.165 cfs
Storm frequency	= 10 yrs	Time to peak	= 730 min
Time interval	= 5 min	Hyd. volume	= 16,557 cuft
Drainage area	= 1.650 ac	Curve number	= 79
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.00 min
Total precip.	= 5.17 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

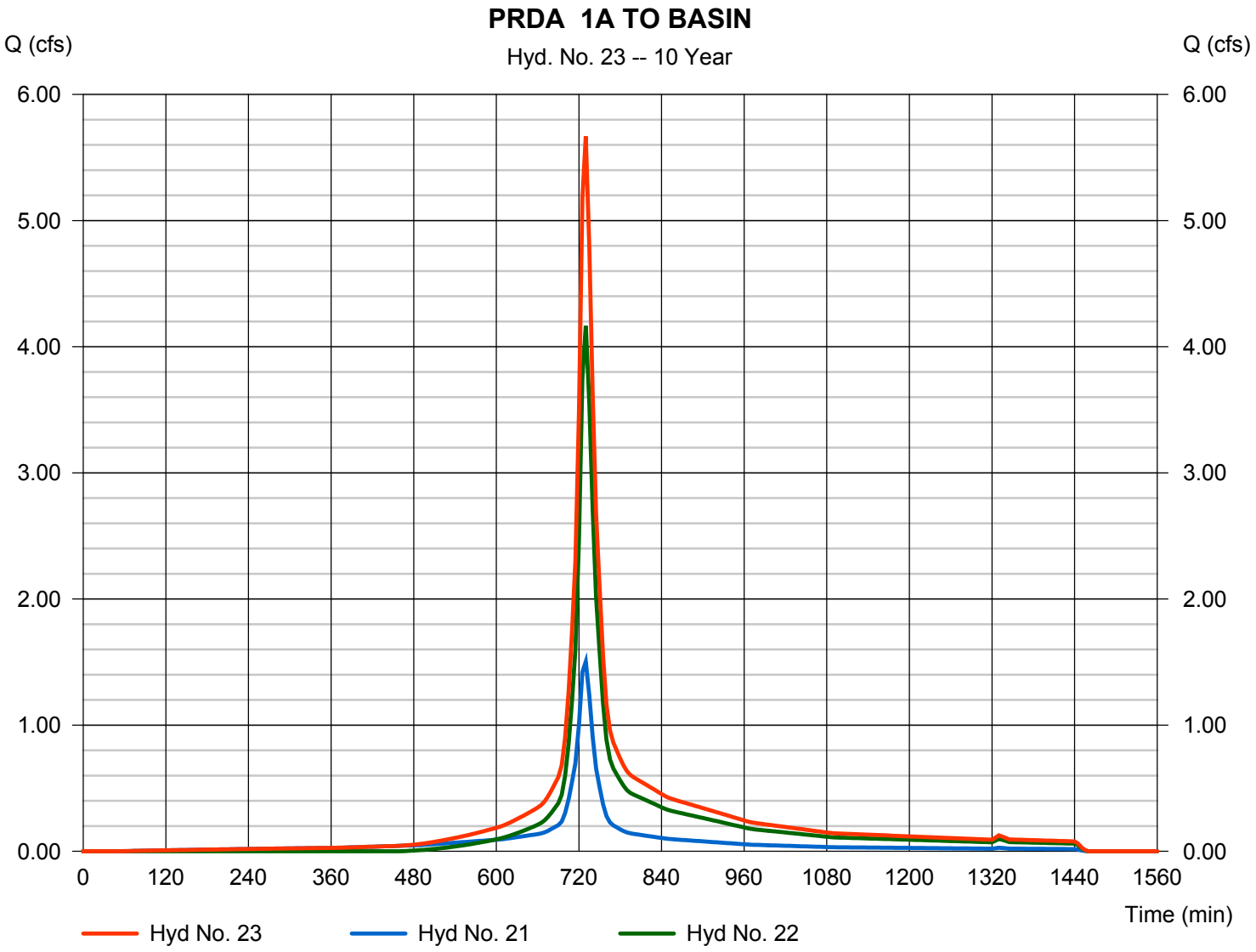


Hydrograph Report

Hyd. No. 23

PRDA 1A TO BASIN

Hydrograph type	= Combine	Peak discharge	= 5.667 cfs
Storm frequency	= 10 yrs	Time to peak	= 730 min
Time interval	= 5 min	Hyd. volume	= 23,439 cuft
Inflow hyds.	= 21, 22	Contrib. drain. area	= 2.060 ac



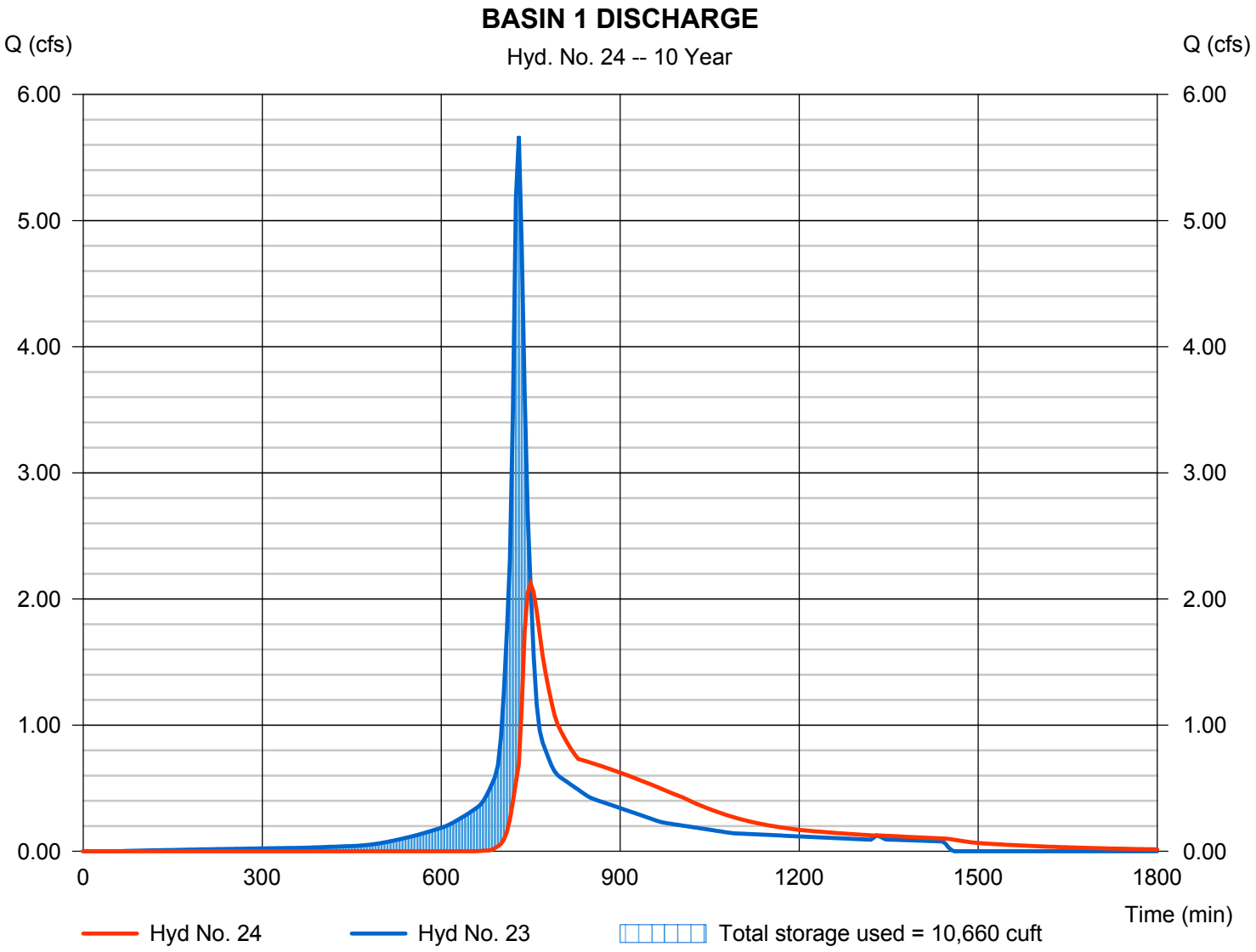
Hydrograph Report

Hyd. No. 24

BASIN 1 DISCHARGE

Hydrograph type	= Reservoir	Peak discharge	= 2.121 cfs
Storm frequency	= 10 yrs	Time to peak	= 750 min
Time interval	= 5 min	Hyd. volume	= 21,222 cuft
Inflow hyd. No.	= 23 - PRDA 1A TO BASIN	Max. Elevation	= 255.35 ft
Reservoir name	= SWM BASIN 1	Max. Storage	= 10,660 cuft

Storage Indication method used.

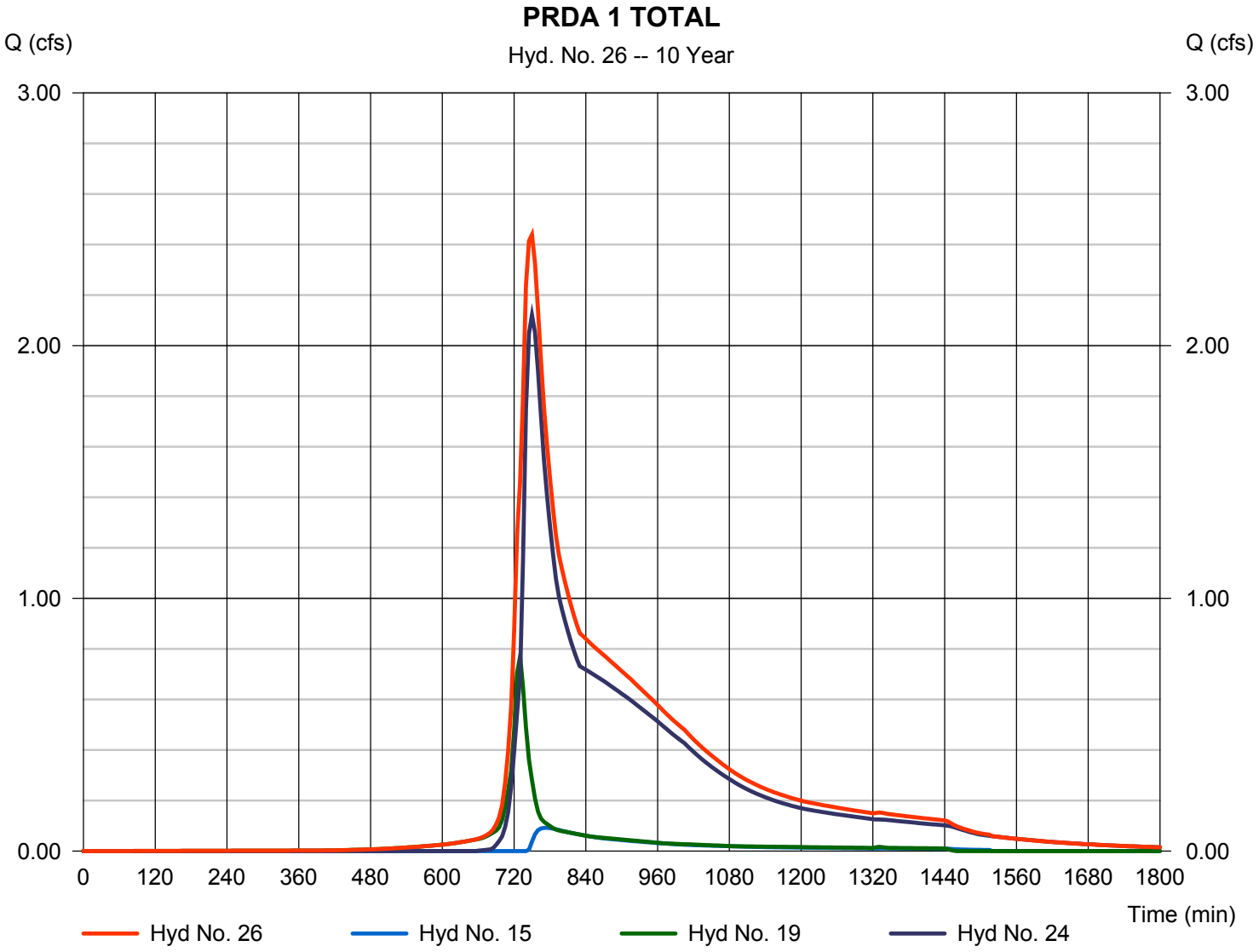


Hydrograph Report

Hyd. No. 26

PRDA 1 TOTAL

Hydrograph type	= Combine	Peak discharge	= 2.439 cfs
Storm frequency	= 10 yrs	Time to peak	= 750 min
Time interval	= 5 min	Hyd. volume	= 25,593 cuft
Inflow hyds.	= 15, 19, 24	Contrib. drain. area	= 0.000 ac

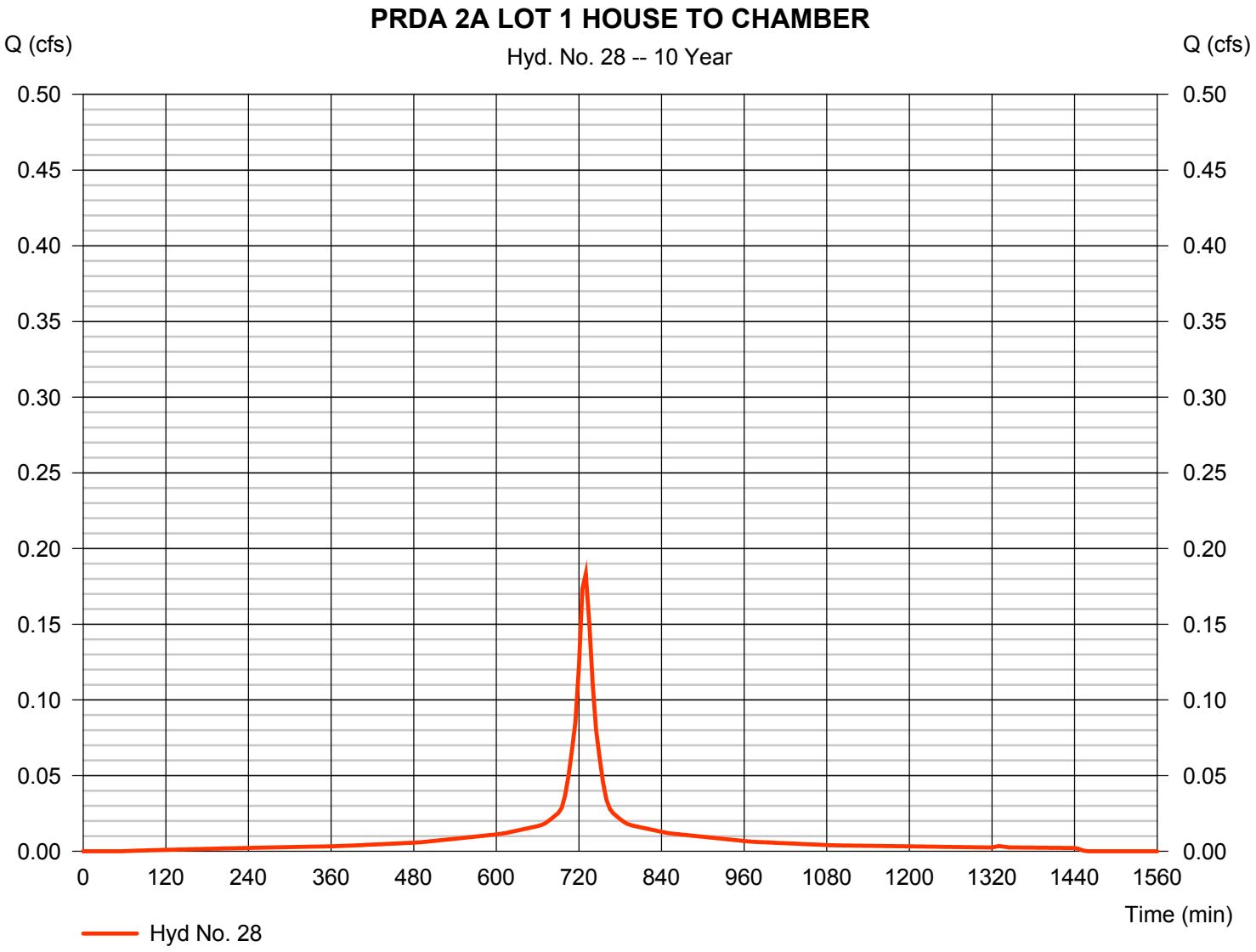


Hydrograph Report

Hyd. No. 28

PRDA 2A LOT 1 HOUSE TO CHAMBER

Hydrograph type	= SCS Runoff	Peak discharge	= 0.183 cfs
Storm frequency	= 10 yrs	Time to peak	= 730 min
Time interval	= 5 min	Hyd. volume	= 839 cuft
Drainage area	= 0.050 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.00 min
Total precip.	= 5.17 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



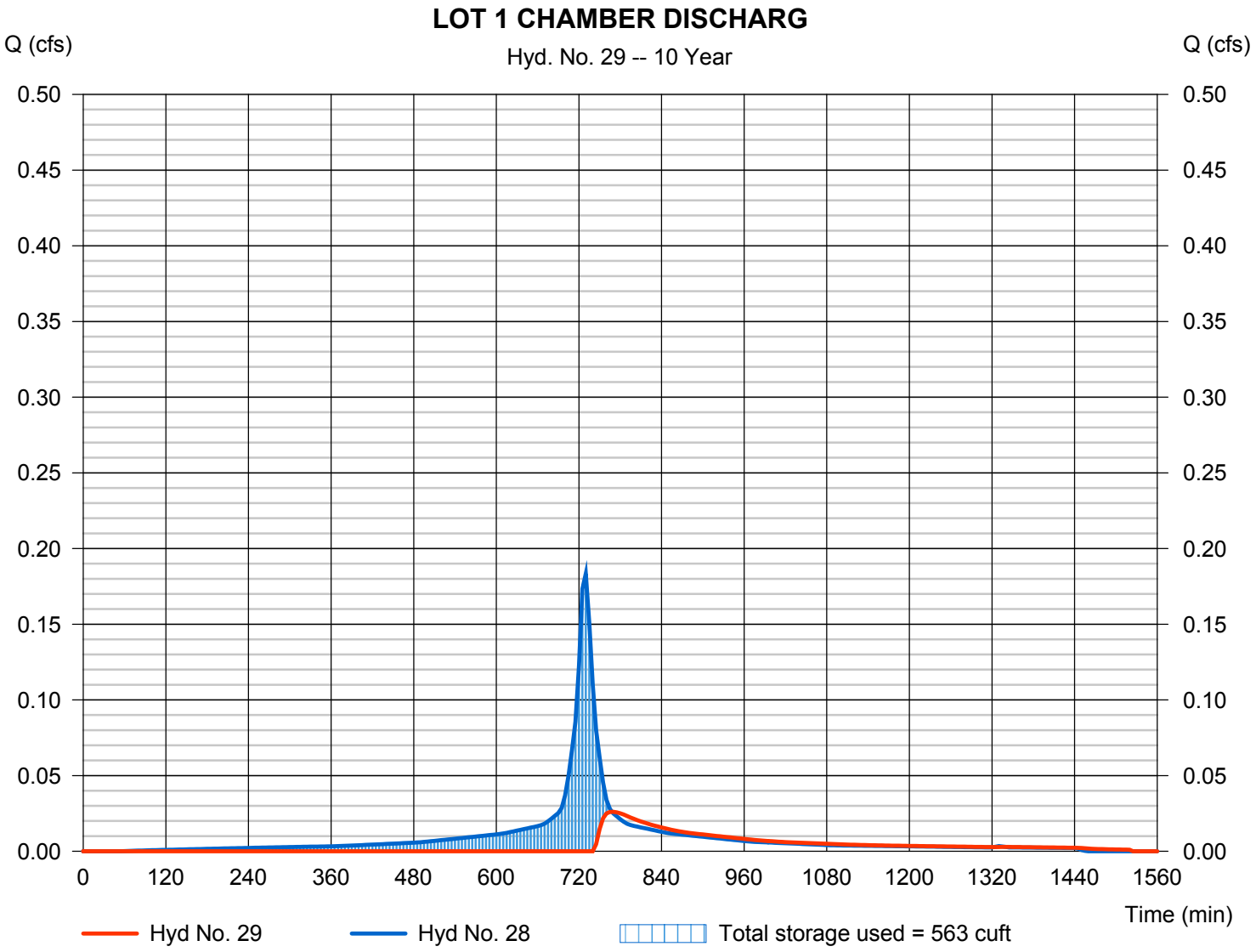
Hydrograph Report

Hyd. No. 29

LOT 1 CHAMBER DISCHARG

Hydrograph type	=	Reservoir	Peak discharge	=	0.026 cfs
Storm frequency	=	10 yrs	Time to peak	=	770 min
Time interval	=	5 min	Hyd. volume	=	324 cuft
Inflow hyd. No.	=	28 - PRDA 2A LOT 1 HOUSE TO CHAMBER	Max. Elevation	=	2.50 ft
Reservoir name	=	CHAMBERS LOT 1	Max. Storage	=	563 cuft

Storage Indication method used.

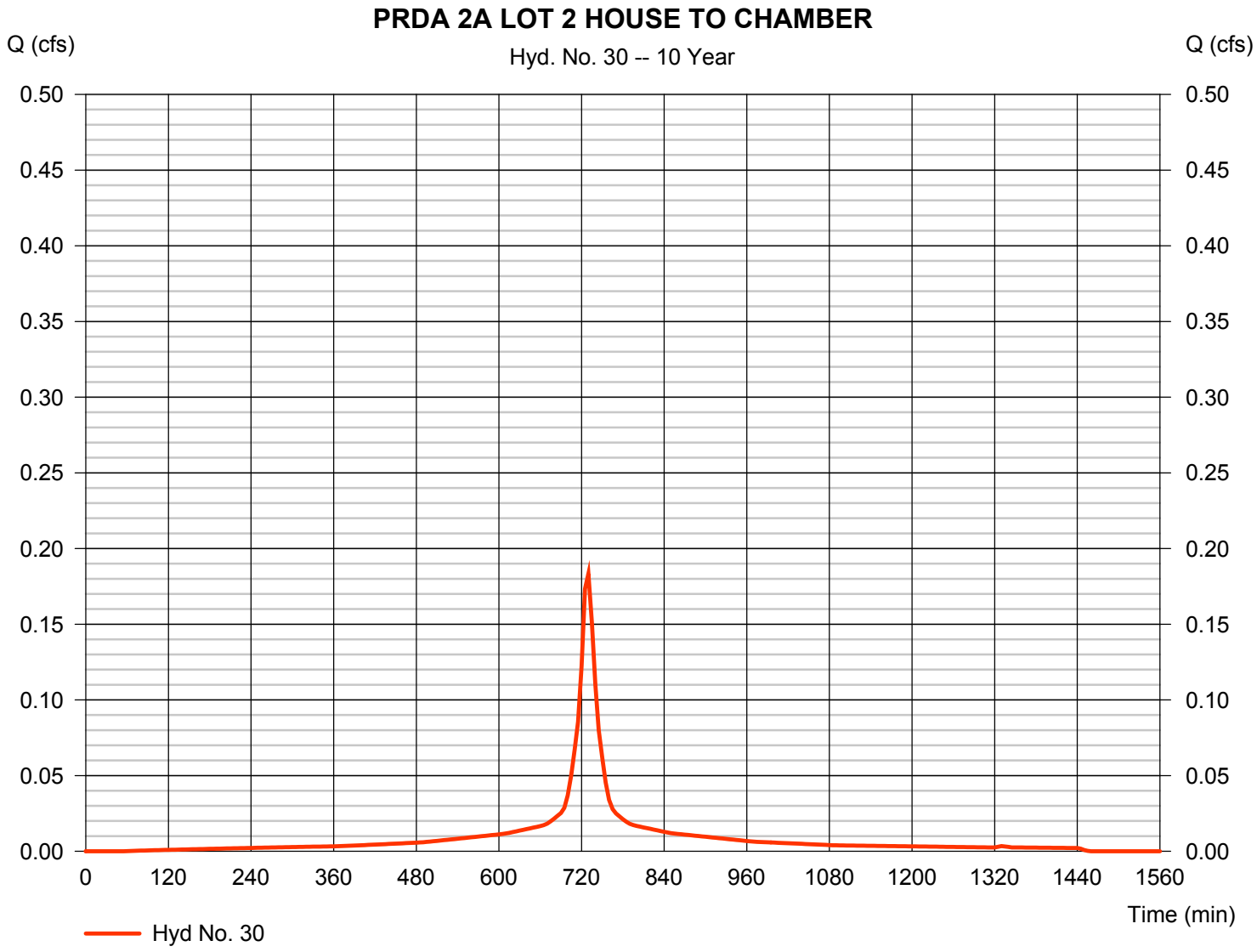


Hydrograph Report

Hyd. No. 30

PRDA 2A LOT 2 HOUSE TO CHAMBER

Hydrograph type	= SCS Runoff	Peak discharge	= 0.183 cfs
Storm frequency	= 10 yrs	Time to peak	= 730 min
Time interval	= 5 min	Hyd. volume	= 839 cuft
Drainage area	= 0.050 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.00 min
Total precip.	= 5.17 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



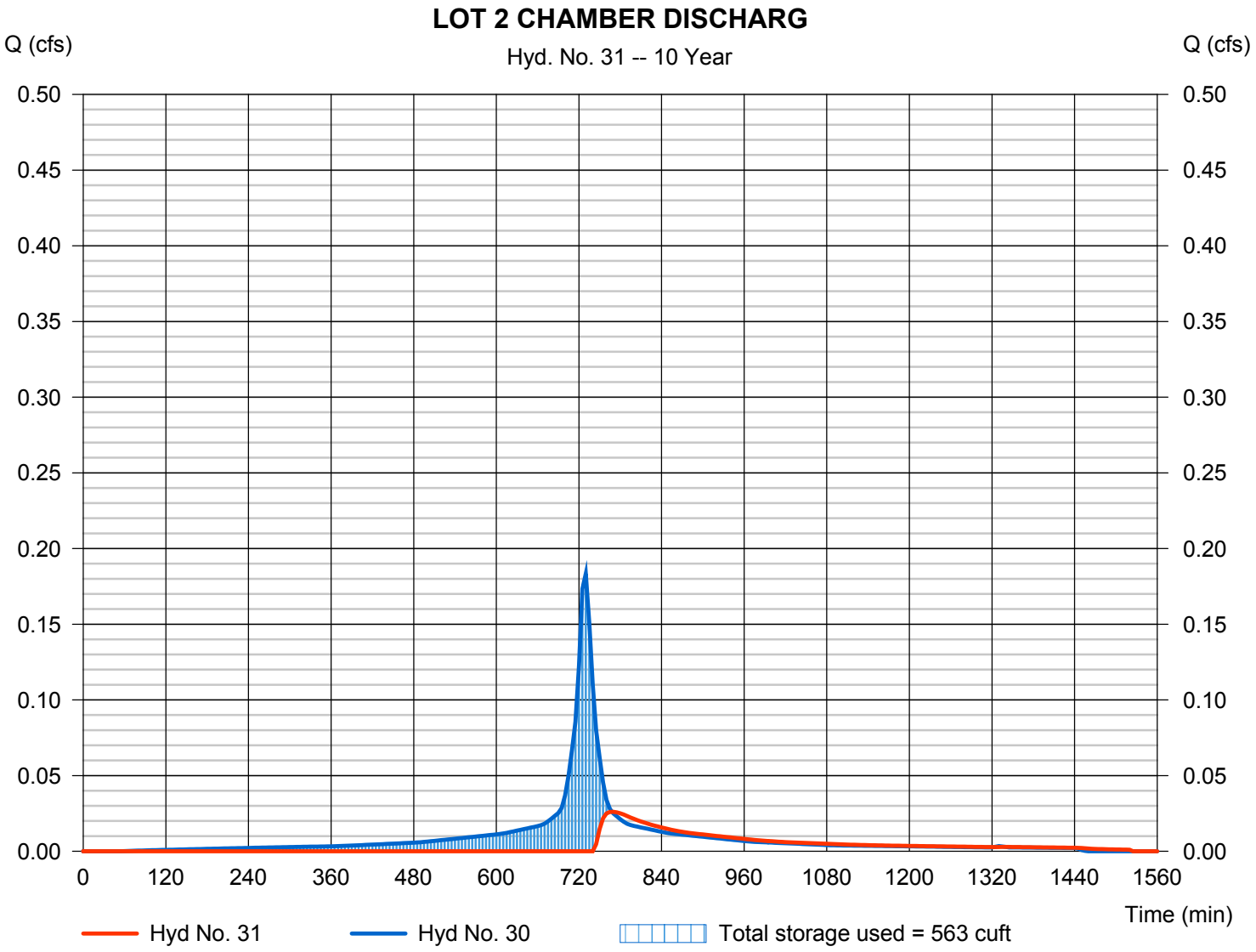
Hydrograph Report

Hyd. No. 31

LOT 2 CHAMBER DISCHARG

Hydrograph type	=	Reservoir	Peak discharge	=	0.026 cfs
Storm frequency	=	10 yrs	Time to peak	=	770 min
Time interval	=	5 min	Hyd. volume	=	324 cuft
Inflow hyd. No.	=	30 - PRDA 2A LOT 2 HOUSE TO CHAMBER	Max. Elevation	=	2.50 ft
Reservoir name	=	CHAMBERS LOT 2	Max. Storage	=	563 cuft

Storage Indication method used.

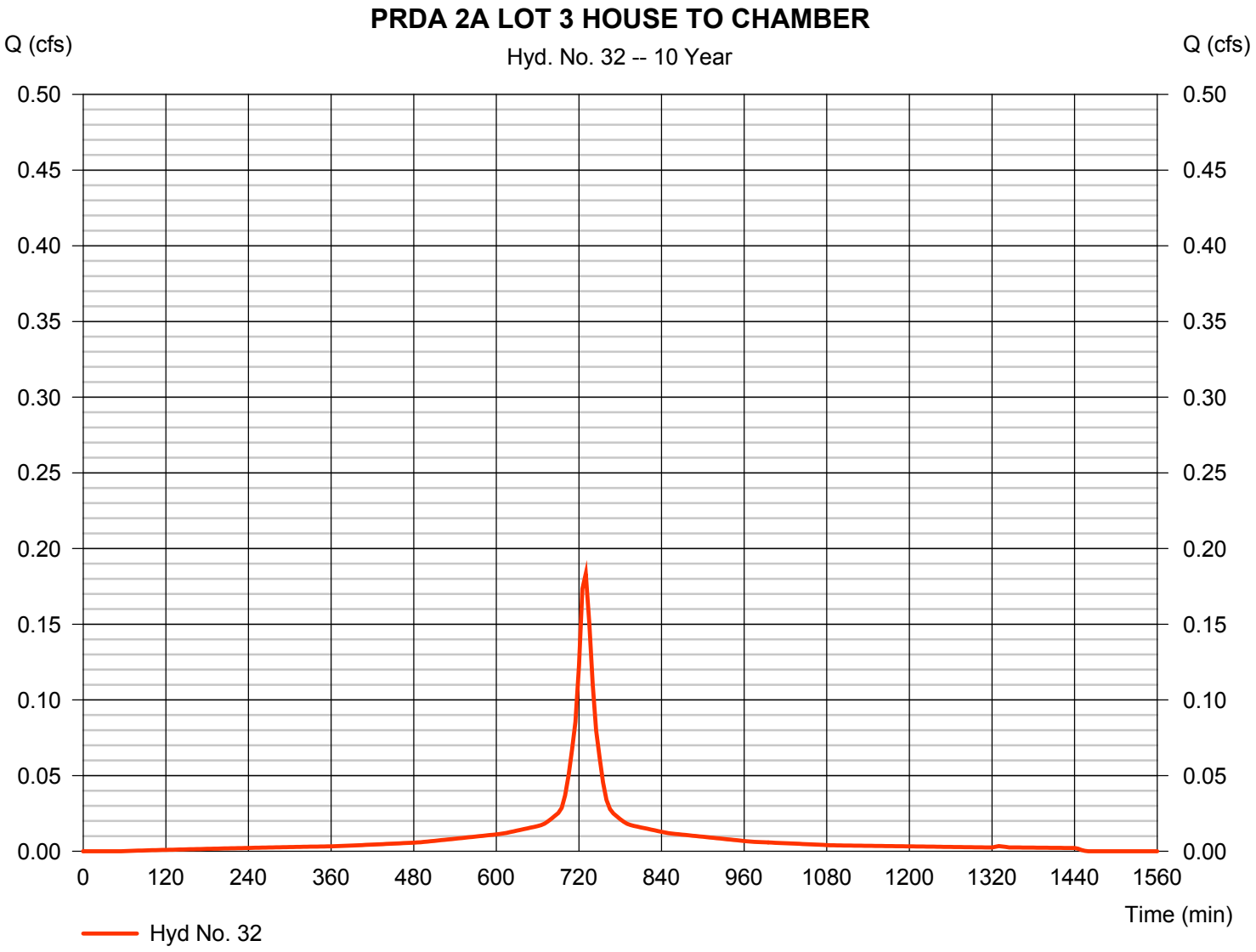


Hydrograph Report

Hyd. No. 32

PRDA 2A LOT 3 HOUSE TO CHAMBER

Hydrograph type	= SCS Runoff	Peak discharge	= 0.183 cfs
Storm frequency	= 10 yrs	Time to peak	= 730 min
Time interval	= 5 min	Hyd. volume	= 839 cuft
Drainage area	= 0.050 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.00 min
Total precip.	= 5.17 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



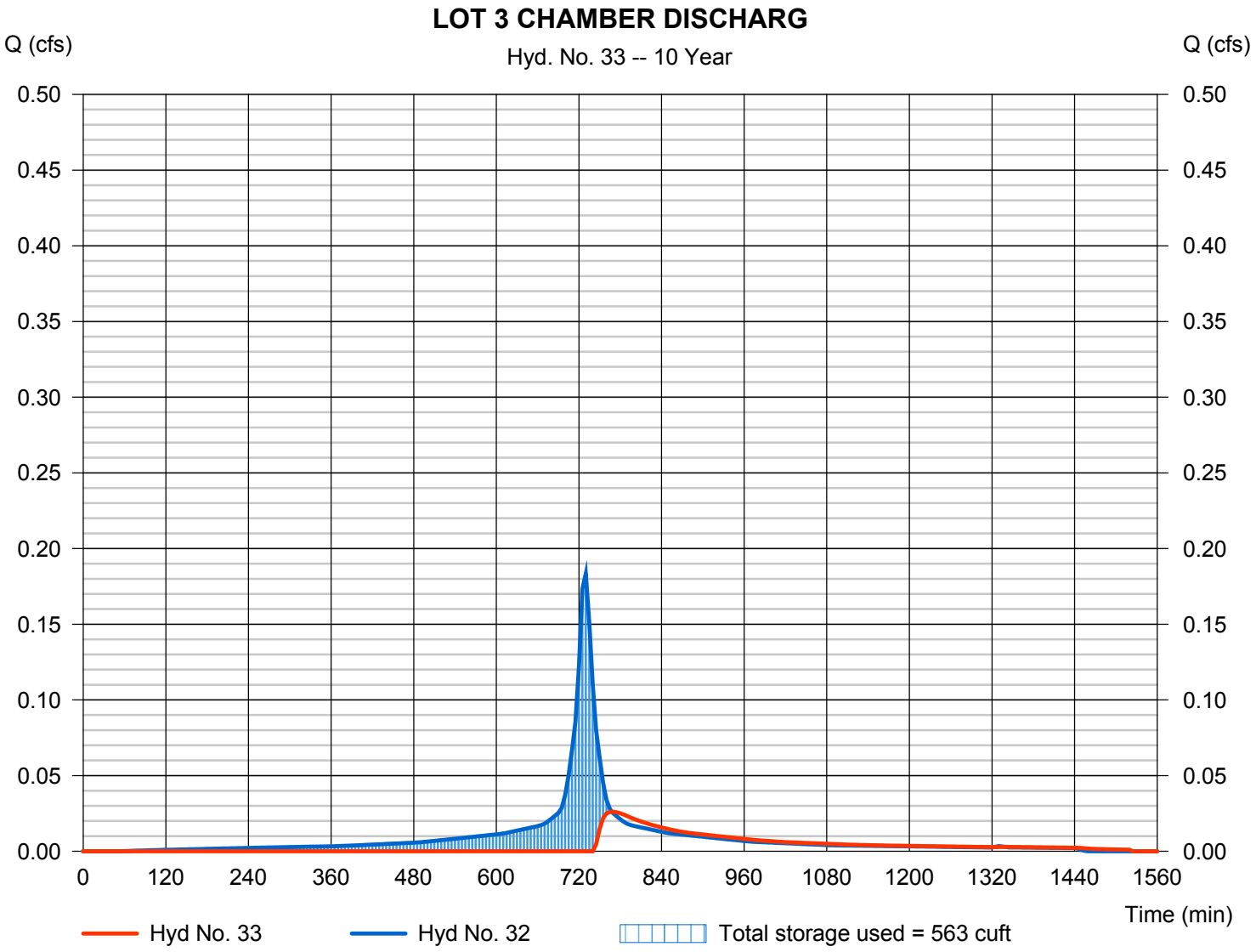
Hydrograph Report

Hyd. No. 33

LOT 3 CHAMBER DISCHARG

Hydrograph type	=	Reservoir	Peak discharge	=	0.026 cfs
Storm frequency	=	10 yrs	Time to peak	=	770 min
Time interval	=	5 min	Hyd. volume	=	324 cuft
Inflow hyd. No.	=	32 - PRDA 2A LOT 3 HOUSE TO CHAMBER	Max. Elevation	=	2.50 ft
Reservoir name	=	CHAMBERS LOT 3	Max. Storage	=	563 cuft

Storage Indication method used.

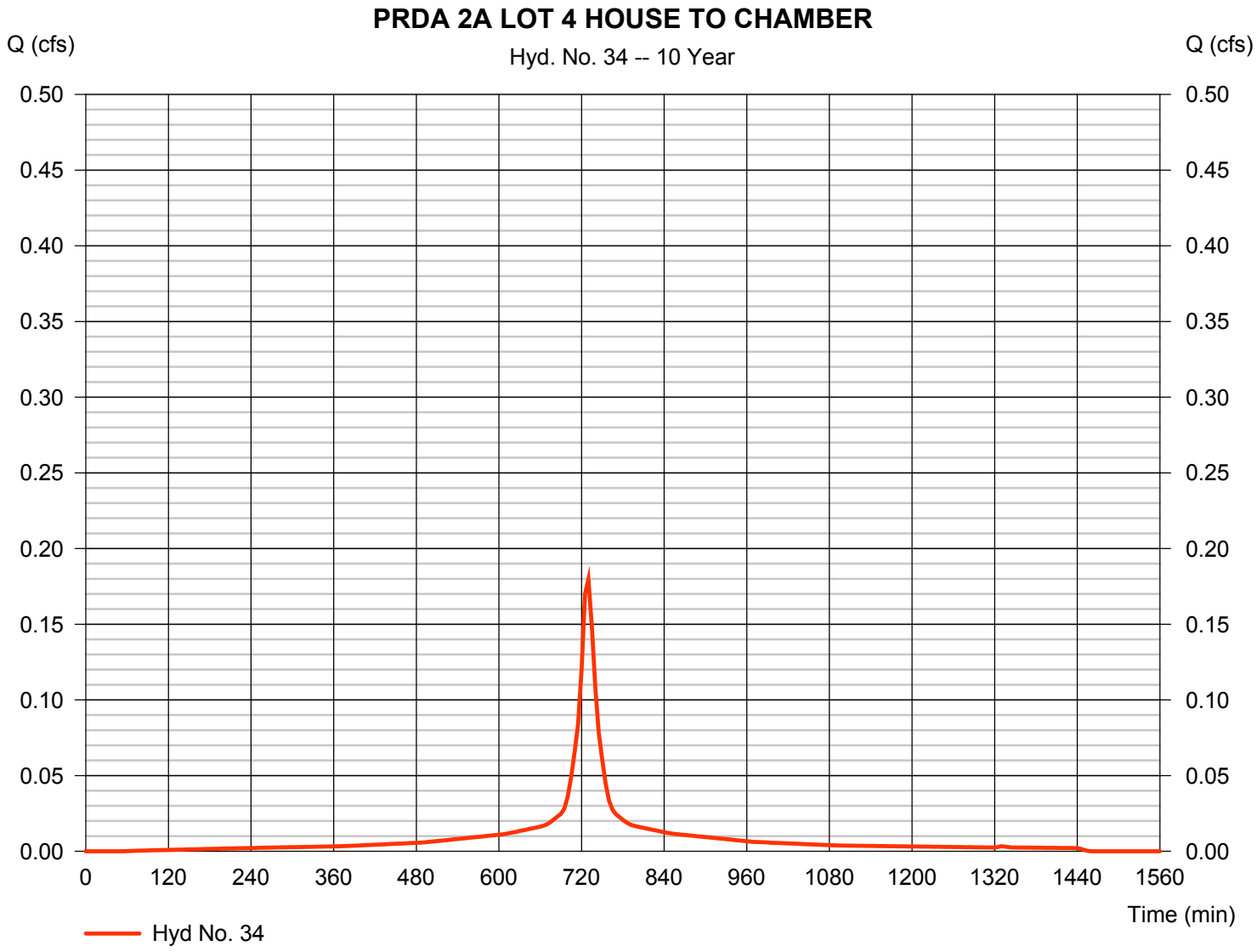


Hydrograph Report

Hyd. No. 34

PRDA 2A LOT 4 HOUSE TO CHAMBER

Hydrograph type	= SCS Runoff	Peak discharge	= 0.180 cfs
Storm frequency	= 10 yrs	Time to peak	= 730 min
Time interval	= 5 min	Hyd. volume	= 823 cuft
Drainage area	= 0.049 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.00 min
Total precip.	= 5.17 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



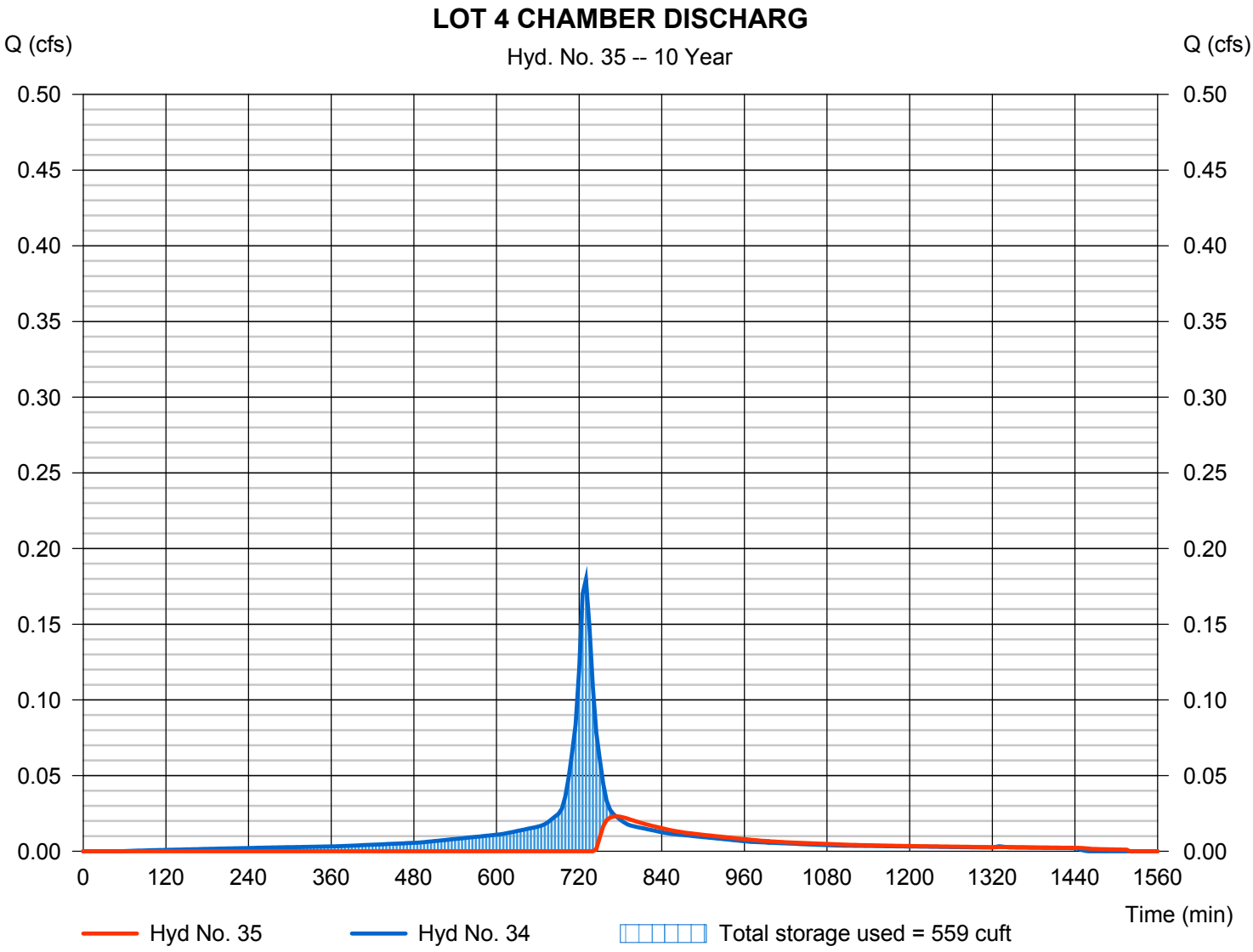
Hydrograph Report

Hyd. No. 35

LOT 4 CHAMBER DISCHARG

Hydrograph type	=	Reservoir	Peak discharge	=	0.023 cfs
Storm frequency	=	10 yrs	Time to peak	=	775 min
Time interval	=	5 min	Hyd. volume	=	307 cuft
Inflow hyd. No.	=	34 - PRDA 2A LOT 4 HOUSE TO CHAMBER	Max. Elevation	=	2.48 ft
Reservoir name	=	CHAMBERS LOT 4	Max. Storage	=	559 cuft

Storage Indication method used.

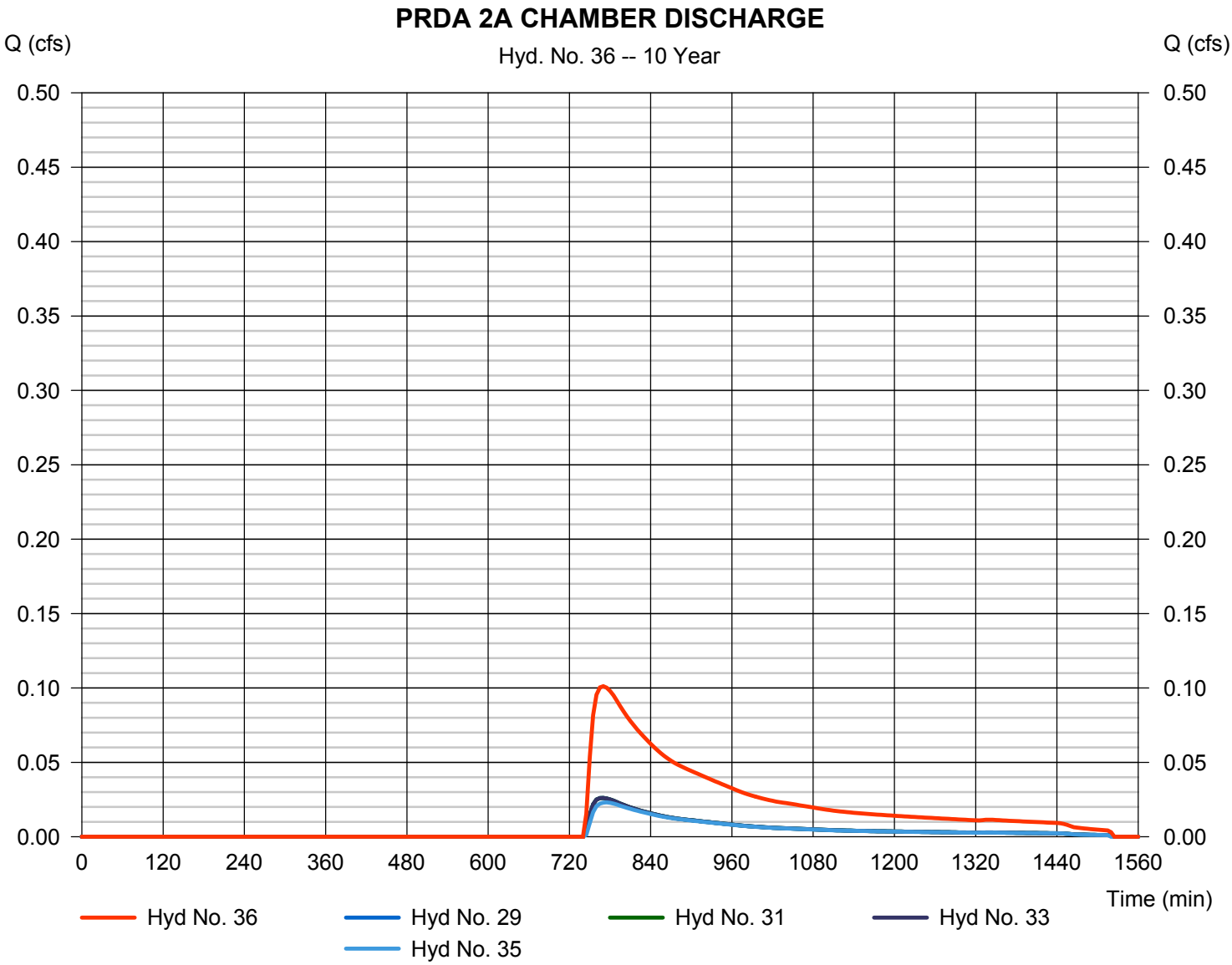


Hydrograph Report

Hyd. No. 36

PRDA 2A CHAMBER DISCHARGE

Hydrograph type	= Combine	Peak discharge	= 0.101 cfs
Storm frequency	= 10 yrs	Time to peak	= 770 min
Time interval	= 5 min	Hyd. volume	= 1,279 cuft
Inflow hyds.	= 29, 31, 33, 35	Contrib. drain. area	= 0.000 ac

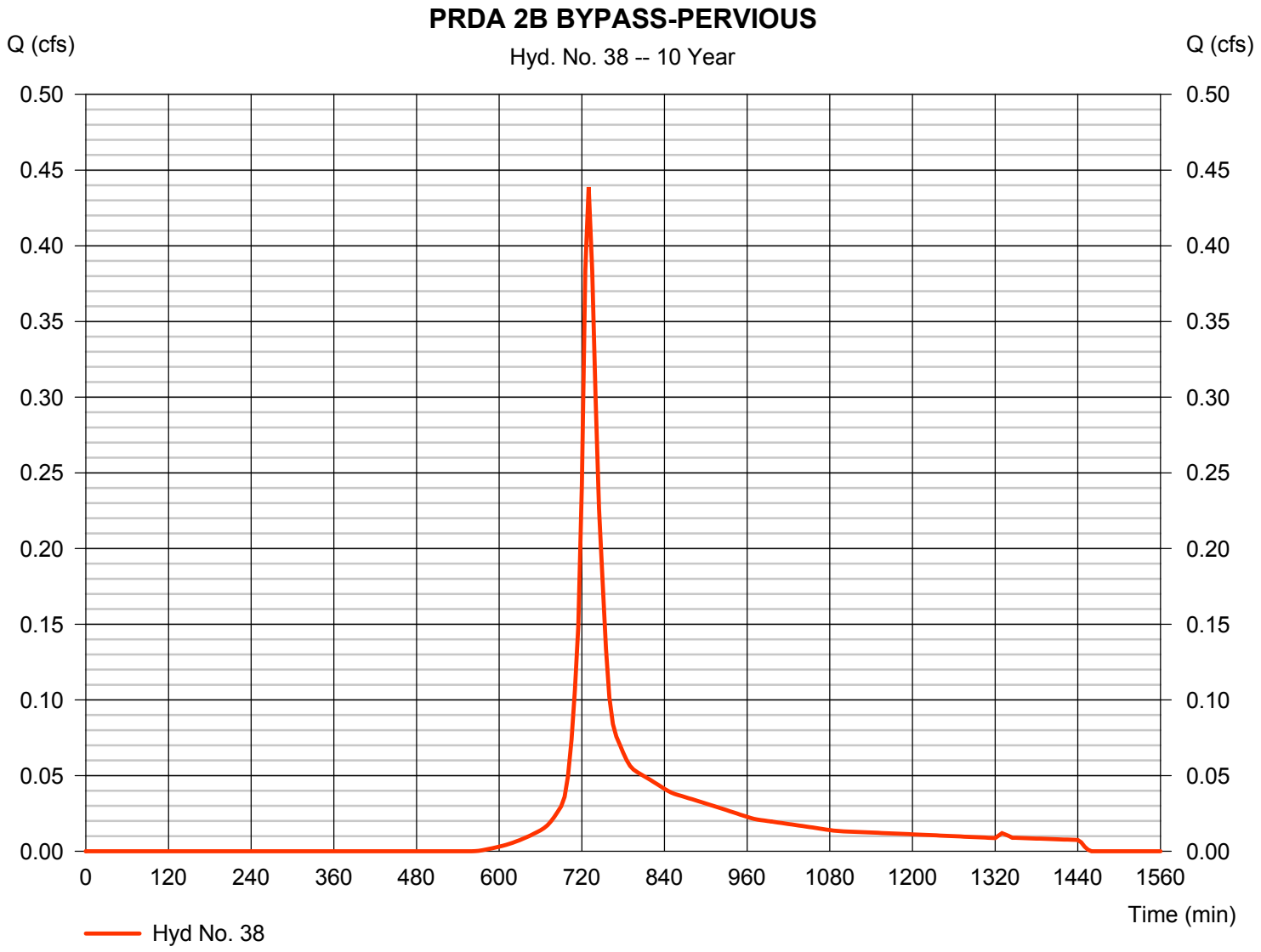


Hydrograph Report

Hyd. No. 38

PRDA 2B BYPASS-PERVIOUS

Hydrograph type	= SCS Runoff	Peak discharge	= 0.439 cfs
Storm frequency	= 10 yrs	Time to peak	= 730 min
Time interval	= 5 min	Hyd. volume	= 1,758 cuft
Drainage area	= 0.230 ac	Curve number	= 71
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.00 min
Total precip.	= 5.17 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

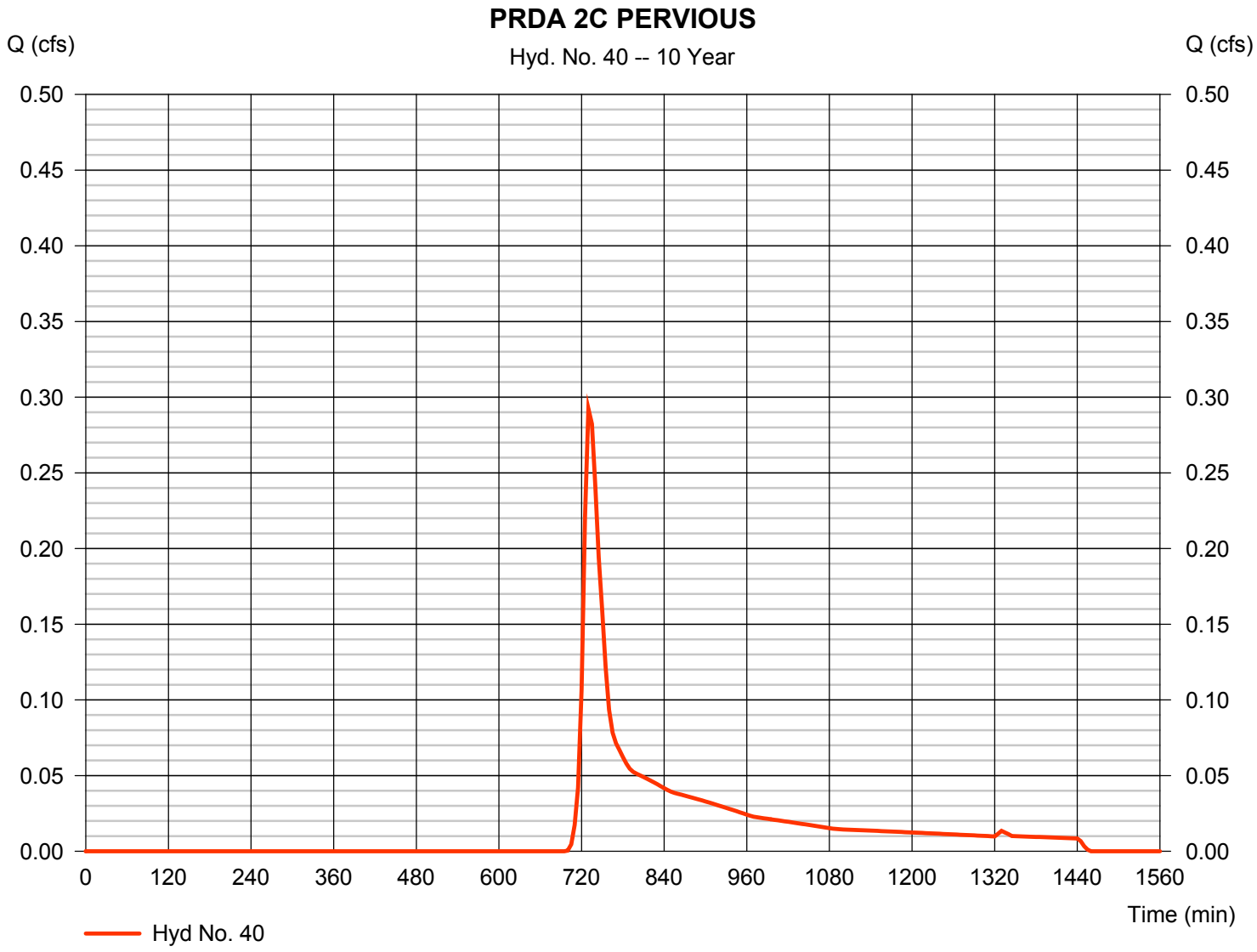


Hydrograph Report

Hyd. No. 40

PRDA 2C PERVIOUS

Hydrograph type	= SCS Runoff	Peak discharge	= 0.292 cfs
Storm frequency	= 10 yrs	Time to peak	= 730 min
Time interval	= 5 min	Hyd. volume	= 1,414 cuft
Drainage area	= 0.390 ac	Curve number	= 55
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.00 min
Total precip.	= 5.17 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

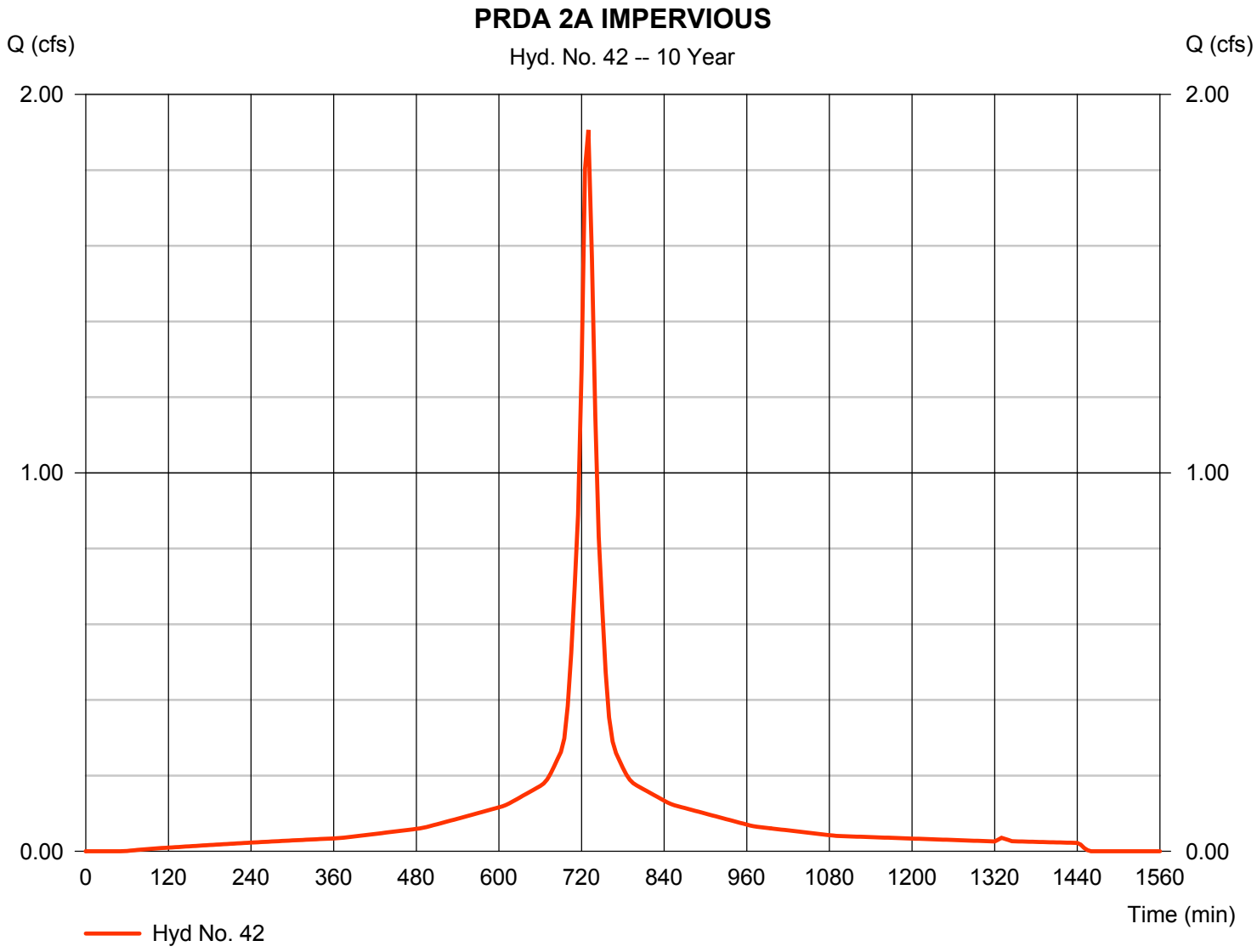


Hydrograph Report

Hyd. No. 42

PRDA 2A IMPERVIOUS

Hydrograph type	= SCS Runoff	Peak discharge	= 1.906 cfs
Storm frequency	= 10 yrs	Time to peak	= 730 min
Time interval	= 5 min	Hyd. volume	= 8,729 cuft
Drainage area	= 0.520 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.00 min
Total precip.	= 5.17 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

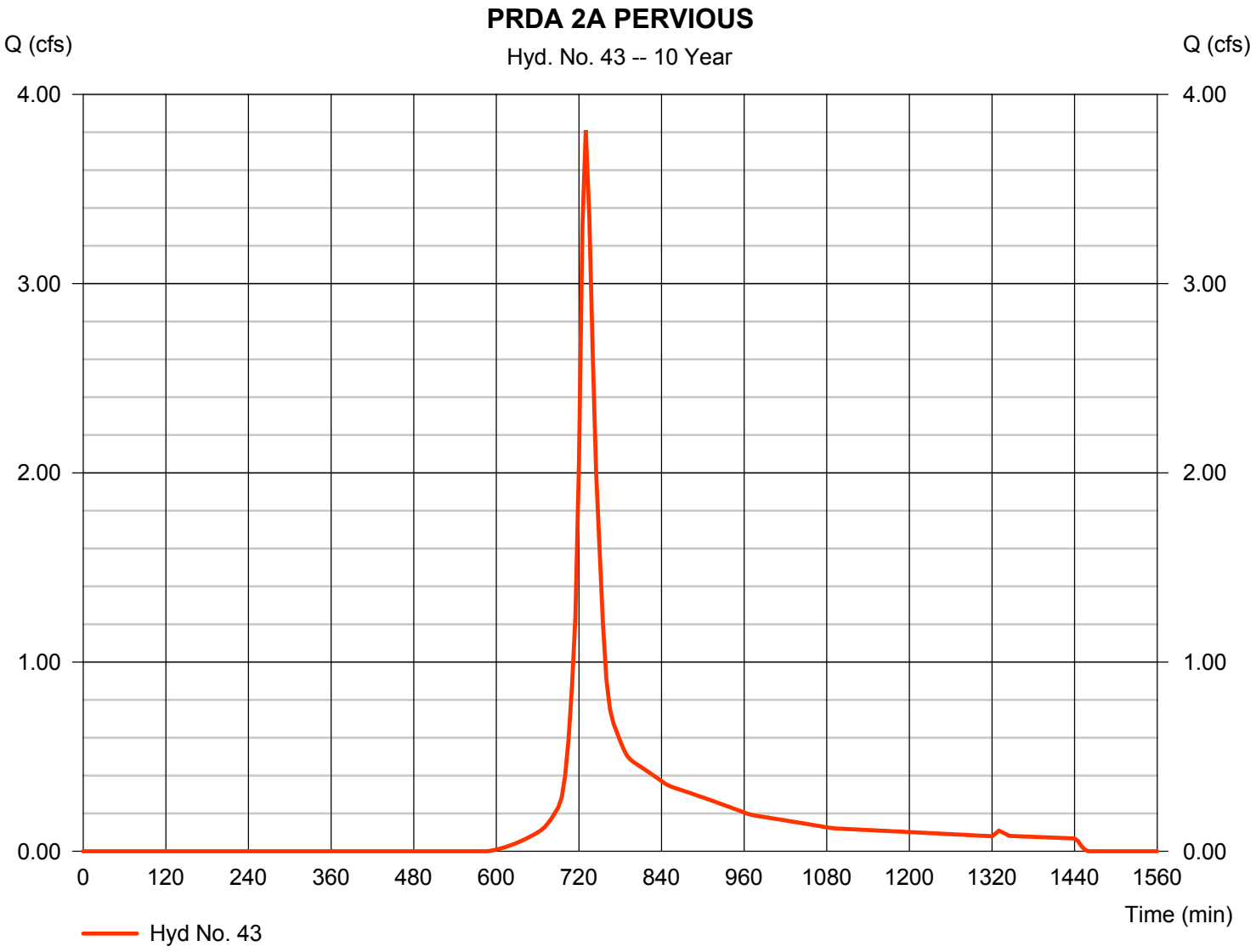


Hydrograph Report

Hyd. No. 43

PRDA 2A PERVIOUS

Hydrograph type	= SCS Runoff	Peak discharge	= 3.810 cfs
Storm frequency	= 10 yrs	Time to peak	= 730 min
Time interval	= 5 min	Hyd. volume	= 15,374 cuft
Drainage area	= 2.170 ac	Curve number	= 69
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.00 min
Total precip.	= 5.17 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

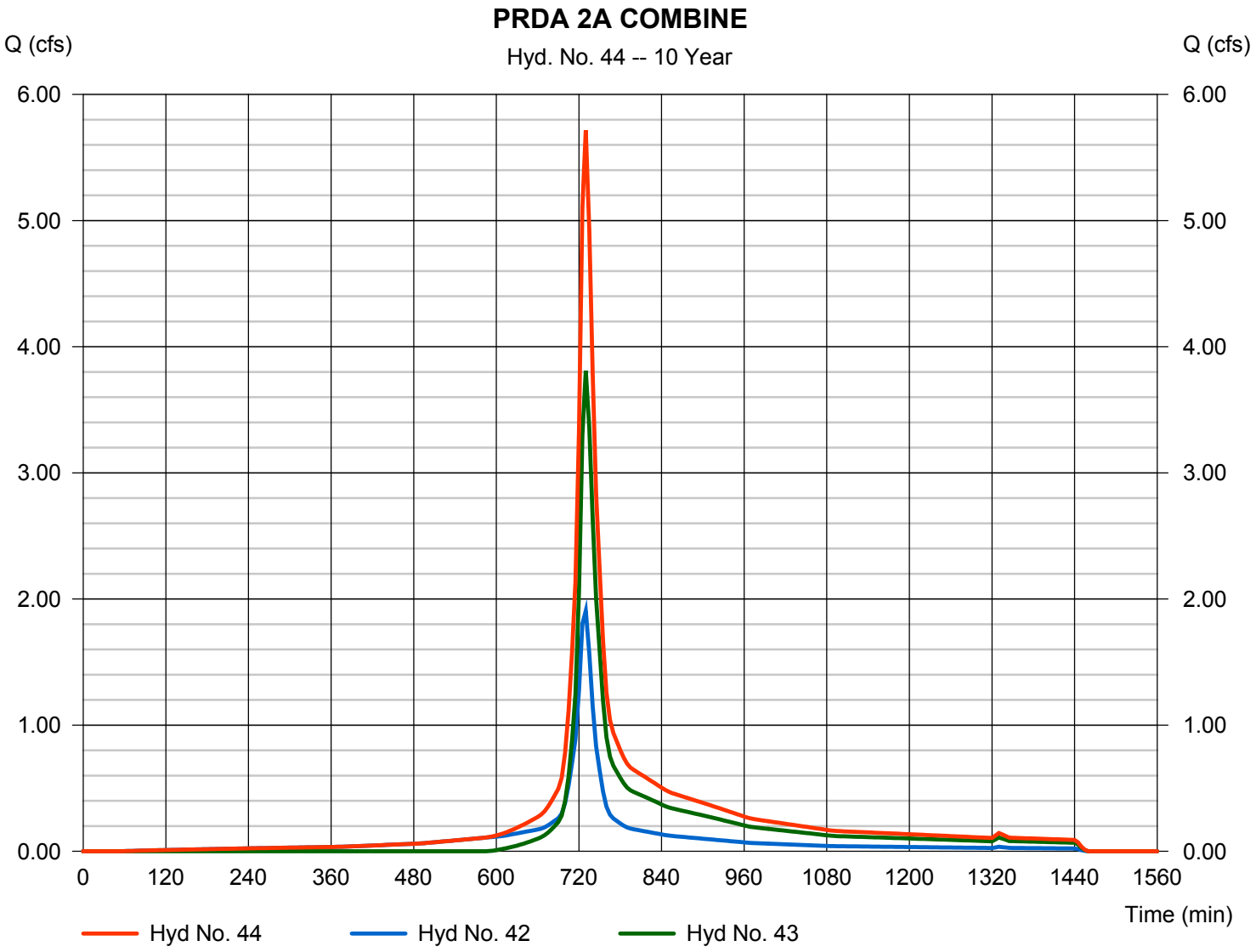


Hydrograph Report

Hyd. No. 44

PRDA 2A COMBINE

Hydrograph type	=	Combine	Peak discharge	=	5.716 cfs
Storm frequency	=	10 yrs	Time to peak	=	730 min
Time interval	=	5 min	Hyd. volume	=	24,103 cuft
Inflow hyds.	=	42, 43	Contrib. drain. area	=	2.690 ac

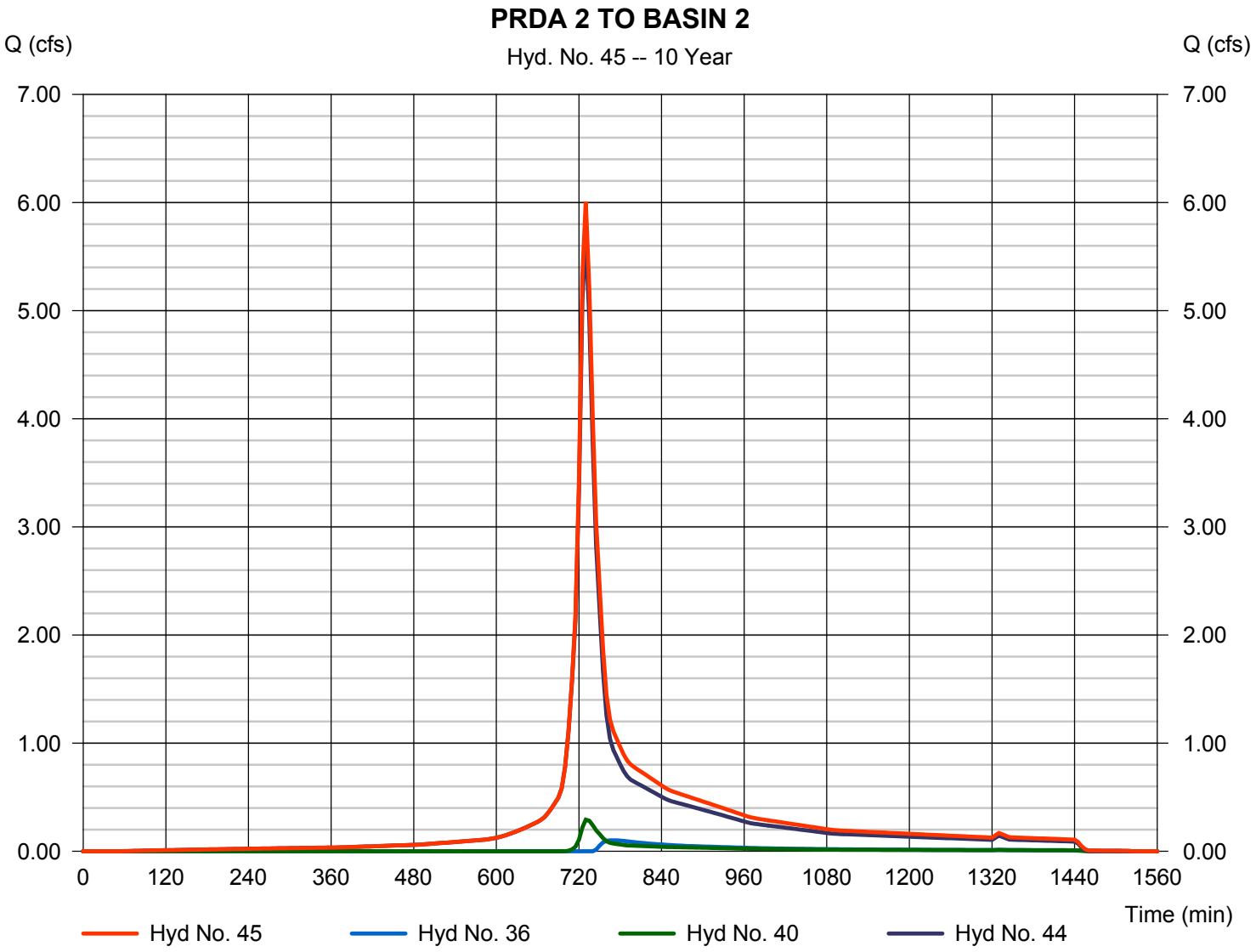


Hydrograph Report

Hyd. No. 45

PRDA 2 TO BASIN 2

Hydrograph type	= Combine	Peak discharge	= 6.009 cfs
Storm frequency	= 10 yrs	Time to peak	= 730 min
Time interval	= 5 min	Hyd. volume	= 26,797 cuft
Inflow hyds.	= 36, 40, 44	Contrib. drain. area	= 0.390 ac



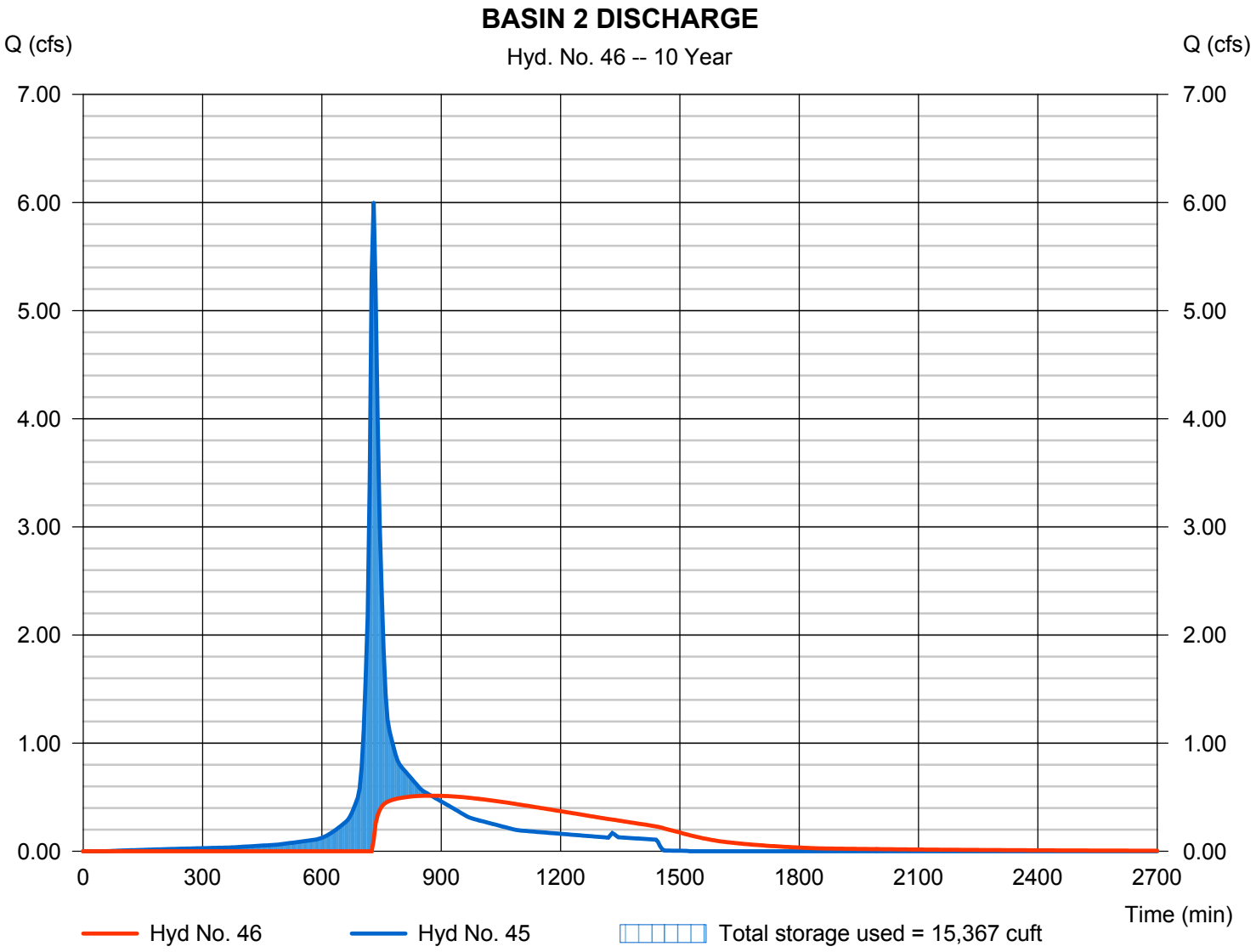
Hydrograph Report

Hyd. No. 46

BASIN 2 DISCHARGE

Hydrograph type	=	Reservoir	Peak discharge	=	0.514 cfs
Storm frequency	=	10 yrs	Time to peak	=	875 min
Time interval	=	5 min	Hyd. volume	=	20,365 cuft
Inflow hyd. No.	=	45 - PRDA 2 TO BASIN 2	Max. Elevation	=	226.42 ft
Reservoir name	=	SWM BASIN 2	Max. Storage	=	15,367 cuft

Storage Indication method used.

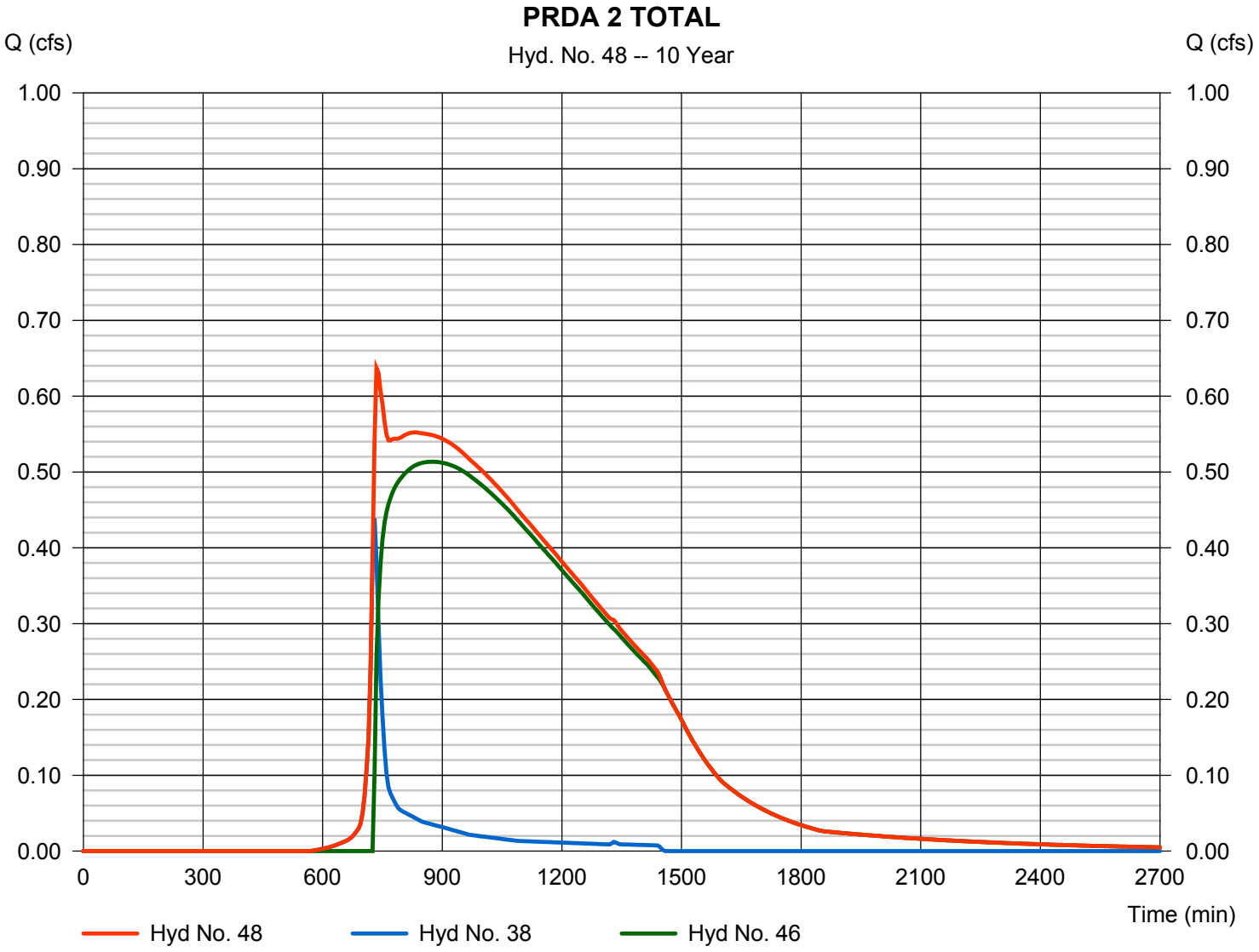


Hydrograph Report

Hyd. No. 48

PRDA 2 TOTAL

Hydrograph type	= Combine	Peak discharge	= 0.637 cfs
Storm frequency	= 10 yrs	Time to peak	= 735 min
Time interval	= 5 min	Hyd. volume	= 22,123 cuft
Inflow hyds.	= 38, 46	Contrib. drain. area	= 0.230 ac

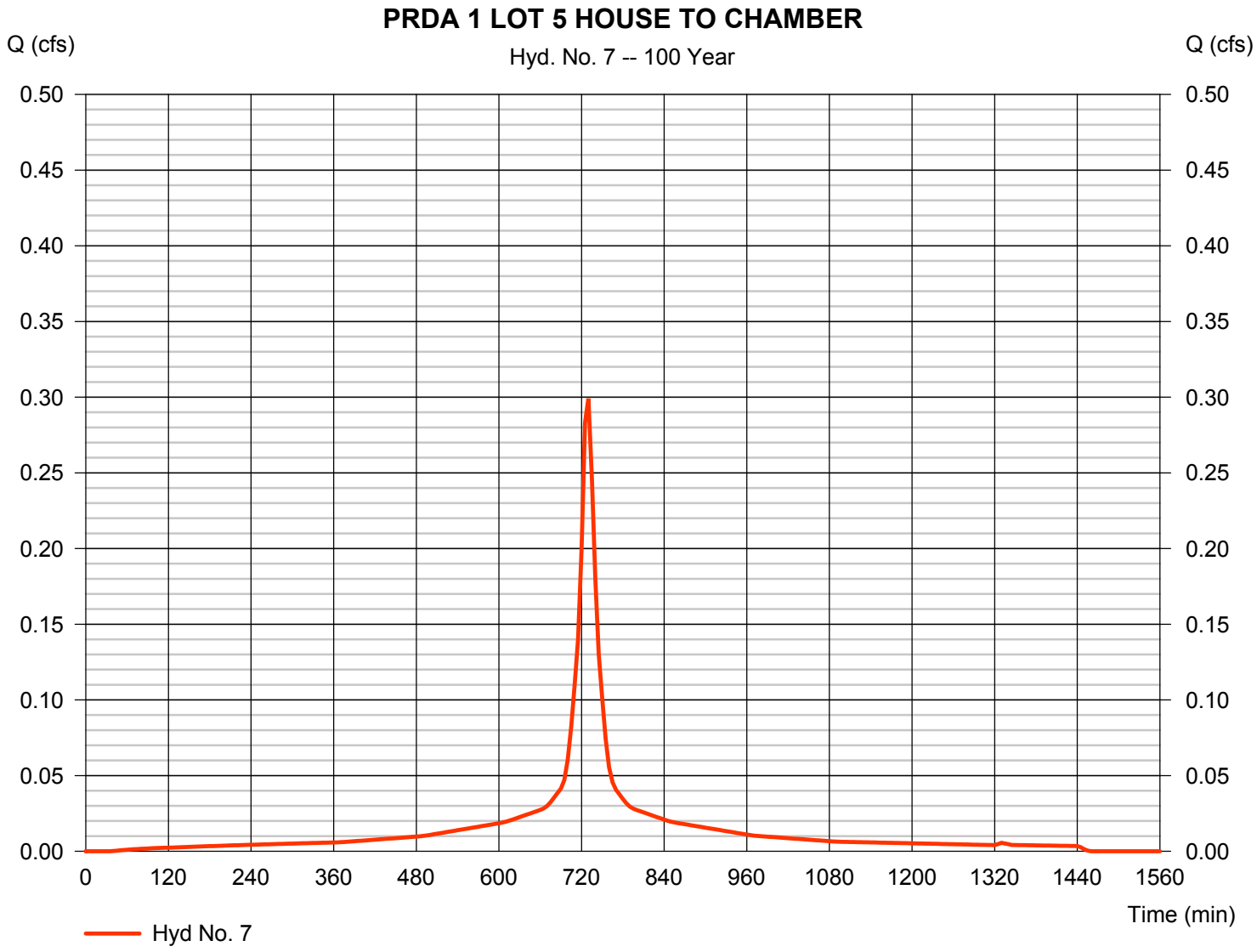


Hydrograph Report

Hyd. No. 7

PRDA 1 LOT 5 HOUSE TO CHAMBER

Hydrograph type	= SCS Runoff	Peak discharge	= 0.299 cfs
Storm frequency	= 100 yrs	Time to peak	= 730 min
Time interval	= 5 min	Hyd. volume	= 1,391 cuft
Drainage area	= 0.049 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.00 min
Total precip.	= 8.58 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



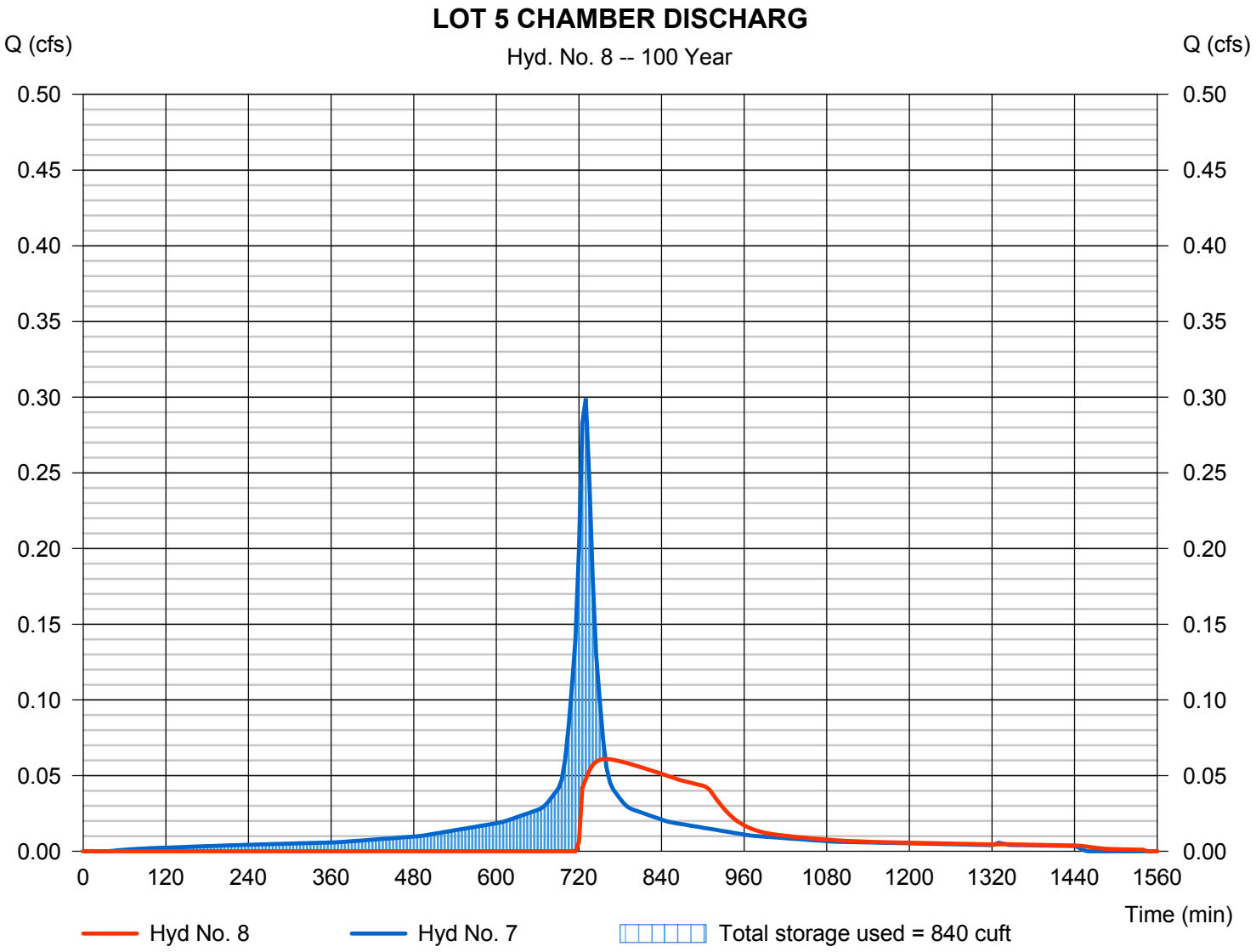
Hydrograph Report

Hyd. No. 8

LOT 5 CHAMBER DISCHARG

Hydrograph type	=	Reservoir	Peak discharge	=	0.061 cfs
Storm frequency	=	100 yrs	Time to peak	=	760 min
Time interval	=	5 min	Hyd. volume	=	875 cuft
Inflow hyd. No.	=	7 - PRDA 1 LOT 5 HOUSE TO CHAMBER	Max. Elevation	=	3.61 ft
Reservoir name	=	CHAMBERS LOT 5	Max. Storage	=	840 cuft

Storage Indication method used.

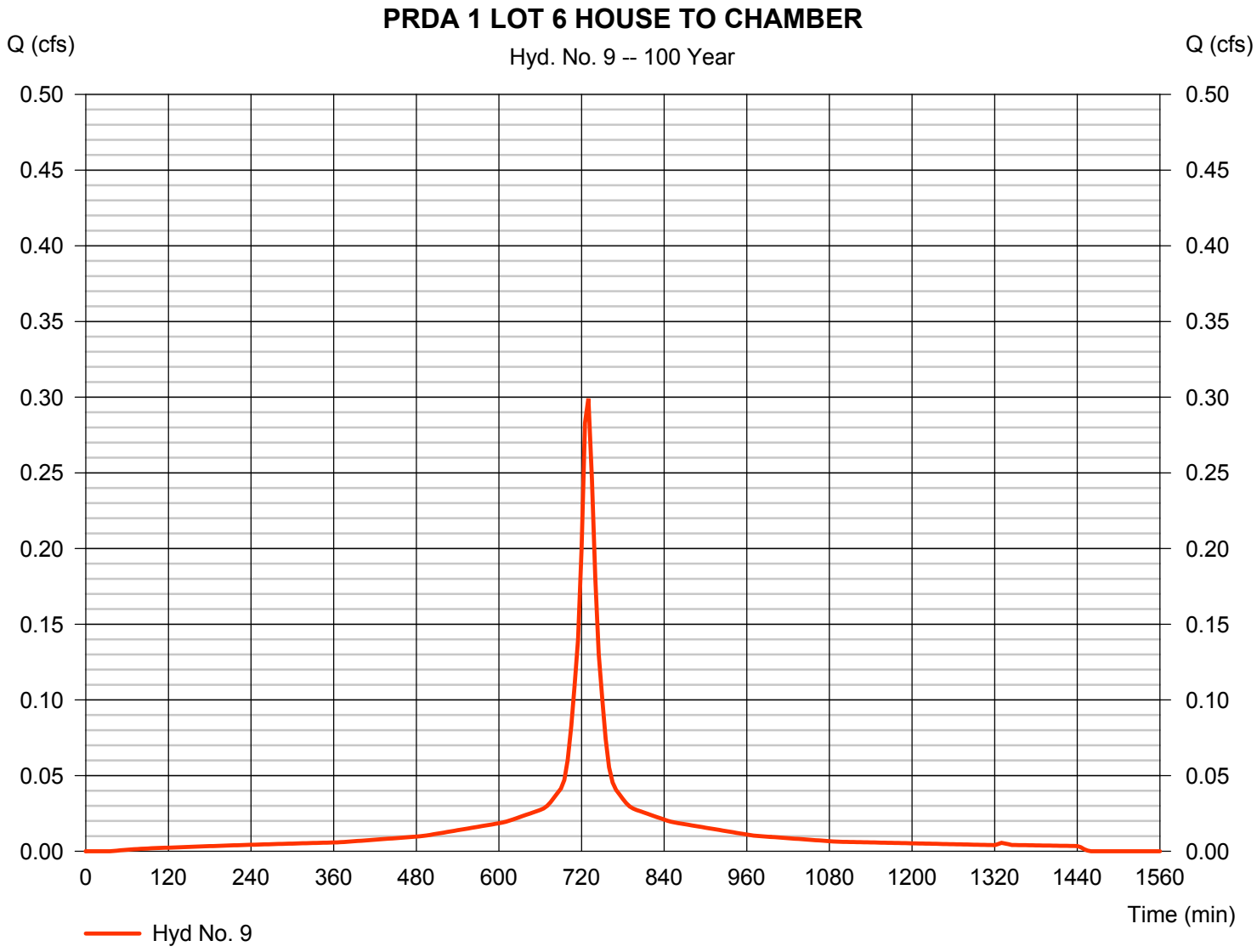


Hydrograph Report

Hyd. No. 9

PRDA 1 LOT 6 HOUSE TO CHAMBER

Hydrograph type	= SCS Runoff	Peak discharge	= 0.299 cfs
Storm frequency	= 100 yrs	Time to peak	= 730 min
Time interval	= 5 min	Hyd. volume	= 1,391 cuft
Drainage area	= 0.049 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.00 min
Total precip.	= 8.58 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



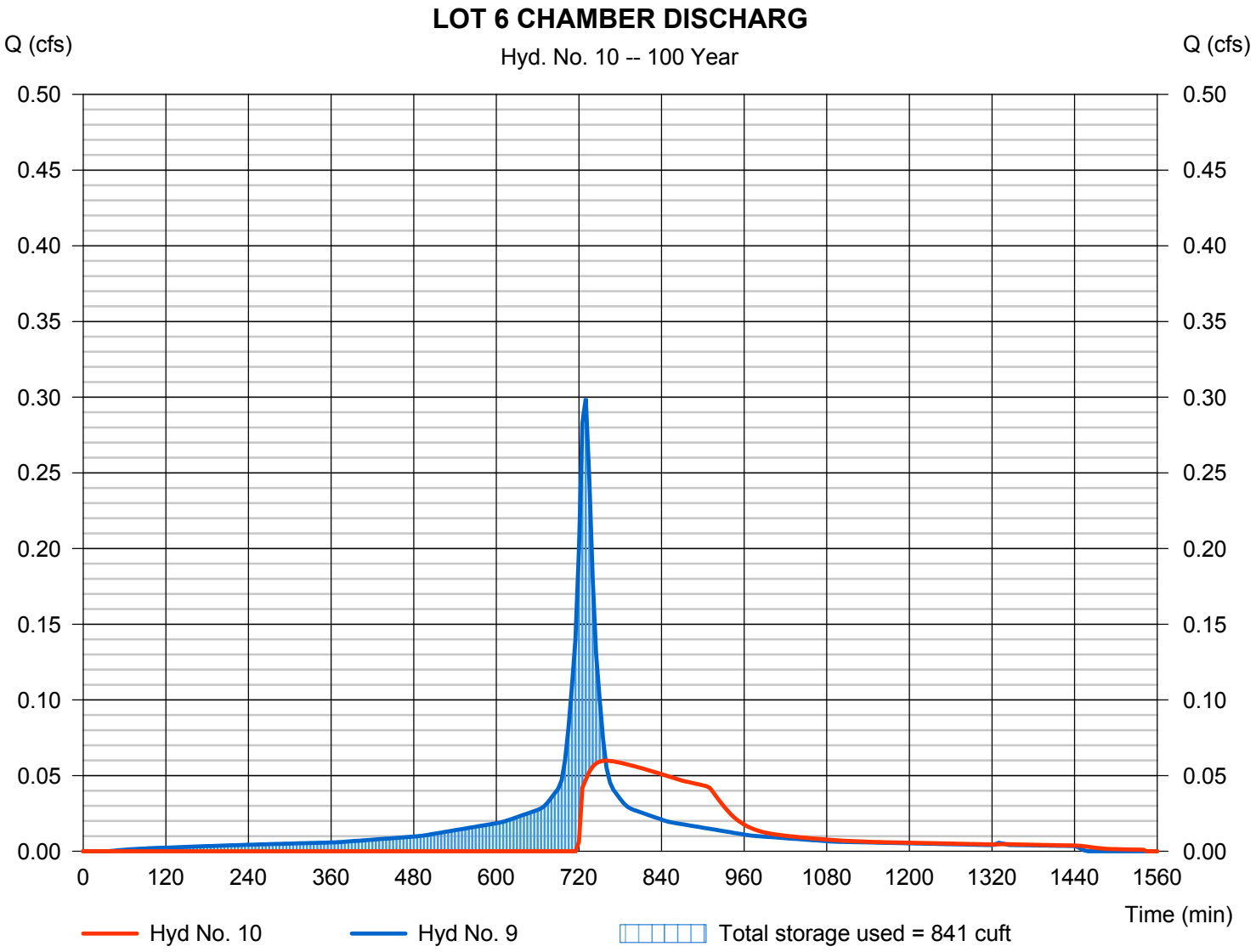
Hydrograph Report

Hyd. No. 10

LOT 6 CHAMBER DISCHARG

Hydrograph type	=	Reservoir	Peak discharge	=	0.060 cfs
Storm frequency	=	100 yrs	Time to peak	=	760 min
Time interval	=	5 min	Hyd. volume	=	875 cuft
Inflow hyd. No.	=	9 - PRDA 1 LOT 6 HOUSE TO CHAMBER	Max. Elevation	=	3.62 ft
Reservoir name	=	CHAMBERS LOT 6	Max. Storage	=	841 cuft

Storage Indication method used.

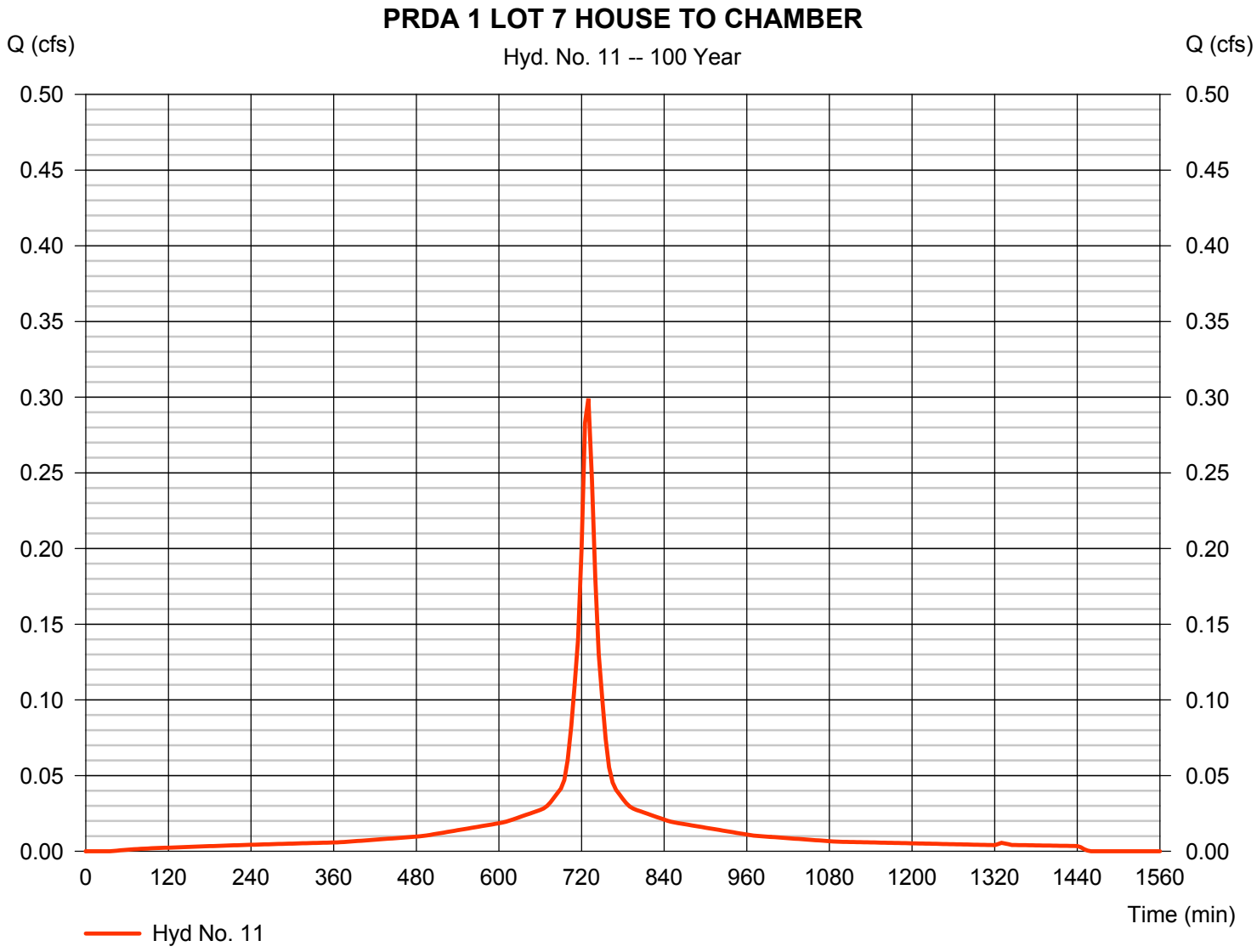


Hydrograph Report

Hyd. No. 11

PRDA 1 LOT 7 HOUSE TO CHAMBER

Hydrograph type	= SCS Runoff	Peak discharge	= 0.299 cfs
Storm frequency	= 100 yrs	Time to peak	= 730 min
Time interval	= 5 min	Hyd. volume	= 1,391 cuft
Drainage area	= 0.049 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.00 min
Total precip.	= 8.58 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



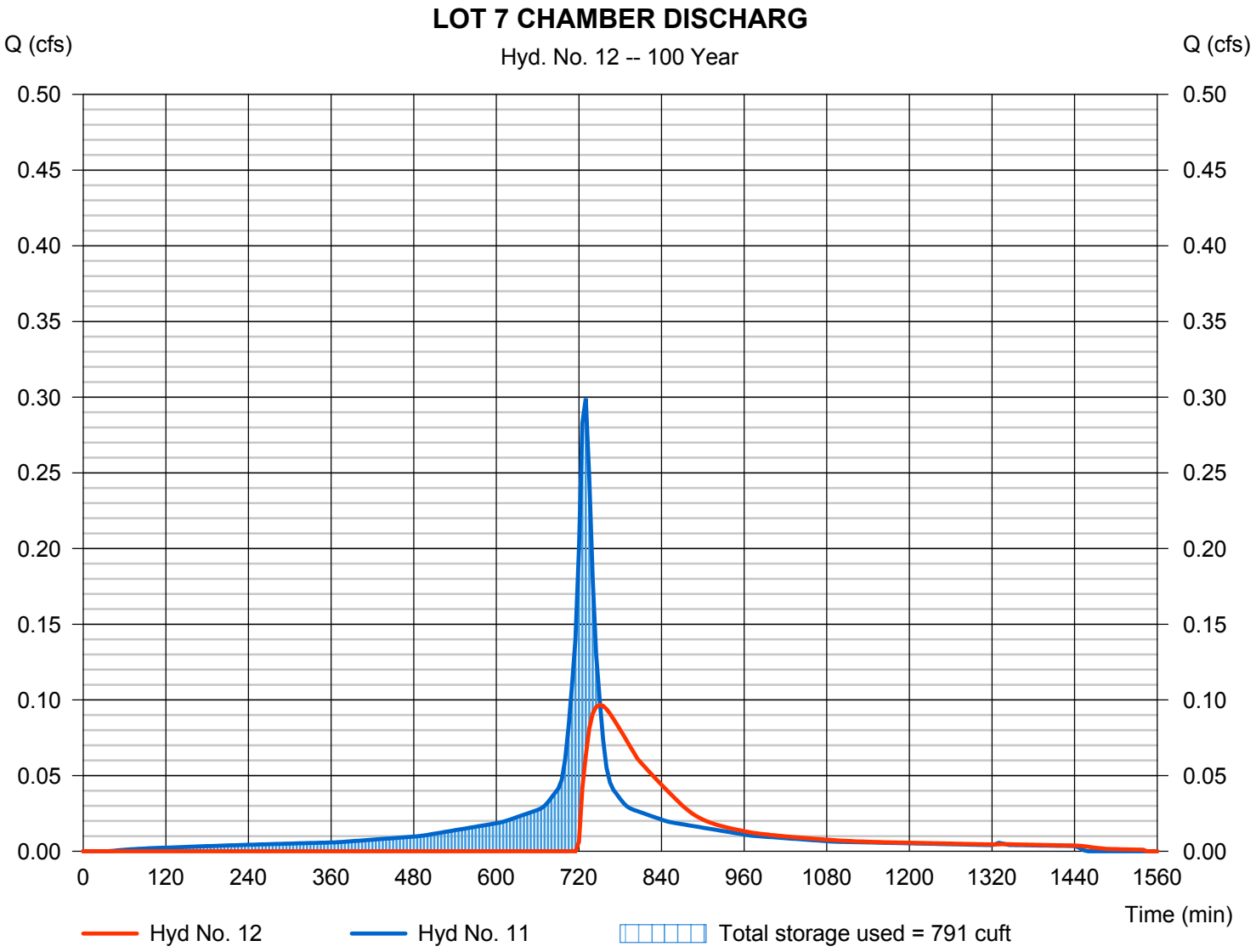
Hydrograph Report

Hyd. No. 12

LOT 7 CHAMBER DISCHARG

Hydrograph type	=	Reservoir	Peak discharge	=	0.097 cfs
Storm frequency	=	100 yrs	Time to peak	=	750 min
Time interval	=	5 min	Hyd. volume	=	875 cuft
Inflow hyd. No.	=	11 - PRDA 1 LOT 7 HOUSE TO CHAMBER	Max. Elevation	=	3.39 ft
Reservoir name	=	CHAMBERS LOT 7	Max. Storage	=	791 cuft

Storage Indication method used.

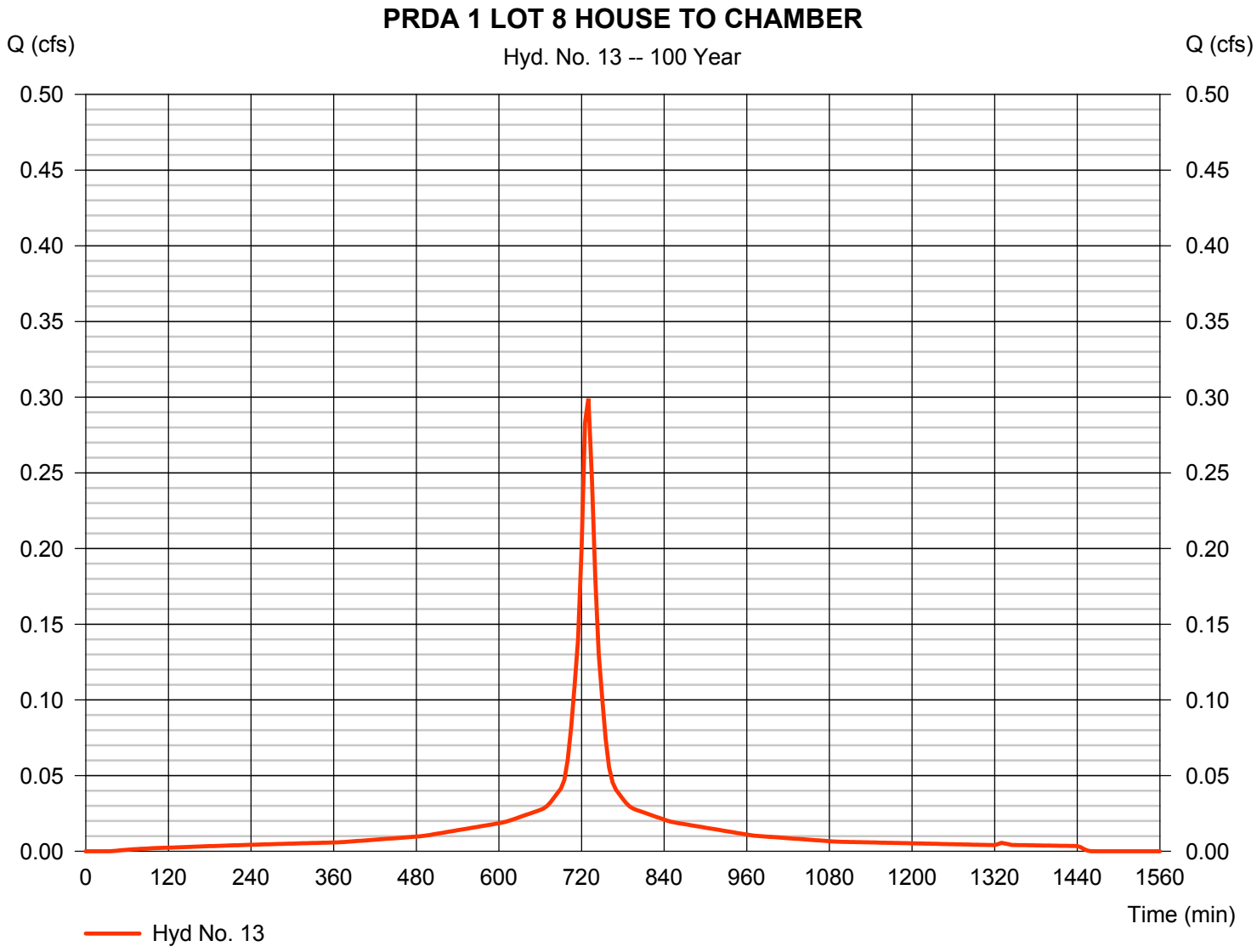


Hydrograph Report

Hyd. No. 13

PRDA 1 LOT 8 HOUSE TO CHAMBER

Hydrograph type	= SCS Runoff	Peak discharge	= 0.299 cfs
Storm frequency	= 100 yrs	Time to peak	= 730 min
Time interval	= 5 min	Hyd. volume	= 1,391 cuft
Drainage area	= 0.049 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.00 min
Total precip.	= 8.58 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



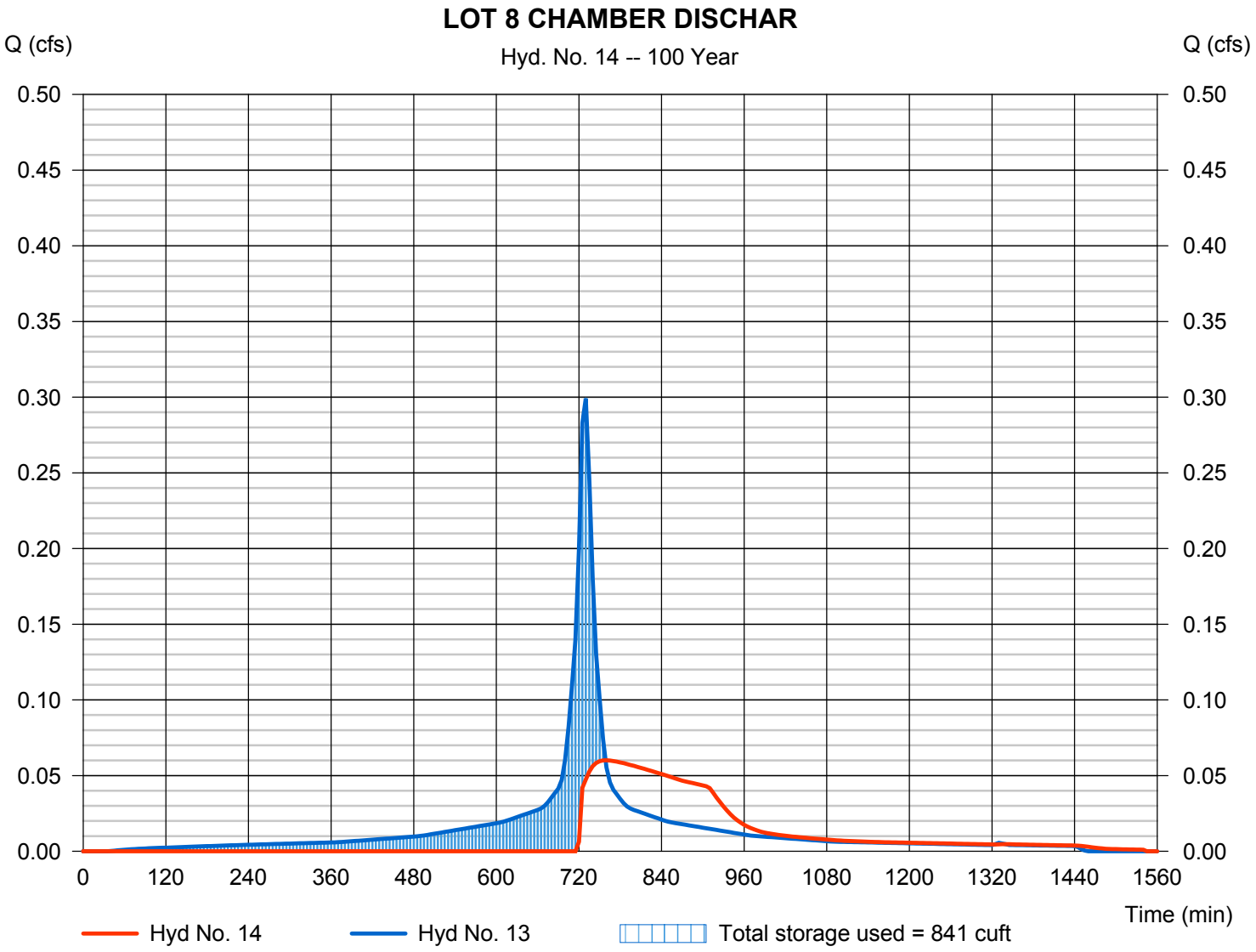
Hydrograph Report

Hyd. No. 14

LOT 8 CHAMBER DISCHAR

Hydrograph type	=	Reservoir	Peak discharge	=	0.060 cfs
Storm frequency	=	100 yrs	Time to peak	=	760 min
Time interval	=	5 min	Hyd. volume	=	875 cuft
Inflow hyd. No.	=	13 - PRDA 1 LOT 8 HOUSE TO CHAMBER	Max. Elevation	=	3.62 ft
Reservoir name	=	CHAMBERS LOT 8	Max. Storage	=	841 cuft

Storage Indication method used.

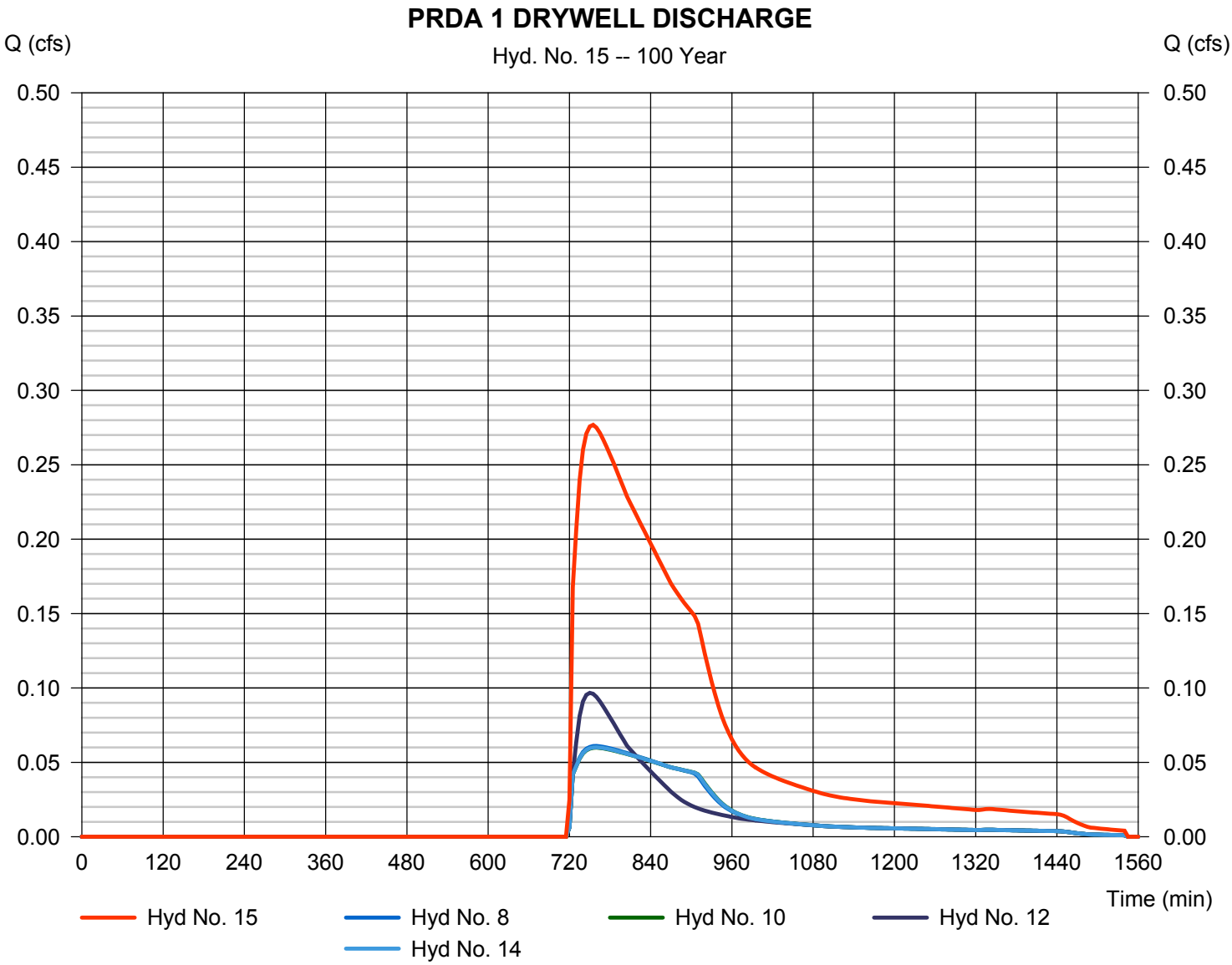


Hydrograph Report

Hyd. No. 15

PRDA 1 DRYWELL DISCHARGE

Hydrograph type	=	Combine	Peak discharge	=	0.277 cfs
Storm frequency	=	100 yrs	Time to peak	=	755 min
Time interval	=	5 min	Hyd. volume	=	3,501 cuft
Inflow hyds.	=	8, 10, 12, 14	Contrib. drain. area	=	0.000 ac

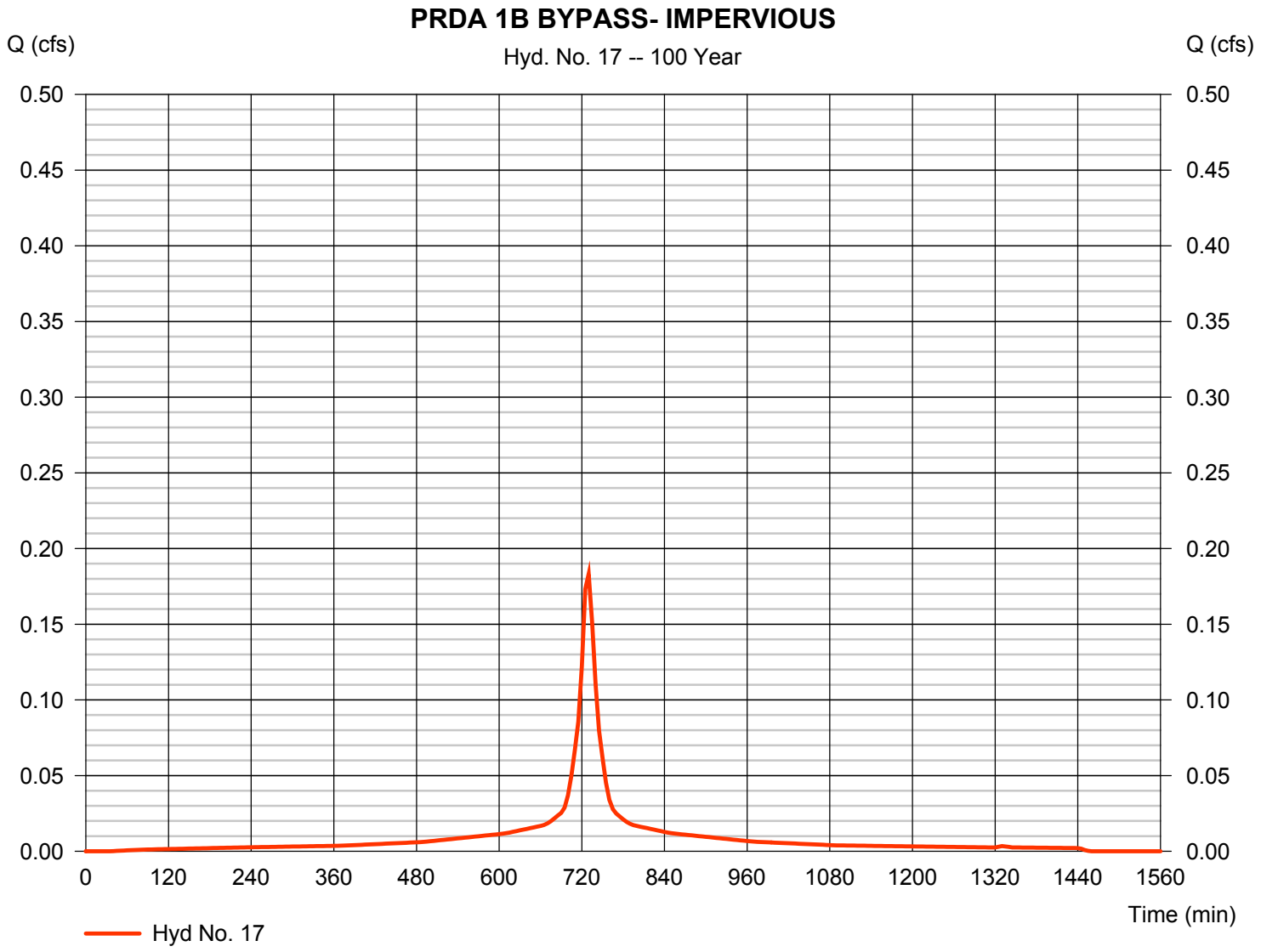


Hydrograph Report

Hyd. No. 17

PRDA 1B BYPASS- IMPERVIOUS

Hydrograph type	= SCS Runoff	Peak discharge	= 0.183 cfs
Storm frequency	= 100 yrs	Time to peak	= 730 min
Time interval	= 5 min	Hyd. volume	= 851 cuft
Drainage area	= 0.030 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.00 min
Total precip.	= 8.58 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

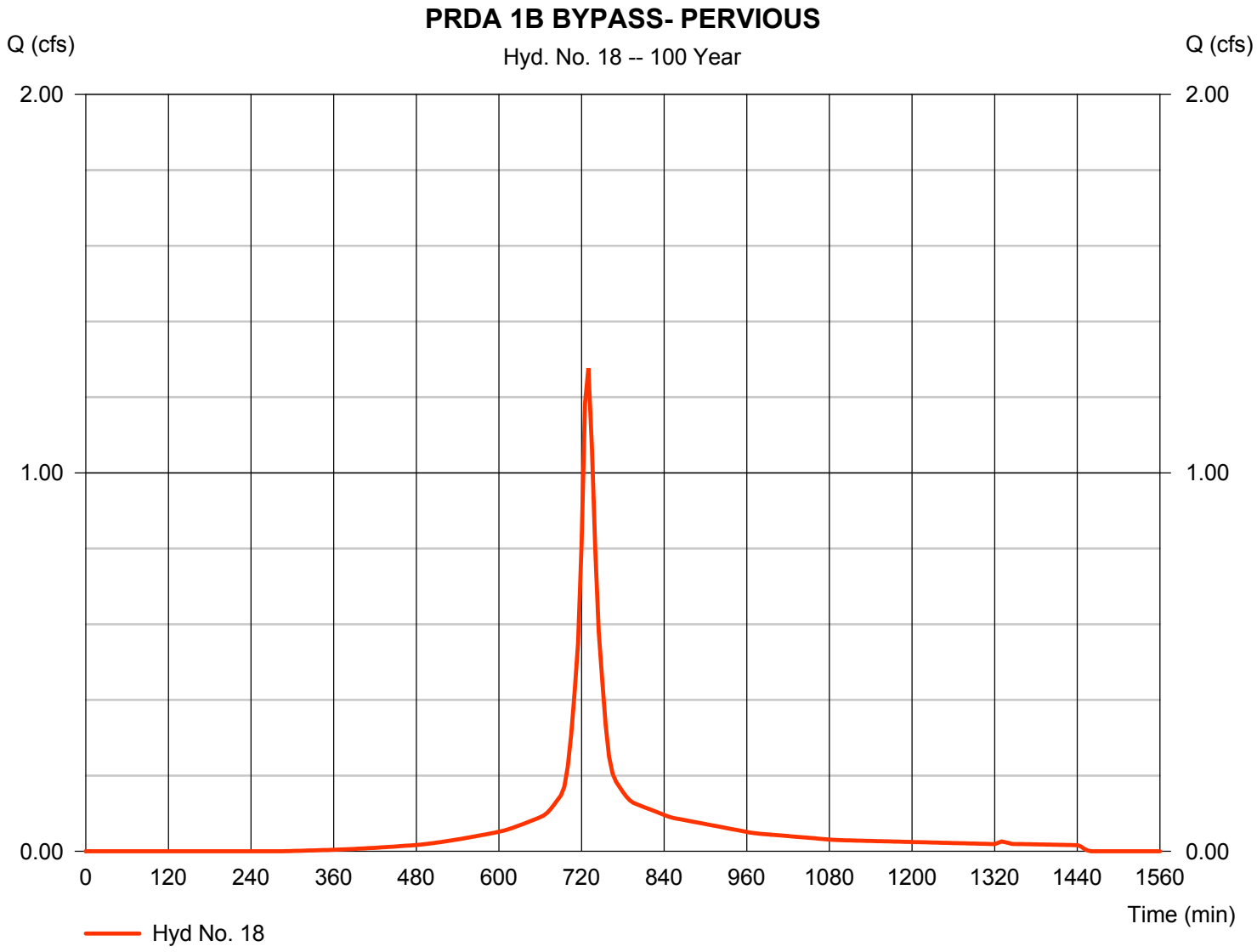


Hydrograph Report

Hyd. No. 18

PRDA 1B BYPASS- PERVIOUS

Hydrograph type	= SCS Runoff	Peak discharge	= 1.276 cfs
Storm frequency	= 100 yrs	Time to peak	= 730 min
Time interval	= 5 min	Hyd. volume	= 5,237 cuft
Drainage area	= 0.240 ac	Curve number	= 82
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.00 min
Total precip.	= 8.58 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

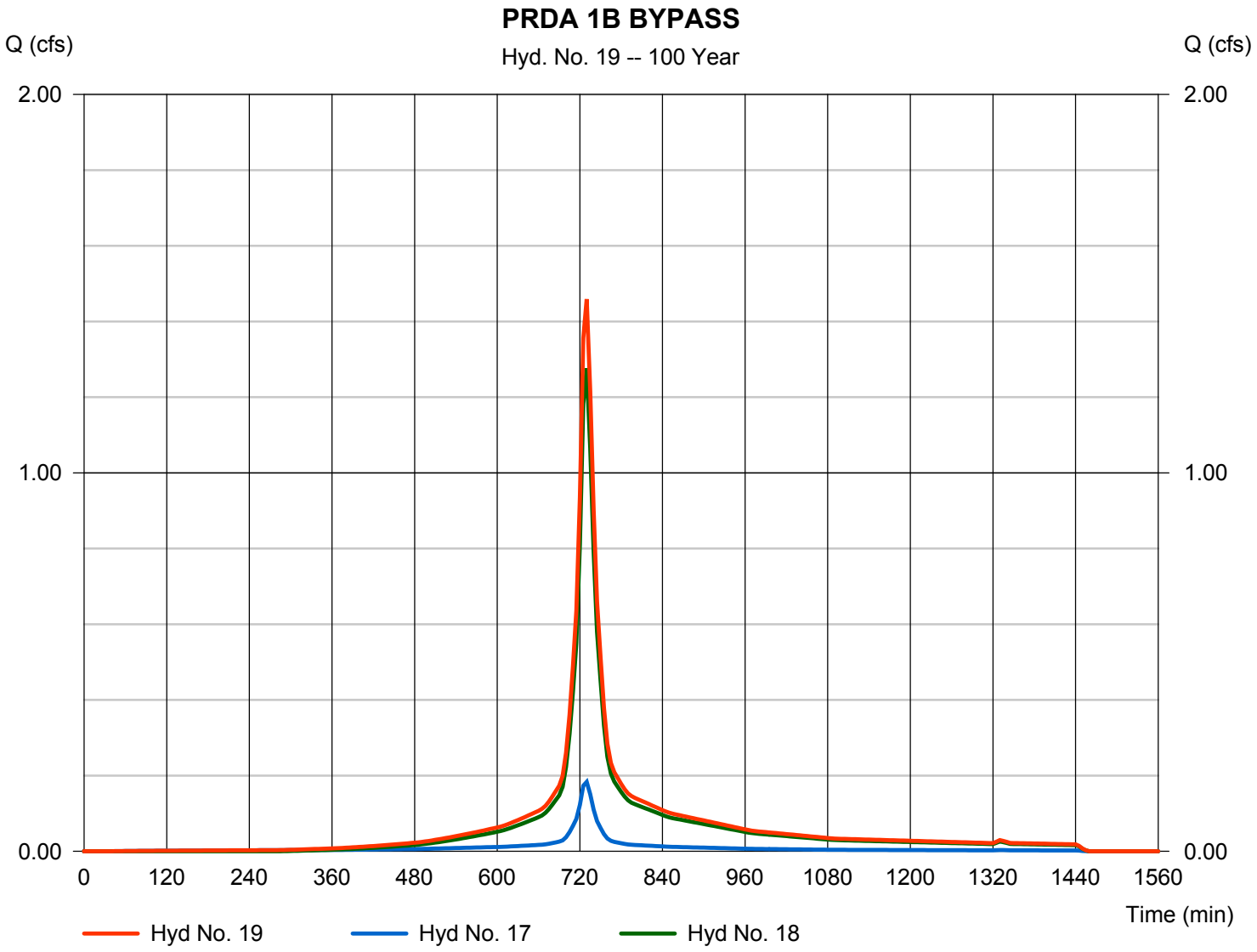


Hydrograph Report

Hyd. No. 19

PRDA 1B BYPASS

Hydrograph type	=	Combine	Peak discharge	=	1.459 cfs
Storm frequency	=	100 yrs	Time to peak	=	730 min
Time interval	=	5 min	Hyd. volume	=	6,088 cuft
Inflow hyds.	=	17, 18	Contrib. drain. area	=	0.270 ac

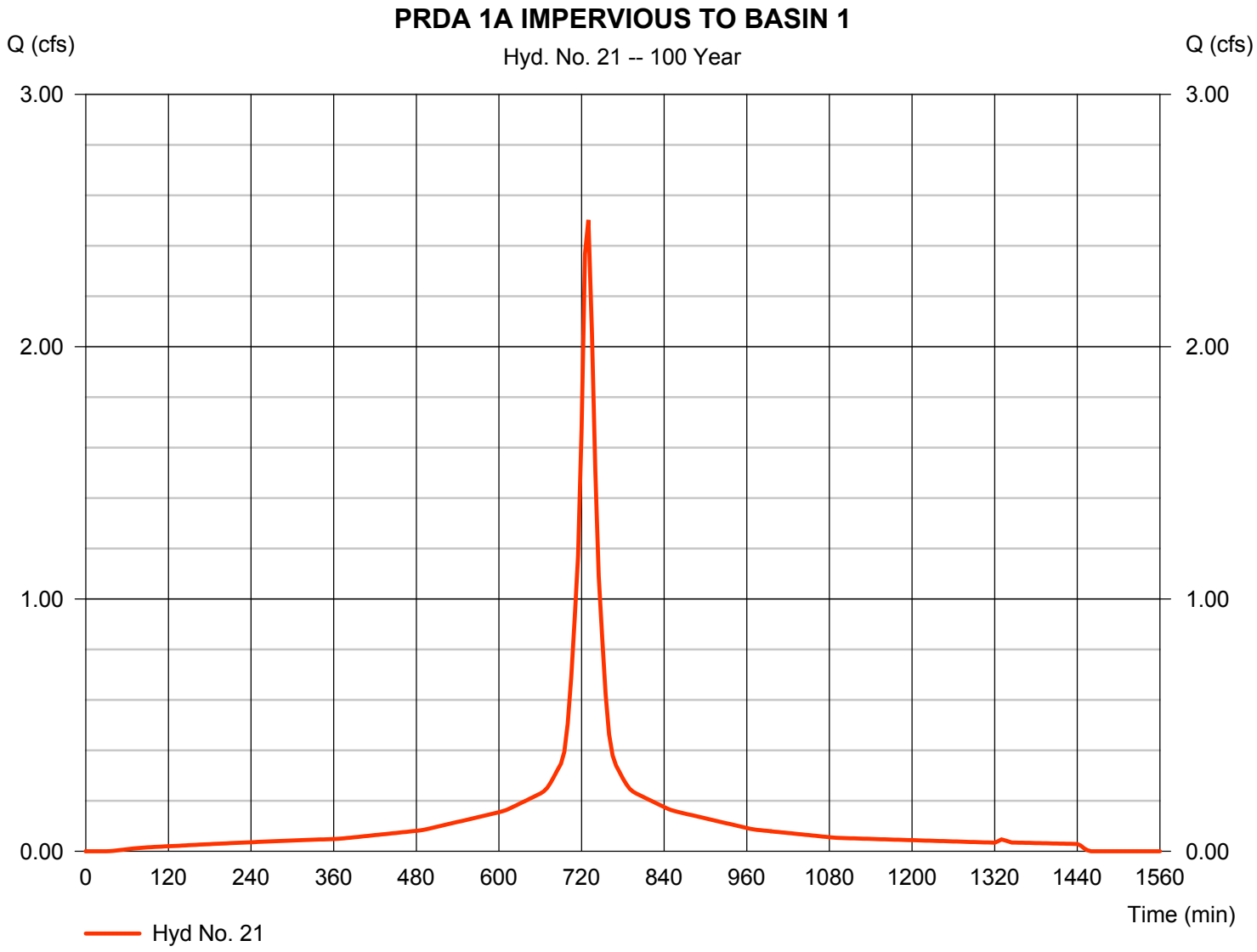


Hydrograph Report

Hyd. No. 21

PRDA 1A IMPERVIOUS TO BASIN 1

Hydrograph type	= SCS Runoff	Peak discharge	= 2.503 cfs
Storm frequency	= 100 yrs	Time to peak	= 730 min
Time interval	= 5 min	Hyd. volume	= 11,636 cuft
Drainage area	= 0.410 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.00 min
Total precip.	= 8.58 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

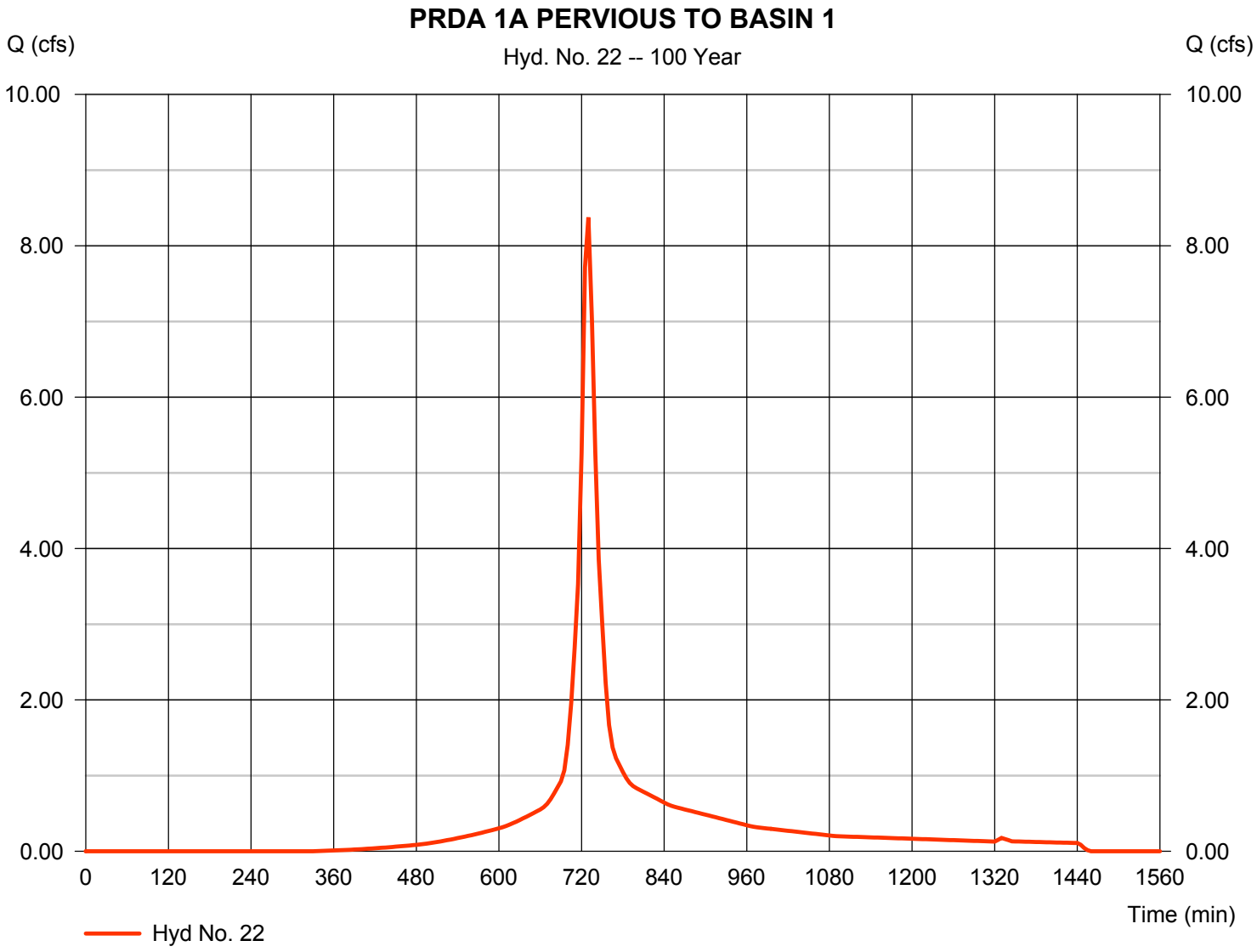


Hydrograph Report

Hyd. No. 22

PRDA 1A PERVIOUS TO BASIN 1

Hydrograph type	= SCS Runoff	Peak discharge	= 8.376 cfs
Storm frequency	= 100 yrs	Time to peak	= 730 min
Time interval	= 5 min	Hyd. volume	= 33,972 cuft
Drainage area	= 1.650 ac	Curve number	= 79
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.00 min
Total precip.	= 8.58 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

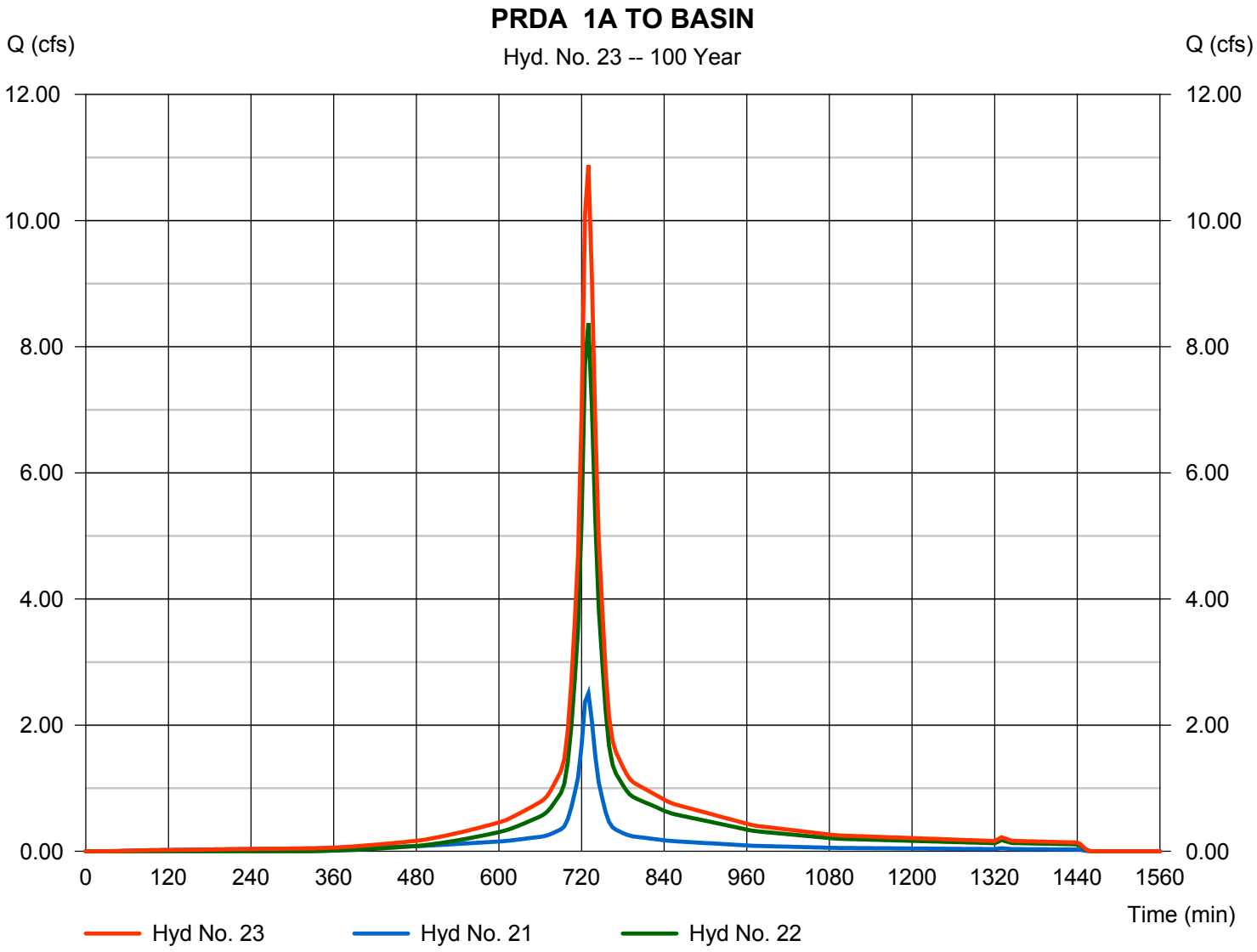


Hydrograph Report

Hyd. No. 23

PRDA 1A TO BASIN

Hydrograph type	= Combine	Peak discharge	= 10.88 cfs
Storm frequency	= 100 yrs	Time to peak	= 730 min
Time interval	= 5 min	Hyd. volume	= 45,609 cuft
Inflow hyds.	= 21, 22	Contrib. drain. area	= 2.060 ac



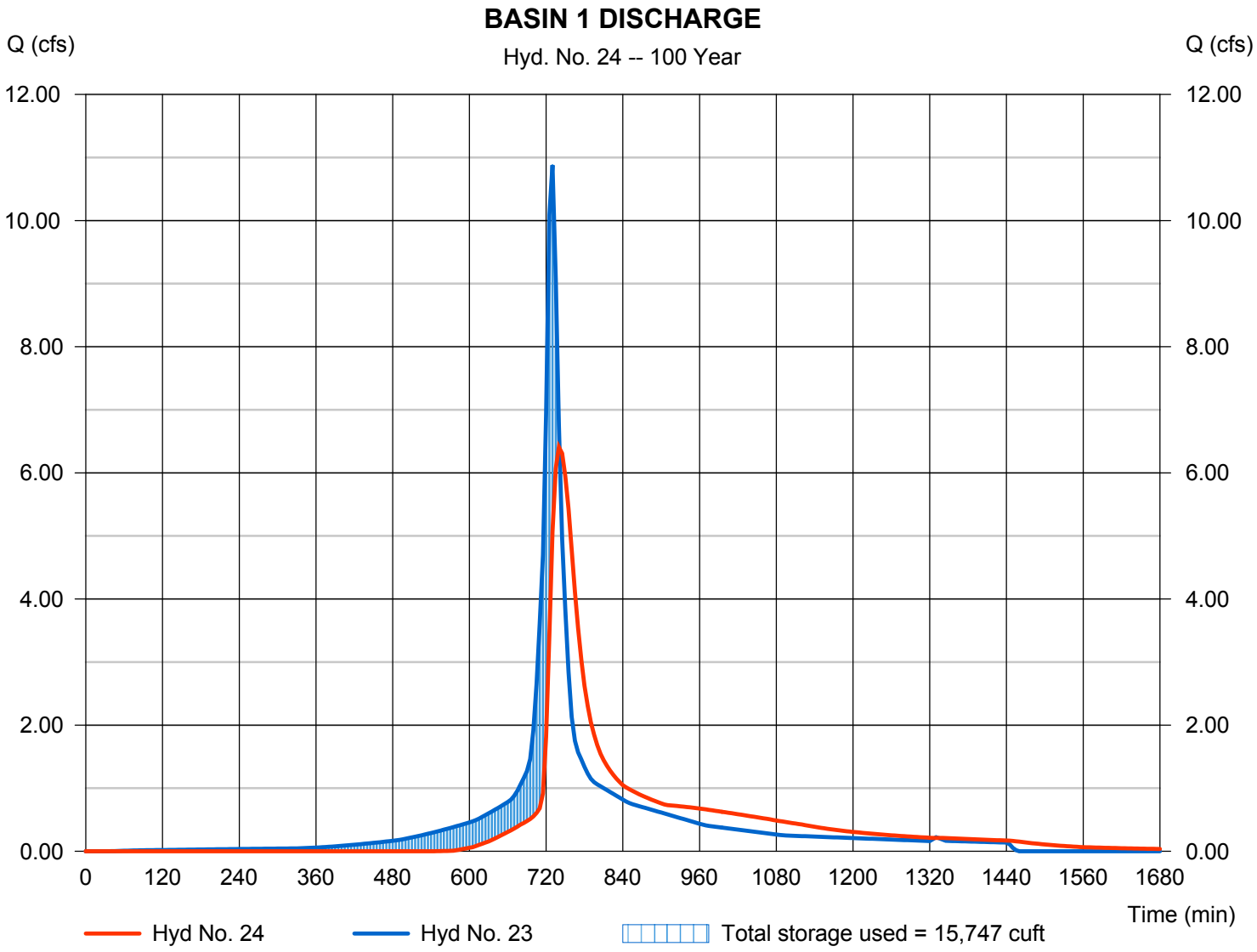
Hydrograph Report

Hyd. No. 24

BASIN 1 DISCHARGE

Hydrograph type	= Reservoir	Peak discharge	= 6.408 cfs
Storm frequency	= 100 yrs	Time to peak	= 740 min
Time interval	= 5 min	Hyd. volume	= 43,391 cuft
Inflow hyd. No.	= 23 - PRDA 1A TO BASIN	Max. Elevation	= 256.08 ft
Reservoir name	= SWM BASIN 1	Max. Storage	= 15,747 cuft

Storage Indication method used.

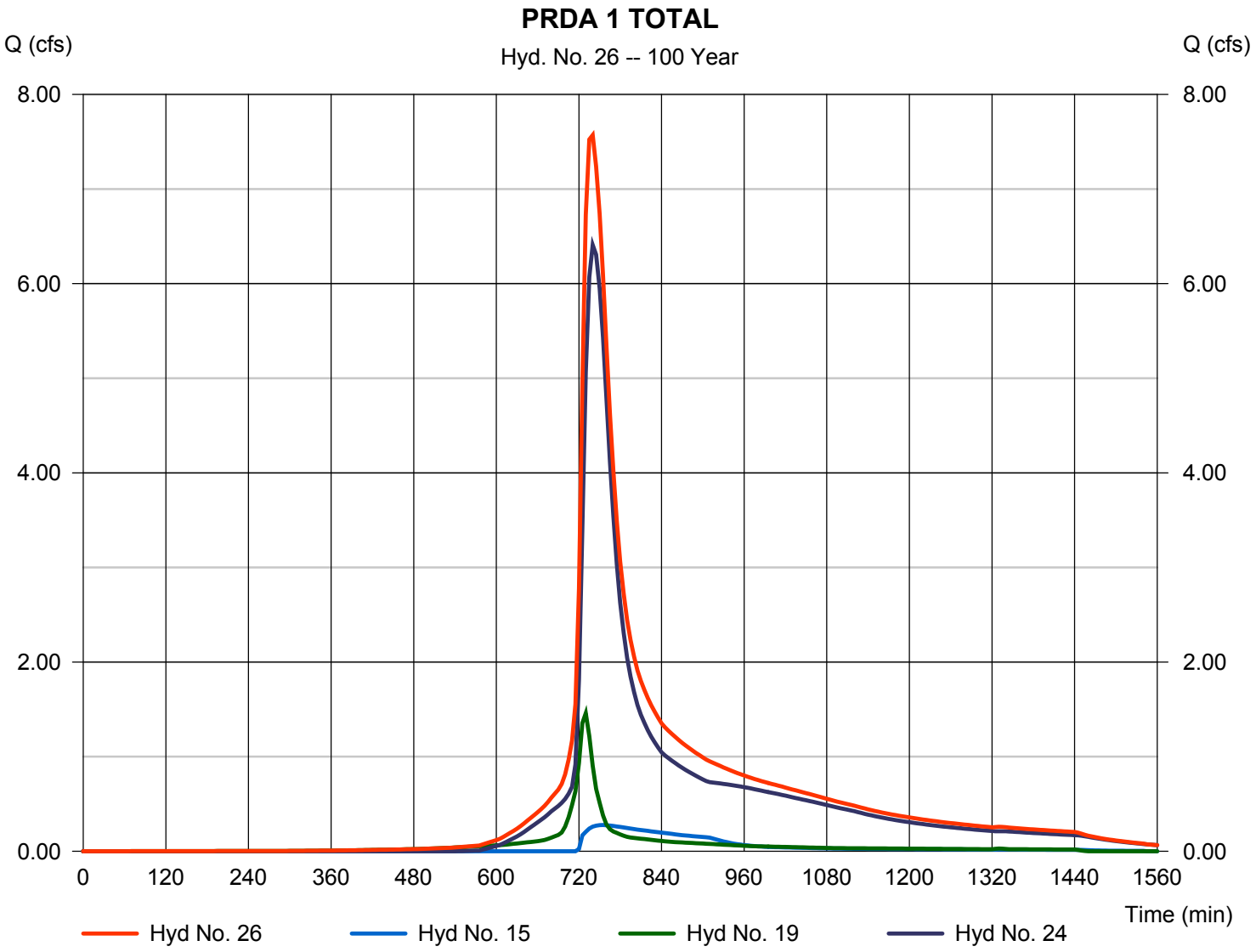


Hydrograph Report

Hyd. No. 26

PRDA 1 TOTAL

Hydrograph type	= Combine	Peak discharge	= 7.571 cfs
Storm frequency	= 100 yrs	Time to peak	= 740 min
Time interval	= 5 min	Hyd. volume	= 52,981 cuft
Inflow hyds.	= 15, 19, 24	Contrib. drain. area	= 0.000 ac

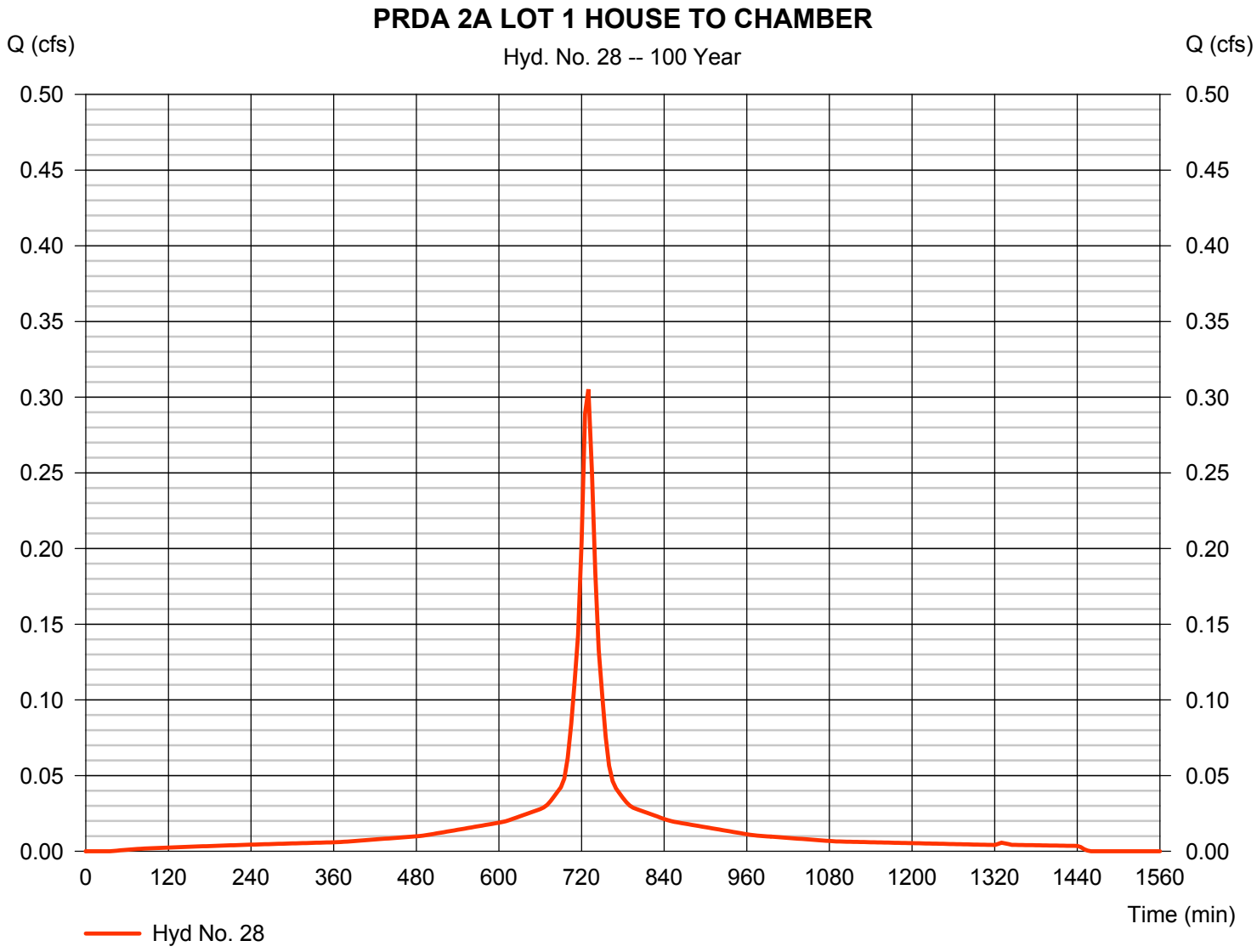


Hydrograph Report

Hyd. No. 28

PRDA 2A LOT 1 HOUSE TO CHAMBER

Hydrograph type	= SCS Runoff	Peak discharge	= 0.305 cfs
Storm frequency	= 100 yrs	Time to peak	= 730 min
Time interval	= 5 min	Hyd. volume	= 1,419 cuft
Drainage area	= 0.050 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.00 min
Total precip.	= 8.58 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



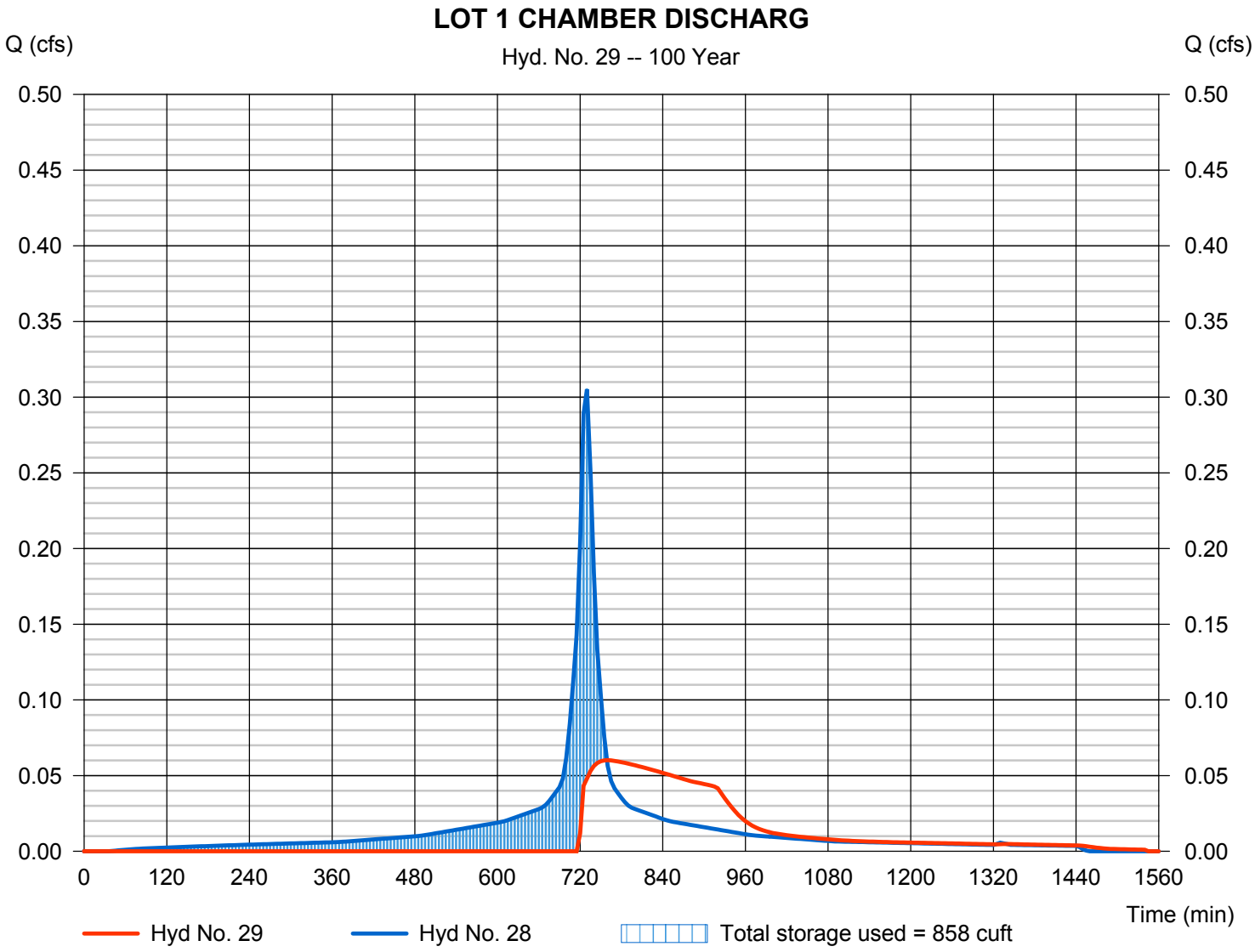
Hydrograph Report

Hyd. No. 29

LOT 1 CHAMBER DISCHARG

Hydrograph type	=	Reservoir	Peak discharge	=	0.060 cfs
Storm frequency	=	100 yrs	Time to peak	=	760 min
Time interval	=	5 min	Hyd. volume	=	904 cuft
Inflow hyd. No.	=	28 - PRDA 2A LOT 1 HOUSE TO CHAMBER	Max. Elevation	=	3.70 ft
Reservoir name	=	CHAMBERS LOT 1	Max. Storage	=	858 cuft

Storage Indication method used.

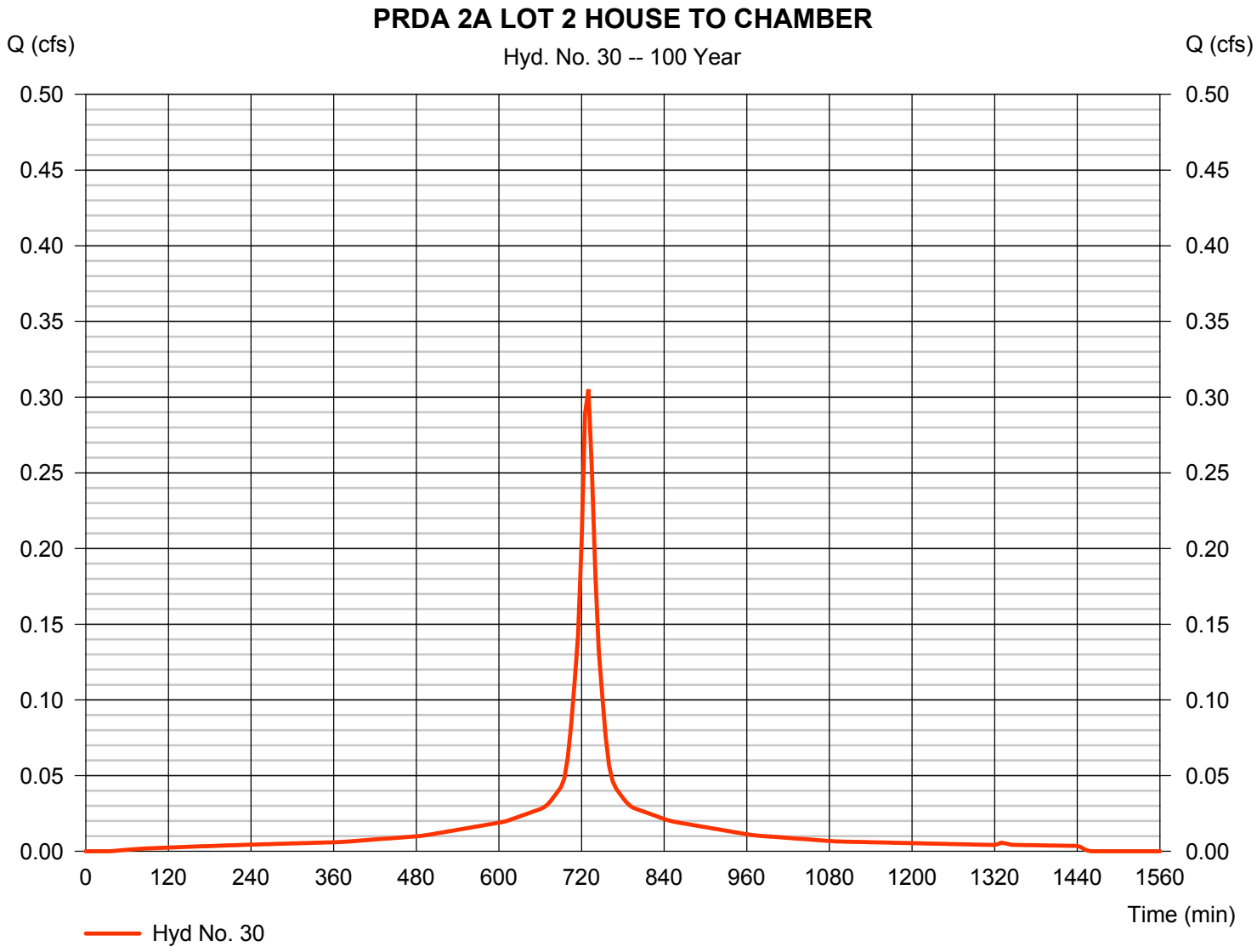


Hydrograph Report

Hyd. No. 30

PRDA 2A LOT 2 HOUSE TO CHAMBER

Hydrograph type	= SCS Runoff	Peak discharge	= 0.305 cfs
Storm frequency	= 100 yrs	Time to peak	= 730 min
Time interval	= 5 min	Hyd. volume	= 1,419 cuft
Drainage area	= 0.050 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.00 min
Total precip.	= 8.58 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



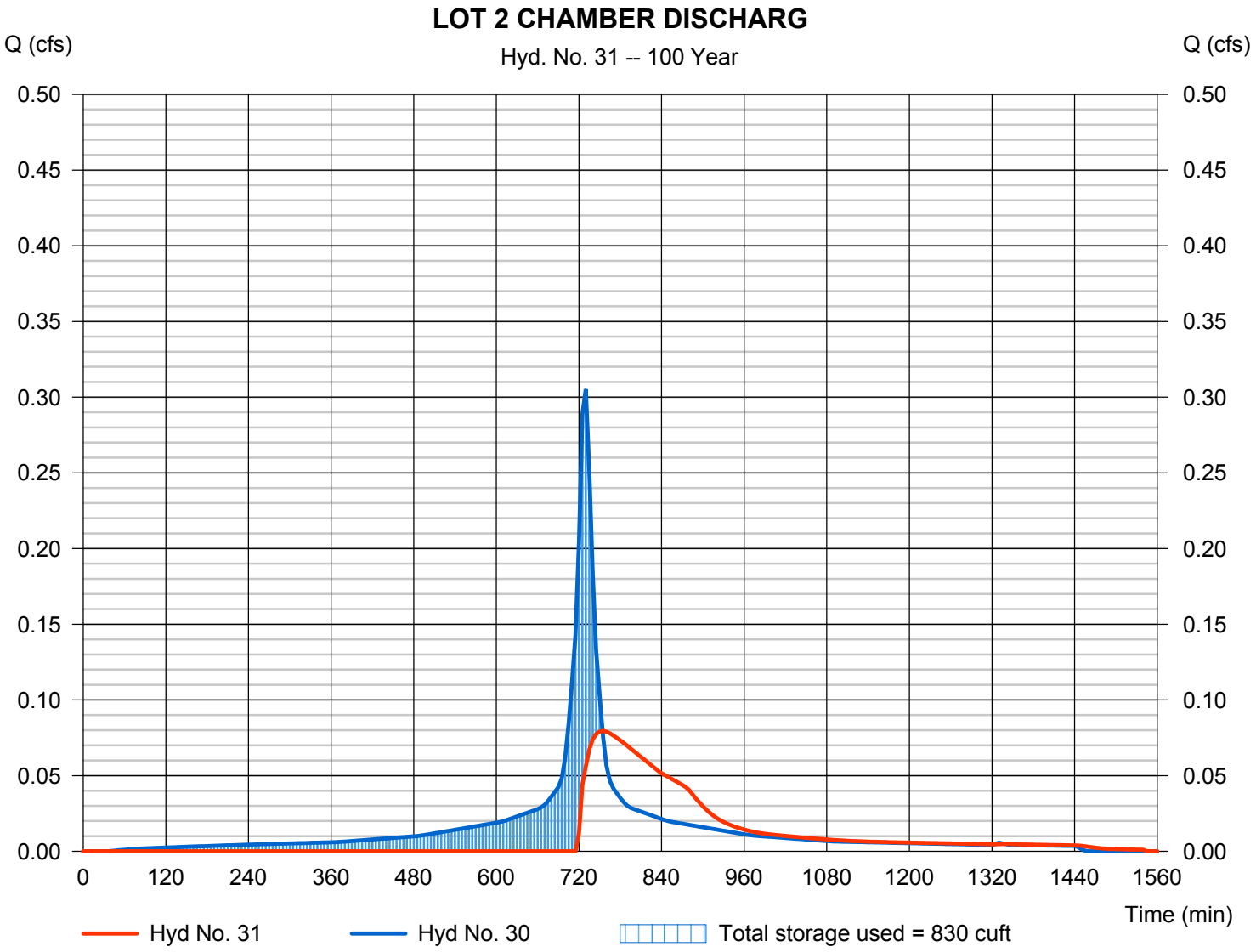
Hydrograph Report

Hyd. No. 31

LOT 2 CHAMBER DISCHARG

Hydrograph type	=	Reservoir	Peak discharge	=	0.080 cfs
Storm frequency	=	100 yrs	Time to peak	=	755 min
Time interval	=	5 min	Hyd. volume	=	904 cuft
Inflow hyd. No.	=	30 - PRDA 2A LOT 2 HOUSE TO CHAMBER	Max. Elevation	=	3.57 ft
Reservoir name	=	CHAMBERS LOT 2	Max. Storage	=	830 cuft

Storage Indication method used.

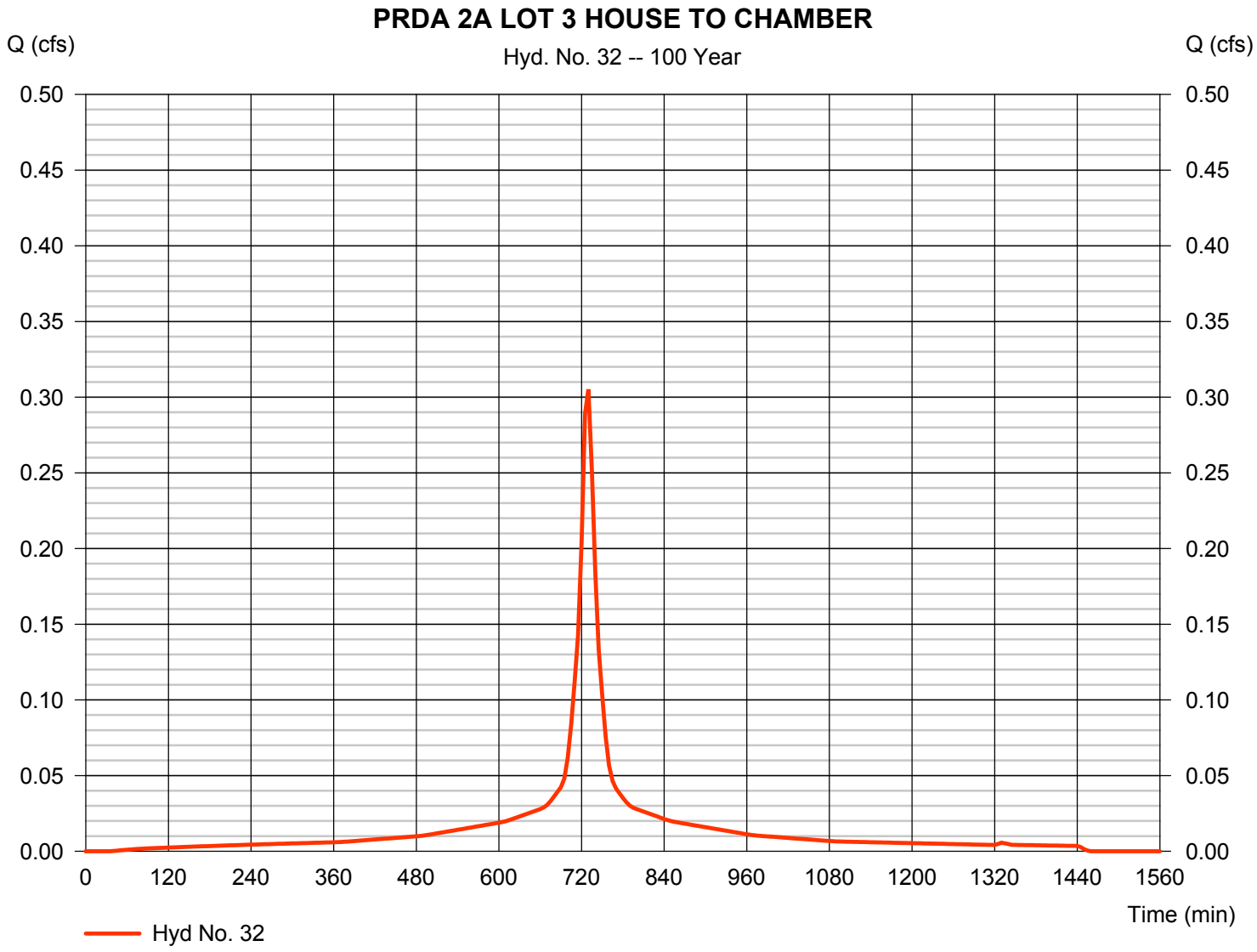


Hydrograph Report

Hyd. No. 32

PRDA 2A LOT 3 HOUSE TO CHAMBER

Hydrograph type	= SCS Runoff	Peak discharge	= 0.305 cfs
Storm frequency	= 100 yrs	Time to peak	= 730 min
Time interval	= 5 min	Hyd. volume	= 1,419 cuft
Drainage area	= 0.050 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.00 min
Total precip.	= 8.58 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



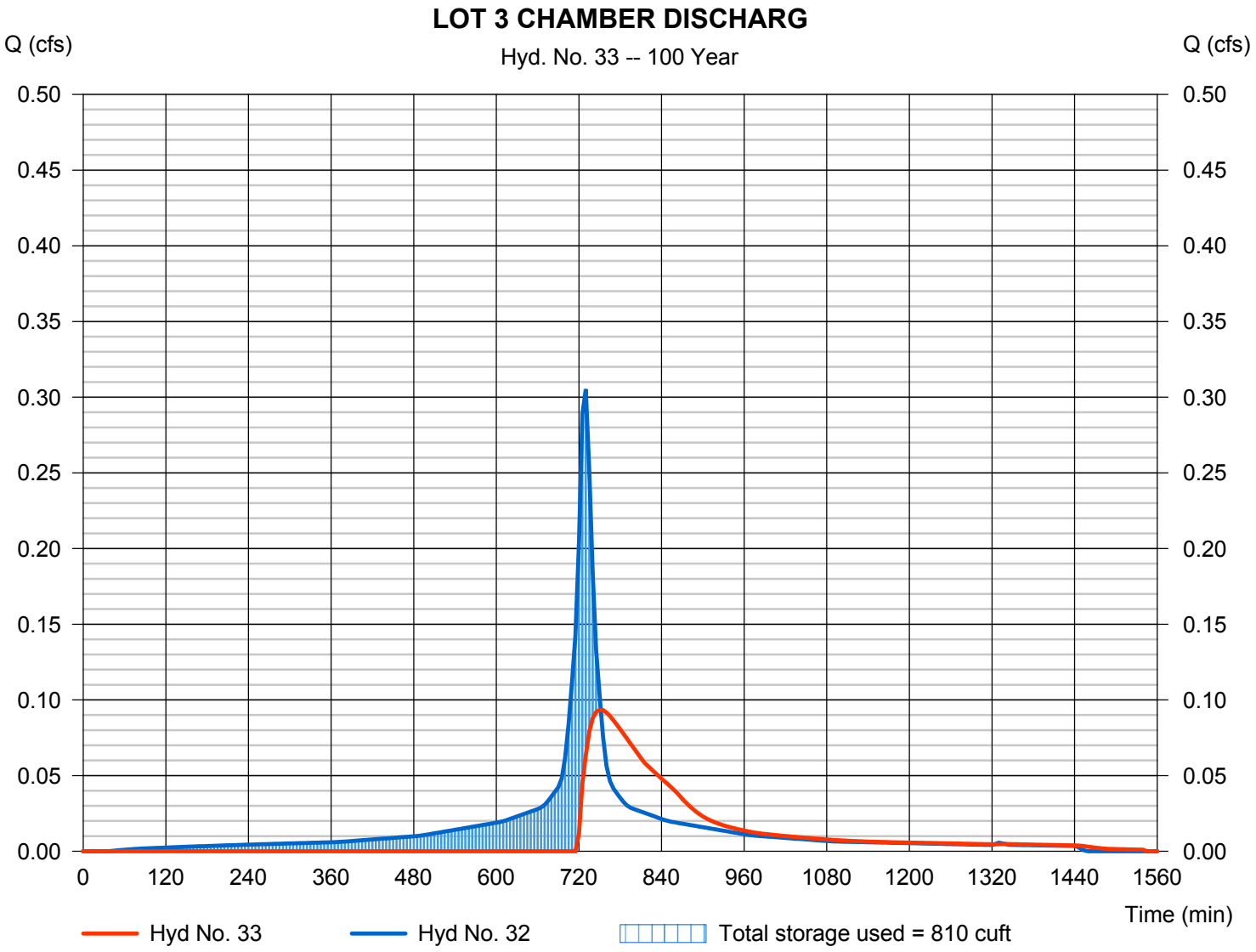
Hydrograph Report

Hyd. No. 33

LOT 3 CHAMBER DISCHARG

Hydrograph type	=	Reservoir	Peak discharge	=	0.093 cfs
Storm frequency	=	100 yrs	Time to peak	=	750 min
Time interval	=	5 min	Hyd. volume	=	904 cuft
Inflow hyd. No.	=	32 - PRDA 2A LOT 3 HOUSE TO CHAMBER	Max. Elevation	=	3.48 ft
Reservoir name	=	CHAMBERS LOT 3	Max. Storage	=	810 cuft

Storage Indication method used.

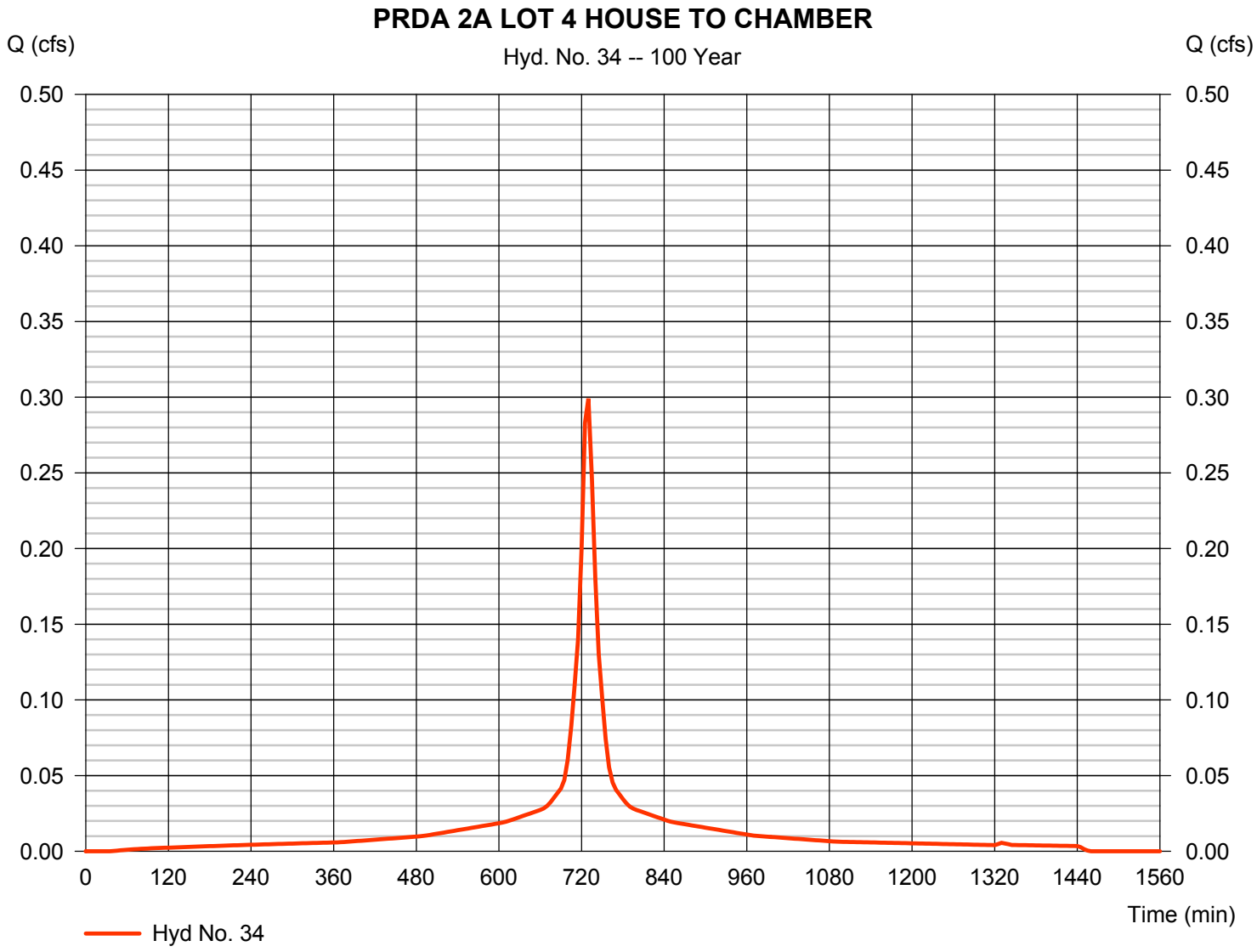


Hydrograph Report

Hyd. No. 34

PRDA 2A LOT 4 HOUSE TO CHAMBER

Hydrograph type	= SCS Runoff	Peak discharge	= 0.299 cfs
Storm frequency	= 100 yrs	Time to peak	= 730 min
Time interval	= 5 min	Hyd. volume	= 1,391 cuft
Drainage area	= 0.049 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.00 min
Total precip.	= 8.58 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



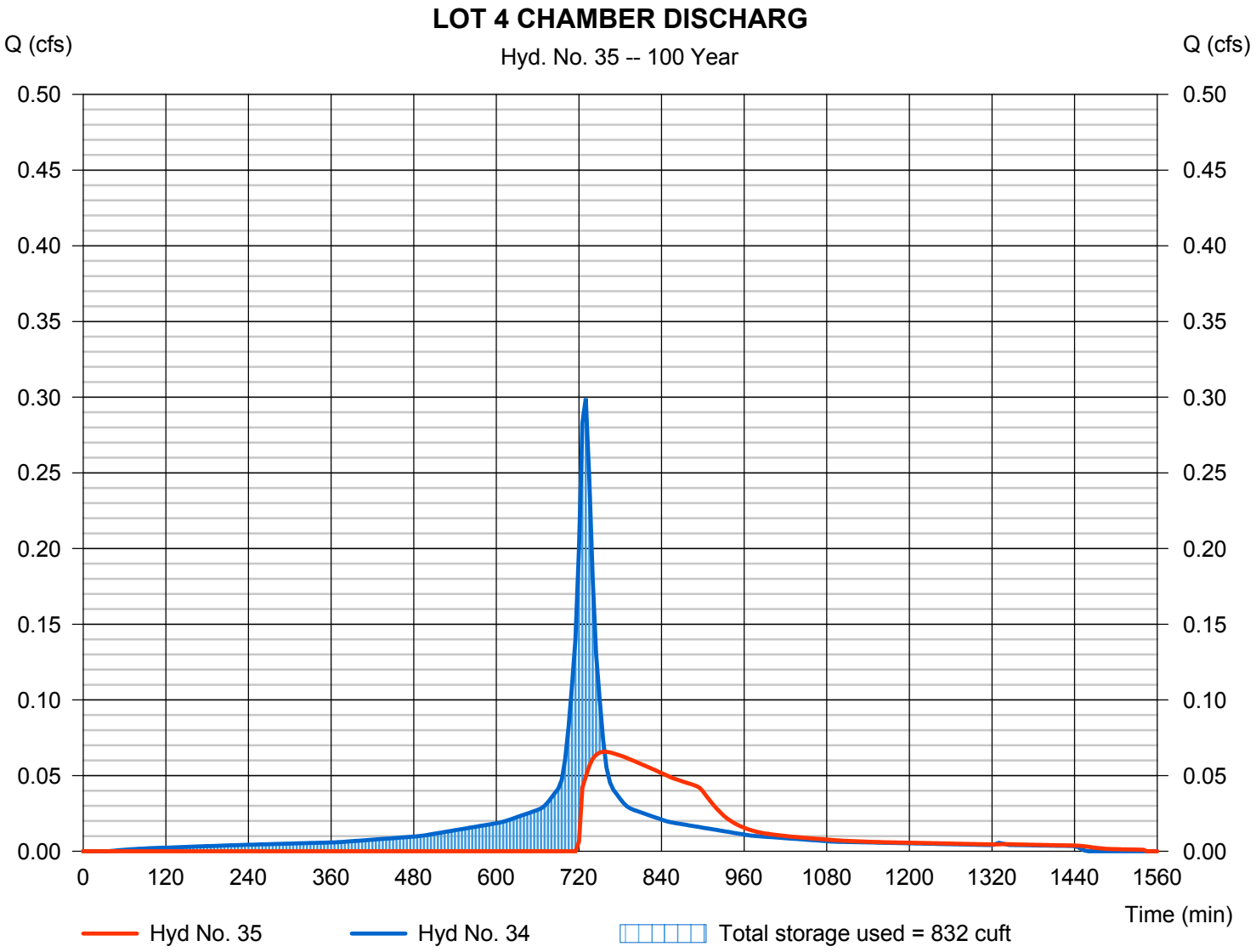
Hydrograph Report

Hyd. No. 35

LOT 4 CHAMBER DISCHARG

Hydrograph type	=	Reservoir	Peak discharge	=	0.066 cfs
Storm frequency	=	100 yrs	Time to peak	=	755 min
Time interval	=	5 min	Hyd. volume	=	875 cuft
Inflow hyd. No.	=	34 - PRDA 2A LOT 4 HOUSE TO CHAMBER	Max. Elevation	=	3.58 ft
Reservoir name	=	CHAMBERS LOT 4	Max. Storage	=	832 cuft

Storage Indication method used.

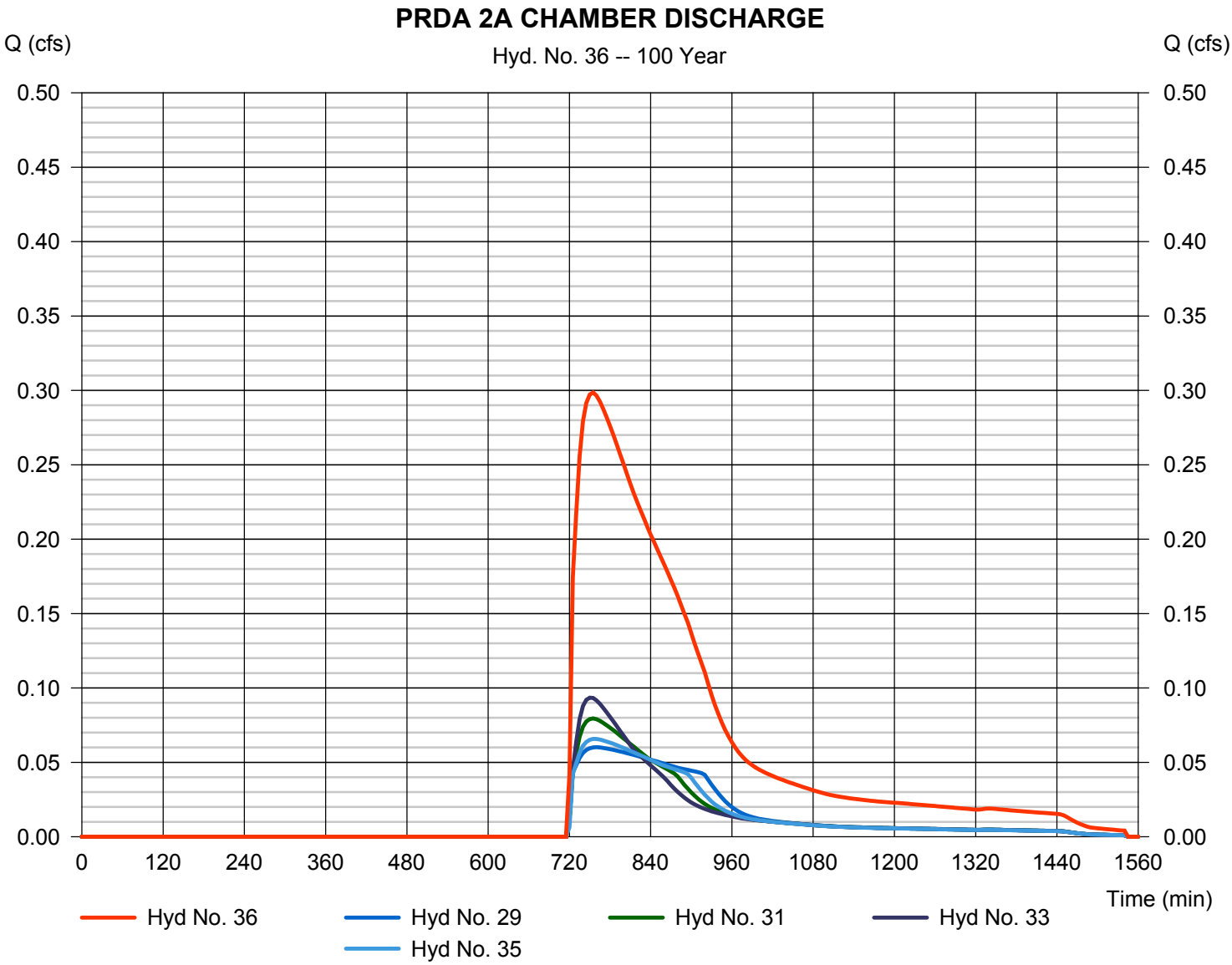


Hydrograph Report

Hyd. No. 36

PRDA 2A CHAMBER DISCHARGE

Hydrograph type	= Combine	Peak discharge	= 0.299 cfs
Storm frequency	= 100 yrs	Time to peak	= 755 min
Time interval	= 5 min	Hyd. volume	= 3,586 cuft
Inflow hyds.	= 29, 31, 33, 35	Contrib. drain. area	= 0.000 ac

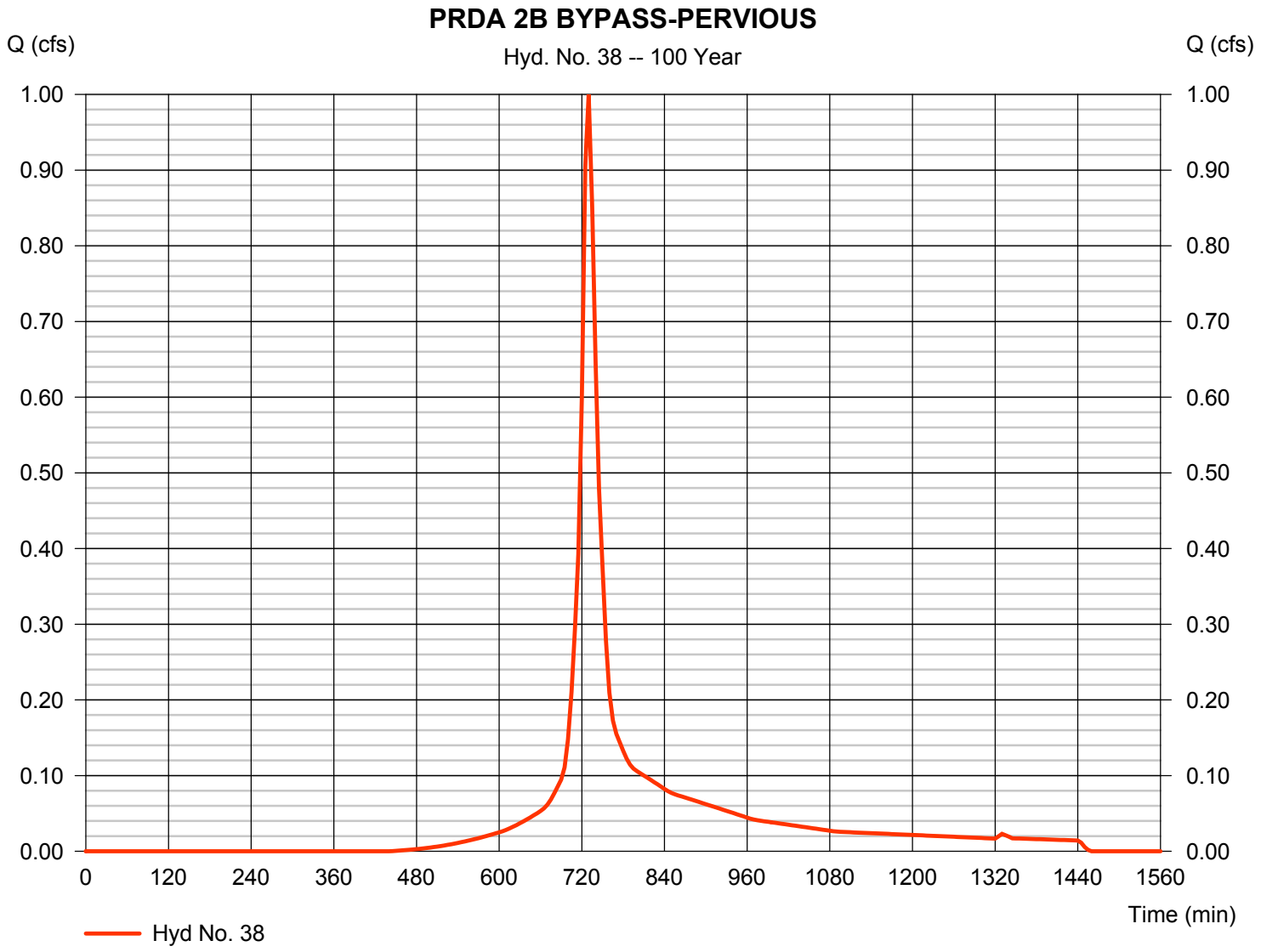


Hydrograph Report

Hyd. No. 38

PRDA 2B BYPASS-PERVIOUS

Hydrograph type	= SCS Runoff	Peak discharge	= 1.000 cfs
Storm frequency	= 100 yrs	Time to peak	= 730 min
Time interval	= 5 min	Hyd. volume	= 3,981 cuft
Drainage area	= 0.230 ac	Curve number	= 71
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.00 min
Total precip.	= 8.58 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

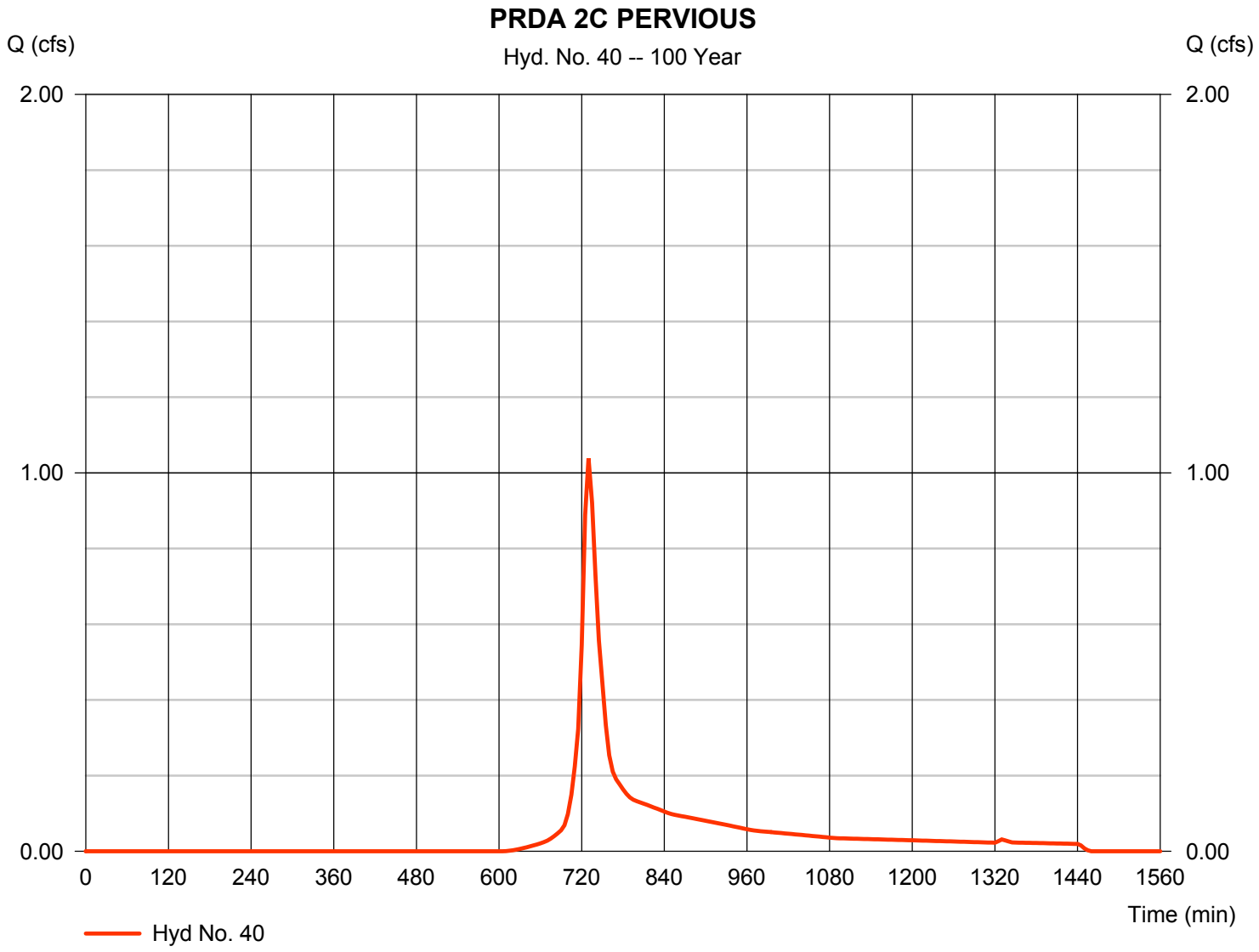


Hydrograph Report

Hyd. No. 40

PRDA 2C PERVIOUS

Hydrograph type	= SCS Runoff	Peak discharge	= 1.038 cfs
Storm frequency	= 100 yrs	Time to peak	= 730 min
Time interval	= 5 min	Hyd. volume	= 4,231 cuft
Drainage area	= 0.390 ac	Curve number	= 55
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.00 min
Total precip.	= 8.58 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

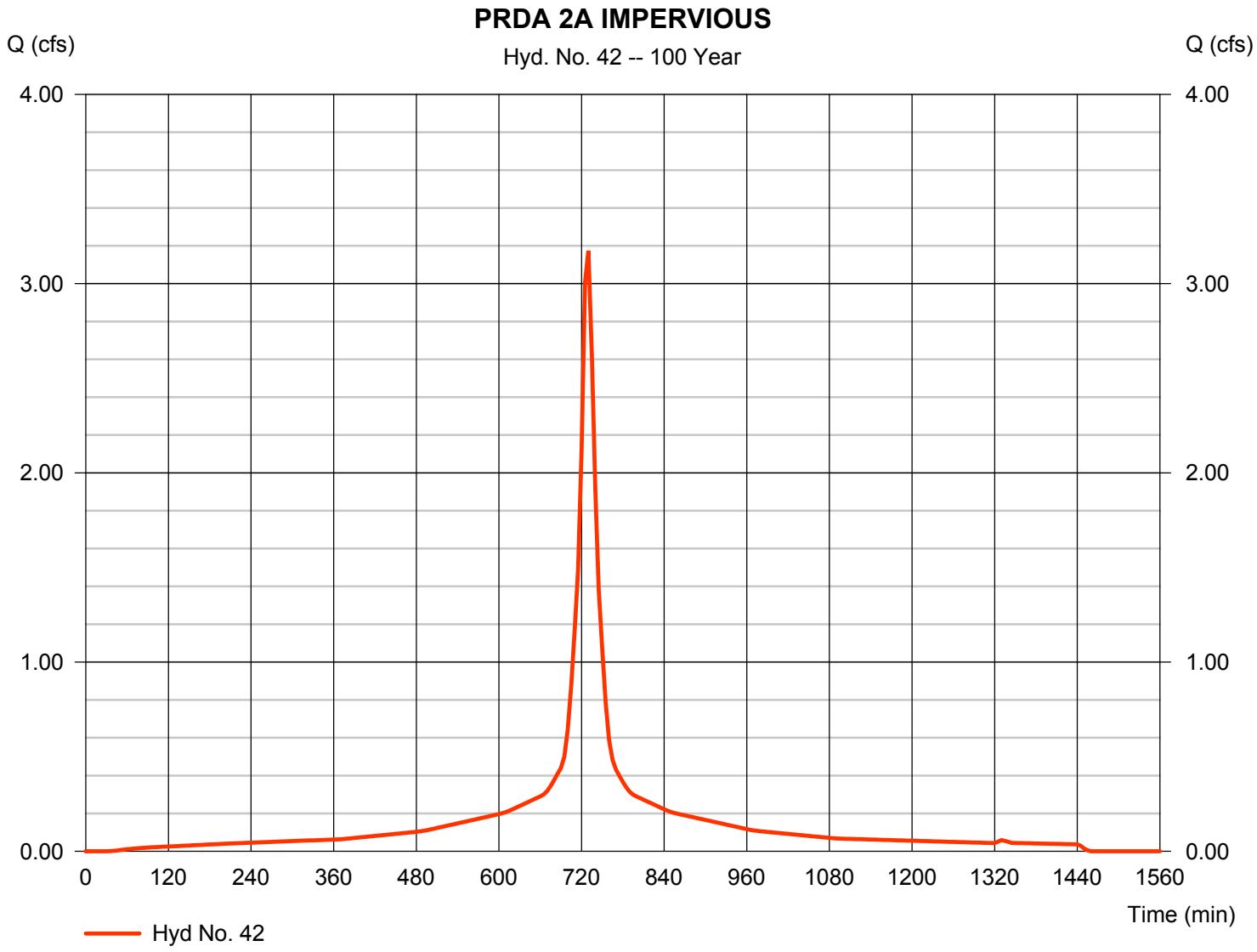


Hydrograph Report

Hyd. No. 42

PRDA 2A IMPERVIOUS

Hydrograph type	= SCS Runoff	Peak discharge	= 3.174 cfs
Storm frequency	= 100 yrs	Time to peak	= 730 min
Time interval	= 5 min	Hyd. volume	= 14,758 cuft
Drainage area	= 0.520 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.00 min
Total precip.	= 8.58 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

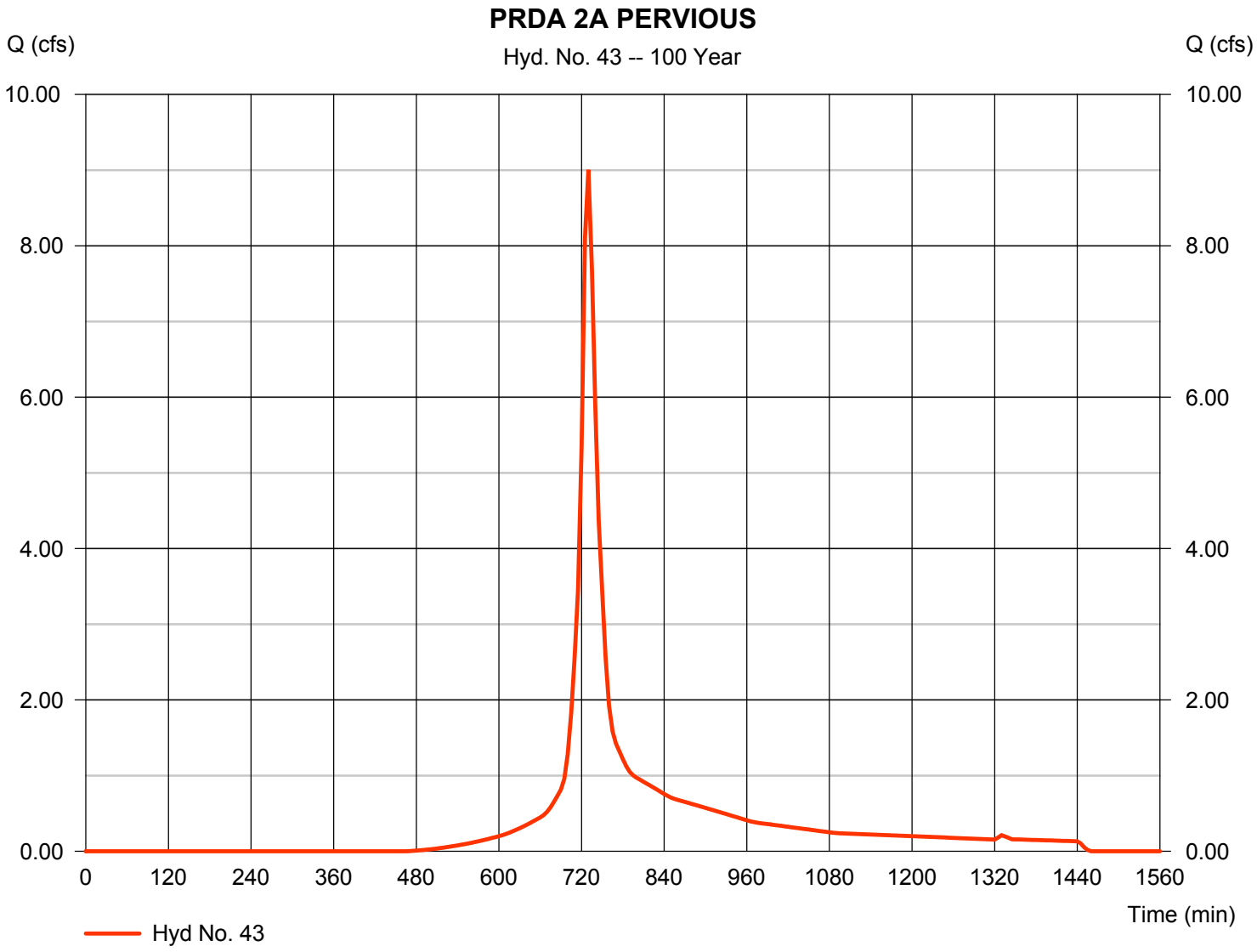


Hydrograph Report

Hyd. No. 43

PRDA 2A PERVIOUS

Hydrograph type	= SCS Runoff	Peak discharge	= 9.005 cfs
Storm frequency	= 100 yrs	Time to peak	= 730 min
Time interval	= 5 min	Hyd. volume	= 35,792 cuft
Drainage area	= 2.170 ac	Curve number	= 69
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.00 min
Total precip.	= 8.58 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

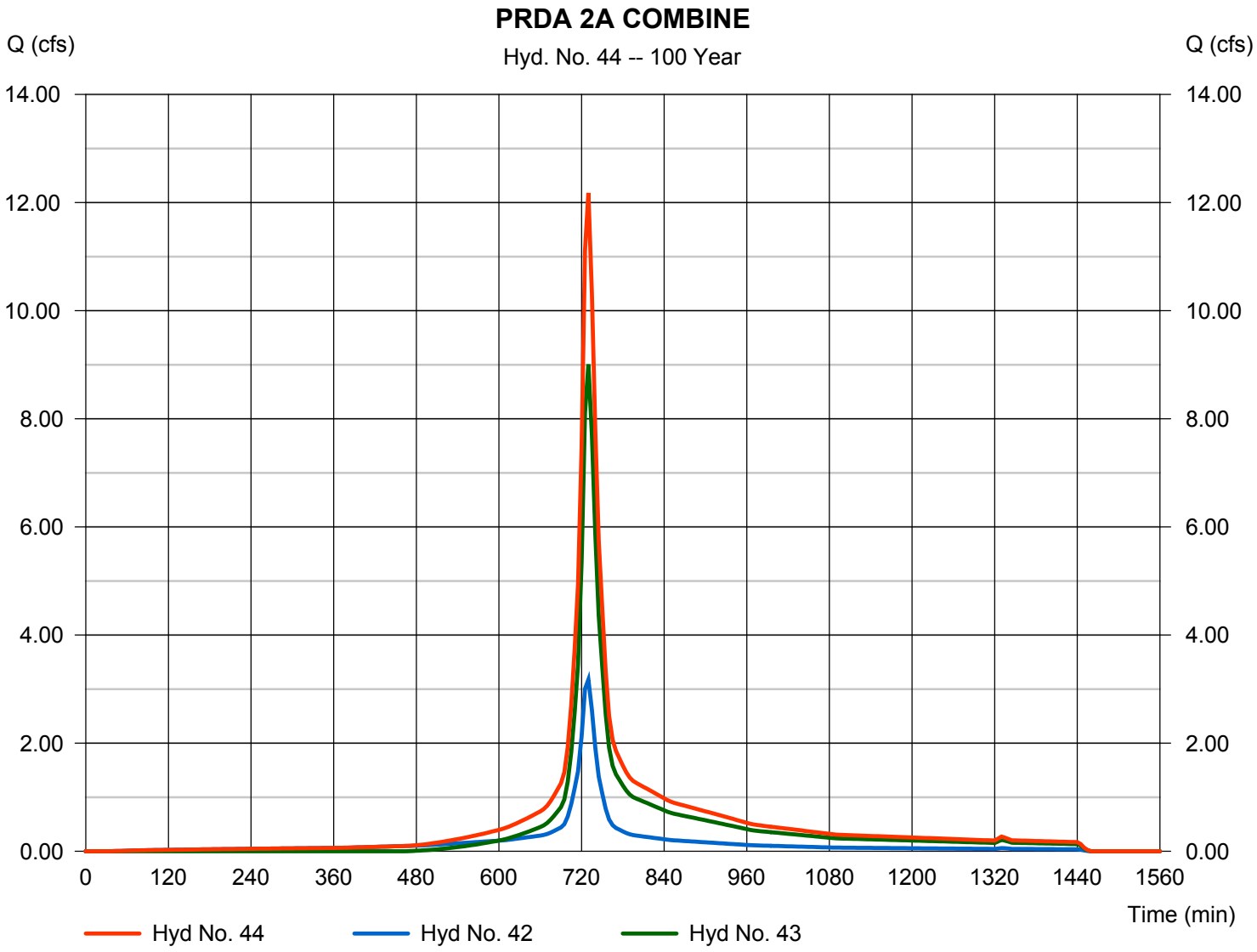


Hydrograph Report

Hyd. No. 44

PRDA 2A COMBINE

Hydrograph type	=	Combine	Peak discharge	=	12.18 cfs
Storm frequency	=	100 yrs	Time to peak	=	730 min
Time interval	=	5 min	Hyd. volume	=	50,550 cuft
Inflow hyds.	=	42, 43	Contrib. drain. area	=	2.690 ac

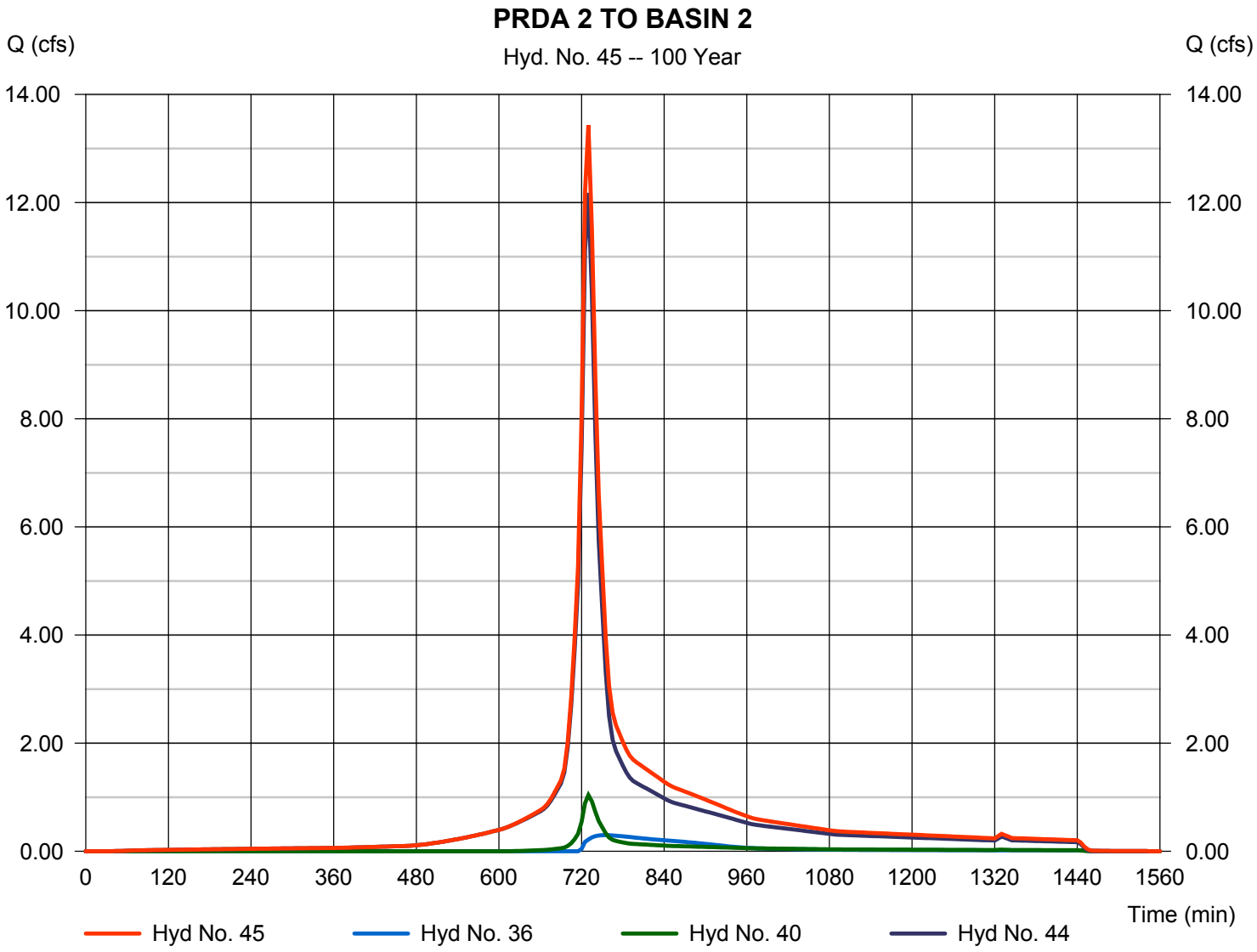


Hydrograph Report

Hyd. No. 45

PRDA 2 TO BASIN 2

Hydrograph type	= Combine	Peak discharge	= 13.43 cfs
Storm frequency	= 100 yrs	Time to peak	= 730 min
Time interval	= 5 min	Hyd. volume	= 58,367 cuft
Inflow hyds.	= 36, 40, 44	Contrib. drain. area	= 0.390 ac



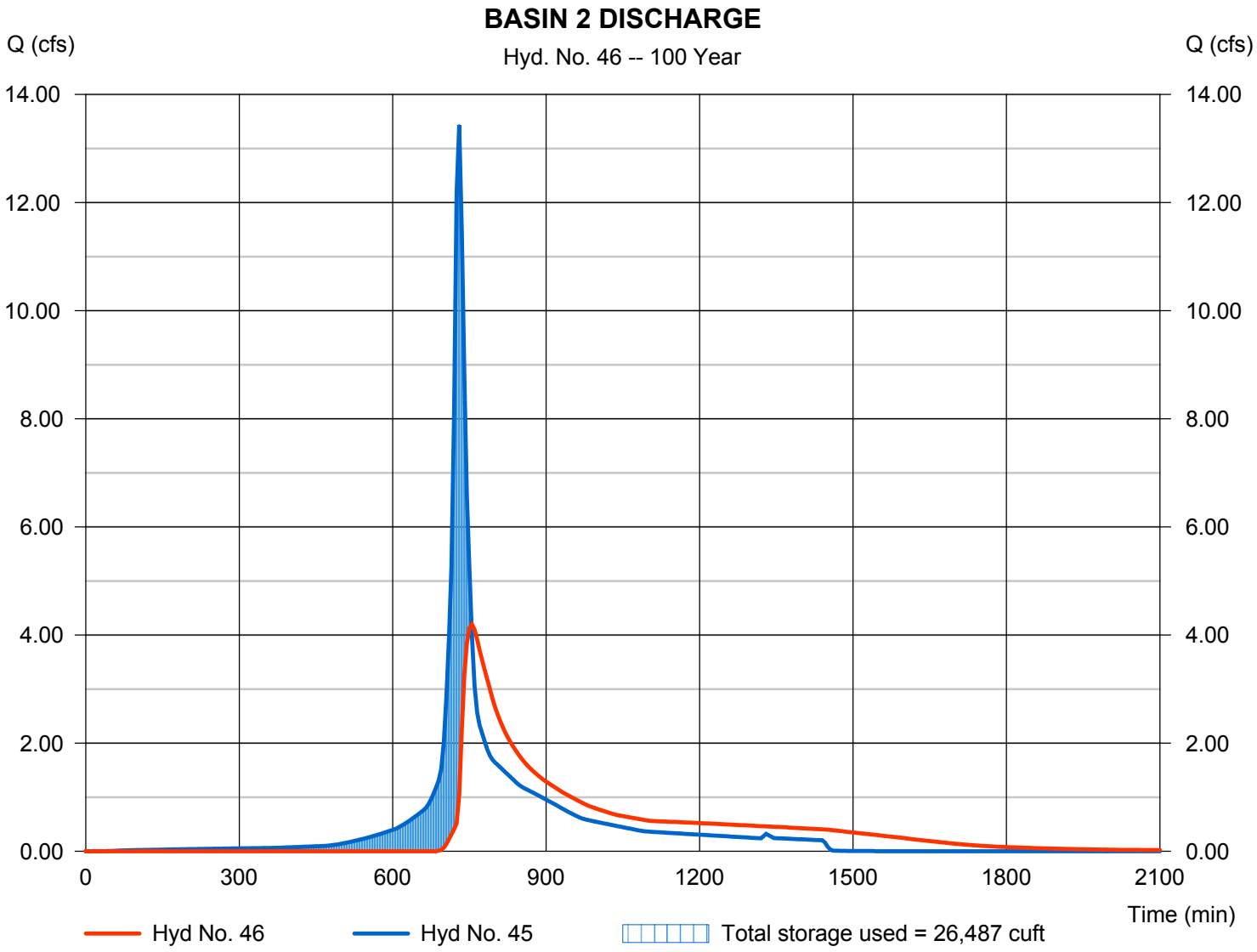
Hydrograph Report

Hyd. No. 46

BASIN 2 DISCHARGE

Hydrograph type	= Reservoir	Peak discharge	= 4.196 cfs
Storm frequency	= 100 yrs	Time to peak	= 755 min
Time interval	= 5 min	Hyd. volume	= 51,936 cuft
Inflow hyd. No.	= 45 - PRDA 2 TO BASIN 2	Max. Elevation	= 227.79 ft
Reservoir name	= SWM BASIN 2	Max. Storage	= 26,487 cuft

Storage Indication method used.

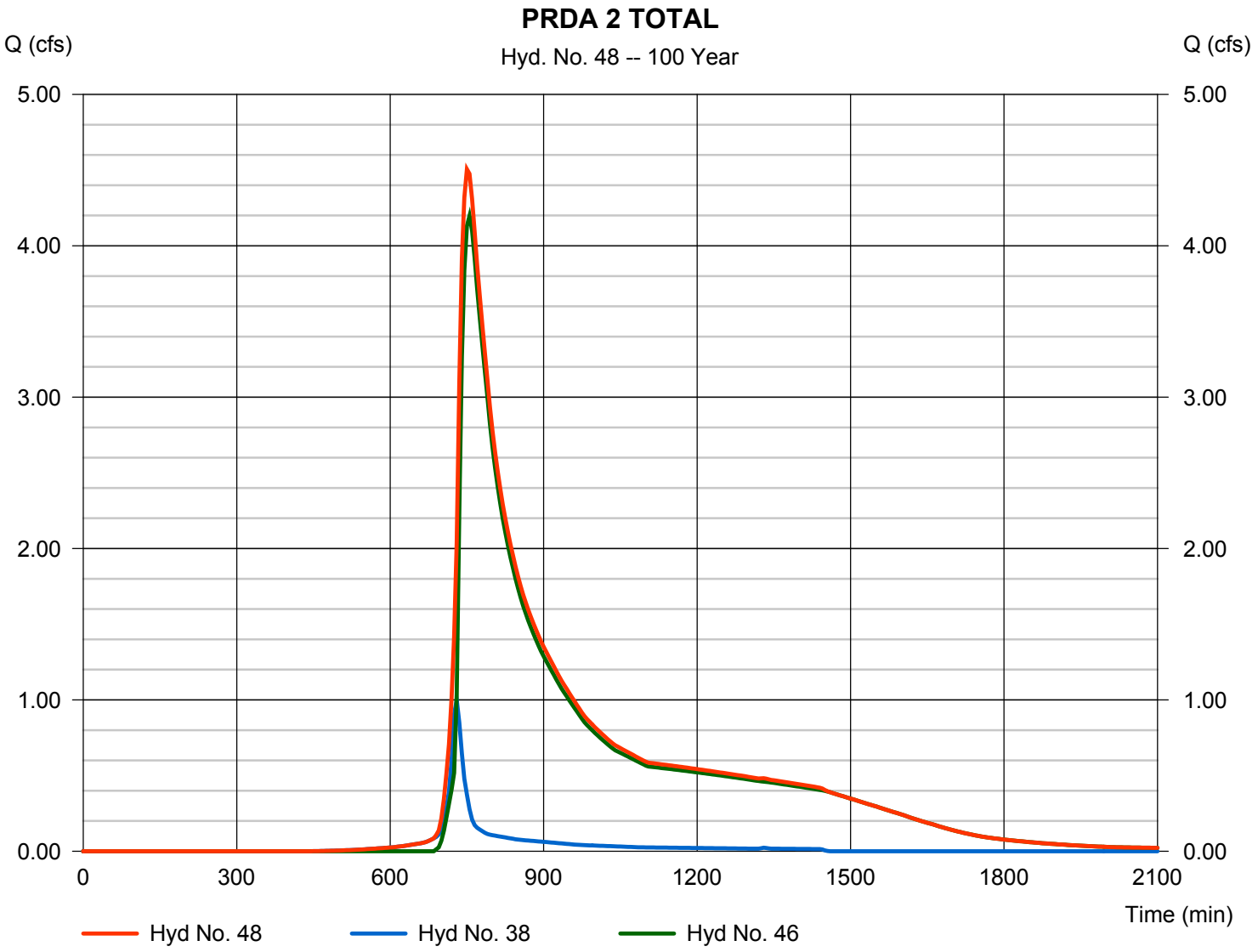


Hydrograph Report

Hyd. No. 48

PRDA 2 TOTAL

Hydrograph type	= Combine	Peak discharge	= 4.506 cfs
Storm frequency	= 100 yrs	Time to peak	= 750 min
Time interval	= 5 min	Hyd. volume	= 55,917 cuft
Inflow hyds.	= 38, 46	Contrib. drain. area	= 0.230 ac



APPENDIX G – STORM SEWER AND DRYWELL SIZING CALCULATIONS

Parisi-Gillette

Project No. 0115210

25-Year Storm Pipe Computation

Run			Drainage Area			Runoff				Pipe Data					Profile Data
Loc.	From	To	A (ac)	C	CA	TC (min)	I (in)	Q (cfs)	Cum. Q (cfs)	Pipe Size (in)	Pipe Slope (ft/ft)	n	Pipe Cap. (cfs)	V velocity (ft/sec)	L length (ft)
Inlet A-6	A-6	A-5	0.45	0.99	0.45	6.00	6.08	2.7	**2.7**	15	0.0100	0.011	7.6	**6.2**	34
Inlet A-5	A-5	A-4	0.08	0.99	0.08	6.00	6.08	0.5	**3.2**	15	0.0060	0.011	5.9	**4.8**	84
Inlet A-4	A-4	A-3	0.92	0.99	0.91	6.00	6.08	5.5	**8.8**	18	0.0060	0.011	9.6	**5.4**	68
Inlet B-12	B-12	B-11	0.69	0.99	0.68	6.00	6.08	4.2	**4.2**	15	0.0100	0.011	7.6	**6.2**	29
Inlet B-11	B-11	B-6	0.07	0.99	0.07	6.00	6.08	0.4	**4.5**	15	0.0060	0.011	5.9	**4.8**	93
Inlet B-10	B-10	B-9	0.01	0.99	0.01	6.00	6.08	0.0	**0.0**	15	0.0100	0.011	7.6	**6.2**	23
Inlet B-9	B-9	B-6	0.05	0.99	0.05	6.00	6.08	0.3	**0.4**	15	0.0090	0.011	7.2	**5.9**	68
Inlet B-8	B-8	B-7	0.30	0.99	0.30	6.00	6.08	1.8	**1.8**	15	0.0100	0.011	7.6	**6.2**	30
Inlet B-7	B-7	B-6	0.09	0.99	0.09	6.00	6.08	0.5	**2.3**	15	0.0200	0.011	10.8	**8.8**	106
Inlet B-6	B-6	B-5	0.06	0.99	0.06	6.00	6.08	0.3	**7.6**	15	0.0500	0.011	17.0	**13.9**	143
MH B-5	B-5	B-4	0.05	0.99	0.05	6.00	6.08	0.3	**7.6**	15	0.0500	0.011	17.0	**13.9**	174
MH B-4	B-4	B-3							**7.6**	18	0.0200	0.011	17.5	**9.9**	28

APPENDIX H – WATER QUALITY STORM HYDROLOGIC ANALYSIS AND RUNOFF QUANTITY CALCULATION AND CERTIFICATIONS

New Jersey Groundwater Recharge Spreadsheet Version 2.0 November 2003

Annual Groundwater Recharge Analysis (based on GSR-32)

Project Name:	Delaware Avenue Subdivision
Description:	-
Analysis Date:	01/31/19

Select Township ↓	Average Annual P (in)	Climatic Factor
MORRIS CO., CHATHAM TWP	49.2	1.69

Pre-Developed Conditions

Land Segment	Area (acres)	TR-55 Land Cover	Soil	Annual Recharge (in)	Annual Recharge (cu.ft)
1	4.35	Woods	Penn	15.9	251,328
2	1.69	Woods	Minoa	15.3	93,996
3	0.04	Woods	Parsippany	0.0	-
4					
5	0.01	Impervious areas	Minoa	0.0	-
6	0.08	Impervious areas	Penn	0.0	-
7					
8					
9					
10					
11	0				
12	0				
13	0				
14	0				
15	0				
Total =	6.2			Total Annual Recharge (in)	Total Annual Recharge (cu-ft)
				15.4	345,324

Post-Developed Conditions

Land Segment	Area (acres)	TR-55 Land Cover	Soil	Annual Recharge (in)	Annual Recharge (cu.ft)
1	1.54	Impervious areas	Penn	0.0	-
2	0.38	Impervious areas	Minoa	0.0	-
3			Parsippany		
4	2.5	Open space	Penn	15.2	137,648
5	1.32	Open space	Minoa	14.8	70,912
6	0.04	Open space	Parsippany	0.0	-
7	0.39	Woods	Penn	15.9	22,533
8					
9					
10	0				
11	0				
12	0				
13	0				
14	0				
15	0				
Total =	6.2			Total Annual Recharge (in)	Total Annual Recharge (cu.ft)
				10.3	231,093

Annual Recharge Requirements Calculation ↓

% of Pre-Developed Annual Recharge to Preserve =	100%	Total Impervious Area (sq.ft)	83,635
Post-Development Annual Recharge Deficit=	*114,231*	(cubic feet)	

Recharge Efficiency Parameters Calculations (area averages)

RWC=	4.46	(in)	DRWC=	4.46	(in)
ERWC =	0.69	(in)	EDRWC=	0.69	(in)

Procedure to fill the Pre-Development and Post-Development Conditions Tables

For each land segment, first enter the area, then select TR-55 Land Cover, then select Soil. Start from the top of the table and proceed downward. Don't leave blank rows (with A=0) in between your segment entries. Rows with A=0 will not be displayed or used in calculations. For impervious areas outside of standard lots select "Impervious Areas" as the Land Cover. Soil type for impervious areas are only required if an infiltration facility will be built within these areas.

Project Name	Description	Analysis Date	BMP or LID Type
Delaware Avenue Subdivis-		01/31/19	SWM-1 (Infiltration Basin)

Recharge BMP Input Parameters

Parameter	Symbol	Value	Unit
BMP Area	ABMP	7089.0	sq.ft
BMP Effective Depth, this is the design variable	dBMP	4.2	in
Upper level of the BMP surface (negative if above ground)	dBMPu	-4.2	in
Depth of lower surface of BMP, must be>=dBMPu	dEXC	0.0	in
Post-development Land Segment Location of BMP , Input Zero if Location is distributed or undetermined	SegBMP	5	unitless

Root Zone Water capacity Calculated Parameters

Parameter	Symbol	Value	Unit
Empty Portion of RWC under Post-D Natural Recharge	ERWC	0.98	in
ERWC Modified to consider dEXC	EDRWC	0.98	in
Empty Portion of RWC under Infilt. BMP	RERWC	0.81	in

Recharge Design Parameters

Parameter	Symbol	Value	Unit
Inches of Runoff to capture	Qdesign	1.22	in
Inches of Rainfall to capture	Pdesign	1.44	in
Recharge Provided Avg. over Imp. Area		19.5	in
Runoff Captured Avg. over imp. Area		33.9	in

BMP Calculated Size Parameters

ABMP/Aimp	Aratio	0.27	unitless
BMP Volume	VBMP	2,481	cu.ft

CALCULATION CHECK MESSAGES

Volume Balance-> Solve Problem to satisfy Annual Recharge
dBMP Check---> OK
dEXC Check---> OK
BMP Location---> OK

Parameters from Annual Recharge Worksheet

Post-D Deficit Recharge (or desired recharge volume)	Vdef	114,231	cu.ft
Post-D Impervious Area (or target Impervious Area)	Aimp	26,150	sq.ft
Root Zone Water Capacity	RWC	6.33	in
RWC Modified to consider dEXC	DRWC	6.33	in
Climatic Factor	C-factor	1.69	no units
Average Annual P	Pavg	49.2	in
Recharge Requirement over Imp. Area	dr	16.4	in

System Performance Calculated Parameters

Annual BMP Recharge Volume		42,511	cu.ft
Avg BMP Recharge Efficiency		57.6%	Represents % Infiltration Recharged
%Rainfall became Runoff		78.5%	%
%Runoff Infiltrated		87.7%	%
%Runoff Recharged		15.8%	%
%Rainfall Recharged		12.4%	%

OTHER NOTES

Pdesign is accurate only after BMP dimensions are updated to make rech volume= deficit volume. The portion of BMP infiltration prior to filling and the area occupied by BMP are ignored in these calculations. Results are sensetive to dBMP, make sure dBMP selected is small enough for BMP to empty in less than 3 days. For land Segment Location of BMP if you select "impervious areas" RWC will be minimal but not zero as determined by the soil type and a shallow root zone for this Land Cover allowing consideration of lateral flow and other losses.

How to solve for different recharge volumes: By default the spreadsheet assigns the values of total deficit recharge volume "Vdef" and total proposed impervious area "Aimp" from the "Annual Recharge" sheet to "Vdef" and "Aimp" on this page. This allows solution for a single BMP to handle the entire recharge requirement assuming the runoff from entire impervious area is available to the BMP.
To solve for a smaller BMP or a LID-IMP to recharge only part of the recharge requirement, set Vdef to your target value and Aimp to impervious area directly connected to your infiltration facility and then solve for ABMP or dBMP. To go back to the default configuration clik the "Default Vdef & Aimp" button.

Project Name	Description	Analysis Date	BMP or LID Type
Delaware Avenue Subdivis	-	01/31/19	SWM-2 (Infiltration Basin)

Recharge BMP Input Parameters

Parameter	Symbol	Value	Unit
BMP Area	ABMP	8002.0	sq.ft
BMP Effective Depth, this is the design variable	dBMP	9.6	in
Upper level of the BMP surface (negative if above ground)	dBMPu	-9.6	in
Depth of lower surface of BMP, must be>=dBMPu	dEXC	0.0	in
Post-development Land Segment Location of BMP , Input Zero if Location is distributed or undetermined	SegBMP	4	unitless

Root Zone Water capacity Calculated Parameters

Parameter	Symbol	Value	Unit
Empty Portion of RWC under Post-D Natural Recharge	ERWC	0.63	in
ERWC Modified to consider dEXC	EDRWC	0.63	in
Empty Portion of RWC under Infilt. BMP	RERWC	0.54	in

Recharge Design Parameters

Parameter	Symbol	Value	Unit
Inches of Runoff to capture	Qdesign	1.22	in
Inches of Rainfall to capture	Pdesign	1.44	in
Recharge Provided Avg. over Imp. Area		19.5	in
Runoff Captured Avg. over imp. Area		33.9	in

BMP Calculated Size Parameters

ABMP/Aimp	Aratio	0.26	unitless
BMP Volume	VBMP	6,402	cu.ft

CALCULATION CHECK MESSAGES

Volume Balance-> Solve Problem to satisfy Annual Recharge
dBMP Check---> OK
dEXC Check---> OK
BMP Location---> OK

Parameters from Annual Recharge Worksheet

Post-D Deficit Recharge (or desired recharge volume)	Vdef	114,231	cu.ft
Post-D Impervious Area (or target Impervious Area)	Aimp	31,100	sq.ft
Root Zone Water Capacity	RWC	4.07	in
RWC Modified to consider dEXC	DRWC	4.07	in
Climatic Factor	C-factor	1.69	no units
Average Annual P	Pavg	49.2	in
Recharge Requirement over Imp. Area	dr	16.4	in

System Performance Calculated Parameters

Annual BMP Recharge Volume		47,986	cu.ft
Avg BMP Recharge Efficiency		57.6%	Represents % Infiltration Recharged
%Rainfall became Runoff		78.5%	%
%Runoff Infiltrated		83.2%	%
%Runoff Recharged		17.8%	%
%Rainfall Recharged		14.0%	%

OTHER NOTES

Pdesign is accurate only after BMP dimensions are updated to make rech volume= deficit volume. The portion of BMP infiltration prior to filling and the area occupied by BMP are ignored in these calculations. Results are sensetive to dBMP, make sure dBMP selected is small enough for BMP to empty in less than 3 days. For land Segment Location of BMP if you select "impervious areas" RWC will be minimal but not zero as determined by the soil type and a shallow root zone for this Land Cover allowing consideration of lateral flow and other losses.

How to solve for different recharge volumes: By default the spreadsheet assigns the values of total deficit recharge volume "Vdef" and total proposed impervious area "Aimp" from the "Annual Recharge" sheet to "Vdef" and "Aimp" on this page. This allows solution for a single BMP to handle the entire recharge requirement assuming the runoff from entire impervious area is available to the BMP.
To solve for a smaller BMP or a LID-IMP to recharge only part of the recharge requirement, set Vdef to your target value and Aimp to impervious area directly connected to your infiltration facility and then solve for ABMP or dBMP. To go back to the default configuration clik the "Default Vdef & Aimp" button.

Project Name	Description	Analysis Date	BMP or LID Type
Delaware Avenue Subdivis-		01/31/19	Chambers (Total Onsite)

Recharge BMP Input Parameters

Parameter	Symbol	Value	Unit
BMP Area	ABMP	4104.0	sq.ft
BMP Effective Depth, this is the design variable	dBMP	25.2	in
Upper level of the BMP surface (negative if above ground)	dBMPu	6.0	in
Depth of lower surface of BMP, must be>=dBMPu	dEXC	42.5	in
Post-development Land Segment Location of BMP , Input Zero if Location is distributed or undetermined	SegBMP	0	unitless

Root Zone Water capacity Calculated Parameters

Parameter	Symbol	Value	Unit
Empty Portion of RWC under Post-D Natural Recharge	ERWC	0.69	in
ERWC Modified to consider dEXC	EDRWC	0.69	in
Empty Portion of RWC under Infilt. BMP	RERWC	0.59	in

Recharge Design Parameters

Parameter	Symbol	Value	Unit
Inches of Runoff to capture	Qdesign	1.22	in
Inches of Rainfall to capture	Pdesign	1.44	in
Recharge Provided Avg. over Imp. Area		19.5	in
Runoff Captured Avg. over imp. Area		33.9	in

BMP Calculated Size Parameters

ABMP/Aimp	Aratio	0.05	unitless
BMP Volume	VBMP	8,618	cu.ft

CALCULATION CHECK MESSAGES

Volume Balance-> **Solve Problem to satisfy Annual Recharge**
dBMP Check---> **OK**
dEXC Check---> **OK**
BMP Location---> **Location is selected as distributed or undetermined**

Parameters from Annual Recharge Worksheet

Post-D Deficit Recharge (or desired recharge volume)	Vdef	114,231	cu.ft
Post-D Impervious Area (or target Impervious Area)	Aimp	83,635	sq.ft
Root Zone Water Capacity	RWC	4.46	in
RWC Modified to consider dEXC	DRWC	4.46	in
Climatic Factor	C-factor	1.69	no units
Average Annual P	Pavg	49.2	in
Recharge Requirement over Imp. Area	dr	16.4	in

System Performance Calculated Parameters

Annual BMP Recharge Volume		24,610	cu.ft
Avg BMP Recharge Efficiency		57.6%	Represents % Infiltration Recharged
%Rainfall became Runoff		78.5%	%
%Runoff Infiltrated		15.9%	%
%Runoff Recharged		9.1%	%
%Rainfall Recharged		7.2%	%

OTHER NOTES

Pdesign is accurate only after BMP dimensions are updated to make rech volume= deficit volume. The portion of BMP infiltration prior to filling and the area occupied by BMP are ignored in these calculations. Results are sensetive to dBMP, make sure dBMP selected is small enough for BMP to empty in less than 3 days. For land Segment Location of BMP if you select "impervious areas" RWC will be minimal but not zero as determined by the soil type and a shallow root zone for this Land Cover allowing consideration of lateral flow and other losses.

How to solve for different recharge volumes: By default the spreadsheet assigns the values of total deficit recharge volume "Vdef" and total proposed impervious area "Aimp" from the "Annual Recharge" sheet to "Vdef" and "Aimp" on this page. This allows solution for a single BMP to handle the entire recharge requirement assuming the runoff from entire impervious area is available to the BMP.
To solve for a smaller BMP or a LID-IMP to recharge only part of the recharge requirement, set Vdef to your target value and Aimp to impervious area directly connected to your infiltration facility and then solve for ABMP or dBMP. To go back to the default configuration clik the "Default Vdef & Aimp" button.

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	0.000	5	n/a	0	------	------	------	EXDA 1
3	SCS Runoff	0.199	5	70	317	------	------	------	EXDA 2 IMPERVIOUS
4	SCS Runoff	0.000	5	n/a	0	------	------	------	EXDA 2 PERVIOUS
5	Combine	0.199	5	70	317	3, 4	------	------	EXDA 2
7	SCS Runoff	0.109	5	70	172	------	------	------	PRDA 1 LOT 5 HOUSE TO CHAMBE
8	Reservoir	0.000	5	n/a	0	7	1.54	172	LOT 5 CHAMBER DISCHARG
9	SCS Runoff	0.109	5	70	172	------	------	------	PRDA 1 LOT 6 HOUSE TO CHAMBE
10	Reservoir	0.000	5	n/a	0	9	1.54	172	LOT 6 CHAMBER DISCHARG
11	SCS Runoff	0.109	5	70	172	------	------	------	PRDA 1 LOT 7 HOUSE TO CHAMBE
12	Reservoir	0.000	5	n/a	0	11	1.54	172	LOT 7 CHAMBER DISCHARG
13	SCS Runoff	0.109	5	70	172	------	------	------	PRDA 1 LOT 8 HOUSE TO CHAMBE
14	Reservoir	0.000	5	n/a	0	13	1.54	172	LOT 8 CHAMBER DISCHAR
15	Combine	0.000	5	n/a	0	8, 10, 12, 14	------	------	PRDA 1 DRYWELL DISCHARGE
17	SCS Runoff	0.066	5	70	106	------	------	------	PRDA 1B BYPASS- IMPERVIOUS
18	SCS Runoff	0.098	5	75	176	------	------	------	PRDA 1B BYPASS- PERVIOUS
19	Combine	0.162	5	70	282	17, 18	------	------	PRDA 1B BYPASS
21	SCS Runoff	0.909	5	70	1,443	------	------	------	PRDA 1A IMPERVIOUS TO BASIN 1
22	SCS Runoff	0.448	5	75	840	------	------	------	PRDA 1A PERVIOUS TO BASIN 1
23	Combine	1.300	5	70	2,283	21, 22	------	------	PRDA 1A TO BASIN
24	Reservoir	0.002	5	140	66	23	254.17	2,281	BASIN 1 DISCHARGE
26	Combine	0.162	5	70	347	15, 19, 24,	------	------	PRDA 1 TOTAL
28	SCS Runoff	0.111	5	70	176	------	------	------	PRDA 2A LOT 1 HOUSE TO CHAMB
29	Reservoir	0.000	5	n/a	0	28	1.55	176	LOT 1 CHAMBER DISCHARG
30	SCS Runoff	0.111	5	70	176	------	------	------	PRDA 2A LOT 2 HOUSE TO CHAMB
31	Reservoir	0.000	5	n/a	0	30	1.55	176	LOT 2 CHAMBER DISCHARG
32	SCS Runoff	0.111	5	70	176	------	------	------	PRDA 2A LOT 3 HOUSE TO CHAMB
33	Reservoir	0.000	5	n/a	0	32	1.55	176	LOT 3 CHAMBER DISCHARG
34	SCS Runoff	0.109	5	70	172	------	------	------	PRDA 2A LOT 4 HOUSE TO CHAMB
35	Reservoir	0.000	5	n/a	0	34	1.54	172	LOT 4 CHAMBER DISCHARG
36	Combine	0.000	5	n/a	0	29, 31, 33, 35	------	------	PRDA 2A CHAMBER DISCHARGE

Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

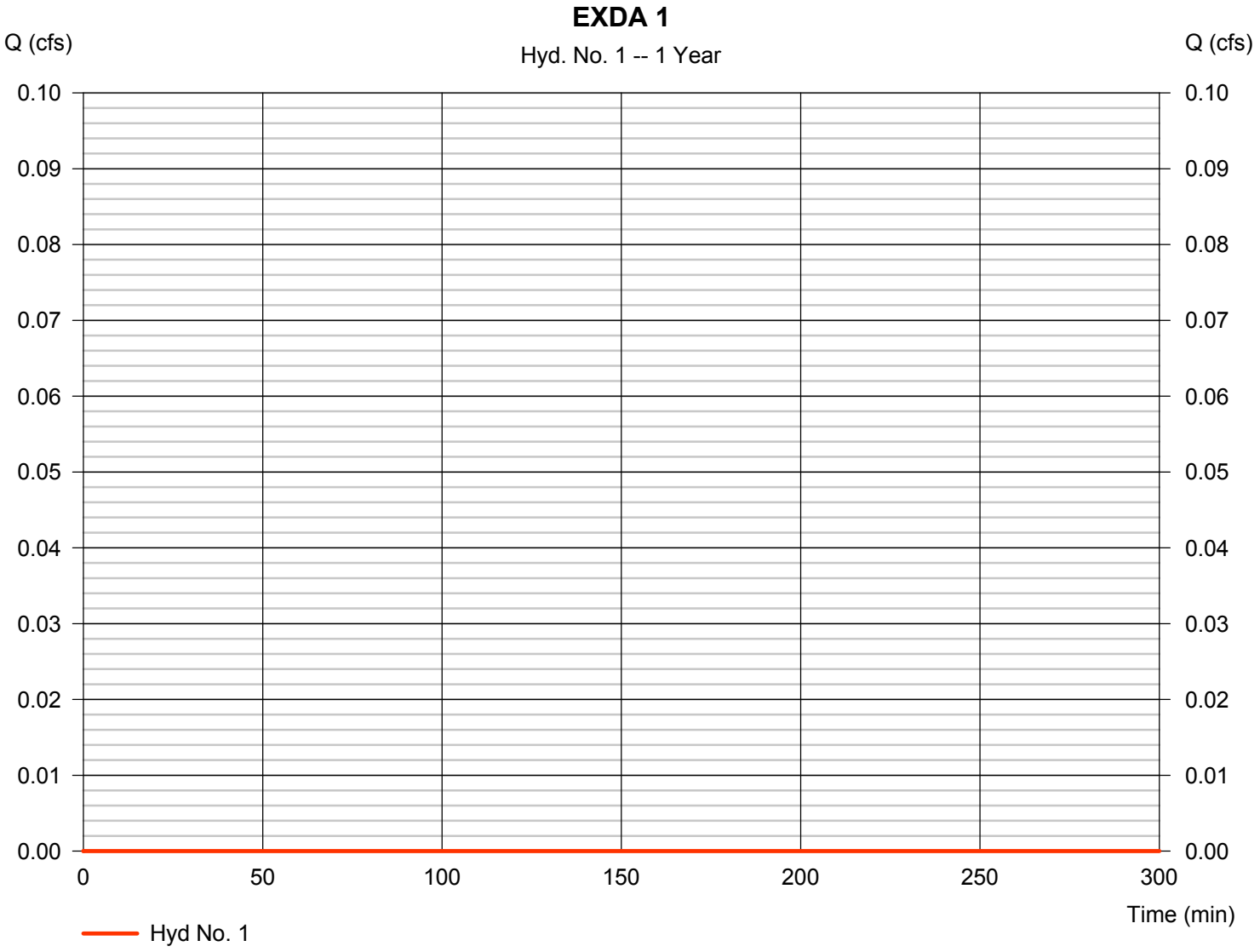
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
38	SCS Runoff	0.012	5	85	31	------	------	------	PRDA 2B BYPASS-PERVIOUS
40	SCS Runoff	0.000	5	n/a	0	------	------	------	PRDA 2C PERVIOUS
42	SCS Runoff	1.153	5	70	1,830	------	------	------	PRDA 2A IMPERVIOUS
43	SCS Runoff	0.073	5	105	188	------	------	------	PRDA 2A PERVIOUS
44	Combine	1.162	5	70	2,018	42, 43	------	------	PRDA 2A COMBINE
45	Combine	1.162	5	70	2,018	36, 40, 44	------	------	PRDA 2 TO BASIN 2
46	Reservoir	0.000	5	n/a	0	45	224.75	2,018	BASIN 2 DISCHARGE
48	Combine	0.012	5	85	31	38, 46,	------	------	PRDA 2 TOTAL

Hydrograph Report

Hyd. No. 1

EXDA 1

Hydrograph type	= SCS Runoff	Peak discharge	= 0.000 cfs
Storm frequency	= 1 yrs	Time to peak	= n/a
Time interval	= 5 min	Hyd. volume	= 0 cuft
Drainage area	= 3.080 ac	Curve number	= 67
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 25.00 min
Total precip.	= 0.00 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

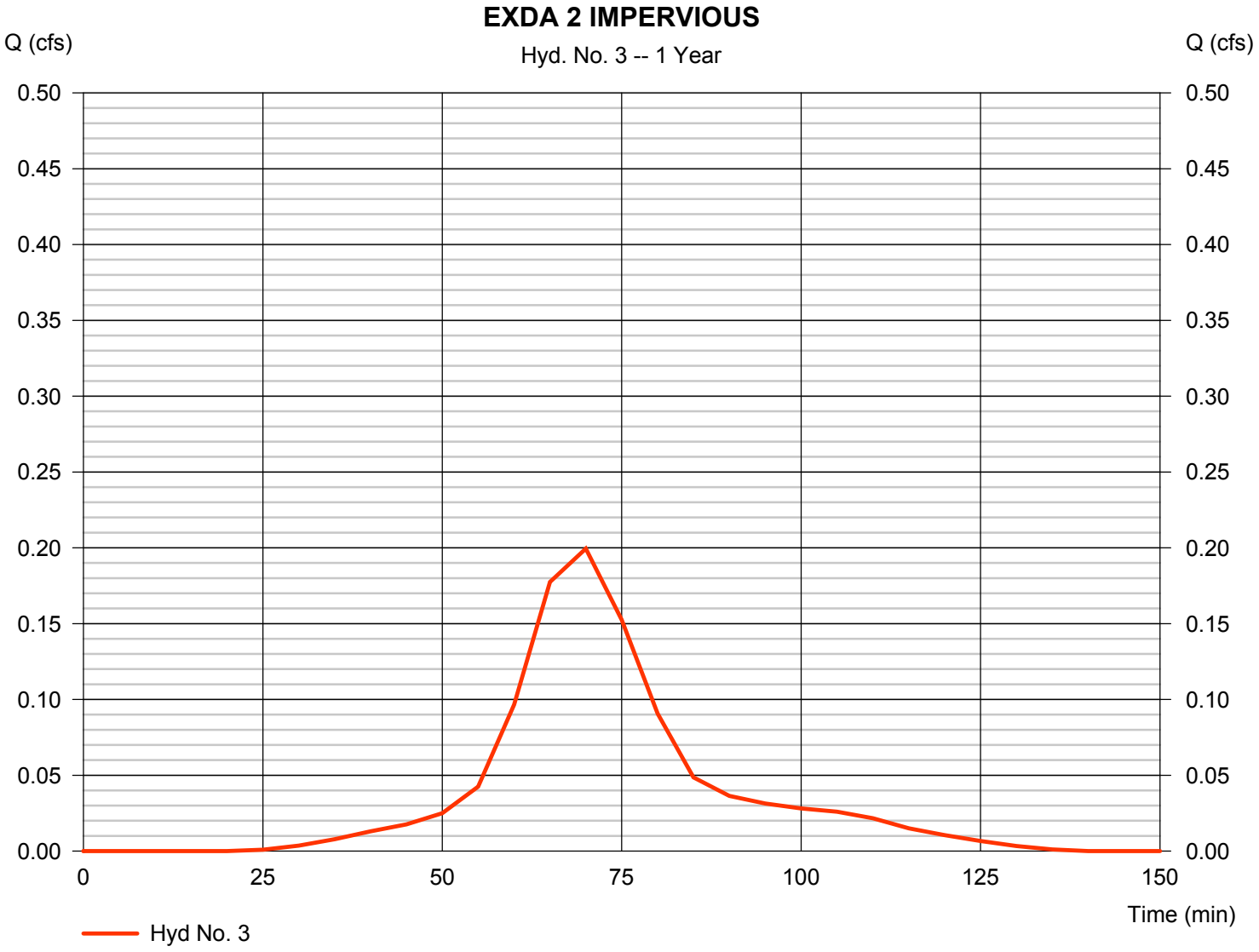


Hydrograph Report

Hyd. No. 3

EXDA 2 IMPERVIOUS

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.199 cfs
Storm frequency	=	1 yrs	Time to peak	=	70 min
Time interval	=	5 min	Hyd. volume	=	317 cuft
Drainage area	=	0.090 ac	Curve number	=	98
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	10.00 min
Total precip.	=	1.25 in	Distribution	=	Custom
Storm duration	=	R:\Hydroflow Standards\1.25in24hr.tcds	Shape factor	=	484

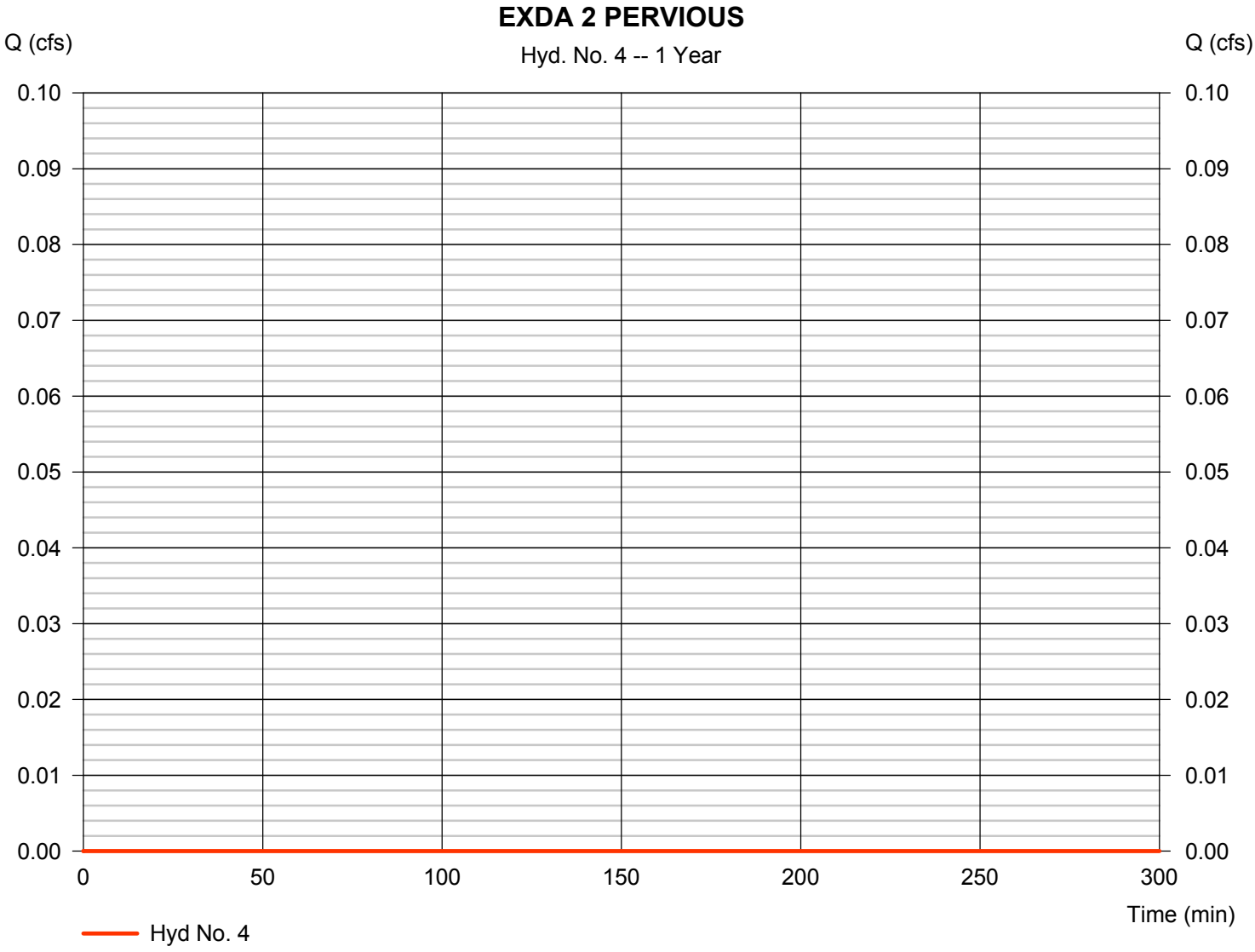


Hydrograph Report

Hyd. No. 4

EXDA 2 PERVIOUS

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.000 cfs
Storm frequency	=	1 yrs	Time to peak	=	n/a
Time interval	=	5 min	Hyd. volume	=	0 cuft
Drainage area	=	3.000 ac	Curve number	=	55
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	25.00 min
Total precip.	=	1.25 in	Distribution	=	Custom
Storm duration	=	R:\Hydroflow Standards\1.25in24hr.tcds	Shape factor	=	484

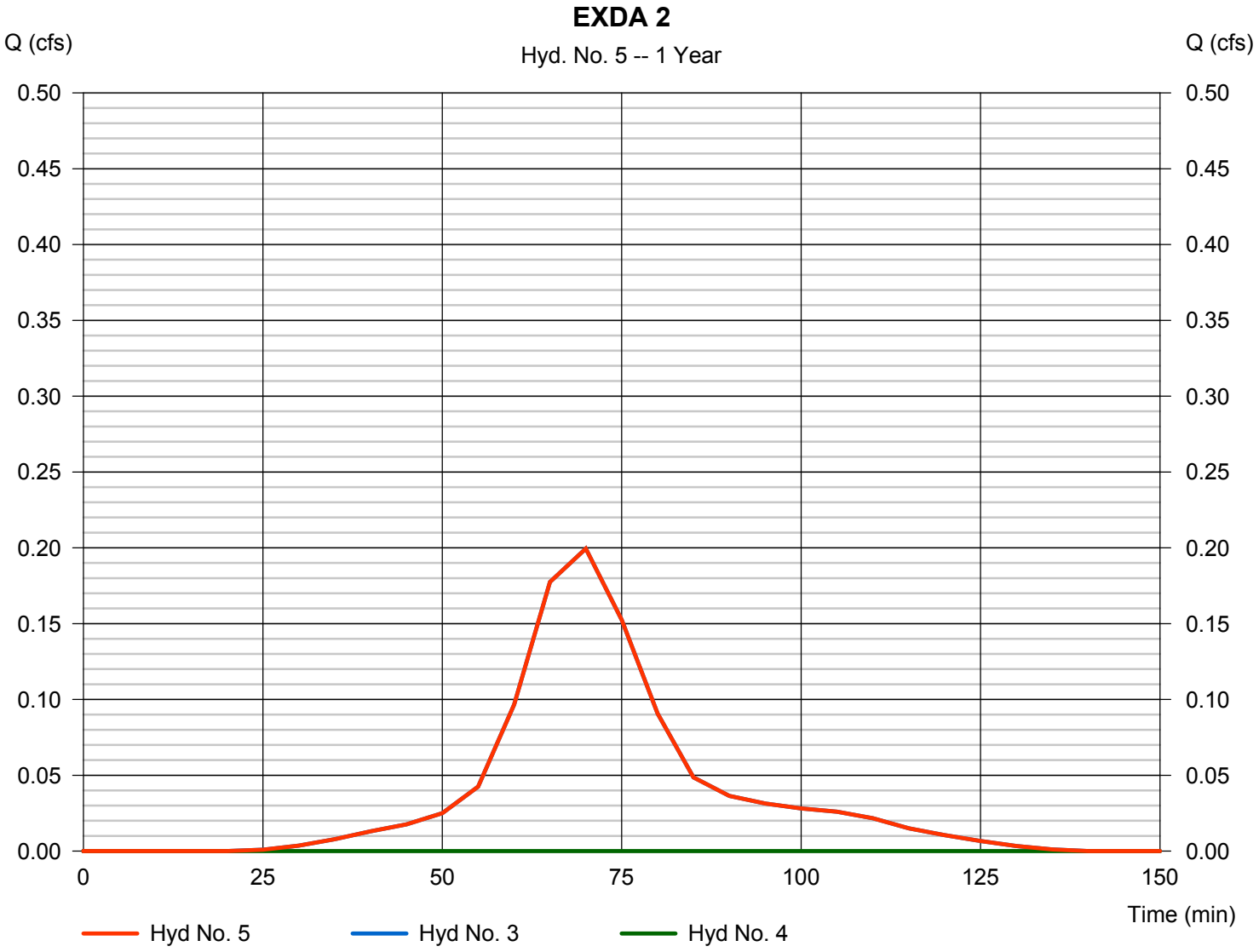


Hydrograph Report

Hyd. No. 5

EXDA 2

Hydrograph type	= Combine	Peak discharge	= 0.199 cfs
Storm frequency	= 1 yrs	Time to peak	= 70 min
Time interval	= 5 min	Hyd. volume	= 317 cuft
Inflow hyds.	= 3, 4	Contrib. drain. area	= 3.090 ac

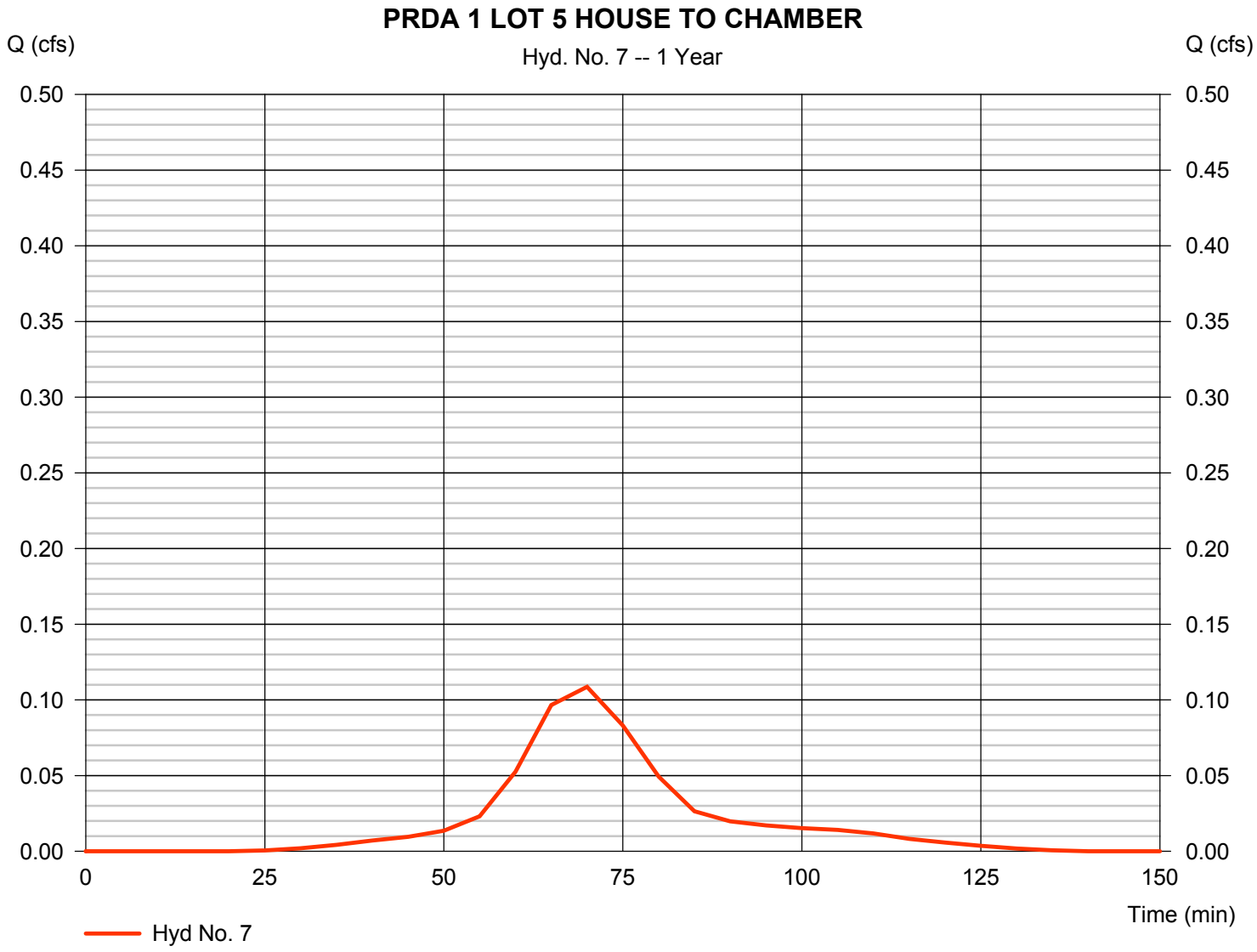


Hydrograph Report

Hyd. No. 7

PRDA 1 LOT 5 HOUSE TO CHAMBER

Hydrograph type	= SCS Runoff	Peak discharge	= 0.109 cfs
Storm frequency	= 1 yrs	Time to peak	= 70 min
Time interval	= 5 min	Hyd. volume	= 172 cuft
Drainage area	= 0.049 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.00 min
Total precip.	= 1.25 in	Distribution	= Custom
Storm duration	= R:\Hydroflow Standards\1.25in24hr.tcds	Shape factor	= 484



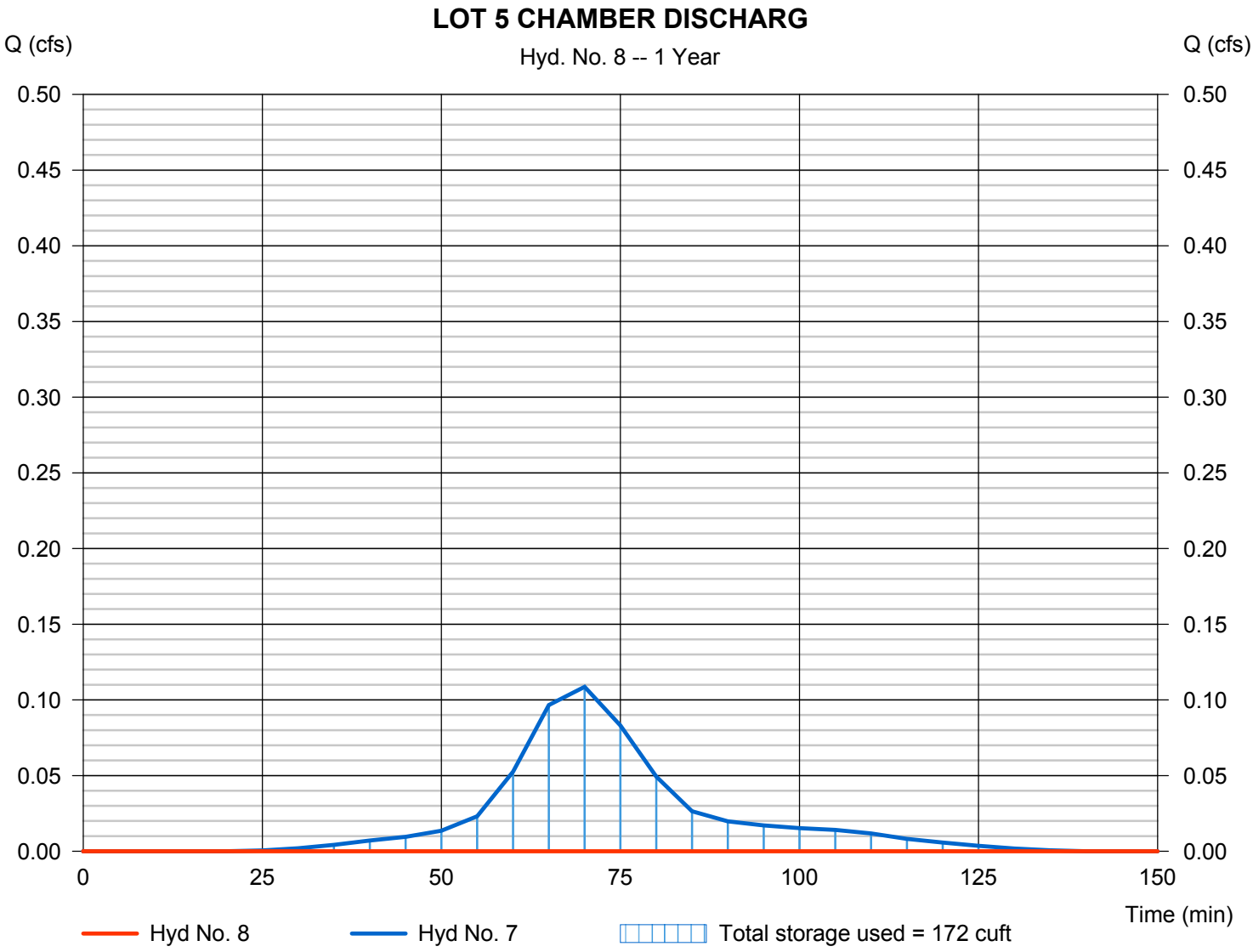
Hydrograph Report

Hyd. No. 8

LOT 5 CHAMBER DISCHARG

Hydrograph type	=	Reservoir	Peak discharge	=	0.000 cfs
Storm frequency	=	1 yrs	Time to peak	=	n/a
Time interval	=	5 min	Hyd. volume	=	0 cuft
Inflow hyd. No.	=	7 - PRDA 1 LOT 5 HOUSE TO CHAMBER	Max. Elevation	=	1.54 ft
Reservoir name	=	CHAMBERS LOT 5	Max. Storage	=	172 cuft

Storage Indication method used.



Pond Report

Pond No. 8 - CHAMBERS LOT 5

Pond Data

UG Chambers -Invert elev. = 1.30 ft, Rise x Span = 1.54 x 2.75 ft, Barrel Len = 60.00 ft, No. Barrels = 2, Slope = 0.00%, Headers = Yes
Encasement -Invert elev. = 1.00 ft, Width = 4.00 ft, Height = 3.00 ft, Voids = 40.00%

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	1.00	n/a	0	0
0.30	1.30	n/a	65	65
0.60	1.60	n/a	132	197
0.90	1.90	n/a	130	327
1.20	2.20	n/a	124	451
1.50	2.50	n/a	114	565
1.80	2.80	n/a	97	662
2.10	3.10	n/a	67	729
2.40	3.40	n/a	65	794
2.70	3.70	n/a	65	859
3.00	4.00	n/a	65	924

Culvert / Orifice Structures

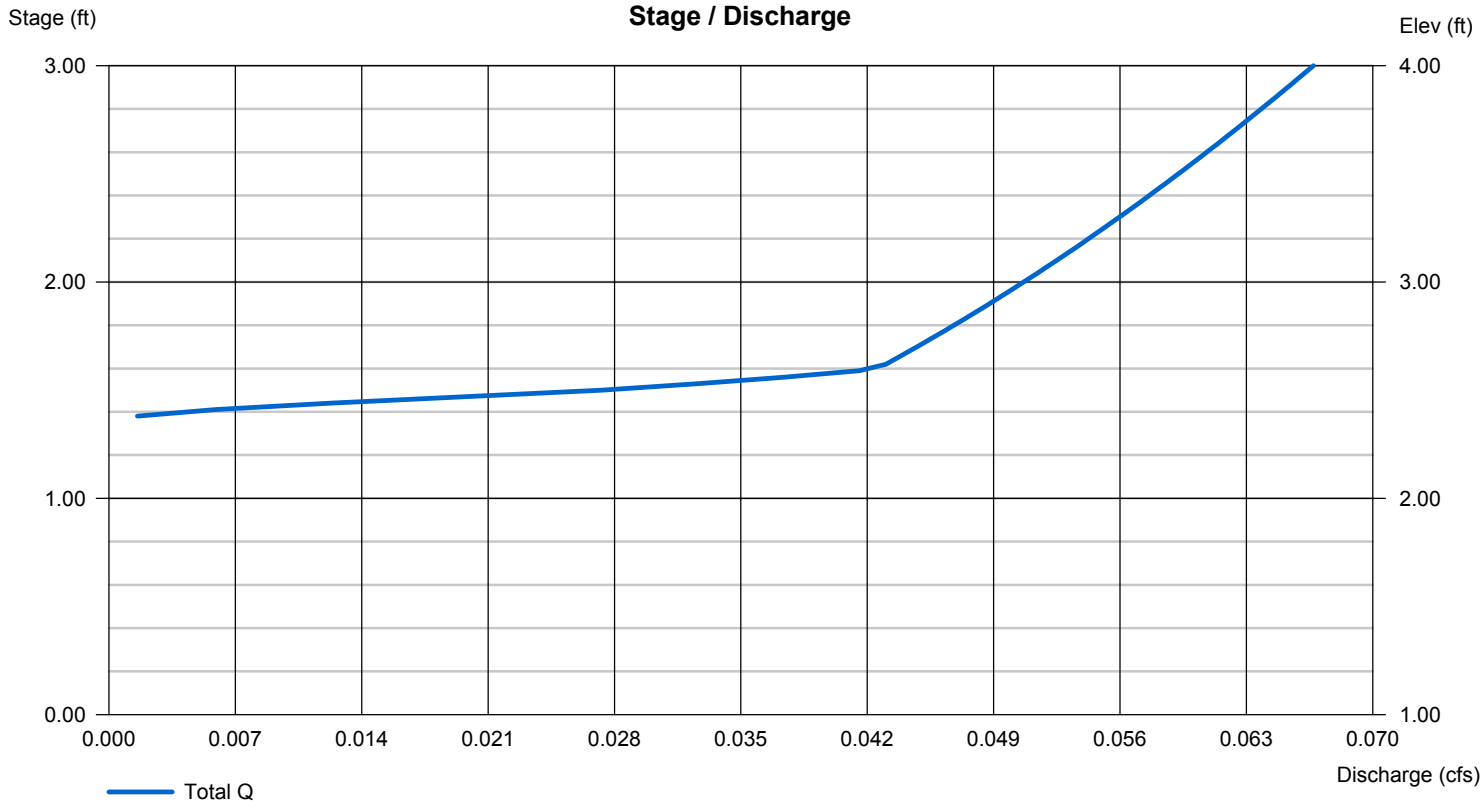
	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 2.00	0.00	0.00	0.00
Span (in)	= 2.00	0.00	0.00	0.00
No. Barrels	= 1	0	0	0
Invert El. (ft)	= 2.35	0.00	0.00	0.00
Length (ft)	= 44.00	0.00	0.00	0.00
Slope (%)	= 2.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	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 Wet area)
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).

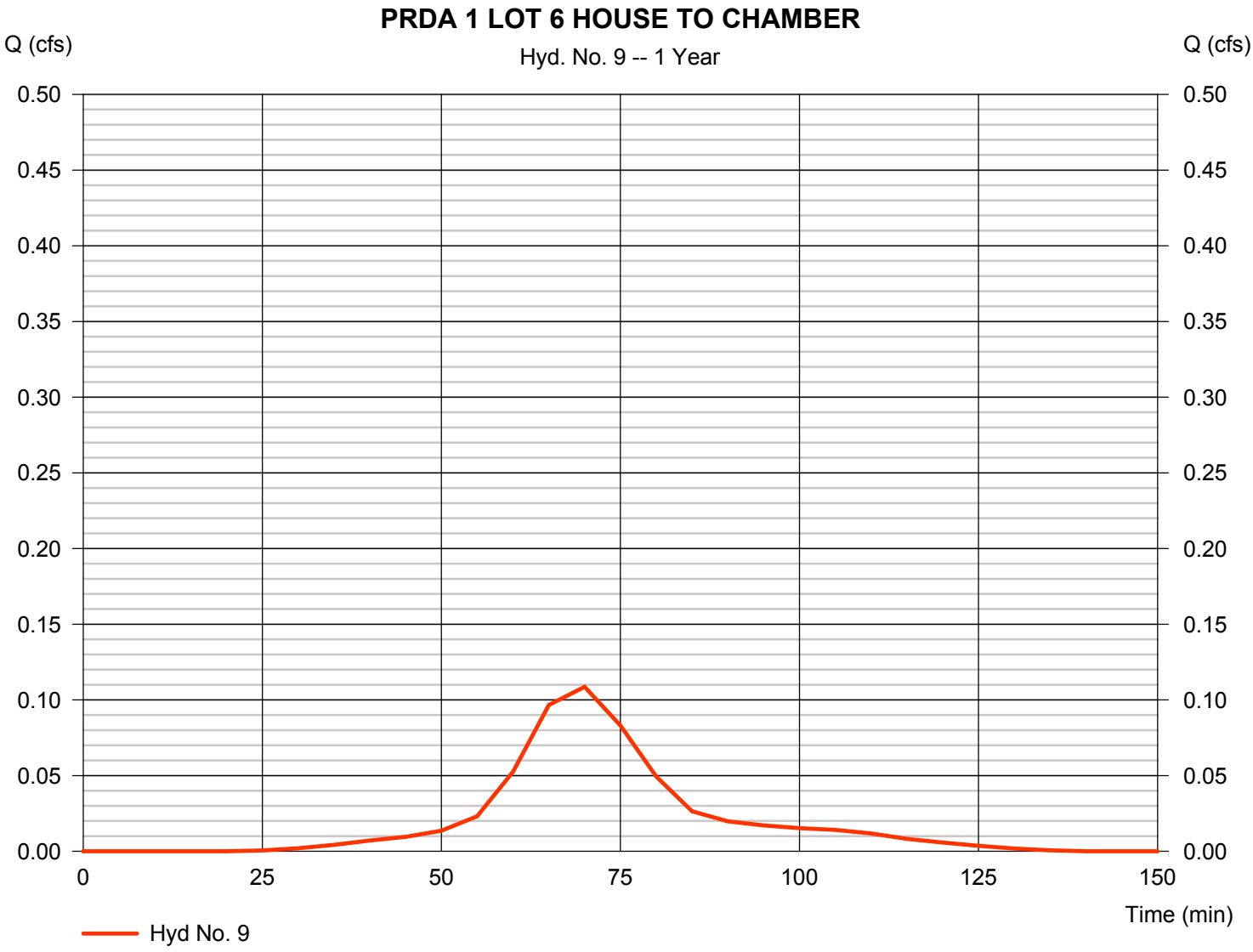


Hydrograph Report

Hyd. No. 9

PRDA 1 LOT 6 HOUSE TO CHAMBER

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.109 cfs
Storm frequency	=	1 yrs	Time to peak	=	70 min
Time interval	=	5 min	Hyd. volume	=	172 cuft
Drainage area	=	0.049 ac	Curve number	=	98
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	10.00 min
Total precip.	=	1.25 in	Distribution	=	Custom
Storm duration	=	R:\Hydroflow Standards\1.25in24hr.tcds	Shape factor	=	484



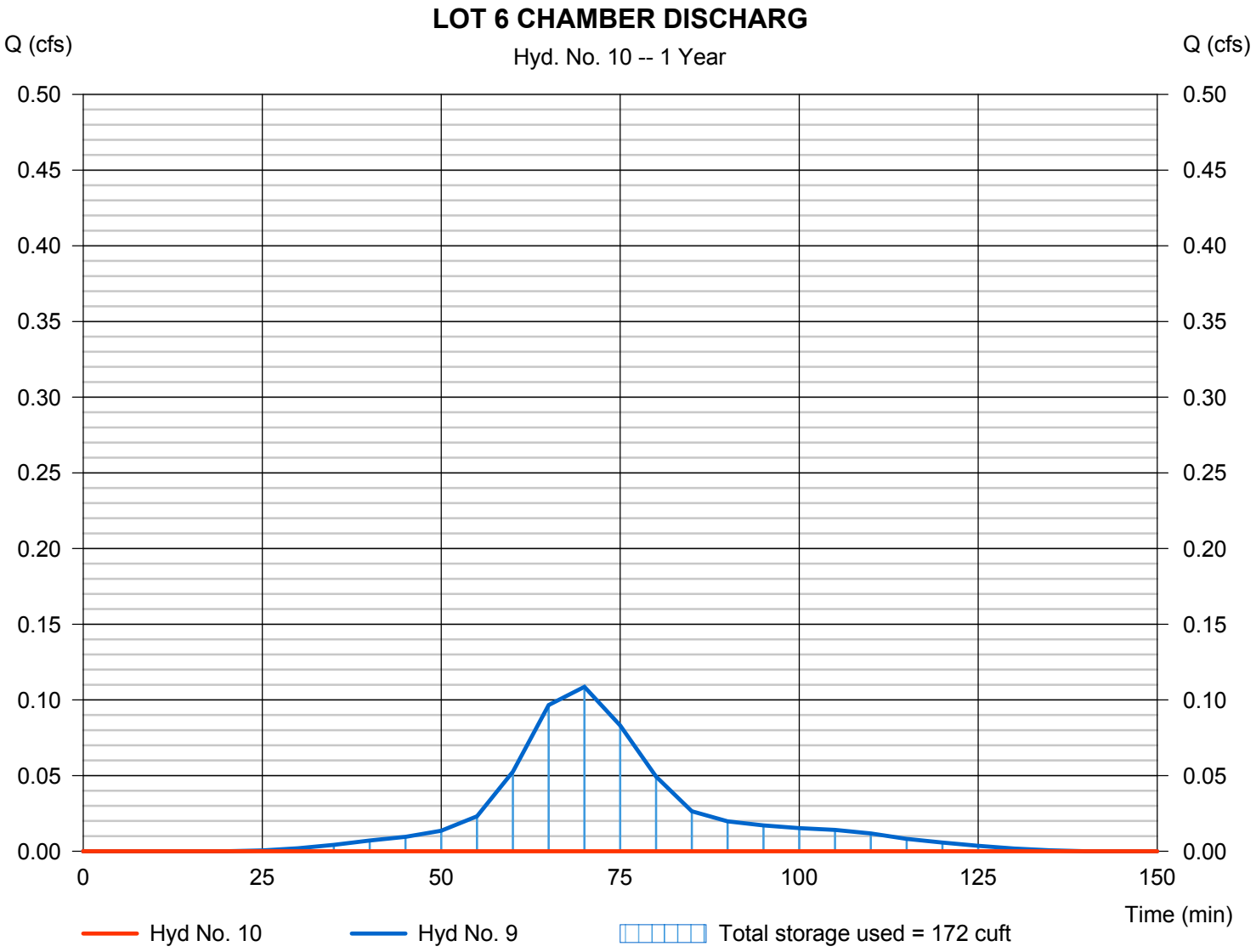
Hydrograph Report

Hyd. No. 10

LOT 6 CHAMBER DISCHARG

Hydrograph type	=	Reservoir	Peak discharge	=	0.000 cfs
Storm frequency	=	1 yrs	Time to peak	=	n/a
Time interval	=	5 min	Hyd. volume	=	0 cuft
Inflow hyd. No.	=	9 - PRDA 1 LOT 6 HOUSE TO CHAMBER	Max. Elevation	=	1.54 ft
Reservoir name	=	CHAMBERS LOT 6	Max. Storage	=	172 cuft

Storage Indication method used.



Pond Report

Pond No. 9 - CHAMBERS LOT 6

Pond Data

UG Chambers -Invert elev. = 1.30 ft, Rise x Span = 1.54 x 2.75 ft, Barrel Len = 60.00 ft, No. Barrels = 2, Slope = 0.00%, Headers = Yes
Encasement -Invert elev. = 1.00 ft, Width = 4.00 ft, Height = 3.00 ft, Voids = 40.00%

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	1.00	n/a	0	0
0.30	1.30	n/a	65	65
0.60	1.60	n/a	132	197
0.90	1.90	n/a	130	327
1.20	2.20	n/a	124	451
1.50	2.50	n/a	114	565
1.80	2.80	n/a	97	662
2.10	3.10	n/a	67	729
2.40	3.40	n/a	65	794
2.70	3.70	n/a	65	859
3.00	4.00	n/a	65	924

Culvert / Orifice Structures

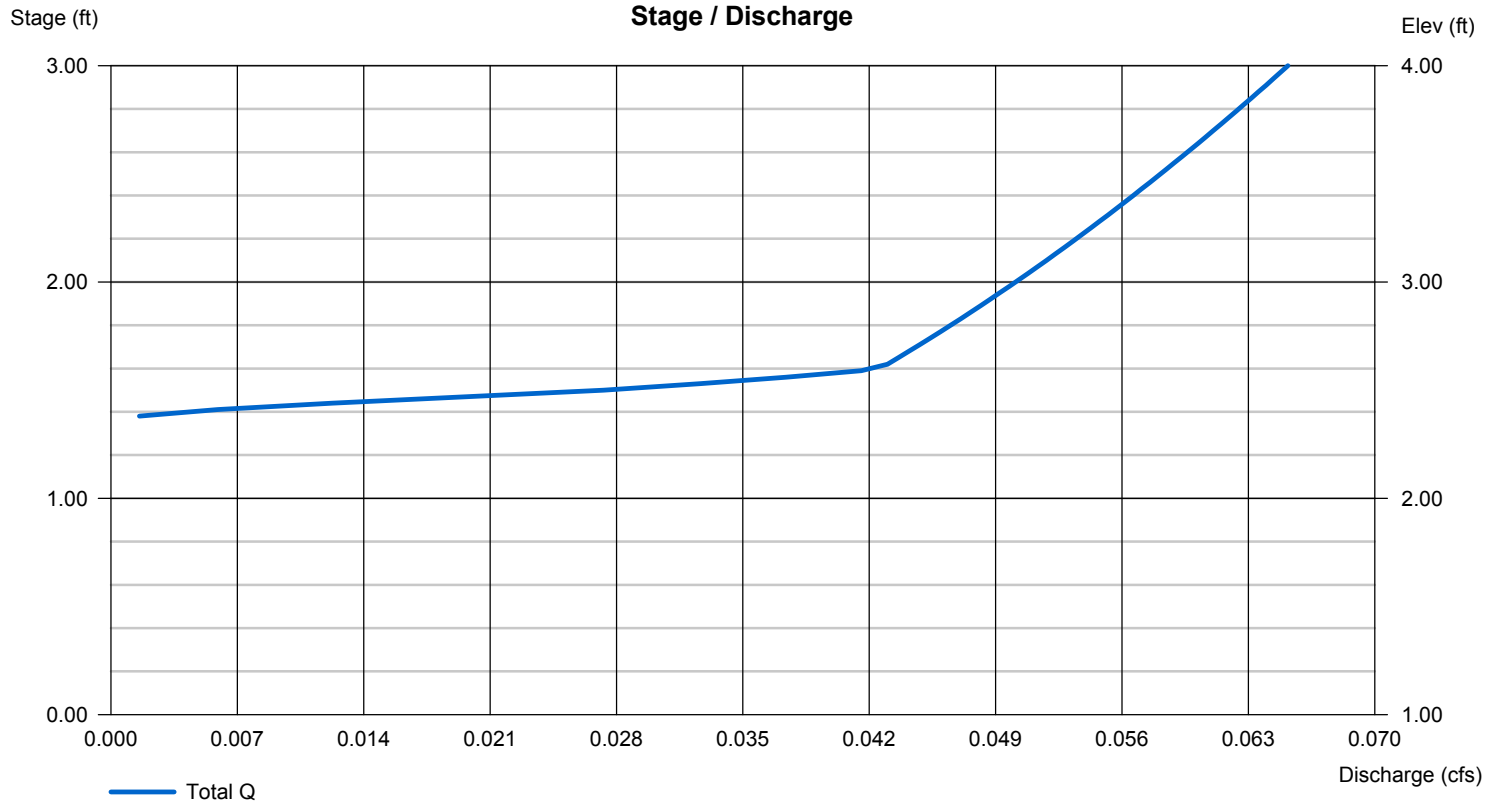
	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 2.00	0.00	0.00	0.00
Span (in)	= 2.00	0.00	0.00	0.00
No. Barrels	= 1	0	0	0
Invert El. (ft)	= 2.35	0.00	0.00	0.00
Length (ft)	= 48.00	0.00	0.00	0.00
Slope (%)	= 2.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	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 Wet area)
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).

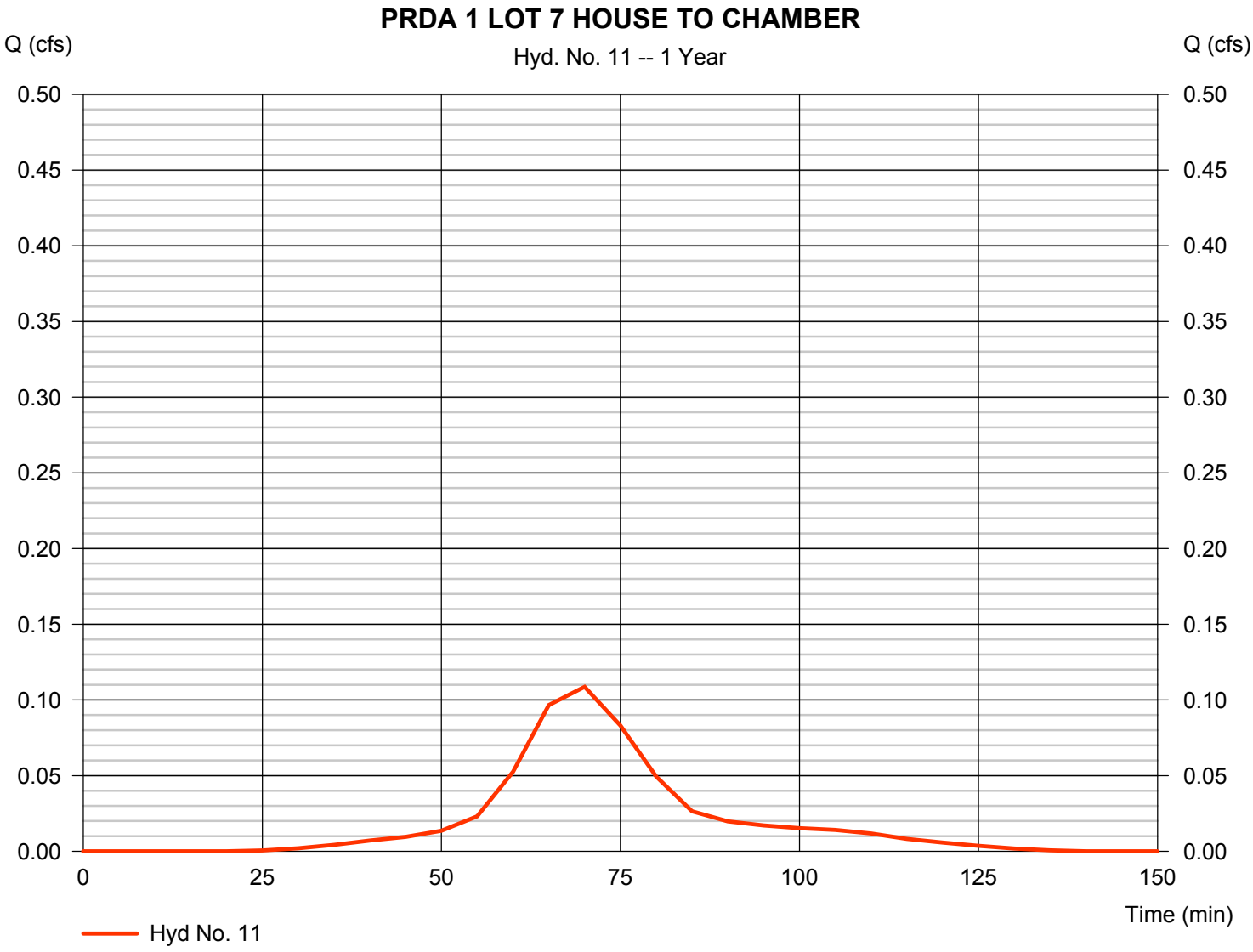


Hydrograph Report

Hyd. No. 11

PRDA 1 LOT 7 HOUSE TO CHAMBER

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.109 cfs
Storm frequency	=	1 yrs	Time to peak	=	70 min
Time interval	=	5 min	Hyd. volume	=	172 cuft
Drainage area	=	0.049 ac	Curve number	=	98
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	10.00 min
Total precip.	=	1.25 in	Distribution	=	Custom
Storm duration	=	R:\Hydroflow Standards\1.25in24hr.tcds	Shape factor	=	484



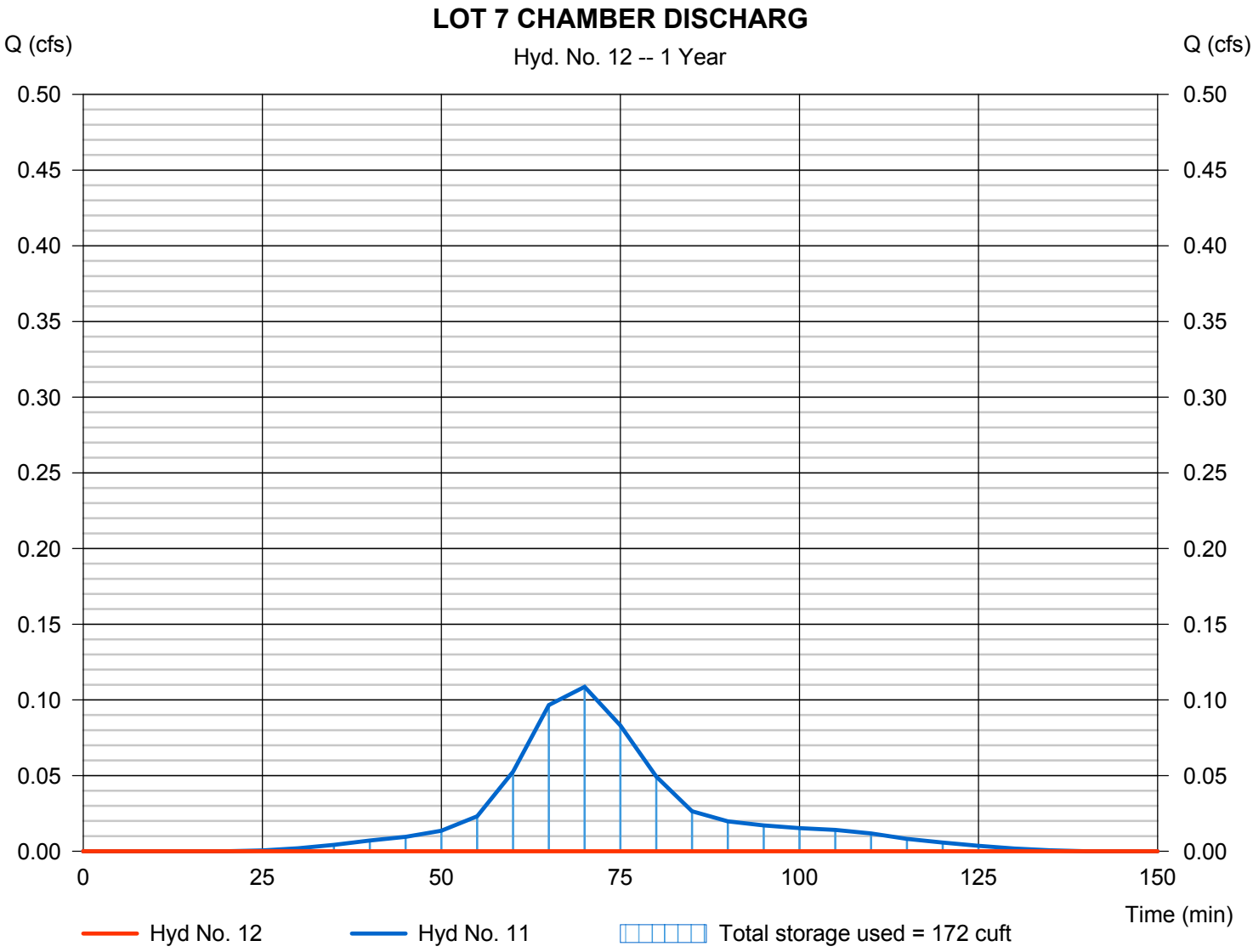
Hydrograph Report

Hyd. No. 12

LOT 7 CHAMBER DISCHARG

Hydrograph type	=	Reservoir	Peak discharge	=	0.000 cfs
Storm frequency	=	1 yrs	Time to peak	=	n/a
Time interval	=	5 min	Hyd. volume	=	0 cuft
Inflow hyd. No.	=	11 - PRDA 1 LOT 7 HOUSE TO CHAMBER	Max. Elevation	=	1.54 ft
Reservoir name	=	CHAMBERS LOT 7	Max. Storage	=	172 cuft

Storage Indication method used.



Pond Report

Pond No. 11 - CHAMBERS LOT 7

Pond Data

UG Chambers -Invert elev. = 1.30 ft, Rise x Span = 1.54 x 2.75 ft, Barrel Len = 60.00 ft, No. Barrels = 2, Slope = 0.00%, Headers = Yes
Encasement -Invert elev. = 1.00 ft, Width = 4.00 ft, Height = 3.00 ft, Voids = 40.00%

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	1.00	n/a	0	0
0.30	1.30	n/a	65	65
0.60	1.60	n/a	132	197
0.90	1.90	n/a	130	327
1.20	2.20	n/a	124	451
1.50	2.50	n/a	114	565
1.80	2.80	n/a	97	662
2.10	3.10	n/a	67	729
2.40	3.40	n/a	65	794
2.70	3.70	n/a	65	859
3.00	4.00	n/a	65	924

Culvert / Orifice Structures

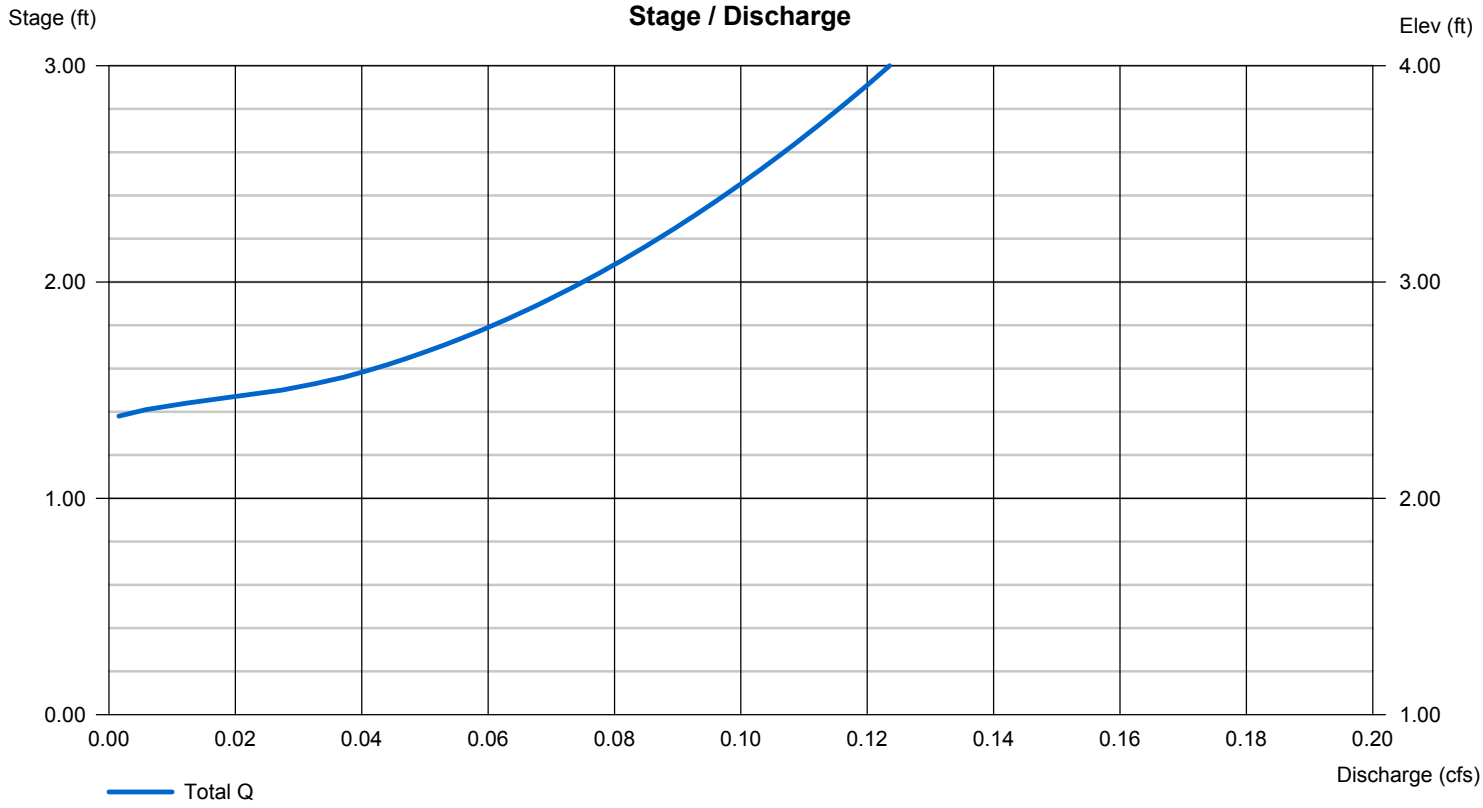
	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 2.00	0.00	0.00	0.00
Span (in)	= 2.00	0.00	0.00	0.00
No. Barrels	= 1	0	0	0
Invert El. (ft)	= 2.35	0.00	0.00	0.00
Length (ft)	= 5.00	0.00	0.00	0.00
Slope (%)	= 2.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

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 Wet area)
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).

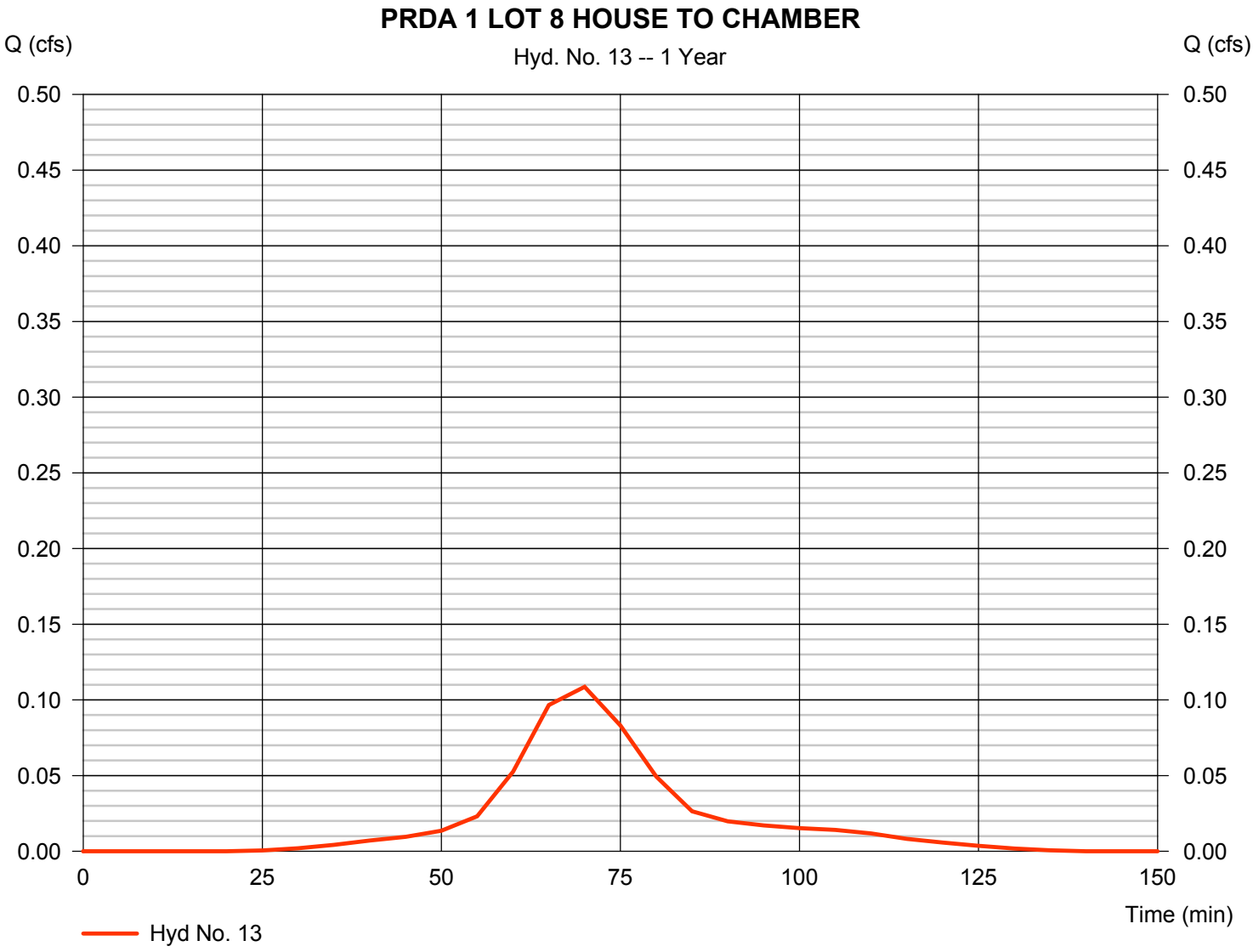


Hydrograph Report

Hyd. No. 13

PRDA 1 LOT 8 HOUSE TO CHAMBER

Hydrograph type	= SCS Runoff	Peak discharge	= 0.109 cfs
Storm frequency	= 1 yrs	Time to peak	= 70 min
Time interval	= 5 min	Hyd. volume	= 172 cuft
Drainage area	= 0.049 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.00 min
Total precip.	= 1.25 in	Distribution	= Custom
Storm duration	= R:\Hydroflow Standards\1.25in24hr.tcds	Shape factor	= 484



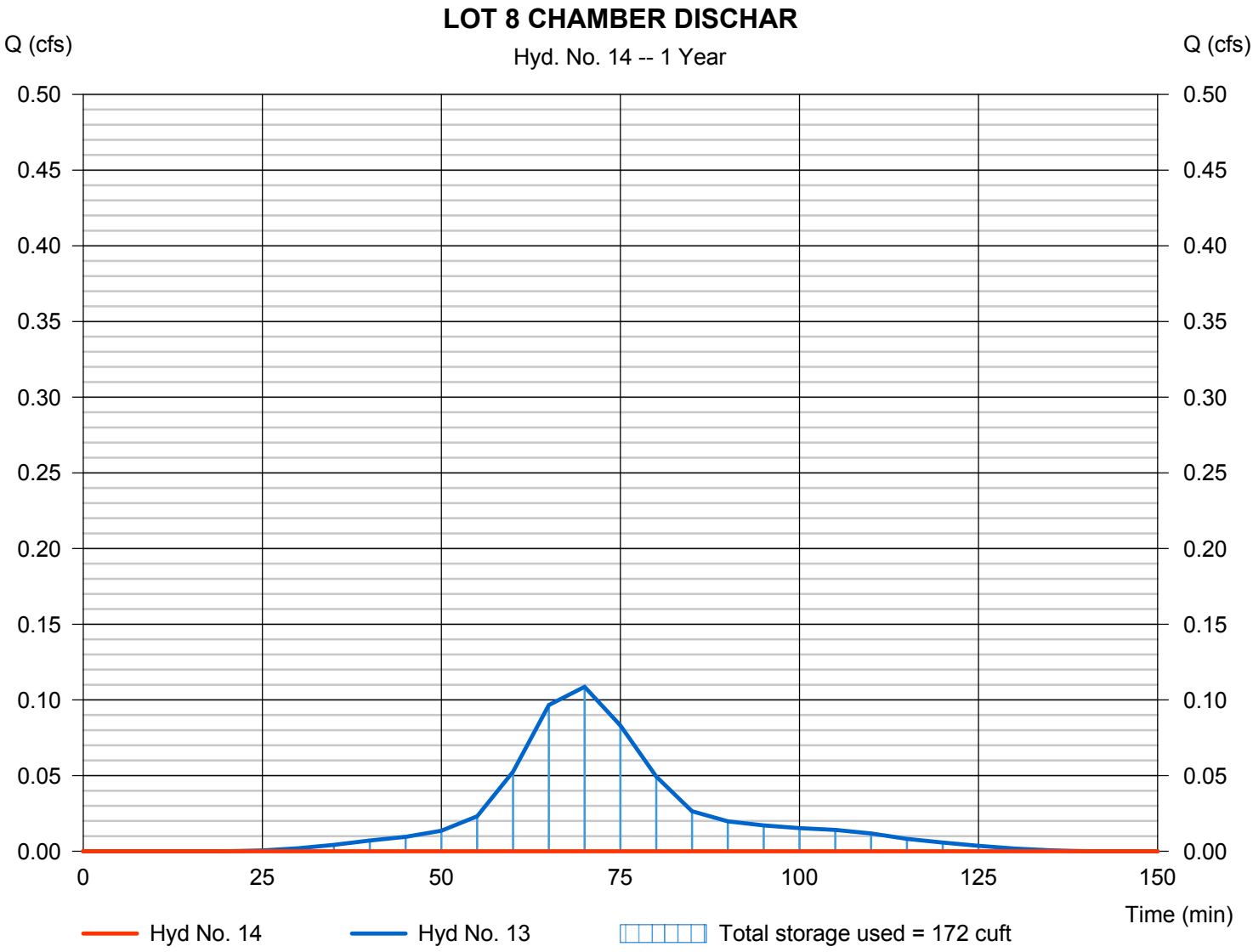
Hydrograph Report

Hyd. No. 14

LOT 8 CHAMBER DISCHAR

Hydrograph type	=	Reservoir	Peak discharge	=	0.000 cfs
Storm frequency	=	1 yrs	Time to peak	=	n/a
Time interval	=	5 min	Hyd. volume	=	0 cuft
Inflow hyd. No.	=	13 - PRDA 1 LOT 8 HOUSE TO CHAMBER	Max. Elevation	=	1.54 ft
Reservoir name	=	CHAMBERS LOT 8	Max. Storage	=	172 cuft

Storage Indication method used.



Pond Report

Pond No. 12 - CHAMBERS LOT 8

Pond Data

UG Chambers -Invert elev. = 1.30 ft, Rise x Span = 1.54 x 2.75 ft, Barrel Len = 60.00 ft, No. Barrels = 2, Slope = 0.00%, Headers = Yes
Encasement -Invert elev. = 1.00 ft, Width = 4.00 ft, Height = 3.00 ft, Voids = 40.00%

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	1.00	n/a	0	0
0.30	1.30	n/a	65	65
0.60	1.60	n/a	132	197
0.90	1.90	n/a	130	327
1.20	2.20	n/a	124	451
1.50	2.50	n/a	114	565
1.80	2.80	n/a	97	662
2.10	3.10	n/a	67	729
2.40	3.40	n/a	65	794
2.70	3.70	n/a	65	859
3.00	4.00	n/a	65	924

Culvert / Orifice Structures

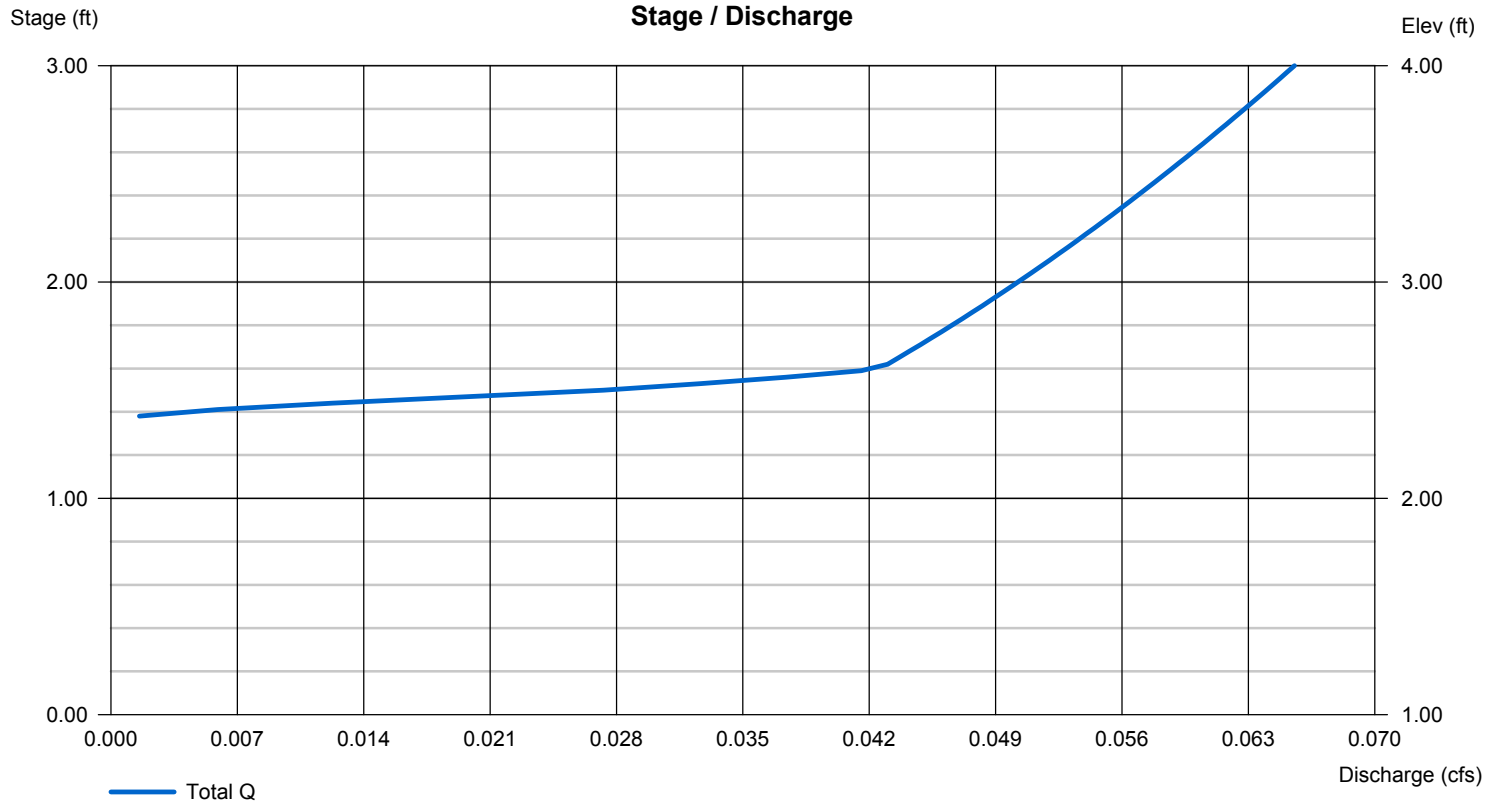
	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 2.00	0.00	0.00	0.00
Span (in)	= 2.00	0.00	0.00	0.00
No. Barrels	= 1	0	0	0
Invert El. (ft)	= 2.35	0.00	0.00	0.00
Length (ft)	= 47.00	0.00	0.00	0.00
Slope (%)	= 2.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	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 Wet area)
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).

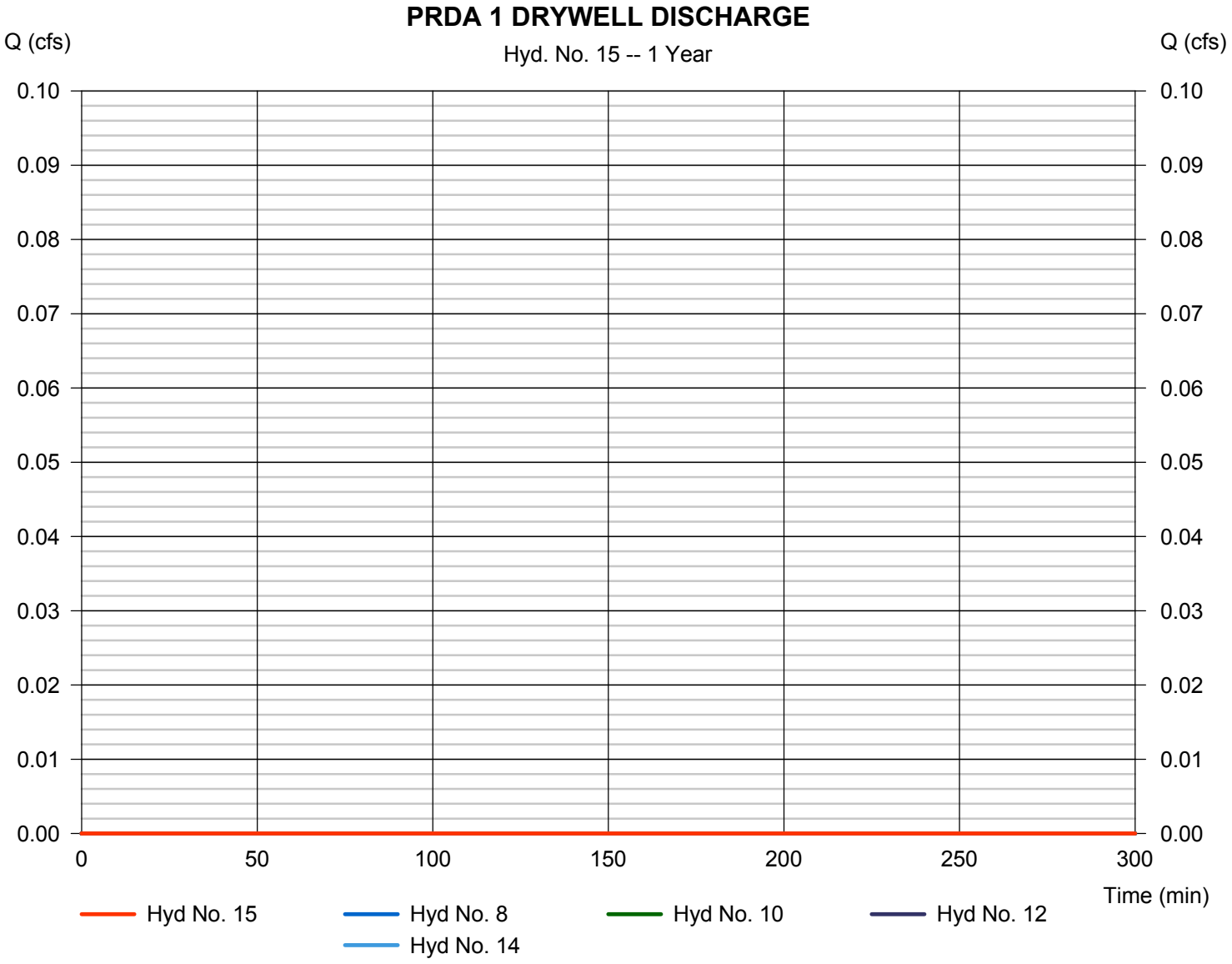


Hydrograph Report

Hyd. No. 15

PRDA 1 DRYWELL DISCHARGE

Hydrograph type	= Combine	Peak discharge	= 0.000 cfs
Storm frequency	= 1 yrs	Time to peak	= n/a
Time interval	= 5 min	Hyd. volume	= 0 cuft
Inflow hyds.	= 8, 10, 12, 14	Contrib. drain. area	= 0.000 ac

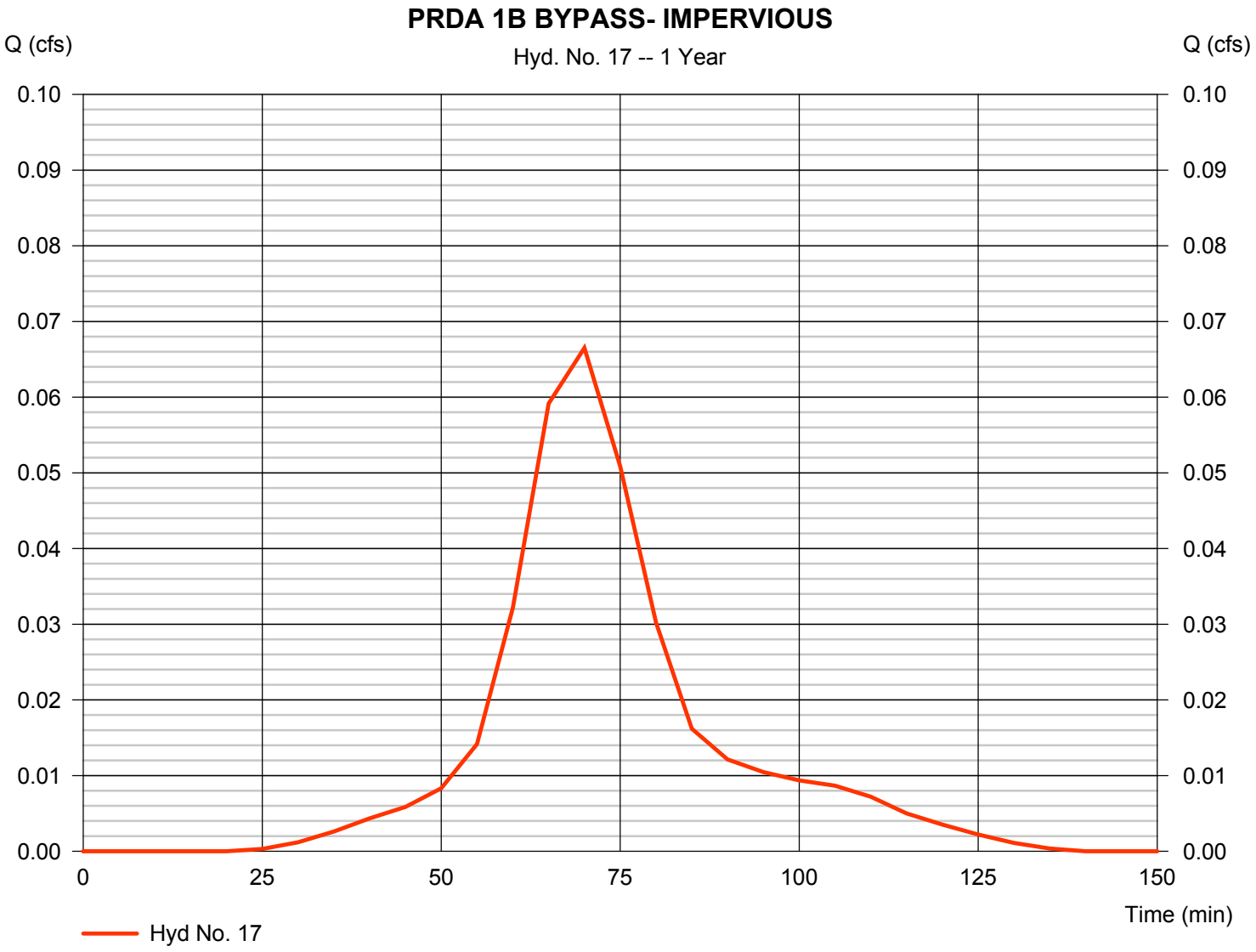


Hydrograph Report

Hyd. No. 17

PRDA 1B BYPASS- IMPERVIOUS

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.066 cfs
Storm frequency	=	1 yrs	Time to peak	=	70 min
Time interval	=	5 min	Hyd. volume	=	106 cuft
Drainage area	=	0.030 ac	Curve number	=	98
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	10.00 min
Total precip.	=	1.25 in	Distribution	=	Custom
Storm duration	=	R:\Hydroflow Standards\1.25in24hr.tcds	Shape factor	=	484

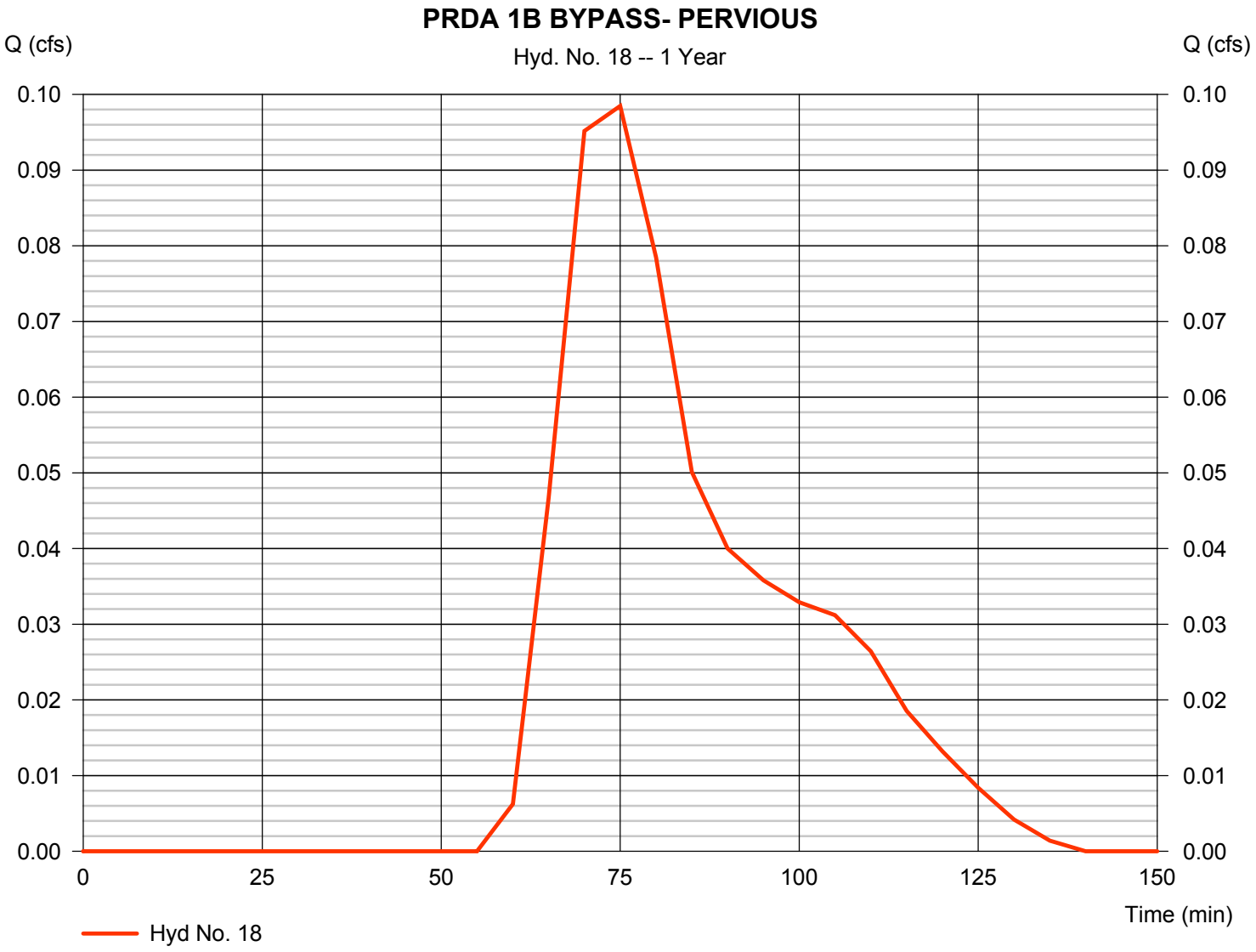


Hydrograph Report

Hyd. No. 18

PRDA 1B BYPASS- PERVIOUS

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.098 cfs
Storm frequency	=	1 yrs	Time to peak	=	75 min
Time interval	=	5 min	Hyd. volume	=	176 cuft
Drainage area	=	0.240 ac	Curve number	=	82
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	10.00 min
Total precip.	=	1.25 in	Distribution	=	Custom
Storm duration	=	R:\Hydroflow Standards\1.25in2hr.tcds	Shape factor	=	484

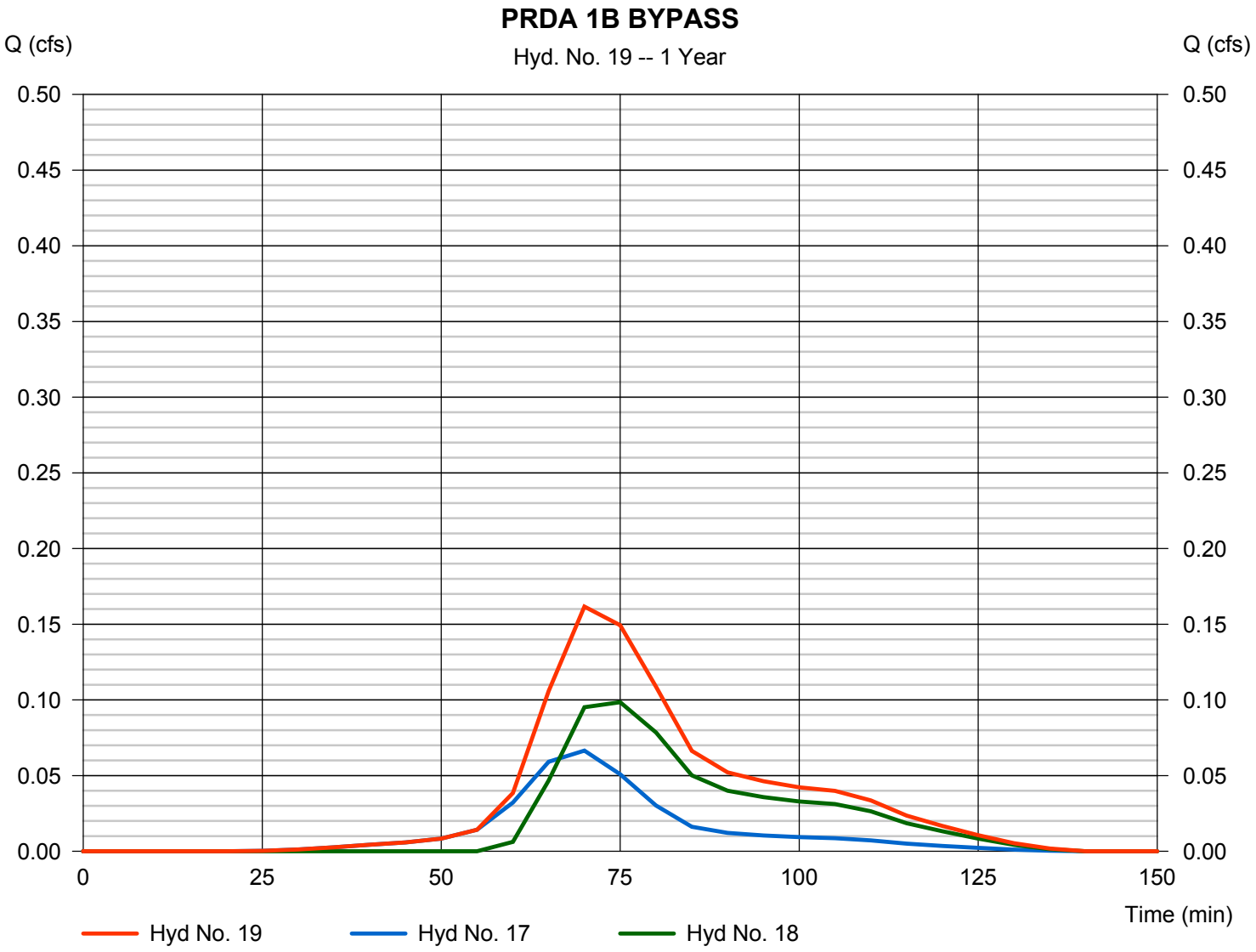


Hydrograph Report

Hyd. No. 19

PRDA 1B BYPASS

Hydrograph type	= Combine	Peak discharge	= 0.162 cfs
Storm frequency	= 1 yrs	Time to peak	= 70 min
Time interval	= 5 min	Hyd. volume	= 282 cuft
Inflow hyds.	= 17, 18	Contrib. drain. area	= 0.270 ac



Hydrograph Report

Hyd. No. 21

PRDA 1A IMPERVIOUS TO BASIN 1

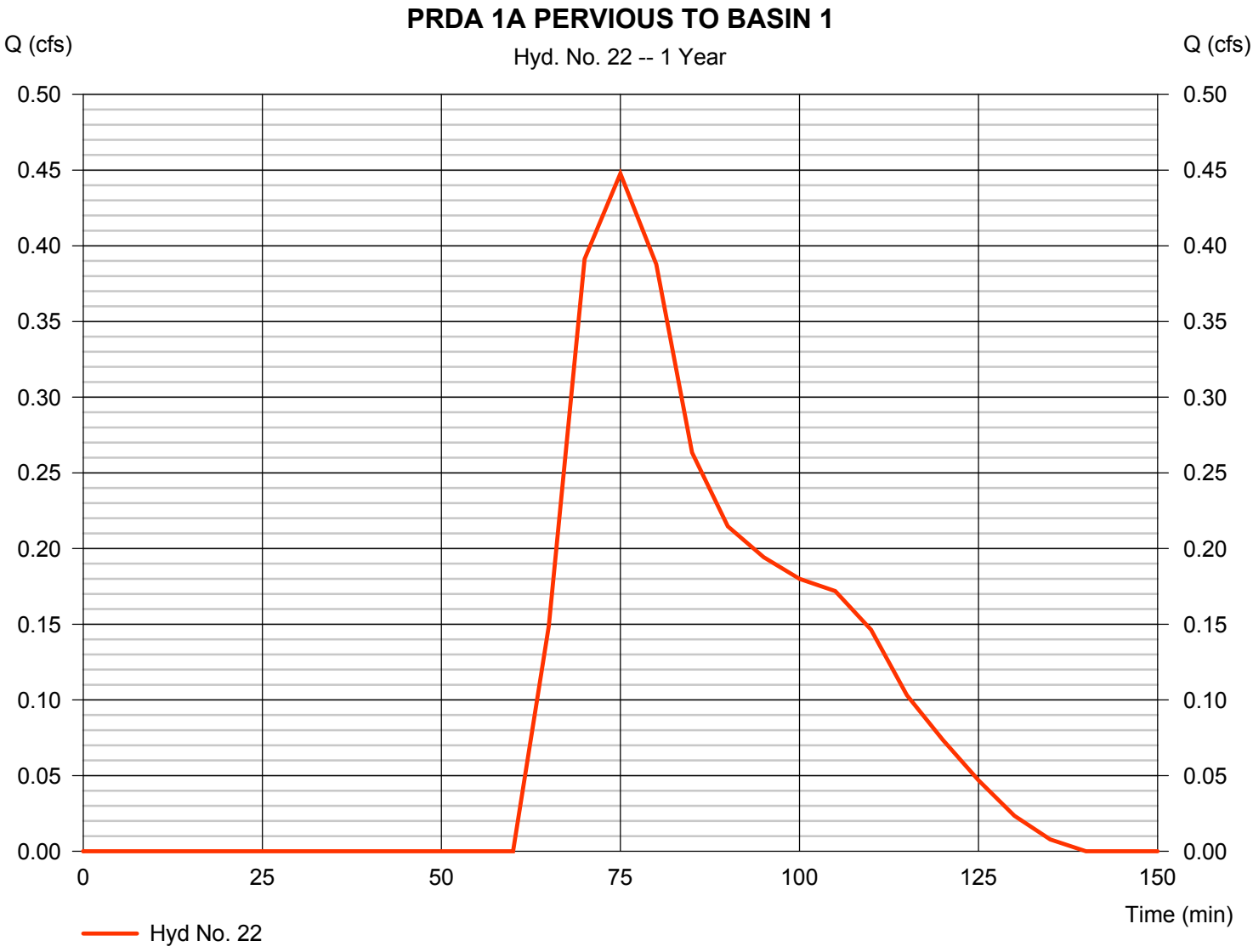
Hydrograph type	=	SCS Runoff	Peak discharge	=	0.909 cfs
Storm frequency	=	1 yrs	Time to peak	=	70 min
Time interval	=	5 min	Hyd. volume	=	1,443 cuft
Drainage area	=	0.410 ac	Curve number	=	98
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	10.00 min
Total precip.	=	1.25 in	Distribution	=	Custom
Storm duration	=	R:\Hydroflow Standards\1.25in24hr.tcds	Shape factor	=	484

Hydrograph Report

Hyd. No. 22

PRDA 1A PERVIOUS TO BASIN 1

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.448 cfs
Storm frequency	=	1 yrs	Time to peak	=	75 min
Time interval	=	5 min	Hyd. volume	=	840 cuft
Drainage area	=	1.650 ac	Curve number	=	79
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	10.00 min
Total precip.	=	1.25 in	Distribution	=	Custom
Storm duration	=	R:\Hydroflow Standards\1.25in24hr.tcds	Shape factor	=	484

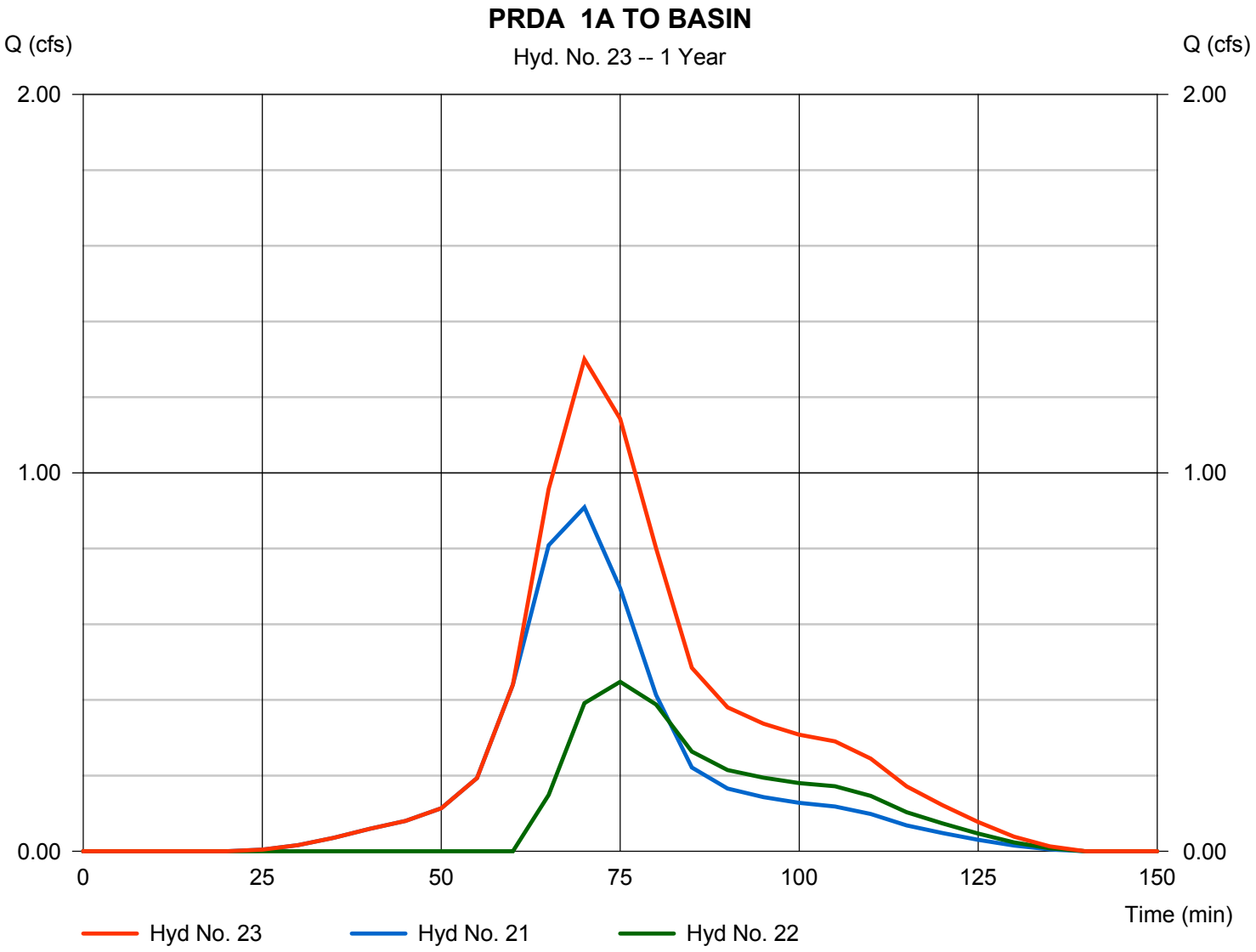


Hydrograph Report

Hyd. No. 23

PRDA 1A TO BASIN

Hydrograph type	= Combine	Peak discharge	= 1.300 cfs
Storm frequency	= 1 yrs	Time to peak	= 70 min
Time interval	= 5 min	Hyd. volume	= 2,283 cuft
Inflow hyds.	= 21, 22	Contrib. drain. area	= 2.060 ac



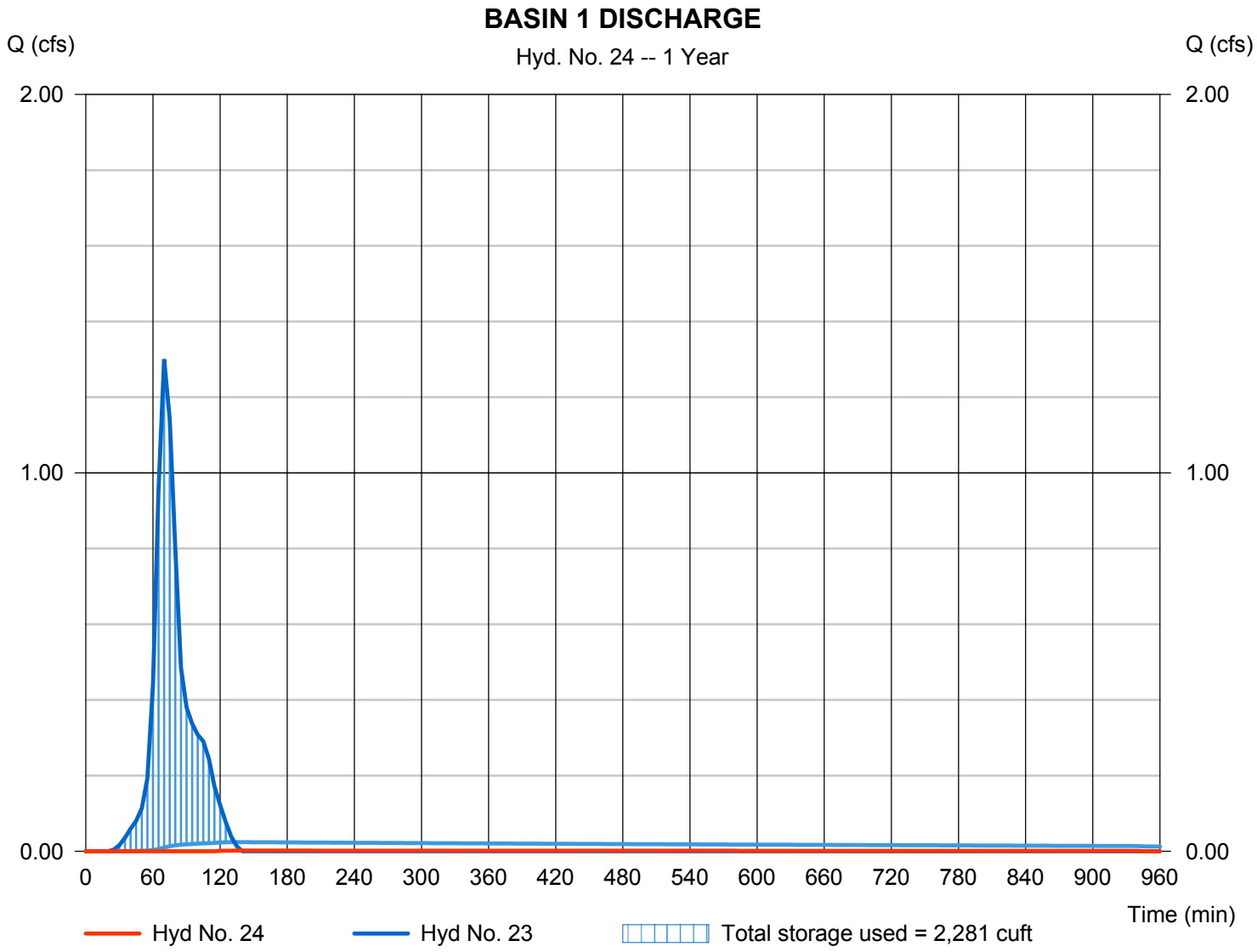
Hydrograph Report

Hyd. No. 24

BASIN 1 DISCHARGE

Hydrograph type	= Reservoir	Peak discharge	= 0.002 cfs
Storm frequency	= 1 yrs	Time to peak	= 140 min
Time interval	= 5 min	Hyd. volume	= 66 cuft
Inflow hyd. No.	= 23 - PRDA 1A TO BASIN	Max. Elevation	= 254.17 ft
Reservoir name	= SWM BASIN 1	Max. Storage	= 2,281 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Pond Report

Pond No. 1 - SWM BASIN 1

Pond Data

Contours -User-defined contour areas. Average end area method used for volume calculation. Begining Elevation = 253.85 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	253.85	7,089	0	0
1.00	254.85	7,089	7,089	7,089
2.00	255.85	7,089	7,089	14,178
2.15	256.00	7,089	1,063	15,241
2.50	256.35	7,089	2,481	17,723
3.50	257.35	7,089	7,089	24,812

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 15.00	6.00	Inactive	0.00
Span (in)	= 15.00	6.00	7.00	0.00
No. Barrels	= 1	1	1	0
Invert El. (ft)	= 253.85	254.20	254.30	0.00
Length (ft)	= 20.00	1.00	1.00	0.00
Slope (%)	= 1.00	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	Yes	Yes	No

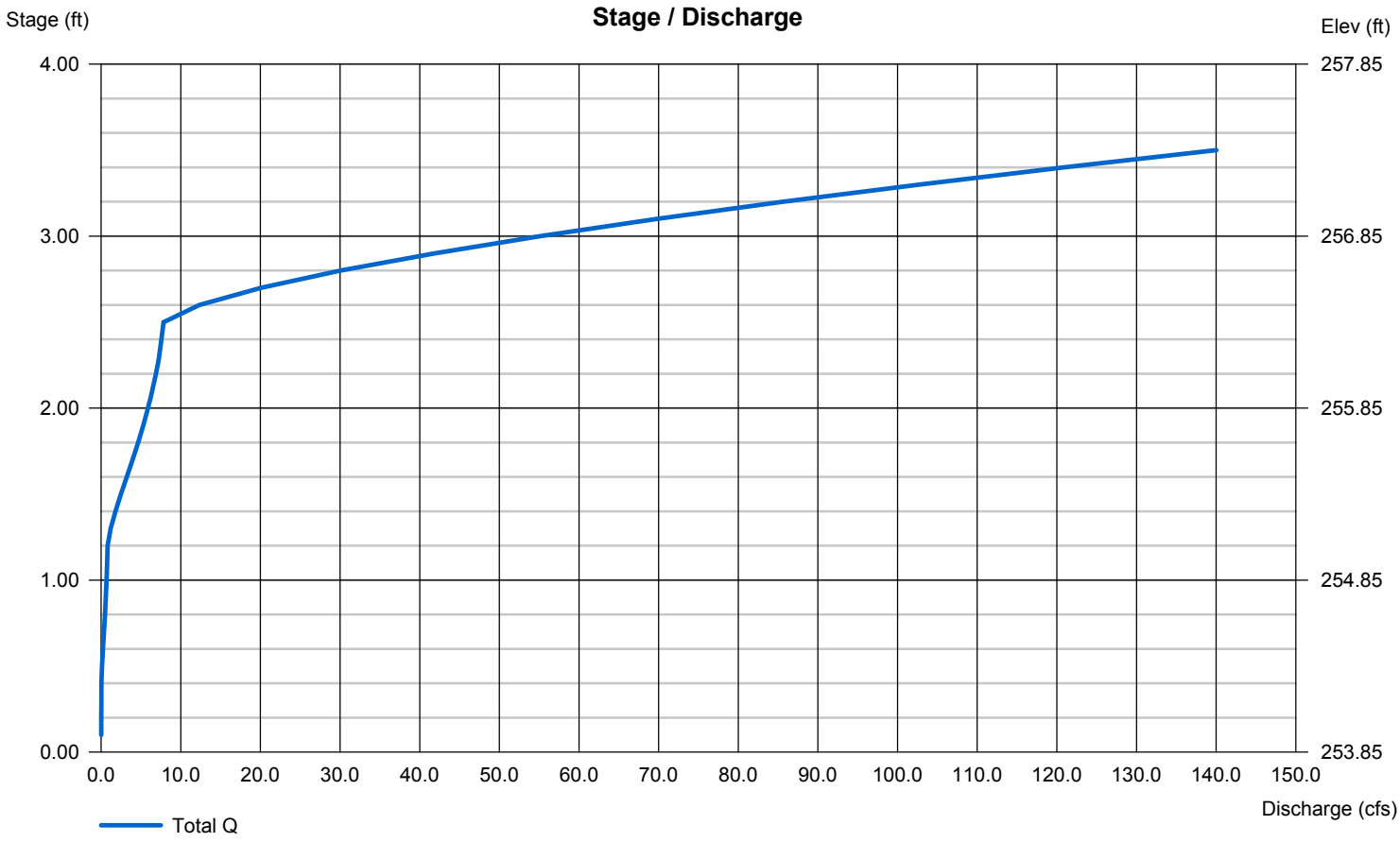
Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 16.00	3.00	50.00	0.00
Crest El. (ft)	= 256.35	255.05	256.35	0.00
Weir Coeff.	= 3.33	3.33	2.60	3.33
Weir Type	= 1	Rect	Broad	---
Multi-Stage	= Yes	Yes	No	No

Exfil.(in/hr) = 0.500 (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).

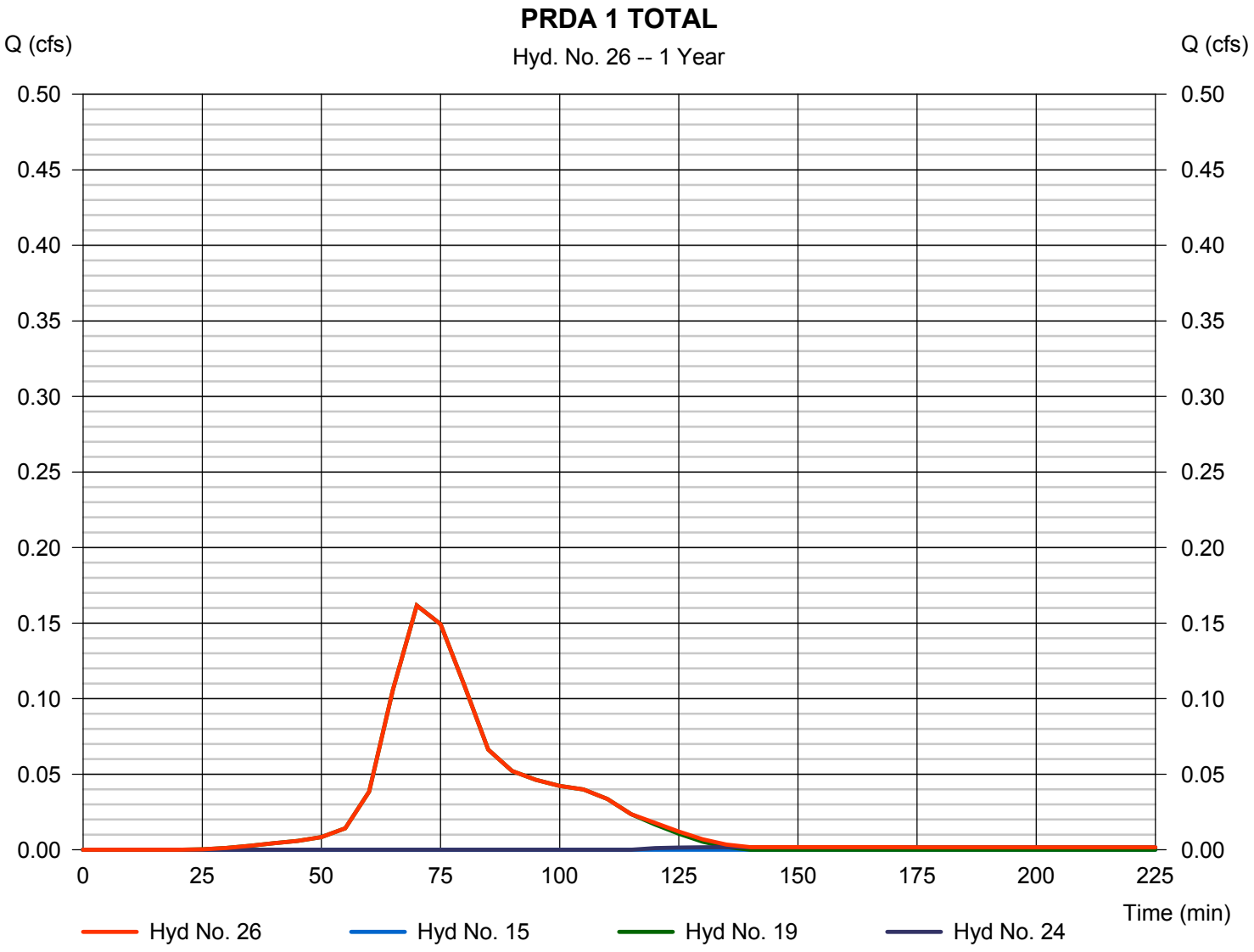


Hydrograph Report

Hyd. No. 26

PRDA 1 TOTAL

Hydrograph type	= Combine	Peak discharge	= 0.162 cfs
Storm frequency	= 1 yrs	Time to peak	= 70 min
Time interval	= 5 min	Hyd. volume	= 347 cuft
Inflow hyds.	= 15, 19, 24	Contrib. drain. area	= 0.000 ac

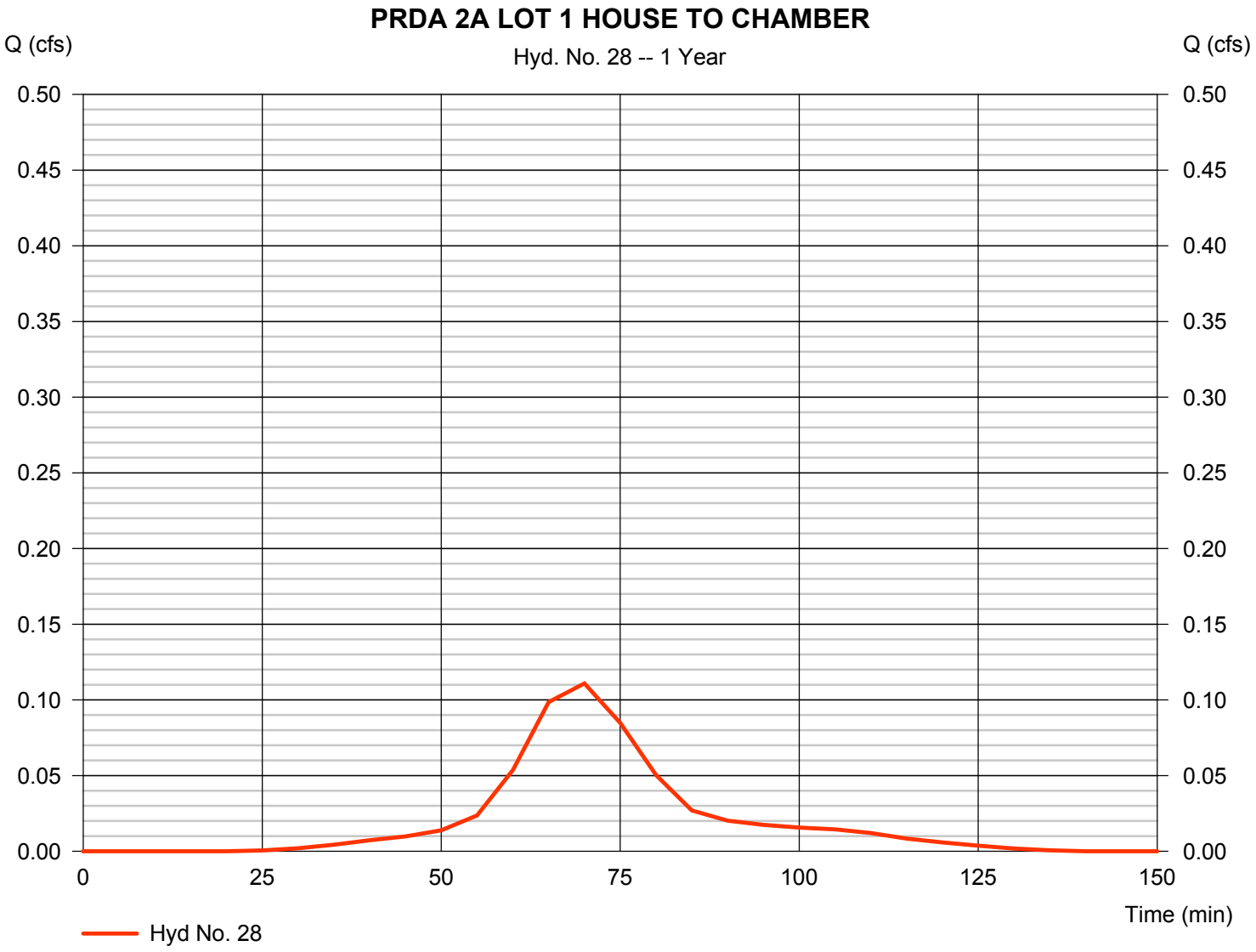


Hydrograph Report

Hyd. No. 28

PRDA 2A LOT 1 HOUSE TO CHAMBER

Hydrograph type	= SCS Runoff	Peak discharge	= 0.111 cfs
Storm frequency	= 1 yrs	Time to peak	= 70 min
Time interval	= 5 min	Hyd. volume	= 176 cuft
Drainage area	= 0.050 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.00 min
Total precip.	= 1.25 in	Distribution	= Custom
Storm duration	= R:\Hydroflow Standards\1.25in24hr.tcds	Shape factor	= 484



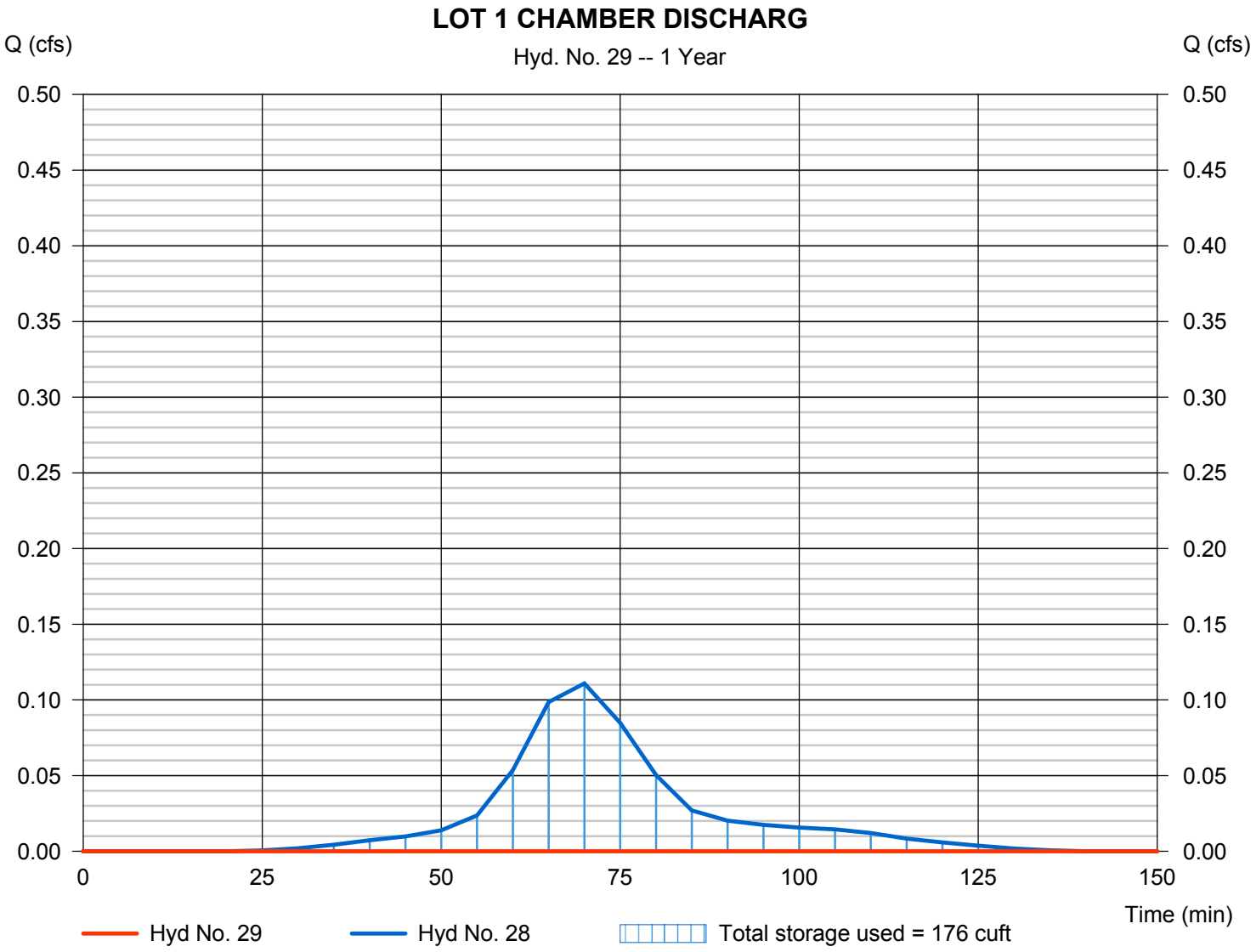
Hydrograph Report

Hyd. No. 29

LOT 1 CHAMBER DISCHARG

Hydrograph type	=	Reservoir	Peak discharge	=	0.000 cfs
Storm frequency	=	1 yrs	Time to peak	=	n/a
Time interval	=	5 min	Hyd. volume	=	0 cuft
Inflow hyd. No.	=	28 - PRDA 2A LOT 1 HOUSE TO CHAMBER	Max. Elevation	=	1.55 ft
Reservoir name	=	CHAMBERS LOT 1	Max. Storage	=	176 cuft

Storage Indication method used.



Pond Report

Pond No. 4 - CHAMBERS LOT 1

Pond Data

UG Chambers -Invert elev. = 1.30 ft, Rise x Span = 1.54 x 2.75 ft, Barrel Len = 60.00 ft, No. Barrels = 2, Slope = 0.00%, Headers = Yes
Encasement -Invert elev. = 1.00 ft, Width = 4.00 ft, Height = 3.00 ft, Voids = 40.00%

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	1.00	n/a	0	0
0.30	1.30	n/a	65	65
0.60	1.60	n/a	132	197
0.90	1.90	n/a	130	327
1.20	2.20	n/a	124	451
1.50	2.50	n/a	114	565
1.80	2.80	n/a	97	662
2.10	3.10	n/a	67	729
2.40	3.40	n/a	65	794
2.70	3.70	n/a	65	859
3.00	4.00	n/a	65	924

Culvert / Orifice Structures

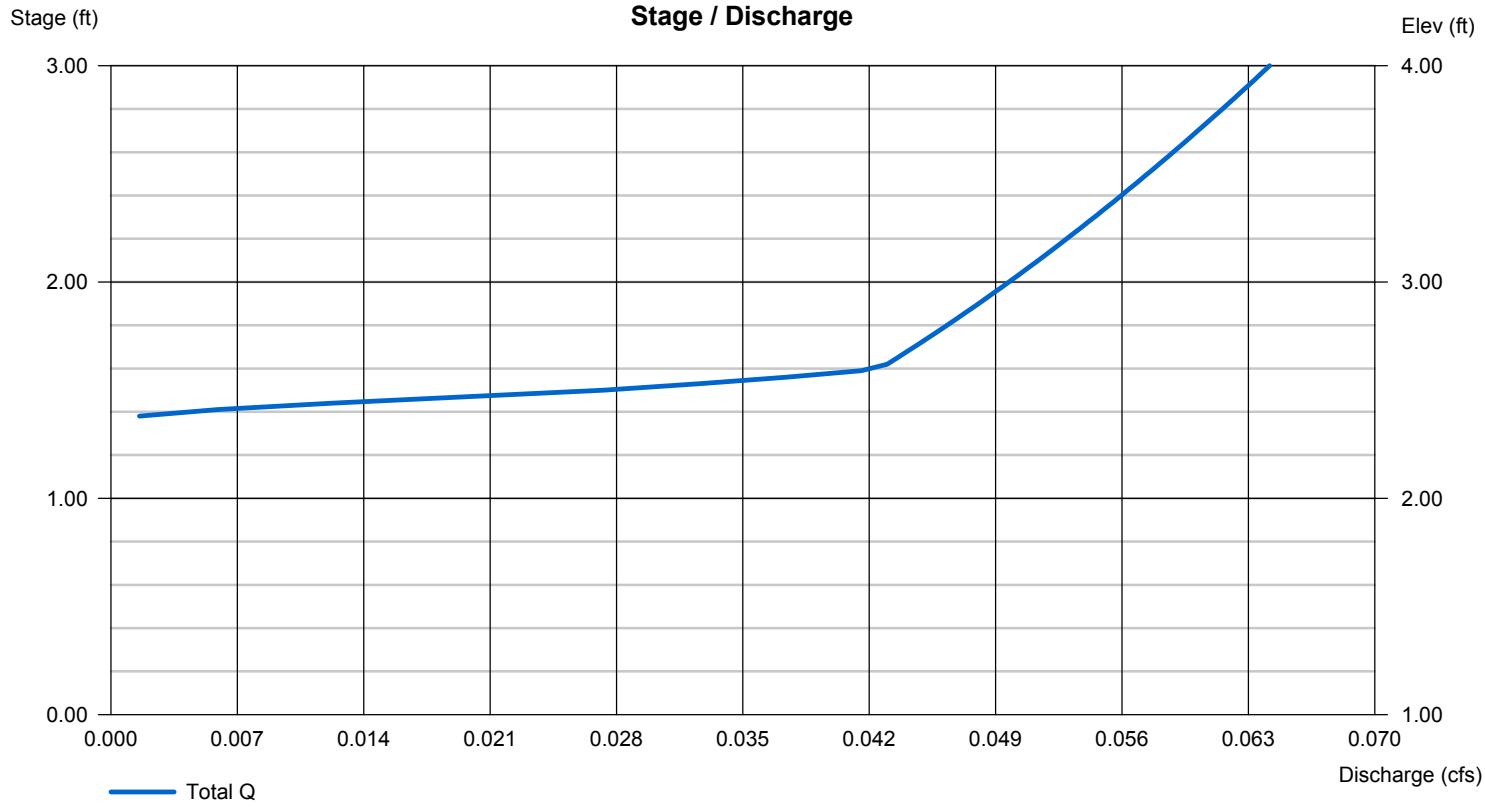
	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 2.00	0.00	0.00	0.00
Span (in)	= 2.00	0.00	0.00	0.00
No. Barrels	= 1	0	0	0
Invert El. (ft)	= 2.35	0.00	0.00	0.00
Length (ft)	= 51.00	0.00	0.00	0.00
Slope (%)	= 2.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	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 Wet area)
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).

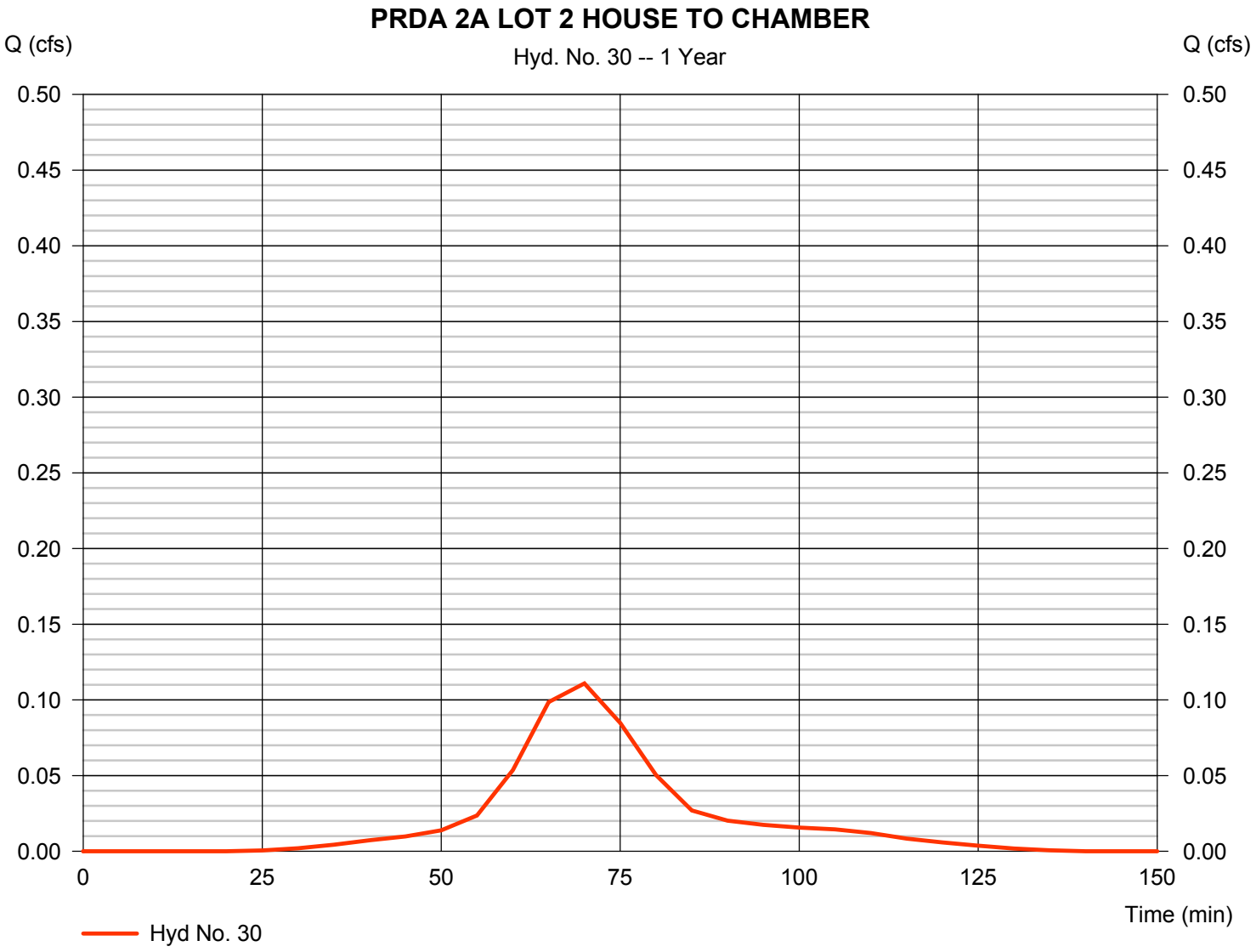


Hydrograph Report

Hyd. No. 30

PRDA 2A LOT 2 HOUSE TO CHAMBER

Hydrograph type	= SCS Runoff	Peak discharge	= 0.111 cfs
Storm frequency	= 1 yrs	Time to peak	= 70 min
Time interval	= 5 min	Hyd. volume	= 176 cuft
Drainage area	= 0.050 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.00 min
Total precip.	= 1.25 in	Distribution	= Custom
Storm duration	= R:\Hydroflow Standards\1.25in24hr.tcds	Shape factor	= 484



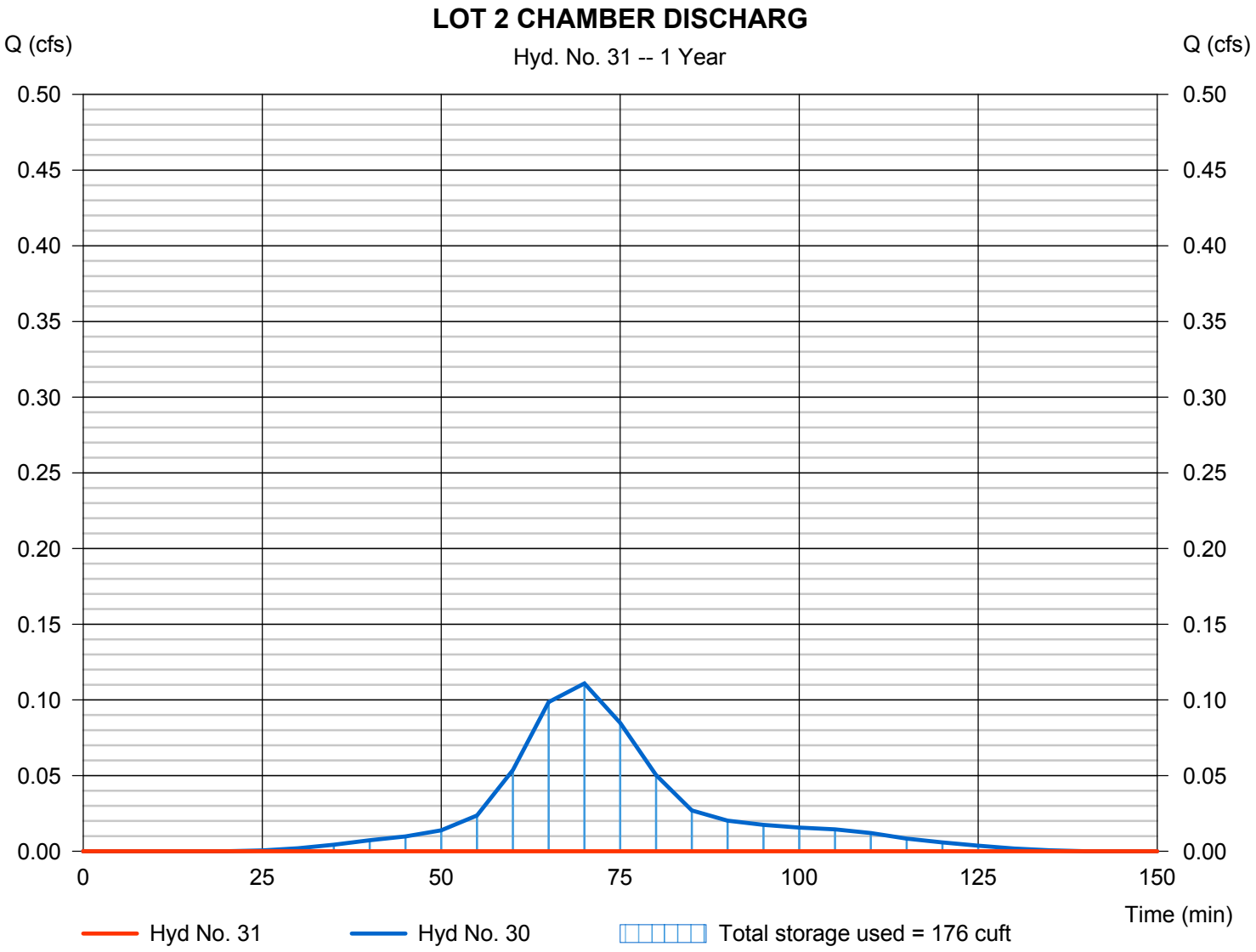
Hydrograph Report

Hyd. No. 31

LOT 2 CHAMBER DISCHARG

Hydrograph type	=	Reservoir	Peak discharge	=	0.000 cfs
Storm frequency	=	1 yrs	Time to peak	=	n/a
Time interval	=	5 min	Hyd. volume	=	0 cuft
Inflow hyd. No.	=	30 - PRDA 2A LOT 2 HOUSE TO CHAMBER	Max. Elevation	=	1.55 ft
Reservoir name	=	CHAMBERS LOT 2	Max. Storage	=	176 cuft

Storage Indication method used.



Pond Report

Pond No. 5 - CHAMBERS LOT 2

Pond Data

UG Chambers -Invert elev. = 1.30 ft, Rise x Span = 1.54 x 2.75 ft, Barrel Len = 60.00 ft, No. Barrels = 2, Slope = 0.00%, Headers = Yes
Encasement -Invert elev. = 1.00 ft, Width = 4.00 ft, Height = 3.00 ft, Voids = 40.00%

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	1.00	n/a	0	0
0.30	1.30	n/a	65	65
0.60	1.60	n/a	132	197
0.90	1.90	n/a	130	327
1.20	2.20	n/a	124	451
1.50	2.50	n/a	114	565
1.80	2.80	n/a	97	662
2.10	3.10	n/a	67	729
2.40	3.40	n/a	65	794
2.70	3.70	n/a	65	859
3.00	4.00	n/a	65	924

Culvert / Orifice Structures

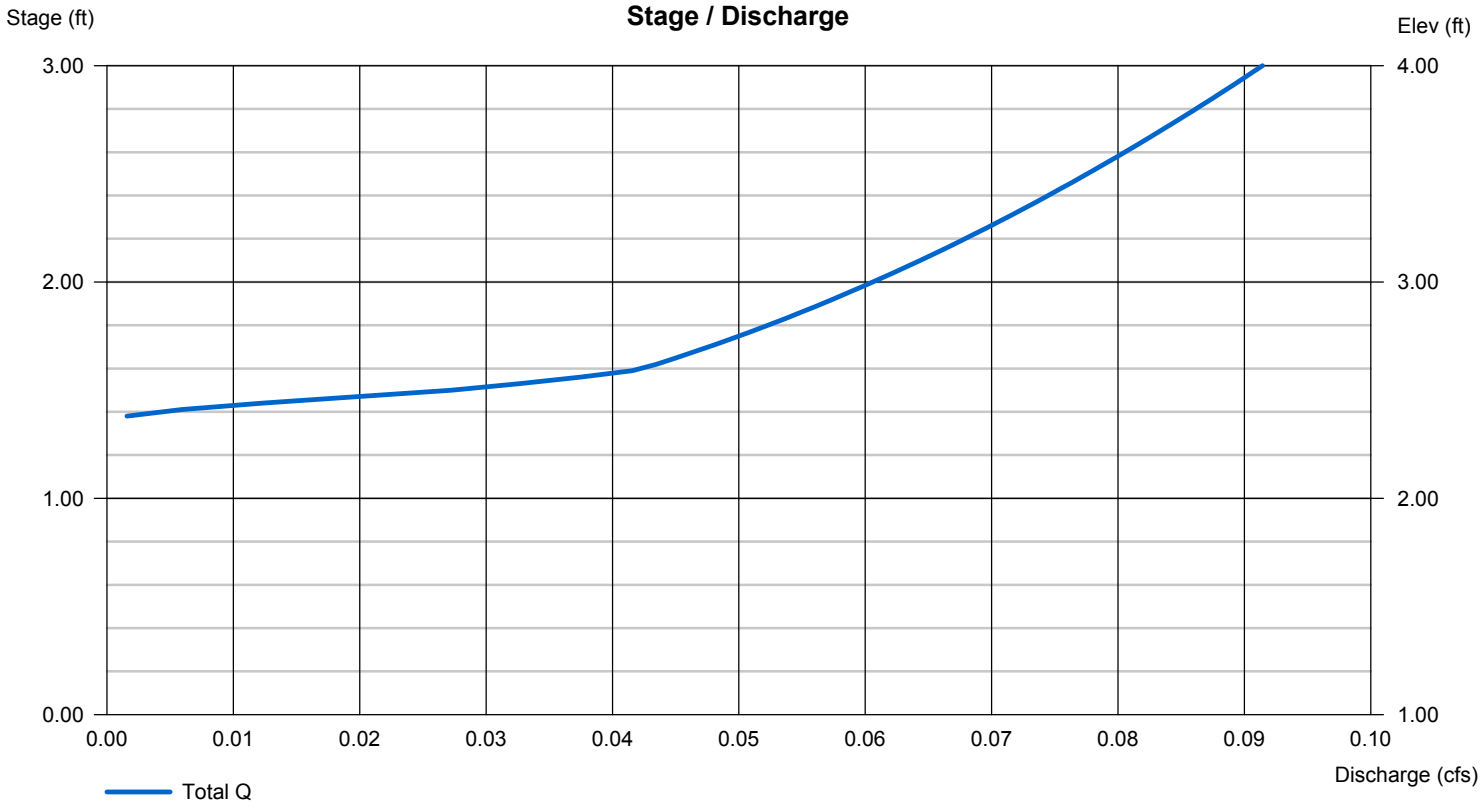
	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 2.00	0.00	0.00	0.00
Span (in)	= 2.00	0.00	0.00	0.00
No. Barrels	= 1	0	0	0
Invert El. (ft)	= 2.35	0.00	0.00	0.00
Length (ft)	= 15.00	0.00	0.00	0.00
Slope (%)	= 2.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	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 Wet area)
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).

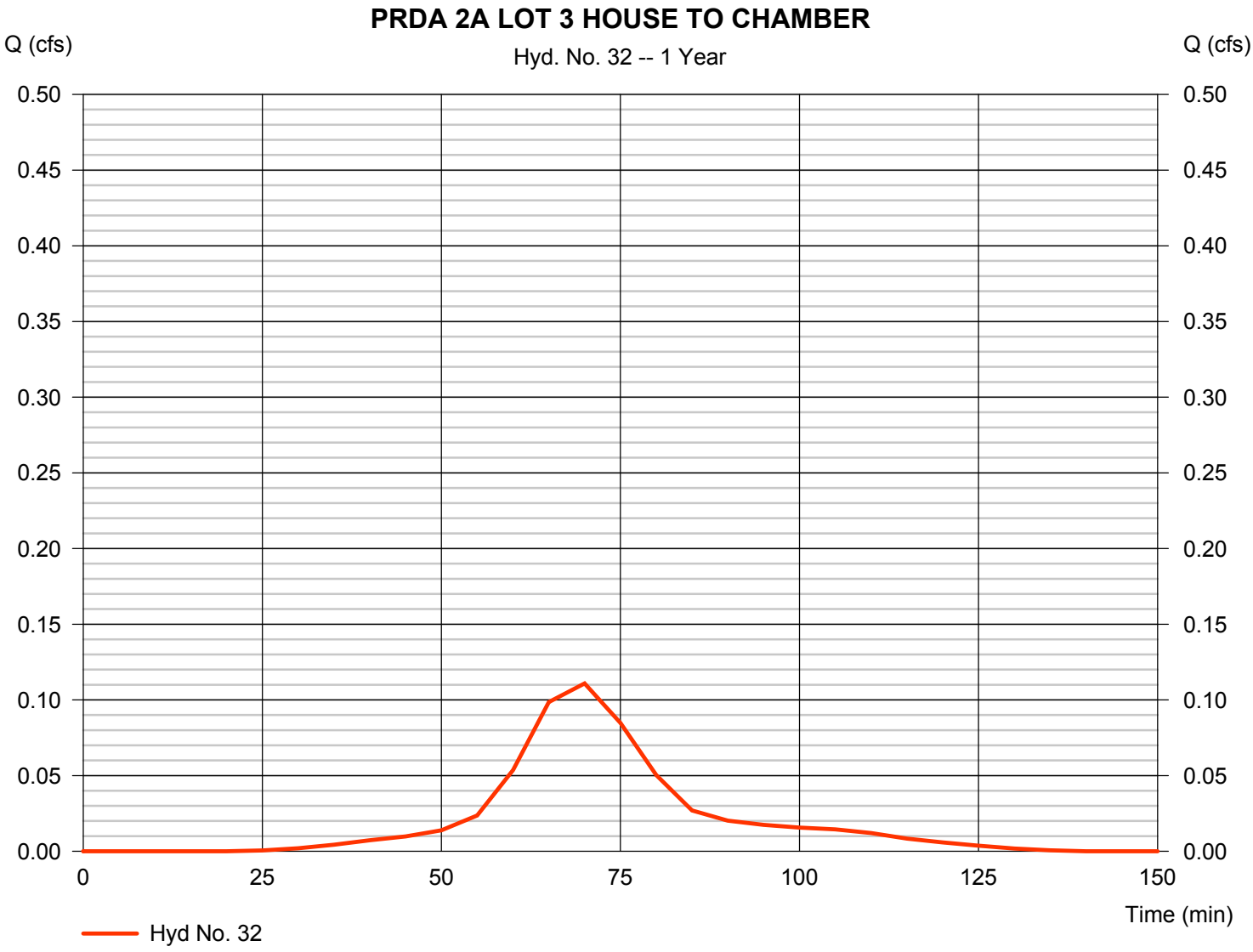


Hydrograph Report

Hyd. No. 32

PRDA 2A LOT 3 HOUSE TO CHAMBER

Hydrograph type	= SCS Runoff	Peak discharge	= 0.111 cfs
Storm frequency	= 1 yrs	Time to peak	= 70 min
Time interval	= 5 min	Hyd. volume	= 176 cuft
Drainage area	= 0.050 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.00 min
Total precip.	= 1.25 in	Distribution	= Custom
Storm duration	= R:\Hydroflow Standards\1.25in24hr.tcds	Shape factor	= 484



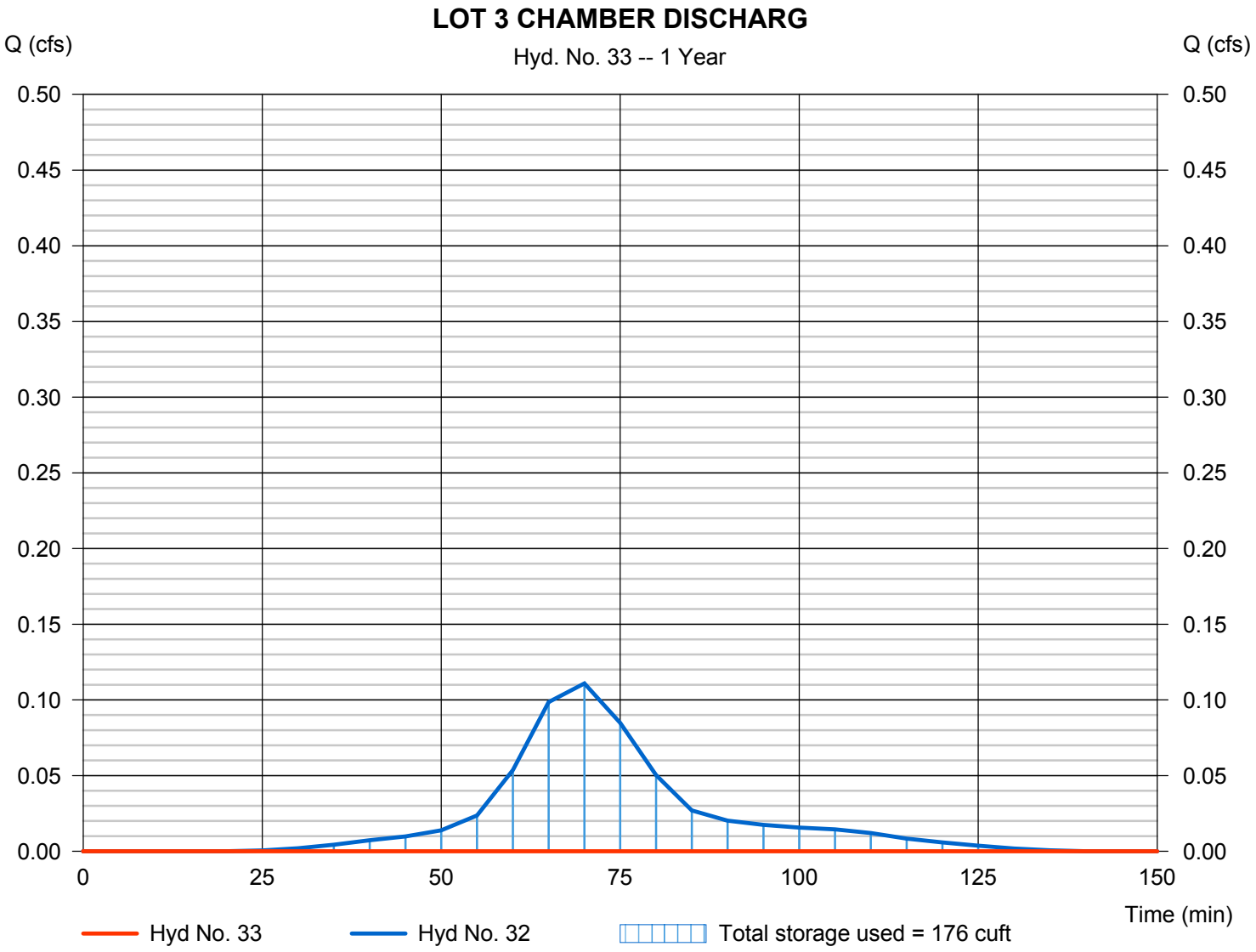
Hydrograph Report

Hyd. No. 33

LOT 3 CHAMBER DISCHARG

Hydrograph type	=	Reservoir	Peak discharge	=	0.000 cfs
Storm frequency	=	1 yrs	Time to peak	=	n/a
Time interval	=	5 min	Hyd. volume	=	0 cuft
Inflow hyd. No.	=	32 - PRDA 2A LOT 3 HOUSE TO CHAMBER	Max. Elevation	=	1.55 ft
Reservoir name	=	CHAMBERS LOT 3	Max. Storage	=	176 cuft

Storage Indication method used.



Pond Report

Pond No. 6 - CHAMBERS LOT 3

Pond Data

UG Chambers -Invert elev. = 1.30 ft, Rise x Span = 1.54 x 2.75 ft, Barrel Len = 60.00 ft, No. Barrels = 2, Slope = 0.00%, Headers = Yes
Encasement -Invert elev. = 1.00 ft, Width = 4.00 ft, Height = 3.00 ft, Voids = 40.00%

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	1.00	n/a	0	0
0.30	1.30	n/a	65	65
0.60	1.60	n/a	132	197
0.90	1.90	n/a	130	327
1.20	2.20	n/a	124	451
1.50	2.50	n/a	114	565
1.80	2.80	n/a	97	662
2.10	3.10	n/a	67	729
2.40	3.40	n/a	65	794
2.70	3.70	n/a	65	859
3.00	4.00	n/a	65	924

Culvert / Orifice Structures

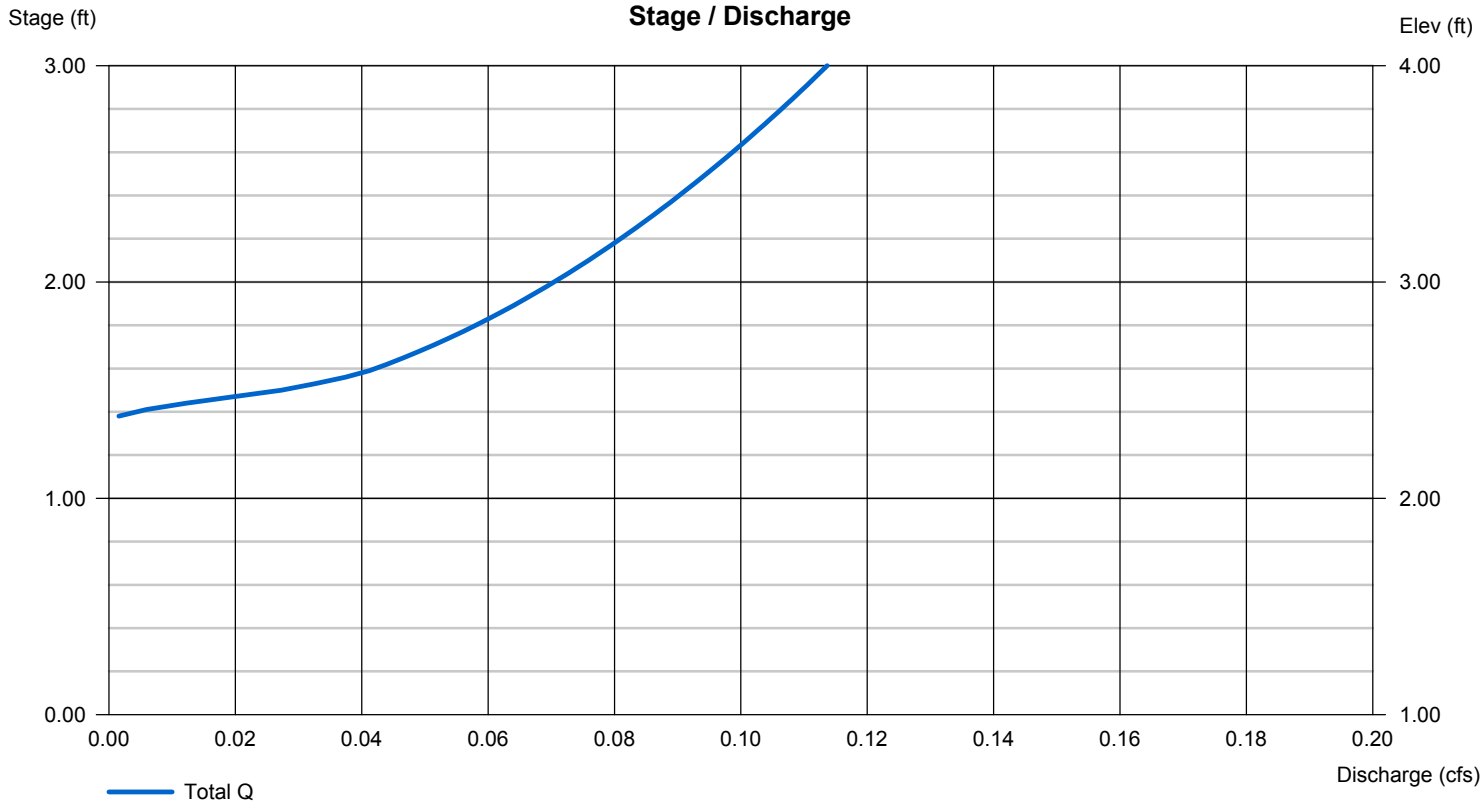
	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 2.00	0.00	0.00	0.00
Span (in)	= 2.00	0.00	0.00	0.00
No. Barrels	= 1	0	0	0
Invert El. (ft)	= 2.35	0.00	0.00	0.00
Length (ft)	= 7.00	0.00	0.00	0.00
Slope (%)	= 2.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

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 Wet area)
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).

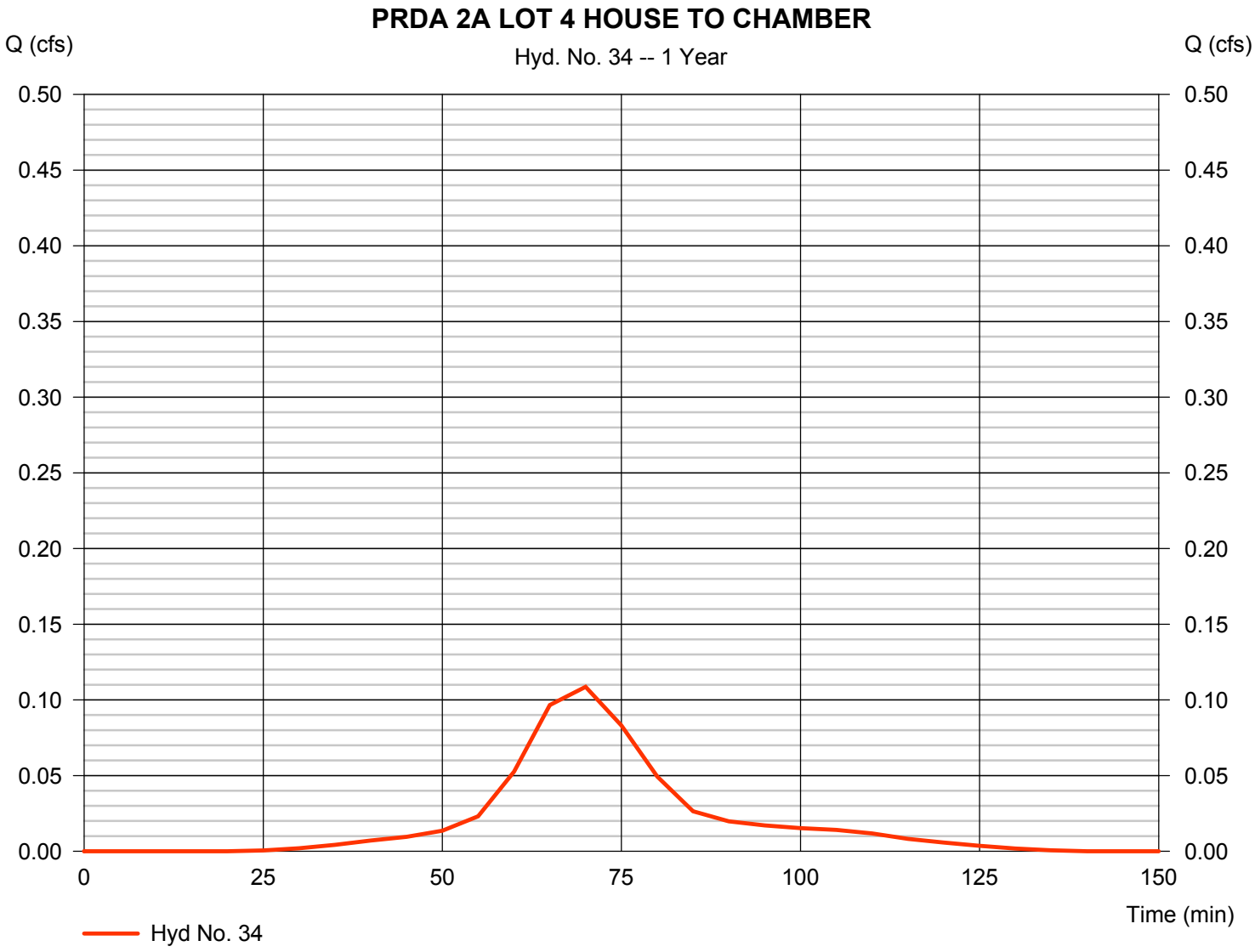


Hydrograph Report

Hyd. No. 34

PRDA 2A LOT 4 HOUSE TO CHAMBER

Hydrograph type	= SCS Runoff	Peak discharge	= 0.109 cfs
Storm frequency	= 1 yrs	Time to peak	= 70 min
Time interval	= 5 min	Hyd. volume	= 172 cuft
Drainage area	= 0.049 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.00 min
Total precip.	= 1.25 in	Distribution	= Custom
Storm duration	= R:\Hydroflow Standards\1.25in24hr.tcds	Shape factor	= 484



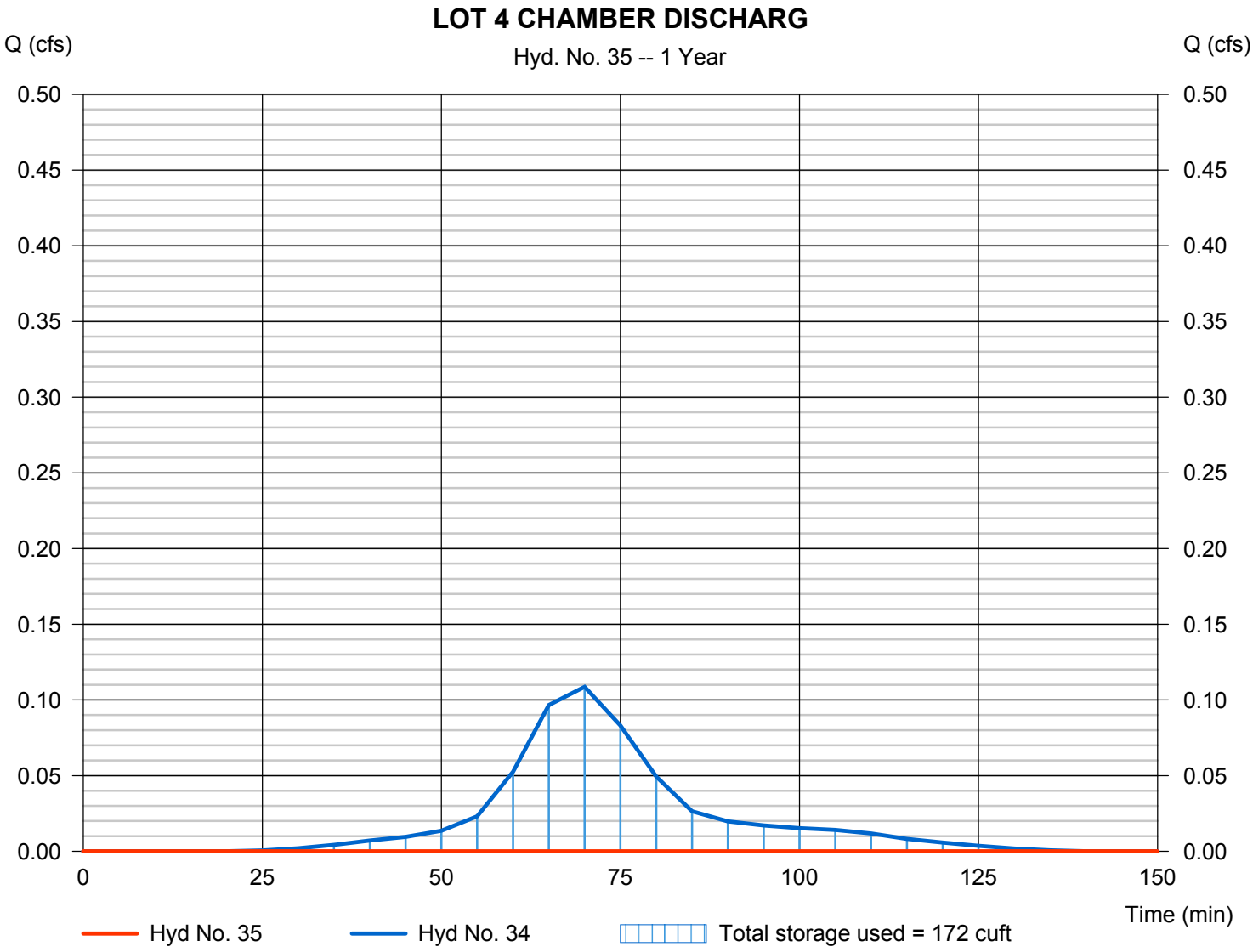
Hydrograph Report

Hyd. No. 35

LOT 4 CHAMBER DISCHARG

Hydrograph type	=	Reservoir	Peak discharge	=	0.000 cfs
Storm frequency	=	1 yrs	Time to peak	=	n/a
Time interval	=	5 min	Hyd. volume	=	0 cuft
Inflow hyd. No.	=	34 - PRDA 2A LOT 4 HOUSE TO CHAMBER	Max. Elevation	=	1.54 ft
Reservoir name	=	CHAMBERS LOT 4	Max. Storage	=	172 cuft

Storage Indication method used.



Pond Report

Pond No. 7 - CHAMBERS LOT 4

Pond Data

UG Chambers -Invert elev. = 1.30 ft, Rise x Span = 1.54 x 2.75 ft, Barrel Len = 60.00 ft, No. Barrels = 2, Slope = 0.00%, Headers = Yes
Encasement -Invert elev. = 1.00 ft, Width = 4.00 ft, Height = 3.00 ft, Voids = 40.00%

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	1.00	n/a	0	0
0.30	1.30	n/a	65	65
0.60	1.60	n/a	132	197
0.90	1.90	n/a	130	327
1.20	2.20	n/a	124	451
1.50	2.50	n/a	114	565
1.80	2.80	n/a	97	662
2.10	3.10	n/a	67	729
2.40	3.40	n/a	65	794
2.70	3.70	n/a	65	859
3.00	4.00	n/a	65	924

Culvert / Orifice Structures

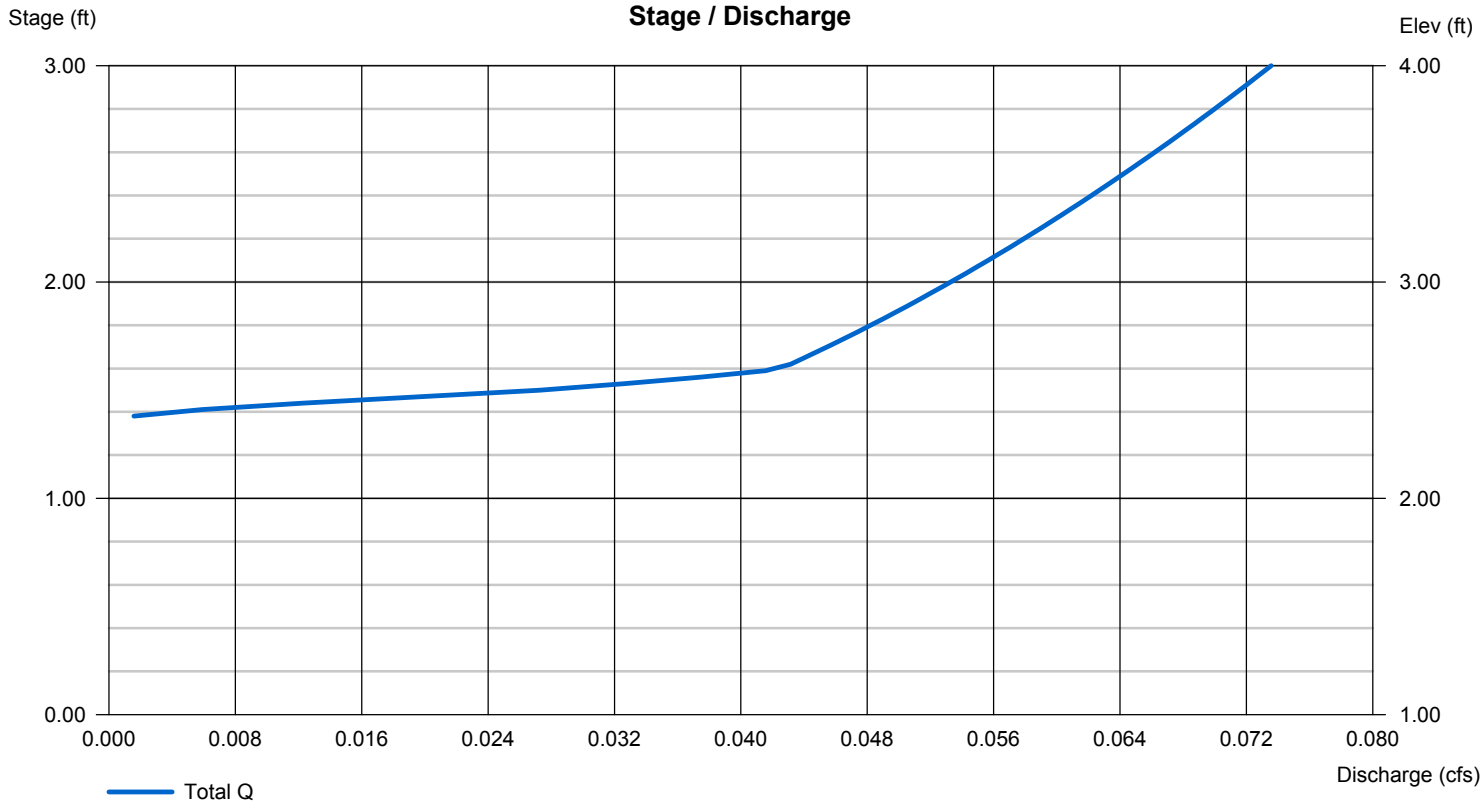
	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 2.00	0.00	0.00	0.00
Span (in)	= 2.00	0.00	0.00	0.00
No. Barrels	= 1	0	0	0
Invert El. (ft)	= 2.35	0.00	0.00	0.00
Length (ft)	= 31.00	0.00	0.00	0.00
Slope (%)	= 2.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	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 Wet area)
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).

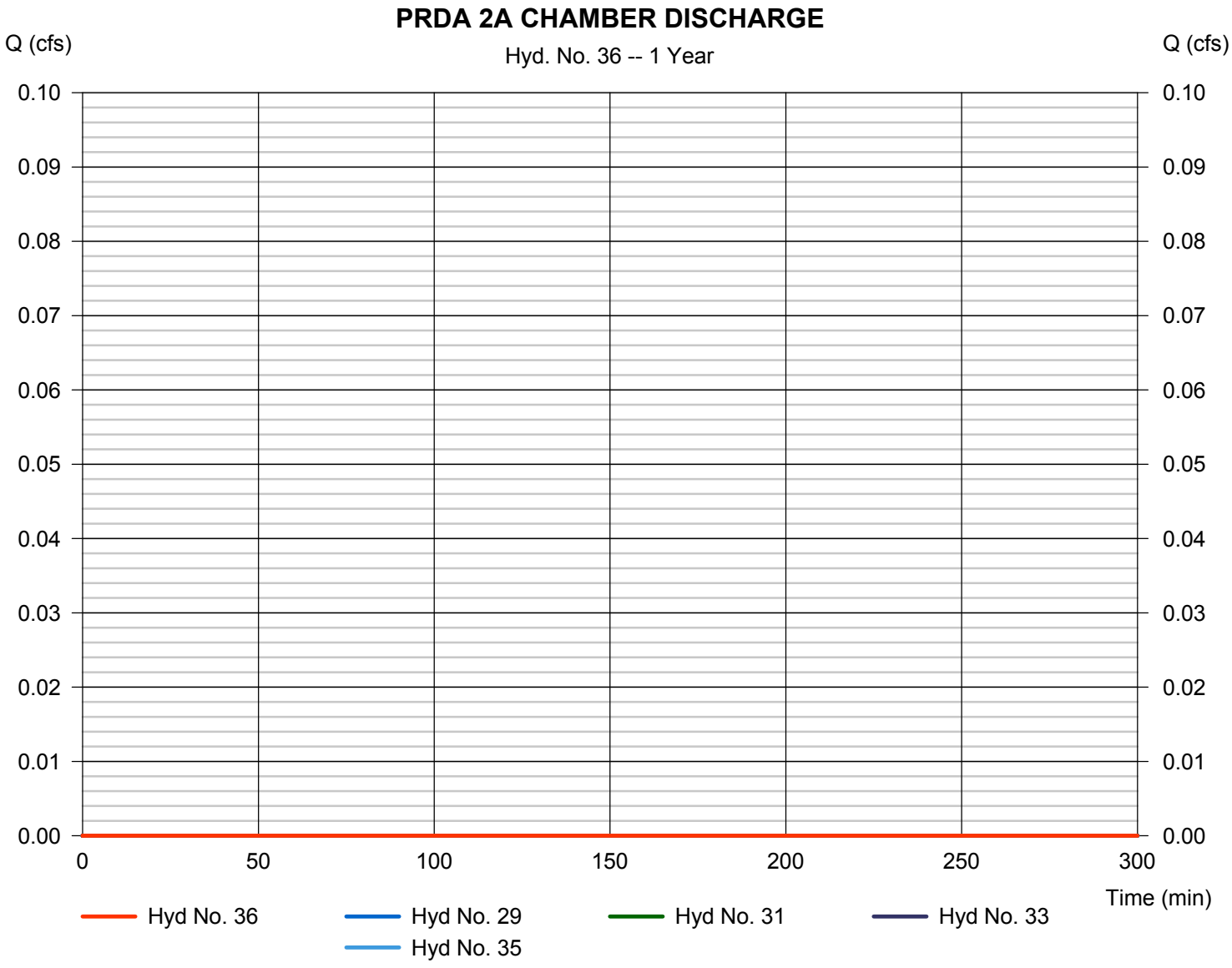


Hydrograph Report

Hyd. No. 36

PRDA 2A CHAMBER DISCHARGE

Hydrograph type	= Combine	Peak discharge	= 0.000 cfs
Storm frequency	= 1 yrs	Time to peak	= n/a
Time interval	= 5 min	Hyd. volume	= 0 cuft
Inflow hyds.	= 29, 31, 33, 35	Contrib. drain. area	= 0.000 ac

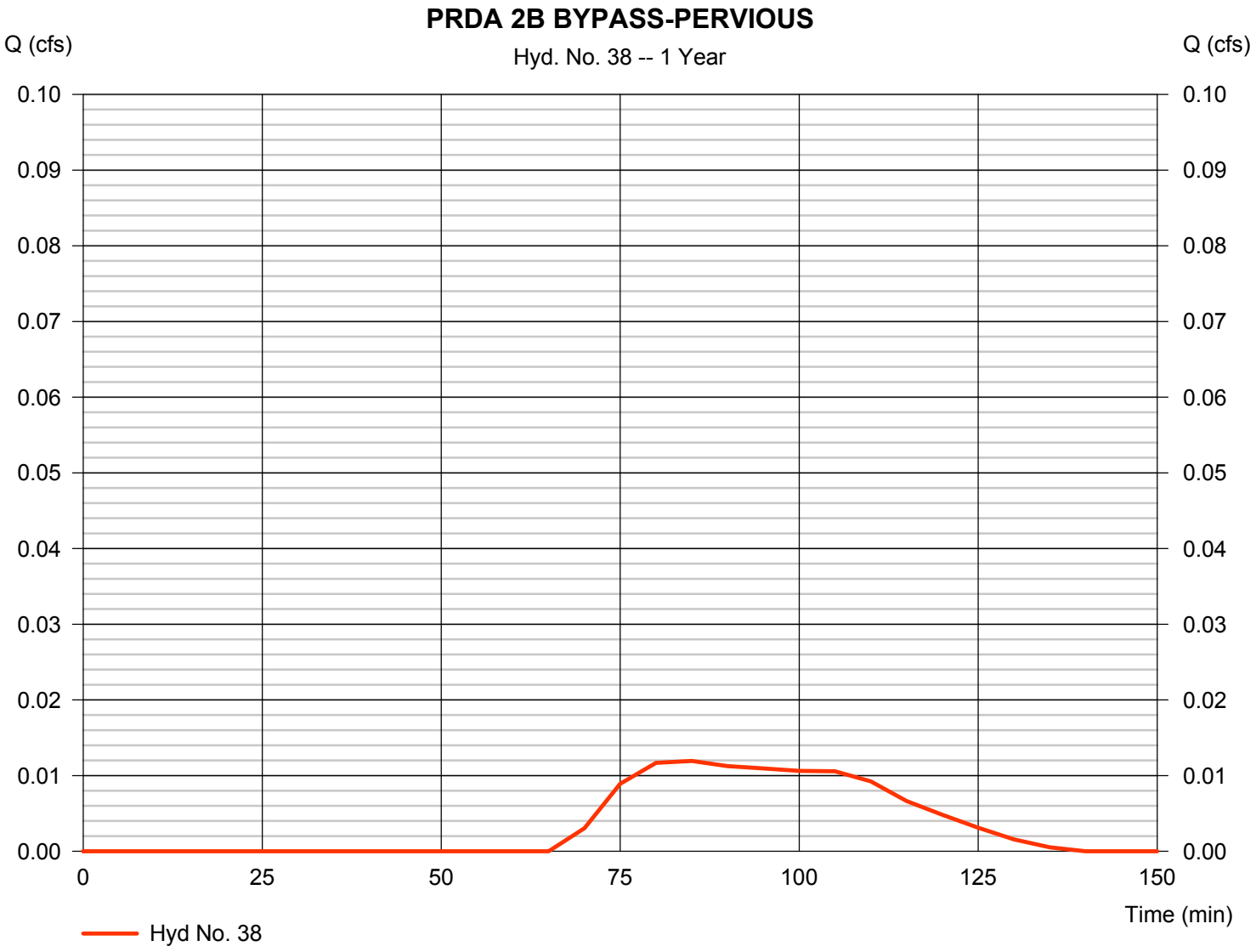


Hydrograph Report

Hyd. No. 38

PRDA 2B BYPASS-PERVIOUS

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.012 cfs
Storm frequency	=	1 yrs	Time to peak	=	85 min
Time interval	=	5 min	Hyd. volume	=	31 cuft
Drainage area	=	0.230 ac	Curve number	=	71
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	10.00 min
Total precip.	=	1.25 in	Distribution	=	Custom
Storm duration	=	R:\Hydroflow Standards\1.25in24hr.tcds	Shape factor	=	484

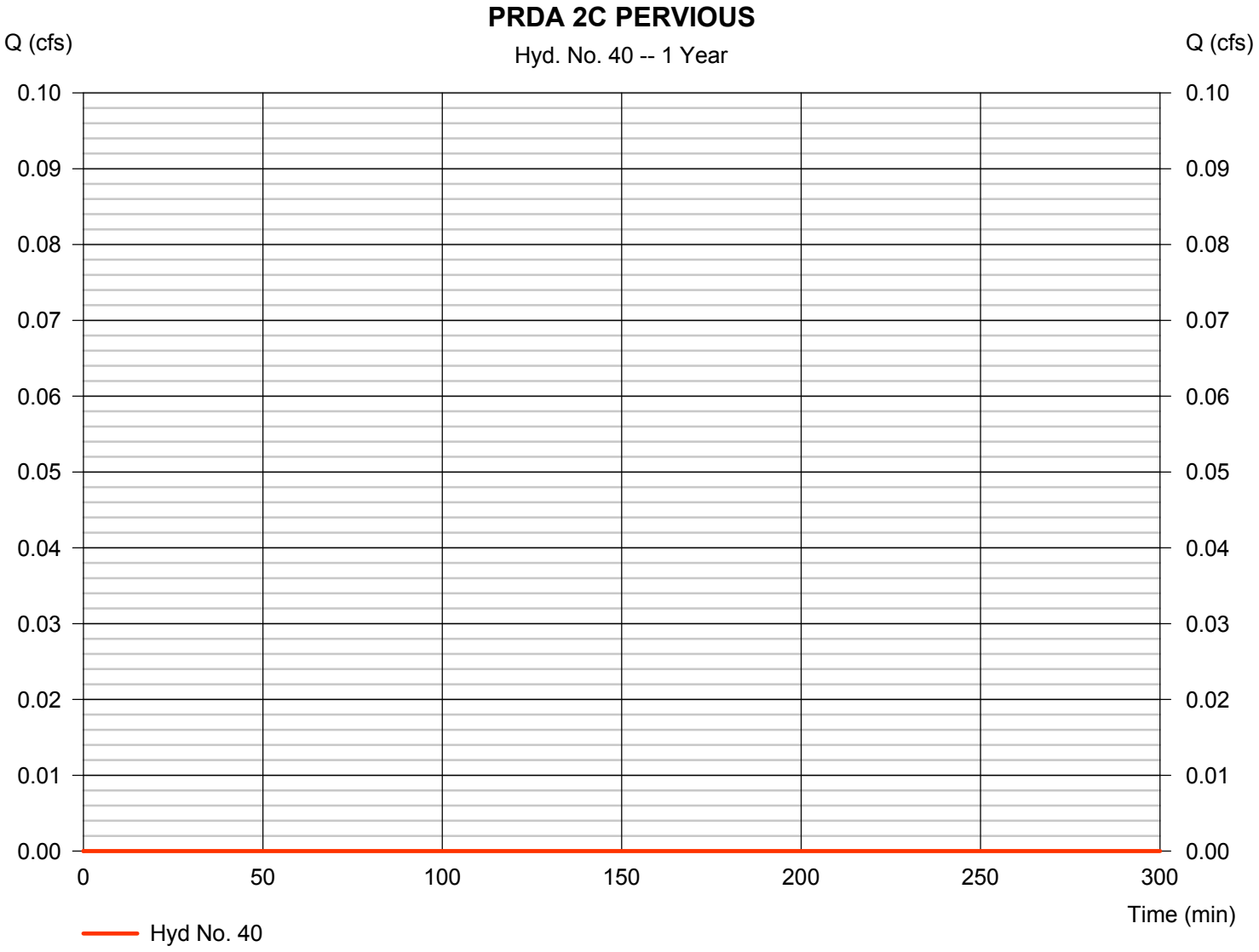


Hydrograph Report

Hyd. No. 40

PRDA 2C PERVIOUS

Hydrograph type	= SCS Runoff	Peak discharge	= 0.000 cfs
Storm frequency	= 1 yrs	Time to peak	= n/a
Time interval	= 5 min	Hyd. volume	= 0 cuft
Drainage area	= 0.390 ac	Curve number	= 55
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.00 min
Total precip.	= 1.25 in	Distribution	= Custom
Storm duration	= R:\Hydroflow Standards\1.25in24hr.tcds	Shape factor	= 484

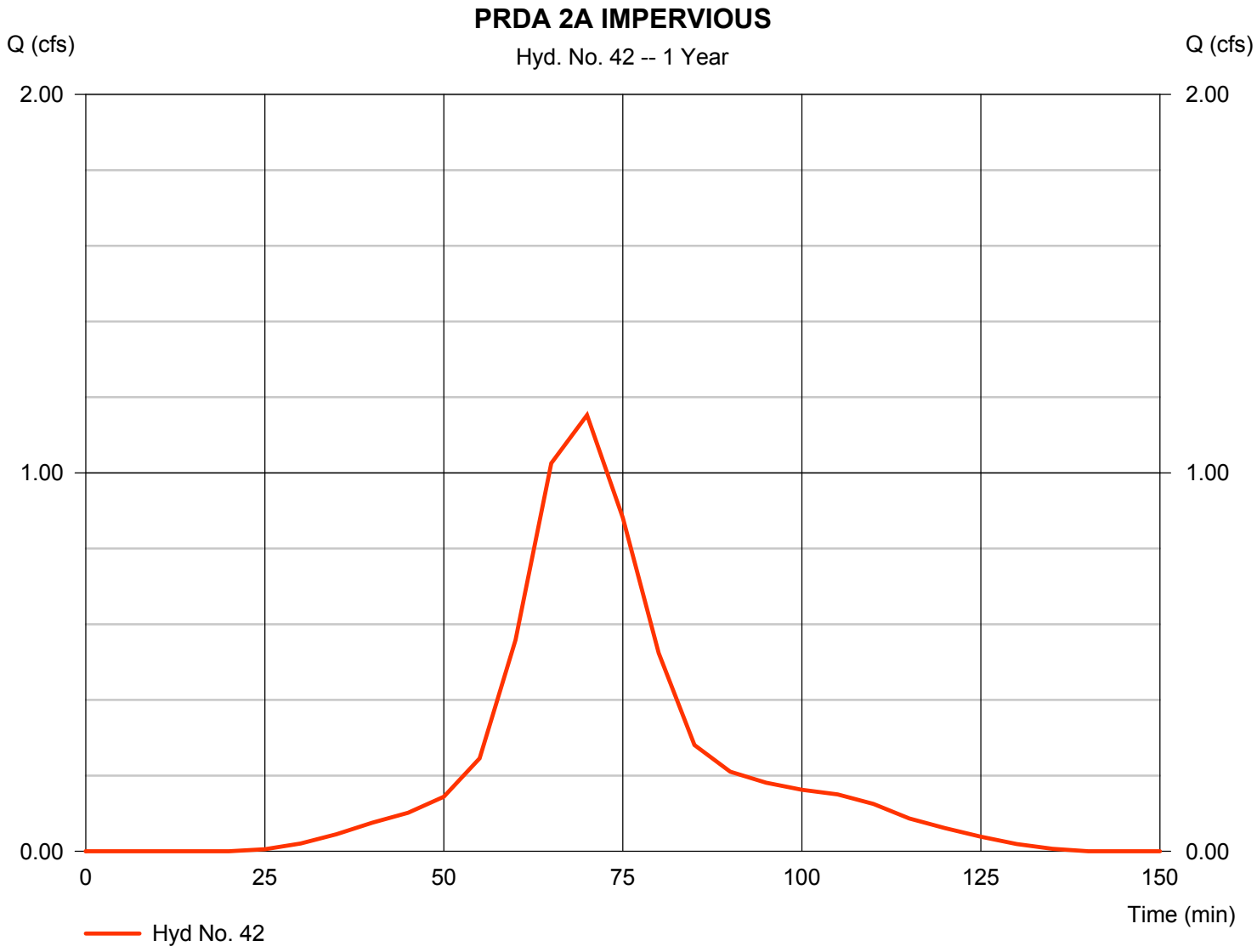


Hydrograph Report

Hyd. No. 42

PRDA 2A IMPERVIOUS

Hydrograph type	=	SCS Runoff	Peak discharge	=	1.153 cfs
Storm frequency	=	1 yrs	Time to peak	=	70 min
Time interval	=	5 min	Hyd. volume	=	1,830 cuft
Drainage area	=	0.520 ac	Curve number	=	98
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	10.00 min
Total precip.	=	1.25 in	Distribution	=	Custom
Storm duration	=	R:\Hydroflow Standards\1.25in24hr.tcds	Shape factor	=	484

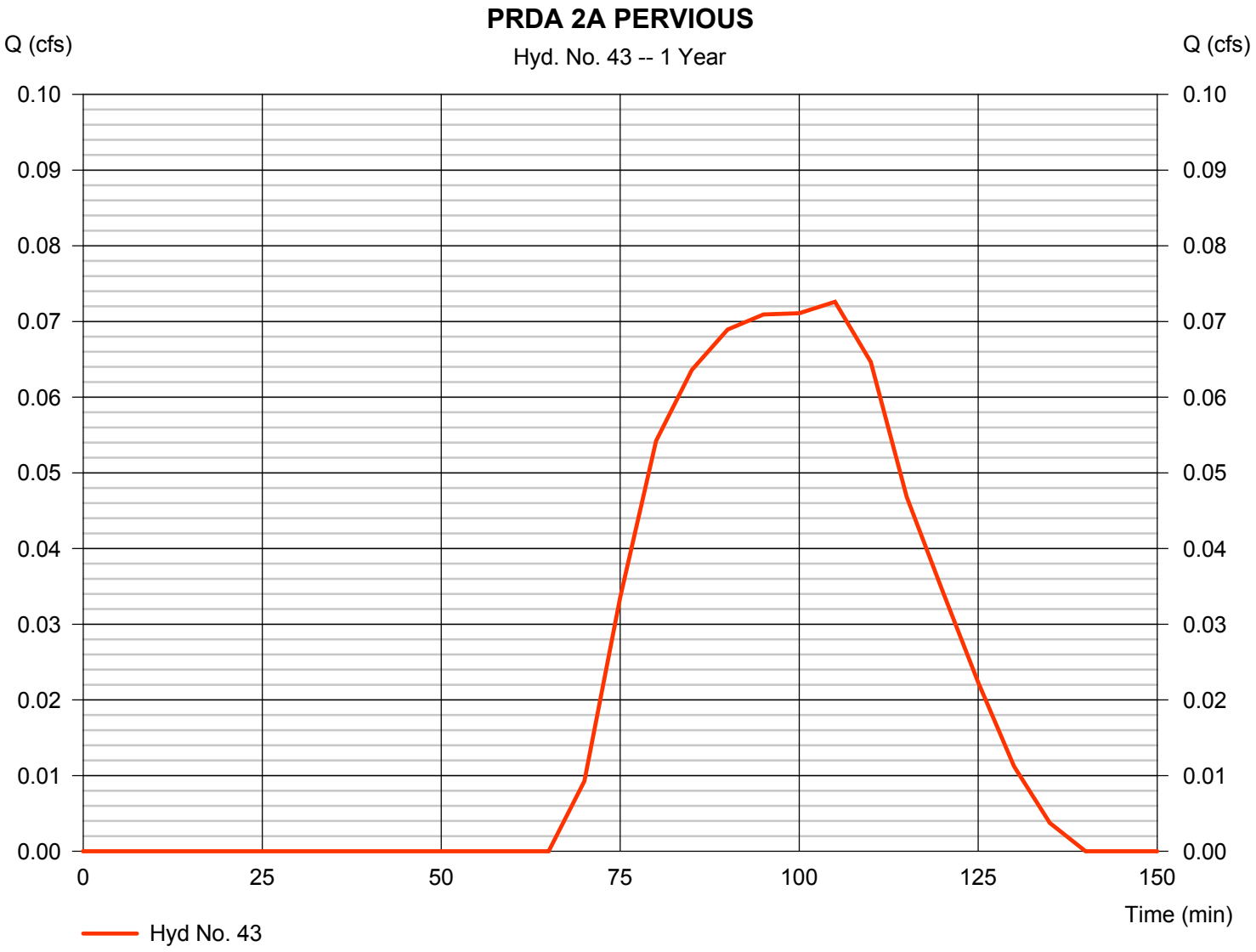


Hydrograph Report

Hyd. No. 43

PRDA 2A PERVIOUS

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.073 cfs
Storm frequency	=	1 yrs	Time to peak	=	105 min
Time interval	=	5 min	Hyd. volume	=	188 cuft
Drainage area	=	2.170 ac	Curve number	=	69
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	10.00 min
Total precip.	=	1.25 in	Distribution	=	Custom
Storm duration	=	R:\Hydroflow Standards\1.25in2hr.tcd	Shape factor	=	484

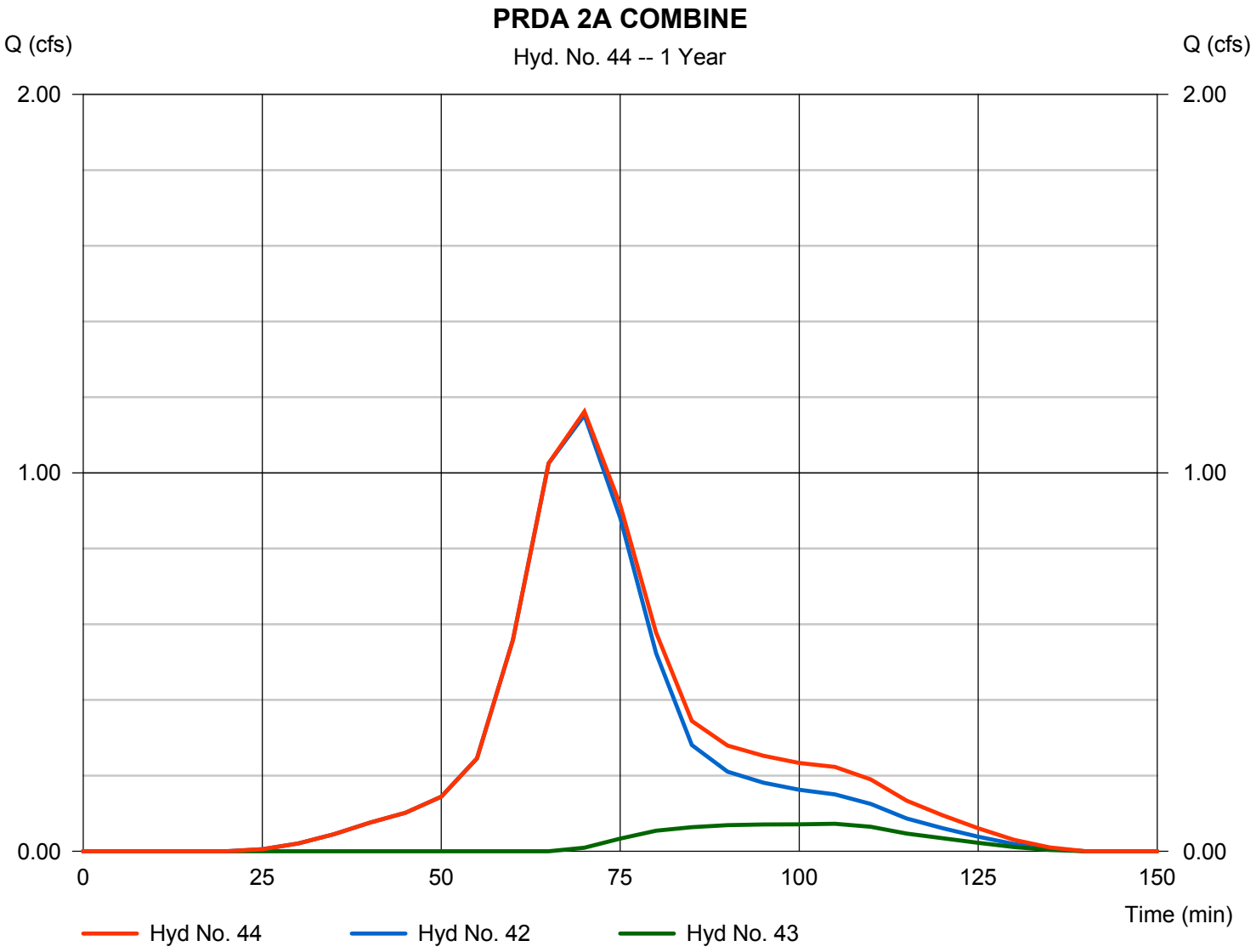


Hydrograph Report

Hyd. No. 44

PRDA 2A COMBINE

Hydrograph type	= Combine	Peak discharge	= 1.162 cfs
Storm frequency	= 1 yrs	Time to peak	= 70 min
Time interval	= 5 min	Hyd. volume	= 2,018 cuft
Inflow hyds.	= 42, 43	Contrib. drain. area	= 2.690 ac

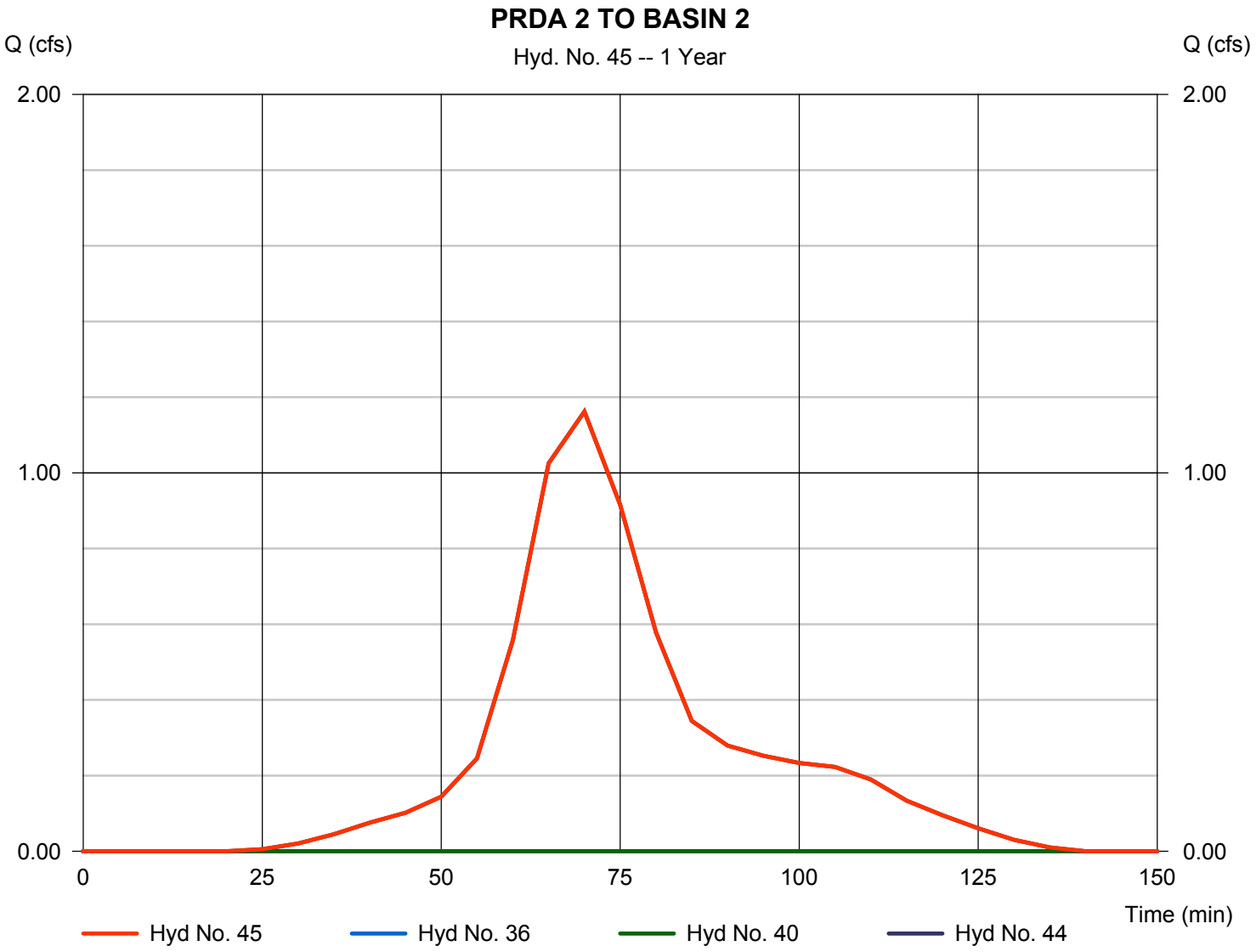


Hydrograph Report

Hyd. No. 45

PRDA 2 TO BASIN 2

Hydrograph type	= Combine	Peak discharge	= 1.162 cfs
Storm frequency	= 1 yrs	Time to peak	= 70 min
Time interval	= 5 min	Hyd. volume	= 2,018 cuft
Inflow hyds.	= 36, 40, 44	Contrib. drain. area	= 0.390 ac



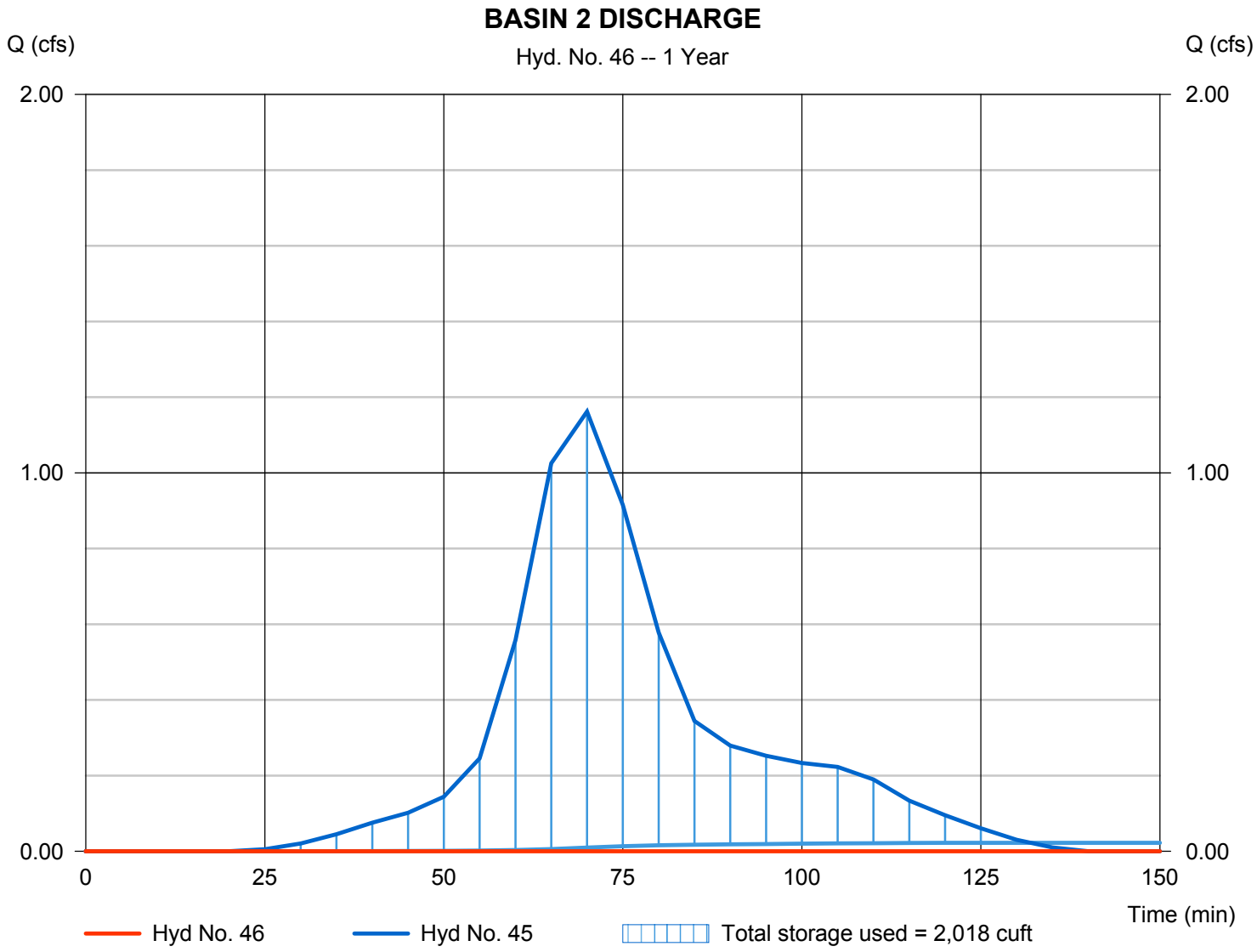
Hydrograph Report

Hyd. No. 46

BASIN 2 DISCHARGE

Hydrograph type	= Reservoir	Peak discharge	= 0.000 cfs
Storm frequency	= 1 yrs	Time to peak	= n/a
Time interval	= 5 min	Hyd. volume	= 0 cuft
Inflow hyd. No.	= 45 - PRDA 2 TO BASIN 2	Max. Elevation	= 224.75 ft
Reservoir name	= SWM BASIN 2	Max. Storage	= 2,018 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Pond Report

Pond No. 2 - SWM BASIN 2

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 224.50 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	224.50	8,002	0	0
1.00	225.50	8,002	8,001	8,001
2.00	226.50	8,002	8,001	16,002
3.00	227.50	8,002	8,001	24,004
4.00	228.50	9,187	8,587	32,590

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 15.00	4.50	0.00	0.00
Span (in)	= 15.00	4.50	0.00	0.00
No. Barrels	= 1	1	0	0
Invert El. (ft)	= 224.50	225.30	0.00	0.00
Length (ft)	= 40.00	0.00	0.00	0.00
Slope (%)	= 1.00	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	Yes	No	No

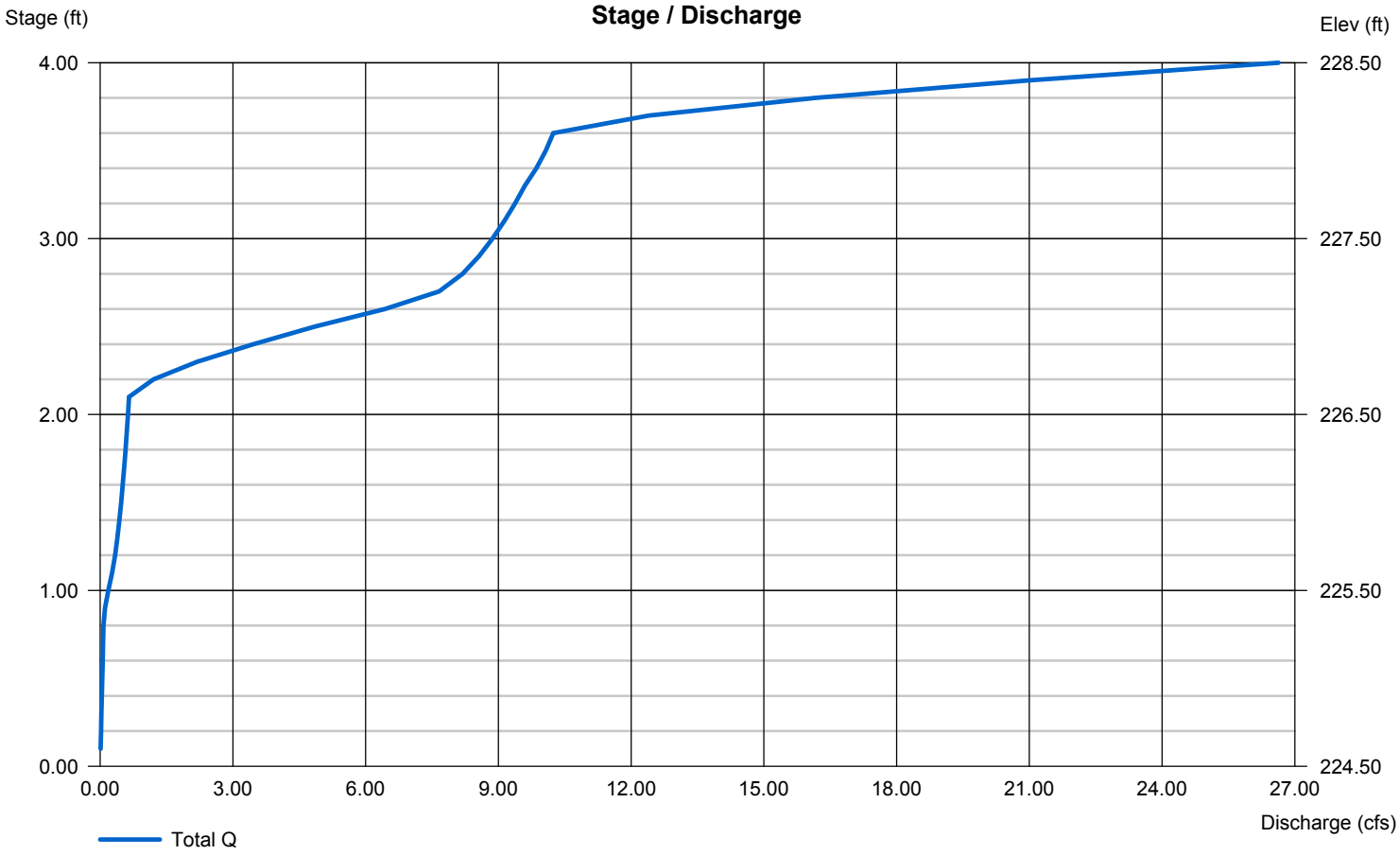
Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 24.00	5.00	24.00	0.00
Crest El. (ft)	= 227.80	226.60	228.10	0.00
Weir Coeff.	= 3.33	3.33	2.60	3.33
Weir Type	= 1	Rect	Broad	---
Multi-Stage	= Yes	Yes	No	No

Exfil.(in/hr) = 0.500 (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).

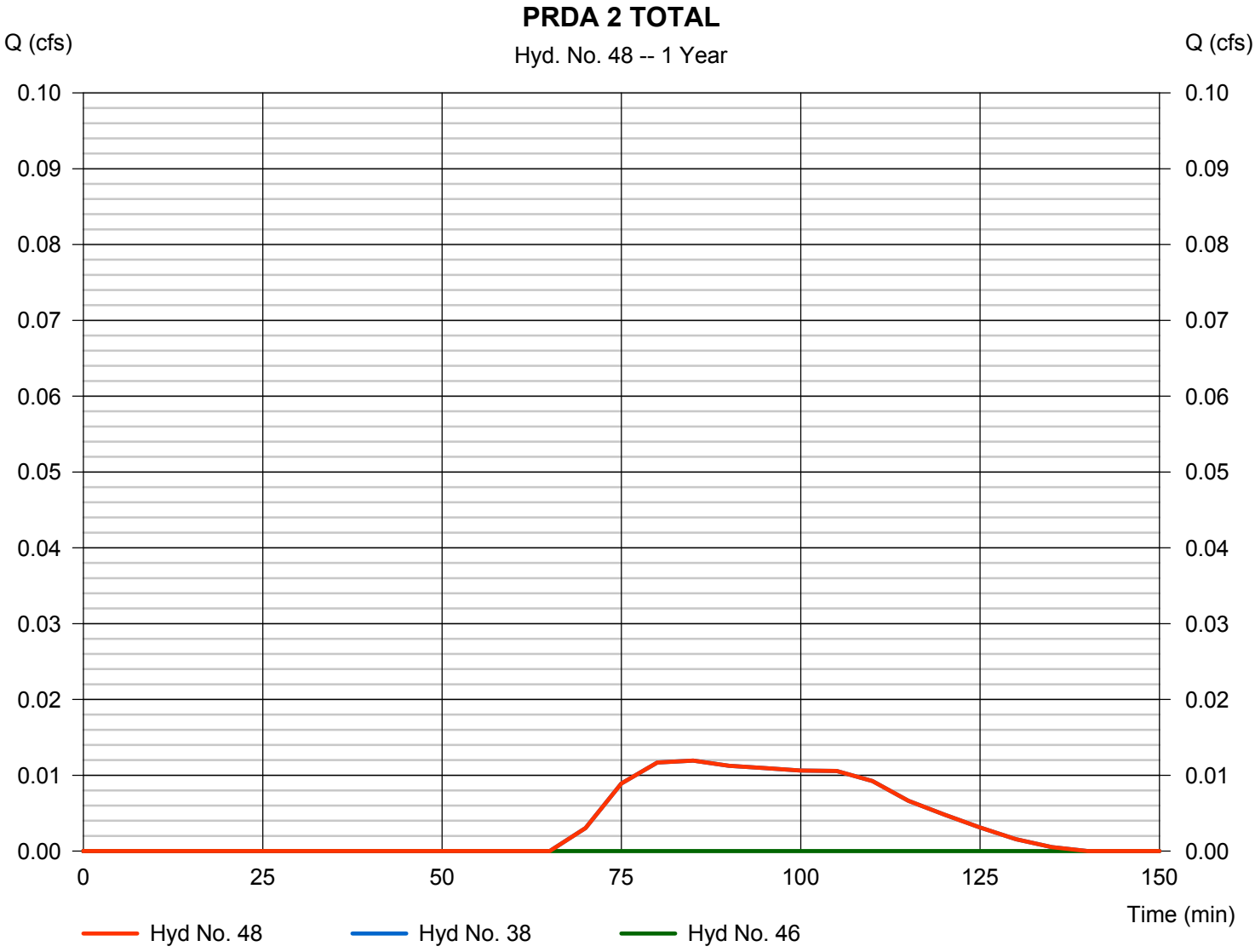


Hydrograph Report

Hyd. No. 48

PRDA 2 TOTAL

Hydrograph type	= Combine	Peak discharge	= 0.012 cfs
Storm frequency	= 1 yrs	Time to peak	= 85 min
Time interval	= 5 min	Hyd. volume	= 31 cuft
Inflow hyds.	= 38, 46	Contrib. drain. area	= 0.230 ac



Hydraflow Rainfall Report

Return Period (Yrs)	Intensity-Duration-Frequency Equation Coefficients (FHA)			
	B	D	E	(N/A)
1	0.0000	0.0000	0.0000	--------
2	69.8703	13.1000	0.8658	--------
3	0.0000	0.0000	0.0000	--------
5	79.2597	14.6000	0.8369	--------
10	88.2351	15.5000	0.8279	--------
25	102.6072	16.5000	0.8217	--------
50	114.8193	17.2000	0.8199	--------
100	127.1596	17.8000	0.8186	--------

File name: SampleFHA.idf

Intensity = B / (Tc + D)^E

Return Period (Yrs)	Intensity Values (in/hr)											
	5 min	10	15	20	25	30	35	40	45	50	55	60
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	5.69	4.61	3.89	3.38	2.99	2.69	2.44	2.24	2.07	1.93	1.81	1.70
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	6.57	5.43	4.65	4.08	3.65	3.30	3.02	2.79	2.59	2.42	2.27	2.15
10	7.24	6.04	5.21	4.59	4.12	3.74	3.43	3.17	2.95	2.77	2.60	2.46
25	8.25	6.95	6.03	5.34	4.80	4.38	4.02	3.73	3.48	3.26	3.07	2.91
50	9.04	7.65	6.66	5.92	5.34	4.87	4.49	4.16	3.88	3.65	3.44	3.25
100	9.83	8.36	7.30	6.50	5.87	5.36	4.94	4.59	4.29	4.03	3.80	3.60

Tc = time in minutes. Values may exceed 60.

Precip. file name: F:\2015\0115210 - Parisi - Gillette\docs\Reports\Stormwater\Resources\Long Hill Twp.pcp

Storm Distribution	Rainfall Precipitation Table (in)							
	1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr
SCS 24-hour	0.00	3.42	0.00	4.46	5.17	6.36	7.31	8.58
SCS 6-Hr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-1st	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-2nd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-3rd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-4th	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-Indy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Custom	1.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00

APPENDIX I – EMERGENCY SPILLWAY CALCULATIONS

Project: Parisi-Gillette Subdivision **Date:** 01/31/19
Location: Delaware Ave, Long Hill Township **By:** MMS

Emergency Spillway

Basin 1

Emergency Spillway - NJDEP Criteria

Peak 100 Year Inflow to Basin = 10.80 cfs

100 Year Inflow Plus 50% = 16.20 cfs

Emergency Spillway = **50.00** LF Broad Crested Weir at Elev = **256.60**

Weir Equation: Q = CLH^1.5

Solving for H = (Q/CL)^0.67

Where: Q 16.20 cfs
L = 50.00 feet
C = 2.60 (Discharge Coefficient)
H = Hydraulic Head over Spillway

Hydraulic Head H = 0.25 ft

Velocity Over Spillway : V = Q/A

Where: Q = 16.20 cfs
A = L x H = 12.39 sf

Velocity V= 1.31 fps

Emergency Water Surface Elevation = 256.60 + H = 256.85

Top of Berm = 256.85 + 1 ft (Freeboard)= 257.85

Set Top of Berm Elevation = 257.90

Project: Parisi-Gillette Subdivision **Date:** 01/31/19
Location: Delaware Ave, Long Hill Township **By:** MMS

Emergency Spillway

Basin 2

Emergency Spillway - NJDEP Criteria

Peak 100 Year Inflow to Basin = 13.43 cfs

100 Year Inflow Plus 50% = 20.15 cfs

Emergency Spillway = **100.00** LF Broad Crested Weir at Elev = **228.10**

Weir Equation: Q = CLH^1.5

Solving for = (Q/CL)^0.67

Where: Q 20.15 cfs
L = 100.00 feet
C = 2.60 (Discharge Coefficient)
H = Hydraulic Head over Spillway

Hydraulic Head H = 0.18 ft

Velocity Over Spillway : V = Q/A

Where: Q = 20.15 cfs
A = L x H = 18.02 sf

Velocity V= 1.12 fps

Emergency Water Surface Elevation = 228.10 + H = 228.28

Top of Berm = 228.28 + 1 ft (Freeboard)= 229.28

Set Top of Berm Elevation = 229.30

APPENDIX J – SOIL EROSION CONTROL CALCULATIONS

PROJECT- Parisi-Gillette
NUMBER- 115210
BY- CBR
DATE- 4/3/2020

RIPRAP APRON CALCULATIONS BASIN 1 - IN

Do = 1.50
Wo = 1.50
TW = 0.93 (0.2 Do ASSUMED)
Q = 8.80 CFS MAX. FLOW BASED ON HW
Y = DEPTH OF SCOUR HOLE BELOW INVERT
q= 5.87 CFS/FT (Q/Wo)

CASE 1 - TW < 1/2 Do

La =	1.8 (q/(Do ^0.5)) + 7Do	=	19.12	FEET
		USE	20.0	FEET
Wa =	3Wo +La	=	24.5	FEET
		USE	25.0	FEET

CASE 2 - TW > 1/2 Do

La =	3*Do (q/(Do ^0.5))	=	21.56	FEET
		USE	22.0	FEET
Wa =	3Wo + 0.4La	=	13.3	FEET
		USE	14.0	FEET

RIPRAP SIZING

D50 =	$\frac{0.02}{Tw} q^{1.33} \times 12$	=	2.71	INCHES
		USE	6.0	INCHES

PROJECT- Parisi-Gillette
NUMBER- 115210
BY- CBR
DATE- 4/3/2020

RIPRAP APRON CALCULATIONS BASIN 2 - IN

Do = 1.50
Wo = 1.50
TW = 1.09 (0.2 Do ASSUMED)
Q = 7.60 CFS MAX. FLOW BASED ON HW
Y = DEPTH OF SCOUR HOLE BELOW INVERT
q= 5.07 CFS/FT (Q/Wo)

CASE 1 - TW < 1/2 Do

La =	1.8 (q/(Do ^0.5)) + 7Do	=	17.95	FEET
		USE	18.0	FEET
Wa =	3Wo +La	=	22.5	FEET
		USE	23.0	FEET

CASE 2 - TW > 1/2 Do

La =	3*Do (q/(Do ^0.5))	=	18.62	FEET
		USE	19.0	FEET
Wa =	3Wo + 0.4La	=	12.1	FEET
		USE	13.0	FEET

RIPRAP SIZING

D50 =	$\frac{0.02}{Tw} q^{1.33} \times 12$	=	1.91	INCHES
		USE	6.0	INCHES

PROJECT- Parisi-Gillette
NUMBER- 115210
BY- CBR
DATE- 4/3/2020

RIPRAP APRON CALCULATIONS BASIN 2- OUT

Do = 1.25
Wo = 1.25
TW = 0.20 (0.2 Do ASSUMED)
Q = 1.30 CFS MAX. FLOW BASED ON HW
Y = DEPTH OF SCOUR HOLE BELOW INVERT
q= 1.04 CFS/FT (Q/Wo)

CASE 1 - TW < 1/2 Do

La =	1.8 (q/(Do ^0.5)) + 7Do	=	10.42	FEET
		USE	11.0	FEET
Wa =	3Wo +La	=	14.8	FEET
		USE	15.0	FEET

CASE 2 - TW > 1/2 Do

La =	3*Do (q/(Do ^0.5))	=	3.48	FEET
		USE	4.0	FEET
Wa =	3Wo + 0.4La	=	5.4	FEET
		USE	6.0	FEET

RIPRAP SIZING

D50 =	$\frac{0.02}{Tw} q^{1.33} \times 12$	=	1.26	INCHES
		USE	6.0	INCHES

PROJECT- Parisi-Gillette
NUMBER- 115210
BY- MMS
DATE- 1/31/2019

RIPRAP APRON CALCULATIONS LOTS 2 & 3
STORMWATER CHAMBERS

Do = 0.50
Wo = 0.50
TW = 0.20 (0.2 Do ASSUMED)
Q = 0.05 CFS MAX. FLOW BASED ON HW
Y = DEPTH OF SCOUR HOLE BELOW INVERT
q= 0.10 CFS/FT (Q/Wo)

CASE 1 - TW < 1/2 Do

La =	1.8 (q/(Do ^0.5)) + 7Do	=	3.75	FEET
		USE	4.0	FEET
Wa =	3Wo +La	=	5.5	FEET
		USE	6.0	FEET

CASE 2 - TW > 1/2 Do

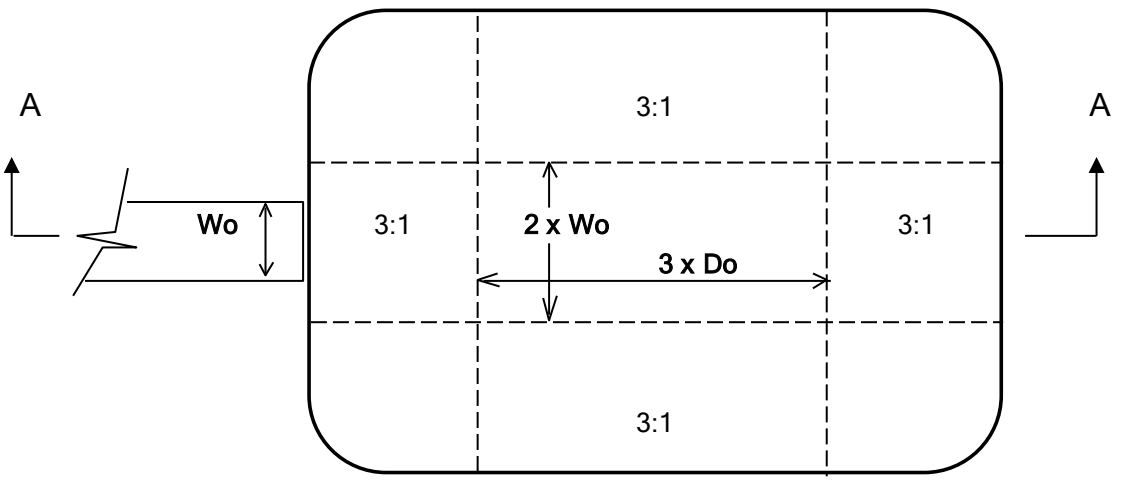
La =	3*Do (q/(Do ^0.5))	=	0.21	FEET
		USE	1.0	FEET
Wa =	3Wo + 0.4La	=	1.9	FEET
		USE	2.0	FEET

RIPRAP SIZING

D50 =	$\frac{0.02}{Tw} q^{1.33} \times 12$	=	0.06	INCHES
		USE	6.0	INCHES

140 West Main Street, High Bridge NJ 08829

Project: Delaware Ave Subdivision **Date:** 01/31/19
Location: Long Hill Township, Morris County NJ **By:** KO



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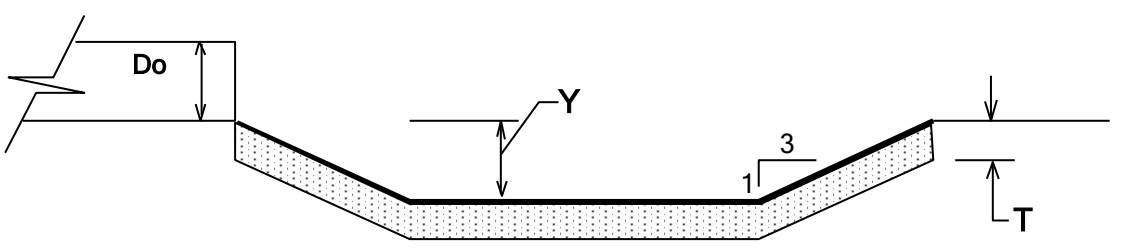

SECTION A - A

T = 3 x d50 without filter fabric
T = 2 x d50 with filter fabric

SCOUR HOLE

(nts)

STRUCTURE #	Q (cfs)	Do (in)	Wo (in)	TW (ft)	Y = .5 Do (Y or N)	Y (ft)	d 50 (ft)	USE d 50 (in)
Basin 1 Out	3.818	15	15	0.2	N	1.25	0.15	6

FORMULAS: $d50 = \frac{0.0125\,(Q/Do)^{1.33}}{TW}$ where Y = 0.5 Do

$d50 = \frac{0.0082\,(Q/Do)^{1.33}}{TW}$ where Y = Do

Where TW cannot be computed USE TW = 0.2 Do

APPENDIX K – STORMWATER MANAGEMENT MAINTENANCE PLAN (ATTACHED SEPARATELY)

APPENDIX L – DRAINAGE AREA PLANS (ATTACHED SEPARATELY)