EDEN-MLV-02 STORMWATER CALCULATIONS

1.0 Stormwater Management Design Summary

1.1 Introduction

The EDEN-MLV-02 valve site will be constructed as part of the Southeast Supply Enhancement Project, located in Pittsylvania County, Virginia. The site will be constructed within the limits of Tract SSE31-VA-PI-0095.1 located off Pine Lake Rd, Danville, Virginia 24541. The parcel is composed of approximately 4.2 acres.

The EDEN-MLV-03 valve site consists of the expansion of the existing valve site. This includes an expanded gravel pad, aboveground piping, and fence. Removal of identified sections of fence will occur within the existing valve site. The project will include approximately 0.23 acres of new impervious gravel area.

The proposed project must follow the Virginia Code §9VAC25-875 pertaining to Virginia Stormwater Management Program (VSMP) Permit regulations, and the Virginia Erosion and Sediment Control Regulations. Under the technical criteria, the valve site design will have to meet requirements for water quality (§9VAC25-260), channel protection (§9VAC25-875-600.B), and flood protection (§9VAC25-875-600.C) as it relates to post-construction stormwater runoff.

1.2 Existing Site Characteristics

The valve site will only impact Tract SSE31-VA-PI-0095.1, which is approximately 4.2 acres. Improvements on the project site include an existing valve site and gravel access; the remainder of the site consist of vegetated pipeline right-of-way (ROW) and forested area.

1.2.1 Existing Soil Characteristics

Based on the Soil Survey report for Pittsylvania County, Virginia, the soils consist primarily of Clover fine sandy loam, 2 to 7 percent slopes (23B), hydraulic soil group (HSG) B, and Clover fine sandy loam, 7 to 15 percent slopes (23C), HSG B.

The USDA Soils Survey map has been included for the entire Southeast Supply Enhancement Project in the appendices of the SWPPP.

1.2.2 Drainage Area Conditions

The valve site is entirely within one drainage area. The drainage area sheets flows to the forested area to the north and into the existing roadside ditch. Drainage area maps have been included in Attachment 5.

1.2.3 Adjacent Areas

Areas outside of the parcel boundary are not anticipated to be impacted by the valve site. BMPs, as depicted on the plans and described herein, shall be utilized as perimeter controls for the site to prevent sediment laden stormwater from entering downstream channels or properties.

1.3 Methodology and System Description

The valve site was designed in accordance with the Virginia Stormwater Management Act and Regulations. The valve site shall be considered a re-development project due to work consisting of expansion of an existing valve site. A drainage area of 1.26 acres within the projects limits of disturbance was selected as the water quality limits of analysis and the Virginia Runoff Reduction Method was utilized to analyze the pollutant load produced by the site. Water Quality Land Cover Maps have been included in Attachment 2.

1.4 Water Quality

The valve site shall be considered a re-development as part of the property is developed (existing valve site) with impervious cover. In accordance with §9VAC25-260, the required pollutant load removal requirements were calculated utilizing Virginia Runoff Reduction Method (VRRM) and associated spreadsheets for re- development. Table 1.1 illustrates the pre-construction land cover conditions, while Table 1.2 illustrates the post-construction land cover conditions. Please see Attachment 3 for calculations pertaining to water quality and Attachment 2 for land cover maps which illustrate pre- and post-construction cover conditions.

Table 1. 1 Pre-Development Land Cover (acres)

	A Soils	B Soils	C Soils	D Soils	Totals
Forest (acres)	0.00	0.60	0.00	0.00	0.60
Mixed Open (acres)	0.00	0.38	0.00	0.00	0.38
Managed Turf (acres)	0.00	0.00	0.00	0.00	0.00
Impervious Cover (acres)	0.00	0.28	0.00	0.00	0.28
Total					1.26

Table 1. 2 Post-Development Land Cover (acres)

	A Soils	B Soils	C Soils	D Soils	Totals
Forest (acres)	0.00	0.25	0.00	0.00	0.25
Mixed Open (acres)	0.00	0.50	0.00	0.00	0.50
Managed Turf (acres)	0.00	0.00	0.00	0.00	0.00
Impervious Cover (acres)	0.00	0.51	0.00	0.00	0.51
Total					1.26

As aforementioned and as illustrated in Table 1.1 and 1.2, the soils within the property boundary are considered Hydrologic Soil Group B soils. Grading and new improvements for the valve site will alter the drainage areas from pre- to post-construction and the project will result in a total impervious area of 0.51 acres (existing impervious plus new impervious). The VRRM spreadsheet indicated the post-construction total phosphorous load reduction required for the site is 0.25 lbs/yr. The post-construction total phosphorous load reduction achieved for the site is 0.20 lbs/yr. A summary of the VRRM spreadsheets has been provided in Attachment 3. The valve site will satisfy water quality requirements by being in compliance with §9VAC25-260, by installing a Level 1 design dry swale, and by purchasing offsite nutrient credits. Nutrient credit letters of availability have been provided in Attachment 4 from the Birch Creek Nutrient Bank located in Halifax County. Upon approval of the proposed water quality

management solution selected, Williams will purchase the nutrient credits and the bank will retire 0.05 lbs/yr of phosphorous credit in accordance with the Nutrient Offset Certification regulations.

1.5 Channel Protection and Flood Protection

Channel and flood protection calculations were completed for the Point of Interest (POI) in accordance with the minimum standards set by §9VAC25-875-600.B and §9VAC25-875-600.C. Because runoff from the site will drain to a manmade stormwater conveyance system (roadside ditch), the roadside ditch shall convey the post-construction peak flow rate from the 2-year 24-hour storm event without causing erosion of the system, or the maximum peak flow rate from the 1-year 24-hour storm shall be calculated by using the energy balance equation:

$$Q_{Developed} \leq I.F.*(Q_{Pre\text{-}developed} * RV_{Pre\text{-}Developed})/RV_{Developed}$$

I.F. (Improvement Factor) equals 0.8 for sites > 1 acre or 0.9 for sites ≤ 1 acre.
$Q_{Developed}$ = The allowable peak flow rate of runoff from the developed site.
$RV_{Developed}$ = The volume of runoff from the site in the developed condition.
$Q_{Pre\text{-}Developed}$ = The peak flow rate of runoff from the site in the pre-developed condition.
$RV_{Pre\text{-}Developed}$ = The volume of runoff from the site in pre-developed condition.

$0.41 \leq 0.8 * (0.81 * 1990) / 1725$
$0.41 \leq 0.75$; therefore, energy balance has been met.

The roadside ditch was analyzed at the POI using the 2-year 24-hour storm to determine velocity. The ditch has a velocity of less than 3 fps for the 2-year 24-hour storm; therefore, it is anticipated that the proposed activities will not cause erosion of the existing ditch. Since energy balance has been met and the roadside ditch will convey the post-construction peak flow rate from the 2-year 24-hour storm event without causing erosion of the system, channel protection requirements have been met for the site in accordance with §9VAC25-875-600.B.1.a.

Flood protection requirements are met because there are no known issues with localized flooding and post-construction peak flow at the POI decreases from the pre-construction peak flow for the 10-year 24-hour storm event, and the roadside ditch confines the post-construction peak flow rate from the 10-year 24-hour storm event in accordance with §9VAC25-875-600.C.1.

See Attachment 5 for pre- and post-construction drainage area maps, Attachment 6 for peak flow hydrographs, and Attachment 7 for roadside ditch calculations.

1.6 Stormwater Conveyance

Stormwater management for the valve site will consist of the construction of a dry swale. See the EDEN-MLV-02 SWM Plan for details on construction of the dry swale. Dry swales are shallow channels with a series of check dams that provide temporary storage to allow infiltration of the treatment volume. Dry swales use an engineered soil media as the channel bed. Dry swales are vegetated with turf or other surface material (including large cobbles and ornamental plants).

The dry swale was designed with enough capacity to contain the 10-year flow within the banks of the swale. See calculations in Attachment 8. The drainage area was delineated from a POI that encompasses the longest flow path. Hydraflow Hydrographs Extensions for Autodesk Civil 3D 2019 (Hydraflow) which utilizes the Manning Formula, was utilized to analyze to analyze the conveyances for the 1-year 24-hour and 10-year 24-hour peak discharge. For routing purposes, the drainage area was split into seven sub areas. Six detained areas (drainage area to each check dam and spillway), and the undetained area (drainage area not contributing to the swale). The seven sub areas were combined in Hydraflow to give a composite peak flow at the POI. The dry swale was broken up into six different ponds within Hydraflow to represent the proposed storage behind each check dam and the spillway. The time of concentration (TOC) pre- and post-construction was determined to be less than 6 minutes; therefore, 6 minutes was used in Hydraflow per TR-55.

ATTACHMENT 1
Point Precipitation Frequency Estimates

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NOAA Atlas 14, Volume 2, Version 3
Location name: Danville, Virginia, USA*
Latitude: 36.6302°, Longitude: -79.5479°
Elevation: 681 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

G.M. Bonnin, D. Martin, B. Lin, T. Parzybok, M.Yekta, and D. Riley

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.365 (0.332-0.399)	0.435 (0.397-0.476)	0.515 (0.469-0.564)	0.571 (0.519-0.624)	0.638 (0.578-0.695)	0.682 (0.615-0.743)	0.725 (0.651-0.791)	0.763 (0.682-0.834)	0.807 (0.715-0.884)	0.839 (0.738-0.921)
10-min	0.583 (0.531-0.637)	0.695 (0.635-0.762)	0.825 (0.751-0.903)	0.913 (0.830-0.997)	1.02 (0.921-1.11)	1.09 (0.980-1.18)	1.15 (1.04-1.26)	1.21 (1.08-1.32)	1.28 (1.13-1.40)	1.32 (1.16-1.45)
15-min	0.728 (0.663-0.796)	0.874 (0.798-0.958)	1.04 (0.950-1.14)	1.16 (1.05-1.26)	1.29 (1.17-1.40)	1.38 (1.24-1.50)	1.46 (1.31-1.59)	1.53 (1.36-1.67)	1.61 (1.42-1.76)	1.66 (1.46-1.82)
30-min	0.998 (0.909-1.09)	1.21 (1.10-1.32)	1.48 (1.35-1.62)	1.67 (1.52-1.83)	1.91 (1.73-2.08)	2.07 (1.87-2.26)	2.23 (2.00-2.43)	2.38 (2.12-2.60)	2.56 (2.26-2.80)	2.69 (2.36-2.95)
60-min	1.24 (1.13-1.36)	1.52 (1.38-1.66)	1.90 (1.73-2.08)	2.18 (1.98-2.38)	2.54 (2.30-2.77)	2.81 (2.53-3.06)	3.07 (2.76-3.35)	3.33 (2.98-3.64)	3.67 (3.25-4.02)	3.92 (3.45-4.30)
2-hr	1.47 (1.34-1.62)	1.79 (1.63-1.97)	2.26 (2.05-2.48)	2.62 (2.37-2.87)	3.10 (2.79-3.39)	3.48 (3.11-3.80)	3.86 (3.43-4.22)	4.24 (3.75-4.64)	4.77 (4.17-5.22)	5.18 (4.48-5.67)
3-hr	1.58 (1.44-1.74)	1.93 (1.76-2.12)	2.43 (2.22-2.67)	2.82 (2.56-3.09)	3.34 (3.01-3.65)	3.73 (3.35-4.08)	4.15 (3.70-4.53)	4.56 (4.04-4.98)	5.11 (4.47-5.59)	5.54 (4.80-6.07)
6-hr	1.95 (1.78-2.15)	2.36 (2.16-2.61)	2.97 (2.70-3.28)	3.46 (3.14-3.81)	4.14 (3.72-4.54)	4.69 (4.19-5.14)	5.27 (4.67-5.77)	5.87 (5.15-6.42)	6.72 (5.80-7.34)	7.40 (6.30-8.10)
12-hr	2.35 (2.14-2.59)	2.85 (2.60-3.14)	3.60 (3.28-3.96)	4.23 (3.83-4.64)	5.12 (4.60-5.60)	5.87 (5.23-6.40)	6.68 (5.89-7.26)	7.55 (6.57-8.18)	8.82 (7.52-9.57)	9.86 (8.27-10.7)
24-hr	2.81 (2.60-3.04)	3.40 (3.15-3.68)	4.32 (4.01-4.68)	5.10 (4.71-5.50)	6.23 (5.71-6.70)	7.18 (6.55-7.72)	8.22 (7.44-8.84)	9.36 (8.40-10.1)	11.0 (9.76-11.9)	12.5 (10.9-13.4)
2-day	3.30 (3.07-3.56)	4.00 (3.72-4.31)	5.05 (4.69-5.44)	5.91 (5.47-6.35)	7.14 (6.58-7.67)	8.17 (7.49-8.77)	9.26 (8.44-9.95)	10.4 (9.43-11.2)	12.1 (10.8-13.1)	13.5 (12.0-14.7)
3-day	3.49 (3.24-3.76)	4.22 (3.92-4.56)	5.33 (4.95-5.75)	6.24 (5.78-6.72)	7.53 (6.94-8.11)	8.61 (7.90-9.26)	9.76 (8.89-10.5)	11.0 (9.94-11.9)	12.8 (11.4-13.8)	14.3 (12.6-15.5)
4-day	3.67 (3.42-3.97)	4.44 (4.13-4.80)	5.61 (5.21-6.06)	6.56 (6.08-7.08)	7.92 (7.30-8.55)	9.05 (8.30-9.76)	10.3 (9.34-11.1)	11.6 (10.4-12.5)	13.4 (12.0-14.5)	15.0 (13.3-16.3)
7-day	4.21 (3.94-4.52)	5.06 (4.74-5.42)	6.29 (5.88-6.74)	7.29 (6.80-7.81)	8.72 (8.09-9.33)	9.90 (9.14-10.6)	11.1 (10.2-11.9)	12.5 (11.4-13.4)	14.4 (12.9-15.5)	15.9 (14.2-17.2)
10-day	4.77 (4.48-5.09)	5.70 (5.36-6.10)	7.01 (6.58-7.49)	8.07 (7.55-8.61)	9.54 (8.90-10.2)	10.7 (9.98-11.5)	12.0 (11.1-12.8)	13.3 (12.2-14.2)	15.2 (13.8-16.3)	16.7 (15.0-17.9)
20-day	6.41 (6.05-6.82)	7.64 (7.21-8.12)	9.19 (8.67-9.77)	10.4 (9.80-11.1)	12.1 (11.3-12.8)	13.4 (12.5-14.2)	14.7 (13.7-15.7)	16.1 (14.9-17.1)	17.9 (16.5-19.2)	19.3 (17.7-20.7)
30-day	7.92 (7.51-8.36)	9.37 (8.89-9.89)	11.0 (10.5-11.6)	12.3 (11.7-13.0)	14.0 (13.2-14.8)	15.3 (14.4-16.1)	16.5 (15.5-17.4)	17.7 (16.6-18.7)	19.3 (18.0-20.5)	20.5 (19.0-21.8)
45-day	9.98 (9.47-10.5)	11.8 (11.2-12.4)	13.7 (13.0-14.4)	15.2 (14.4-16.0)	17.0 (16.1-17.9)	18.5 (17.4-19.4)	19.8 (18.6-20.9)	21.1 (19.8-22.3)	22.8 (21.3-24.1)	24.0 (22.3-25.4)
60-day	11.9 (11.4-12.5)	14.0 (13.3-14.7)	16.1 (15.3-16.9)	17.7 (16.8-18.5)	19.7 (18.7-20.6)	21.1 (20.0-22.2)	22.5 (21.3-23.7)	23.9 (22.5-25.1)	25.6 (24.0-26.9)	26.8 (25.1-28.3)

[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

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PF graphical

ATTACHMENT 2
Pre- and Post-Construction Water Quality Maps

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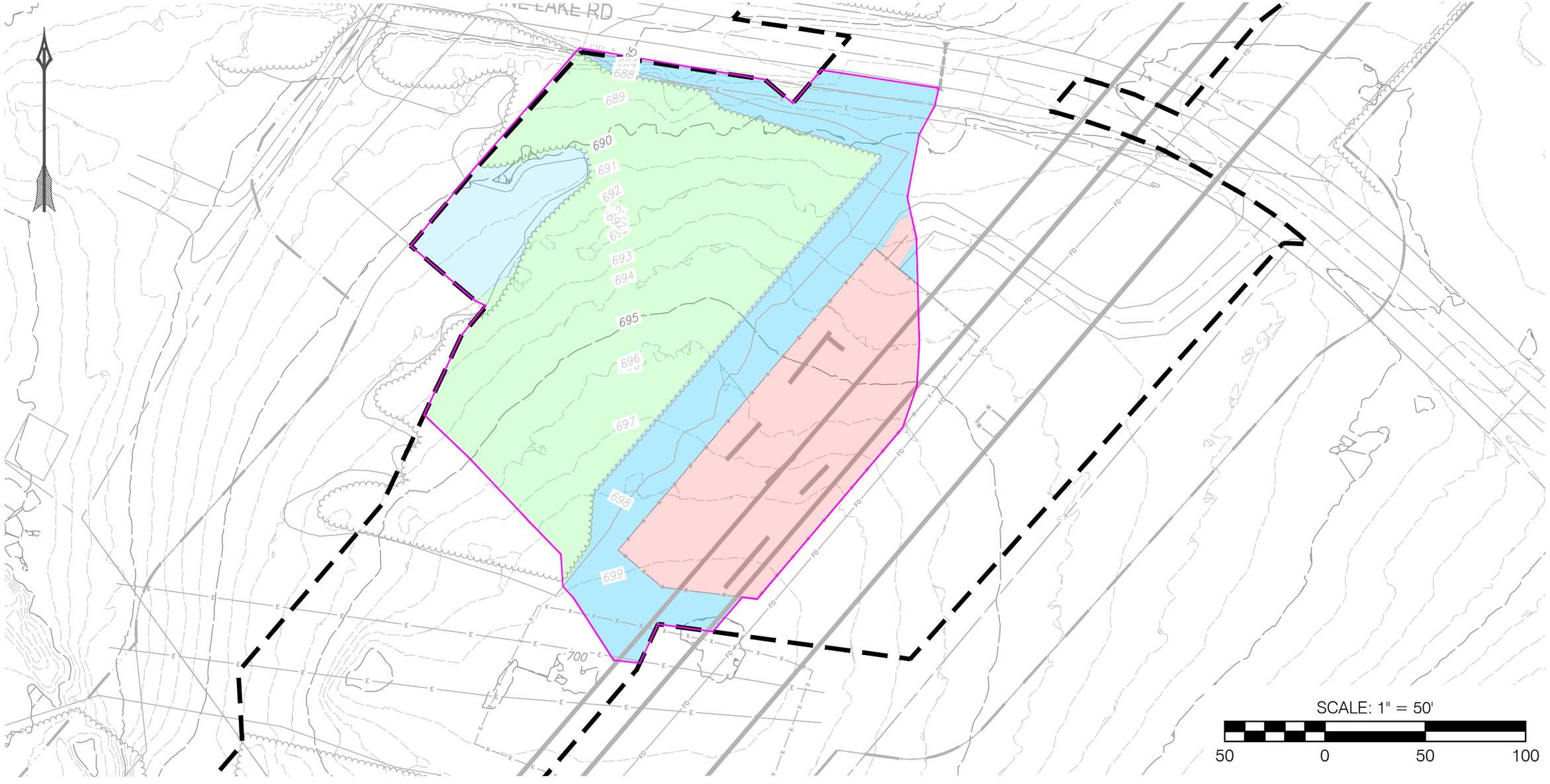

LEGEND

- FOREST
- MIXED OPEN
- IMPERVIOUS
- LIMIT OF DISTURBANCE
- DRAINAGE AREA BOUNDARY

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
SOUTHEAST SUPPLY ENHANCEMENT PROJECT
EDEN–MLV–02 PRE–CONSTRUCTION WATER QUALITY MAP
PITTSYLVANIA COUNTY, VIRGINIA

DRAWN BY: JB	DATE: 02/19/2025	ISSUED FOR BID:	SCALE: AS SHOWN
CHECKED BY: JML	DATE: 02/25/2025	ISSUED FOR CONSTRUCTION:	
APPROVED BY: RCM	DATE: 03/20/2025	DRAWING NO.: R230851.01	001 OF 001

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LEGEND

- FOREST
- MIXED OPEN
- IMPERVIOUS
- LIMIT OF DISTURBANCE
- DRAINAGE AREA BOUNDARY
- DETAINED AREA

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
SOUTHEAST SUPPLY ENHANCEMENT PROJECT
EDEN–MLV–02 POST–CONSTRUCTION WATER QUALITY MAP
PITTSYLVANIA COUNTY, VIRGINIA

DRAWN BY: JB	DATE: 02/19/2025	ISSUED FOR BID:	SCALE: AS SHOWN
CHECKED BY: JML	DATE: 02/25/2025	ISSUED FOR CONSTRUCTION:	
APPROVED BY: RCM	DATE: 03/20/2025	DRAWING NO.: R230851.01	001 OF 001

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ATTACHMENT 3
VRRM Spreadsheet

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DEQ Virginia Runoff Reduction Method Re-Development Compliance Spreadsheet - Version 4.1

BMP Design Specifications List: **2024 Stds & Specs**

Site Summary - Linear Development Project***

Project Title: EDEN-MLV-02
Date: 45776

Total Disturbed Acreage:	1.26

Site Land Cover Summary

Pre-ReDevelopment Land Cover (acres)

	A soils	B Soils	C Soils	D Soils	Totals	% of Total
Forest (acres)	0.00	0.60	0.00	0.00	0.60	48
Mixed Open (acres)	0.00	0.38	0.00	0.00	0.38	30
Managed Turf (acres)	0.00	0.00	0.00	0.00	0.00	0
Impervious Cover (acres)	0.00	0.28	0.00	0.00	0.28	22
					1.26	100

Post-ReDevelopment Land Cover (acres)

	A soils	B Soils	C Soils	D Soils	Totals	% of Total	
Forest (acres)	0.00	0.25	0.00	0.00	0.25	20	*
Mixed Open (acres)	0.00	0.50	0.00	0.00	0.50	40	
Managed Turf (acres)	0.00	0.00	0.00	0.00	0.00	0	
Impervious Cover (acres)	0.00	0.51	0.00	0.00	0.51	40	
					1.26	100	

*** Forest/Open Space areas must be protected in accordance with the Virginia Runoff Reduction Method**

Site Tv and Land Cover Nutrient Loads

	Final Post-Development (Post-ReDevelopment & New Impervious)	Post-ReDevelopment	Post-Development (New Impervious)	Adjusted Pre-ReDevelopment
Site Rv	0.43	0.32	0.00	0.31
Treatment Volume (ft^3)	1,986	1,192	793	1,158
TP Load (lb/yr)	0.62	0.43	0.20	0.39

Pre-ReDevelopment TP Load per acre (lb/acre/yr)	Final Post-Development TP Load per acre (lb/acre/yr)	Post-ReDevelopment TP Load per acre (lb/acre/yr)
0.38	**0.49**	**0.41**

Total TP Load Reduction Required (lb/yr)	**0.30**	N/A***	N/A***

******This is a linear development project***

	Final Post-Development Load (Post-ReDevelopment & New Impervious)	Pre-ReDevelopment
TN Load (lb/yr)	7.33	4.68

Site Compliance Summary - ***Linear Development Project

Maximum % Reduction Required Below Pre-ReDevelopment Load	20%

Total Runoff Volume Reduction (ft^3)	502
Total TP Load Reduction Achieved (lb/yr)	0.20
Total TN Load Reduction Achieved (lb/yr)	2.49
Remaining Post Development TP Load (lb/yr)	0.42
Remaining TP Load Reduction (lb/yr) Required	**0.05**

Drainage Area Summary

	D.A. A	D.A. B	D.A. C	D.A. D	D.A. E	Total
Forest (acres)	0.25	0.00	0.00	0.00	0.00	0.25
Mixed Open (acres)	0.50	0.00	0.00	0.00	0.00	0.50
Managed Turf (acres)	0.00	0.00	0.00	0.00	0.00	0.00
Impervious Cover (acres)	0.51	0.00	0.00	0.00	0.00	0.51
Total Area (acres)	**1.26**	**0.00**	**0.00**	**0.00**	**0.00**	**1.26**

Drainage Area Compliance Summary

	D.A. A	D.A. B	D.A. C	D.A. D	D.A. E	Total
TP Load Reduced (lb/yr)	0.20	0.00	0.00	0.00	0.00	0.20
TN Load Reduced (lb/yr)	2.49	0.00	0.00	0.00	0.00	2.49

Drainage Area A Summary

Land Cover Summary

0

	A Soils	B Soils	C Soils	D Soils	Total	% of Total
Forest (acres)	0.00	0.25	0.00	0.00	0.25	20
Mixed Open (acres)	0.00	0.50	0.00	0.00	0.50	40
Managed Turf (acres)	0.00	0.00	0.00	0.00	0.00	0
Impervious Cover (acres)	0.00	0.51	0.00	0.00	0.51	40
					1.26	

BMP Selections

Practice	Open Mixed Area (acres)	Managed Turf Credit Area (acres)	Impervious Cover Credit Area (acres)	BMP Treatment Volume (ft^3)	TP Load from Upstream Practices (lbs)	Untreated TP Load to Practice (lbs)	TP Removed (lb/yr)	TP Remaining (lb/yr)	Downstream Treatment to be Employed
5.a. Dry Swale #1 (P-CNV-02)	**0.29**		**0.33**	**1,253.80**	**0.00**	**0.38**	**0.20**	**0.18**	**None**

Total Impervious Cover Treated (acres)	0.33
Total Turf Area Treated (acres)	0.00
Total Mixed Open Area Treated (acres)	0.29
Total TP Load Reduction Achieved in D.A. (lb/yr)	0.20
Total TN Load Reduction Achieved in D.A. (lb/yr)	2.49

Runoff Volume and CN Calculations

	1-year storm	2-year storm	10-year storm
Target Rainfall Event (in)	2.81	3.40	5.10

Drainage Areas	RV & CN	Drainage Area A	Drainage Area B	Drainage Area C	Drainage Area D	Drainage Area E
CN		74	0	0	0	0
RR (ft^3)		502	0	0	0	0
1-year return period	RV wo RR (ws-in)	0.79	0.00	0.00	0.00	0.00
	RV w RR (ws-in)	0.68	0.00	0.00	0.00	0.00
	CN adjusted	72	0	0	0	0
2-year return period	RV wo RR (ws-in)	1.17	0.00	0.00	0.00	0.00
	RV w RR (ws-in)	1.06	0.00	0.00	0.00	0.00
	CN adjusted	72	0	0	0	0
10-year return period	RV wo RR (ws-in)	2.44	0.00	0.00	0.00	0.00
	RV w RR (ws-in)	2.33	0.00	0.00	0.00	0.00
	CN adjusted	73	0	0	0	0

ATTACHMENT 4
Nutrient Credit Receipt

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AFFIDAVIT OF PHOSPHORUS CREDIT SALE

Eco-Cap, LLC, a Virginia limited liability company (the "Company"), hereby certifies the following:

1. Pursuant to that certain Nutrient Credit Purchase and Sale Agreement dated April 4, 2025 (the "Agreement"), between the Company ("Seller") and **TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC** ("Buyer"), the Company, for the benefit of the Buyer, agreed to sell from its Birch Creek Nutrient Bank in Halifax County, Virginia, **19.75** pounds of nonpoint source phosphorus credits to Buyer and retire the associated ratio of nonpoint source nitrogen credits at the credit generating facility in the amount of **152.15** pounds of nitrogen credits;

2. The Company and the Buyer, as of April 14th, 2025, have closed the transaction contemplated by the Agreement and the Company has sold to Buyer the **19.75** pounds of phosphorus credits.

WITNESS the following signature:

Eco-Cap, LLC, a Virginia limited liability company

By: CJ
Casey Jensen, President

Date: 4/14/25

Commonwealth of Virginia

County of Chesterfield, to-wit

Sworn to and subscribed before me this 14 day of April, 2025, by Casey Jensen, President, on behalf of Eco-Cap, LLC, a Virginia limited liability company.

My commission expires: 9/30/27

LeAnne Renee Saunders
Notary Public

LeAnne Renee Saunders NOTARY PUBLIC REG. #8094332 MY COMMISSION EXPIRES 9/30/2027 COMMONWEALTH OF VIRGINIA

Project Name: Transcontinental Gas Pipe Line Company, LLC
Permittee: TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
Phosphorus Credits: 19.75 lbs.
Associated Nitrogen Credit: 152.15 lbs.

Eco-Cap, LLC

BILL OF SALE

THIS BILL OF SALE is made as of April 16th, 2025, by Eco-Cap, LLC, a Virginia limited liability company ("Seller"), to **TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC** ("Buyer").

WHEREAS, Seller and Buyer have entered into that certain Nutrient Credit Sale Agreement as of April 4, 2025 (the "Agreement") for the sale by the Seller and purchase by the Buyer of nonpoint source phosphorus credits generated within the Birch Creek Nutrient Bank in Halifax County, Virginia (the "Bank").

NOW, THEREFORE, for and in consideration of the payment of the Purchase Price (as defined in the Agreement) and other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, Seller hereby sells, transfers, assigns, conveys, delivers and sets over to Buyer, its successors and assigns, **19.75** pounds of phosphorus credits and retires **152.15** pounds of nitrogen credits associated with the phosphorous credits generated at the Bank as such are described in the Agreement.

TO HAVE AND TO HOLD all such phosphorus credits hereby sold and transferred to Buyer and its successors and assigns forever.

IN WITNESS WHEREOF, Seller has caused this Bill of Sale to be executed by its duly authorized representative as of the date first above written.

Eco-Cap, LLC

By: _____

Casey Jensen, President

Project Name: Transcontinental Gas Pipe Line Company, LLC
Permittee: TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
Phosphorus Credits: 19.75 lbs.
Associated Nitrogen Credit: 152.15 lbs.

ATTACHMENT 5
Pre- and Post-Construction Drainage Maps

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LEGEND

- FOREST
- MEADOW
- IMPERVIOUS
- LIMIT OF DISTURBANCE
- DRAINAGE AREA BOUNDARY
- SHEET FLOW
- SHALLOW CONCENTRATED

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
SOUTHEAST SUPPLY ENHANCEMENT PROJECT
EDEN–MLV–02 PRE–CONSTRUCTION DRAINAGE MAP
PITTSYLVANIA COUNTY, VIRGINIA

DRAWN BY: JB	DATE: 02/19/2025	ISSUED FOR BID:	SCALE: AS SHOWN
CHECKED BY: JML	DATE: 02/25/2025	ISSUED FOR CONSTRUCTION:	
APPROVED BY: RCM	DATE: 03/20/2025	DRAWING NO.: R230851.01	001 OF 001

Z:\2023\R230851.01 - Williams SE Supply Enhance\CAD\Worksheets\EDEN-MLV-02 Drainage Maps\Pre-Construction Water Quantity Map.dwg 6/4/2025 7:28 PM

POINT OF INTEREST

SPILLWAY DETAINED AREA

CHECK DAM 5 DETAINED AREA

UNDETAINED AREA TIME OF CONCENTRATION (LESS THAN 6 MINUTES)

CHECK DAM 4 DETAINED AREA

CHECK DAM 3 DETAINED AREA

CHECK DAM 2 DETAINED AREA

CHECK DAM 1 DETAINED AREA

SPILLWAY DETAINED AREA TIME OF CONCENTRATION (LESS THAN 6 MINUTES)

CHECK DAM 5 DETAINED AREA TIME OF CONCENTRATION (LESS THAN 6 MINUTES)

CHECK DAM 4 DETAINED AREA TIME OF CONCENTRATION (LESS THAN 6 MINUTES)

CHECK DAM 3 DETAINED AREA TIME OF CONCENTRATION (LESS THAN 6 MINUTES)

CHECK DAM 2 DETAINED AREA TIME OF CONCENTRATION (LESS THAN 6 MINUTES)

CHECK DAM 1 DETAINED AREA TIME OF CONCENTRATION (LESS THAN 6 MINUTES)

SCALE: 1" = 50'

50 0 50 100

LEGEND

- FOREST/BRUSH
- MEADOW
- IMPERVIOUS
- LIMIT OF DISTURBANCE
- DRAINAGE AREA BOUNDARY
- DETAINED AREA
- SHEET FLOW
- SHALLOW CONCENTRATED

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC

SOUTHEAST SUPPLY ENHANCEMENT PROJECT

EDEN–MLV–02 POST–CONSTRUCTION DRAINAGE MAP

PITTSYLVANIA COUNTY, VIRGINIA

DRAWN BY: JB	DATE: 02/19/2025	ISSUED FOR BID:	SCALE: AS SHOWN
CHECKED BY: JML	DATE: 02/25/2025	ISSUED FOR CONSTRUCTION:	
APPROVED BY: RCM	DATE: 03/20/2025	DRAWING NO.: R230851.01	001 OF 001

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ATTACHMENT 6
Peak Flow Hydrographs

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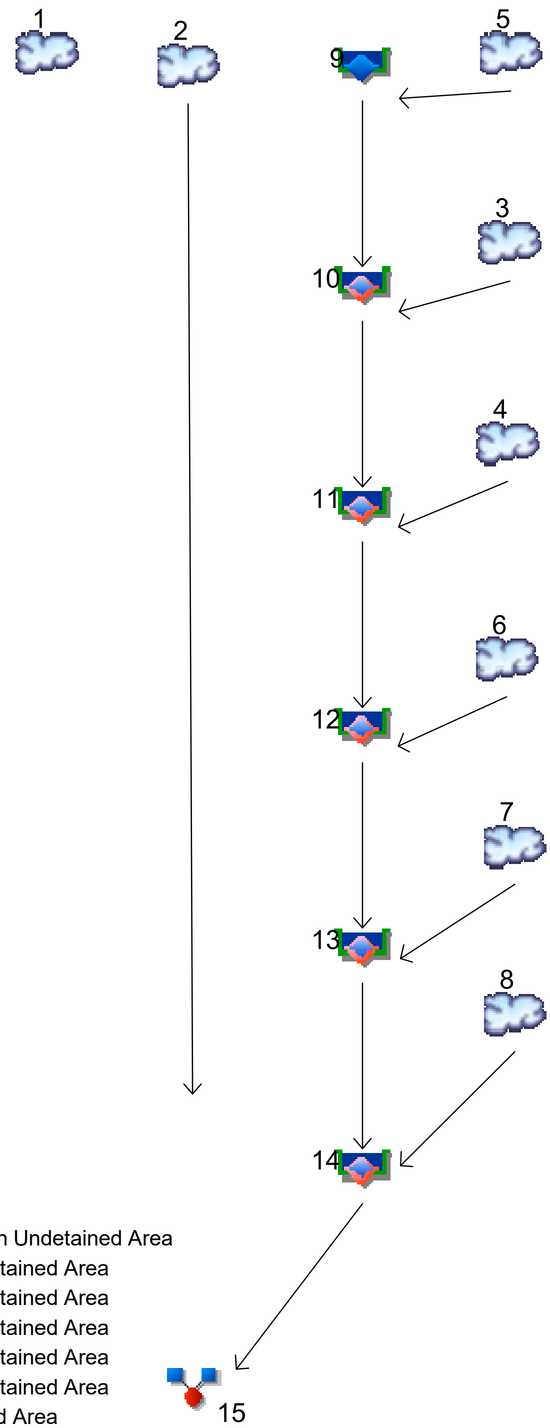
Hydraflow Table of Contents

Contents continued

Watershed Model Schematic

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022



Legend

Hyd.	Origin	Description
1	SCS Runoff	Pre-Construction
2	SCS Runoff	Post-Construction Undetained Area
3	SCS Runoff	Check Dam 2 Detained Area
4	SCS Runoff	Check Dam 3 Detained Area
5	SCS Runoff	Check Dam 1 Detained Area
6	SCS Runoff	Check Dam 4 Detained Area
7	SCS Runoff	Check Dam 5 Detained Area
8	SCS Runoff	Spillway Detained Area
9	Reservoir	Through Check Dam 1
10	Reservoir(i)	Through Check Dam 2
11	Reservoir(i)	Through Check Dam 3
12	Reservoir(i)	Through Check Dam 4
13	Reservoir(i)	Through Check Dam 5
14	Reservoir(i)	Through Spillway
15	Combine	Post-Construction Combined

Hydrograph Return Period Recap

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022

Hyd. No.	Hydrograph type (origin)	Inflow hyd(s)	Peak Outflow (cfs)								Hydrograph Description
			1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr	
1	SCS Runoff	------	0.813	-------	-------	-------	4.016	-------	-------	-------	Pre-Construction
2	SCS Runoff	------	0.413	-------	-------	-------	2.040	-------	-------	-------	Post-Construction Undetained Area
3	SCS Runoff	------	0.144	-------	-------	-------	0.454	-------	-------	-------	Check Dam 2 Detained Area
4	SCS Runoff	------	0.186	-------	-------	-------	0.490	-------	-------	-------	Check Dam 3 Detained Area
5	SCS Runoff	------	0.040	-------	-------	-------	0.231	-------	-------	-------	Check Dam 1 Detained Area
6	SCS Runoff	------	0.313	-------	-------	-------	0.766	-------	-------	-------	Check Dam 4 Detained Area
7	SCS Runoff	------	0.318	-------	-------	-------	0.742	-------	-------	-------	Check Dam 5 Detained Area
8	SCS Runoff	------	0.277	-------	-------	-------	0.632	-------	-------	-------	Spillway Detained Area
9	Reservoir	5	0.000	-------	-------	-------	0.005	-------	-------	-------	Through Check Dam 1
10	Reservoir(i)	9, 3	0.003	-------	-------	-------	0.297	-------	-------	-------	Through Check Dam 2
11	Reservoir(i)	10, 4	0.004	-------	-------	-------	0.421	-------	-------	-------	Through Check Dam 3
12	Reservoir(i)	11, 6	0.036	-------	-------	-------	0.762	-------	-------	-------	Through Check Dam 4
13	Reservoir(i)	12, 7	0.044	-------	-------	-------	1.001	-------	-------	-------	Through Check Dam 5
14	Reservoir(i)	13, 8	0.009	-------	-------	-------	1.154	-------	-------	-------	Through Spillway
15	Combine	2, 14	0.413	-------	-------	-------	2.434	-------	-------	-------	Post-Construction Combined

Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022

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	0.813	1	719	1,990	------	------	------	Pre-Construction
2	SCS Runoff	0.413	1	719	1,011	------	------	------	Post-Construction Undetained Area
3	SCS Runoff	0.144	1	718	296	------	------	------	Check Dam 2 Detained Area
4	SCS Runoff	0.186	1	718	374	------	------	------	Check Dam 3 Detained Area
5	SCS Runoff	0.040	1	719	107	------	------	------	Check Dam 1 Detained Area
6	SCS Runoff	0.313	1	718	630	------	------	------	Check Dam 4 Detained Area
7	SCS Runoff	0.318	1	718	642	------	------	------	Check Dam 5 Detained Area
8	SCS Runoff	0.277	1	718	562	------	------	------	Spillway Detained Area
9	Reservoir	0.000	1	n/a	0	5	693.07	107	Through Check Dam 1
10	Reservoir(i)	0.003	1	1058	154	9, 3	692.74	190	Through Check Dam 2
11	Reservoir(i)	0.004	1	955	245	10, 4	692.54	380	Through Check Dam 3
12	Reservoir(i)	0.036	1	740	593	11, 6	691.76	478	Through Check Dam 4
13	Reservoir(i)	0.044	1	731	885	12, 7	691.21	555	Through Check Dam 5
14	Reservoir(i)	0.009	1	980	714	13, 8	690.60	777	Through Spillway
15	Combine	0.413	1	719	1,725	2, 14	------	------	Post-Construction Combined

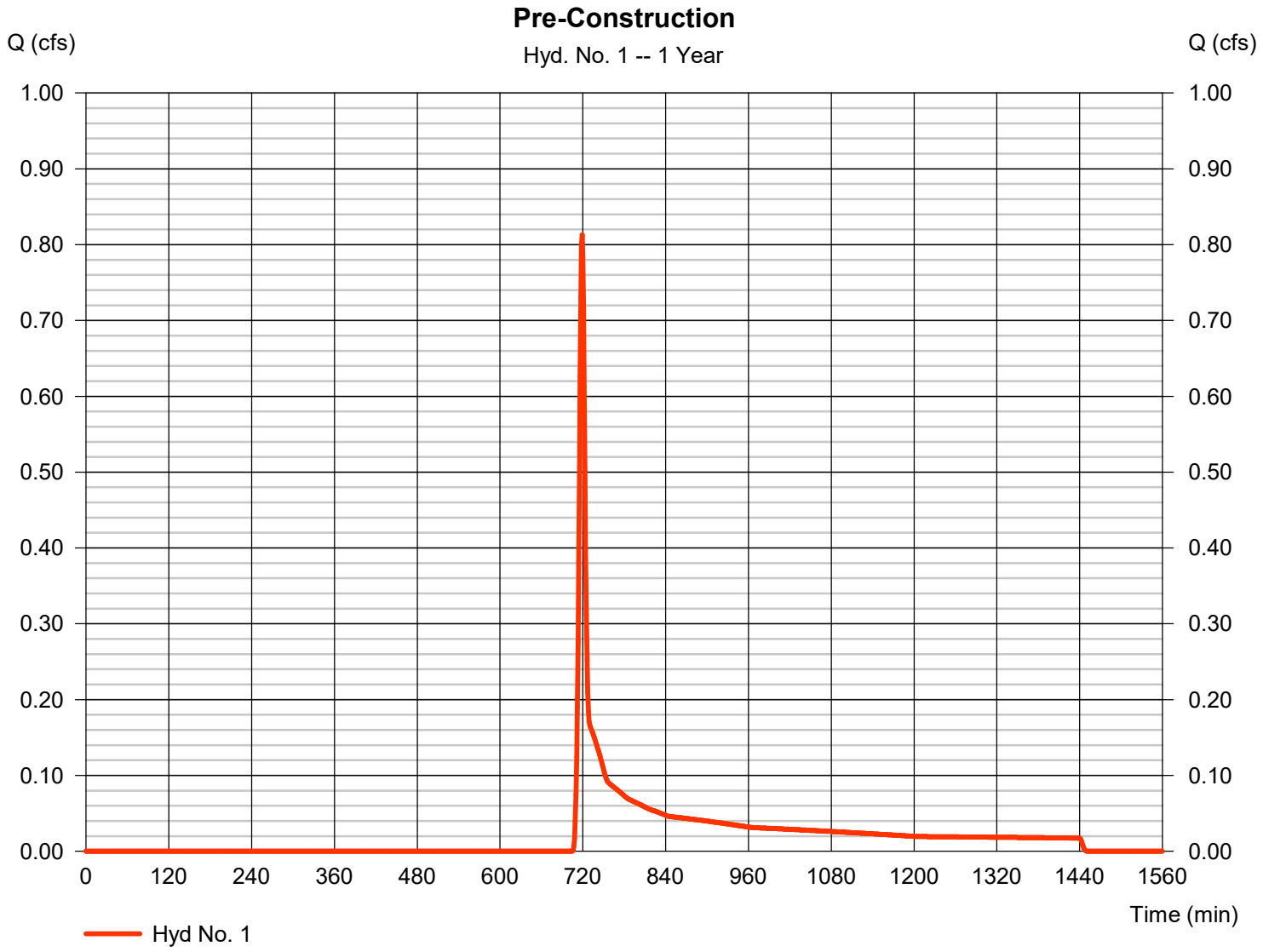
Hydrograph Report

Hyd. No. 1

Pre-Construction

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.813 cfs
Storm frequency	=	1 yrs	Time to peak	=	719 min
Time interval	=	1 min	Hyd. volume	=	1,990 cuft
Drainage area	=	1.260 ac	Curve number	=	65*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	6.00 min
Total precip.	=	2.81 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.600 x 55) + (0.380 x 58) + (0.280 x 98)] / 1.260



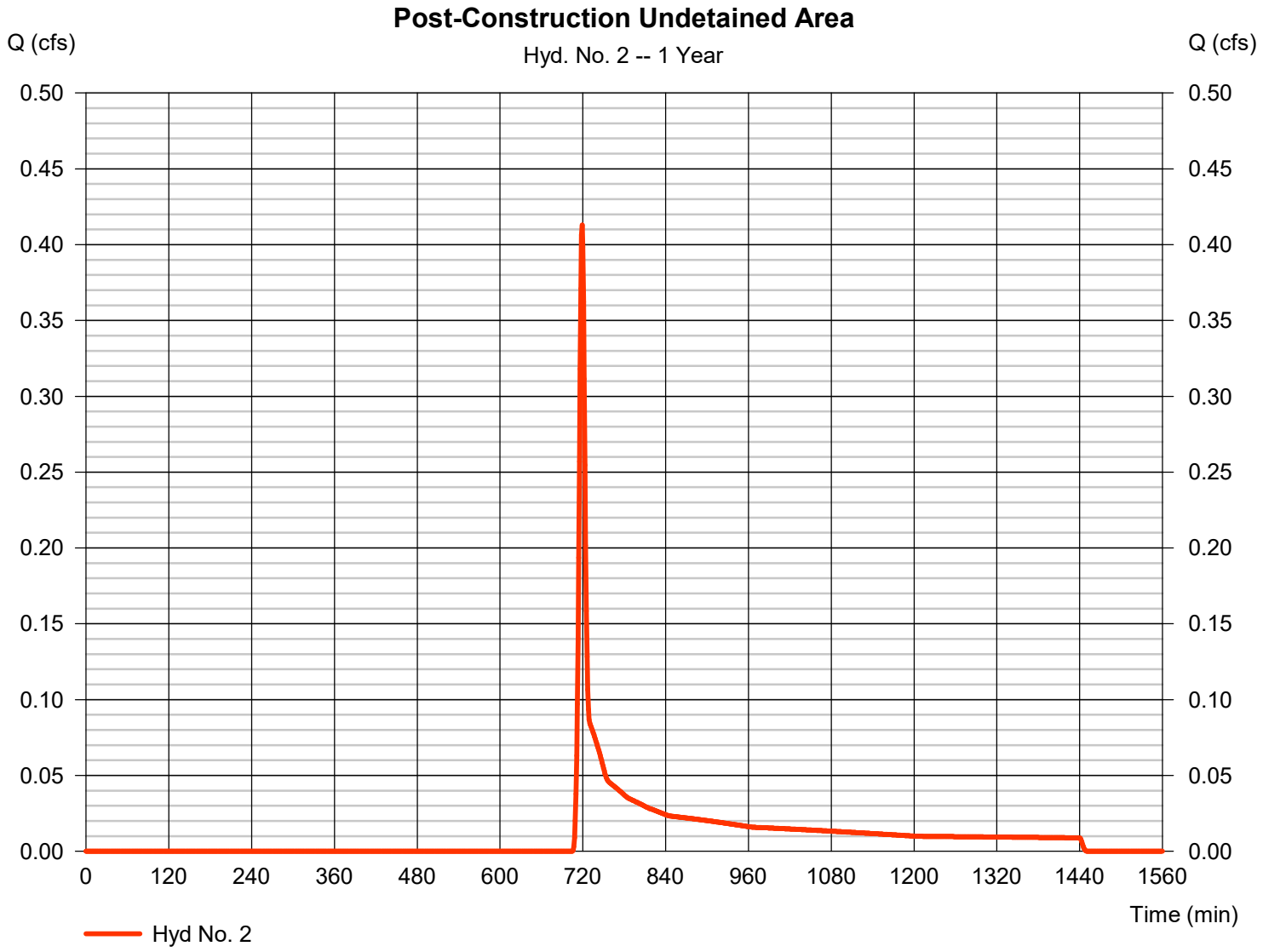
Hydrograph Report

Hyd. No. 2

Post-Construction Undetained Area

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.413 cfs
Storm frequency	=	1 yrs	Time to peak	=	719 min
Time interval	=	1 min	Hyd. volume	=	1,011 cuft
Drainage area	=	0.640 ac	Curve number	=	65*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	6.00 min
Total precip.	=	2.81 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.210 x 58) + (0.180 x 98) + (0.250 x 48)] / 0.640



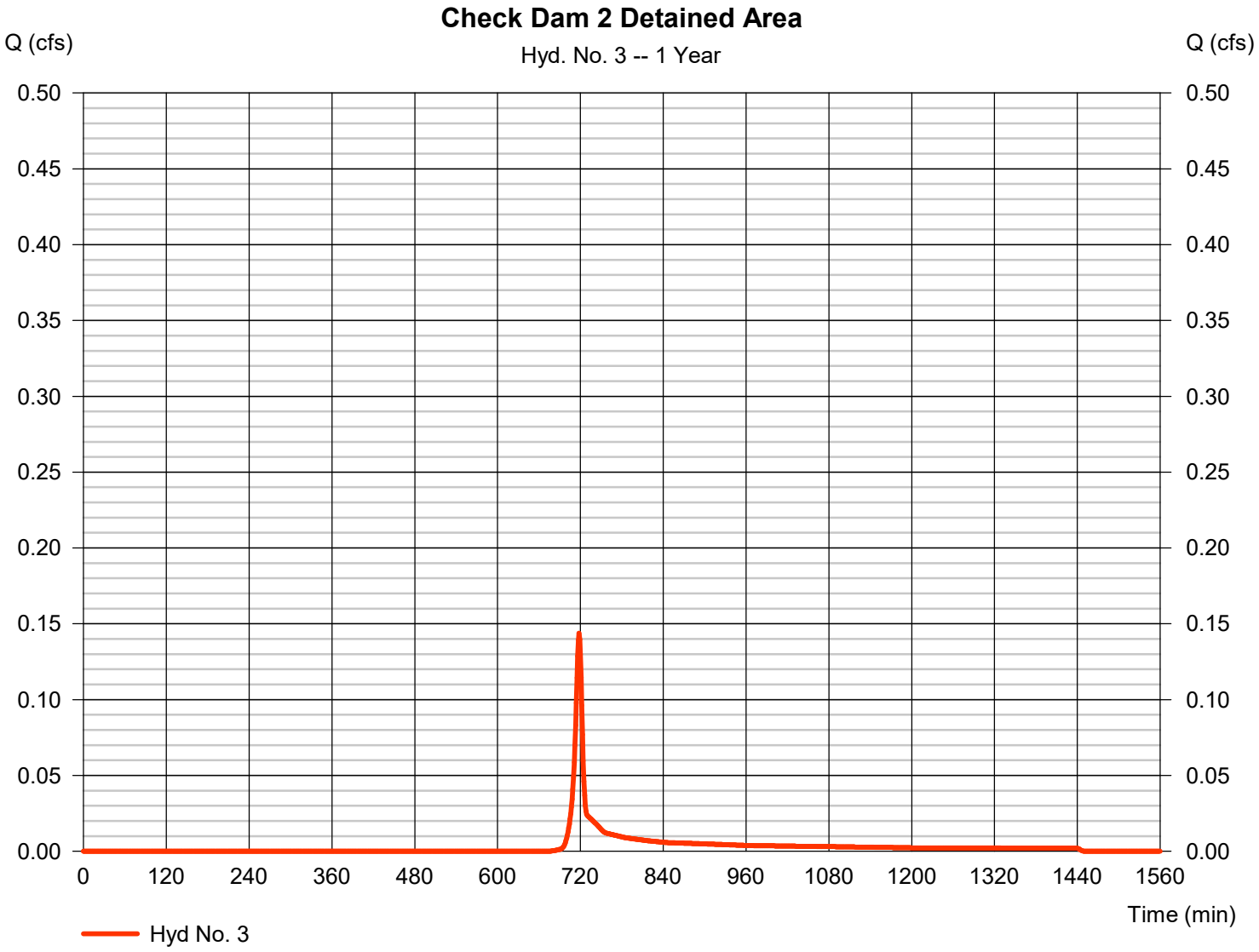
Hydrograph Report

Hyd. No. 3

Check Dam 2 Detained Area

Hydrograph type	= SCS Runoff	Peak discharge	= 0.144 cfs
Storm frequency	= 1 yrs	Time to peak	= 718 min
Time interval	= 1 min	Hyd. volume	= 296 cuft
Drainage area	= 0.100 ac	Curve number	= 74*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 2.81 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.060 x 58) + (0.040 x 98)] / 0.100



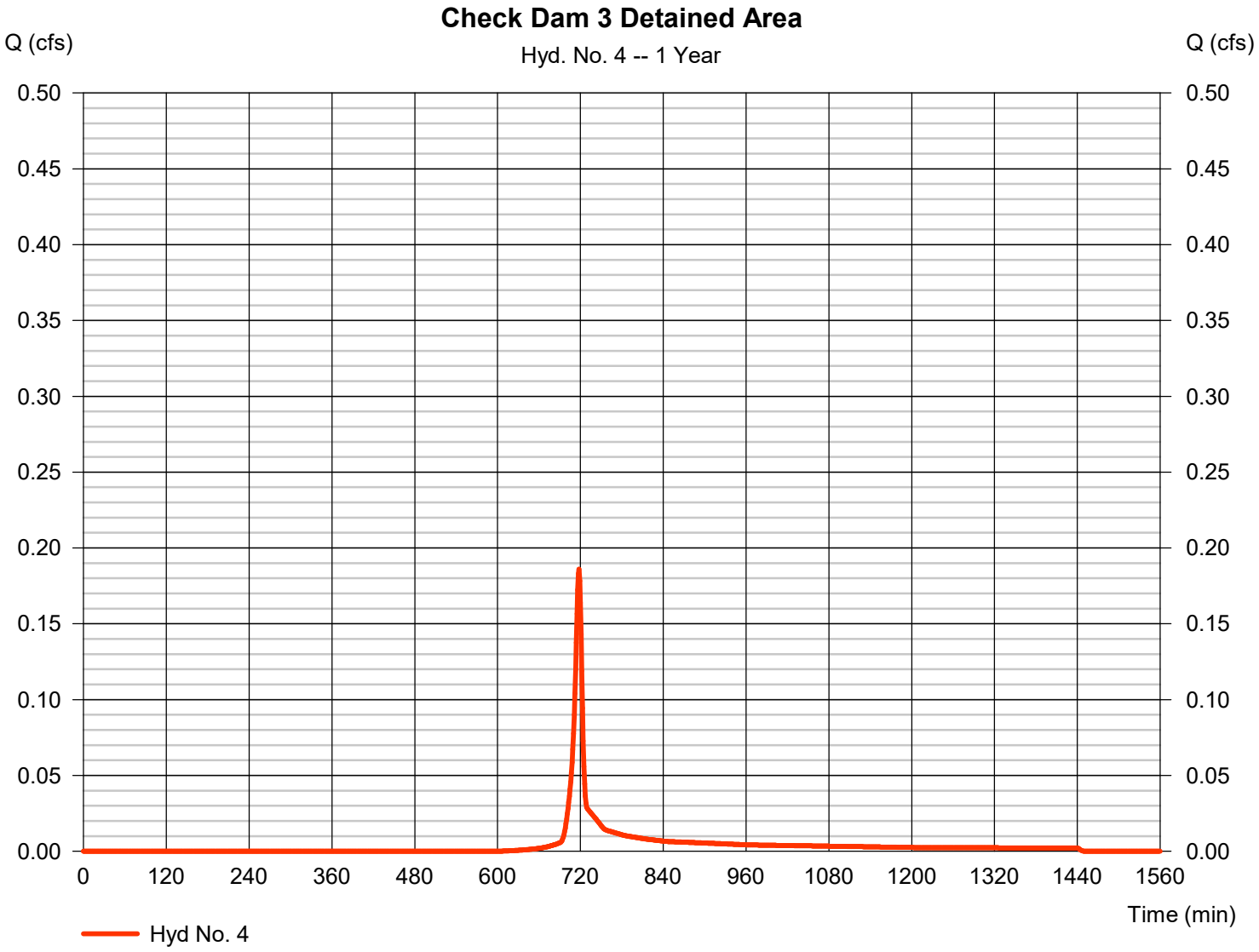
Hydrograph Report

Hyd. No. 4

Check Dam 3 Detained Area

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.186 cfs
Storm frequency	=	1 yrs	Time to peak	=	718 min
Time interval	=	1 min	Hyd. volume	=	374 cuft
Drainage area	=	0.090 ac	Curve number	=	80*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	6.00 min
Total precip.	=	2.81 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.040 x 58) + (0.050 x 98)] / 0.090



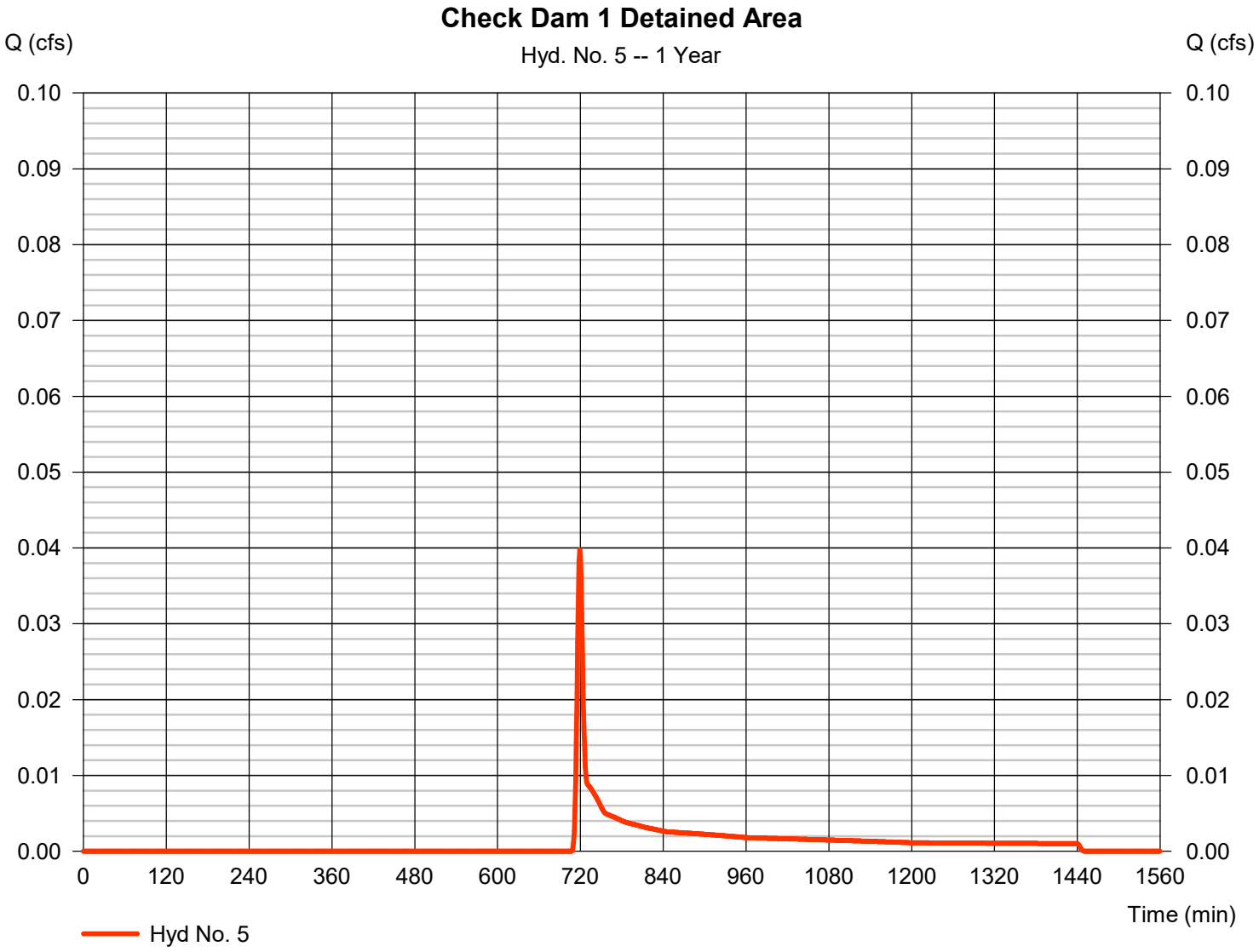
Hydrograph Report

Hyd. No. 5

Check Dam 1 Detained Area

Hydrograph type	= SCS Runoff	Peak discharge	= 0.040 cfs
Storm frequency	= 1 yrs	Time to peak	= 719 min
Time interval	= 1 min	Hyd. volume	= 107 cuft
Drainage area	= 0.080 ac	Curve number	= 63*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 2.81 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.070 x 58) + (0.010 x 98)] / 0.080



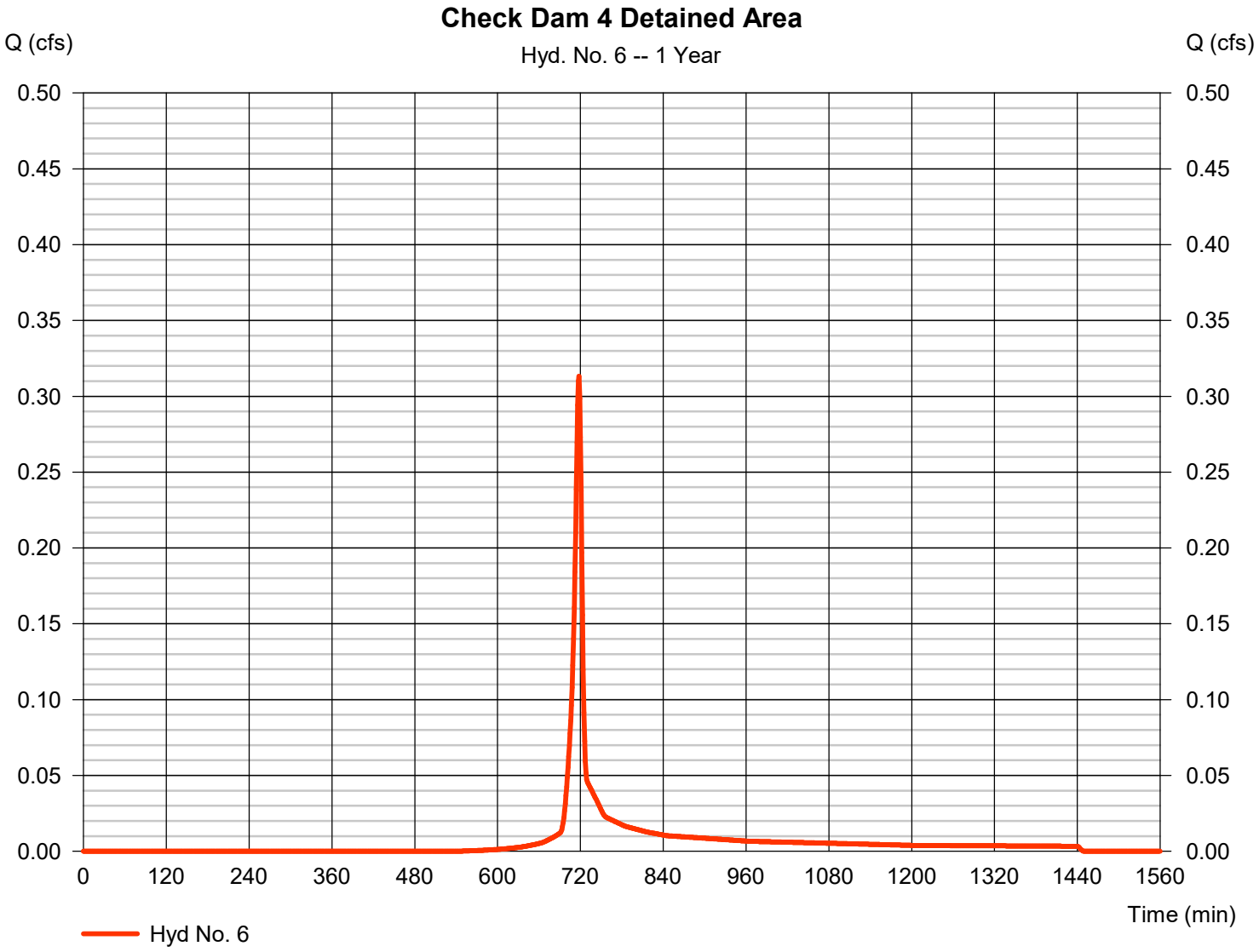
Hydrograph Report

Hyd. No. 6

Check Dam 4 Detained Area

Hydrograph type	= SCS Runoff	Peak discharge	= 0.313 cfs
Storm frequency	= 1 yrs	Time to peak	= 718 min
Time interval	= 1 min	Hyd. volume	= 630 cuft
Drainage area	= 0.130 ac	Curve number	= 83*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 2.81 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.050 x 58) + (0.080 x 98)] / 0.130



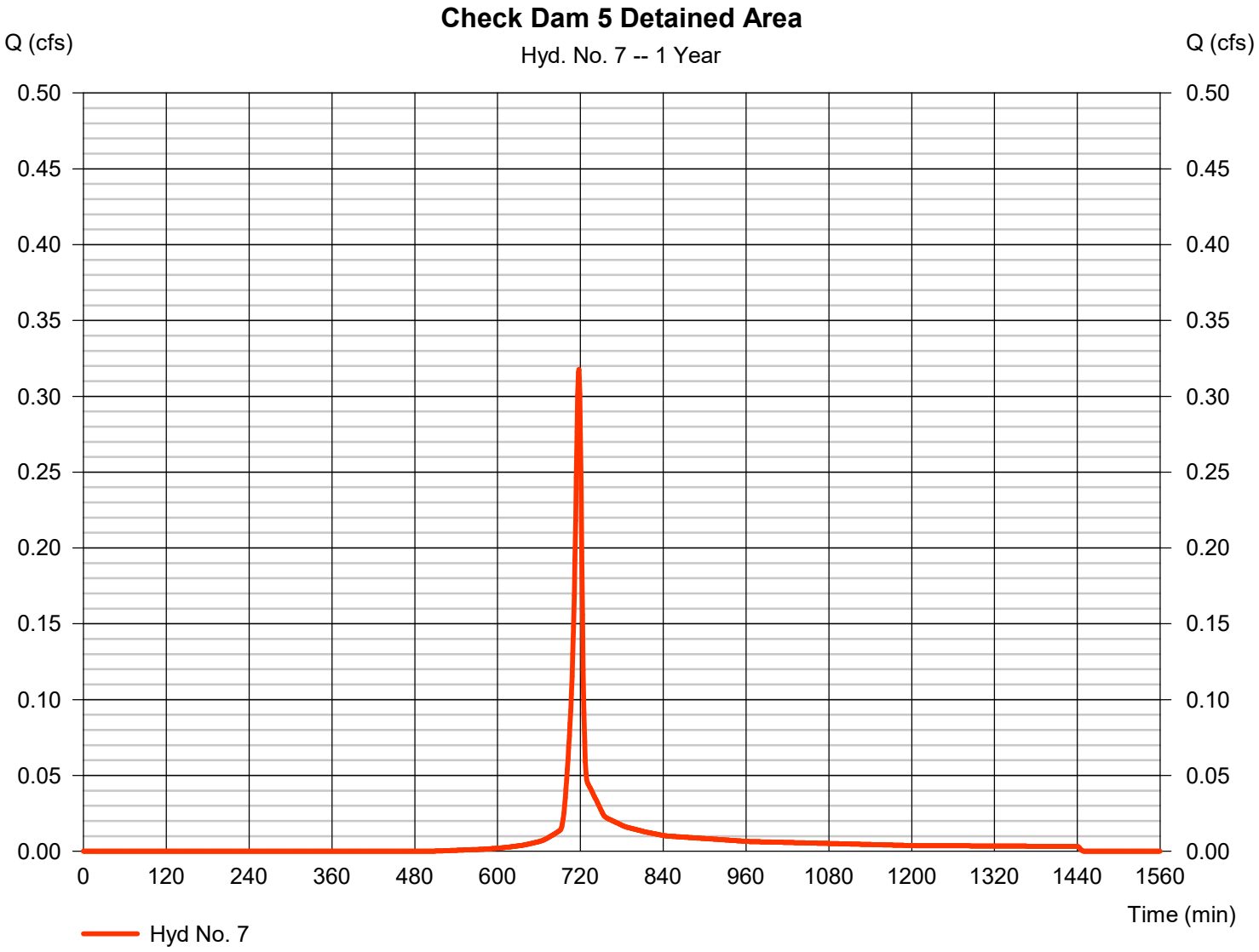
Hydrograph Report

Hyd. No. 7

Check Dam 5 Detained Area

Hydrograph type	= SCS Runoff	Peak discharge	= 0.318 cfs
Storm frequency	= 1 yrs	Time to peak	= 718 min
Time interval	= 1 min	Hyd. volume	= 642 cuft
Drainage area	= 0.120 ac	Curve number	= 85*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 2.81 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.040 x 58) + (0.080 x 98)] / 0.120



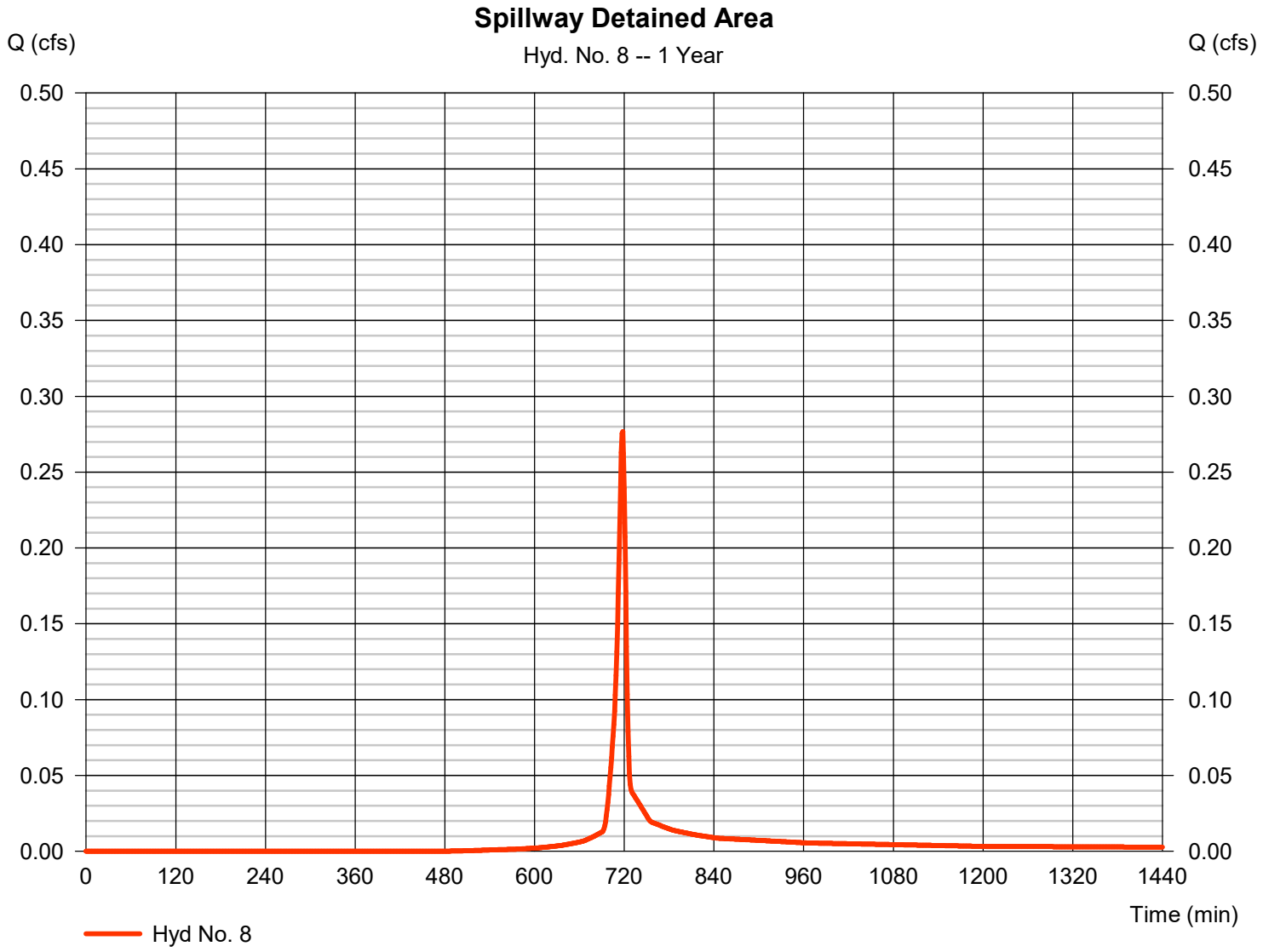
Hydrograph Report

Hyd. No. 8

Spillway Detained Area

Hydrograph type	= SCS Runoff	Peak discharge	= 0.277 cfs
Storm frequency	= 1 yrs	Time to peak	= 718 min
Time interval	= 1 min	Hyd. volume	= 562 cuft
Drainage area	= 0.100 ac	Curve number	= 86*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 2.81 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.030 x 58) + (0.070 x 98)] / 0.100



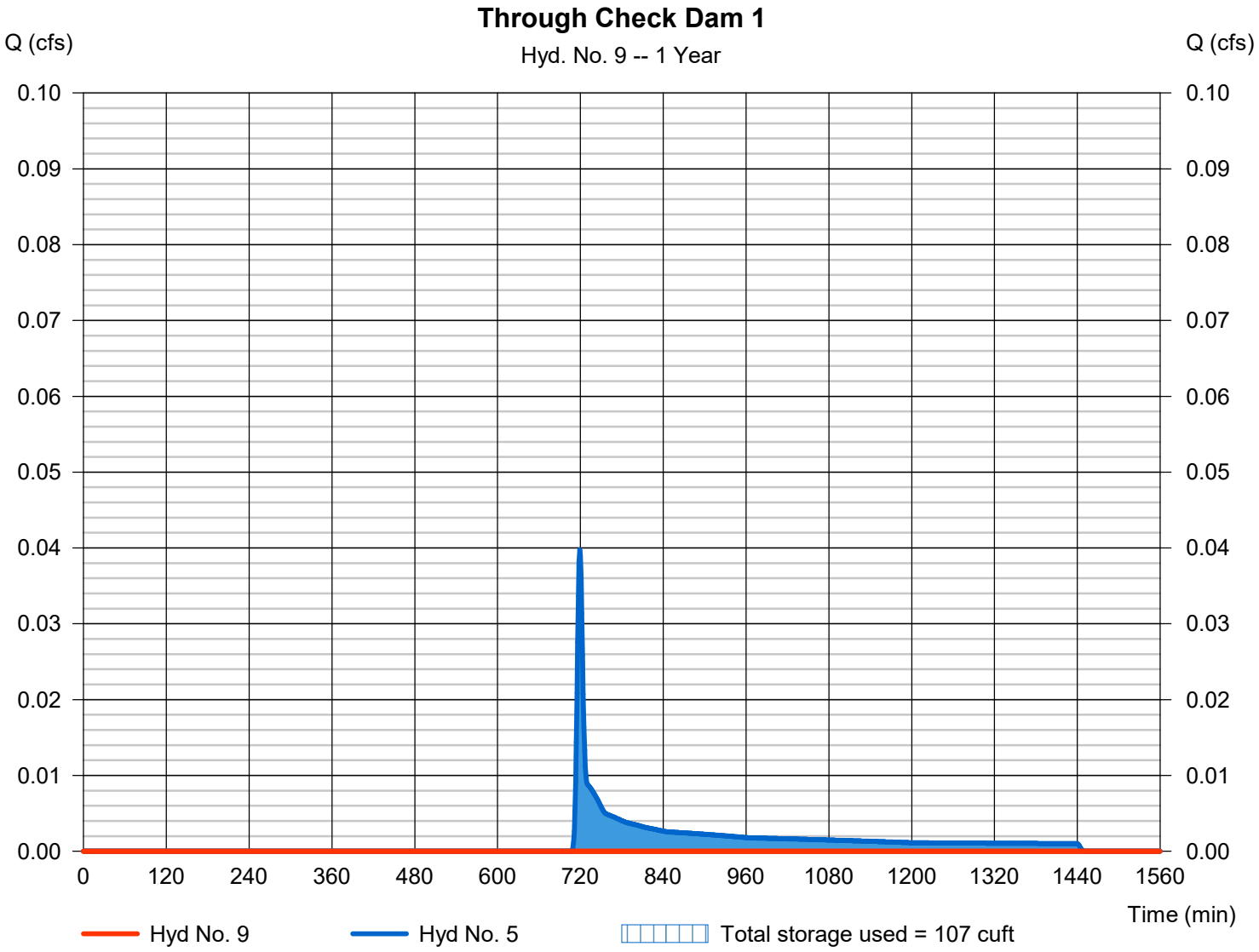
Hydrograph Report

Hyd. No. 9

Through Check Dam 1

Hydrograph type	=	Reservoir	Peak discharge	=	0.000 cfs
Storm frequency	=	1 yrs	Time to peak	=	n/a
Time interval	=	1 min	Hyd. volume	=	0 cuft
Inflow hyd. No.	=	5 - Check Dam 1 Detained Area	Max. Elevation	=	693.07 ft
Reservoir name	=	Dry Swale Section 1	Max. Storage	=	107 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Pond Report

Pond No. 1 - Dry Swale Section 1

Pond Data

Pond storage is based on user-defined values.

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	691.85	n/a	0	0
0.50	692.35	n/a	44	44
1.00	692.85	n/a	44	88
1.50	693.35	n/a	44	131
2.00	693.85	n/a	114	245
2.50	694.35	n/a	114	359
3.00	694.85	n/a	114	473

*Note, volume @ elevation 694.85 is a dummy value as Hydraflow will not calculate flow correctly unless areas exists above spillway.

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 0.50	0.00	0.00	0.00
Span (in)	= 0.50	0.00	0.00	0.00
No. Barrels	= 1	0	0	0
Invert El. (ft)	= 693.35	0.00	0.00	0.00
Length (ft)	= 0.00	0.00	0.00	0.00
Slope (%)	= 0.00	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)	= 1.00	16.00	0.00	0.00
Crest El. (ft)	= 694.10	694.35	0.00	0.00
Weir Coeff.	= 3.33	2.60	3.33	3.33
Weir Type	= Ciplti	Broad	---	---
Multi-Stage	= No	No	No	No

Exfil.(in/hr) = 1.700 (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).

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0	691.85	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.05	4	691.90	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.10	9	691.95	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.15	13	692.00	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.20	18	692.05	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.25	22	692.10	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.30	26	692.15	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.35	31	692.20	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.40	35	692.25	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.45	39	692.30	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.50	44	692.35	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.55	48	692.40	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.60	53	692.45	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.65	57	692.50	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.70	61	692.55	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.75	66	692.60	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.80	70	692.65	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.85	74	692.70	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.90	79	692.75	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.95	83	692.80	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
1.00	88	692.85	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
1.05	92	692.90	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
1.10	96	692.95	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
1.15	101	693.00	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
1.20	105	693.05	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
1.25	109	693.10	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
1.30	114	693.15	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
1.35	118	693.20	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
1.40	123	693.25	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
1.45	127	693.30	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
1.50	131	693.35	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
1.55	143	693.40	0.00 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.001
1.60	154	693.45	0.00 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.002
1.65	165	693.50	0.00 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.002
1.70	177	693.55	0.00 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.003
1.75	188	693.60	0.00 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.003
1.80	200	693.65	0.00 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.003

Continues on next page...

Dry Swale Section 1

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
1.85	211	693.70	0.00 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.004
1.90	222	693.75	0.00 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.004
1.95	234	693.80	0.00 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.004
2.00	245	693.85	0.00 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.005
2.05	256	693.90	0.00 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.005
2.10	268	693.95	0.00 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.005
2.15	279	694.00	0.01 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.005
2.20	291	694.05	0.01 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.005
2.25	302	694.10	0.01 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.006
2.30	313	694.15	0.01 ic	---	---	---	0.04	0.00	---	---	0.000	---	0.043
2.35	325	694.20	0.01 ic	---	---	---	0.11	0.00	---	---	0.000	---	0.111
2.40	336	694.25	0.01 ic	---	---	---	0.19	0.00	---	---	0.000	---	0.199
2.45	348	694.30	0.01 ic	---	---	---	0.30	0.00	---	---	0.000	---	0.304
2.50	359	694.35	0.01 ic	---	---	---	0.42	0.00	---	---	0.000	---	0.423
2.55	370	694.40	0.01 ic	---	---	---	0.55	0.46	---	---	0.000	---	1.019
2.60	382	694.45	0.01 ic	---	---	---	0.69	1.32	---	---	0.000	---	2.011
2.65	393	694.50	0.01 ic	---	---	---	0.84	2.42	---	---	0.000	---	3.265
2.70	405	694.55	0.01 ic	---	---	---	1.01	3.72	---	---	0.000	---	4.732
2.75	416	694.60	0.01 ic	---	---	---	1.18	5.20	---	---	0.000	---	6.382
2.80	427	694.65	0.01 ic	---	---	---	1.36	6.83	---	---	0.000	---	8.199
2.85	439	694.70	0.01 ic	---	---	---	1.55	8.61	---	---	0.000	---	10.17
2.90	450	694.75	0.01 ic	---	---	---	1.74	10.52	---	---	0.000	---	12.27
2.95	462	694.80	0.01 ic	---	---	---	1.95	12.55	---	---	0.000	---	14.51
3.00	473	694.85	0.01 ic	---	---	---	2.16	14.71	---	---	0.000	---	16.88

...End

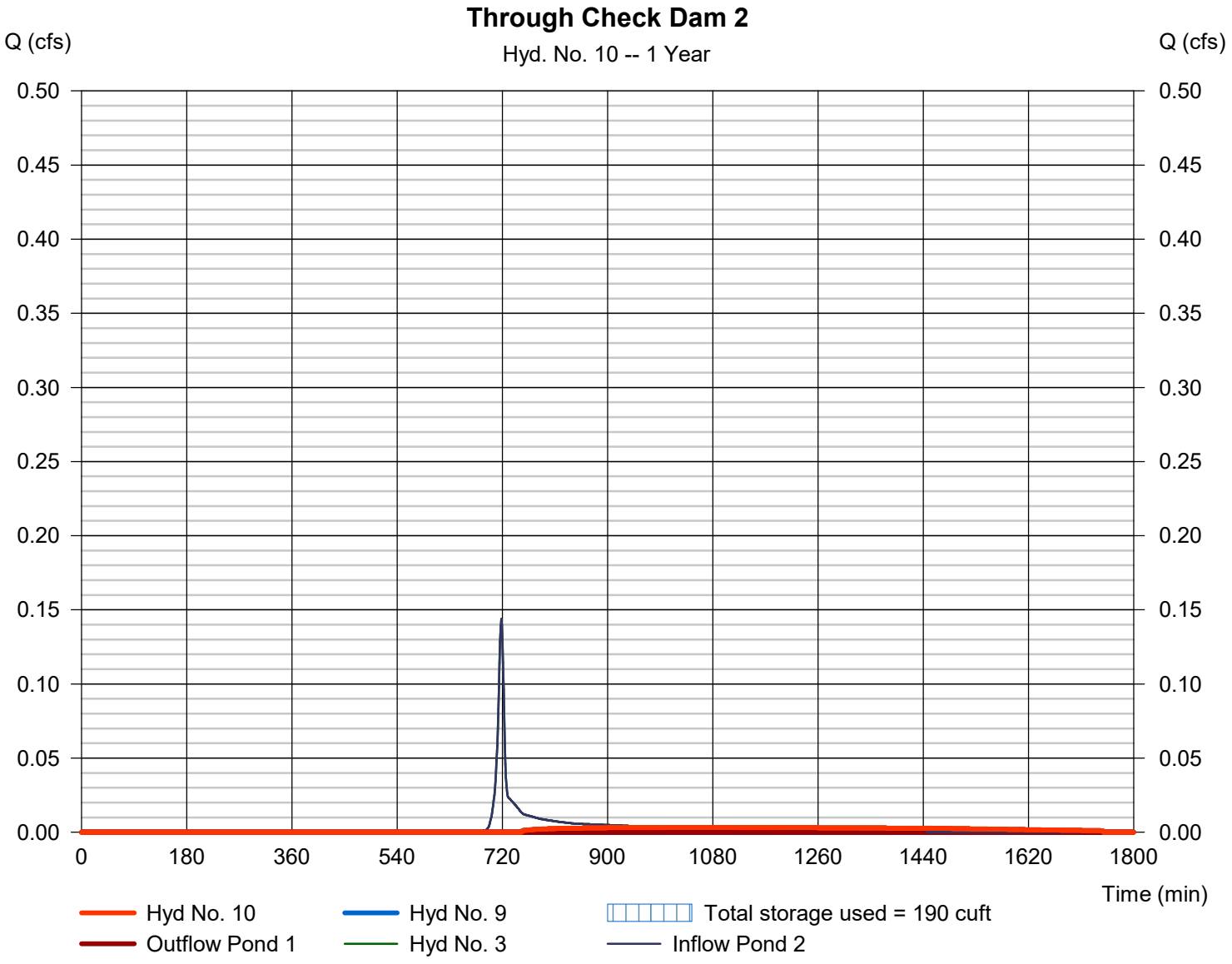
Hydrograph Report

Hyd. No. 10

Through Check Dam 2

Hydrograph type	=	Reservoir (Interconnected)	Peak discharge	=	0.003 cfs
Storm frequency	=	1 yrs	Time to peak	=	1058 min
Time interval	=	1 min	Hyd. volume	=	154 cuft
Upper Pond	=	Dry Swale Section 1	Lower Pond	=	Dry Swale Section 2
Inflow hyd.	=	9 - Through Check Dam 1	Other Inflow hyd.	=	3 - Check Dam 2
Max. Elevation	=	691.90 ft	Max. Elevation	=	692.74 ft
Max. Storage	=	0 cuft	Max. Storage	=	190 cuft

Interconnected Pond Routing. Storage Indication method used. Exfiltration extracted from Outflow.



Pond No. 1 - Dry Swale Section 1

Pond Data

Pond storage is based on user-defined values.

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	691.85	n/a	0	0
0.50	692.35	n/a	44	44
1.00	692.85	n/a	44	88
1.50	693.35	n/a	44	131
2.00	693.85	n/a	114	245
2.50	694.35	n/a	114	359
3.00	694.85	n/a	114	473

*Note, volume @ elevation 694.85 is a dummy value as Hydraflow will not calculate flow correctly unless areas exists above spillway.

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 0.50	0.00	0.00	0.00
Span (in)	= 0.50	0.00	0.00	0.00
No. Barrels	= 1	0	0	0
Invert El. (ft)	= 693.35	0.00	0.00	0.00
Length (ft)	= 0.00	0.00	0.00	0.00
Slope (%)	= 0.00	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)	= 1.00	16.00	0.00	0.00
Crest El. (ft)	= 694.10	694.35	0.00	0.00
Weir Coeff.	= 3.33	2.60	3.33	3.33
Weir Type	= Ciplti	Broad	---	---
Multi-Stage	= No	No	No	No

Exfil.(in/hr) = 1.700 (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).

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0	691.85	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.05	4	691.90	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.10	9	691.95	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.15	13	692.00	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.20	18	692.05	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.25	22	692.10	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.30	26	692.15	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.35	31	692.20	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.40	35	692.25	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.45	39	692.30	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.50	44	692.35	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.55	48	692.40	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.60	53	692.45	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.65	57	692.50	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.70	61	692.55	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.75	66	692.60	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.80	70	692.65	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.85	74	692.70	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.90	79	692.75	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.95	83	692.80	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
1.00	88	692.85	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
1.05	92	692.90	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
1.10	96	692.95	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
1.15	101	693.00	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
1.20	105	693.05	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
1.25	109	693.10	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
1.30	114	693.15	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
1.35	118	693.20	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
1.40	123	693.25	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
1.45	127	693.30	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
1.50	131	693.35	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
1.55	143	693.40	0.00 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.001
1.60	154	693.45	0.00 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.002
1.65	165	693.50	0.00 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.002
1.70	177	693.55	0.00 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.003
1.75	188	693.60	0.00 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.003
1.80	200	693.65	0.00 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.003

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Dry Swale Section 1

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
1.85	211	693.70	0.00 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.004
1.90	222	693.75	0.00 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.004
1.95	234	693.80	0.00 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.004
2.00	245	693.85	0.00 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.005
2.05	256	693.90	0.00 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.005
2.10	268	693.95	0.00 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.005
2.15	279	694.00	0.01 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.005
2.20	291	694.05	0.01 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.005
2.25	302	694.10	0.01 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.006
2.30	313	694.15	0.01 ic	---	---	---	0.04	0.00	---	---	0.000	---	0.043
2.35	325	694.20	0.01 ic	---	---	---	0.11	0.00	---	---	0.000	---	0.111
2.40	336	694.25	0.01 ic	---	---	---	0.19	0.00	---	---	0.000	---	0.199
2.45	348	694.30	0.01 ic	---	---	---	0.30	0.00	---	---	0.000	---	0.304
2.50	359	694.35	0.01 ic	---	---	---	0.42	0.00	---	---	0.000	---	0.423
2.55	370	694.40	0.01 ic	---	---	---	0.55	0.46	---	---	0.000	---	1.019
2.60	382	694.45	0.01 ic	---	---	---	0.69	1.32	---	---	0.000	---	2.011
2.65	393	694.50	0.01 ic	---	---	---	0.84	2.42	---	---	0.000	---	3.265
2.70	405	694.55	0.01 ic	---	---	---	1.01	3.72	---	---	0.000	---	4.732
2.75	416	694.60	0.01 ic	---	---	---	1.18	5.20	---	---	0.000	---	6.382
2.80	427	694.65	0.01 ic	---	---	---	1.36	6.83	---	---	0.000	---	8.199
2.85	439	694.70	0.01 ic	---	---	---	1.55	8.61	---	---	0.000	---	10.17
2.90	450	694.75	0.01 ic	---	---	---	1.74	10.52	---	---	0.000	---	12.27
2.95	462	694.80	0.01 ic	---	---	---	1.95	12.55	---	---	0.000	---	14.51
3.00	473	694.85	0.01 ic	---	---	---	2.16	14.71	---	---	0.000	---	16.88

...End

Pond No. 2 - Dry Swale Section 2

Pond Data

Pond storage is based on user-defined values.

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	690.98	n/a	0	0
0.50	691.48	n/a	44	44
1.00	691.98	n/a	44	88
1.50	692.48	n/a	44	131
2.00	692.98	n/a	114	245
2.50	693.48	n/a	114	359
3.00	693.98	n/a	114	473

*Note, volume @ elevation 693.98 is a dummy value as Hydraflow will not calculate flow correctly unless areas exists above spillway.

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 0.50	0.00	0.00	0.00
Span (in)	= 0.50	0.00	0.00	0.00
No. Barrels	= 1	0	0	0
Invert El. (ft)	= 692.48	0.00	0.00	0.00
Length (ft)	= 0.00	0.00	0.00	0.00
Slope (%)	= 0.00	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)	= 1.00	16.00	0.00	0.00
Crest El. (ft)	= 693.23	693.48	0.00	0.00
Weir Coeff.	= 3.33	2.60	3.33	3.33
Weir Type	= Ciplti	Broad	---	---
Multi-Stage	= No	No	No	No

Exfil.(in/hr) = 1.700 (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).

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0	690.98	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.05	4	691.03	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.10	9	691.08	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.15	13	691.13	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.20	18	691.18	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.25	22	691.23	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.30	26	691.28	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.35	31	691.33	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.40	35	691.38	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.45	39	691.43	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.50	44	691.48	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.55	48	691.53	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.60	53	691.58	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.65	57	691.63	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.70	61	691.68	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.75	66	691.73	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.80	70	691.78	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.85	74	691.83	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.90	79	691.88	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.95	83	691.93	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
1.00	88	691.98	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
1.05	92	692.03	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
1.10	96	692.08	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
1.15	101	692.13	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
1.20	105	692.18	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
1.25	109	692.23	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
1.30	114	692.28	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
1.35	118	692.33	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
1.40	123	692.38	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
1.45	127	692.43	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
1.50	131	692.48	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
1.55	143	692.53	0.00 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.001
1.60	154	692.58	0.00 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.002
1.65	165	692.63	0.00 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.002
1.70	177	692.68	0.00 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.003
1.75	188	692.73	0.00 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.003
1.80	200	692.78	0.00 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.003

Continues on next page...

Dry Swale Section 2

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
1.85	211	692.83	0.00 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.004
1.90	222	692.88	0.00 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.004
1.95	234	692.93	0.00 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.004
2.00	245	692.98	0.00 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.005
2.05	256	693.03	0.00 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.005
2.10	268	693.08	0.00 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.005
2.15	279	693.13	0.01 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.005
2.20	291	693.18	0.01 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.005
2.25	302	693.23	0.01 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.006
2.30	313	693.28	0.01 ic	---	---	---	0.04	0.00	---	---	0.000	---	0.043
2.35	325	693.33	0.01 ic	---	---	---	0.11	0.00	---	---	0.000	---	0.111
2.40	336	693.38	0.01 ic	---	---	---	0.19	0.00	---	---	0.000	---	0.199
2.45	348	693.43	0.01 ic	---	---	---	0.30	0.00	---	---	0.000	---	0.304
2.50	359	693.48	0.01 ic	---	---	---	0.42	0.00	---	---	0.000	---	0.423
2.55	370	693.53	0.01 ic	---	---	---	0.55	0.46	---	---	0.000	---	1.019
2.60	382	693.58	0.01 ic	---	---	---	0.69	1.32	---	---	0.000	---	2.011
2.65	393	693.63	0.01 ic	---	---	---	0.84	2.42	---	---	0.000	---	3.265
2.70	405	693.68	0.01 ic	---	---	---	1.01	3.72	---	---	0.000	---	4.732
2.75	416	693.73	0.01 ic	---	---	---	1.18	5.20	---	---	0.000	---	6.382
2.80	427	693.78	0.01 ic	---	---	---	1.36	6.83	---	---	0.000	---	8.199
2.85	439	693.83	0.01 ic	---	---	---	1.55	8.61	---	---	0.000	---	10.17
2.90	450	693.88	0.01 ic	---	---	---	1.74	10.52	---	---	0.000	---	12.27
2.95	462	693.93	0.01 ic	---	---	---	1.95	12.55	---	---	0.000	---	14.51
3.00	473	693.98	0.01 ic	---	---	---	2.16	14.71	---	---	0.000	---	16.88

...End

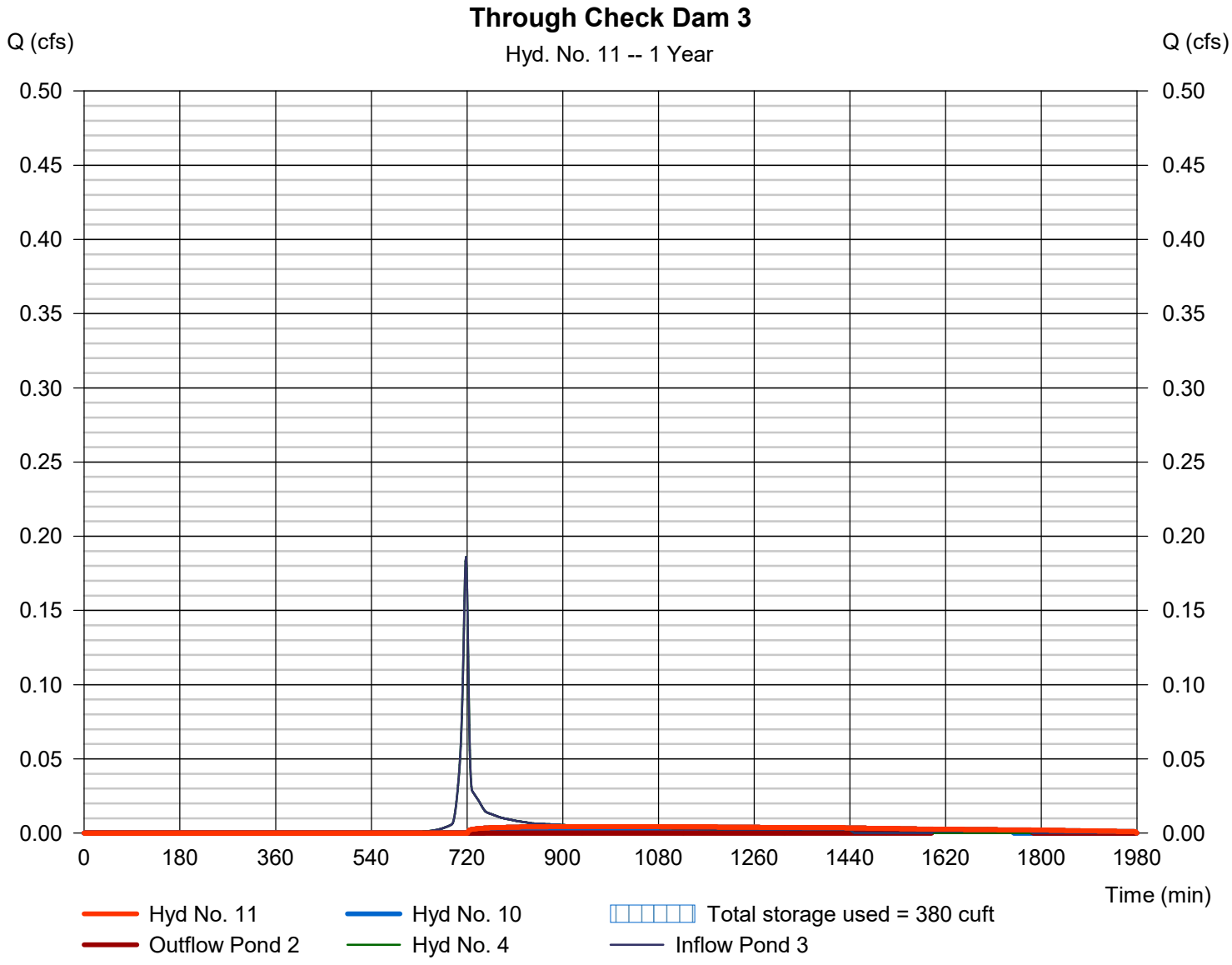
Hydrograph Report

Hyd. No. 11

Through Check Dam 3

Hydrograph type	=	Reservoir (Interconnected)	Peak discharge	=	0.004 cfs
Storm frequency	=	1 yrs	Time to peak	=	955 min
Time interval	=	1 min	Hyd. volume	=	245 cuft
Upper Pond	=	Dry Swale Section 2	Lower Pond	=	Dry Swale Section 3
Inflow hyd.	=	10 - Through Check Dam 2	Other Inflow hyd.	=	4 - Check Dam 3
Max. Elevation	=	692.54 ft	Max. Elevation	=	692.06 ft
Max. Storage	=	144 cuft	Max. Storage	=	236 cuft

Interconnected Pond Routing. Storage Indication method used. Exfiltration extracted from Outflow.



Pond No. 2 - Dry Swale Section 2

Pond Data

Pond storage is based on user-defined values.

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	690.98	n/a	0	0
0.50	691.48	n/a	44	44
1.00	691.98	n/a	44	88
1.50	692.48	n/a	44	131
2.00	692.98	n/a	114	245
2.50	693.48	n/a	114	359
3.00	693.98	n/a	114	473

*Note, volume @ elevation 693.98 is a dummy value as Hydraflow will not calculate flow correctly unless areas exists above spillway.

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 0.50	0.00	0.00	0.00
Span (in)	= 0.50	0.00	0.00	0.00
No. Barrels	= 1	0	0	0
Invert El. (ft)	= 692.48	0.00	0.00	0.00
Length (ft)	= 0.00	0.00	0.00	0.00
Slope (%)	= 0.00	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)	= 1.00	16.00	0.00	0.00
Crest El. (ft)	= 693.23	693.48	0.00	0.00
Weir Coeff.	= 3.33	2.60	3.33	3.33
Weir Type	= Ciplti	Broad	---	---
Multi-Stage	= No	No	No	No

Exfil.(in/hr) = 1.700 (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).

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0	690.98	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.05	4	691.03	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.10	9	691.08	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.15	13	691.13	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.20	18	691.18	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.25	22	691.23	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.30	26	691.28	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.35	31	691.33	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.40	35	691.38	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.45	39	691.43	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.50	44	691.48	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.55	48	691.53	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.60	53	691.58	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.65	57	691.63	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.70	61	691.68	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.75	66	691.73	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.80	70	691.78	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.85	74	691.83	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.90	79	691.88	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.95	83	691.93	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
1.00	88	691.98	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
1.05	92	692.03	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
1.10	96	692.08	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
1.15	101	692.13	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
1.20	105	692.18	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
1.25	109	692.23	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
1.30	114	692.28	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
1.35	118	692.33	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
1.40	123	692.38	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
1.45	127	692.43	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
1.50	131	692.48	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
1.55	143	692.53	0.00 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.001
1.60	154	692.58	0.00 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.002
1.65	165	692.63	0.00 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.002
1.70	177	692.68	0.00 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.003
1.75	188	692.73	0.00 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.003
1.80	200	692.78	0.00 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.003

Continues on next page...

Dry Swale Section 2

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
1.85	211	692.83	0.00 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.004
1.90	222	692.88	0.00 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.004
1.95	234	692.93	0.00 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.004
2.00	245	692.98	0.00 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.005
2.05	256	693.03	0.00 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.005
2.10	268	693.08	0.00 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.005
2.15	279	693.13	0.01 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.005
2.20	291	693.18	0.01 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.005
2.25	302	693.23	0.01 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.006
2.30	313	693.28	0.01 ic	---	---	---	0.04	0.00	---	---	0.000	---	0.043
2.35	325	693.33	0.01 ic	---	---	---	0.11	0.00	---	---	0.000	---	0.111
2.40	336	693.38	0.01 ic	---	---	---	0.19	0.00	---	---	0.000	---	0.199
2.45	348	693.43	0.01 ic	---	---	---	0.30	0.00	---	---	0.000	---	0.304
2.50	359	693.48	0.01 ic	---	---	---	0.42	0.00	---	---	0.000	---	0.423
2.55	370	693.53	0.01 ic	---	---	---	0.55	0.46	---	---	0.000	---	1.019
2.60	382	693.58	0.01 ic	---	---	---	0.69	1.32	---	---	0.000	---	2.011
2.65	393	693.63	0.01 ic	---	---	---	0.84	2.42	---	---	0.000	---	3.265
2.70	405	693.68	0.01 ic	---	---	---	1.01	3.72	---	---	0.000	---	4.732
2.75	416	693.73	0.01 ic	---	---	---	1.18	5.20	---	---	0.000	---	6.382
2.80	427	693.78	0.01 ic	---	---	---	1.36	6.83	---	---	0.000	---	8.199
2.85	439	693.83	0.01 ic	---	---	---	1.55	8.61	---	---	0.000	---	10.17
2.90	450	693.88	0.01 ic	---	---	---	1.74	10.52	---	---	0.000	---	12.27
2.95	462	693.93	0.01 ic	---	---	---	1.95	12.55	---	---	0.000	---	14.51
3.00	473	693.98	0.01 ic	---	---	---	2.16	14.71	---	---	0.000	---	16.88

...End

Pond No. 3 - Dry Swale Section 3

Pond Data

Pond storage is based on user-defined values.

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	690.10	n/a	0	0
0.50	690.60	n/a	44	44
1.00	691.10	n/a	44	88
1.50	691.60	n/a	44	131
2.00	692.10	n/a	114	245
2.50	692.60	n/a	114	359
3.50	693.10	n/a	641	1,000

*Note, volume @ elevation 693.10 is a dummy value as Hydraflow will not calculate flow correctly unless areas exists above spillway.

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 0.50	0.00	0.00	0.00
Span (in)	= 0.50	0.00	0.00	0.00
No. Barrels	= 1	0	0	0
Invert El. (ft)	= 691.60	0.00	0.00	0.00
Length (ft)	= 0.00	0.00	0.00	0.00
Slope (%)	= 0.00	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)	= 1.00	16.00	0.00	0.00
Crest El. (ft)	= 692.35	692.60	0.00	0.00
Weir Coeff.	= 3.33	2.60	3.33	3.33
Weir Type	= Ciplti	Broad	---	---
Multi-Stage	= No	No	No	No

Exfil.(in/hr) = 1.700 (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).

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0	690.10	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.05	4	690.15	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.10	9	690.20	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.15	13	690.25	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.20	18	690.30	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.25	22	690.35	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.30	26	690.40	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.35	31	690.45	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.40	35	690.50	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.45	39	690.55	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.50	44	690.60	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.55	48	690.65	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.60	53	690.70	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.65	57	690.75	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.70	61	690.80	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.75	66	690.85	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.80	70	690.90	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.85	74	690.95	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.90	79	691.00	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.95	83	691.05	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
1.00	88	691.10	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
1.05	92	691.15	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
1.10	96	691.20	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
1.15	101	691.25	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
1.20	105	691.30	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
1.25	109	691.35	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
1.30	114	691.40	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
1.35	118	691.45	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
1.40	123	691.50	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
1.45	127	691.55	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
1.50	131	691.60	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
1.55	143	691.65	0.00 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.001
1.60	154	691.70	0.00 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.002
1.65	165	691.75	0.00 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.002
1.70	177	691.80	0.00 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.003
1.75	188	691.85	0.00 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.003
1.80	200	691.90	0.00 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.003

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Dry Swale Section 3

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
1.85	211	691.95	0.00 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.004
1.90	222	692.00	0.00 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.004
1.95	234	692.05	0.00 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.004
2.00	245	692.10	0.00 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.005
2.05	256	692.15	0.00 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.005
2.10	268	692.20	0.00 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.005
2.15	279	692.25	0.01 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.005
2.20	291	692.30	0.01 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.005
2.25	302	692.35	0.01 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.006
2.30	313	692.40	0.01 ic	---	---	---	0.04	0.00	---	---	0.000	---	0.043
2.35	325	692.45	0.01 ic	---	---	---	0.11	0.00	---	---	0.000	---	0.111
2.40	336	692.50	0.01 ic	---	---	---	0.19	0.00	---	---	0.000	---	0.199
2.45	348	692.55	0.01 ic	---	---	---	0.30	0.00	---	---	0.000	---	0.304
2.50	359	692.60	0.01 ic	---	---	---	0.42	0.00	---	---	0.000	---	0.423
2.60	423	692.70	0.01 ic	---	---	---	0.69	1.32	---	---	0.000	---	2.011
2.70	487	692.80	0.01 ic	---	---	---	1.01	3.72	---	---	0.000	---	4.732
2.80	551	692.90	0.01 ic	---	---	---	1.36	6.83	---	---	0.000	---	8.199
2.90	615	693.00	0.01 ic	---	---	---	1.74	10.52	---	---	0.000	---	12.27
3.00	679	693.10	0.01 ic	---	---	---	2.16	14.70	---	---	0.000	---	16.87
3.10	744	693.20	0.01 ic	---	---	---	2.61	19.33	---	---	0.000	---	21.94
3.20	808	693.30	0.01 ic	---	---	---	3.08	24.35	---	---	0.000	---	27.45
3.30	872	693.40	0.01 ic	---	---	---	3.58	29.76	---	---	0.000	---	33.35
3.40	936	693.50	0.01 ic	---	---	---	4.11	35.51	---	---	0.000	---	39.62
3.50	1,000	693.10	0.01 ic	---	---	---	2.16	14.71	---	---	0.000	---	16.88

...End

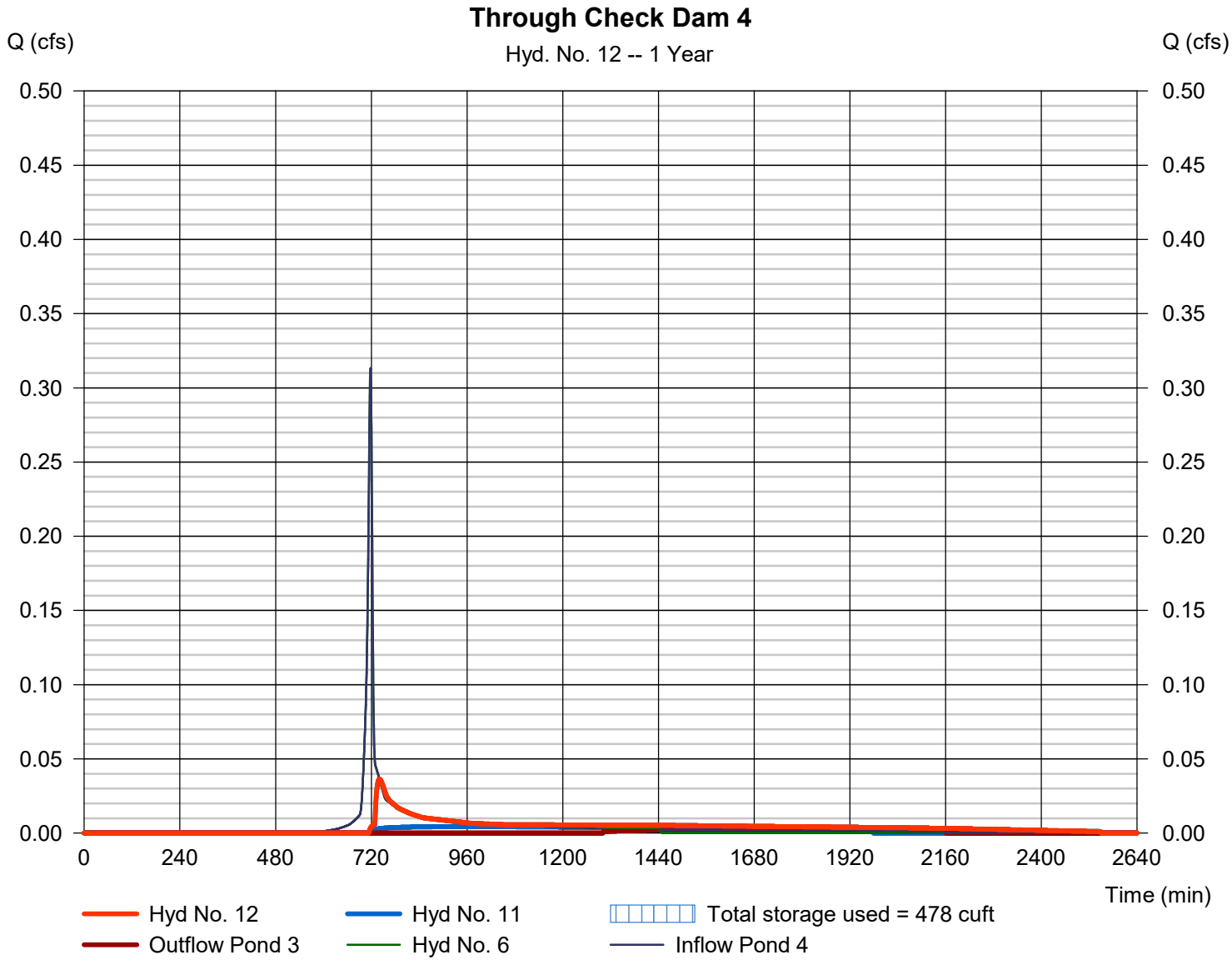
Hydrograph Report

Hyd. No. 12

Through Check Dam 4

Hydrograph type	=	Reservoir (Interconnected)	Peak discharge	=	0.036 cfs
Storm frequency	=	1 yrs	Time to peak	=	740 min
Time interval	=	1 min	Hyd. volume	=	593 cuft
Upper Pond	=	Dry Swale Section 3	Lower Pond	=	Dry Swale Section 4
Inflow hyd.	=	11 - Through Check Dam 3	Other Inflow hyd.	=	6 - Check Dam 4
Max. Elevation	=	691.76 ft	Max. Elevation	=	691.52 ft
Max. Storage	=	167 cuft	Max. Storage	=	311 cuft

Interconnected Pond Routing. Storage Indication method used. Exfiltration extracted from Outflow.



Pond No. 3 - Dry Swale Section 3

Pond Data

Pond storage is based on user-defined values.

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	690.10	n/a	0	0
0.50	690.60	n/a	44	44
1.00	691.10	n/a	44	88
1.50	691.60	n/a	44	131
2.00	692.10	n/a	114	245
2.50	692.60	n/a	114	359
3.50	693.10	n/a	641	1,000

*Note, volume @ elevation 693.10 is a dummy value as Hydraflow will not calculate flow correctly unless areas exists above spillway.

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 0.50	0.00	0.00	0.00
Span (in)	= 0.50	0.00	0.00	0.00
No. Barrels	= 1	0	0	0
Invert El. (ft)	= 691.60	0.00	0.00	0.00
Length (ft)	= 0.00	0.00	0.00	0.00
Slope (%)	= 0.00	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)	= 1.00	16.00	0.00	0.00
Crest El. (ft)	= 692.35	692.60	0.00	0.00
Weir Coeff.	= 3.33	2.60	3.33	3.33
Weir Type	= Ciplti	Broad	---	---
Multi-Stage	= No	No	No	No

Exfil.(in/hr) = 1.700 (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).

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0	690.10	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.05	4	690.15	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.10	9	690.20	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.15	13	690.25	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.20	18	690.30	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.25	22	690.35	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.30	26	690.40	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.35	31	690.45	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.40	35	690.50	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.45	39	690.55	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.50	44	690.60	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.55	48	690.65	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.60	53	690.70	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.65	57	690.75	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.70	61	690.80	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.75	66	690.85	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.80	70	690.90	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.85	74	690.95	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.90	79	691.00	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.95	83	691.05	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
1.00	88	691.10	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
1.05	92	691.15	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
1.10	96	691.20	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
1.15	101	691.25	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
1.20	105	691.30	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
1.25	109	691.35	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
1.30	114	691.40	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
1.35	118	691.45	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
1.40	123	691.50	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
1.45	127	691.55	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
1.50	131	691.60	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
1.55	143	691.65	0.00 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.001
1.60	154	691.70	0.00 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.002
1.65	165	691.75	0.00 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.002
1.70	177	691.80	0.00 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.003
1.75	188	691.85	0.00 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.003
1.80	200	691.90	0.00 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.003

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Dry Swale Section 3

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
1.85	211	691.95	0.00 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.004
1.90	222	692.00	0.00 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.004
1.95	234	692.05	0.00 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.004
2.00	245	692.10	0.00 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.005
2.05	256	692.15	0.00 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.005
2.10	268	692.20	0.00 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.005
2.15	279	692.25	0.01 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.005
2.20	291	692.30	0.01 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.005
2.25	302	692.35	0.01 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.006
2.30	313	692.40	0.01 ic	---	---	---	0.04	0.00	---	---	0.000	---	0.043
2.35	325	692.45	0.01 ic	---	---	---	0.11	0.00	---	---	0.000	---	0.111
2.40	336	692.50	0.01 ic	---	---	---	0.19	0.00	---	---	0.000	---	0.199
2.45	348	692.55	0.01 ic	---	---	---	0.30	0.00	---	---	0.000	---	0.304
2.50	359	692.60	0.01 ic	---	---	---	0.42	0.00	---	---	0.000	---	0.423
2.60	423	692.70	0.01 ic	---	---	---	0.69	1.32	---	---	0.000	---	2.011
2.70	487	692.80	0.01 ic	---	---	---	1.01	3.72	---	---	0.000	---	4.732
2.80	551	692.90	0.01 ic	---	---	---	1.36	6.83	---	---	0.000	---	8.199
2.90	615	693.00	0.01 ic	---	---	---	1.74	10.52	---	---	0.000	---	12.27
3.00	679	693.10	0.01 ic	---	---	---	2.16	14.70	---	---	0.000	---	16.87
3.10	744	693.20	0.01 ic	---	---	---	2.61	19.33	---	---	0.000	---	21.94
3.20	808	693.30	0.01 ic	---	---	---	3.08	24.35	---	---	0.000	---	27.45
3.30	872	693.40	0.01 ic	---	---	---	3.58	29.76	---	---	0.000	---	33.35
3.40	936	693.50	0.01 ic	---	---	---	4.11	35.51	---	---	0.000	---	39.62
3.50	1,000	693.10	0.01 ic	---	---	---	2.16	14.71	---	---	0.000	---	16.88

...End

Pond No. 4 - Dry Swale Section 4

Pond Data

Pond storage is based on user-defined values.

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	689.23	n/a	0	0
0.50	689.73	n/a	44	44
1.00	690.23	n/a	44	88
1.50	690.73	n/a	44	131
2.00	691.23	n/a	114	245
2.50	691.73	n/a	114	359
3.50	692.73	n/a	641	1,000

*Note, volume @ elevation 692.73 is a dummy value as Hydraflow will not calculate flow correctly unless areas exists above spillway.

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 0.50	0.00	0.00	0.00
Span (in)	= 0.50	0.00	0.00	0.00
No. Barrels	= 1	0	0	0
Invert El. (ft)	= 690.73	0.00	0.00	0.00
Length (ft)	= 0.00	0.00	0.00	0.00
Slope (%)	= 0.00	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)	= 1.00	16.00	0.00	0.00
Crest El. (ft)	= 691.48	691.73	0.00	0.00
Weir Coeff.	= 3.33	2.60	3.33	3.33
Weir Type	= Ciplti	Broad	---	---
Multi-Stage	= No	No	No	No

Exfil.(in/hr) = 1.700 (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).

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0	689.23	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.05	4	689.28	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.10	9	689.33	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.15	13	689.38	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.20	18	689.43	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.25	22	689.48	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.30	26	689.53	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.35	31	689.58	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.40	35	689.63	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.45	39	689.68	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.50	44	689.73	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.55	48	689.78	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.60	53	689.83	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.65	57	689.88	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.70	61	689.93	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.75	66	689.98	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.80	70	690.03	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.85	74	690.08	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.90	79	690.13	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.95	83	690.18	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
1.00	88	690.23	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
1.05	92	690.28	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
1.10	96	690.33	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
1.15	101	690.38	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
1.20	105	690.43	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
1.25	109	690.48	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
1.30	114	690.53	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
1.35	118	690.58	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
1.40	123	690.63	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
1.45	127	690.68	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
1.50	131	690.73	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
1.55	143	690.78	0.00 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.001
1.60	154	690.83	0.00 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.002
1.65	165	690.88	0.00 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.002
1.70	177	690.93	0.00 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.003
1.75	188	690.98	0.00 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.003
1.80	200	691.03	0.00 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.003

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Dry Swale Section 4

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
1.85	211	691.08	0.00 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.004
1.90	222	691.13	0.00 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.004
1.95	234	691.18	0.00 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.004
2.00	245	691.23	0.00 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.005
2.05	256	691.28	0.00 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.005
2.10	268	691.33	0.00 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.005
2.15	279	691.38	0.01 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.005
2.20	291	691.43	0.01 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.005
2.25	302	691.48	0.01 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.006
2.30	313	691.53	0.01 ic	---	---	---	0.04	0.00	---	---	0.000	---	0.043
2.35	325	691.58	0.01 ic	---	---	---	0.11	0.00	---	---	0.000	---	0.111
2.40	336	691.63	0.01 ic	---	---	---	0.19	0.00	---	---	0.000	---	0.199
2.45	348	691.68	0.01 ic	---	---	---	0.30	0.00	---	---	0.000	---	0.304
2.50	359	691.73	0.01 ic	---	---	---	0.42	0.00	---	---	0.000	---	0.423
2.60	423	691.83	0.01 ic	---	---	---	0.69	1.32	---	---	0.000	---	2.011
2.70	487	691.93	0.01 ic	---	---	---	1.01	3.72	---	---	0.000	---	4.732
2.80	551	692.03	0.01 ic	---	---	---	1.36	6.83	---	---	0.000	---	8.199
2.90	615	692.13	0.01 ic	---	---	---	1.74	10.52	---	---	0.000	---	12.27
3.00	679	692.23	0.01 ic	---	---	---	2.16	14.70	---	---	0.000	---	16.87
3.10	744	692.33	0.01 ic	---	---	---	2.61	19.33	---	---	0.000	---	21.94
3.20	808	692.43	0.01 ic	---	---	---	3.08	24.35	---	---	0.000	---	27.45
3.30	872	692.53	0.01 ic	---	---	---	3.58	29.76	---	---	0.000	---	33.35
3.40	936	692.63	0.01 ic	---	---	---	4.11	35.51	---	---	0.000	---	39.62
3.50	1,000	692.73	0.01 ic	---	---	---	4.65	41.60	---	---	0.000	---	46.26

...End

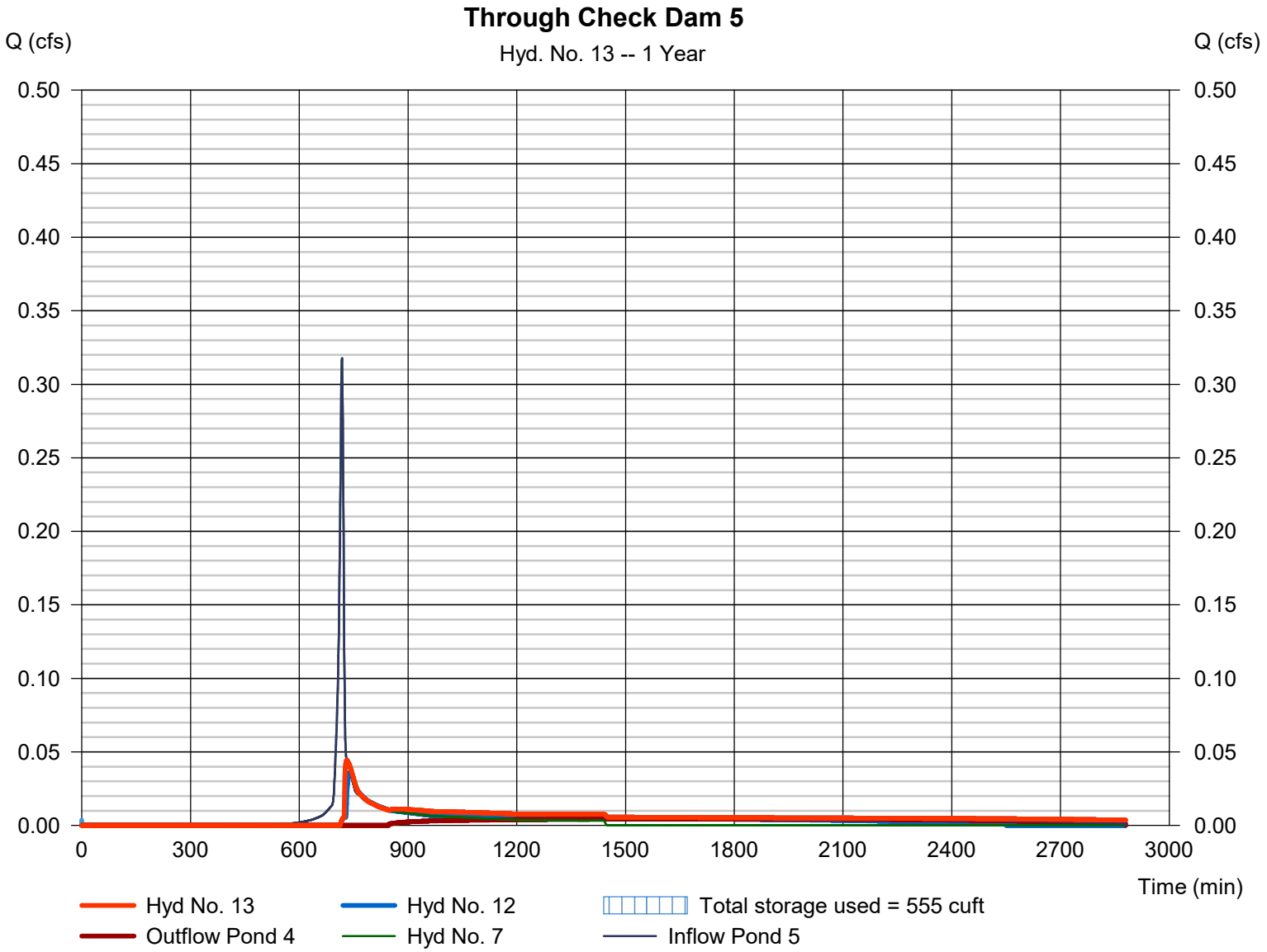
Hydrograph Report

Hyd. No. 13

Through Check Dam 5

Hydrograph type	=	Reservoir (Interconnected)	Peak discharge	=	0.044 cfs
Storm frequency	=	1 yrs	Time to peak	=	731 min
Time interval	=	1 min	Hyd. volume	=	885 cuft
Upper Pond	=	Dry Swale Section 4	Lower Pond	=	Dry Swale Section 5
Inflow hyd.	=	12 - Through Check Dam 4	Other Inflow hyd.	=	7 - Check Dam 5
Max. Elevation	=	691.21 ft	Max. Elevation	=	690.65 ft
Max. Storage	=	241 cuft	Max. Storage	=	314 cuft

Interconnected Pond Routing. Storage Indication method used. Exfiltration extracted from Outflow.



Pond No. 4 - Dry Swale Section 4

Pond Data

Pond storage is based on user-defined values.

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	689.23	n/a	0	0
0.50	689.73	n/a	44	44
1.00	690.23	n/a	44	88
1.50	690.73	n/a	44	131
2.00	691.23	n/a	114	245
2.50	691.73	n/a	114	359
3.50	692.73	n/a	641	1,000

*Note, volume @ elevation 692.73 is a dummy value as Hydraflow will not calculate flow correctly unless areas exists above spillway.

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 0.50	0.00	0.00	0.00
Span (in)	= 0.50	0.00	0.00	0.00
No. Barrels	= 1	0	0	0
Invert El. (ft)	= 690.73	0.00	0.00	0.00
Length (ft)	= 0.00	0.00	0.00	0.00
Slope (%)	= 0.00	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)	= 1.00	16.00	0.00	0.00
Crest El. (ft)	= 691.48	691.73	0.00	0.00
Weir Coeff.	= 3.33	2.60	3.33	3.33
Weir Type	= Ciplti	Broad	---	---
Multi-Stage	= No	No	No	No

Exfil.(in/hr) = 1.700 (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).

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0	689.23	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.05	4	689.28	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.10	9	689.33	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.15	13	689.38	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.20	18	689.43	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.25	22	689.48	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.30	26	689.53	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.35	31	689.58	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.40	35	689.63	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.45	39	689.68	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.50	44	689.73	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.55	48	689.78	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.60	53	689.83	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.65	57	689.88	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.70	61	689.93	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.75	66	689.98	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.80	70	690.03	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.85	74	690.08	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.90	79	690.13	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.95	83	690.18	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
1.00	88	690.23	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
1.05	92	690.28	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
1.10	96	690.33	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
1.15	101	690.38	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
1.20	105	690.43	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
1.25	109	690.48	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
1.30	114	690.53	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
1.35	118	690.58	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
1.40	123	690.63	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
1.45	127	690.68	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
1.50	131	690.73	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
1.55	143	690.78	0.00 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.001
1.60	154	690.83	0.00 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.002
1.65	165	690.88	0.00 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.002
1.70	177	690.93	0.00 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.003
1.75	188	690.98	0.00 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.003
1.80	200	691.03	0.00 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.003

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Dry Swale Section 4

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
1.85	211	691.08	0.00 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.004
1.90	222	691.13	0.00 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.004
1.95	234	691.18	0.00 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.004
2.00	245	691.23	0.00 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.005
2.05	256	691.28	0.00 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.005
2.10	268	691.33	0.00 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.005
2.15	279	691.38	0.01 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.005
2.20	291	691.43	0.01 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.005
2.25	302	691.48	0.01 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.006
2.30	313	691.53	0.01 ic	---	---	---	0.04	0.00	---	---	0.000	---	0.043
2.35	325	691.58	0.01 ic	---	---	---	0.11	0.00	---	---	0.000	---	0.111
2.40	336	691.63	0.01 ic	---	---	---	0.19	0.00	---	---	0.000	---	0.199
2.45	348	691.68	0.01 ic	---	---	---	0.30	0.00	---	---	0.000	---	0.304
2.50	359	691.73	0.01 ic	---	---	---	0.42	0.00	---	---	0.000	---	0.423
2.60	423	691.83	0.01 ic	---	---	---	0.69	1.32	---	---	0.000	---	2.011
2.70	487	691.93	0.01 ic	---	---	---	1.01	3.72	---	---	0.000	---	4.732
2.80	551	692.03	0.01 ic	---	---	---	1.36	6.83	---	---	0.000	---	8.199
2.90	615	692.13	0.01 ic	---	---	---	1.74	10.52	---	---	0.000	---	12.27
3.00	679	692.23	0.01 ic	---	---	---	2.16	14.70	---	---	0.000	---	16.87
3.10	744	692.33	0.01 ic	---	---	---	2.61	19.33	---	---	0.000	---	21.94
3.20	808	692.43	0.01 ic	---	---	---	3.08	24.35	---	---	0.000	---	27.45
3.30	872	692.53	0.01 ic	---	---	---	3.58	29.76	---	---	0.000	---	33.35
3.40	936	692.63	0.01 ic	---	---	---	4.11	35.51	---	---	0.000	---	39.62
3.50	1,000	692.73	0.01 ic	---	---	---	4.65	41.60	---	---	0.000	---	46.26

...End

Pond No. 5 - Dry Swale Section 5

Pond Data

Pond storage is based on user-defined values.

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	688.35	n/a	0	0
0.50	688.85	n/a	44	44
1.00	689.35	n/a	44	88
1.50	689.85	n/a	44	131
2.00	690.35	n/a	114	245
2.50	690.85	n/a	114	359
3.50	691.85	n/a	641	1,000

*Note, volume @ elevation 691.85 is a dummy value as Hydraflow will not calculate flow correctly unless areas exists above spillway.

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 0.50	0.00	0.00	0.00
Span (in)	= 0.50	0.00	0.00	0.00
No. Barrels	= 1	0	0	0
Invert El. (ft)	= 689.85	0.00	0.00	0.00
Length (ft)	= 0.00	0.00	0.00	0.00
Slope (%)	= 0.00	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)	= 1.00	16.00	0.00	0.00
Crest El. (ft)	= 690.60	690.85	0.00	0.00
Weir Coeff.	= 3.33	2.60	3.33	3.33
Weir Type	= Ciplti	Broad	---	---
Multi-Stage	= No	No	No	No

Exfil.(in/hr) = 1.700 (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).

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0	688.35	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.05	4	688.40	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.10	9	688.45	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.15	13	688.50	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.20	18	688.55	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.25	22	688.60	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.30	26	688.65	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.35	31	688.70	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.40	35	688.75	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.45	39	688.80	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.50	44	688.85	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.55	48	688.90	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.60	53	688.95	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.65	57	689.00	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.70	61	689.05	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.75	66	689.10	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.80	70	689.15	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.85	74	689.20	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.90	79	689.25	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.95	83	689.30	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
1.00	88	689.35	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
1.05	92	689.40	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
1.10	96	689.45	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
1.15	101	689.50	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
1.20	105	689.55	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
1.25	109	689.60	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
1.30	114	689.65	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
1.35	118	689.70	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
1.40	123	689.75	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
1.45	127	689.80	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
1.50	131	689.85	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
1.55	143	689.90	0.00 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.001
1.60	154	689.95	0.00 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.002
1.65	165	690.00	0.00 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.002
1.70	177	690.05	0.00 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.003
1.75	188	690.10	0.00 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.003
1.80	200	690.15	0.00 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.003

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Dry Swale Section 5

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
1.85	211	690.20	0.00 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.004
1.90	222	690.25	0.00 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.004
1.95	234	690.30	0.00 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.004
2.00	245	690.35	0.00 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.005
2.05	256	690.40	0.00 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.005
2.10	268	690.45	0.00 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.005
2.15	279	690.50	0.01 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.005
2.20	291	690.55	0.01 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.005
2.25	302	690.60	0.01 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.006
2.30	313	690.65	0.01 ic	---	---	---	0.04	0.00	---	---	0.000	---	0.043
2.35	325	690.70	0.01 ic	---	---	---	0.11	0.00	---	---	0.000	---	0.111
2.40	336	690.75	0.01 ic	---	---	---	0.19	0.00	---	---	0.000	---	0.199
2.45	348	690.80	0.01 ic	---	---	---	0.30	0.00	---	---	0.000	---	0.304
2.50	359	690.85	0.01 ic	---	---	---	0.42	0.00	---	---	0.000	---	0.423
2.60	423	690.95	0.01 ic	---	---	---	0.69	1.32	---	---	0.000	---	2.011
2.70	487	691.05	0.01 ic	---	---	---	1.01	3.72	---	---	0.000	---	4.732
2.80	551	691.15	0.01 ic	---	---	---	1.36	6.83	---	---	0.000	---	8.199
2.90	615	691.25	0.01 ic	---	---	---	1.74	10.52	---	---	0.000	---	12.27
3.00	679	691.35	0.01 ic	---	---	---	2.16	14.70	---	---	0.000	---	16.87
3.10	744	691.45	0.01 ic	---	---	---	2.61	19.33	---	---	0.000	---	21.94
3.20	808	691.55	0.01 ic	---	---	---	3.08	24.35	---	---	0.000	---	27.45
3.30	872	691.65	0.01 ic	---	---	---	3.58	29.76	---	---	0.000	---	33.35
3.40	936	691.75	0.01 ic	---	---	---	4.11	35.51	---	---	0.000	---	39.62
3.50	1,000	691.85	0.01 ic	---	---	---	4.65	41.60	---	---	0.000	---	46.26

...End

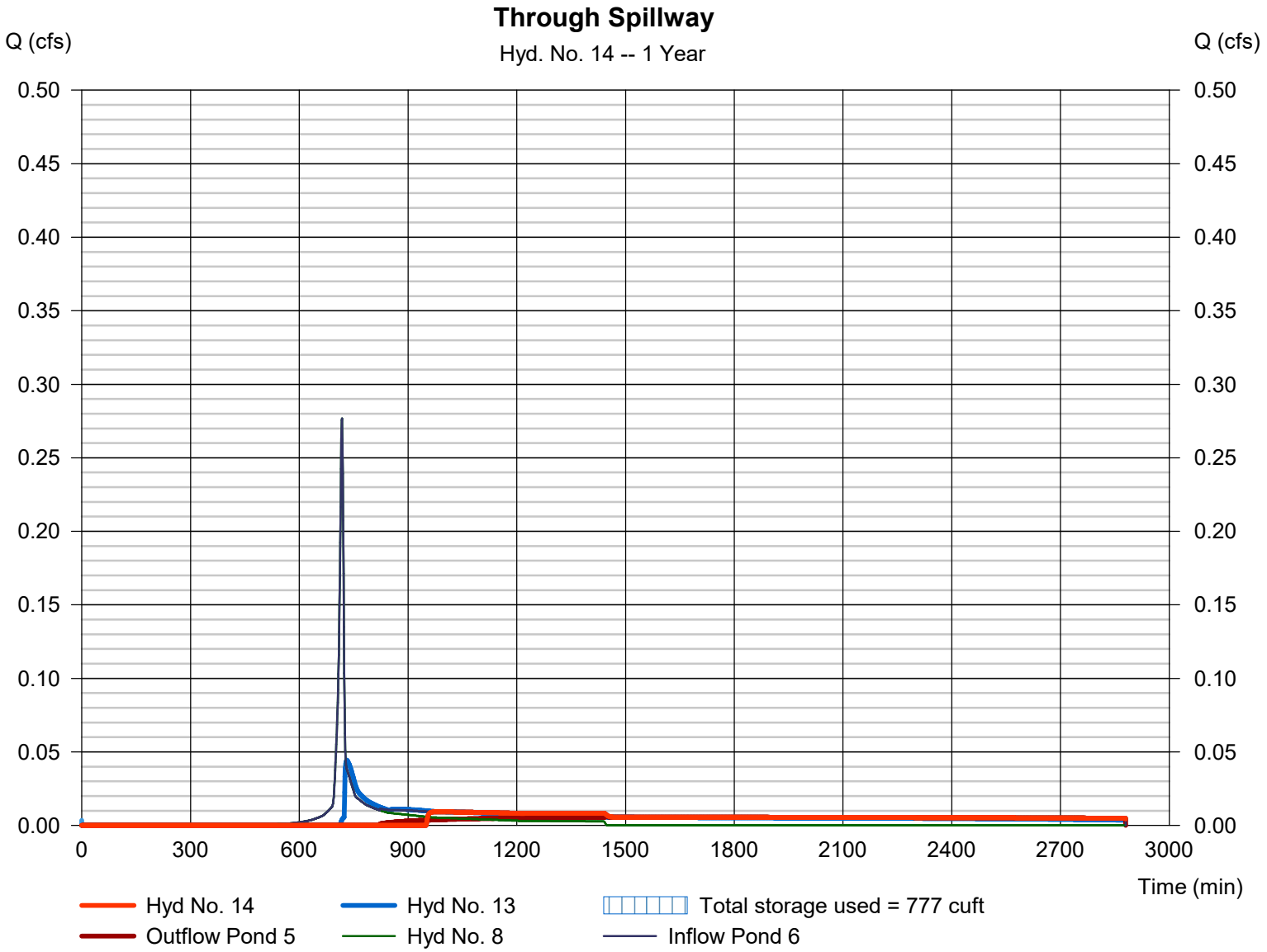
Hydrograph Report

Hyd. No. 14

Through Spillway

Hydrograph type	=	Reservoir (Interconnected)	Peak discharge	=	0.009 cfs
Storm frequency	=	1 yrs	Time to peak	=	980 min
Time interval	=	1 min	Hyd. volume	=	714 cuft
Upper Pond	=	Dry Swale Section 5	Lower Pond	=	Dry Swale Section 6
Inflow hyd.	=	13 - Through Check Dam 5	Other Inflow hyd.	=	8 - Spillway De
Max. Elevation	=	690.60 ft	Max. Elevation	=	689.73 ft
Max. Storage	=	302 cuft	Max. Storage	=	475 cuft

Interconnected Pond Routing. Storage Indication method used. Exfiltration extracted from Outflow.



Pond No. 5 - Dry Swale Section 5

Pond Data

Pond storage is based on user-defined values.

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	688.35	n/a	0	0
0.50	688.85	n/a	44	44
1.00	689.35	n/a	44	88
1.50	689.85	n/a	44	131
2.00	690.35	n/a	114	245
2.50	690.85	n/a	114	359
3.50	691.85	n/a	641	1,000

*Note, volume @ elevation 691.85 is a dummy value as Hydraflow will not calculate flow correctly unless areas exists above spillway.

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 0.50	0.00	0.00	0.00
Span (in)	= 0.50	0.00	0.00	0.00
No. Barrels	= 1	0	0	0
Invert El. (ft)	= 689.85	0.00	0.00	0.00
Length (ft)	= 0.00	0.00	0.00	0.00
Slope (%)	= 0.00	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)	= 1.00	16.00	0.00	0.00
Crest El. (ft)	= 690.60	690.85	0.00	0.00
Weir Coeff.	= 3.33	2.60	3.33	3.33
Weir Type	= Ciplti	Broad	---	---
Multi-Stage	= No	No	No	No

Exfil.(in/hr) = 1.700 (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).

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0	688.35	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.05	4	688.40	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.10	9	688.45	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.15	13	688.50	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.20	18	688.55	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.25	22	688.60	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.30	26	688.65	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.35	31	688.70	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.40	35	688.75	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.45	39	688.80	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.50	44	688.85	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.55	48	688.90	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.60	53	688.95	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.65	57	689.00	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.70	61	689.05	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.75	66	689.10	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.80	70	689.15	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.85	74	689.20	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.90	79	689.25	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
0.95	83	689.30	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
1.00	88	689.35	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
1.05	92	689.40	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
1.10	96	689.45	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
1.15	101	689.50	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
1.20	105	689.55	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
1.25	109	689.60	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
1.30	114	689.65	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
1.35	118	689.70	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
1.40	123	689.75	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
1.45	127	689.80	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
1.50	131	689.85	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
1.55	143	689.90	0.00 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.001
1.60	154	689.95	0.00 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.002
1.65	165	690.00	0.00 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.002
1.70	177	690.05	0.00 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.003
1.75	188	690.10	0.00 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.003
1.80	200	690.15	0.00 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.003

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Dry Swale Section 5

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
1.85	211	690.20	0.00 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.004
1.90	222	690.25	0.00 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.004
1.95	234	690.30	0.00 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.004
2.00	245	690.35	0.00 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.005
2.05	256	690.40	0.00 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.005
2.10	268	690.45	0.00 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.005
2.15	279	690.50	0.01 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.005
2.20	291	690.55	0.01 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.005
2.25	302	690.60	0.01 ic	---	---	---	0.00	0.00	---	---	0.000	---	0.006
2.30	313	690.65	0.01 ic	---	---	---	0.04	0.00	---	---	0.000	---	0.043
2.35	325	690.70	0.01 ic	---	---	---	0.11	0.00	---	---	0.000	---	0.111
2.40	336	690.75	0.01 ic	---	---	---	0.19	0.00	---	---	0.000	---	0.199
2.45	348	690.80	0.01 ic	---	---	---	0.30	0.00	---	---	0.000	---	0.304
2.50	359	690.85	0.01 ic	---	---	---	0.42	0.00	---	---	0.000	---	0.423
2.60	423	690.95	0.01 ic	---	---	---	0.69	1.32	---	---	0.000	---	2.011
2.70	487	691.05	0.01 ic	---	---	---	1.01	3.72	---	---	0.000	---	4.732
2.80	551	691.15	0.01 ic	---	---	---	1.36	6.83	---	---	0.000	---	8.199
2.90	615	691.25	0.01 ic	---	---	---	1.74	10.52	---	---	0.000	---	12.27
3.00	679	691.35	0.01 ic	---	---	---	2.16	14.70	---	---	0.000	---	16.87
3.10	744	691.45	0.01 ic	---	---	---	2.61	19.33	---	---	0.000	---	21.94
3.20	808	691.55	0.01 ic	---	---	---	3.08	24.35	---	---	0.000	---	27.45
3.30	872	691.65	0.01 ic	---	---	---	3.58	29.76	---	---	0.000	---	33.35
3.40	936	691.75	0.01 ic	---	---	---	4.11	35.51	---	---	0.000	---	39.62
3.50	1,000	691.85	0.01 ic	---	---	---	4.65	41.60	---	---	0.000	---	46.26

...End

Pond No. 6 - Dry Swale Section 6

Pond Data

Pond storage is based on user-defined values.

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	687.48	n/a	0	0
0.50	687.98	n/a	44	44
1.00	688.48	n/a	44	88
1.50	688.98	n/a	44	131
2.00	689.48	n/a	114	245
2.50	689.98	n/a	455	700
3.50	690.98	n/a	300	1,000

*Note, volume @ elevation 690.98 is a dummy value as Hydraflow will not calculate flow correctly unless areas exists above spillway.

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 0.00	0.00	0.00	0.00
Span (in)	= 0.00	0.00	0.00	0.00
No. Barrels	= 0	0	0	0
Invert El. (ft)	= 0.00	0.00	0.00	0.00
Length (ft)	= 0.00	0.00	0.00	0.00
Slope (%)	= 0.00	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)	= 5.00	0.00	0.00	0.00
Crest El. (ft)	= 689.73	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= Ciplti	Broad	---	---
Multi-Stage	= No	No	No	No

Exfil.(in/hr) = 1.700 (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).

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0	687.48	---	---	---	---	0.00	---	---	---	0.000	---	0.000
0.05	4	687.53	---	---	---	---	0.00	---	---	---	0.000	---	0.000
0.10	9	687.58	---	---	---	---	0.00	---	---	---	0.000	---	0.000
0.15	13	687.63	---	---	---	---	0.00	---	---	---	0.000	---	0.000
0.20	18	687.68	---	---	---	---	0.00	---	---	---	0.000	---	0.000
0.25	22	687.73	---	---	---	---	0.00	---	---	---	0.000	---	0.000
0.30	26	687.78	---	---	---	---	0.00	---	---	---	0.000	---	0.000
0.35	31	687.83	---	---	---	---	0.00	---	---	---	0.000	---	0.000
0.40	35	687.88	---	---	---	---	0.00	---	---	---	0.000	---	0.000
0.45	39	687.93	---	---	---	---	0.00	---	---	---	0.000	---	0.000
0.50	44	687.98	---	---	---	---	0.00	---	---	---	0.000	---	0.000
0.55	48	688.03	---	---	---	---	0.00	---	---	---	0.000	---	0.000
0.60	53	688.08	---	---	---	---	0.00	---	---	---	0.000	---	0.000
0.65	57	688.13	---	---	---	---	0.00	---	---	---	0.000	---	0.000
0.70	61	688.18	---	---	---	---	0.00	---	---	---	0.000	---	0.000
0.75	66	688.23	---	---	---	---	0.00	---	---	---	0.000	---	0.000
0.80	70	688.28	---	---	---	---	0.00	---	---	---	0.000	---	0.000
0.85	74	688.33	---	---	---	---	0.00	---	---	---	0.000	---	0.000
0.90	79	688.38	---	---	---	---	0.00	---	---	---	0.000	---	0.000
0.95	83	688.43	---	---	---	---	0.00	---	---	---	0.000	---	0.000
1.00	88	688.48	---	---	---	---	0.00	---	---	---	0.000	---	0.000
1.05	92	688.53	---	---	---	---	0.00	---	---	---	0.000	---	0.000
1.10	96	688.58	---	---	---	---	0.00	---	---	---	0.000	---	0.000
1.15	101	688.63	---	---	---	---	0.00	---	---	---	0.000	---	0.000
1.20	105	688.68	---	---	---	---	0.00	---	---	---	0.000	---	0.000
1.25	109	688.73	---	---	---	---	0.00	---	---	---	0.000	---	0.000
1.30	114	688.78	---	---	---	---	0.00	---	---	---	0.000	---	0.000
1.35	118	688.83	---	---	---	---	0.00	---	---	---	0.000	---	0.000
1.40	123	688.88	---	---	---	---	0.00	---	---	---	0.000	---	0.000
1.45	127	688.93	---	---	---	---	0.00	---	---	---	0.000	---	0.000
1.50	131	688.98	---	---	---	---	0.00	---	---	---	0.000	---	0.000
1.55	143	689.03	---	---	---	---	0.00	---	---	---	0.000	---	0.000
1.60	154	689.08	---	---	---	---	0.00	---	---	---	0.000	---	0.000
1.65	165	689.13	---	---	---	---	0.00	---	---	---	0.000	---	0.000
1.70	177	689.18	---	---	---	---	0.00	---	---	---	0.000	---	0.000
1.75	188	689.23	---	---	---	---	0.00	---	---	---	0.000	---	0.000
1.80	200	689.28	---	---	---	---	0.00	---	---	---	0.000	---	0.000

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Dry Swale Section 6

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
1.85	211	689.33	---	---	---	---	0.00	---	---	---	0.000	---	0.000
1.90	222	689.38	---	---	---	---	0.00	---	---	---	0.000	---	0.000
1.95	234	689.43	---	---	---	---	0.00	---	---	---	0.000	---	0.000
2.00	245	689.48	---	---	---	---	0.00	---	---	---	0.000	---	0.000
2.05	291	689.53	---	---	---	---	0.00	---	---	---	0.000	---	0.000
2.10	336	689.58	---	---	---	---	0.00	---	---	---	0.000	---	0.000
2.15	382	689.63	---	---	---	---	0.00	---	---	---	0.000	---	0.000
2.20	427	689.68	---	---	---	---	0.00	---	---	---	0.000	---	0.000
2.25	473	689.73	---	---	---	---	0.00	---	---	---	0.000	---	0.000
2.30	518	689.78	---	---	---	---	0.19	---	---	---	0.000	---	0.186
2.35	564	689.83	---	---	---	---	0.53	---	---	---	0.000	---	0.526
2.40	609	689.88	---	---	---	---	0.97	---	---	---	0.000	---	0.966
2.45	655	689.93	---	---	---	---	1.49	---	---	---	0.000	---	1.488
2.50	700	689.98	---	---	---	---	2.08	---	---	---	0.000	---	2.081
2.60	730	690.08	---	---	---	---	3.45	---	---	---	0.000	---	3.447
2.70	760	690.18	---	---	---	---	5.03	---	---	---	0.000	---	5.025
2.80	790	690.28	---	---	---	---	6.79	---	---	---	0.000	---	6.790
2.90	820	690.38	---	---	---	---	8.72	---	---	---	0.000	---	8.723
3.00	850	690.48	---	---	---	---	10.81	---	---	---	0.000	---	10.81
3.10	880	690.58	---	---	---	---	13.04	---	---	---	0.000	---	13.04
3.20	910	690.68	---	---	---	---	15.41	---	---	---	0.000	---	15.41
3.30	940	690.78	---	---	---	---	17.91	---	---	---	0.000	---	17.91
3.40	970	690.88	---	---	---	---	20.53	---	---	---	0.000	---	20.53
3.50	1,000	690.98	---	---	---	---	23.27	---	---	---	0.000	---	23.27

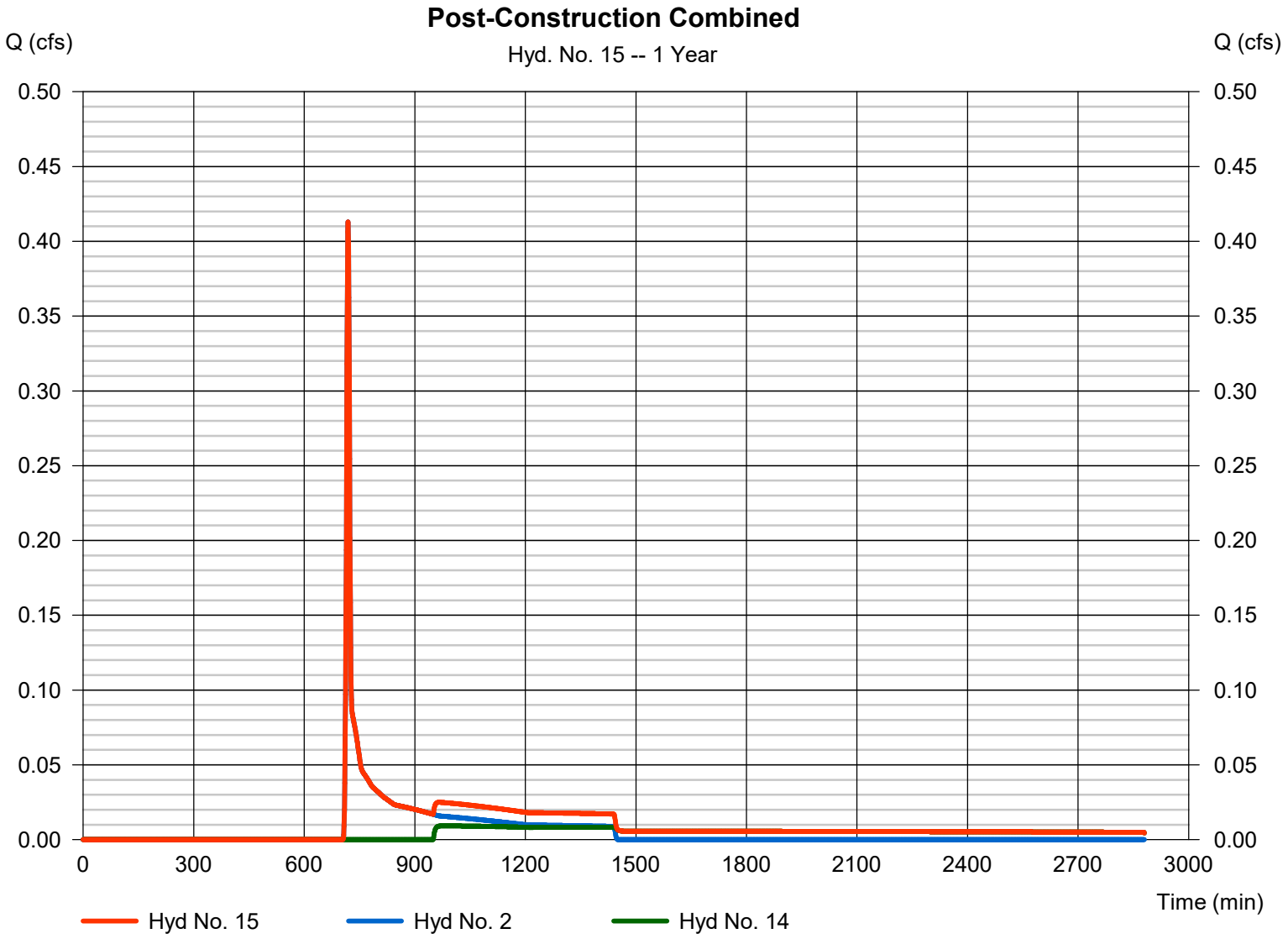
...End

Hydrograph Report

Hyd. No. 15

Post-Construction Combined

Hydrograph type	= Combine	Peak discharge	= 0.413 cfs
Storm frequency	= 1 yrs	Time to peak	= 719 min
Time interval	= 1 min	Hyd. volume	= 1,725 cuft
Inflow hyds.	= 2, 14	Contrib. drain. area	= 0.640 ac



Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	4.016	1	718	8,115	------	------	------	Pre-Construction
2	SCS Runoff	2.040	1	718	4,122	------	------	------	Post-Construction Undetained Area
3	SCS Runoff	0.454	1	718	915	------	------	------	Check Dam 2 Detained Area
4	SCS Runoff	0.490	1	718	1,004	------	------	------	Check Dam 3 Detained Area
5	SCS Runoff	0.231	1	718	471	------	------	------	Check Dam 1 Detained Area
6	SCS Runoff	0.766	1	717	1,589	------	------	------	Check Dam 4 Detained Area
7	SCS Runoff	0.742	1	717	1,555	------	------	------	Check Dam 5 Detained Area
8	SCS Runoff	0.632	1	717	1,333	------	------	------	Spillway Detained Area
9	Reservoir	0.005	1	1010	330	5	694.04	288	Through Check Dam 1
10	Reservoir(i)	0.297	1	722	962	9, 3	693.63	541	Through Check Dam 2
11	Reservoir(i)	0.421	1	720	1,515	10, 4	693.24	664	Through Check Dam 3
12	Reservoir(i)	0.762	1	718	2,515	11, 6	692.39	684	Through Check Dam 4
13	Reservoir(i)	1.001	1	722	3,468	12, 7	691.74	747	Through Check Dam 5
14	Reservoir(i)	1.154	1	724	4,030	13, 8	690.88	1,006	Through Spillway
15	Combine	2.434	1	719	8,152	2, 14	------	------	Post-Construction Combined

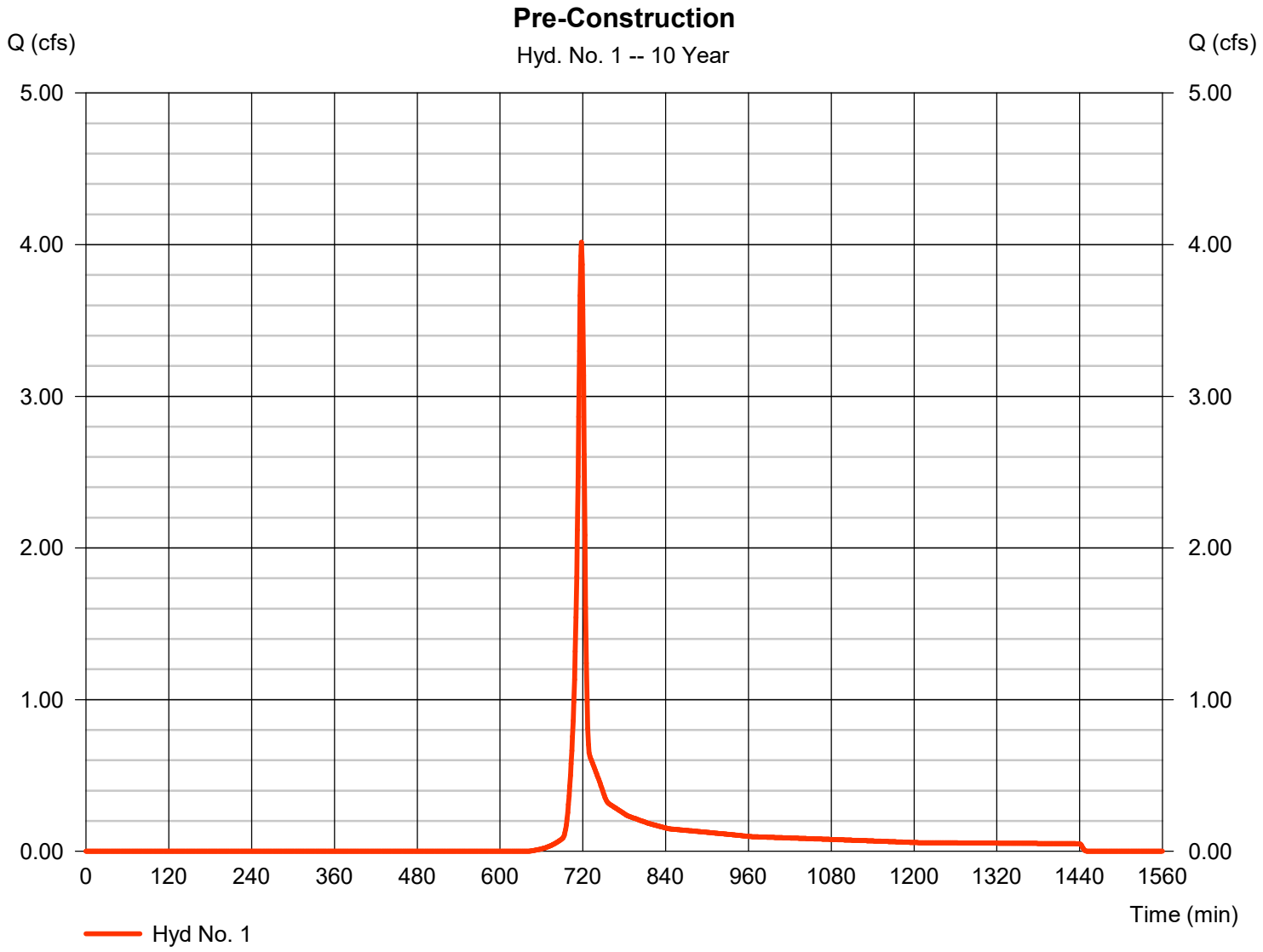
Hydrograph Report

Hyd. No. 1

Pre-Construction

Hydrograph type	=	SCS Runoff	Peak discharge	=	4.016 cfs
Storm frequency	=	10 yrs	Time to peak	=	718 min
Time interval	=	1 min	Hyd. volume	=	8,115 cuft
Drainage area	=	1.260 ac	Curve number	=	65*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	6.00 min
Total precip.	=	5.10 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.600 x 55) + (0.380 x 58) + (0.280 x 98)] / 1.260



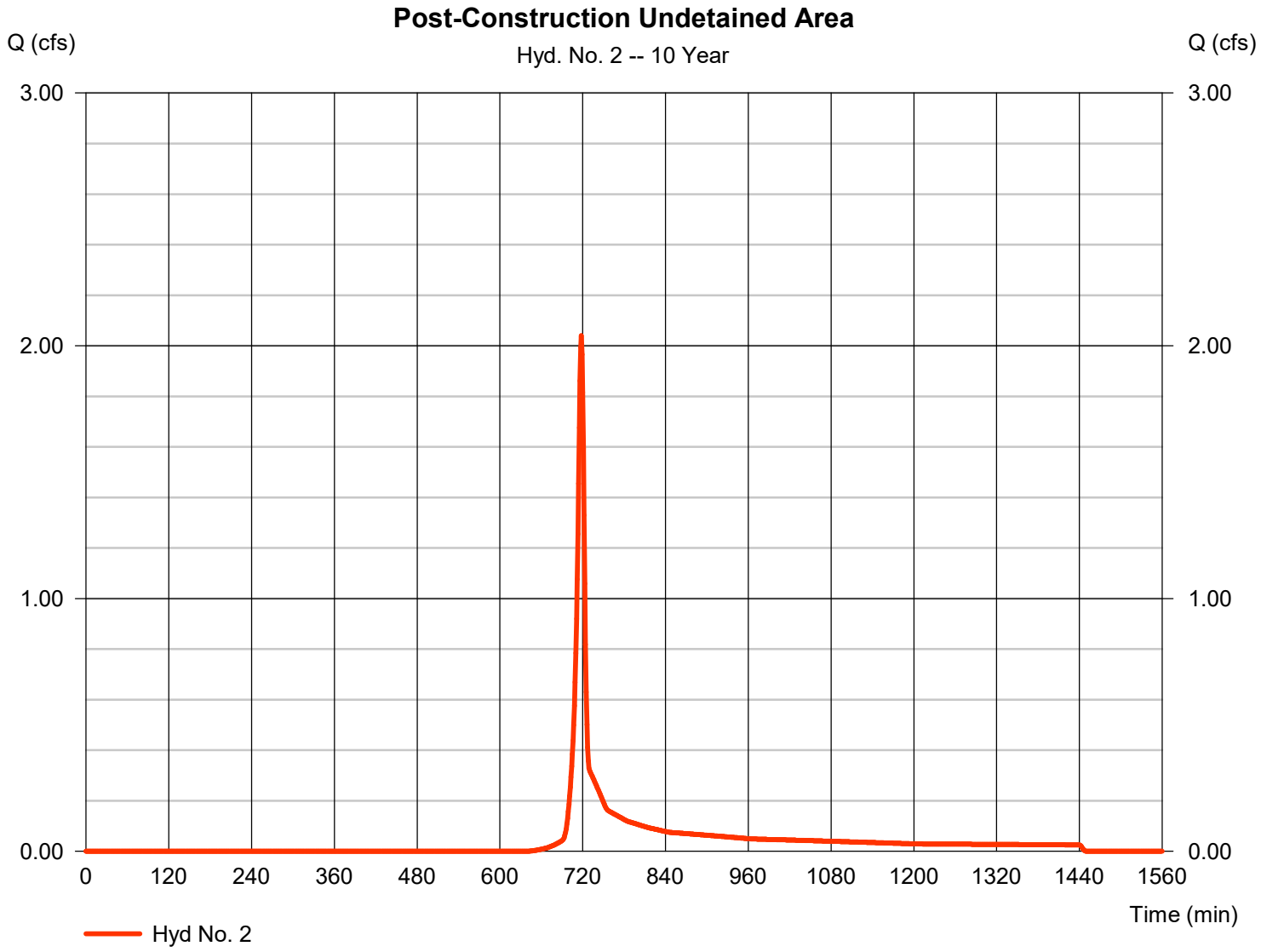
Hydrograph Report

Hyd. No. 2

Post-Construction Undetained Area

Hydrograph type	=	SCS Runoff	Peak discharge	=	2.040 cfs
Storm frequency	=	10 yrs	Time to peak	=	718 min
Time interval	=	1 min	Hyd. volume	=	4,122 cuft
Drainage area	=	0.640 ac	Curve number	=	65*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	6.00 min
Total precip.	=	5.10 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.210 x 58) + (0.180 x 98) + (0.250 x 48)] / 0.640



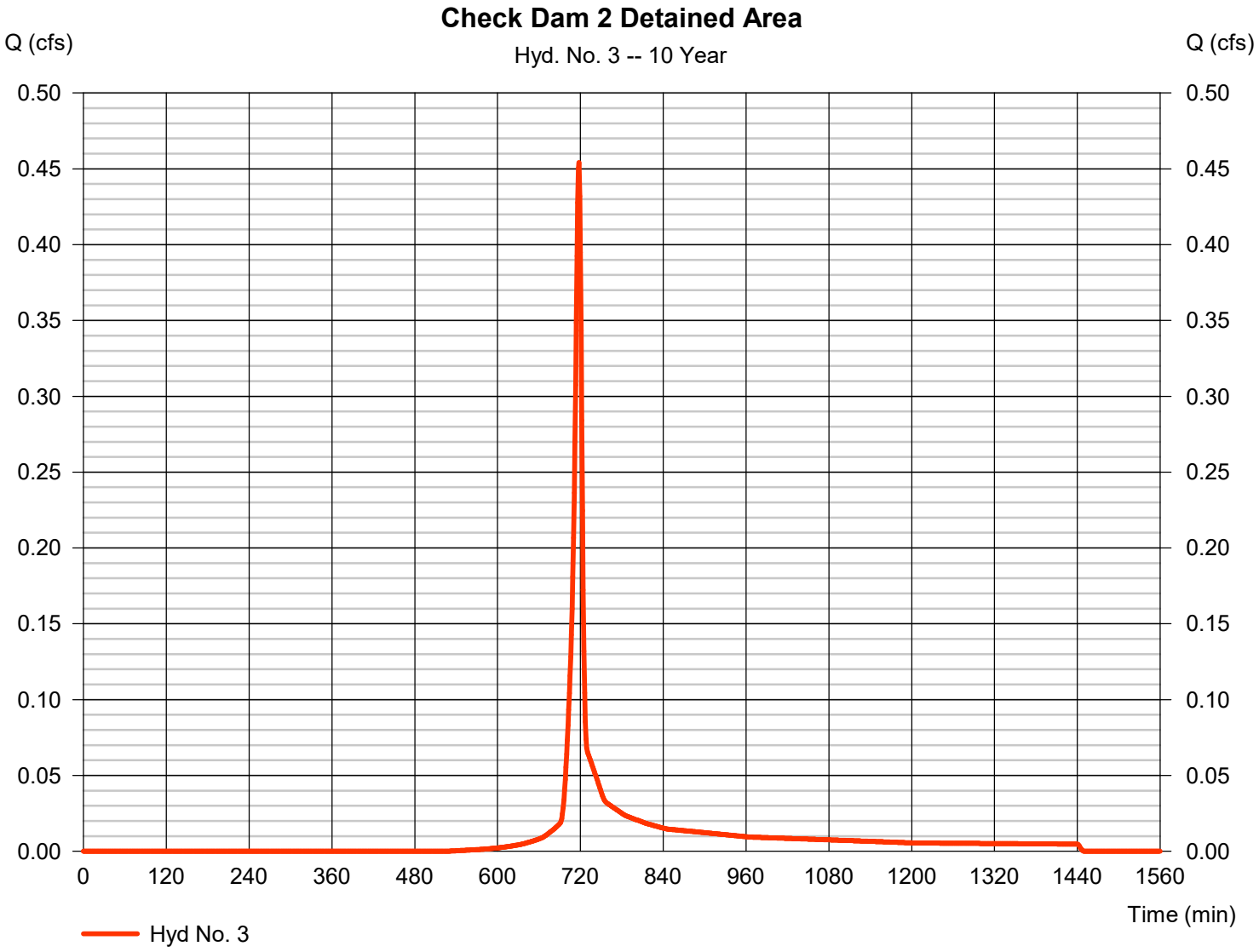
Hydrograph Report

Hyd. No. 3

Check Dam 2 Detained Area

Hydrograph type	= SCS Runoff	Peak discharge	= 0.454 cfs
Storm frequency	= 10 yrs	Time to peak	= 718 min
Time interval	= 1 min	Hyd. volume	= 915 cuft
Drainage area	= 0.100 ac	Curve number	= 74*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 5.10 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.060 x 58) + (0.040 x 98)] / 0.100



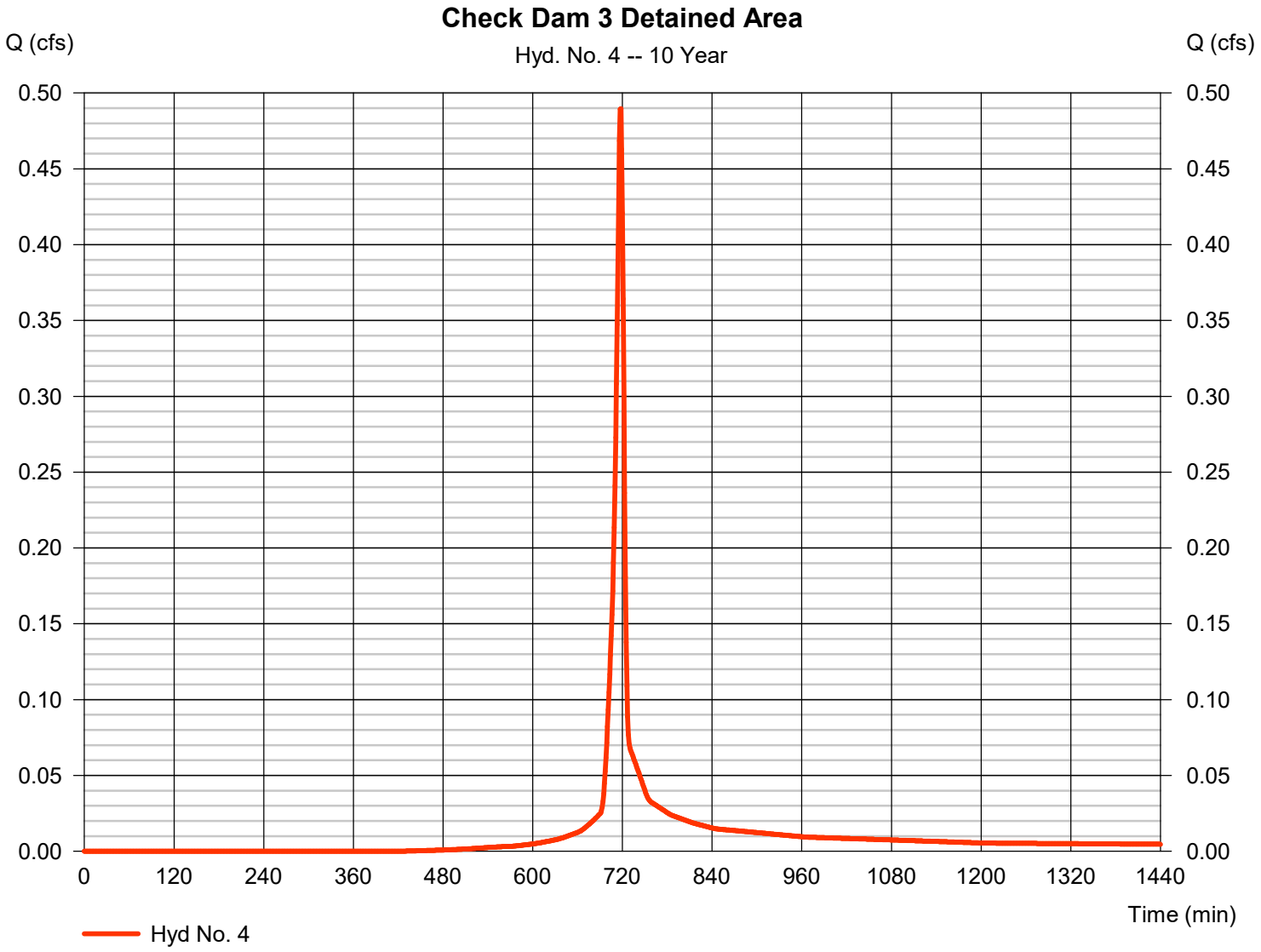
Hydrograph Report

Hyd. No. 4

Check Dam 3 Detained Area

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.490 cfs
Storm frequency	=	10 yrs	Time to peak	=	718 min
Time interval	=	1 min	Hyd. volume	=	1,004 cuft
Drainage area	=	0.090 ac	Curve number	=	80*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	6.00 min
Total precip.	=	5.10 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.040 x 58) + (0.050 x 98)] / 0.090



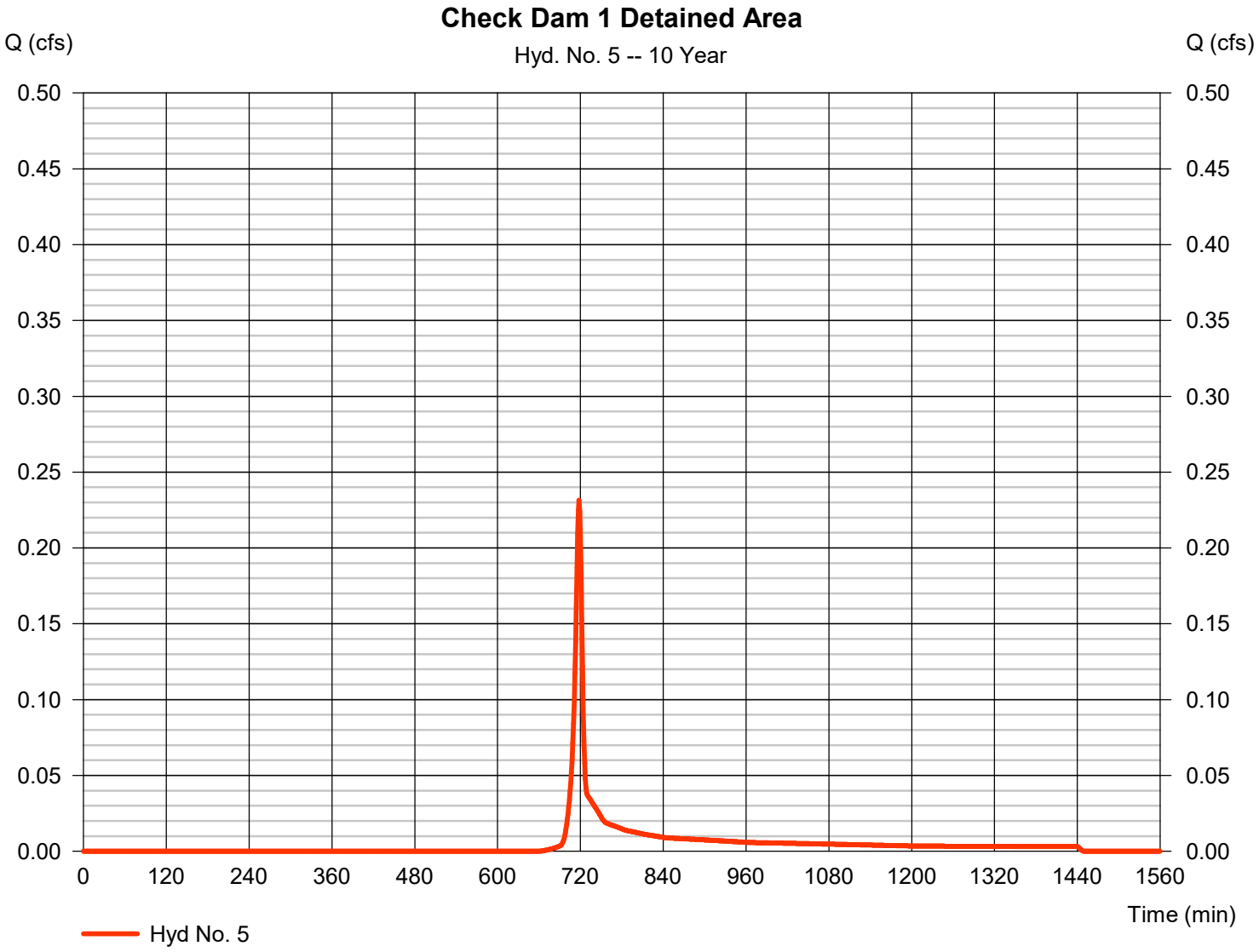
Hydrograph Report

Hyd. No. 5

Check Dam 1 Detained Area

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.231 cfs
Storm frequency	=	10 yrs	Time to peak	=	718 min
Time interval	=	1 min	Hyd. volume	=	471 cuft
Drainage area	=	0.080 ac	Curve number	=	63*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	6.00 min
Total precip.	=	5.10 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.070 x 58) + (0.010 x 98)] / 0.080



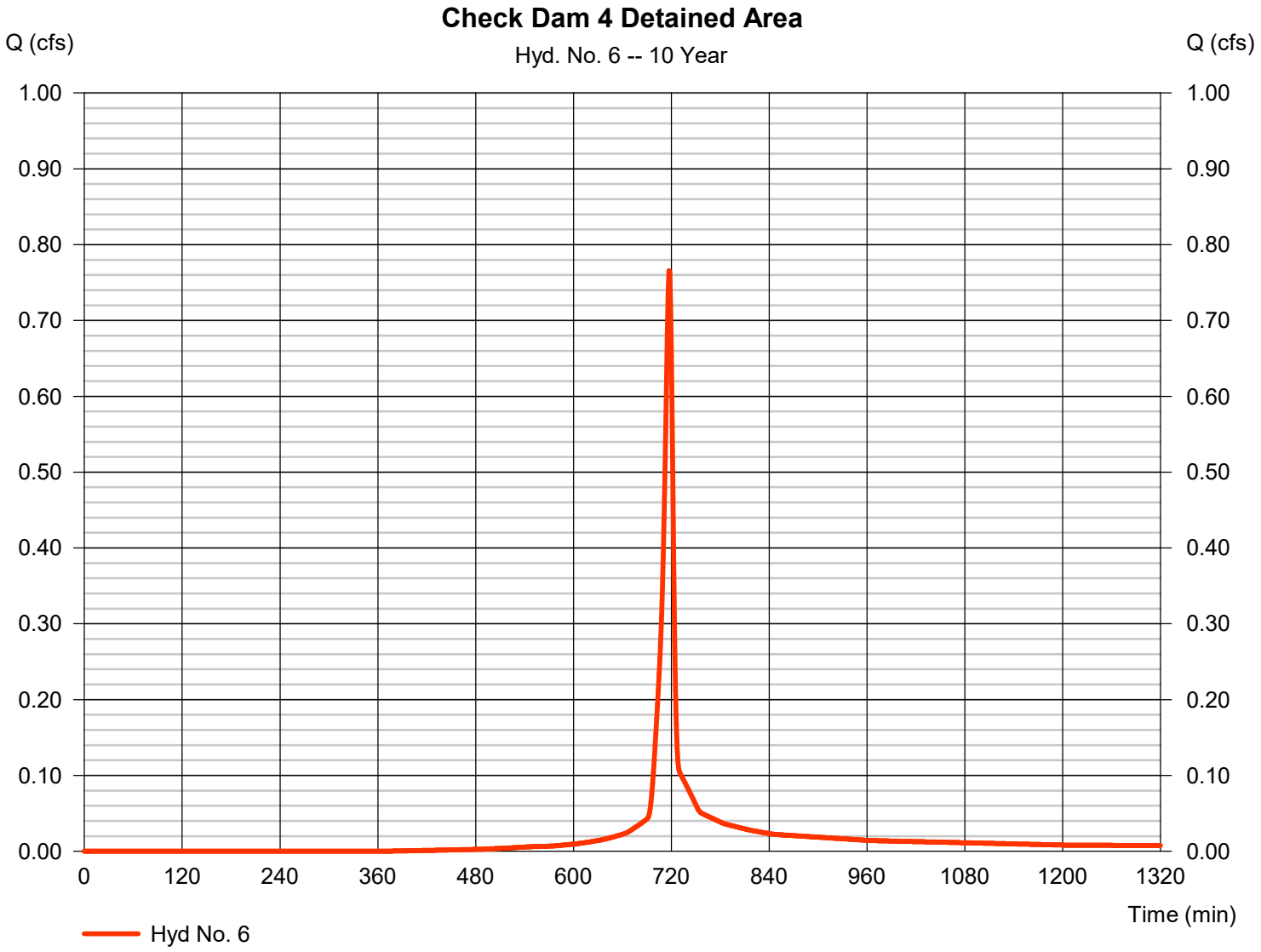
Hydrograph Report

Hyd. No. 6

Check Dam 4 Detained Area

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.766 cfs
Storm frequency	=	10 yrs	Time to peak	=	717 min
Time interval	=	1 min	Hyd. volume	=	1,589 cuft
Drainage area	=	0.130 ac	Curve number	=	83*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	6.00 min
Total precip.	=	5.10 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.050 x 58) + (0.080 x 98)] / 0.130



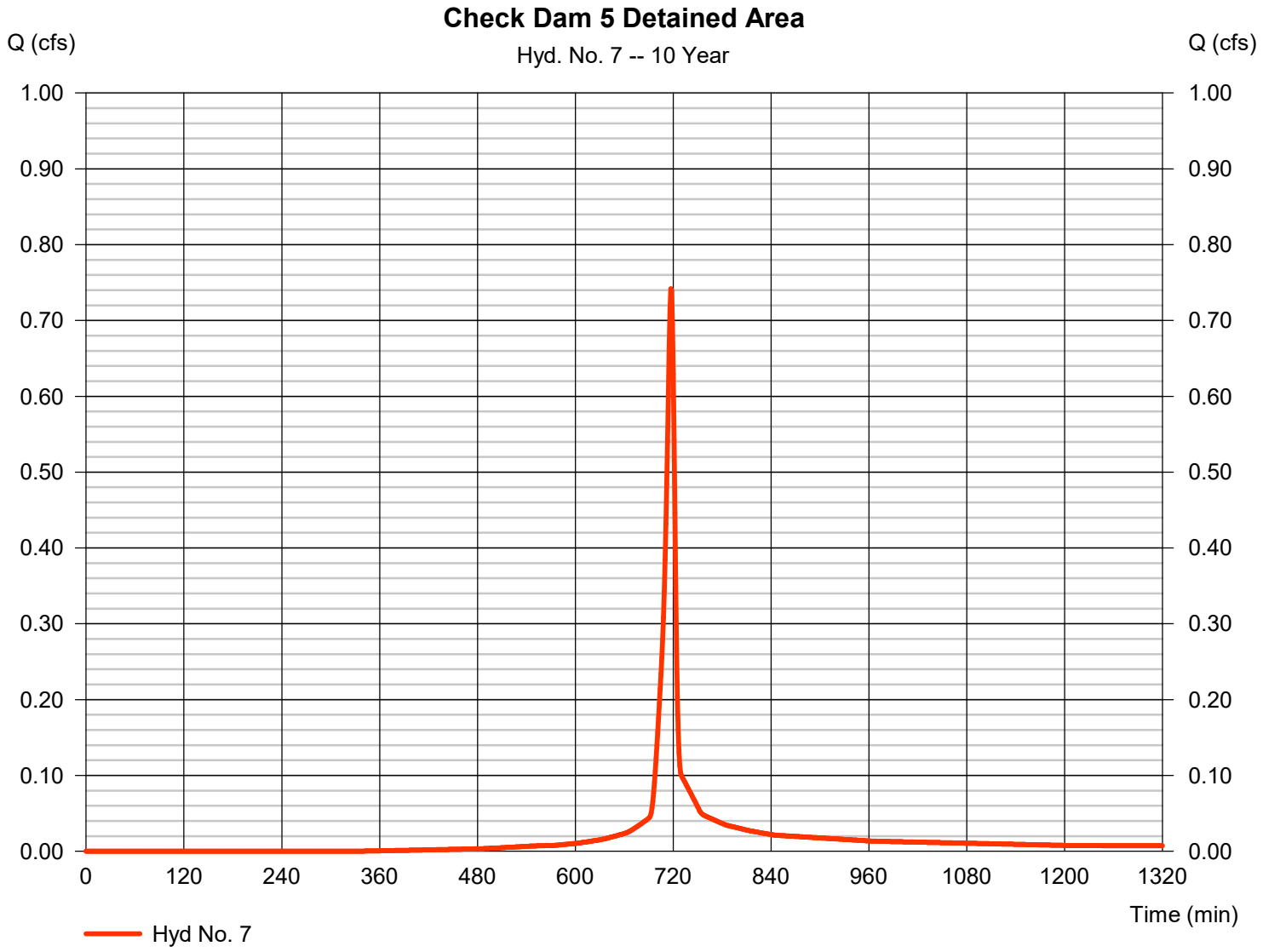
Hydrograph Report

Hyd. No. 7

Check Dam 5 Detained Area

Hydrograph type	= SCS Runoff	Peak discharge	= 0.742 cfs
Storm frequency	= 10 yrs	Time to peak	= 717 min
Time interval	= 1 min	Hyd. volume	= 1,555 cuft
Drainage area	= 0.120 ac	Curve number	= 85*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 5.10 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.040 x 58) + (0.080 x 98)] / 0.120



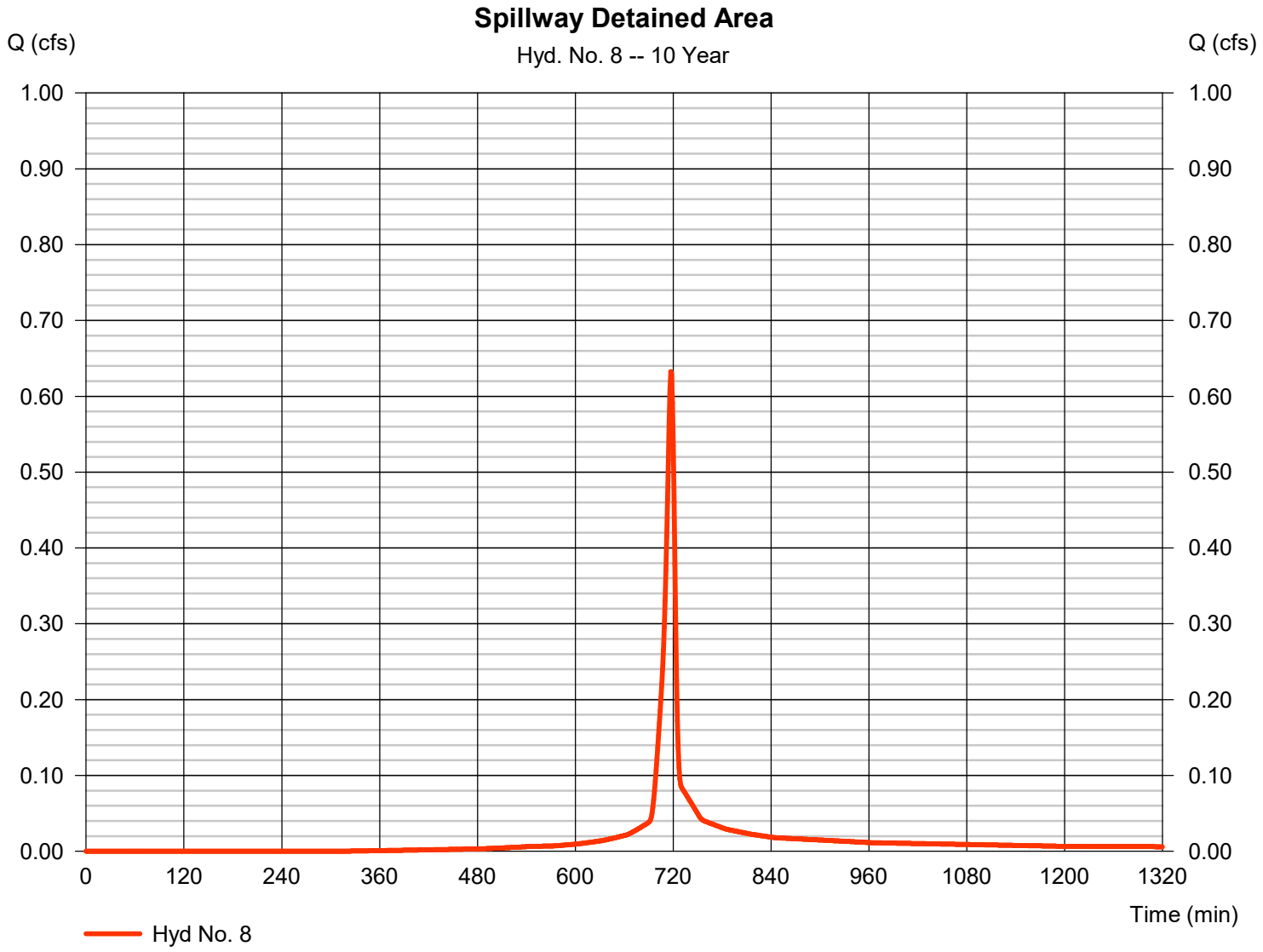
Hydrograph Report

Hyd. No. 8

Spillway Detained Area

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.632 cfs
Storm frequency	=	10 yrs	Time to peak	=	717 min
Time interval	=	1 min	Hyd. volume	=	1,333 cuft
Drainage area	=	0.100 ac	Curve number	=	86*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	6.00 min
Total precip.	=	5.10 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.030 x 58) + (0.070 x 98)] / 0.100



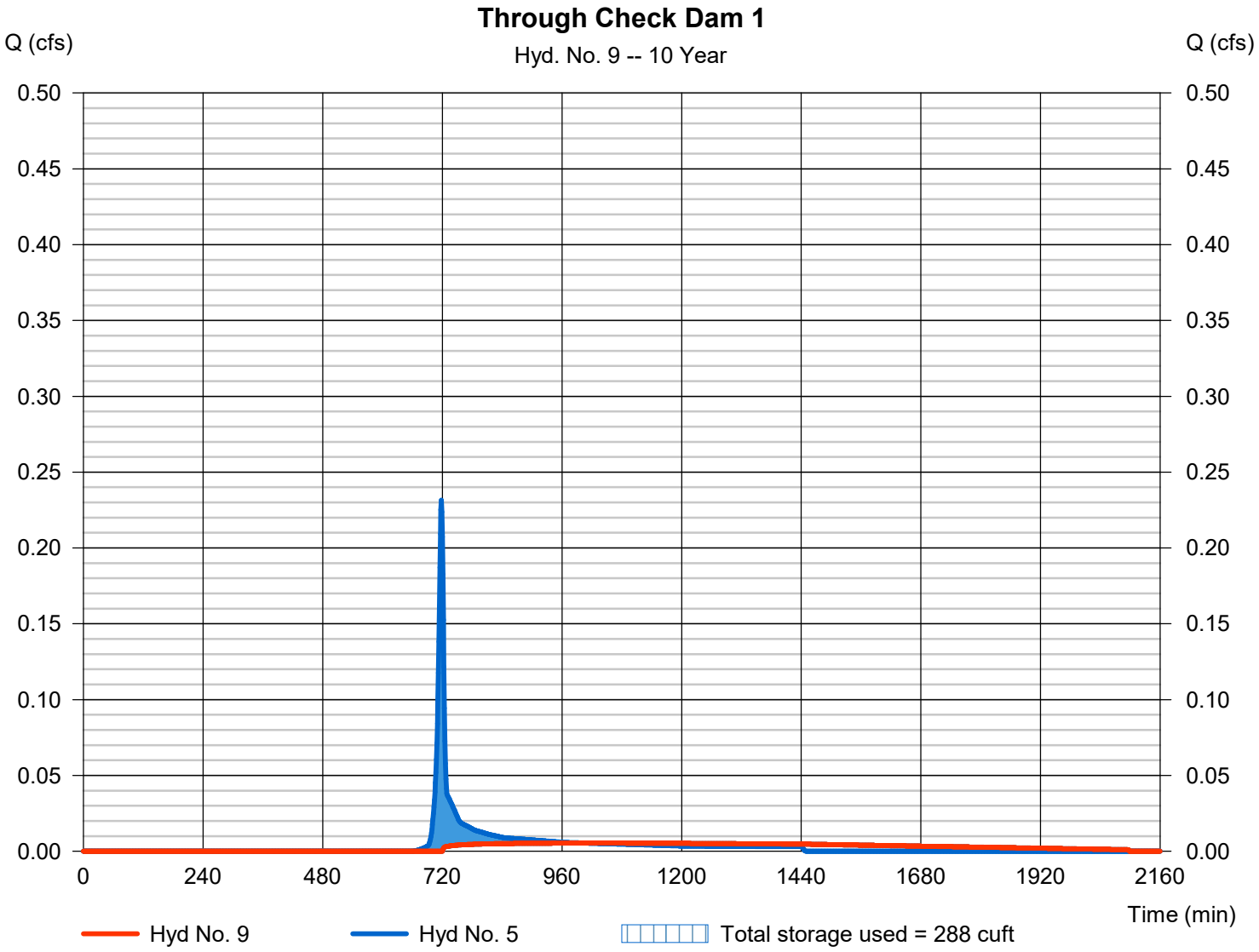
Hydrograph Report

Hyd. No. 9

Through Check Dam 1

Hydrograph type	=	Reservoir	Peak discharge	=	0.005 cfs
Storm frequency	=	10 yrs	Time to peak	=	1010 min
Time interval	=	1 min	Hyd. volume	=	330 cuft
Inflow hyd. No.	=	5 - Check Dam 1 Detained Area	Max. Elevation	=	694.04 ft
Reservoir name	=	Dry Swale Section 1	Max. Storage	=	288 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



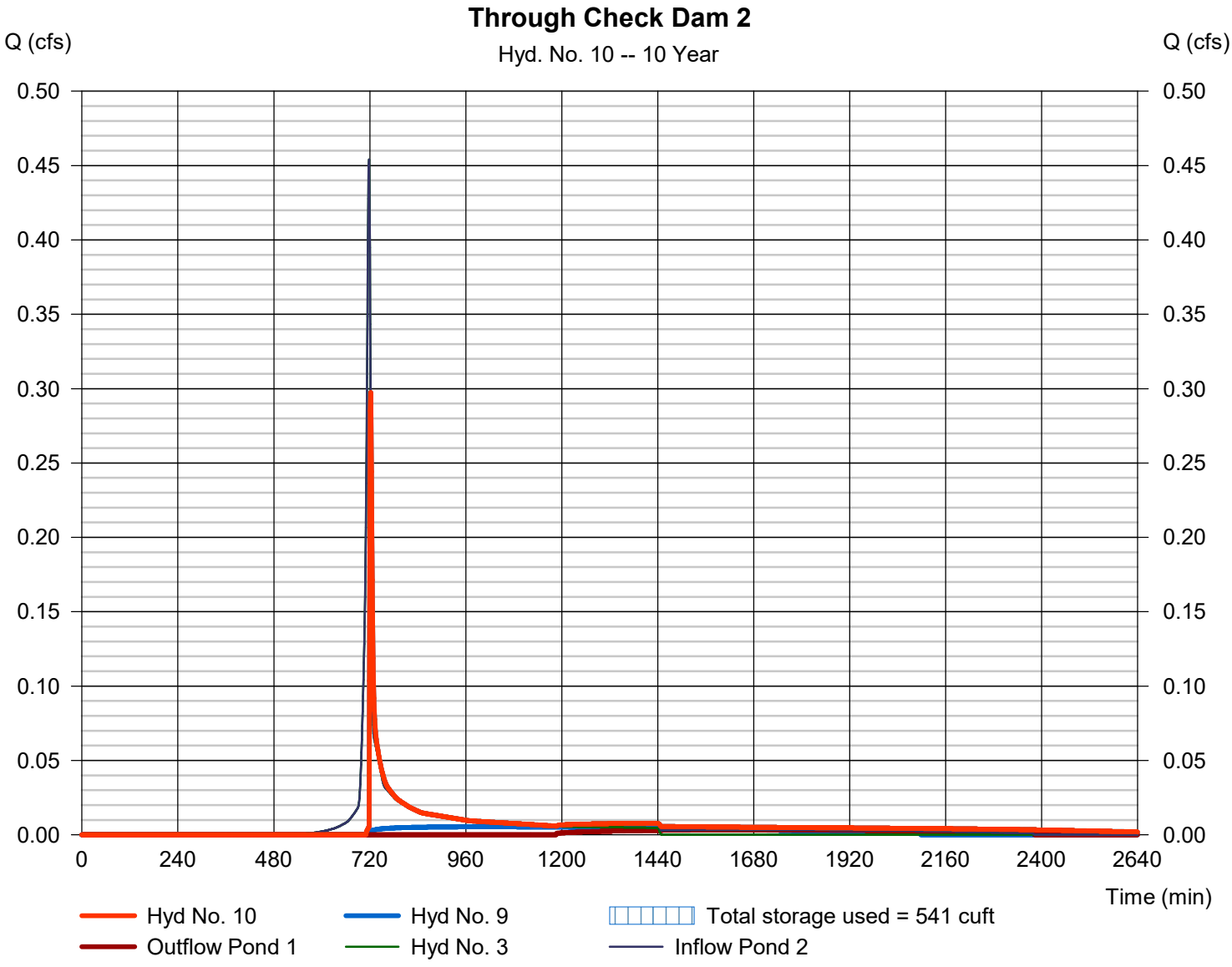
Hydrograph Report

Hyd. No. 10

Through Check Dam 2

Hydrograph type	=	Reservoir (Interconnected)	Peak discharge	=	0.297 cfs
Storm frequency	=	10 yrs	Time to peak	=	722 min
Time interval	=	1 min	Hyd. volume	=	962 cuft
Upper Pond	=	Dry Swale Section 1	Lower Pond	=	Dry Swale Section 2
Inflow hyd.	=	9 - Through Check Dam 1	Other Inflow hyd.	=	3 - Check Dam 2
Max. Elevation	=	693.63 ft	Max. Elevation	=	693.43 ft
Max. Storage	=	194 cuft	Max. Storage	=	347 cuft

Interconnected Pond Routing. Storage Indication method used. Exfiltration extracted from Outflow.



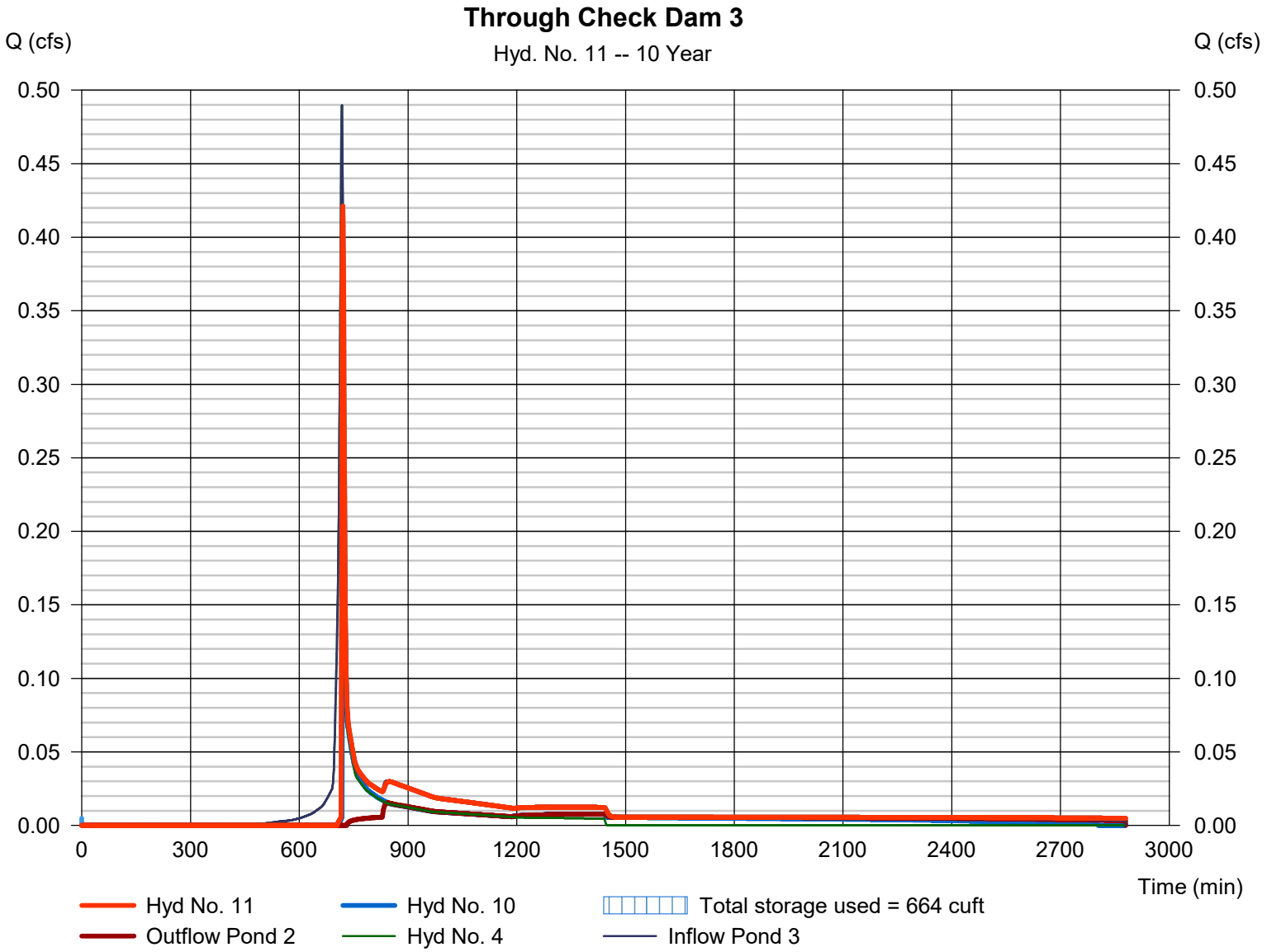
Hydrograph Report

Hyd. No. 11

Through Check Dam 3

Hydrograph type	=	Reservoir (Interconnected)	Peak discharge	=	0.421 cfs
Storm frequency	=	10 yrs	Time to peak	=	720 min
Time interval	=	1 min	Hyd. volume	=	1,515 cuft
Upper Pond	=	Dry Swale Section 2	Lower Pond	=	Dry Swale Section 3
Inflow hyd.	=	10 - Through Check Dam 2	Other Inflow hyd.	=	4 - Check Dam 3
Max. Elevation	=	693.24 ft	Max. Elevation	=	692.60 ft
Max. Storage	=	305 cuft	Max. Storage	=	359 cuft

Interconnected Pond Routing. Storage Indication method used. Exfiltration extracted from Outflow.



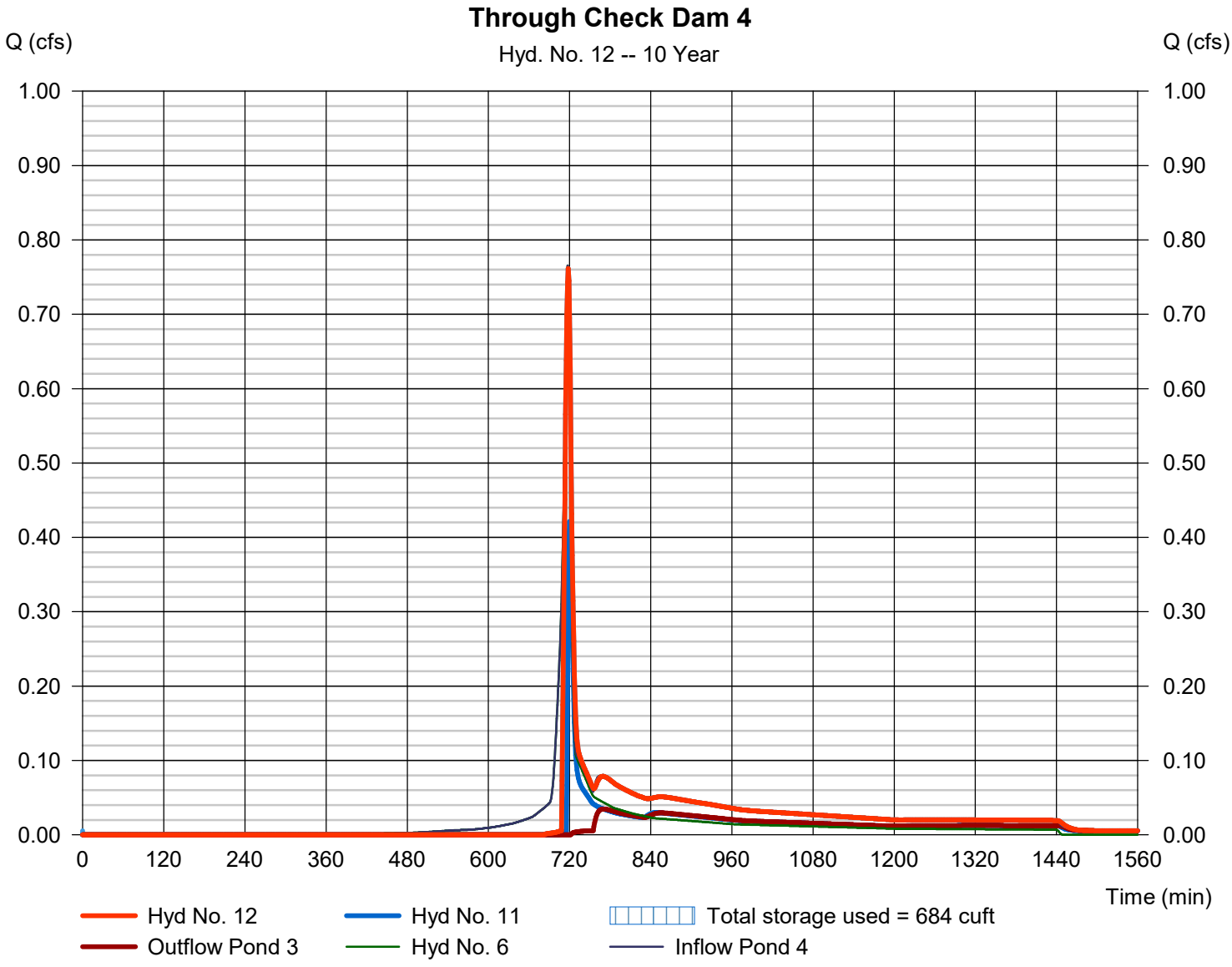
Hydrograph Report

Hyd. No. 12

Through Check Dam 4

Hydrograph type	=	Reservoir (Interconnected)	Peak discharge	=	0.762 cfs
Storm frequency	=	10 yrs	Time to peak	=	718 min
Time interval	=	1 min	Hyd. volume	=	2,515 cuft
Upper Pond	=	Dry Swale Section 3	Lower Pond	=	Dry Swale Section 4
Inflow hyd.	=	11 - Through Check Dam 3	Other Inflow hyd.	=	6 - Check Dam 4
Max. Elevation	=	692.39 ft	Max. Elevation	=	691.75 ft
Max. Storage	=	311 cuft	Max. Storage	=	373 cuft

Interconnected Pond Routing. Storage Indication method used. Exfiltration extracted from Outflow.



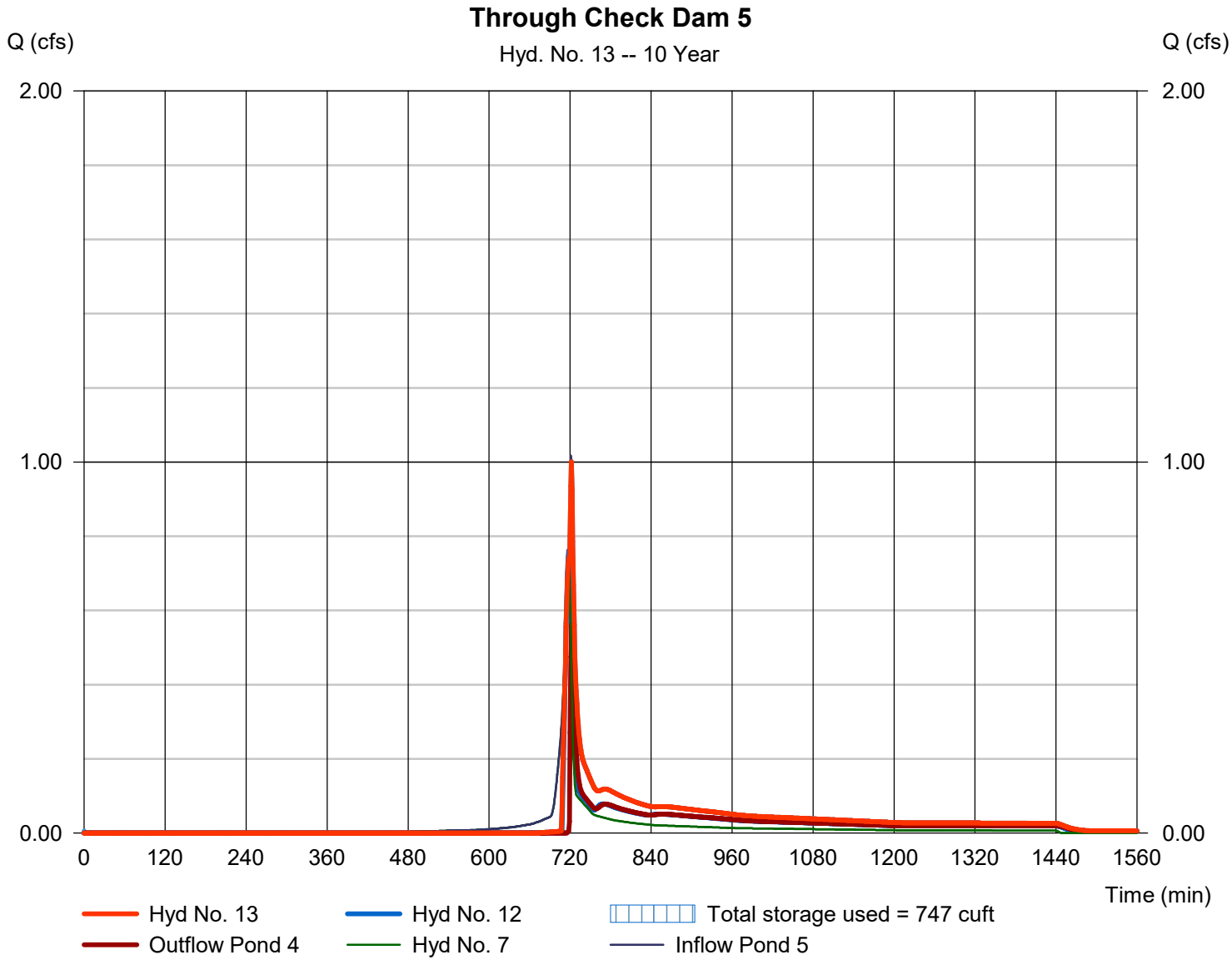
Hydrograph Report

Hyd. No. 13

Through Check Dam 5

Hydrograph type	=	Reservoir (Interconnected)	Peak discharge	=	1.001 cfs
Storm frequency	=	10 yrs	Time to peak	=	722 min
Time interval	=	1 min	Hyd. volume	=	3,468 cuft
Upper Pond	=	Dry Swale Section 4	Lower Pond	=	Dry Swale Section 5
Inflow hyd.	=	12 - Through Check Dam 4	Other Inflow hyd.	=	7 - Check Dam 5
Max. Elevation	=	691.74 ft	Max. Elevation	=	690.89 ft
Max. Storage	=	365 cuft	Max. Storage	=	382 cuft

Interconnected Pond Routing. Storage Indication method used. Exfiltration extracted from Outflow.



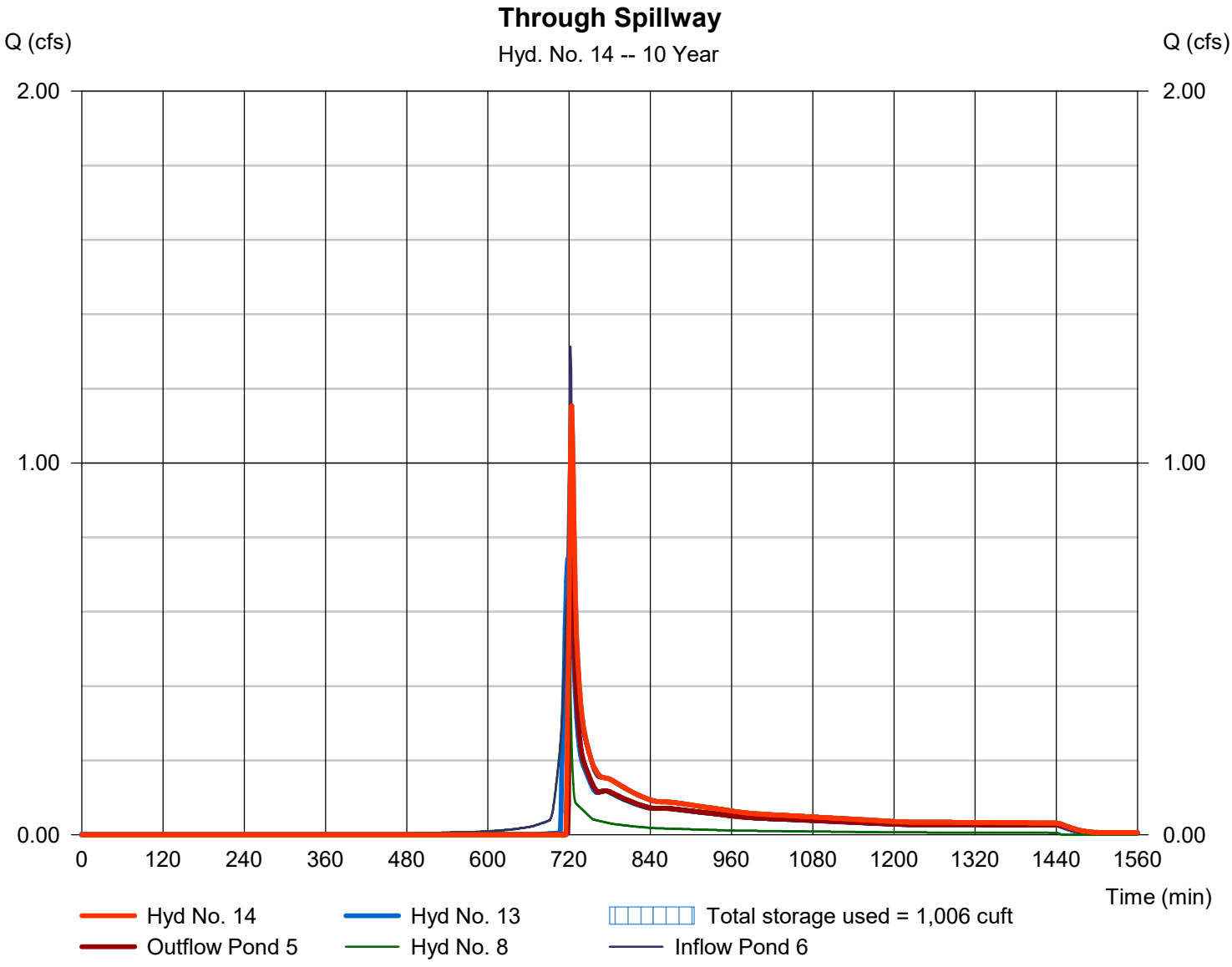
Hydrograph Report

Hyd. No. 14

Through Spillway

Hydrograph type	=	Reservoir (Interconnected)	Peak discharge	=	1.154 cfs
Storm frequency	=	10 yrs	Time to peak	=	724 min
Time interval	=	1 min	Hyd. volume	=	4,030 cuft
Upper Pond	=	Dry Swale Section 5	Lower Pond	=	Dry Swale Section 6
Inflow hyd.	=	13 - Through Check Dam 5	Other Inflow hyd.	=	8 - Spillway De
Max. Elevation	=	690.88 ft	Max. Elevation	=	689.90 ft
Max. Storage	=	381 cuft	Max. Storage	=	625 cuft

Interconnected Pond Routing. Storage Indication method used. Exfiltration extracted from Outflow.

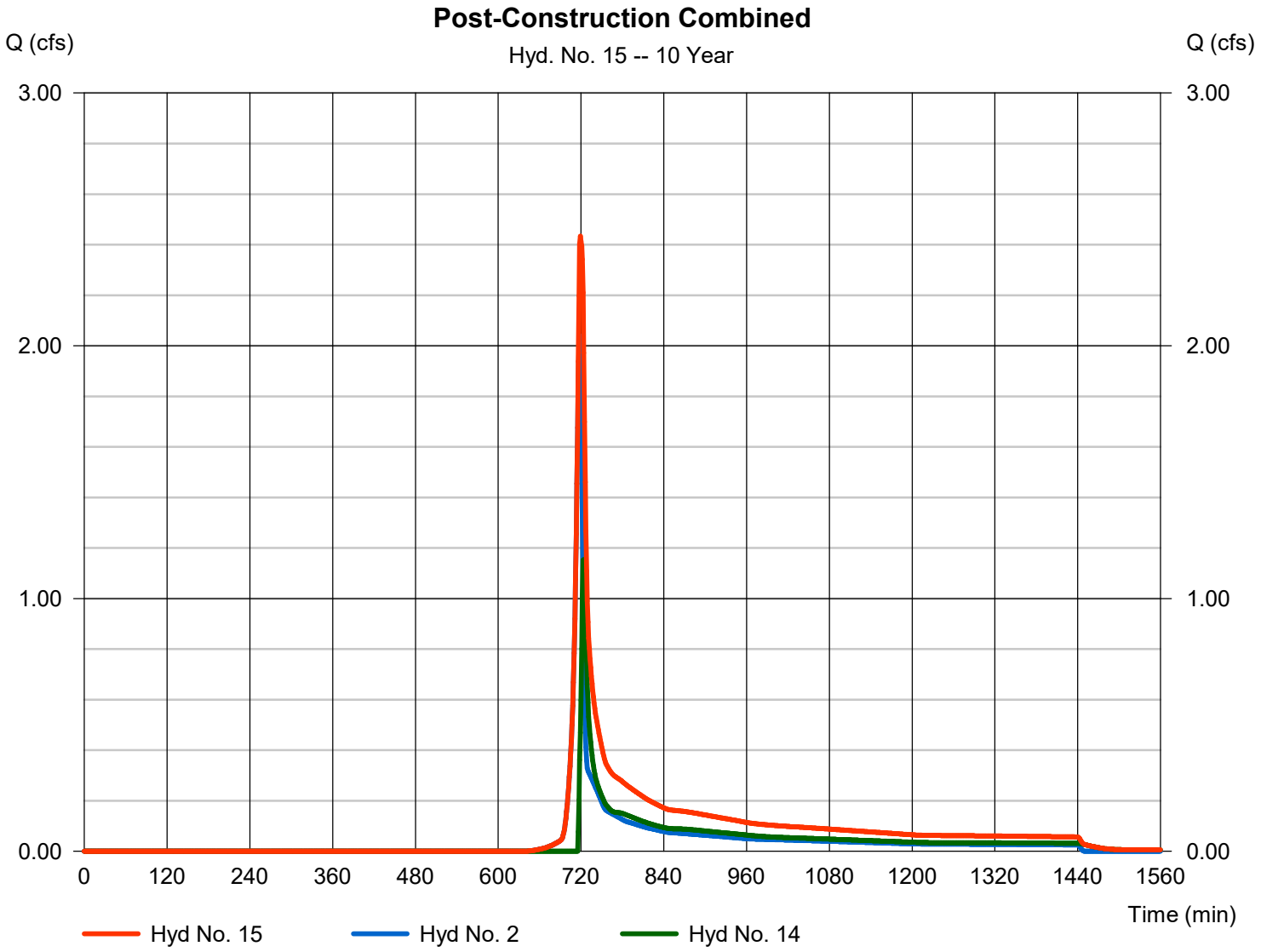


Hydrograph Report

Hyd. No. 15

Post-Construction Combined

Hydrograph type	=	Combine	Peak discharge	=	2.434 cfs
Storm frequency	=	10 yrs	Time to peak	=	719 min
Time interval	=	1 min	Hyd. volume	=	8,152 cuft
Inflow hyds.	=	2, 14	Contrib. drain. area	=	0.640 ac



ATTACHMENT 7
Roadside Ditch Calculations

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Channel Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Wednesday, Jun 4 2025

Roadside Ditch (2-year 24-hour storm)

Trapezoidal

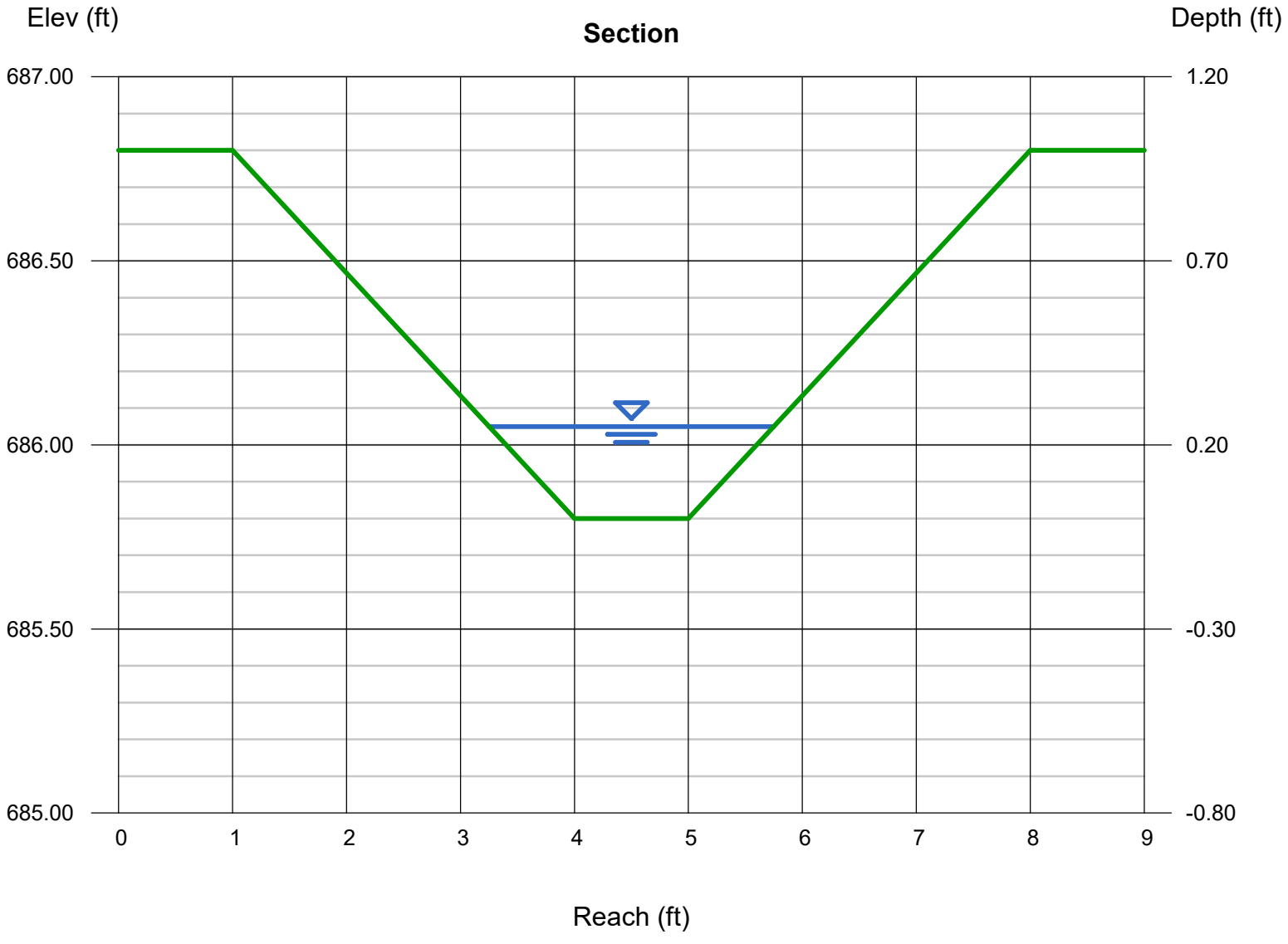
Bottom Width (ft)	= 1.00
Side Slopes (z:1)	= 3.00, 3.00
Total Depth (ft)	= 1.00
Invert Elev (ft)	= 685.80
Slope (%)	= 1.50
N-Value	= 0.030

Calculations

Compute by:	Known Q
Known Q (cfs)	= 0.77

Highlighted

Depth (ft)	= 0.25
Q (cfs)	= 0.770
Area (sqft)	= 0.44
Velocity (ft/s)	= 1.76
Wetted Perim (ft)	= 2.58
Crit Depth, Yc (ft)	= 0.22
Top Width (ft)	= 2.50
EGL (ft)	= 0.30



Channel Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Wednesday, Jun 4 2025

Roadside Ditch (10-year 24-hour storm)

Trapezoidal

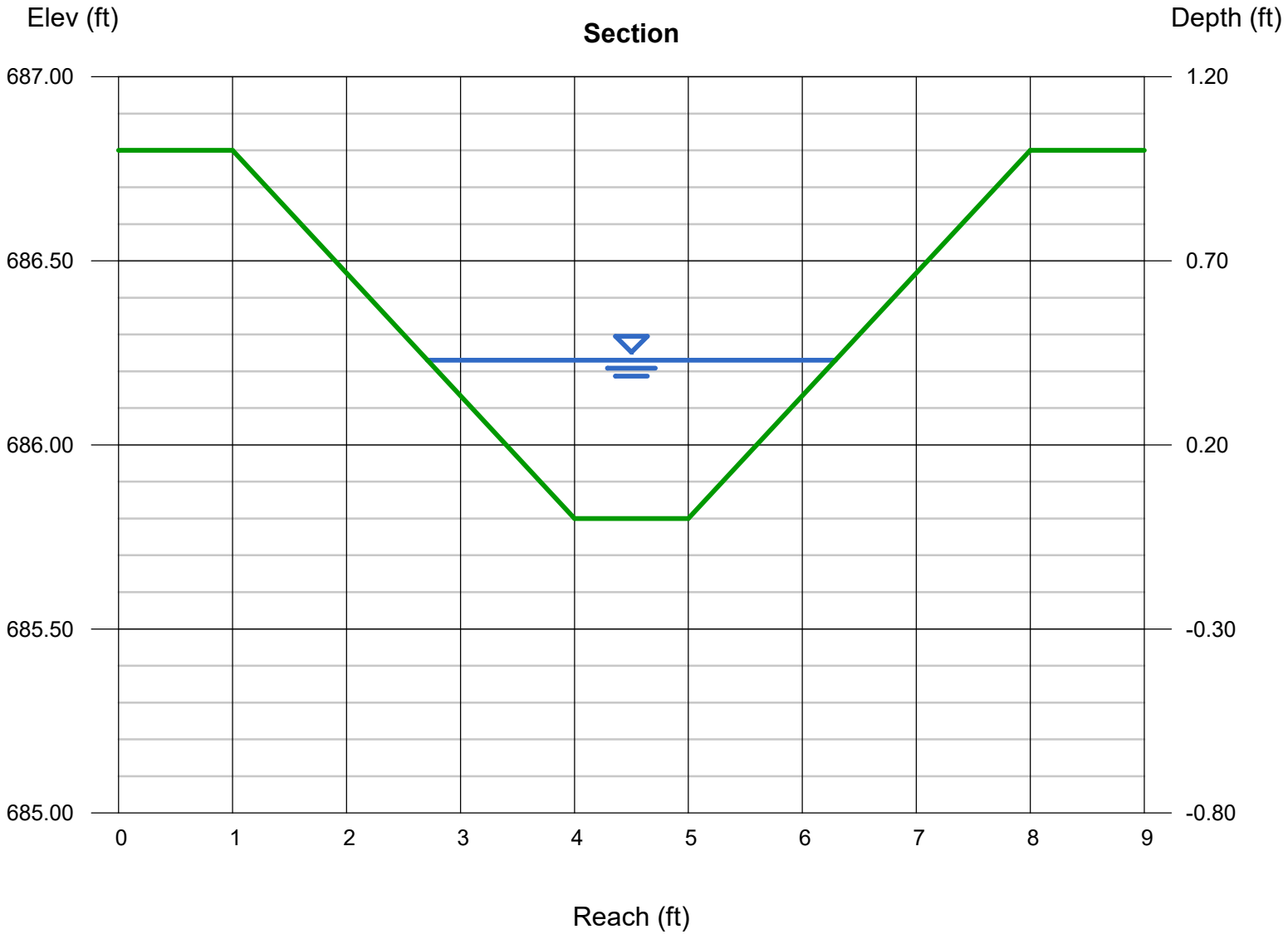
Bottom Width (ft)	= 1.00
Side Slopes (z:1)	= 3.00, 3.00
Total Depth (ft)	= 1.00
Invert Elev (ft)	= 685.80
Slope (%)	= 1.50
N-Value	= 0.030

Calculations

Compute by:	Known Q
Known Q (cfs)	= 2.43

Highlighted

Depth (ft)	= 0.43
Q (cfs)	= 2.430
Area (sqft)	= 0.98
Velocity (ft/s)	= 2.47
Wetted Perim (ft)	= 3.72
Crit Depth, Yc (ft)	= 0.40
Top Width (ft)	= 3.58
EGL (ft)	= 0.52



ATTACHMENT 8
Dry Swale Calculations

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Channel Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Tuesday, Apr 29 2025

Dry Swale

Trapezoidal

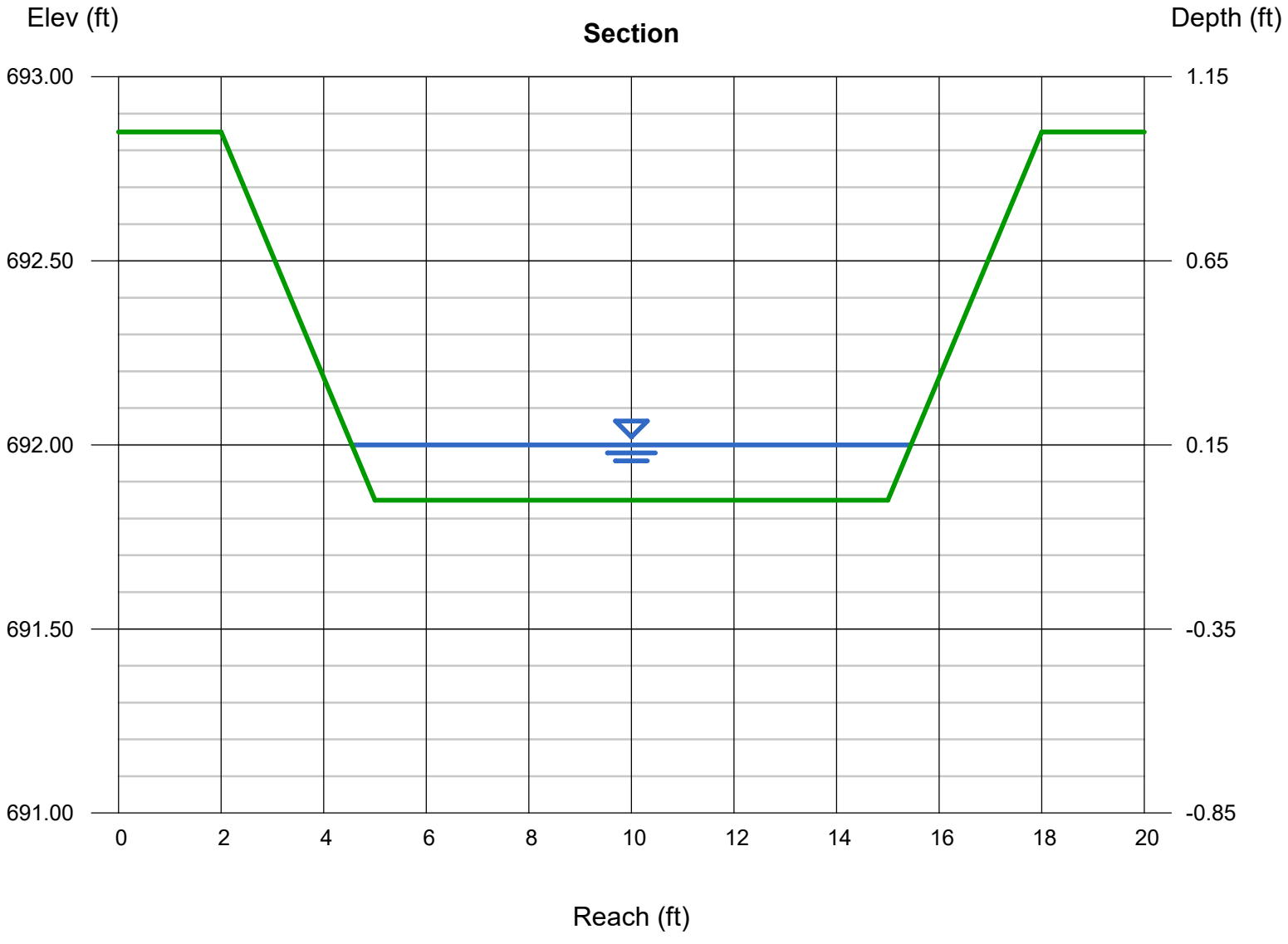
Bottom Width (ft)	= 10.00
Side Slopes (z:1)	= 3.00, 3.00
Total Depth (ft)	= 1.00
Invert Elev (ft)	= 691.85
Slope (%)	= 2.50
N-Value	= 0.030

Calculations

Compute by:	Known Q
Known Q (cfs)	= 3.28

Highlighted

Depth (ft)	= 0.15
Q (cfs)	= 3.280
Area (sqft)	= 1.57
Velocity (ft/s)	= 2.09
Wetted Perim (ft)	= 10.95
Crit Depth, Yc (ft)	= 0.15
Top Width (ft)	= 10.90
EGL (ft)	= 0.22



LEVEL 1 DRY SWALE DESIGN WORKSHEET

Design Data

PROJECT NAME:	SSE EDEN-MLV-02		
LOCATION:	Pittsylvania County, VA		
PREPARED BY:	TRUAXHW	DATE:	4/8/2025
CHECKED BY:	BARCLJA	DATE:	4/29/2025

Design Parameters

TvBMP =	1254 ft^3	*<-- See VRRM*
Soil Media Depth=	1.5 ft	*<-- Minimum: 18", Recommended Maximum: 36"*
Soil Media Porosity (η)=	0.25	*<-- See Figure P-CNV-02-1*
Slope	2.5%	*<-- Effective Swale Slopes < 4% for Level 1*

Equation P-CNV-02-1. Dry Swale Level 1 Design Storage Depth
(Surface Ponding Not Considered)

Storage Depth =(Soil Media Depth*Soil Media Porosity)+(Gravel Depth*Gravel Porosity)

Equivalent Storage Depth = 0.4 ft

Equation P-CNV-02-3. Dry Swale Level 1 Design Surface Area

SA (sq. ft.) = (TvBMP – volume of surface storage)/Equivalent Storage Depth

Channel drop =	5.25 ft	*<-- Channel drop = Channel length x Channel slope*
Number of dams =	6 *	*<-- Number of dams = Channel drop / Dam Height*
Section length =	35 ft	*<-- Section length = Channel length / Number of dams*
Storage per dam =	227.5 cf	*<-- Storage per dam = 0.5 x Section Length x Dam Height x (Check dam top width + Bottom width) / 2*
Surface storage =	1365 cf	*<--Swale storage = Storage per dam x Number of dams*

* This includes the storage behind the spillway. 5 check dams are proposed

Volume of surface storage=	1365 cf	
Soil media storage =	788 cf	*<--Soil media storage = Equivalent Storage Depth x Surface Area*
Dry swale storage=	2153 cf	*<--Dry swale storage = Volume of surface storage + Soil media storage*

Current Dry Swale Geometry

Length =	210 ft
Bottom Width =	10 ft
Top Width =	16 ft
Surface Area	2100 ft^2

The dry treatment swale is sized adequately.

Infiltration Test Field Data

SUBJECT: Southeast Supply Enhancement Project (EDEN-MLV-02)
BY: JAB Date: 4/20/2025
CHECKED: _____ Date: _____

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Test Hole #3					
Reading	delta T (min)	Delta (in)	Perc Rate (in/hr)	Elevation (ft)	Depth (ft)
1	10	0.500	3.000	690.50	0.5
2	10	0.500	3.000	690.50	0.5
3	10	0.500	3.000	690.50	0.5
4	10	0.375	2.250	690.50	0.5
	Final Value	0.469	2.813		

Test Hole #4					
Reading	delta T (min)	Delta (in)	Perc Rate (in/hr)	Elevation (ft)	Depth (ft)
1	10	0.625	3.750	691.50	0.5
2	10	0.625	3.750	691.50	0.5
3	10	0.625	3.750	691.50	0.5
4	10	0.625	3.750	691.50	0.5
	Final Value	0.625	3.750		

Test Hole #5					
Reading	delta T (min)	Delta (in)	Perc Rate (in/hr)	Elevation (ft)	Depth (ft)
1	10	0.625	3.750	691.50	0.5
2	10	0.625	3.750	691.50	0.5
3	10	0.625	3.750	691.50	0.5
4	10	0.625	3.750	691.50	0.5
	Final Value	0.625	3.750		

Infiltration Rate:	3.41	in/hr
Factor of Safety:	2	
Infiltration Rate:	1.70	in/hr

Project:	By:	Date:
	JAB	4/20/2025
Southeast Supply Enhancement Project (EDEN-MLV-02)	Checked:	Date:
Description:		
Drawdown of Dry Swale		

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Introduction:

The VADEQ Stormwater Management Handbook specifies that dry swales should be designed so that the desired treatement volume is completely filterd within 6 hours or less.

Calculations:

Infiltration area determined by using the infiltration bottom surface area.

Dewatering Time (hr) = (12*Treatment volume)/(Infiltration area X infiltration design rate

Dry Swale

Volume of surface storage =	1,365	cf	<-- *See Dry Swale Design Worksheet*
Infiltration Area =	2,100	sq.ft.	
Infiltration design rate =	1.70	in/hr	
Dewatering Time =	5	hrs (calculated)	

ATTACHMENT 9
Infiltration Testing Report

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SUBJECT Williams SSE Project – EDEN-MLV-02

Infiltration Testing Results and Calculations

DESIGNED BY: BAC DATE 10/04/2024 PROJ. NO. R230851.01

CHECKED BY: RRC DATE 10/08/2024 SECTION NO. 1 OF 5

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Introduction

This package determines the effective infiltration rates for the Williams SSE Project (Project) EDEN-MLV-02 proposed Post Construction Stormwater Management (PCSM) Best Management Practices (BMP).

Procedure

Prepare the testing area by levelling the ground and scraping any shrubs from the surface. Place outer ring on the testing area and drive the ring into the ground using a flat wooden board and a hammer. Drive the ring to a minimum depth of 2 inches. Next, place the inner ring and repeat the process. The bottom rim of both rings should be at the same level. Presoak the test area immediately prior to testing by filling both rings with water until the rim at every 30-minute intervals for an hour. The minimum water depth should be 4 inches. Depending on the drop-in water level after presoak period, the measurement intervals are determined. If water level drop was 2 inches or more, 10-minute intervals are used; and if water level drop was less than 2 inches, then 30-minute intervals are used. Note down the reading at each interval, after which the ring should be filled with water until the rim. Measure water level at each interval until a stabilized reading is obtained, which means a difference of 0.25 inch or less between the highest and lowest reading.

Method

In accordance with Appendix C of the Virginia Stormwater Management Handbook, double ring infiltrometer tests were conducted on site at the proposed locations of the infiltration BMPs as shown on the map in this package. The testing was conducted at the surface elevation of the proposed BMPs and completed on September 10, 2024. The existing condition of the site included woodland area. The soil test pits were machine excavated.

Test No. IT #1

Based on visual observation of the ground surface and from shallow excavations made to the test area during infiltration testing on September 10, 2024, the near surface soil and subsoil consists of six feet of dry sand with some gravel, a little silt, trace clay, and cobbles. Roots were present down to a depth of one foot. A leachate zone was present at a depth of 1 foot. One infiltration test was conducted within the test pit at a depth of 2 feet.

Test No. IT #2

Based on visual observation of the ground surface and from shallow excavations made to the test area during infiltration testing on September 10, 2024, the near surface soil and subsoil consists of 6.1 feet of dry to damp sand with some silt and a little clay. One infiltration test was conducted within the test pit at a depth of 2 feet.

Test No. IT #3

Based on visual observation of the ground surface and from shallow excavations made to the test area during infiltration testing on September 10, 2024, the near surface soil consists of 2.5 feet of dry sand with some gravel and trace silt. Roots were present to a depth of three feet. A leachate zone was present at a depth of 2.5 feet. The subsoil consists of dry to damp sand with some silt and trace clay. One infiltration test was conducted within the test pit at a depth of 0.5 feet.

Test No. IT #4

Based on visual observation of the ground surface and from shallow excavations made to the test area during infiltration testing on September 10, 2024, the near surface soil consists of three feet of dry sand with some gravel and trace silt. The subsoil consists of dry to damp sand with some silt and a little clay. One infiltration test was conducted within the test pit at a depth of 0.5 feet.

Test No. IT #5

Based on visual observation of the ground surface and from shallow excavations made to the test area during infiltration testing on September 10, 2024, the near surface soil and subsoil consists of six feet of dry sand with some clay, some silt, and trace gravel. Roots were present to a depth of 3.5 feet. One infiltration test was conducted within the test pit at a depth of 0.5 feet.

Test No. IT #6

Based on visual observation of the ground surface and from shallow excavations made to the test area during infiltration testing on September 10, 2024, the near surface soil and subsoil consists of 6.8 feet of dry sand with some silt, a little clay, and trace gravel. One infiltration test was conducted within the test pit at a depth of 0.5 feet.

Test No. IT #7

Based on visual observation of the ground surface and from shallow excavations made to the test area during infiltration testing on September 10, 2024, the near surface soil and subsoil consists of 7.6 feet of dry sand with some silt, a little clay, and a little gravel. One infiltration test was conducted within the test pit at a depth of 0.5 feet.

Test No. IT #8

Based on visual observation of the ground surface and from shallow excavations made to the test area during infiltration testing on September 10, 2024, the near surface soil and subsoil consists of six feet of dry sand with some silt, a little clay, and a little gravel. Roots were present from 1 to 2 feet deep. One infiltration test was conducted within the test pit at a depth of 0.5 feet.

Geologic Test Results

Test Pits of approximately 6-ft to 7.6-ft deep were dug in the infiltration BMP locations to observe the soil horizon and the overall soil conditions both horizontally and vertically.

Test No. TP #1

Based on visual observation of the ground surface and from test pit dug 6 feet deep on September 10, 2024, the near surface soil and subsoil consists of six feet of yellow orange (10YR 7/8) dry sand with some gravel, a little silt, trace clay, cobbles, blocky, heterogeneous, stiff, non to low plastic fines, and colluvium. Roots were present from surface to a depth of one foot. A leachate zone was present at one foot. No bedrock or groundwater was encountered.

Test No. TP #2

Based on visual observation of the ground surface and from test pit dug 6.1 feet deep on September 10, 2024, the near surface soil and subsoil consists of 6.1 feet of light yellowish (2.5YR 7/6) dry to damp sand with some silt, a little clay, blocky, flat to elongated, heterogeneous, low to non-plastic fines, and colluvium. No bedrock or groundwater was encountered.

Test No. TP #3

Based on visual observation of the ground surface and from test pit dug 6.2 feet deep on September 10, 2024, the near surface soil consists of 2.5 feet of dull orange (7.5YR 4/7) dry sand with some gravel, trace silt, blocky, heterogeneous, non-plastic fines, and colluvium. The subsoil consists of bright brown (10YR 6/6) with light gray (5YR 7/1) dry to damp sand with some silt, trace clay, rounded, homogeneous, colluvium, low plastic fines, and a leachate zone present throughout. Roots were present from surface to three feet deep. Potential presence of seasonal high groundwater table located within the test pit. No bedrock was encountered.

Test No. TP #4

Based on visual observation of the ground surface and from test pit dug 6 feet deep on September 10, 2024, the near surface soil consists of three feet of dull orange (7.5YR 4/7) dry sand with some gravel, trace silt, blocky, heterogeneous, angular to sub-angular, non-plastic fines, and colluvium. The subsoil consists of bright brown (10YR 6/6) with light red gray (5YR 7/1) dry to damp sand with some silt, a little clay, rounded, low plastic fines, and residuum. A leachate zone was present from 2.5 feet to 6 feet deep. Potential presence of seasonal high groundwater table located within the test pit. No bedrock was encountered.

Test No. TP #5

Based on visual observation of the ground surface and from test pit dug 6 feet deep on September 10, 2024, the near surface soil and subsoil consists of six feet of dull orange (7.5YR 4/7) dry sand with some clay, some silt, trace gravel, blocky, heterogeneous, low to non-plastic fines, sub-rounded to angular, and colluvium. Roots were present from surface to a depth of 3.5 feet. No bedrock or groundwater was encountered.

Test No. TP #6

Based on visual observation of the ground surface and from test pit dug 6.8 feet deep on September 10, 2024, the near surface soil and subsoil consists of 6.8 feet of brown yellow (2.5YR 7/4) dry sand with some silt, a little clay, trace gravel, blocky, heterogeneous, low to non-plastic fines, angular, and colluvium. No bedrock or groundwater was encountered.

Test No. TP #7

Based on visual observation of the ground surface and from test pit dug 7.6 feet deep on September 10, 2024, the near surface soil and subsoil consists of 7.6 feet of brown yellow (2.5YR 7/4) dry sand with some silt, a little clay, a little gravel, blocky, heterogeneous, low to non-plastic fines, angular, and colluvium. No bedrock or groundwater was encountered.

Test No. TP #8

Based on visual observation of the ground surface and from test pit dug 6 feet deep on September 10, 2024, the near surface soil and subsoil consists of six feet of brown yellow (7.5YR 4/7) dry sand with some silt, a little clay, a little gravel, blocky, heterogeneous, low to non-plastic fines, flat to angular, and colluvium. Roots were present from 1-foot to 2-feet deep. No bedrock or groundwater was encountered.

gai consultants

Infiltration Testing Worksheets

Double Ring Infiltrometer Field Test

Test Pit Number: 1	Project Name: Williams SSE - MP 1394.69	Project #R230851.01

Depth of Excavation (ft.): 2 Depth of Topsoil (in.): See Soil Test Pit Log Depth of Watertable (ft): See Soil Test Pit Log	Soil Conditions: See Soil Test Pit Log

1-hour Pre-soak

	Start Time	Fill Mark from Bottom (inches)	Drop in Water Level (inches)	Measured Time
1	11:07 AM	N/A	0.375	11:37 AM
2	11:37 AM	N/A	0.375	12:07 PM

Less than 2-inches of drop, Use 30 minute measurement intervals
More than 2-inches of drop, Use 10-minute measurement intervals

Infiltration Testing

	Start Time	Fill Mark from Bottom (inches)	Drop in Water Level (inches)	Measured Time
1	12:07 PM	N/A	0.375	12:37 PM
2	12:37 PM	N/A	0.25	1:07 PM
3	1:07 PM	N/A	0.25	1:37 PM
4	1:37 PM	N/A	0.25	2:07 PM

Stop test if there is a stabilized rate of drop, meaning a difference of 1/4 inch or less of drop between the highest and lowest readings of the top four readings

5				
6				
7				
8				

Infiltration Rate:(Average Drop in Water Level/30 minutes) x 60 minutes/1 hour =	0.56	in/hr
Infiltration Rate:(Average Drop in Water Level/10 minutes) x 60 minutes/1 hour =		in/hr
		in/hr

Test Performed: 9-10-2024
Test By: Ryan Connell and Brandon Clark

Double Ring Infiltrometer Field Test

Test Pit Number: 2	Project Name: Williams SSE - MP 1394.69	Project #R230851.01

Depth of Excavation (ft.): 2 Depth of Topsoil (in.): See Soil Test Pit Log Depth of Watertable (ft): See Soil Test Pit Log	Soil Conditions: See Soil Test Pit Log

1-hour Pre-soak

	Start Time	Fill Mark from Bottom (inches)	Drop in Water Level (inches)	Measured Time
1	11:36 AM	N/A	2.75	12:06 PM
2	12:06 PM	N/A	1.375	12:36 PM

Less than 2-inches of drop, Use 30 minute measurement intervals
More than 2-inches of drop, Use 10-minute measurement intervals

Infiltration Testing

	Start Time	Fill Mark from Bottom (inches)	Drop in Water Level (inches)	Measured Time
1	12:36 PM	N/A	0.75	1:06 PM
2	1:06 PM	N/A	0.75	1:36 PM
3	1:36 PM	N/A	0.625	2:06 PM
4	2:06 PM	N/A	0.625	2:36 PM

Stop test if there is a stabilized rate of drop, meaning a difference of 1/4 inch or less of drop between the highest and lowest readings of the top four readings

5				
6				
7				
8				

Infiltration Rate:(Average Drop in Water Level/30 minutes) x 60 minutes/1 hour =	1.38	in/hr
Infiltration Rate:(Average Drop in Water Level/10 minutes) x 60 minutes/1 hour =		in/hr
		in/hr

Test Performed: 9-10-2024
Test By: Ryan Connell and Brandon Clark

Double Ring Infiltrometer Field Test

Test Pit Number: 3	Project Name: Williams SSE - MP 1394.69	Project #R230851.01

Depth of Excavation (ft.): 0.5 Depth of Topsoil (in.): See Soil Test Pit Log Depth of Watertable (ft): See Soil Test Pit Log	Soil Conditions: See Soil Test Pit Log

1-hour Pre-soak

	Start Time	Fill Mark from Bottom (inches)	Drop in Water Level (inches)	Measured Time
1	8:08 AM	N/A	2.25	8:38 AM
2	8:38 AM	N/A	2	9:08 AM

Less than 2-inches of drop, Use 30 minute measurement intervals
More than 2-inches of drop, Use 10-minute measurement intervals

Infiltration Testing

	Start Time	Fill Mark from Bottom (inches)	Drop in Water Level (inches)	Measured Time
1	9:08 AM	N/A	0.5	9:18 AM
2	9:18 AM	N/A	0.5	9:28 AM
3	9:28 AM	N/A	0.5	9:38 AM
4	9:38 AM	N/A	0.375	9:48 AM

Stop test if there is a stabilized rate of drop, meaning a difference of 1/4 inch or less of drop between the highest and lowest readings of the top four readings

5				
6				
7				
8				

Infiltration Rate:(Average Drop in Water Level/30 minutes) x 60 minutes/1 hour =		in/hr
Infiltration Rate:(Average Drop in Water Level/10 minutes) x 60 minutes/1 hour =	2.81	in/hr
		in/hr

Test Performed: 9-10-2024
Test By: Ryan Connell and Brandon Clark

Double Ring Infiltrometer Field Test

Test Pit Number: 4	Project Name: Williams SSE - MP 1394.69	Project #R230851.01

Depth of Excavation (ft.): 0.5 Depth of Topsoil (in.): See Soil Test Pit Log Depth of Watertable (ft): See Soil Test Pit Log	Soil Conditions: See Soil Test Pit Log

1-hour Pre-soak

	Start Time	Fill Mark from Bottom (inches)	Drop in Water Level (inches)	Measured Time
1	8:33 AM	N/A	3.75	9:03 AM
2	9:03 AM	N/A	2.25	9:33 AM

Less than 2-inches of drop, Use 30 minute measurement intervals

More than 2-inches of drop, Use 10-minute measurement intervals

Infiltration Testing

	Start Time	Fill Mark from Bottom (inches)	Drop in Water Level (inches)	Measured Time
1	9:33 AM	N/A	0.625	9:43 AM
2	9:43 AM	N/A	0.625	9:53 AM
3	9:53 AM	N/A	0.625	10:03 AM
4	10:03 AM	N/A	0.625	10:13 AM

Stop test if there is a stabilized rate of drop, meaning a difference of 1/4 inch or less of drop between the highest and lowest readings of the top four readings

5				
6				
7				
8				

Infiltration Rate:(Average Drop in Water Level/30 minutes) x 60 minutes/1 hour =		in/hr
Infiltration Rate:(Average Drop in Water Level/10 minutes) x 60 minutes/1 hour =	3.75	in/hr
		in/hr

Test Performed: 9-10-2024

Test By: Ryan Connell and Brandon Clark

Double Ring Infiltrometer Field Test

Test Pit Number: 5	Project Name: Williams SSE - MP 1394.69	Project #R230851.01

Depth of Excavation (ft.): 0.5 Depth of Topsoil (in.): See Soil Test Pit Log Depth of Watertable (ft): See Soil Test Pit Log	Soil Conditions: See Soil Test Pit Log

1-hour Pre-soak

	Start Time	Fill Mark from Bottom (inches)	Drop in Water Level (inches)	Measured Time
1	9:07 AM	N/A	2.375	9:37 AM
2	9:37 AM	N/A	2	10:07 AM

Less than 2-inches of drop, Use 30 minute measurement intervals
More than 2-inches of drop, Use 10-minute measurement intervals

Infiltration Testing

	Start Time	Fill Mark from Bottom (inches)	Drop in Water Level (inches)	Measured Time
1	10:07 AM	N/A	0.625	10:17 AM
2	10:17 AM	N/A	0.625	10:27 AM
3	10:27 AM	N/A	0.625	10:37 AM
4	10:37 AM	N/A	0.625	10:47 AM

Stop test if there is a stabilized rate of drop, meaning a difference of 1/4 inch or less of drop between the highest and lowest readings of the top four readings

5				
6				
7				
8				

Infiltration Rate:(Average Drop in Water Level/30 minutes) x 60 minutes/1 hour =		in/hr
Infiltration Rate:(Average Drop in Water Level/10 minutes) x 60 minutes/1 hour =	3.75	in/hr
		in/hr

Test Performed: 9-10-2024
Test By: Ryan Connell and Brandon Clark

Double Ring Infiltrometer Field Test

Test Pit Number: 6	Project Name: Williams SSE - MP 1394.69	Project #R230851.01

Depth of Excavation (ft.): 0.5 Depth of Topsoil (in.): See Soil Test Pit Log Depth of Watertable (ft): See Soil Test Pit Log	Soil Conditions: See Soil Test Pit Log

1-hour Pre-soak

	Start Time	Fill Mark from Bottom (inches)	Drop in Water Level (inches)	Measured Time
1	10:31 AM	N/A	4.75	11:01 AM
2	11:01 AM	N/A	3.75	11:31 AM

Less than 2-inches of drop, Use 30 minute measurement intervals
More than 2-inches of drop, Use 10-minute measurement intervals

Infiltration Testing

	Start Time	Fill Mark from Bottom (inches)	Drop in Water Level (inches)	Measured Time
1	11:31 AM	N/A	1	11:41 AM
2	11:41 AM	N/A	1	11:51 AM
3	11:51 AM	N/A	1	12:01 PM
4	12:01 PM	N/A	0.875	12:11 PM

Stop test if there is a stabilized rate of drop, meaning a difference of 1/4 inch or less of drop between the highest and lowest readings of the top four readings

5				
6				
7				
8				

Infiltration Rate:(Average Drop in Water Level/30 minutes) x 60 minutes/1 hour =		in/hr
Infiltration Rate:(Average Drop in Water Level/10 minutes) x 60 minutes/1 hour =	5.81	in/hr
		in/hr

Test Performed: 9-10-2024
Test By: Ryan Connell and Brandon Clark

Double Ring Infiltrometer Field Test

Test Pit Number: 7	Project Name: Williams SSE - MP 1394.69	Project #R230851.01

Depth of Excavation (ft.): 0.5 Depth of Topsoil (in.): See Soil Test Pit Log Depth of Watertable (ft): See Soil Test Pit Log	Soil Conditions: See Soil Test Pit Log

1-hour Pre-soak

	Start Time	Fill Mark from Bottom (inches)	Drop in Water Level (inches)	Measured Time
1	10:03 AM	N/A	2.375	10:33 AM
2	10:33 AM	N/A	2	11:03 AM

Less than 2-inches of drop, Use 30 minute measurement intervals
More than 2-inches of drop, Use 10-minute measurement intervals

Infiltration Testing

	Start Time	Fill Mark from Bottom (inches)	Drop in Water Level (inches)	Measured Time
1	11:03 AM	N/A	0.5	11:13 AM
2	11:13 AM	N/A	0.625	11:23 AM
3	11:23 AM	N/A	0.5	11:33 AM
4	11:33 AM	N/A	0.5	11:43 AM

Stop test if there is a stabilized rate of drop, meaning a difference of 1/4 inch or less of drop between the highest and lowest readings of the top four readings

5				
6				
7				
8				

Infiltration Rate:(Average Drop in Water Level/30 minutes) x 60 minutes/1 hour =		in/hr
Infiltration Rate:(Average Drop in Water Level/10 minutes) x 60 minutes/1 hour =	3.19	in/hr
		in/hr

Test Performed: 9-10-2024
Test By: Ryan Connell and Brandon Clark

Double Ring Infiltrometer Field Test

Test Pit Number: 8	Project Name: Williams SSE - MP 1394.69	Project #R230851.01

Depth of Excavation (ft.): 0.5 Depth of Topsoil (in.): See Soil Test Pit Log Depth of Watertable (ft): See Soil Test Pit Log	Soil Conditions: See Soil Test Pit Log

1-hour Pre-soak

	Start Time	Fill Mark from Bottom (inches)	Drop in Water Level (inches)	Measured Time
1	9:35 AM	N/A	4.5	10:05 AM
2	10:05 AM	N/A	3.625	10:35 AM

Less than 2-inches of drop, Use 30 minute measurement intervals
More than 2-inches of drop, Use 10-minute measurement intervals

Infiltration Testing

	Start Time	Fill Mark from Bottom (inches)	Drop in Water Level (inches)	Measured Time
1	10:35 AM	N/A	1.25	10:45 AM
2	10:45 AM	N/A	1.125	10:55 AM
3	10:55 AM	N/A	1.125	11:05 AM
4	11:05 AM	N/A	1	11:15 AM

Stop test if there is a stabilized rate of drop, meaning a difference of 1/4 inch or less of drop between the highest and lowest readings of the top four readings

5				
6				
7				
8				

Infiltration Rate:(Average Drop in Water Level/30 minutes) x 60 minutes/1 hour =		in/hr
Infiltration Rate:(Average Drop in Water Level/10 minutes) x 60 minutes/1 hour =	6.75	in/hr
		in/hr

Test Performed: 9-10-2024
Test By: Ryan Connell and Brandon Clark

gai consultants

Soil Test Pit Logs

PROJECT **Williams SSE Project – MP 1394.69**

ELEVATION 686ft Lat/Long (36°37'47", -79°32'50") BORING NO. **TP-1**

ELEVATION GW **Dry** PROJECT NO. **R210356.01**

DATE **09/10/24** CLASSIFIED BY **KK** PAGE **1** OF **1**

DEPTH (FEET)	RECOVERY IN FEET/ % RECOVERY	DESCRIPTION: PROFILE	DESCRIPTION: COLOR	DESCRIPTION: MATERIAL CLASSIFICATION	REMARKS*
	1.0	1.0	Yellow orange	Sand, some Gravel, little Silt, trace Clay, Cobbles encountered, blocky, heterogeneous	
1.0	100%		10YR 7/8	dry, stiff,non to low plastic fines, colluvium, a-1-b/sp (0.0' - 6.0')	
	1.0			Roots from 0.0' - 1.0'	
2.0	100%			Leachate zone present at 1.0'	
	1.0				**No presence of seasonal high**
3.0	100%				**groundwater table within**
	1.0	6.0			**the test pit.**
4.0	100%				
	1.0				
5.0	100%				
	1.0				
6.0	100%			Pit terminated at 6.0 ft	

Test pits were completed by Southeast Connections, LLC . using a Cat 305E2 CR Mini Excavator with a 2 ft bucket on 9/10/24.

PROJECT **Williams SSE Project – MP 1394.69**

ELEVATION 681ft Lat/Long (36°37'47". -79°32'50") BORING NO. **TP-2**

ELEVATION GW **Dry** PROJECT NO. **R210356.01**

DATE **09/10/24** CLASSIFIED BY **KK** PAGE **1** OF **1**

DEPTH (FEET)	RECOVERY IN FEET/ % RECOVERY	DESCRIPTION: PROFILE	DESCRIPTION: COLOR	DESCRIPTION: MATERIAL CLASSIFICATION	REMARKS*
	1.0		Light yellowish	Sand, some Silt, litte Clay, dry to damp, blocky, flat to elongated, heterogeneous	
1.0	100%		2.5YR 7/6	low to non-plastic fines, collivium, a-1-b/sp, (0.0' - 6.1')	**No presence of seasonal high**
	1.0				**groundwater table**
2.0	100%				**present.**
	1.0				
3.0	100%				
	1.0	6.1			
4.0	100%				
	1.0				
5.0	100%				
	1.0				
6.0	100%			Pit terminated at 6.1 ft	

Test pits were completed by Southeast Connections, LLC . using a Cat 305E2 CR Mini Excavator with a 2 ft bucket on 9/10/24.

PROJECT **Williams SSE Project – MP 1394.69**

ELEVATION 686ft Lat/Long (36°37'47". -79°32'49") BORING NO. **TP-3**

ELEVATION GW **Dry** PROJECT NO. **R210356.01**

DATE **09/10/24** CLASSIFIED BY **KK** PAGE **1** OF **1**

DEPTH (FEET)	RECOVERY IN FEET/ % RECOVERY	PROFILE	DESCRIPTION: COLOR	DESCRIPTION: MATERIAL CLASSIFICATION	REMARKS*
	1.0		Dull orange	Sand, some Gravel, trace Silt, blocky, dry, heterogeneous, non-plastic fines,	
1.0	100%		7.5YR 4/7	colluvium, a-1-b/sm (0.0' - 2.5')	
	1.0			0.0' - 3.0' Roots present	
2.0	100%			2.5' Leachate zone present	
	1.0				**Potential presence of seasonal**
3.0	100%				**high groundwater table within**
	1.0	6.2	10YR 6/6	Sand, some Silt, trace Clay, dry to damp, homogeneous, rounded, colluvium,	**the test pit.**
4.0	100%		Bright brown	low plastic fines, a-2-4/sm, leachate zone present throughout	
	1.0		with light gray	a-1-b/sm (2.5' - 6.2')	
5.0	100%		5R 7/1		
	1.0				
6.0	100%			Pit terminated at 6.2 ft	

Test pits were completed by Southeast Connections, LLC . using a Cat 305E2 CR Mini Excavator with a 2 ft bucket on 9/10/24.

PROJECT **Williams SSE Project – MP 1394.69**

ELEVATION 686ft Lat/Long (36°37'48". -79°32'49") BORING NO. **TP-4**

ELEVATION GW **Dry** PROJECT NO. **R210356.01**

DATE **09/10/24** CLASSIFIED BY **KK** PAGE **1** OF **1**

DEPTH (FEET)	RECOVERY IN FEET/ % RECOVERY	DESCRIPTION			REMARKS*
		PROFILE	COLOR	MATERIAL CLASSIFICATION	
	1.0	1.0	Dull orange	Sand, some Gravel, trace Silt, blocky, heterogeneous, dry, angular to sub-angular	
1.0	100%		7.5 YR 4/7	non-plastic fines, colluvium, a-1-b/sp (0.0' - 3.0')	
	1.0	6.0			
2.0	100%				
	1.0				**Potential presence of seasonal**
3.0	100%				**high groundwater table within**
	1.0		10 YR 6/6	Sand, some Silt, little Clay, rounded, dry to damp, rounded, low plastic fines,	**the test pit.**
4.0	100%		Bright brown	residuum, a-1-b/sm (3.0' - 6.0')	
	1.0		with	Leachate zone present (2.5' - 6.0')	
5.0	100%		Light Red Gray		
	1.0		5R 7/1		
6.0	100%			Pit terminated at 6.0 ft	

Test pits were completed by Southeast Connections, LLC . using a Cat 305E2 CR Mini Excavator with a 2 ft bucket on 9/10/24.

PROJECT **Williams SSE Project – MP 1394.69**

ELEVATION 689ft Lat/Long (36°37'46". -79°32'50") BORING NO. **TP-5**

ELEVATION GW **Dry** PROJECT NO. **R210356.01**

DATE **09/10/24** CLASSIFIED BY **KK** PAGE **1** OF **1**

DEPTH (FEET)	RECOVERY IN FEET/ % RECOVERY	DESCRIPTION			REMARKS*
		PROFILE	COLOR	MATERIAL CLASSIFICATION	
	1.0		Dull orange	Sand, some Clay, some Silt, trace Gravel, blocky, heterogeneous, dry	
1.0	100%		7.5YR 4/7	low to non-plastic fines, sub-rounded to angular, colluvium, a-2-6/sc (0.0' - 6.0')	
	1.0			Roots to 3.5'	
2.0	100%				
	1.0				**No presence of seasonal high**
3.0	100%				**groundwater table**
	1.0	6.0			**present.**
4.0	100%				
	1.0				
5.0	100%				
	1.0				
6.0	100%			Pit terminated at 6.0 ft	

Test pits were completed by Southeast Connections, LLC . using a Cat 305E2 CR Mini Excavator with a 2 ft bucket on 9/10/24.

PROJECT **Williams SSE Project – MP 1394.69**

ELEVATION 688ft Lat/Long (36°37'46". -79°32'49") BORING NO. **TP-6**

ELEVATION GW **Dry** PROJECT NO. **R210356.01**

DATE **09/10/24** CLASSIFIED BY **KK** PAGE **1** OF **1**

DEPTH (FEET)	RECOVERY IN FEET/ % RECOVERY	DESCRIPTION			REMARKS*
		PROFILE	COLOR	MATERIAL CLASSIFICATION	
	1.0		Brown yellow	Sand, some Silt, little Clay, trace Gravel, blocky, heterogeneous, dry	
1.0	100%		2.5YR 7/4	low to non-plastic fines, angular, colluvium, a-1-b/sm (0.0' - 6.8')	
	1.0				
2.0	100%				
	1.0				
3.0	100%				**No presence of seasonal high**
	1.0	6.8			**groundwater table**
4.0	100%				**present.**
	1.0				
5.0	100%				
	1.0				
6.0	100%				
				Pit terminated at 6.8 ft	

Test pits were completed by Southeast Connections, LLC . using a Cat 305E2 CR Mini Excavator with a 2 ft bucket on 9/10/24.

PROJECT **Williams SSE Project – MP 1394.69**

ELEVATION 688ft Lat/Long (36°37'46". -79°32'49") BORING NO. **TP-7**

ELEVATION GW **Dry** PROJECT NO. **R210356.01**

DATE **09/10/24** CLASSIFIED BY **KK** PAGE **1** OF **1**

DEPTH (FEET)	RECOVERY IN FEET/ % RECOVERY	DESCRIPTION			REMARKS*
		PROFILE	COLOR	MATERIAL CLASSIFICATION	
	1.0		Brown yellow	Sand, some Silt, little Clay, little Gravel, blocky, heterogeneous, dry	
1.0	100%		2.5YR 7/4	low to non-plastic fines, angular, colluvium, a-1-b/sm (0.0' - 7.6')	
	1.0				
2.0	100%				
	1.0				
3.0	100%				**No presence of seasonal high**
	1.0				**groundwater table**
4.0	100%	7.6			**present.**
	1.0				
5.0	100%				
	1.0				
6.0	100%				
	1.0				
7.0	100%				
				Pit terminated at 7.6 ft	

Test pits were completed by Southeast Connections, LLC . using a Cat 305E2 CR Mini Excavator with a 2 ft bucket on 9/10/24.

PROJECT **Williams SSE Project – MP 1394.69**

ELEVATION 690ft Lat/Long (36°37'46". -79°32'50") BORING NO. **TP-8**

ELEVATION GW **Dry** PROJECT NO. **R210356.01**

DATE **09/10/24** CLASSIFIED BY **KK** PAGE **1** OF **1**

DEPTH (FEET)	RECOVERY IN FEET/ % RECOVERY	DESCRIPTION: PROFILE	DESCRIPTION: COLOR	DESCRIPTION: MATERIAL CLASSIFICATION	REMARKS*
	1.0		Brown yellow	Sand, some Silt, little Clay, little Gravel, blocky, heterogeneous, dry	
1.0	100%		7.5YR 4/7	low to non-plastic fines, flat to angular, colluvium, a-1-b/sm (0.0' - 6.0')	
	1.0			Roots from 1' - 2'	
2.0	100%				
	1.0				**No presence of seasonal high**
3.0	100%				**groundwater table**
	1.0	6.0			**present.**
4.0	100%				
	1.0				
5.0	100%				
	1.0				
6.0	100%			Pit terminated at 6.0 ft	

Test pits were completed by Southeast Connections, LLC . using a Cat 305E2 CR Mini Excavator with a 2 ft bucket on 9/10/24.