

2084 Brilla LLC

COMMENTS and RESPONSES 3/18/2024

Local Line COMMENT

RESPONSE

Reference Sheet (s)

Preliminary Subdivision and Land Development – 1st Review				1/12/2024
A. Zoning Ordinance Review				
1	1	<p>1. Sec. 232-380. – Use regulations.</p> <p>a. A variance was granted but not reflected in the Zoning Table and note 5 is incorrect. It reads: Auto Repair and Storage Garage, not what was granted. Update the note to reflect the accurate approved uses and identify that a variance was granted.</p> <p>i. Proposed use of a warehouse distribution (Lot 1)</p> <p>ii. Proposed personal storage garage (Lot 2).</p>	Note 5 has been replaced with revised tables.	1
2	2	<p>Sec. 232-583. – Yard exception for private garages, accessory building and retaining walls.</p> <p>a. The applicant proposes a 5-foot-tall board-on-board fence along Pine Ave for screening purposes.</p> <p>i. Fences located beyond the front setback line shall not exceed four (4) feet in height. Please revise the design.</p> <p>b. Retaining walls shall not be located any closer than three (3) feet from property lines unless construction and maintenance easements are produced from abutting property owners. Retaining wall #3 has a section that is perpendicular to parcel 02-017-090, requiring a construction and maintenance easement from the adjacent property owner.</p>	<p>a Fence height reduced to 4 feet.</p> <p>b Retaining Wall 3 has been revised.</p>	<p>3, 20</p> <p>4</p>
B. Subdivision and Land Development Ordinance (SALDO) Review				
3	1	<p>1. Sec. 201-41. – Preliminary plan requirements.</p> <p>a. Please update the plans indicating that Emery Lane is a paper street.</p> <p>b. There is an overhead PECO utility line running along the frontage of Bristol Road. Confirm the presence of any easements on this land and provide a statement from the utility.</p> <p>c. The storm drain labels for the points of connection are incomplete. The information for these locations should be revised to provide all information.</p>	<p>Emery Lane label has been revised</p> <p>PECO has been contacted.</p> <p>All available storm drain information has been included on the plans.</p>	<p>1</p> <p>2</p> <p>5,14</p>

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4	2	<p>Sec. 201-104. – Street design standards. a. Bristol Road is classified as a Minor Arterial and has a right of way width of 80-feet. Bristol Road currently has a ROW of 60 feet. Therefore, the applicant should dedicate ten (10) feet of ROW to Bensalem Township for the purposes for future roadway improvements. The applicant is offering a 10-foot strip of land along Bristol Road of access easement. If the intent of the “Access easement” is to fulfill the 10-feet of ROW that is to be dedicated to the Township for future roadway improvements, the plans should be updated as such, and all setback dimensions shall be measured from the 10-foot setback line. However, there were variances already provided for the front yard setbacks currently shown on the plans. Please clarify the intent.</p>	<p>The easement is an easement for future sidewalk.Added Note 9 See waiver 3 sheet 1</p>	1
5	3	<p>Sec. 201-106. – Environmental protection and open space preservation. a. The updated proposed grading divert water to Pine Street at the SW corner. Grading shall not take place within three (3) feet of a property line. Applicant is requesting a waiver.</p>	information only	na
6	4	<p>Sec. 201-110. – Curbs. a. Curbs should be provided by the developer. Approximately 489 feet along E Bristol Road, 61 feet along Grove Avenue, and 130 feet along Pine Street. Applicant proposes to curb entrance to lot 1 only. The applicant requests a waiver to pay a fee in lieu of installing the curb. b. The cartway width shall be widened by an additional 10 feet to meet the requirement of the widening of East Bristol Road. The applicant requests a waiver and indicates a 10-foot access easement. The purpose of the easement shall be clarified. If it is for future needs to widen Bristol Road, the front yard setbacks shall be dimensioned from the future ROW line.</p>	<p>information only The easement is an easement for future sidewalk.Added Note 9</p>	na 1

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#	Local	Line	COMMENT	RESPONSE	Reference Sheet (s)
7	5		<p>Sec. 201-111. – Sidewalks.</p> <p>a. Sidewalks should be provided; approximately 489 feet along East Bristol Road and 61 feet along Grove Avenue, and 130 feet along Pine Street. The applicant requests a waiver to pay a fee in lieu of installing the sidewalk.</p>	information only	na
8	6		<p>Sec. 201-112. – Motor vehicle parking facilities.</p> <p>a. The proposed dead end parking area for Lot 1 does not provide sufficient back-up area for the end stalls and should be redesigned. A vehicle turning plan illustrates that a large SUV can make the maneuvers for lot 1. The applicant seeks a waiver for this condition for lot 2.</p> <p>i. This office supports this action and the applicant shall install a sign for Lot 2 indicating that the parking is private parking. Update the plans.</p>	<p>a information only</p> <p>b Added a sign</p>	<p>na</p> <p>5</p>
			C. STORMWATER MANAGEMENT ORDINANCE COMMENTS		
9	1		<p>1. Sec. 196-31. – General requirements.</p> <p>a. One of the infiltration basins, the one nearest the loading parking space for Lot 1, does not meet the recommended range for applicable infiltration rates to be used in a PADEP SWM BMP.</p>	An additional field test that has been completed. Test location 6 The tested rate is 3.25 inches/hour. The assumed rate for Seepage Bed 1B is 1.0 inches/hour. Therefore Seepage Bed 1B is considered adequate without further analysis.	2, 18
10	2		<p>2. Sec. 196-61. – Design criteria.</p> <p>a. A note was needed to the plans explain that any increase in runoff may require necessary corrective measures, and the costs for such measures will be borne entirely by the developer.</p> <p>b. Storm pipes or other structures shall be reinforced concrete pipe have a minimum grade of ½ 0/0 and a minimum inside diameter of 18 inches. The proposed stormwater pipe has varying sizes of HDPE and the applicant requests a waiver of this standard.</p> <p>c. The minimum cover over the pipe shall be two (2) feet; a minimum of one-half (0.5) foot below subgrade. The proposed storm drain does not meet these criteria and the applicant requests a waiver.</p>	<p>Added Note 10</p> <p>information only</p> <p>information only</p>	1
			DESIGN CONDITIONS		

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Reference Sheet (s)

11	1	<p>DESIGN CONDITIONS The following is a list of design conditions of the Zoning Hearing Board decision, dated February 8, 2022:</p> <ol style="list-style-type: none"> 1. Redevelopment must be generally consistent with the Site Plan/Zoning Exhibit, prepared by Fiorvanti, Inc. dated 07/26/2021, last revised 12/10/2021. 2. No access to the subject lot from Pine Street. 3. No building doors facing Pine Street. 4. Placement of fencing along Pine Street to discourage access from Pine Street. 5. Placement of additional screen planting along Pine Street. 6. No deliveries by vehicles with gross vehicle weight over 10,000 pounds. 7. No public access to the private garage on the small lot. 	information only	na
		GRANTED VARIANCES		
12	1	<p>The following is a list of variances granted on February 8, 2022:</p> <ol style="list-style-type: none"> 1. Sec. 232-55. – To allow for disturbance of manmade steep slopes. 2. Sec. 232-380. – To permit a Warehouse Distribution (Lot 1) 3. Sec. 232-380. – To permit a Personal Storage Garage (Lot 2) 4. Sec. 232-381.(3)(a) – To permit front yard setbacks of 23.1 feet, 53.1 feet, and 13.13 feet where 75 feet is otherwise required. 5. Sec. 232-381.(3)(c) – To permit rear yard setbacks of 22.2 feet, 22.2 feet, and 8 feet, where 35 feet is otherwise required. 6. Sec. 232-381.(1) – To permit Lot 2 to have a minimum area of 6007 square feet, where 7200 square feet is the minimum (existing nonconformity) 7. Sec. 232-593. – A 75-foot yard shall be required, when adjacent to a residential district, measured from the rear of the 20-foot bufferyard and planting strip. A variance has been granted to not require the 75-foot yard adjacent to the residential district. 	information only	na
		WAIVERS		

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Reference Sheet (s)

13	1	<p>The following is a list of requested waivers from the applicant:</p> <ol style="list-style-type: none"> 1. Sec. 196-31(k) – Drainage of storage facilities; volume and control rate 2. Sec. 201-104(b)(6) – Dedication of additional ROW 3. Sec. 201-41(d)(9) – Manmade features within 400’ 4. Sec. 201-62(a) – Preliminary and final land development plan 5. Sec. 201-110(a) and (b) – Curbs 6. Sec. 201-111(a) – Sidewalks 7. Sec. 201-112(d) – Planting strip, between parking area and building 8. Sec. 201-112(e) – Sufficient backup area, dead-end parking areas 9. Sec. 201-112(h) – Parking areas to be set back minimum of 15’ from Ultimate ROW and property lines 10. Sec. 201-112(i) – Nonresidential parking areas/access driveways shall be paved/ curbed 11. Sec. 201-112(o) – Provide lighting plan 12. Sec. 201-112(p) – Screening for parking facilities parallel to public ROW 13. Sec. 201-114(e) – Bufferyard and planting strip 	information only	na
		Land Development Traffic Review		1/12/2024
14	1	Bristol Road is a state route. A PennDOT Highway Occupancy Permit (HOP) will need to be obtained for any work performed in the state’s right-of-way. Please submit plans and correspondence to the Township for review and approval.	HOP application is in process	na
15	2	A traffic impact fee will be necessary for this project. This will be calculated once additional information is received from the developer. We are currently working with the developers engineer to receive this information.	information only	na
16	3	The proposed shoulder grade at drive A should be discussed with PennDOT. It is our experience the Department would keep the existing roadway slope through the shoulder or break the shoulder down not up as shown on the plans.	The shoulder does not break in an up direction. From the edge of the travel lane the pavement breaks down to a gutter line then up to a future sidewalk crossing	12

2084 Brilla LLC

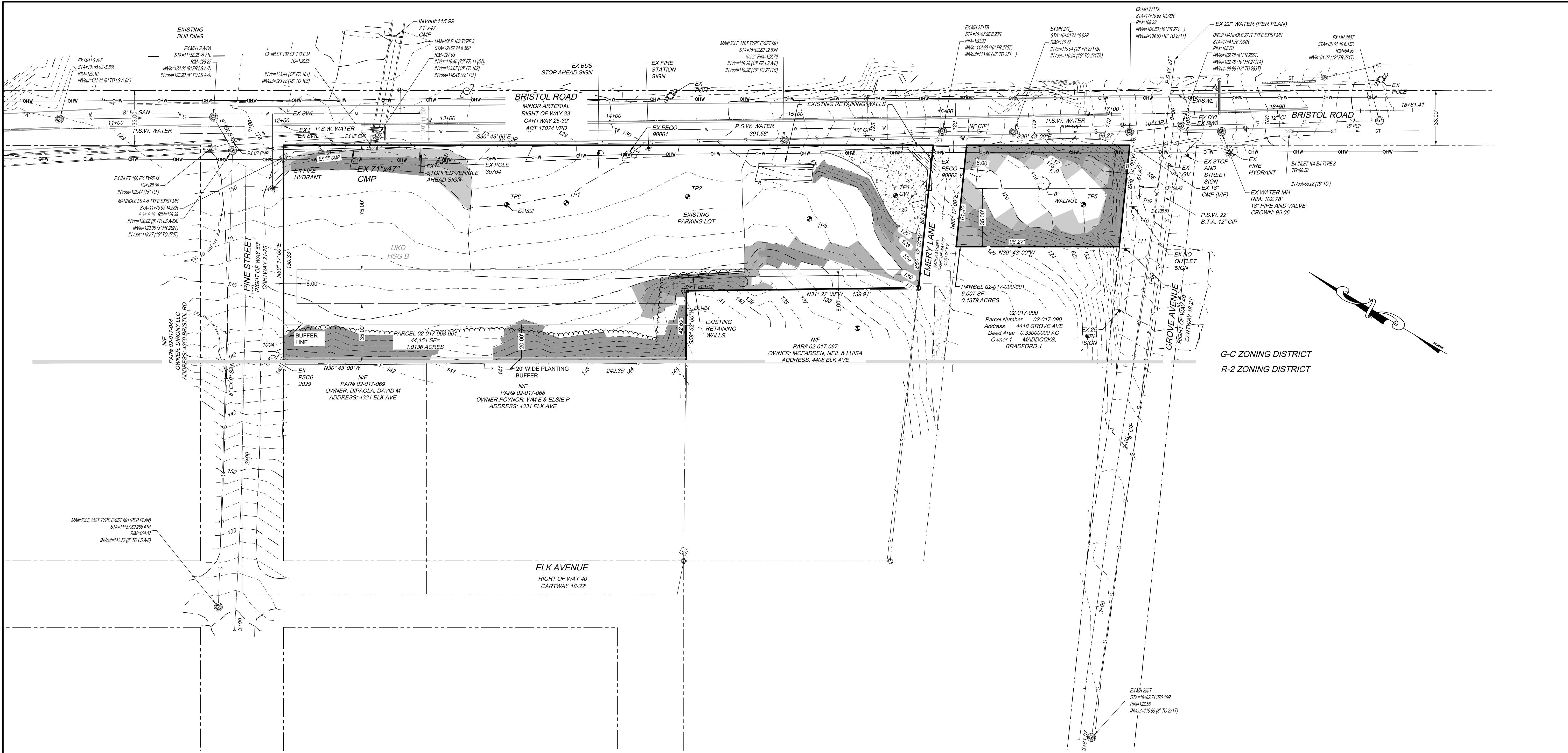
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17	4	<p>The sight distance should be calculated for the driveway based on the appropriate grades and speeds using PennDOT’s sight distance formula. The following sight distance note should be provided for the driveway.</p> <p>“All sight distance obstructions (including but not limited to embankments and vegetation) shall be removed by the applicant to provide a minimum of xxx’ feet of sight distance to the left and xxx’ feet of sight distance to the right for a driver exiting the proposed driveway onto Road. The driveway must be considered to be positioned 10’ from the near edge of the closest highway through travel lane at an eye height of three feet-six inches (3’-6”) above the pavement surface. The point sighted by the exiting driver shall be three feet-six inches (3’-6”) above the pavement surface located in the center of the closest highway travel lane designated for use by approaching traffic. This sight distance shall be maintained by the applicant and/or the applicant’s successors and assigns”. Sight distance triangles indicating the heretofore-described sight distance should be shown to ensure that the existing/proposed landscaping will not restrict sight distance.</p>	Added Note 1	3
18	5	<p>The following general notes should be included on the plan:</p> <ul style="list-style-type: none"> a. “All proposed pedestrian facilities reflected on these plans shall be constructed to comply with the following standards: <ul style="list-style-type: none"> i. PennDOT Design Manual 2, Chapter 6. ii. PennDOT Standards for Roadway Construction, Publication 72M, RC-67M. iii. U.S. Access Board, Public Right of Way Accessibility Guidelines (PROWAG) and 2010 ADA Standards for Accessible Design.” 	Added Note 2	3
19	6	<p>Provide truck turning templates for the largest Township emergency vehicle. Note, the fire truck template used needs to be revised to the Township’s largest emergency vehicle.</p>	A larger truck has been used.	6
20	7	<p>Revise the retaining wall detail to show the correct grading behind the wall, bollards and parking lot location. Note, a full review of the wall calculations will need to be completed by our office.</p>	A second detail has been added for the wall with parking above. Structural design is in process with Joe Keil P.E.	5



FIORAVANTI, INC.
 CIVIL ENGINEERS & LAND SURVEYORS
 618 STREET ROAD • SOUTHAMPTON, PA 18966
 (215) 322-2143

REVISIONS

NO.	DESCRIPTION	DATE
1	TOWNSHIP COMMENTS	9/22/2023
2	TOWNSHIP COMMENTS	3/18/2024

DATE: 8/24/2022
 SCALE: 1"=30'
 JOB # 2084 FB #
 DRAWN STAFF CHECKED: VWF

4304 & 411 BRISTOL ROAD
 BENSALEM TOWNSHIP, PA
 PREPARED FOR:
BRILLA LLC
 52 E GEORGIANNA DRIVE
 RICHBORO PA 18954

SOIL INFILTRATION TEST RESULTS

TEST #	GROUND ELEVATION	DEPTH OF TEST PIT	DEPTH OF TESTING	ELEVATION OF TESTING	DEPTH TO ROCK	ELEVATION OF ROCK	DEPTH TO GROUND WATER	ELEVATION OF GROUND WATER	AVERAGE INFILTRATION RATE
1	130.4	7 ft	5 ft	125.4	NE		NE		13.5 inches/hour
2	131.4	4 ft		NA	4 ft	127.4	NE		
3	132.2	7 ft	5 ft	127.2	NE		NE		0.50 inches/hour
4	126.1	6 ft		NA	NE		6 ft	120.4	
5	117.7	7 ft	4.5 ft	113.2	NE		NE		0.50 inches/hour
6	130.0	8 ft	5 ft	125	NE		NE		3.25 inches/hour

NE = NOT ENCOUNTERED

TABLE E.1 LIMITATIONS OF PENNSYLVANIA SOILS PERTAINING TO EARTHMOVING PROJECTS

SYMBOL	SOIL DESCRIPTION	LOCATION	HYDRO GROUP	CUTBANKS CAVE	CORROSIVE TO CONCRETE	DROUGHTY	EASILY ERODIBLE	FLOODING	DEPTH TO SATURATED ZONE	SEASONAL HIGH WATER TABLE	HYDRIC/HYDRIC INCLUSIONS	LOW STRENGTH/LANDSLIDE PRONE	SLOW PERCOLATION	PIPING	POOR SOURCE OF TOPSOIL	FROST ACTION	SHRINK-SWELL	POTENTIAL SINKHOLE	PONDING	WETNESS	RESOLUTION OF LIMITATIONS
ukd	URBAN LAND-CHESTER COMPLEX, 8 TO 25 PERCENT SLOPES	SITE	B																		NOT RATED

1 TRENCH SHORING REQUIRED
 2 PLASTIC PIPE SPECIFIED FOR STORM SEWER
 4 SILT SOCK PROPOSED, IMMEDIATE STABILIZATION REQUIRED
 6-7 PROPOSED LOD AT HIGHER ELEVATIONS
 8 3:1 MAX SLOPES PROPOSED
 9 INFILTRATION TESTING CONDUCTED
 10 INSPECTIONS TO MONITOR BACKFILLS
 11 TOPSOIL TO BE OBTAINED FROM OTHER AREAS OF THE SITE
 12 SUITABLE STONE BASE UNDER PAVEMENT
 16 INFILTRATION TESTING CONDUCTED

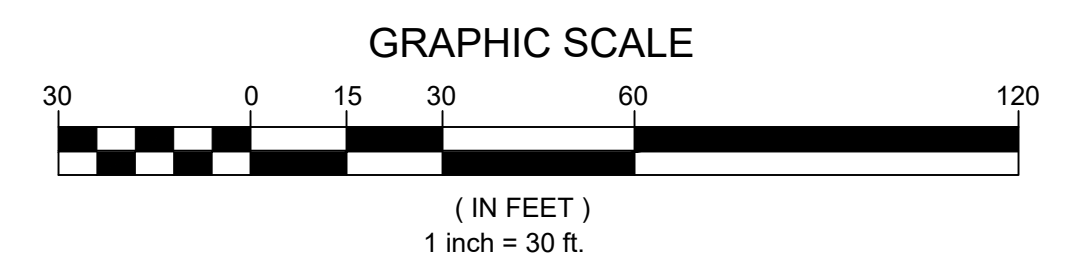
LEGEND

- EXISTING PROPERTY LINE
- EXISTING 1 FOOT CONTOUR
- EXISTING 5 FOOT CONTOUR
- EXISTING CURB
- EDGE OF EXISTING PAVED ROAD
- EXISTING FENCE
- EXISTING EASEMENT
- EXISTING STORM SEWER
- EXISTING SANITARY SEWER
- EXISTING WATER MAIN
- EXISTING POLES
- EXISTING BUILDINGS
- EXISTING BUILDING SETBACK
- SOILS
- EXISTING PAVED DRIVEWAY
- EXISTING TREE MASS
- EXISTING TREES AND BUSHES TO REMAIN
- EXISTING TREES AND BUSHES TO BE REMOVED
- STEEP SLOPES W/ GRADIENT OF 8 - 15%
- STEEP SLOPES W/ GRADIENT OF 15 - 25%
- VERY STEEP SLOPES W/ GRADIENTS EXCEEDING 25%

Before You Dig Anywhere
 In... PENNSYLVANIA
 STOP! CALL 1-800-242-1776
 PA Law requires 3 working days notice before you excavate.
 PA ONE CALL SYSTEM, INC.

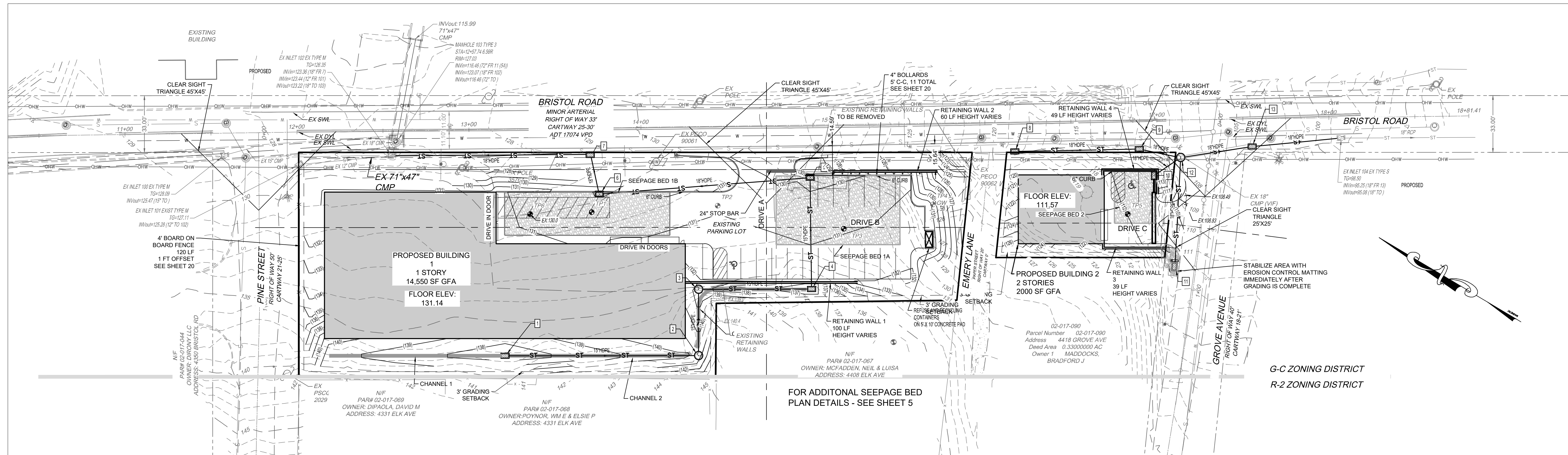
ATTENTION ALL CONTRACTORS: LOCATIONS OF ALL EXISTING UTILITIES SHOWN HEREON HAVE BEEN DEVELOPED FROM UTILITY COMPANY RECORDS AND/OR ABOVE-GROUND INSPECTION OF THE SITE. COMPLETENESS OR ACCURACY OF TYPE, SIZE, DEPTH OR HORIZONTAL LOCATION OF UNDERGROUND FACILITIES OR STRUCTURES CANNOT BE GUARANTEED. PURSUANT TO REQUIREMENTS OF PENNSYLVANIA LEGISLATIVE ACT NUMBER 38, CONTRACTORS MUST VERIFY LOCATION AND DEPTH OF ALL UNDERGROUND UTILITIES AND FACILITIES PRIOR TO START OF WORK.

PENNSYLVANIA ONE CALL SERIAL NUMBER FOR THIS SITE:
 # 2022-227-2986



EXISTING FEATURES PLAN

SHEET 2 OF 20



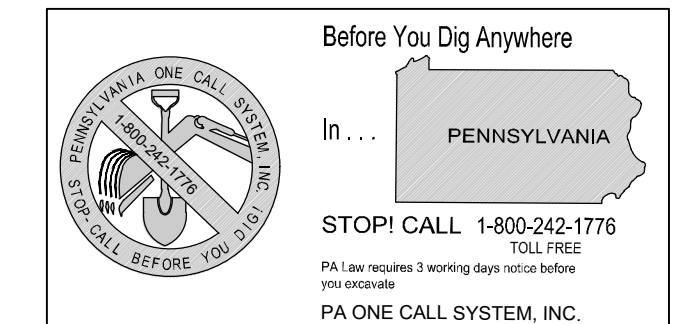
GRADING PLAN
SCALE: 1" = 1'(HORIZ.)

LEGEND

	EXISTING PROPERTY LINE
	EXISTING 1 FOOT CONTOUR
	EXISTING 5 FOOT CONTOUR
	EXISTING CURB
	EDGE OF EXISTING PAVED ROAD
	EXISTING FENCE
	EXISTING EASEMENT
	EXISTING STORM SEWER
	EXISTING SANITARY SEWER
	EXISTING WATER MAIN
	EXISTING POLES
	EXISTING BUILDINGS
	EXISTING BUILDING SETBACK
	SOILS
	EXISTING PAVED DRIVEWAY
	EXISTING TREE MASS
	EXISTING TREES AND BUSHES TO REMAIN
	EXISTING TREES AND BUSHES TO BE REMOVED
	PROPOSED BUILDING
	PROPOSED EDGE OF PAVEMENT
	PROPOSED RIGHT OF WAY
	PROPOSED BUILDING SETBACK
	PROPOSED SEEPAGE BED
	PROPOSED GRADE
	PROPOSED CLEAR SIGHT TRIANGLE
	PROPOSED STORM SEWER
	PROPOSED SANITARY SEWER
	PROPOSED WATER MAIN
	INFILTRATION AREA PROTECTION FENCE
	PROPOSED TREE PROTECTION FENCE

GENERAL NOTES

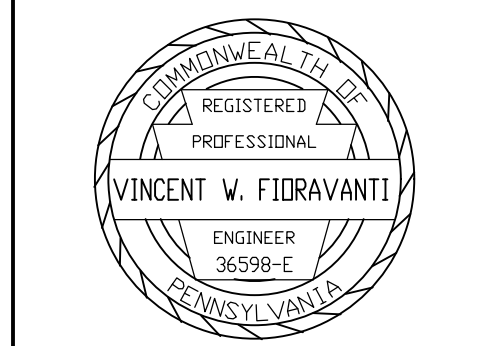
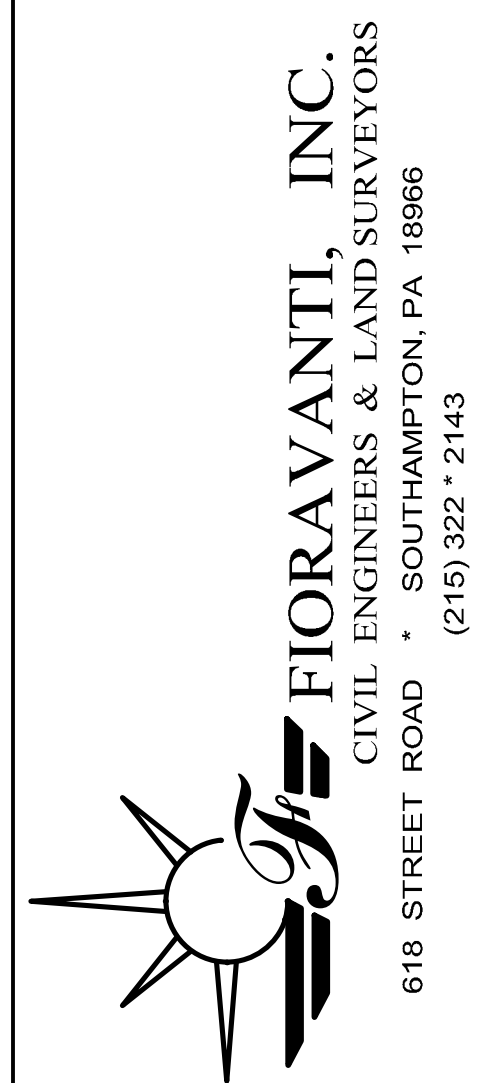
- ALL SIGHT DISTANCE OBSTRUCTIONS (INCLUDING BUT NOT LIMITED TO EMBANKMENTS AND VEGETATION) SHALL BE REMOVED BY THE APPLICANT TO PROVIDE A MINIMUM OF 440' FEET OF SIGHT DISTANCE TO THE LEFT AND 350' FEET OF SIGHT DISTANCE TO THE RIGHT FOR A DRIVER EXITING THE PROPOSED DRIVEWAY ONTO ROAD. THE DRIVEWAY MUST BE CONSIDERED TO BE POSITIONED 10' FROM THE NEAR EDGE OF THE CLOSEST HIGHWAY THROUGH TRAVEL LANE AT AN EYE HEIGHT OF THREE FEET SIX INCHES (3'-6") ABOVE THE PAVEMENT SURFACE. THE POINT SIGHTED BY THE EXITING DRIVER SHALL BE THREE FEET SIX INCHES (3'-6") ABOVE THE PAVEMENT SURFACE LOCATED IN THE CENTER OF THE CLOSEST HIGHWAY TRAVEL LANE DESIGNATED FOR USE BY APPROACHING TRAFFIC. THIS SIGHT DISTANCE SHALL BE MAINTAINED BY THE APPLICANT AND/OR THE APPLICANT'S SUCCESSORS AND ASSIGNORS.
- ALL PROPOSED PEDESTRIAN FACILITIES REFLECTED ON THESE PLANS SHALL BE CONSTRUCTED TO COMPLY WITH THE FOLLOWING STANDARDS:
 - PENNDOT DESIGN MANUAL 2, CHAPTER 6.
 - PENNDOT STANDARDS FOR ROADWAY CONSTRUCTION, PUBLICATION 72M, RC-67M.
 - U.S. ACCESS BOARD, PUBLIC RIGHT OF WAY ACCESSIBILITY GUIDELINES (PROWAG) AND 2010 ADA STANDARDS FOR ACCESSIBLE DESIGN.



GRAPHIC SCALE
0 15 30 60 120
(IN FEET)
1 inch = 30 ft.

ATTENTION ALL CONTRACTORS: LOCATIONS OF ALL EXISTING UTILITIES SHOWN HEREON HAVE BEEN DEVELOPED FROM UTILITY COMPANY RECORDS AND/OR ABOVE-GROUND INSPECTION OF THE SITE. COMPLETENESS OR ACCURACY OF TYPE, SIZE, DEPTH OR HORIZONTAL LOCATION OF UNDERGROUND FACILITIES OR STRUCTURES CANNOT BE GUARANTEED. PURSUANT TO REQUIREMENTS OF PENNSYLVANIA LEGISLATIVE ACT NUMBER 38, CONTRACTORS MUST VERIFY LOCATION AND DEPTH OF ALL UNDERGROUND UTILITIES AND FACILITIES PRIOR TO START OF WORK.

PENNSYLVANIA ONE CALL SERIAL NUMBER FOR THIS SITE:
2022-227-2998



REVISIONS

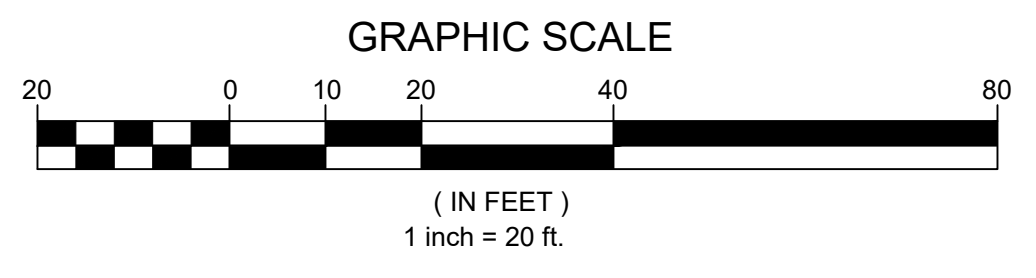
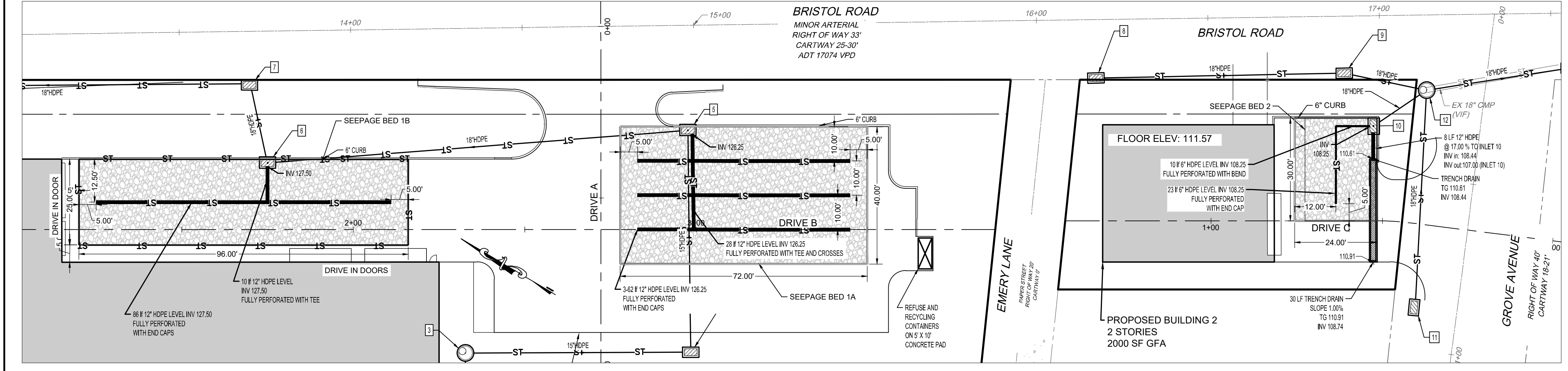
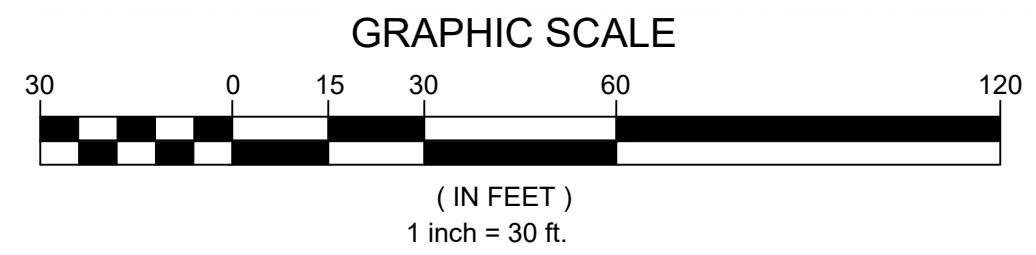
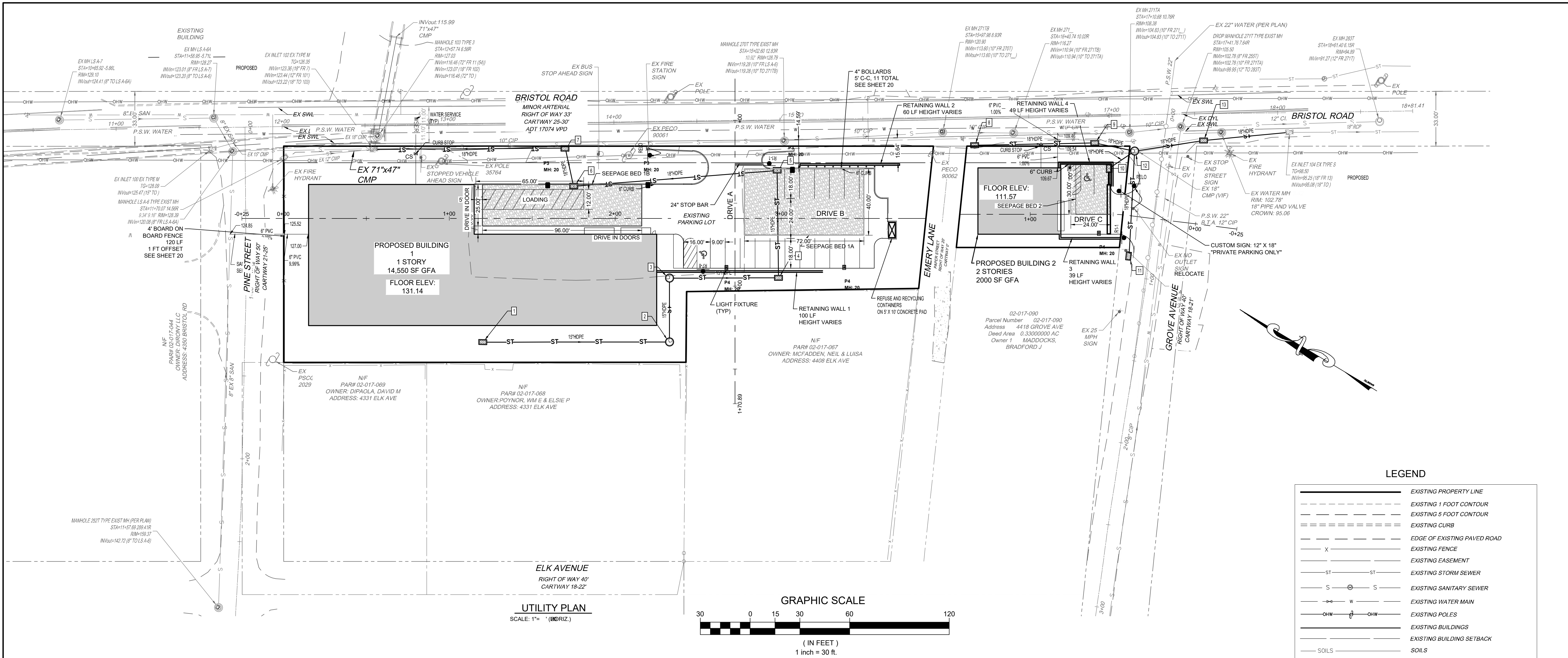
NO.	DESCRIPTION	DATE
1	TOWNSHIP COMMENTS	9/22/2023
2	TOWNSHIP COMMENTS	3/18/2024

DATE:	8/24/2022
SCALE:	1" = 30'
JOB #	2084
FB #	
DRAWN	STAFF
CHECKED:	VWF

4304 & 411 BRISTOL ROAD
BENSLEM TOWNSHIP, PA
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52 E GEORGIANNA DRIVE
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GRADING PLAN

SHEET
3 OF 20

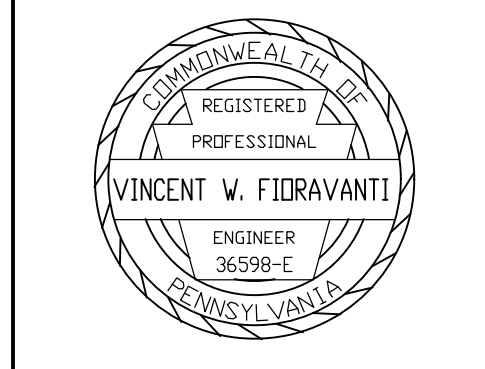


UTILITIES	
NAME	SERVICES
AQUA PENNSYLVANIA	WATER
BUCKS COUNTY WATER AND SEWER AUTHORITY	SEWER
BENSALEM TOWNSHIP	DRAINAGE
PECO	GAS AND ELECTRIC
COMCAST CABLE COMMUNICATIONS	CABLE AND PHONE

LEGEND	
	EXISTING PROPERTY LINE
	EXISTING 1 FOOT CONTOUR
	EXISTING 5 FOOT CONTOUR
	EXISTING CURB
	EDGE OF EXISTING PAVED ROAD
	EXISTING FENCE
	EXISTING EASEMENT
	EXISTING STORM SEWER
	EXISTING SANITARY SEWER
	EXISTING WATER MAIN
	EXISTING POLES
	EXISTING BUILDINGS
	EXISTING BUILDING SETBACK
	SOILS
	EXISTING PAVED DRIVEWAY
	EXISTING TREE MASS
	EXISTING TREES AND BUSHES TO REMAIN
	PROPOSED BUILDING
	PROPOSED EDGE OF PAVEMENT
	PROPOSED CURB
	PROPOSED SEEPAGE BED
	INFILTRATION AREA PROTECTION FENCE
	PROPOSED STORM SEWER
	PROPOSED SANITARY SEWER
	PROPOSED SANITARY LATERAL
	PROPOSED WATER MAIN
	PROPOSED WATER SERVICE
	PROPOSED CABLE, GAS, ELEC AND PHONE
	C&T

- GENERAL NOTES**
- ALL WATER AND SANITARY SEWER IMPROVEMENTS WILL BE INSTALLED AND TESTED IN ACCORDANCE WITH BCWSA STANDARD CONSTRUCTION SPECIFICATIONS, INCLUDING VACUUM TESTING OF SANITARY SEWER MANHOLES, LEAKAGE TESTING AND TV INSPECTION OF SANITARY SEWER MAINS.
 - NO WORK SHOULD COMMENCE UNTIL THE APPLICANT'S CONTRACTOR HAS OBTAINED ALL INSURANCE REQUIRED. CONTRACTOR SHALL REQUIRE EACH SUBCONTRACTOR TO MAINTAIN INSURANCE DURING THE PROJECT PERIOD. A PRE-CONSTRUCTION MEETING WITH BCWSA IS ALSO REQUIRED PRIOR TO BEGINNING WORK.
 - SANITARY SEWER PVC PIPE SHALL BE PVC SDR 35, AND CONFORM TO THE FOLLOWING AMERICAN SOCIETY FOR TESTING MATERIALS (ASTM) STANDARD SPECIFICATIONS (LATEST EDITIONS): D3034, D1784, F1336 AND D3212.
 - WATER SERVICES FOR LOTS 1 AND 2 SHALL BE 3/4" ONE PIECE TYPE K COPPER.
 - ANY WATER MAIN CROSSING ANOTHER UTILITY SHALL HAVE 18-INCHES OF VERTICAL CLEARANCE OR SHALL BE ENCASED A DISTANCE OF TEN (10) FEET ON EITHER SIDE OF THE CROSSING.
 - WATERTIGHT, BOLTED MANHOLE COVERS SHALL BE PROVIDED FOR ALL SANITARY SEWER MANHOLES IN LANDSCAPE AREAS.
 - ANY SANITARY SEWER CROSSING ANOTHER UTILITY SHALL HAVE 18-INCHES OF VERTICAL CLEARANCE OR SHALL BE ENCASED A DISTANCE OF TEN (10) FEET ON EITHER SIDE OF THE CROSSING.
 - IN THE EVENT THAT THE DISTANCE FROM THE CURB STOP TO THE BUILDING IS GREATER THAN 100 FEET (AND THE SERVICE LINE REQUIRES A COUPLING AND IS NOT ONE CONTINUOUS PIPE) A METER PIT SHALL BE REQUIRED AT THE RIGHT-OF-WAY LINE.
 - THE CONTRACTOR SHALL COORDINATE ALL WET TAPS WITH BCWSA.
 - EASEMENT DESCRIPTIONS AND EXHIBITS, FOR WATER AND SEWER, ARE NEEDED FOR RECORDING WITH THE IMPROVEMENT AGREEMENT.
 - ANY EXISTING PRIVATE WELLS LOCATED ON SITE TO BE ABANDONED, SHALL BE ABANDONED IN ACCORDANCE WITH THE BUCKS COUNTY HEALTH DEPARTMENT REQUIREMENTS.
 - ALL ROOF DRAINS (NOT SHOWN) FROM THE BUILDINGS SHALL DISCHARGE TO ONE OR MORE OF THE SEEPAGE BEDS AS FOLLOWS:
 LOT 1 BUILDING FRONT ROOF DRAINS TO SEEPAGE BED 1B. LOT 1 BUILDING REAR ROOF DRAINS TO SEEPAGE BED 1A VIA STORM SEWERS.
 LOT 2 BUILDING ALL ROOF DRAINS TO SEEPAGE BED 2.

FIORAVANTI, INC.
 CIVIL ENGINEERS & LAND SURVEYORS
 618 STREET ROAD • SOUTHAMPTON, PA 18966
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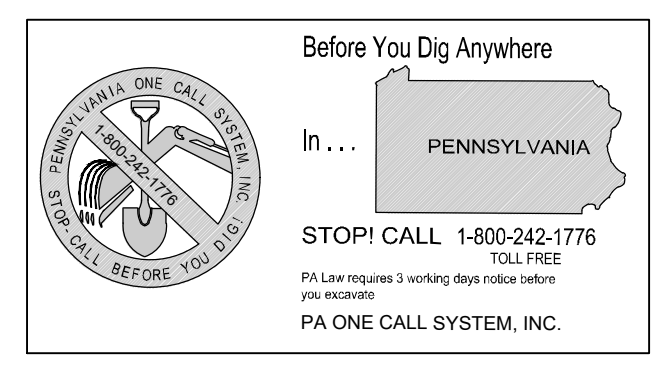
REVISIONS		
NO.	DESCRIPTION	DATE
1	TOWNSHIP COMMENTS	9/22/2023
2	TOWNSHIP COMMENTS	3/18/2024

DATE: 8/24/2022
 SCALE: 1"=30'
 JOB # 2084 FB #
 DRAWN: STAFF CHECKED: VWF

4304 & 411 BRISTOL ROAD
 BENSALEM TOWNSHIP, PA
 PREPARED FOR:
 BRILLA LLC
 52 E GEORGIANNA DRIVE
 RICHBORO PA 18954

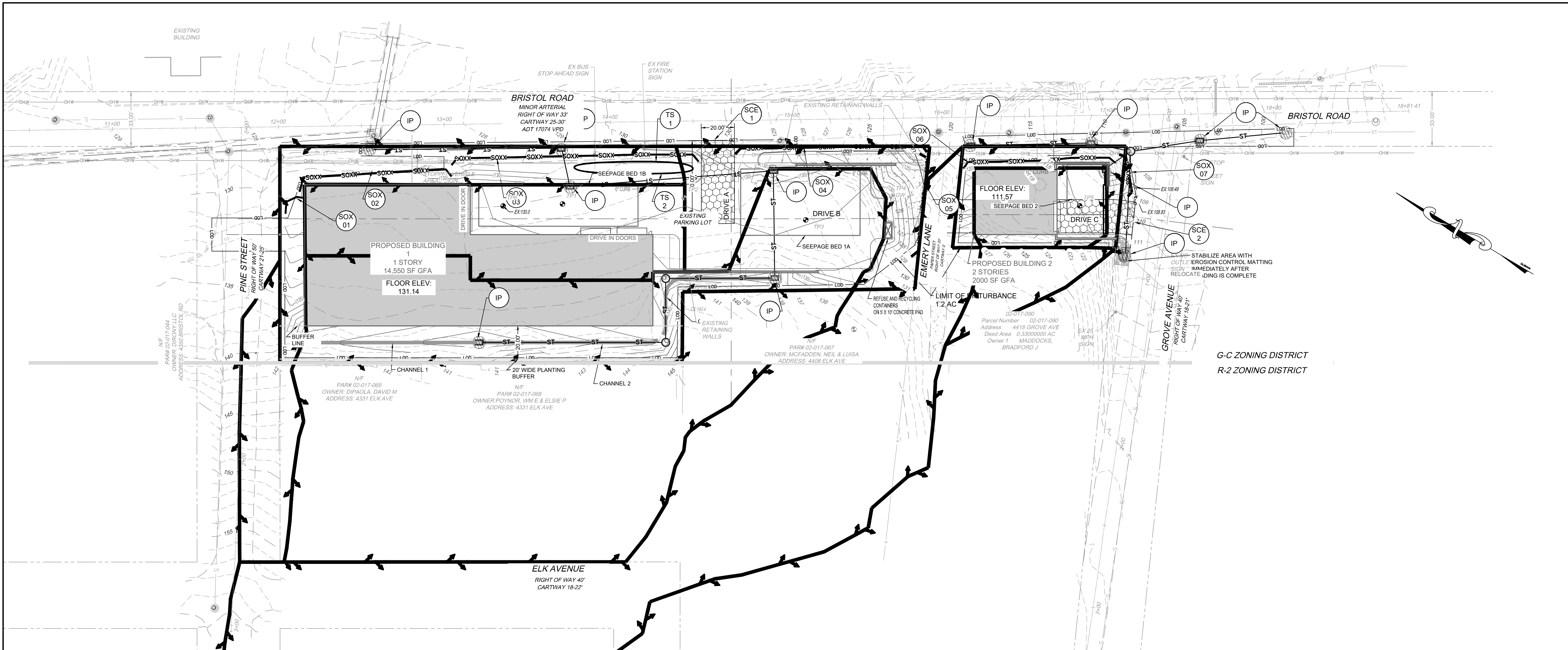
UTILITY PLAN

SHEET 5 OF 20



ATTENTION ALL CONTRACTORS: LOCATIONS OF ALL EXISTING UTILITIES SHOWN HEREON HAVE BEEN DEVELOPED FROM UTILITY COMPANY RECORDS AND/OR ABOVE-GROUND INSPECTION OF THE SITE COMPLETED BY THE ENGINEER. TYPE, SIZE, DEPTH OR HORIZONTAL LOCATION OF UNDERGROUND FACILITIES OR STRUCTURES CANNOT BE GUARANTEED. PURSUANT TO REQUIREMENTS OF PENNSYLVANIA LEGISLATIVE ACT NUMBER 38, CONTRACTORS MUST VERIFY LOCATION AND DEPTH OF ALL UNDERGROUND UTILITIES AND FACILITIES PRIOR TO START OF WORK.

PENNSYLVANIA ONE CALL SERIAL NUMBER FOR THIS SITE: # 2022-227-2998



FIORAVANTI, INC.
 CIVIL ENGINEERS & LAND SURVEYORS
 618 STREET ROAD • SOUTHAMPTON, PA 18966
 (215) 322-2143

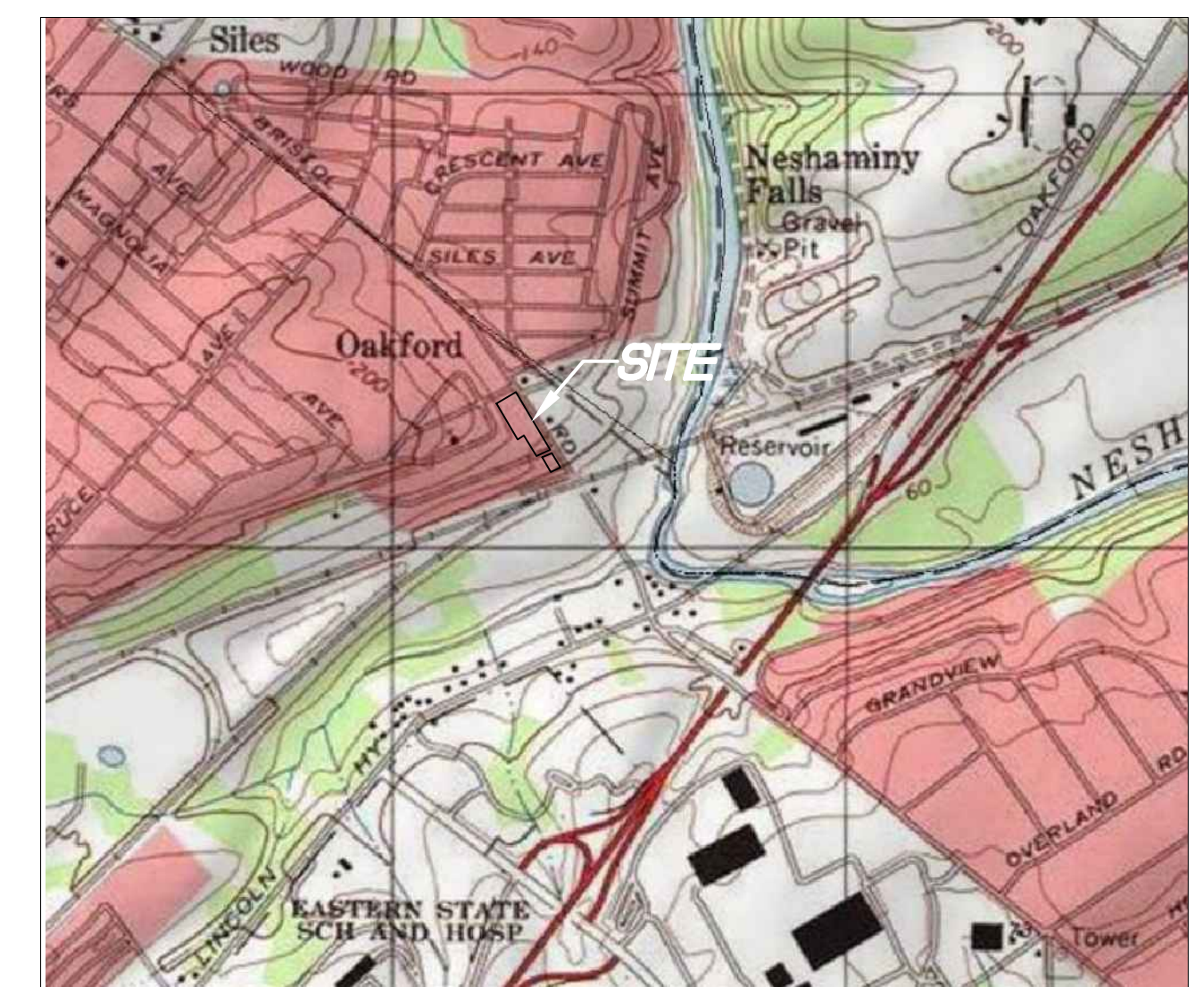
REVISIONS

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LEGEND

	EXISTING PROPERTY LINE
	EXISTING 1 FOOT CONTOUR
	EXISTING 5 FOOT CONTOUR
	EXISTING CURB
	EDGE OF EXISTING PAVED ROAD
	EXISTING FENCE
	EXISTING EASEMENT
	EXISTING STORM SEWER
	EXISTING SANITARY SEWER
	EXISTING WATER MAIN
	EXISTING POLES
	EXISTING BUILDINGS
	EXISTING BUILDING SETBACK
	SOILS
	EXISTING PAVED DRIVEWAY
	EXISTING TREE MASS
	EXISTING TREES AND BUSHES TO REMAIN
	EXISTING TREES AND BUSHES TO BE REMOVED
	PROPOSED BUILDING
	PROPOSED EDGE OF PAVEMENT
	PROPOSED RIGHT OF WAY
	PROPOSED BUILDING SETBACK
	PROPOSED SEEPAGE BED
	PROPOSED GRADE
	PROPOSED CLEAR SIGHT TRIANGLE
	PROPOSED STORM SEWER
	PROPOSED SANITARY SEWER
	PROPOSED WATER MAIN
	INFILTRATION AREA PROTECTION FENCE
	PROPOSED TREE PROTECTION FENCE
	POST-DEVELOPMENT DRAINAGE AREA



USGS LOCATION MAP
1"=1000'

I, VINCENT W. FIORAVANTI P.E., ON THIS DATE (), HEREBY CERTIFY THAT THE SWM SITE PLAN MEETS ALL DESIGN STANDARDS AND CRITERIA OF THE NESHAMINY CREEK WATERSHED ACT 167 STORMWATER MANAGEMENT ORDINANCE OR PLAN.

 SIGNATURE DATE

GENERAL NOTES:

- OPERATION AND MAINTENANCE OF ALL BEST MANAGEMENT PRACTICES (B.M.P.) ARE THE SOLE OBLIGATION OF THE OWNER.
- THE PROPERTY OWNER WHERE BMP'S ARE TO BE INSTALLED SHALL RECORD THE STORMWATER MANAGEMENT PLAN, OPERATIONS AND MAINTENANCE AGREEMENTS AND EASEMENTS IN THE OFFICE OF THE RECORDER OF DEEDS FOR THE COUNTY.
- IT SHALL BE UNLAWFUL TO ALTER ANY PERMANENT STORMWATER BESTMANAGEMENT PRACTICE REQUIRED OR ALLOW THE PROPERTY TO REMAIN IN A CONDITION WHICH IS NOT CONFORMED TO AN APPROVED BMP OPERATIONS AND MAINTENANCE PLAN UNLESS EXCEPTION IS GRANTED BY THE APPROPRIATE AUTHORITIES, INCLUDING DEP.
- NO PERSON SHALL MODIFY, REMOVE, FILL, LANDSCAPE OR ALTER ANY STORMWATER MANAGEMENT (SWM) BEST MANAGEMENT PRACTICES (BMPs), FACILITIES, AREA, OR STRUCTURES UNLESS IT IS PART OF AN APPROVED MAINTENANCE PROGRAM AND WRITTEN APPROVAL OF DEP HAS BEEN OBTAINED.
- NO PERSON SHALL PLACE ANY STRUCTURE, FILL, LANDSCAPING, OR VEGETATION INTO A STORMWATER FACILITY OR BMP OR WITHIN A DRAINAGE EASEMENT WHICH WOULD LIMIT OR ALTER THE FUNCTIONING OF THE STORMWATER FACILITY OR BMP.
- THIS INSTRUMENT PROVIDES A BLANKET EASEMENT FOR ALL STORMWATER FACILITIES ON-SITE IN ORDER TO ALLOW THE MUNICIPALITY AND / OR DEP TO PERFORM INSPECTIONS AND EMERGENCY MAINTENANCE, IF NECESSARY, OF THESE FACILITIES.
- AT LEAST THREE DAYS PRIOR TO INSTALLATION OF THE BEST MANAGEMENT PRACTICES (BMPs) AND/OR STORMWATER MANAGEMENT(SWM)FACILITIES THE TOWNSHIP ENGINEER INSPECTIONS AND DESIGN ENGINEER MUST BE CALLED TO SCHEDULE AN INSPECTION FOR EACH STORMWATER MANAGEMENT PRACTICE OR FACILITY.
- THE STORMWATER FACILITIES SHOWN ON THESE PLANS ARE A BASIC AND PERPETUAL PART OF THE STORMWATER MANAGEMENT SYSTEM OF THE PROPOSED SITE LOCATED IN BENSALEM TOWNSHIP, BUCKS COUNTY, COMMONWEALTH OF PENNSYLVANIA, AND SUCH ARE TO BE PROTECTED AND PRESERVED IN ACCORDANCE WITH THE APPROVED FINAL PLANS BY THE OWNERS, THEIR SUCCESSORS AND ASSIGNS OF THESE LANDS. BENSALEM TOWNSHIP AND/OR ITS AGENTS RESERVE THE RIGHT AND PRIVILEGE TO ENTER UPON THESE LANDS FROM TIME TO TIME FOR THE INSPECTION OF THESE FACILITIES IN ORDER TO DETERMINE THAT PROPER OPERATION AND MAINTENANCE AND THAT THE STRUCTURAL AND DESIGN INTEGRITY IS BEING MAINTAINED BY THE OWNER.

IMPERVIOUS AREAS (sf)

ITEM	LOT 1	LOT 2
PARKING, WALKS AND PADS	11470	1441
BUILDINGS	14550	2000
TOTAL	26020	3441
LOT AREA	44151	6007
BUILDING COVERAGE	32.96%	33.29%
IMPERVIOUS COVERAGE	58.93%	57.28%

Before You Dig Anywhere

In ... PENNSYLVANIA

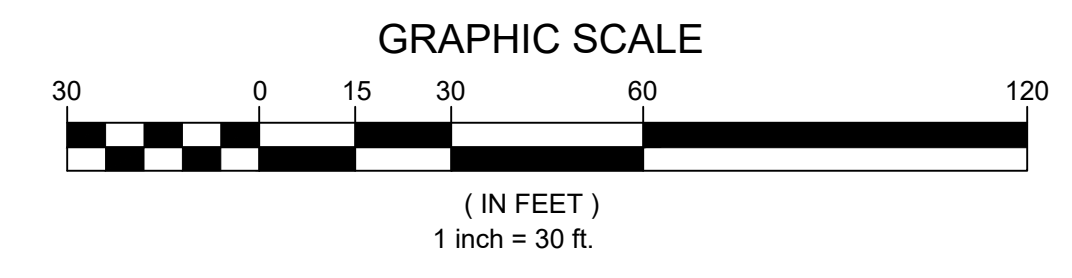
STOP! CALL 1-800-242-1776 TOLL FREE

PA Law requires 3 working days notice before dig activity.

PA ONE CALL SYSTEM, INC.

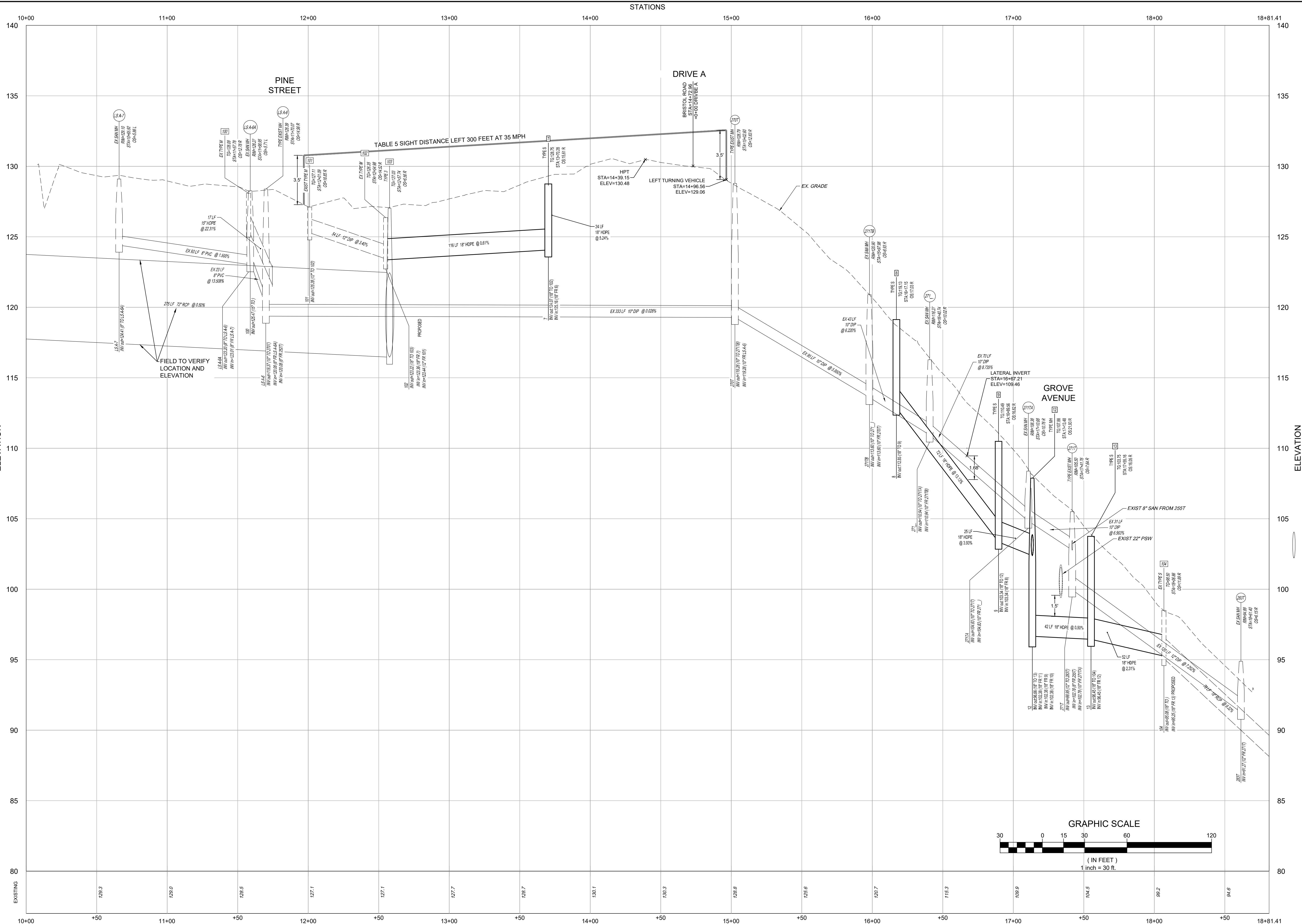
ATTENTION ALL CONTRACTORS: LOCATIONS OF ALL EXISTING UTILITIES SHOWN HEREON HAVE BEEN DEVELOPED FROM UTILITY COMPANY RECORDS AND/OR ABOVE-GROUND INSPECTION OF THE SITE. COMPLETENESS OR ACCURACY OF TYPE, SIZE, DEPTH OR HORIZONTAL LOCATION OF UNDERGROUND FACILITIES OR STRUCTURES CANNOT BE GUARANTEED. PURSUANT TO REQUIREMENTS OF PENNSYLVANIA LEGISLATIVE ACT NUMBER 38, CONTRACTORS MUST VERIFY LOCATION AND DEPTH OF ALL UNDERGROUND UTILITIES AND FACILITIES PRIOR TO START OF WORK.

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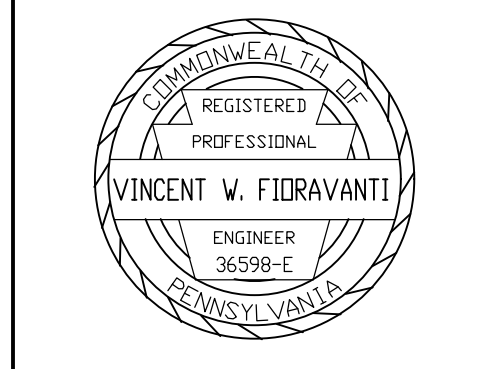
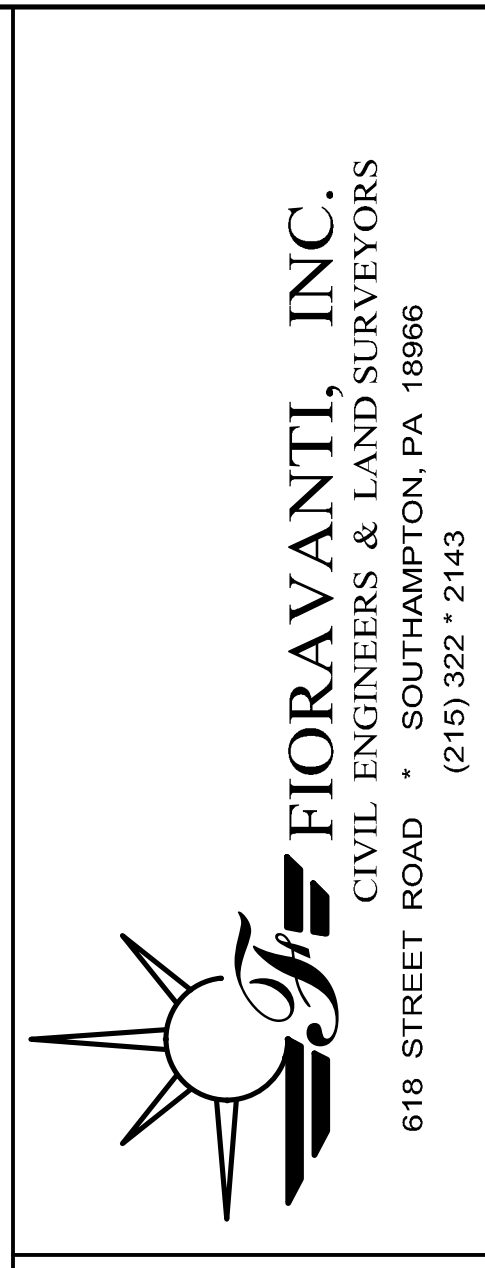


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 BENSALEM TOWNSHIP, PA
 PREPARED FOR:
 BRILLA LLC
 52 E GEORGIANNA DRIVE
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POST CONSTRUCTION STORMWATER MANAGEMENT PLAN



STATIONS
 PROFILE: BRISTOL ROAD
 STA: 10+00.00 TO STA: 18+81.41



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**BRISTOL ROAD
 PROFILE**

T:\Acad Projects\2084 Brilla LLC\3 design plans and submittals\Submittal 03 Revised BT\CAD FILES\2084 Site Plan.dwg, 14 Prof Ex, 3/19/2024 12:39 PM

EROSION AND SEDIMENTATION CONTROL NOTES

Priority Note:
Prior to the start of construction activities the Owner/Responsible Person (O/RP) for management of the construction site work shall be familiar with:

Pennsylvania Department of Environmental Protection Erosion and Sedimentation Pollution Control Manual, Technical Guidance Number: 3663-2134-008 Dated: March 2012, latest edition

PAGE AND TABLE NUMBERS REFER TO THIS MANUAL.

I Standard E&S Plan Notes from the Pennsylvania Erosion and Sediment Pollution Control Manual, Appendix C

- ALL EARTH DISTURBANCES, INCLUDING CLEARING AND GRUBBING AS WELL AS CUTS AND FILLS SHALL BE DONE IN ACCORDANCE WITH THE APPROVED E&S PLAN. A COPY OF THE APPROVED DRAWINGS (STAMPED, SIGNED AND DATED BY THE REVIEWING AGENCY) MUST BE AVAILABLE AT THE PROJECT SITE AT ALL TIMES. THE REVIEWING AGENCY SHALL BE NOTIFIED OF ANY CHANGES TO THE APPROVED PLAN PRIOR TO IMPLEMENTATION OF THOSE CHANGES. THE REVIEWING AGENCY MAY REQUIRE A WRITTEN SUBMITTAL OF THOSE CHANGES FOR REVIEW AND APPROVAL AT ITS DISCRETION.
- SEE BCCD NOTE 1.
- AT LEAST THREE DAYS BEFORE STARTING ANY EARTH DISTURBANCE ACTIVITY OR EXPANDING INTO AN AREA PREVIOUSLY UNMARKED, THE PENNSYLVANIA ONE CALL SYSTEM INC. SHALL BE NOTIFIED AT 1-800-2542-1776 FOR LOCATION OF EXISTING UNDERGROUND UTILITIES.
- ALL EARTH DISTURBANCE ACTIVITIES SHALL PROCEED IN ACCORDANCE WITH THE SEQUENCE PROVIDED ON THE PLAN DRAWINGS. DEVIATION FROM THAT SEQUENCE MUST BE APPROVED IN WRITING FROM THE LOCAL CONSERVATION DISTRICT OR BY THE DEPARTMENT PRIOR TO IMPLEMENTATION.
- AREAS TO BE FILLED ARE TO BE CLEARED, GRUBBED, AND STRIPPED OF TOPSOIL TO REMOVE TREES, VEGETATION, ROOTS AND OTHER OBJECTIONABLE MATERIAL.
- CLEARING, GRUBBING, AND TOPSOIL STRIPPING SHALL BE LIMITED TO THOSE AREAS DESCRIBED IN EACH STAGE OF THE CONSTRUCTION SEQUENCE. GENERAL SITE CLEARING, GRUBBING, AND TOPSOIL STRIPPING MAY NOT COMMENCE IN ANY STAGE OR PHASE OF THE PROJECT UNTIL THE E&S BMPs SPECIFIED BY THE SEQUENCE FOR THAT STAGE OR PHASE HAVE BEEN INSTALLED AND ARE FUNCTIONING AS DESCRIBED IN THIS E&S PLAN.
- AT NO TIME SHALL CONSTRUCTION VEHICLES BE ALLOWED TO ENTER AREAS OUTSIDE THE LIMIT OF DISTURBANCE BOUNDARIES SHOWN ON THE PLAN MAPS. THESE AREAS MUST BE CLEARLY MARKED AND FENCES OFF BEFORE CLEARING AND GRUBBING.
- TOPSOIL REQUIRED FOR THE ESTABLISHMENT OF VEGETATION SHALL BE STOCKPILED AT THE LOCATION(S) SHOWN ON THE PLAN MAP(S) IN THE AMOUNT NECESSARY TO COMPLETE THE FINISH GRADING OF ALL EXPOSED AREAS THAT ARE TO BE STABILIZED BY VEGETATION. STOCKPILE HEIGHTS MUST NOT EXCEED 35 FEET. STOCKPILE SLOPES MUST NOT EXCEED 2H:1V OR FLATTER.
- SEE BCCD NOTE 7. THE LOCAL CONSERVATION DISTRICT AND/OR THE REGIONAL OFFICE OF THE DEPARTMENT SHALL BE NOTIFIED.
- SEE BCCD NOTE 14.
- ALL OFF-SITE WASTE AND BORROW AREAS MUST HAVE AN E&S PLAN APPROVED BY THE LOCAL CONSERVATION DISTRICT OR THE DEPARTMENT FULLY IMPLEMENTED PRIOR TO BEING ACTIVATED.
- THE CONTRACTOR IS RESPONSIBLE FOR ENSURING THAT ANY MATERIAL BROUGHT ON THE SITE IS CLEAN FILL. FORM FP-001 MUST BE RETAINED BY THE PROPERTY OWNER FOR ANY FILL OR SOIL AFFECTED BY A SPILL OR RELEASE OF A REGULATED SUBSTANCE BUT QUALIFYING AS CLEAN FILL DUE TO ANALYTICAL TESTING.
- ALL PUMPING OF WATER FROM ANY WORK AREA SHALL BE DONE ACCORDING TO THE PROCEDURE DESCRIBED IN THIS PLAN, OVER UNDISTURBED VEGETATED AREAS.
- VEHICLES AND EQUIPMENT MAY NEITHER ENTER DIRECTLY NOR EXIT DIRECTLY FROM LOTS (SEE CITY LOT NUMBERS) ONTO (SEE CITY ROAD NAMES).
- SEE BCCD NOTE 6.
- A LOG SHOWING THE DATES THAT THE E&S BMPs WERE INSPECTED AS WELL AS ANY DEFICIENCIES FOUND AND THE DATE THEY WERE CORRECTED SHALL BE MAINTAINED ON THE SITE AND MADE AVAILABLE TO THE REGULATORY AGENCY OFFICIALS AT THE TIME OF INSPECTION.
- SEDIMENT TRACKED ONTO ANY PUBLIC ROADWAY OR SIDEWALK SHALL BE RETURNED TO THE CONSTRUCTION SITE BY THE END OF EACH WORKDAY AND DISPOSED IN THE MANNER DESCRIBED IN THIS PLAN. IN NO CASE SHALL THE SEDIMENT BE WASHED, SHOVELED, OR SWEEPED INTO ANY ROADSIDE DITCH, STORM SEWER, OR SURFACE WATER.
- ALL SEDIMENT REMOVED FROM BMPs SHALL BE DISPOSED OF IN THE MANNER DESCRIBED ON THE PLAN DRAWINGS. SEE ALSO MCCD NOTE 12.
- AREAS WHICH ARE TO BE TOPSOILED SHALL BE SCARIFIED TO A MINIMUM DEPTH OF 3 TO 5 INCHES -- 6 TO 12 INCHES ON COMPACTED SOILS -- PRIOR TO PLACEMENT OF THE TOP SOIL. AREAS TO BE VEGETATED SHALL HAVE A MINIMUM 4 INCHES OF TOPSOIL IN PLACE PRIOR TO SEEDING AND MULCHING. FILL OUTSLOPES SHALL HAVE A MINIMUM OF 2 INCHES OF TOPSOIL.
- ALL FILLS SHALL BE COMPACTED AS REQUIRED TO REDUCE EROSION, SLIPPAGE, SETTLEMENT, SUBSIDENCE OR OTHER RELATED PROBLEMS. FILL INTENDED TO SUPPORT BUILDINGS, STRUCTURES AND CONDUITS, ETC. SHALL BE COMPACTED IN ACCORDANCE WITH LOCAL REQUIREMENTS OR CODES.
- ALL EARTHEN FILLS SHALL BE PLACED IN COMPACTED LAYERS NOT TO EXCEED 9 INCHES IN THICKNESS.
- FILL MATERIALS SHALL BE FREE OF FROZEN PARTICLES, BRUSH, ROOTS, SOD, OR OTHER FOREIGN OR OBJECTIONABLE MATERIALS THAT WOULD INTERFERE WITH OR PREVENT CONSTRUCTION OF SATISFACTORY FILLS.
- FROZEN MATERIALS OR SOFT, MUCKY, OR HIGHLY COMPRESSIBLE MATERIALS SHALL NOT BE INCORPORATED INTO FILLS.
- FILL SHALL NOT BE PLACED ON SATURATED OR FROZEN SURFACES.
- SEEPS OR SPRINGS ENCOUNTERED DURING CONSTRUCTION SHALL BE HANDLED IN ACCORDANCE WITH THE STANDARD AND SPECIFICATION FOR SUBSURFACE DRAIN OR OTHER APPROVED METHOD.
- ALL GRADED AREAS SHALL BE PERMANENTLY STABILIZED IMMEDIATELY UPON REACHING FINISHED GRADE. CUT SLOPES IN COMPETENT BEDROCK AND ROCK FILLS NEED NOT BE VEGETATED. SEEDS AREAS WITHIN 50 FEET OF A SURFACE WATER, OR AS OTHERWISE SHOWN ON THE PLAN DRAWINGS, SHALL BE BLANKETED ACCORDING TO THE STANDARDS OF THIS PLAN.
- SEE BCCD NOTE 15.
- PERMANENT STABILIZATION IS DEFINED AS A MINIMUM UNIFORM, PERENNIAL 70% VEGETATIVE COVER OR OTHER PERMANENT NON-VEGETATIVE COVER WITH A DENSITY SUFFICIENT TO RESIST ACCELERATED EROSION. CUT AND FILL SLOPES SHALL BE CAPABLE OF RESISTING FAILURE DUE TO SLUMPING, SLIDING, OR OTHER MOVEMENTS.
- E&S BMPs SHALL REMAIN FUNCTIONAL AS SUCH UNTIL ALL AREAS TRIBUTARY TO THEM ARE PERMANENTLY STABILIZED OR UNTIL THE ARE REPLACED BY ANOTHER BMP APPROVED BY THE LOCAL CONSERVATION DISTRICT OR THE DEPARTMENT.
- UPON COMPLETION OF ALL EARTH DISTURBANCE ACTIVITIES AND PERMANENT STABILIZATION OF ALL DISTURBED AREAS, THE O/RP SHALL CONTACT THE LOCAL CONSERVATION DISTRICT FOR AN INSPECTION PRIOR TO THE REMOVAL/CONVERSION OF THE E&S BMPs.
- AFTER FINAL SITE STABILIZATION HAS BEEN ACHIEVED, TEMPORARY EROSION AND SEDIMENT BMPs MUST BE REMOVED OR CONVERTED TO PERMANENT POST CONSTRUCTION STORMWATER MANAGEMENT BMPs. AREAS DISTURBED DURING REMOVAL OR CONVERSION OF THE BMPs SHALL BE STABILIZED IMMEDIATELY. IN ORDER TO ENSURE RAPID REVEGETATION OF DISTURBED AREAS, SUCH REMOVAL/CONVERSIONS ARE TO BE DONE ONLY DURING THE GERMINATING SEASON.
- UPON COMPLETION OF ALL EARTH DISTURBANCE ACTIVITIES AND PERMANENT STABILIZATION OF ALL DISTURBED AREAS, THE O/RP SHALL CONTACT THE LOCAL CONSERVATION DISTRICT TO SCHEDULE A FINAL INSPECTION.
- FAILURE TO CORRECTLY INSTALL E&S BMPs, FAILURE TO PREVENT SEDIMENT--LADEN RUNOFF FROM LEAVING THE CONSTRUCTION SITE, OR FAILURE TO TAKE IMMEDIATE CORRECTIVE ACTION TO RESOLVE FAILURE OF E&S BMPs MAY RESULT IN ADMINISTRATIVE, CIVIL, AND/OR CRIMINAL PENALTIES BEING INSTITUTED BY THE DEPARTMENT AS DEFINED IN SECTION 602 OF THE PENNSYLVANIA CLEAN STREAMS LAW. THE CLEAN STREAMS LAW PROVIDES FOR UP TO \$10,000 PER DAY IN CIVIL PENALTIES, UP TO \$10,000 IN SUMMARY CRIMINAL PENALTIES, AND UP TO \$25,000 IN MISDEMEANOR CRIMINAL PENALTIES FOR EACH VIOLATION.

I BCCD GENERAL NOTES

- ALL EARTH DISTURBANCES, INCLUDING CLEARING AND GRUBBING AS WELL AS CUTS AND FILLS SHALL BE DONE IN ACCORDANCE WITH THE APPROVED E&S PLAN. A COPY OF THE APPROVED DRAWINGS (STAMPED, SIGNED AND DATED BY THE REVIEWING AGENCY) MUST BE AVAILABLE AT THE PROJECT SITE AT ALL TIMES. THE REVIEWING AGENCY SHALL BE NOTIFIED OF ANY CHANGES TO THE APPROVED PLAN PRIOR TO IMPLEMENTATION OF THOSE CHANGES. THE REVIEWING AGENCY MAY REQUIRE A WRITTEN SUBMITTAL OF THOSE CHANGES FOR REVIEW AND APPROVAL AT ITS DISCRETION.
- AT LEAST 7 DAYS PRIOR TO STARTING ANY EARTH DISTURBANCE ACTIVITIES, INCLUDING CLEARING AND GRUBBING, THE OWNER AND/OR OPERATOR SHALL INVITE ALL CONTRACTORS, THE LANDOWNER, APPROPRIATE MUNICIPAL OFFICIALS, THE E&S PLAN PREPARER, THE PCSM PLAN PREPARER, THE LICENSED PROFESSIONAL RESPONSIBLE FOR OVERSIGHT OF CRITICAL STAGES OF IMPLEMENTATION OF THE PCSM PLAN, AND A REPRESENTATIVE FROM THE LOCAL CONSERVATION DISTRICT TO AN ON-SITE PRECONSTRUCTION MEETING.
- AT LEAST 3 DAYS PRIOR TO STARTING ANY EARTH DISTURBANCE ACTIVITIES, OR EXPANDING INTO AN AREA PREVIOUSLY UNMARKED, THE PENNSYLVANIA ONE CALL SYSTEM INC. SHALL BE NOTIFIED AT 1-800-242-1776 FOR THE LOCATION OF EXISTING UNDERGROUND UTILITIES.
- ALL EARTH DISTURBANCE ACTIVITIES SHALL PROCEED IN ACCORDANCE WITH THE SEQUENCE PROVIDED ON THE PLAN DRAWINGS. DEVIATION FROM THAT SEQUENCE MUST BE APPROVED IN WRITING FROM THE LOCAL CONSERVATION DISTRICT OR BY THE DEPARTMENT PRIOR TO IMPLEMENTATION.
- AREAS TO BE FILLED ARE TO BE CLEARED, GRUBBED, AND STRIPPED OF TOPSOIL TO REMOVE TREES, VEGETATION, ROOTS AND OTHER OBJECTIONABLE MATERIAL.
- CLEARING, GRUBBING, AND TOPSOIL STRIPPING SHALL BE LIMITED TO THOSE AREAS DESCRIBED IN EACH STAGE OF THE CONSTRUCTION SEQUENCE. GENERAL SITE CLEARING, GRUBBING, AND TOPSOIL STRIPPING MAY NOT COMMENCE IN ANY STAGE OR PHASE OF THE PROJECT UNTIL THE E&S BMPs SPECIFIED BY THE BMP SEQUENCE FOR THAT STAGE OR PHASE HAVE BEEN INSTALLED AND ARE FUNCTIONING AS DESCRIBED IN THIS E&S PLAN.
- AT NO TIME SHALL CONSTRUCTION VEHICLES BE ALLOWED TO ENTER AREAS OUTSIDE THE LIMIT OF DISTURBANCE BOUNDARIES SHOWN ON THE PLAN MAPS. THESE AREAS MUST BE CLEARLY MARKED AND FENCED OFF BEFORE CLEARING AND GRUBBING OPERATIONS BEGIN.
- TOPSOIL REQUIRED FOR THE ESTABLISHMENT OF VEGETATION SHALL BE STOCKPILED AT THE LOCATION(S) SHOWN ON THE PLAN MAP(S) IN THE AMOUNT NECESSARY TO COMPLETE THE FINISH GRADING OF ALL EXPOSED AREAS THAT ARE TO BE STABILIZED BY VEGETATION. EACH STOCKPILE SHALL BE PROTECTED IN THE MANNER SHOWN ON THE PLAN DRAWINGS. STOCKPILE HEIGHTS SHALL NOT EXCEED 35 FEET. STOCKPILE SLOPES SHALL BE 2H:1V OR FLATTER.
- IMMEDIATELY UPON DISCOVERING UNFORESEEN CIRCUMSTANCES POSING THE POTENTIAL FOR ACCELERATED EROSION AND/OR SEDIMENT POLLUTION, THE OPERATOR SHALL IMPLEMENT APPROPRIATE BEST MANAGEMENT PRACTICES TO MINIMIZE THE POTENTIAL FOR EROSION AND SEDIMENT POLLUTION AND NOTIFY THE LOCAL CONSERVATION DISTRICT AND/OR THE REGIONAL OFFICE OF THE DEPARTMENT.
- ALL BUILDING MATERIALS AND WASTES SHALL BE REMOVED FROM THE SITE AND RECYCLED OR DISPOSED OF IN ACCORDANCE WITH THE DEPARTMENT'S SOLID WASTE MANAGEMENT REGULATIONS AT 25 PA. CODE 2601 ET SEQ., 271.1, AND 2871.1 ET. SEQ. NO BUILDING MATERIALS OR WASTES OR UNUSED BUILDING MATERIALS SHALL BE BURNED, BURIED, DUMPED, OR DISCHARGED AT THE SITE.
- ALL OFF-SITE WASTE AND BORROW AREAS MUST HAVE AN E&S PLAN APPROVED BY THE LOCAL CONSERVATION DISTRICT OR THE DEPARTMENT FULLY IMPLEMENTED PRIOR TO BEING ACTIVATED.
- THE CONTRACTOR IS RESPONSIBLE FOR ENSURING THAT ANY MATERIAL BROUGHT ON SITE IS CLEAN FILL. FORM FP-001 MUST BE RETAINED BY THE PROPERTY OWNER FOR ANY FILL MATERIAL AFFECTED BY A SPILL OR RELEASE OF A REGULATED SUBSTANCE BUT QUALIFYING AS CLEAN FILL DUE TO ANALYTICAL TESTING.
- ALL PUMPING OF WATER FROM ANY WORK AREA SHALL BE DONE ACCORDING TO THE PROCEDURE DESCRIBED IN THIS PLAN, OVER UNDISTURBED VEGETATED AREAS.
- VEHICLES AND EQUIPMENT MAY NEITHER ENTER DIRECTLY NOR EXIT DIRECTLY FROM THE SITE ONTO STONEYFORD ROAD OR EAST VILLAGE ROAD EXCEPT FOR INDIVIDUAL LOT CONSTRUCTION.
- UNTIL THE SITE IS STABILIZED, ALL EROSION AND SEDIMENT BMPs SHALL BE MAINTAINED PROPERLY. MAINTENANCE SHALL INCLUDE INSPECTIONS OF ALL EROSION AND SEDIMENT BMPs AFTER EACH RUNOFF EVENT AND ON A REGULAR BASIS. ALL PREVENTATIVE AND REMEDIAL MAINTENANCE WORK, INCLUDING CLEAN OUT, REPAIR, REPLACEMENT, REGRADING, RESEEDING, REMULCHING AND RESETTING MUST BE PERFORMED IMMEDIATELY IF THE E&S BMPs FAIL TO PERFORM AS EXPECTED, REPLACEMENT BMPs, OR MODIFICATIONS OF THOSE INSTALLED WILL BE REQUIRED.
- A LOG SHOWING DATES THAT E&S BMPs WERE INSPECTED AS WELL AS ANY DEFICIENCIES FOUND AND THE DATE THEY WERE CORRECTED SHALL BE MAINTAINED ON THE SITE AND MADE AVAILABLE TO REGULATORY AGENCY OFFICIALS AT THE TIME OF INSPECTION.
- SEDIMENT TRACKED ONTO ANY PUBLIC ROADWAY OR SIDEWALK SHALL BE RETURNED TO THE CONSTRUCTION SITE BY THE END OF EACH WORKDAY AND DISPOSED IN THE MANNER DESCRIBED IN THIS PLAN. IN NO CASE SHALL THE SEDIMENT BE WASHED, SHOVELED, OR SWEEPED INTO ANY ROADSIDE DITCH, STORM SEWER, OR SURFACE WATER.
- ALL SEDIMENT REMOVED FROM BMPs SHALL BE DISPOSED OF IN THE MANNER DESCRIBED ON THE PLAN DRAWINGS.
- AREAS WHICH ARE TO BE TOPSOILED SHALL BE SCARIFIED TO A MINIMUM DEPTH OF 3 TO 5 INCHES -- 6 TO 12 INCHES ON COMPACTED SOILS -- PRIOR TO PLACEMENT OF TOPSOIL. AREAS TO BE VEGETATED SHALL HAVE A MINIMUM 4 INCHES OF TOPSOIL IN PLACE PRIOR TO SEEDING AND MULCHING. FILL OUTSLOPES SHALL HAVE A MINIMUM OF 2 INCHES OF TOPSOIL.
- ALL FILLS SHALL BE COMPACTED AS REQUIRED TO REDUCE EROSION, SLIPPAGE, SETTLEMENT, SUBSIDENCE OR OTHER RELATED PROBLEMS. FILL INTENDED TO SUPPORT BUILDINGS, STRUCTURES AND CONDUITS, ETC. SHALL BE COMPACTED IN ACCORDANCE WITH LOCAL REQUIREMENTS OR CODES.
- ALL EARTHEN FILLS SHALL BE PLACED IN COMPACTED LAYERS NOT TO EXCEED 9 INCHES IN THICKNESS.
- FILL MATERIALS SHALL BE FREE OF FROZEN PARTICLES, BRUSH, ROOTS, SOD, OR OTHER OBJECTIONABLE MATERIALS THAT WOULD INTERFERE WITH OR PREVENT CONSTRUCTION OF SATISFACTORY FILLS.
- FROZEN MATERIALS OR SOFT, MUCKY, OR HIGHLY COMPRESSIBLE MATERIALS SHALL NOT BE INCORPORATED INTO FILLS.
- FILL SHALL NOT BE PLACED ON SATURATED OR FROZEN SURFACES.
- SEEPS OR SPRINGS ENCOUNTERED DURING CONSTRUCTION SHALL BE HANDLED IN ACCORDANCE WITH THE STANDARD AND SPECIFICATION FOR SUBSURFACE DRAIN OR OTHER APPROVED METHOD.
- ALL GRADED AREAS SHALL BE PERMANENTLY STABILIZED IMMEDIATELY UPON REACHING FINISHED GRADE. CUT SLOPES IN COMPETENT BEDROCK AND ROCK FILLS NEED NOT BE VEGETATED. SEEDS AREAS WITHIN 50 FEET OF A SURFACE WATER, OR AS OTHERWISE SHOWN ON THE PLAN DRAWINGS, SHALL BE BLANKETED ACCORDING TO THE STANDARDS OF THIS PLAN.
- IMMEDIATELY AFTER EARTH DISTURBANCE ACTIVITIES CEASE IN ANY AREA OR SUBAREA OF THE PROJECT, THE OPERATOR SHALL STABILIZE ALL DISTURBED AREAS. DURING NON-GERMINATING MONTHS, MULCH OR PROTECTIVE BLANKETING SHALL BE APPLIED AS DESCRIBED IN THE PLAN. AREAS NOT AT FINISHED GRADE, WHICH WILL BE REACTIVATED WITHIN 1 YEAR, MAY BE STABILIZED IN ACCORDANCE WITH THE TEMPORARY STABILIZATION SPECIFICATIONS. THOSE AREAS WHICH WILL NOT BE REACTIVATED WITHIN 1 YEAR SHALL BE STABILIZED IN ACCORDANCE WITH THE PERMANENT STABILIZATION SPECIFICATIONS.
- PERMANENT STABILIZATION IS DEFINED AS A MINIMUM UNIFORM, PERENNIAL 70% VEGETATIVE COVER OR OTHER PERMANENT NON-VEGETATIVE COVER WITH A DENSITY SUFFICIENT TO RESIST ACCELERATED EROSION. CUT AND FILL SLOPES SHALL BE CAPABLE OF RESISTING FAILURE DUE TO SLUMPING, SLIDING, OR OTHER MOVEMENTS.
- E&S BMPs SHALL REMAIN FUNCTIONAL AS SUCH UNTIL ALL AREAS TRIBUTARY TO THEM ARE PERMANENTLY STABILIZED OR UNTIL THEY ARE REPLACED BY ANOTHER BMP APPROVED BY THE LOCAL CONSERVATION DISTRICT OR THE DEPARTMENT.
- UPON COMPLETION OF ALL EARTH DISTURBANCE ACTIVITIES AND PERMANENT STABILIZATION OF ALL DISTURBED AREAS, THE OWNER AND/OR OPERATOR SHALL CONTACT THE LOCAL CONSERVATION DISTRICT FOR AN INSPECTION PRIOR TO REMOVAL/CONVERSION OF THE E&S BMPs.
- AFTER FINAL SITE STABILIZATION HAS BEEN ACHIEVED, TEMPORARY EROSION AND SEDIMENT BMPs MUST BE REMOVED OR CONVERTED TO PERMANENT POST CONSTRUCTION STORMWATER MANAGEMENT BMPs. AREAS DISTURBED DURING REMOVAL OR CONVERSION OF THE BMPs SHALL BE STABILIZED IMMEDIATELY. IN ORDER TO ENSURE RAPID REVEGETATION OF DISTURBED AREAS, SUCH REMOVAL/CONVERSIONS ARE TO BE DONE ONLY DURING THE GERMINATING SEASON.
- UPON COMPLETION OF ALL EARTH DISTURBANCE ACTIVITIES AND PERMANENT STABILIZATION OF ALL DISTURBED AREAS, THE OWNER AND/OR OPERATOR SHALL CONTACT THE LOCAL CONSERVATION DISTRICT TO SCHEDULE A FINAL INSPECTION.
- FAILURE TO CORRECTLY INSTALL E&S BMPs, FAILURE TO PREVENT SEDIMENT--LADEN RUNOFF FROM LEAVING THE CONSTRUCTION SITE, OR FAILURE TO TAKE IMMEDIATE CORRECTIVE ACTION TO RESOLVE FAILURE OF E&S BMPs MAY RESULT IN ADMINISTRATIVE, CIVIL, AND/OR CRIMINAL PENALTIES BEING INSTITUTED BY THE DEPARTMENT AS DEFINED IN SECTION 602 OF THE PENNSYLVANIA CLEAN STREAMS LAW. THE CLEAN STREAMS LAW PROVIDES FOR UP TO \$10,000 PER DAY IN CIVIL PENALTIES, UP TO \$10,000 IN SUMMARY CRIMINAL PENALTIES, AND UP TO \$25,000 IN MISDEMEANOR CRIMINAL PENALTIES FOR EACH VIOLATION.

A. STABILIZED CONSTRUCTION ENTRANCE

- WHERE CONSTRUCTION TRAFFIC WILL ENTER PAVED ROADS, A STABILIZED CONSTRUCTION ENTRANCE SHALL BE PROVIDED TO PREVENT THE TRACKING OR FLOW OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY. SEE "STABILIZED CONSTRUCTION ENTRANCE" DETAIL.

B. SILT FENCE

- SILT FENCE SHALL BE PROVIDED AS INDICATED ON THE DRAWINGS, ALONG THE LOWER PERIPHERY OF THE ACTIVE WORK AREA WHERE SEDIMENT LADEN WATER MAY BE EXPECTED TO FLOW ONTO INACTIVE AREAS. SEE "SILT FENCE" DETAIL.
- SYNTHETIC SILT FENCE FILTER FABRIC SHALL BE A PERVIOUS SHEET OF PROPYLENE NYLON, POLYESTER, OR ETHYLENE YARN PRODUCED BY A REPUTABLE MANUFACTURER FOR THE SPECIFIC PURPOSE OF BEING USED AS A SILT FENCING MEDIA.

C. STOCKPILE

- ALL STRIPPED TOPSOIL AND EXCAVATED EARTHEN MATERIAL TO BE USED WITHIN THE PROJECT SITE SHALL BE PROPERLY STOCKPILED. MATERIAL FOUND TO BE UNSUITABLE FOR SUBSEQUENT USE OR IN EXCESS OF QUALITY REQUIRED SHALL BE DISPOSED OFFSITE. LOCATION, METHOD OF DISPOSAL, AND MEANS OF TRANSPORT SHALL BE IN ACCORDANCE WITH STATE AND LOCAL LAWS.
- IMMEDIATELY AFTER STOCKPILING OPERATIONS HAVE BEEN COMPLETED, THE STOCK PILE SHALL BE TEMPORARILY STABILIZED AS DESCRIBED IN THE "TEMPORARY STABILIZATION" SECTION OF THESE SPECIFICATIONS.
- SILT FENCE SHALL BE PROVIDED AT THE BASE OF ALL OF THE STOCKPILES FOR ADDITIONAL PROTECTION. SEE "STOCKPILE CONTROL" DETAIL.

A. SOIL AMENDMENT APPLICATION RATE EQUIVALENTS

TABLE 11.2, Pg 266	Per Acre	Per 1000 s.f.	Notes
AGRICULTURAL LIME	1 ton	40 lb	Typically not required for
10-10-10 FERTILIZER	500 lb	12.5 lb	stockpiles

- SEED MIX - TEMPORARY EROSION CONTROL COVER
ERNST SEED MIX ERNMX-104 or equivalent
SEED RATE: 50 lb per acre
MIX TYPE: DISTURBED SITES AND STEEP SLOPES
SPECIES LIST: 50% Annual Ryegrass, Lolium multiflorum L. perenne var. (Italicum) 50% Perennial Ryegrass, "Roadster" (turf type) (Lolium perenne, Roadster)

OTHER MIXES:
OPTIMUM SEEDING DATES ARE FEBRUARY 15 THRU MAY 1 OR AUGUST 15 THRU OCTOBER 15 FOR THE FOLLOWING SPECIES:

ACRE	SPECIES	POUNDS (DOUBLE FOR SANDY SOIL)	OPTIMUM SEED DEPTH	ANNUAL RYEGRASS	PER
0.5 INCH	PERENNIAL RYEGRASS	40	1.0 INCH	40	BARLEY
OATS	96	1.0 INCH			

OPTIMUM SEEDING DATES ARE MAY 1 THRU AUGUST 15 FOR THE FOLLOWING SPECIES:

ACRE	SPECIES	POUNDS (DOUBLE FOR SANDY SOIL)	OPTIMUM SEED DEPTH	ANNUAL RYEGRASS	PER
PEARL MILLET	20	1.0 INCH			
SUNDOGGRASS	30	1.0 INCH			
MILLET (GERMAN OR HUNGARIAN)	30	1.0 INCH			
WEeping LOVEGRASS	5	1.0 INCH			

C. MULCHING

- SEE PAGES 270 - 277 FOR MULCHING AND STABILIZATION METHODS. TABLE 11.6, Pg 271 - MULCH APPLICATION RATES TABLE 11.7, Pg 276 - Typical Polymer Stabilized Fiber Matrix Application Rates
- MULCHING SHALL BE PROVIDED AS REQUIRED IN AREAS DIFFICULT TO VEGETATE.
- MULCHING METHODS AND MATERIALS SHALL CONFORM TO THE FOLLOWING:
 - MULCH MATERIALS SHALL BE UNSALTED HAY, OR SMALL GRAIN STRAW APPLIED AT A RATE OF 3 TONS PER ACRE. MULCH BLOWERS SHALL NOT GRIND OR CHOP MATERIAL.
 - MULCH SHALL BE SPREAD UNIFORMLY BY HAND OR MECHANICALLY SO THAT APPROXIMATELY 75% TO 95% OF THE SOIL SURFACE WILL BE COVERED
 - MULCH ANCHORING SHALL BE ACCOMPLISHED IMMEDIATELY AFTER PLACEMENT TO MINIMIZE LOSS BY WIND OR WATER. THIS MAY BE DONE BY ONE OF THE FOLLOWING METHODS, DEPENDING UPON THE SIZE OF SLOPES AND COSTS.
 - MULCH NETTINGS: STAPLE PAPER, JUTE, COTTON OR PLASTIC NETTINGS TO THE SOIL SURFACE. USE A DEGRADABLE NETTING IN AREAS TO BE MOWED.
 - LIQUID MULCH BINDERS: MAY BE USED TO ANCHOR HAY OR STRAW MULCHES. APPLICATIONS SHOULD BE HEAVIER AT EDGES.
 - WHERE WIND CATCHES THE MULCH, IN VALLEYS AND AT CRESTS OF BANKS, REMAINDER OF AREA SHOULD BE UNIFORM IN APPEARANCE.
 - WOOD-FIBER OR PAPER-FIBER MULCH AT THE RATE OF 1,500 POUNDS PER ACRE MAY BE APPLIED BY A HYDROSEEDER. USE IS LIMITED TO FLATTER SLOPES.

A. GRADING STANDARDS

- SEE E&S PLAN NOTES: 5, 19-24, AND 26.
- SEE CHAPTER 16 - GRADING STANDARDS, Pg 325-326 FOR ADDITIONAL NOTES.

B. SOIL AMENDMENT APPLICATION RATE EQUIVALENTS

TABLE 11.2, Pg 266	Per Acre	Per 1000 s.f.	Notes
AGRICULTURAL LIME	6 ton	240 lb	Or as per soil test; may not be required in agricultural fields.
10-10-10 FERTILIZER	1000 lb	25 lb	

C. SEEDING STANDARDS

- UNLESS SPECIFIED ELSEWHERE ON THE PLAN DRAWINGS, SEE Pg 263-269 FOR SEEDING SPECIFICATIONS.
 - TABLE 11.3 - Plant Tolerances of Soil Limitation Factors
 - TABLE 11.4 - Recommended Seed Mixtures
 - TABLE 11.5 - Recommended Seed Mixtures for Stabilizing Disturbed Areas

MAINTENANCE

SITE MAINTENANCE OF EROSION AND SEDIMENTATION CONTROLS CAN BE FOUND AT THE FOLLOWING LOCATIONS:

SEE THE FOLLOWING E&S NOTES: 9, 13, 15-18, 29, AND 33.
SEE THE FOLLOWING MCCD NOTES: 5-8, 12, 15, AND 17-18.

RECYCLING

RECYCLING AND DISPOSAL OF BUILDING MATERIALS AND WASTES CAN BE FOUND AT THE FOLLOWING LOCATION:
SEE MCCD NOTE NUMBER 14.

Standard Notes Involving Earthwork:

If the site will need to import or export material from the site, the responsibility for performing environmental due diligence and determination of clean fill will rest with the applicant and owner.

Clean Fill is defined as: Uncontaminated, non-water soluble, non-decomposable, inert, solid material. The term includes soil, rock, stone, dredged material, used asphalt, and brick, block or concrete from construction and demolition activities that is separate from other waste and is recognizable as such. The term does not include materials placed in or on the waters of the Commonwealth unless otherwise authorized. (The term "used asphalt" does not include milled asphalt or asphalt that has been processed for re-use).

Clean Fill affected by a spill or release of a regulated substance:

Fill materials affected by a spill or release of a regulated substance still qualifies as clean fill provided the testing reveals that the fill material contains concentrations of regulated substances that are below the residential limits in Tables FP-1a and FP-1b found in the Department's policy "Management of Fill".

Any person placing clean fill that has been affected by a spill or release of a regulated substance must use form FP-001 to certify the origin of the fill material and the results of the analytical testing to qualify the material as clean fill. Form FP-001 must be retained by the owner of the property receiving the fill. A copy of Form FP-001 can be found at the end of these instructions.

Environmental due diligence: The applicant must perform environmental due diligence to determine if the fill materials associated with the project qualify as clean fill. Environmental due diligence is defined as: *Investigative techniques, including, but not limited to, visual property inspections, electronic data base searches, review of property ownership, review of property use history, Sanborn maps, environmental questionnaires, transaction screens, analytical testing, environmental assessments or audits. Analytical testing is not a required part of due diligence unless visual inspection and/or review of the past land use of the property indicates that the fill may have been subjected to a spill or release of regulated substance.* If the fill may have been affected by a spill or release of a regulated substance, it must be tested to determine if it qualifies as clean fill. Testing should be performed in accordance with Appendix A of the Department's policy "Management of Fill".

Fill material that does not qualify as clean fill is regulated fill. Regulated fill is waste and must be managed in accordance with the Department's municipal or residual waste regulations based on 25 Pa. Code Chapters 287 Residual Waste Management or 271 Municipal Waste Management, whichever is applicable. These regulations are available on-line at www.pacode.com.

FILL DETERMINATION:

- If due diligence shows no evidence of a release of a regulated substance, the material may be managed as clean fill under this policy.
- If due diligence shows evidence of a release, the material must be tested to determine if it qualifies as clean fill. testing must be performed in accordance with appendix a.
 - If testing reveals that the material contains concentrations of regulated substances that are below the residential limits in table fp-1a and b, the material may be managed as clean fill.
 - If testing reveals that the material contains concentrations of regulated substances that exceed the limits in table fp-1a and b, the material must be managed as regulated fill.
- A person may not blend or mix materials to become clean fill. Materials that contain regulated substances that are intentionally released may not be managed under this policy.

B MANAGEMENT OF CLEAN FILL:

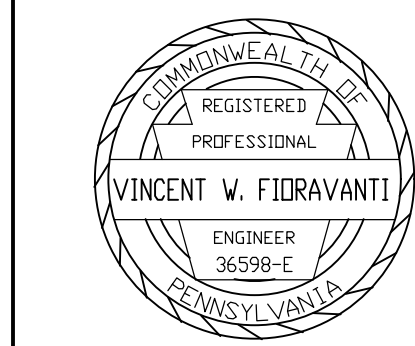
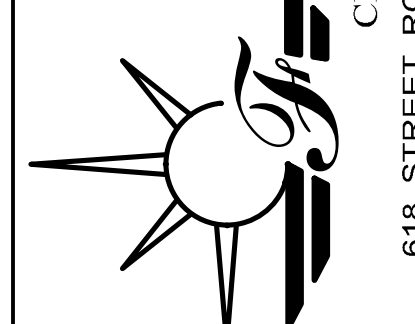
- Use of material as clean fill does not require a permit under the solid waste management act and regulations, and it may be used in an unrestricted or unregulated manner under this act and its regulations. the use of materials as clean fill is still regulated under other environmental laws and regulations. a person using materials as clean fill under the policy is still subject to and must comply with all applicable requirements governing the placement or use of material as clean fill, such as Chapter 102 (Erosion and Sediment Control) and Chapter 105 (Dam Safety and Waterway Management).
- Best management practices (BMP) must be followed prior to demolition activities to remove materials like lead-based paint surface, friable asbestos and hazardous materials such as mercury switches, PCB ballasts and fluorescent light bulbs from a building if the brick, block, or concrete is used as clean fill.
- Clean fill may not contain any free liquids based on visual inspection, and shall not create public nuisances (for example objectionable odors) to users of the receiving property or adjacent properties.

CONSTRUCTION SEQUENCE

STEP	DESCRIPTION
1	AT LEAST 3 DAYS PRIOR TO CONSTRUCTION, CONTACT PA ONE CALL
2	PRE-CONSTRUCTION MEETING WITH TOWNSHIP AND BCCD
2	CONSTRUCT STABILIZED CONSTRUCTION ENTRANCES SCE-1 AND SCE-2 AS SHOWN ON THE PLANS
2	INSTALL ALL SILT SOXX AS SHOWN ON THE PLANS. INSTALL WORK FENCE AROUND LIMITS OF SEEPAGE BEDS
3	CONSTRUCT AND STABILIZE STORM SEWER 1-7 TO 102
3	CONSTRUCT AND STABILIZE CHANNELS 1, 2, AND 3 TO DIVERT OFF SITE RUNOFF AROUND THE WORK AREA
4	STRIP AND STOCKPILE TOPSOIL
5	ROUGH GRADE BUILDING PADS AND STABILIZE.
6	CONSTRUCT DWELLING, INSTALL UTILITIES, FINE GRADE SITE, TOPSOIL AND STABILIZE ALL AREAS EXCEPT SEEPAGE BEDS.
7	AFTER ENTIRE LOT IS STABILIZED INSTALL SEEPAGE BEDS. (SEE BELOW FOR SPECIFIC CONSTRUCTION SEQUENCE)
	THE FOLLOWING CONTROLS CAN BE REMOVED, INSTALLED AND OR MODIFIED AFTER TRIBUTARY AREAS ARE STABILIZED.
8	STABILIZED MEANS AT LEAST 70% PER SQUARE YARD OF PERENNIAL VEGETATIVE COVER WITH A DENSITY CAPABLE OF RESISTING EROSION. (SEE GENERAL NOTE B THIS SHEET)
	REMOVE SILT SOXX AND STABILIZED ENTRANCE

SEEPAGE BED CONSTRUCTION SEQUENCE

STEP	DESCRIPTION
1	PROTECT INFILTRATION BED AREA FROM COMPACTION PRIOR TO INSTALLATION TO THE EXTENT POSSIBLE.
2	INSTALL AND MAINTAIN PROPER EROSION AND SEDIMENT CONTROL MEASURES DURING CONSTRUCTION.
	EXCAVATE INFILTRATION BED BOTTOM TO AN UNCOMPACTED SUBGRADE FREE FROM ROCKS AS SHOWN ON THE PLANS. DO NOT COMPACT SUBGRADE
	SCARIFY THE BOTTOM OF THE BED. THIS IS A CRITICAL STEP AND THE BOTTOM OF THE BED SHOULD BE INSPECTED AND APPROVED BY THE ENGINEER PRIOR TO FINAL STABILIZATION. AFTER APPROVAL IS OBTAINED INSTALL LANDSCAPING AND MULCH.
2	PLANT, SEED AND STABILIZE REMAINING AREA. REINSTALL FENCE REMOVED FOUR CONSTRUCTION



REVISIONS

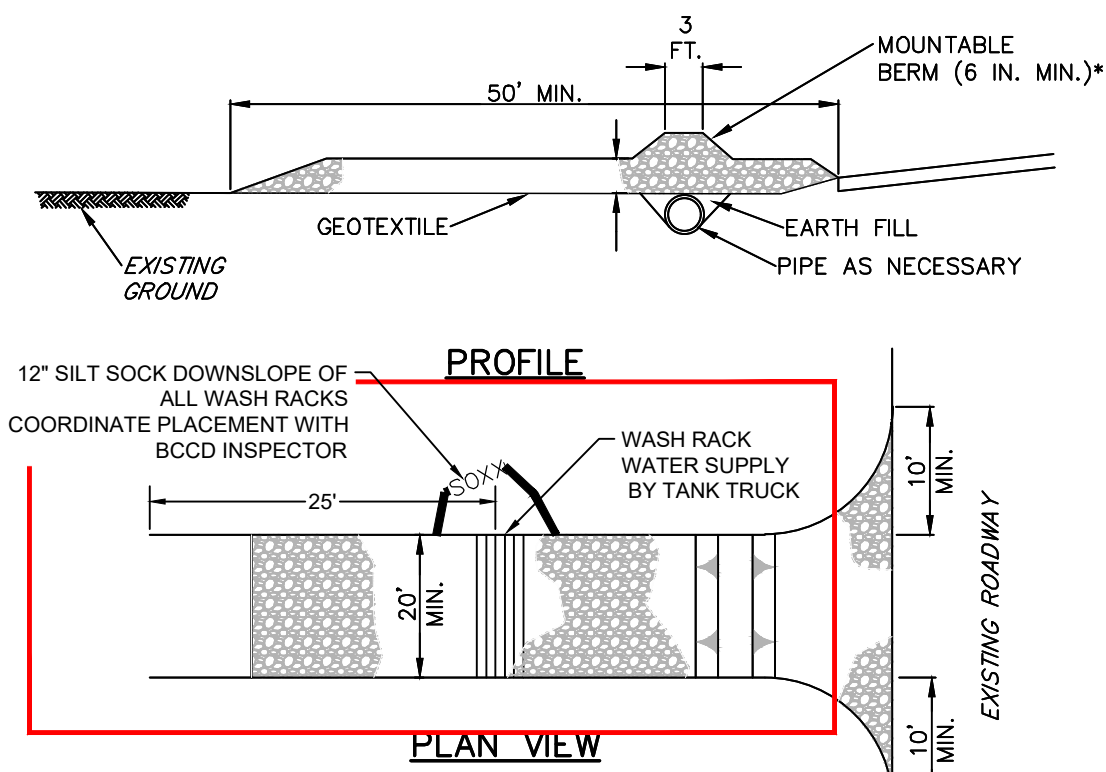
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1	TOWNSHIP COMMENTS	9/22/2023
2	TOWNSHIP COMMENTS	3/18/2024

DATE:	8/24/2022
SCALE:	NA
JOB #	2084
FB #	--
DRAWN	STAFF
CHECKED:	VWF

4304 & 411 BRISTOL ROAD
 BENSLEM TOWNSHIP, PA
 PREPARED FOR:
BRILLA LLC
 52 E GEORGIANA DRIVE
 RICHBORO PA 18954

EROSION AND SEDIMENTATION CONTROL SPECIFICATIONS

SHEET 15 OF 20



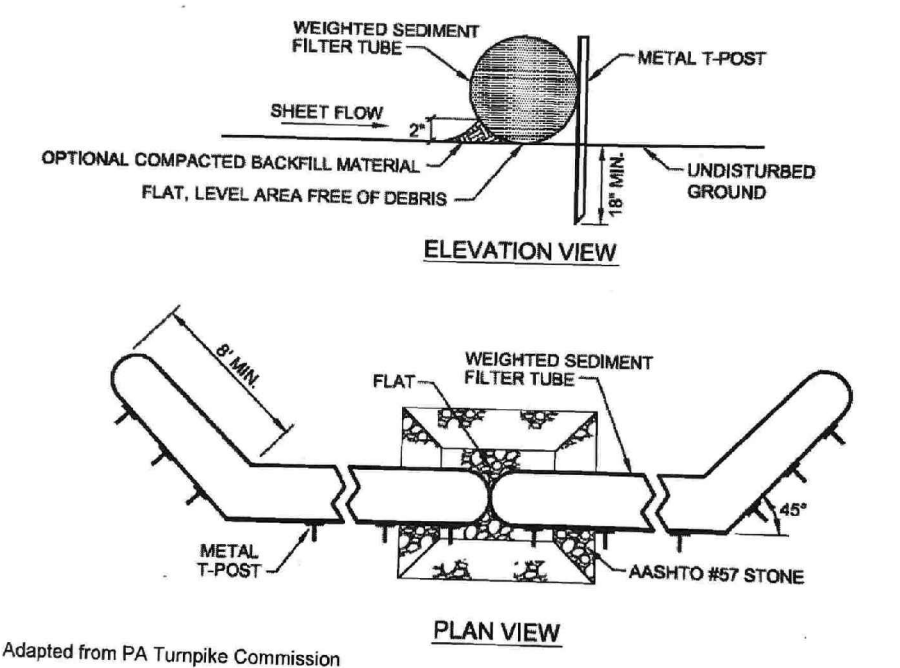
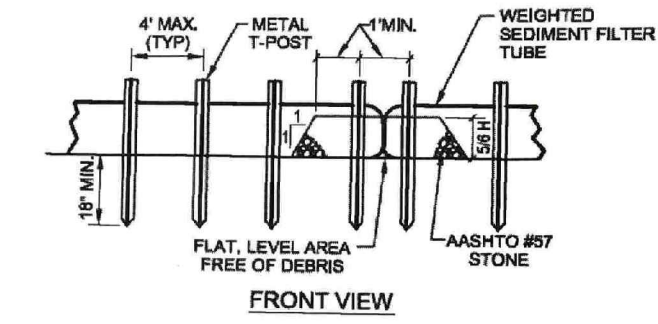
Standard Construction Detail #3-1
Rock Construction Entrance

NOTES:

- * MOUNTABLE BERM USED TO PROVIDE PROPER COVER FOR PIPE
- REMOVE TOPSOIL PRIOR TO INSTALLATION OF ROCK CONSTRUCTION ENTRANCE. EXTEND ROCK OVER FULL WIDTH OF ENTRANCE.
- RUNOFF SHALL BE DIVERTED FROM ROADWAY TO A SUITABLE SEDIMENT REMOVAL BMP PRIOR TO ENTERING ROCK CONSTRUCTION ENTRANCE.
- MOUNTABLE BERM SHALL BE INSTALLED WHEREVER OPTIONAL CULVERT PIPE IS USED AND PROPER PIPE COVER AS SPECIFIED BY MANUFACTURER IS NOT OTHERWISE PROVIDED. PIPE SHALL BE SIZED APPROPRIATELY FOR SIZE OF DITCH BEING CROSSED.
- MAINTENANCE: ROCK CONSTRUCTION ENTRANCE THICKNESS SHALL BE CONSTANTLY MAINTAINED TO THE SPECIFIED DIMENSIONS BY ADDING ROCK. A STOCKPILE SHALL BE MAINTAINED ON SITE FOR THIS PURPOSE. ALL SEDIMENT DEPOSITED ON PAVED ROADWAYS SHALL BE REMOVED AND RETURNED TO THE CONSTRUCTION SITE IMMEDIATELY. IF EXCESSIVE AMOUNTS OF SEDIMENT ARE BEING DEPOSITED ON ROADWAY, EXTEND LENGTH OF ROCK CONSTRUCTION ENTRANCE BY 50 FOOT INCREMENTS UNTIL CONDITION IS ALLEVIATED OR INSTALL WASH RACK. WASHING THE ROADWAY OR SWEEPING THE DEPOSITS INTO ROADWAY DITCHES, SEWERS, CULVERTS, OR OTHER DRAINAGE COURSES IS NOT ACCEPTABLE.

Standard Construction Detail #3-1
Rock Construction Entrance

Standard Construction Detail #4-3
Weighted Sediment Filter Tube Installation



Adapted from PA Turnpike Commission

Sediment tube placement area shall be prepared so that it is free of all debris, including rocks, sticks, roots, etc. A 2" layer of AASHTO #57 stone shall be placed where the logs come together. Ends of tubes may be overlapped according to manufacturer's specifications instead of the AASHTO #57 stone.

Sediment tubes shall be placed at existing level grade. Ends shall be extended upslope at 45° to the main filter log alignment for a minimum of 8 feet (Figure 4.1).

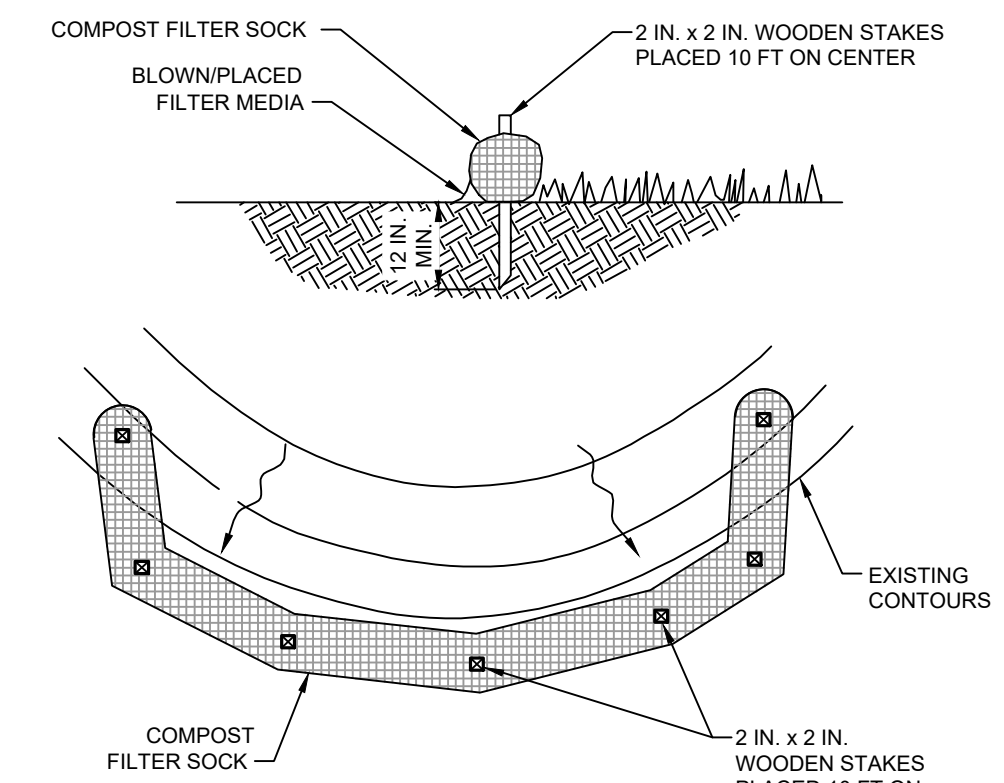
Sediment tubes shall be inspected weekly and after each runoff event.

Sediment deposits shall be cleaned from the log when it reaches half the height of the tube.

Damaged tubes shall be replaced within 24 hours of inspection. A supply of tubes shall be maintained on site for this purpose.

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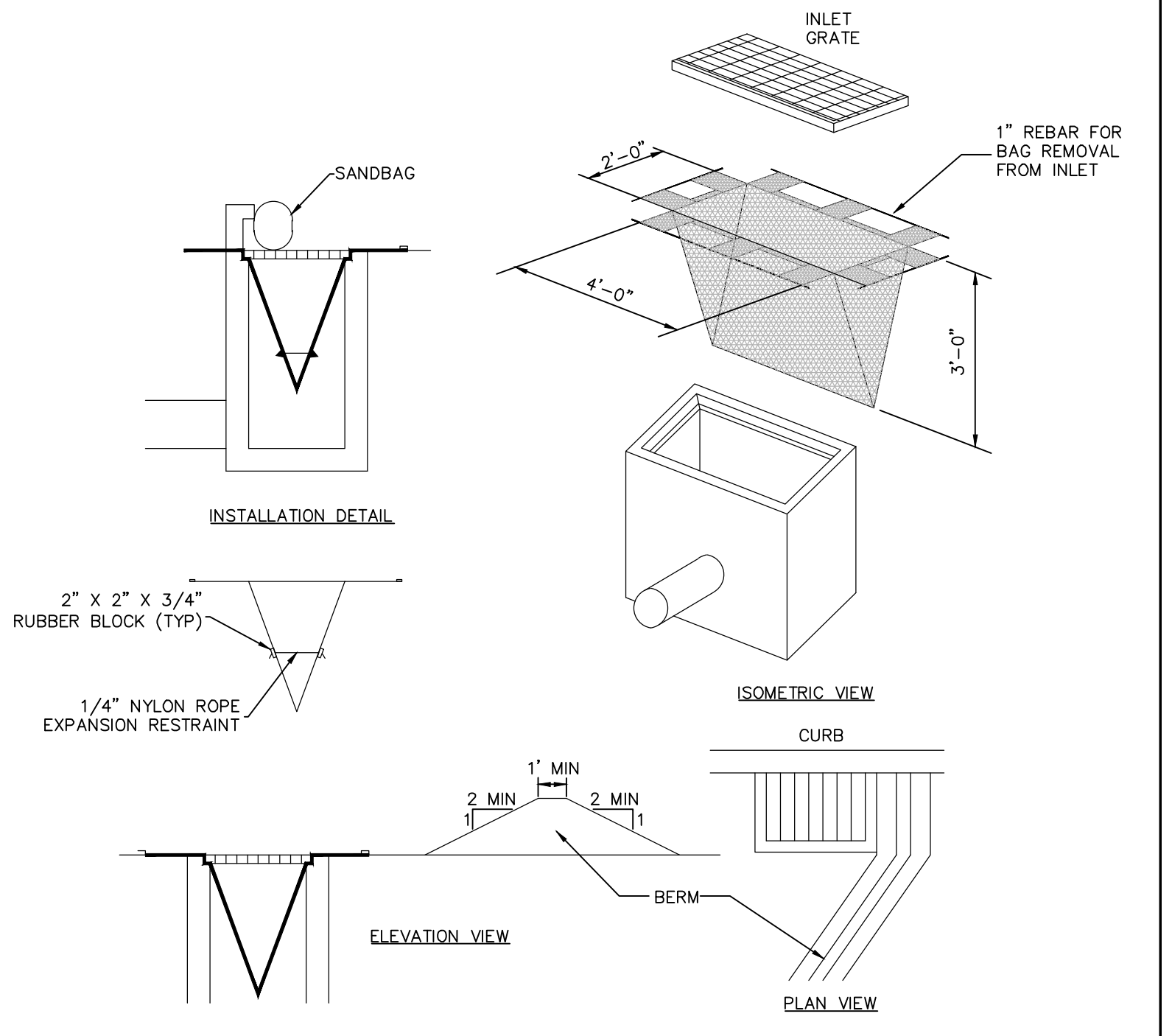
Standard Construction Detail #4-3
weighted sediment filter tube in areas concentrated flow



NOTES:

- SOCK FABRIC SHALL MEET STANDARDS OF TABLE 4.1 OF THE PA DEP EROSION CONTROL MANUAL. COMPOST SHALL MEET THE STANDARDS OF TABLE 4.2 OF THE PA DEP EROSION CONTROL MANUAL.
- COMPOST FILTER SOCK SHALL BE PLACED AT EXISTING LEVEL GRADE. BOTH ENDS OF THE BARRIER SHALL BE EXTENDED AT LEAST 8 FEET UP SLOPE AT 45 DEGREES TO THE MAIN BARRIER ALIGNMENT. MAXIMUM SLOPE LENGTH ABOVE ANY BARRIER SHALL NOT EXCEED THAT SPECIFIED FOR THE SIZE OF THE SOCK AND THE SLOPE OF ITS TRIBUTARY AREA.
- TRAFFIC SHALL NOT BE PERMITTED TO CROSS COMPOST FILTER SOCKS.
- ACCUMULATED SEDIMENT SHALL BE REMOVED WHEN IT REACHES 1/2 THE ABOVE GROUND HEIGHT OF THE BARRIER AND DISPOSED IN THE MANNER DESCRIBED ELSEWHERE IN THE PLAN.
- COMPOST FILTER SOCKS SHALL BE INSPECTED WEEKLY AND AFTER EACH RUNOFF EVENT. DAMAGED SOCKS SHALL BE REPAIRED ACCORDING TO MANUFACTURER'S SPECIFICATIONS OR REPLACED WITHIN 24 HOURS OF INSPECTION.
- BIODEGRADABLE COMPOST FILTER SOCKS SHALL BE REPLACED AFTER 6 MONTHS. PHOTODEGRADABLE SOCKS AFTER 1 YEAR. POLYPROPYLENE SOCKS SHALL BE REPLACED ACCORDING TO MANUFACTURER'S RECOMMENDATIONS.
- UPON STABILIZATION OF THE AREA TRIBUTARY TO THE SOCK, STAKES SHALL BE REMOVED. THE SOCK MAY BE LEFT IN PLACE AND VEGETATED OR REMOVED. IN THE LATTER CASE, THE MESH SHALL BE CUT OPEN AND THE MULCH SPREAD AS A SOIL SUPPLEMENT.

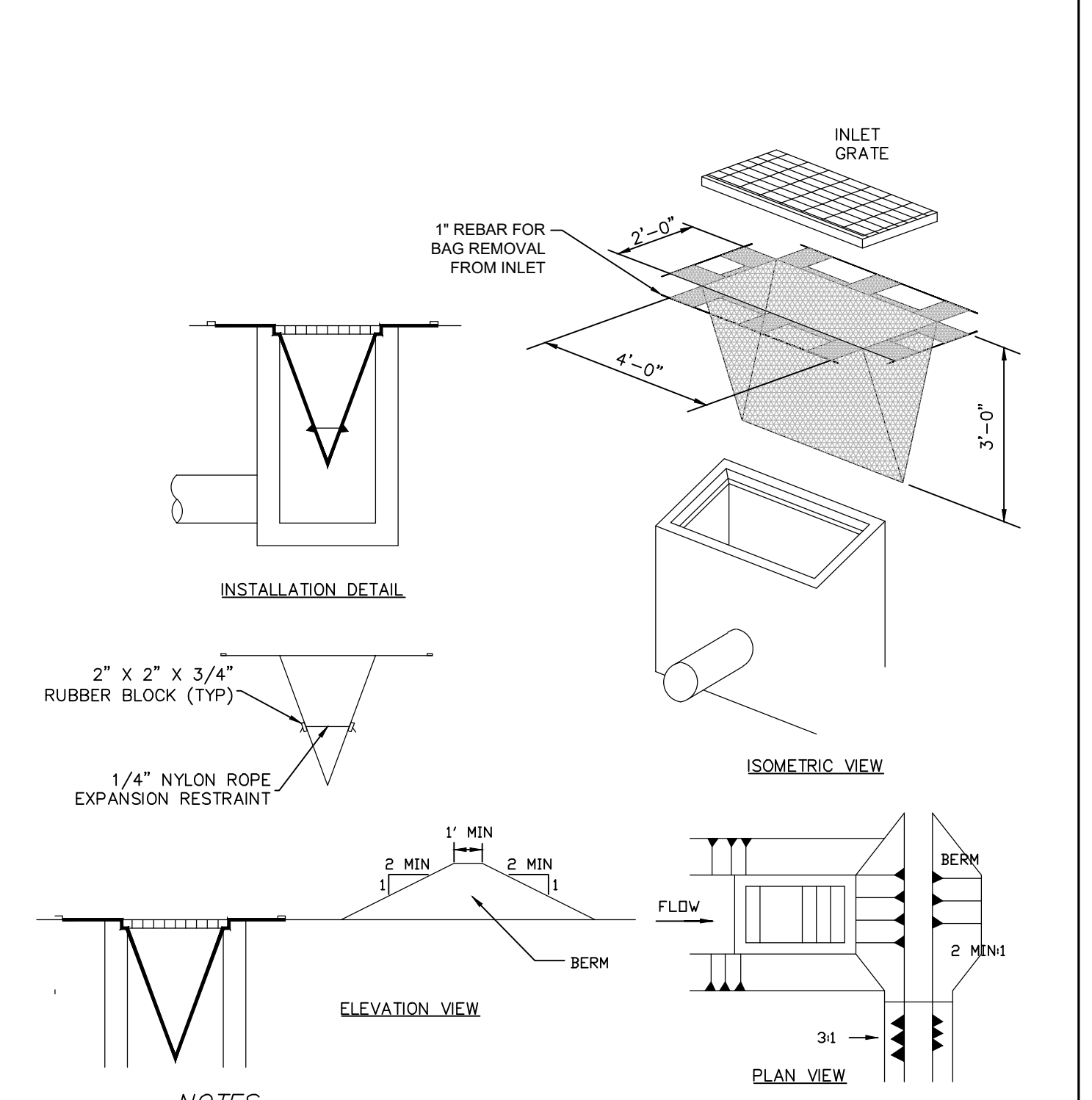
Standard Construction Detail #4-1
Compost Filter Sock aka "Silt Sock"



NOTES:

- MAXIMUM DRAINAGE AREA = 1/2 ACRE. INLET PROTECTION IS NOT REQUIRED FOR INLET TRIBUTARY TO SEDIMENT BASIN OR TRAP. BERMS REQUIRED FOR ALL INSTALLATIONS.
- EARTHEN BERM SHALL BE MAINTAINED UNTIL ROADWAY IS STONED. ROAD SUBBASE BERM SHALL BE MAINTAINED UNTIL ROADWAY IS PAVED.
- SIX INCH MINIMUM HEIGHT ASPHALT BERM SHALL BE MAINTAINED UNTIL ROADWAY SURFACE RECEIVES FINAL COAT.
- DO NOT USE ON MAJOR PAVED ROADWAYS WHERE PONDING MAY CAUSE TRAFFIC HAZARDS

IP FILTER BAG INLET PROTECTION
TYPE C INLETS CURBED ROADWAY



NOTES:

- MAXIMUM DRAINAGE AREA = 1/2 ACRE.
- INLET PROTECTION IS NOT REQUIRED FOR INLET TRIBUTARY TO SEDIMENT BASIN OR TRAP. BERMS REQUIRED FOR ALL INSTALLATIONS.
- EARTHEN BERM SHALL BE MAINTAINED UNTIL ROADWAY IS STONED. ROAD SUBBASE BERM SHALL BE MAINTAINED UNTIL ROADWAY IS PAVED. EARTHEN BERM IN CHANNEL SHALL BE MAINTAINED UNTIL PERMANENT STABILIZATION IS COMPLETED OR TO REMAIN PERMANENTLY.
- DO NOT USE ON MAJOR PAVED ROADWAYS WHERE PONDING MAY CAUSE TRAFFIC HAZARDS

IP FILTER BAG INLET PROTECTION
TYPE M INLETS, CHANNEL OR
ROADSIDE SWALE

NOTES:

- LOW VOLUME FILTER BAGS SHALL BE MADE FROM NON-WOVEN GEOTEXTILE MATERIAL SEWN WITH HIGH STRENGTH DOUBLE STITCHED "J" TYPE SEAMS. THEY SHALL BE CAPABLE OF TRAPPING PARTICLES LARGER THAN 150 MICRONS. HIGH VOLUME FILTER BAGS SHALL BE MADE FROM WOVEN GEOTEXTILES THAT MEET THE FOLLOWING STANDARDS:

PROPERTY	TEST METHOD	MINIMUM STANDARD
AVG. WIDE WIDTH STRENGTH	ASTM D-4884	60 LB/IN
GRAB TENSILE	ASTM D-4632	205 LB
PUNCTURE	ASTM D-4833	110 LB
MULLEN BURST	ASTM D-3786	350 PSI
UV RESISTANCE	ASTM D-4355	70%
AOS % RETAINED	ASTM D-4751	80 SIEVE

A SUITABLE MEANS OF ACCESSING THE BAG WITH MACHINERY REQUIRED FOR DISPOSAL PURPOSES SHALL BE PROVIDED. FILTER BAGS SHALL BE REPLACED WHEN THEY BECOME 1/2 FULL OF SEDIMENT. SPARE BAGS SHALL BE KEPT AVAILABLE FOR REPLACEMENT OF THOSE THAT HAVE FAILED OR ARE FILLED. BAGS SHALL BE PLACED ON STRAPS TO FACILITATE REMOVAL UNLESS BAGS COME WITH LIFTING STRAPS ALREADY ATTACHED.

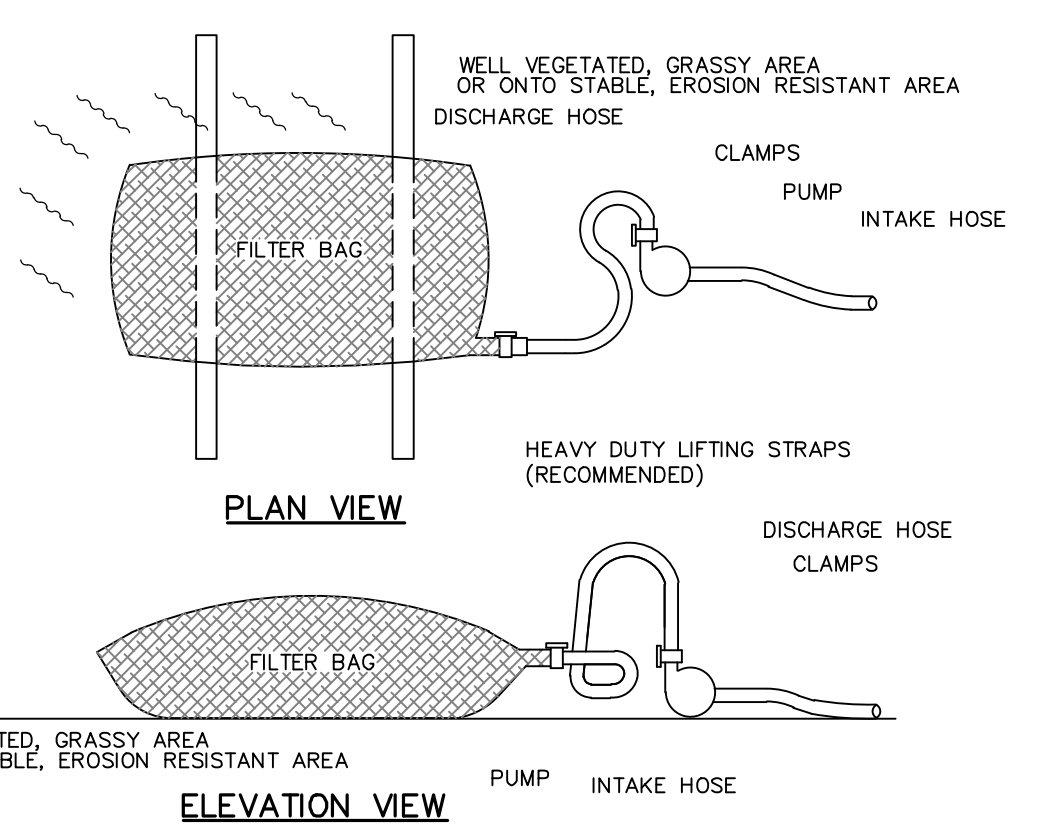
BAGS SHALL BE LOCATED IN WELL-VEGETATED (GRASSY) AREA AND DISCHARGE ONTO STABLE. EROSION RESISTANT AREAS, WHERE THIS IS NOT POSSIBLE, A GEOTEXTILE UNDERLAYMENT AND FLOW PATH SHALL BE PROVIDED. BAGS MAY BE PLACED ON FILTER STONE TO INCREASE DISCHARGE CAPACITY. BAGS SHALL NOT BE PLACED ON SLOPES GREATER THAN 5%. FOR SLOPES EXCEEDING 5% CLEAN ROCK OR OTHER NON-ERODIBLE AND NON-POLLUTING MATERIAL MAY BE PLACED UNDER THE BAG TO REDUCE SLOPE STEEPNESS.

NO DOWNSLOPE SEDIMENT BARRIER IS REQUIRED FOR MOST INSTALLATIONS. COMPOST BERM OR COMPOST FILTER SOCK SHALL BE INSTALLED BELOW BAGS LOCATED IN HQ OR EY WATERSHEDS, WITHIN 50 FEET OF ANY RECEIVING SURFACE WATER OR WHERE GRASSY AREA IS NOT AVAILABLE.

THE PUMP DISCHARGE HOSE SHALL BE INSERTED INTO THE BAGS IN THE MANNER SPECIFIED BY THE MANUFACTURER AND SECURELY CLAMPED. A PIECE OF PVC PIPE IS RECOMMENDED FOR THIS PURPOSE.

THE PUMPING RATE SHALL BE NO GREATER THAN 750 GPM OR 1/2 THE MAXIMUM SPECIFIED BY THE MANUFACTURER, WHICHEVER IS LESS. PUMP INTAKES SHALL BE FLOATING AND SCREENED.

FILTER BAGS SHALL BE INSPECTED DAILY. IF ANY PROBLEM IS DETECTED, PUMPING SHALL CEASE IMMEDIATELY AND NOT RESUME UNTIL THE PROBLEM IS CORRECTED.



Standard Construction Detail #3-16
Pumped Water Filter Bag aka "Dirt Bag"

Standard Construction Detail #3-16
Pumped Water Filter Bag aka "Dirt Bag"

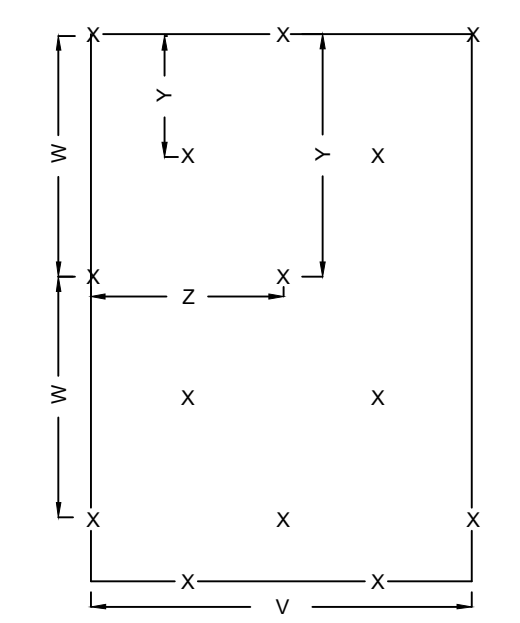
- NOTES FOR INSTALLATION OF EROSION CONTROL BLANKETS:**
- PREPARE SOIL BEFORE INSTALLING BLANKETS, INCLUDING APPLICATION OF LINE, FERTILIZER AND SEED.
 - BEGIN AT THE TOP OF THE CHANNEL BY ANCHORING THE BLANKET IN A 6" DEEP x 6" WIDE TRENCH BACKFILL AND COMPACT THE TRENCH AFTER STAPLING.
 - ROLL CENTER BLANKET IN DIRECTION OF WATER FLOW ON BOTTOM OF CHANNEL, STARTING AT DOWNSTREAM LOCATION.
 - PLACE BLANKETS END OVER END (SHINGLE STYLE) WITH A 6" OVERLAP. USE A DOUBLE ROW OF STAGGERED STAPLES 4" APART TO SECURE BLANKETS.
 - FULL LENGTH EDGE OF BLANKETS AT TOP OF SIDE SLOPES MUST BE ANCHORED IN 6" DEEP x 6" WIDE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING.
 - BLANKETS ON SIDE SLOPES MUST BE OVERLAPPED 4" OVER THE CENTER BLANKET AND STAPLED.
 - THE TERMINAL END OF THE BLANKETS MUST BE ANCHORED IN A 6" DEEP x 6" WIDE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING.

LINING	MATERIAL COMPOSITION
S-75	STRAW 0.5 LBS/SQ YD NET LIGHTWEIGHT DEGRADABLE TOP SIDE ONLY THREAD COTTON, BIO-DEGRADABLE
S-150	STRAW 0.5 LBS/SQ YD NET LIGHTWEIGHT DEGRADABLE BOTH SIDES THREAD COTTON, BIO-DEGRADABLE
SC-150	STRAW 0.35 LBS/SQ YD COCONUT 0.15 LBS/SQ YD NET HEAVYWEIGHT UV STABILIZED TOP LIGHTWEIGHT BOTTOM STABILIZED BOTH SIDES THREAD BLACK POLYESTER
C-125	COCONUT 0.50 LBS/SQ YD NET HEAVYWEIGHT UV STABILIZED BOTH SIDES THREAD BLACK POLYESTER
P-300	FIBERS 0.60 LBS/SQ YD NET EXTRA HEAVYWEIGHT UV STABILIZED BOTH SIDES THREAD BLACK POLYESTER

NOTES:

- All linings manufactured by North American Green.
- Roll Specifications: Width = 6.5 FT (All linings) Length = 83.5 FT Weight = 30 LBS Area = 60 SQ YDS

NORTH AMERICAN GREEN BLANKET SPECIFICATIONS
(NOT TO SCALE)

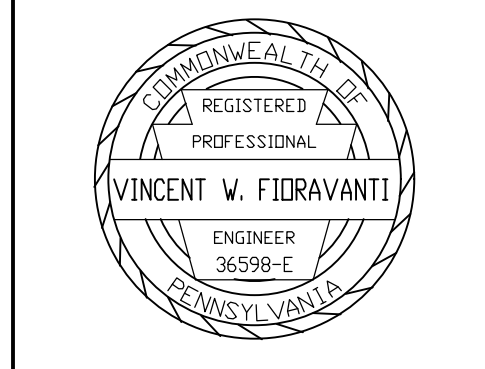
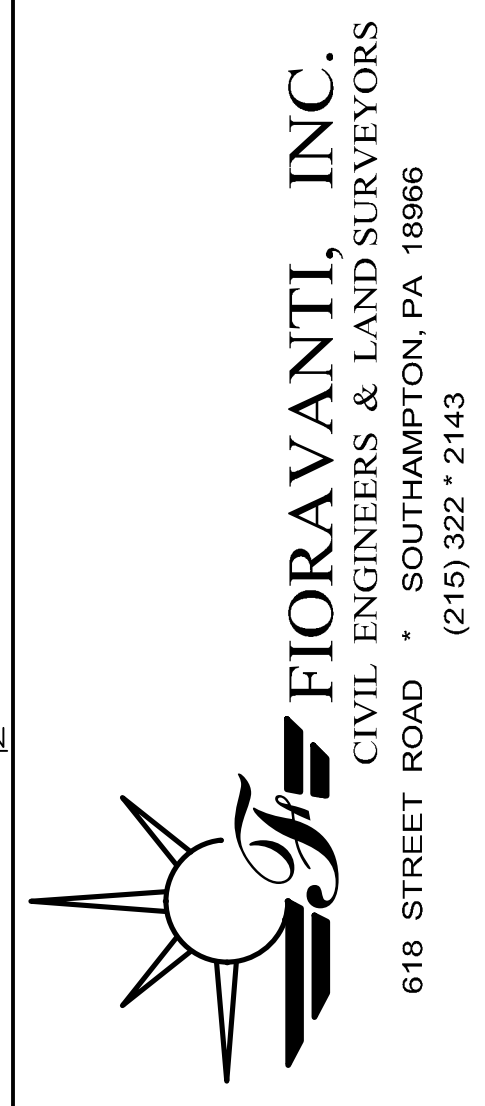


EROSION CONTROL BLANKET TYPICAL STAPLE PATTERN
(NDT TO SCALE)

STAPLE PATTERN PER SQ YD	EDGE STAPLE SPACING		INTERIOR STAPLE SPACING	
	ALONG ROLL	ACROSS ROLL	ALONG ROLL	ACROSS ROLL
A	1	6 ft	3 ft	3 ft
B	1.5	6 ft	6 ft staggered	3 ft staggered
C	2	4 ft	4 ft staggered	3 ft staggered
D	3.5	4 ft	2 ft	20 in.
E	3.8	10 in.	40 in. staggered	20 in. staggered

NOTE: Use 6 inch, 11 gauge "U" staples. Staples 8 inch and may be used for loose soils. Staples 9 gauge or heavier may be necessary in hard or rocky soils

NORTH AMERICAN GREEN STAPLE PATTERN SCHEDULE



REVISIONS

NO.	DESCRIPTION	DATE
1	TOWNSHIP COMMENTS	9/22/2023
2	TOWNSHIP COMMENTS	3/18/2024

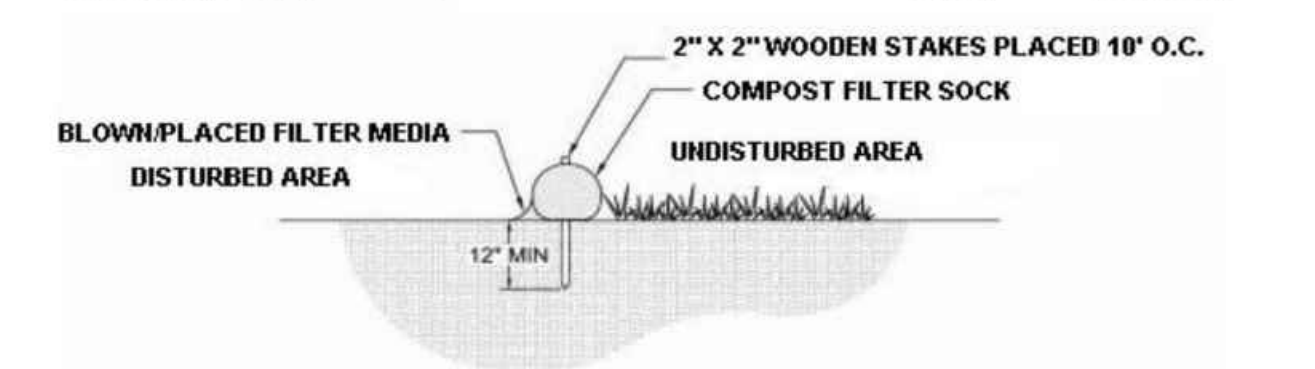
DATE: 8/24/2022
SCALE: NTS
JOB # 2084
DRAWN: STAFF
CHECKED: VWF

4304 & 411 BRISTOL ROAD
BENSLEM TOWNSHIP, PA
PREPARED FOR:
BRILLA LLC
52 E GEORGIANNA DRIVE
RICHBORO PA 18954

EROSION AND
SEDIMENTATION
CONTROL
DETAILS

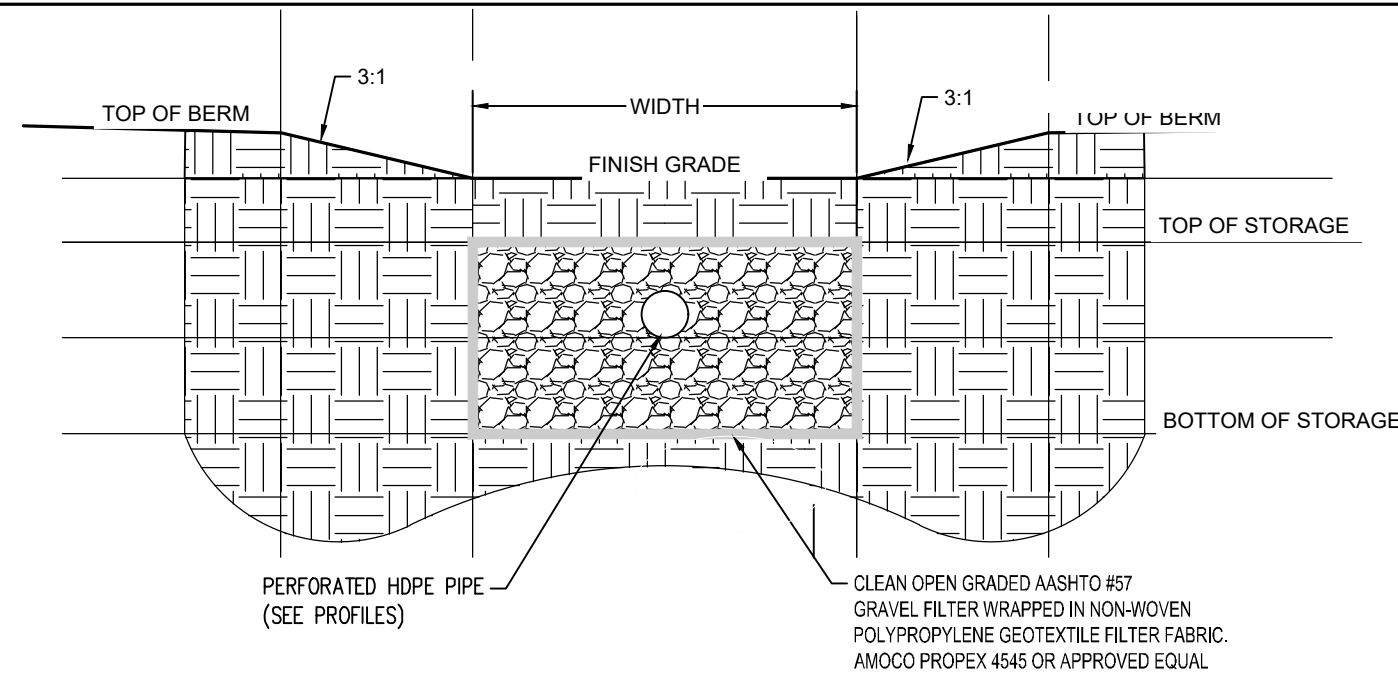
STANDARD E&S WORKSHEET #1
COMPOST FILTER SOCKS

Project Name: 2084 Brilla LLC
Location: Bensalem Township
Prepared By: DLF
Checked By: VWF
DATE: 08/12/2022
DATE: 08/12/2022



Barrier Number	Sock Size	LOCATION	Percent Slope	Slope Length Above Barrier	Allowable Length
1	12	perimeter	8.5	57	181
2	12	perimeter	7.0	103	196
3	12	perimeter	9.6	110	166
4	18	perimeter	10.2	213	244
5	18	perimeter	9.9	217	263
6	12	perimeter	10.9	123	151
7	18	perimeter	14.3	158	222

NOTE:
ALL OTHER COMPOST SOCKS ON THE PLANS AND NOT NUMBERED ARE 12 INCH COMPOST FILTER SOCKS



**BMP SEEPAGE BED CROSS SECTION
STONE STORAGE**
(NOT TO SCALE)

NOTES

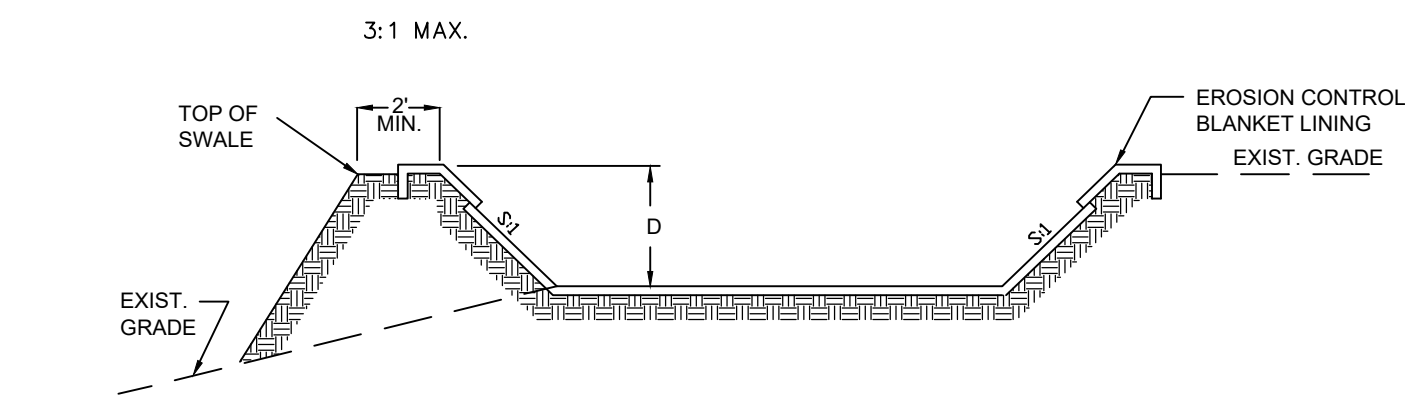
1. GEOTEXTILE IS TO BE NON-WOVEN POLYPROPYLENE GEOTEXTILE FILTER FABRIC. AMOCO PROPEX 4545 OR APPROVED EQUAL.
2. PRIOR TO PLACEMENT OF GEOTEXTILE AND STONE CONTRACTOR TO VERIFY EXCAVATION ELEVATIONS AROUND THE PERIMETER OF THE STONE PLACEMENT AREA.

INSPECTION AND MAINTENANCE OF SEEPAGE BEDS

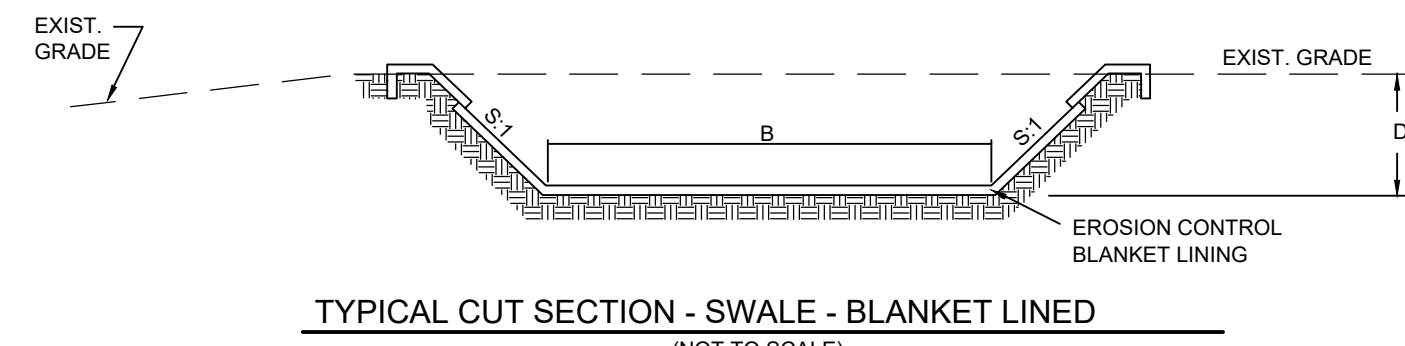
IT IS THE RESPONSIBILITY OF THE INDIVIDUAL OWNER TO COMPLETE ALL REQUIRED MAINTENANCE ITEMS AND ENSURE PROPER OPERATION OF THE SYSTEM IN ACCORDANCE WITH THE FOLLOWING INFORMATION:

1. SEEPAGE BEDS:
 - MAINTENANCE
 - A. EMBANKMENT - THE FACILITY IS CONSTRUCTED WITH EARTHEN GRADING, BERMS AND OVER FLOWS. THE STRUCTURAL INTEGRITY OF THE FINAL GRADES AND ELEVATIONS MUST BE MAINTAINED. 100% VEGETATIVE STABLE GROUND COVER MUST BE MAINTAINED TO PREVENT SOIL LOSS AND EROSION OF THE BERM AND OVER FLOWS.
 - B. ALL GRASS AREAS IN THE BASIN MUST BE MOWED AT A MINIMUM OF TWO TO THREE TIMES PER YEAR. NO TREES SHALL BE PLANTED OR PERMITTED TO NATURALLY OCCUR WITHIN THE BASIN SINCE IT WOULD ALTER THE FUNCTIONING OF THE SYSTEM
 - C. ANY EROSION NOTED SHALL BE REPAIRED AND REVEGETATED TO DESIGN GRADES
 - D. ALL TRASH AND DEBRIS WHICH MAY HAVE ACCUMULATED ON THE GRATE OR ON SURFACE OF THE STONE TRENCH SURROUNDING THE INLET SHALL BE REMOVED. THIS SHALL BE CONDUCTED ON AN AS NEEDED BASIS AND AFTER EACH RAINFALL EVENT
 - INSPECTION SCHEDULE:
 1. EMBANKMENT, GRADES AND VEGETATION - AT THE BEGINNING OF EACH GROWING SEASON - REPAIR AND REVEGETATE AS NEEDED
 2. INLET STRUCTURES - GRATE TOP AND STONE INLET TRENCH - INSPECT AFTER EACH SIGNIFICANT STORM EVENT. CLEAN DEBRIS AND ENSURE STRUCTURAL INTEGRITY IS MAINTAINED.

SEEPAGE BEDS																
SEEPAGE BED	BED TYPE	SITE WATERSHED		BED DIMENSIONS				ELEVATIONS			SOIL TESTING					
		DRAINAGE AREA (AC)	IMPERVIOUS AREA (AC)	LENGTH (FEET)	WIDTH (FEET)	DEPTH (FEET)	BOTTOM OF STORAGE	TOP OF STORAGE	MINIMUM FINISH GRADE	OUTLET PIPE INVERT	TEST LOCATION	GROUND ELEVATION AT TEST	TEST DEPTH ELEVATION	ROCK DEPTH ELEVATION	GROUNDWATER DEPTH ELEVATION	INFILTRATION RATE
1A	STONE	0.44	0.27	72	40	2.00	126.00	128.00	129.79	127.00	3	132.2	5 FT 127.2	NE	NE	0.50 IN/HR
1B	STONE	0.27	0.26	96	25	2.00	127.00	129.00	129.92	126.40	6	130.0	5 FT 125.0	NE	NE	3.25 IN/HR
2	STONE	0.09	0.07	30	24	1.00	108.00	109.00	110.48	106.50	5	117.7	4.5 FT 113.2	NE	NE	0.50 IN/HR



TYPICAL FILL SECTION - SWALE - BLANKET LINED
(NOT TO SCALE)

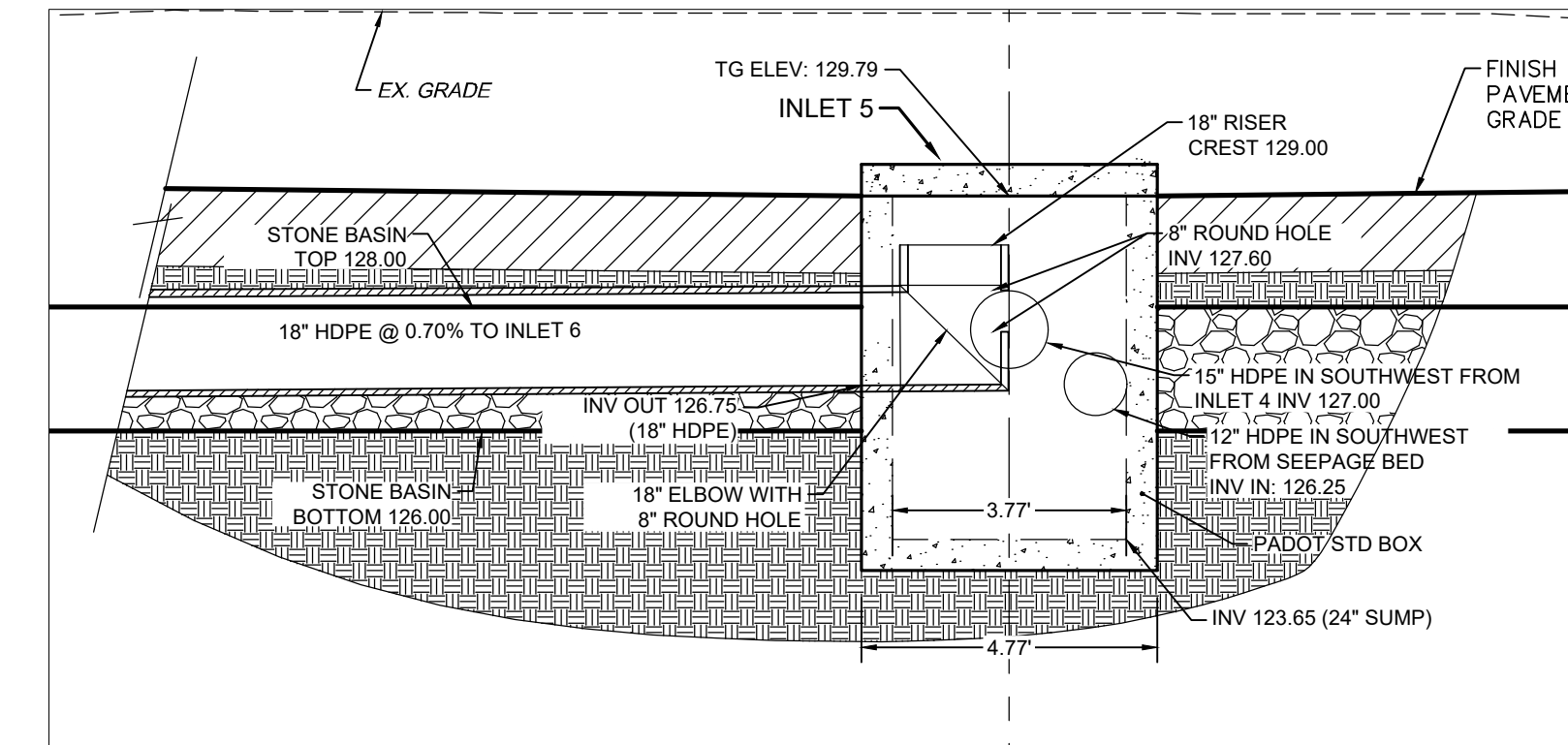


TYPICAL CUT SECTION - SWALE - BLANKET LINED
(NOT TO SCALE)

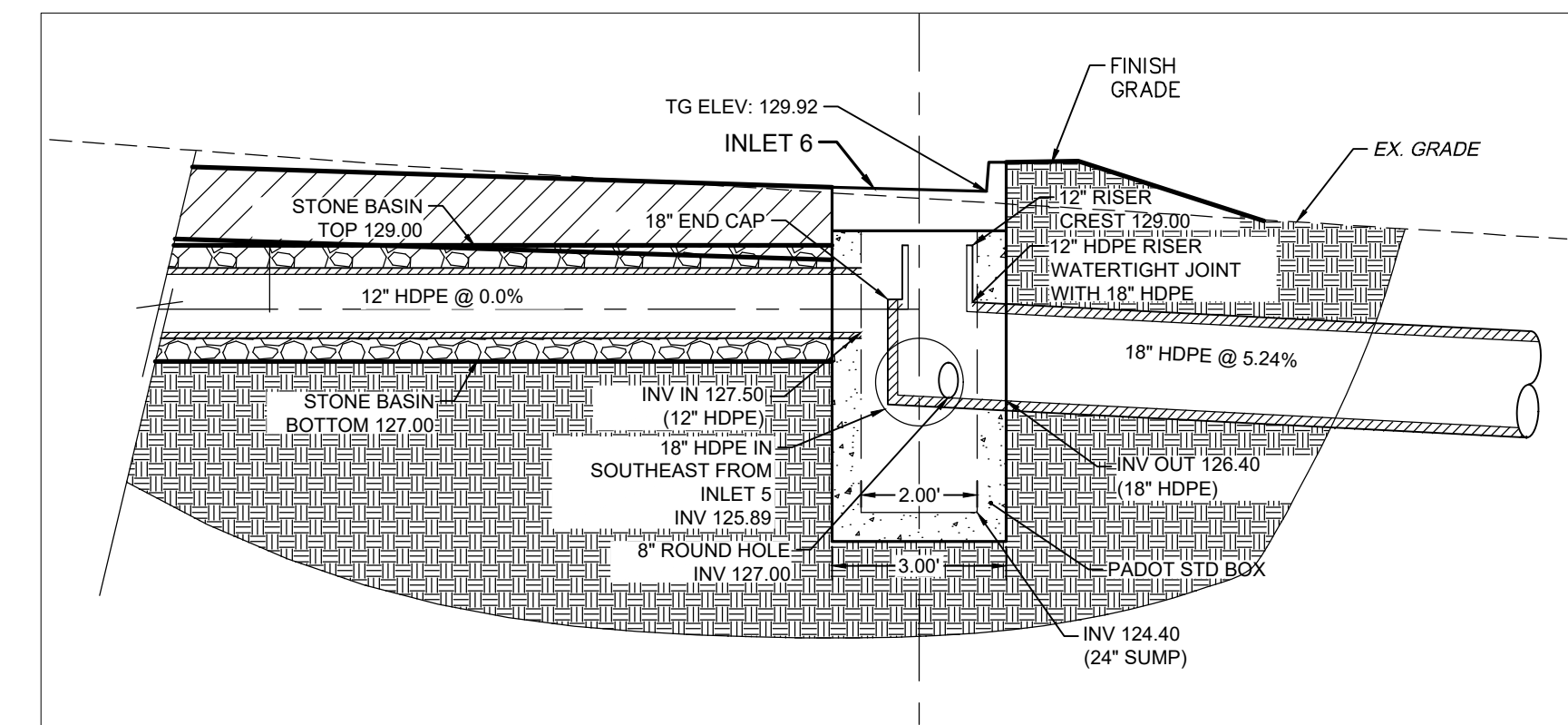
- SWALE CONSTRUCTION NOTES:**
1. EXCAVATION SHALL BEGIN AT DOWNSTREAM END OF THE SWALE.
 2. ALL TREES, ROOTS AND OTHER OBJECTIONABLE MATERIAL SHALL BE REMOVED SO AS NOT TO INTERFERE WITH FLOW.
 3. FILLS SHALL BE COMPACTED BY EARTHMOVING EQUIPMENT TO PREVENT EROSION.
 4. INTERSECTION OF SIDES AND BOTTOM SHALL BE ROUNDED.
 5. CHANGES IN HORIZONTAL AND VERTICAL ALIGNMENT SHALL BE GRADUAL. UNINTERRUPTED POSITIVE GRADE MUST BE MAINTAINED TO THE OUTLET.
 6. STABILIZE SWALES IMMEDIATELY AFTER GRADING IS COMPLETE.
 7. FOR ROCK LINED SWALES INSTALL CLASS 2 TYPE B GEOTEXTILE UNDER ROCK LINING.
 8. S75 OR S150 ETC REFERS TO "NORTH AMERICAN GREENS EROSION CONTROL BLANKET" OR EQUAL IF APPROVED BY THE OWNER.
 9. SWALE ROCK FILTERS SHOULD BE PLACED AT THE END OF SWALES UNTIL THE SWALES ARE STABILIZED.

TRAPEZOIDAL SWALE SCHEDULE

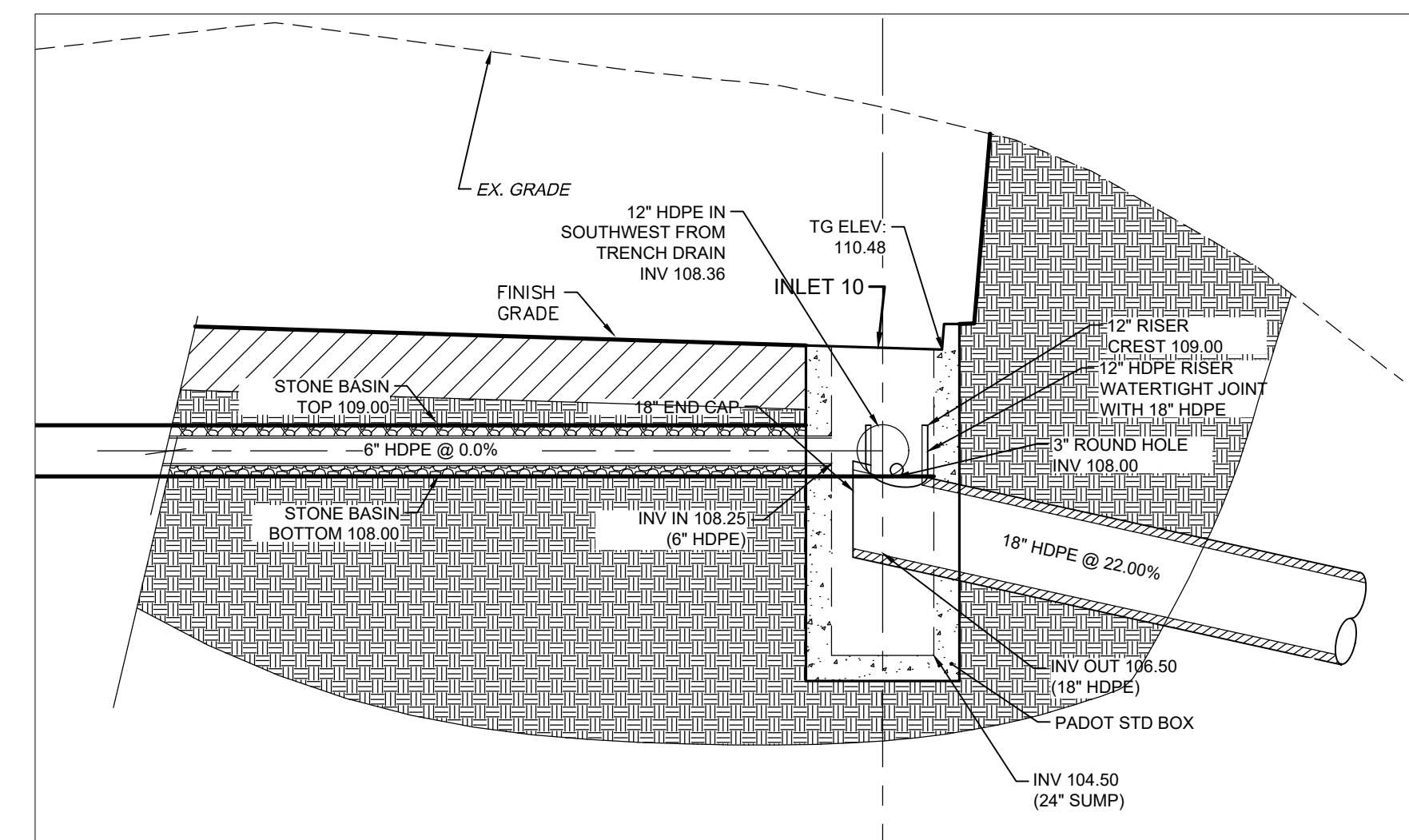
SWALE	MIN BOTTOM WIDTH "B" (ft)	SIDE SLOPES LEFT (ft/ft)	SIDE SLOPES RIGHT (ft/ft)	MIN DEPTH "D" (ft)	LONGITUDINAL SLOPE		LINING
					MIN (ft/ft)	MAX (ft/ft)	
1	2	3.0	3.0	0.5	0.020	0.025	S150
2	2	3.0	3.0	0.5	0.025	0.030	S150
3	2	3.0	3.0	0.5	0.020	0.074	SC150



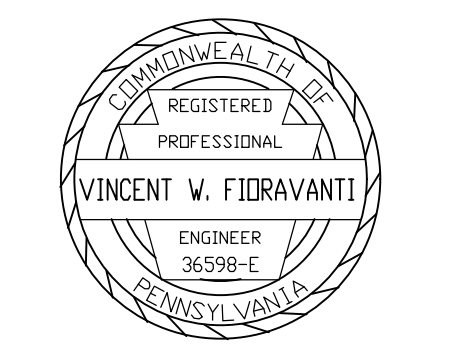
SEEPAGE BED 1B OUTLET
SCALE: 1"= 1'(HORIZ.)



SEEPAGE BED 1B OUTLET
SCALE: 1"= 1'(HORIZ.)



SEEPAGE BED 2 OUTLET
SCALE: 1"= 1'(HORIZ.)



REVISIONS

NO.	DESCRIPTION	DATE
1	TOWNSHIP COMMENTS	9/22/2023
2	TOWNSHIP COMMENTS	3/18/2024

DATE: 8/24/2022
SCALE: AS NOTED
JOB # 2084
DRAWN: STAFF
CHECKED: VWF

4304 & 411 BRISTOL ROAD
BENSLEM TOWNSHIP, PA
PREPARED FOR:
BRILLA LLC
52 E GEORGIANNA DRIVE
RICHBORO PA 18954

**STORMWATER
MANAGEMENT
DETAILS**

Stormwater Management Narrative Report

Prepared for
4304 and 411 Bristol Road
Bensalem Township, PA 18966

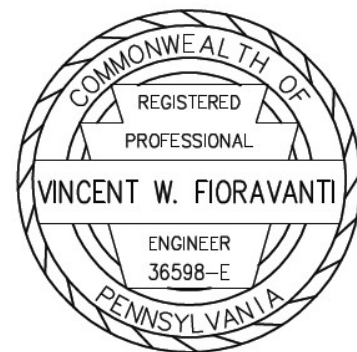
For
Brilla LLC
52 East Georgianna drive
Richboro, PA 19053

Date
8-24-2022

Revised
9-23-2023

PREPARED BY

FIORAVANTI, INC.
618 STREET ROAD
SOUTHAMPTON, PENNSYLVANIA 18966



PROFESSIONAL ENGINEER
REGISTRATION NUMBER

SEAL

PROJECT NARRATIVE

Existing Conditions

This project involves the development of two tracts totaling a 1.1 acres +/- tract of land in Bensalem Township, Bucks County Pa.

The site is bordered on the northeast side by Bristol Road. Improvements on the site in its pre development condition include remnants of a paved parking area. Existing soil cover consists of lawn and wooded areas with underbrush. A significant area from the southwest drains to the site towards Bristol Road.

Under current conditions runoff from the site discharges east to Bristol Road. A substantial drainage area flows to the site from the southwestern residential properties. A site inspection was conducted on 7-28-2022 to verify drainage flow paths from these offsite areas. PASDA topography has been added to the plans to delineate these off site drainage areas.

Proposed Development

In the post development scenario, the property will be developed as commercial properties. The runoff from the new impervious surfaces on each lot will be controlled by three basins. Overflow discharges from each basin will be directed in the general direction of existing drainage paths southeast and northwest on Bristol Road.

Stormwater Quality and Volume Control

Infiltration is proposed for both properties using two of three underground infiltration beds labeled as seepage beds 1A and 1B . The beds are sized in accordance with PADEP requirements for infiltration footprint relative to drainage area and impervious area. Only site drainage areas and impervious areas are considered for footprint sizing as considering offsite areas would be impractical. The two beds also meet the requirements for infiltrating the 2 year storm based on PADEP methods which do not use Cn averaging. In addition, a SCS routing is included to verify the 2 year storm volume is infiltrated. Results of all these conflicting requirements are included in this report. Additional on site testing . TP6, was conducted in the vicinity of Seepage Bed 1 B to verify that the test results from location TP 1 are reasonable. Regardless of the results from test pits TP 1 and TP6, a conservatively low value of 1.0 in/hour was assumed for Seepage Bed 1B. This values is much less than the test results from TP1 and TP 6 with safety factors applied. The required infiltration volume is obtained as verified by routing and is documented in this report

Stormwater Quantity

Peak flow rates are controlled as required in Bensalem code Section 196-135
Volume controls are provided by all three of the three infiltration basins as required inSection 196-135

Storm water flow rates, for the 1, 2, 5, 10, 25, 50 and 100 year storms, were calculated

using the Rational Method.

Hydraulics

Piping is sized for the 100 year storm to ensure conveyance to the seepage beds. The enclosed spreadsheet evaluates the manning's equation all pipe runs.

Travel lane encroachment of gutter flow along Bristol Road at the entrance of Drive A is documented to be much less than half a travel lane along Bristol Road. The fictitious structure used to document flow in this report is structure 200. 10 year discharge to the gutter is 0.5 cfs.

Basin overflow - Basin overflow is conveyed using the basin outlet structure barrel. All three basin outlet barrels have risers in the outlet structure. The crest of these risers form the emergency outlet control. Design discharges are the storage facility inflows. For basin 1 B design flows are the sum of Basin 1A and !B design inflows. This is a reasonably conservative design, accepted by many Townships.

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	<i>end page</i>

Project: 2084 Brilla LLC
 Location: Bensalem Township

By: DLF
 Date: 9/22/2023

The following table demonstrates compliance with Act 167 Section 303. Volume Control

2 YEAR VOLUME CONTROL VOLUME SUMMARY

BMP	Condition	2 Year Volume	2 Year Volume Infiltrated	2 Year Volume Detained
Seepage Bed 1A	Inflow	5169		
	Outflow	2301		
	Treated	2868	2868	
Seepage Bed 1B	Inflow	5215		
	Outflow	2682		
	Treated	2533	2533	
Seepage Bed 2	Inflow			
	Outflow			
	Treated	0	0	
TOTAL			5401	

2 year infiltrated volume for this site is **5401** cf

Required 2 year infiltrated volume for this site is **5088** cf **ok**

Pennsylvania Stormwater Best Management Practices Manual

PROJECT: 2084 Brilla LLC

VOLUME WORKSHEET

2-Year Rainfall 3.26 in

Pre-Construction Conditions

Cover Type/ Condition	Soil Type	Area (sf)	Area (ac)	Cn	S	Ia (0.2*S)	Q Runoff (in)	Runoff Volume ² (ft ³)	Remarks
Woodland	A			30	23.33	4.67	0.09		
Meadow	A			30	23.33	4.67	0.09		
Lawn	A			39	15.64	3.13	0.00		
Impervious	A			98	0.20	0.04	3.03		
Woodland	B	9757	0.22	55	8.18	1.64	0.27	219	
Meadow	B			58	7.24	1.45	0.36		
Lawn	B	30056	0.69	61	6.39	1.28	0.47	1174	
Impervious	B	10106	0.23	98	0.20	0.04	3.03	2549	
Woodland	C			70	4.29	0.86	0.86		
Meadow	C			71	4.08	0.82	0.91		
Lawn	C			74	3.51	0.70	1.08		
Impervious	C			98	0.20	0.04	3.03		
Woodland	D			77	2.99	0.60	1.25		
Meadow	D			78	2.82	0.56	1.32		
Lawn	D			80	2.50	0.50	1.45		
Impervious	D			98	0.20	0.04	3.03		
Total			1.15					3942	

Developed Conditions:

Cover Type/ Condition	Soil Type	Area (sf)	Area (ac)	Cn	S	Ia (0.2*S)	Q Runoff (in)	Runoff Volume ² (ft ³)	Remarks
Woodland	A			30	23.33	4.67	0.09		
Meadow	A			30	23.33	4.67	0.09		
Lawn	A			40.95	14.42	2.88	0.01		
Impervious	A			98	0.20	0.04	3.03		
Woodland	B			55	8.18	1.64	0.27		
Meadow	B			58	7.24	1.45	0.36		
Lawn	B	18295	0.42	64.05	5.61	1.12	0.59	899	
Impervious	B	32234	0.74	98	0.20	0.04	3.03	8132	
Woodland	C			70	4.29	0.86	0.86		
Meadow	C			71	4.08	0.82	0.91		
Lawn	C			77.7	2.87	0.57	1.30		
Impervious	C			98	0.20	0.04	3.03		
Woodland	D			77	2.99	0.60	1.25		
Meadow	D			78	2.82	0.56	1.32		
Lawn	D			84	1.90	0.38	1.73		
Impervious	D			98	0.20	0.04	3.03		
Total			1.16					9031	

Volume Increase 5088 cf Post Development multiplier 1.05
Volume Infiltrated 5401 cf

Project: 2084 Brilla LLC
 Location: Bensalem Township

By: DLF
 Date: 9/22/2023

Peak Rate Control Summary Table

SCS Method

Point of Interest 1 Neshaminy Creek District B

Design Storm	Post Development Runoff and Discharges			Seepage Bed 1A			Outlets									
	1A Site	1A Off Site	1A Total	Discharge	Elevation	Storage	Length	Width	Area	Floor	Top	Depth	Voids	Invert	Quantity	Size
1	1.09	0.62	1.71	0.05	127.72	2015	72.00	40.00	2880.00	126.00	128.00	2.00	0.40			
2	1.46	1.05	2.50	0.27	127.89	2214										
Hydroflow col	c	c	c	c	i	j										
Hydroflow row	6	7	8	9	9	9										

Point of Interest 1

Design Storm	Post Development Runoff and Discharges			Seepage Bed 1B			Outlets								
	1B Site	1B Total	Discharge	Elevation	Storage	Length	Width	Area	Floor	Top	Depth	Voids	Invert	Quantity	Size
1	1.04	1.04	0.66	127.49	472	96.00	25.00	2400.00	127.00	129.00	2.00	0.40			
2	1.27	1.27	0.83	127.58	556										
Hydroflow col	c	c	c	i	j										
Hydroflow row	10	11	12	12	12										

Point of Interest 2 Neshaminy Creek District B

Design Storm	Post Development Runoff and Discharges			Seepage Bed 2			Outlets									
	Site	Off Site	Total	Discharge	Elevation	Storage	Length	Width	Area	Floor	Top	Depth	Voids	Invert	Quantity	Size
1	0.29	0.00	0.29	0.15	108.50	147	30.00	24.00	720.00	108.00	109.00	1.00	0.40			
2	0.36	0.02	0.37	0.18	108.67	197										
Hydroflow col	c	c	c	c	i	j										
Hydroflow row	20	21	22	23	23	23										

Seepage Bed Drain Times

Structure	Rainfall	Length	Width	Floor Area	Max Water Depth	Void Ratio	Maximum Water Volume	Test Location	Tested Infiltration Rate	Design Infiltration Rate		Total Drain Time
		<i>ft</i>	<i>ft</i>	<i>sf</i>	<i>ft</i>					<i>cf</i>	<i>in/hr</i>	
Seepage Bed 1A	3.26	72	40	2880	2.00	0.40	2304	3	0.50	0.25	0.0000058	38.40
Seepage Bed 1B	3.26	96	25	2400	2.00	0.40	1920	1	13.50	6.75	0.0001563	1.42
Seepage Bed 2	3.26	30	24	720	1.00	0.40	288	5				

end page

Project: 2084 Brilla LLC
 Location: Bensalem Township

By: DLF
 Date: 9/22/2023

Input Summary SCS Method

	Point of Interest	Name	Discharge To	Condition	Location	Area (ac)	Impervious	Lawn	Cn	Tc (min)	Notes
1	1	1	Property Line	Present	Site	0.74	0.19		69.89	6.00	
2	1	1	Property Line	Present	Offsite	0.73	0.16		69.11	6.00	
3	1	1A	Seepage Bed	Developed	Site	0.44	0.27		84.88	6.00	
4	1	1A	Seepage Bed	Developed	Offsite	0.75	0.15	0.60	68.40	6.00	
5	1	1B	Seepage Bed	Developed	Site	0.27	0.26	0.01	96.74	6.00	
6	1	1	Bypass	Developed	Site	0.16	0.07	0.09	78.90	6.00	
7	1	1	Bypass	Developed	Offsite	0.11	0.04	0.07	74.45	6.00	
8	2	2	Property Line	Present	Site	0.41	0.04	0.37	62.64	6.77	
9	2	2	Property Line	Present	Offsite	1.52	0.32	1.20	68.36	6.77	
10	2	2	Seepage Bed	Developed	Site	0.09	0.07	0.02	90.46	6.00	
11	2	2	Seepage Bed	Developed	Offsite	0.06	0.00		55.00	6.00	
12	2	2	Bypass	Developed	Site	0.20	0.07		75.93	6.00	
13	2	2	Bypass	Developed	Offsite	1.35	0.32		69.50	6.00	

Seepage Bed Loadings

	Seepage Bed	Impervious Area	Ratio to 1	Reccomended Bed Footprint	Drainage Area	Ratio to 1	Reccomended Bed Footprint	Proposed Bed Footprint	Result
	1A	11761	5.00	2352	19166	8.00	2396	2880	120%
	1B	11326	5.00	2265	11761	8.00	1470	2400	106%
	2	3049	5.00	610	3920	8.00	490	720	118%

WORKSHEET: 2 Runoff curve number and runoff

Project 2084 Brilla LLC
 Location: Bensalem Township

By: DLF
 Date: 09/22/2023

Condition Present
 Ex imp credit 0.80
 Lawn x 1.00

POI 1
 Discharge to Property Line
 Location Site

Watershed Area 0.74 acres
 0.0012 sq mi

Runoff curve number Cn

	Soil name	Cover Description	Cn	Area <i>acres</i>	"Cn" x Area <i>acres</i>
<i>soil group total in acres</i>	A	Impervious	98.00		
	A	Turf	39.00		
	A	Meadow	30.00		
	A	Woods	30.00		
<i>soil group total in acres 0.74</i>	B	Impervious	98.00	0.19	18.82
	B	Turf	61.00	0.46	28.06
	B	Meadow	58.00		
	B	Woods	55.00	0.09	4.84
<i>soil group total in acres</i>	C	Impervious	98.00		
	C	Turf	74.00		
	C	Meadow	71.00		
	C	Woods	70.00		
<i>soil group total in acres</i>	D	Impervious	98.00		
	D	Turf	80.00		
	D	Meadow	78.00		
	D	Woods	77.00		
Total				0.74	51.72

Cn= 69.89 25.95% Impervious

Runoff Volumes			
Storm yr	Rainfall in	Runoff in	Volume cf
MDE		0.22	
EISA		0.22	
1	2.71	0.55	1490
2	3.26	0.86	2303
5	4.11	1.40	3750
10	4.81	1.89	5071
25	5.83	2.66	7147
50	6.70	3.36	9023
100	7.63	4.14	11109

25.9%

WORKSHEET: 2 Runoff curve number and runoff

Project 2084 Brilla LLC
 Location: Bensalem Township

By: DLF
 Date: 09/22/2023

Condition POI 1
 Ex imp credit 1.00 Discharge to Property Line
 Lawn x 1.00 Location Offsite
 Watershed Area 0.73 acres

Runoff curve number Cn 0.0011 sq mi

	Soil name	Cover Description	"Cn"	Area <i>acres</i>	"Cn" x Area <i>acres</i>
<i>soil group total in acres</i>	A	Impervious	98.00		
	A	Turf	39.00		
	A	Meadow	30.00		
	A	Woods	30.00		
<i>soil group total in acres 0.73</i>	B	Impervious	98.00	0.16	15.68
	B	Turf	61.00	0.57	34.77
	B	Meadow	58.00		
	B	Woods	55.00		
<i>soil group total in acres</i>	C	Impervious	98.00		
	C	Turf	74.00		
	C	Meadow	71.00		
	C	Woods	70.00		
<i>soil group total in acres</i>	D	Impervious	98.00		
	D	Turf	80.00		
	D	Meadow	78.00		
	D	Woods	77.00		
	Total			0.73	50.45

Cn= 21.92% Impervious

Runoff Volumes

Storm yr	Rainfall in	Runoff in	Volume cf
MDE		0.22	592
EISA		0.22	592
1	2.71	0.52	1390
2	3.26	0.82	2170
5	4.11	1.35	3566
10	4.81	1.83	4846
25	5.83	2.59	6864
50	6.70	3.28	8693
100	7.63	4.05	10730

WORKSHEET: 2 Runoff curve number and runoff

Project 2084 Brilla LLC
 Location: Bensalem Township

By: DLF
 Date: 09/22/2023

Condition Developed
 Ex imp credit 1.00
 Lawn x 1.05

POI 1A
 Discharge to Seepage Bed
 Location Site

Watershed Area 0.44 acres
 0.0007 sq mi

Runoff curve number Cn

	Soil name	Cover Description	"Cn"	Area <i>acres</i>	"Cn" x Area <i>acres</i>
<i>soil group total in acres</i>	A	Impervious	98.00		
	A	Turf	40.95		
	A	Meadow	30.00		
	A	Woods	30.00		
<i>soil group total in acres 0.44</i>	B	Impervious	98.00	0.27	26.46
	B	Turf	64.05	0.17	10.89
	B	Meadow	58.00		
	B	Woods	55.00		
<i>soil group total in acres</i>	C	Impervious	98.00		
	C	Turf	77.70		
	C	Meadow	71.00		
	C	Woods	70.00		
<i>soil group total in acres</i>	D	Impervious	98.00		
	D	Turf	84.00		
	D	Meadow	78.00		
	D	Woods	77.00		
	Total			0.440	37.35

Cn= 84.88 61.36% Impervious

Runoff Volumes	Storm yr	Rainfall in	Runoff in	Volume cf
MDE			0.09	142
EISA			0.09	142
1		2.71	1.34	2140
2		3.26	1.80	2875
5		4.11	2.55	4066
10		4.81	3.18	5082
25		5.83	4.13	6597
50		6.70	4.95	7911
100		7.63	5.84	9333

WORKSHEET: 2 Runoff curve number and runoff

Project 2084 Brilla LLC
 Location: Bensalem Township

By: DLF
 Date: 09/22/2023

Condition Developed POI 1A
 Ex imp credit 1.00 Discharge to Seepage Bed
 Lawn x 1.00 Location Offsite

Watershed Area 0.75 acres
 0.0012 sq mi

Runoff curve number Cn

	Soil name	Cover Description	"Cn"	Area <i>acres</i>	"Cn" x Area <i>acres</i>
<i>soil group total in acres</i>	A	Impervious	98.00		
	A	Turf	39.00		
	A	Meadow	30.00		
	A	Woods	30.00		
<i>soil group total in acres 0.75</i>	B	Impervious	98.00	0.15	14.70
	B	Turf	61.00	0.60	36.60
	B	Meadow	58.00		
	B	Woods	55.00		
<i>soil group total in acres</i>	C	Impervious	98.00		
	C	Turf	74.00		
	C	Meadow	71.00		
	C	Woods	70.00		
<i>soil group total in acres</i>	D	Impervious	98.00		
	D	Turf	80.00		
	D	Meadow	78.00		
	D	Woods	77.00		
Total				0.75	51.30

Cn= 68.40 20.00% Impervious

Runoff Volumes

	Storm yr	Rainfall in	Runoff in	Volume cf
	MDE		0.23	629
	EISA		0.23	629
	1	2.71	0.50	1356
	2	3.26	0.78	2136
	5	4.11	1.30	3540
	10	4.81	1.78	4833
	25	5.83	2.53	6879
	50	6.70	3.21	8737
	100	7.63	3.97	10810

WORKSHEET: 2 Runoff curve number and runoff

Project 2084 Brilla LLC
 Location: Bensalem Township

By: DLF
 Date: 09/22/2023

Condition **Developed** POI 1
 Ex imp credit 1.00 Discharge to Bypass
 Lawn x 1.05 Location Site

Watershed Area 0.16 acres
 Runoff curve number Cn 0.0003 sq mi

	Soil name	Cover Description	"Cn"	Area acres	"Cn" x Area acres
<i>soil group total in acres</i>	A	Impervious	98.00		
	A	Turf	40.95		
	A	Meadow	30.00		
	A	Woods	30.00		
<i>soil group total in acres 0.16</i>	B	Impervious	98.00	0.07	6.86
	B	Turf	64.05	0.09	5.76
	B	Meadow	58.00		
	B	Woods	55.00		
<i>soil group total in acres</i>	C	Impervious	98.00		
	C	Turf	77.70		
	C	Meadow	71.00		
	C	Woods	70.00		
<i>soil group total in acres</i>	D	Impervious	98.00		
	D	Turf	84.00		
	D	Meadow	78.00		
	D	Woods	77.00		
	Total			0.16	12.62

Cn= **78.90** 43.75% Impervious

Runoff Volumes			
Storm yr	Rainfall in	Runoff in	Volume cf
MDE		0.13	78
EISA		0.13	78
1	2.71	0.98	567
2	3.26	1.38	799
5	4.11	2.05	1188
10	4.81	2.63	1528
25	5.83	3.52	2044
50	6.70	4.30	2498
100	7.63	5.15	2993

WORKSHEET: 2 Runoff curve number and runoff

Project 2084 Brilla LLC
 Location: Bensalem Township

By: DLF
 Date: 09/22/2023

Condition **Developed** POI 1
 Ex imp credit 1.00 Discharge to Bypass
 Lawn x 1.00 Location Offsite

Watershed Area 0.11 acres
 Runoff curve number Cn 0.0002 sq mi

	Soil name	Cover Description	"Cn"	Area acres	"Cn" x Area acres
<i>soil group total in acres</i>	A	Impervious	98.00		
	A	Turf	39.00		
	A	Meadow	30.00		
	A	Woods	30.00		
<i>soil group total in acres 0.11</i>	B	Impervious	98.00	0.04	3.92
	B	Turf	61.00	0.07	4.27
	B	Meadow	58.00		
	B	Woods	55.00		
<i>soil group total in acres</i>	C	Impervious	98.00		
	C	Turf	74.00		
	C	Meadow	71.00		
	C	Woods	70.00		
<i>soil group total in acres</i>	D	Impervious	98.00		
	D	Turf	80.00		
	D	Meadow	78.00		
	D	Woods	77.00		
	Total			0.11	8.19

Cn= **74.45** 36.36% Impervious

Runoff Volumes

Storm yr	Rainfall in	Runoff in	Volume cf
MDE		0.17	69
EISA		0.17	69
1	2.71	0.75	300
2	3.26	1.10	441
5	4.11	1.71	683
10	4.81	2.25	899
25	5.83	3.09	1232
50	6.70	3.83	1529
100	7.63	4.65	1856

WORKSHEET: 2 Runoff curve number and runoff

Project 2084 Brilla LLC
 Location: Bensalem Township

By: DLF
 Date: 09/22/2023

Condition **Present** POI 2
 Ex imp credit 1.00 Discharge to Property Line
 Lawn x 1.00 Location Offsite

Watershed Area 1.52 acres
 0.0024 sq mi

Runoff curve number Cn

	Soil name	Cover Description	"Cn"	Area acres	"Cn" x Area acres
<i>soil group total in acres</i>	A	Impervious	98.00		
	A	Turf	39.00		
	A	Meadow	30.00		
	A	Woods	30.00		
<i>soil group total in acres 1.52</i>	B	Impervious	98.00	0.32	31.36
	B	Turf	61.00	1.09	66.49
	B	Meadow	58.00		
	B	Woods	55.00	0.11	6.05
<i>soil group total in acres</i>	C	Impervious	98.00		
	C	Turf	74.00		
	C	Meadow	71.00		
	C	Woods	70.00		
<i>soil group total in acres</i>	D	Impervious	98.00		
	D	Turf	80.00		
	D	Meadow	78.00		
	D	Woods	77.00		
	Total			1.52	103.90

Cn= **68.36** 21.05% Impervious

Runoff Volumes

Storm yr	Rainfall in	Runoff in	Volume cf
MDE		0.23	1277
EISA		0.23	1277
1	2.71	0.50	2738
2	3.26	0.78	4317
5	4.11	1.30	7159
10	4.81	1.77	9777
25	5.83	2.52	13919
50	6.70	3.20	17682
100	7.63	3.97	21881

WORKSHEET: 2 Runoff curve number and runoff

Project 2084 Brilla LLC
 Location: Bensalem Township

By: DLF
 Date: 09/22/2023

Condition **Developed** POI 2
 Ex imp credit 1.00 Discharge to Seepage Bed
 Lawn x 1.05 Location Site

Watershed Area 0.09 acres
 0.0001 sq mi

Runoff curve number Cn

	Soil name	Cover Description	"Cn"	Area acres	"Cn" x Area acres
<i>soil group total in acres</i>	A	Impervious	98.00		
	A	Turf	40.95		
	A	Meadow	30.00		
	A	Woods	30.00		
<i>soil group total in acres 0.09</i>	B	Impervious	98.00	0.07	6.86
	B	Turf	64.05	0.02	1.28
	B	Meadow	58.00		
	B	Woods	55.00		
<i>soil group total in acres</i>	C	Impervious	98.00		
	C	Turf	77.70		
	C	Meadow	71.00		
	C	Woods	70.00		
<i>soil group total in acres</i>	D	Impervious	98.00		
	D	Turf	84.00		
	D	Meadow	78.00		
	D	Woods	77.00		
	Total			0.09	8.14

Post Development multiplier 1.05

Cn= **90.46** 77.78% Impervious

Runoff Volumes

Storm yr	Rainfall in	Runoff in	Volume cf
MDE		0.05	17
EISA		0.05	17
1	2.71	1.76	574
2	3.26	2.27	740
5	4.11	3.07	1002
10	4.81	3.74	1222
25	5.83	4.73	1545
50	6.70	5.58	1823
100	7.63	6.50	2122

WORKSHEET: 2 Runoff curve number and runoff

Project 2084 Brilla LLC
 Location: Bensalem Township

By: DLF
 Date: 09/22/2023

Condition **Developed** POI 2
 Ex imp credit 1.00 Discharge to Seepage Bed
 Lawn x 1.00 Location Offsite

Watershed Area 0.06 acres
 0.0001 sq mi

Runoff curve number Cn

	Soil name	Cover Description	"Cn"	Area acres	"Cn" x Area acres
<i>soil group total in acres</i>	A	Impervious	98.00		
	A	Turf	39.00		
	A	Meadow	30.00		
	A	Woods	30.00		
<i>soil group total in acres 0.06</i>	B	Impervious	98.00		
	B	Turf	61.00		
	B	Meadow	58.00		
	B	Woods	55.00	0.06	3.30
<i>soil group total in acres</i>	C	Impervious	98.00		
	C	Turf	74.00		
	C	Meadow	71.00		
	C	Woods	70.00		
<i>soil group total in acres</i>	D	Impervious	98.00		
	D	Turf	80.00		
	D	Meadow	78.00		
	D	Woods	77.00		
	Total			0.06	3.30

Cn= **55.00** Impervious

Runoff Volumes

Storm yr	Rainfall in	Runoff in	Volume cf
MDE		0.41	89
EISA		0.41	89
1	2.71	0.12	27
2	3.26	0.27	59
5	4.11	0.57	125
10	4.81	0.89	193
25	5.83	1.42	310
50	6.70	1.94	422
100	7.63	2.53	552

WORKSHEET: 2 Runoff curve number and runoff

Project 2084 Brilla LLC
 Location: Bensalem Township

By: DLF
 Date: 09/22/2023

Condition Developed POI 2
 Ex imp credit 1.00 Discharge to Bypass
 Lawn x 1.05 Location Site

Watershed Area 0.20 acres
 0.0003 sq mi

Runoff curve number Cn

	Soil name	Cover Description	"Cn"	Area <i>acres</i>	"Cn" x Area <i>acres</i>
<i>soil group total in acres</i>	A	Impervious	98.00		
	A	Turf	40.95		
	A	Meadow	30.00		
	A	Woods	30.00		
<i>soil group total in acres 0.20</i>	B	Impervious	98.00	0.07	6.86
	B	Turf	64.05	0.13	8.33
	B	Meadow	58.00		
	B	Woods	55.00		
<i>soil group total in acres</i>	C	Impervious	98.00		
	C	Turf	77.70		
	C	Meadow	71.00		
	C	Woods	70.00		
<i>soil group total in acres</i>	D	Impervious	98.00		
	D	Turf	84.00		
	D	Meadow	78.00		
	D	Woods	77.00		
Total				0.20	15.19

Cn= 75.93 35.00% Impervious

Runoff Volumes

Storm yr	Rainfall in	Runoff in	Volume cf
MDE		0.16	115
EISA		0.16	115
1	2.71	0.82	597
2	3.26	1.19	864
5	4.11	1.82	1320
10	4.81	2.37	1724
25	5.83	3.23	2343
50	6.70	3.98	2893
100	7.63	4.81	3496

WORKSHEET: 2 Runoff curve number and runoff

Project 2084 Brilla LLC
 Location: Bensalem Township

By: DLF
 Date: 09/22/2023

Condition **Developed** POI 2
 Ex imp credit 1.00 Discharge to Bypass
 Lawn x 1.00 Location Offsite

Watershed Area 1.35 acres
 0.0021 sq mi

Runoff curve number Cn

	Soil name	Cover Description	"Cn"	Area acres	"Cn" x Area acres
<i>soil group total in acres</i>	A	Impervious	98.00		
	A	Turf	39.00		
	A	Meadow	30.00		
	A	Woods	30.00		
<i>soil group total in acres 1.35</i>	B	Impervious	98.00	0.32	31.36
	B	Turf	61.00	0.97	59.17
	B	Meadow	58.00		
	B	Woods	55.00	0.06	3.30
<i>soil group total in acres</i>	C	Impervious	98.00		
	C	Turf	74.00		
	C	Meadow	71.00		
	C	Woods	70.00		
<i>soil group total in acres</i>	D	Impervious	98.00		
	D	Turf	80.00		
	D	Meadow	78.00		
	D	Woods	77.00		
	Total			1.35	93.83

impervious= 23 percent of area of Lot 4

Cn= **69.50** 23.70% Impervious

Runoff Volumes			
Storm yr	Rainfall in	Runoff in	Volume cf
MDE		0.22	1075
EISA		0.22	1075
1	2.71	0.54	2645
2	3.26	0.84	4109
5	4.11	1.37	6720
10	4.81	1.86	9108
25	5.83	2.63	12868
50	6.70	3.32	16271
100	7.63	4.09	20057

WORKSHEET: 2 Runoff curve number and runoff

Project 2084 Brilla LLC
 Location: Bensalem Township

By: DLF
 Date: 09/22/2023

Condition Developed POI 1B
 Ex imp credit 1.00 Discharge to Seepage Bed
 Lawn x 1.05 Location Site

Watershed Area 0.27 acres
 0.0004 sq mi

Runoff curve number Cn

	Soil name	Cover Description	"Cn"	Area <i>acres</i>	"Cn" x Area <i>acres</i>
<i>soil group total in acres</i>	A	Impervious	98.00		
	A	Turf	40.95		
	A	Meadow	30.00		
	A	Woods	30.00		
<i>soil group total in acres 0.27</i>	B	Impervious	98.00	0.26	25.48
	B	Turf	64.05	0.01	0.64
	B	Meadow	58.00		
	B	Woods	55.00		
<i>soil group total in acres</i>	C	Impervious	98.00		
	C	Turf	77.70		
	C	Meadow	71.00		
	C	Woods	70.00		
<i>soil group total in acres</i>	D	Impervious	98.00		
	D	Turf	84.00		
	D	Meadow	78.00		
	D	Woods	77.00		
			Total	0.27	26.12

Post Development multiplier 1.05

Cn= 96.74 96.30% Impervious

Runoff Volumes

	Storm yr	Rainfall in	Runoff in	Volume cf
	MDE		0.02	17
	EISA		0.02	17
	1	2.71	2.34	2297
	2	3.26	2.89	2831
	5	4.11	3.73	3658
	10	4.81	4.43	4340
	25	5.83	5.44	5336
	50	6.70	6.31	6187
	100	7.63	7.24	7096

WORKSHEET: 3 Time of Concentration (Tc) or travel time (Tt)

Project 2084 Brilla LLC
 Location: Bensalem Township

By: DLF
 Date: 09/22/2023

Circle one Present

POI 1

Sheet flow

		Segment ID	1	
1	Surface description		Grass	
2	Manning's roughness coefficient, n		0.24	
3	Flow length, L	ft	74	
4	Two-year 24 hour rainfall, P2	inches	3.26	
5	Land slope, S	ft/ft	0.123	
6	$Tt=0.042(nL)^{.8}/P2^{.5}*S^{.4}$	minutes	5.37	Sum = 5.37

Shallow concentrated flow

	Segment ID	1	2	3	4	
7	Surface description	UNPAVED	UNPAVED	UNPAVED	UNPAVED	
8	Flow length, L (ft)	74	114			
9	Watercourse slope, S (ft/ft)	0.149	0.078			
10	Average velocity, V (ft/sec)	6.22	4.51			
11	$Tt = L / 60 * V$ (min)	0.20	0.42			Sum = 0.62

Channel and Pipe flow

	Channel 1	Pipe 1	Channel 1	Channel 2	
12	Segment ID				
13	channel bottom width or pipe diameter (ft)				
14	Flow depth (ft)				
15	Channel side slope left $_ : 1$				
16	Channel side slope right $_ : 1$				
17	Cross sectional flow area, A (sf)				
18	Wetted perimeter, Pw (ft)				
19	Hydraulic radius, A/Pw (ft)				
20	Watercourse slope, S (ft/ft)				
21	Manning's roughness coefficient, n	0.050			
22	Average velocity (ft/sec)				
23	Flow length, L (ft)				
24	$Tt = L / 60 * V$ (min)				Sum =

25 **Watershed Tc** minutes = hours

WORKSHEET: 3 Time of Concentration (Tc) or travel time (Tt)

Project 2084 Brilla LLC
 Location: Bensalem Township

By: DLF
 Date: 09/22/2023

Circle one Present POI 2

Sheet flow

		Segment ID	1		
1	Surface description		Grass		
2	Manning's roughness coefficient, n		0.24		
3	Flow length, L	ft	65		
4	Two-year 24 hour rainfall, P2	inches	3.26		
5	Land slope, S	ft/ft	0.075		
6	$Tt=0.042(nL)^{.8}/P2^{.5}*S^{.4}$	minutes	5.89	Sum =	5.89

Shallow concentrated flow

		Segment ID	1	2	3	4
7	Surface description		UNPAVED	UNPAVED	UNPAVED	Paved
8	Flow length, L (ft)		61	49	97	92
9	Watercourse slope, S (ft/ft)		0.082	0.143	0.114	0.109
10	Average velocity, V (ft/sec)		4.62	6.10	5.46	6.70
11	$Tt = L / 60 * V$ (min)		0.22	0.13	0.30	0.23
					Sum =	0.88

Channel and Pipe flow

		Pipe 1	Pipe 2	Channel 2	Channel 1
12	Segment ID				
17	Cross sectional flow area, A (sf)				
18	Wetted perimeter, Pw (ft)				
19	Hydraulic radius, A/Pw (ft)				
20	Watercourse slope, S (ft/ft)				
21	Manning's roughness coefficient, n	0.013	0.013	0.050	0.050
22	Average velocity (ft/sec)				
23	Flow length, L (ft)				
24	$Tt = L / 60 * V$ (min)				
				Sum =	

25 **Watershed Tc** 6.77 minutes = 0.11 hours

Hydrograph Return Period Recap

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

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	----	0.702	1.146	----	----	----	----	----	----	1 Pre Dev Site
2	SCS Runoff	----	0.643	1.070	----	----	----	----	----	----	1 Pre Dev Off Site
3	Combine	1, 2	1.345	2.215	----	----	----	----	----	----	1 Pre Dev Total ****
4	SCS Runoff	----	1.094	1.456	----	----	----	----	----	----	1A Post Dev Site
5	SCS Runoff	----	0.616	1.045	----	----	----	----	----	----	1A Post Dev Off Site
6	Combine	4, 5	1.710	2.501	----	----	----	----	----	----	1A Post Dev Controlled Total
7	Reservoir	6	0.050	0.272	----	----	----	----	----	----	Seepage Bed 1A
8	SCS Runoff	----	1.044	1.270	----	----	----	----	----	----	1B Post Dev Site
9	Combine	7, 8	1.044	1.270	----	----	----	----	----	----	1B Post Dev Controlled Total
10	Reservoir	9	0.661	0.834	----	----	----	----	----	----	Seepage Bed 1B
11	SCS Runoff	----	0.290	0.410	----	----	----	----	----	----	1 Post Dev Site Bypass
12	SCS Runoff	----	0.151	0.225	----	----	----	----	----	----	1 Post Dev Off Site Bypass
13	Combine	10, 11, 12	1.044	1.401	----	----	----	----	----	----	1 Post Dev Total ****
15	SCS Runoff	----	0.141	0.305	----	----	----	----	----	----	2 Pre Dev Site
16	SCS Runoff	----	1.117	1.900	----	----	----	----	----	----	2 Pre Dev Off Site
17	Combine	15, 16	1.252	2.205	----	----	----	----	----	----	2 Pre Dev Total ****
18	SCS Runoff	----	0.285	0.363	----	----	----	----	----	----	2 Post Dev Site
19	SCS Runoff	----	0.002	0.015	----	----	----	----	----	----	2 Post Dev Off Site
20	Combine	18, 19	0.285	0.373	----	----	----	----	----	----	2 Post Dev Controlled Total
21	Reservoir	20	0.145	0.175	----	----	----	----	----	----	Seepage Bed 2
22	SCS Runoff	----	0.301	0.442	----	----	----	----	----	----	2 Post Dev Site Bypass
23	SCS Runoff	----	1.235	2.034	----	----	----	----	----	----	2 Post Dev Off Site Bypass
24	Combine	21, 22, 23	1.664	2.629	----	----	----	----	----	----	2 Post Dev Total ****

Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

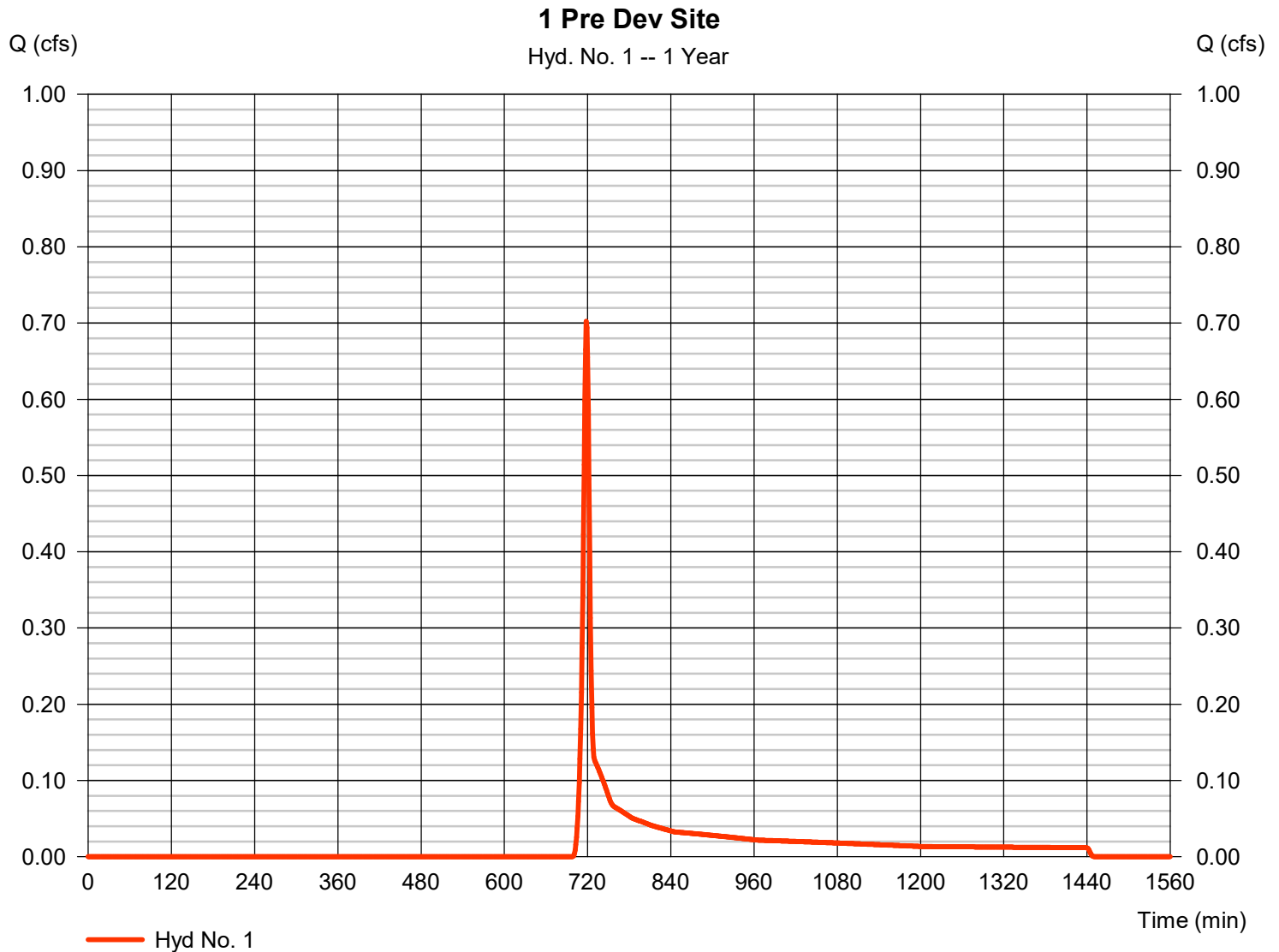
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	0.702	1	718	1,538	----	----	----	1 Pre Dev Site
2	SCS Runoff	0.643	1	718	1,433	----	----	----	1 Pre Dev Off Site
3	Combine	1.345	1	718	2,971	1, 2	----	----	1 Pre Dev Total ****
4	SCS Runoff	1.094	1	718	2,209	----	----	----	1A Post Dev Site
5	SCS Runoff	0.616	1	718	1,398	----	----	----	1A Post Dev Off Site
6	Combine	1.710	1	718	3,607	4, 5	----	----	1A Post Dev Controlled Total
7	Reservoir	0.050	1	839	810	6	127.72	2,015	Seepage Bed 1A
8	SCS Runoff	1.044	1	717	2,365	----	----	----	1B Post Dev Site
9	Combine	1.044	1	717	3,174	7, 8	----	----	1B Post Dev Controlled Total
10	Reservoir	0.661	1	721	1,121	9	127.49	472	Seepage Bed 1B
11	SCS Runoff	0.290	1	718	584	----	----	----	1 Post Dev Site Bypass
12	SCS Runoff	0.151	1	718	310	----	----	----	1 Post Dev Off Site Bypass
13	Combine	1.044	1	719	2,015	10, 11, 12	----	----	1 Post Dev Total ****
15	SCS Runoff	0.141	1	720	445	----	----	----	2 Pre Dev Site
16	SCS Runoff	1.117	1	719	2,679	----	----	----	2 Pre Dev Off Site
17	Combine	1.252	1	719	3,123	15, 16	----	----	2 Pre Dev Total ****
18	SCS Runoff	0.285	1	717	593	----	----	----	2 Post Dev Site
19	SCS Runoff	0.002	1	723	28	----	----	----	2 Post Dev Off Site
20	Combine	0.285	1	717	621	18, 19	----	----	2 Post Dev Controlled Total
21	Reservoir	0.145	1	723	615	20	108.50	147	Seepage Bed 2
22	SCS Runoff	0.301	1	718	614	----	----	----	2 Post Dev Site Bypass
23	SCS Runoff	1.235	1	718	2,727	----	----	----	2 Post Dev Off Site Bypass
24	Combine	1.664	1	718	3,956	21, 22, 23	----	----	2 Post Dev Total ****
301 Watersheds 2084 SCS.gpw					Return Period: 1 Year			Friday, 09 / 22 / 2023	

Hydrograph Report

Hyd. No. 1

1 Pre Dev Site

Hydrograph type	= SCS Runoff	Peak discharge	= 0.702 cfs
Storm frequency	= 1 yrs	Time to peak	= 718 min
Time interval	= 1 min	Hyd. volume	= 1,538 cuft
Drainage area	= 0.740 ac	Curve number	= 69.9
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 2.71 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

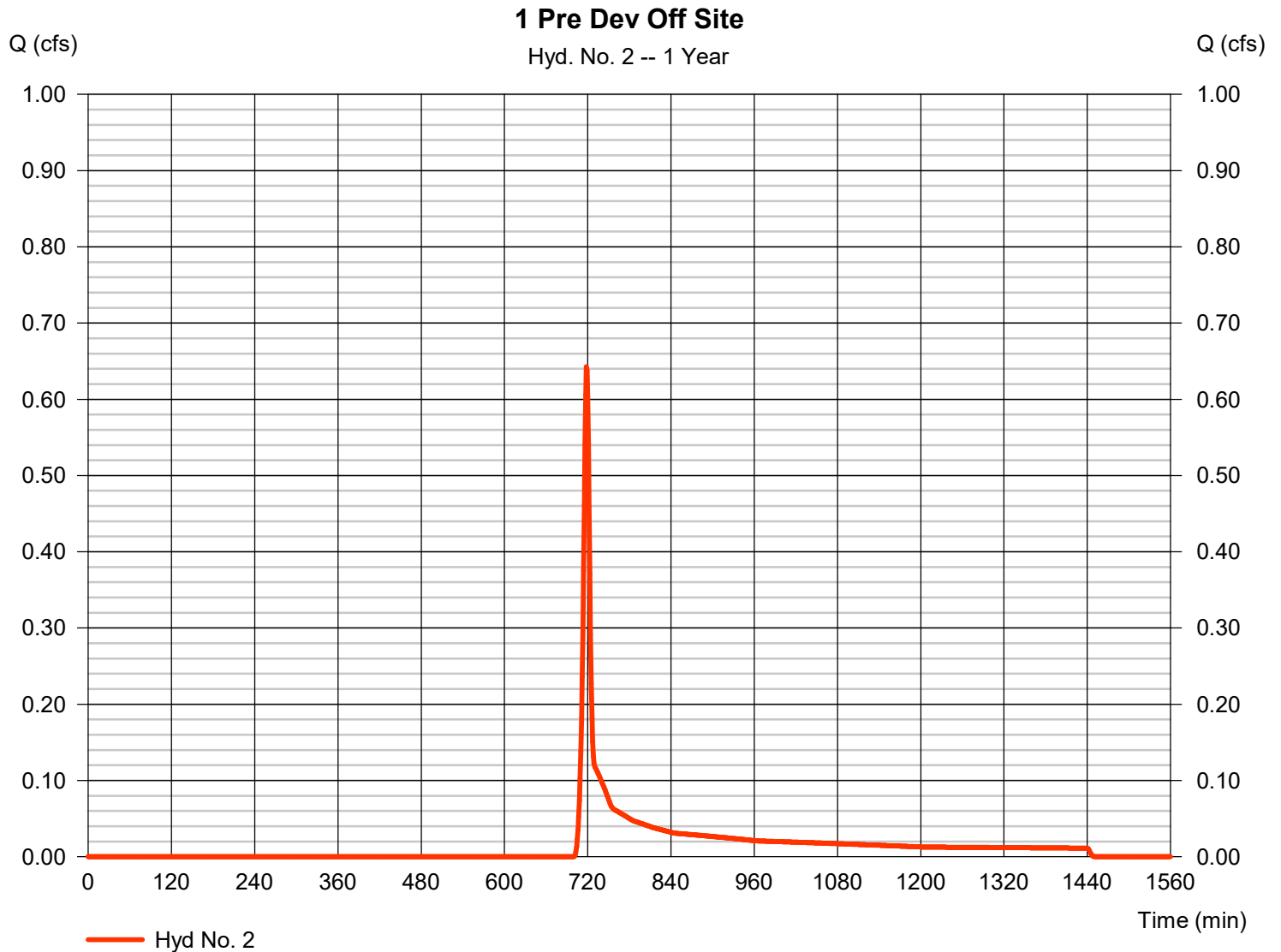


Hydrograph Report

Hyd. No. 2

1 Pre Dev Off Site

Hydrograph type	= SCS Runoff	Peak discharge	= 0.643 cfs
Storm frequency	= 1 yrs	Time to peak	= 718 min
Time interval	= 1 min	Hyd. volume	= 1,433 cuft
Drainage area	= 0.730 ac	Curve number	= 69.1
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 2.71 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



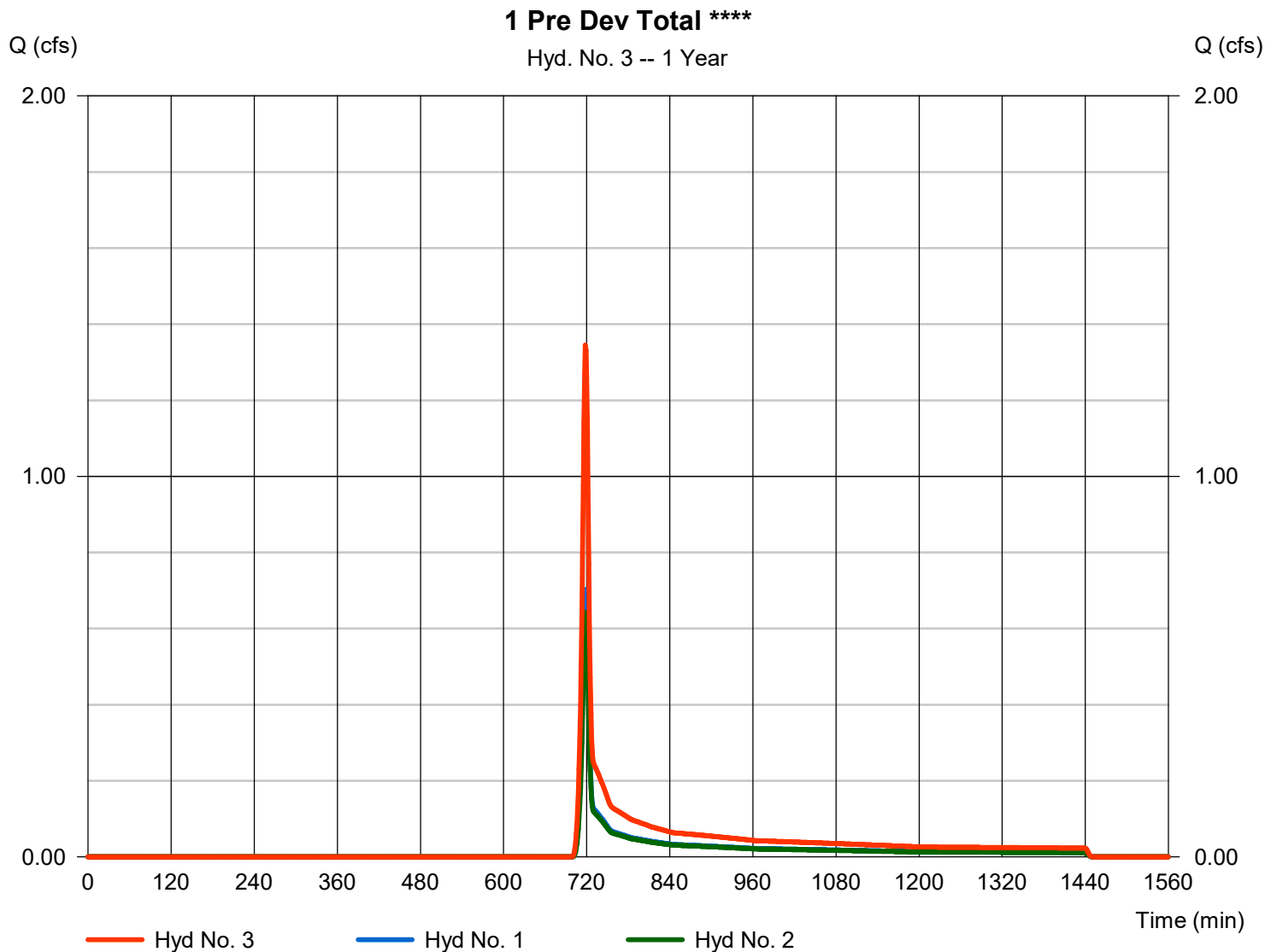
Hydrograph Report

Hyd. No. 3

1 Pre Dev Total ****

Hydrograph type = Combine
Storm frequency = 1 yrs
Time interval = 1 min
Inflow hyds. = 1, 2

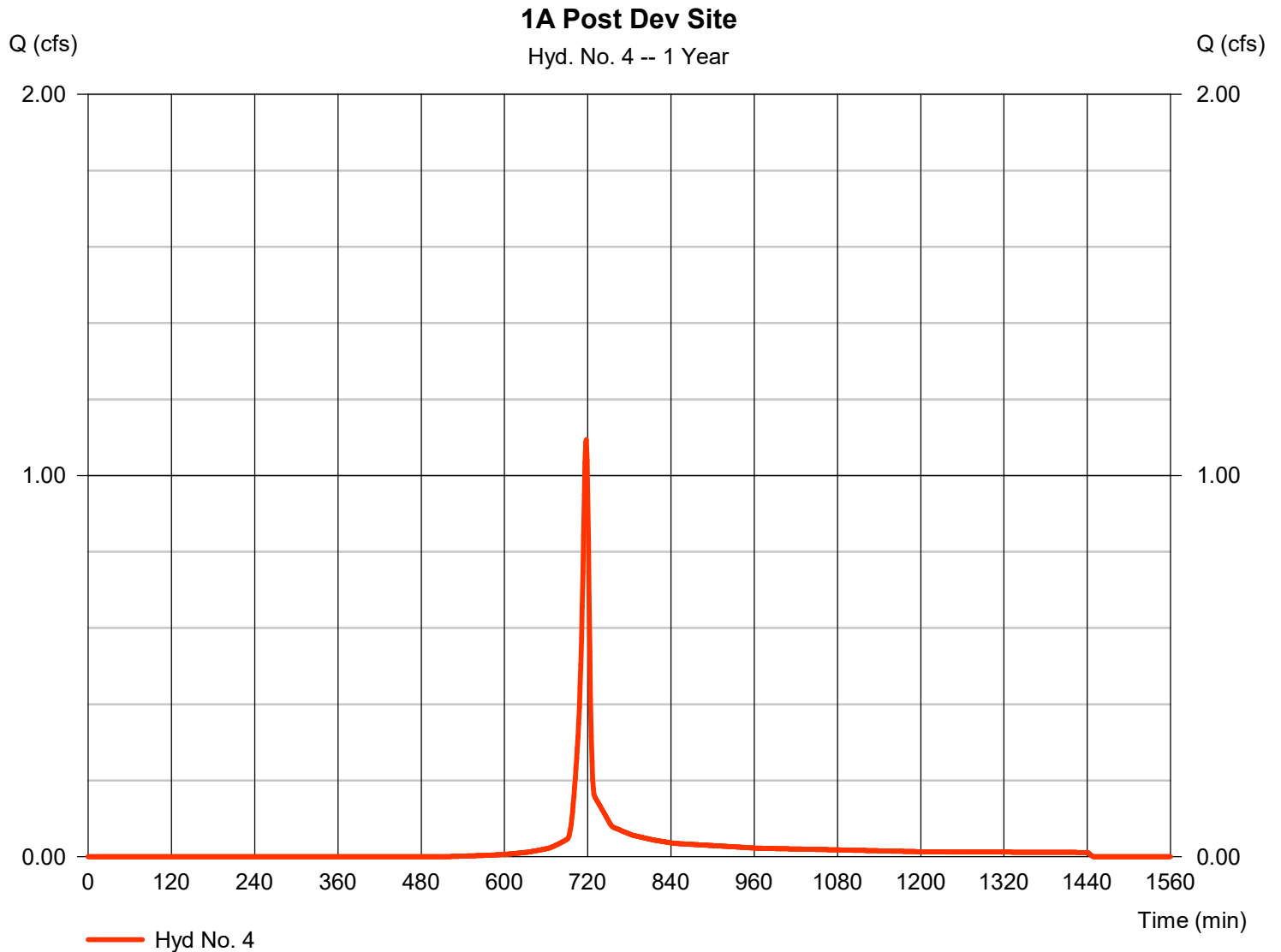
Peak discharge = 1.345 cfs
Time to peak = 718 min
Hyd. volume = 2,971 cuft
Contrib. drain. area = 1.470 ac



Hyd. No. 4

1A Post Dev Site

Hydrograph type	= SCS Runoff	Peak discharge	= 1.094 cfs
Storm frequency	= 1 yrs	Time to peak	= 718 min
Time interval	= 1 min	Hyd. volume	= 2,209 cuft
Drainage area	= 0.440 ac	Curve number	= 84.9
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 2.71 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

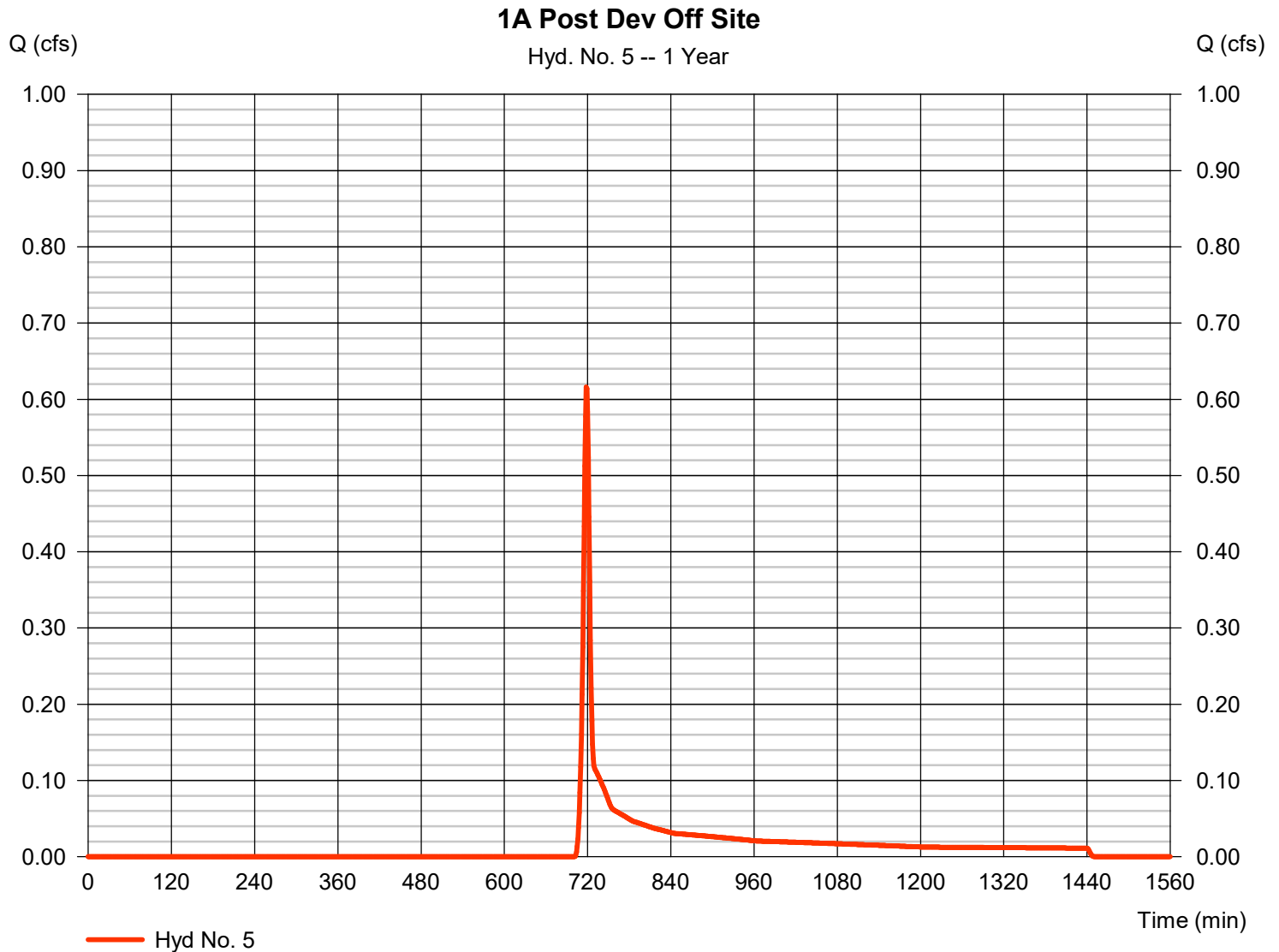


Hydrograph Report

Hyd. No. 5

1A Post Dev Off Site

Hydrograph type	= SCS Runoff	Peak discharge	= 0.616 cfs
Storm frequency	= 1 yrs	Time to peak	= 718 min
Time interval	= 1 min	Hyd. volume	= 1,398 cuft
Drainage area	= 0.750 ac	Curve number	= 68.4
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	=	Time of conc. (Tc)	= 6.00 min
Total precip.	= 2.71 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



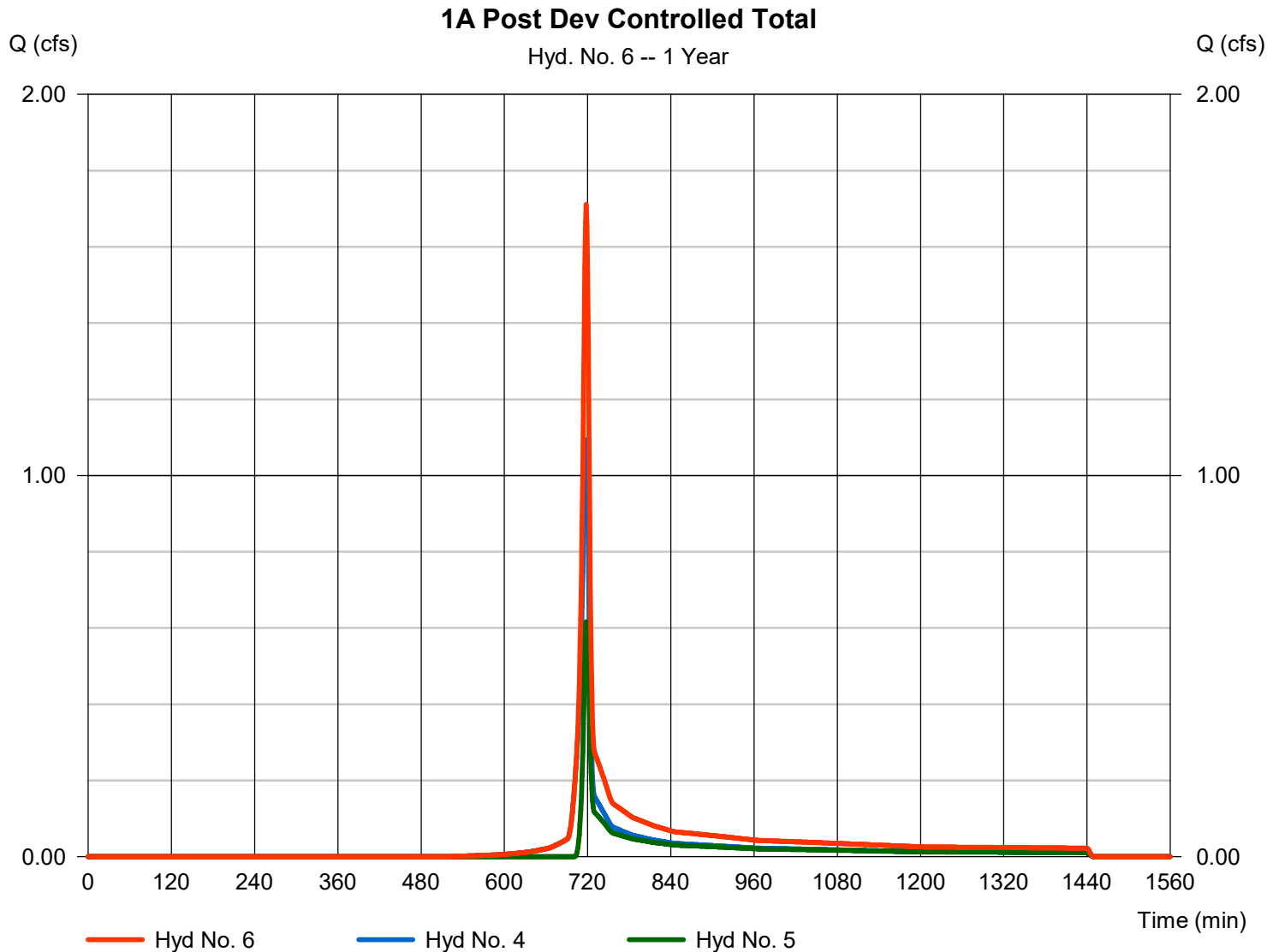
Hydrograph Report

Hyd. No. 6

1A Post Dev Controlled Total

Hydrograph type = Combine
Storm frequency = 1 yrs
Time interval = 1 min
Inflow hyds. = 4, 5

Peak discharge = 1.710 cfs
Time to peak = 718 min
Hyd. volume = 3,607 cuft
Contrib. drain. area = 1.190 ac

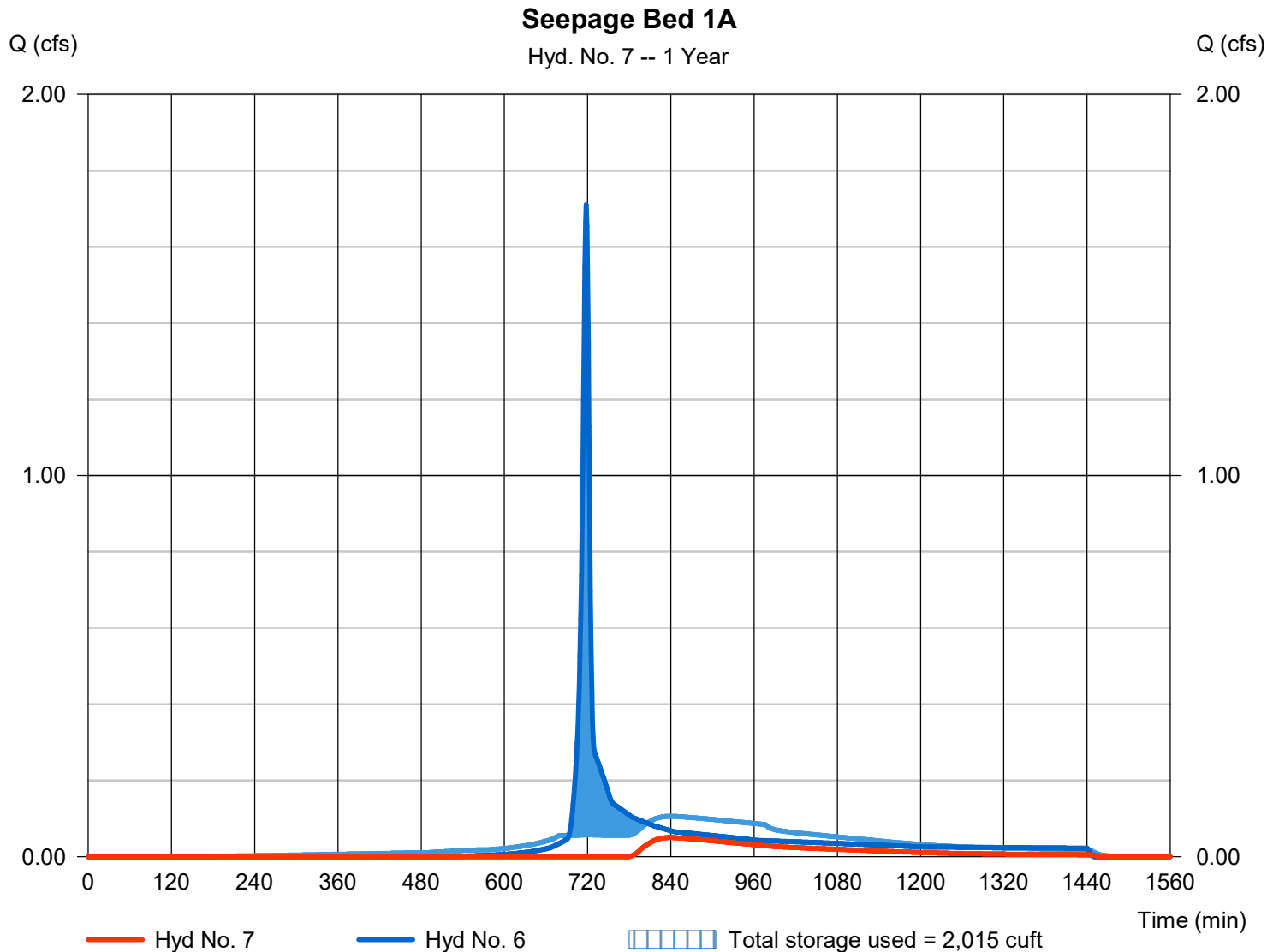


Hyd. No. 7

Seepage Bed 1A

Hydrograph type	= Reservoir	Peak discharge	= 0.050 cfs
Storm frequency	= 1 yrs	Time to peak	= 839 min
Time interval	= 1 min	Hyd. volume	= 810 cuft
Inflow hyd. No.	= 6 - 1A Post Dev Controlled Total	Max. Elevation	= 127.72 ft
Reservoir name	= Seepage Bed 1A	Max. Storage	= 2,015 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Pond Report

Pond No. 1 - Seepage Bed 1A

Pond Data

UG Chambers -Invert elev. = 126.25 ft, Rise x Span = 1.00 x 1.00 ft, Barrel Len = 72.00 ft, No. Barrels = 1, Slope = 0.00%, Headers = No
Encasement -Invert elev. = 126.00 ft, Width = 40.00 ft, Height = 2.00 ft, Voids = 40.00%

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	126.00	n/a	0	0
0.20	126.20	n/a	230	230
0.40	126.40	n/a	234	464
0.60	126.60	n/a	238	702
0.80	126.80	n/a	239	941
1.00	127.00	n/a	239	1,180
1.20	127.20	n/a	236	1,416
1.40	127.40	n/a	231	1,647
1.60	127.60	n/a	230	1,878
1.80	127.80	n/a	230	2,108
2.00	128.00	n/a	230	2,338

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 18.00	8.00	0.00	0.00
Span (in)	= 18.00	8.00	0.00	0.00
No. Barrels	= 1	1	0	0
Invert El. (ft)	= 126.75	127.60	0.00	0.00
Length (ft)	= 123.00	0.50	0.00	0.00
Slope (%)	= 0.70	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	Yes	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 4.71	Inactive	Inactive	Inactive
Crest El. (ft)	= 129.00	0.00	0.00	0.00
Weir Coeff.	= 3.32	3.32	3.33	3.33
Weir Type	= Broad	Broad	---	---
Multi-Stage	= Yes	No	No	No
Exfil.(in/hr)	= 0.250 (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	126.00	0.00	0.00	---	---	0.00	0.00	---	---	0.000	---	0.000
0.02	23	126.02	0.00	0.00	---	---	0.00	0.00	---	---	0.017	---	0.017
0.04	46	126.04	0.00	0.00	---	---	0.00	0.00	---	---	0.017	---	0.017
0.06	69	126.06	0.00	0.00	---	---	0.00	0.00	---	---	0.017	---	0.017
0.08	92	126.08	0.00	0.00	---	---	0.00	0.00	---	---	0.017	---	0.017
0.10	115	126.10	0.00	0.00	---	---	0.00	0.00	---	---	0.017	---	0.017
0.12	138	126.12	0.00	0.00	---	---	0.00	0.00	---	---	0.017	---	0.017
0.14	161	126.14	0.00	0.00	---	---	0.00	0.00	---	---	0.017	---	0.017
0.16	184	126.16	0.00	0.00	---	---	0.00	0.00	---	---	0.017	---	0.017
0.18	207	126.18	0.00	0.00	---	---	0.00	0.00	---	---	0.017	---	0.017
0.20	230	126.20	0.00	0.00	---	---	0.00	0.00	---	---	0.017	---	0.017
0.22	254	126.22	0.00	0.00	---	---	0.00	0.00	---	---	0.017	---	0.017
0.24	277	126.24	0.00	0.00	---	---	0.00	0.00	---	---	0.017	---	0.017
0.26	301	126.26	0.00	0.00	---	---	0.00	0.00	---	---	0.017	---	0.017
0.28	324	126.28	0.00	0.00	---	---	0.00	0.00	---	---	0.017	---	0.017
0.30	347	126.30	0.00	0.00	---	---	0.00	0.00	---	---	0.017	---	0.017
0.32	371	126.32	0.00	0.00	---	---	0.00	0.00	---	---	0.017	---	0.017
0.34	394	126.34	0.00	0.00	---	---	0.00	0.00	---	---	0.017	---	0.017
0.36	417	126.36	0.00	0.00	---	---	0.00	0.00	---	---	0.017	---	0.017
0.38	441	126.38	0.00	0.00	---	---	0.00	0.00	---	---	0.017	---	0.017
0.40	464	126.40	0.00	0.00	---	---	0.00	0.00	---	---	0.017	---	0.017
0.42	488	126.42	0.00	0.00	---	---	0.00	0.00	---	---	0.017	---	0.017
0.44	512	126.44	0.00	0.00	---	---	0.00	0.00	---	---	0.017	---	0.017
0.46	535	126.46	0.00	0.00	---	---	0.00	0.00	---	---	0.017	---	0.017
0.48	559	126.48	0.00	0.00	---	---	0.00	0.00	---	---	0.017	---	0.017
0.50	583	126.50	0.00	0.00	---	---	0.00	0.00	---	---	0.017	---	0.017
0.52	607	126.52	0.00	0.00	---	---	0.00	0.00	---	---	0.017	---	0.017
0.54	631	126.54	0.00	0.00	---	---	0.00	0.00	---	---	0.017	---	0.017
0.56	654	126.56	0.00	0.00	---	---	0.00	0.00	---	---	0.017	---	0.017
0.58	678	126.58	0.00	0.00	---	---	0.00	0.00	---	---	0.017	---	0.017
0.60	702	126.60	0.00	0.00	---	---	0.00	0.00	---	---	0.017	---	0.017
0.62	726	126.62	0.00	0.00	---	---	0.00	0.00	---	---	0.017	---	0.017

Continues on next page...

Seepage Bed 1A

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
0.64	750	126.64	0.00	0.00	---	---	0.00	0.00	---	---	0.017	---	0.017
0.66	774	126.66	0.00	0.00	---	---	0.00	0.00	---	---	0.017	---	0.017
0.68	798	126.68	0.00	0.00	---	---	0.00	0.00	---	---	0.017	---	0.017
0.70	821	126.70	0.00	0.00	---	---	0.00	0.00	---	---	0.017	---	0.017
0.72	845	126.72	0.00	0.00	---	---	0.00	0.00	---	---	0.017	---	0.017
0.74	869	126.74	0.00	0.00	---	---	0.00	0.00	---	---	0.017	---	0.017
0.76	893	126.76	0.00	0.00	---	---	0.00	0.00	---	---	0.017	---	0.017
0.78	917	126.78	0.00	0.00	---	---	0.00	0.00	---	---	0.017	---	0.017
0.80	941	126.80	0.00	0.00	---	---	0.00	0.00	---	---	0.017	---	0.017
0.82	965	126.82	0.00	0.00	---	---	0.00	0.00	---	---	0.017	---	0.017
0.84	989	126.84	0.00	0.00	---	---	0.00	0.00	---	---	0.017	---	0.017
0.86	1,012	126.86	0.00	0.00	---	---	0.00	0.00	---	---	0.017	---	0.017
0.88	1,036	126.88	0.00	0.00	---	---	0.00	0.00	---	---	0.017	---	0.017
0.90	1,060	126.90	0.00	0.00	---	---	0.00	0.00	---	---	0.017	---	0.017
0.92	1,084	126.92	0.00	0.00	---	---	0.00	0.00	---	---	0.017	---	0.017
0.94	1,108	126.94	0.00	0.00	---	---	0.00	0.00	---	---	0.017	---	0.017
0.96	1,132	126.96	0.00	0.00	---	---	0.00	0.00	---	---	0.017	---	0.017
0.98	1,156	126.98	0.00	0.00	---	---	0.00	0.00	---	---	0.017	---	0.017
1.00	1,180	127.00	0.00	0.00	---	---	0.00	0.00	---	---	0.017	---	0.017
1.02	1,203	127.02	0.00	0.00	---	---	0.00	0.00	---	---	0.018	---	0.018
1.04	1,227	127.04	0.00	0.00	---	---	0.00	0.00	---	---	0.018	---	0.018
1.06	1,250	127.06	0.00	0.00	---	---	0.00	0.00	---	---	0.018	---	0.018
1.08	1,274	127.08	0.00	0.00	---	---	0.00	0.00	---	---	0.018	---	0.018
1.10	1,298	127.10	0.00	0.00	---	---	0.00	0.00	---	---	0.018	---	0.018
1.12	1,321	127.12	0.00	0.00	---	---	0.00	0.00	---	---	0.018	---	0.018
1.14	1,345	127.14	0.00	0.00	---	---	0.00	0.00	---	---	0.018	---	0.018
1.16	1,369	127.16	0.00	0.00	---	---	0.00	0.00	---	---	0.018	---	0.018
1.18	1,392	127.18	0.00	0.00	---	---	0.00	0.00	---	---	0.018	---	0.018
1.20	1,416	127.20	0.00	0.00	---	---	0.00	0.00	---	---	0.018	---	0.018
1.22	1,439	127.22	0.00	0.00	---	---	0.00	0.00	---	---	0.018	---	0.018
1.24	1,462	127.24	0.00	0.00	---	---	0.00	0.00	---	---	0.018	---	0.018
1.26	1,485	127.26	0.00	0.00	---	---	0.00	0.00	---	---	0.018	---	0.018
1.28	1,508	127.28	0.00	0.00	---	---	0.00	0.00	---	---	0.018	---	0.018
1.30	1,532	127.30	0.00	0.00	---	---	0.00	0.00	---	---	0.018	---	0.018
1.32	1,555	127.32	0.00	0.00	---	---	0.00	0.00	---	---	0.018	---	0.018
1.34	1,578	127.34	0.00	0.00	---	---	0.00	0.00	---	---	0.018	---	0.018
1.36	1,601	127.36	0.00	0.00	---	---	0.00	0.00	---	---	0.018	---	0.018
1.38	1,624	127.38	0.00	0.00	---	---	0.00	0.00	---	---	0.018	---	0.018
1.40	1,647	127.40	0.00	0.00	---	---	0.00	0.00	---	---	0.018	---	0.018
1.42	1,670	127.42	0.00	0.00	---	---	0.00	0.00	---	---	0.018	---	0.018
1.44	1,693	127.44	0.00	0.00	---	---	0.00	0.00	---	---	0.018	---	0.018
1.46	1,716	127.46	0.00	0.00	---	---	0.00	0.00	---	---	0.018	---	0.018
1.48	1,739	127.48	0.00	0.00	---	---	0.00	0.00	---	---	0.018	---	0.018
1.50	1,762	127.50	0.00	0.00	---	---	0.00	0.00	---	---	0.018	---	0.018
1.52	1,785	127.52	0.00	0.00	---	---	0.00	0.00	---	---	0.018	---	0.018
1.54	1,808	127.54	0.00	0.00	---	---	0.00	0.00	---	---	0.018	---	0.018
1.56	1,831	127.56	0.00	0.00	---	---	0.00	0.00	---	---	0.018	---	0.018
1.58	1,854	127.58	0.00	0.00	---	---	0.00	0.00	---	---	0.018	---	0.018
1.60	1,878	127.60	0.00	0.00	---	---	0.00	0.00	---	---	0.018	---	0.018
1.62	1,901	127.62	0.00 ic	0.00 ic	---	---	0.00	0.00	---	---	0.018	---	0.020
1.64	1,924	127.64	0.01 ic	0.01 ic	---	---	0.00	0.00	---	---	0.018	---	0.024
1.66	1,947	127.66	0.01 ic	0.01 ic	---	---	0.00	0.00	---	---	0.018	---	0.031
1.68	1,970	127.68	0.03 ic	0.02 ic	---	---	0.00	0.00	---	---	0.018	---	0.042
1.70	1,993	127.70	0.04 ic	0.04 ic	---	---	0.00	0.00	---	---	0.018	---	0.054
1.72	2,016	127.72	0.05 ic	0.05 ic	---	---	0.00	0.00	---	---	0.018	---	0.069
1.74	2,039	127.74	0.07 ic	0.07 ic	---	---	0.00	0.00	---	---	0.018	---	0.087
1.76	2,062	127.76	0.09 ic	0.09 ic	---	---	0.00	0.00	---	---	0.018	---	0.109
1.78	2,085	127.78	0.12 ic	0.11 ic	---	---	0.00	0.00	---	---	0.018	---	0.130
1.80	2,108	127.80	0.14 ic	0.13 ic	---	---	0.00	0.00	---	---	0.018	---	0.153
1.82	2,131	127.82	0.17 ic	0.16 ic	---	---	0.00	0.00	---	---	0.018	---	0.179
1.84	2,154	127.84	0.20 ic	0.19 ic	---	---	0.00	0.00	---	---	0.018	---	0.207
1.86	2,177	127.86	0.22 ic	0.22 ic	---	---	0.00	0.00	---	---	0.018	---	0.238
1.88	2,200	127.88	0.25 ic	0.25 ic	---	---	0.00	0.00	---	---	0.018	---	0.270
1.90	2,223	127.90	0.29 ic	0.29 ic	---	---	0.00	0.00	---	---	0.018	---	0.305
1.92	2,246	127.92	0.33 ic	0.32 ic	---	---	0.00	0.00	---	---	0.018	---	0.341
1.94	2,269	127.94	0.36 ic	0.36 ic	---	---	0.00	0.00	---	---	0.018	---	0.379
1.96	2,292	127.96	0.41 ic	0.40 ic	---	---	0.00	0.00	---	---	0.018	---	0.417
1.98	2,315	127.98	0.43 ic	0.43 ic	---	---	0.00	0.00	---	---	0.018	---	0.450
2.00	2,338	128.00	0.49 ic	0.47 ic	---	---	0.00	0.00	---	---	0.018	---	0.491

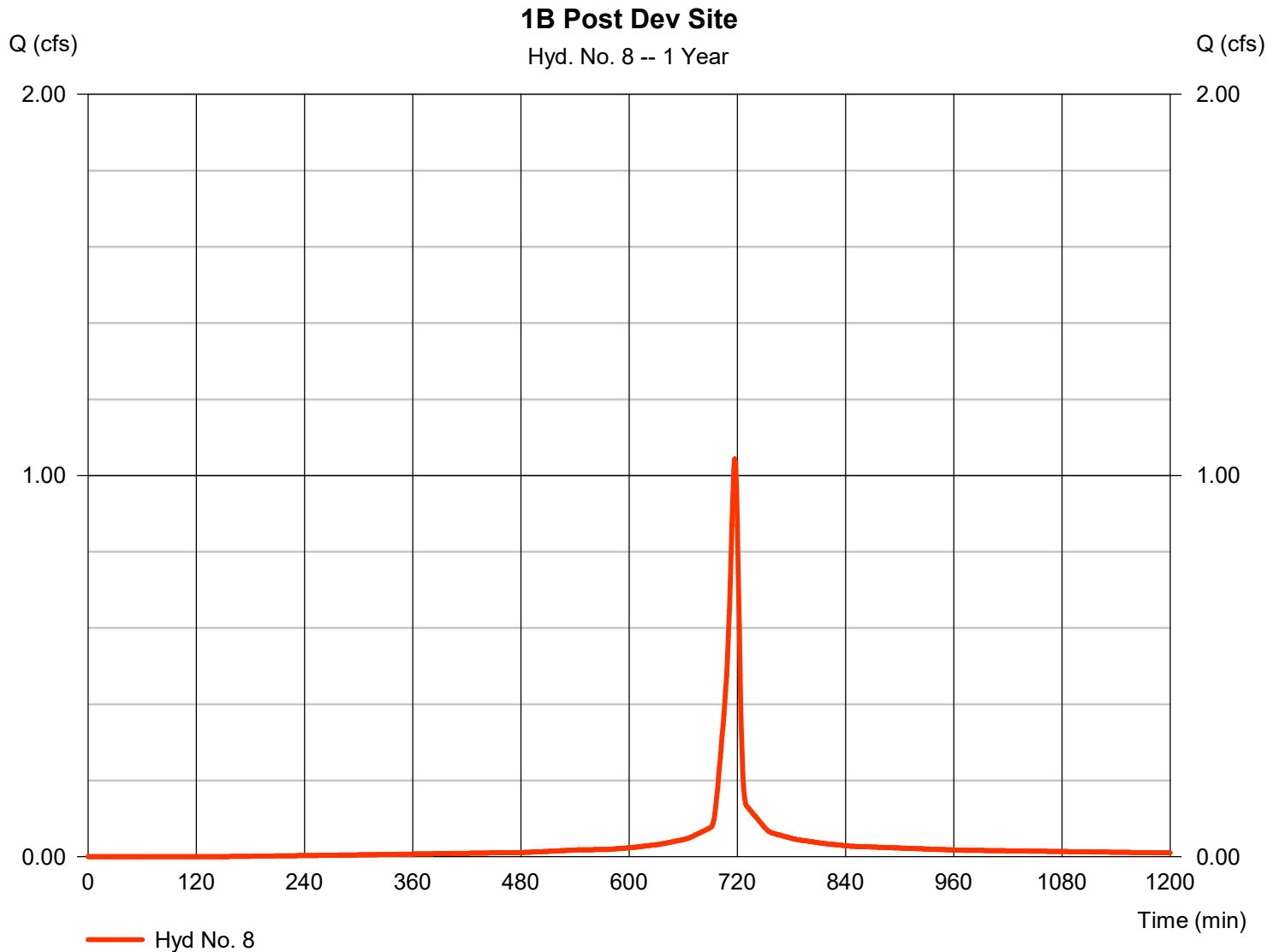
...End

Hydrograph Report

Hyd. No. 8

1B Post Dev Site

Hydrograph type	= SCS Runoff	Peak discharge	= 1.044 cfs
Storm frequency	= 1 yrs	Time to peak	= 717 min
Time interval	= 1 min	Hyd. volume	= 2,365 cuft
Drainage area	= 0.270 ac	Curve number	= 96.7
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	=	Time of conc. (Tc)	= 6.00 min
Total precip.	= 2.71 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



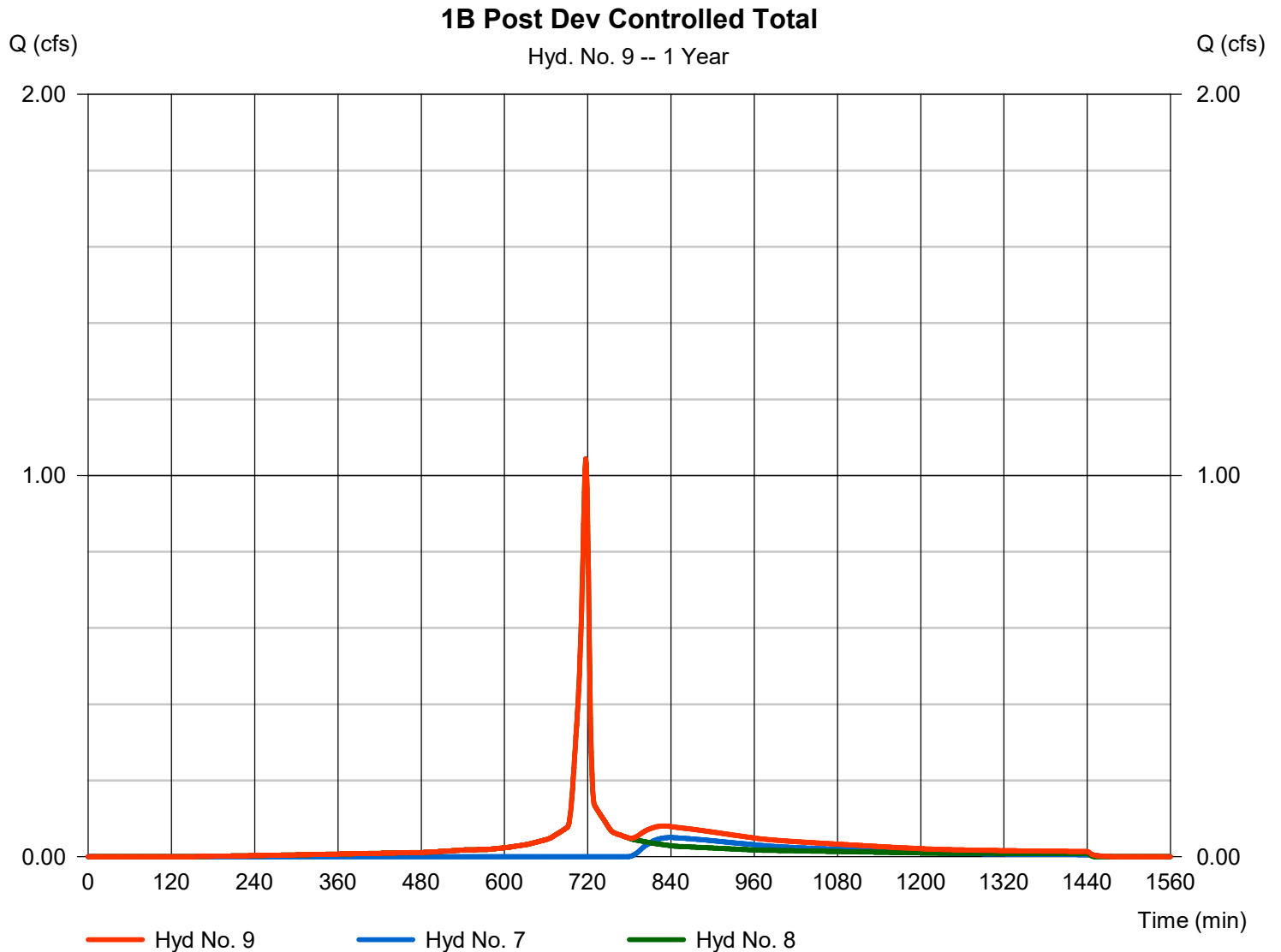
Hydrograph Report

Hyd. No. 9

1B Post Dev Controlled Total

Hydrograph type = Combine
Storm frequency = 1 yrs
Time interval = 1 min
Inflow hyds. = 7, 8

Peak discharge = 1.044 cfs
Time to peak = 717 min
Hyd. volume = 3,174 cuft
Contrib. drain. area = 0.270 ac



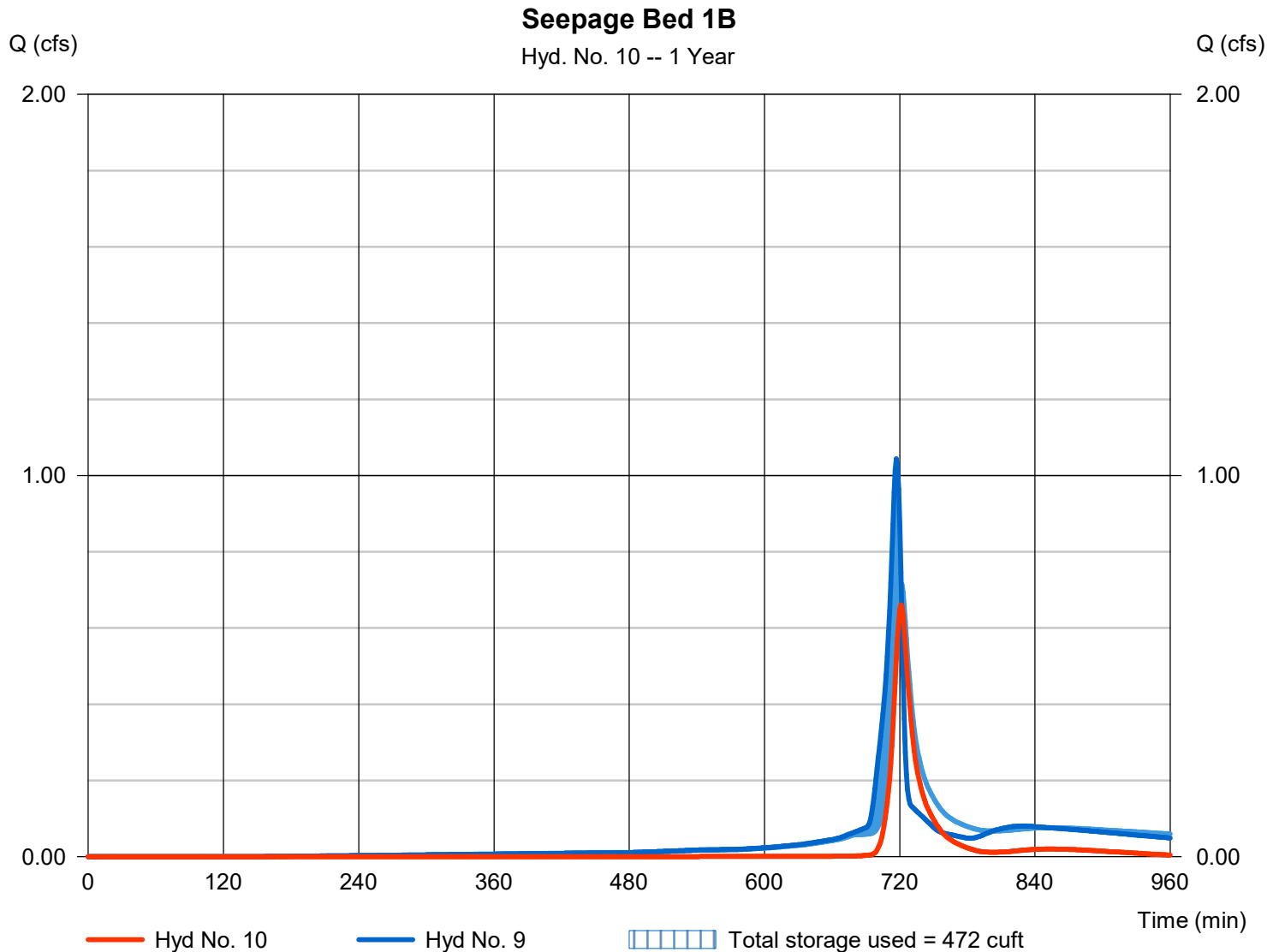
Hydrograph Report

Hyd. No. 10

Seepage Bed 1B

Hydrograph type	= Reservoir	Peak discharge	= 0.661 cfs
Storm frequency	= 1 yrs	Time to peak	= 721 min
Time interval	= 1 min	Hyd. volume	= 1,121 cuft
Inflow hyd. No.	= 9 - 1B Post Dev Controlled Total	Max. Elevation	= 127.49 ft
Reservoir name	= Seepage Bed 1B	Max. Storage	= 472 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Pond Report

Pond No. 2 - Seepage Bed 1B

Pond Data

UG Chambers -Invert elev. = 127.50 ft, Rise x Span = 1.00 x 1.00 ft, Barrel Len = 96.00 ft, No. Barrels = 1, Slope = 0.00%, Headers = No
Encasement -Invert elev. = 127.00 ft, Width = 25.00 ft, Height = 2.00 ft, Voids = 40.00%

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	127.00	n/a	0	0
0.20	127.20	n/a	192	192
0.40	127.40	n/a	192	384
0.60	127.60	n/a	194	578
0.80	127.80	n/a	201	780
1.00	128.00	n/a	203	983
1.20	128.20	n/a	203	1,186
1.40	128.40	n/a	201	1,387
1.60	128.60	n/a	194	1,582
1.80	128.80	n/a	192	1,774
2.00	129.00	n/a	192	1,966

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 18.00	8.00	0.00	0.00
Span (in)	= 18.00	8.00	0.00	0.00
No. Barrels	= 1	1	0	0
Invert El. (ft)	= 126.40	127.00	0.00	0.00
Length (ft)	= 24.00	0.50	0.00	0.00
Slope (%)	= 5.24	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	Yes	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 3.14	Inactive	Inactive	Inactive
Crest El. (ft)	= 129.00	0.00	0.00	0.00
Weir Coeff.	= 3.32	3.32	3.33	3.33
Weir Type	= Broad	Broad	---	---
Multi-Stage	= Yes	No	No	No
Exfil.(in/hr)	= 1.000 (by Wet area)			
TW Elev. (ft)	= 0.00			

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

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	127.00	0.00	0.00	---	---	0.00	0.00	---	---	0.000	---	0.000
0.02	19	127.02	1.78 ic	0.00 ic	---	---	0.00	0.00	---	---	0.056	---	0.057
0.04	38	127.04	1.78 ic	0.01 ic	---	---	0.00	0.00	---	---	0.056	---	0.062
0.06	58	127.06	1.78 ic	0.01 ic	---	---	0.00	0.00	---	---	0.056	---	0.069
0.08	77	127.08	1.78 ic	0.02 ic	---	---	0.00	0.00	---	---	0.056	---	0.080
0.10	96	127.10	1.78 ic	0.04 ic	---	---	0.00	0.00	---	---	0.056	---	0.092
0.12	115	127.12	1.78 ic	0.05 ic	---	---	0.00	0.00	---	---	0.056	---	0.107
0.14	134	127.14	1.78 ic	0.07 ic	---	---	0.00	0.00	---	---	0.056	---	0.125
0.16	154	127.16	1.78 ic	0.09 ic	---	---	0.00	0.00	---	---	0.056	---	0.147
0.18	173	127.18	1.78 ic	0.11 ic	---	---	0.00	0.00	---	---	0.056	---	0.168
0.20	192	127.20	1.78 ic	0.13 ic	---	---	0.00	0.00	---	---	0.056	---	0.191
0.22	211	127.22	1.78 ic	0.16 ic	---	---	0.00	0.00	---	---	0.057	---	0.217
0.24	230	127.24	1.78 ic	0.19 ic	---	---	0.00	0.00	---	---	0.057	---	0.246
0.26	250	127.26	1.78 ic	0.22 ic	---	---	0.00	0.00	---	---	0.057	---	0.276
0.28	269	127.28	1.78 ic	0.25 ic	---	---	0.00	0.00	---	---	0.057	---	0.309
0.30	288	127.30	1.78 ic	0.29 ic	---	---	0.00	0.00	---	---	0.057	---	0.343
0.32	307	127.32	1.78 ic	0.32 ic	---	---	0.00	0.00	---	---	0.057	---	0.380
0.34	326	127.34	1.78 ic	0.36 ic	---	---	0.00	0.00	---	---	0.057	---	0.417
0.36	346	127.36	1.78 ic	0.40 ic	---	---	0.00	0.00	---	---	0.057	---	0.456
0.38	365	127.38	1.78 ic	0.43 ic	---	---	0.00	0.00	---	---	0.057	---	0.489
0.40	384	127.40	1.78 ic	0.47 ic	---	---	0.00	0.00	---	---	0.057	---	0.530
0.42	404	127.42	1.78 ic	0.51 ic	---	---	0.00	0.00	---	---	0.057	---	0.570
0.44	423	127.44	1.78 ic	0.55 ic	---	---	0.00	0.00	---	---	0.058	---	0.611
0.46	442	127.46	1.78 ic	0.59 ic	---	---	0.00	0.00	---	---	0.058	---	0.652
0.48	462	127.48	1.78 ic	0.64 ic	---	---	0.00	0.00	---	---	0.058	---	0.699
0.50	481	127.50	1.78 ic	0.68 ic	---	---	0.00	0.00	---	---	0.058	---	0.738
0.52	501	127.52	1.78 ic	0.72 ic	---	---	0.00	0.00	---	---	0.058	---	0.776
0.54	520	127.54	1.78 ic	0.76 ic	---	---	0.00	0.00	---	---	0.058	---	0.818
0.56	540	127.56	1.78 ic	0.80 ic	---	---	0.00	0.00	---	---	0.058	---	0.857
0.58	559	127.58	1.78 ic	0.84 ic	---	---	0.00	0.00	---	---	0.058	---	0.898
0.60	578	127.60	1.78 ic	0.88 ic	---	---	0.00	0.00	---	---	0.058	---	0.934
0.62	599	127.62	1.78 ic	0.91 ic	---	---	0.00	0.00	---	---	0.058	---	0.966

Continues on next page...

Seepage Bed 1B

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
0.64	619	127.64	1.78 ic	0.94 ic	---	---	0.00	0.00	---	---	0.058	---	0.997
0.66	639	127.66	1.78 ic	0.96 ic	---	---	0.00	0.00	---	---	0.058	---	1.023
0.68	659	127.68	1.78 ic	0.99 ic	---	---	0.00	0.00	---	---	0.059	---	1.048
0.70	679	127.70	1.78 ic	1.02 ic	---	---	0.00	0.00	---	---	0.059	---	1.076
0.72	699	127.72	1.78 ic	1.04 ic	---	---	0.00	0.00	---	---	0.059	---	1.104
0.74	719	127.74	1.78 ic	1.07 ic	---	---	0.00	0.00	---	---	0.059	---	1.131
0.76	739	127.76	1.78 ic	1.10 ic	---	---	0.00	0.00	---	---	0.059	---	1.157
0.78	759	127.78	1.78 ic	1.12 ic	---	---	0.00	0.00	---	---	0.059	---	1.182
0.80	780	127.80	1.78 ic	1.15 ic	---	---	0.00	0.00	---	---	0.059	---	1.207
0.82	800	127.82	1.78 ic	1.17 ic	---	---	0.00	0.00	---	---	0.059	---	1.232
0.84	820	127.84	1.78 ic	1.20 ic	---	---	0.00	0.00	---	---	0.059	---	1.255
0.86	841	127.86	1.78 ic	1.22 ic	---	---	0.00	0.00	---	---	0.059	---	1.279
0.88	861	127.88	1.78 ic	1.24 ic	---	---	0.00	0.00	---	---	0.059	---	1.302
0.90	881	127.90	1.78 ic	1.27 ic	---	---	0.00	0.00	---	---	0.060	---	1.325
0.92	902	127.92	1.78 ic	1.29 ic	---	---	0.00	0.00	---	---	0.060	---	1.347
0.94	922	127.94	1.78 ic	1.31 ic	---	---	0.00	0.00	---	---	0.060	---	1.369
0.96	942	127.96	1.78 ic	1.33 ic	---	---	0.00	0.00	---	---	0.060	---	1.390
0.98	962	127.98	1.78 ic	1.35 ic	---	---	0.00	0.00	---	---	0.060	---	1.411
1.00	983	128.00	1.78 ic	1.37 ic	---	---	0.00	0.00	---	---	0.060	---	1.432
1.02	1,003	128.02	1.78 ic	1.39 ic	---	---	0.00	0.00	---	---	0.060	---	1.453
1.04	1,023	128.04	1.78 ic	1.41 ic	---	---	0.00	0.00	---	---	0.060	---	1.473
1.06	1,044	128.06	1.78 ic	1.43 ic	---	---	0.00	0.00	---	---	0.060	---	1.493
1.08	1,064	128.08	1.78 ic	1.45 ic	---	---	0.00	0.00	---	---	0.060	---	1.513
1.10	1,084	128.10	1.78 ic	1.47 ic	---	---	0.00	0.00	---	---	0.060	---	1.532
1.12	1,105	128.12	1.78 ic	1.49 ic	---	---	0.00	0.00	---	---	0.061	---	1.551
1.14	1,125	128.14	1.78 ic	1.51 ic	---	---	0.00	0.00	---	---	0.061	---	1.570
1.16	1,145	128.16	1.78 ic	1.53 ic	---	---	0.00	0.00	---	---	0.061	---	1.589
1.18	1,166	128.18	1.78 ic	1.55 ic	---	---	0.00	0.00	---	---	0.061	---	1.607
1.20	1,186	128.20	1.78 ic	1.56 ic	---	---	0.00	0.00	---	---	0.061	---	1.625
1.22	1,206	128.22	1.78 ic	1.58 ic	---	---	0.00	0.00	---	---	0.061	---	1.643
1.24	1,226	128.24	1.78 ic	1.60 ic	---	---	0.00	0.00	---	---	0.061	---	1.661
1.26	1,246	128.26	1.78 ic	1.62 ic	---	---	0.00	0.00	---	---	0.061	---	1.679
1.28	1,267	128.28	1.78 ic	1.64 ic	---	---	0.00	0.00	---	---	0.061	---	1.696
1.30	1,287	128.30	1.78 ic	1.65 ic	---	---	0.00	0.00	---	---	0.061	---	1.714
1.32	1,307	128.32	1.78 ic	1.67 ic	---	---	0.00	0.00	---	---	0.061	---	1.731
1.34	1,327	128.34	1.78 ic	1.69 ic	---	---	0.00	0.00	---	---	0.062	---	1.748
1.36	1,347	128.36	1.78 ic	1.70 ic	---	---	0.00	0.00	---	---	0.062	---	1.764
1.38	1,367	128.38	1.78 ic	1.72 ic	---	---	0.00	0.00	---	---	0.062	---	1.781
1.40	1,387	128.40	1.78 ic	1.74 ic	---	---	0.00	0.00	---	---	0.062	---	1.797
1.42	1,407	128.42	1.78 ic	1.75 ic	---	---	0.00	0.00	---	---	0.062	---	1.814
1.44	1,426	128.44	1.78 ic	1.77 ic	---	---	0.00	0.00	---	---	0.062	---	1.830
1.46	1,445	128.46	1.78 ic	1.78 ic	---	---	0.00	0.00	---	---	0.062	---	1.846
1.48	1,465	128.48	1.84 ic	1.80 ic	---	---	0.00	0.00	---	---	0.062	---	1.862
1.50	1,484	128.50	1.84 ic	1.82 ic	---	---	0.00	0.00	---	---	0.062	---	1.877
1.52	1,504	128.52	1.84 ic	1.83 ic	---	---	0.00	0.00	---	---	0.062	---	1.893
1.54	1,523	128.54	1.85 ic	1.85 ic	---	---	0.00	0.00	---	---	0.062	---	1.908
1.56	1,543	128.56	1.90 ic	1.86 ic	---	---	0.00	0.00	---	---	0.062	---	1.924
1.58	1,562	128.58	1.90 ic	1.88 ic	---	---	0.00	0.00	---	---	0.063	---	1.939
1.60	1,582	128.60	1.90 ic	1.89 ic	---	---	0.00	0.00	---	---	0.063	---	1.954
1.62	1,601	128.62	1.91 ic	1.91 ic	---	---	0.00	0.00	---	---	0.063	---	1.969
1.64	1,620	128.64	1.97 ic	1.92 ic	---	---	0.00	0.00	---	---	0.063	---	1.984
1.66	1,639	128.66	1.97 ic	1.94 ic	---	---	0.00	0.00	---	---	0.063	---	1.999
1.68	1,658	128.68	1.97 ic	1.95 ic	---	---	0.00	0.00	---	---	0.063	---	2.013
1.70	1,678	128.70	1.97 ic	1.96 ic	---	---	0.00	0.00	---	---	0.063	---	2.028
1.72	1,697	128.72	1.98 ic	1.98 ic	---	---	0.00	0.00	---	---	0.063	---	2.042
1.74	1,716	128.74	2.03 ic	1.99 ic	---	---	0.00	0.00	---	---	0.063	---	2.056
1.76	1,735	128.76	2.03 ic	2.01 ic	---	---	0.00	0.00	---	---	0.063	---	2.071
1.78	1,754	128.78	2.03 ic	2.02 ic	---	---	0.00	0.00	---	---	0.063	---	2.085
1.80	1,774	128.80	2.04 ic	2.04 ic	---	---	0.00	0.00	---	---	0.064	---	2.099
1.82	1,793	128.82	2.10 ic	2.05 ic	---	---	0.00	0.00	---	---	0.064	---	2.113
1.84	1,812	128.84	2.10 ic	2.06 ic	---	---	0.00	0.00	---	---	0.064	---	2.127
1.86	1,831	128.86	2.10 ic	2.08 ic	---	---	0.00	0.00	---	---	0.064	---	2.140
1.88	1,850	128.88	2.10 ic	2.09 ic	---	---	0.00	0.00	---	---	0.064	---	2.154
1.90	1,870	128.90	2.10 ic	2.10 ic	---	---	0.00	0.00	---	---	0.064	---	2.167
1.92	1,889	128.92	2.16 ic	2.12 ic	---	---	0.00	0.00	---	---	0.064	---	2.181
1.94	1,908	128.94	2.16 ic	2.13 ic	---	---	0.00	0.00	---	---	0.064	---	2.194
1.96	1,927	128.96	2.16 ic	2.14 ic	---	---	0.00	0.00	---	---	0.064	---	2.208
1.98	1,946	128.98	2.16 ic	2.16 ic	---	---	0.00	0.00	---	---	0.064	---	2.221
2.00	1,966	129.00	2.17 ic	2.17 ic	---	---	0.00	0.00	---	---	0.064	---	2.234

...End

Hydrograph Report

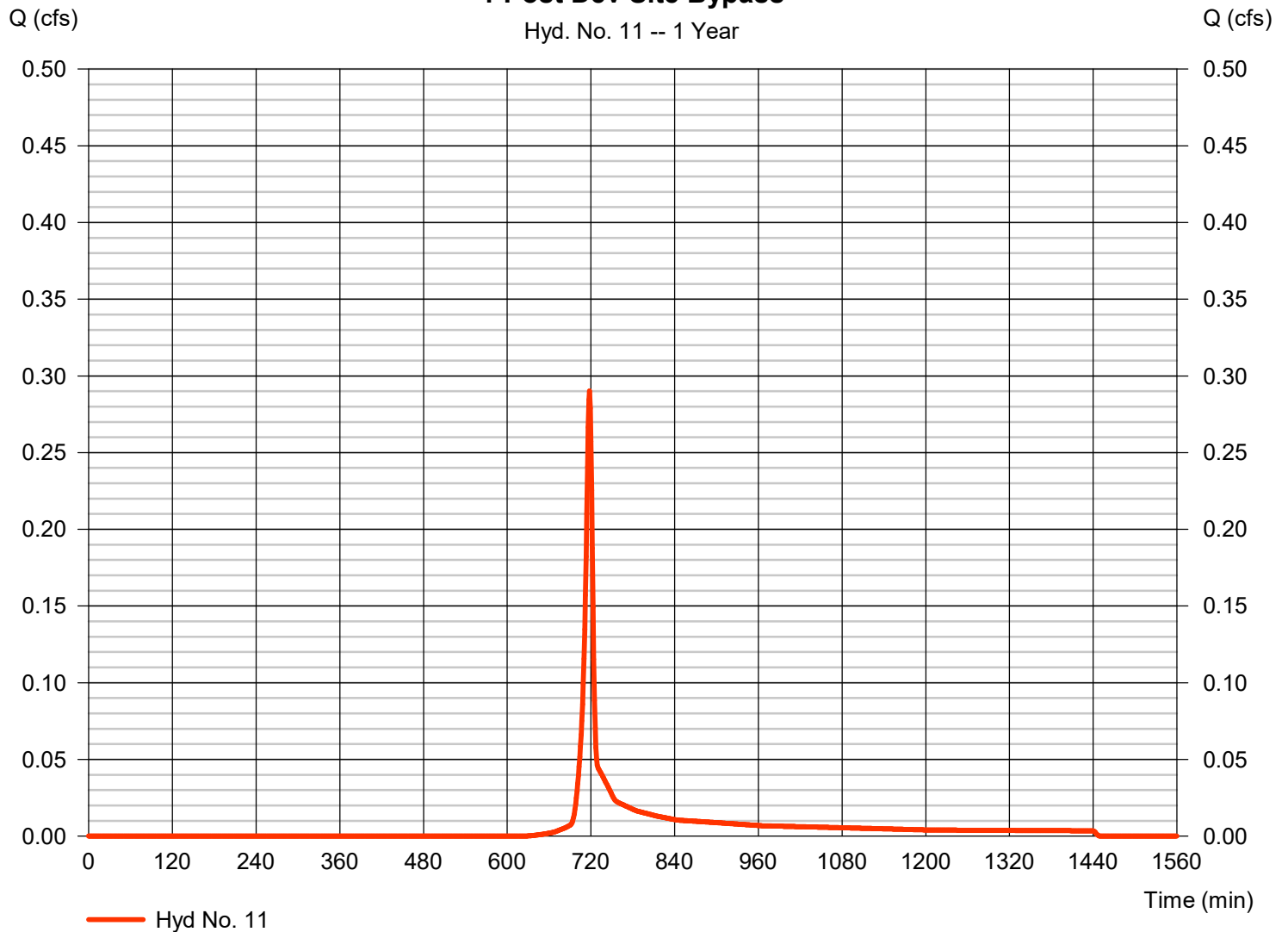
Hyd. No. 11

1 Post Dev Site Bypass

Hydrograph type	= SCS Runoff	Peak discharge	= 0.290 cfs
Storm frequency	= 1 yrs	Time to peak	= 718 min
Time interval	= 1 min	Hyd. volume	= 584 cuft
Drainage area	= 0.160 ac	Curve number	= 78.9
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	=	Time of conc. (Tc)	= 6.00 min
Total precip.	= 2.71 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

1 Post Dev Site Bypass

Hyd. No. 11 -- 1 Year



Hydrograph Report

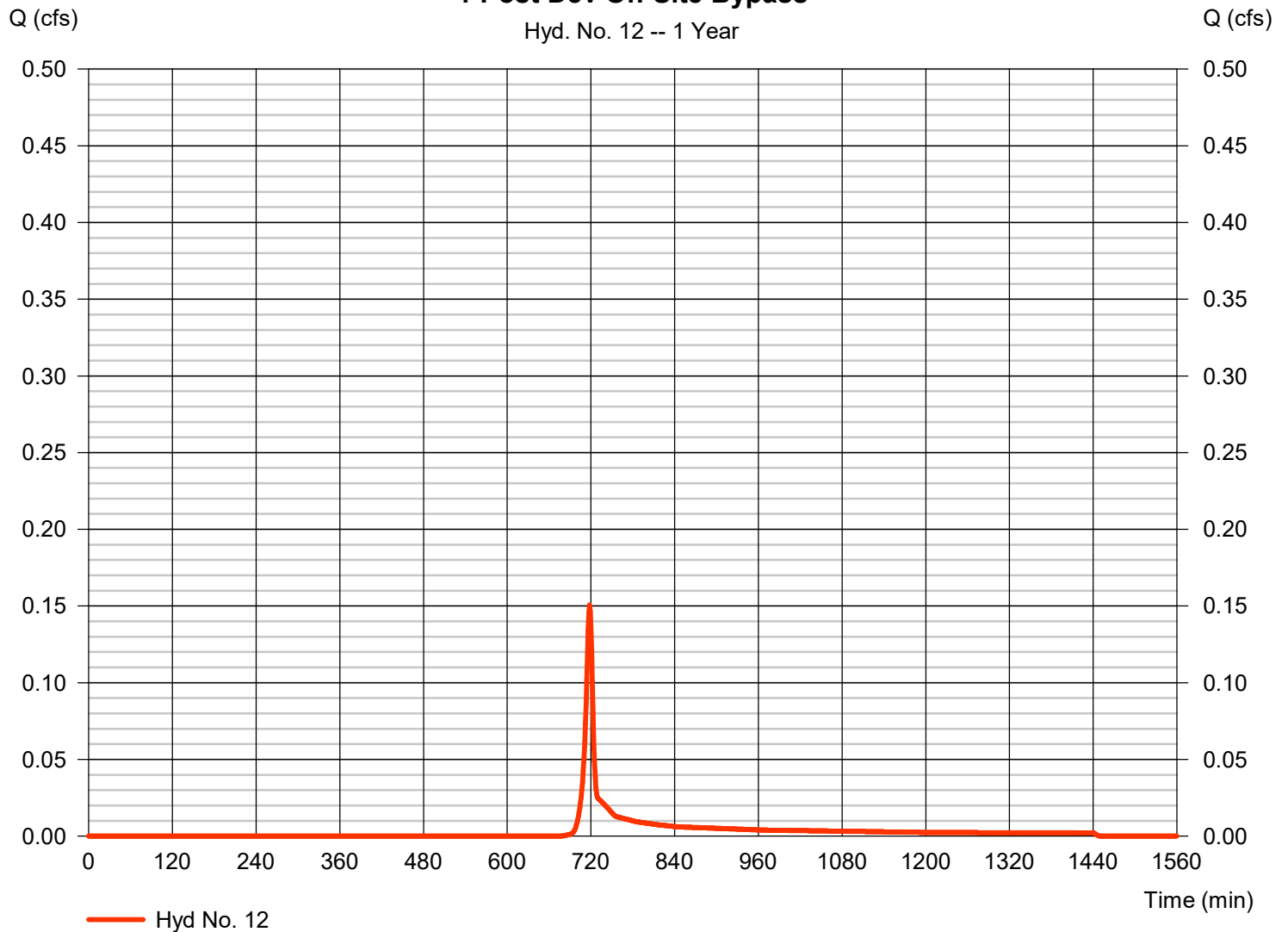
Hyd. No. 12

1 Post Dev Off Site Bypass

Hydrograph type	= SCS Runoff	Peak discharge	= 0.151 cfs
Storm frequency	= 1 yrs	Time to peak	= 718 min
Time interval	= 1 min	Hyd. volume	= 310 cuft
Drainage area	= 0.110 ac	Curve number	= 74.5
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 2.71 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

1 Post Dev Off Site Bypass

Hyd. No. 12 -- 1 Year

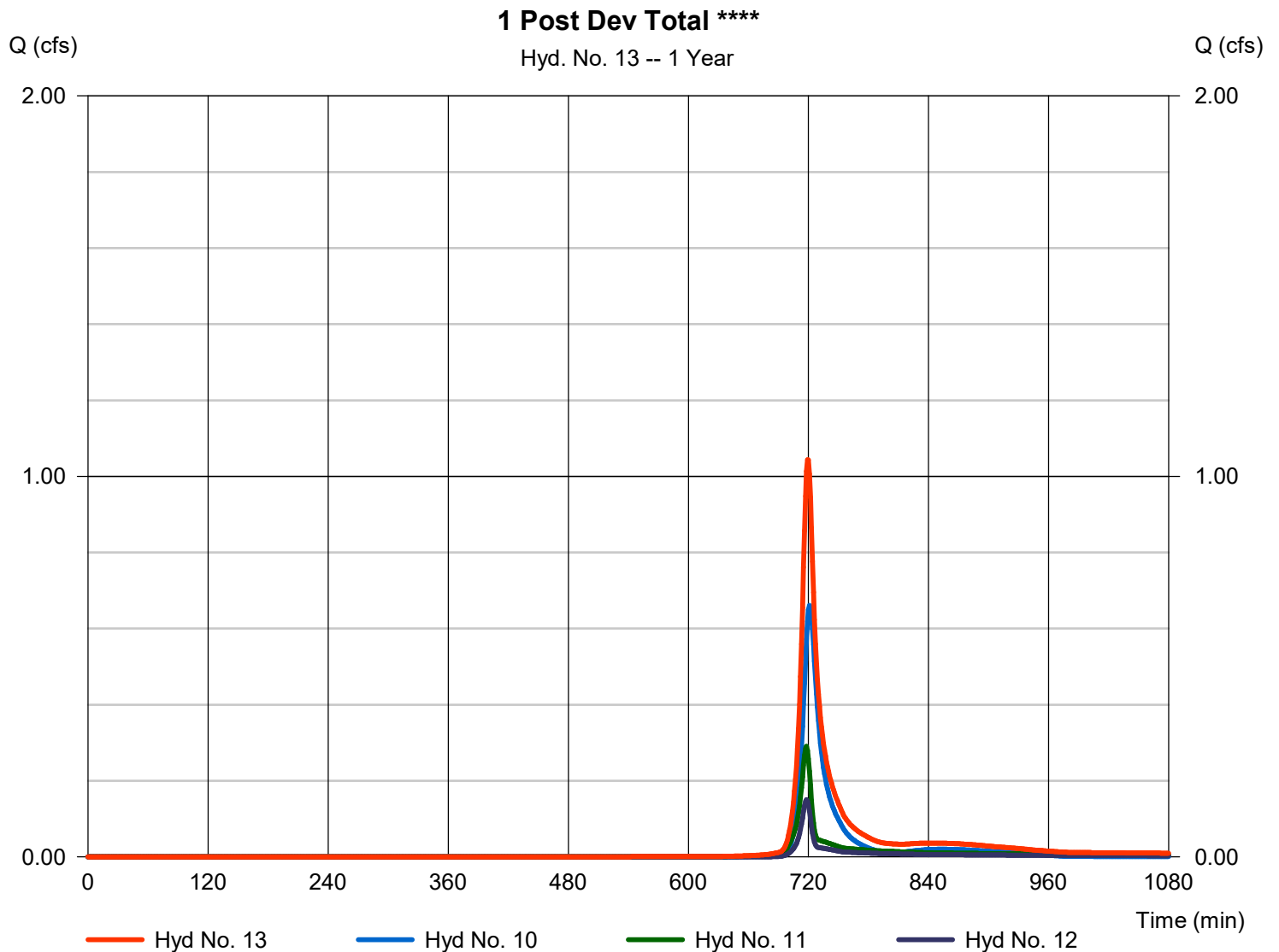


Hydrograph Report

Hyd. No. 13

1 Post Dev Total ****

Hydrograph type	= Combine	Peak discharge	= 1.044 cfs
Storm frequency	= 1 yrs	Time to peak	= 719 min
Time interval	= 1 min	Hyd. volume	= 2,015 cuft
Inflow hyds.	= 10, 11, 12	Contrib. drain. area	= 0.270 ac

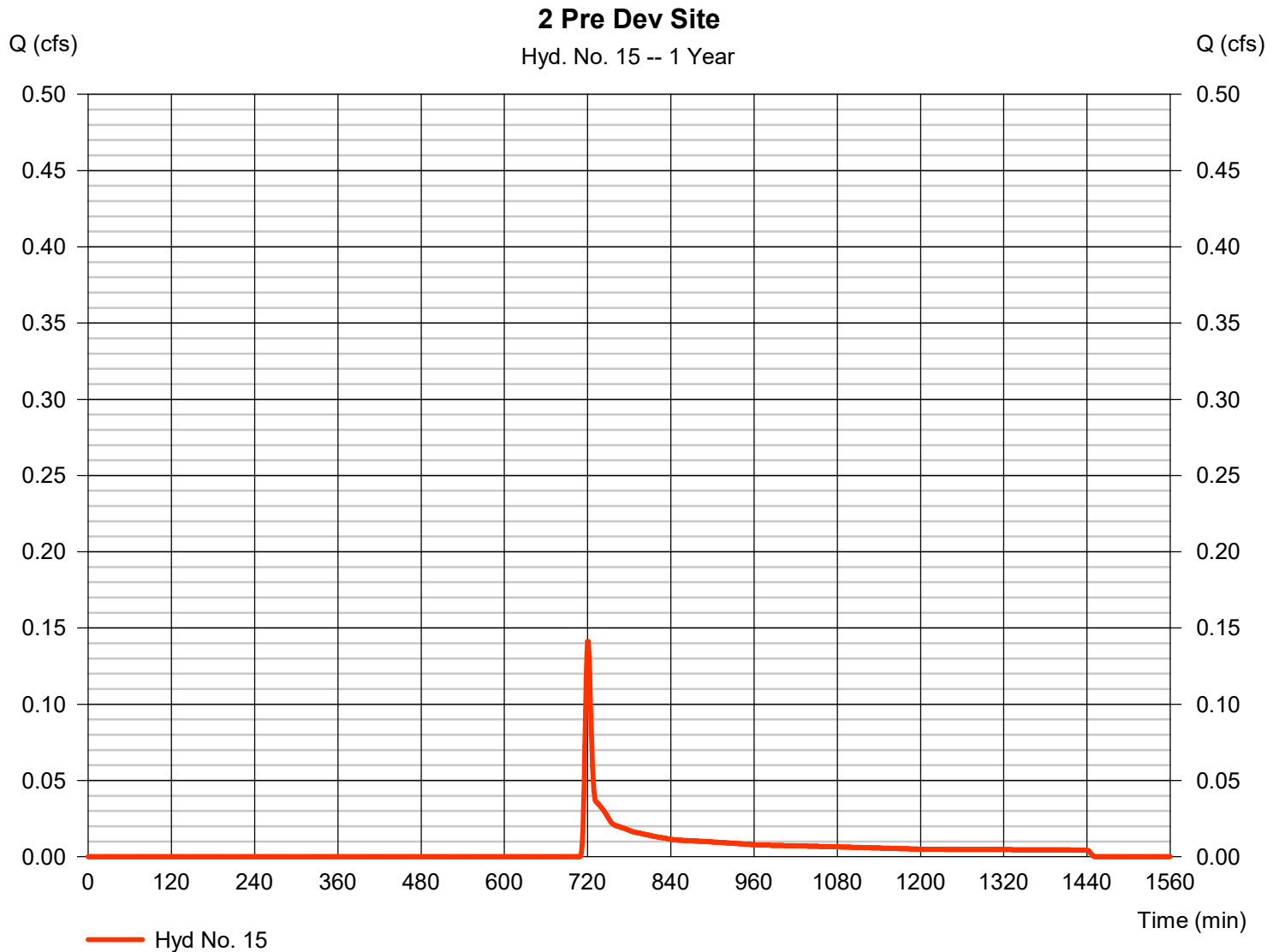


Hydrograph Report

Hyd. No. 15

2 Pre Dev Site

Hydrograph type	= SCS Runoff	Peak discharge	= 0.141 cfs
Storm frequency	= 1 yrs	Time to peak	= 720 min
Time interval	= 1 min	Hyd. volume	= 445 cuft
Drainage area	= 0.410 ac	Curve number	= 62.6
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 7.00 min
Total precip.	= 2.71 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

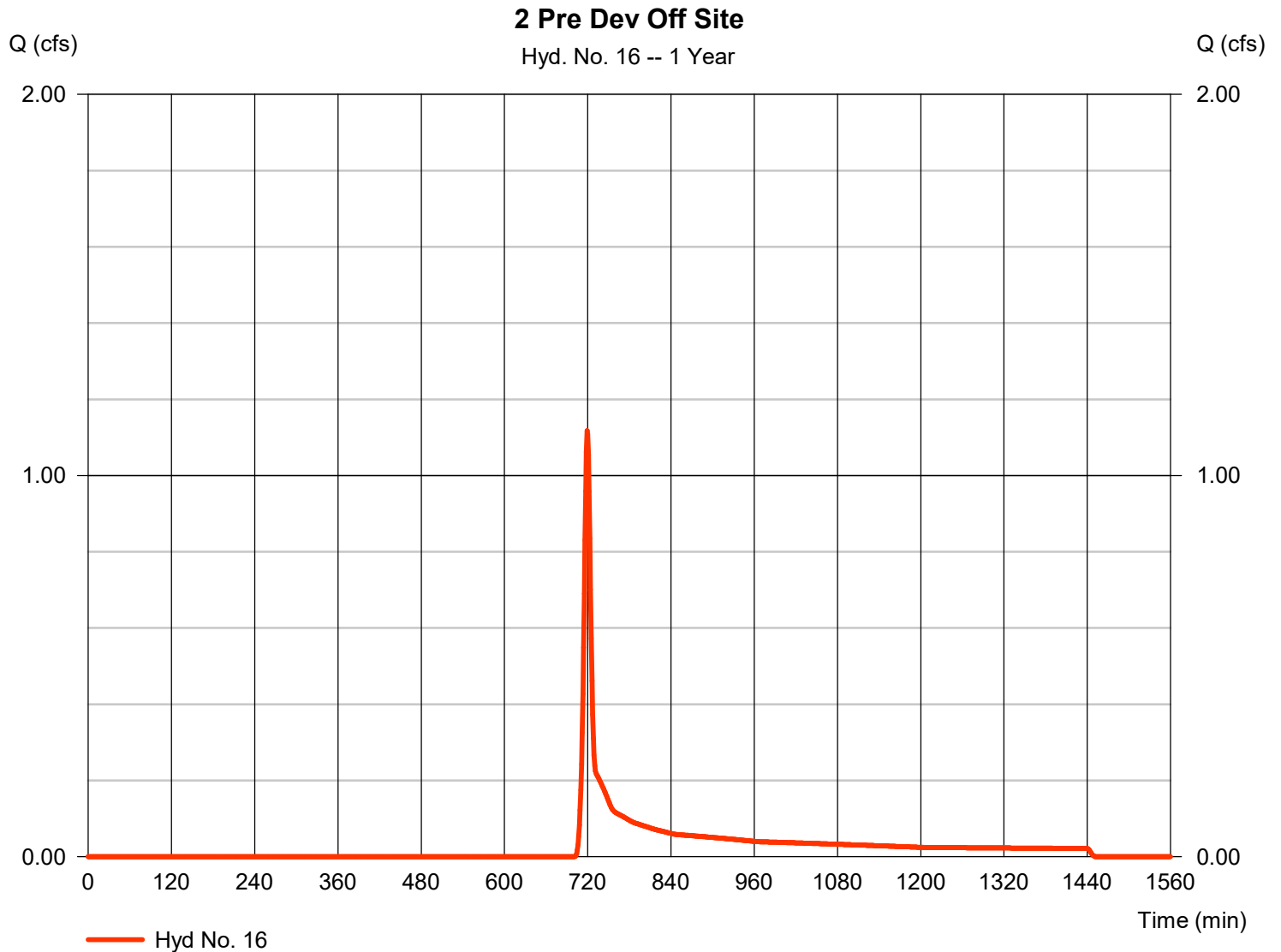


Hydrograph Report

Hyd. No. 16

2 Pre Dev Off Site

Hydrograph type	= SCS Runoff	Peak discharge	= 1.117 cfs
Storm frequency	= 1 yrs	Time to peak	= 719 min
Time interval	= 1 min	Hyd. volume	= 2,679 cuft
Drainage area	= 1.520 ac	Curve number	= 68.4
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 7.00 min
Total precip.	= 2.71 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



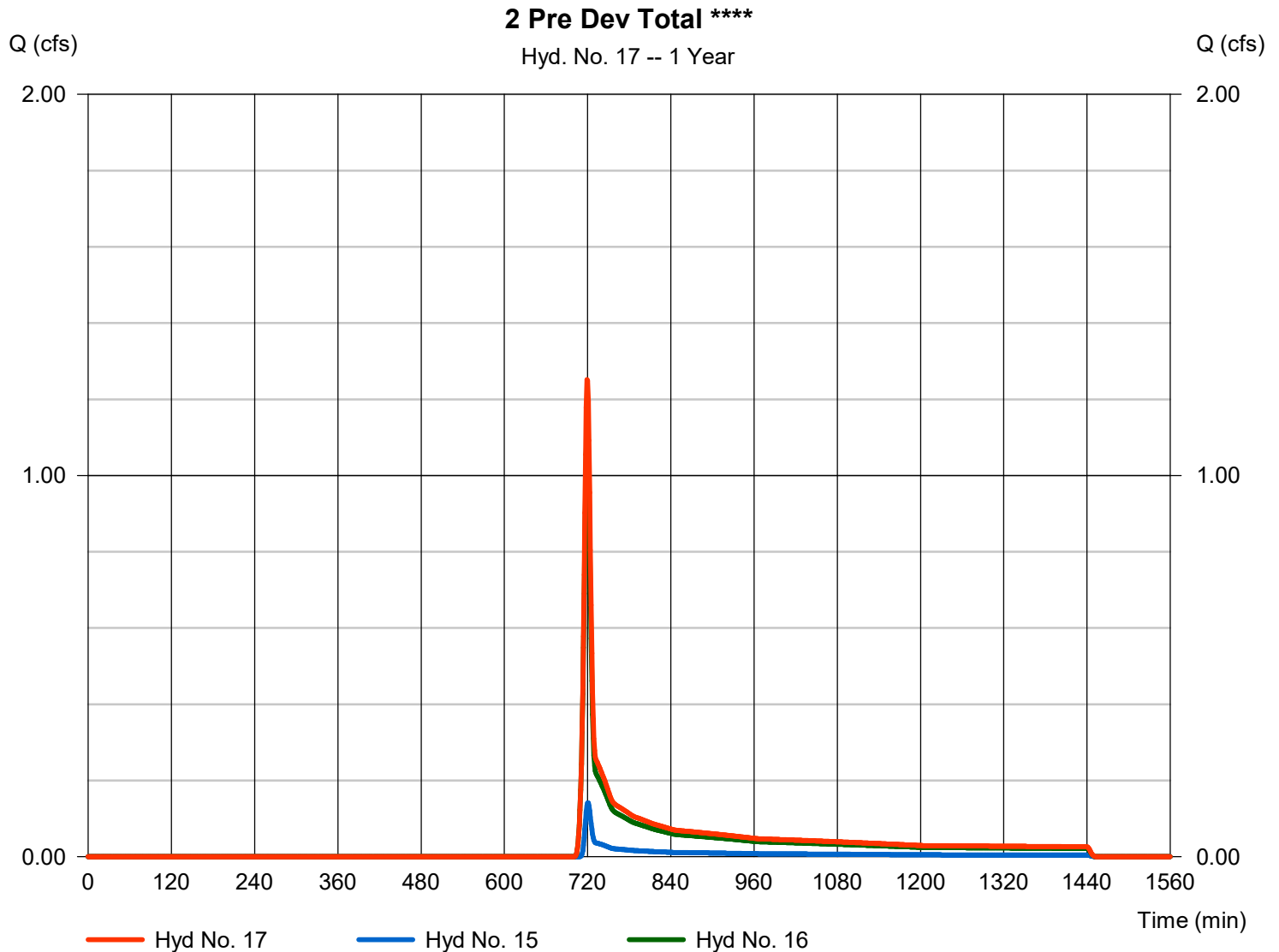
Hydrograph Report

Hyd. No. 17

2 Pre Dev Total ****

Hydrograph type = Combine
Storm frequency = 1 yrs
Time interval = 1 min
Inflow hyds. = 15, 16

Peak discharge = 1.252 cfs
Time to peak = 719 min
Hyd. volume = 3,123 cuft
Contrib. drain. area = 1.930 ac

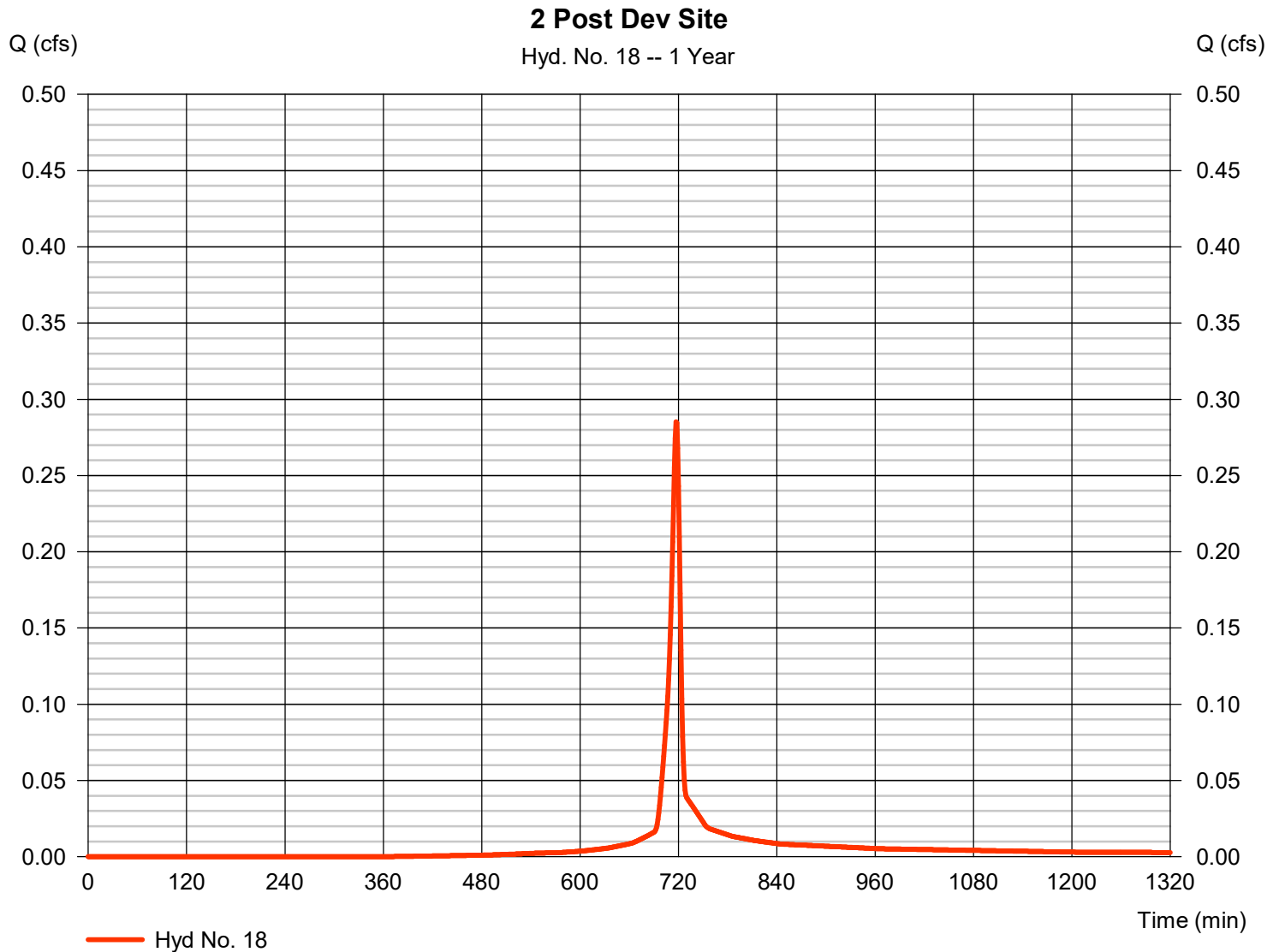


Hydrograph Report

Hyd. No. 18

2 Post Dev Site

Hydrograph type	= SCS Runoff	Peak discharge	= 0.285 cfs
Storm frequency	= 1 yrs	Time to peak	= 717 min
Time interval	= 1 min	Hyd. volume	= 593 cuft
Drainage area	= 0.090 ac	Curve number	= 90.5
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	=	Time of conc. (Tc)	= 6.00 min
Total precip.	= 2.71 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

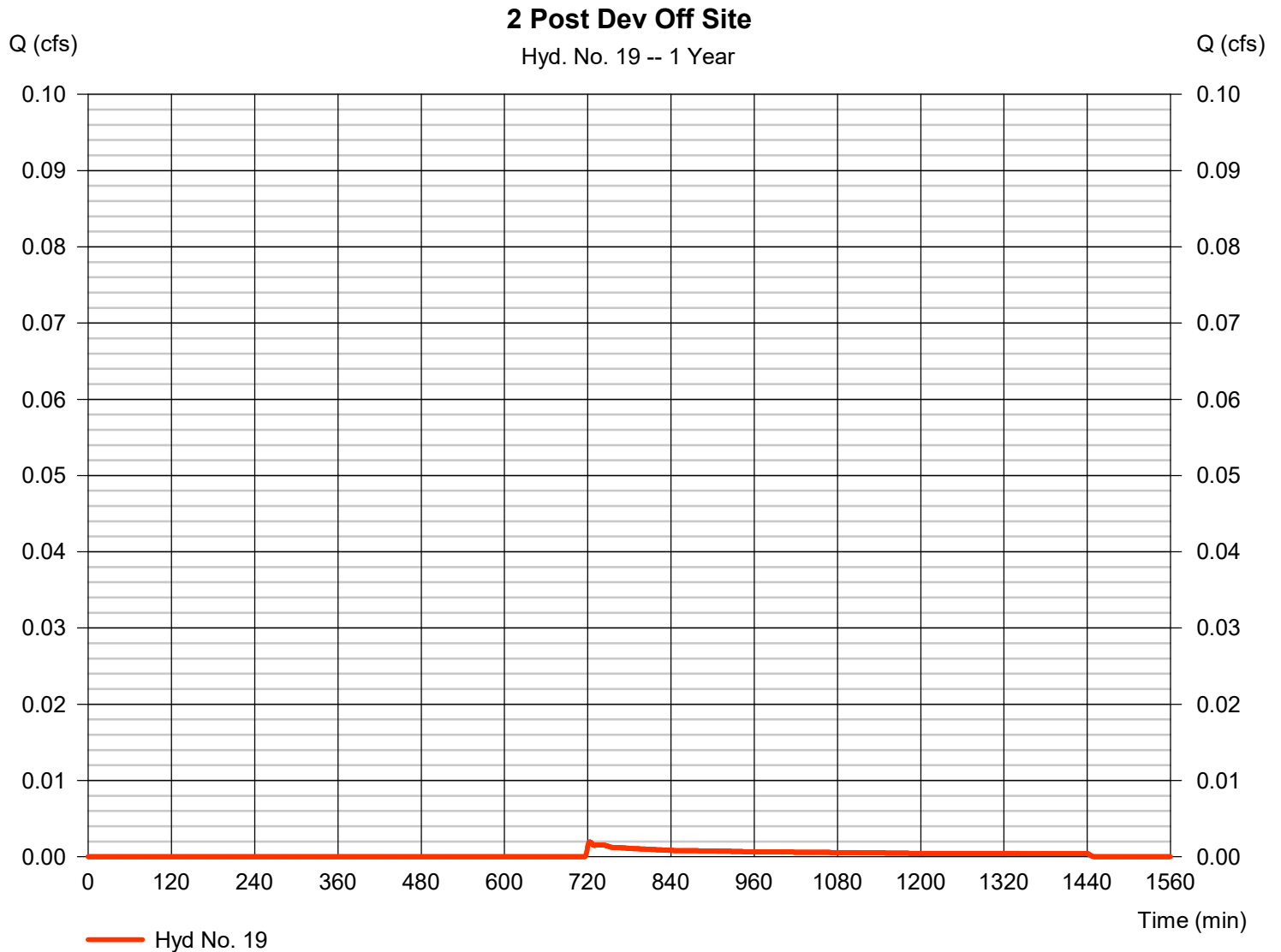


Hydrograph Report

Hyd. No. 19

2 Post Dev Off Site

Hydrograph type	= SCS Runoff	Peak discharge	= 0.002 cfs
Storm frequency	= 1 yrs	Time to peak	= 723 min
Time interval	= 1 min	Hyd. volume	= 28 cuft
Drainage area	= 0.060 ac	Curve number	= 55
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 2.71 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



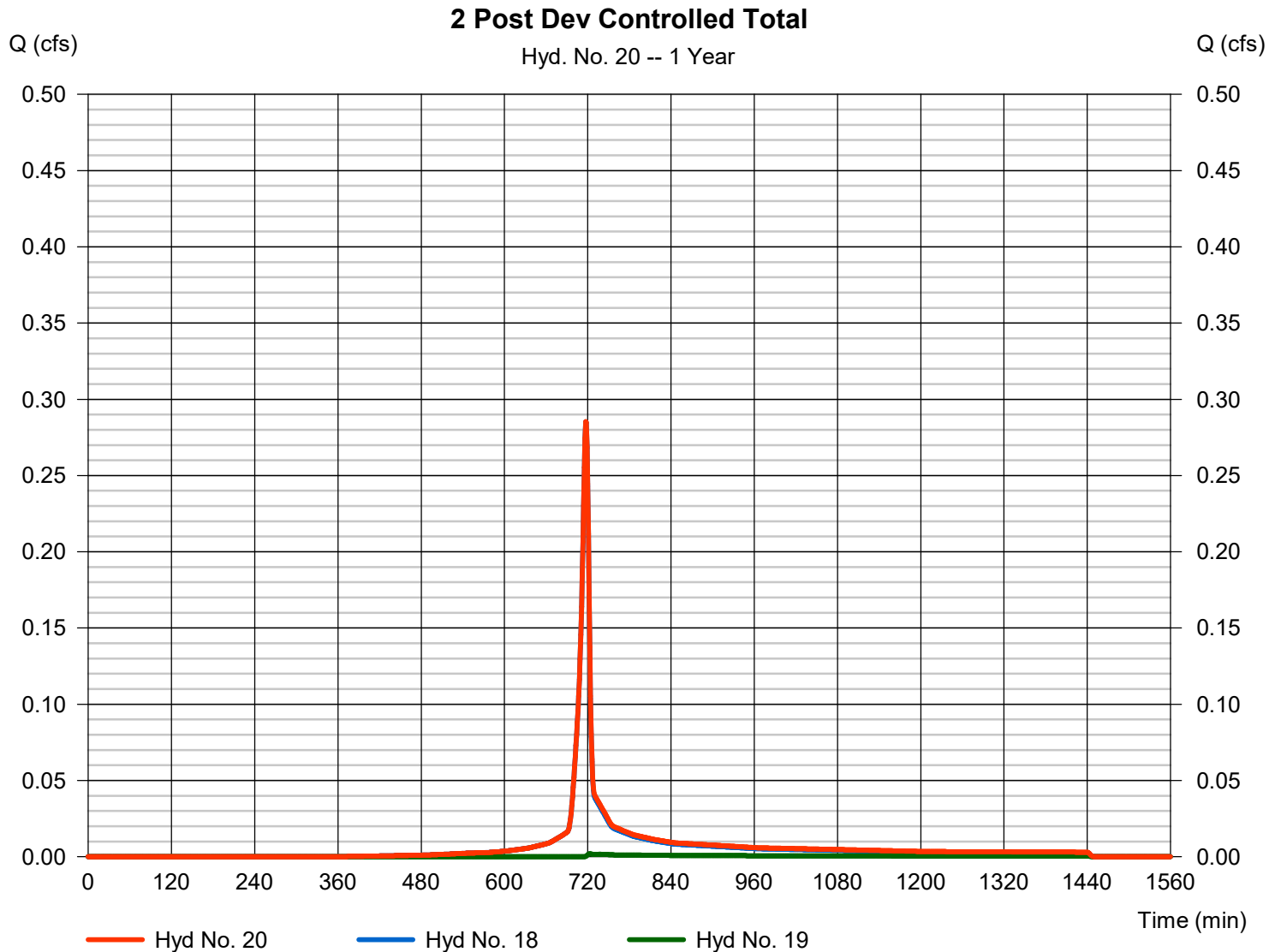
Hydrograph Report

Hyd. No. 20

2 Post Dev Controlled Total

Hydrograph type = Combine
Storm frequency = 1 yrs
Time interval = 1 min
Inflow hyds. = 18, 19

Peak discharge = 0.285 cfs
Time to peak = 717 min
Hyd. volume = 621 cuft
Contrib. drain. area = 0.150 ac



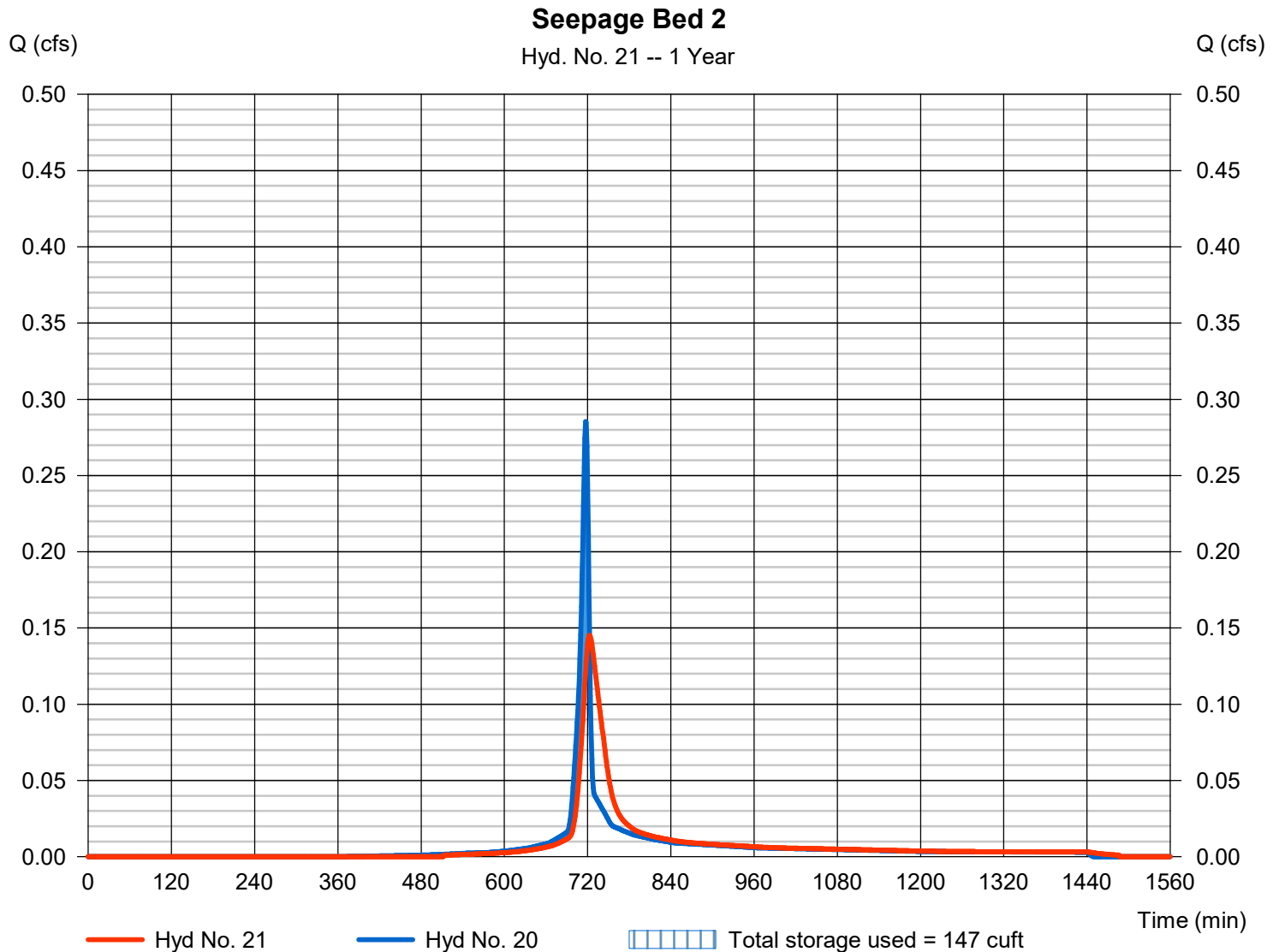
Hydrograph Report

Hyd. No. 21

Seepage Bed 2

Hydrograph type	= Reservoir	Peak discharge	= 0.145 cfs
Storm frequency	= 1 yrs	Time to peak	= 723 min
Time interval	= 1 min	Hyd. volume	= 615 cuft
Inflow hyd. No.	= 20 - 2 Post Dev Controlled Total	Max. Elevation	= 108.50 ft
Reservoir name	= Seepage Bed 2	Max. Storage	= 147 cuft

Storage Indication method used.



Pond Report

Pond No. 3 - Seepage Bed 2

Pond Data

UG Chambers -Invert elev. = 108.25 ft, Rise x Span = 0.50 x 0.50 ft, Barrel Len = 30.00 ft, No. Barrels = 1, Slope = 0.00%, Headers = No
Encasement -Invert elev. = 108.00 ft, Width = 24.00 ft, Height = 1.00 ft, Voids = 40.00%

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	108.00	n/a	0	0
0.10	108.10	n/a	29	29
0.20	108.20	n/a	29	58
0.30	108.30	n/a	29	87
0.40	108.40	n/a	30	116
0.50	108.50	n/a	30	146
0.60	108.60	n/a	30	175
0.70	108.70	n/a	30	205
0.80	108.80	n/a	29	234
0.90	108.90	n/a	29	263
1.00	109.00	n/a	29	292

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 18.00	3.00	0.00	0.00
Span (in)	= 18.00	3.00	0.00	0.00
No. Barrels	= 1	1	0	0
Invert El. (ft)	= 106.50	108.00	0.00	0.00
Length (ft)	= 42.00	0.50	0.00	0.00
Slope (%)	= 22.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	Yes	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 3.14	Inactive	Inactive	Inactive
Crest El. (ft)	= 109.00	0.00	0.00	0.00
Weir Coeff.	= 3.32	3.32	3.33	3.33
Weir Type	= Broad	Broad	---	---
Multi-Stage	= Yes	No	No	No
Exfil.(in/hr)	= 0.000 (by Wet area)			
TW Elev. (ft)	= 0.00			

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

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	108.00	0.00	0.00	---	---	0.00	0.00	---	---	---	---	0.000
0.01	3	108.01	7.37 ic	0.00 ic	---	---	0.00	0.00	---	---	---	---	0.000
0.02	6	108.02	7.37 ic	0.00 ic	---	---	0.00	0.00	---	---	---	---	0.001
0.03	9	108.03	7.37 ic	0.00 ic	---	---	0.00	0.00	---	---	---	---	0.002
0.04	12	108.04	7.37 ic	0.00 ic	---	---	0.00	0.00	---	---	---	---	0.004
0.05	14	108.05	7.37 ic	0.01 ic	---	---	0.00	0.00	---	---	---	---	0.006
0.06	17	108.06	7.37 ic	0.01 ic	---	---	0.00	0.00	---	---	---	---	0.008
0.07	20	108.07	7.37 ic	0.01 ic	---	---	0.00	0.00	---	---	---	---	0.010
0.08	23	108.08	7.37 ic	0.01 ic	---	---	0.00	0.00	---	---	---	---	0.013
0.09	26	108.09	7.37 ic	0.02 ic	---	---	0.00	0.00	---	---	---	---	0.016
0.10	29	108.10	7.37 ic	0.02 ic	---	---	0.00	0.00	---	---	---	---	0.020
0.11	32	108.11	7.37 ic	0.02 ic	---	---	0.00	0.00	---	---	---	---	0.024
0.12	35	108.12	7.37 ic	0.03 ic	---	---	0.00	0.00	---	---	---	---	0.028
0.13	37	108.13	7.37 ic	0.03 ic	---	---	0.00	0.00	---	---	---	---	0.032
0.14	40	108.14	7.37 ic	0.04 ic	---	---	0.00	0.00	---	---	---	---	0.036
0.15	43	108.15	7.37 ic	0.04 ic	---	---	0.00	0.00	---	---	---	---	0.041
0.16	46	108.16	7.37 ic	0.05 ic	---	---	0.00	0.00	---	---	---	---	0.046
0.17	49	108.17	7.37 ic	0.05 ic	---	---	0.00	0.00	---	---	---	---	0.050
0.18	52	108.18	7.37 ic	0.06 ic	---	---	0.00	0.00	---	---	---	---	0.055
0.19	55	108.19	7.37 ic	0.06 ic	---	---	0.00	0.00	---	---	---	---	0.060
0.20	58	108.20	7.37 ic	0.06 ic	---	---	0.00	0.00	---	---	---	---	0.064
0.21	61	108.21	7.37 ic	0.07 ic	---	---	0.00	0.00	---	---	---	---	0.069
0.22	63	108.22	7.37 ic	0.07 ic	---	---	0.00	0.00	---	---	---	---	0.073
0.23	66	108.23	7.37 ic	0.08 ic	---	---	0.00	0.00	---	---	---	---	0.077
0.24	69	108.24	7.37 ic	0.08 ic	---	---	0.00	0.00	---	---	---	---	0.081
0.25	72	108.25	7.37 ic	0.08 ic	---	---	0.00	0.00	---	---	---	---	0.084
0.26	75	108.26	7.37 ic	0.09 ic	---	---	0.00	0.00	---	---	---	---	0.087
0.27	78	108.27	7.37 ic	0.09 ic	---	---	0.00	0.00	---	---	---	---	0.090
0.28	81	108.28	7.37 ic	0.09 ic	---	---	0.00	0.00	---	---	---	---	0.093
0.29	84	108.29	7.37 ic	0.10 ic	---	---	0.00	0.00	---	---	---	---	0.096
0.30	87	108.30	7.37 ic	0.10 ic	---	---	0.00	0.00	---	---	---	---	0.099
0.31	90	108.31	7.37 ic	0.10 ic	---	---	0.00	0.00	---	---	---	---	0.102

Continues on next page...

Seepage Bed 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
0.32	93	108.32	7.37 ic	0.10 ic	---	---	0.00	0.00	---	---	---	---	0.104
0.33	95	108.33	7.37 ic	0.11 ic	---	---	0.00	0.00	---	---	---	---	0.107
0.34	98	108.34	7.37 ic	0.11 ic	---	---	0.00	0.00	---	---	---	---	0.110
0.35	101	108.35	7.37 ic	0.11 ic	---	---	0.00	0.00	---	---	---	---	0.112
0.36	104	108.36	7.37 ic	0.11 ic	---	---	0.00	0.00	---	---	---	---	0.115
0.37	107	108.37	7.37 ic	0.12 ic	---	---	0.00	0.00	---	---	---	---	0.117
0.38	110	108.38	7.37 ic	0.12 ic	---	---	0.00	0.00	---	---	---	---	0.119
0.39	113	108.39	7.37 ic	0.12 ic	---	---	0.00	0.00	---	---	---	---	0.122
0.40	116	108.40	7.37 ic	0.12 ic	---	---	0.00	0.00	---	---	---	---	0.124
0.41	119	108.41	7.37 ic	0.13 ic	---	---	0.00	0.00	---	---	---	---	0.126
0.42	122	108.42	7.37 ic	0.13 ic	---	---	0.00	0.00	---	---	---	---	0.128
0.43	125	108.43	7.37 ic	0.13 ic	---	---	0.00	0.00	---	---	---	---	0.131
0.44	128	108.44	7.37 ic	0.13 ic	---	---	0.00	0.00	---	---	---	---	0.133
0.45	131	108.45	7.37 ic	0.13 ic	---	---	0.00	0.00	---	---	---	---	0.135
0.46	134	108.46	7.37 ic	0.14 ic	---	---	0.00	0.00	---	---	---	---	0.137
0.47	137	108.47	7.37 ic	0.14 ic	---	---	0.00	0.00	---	---	---	---	0.139
0.48	140	108.48	7.37 ic	0.14 ic	---	---	0.00	0.00	---	---	---	---	0.141
0.49	143	108.49	7.37 ic	0.14 ic	---	---	0.00	0.00	---	---	---	---	0.143
0.50	146	108.50	7.37 ic	0.14 ic	---	---	0.00	0.00	---	---	---	---	0.145
0.51	149	108.51	7.37 ic	0.15 ic	---	---	0.00	0.00	---	---	---	---	0.147
0.52	152	108.52	7.37 ic	0.15 ic	---	---	0.00	0.00	---	---	---	---	0.149
0.53	155	108.53	7.37 ic	0.15 ic	---	---	0.00	0.00	---	---	---	---	0.150
0.54	158	108.54	7.37 ic	0.15 ic	---	---	0.00	0.00	---	---	---	---	0.152
0.55	161	108.55	7.37 ic	0.15 ic	---	---	0.00	0.00	---	---	---	---	0.154
0.56	164	108.56	7.37 ic	0.16 ic	---	---	0.00	0.00	---	---	---	---	0.156
0.57	167	108.57	7.37 ic	0.16 ic	---	---	0.00	0.00	---	---	---	---	0.158
0.58	170	108.58	7.37 ic	0.16 ic	---	---	0.00	0.00	---	---	---	---	0.159
0.59	173	108.59	7.37 ic	0.16 ic	---	---	0.00	0.00	---	---	---	---	0.161
0.60	175	108.60	7.37 ic	0.16 ic	---	---	0.00	0.00	---	---	---	---	0.163
0.61	178	108.61	7.37 ic	0.16 ic	---	---	0.00	0.00	---	---	---	---	0.165
0.62	181	108.62	7.37 ic	0.17 ic	---	---	0.00	0.00	---	---	---	---	0.166
0.63	184	108.63	7.37 ic	0.17 ic	---	---	0.00	0.00	---	---	---	---	0.168
0.64	187	108.64	7.37 ic	0.17 ic	---	---	0.00	0.00	---	---	---	---	0.170
0.65	190	108.65	7.37 ic	0.17 ic	---	---	0.00	0.00	---	---	---	---	0.171
0.66	193	108.66	7.37 ic	0.17 ic	---	---	0.00	0.00	---	---	---	---	0.173
0.67	196	108.67	7.37 ic	0.17 ic	---	---	0.00	0.00	---	---	---	---	0.174
0.68	199	108.68	7.37 ic	0.18 ic	---	---	0.00	0.00	---	---	---	---	0.176
0.69	202	108.69	7.37 ic	0.18 ic	---	---	0.00	0.00	---	---	---	---	0.178
0.70	205	108.70	7.37 ic	0.18 ic	---	---	0.00	0.00	---	---	---	---	0.179
0.71	208	108.71	7.37 ic	0.18 ic	---	---	0.00	0.00	---	---	---	---	0.181
0.72	211	108.72	7.37 ic	0.18 ic	---	---	0.00	0.00	---	---	---	---	0.182
0.73	214	108.73	7.37 ic	0.18 ic	---	---	0.00	0.00	---	---	---	---	0.184
0.74	217	108.74	7.37 ic	0.19 ic	---	---	0.00	0.00	---	---	---	---	0.185
0.75	219	108.75	7.37 ic	0.19 ic	---	---	0.00	0.00	---	---	---	---	0.187
0.76	222	108.76	7.37 ic	0.19 ic	---	---	0.00	0.00	---	---	---	---	0.188
0.77	225	108.77	7.37 ic	0.19 ic	---	---	0.00	0.00	---	---	---	---	0.190
0.78	228	108.78	7.37 ic	0.19 ic	---	---	0.00	0.00	---	---	---	---	0.191
0.79	231	108.79	7.37 ic	0.19 ic	---	---	0.00	0.00	---	---	---	---	0.193
0.80	234	108.80	7.37 ic	0.19 ic	---	---	0.00	0.00	---	---	---	---	0.194
0.81	237	108.81	7.37 ic	0.20 ic	---	---	0.00	0.00	---	---	---	---	0.196
0.82	240	108.82	7.37 ic	0.20 ic	---	---	0.00	0.00	---	---	---	---	0.197
0.83	243	108.83	7.37 ic	0.20 ic	---	---	0.00	0.00	---	---	---	---	0.198
0.84	246	108.84	7.37 ic	0.20 ic	---	---	0.00	0.00	---	---	---	---	0.200
0.85	248	108.85	7.37 ic	0.20 ic	---	---	0.00	0.00	---	---	---	---	0.201
0.86	251	108.86	7.37 ic	0.20 ic	---	---	0.00	0.00	---	---	---	---	0.203
0.87	254	108.87	7.37 ic	0.20 ic	---	---	0.00	0.00	---	---	---	---	0.204
0.88	257	108.88	7.37 ic	0.21 ic	---	---	0.00	0.00	---	---	---	---	0.205
0.89	260	108.89	7.37 ic	0.21 ic	---	---	0.00	0.00	---	---	---	---	0.207
0.90	263	108.90	7.37 ic	0.21 ic	---	---	0.00	0.00	---	---	---	---	0.208
0.91	266	108.91	7.37 ic	0.21 ic	---	---	0.00	0.00	---	---	---	---	0.209
0.92	269	108.92	7.37 ic	0.21 ic	---	---	0.00	0.00	---	---	---	---	0.211
0.93	271	108.93	7.37 ic	0.21 ic	---	---	0.00	0.00	---	---	---	---	0.212
0.94	274	108.94	7.37 ic	0.21 ic	---	---	0.00	0.00	---	---	---	---	0.213
0.95	277	108.95	7.37 ic	0.21 ic	---	---	0.00	0.00	---	---	---	---	0.215
0.96	280	108.96	7.37 ic	0.22 ic	---	---	0.00	0.00	---	---	---	---	0.216
0.97	283	108.97	7.37 ic	0.22 ic	---	---	0.00	0.00	---	---	---	---	0.217
0.98	286	108.98	7.37 ic	0.22 ic	---	---	0.00	0.00	---	---	---	---	0.219
0.99	289	108.99	7.37 ic	0.22 ic	---	---	0.00	0.00	---	---	---	---	0.220
1.00	292	109.00	7.37 ic	0.22 ic	---	---	0.00	0.00	---	---	---	---	0.221

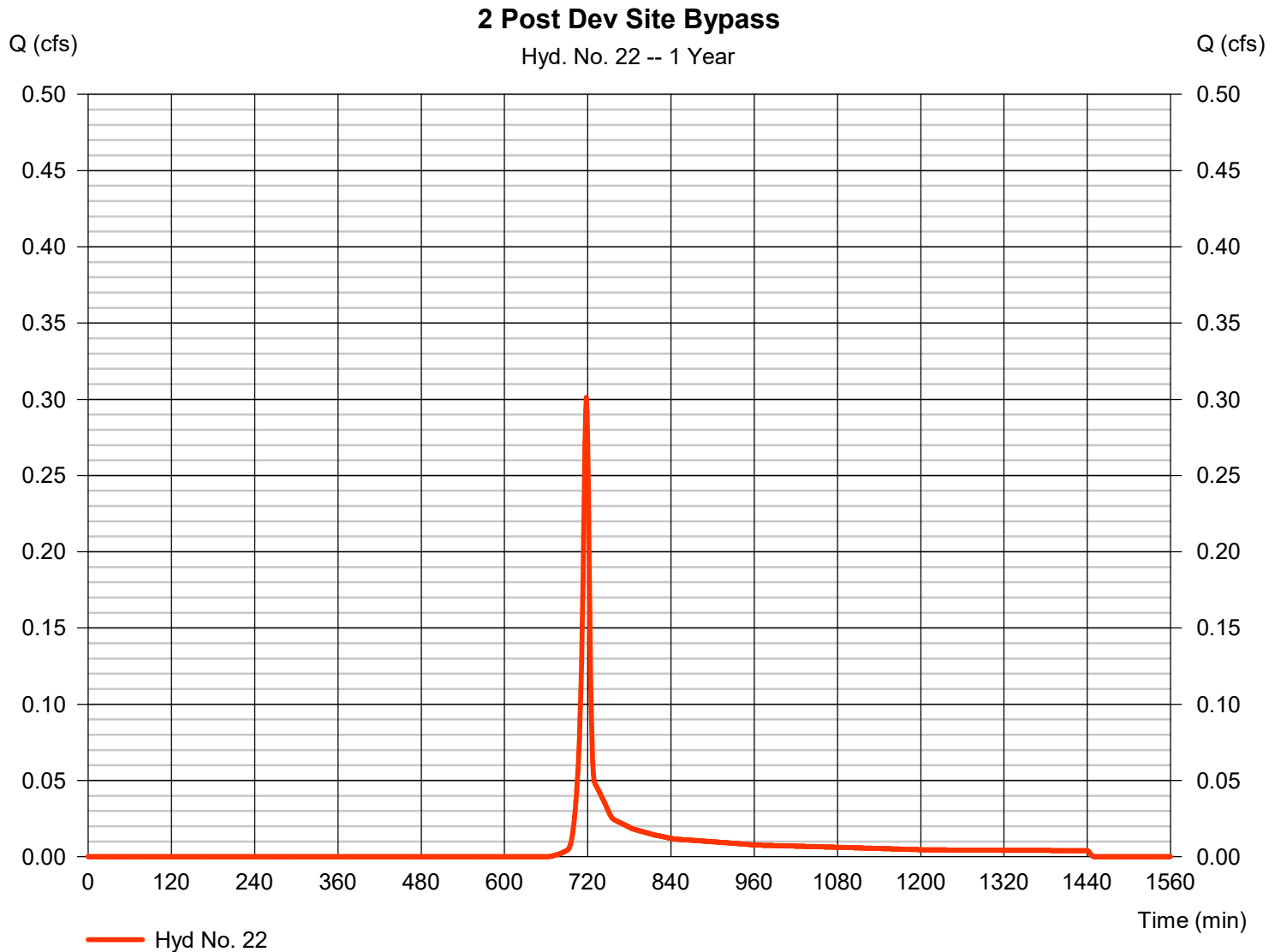
...End

Hydrograph Report

Hyd. No. 22

2 Post Dev Site Bypass

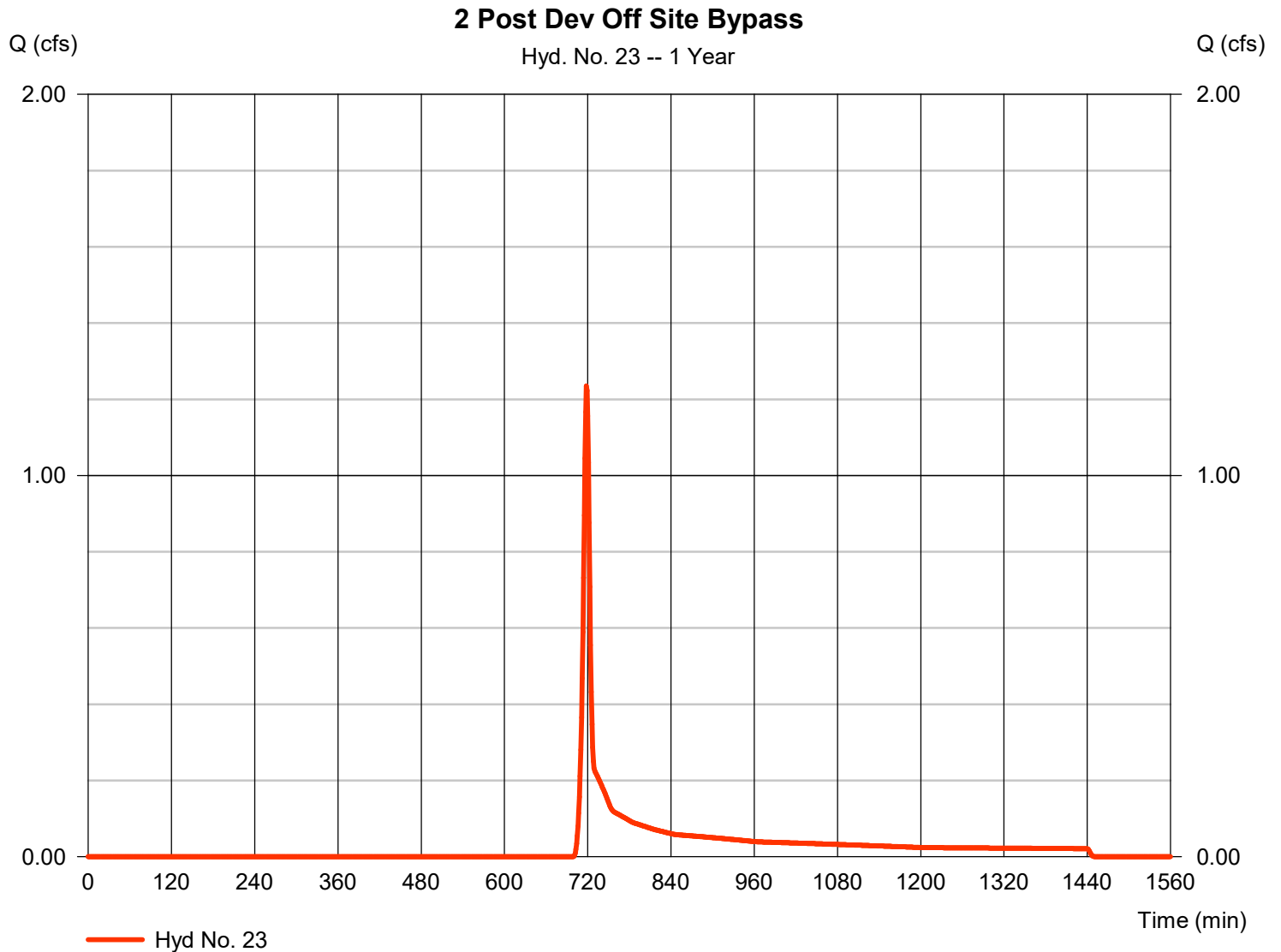
Hydrograph type	= SCS Runoff	Peak discharge	= 0.301 cfs
Storm frequency	= 1 yrs	Time to peak	= 718 min
Time interval	= 1 min	Hyd. volume	= 614 cuft
Drainage area	= 0.200 ac	Curve number	= 75.9
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	=	Time of conc. (Tc)	= 6.00 min
Total precip.	= 2.71 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hyd. No. 23

2 Post Dev Off Site Bypass

Hydrograph type	= SCS Runoff	Peak discharge	= 1.235 cfs
Storm frequency	= 1 yrs	Time to peak	= 718 min
Time interval	= 1 min	Hyd. volume	= 2,727 cuft
Drainage area	= 1.350 ac	Curve number	= 69.5
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 2.71 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



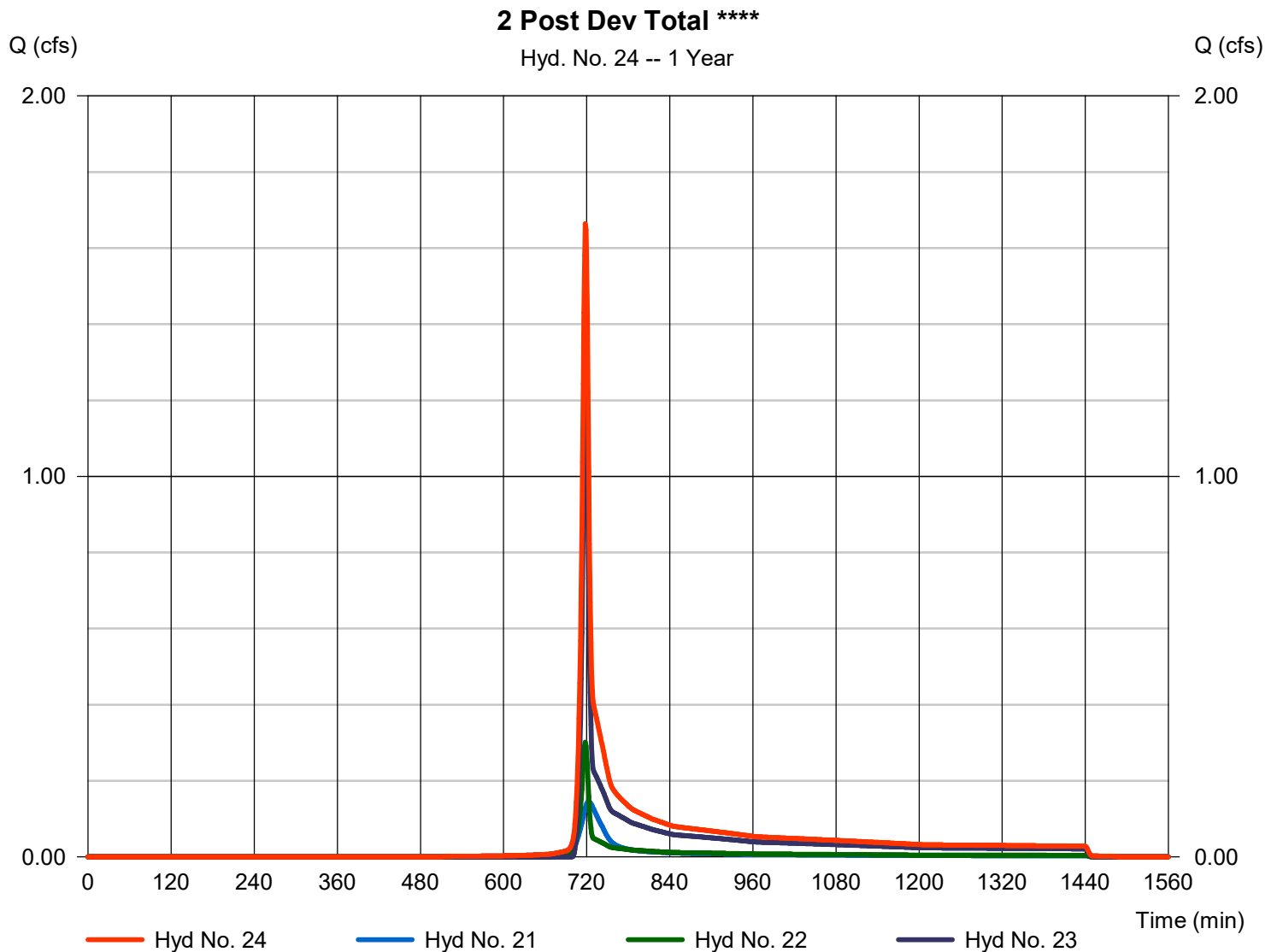
Hydrograph Report

Hyd. No. 24

2 Post Dev Total ****

Hydrograph type = Combine
Storm frequency = 1 yrs
Time interval = 1 min
Inflow hyds. = 21, 22, 23

Peak discharge = 1.664 cfs
Time to peak = 718 min
Hyd. volume = 3,956 cuft
Contrib. drain. area = 1.550 ac



Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

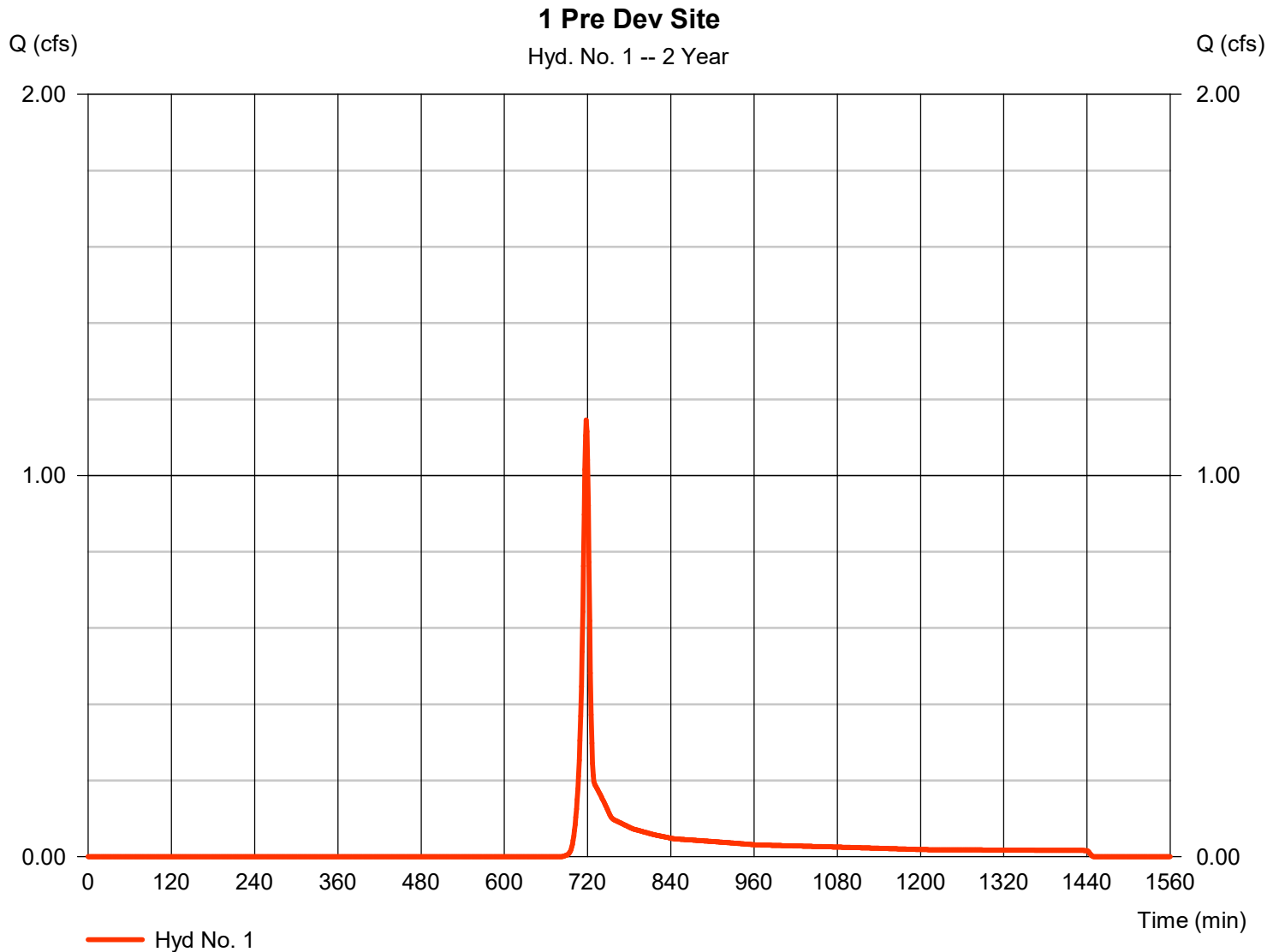
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	1.146	1	718	2,377	----	----	----	1 Pre Dev Site
2	SCS Runoff	1.070	1	718	2,237	----	----	----	1 Pre Dev Off Site
3	Combine	2.215	1	718	4,614	1, 2	----	----	1 Pre Dev Total ****
4	SCS Runoff	1.456	1	718	2,967	----	----	----	1A Post Dev Site
5	SCS Runoff	1.045	1	718	2,203	----	----	----	1A Post Dev Off Site
6	Combine	2.501	1	718	5,169	4, 5	----	----	1A Post Dev Controlled Total
7	Reservoir	0.272	1	743	2,311	6	127.89	2,214	Seepage Bed 1A
8	SCS Runoff	1.270	1	717	2,914	----	----	----	1B Post Dev Site
9	Combine	1.270	1	717	5,225	7, 8	----	----	1B Post Dev Controlled Total
10	Reservoir	0.834	1	721	2,703	9	127.58	556	Seepage Bed 1B
11	SCS Runoff	0.410	1	718	824	----	----	----	1 Post Dev Site Bypass
12	SCS Runoff	0.225	1	718	455	----	----	----	1 Post Dev Off Site Bypass
13	Combine	1.401	1	719	3,982	10, 11, 12	----	----	1 Post Dev Total ****
15	SCS Runoff	0.305	1	720	770	----	----	----	2 Pre Dev Site
16	SCS Runoff	1.900	1	719	4,220	----	----	----	2 Pre Dev Off Site
17	Combine	2.205	1	719	4,990	15, 16	----	----	2 Pre Dev Total ****
18	SCS Runoff	0.363	1	717	764	----	----	----	2 Post Dev Site
19	SCS Runoff	0.015	1	720	60	----	----	----	2 Post Dev Off Site
20	Combine	0.373	1	718	825	18, 19	----	----	2 Post Dev Controlled Total
21	Reservoir	0.175	1	723	819	20	108.67	197	Seepage Bed 2
22	SCS Runoff	0.442	1	718	889	----	----	----	2 Post Dev Site Bypass
23	SCS Runoff	2.034	1	718	4,236	----	----	----	2 Post Dev Off Site Bypass
24	Combine	2.629	1	718	5,944	21, 22, 23	----	----	2 Post Dev Total ****
301 Watersheds 2084 SCS.gpw					Return Period: 2 Year			Friday, 09 / 22 / 2023	

Hydrograph Report

Hyd. No. 1

1 Pre Dev Site

Hydrograph type	= SCS Runoff	Peak discharge	= 1.146 cfs
Storm frequency	= 2 yrs	Time to peak	= 718 min
Time interval	= 1 min	Hyd. volume	= 2,377 cuft
Drainage area	= 0.740 ac	Curve number	= 69.9
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 3.26 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

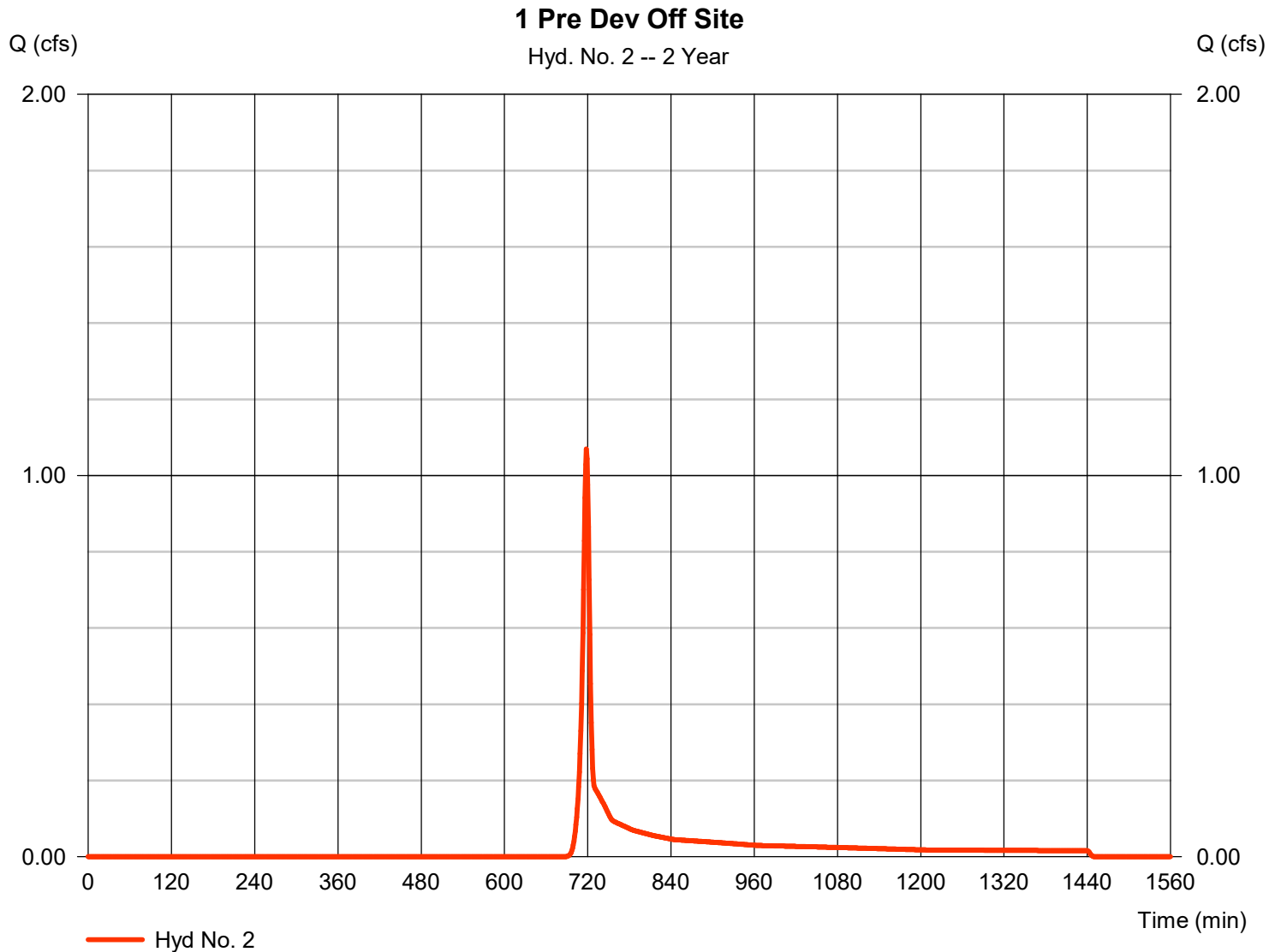


Hydrograph Report

Hyd. No. 2

1 Pre Dev Off Site

Hydrograph type	= SCS Runoff	Peak discharge	= 1.070 cfs
Storm frequency	= 2 yrs	Time to peak	= 718 min
Time interval	= 1 min	Hyd. volume	= 2,237 cuft
Drainage area	= 0.730 ac	Curve number	= 69.1
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 3.26 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



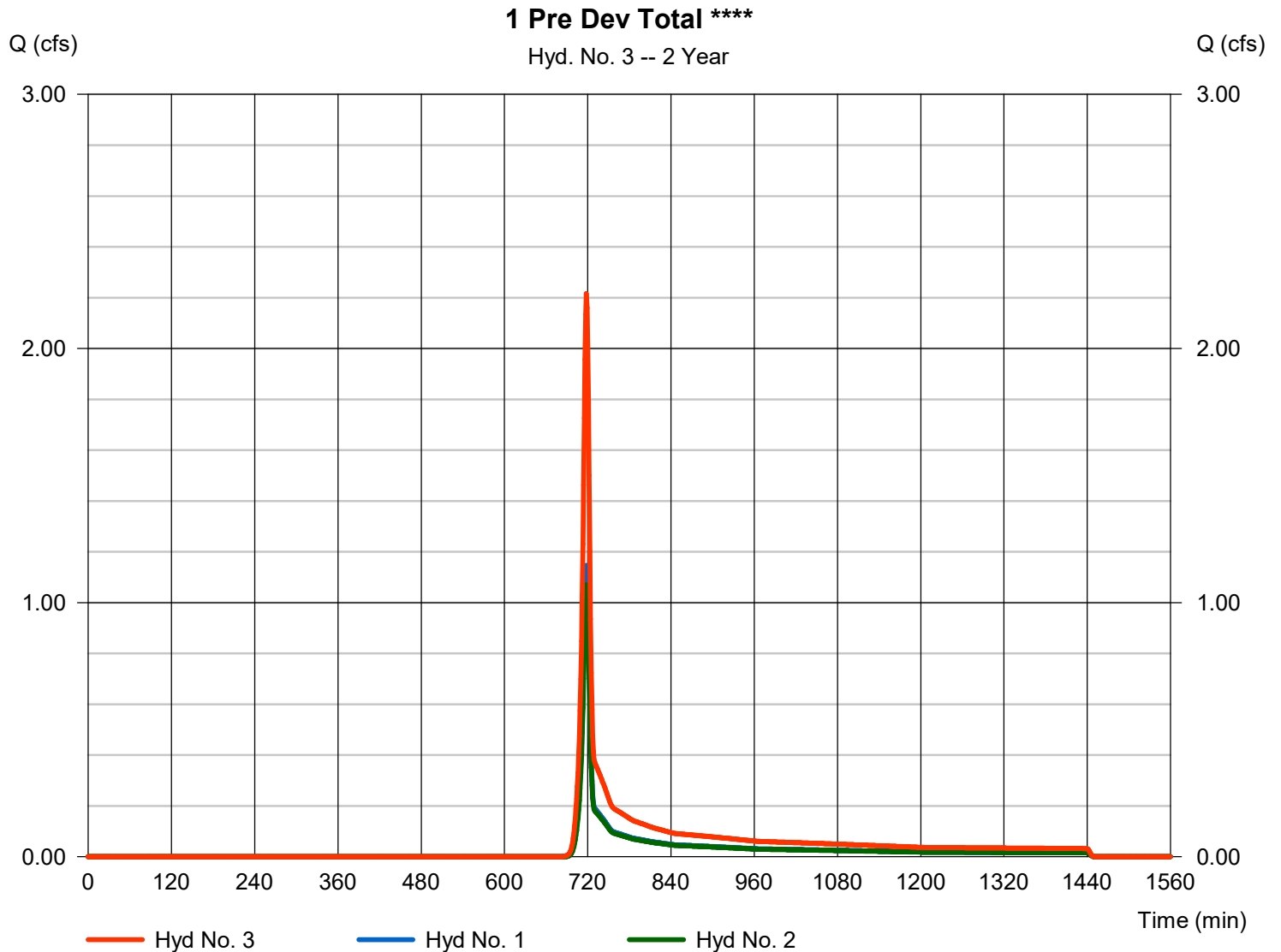
Hydrograph Report

Hyd. No. 3

1 Pre Dev Total ****

Hydrograph type = Combine
Storm frequency = 2 yrs
Time interval = 1 min
Inflow hyds. = 1, 2

Peak discharge = 2.215 cfs
Time to peak = 718 min
Hyd. volume = 4,614 cuft
Contrib. drain. area = 1.470 ac

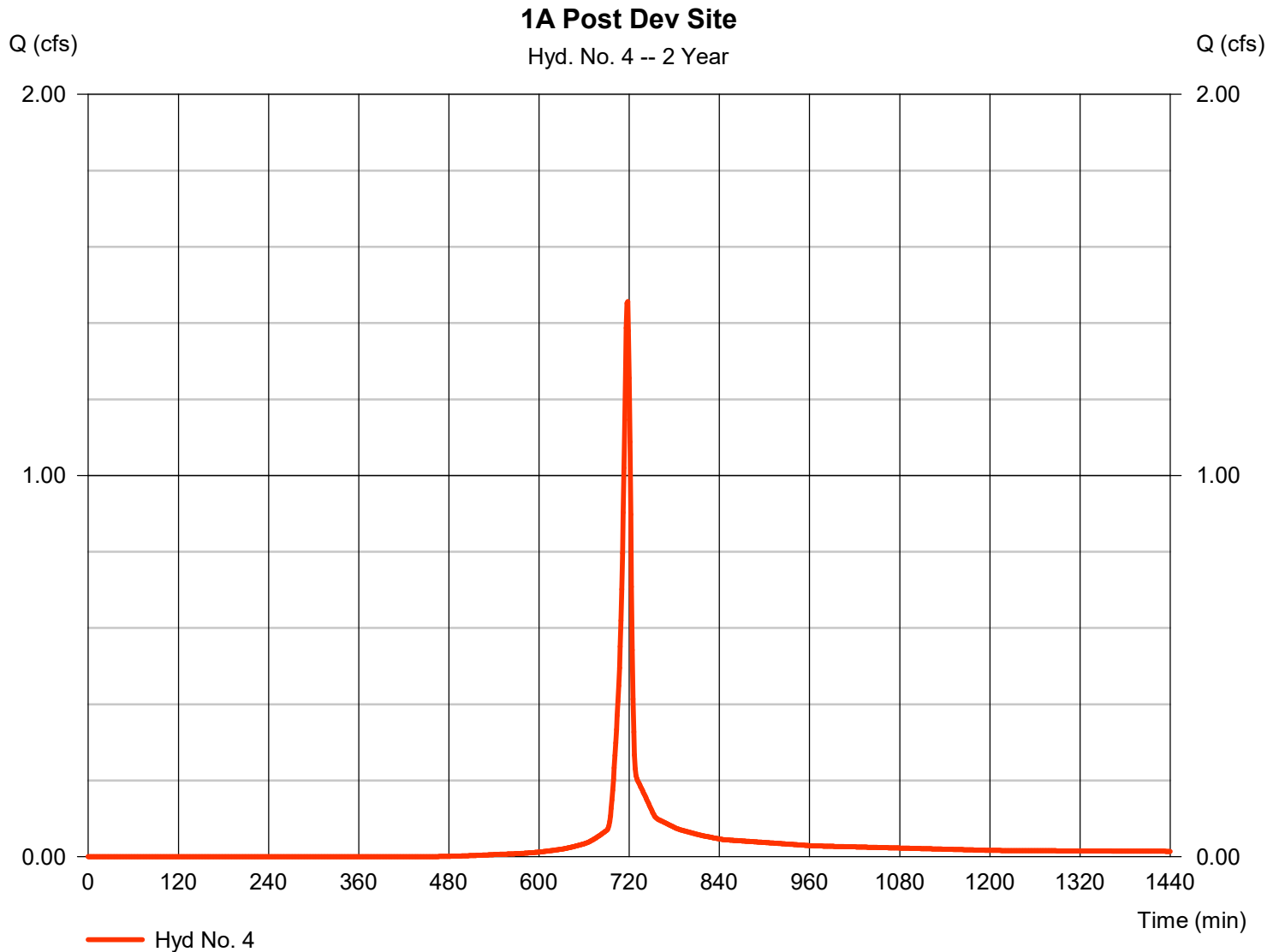


Hydrograph Report

Hyd. No. 4

1A Post Dev Site

Hydrograph type	= SCS Runoff	Peak discharge	= 1.456 cfs
Storm frequency	= 2 yrs	Time to peak	= 718 min
Time interval	= 1 min	Hyd. volume	= 2,967 cuft
Drainage area	= 0.440 ac	Curve number	= 84.9
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 3.26 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

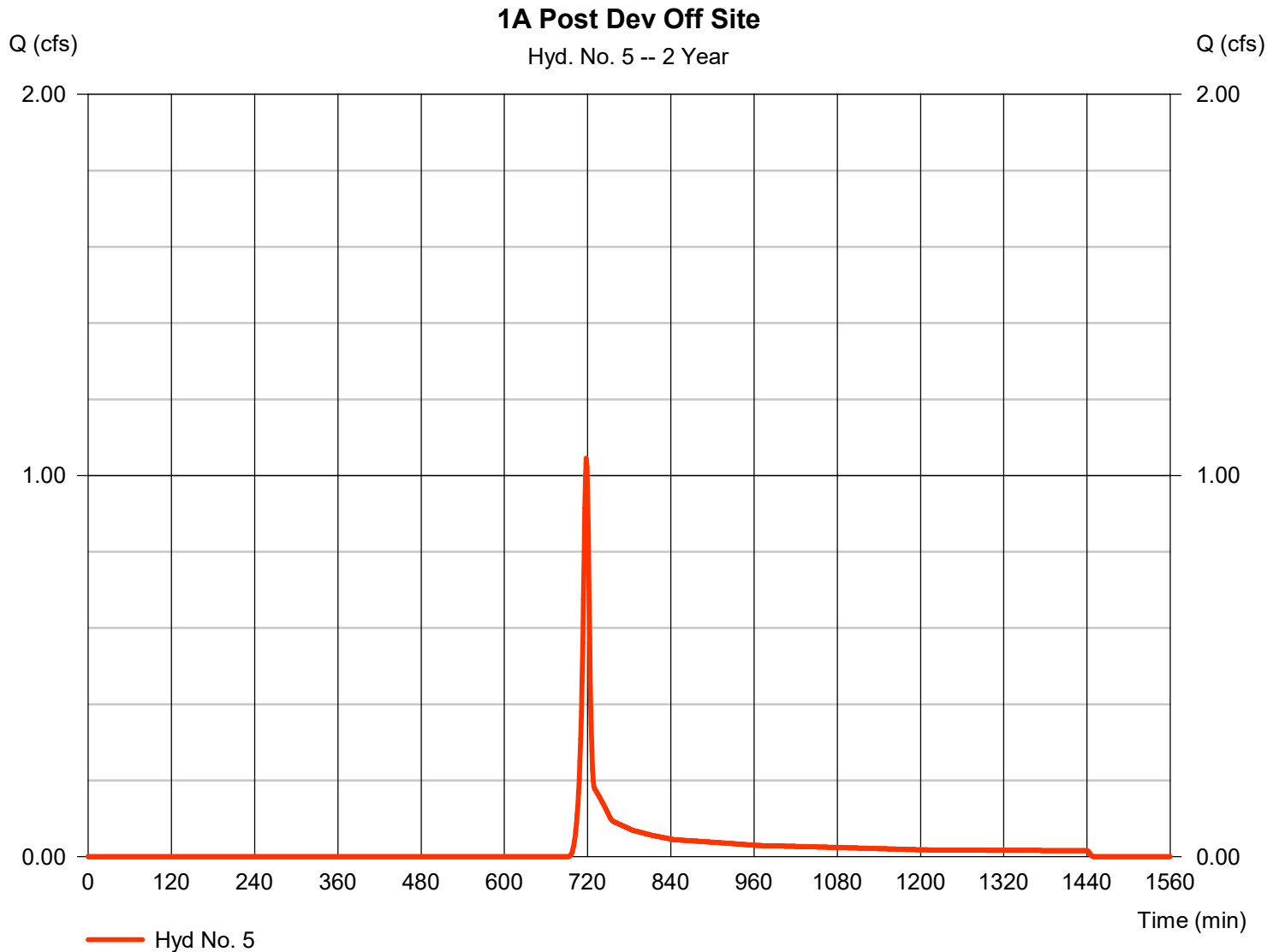


Hydrograph Report

Hyd. No. 5

1A Post Dev Off Site

Hydrograph type	= SCS Runoff	Peak discharge	= 1.045 cfs
Storm frequency	= 2 yrs	Time to peak	= 718 min
Time interval	= 1 min	Hyd. volume	= 2,203 cuft
Drainage area	= 0.750 ac	Curve number	= 68.4
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	=	Time of conc. (Tc)	= 6.00 min
Total precip.	= 3.26 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



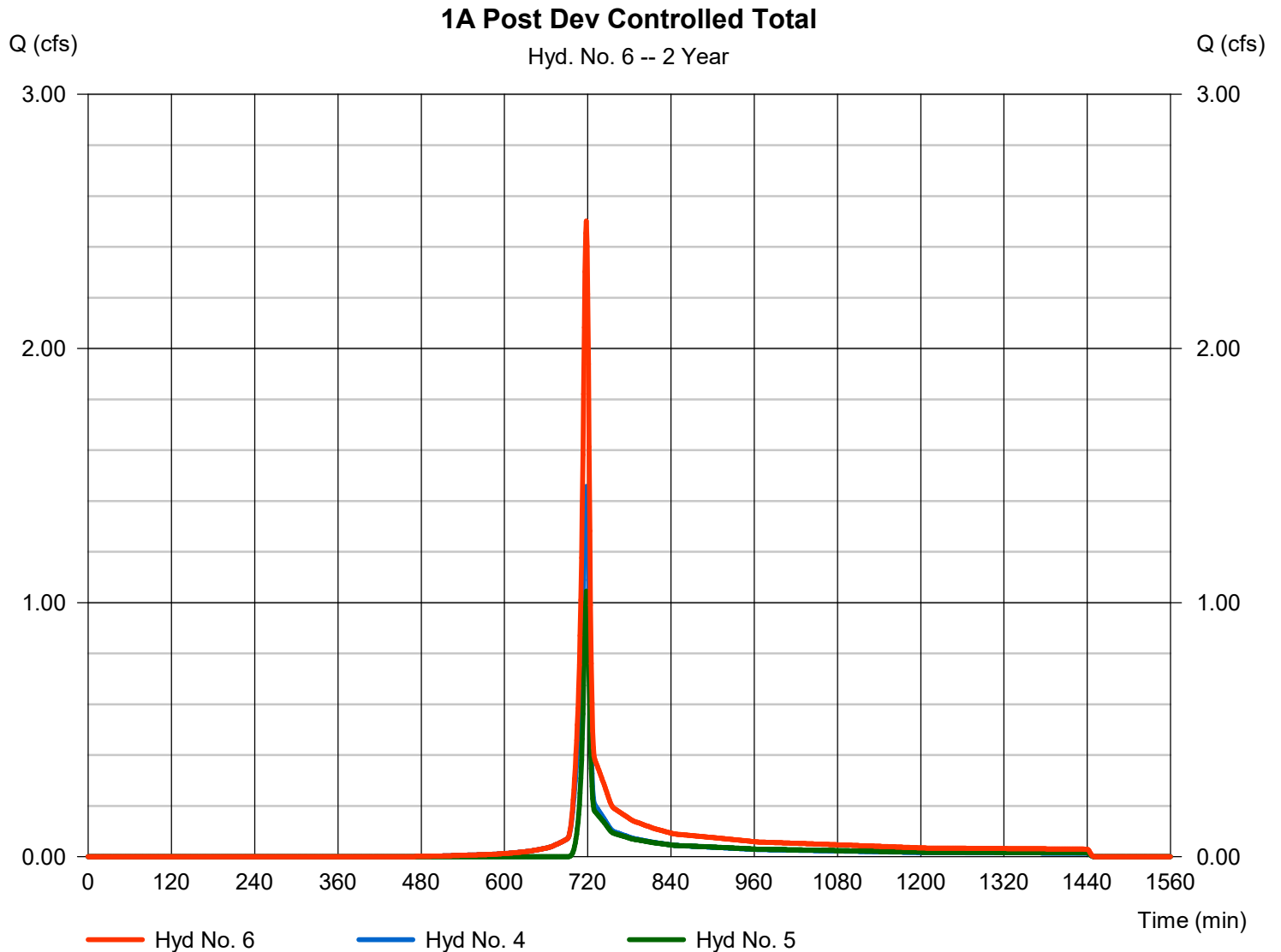
Hydrograph Report

Hyd. No. 6

1A Post Dev Controlled Total

Hydrograph type = Combine
Storm frequency = 2 yrs
Time interval = 1 min
Inflow hyds. = 4, 5

Peak discharge = 2.501 cfs
Time to peak = 718 min
Hyd. volume = 5,169 cuft
Contrib. drain. area = 1.190 ac

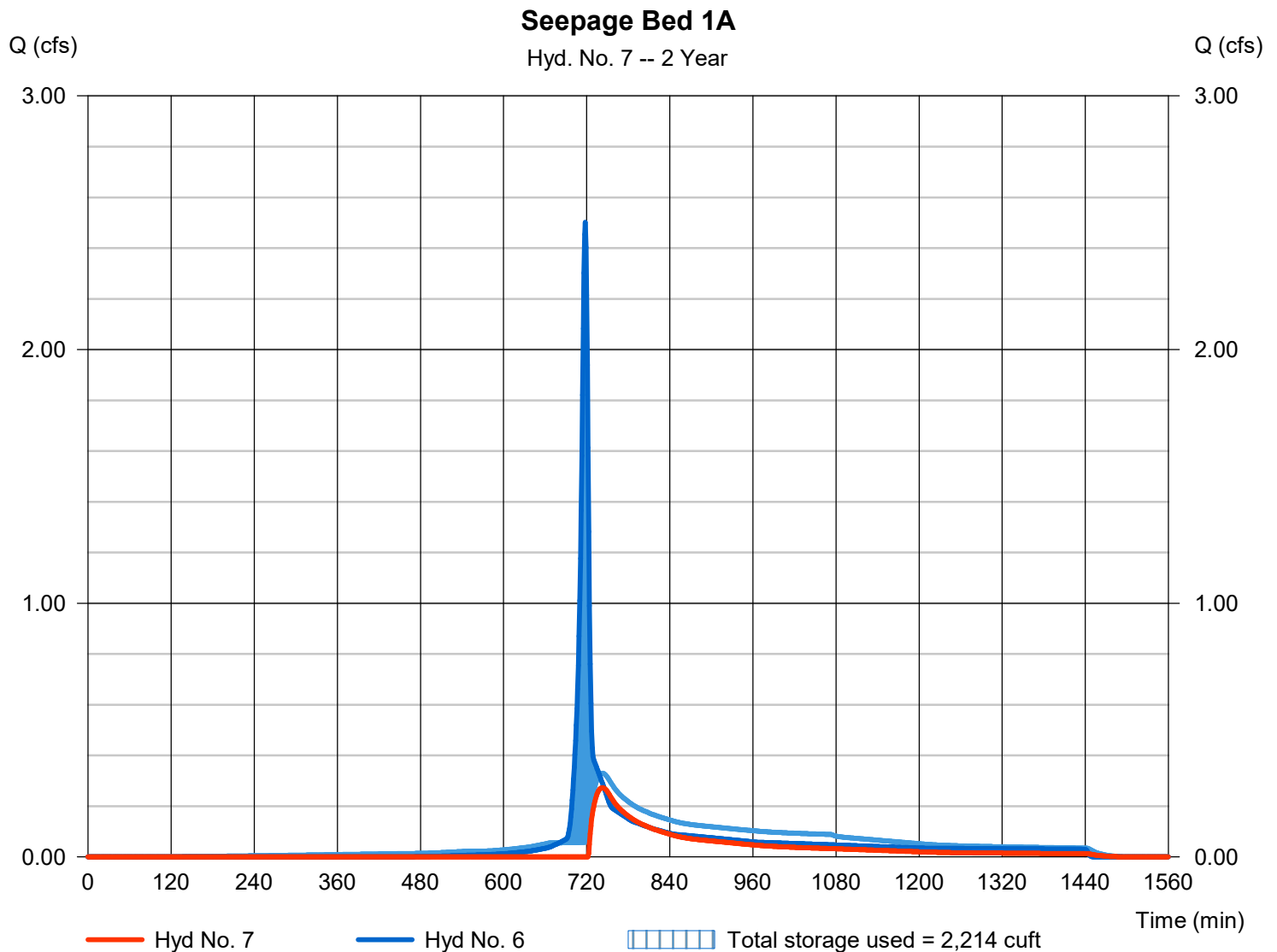


Hyd. No. 7

Seepage Bed 1A

Hydrograph type	= Reservoir	Peak discharge	= 0.272 cfs
Storm frequency	= 2 yrs	Time to peak	= 743 min
Time interval	= 1 min	Hyd. volume	= 2,311 cuft
Inflow hyd. No.	= 6 - 1A Post Dev Controlled Total	Max. Elevation	= 127.89 ft
Reservoir name	= Seepage Bed 1A	Max. Storage	= 2,214 cuft

Storage Indication method used. Exfiltration extracted from Outflow.

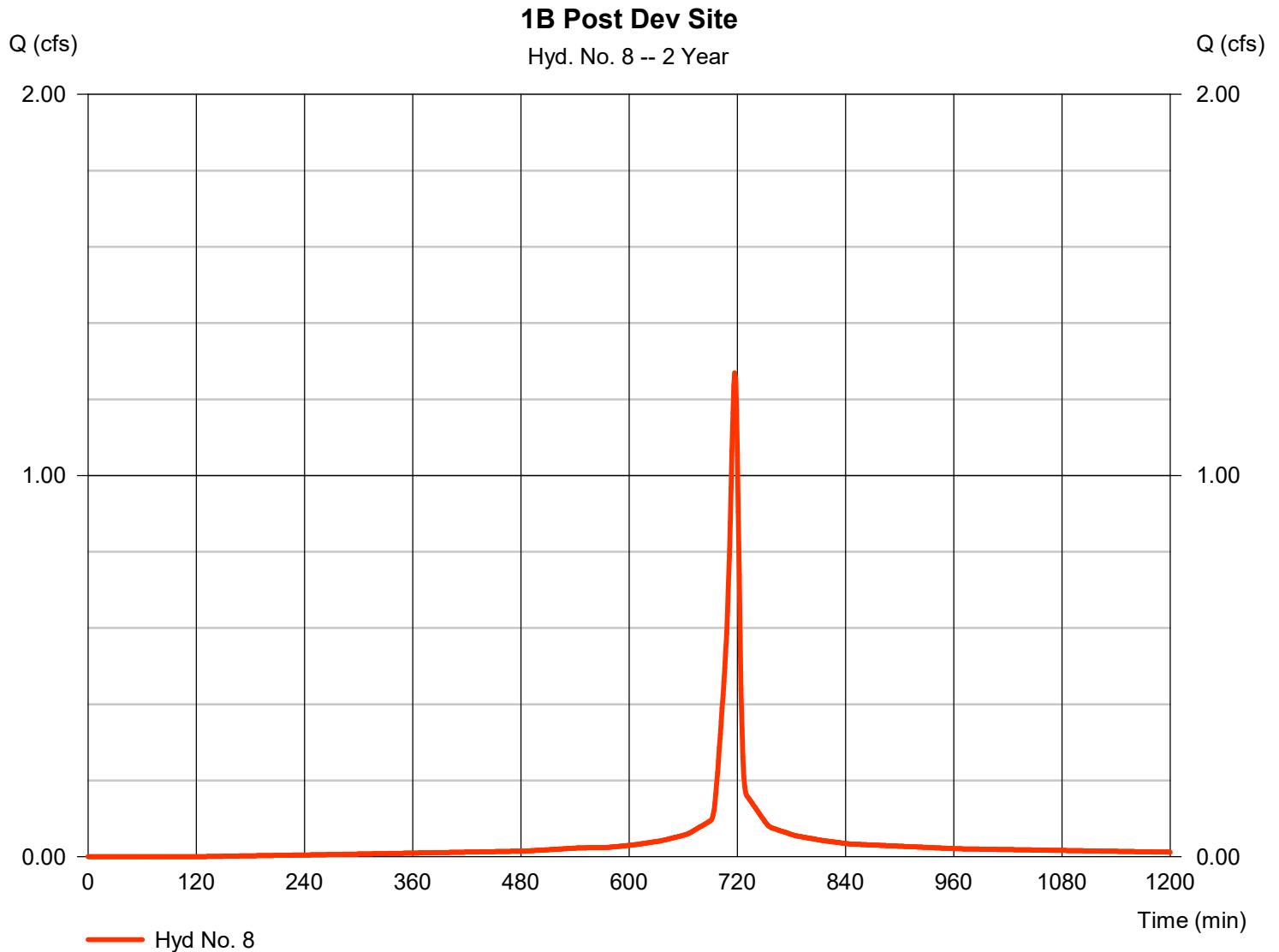


Hydrograph Report

Hyd. No. 8

1B Post Dev Site

Hydrograph type	= SCS Runoff	Peak discharge	= 1.270 cfs
Storm frequency	= 2 yrs	Time to peak	= 717 min
Time interval	= 1 min	Hyd. volume	= 2,914 cuft
Drainage area	= 0.270 ac	Curve number	= 96.7
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	=	Time of conc. (Tc)	= 6.00 min
Total precip.	= 3.26 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



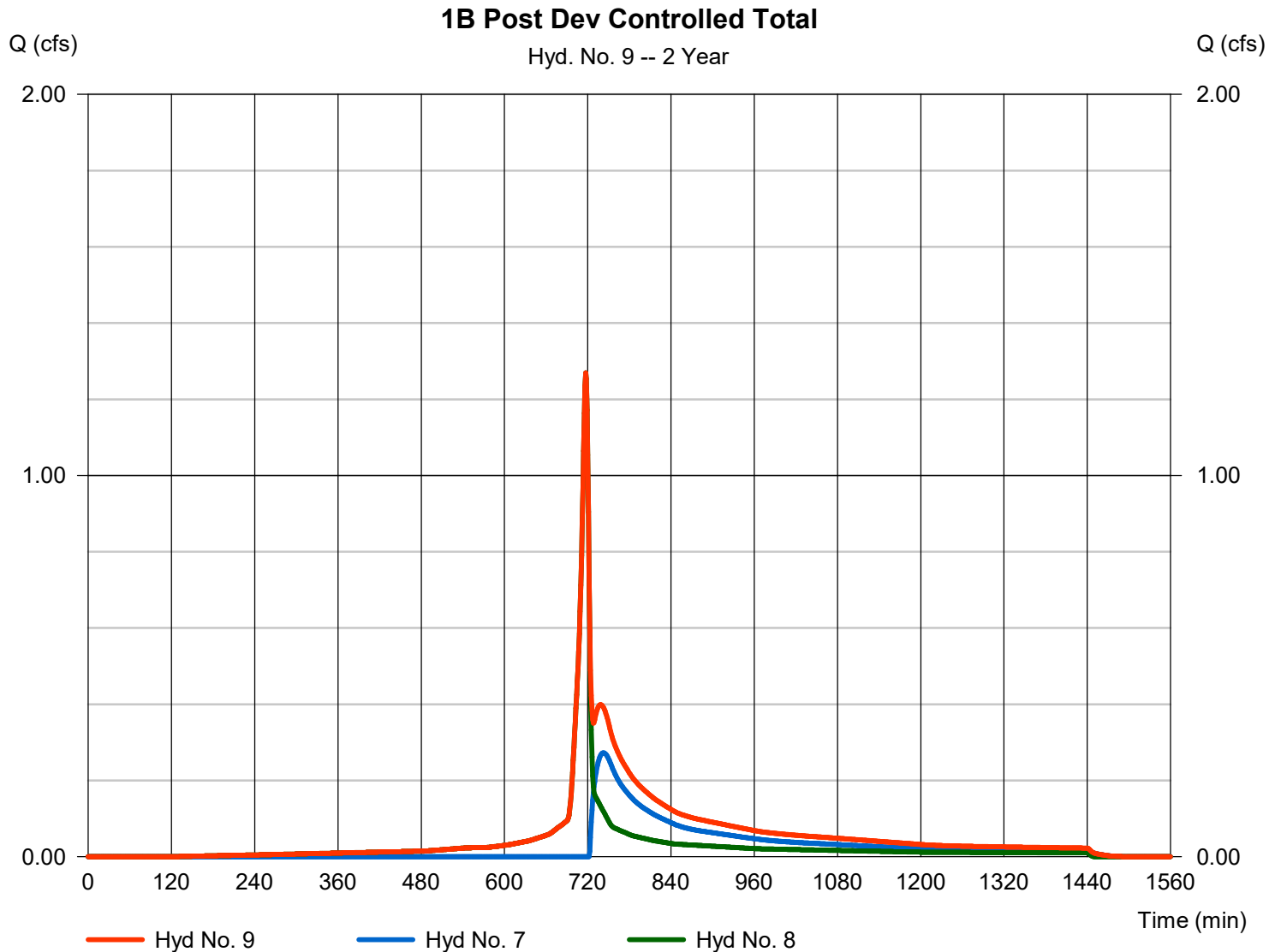
Hydrograph Report

Hyd. No. 9

1B Post Dev Controlled Total

Hydrograph type = Combine
Storm frequency = 2 yrs
Time interval = 1 min
Inflow hyds. = 7, 8

Peak discharge = 1.270 cfs
Time to peak = 717 min
Hyd. volume = 5,225 cuft
Contrib. drain. area = 0.270 ac

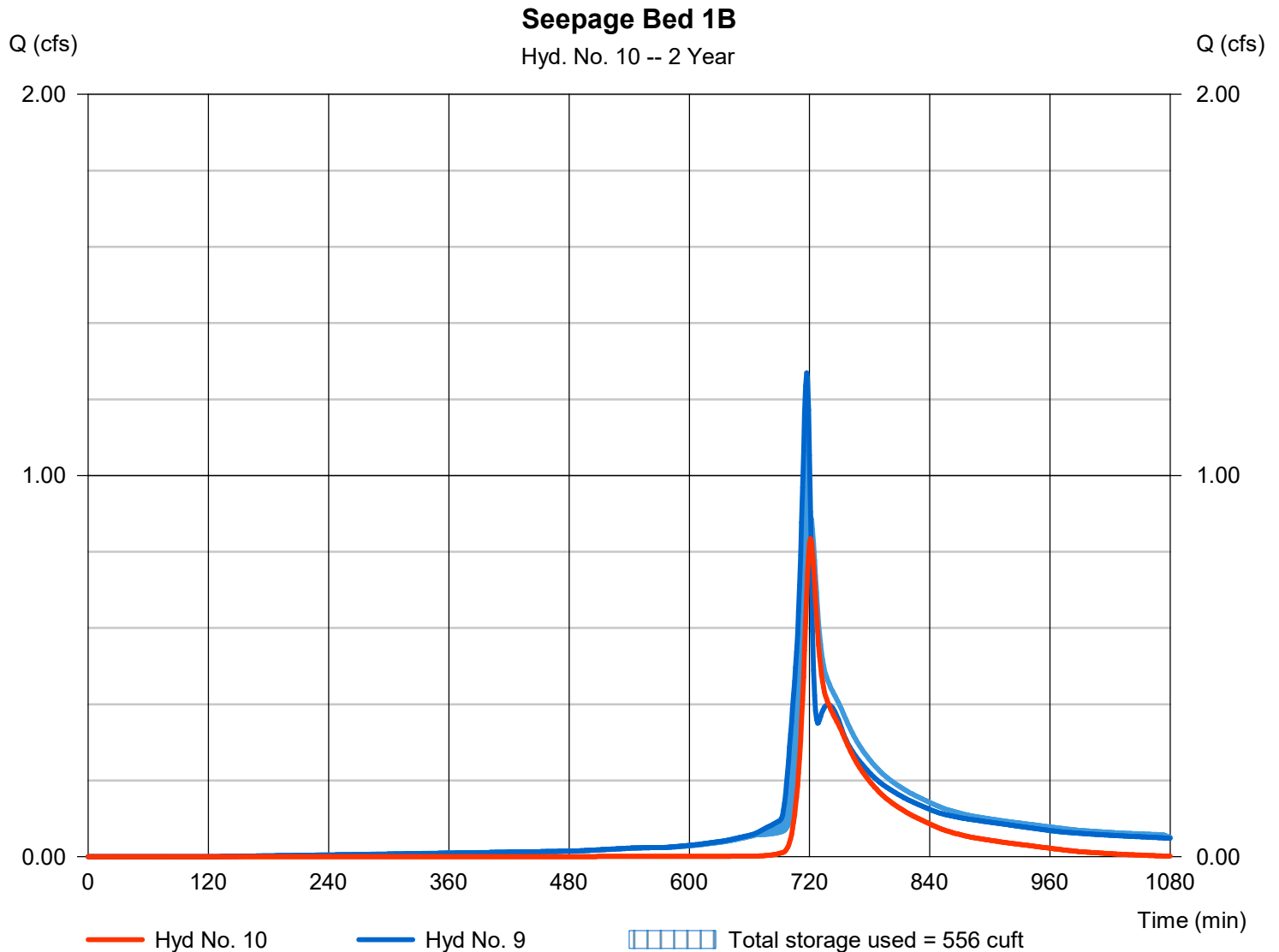


Hyd. No. 10

Seepage Bed 1B

Hydrograph type	= Reservoir	Peak discharge	= 0.834 cfs
Storm frequency	= 2 yrs	Time to peak	= 721 min
Time interval	= 1 min	Hyd. volume	= 2,703 cuft
Inflow hyd. No.	= 9 - 1B Post Dev Controlled Total	Max. Elevation	= 127.58 ft
Reservoir name	= Seepage Bed 1B	Max. Storage	= 556 cuft

Storage Indication method used. Exfiltration extracted from Outflow.

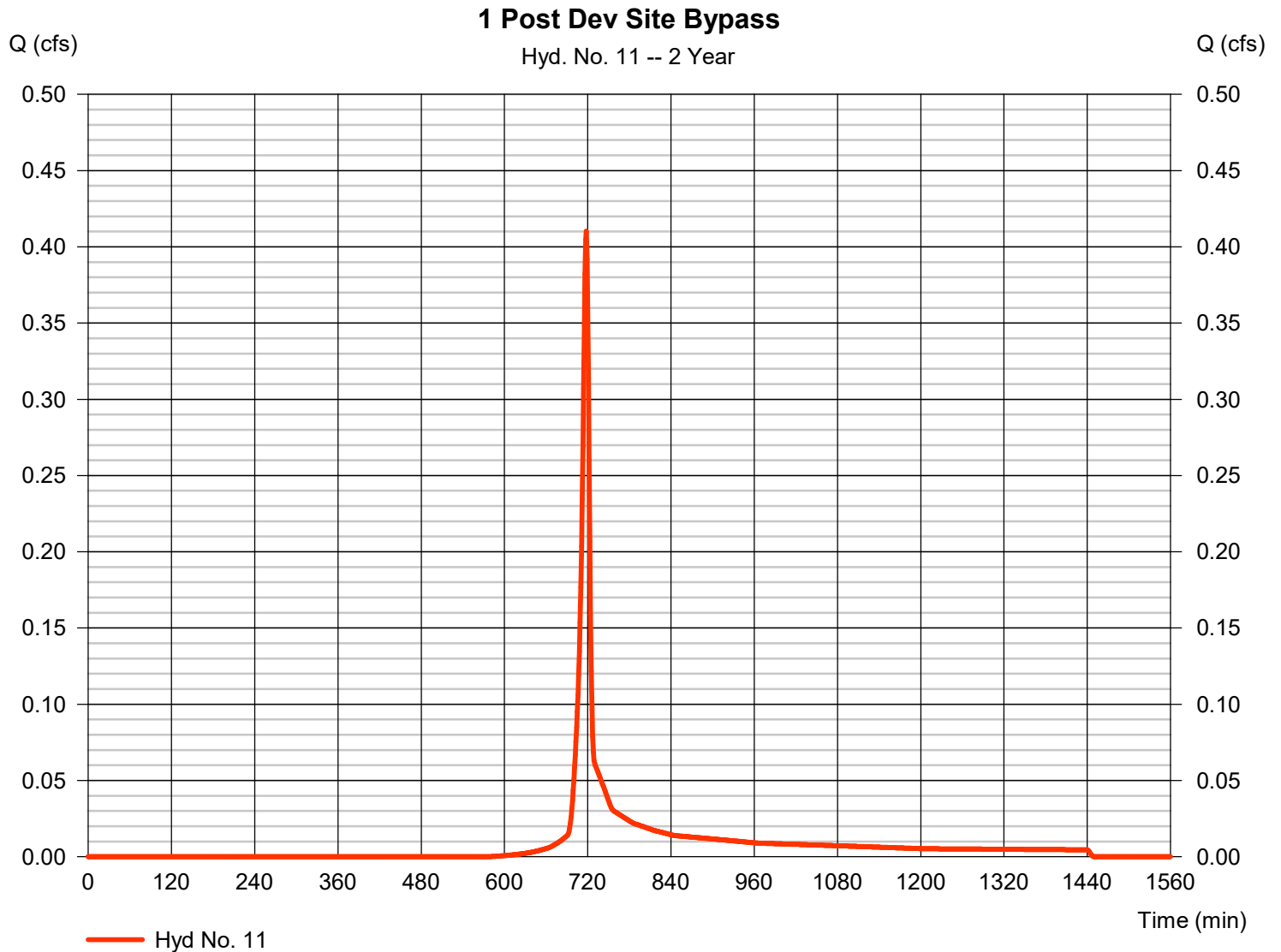


Hydrograph Report

Hyd. No. 11

1 Post Dev Site Bypass

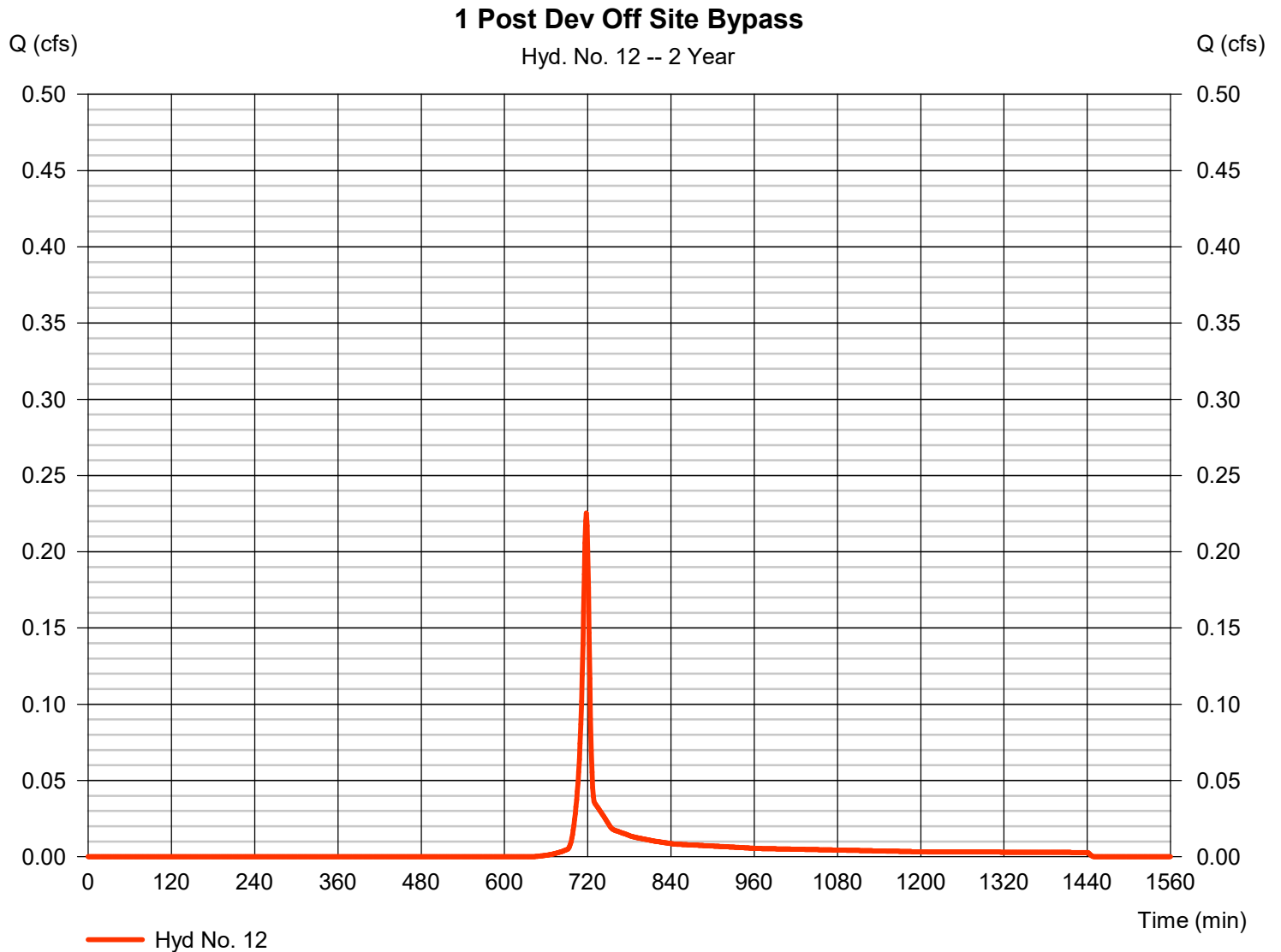
Hydrograph type	= SCS Runoff	Peak discharge	= 0.410 cfs
Storm frequency	= 2 yrs	Time to peak	= 718 min
Time interval	= 1 min	Hyd. volume	= 824 cuft
Drainage area	= 0.160 ac	Curve number	= 78.9
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	=	Time of conc. (Tc)	= 6.00 min
Total precip.	= 3.26 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hyd. No. 12

1 Post Dev Off Site Bypass

Hydrograph type	= SCS Runoff	Peak discharge	= 0.225 cfs
Storm frequency	= 2 yrs	Time to peak	= 718 min
Time interval	= 1 min	Hyd. volume	= 455 cuft
Drainage area	= 0.110 ac	Curve number	= 74.5
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 3.26 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

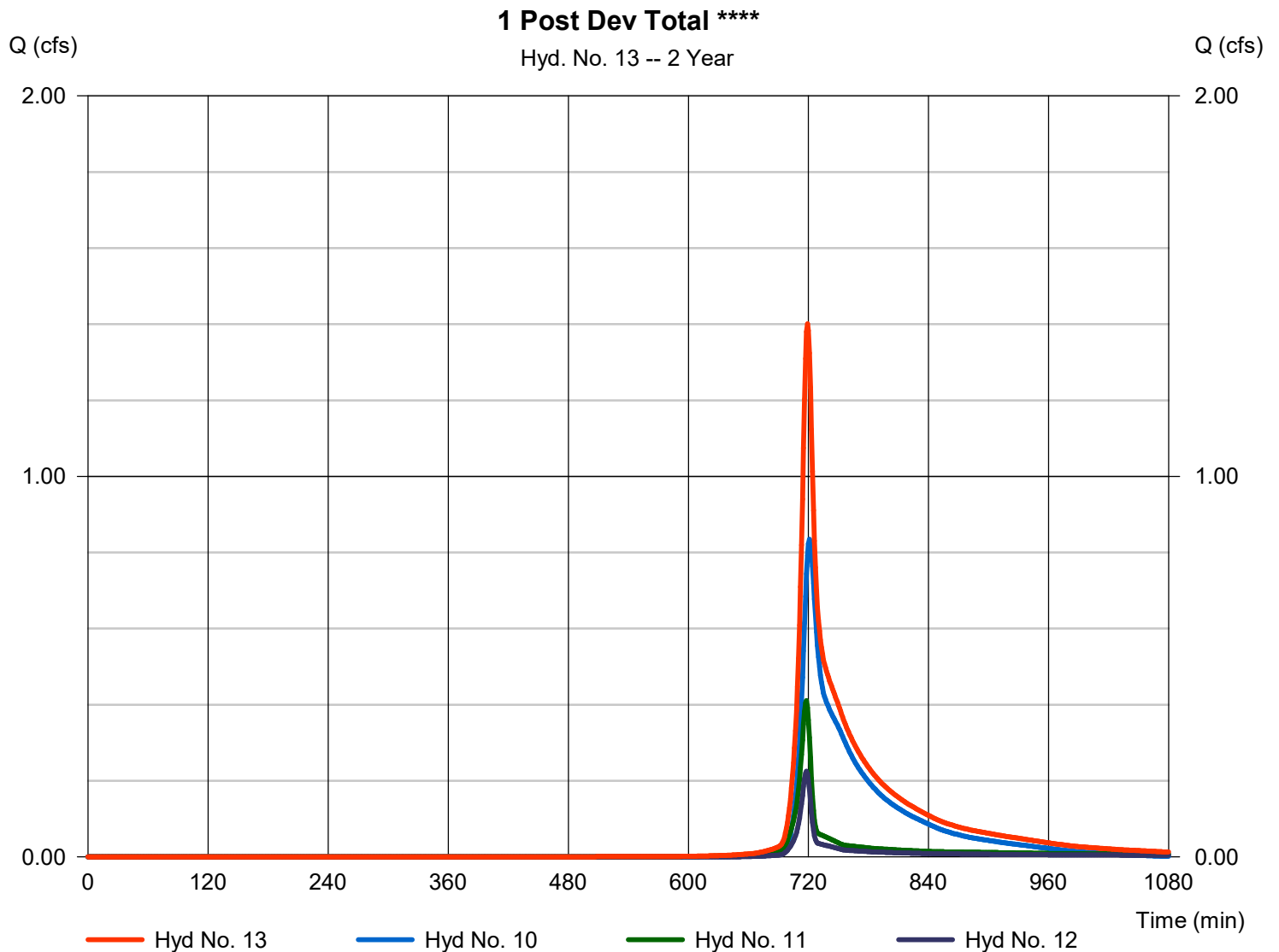


Hydrograph Report

Hyd. No. 13

1 Post Dev Total ****

Hydrograph type	= Combine	Peak discharge	= 1.401 cfs
Storm frequency	= 2 yrs	Time to peak	= 719 min
Time interval	= 1 min	Hyd. volume	= 3,982 cuft
Inflow hyds.	= 10, 11, 12	Contrib. drain. area	= 0.270 ac

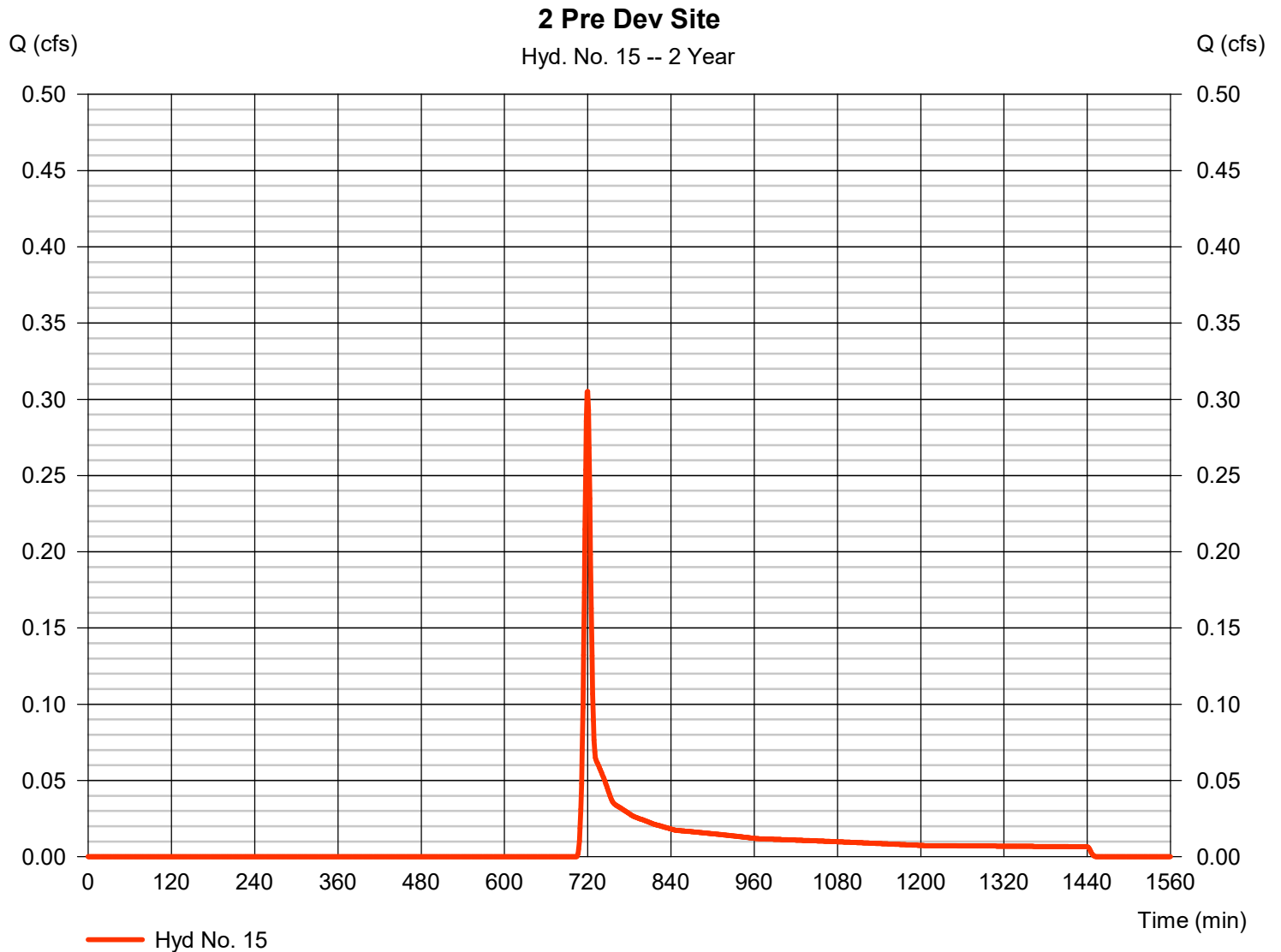


Hydrograph Report

Hyd. No. 15

2 Pre Dev Site

Hydrograph type	= SCS Runoff	Peak discharge	= 0.305 cfs
Storm frequency	= 2 yrs	Time to peak	= 720 min
Time interval	= 1 min	Hyd. volume	= 770 cuft
Drainage area	= 0.410 ac	Curve number	= 62.6
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 7.00 min
Total precip.	= 3.26 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

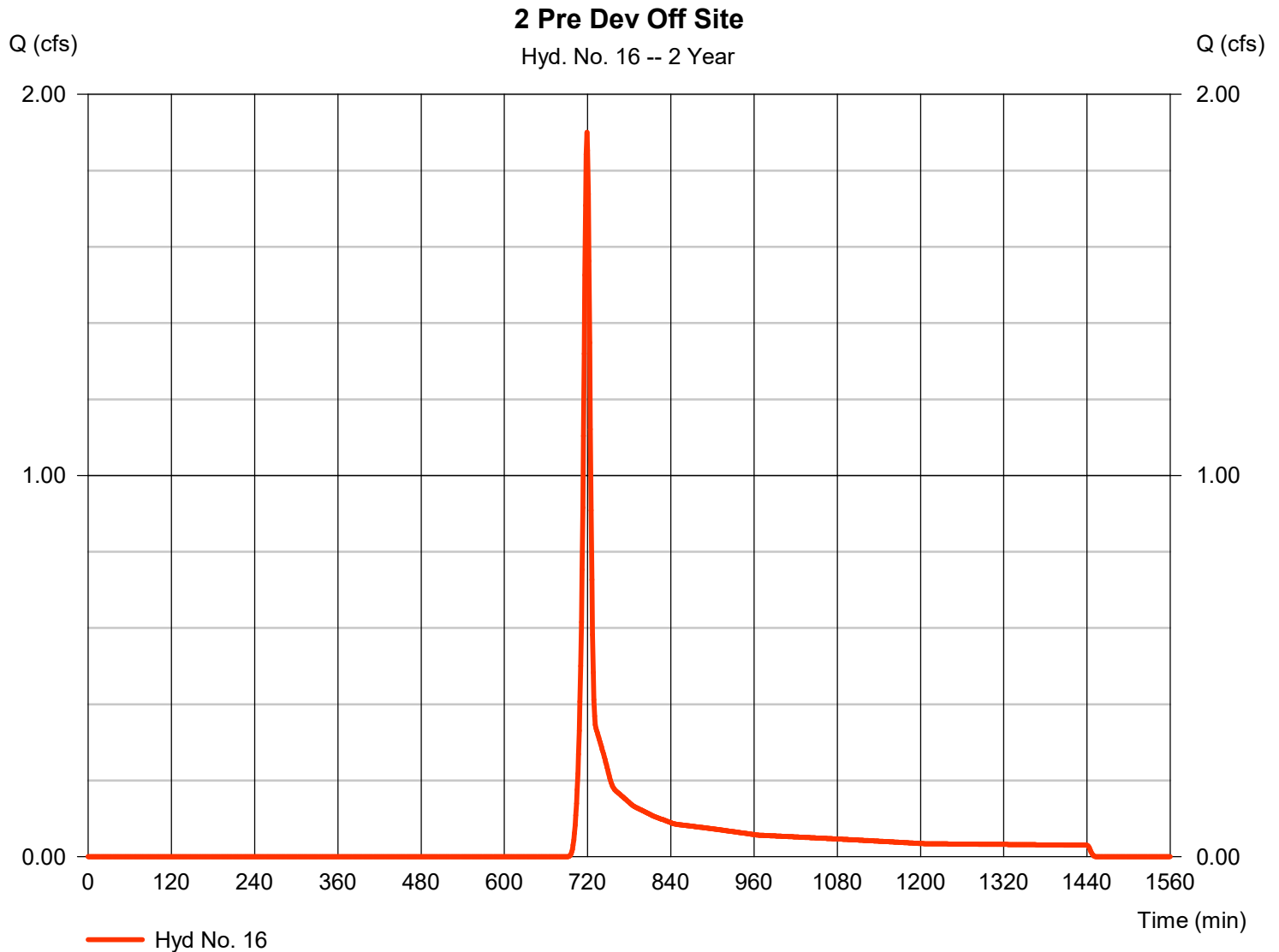


Hydrograph Report

Hyd. No. 16

2 Pre Dev Off Site

Hydrograph type	= SCS Runoff	Peak discharge	= 1.900 cfs
Storm frequency	= 2 yrs	Time to peak	= 719 min
Time interval	= 1 min	Hyd. volume	= 4,220 cuft
Drainage area	= 1.520 ac	Curve number	= 68.4
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 7.00 min
Total precip.	= 3.26 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



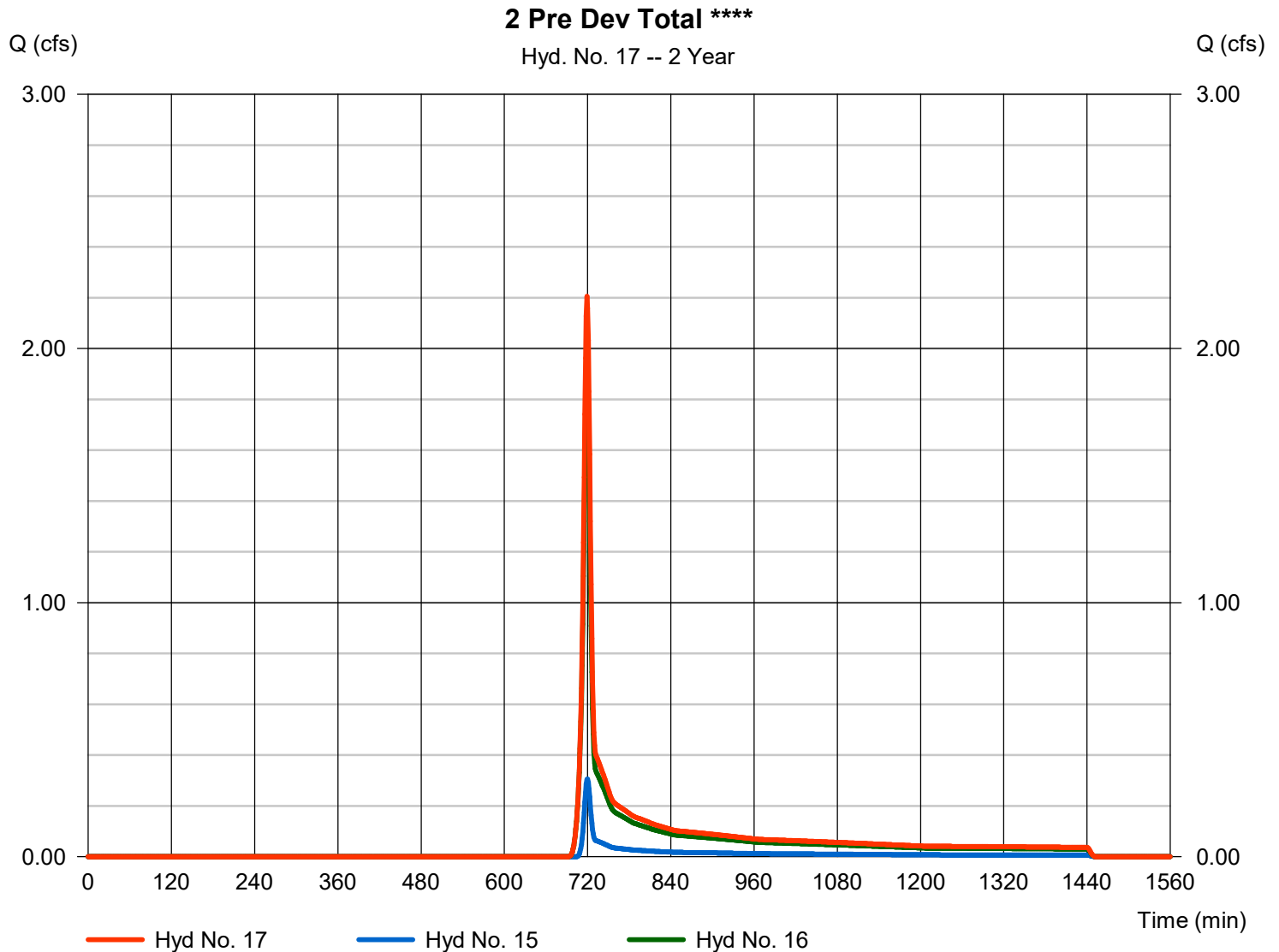
Hydrograph Report

Hyd. No. 17

2 Pre Dev Total ****

Hydrograph type = Combine
Storm frequency = 2 yrs
Time interval = 1 min
Inflow hyds. = 15, 16

Peak discharge = 2.205 cfs
Time to peak = 719 min
Hyd. volume = 4,990 cuft
Contrib. drain. area = 1.930 ac

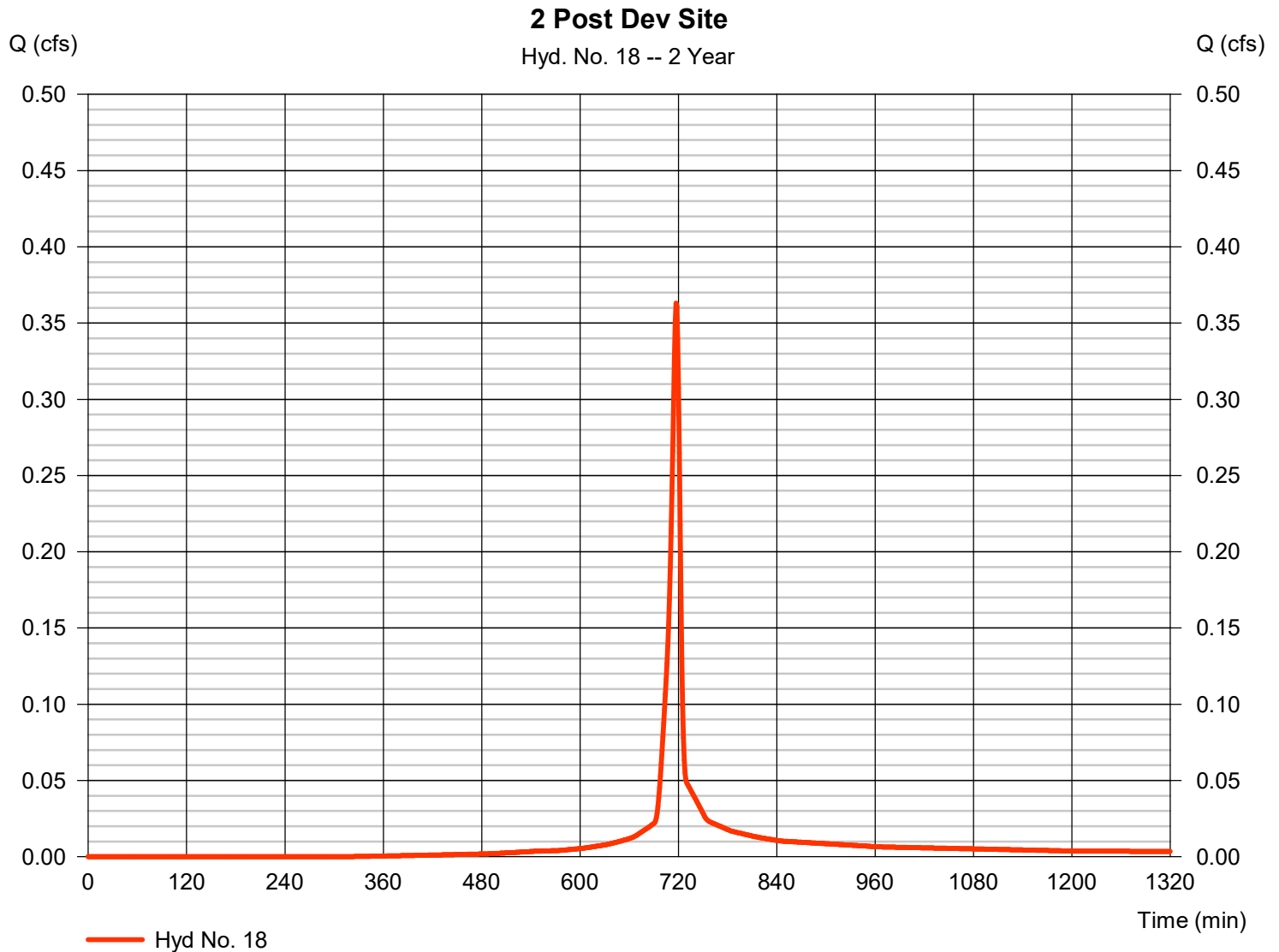


Hydrograph Report

Hyd. No. 18

2 Post Dev Site

Hydrograph type	= SCS Runoff	Peak discharge	= 0.363 cfs
Storm frequency	= 2 yrs	Time to peak	= 717 min
Time interval	= 1 min	Hyd. volume	= 764 cuft
Drainage area	= 0.090 ac	Curve number	= 90.5
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	=	Time of conc. (Tc)	= 6.00 min
Total precip.	= 3.26 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

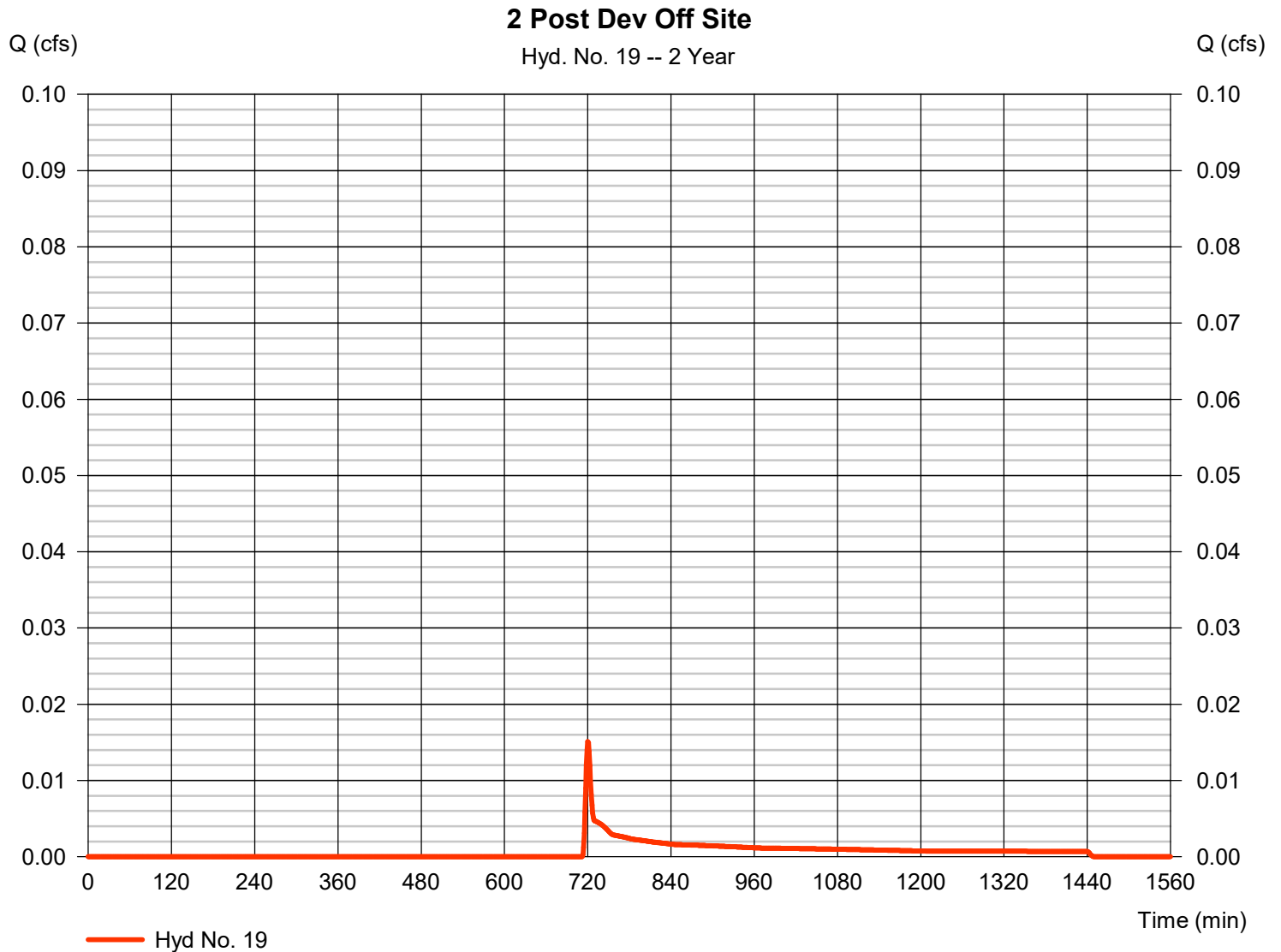


Hydrograph Report

Hyd. No. 19

2 Post Dev Off Site

Hydrograph type	= SCS Runoff	Peak discharge	= 0.015 cfs
Storm frequency	= 2 yrs	Time to peak	= 720 min
Time interval	= 1 min	Hyd. volume	= 60 cuft
Drainage area	= 0.060 ac	Curve number	= 55
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 3.26 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



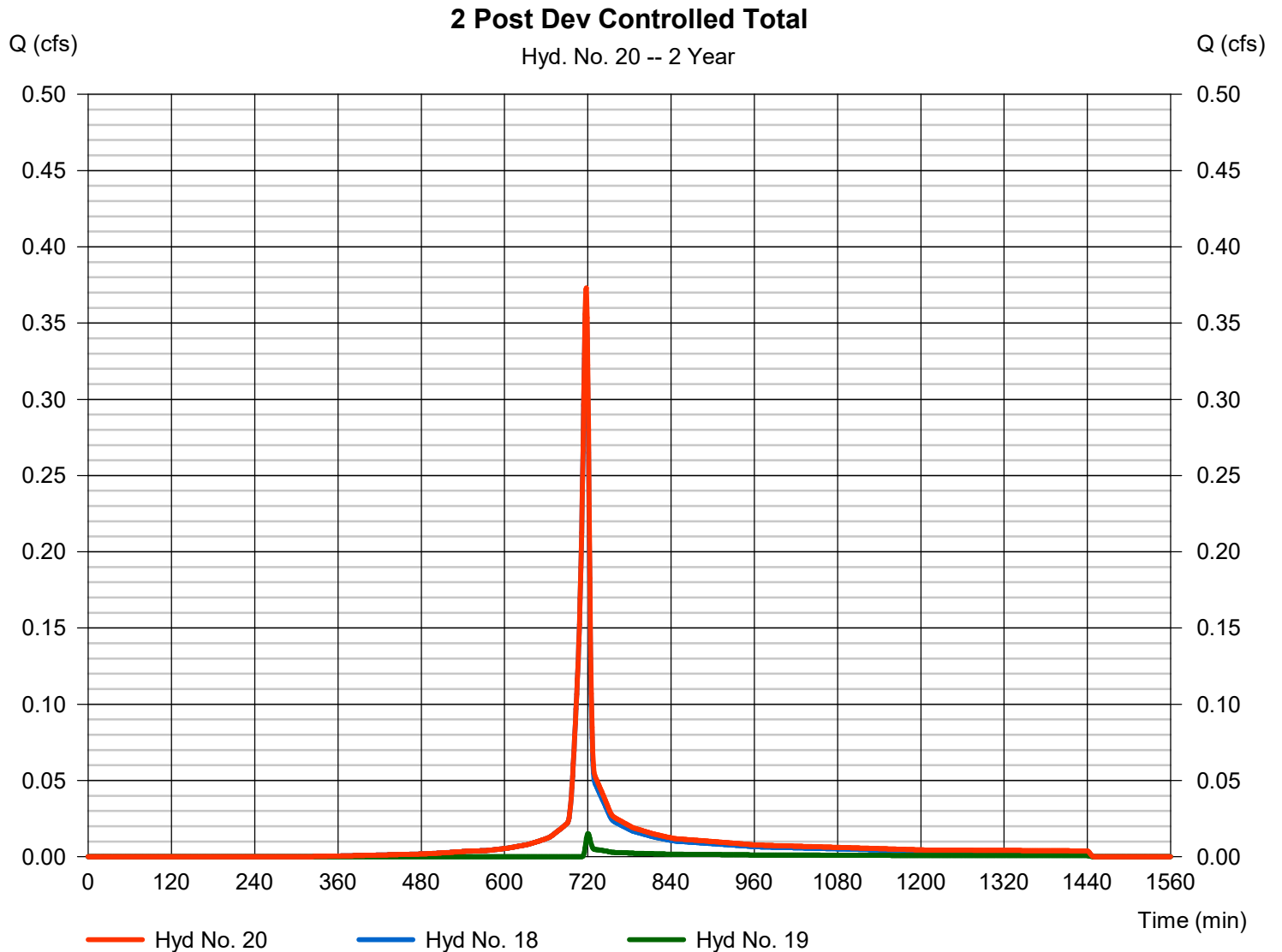
Hydrograph Report

Hyd. No. 20

2 Post Dev Controlled Total

Hydrograph type = Combine
Storm frequency = 2 yrs
Time interval = 1 min
Inflow hyds. = 18, 19

Peak discharge = 0.373 cfs
Time to peak = 718 min
Hyd. volume = 825 cuft
Contrib. drain. area = 0.150 ac



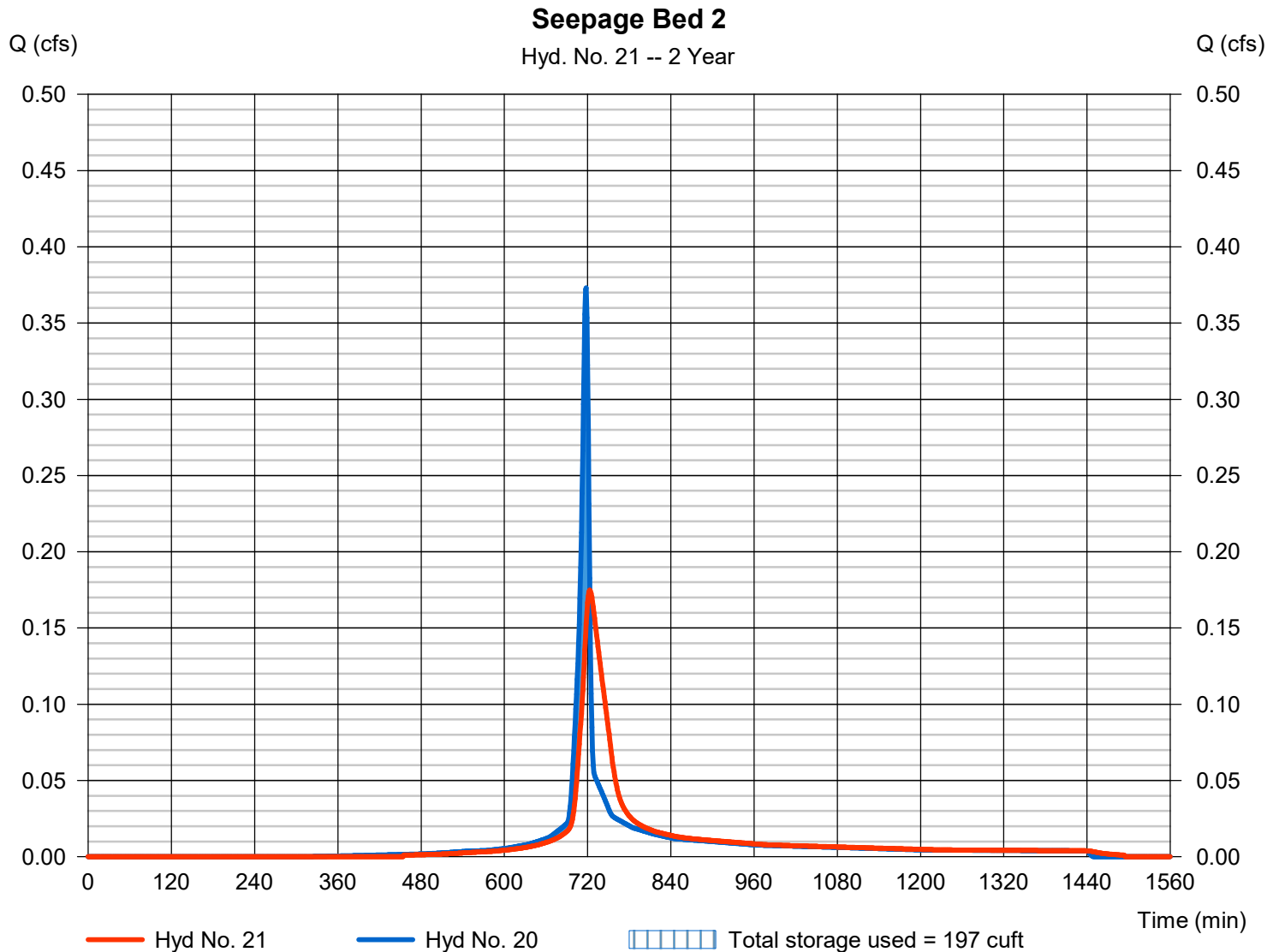
Hydrograph Report

Hyd. No. 21

Seepage Bed 2

Hydrograph type	= Reservoir	Peak discharge	= 0.175 cfs
Storm frequency	= 2 yrs	Time to peak	= 723 min
Time interval	= 1 min	Hyd. volume	= 819 cuft
Inflow hyd. No.	= 20 - 2 Post Dev Controlled Total	Max. Elevation	= 108.67 ft
Reservoir name	= Seepage Bed 2	Max. Storage	= 197 cuft

Storage Indication method used.

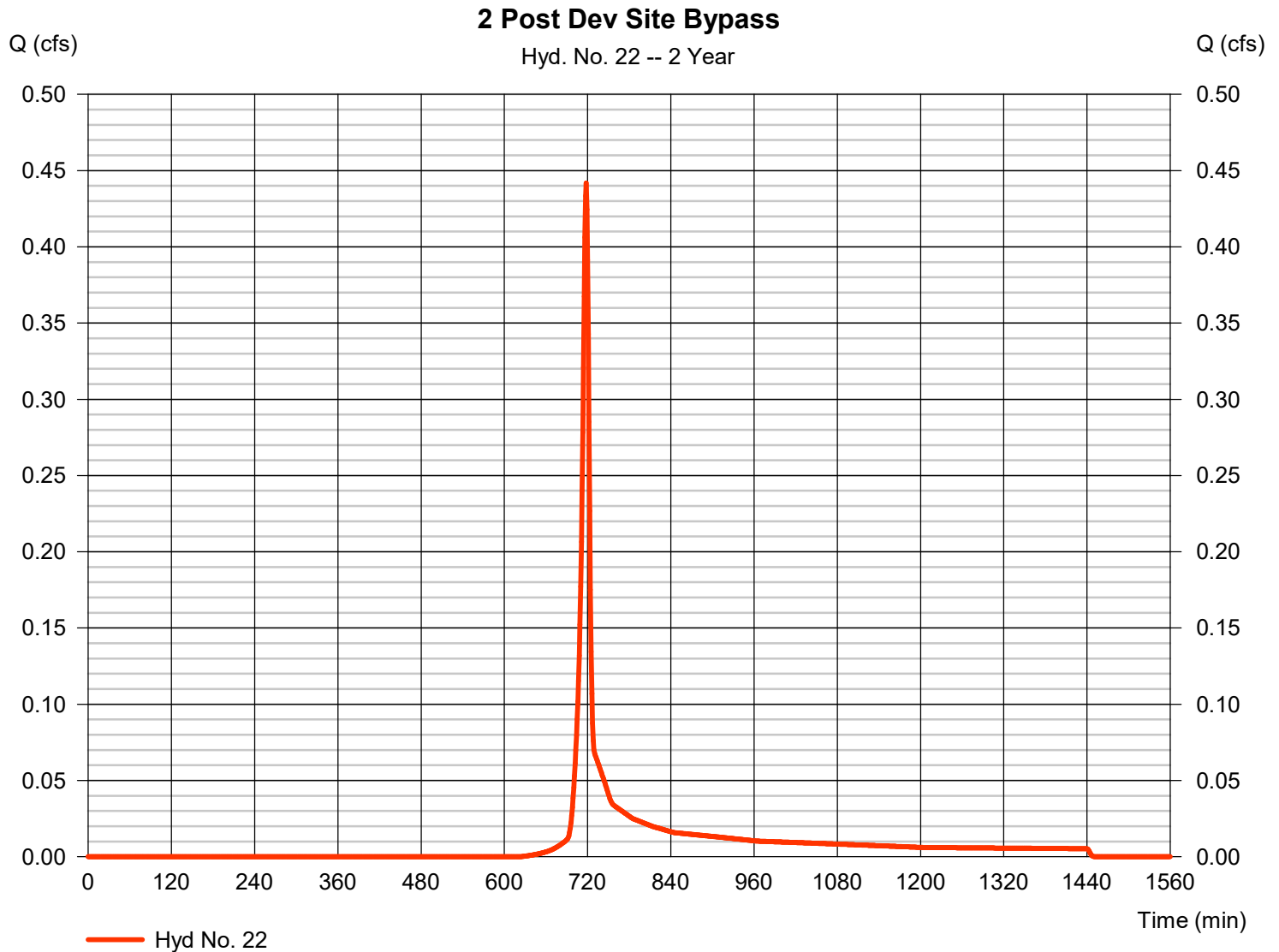


Hydrograph Report

Hyd. No. 22

2 Post Dev Site Bypass

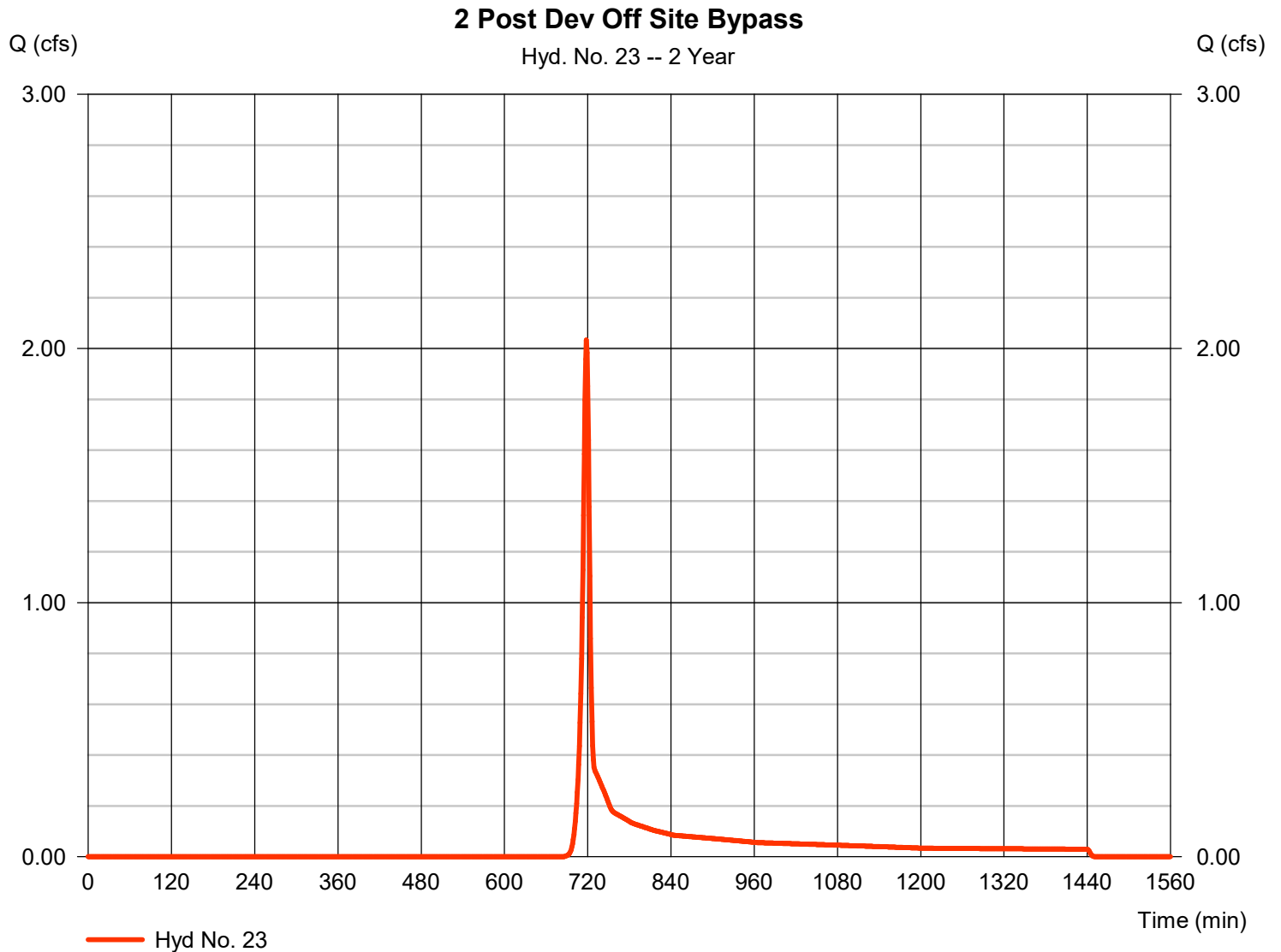
Hydrograph type	= SCS Runoff	Peak discharge	= 0.442 cfs
Storm frequency	= 2 yrs	Time to peak	= 718 min
Time interval	= 1 min	Hyd. volume	= 889 cuft
Drainage area	= 0.200 ac	Curve number	= 75.9
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	=	Time of conc. (Tc)	= 6.00 min
Total precip.	= 3.26 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hyd. No. 23

2 Post Dev Off Site Bypass

Hydrograph type	= SCS Runoff	Peak discharge	= 2.034 cfs
Storm frequency	= 2 yrs	Time to peak	= 718 min
Time interval	= 1 min	Hyd. volume	= 4,236 cuft
Drainage area	= 1.350 ac	Curve number	= 69.5
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 3.26 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



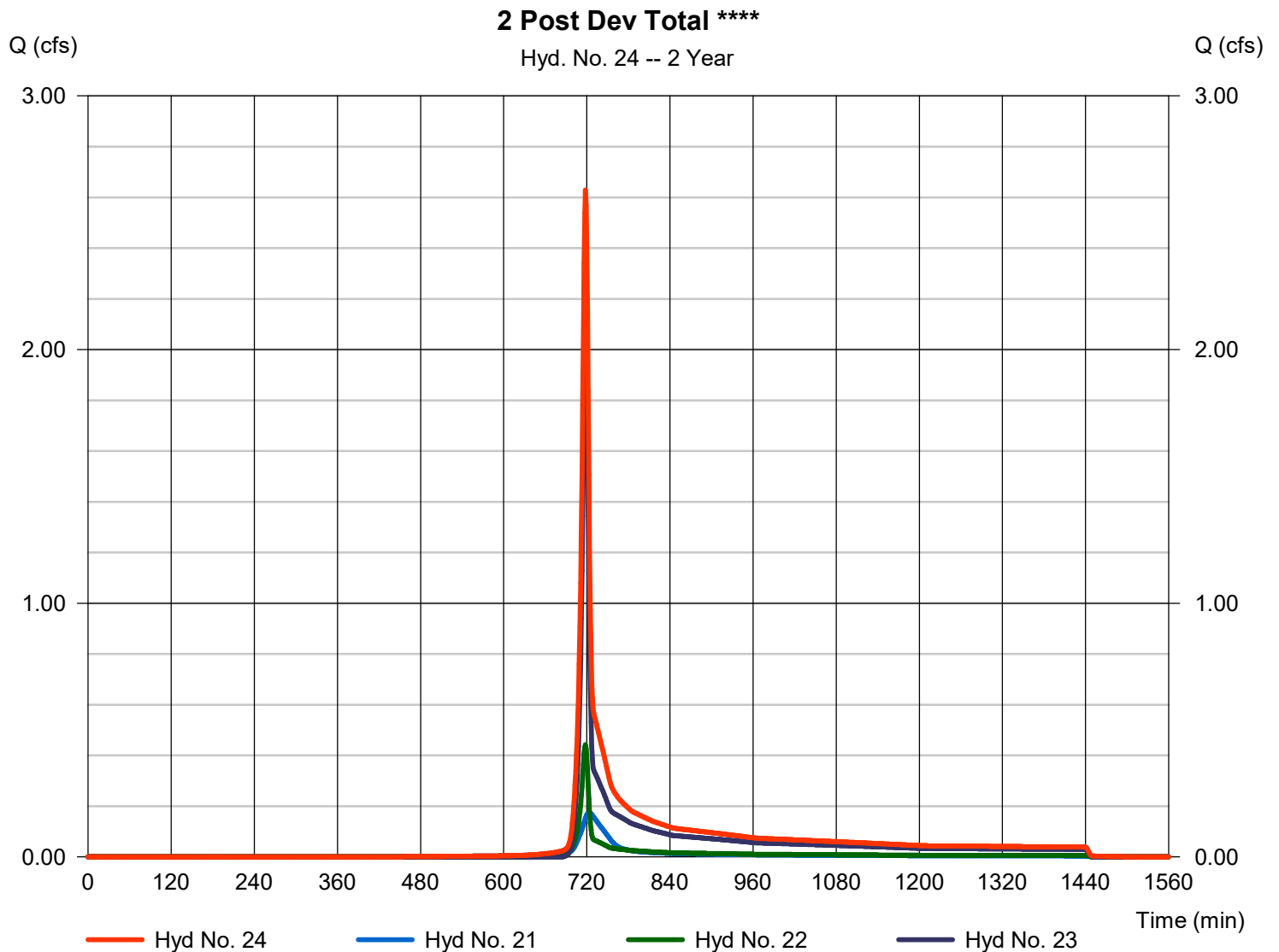
Hydrograph Report

Hyd. No. 24

2 Post Dev Total ****

Hydrograph type = Combine
Storm frequency = 2 yrs
Time interval = 1 min
Inflow hyds. = 21, 22, 23

Peak discharge = 2.629 cfs
Time to peak = 718 min
Hyd. volume = 5,944 cuft
Contrib. drain. area = 1.550 ac



Project: 2084 Brilla LLC
 Location: Bensalem Township

By: DLF
 Date: 9/22/2023

Peak Rate Control Summary Table

Rational Method

Point of Interest 1 Neshaminy Creek District B

Design Storm	Pre Development Runoff			Post Development Runoff and Discharges							
	Site	Off Site	Total	1A Site	1A Off Site	1A Total	Seepage Bed 1A			1B Site	1B Total
							Discharge	Elevation	Storage		
1	1.36	1.45	2.81	1.24	1.33	2.57	0.00	126.78	915	0.98	0.98
2	1.62	1.72	3.34	1.48	1.58	3.06	0.00	126.92	1090	1.17	1.17
5	1.91	2.04	3.95	1.74	1.87	3.62	0.00	127.09	1290	1.38	1.38
10	2.12	2.26	4.38	1.93	2.08	4.01	0.00	127.21	1432	1.53	1.53
25	2.37	2.52	4.89	2.16	2.32	4.48	0.00	127.36	1601	1.71	1.71
50	2.55	2.71	5.26	2.32	2.49	4.82	0.00	127.46	1722	1.83	1.83
100	2.72	2.89	5.60	2.47	2.66	5.13	0.00	127.56	1836	1.96	1.96

Hydroflow col c c c c c c c c i j c c
 Hydroflow row 3 4 5 6 7 8 9 9 9 10 11

Point of Interest 1

Design Storm	Post Development Runoff and Discharges							
	Seepage Bed 1B			Bypass Site	Bypass Off Site	Post Total	Allowable	% of allowable
1	0.23	127.27	255	0.38	0.24	0.72	2.81	25%
2	0.31	127.31	299	0.46	0.29	0.87	3.34	26%
5	0.40	127.36	348	0.54	0.34	1.05	3.95	27%
10	0.47	127.40	382	0.60	0.38	1.18	4.38	27%
25	0.55	127.44	421	0.67	0.42	1.34	4.89	27%
50	0.61	127.47	449	0.72	0.45	1.46	5.26	28%
100	0.67	127.49	474	0.76	0.48	1.57	5.60	28%

Hydroflow col c i j c c c
 Hydroflow row 12 12 12 13 14 15

Point of Interest 2 Neshaminy Creek District B

Design Storm	Pre Development Runoff			Post Development Runoff and Discharges						
	Site	Off Site	Total	Site	Off Site	Total	Seepage Bed 2			
							Discharge	Elevation	Storage	
1	0.48	2.52	3.01	0.29	0.03	0.31	0.10	108.29	82	
2	0.58	3.00	3.58	0.34	0.03	0.37	0.11	108.34	98	
5	0.68	3.56	4.24	0.41	0.04	0.44	0.12	108.40	116	
10	0.76	3.95	4.70	0.45	0.04	0.49	0.13	108.44	129	
25	0.85	4.41	5.26	0.50	0.04	0.55	0.14	108.49	144	
50	0.91	4.74	5.65	0.54	0.05	0.59	0.15	108.53	156	
100	0.97	5.05	6.02	0.58	0.05	0.63	0.16	108.57	166	

Hydroflow col c c c c c c c i j
 Hydroflow row 17 18 19 20 21 22 23 23 23

Point of Interest 2 Neshaminy Creek District B

Design Storm	Bypass Site	Bypass Off Site	Post Total	Allowable	% of allowable
1	0.44	2.50	3.00	3.01	100%
2	0.52	2.98	3.57	3.58	100%
5	0.62	3.52	4.22	4.24	100%
10	0.69	3.90	4.68	4.70	99%
25	0.77	4.36	5.22	5.26	99%
50	0.82	4.68	5.61	5.65	99%
100	0.88	4.99	5.98	6.02	99%

Hydroflow col c c
 Hydroflow row 24 25 26

Project: 2084 Brilla LLC
 Location: Bensalem Township

By: DLF
 Date: 9/22/2023

Input Summary Rational Method

	Point of Interest	Name	Discharge To	Condition	Location	Area (ac)	Impervious	Lawn	C	Tc (min)	Notes
1	1	1	Property Line	Present	Site	0.74	0.19		0.47	6.00	
2	1	1	Property Line	Present	Offsite	0.73	0.16		0.48	6.00	
3	1	1A	Seepage Bed	Developed	Site	0.44	0.27		0.73	6.00	
4	1	1A	Seepage Bed	Developed	Offsite	0.75	0.15	0.60	0.46	6.00	
5	1	1B	Seepage Bed	Developed	Site	0.27	0.26	0.01	0.94	6.00	
6	1	1	Bypass	Developed	Site	0.16	0.07	0.09	0.62	6.00	
7	1	1	Bypass	Developed	Offsite	0.11	0.04	0.07	0.57	6.00	
8	2	2	Property Line	Present	Site	0.41	0.04	0.37	0.32	6.77	
9	2	2	Property Line	Present	Offsite	1.52	0.32	1.20	0.45	6.77	
10	2	2	Seepage Bed	Developed	Site	0.09	0.07	0.02	0.83	6.00	
11	2	2	Seepage Bed	Developed	Offsite	0.06	0.00		0.11	6.00	
12	2	2	Bypass	Developed	Site	0.20	0.07		0.57	6.00	
13	2	2	Bypass	Developed	Offsite	1.35	0.32		0.48	6.00	

Seepage Bed Loadings

	Seepage Bed	Impervious Area	Ratio to 1	Reccomended Bed Footprint	Drainage Area	Ratio to 1	Reccomended Bed Footprint	Proposed Bed Footprint	Result
	1A	11761	5.00	2352	19166	8.00	2396	2880	120%
	1B	11326	5.00	2265	11761	8.00	1470	2400	106%
	2	3049	5.00	610	3920	8.00	490	720	118%

Rational Method C Value Calculations

Project 2084 Brilla LLC
 Location: Bensalem Township

By: DLF
 Date: 08/12/2022

Summary Table of Rational Runoff Coefficients

Soils	A						B						C						D						Min	Max	Multiplier	Values used							
	< 25			≥ 25			< 25			≥ 25			< 25			≥ 25			< 25			≥ 25						Pre	Post						
Frequency	0-2	2-6	6+	0-2	2-6	6+	0-2	2-6	6+	0-2	2-6	6+	0-2	2-6	6+	0-2	2-6	6+	0-2	2-6	6+	0-2	2-6	6+	0-2	2-6	6+	0-2	2-6	6+	0-2	2-6	6+		
Slope	0.85	0.86	0.87	0.95	0.96	0.97	0.85	0.86	0.87	0.95	0.96	0.97	0.85	0.86	0.87	0.95	0.96	0.97	0.85	0.86	0.87	0.95	0.96	0.97	0.85	0.86	0.87	0.95	0.96	0.97	0.85	0.97	1.00		0.96
Impervious	0.10	0.16	0.25	0.14	0.22	0.30	0.14	0.22	0.30	0.20	0.28	0.37	0.20	0.28	0.36	0.26	0.35	0.44	0.24	0.30	0.40	0.30	0.40	0.50	0.10	0.50	1.00	0.20							
Meadow	0.12	0.20	0.30	0.15	0.25	0.37	0.18	0.28	0.37	0.23	0.34	0.45	0.24	0.34	0.44	0.30	0.42	0.52	0.30	0.40	0.50	0.37	0.50	0.62	0.12	0.62	1.00						0.50		
Lawn/Pasture/Turf	0.05	0.08	0.11	0.08	0.11	0.14	0.08	0.11	0.14	0.10	0.14	0.18	0.10	0.13	0.16	0.12	0.16	0.20	0.12	0.16	0.20	0.15	0.20	0.25	0.05	0.25	1.00	0.10							
Woods Good																																			

* *Source: Rawls, W.J., S.L. Wong and R.H. McCuen, 1981, "Comparison of Urban Flood Frequency Procedures," Preliminary Draft, U.S. Department of Agriculture, Soil*
 ** *Northampton Township Chapter 23 and Table 23-B-7*
 Bensalem Township Table B-7. Rational Runoff Coefficients

Rational Method Runoff Coefficient

Project: 2084 Brilla LLC
 Location: Bensalem Township

By: DLF
 Date: 09/22/2023

Condition: Present
 Ex imp credit: 0.80
 Lawn x: 1.00

POI: 1
 Discharge to Location: Property Line Site

Watershed Area: 0.74 acres
 0.0012 sq mi

Runoff Coefficient

	Soil name	Cover Description	C	Area <i>acres</i>	"C" x Area <i>acres</i>
<i>soil group total in acres</i>	A	Impervious	0.96		
	A	Turf	0.25		
	A	Meadow	0.16		
	A	Woods	0.10		
<i>soil group total in acres 0.74</i>	B	Impervious	0.96	0.19	0.18
	B	Turf	0.34	0.46	0.16
	B	Meadow	0.22		
	B	Woods	0.11	0.09	0.01
<i>soil group total in acres</i>	C	Impervious	0.96		
	C	Turf	0.50		
	C	Meadow	0.28		
	C	Woods	0.10		
<i>soil group total in acres</i>	D	Impervious	0.96		
	D	Turf	0.50		
	D	Meadow	0.20		
	D	Woods	0.10		
Total				0.74	0.35

C = 0.47 25.95% Impervious

Runoff Volumes

	Storm yr	Rainfall in	Runoff in	Volume cf
	MDE		105.09	
	EISA		105.09	
	1	2.71	103.58	278226
	2	3.26	103.27	277403
	5	4.11	102.80	276134
	10	4.81	102.41	275092
	25	5.83	101.85	273578
	50	6.70	101.37	272290
	100	7.63	100.86	270918

25.9%

Rational Method Runoff Coefficient

Project: 2084 Brilla LLC
 Location: Bensalem Township

By: DLF
 Date: 09/22/2023

Condition: POI: 1
 Ex imp credit: 1.00 Discharge to: Property Line
 Lawn x: 1.00 Location: Offsite
 Watershed Area: 0.73 acres
 Runoff Coefficient: 0.0011 sq mi

	Soil name	Cover Description	"C"	Area <i>acres</i>	"C" x Area <i>acres</i>
<i>soil group total in acres</i>	A	Impervious	0.96		
	A	Turf	0.25		
	A	Meadow	0.16		
	A	Woods	0.10		
<i>soil group total in acres 0.73</i>	B	Impervious	0.96	0.16	0.15
	B	Turf	0.34	0.57	0.19
	B	Meadow	0.22		
	B	Woods	0.11		
<i>soil group total in acres</i>	C	Impervious	0.96		
	C	Turf	0.50		
	C	Meadow	0.28		
	C	Woods	0.10		
<i>soil group total in acres</i>	D	Impervious	0.96		
	D	Turf	0.50		
	D	Meadow	0.20		
	D	Woods	0.10		
	Total			0.73	0.35

C= 21.92% Impervious

Runoff Volumes

Storm yr	Rainfall in	Runoff in	Volume cf
MDE		104.57	277090
EISA		104.57	277090
1	2.71	103.05	273069
2	3.26	102.74	272257
5	4.11	102.27	271005
10	4.81	101.88	269977
25	5.83	101.32	268484
50	6.70	100.84	267214
100	7.63	100.33	265860

Rational Method Runoff Coefficient

Project 2084 Brilla LLC
 Location: Bensalem Township

By: DLF
 Date: 09/22/2023

Condition Developed
 Ex imp credit 1.00
 Lawn x 1.05

POI 1A
 Discharge to Seepage Bed
 Location Site

Watershed Area 0.44 acres
 0.0007 sq mi

Runoff Coefficient

area

	Soil name	Cover Description	"C"	Area <i>acres</i>	"C" x Area <i>acres</i>
<i>soil group total in acres</i>	A	Impervious	0.96		
	A	Turf	0.26		
	A	Meadow	0.16		
	A	Woods	0.10		
<i>soil group total in acres 0.44</i>	B	Impervious	0.96	0.27	0.26
	B	Turf	0.36	0.17	0.06
	B	Meadow	0.22		
	B	Woods	0.11		
<i>soil group total in acres</i>	C	Impervious	0.96		
	C	Turf	0.53		
	C	Meadow	0.28		
	C	Woods	0.10		
<i>soil group total in acres</i>	D	Impervious	0.96		
	D	Turf	0.53		
	D	Meadow	0.20		
	D	Woods	0.10		
Total				0.440	0.32

C= 0.73 61.36% Impervious

Runoff Volumes

Storm yr	Rainfall in	Runoff in	Volume cf
MDE		68.27	109047
EISA		68.27	109047
1	2.71	66.76	106629
2	3.26	66.46	106142
5	4.11	65.99	105393
10	4.81	65.60	104778
25	5.83	65.04	103886
50	6.70	64.57	103129
100	7.63	64.06	102324

Rational Method Runoff Coefficient

Project: 2084 Brilla LLC
 Location: Bensalem Township

By: DLF
 Date: 09/22/2023

Condition: Developed POI: 1A
 Ex imp credit: 1.00 Discharge to: Seepage Bed
 Lawn x: 1.00 Location: Offsite

Watershed Area: 0.75 acres
 Runoff Coefficient: 0.0012 sq mi

	Soil name	Cover Description	"C"	Area <i>acres</i>	"C" x Area <i>acres</i>
<i>soil group total in acres</i>	A	Impervious	0.96		
	A	Turf	0.25		
	A	Meadow	0.16		
	A	Woods	0.10		
<i>soil group total in acres 0.75</i>	B	Impervious	0.96	0.15	0.14
	B	Turf	0.34	0.60	0.20
	B	Meadow	0.22		
	B	Woods	0.11		
<i>soil group total in acres</i>	C	Impervious	0.96		
	C	Turf	0.50		
	C	Meadow	0.28		
	C	Woods	0.10		
<i>soil group total in acres</i>	D	Impervious	0.96		
	D	Turf	0.50		
	D	Meadow	0.20		
	D	Woods	0.10		
Total				0.75	0.35

C = 0.46 20.00% Impervious

Runoff Volumes

Storm yr	Rainfall in	Runoff in	Volume cf
MDE		107.26	292012
EISA		107.26	292012
1	2.71	105.74	287880
2	3.26	105.43	287046
5	4.11	104.96	285759
10	4.81	104.57	284703
25	5.83	104.01	283167
50	6.70	103.53	281862
100	7.63	103.02	280471

Rational Method Runoff Coefficient

Project 2084 Brilla LLC
 Location: Bensalem Township

By: DLF
 Date: 09/22/2023

Condition Developed POI 1
 Ex imp credit 1.00 Discharge to Bypass
 Lawn x 1.05 Location Site

Watershed Area 0.16 acres
 Runoff Coefficient 0.0003 sq mi

	Soil name	Cover Description	"C"	Area <i>acres</i>	"C" x Area <i>acres</i>
<i>soil group total in acres</i>	A	Impervious	0.96		
	A	Turf	0.26		
	A	Meadow	0.16		
	A	Woods	0.10		
<i>soil group total in acres 0.16</i>	B	Impervious	0.96	0.07	0.07
	B	Turf	0.36	0.09	0.03
	B	Meadow	0.22		
	B	Woods	0.11		
<i>soil group total in acres</i>	C	Impervious	0.96		
	C	Turf	0.53		
	C	Meadow	0.28		
	C	Woods	0.10		
<i>soil group total in acres</i>	D	Impervious	0.96		
	D	Turf	0.53		
	D	Meadow	0.20		
	D	Woods	0.10		
	Total			0.16	0.10

C= 0.62 43.75% Impervious

Runoff Volumes			
Storm yr	Rainfall in	Runoff in	Volume cf
MDE		80.04	46487
EISA		80.04	46487
1	2.71	78.52	45607
2	3.26	78.22	45429
5	4.11	77.75	45156
10	4.81	77.36	44932
25	5.83	76.80	44606
50	6.70	76.33	44330
100	7.63	75.82	44035

Rational Method Runoff Coefficient

Project 2084 Brilla LLC
 Location: Bensalem Township

By: DLF
 Date: 09/22/2023

Condition **Developed**
 Ex imp credit 1.00
 Lawn x 1.00

POI 1
 Discharge to Bypass
 Location Offsite

Watershed Area 0.11 acres
 Runoff Coefficient 0.0002 sq mi

Runoff Coefficient

	Soil name	Cover Description	"C"	Area <i>acres</i>	"C" x Area <i>acres</i>
<i>soil group total in acres</i>	A	Impervious	0.96		
	A	Turf	0.25		
	A	Meadow	0.16		
	A	Woods	0.10		
<i>soil group total in acres 0.11</i>	B	Impervious	0.96	0.04	0.04
	B	Turf	0.34	0.07	0.02
	B	Meadow	0.22		
	B	Woods	0.11		
<i>soil group total in acres</i>	C	Impervious	0.96		
	C	Turf	0.50		
	C	Meadow	0.28		
	C	Woods	0.10		
<i>soil group total in acres</i>	D	Impervious	0.96		
	D	Turf	0.50		
	D	Meadow	0.20		
	D	Woods	0.10		
	Total			0.11	0.06

C= **0.57** 36.36% Impervious

Runoff Volumes

Storm yr	Rainfall in	Runoff in	Volume cf
MDE		87.92	35108
EISA		87.92	35108
1	2.71	86.41	34503
2	3.26	86.10	34381
5	4.11	85.63	34193
10	4.81	85.24	34038
25	5.83	84.68	33814
50	6.70	84.21	33623
100	7.63	83.70	33420

Rational Method Runoff Coefficient

Project: 2084 Brilla LLC
 Location: Bensalem Township

By: DLF
 Date: 09/22/2023

Condition: Present POI: 2
 Ex imp credit: 0.80 Discharge to: Property Line
 Lawn x: 1.00 Location: Site

Watershed Area: 0.41 acres
 0.0006 sq mi

Runoff Coefficient

	Soil name	Cover Description	"C"	Area <i>acres</i>	"C" x Area <i>acres</i>
<i>soil group total in acres</i>	A	Impervious	0.96		
	A	Turf	0.25		
	A	Meadow	0.16		
	A	Woods	0.10		
<i>soil group total in acres 0.41</i>	B	Impervious	0.96	0.04	0.04
	B	Turf	0.34	0.23	0.08
	B	Meadow	0.22		
	B	Woods	0.11	0.14	0.01
<i>soil group total in acres</i>	C	Impervious	0.96		
	C	Turf	0.50		
	C	Meadow	0.28		
	C	Woods	0.10		
<i>soil group total in acres</i>	D	Impervious	0.96		
	D	Turf	0.50		
	D	Meadow	0.20		
	D	Woods	0.10		
Total				0.41	0.13

C = 0.32 9.76% Impervious

Runoff Volumes

Storm yr	Rainfall in	Runoff in	Volume cf
MDE		153.80	226671
EISA		153.80	226671
1	2.71	152.28	224431
2	3.26	151.98	223978
5	4.11	151.50	223279
10	4.81	151.11	222705
25	5.83	150.54	221869
50	6.70	150.06	221158
100	7.63	149.55	220400

Rational Method Runoff Coefficient

Project 2084 Brilla LLC
 Location: Bensalem Township

By: DLF
 Date: 09/22/2023

Condition **Developed**
 Ex imp credit 1.00
 Lawn x 1.05

POI 2
 Discharge to Seepage Bed
 Location Site

Watershed Area 0.09 acres
 0.0001 sq mi

Runoff Coefficient

	Soil name	Cover Description	"C"	Area <i>acres</i>	"C" x Area <i>acres</i>
<i>soil group total in acres</i>	A	Impervious	0.96		
	A	Turf	0.26		
	A	Meadow	0.16		
	A	Woods	0.10		
<i>soil group total in acres 0.09</i>	B	Impervious	0.96	0.07	0.07
	B	Turf	0.36	0.02	0.01
	B	Meadow	0.22		
	B	Woods	0.11		
<i>soil group total in acres</i>	C	Impervious	0.96		
	C	Turf	0.53		
	C	Meadow	0.28		
	C	Woods	0.10		
<i>soil group total in acres</i>	D	Impervious	0.96		
	D	Turf	0.53		
	D	Meadow	0.20		
	D	Woods	0.10		
	Total			0.09	0.07

Post Development multiplier 1.05

C= **0.83** 77.78% Impervious

Runoff Volumes

Storm yr	Rainfall in	Runoff in	Volume cf
MDE		60.03	19613
EISA		60.03	19613
1	2.71	58.52	19119
2	3.26	58.22	19019
5	4.11	57.75	18866
10	4.81	57.36	18741
25	5.83	56.81	18559
50	6.70	56.34	18405
100	7.63	55.83	18241

Rational Method Runoff Coefficient

Project 2084 Brilla LLC
 Location: Bensalem Township

By: DLF
 Date: 09/22/2023

Condition Developed
 Ex imp credit 1.00
 Lawn x 1.00

POI 2
 Discharge to Seepage Bed
 Location Offsite

Watershed Area 0.06 acres
 0.0001 sq mi

Runoff Coefficient

	Soil name	Cover Description	"C"	Area <i>acres</i>	"C" x Area <i>acres</i>
<i>soil group total in acres</i>	A	Impervious	0.96		
	A	Turf	0.25		
	A	Meadow	0.16		
	A	Woods	0.10		
<i>soil group total in acres 0.06</i>	B	Impervious	0.96		
	B	Turf	0.34		
	B	Meadow	0.22		
	B	Woods	0.11	0.06	0.01
<i>soil group total in acres</i>	C	Impervious	0.96		
	C	Turf	0.50		
	C	Meadow	0.28		
	C	Woods	0.10		
<i>soil group total in acres</i>	D	Impervious	0.96		
	D	Turf	0.50		
	D	Meadow	0.20		
	D	Woods	0.10		
	Total			0.06	0.01

C= 0.11 Impervious

Runoff Volumes

Storm yr	Rainfall in	Runoff in	Volume cf
MDE		454.05	98891
EISA		454.05	98891
1	2.71	452.52	98559
2	3.26	452.21	98492
5	4.11	451.74	98388
10	4.81	451.34	98303
25	5.83	450.77	98178
50	6.70	450.29	98072
100	7.63	449.77	97959

Rational Method Runoff Coefficient

Project 2084 Brilla LLC
 Location: Bensalem Township

By: DLF
 Date: 09/22/2023

Condition Developed POI 2
 Ex imp credit 1.00 Discharge to Bypass
 Lawn x 1.05 Location Site

Watershed Area 0.20 acres
 0.0003 sq mi

Runoff Coefficient

	Soil name	Cover Description	"C"	Area <i>acres</i>	"C" x Area <i>acres</i>
<i>soil group total in acres</i>	A	Impervious	0.96		
	A	Turf	0.26		
	A	Meadow	0.16		
	A	Woods	0.10		
<i>soil group total in acres 0.20</i>	B	Impervious	0.96	0.07	0.07
	B	Turf	0.36	0.13	0.05
	B	Meadow	0.22		
	B	Woods	0.11		
<i>soil group total in acres</i>	C	Impervious	0.96		
	C	Turf	0.53		
	C	Meadow	0.28		
	C	Woods	0.10		
<i>soil group total in acres</i>	D	Impervious	0.96		
	D	Turf	0.53		
	D	Meadow	0.20		
	D	Woods	0.10		
Total				0.20	0.11

C= 0.57 35.00% Impervious

Runoff Volumes

Storm yr	Rainfall in	Runoff in	Volume cf
MDE		87.52	63540
EISA		87.52	63540
1	2.71	86.00	62439
2	3.26	85.70	62217
5	4.11	85.23	61875
10	4.81	84.84	61594
25	5.83	84.28	61186
50	6.70	83.80	60840
100	7.63	83.29	60471

Rational Method Runoff Coefficient

Project 2084 Brilla LLC
 Location: Bensalem Township

By: DLF
 Date: 09/22/2023

Condition Developed POI 2
 Ex imp credit 1.00 Discharge to Bypass
 Lawn x 1.00 Location Offsite

Watershed Area 1.35 acres
 0.0021 sq mi

Runoff Coefficient

	Soil name	Cover Description	"C"	Area <i>acres</i>	"C" x Area <i>acres</i>
<i>soil group total in acres</i>	A	Impervious	0.96		
	A	Turf	0.25		
	A	Meadow	0.16		
	A	Woods	0.10		
<i>soil group total in acres 1.35</i>	B	Impervious	0.96	0.32	0.31
	B	Turf	0.34	0.97	0.33
	B	Meadow	0.22		
	B	Woods	0.11	0.06	0.01
<i>soil group total in acres</i>	C	Impervious	0.96		
	C	Turf	0.50		
	C	Meadow	0.28		
	C	Woods	0.10		
<i>soil group total in acres</i>	D	Impervious	0.96		
	D	Turf	0.50		
	D	Meadow	0.20		
	D	Woods	0.10		
	Total			1.35	0.64

impervious= 23 percent of area of Lot 4

C= 0.48 23.70% Impervious

Runoff Volumes			
Storm yr	Rainfall in	Runoff in	Volume cf
MDE		104.38	511508
EISA		104.38	511508
1	2.71	102.86	504072
2	3.26	102.55	502571
5	4.11	102.08	500256
10	4.81	101.69	498355
25	5.83	101.13	495593
50	6.70	100.65	493245
100	7.63	100.14	490742

Rational Method Runoff Coefficient

Project: 2084 Brilla LLC
 Location: Bensalem Township

By: DLF
 Date: 09/22/2023

Condition: Developed POI: 1B
 Ex imp credit: 1.00 Discharge to: Seepage Bed
 Lawn x: 1.05 Location: Site

Watershed Area: 0.27 acres
 Runoff Coefficient: 0.0004 sq mi

Runoff Coefficient

	Soil name	Cover Description	"C"	Area <i>acres</i>	"C" x Area <i>acres</i>
<i>soil group total in acres</i>	A	Impervious	0.96		
	A	Turf	0.26		
	A	Meadow	0.16		
	A	Woods	0.10		
<i>soil group total in acres 0.27</i>	B	Impervious	0.96	0.26	0.25
	B	Turf	0.36	0.01	0.00
	B	Meadow	0.22		
	B	Woods	0.11		
<i>soil group total in acres</i>	C	Impervious	0.96		
	C	Turf	0.53		
	C	Meadow	0.28		
	C	Woods	0.10		
<i>soil group total in acres</i>	D	Impervious	0.96		
	D	Turf	0.53		
	D	Meadow	0.20		
	D	Woods	0.10		
			Total	0.27	0.25

Post Development multiplier: 1.05

C = 0.94 96.30% Impervious

Runoff Volumes

Storm yr	Rainfall in	Runoff in	Volume cf
MDE		52.82	51773
EISA		52.82	51773
1	2.71	51.31	50292
2	3.26	51.01	49995
5	4.11	50.54	49537
10	4.81	50.16	49163
25	5.83	49.61	48620
50	6.70	49.14	48160
100	7.63	48.64	47671

Hydrograph Return Period Recap

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

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	Mod. Rational	-----	1.362	1.619	-----	1.914	2.122	2.370	2.548	2.715	1 Pre Dev Site
2	Mod. Rational	-----	1.449	1.722	-----	2.036	2.257	2.521	2.710	2.889	1 Pre Dev Off Site
3	Combine	1, 2	2.811	3.341	-----	3.950	4.379	4.892	5.258	5.604	1 Pre Dev Total ****
4	Mod. Rational	-----	1.241	1.475	-----	1.744	1.933	2.160	2.322	2.474	1A Post Dev Site
5	Mod. Rational	-----	1.333	1.584	-----	1.873	2.076	2.320	2.494	2.658	1A Post Dev Off Site
6	Combine	4, 5	2.574	3.059	-----	3.617	4.010	4.480	4.815	5.132	1A Post Dev Controlled Total
7	Reservoir	6	0.000	0.000	-----	0.000	0.000	0.000	0.000	0.000	Seepage Bed 1A
8	Mod. Rational	-----	0.981	1.165	-----	1.378	1.528	1.707	1.834	1.955	1B Post Dev Site
9	Combine	7, 8	0.981	1.165	-----	1.378	1.528	1.707	1.834	1.955	1B Post Dev Controlled Total
10	Reservoir	9	0.229	0.307	-----	0.403	0.467	0.549	0.610	0.666	Seepage Bed 1B
11	Mod. Rational	-----	0.383	0.456	-----	0.539	0.597	0.667	0.717	0.764	1 Post Dev Site Bypass
12	Mod. Rational	-----	0.242	0.288	-----	0.340	0.377	0.422	0.453	0.483	1 Post Dev Off Site Bypass
13	Combine	10, 11, 12	0.716	0.868	-----	1.050	1.182	1.343	1.460	1.572	1 Post Dev Total ****
15	Mod. Rational	-----	0.484	0.576	-----	0.682	0.757	0.846	0.910	0.969	2 Pre Dev Site
16	Mod. Rational	-----	2.523	3.001	-----	3.556	3.946	4.409	4.742	5.054	2 Pre Dev Off Site
17	Combine	15, 16	3.007	3.577	-----	4.239	4.703	5.255	5.651	6.024	2 Pre Dev Total ****
18	Mod. Rational	-----	0.289	0.343	-----	0.406	0.450	0.502	0.540	0.575	2 Post Dev Site
19	Mod. Rational	-----	0.025	0.030	-----	0.036	0.040	0.044	0.048	0.051	2 Post Dev Off Site
20	Combine	18, 19	0.314	0.373	-----	0.441	0.489	0.547	0.588	0.626	2 Post Dev Controlled Total
21	Reservoir	20	0.095	0.109	-----	0.124	0.133	0.144	0.151	0.158	Seepage Bed 2
22	Mod. Rational	-----	0.440	0.523	-----	0.619	0.686	0.767	0.824	0.878	2 Post Dev Site Bypass
23	Mod. Rational	-----	2.503	2.976	-----	3.518	3.900	4.357	4.684	4.992	2 Post Dev Off Site Bypass
24	Combine	21, 22, 23	2.999	3.569	-----	4.220	4.677	5.224	5.613	5.981	2 Post Dev Total ****

Hydrograph Summary Report

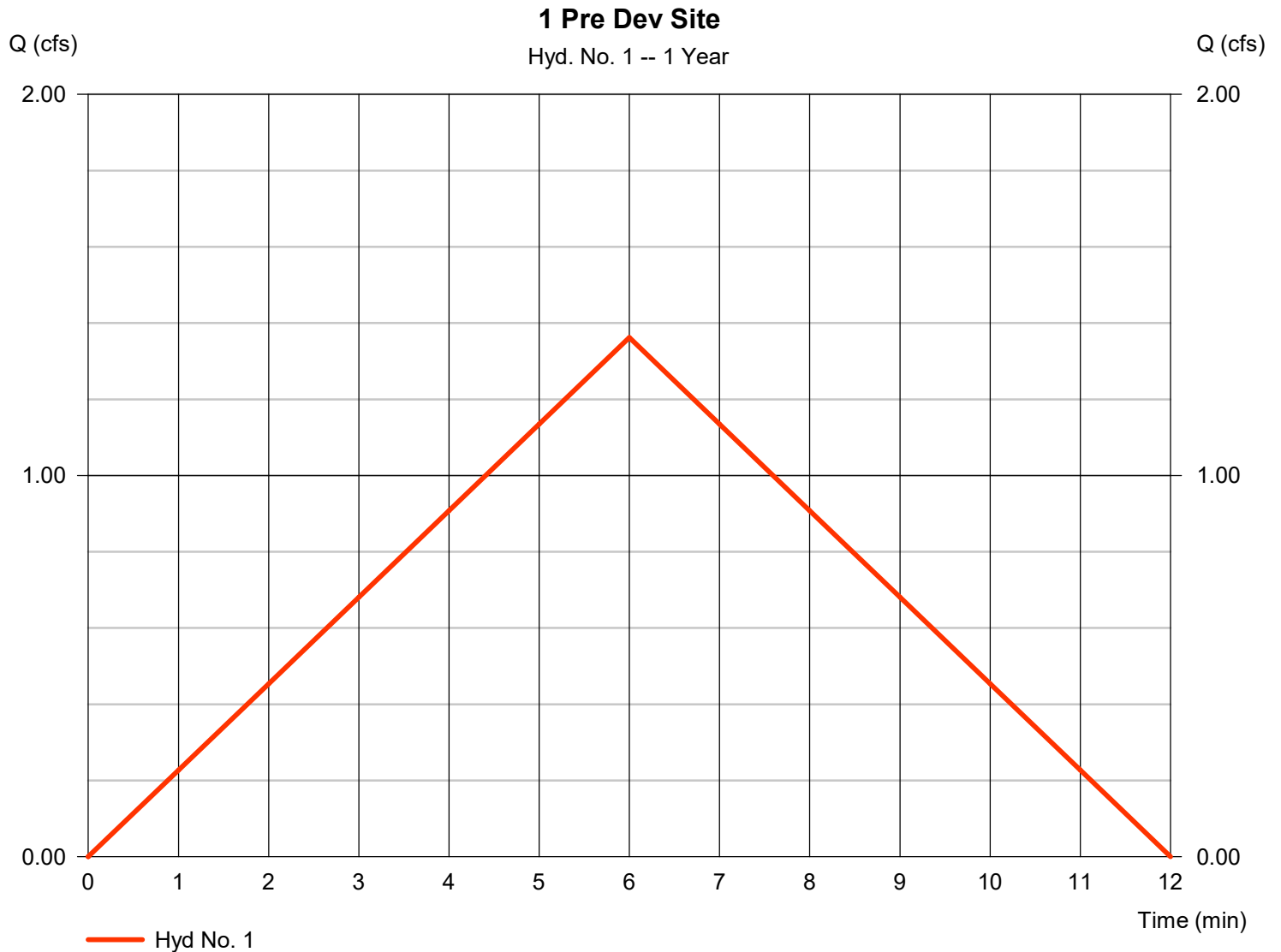
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

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	Mod. Rational	1.362	1	6	490	----	----	----	1 Pre Dev Site
2	Mod. Rational	1.449	1	6	522	----	----	----	1 Pre Dev Off Site
3	Combine	2.811	1	6	1,012	1, 2	----	----	1 Pre Dev Total ****
4	Mod. Rational	1.241	1	6	447	----	----	----	1A Post Dev Site
5	Mod. Rational	1.333	1	6	480	----	----	----	1A Post Dev Off Site
6	Combine	2.574	1	6	927	4, 5	----	----	1A Post Dev Controlled Total
7	Reservoir	0.000	1	889	0	6	126.78	915	Seepage Bed 1A
8	Mod. Rational	0.981	1	6	353	----	----	----	1B Post Dev Site
9	Combine	0.981	1	6	353	7, 8	----	----	1B Post Dev Controlled Total
10	Reservoir	0.229	1	10	184	9	127.27	255	Seepage Bed 1B
11	Mod. Rational	0.383	1	6	138	----	----	----	1 Post Dev Site Bypass
12	Mod. Rational	0.242	1	6	87	----	----	----	1 Post Dev Off Site Bypass
13	Combine	0.716	1	6	409	10, 11, 12	----	----	1 Post Dev Total ****
15	Mod. Rational	0.484	1	7	203	----	----	----	2 Pre Dev Site
16	Mod. Rational	2.523	1	7	1,060	----	----	----	2 Pre Dev Off Site
17	Combine	3.007	1	7	1,263	15, 16	----	----	2 Pre Dev Total ****
18	Mod. Rational	0.289	1	6	104	----	----	----	2 Post Dev Site
19	Mod. Rational	0.025	1	6	9	----	----	----	2 Post Dev Off Site
20	Combine	0.314	1	6	113	18, 19	----	----	2 Post Dev Controlled Total
21	Reservoir	0.095	1	10	107	20	108.29	82.3	Seepage Bed 2
22	Mod. Rational	0.440	1	6	159	----	----	----	2 Post Dev Site Bypass
23	Mod. Rational	2.503	1	6	901	----	----	----	2 Post Dev Off Site Bypass
24	Combine	2.999	1	6	1,167	21, 22, 23	----	----	2 Post Dev Total ****
301 Watersheds 2084 RM.gpw					Return Period: 1 Year			Friday, 09 / 22 / 2023	

Hyd. No. 1

1 Pre Dev Site

Hydrograph type	= Mod. Rational	Peak discharge	= 1.362 cfs
Storm frequency	= 1 yrs	Time to peak	= 6 min
Time interval	= 1 min	Hyd. volume	= 490 cuft
Drainage area	= 0.750 ac	Runoff coeff.	= 0.47
Intensity	= 3.863 in/hr	Tc by User	= 6.00 min
IDF Curve	= PA-Doylestown.IDF	Storm duration	= 1.0 x Tc
Target Q	=n/a	Est. Req'd Storage	=n/a



Hyd. No. 2

1 Pre Dev Off Site

Hydrograph type	= Mod. Rational	Peak discharge	= 1.449 cfs
Storm frequency	= 1 yrs	Time to peak	= 6 min
Time interval	= 1 min	Hyd. volume	= 522 cuft
Drainage area	= 0.750 ac	Runoff coeff.	= 0.5
Intensity	= 3.863 in/hr	Tc by User	= 6.00 min
IDF Curve	= PA-Doylestown.IDF	Storm duration	= 1.0 x Tc
Target Q	=n/a	Est. Req'd Storage	=n/a

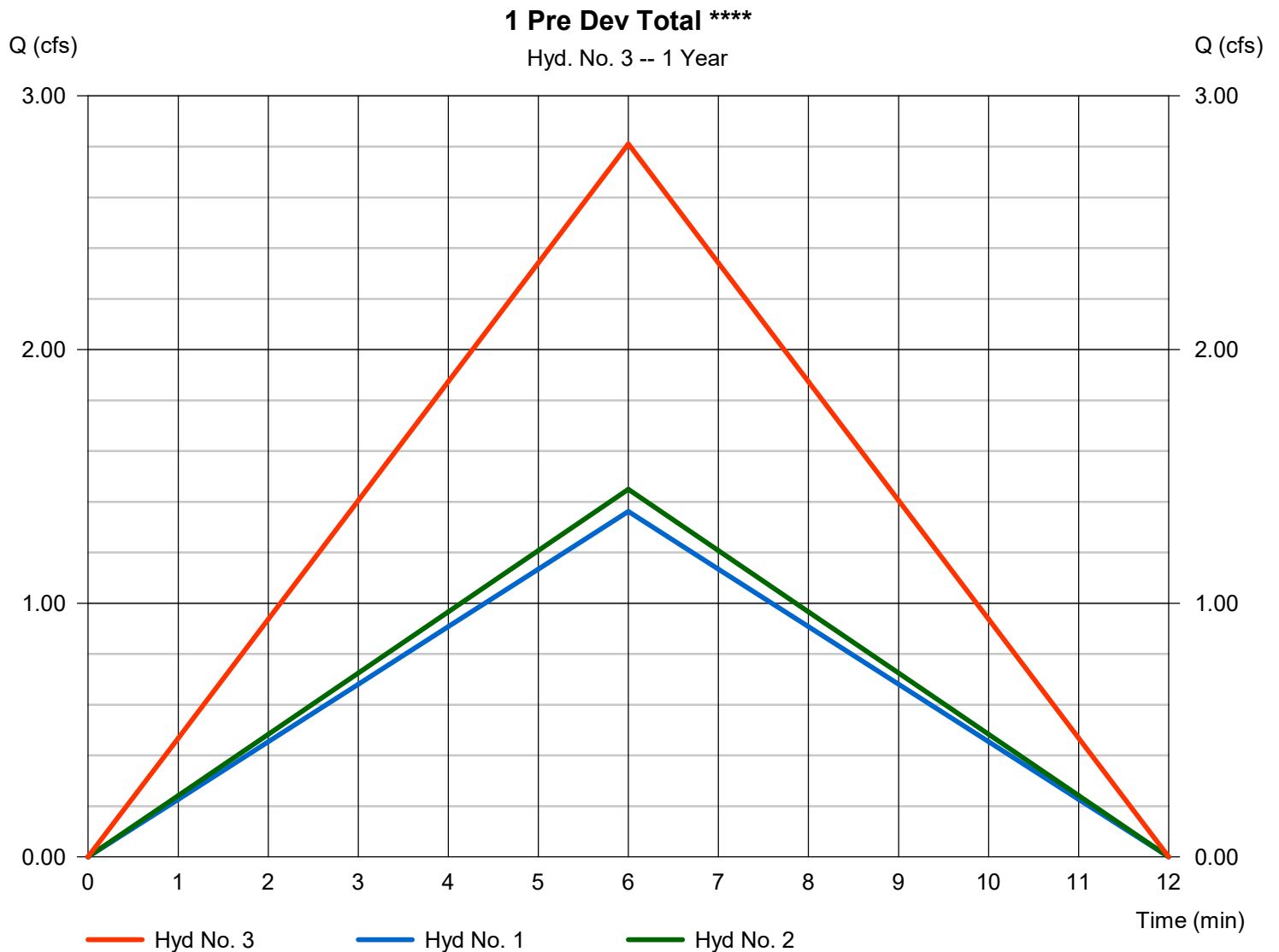


Hyd. No. 3

1 Pre Dev Total ****

Hydrograph type = Combine
Storm frequency = 1 yrs
Time interval = 1 min
Inflow hyds. = 1, 2

Peak discharge = 2.811 cfs
Time to peak = 6 min
Hyd. volume = 1,012 cuft
Contrib. drain. area = 1.500 ac



Hyd. No. 4

1A Post Dev Site

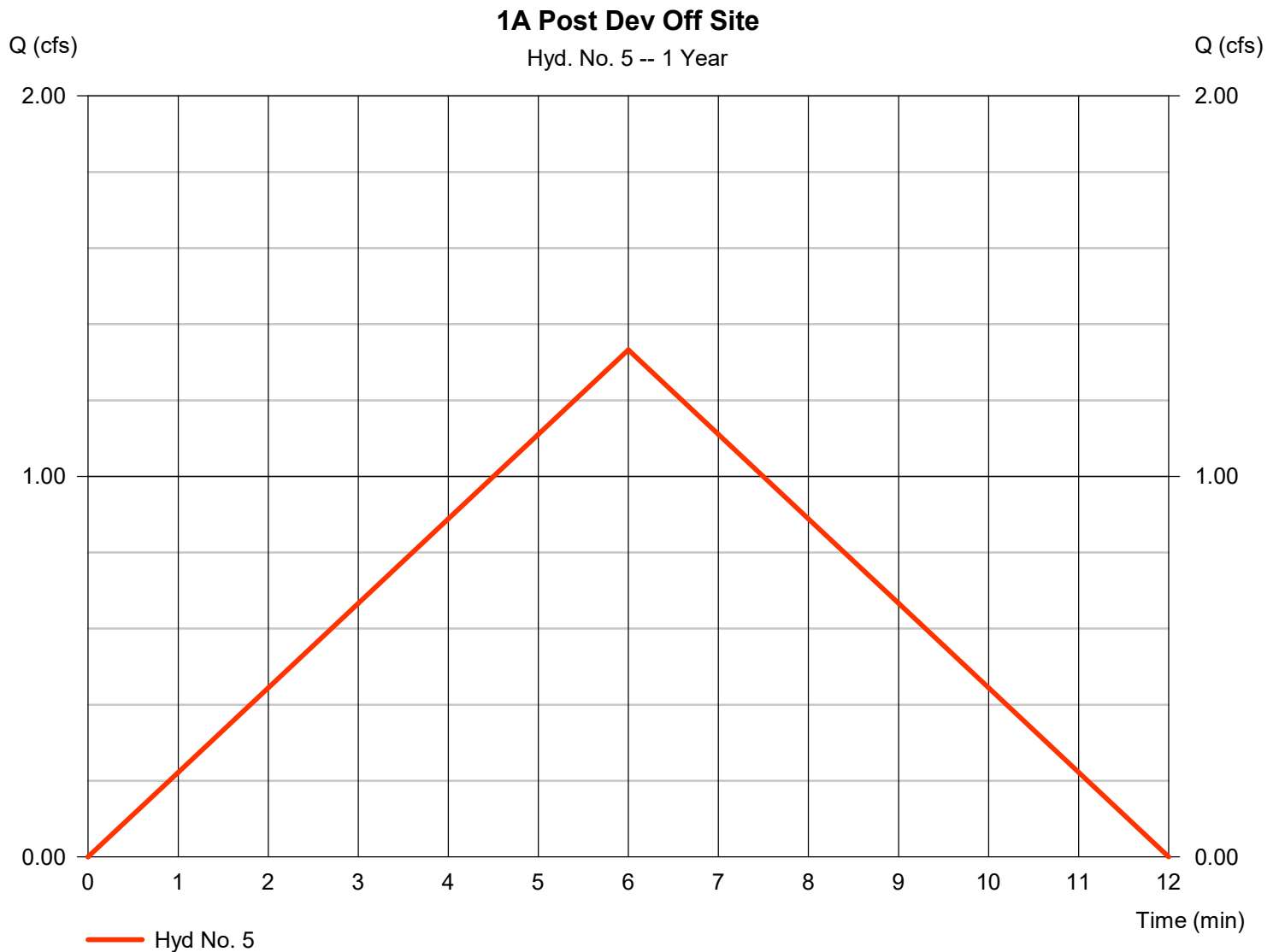
Hydrograph type	= Mod. Rational	Peak discharge	= 1.241 cfs
Storm frequency	= 1 yrs	Time to peak	= 6 min
Time interval	= 1 min	Hyd. volume	= 447 cuft
Drainage area	= 0.440 ac	Runoff coeff.	= 0.73
Intensity	= 3.863 in/hr	Tc by User	= 6.00 min
IDF Curve	= PA-Doylestown.IDF	Storm duration	= 1.0 x Tc
Target Q	=n/a	Est. Req'd Storage	=n/a



Hyd. No. 5

1A Post Dev Off Site

Hydrograph type	= Mod. Rational	Peak discharge	= 1.333 cfs
Storm frequency	= 1 yrs	Time to peak	= 6 min
Time interval	= 1 min	Hyd. volume	= 480 cuft
Drainage area	= 0.750 ac	Runoff coeff.	= 0.46
Intensity	= 3.863 in/hr	Tc by User	= 6.00 min
IDF Curve	= PA-Doylestown.IDF	Storm duration	= 1.0 x Tc
Target Q	=n/a	Est. Req'd Storage	=n/a

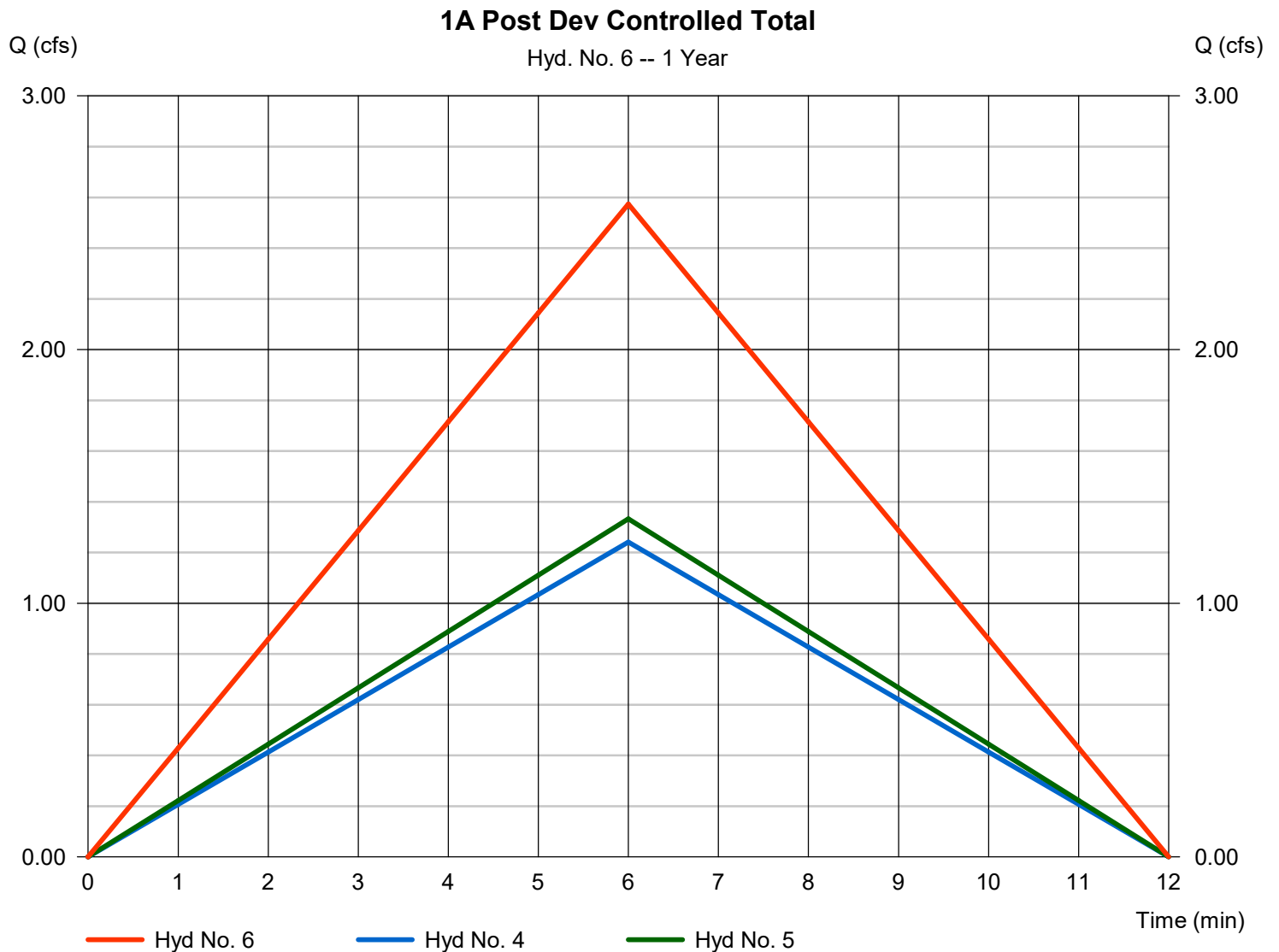


Hyd. No. 6

1A Post Dev Controlled Total

Hydrograph type = Combine
Storm frequency = 1 yrs
Time interval = 1 min
Inflow hyds. = 4, 5

Peak discharge = 2.574 cfs
Time to peak = 6 min
Hyd. volume = 927 cuft
Contrib. drain. area = 1.190 ac

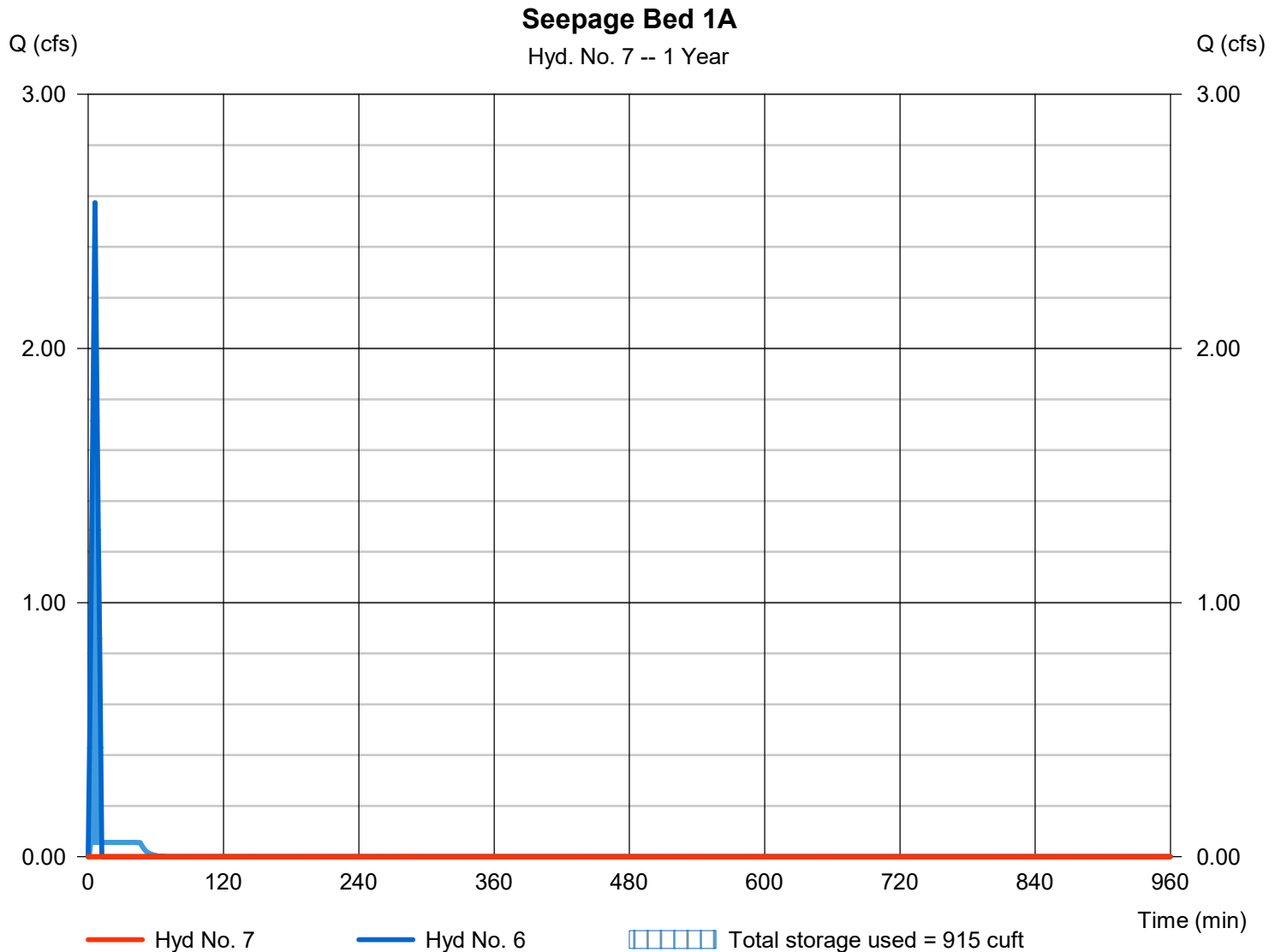


Hyd. No. 7

Seepage Bed 1A

Hydrograph type	= Reservoir	Peak discharge	= 0.000 cfs
Storm frequency	= 1 yrs	Time to peak	= 889 min
Time interval	= 1 min	Hyd. volume	= 0 cuft
Inflow hyd. No.	= 6 - 1A Post Dev Controlled Total	Max. Elevation	= 126.78 ft
Reservoir name	= Seepage Bed 1A	Max. Storage	= 915 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Pond Report

Pond No. 1 - Seepage Bed 1A

Pond Data

UG Chambers -Invert elev. = 126.25 ft, Rise x Span = 1.00 x 1.00 ft, Barrel Len = 72.00 ft, No. Barrels = 1, Slope = 0.00%, Headers = No
Encasement -Invert elev. = 126.00 ft, Width = 40.00 ft, Height = 2.00 ft, Voids = 40.00%

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	126.00	n/a	0	0
0.20	126.20	n/a	230	230
0.40	126.40	n/a	234	464
0.60	126.60	n/a	238	702
0.80	126.80	n/a	239	941
1.00	127.00	n/a	239	1,180
1.20	127.20	n/a	236	1,416
1.40	127.40	n/a	231	1,647
1.60	127.60	n/a	230	1,878
1.80	127.80	n/a	230	2,108
2.00	128.00	n/a	230	2,338

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 18.00	8.00	0.00	Inactive
Span (in)	= 18.00	8.00	0.00	0.00
No. Barrels	= 1	1	0	0
Invert El. (ft)	= 126.75	127.60	0.00	0.00
Length (ft)	= 123.00	0.50	0.00	0.00
Slope (%)	= 0.70	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	Yes	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 4.71	Inactive	Inactive	Inactive
Crest El. (ft)	= 129.00	0.00	0.00	0.00
Weir Coeff.	= 3.32	3.32	3.33	3.33
Weir Type	= Broad	Broad	---	---
Multi-Stage	= Yes	No	No	No
Exfil.(in/hr)	= 0.250 (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	126.00	0.00	0.00	---	---	0.00	0.00	---	---	0.000	---	0.000
0.02	23	126.02	0.00	0.00	---	---	0.00	0.00	---	---	0.017	---	0.017
0.04	46	126.04	0.00	0.00	---	---	0.00	0.00	---	---	0.017	---	0.017
0.06	69	126.06	0.00	0.00	---	---	0.00	0.00	---	---	0.017	---	0.017
0.08	92	126.08	0.00	0.00	---	---	0.00	0.00	---	---	0.017	---	0.017
0.10	115	126.10	0.00	0.00	---	---	0.00	0.00	---	---	0.017	---	0.017
0.12	138	126.12	0.00	0.00	---	---	0.00	0.00	---	---	0.017	---	0.017
0.14	161	126.14	0.00	0.00	---	---	0.00	0.00	---	---	0.017	---	0.017
0.16	184	126.16	0.00	0.00	---	---	0.00	0.00	---	---	0.017	---	0.017
0.18	207	126.18	0.00	0.00	---	---	0.00	0.00	---	---	0.017	---	0.017
0.20	230	126.20	0.00	0.00	---	---	0.00	0.00	---	---	0.017	---	0.017
0.22	254	126.22	0.00	0.00	---	---	0.00	0.00	---	---	0.017	---	0.017
0.24	277	126.24	0.00	0.00	---	---	0.00	0.00	---	---	0.017	---	0.017
0.26	301	126.26	0.00	0.00	---	---	0.00	0.00	---	---	0.017	---	0.017
0.28	324	126.28	0.00	0.00	---	---	0.00	0.00	---	---	0.017	---	0.017
0.30	347	126.30	0.00	0.00	---	---	0.00	0.00	---	---	0.017	---	0.017
0.32	371	126.32	0.00	0.00	---	---	0.00	0.00	---	---	0.017	---	0.017
0.34	394	126.34	0.00	0.00	---	---	0.00	0.00	---	---	0.017	---	0.017
0.36	417	126.36	0.00	0.00	---	---	0.00	0.00	---	---	0.017	---	0.017
0.38	441	126.38	0.00	0.00	---	---	0.00	0.00	---	---	0.017	---	0.017
0.40	464	126.40	0.00	0.00	---	---	0.00	0.00	---	---	0.017	---	0.017
0.42	488	126.42	0.00	0.00	---	---	0.00	0.00	---	---	0.017	---	0.017
0.44	512	126.44	0.00	0.00	---	---	0.00	0.00	---	---	0.017	---	0.017
0.46	535	126.46	0.00	0.00	---	---	0.00	0.00	---	---	0.017	---	0.017
0.48	559	126.48	0.00	0.00	---	---	0.00	0.00	---	---	0.017	---	0.017
0.50	583	126.50	0.00	0.00	---	---	0.00	0.00	---	---	0.017	---	0.017
0.52	607	126.52	0.00	0.00	---	---	0.00	0.00	---	---	0.017	---	0.017
0.54	631	126.54	0.00	0.00	---	---	0.00	0.00	---	---	0.017	---	0.017
0.56	654	126.56	0.00	0.00	---	---	0.00	0.00	---	---	0.017	---	0.017
0.58	678	126.58	0.00	0.00	---	---	0.00	0.00	---	---	0.017	---	0.017
0.60	702	126.60	0.00	0.00	---	---	0.00	0.00	---	---	0.017	---	0.017
0.62	726	126.62	0.00	0.00	---	---	0.00	0.00	---	---	0.017	---	0.017

Continues on next page...

Seepage Bed 1A

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
0.64	750	126.64	0.00	0.00	---	---	0.00	0.00	---	---	0.017	---	0.017
0.66	774	126.66	0.00	0.00	---	---	0.00	0.00	---	---	0.017	---	0.017
0.68	798	126.68	0.00	0.00	---	---	0.00	0.00	---	---	0.017	---	0.017
0.70	821	126.70	0.00	0.00	---	---	0.00	0.00	---	---	0.017	---	0.017
0.72	845	126.72	0.00	0.00	---	---	0.00	0.00	---	---	0.017	---	0.017
0.74	869	126.74	0.00	0.00	---	---	0.00	0.00	---	---	0.017	---	0.017
0.76	893	126.76	0.00	0.00	---	---	0.00	0.00	---	---	0.017	---	0.017
0.78	917	126.78	0.00	0.00	---	---	0.00	0.00	---	---	0.017	---	0.017
0.80	941	126.80	0.00	0.00	---	---	0.00	0.00	---	---	0.017	---	0.017
0.82	965	126.82	0.00	0.00	---	---	0.00	0.00	---	---	0.017	---	0.017
0.84	989	126.84	0.00	0.00	---	---	0.00	0.00	---	---	0.017	---	0.017
0.86	1,012	126.86	0.00	0.00	---	---	0.00	0.00	---	---	0.017	---	0.017
0.88	1,036	126.88	0.00	0.00	---	---	0.00	0.00	---	---	0.017	---	0.017
0.90	1,060	126.90	0.00	0.00	---	---	0.00	0.00	---	---	0.017	---	0.017
0.92	1,084	126.92	0.00	0.00	---	---	0.00	0.00	---	---	0.017	---	0.017
0.94	1,108	126.94	0.00	0.00	---	---	0.00	0.00	---	---	0.017	---	0.017
0.96	1,132	126.96	0.00	0.00	---	---	0.00	0.00	---	---	0.017	---	0.017
0.98	1,156	126.98	0.00	0.00	---	---	0.00	0.00	---	---	0.017	---	0.017
1.00	1,180	127.00	0.00	0.00	---	---	0.00	0.00	---	---	0.017	---	0.017
1.02	1,203	127.02	0.00	0.00	---	---	0.00	0.00	---	---	0.018	---	0.018
1.04	1,227	127.04	0.00	0.00	---	---	0.00	0.00	---	---	0.018	---	0.018
1.06	1,250	127.06	0.00	0.00	---	---	0.00	0.00	---	---	0.018	---	0.018
1.08	1,274	127.08	0.00	0.00	---	---	0.00	0.00	---	---	0.018	---	0.018
1.10	1,298	127.10	0.00	0.00	---	---	0.00	0.00	---	---	0.018	---	0.018
1.12	1,321	127.12	0.00	0.00	---	---	0.00	0.00	---	---	0.018	---	0.018
1.14	1,345	127.14	0.00	0.00	---	---	0.00	0.00	---	---	0.018	---	0.018
1.16	1,369	127.16	0.00	0.00	---	---	0.00	0.00	---	---	0.018	---	0.018
1.18	1,392	127.18	0.00	0.00	---	---	0.00	0.00	---	---	0.018	---	0.018
1.20	1,416	127.20	0.00	0.00	---	---	0.00	0.00	---	---	0.018	---	0.018
1.22	1,439	127.22	0.00	0.00	---	---	0.00	0.00	---	---	0.018	---	0.018
1.24	1,462	127.24	0.00	0.00	---	---	0.00	0.00	---	---	0.018	---	0.018
1.26	1,485	127.26	0.00	0.00	---	---	0.00	0.00	---	---	0.018	---	0.018
1.28	1,508	127.28	0.00	0.00	---	---	0.00	0.00	---	---	0.018	---	0.018
1.30	1,532	127.30	0.00	0.00	---	---	0.00	0.00	---	---	0.018	---	0.018
1.32	1,555	127.32	0.00	0.00	---	---	0.00	0.00	---	---	0.018	---	0.018
1.34	1,578	127.34	0.00	0.00	---	---	0.00	0.00	---	---	0.018	---	0.018
1.36	1,601	127.36	0.00	0.00	---	---	0.00	0.00	---	---	0.018	---	0.018
1.38	1,624	127.38	0.00	0.00	---	---	0.00	0.00	---	---	0.018	---	0.018
1.40	1,647	127.40	0.00	0.00	---	---	0.00	0.00	---	---	0.018	---	0.018
1.42	1,670	127.42	0.00	0.00	---	---	0.00	0.00	---	---	0.018	---	0.018
1.44	1,693	127.44	0.00	0.00	---	---	0.00	0.00	---	---	0.018	---	0.018
1.46	1,716	127.46	0.00	0.00	---	---	0.00	0.00	---	---	0.018	---	0.018
1.48	1,739	127.48	0.00	0.00	---	---	0.00	0.00	---	---	0.018	---	0.018
1.50	1,762	127.50	0.00	0.00	---	---	0.00	0.00	---	---	0.018	---	0.018
1.52	1,785	127.52	0.00	0.00	---	---	0.00	0.00	---	---	0.018	---	0.018
1.54	1,808	127.54	0.00	0.00	---	---	0.00	0.00	---	---	0.018	---	0.018
1.56	1,831	127.56	0.00	0.00	---	---	0.00	0.00	---	---	0.018	---	0.018
1.58	1,854	127.58	0.00	0.00	---	---	0.00	0.00	---	---	0.018	---	0.018
1.60	1,878	127.60	0.00	0.00	---	---	0.00	0.00	---	---	0.018	---	0.018
1.62	1,901	127.62	0.00 ic	0.00 ic	---	---	0.00	0.00	---	---	0.018	---	0.020
1.64	1,924	127.64	0.01 ic	0.01 ic	---	---	0.00	0.00	---	---	0.018	---	0.024
1.66	1,947	127.66	0.01 ic	0.01 ic	---	---	0.00	0.00	---	---	0.018	---	0.031
1.68	1,970	127.68	0.03 ic	0.02 ic	---	---	0.00	0.00	---	---	0.018	---	0.042
1.70	1,993	127.70	0.04 ic	0.04 ic	---	---	0.00	0.00	---	---	0.018	---	0.054
1.72	2,016	127.72	0.05 ic	0.05 ic	---	---	0.00	0.00	---	---	0.018	---	0.069
1.74	2,039	127.74	0.07 ic	0.07 ic	---	---	0.00	0.00	---	---	0.018	---	0.087
1.76	2,062	127.76	0.09 ic	0.09 ic	---	---	0.00	0.00	---	---	0.018	---	0.109
1.78	2,085	127.78	0.12 ic	0.11 ic	---	---	0.00	0.00	---	---	0.018	---	0.130
1.80	2,108	127.80	0.14 ic	0.13 ic	---	---	0.00	0.00	---	---	0.018	---	0.153
1.82	2,131	127.82	0.17 ic	0.16 ic	---	---	0.00	0.00	---	---	0.018	---	0.179
1.84	2,154	127.84	0.20 ic	0.19 ic	---	---	0.00	0.00	---	---	0.018	---	0.207
1.86	2,177	127.86	0.22 ic	0.22 ic	---	---	0.00	0.00	---	---	0.018	---	0.238
1.88	2,200	127.88	0.25 ic	0.25 ic	---	---	0.00	0.00	---	---	0.018	---	0.270
1.90	2,223	127.90	0.29 ic	0.29 ic	---	---	0.00	0.00	---	---	0.018	---	0.305
1.92	2,246	127.92	0.33 ic	0.32 ic	---	---	0.00	0.00	---	---	0.018	---	0.341
1.94	2,269	127.94	0.36 ic	0.36 ic	---	---	0.00	0.00	---	---	0.018	---	0.379
1.96	2,292	127.96	0.41 ic	0.40 ic	---	---	0.00	0.00	---	---	0.018	---	0.417
1.98	2,315	127.98	0.43 ic	0.43 ic	---	---	0.00	0.00	---	---	0.018	---	0.450
2.00	2,338	128.00	0.49 ic	0.47 ic	---	---	0.00	0.00	---	---	0.018	---	0.491

...End

Hyd. No. 8

1B Post Dev Site

Hydrograph type	= Mod. Rational	Peak discharge	= 0.981 cfs
Storm frequency	= 1 yrs	Time to peak	= 6 min
Time interval	= 1 min	Hyd. volume	= 353 cuft
Drainage area	= 0.270 ac	Runoff coeff.	= 0.94
Intensity	= 3.863 in/hr	Tc by User	= 6.00 min
IDF Curve	= PA-Doylestown.IDF	Storm duration	= 1.0 x Tc
Target Q	=n/a	Est. Req'd Storage	=n/a



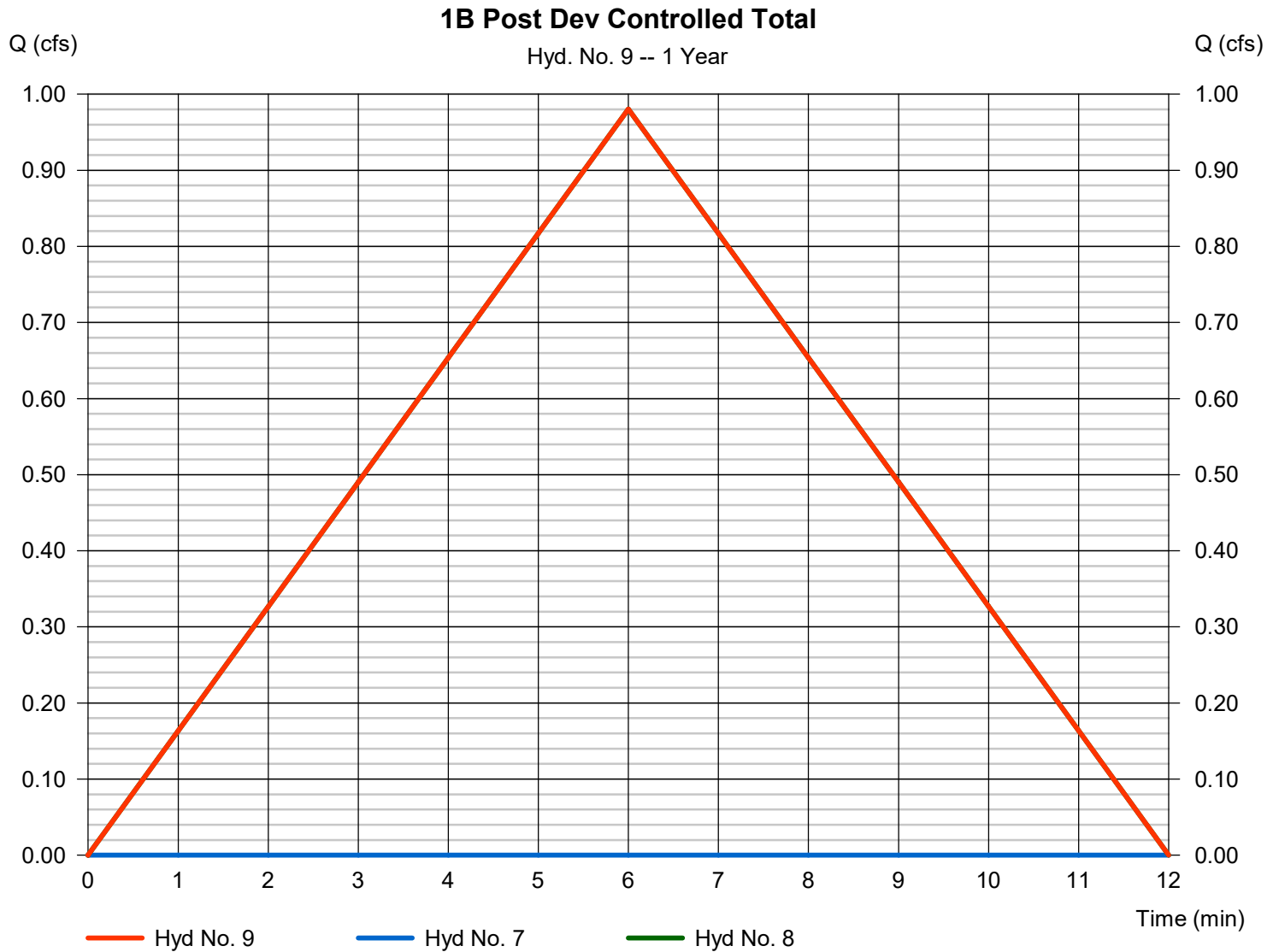
Hydrograph Report

Hyd. No. 9

1B Post Dev Controlled Total

Hydrograph type = Combine
Storm frequency = 1 yrs
Time interval = 1 min
Inflow hyds. = 7, 8

Peak discharge = 0.981 cfs
Time to peak = 6 min
Hyd. volume = 353 cuft
Contrib. drain. area = 0.270 ac

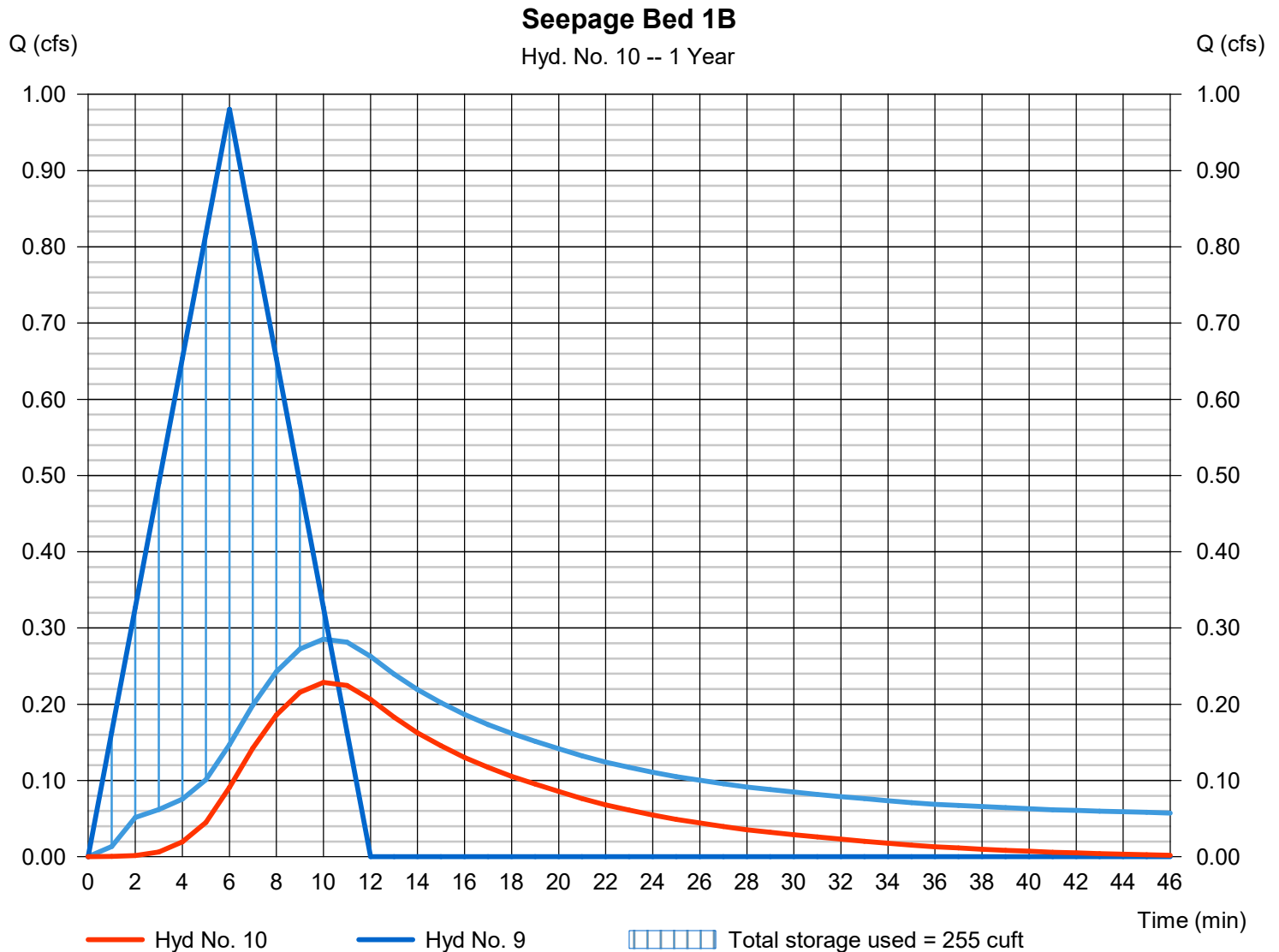


Hyd. No. 10

Seepage Bed 1B

Hydrograph type	= Reservoir	Peak discharge	= 0.229 cfs
Storm frequency	= 1 yrs	Time to peak	= 10 min
Time interval	= 1 min	Hyd. volume	= 184 cuft
Inflow hyd. No.	= 9 - 1B Post Dev Controlled Total	Max. Elevation	= 127.27 ft
Reservoir name	= Seepage Bed 1B	Max. Storage	= 255 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Pond Report

Pond No. 2 - Seepage Bed 1B

Pond Data

UG Chambers -Invert elev. = 127.50 ft, Rise x Span = 1.00 x 1.00 ft, Barrel Len = 96.00 ft, No. Barrels = 1, Slope = 0.00%, Headers = No
Encasement -Invert elev. = 127.00 ft, Width = 25.00 ft, Height = 2.00 ft, Voids = 40.00%

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	127.00	n/a	0	0
0.20	127.20	n/a	192	192
0.40	127.40	n/a	192	384
0.60	127.60	n/a	194	578
0.80	127.80	n/a	201	780
1.00	128.00	n/a	203	983
1.20	128.20	n/a	203	1,186
1.40	128.40	n/a	201	1,387
1.60	128.60	n/a	194	1,582
1.80	128.80	n/a	192	1,774
2.00	129.00	n/a	192	1,966

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 18.00	8.00	0.00	0.00
Span (in)	= 18.00	8.00	0.00	0.00
No. Barrels	= 1	1	0	0
Invert El. (ft)	= 126.40	127.00	0.00	0.00
Length (ft)	= 24.00	0.50	0.00	0.00
Slope (%)	= 5.24	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	Yes	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 3.14	Inactive	Inactive	Inactive
Crest El. (ft)	= 129.00	0.00	0.00	0.00
Weir Coeff.	= 3.32	3.32	3.33	3.33
Weir Type	= Broad	Broad	---	---
Multi-Stage	= Yes	No	No	No
Exfil.(in/hr)	= 1.000 (by Wet area)			
TW Elev. (ft)	= 0.00			

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

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	127.00	0.00	0.00	---	---	0.00	0.00	---	---	0.000	---	0.000
0.02	19	127.02	1.78 ic	0.00 ic	---	---	0.00	0.00	---	---	0.056	---	0.057
0.04	38	127.04	1.78 ic	0.01 ic	---	---	0.00	0.00	---	---	0.056	---	0.062
0.06	58	127.06	1.78 ic	0.01 ic	---	---	0.00	0.00	---	---	0.056	---	0.069
0.08	77	127.08	1.78 ic	0.02 ic	---	---	0.00	0.00	---	---	0.056	---	0.080
0.10	96	127.10	1.78 ic	0.04 ic	---	---	0.00	0.00	---	---	0.056	---	0.092
0.12	115	127.12	1.78 ic	0.05 ic	---	---	0.00	0.00	---	---	0.056	---	0.107
0.14	134	127.14	1.78 ic	0.07 ic	---	---	0.00	0.00	---	---	0.056	---	0.125
0.16	154	127.16	1.78 ic	0.09 ic	---	---	0.00	0.00	---	---	0.056	---	0.147
0.18	173	127.18	1.78 ic	0.11 ic	---	---	0.00	0.00	---	---	0.056	---	0.168
0.20	192	127.20	1.78 ic	0.13 ic	---	---	0.00	0.00	---	---	0.056	---	0.191
0.22	211	127.22	1.78 ic	0.16 ic	---	---	0.00	0.00	---	---	0.057	---	0.217
0.24	230	127.24	1.78 ic	0.19 ic	---	---	0.00	0.00	---	---	0.057	---	0.246
0.26	250	127.26	1.78 ic	0.22 ic	---	---	0.00	0.00	---	---	0.057	---	0.276
0.28	269	127.28	1.78 ic	0.25 ic	---	---	0.00	0.00	---	---	0.057	---	0.309
0.30	288	127.30	1.78 ic	0.29 ic	---	---	0.00	0.00	---	---	0.057	---	0.343
0.32	307	127.32	1.78 ic	0.32 ic	---	---	0.00	0.00	---	---	0.057	---	0.380
0.34	326	127.34	1.78 ic	0.36 ic	---	---	0.00	0.00	---	---	0.057	---	0.417
0.36	346	127.36	1.78 ic	0.40 ic	---	---	0.00	0.00	---	---	0.057	---	0.456
0.38	365	127.38	1.78 ic	0.43 ic	---	---	0.00	0.00	---	---	0.057	---	0.489
0.40	384	127.40	1.78 ic	0.47 ic	---	---	0.00	0.00	---	---	0.057	---	0.530
0.42	404	127.42	1.78 ic	0.51 ic	---	---	0.00	0.00	---	---	0.057	---	0.570
0.44	423	127.44	1.78 ic	0.55 ic	---	---	0.00	0.00	---	---	0.058	---	0.611
0.46	442	127.46	1.78 ic	0.59 ic	---	---	0.00	0.00	---	---	0.058	---	0.652
0.48	462	127.48	1.78 ic	0.64 ic	---	---	0.00	0.00	---	---	0.058	---	0.699
0.50	481	127.50	1.78 ic	0.68 ic	---	---	0.00	0.00	---	---	0.058	---	0.738
0.52	501	127.52	1.78 ic	0.72 ic	---	---	0.00	0.00	---	---	0.058	---	0.776
0.54	520	127.54	1.78 ic	0.76 ic	---	---	0.00	0.00	---	---	0.058	---	0.818
0.56	540	127.56	1.78 ic	0.80 ic	---	---	0.00	0.00	---	---	0.058	---	0.857
0.58	559	127.58	1.78 ic	0.84 ic	---	---	0.00	0.00	---	---	0.058	---	0.898
0.60	578	127.60	1.78 ic	0.88 ic	---	---	0.00	0.00	---	---	0.058	---	0.934
0.62	599	127.62	1.78 ic	0.91 ic	---	---	0.00	0.00	---	---	0.058	---	0.966

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Seepage Bed 1B

Stage / Storage / Discharge Table

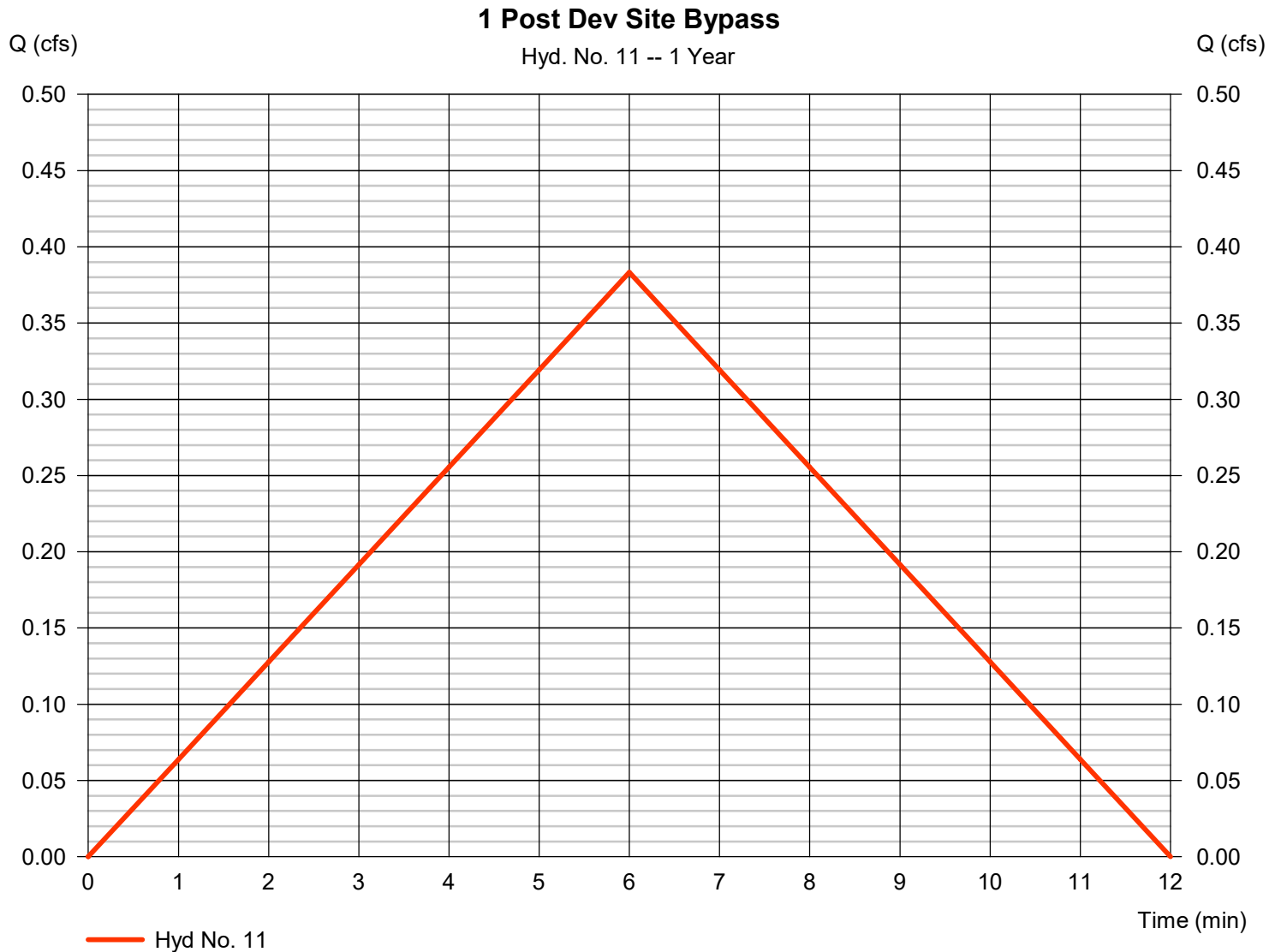
Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.64	619	127.64	1.78 ic	0.94 ic	---	---	0.00	0.00	---	---	0.058	---	0.997
0.66	639	127.66	1.78 ic	0.96 ic	---	---	0.00	0.00	---	---	0.058	---	1.023
0.68	659	127.68	1.78 ic	0.99 ic	---	---	0.00	0.00	---	---	0.059	---	1.048
0.70	679	127.70	1.78 ic	1.02 ic	---	---	0.00	0.00	---	---	0.059	---	1.076
0.72	699	127.72	1.78 ic	1.04 ic	---	---	0.00	0.00	---	---	0.059	---	1.104
0.74	719	127.74	1.78 ic	1.07 ic	---	---	0.00	0.00	---	---	0.059	---	1.131
0.76	739	127.76	1.78 ic	1.10 ic	---	---	0.00	0.00	---	---	0.059	---	1.157
0.78	759	127.78	1.78 ic	1.12 ic	---	---	0.00	0.00	---	---	0.059	---	1.182
0.80	780	127.80	1.78 ic	1.15 ic	---	---	0.00	0.00	---	---	0.059	---	1.207
0.82	800	127.82	1.78 ic	1.17 ic	---	---	0.00	0.00	---	---	0.059	---	1.232
0.84	820	127.84	1.78 ic	1.20 ic	---	---	0.00	0.00	---	---	0.059	---	1.255
0.86	841	127.86	1.78 ic	1.22 ic	---	---	0.00	0.00	---	---	0.059	---	1.279
0.88	861	127.88	1.78 ic	1.24 ic	---	---	0.00	0.00	---	---	0.059	---	1.302
0.90	881	127.90	1.78 ic	1.27 ic	---	---	0.00	0.00	---	---	0.060	---	1.325
0.92	902	127.92	1.78 ic	1.29 ic	---	---	0.00	0.00	---	---	0.060	---	1.347
0.94	922	127.94	1.78 ic	1.31 ic	---	---	0.00	0.00	---	---	0.060	---	1.369
0.96	942	127.96	1.78 ic	1.33 ic	---	---	0.00	0.00	---	---	0.060	---	1.390
0.98	962	127.98	1.78 ic	1.35 ic	---	---	0.00	0.00	---	---	0.060	---	1.411
1.00	983	128.00	1.78 ic	1.37 ic	---	---	0.00	0.00	---	---	0.060	---	1.432
1.02	1,003	128.02	1.78 ic	1.39 ic	---	---	0.00	0.00	---	---	0.060	---	1.453
1.04	1,023	128.04	1.78 ic	1.41 ic	---	---	0.00	0.00	---	---	0.060	---	1.473
1.06	1,044	128.06	1.78 ic	1.43 ic	---	---	0.00	0.00	---	---	0.060	---	1.493
1.08	1,064	128.08	1.78 ic	1.45 ic	---	---	0.00	0.00	---	---	0.060	---	1.513
1.10	1,084	128.10	1.78 ic	1.47 ic	---	---	0.00	0.00	---	---	0.060	---	1.532
1.12	1,105	128.12	1.78 ic	1.49 ic	---	---	0.00	0.00	---	---	0.061	---	1.551
1.14	1,125	128.14	1.78 ic	1.51 ic	---	---	0.00	0.00	---	---	0.061	---	1.570
1.16	1,145	128.16	1.78 ic	1.53 ic	---	---	0.00	0.00	---	---	0.061	---	1.589
1.18	1,166	128.18	1.78 ic	1.55 ic	---	---	0.00	0.00	---	---	0.061	---	1.607
1.20	1,186	128.20	1.78 ic	1.56 ic	---	---	0.00	0.00	---	---	0.061	---	1.625
1.22	1,206	128.22	1.78 ic	1.58 ic	---	---	0.00	0.00	---	---	0.061	---	1.643
1.24	1,226	128.24	1.78 ic	1.60 ic	---	---	0.00	0.00	---	---	0.061	---	1.661
1.26	1,246	128.26	1.78 ic	1.62 ic	---	---	0.00	0.00	---	---	0.061	---	1.679
1.28	1,267	128.28	1.78 ic	1.64 ic	---	---	0.00	0.00	---	---	0.061	---	1.696
1.30	1,287	128.30	1.78 ic	1.65 ic	---	---	0.00	0.00	---	---	0.061	---	1.714
1.32	1,307	128.32	1.78 ic	1.67 ic	---	---	0.00	0.00	---	---	0.061	---	1.731
1.34	1,327	128.34	1.78 ic	1.69 ic	---	---	0.00	0.00	---	---	0.062	---	1.748
1.36	1,347	128.36	1.78 ic	1.70 ic	---	---	0.00	0.00	---	---	0.062	---	1.764
1.38	1,367	128.38	1.78 ic	1.72 ic	---	---	0.00	0.00	---	---	0.062	---	1.781
1.40	1,387	128.40	1.78 ic	1.74 ic	---	---	0.00	0.00	---	---	0.062	---	1.797
1.42	1,407	128.42	1.78 ic	1.75 ic	---	---	0.00	0.00	---	---	0.062	---	1.814
1.44	1,426	128.44	1.78 ic	1.77 ic	---	---	0.00	0.00	---	---	0.062	---	1.830
1.46	1,445	128.46	1.78 ic	1.78 ic	---	---	0.00	0.00	---	---	0.062	---	1.846
1.48	1,465	128.48	1.84 ic	1.80 ic	---	---	0.00	0.00	---	---	0.062	---	1.862
1.50	1,484	128.50	1.84 ic	1.82 ic	---	---	0.00	0.00	---	---	0.062	---	1.877
1.52	1,504	128.52	1.84 ic	1.83 ic	---	---	0.00	0.00	---	---	0.062	---	1.893
1.54	1,523	128.54	1.85 ic	1.85 ic	---	---	0.00	0.00	---	---	0.062	---	1.908
1.56	1,543	128.56	1.90 ic	1.86 ic	---	---	0.00	0.00	---	---	0.062	---	1.924
1.58	1,562	128.58	1.90 ic	1.88 ic	---	---	0.00	0.00	---	---	0.063	---	1.939
1.60	1,582	128.60	1.90 ic	1.89 ic	---	---	0.00	0.00	---	---	0.063	---	1.954
1.62	1,601	128.62	1.91 ic	1.91 ic	---	---	0.00	0.00	---	---	0.063	---	1.969
1.64	1,620	128.64	1.97 ic	1.92 ic	---	---	0.00	0.00	---	---	0.063	---	1.984
1.66	1,639	128.66	1.97 ic	1.94 ic	---	---	0.00	0.00	---	---	0.063	---	1.999
1.68	1,658	128.68	1.97 ic	1.95 ic	---	---	0.00	0.00	---	---	0.063	---	2.013
1.70	1,678	128.70	1.97 ic	1.96 ic	---	---	0.00	0.00	---	---	0.063	---	2.028
1.72	1,697	128.72	1.98 ic	1.98 ic	---	---	0.00	0.00	---	---	0.063	---	2.042
1.74	1,716	128.74	2.03 ic	1.99 ic	---	---	0.00	0.00	---	---	0.063	---	2.056
1.76	1,735	128.76	2.03 ic	2.01 ic	---	---	0.00	0.00	---	---	0.063	---	2.071
1.78	1,754	128.78	2.03 ic	2.02 ic	---	---	0.00	0.00	---	---	0.063	---	2.085
1.80	1,774	128.80	2.04 ic	2.04 ic	---	---	0.00	0.00	---	---	0.064	---	2.099
1.82	1,793	128.82	2.10 ic	2.05 ic	---	---	0.00	0.00	---	---	0.064	---	2.113
1.84	1,812	128.84	2.10 ic	2.06 ic	---	---	0.00	0.00	---	---	0.064	---	2.127
1.86	1,831	128.86	2.10 ic	2.08 ic	---	---	0.00	0.00	---	---	0.064	---	2.140
1.88	1,850	128.88	2.10 ic	2.09 ic	---	---	0.00	0.00	---	---	0.064	---	2.154
1.90	1,870	128.90	2.10 ic	2.10 ic	---	---	0.00	0.00	---	---	0.064	---	2.167
1.92	1,889	128.92	2.16 ic	2.12 ic	---	---	0.00	0.00	---	---	0.064	---	2.181
1.94	1,908	128.94	2.16 ic	2.13 ic	---	---	0.00	0.00	---	---	0.064	---	2.194
1.96	1,927	128.96	2.16 ic	2.14 ic	---	---	0.00	0.00	---	---	0.064	---	2.208
1.98	1,946	128.98	2.16 ic	2.16 ic	---	---	0.00	0.00	---	---	0.064	---	2.221
2.00	1,966	129.00	2.17 ic	2.17 ic	---	---	0.00	0.00	---	---	0.064	---	2.234

...End

Hyd. No. 11

1 Post Dev Site Bypass

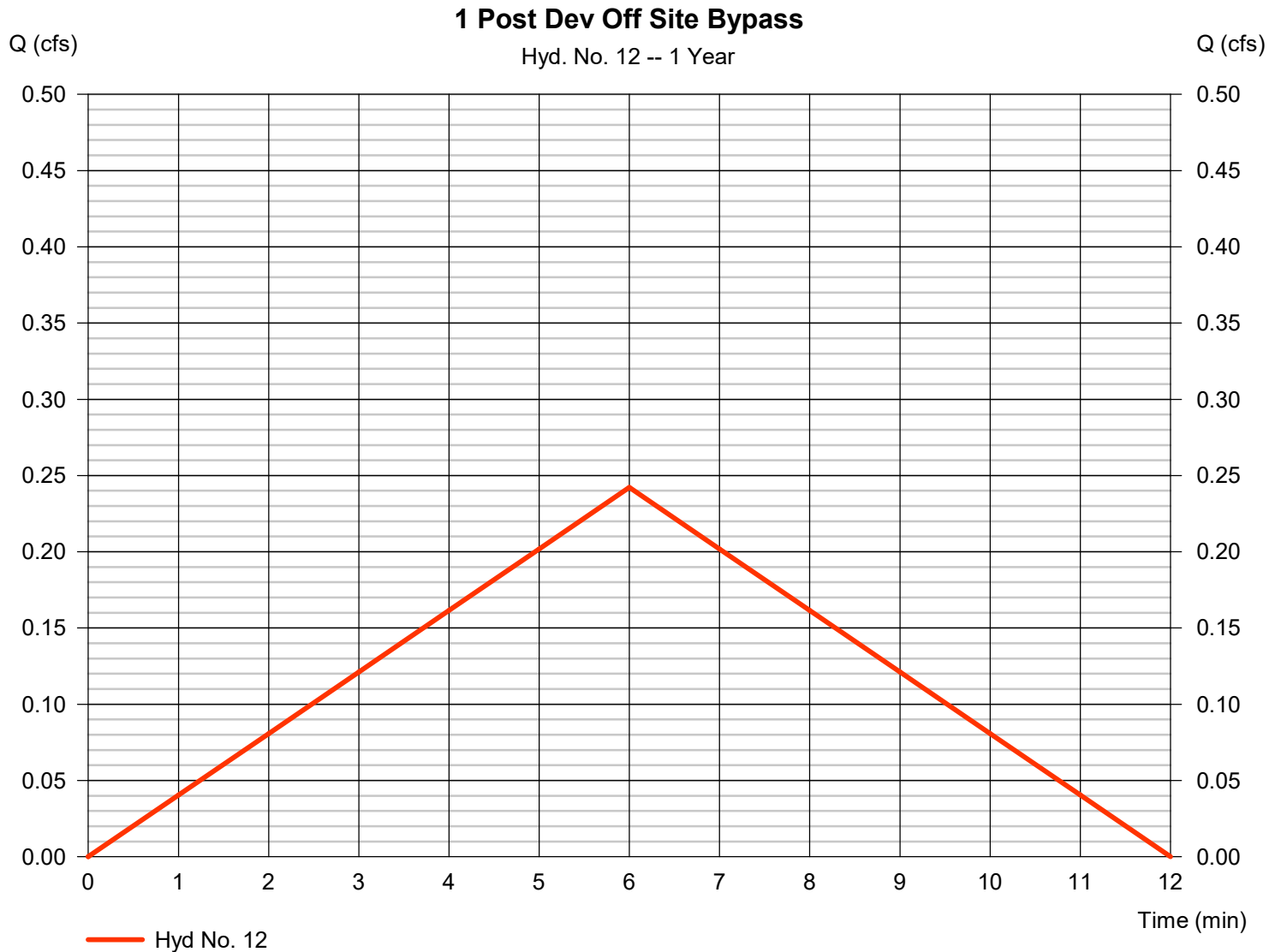
Hydrograph type	= Mod. Rational	Peak discharge	= 0.383 cfs
Storm frequency	= 1 yrs	Time to peak	= 6 min
Time interval	= 1 min	Hyd. volume	= 138 cuft
Drainage area	= 0.160 ac	Runoff coeff.	= 0.62
Intensity	= 3.863 in/hr	Tc by User	= 6.00 min
IDF Curve	= PA-Doylestown.IDF	Storm duration	= 1.0 x Tc
Target Q	=n/a	Est. Req'd Storage	=n/a



Hyd. No. 12

1 Post Dev Off Site Bypass

Hydrograph type	= Mod. Rational	Peak discharge	= 0.242 cfs
Storm frequency	= 1 yrs	Time to peak	= 6 min
Time interval	= 1 min	Hyd. volume	= 87 cuft
Drainage area	= 0.110 ac	Runoff coeff.	= 0.57
Intensity	= 3.863 in/hr	Tc by User	= 6.00 min
IDF Curve	= PA-Doylestown.IDF	Storm duration	= 1.0 x Tc
Target Q	=n/a	Est. Req'd Storage	=n/a

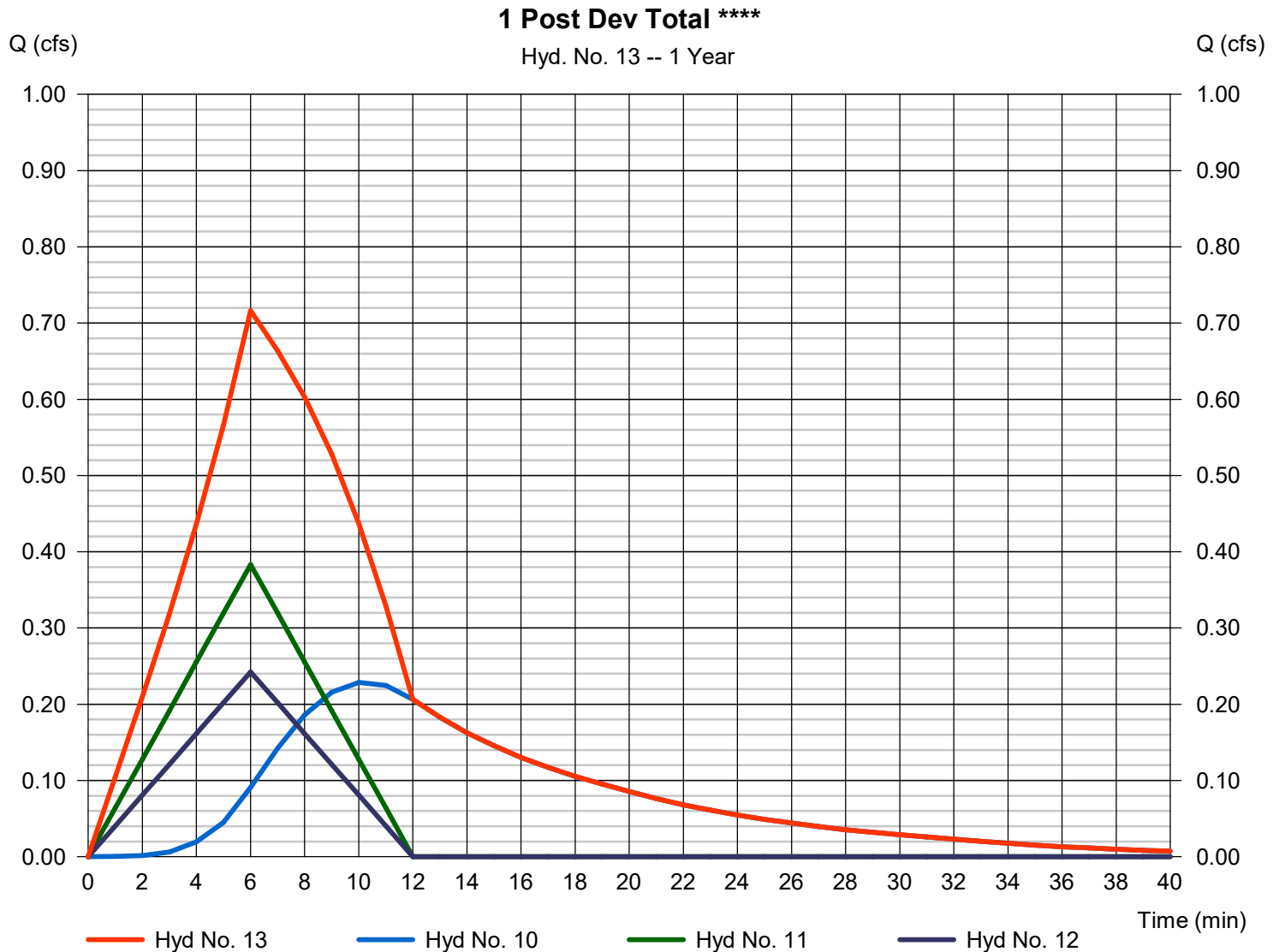


Hydrograph Report

Hyd. No. 13

1 Post Dev Total ****

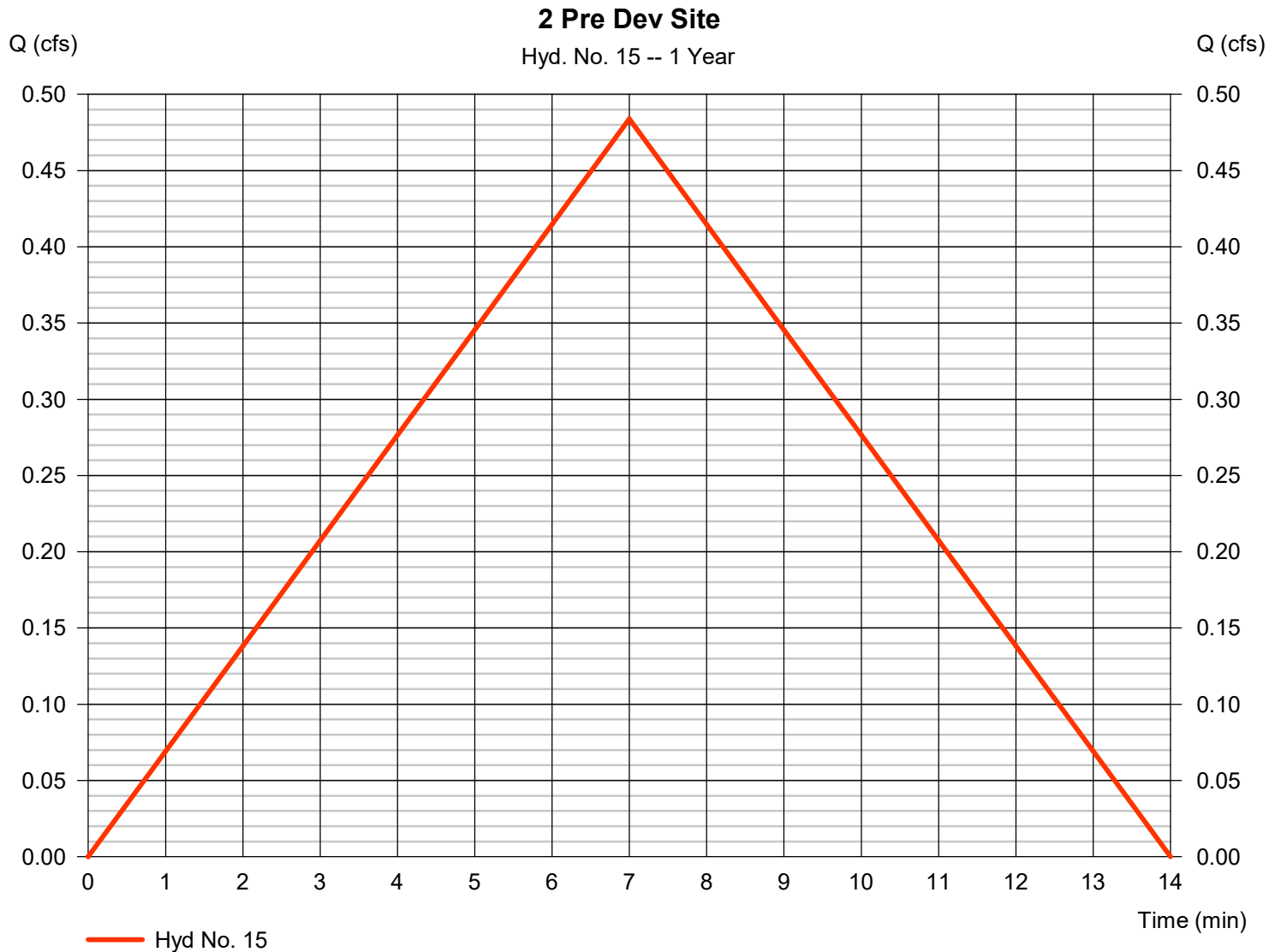
Hydrograph type	= Combine	Peak discharge	= 0.716 cfs
Storm frequency	= 1 yrs	Time to peak	= 6 min
Time interval	= 1 min	Hyd. volume	= 409 cuft
Inflow hyds.	= 10, 11, 12	Contrib. drain. area	= 0.270 ac



Hyd. No. 15

2 Pre Dev Site

Hydrograph type	= Mod. Rational	Peak discharge	= 0.484 cfs
Storm frequency	= 1 yrs	Time to peak	= 7 min
Time interval	= 1 min	Hyd. volume	= 203 cuft
Drainage area	= 0.410 ac	Runoff coeff.	= 0.32
Intensity	= 3.688 in/hr	Tc by User	= 7.00 min
IDF Curve	= PA-Doylestown.IDF	Storm duration	= 1.0 x Tc
Target Q	=n/a	Est. Req'd Storage	=n/a



Hyd. No. 16

2 Pre Dev Off Site

Hydrograph type	= Mod. Rational	Peak discharge	= 2.523 cfs
Storm frequency	= 1 yrs	Time to peak	= 7 min
Time interval	= 1 min	Hyd. volume	= 1,060 cuft
Drainage area	= 1.520 ac	Runoff coeff.	= 0.45
Intensity	= 3.688 in/hr	Tc by User	= 7.00 min
IDF Curve	= PA-Doylestown.IDF	Storm duration	= 1.0 x Tc
Target Q	=n/a	Est. Req'd Storage	=n/a

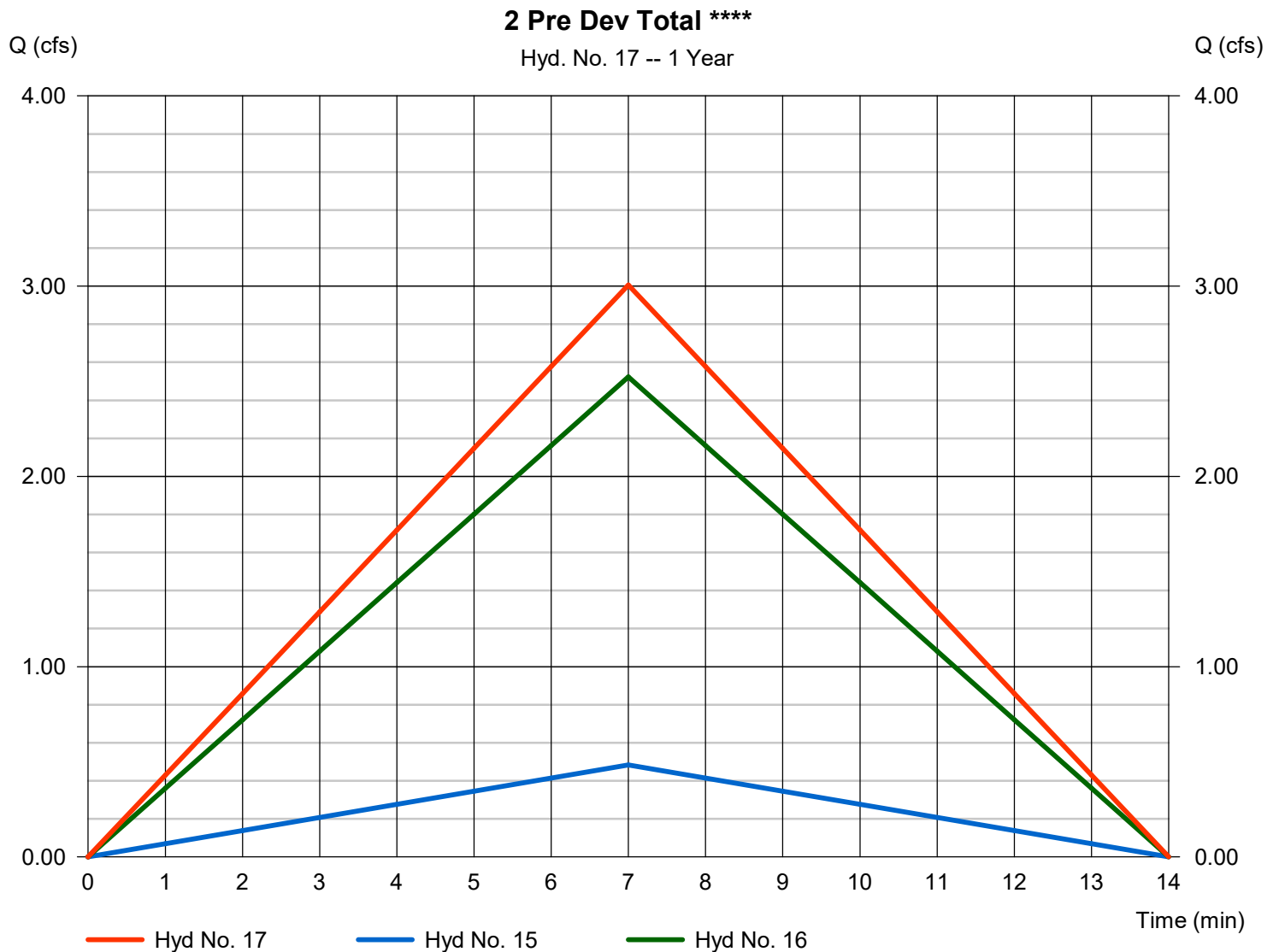


Hyd. No. 17

2 Pre Dev Total ****

Hydrograph type = Combine
Storm frequency = 1 yrs
Time interval = 1 min
Inflow hyds. = 15, 16

Peak discharge = 3.007 cfs
Time to peak = 7 min
Hyd. volume = 1,263 cuft
Contrib. drain. area = 1.930 ac



Hyd. No. 18

2 Post Dev Site

Hydrograph type	= Mod. Rational	Peak discharge	= 0.289 cfs
Storm frequency	= 1 yrs	Time to peak	= 6 min
Time interval	= 1 min	Hyd. volume	= 104 cuft
Drainage area	= 0.090 ac	Runoff coeff.	= 0.83
Intensity	= 3.863 in/hr	Tc by User	= 6.00 min
IDF Curve	= PA-Doylestown.IDF	Storm duration	= 1.0 x Tc
Target Q	=n/a	Est. Req'd Storage	=n/a



Hydrograph Report

Hyd. No. 19

2 Post Dev Off Site

Hydrograph type	= Mod. Rational	Peak discharge	= 0.025 cfs
Storm frequency	= 1 yrs	Time to peak	= 6 min
Time interval	= 1 min	Hyd. volume	= 9 cuft
Drainage area	= 0.060 ac	Runoff coeff.	= 0.11
Intensity	= 3.863 in/hr	Tc by User	= 6.00 min
IDF Curve	= PA-Doylestown.IDF	Storm duration	= 1.0 x Tc
Target Q	=n/a	Est. Req'd Storage	=n/a



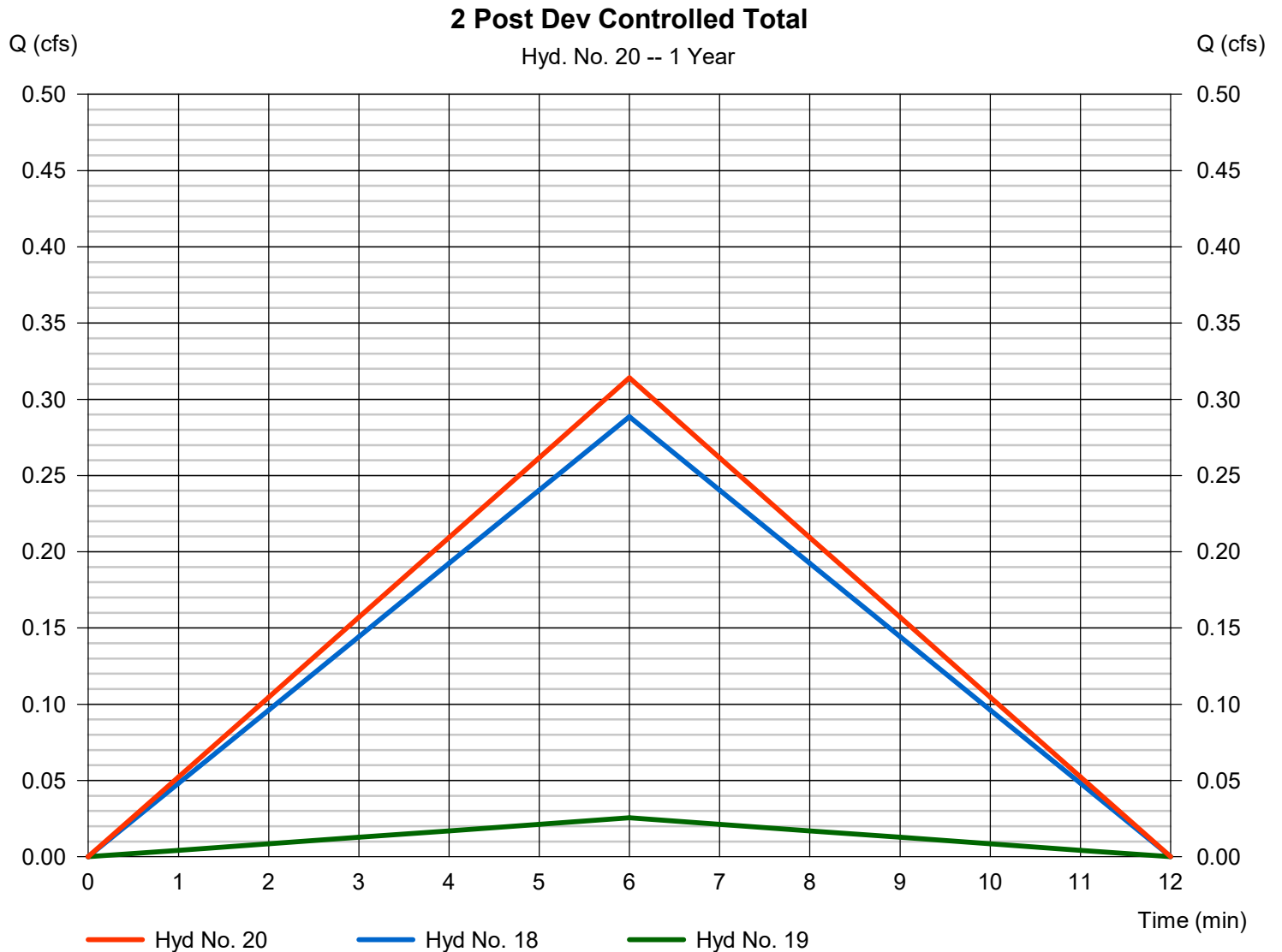
Hydrograph Report

Hyd. No. 20

2 Post Dev Controlled Total

Hydrograph type = Combine
Storm frequency = 1 yrs
Time interval = 1 min
Inflow hyds. = 18, 19

Peak discharge = 0.314 cfs
Time to peak = 6 min
Hyd. volume = 113 cuft
Contrib. drain. area = 0.150 ac

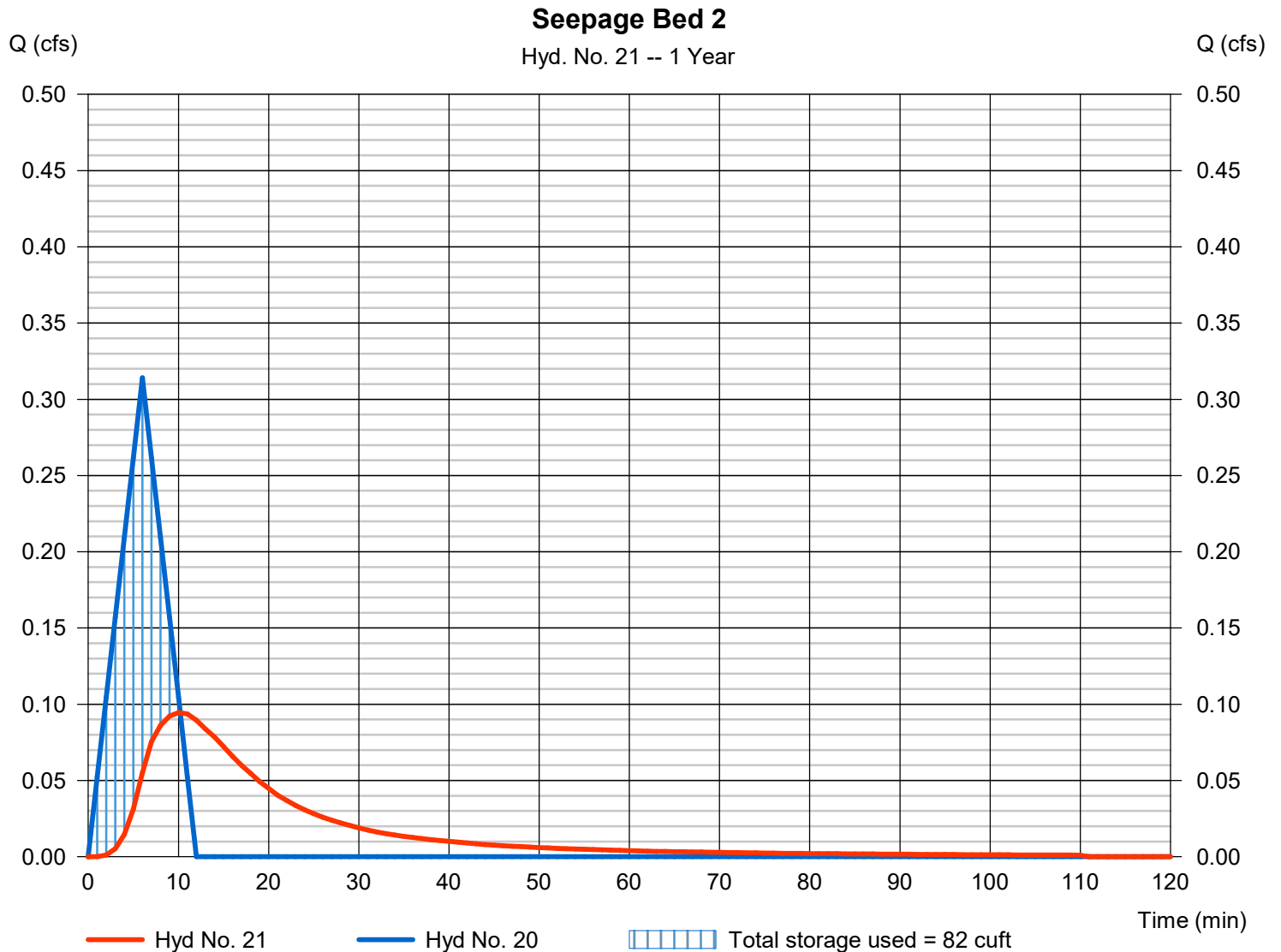


Hyd. No. 21

Seepage Bed 2

Hydrograph type	= Reservoir	Peak discharge	= 0.095 cfs
Storm frequency	= 1 yrs	Time to peak	= 10 min
Time interval	= 1 min	Hyd. volume	= 107 cuft
Inflow hyd. No.	= 20 - 2 Post Dev Controlled Total	Max. Elevation	= 108.29 ft
Reservoir name	= Seepage Bed 2	Max. Storage	= 82 cuft

Storage Indication method used.



Pond Report

Pond No. 3 - Seepage Bed 2

Pond Data

UG Chambers -Invert elev. = 108.25 ft, Rise x Span = 0.50 x 0.50 ft, Barrel Len = 30.00 ft, No. Barrels = 1, Slope = 0.00%, Headers = No
Encasement -Invert elev. = 108.00 ft, Width = 24.00 ft, Height = 1.00 ft, Voids = 40.00%

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	108.00	n/a	0	0
0.10	108.10	n/a	29	29
0.20	108.20	n/a	29	58
0.30	108.30	n/a	29	87
0.40	108.40	n/a	30	116
0.50	108.50	n/a	30	146
0.60	108.60	n/a	30	175
0.70	108.70	n/a	30	205
0.80	108.80	n/a	29	234
0.90	108.90	n/a	29	263
1.00	109.00	n/a	29	292

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 18.00	3.00	0.00	0.00
Span (in)	= 18.00	3.00	0.00	0.00
No. Barrels	= 1	1	0	0
Invert El. (ft)	= 106.50	108.00	0.00	0.00
Length (ft)	= 42.00	0.50	0.00	0.00
Slope (%)	= 22.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	Yes	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 3.14	Inactive	Inactive	Inactive
Crest El. (ft)	= 109.00	0.00	0.00	0.00
Weir Coeff.	= 3.32	3.32	3.33	3.33
Weir Type	= Broad	Broad	---	---
Multi-Stage	= Yes	No	No	No
Exfil.(in/hr)	= 0.000 (by Wet area)			
TW Elev. (ft)	= 0.00			

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

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	108.00	0.00	0.00	---	---	0.00	0.00	---	---	---	---	0.000
0.01	3	108.01	7.37 ic	0.00 ic	---	---	0.00	0.00	---	---	---	---	0.000
0.02	6	108.02	7.37 ic	0.00 ic	---	---	0.00	0.00	---	---	---	---	0.001
0.03	9	108.03	7.37 ic	0.00 ic	---	---	0.00	0.00	---	---	---	---	0.002
0.04	12	108.04	7.37 ic	0.00 ic	---	---	0.00	0.00	---	---	---	---	0.004
0.05	14	108.05	7.37 ic	0.01 ic	---	---	0.00	0.00	---	---	---	---	0.006
0.06	17	108.06	7.37 ic	0.01 ic	---	---	0.00	0.00	---	---	---	---	0.008
0.07	20	108.07	7.37 ic	0.01 ic	---	---	0.00	0.00	---	---	---	---	0.010
0.08	23	108.08	7.37 ic	0.01 ic	---	---	0.00	0.00	---	---	---	---	0.013
0.09	26	108.09	7.37 ic	0.02 ic	---	---	0.00	0.00	---	---	---	---	0.016
0.10	29	108.10	7.37 ic	0.02 ic	---	---	0.00	0.00	---	---	---	---	0.020
0.11	32	108.11	7.37 ic	0.02 ic	---	---	0.00	0.00	---	---	---	---	0.024
0.12	35	108.12	7.37 ic	0.03 ic	---	---	0.00	0.00	---	---	---	---	0.028
0.13	37	108.13	7.37 ic	0.03 ic	---	---	0.00	0.00	---	---	---	---	0.032
0.14	40	108.14	7.37 ic	0.04 ic	---	---	0.00	0.00	---	---	---	---	0.036
0.15	43	108.15	7.37 ic	0.04 ic	---	---	0.00	0.00	---	---	---	---	0.041
0.16	46	108.16	7.37 ic	0.05 ic	---	---	0.00	0.00	---	---	---	---	0.046
0.17	49	108.17	7.37 ic	0.05 ic	---	---	0.00	0.00	---	---	---	---	0.050
0.18	52	108.18	7.37 ic	0.06 ic	---	---	0.00	0.00	---	---	---	---	0.055
0.19	55	108.19	7.37 ic	0.06 ic	---	---	0.00	0.00	---	---	---	---	0.060
0.20	58	108.20	7.37 ic	0.06 ic	---	---	0.00	0.00	---	---	---	---	0.064
0.21	61	108.21	7.37 ic	0.07 ic	---	---	0.00	0.00	---	---	---	---	0.069
0.22	63	108.22	7.37 ic	0.07 ic	---	---	0.00	0.00	---	---	---	---	0.073
0.23	66	108.23	7.37 ic	0.08 ic	---	---	0.00	0.00	---	---	---	---	0.077
0.24	69	108.24	7.37 ic	0.08 ic	---	---	0.00	0.00	---	---	---	---	0.081
0.25	72	108.25	7.37 ic	0.08 ic	---	---	0.00	0.00	---	---	---	---	0.084
0.26	75	108.26	7.37 ic	0.09 ic	---	---	0.00	0.00	---	---	---	---	0.087
0.27	78	108.27	7.37 ic	0.09 ic	---	---	0.00	0.00	---	---	---	---	0.090
0.28	81	108.28	7.37 ic	0.09 ic	---	---	0.00	0.00	---	---	---	---	0.093
0.29	84	108.29	7.37 ic	0.10 ic	---	---	0.00	0.00	---	---	---	---	0.096
0.30	87	108.30	7.37 ic	0.10 ic	---	---	0.00	0.00	---	---	---	---	0.099
0.31	90	108.31	7.37 ic	0.10 ic	---	---	0.00	0.00	---	---	---	---	0.102

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Seepage Bed 2

Stage / Storage / Discharge Table

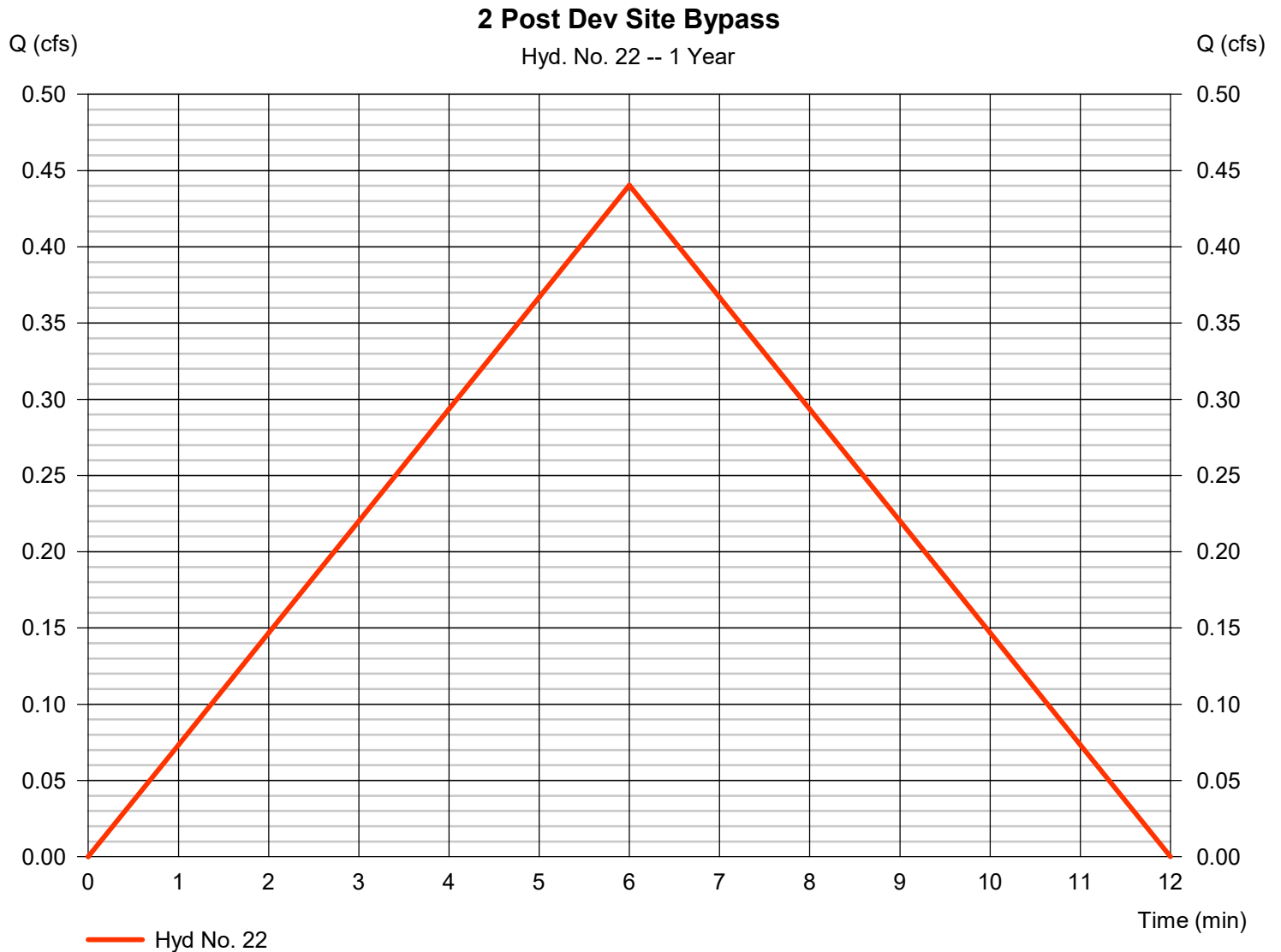
Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.32	93	108.32	7.37 ic	0.10 ic	---	---	0.00	0.00	---	---	---	---	0.104
0.33	95	108.33	7.37 ic	0.11 ic	---	---	0.00	0.00	---	---	---	---	0.107
0.34	98	108.34	7.37 ic	0.11 ic	---	---	0.00	0.00	---	---	---	---	0.110
0.35	101	108.35	7.37 ic	0.11 ic	---	---	0.00	0.00	---	---	---	---	0.112
0.36	104	108.36	7.37 ic	0.11 ic	---	---	0.00	0.00	---	---	---	---	0.115
0.37	107	108.37	7.37 ic	0.12 ic	---	---	0.00	0.00	---	---	---	---	0.117
0.38	110	108.38	7.37 ic	0.12 ic	---	---	0.00	0.00	---	---	---	---	0.119
0.39	113	108.39	7.37 ic	0.12 ic	---	---	0.00	0.00	---	---	---	---	0.122
0.40	116	108.40	7.37 ic	0.12 ic	---	---	0.00	0.00	---	---	---	---	0.124
0.41	119	108.41	7.37 ic	0.13 ic	---	---	0.00	0.00	---	---	---	---	0.126
0.42	122	108.42	7.37 ic	0.13 ic	---	---	0.00	0.00	---	---	---	---	0.128
0.43	125	108.43	7.37 ic	0.13 ic	---	---	0.00	0.00	---	---	---	---	0.131
0.44	128	108.44	7.37 ic	0.13 ic	---	---	0.00	0.00	---	---	---	---	0.133
0.45	131	108.45	7.37 ic	0.13 ic	---	---	0.00	0.00	---	---	---	---	0.135
0.46	134	108.46	7.37 ic	0.14 ic	---	---	0.00	0.00	---	---	---	---	0.137
0.47	137	108.47	7.37 ic	0.14 ic	---	---	0.00	0.00	---	---	---	---	0.139
0.48	140	108.48	7.37 ic	0.14 ic	---	---	0.00	0.00	---	---	---	---	0.141
0.49	143	108.49	7.37 ic	0.14 ic	---	---	0.00	0.00	---	---	---	---	0.143
0.50	146	108.50	7.37 ic	0.14 ic	---	---	0.00	0.00	---	---	---	---	0.145
0.51	149	108.51	7.37 ic	0.15 ic	---	---	0.00	0.00	---	---	---	---	0.147
0.52	152	108.52	7.37 ic	0.15 ic	---	---	0.00	0.00	---	---	---	---	0.149
0.53	155	108.53	7.37 ic	0.15 ic	---	---	0.00	0.00	---	---	---	---	0.150
0.54	158	108.54	7.37 ic	0.15 ic	---	---	0.00	0.00	---	---	---	---	0.152
0.55	161	108.55	7.37 ic	0.15 ic	---	---	0.00	0.00	---	---	---	---	0.154
0.56	164	108.56	7.37 ic	0.16 ic	---	---	0.00	0.00	---	---	---	---	0.156
0.57	167	108.57	7.37 ic	0.16 ic	---	---	0.00	0.00	---	---	---	---	0.158
0.58	170	108.58	7.37 ic	0.16 ic	---	---	0.00	0.00	---	---	---	---	0.159
0.59	173	108.59	7.37 ic	0.16 ic	---	---	0.00	0.00	---	---	---	---	0.161
0.60	175	108.60	7.37 ic	0.16 ic	---	---	0.00	0.00	---	---	---	---	0.163
0.61	178	108.61	7.37 ic	0.16 ic	---	---	0.00	0.00	---	---	---	---	0.165
0.62	181	108.62	7.37 ic	0.17 ic	---	---	0.00	0.00	---	---	---	---	0.166
0.63	184	108.63	7.37 ic	0.17 ic	---	---	0.00	0.00	---	---	---	---	0.168
0.64	187	108.64	7.37 ic	0.17 ic	---	---	0.00	0.00	---	---	---	---	0.170
0.65	190	108.65	7.37 ic	0.17 ic	---	---	0.00	0.00	---	---	---	---	0.171
0.66	193	108.66	7.37 ic	0.17 ic	---	---	0.00	0.00	---	---	---	---	0.173
0.67	196	108.67	7.37 ic	0.17 ic	---	---	0.00	0.00	---	---	---	---	0.174
0.68	199	108.68	7.37 ic	0.18 ic	---	---	0.00	0.00	---	---	---	---	0.176
0.69	202	108.69	7.37 ic	0.18 ic	---	---	0.00	0.00	---	---	---	---	0.178
0.70	205	108.70	7.37 ic	0.18 ic	---	---	0.00	0.00	---	---	---	---	0.179
0.71	208	108.71	7.37 ic	0.18 ic	---	---	0.00	0.00	---	---	---	---	0.181
0.72	211	108.72	7.37 ic	0.18 ic	---	---	0.00	0.00	---	---	---	---	0.182
0.73	214	108.73	7.37 ic	0.18 ic	---	---	0.00	0.00	---	---	---	---	0.184
0.74	217	108.74	7.37 ic	0.19 ic	---	---	0.00	0.00	---	---	---	---	0.185
0.75	219	108.75	7.37 ic	0.19 ic	---	---	0.00	0.00	---	---	---	---	0.187
0.76	222	108.76	7.37 ic	0.19 ic	---	---	0.00	0.00	---	---	---	---	0.188
0.77	225	108.77	7.37 ic	0.19 ic	---	---	0.00	0.00	---	---	---	---	0.190
0.78	228	108.78	7.37 ic	0.19 ic	---	---	0.00	0.00	---	---	---	---	0.191
0.79	231	108.79	7.37 ic	0.19 ic	---	---	0.00	0.00	---	---	---	---	0.193
0.80	234	108.80	7.37 ic	0.19 ic	---	---	0.00	0.00	---	---	---	---	0.194
0.81	237	108.81	7.37 ic	0.20 ic	---	---	0.00	0.00	---	---	---	---	0.196
0.82	240	108.82	7.37 ic	0.20 ic	---	---	0.00	0.00	---	---	---	---	0.197
0.83	243	108.83	7.37 ic	0.20 ic	---	---	0.00	0.00	---	---	---	---	0.198
0.84	246	108.84	7.37 ic	0.20 ic	---	---	0.00	0.00	---	---	---	---	0.200
0.85	248	108.85	7.37 ic	0.20 ic	---	---	0.00	0.00	---	---	---	---	0.201
0.86	251	108.86	7.37 ic	0.20 ic	---	---	0.00	0.00	---	---	---	---	0.203
0.87	254	108.87	7.37 ic	0.20 ic	---	---	0.00	0.00	---	---	---	---	0.204
0.88	257	108.88	7.37 ic	0.21 ic	---	---	0.00	0.00	---	---	---	---	0.205
0.89	260	108.89	7.37 ic	0.21 ic	---	---	0.00	0.00	---	---	---	---	0.207
0.90	263	108.90	7.37 ic	0.21 ic	---	---	0.00	0.00	---	---	---	---	0.208
0.91	266	108.91	7.37 ic	0.21 ic	---	---	0.00	0.00	---	---	---	---	0.209
0.92	269	108.92	7.37 ic	0.21 ic	---	---	0.00	0.00	---	---	---	---	0.211
0.93	271	108.93	7.37 ic	0.21 ic	---	---	0.00	0.00	---	---	---	---	0.212
0.94	274	108.94	7.37 ic	0.21 ic	---	---	0.00	0.00	---	---	---	---	0.213
0.95	277	108.95	7.37 ic	0.21 ic	---	---	0.00	0.00	---	---	---	---	0.215
0.96	280	108.96	7.37 ic	0.22 ic	---	---	0.00	0.00	---	---	---	---	0.216
0.97	283	108.97	7.37 ic	0.22 ic	---	---	0.00	0.00	---	---	---	---	0.217
0.98	286	108.98	7.37 ic	0.22 ic	---	---	0.00	0.00	---	---	---	---	0.219
0.99	289	108.99	7.37 ic	0.22 ic	---	---	0.00	0.00	---	---	---	---	0.220
1.00	292	109.00	7.37 ic	0.22 ic	---	---	0.00	0.00	---	---	---	---	0.221

...End

Hyd. No. 22

2 Post Dev Site Bypass

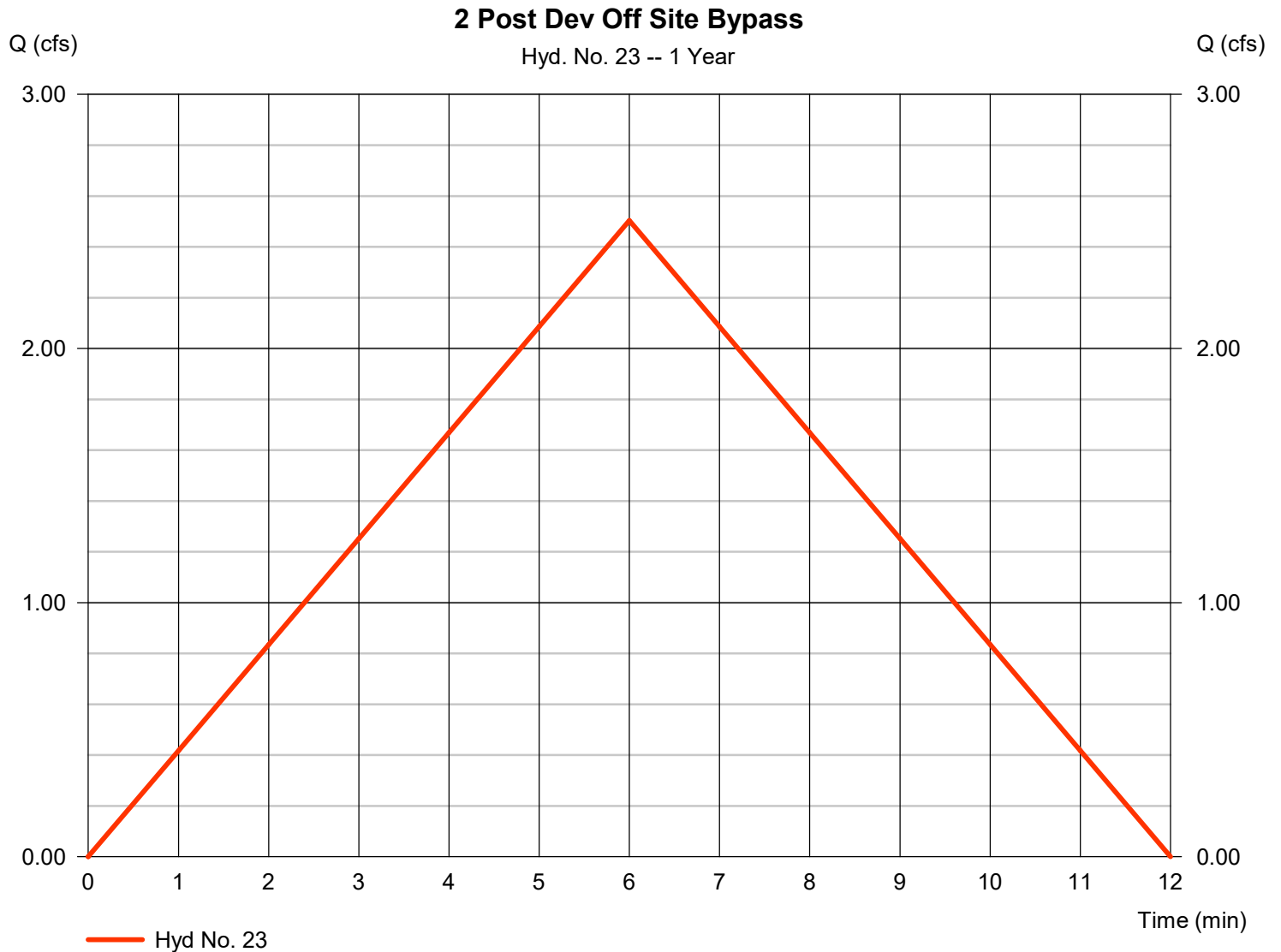
Hydrograph type	= Mod. Rational	Peak discharge	= 0.440 cfs
Storm frequency	= 1 yrs	Time to peak	= 6 min
Time interval	= 1 min	Hyd. volume	= 159 cuft
Drainage area	= 0.200 ac	Runoff coeff.	= 0.57
Intensity	= 3.863 in/hr	Tc by User	= 6.00 min
IDF Curve	= PA-Doylestown.IDF	Storm duration	= 1.0 x Tc
Target Q	=n/a	Est. Req'd Storage	=n/a



Hyd. No. 23

2 Post Dev Off Site Bypass

Hydrograph type	= Mod. Rational	Peak discharge	= 2.503 cfs
Storm frequency	= 1 yrs	Time to peak	= 6 min
Time interval	= 1 min	Hyd. volume	= 901 cuft
Drainage area	= 1.350 ac	Runoff coeff.	= 0.48
Intensity	= 3.863 in/hr	Tc by User	= 6.00 min
IDF Curve	= PA-Doylestown.IDF	Storm duration	= 1.0 x Tc
Target Q	=n/a	Est. Req'd Storage	=n/a



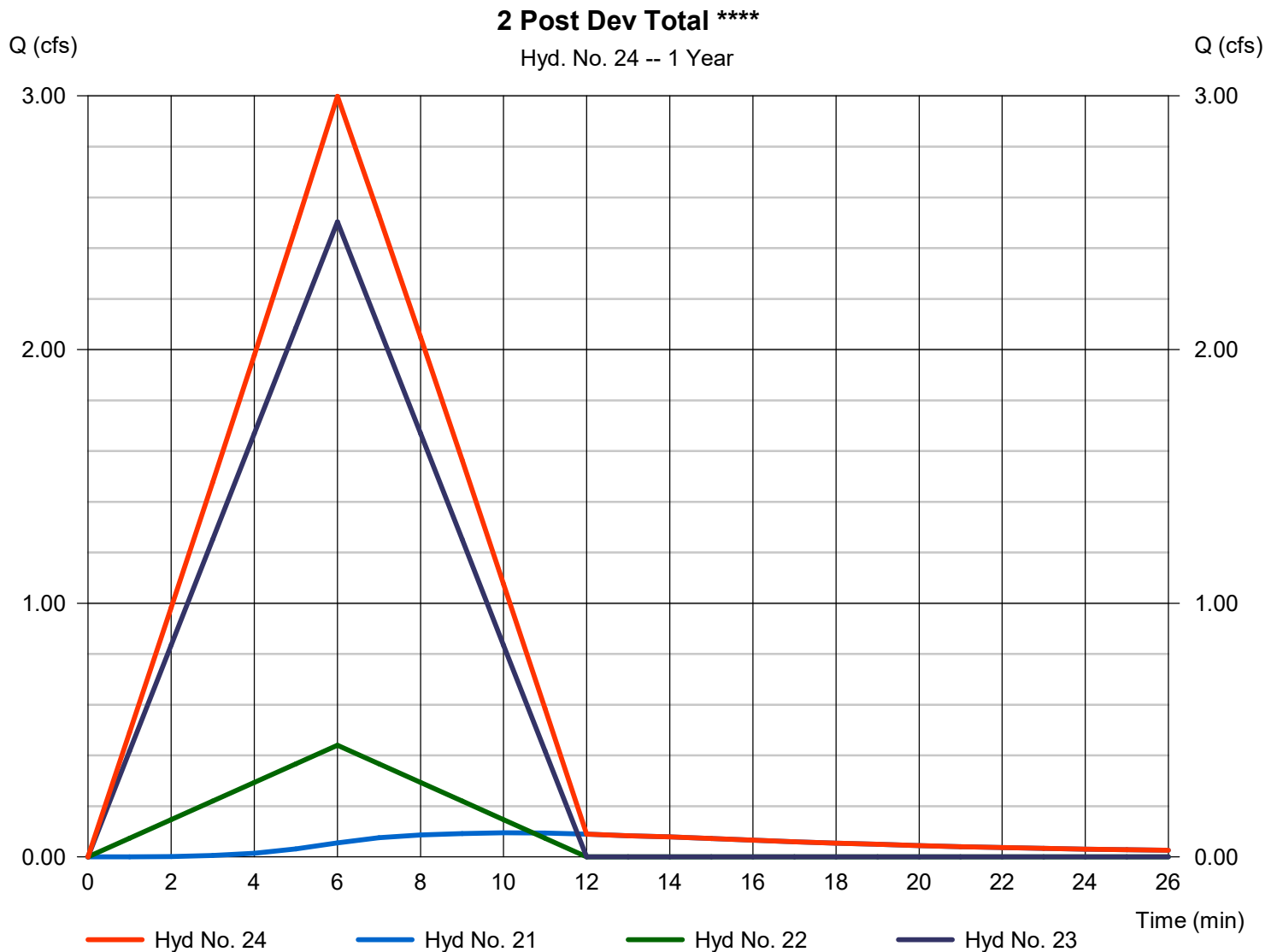
Hydrograph Report

Hyd. No. 24

2 Post Dev Total ****

Hydrograph type = Combine
Storm frequency = 1 yrs
Time interval = 1 min
Inflow hyds. = 21, 22, 23

Peak discharge = 2.999 cfs
Time to peak = 6 min
Hyd. volume = 1,167 cuft
Contrib. drain. area = 1.550 ac



Hydrograph Summary Report

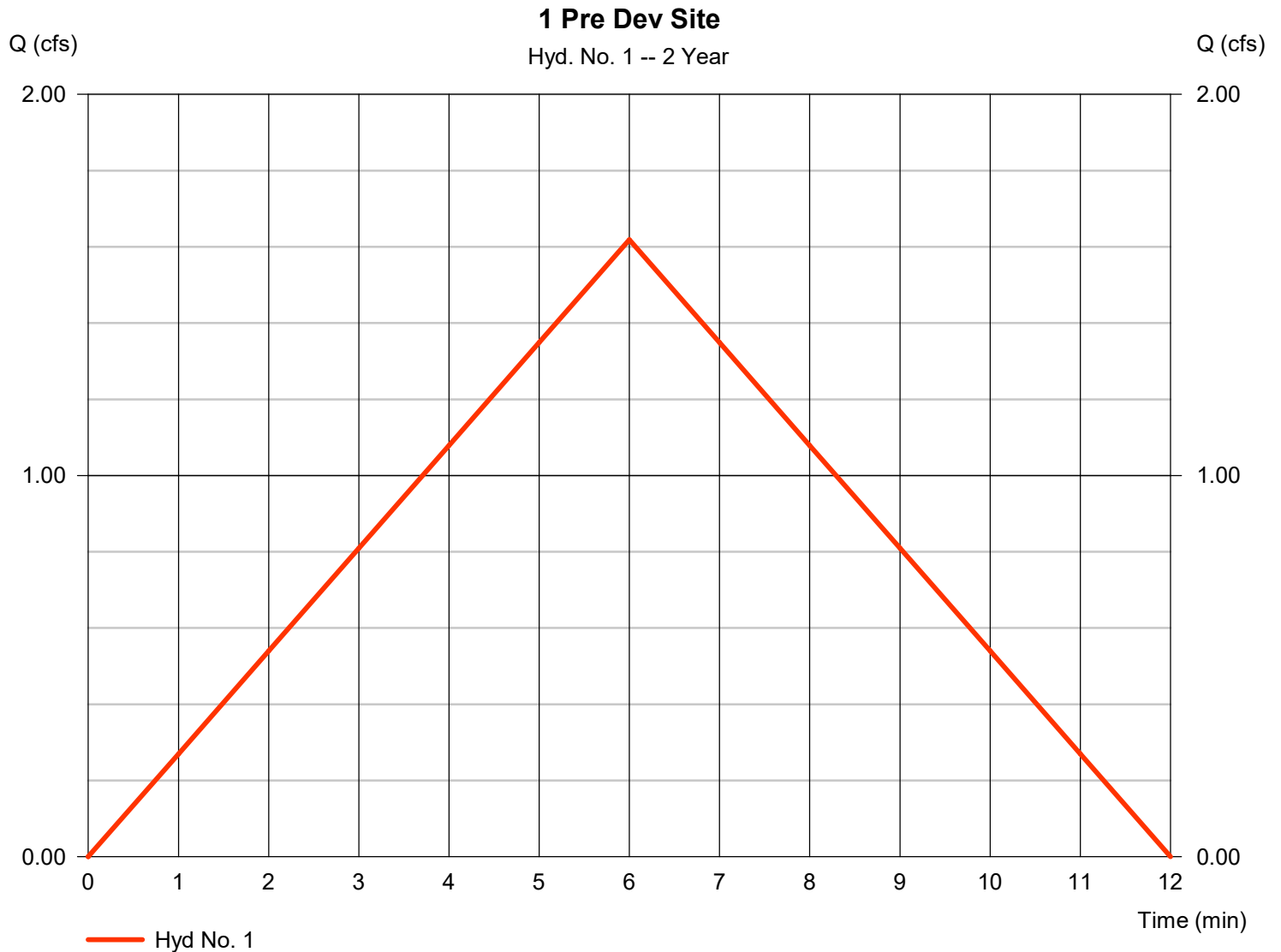
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

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	Mod. Rational	1.619	1	6	583	----	----	----	1 Pre Dev Site	
2	Mod. Rational	1.722	1	6	620	----	----	----	1 Pre Dev Off Site	
3	Combine	3.341	1	6	1,203	1, 2	----	----	1 Pre Dev Total ****	
4	Mod. Rational	1.475	1	6	531	----	----	----	1A Post Dev Site	
5	Mod. Rational	1.584	1	6	570	----	----	----	1A Post Dev Off Site	
6	Combine	3.059	1	6	1,101	4, 5	----	----	1A Post Dev Controlled Total	
7	Reservoir	0.000	1	86	0	6	126.92	1,090	Seepage Bed 1A	
8	Mod. Rational	1.165	1	6	420	----	----	----	1B Post Dev Site	
9	Combine	1.165	1	6	420	7, 8	----	----	1B Post Dev Controlled Total	
10	Reservoir	0.307	1	10	242	9	127.31	299	Seepage Bed 1B	
11	Mod. Rational	0.456	1	6	164	----	----	----	1 Post Dev Site Bypass	
12	Mod. Rational	0.288	1	6	104	----	----	----	1 Post Dev Off Site Bypass	
13	Combine	0.868	1	6	510	10, 11, 12	----	----	1 Post Dev Total ****	
15	Mod. Rational	0.576	1	7	242	----	----	----	2 Pre Dev Site	
16	Mod. Rational	3.001	1	7	1,260	----	----	----	2 Pre Dev Off Site	
17	Combine	3.577	1	7	1,502	15, 16	----	----	2 Pre Dev Total ****	
18	Mod. Rational	0.343	1	6	123	----	----	----	2 Post Dev Site	
19	Mod. Rational	0.030	1	6	11	----	----	----	2 Post Dev Off Site	
20	Combine	0.373	1	6	134	18, 19	----	----	2 Post Dev Controlled Total	
21	Reservoir	0.109	1	10	128	20	108.34	97.6	Seepage Bed 2	
22	Mod. Rational	0.523	1	6	188	----	----	----	2 Post Dev Site Bypass	
23	Mod. Rational	2.976	1	6	1,071	----	----	----	2 Post Dev Off Site Bypass	
24	Combine	3.569	1	6	1,388	21, 22, 23	----	----	2 Post Dev Total ****	
301 Watersheds 2084 RM.gpw					Return Period: 2 Year			Friday, 09 / 22 / 2023		

Hyd. No. 1

1 Pre Dev Site

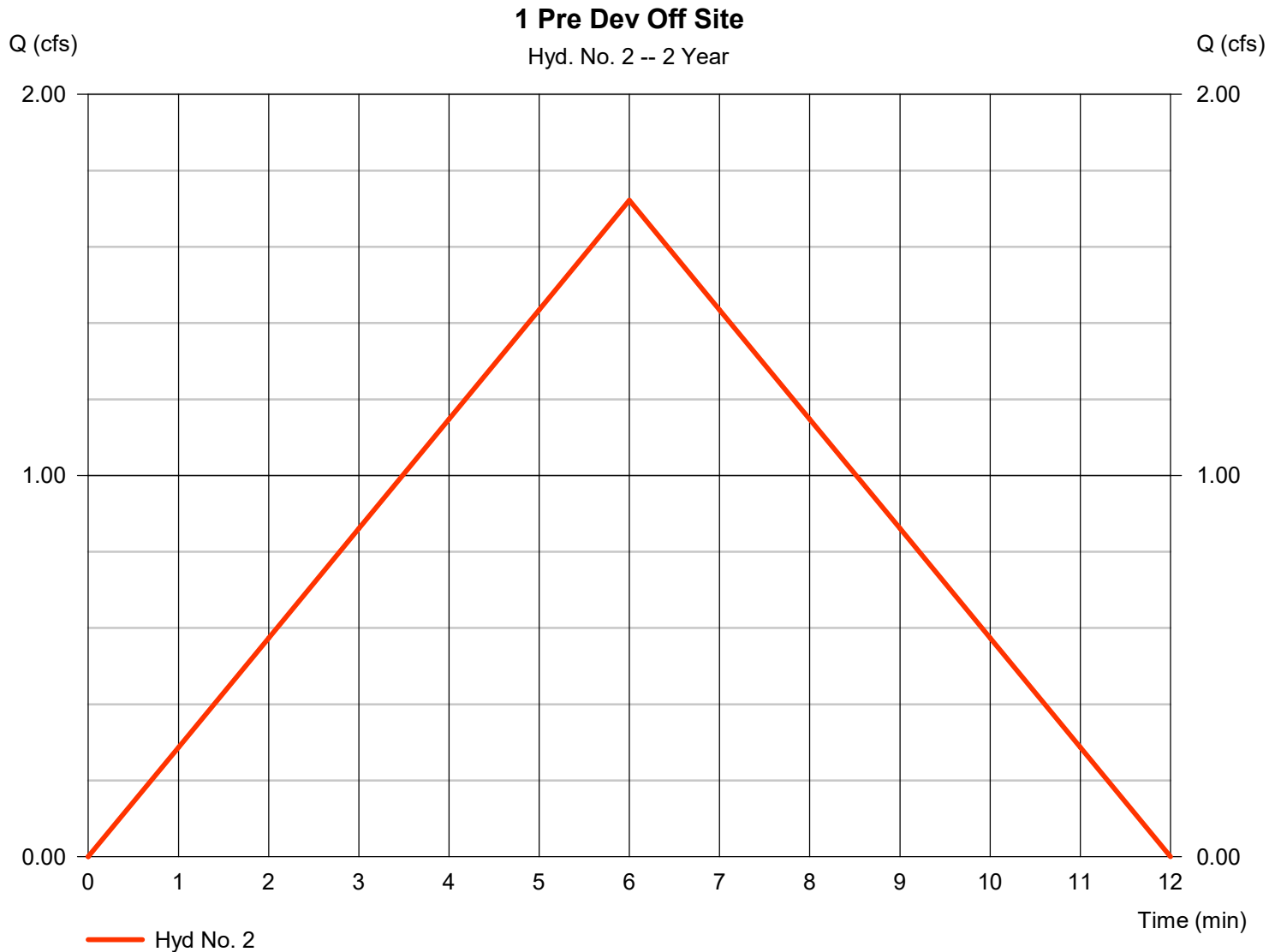
Hydrograph type	= Mod. Rational	Peak discharge	= 1.619 cfs
Storm frequency	= 2 yrs	Time to peak	= 6 min
Time interval	= 1 min	Hyd. volume	= 583 cuft
Drainage area	= 0.750 ac	Runoff coeff.	= 0.47
Intensity	= 4.592 in/hr	Tc by User	= 6.00 min
IDF Curve	= PA-Doylestown.IDF	Storm duration	= 1.0 x Tc
Target Q	=n/a	Est. Req'd Storage	=n/a



Hyd. No. 2

1 Pre Dev Off Site

Hydrograph type	= Mod. Rational	Peak discharge	= 1.722 cfs
Storm frequency	= 2 yrs	Time to peak	= 6 min
Time interval	= 1 min	Hyd. volume	= 620 cuft
Drainage area	= 0.750 ac	Runoff coeff.	= 0.5
Intensity	= 4.592 in/hr	Tc by User	= 6.00 min
IDF Curve	= PA-Doylestown.IDF	Storm duration	= 1.0 x Tc
Target Q	=n/a	Est. Req'd Storage	=n/a

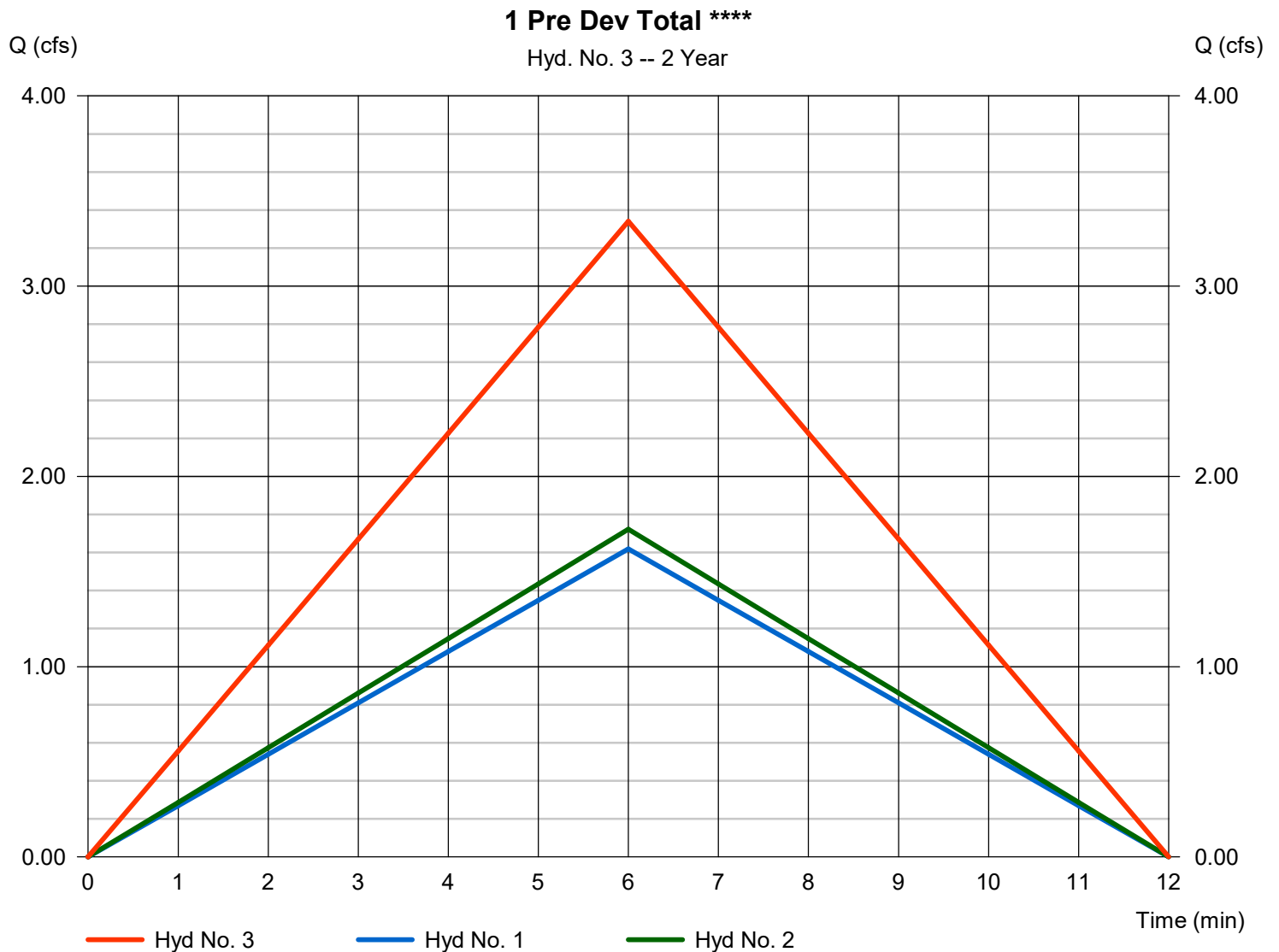


Hyd. No. 3

1 Pre Dev Total ****

Hydrograph type = Combine
Storm frequency = 2 yrs
Time interval = 1 min
Inflow hyds. = 1, 2

Peak discharge = 3.341 cfs
Time to peak = 6 min
Hyd. volume = 1,203 cuft
Contrib. drain. area = 1.500 ac



Hyd. No. 4

1A Post Dev Site

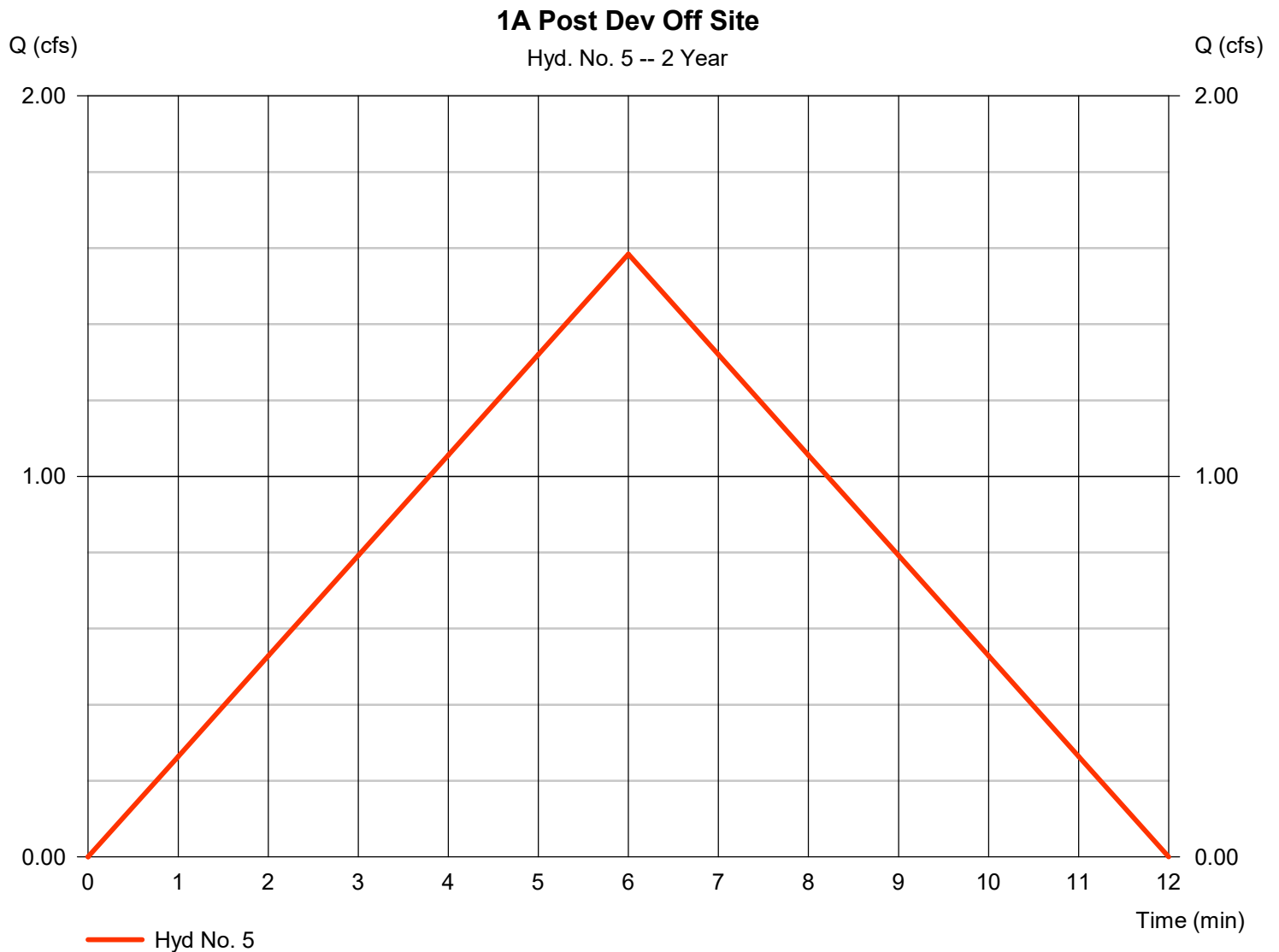
Hydrograph type	= Mod. Rational	Peak discharge	= 1.475 cfs
Storm frequency	= 2 yrs	Time to peak	= 6 min
Time interval	= 1 min	Hyd. volume	= 531 cuft
Drainage area	= 0.440 ac	Runoff coeff.	= 0.73
Intensity	= 4.592 in/hr	Tc by User	= 6.00 min
IDF Curve	= PA-Doylestown.IDF	Storm duration	= 1.0 x Tc
Target Q	=n/a	Est. Req'd Storage	=n/a



Hyd. No. 5

1A Post Dev Off Site

Hydrograph type	= Mod. Rational	Peak discharge	= 1.584 cfs
Storm frequency	= 2 yrs	Time to peak	= 6 min
Time interval	= 1 min	Hyd. volume	= 570 cuft
Drainage area	= 0.750 ac	Runoff coeff.	= 0.46
Intensity	= 4.592 in/hr	Tc by User	= 6.00 min
IDF Curve	= PA-Doylestown.IDF	Storm duration	= 1.0 x Tc
Target Q	=n/a	Est. Req'd Storage	=n/a

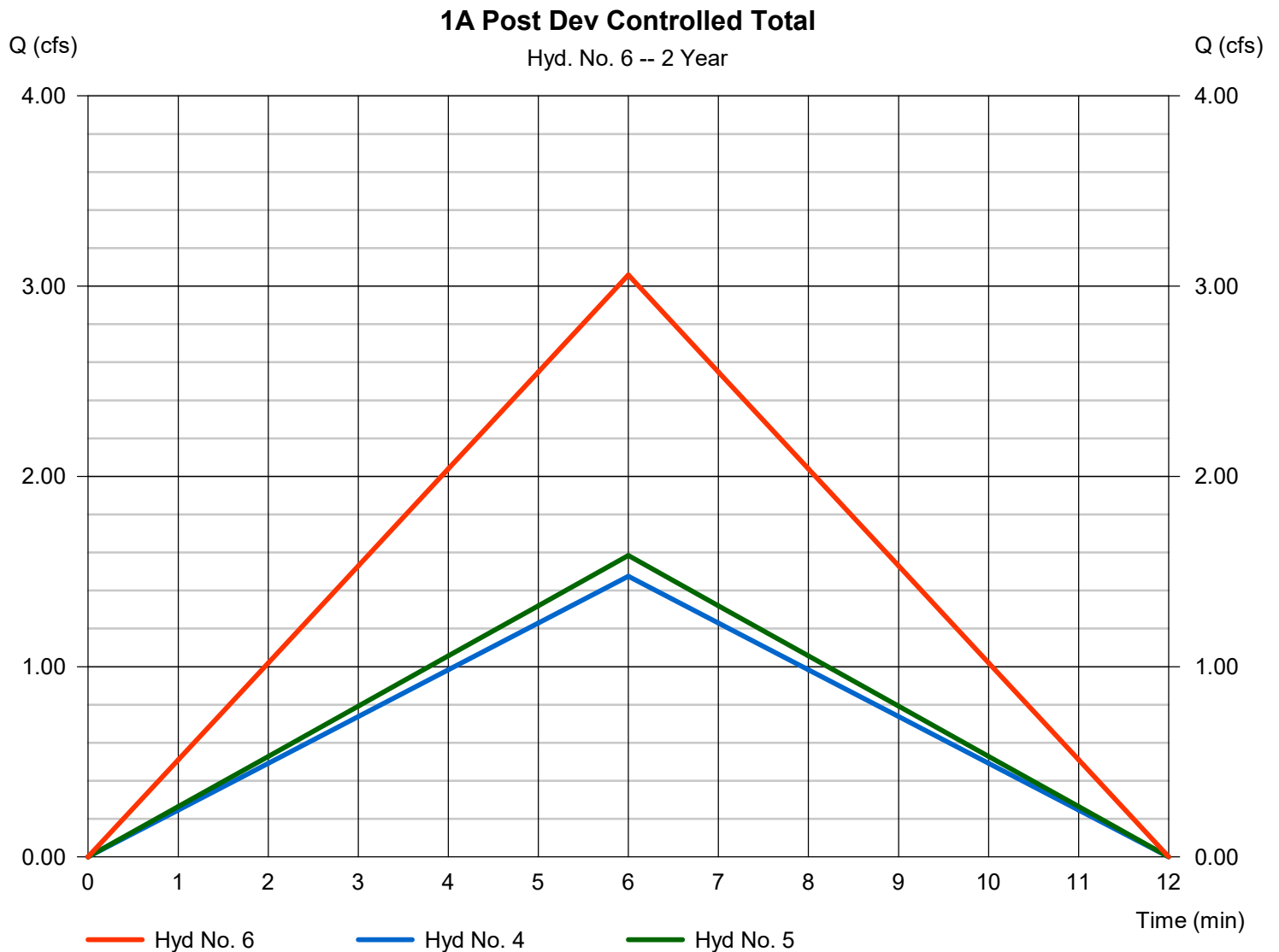


Hyd. No. 6

1A Post Dev Controlled Total

Hydrograph type = Combine
Storm frequency = 2 yrs
Time interval = 1 min
Inflow hyds. = 4, 5

Peak discharge = 3.059 cfs
Time to peak = 6 min
Hyd. volume = 1,101 cuft
Contrib. drain. area = 1.190 ac



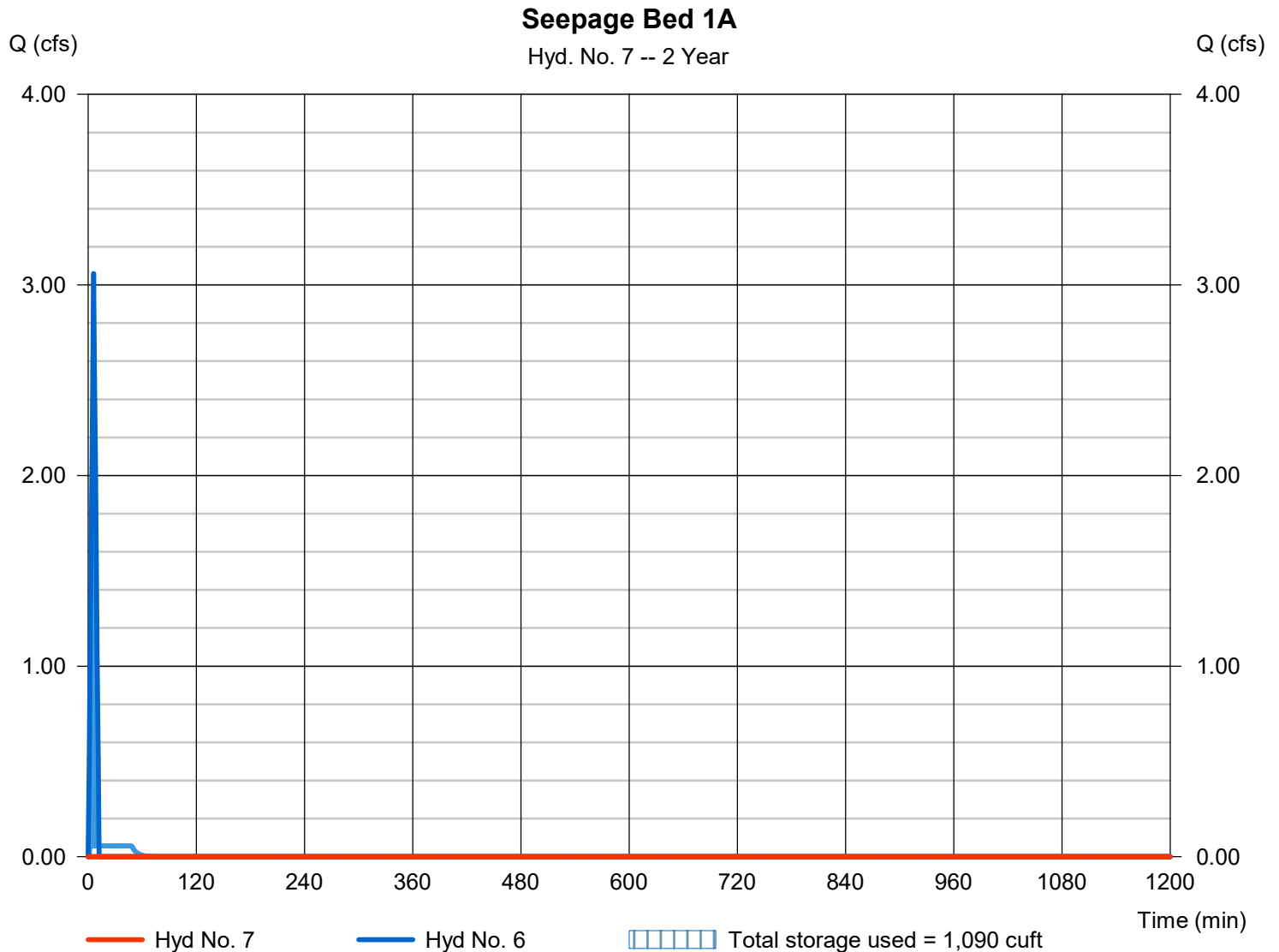
Hydrograph Report

Hyd. No. 7

Seepage Bed 1A

Hydrograph type	= Reservoir	Peak discharge	= 0.000 cfs
Storm frequency	= 2 yrs	Time to peak	= 86 min
Time interval	= 1 min	Hyd. volume	= 0 cuft
Inflow hyd. No.	= 6 - 1A Post Dev Controlled Total	Max. Elevation	= 126.92 ft
Reservoir name	= Seepage Bed 1A	Max. Storage	= 1,090 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Hyd. No. 8

1B Post Dev Site

Hydrograph type	= Mod. Rational	Peak discharge	= 1.165 cfs
Storm frequency	= 2 yrs	Time to peak	= 6 min
Time interval	= 1 min	Hyd. volume	= 420 cuft
Drainage area	= 0.270 ac	Runoff coeff.	= 0.94
Intensity	= 4.592 in/hr	Tc by User	= 6.00 min
IDF Curve	= PA-Doylestown.IDF	Storm duration	= 1.0 x Tc
Target Q	=n/a	Est. Req'd Storage	=n/a

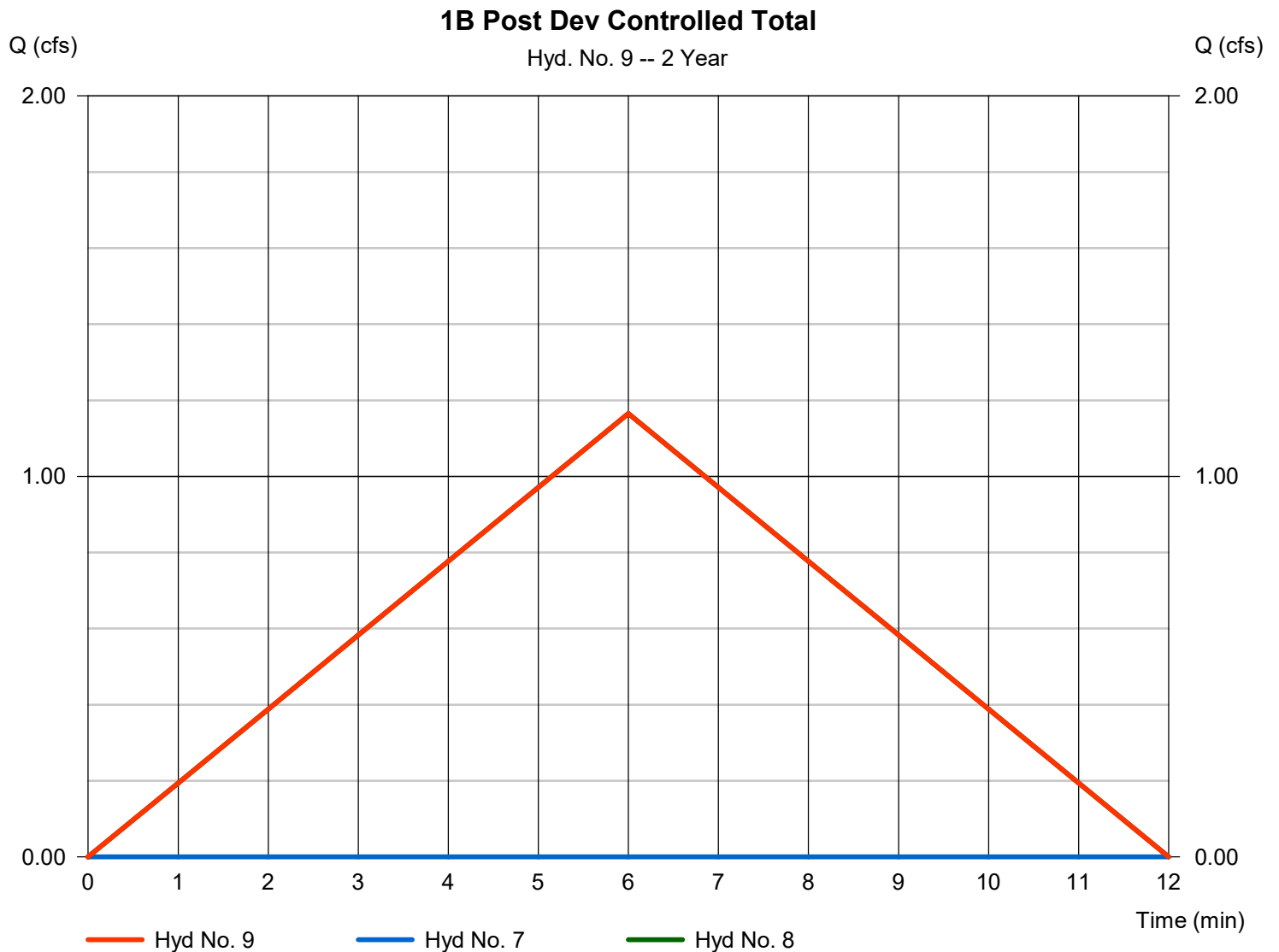


Hyd. No. 9

1B Post Dev Controlled Total

Hydrograph type = Combine
Storm frequency = 2 yrs
Time interval = 1 min
Inflow hyds. = 7, 8

Peak discharge = 1.165 cfs
Time to peak = 6 min
Hyd. volume = 420 cuft
Contrib. drain. area = 0.270 ac



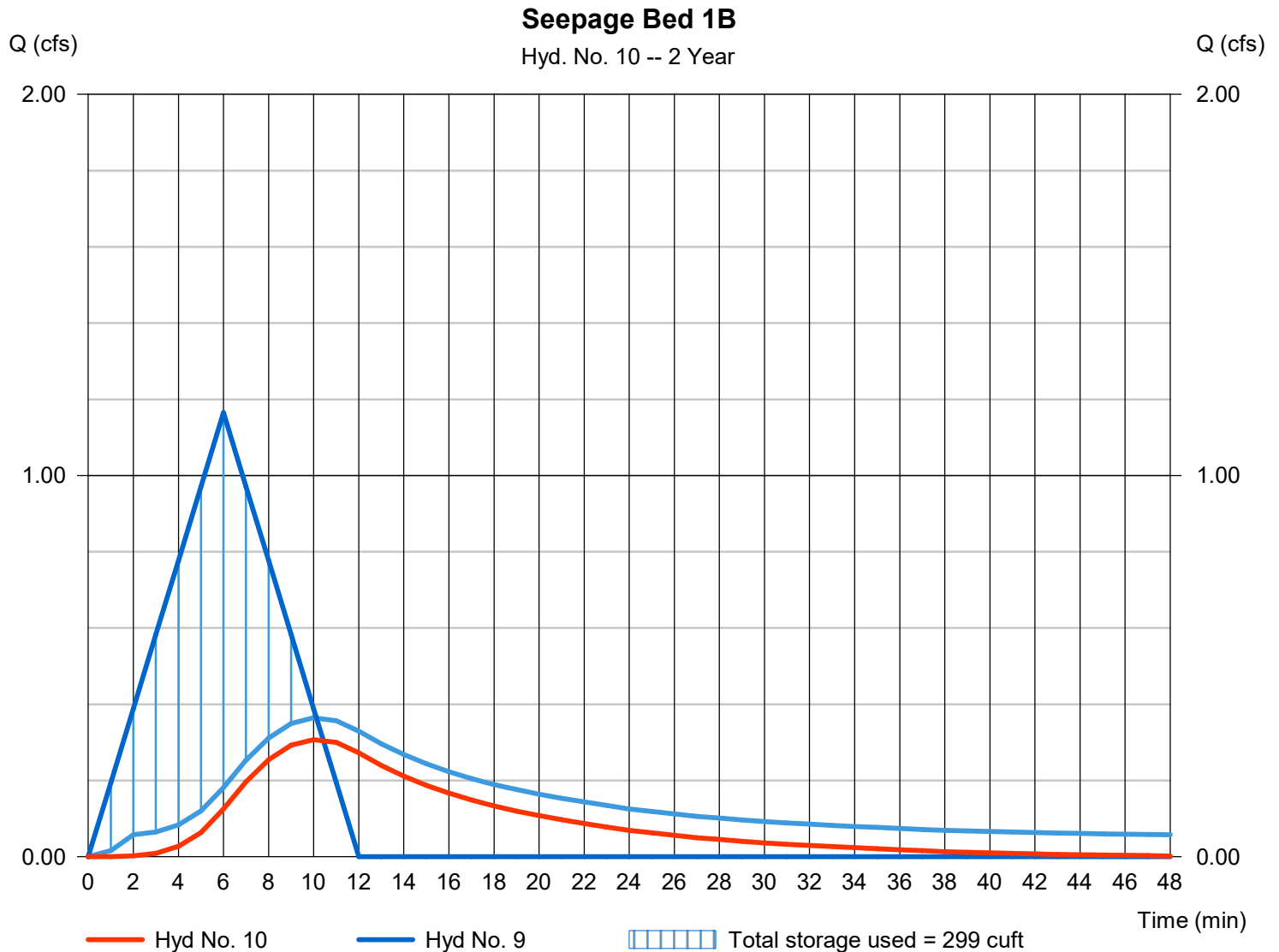
Hydrograph Report

Hyd. No. 10

Seepage Bed 1B

Hydrograph type	= Reservoir	Peak discharge	= 0.307 cfs
Storm frequency	= 2 yrs	Time to peak	= 10 min
Time interval	= 1 min	Hyd. volume	= 242 cuft
Inflow hyd. No.	= 9 - 1B Post Dev Controlled Total	Max. Elevation	= 127.31 ft
Reservoir name	= Seepage Bed 1B	Max. Storage	= 299 cuft

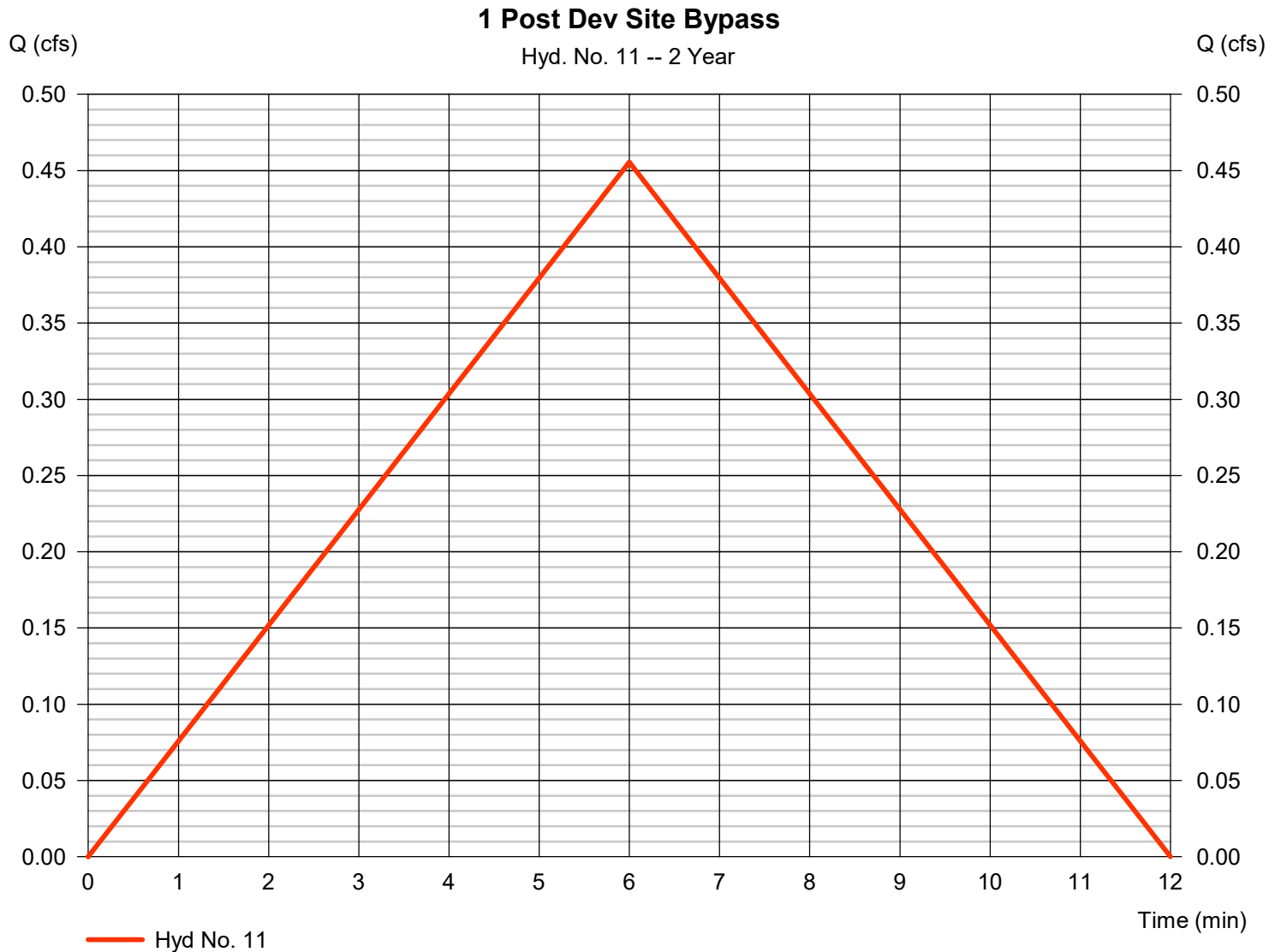
Storage Indication method used. Exfiltration extracted from Outflow.



Hyd. No. 11

1 Post Dev Site Bypass

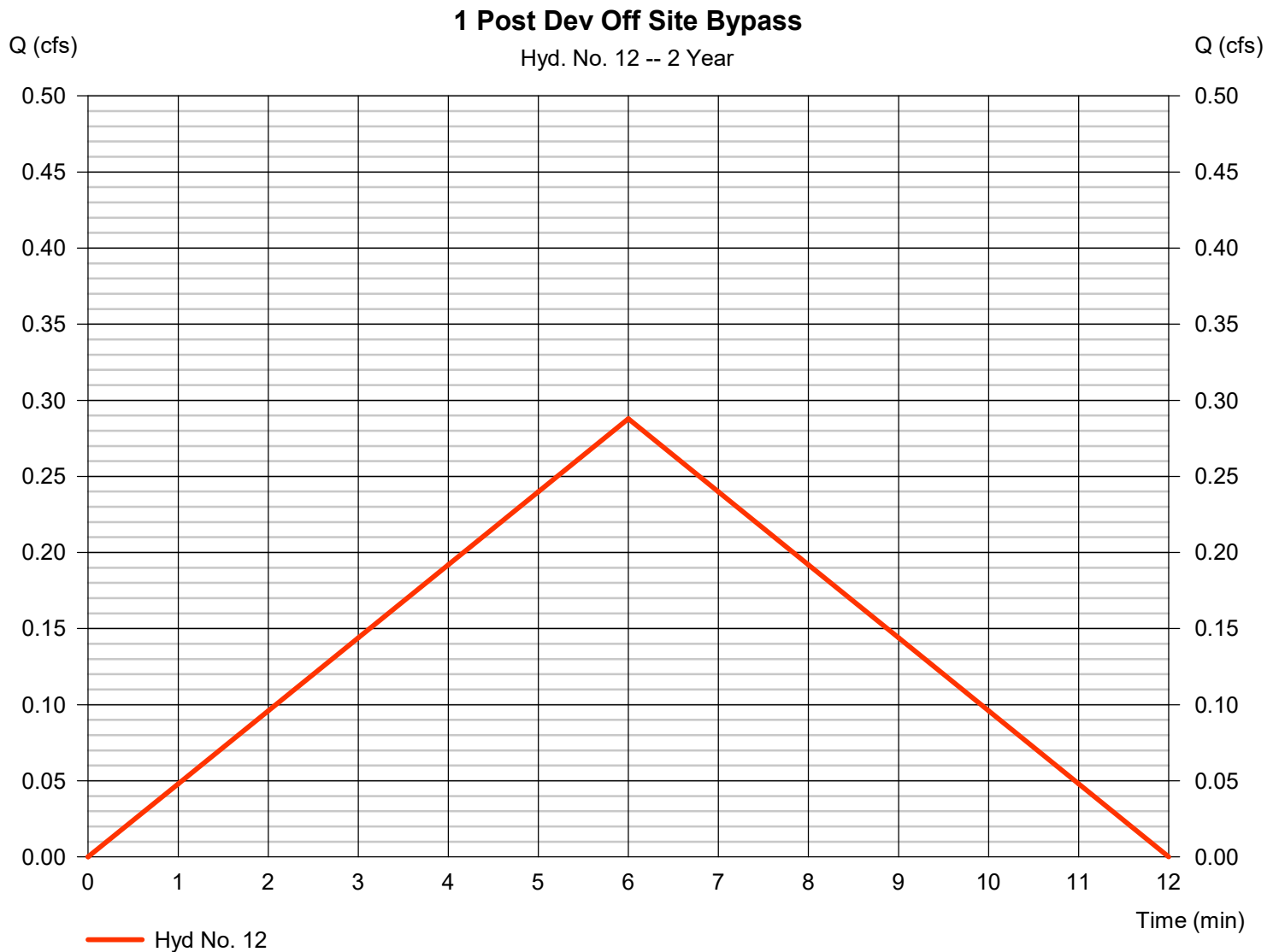
Hydrograph type	= Mod. Rational	Peak discharge	= 0.456 cfs
Storm frequency	= 2 yrs	Time to peak	= 6 min
Time interval	= 1 min	Hyd. volume	= 164 cuft
Drainage area	= 0.160 ac	Runoff coeff.	= 0.62
Intensity	= 4.592 in/hr	Tc by User	= 6.00 min
IDF Curve	= PA-Doylestown.IDF	Storm duration	= 1.0 x Tc
Target Q	=n/a	Est. Req'd Storage	=n/a



Hyd. No. 12

1 Post Dev Off Site Bypass

Hydrograph type	= Mod. Rational	Peak discharge	= 0.288 cfs
Storm frequency	= 2 yrs	Time to peak	= 6 min
Time interval	= 1 min	Hyd. volume	= 104 cuft
Drainage area	= 0.110 ac	Runoff coeff.	= 0.57
Intensity	= 4.592 in/hr	Tc by User	= 6.00 min
IDF Curve	= PA-Doylestown.IDF	Storm duration	= 1.0 x Tc
Target Q	=n/a	Est. Req'd Storage	=n/a

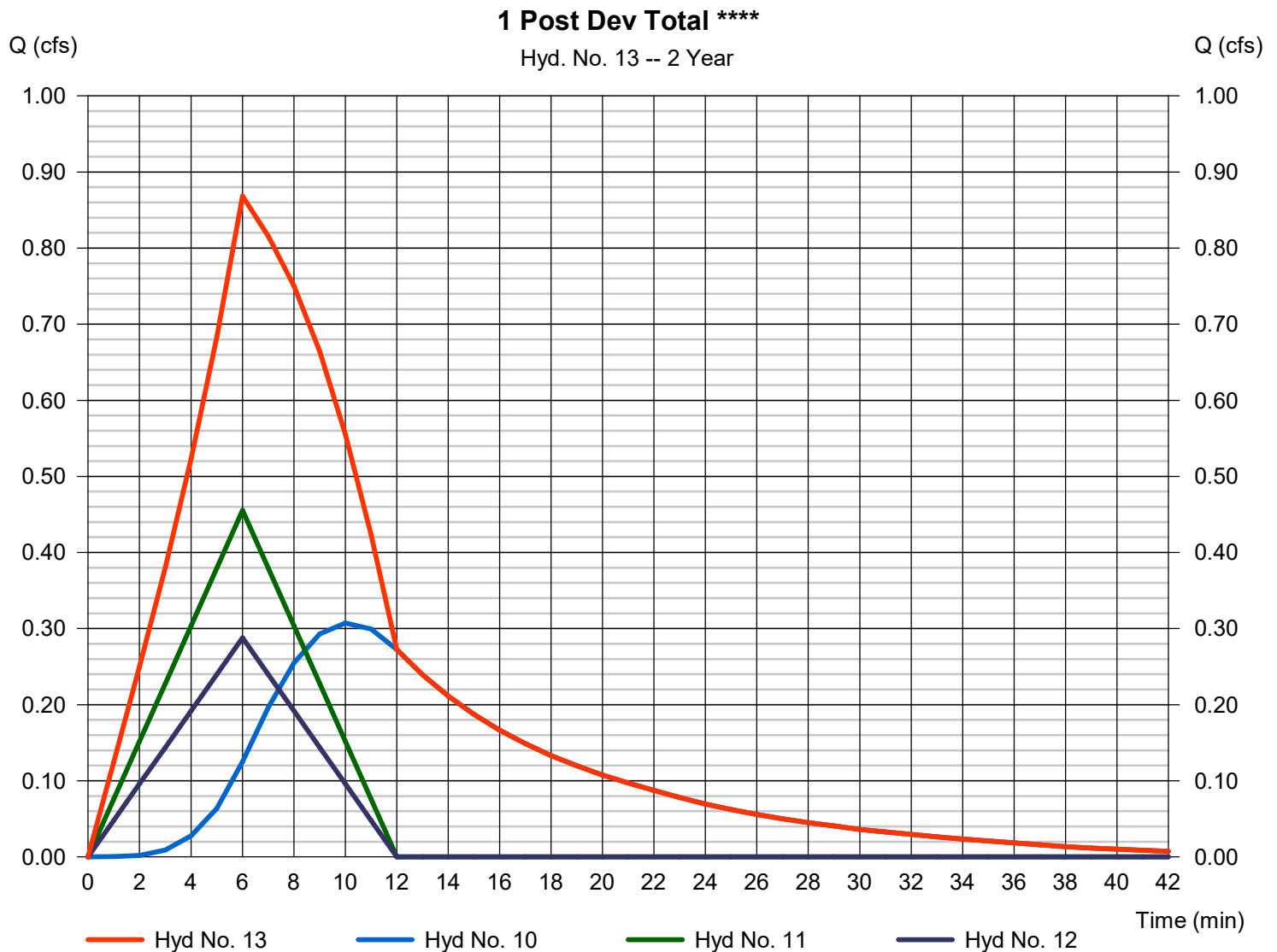


Hydrograph Report

Hyd. No. 13

1 Post Dev Total ****

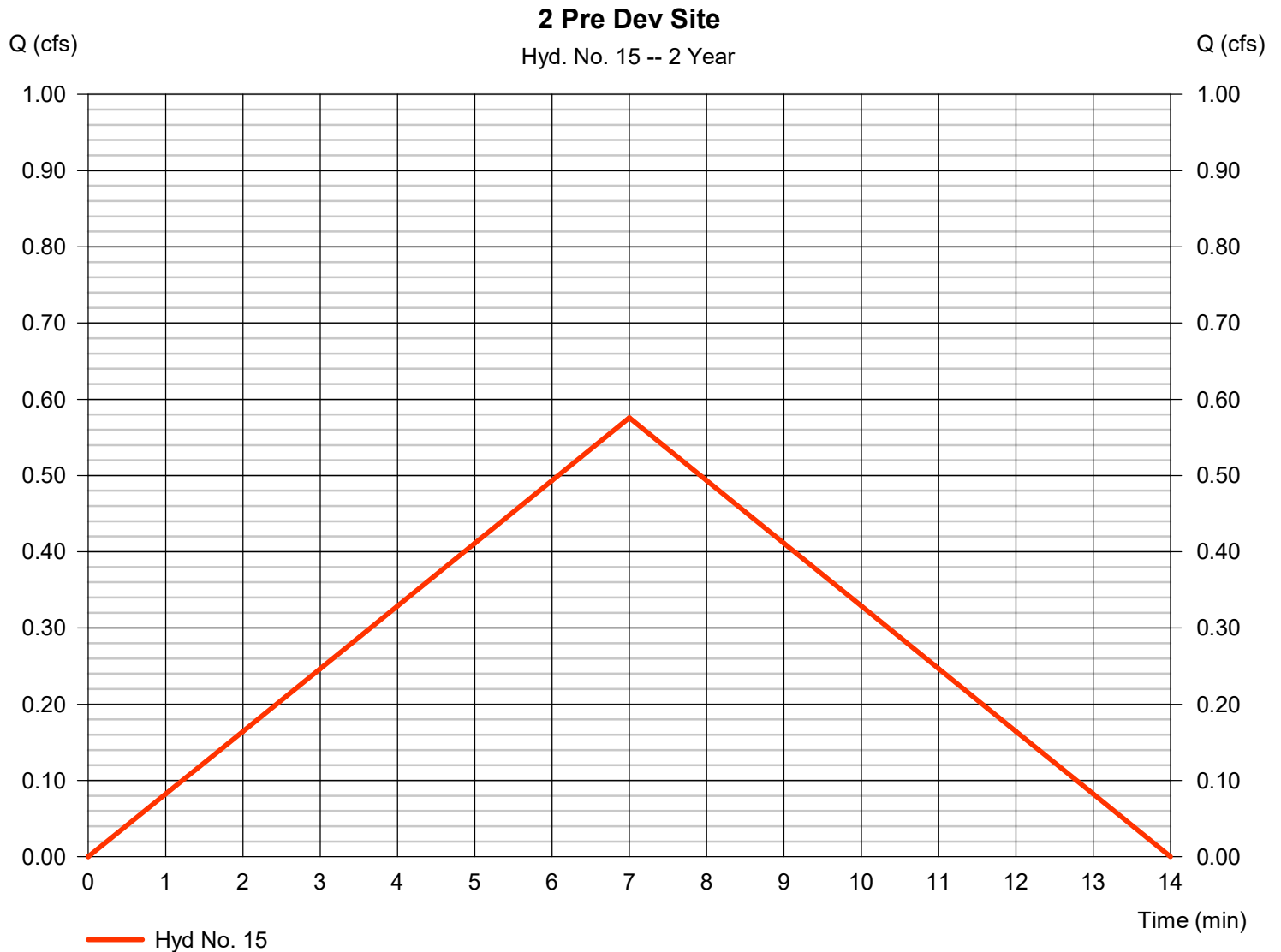
Hydrograph type	= Combine	Peak discharge	= 0.868 cfs
Storm frequency	= 2 yrs	Time to peak	= 6 min
Time interval	= 1 min	Hyd. volume	= 510 cuft
Inflow hyds.	= 10, 11, 12	Contrib. drain. area	= 0.270 ac



Hyd. No. 15

2 Pre Dev Site

Hydrograph type	= Mod. Rational	Peak discharge	= 0.576 cfs
Storm frequency	= 2 yrs	Time to peak	= 7 min
Time interval	= 1 min	Hyd. volume	= 242 cuft
Drainage area	= 0.410 ac	Runoff coeff.	= 0.32
Intensity	= 4.387 in/hr	Tc by User	= 7.00 min
IDF Curve	= PA-Doylestown.IDF	Storm duration	= 1.0 x Tc
Target Q	=n/a	Est. Req'd Storage	=n/a



Hyd. No. 16

2 Pre Dev Off Site

Hydrograph type	= Mod. Rational	Peak discharge	= 3.001 cfs
Storm frequency	= 2 yrs	Time to peak	= 7 min
Time interval	= 1 min	Hyd. volume	= 1,260 cuft
Drainage area	= 1.520 ac	Runoff coeff.	= 0.45
Intensity	= 4.387 in/hr	Tc by User	= 7.00 min
IDF Curve	= PA-Doylestown.IDF	Storm duration	= 1.0 x Tc
Target Q	=n/a	Est. Req'd Storage	=n/a



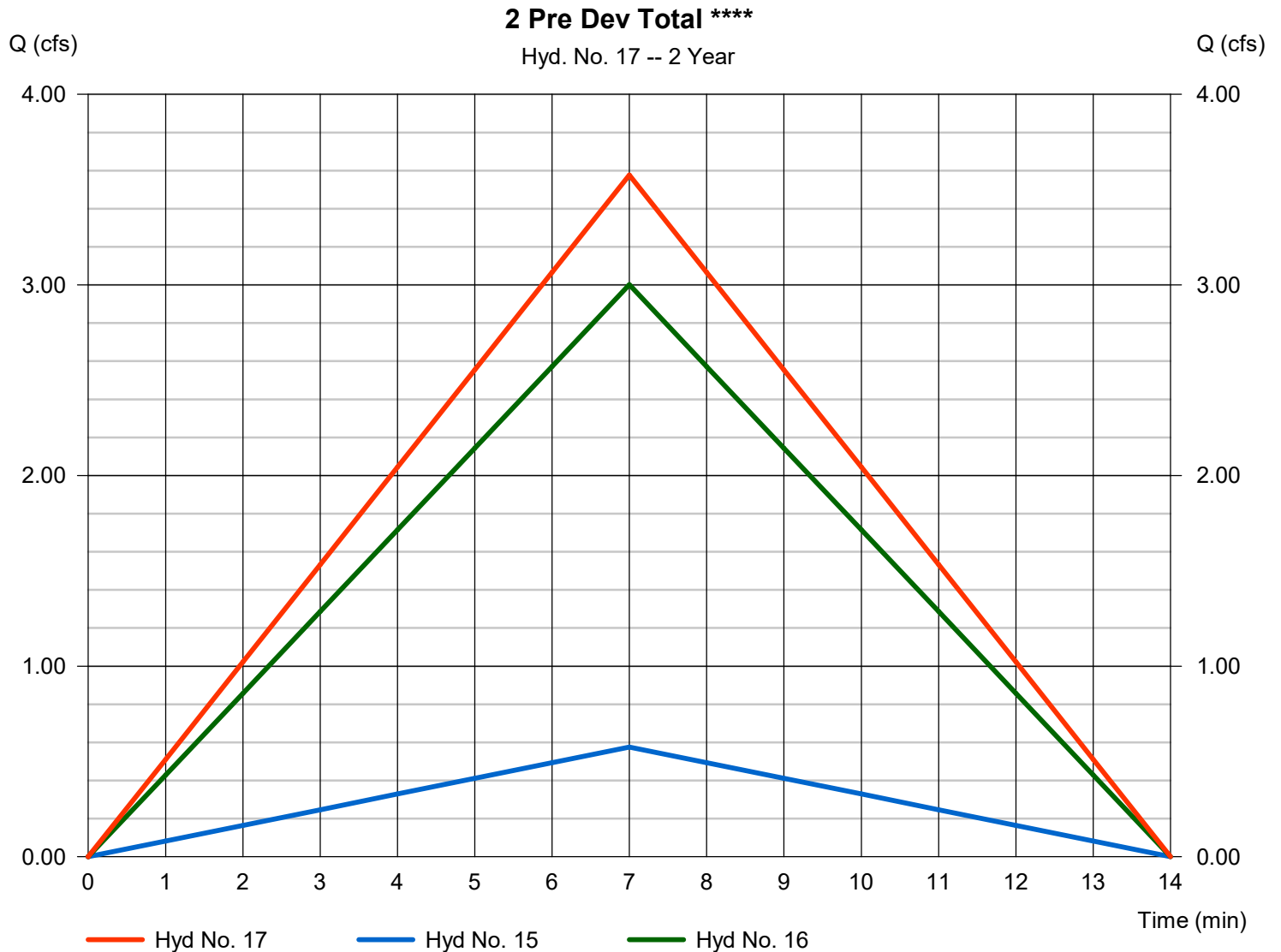
Hydrograph Report

Hyd. No. 17

2 Pre Dev Total ****

Hydrograph type = Combine
Storm frequency = 2 yrs
Time interval = 1 min
Inflow hyds. = 15, 16

Peak discharge = 3.577 cfs
Time to peak = 7 min
Hyd. volume = 1,502 cuft
Contrib. drain. area = 1.930 ac



Hydrograph Report

Hyd. No. 18

2 Post Dev Site

Hydrograph type	= Mod. Rational	Peak discharge	= 0.343 cfs
Storm frequency	= 2 yrs	Time to peak	= 6 min
Time interval	= 1 min	Hyd. volume	= 123 cuft
Drainage area	= 0.090 ac	Runoff coeff.	= 0.83
Intensity	= 4.592 in/hr	Tc by User	= 6.00 min
IDF Curve	= PA-Doylestown.IDF	Storm duration	= 1.0 x Tc
Target Q	=n/a	Est. Req'd Storage	=n/a



Hydrograph Report

Hyd. No. 19

2 Post Dev Off Site

Hydrograph type	= Mod. Rational	Peak discharge	= 0.030 cfs
Storm frequency	= 2 yrs	Time to peak	= 6 min
Time interval	= 1 min	Hyd. volume	= 11 cuft
Drainage area	= 0.060 ac	Runoff coeff.	= 0.11
Intensity	= 4.592 in/hr	Tc by User	= 6.00 min
IDF Curve	= PA-Doylestown.IDF	Storm duration	= 1.0 x Tc
Target Q	=n/a	Est. Req'd Storage	=n/a



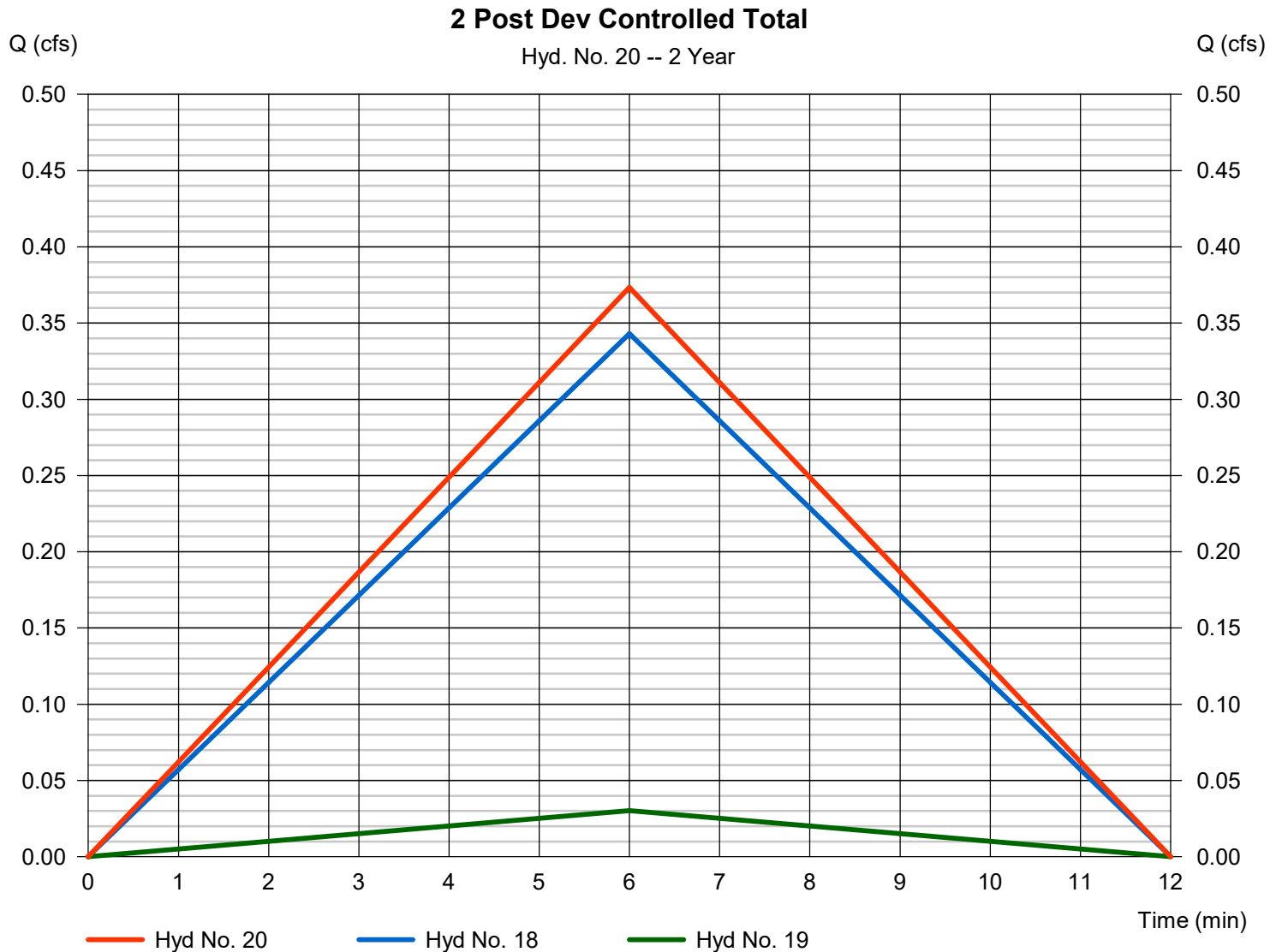
Hydrograph Report

Hyd. No. 20

2 Post Dev Controlled Total

Hydrograph type = Combine
Storm frequency = 2 yrs
Time interval = 1 min
Inflow hyds. = 18, 19

Peak discharge = 0.373 cfs
Time to peak = 6 min
Hyd. volume = 134 cuft
Contrib. drain. area = 0.150 ac



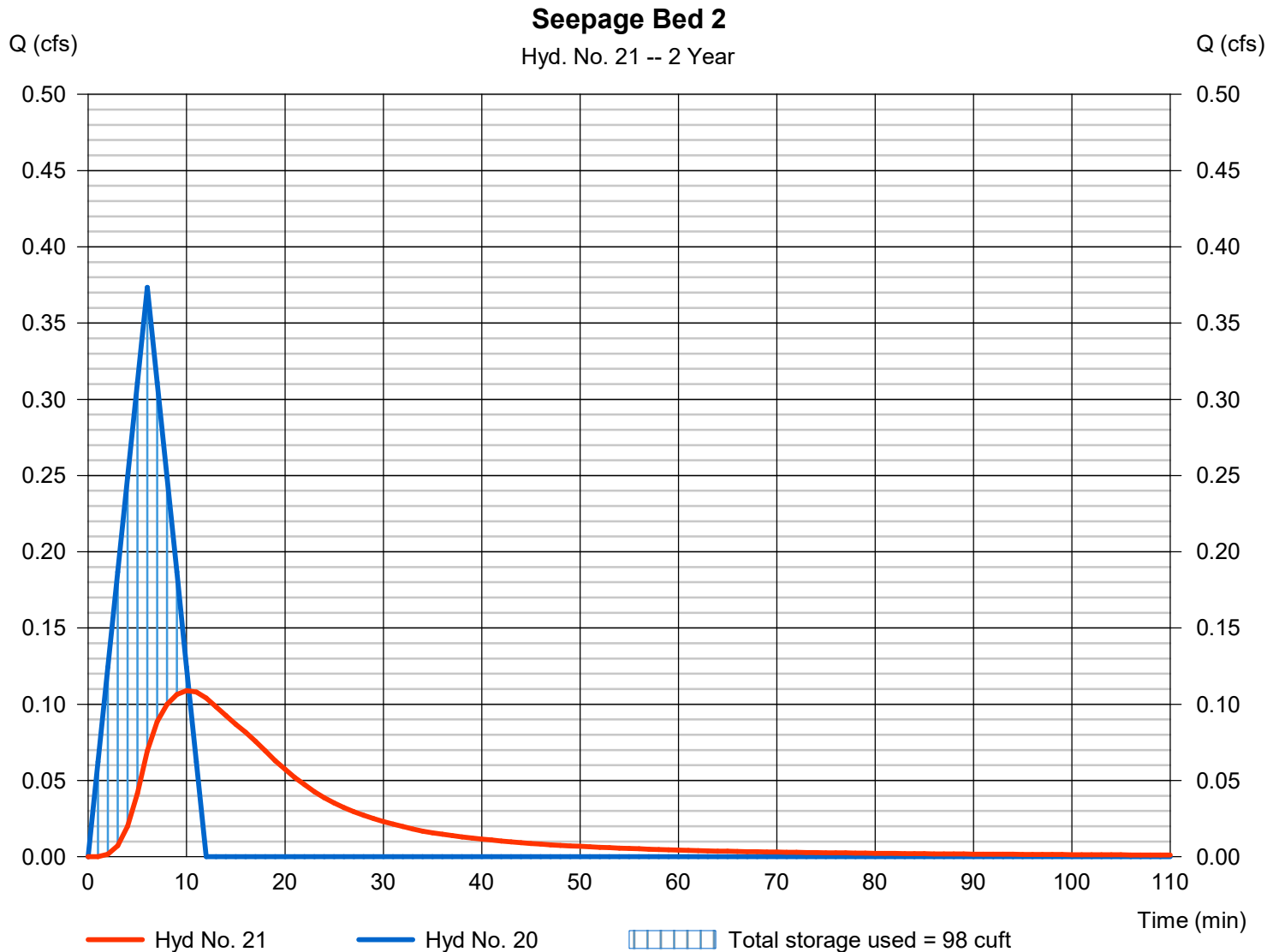
Hydrograph Report

Hyd. No. 21

Seepage Bed 2

Hydrograph type	= Reservoir	Peak discharge	= 0.109 cfs
Storm frequency	= 2 yrs	Time to peak	= 10 min
Time interval	= 1 min	Hyd. volume	= 128 cuft
Inflow hyd. No.	= 20 - 2 Post Dev Controlled Total	Max. Elevation	= 108.34 ft
Reservoir name	= Seepage Bed 2	Max. Storage	= 98 cuft

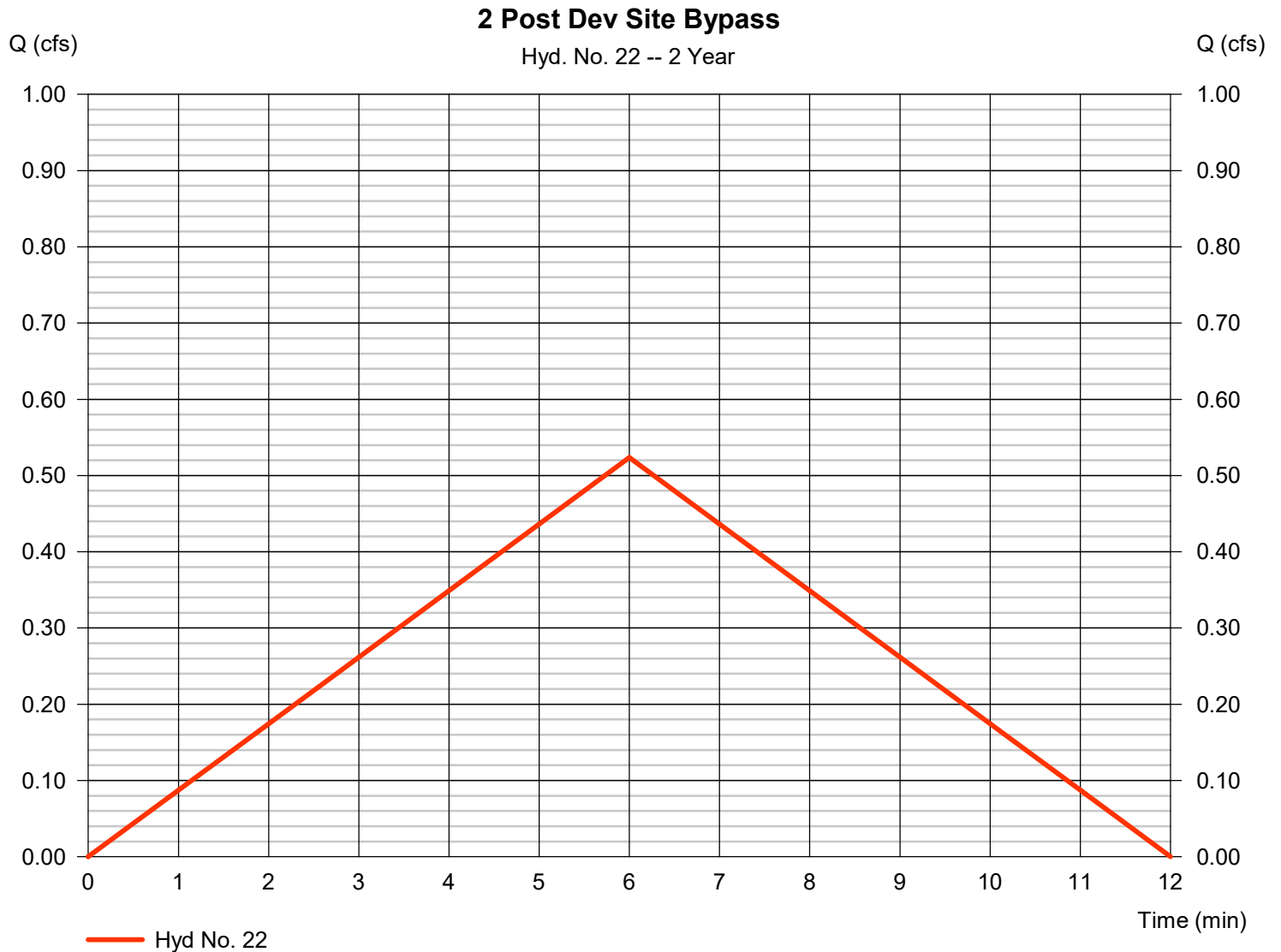
Storage Indication method used.



Hyd. No. 22

2 Post Dev Site Bypass

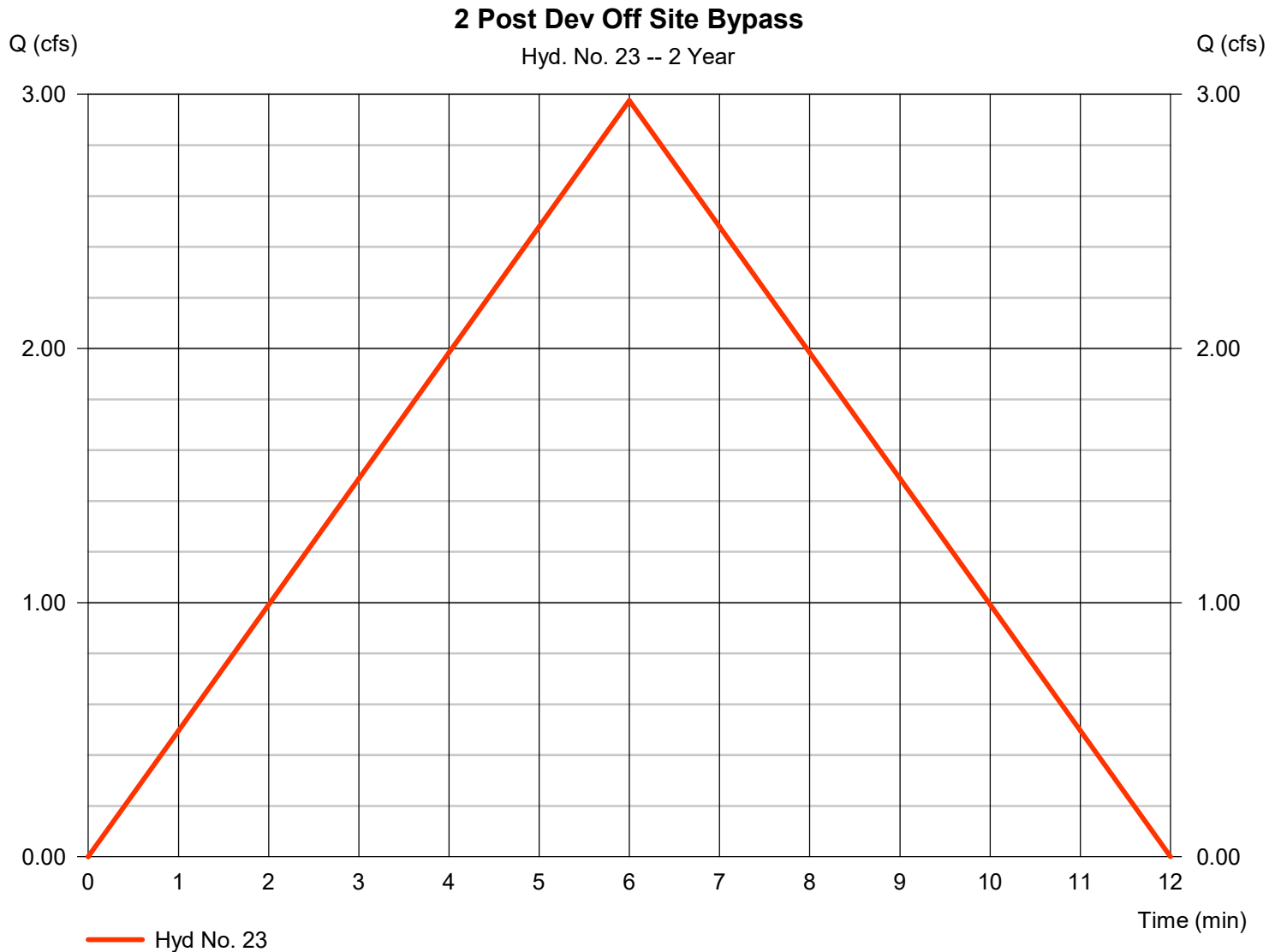
Hydrograph type	= Mod. Rational	Peak discharge	= 0.523 cfs
Storm frequency	= 2 yrs	Time to peak	= 6 min
Time interval	= 1 min	Hyd. volume	= 188 cuft
Drainage area	= 0.200 ac	Runoff coeff.	= 0.57
Intensity	= 4.592 in/hr	Tc by User	= 6.00 min
IDF Curve	= PA-Doylestown.IDF	Storm duration	= 1.0 x Tc
Target Q	=n/a	Est. Req'd Storage	=n/a



Hyd. No. 23

2 Post Dev Off Site Bypass

Hydrograph type	= Mod. Rational	Peak discharge	= 2.976 cfs
Storm frequency	= 2 yrs	Time to peak	= 6 min
Time interval	= 1 min	Hyd. volume	= 1,071 cuft
Drainage area	= 1.350 ac	Runoff coeff.	= 0.48
Intensity	= 4.592 in/hr	Tc by User	= 6.00 min
IDF Curve	= PA-Doylestown.IDF	Storm duration	= 1.0 x Tc
Target Q	=n/a	Est. Req'd Storage	=n/a



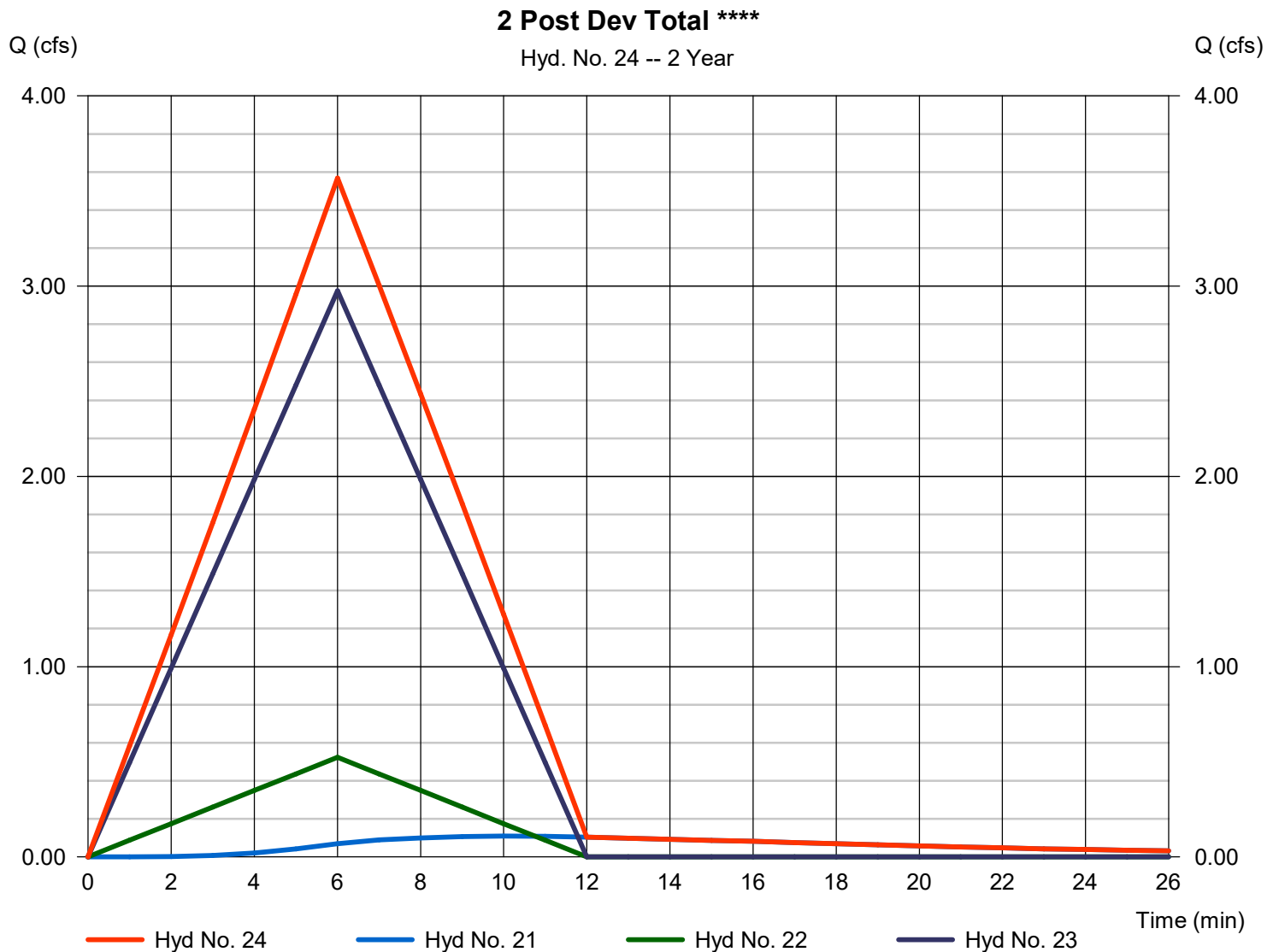
Hydrograph Report

Hyd. No. 24

2 Post Dev Total ****

Hydrograph type = Combine
Storm frequency = 2 yrs
Time interval = 1 min
Inflow hyds. = 21, 22, 23

Peak discharge = 3.569 cfs
Time to peak = 6 min
Hyd. volume = 1,388 cuft
Contrib. drain. area = 1.550 ac



Hydrograph Summary Report

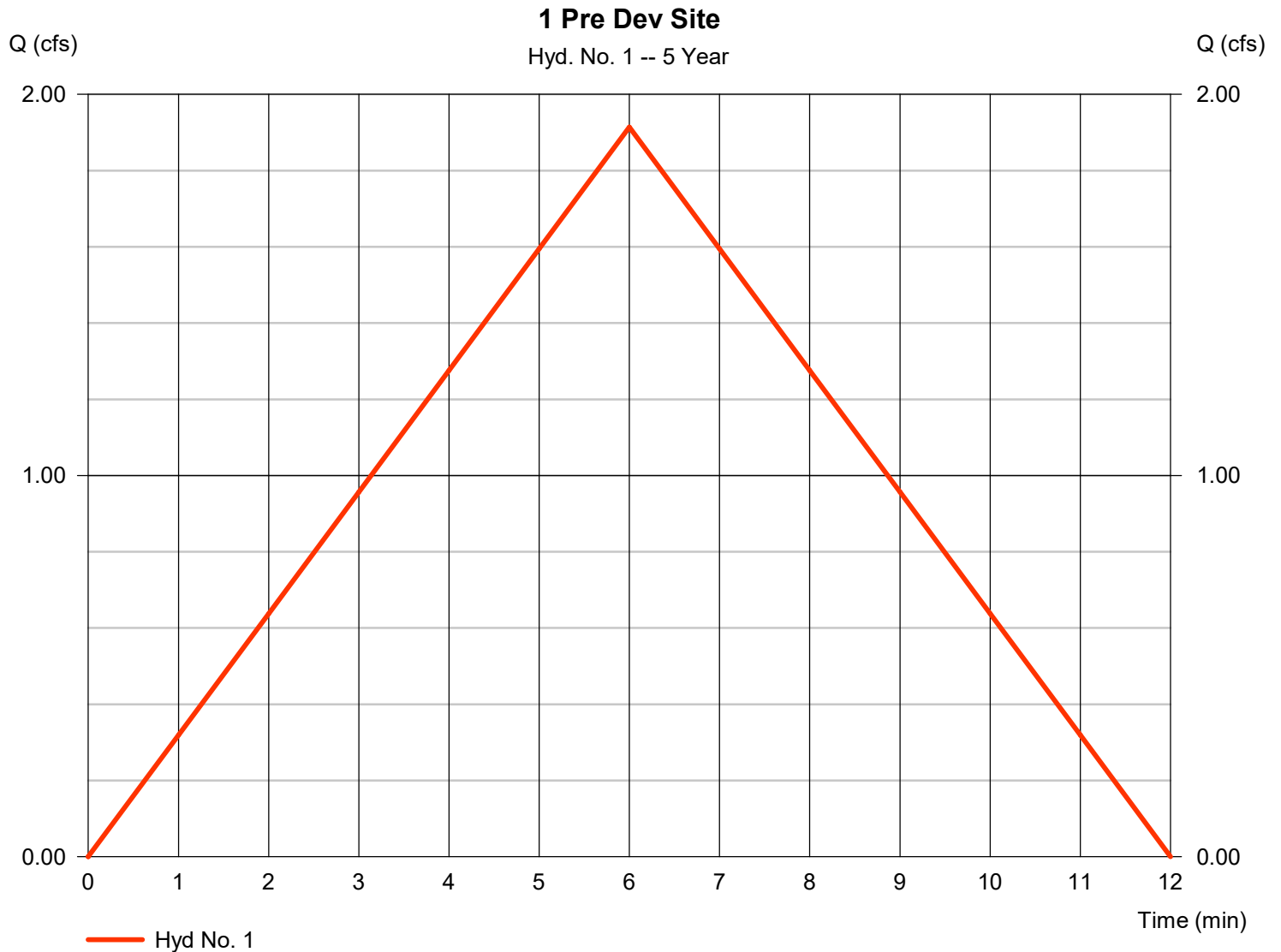
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

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	Mod. Rational	1.914	1	6	689	----	----	----	1 Pre Dev Site
2	Mod. Rational	2.036	1	6	733	----	----	----	1 Pre Dev Off Site
3	Combine	3.950	1	6	1,422	1, 2	----	----	1 Pre Dev Total ****
4	Mod. Rational	1.744	1	6	628	----	----	----	1A Post Dev Site
5	Mod. Rational	1.873	1	6	674	----	----	----	1A Post Dev Off Site
6	Combine	3.617	1	6	1,302	4, 5	----	----	1A Post Dev Controlled Total
7	Reservoir	0.000	1	277	0	6	127.09	1,290	Seepage Bed 1A
8	Mod. Rational	1.378	1	6	496	----	----	----	1B Post Dev Site
9	Combine	1.378	1	6	496	7, 8	----	----	1B Post Dev Controlled Total
10	Reservoir	0.403	1	10	312	9	127.36	348	Seepage Bed 1B
11	Mod. Rational	0.539	1	6	194	----	----	----	1 Post Dev Site Bypass
12	Mod. Rational	0.340	1	6	123	----	----	----	1 Post Dev Off Site Bypass
13	Combine	1.050	1	6	628	10, 11, 12	----	----	1 Post Dev Total ****
15	Mod. Rational	0.682	1	7	287	----	----	----	2 Pre Dev Site
16	Mod. Rational	3.556	1	7	1,494	----	----	----	2 Pre Dev Off Site
17	Combine	4.239	1	7	1,780	15, 16	----	----	2 Pre Dev Total ****
18	Mod. Rational	0.406	1	6	146	----	----	----	2 Post Dev Site
19	Mod. Rational	0.036	1	6	13	----	----	----	2 Post Dev Off Site
20	Combine	0.441	1	6	159	18, 19	----	----	2 Post Dev Controlled Total
21	Reservoir	0.124	1	10	153	20	108.40	116	Seepage Bed 2
22	Mod. Rational	0.619	1	6	223	----	----	----	2 Post Dev Site Bypass
23	Mod. Rational	3.518	1	6	1,267	----	----	----	2 Post Dev Off Site Bypass
24	Combine	4.220	1	6	1,642	21, 22, 23	----	----	2 Post Dev Total ****
301 Watersheds 2084 RM.gpw					Return Period: 5 Year			Friday, 09 / 22 / 2023	

Hyd. No. 1

1 Pre Dev Site

Hydrograph type	= Mod. Rational	Peak discharge	= 1.914 cfs
Storm frequency	= 5 yrs	Time to peak	= 6 min
Time interval	= 1 min	Hyd. volume	= 689 cuft
Drainage area	= 0.750 ac	Runoff coeff.	= 0.47
Intensity	= 5.429 in/hr	Tc by User	= 6.00 min
IDF Curve	= PA-Doylestown.IDF	Storm duration	= 1.0 x Tc
Target Q	=n/a	Est. Req'd Storage	=n/a



Hyd. No. 2

1 Pre Dev Off Site

Hydrograph type	= Mod. Rational	Peak discharge	= 2.036 cfs
Storm frequency	= 5 yrs	Time to peak	= 6 min
Time interval	= 1 min	Hyd. volume	= 733 cuft
Drainage area	= 0.750 ac	Runoff coeff.	= 0.5
Intensity	= 5.429 in/hr	Tc by User	= 6.00 min
IDF Curve	= PA-Doylestown.IDF	Storm duration	= 1.0 x Tc
Target Q	=n/a	Est. Req'd Storage	=n/a

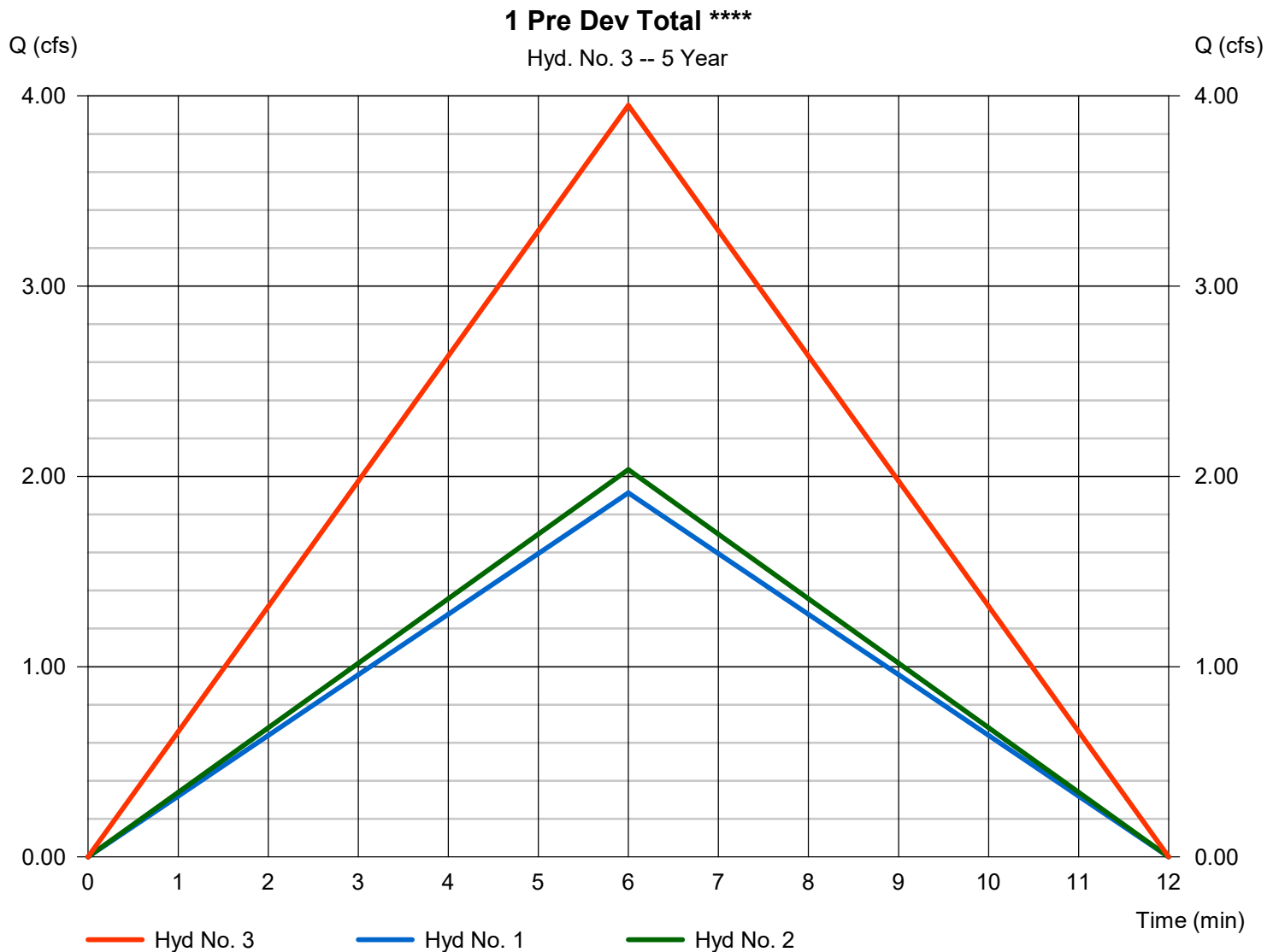


Hyd. No. 3

1 Pre Dev Total ****

Hydrograph type = Combine
Storm frequency = 5 yrs
Time interval = 1 min
Inflow hyds. = 1, 2

Peak discharge = 3.950 cfs
Time to peak = 6 min
Hyd. volume = 1,422 cuft
Contrib. drain. area = 1.500 ac



Hyd. No. 4

1A Post Dev Site

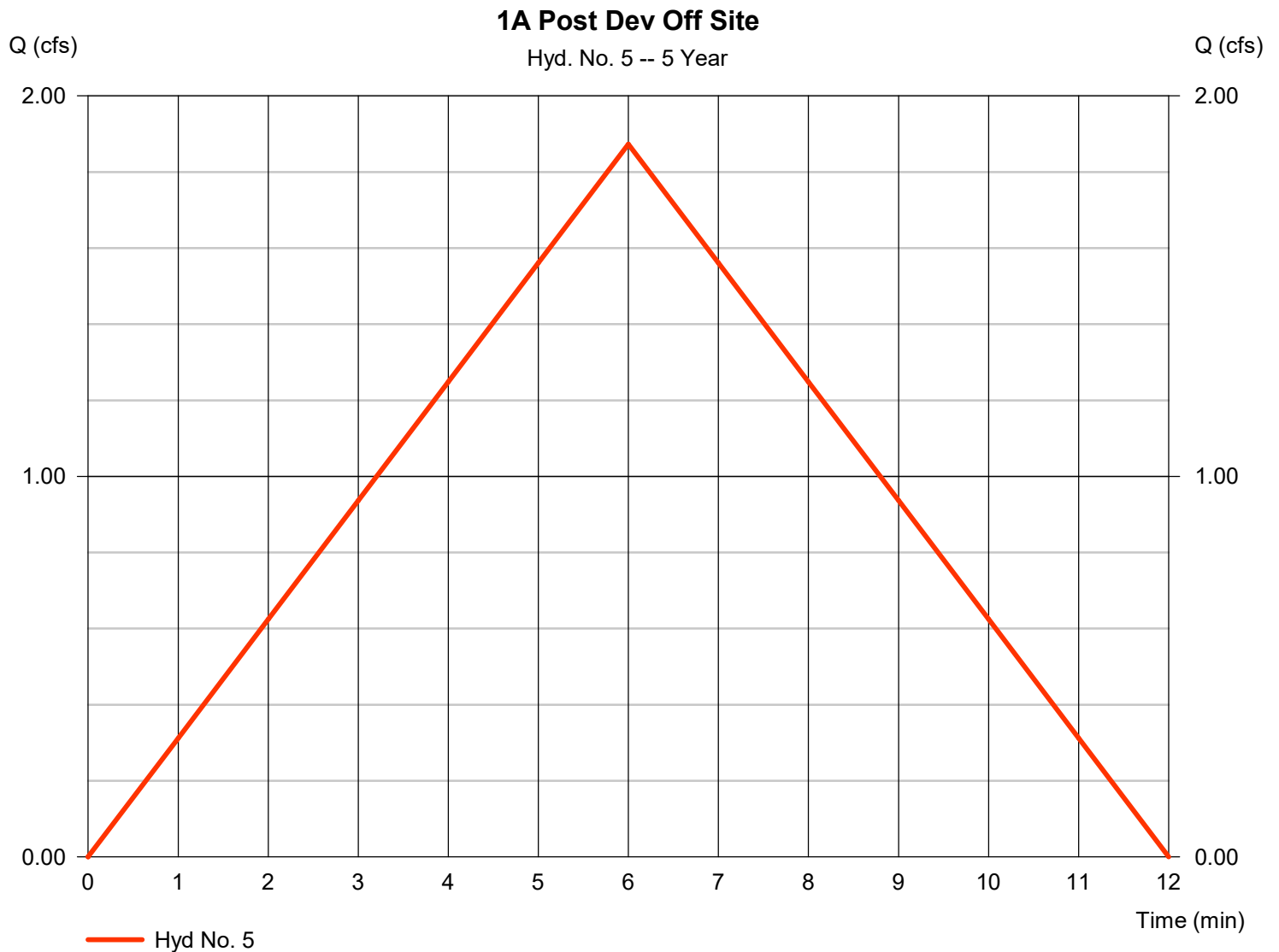
Hydrograph type	= Mod. Rational	Peak discharge	= 1.744 cfs
Storm frequency	= 5 yrs	Time to peak	= 6 min
Time interval	= 1 min	Hyd. volume	= 628 cuft
Drainage area	= 0.440 ac	Runoff coeff.	= 0.73
Intensity	= 5.429 in/hr	Tc by User	= 6.00 min
IDF Curve	= PA-Doylestown.IDF	Storm duration	= 1.0 x Tc
Target Q	=n/a	Est. Req'd Storage	=n/a



Hyd. No. 5

1A Post Dev Off Site

Hydrograph type	= Mod. Rational	Peak discharge	= 1.873 cfs
Storm frequency	= 5 yrs	Time to peak	= 6 min
Time interval	= 1 min	Hyd. volume	= 674 cuft
Drainage area	= 0.750 ac	Runoff coeff.	= 0.46
Intensity	= 5.429 in/hr	Tc by User	= 6.00 min
IDF Curve	= PA-Doylestown.IDF	Storm duration	= 1.0 x Tc
Target Q	=n/a	Est. Req'd Storage	=n/a

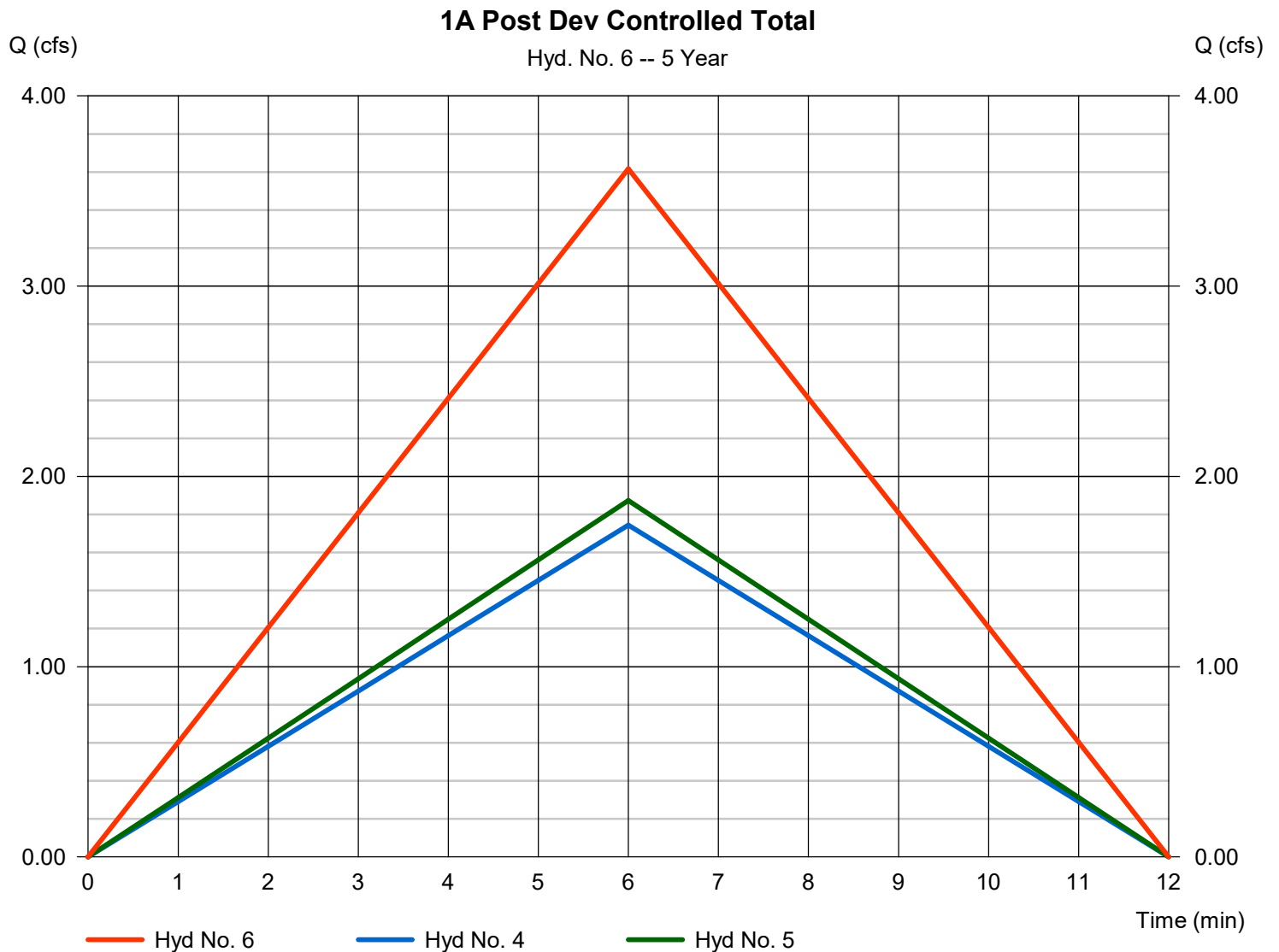


Hyd. No. 6

1A Post Dev Controlled Total

Hydrograph type = Combine
Storm frequency = 5 yrs
Time interval = 1 min
Inflow hyds. = 4, 5

Peak discharge = 3.617 cfs
Time to peak = 6 min
Hyd. volume = 1,302 cuft
Contrib. drain. area = 1.190 ac



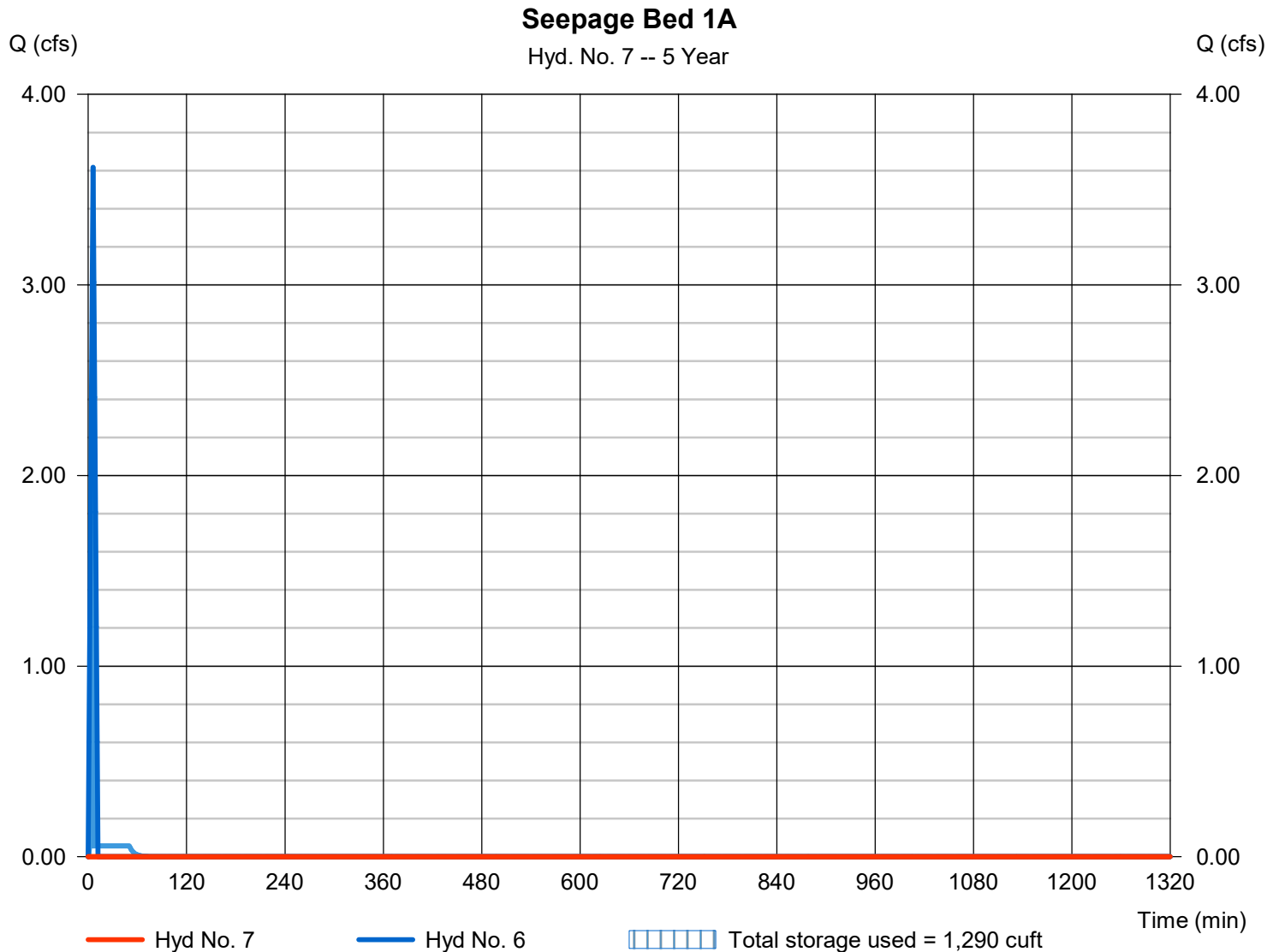
Hydrograph Report

Hyd. No. 7

Seepage Bed 1A

Hydrograph type	= Reservoir	Peak discharge	= 0.000 cfs
Storm frequency	= 5 yrs	Time to peak	= 277 min
Time interval	= 1 min	Hyd. volume	= 0 cuft
Inflow hyd. No.	= 6 - 1A Post Dev Controlled Total	Max. Elevation	= 127.09 ft
Reservoir name	= Seepage Bed 1A	Max. Storage	= 1,290 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Hyd. No. 8

1B Post Dev Site

Hydrograph type	= Mod. Rational	Peak discharge	= 1.378 cfs
Storm frequency	= 5 yrs	Time to peak	= 6 min
Time interval	= 1 min	Hyd. volume	= 496 cuft
Drainage area	= 0.270 ac	Runoff coeff.	= 0.94
Intensity	= 5.429 in/hr	Tc by User	= 6.00 min
IDF Curve	= PA-Doylestown.IDF	Storm duration	= 1.0 x Tc
Target Q	=n/a	Est. Req'd Storage	=n/a



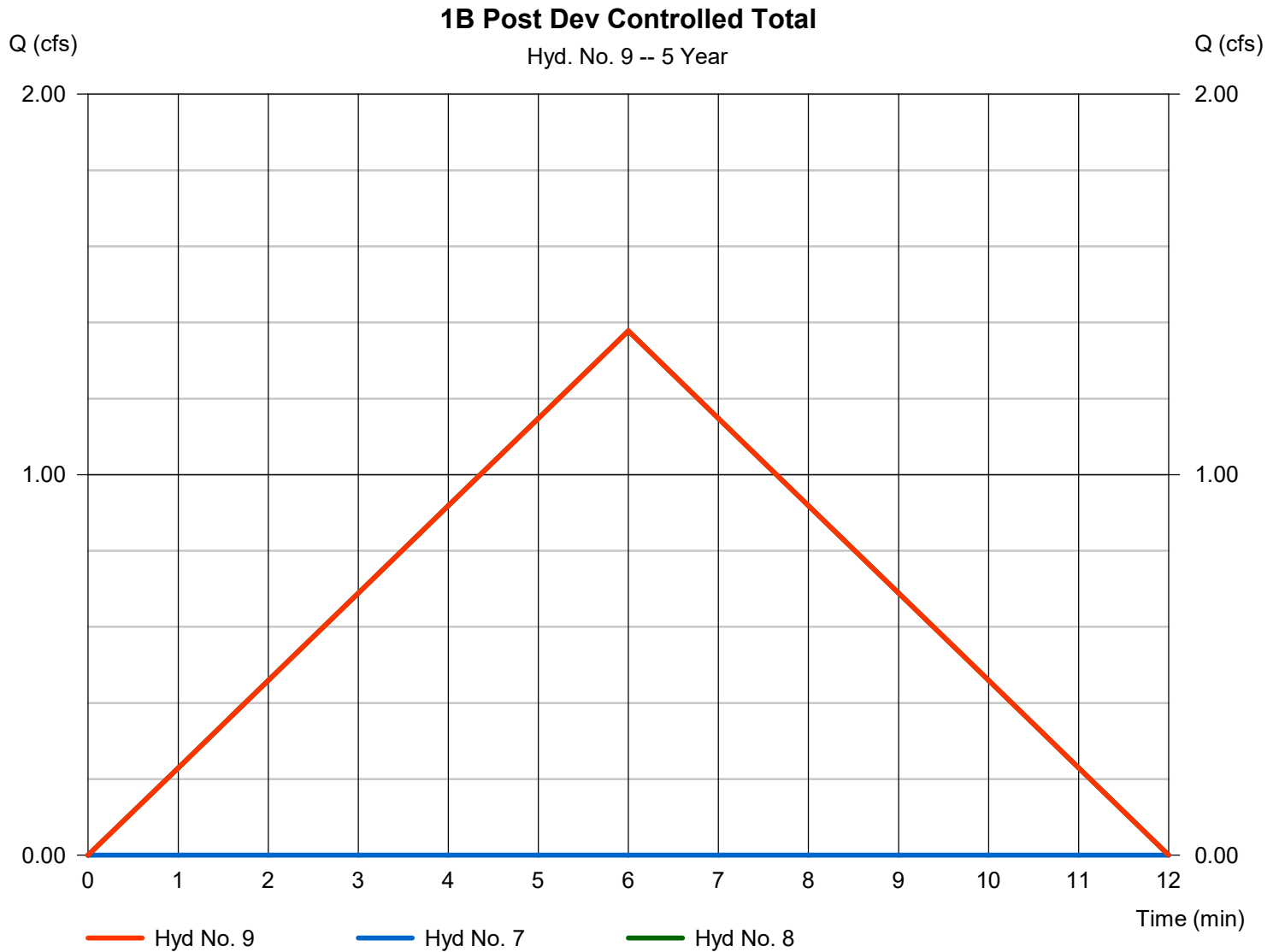
Hydrograph Report

Hyd. No. 9

1B Post Dev Controlled Total

Hydrograph type = Combine
Storm frequency = 5 yrs
Time interval = 1 min
Inflow hyds. = 7, 8

Peak discharge = 1.378 cfs
Time to peak = 6 min
Hyd. volume = 496 cuft
Contrib. drain. area = 0.270 ac



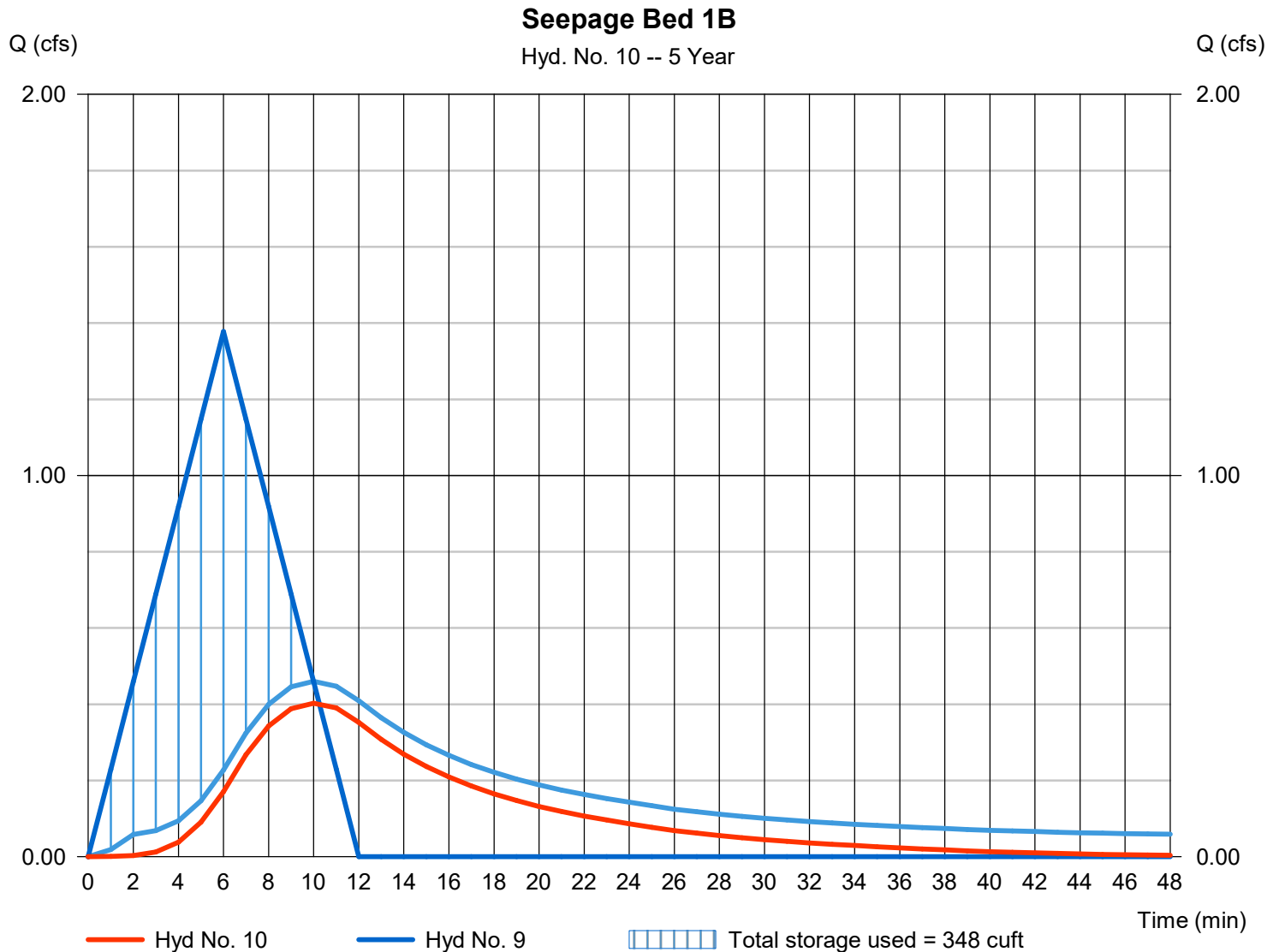
Hydrograph Report

Hyd. No. 10

Seepage Bed 1B

Hydrograph type	= Reservoir	Peak discharge	= 0.403 cfs
Storm frequency	= 5 yrs	Time to peak	= 10 min
Time interval	= 1 min	Hyd. volume	= 312 cuft
Inflow hyd. No.	= 9 - 1B Post Dev Controlled Total	Max. Elevation	= 127.36 ft
Reservoir name	= Seepage Bed 1B	Max. Storage	= 348 cuft

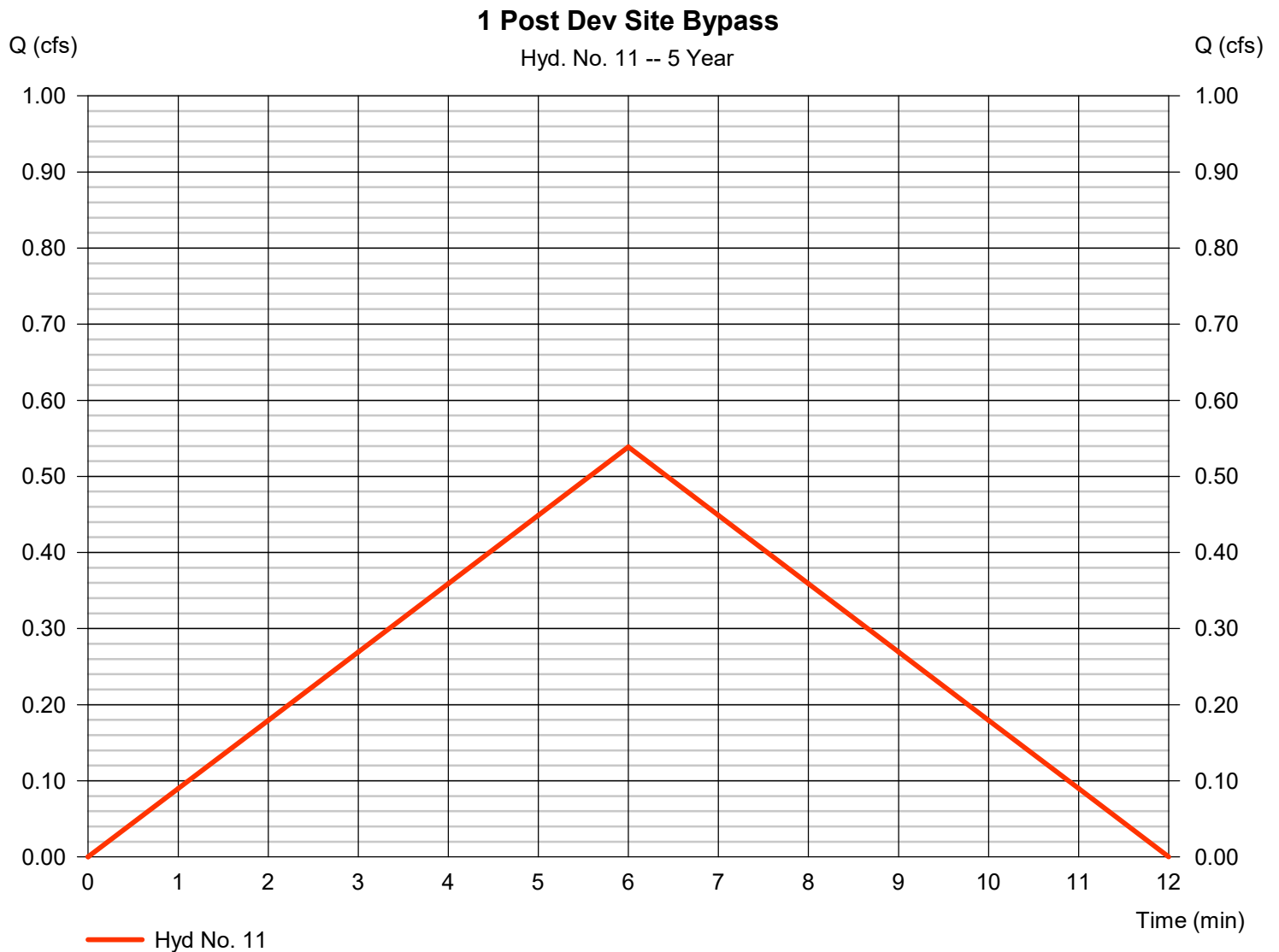
Storage Indication method used. Exfiltration extracted from Outflow.



Hyd. No. 11

1 Post Dev Site Bypass

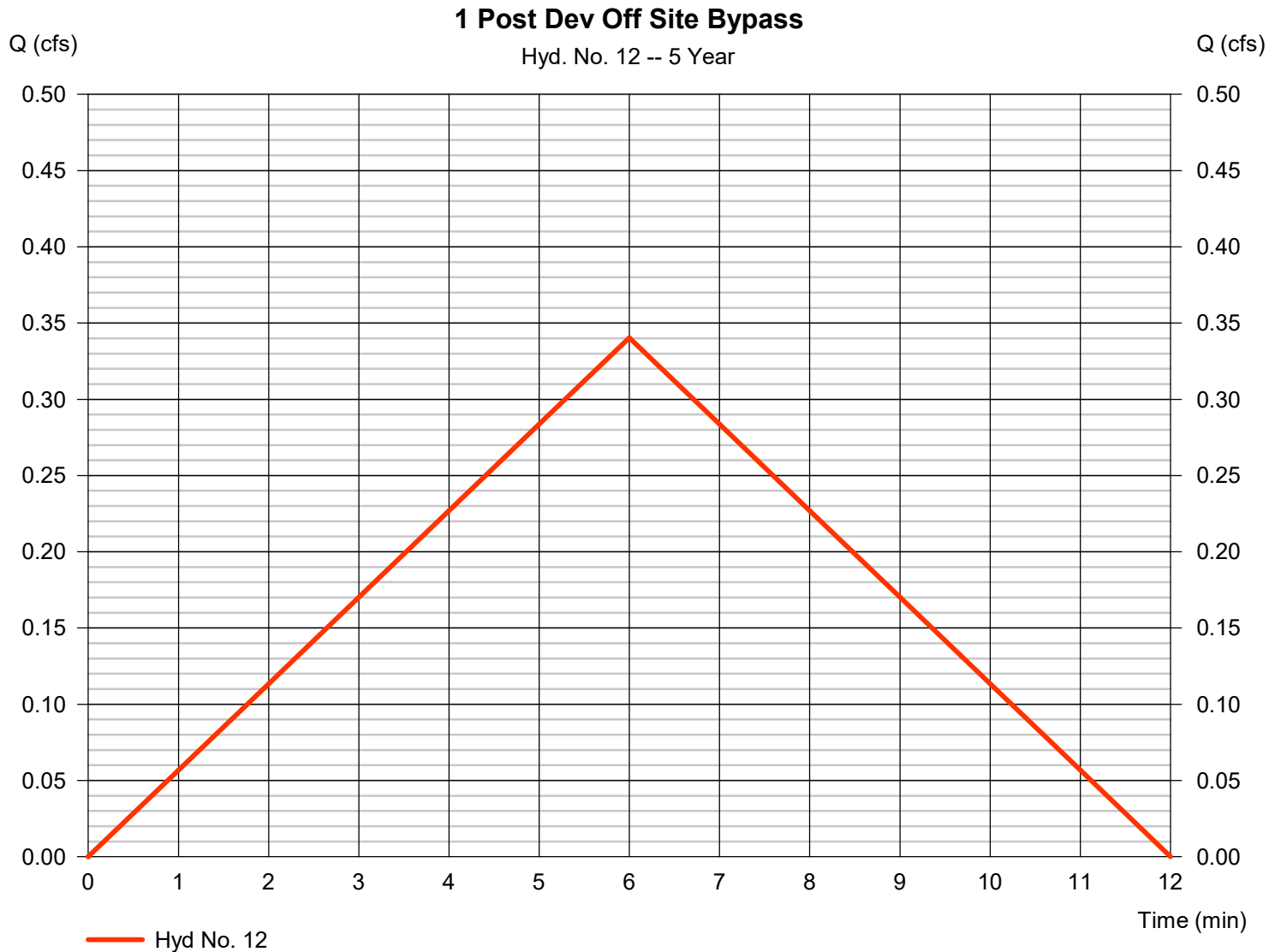
Hydrograph type	= Mod. Rational	Peak discharge	= 0.539 cfs
Storm frequency	= 5 yrs	Time to peak	= 6 min
Time interval	= 1 min	Hyd. volume	= 194 cuft
Drainage area	= 0.160 ac	Runoff coeff.	= 0.62
Intensity	= 5.429 in/hr	Tc by User	= 6.00 min
IDF Curve	= PA-Doylestown.IDF	Storm duration	= 1.0 x Tc
Target Q	=n/a	Est. Req'd Storage	=n/a



Hyd. No. 12

1 Post Dev Off Site Bypass

Hydrograph type	= Mod. Rational	Peak discharge	= 0.340 cfs
Storm frequency	= 5 yrs	Time to peak	= 6 min
Time interval	= 1 min	Hyd. volume	= 123 cuft
Drainage area	= 0.110 ac	Runoff coeff.	= 0.57
Intensity	= 5.429 in/hr	Tc by User	= 6.00 min
IDF Curve	= PA-Doylestown.IDF	Storm duration	= 1.0 x Tc
Target Q	=n/a	Est. Req'd Storage	=n/a



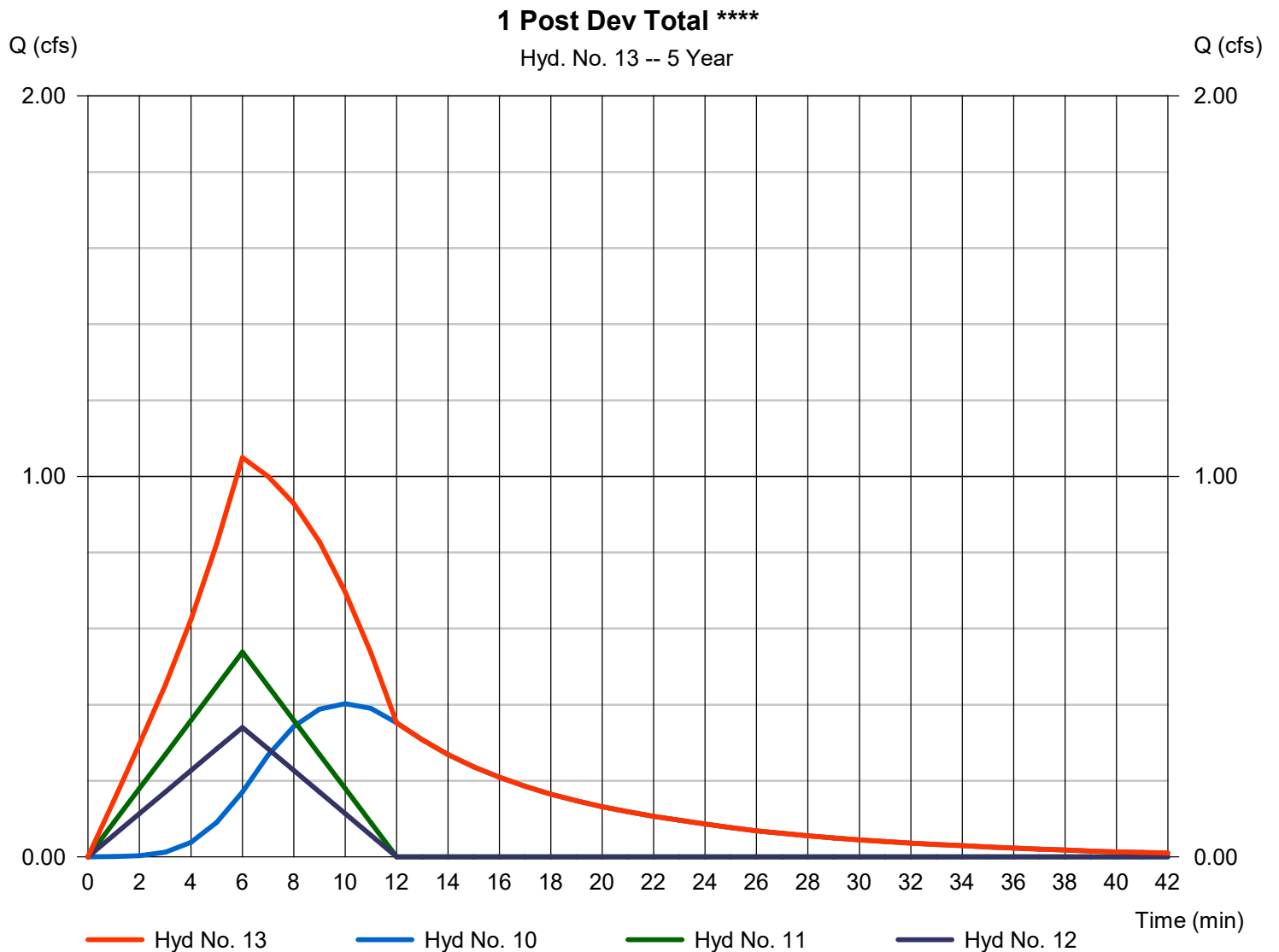
Hydrograph Report

Hyd. No. 13

1 Post Dev Total ****

Hydrograph type = Combine
Storm frequency = 5 yrs
Time interval = 1 min
Inflow hyds. = 10, 11, 12

Peak discharge = 1.050 cfs
Time to peak = 6 min
Hyd. volume = 628 cuft
Contrib. drain. area = 0.270 ac



Hyd. No. 15

2 Pre Dev Site

Hydrograph type	= Mod. Rational	Peak discharge	= 0.682 cfs
Storm frequency	= 5 yrs	Time to peak	= 7 min
Time interval	= 1 min	Hyd. volume	= 287 cuft
Drainage area	= 0.410 ac	Runoff coeff.	= 0.32
Intensity	= 5.199 in/hr	Tc by User	= 7.00 min
IDF Curve	= PA-Doylestown.IDF	Storm duration	= 1.0 x Tc
Target Q	=n/a	Est. Req'd Storage	=n/a



Hyd. No. 16

2 Pre Dev Off Site

Hydrograph type	= Mod. Rational	Peak discharge	= 3.556 cfs
Storm frequency	= 5 yrs	Time to peak	= 7 min
Time interval	= 1 min	Hyd. volume	= 1,494 cuft
Drainage area	= 1.520 ac	Runoff coeff.	= 0.45
Intensity	= 5.199 in/hr	Tc by User	= 7.00 min
IDF Curve	= PA-Doylestown.IDF	Storm duration	= 1.0 x Tc
Target Q	=n/a	Est. Req'd Storage	=n/a



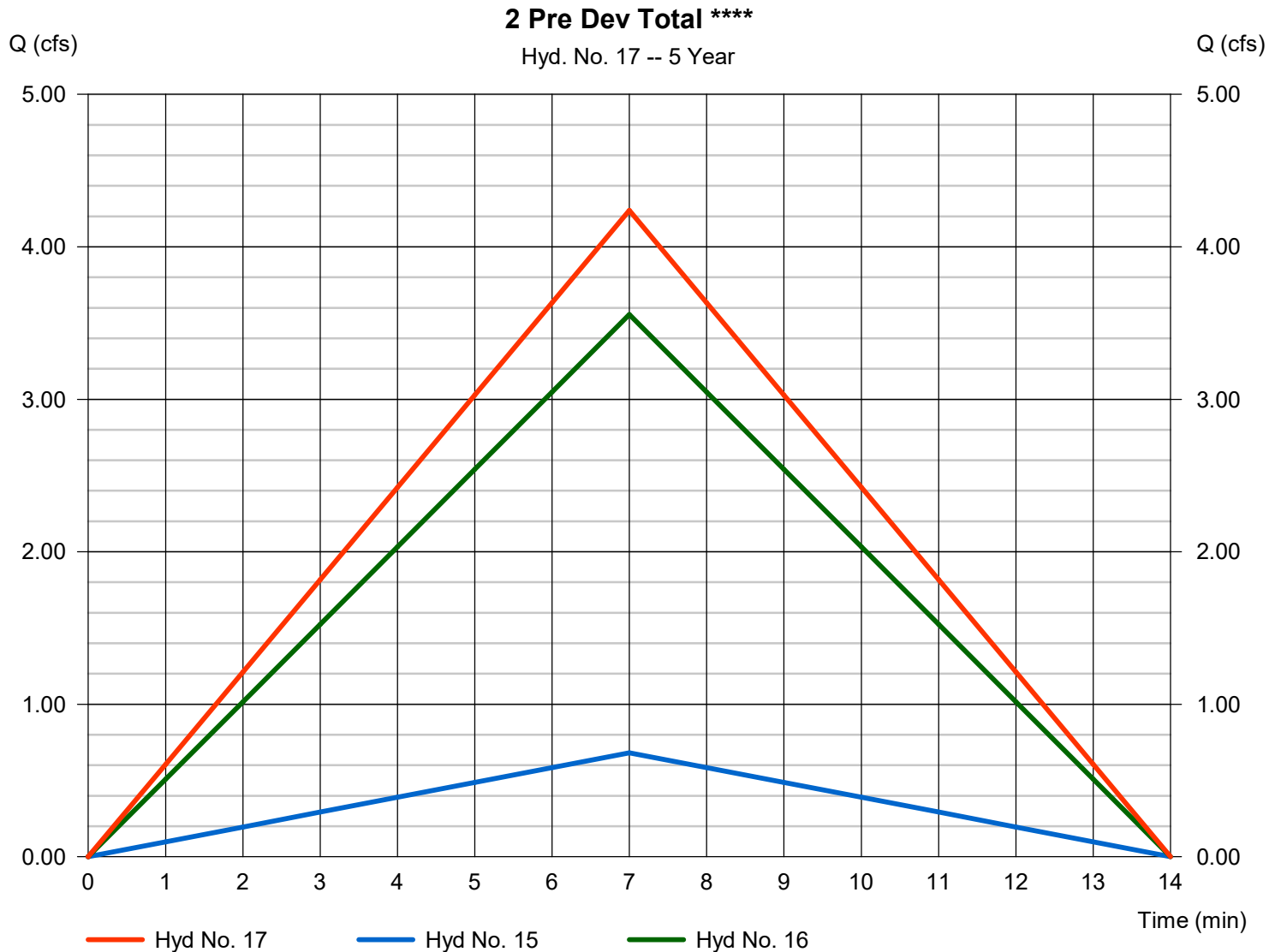
Hydrograph Report

Hyd. No. 17

2 Pre Dev Total ****

Hydrograph type = Combine
Storm frequency = 5 yrs
Time interval = 1 min
Inflow hyds. = 15, 16

Peak discharge = 4.239 cfs
Time to peak = 7 min
Hyd. volume = 1,780 cuft
Contrib. drain. area = 1.930 ac



Hydrograph Report

Hyd. No. 18

2 Post Dev Site

Hydrograph type	= Mod. Rational	Peak discharge	= 0.406 cfs
Storm frequency	= 5 yrs	Time to peak	= 6 min
Time interval	= 1 min	Hyd. volume	= 146 cuft
Drainage area	= 0.090 ac	Runoff coeff.	= 0.83
Intensity	= 5.429 in/hr	Tc by User	= 6.00 min
IDF Curve	= PA-Doylestown.IDF	Storm duration	= 1.0 x Tc
Target Q	=n/a	Est. Req'd Storage	=n/a



Hydrograph Report

Hyd. No. 19

2 Post Dev Off Site

Hydrograph type	= Mod. Rational	Peak discharge	= 0.036 cfs
Storm frequency	= 5 yrs	Time to peak	= 6 min
Time interval	= 1 min	Hyd. volume	= 13 cuft
Drainage area	= 0.060 ac	Runoff coeff.	= 0.11
Intensity	= 5.429 in/hr	Tc by User	= 6.00 min
IDF Curve	= PA-Doylestown.IDF	Storm duration	= 1.0 x Tc
Target Q	=n/a	Est. Req'd Storage	=n/a



Hydrograph Report

Hyd. No. 20

2 Post Dev Controlled Total

Hydrograph type = Combine
Storm frequency = 5 yrs
Time interval = 1 min
Inflow hyds. = 18, 19

Peak discharge = 0.441 cfs
Time to peak = 6 min
Hyd. volume = 159 cuft
Contrib. drain. area = 0.150 ac



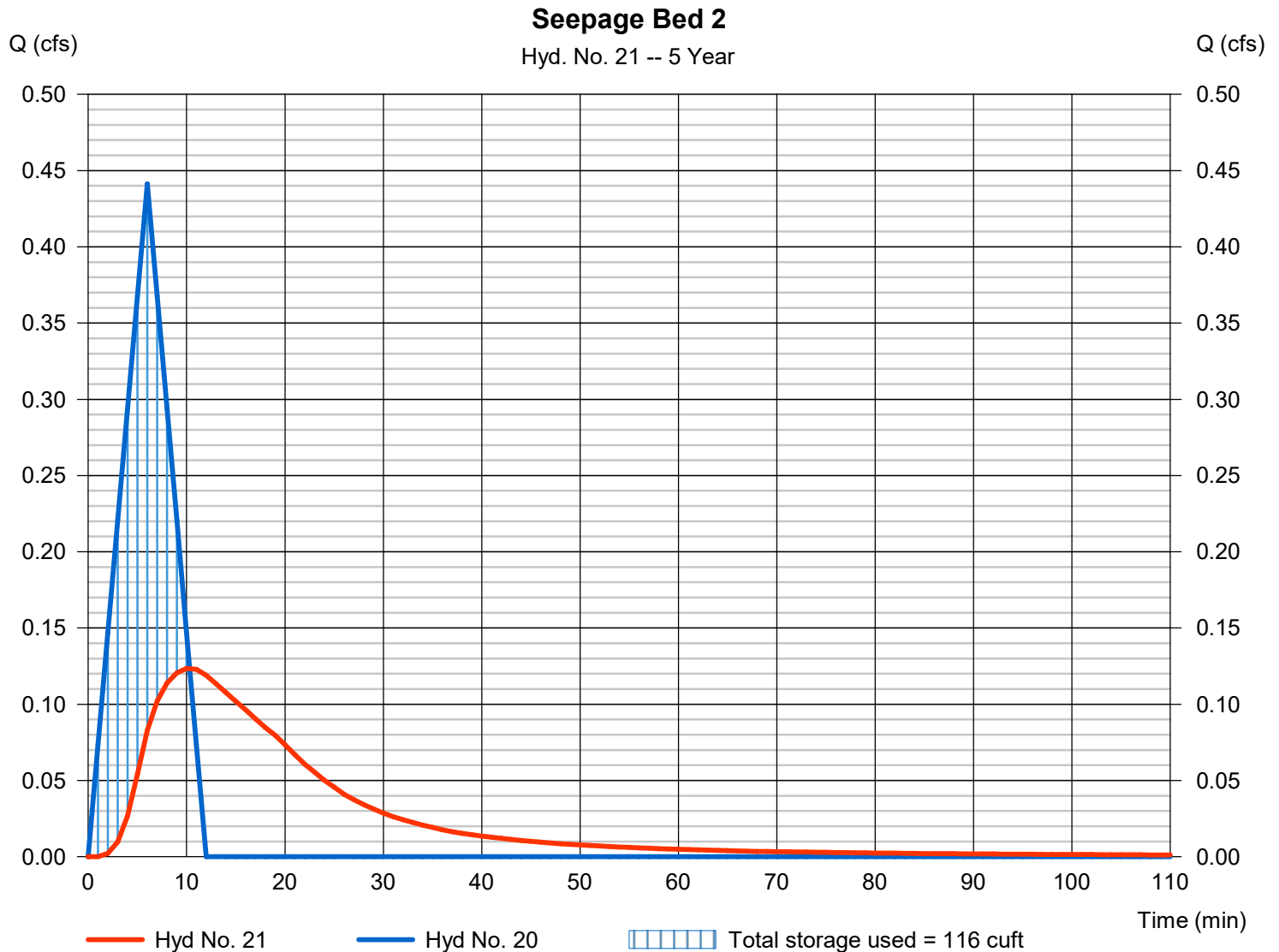
Hydrograph Report

Hyd. No. 21

Seepage Bed 2

Hydrograph type	= Reservoir	Peak discharge	= 0.124 cfs
Storm frequency	= 5 yrs	Time to peak	= 10 min
Time interval	= 1 min	Hyd. volume	= 153 cuft
Inflow hyd. No.	= 20 - 2 Post Dev Controlled Total	Max. Elevation	= 108.40 ft
Reservoir name	= Seepage Bed 2	Max. Storage	= 116 cuft

Storage Indication method used.



Hyd. No. 22

2 Post Dev Site Bypass

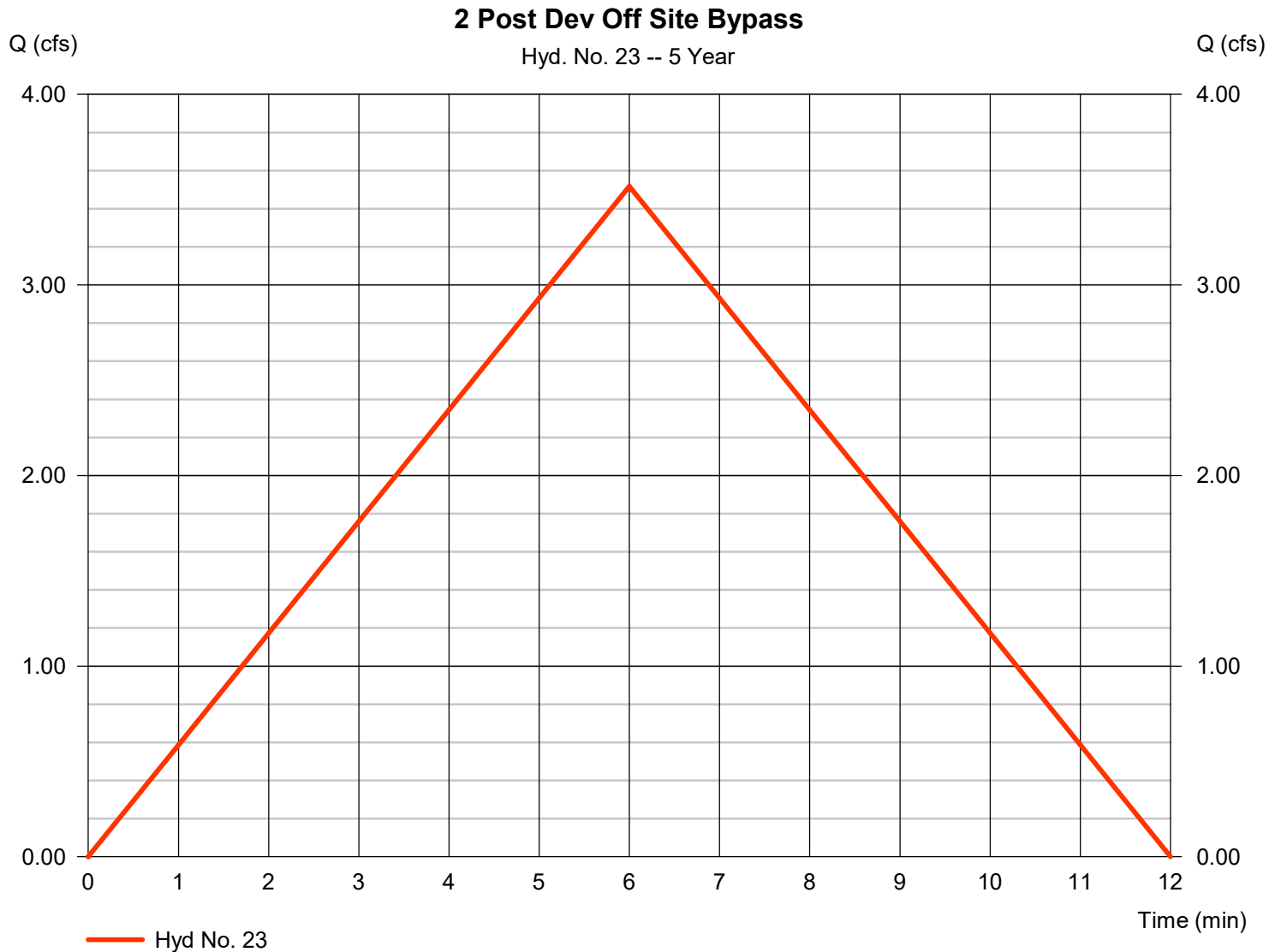
Hydrograph type	= Mod. Rational	Peak discharge	= 0.619 cfs
Storm frequency	= 5 yrs	Time to peak	= 6 min
Time interval	= 1 min	Hyd. volume	= 223 cuft
Drainage area	= 0.200 ac	Runoff coeff.	= 0.57
Intensity	= 5.429 in/hr	Tc by User	= 6.00 min
IDF Curve	= PA-Doylestown.IDF	Storm duration	= 1.0 x Tc
Target Q	=n/a	Est. Req'd Storage	=n/a



Hyd. No. 23

2 Post Dev Off Site Bypass

Hydrograph type	= Mod. Rational	Peak discharge	= 3.518 cfs
Storm frequency	= 5 yrs	Time to peak	= 6 min
Time interval	= 1 min	Hyd. volume	= 1,267 cuft
Drainage area	= 1.350 ac	Runoff coeff.	= 0.48
Intensity	= 5.429 in/hr	Tc by User	= 6.00 min
IDF Curve	= PA-Doylestown.IDF	Storm duration	= 1.0 x Tc
Target Q	=n/a	Est. Req'd Storage	=n/a



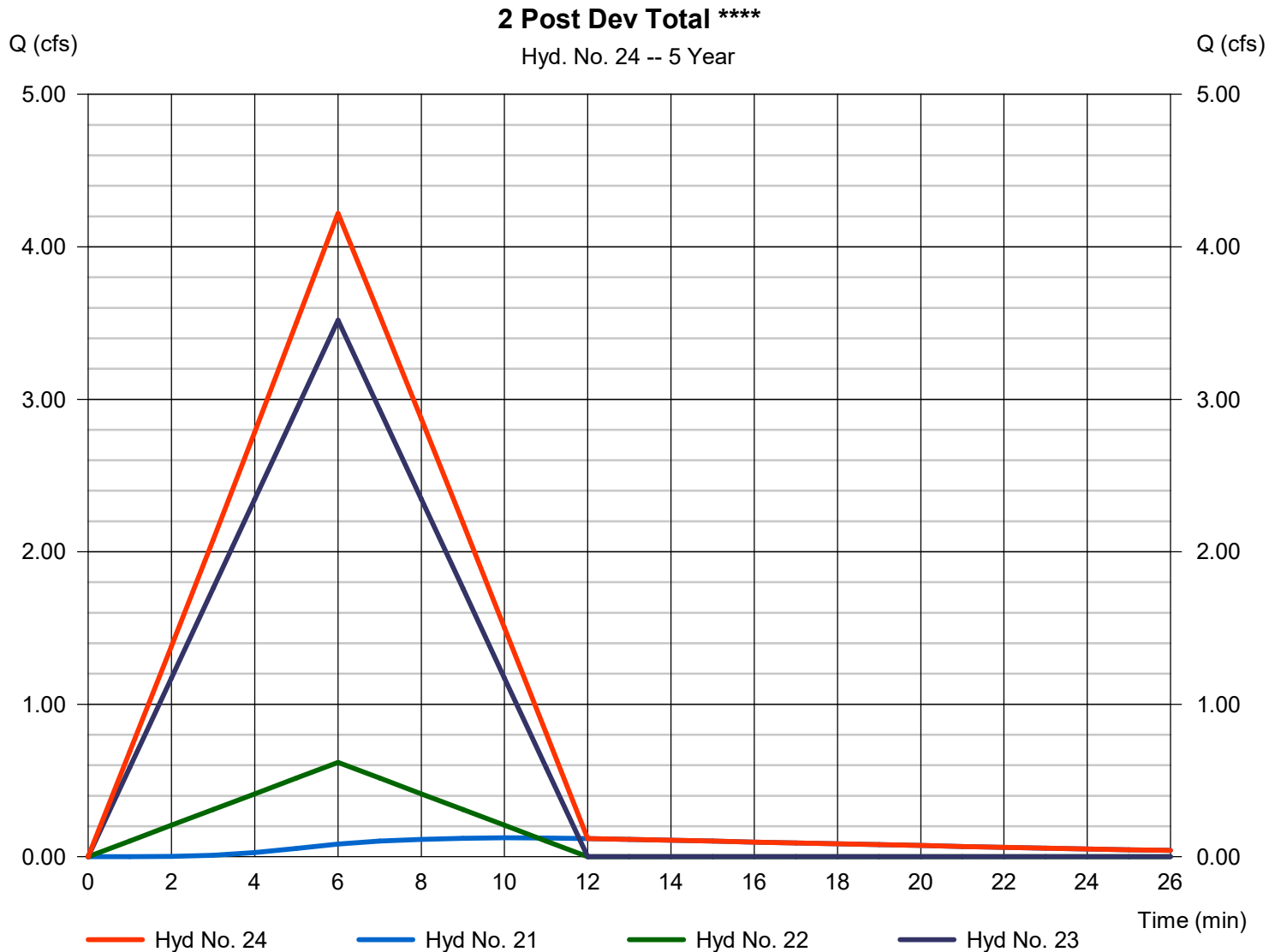
Hydrograph Report

Hyd. No. 24

2 Post Dev Total ****

Hydrograph type = Combine
Storm frequency = 5 yrs
Time interval = 1 min
Inflow hyds. = 21, 22, 23

Peak discharge = 4.220 cfs
Time to peak = 6 min
Hyd. volume = 1,642 cuft
Contrib. drain. area = 1.550 ac



Hydrograph Summary Report

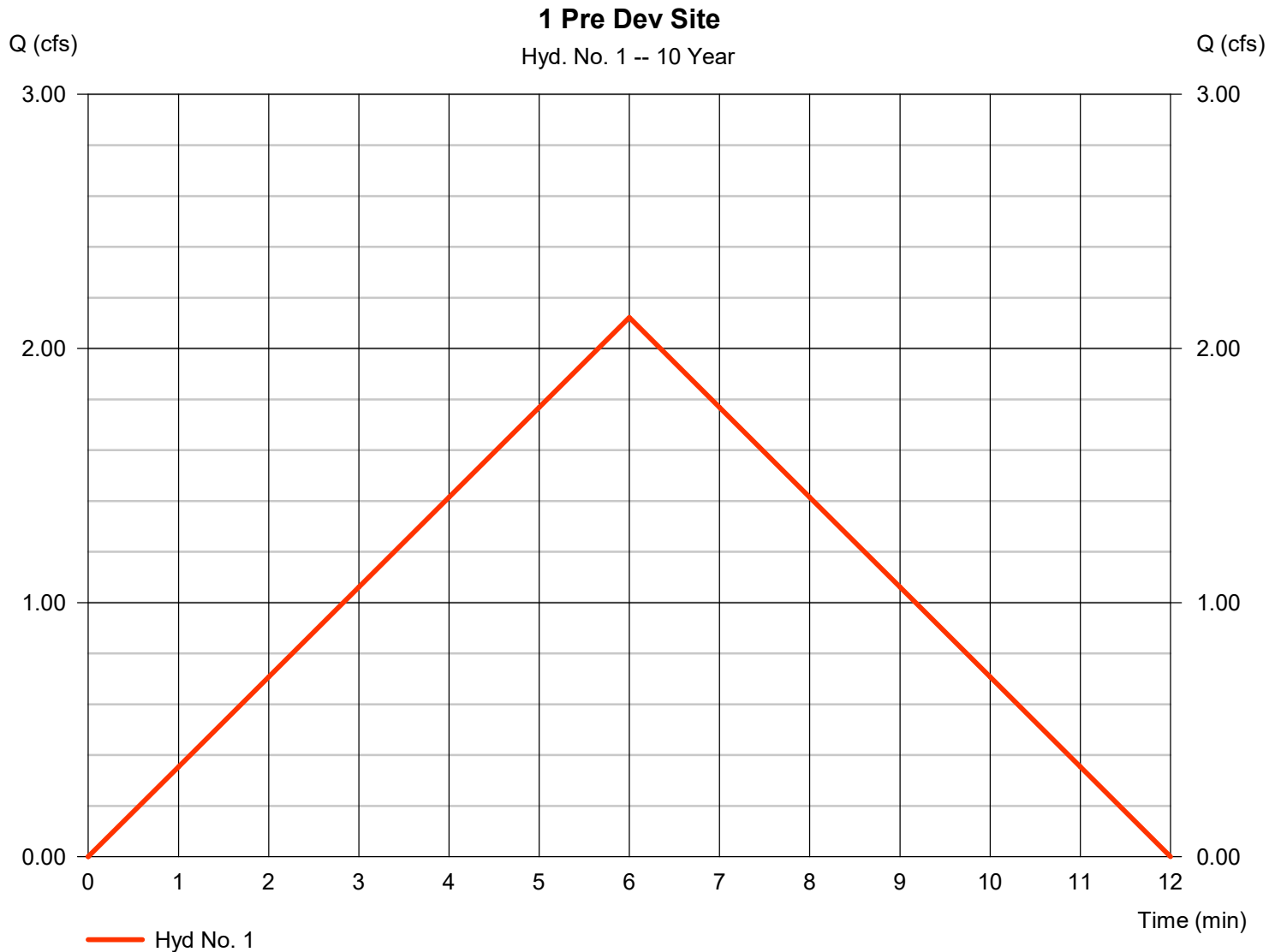
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

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	Mod. Rational	2.122	1	6	764	----	----	----	1 Pre Dev Site	
2	Mod. Rational	2.257	1	6	813	----	----	----	1 Pre Dev Off Site	
3	Combine	4.379	1	6	1,576	1, 2	----	----	1 Pre Dev Total ****	
4	Mod. Rational	1.933	1	6	696	----	----	----	1A Post Dev Site	
5	Mod. Rational	2.076	1	6	748	----	----	----	1A Post Dev Off Site	
6	Combine	4.010	1	6	1,443	4, 5	----	----	1A Post Dev Controlled Total	
7	Reservoir	0.000	1	12	0	6	127.21	1,432	Seepage Bed 1A	
8	Mod. Rational	1.528	1	6	550	----	----	----	1B Post Dev Site	
9	Combine	1.528	1	6	550	7, 8	----	----	1B Post Dev Controlled Total	
10	Reservoir	0.467	1	10	362	9	127.40	382	Seepage Bed 1B	
11	Mod. Rational	0.597	1	6	215	----	----	----	1 Post Dev Site Bypass	
12	Mod. Rational	0.377	1	6	136	----	----	----	1 Post Dev Off Site Bypass	
13	Combine	1.182	1	6	713	10, 11, 12	----	----	1 Post Dev Total ****	
15	Mod. Rational	0.757	1	7	318	----	----	----	2 Pre Dev Site	
16	Mod. Rational	3.946	1	7	1,658	----	----	----	2 Pre Dev Off Site	
17	Combine	4.703	1	7	1,975	15, 16	----	----	2 Pre Dev Total ****	
18	Mod. Rational	0.450	1	6	162	----	----	----	2 Post Dev Site	
19	Mod. Rational	0.040	1	6	14	----	----	----	2 Post Dev Off Site	
20	Combine	0.489	1	6	176	18, 19	----	----	2 Post Dev Controlled Total	
21	Reservoir	0.133	1	10	170	20	108.44	129	Seepage Bed 2	
22	Mod. Rational	0.686	1	6	247	----	----	----	2 Post Dev Site Bypass	
23	Mod. Rational	3.900	1	6	1,404	----	----	----	2 Post Dev Off Site Bypass	
24	Combine	4.677	1	6	1,821	21, 22, 23	----	----	2 Post Dev Total ****	
301 Watersheds 2084 RM.gpw					Return Period: 10 Year			Friday, 09 / 22 / 2023		

Hyd. No. 1

1 Pre Dev Site

Hydrograph type	= Mod. Rational	Peak discharge	= 2.122 cfs
Storm frequency	= 10 yrs	Time to peak	= 6 min
Time interval	= 1 min	Hyd. volume	= 764 cuft
Drainage area	= 0.750 ac	Runoff coeff.	= 0.47
Intensity	= 6.019 in/hr	Tc by User	= 6.00 min
IDF Curve	= PA-Doylestown.IDF	Storm duration	= 1.0 x Tc
Target Q	=n/a	Est. Req'd Storage	=n/a



Hyd. No. 2

1 Pre Dev Off Site

Hydrograph type	= Mod. Rational	Peak discharge	= 2.257 cfs
Storm frequency	= 10 yrs	Time to peak	= 6 min
Time interval	= 1 min	Hyd. volume	= 813 cuft
Drainage area	= 0.750 ac	Runoff coeff.	= 0.5
Intensity	= 6.019 in/hr	Tc by User	= 6.00 min
IDF Curve	= PA-Doylestown.IDF	Storm duration	= 1.0 x Tc
Target Q	=n/a	Est. Req'd Storage	=n/a



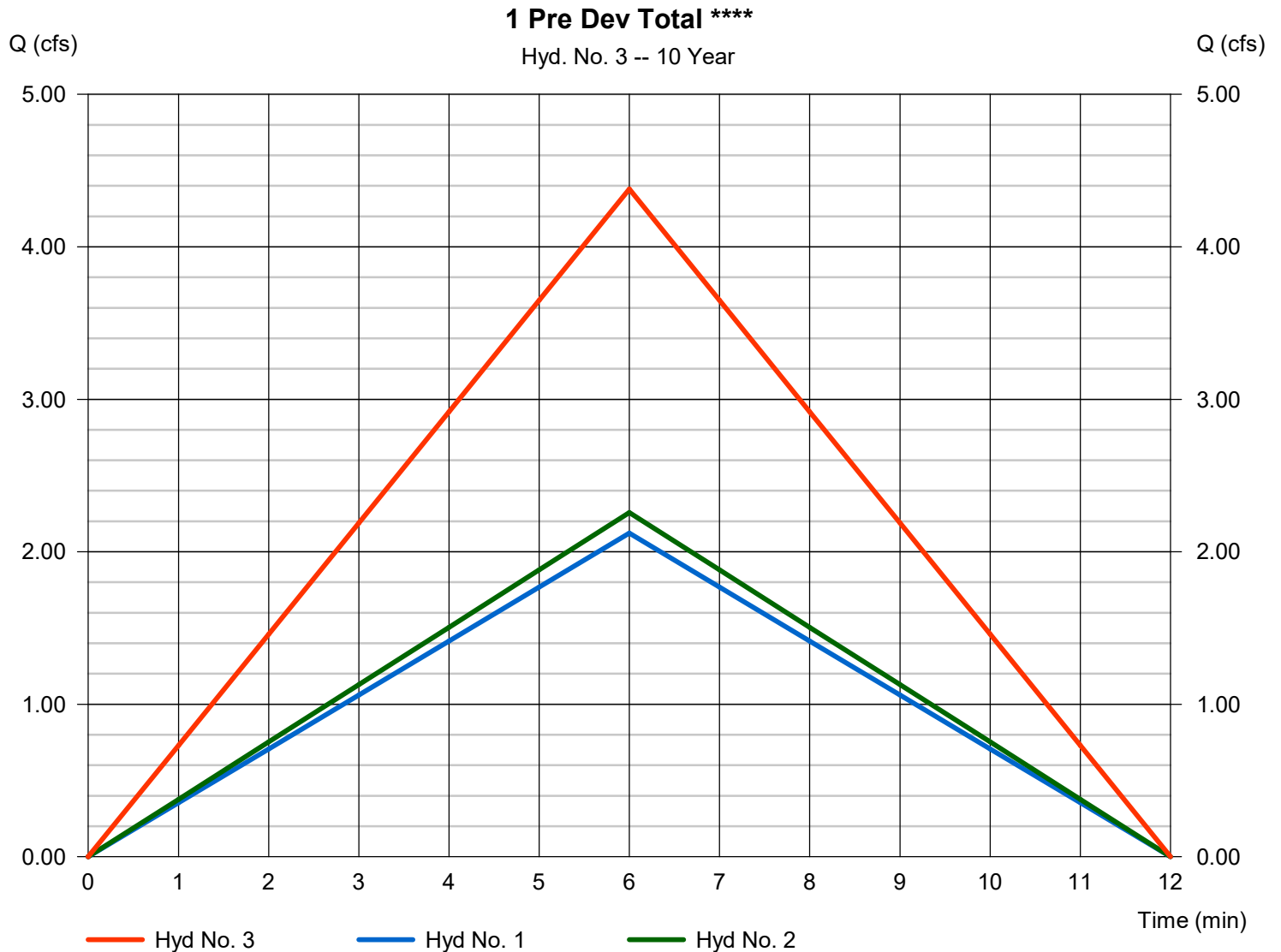
Hydrograph Report

Hyd. No. 3

1 Pre Dev Total ****

Hydrograph type = Combine
Storm frequency = 10 yrs
Time interval = 1 min
Inflow hyds. = 1, 2

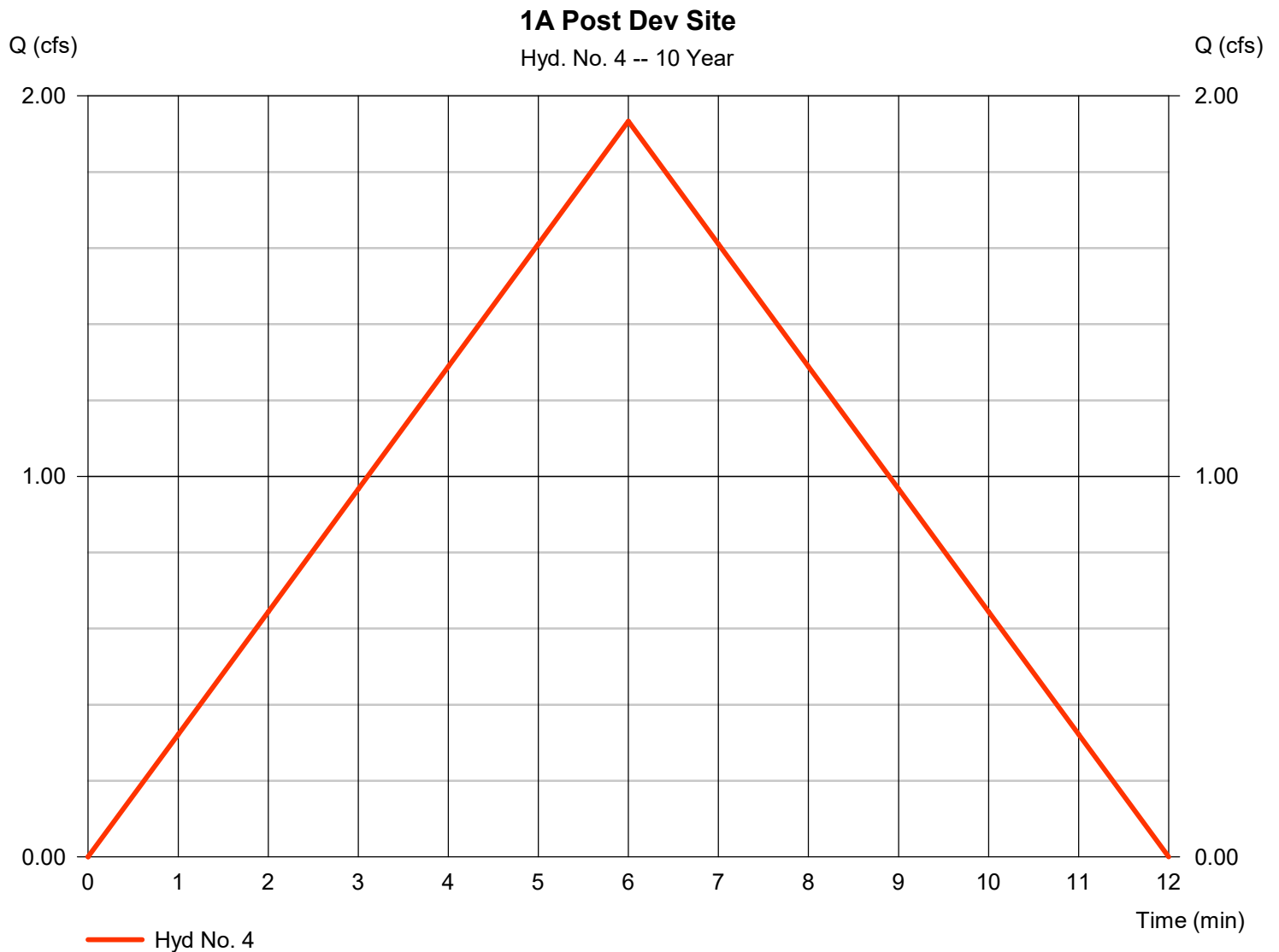
Peak discharge = 4.379 cfs
Time to peak = 6 min
Hyd. volume = 1,576 cuft
Contrib. drain. area = 1.500 ac



Hyd. No. 4

1A Post Dev Site

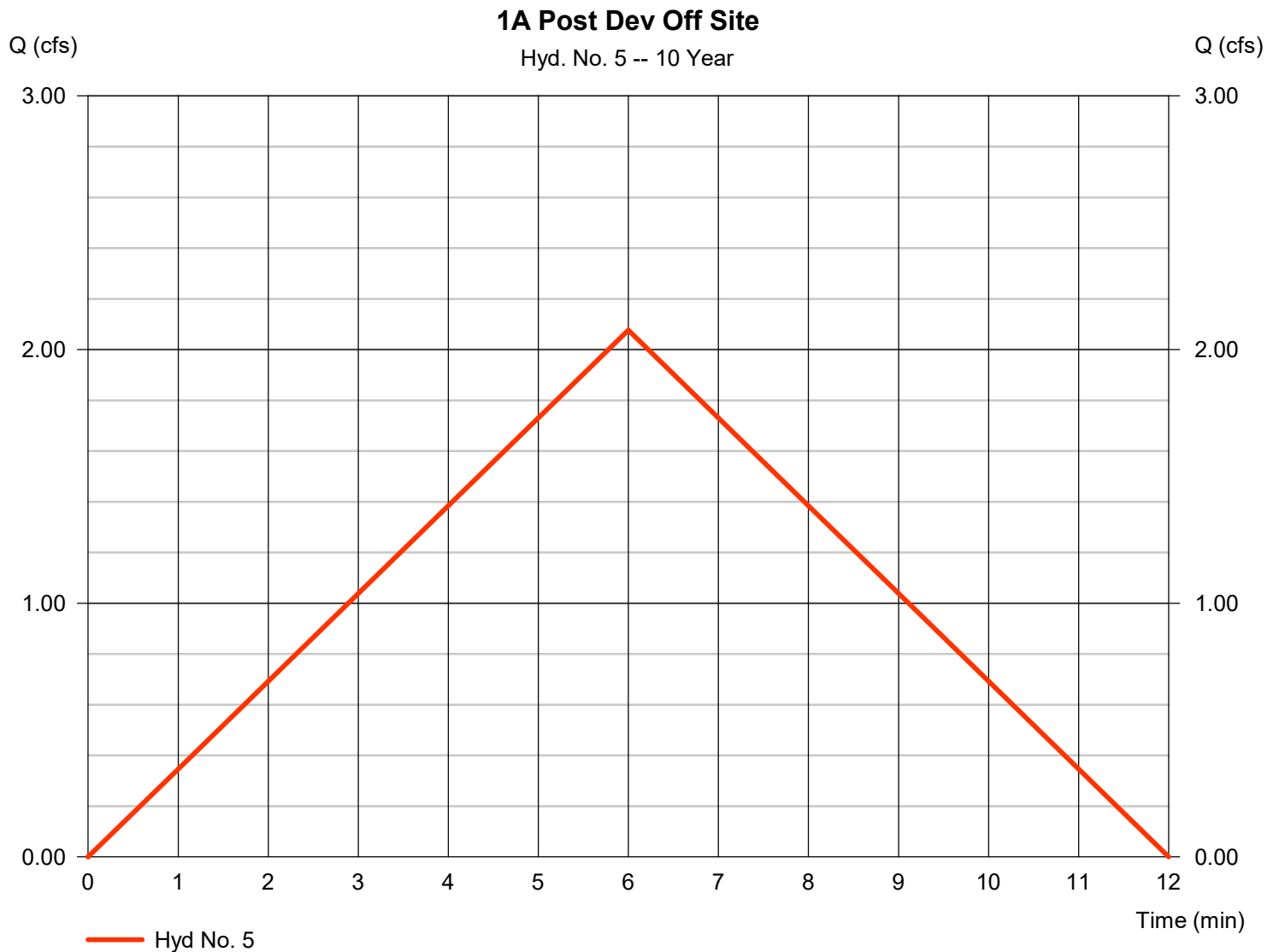
Hydrograph type	= Mod. Rational	Peak discharge	= 1.933 cfs
Storm frequency	= 10 yrs	Time to peak	= 6 min
Time interval	= 1 min	Hyd. volume	= 696 cuft
Drainage area	= 0.440 ac	Runoff coeff.	= 0.73
Intensity	= 6.019 in/hr	Tc by User	= 6.00 min
IDF Curve	= PA-Doylestown.IDF	Storm duration	= 1.0 x Tc
Target Q	=n/a	Est. Req'd Storage	=n/a



Hyd. No. 5

1A Post Dev Off Site

Hydrograph type	= Mod. Rational	Peak discharge	= 2.076 cfs
Storm frequency	= 10 yrs	Time to peak	= 6 min
Time interval	= 1 min	Hyd. volume	= 748 cuft
Drainage area	= 0.750 ac	Runoff coeff.	= 0.46
Intensity	= 6.019 in/hr	Tc by User	= 6.00 min
IDF Curve	= PA-Doylestown.IDF	Storm duration	= 1.0 x Tc
Target Q	=n/a	Est. Req'd Storage	=n/a

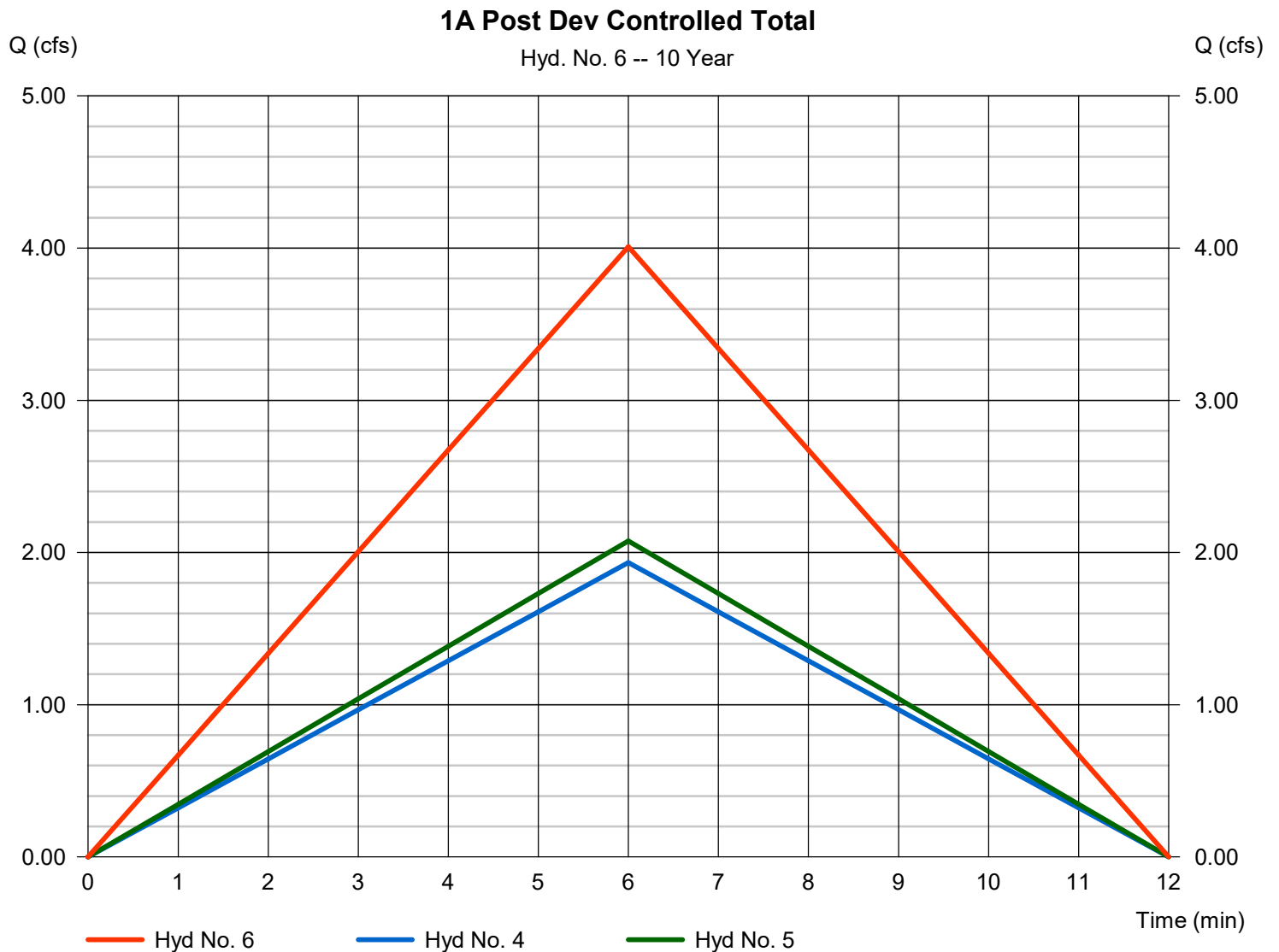


Hyd. No. 6

1A Post Dev Controlled Total

Hydrograph type = Combine
Storm frequency = 10 yrs
Time interval = 1 min
Inflow hyds. = 4, 5

Peak discharge = 4.010 cfs
Time to peak = 6 min
Hyd. volume = 1,443 cuft
Contrib. drain. area = 1.190 ac

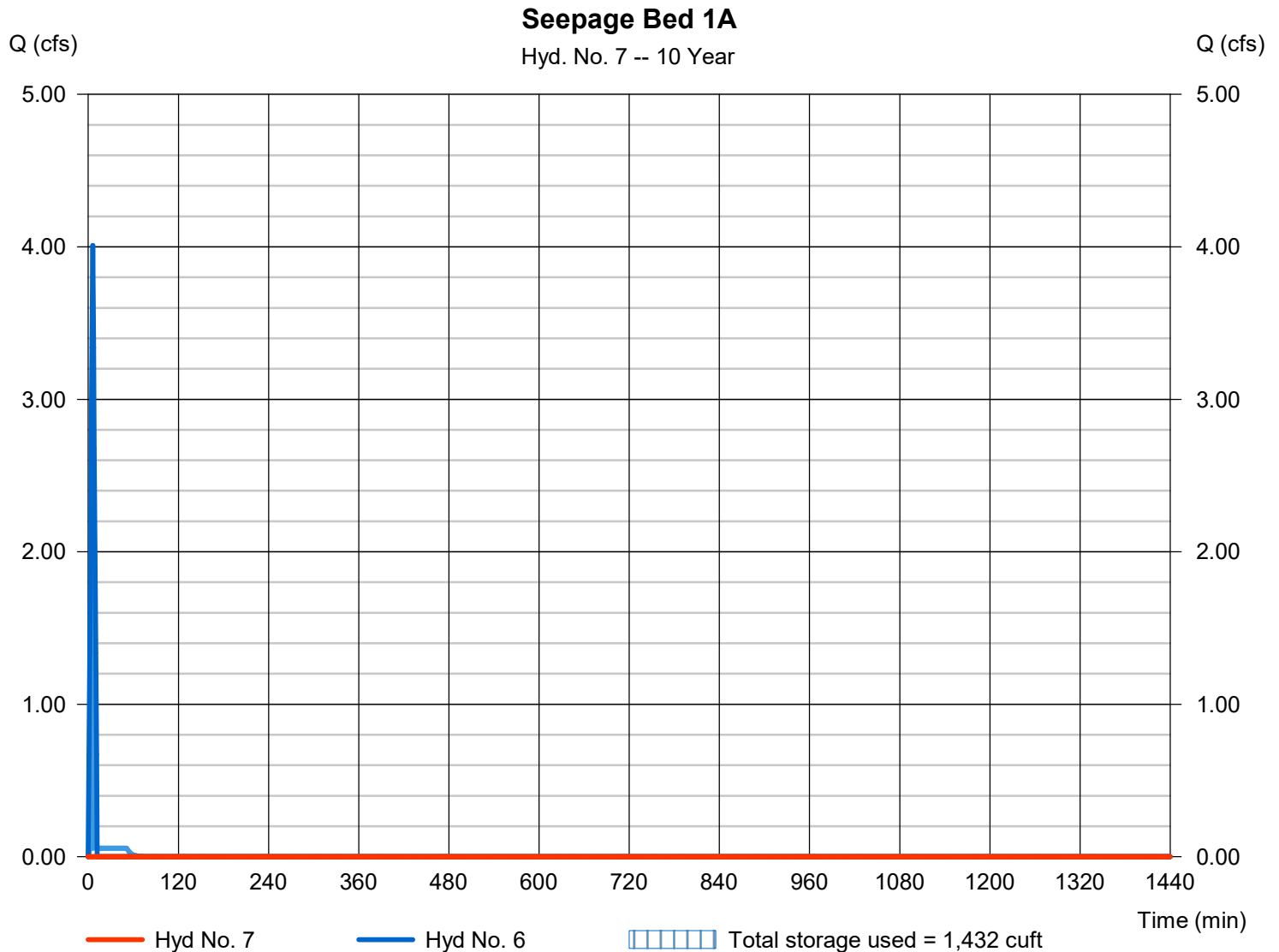


Hyd. No. 7

Seepage Bed 1A

Hydrograph type	= Reservoir	Peak discharge	= 0.000 cfs
Storm frequency	= 10 yrs	Time to peak	= 12 min
Time interval	= 1 min	Hyd. volume	= 0 cuft
Inflow hyd. No.	= 6 - 1A Post Dev Controlled Total	Max. Elevation	= 127.21 ft
Reservoir name	= Seepage Bed 1A	Max. Storage	= 1,432 cuft

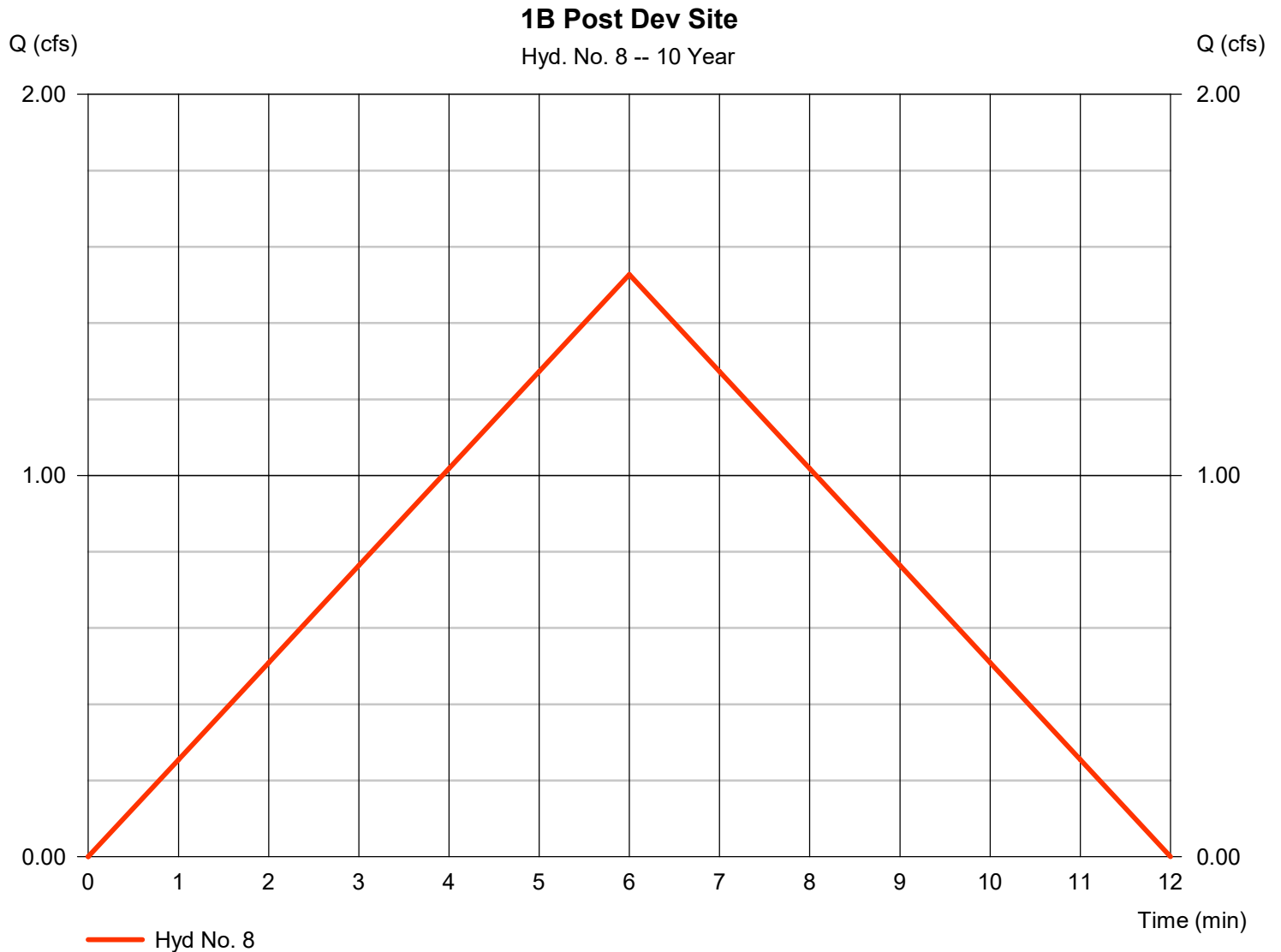
Storage Indication method used. Exfiltration extracted from Outflow.



Hyd. No. 8

1B Post Dev Site

Hydrograph type	= Mod. Rational	Peak discharge	= 1.528 cfs
Storm frequency	= 10 yrs	Time to peak	= 6 min
Time interval	= 1 min	Hyd. volume	= 550 cuft
Drainage area	= 0.270 ac	Runoff coeff.	= 0.94
Intensity	= 6.019 in/hr	Tc by User	= 6.00 min
IDF Curve	= PA-Doylestown.IDF	Storm duration	= 1.0 x Tc
Target Q	=n/a	Est. Req'd Storage	=n/a

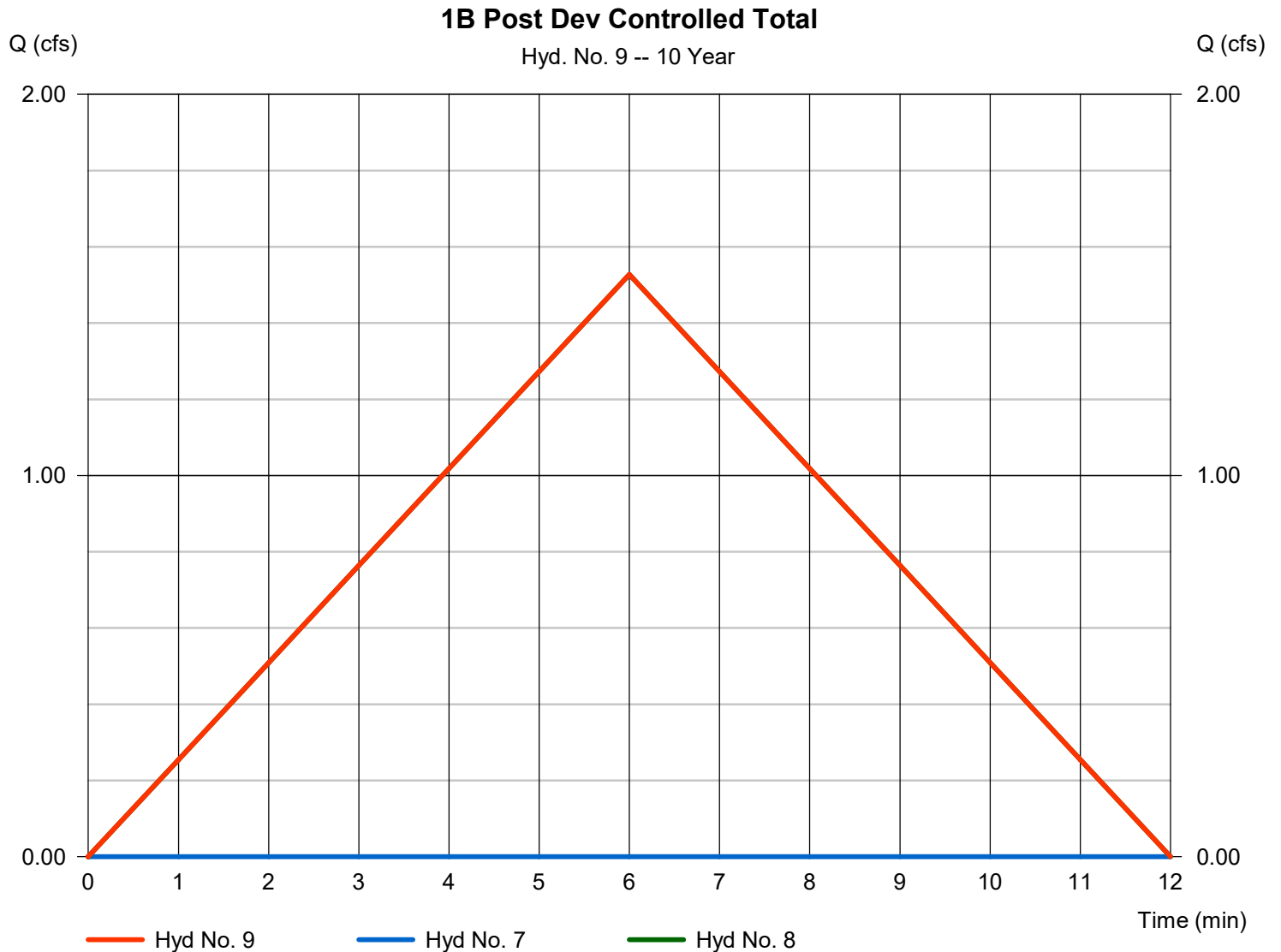


Hyd. No. 9

1B Post Dev Controlled Total

Hydrograph type = Combine
Storm frequency = 10 yrs
Time interval = 1 min
Inflow hyds. = 7, 8

Peak discharge = 1.528 cfs
Time to peak = 6 min
Hyd. volume = 550 cuft
Contrib. drain. area = 0.270 ac

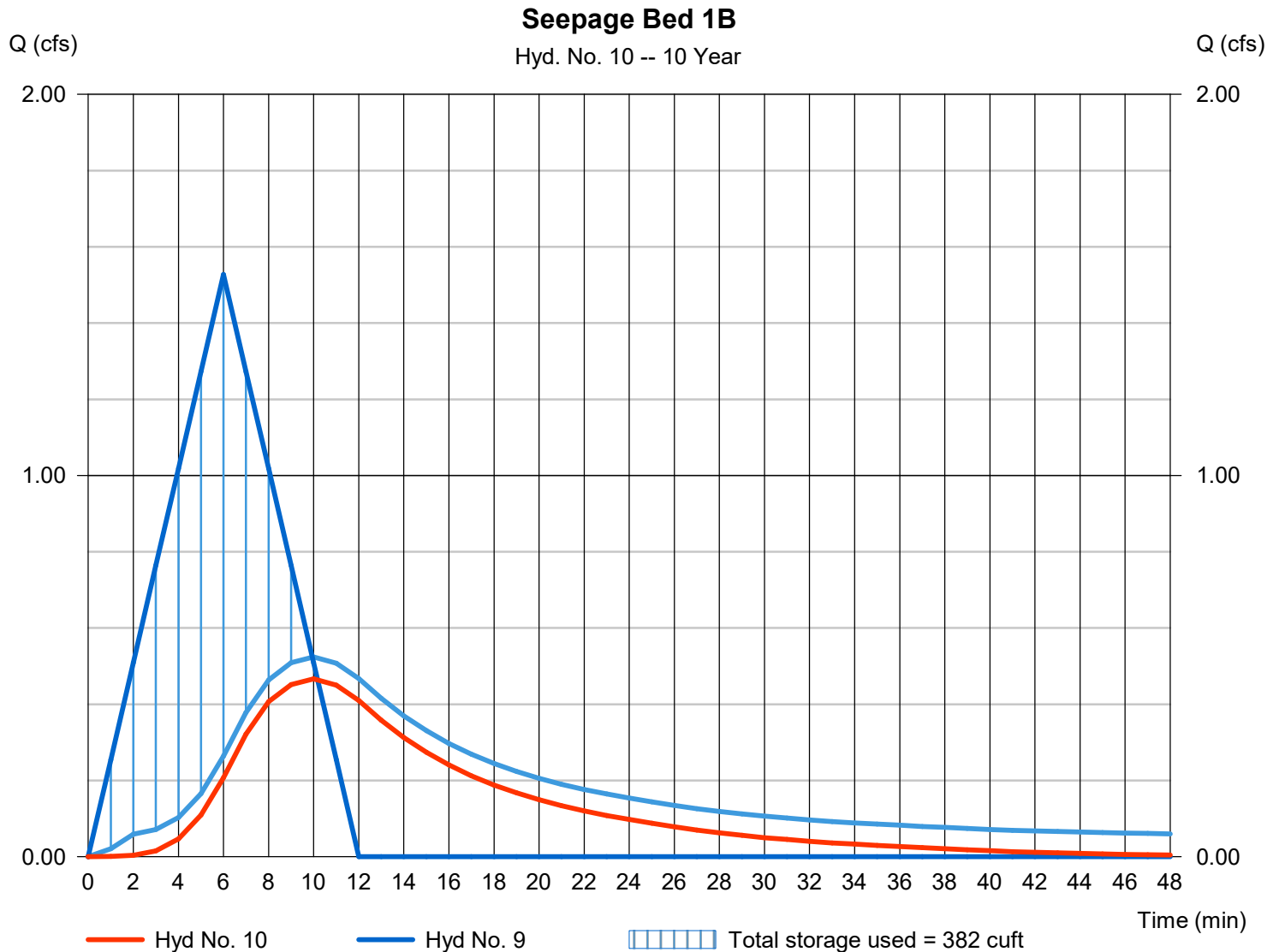


Hyd. No. 10

Seepage Bed 1B

Hydrograph type	= Reservoir	Peak discharge	= 0.467 cfs
Storm frequency	= 10 yrs	Time to peak	= 10 min
Time interval	= 1 min	Hyd. volume	= 362 cuft
Inflow hyd. No.	= 9 - 1B Post Dev Controlled Total	Max. Elevation	= 127.40 ft
Reservoir name	= Seepage Bed 1B	Max. Storage	= 382 cuft

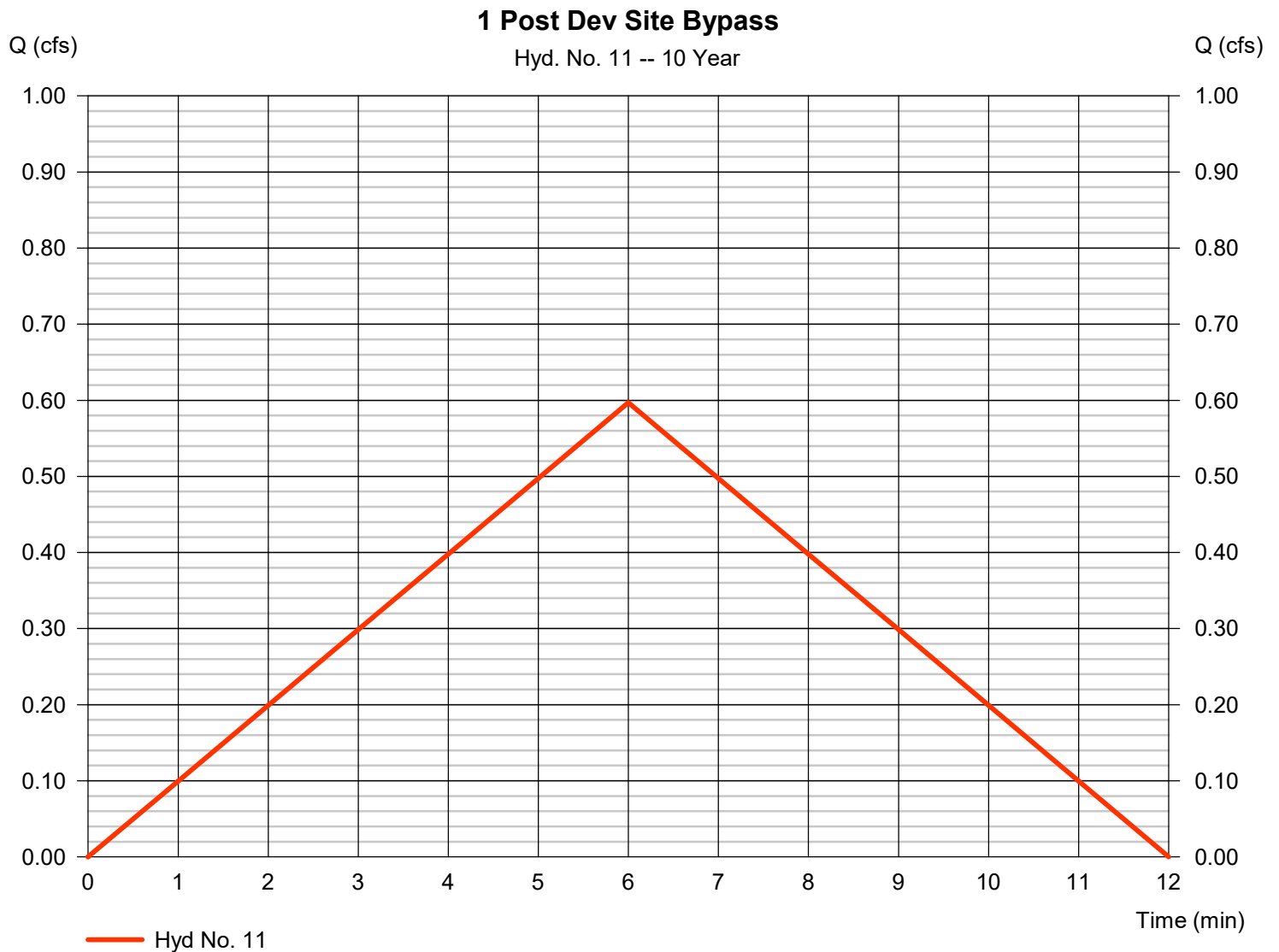
Storage Indication method used. Exfiltration extracted from Outflow.



Hyd. No. 11

1 Post Dev Site Bypass

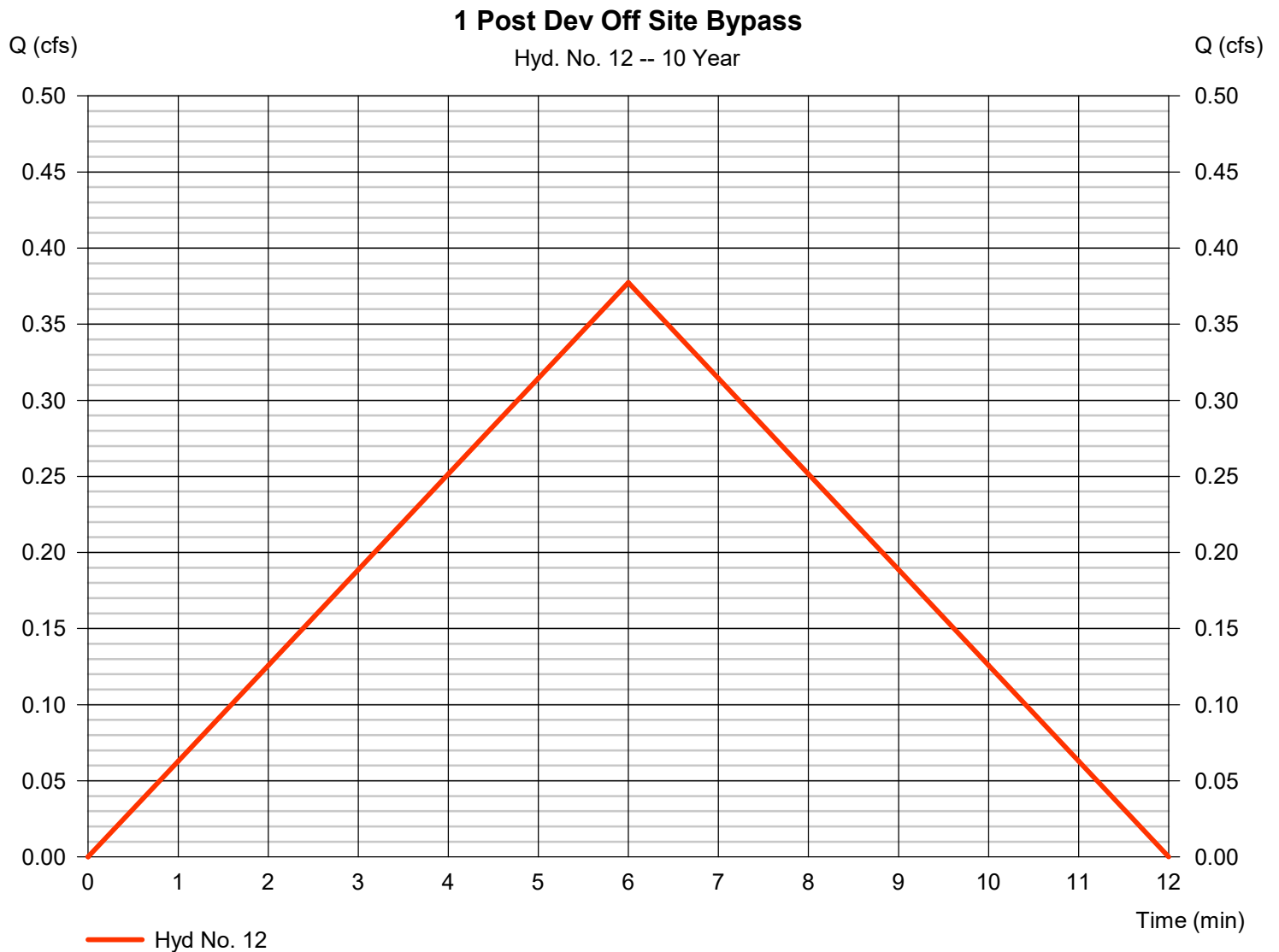
Hydrograph type	= Mod. Rational	Peak discharge	= 0.597 cfs
Storm frequency	= 10 yrs	Time to peak	= 6 min
Time interval	= 1 min	Hyd. volume	= 215 cuft
Drainage area	= 0.160 ac	Runoff coeff.	= 0.62
Intensity	= 6.019 in/hr	Tc by User	= 6.00 min
IDF Curve	= PA-Doylestown.IDF	Storm duration	= 1.0 x Tc
Target Q	=n/a	Est. Req'd Storage	=n/a



Hyd. No. 12

1 Post Dev Off Site Bypass

Hydrograph type	= Mod. Rational	Peak discharge	= 0.377 cfs
Storm frequency	= 10 yrs	Time to peak	= 6 min
Time interval	= 1 min	Hyd. volume	= 136 cuft
Drainage area	= 0.110 ac	Runoff coeff.	= 0.57
Intensity	= 6.019 in/hr	Tc by User	= 6.00 min
IDF Curve	= PA-Doylestown.IDF	Storm duration	= 1.0 x Tc
Target Q	=n/a	Est. Req'd Storage	=n/a

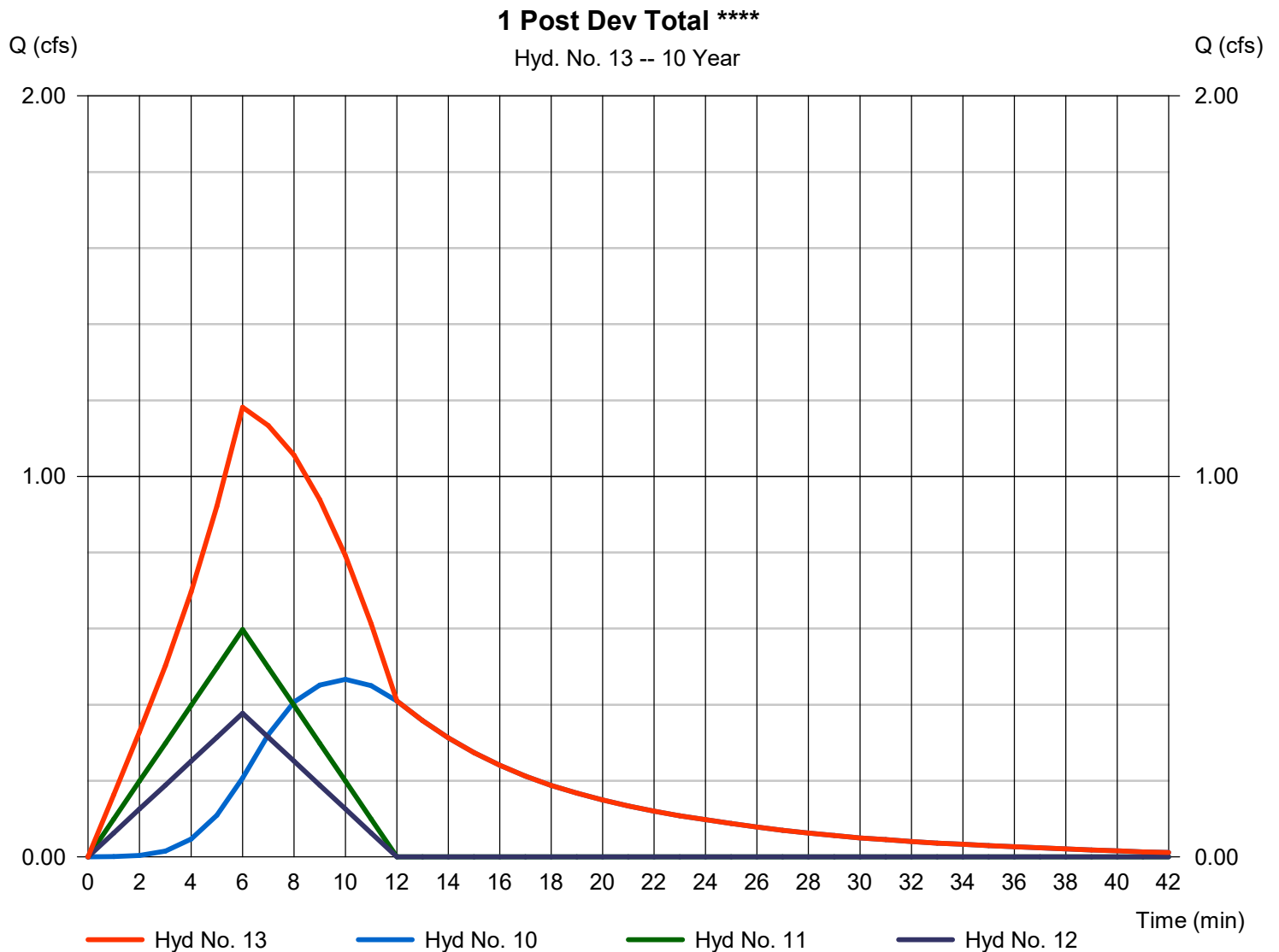


Hydrograph Report

Hyd. No. 13

1 Post Dev Total ****

Hydrograph type	= Combine	Peak discharge	= 1.182 cfs
Storm frequency	= 10 yrs	Time to peak	= 6 min
Time interval	= 1 min	Hyd. volume	= 713 cuft
Inflow hyds.	= 10, 11, 12	Contrib. drain. area	= 0.270 ac



Hyd. No. 15

2 Pre Dev Site

Hydrograph type	= Mod. Rational	Peak discharge	= 0.757 cfs
Storm frequency	= 10 yrs	Time to peak	= 7 min
Time interval	= 1 min	Hyd. volume	= 318 cuft
Drainage area	= 0.410 ac	Runoff coeff.	= 0.32
Intensity	= 5.770 in/hr	Tc by User	= 7.00 min
IDF Curve	= PA-Doylestown.IDF	Storm duration	= 1.0 x Tc
Target Q	=n/a	Est. Req'd Storage	=n/a



Hyd. No. 16

2 Pre Dev Off Site

Hydrograph type	= Mod. Rational	Peak discharge	= 3.946 cfs
Storm frequency	= 10 yrs	Time to peak	= 7 min
Time interval	= 1 min	Hyd. volume	= 1,658 cuft
Drainage area	= 1.520 ac	Runoff coeff.	= 0.45
Intensity	= 5.770 in/hr	Tc by User	= 7.00 min
IDF Curve	= PA-Doylestown.IDF	Storm duration	= 1.0 x Tc
Target Q	=n/a	Est. Req'd Storage	=n/a



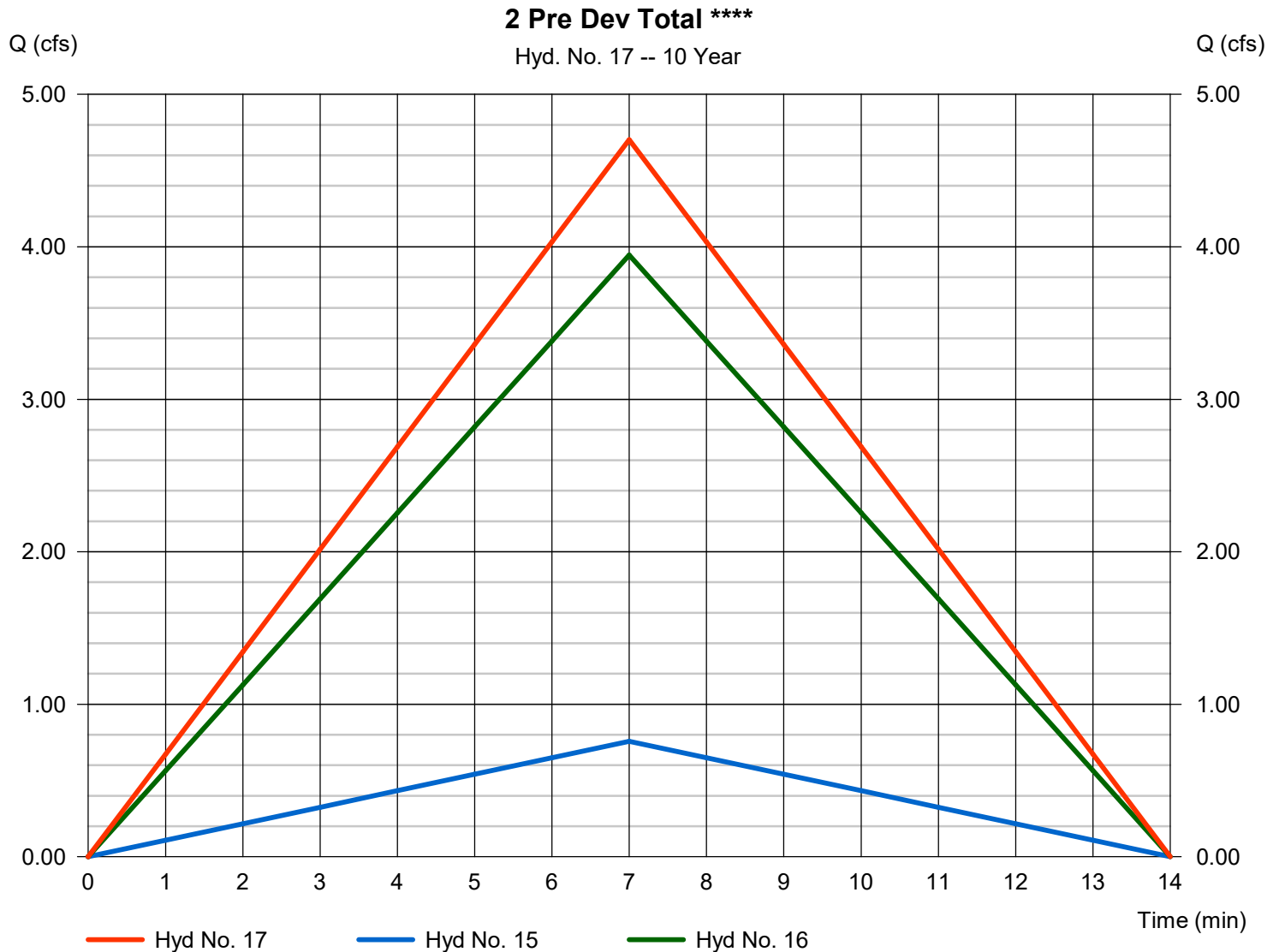
Hydrograph Report

Hyd. No. 17

2 Pre Dev Total ****

Hydrograph type = Combine
Storm frequency = 10 yrs
Time interval = 1 min
Inflow hyds. = 15, 16

Peak discharge = 4.703 cfs
Time to peak = 7 min
Hyd. volume = 1,975 cuft
Contrib. drain. area = 1.930 ac



Hydrograph Report

Hyd. No. 18

2 Post Dev Site

Hydrograph type	= Mod. Rational	Peak discharge	= 0.450 cfs
Storm frequency	= 10 yrs	Time to peak	= 6 min
Time interval	= 1 min	Hyd. volume	= 162 cuft
Drainage area	= 0.090 ac	Runoff coeff.	= 0.83
Intensity	= 6.019 in/hr	Tc by User	= 6.00 min
IDF Curve	= PA-Doylestown.IDF	Storm duration	= 1.0 x Tc
Target Q	=n/a	Est. Req'd Storage	=n/a



Hydrograph Report

Hyd. No. 19

2 Post Dev Off Site

Hydrograph type	= Mod. Rational	Peak discharge	= 0.040 cfs
Storm frequency	= 10 yrs	Time to peak	= 6 min
Time interval	= 1 min	Hyd. volume	= 14 cuft
Drainage area	= 0.060 ac	Runoff coeff.	= 0.11
Intensity	= 6.019 in/hr	Tc by User	= 6.00 min
IDF Curve	= PA-Doylestown.IDF	Storm duration	= 1.0 x Tc
Target Q	=n/a	Est. Req'd Storage	=n/a



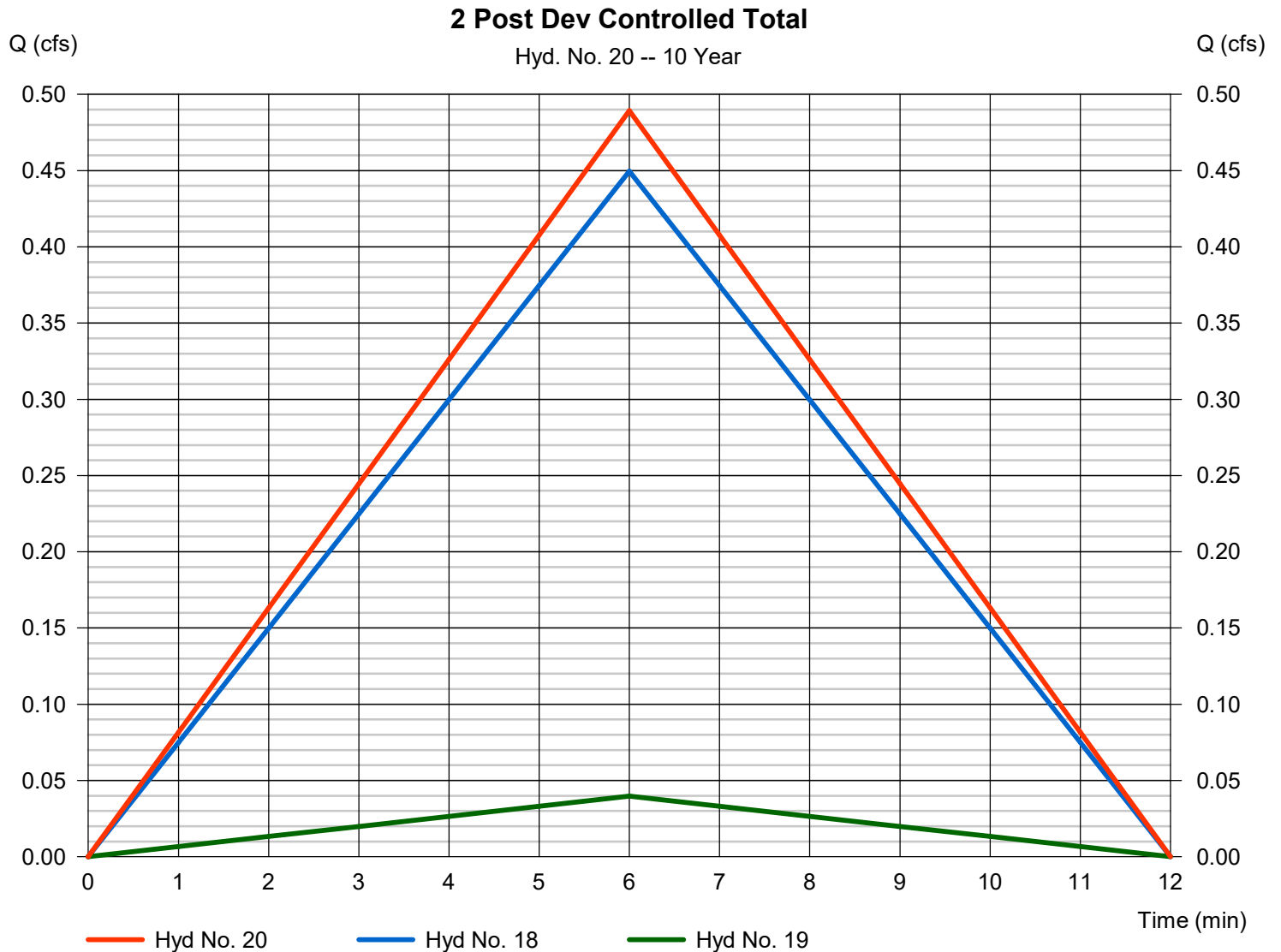
Hydrograph Report

Hyd. No. 20

2 Post Dev Controlled Total

Hydrograph type = Combine
Storm frequency = 10 yrs
Time interval = 1 min
Inflow hyds. = 18, 19

Peak discharge = 0.489 cfs
Time to peak = 6 min
Hyd. volume = 176 cuft
Contrib. drain. area = 0.150 ac



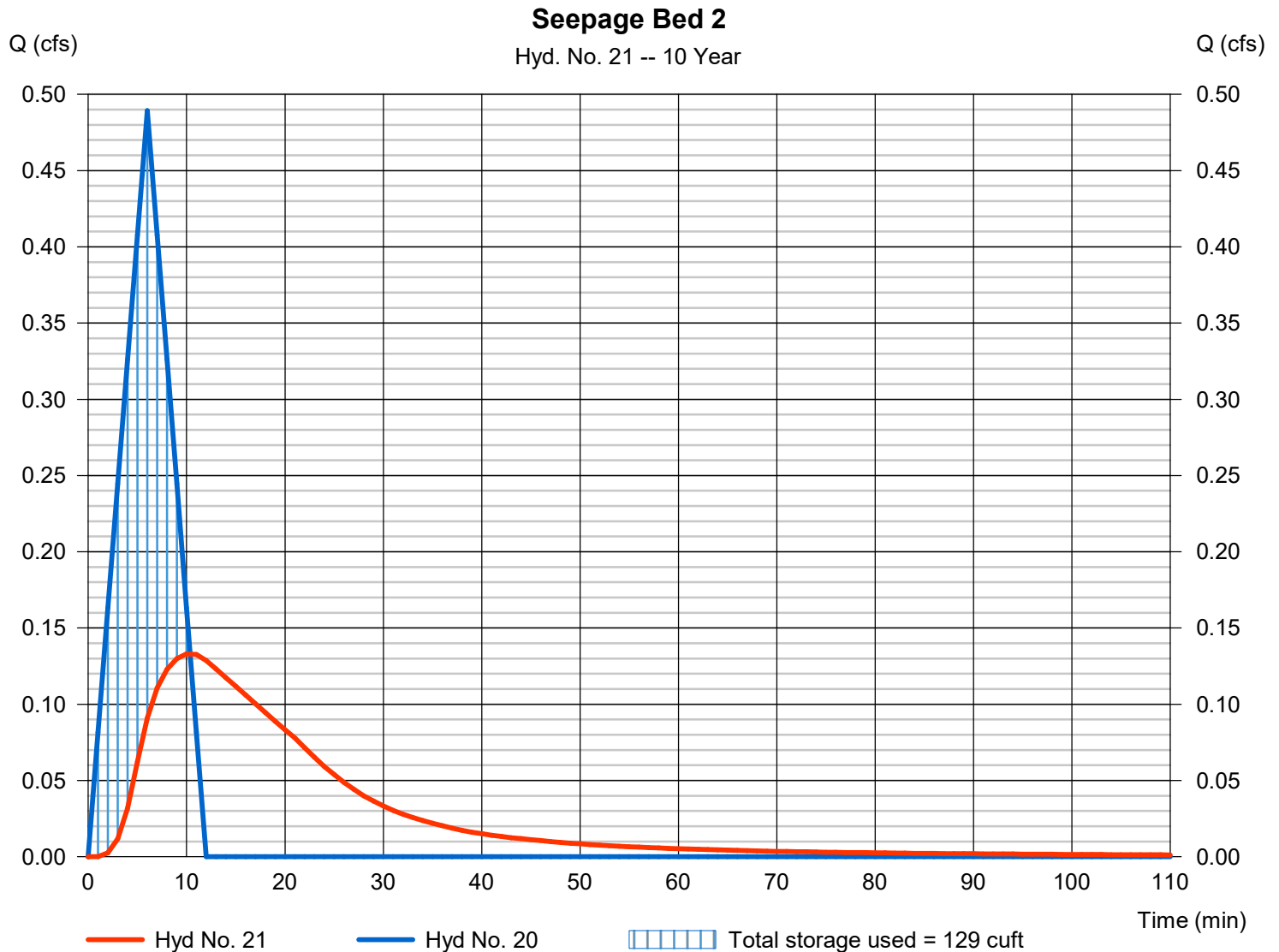
Hydrograph Report

Hyd. No. 21

Seepage Bed 2

Hydrograph type	= Reservoir	Peak discharge	= 0.133 cfs
Storm frequency	= 10 yrs	Time to peak	= 10 min
Time interval	= 1 min	Hyd. volume	= 170 cuft
Inflow hyd. No.	= 20 - 2 Post Dev Controlled Total	Max. Elevation	= 108.44 ft
Reservoir name	= Seepage Bed 2	Max. Storage	= 129 cuft

Storage Indication method used.



Hyd. No. 22

2 Post Dev Site Bypass

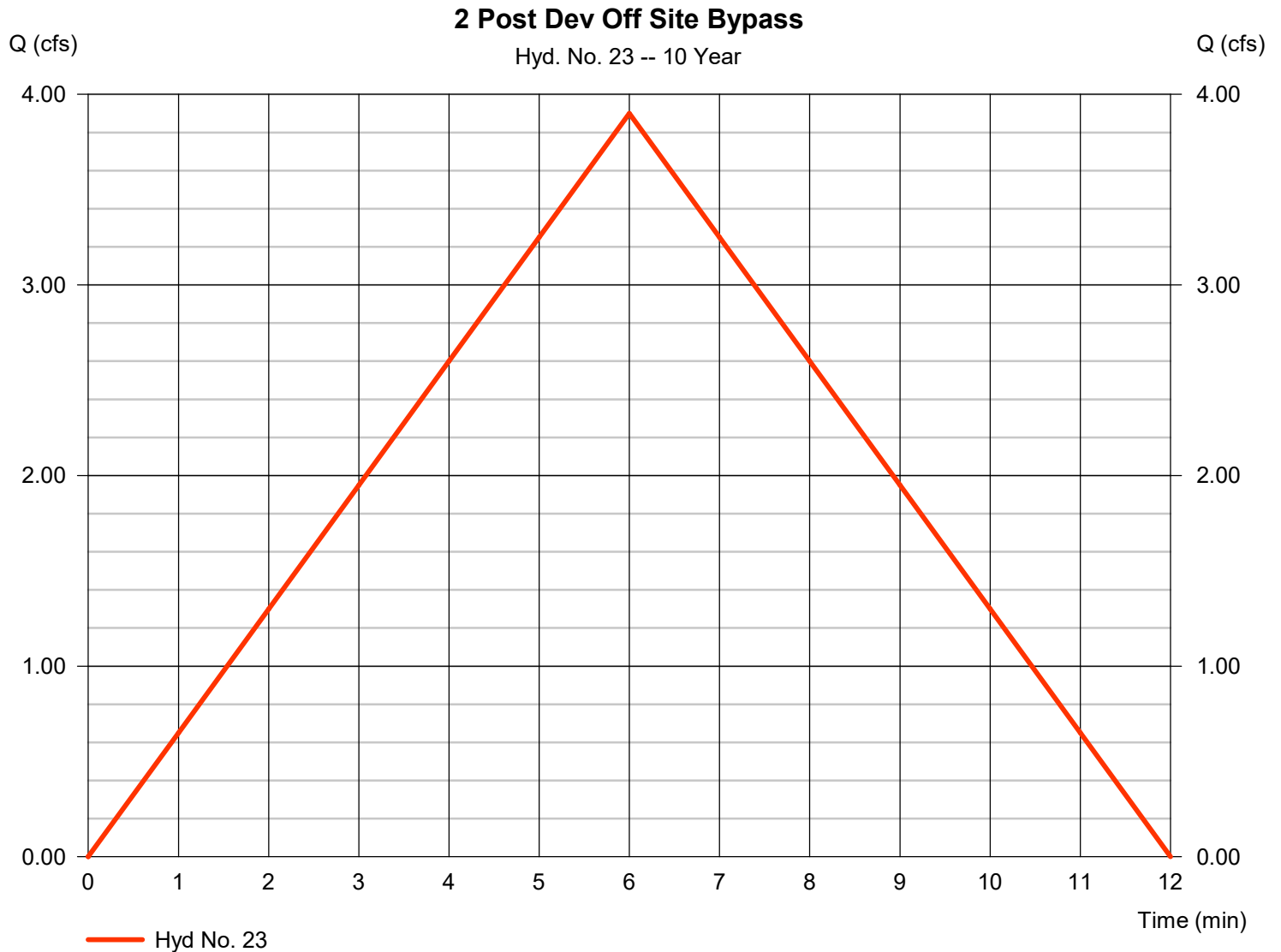
Hydrograph type	= Mod. Rational	Peak discharge	= 0.686 cfs
Storm frequency	= 10 yrs	Time to peak	= 6 min
Time interval	= 1 min	Hyd. volume	= 247 cuft
Drainage area	= 0.200 ac	Runoff coeff.	= 0.57
Intensity	= 6.019 in/hr	Tc by User	= 6.00 min
IDF Curve	= PA-Doylestown.IDF	Storm duration	= 1.0 x Tc
Target Q	=n/a	Est. Req'd Storage	=n/a



Hyd. No. 23

2 Post Dev Off Site Bypass

Hydrograph type	= Mod. Rational	Peak discharge	= 3.900 cfs
Storm frequency	= 10 yrs	Time to peak	= 6 min
Time interval	= 1 min	Hyd. volume	= 1,404 cuft
Drainage area	= 1.350 ac	Runoff coeff.	= 0.48
Intensity	= 6.019 in/hr	Tc by User	= 6.00 min
IDF Curve	= PA-Doylestown.IDF	Storm duration	= 1.0 x Tc
Target Q	=n/a	Est. Req'd Storage	=n/a



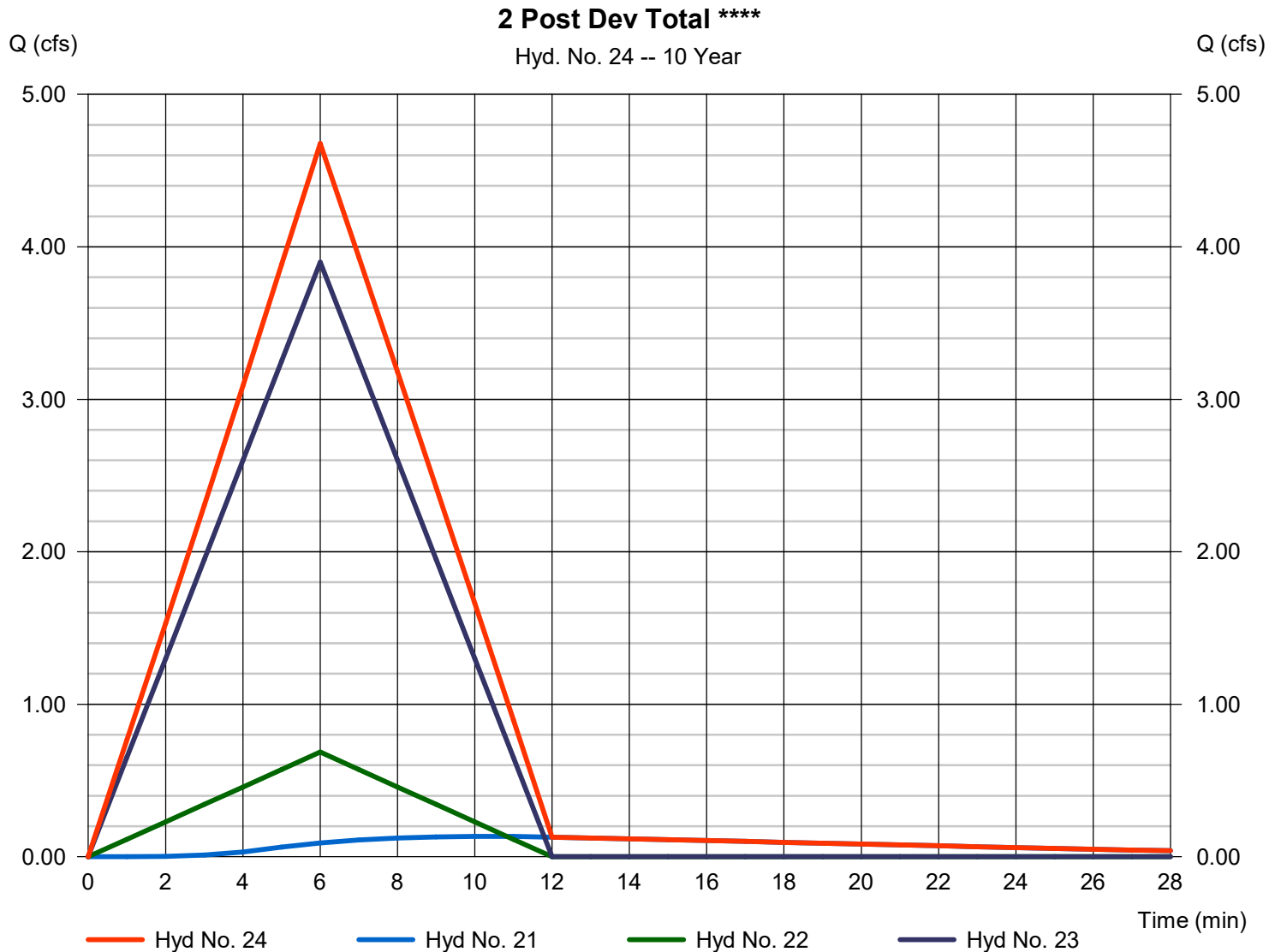
Hydrograph Report

Hyd. No. 24

2 Post Dev Total ****

Hydrograph type = Combine
Storm frequency = 10 yrs
Time interval = 1 min
Inflow hyds. = 21, 22, 23

Peak discharge = 4.677 cfs
Time to peak = 6 min
Hyd. volume = 1,821 cuft
Contrib. drain. area = 1.550 ac



Hydrograph Summary Report

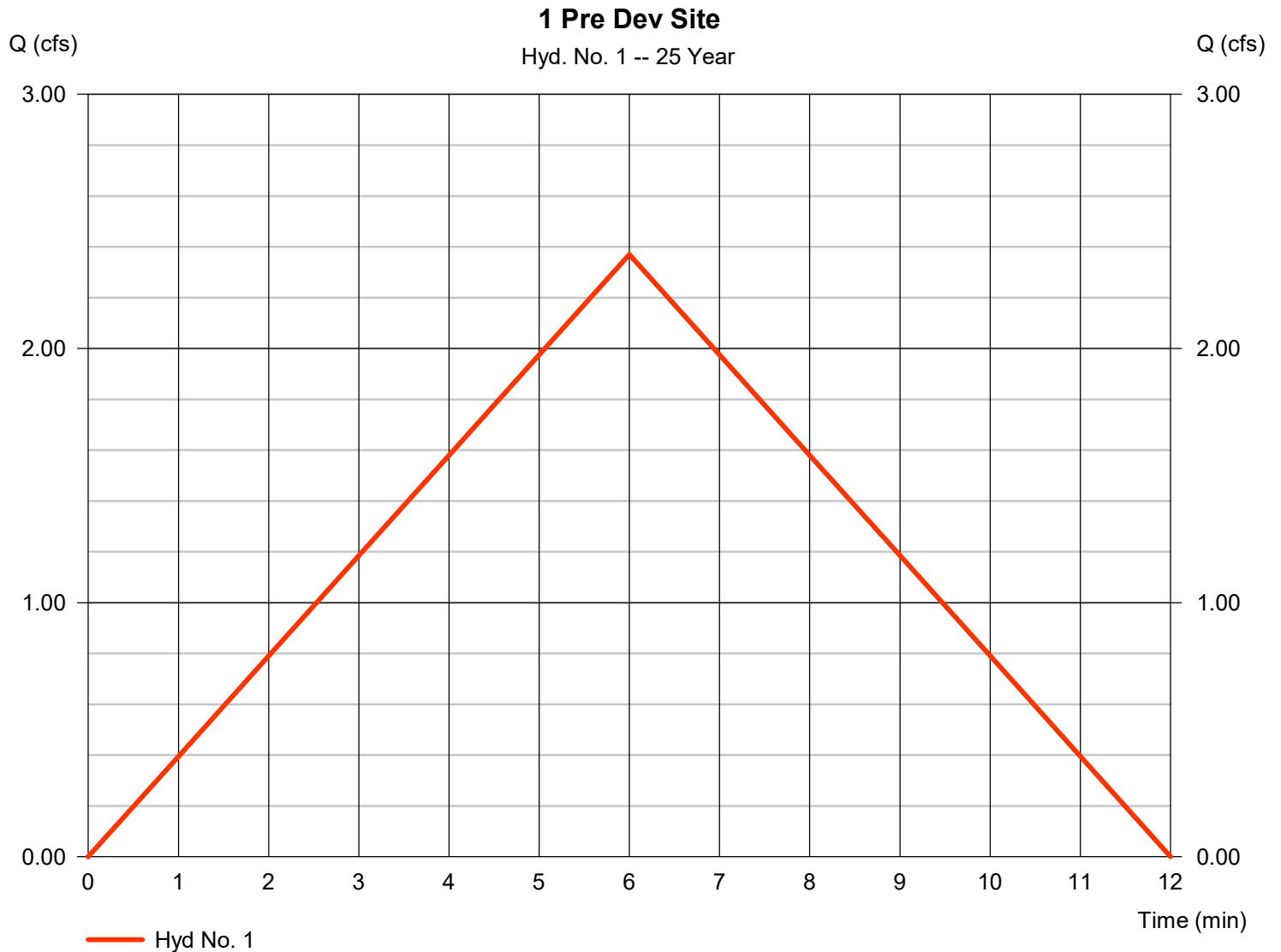
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

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	Mod. Rational	2.370	1	6	853	----	----	----	1 Pre Dev Site
2	Mod. Rational	2.521	1	6	908	----	----	----	1 Pre Dev Off Site
3	Combine	4.892	1	6	1,761	1, 2	----	----	1 Pre Dev Total ****
4	Mod. Rational	2.160	1	6	778	----	----	----	1A Post Dev Site
5	Mod. Rational	2.320	1	6	835	----	----	----	1A Post Dev Off Site
6	Combine	4.480	1	6	1,613	4, 5	----	----	1A Post Dev Controlled Total
7	Reservoir	0.000	1	164	0	6	127.36	1,601	Seepage Bed 1A
8	Mod. Rational	1.707	1	6	614	----	----	----	1B Post Dev Site
9	Combine	1.707	1	6	614	7, 8	----	----	1B Post Dev Controlled Total
10	Reservoir	0.549	1	10	422	9	127.44	421	Seepage Bed 1B
11	Mod. Rational	0.667	1	6	240	----	----	----	1 Post Dev Site Bypass
12	Mod. Rational	0.422	1	6	152	----	----	----	1 Post Dev Off Site Bypass
13	Combine	1.343	1	6	814	10, 11, 12	----	----	1 Post Dev Total ****
15	Mod. Rational	0.846	1	7	355	----	----	----	2 Pre Dev Site
16	Mod. Rational	4.409	1	7	1,852	----	----	----	2 Pre Dev Off Site
17	Combine	5.255	1	7	2,207	15, 16	----	----	2 Pre Dev Total ****
18	Mod. Rational	0.502	1	6	181	----	----	----	2 Post Dev Site
19	Mod. Rational	0.044	1	6	16	----	----	----	2 Post Dev Off Site
20	Combine	0.547	1	6	197	18, 19	----	----	2 Post Dev Controlled Total
21	Reservoir	0.144	1	10	191	20	108.49	144	Seepage Bed 2
22	Mod. Rational	0.767	1	6	276	----	----	----	2 Post Dev Site Bypass
23	Mod. Rational	4.357	1	6	1,569	----	----	----	2 Post Dev Off Site Bypass
24	Combine	5.224	1	6	2,035	21, 22, 23	----	----	2 Post Dev Total ****

Hyd. No. 1

1 Pre Dev Site

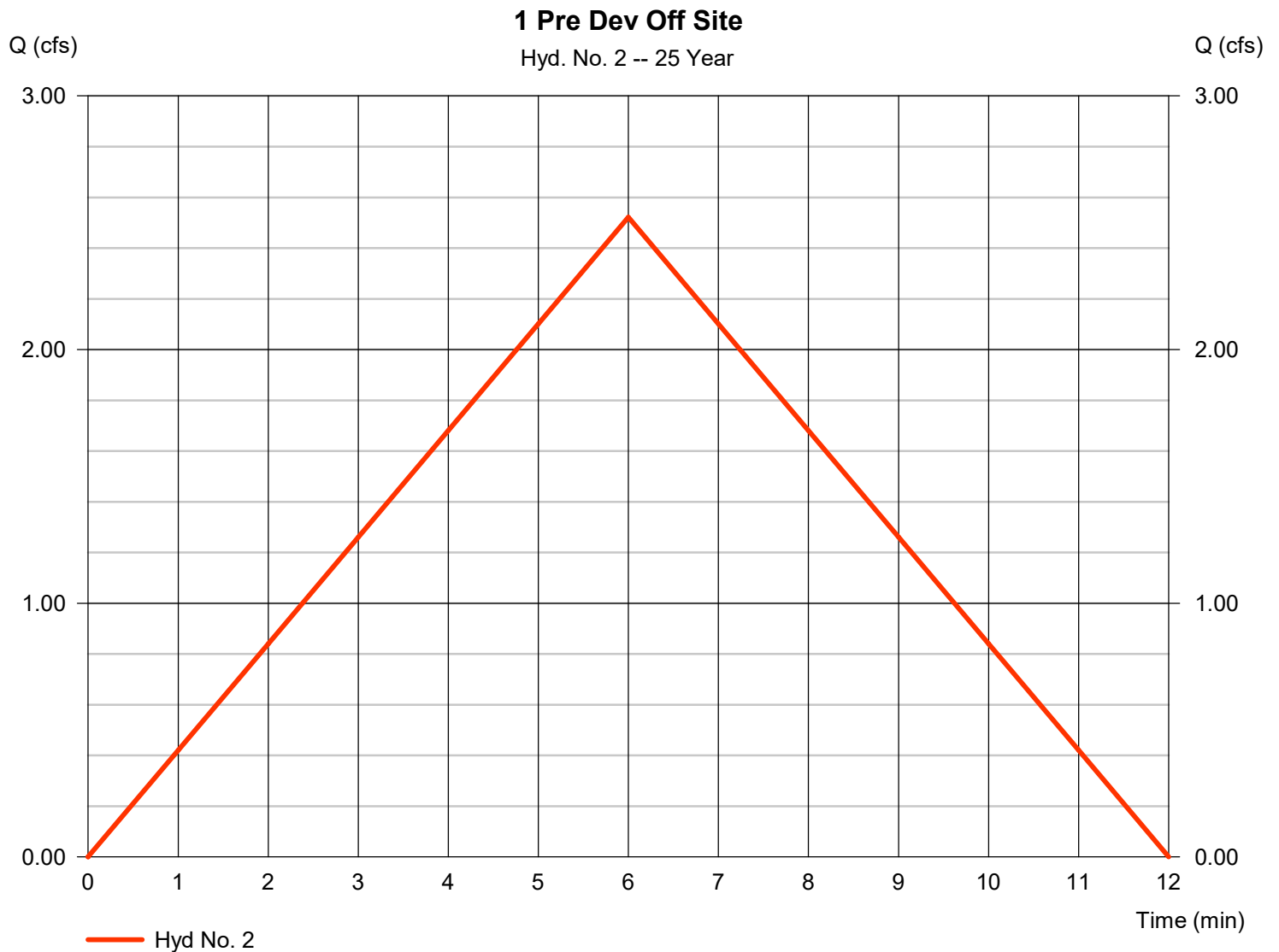
Hydrograph type	= Mod. Rational	Peak discharge	= 2.370 cfs
Storm frequency	= 25 yrs	Time to peak	= 6 min
Time interval	= 1 min	Hyd. volume	= 853 cuft
Drainage area	= 0.750 ac	Runoff coeff.	= 0.47
Intensity	= 6.724 in/hr	Tc by User	= 6.00 min
IDF Curve	= PA-Doylestown.IDF	Storm duration	= 1.0 x Tc
Target Q	=n/a	Est. Req'd Storage	=n/a



Hyd. No. 2

1 Pre Dev Off Site

Hydrograph type	= Mod. Rational	Peak discharge	= 2.521 cfs
Storm frequency	= 25 yrs	Time to peak	= 6 min
Time interval	= 1 min	Hyd. volume	= 908 cuft
Drainage area	= 0.750 ac	Runoff coeff.	= 0.5
Intensity	= 6.724 in/hr	Tc by User	= 6.00 min
IDF Curve	= PA-Doylestown.IDF	Storm duration	= 1.0 x Tc
Target Q	=n/a	Est. Req'd Storage	=n/a



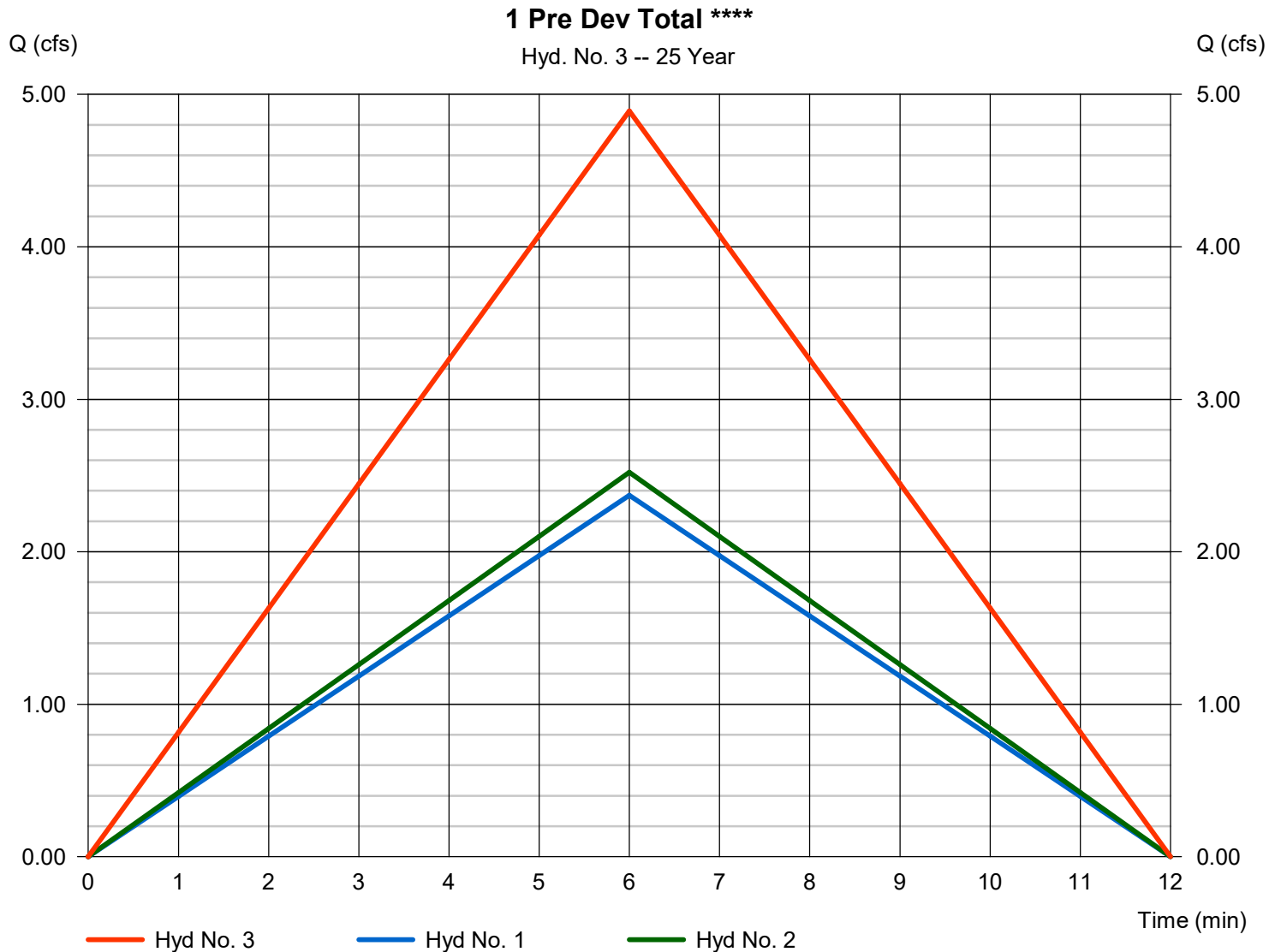
Hydrograph Report

Hyd. No. 3

1 Pre Dev Total ****

Hydrograph type = Combine
Storm frequency = 25 yrs
Time interval = 1 min
Inflow hyds. = 1, 2

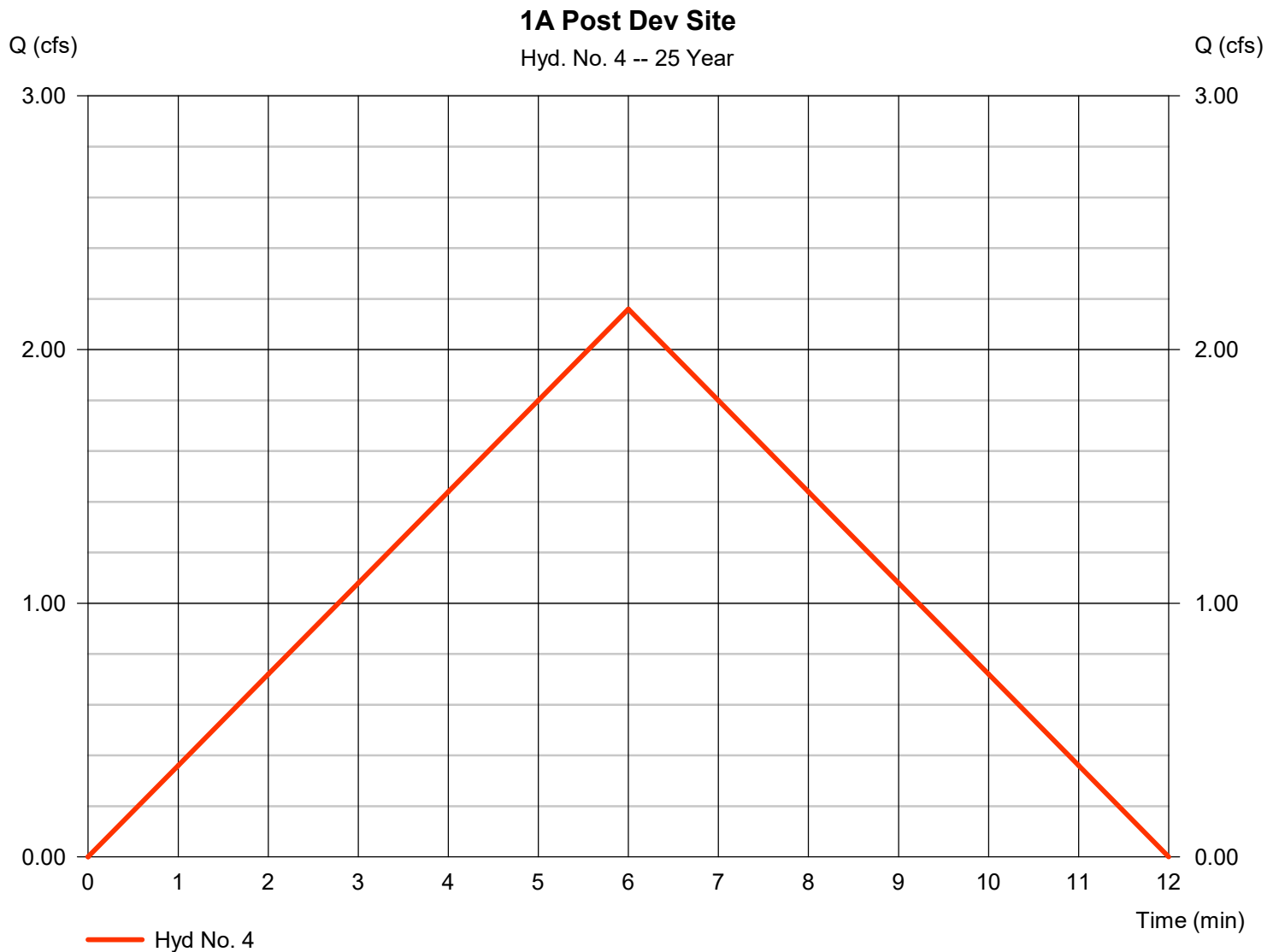
Peak discharge = 4.892 cfs
Time to peak = 6 min
Hyd. volume = 1,761 cuft
Contrib. drain. area = 1.500 ac



Hyd. No. 4

1A Post Dev Site

Hydrograph type	= Mod. Rational	Peak discharge	= 2.160 cfs
Storm frequency	= 25 yrs	Time to peak	= 6 min
Time interval	= 1 min	Hyd. volume	= 778 cuft
Drainage area	= 0.440 ac	Runoff coeff.	= 0.73
Intensity	= 6.724 in/hr	Tc by User	= 6.00 min
IDF Curve	= PA-Doylestown.IDF	Storm duration	= 1.0 x Tc
Target Q	=n/a	Est. Req'd Storage	=n/a



Hyd. No. 5

1A Post Dev Off Site

Hydrograph type	= Mod. Rational	Peak discharge	= 2.320 cfs
Storm frequency	= 25 yrs	Time to peak	= 6 min
Time interval	= 1 min	Hyd. volume	= 835 cuft
Drainage area	= 0.750 ac	Runoff coeff.	= 0.46
Intensity	= 6.724 in/hr	Tc by User	= 6.00 min
IDF Curve	= PA-Doylestown.IDF	Storm duration	= 1.0 x Tc
Target Q	=n/a	Est. Req'd Storage	=n/a

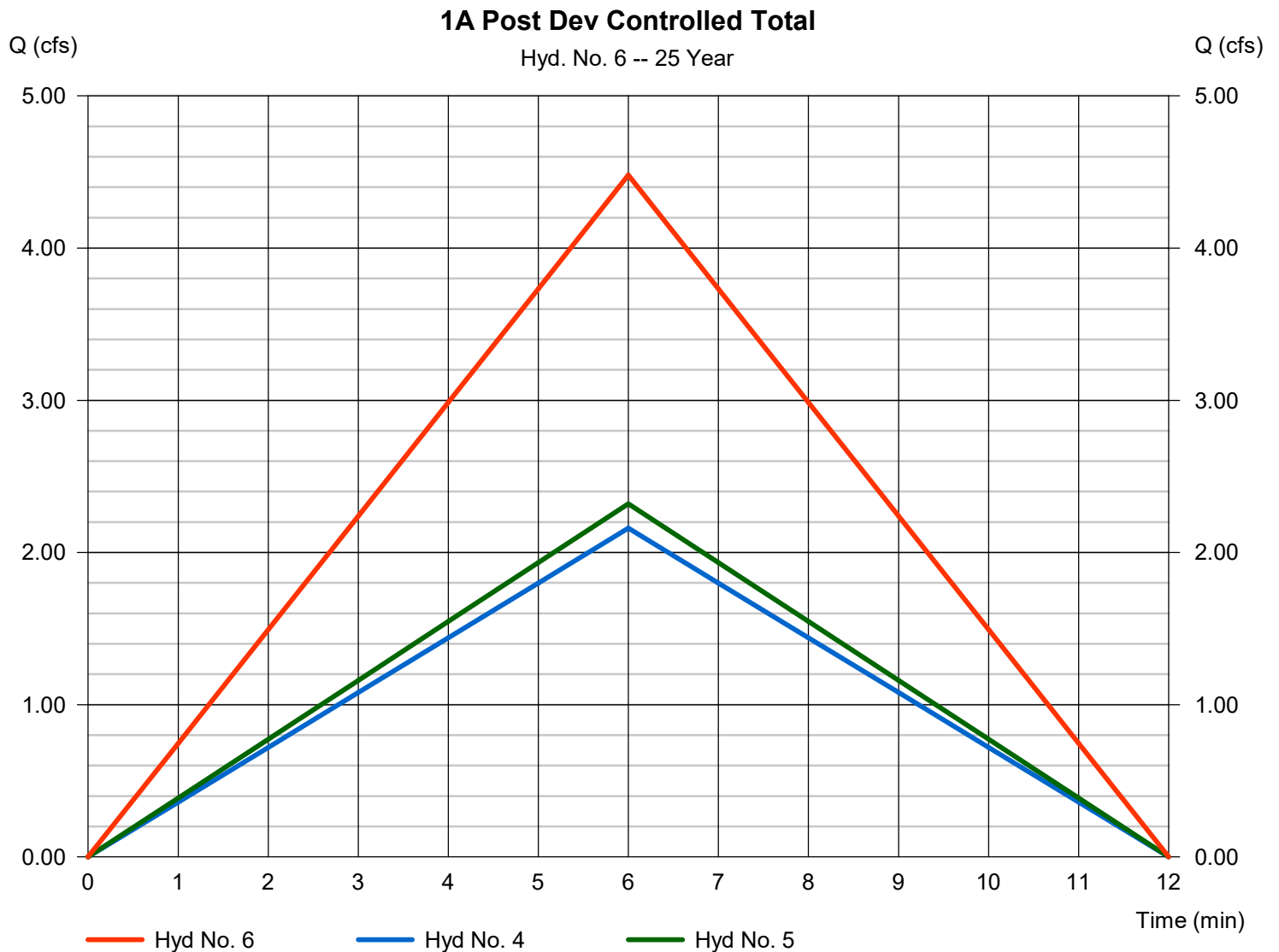


Hyd. No. 6

1A Post Dev Controlled Total

Hydrograph type = Combine
Storm frequency = 25 yrs
Time interval = 1 min
Inflow hyds. = 4, 5

Peak discharge = 4.480 cfs
Time to peak = 6 min
Hyd. volume = 1,613 cuft
Contrib. drain. area = 1.190 ac

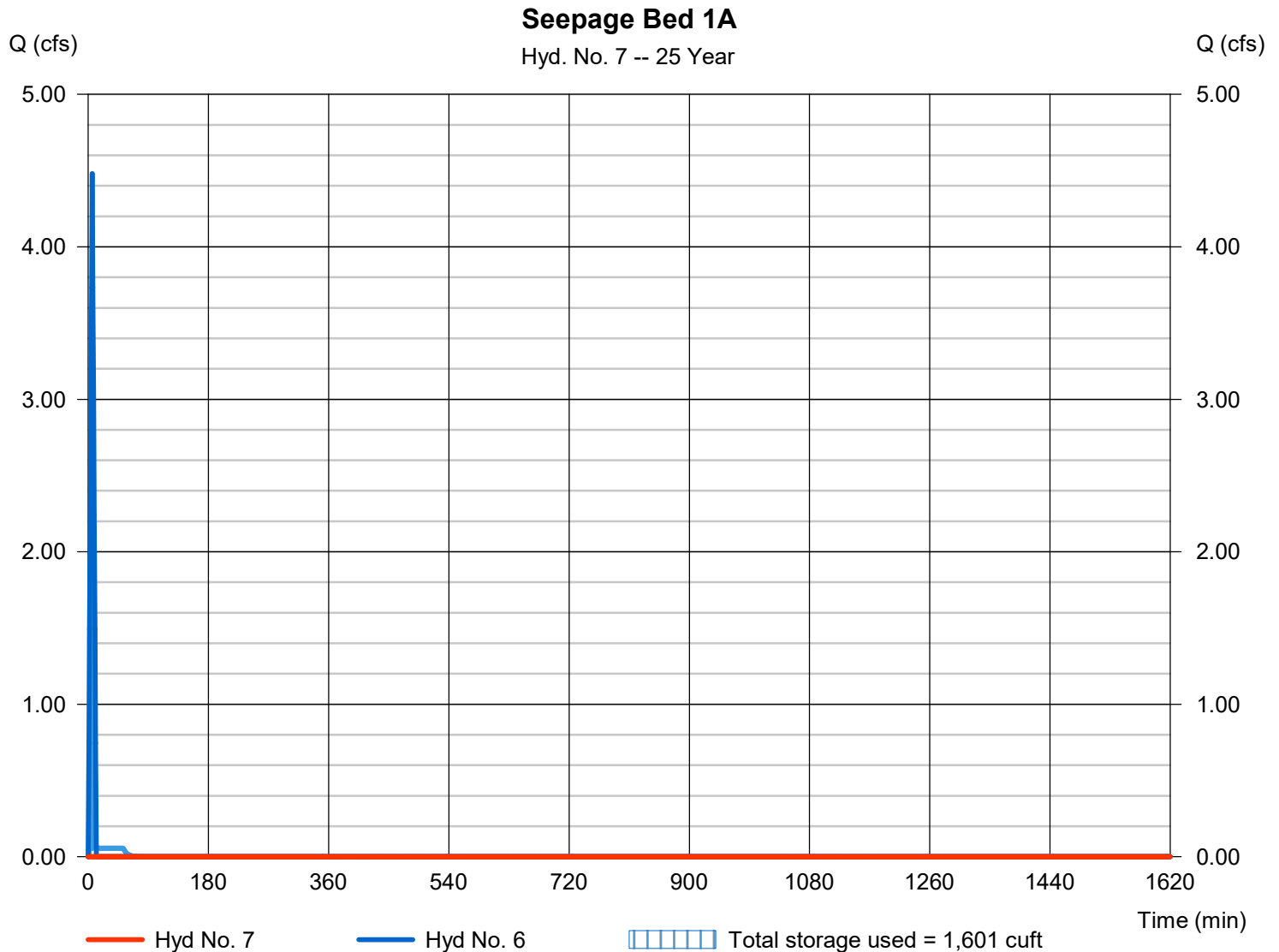


Hyd. No. 7

Seepage Bed 1A

Hydrograph type	= Reservoir	Peak discharge	= 0.000 cfs
Storm frequency	= 25 yrs	Time to peak	= 164 min
Time interval	= 1 min	Hyd. volume	= 0 cuft
Inflow hyd. No.	= 6 - 1A Post Dev Controlled Total	Max. Elevation	= 127.36 ft
Reservoir name	= Seepage Bed 1A	Max. Storage	= 1,601 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Hyd. No. 8

1B Post Dev Site

Hydrograph type	= Mod. Rational	Peak discharge	= 1.707 cfs
Storm frequency	= 25 yrs	Time to peak	= 6 min
Time interval	= 1 min	Hyd. volume	= 614 cuft
Drainage area	= 0.270 ac	Runoff coeff.	= 0.94
Intensity	= 6.724 in/hr	Tc by User	= 6.00 min
IDF Curve	= PA-Doylestown.IDF	Storm duration	= 1.0 x Tc
Target Q	=n/a	Est. Req'd Storage	=n/a

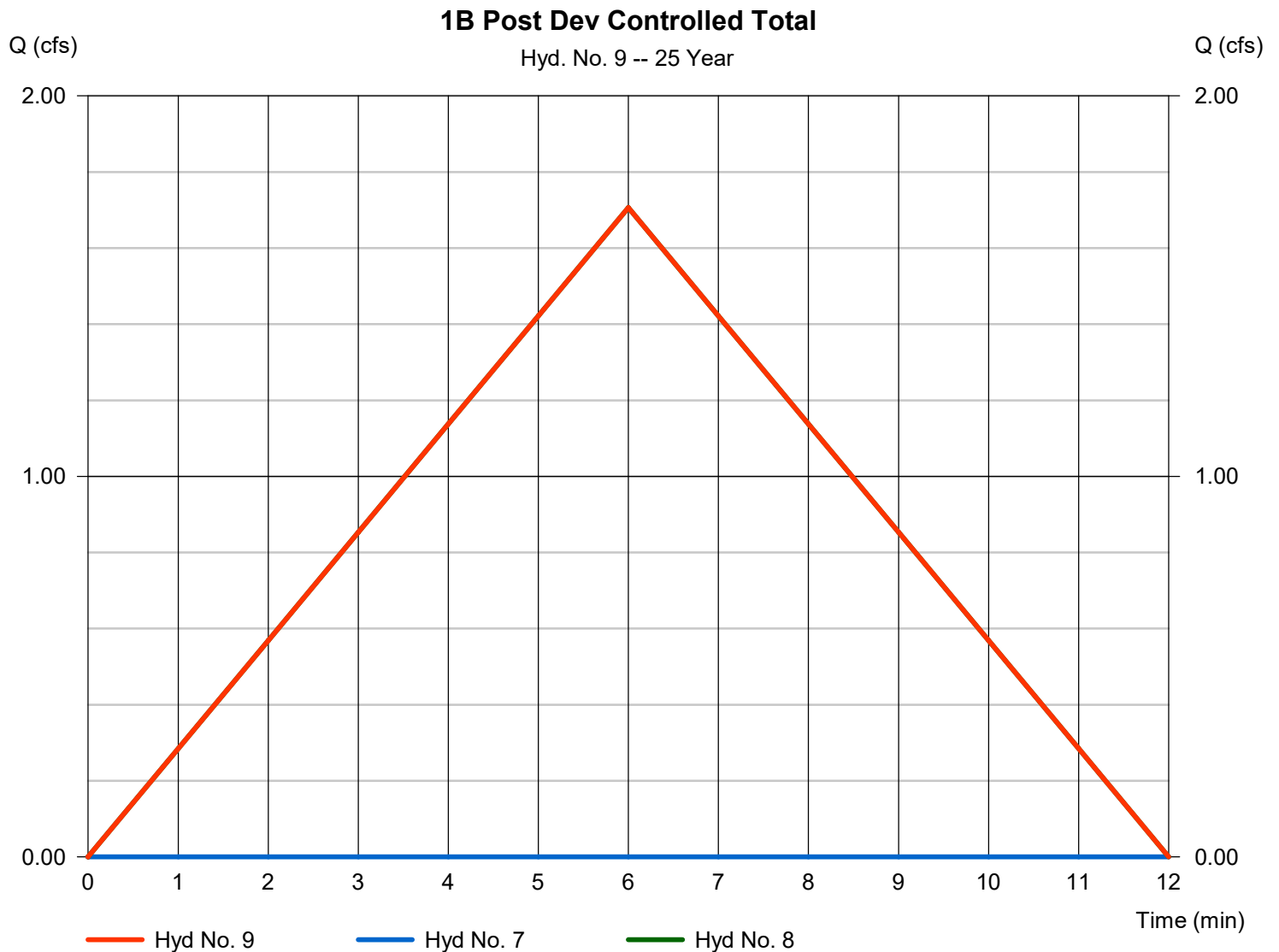


Hyd. No. 9

1B Post Dev Controlled Total

Hydrograph type = Combine
Storm frequency = 25 yrs
Time interval = 1 min
Inflow hyds. = 7, 8

Peak discharge = 1.707 cfs
Time to peak = 6 min
Hyd. volume = 614 cuft
Contrib. drain. area = 0.270 ac

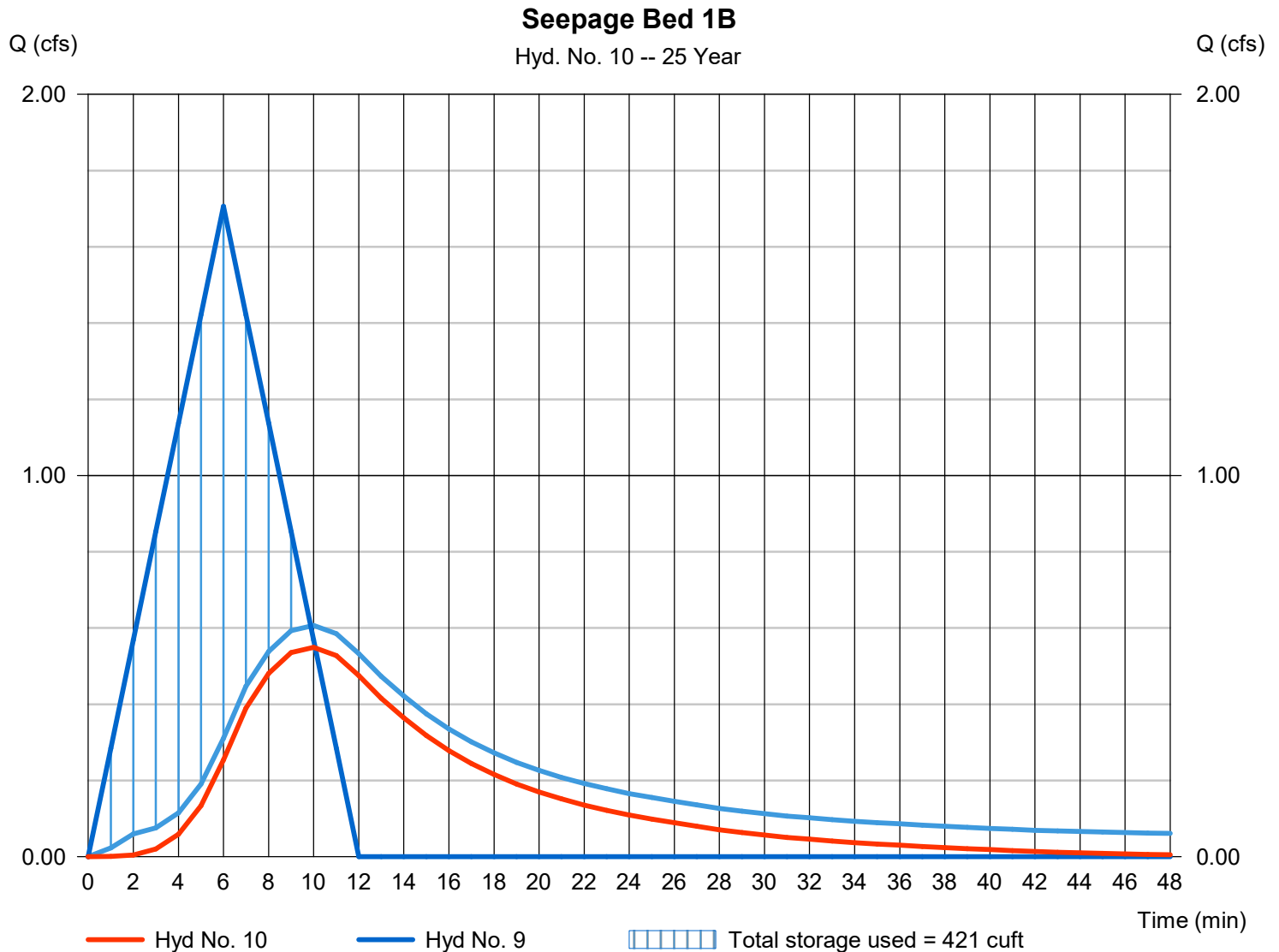


Hyd. No. 10

Seepage Bed 1B

Hydrograph type	= Reservoir	Peak discharge	= 0.549 cfs
Storm frequency	= 25 yrs	Time to peak	= 10 min
Time interval	= 1 min	Hyd. volume	= 422 cuft
Inflow hyd. No.	= 9 - 1B Post Dev Controlled Total	Max. Elevation	= 127.44 ft
Reservoir name	= Seepage Bed 1B	Max. Storage	= 421 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Hyd. No. 11

1 Post Dev Site Bypass

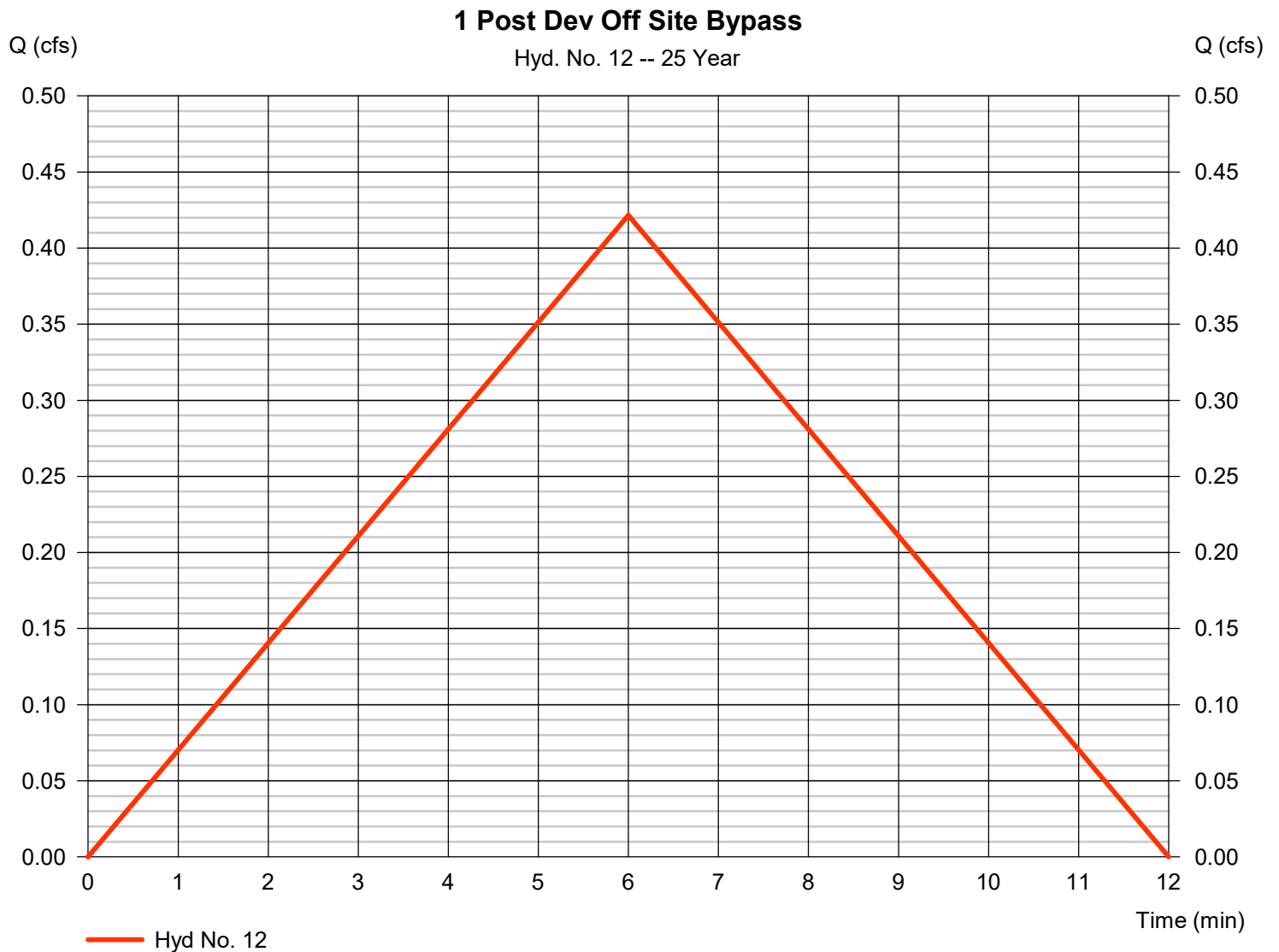
Hydrograph type	= Mod. Rational	Peak discharge	= 0.667 cfs
Storm frequency	= 25 yrs	Time to peak	= 6 min
Time interval	= 1 min	Hyd. volume	= 240 cuft
Drainage area	= 0.160 ac	Runoff coeff.	= 0.62
Intensity	= 6.724 in/hr	Tc by User	= 6.00 min
IDF Curve	= PA-Doylestown.IDF	Storm duration	= 1.0 x Tc
Target Q	=n/a	Est. Req'd Storage	=n/a



Hyd. No. 12

1 Post Dev Off Site Bypass

Hydrograph type	= Mod. Rational	Peak discharge	= 0.422 cfs
Storm frequency	= 25 yrs	Time to peak	= 6 min
Time interval	= 1 min	Hyd. volume	= 152 cuft
Drainage area	= 0.110 ac	Runoff coeff.	= 0.57
Intensity	= 6.724 in/hr	Tc by User	= 6.00 min
IDF Curve	= PA-Doylestown.IDF	Storm duration	= 1.0 x Tc
Target Q	=n/a	Est. Req'd Storage	=n/a



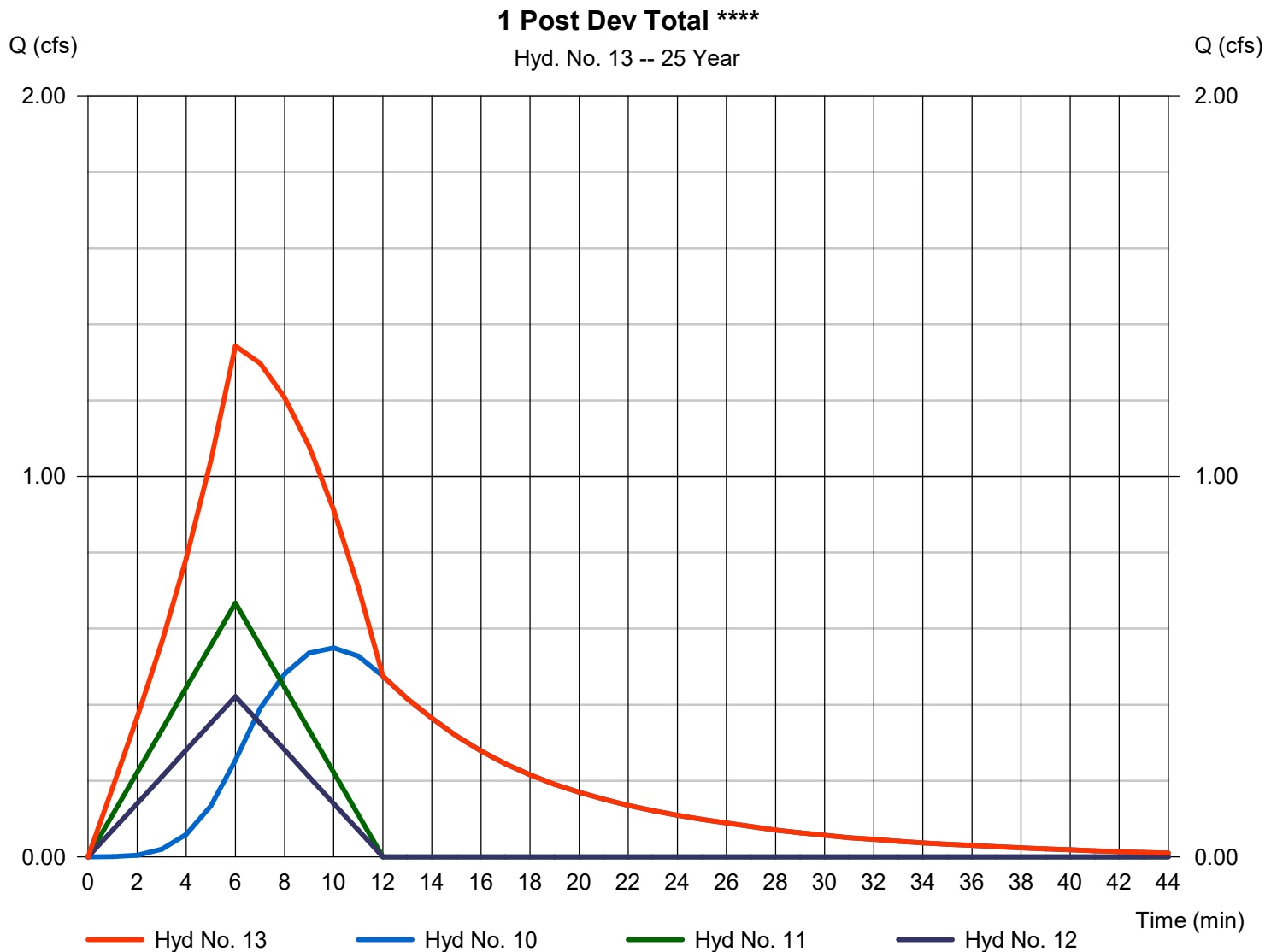
Hydrograph Report

Hyd. No. 13

1 Post Dev Total ****

Hydrograph type = Combine
Storm frequency = 25 yrs
Time interval = 1 min
Inflow hyds. = 10, 11, 12

Peak discharge = 1.343 cfs
Time to peak = 6 min
Hyd. volume = 814 cuft
Contrib. drain. area = 0.270 ac

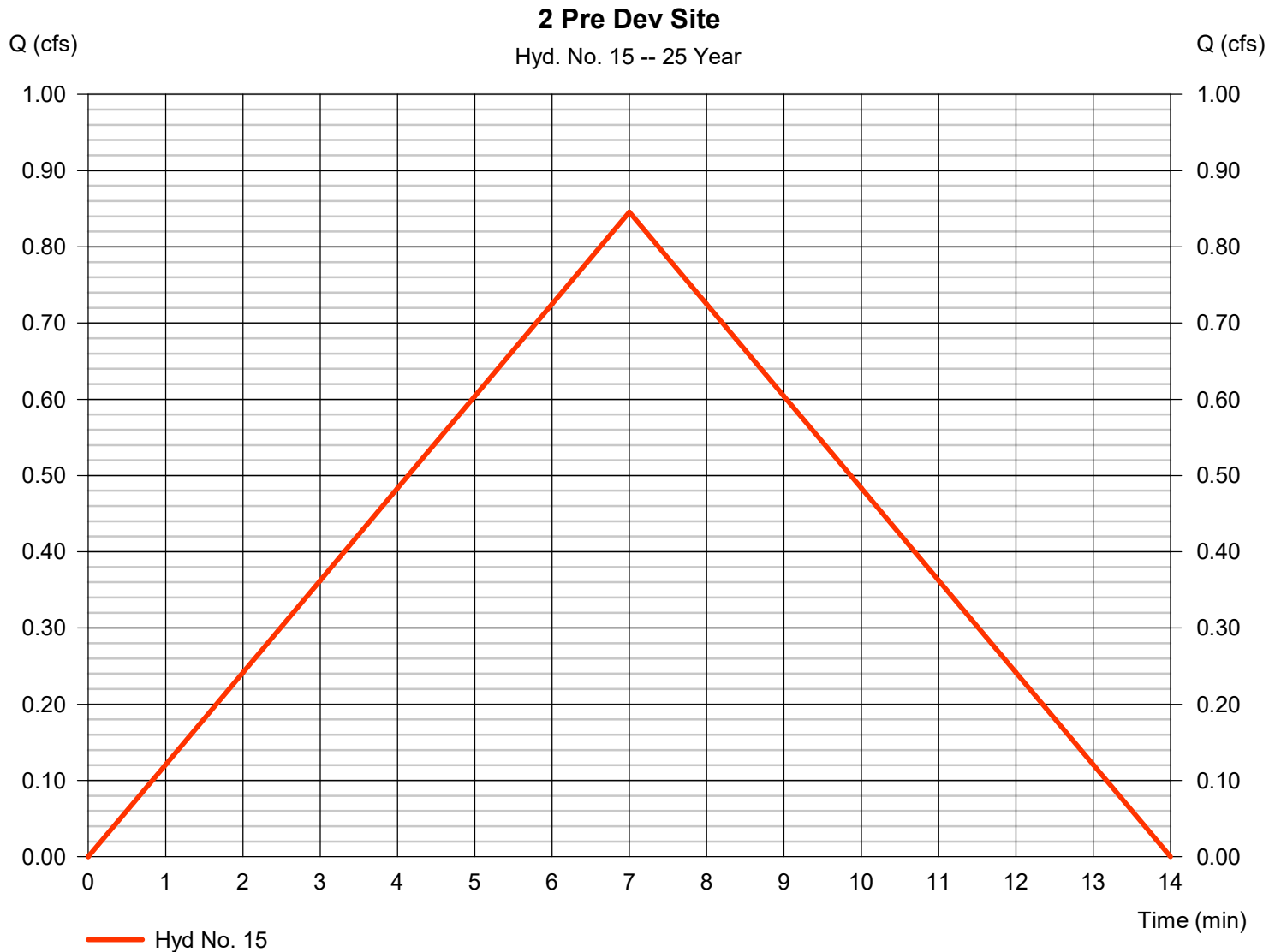


Hydrograph Report

Hyd. No. 15

2 Pre Dev Site

Hydrograph type	= Mod. Rational	Peak discharge	= 0.846 cfs
Storm frequency	= 25 yrs	Time to peak	= 7 min
Time interval	= 1 min	Hyd. volume	= 355 cuft
Drainage area	= 0.410 ac	Runoff coeff.	= 0.32
Intensity	= 6.446 in/hr	Tc by User	= 7.00 min
IDF Curve	= PA-Doylestown.IDF	Storm duration	= 1.0 x Tc
Target Q	=n/a	Est. Req'd Storage	=n/a



Hyd. No. 16

2 Pre Dev Off Site

Hydrograph type	= Mod. Rational	Peak discharge	= 4.409 cfs
Storm frequency	= 25 yrs	Time to peak	= 7 min
Time interval	= 1 min	Hyd. volume	= 1,852 cuft
Drainage area	= 1.520 ac	Runoff coeff.	= 0.45
Intensity	= 6.446 in/hr	Tc by User	= 7.00 min
IDF Curve	= PA-Doylestown.IDF	Storm duration	= 1.0 x Tc
Target Q	=n/a	Est. Req'd Storage	=n/a



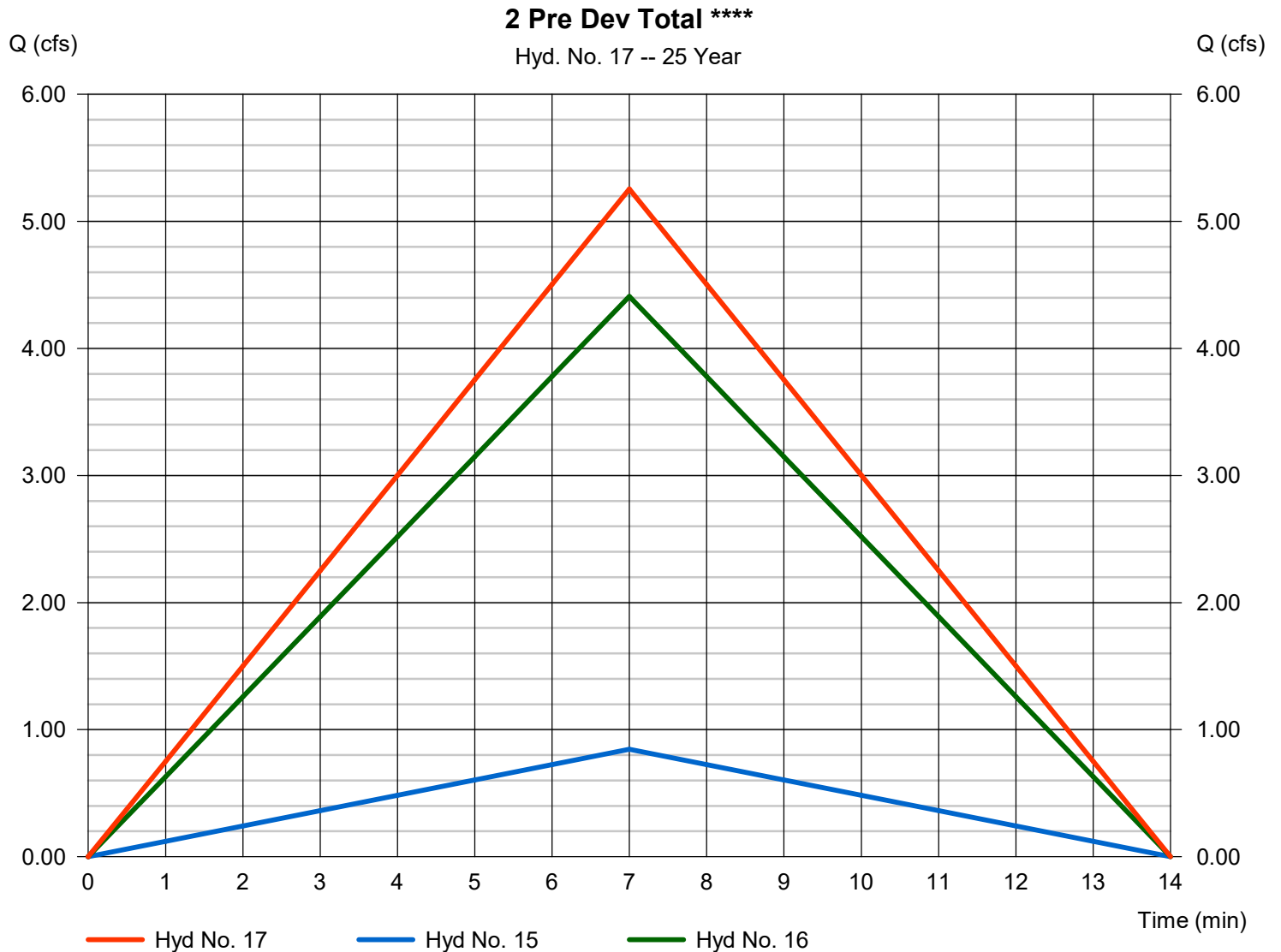
Hydrograph Report

Hyd. No. 17

2 Pre Dev Total ****

Hydrograph type = Combine
Storm frequency = 25 yrs
Time interval = 1 min
Inflow hyds. = 15, 16

Peak discharge = 5.255 cfs
Time to peak = 7 min
Hyd. volume = 2,207 cuft
Contrib. drain. area = 1.930 ac



Hydrograph Report

Hyd. No. 18

2 Post Dev Site

Hydrograph type	= Mod. Rational	Peak discharge	= 0.502 cfs
Storm frequency	= 25 yrs	Time to peak	= 6 min
Time interval	= 1 min	Hyd. volume	= 181 cuft
Drainage area	= 0.090 ac	Runoff coeff.	= 0.83
Intensity	= 6.724 in/hr	Tc by User	= 6.00 min
IDF Curve	= PA-Doylestown.IDF	Storm duration	= 1.0 x Tc
Target Q	=n/a	Est. Req'd Storage	=n/a



Hydrograph Report

Hyd. No. 19

2 Post Dev Off Site

Hydrograph type	= Mod. Rational	Peak discharge	= 0.044 cfs
Storm frequency	= 25 yrs	Time to peak	= 6 min
Time interval	= 1 min	Hyd. volume	= 16 cuft
Drainage area	= 0.060 ac	Runoff coeff.	= 0.11
Intensity	= 6.724 in/hr	Tc by User	= 6.00 min
IDF Curve	= PA-Doylestown.IDF	Storm duration	= 1.0 x Tc
Target Q	=n/a	Est. Req'd Storage	=n/a



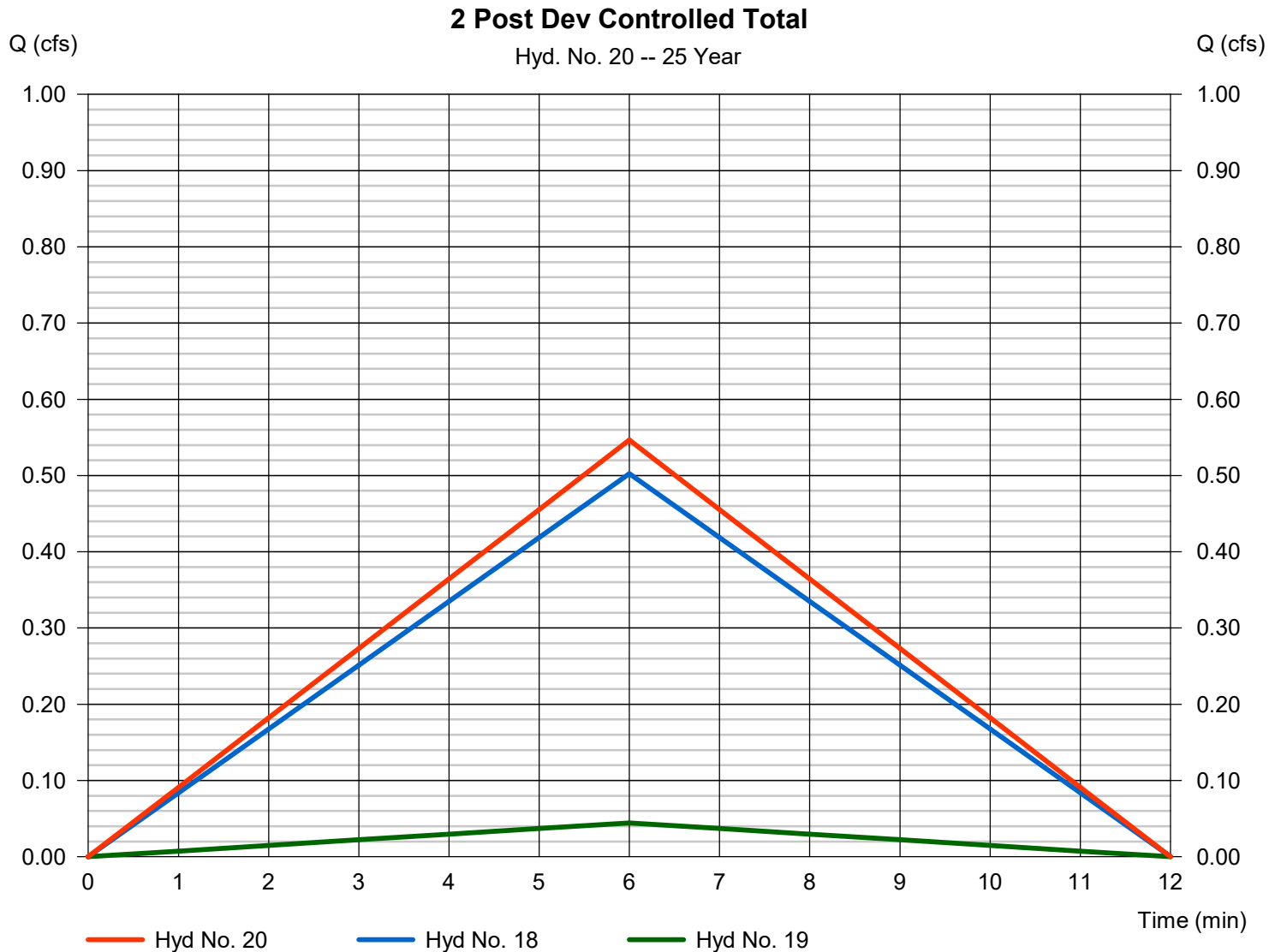
Hydrograph Report

Hyd. No. 20

2 Post Dev Controlled Total

Hydrograph type = Combine
Storm frequency = 25 yrs
Time interval = 1 min
Inflow hyds. = 18, 19

Peak discharge = 0.547 cfs
Time to peak = 6 min
Hyd. volume = 197 cuft
Contrib. drain. area = 0.150 ac

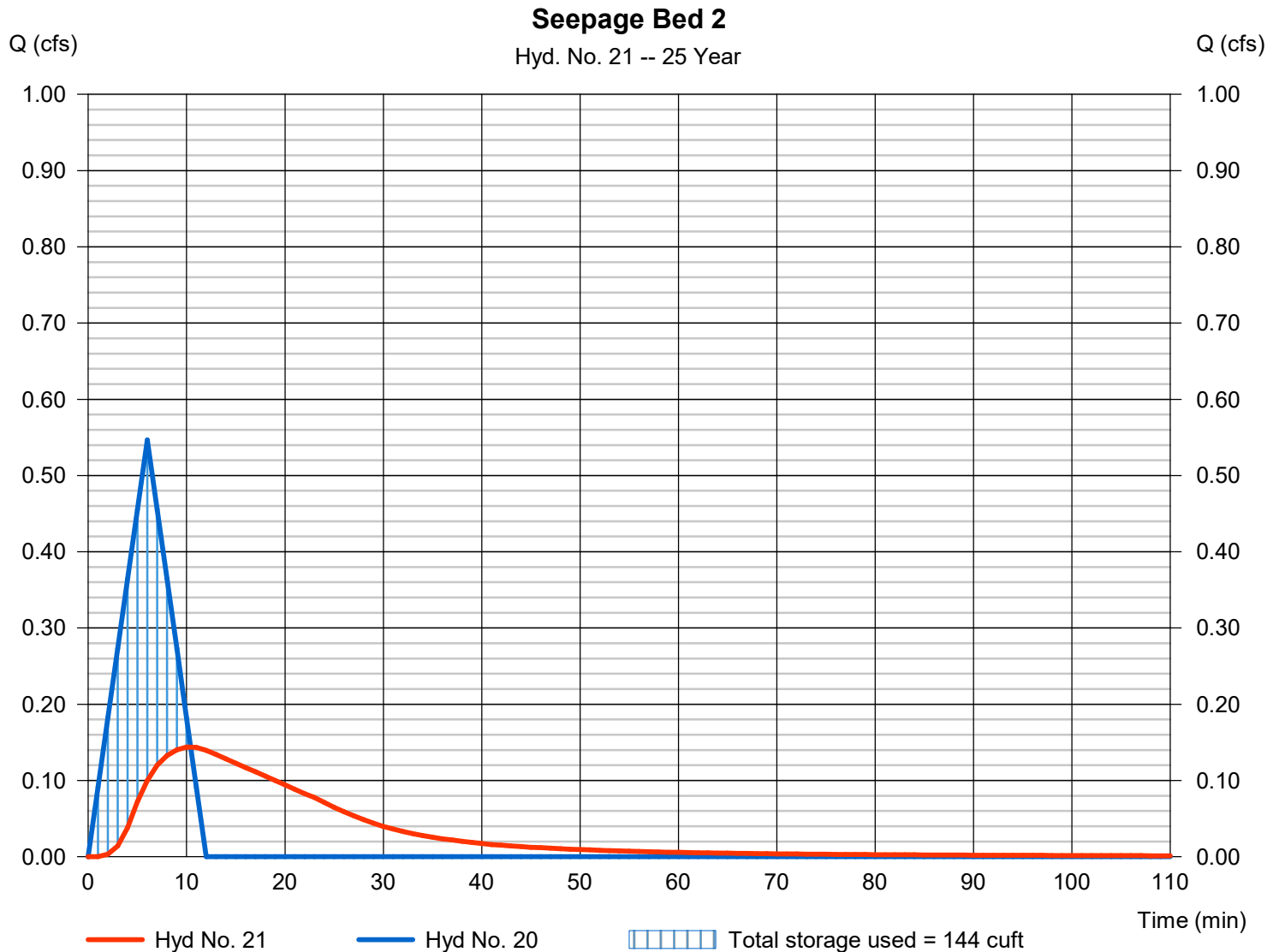


Hyd. No. 21

Seepage Bed 2

Hydrograph type	= Reservoir	Peak discharge	= 0.144 cfs
Storm frequency	= 25 yrs	Time to peak	= 10 min
Time interval	= 1 min	Hyd. volume	= 191 cuft
Inflow hyd. No.	= 20 - 2 Post Dev Controlled Total	Max. Elevation	= 108.49 ft
Reservoir name	= Seepage Bed 2	Max. Storage	= 144 cuft

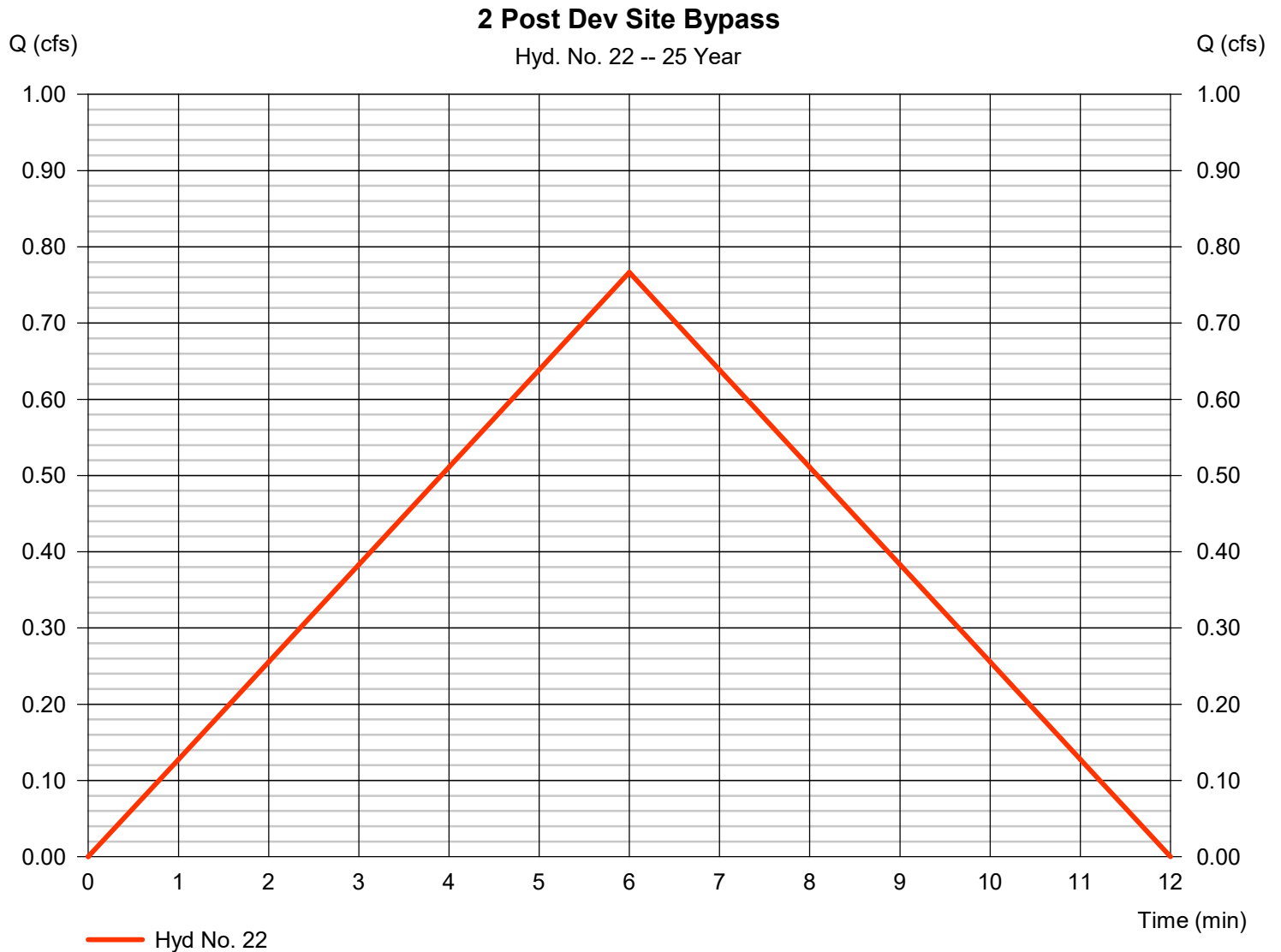
Storage Indication method used.



Hyd. No. 22

2 Post Dev Site Bypass

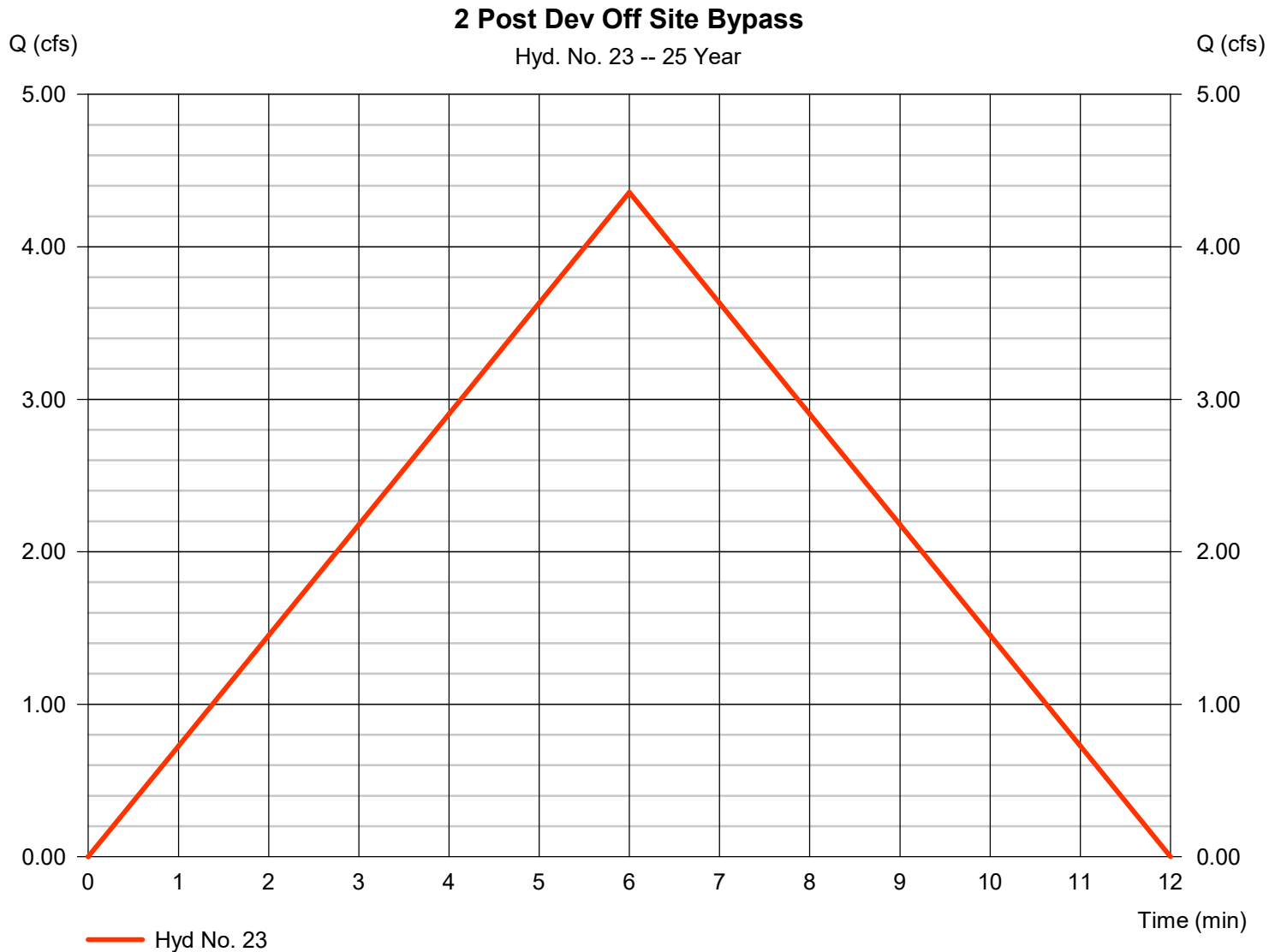
Hydrograph type	= Mod. Rational	Peak discharge	= 0.767 cfs
Storm frequency	= 25 yrs	Time to peak	= 6 min
Time interval	= 1 min	Hyd. volume	= 276 cuft
Drainage area	= 0.200 ac	Runoff coeff.	= 0.57
Intensity	= 6.724 in/hr	Tc by User	= 6.00 min
IDF Curve	= PA-Doylestown.IDF	Storm duration	= 1.0 x Tc
Target Q	=n/a	Est. Req'd Storage	=n/a



Hyd. No. 23

2 Post Dev Off Site Bypass

Hydrograph type	= Mod. Rational	Peak discharge	= 4.357 cfs
Storm frequency	= 25 yrs	Time to peak	= 6 min
Time interval	= 1 min	Hyd. volume	= 1,569 cuft
Drainage area	= 1.350 ac	Runoff coeff.	= 0.48
Intensity	= 6.724 in/hr	Tc by User	= 6.00 min
IDF Curve	= PA-Doylestown.IDF	Storm duration	= 1.0 x Tc
Target Q	=n/a	Est. Req'd Storage	=n/a

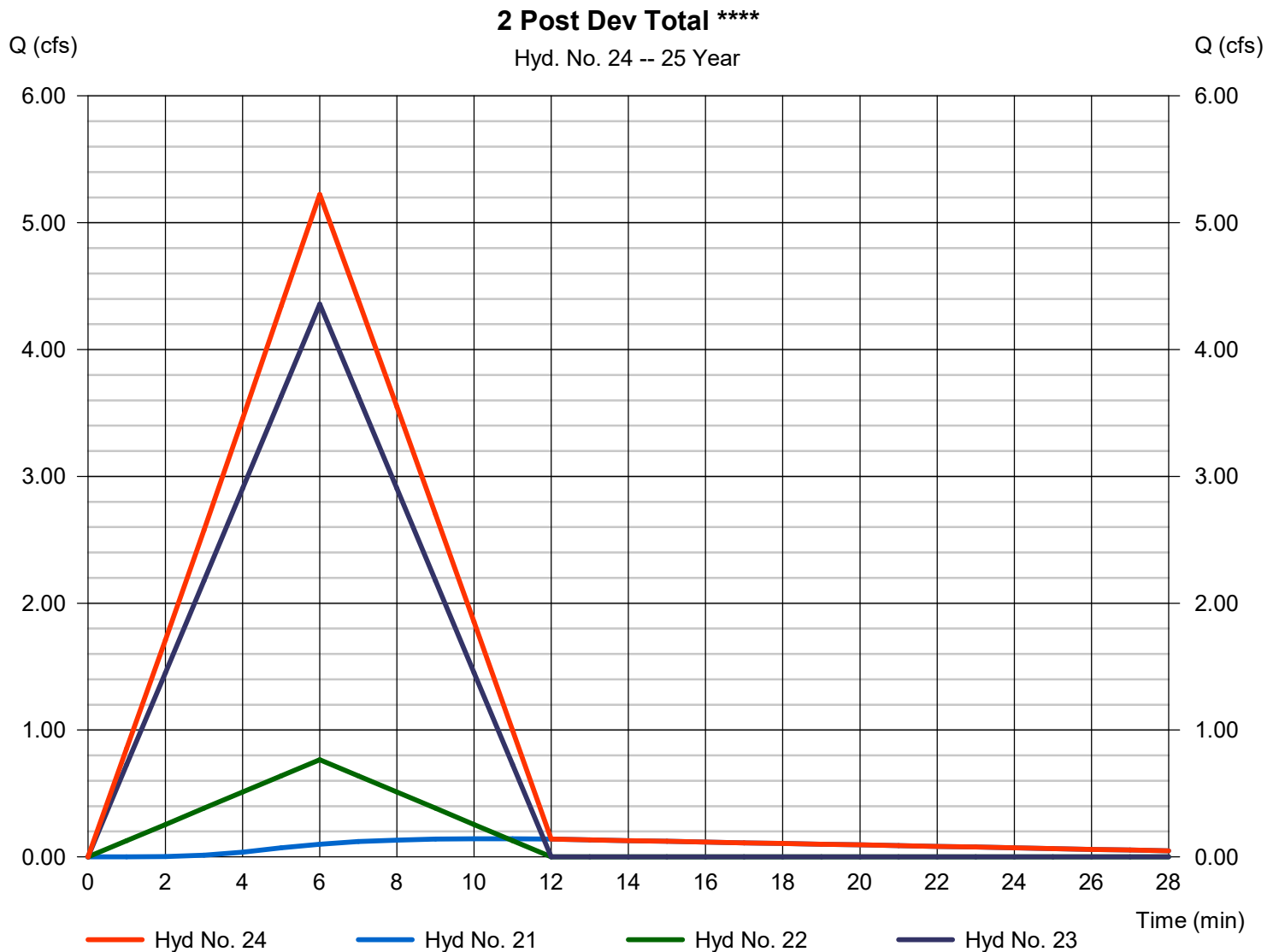


Hydrograph Report

Hyd. No. 24

2 Post Dev Total ****

Hydrograph type	= Combine	Peak discharge	= 5.224 cfs
Storm frequency	= 25 yrs	Time to peak	= 6 min
Time interval	= 1 min	Hyd. volume	= 2,035 cuft
Inflow hyds.	= 21, 22, 23	Contrib. drain. area	= 1.550 ac



Hydrograph Summary Report

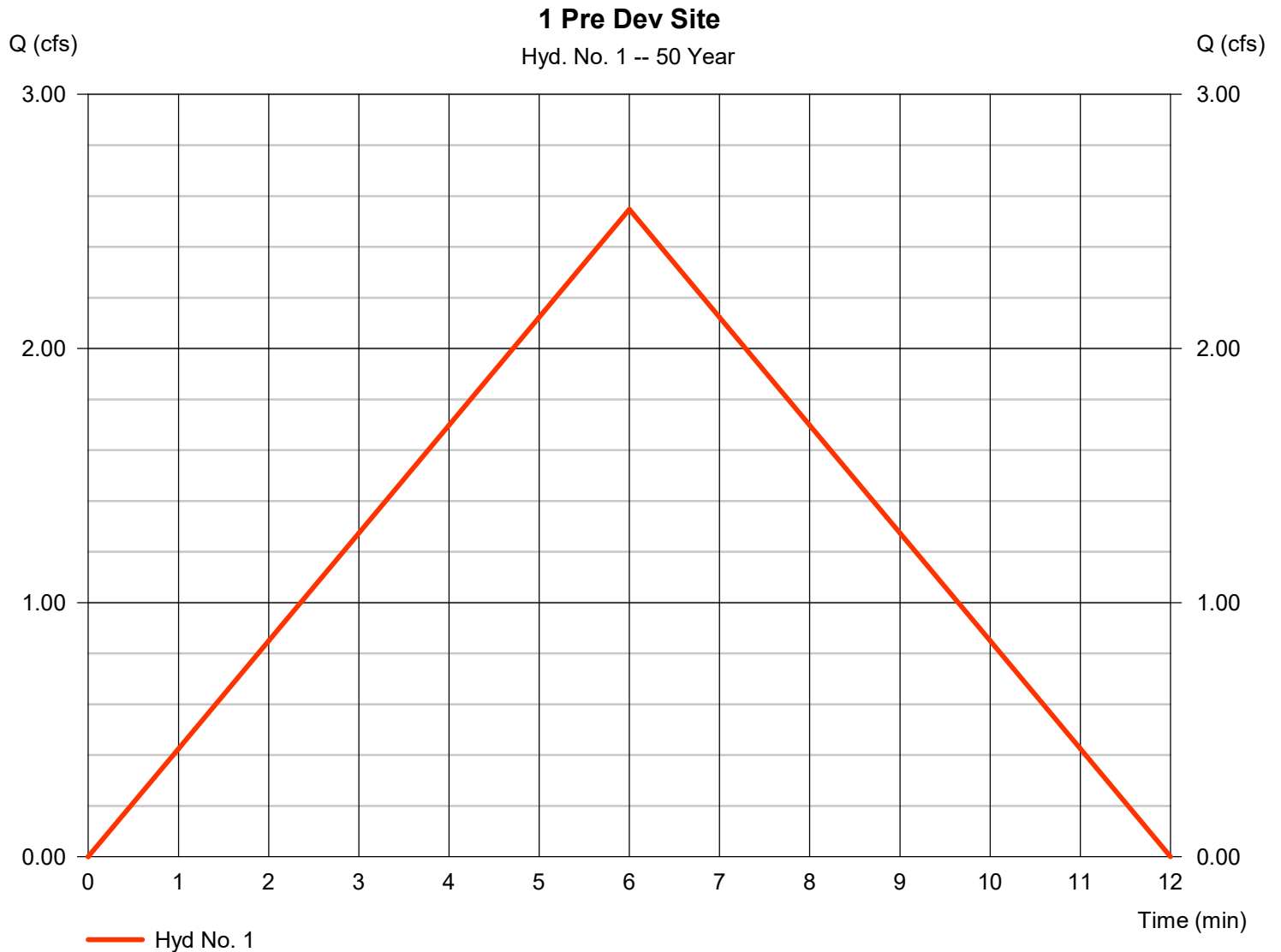
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

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	Mod. Rational	2.548	1	6	917	----	----	----	1 Pre Dev Site
2	Mod. Rational	2.710	1	6	976	----	----	----	1 Pre Dev Off Site
3	Combine	5.258	1	6	1,893	1, 2	----	----	1 Pre Dev Total ****
4	Mod. Rational	2.322	1	6	836	----	----	----	1A Post Dev Site
5	Mod. Rational	2.494	1	6	898	----	----	----	1A Post Dev Off Site
6	Combine	4.815	1	6	1,733	4, 5	----	----	1A Post Dev Controlled Total
7	Reservoir	0.000	1	12	0	6	127.46	1,722	Seepage Bed 1A
8	Mod. Rational	1.834	1	6	660	----	----	----	1B Post Dev Site
9	Combine	1.834	1	6	660	7, 8	----	----	1B Post Dev Controlled Total
10	Reservoir	0.610	1	10	466	9	127.47	449	Seepage Bed 1B
11	Mod. Rational	0.717	1	6	258	----	----	----	1 Post Dev Site Bypass
12	Mod. Rational	0.453	1	6	163	----	----	----	1 Post Dev Off Site Bypass
13	Combine	1.460	1	6	887	10, 11, 12	----	----	1 Post Dev Total ****
15	Mod. Rational	0.910	1	7	382	----	----	----	2 Pre Dev Site
16	Mod. Rational	4.742	1	7	1,992	----	----	----	2 Pre Dev Off Site
17	Combine	5.651	1	7	2,374	15, 16	----	----	2 Pre Dev Total ****
18	Mod. Rational	0.540	1	6	194	----	----	----	2 Post Dev Site
19	Mod. Rational	0.048	1	6	17	----	----	----	2 Post Dev Off Site
20	Combine	0.588	1	6	212	18, 19	----	----	2 Post Dev Controlled Total
21	Reservoir	0.151	1	10	206	20	108.53	156	Seepage Bed 2
22	Mod. Rational	0.824	1	6	297	----	----	----	2 Post Dev Site Bypass
23	Mod. Rational	4.684	1	6	1,686	----	----	----	2 Post Dev Off Site Bypass
24	Combine	5.613	1	6	2,188	21, 22, 23	----	----	2 Post Dev Total ****
301 Watersheds 2084 RM.gpw					Return Period: 50 Year			Friday, 09 / 22 / 2023	

Hyd. No. 1

1 Pre Dev Site

Hydrograph type	= Mod. Rational	Peak discharge	= 2.548 cfs
Storm frequency	= 50 yrs	Time to peak	= 6 min
Time interval	= 1 min	Hyd. volume	= 917 cuft
Drainage area	= 0.750 ac	Runoff coeff.	= 0.47
Intensity	= 7.228 in/hr	Tc by User	= 6.00 min
IDF Curve	= PA-Doylestown.IDF	Storm duration	= 1.0 x Tc
Target Q	=n/a	Est. Req'd Storage	=n/a



Hyd. No. 2

1 Pre Dev Off Site

Hydrograph type	= Mod. Rational	Peak discharge	= 2.710 cfs
Storm frequency	= 50 yrs	Time to peak	= 6 min
Time interval	= 1 min	Hyd. volume	= 976 cuft
Drainage area	= 0.750 ac	Runoff coeff.	= 0.5
Intensity	= 7.228 in/hr	Tc by User	= 6.00 min
IDF Curve	= PA-Doylestown.IDF	Storm duration	= 1.0 x Tc
Target Q	=n/a	Est. Req'd Storage	=n/a



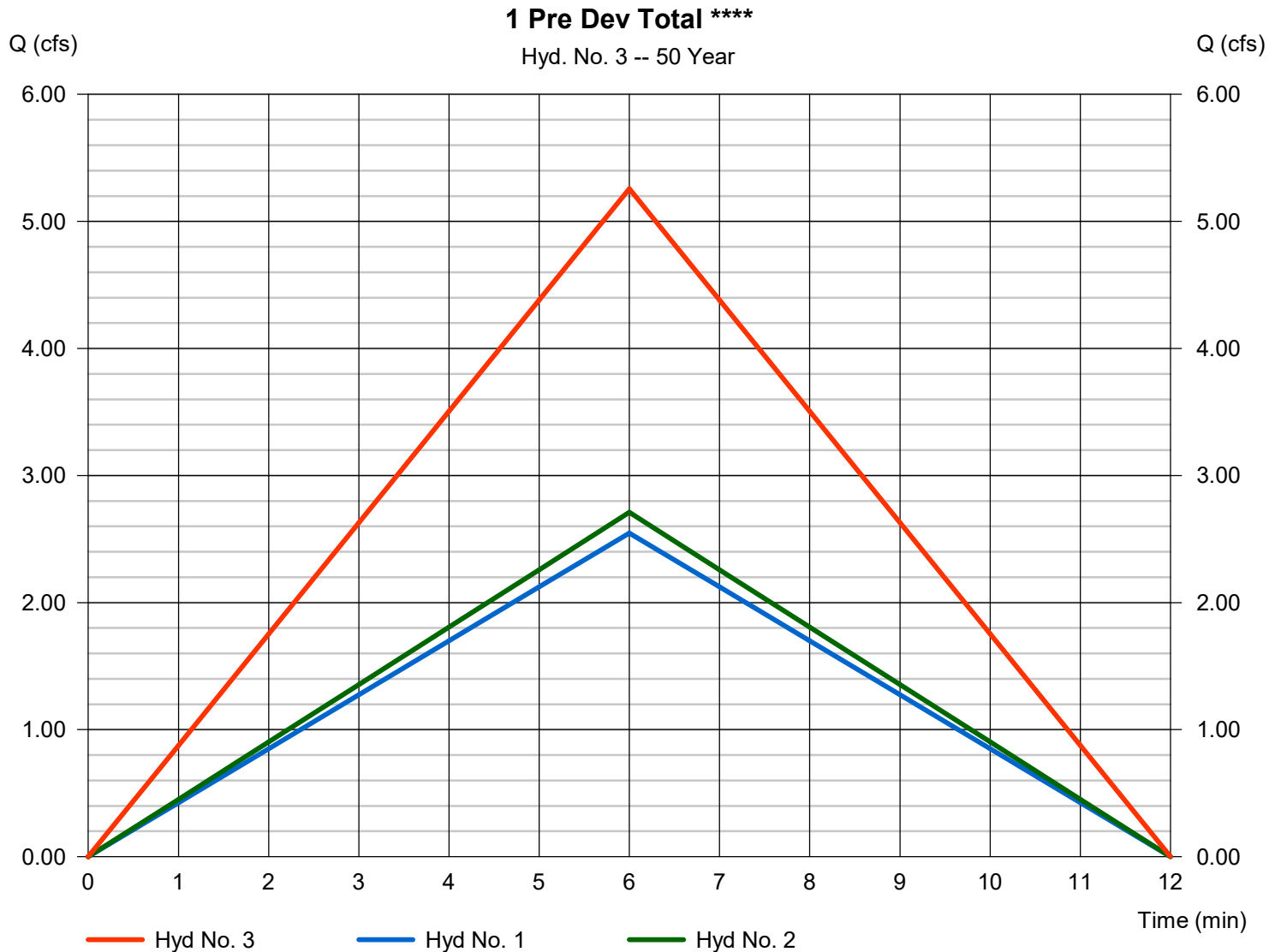
Hydrograph Report

Hyd. No. 3

1 Pre Dev Total ****

Hydrograph type = Combine
Storm frequency = 50 yrs
Time interval = 1 min
Inflow hyds. = 1, 2

Peak discharge = 5.258 cfs
Time to peak = 6 min
Hyd. volume = 1,893 cuft
Contrib. drain. area = 1.500 ac



Hyd. No. 4

1A Post Dev Site

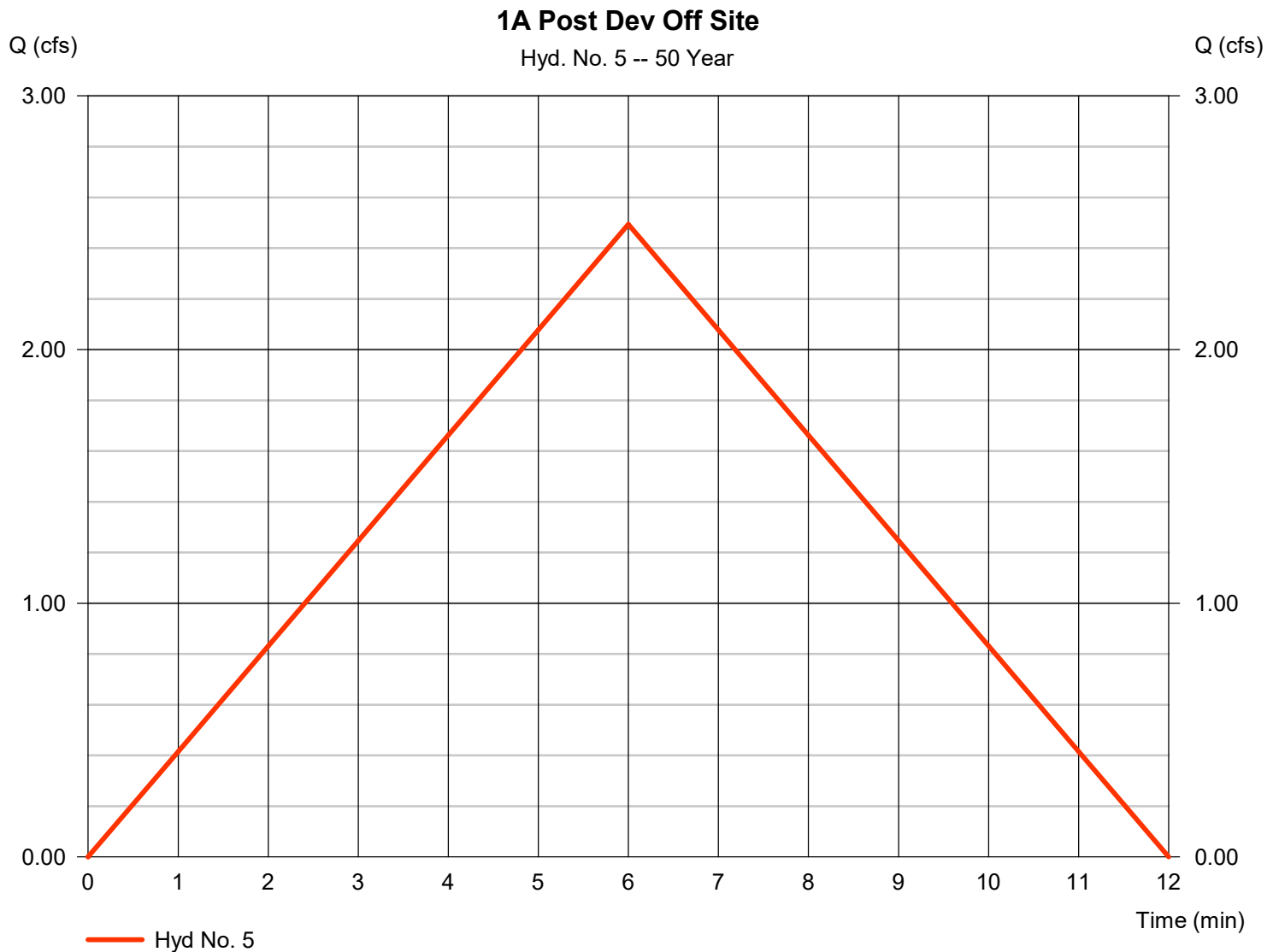
Hydrograph type	= Mod. Rational	Peak discharge	= 2.322 cfs
Storm frequency	= 50 yrs	Time to peak	= 6 min
Time interval	= 1 min	Hyd. volume	= 836 cuft
Drainage area	= 0.440 ac	Runoff coeff.	= 0.73
Intensity	= 7.228 in/hr	Tc by User	= 6.00 min
IDF Curve	= PA-Doylestown.IDF	Storm duration	= 1.0 x Tc
Target Q	=n/a	Est. Req'd Storage	=n/a



Hyd. No. 5

1A Post Dev Off Site

Hydrograph type	= Mod. Rational	Peak discharge	= 2.494 cfs
Storm frequency	= 50 yrs	Time to peak	= 6 min
Time interval	= 1 min	Hyd. volume	= 898 cuft
Drainage area	= 0.750 ac	Runoff coeff.	= 0.46
Intensity	= 7.228 in/hr	Tc by User	= 6.00 min
IDF Curve	= PA-Doylestown.IDF	Storm duration	= 1.0 x Tc
Target Q	=n/a	Est. Req'd Storage	=n/a

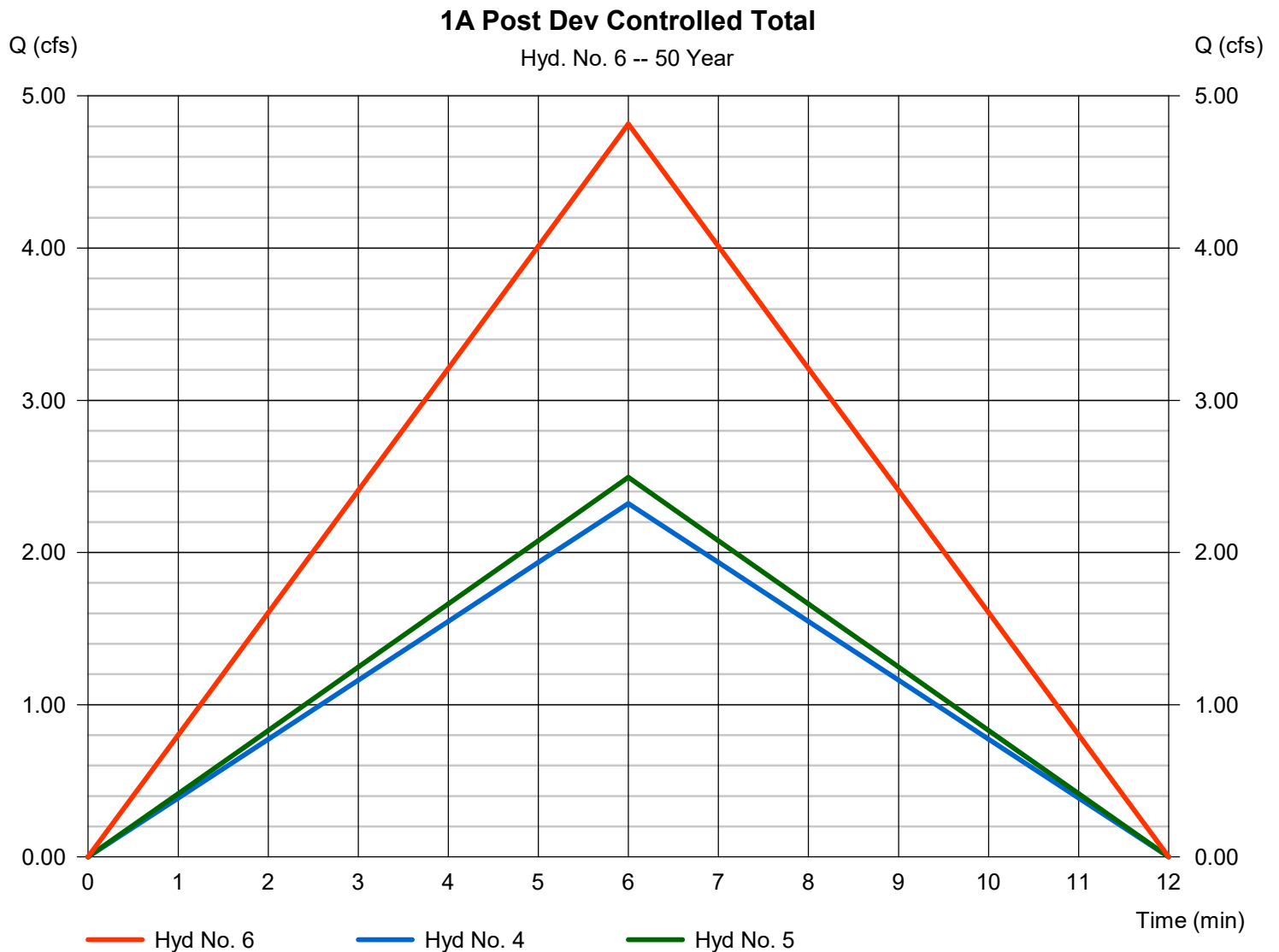


Hyd. No. 6

1A Post Dev Controlled Total

Hydrograph type = Combine
Storm frequency = 50 yrs
Time interval = 1 min
Inflow hyds. = 4, 5

Peak discharge = 4.815 cfs
Time to peak = 6 min
Hyd. volume = 1,733 cuft
Contrib. drain. area = 1.190 ac

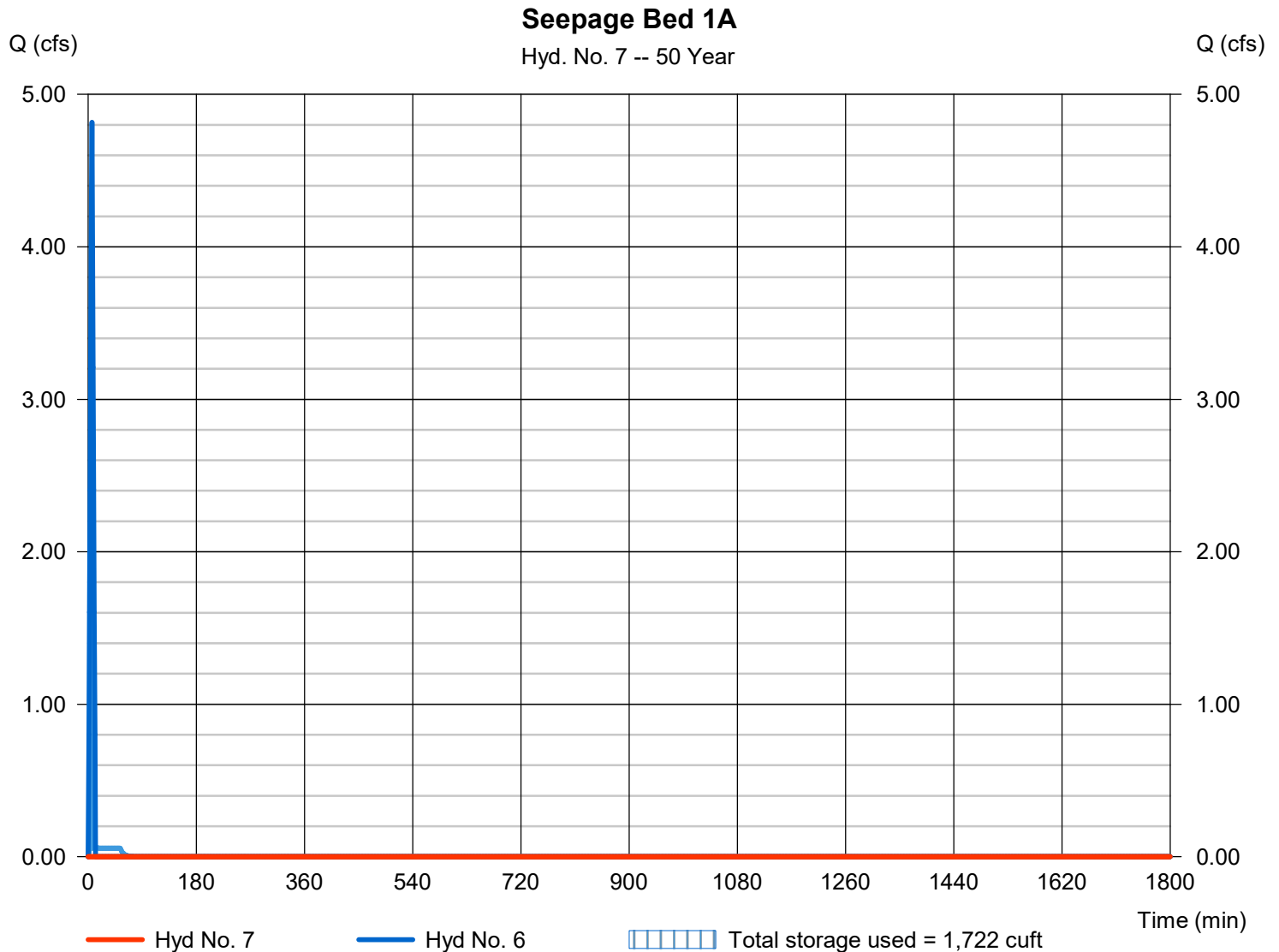


Hyd. No. 7

Seepage Bed 1A

Hydrograph type	= Reservoir	Peak discharge	= 0.000 cfs
Storm frequency	= 50 yrs	Time to peak	= 12 min
Time interval	= 1 min	Hyd. volume	= 0 cuft
Inflow hyd. No.	= 6 - 1A Post Dev Controlled Total	Max. Elevation	= 127.46 ft
Reservoir name	= Seepage Bed 1A	Max. Storage	= 1,722 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Hyd. No. 8

1B Post Dev Site

Hydrograph type	= Mod. Rational	Peak discharge	= 1.834 cfs
Storm frequency	= 50 yrs	Time to peak	= 6 min
Time interval	= 1 min	Hyd. volume	= 660 cuft
Drainage area	= 0.270 ac	Runoff coeff.	= 0.94
Intensity	= 7.228 in/hr	Tc by User	= 6.00 min
IDF Curve	= PA-Doylestown.IDF	Storm duration	= 1.0 x Tc
Target Q	=n/a	Est. Req'd Storage	=n/a

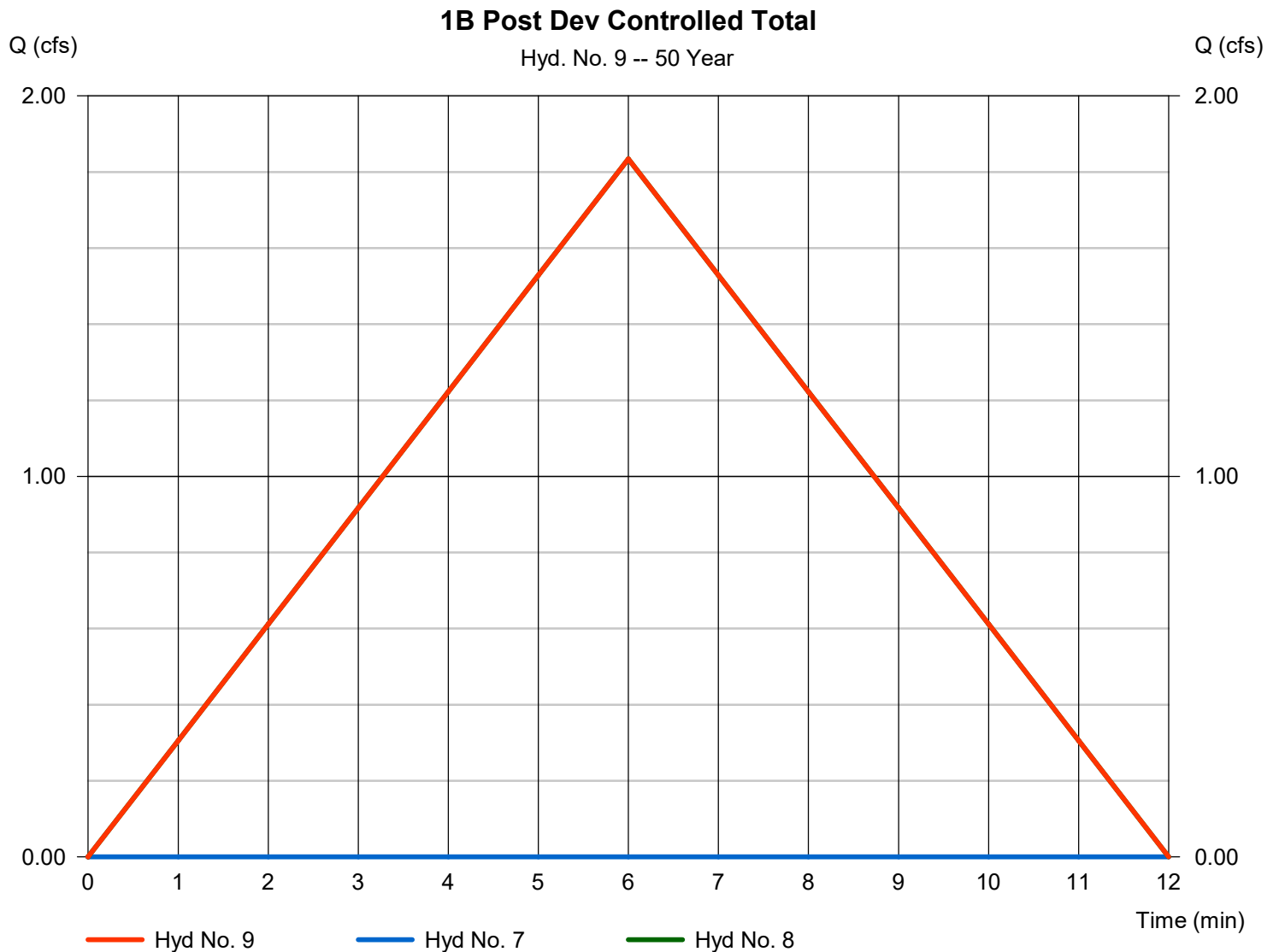


Hyd. No. 9

1B Post Dev Controlled Total

Hydrograph type = Combine
Storm frequency = 50 yrs
Time interval = 1 min
Inflow hyds. = 7, 8

Peak discharge = 1.834 cfs
Time to peak = 6 min
Hyd. volume = 660 cuft
Contrib. drain. area = 0.270 ac



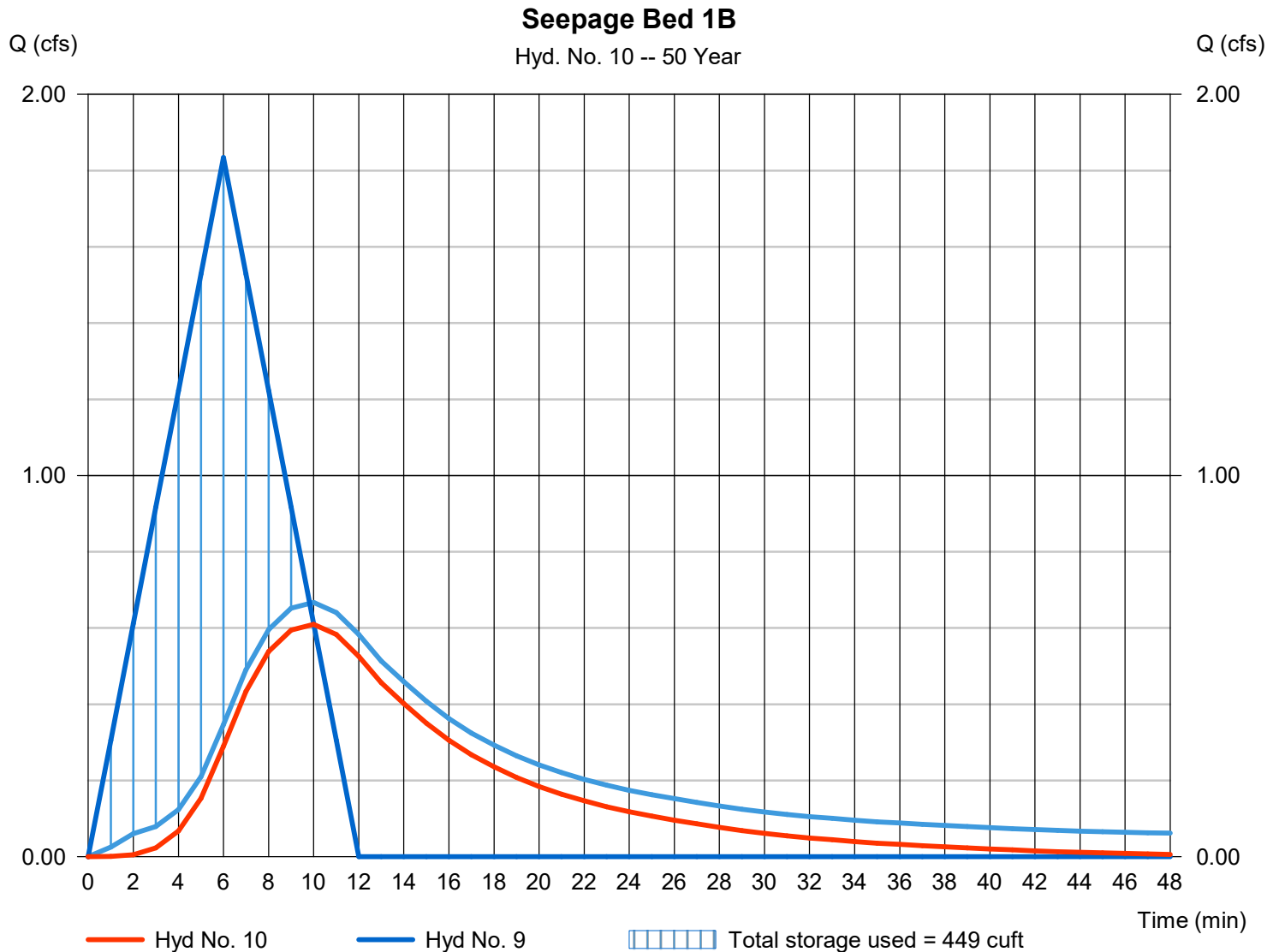
Hydrograph Report

Hyd. No. 10

Seepage Bed 1B

Hydrograph type	= Reservoir	Peak discharge	= 0.610 cfs
Storm frequency	= 50 yrs	Time to peak	= 10 min
Time interval	= 1 min	Hyd. volume	= 466 cuft
Inflow hyd. No.	= 9 - 1B Post Dev Controlled Total	Max. Elevation	= 127.47 ft
Reservoir name	= Seepage Bed 1B	Max. Storage	= 449 cuft

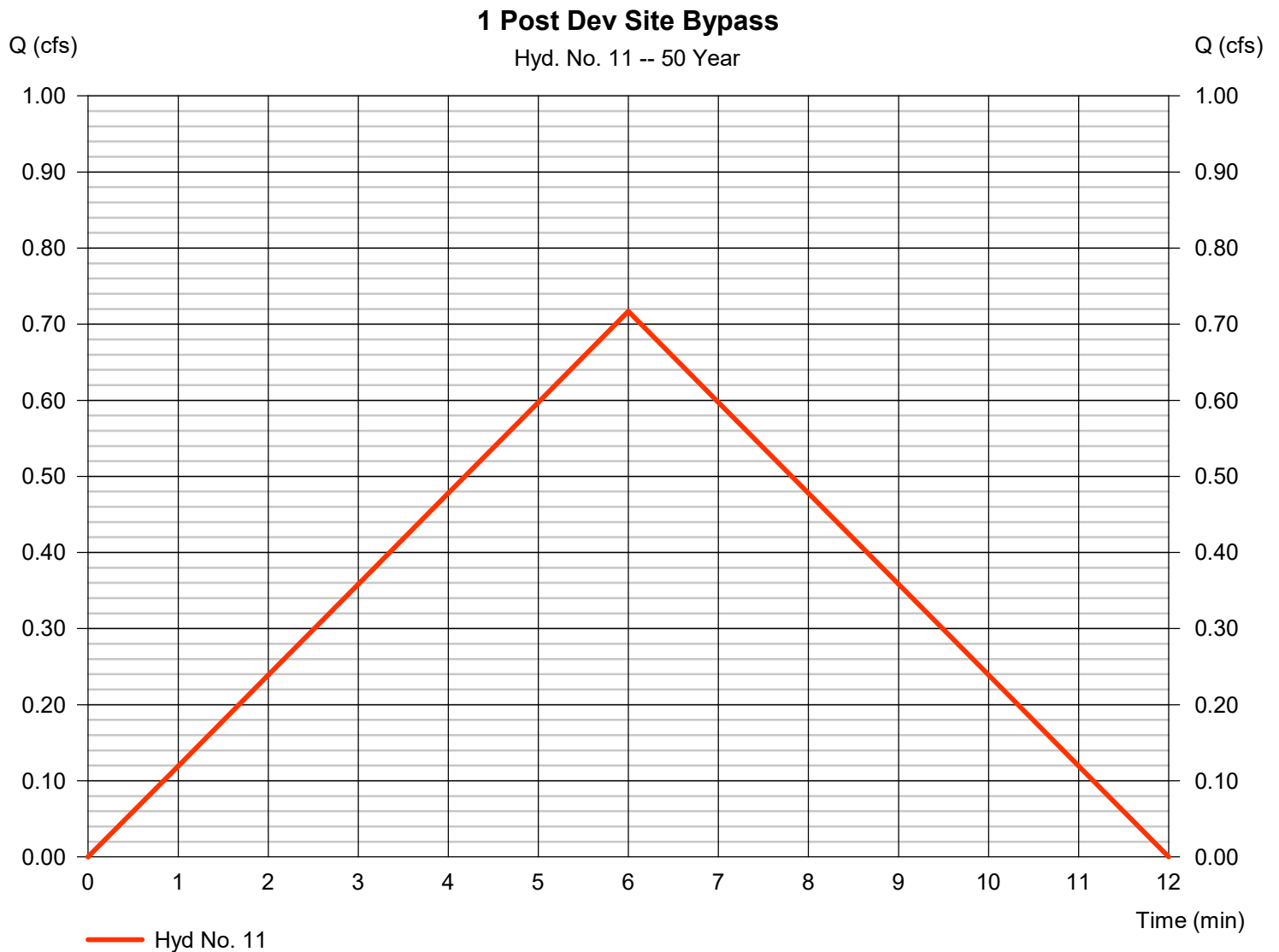
Storage Indication method used. Exfiltration extracted from Outflow.



Hyd. No. 11

1 Post Dev Site Bypass

Hydrograph type	= Mod. Rational	Peak discharge	= 0.717 cfs
Storm frequency	= 50 yrs	Time to peak	= 6 min
Time interval	= 1 min	Hyd. volume	= 258 cuft
Drainage area	= 0.160 ac	Runoff coeff.	= 0.62
Intensity	= 7.228 in/hr	Tc by User	= 6.00 min
IDF Curve	= PA-Doylestown.IDF	Storm duration	= 1.0 x Tc
Target Q	=n/a	Est. Req'd Storage	=n/a

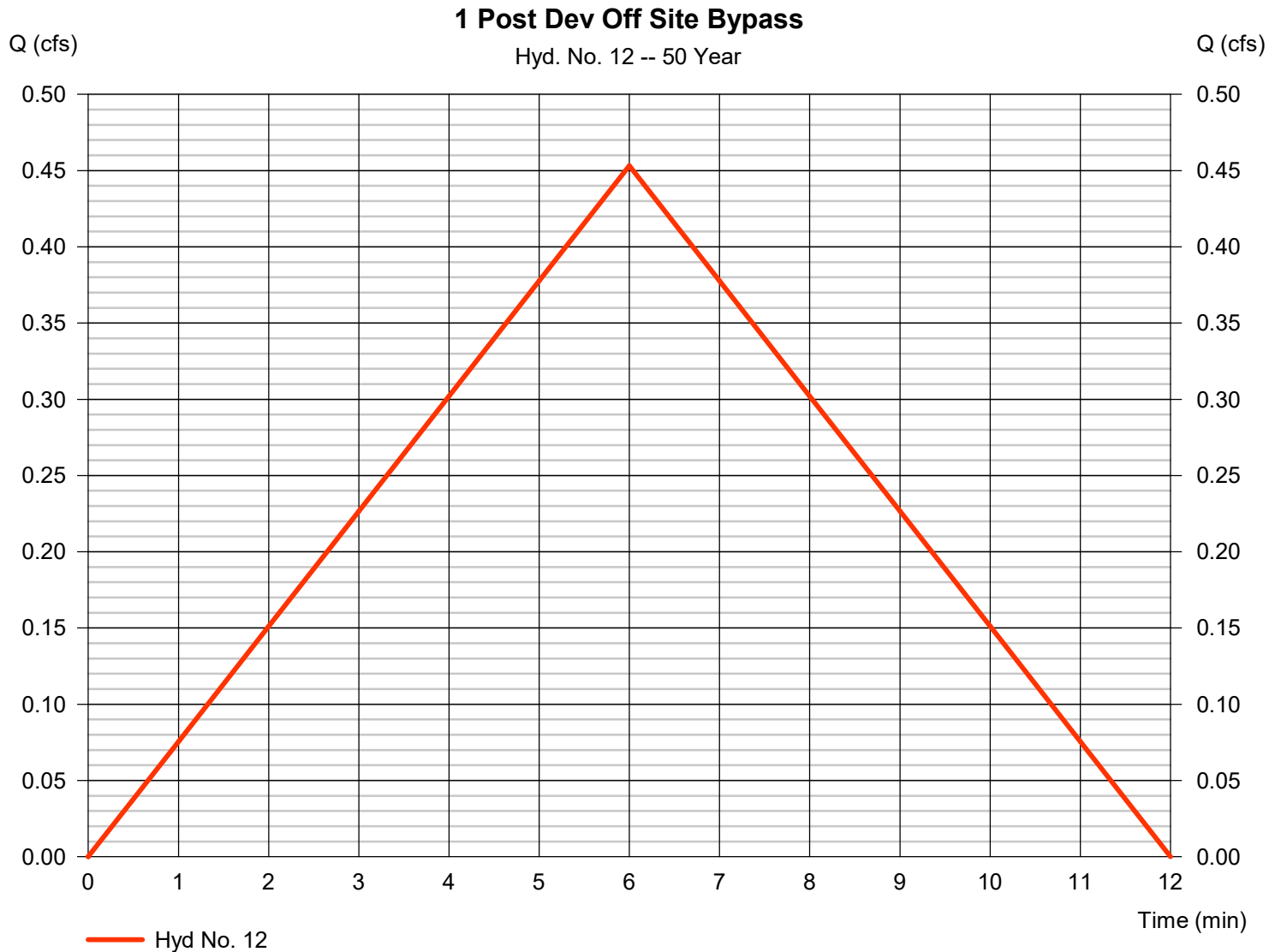


Hydrograph Report

Hyd. No. 12

1 Post Dev Off Site Bypass

Hydrograph type	= Mod. Rational	Peak discharge	= 0.453 cfs
Storm frequency	= 50 yrs	Time to peak	= 6 min
Time interval	= 1 min	Hyd. volume	= 163 cuft
Drainage area	= 0.110 ac	Runoff coeff.	= 0.57
Intensity	= 7.228 in/hr	Tc by User	= 6.00 min
IDF Curve	= PA-Doylestown.IDF	Storm duration	= 1.0 x Tc
Target Q	=n/a	Est. Req'd Storage	=n/a

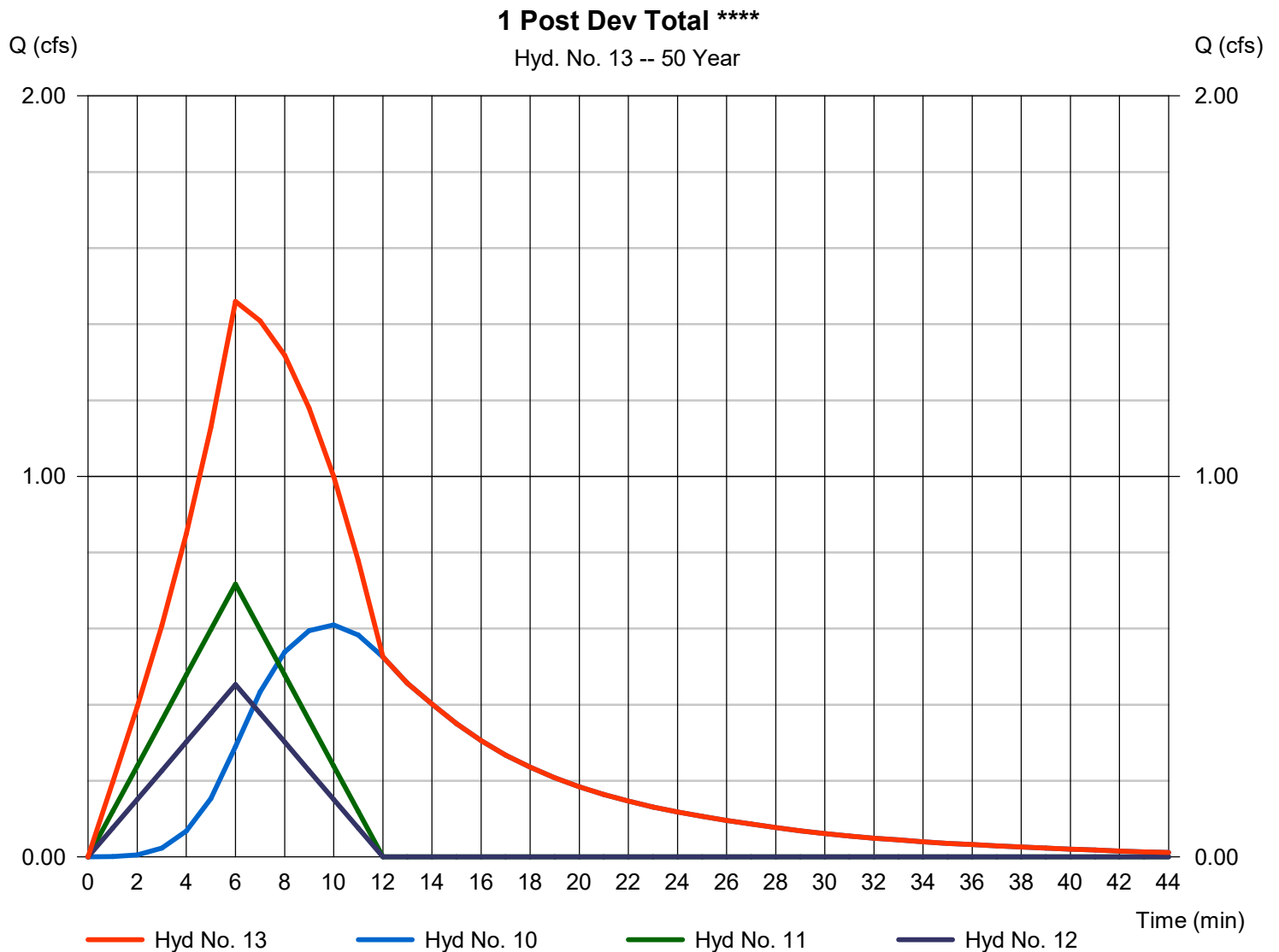


Hydrograph Report

Hyd. No. 13

1 Post Dev Total ****

Hydrograph type	= Combine	Peak discharge	= 1.460 cfs
Storm frequency	= 50 yrs	Time to peak	= 6 min
Time interval	= 1 min	Hyd. volume	= 887 cuft
Inflow hyds.	= 10, 11, 12	Contrib. drain. area	= 0.270 ac

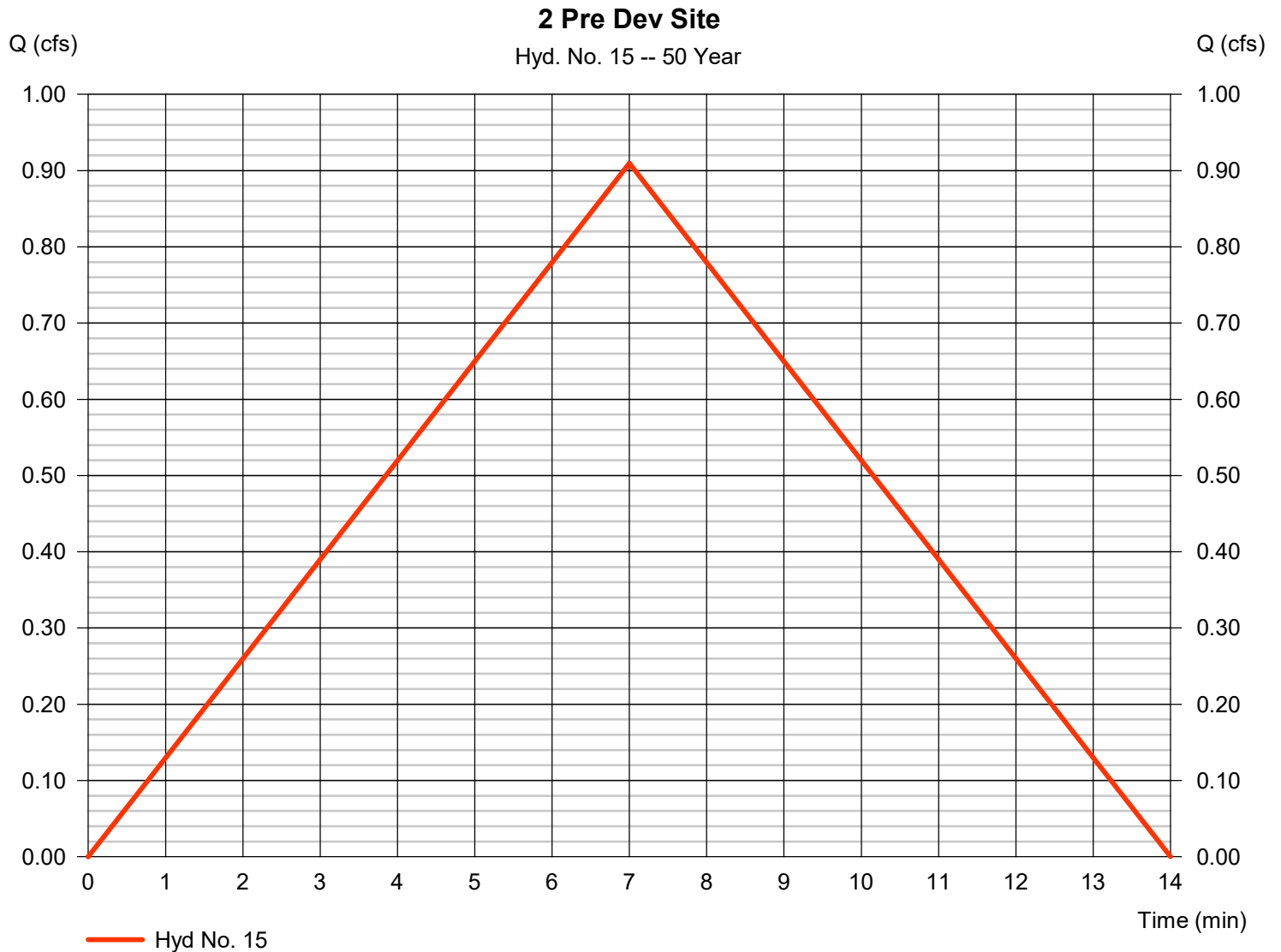


Hydrograph Report

Hyd. No. 15

2 Pre Dev Site

Hydrograph type	= Mod. Rational	Peak discharge	= 0.910 cfs
Storm frequency	= 50 yrs	Time to peak	= 7 min
Time interval	= 1 min	Hyd. volume	= 382 cuft
Drainage area	= 0.410 ac	Runoff coeff.	= 0.32
Intensity	= 6.933 in/hr	Tc by User	= 7.00 min
IDF Curve	= PA-Doylestown.IDF	Storm duration	= 1.0 x Tc
Target Q	=n/a	Est. Req'd Storage	=n/a



Hyd. No. 16

2 Pre Dev Off Site

Hydrograph type	= Mod. Rational	Peak discharge	= 4.742 cfs
Storm frequency	= 50 yrs	Time to peak	= 7 min
Time interval	= 1 min	Hyd. volume	= 1,992 cuft
Drainage area	= 1.520 ac	Runoff coeff.	= 0.45
Intensity	= 6.933 in/hr	Tc by User	= 7.00 min
IDF Curve	= PA-Doylestown.IDF	Storm duration	= 1.0 x Tc
Target Q	=n/a	Est. Req'd Storage	=n/a

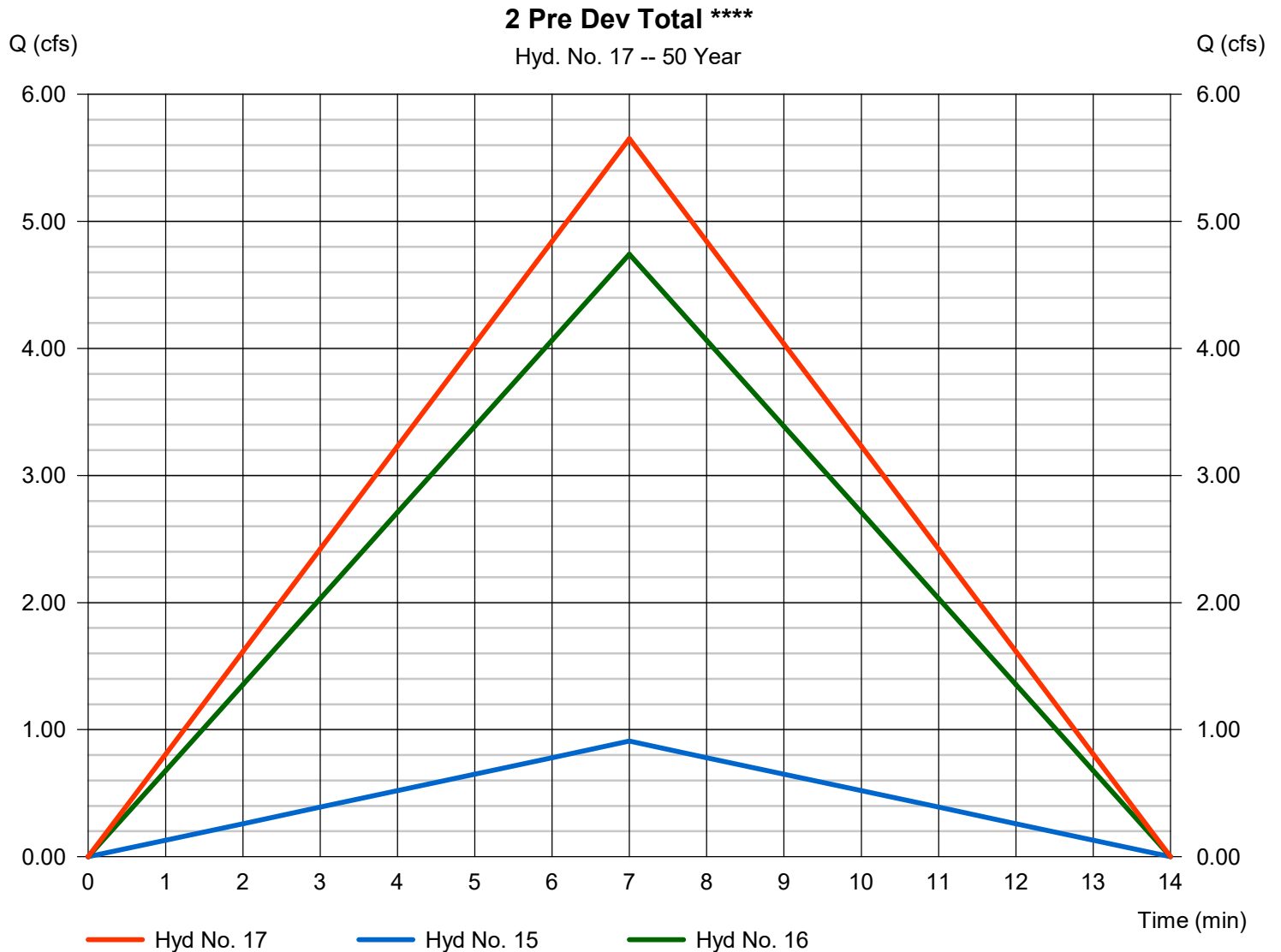


Hyd. No. 17

2 Pre Dev Total ****

Hydrograph type = Combine
Storm frequency = 50 yrs
Time interval = 1 min
Inflow hyds. = 15, 16

Peak discharge = 5.651 cfs
Time to peak = 7 min
Hyd. volume = 2,374 cuft
Contrib. drain. area = 1.930 ac



Hyd. No. 18

2 Post Dev Site

Hydrograph type	= Mod. Rational	Peak discharge	= 0.540 cfs
Storm frequency	= 50 yrs	Time to peak	= 6 min
Time interval	= 1 min	Hyd. volume	= 194 cuft
Drainage area	= 0.090 ac	Runoff coeff.	= 0.83
Intensity	= 7.228 in/hr	Tc by User	= 6.00 min
IDF Curve	= PA-Doylestown.IDF	Storm duration	= 1.0 x Tc
Target Q	=n/a	Est. Req'd Storage	=n/a



Hydrograph Report

Hyd. No. 19

2 Post Dev Off Site

Hydrograph type	= Mod. Rational	Peak discharge	= 0.048 cfs
Storm frequency	= 50 yrs	Time to peak	= 6 min
Time interval	= 1 min	Hyd. volume	= 17 cuft
Drainage area	= 0.060 ac	Runoff coeff.	= 0.11
Intensity	= 7.228 in/hr	Tc by User	= 6.00 min
IDF Curve	= PA-Doylestown.IDF	Storm duration	= 1.0 x Tc
Target Q	=n/a	Est. Req'd Storage	=n/a



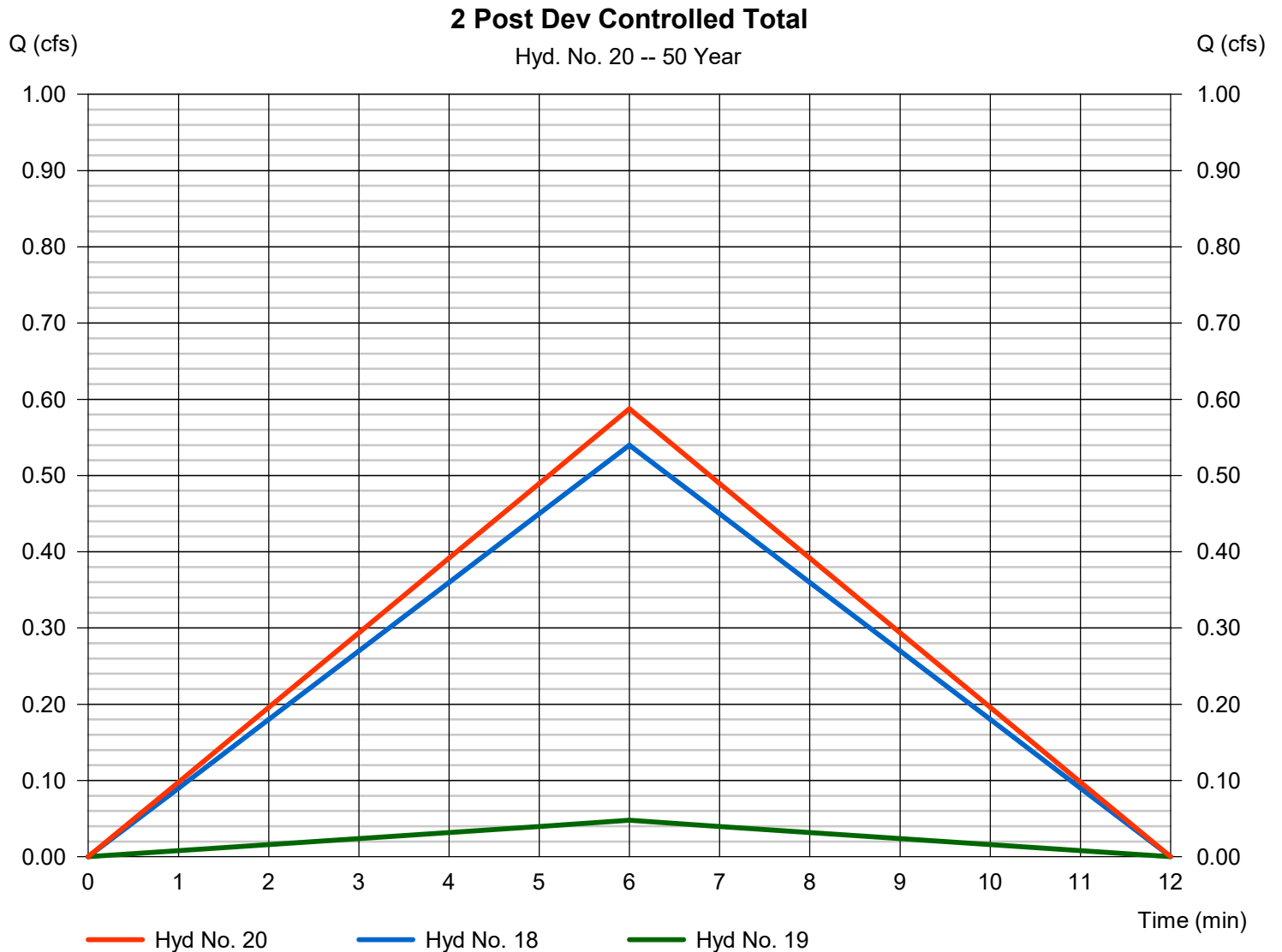
Hydrograph Report

Hyd. No. 20

2 Post Dev Controlled Total

Hydrograph type = Combine
Storm frequency = 50 yrs
Time interval = 1 min
Inflow hyds. = 18, 19

Peak discharge = 0.588 cfs
Time to peak = 6 min
Hyd. volume = 212 cuft
Contrib. drain. area = 0.150 ac

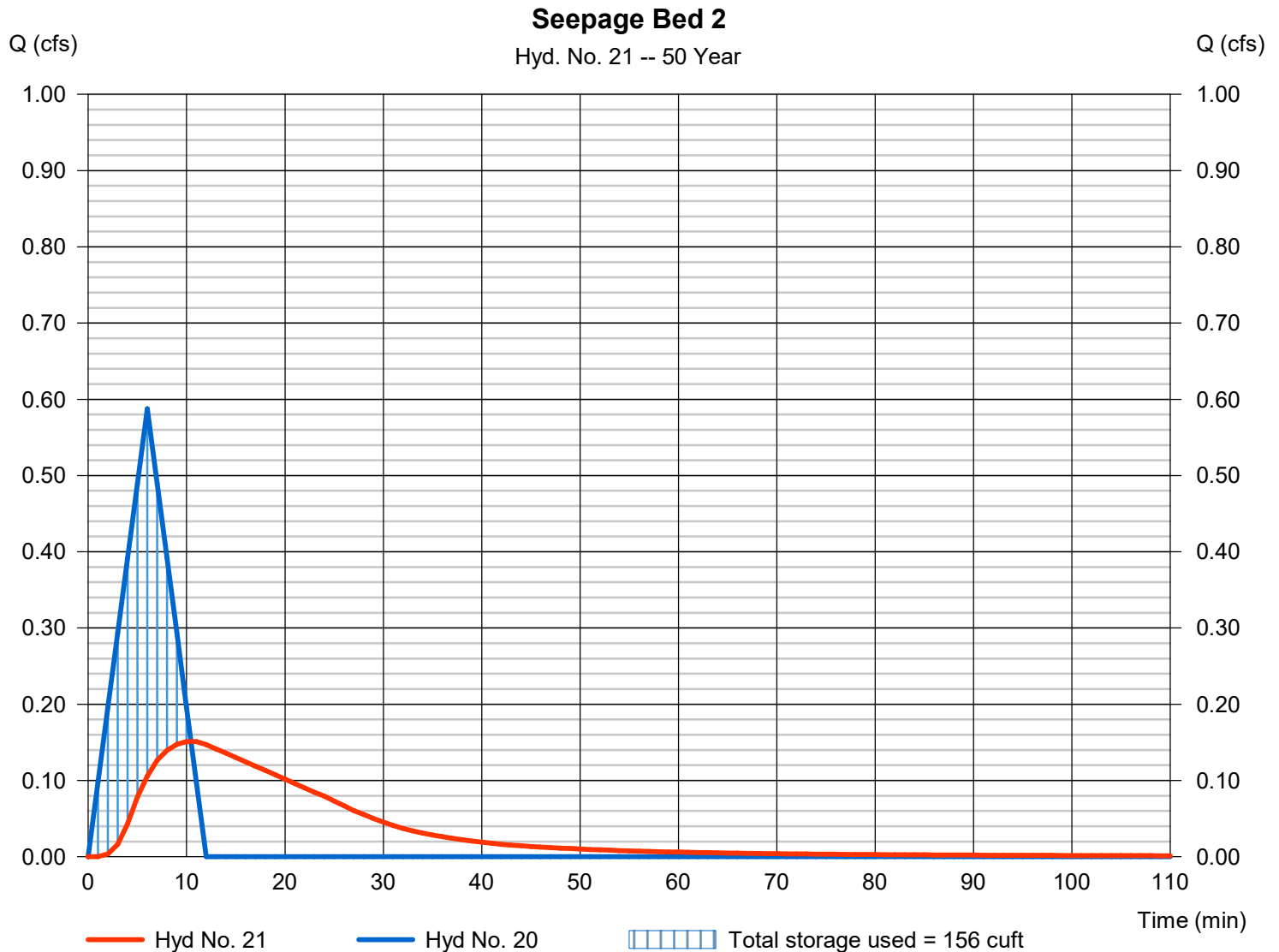


Hyd. No. 21

Seepage Bed 2

Hydrograph type	= Reservoir	Peak discharge	= 0.151 cfs
Storm frequency	= 50 yrs	Time to peak	= 10 min
Time interval	= 1 min	Hyd. volume	= 206 cuft
Inflow hyd. No.	= 20 - 2 Post Dev Controlled Total	Max. Elevation	= 108.53 ft
Reservoir name	= Seepage Bed 2	Max. Storage	= 156 cuft

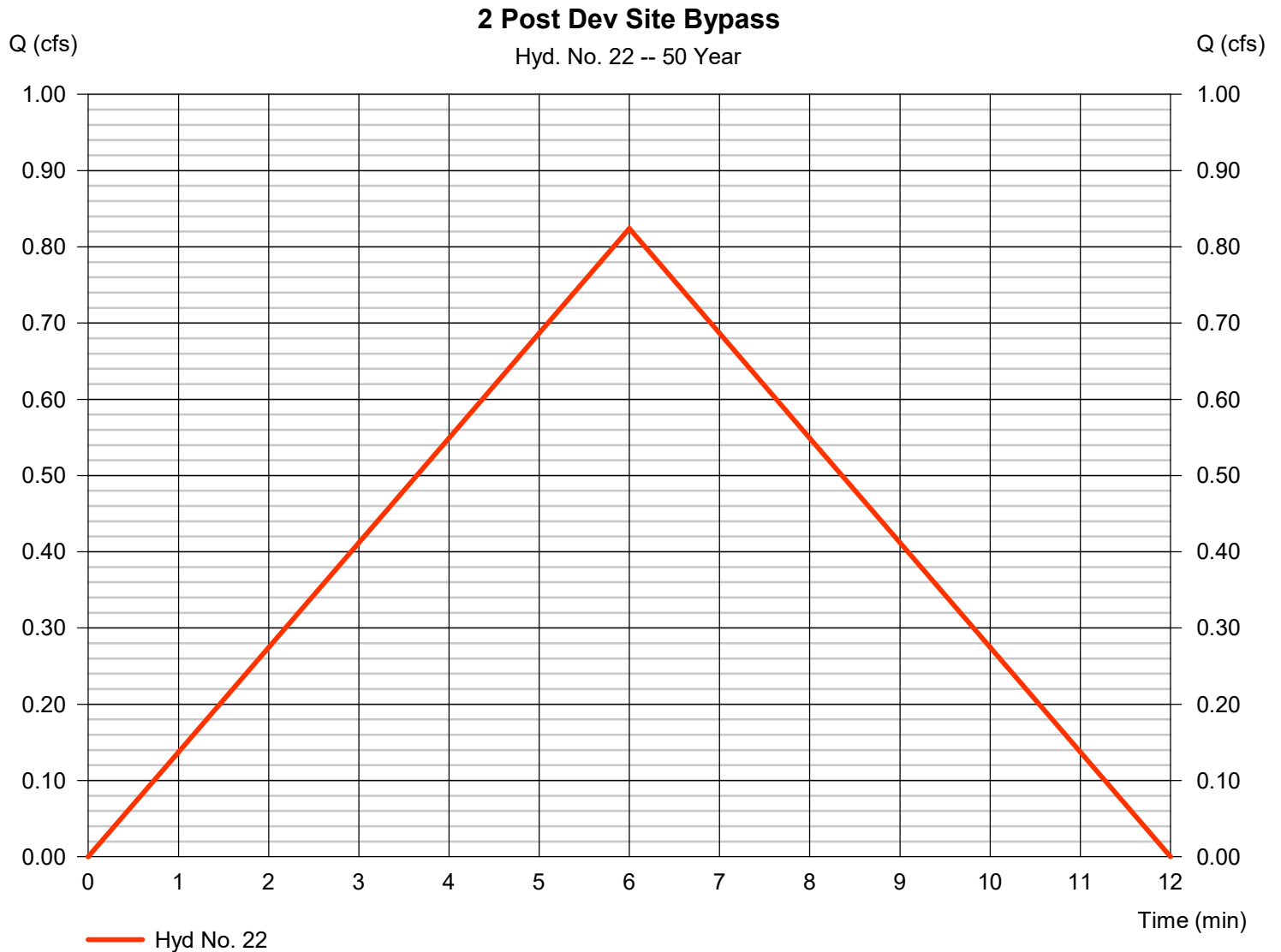
Storage Indication method used.



Hyd. No. 22

2 Post Dev Site Bypass

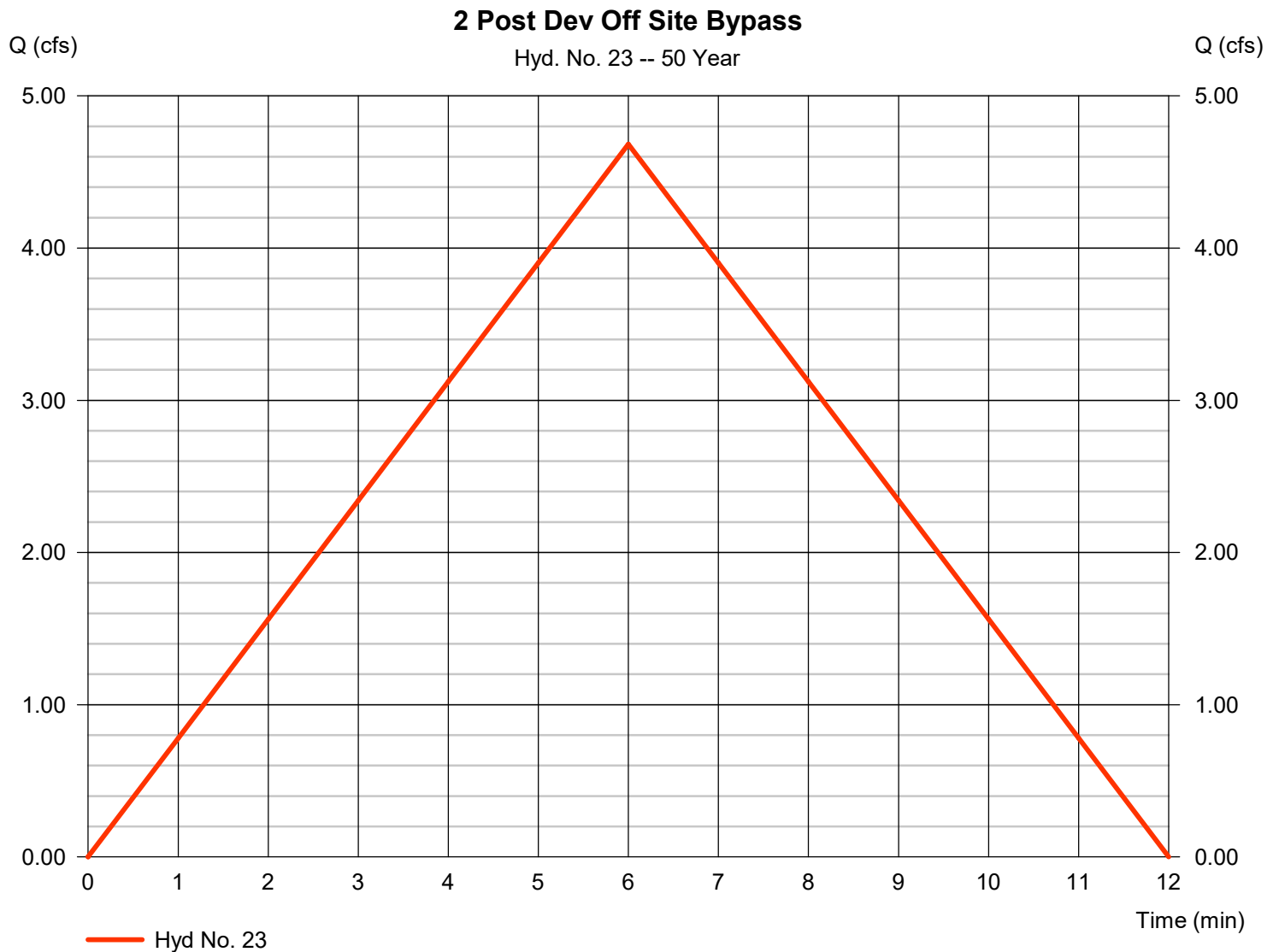
Hydrograph type	= Mod. Rational	Peak discharge	= 0.824 cfs
Storm frequency	= 50 yrs	Time to peak	= 6 min
Time interval	= 1 min	Hyd. volume	= 297 cuft
Drainage area	= 0.200 ac	Runoff coeff.	= 0.57
Intensity	= 7.228 in/hr	Tc by User	= 6.00 min
IDF Curve	= PA-Doylestown.IDF	Storm duration	= 1.0 x Tc
Target Q	=n/a	Est. Req'd Storage	=n/a



Hyd. No. 23

2 Post Dev Off Site Bypass

Hydrograph type	= Mod. Rational	Peak discharge	= 4.684 cfs
Storm frequency	= 50 yrs	Time to peak	= 6 min
Time interval	= 1 min	Hyd. volume	= 1,686 cuft
Drainage area	= 1.350 ac	Runoff coeff.	= 0.48
Intensity	= 7.228 in/hr	Tc by User	= 6.00 min
IDF Curve	= PA-Doylestown.IDF	Storm duration	= 1.0 x Tc
Target Q	=n/a	Est. Req'd Storage	=n/a

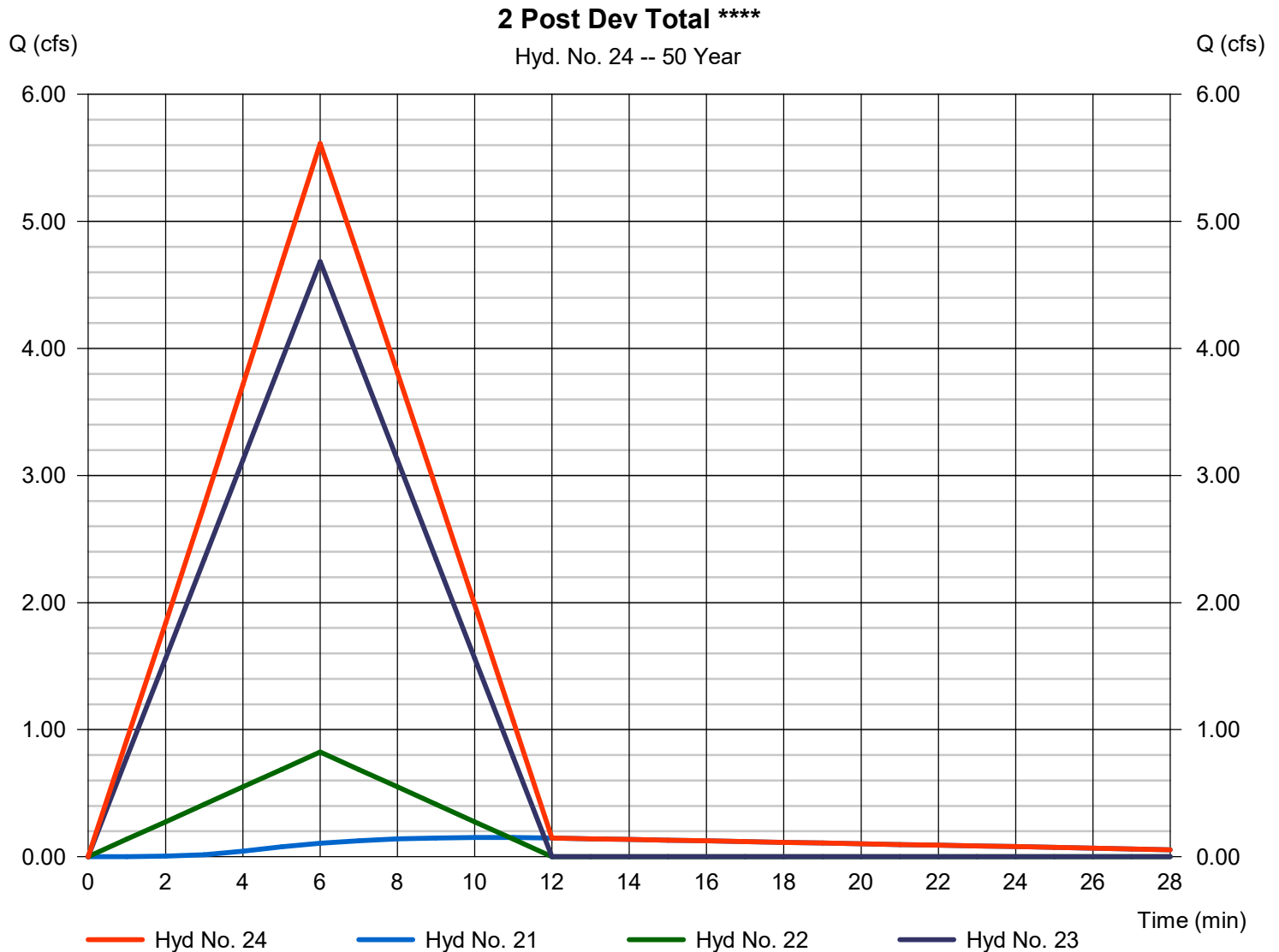


Hydrograph Report

Hyd. No. 24

2 Post Dev Total ****

Hydrograph type	= Combine	Peak discharge	= 5.613 cfs
Storm frequency	= 50 yrs	Time to peak	= 6 min
Time interval	= 1 min	Hyd. volume	= 2,188 cuft
Inflow hyds.	= 21, 22, 23	Contrib. drain. area	= 1.550 ac



Hydrograph Summary Report

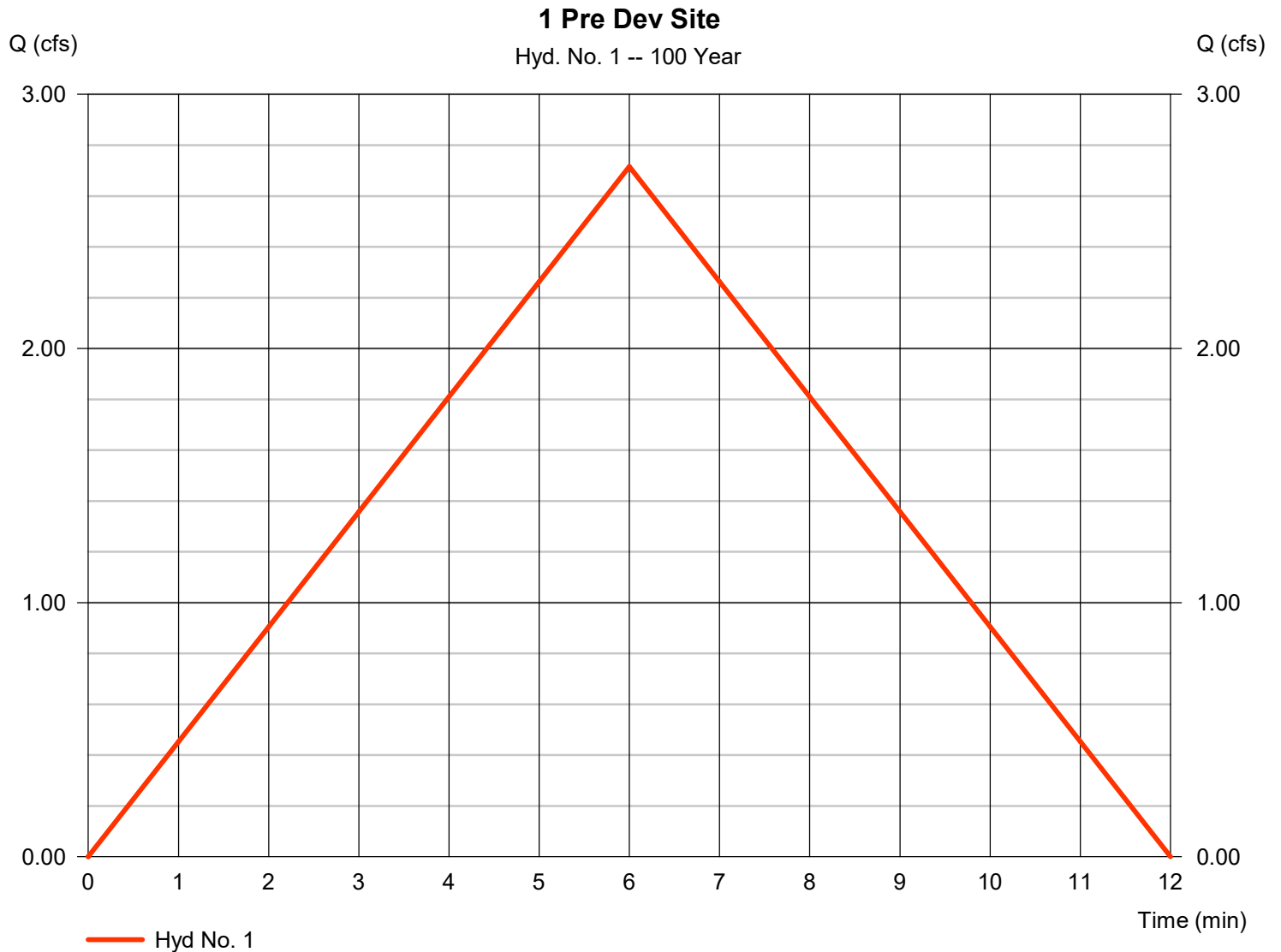
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

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	Mod. Rational	2.715	1	6	978	----	----	----	1 Pre Dev Site	
2	Mod. Rational	2.889	1	6	1,040	----	----	----	1 Pre Dev Off Site	
3	Combine	5.604	1	6	2,018	1, 2	----	----	1 Pre Dev Total ****	
4	Mod. Rational	2.474	1	6	891	----	----	----	1A Post Dev Site	
5	Mod. Rational	2.658	1	6	957	----	----	----	1A Post Dev Off Site	
6	Combine	5.132	1	6	1,848	4, 5	----	----	1A Post Dev Controlled Total	
7	Reservoir	0.000	1	102	0	6	127.56	1,836	Seepage Bed 1A	
8	Mod. Rational	1.955	1	6	704	----	----	----	1B Post Dev Site	
9	Combine	1.955	1	6	704	7, 8	----	----	1B Post Dev Controlled Total	
10	Reservoir	0.666	1	10	507	9	127.49	474	Seepage Bed 1B	
11	Mod. Rational	0.764	1	6	275	----	----	----	1 Post Dev Site Bypass	
12	Mod. Rational	0.483	1	6	174	----	----	----	1 Post Dev Off Site Bypass	
13	Combine	1.572	1	6	956	10, 11, 12	----	----	1 Post Dev Total ****	
15	Mod. Rational	0.969	1	7	407	----	----	----	2 Pre Dev Site	
16	Mod. Rational	5.054	1	7	2,123	----	----	----	2 Pre Dev Off Site	
17	Combine	6.024	1	7	2,530	15, 16	----	----	2 Pre Dev Total ****	
18	Mod. Rational	0.575	1	6	207	----	----	----	2 Post Dev Site	
19	Mod. Rational	0.051	1	6	18	----	----	----	2 Post Dev Off Site	
20	Combine	0.626	1	6	225	18, 19	----	----	2 Post Dev Controlled Total	
21	Reservoir	0.158	1	10	220	20	108.57	166	Seepage Bed 2	
22	Mod. Rational	0.878	1	6	316	----	----	----	2 Post Dev Site Bypass	
23	Mod. Rational	4.992	1	6	1,797	----	----	----	2 Post Dev Off Site Bypass	
24	Combine	5.981	1	6	2,333	21, 22, 23	----	----	2 Post Dev Total ****	
301 Watersheds 2084 RM.gpw					Return Period: 100 Year			Friday, 09 / 22 / 2023		

Hyd. No. 1

1 Pre Dev Site

Hydrograph type	= Mod. Rational	Peak discharge	= 2.715 cfs
Storm frequency	= 100 yrs	Time to peak	= 6 min
Time interval	= 1 min	Hyd. volume	= 978 cuft
Drainage area	= 0.750 ac	Runoff coeff.	= 0.47
Intensity	= 7.704 in/hr	Tc by User	= 6.00 min
IDF Curve	= PA-Doylestown.IDF	Storm duration	= 1.0 x Tc
Target Q	=n/a	Est. Req'd Storage	=n/a



Hyd. No. 2

1 Pre Dev Off Site

Hydrograph type	= Mod. Rational	Peak discharge	= 2.889 cfs
Storm frequency	= 100 yrs	Time to peak	= 6 min
Time interval	= 1 min	Hyd. volume	= 1,040 cuft
Drainage area	= 0.750 ac	Runoff coeff.	= 0.5
Intensity	= 7.704 in/hr	Tc by User	= 6.00 min
IDF Curve	= PA-Doylestown.IDF	Storm duration	= 1.0 x Tc
Target Q	=n/a	Est. Req'd Storage	=n/a

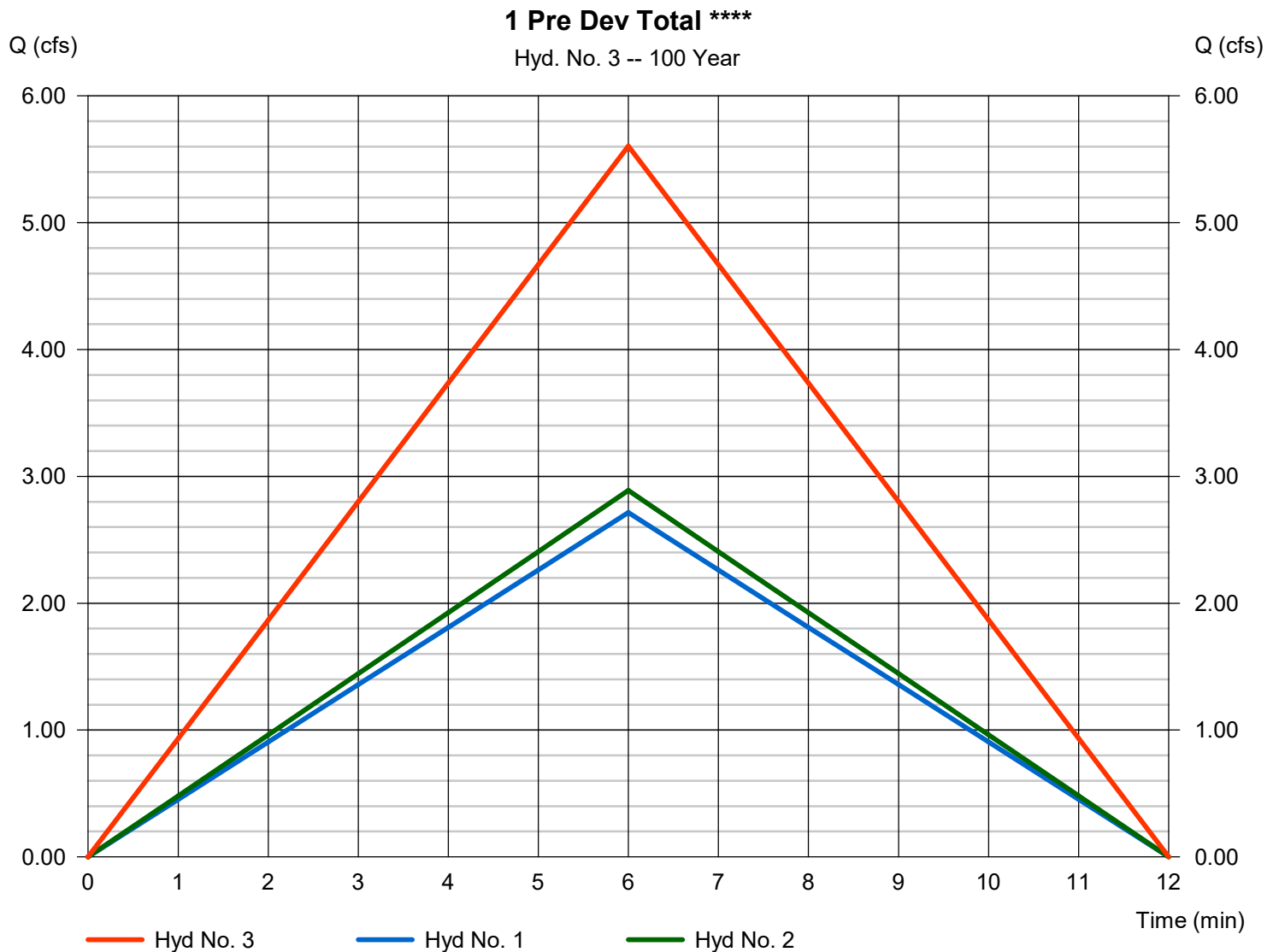


Hyd. No. 3

1 Pre Dev Total ****

Hydrograph type = Combine
Storm frequency = 100 yrs
Time interval = 1 min
Inflow hyds. = 1, 2

Peak discharge = 5.604 cfs
Time to peak = 6 min
Hyd. volume = 2,018 cuft
Contrib. drain. area = 1.500 ac



Hyd. No. 4

1A Post Dev Site

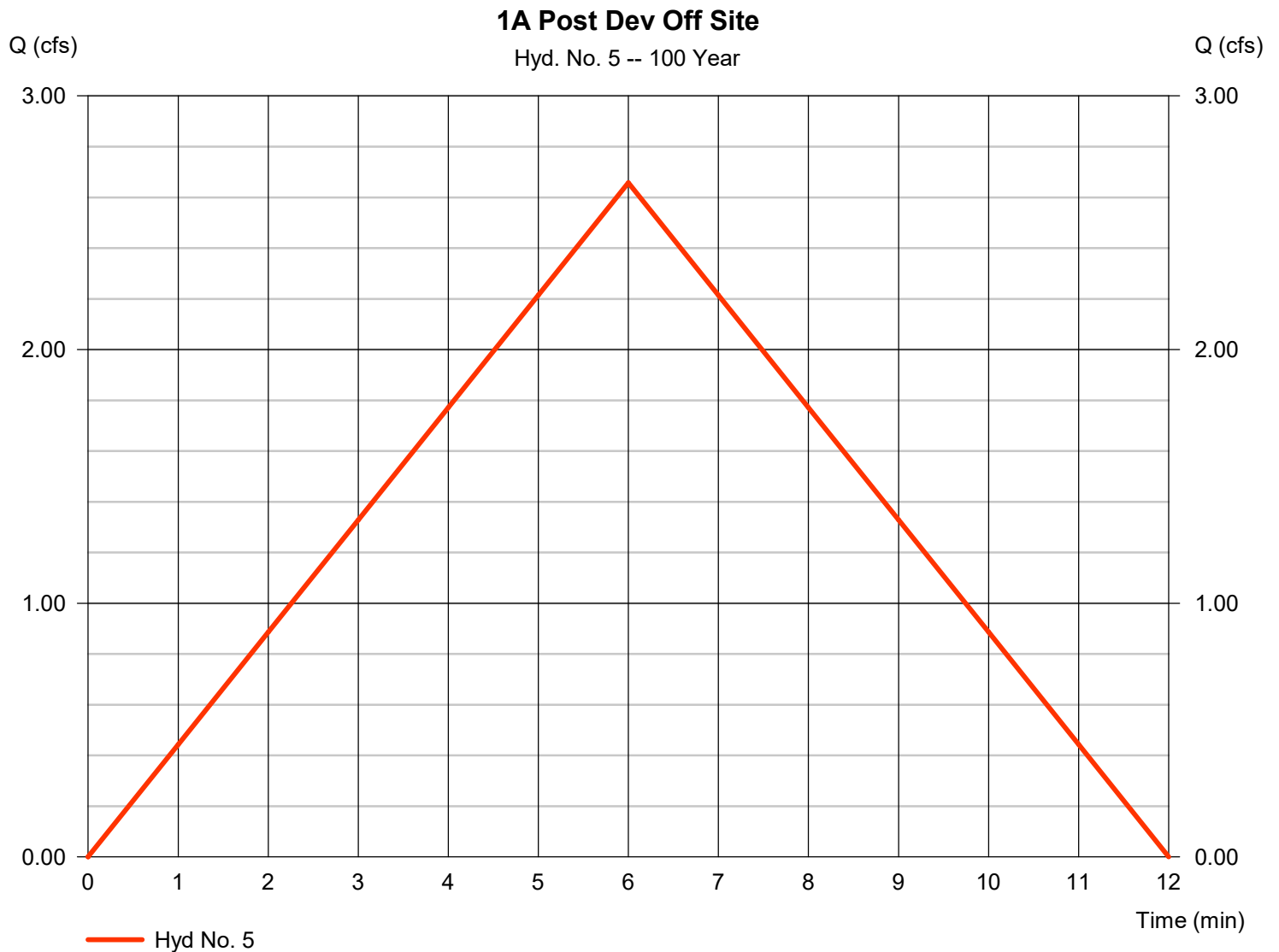
Hydrograph type	= Mod. Rational	Peak discharge	= 2.474 cfs
Storm frequency	= 100 yrs	Time to peak	= 6 min
Time interval	= 1 min	Hyd. volume	= 891 cuft
Drainage area	= 0.440 ac	Runoff coeff.	= 0.73
Intensity	= 7.704 in/hr	Tc by User	= 6.00 min
IDF Curve	= PA-Doylestown.IDF	Storm duration	= 1.0 x Tc
Target Q	=n/a	Est. Req'd Storage	=n/a



Hyd. No. 5

1A Post Dev Off Site

Hydrograph type	= Mod. Rational	Peak discharge	= 2.658 cfs
Storm frequency	= 100 yrs	Time to peak	= 6 min
Time interval	= 1 min	Hyd. volume	= 957 cuft
Drainage area	= 0.750 ac	Runoff coeff.	= 0.46
Intensity	= 7.704 in/hr	Tc by User	= 6.00 min
IDF Curve	= PA-Doylestown.IDF	Storm duration	= 1.0 x Tc
Target Q	=n/a	Est. Req'd Storage	=n/a

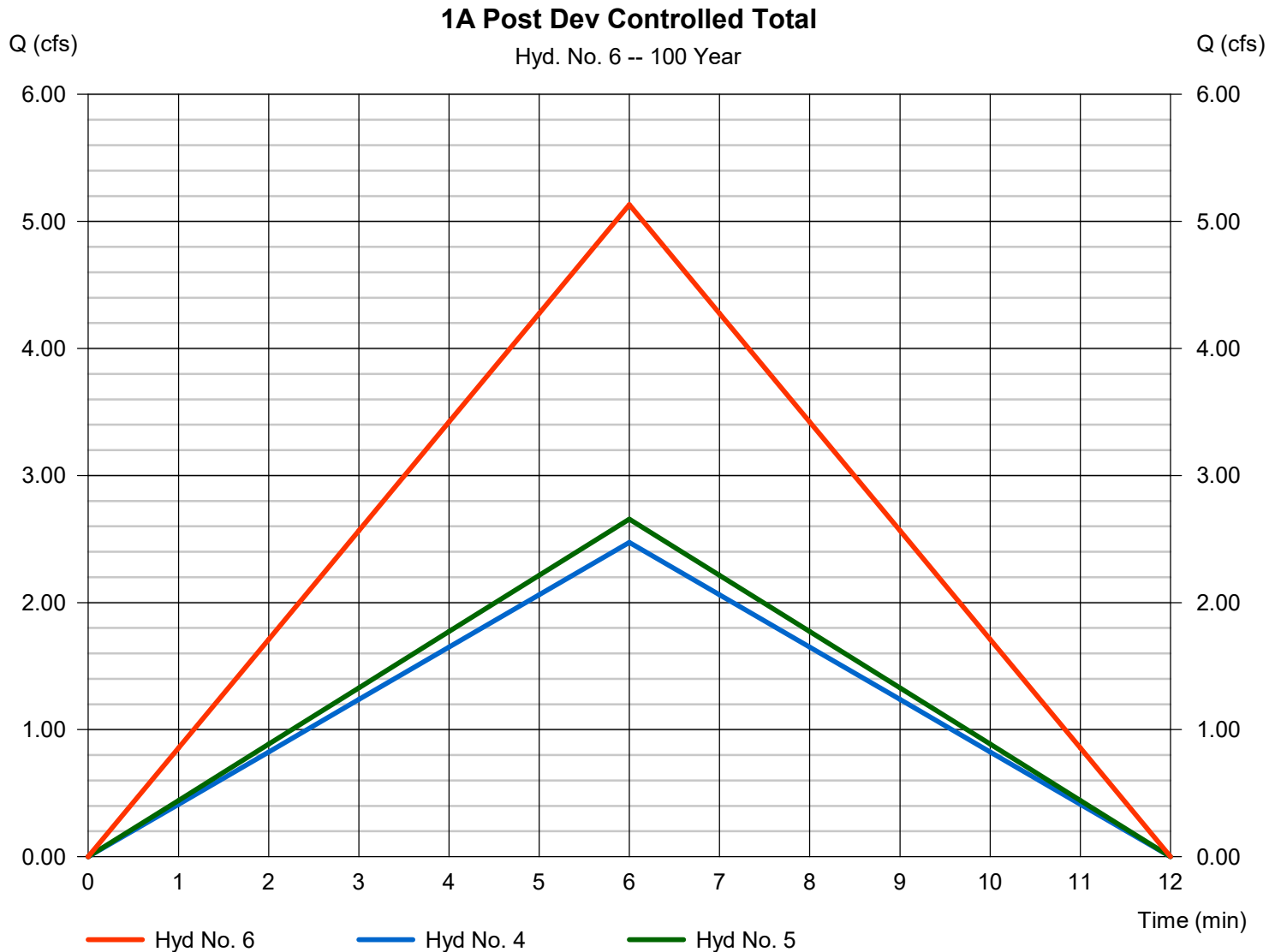


Hyd. No. 6

1A Post Dev Controlled Total

Hydrograph type = Combine
Storm frequency = 100 yrs
Time interval = 1 min
Inflow hyds. = 4, 5

Peak discharge = 5.132 cfs
Time to peak = 6 min
Hyd. volume = 1,848 cuft
Contrib. drain. area = 1.190 ac



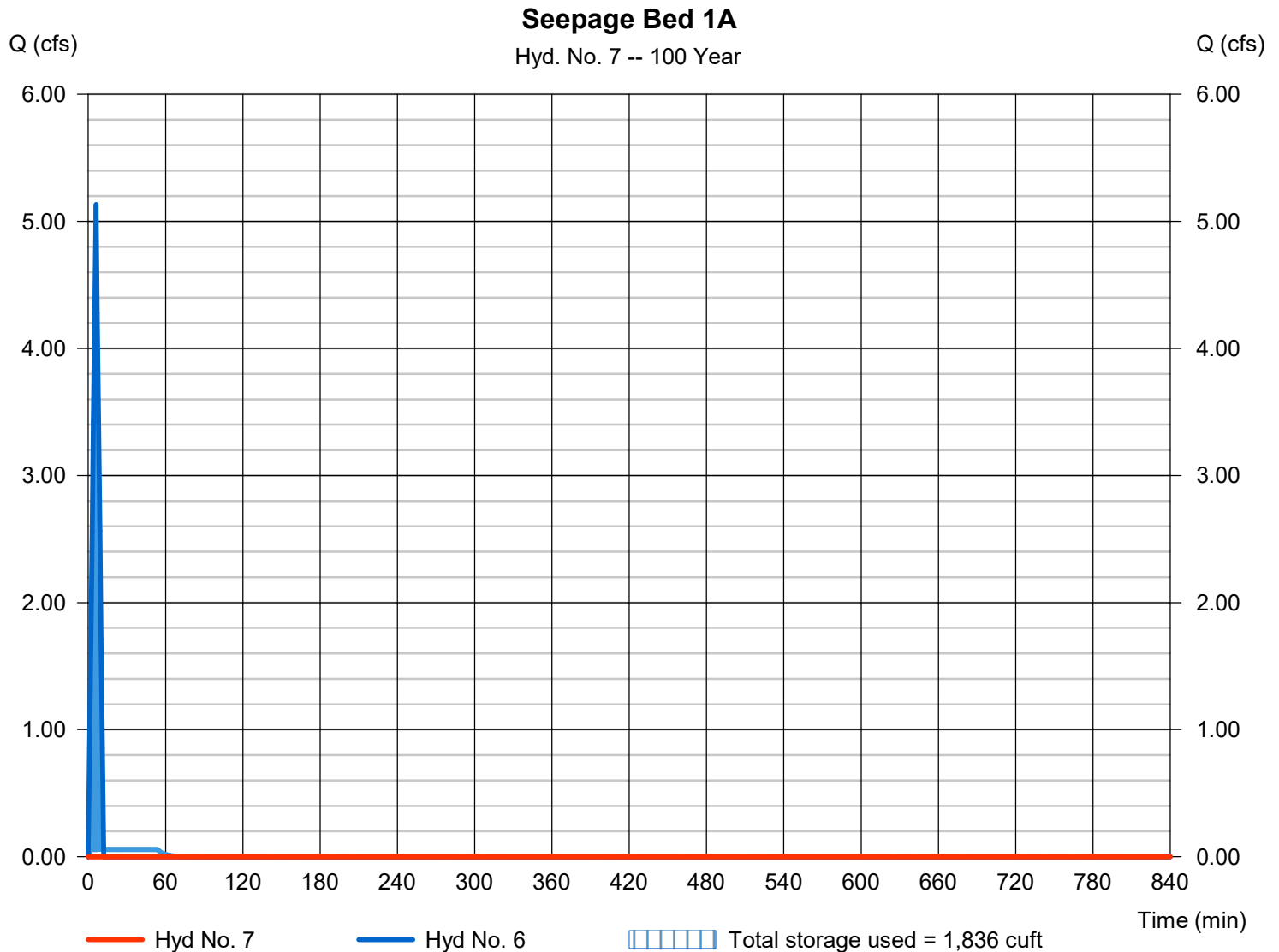
Hydrograph Report

Hyd. No. 7

Seepage Bed 1A

Hydrograph type	= Reservoir	Peak discharge	= 0.000 cfs
Storm frequency	= 100 yrs	Time to peak	= 102 min
Time interval	= 1 min	Hyd. volume	= 0 cuft
Inflow hyd. No.	= 6 - 1A Post Dev Controlled Total	Max. Elevation	= 127.56 ft
Reservoir name	= Seepage Bed 1A	Max. Storage	= 1,836 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Hyd. No. 8

1B Post Dev Site

Hydrograph type	= Mod. Rational	Peak discharge	= 1.955 cfs
Storm frequency	= 100 yrs	Time to peak	= 6 min
Time interval	= 1 min	Hyd. volume	= 704 cuft
Drainage area	= 0.270 ac	Runoff coeff.	= 0.94
Intensity	= 7.704 in/hr	Tc by User	= 6.00 min
IDF Curve	= PA-Doylestown.IDF	Storm duration	= 1.0 x Tc
Target Q	=n/a	Est. Req'd Storage	=n/a

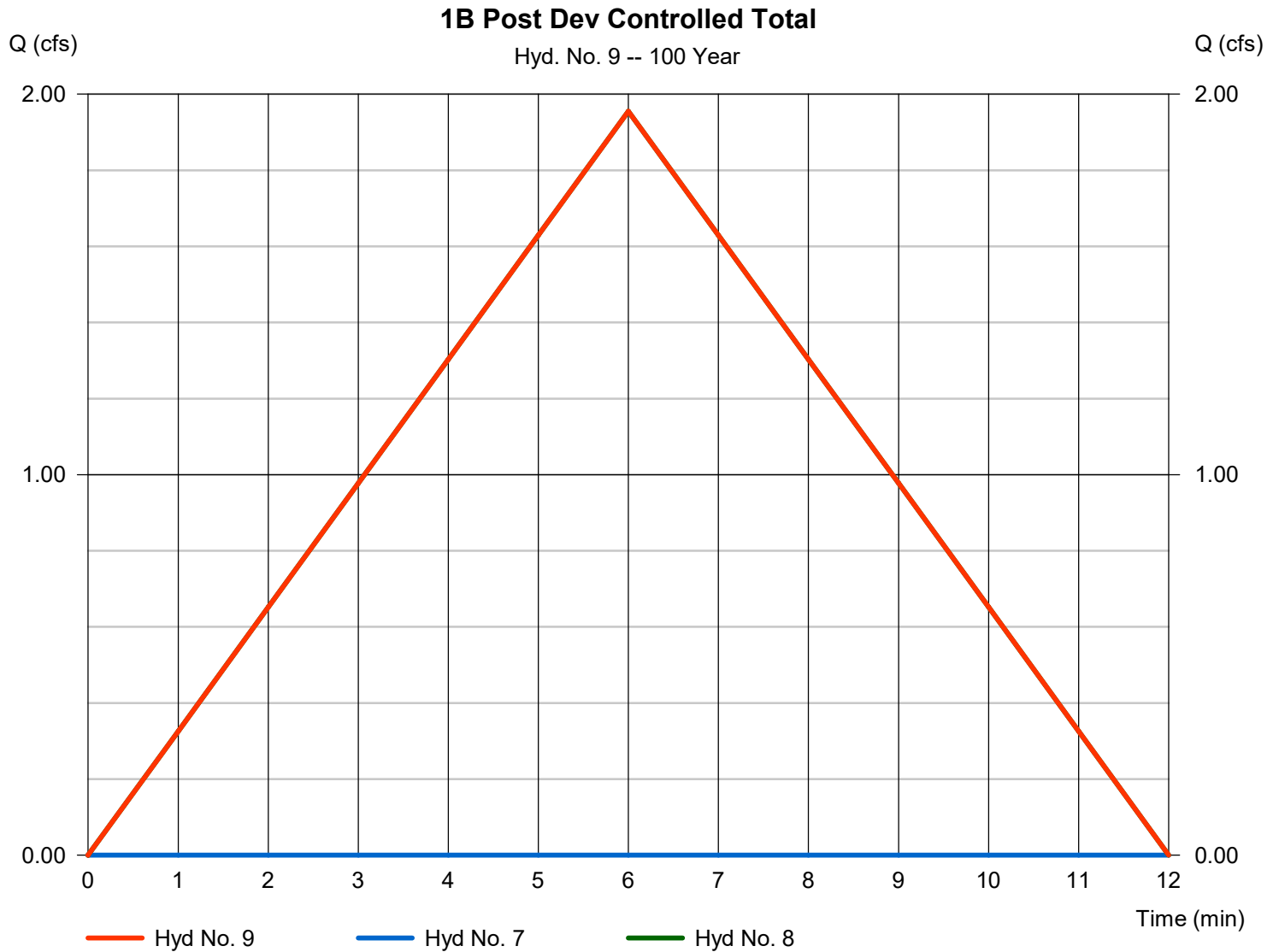


Hydrograph Report

Hyd. No. 9

1B Post Dev Controlled Total

Hydrograph type	= Combine	Peak discharge	= 1.955 cfs
Storm frequency	= 100 yrs	Time to peak	= 6 min
Time interval	= 1 min	Hyd. volume	= 704 cuft
Inflow hyds.	= 7, 8	Contrib. drain. area	= 0.270 ac

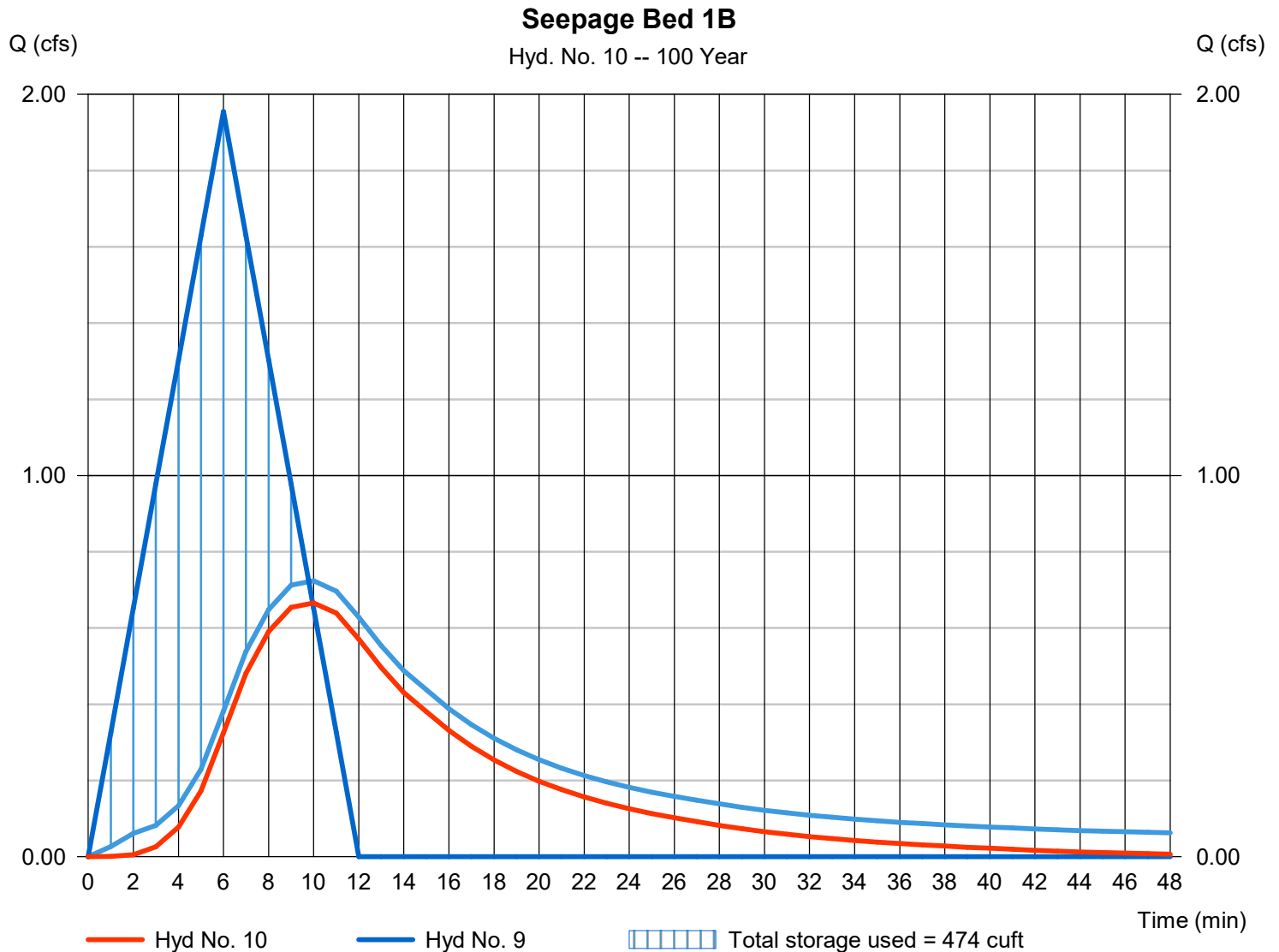


Hyd. No. 10

Seepage Bed 1B

Hydrograph type	= Reservoir	Peak discharge	= 0.666 cfs
Storm frequency	= 100 yrs	Time to peak	= 10 min
Time interval	= 1 min	Hyd. volume	= 507 cuft
Inflow hyd. No.	= 9 - 1B Post Dev Controlled Total	Max. Elevation	= 127.49 ft
Reservoir name	= Seepage Bed 1B	Max. Storage	= 474 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Hyd. No. 11

1 Post Dev Site Bypass

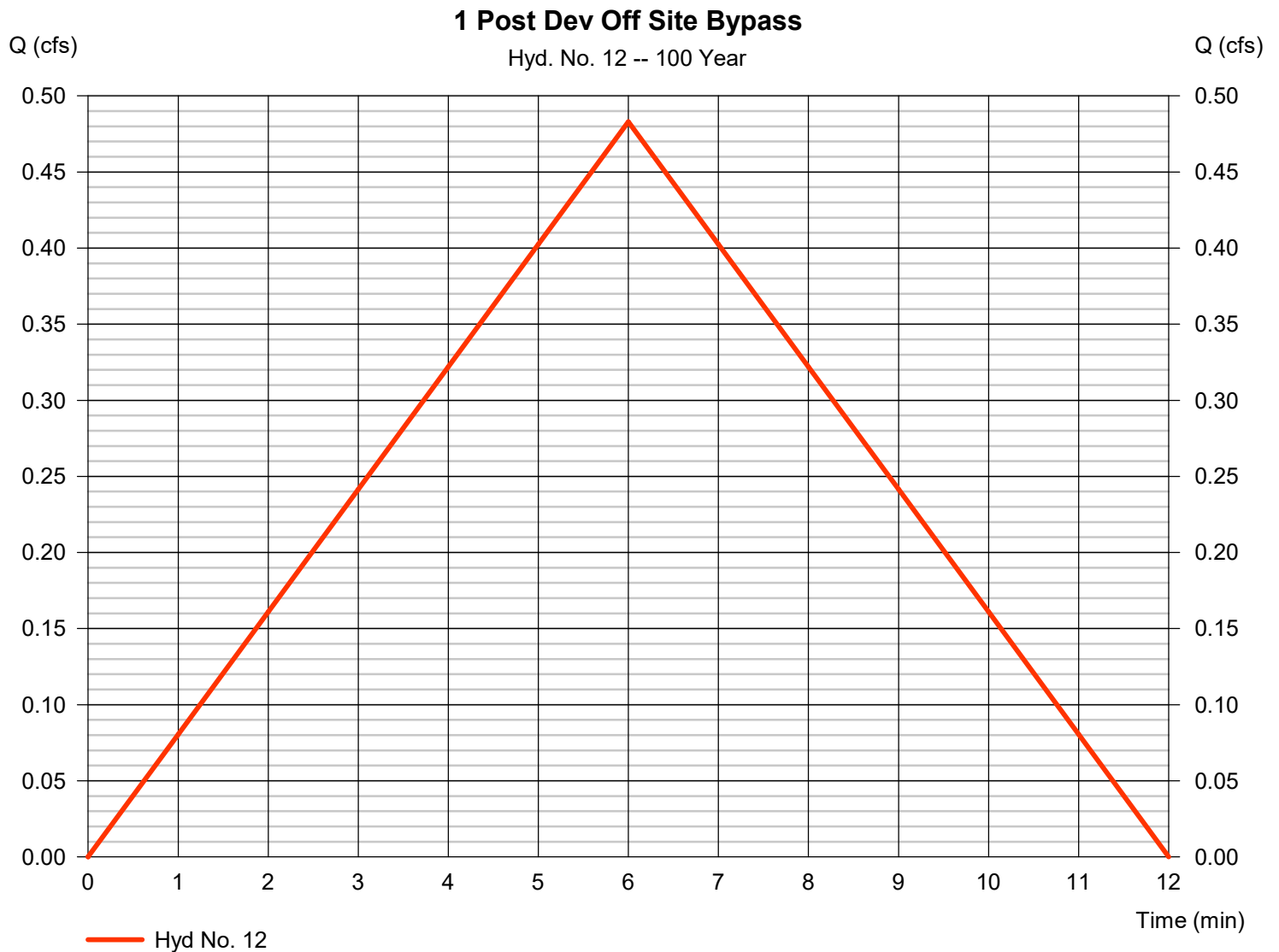
Hydrograph type	= Mod. Rational	Peak discharge	= 0.764 cfs
Storm frequency	= 100 yrs	Time to peak	= 6 min
Time interval	= 1 min	Hyd. volume	= 275 cuft
Drainage area	= 0.160 ac	Runoff coeff.	= 0.62
Intensity	= 7.704 in/hr	Tc by User	= 6.00 min
IDF Curve	= PA-Doylestown.IDF	Storm duration	= 1.0 x Tc
Target Q	=n/a	Est. Req'd Storage	=n/a



Hyd. No. 12

1 Post Dev Off Site Bypass

Hydrograph type	= Mod. Rational	Peak discharge	= 0.483 cfs
Storm frequency	= 100 yrs	Time to peak	= 6 min
Time interval	= 1 min	Hyd. volume	= 174 cuft
Drainage area	= 0.110 ac	Runoff coeff.	= 0.57
Intensity	= 7.704 in/hr	Tc by User	= 6.00 min
IDF Curve	= PA-Doylestown.IDF	Storm duration	= 1.0 x Tc
Target Q	=n/a	Est. Req'd Storage	=n/a



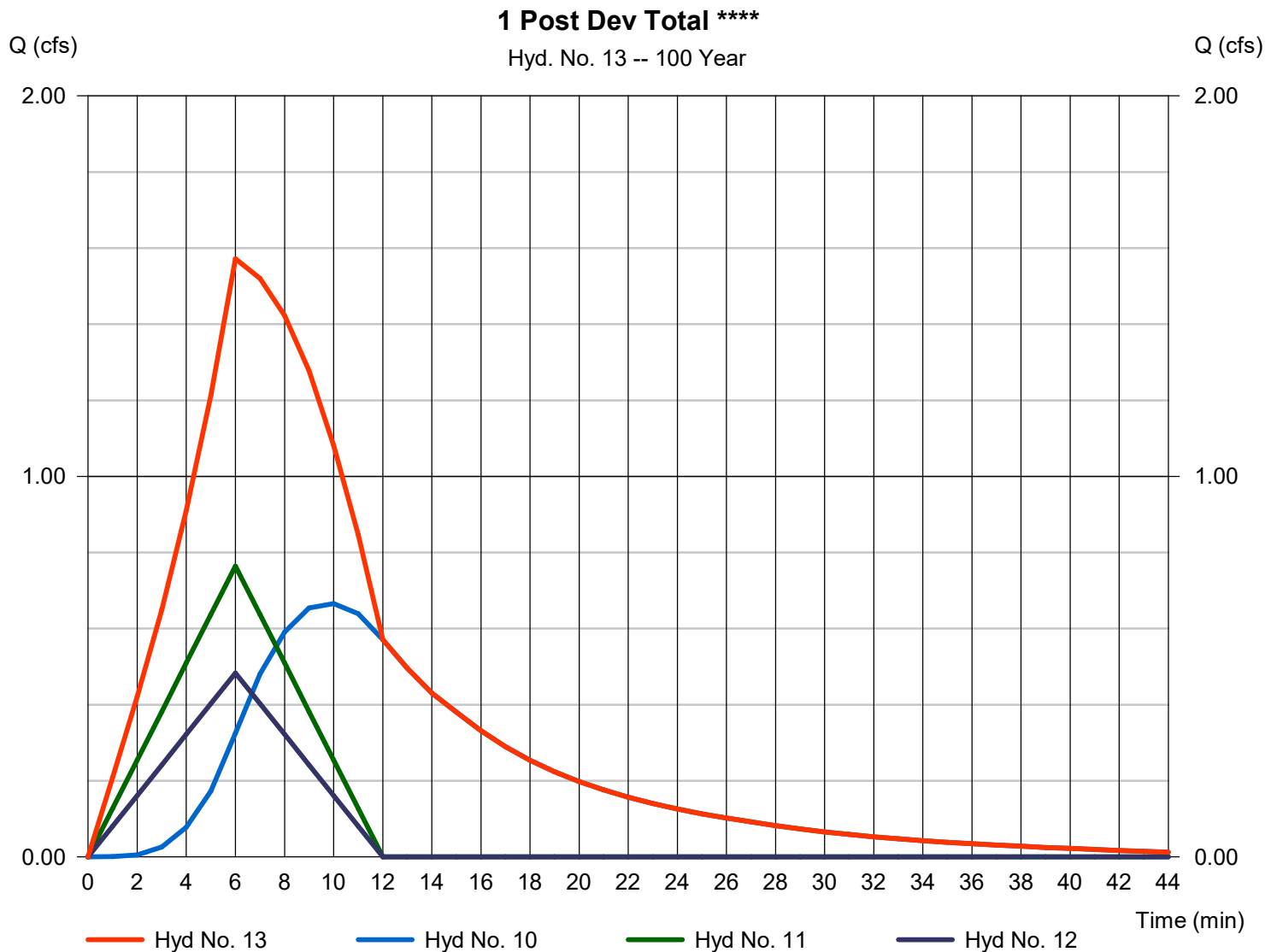
Hydrograph Report

Hyd. No. 13

1 Post Dev Total ****

Hydrograph type = Combine
Storm frequency = 100 yrs
Time interval = 1 min
Inflow hyds. = 10, 11, 12

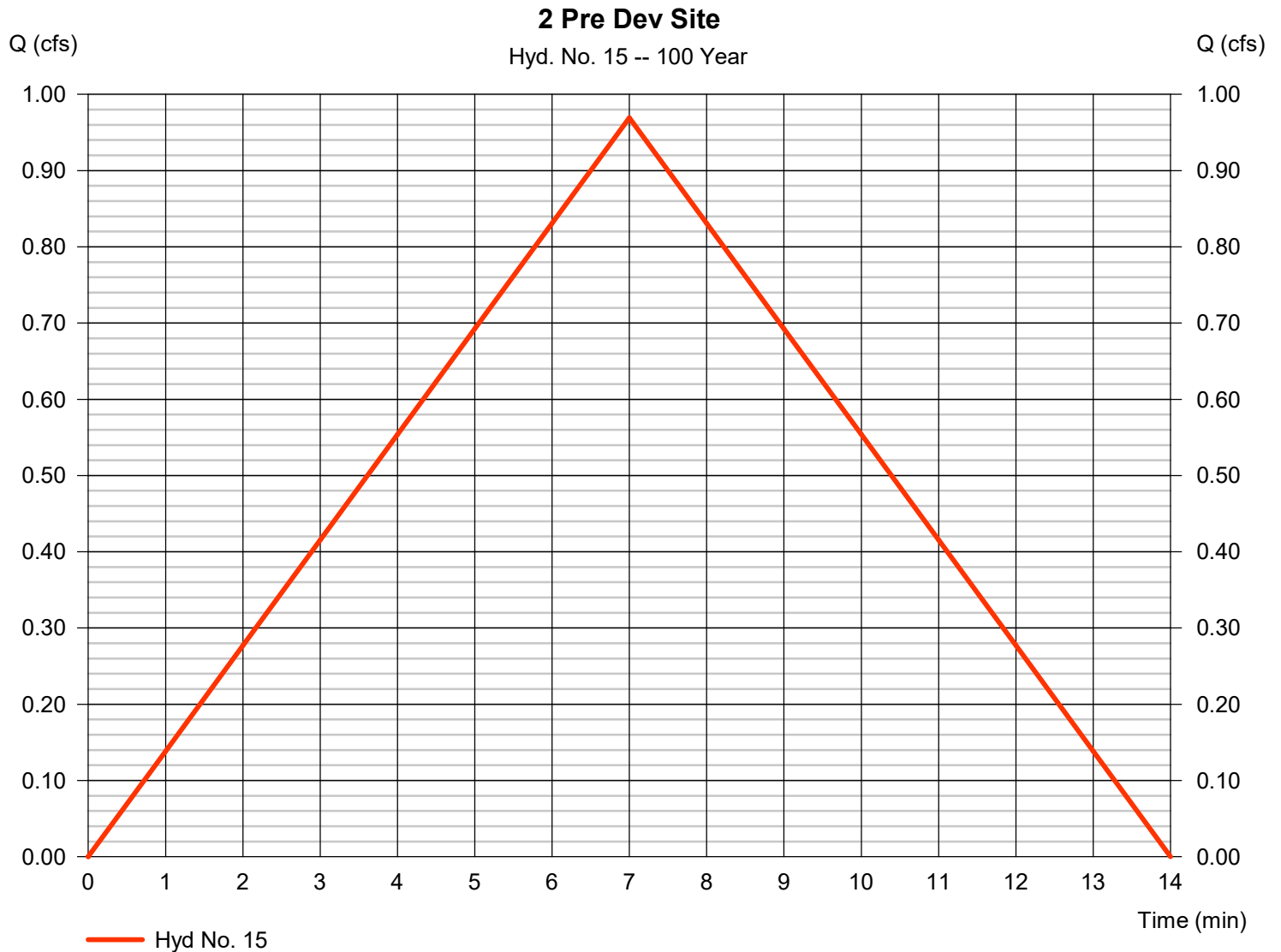
Peak discharge = 1.572 cfs
Time to peak = 6 min
Hyd. volume = 956 cuft
Contrib. drain. area = 0.270 ac



Hyd. No. 15

2 Pre Dev Site

Hydrograph type	= Mod. Rational	Peak discharge	= 0.969 cfs
Storm frequency	= 100 yrs	Time to peak	= 7 min
Time interval	= 1 min	Hyd. volume	= 407 cuft
Drainage area	= 0.410 ac	Runoff coeff.	= 0.32
Intensity	= 7.389 in/hr	Tc by User	= 7.00 min
IDF Curve	= PA-Doylestown.IDF	Storm duration	= 1.0 x Tc
Target Q	=n/a	Est. Req'd Storage	=n/a



Hydrograph Report

Hyd. No. 16

2 Pre Dev Off Site

Hydrograph type	= Mod. Rational	Peak discharge	= 5.054 cfs
Storm frequency	= 100 yrs	Time to peak	= 7 min
Time interval	= 1 min	Hyd. volume	= 2,123 cuft
Drainage area	= 1.520 ac	Runoff coeff.	= 0.45
Intensity	= 7.389 in/hr	Tc by User	= 7.00 min
IDF Curve	= PA-Doylestown.IDF	Storm duration	= 1.0 x Tc
Target Q	=n/a	Est. Req'd Storage	=n/a

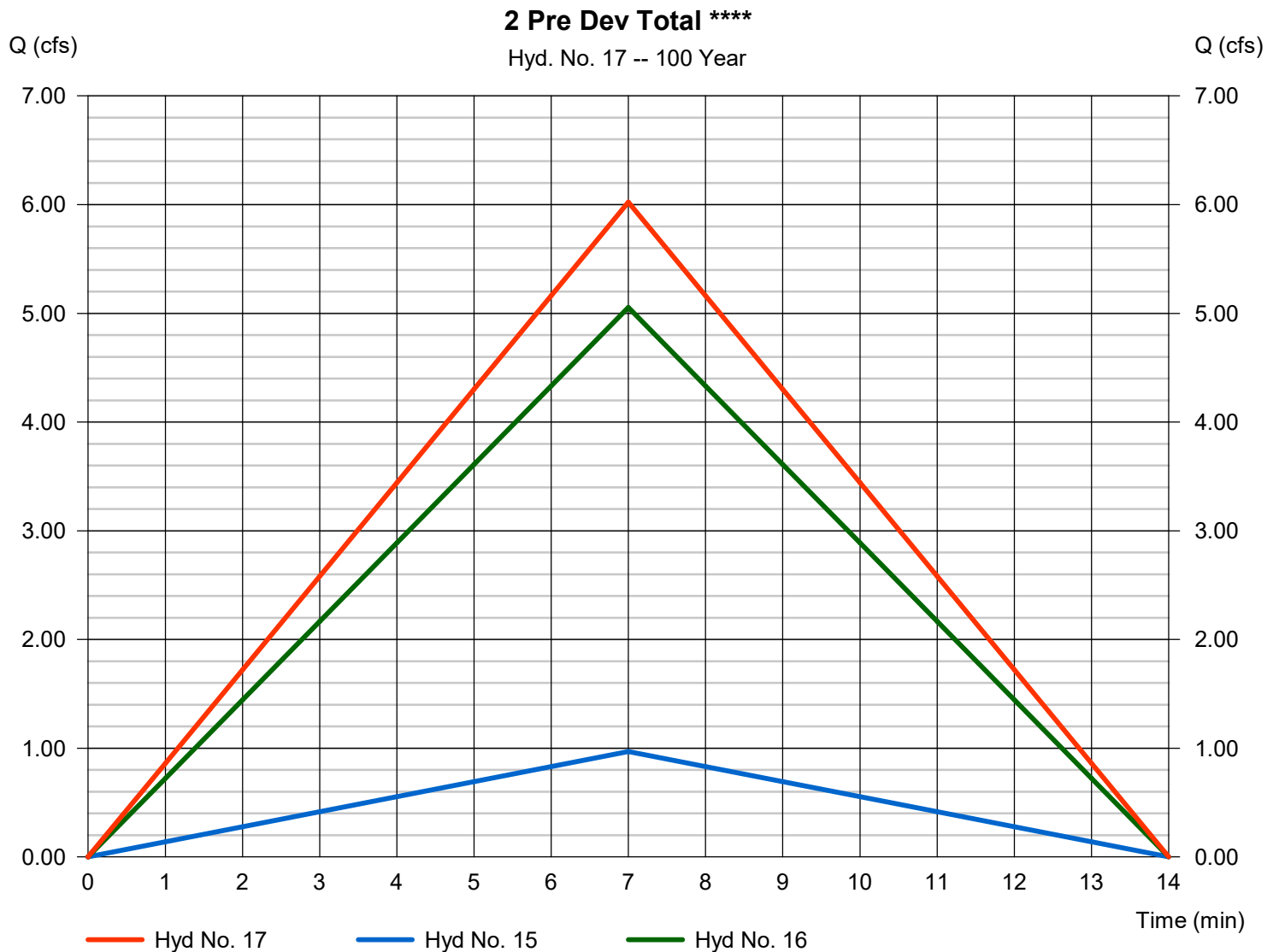


Hyd. No. 17

2 Pre Dev Total ****

Hydrograph type = Combine
Storm frequency = 100 yrs
Time interval = 1 min
Inflow hyds. = 15, 16

Peak discharge = 6.024 cfs
Time to peak = 7 min
Hyd. volume = 2,530 cuft
Contrib. drain. area = 1.930 ac



Hydrograph Report

Hyd. No. 18

2 Post Dev Site

Hydrograph type	= Mod. Rational	Peak discharge	= 0.575 cfs
Storm frequency	= 100 yrs	Time to peak	= 6 min
Time interval	= 1 min	Hyd. volume	= 207 cuft
Drainage area	= 0.090 ac	Runoff coeff.	= 0.83
Intensity	= 7.704 in/hr	Tc by User	= 6.00 min
IDF Curve	= PA-Doylestown.IDF	Storm duration	= 1.0 x Tc
Target Q	=n/a	Est. Req'd Storage	=n/a



Hydrograph Report

Hyd. No. 19

2 Post Dev Off Site

Hydrograph type	= Mod. Rational	Peak discharge	= 0.051 cfs
Storm frequency	= 100 yrs	Time to peak	= 6 min
Time interval	= 1 min	Hyd. volume	= 18 cuft
Drainage area	= 0.060 ac	Runoff coeff.	= 0.11
Intensity	= 7.704 in/hr	Tc by User	= 6.00 min
IDF Curve	= PA-Doylestown.IDF	Storm duration	= 1.0 x Tc
Target Q	=n/a	Est. Req'd Storage	=n/a



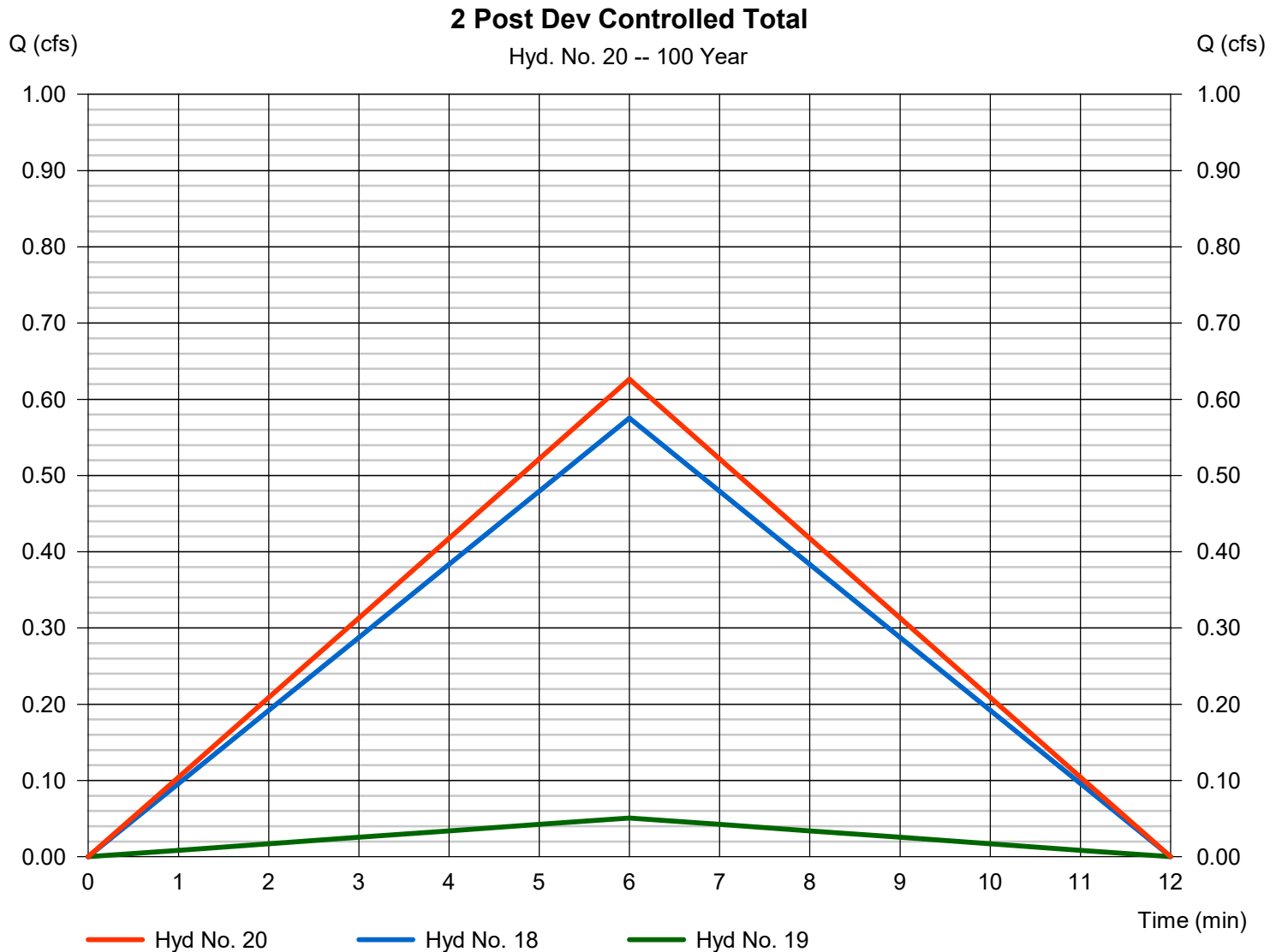
Hydrograph Report

Hyd. No. 20

2 Post Dev Controlled Total

Hydrograph type = Combine
Storm frequency = 100 yrs
Time interval = 1 min
Inflow hyds. = 18, 19

Peak discharge = 0.626 cfs
Time to peak = 6 min
Hyd. volume = 225 cuft
Contrib. drain. area = 0.150 ac



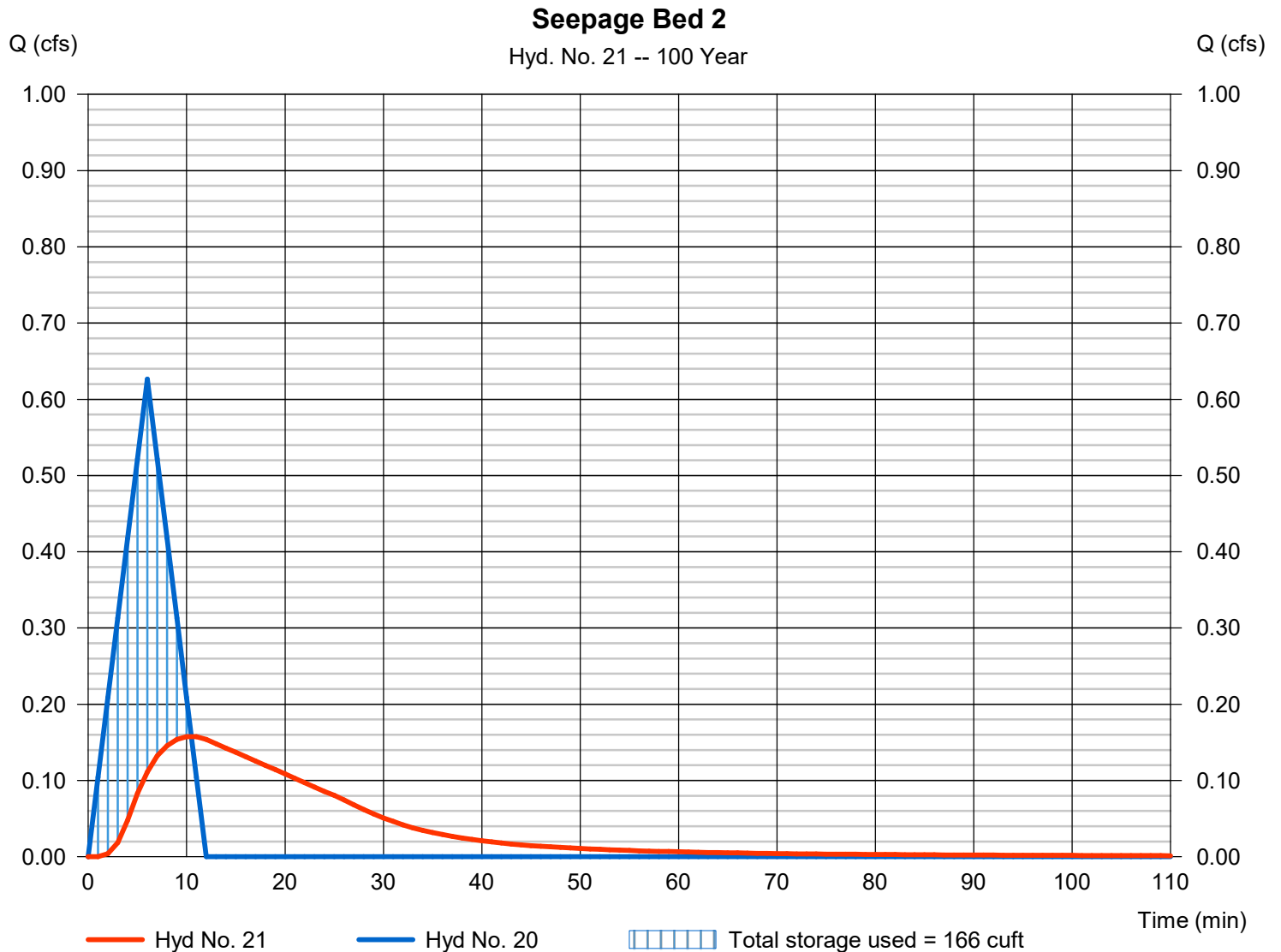
Hydrograph Report

Hyd. No. 21

Seepage Bed 2

Hydrograph type	= Reservoir	Peak discharge	= 0.158 cfs
Storm frequency	= 100 yrs	Time to peak	= 10 min
Time interval	= 1 min	Hyd. volume	= 220 cuft
Inflow hyd. No.	= 20 - 2 Post Dev Controlled Total	Max. Elevation	= 108.57 ft
Reservoir name	= Seepage Bed 2	Max. Storage	= 166 cuft

Storage Indication method used.

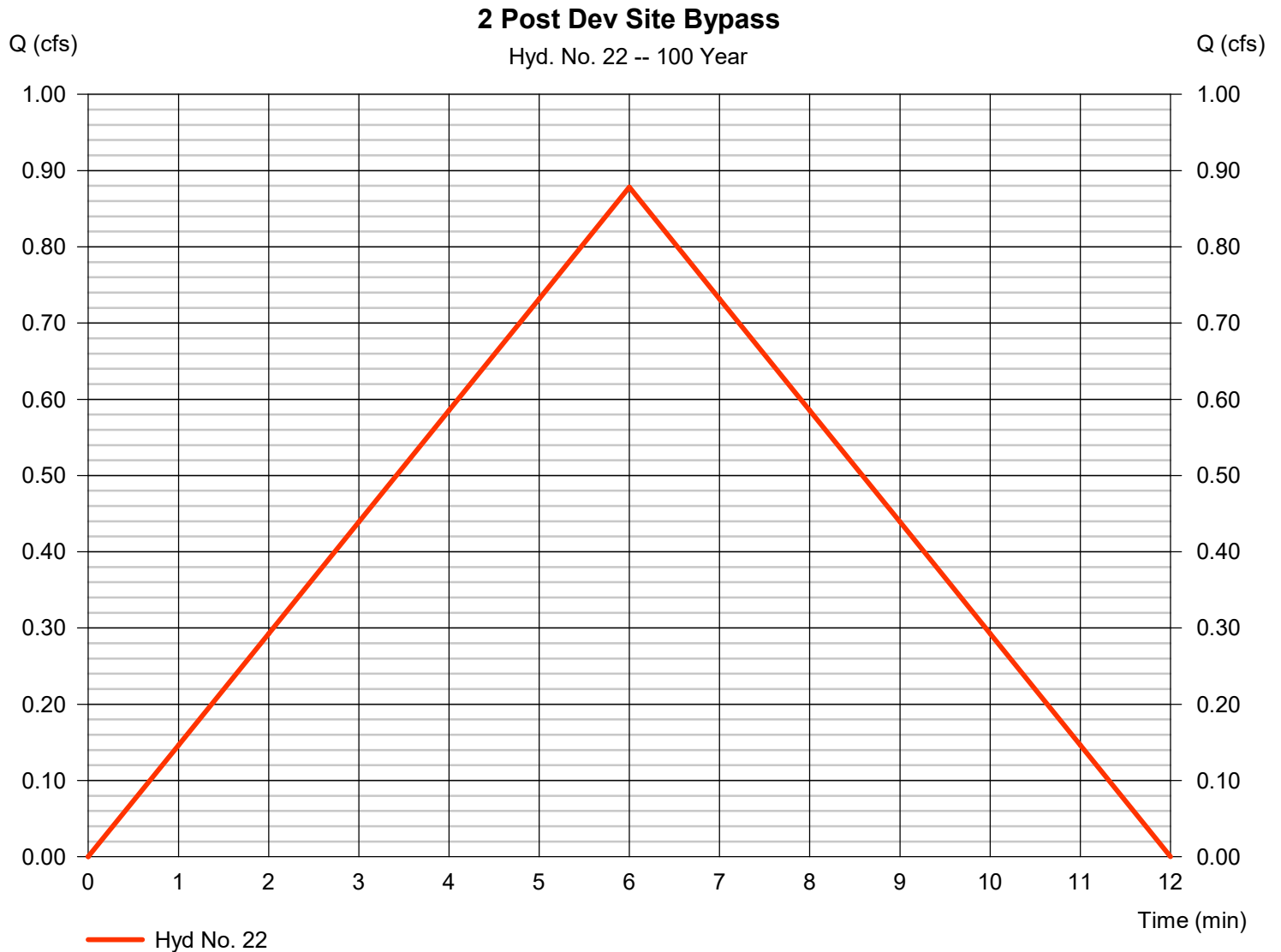


Hydrograph Report

Hyd. No. 22

2 Post Dev Site Bypass

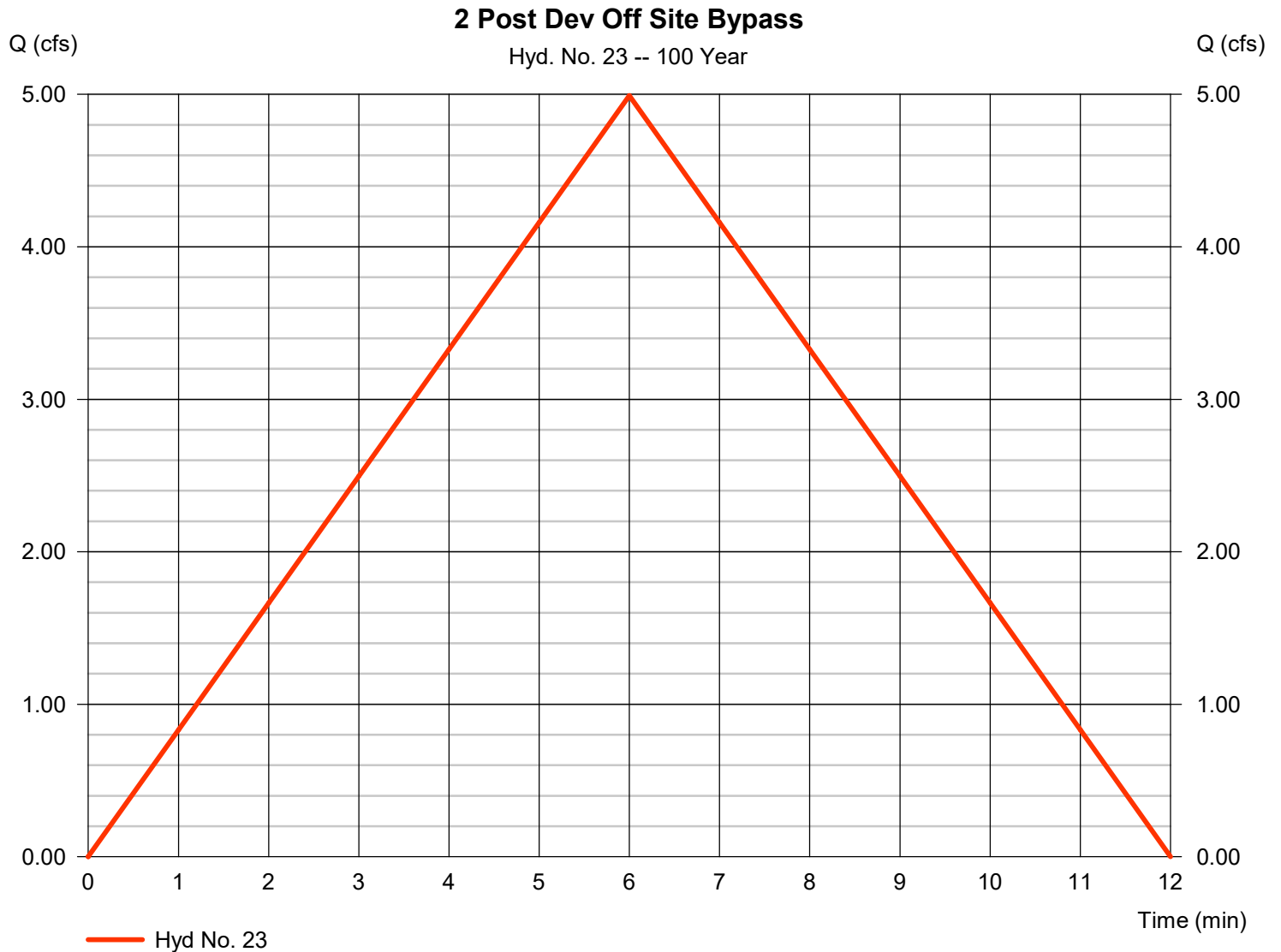
Hydrograph type	= Mod. Rational	Peak discharge	= 0.878 cfs
Storm frequency	= 100 yrs	Time to peak	= 6 min
Time interval	= 1 min	Hyd. volume	= 316 cuft
Drainage area	= 0.200 ac	Runoff coeff.	= 0.57
Intensity	= 7.704 in/hr	Tc by User	= 6.00 min
IDF Curve	= PA-Doylestown.IDF	Storm duration	= 1.0 x Tc
Target Q	=n/a	Est. Req'd Storage	=n/a



Hyd. No. 23

2 Post Dev Off Site Bypass

Hydrograph type	= Mod. Rational	Peak discharge	= 4.992 cfs
Storm frequency	= 100 yrs	Time to peak	= 6 min
Time interval	= 1 min	Hyd. volume	= 1,797 cuft
Drainage area	= 1.350 ac	Runoff coeff.	= 0.48
Intensity	= 7.704 in/hr	Tc by User	= 6.00 min
IDF Curve	= PA-Doylestown.IDF	Storm duration	= 1.0 x Tc
Target Q	=n/a	Est. Req'd Storage	=n/a



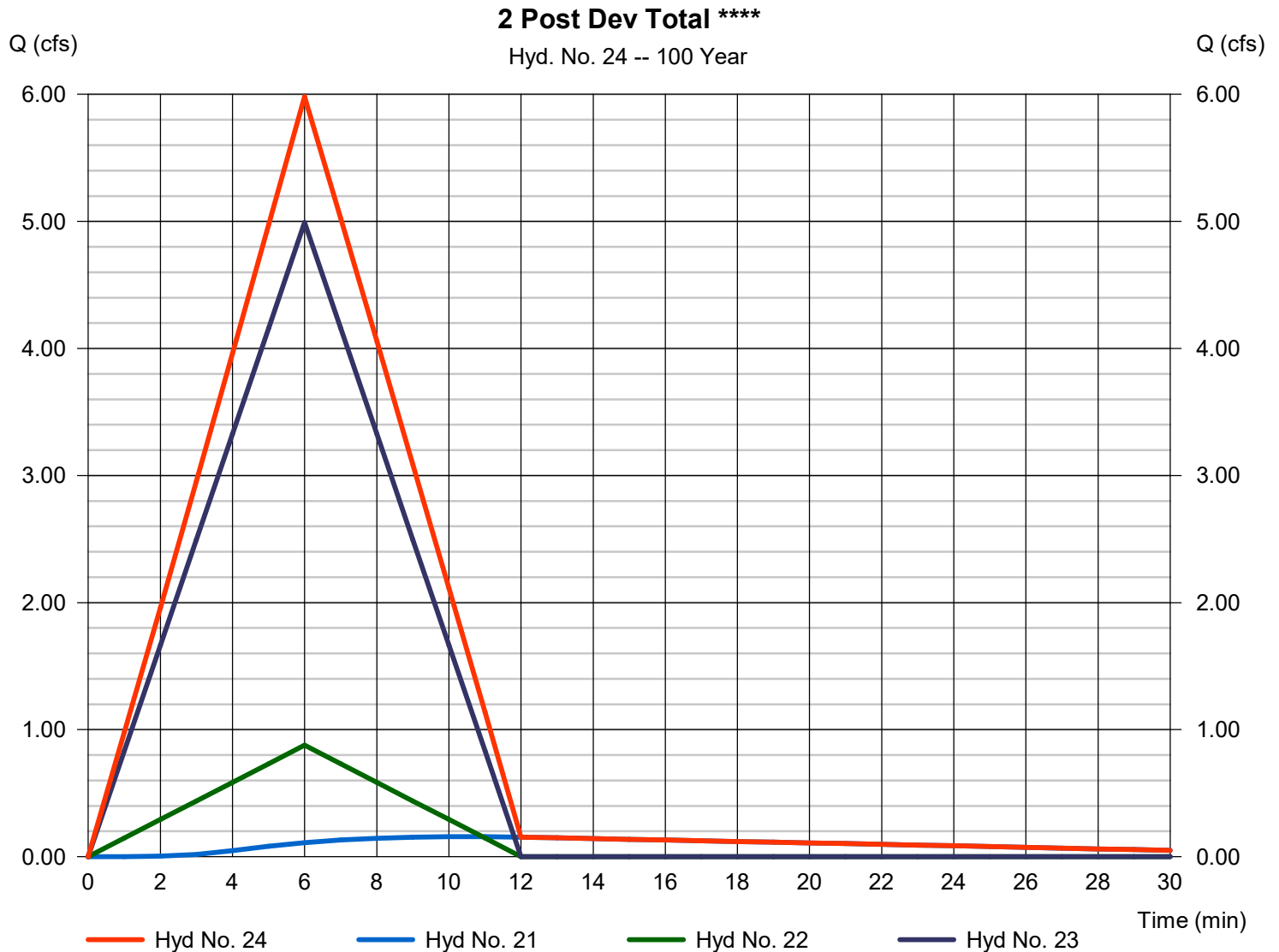
Hydrograph Report

Hyd. No. 24

2 Post Dev Total ****

Hydrograph type = Combine
Storm frequency = 100 yrs
Time interval = 1 min
Inflow hyds. = 21, 22, 23

Peak discharge = 5.981 cfs
Time to peak = 6 min
Hyd. volume = 2,333 cuft
Contrib. drain. area = 1.550 ac



Structure

SEEPAGE BED 1A

Broad Crested Weir

Crest	129.00	feet
Increment	0.10	feet
Length	4.71	feet
C	3.32	Discharge coefficient
Qc =	C x Length x Height ^{1.5}	
Known Q	5.13	cfs
Flow Depth	0.48	feet
Elevation	129.48	feet
Finished		
Grade	129.79	feet
Freeboard	0.31	feet

STAGE/DISCHARGE CALCULATIONS

Elev (ft)	Height (ft)	Discharge (cfs)
129.00	0.00	0.00
129.10	0.10	0.49
129.20	0.20	1.40
129.30	0.30	2.57
129.40	0.40	3.96
129.50	0.50	5.53
129.60	0.60	7.27
129.70	0.70	9.16

SEEPAGE BED 1B

Broad Crested Weir

Crest	129.00	feet
Increment	0.25	feet
Length	3.14	feet
C	3.32	Discharge coefficient
Qc =	C x Length x Height ^{1.5}	
Known Q	7.09	cfs
Flow Depth	0.77	feet
Elevation	129.77	feet
Finished Grade	129.92	feet
Freeboard	0.15	feet

STAGE/DISCHARGE CALCULATIONS

Elev (ft)	Height (ft)	Discharge (cfs)
129.00	0.00	0.00
129.25	0.25	1.30
129.50	0.50	3.69
129.75	0.75	6.77
130.00	1.00	10.43
130.25	1.25	14.58
130.50	1.50	19.16
130.75	1.75	24.15

SEEPAGE BED 2

Broad Crested Weir

Crest	109.00	feet
Increment	0.25	feet
Length	3.14	feet
C	3.32	Discharge coefficient
Qc =	C x Length x Height ^{1.5}	
Known Q	0.63	cfs
Flow Depth	0.15	feet
Elevation	109.15	feet
Finished		
Grade	110.48	feet
Freeboard	1.33	feet

STAGE/DISCHARGE CALCULATIONS

Elev (ft)	Height (ft)	Discharge (cfs)
109.00	0.00	0.00
110.25	1.25	21.86
110.35	1.35	24.54
110.45	1.45	27.32
110.55	1.55	30.19
110.65	1.65	33.16
110.75	1.75	36.22
110.85	1.85	39.37
110.95	1.95	42.60

Storm Drain Capacity Computations

10 year storm

From Point	To Point	Drain Area acres	Runoff Coef. C	CA											Inlet Time min-utes	Rain Fall in./hr.	Inc Run-Off Q c.f.s.	Contributing Run-Off		Identical Pipes	
				CA								Travel Times						c.f.s.	Source		
				Incre-ment	Trib1 ID	Trib1 CA	Trib2 ID	Trib2 CA	Trib3 ID	Trib3 CA	Accum-ulated	Tc To Inlet	Trib1 Tc	Trib2 Tc							Trib3 Tc
0																					
1	2	0.91	0.65	0.59							0.59				5.00	6.29	3.71				1
2	3				1	0.59					0.59		5.00		5.00	6.29					1
3	4			0.00	2	0.59					0.59		5.00		5.00	6.29	0.00				1
4	5	0.06	0.31	0.02	3	0.59					0.61		5.00		5.00	6.29	0.13				1
5	6														5.00	6.29		5.13	Basin 1A		1
6	7														5.00	6.29		7.09	Basin 1B		1
7	102	0.05	0.63	0.03	6						0.03		5.00		5.00	6.29	0.19				1
8	9	1.58	0.57	0.90							0.90				5.00	6.29	5.66				1
9	12	0.05	0.64	0.03	8	0.90					0.93		5.00		5.00	6.29	0.19				1
10	12														5.00	6.29		0.63	Basin 2		1
11	12	0.34	0.61	0.21							0.21				5.00	6.29	1.32				1
102	103	0.10	1.04	0.10	7	0.03	101				0.13		5.00		5.00	6.29	0.63				1
104	none			0.00	13						0.00				5.00	6.29	0.00				1
200	Outlet	0.08	1.00	0.08							0.08				5.00	6.29	0.50				1

Storm Drain

3/18/2024

Doylestown

Pennsylvania

From Point	To Point	Identical Pipes	TOTAL RUN-OFF Q per Pipe cfs	Invert Elevations		Length ft.	Slope ft./ft.	Dia. in	Wall	n value	Capacity c.f.s.	Flow Depth feet	US WSEL feet	DS WSEL feet	Vel. f.p.s.	Flow Time minutes	Travel Time minutes	REMARKS
				Upper	Lower													
0																		
1	2	1	3.71	134.13	133.57	112	0.0050	15	D	0.012	4.96	0.81	134.94	134.38	4.43	0.42	5.42	
2	3	1	3.71	133.57	133.38	39	0.0050	15	D	0.012	4.96	0.81	134.38	134.19	4.43	0.14	5.14	
3	4	1	3.71	133.38	133.05	66	0.0050	15	D	0.012	4.96	0.81	134.19	133.86	4.43	0.25	5.25	
4	5	1	3.84	129.05	127.00	65	0.0317	15	D	0.012	12.49	0.48	129.53	127.48	8.95	0.12	5.12	
5	6	1	5.13	126.75	125.89	123	0.0070	18	D	0.012	9.55	0.78	127.53	126.67	5.49	0.37	5.37	100 year emergency flows used
6	7	1	7.09	126.40	125.16	24	0.0524	18	D	0.012	26.12	0.53	126.93	125.69	12.56	0.03	5.03	100 year emergency flows used
7	102	1	0.19	124.07	123.36	116	0.0061	18	D	0.012	8.91	0.15	124.22	123.51	2.01	0.96	5.96	
8	9	1	5.66	112.85	103.34	72	0.1313	18	D	0.012	41.35	0.38	113.23	103.72	16.33	0.07	5.07	
9	12	1	5.85	103.34	102.38	25	0.0393	18	D	0.012	22.62	0.52	103.86	102.90	10.73	0.04	5.04	
10	12	1	0.63	106.50	102.38	19	0.2200	18	D	0.012	53.52	0.11	106.61	102.49	10.19	0.03	5.03	100 year emergency flows used
11	12	1	1.32	107.70	102.38	62	0.0856	18	D	0.012	33.38	0.20	107.90	102.58	9.17	0.11	5.11	
102	103	1	0.82	123.22	123.07	8	0.0179	18	D	0.012	15.27	0.24	123.46	123.31	4.59	0.03	5.03	
104	none	1	0.00	95.08	87.81	78	0.0932	18	D	0.012	34.83	0.01	95.09	87.82	0.83	1.58	6.58	
200	Outlet	1	0.50	95.08	87.81	78	0.0932	18	D	0.012	34.83	0.13	95.21	87.94	7.07	0.18	5.18	Drive A entrance Bristol Road gutter flow

Perforation Computations

Project: 2084 Brilla LLC 100 year storm
 Location: Bensalem Township

By: DLF
 Date: 08/12/2022

Structure	Pipe	Discharge	Cd	Perforation			Grate feet	Invert feet	H feet	QL cfs	Length Min feet	Length Provided feet
				Diameter in	Perforation Area sf/ft							
Seepage Bed 1A	12	6.09	0.6	0.313	1.5	0.0104	130.29	125.90	2.89	0.0853	71.39	178
Seepage Bed 1B	12	1.96	0.6	0.313	1.5	0.0104	130.42	125.90	3.02	0.0872	22.43	100
Seepage Bed 2	12	0.64	0.6	0.313	1.5	0.0104	111.26	106.60	3.16	0.0892	7.20	36

$$H = \text{Grate} - \text{invert} - 1 - \text{dia}/2$$

$$L \text{ (length of level spreader pipe)} = Q / Q_L$$

Q_L (discharge per linear foot) = Q_O * # of perforations per linear foot of pipe (provided by manufacturer, based on perforation diameter)

$$Q_O \text{ (perforation flow rate)} = C_d * A * (2 * g * H)^{0.5}$$

Q_O = the free outfall flow rate through one perforation (ft³/sec)

C_d = Coefficient of discharge (typically 0.60)

A = Cross sectional area of one perforation (ft²)

g = 32.2 ft/sec²

H = head, average height of water above perforation (ft) (provided by manufacturer)

Standard Perforation Patterns

AASHTO Class II Perforation

The following terminology for perforations is derived from the applicable AASHTO specification. Differences between the specifications are covered in the table below. Class II perforations shall be located in the outside valleys of the corrugations, be circular and/or slotted and evenly spaced around the circumference and length of the pipe. The perforations shall be located in the outside valleys of the corrugations. The water inlet area shall be no less than 0.945 in²/ft (20 cm²/m) for pipe diameters 4- through 10-inch (100 - 250mm), 1.42 in²/ft (30 cm²/m) for pipe diameters 12- through 18-inch (300 - 450 mm) and 1.89 in²/ft (40 cm²/m) for pipe diameters larger than and equal to 24 inches (600 mm). Table 1 below represents ADS standard perforation patterns for AASHTO Class II.

Nominal I.D.		Perforation Type	Maximum Slot Length or Diameter		Maximum Slot Width		Minimum Inlet Area	
in	mm		in	mm	in	mm	in ² /ft	cm ² /m
4	100	Slot	0.875	22	0.125	3	1.0	21
6	150	Slot	0.875	22	0.125	3	1.0	21
8	200	Slot	1.18	30	0.125	3	1.0	21
10	250	Slot	1.18	30	0.125	3	1.0	21
12	300	Circular	0.313	8	-	-	1.5	32
15	375	Circular	0.313	8	-	-	1.5	32
18	450	Circular	0.313	8	-	-	1.5	32
24	600	Circular	0.313	8	-	-	2.0	42
30	750	Circular	0.375	9.5	-	-	2.0	42
36	900	Circular	0.375	9.5	-	-	2.0	42
42	1050	Circular	0.375	9.5	-	-	2.0	42
48	1200	Circular	0.375	9.5	-	-	2.0	42
54	1350	Circular	0.375	9.5	-	-	2.0	42
60	1500	Circular	0.375	9.5	-	-	2.0	42

DRIVE A ENTRANCE

User-defined

Invert Elev (ft) = 129.70
 Slope (%) = 2.28
 N-Value = 0.015

Highlighted

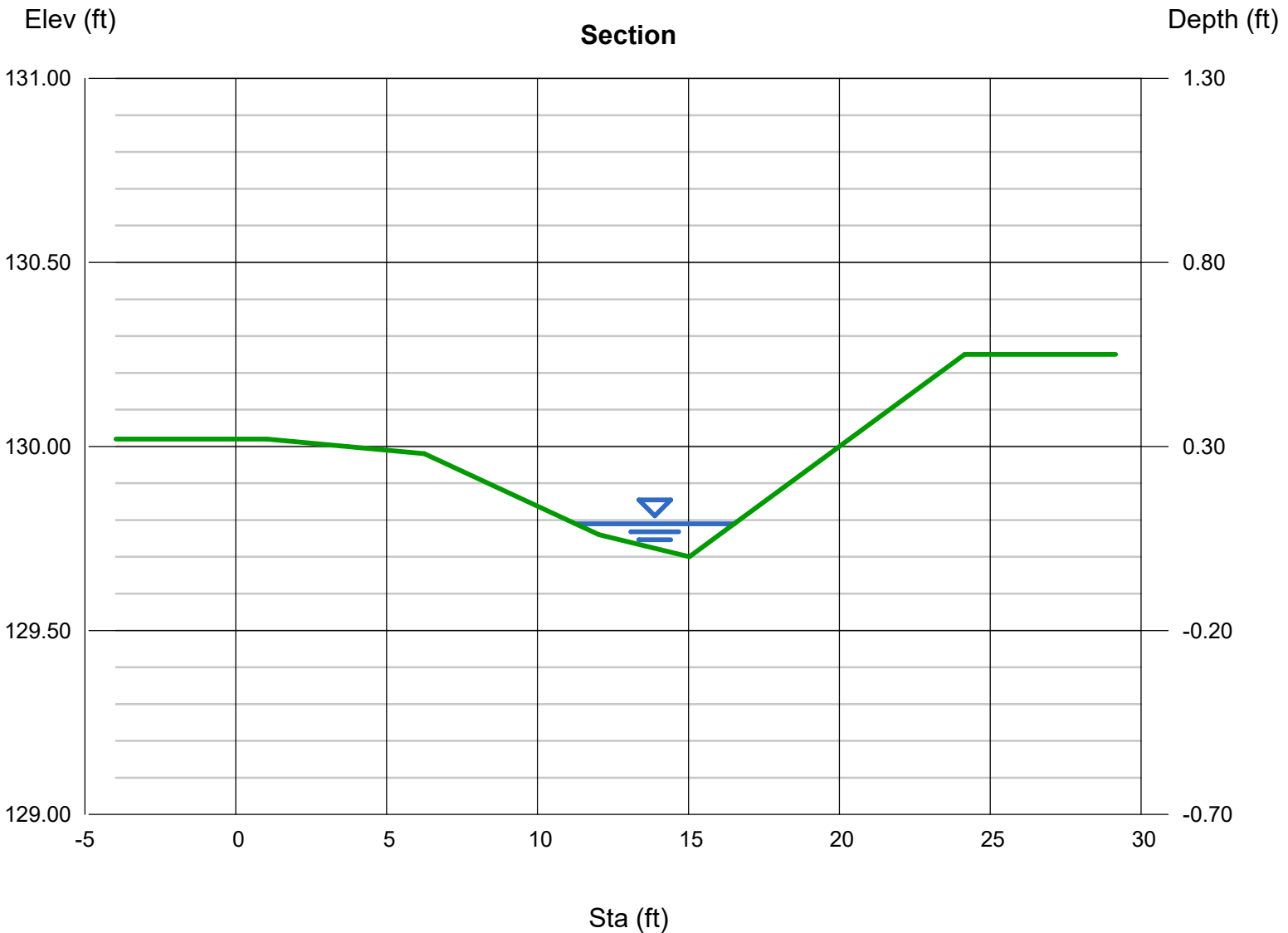
Depth (ft) = 0.09
 Q (cfs) = 0.500
 Area (sqft) = 0.26
 Velocity (ft/s) = 1.93
 Wetted Perim (ft) = 5.28
 Crit Depth, Yc (ft) = 0.11
 Top Width (ft) = 5.27
 EGL (ft) = 0.15

Calculations

Compute by: Known Q
 Known Q (cfs) = 0.50

(Sta, El, n)-(Sta, El, n)...

(1.03, 130.02)-(6.25, 129.98, 0.015)-(12.04, 129.76, 0.015)-(15.03, 129.70, 0.015)-(24.16, 130.25, 0.015)



User-Defined Channel ✕

Station-Elev Data ▶ = ✕

Point	Sta	Elev	Mannings
1	1.03	130.02	---
2	6.25	129.98	0.015
3	12.04	129.76	0.015
4	15.03	129.70	0.015
5	24.16	130.25	0.015
6			
7			
8			
9			
10			
11			
12			

OK
Cancel

Clear

STANDARD E&S WORKSHEET # 11
Channel Design Data

Project Name 2084 Brilla LLC
 Location: Bensalem Township

Prepared By: DLF Date: 9/22/2023
 Checked By: VWF Date: 9/22/2023

- see Channel Or Channel Section
- note Slope Condiiton
- Temporary Or Permanent Lining? (T or P)
- Design Storm (2, 5, or 10 yr) (yr)
- Acres (ac)
- 1 Multiplier (1.6, 2.25, or 2.75)
- Qr (Required Capacity PADEP method) (cfs)
- C value
- Tc min
- Rainfall intensity in/hour
- Qr (Required Capacity Rational method) (cfs)
- Additional Flow (cfs)
- Qr (Required Capacity to use) (cfs)
- 2 Protective Lining
- 2 n (Manning'S Coefficient)
- Va (Allowable Velocity) (fps)
- V (Calculated At Flow Depth d) (fps)
- Ta (Max Allowable Shear Stress) (lb/ft2)
- Td (Calc'D Shear Stress At Flow Depth d) (lb/ft2)
- Channel Bottom Width (ft)
- Channel Side Slopes (h:v)
- D (Total Depth) (ft)
- Channel Top Width @ D (ft)
- d (Calculated Flow Depth) (ft)
- Channel Top Width @ Flow Depth d (ft)
- Bottom Width: Flow Depth Ratio (12:1 MAX) (12:1 MAX)
- D50 Stone Size (in)
- A (Cross-Sectional Area) (sq. ft.)
- R (Hydraulic Radius)
- 3 S (Bed Slope) (ft/ft)
- 5 Design Method For Protective Lining
- Permissible Velocity (V) Or Shear Stress (S)

Channel 1				Channel 2				Channel 3			
Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
T		P		T		P		T		P	
2	2	2	2	2	2	2	2	2	2	2	2
1.6	1.6	2.75	2.75	1.6	1.6	2.75	2.75	1.6	1.6	2.75	2.75
2.89	2.89	2.89	2.89	2.89	2.89	2.89	2.89	3.02	3.02	3.02	3.02
2.89	2.89	2.89	2.89	2.89	2.89	2.89	2.89	3.02	3.02	3.02	3.02
S150	S150	C	C	S150	S150	C	C	SC150	SC150	C	C
0.055	0.055	0.100	0.070	0.055	0.055	0.070	0.060	0.050	0.050	0.070	0.050
NA	NA	5.00	5.00	NA	NA	5.00	5.00	NA	NA	5.00	5.00
		1.51	1.64			1.64	1.96	1.95	3.11	1.53	3.11
1.75	1.75	NA	NA	1.75	1.75	NA	NA	2.00	2.00	NA	NA
1.00	0.69			1.00	0.80			1.00	1.51	0.68	1.51
2	2	2	2	2	2	2	2	2	2	2	2
3	3	3	3	3	3	3	3	3	3	3	3
1	1	1	1	1	1	1	1	1	1	1	1
8	8	8	8	8	8	8	8	8	8	8	8
0.5	0.4	0.5	0.5	0.4	0.4	0.5	0.4	0.5	0.3	0.5	0.3
4.83	4.7	5.2	5.0	4.7	4.6	5.0	4.7	4.8	4.0	5.3	4.0
4.2	4.5	3.8	4.0	4.5	4.7	4.0	4.5	4.4	6.1	3.7	6.1
1.608	1.484	1.913	1.765	1.484	1.392	1.765	1.479	1.550	0.971	1.976	0.971
0.323	0.308	0.357	0.341	0.308	0.297	0.341	0.308	0.316	0.239	0.363	0.239
0.020	0.025	0.020	0.025	0.025	0.030	0.025	0.030	0.020	0.074	0.020	0.074
S	S	V	V	S	S	V	V	S	S	V	V

Note: Discharges from storm sewer calculations 100 year design storm



1590 Canary Road, Quakertown, PA 18951 | 215-536-7006 | Fax: 215-538-6136

May 4, 2022
(revised 9/16/23)

Anton Poteryahin
52 E. Georgianna Dr.
Richboro, PA 18954

Via email to: a.poteryahin94@gmail.com

Re: Stormwater Infiltration Testing
4304 Bristol Road
Feasterville-Trevoise, PA 19053
T.M.P. No.: 02-017-068-001 & 02-017-090-001
Bensalem Township, Bucks County, PA

Dear Mr. Poteryahin:

VW Consultants, LLC (VW) completed an evaluation of the above referenced property on April 26, 2022 and September 15, 2023 for the feasibility of stormwater infiltration. Testing was conducted at the six locations marked on the attached Test Pit Location Plan, which is based on the Existing Features Plan for 4304 & 411 Bristol Road, prepared by Fioravanti, Inc., dated 7/26/2021. The results of the testing, including soil test pit descriptions and infiltration rates at specified depths, expressed in inches below ground surface (B.G.S.), are summarized at the end of this report. The infiltration rates were established by the double-ring methodology, as described in the current *PADEP Stormwater Best Management Practices Manual (2006)*. Single-ring infiltrometers were utilized at Test Pit SW-1 and SW-6 due to the rock fragment content at the testing depth. Our findings indicate that infiltration of stormwater runoff is feasible at select locations and depths as listed in the summary table at the end of this report.

Project Setting

The project site is an existing commercial property that consists of two tax parcels on approximately 1.2 acres. The project site is mostly open and partially covered in asphalt in the middle. The project site moderately to steeply slopes downhill towards Bristol Road and Grove Avenue. VW performed the site testing throughout the property in support of proposed stormwater management facilities for new building construction.

Based on a review of a United States Geologic survey map of Pennsylvania, the project site is underlain by the Chickies Formation. This formation consists of light-gray, hard, massive, Scolithus-bearing quartzite and quartz schist; thin, inter-bedded dark slate at top; conglomerate (Hellam Member) at base.

Based on a review of the Web Soil Survey, the site soils have been mapped by the Natural Resource Conservation Service as containing the Urban Land - Chester Complex soil series. While the soil profile characteristics and permeability rates of the Urban Land soil series have not been quantified, the soils are variable and generally consist of deep profiles similar to the nearby undisturbed soils. Chester silt loams are classified as very deep, well-drained soils formed in materials weathered from micaceous schist. Chester soils are classified as Hydrologic Soil Group B, while Urban Land soils are generally classified as Hydrologic Soil Group D.

Site Soils

The site was evaluated by a professional soil scientist and the soil profiles were described in accordance to the criteria of the USDA-SCS *Soil Survey Manual Handbook No. 18 (3/2017)* and the USDA-NRCS *Field Book for Describing and Sampling Soils Version 3.0 (9/2012)*. A copy of the prepared soil profile descriptions is included with this report.

Six test pits were performed on the project site in support of proposed stormwater management facilities, as shown on the attached Test Pit Location Plan. In the test pits, VW generally observed asphalt, stone or fill soils at the surface that were placed over residual quartzite or schist soils. The clean fill soils generally consisted of dark yellowish brown to multicolored channery loams that are most likely from grading the site in the past. No deleterious material was observed within the fill soils. The residual soils consisted of very pale brown, pale yellow or variegated silt loams, loams, fine sandy loams and sandy loams with varying amounts of rock fragments throughout. Hard bedrock, indicated by machine refusal, was only encountered at Test Pit SW-2 at 48 inches below the existing ground surface.

Redoximorphic features, an indication of seasonal wetness, were not observed in any of the test pits during the field investigation. A regional groundwater table was not observed in any of the test pits during the field investigation. However, water was observed at Test Pit SW-4 at 72 inches below the existing ground surface due to its location down slope of a stormwater drainage swale that drains a large portion of upslope properties. This is not a regional groundwater table, but an artificial water table due to its location and getting stormwater runoff after rain events. Water was not observed in any of the other test pits, even at deeper depths. Please see the soil profile descriptions for a more detailed description of the soils observed at each location.

At completion, the test pits were backfilled and compacted with the excavated material, and leveled off with the surrounding grades. No additional compaction effort or site restoration was performed.

Infiltration Testing

To establish infiltration rates, two single-ring infiltrometer tests were conducted at Test Pit SW-1 and SW-6, and one double-ring infiltrometer test was conducted at Test Pits SW-3 and SW-5. Only one double-ring test could be completed in SW-3 and SW-5 due to test pit size constraints. No infiltration testing was performed at Test Pits SW-2 and SW-4 due to observed rock or water. All tests were conducted at the depth noted on the table below, depth expressed in inches below ground surface (B.G.S.). The test rates were averaged, where applicable, to obtain an average infiltration rate at that depth. The infiltration tests were conducted following the procedure of the current *PADEP Stormwater Best Management Practices Manual (2006)* for both test technique and calculation of the infiltration rate. Please be advised that this calculation, which is consistent with the methodology of the current PADEP Stormwater Manual, is not a soil hydraulic conductivity rate as determined by Darcy's Law.

The table below is a summary of the infiltration test depths and the infiltration rates obtained by VW during the field testing.

Pit No.	Pit Depth (in, BGS)	Observed Redox Features (in, BGS)	Depth to Rock (in, BGS)	Depth to Water (in, BGS)	Infiltration Test Depth (in, BGS)	Infiltration Rate (in/hr.)
SW-1	84	NE	NE	NE	60	13.5
SW-2	48	NE	48	NE	N/A	N/A
SW-3	84	NE	NE	NE	60	0.5

Pit No.	Pit Depth (in, BGS)	Observed Redox Features (in, BGS)	Depth to Rock (in, BGS)	Depth to Water (in, BGS)	Infiltration Test Depth (in, BGS)	Infiltration Rate (in/hr.)
SW-4	72	NE	NE	72*	N/A	N/A
SW-5	84	NE	NE	NE	54	0.5
SW-6	96	NE	NE	NE	60	3.25

NE= not encountered

*The water observed at Test Pit SW-4 at 72 inches below grade can be attributed to the test pit's location directly down slope of an existing stormwater drainage swale that drains a large portion of upslope properties. This is not a regional groundwater table, as water was not observed in any other test pit, even at deeper depths.

Conclusions and Recommendations

VW observed the site soils at six test pit locations and performed infiltration testing at four test pit locations on the subject property. Based on the observed soil conditions and infiltration rates obtained during the site testing, it is recommended that stormwater management facilities be designed at the locations and depths tested where suitable soils and infiltration rates were obtained. The infiltration facilities should be designed by a professional engineer at the depth of the infiltration testing using appropriate engineering practices and with a safety factor reduction from the measured infiltration rate. Care should be taken to preserve the soil infiltrative surface during pre- and post-construction of the stormwater management facility.

Our findings are the result of testing conducted in specific locations and conditions. Should conditions contrary to the findings in this report be discovered prior to, during, or after construction of the stormwater control devices, VW must be notified so our recommendations can be reviewed or revised, if necessary. Additionally, if the stormwater management facility location and/or size changes, a VW soil scientist and the project engineer should review the site testing to confirm additional soil testing is not warranted.

Should you have any questions regarding the information included in this report, please contact me at 215-778-5284, or by email at mhostrander@vw-consultants.com.

Respectfully submitted,



VW Consultants, LLC
Matthew C. Hostrander, CPSS
Professional Soil Scientist

Enclosures: soil profile descriptions, infiltration data sheets and test pit location plan

cc: Vince Fioravanti, P.E. of Fioravanti, Inc.

Matthew C. Hostrander, CPSS
Professional Soil Scientist

Date: 4/26/22 Pit # SW-1
Project: Poteryahin
Location: 4304 Bristol Road
Bensalem Township, Bucks Co., PA
Soil Series Mapped: Urban-Chester
Soil Series Classified: Urban Land

Limiting Zone 84+" none

Slope: 1-3%

Conduct Single Ring Infiltrometer Test at 60"

Horizon	Depth (In.)	Matrix Color	Texture	Structure	Consistence	Fe Redox Depletions	Fe Redox Concentrations	Boundary
	0-9		Asphalt & Stone					
BC	9-36	10YR 4/6	cb fsl	1 m sbk	friable	none	none	clear wavy
C	36-84+	2.5Y 7/4	vcb sl	0 m	very friable	none	none	

Township Representative: None Soil Scientist: Matthew C. Hostrander

Notes: Site evaluation for stormwater infiltration. No groundwater encountered. No bedrock encountered. Asphalt and stone observed from 0 to 9 inches below grade.

Weather / Field Conditions: Overcast, 60s, soil moist.

Others Present at Site: B.P. Dumpster – backhoe provider and operator.

EPIPEDON	COARSE FRAGMENTS (% of Vol.)	STRUCTURE	REDOX FEATURES
	15-35% 35-65% >65%	Grade	Abundance
	(gr) gravelly (vgr) very gravelly (egr)extr. gravelly	<i>Structureless</i> - 0	<i>f</i> - Few <2%
SUBSURFACE HORIZON(S)	(ch) channery (vch) very channery (ech) extr.channery	<i>Weak</i> - 1	<i>c</i> - Common 2-20%
	(cb) cobbly (vcb) very cobbly (ecb) extr. cobbly	<i>Moderate</i> - 2	<i>m</i> - Many >20%
	(fl) flaggy (vfl) very flaggy (efl) extr. flaggy	<i>Strong</i> - 3	Contrast
	(st) stony (vst) very stony (est) extr. stony	Type	<i>f</i> - Faint
SOIL ORDER	(bd) bouldery (vbd) very bouldery (ebd) extr. bouldery	pl - platy	<i>d</i> - Distinct
Entisol		pr - prismatic	<i>p</i> - Prominent
	TEXTURE	cpr - columnar	
	cos - coarse sand	gr - granular	BOUNDARY
DRAINAGE CLASS	s - sand	abk - angular blocky	Distinctness
	fs - fine sand	sbk - subangular blocky	<i>Abrupt</i> <1" (thick)
	vfs - very fine sand	m - massive	<i>Clear</i> 1-2.5"
	lcos - loamy coarse sand	s - single grain	<i>Gradual</i> 2.5 -5"
	ls - loamy sand	Size	<i>Diffuse</i> >5
LANDFORM	lfs - loamy fine sand	vf - very fine	Topography
Upland	lvfs - loamy very fine sand	f - fine	<i>Smooth</i> - boundary is nearly level
	cosl - coarse sandy loam	m - medium	<i>Wavy</i> - pockets with width greater than depth
	sl - sandy loam	co - coarse	<i>Irregular</i> - pockets with depth greater than width
POSITION	fsl - fine sandy loam	vc - very coarse	<i>Broken</i> discontinuous
Summit	vfsl - very fine sandy loam	vt - very thin	
	l - loam	t - thin	
PARENT MATERIAL	sil - silt loam	th - thick	
Fill	si - silt	vth - very thick	
Residuum	scl - sandy clay loam		
	cl - clay loam		
	sicl - silty clay loam		
BEDROCK LITHOLOGY	sc - sandy clay		
Quartzite	sic - silty clay		
	c - clay		

Matthew C. Hostrander, CPSS
Professional Soil Scientist

Date: 4/26/22 Pit # SW-2
Project: Poteryahin
Location: 4304 Bristol Road
Bensalem Township, Bucks Co., PA
Soil Series Mapped: Urban-Chester
Soil Series Classified: Urban Land

Limiting Zone 48" Bedrock

Slope: 1-3%

Conduct Double Ring Infiltrometer Test at N/A"

Horizon	Depth (In.)	Matrix Color	Texture	Structure	Consistence	Fe Redox Depletions	Fe Redox Concentrations	Boundary
	0-6		Asphalt & Stone					
^B	6-16	10YR 4/4	vch l	1 th pl	friable	none	none	abrupt wavy
C	16-48	10YR 7/4	ecb l	0 m	very friable	none	none	
R	48+	Bedrock						

Township Representative: None Soil Scientist: Matthew C. Hostrander

Notes: Site evaluation for stormwater infiltration. No groundwater encountered. Bedrock encountered at 48" bgs. Asphalt and stone observed from 0 to 6 inches below grade. Clean reworked site fill soils observed from 6 to 16 inches below grade.

Weather / Field Conditions: Overcast, 60s, soil moist.

Others Present at Site: B.P. Dumpster – backhoe provider and operator.

EPIPEDON	<u>COARSE FRAGMENTS (% of Vol.)</u> 15-35% 35-65% >65% (gr) gravelly (vgr) very gravelly (egr)extr. gravelly (ch) channery (vch) very channery (ech) extr.channery (cb) cobbly (vcb) very cobbly (ecb) extr. cobbly (fl) flaggy (vfl) very flaggy (efl) extr. flaggy (st) stony (vst) very stony (est) extr. stony (bd) bouldery (vbd) very bouldery (ebd) extr. bouldery	<u>STRUCTURE</u> Grade Structureless - 0 Weak - 1 Moderate - 2 Strong - 3 Type pl - platy pr - prismatic cpr - columnar gr - granular abk - angular blocky sbk - subangular blocky m - massive s - single grain Size vf - very fine f - fine m - medium co - coarse vc - very coarse vt - very thin t - thin th - thick vth - very thick	<u>REDOX FEATURES</u> Abundance f - Few <2% c - Common 2-20% m - Many >20% Contrast f - Faint d - Distinct p - Prominent
SUBSURFACE HORIZON(S)			<u>BOUNDARY</u> Distinctness Abrupt <1" (thick) Clear 1-2.5" Gradual 2.5 -5" Diffuse >5
SOIL ORDER Entisol	<u>TEXTURE</u> cos - coarse sand s - sand fs - fine sand vfs - very fine sand lcos - loamy coarse sand ls - loamy sand lfs - loamy fine sand lvfs - loamy very fine sand cosl - coarse sandy loam sl - sandy loam fsl - fine sandy loam vfsl - very fine sandy loam l - loam sil - silt loam si - silt scl - sandy clay loam cl - clay loam sicl - silty clay loam sc - sandy clay sic - silty clay c - clay		Topography Smooth - boundary is nearly level Wavy - pockets with width greater than depth Irregular - pockets with depth greater than width Broken discontinuous
DRAINAGE CLASS			
LANDFORM Upland			
POSITION Summit			
PARENT MATERIAL Fill Residuum			
BEDROCK LITHOLOGY Quartzite			

Matthew C. Hostrander, CPSS
Professional Soil Scientist

Date: 4/26/22 Pit # SW-3
Project: Poteryahin
Location: 4304 Bristol Road
Bensalem Township, Bucks Co., PA
Soil Series Mapped: Urban-Chester
Soil Series Classified: Urban Land

Limiting Zone 84+" none

Slope: 1-3%

Conduct Double Ring Infiltrometer Test at 60"

Horizon	Depth (In.)	Matrix Color	Texture	Structure	Consistence	Fe Redox Depletions	Fe Redox Concentrations	Boundary
^B	0-15	Multicolor	ch l	1 th pl 1 f sbk	friable	none	none	abrupt wavy
C1	15-34	10YR 5/6	cb l	0 m	very friable	none	none	clear wavy
C2	34-84+	2.5Y 7/4	sil l	0 m	friable	none	none	

Township Representative: None Soil Scientist: Matthew C. Hostrander

Notes: Site evaluation for stormwater infiltration. No groundwater encountered. No bedrock encountered. Clean reworked site fill soils observed from 0 to 15 inches below grade.

Weather / Field Conditions: Overcast, 60s, soil moist.

Others Present at Site: B.P. Dumpster – backhoe provider and operator.

EPIPEDON	<u>COARSE FRAGMENTS (% of Vol.)</u> 15-35% 35-65% >65% (gr) gravelly (vgr) very gravelly (egr)extr. gravelly (ch) channery (vch) very channery (ech) extr.channery (cb) cobbly (vcb) very cobbly (ecb) extr. cobbly (fl) flaggy (vfl) very flaggy (efl) extr. flaggy (st) stony (vst) very stony (est) extr. stony (bd) bouldery (vbd) very bouldery (ebd) extr. bouldery	<u>STRUCTURE</u> Grade Structureless - 0 Weak - 1 Moderate - 2 Strong - 3 Type pl - platy pr - prismatic cpr - columnar gr - granular abk - angular blocky sbk - subangular blocky m - massive s - single grain Size vf - very fine f - fine m - medium co - coarse vc - very coarse vt - very thin t - thin th - thick vth - very thick	<u>REDOX FEATURES</u> Abundance f - Few <2% c - Common 2-20% m - Many >20% Contrast f - Faint d - Distinct p - Prominent
SUBSURFACE HORIZON(S)			<u>BOUNDARY</u> Distinctness Abrupt <1" (thick) Clear 1-2.5" Gradual 2.5 -5" Diffuse >5 Topography Smooth - boundary is nearly level Wavy - pockets with width greater than depth Irregular - pockets with depth greater than width Broken discontinuous
SOIL ORDER Entisol	<u>TEXTURE</u> cos - coarse sand s - sand fs - fine sand vfs - very fine sand lcos - loamy coarse sand ls - loamy sand lfs - loamy fine sand lvfs - loamy very fine sand cosl - coarse sandy loam sl - sandy loam fsl - fine sandy loam vfsl - very fine sandy loam l - loam sil - silt loam si - silt scl - sandy clay loam cl - clay loam sicl - silty clay loam sc - sandy clay sic - silty clay c - clay		
DRAINAGE CLASS			
LANDFORM Upland			
POSITION Summit			
PARENT MATERIAL Fill Residuum			
BEDROCK LITHOLOGY Schist			

Matthew C. Hostrander, CPSS
Professional Soil Scientist

Date: 4/26/22 Pit # SW-4
Project: Poteryahin
Location: 4304 Bristol Road
Bensalem Township, Bucks Co., PA
Soil Series Mapped: Urban-Chester
Soil Series Classified: Urban Land

Limiting Zone 72" Water

Slope: 8-12%

Conduct Double Ring Infiltrometer Test at N/A"

Horizon	Depth (In.)	Matrix Color	Texture	Structure	Consistence	Fe Redox Depletions	Fe Redox Concentrations	Boundary
^B	0-24	10YR 4/4	ch l	1 f sbk	very friable	none	none	abrupt wavy
C	24-72	Variegated	sil	0 m	friable	none	none	
	72+	Water						

Township Representative: None Soil Scientist: Matthew C. Hostrander

Notes: Site evaluation for stormwater infiltration. Water from stormwater drainage observed at 72" bgs. No bedrock encountered. Clean reworked site fill soils observed from 0 to 24 inches below grade.

Weather / Field Conditions: Overcast, 60s, soil moist.

Others Present at Site: B.P. Dumpster – backhoe provider and operator.

EPIPEDON	<u>COARSE FRAGMENTS (% of Vol.)</u> 15-35% 35-65% >65% (gr) gravelly (vgr) very gravelly (egr)extr. gravelly (ch) channery (vch) very channery (ech) extr.channery (cb) cobbly (vcb) very cobbly (ecb) extr. cobbly (fl) flaggy (vfl) very flaggy (efl) extr. flaggy (st) stony (vst) very stony (est) extr. stony (bd) bouldery (vbd) very bouldery (ebd) extr. bouldery	<u>STRUCTURE</u> Grade Structureless - 0 Weak - 1 Moderate - 2 Strong - 3 Type pl - platy pr - prismatic cpr - columnar gr - granular abk - angular blocky sbk - subangular blocky m - massive s - single grain Size vf - very fine f - fine m - medium co - coarse vc - very coarse vt - very thin t - thin th - thick vth - very thick	<u>REDOX FEATURES</u> Abundance f - Few <2% c - Common 2-20% m - Many >20% Contrast f - Faint d - Distinct p - Prominent
SUBSURFACE HORIZON(S)			<u>BOUNDARY</u> Distinctness Abrupt <1" (thick) Clear 1-2.5" Gradual 2.5 -5" Diffuse >5
SOIL ORDER Entisol	<u>TEXTURE</u> cos - coarse sand s - sand fs - fine sand vfs - very fine sand lcos - loamy coarse sand ls - loamy sand lfs - loamy fine sand lvfs - loamy very fine sand cosl - coarse sandy loam sl - sandy loam fsl - fine sandy loam vfsl - very fine sandy loam l - loam sil - silt loam si - silt scl - sandy clay loam cl - clay loam sicl - silty clay loam sc - sandy clay sic - silty clay c - clay		Topography Smooth - boundary is nearly level Wavy - pockets with width greater than depth Irregular - pockets with depth greater than width Broken discontinuous
DRAINAGE CLASS			
LANDFORM Upland			
POSITION Backslope			
PARENT MATERIAL Fill Residuum			
BEDROCK LITHOLOGY Schist			

Matthew C. Hostrander, CPSS
Professional Soil Scientist

Date: 4/26/22 Pit # SW-5
Project: Poteryahin
Location: 4304 Bristol Road
Bensalem Township, Bucks Co., PA
Soil Series Mapped: Urban-Chester
Soil Series Classified: Urban Land

Limiting Zone 84+" none

Slope: 1-3%

Conduct Double Ring Infiltrometer Test at 54"

Horizon	Depth (In.)	Matrix Color	Texture	Structure	Consistence	Fe Redox Depletions	Fe Redox Concentrations	Boundary
^B1	0-24	Multicolor	ch l	1 f sbk	very friable	none	none	abrupt smooth
^B2	24-44	10YR 7/4	vcb l	1 f sbk	very friable	none	none	abrupt smooth
C1	44-57	10YR 4/4	ch l	1 th pl 0 m	friable	none	none	abrupt wavy
C2	57-84+	Variegated	sil	0 m	friable	none	none	

Township Representative: None Soil Scientist: Matthew C. Hostrander

Notes: Site evaluation for stormwater infiltration. No groundwater encountered. No bedrock encountered. Clean reworked site fill soils observed from 0 to 44 inches below grade.

Weather / Field Conditions: Overcast, 60s, soil moist.

Others Present at Site: B.P. Dumpster – backhoe provider and operator.

EPIPEDON	COARSE FRAGMENTS (% of Vol.)	STRUCTURE	REDOX FEATURES
	15-35% 35-65% >65%	Grade	Abundance
	(gr) gravelly (vgr) very gravelly (egr)extr. gravelly	<i>Structureless</i> - 0	<i>f</i> - Few <2%
SUBSURFACE HORIZON(S)	(ch) channery (vch) very channery (ech) extr.channery	<i>Weak</i> - 1	<i>c</i> - Common 2-20%
	(cb) cobbly (vcb) very cobbly (ecb) extr. cobbly	<i>Moderate</i> - 2	<i>m</i> - Many >20%
	(fl) flaggy (vfl) very flaggy (efl) extr. flaggy	<i>Strong</i> - 3	Contrast
	(st) stony (vst) very stony (est) extr. stony	Type	<i>f</i> - Faint
SOIL ORDER	(bd) bouldery (vbd) very bouldery (ebd) extr. bouldery	pl - platy	<i>d</i> - Distinct
Entisol		pr - prismatic	<i>p</i> - Prominent
	TEXTURE	cpr - columnar	
	cos - coarse sand	gr - granular	BOUNDARY
DRAINAGE CLASS	s - sand	abk - angular blocky	Distinctness
	fs - fine sand	sbk - subangular blocky	<i>Abrupt</i> <1" (thick)
	vfs - very fine sand	m - massive	<i>Clear</i> 1-2.5"
	lcos - loamy coarse sand	s - single grain	<i>Gradual</i> 2.5 -5"
	ls - loamy sand	Size	<i>Diffuse</i> >5
LANDFORM	lfs - loamy fine sand	vf - very fine	Topography
Terrace	lvfs - loamy very fine sand	f - fine	<i>Smooth</i> - boundary is nearly level
	cosl - coarse sandy loam	m - medium	<i>Wavy</i> - pockets with width greater than depth
	sl - sandy loam	co - coarse	<i>Irregular</i> - pockets with depth greater than width
POSITION	fsl - fine sandy loam	vc - very coarse	<i>Broken</i> discontinuous
	vfsl - very fine sandy loam	vt - very thin	
	l - loam	t - thin	
PARENT MATERIAL	sil - silt loam	th - thick	
Fill	si - silt	vth - very thick	
Residuum	scl - sandy clay loam		
	cl - clay loam		
	sicl - silty clay loam		
BEDROCK LITHOLOGY	sc - sandy clay		
Schist	sic - silty clay		
	c - clay		

Matthew C. Hostrander, CPSS
Professional Soil Scientist

Date: 9/15/23 Pit # SW-6
Project: Poteryahin
Location: 4304 Bristol Road
Bensalem Township, Bucks Co., PA
Soil Series Mapped: Urban-Chester
Soil Series Classified: Urban-Chester

Limiting Zone 96+" none

Slope: 3-5%

Conduct Single Ring Infiltrometer Test at 60"

Horizon	Depth (In.)	Matrix Color	Texture	Structure	Consistence	Fe Redox Depletions	Fe Redox Concentrations	Boundary
	0-8		Asphalt & Stone					
^B	8-22	10YR 3/6	ch l	1 f sbk	friable	none	none	clear wavy
Bt	22-33	10YR 4/4	sil	2 m sbk	friable	none	none	clear wavy
BC	33-60	10YR 5/4	sil	1 th pl 1 m sbk	friable	none	none	clear wavy
C1	60-80	10YR 5/4	cb l	0 m	friable	none	none	clear wavy
C2	80-96+	2.5Y 6/4	vcb fsl	0 m	very friable	none	none	

Township Representative: None Soil Scientist: Matthew C. Hostrander

Notes: Site evaluation for stormwater infiltration. No groundwater encountered. No bedrock encountered. Asphalt and stone observed from 0 to 8 inches below grade. Clean reworked site fill soils observed from 8 to 22 inches below grade.

Weather / Field Conditions: Sunny, 70s, soil moist.

Others Present at Site: Geary Erney of Total Contracting, LLC – backhoe provider and operator.

EPIPEDON	<u>COARSE FRAGMENTS (% of Vol.)</u> 15-35% 35-65% >65% (gr) gravelly (vgr) very gravelly (egr)extr. gravelly (ch) channery (vch) very channery (ech) extr.channery (cb) cobbly (vcb) very cobbly (ecb) extr. cobbly (fl) flaggy (vfl) very flaggy (efl) extr. flaggy (st) stony (vst) very stony (est) extr. stony (bd) bouldery (vbd) very bouldery (ebd) extr. bouldery	<u>STRUCTURE</u> Grade Structureless - 0 Weak - 1 Moderate - 2 Strong - 3 Type pl - platy pr - prismatic cpr - columnar gr - granular abk - angular blocky sbk - subangular blocky m - massive s - single grain Size vf - very fine f - fine m - medium co - coarse vc - very coarse vt - very thin t - thin th - thick vth - very thick	<u>REDOX FEATURES</u> Abundance f - Few <2% c - Common 2-20% m - Many >20% Contrast f - Faint d - Distinct p - Prominent <u>BOUNDARY</u> Distinctness Abrupt <1" (thick) Clear 1-2.5" Gradual 2.5 -5" Diffuse >5 Topography Smooth - boundary is nearly level Wavy - pockets with width greater than depth Irregular - pockets with depth greater than width Broken discontinuous
SUBSURFACE HORIZON(S) Argillic			
SOIL ORDER Ultisol	<u>TEXTURE</u> cos - coarse sand s - sand fs - fine sand vfs - very fine sand lcos - loamy coarse sand ls - loamy sand lfs - loamy fine sand lvfs - loamy very fine sand cosl - coarse sandy loam sl - sandy loam fsl - fine sandy loam vfsl - very fine sandy loam l - loam sil - silt loam si - silt scl - sandy clay loam cl - clay loam sicl - silty clay loam sc - sandy clay sic - silty clay c - clay		
DRAINAGE CLASS Well Drained			
LANDFORM Upland			
POSITION Summit			
PARENT MATERIAL Fill Residuum			
BEDROCK LITHOLOGY Quartzite			

1590 Canary Road, Quakertown, PA 18951 | 215-536-7006 | 215-538-6136



Single Ring Infiltrometer Test Report

Site: 4304 Bristol Road - SW-1
 Municipality: Bensalem Township
 County: Bucks
 Date: 4/26/2022

Testing Depth: 60"
 (Below Ground Surface)

	Test #1	Test #2
	Drop (in)	Drop (in)
Presoak 1 (30 min)	Dry	Dry
Presoak 2 (30 min)	Dry	Dry

	Test #1	Test #2
Interval 1 (min)	5	5
Drop (in)	1.25	1.5

Interval 2 (min)	5	5
Drop (in)	1.25	1.5

Interval 3 (min)	5	5
Drop (in)	1.25	1.25

Interval 4 (min)	5	5
Drop (in)	1.0	1.25

Interval 5 (min)	5	5
Drop (in)	1.0	1.25

Interval 6 (min)	5	5
Drop (in)	1.0	1.25

Interval 7 (min)	5	5
Drop (in)	1.0	1.25

Interval 8 (min)	5	5
Drop (in)	1.0	1.25

Final Drop in/hr	12.0	15.0
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Infiltration Rate= 13.50 in/hr

1590 Canary Road, Quakertown, PA 18951 | 215-536-7006 | 215-538-6136



Double Ring Infiltrometer Test Report

Site: 4304 Bristol Road - SW-3
 Municipality: Bensalem Township
 County: Bucks
 Date: 4/26/2022

Testing Depth: 60"
 (Below Ground Surface)

Test #1

Drop (in)

Presoak 1 (30 min)	0.25
Presoak 2 (30 min)	0.25

Test #1

Interval 1 (min)	30
Drop (in)	0.25

Interval 2 (min)	30
Drop (in)	0.25

Interval 3 (min)	30
Drop (in)	0.25

Interval 4 (min)	30
Drop (in)	0.25

Final Drop in/hr	0.50
------------------	------

Infiltration Rate= 0.50 in/hr

1590 Canary Road, Quakertown, PA 18951 | 215-536-7006 | 215-538-6136



Double Ring Infiltrometer Test Report

Site: 4304 Bristol Road - SW-5
 Municipality: Bensalem Township
 County: Bucks
 Date: 4/26/2022

Testing Depth: 54"
 (Below Ground Surface)

Test #1

Drop (in)

Presoak 1 (30 min)	0.25
Presoak 2 (30 min)	0.25

Test #1

Interval 1 (min)	30
Drop (in)	0.25

Interval 2 (min)	30
Drop (in)	0.25

Interval 3 (min)	30
Drop (in)	0.25

Interval 4 (min)	30
Drop (in)	0.25

Final Drop in/hr	0.50
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Infiltration Rate= 0.50 in/hr

1590 Canary Road, Quakertown, PA 18951 | 215-536-7006 | 215-538-6136



Single Ring Infiltrometer Test Report

Site: 4304 Bristol Road - SW-6
 Municipality: Bensalem Township
 County: Bucks
 Date: 9/15/2023

Testing Depth: 60"
 (Below Ground Surface)

	Test #1	Test #2
	Drop (in)	Drop (in)
Presoak 1 (30 min)	1.75	1.75
Presoak 2 (30 min)	1.5	1.75

	Test #1	Test #2
Interval 1 (min)	30	30
Drop (in)	1.5	1.75

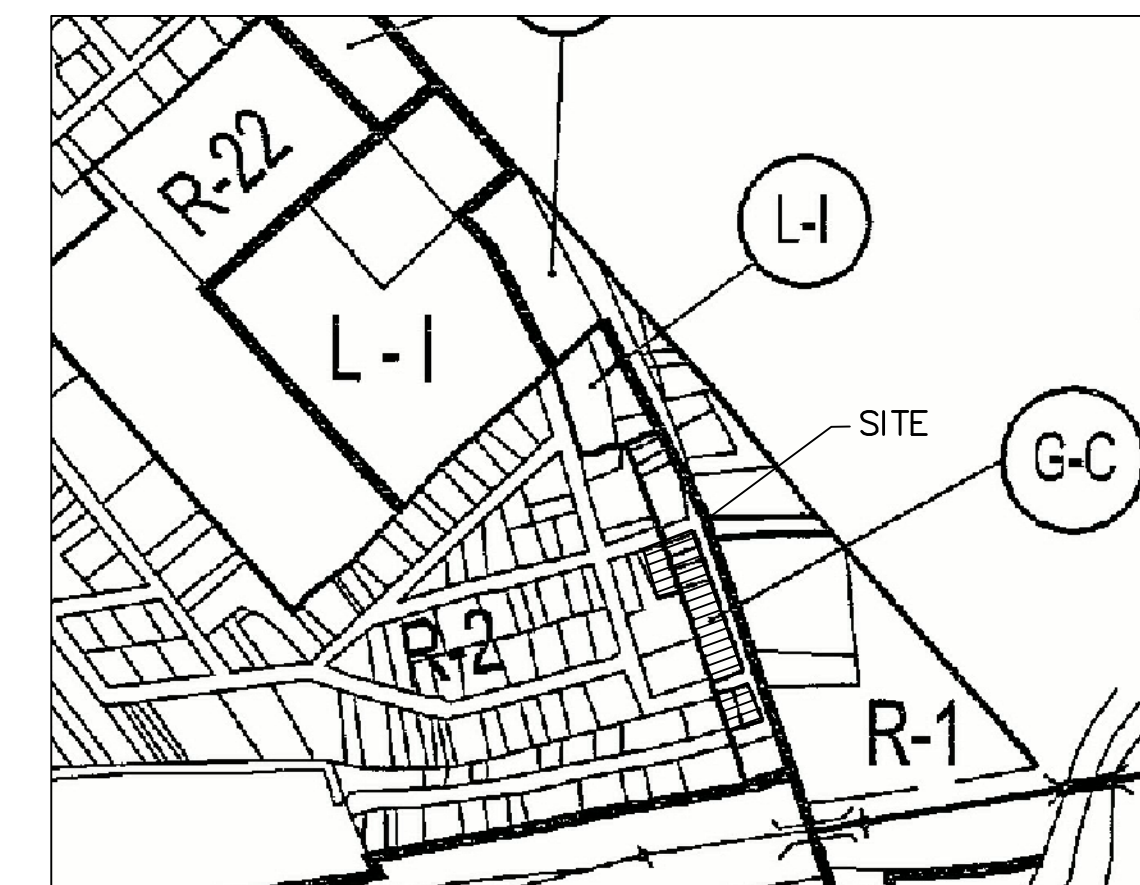
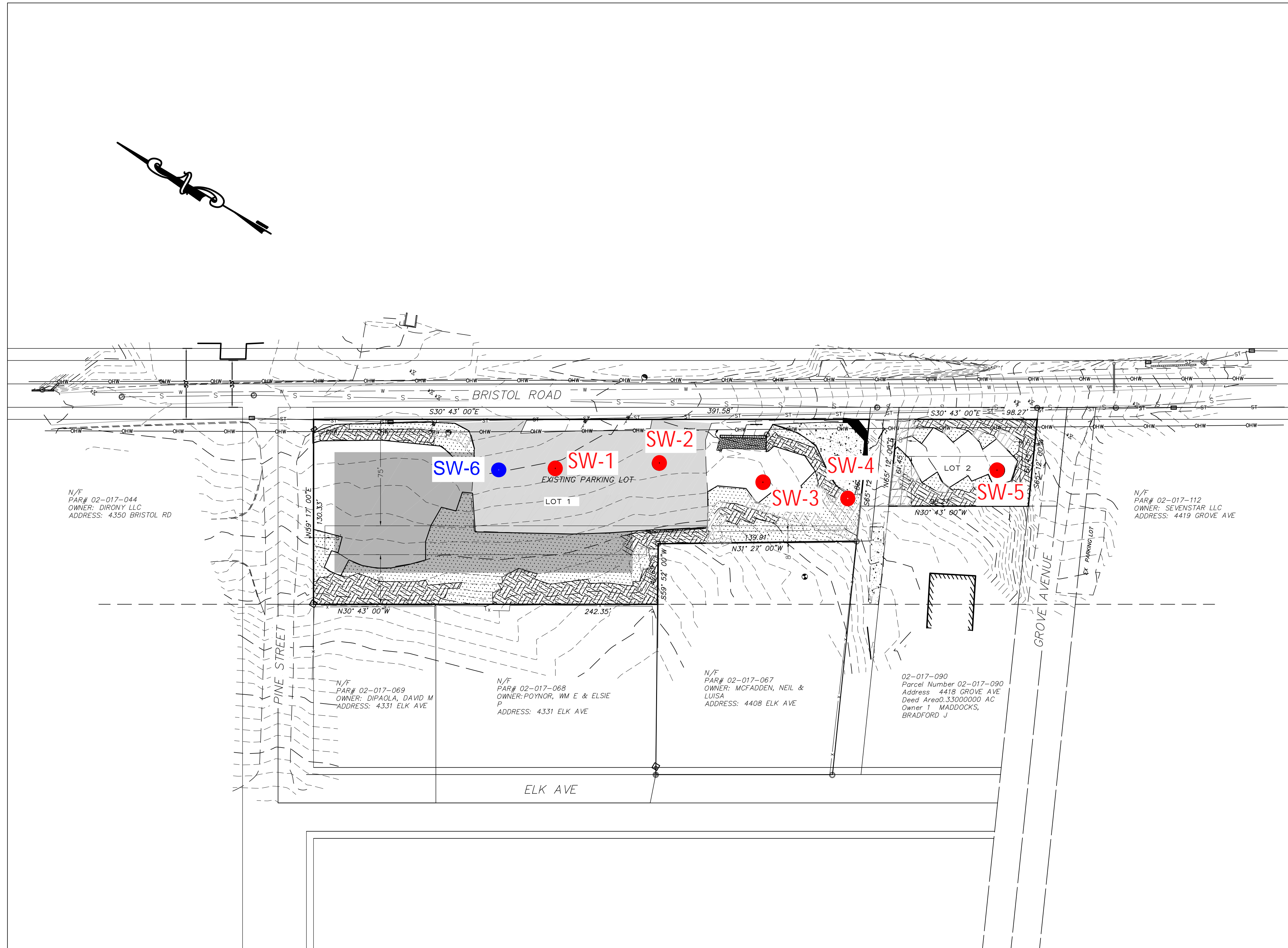
Interval 2 (min)	30	30
Drop (in)	1.5	1.75

Interval 3 (min)	30	30
Drop (in)	1.5	1.75

Interval 4 (min)	30	30
Drop (in)	1.5	1.75

Final Drop in/hr	3.0	3.5
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Infiltration Rate= 3.25 in/hr



LOCATION MAP: 1" = 500'

GENERAL NOTES

1. THIS PLAN DEPICTS THE PROPOSED DEVELOPMENT OF 4304 AND 411 BRISTOL ROAD EACH WITH A TWO STORY COMMERCIAL BUILDING CONTAINING WAREHOUSE SPACE ON THE FIRST FLOOR AND OFFICE SPACE ON THE SECOND FLOOR. PROPOSED BUILDINGS WILL BE SERVICED WITH PUBLIC WATER AND SEWER AS WELL AS RELATED INFRASTRUCTURE.

2. OWNER/APPLICANT:

ANTON POTERYAHIN
BRILLA LLC
52 E GEORGIANNA DRIVE
RICHBORO PA 18954

3. PARID: 02-017-068-001 (LOT 1 - 4304 BRISTOL RD)
& 02-017-090-001 (LOT 2 - 411 BRISTOL RD)

4. ZONING DISTRICT GC: GENERAL COMMERCIAL

PROPOSED USE - AUTO REPAIR ITEM	REQUIRED	EXISTING LOT 1
MIN LOT AREA	7200 SF	44151 SF
LOT WIDTH	60 FT	391.6 FT
FRONT YARD	75 FT	NA*
SIDE YARD MIN	8 FT	8 FT
REAR YARD	35 FT	NA*
BUILDING HEIGHT	45 FT	NA
MAX BLDG COV	35 %	0 %
MAX IMP SITE	60 %	32.6 %

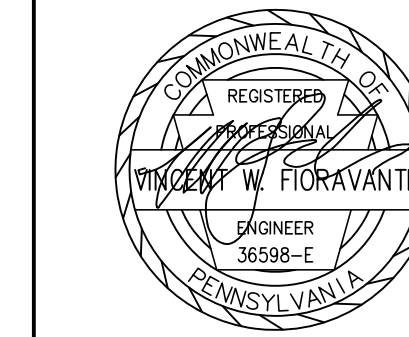
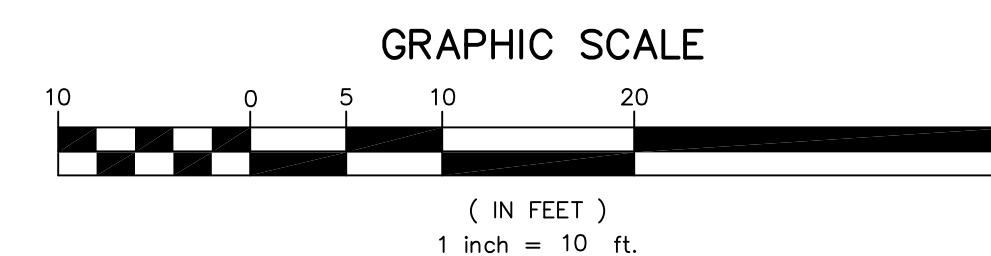
* EXISTING NON CONFORMITY
** VARIANCE REQUIRED

ITEM	REQUIRED	EXISTING LOT 2
MIN LOT AREA	7200 SF	6007 SF *
LOT WIDTH	60 FT	98.27 FT
FRONT YARD	75 FT	OVERLAP FT*
SIDE YARD MIN	8 FT	8 FT
REAR YARD	35 FT	OVERLAP FT*
BUILDING HEIGHT	45 FT	<45 FT
MAX BLDG COV	35 %	0 %
MAX IMP SITE	60 %	0 %

* EXISTING NON CONFORMITY
** VARIANCE REQUIRED

LEGEND

--- 100 YR ---	FEMA FLOODPLAIN
--- SOILS ---	SOILS
---	STREAM
--- WL ---	EXISTING WETLANDS
---	EXISTING BUILDINGS
---	EXISTING PROPERTY LINE
---	EXISTING 2 FOOT CONTOUR
---	EXISTING 10 FOOT CONTOUR
---	EXISTING CURB
---	EXISTING PAVED DRIVEWAY
X	EXISTING FENCE
---	EXISTING TREE MASS
☉ ☽ ☼	EXISTING TREES AND BUSHES TO REMAIN
---	EXISTING EASEMENT
---	EDGE OF EXISTING PAVED ROAD
--- OHW ---	EXISTING POLES
--- ST ---	EXISTING STORM SEWER
--- S ---	EXISTING SANITARY SEWER
--- W ---	EXISTING WATER MAIN
--- G ---	EXISTING GAS MAIN



REVISIONS

NO.	DESCRIPTION	DATE
1		
2		

DATE: 7-26-21
SCALE: 1"=10'
JOB # 2084 FB # ---
DRAWN: GH CHECKED: VMF

4304 & 411 BRISTOL ROAD
BENSALEM TOWNSHIP, PA
PREPARED FOR:
MR. ANTON POTERYAHIN
52 E GEORGIANNA DRIVE
RICHBORO PA 18954

EXISTING
FEATURES
PLAN

SHEET
2 OF 2

FIORAVANTI, INC.
CIVIL ENGINEERS & LAND SURVEYORS
618 STREET ROAD * SOUTHAMPTON, PA 18966
(215) 322 * 2143