

DRAINAGE REPORT

Orlando Excavations, LLC

95 Rescue Lane
Bloomfield, CT

April 11, 2025



PREPARED BY:

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

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missing from report

Include CT soil
survey info with
hydrologic soil groups
(HSG) of site soils

include dimension of
yard and material
composition

SUMMARY

The applicant proposes to construct a 900 sf storage building and an outdoor material stockpile yard at their 95 Rescue Lane Bloomfield property. Minor grading and considerable land clearing is required for construction. The proposed drainage system is designed with detention basins to reduce post -development flows to pre-development levels for the 2-yr, 10-yr, 25-yr, 50-yr, and 100-year storms.

The proposed site grading will direct sheetflow runoff from the proposed stock yard area into a detention basin. The detention basin reduces the post-development flows to pre-development levels prior to being piped to on-site wetlands. A summary of the watershed analysis is found on the next page. Hydraulics Hydrographs software is used to evaluate the pre- and post- development conditions.

Dead storage in the detention basin stores the stormwater quality volume, see Appendix C for calculations.

A Stormwater Operations & Maintenance Plan is found in Appendix D.

The amount of
grading appears
significant due to size
of site

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

Orlando Excavations, LLC
95 Rescue Lane, Bloomfield, CT

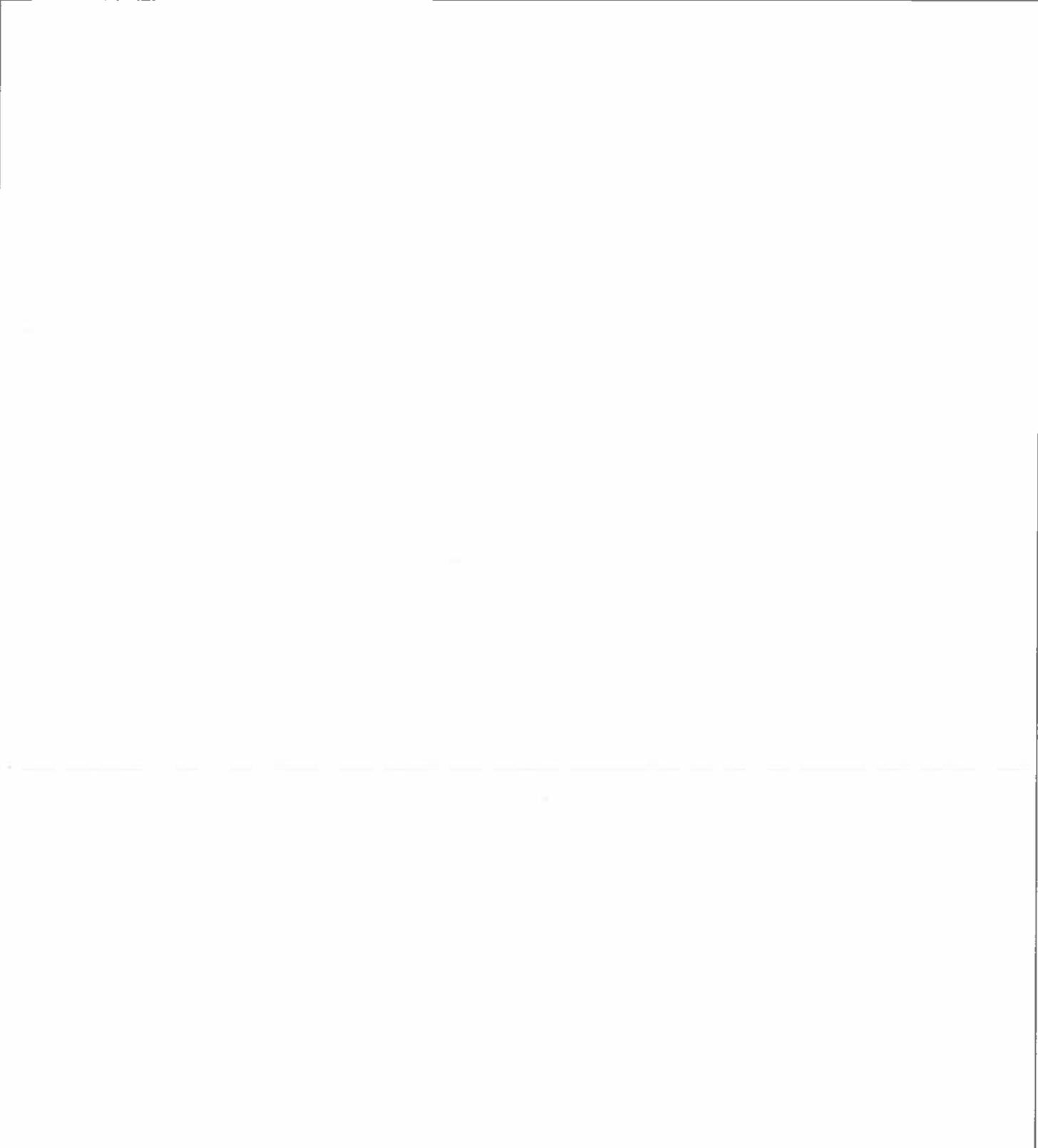
SUMMARY OF DISCHARGES

STORM (YEAR)	EXISTING (CFS)	PROPOSED (CFS)	CHANGE (CFS)
2	6.09	2.74	-3.35
10	13.40	4.20	-9.20
25	18.20	5.91	-12.29
50	21.98	8.66	-13.32
100	25.73	10.28	-15.45

APPENDIX A:
HYDROLOGIC CALCULATIONS: EXISTING CONDITIONS

Watershed Model Schematic

Hydraflow Hydrographs by InteliSolve v9.1



Legend

<u>Hyd. Origin</u>	<u>Description</u>
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1	SCS Runoff Existing Conditions
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Hydrograph Return Period Recap

Hydraflow Hydrographs by Intelisolve v9.1

Hyd. No.	Hydrograph type (origin)	Inflow Hyd(s)	Peak Outflow (cfs)								Hydrograph description
			1-Yr	2-Yr	3-Yr	5-Yr	10-Yr	25-Yr	50-Yr	100-Yr	
1	SCS Runoff	-----	-----	6.088	-----	-----	13.40	18.20	21.98	25.73	Existing Conditions

Hydrograph Report

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Hydraflow Hydrographs by Intelisolve v9.1

Friday, Apr 11, 2025

Hyd. No. 1

Existing Conditions

Hydrograph type = SCS Runoff
Storm frequency = 2 yrs
Time interval = 2 min
Drainage area = 3.600 ac
Basin Slope = 0.0 %
Tc method = USER
Total precip. = 3.60 in
Storm duration = 24 hrs

Tc seems very low
for 3.6 acres; provide
Tc path on watershed
mapping

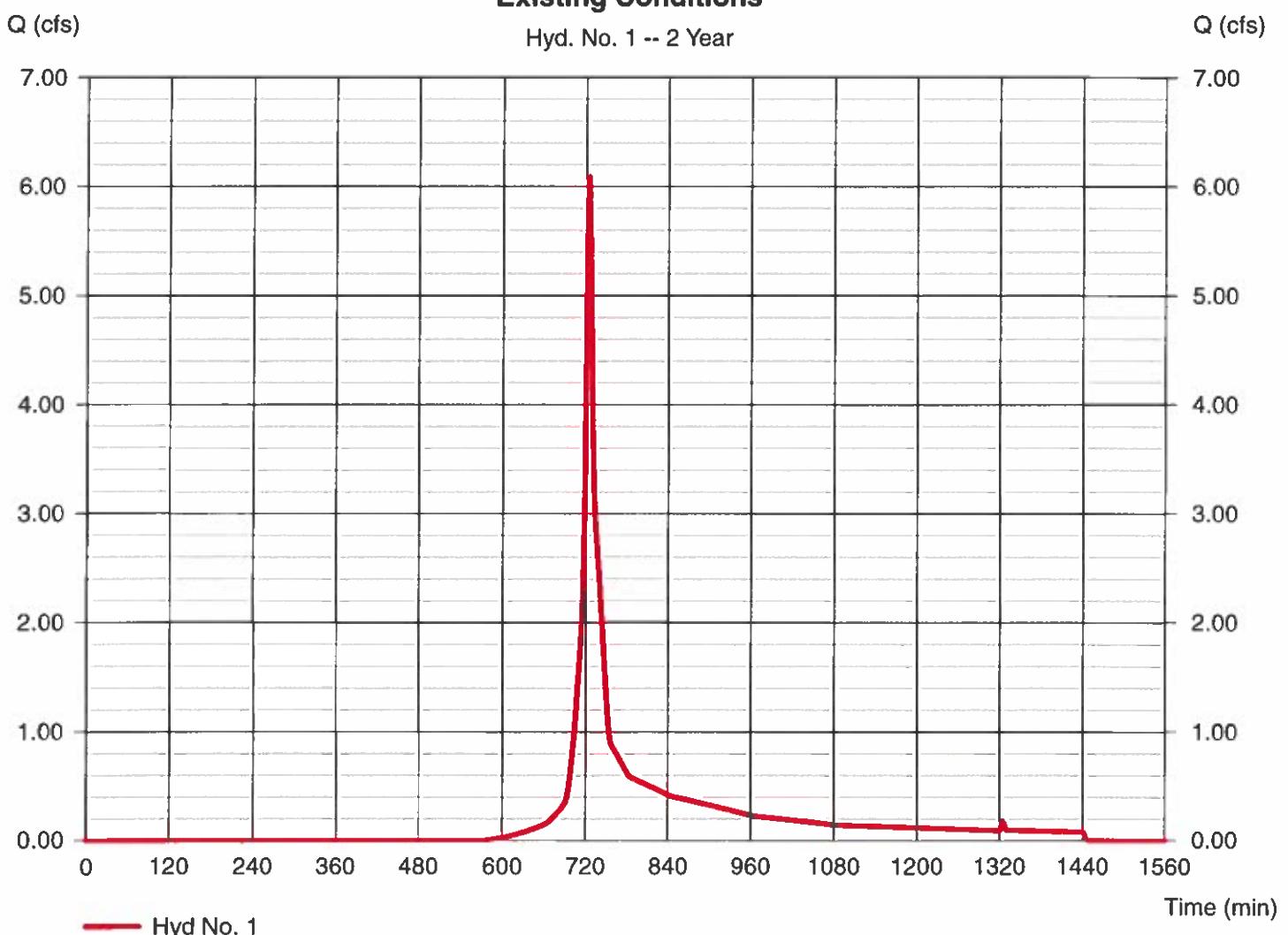
provide backup data for
value used

Peak discharge = 6.088 cfs
Time to peak = 724 min
Hyd. volume = 18.441 cuft
Curve number = 77
Hydraulic length = 0 ft
Time of conc. (Tc) = 5.00 min
Distribution = Type III
Shape factor = 484

precipitation values should be
based on Atlas 14 Volume 10
values for site location; this
comment applies for other storms
also 10 yr through 100 yr

Existing Conditions

Hyd. No. 1 -- 2 Year



Hydrograph Report

Hydraflow Hydrographs by Intelsolve v9.1

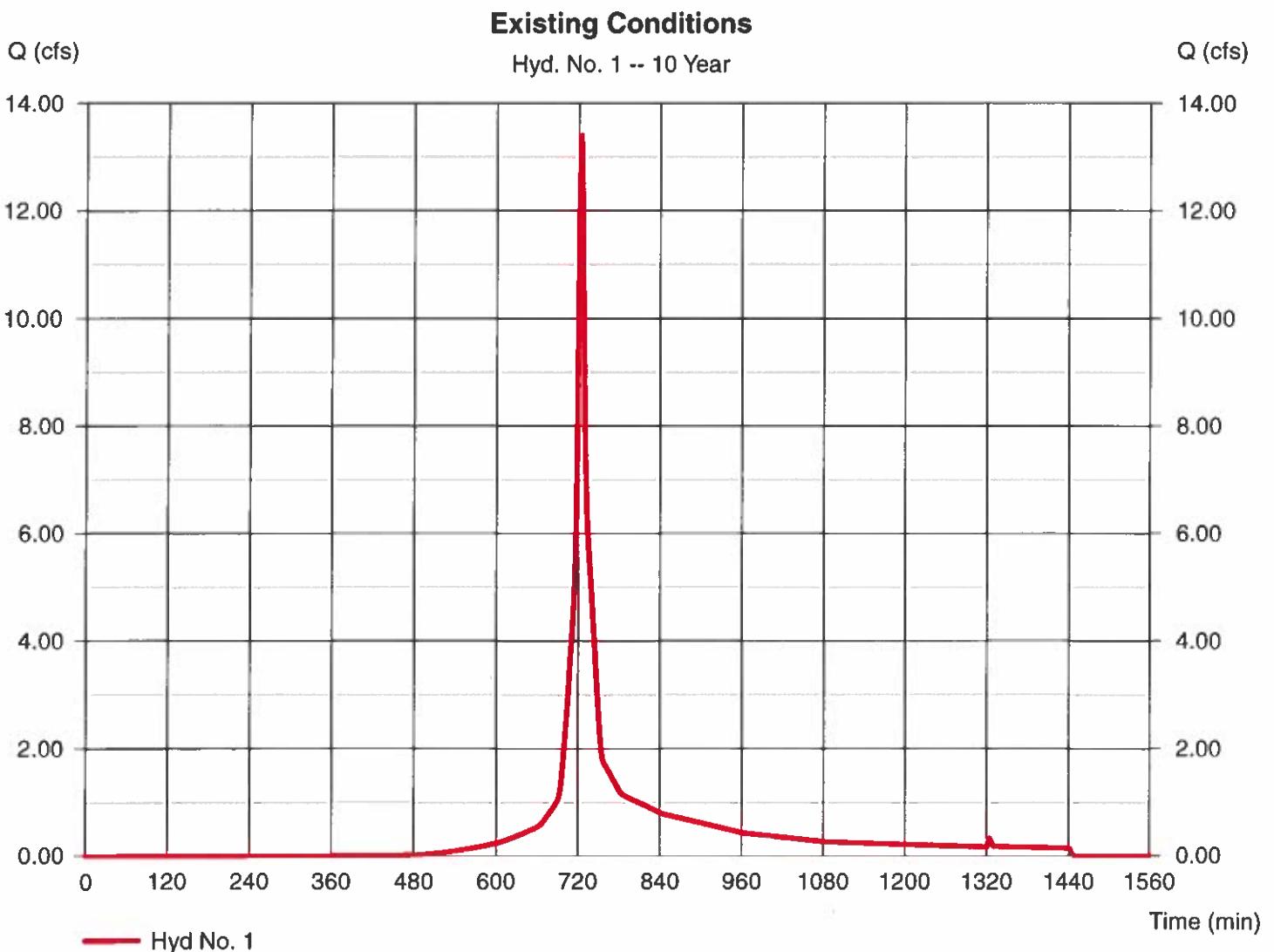
Friday, Apr 11, 2025

Hyd. No. 1

Existing Conditions

Hydrograph type = SCS Runoff
 Storm frequency = 10 yrs
 Time interval = 2 min
 Drainage area = 3.600 ac
 Basin Slope = 0.0 %
 Tc method = USER
 Total precip. = 5.76 in
 Storm duration = 24 hrs

Peak discharge = 13.40 cfs
 Time to peak = 724 min
 Hyd. volume = 40,066 cuft
 Curve number = 77
 Hydraulic length = 0 ft
 Time of conc. (Tc) = 5.00 min
 Distribution = Type III
 Shape factor = 484



Hydrograph Report

5

Hydraflow Hydrographs by InteliSolve v9.1

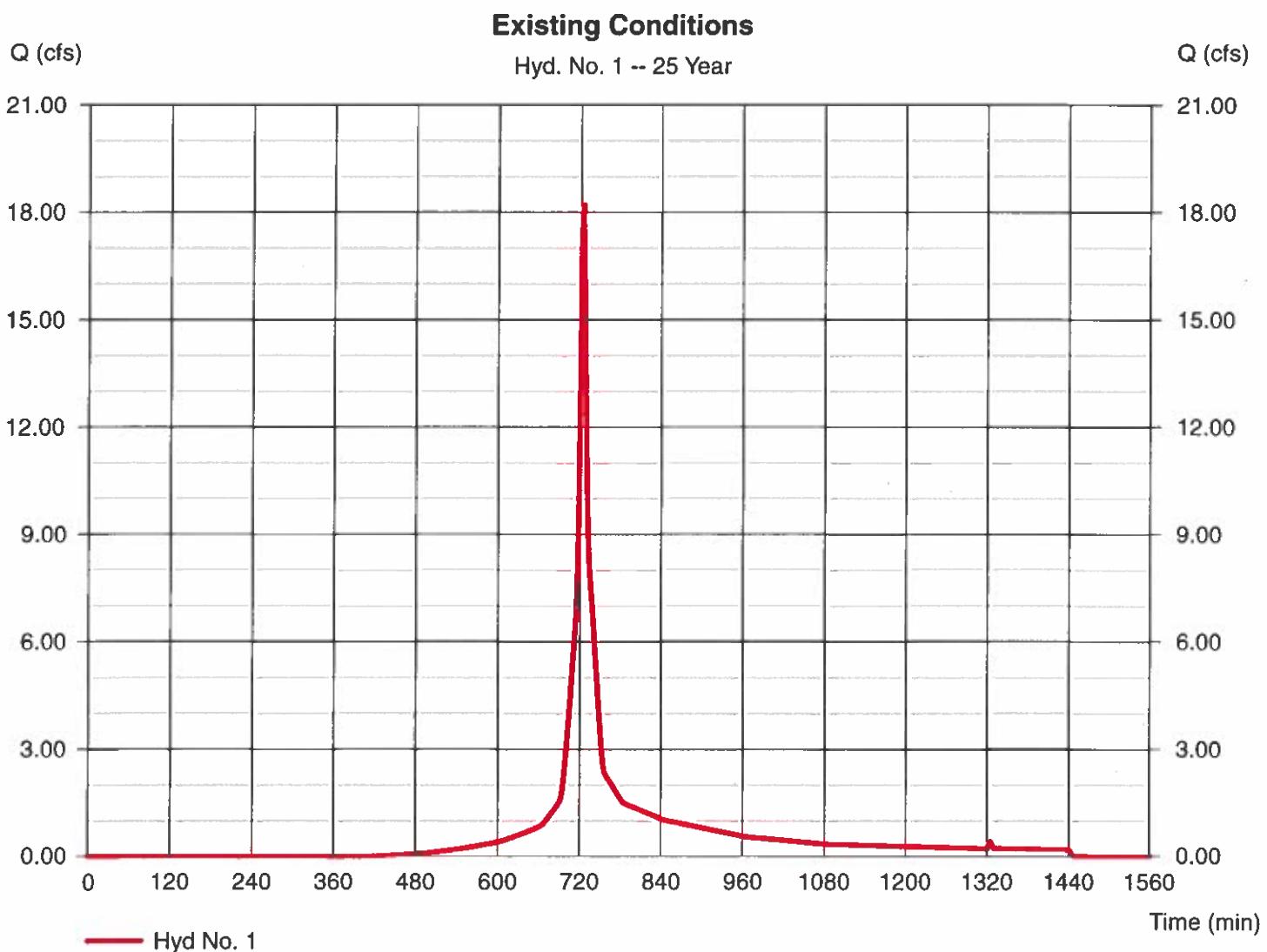
Friday, Apr 11, 2025

Hyd. No. 1

Existing Conditions

Hydrograph type = SCS Runoff
Storm frequency = 25 yrs
Time interval = 2 min
Drainage area = 3.600 ac
Basin Slope = 0.0 %
Tc method = USER
Total precip. = 7.11 in
Storm duration = 24 hrs

Peak discharge = 18.20 cfs
Time to peak = 724 min
Hyd. volume = 54,700 cuft
Curve number = 77
Hydraulic length = 0 ft
Time of conc. (Tc) = 5.00 min
Distribution = Type III
Shape factor = 484



Hydrograph Report

Hydraflow Hydrographs by InteliSolve v9.1

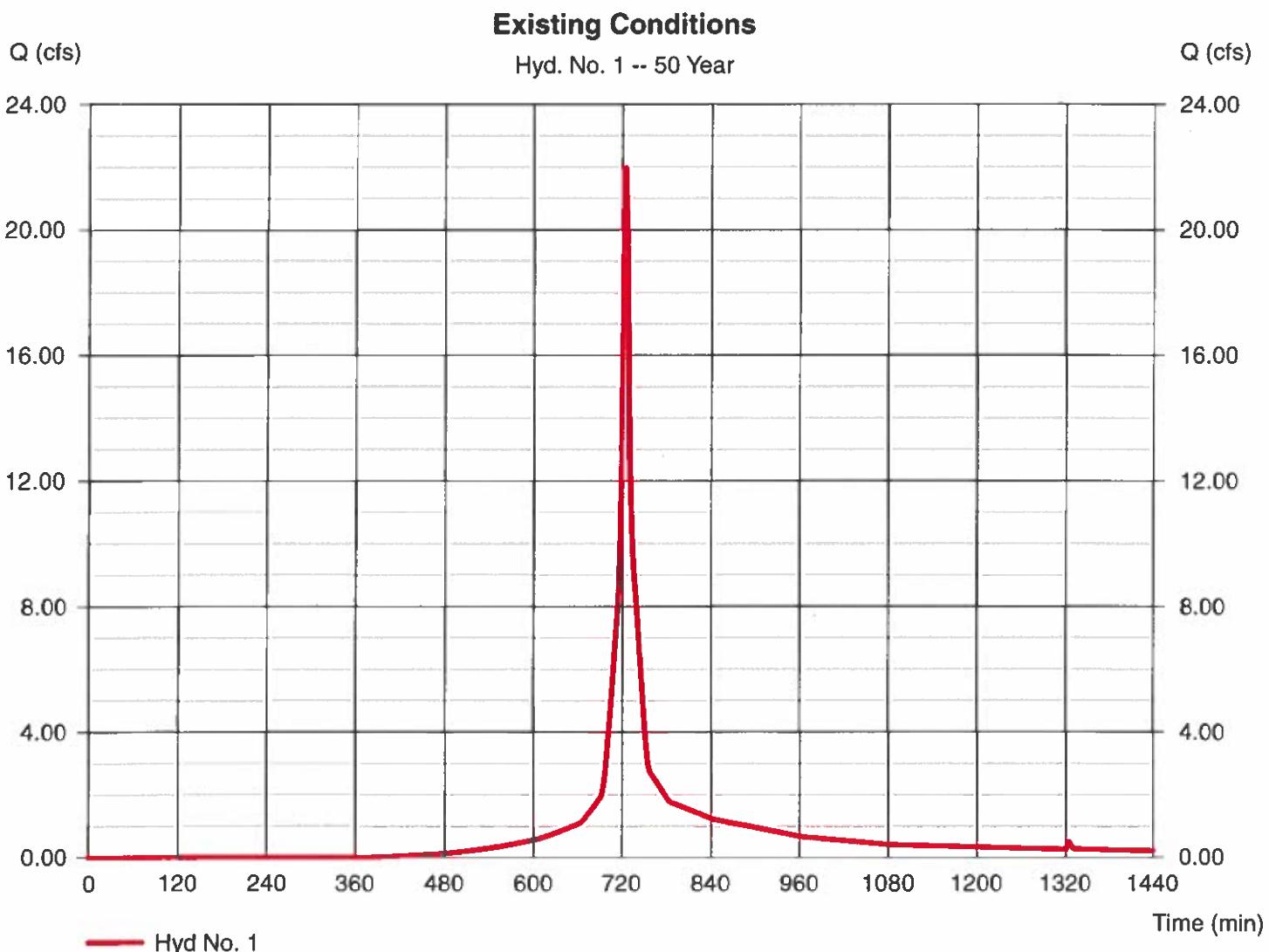
Friday, Apr 11, 2025

Hyd. No. 1

Existing Conditions

Hydrograph type = SCS Runoff
 Storm frequency = 50 yrs
 Time interval = 2 min
 Drainage area = 3.600 ac
 Basin Slope = 0.0 %
 Tc method = USER
 Total precip. = 8.16 in
 Storm duration = 24 hrs

Peak discharge = 21.98 cfs
 Time to peak = 724 min
 Hyd. volume = 66,418 cuft
 Curve number = 77
 Hydraulic length = 0 ft
 Time of conc. (Tc) = 5.00 min
 Distribution = Type III
 Shape factor = 484



Hydrograph Report

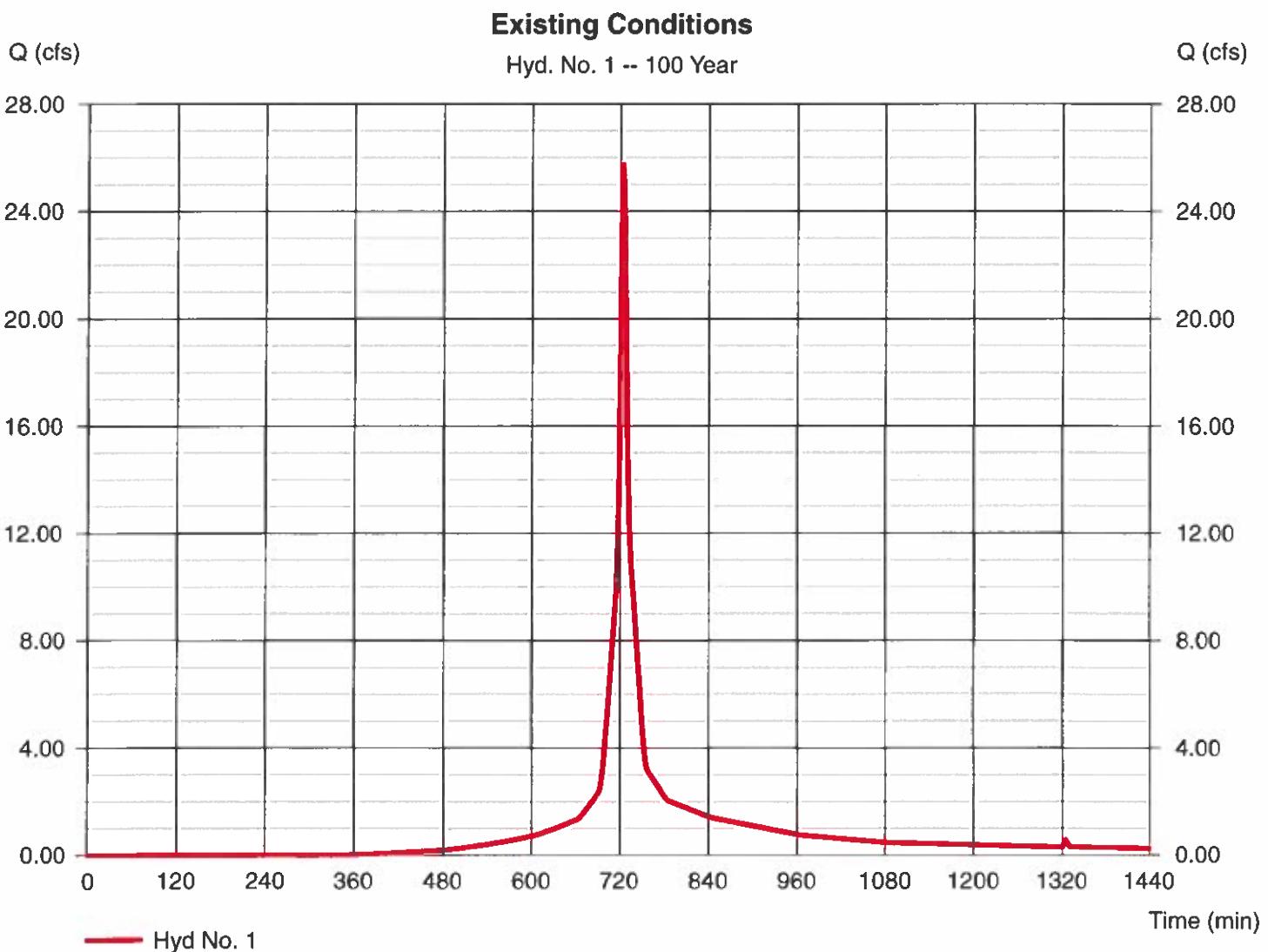
Hydraflow Hydrographs by Intelisolve v9.1

Friday, Apr 11, 2025

Hyd. No. 1

Existing Conditions

Hydrograph type	= SCS Runoff	Peak discharge	= 25.73 cfs
Storm frequency	= 100 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 78,229 cuft
Drainage area	= 3.600 ac	Curve number	= 77
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 5.00 min
Total precip.	= 9.20 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

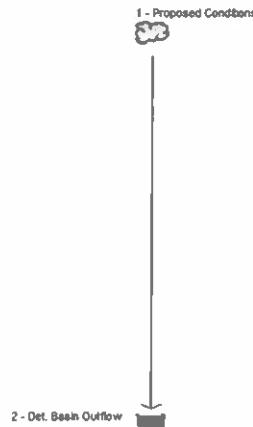


APPENDIX B:

HYDROLOGIC CALCULATIONS: PROPOSED CONDITIONS

Watershed Model Schematic

Hydraflow Hydrographs by InteliSolve v9.1



Legend

<u>Hyd. Origin</u>	<u>Description</u>
--------------------	--------------------

1	SCS Runoff	Proposed Conditions
2	Reservoir	Det. Basin Outflow

Hydrograph Return Period Recap

Hydraflow Hydrographs by Intelisolve v9.1

Hyd. No.	Hydrograph type (origin)	Inflow Hyd(s)	Peak Outflow (cfs)								Hydrograph description
			1-Yr	2-Yr	3-Yr	5-Yr	10-Yr	25-Yr	50-Yr	100-Yr	
1	SCS Runoff	-----	-----	9.582	-----	-----	17.37	22.21	25.95	29.63	Proposed Conditions
2	Reservoir	1	-----	2.744	-----	-----	4.202	5.908	8.655	10.28	Det. Basin Outflow

Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.1

Friday, Apr 11, 2025

Hyd. No. 1

Proposed Conditions

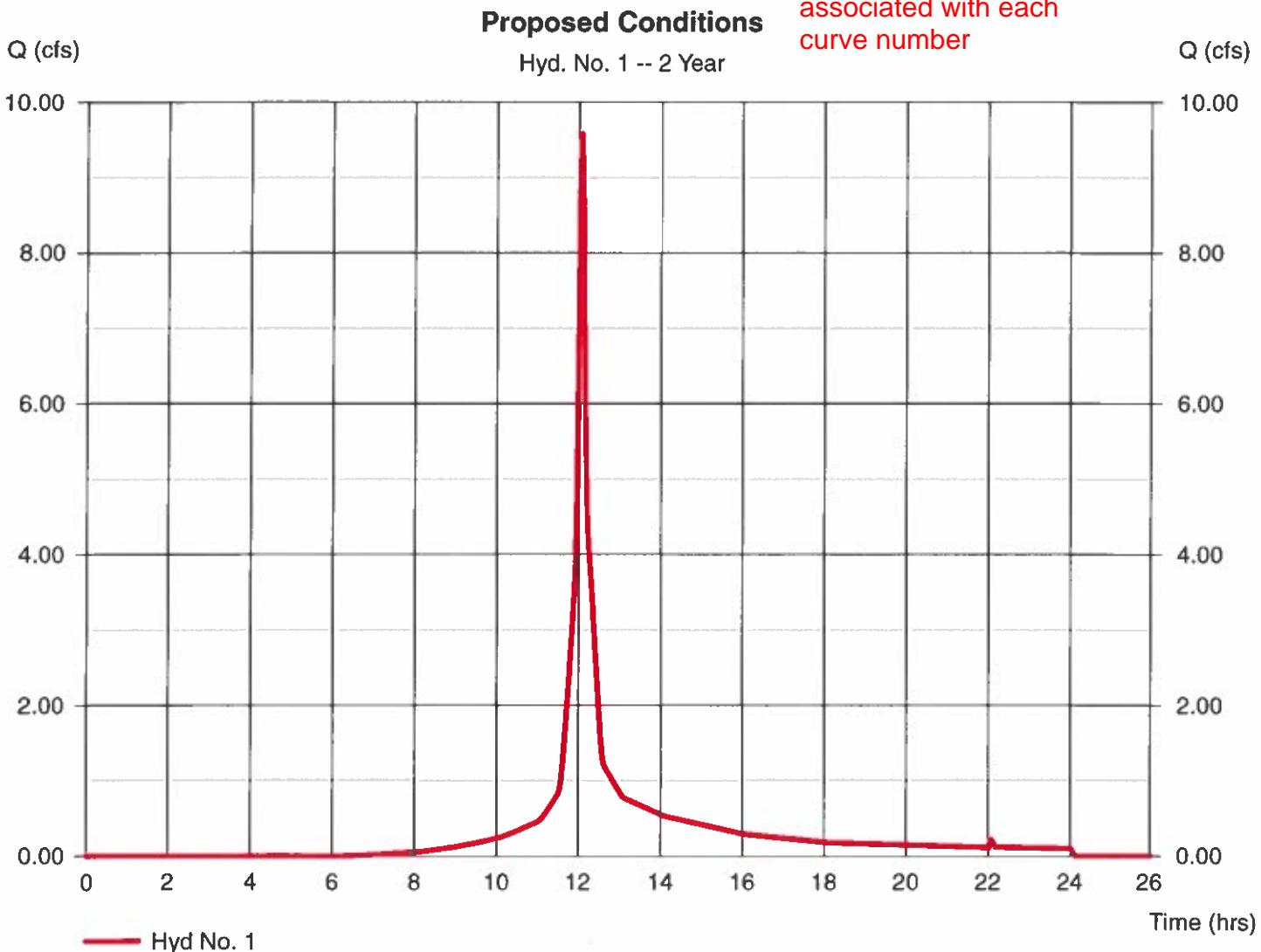
Hydrograph type = SCS Runoff
 Storm frequency = 2 yrs
 Time interval = 2 min
 Drainage area = 3.600 ac
 Basin Slope = 0.0 %
 Tc method = USER
 Total precip. = 3.60 in
 Storm duration = 24 hrs

Peak discharge = 9.582 cfs
 Time to peak = 12.07 hrs
 Hyd. volume = 28,913 cuft
 Curve number = 88*
 Hydraulic length = 0 ft
 Time of conc. (Tc) = 5.00 min
 Distribution = Type III
 Shape factor = 484

Provide calculation

* Composite (Area/CN) = $[(0.020 \times 98) + (2.430 \times 91) + (1.150 \times 80)] / 3.600$

Provide backup data including description of land use associated with each curve number



Hydrograph Report

Hydraflow Hydrographs by Intelsolve v9.1

Friday, Apr 11, 2025

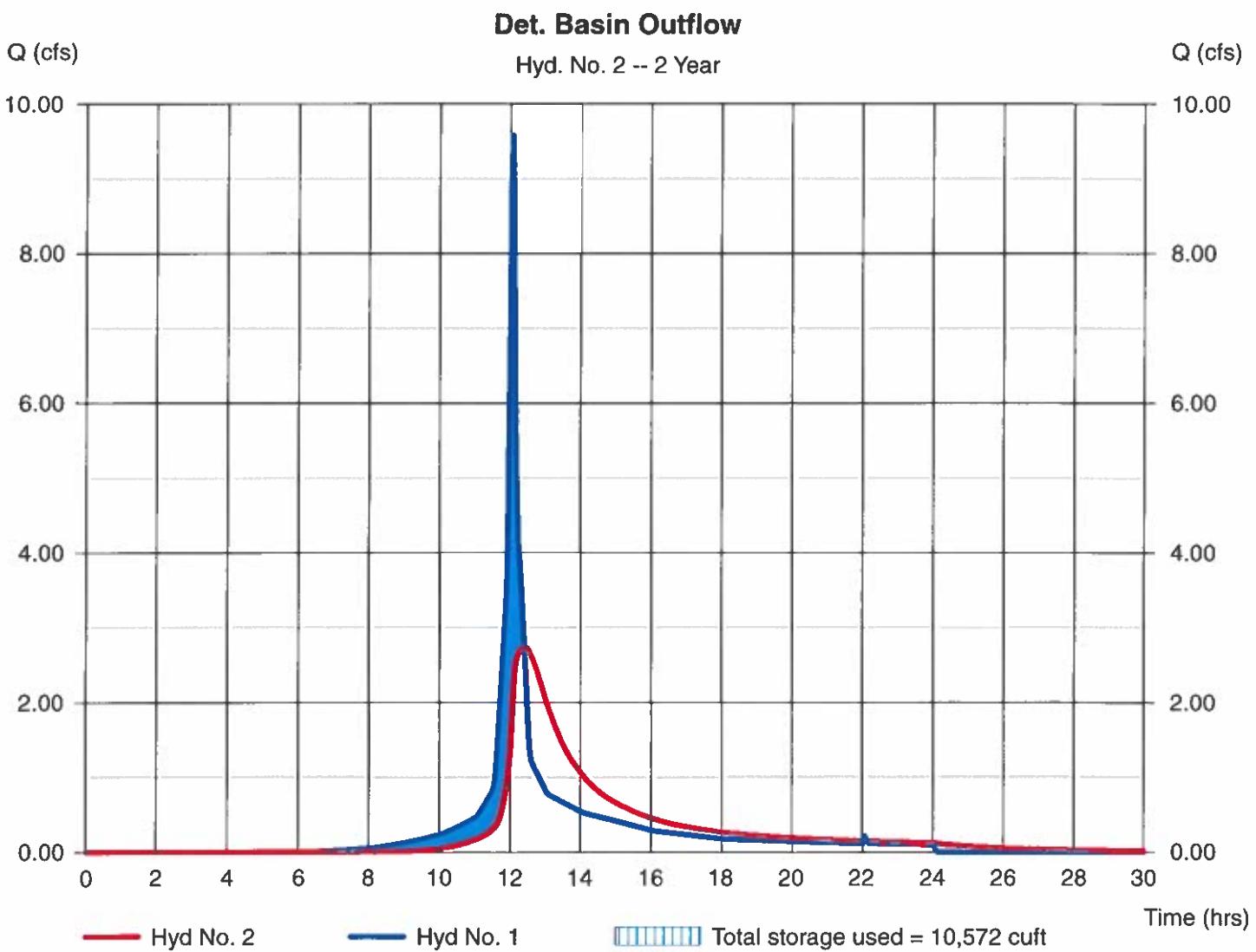
Hyd. No. 2

Det. Basin Outflow

Hydrograph type = Reservoir
 Storm frequency = 2 yrs
 Time interval = 2 min
 Inflow hyd. No. = 1 - Proposed Conditions
 Reservoir name = <New Pond>

Peak discharge = 2.744 cfs
 Time to peak = 12.40 hrs
 Hyd. volume = 28,872 cuft
 Max. Elevation = 117.03 ft
 Max. Storage = 10,572 cuft

Storage Indication method used.



Pond Report

5

Hydraflow Hydrographs by Intelisolve v9.1

Friday, Apr 11, 2025

Pond No. 1 - <New Pond>

Pond Data

Contours - User-defined contour areas. Conic method used for volume calculation. Beginning Elevation = 116.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	116.00	9,000	0	0
0.50	116.50	10,250	4,809	4,809
1.00	117.00	11,500	5,434	10,243
1.50	117.50	13,000	6,121	16,363
2.00	118.00	14,500	6,871	23,234
2.50	118.50	16,000	7,621	30,855
3.00	119.00	17,500	8,371	39,227

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 18.00	12.00	0.00	0.00
Span (in)	= 18.00	12.00	0.00	0.00
No. Barrels	= 1	1	0	0
Invert El. (ft)	= 115.00	116.00	0.00	0.00
Length (ft)	= 600.00	1.00	0.00	0.00
Slope (%)	= 0.67	1.00	0.00	n/a
N-Value	= .012	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	Yes	No	No

Weir Structures

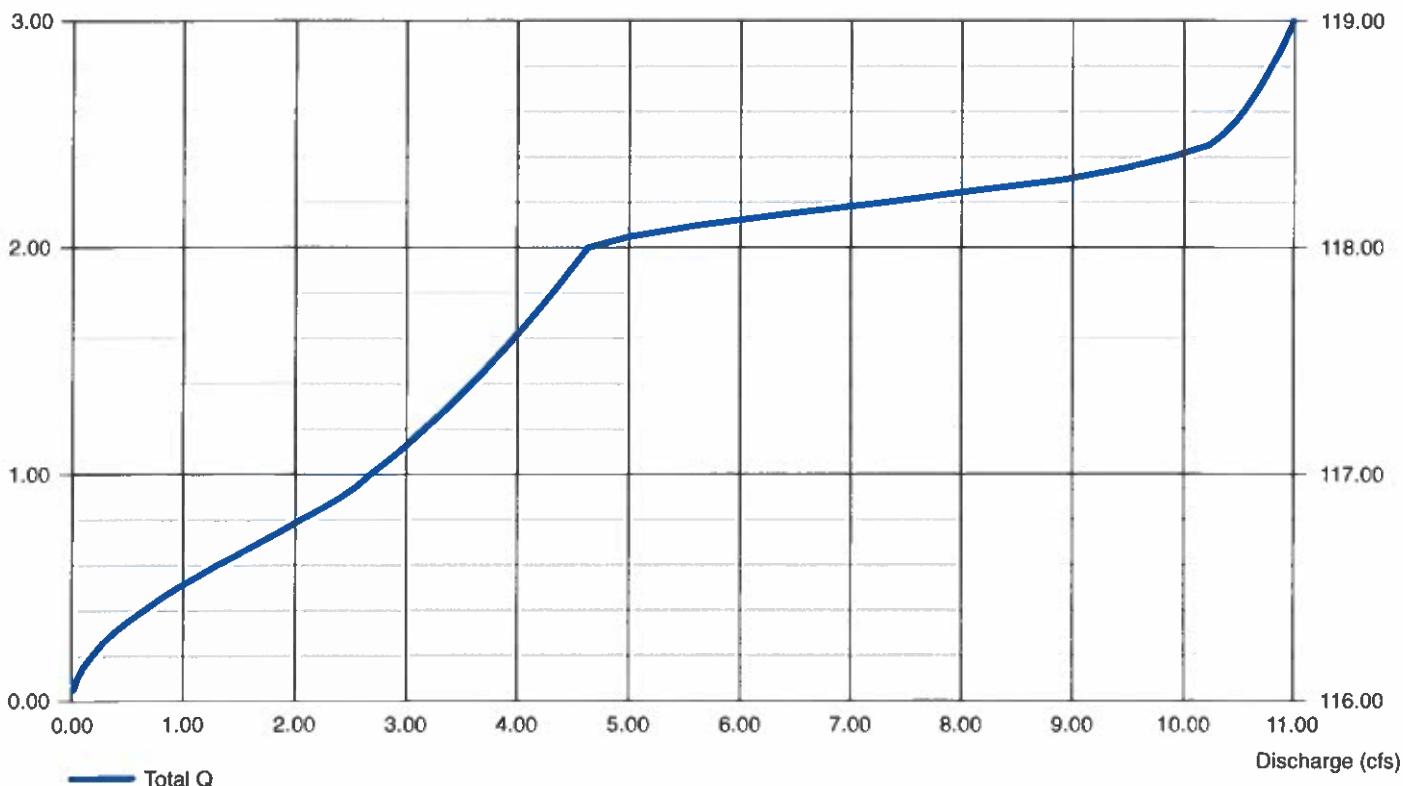
	[A]	[B]	[C]	[D]
Crest Len (ft)	= 8.00	0.00	0.00	0.00
Crest El. (ft)	= 118.00	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= Rect	---	---	---
Multi-Stage	= Yes	No	No	No
Exfil.(in/hr)	= 0.000 (by Contour)			
TW Elev. (ft)	= 0.00			

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

Stage (ft)

Stage / Discharge

Elev (ft)



Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.1

Friday, Apr 11, 2025

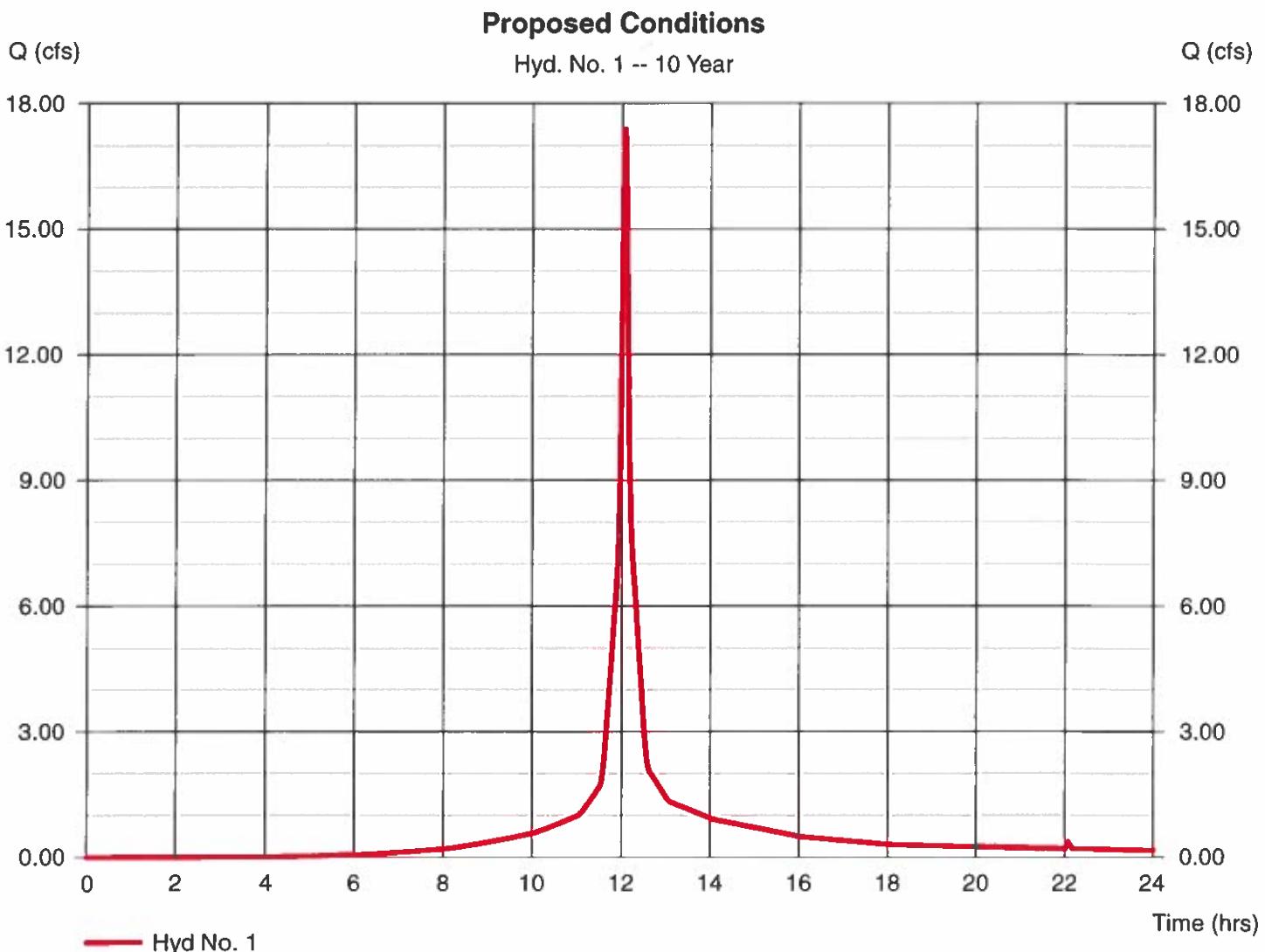
Hyd. No. 1

Proposed Conditions

Hydrograph type = SCS Runoff
 Storm frequency = 10 yrs
 Time interval = 2 min
 Drainage area = 3.600 ac
 Basin Slope = 0.0 %
 Tc method = USER
 Total precip. = 5.76 in
 Storm duration = 24 hrs

Peak discharge = 17.37 cfs
 Time to peak = 12.07 hrs
 Hyd. volume = 53,845 cuft
 Curve number = 88*
 Hydraulic length = 0 ft
 Time of conc. (Tc) = 5.00 min
 Distribution = Type III
 Shape factor = 484

* Composite (Area/CN) = $[(0.020 \times 98) + (2.430 \times 91) + (1.150 \times 80)] / 3.600$



Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.1

Friday, Apr 11, 2025

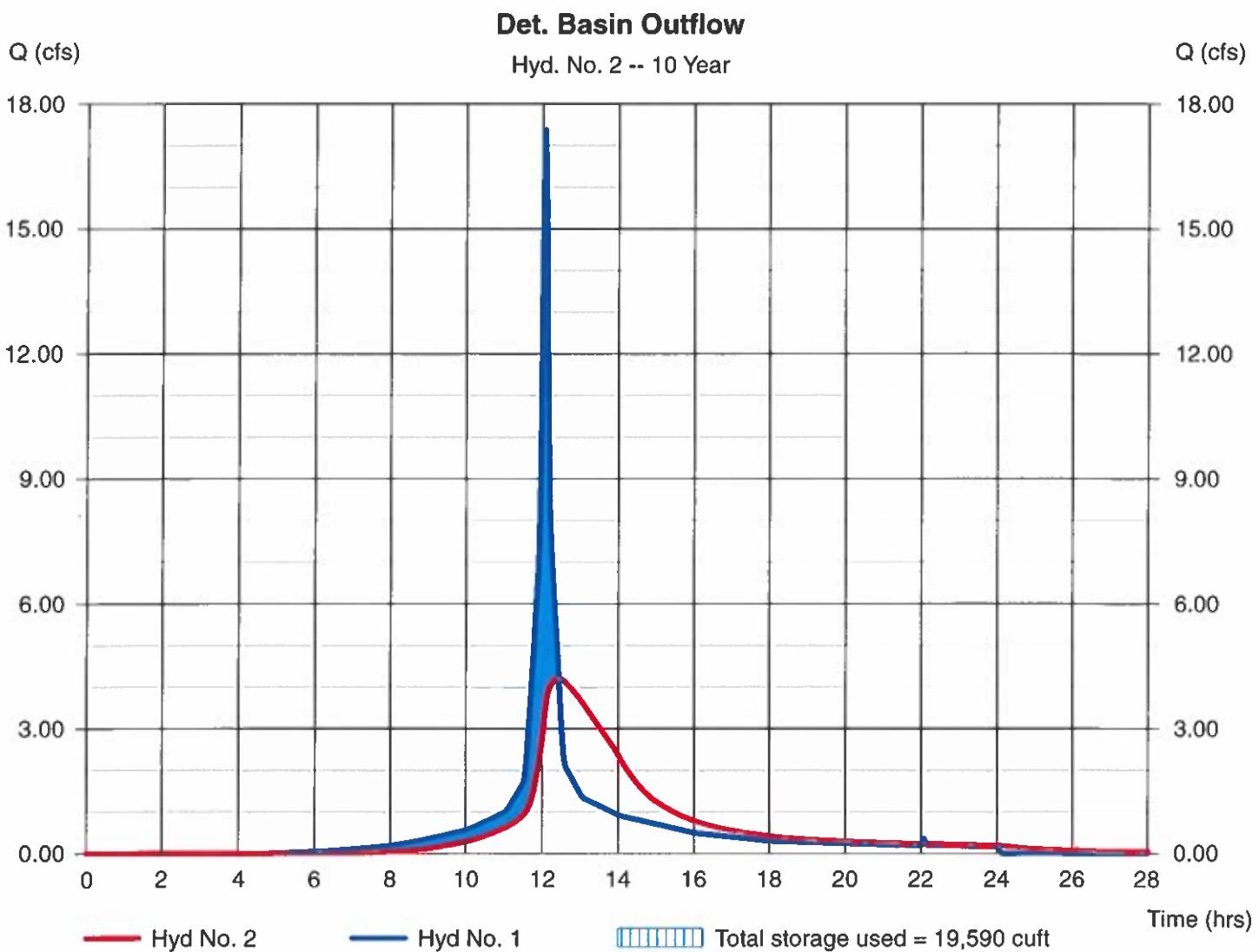
Hyd. No. 2

Det. Basin Outflow

Hydrograph type = Reservoir
 Storm frequency = 10 yrs
 Time interval = 2 min
 Inflow hyd. No. = 1 - Proposed Conditions
 Reservoir name = <New Pond>

Peak discharge = 4.202 cfs
 Time to peak = 12.43 hrs
 Hyd. volume = 53,803 cuft
 Max. Elevation = 117.73 ft
 Max. Storage = 19,590 cuft

Storage Indication method used.



Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.1

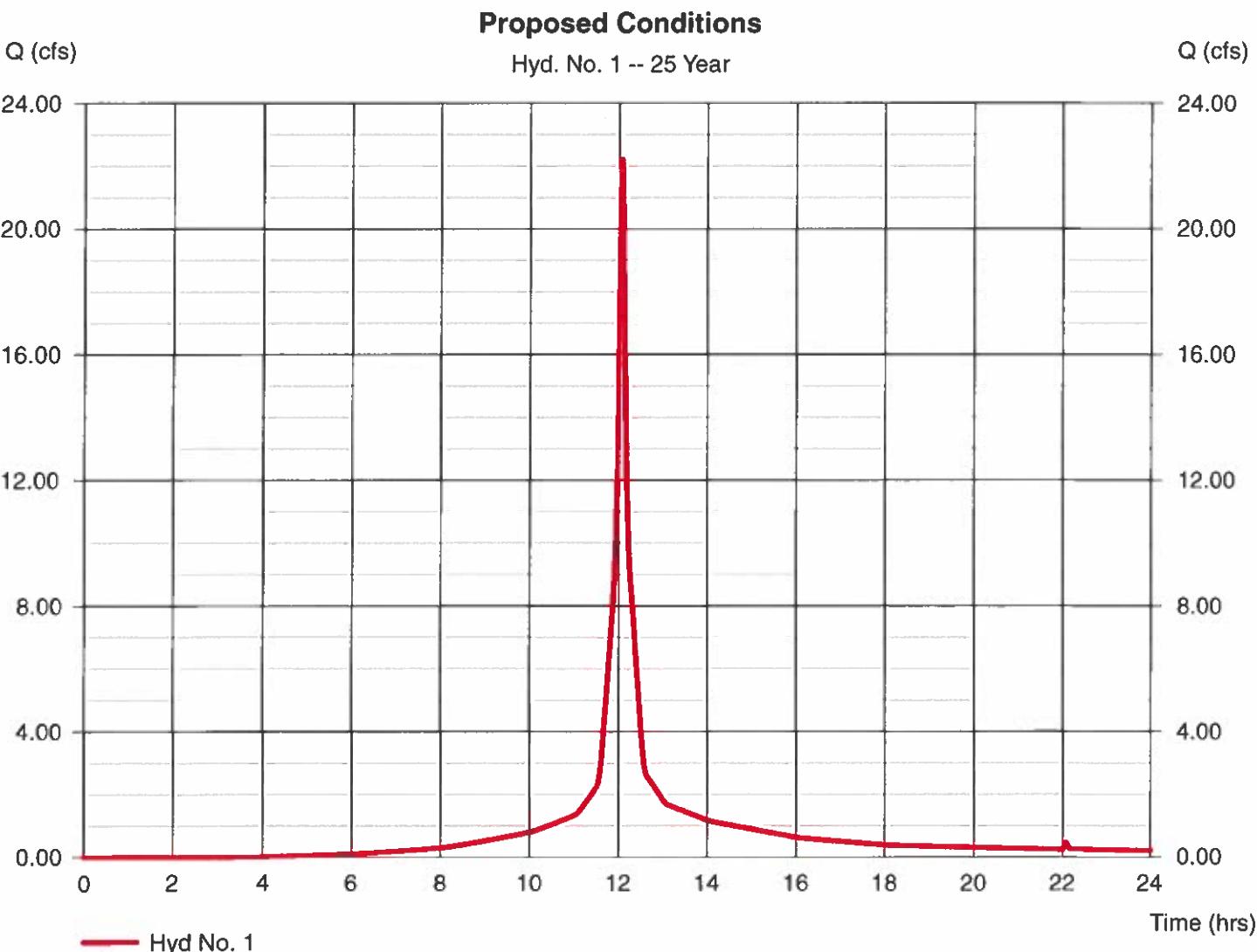
Friday, Apr 11, 2025

Hyd. No. 1

Proposed Conditions

Hydrograph type	= SCS Runoff	Peak discharge	= 22.21 cfs
Storm frequency	= 25 yrs	Time to peak	= 12.07 hrs
Time interval	= 2 min	Hyd. volume	= 69,837 cuft
Drainage area	= 3.600 ac	Curve number	= 88*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 5.00 min
Total precip.	= 7.11 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = $[(0.020 \times 98) + (2.430 \times 91) + (1.150 \times 80)] / 3.600$



Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.1

Friday, Apr 11, 2025

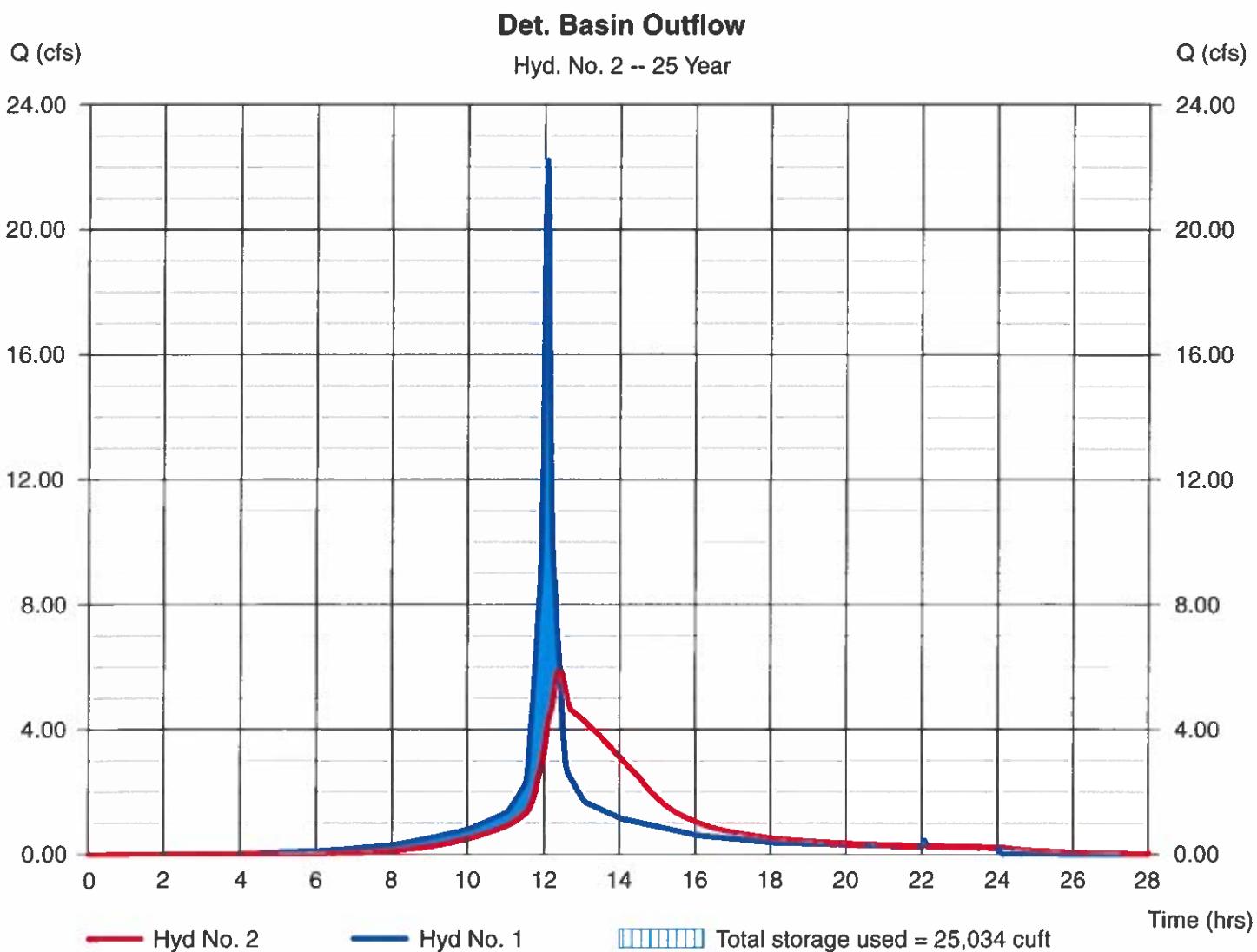
Hyd. No. 2

Det. Basin Outflow

Hydrograph type = Reservoir
 Storm frequency = 25 yrs
 Time interval = 2 min
 Inflow hyd. No. = 1 - Proposed Conditions
 Reservoir name = <New Pond>

Peak discharge	= 5,908 cfs
Time to peak	= 12.40 hrs
Hyd. volume	= 69,795 cuft
Max. Elevation	= 118.12 ft
Max. Storage	= 25,034 cuft

Storage Indication method used.



Hydrograph Report

Hydraflow Hydrographs by InteliSolve v9.1

Friday, Apr 11, 2025

Hyd. No. 1

Proposed Conditions

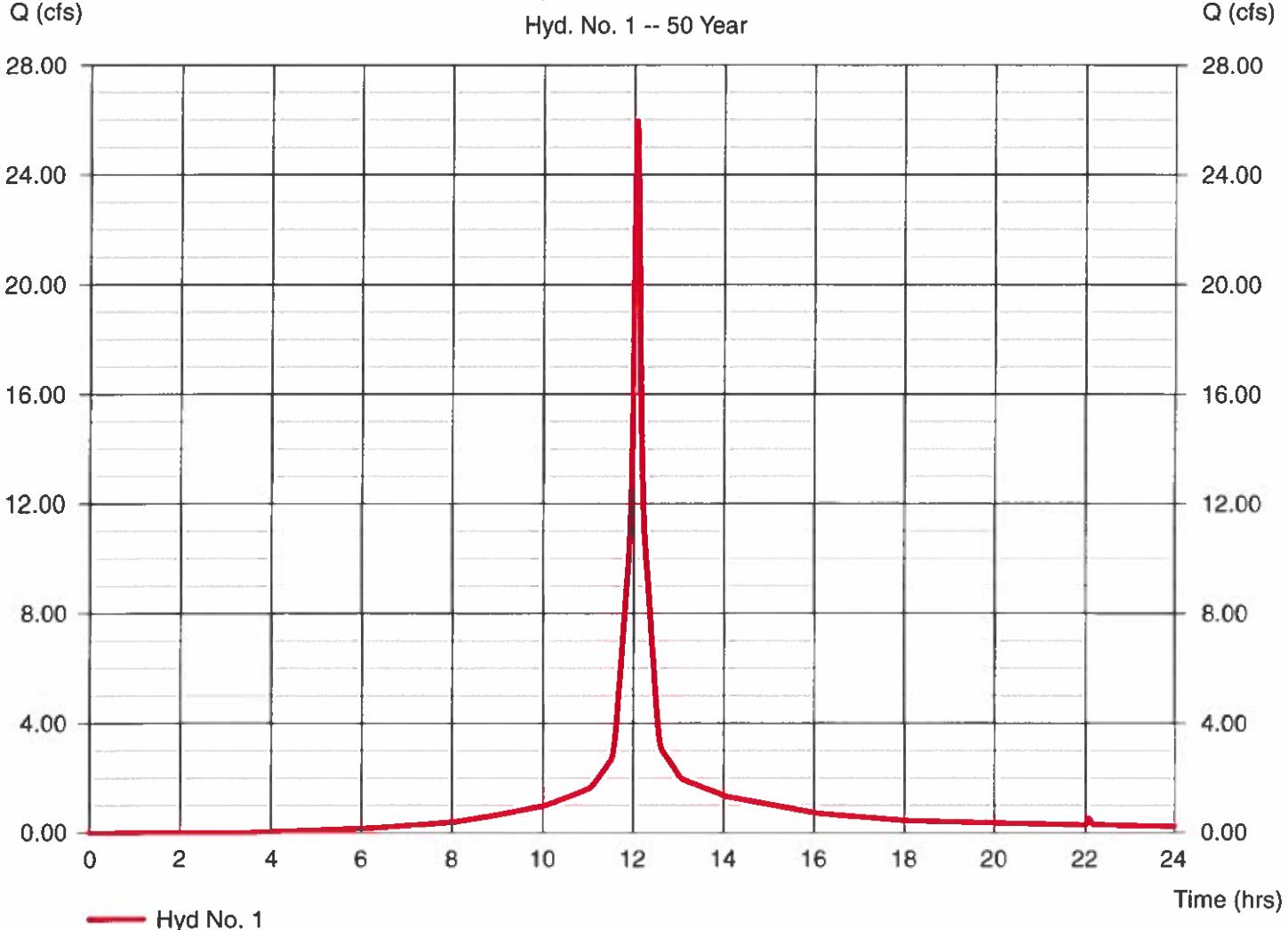
Hydrograph type = SCS Runoff
 Storm frequency = 50 yrs
 Time interval = 2 min
 Drainage area = 3.600 ac
 Basin Slope = 0.0 %
 Tc method = USER
 Total precip. = 8.16 in
 Storm duration = 24 hrs

Peak discharge = 25.95 cfs
 Time to peak = 12.07 hrs
 Hyd. volume = 82,385 cuft
 Curve number = 88*
 Hydraulic length = 0 ft
 Time of conc. (Tc) = 5.00 min
 Distribution = Type III
 Shape factor = 484

* Composite (Area/CN) = [(0.020 x 98) + (2.430 x 91) + (1.150 x 80)] / 3.600

Proposed Conditions

Hyd. No. 1 -- 50 Year



Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.1

Friday, Apr 11, 2025

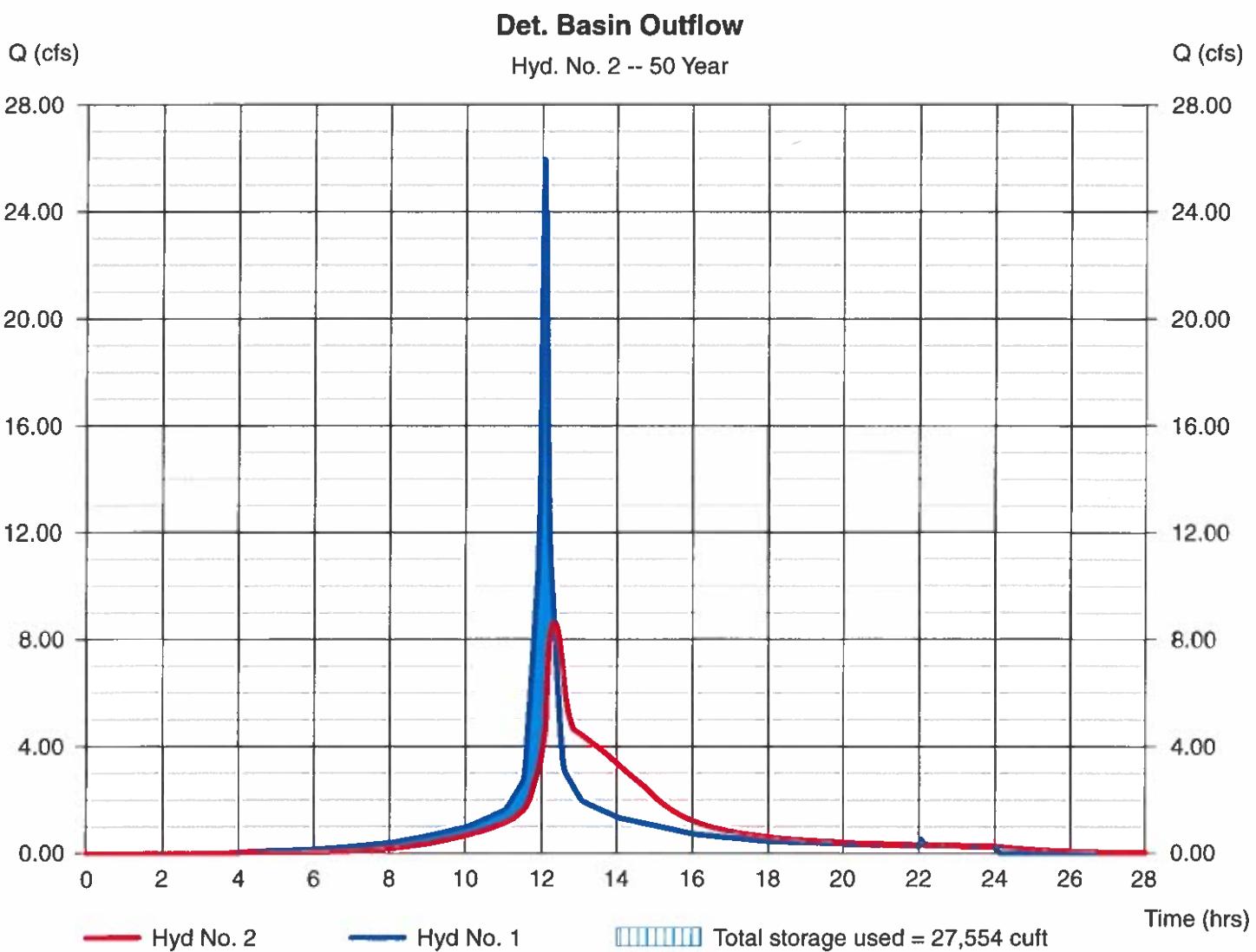
Hyd. No. 2

Det. Basin Outflow

Hydrograph type = Reservoir
 Storm frequency = 50 yrs
 Time interval = 2 min
 Inflow hyd. No. = 1 - Proposed Conditions
 Reservoir name = <New Pond>

Peak discharge = 8.655 cfs
 Time to peak = 12.33 hrs
 Hyd. volume = 82,344 cuft
 Max. Elevation = 118.28 ft
 Max. Storage = 27,554 cuft

Storage Indication method used.



Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.1

Friday, Apr 11, 2025

Hyd. No. 1

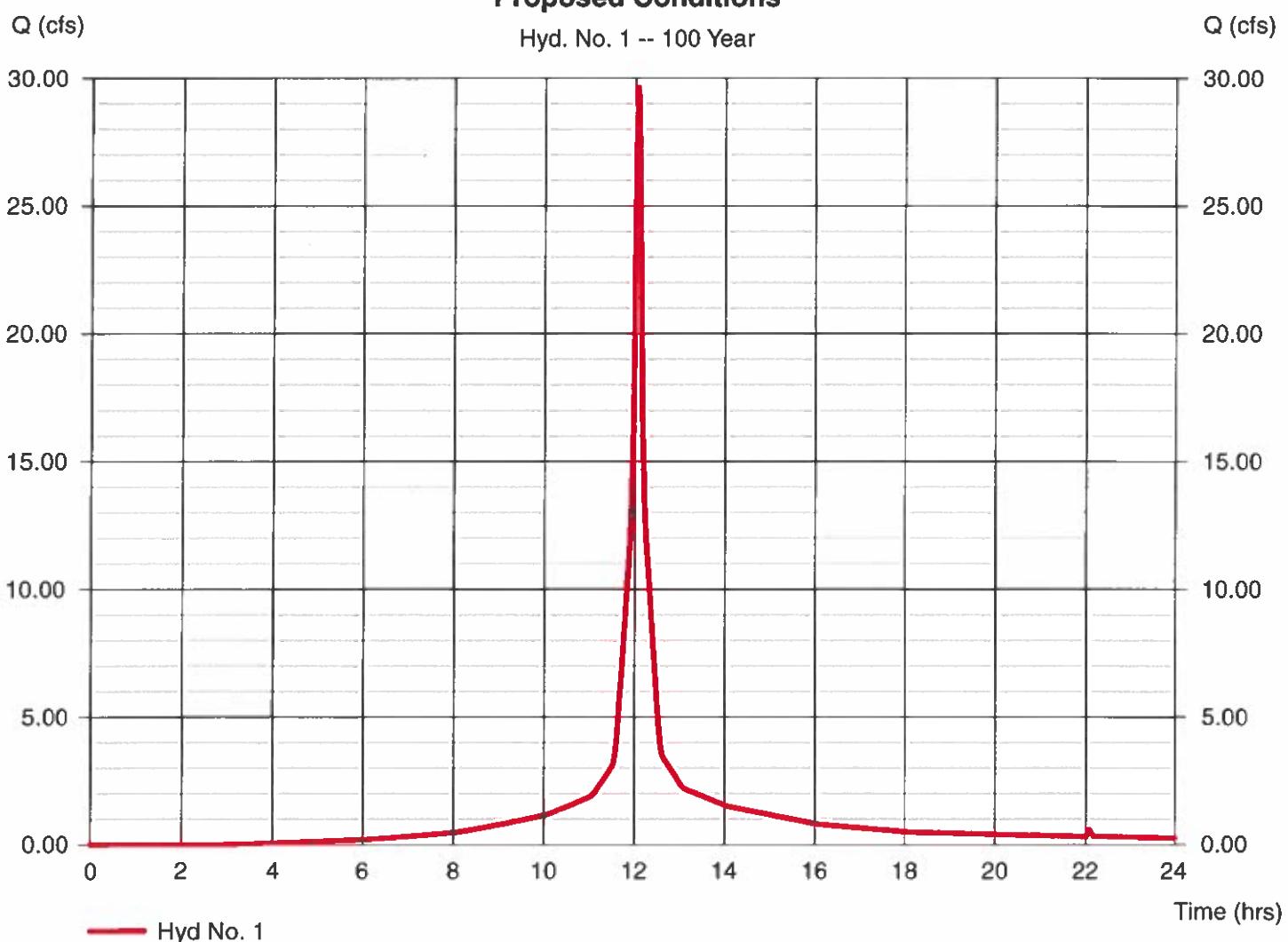
Proposed Conditions

Hydrograph type	= SCS Runoff	Peak discharge	= 29.63 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.07 hrs
Time interval	= 2 min	Hyd. volume	= 94,878 cuft
Drainage area	= 3.600 ac	Curve number	= 88*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 5.00 min
Total precip.	= 9.20 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.020 x 98) + (2.430 x 91) + (1.150 x 80)] / 3.600

Proposed Conditions

Hyd. No. 1 -- 100 Year



Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.1

Friday, Apr 11, 2025

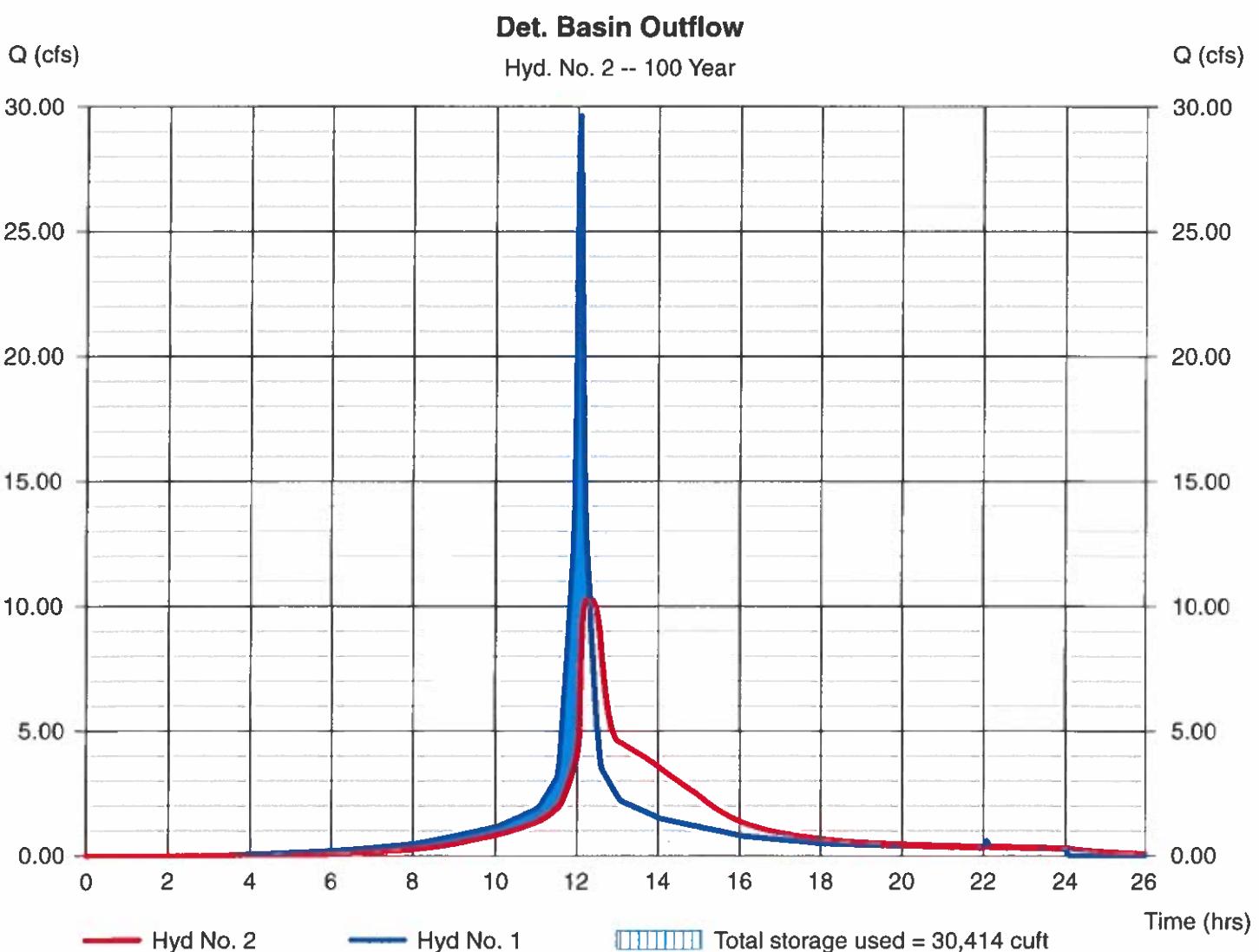
Hyd. No. 2

Det. Basin Outflow

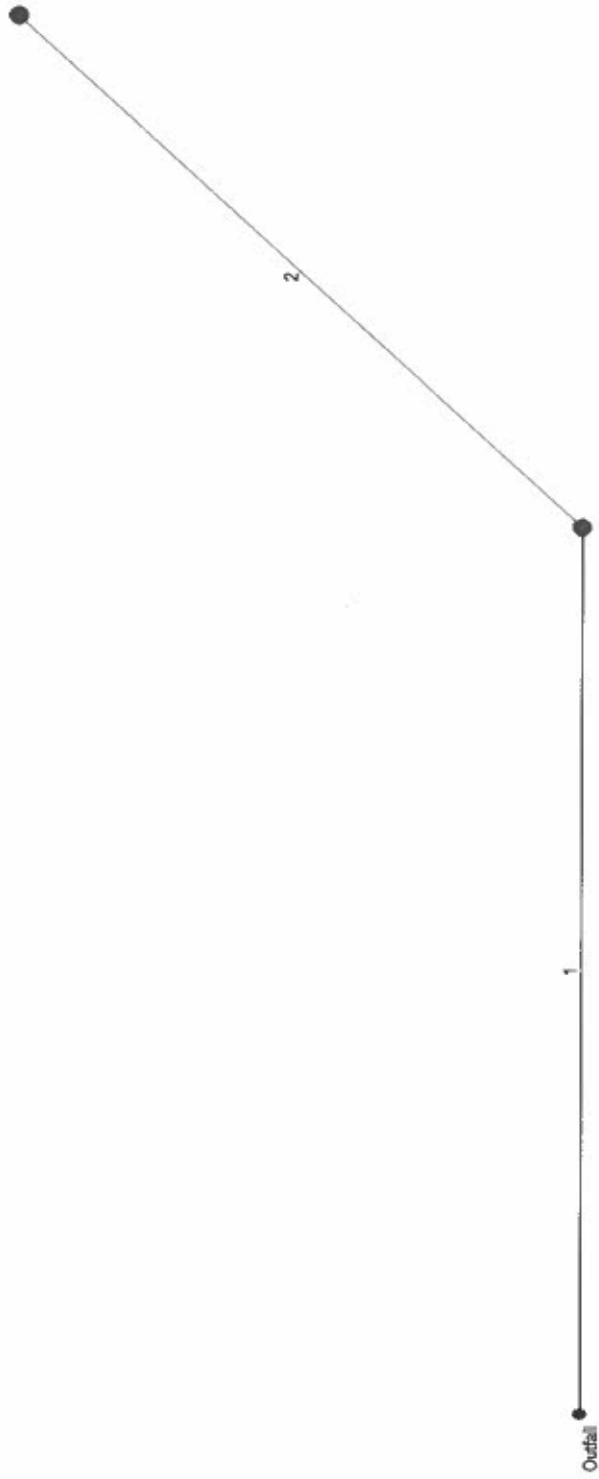
Hydrograph type = Reservoir
 Storm frequency = 100 yrs
 Time interval = 2 min
 Inflow hyd. No. = 1 - Proposed Conditions
 Reservoir name = <New Pond>

Peak discharge = 10.28 cfs
 Time to peak = 12.30 hrs
 Hyd. volume = 94,836 cuft
 Max. Elevation = 118.47 ft
 Max. Storage = 30,414 cuft

Storage Indication method used.



Hydraflow Plan View



Project File: New.stm

No. Lines: 2

04-11-2025

Storm Sewer Tabulation

Station	Len	Drng Area	Rnoff coeff	Area x C			Tc			Rain (I) (in/hr)	Total flow (cfs)	Cap full (ft)	Vel	Pipe	Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID		
				Incr	Total	(ac)	(ac)	(C)	Incr						Up	Dn	Up	Dn	Up	Dn			
1	End	325.0	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.8	0.0	10.30	10.18	6.56	18	0.80	113.60	111.00	114.85	112.25	116.00	115.00	Outlet
2	1	265.0	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	10.30	8.27	5.83	18	0.53	115.00	113.60	117.66	115.49	119.70	116.00	DB out

APPENDIX C: WATER QUALITY CALCULATIONS

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

Orlando Excavations, LLC
95 Rescue Lane, Bloomfield, CT

WATER QUALITY BASIN VOLUME CALCULATIONS-1.3"

VOLUME					
ELEV. (FT)	AREA (SF)	AVE. AREA (SF)	ΔZ (FT)	ΔV (CF)	ΣV (CF)
114.4	5,400	7,200	1.60	11,520	0
116.0	9,000				11,520
VOLUME PROVIDED					11,520

RUNOFF CURVE NUMBERS

	AREA DESCRIPTION	AREA (ACRE)	C	CA	
	PAVED/BLDG	0.02	98	2	
	LAWN/GRASS	1.15	80	92	
	GRAVEL	2.43	91	221	
	TOTAL	3.60	87.5	315	

WATERSHED AREA: 3.60 ACRES

WATER QUALITY VOLUME, WQV= $(1.3'')(R)(A)/12$ R=.05+.009(I)= 0.663
I = PERCENT IMPERVIOUS = 68.06 %
WQV= 1.3 0.663 3.60 / 12 =
VOLUME REQUIRED 0.26 AC-FT = 11,255 CF

VOLUME PROVIDED IN WATER QUALITY BASIN IS GREATER THAN REQUIRED WQV, THEREFORE OK

APPENDIX D: STORMWATER OPERATIONS & MAINTENANCE PLAN

Stormwater Operations & Maintenance Plan
Orlando Excavations
95 Rescue Lane
Bloomfield, CT

The applicant proposes to construct a 900 sf storage building and an outdoor material stockpile yard at their 95 Rescue Lane Bloomfield property. Minor grading and considerable land clearing is required for construction. The proposed drainage system is designed with detention basins to reduce post -development flows to pre-development levels for the 2-yr, 10-yr, 25-yr, 50-yr, and 100-year storms.

The detention basin is designed with dead storage to provide for the water quality volume. A Drainage Report is included with the project documents which details the drainage analysis and design. The proposed site grading will direct sheetflow runoff from the proposed stock yard area into a detention basin. The detention basin reduces the post-development flows to pre-development levels prior to being piped to on-site wetlands.

Silt fence will be installed at the toe of all grading fill slopes. A construction entrance is proposed to minimize the transport of sediment from the site during construction. A riprap is located at the drain pipe outlet to reduce the energy from the pipe discharge. Upon completion of grading and graveling operations all non-graveled areas disturbed during construction will be covered with topsoil, seeded and mulched to establish a durable grass surface. All erosion control measures will be maintained until a grass surface is established.

The plan implements the best management practices described below and on Site Plans and details.

A sediment and erosion plan is included on the project construction drawings which details measures necessary during construction. This Stormwater Operations & Maintenance Plan is prepared to address long term maintenance of the site facilities to enhance stormwater quality.

The following annual inspections and maintenance shall be performed. The inspection and maintenance shall be performed in the spring of each year. Additional inspections shall be made after any large rainfall event (three inches of rain or more within a 24 hour period). The Owner of the property shall be responsible for the implementation of this plan.

1. Clean gravel lot. Sweep lot of any accumulated sand from the winter maintenance operations.
2. The stone filter strip shall be inspected. Any missing stone shall be replaced. Any accumulated sand/debris shall be removed.
3. Inspect riprap. Inspect the riprap at the outlets, remove any debris and accumulated sediment. Any displaced or missing riprap shall be replaced.

4. Inspect the detention basin. Remove any accumulated debris; inspect for any bare soil areas and any dead or dying vegetation. Sediment shall be removed from the basin once there is approximately six inches of accumulated sediment in the bottom of the basin. Inspect the outlet structure and remove any accumulated debris or sediment. If any of the concrete is spalled or damaged it shall be repaired.
5. Clear vegetative growth in basins and swales.

Routine site maintenance shall be performed as follows to limit pollutant loads into the stormwater system.

1. Daily debris and litter removal from the site will eliminate entry into the stormwater system.
2. During winter snow removal and deicing operations the use of salts shall be minimized, and used only in icy locations.

APPENDIX E: WATERSHED MAP