STORMWATER MANAGEMENT REPORT
FOR
20 WEST TRANSPORT PARTNERS, LLC

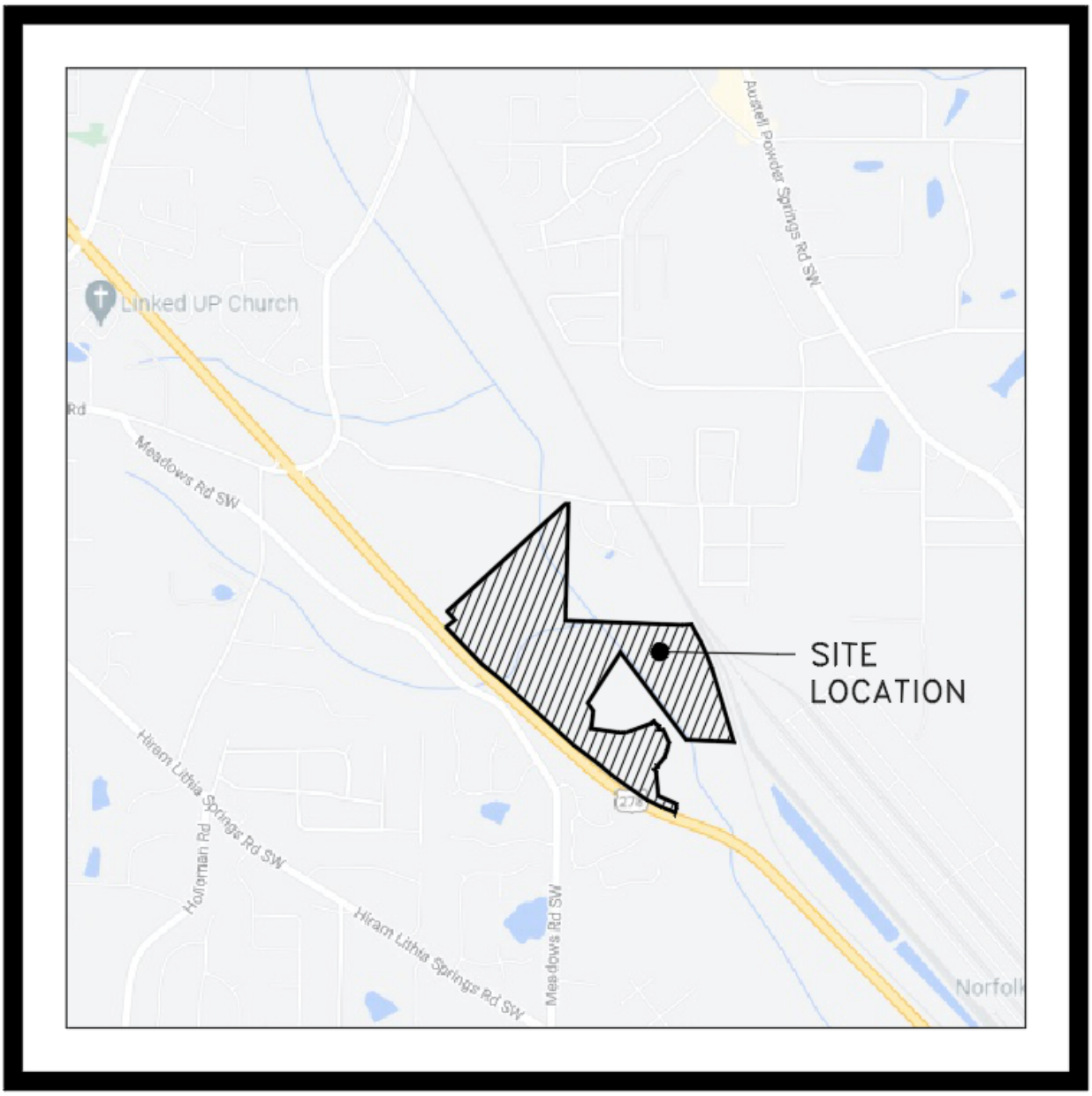
LOCATED:
THE CITY POWDER SPRINGS,
COBB COUNTY, GEORGIA

OWNER/ DEVELOPER:
20 WEST TRANSPOT PARTNERS, LLC
ATTN: MARK HAWKS
910 DAVIS BEND
ALPHARETTA, GEORGIA 30004

PREPARED BY:
THE SOUTHEAST CIVIL GROUP, LLC.
8665 BALDWIN PARKWAY
DOUGLASVILLE, GEORGIA 30134

DATE: FEBRUARY 6, 2023

The Southeast Civil Group, LLC



SITE LOCATION MAP
CITY OF POWDER SPRINGS,
COBB COUNTY, GEORGIA
SCALE: 1"=2000'

Introduction

This report is in regards to site improvements for 20 West Transport Partners, LLC. Proposed improvements include pervious surface truck storage, pervious entrance and drives, storm sewer networks, and four on-site stormwater management facilities. The subject site is located at the dead end of Burrow Trail, Parcel # 19112600010 and 19109600010. The site lies within Land Lots 1096, 1125, 1126, 1127, and 1169, District 19, Section 2 of The City of Powder Springs, Cobb County Georgia. The GPS location is 33.837400º N, -84.680866º W.

This study examines the post developed site hydrology for the 1-, 2-, 5-, 10-, 25-, 50-, and 100-year 24-hour rainfall events (using current Powder Springs rainfall intensity obtained from The National Oceanic and Atmospheric Administration, see Appendix B – Rainfall Data) using the SCS method. The study shows that through the use of four on-site micropool extended detention ponds, water quality and channel protection volumes are met for the entire site (see Appendix E – Water Quality Design). Georgia Stormwater Management Manual's Stormwater Quality Site Development Review Tool is included within this report as well, and shows the site achieves water quality requirements through the use of these BMP's. "Hydraflow Hydrographs Extension for AutoCad Civil 3D 2023" is the analysis software used for this study.

Stormwater detention for the site is proposed to be waived due to the relatively small proportion of the on-site basins when compared to the overall basin of Powder Springs Creek at the location the site runoff converges with Powder Springs Creek. Timing of peak flows from the site were found to be well in advance of the peak flows for the Powder Springs Creek basin; thus, resulting in no increase in peak flow at the study point. The studied on-site basins contain a total of 37.11 acres, which is approximately 0.23% of the 25.40 square mile Powder Springs Creek basin at the study point. See Appendix D – Waiving Detention Study for further information and supporting documentation.

Hydrologic Methodology

Peak Flows for the Powder Springs Creek basin 10-, 50-, and 100-yr rainfall event as well as the drainage area for the basin were obtained from FEMA's Flood Insurance Study, latest edition (see Appendix D for results). Once a Lag Time was calculated, a manual hydrograph was created with corresponding flows and time intervals using the USGS method as outlined in the GSWMM. Hydrographs for the post-developed site were created in a similar fashion; obtaining peak flows and drainage areas by reaching all on-site studied basins to the selected study point. The hydrograph for the Powder Springs Creek basin was added to Post-Developed Site Hydrograph. See Appendix D for calculations and supporting figures.

Pre-Developed Site

The subject property contains approximately 93.42 acres. The majority of the site will remain undisturbed for this project. The site in its current condition is partially developed, containing approximately 15.3 acres of gravel truck storage. The remainder of the site consists of wetland

areas and woodlands with good cover. The northern portion of the site primarily drains as sheet flow into the wetland areas which eventually drains into Powder Springs Creek. Only a small portion from the north of the site drains as channel flow into an unnamed tributary of Powder Springs Creek, which flows directly through the middle of the property. The southern portion of the site primarily drains as sheet flow into the wetland areas which eventually drain into Powder Springs Creek.

Post-Developed Site

The post-developed hydrological analysis includes five basins. Proposed Basin 1 is reached to the study point at Powder Springs Creek. Proposed Basin 2 is routed through the proposed micropool extended detention pond 2, then reached to the study point at Powder Springs Creek. Proposed Basin 3 is routed through the proposed micropool extended detention pond 3, then reached to the study point at Powder Springs Creek. Proposed Basin 4 is routed through the proposed micropool extended detention pond 4, then reached to the study point at Powder Springs Creek. Proposed Basin 5 is routed through the proposed micropool extended detention pond 5, then reached to the study point in Powder Springs Creek. Proposed Basin 1 is 3.05 acres and is estimated to have a composite curve number of 85 with a time of concentration of 5 minutes. Proposed Basin 2 is 6.35 acres and is estimated to have a composite curve number of 81, with a time of concentration of 5 minutes. Proposed Basin 3 is 11.48 acres and is estimated to have a composite curve number of 76, with a time of concentration of 5 minutes. Proposed Basin 4 is 6.71 acres and is estimated to have a composite curve number of 72, with a time of concentration of 5 minutes. Proposed Basin 5 is 9.52 acres and is estimated to have a composite curve number of 72, with a time of concentration of 5 minutes. (See Appendix C – Hydrology Results for further information and calculations).

Results

The results of this study show that stormwater detention can be waived without increasing peak flows at the chosen study point in Powder Springs Creek. Peak flows from the site occur far enough in advance of the peak flows for the Powder Springs Creek basin that the overall peak flows and high water elevations for Powder Springs Creek are not increased (See Table 1 below). Figures 1-3 in Appendix D show that the peak flows from the site occur during the ascending limb of the Powder Springs Creek Hydrograph. Should detention be provided for the site, it could actually extend the timing of the peak flows from the site such that overall peak flows at the chosen study point are increased. Water quality and channel protection requirements are met for the overall development. See Appendix E – Water Quality Design for further information and calculations. Water surface elevations in the proposed micropool extended detention ponds for all storm events analyzed are shown in Tables 2-5 below. All micropool extended detention ponds have been analyzed under a “clogged condition” as well. This analysis assumes the principal spillway is clogged and the emergency spillway is the only means of drainage through the pond. The results of this analysis prove that under a “clogged condition” the emergency spillway is sufficiently sized to convey the 100-year flows without overtopping of the dam. See Appendix F for details of the stormwater management facilities and clogged condition results.

Table 1 – Peak Flows

HYDROLOGY SUMMARY			
HYDROGRAPH DESCRIPTION	PEAK FLOW (CFS)		
	10-YR	50-YR	100-YR
POWDER SPRINGS CREEK BASIN	3628.29	5655.77	6193.37
POWDER SPGS & POST DEVELOPED	3628.29	5655.77	6193.37

Table 2 – Maximum Water Surface Elevation

HYDROLOGY SUMMARY							
HYDROGRAPH DESCRIPTION	MAX WATER SURFACE ELEVATION (FT)						
	1-YR	2-YR	5-YR	10-YR	25-YR	50-YR	100-YR
PROPOSED MICROPOOL EXTEDED DETENTION POND 2	891.51	891.82	892.14	892.36	892.59	891.72	892.82

Table 3 – Maximum Water Surface Elevation

HYDROLOGY SUMMARY							
HYDROGRAPH DESCRIPTION	MAX WATER SURFACE ELEVATION (FT)						
	1-YR	2-YR	5-YR	10-YR	25-YR	50-YR	100-YR
PROPOSED MICROPOOL EXTEDED DETENTION POND 3	893.54	893.83	894.08	894.20	894.34	894.44	894.54

Table 4 – Maximum Water Surface Elevation

HYDROLOGY SUMMARY							
HYDROGRAPH DESCRIPTION	MAX WATER SURFACE ELEVATION (FT)						
	1-YR	2-YR	5-YR	10-YR	25-YR	50-YR	100-YR
PROPOSED MICROPOOL EXTEDED DETENTION POND 4	896.06	896.40	896.86	897.11	897.54	897.96	898.21

Table 5 – Maximum Water Surface Elevation

HYDROLOGY SUMMARY							
HYDROGRAPH DESCRIPTION	MAX WATER SURFACE ELEVATION (FT)						
	1-YR	2-YR	5-YR	10-YR	25-YR	50-YR	100-YR
PROPOSED MICROPOOL EXTEDED DETENTION POND 5	894.64	894.87	895.33	895.84	896.29	896.47	896.60

It is my professional opinion that this development will not adversely impact downstream properties, provided that the proposed stormwater management facilities are properly installed and maintained.

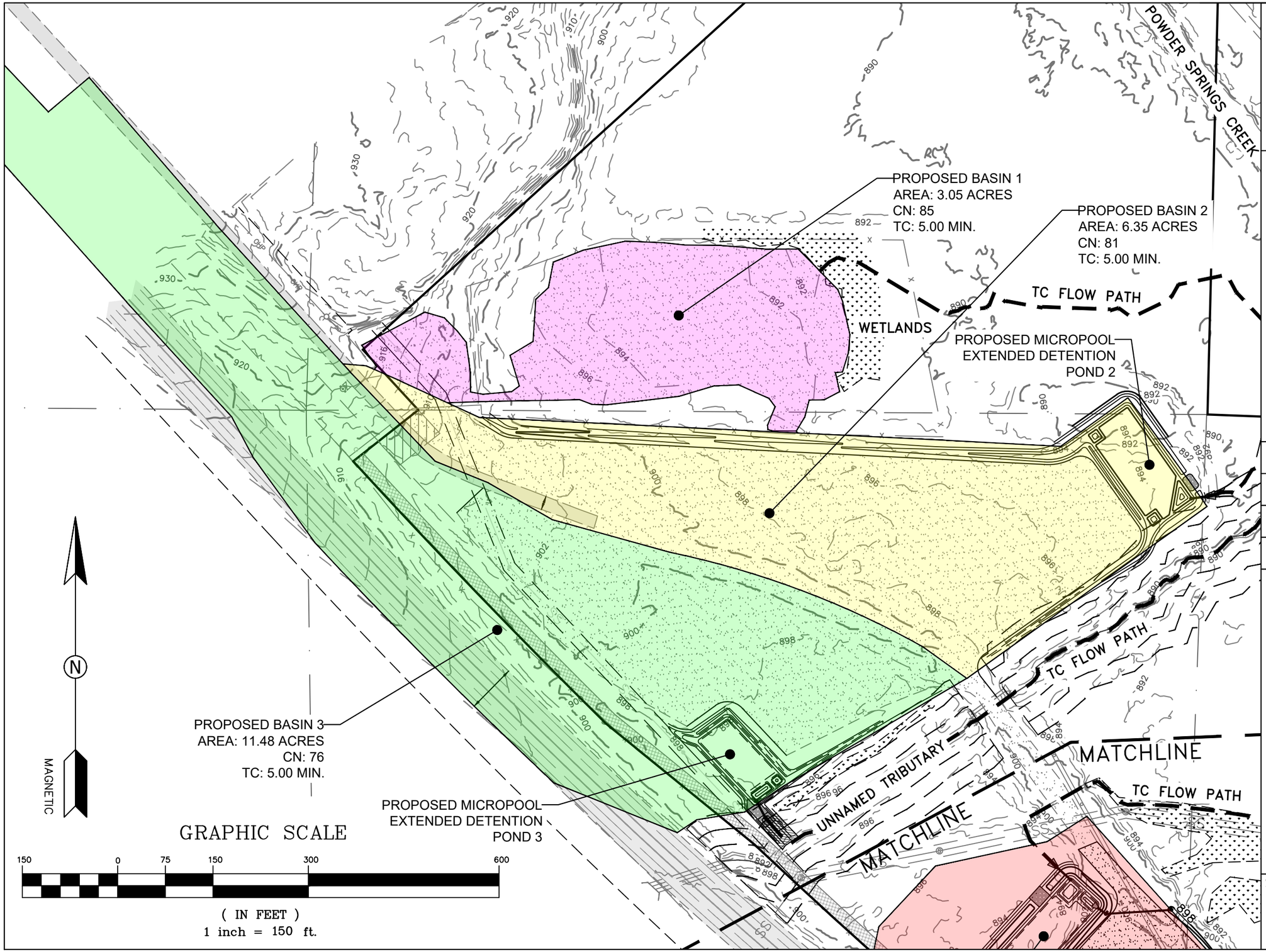
Flood Plain Encroachment

The majority of the subject site is located within mapped FEMA flood plain. A portion of the proposed improvements associated with this project occur within the flood plain. The intent of these improvements are to bring a currently functioning site into stormwater management compliance. Cuts and fills for the project have been analyzed to ensure no flood storage is lost as a result of the proposed project. A no-rise study was prepared to ensure no adverse impacts to adjacent properties. See Appendix H for calculations and supporting documentation.

Appendix Summary

Appendix A – Drainage Basin Maps
Appendix B – Rainfall Data
Appendix C – Hydrology Results
Appendix D – Waiving Detention Study
Appendix E – Water Quality Design
Appendix F – BMP Data
Appendix G – Storm Sewer Design
Appendix H – No-Rise Report
Appendix I – Operation & Maintenance

Appendix A – Drainage Basin Maps



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JOB #: 220702

SCALE: 1"=150'

DATE: 02/06/2023

DRAWN BY: MGF

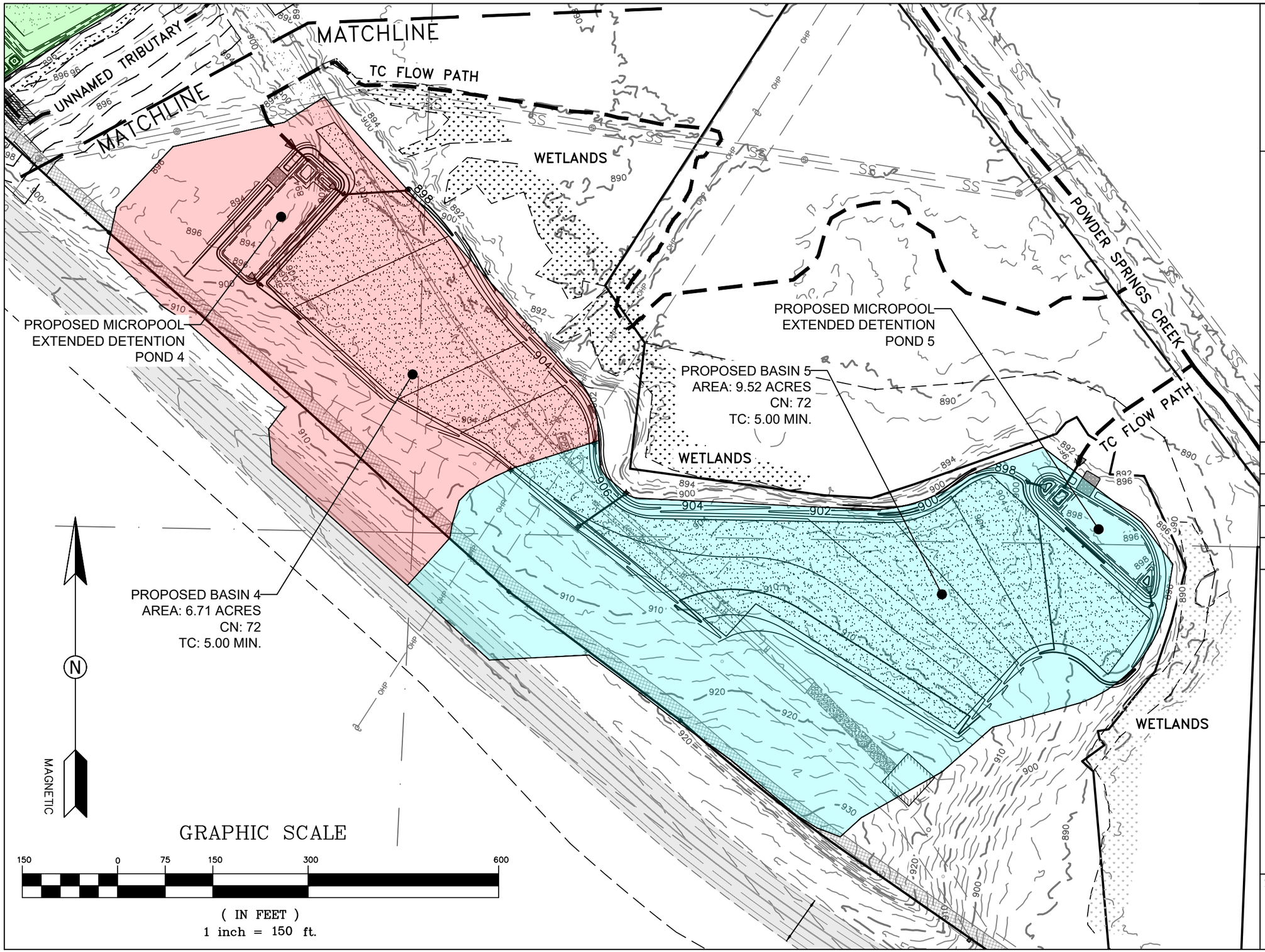
POST DEVELOPMENT DRAINAGE BASIN MAP

20 WEST TRANSPORT PARTNERS, LLC

LOCATED IN LL 1096, 1125, 1126, 1127, 1169, DISTRICT 19, SECTION 2
CITY OF POWDER SPRINGS,
COBB COUNTY, GEORGIA

SHEET:

SHEET 1 of 2



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POST DEVELOPMENT DRAINAGE BASIN MAP

20 WEST TRANSPORT PARTNERS, LLC

LOCATED IN LL 1096, 1125, 1126, 1127, 1169, DISTRICT 19, SECTION 2 CITY OF POWDER SPRINGS, COBB COUNTY, GEORGIA

SHEET:

SHEET 2 of 2

Appendix B – Rainfall Data

NOAA Atlas 14, Volume 9, Version 2
Location name: Powder Springs, Georgia, USA*
Latitude: 33.8596°, Longitude: -84.6852°
Elevation: 923.04 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Deborah Martin, Sandra Pavlovic, Ishani Roy, Michael St. Laurent, Carl Trypaluk, Dale Unruh, Michael Yekta, Geoffery Bonnin

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

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

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	**0.402** (0.330-0.490)	**0.462** (0.378-0.562)	**0.564** (0.461-0.688)	**0.655** (0.531-0.801)	**0.786** (0.620-0.990)	**0.893** (0.687-1.13)	**1.01** (0.747-1.30)	**1.13** (0.801-1.48)	**1.29** (0.883-1.73)	**1.42** (0.946-1.92)
10-min	**0.589** (0.483-0.717)	**0.676** (0.554-0.823)	**0.826** (0.675-1.01)	**0.958** (0.778-1.17)	**1.15** (0.908-1.45)	**1.31** (1.01-1.66)	**1.47** (1.09-1.90)	**1.65** (1.17-2.17)	**1.89** (1.29-2.53)	**2.08** (1.39-2.81)
15-min	**0.719** (0.589-0.875)	**0.825** (0.676-1.00)	**1.01** (0.823-1.23)	**1.17** (0.949-1.43)	**1.40** (1.11-1.77)	**1.60** (1.23-2.03)	**1.80** (1.33-2.32)	**2.01** (1.43-2.64)	**2.31** (1.58-3.09)	**2.54** (1.69-3.42)
30-min	**1.03** (0.848-1.26)	**1.19** (0.972-1.44)	**1.45** (1.18-1.77)	**1.68** (1.37-2.06)	**2.02** (1.59-2.54)	**2.30** (1.77-2.91)	**2.58** (1.92-3.33)	**2.89** (2.06-3.80)	**3.31** (2.27-4.44)	**3.65** (2.43-4.92)
60-min	**1.35** (1.11-1.64)	**1.55** (1.26-1.88)	**1.89** (1.54-2.30)	**2.19** (1.78-2.68)	**2.63** (2.07-3.31)	**2.99** (2.30-3.80)	**3.37** (2.50-4.35)	**3.78** (2.69-4.96)	**4.34** (2.97-5.81)	**4.79** (3.18-6.46)
2-hr	**1.66** (1.38-2.00)	**1.90** (1.57-2.30)	**2.32** (1.91-2.81)	**2.69** (2.21-3.26)	**3.24** (2.58-4.05)	**3.69** (2.87-4.64)	**4.16** (3.13-5.32)	**4.66** (3.37-6.07)	**5.37** (3.73-7.12)	**5.93** (4.00-7.91)
3-hr	**1.87** (1.56-2.25)	**2.14** (1.78-2.57)	**2.60** (2.15-3.13)	**3.01** (2.48-3.63)	**3.62** (2.90-4.49)	**4.12** (3.22-5.15)	**4.64** (3.52-5.90)	**5.20** (3.79-6.73)	**5.99** (4.20-7.90)	**6.62** (4.51-8.77)
6-hr	**2.31** (1.94-2.75)	**2.62** (2.20-3.12)	**3.16** (2.64-3.76)	**3.64** (3.03-4.34)	**4.34** (3.52-5.34)	**4.92** (3.90-6.09)	**5.53** (4.24-6.95)	**6.17** (4.56-7.90)	**7.08** (5.04-9.23)	**7.80** (5.40-10.2)
12-hr	**2.87** (2.43-3.37)	**3.24** (2.74-3.81)	**3.87** (3.26-4.56)	**4.42** (3.71-5.22)	**5.22** (4.27-6.33)	**5.86** (4.69-7.17)	**6.54** (5.07-8.13)	**7.25** (5.42-9.17)	**8.23** (5.94-10.6)	**9.01** (6.34-11.7)
24-hr	**3.43** (2.93-4.00)	**3.91** (3.34-4.56)	**4.71** (4.01-5.50)	**5.38** (4.56-6.30)	**6.32** (5.21-7.57)	**7.07** (5.71-8.52)	**7.82** (6.13-9.58)	**8.59** (6.50-10.7)	**9.64** (7.05-12.2)	**10.4** (7.47-13.4)
2-day	**3.96** (3.41-4.56)	**4.57** (3.94-5.27)	**5.57** (4.78-6.43)	**6.39** (5.47-7.41)	**7.53** (6.26-8.90)	**8.41** (6.86-10.0)	**9.29** (7.37-11.2)	**10.2** (7.80-12.5)	**11.3** (8.42-14.2)	**12.2** (8.89-15.5)
3-day	**4.33** (3.75-4.96)	**4.93** (4.27-5.66)	**5.94** (5.14-6.83)	**6.80** (5.85-7.84)	**8.02** (6.73-9.45)	**8.98** (7.39-10.7)	**9.95** (7.97-12.0)	**11.0** (8.50-13.5)	**12.3** (9.26-15.4)	**13.4** (9.84-16.9)
4-day	**4.64** (4.04-5.30)	**5.24** (4.56-5.99)	**6.26** (5.43-7.16)	**7.14** (6.17-8.19)	**8.41** (7.11-9.90)	**9.45** (7.83-11.2)	**10.5** (8.49-12.7)	**11.6** (9.10-14.3)	**13.2** (9.99-16.5)	**14.4** (10.7-18.1)
7-day	**5.46** (4.79-6.19)	**6.11** (5.36-6.92)	**7.24** (6.33-8.22)	**8.25** (7.18-9.39)	**9.74** (8.32-11.4)	**11.0** (9.19-12.9)	**12.3** (10.0-14.7)	**13.6** (10.8-16.6)	**15.6** (12.0-19.3)	**17.1** (12.8-21.3)
10-day	**6.17** (5.45-6.96)	**6.89** (6.07-7.77)	**8.14** (7.15-9.19)	**9.25** (8.09-10.5)	**10.9** (9.37-12.7)	**12.2** (10.3-14.4)	**13.7** (11.3-16.3)	**15.2** (12.1-18.4)	**17.4** (13.4-21.4)	**19.1** (14.4-23.6)
20-day	**8.26** (7.36-9.22)	**9.13** (8.13-10.2)	**10.6** (9.44-11.9)	**11.9** (10.6-13.4)	**13.9** (12.0-15.9)	**15.4** (13.1-17.8)	**17.0** (14.2-20.0)	**18.7** (15.2-22.4)	**21.1** (16.6-25.6)	**23.0** (17.7-28.1)
30-day	**10.1** (9.07-11.2)	**11.2** (9.99-12.4)	**12.9** (11.5-14.3)	**14.4** (12.8-16.0)	**16.5** (14.3-18.7)	**18.1** (15.5-20.7)	**19.8** (16.6-23.0)	**21.5** (17.5-25.5)	**23.9** (18.9-28.7)	**25.7** (20.0-31.2)
45-day	**12.7** (11.4-14.0)	**14.0** (12.6-15.4)	**16.0** (14.4-17.7)	**17.8** (15.9-19.7)	**20.1** (17.5-22.6)	**21.8** (18.8-24.7)	**23.5** (19.8-27.1)	**25.2** (20.7-29.5)	**27.4** (21.9-32.7)	**29.1** (22.9-35.1)
60-day	**14.9** (13.5-16.4)	**16.5** (14.9-18.1)	**18.9** (17.1-20.8)	**20.9** (18.8-23.0)	**23.4** (20.5-26.1)	**25.2** (21.8-28.4)	**26.9** (22.8-30.8)	**28.6** (23.5-33.2)	**30.6** (24.6-36.2)	**32.0** (25.4-38.5)

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

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

Please refer to NOAA Atlas 14 document for more information.

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PF graphical

NOAA Atlas 14, Volume 9, Version 2
Location name: Powder Springs, Georgia, USA*
Latitude: 33.8596°, Longitude: -84.6852°
Elevation: 923.04 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Deborah Martin, Sandra Pavlovic, Ishani Roy, Michael St. Laurent, Carl Trypaluk, Dale Unruh, Michael Yekta, Geoffery Bonnin

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

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

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	**4.82** (3.96-5.88)	**5.54** (4.54-6.74)	**6.77** (5.53-8.26)	**7.86** (6.37-9.61)	**9.43** (7.44-11.9)	**10.7** (8.24-13.6)	**12.1** (8.96-15.6)	**13.5** (9.61-17.7)	**15.5** (10.6-20.7)	**17.1** (11.4-23.0)
10-min	**3.53** (2.90-4.30)	**4.06** (3.32-4.94)	**4.96** (4.05-6.05)	**5.75** (4.67-7.03)	**6.91** (5.45-8.70)	**7.85** (6.04-9.96)	**8.84** (6.56-11.4)	**9.89** (7.04-13.0)	**11.3** (7.76-15.2)	**12.5** (8.31-16.8)
15-min	**2.88** (2.36-3.50)	**3.30** (2.70-4.02)	**4.03** (3.29-4.92)	**4.68** (3.80-5.72)	**5.62** (4.43-7.07)	**6.38** (4.91-8.10)	**7.18** (5.34-9.27)	**8.04** (5.72-10.6)	**9.22** (6.31-12.3)	**10.2** (6.76-13.7)
30-min	**2.07** (1.70-2.52)	**2.37** (1.94-2.89)	**2.90** (2.37-3.54)	**3.36** (2.73-4.11)	**4.04** (3.18-5.09)	**4.59** (3.53-5.82)	**5.17** (3.84-6.67)	**5.78** (4.11-7.59)	**6.63** (4.54-8.87)	**7.30** (4.85-9.84)
60-min	**1.35** (1.11-1.64)	**1.55** (1.26-1.88)	**1.89** (1.54-2.30)	**2.19** (1.78-2.68)	**2.63** (2.07-3.31)	**2.99** (2.30-3.80)	**3.37** (2.50-4.35)	**3.78** (2.69-4.96)	**4.34** (2.97-5.81)	**4.79** (3.18-6.46)
2-hr	**0.831** (0.688-1.00)	**0.952** (0.786-1.15)	**1.16** (0.956-1.40)	**1.35** (1.10-1.63)	**1.62** (1.29-2.02)	**1.84** (1.43-2.32)	**2.08** (1.56-2.66)	**2.33** (1.68-3.04)	**2.68** (1.86-3.56)	**2.96** (2.00-3.95)
3-hr	**0.624** (0.519-0.748)	**0.712** (0.591-0.854)	**0.866** (0.717-1.04)	**1.00** (0.826-1.21)	**1.20** (0.967-1.50)	**1.37** (1.07-1.71)	**1.55** (1.17-1.97)	**1.73** (1.26-2.24)	**2.00** (1.40-2.63)	**2.20** (1.50-2.92)
6-hr	**0.386** (0.324-0.459)	**0.438** (0.367-0.521)	**0.528** (0.441-0.629)	**0.608** (0.505-0.725)	**0.725** (0.588-0.891)	**0.821** (0.651-1.02)	**0.923** (0.708-1.16)	**1.03** (0.761-1.32)	**1.18** (0.841-1.54)	**1.30** (0.901-1.71)
12-hr	**0.238** (0.201-0.280)	**0.269** (0.227-0.316)	**0.321** (0.271-0.378)	**0.367** (0.308-0.434)	**0.433** (0.354-0.526)	**0.487** (0.390-0.595)	**0.543** (0.421-0.674)	**0.602** (0.450-0.761)	**0.683** (0.493-0.880)	**0.748** (0.526-0.970)
24-hr	**0.143** (0.122-0.167)	**0.163** (0.139-0.190)	**0.196** (0.167-0.229)	**0.224** (0.190-0.262)	**0.264** (0.217-0.315)	**0.294** (0.238-0.355)	**0.326** (0.255-0.399)	**0.358** (0.271-0.447)	**0.402** (0.294-0.510)	**0.435** (0.311-0.558)
2-day	**0.082** (0.071-0.095)	**0.095** (0.082-0.110)	**0.116** (0.100-0.134)	**0.133** (0.114-0.154)	**0.157** (0.130-0.185)	**0.175** (0.143-0.209)	**0.193** (0.153-0.234)	**0.212** (0.162-0.261)	**0.236** (0.175-0.297)	**0.255** (0.185-0.323)
3-day	**0.060** (0.052-0.069)	**0.068** (0.059-0.079)	**0.083** (0.071-0.095)	**0.094** (0.081-0.109)	**0.111** (0.093-0.131)	**0.125** (0.103-0.148)	**0.138** (0.111-0.167)	**0.152** (0.118-0.187)	**0.171** (0.129-0.214)	**0.186** (0.137-0.235)
4-day	**0.048** (0.042-0.055)	**0.055** (0.047-0.062)	**0.065** (0.057-0.075)	**0.074** (0.064-0.085)	**0.088** (0.074-0.103)	**0.098** (0.082-0.117)	**0.110** (0.088-0.132)	**0.121** (0.095-0.149)	**0.138** (0.104-0.172)	**0.150** (0.111-0.189)
7-day	**0.032** (0.029-0.037)	**0.036** (0.032-0.041)	**0.043** (0.038-0.049)	**0.049** (0.043-0.056)	**0.058** (0.050-0.068)	**0.065** (0.055-0.077)	**0.073** (0.060-0.087)	**0.081** (0.064-0.099)	**0.093** (0.071-0.115)	**0.102** (0.076-0.127)
10-day	**0.026** (0.023-0.029)	**0.029** (0.025-0.032)	**0.034** (0.030-0.038)	**0.039** (0.034-0.044)	**0.045** (0.039-0.053)	**0.051** (0.043-0.060)	**0.057** (0.047-0.068)	**0.063** (0.051-0.077)	**0.072** (0.056-0.089)	**0.080** (0.060-0.098)
20-day	**0.017** (0.015-0.019)	**0.019** (0.017-0.021)	**0.022** (0.020-0.025)	**0.025** (0.022-0.028)	**0.029** (0.025-0.033)	**0.032** (0.027-0.037)	**0.035** (0.030-0.042)	**0.039** (0.032-0.047)	**0.044** (0.035-0.053)	**0.048** (0.037-0.059)
30-day	**0.014** (0.013-0.016)	**0.015** (0.014-0.017)	**0.018** (0.016-0.020)	**0.020** (0.018-0.022)	**0.023** (0.020-0.026)	**0.025** (0.022-0.029)	**0.027** (0.023-0.032)	**0.030** (0.024-0.035)	**0.033** (0.026-0.040)	**0.036** (0.028-0.043)
45-day	**0.012** (0.011-0.013)	**0.013** (0.012-0.014)	**0.015** (0.013-0.016)	**0.016** (0.015-0.018)	**0.019** (0.016-0.021)	**0.020** (0.017-0.023)	**0.022** (0.018-0.025)	**0.023** (0.019-0.027)	**0.025** (0.020-0.030)	**0.027** (0.021-0.032)
60-day	**0.010** (0.009-0.011)	**0.011** (0.010-0.013)	**0.013** (0.012-0.014)	**0.014** (0.013-0.016)	**0.016** (0.014-0.018)	**0.018** (0.015-0.020)	**0.019** (0.016-0.021)	**0.020** (0.016-0.023)	**0.021** (0.017-0.025)	**0.022** (0.018-0.027)

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

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

Please refer to NOAA Atlas 14 document for more information.

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PF graphical

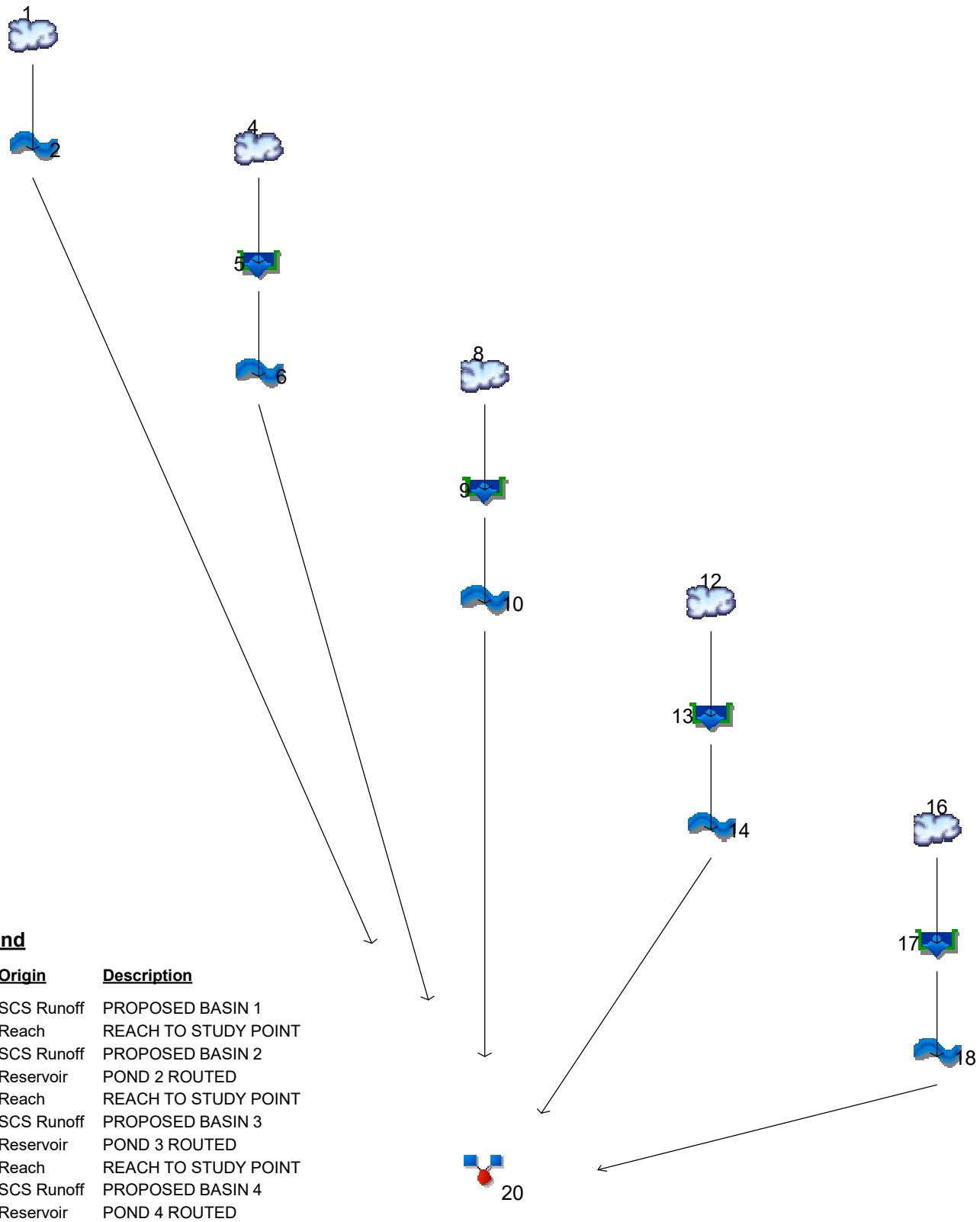
Appendix C – Hydrology Results

Hydraflow Table of Contents

50 - Year

100 - Year

Watershed Model Schematic



Legend

Hyd.	Origin	Description
1	SCS Runoff	PROPOSED BASIN 1
2	Reach	REACH TO STUDY POINT
4	SCS Runoff	PROPOSED BASIN 2
5	Reservoir	POND 2 ROUTED
6	Reach	REACH TO STUDY POINT
8	SCS Runoff	PROPOSED BASIN 3
9	Reservoir	POND 3 ROUTED
10	Reach	REACH TO STUDY POINT
12	SCS Runoff	PROPOSED BASIN 4
13	Reservoir	POND 4 ROUTED
14	Reach	REACH TO STUDY POINT
16	SCS Runoff	PROPOSED BASIN 5
17	Reservoir	POND 5 ROUTED
18	Reach	REACH TO STUDY POINT
20	Combine	REACH COMBINED

Hydrograph Return Period Recap

Hyd. No.	Hydrograph type (origin)	Inflow hyd(s)	Peak Outflow (cfs)								Hydrograph Description
			1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr	
1	SCS Runoff	------	9.990	12.07	-------	15.58	18.53	22.67	25.97	29.25	PROPOSED BASIN 1
2	Reach	1	2.607	3.427	-------	4.943	6.319	8.375	10.10	11.88	REACH TO STUDY POINT
4	SCS Runoff	------	17.68	21.86	-------	29.00	35.08	43.67	50.54	57.42	PROPOSED BASIN 2
5	Reservoir	4	0.495	0.860	-------	2.570	10.11	26.64	39.54	48.76	POND 2 ROUTED
6	Reach	5	0.480	0.732	-------	1.862	3.858	9.384	15.06	20.88	REACH TO STUDY POINT
8	SCS Runoff	------	25.68	32.52	-------	44.48	55.07	70.25	82.53	94.89	PROPOSED BASIN 3
9	Reservoir	8	5.428	19.69	-------	39.61	52.49	68.36	80.34	92.34	POND 3 ROUTED
10	Reach	9	2.130	4.542	-------	10.72	17.08	26.61	34.35	42.09	REACH TO STUDY POINT
12	SCS Runoff	------	12.23	15.95	-------	22.52	28.26	36.80	43.81	50.92	PROPOSED BASIN 4
13	Reservoir	12	0.382	0.469	-------	1.045	2.380	5.756	9.705	23.03	POND 4 ROUTED
14	Reach	13	0.367	0.454	-------	0.855	1.711	3.621	5.708	8.682	REACH TO STUDY POINT
16	SCS Runoff	------	17.36	22.64	-------	31.95	40.09	52.20	62.16	72.24	PROPOSED BASIN 5
17	Reservoir	16	0.631	1.541	-------	4.763	9.723	31.06	48.94	62.36	POND 5 ROUTED
18	Reach	17	0.629	1.522	-------	4.556	8.864	25.17	42.35	57.39	REACH TO STUDY POINT
20	Combine	2, 6, 10, 14, 18,	4.608	8.631	-------	19.85	34.38	69.13	101.08	132.67	REACH COMBINED

Hydrograph Summary Report

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

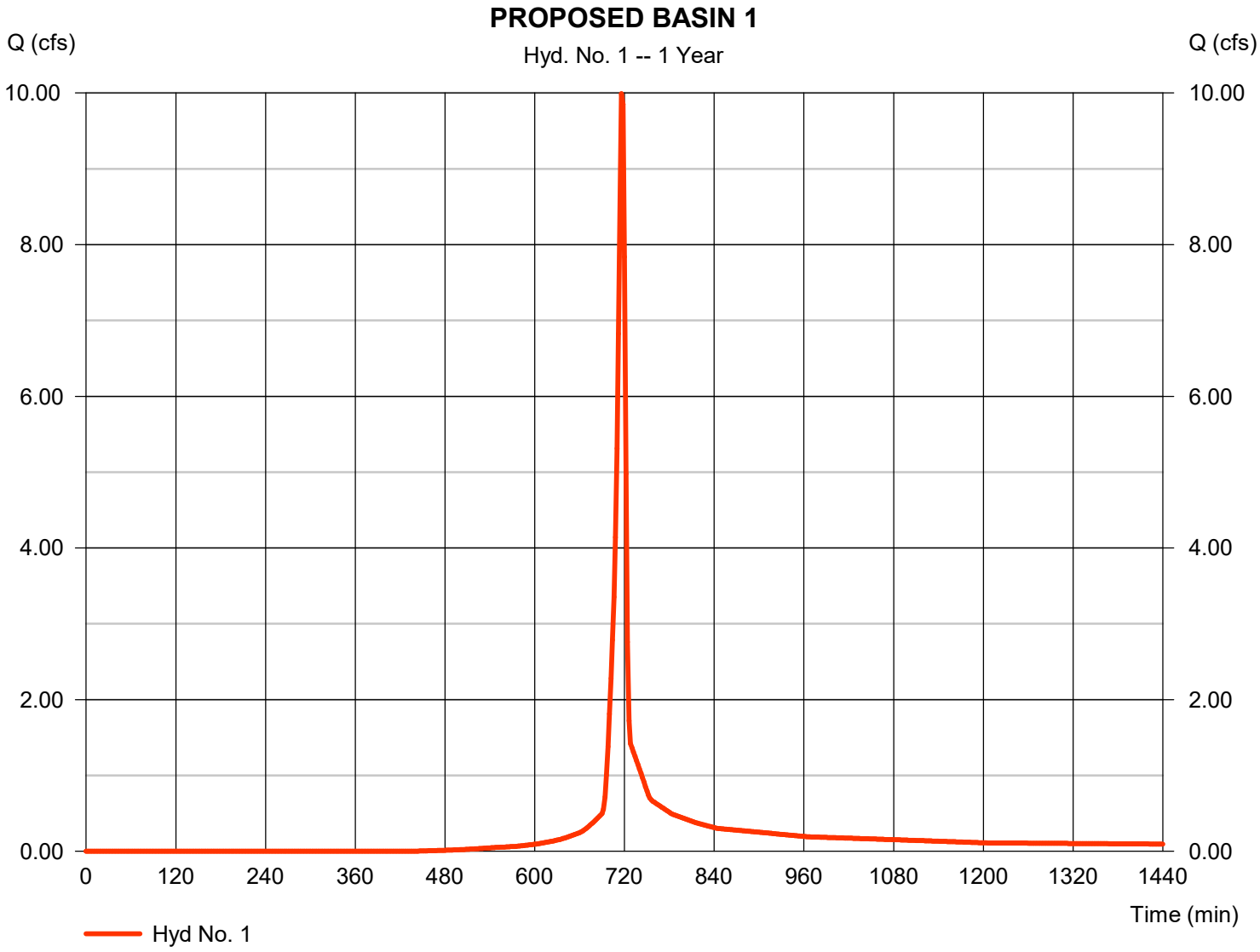
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	9.990	2	716	20,298	------	------	------	PROPOSED BASIN 1
2	Reach	2.607	2	726	20,269	1	------	------	REACH TO STUDY POINT
4	SCS Runoff	17.68	2	716	35,701	------	------	------	PROPOSED BASIN 2
5	Reservoir	0.495	2	890	35,655	4	891.51	23,419	POND 2 ROUTED
6	Reach	0.480	2	1040	35,254	5	------	------	REACH TO STUDY POINT
8	SCS Runoff	25.68	2	718	51,365	------	------	------	PROPOSED BASIN 3
9	Reservoir	5.428	2	726	51,330	8	893.54	21,573	POND 3 ROUTED
10	Reach	2.130	2	778	51,018	9	------	------	REACH TO STUDY POINT
12	SCS Runoff	12.23	2	718	24,557	------	------	------	PROPOSED BASIN 4
13	Reservoir	0.382	2	904	24,480	12	896.06	20,613	POND 4 ROUTED
14	Reach	0.367	2	1068	23,936	13	------	------	REACH TO STUDY POINT
16	SCS Runoff	17.36	2	718	34,840	------	------	------	PROPOSED BASIN 5
17	Reservoir	0.631	2	854	34,787	16	894.64	24,263	POND 5 ROUTED
18	Reach	0.629	2	870	34,307	17	------	------	REACH TO STUDY POINT
20	Combine	4.608	2	756	164,783	2, 6, 10, 14, 18,	------	------	REACH COMBINED

Hydrograph Report

Hyd. No. 1

PROPOSED BASIN 1

Hydrograph type	= SCS Runoff	Peak discharge	= 9.990 cfs
Storm frequency	= 1 yrs	Time to peak	= 716 min
Time interval	= 2 min	Hyd. volume	= 20,298 cuft
Drainage area	= 3.050 ac	Curve number	= 85
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 3.43 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



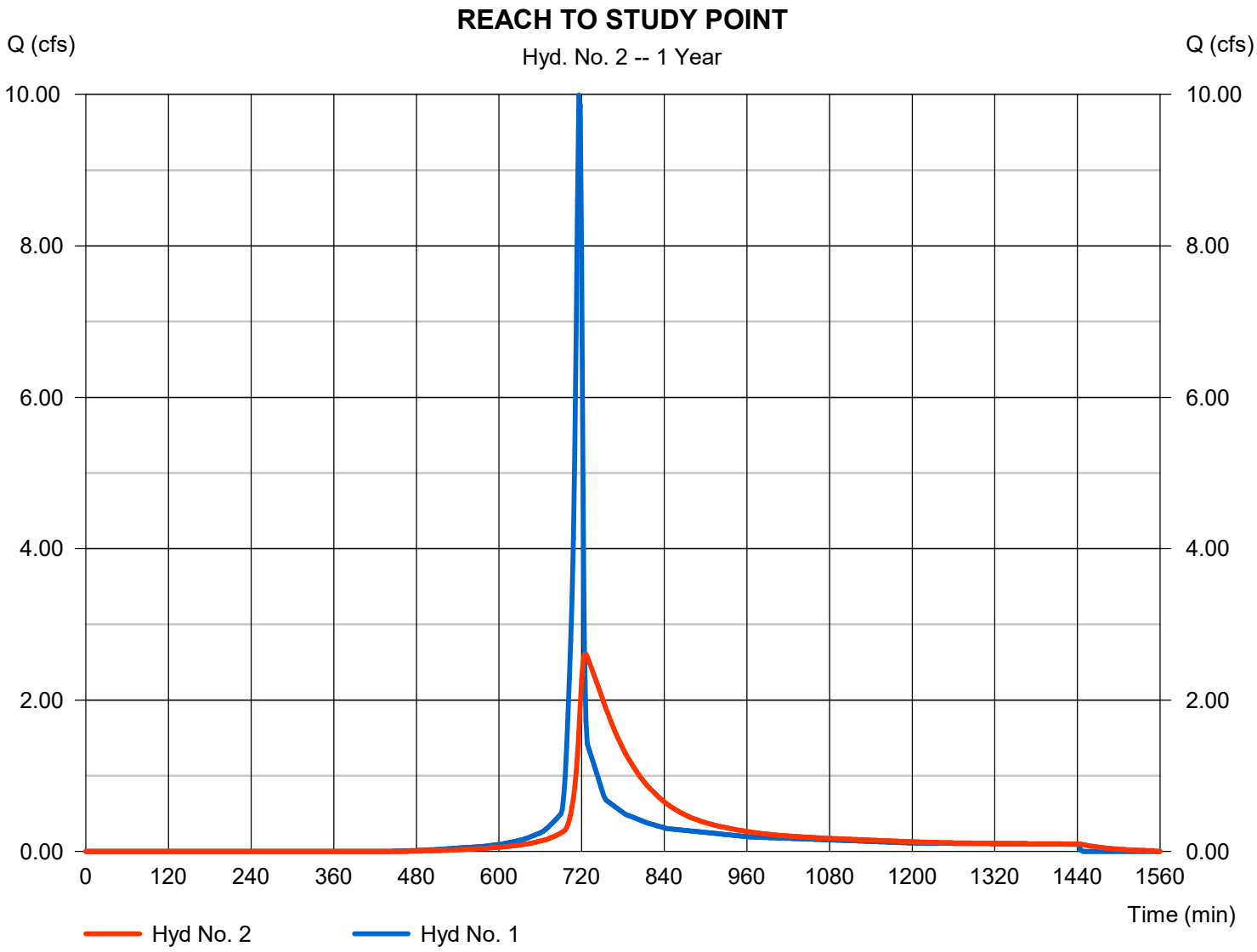
Hydrograph Report

Hyd. No. 2

REACH TO STUDY POINT

Hydrograph type	=	Reach	Peak discharge	=	2.607 cfs
Storm frequency	=	1 yrs	Time to peak	=	726 min
Time interval	=	2 min	Hyd. volume	=	20,269 cuft
Inflow hyd. No.	=	1 - PROPOSED BASIN 1	Section type	=	Trapezoidal
Reach length	=	2981.0 ft	Channel slope	=	0.2 %
Manning's n	=	0.025	Bottom width	=	32.5 ft
Side slope	=	2.5:1	Max. depth	=	5.0 ft
Rating curve x	=	0.262	Rating curve m	=	1.512
Ave. velocity	=	0.70 ft/s	Routing coeff.	=	0.0417

Modified Att-Kin routing method used.



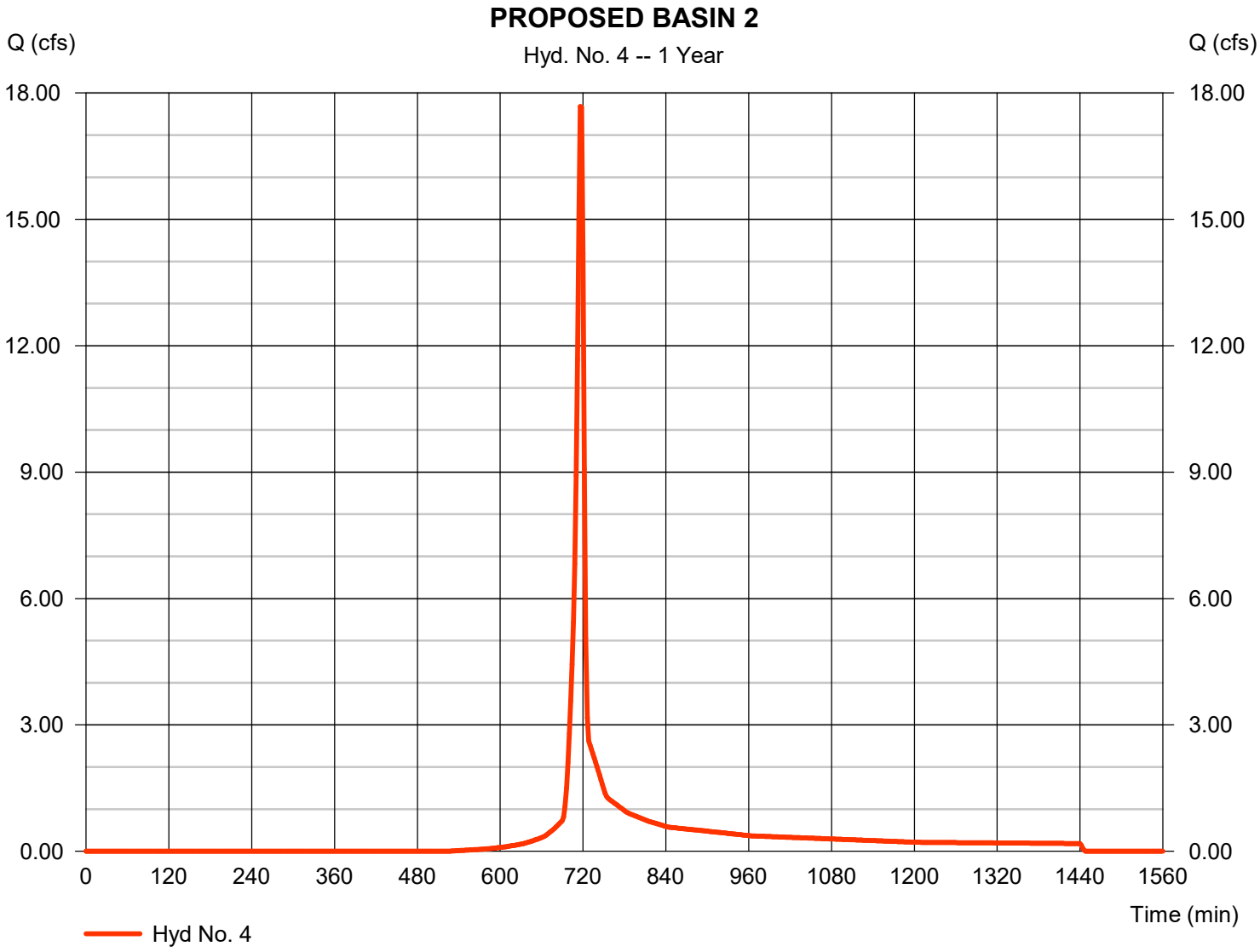
Hydrograph Report

Hyd. No. 4

PROPOSED BASIN 2

Hydrograph type	= SCS Runoff	Peak discharge	= 17.68 cfs
Storm frequency	= 1 yrs	Time to peak	= 716 min
Time interval	= 2 min	Hyd. volume	= 35,701 cuft
Drainage area	= 6.350 ac	Curve number	= 81*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 3.43 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.160 x 98) + (4.950 x 85) + (1.240 x 61)] / 6.350



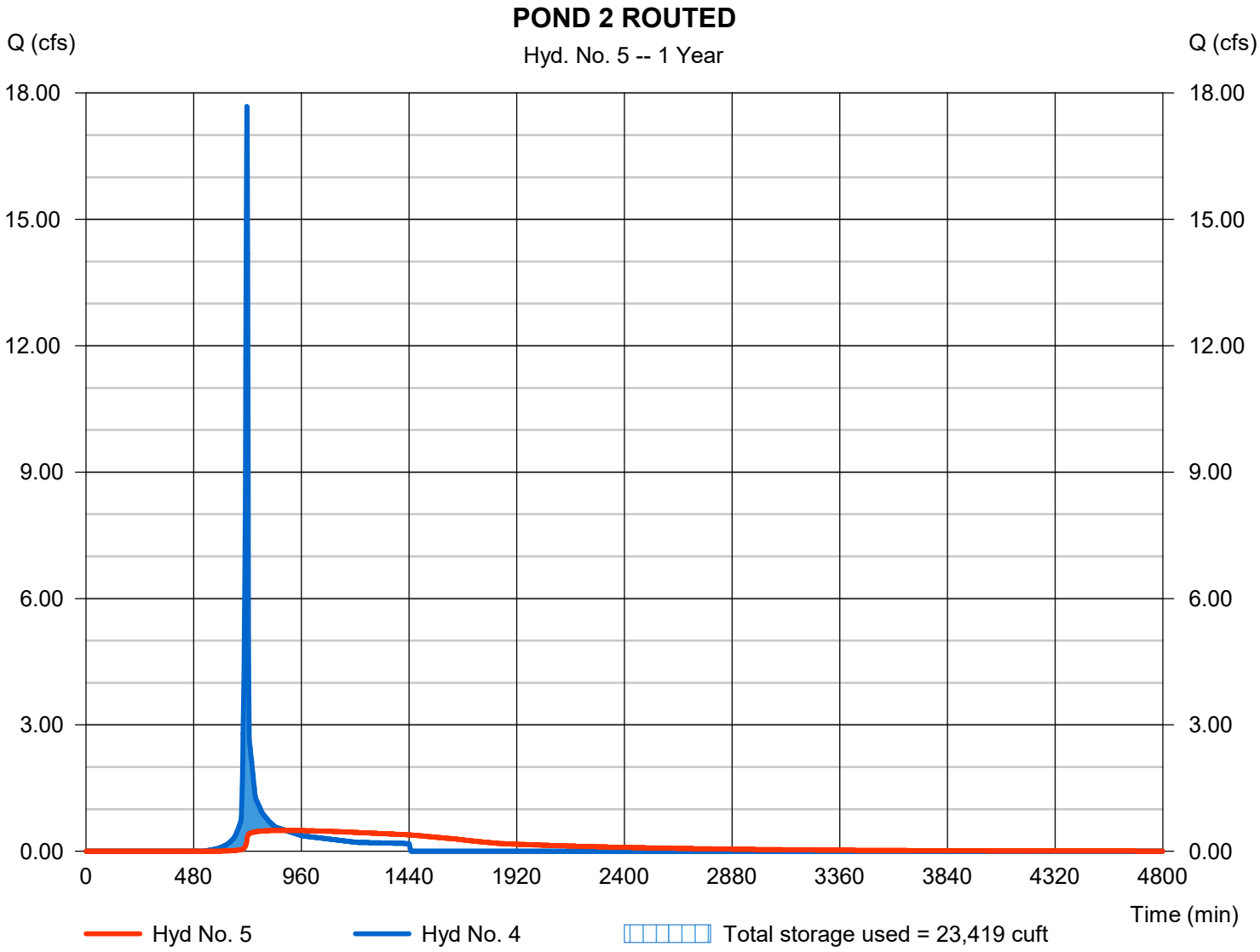
Hydrograph Report

Hyd. No. 5

POND 2 ROUTED

Hydrograph type	=	Reservoir	Peak discharge	=	0.495 cfs
Storm frequency	=	1 yrs	Time to peak	=	890 min
Time interval	=	2 min	Hyd. volume	=	35,655 cuft
Inflow hyd. No.	=	4 - PROPOSED BASIN 2	Max. Elevation	=	891.51 ft
Reservoir name	=	PROPOSED POND 2	Max. Storage	=	23,419 cuft

Storage Indication method used. Wet pond routing start elevation = 890.00 ft.



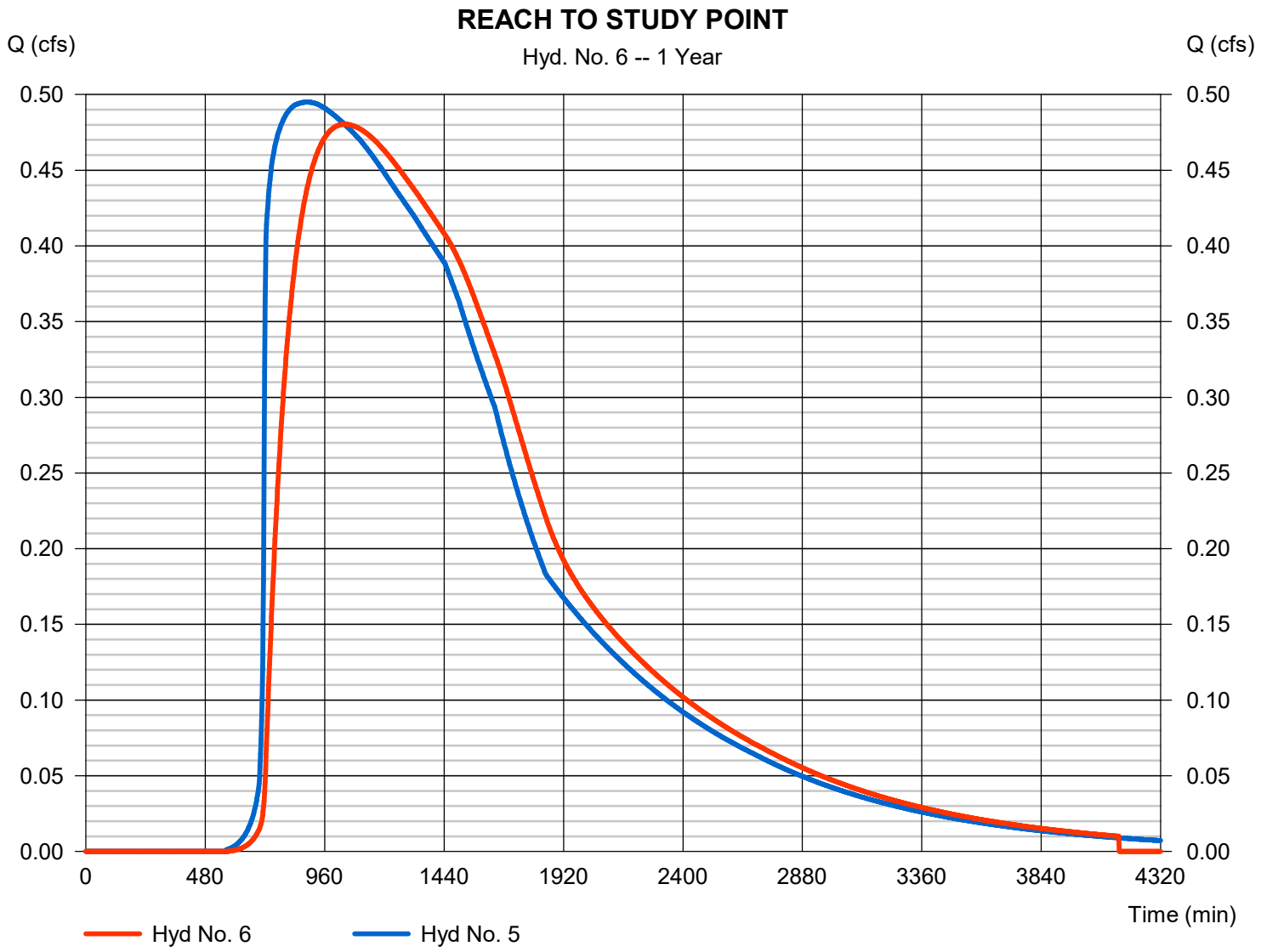
Hydrograph Report

Hyd. No. 6

REACH TO STUDY POINT

Hydrograph type	=	Reach	Peak discharge	=	0.480 cfs
Storm frequency	=	1 yrs	Time to peak	=	1040 min
Time interval	=	2 min	Hyd. volume	=	35,254 cuft
Inflow hyd. No.	=	5 - POND 2 ROUTED	Section type	=	Trapezoidal
Reach length	=	2127.0 ft	Channel slope	=	0.2 %
Manning's n	=	0.025	Bottom width	=	32.5 ft
Side slope	=	2.5:1	Max. depth	=	5.0 ft
Rating curve x	=	0.240	Rating curve m	=	1.512
Ave. velocity	=	0.31 ft/s	Routing coeff.	=	0.0258

Modified Att-Kin routing method used.



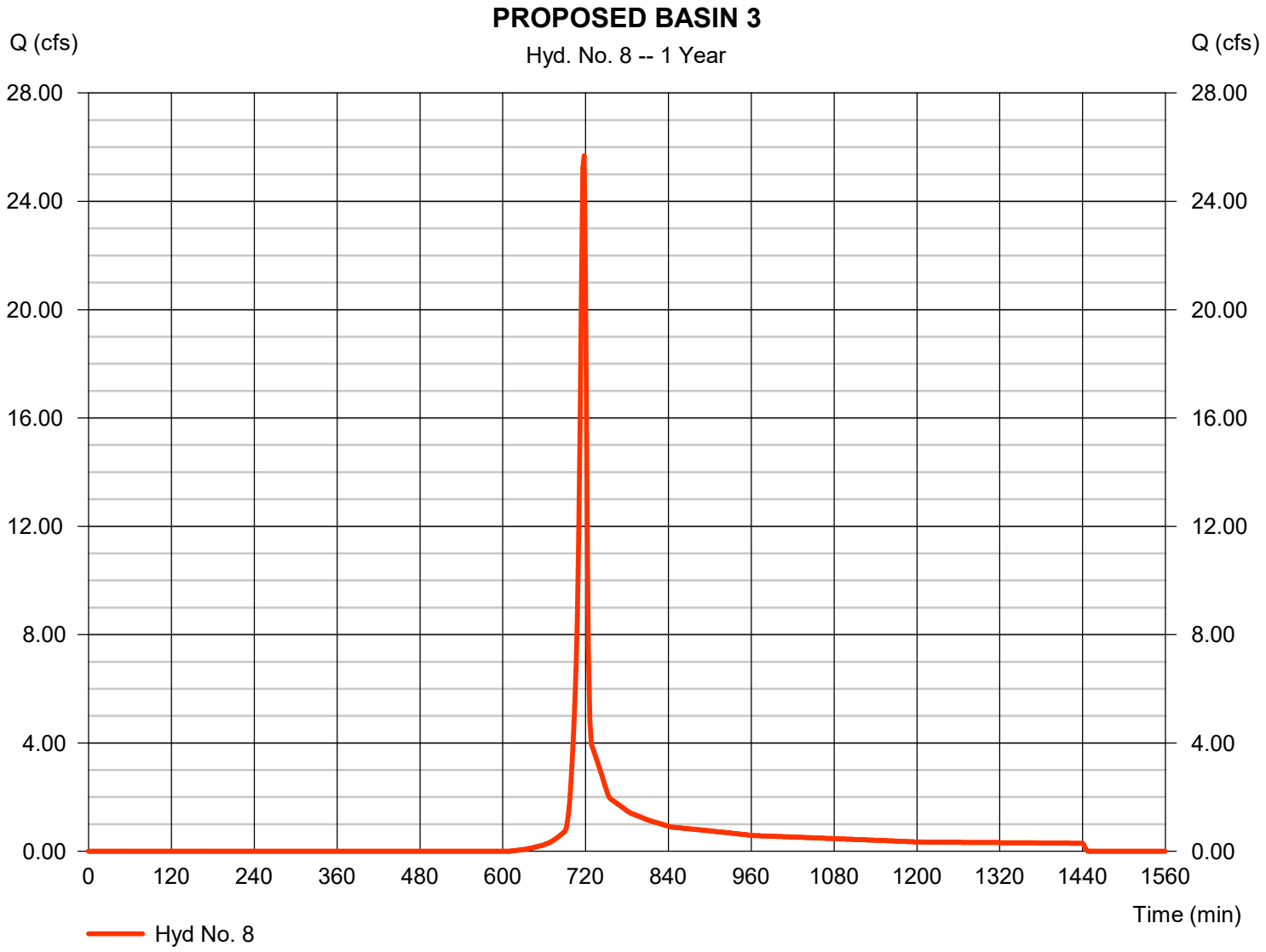
Hydrograph Report

Hyd. No. 8

PROPOSED BASIN 3

Hydrograph type	= SCS Runoff	Peak discharge	= 25.68 cfs
Storm frequency	= 1 yrs	Time to peak	= 718 min
Time interval	= 2 min	Hyd. volume	= 51,365 cuft
Drainage area	= 11.480 ac	Curve number	= 76*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 3.43 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(2.490 x 98) + (3.270 x 85) + (5.720 x 61)] / 11.480



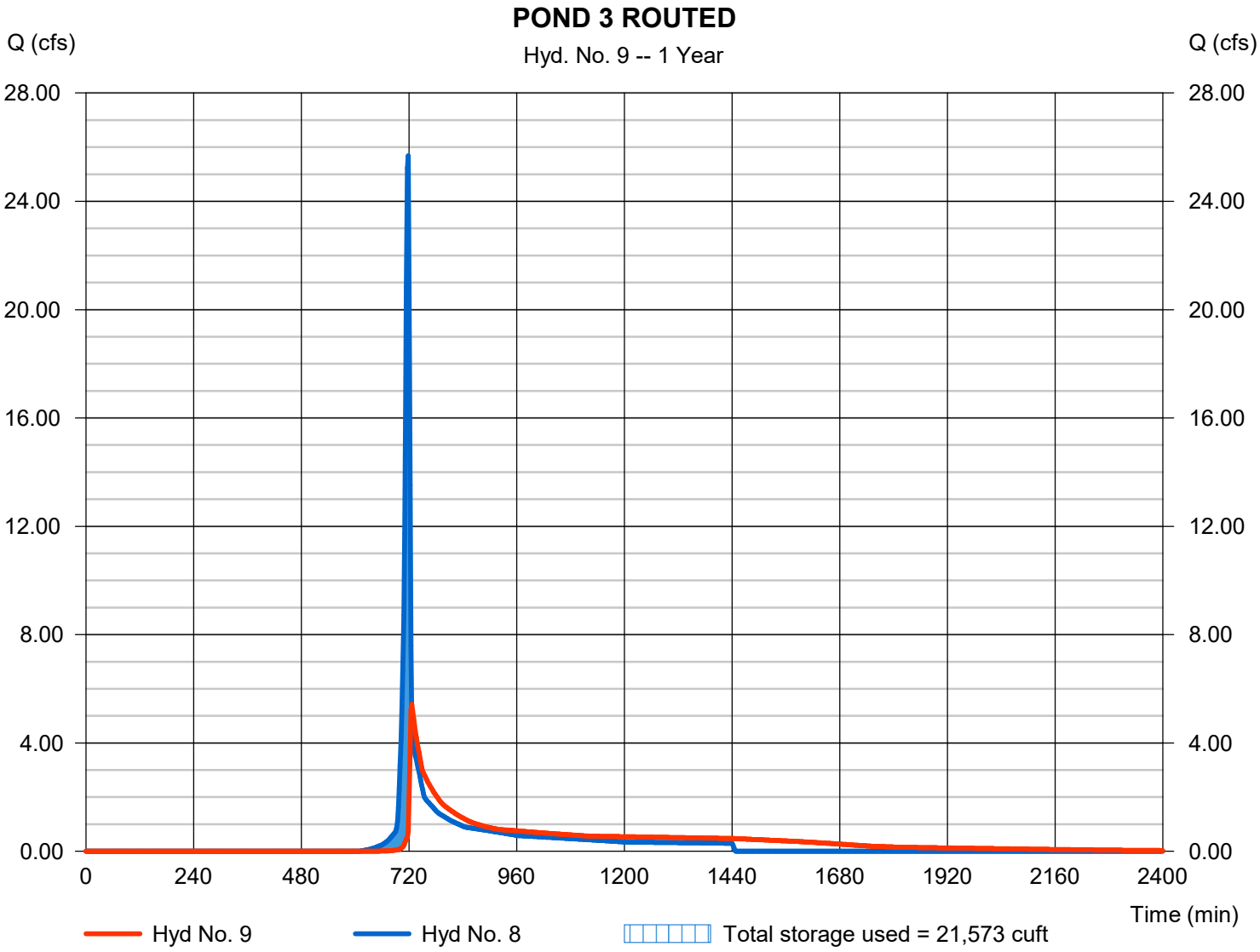
Hydrograph Report

Hyd. No. 9

POND 3 ROUTED

Hydrograph type	=	Reservoir	Peak discharge	=	5.428 cfs
Storm frequency	=	1 yrs	Time to peak	=	726 min
Time interval	=	2 min	Hyd. volume	=	51,330 cuft
Inflow hyd. No.	=	8 - PROPOSED BASIN 3	Max. Elevation	=	893.54 ft
Reservoir name	=	PROPOSED POND 3	Max. Storage	=	21,573 cuft

Storage Indication method used. Wet pond routing start elevation = 891.00 ft.



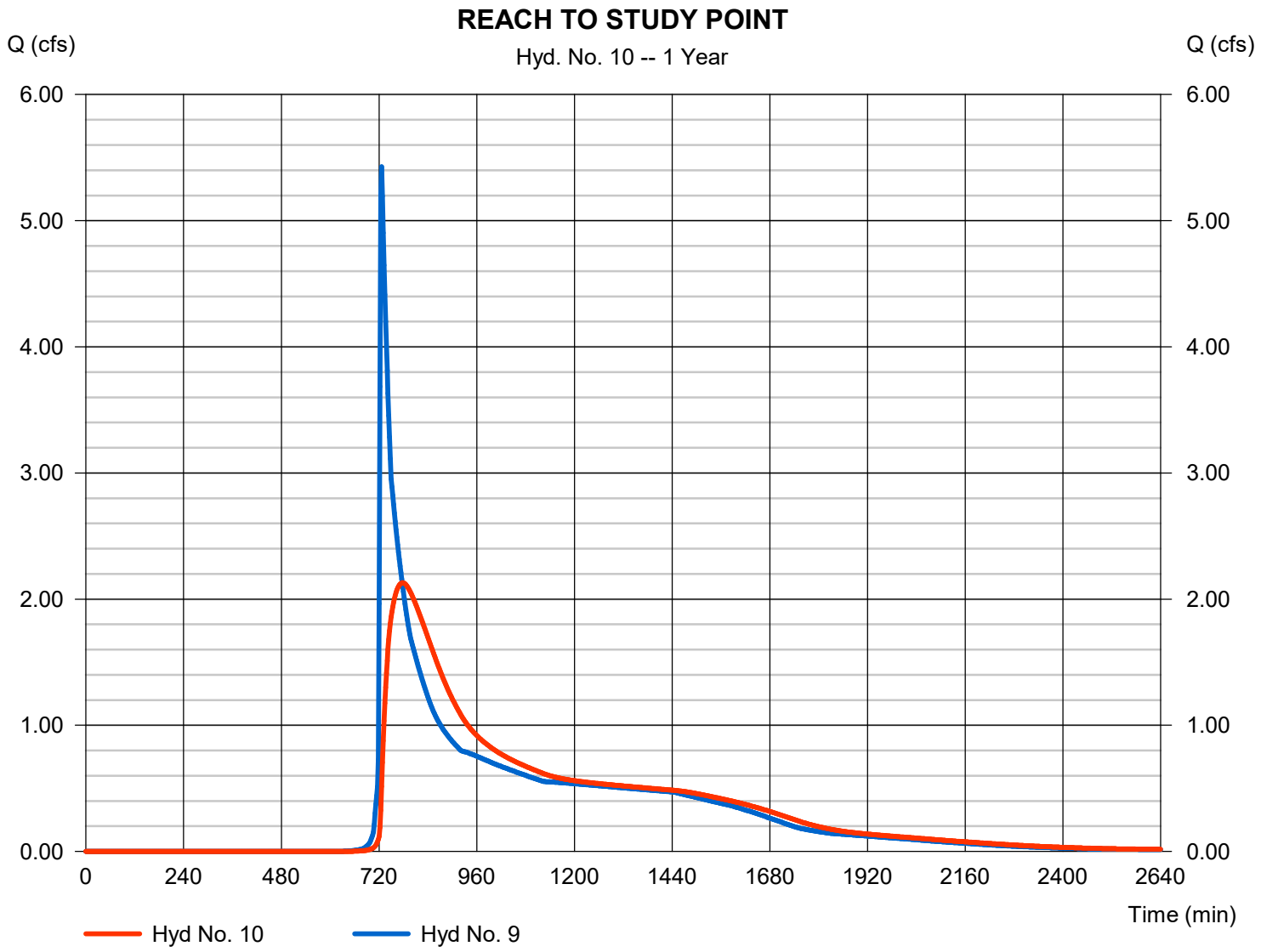
Hydrograph Report

Hyd. No. 10

REACH TO STUDY POINT

Hydrograph type	=	Reach	Peak discharge	=	2.130 cfs
Storm frequency	=	1 yrs	Time to peak	=	778 min
Time interval	=	2 min	Hyd. volume	=	51,018 cuft
Inflow hyd. No.	=	9 - POND 3 ROUTED	Section type	=	Trapezoidal
Reach length	=	3079.0 ft	Channel slope	=	0.2 %
Manning's n	=	0.025	Bottom width	=	32.5 ft
Side slope	=	2.5:1	Max. depth	=	5.0 ft
Rating curve x	=	0.229	Rating curve m	=	1.512
Ave. velocity	=	0.67 ft/s	Routing coeff.	=	0.0387

Modified Att-Kin routing method used.



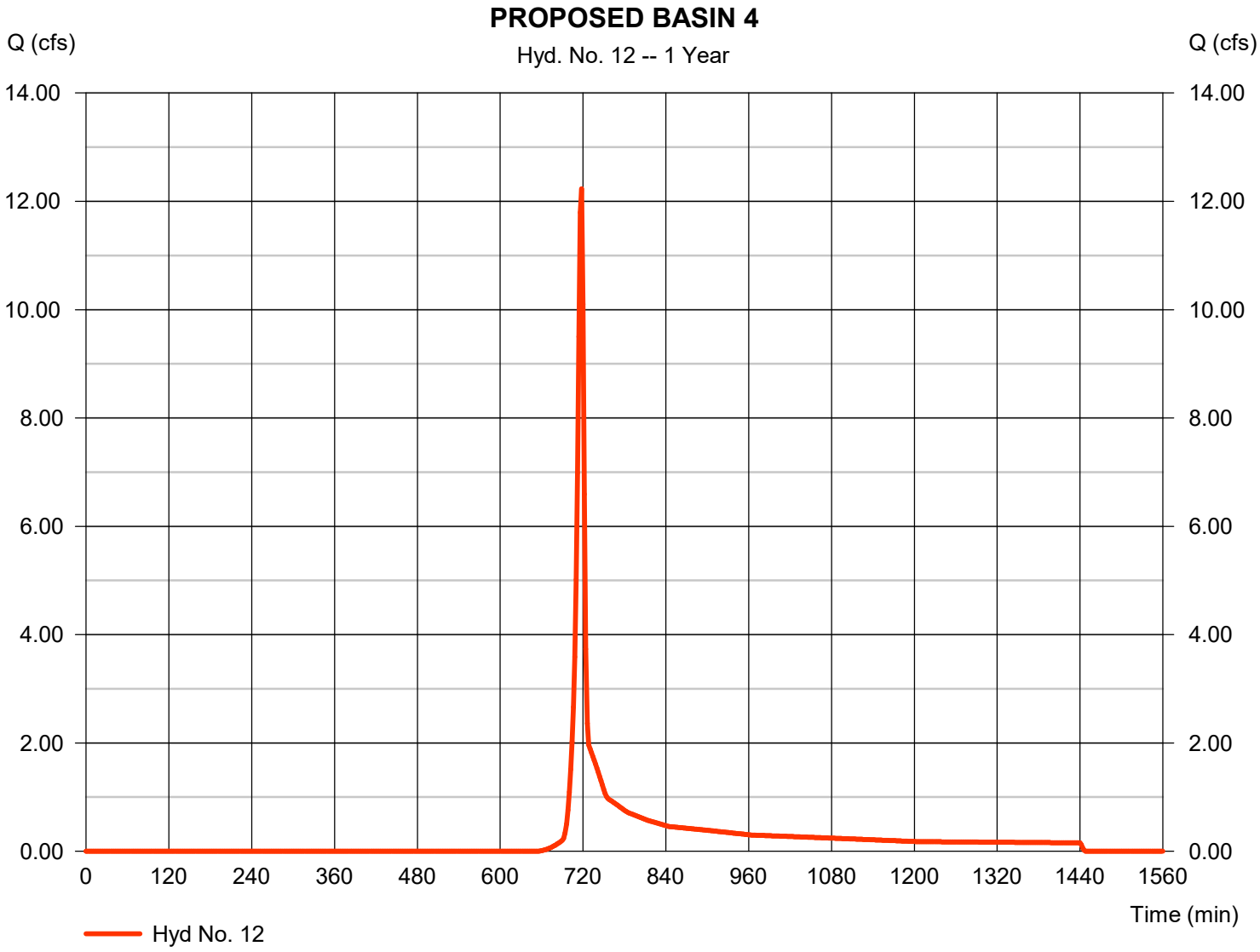
Hydrograph Report

Hyd. No. 12

PROPOSED BASIN 4

Hydrograph type	= SCS Runoff	Peak discharge	= 12.23 cfs
Storm frequency	= 1 yrs	Time to peak	= 718 min
Time interval	= 2 min	Hyd. volume	= 24,557 cuft
Drainage area	= 6.710 ac	Curve number	= 72*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 3.43 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.260 x 98) + (2.540 x 85) + (3.910 x 61)] / 6.710



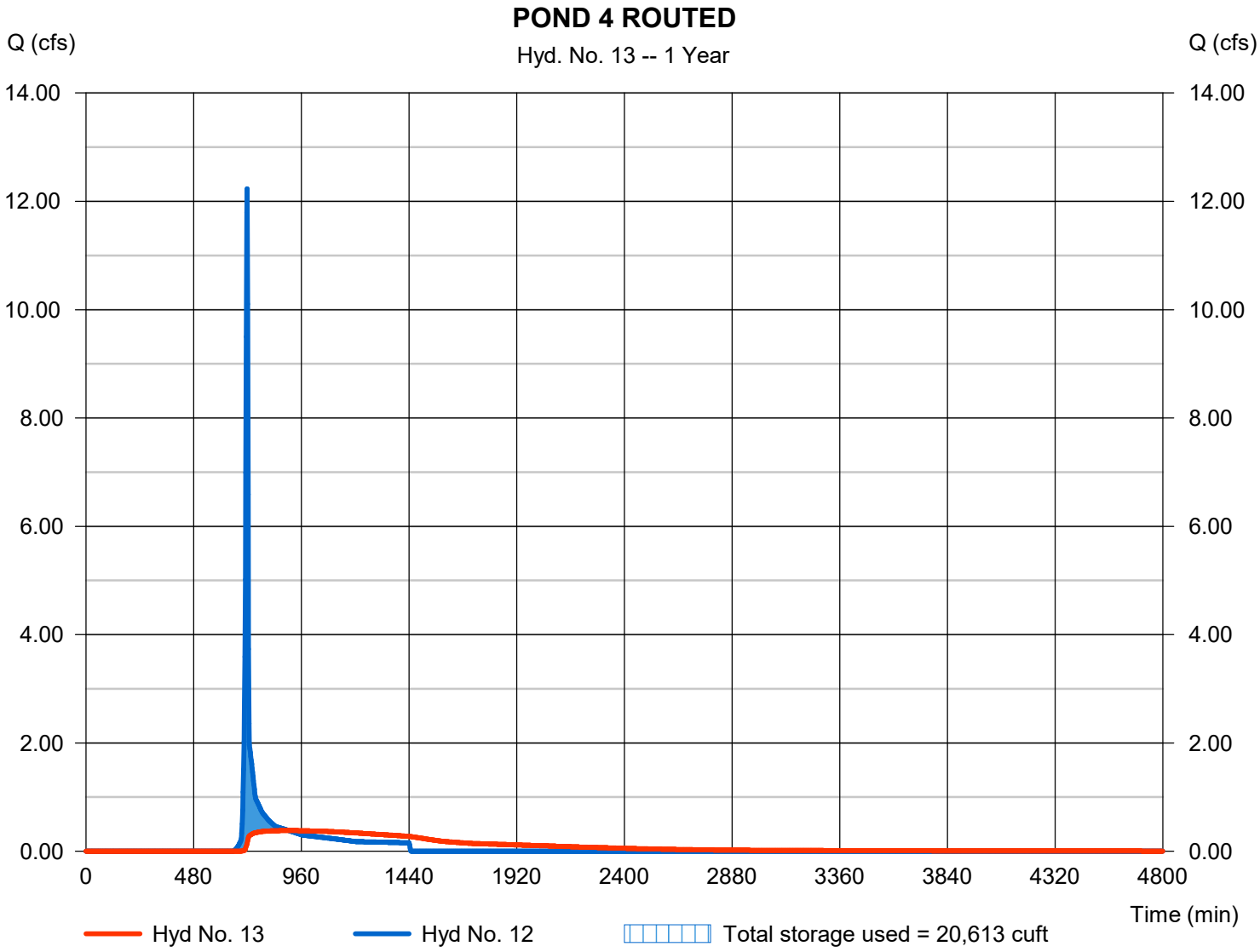
Hydrograph Report

Hyd. No. 13

POND 4 ROUTED

Hydrograph type	=	Reservoir	Peak discharge	=	0.382 cfs
Storm frequency	=	1 yrs	Time to peak	=	904 min
Time interval	=	2 min	Hyd. volume	=	24,480 cuft
Inflow hyd. No.	=	12 - PROPOSED BASIN 4	Max. Elevation	=	896.06 ft
Reservoir name	=	PROPOSED POND 4	Max. Storage	=	20,613 cuft

Storage Indication method used. Wet pond routing start elevation = 895.00 ft.



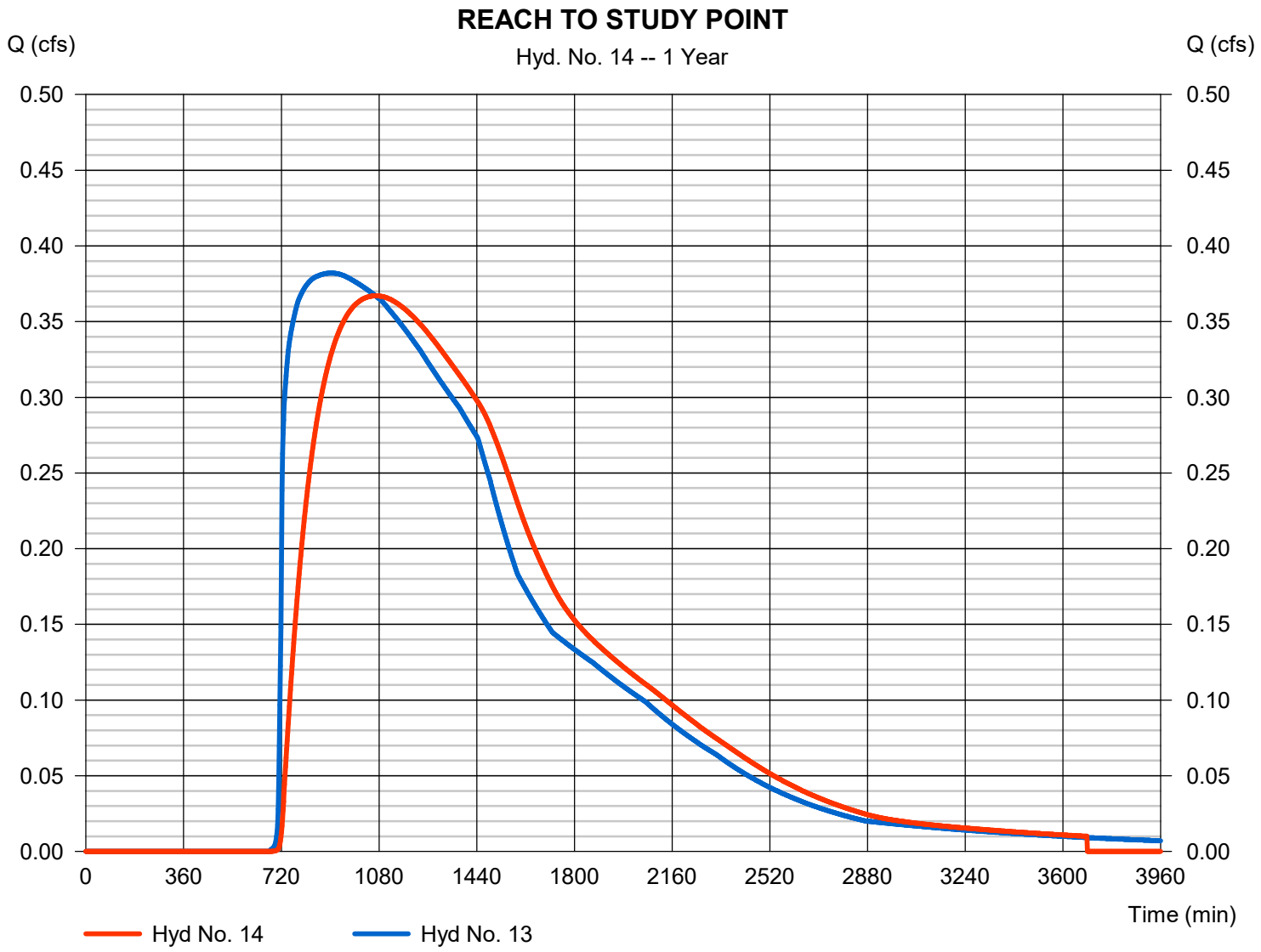
Hydrograph Report

Hyd. No. 14

REACH TO STUDY POINT

Hydrograph type	=	Reach	Peak discharge	=	0.367 cfs
Storm frequency	=	1 yrs	Time to peak	=	1068 min
Time interval	=	2 min	Hyd. volume	=	23,936 cuft
Inflow hyd. No.	=	13 - POND 4 ROUTED	Section type	=	Trapezoidal
Reach length	=	2721.0 ft	Channel slope	=	0.3 %
Manning's n	=	0.025	Bottom width	=	32.5 ft
Side slope	=	2.5:1	Max. depth	=	5.0 ft
Rating curve x	=	0.329	Rating curve m	=	1.512
Ave. velocity	=	0.35 ft/s	Routing coeff.	=	0.0228

Modified Att-Kin routing method used.



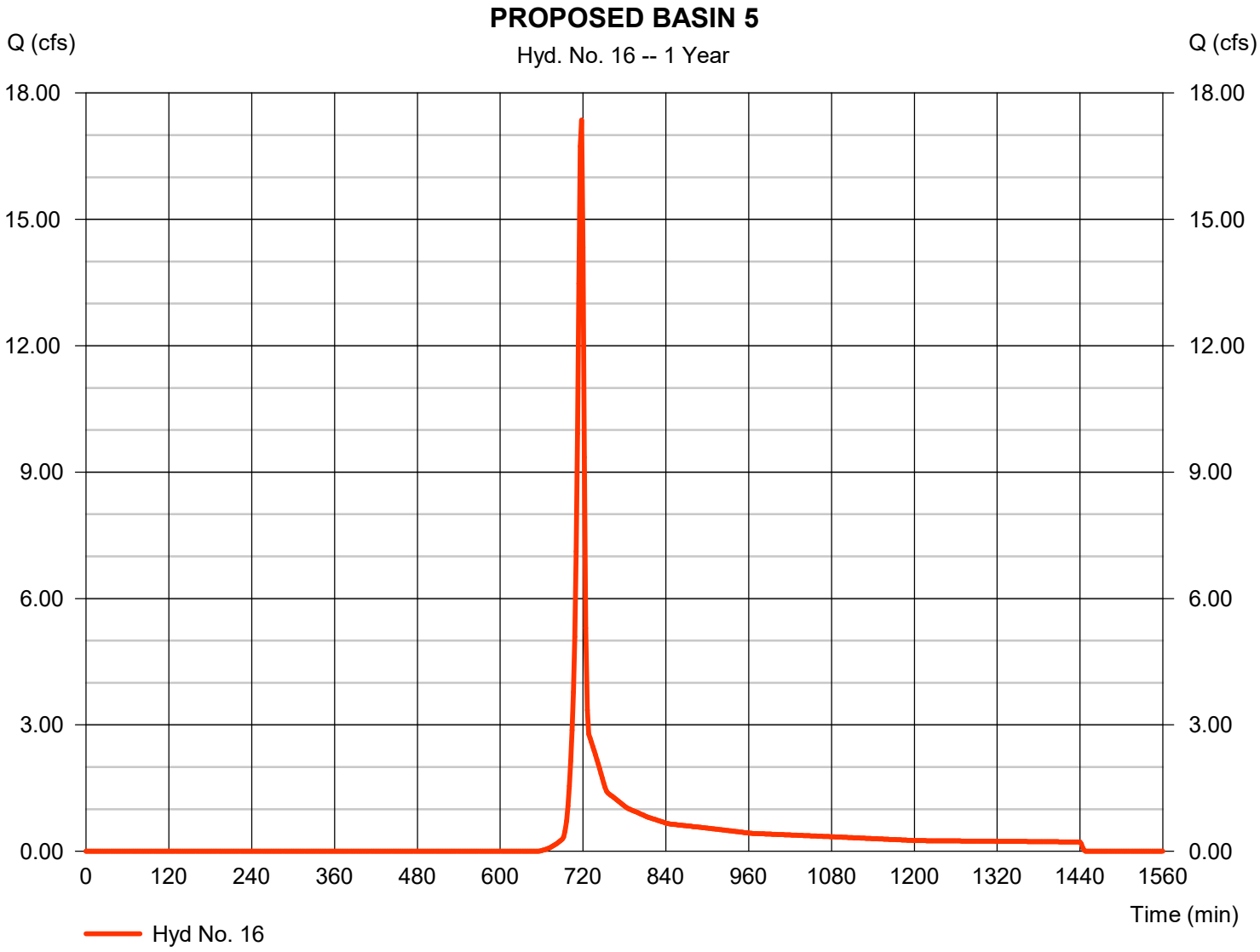
Hydrograph Report

Hyd. No. 16

PROPOSED BASIN 5

Hydrograph type	= SCS Runoff	Peak discharge	= 17.36 cfs
Storm frequency	= 1 yrs	Time to peak	= 718 min
Time interval	= 2 min	Hyd. volume	= 34,840 cuft
Drainage area	= 9.520 ac	Curve number	= 72*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 3.43 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.310 x 98) + (4.000 x 85) + (5.210 x 61)] / 9.520



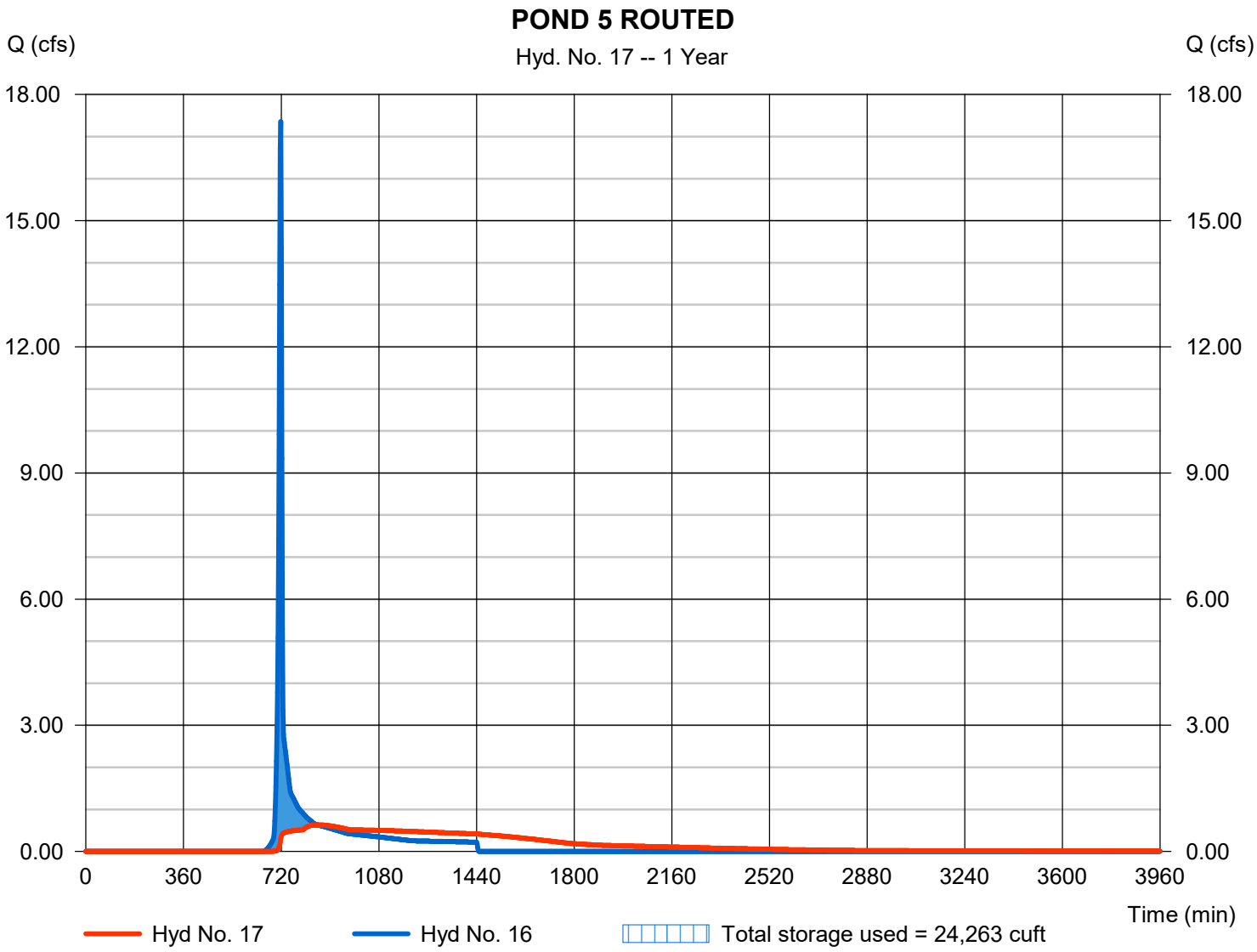
Hydrograph Report

Hyd. No. 17

POND 5 ROUTED

Hydrograph type	=	Reservoir	Peak discharge	=	0.631 cfs
Storm frequency	=	1 yrs	Time to peak	=	854 min
Time interval	=	2 min	Hyd. volume	=	34,787 cuft
Inflow hyd. No.	=	16 - PROPOSED BASIN 5	Max. Elevation	=	894.64 ft
Reservoir name	=	PROPOSED POND 5	Max. Storage	=	24,263 cuft

Storage Indication method used. Wet pond routing start elevation = 893.00 ft.



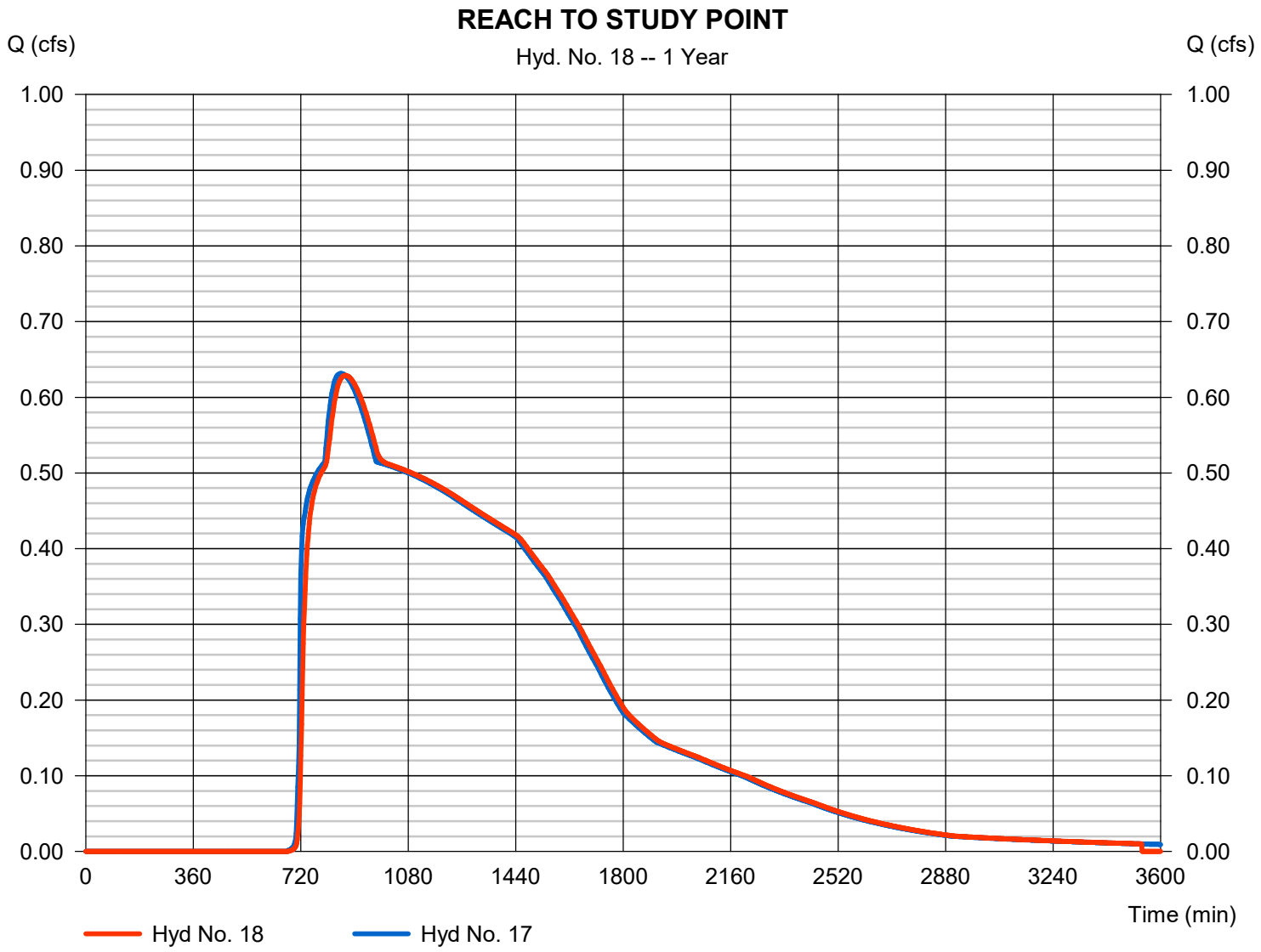
Hydrograph Report

Hyd. No. 18

REACH TO STUDY POINT

Hydrograph type	=	Reach	Peak discharge	=	0.629 cfs
Storm frequency	=	1 yrs	Time to peak	=	870 min
Time interval	=	2 min	Hyd. volume	=	34,307 cuft
Inflow hyd. No.	=	17 - POND 5 ROUTED	Section type	=	Trapezoidal
Reach length	=	597.0 ft	Channel slope	=	1.1 %
Manning's n	=	0.025	Bottom width	=	32.5 ft
Side slope	=	2.5:1	Max. depth	=	5.0 ft
Rating curve x	=	0.610	Rating curve m	=	1.512
Ave. velocity	=	0.62 ft/s	Routing coeff.	=	0.1714

Modified Att-Kin routing method used.

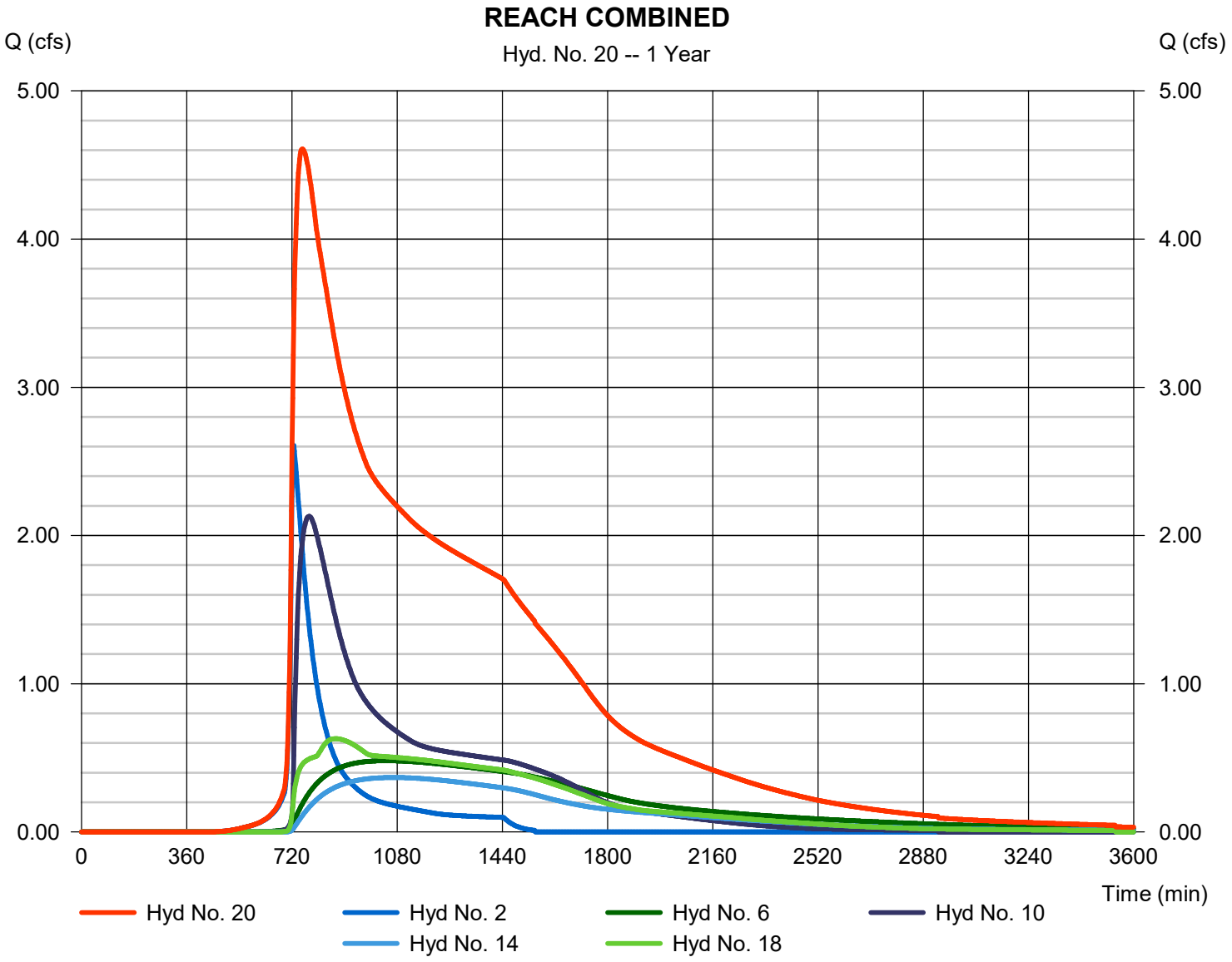


Hydrograph Report

Hyd. No. 20

REACH COMBINED

Hydrograph type	= Combine	Peak discharge	= 4.608 cfs
Storm frequency	= 1 yrs	Time to peak	= 756 min
Time interval	= 2 min	Hyd. volume	= 164,783 cuft
Inflow hyds.	= 2, 6, 10, 14, 18	Contrib. drain. area	= 0.000 ac



Hydrograph Summary Report

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

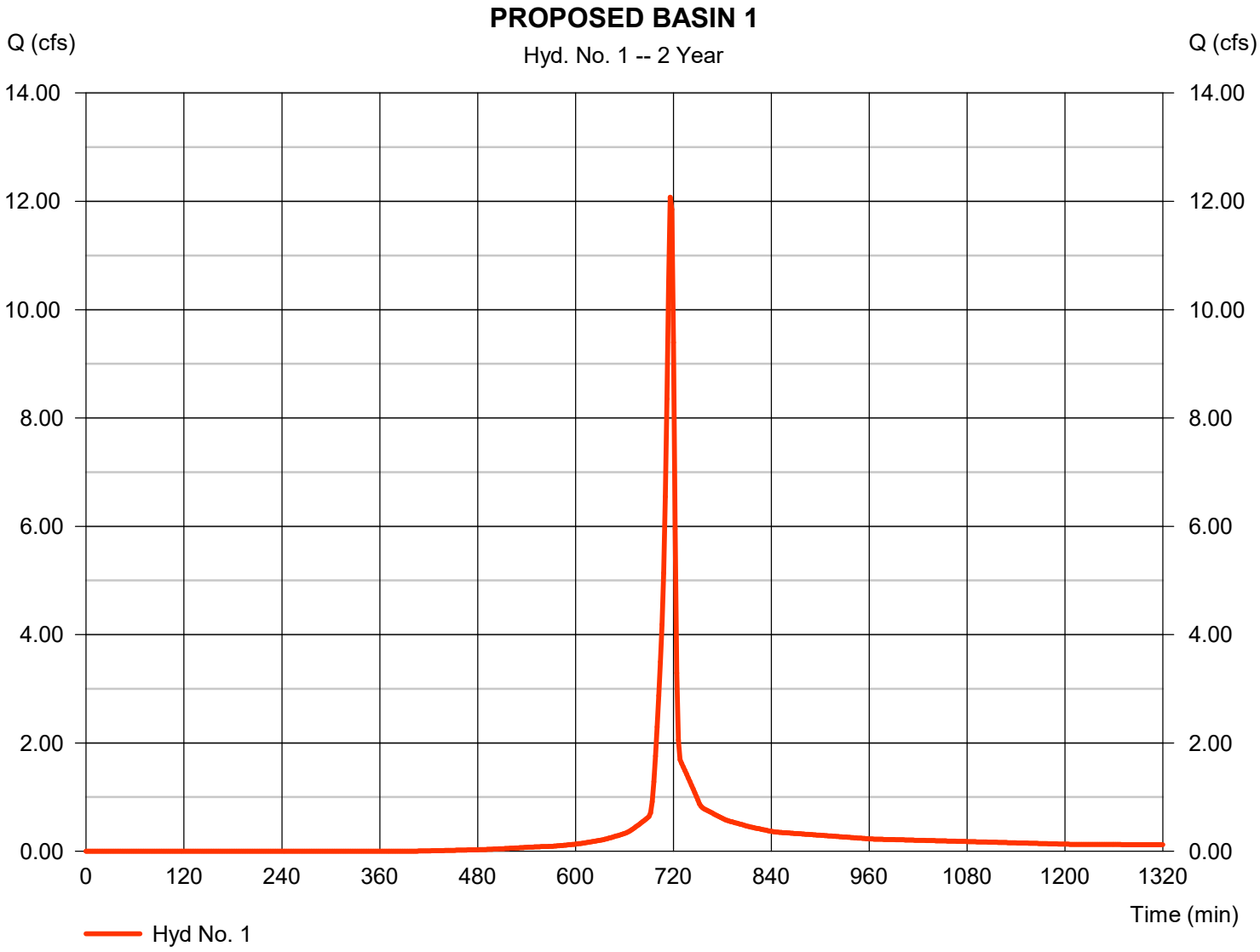
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	12.07	2	716	24,678	------	------	------	PROPOSED BASIN 1
2	Reach	3.427	2	724	24,653	1	------	------	REACH TO STUDY POINT
4	SCS Runoff	21.86	2	716	44,215	------	------	------	PROPOSED BASIN 2
5	Reservoir	0.860	2	814	44,161	4	891.82	27,859	POND 2 ROUTED
6	Reach	0.732	2	906	43,768	5	------	------	REACH TO STUDY POINT
8	SCS Runoff	32.52	2	718	65,240	------	------	------	PROPOSED BASIN 3
9	Reservoir	19.69	2	722	65,205	8	893.83	24,181	POND 3 ROUTED
10	Reach	4.542	2	744	64,892	9	------	------	REACH TO STUDY POINT
12	SCS Runoff	15.95	2	718	31,908	------	------	------	PROPOSED BASIN 4
13	Reservoir	0.469	2	906	31,817	12	896.40	25,302	POND 4 ROUTED
14	Reach	0.454	2	1058	31,287	13	------	------	REACH TO STUDY POINT
16	SCS Runoff	22.64	2	718	45,270	------	------	------	PROPOSED BASIN 5
17	Reservoir	1.541	2	768	45,217	16	894.87	27,174	POND 5 ROUTED
18	Reach	1.522	2	778	44,737	17	------	------	REACH TO STUDY POINT
20	Combine	8.631	2	746	209,337	2, 6, 10, 14, 18,	------	------	REACH COMBINED

Hydrograph Report

Hyd. No. 1

PROPOSED BASIN 1

Hydrograph type	=	SCS Runoff	Peak discharge	=	12.07 cfs
Storm frequency	=	2 yrs	Time to peak	=	716 min
Time interval	=	2 min	Hyd. volume	=	24,678 cuft
Drainage area	=	3.050 ac	Curve number	=	85
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	3.91 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484



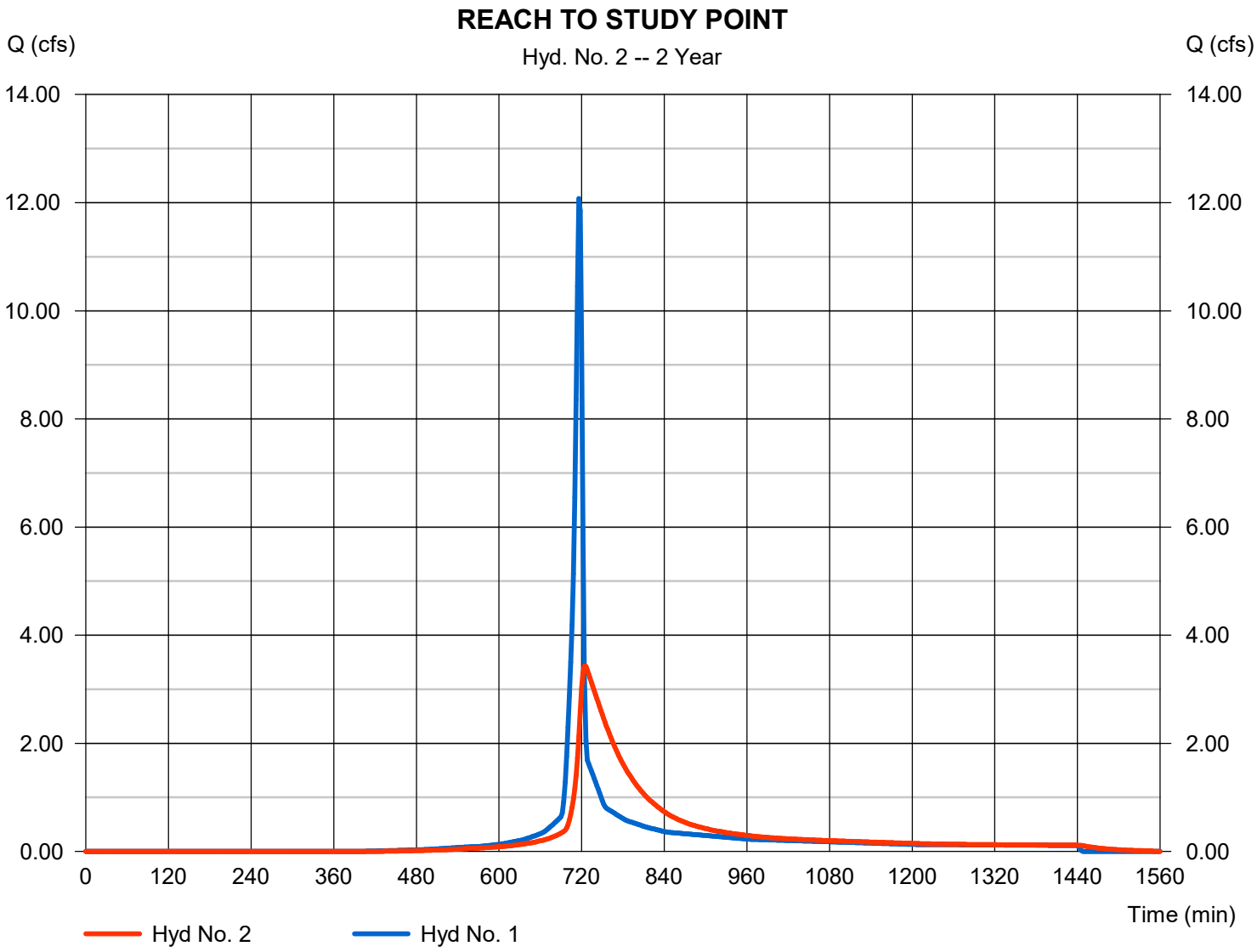
Hydrograph Report

Hyd. No. 2

REACH TO STUDY POINT

Hydrograph type	=	Reach	Peak discharge	=	3.427 cfs
Storm frequency	=	2 yrs	Time to peak	=	724 min
Time interval	=	2 min	Hyd. volume	=	24,653 cuft
Inflow hyd. No.	=	1 - PROPOSED BASIN 1	Section type	=	Trapezoidal
Reach length	=	2981.0 ft	Channel slope	=	0.2 %
Manning's n	=	0.025	Bottom width	=	32.5 ft
Side slope	=	2.5:1	Max. depth	=	5.0 ft
Rating curve x	=	0.262	Rating curve m	=	1.512
Ave. velocity	=	0.77 ft/s	Routing coeff.	=	0.0460

Modified Att-Kin routing method used.



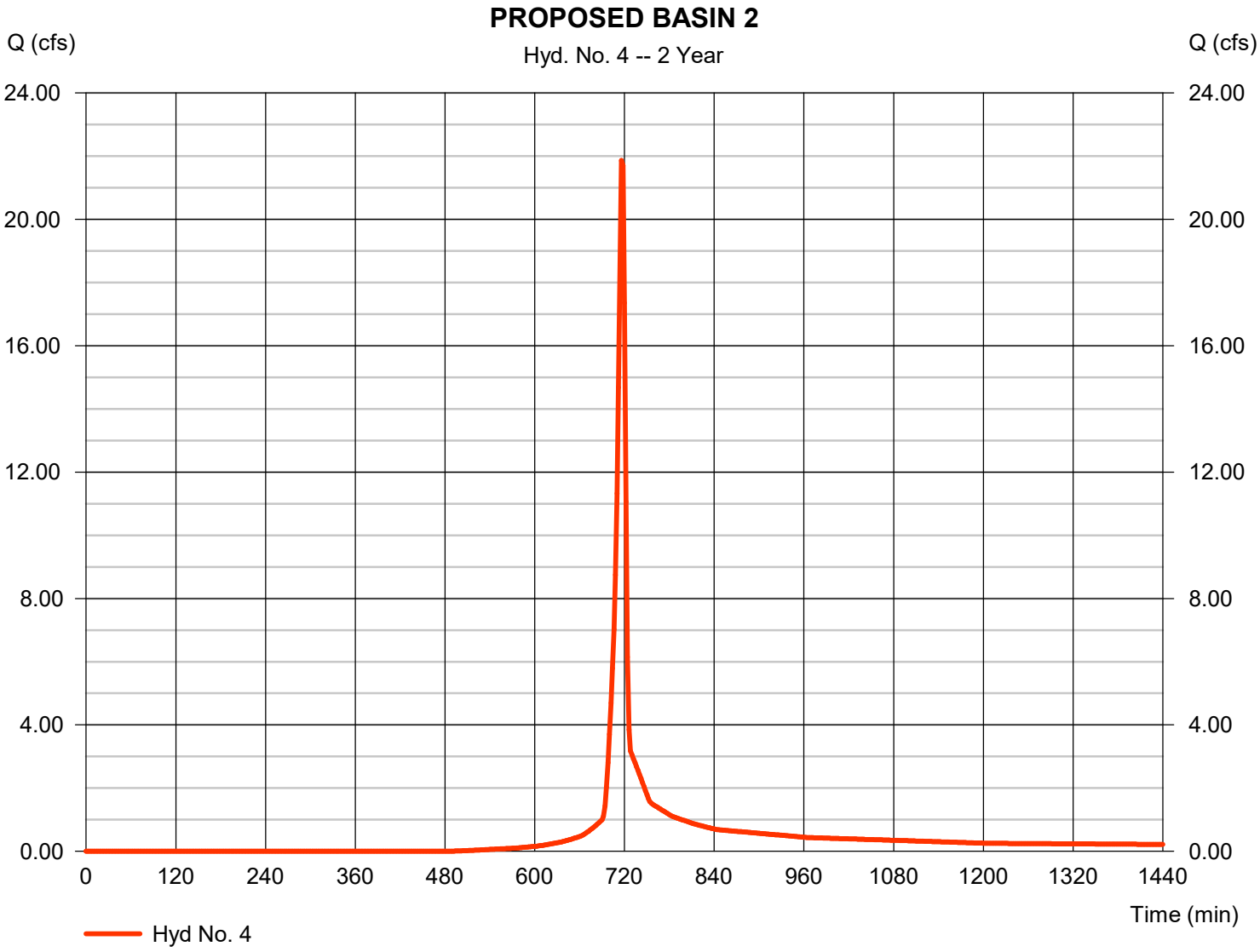
Hydrograph Report

Hyd. No. 4

PROPOSED BASIN 2

Hydrograph type	=	SCS Runoff	Peak discharge	=	21.86 cfs
Storm frequency	=	2 yrs	Time to peak	=	716 min
Time interval	=	2 min	Hyd. volume	=	44,215 cuft
Drainage area	=	6.350 ac	Curve number	=	81*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	3.91 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.160 x 98) + (4.950 x 85) + (1.240 x 61)] / 6.350



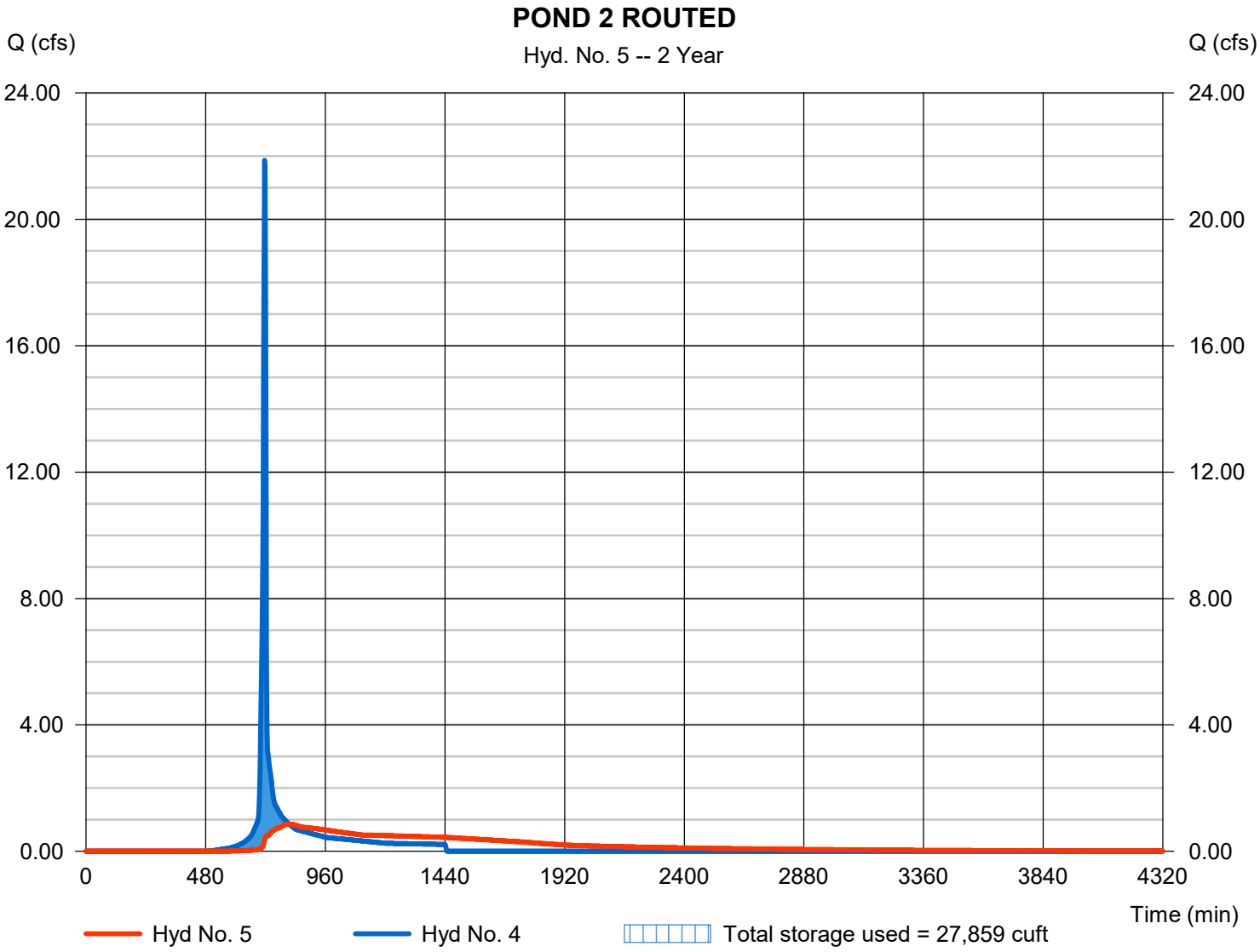
Hydrograph Report

Hyd. No. 5

POND 2 ROUTED

Hydrograph type	=	Reservoir	Peak discharge	=	0.860 cfs
Storm frequency	=	2 yrs	Time to peak	=	814 min
Time interval	=	2 min	Hyd. volume	=	44,161 cuft
Inflow hyd. No.	=	4 - PROPOSED BASIN 2	Max. Elevation	=	891.82 ft
Reservoir name	=	PROPOSED POND 2	Max. Storage	=	27,859 cuft

Storage Indication method used. Wet pond routing start elevation = 890.00 ft.



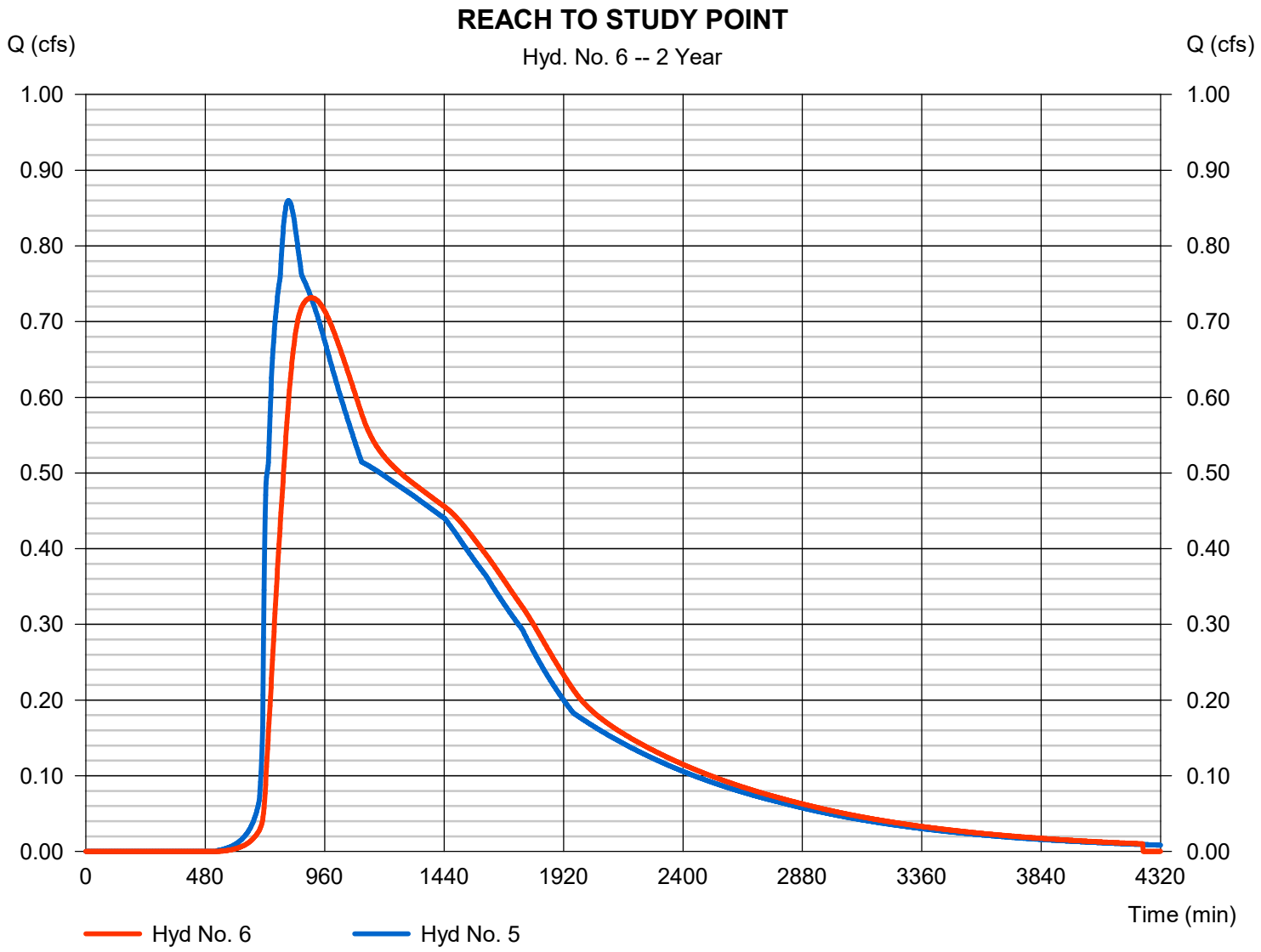
Hydrograph Report

Hyd. No. 6

REACH TO STUDY POINT

Hydrograph type	=	Reach	Peak discharge	=	0.732 cfs
Storm frequency	=	2 yrs	Time to peak	=	906 min
Time interval	=	2 min	Hyd. volume	=	43,768 cuft
Inflow hyd. No.	=	5 - POND 2 ROUTED	Section type	=	Trapezoidal
Reach length	=	2127.0 ft	Channel slope	=	0.2 %
Manning's n	=	0.025	Bottom width	=	32.5 ft
Side slope	=	2.5:1	Max. depth	=	5.0 ft
Rating curve x	=	0.240	Rating curve m	=	1.512
Ave. velocity	=	0.37 ft/s	Routing coeff.	=	0.0311

Modified Att-Kin routing method used.



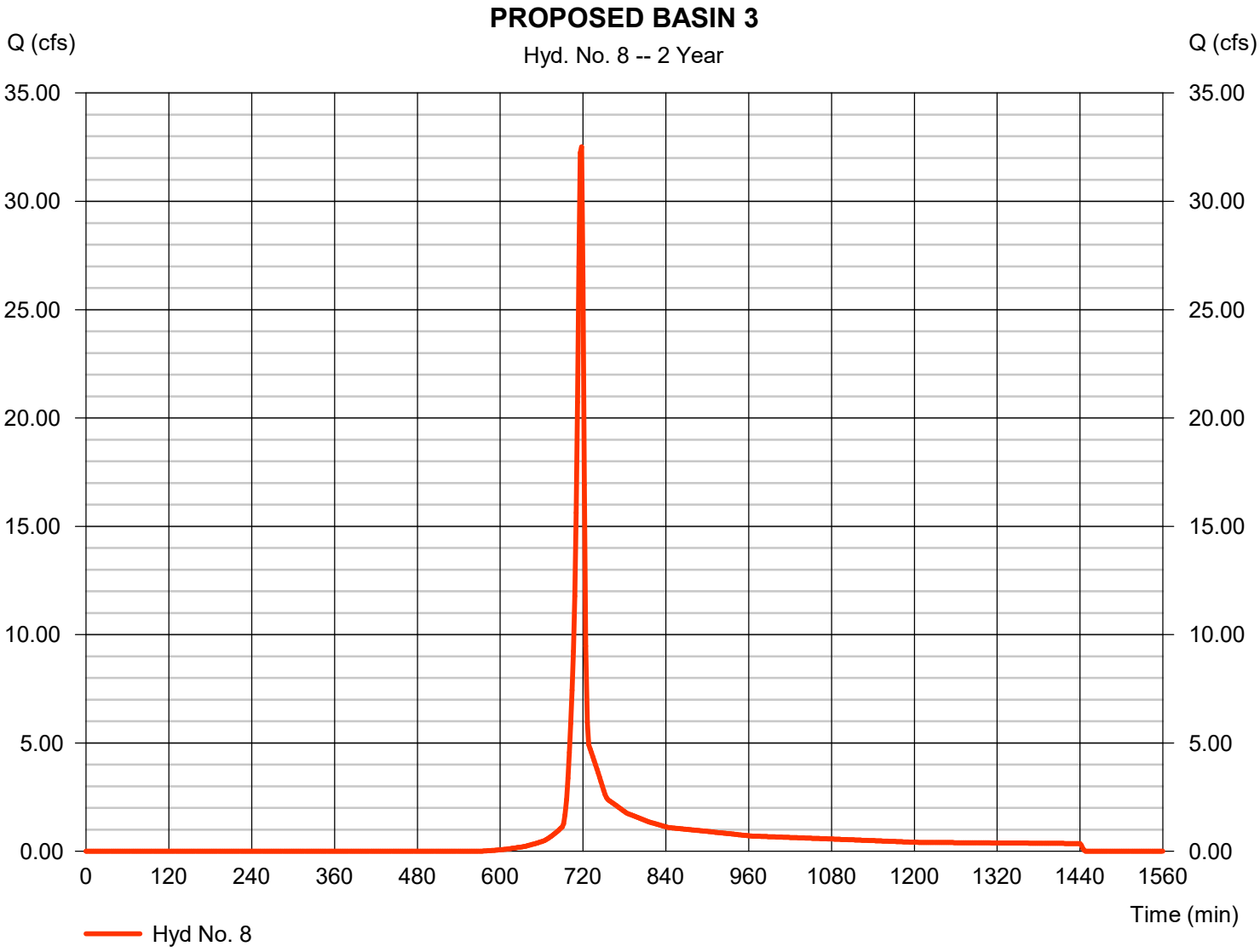
Hydrograph Report

Hyd. No. 8

PROPOSED BASIN 3

Hydrograph type	=	SCS Runoff	Peak discharge	=	32.52 cfs
Storm frequency	=	2 yrs	Time to peak	=	718 min
Time interval	=	2 min	Hyd. volume	=	65,240 cuft
Drainage area	=	11.480 ac	Curve number	=	76*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	3.91 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(2.490 x 98) + (3.270 x 85) + (5.720 x 61)] / 11.480



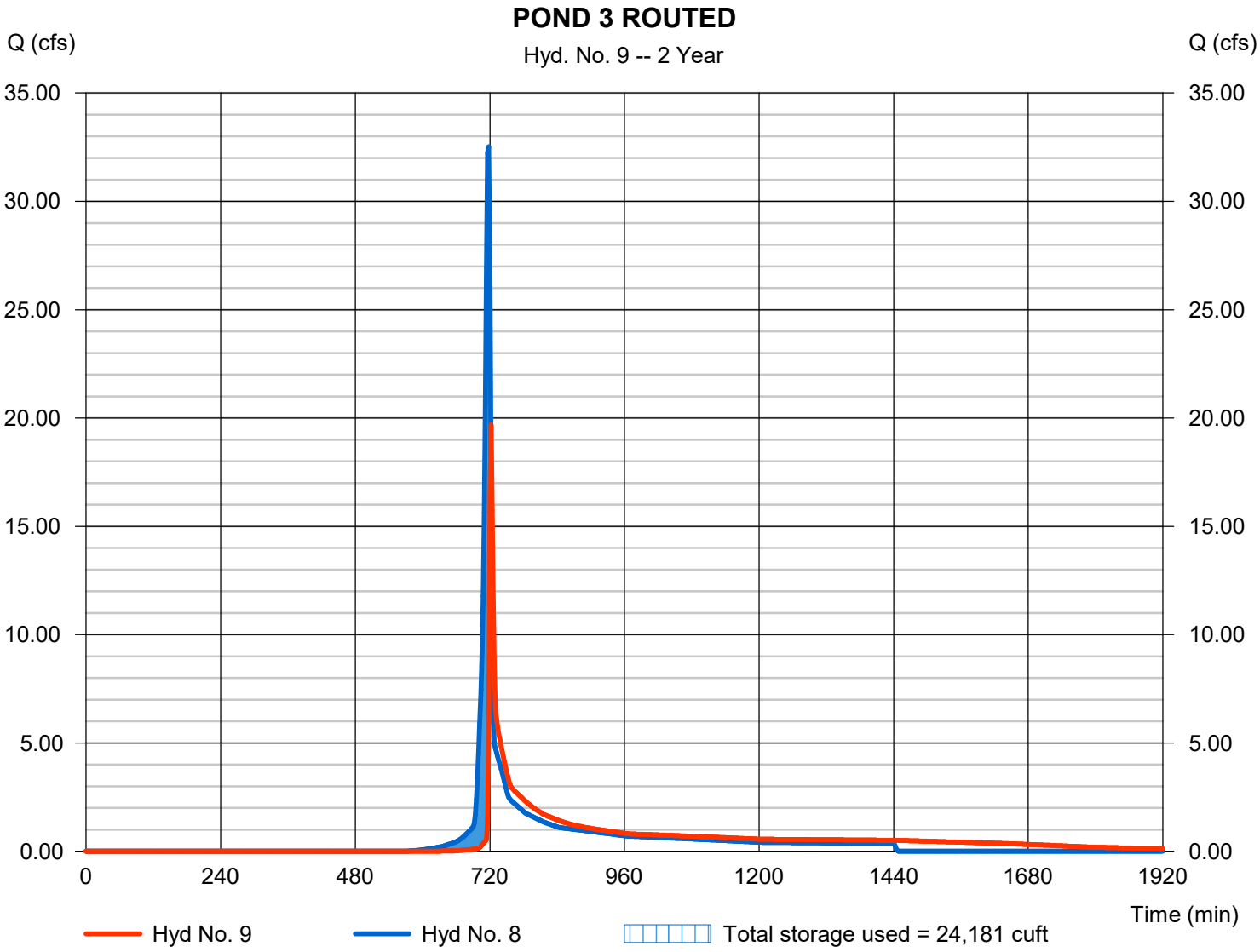
Hydrograph Report

Hyd. No. 9

POND 3 ROUTED

Hydrograph type	=	Reservoir	Peak discharge	=	19.69 cfs
Storm frequency	=	2 yrs	Time to peak	=	722 min
Time interval	=	2 min	Hyd. volume	=	65,205 cuft
Inflow hyd. No.	=	8 - PROPOSED BASIN 3	Max. Elevation	=	893.83 ft
Reservoir name	=	PROPOSED POND 3	Max. Storage	=	24,181 cuft

Storage Indication method used. Wet pond routing start elevation = 891.00 ft.



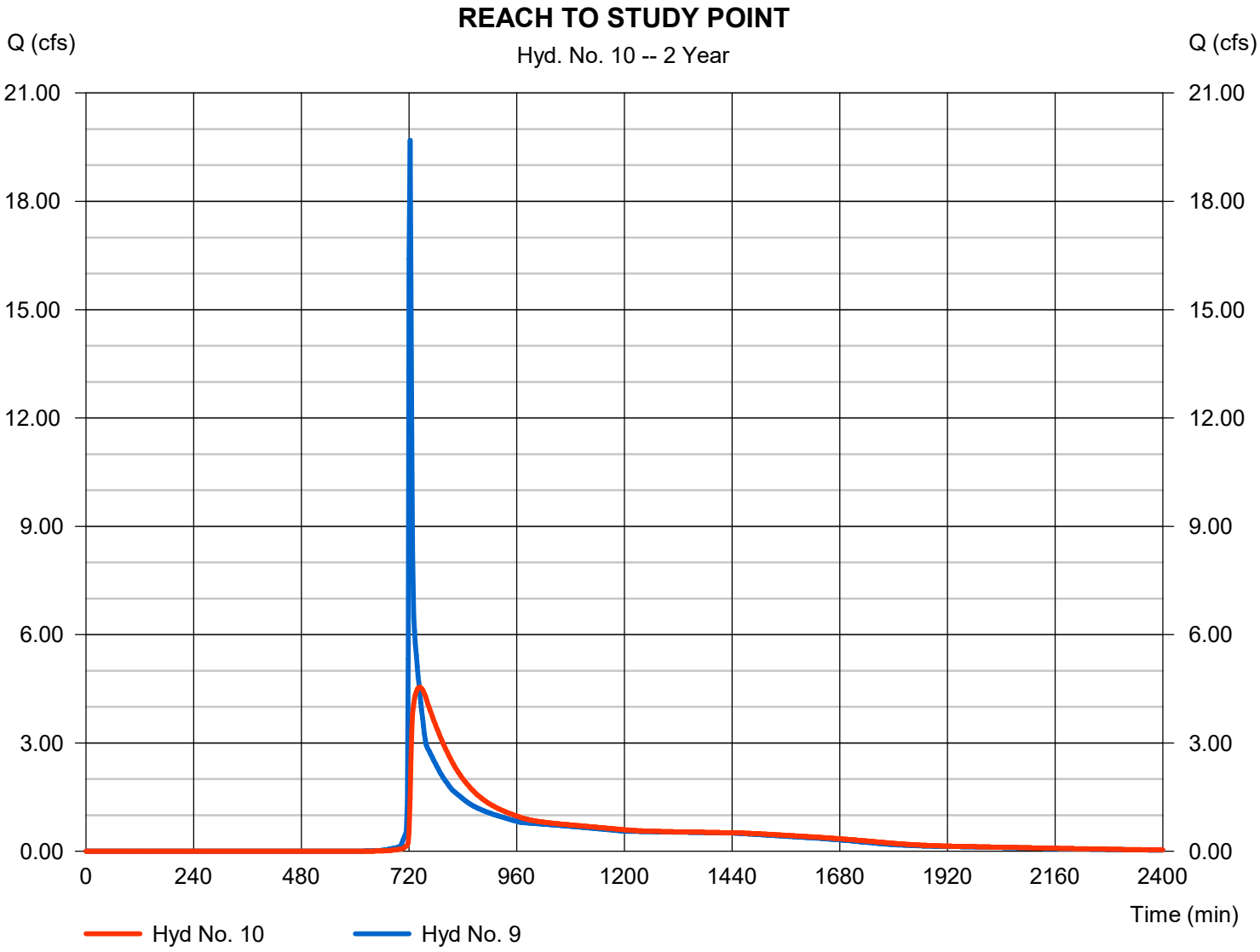
Hydrograph Report

Hyd. No. 10

REACH TO STUDY POINT

Hydrograph type	=	Reach	Peak discharge	=	4.542 cfs
Storm frequency	=	2 yrs	Time to peak	=	744 min
Time interval	=	2 min	Hyd. volume	=	64,892 cuft
Inflow hyd. No.	=	9 - POND 3 ROUTED	Section type	=	Trapezoidal
Reach length	=	3079.0 ft	Channel slope	=	0.2 %
Manning's n	=	0.025	Bottom width	=	32.5 ft
Side slope	=	2.5:1	Max. depth	=	5.0 ft
Rating curve x	=	0.229	Rating curve m	=	1.512
Ave. velocity	=	1.04 ft/s	Routing coeff.	=	0.0592

Modified Att-Kin routing method used.



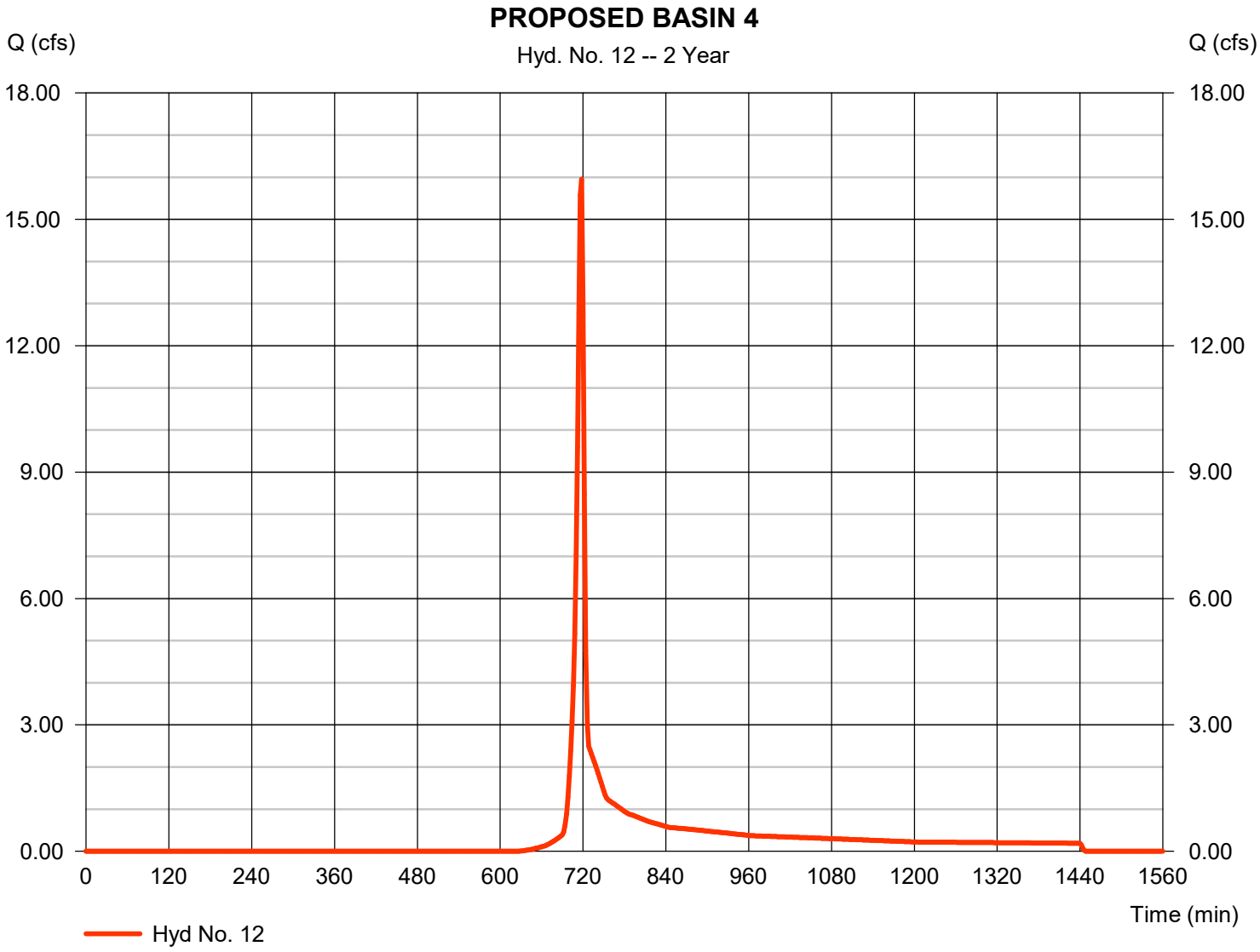
Hydrograph Report

Hyd. No. 12

PROPOSED BASIN 4

Hydrograph type	= SCS Runoff	Peak discharge	= 15.95 cfs
Storm frequency	= 2 yrs	Time to peak	= 718 min
Time interval	= 2 min	Hyd. volume	= 31,908 cuft
Drainage area	= 6.710 ac	Curve number	= 72*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 3.91 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.260 x 98) + (2.540 x 85) + (3.910 x 61)] / 6.710



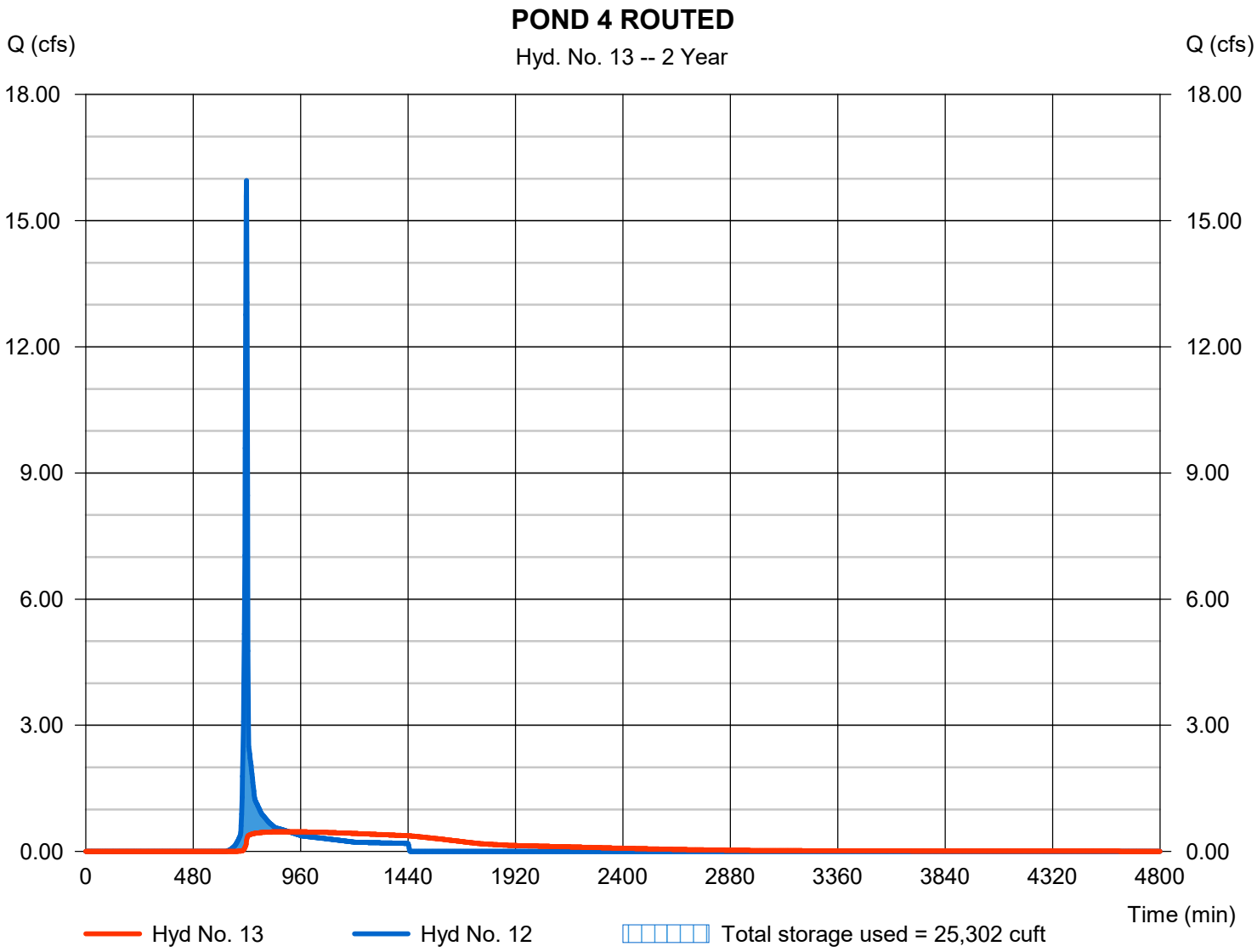
Hydrograph Report

Hyd. No. 13

POND 4 ROUTED

Hydrograph type	=	Reservoir	Peak discharge	=	0.469 cfs
Storm frequency	=	2 yrs	Time to peak	=	906 min
Time interval	=	2 min	Hyd. volume	=	31,817 cuft
Inflow hyd. No.	=	12 - PROPOSED BASIN 4	Max. Elevation	=	896.40 ft
Reservoir name	=	PROPOSED POND 4	Max. Storage	=	25,302 cuft

Storage Indication method used. Wet pond routing start elevation = 895.00 ft.



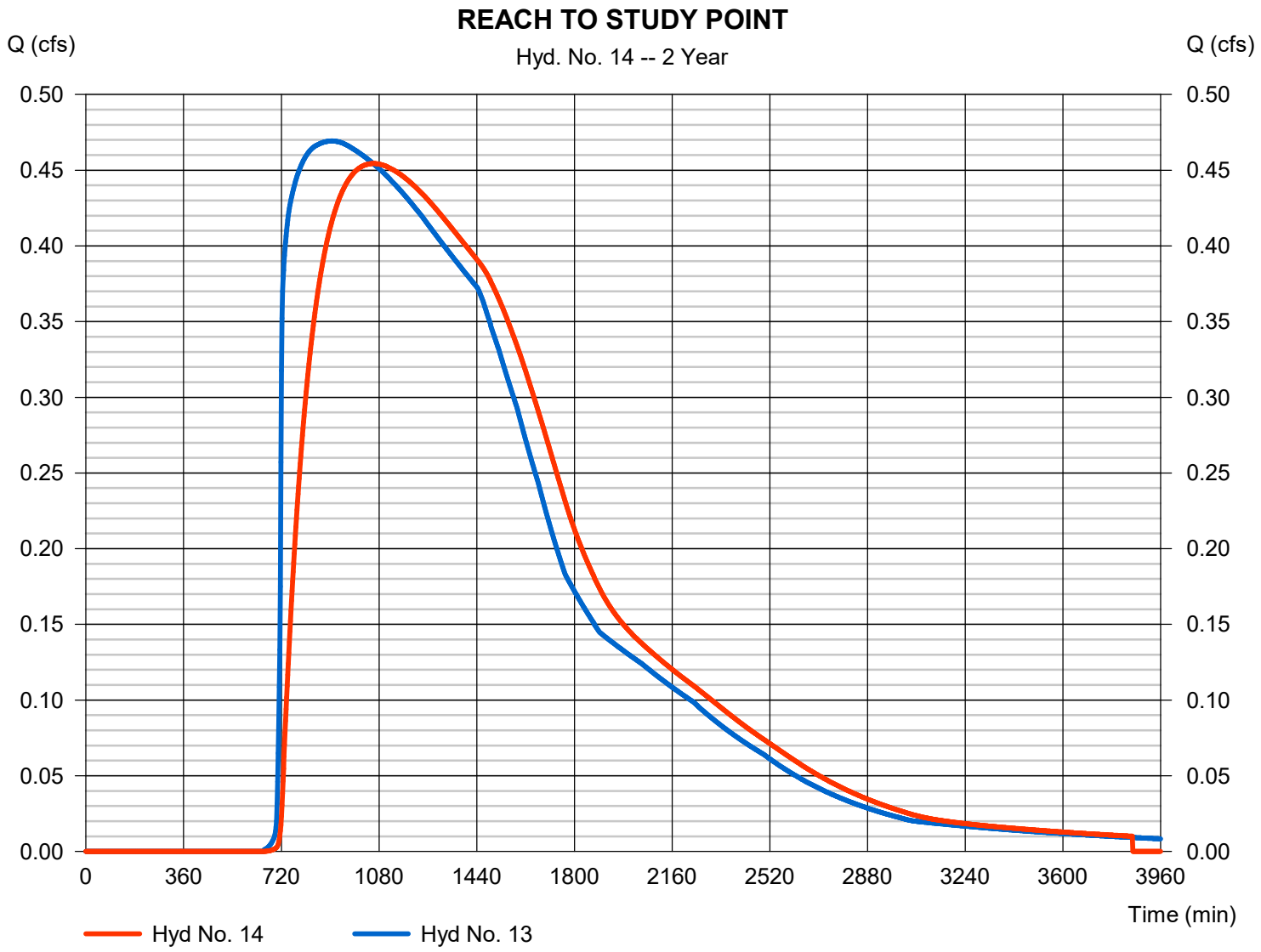
Hydrograph Report

Hyd. No. 14

REACH TO STUDY POINT

Hydrograph type	=	Reach	Peak discharge	=	0.454 cfs
Storm frequency	=	2 yrs	Time to peak	=	1058 min
Time interval	=	2 min	Hyd. volume	=	31,287 cuft
Inflow hyd. No.	=	13 - POND 4 ROUTED	Section type	=	Trapezoidal
Reach length	=	2721.0 ft	Channel slope	=	0.3 %
Manning's n	=	0.025	Bottom width	=	32.5 ft
Side slope	=	2.5:1	Max. depth	=	5.0 ft
Rating curve x	=	0.329	Rating curve m	=	1.512
Ave. velocity	=	0.37 ft/s	Routing coeff.	=	0.0244

Modified Att-Kin routing method used.



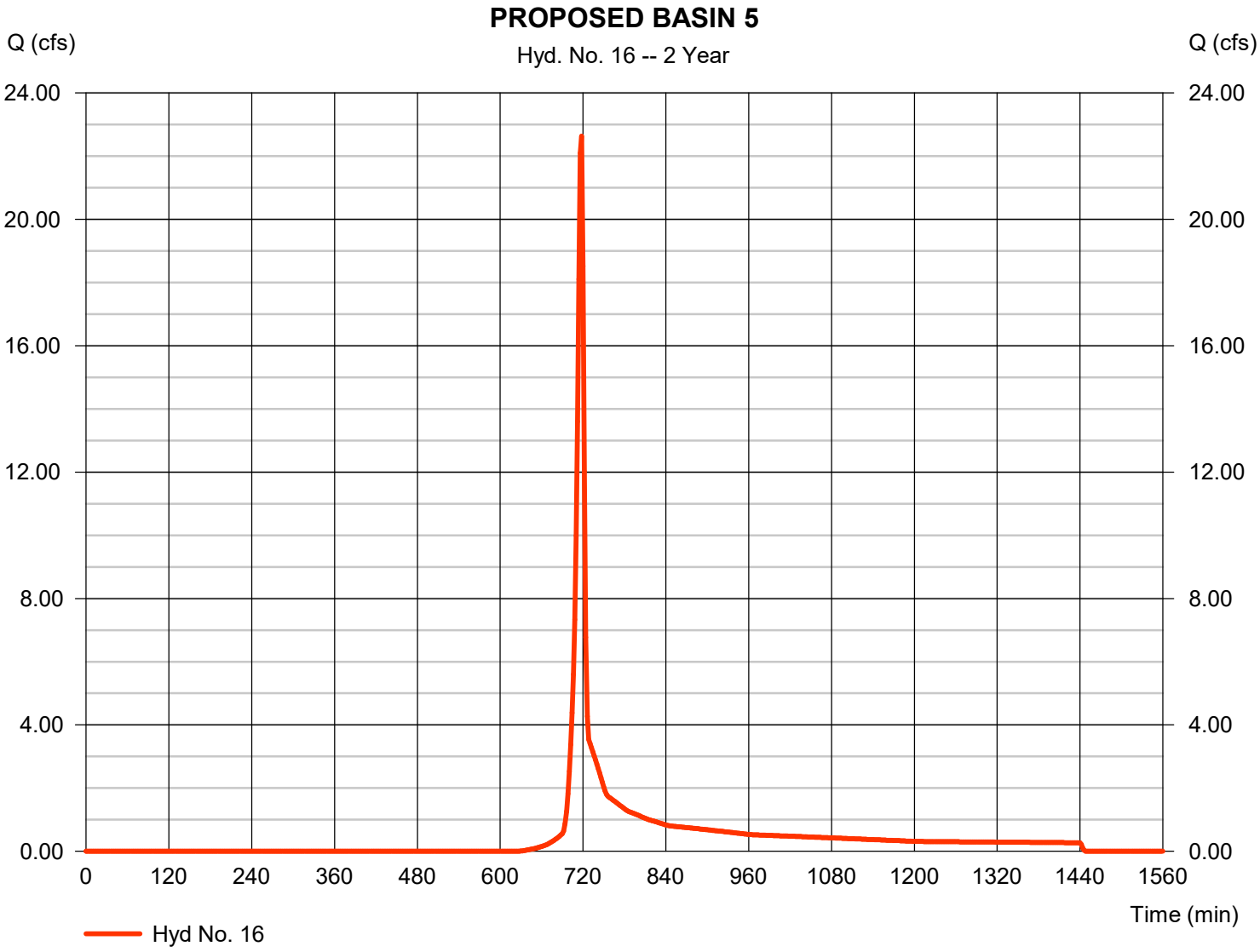
Hydrograph Report

Hyd. No. 16

PROPOSED BASIN 5

Hydrograph type	= SCS Runoff	Peak discharge	= 22.64 cfs
Storm frequency	= 2 yrs	Time to peak	= 718 min
Time interval	= 2 min	Hyd. volume	= 45,270 cuft
Drainage area	= 9.520 ac	Curve number	= 72*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 3.91 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.310 x 98) + (4.000 x 85) + (5.210 x 61)] / 9.520



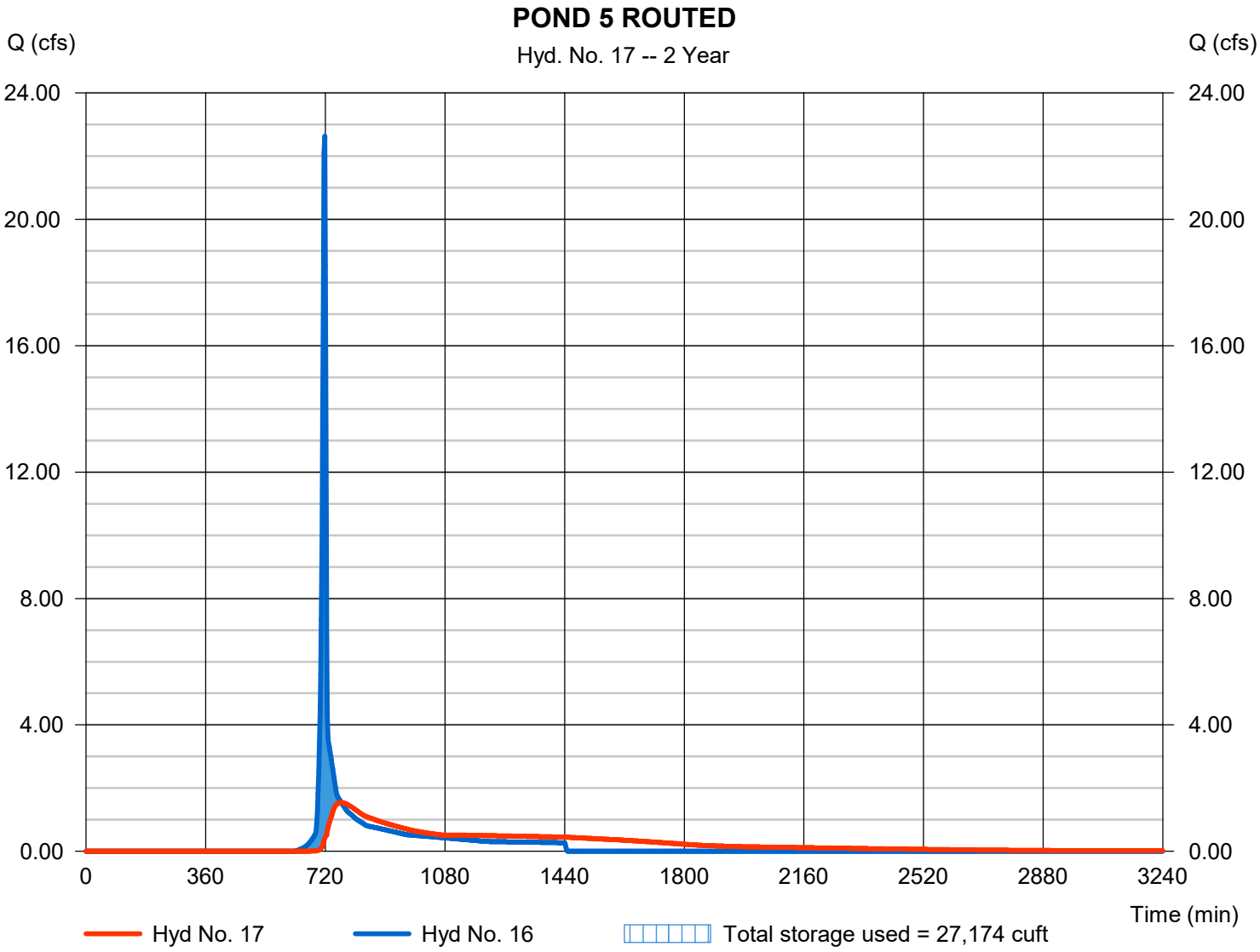
Hydrograph Report

Hyd. No. 17

POND 5 ROUTED

Hydrograph type	=	Reservoir	Peak discharge	=	1.541 cfs
Storm frequency	=	2 yrs	Time to peak	=	768 min
Time interval	=	2 min	Hyd. volume	=	45,217 cuft
Inflow hyd. No.	=	16 - PROPOSED BASIN 5	Max. Elevation	=	894.87 ft
Reservoir name	=	PROPOSED POND 5	Max. Storage	=	27,174 cuft

Storage Indication method used. Wet pond routing start elevation = 893.00 ft.



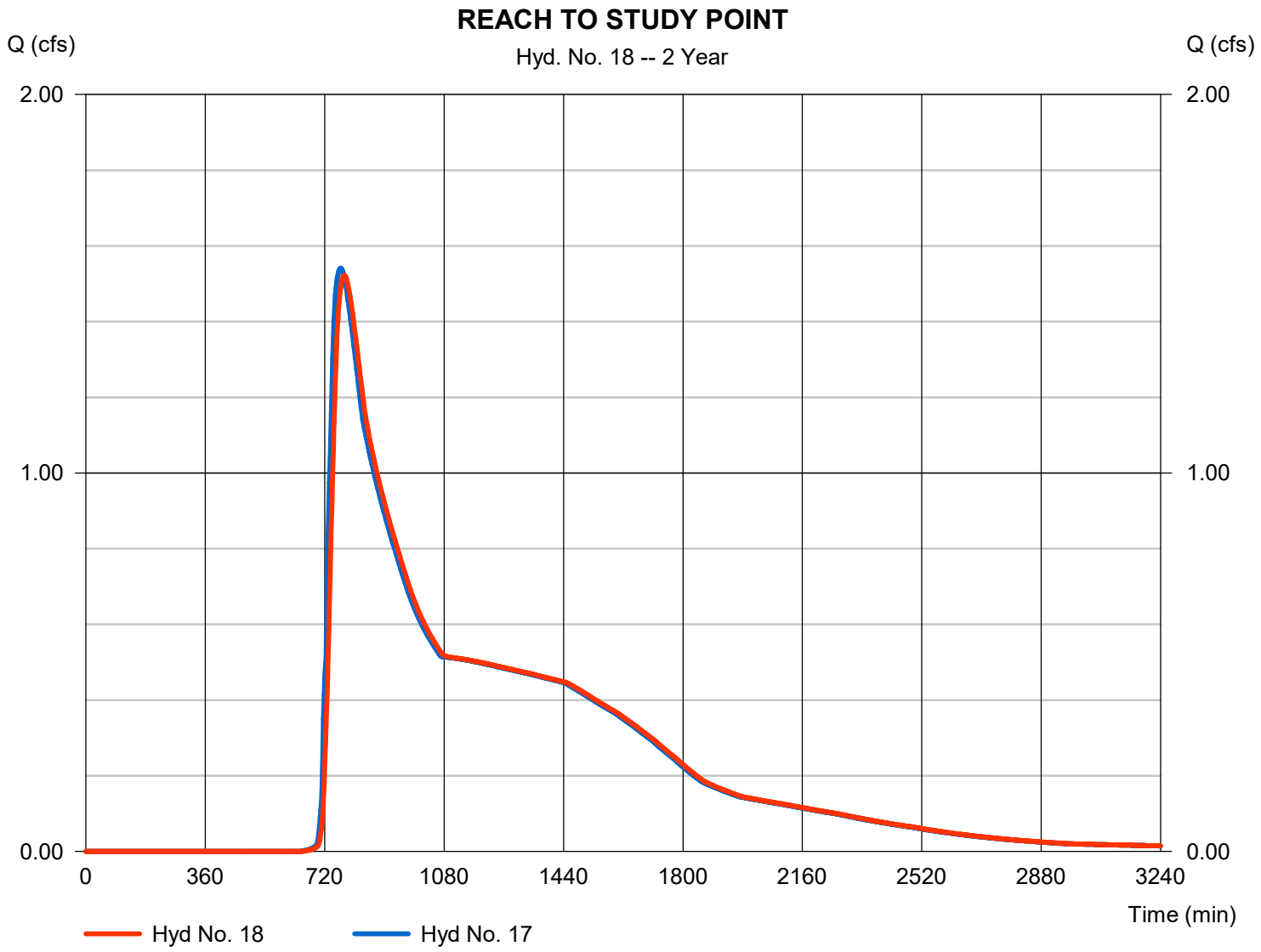
Hydrograph Report

Hyd. No. 18

REACH TO STUDY POINT

Hydrograph type	=	Reach	Peak discharge	=	1.522 cfs
Storm frequency	=	2 yrs	Time to peak	=	778 min
Time interval	=	2 min	Hyd. volume	=	44,737 cuft
Inflow hyd. No.	=	17 - POND 5 ROUTED	Section type	=	Trapezoidal
Reach length	=	597.0 ft	Channel slope	=	1.1 %
Manning's n	=	0.025	Bottom width	=	32.5 ft
Side slope	=	2.5:1	Max. depth	=	5.0 ft
Rating curve x	=	0.610	Rating curve m	=	1.512
Ave. velocity	=	0.83 ft/s	Routing coeff.	=	0.2251

Modified Att-Kin routing method used.

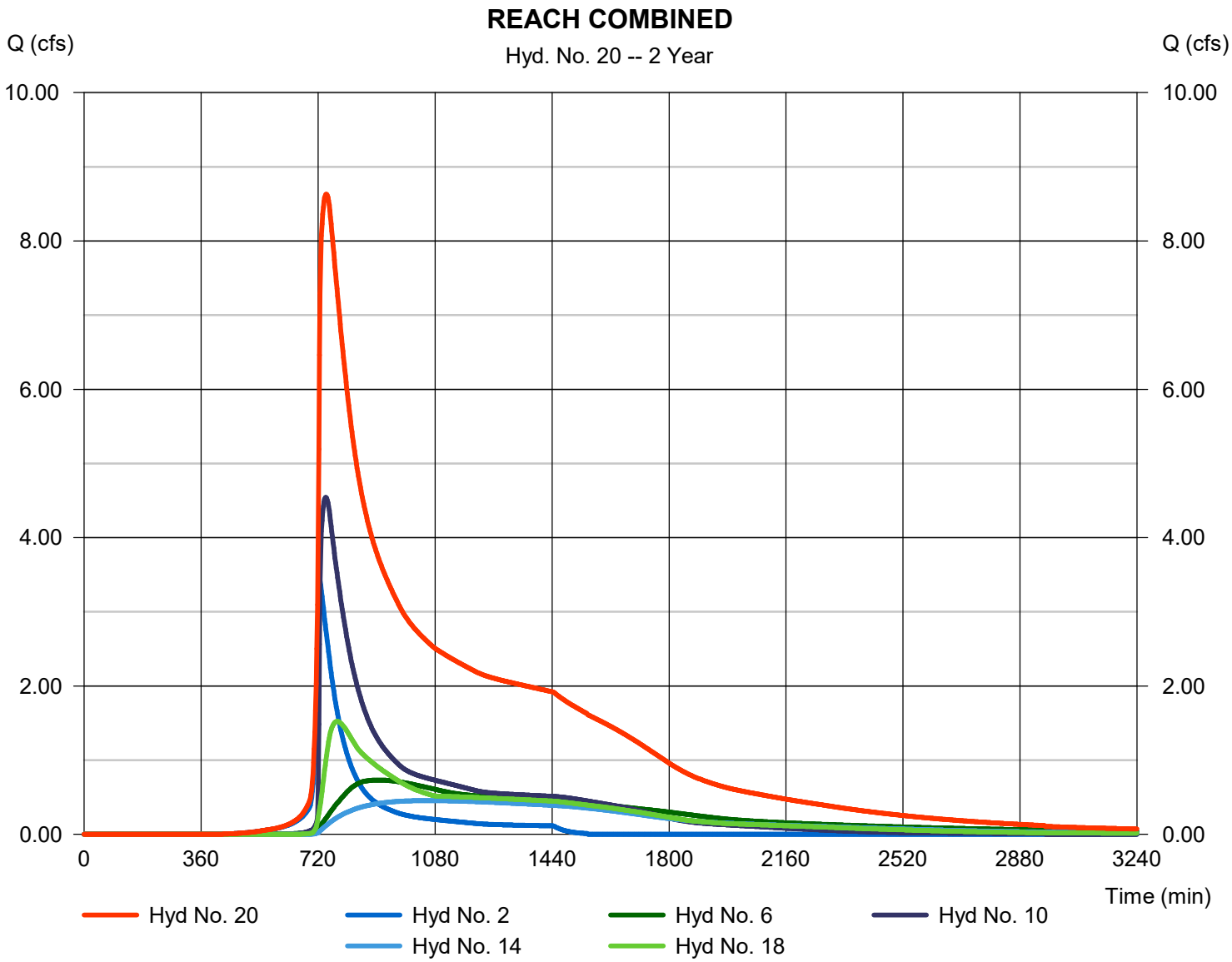


Hydrograph Report

Hyd. No. 20

REACH COMBINED

Hydrograph type	=	Combine	Peak discharge	=	8.631 cfs
Storm frequency	=	2 yrs	Time to peak	=	746 min
Time interval	=	2 min	Hyd. volume	=	209,337 cuft
Inflow hyds.	=	2, 6, 10, 14, 18	Contrib. drain. area	=	0.000 ac



Hydrograph Summary Report

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

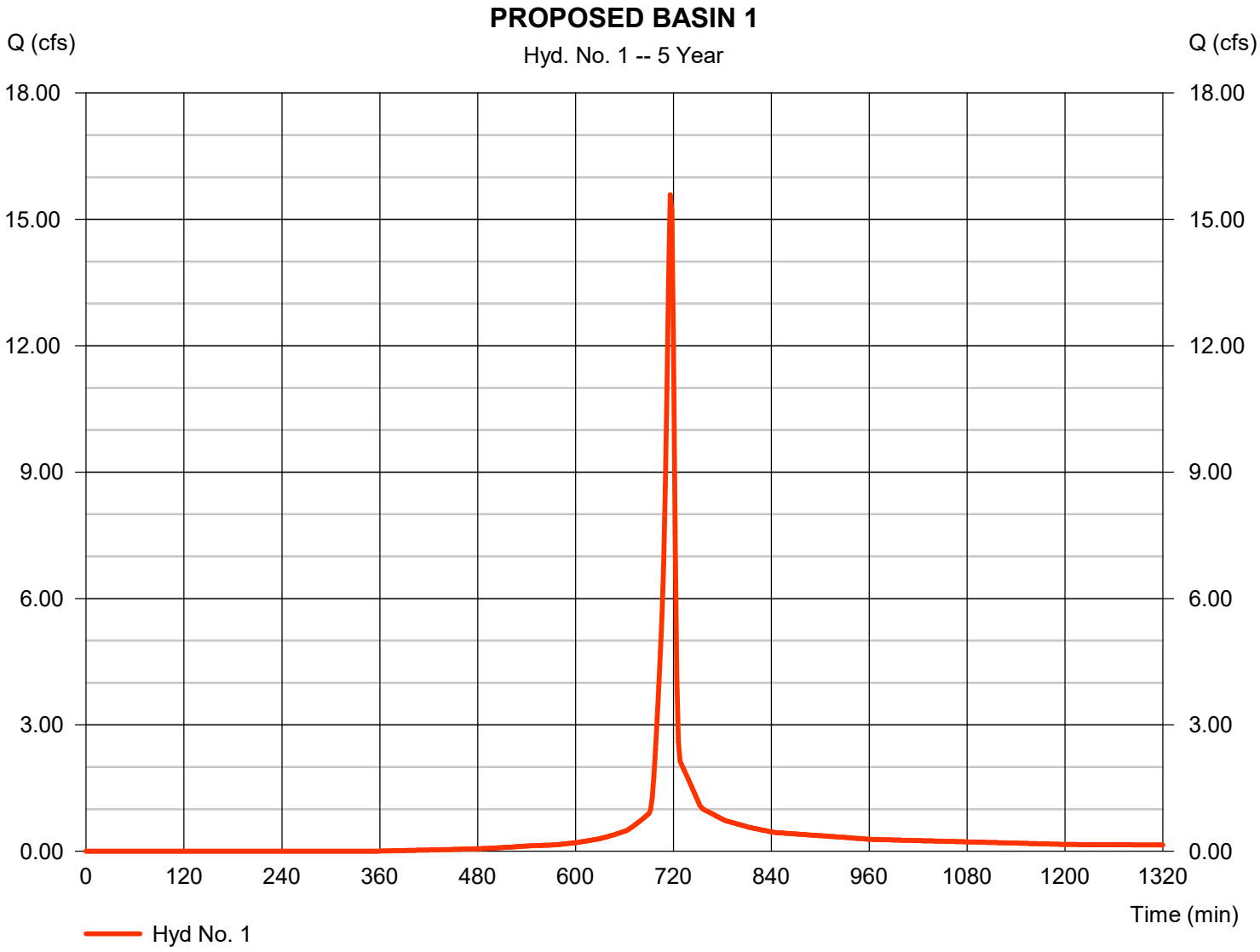
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	15.58	2	716	32,188	------	------	------	PROPOSED BASIN 1
2	Reach	4.943	2	724	32,165	1	------	------	REACH TO STUDY POINT
4	SCS Runoff	29.00	2	716	59,007	------	------	------	PROPOSED BASIN 2
5	Reservoir	2.570	2	746	58,949	4	892.14	32,723	POND 2 ROUTED
6	Reach	1.862	2	800	58,560	5	------	------	REACH TO STUDY POINT
8	SCS Runoff	44.48	2	716	89,802	------	------	------	PROPOSED BASIN 3
9	Reservoir	39.61	2	720	89,767	8	894.08	26,435	POND 3 ROUTED
10	Reach	10.72	2	730	89,454	9	------	------	REACH TO STUDY POINT
12	SCS Runoff	22.52	2	718	45,145	------	------	------	PROPOSED BASIN 4
13	Reservoir	1.045	2	804	45,037	12	896.86	31,868	POND 4 ROUTED
14	Reach	0.855	2	874	44,524	13	------	------	REACH TO STUDY POINT
16	SCS Runoff	31.95	2	718	64,050	------	------	------	PROPOSED BASIN 5
17	Reservoir	4.763	2	728	63,997	16	895.33	32,845	POND 5 ROUTED
18	Reach	4.556	2	742	63,516	17	------	------	REACH TO STUDY POINT
20	Combine	19.85	2	732	288,220	2, 6, 10, 14, 18,	------	------	REACH COMBINED

Hydrograph Report

Hyd. No. 1

PROPOSED BASIN 1

Hydrograph type	= SCS Runoff	Peak discharge	= 15.58 cfs
Storm frequency	= 5 yrs	Time to peak	= 716 min
Time interval	= 2 min	Hyd. volume	= 32,188 cuft
Drainage area	= 3.050 ac	Curve number	= 85
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 4.71 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



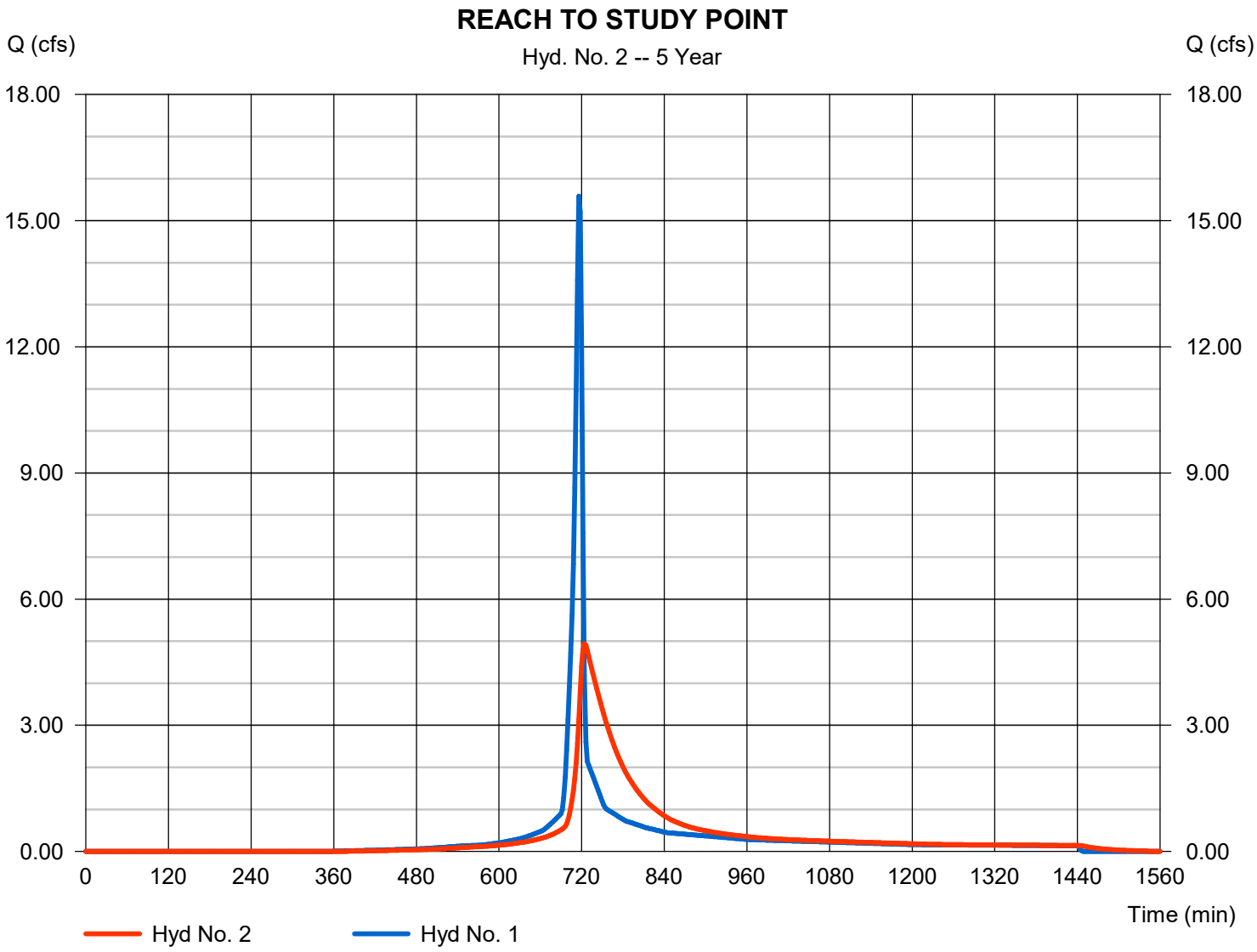
Hydrograph Report

Hyd. No. 2

REACH TO STUDY POINT

Hydrograph type	=	Reach	Peak discharge	=	4.943 cfs
Storm frequency	=	5 yrs	Time to peak	=	724 min
Time interval	=	2 min	Hyd. volume	=	32,165 cuft
Inflow hyd. No.	=	1 - PROPOSED BASIN 1	Section type	=	Trapezoidal
Reach length	=	2981.0 ft	Channel slope	=	0.2 %
Manning's n	=	0.025	Bottom width	=	32.5 ft
Side slope	=	2.5:1	Max. depth	=	5.0 ft
Rating curve x	=	0.262	Rating curve m	=	1.512
Ave. velocity	=	0.89 ft/s	Routing coeff.	=	0.0525

Modified Att-Kin routing method used.



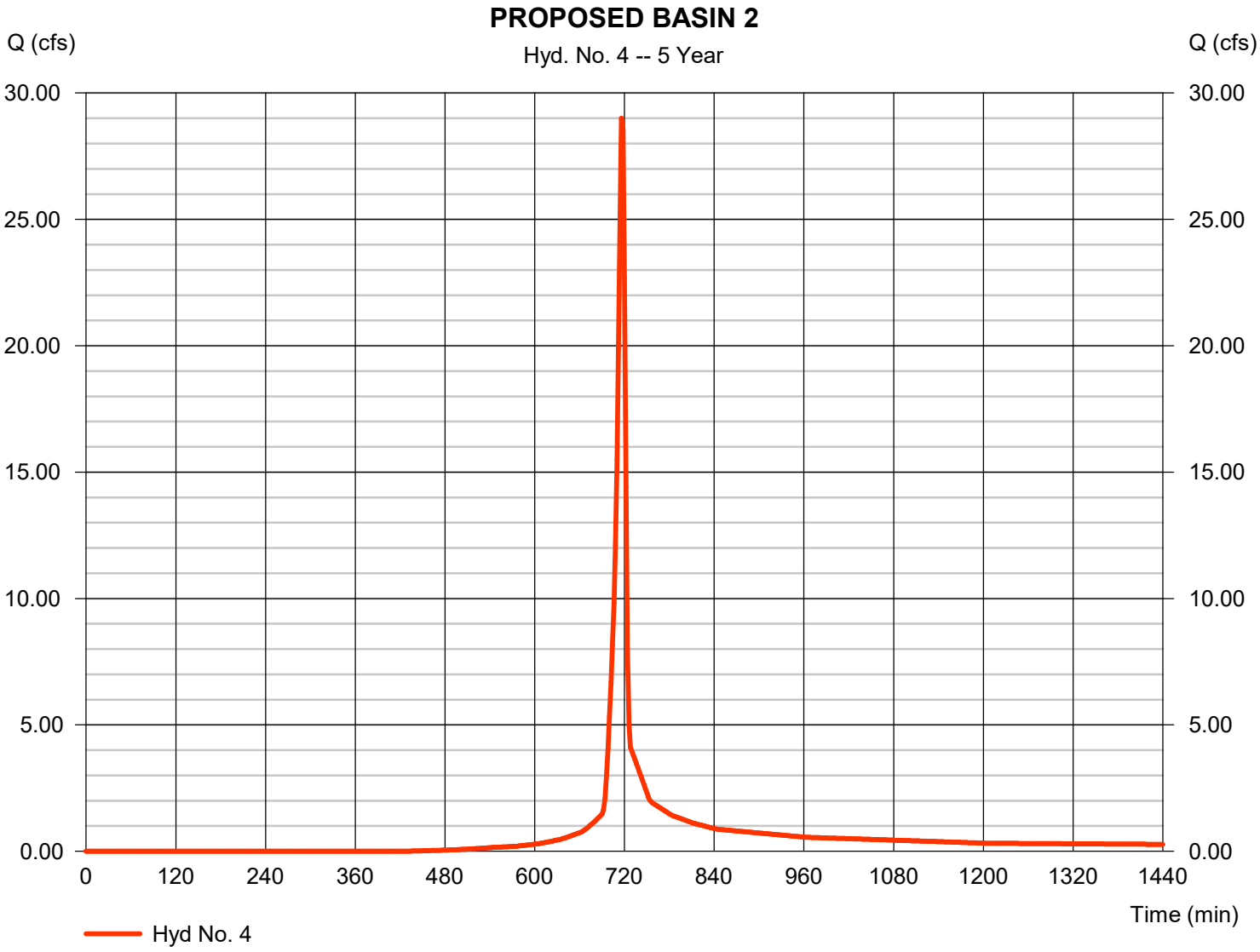
Hydrograph Report

Hyd. No. 4

PROPOSED BASIN 2

Hydrograph type	=	SCS Runoff	Peak discharge	=	29.00 cfs
Storm frequency	=	5 yrs	Time to peak	=	716 min
Time interval	=	2 min	Hyd. volume	=	59,007 cuft
Drainage area	=	6.350 ac	Curve number	=	81*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	4.71 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.160 x 98) + (4.950 x 85) + (1.240 x 61)] / 6.350



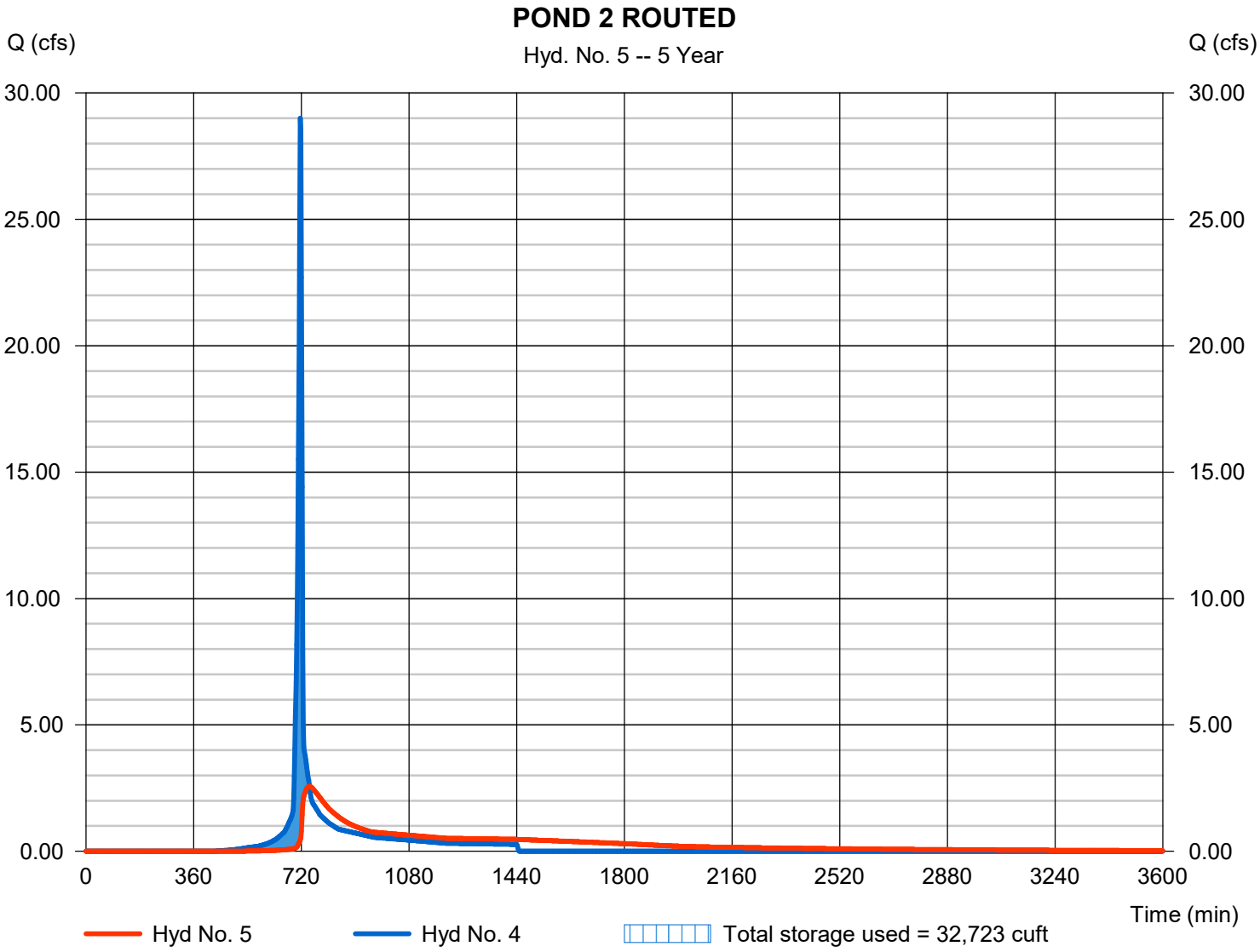
Hydrograph Report

Hyd. No. 5

POND 2 ROUTED

Hydrograph type	=	Reservoir	Peak discharge	=	2.570 cfs
Storm frequency	=	5 yrs	Time to peak	=	746 min
Time interval	=	2 min	Hyd. volume	=	58,949 cuft
Inflow hyd. No.	=	4 - PROPOSED BASIN 2	Max. Elevation	=	892.14 ft
Reservoir name	=	PROPOSED POND 2	Max. Storage	=	32,723 cuft

Storage Indication method used. Wet pond routing start elevation = 890.00 ft.



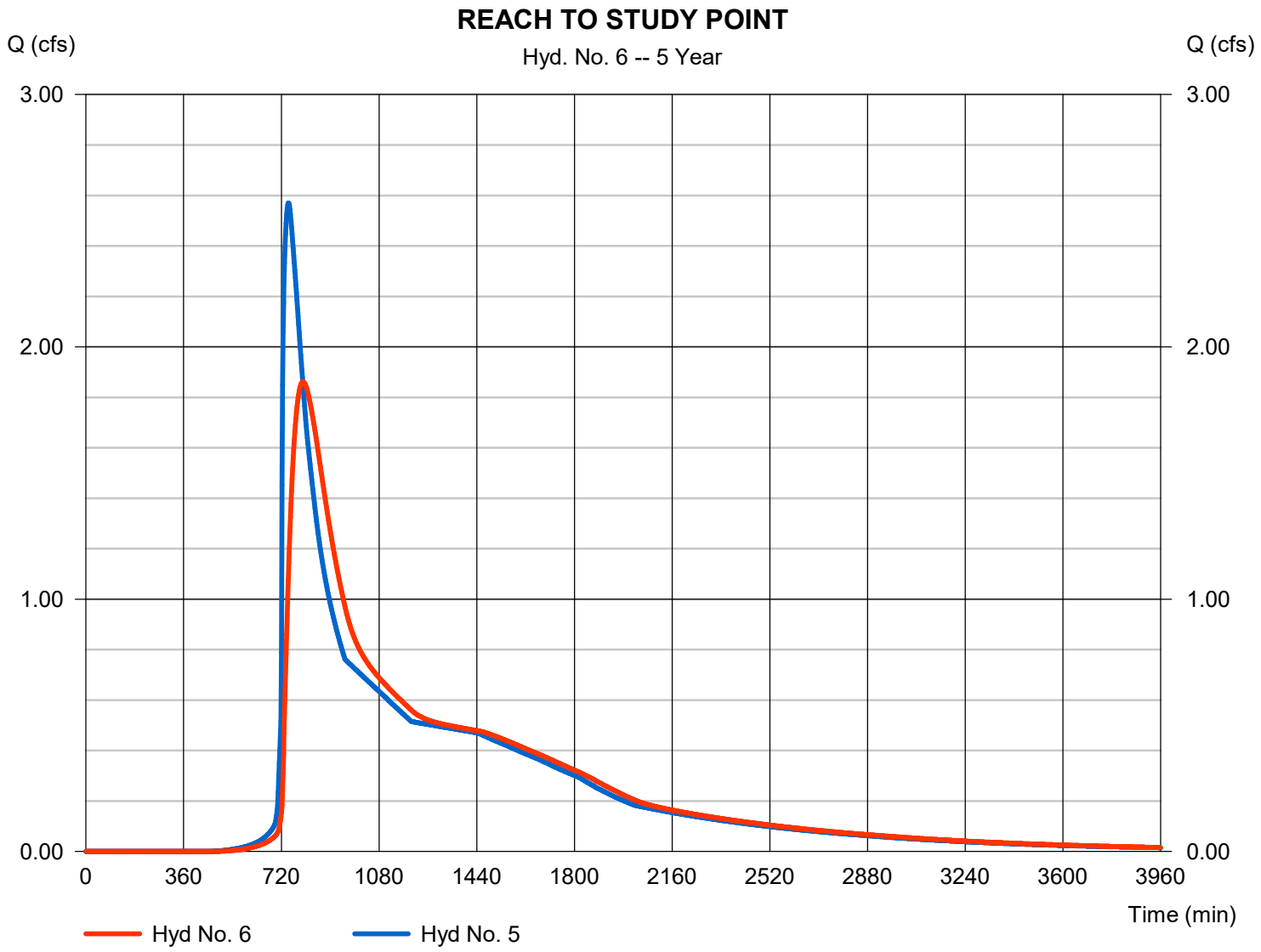
Hydrograph Report

Hyd. No. 6

REACH TO STUDY POINT

Hydrograph type	=	Reach	Peak discharge	=	1.862 cfs
Storm frequency	=	5 yrs	Time to peak	=	800 min
Time interval	=	2 min	Hyd. volume	=	58,560 cuft
Inflow hyd. No.	=	5 - POND 2 ROUTED	Section type	=	Trapezoidal
Reach length	=	2127.0 ft	Channel slope	=	0.2 %
Manning's n	=	0.025	Bottom width	=	32.5 ft
Side slope	=	2.5:1	Max. depth	=	5.0 ft
Rating curve x	=	0.240	Rating curve m	=	1.512
Ave. velocity	=	0.54 ft/s	Routing coeff.	=	0.0447

Modified Att-Kin routing method used.



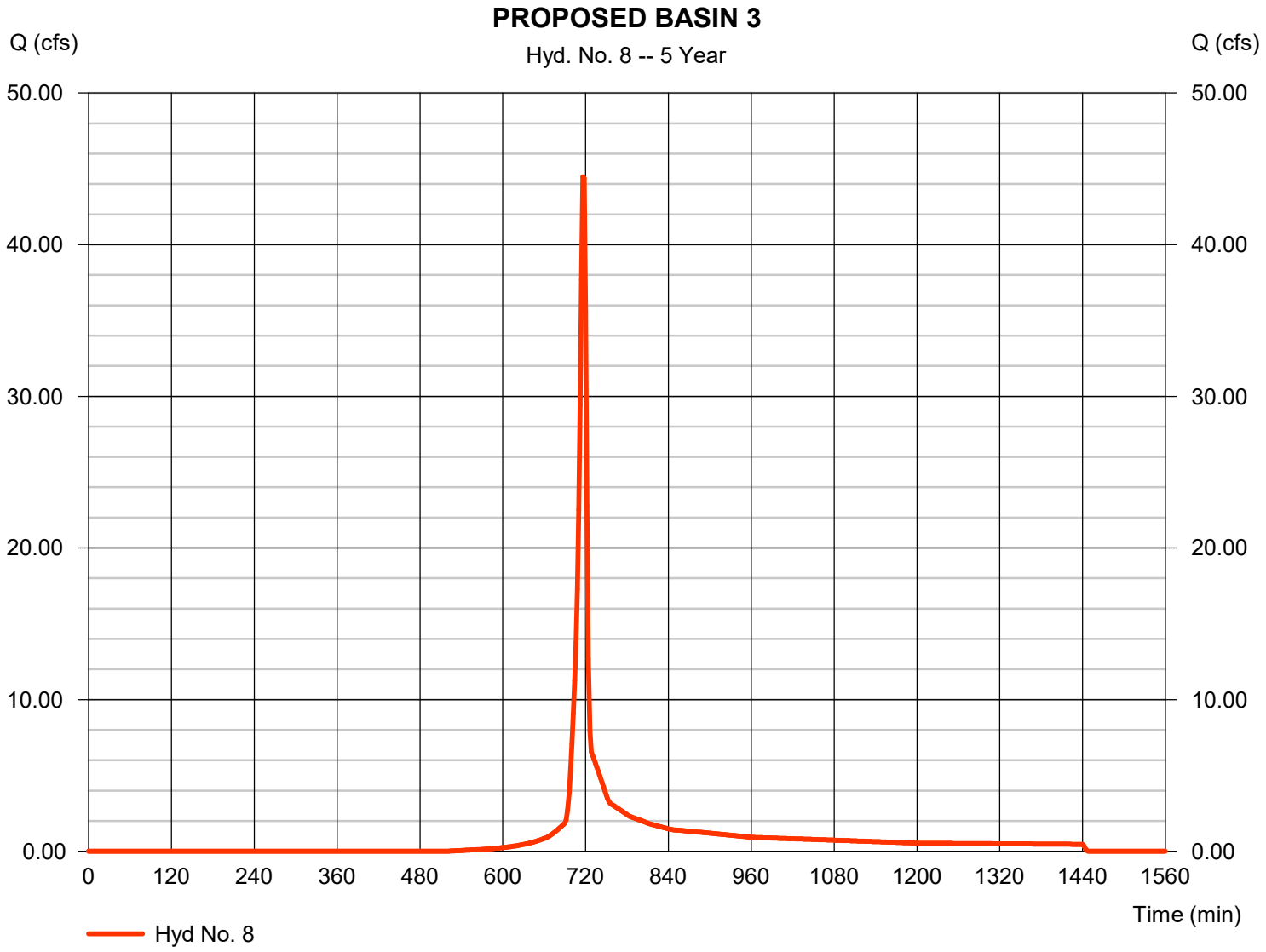
Hydrograph Report

Hyd. No. 8

PROPOSED BASIN 3

Hydrograph type	=	SCS Runoff	Peak discharge	=	44.48 cfs
Storm frequency	=	5 yrs	Time to peak	=	716 min
Time interval	=	2 min	Hyd. volume	=	89,802 cuft
Drainage area	=	11.480 ac	Curve number	=	76*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	4.71 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(2.490 x 98) + (3.270 x 85) + (5.720 x 61)] / 11.480



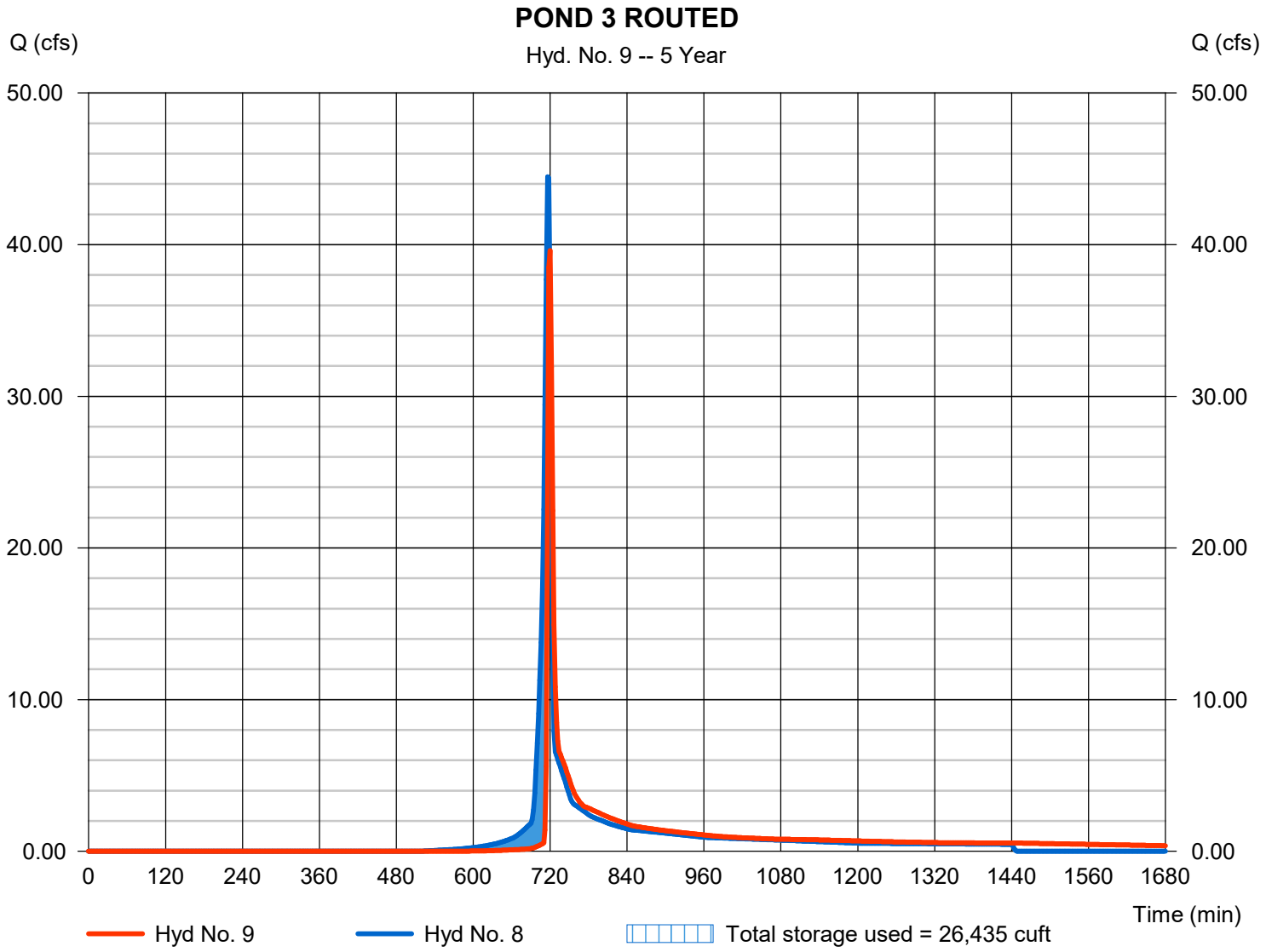
Hydrograph Report

Hyd. No. 9

POND 3 ROUTED

Hydrograph type	=	Reservoir	Peak discharge	=	39.61 cfs
Storm frequency	=	5 yrs	Time to peak	=	720 min
Time interval	=	2 min	Hyd. volume	=	89,767 cuft
Inflow hyd. No.	=	8 - PROPOSED BASIN 3	Max. Elevation	=	894.08 ft
Reservoir name	=	PROPOSED POND 3	Max. Storage	=	26,435 cuft

Storage Indication method used. Wet pond routing start elevation = 891.00 ft.



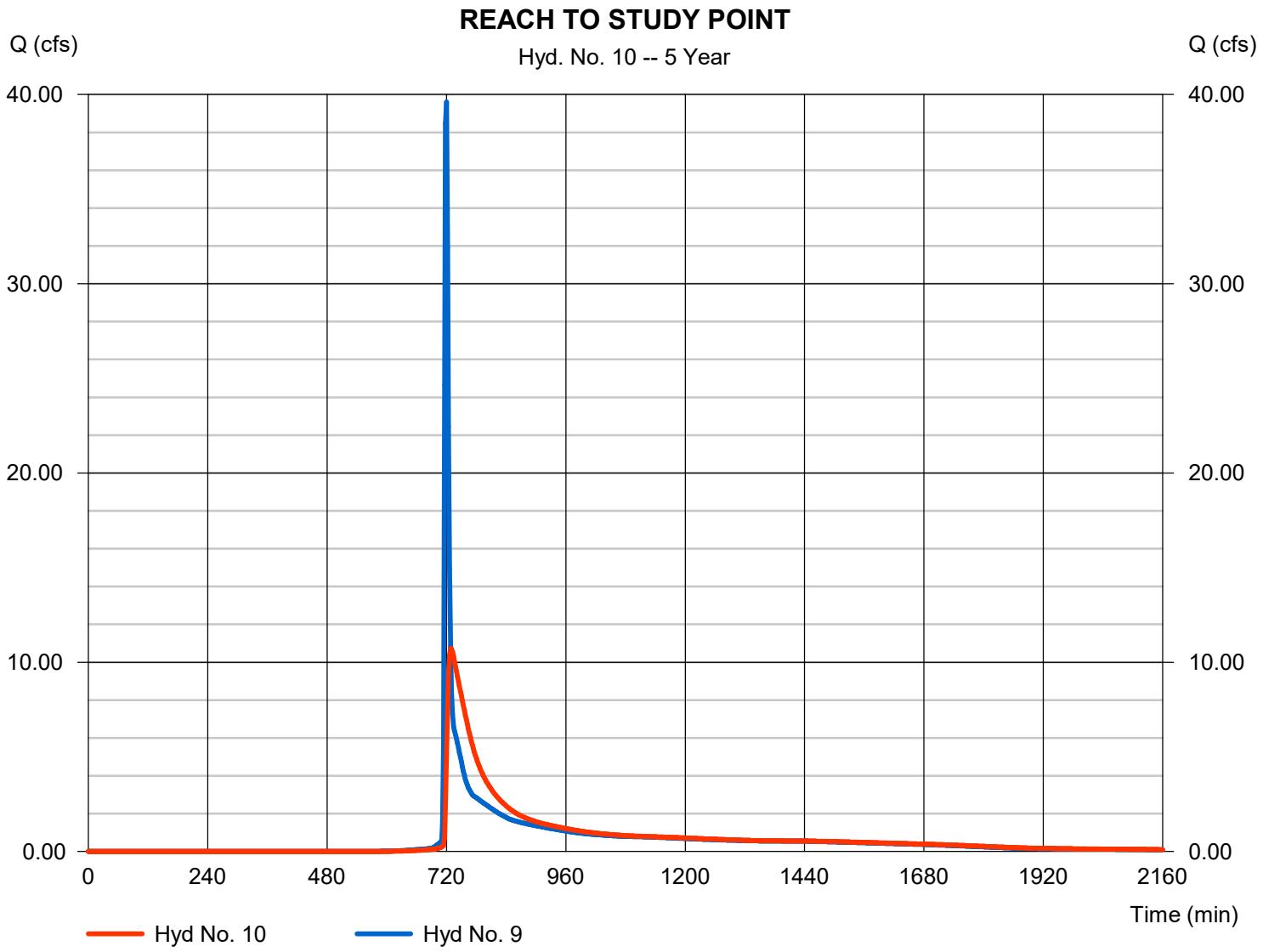
Hydrograph Report

Hyd. No. 10

REACH TO STUDY POINT

Hydrograph type	=	Reach	Peak discharge	=	10.72 cfs
Storm frequency	=	5 yrs	Time to peak	=	730 min
Time interval	=	2 min	Hyd. volume	=	89,454 cuft
Inflow hyd. No.	=	9 - POND 3 ROUTED	Section type	=	Trapezoidal
Reach length	=	3079.0 ft	Channel slope	=	0.2 %
Manning's n	=	0.025	Bottom width	=	32.5 ft
Side slope	=	2.5:1	Max. depth	=	5.0 ft
Rating curve x	=	0.229	Rating curve m	=	1.512
Ave. velocity	=	1.29 ft/s	Routing coeff.	=	0.0732

Modified Att-Kin routing method used.



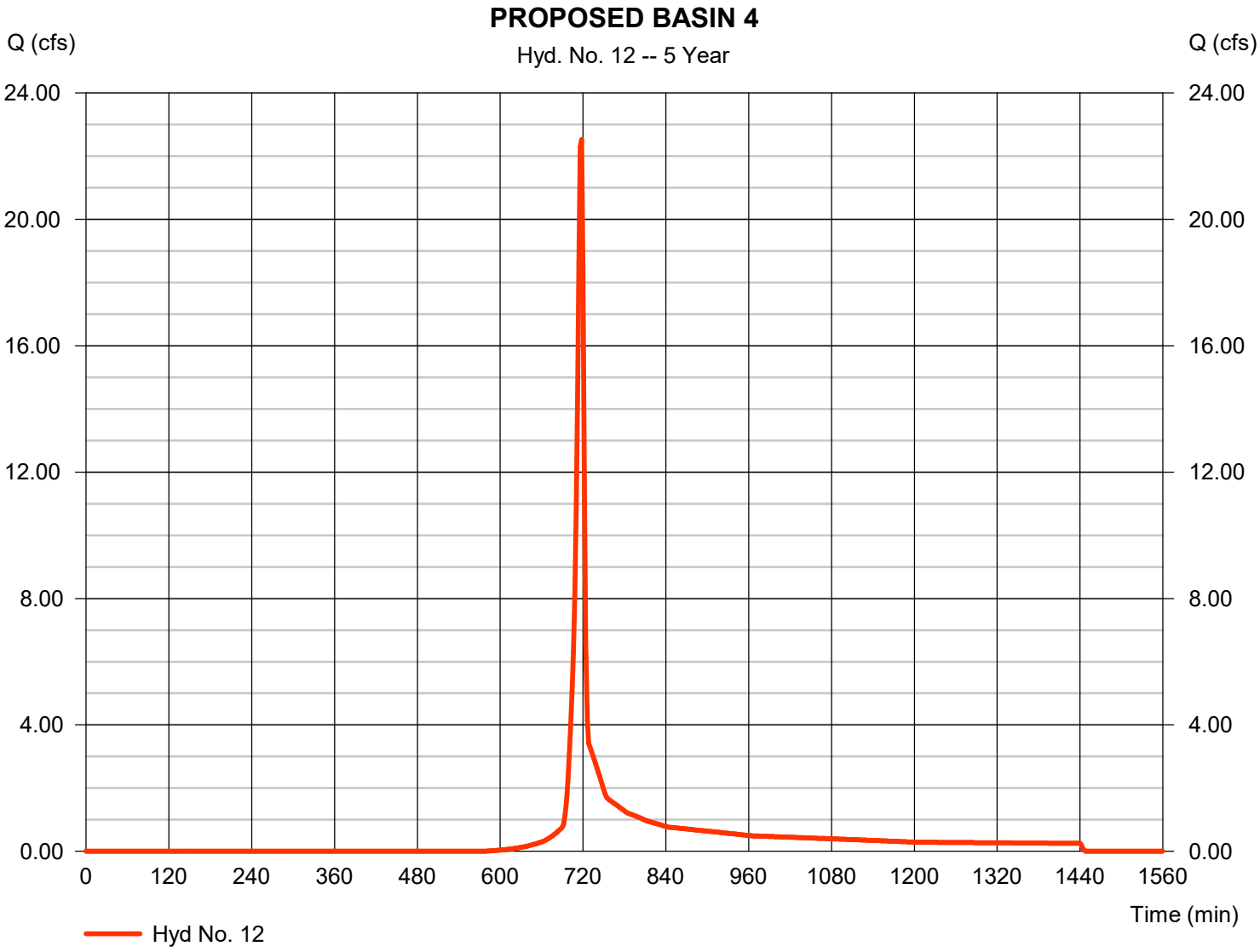
Hydrograph Report

Hyd. No. 12

PROPOSED BASIN 4

Hydrograph type	= SCS Runoff	Peak discharge	= 22.52 cfs
Storm frequency	= 5 yrs	Time to peak	= 718 min
Time interval	= 2 min	Hyd. volume	= 45,145 cuft
Drainage area	= 6.710 ac	Curve number	= 72*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 4.71 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.260 x 98) + (2.540 x 85) + (3.910 x 61)] / 6.710



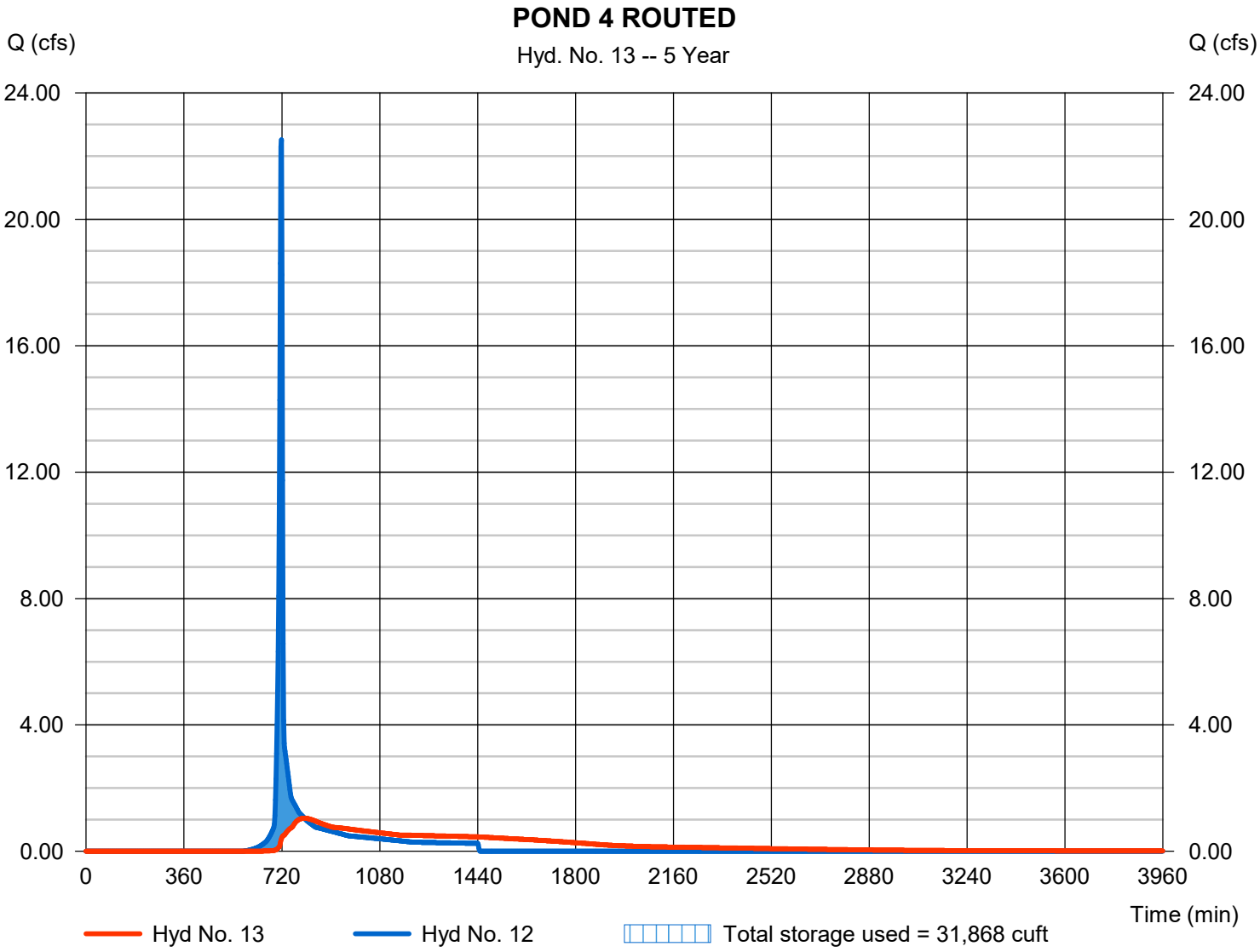
Hydrograph Report

Hyd. No. 13

POND 4 ROUTED

Hydrograph type	=	Reservoir	Peak discharge	=	1.045 cfs
Storm frequency	=	5 yrs	Time to peak	=	804 min
Time interval	=	2 min	Hyd. volume	=	45,037 cuft
Inflow hyd. No.	=	12 - PROPOSED BASIN 4	Max. Elevation	=	896.86 ft
Reservoir name	=	PROPOSED POND 4	Max. Storage	=	31,868 cuft

Storage Indication method used. Wet pond routing start elevation = 895.00 ft.



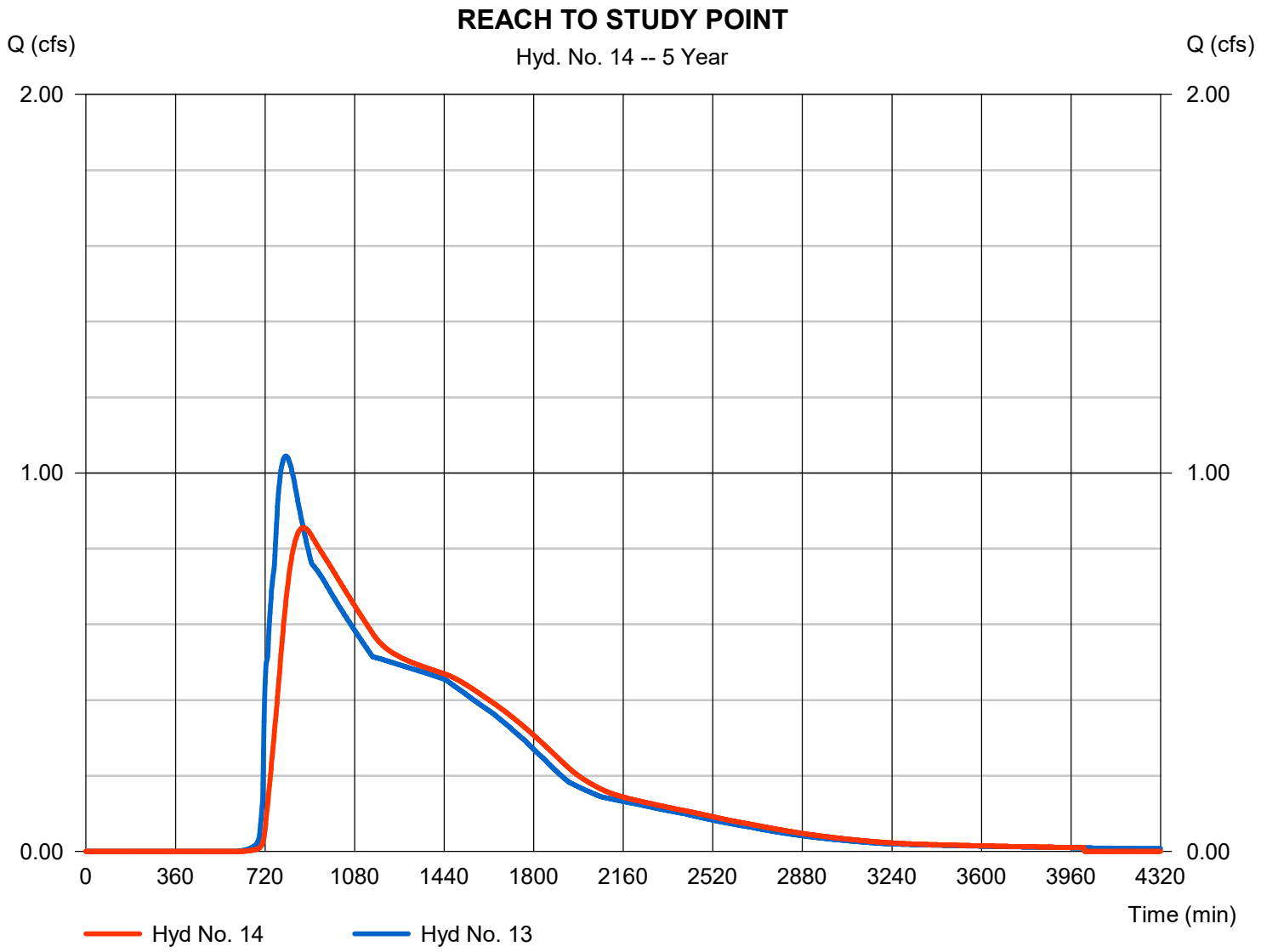
Hydrograph Report

Hyd. No. 14

REACH TO STUDY POINT

Hydrograph type	=	Reach	Peak discharge	=	0.855 cfs
Storm frequency	=	5 yrs	Time to peak	=	874 min
Time interval	=	2 min	Hyd. volume	=	44,524 cuft
Inflow hyd. No.	=	13 - POND 4 ROUTED	Section type	=	Trapezoidal
Reach length	=	2721.0 ft	Channel slope	=	0.3 %
Manning's n	=	0.025	Bottom width	=	32.5 ft
Side slope	=	2.5:1	Max. depth	=	5.0 ft
Rating curve x	=	0.329	Rating curve m	=	1.512
Ave. velocity	=	0.49 ft/s	Routing coeff.	=	0.0319

Modified Att-Kin routing method used.



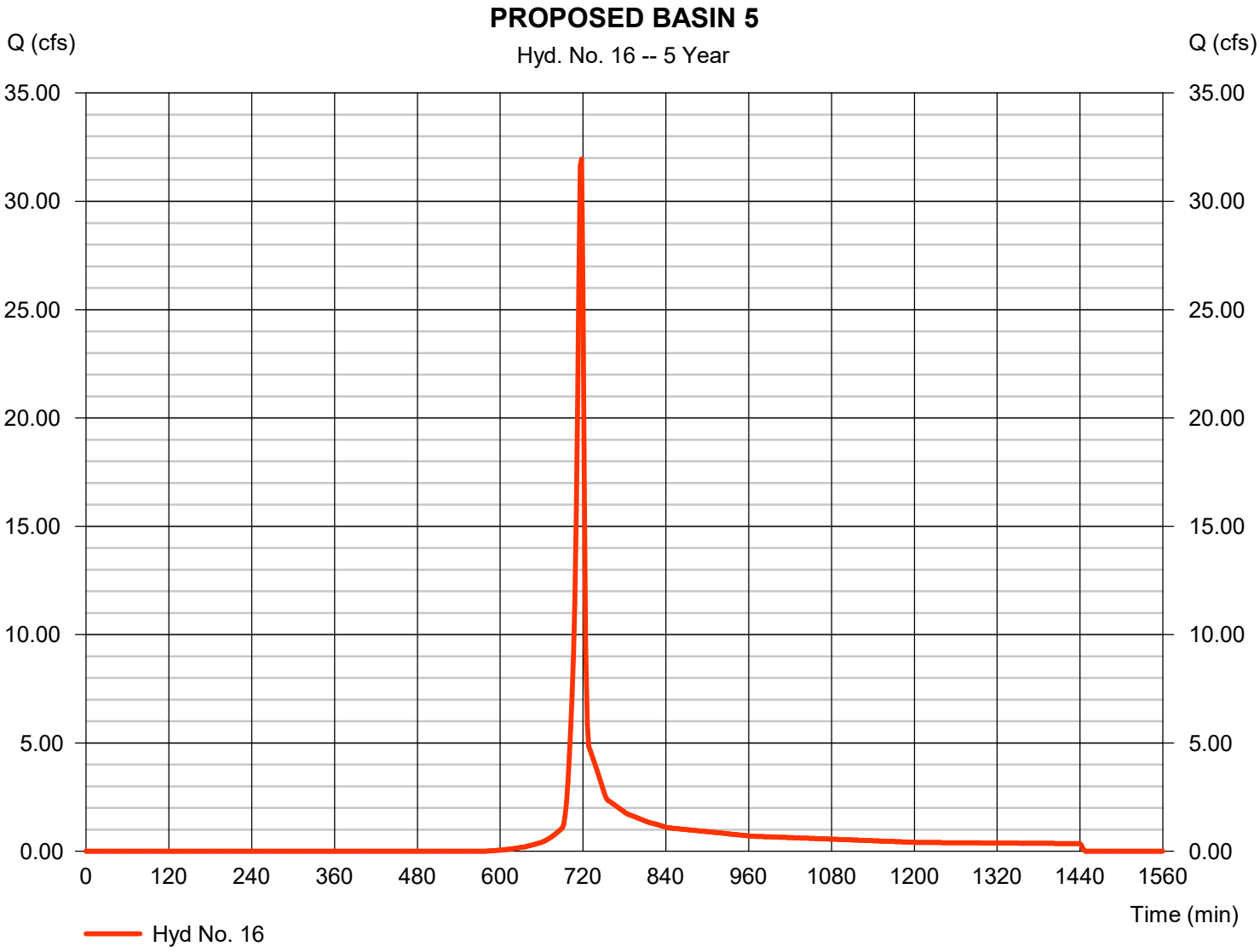
Hydrograph Report

Hyd. No. 16

PROPOSED BASIN 5

Hydrograph type	=	SCS Runoff	Peak discharge	=	31.95 cfs
Storm frequency	=	5 yrs	Time to peak	=	718 min
Time interval	=	2 min	Hyd. volume	=	64,050 cuft
Drainage area	=	9.520 ac	Curve number	=	72*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	4.71 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.310 x 98) + (4.000 x 85) + (5.210 x 61)] / 9.520



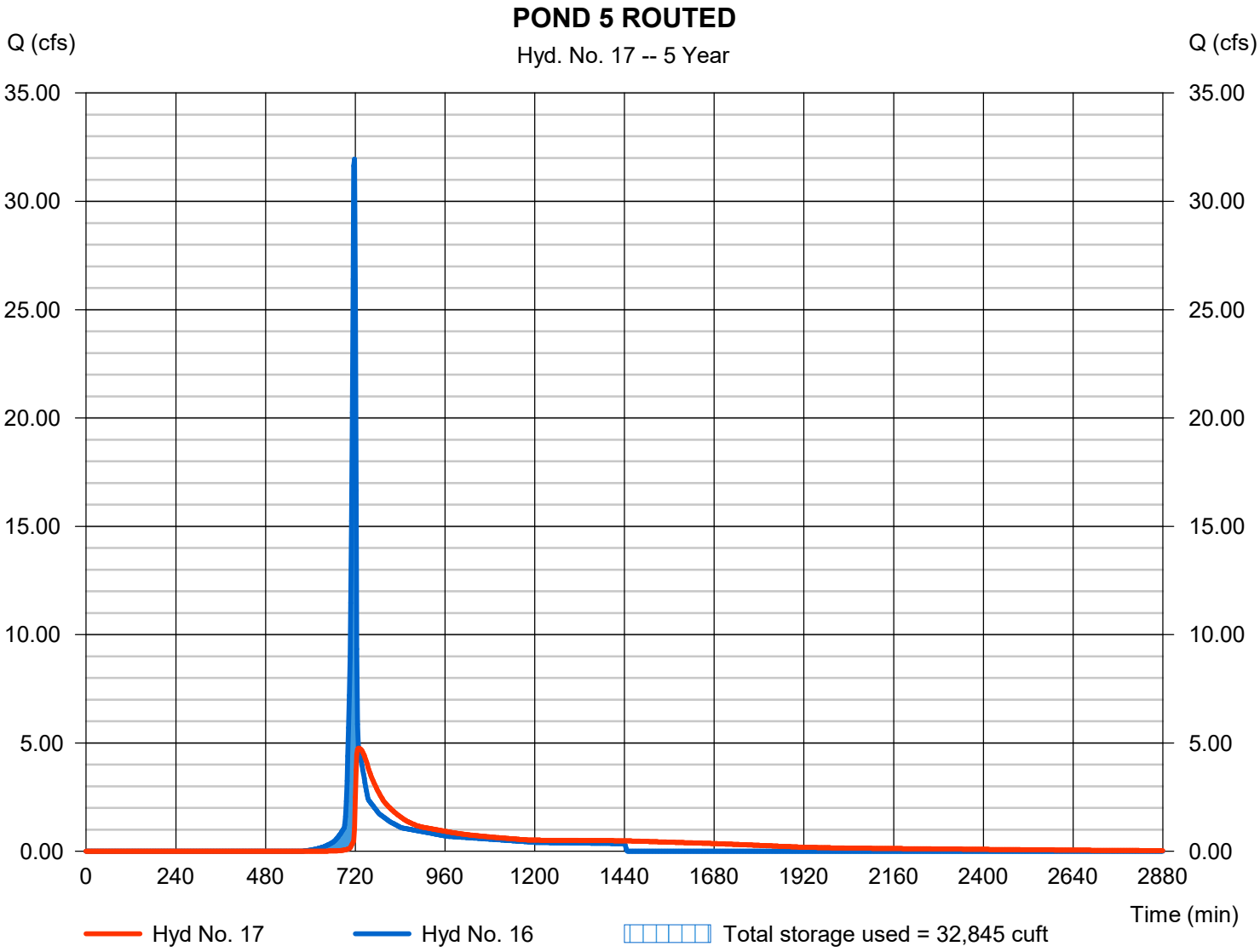
Hydrograph Report

Hyd. No. 17

POND 5 ROUTED

Hydrograph type	=	Reservoir	Peak discharge	=	4.763 cfs
Storm frequency	=	5 yrs	Time to peak	=	728 min
Time interval	=	2 min	Hyd. volume	=	63,997 cuft
Inflow hyd. No.	=	16 - PROPOSED BASIN 5	Max. Elevation	=	895.33 ft
Reservoir name	=	PROPOSED POND 5	Max. Storage	=	32,845 cuft

Storage Indication method used. Wet pond routing start elevation = 893.00 ft.



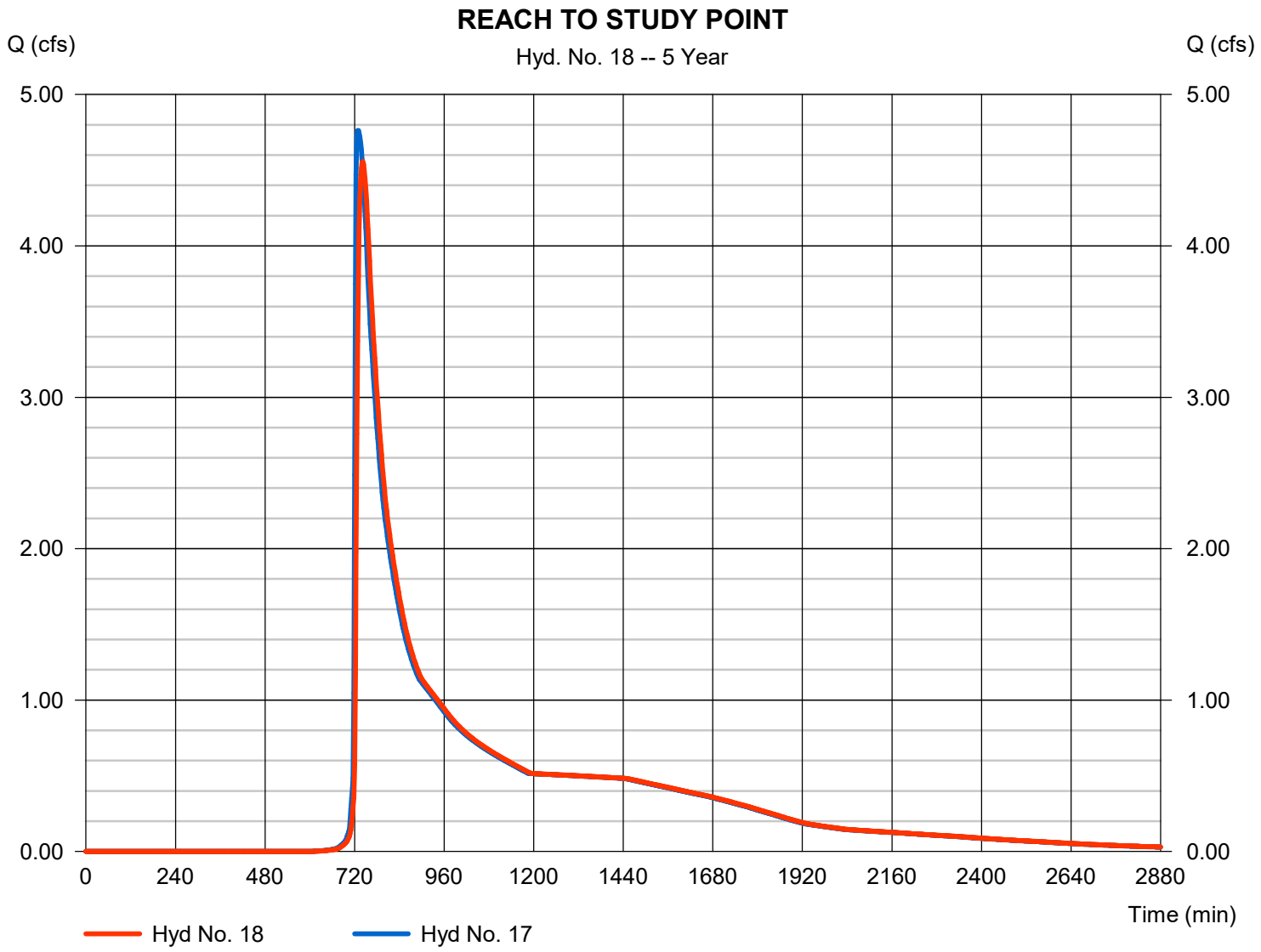
Hydrograph Report

Hyd. No. 18

REACH TO STUDY POINT

Hydrograph type	=	Reach	Peak discharge	=	4.556 cfs
Storm frequency	=	5 yrs	Time to peak	=	742 min
Time interval	=	2 min	Hyd. volume	=	63,516 cuft
Inflow hyd. No.	=	17 - POND 5 ROUTED	Section type	=	Trapezoidal
Reach length	=	597.0 ft	Channel slope	=	1.1 %
Manning's n	=	0.025	Bottom width	=	32.5 ft
Side slope	=	2.5:1	Max. depth	=	5.0 ft
Rating curve x	=	0.610	Rating curve m	=	1.512
Ave. velocity	=	1.22 ft/s	Routing coeff.	=	0.3134

Modified Att-Kin routing method used.

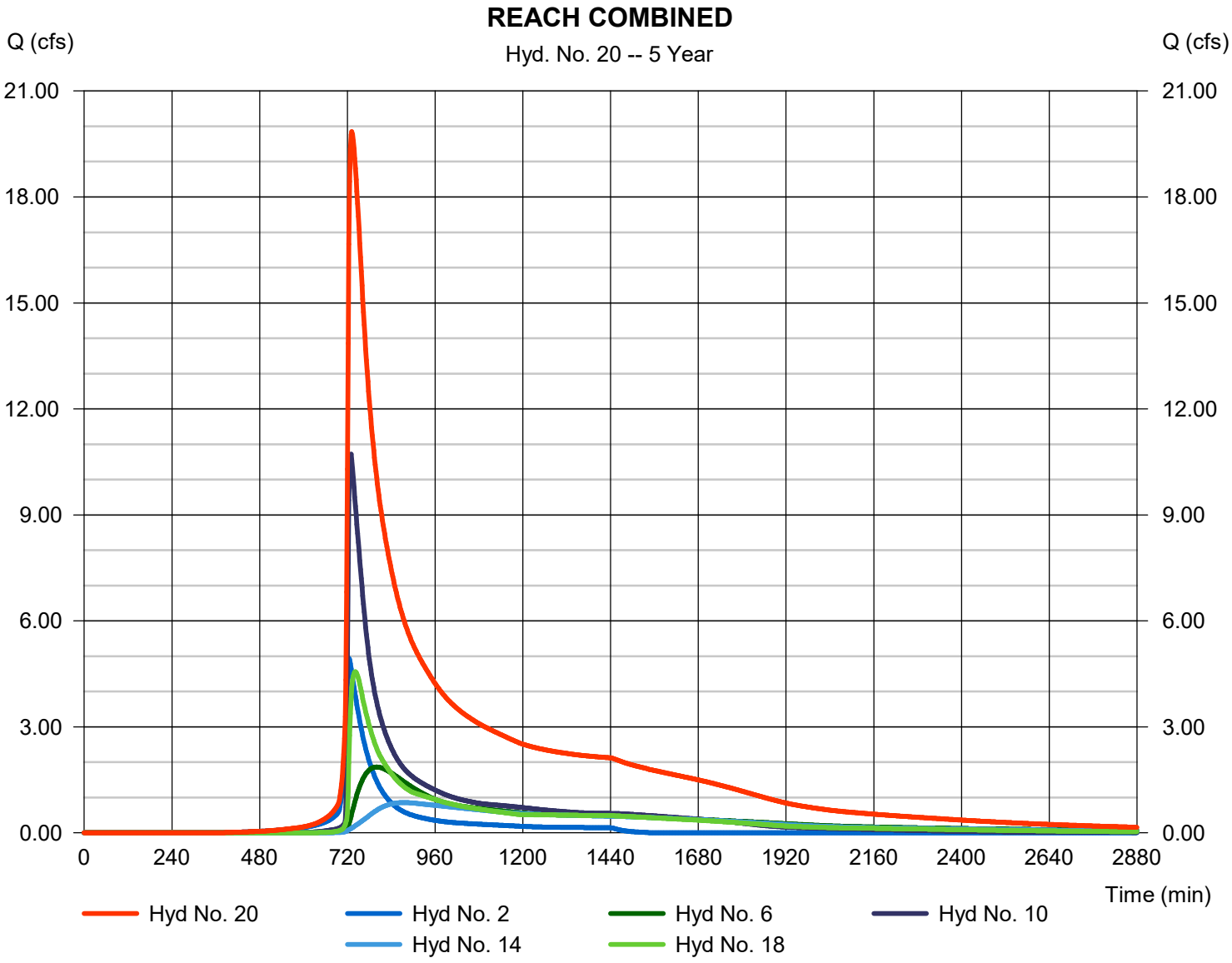


Hydrograph Report

Hyd. No. 20

REACH COMBINED

Hydrograph type	=	Combine	Peak discharge	=	19.85 cfs
Storm frequency	=	5 yrs	Time to peak	=	732 min
Time interval	=	2 min	Hyd. volume	=	288,220 cuft
Inflow hyds.	=	2, 6, 10, 14, 18	Contrib. drain. area	=	0.000 ac



Hydrograph Summary Report

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

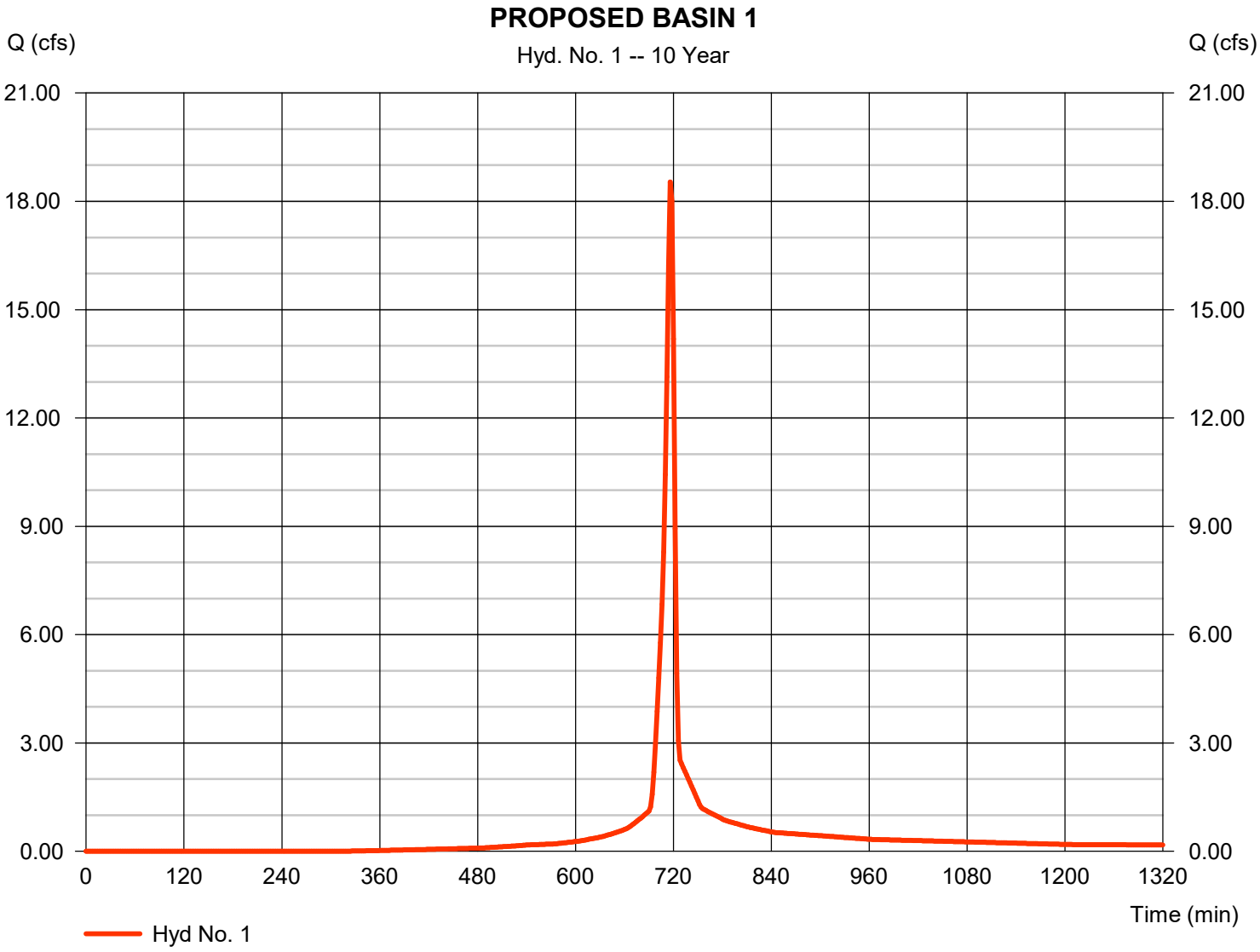
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	18.53	2	716	38,621	------	------	------	PROPOSED BASIN 1
2	Reach	6.319	2	724	38,601	1	------	------	REACH TO STUDY POINT
4	SCS Runoff	35.08	2	716	71,819	------	------	------	PROPOSED BASIN 2
5	Reservoir	10.11	2	724	71,757	4	892.36	36,311	POND 2 ROUTED
6	Reach	3.858	2	748	71,372	5	------	------	REACH TO STUDY POINT
8	SCS Runoff	55.07	2	716	111,415	------	------	------	PROPOSED BASIN 3
9	Reservoir	52.49	2	718	111,380	8	894.20	27,744	POND 3 ROUTED
10	Reach	17.08	2	728	111,067	9	------	------	REACH TO STUDY POINT
12	SCS Runoff	28.26	2	718	56,960	------	------	------	PROPOSED BASIN 4
13	Reservoir	2.380	2	750	56,847	12	897.11	35,375	POND 4 ROUTED
14	Reach	1.711	2	808	56,339	13	------	------	REACH TO STUDY POINT
16	SCS Runoff	40.09	2	718	80,814	------	------	------	PROPOSED BASIN 5
17	Reservoir	9.723	2	724	80,760	16	895.84	39,164	POND 5 ROUTED
18	Reach	8.864	2	732	80,280	17	------	------	REACH TO STUDY POINT
20	Combine	34.38	2	730	357,658	2, 6, 10, 14, 18,	------	------	REACH COMBINED

Hydrograph Report

Hyd. No. 1

PROPOSED BASIN 1

Hydrograph type	=	SCS Runoff	Peak discharge	=	18.53 cfs
Storm frequency	=	10 yrs	Time to peak	=	716 min
Time interval	=	2 min	Hyd. volume	=	38,621 cuft
Drainage area	=	3.050 ac	Curve number	=	85
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	5.38 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484



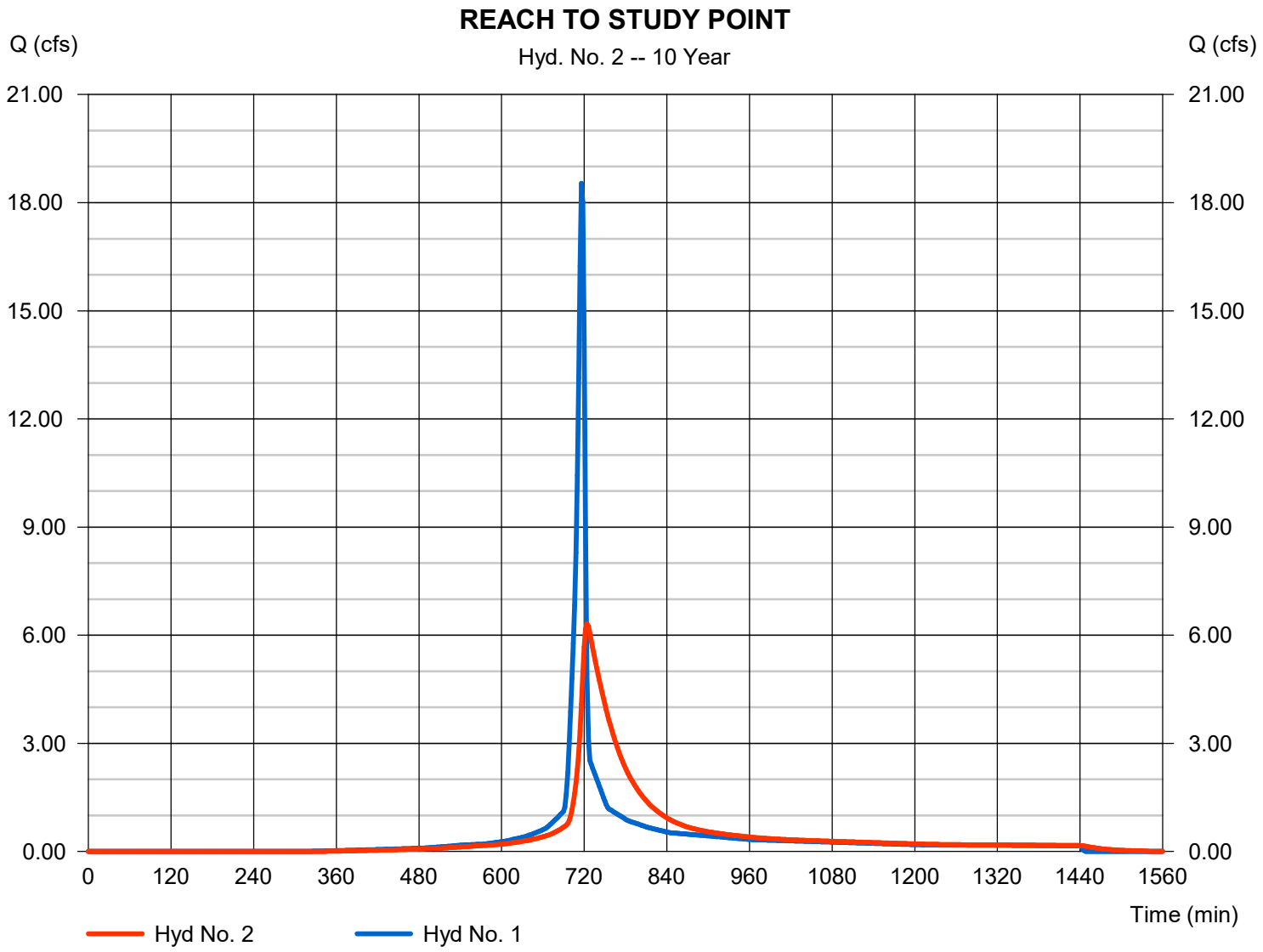
Hydrograph Report

Hyd. No. 2

REACH TO STUDY POINT

Hydrograph type	=	Reach	Peak discharge	=	6.319 cfs
Storm frequency	=	10 yrs	Time to peak	=	724 min
Time interval	=	2 min	Hyd. volume	=	38,601 cuft
Inflow hyd. No.	=	1 - PROPOSED BASIN 1	Section type	=	Trapezoidal
Reach length	=	2981.0 ft	Channel slope	=	0.2 %
Manning's n	=	0.025	Bottom width	=	32.5 ft
Side slope	=	2.5:1	Max. depth	=	5.0 ft
Rating curve x	=	0.262	Rating curve m	=	1.512
Ave. velocity	=	0.97 ft/s	Routing coeff.	=	0.0575

Modified Att-Kin routing method used.



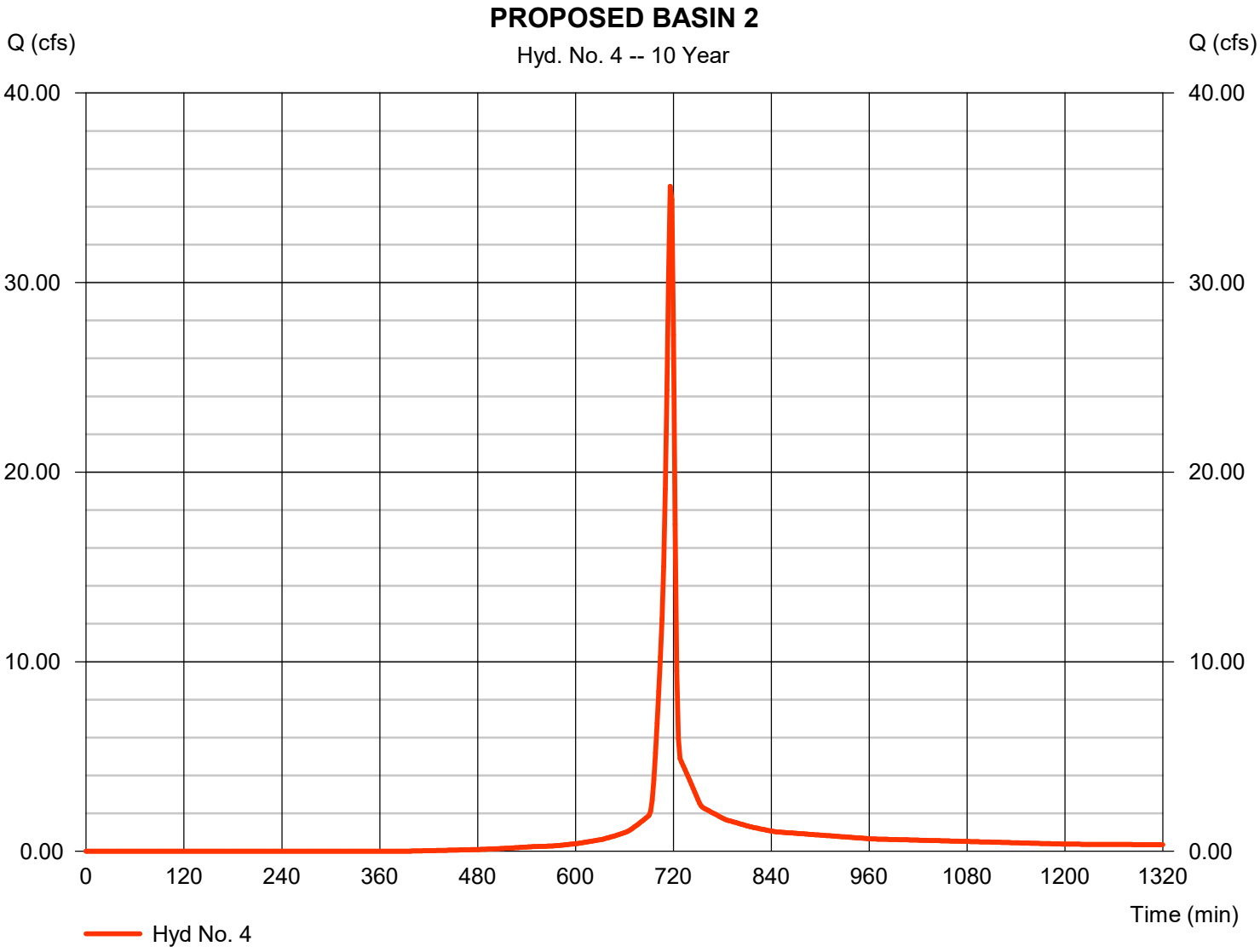
Hydrograph Report

Hyd. No. 4

PROPOSED BASIN 2

Hydrograph type	=	SCS Runoff	Peak discharge	=	35.08 cfs
Storm frequency	=	10 yrs	Time to peak	=	716 min
Time interval	=	2 min	Hyd. volume	=	71,819 cuft
Drainage area	=	6.350 ac	Curve number	=	81*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	5.38 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.160 x 98) + (4.950 x 85) + (1.240 x 61)] / 6.350



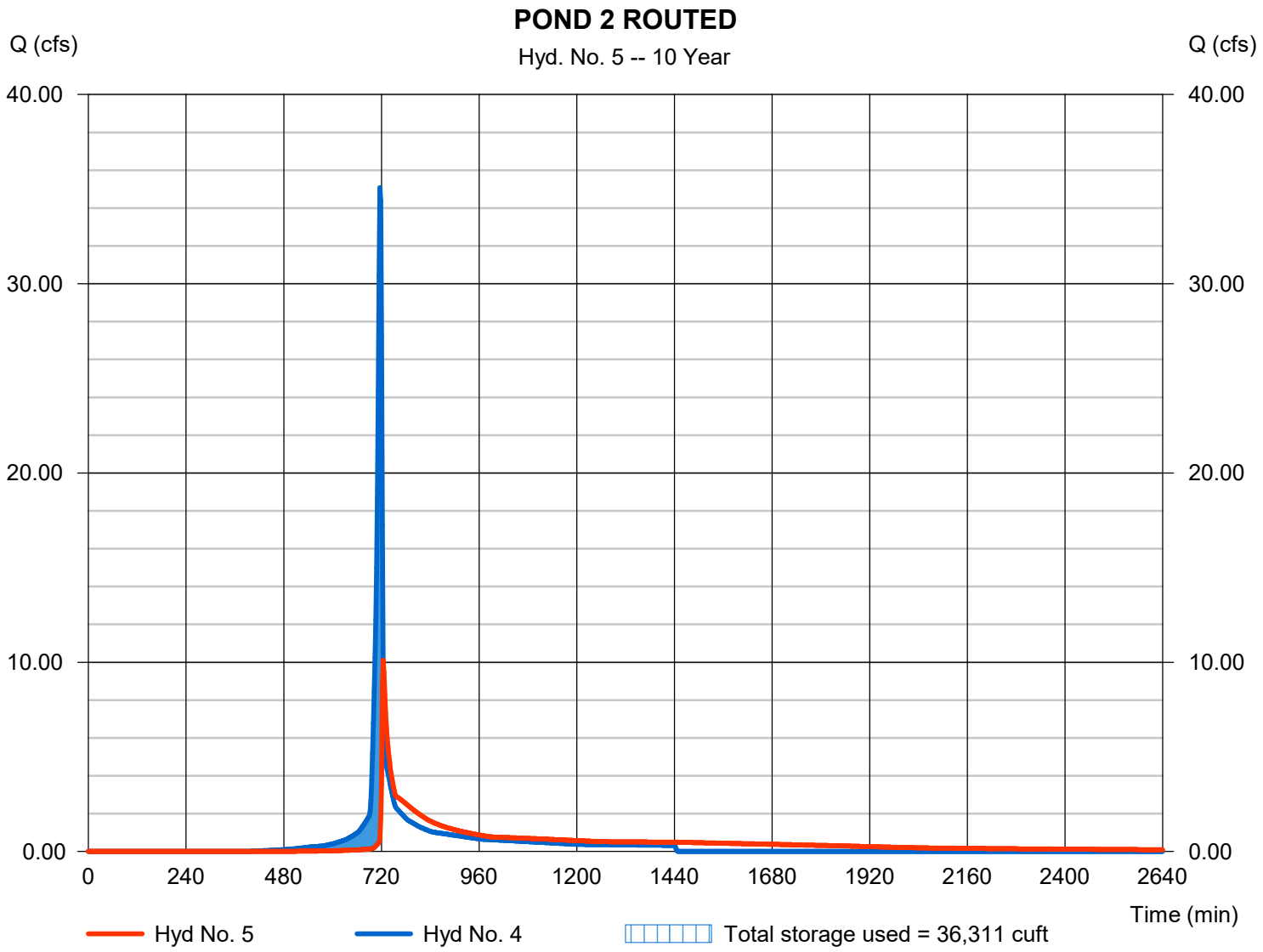
Hydrograph Report

Hyd. No. 5

POND 2 ROUTED

Hydrograph type	=	Reservoir	Peak discharge	=	10.11 cfs
Storm frequency	=	10 yrs	Time to peak	=	724 min
Time interval	=	2 min	Hyd. volume	=	71,757 cuft
Inflow hyd. No.	=	4 - PROPOSED BASIN 2	Max. Elevation	=	892.36 ft
Reservoir name	=	PROPOSED POND 2	Max. Storage	=	36,311 cuft

Storage Indication method used. Wet pond routing start elevation = 890.00 ft.



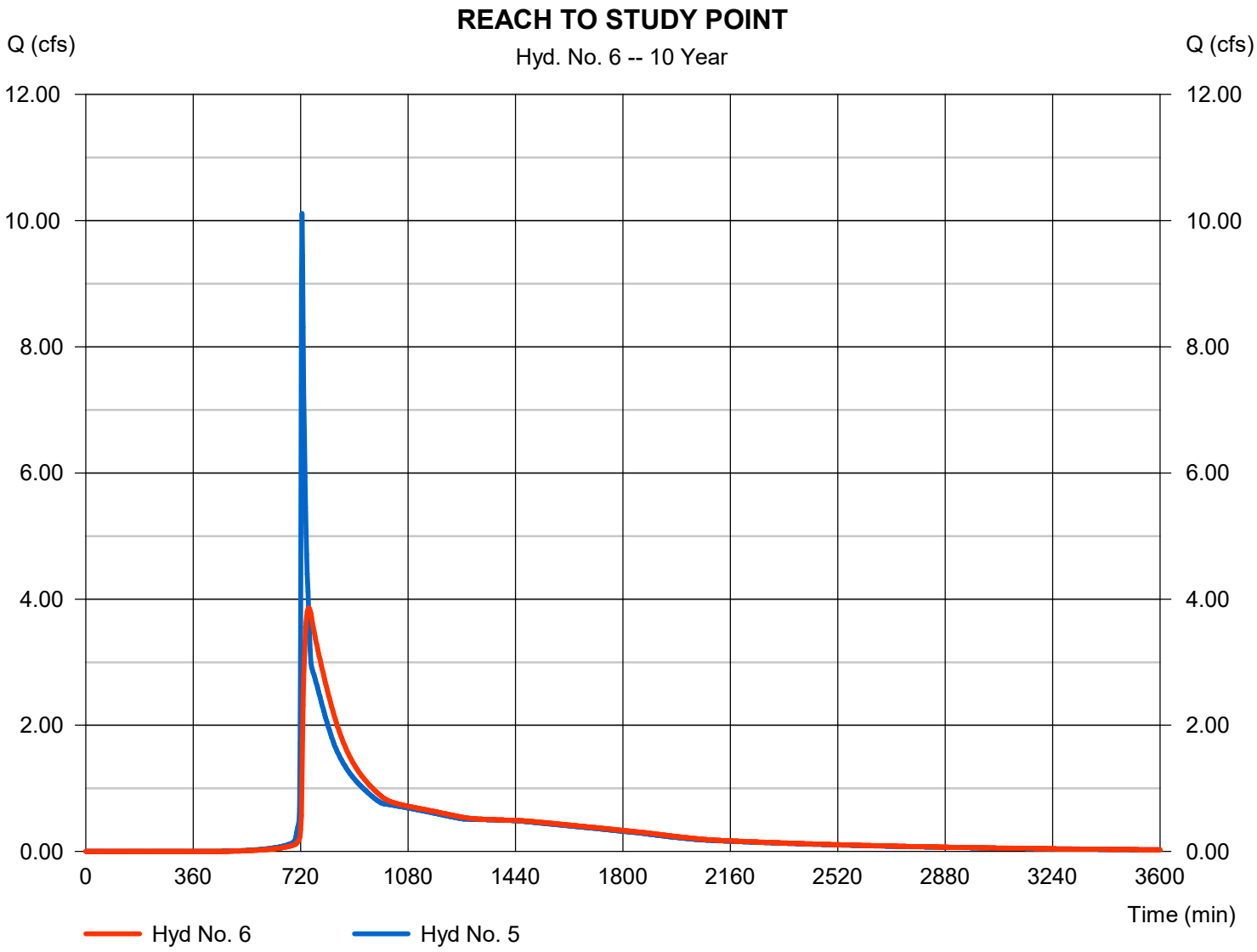
Hydrograph Report

Hyd. No. 6

REACH TO STUDY POINT

Hydrograph type	=	Reach	Peak discharge	=	3.858 cfs
Storm frequency	=	10 yrs	Time to peak	=	748 min
Time interval	=	2 min	Hyd. volume	=	71,372 cuft
Inflow hyd. No.	=	5 - POND 2 ROUTED	Section type	=	Trapezoidal
Reach length	=	2127.0 ft	Channel slope	=	0.2 %
Manning's n	=	0.025	Bottom width	=	32.5 ft
Side slope	=	2.5:1	Max. depth	=	5.0 ft
Rating curve x	=	0.240	Rating curve m	=	1.512
Ave. velocity	=	0.85 ft/s	Routing coeff.	=	0.0702

Modified Att-Kin routing method used.



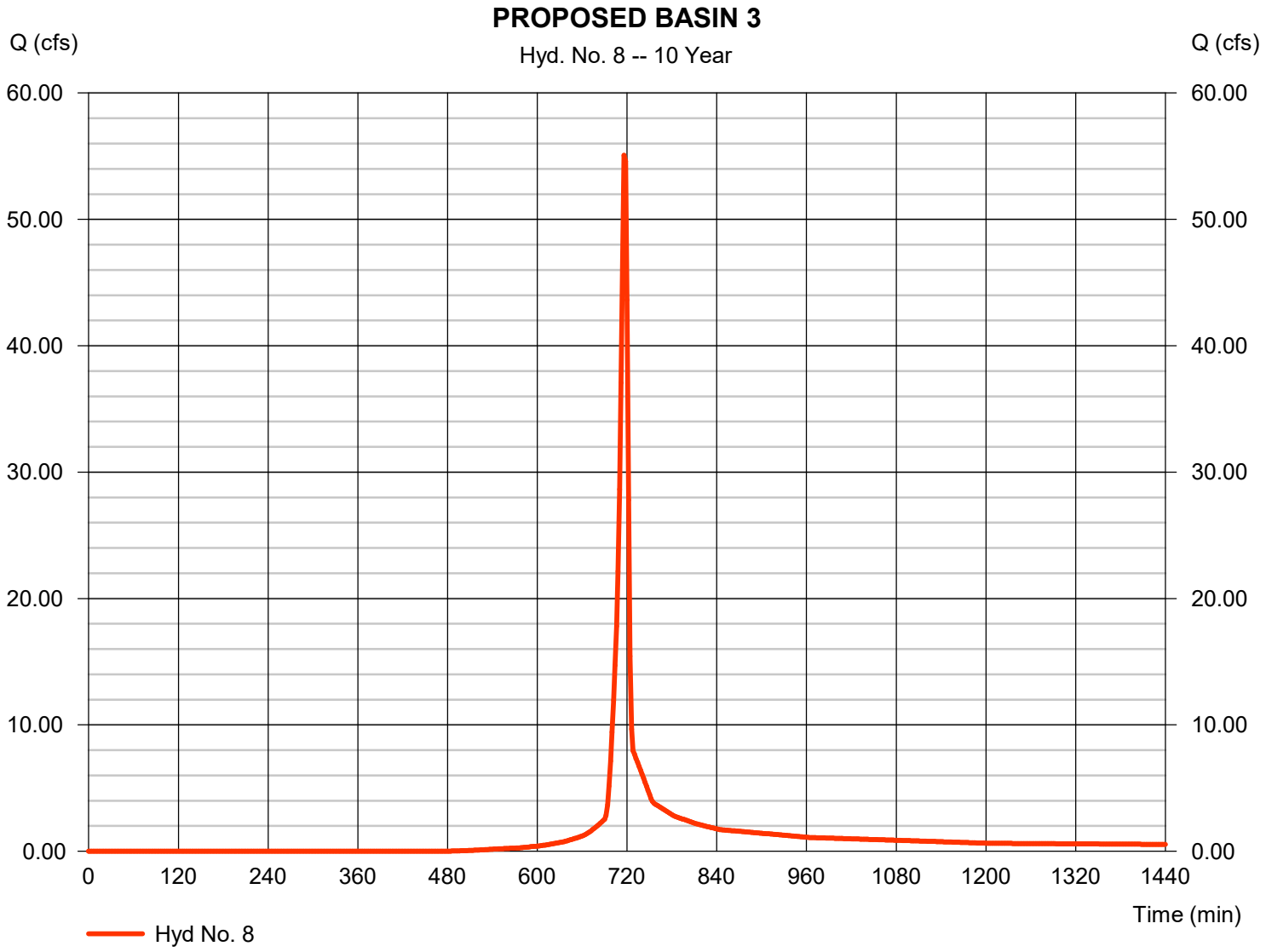
Hydrograph Report

Hyd. No. 8

PROPOSED BASIN 3

Hydrograph type	= SCS Runoff	Peak discharge	= 55.07 cfs
Storm frequency	= 10 yrs	Time to peak	= 716 min
Time interval	= 2 min	Hyd. volume	= 111,415 cuft
Drainage area	= 11.480 ac	Curve number	= 76*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 5.38 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(2.490 x 98) + (3.270 x 85) + (5.720 x 61)] / 11.480



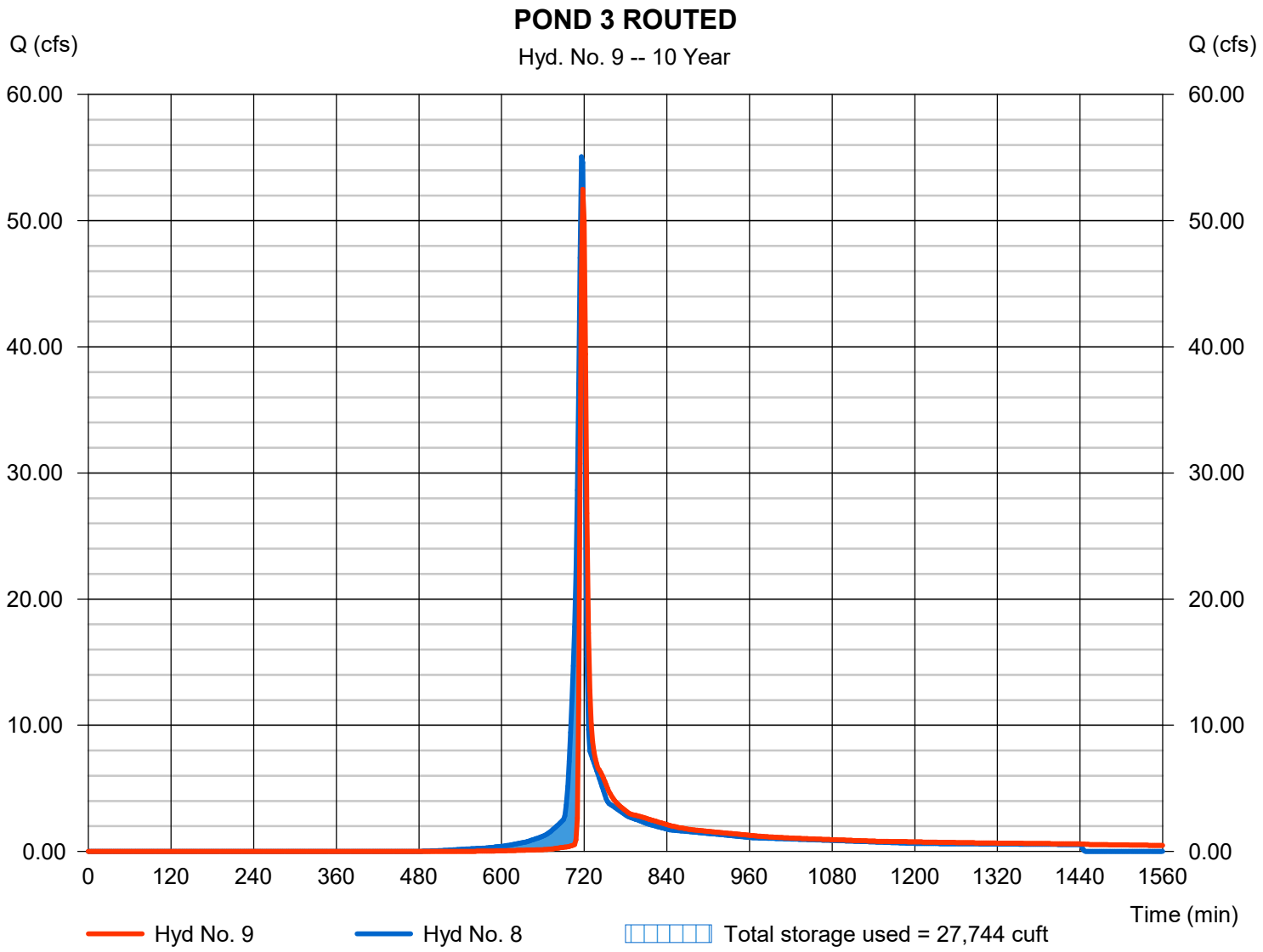
Hydrograph Report

Hyd. No. 9

POND 3 ROUTED

Hydrograph type	=	Reservoir	Peak discharge	=	52.49 cfs
Storm frequency	=	10 yrs	Time to peak	=	718 min
Time interval	=	2 min	Hyd. volume	=	111,380 cuft
Inflow hyd. No.	=	8 - PROPOSED BASIN 3	Max. Elevation	=	894.20 ft
Reservoir name	=	PROPOSED POND 3	Max. Storage	=	27,744 cuft

Storage Indication method used. Wet pond routing start elevation = 891.00 ft.



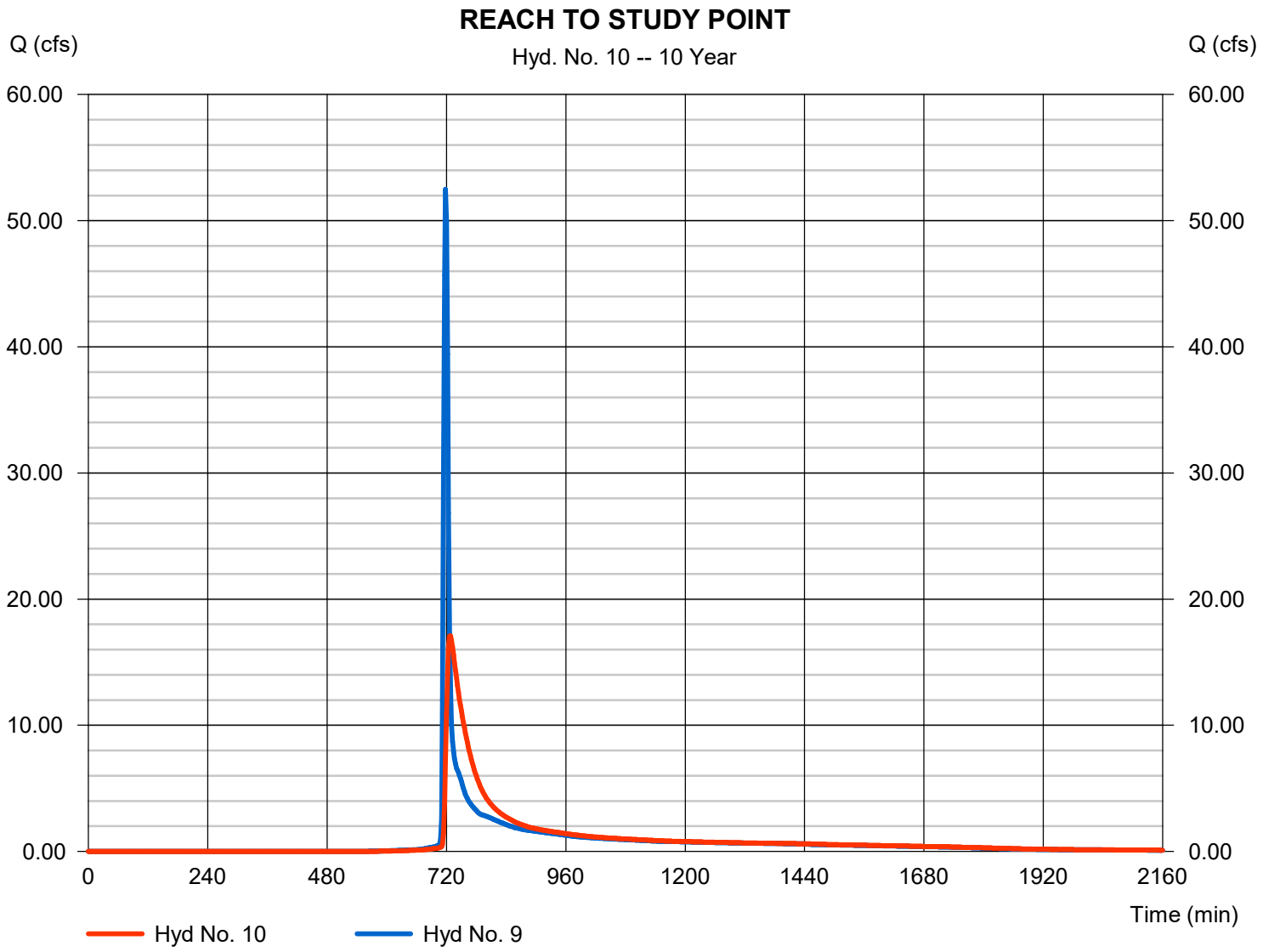
Hydrograph Report

Hyd. No. 10

REACH TO STUDY POINT

Hydrograph type	=	Reach	Peak discharge	=	17.08 cfs
Storm frequency	=	10 yrs	Time to peak	=	728 min
Time interval	=	2 min	Hyd. volume	=	111,067 cuft
Inflow hyd. No.	=	9 - POND 3 ROUTED	Section type	=	Trapezoidal
Reach length	=	3079.0 ft	Channel slope	=	0.2 %
Manning's n	=	0.025	Bottom width	=	32.5 ft
Side slope	=	2.5:1	Max. depth	=	5.0 ft
Rating curve x	=	0.229	Rating curve m	=	1.512
Ave. velocity	=	1.44 ft/s	Routing coeff.	=	0.0814

Modified Att-Kin routing method used.



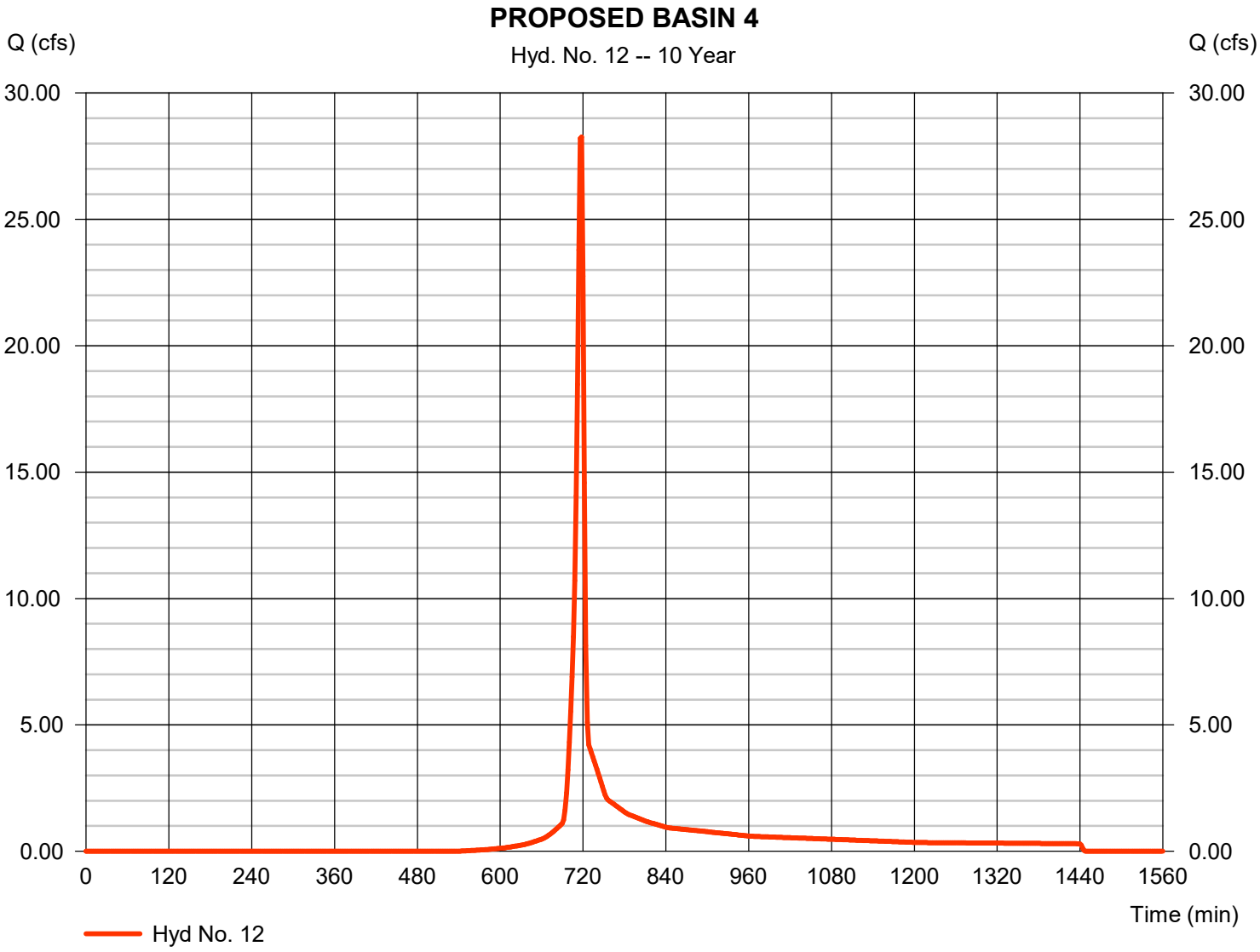
Hydrograph Report

Hyd. No. 12

PROPOSED BASIN 4

Hydrograph type	=	SCS Runoff	Peak discharge	=	28.26 cfs
Storm frequency	=	10 yrs	Time to peak	=	718 min
Time interval	=	2 min	Hyd. volume	=	56,960 cuft
Drainage area	=	6.710 ac	Curve number	=	72*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	5.38 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.260 x 98) + (2.540 x 85) + (3.910 x 61)] / 6.710



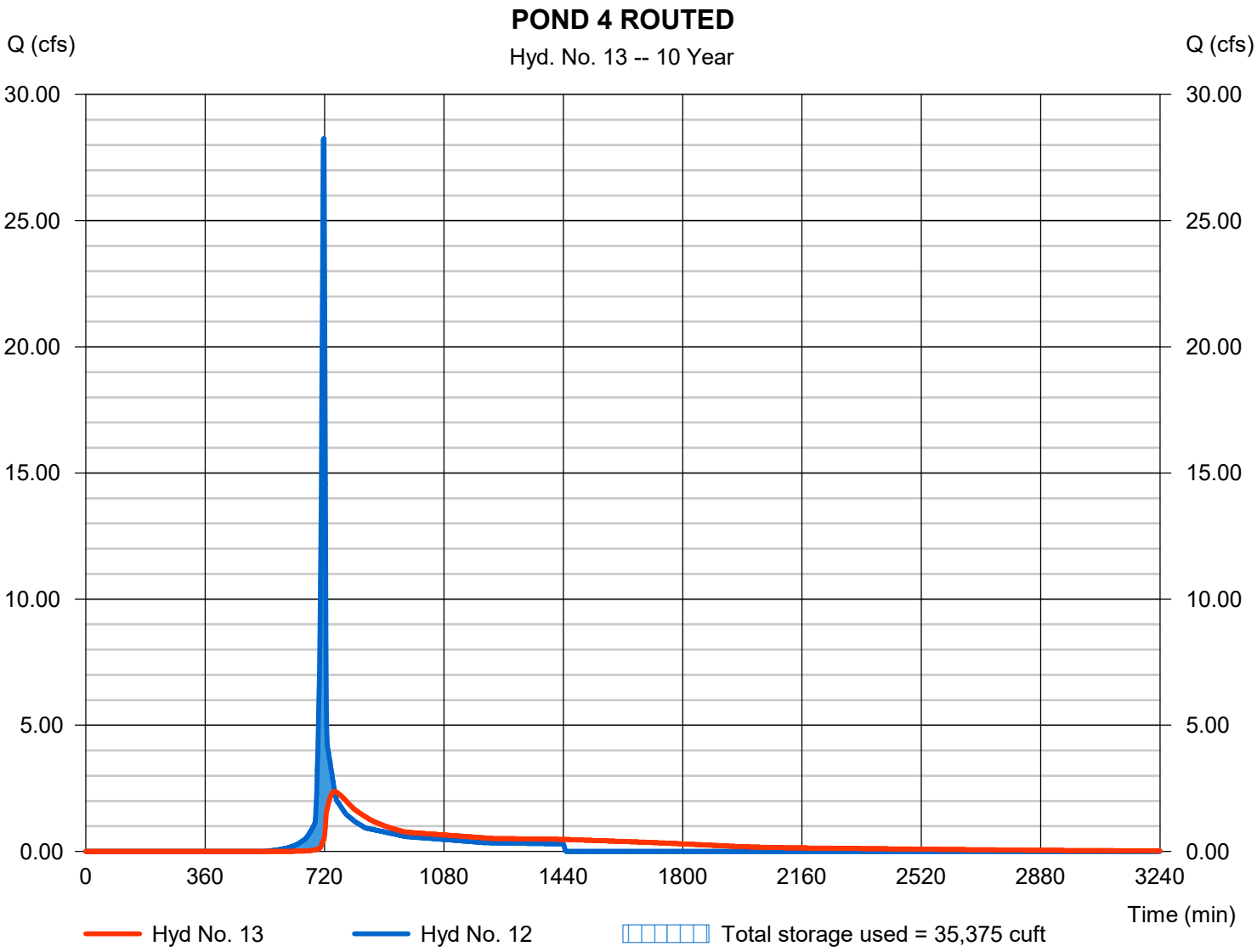
Hydrograph Report

Hyd. No. 13

POND 4 ROUTED

Hydrograph type	=	Reservoir	Peak discharge	=	2.380 cfs
Storm frequency	=	10 yrs	Time to peak	=	750 min
Time interval	=	2 min	Hyd. volume	=	56,847 cuft
Inflow hyd. No.	=	12 - PROPOSED BASIN 4	Max. Elevation	=	897.11 ft
Reservoir name	=	PROPOSED POND 4	Max. Storage	=	35,375 cuft

Storage Indication method used. Wet pond routing start elevation = 895.00 ft.



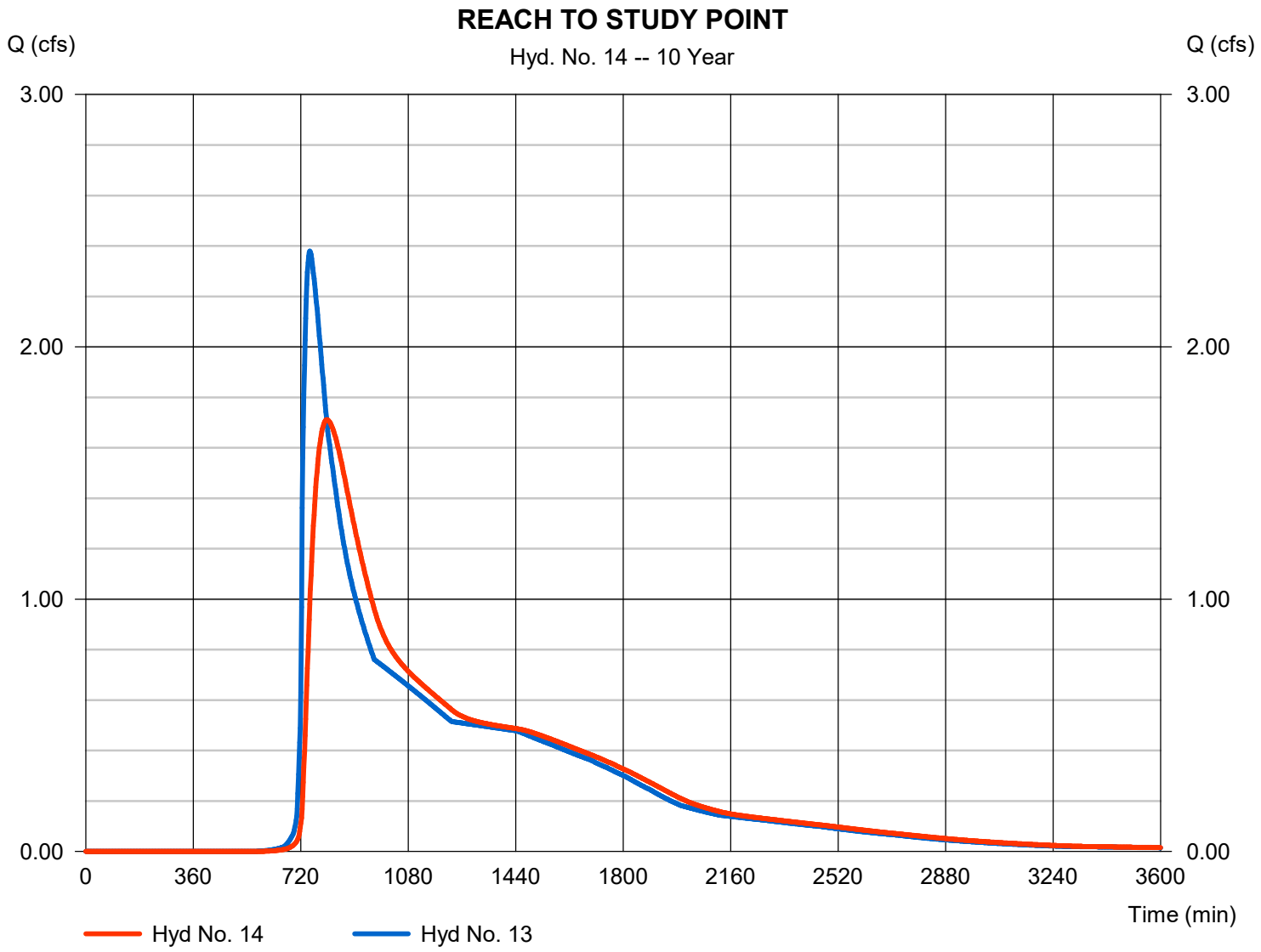
Hydrograph Report

Hyd. No. 14

REACH TO STUDY POINT

Hydrograph type	=	Reach	Peak discharge	=	1.711 cfs
Storm frequency	=	10 yrs	Time to peak	=	808 min
Time interval	=	2 min	Hyd. volume	=	56,339 cuft
Inflow hyd. No.	=	13 - POND 4 ROUTED	Section type	=	Trapezoidal
Reach length	=	2721.0 ft	Channel slope	=	0.3 %
Manning's n	=	0.025	Bottom width	=	32.5 ft
Side slope	=	2.5:1	Max. depth	=	5.0 ft
Rating curve x	=	0.329	Rating curve m	=	1.512
Ave. velocity	=	0.64 ft/s	Routing coeff.	=	0.0419

Modified Att-Kin routing method used.



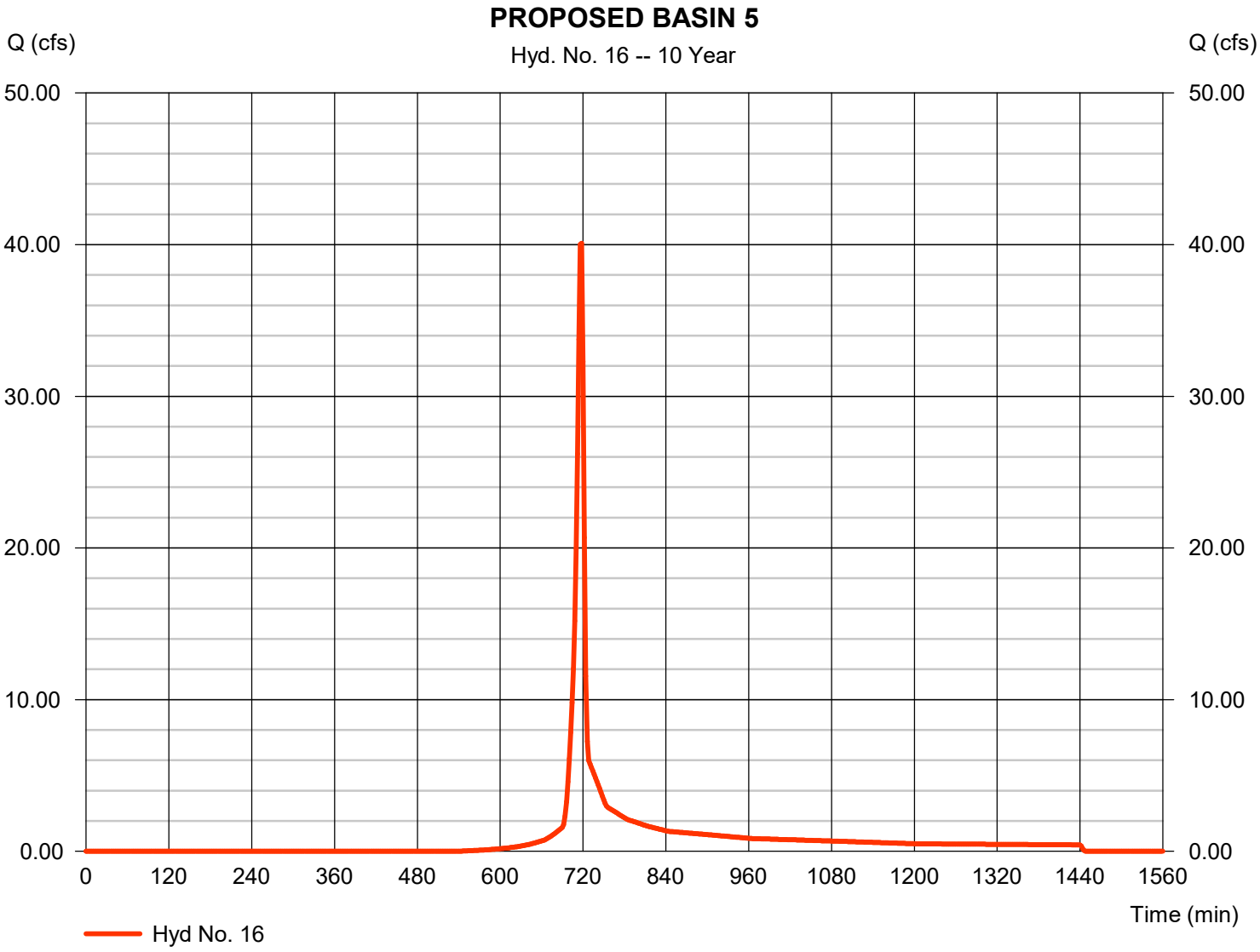
Hydrograph Report

Hyd. No. 16

PROPOSED BASIN 5

Hydrograph type	= SCS Runoff	Peak discharge	= 40.09 cfs
Storm frequency	= 10 yrs	Time to peak	= 718 min
Time interval	= 2 min	Hyd. volume	= 80,814 cuft
Drainage area	= 9.520 ac	Curve number	= 72*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 5.38 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.310 x 98) + (4.000 x 85) + (5.210 x 61)] / 9.520



Hydrograph Report

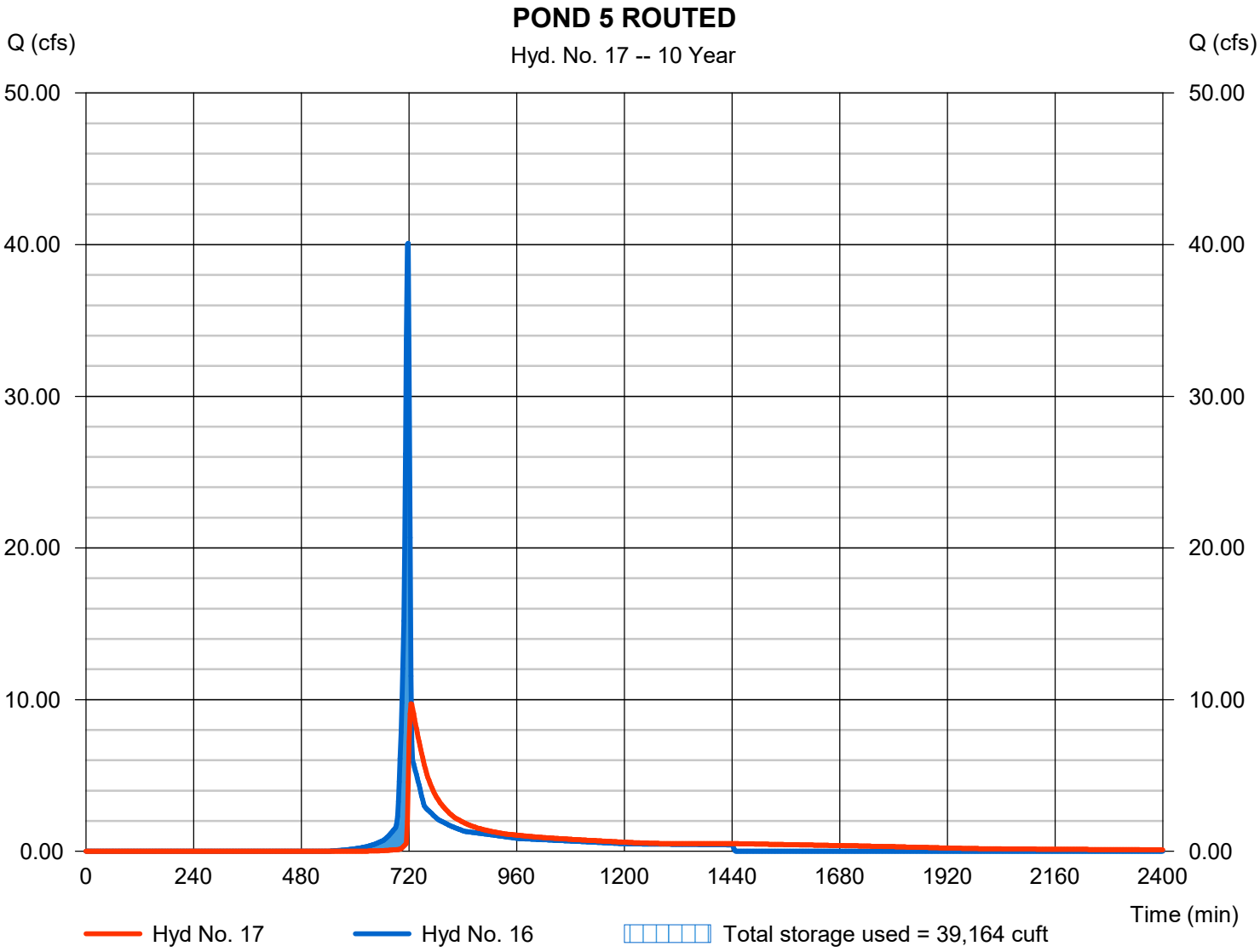
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023 Monday, 02 / 6 / 2023

Hyd. No. 17

POND 5 ROUTED

Hydrograph type	=	Reservoir	Peak discharge	=	9.723 cfs
Storm frequency	=	10 yrs	Time to peak	=	724 min
Time interval	=	2 min	Hyd. volume	=	80,760 cuft
Inflow hyd. No.	=	16 - PROPOSED BASIN 5	Max. Elevation	=	895.84 ft
Reservoir name	=	PROPOSED POND 5	Max. Storage	=	39,164 cuft

Storage Indication method used. Wet pond routing start elevation = 893.00 ft.



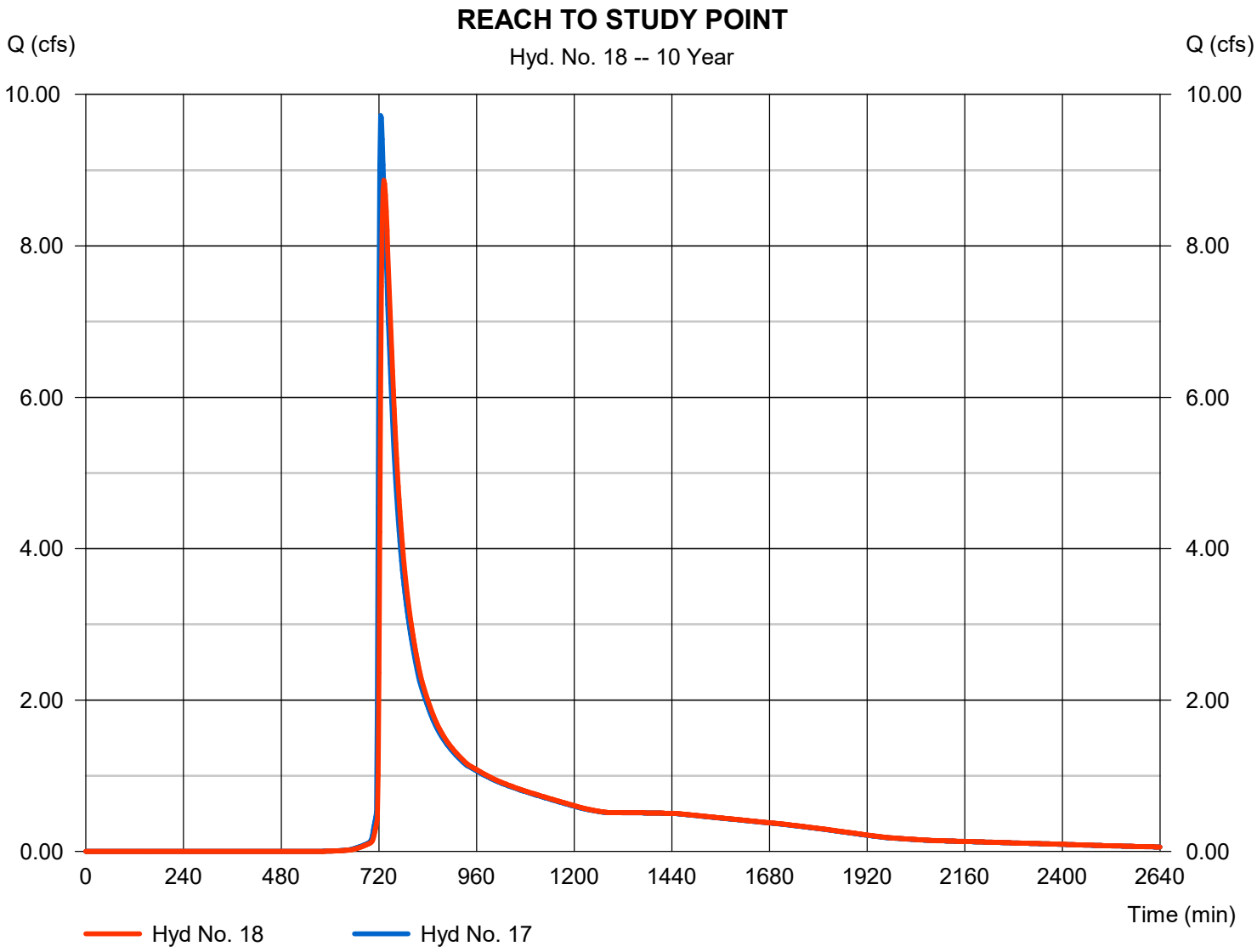
Hydrograph Report

Hyd. No. 18

REACH TO STUDY POINT

Hydrograph type	=	Reach	Peak discharge	=	8.864 cfs
Storm frequency	=	10 yrs	Time to peak	=	732 min
Time interval	=	2 min	Hyd. volume	=	80,280 cuft
Inflow hyd. No.	=	17 - POND 5 ROUTED	Section type	=	Trapezoidal
Reach length	=	597.0 ft	Channel slope	=	1.1 %
Manning's n	=	0.025	Bottom width	=	32.5 ft
Side slope	=	2.5:1	Max. depth	=	5.0 ft
Rating curve x	=	0.610	Rating curve m	=	1.512
Ave. velocity	=	1.56 ft/s	Routing coeff.	=	0.3827

Modified Att-Kin routing method used.

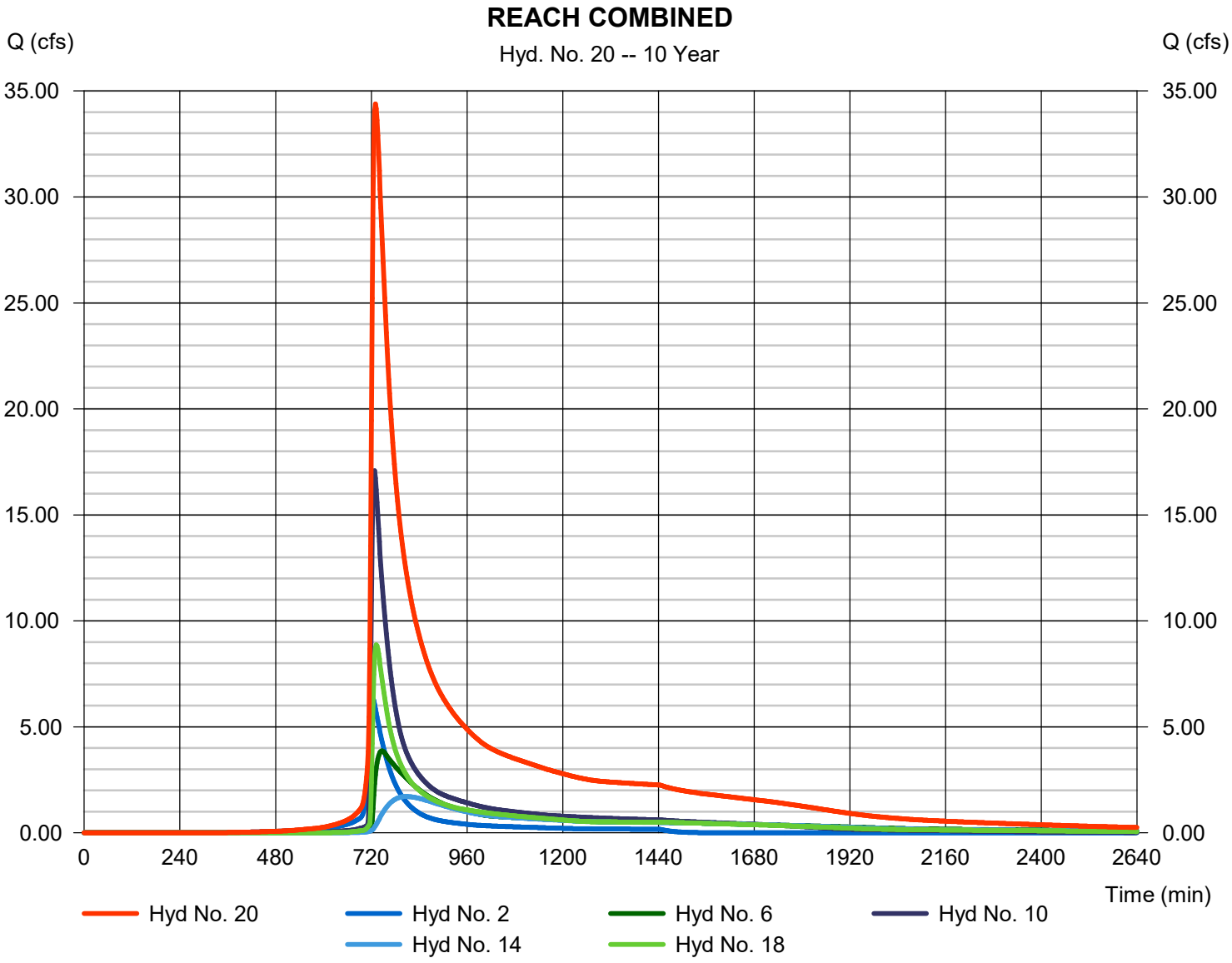


Hydrograph Report

Hyd. No. 20

REACH COMBINED

Hydrograph type	= Combine	Peak discharge	= 34.38 cfs
Storm frequency	= 10 yrs	Time to peak	= 730 min
Time interval	= 2 min	Hyd. volume	= 357,658 cuft
Inflow hyds.	= 2, 6, 10, 14, 18	Contrib. drain. area	= 0.000 ac



Hydrograph Summary Report

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

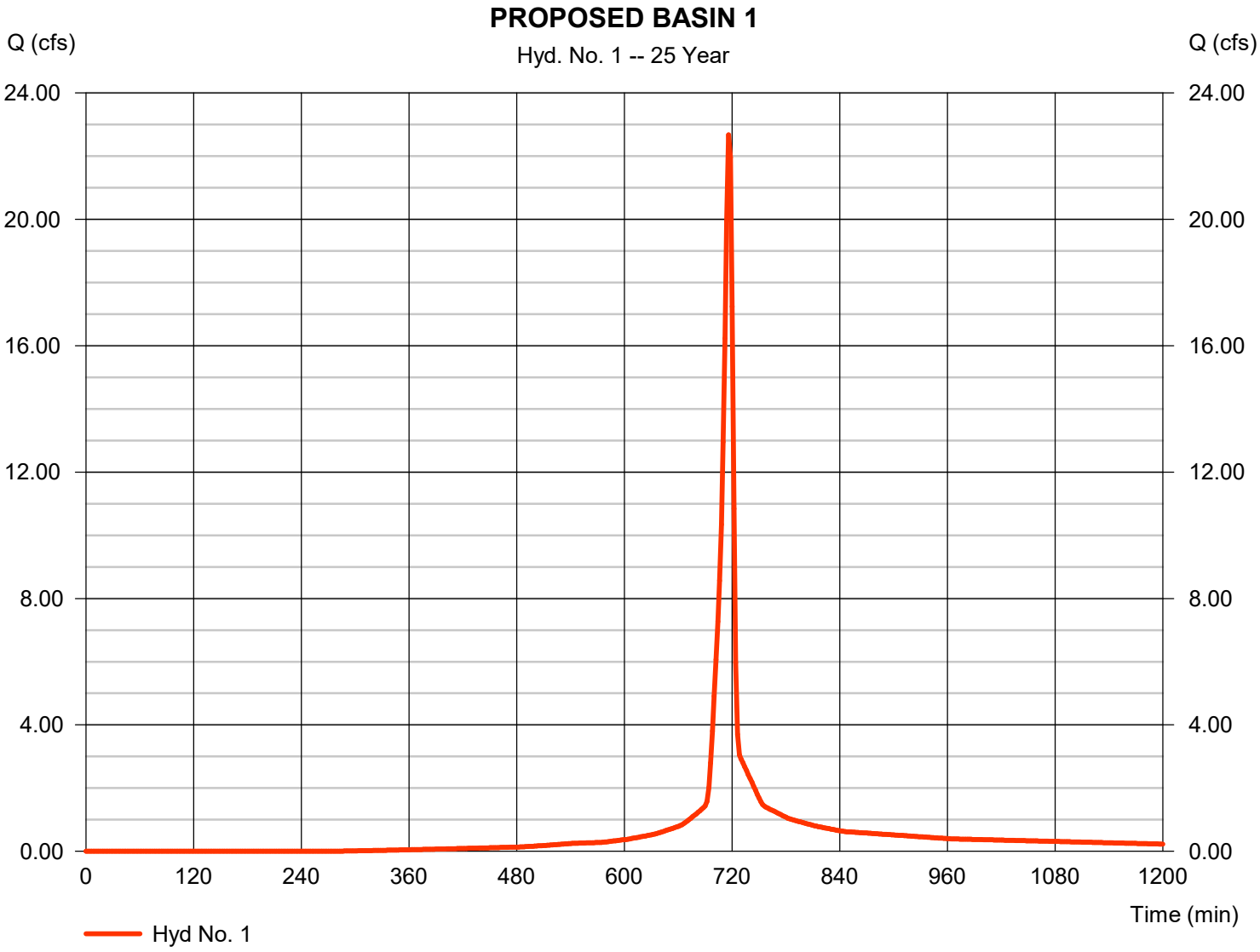
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	22.67	2	716	47,799	------	------	------	PROPOSED BASIN 1
2	Reach	8.375	2	724	47,781	1	------	------	REACH TO STUDY POINT
4	SCS Runoff	43.67	2	716	90,253	------	------	------	PROPOSED BASIN 2
5	Reservoir	26.64	2	722	90,188	4	892.59	40,115	POND 2 ROUTED
6	Reach	9.384	2	732	89,806	5	------	------	REACH TO STUDY POINT
8	SCS Runoff	70.25	2	716	142,903	------	------	------	PROPOSED BASIN 3
9	Reservoir	68.36	2	718	142,868	8	894.34	29,124	POND 3 ROUTED
10	Reach	26.61	2	726	142,556	9	------	------	REACH TO STUDY POINT
12	SCS Runoff	36.80	2	716	74,371	------	------	------	PROPOSED BASIN 4
13	Reservoir	5.756	2	728	74,253	12	897.54	41,459	POND 4 ROUTED
14	Reach	3.621	2	772	73,750	13	------	------	REACH TO STUDY POINT
16	SCS Runoff	52.20	2	716	105,516	------	------	------	PROPOSED BASIN 5
17	Reservoir	31.06	2	722	105,463	16	896.29	45,320	POND 5 ROUTED
18	Reach	25.17	2	726	104,982	17	------	------	REACH TO STUDY POINT
20	Combine	69.13	2	726	458,875	2, 6, 10, 14, 18,	------	------	REACH COMBINED

Hydrograph Report

Hyd. No. 1

PROPOSED BASIN 1

Hydrograph type	= SCS Runoff	Peak discharge	= 22.67 cfs
Storm frequency	= 25 yrs	Time to peak	= 716 min
Time interval	= 2 min	Hyd. volume	= 47,799 cuft
Drainage area	= 3.050 ac	Curve number	= 85
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 6.32 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



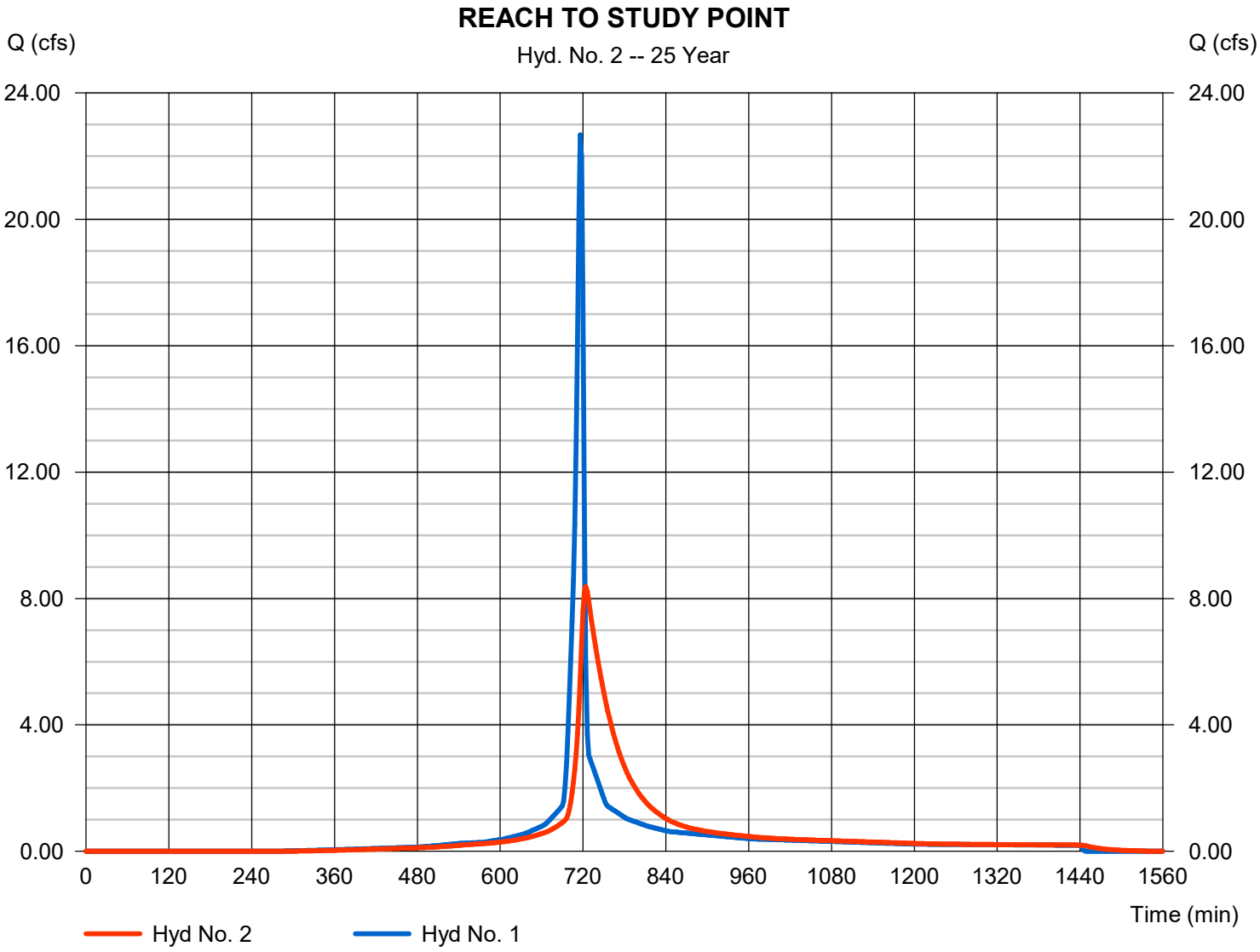
Hydrograph Report

Hyd. No. 2

REACH TO STUDY POINT

Hydrograph type	=	Reach	Peak discharge	=	8.375 cfs
Storm frequency	=	25 yrs	Time to peak	=	724 min
Time interval	=	2 min	Hyd. volume	=	47,781 cuft
Inflow hyd. No.	=	1 - PROPOSED BASIN 1	Section type	=	Trapezoidal
Reach length	=	2981.0 ft	Channel slope	=	0.2 %
Manning's n	=	0.025	Bottom width	=	32.5 ft
Side slope	=	2.5:1	Max. depth	=	5.0 ft
Rating curve x	=	0.262	Rating curve m	=	1.512
Ave. velocity	=	1.08 ft/s	Routing coeff.	=	0.0639

Modified Att-Kin routing method used.



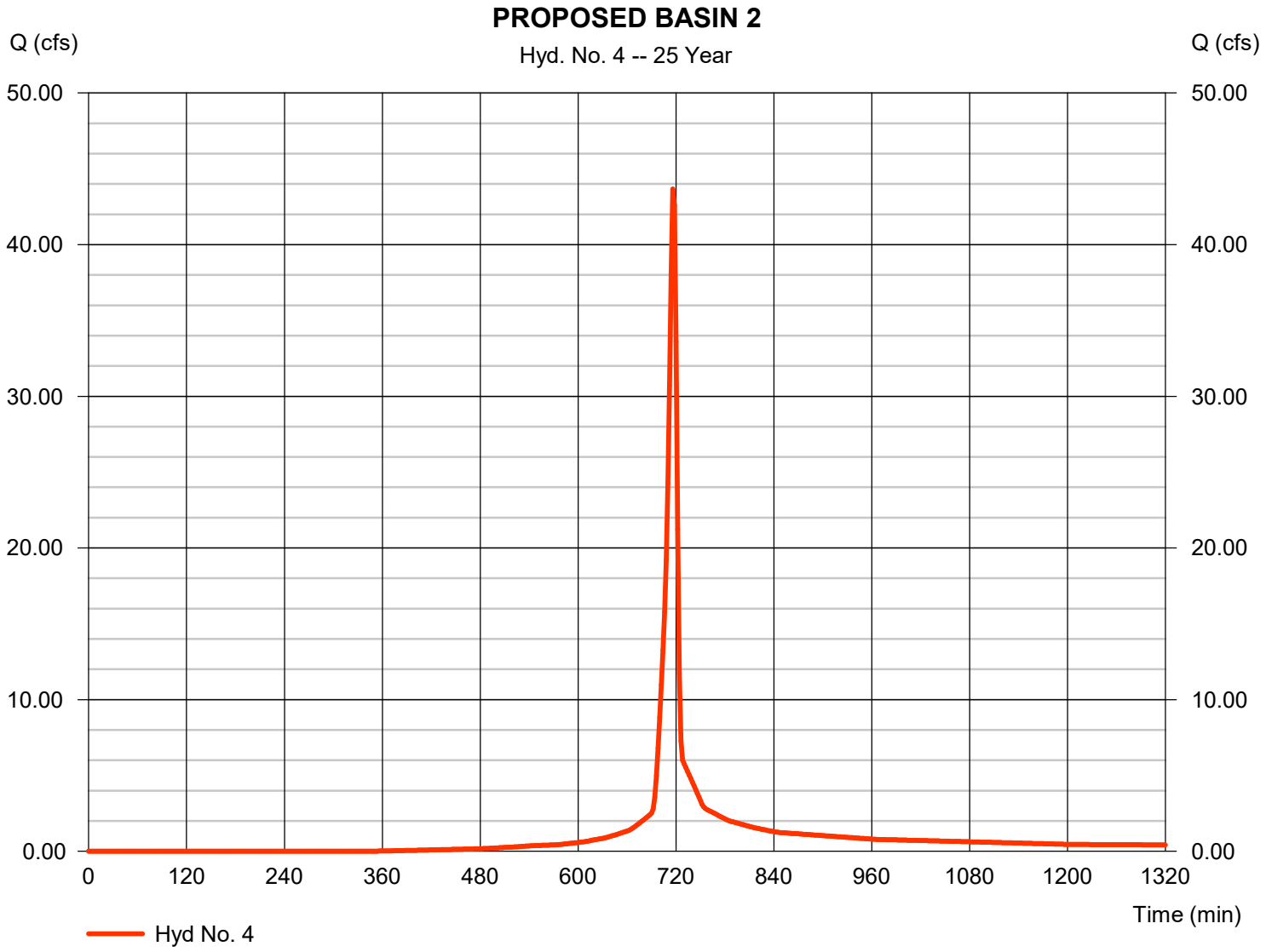
Hydrograph Report

Hyd. No. 4

PROPOSED BASIN 2

Hydrograph type	= SCS Runoff	Peak discharge	= 43.67 cfs
Storm frequency	= 25 yrs	Time to peak	= 716 min
Time interval	= 2 min	Hyd. volume	= 90,253 cuft
Drainage area	= 6.350 ac	Curve number	= 81*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 6.32 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.160 x 98) + (4.950 x 85) + (1.240 x 61)] / 6.350



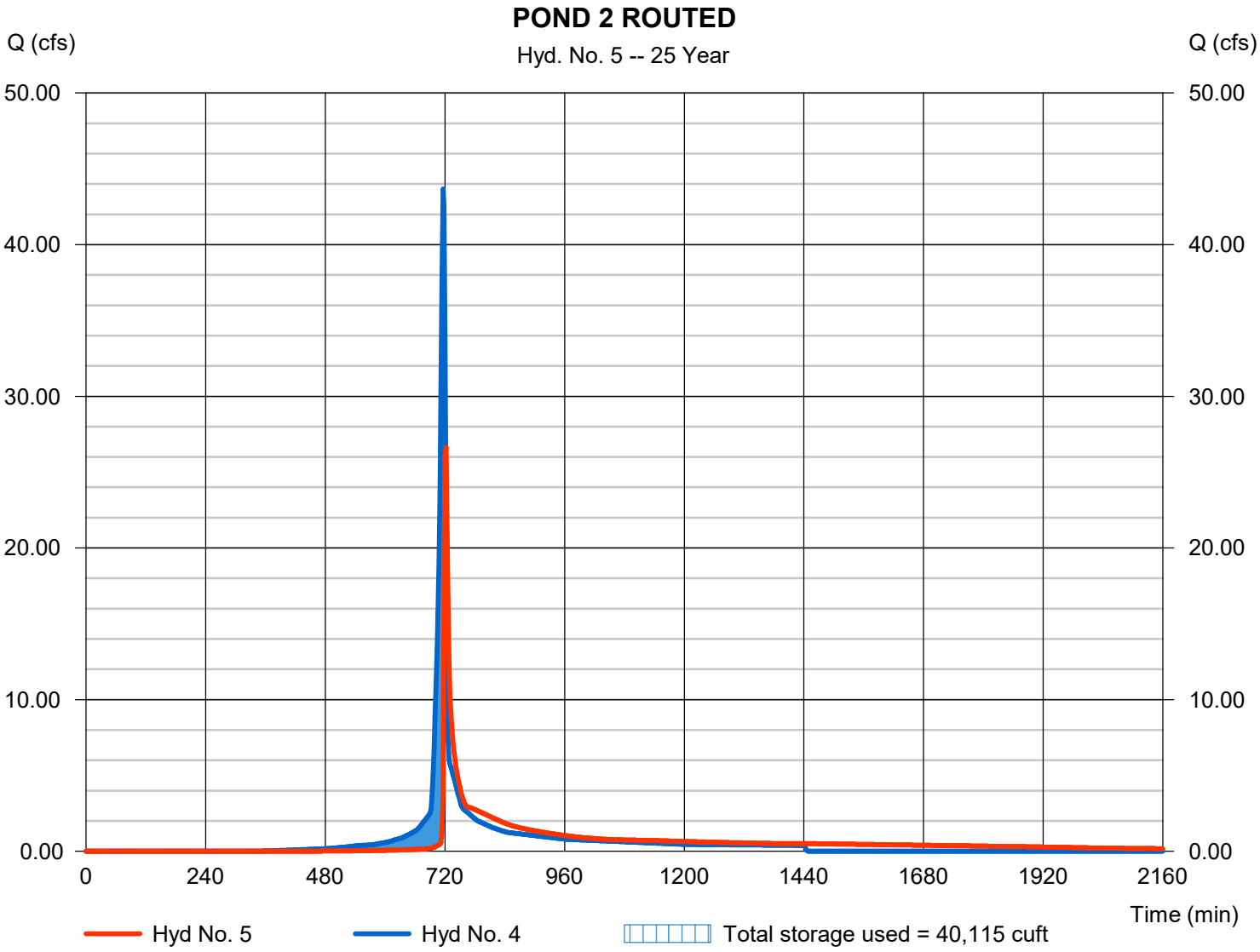
Hydrograph Report

Hyd. No. 5

POND 2 ROUTED

Hydrograph type	=	Reservoir	Peak discharge	=	26.64 cfs
Storm frequency	=	25 yrs	Time to peak	=	722 min
Time interval	=	2 min	Hyd. volume	=	90,188 cuft
Inflow hyd. No.	=	4 - PROPOSED BASIN 2	Max. Elevation	=	892.59 ft
Reservoir name	=	PROPOSED POND 2	Max. Storage	=	40,115 cuft

Storage Indication method used. Wet pond routing start elevation = 890.00 ft.



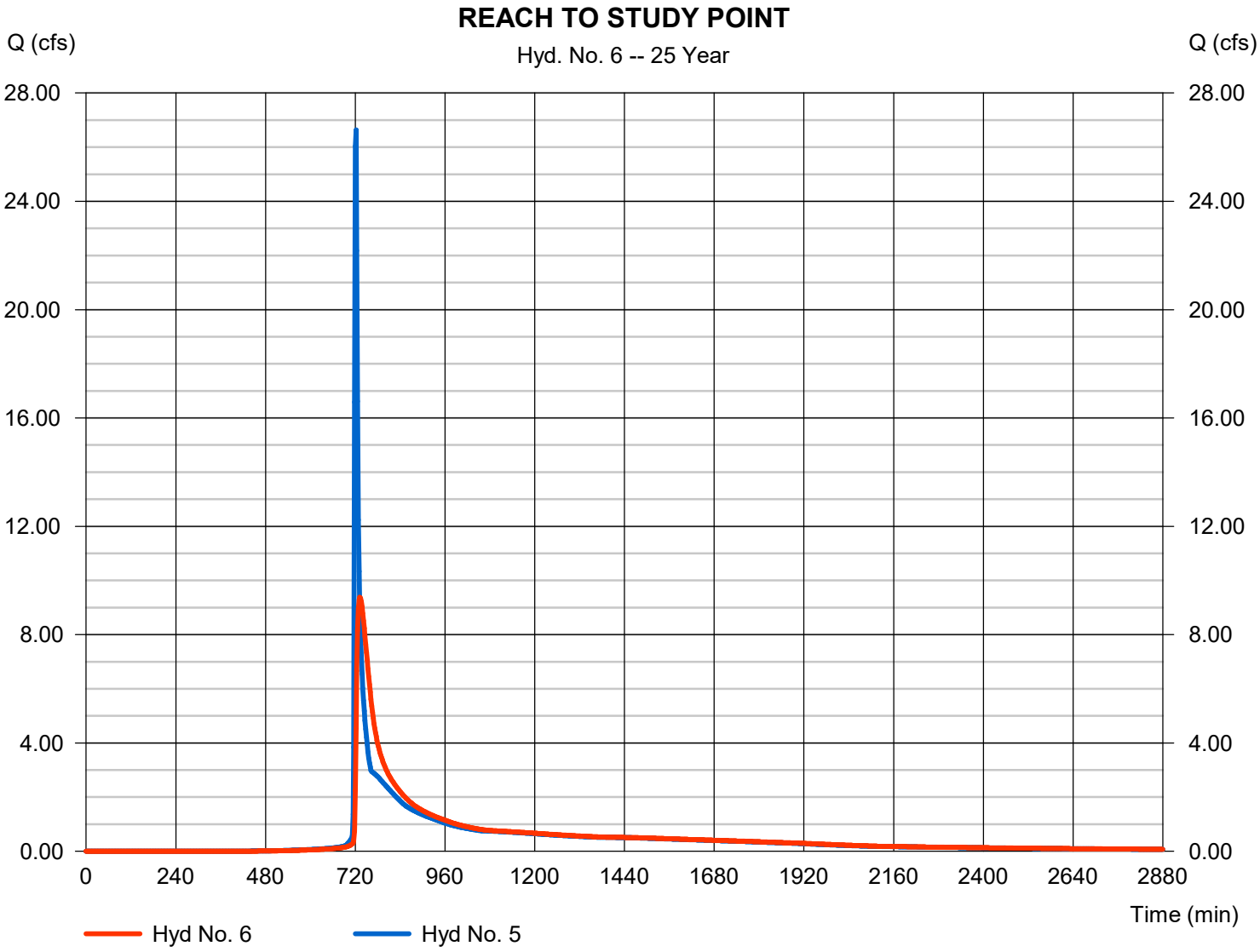
Hydrograph Report

Hyd. No. 6

REACH TO STUDY POINT

Hydrograph type	=	Reach	Peak discharge	=	9.384 cfs
Storm frequency	=	25 yrs	Time to peak	=	732 min
Time interval	=	2 min	Hyd. volume	=	89,806 cuft
Inflow hyd. No.	=	5 - POND 2 ROUTED	Section type	=	Trapezoidal
Reach length	=	2127.0 ft	Channel slope	=	0.2 %
Manning's n	=	0.025	Bottom width	=	32.5 ft
Side slope	=	2.5:1	Max. depth	=	5.0 ft
Rating curve x	=	0.240	Rating curve m	=	1.512
Ave. velocity	=	1.18 ft/s	Routing coeff.	=	0.0961

Modified Att-Kin routing method used.



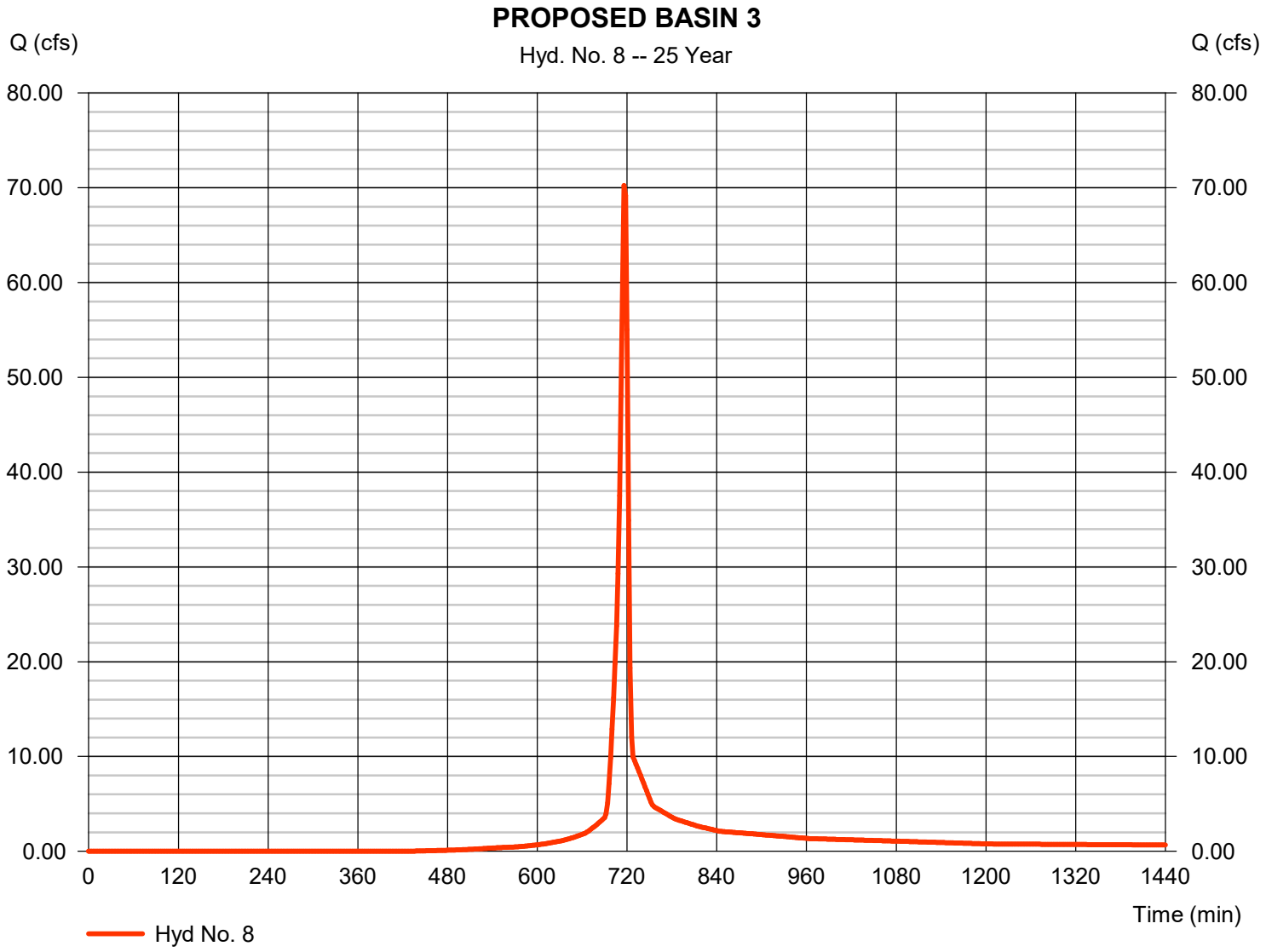
Hydrograph Report

Hyd. No. 8

PROPOSED BASIN 3

Hydrograph type	=	SCS Runoff	Peak discharge	=	70.25 cfs
Storm frequency	=	25 yrs	Time to peak	=	716 min
Time interval	=	2 min	Hyd. volume	=	142,903 cuft
Drainage area	=	11.480 ac	Curve number	=	76*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	6.32 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(2.490 x 98) + (3.270 x 85) + (5.720 x 61)] / 11.480



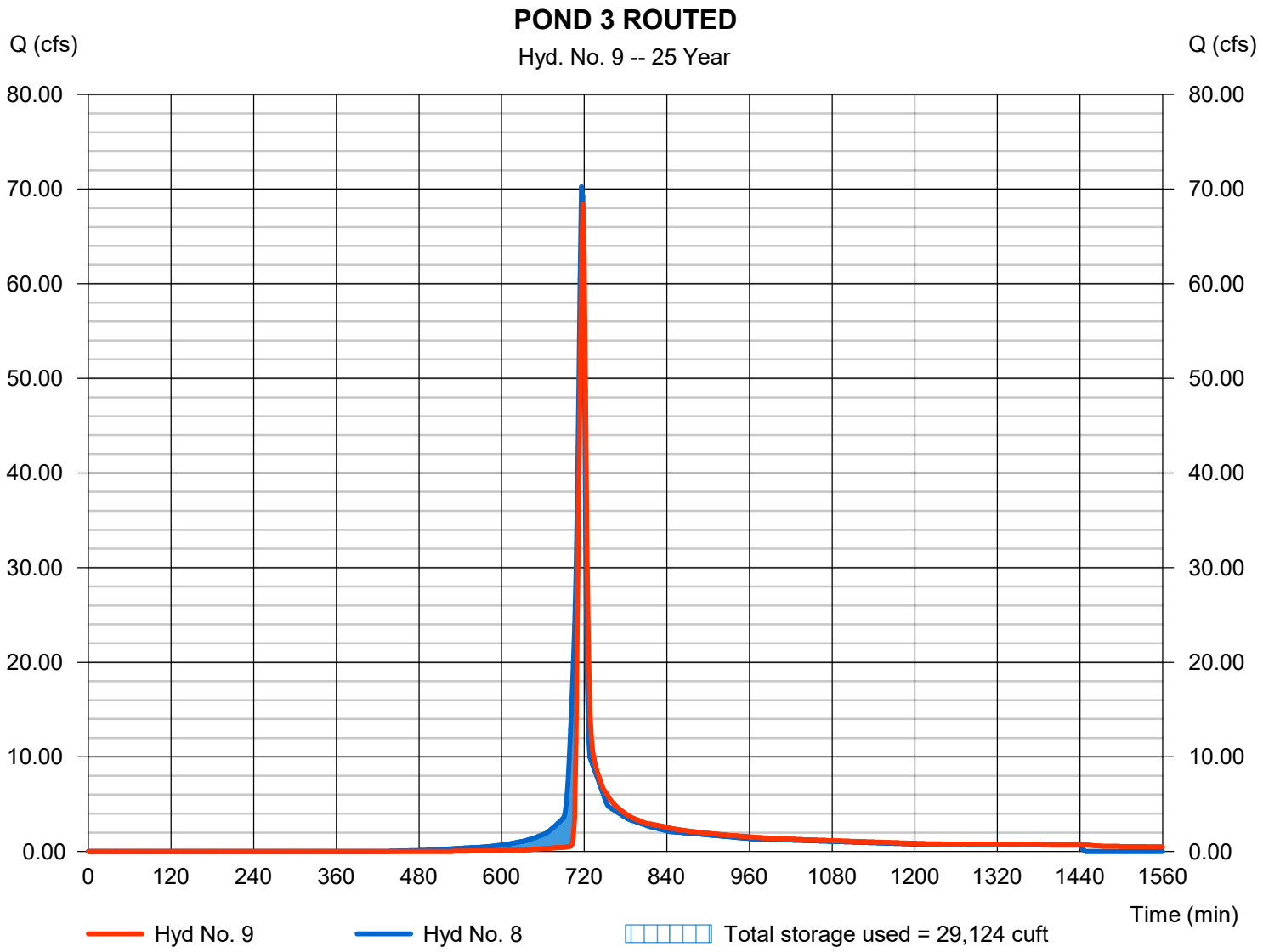
Hydrograph Report

Hyd. No. 9

POND 3 ROUTED

Hydrograph type	=	Reservoir	Peak discharge	=	68.36 cfs
Storm frequency	=	25 yrs	Time to peak	=	718 min
Time interval	=	2 min	Hyd. volume	=	142,868 cuft
Inflow hyd. No.	=	8 - PROPOSED BASIN 3	Max. Elevation	=	894.34 ft
Reservoir name	=	PROPOSED POND 3	Max. Storage	=	29,124 cuft

Storage Indication method used. Wet pond routing start elevation = 891.00 ft.



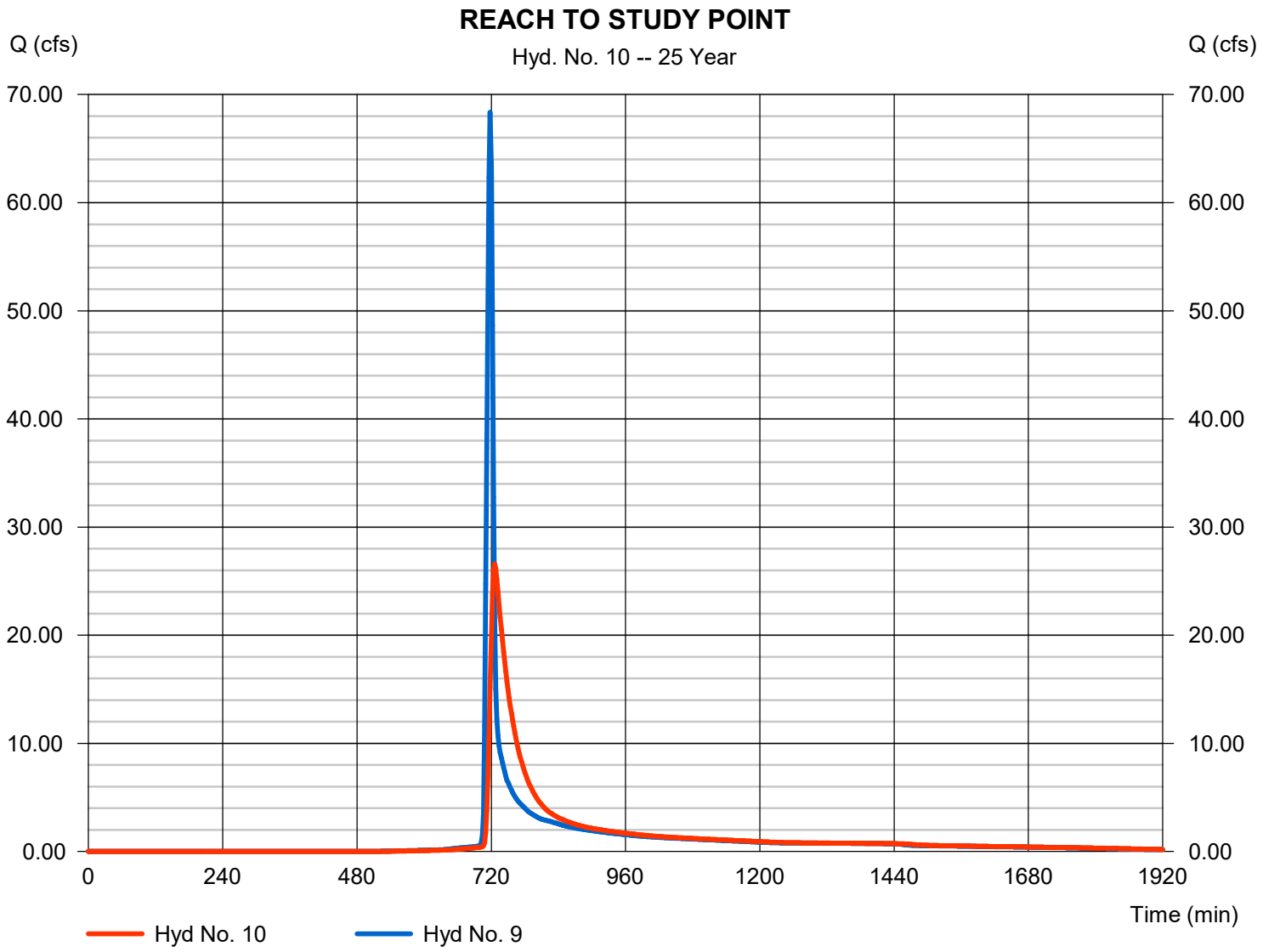
Hydrograph Report

Hyd. No. 10

REACH TO STUDY POINT

Hydrograph type	=	Reach	Peak discharge	=	26.61 cfs
Storm frequency	=	25 yrs	Time to peak	=	726 min
Time interval	=	2 min	Hyd. volume	=	142,556 cuft
Inflow hyd. No.	=	9 - POND 3 ROUTED	Section type	=	Trapezoidal
Reach length	=	3079.0 ft	Channel slope	=	0.2 %
Manning's n	=	0.025	Bottom width	=	32.5 ft
Side slope	=	2.5:1	Max. depth	=	5.0 ft
Rating curve x	=	0.229	Rating curve m	=	1.512
Ave. velocity	=	1.58 ft/s	Routing coeff.	=	0.0889

Modified Att-Kin routing method used.



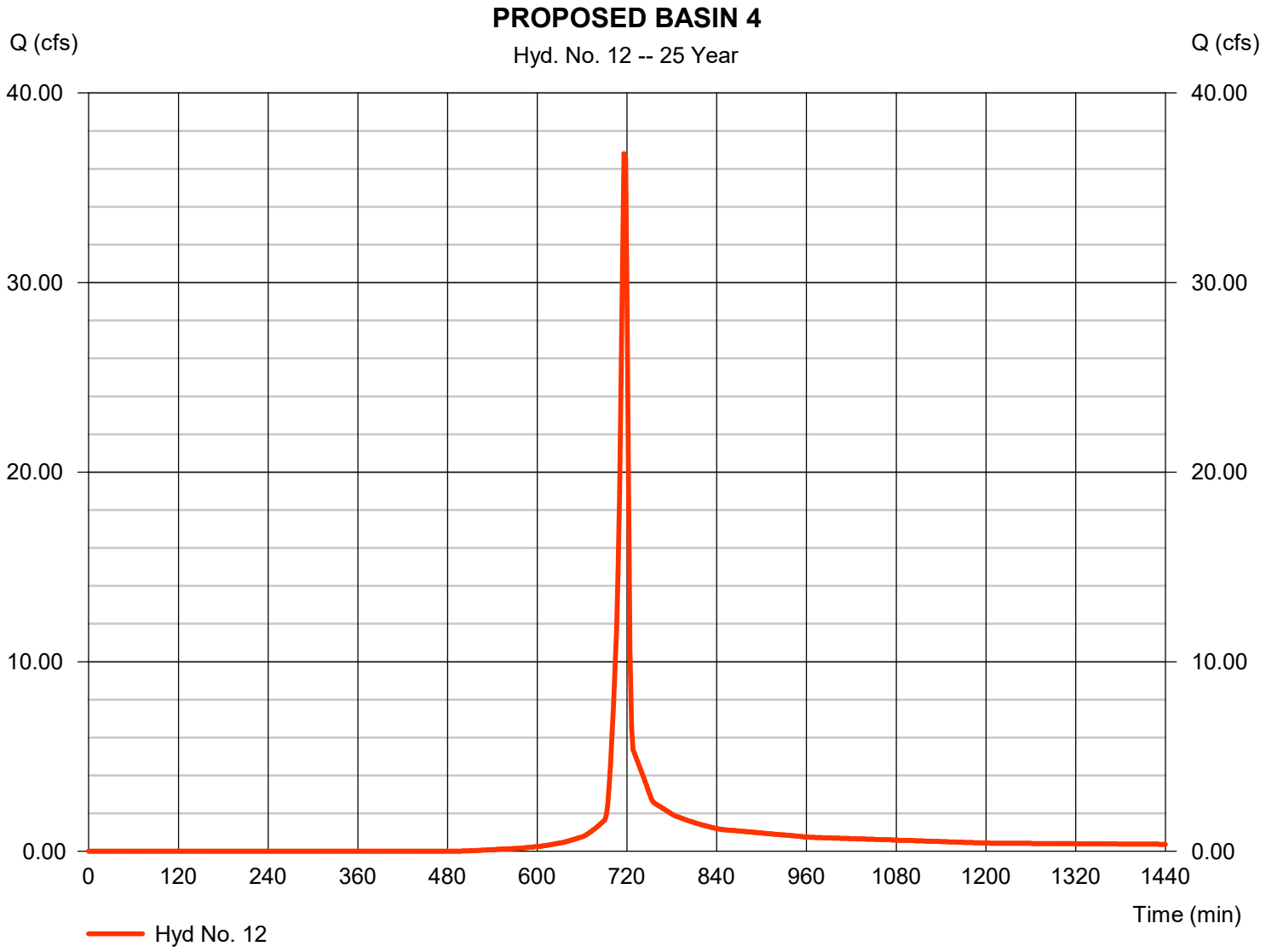
Hydrograph Report

Hyd. No. 12

PROPOSED BASIN 4

Hydrograph type	=	SCS Runoff	Peak discharge	=	36.80 cfs
Storm frequency	=	25 yrs	Time to peak	=	716 min
Time interval	=	2 min	Hyd. volume	=	74,371 cuft
Drainage area	=	6.710 ac	Curve number	=	72*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	6.32 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.260 x 98) + (2.540 x 85) + (3.910 x 61)] / 6.710



Hydrograph Report

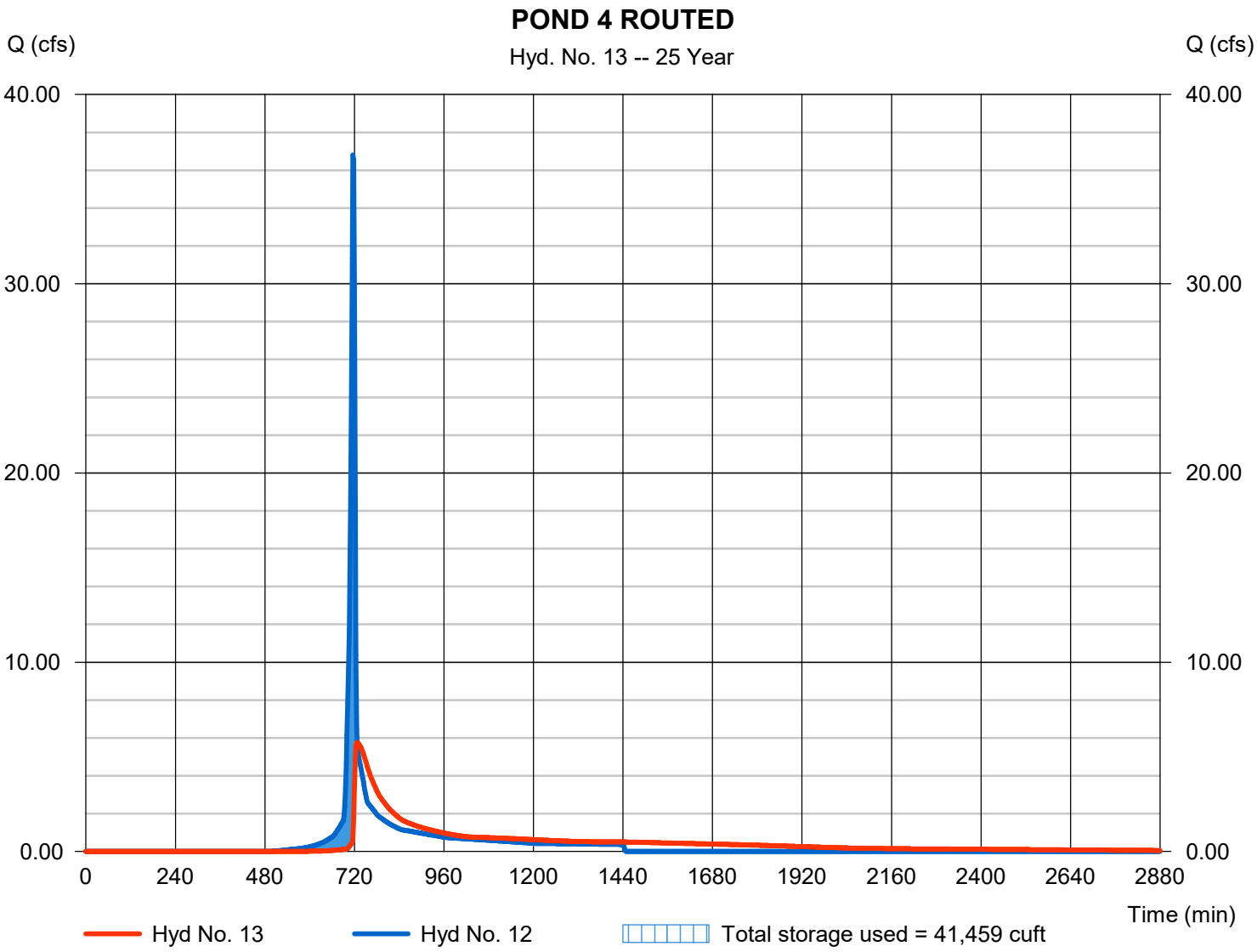
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023 Monday, 02 / 6 / 2023

Hyd. No. 13

POND 4 ROUTED

Hydrograph type	=	Reservoir	Peak discharge	=	5.756 cfs
Storm frequency	=	25 yrs	Time to peak	=	728 min
Time interval	=	2 min	Hyd. volume	=	74,253 cuft
Inflow hyd. No.	=	12 - PROPOSED BASIN 4	Max. Elevation	=	897.54 ft
Reservoir name	=	PROPOSED POND 4	Max. Storage	=	41,459 cuft

Storage Indication method used. Wet pond routing start elevation = 895.00 ft.



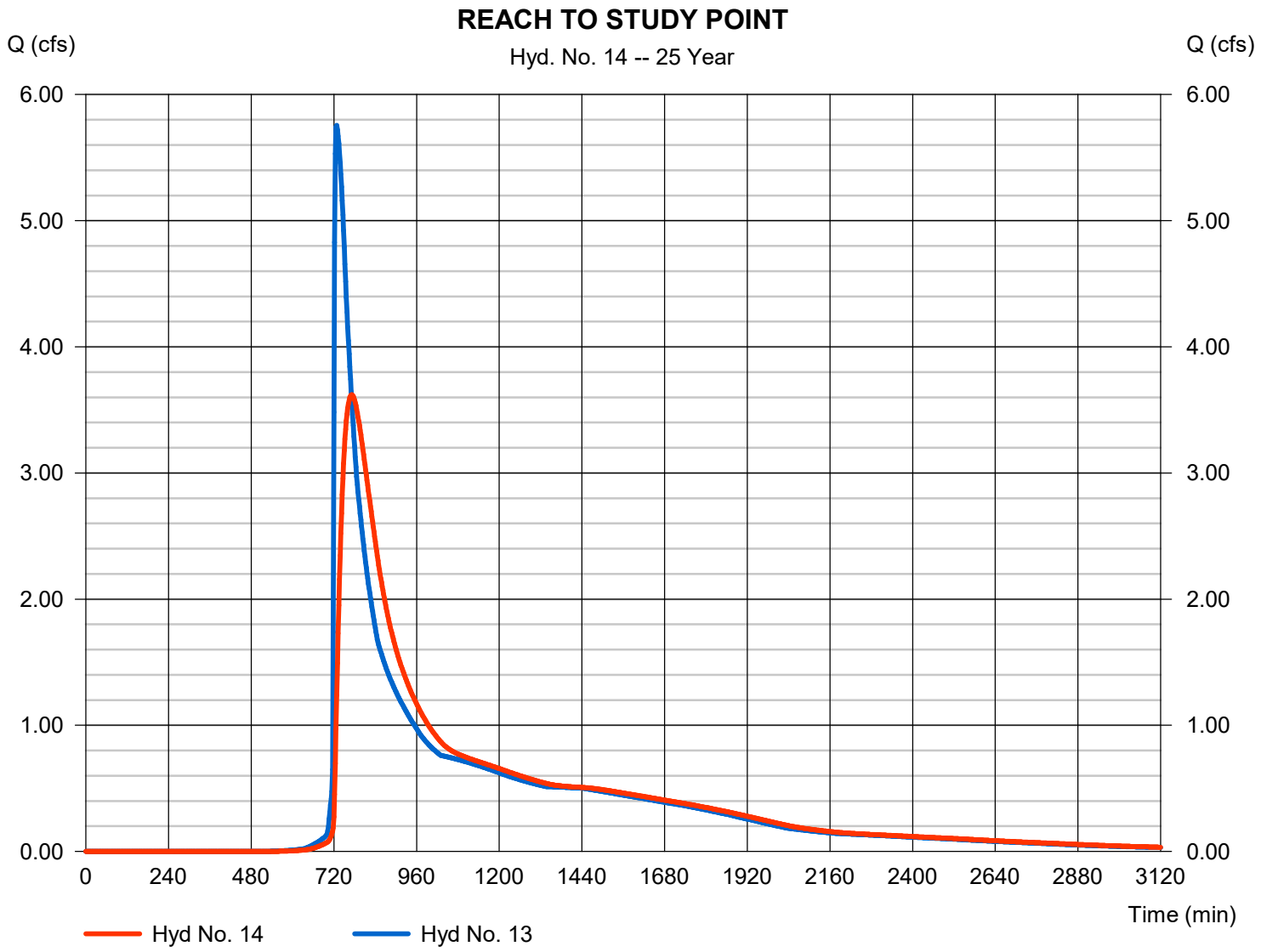
Hydrograph Report

Hyd. No. 14

REACH TO STUDY POINT

Hydrograph type	=	Reach	Peak discharge	=	3.621 cfs
Storm frequency	=	25 yrs	Time to peak	=	772 min
Time interval	=	2 min	Hyd. volume	=	73,750 cuft
Inflow hyd. No.	=	13 - POND 4 ROUTED	Section type	=	Trapezoidal
Reach length	=	2721.0 ft	Channel slope	=	0.3 %
Manning's n	=	0.025	Bottom width	=	32.5 ft
Side slope	=	2.5:1	Max. depth	=	5.0 ft
Rating curve x	=	0.329	Rating curve m	=	1.512
Ave. velocity	=	0.87 ft/s	Routing coeff.	=	0.0562

Modified Att-Kin routing method used.



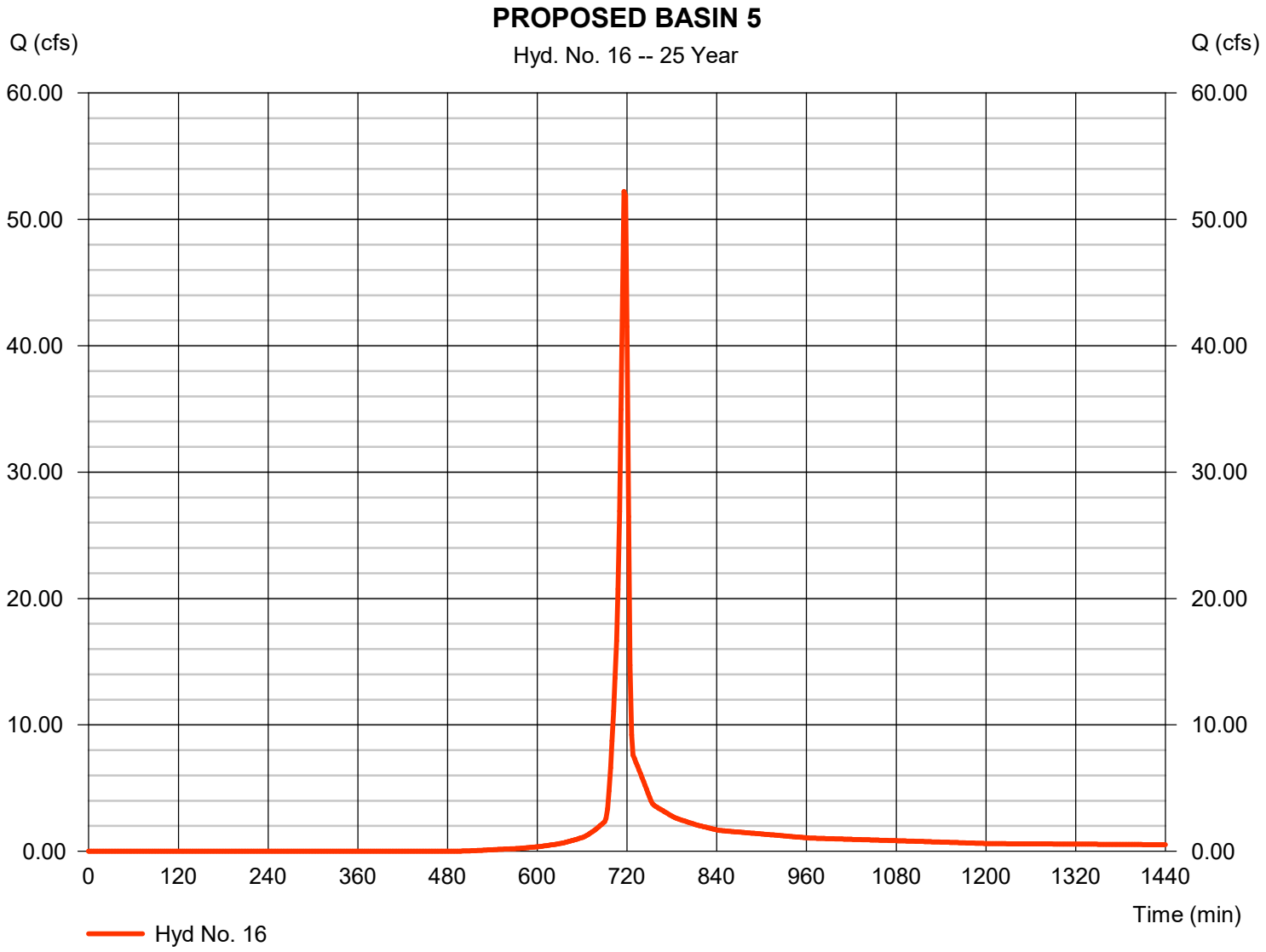
Hydrograph Report

Hyd. No. 16

PROPOSED BASIN 5

Hydrograph type	=	SCS Runoff	Peak discharge	=	52.20 cfs
Storm frequency	=	25 yrs	Time to peak	=	716 min
Time interval	=	2 min	Hyd. volume	=	105,516 cuft
Drainage area	=	9.520 ac	Curve number	=	72*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	6.32 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.310 x 98) + (4.000 x 85) + (5.210 x 61)] / 9.520



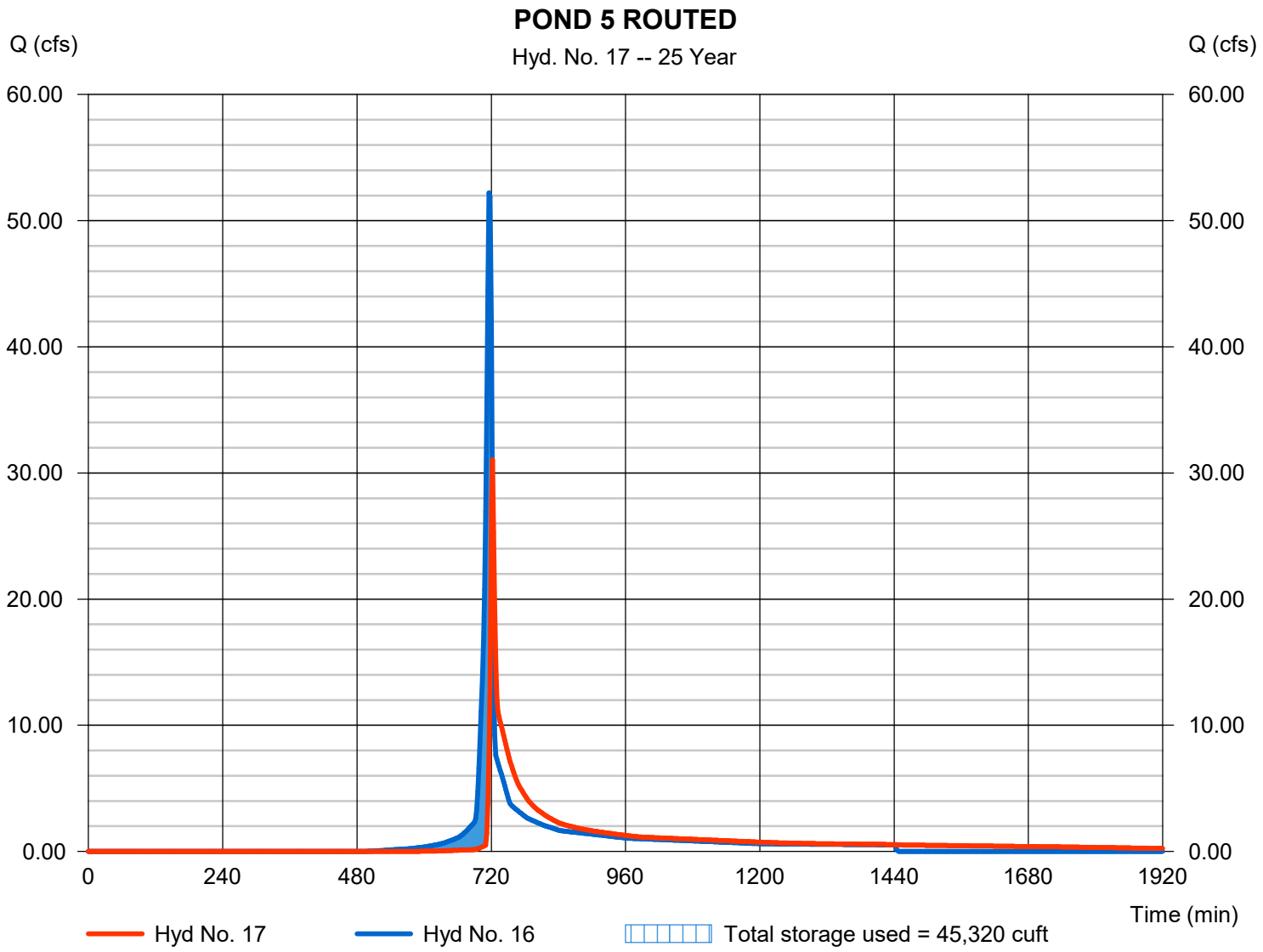
Hydrograph Report

Hyd. No. 17

POND 5 ROUTED

Hydrograph type	=	Reservoir	Peak discharge	=	31.06 cfs
Storm frequency	=	25 yrs	Time to peak	=	722 min
Time interval	=	2 min	Hyd. volume	=	105,463 cuft
Inflow hyd. No.	=	16 - PROPOSED BASIN 5	Max. Elevation	=	896.29 ft
Reservoir name	=	PROPOSED POND 5	Max. Storage	=	45,320 cuft

Storage Indication method used. Wet pond routing start elevation = 893.00 ft.



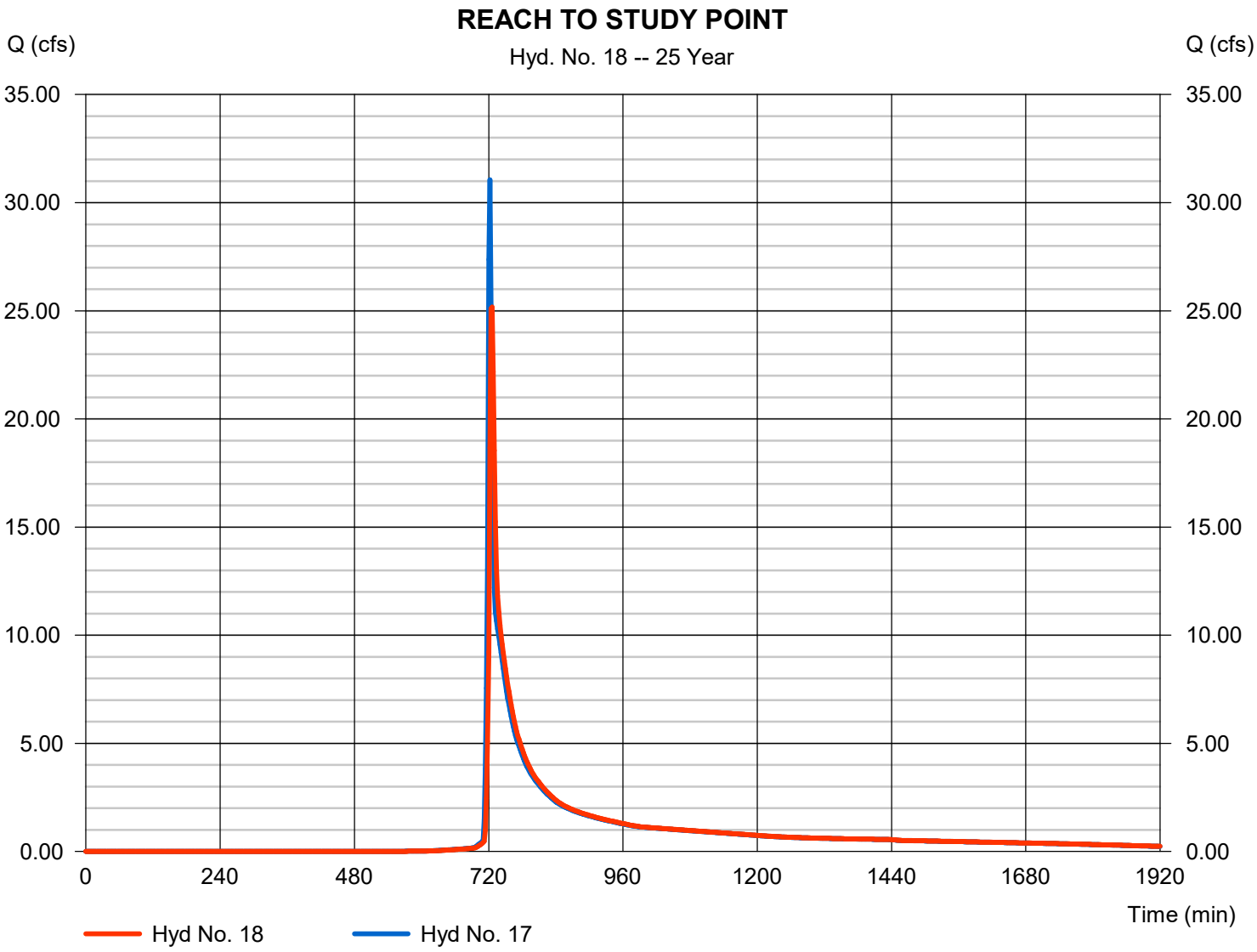
Hydrograph Report

Hyd. No. 18

REACH TO STUDY POINT

Hydrograph type	=	Reach	Peak discharge	=	25.17 cfs
Storm frequency	=	25 yrs	Time to peak	=	726 min
Time interval	=	2 min	Hyd. volume	=	104,982 cuft
Inflow hyd. No.	=	17 - POND 5 ROUTED	Section type	=	Trapezoidal
Reach length	=	597.0 ft	Channel slope	=	1.1 %
Manning's n	=	0.025	Bottom width	=	32.5 ft
Side slope	=	2.5:1	Max. depth	=	5.0 ft
Rating curve x	=	0.610	Rating curve m	=	1.512
Ave. velocity	=	2.31 ft/s	Routing coeff.	=	0.5193

Modified Att-Kin routing method used.

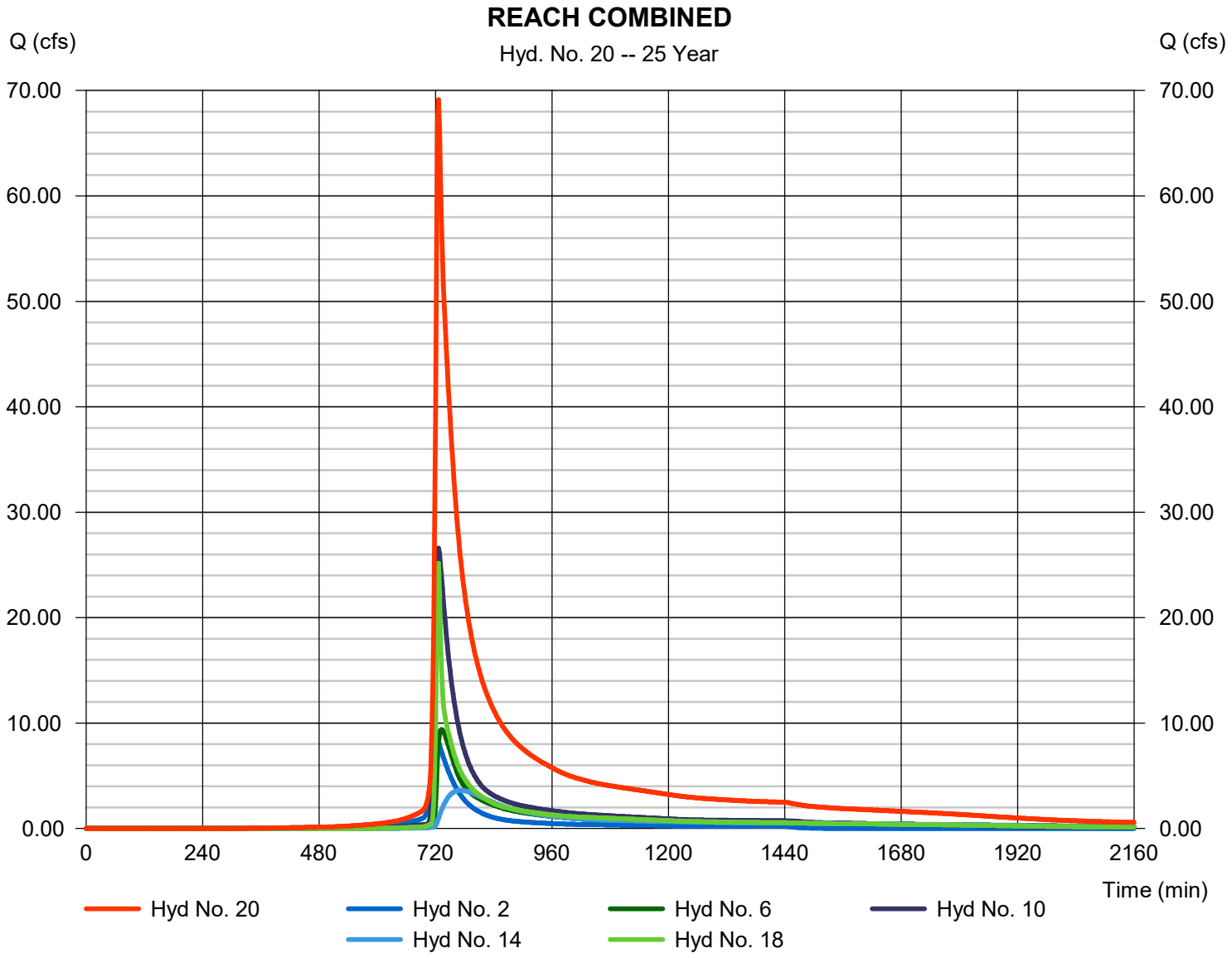


Hydrograph Report

Hyd. No. 20

REACH COMBINED

Hydrograph type	= Combine	Peak discharge	= 69.13 cfs
Storm frequency	= 25 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 458,875 cuft
Inflow hyds.	= 2, 6, 10, 14, 18	Contrib. drain. area	= 0.000 ac



Hydrograph Summary Report

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

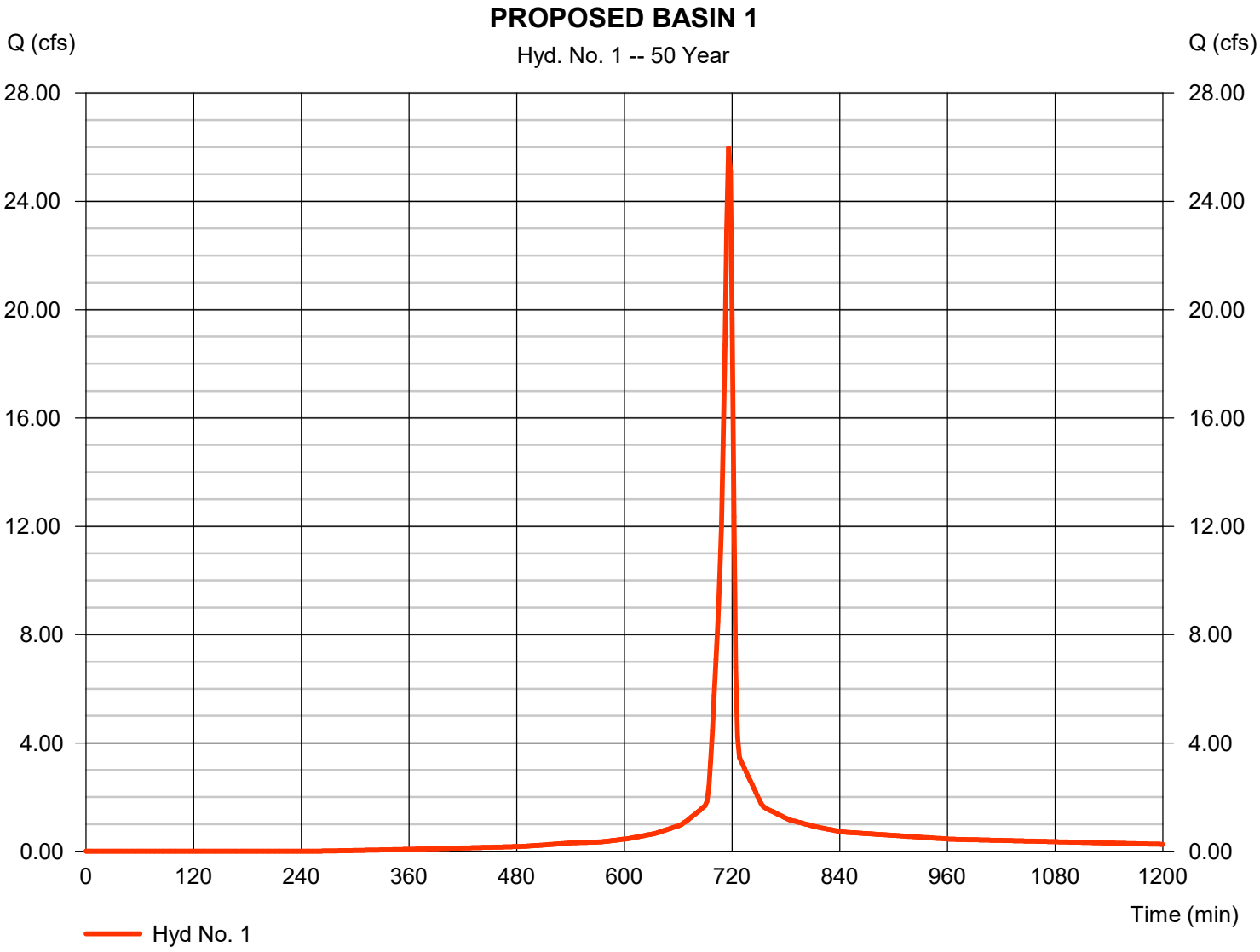
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	25.97	2	716	55,214	------	------	------	PROPOSED BASIN 1
2	Reach	10.10	2	724	55,197	1	------	------	REACH TO STUDY POINT
4	SCS Runoff	50.54	2	716	105,244	------	------	------	PROPOSED BASIN 2
5	Reservoir	39.54	2	720	105,177	4	892.72	42,307	POND 2 ROUTED
6	Reach	15.06	2	728	104,798	5	------	------	REACH TO STUDY POINT
8	SCS Runoff	82.53	2	716	168,762	------	------	------	PROPOSED BASIN 3
9	Reservoir	80.34	2	718	168,727	8	894.44	30,163	POND 3 ROUTED
10	Reach	34.35	2	726	168,414	9	------	------	REACH TO STUDY POINT
12	SCS Runoff	43.81	2	716	88,800	------	------	------	PROPOSED BASIN 4
13	Reservoir	9.705	2	726	88,678	12	897.96	47,313	POND 4 ROUTED
14	Reach	5.708	2	758	88,179	13	------	------	REACH TO STUDY POINT
16	SCS Runoff	62.16	2	716	125,988	------	------	------	PROPOSED BASIN 5
17	Reservoir	48.94	2	720	125,933	16	896.47	48,015	POND 5 ROUTED
18	Reach	42.35	2	724	125,454	17	------	------	REACH TO STUDY POINT
20	Combine	101.08	2	724	542,042	2, 6, 10, 14, 18,	------	------	REACH COMBINED

Hydrograph Report

Hyd. No. 1

PROPOSED BASIN 1

Hydrograph type	= SCS Runoff	Peak discharge	= 25.97 cfs
Storm frequency	= 50 yrs	Time to peak	= 716 min
Time interval	= 2 min	Hyd. volume	= 55,214 cuft
Drainage area	= 3.050 ac	Curve number	= 85
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 7.07 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



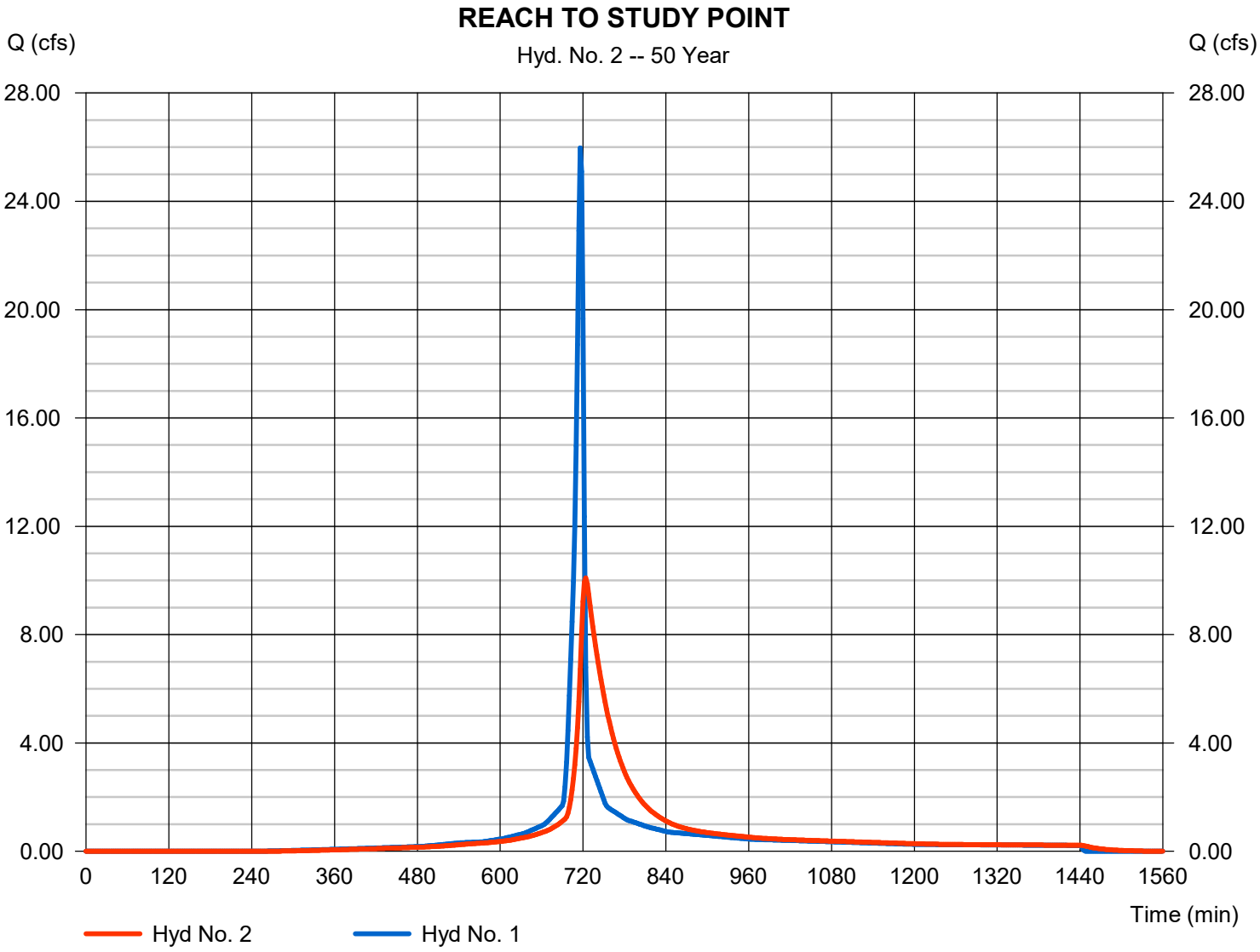
Hydrograph Report

Hyd. No. 2

REACH TO STUDY POINT

Hydrograph type	=	Reach	Peak discharge	=	10.10 cfs
Storm frequency	=	50 yrs	Time to peak	=	724 min
Time interval	=	2 min	Hyd. volume	=	55,197 cuft
Inflow hyd. No.	=	1 - PROPOSED BASIN 1	Section type	=	Trapezoidal
Reach length	=	2981.0 ft	Channel slope	=	0.2 %
Manning's n	=	0.025	Bottom width	=	32.5 ft
Side slope	=	2.5:1	Max. depth	=	5.0 ft
Rating curve x	=	0.262	Rating curve m	=	1.512
Ave. velocity	=	1.17 ft/s	Routing coeff.	=	0.0687

Modified Att-Kin routing method used.



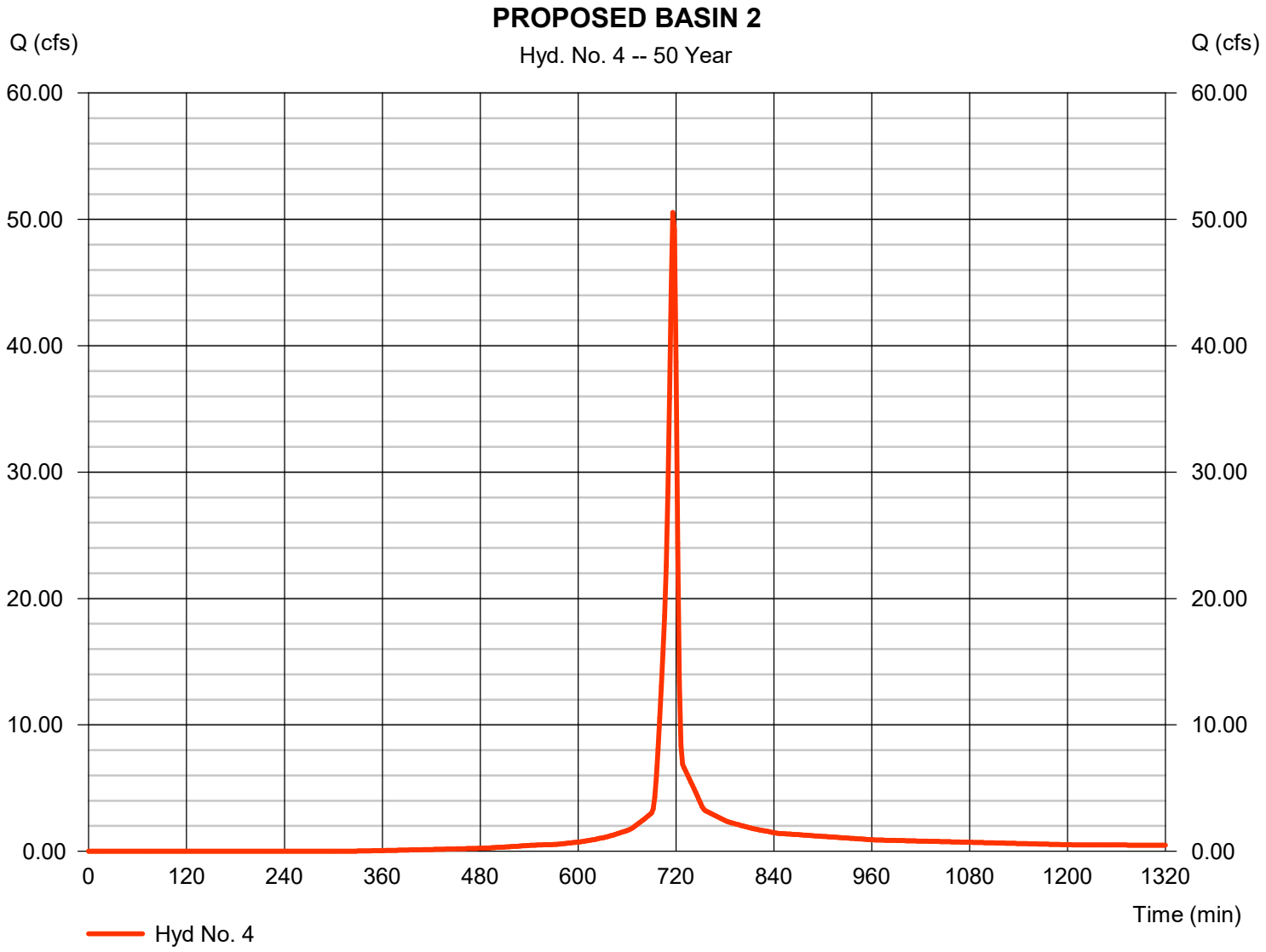
Hydrograph Report

Hyd. No. 4

PROPOSED BASIN 2

Hydrograph type	=	SCS Runoff	Peak discharge	=	50.54 cfs
Storm frequency	=	50 yrs	Time to peak	=	716 min
Time interval	=	2 min	Hyd. volume	=	105,244 cuft
Drainage area	=	6.350 ac	Curve number	=	81*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	7.07 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.160 x 98) + (4.950 x 85) + (1.240 x 61)] / 6.350



Hydrograph Report

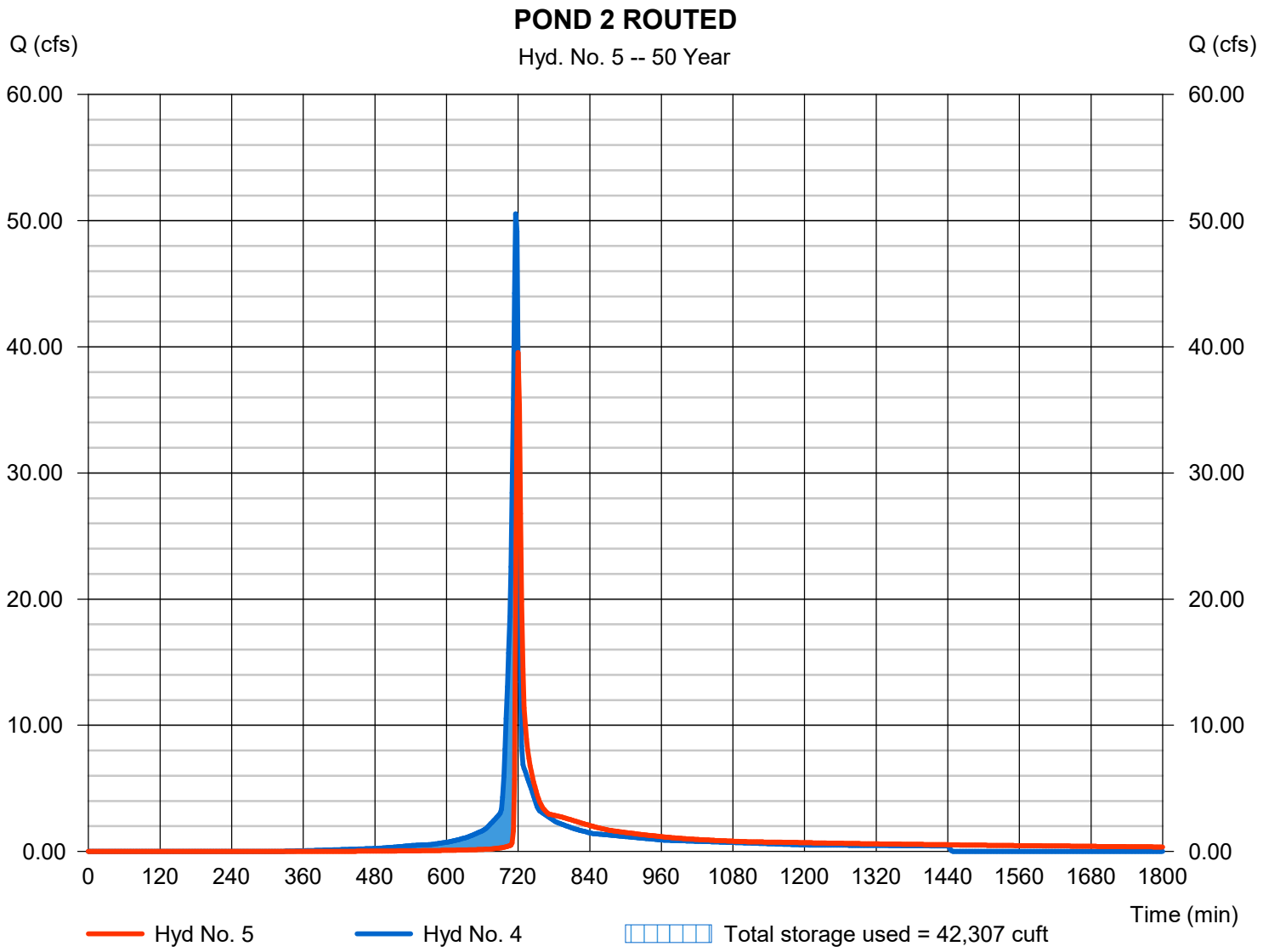
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023 Monday, 02 / 6 / 2023

Hyd. No. 5

POND 2 ROUTED

Hydrograph type	= Reservoir	Peak discharge	= 39.54 cfs
Storm frequency	= 50 yrs	Time to peak	= 720 min
Time interval	= 2 min	Hyd. volume	= 105,177 cuft
Inflow hyd. No.	= 4 - PROPOSED BASIN 2	Max. Elevation	= 892.72 ft
Reservoir name	= PROPOSED POND 2	Max. Storage	= 42,307 cuft

Storage Indication method used. Wet pond routing start elevation = 890.00 ft.



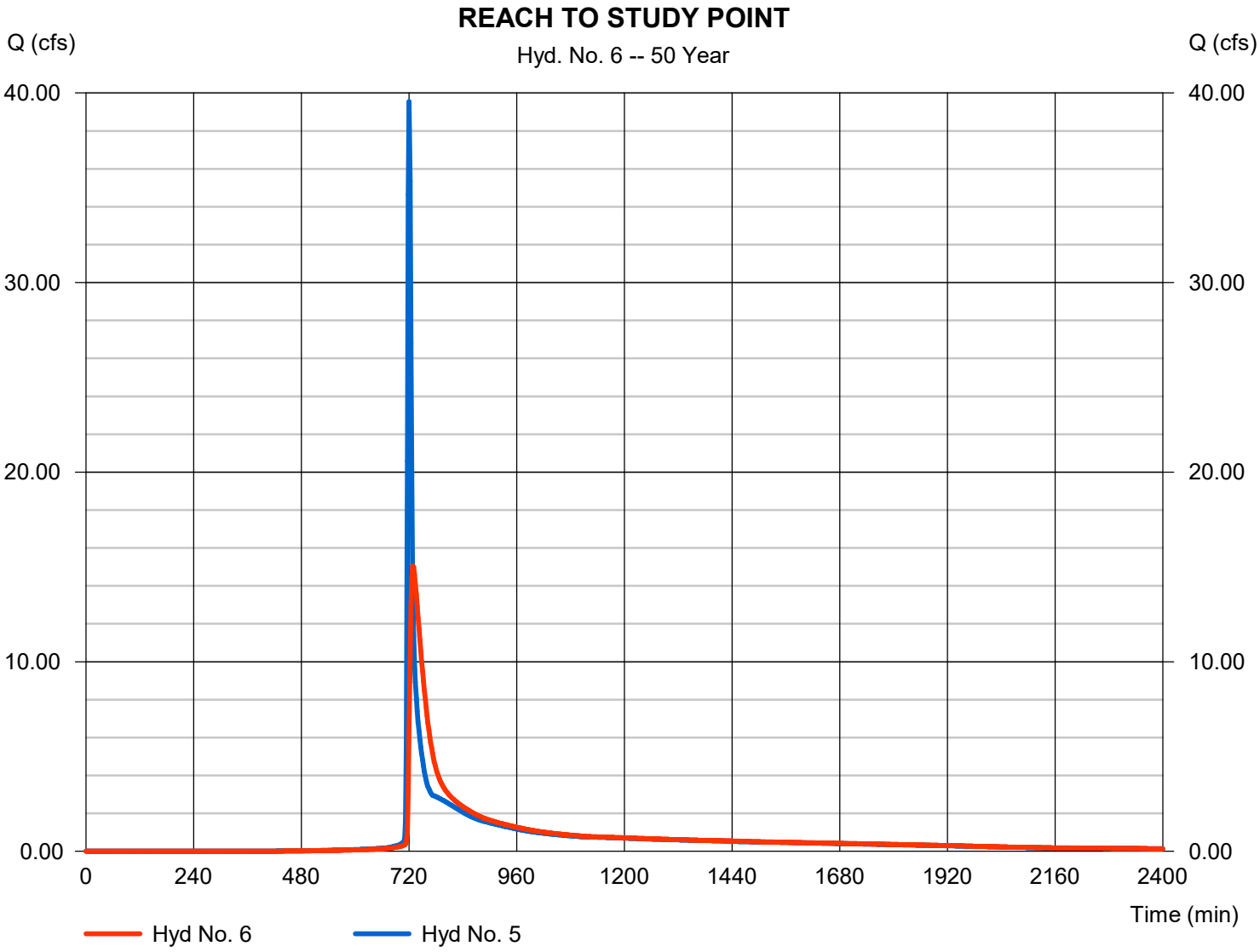
Hydrograph Report

Hyd. No. 6

REACH TO STUDY POINT

Hydrograph type	=	Reach	Peak discharge	=	15.06 cfs
Storm frequency	=	50 yrs	Time to peak	=	728 min
Time interval	=	2 min	Hyd. volume	=	104,798 cuft
Inflow hyd. No.	=	5 - POND 2 ROUTED	Section type	=	Trapezoidal
Reach length	=	2127.0 ft	Channel slope	=	0.2 %
Manning's n	=	0.025	Bottom width	=	32.5 ft
Side slope	=	2.5:1	Max. depth	=	5.0 ft
Rating curve x	=	0.240	Rating curve m	=	1.512
Ave. velocity	=	1.35 ft/s	Routing coeff.	=	0.1091

Modified Att-Kin routing method used.



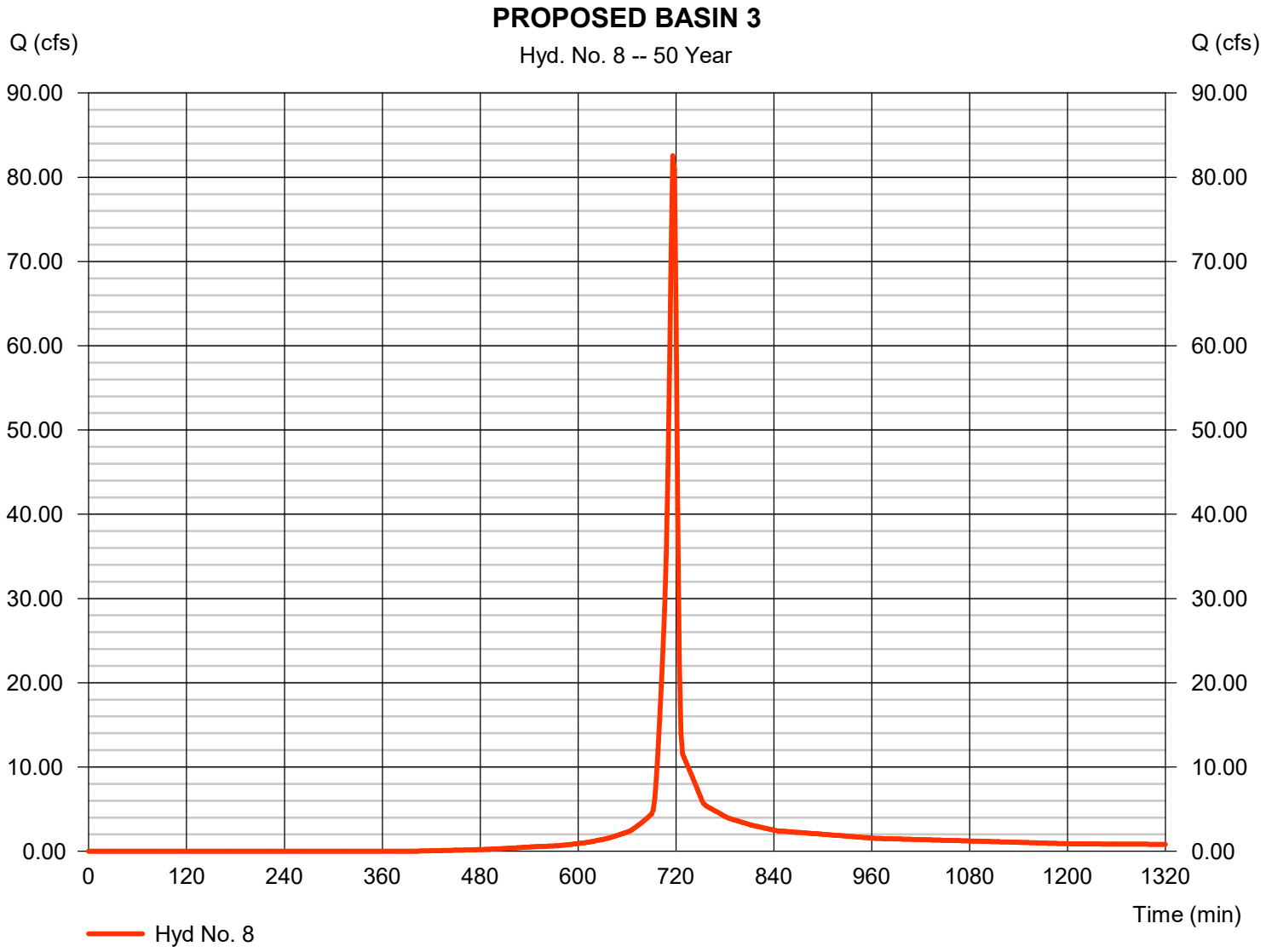
Hydrograph Report

Hyd. No. 8

PROPOSED BASIN 3

Hydrograph type	=	SCS Runoff	Peak discharge	=	82.53 cfs
Storm frequency	=	50 yrs	Time to peak	=	716 min
Time interval	=	2 min	Hyd. volume	=	168,762 cuft
Drainage area	=	11.480 ac	Curve number	=	76*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	7.07 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(2.490 x 98) + (3.270 x 85) + (5.720 x 61)] / 11.480



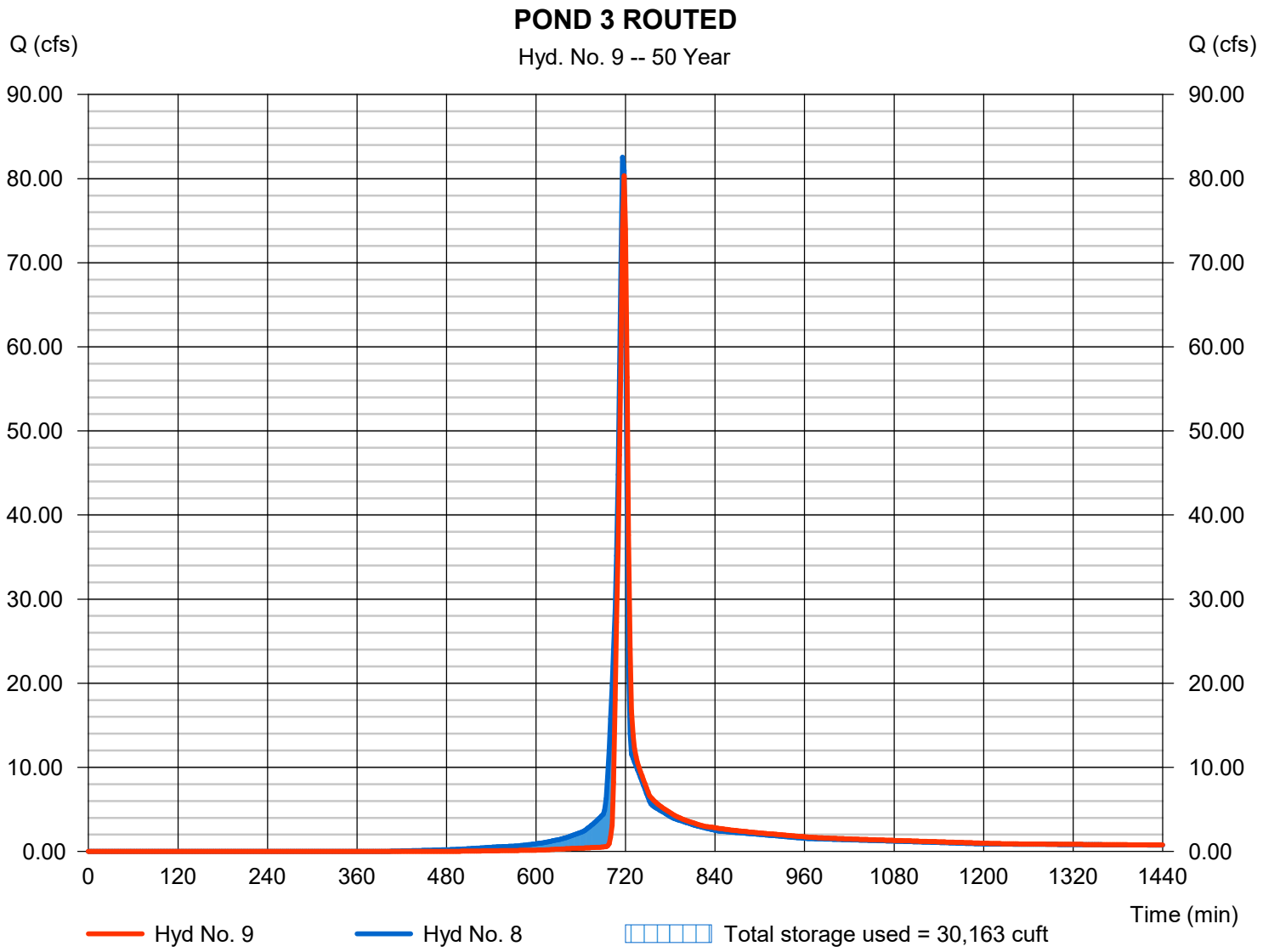
Hydrograph Report

Hyd. No. 9

POND 3 ROUTED

Hydrograph type	=	Reservoir	Peak discharge	=	80.34 cfs
Storm frequency	=	50 yrs	Time to peak	=	718 min
Time interval	=	2 min	Hyd. volume	=	168,727 cuft
Inflow hyd. No.	=	8 - PROPOSED BASIN 3	Max. Elevation	=	894.44 ft
Reservoir name	=	PROPOSED POND 3	Max. Storage	=	30,163 cuft

Storage Indication method used. Wet pond routing start elevation = 891.00 ft.



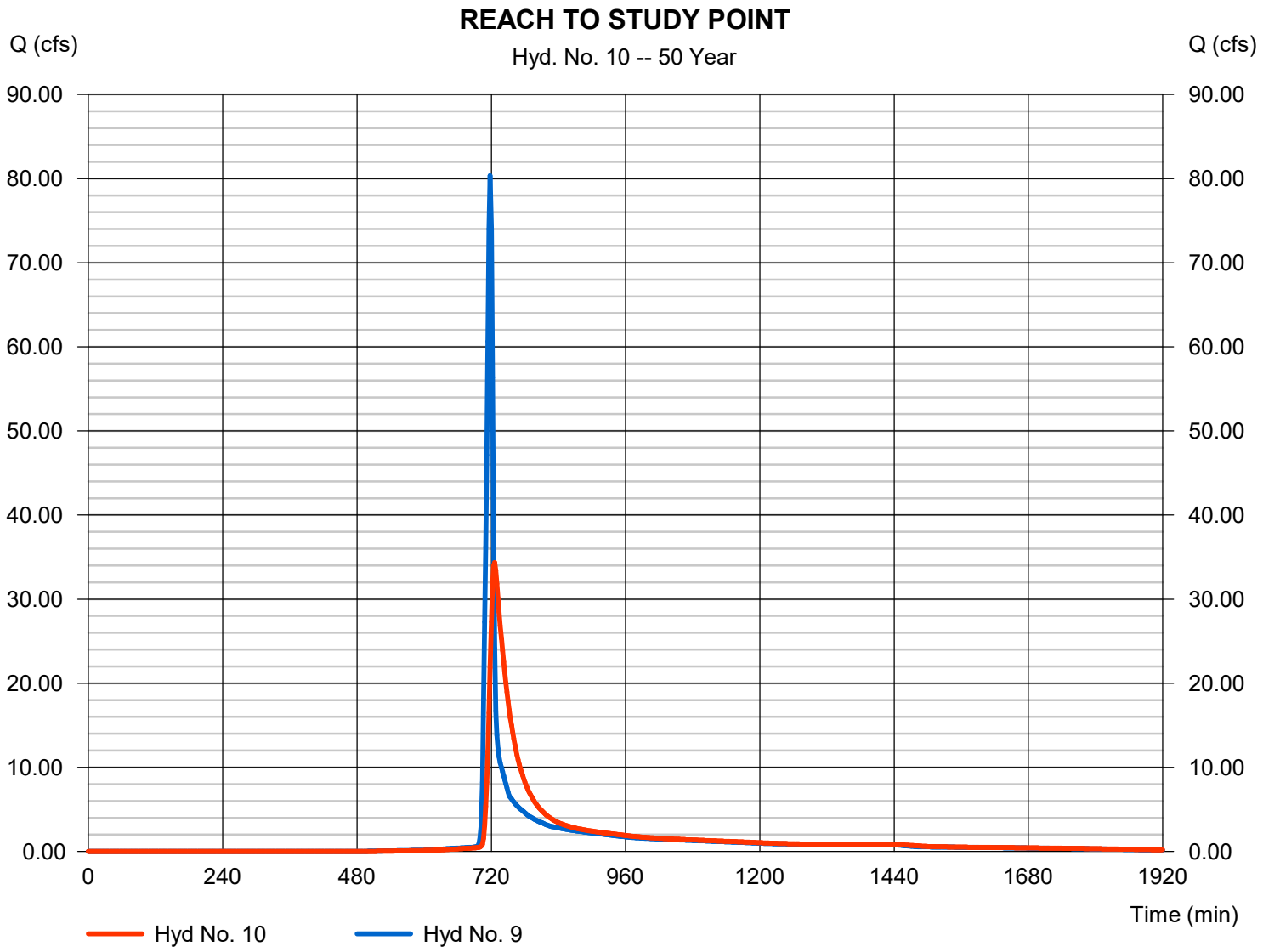
Hydrograph Report

Hyd. No. 10

REACH TO STUDY POINT

Hydrograph type	=	Reach	Peak discharge	=	34.35 cfs
Storm frequency	=	50 yrs	Time to peak	=	726 min
Time interval	=	2 min	Hyd. volume	=	168,414 cuft
Inflow hyd. No.	=	9 - POND 3 ROUTED	Section type	=	Trapezoidal
Reach length	=	3079.0 ft	Channel slope	=	0.2 %
Manning's n	=	0.025	Bottom width	=	32.5 ft
Side slope	=	2.5:1	Max. depth	=	5.0 ft
Rating curve x	=	0.229	Rating curve m	=	1.512
Ave. velocity	=	1.67 ft/s	Routing coeff.	=	0.0937

Modified Att-Kin routing method used.



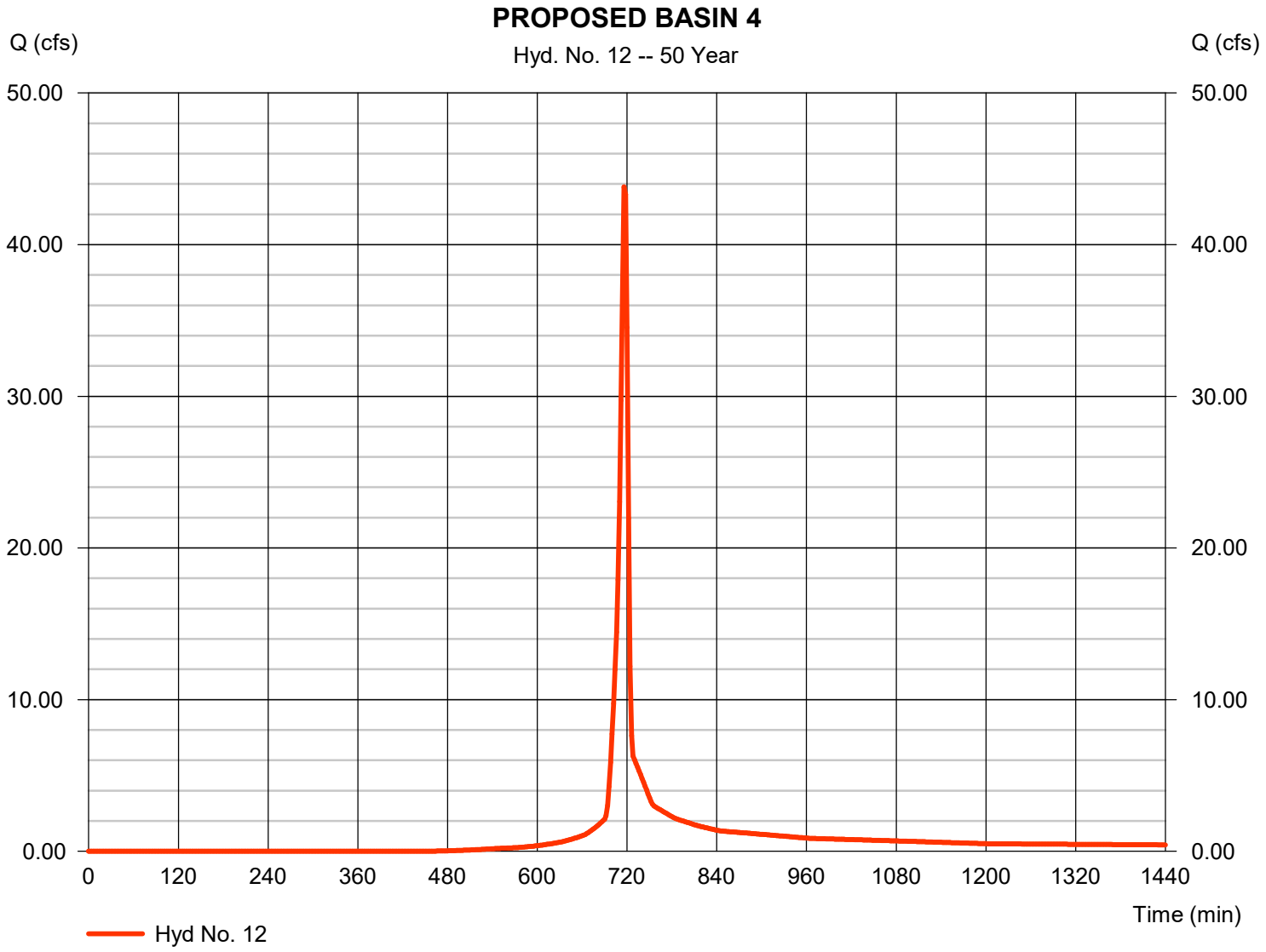
Hydrograph Report

Hyd. No. 12

PROPOSED BASIN 4

Hydrograph type	= SCS Runoff	Peak discharge	= 43.81 cfs
Storm frequency	= 50 yrs	Time to peak	= 716 min
Time interval	= 2 min	Hyd. volume	= 88,800 cuft
Drainage area	= 6.710 ac	Curve number	= 72*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 7.07 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.260 x 98) + (2.540 x 85) + (3.910 x 61)] / 6.710



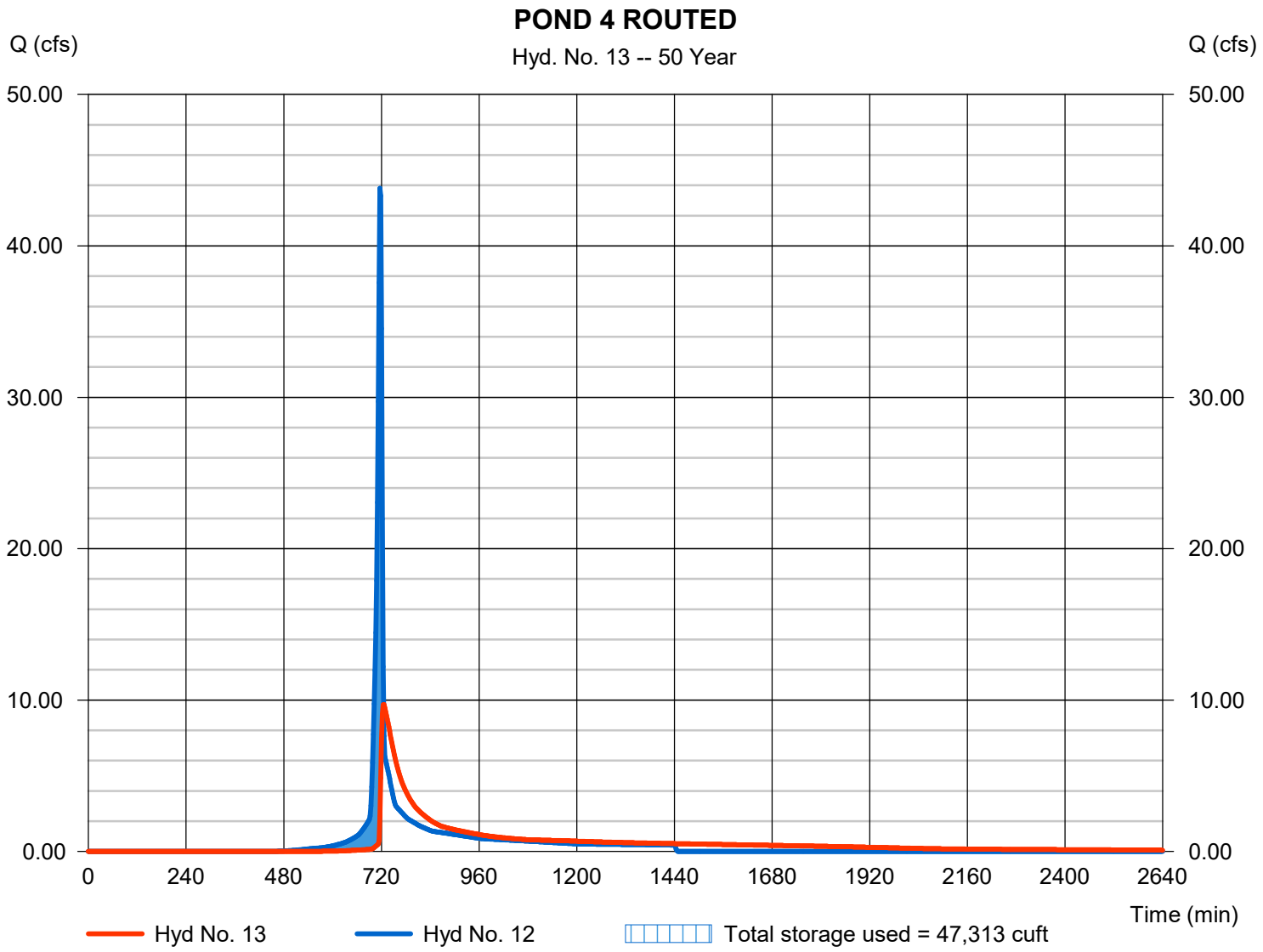
Hydrograph Report

Hyd. No. 13

POND 4 ROUTED

Hydrograph type	=	Reservoir	Peak discharge	=	9.705 cfs
Storm frequency	=	50 yrs	Time to peak	=	726 min
Time interval	=	2 min	Hyd. volume	=	88,678 cuft
Inflow hyd. No.	=	12 - PROPOSED BASIN 4	Max. Elevation	=	897.96 ft
Reservoir name	=	PROPOSED POND 4	Max. Storage	=	47,313 cuft

Storage Indication method used. Wet pond routing start elevation = 895.00 ft.



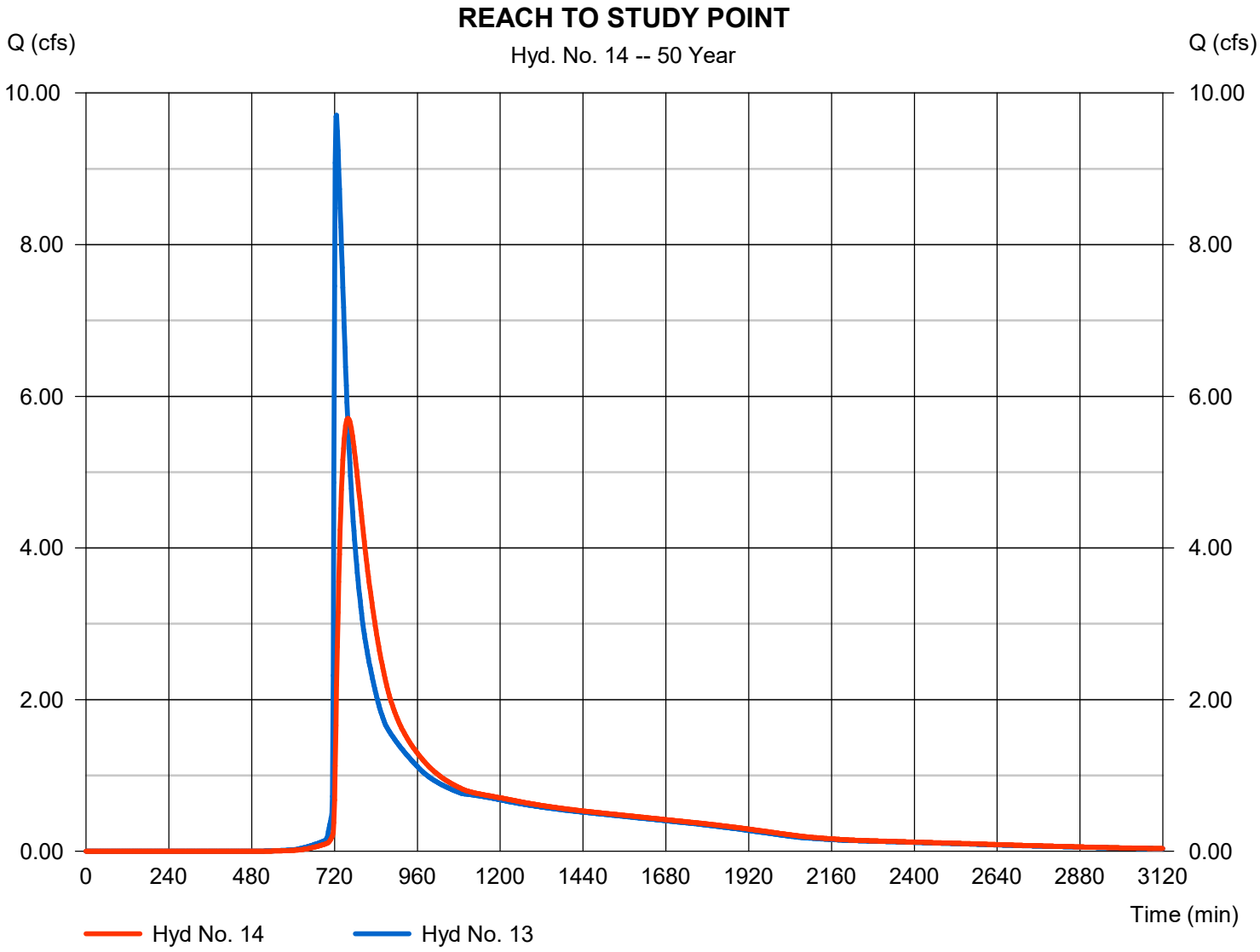
Hydrograph Report

Hyd. No. 14

REACH TO STUDY POINT

Hydrograph type	=	Reach	Peak discharge	=	5.708 cfs
Storm frequency	=	50 yrs	Time to peak	=	758 min
Time interval	=	2 min	Hyd. volume	=	88,179 cuft
Inflow hyd. No.	=	13 - POND 4 ROUTED	Section type	=	Trapezoidal
Reach length	=	2721.0 ft	Channel slope	=	0.3 %
Manning's n	=	0.025	Bottom width	=	32.5 ft
Side slope	=	2.5:1	Max. depth	=	5.0 ft
Rating curve x	=	0.329	Rating curve m	=	1.512
Ave. velocity	=	1.03 ft/s	Routing coeff.	=	0.0667

Modified Att-Kin routing method used.



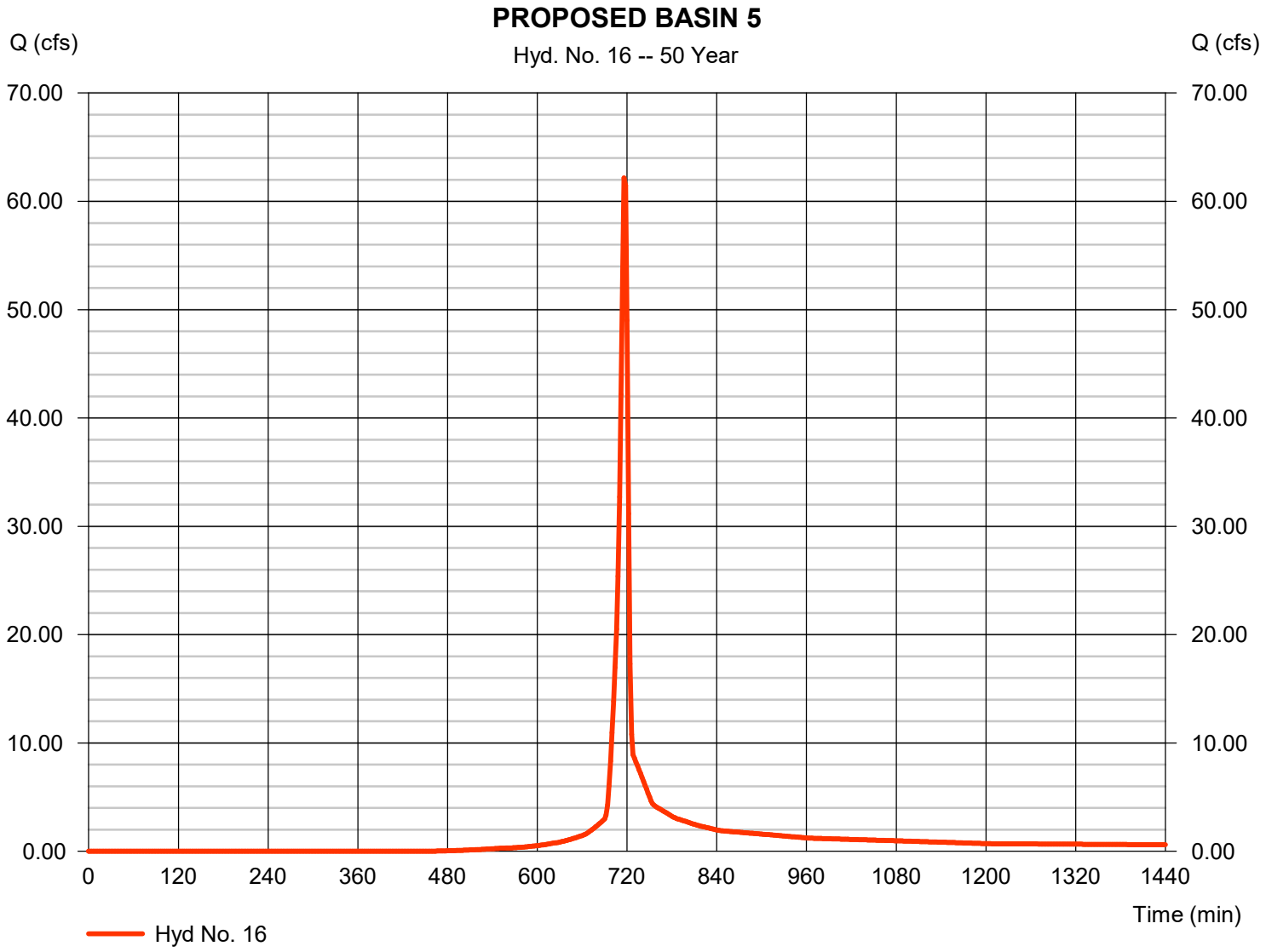
Hydrograph Report

Hyd. No. 16

PROPOSED BASIN 5

Hydrograph type	=	SCS Runoff	Peak discharge	=	62.16 cfs
Storm frequency	=	50 yrs	Time to peak	=	716 min
Time interval	=	2 min	Hyd. volume	=	125,988 cuft
Drainage area	=	9.520 ac	Curve number	=	72*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	7.07 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.310 x 98) + (4.000 x 85) + (5.210 x 61)] / 9.520



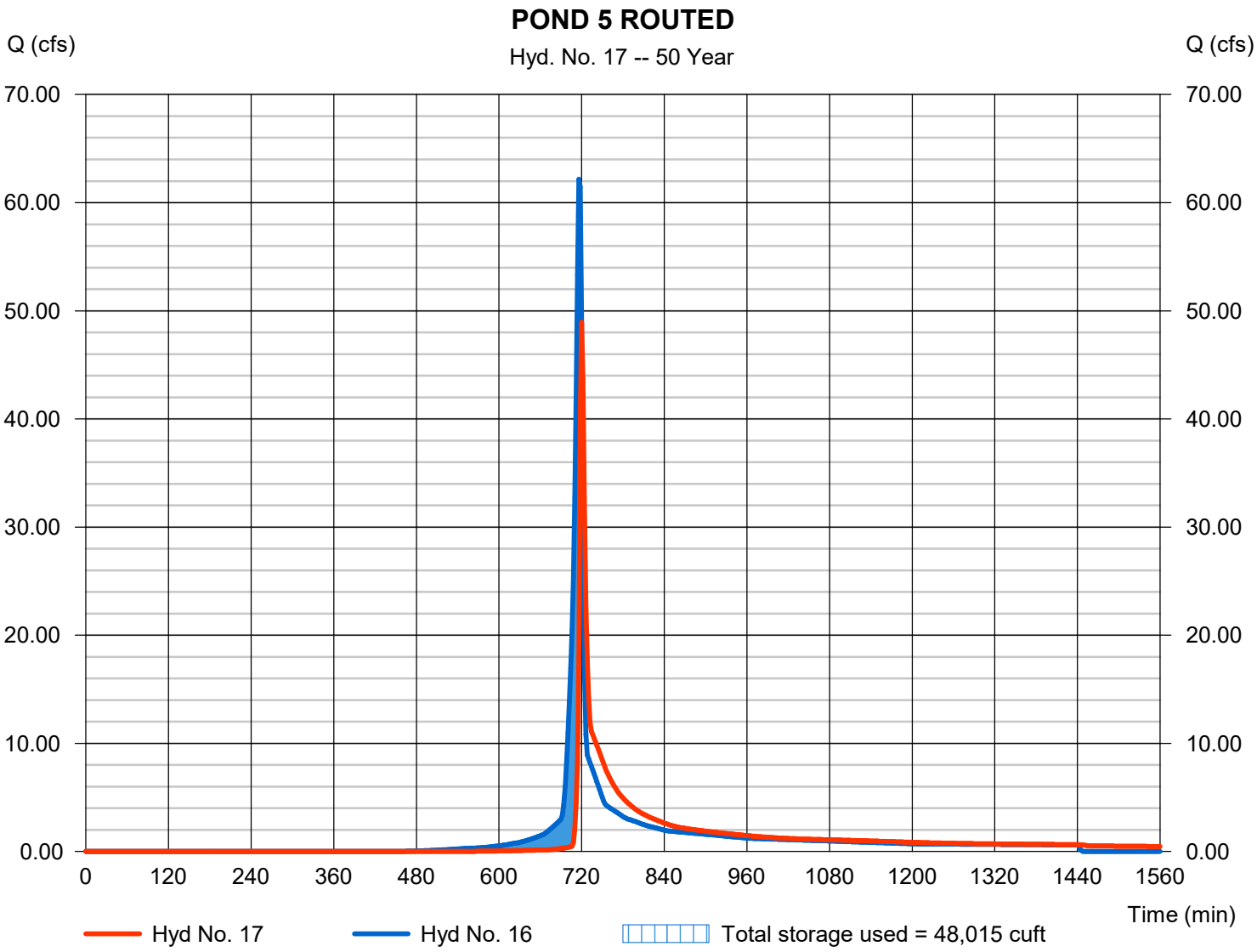
Hydrograph Report

Hyd. No. 17

POND 5 ROUTED

Hydrograph type	=	Reservoir	Peak discharge	=	48.94 cfs
Storm frequency	=	50 yrs	Time to peak	=	720 min
Time interval	=	2 min	Hyd. volume	=	125,933 cuft
Inflow hyd. No.	=	16 - PROPOSED BASIN 5	Max. Elevation	=	896.47 ft
Reservoir name	=	PROPOSED POND 5	Max. Storage	=	48,015 cuft

Storage Indication method used. Wet pond routing start elevation = 893.00 ft.



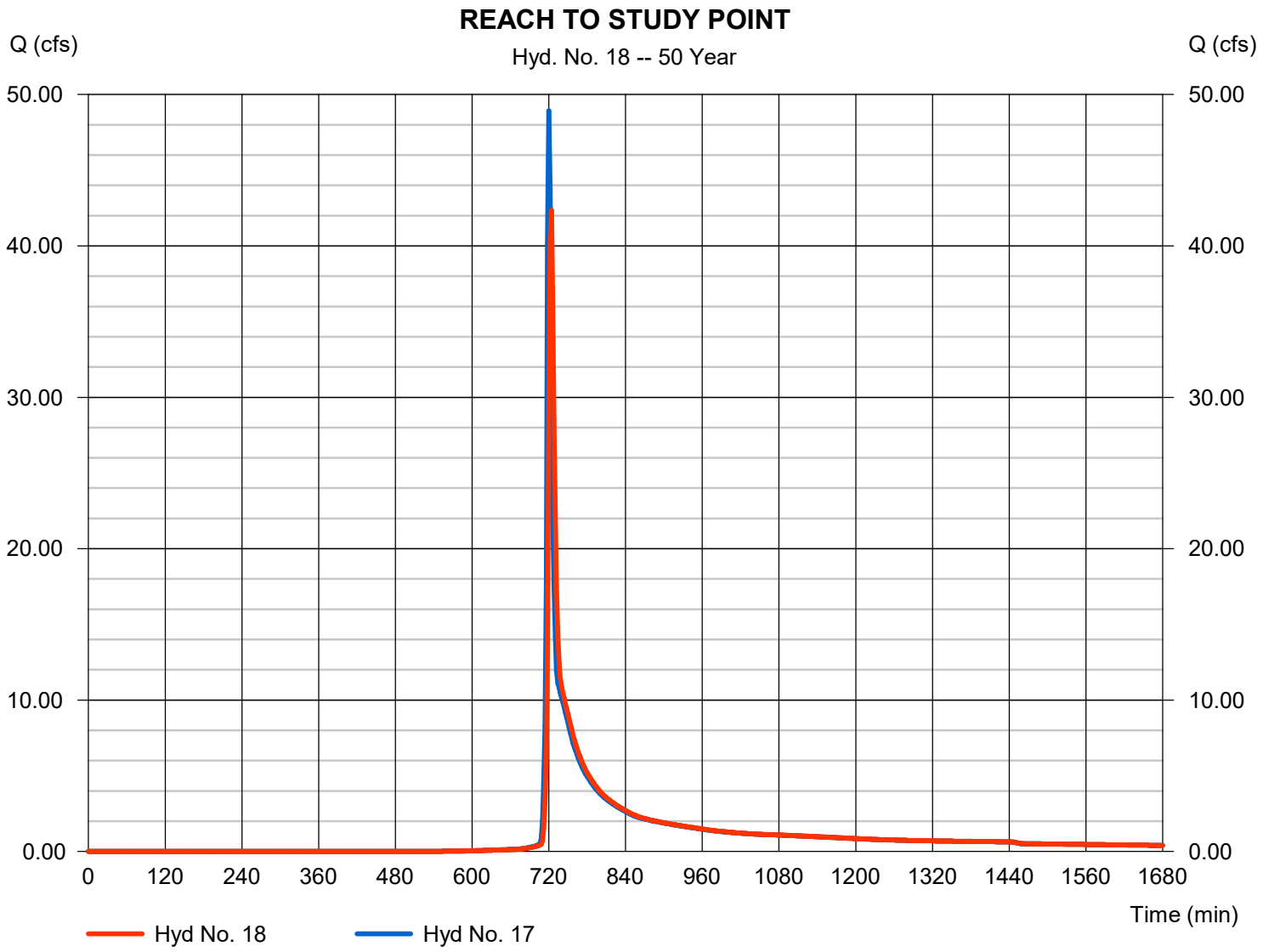
Hydrograph Report

Hyd. No. 18

REACH TO STUDY POINT

Hydrograph type	=	Reach	Peak discharge	=	42.35 cfs
Storm frequency	=	50 yrs	Time to peak	=	724 min
Time interval	=	2 min	Hyd. volume	=	125,454 cuft
Inflow hyd. No.	=	17 - POND 5 ROUTED	Section type	=	Trapezoidal
Reach length	=	597.0 ft	Channel slope	=	1.1 %
Manning's n	=	0.025	Bottom width	=	32.5 ft
Side slope	=	2.5:1	Max. depth	=	5.0 ft
Rating curve x	=	0.610	Rating curve m	=	1.512
Ave. velocity	=	2.69 ft/s	Routing coeff.	=	0.5806

Modified Att-Kin routing method used.

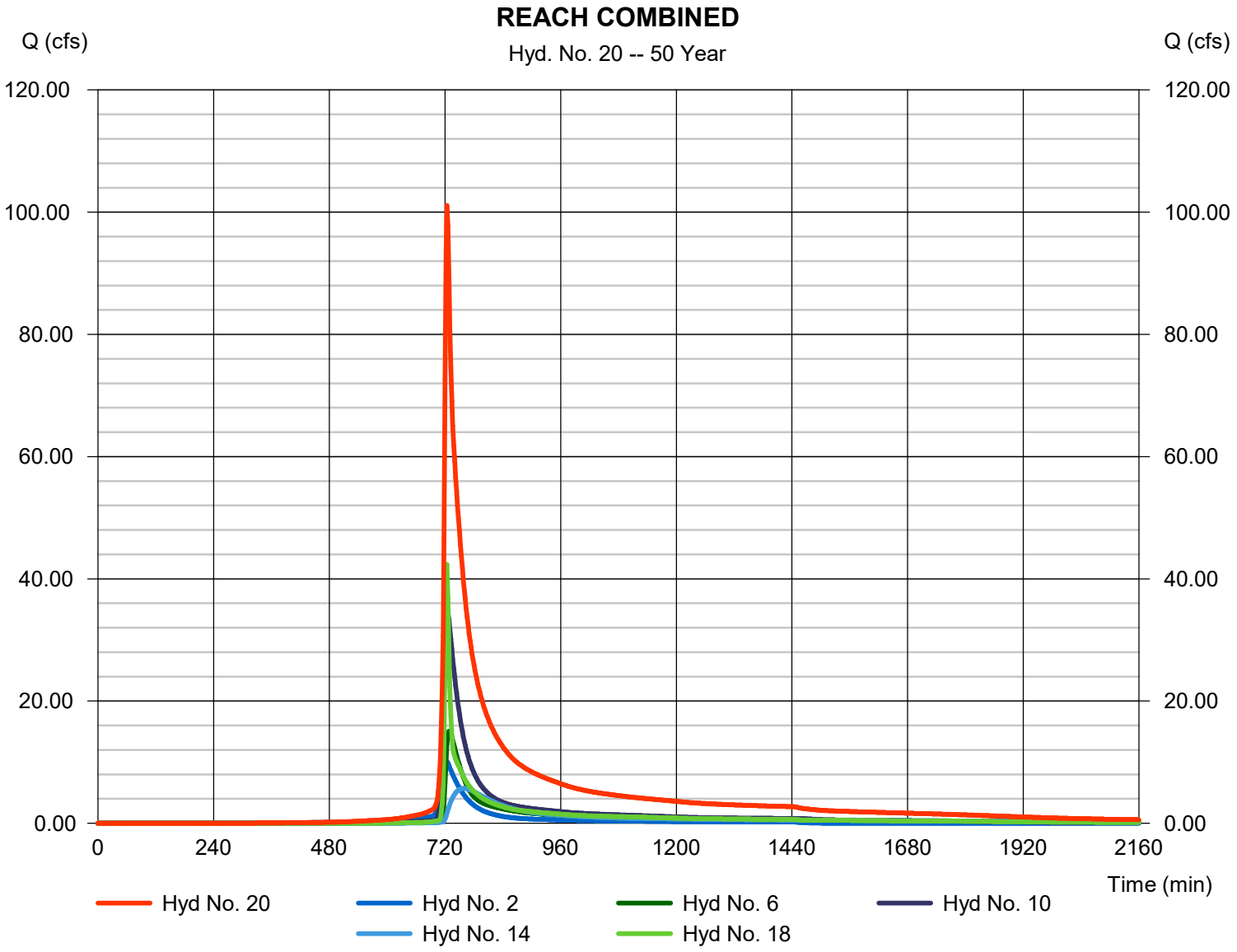


Hydrograph Report

Hyd. No. 20

REACH COMBINED

Hydrograph type	=	Combine	Peak discharge	=	101.08 cfs
Storm frequency	=	50 yrs	Time to peak	=	724 min
Time interval	=	2 min	Hyd. volume	=	542,042 cuft
Inflow hyds.	=	2, 6, 10, 14, 18	Contrib. drain. area	=	0.000 ac



Hydrograph Summary Report

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

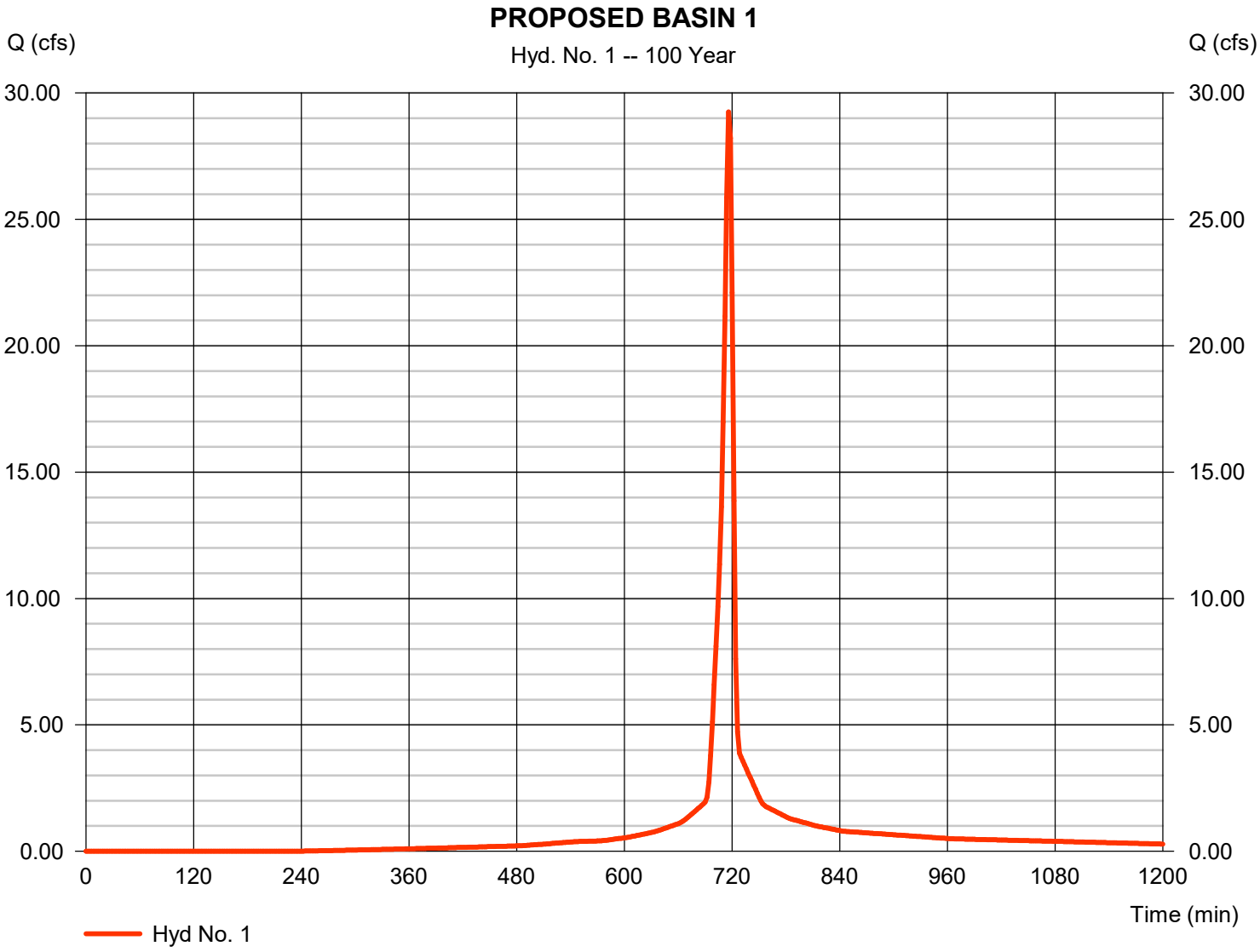
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	29.25	2	716	62,689	------	------	------	PROPOSED BASIN 1
2	Reach	11.88	2	724	62,673	1	------	------	REACH TO STUDY POINT
4	SCS Runoff	57.42	2	716	120,424	------	------	------	PROPOSED BASIN 2
5	Reservoir	48.76	2	720	120,355	4	892.82	43,808	POND 2 ROUTED
6	Reach	20.88	2	728	119,977	5	------	------	REACH TO STUDY POINT
8	SCS Runoff	94.89	2	716	195,120	------	------	------	PROPOSED BASIN 3
9	Reservoir	92.34	2	718	195,085	8	894.54	31,197	POND 3 ROUTED
10	Reach	42.09	2	726	194,772	9	------	------	REACH TO STUDY POINT
12	SCS Runoff	50.92	2	716	103,599	------	------	------	PROPOSED BASIN 4
13	Reservoir	23.03	2	722	103,475	12	898.21	51,321	POND 4 ROUTED
14	Reach	8.682	2	744	102,978	13	------	------	REACH TO STUDY POINT
16	SCS Runoff	72.24	2	716	146,984	------	------	------	PROPOSED BASIN 5
17	Reservoir	62.36	2	720	146,929	16	896.60	49,937	POND 5 ROUTED
18	Reach	57.39	2	722	146,450	17	------	------	REACH TO STUDY POINT
20	Combine	132.67	2	724	626,851	2, 6, 10, 14, 18,	------	------	REACH COMBINED

Hydrograph Report

Hyd. No. 1

PROPOSED BASIN 1

Hydrograph type	=	SCS Runoff	Peak discharge	=	29.25 cfs
Storm frequency	=	100 yrs	Time to peak	=	716 min
Time interval	=	2 min	Hyd. volume	=	62,689 cuft
Drainage area	=	3.050 ac	Curve number	=	85
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	7.82 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484



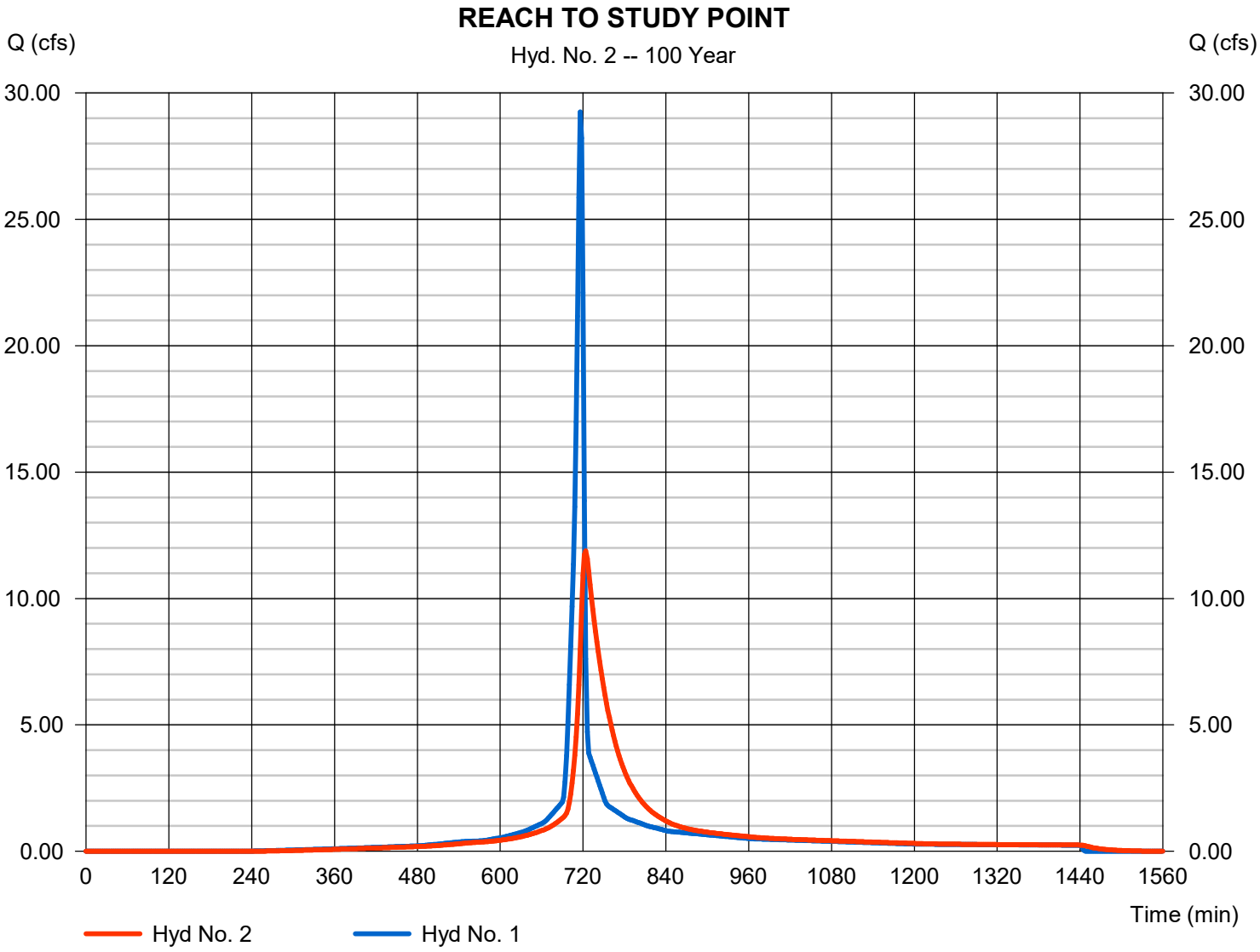
Hydrograph Report

Hyd. No. 2

REACH TO STUDY POINT

Hydrograph type	=	Reach	Peak discharge	=	11.88 cfs
Storm frequency	=	100 yrs	Time to peak	=	724 min
Time interval	=	2 min	Hyd. volume	=	62,673 cuft
Inflow hyd. No.	=	1 - PROPOSED BASIN 1	Section type	=	Trapezoidal
Reach length	=	2981.0 ft	Channel slope	=	0.2 %
Manning's n	=	0.025	Bottom width	=	32.5 ft
Side slope	=	2.5:1	Max. depth	=	5.0 ft
Rating curve x	=	0.262	Rating curve m	=	1.512
Ave. velocity	=	1.25 ft/s	Routing coeff.	=	0.0731

Modified Att-Kin routing method used.



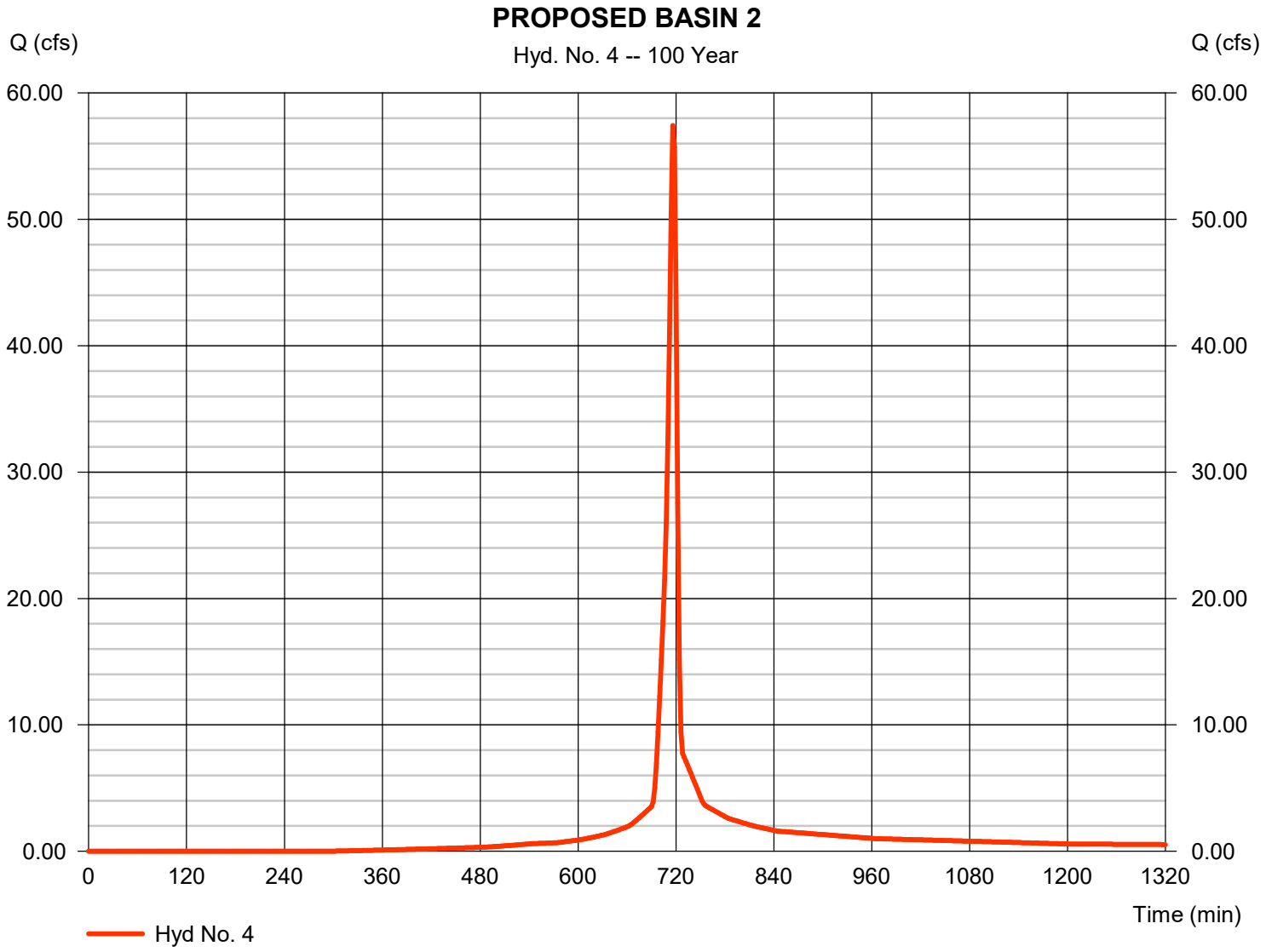
Hydrograph Report

Hyd. No. 4

PROPOSED BASIN 2

Hydrograph type	=	SCS Runoff	Peak discharge	=	57.42 cfs
Storm frequency	=	100 yrs	Time to peak	=	716 min
Time interval	=	2 min	Hyd. volume	=	120,424 cuft
Drainage area	=	6.350 ac	Curve number	=	81*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	7.82 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.160 x 98) + (4.950 x 85) + (1.240 x 61)] / 6.350



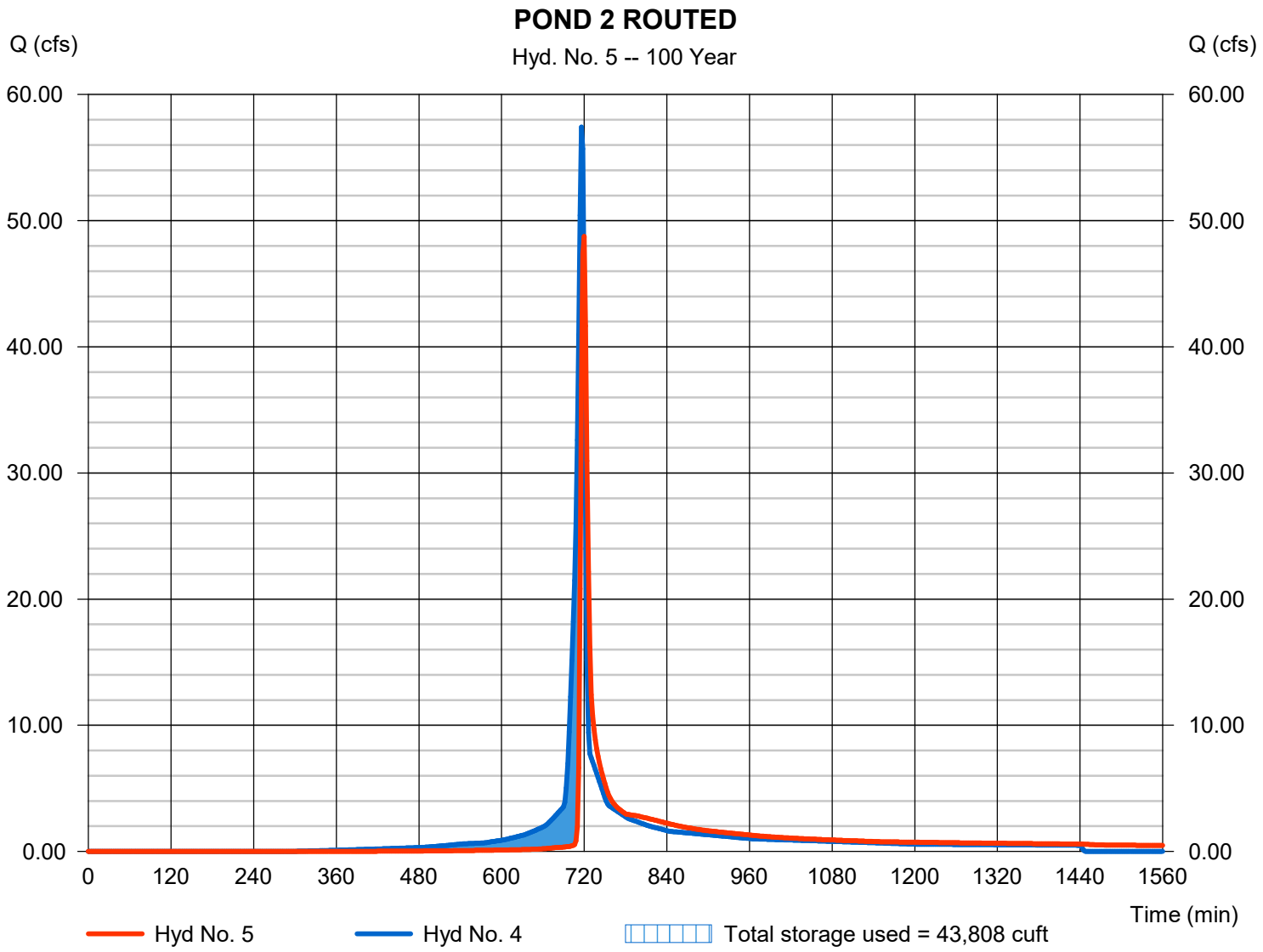
Hydrograph Report

Hyd. No. 5

POND 2 ROUTED

Hydrograph type	= Reservoir	Peak discharge	= 48.76 cfs
Storm frequency	= 100 yrs	Time to peak	= 720 min
Time interval	= 2 min	Hyd. volume	= 120,355 cuft
Inflow hyd. No.	= 4 - PROPOSED BASIN 2	Max. Elevation	= 892.82 ft
Reservoir name	= PROPOSED POND 2	Max. Storage	= 43,808 cuft

Storage Indication method used. Wet pond routing start elevation = 890.00 ft.



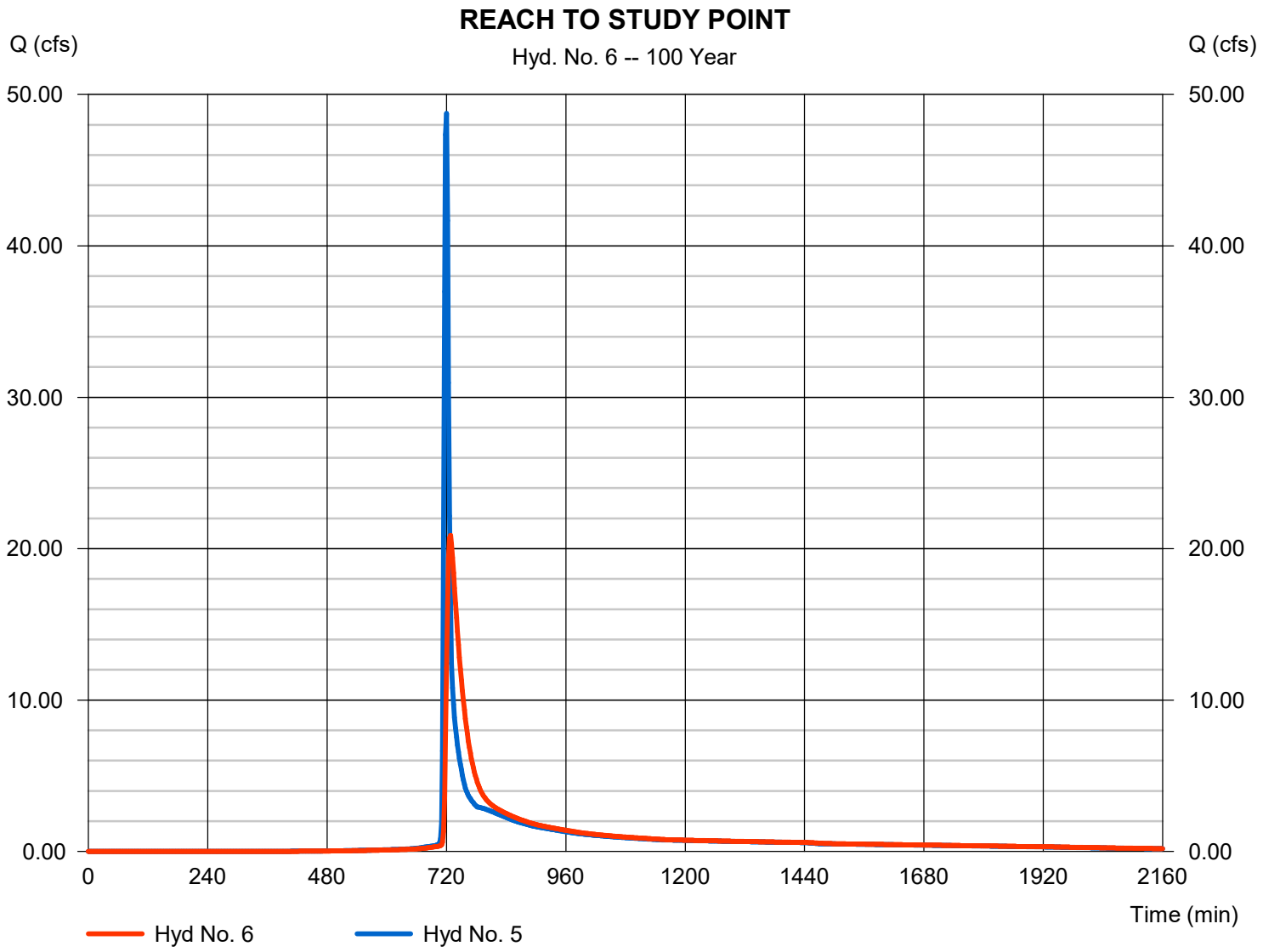
Hydrograph Report

Hyd. No. 6

REACH TO STUDY POINT

Hydrograph type	=	Reach	Peak discharge	=	20.88 cfs
Storm frequency	=	100 yrs	Time to peak	=	728 min
Time interval	=	2 min	Hyd. volume	=	119,977 cuft
Inflow hyd. No.	=	5 - POND 2 ROUTED	Section type	=	Trapezoidal
Reach length	=	2127.0 ft	Channel slope	=	0.2 %
Manning's n	=	0.025	Bottom width	=	32.5 ft
Side slope	=	2.5:1	Max. depth	=	5.0 ft
Rating curve x	=	0.240	Rating curve m	=	1.512
Ave. velocity	=	1.45 ft/s	Routing coeff.	=	0.1167

Modified Att-Kin routing method used.



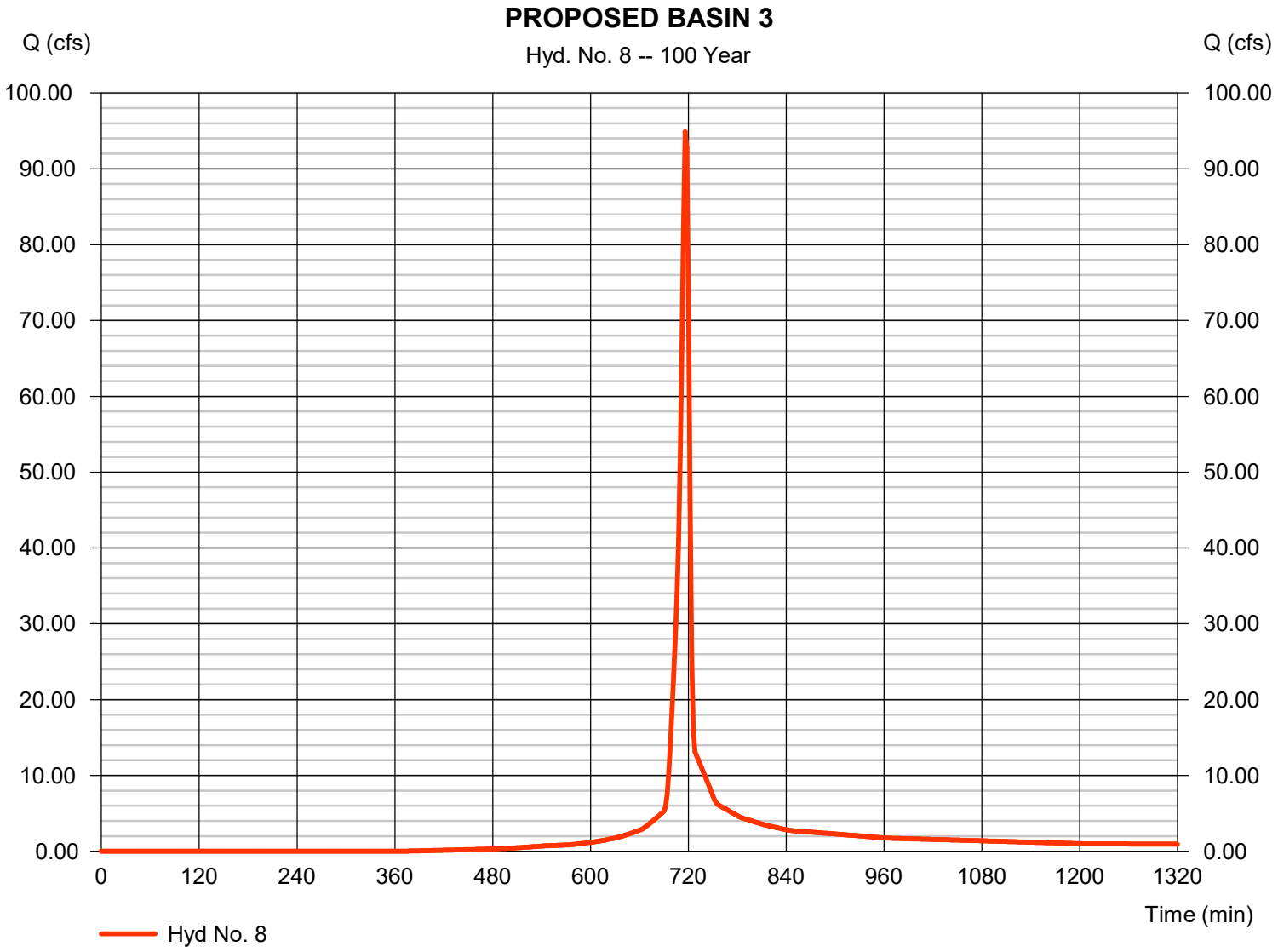
Hydrograph Report

Hyd. No. 8

PROPOSED BASIN 3

Hydrograph type	=	SCS Runoff	Peak discharge	=	94.89 cfs
Storm frequency	=	100 yrs	Time to peak	=	716 min
Time interval	=	2 min	Hyd. volume	=	195,120 cuft
Drainage area	=	11.480 ac	Curve number	=	76*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	7.82 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(2.490 x 98) + (3.270 x 85) + (5.720 x 61)] / 11.480



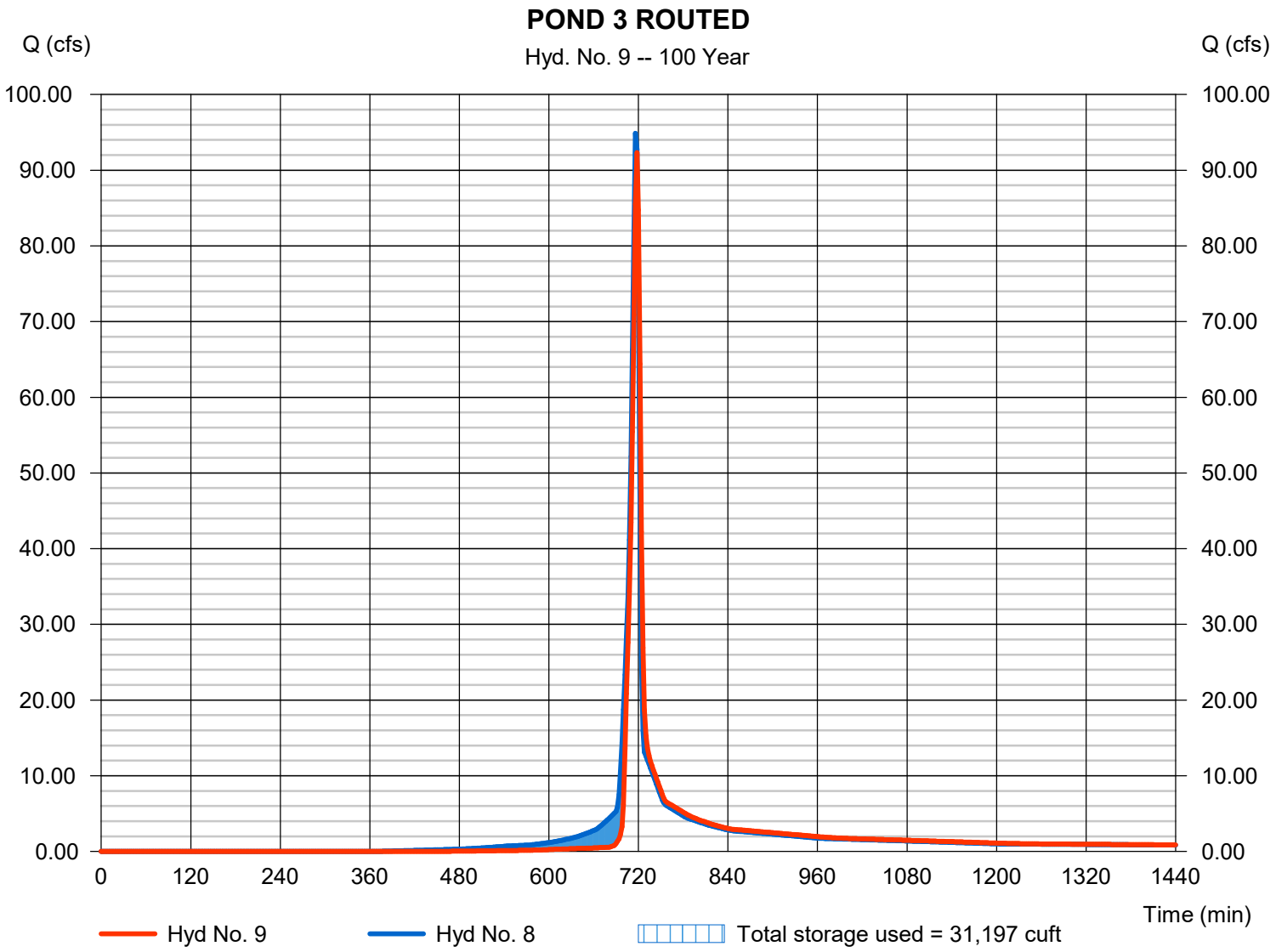
Hydrograph Report

Hyd. No. 9

POND 3 ROUTED

Hydrograph type	=	Reservoir	Peak discharge	=	92.34 cfs
Storm frequency	=	100 yrs	Time to peak	=	718 min
Time interval	=	2 min	Hyd. volume	=	195,085 cuft
Inflow hyd. No.	=	8 - PROPOSED BASIN 3	Max. Elevation	=	894.54 ft
Reservoir name	=	PROPOSED POND 3	Max. Storage	=	31,197 cuft

Storage Indication method used. Wet pond routing start elevation = 891.00 ft.



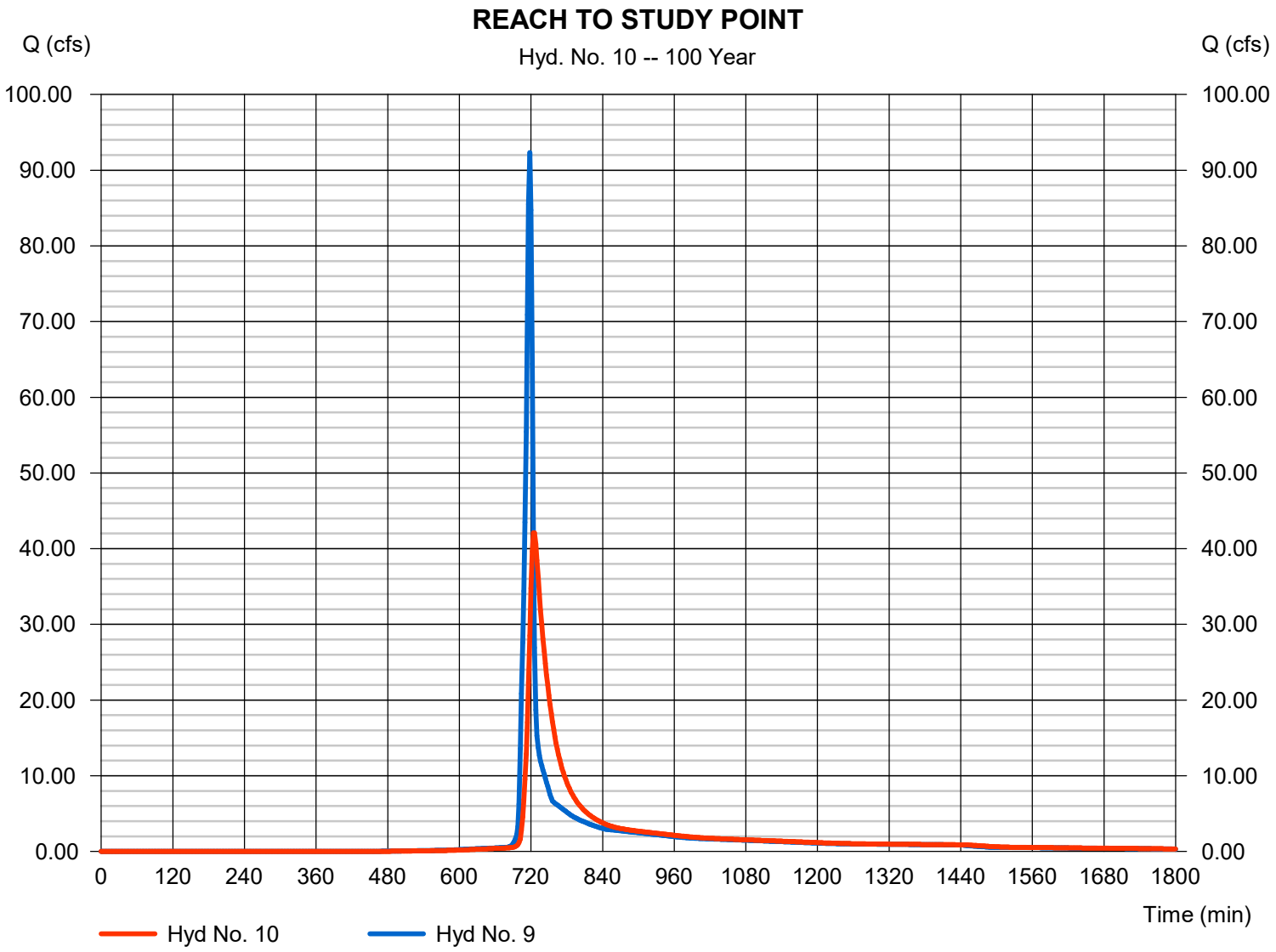
Hydrograph Report

Hyd. No. 10

REACH TO STUDY POINT

Hydrograph type	=	Reach	Peak discharge	=	42.09 cfs
Storm frequency	=	100 yrs	Time to peak	=	726 min
Time interval	=	2 min	Hyd. volume	=	194,772 cuft
Inflow hyd. No.	=	9 - POND 3 ROUTED	Section type	=	Trapezoidal
Reach length	=	3079.0 ft	Channel slope	=	0.2 %
Manning's n	=	0.025	Bottom width	=	32.5 ft
Side slope	=	2.5:1	Max. depth	=	5.0 ft
Rating curve x	=	0.229	Rating curve m	=	1.512
Ave. velocity	=	1.75 ft/s	Routing coeff.	=	0.0980

Modified Att-Kin routing method used.



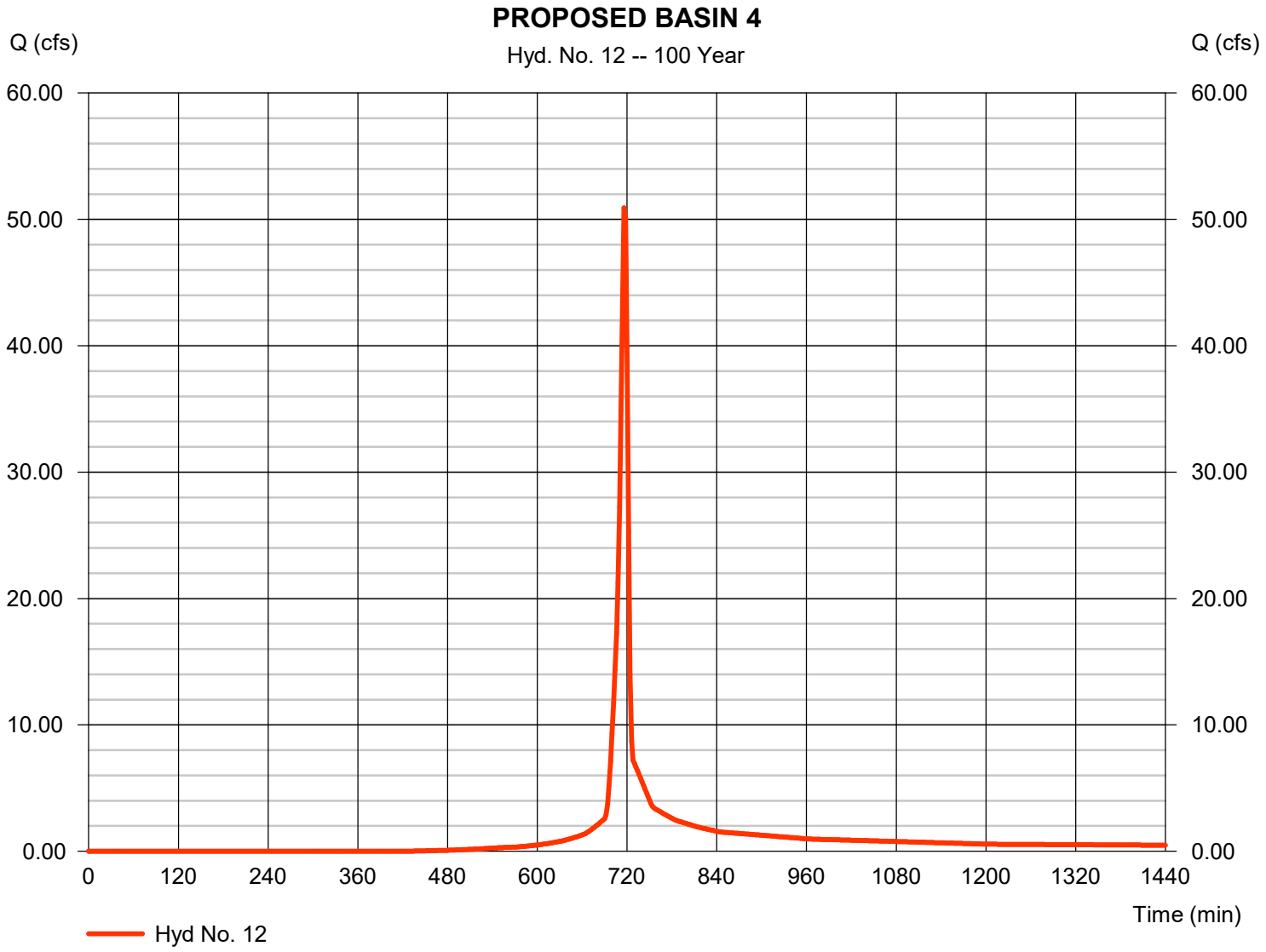
Hydrograph Report

Hyd. No. 12

PROPOSED BASIN 4

Hydrograph type	= SCS Runoff	Peak discharge	= 50.92 cfs
Storm frequency	= 100 yrs	Time to peak	= 716 min
Time interval	= 2 min	Hyd. volume	= 103,599 cuft
Drainage area	= 6.710 ac	Curve number	= 72*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 7.82 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.260 x 98) + (2.540 x 85) + (3.910 x 61)] / 6.710



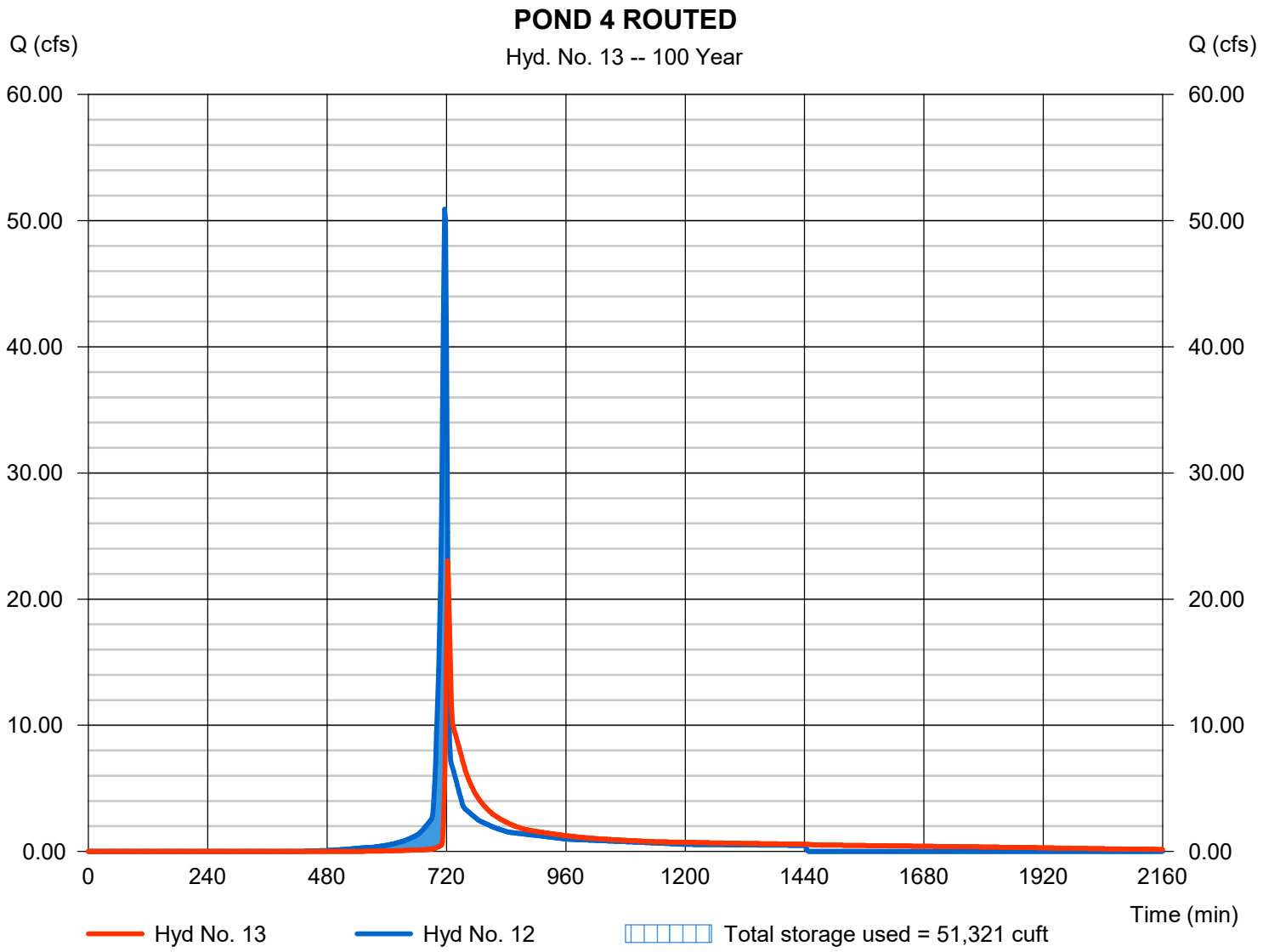
Hydrograph Report

Hyd. No. 13

POND 4 ROUTED

Hydrograph type	=	Reservoir	Peak discharge	=	23.03 cfs
Storm frequency	=	100 yrs	Time to peak	=	722 min
Time interval	=	2 min	Hyd. volume	=	103,475 cuft
Inflow hyd. No.	=	12 - PROPOSED BASIN 4	Max. Elevation	=	898.21 ft
Reservoir name	=	PROPOSED POND 4	Max. Storage	=	51,321 cuft

Storage Indication method used. Wet pond routing start elevation = 895.00 ft.



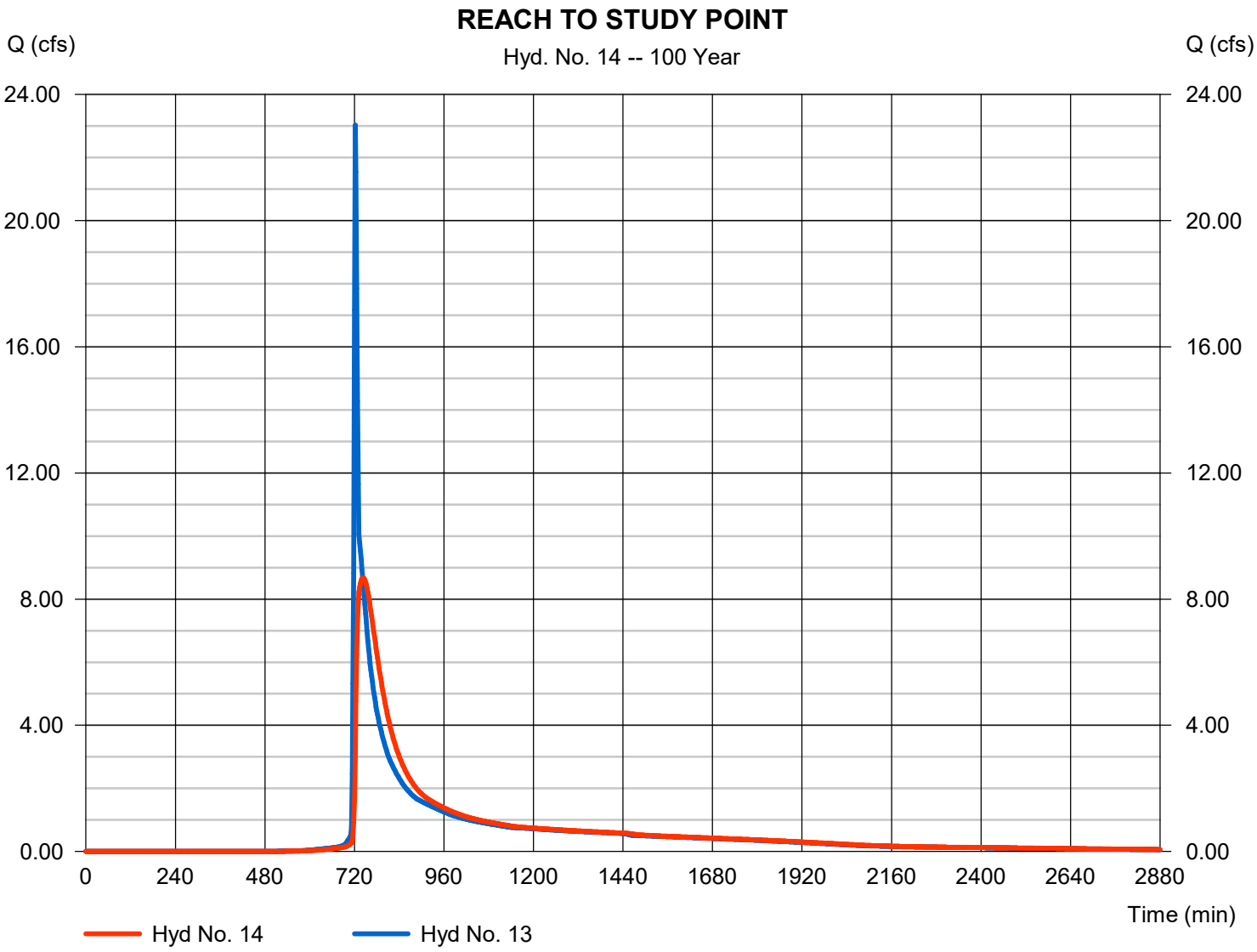
Hydrograph Report

Hyd. No. 14

REACH TO STUDY POINT

Hydrograph type	=	Reach	Peak discharge	=	8.682 cfs
Storm frequency	=	100 yrs	Time to peak	=	744 min
Time interval	=	2 min	Hyd. volume	=	102,978 cuft
Inflow hyd. No.	=	13 - POND 4 ROUTED	Section type	=	Trapezoidal
Reach length	=	2721.0 ft	Channel slope	=	0.3 %
Manning's n	=	0.025	Bottom width	=	32.5 ft
Side slope	=	2.5:1	Max. depth	=	5.0 ft
Rating curve x	=	0.329	Rating curve m	=	1.512
Ave. velocity	=	1.39 ft/s	Routing coeff.	=	0.0883

Modified Att-Kin routing method used.



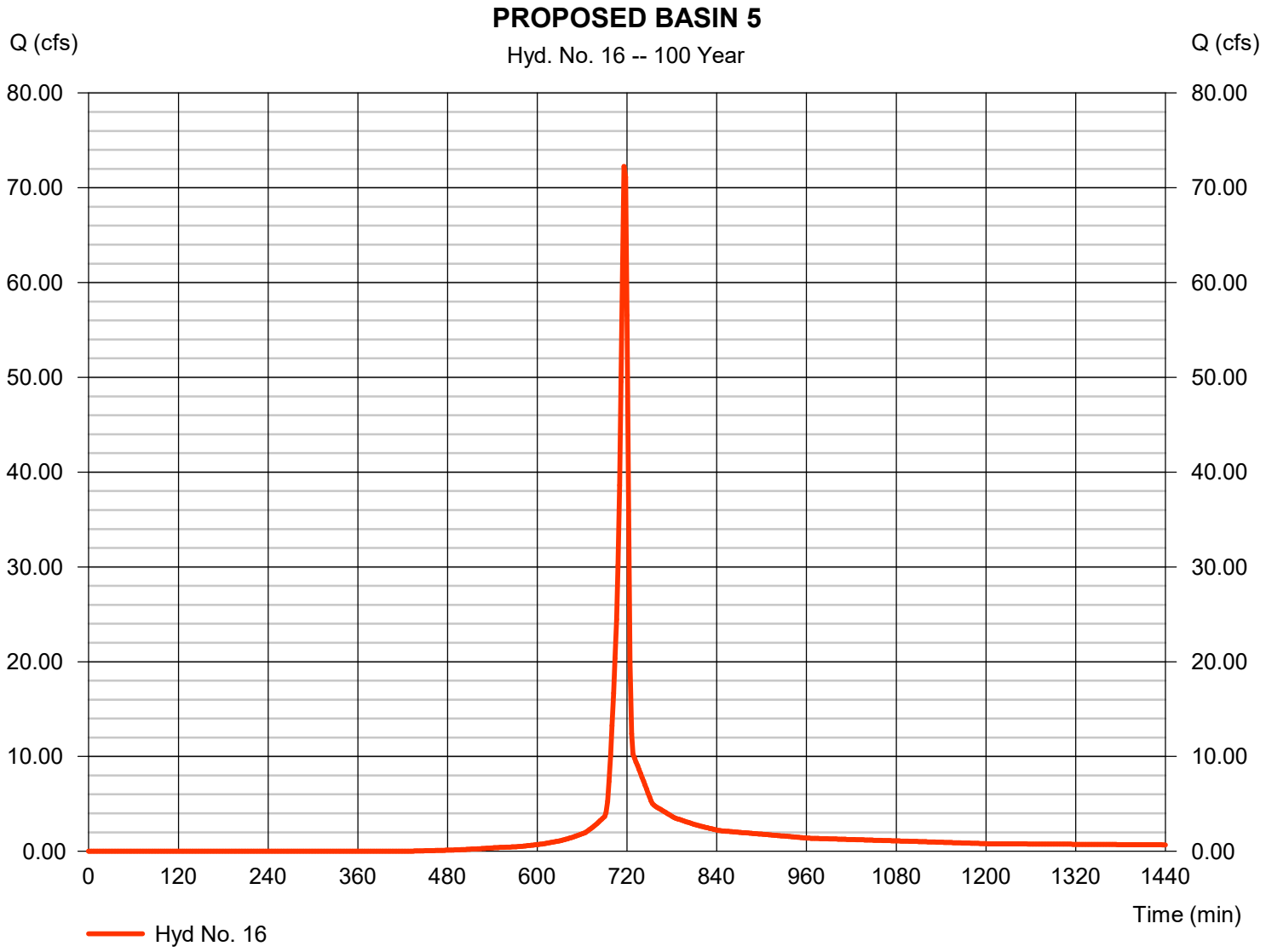
Hydrograph Report

Hyd. No. 16

PROPOSED BASIN 5

Hydrograph type	= SCS Runoff	Peak discharge	= 72.24 cfs
Storm frequency	= 100 yrs	Time to peak	= 716 min
Time interval	= 2 min	Hyd. volume	= 146,984 cuft
Drainage area	= 9.520 ac	Curve number	= 72*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 7.82 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.310 x 98) + (4.000 x 85) + (5.210 x 61)] / 9.520



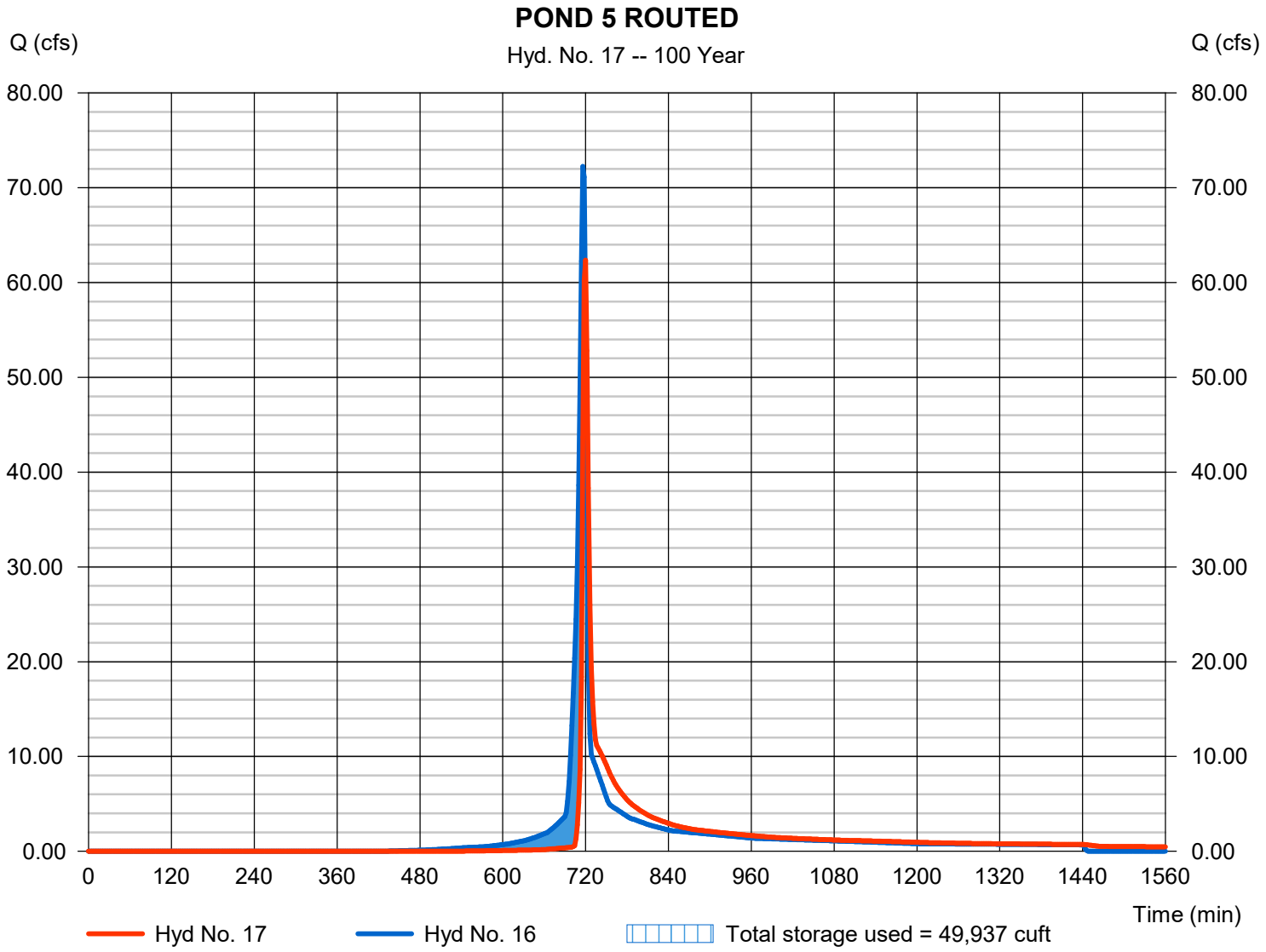
Hydrograph Report

Hyd. No. 17

POND 5 ROUTED

Hydrograph type	=	Reservoir	Peak discharge	=	62.36 cfs
Storm frequency	=	100 yrs	Time to peak	=	720 min
Time interval	=	2 min	Hyd. volume	=	146,929 cuft
Inflow hyd. No.	=	16 - PROPOSED BASIN 5	Max. Elevation	=	896.60 ft
Reservoir name	=	PROPOSED POND 5	Max. Storage	=	49,937 cuft

Storage Indication method used. Wet pond routing start elevation = 893.00 ft.



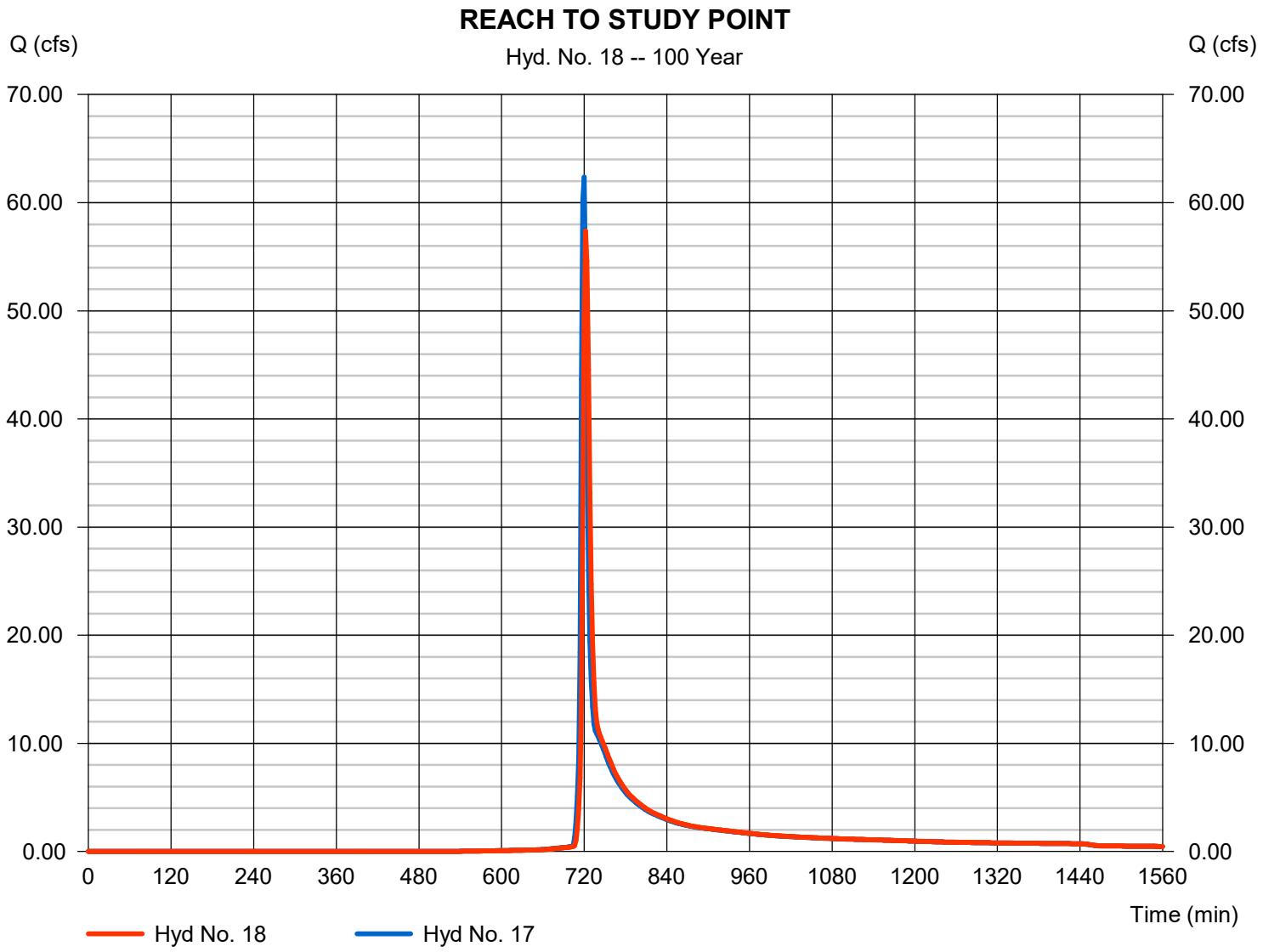
Hydrograph Report

Hyd. No. 18

REACH TO STUDY POINT

Hydrograph type	=	Reach	Peak discharge	=	57.39 cfs
Storm frequency	=	100 yrs	Time to peak	=	722 min
Time interval	=	2 min	Hyd. volume	=	146,450 cuft
Inflow hyd. No.	=	17 - POND 5 ROUTED	Section type	=	Trapezoidal
Reach length	=	597.0 ft	Channel slope	=	1.1 %
Manning's n	=	0.025	Bottom width	=	32.5 ft
Side slope	=	2.5:1	Max. depth	=	5.0 ft
Rating curve x	=	0.610	Rating curve m	=	1.512
Ave. velocity	=	2.92 ft/s	Routing coeff.	=	0.6150

Modified Att-Kin routing method used.

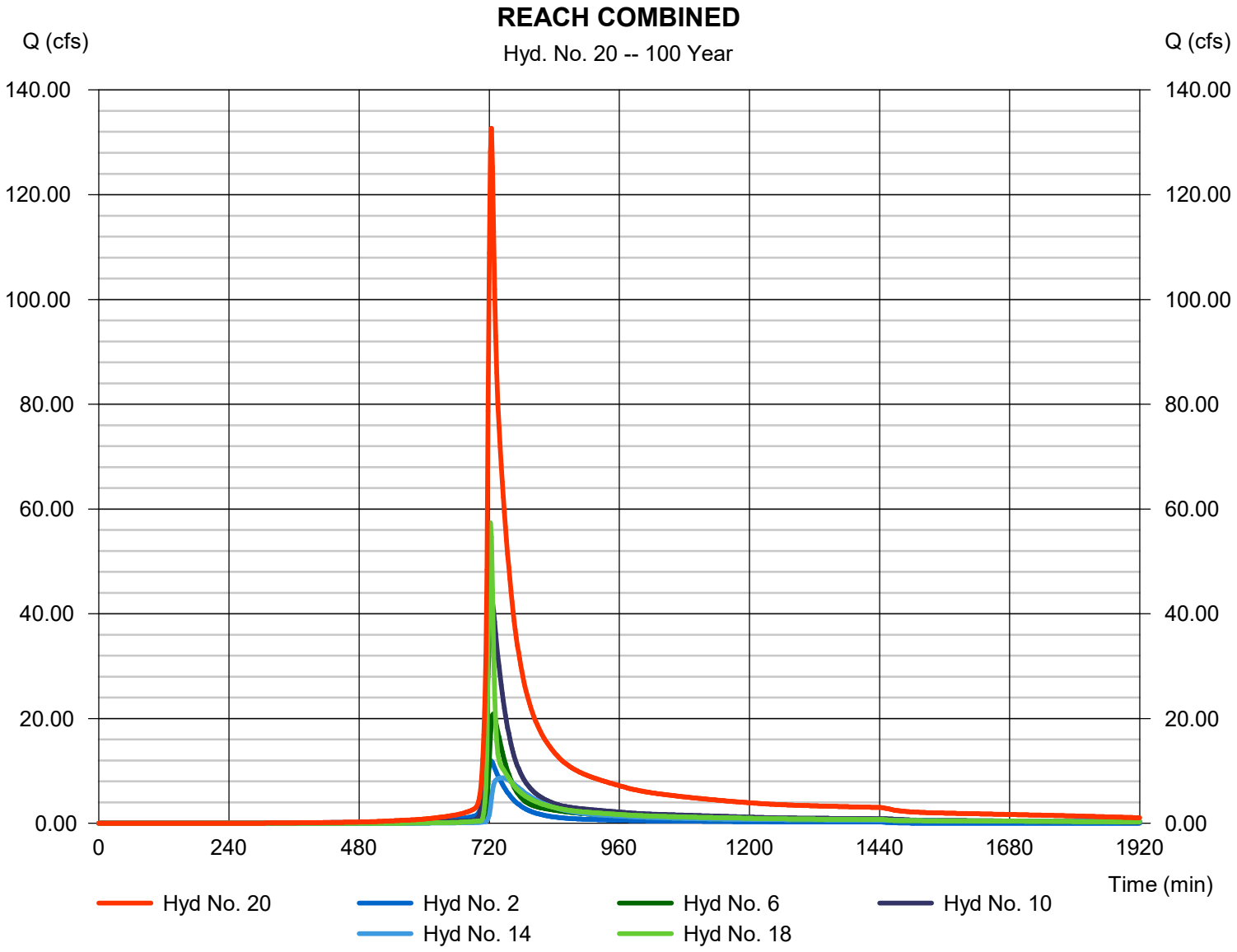


Hydrograph Report

Hyd. No. 20

REACH COMBINED

Hydrograph type	= Combine	Peak discharge	= 132.67 cfs
Storm frequency	= 100 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 626,851 cuft
Inflow hyds.	= 2, 6, 10, 14, 18	Contrib. drain. area	= 0.000 ac



Hydraflow Rainfall Report

Return Period (Yrs)	Intensity-Duration-Frequency Equation Coefficients (FHA)			
	B	D	E	(N/A)
1	25.3548	5.7000	0.7008	--------
2	27.9480	5.4000	0.6918	--------
3	0.0000	0.0000	0.0000	--------
5	35.6652	5.7000	0.7019	--------
10	41.0022	5.6000	0.7003	--------
25	50.3784	5.8000	0.7052	--------
50	57.0172	5.8000	0.7042	--------
100	63.0604	5.6000	0.7002	--------

File name: POWDER SPRINGS.IDF

Intensity = B / (Tc + D)^E

Return Period (Yrs)	Intensity Values (in/hr)											
	5 min	10	15	20	25	30	35	40	45	50	55	60
1	4.82	3.68	3.03	2.61	2.30	2.07	1.89	1.74	1.62	1.52	1.43	1.35
2	5.53	4.22	3.47	2.98	2.63	2.37	2.16	2.00	1.86	1.74	1.64	1.55
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	6.76	5.16	4.25	3.65	3.22	2.90	2.65	2.44	2.27	2.12	2.00	1.89
10	7.85	5.99	4.93	4.23	3.74	3.36	3.06	2.83	2.63	2.46	2.32	2.19
25	9.41	7.19	5.93	5.09	4.49	4.04	3.68	3.40	3.16	2.95	2.78	2.63
50	10.67	8.16	6.73	5.78	5.10	4.59	4.19	3.86	3.59	3.36	3.16	2.99
100	12.07	9.21	7.58	6.51	5.75	5.17	4.72	4.35	4.04	3.78	3.56	3.37

Tc = time in minutes. Values may exceed 60.

east Civil Group\SEC Group - Documents\Design\RAINFALL-IDF CURVES\PRECIPITATION-POWDER SPRINGS.pcp

Storm Distribution	Rainfall Precipitation Table (in)							
	1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr
SCS 24-hour	3.43	3.91	0.00	4.71	5.38	6.32	7.07	7.82
SCS 6-Hr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-1st	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-2nd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-3rd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-4th	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-Indy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Custom	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Appendix D – Waiving Detention Study

POWDER SPRINGS CREEK 10-Yr Rainfall Event (FEMA FIS)

A = Drainage Area (Square Miles): 25.4
(Obtained from FEMA Study)

S = Main Channel Slope (Ft/Mile): 16.9

TL = Lag Time (Hours): 5.66195
TL = 7.86 x (A^0.35) x (TIA^-0.22) x (S^-0.31)

TIA (Total Impervious Area %)= 14.2
(Obtained From StreamStats Report)

QP (CFS)= 3631
(Obtained From FEMA Flood Insurance Study)

DIMENSIONLESS USGS HYDROGRAPH			
t/TL	Q/QP	t/TL	Q/QP
0.25	0.12	1.35	0.62
0.3	0.16	1.4	0.56
0.35	0.21	1.45	0.51
0.4	0.26	1.5	0.47
0.45	0.33	1.55	0.43
0.5	0.4	1.6	0.39
0.55	0.49	1.65	0.36
0.6	0.58	1.7	0.33
0.65	0.67	1.75	0.3
0.7	0.76	1.8	0.28
0.75	0.84	1.85	0.26
0.8	0.9	1.9	0.24
0.85	0.95	1.95	0.22
0.9	0.98	2	0.2
0.95	1	2.05	0.19
1	0.99	2.1	0.17
1.05	0.96	2.15	0.16
1.1	0.92	2.2	0.15
1.15	0.86	2.25	0.14
1.2	0.8	2.3	0.13
1.25	0.74	2.35	0.12
1.3	0.68	2.4	0.11

HYDROGRAPH			
t (min)	Q (cfs)	t (min)	Q (cfs)
84.93	435.72	458.62	2251.22
101.92	580.96	475.60	2033.36
118.90	762.51	492.59	1851.81
135.89	944.06	509.58	1706.57
152.87	1198.23	526.56	1561.33
169.86	1452.40	543.55	1416.09
186.84	1779.19	560.53	1307.16
203.83	2105.98	577.52	1198.23
220.82	2432.77	594.50	1089.30
237.80	2759.56	611.49	1016.68
254.79	3050.04	628.48	944.06
271.77	3267.90	645.46	871.44
288.76	3449.45	662.45	798.82
305.75	3558.38	679.43	726.20
322.73	3631.00	696.42	689.89
339.72	3594.69	713.41	617.27
356.70	3485.76	730.39	580.96
373.69	3340.52	747.38	544.65
390.67	3122.66	764.36	508.34
407.66	2904.80	781.35	472.03
424.65	2686.94	798.33	435.72
441.63	2469.08	815.32	399.41

POWDER SPRINGS CREEK 50-Yr Rainfall Event (FEMA FIS)

A = Drainage Area (Square Miles): 25.4
(Obtained from FEMA Study)

S = Main Channel Slope (Ft/Mile): 16.9

TL = Lag Time (Hours): 5.66195
TL = 7.86 x (A^0.35) x (TIA^-0.22) x (S^-0.31)

TIA (Total Impervious Area %)= 14.2
(Obtained From StreamStats Report)

QP (CFS)= 5660
(Obtained From FEMA Flood Insurance Study)

DIMENSIONLESS USGS HYDROGRAPH			
t/TL	Q/QP	t/TL	Q/QP
0.25	0.12	1.35	0.62
0.3	0.16	1.4	0.56
0.35	0.21	1.45	0.51
0.4	0.26	1.5	0.47
0.45	0.33	1.55	0.43
0.5	0.4	1.6	0.39
0.55	0.49	1.65	0.36
0.6	0.58	1.7	0.33
0.65	0.67	1.75	0.3
0.7	0.76	1.8	0.28
0.75	0.84	1.85	0.26
0.8	0.9	1.9	0.24
0.85	0.95	1.95	0.22
0.9	0.98	2	0.2
0.95	1	2.05	0.19
1	0.99	2.1	0.17
1.05	0.96	2.15	0.16
1.1	0.92	2.2	0.15
1.15	0.86	2.25	0.14
1.2	0.8	2.3	0.13
1.25	0.74	2.35	0.12
1.3	0.68	2.4	0.11

HYDROGRAPH			
t (min)	Q (cfs)	t (min)	Q (cfs)
84.93	679.20	458.62	3509.20
101.92	905.60	475.60	3169.60
118.90	1188.60	492.59	2886.60
135.89	1471.60	509.58	2660.20
152.87	1867.80	526.56	2433.80
169.86	2264.00	543.55	2207.40
186.84	2773.40	560.53	2037.60
203.83	3282.80	577.52	1867.80
220.82	3792.20	594.50	1698.00
237.80	4301.60	611.49	1584.80
254.79	4754.40	628.48	1471.60
271.77	5094.00	645.46	1358.40
288.76	5377.00	662.45	1245.20
305.75	5546.80	679.43	1132.00
322.73	5660.00	696.42	1075.40
339.72	5603.40	713.41	962.20
356.70	5433.60	730.39	905.60
373.69	5207.20	747.38	849.00
390.67	4867.60	764.36	792.40
407.66	4528.00	781.35	735.80
424.65	4188.40	798.33	679.20
441.63	3848.80	815.32	622.60

POWDER SPRINGS CREEK 100-Yr Rainfall Event (FEMA FIS)

A = Drainage Area (Square Miles): 25.4
(Obtained from FEMA Study)

S = Main Channel Slope (Ft/Mile): 16.9

TL = Lag Time (Hours): 5.66195
TL = 7.86 x (A^0.35) x (TIA^-0.22) x (S^-0.31)

TIA (Total Impervious Area %)= 14.2
(Obtained From StreamStats Report)

QP (CFS)= 6198
(Obtained From FEMA Flood Insurance Study)

DIMENSIONLESS USGS HYDROGRAPH			
t/TL	Q/QP	t/TL	Q/QP
0.25	0.12	1.35	0.62
0.3	0.16	1.4	0.56
0.35	0.21	1.45	0.51
0.4	0.26	1.5	0.47
0.45	0.33	1.55	0.43
0.5	0.4	1.6	0.39
0.55	0.49	1.65	0.36
0.6	0.58	1.7	0.33
0.65	0.67	1.75	0.3
0.7	0.76	1.8	0.28
0.75	0.84	1.85	0.26
0.8	0.9	1.9	0.24
0.85	0.95	1.95	0.22
0.9	0.98	2	0.2
0.95	1	2.05	0.19
1	0.99	2.1	0.17
1.05	0.96	2.15	0.16
1.1	0.92	2.2	0.15
1.15	0.86	2.25	0.14
1.2	0.8	2.3	0.13
1.25	0.74	2.35	0.12
1.3	0.68	2.4	0.11

HYDROGRAPH			
t (min)	Q (cfs)	t (min)	Q (cfs)
84.93	743.76	458.62	3842.76
101.92	991.68	475.60	3470.88
118.90	1301.58	492.59	3160.98
135.89	1611.48	509.58	2913.06
152.87	2045.34	526.56	2665.14
169.86	2479.20	543.55	2417.22
186.84	3037.02	560.53	2231.28
203.83	3594.84	577.52	2045.34
220.82	4152.66	594.50	1859.40
237.80	4710.48	611.49	1735.44
254.79	5206.32	628.48	1611.48
271.77	5578.20	645.46	1487.52
288.76	5888.10	662.45	1363.56
305.75	6074.04	679.43	1239.60
322.73	6198.00	696.42	1177.62
339.72	6136.02	713.41	1053.66
356.70	5950.08	730.39	991.68
373.69	5702.16	747.38	929.70
390.67	5330.28	764.36	867.72
407.66	4958.40	781.35	805.74
424.65	4586.52	798.33	743.76
441.63	4214.64	815.32	681.78

DEVELOPED SITE 10-Yr Rainfall Event (SEC Hydrology Study)

A = Drainage Area (Square Miles): 0.057984
(Obtained from SEC hydrology study)

S = Main Channel Slope (Ft/Mile): 16.9

TL = Lag Time (Hours): 0.750752
TL = 7.86 x (A^0.35) x (TIA^-0.22) x (S^-0.31)

TIA (Total Impervious Area %)= 8.6769
(Obtained From SEC hydrology study)

QP (CFS)= 34.38
(Obtained From SEC hydrology study)

DIMENSIONLESS USGS HYDROGRAPH			
t/TL	Q/QP	t/TL	Q/QP
0.25	0.12	1.35	0.62
0.3	0.16	1.4	0.56
0.35	0.21	1.45	0.51
0.4	0.26	1.5	0.47
0.45	0.33	1.55	0.43
0.5	0.4	1.6	0.39
0.55	0.49	1.65	0.36
0.6	0.58	1.7	0.33
0.65	0.67	1.75	0.3
0.7	0.76	1.8	0.28
0.75	0.84	1.85	0.26
0.8	0.9	1.9	0.24
0.85	0.95	1.95	0.22
0.9	0.98	2	0.2
0.95	1	2.05	0.19
1	0.99	2.1	0.17
1.05	0.96	2.15	0.16
1.1	0.92	2.2	0.15
1.15	0.86	2.25	0.14
1.2	0.8	2.3	0.13
1.25	0.74	2.35	0.12
1.3	0.68	2.4	0.11

HYDROGRAPH			
t (min)	Q (cfs)	t (min)	Q (cfs)
11.26	4.13	60.81	21.32
13.51	5.50	63.06	19.25
15.77	7.22	65.32	17.53
18.02	8.94	67.57	16.16
20.27	11.35	69.82	14.78
22.52	13.75	72.07	13.41
24.77	16.85	74.32	12.38
27.03	19.94	76.58	11.35
29.28	23.03	78.83	10.31
31.53	26.13	81.08	9.63
33.78	28.88	83.33	8.94
36.04	30.94	85.59	8.25
38.29	32.66	87.84	7.56
40.54	33.69	90.09	6.88
42.79	34.38	92.34	6.53
45.05	34.04	94.59	5.84
47.30	33.00	96.85	5.50
49.55	31.63	99.10	5.16
51.80	29.57	101.35	4.81
54.05	27.50	103.60	4.47
56.31	25.44	105.86	4.13
58.56	23.38	108.11	3.78

DEVELOPED SITE 50-Yr Rainfall Event (SEC Hydrology Study)

A = Drainage Area (Square Miles): 0.057984
(Obtained from SEC hydrology study)

S = Main Channel Slope (Ft/Mile): 16.9

TL = Lag Time (Hours): 0.750752
TL = 7.86 x (A^0.35) x (TIA^-0.22) x (S^-0.31)

TIA (Total Impervious Area %)= 8.6769
(Obtained From SEC hydrology study)

QP (CFS)= 101.08
(Obtained From SEC hydrology study)

DIMENSIONLESS USGS HYDROGRAPH			
t/TL	Q/QP	t/TL	Q/QP
0.25	0.12	1.35	0.62
0.3	0.16	1.4	0.56
0.35	0.21	1.45	0.51
0.4	0.26	1.5	0.47
0.45	0.33	1.55	0.43
0.5	0.4	1.6	0.39
0.55	0.49	1.65	0.36
0.6	0.58	1.7	0.33
0.65	0.67	1.75	0.3
0.7	0.76	1.8	0.28
0.75	0.84	1.85	0.26
0.8	0.9	1.9	0.24
0.85	0.95	1.95	0.22
0.9	0.98	2	0.2
0.95	1	2.05	0.19
1	0.99	2.1	0.17
1.05	0.96	2.15	0.16
1.1	0.92	2.2	0.15
1.15	0.86	2.25	0.14
1.2	0.8	2.3	0.13
1.25	0.74	2.35	0.12
1.3	0.68	2.4	0.11

HYDROGRAPH			
t (min)	Q (cfs)	t (min)	Q (cfs)
11.26	12.13	60.81	62.67
13.51	16.17	63.06	56.60
15.77	21.23	65.32	51.55
18.02	26.28	67.57	47.51
20.27	33.36	69.82	43.46
22.52	40.43	72.07	39.42
24.77	49.53	74.32	36.39
27.03	58.63	76.58	33.36
29.28	67.72	78.83	30.32
31.53	76.82	81.08	28.30
33.78	84.91	83.33	26.28
36.04	90.97	85.59	24.26
38.29	96.03	87.84	22.24
40.54	99.06	90.09	20.22
42.79	101.08	92.34	19.21
45.05	100.07	94.59	17.18
47.30	97.04	96.85	16.17
49.55	92.99	99.10	15.16
51.80	86.93	101.35	14.15
54.05	80.86	103.60	13.14
56.31	74.80	105.86	12.13
58.56	68.73	108.11	11.12

DEVELOPED SITE 100-Yr Rainfall Event (SEC Hydrology Study)

A = Drainage Area (Square Miles): 0.057984
(Obtained from SEC hydrology study)

S = Main Channel Slope (Ft/Mile): 16.9

TL = Lag Time (Hours): 0.750752
TL = 7.86 x (A^0.35) x (TIA^-0.22) x (S^-0.31)

TIA (Total Impervious Area %)= 8.6769
(Obtained From SEC hydrology study)

QP (CFS)= 132.67
(Obtained From SEC hydrology study)

DIMENSIONLESS USGS HYDROGRAPH			
t/TL	Q/QP	t/TL	Q/QP
0.25	0.12	1.35	0.62
0.3	0.16	1.4	0.56
0.35	0.21	1.45	0.51
0.4	0.26	1.5	0.47
0.45	0.33	1.55	0.43
0.5	0.4	1.6	0.39
0.55	0.49	1.65	0.36
0.6	0.58	1.7	0.33
0.65	0.67	1.75	0.3
0.7	0.76	1.8	0.28
0.75	0.84	1.85	0.26
0.8	0.9	1.9	0.24
0.85	0.95	1.95	0.22
0.9	0.98	2	0.2
0.95	1	2.05	0.19
1	0.99	2.1	0.17
1.05	0.96	2.15	0.16
1.1	0.92	2.2	0.15
1.15	0.86	2.25	0.14
1.2	0.8	2.3	0.13
1.25	0.74	2.35	0.12
1.3	0.68	2.4	0.11

HYDROGRAPH			
t (min)	Q (cfs)	t (min)	Q (cfs)
11.26	15.92	60.81	82.26
13.51	21.23	63.06	74.30
15.77	27.86	65.32	67.66
18.02	34.49	67.57	62.35
20.27	43.78	69.82	57.05
22.52	53.07	72.07	51.74
24.77	65.01	74.32	47.76
27.03	76.95	76.58	43.78
29.28	88.89	78.83	39.80
31.53	100.83	81.08	37.15
33.78	111.44	83.33	34.49
36.04	119.40	85.59	31.84
38.29	126.04	87.84	29.19
40.54	130.02	90.09	26.53
42.79	132.67	92.34	25.21
45.05	131.34	94.59	22.55
47.30	127.36	96.85	21.23
49.55	122.06	99.10	19.90
51.80	114.10	101.35	18.57
54.05	106.14	103.60	17.25
56.31	98.18	105.86	15.92
58.56	90.22	108.11	14.59

Multi-Hydrograph Plot

Hyd. No. 22

POST DEVELOPED SITE

Hydrograph type	=	Manual
Peak discharge	=	34.20 cfs
Time to peak	=	0.73 hrs
Hyd. Volume	=	100,948 cuft

Hyd. No. 24

POWDER SPGS CREEK

Hydrograph type	=	Manual
Peak discharge	=	3628.29 cfs
Time to peak	=	5.40 hrs
Hyd. Volume	=	80,412,464 cuft

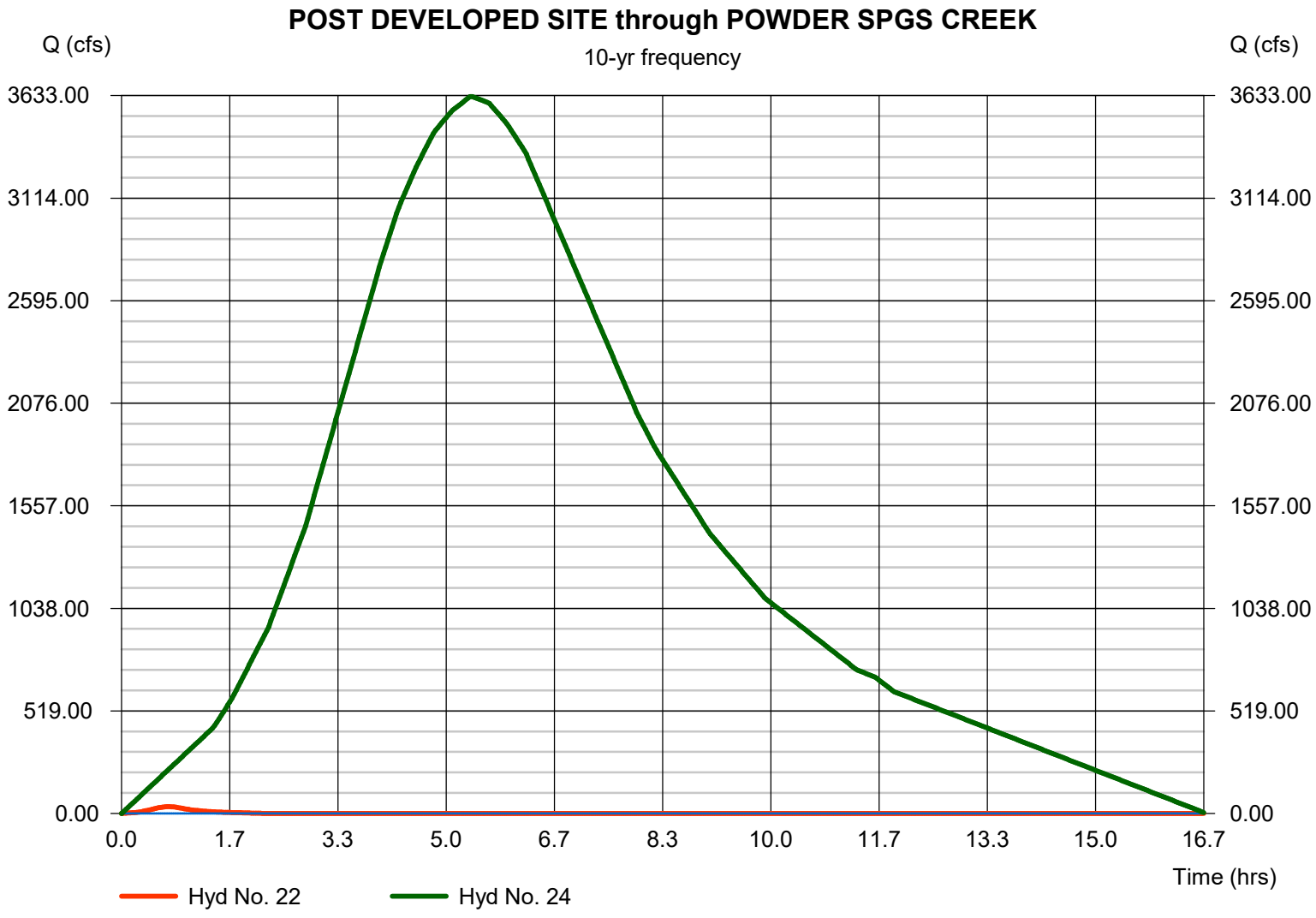


Figure 1 - Post-Developed Site & Powder Springs Creek Basin - 10 Year Rainfall Event

Multi-Hydrograph Plot

Hyd. No. 22

POST DEVELOPED SITE

Hydrograph type	=	Manual
Peak discharge	=	100.54 cfs
Time to peak	=	0.73 hrs
Hyd. Volume	=	296,789 cuft

Hyd. No. 24

POWDER SPGS CREEK

Hydrograph type	=	Manual
Peak discharge	=	5655.77 cfs
Time to peak	=	5.40 hrs
Hyd. Volume	=	125,346,800 cuft

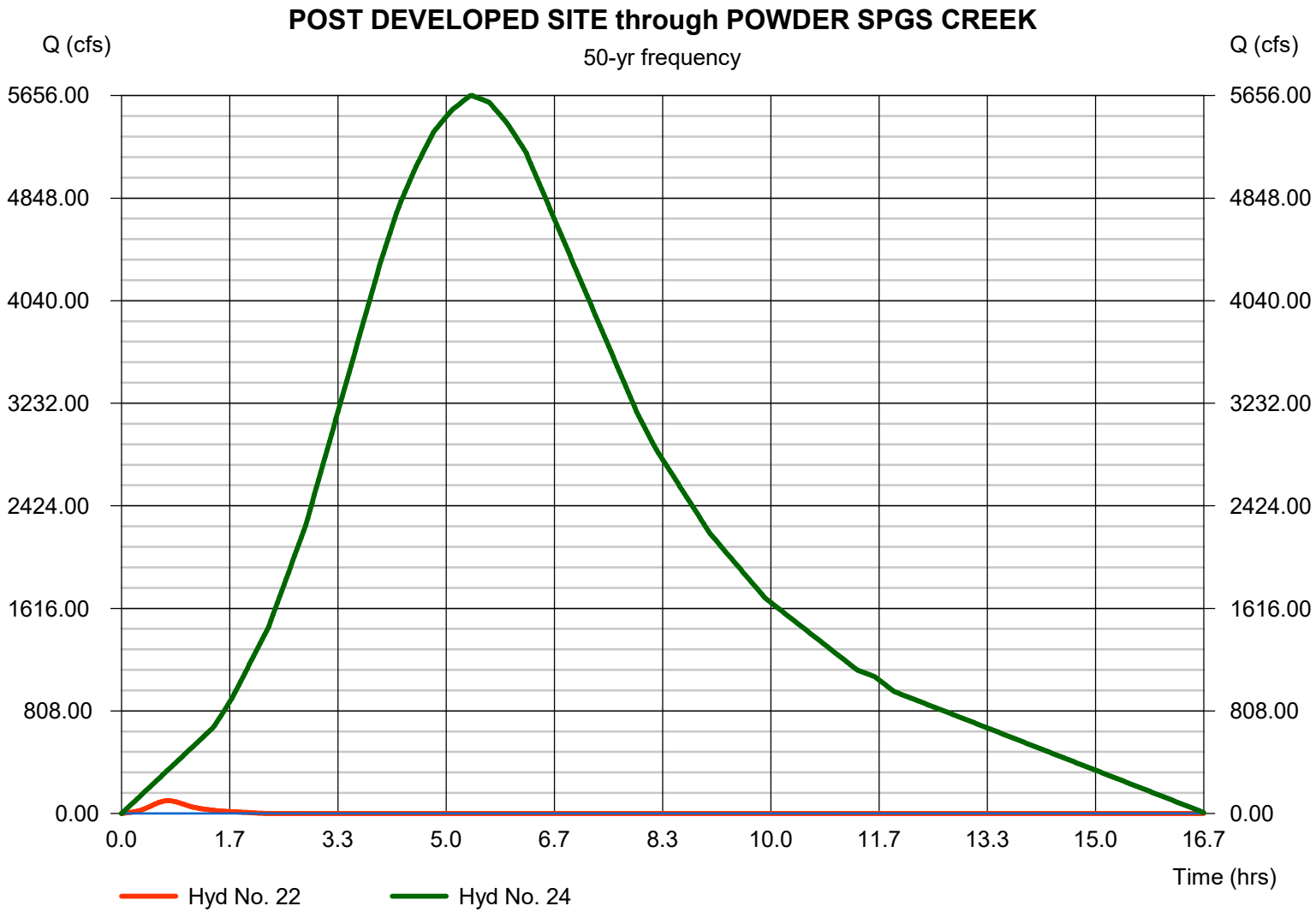


Figure 2 - Post-Developed Site & Powder Springs Creek Basin - 50 Year Rainfall Event

Multi-Hydrograph Plot

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

Hyd. No. 22

POST DEVELOPED SITE

Hydrograph type	=	Manual
Peak discharge	=	131.96 cfs
Time to peak	=	0.73 hrs
Hyd. Volume	=	389,549 cuft

Hyd. No. 24

POWDER SPGS CREEK

Hydrograph type	=	Manual
Peak discharge	=	6193.37 cfs
Time to peak	=	5.40 hrs
Hyd. Volume	=	137,261,376 cuft

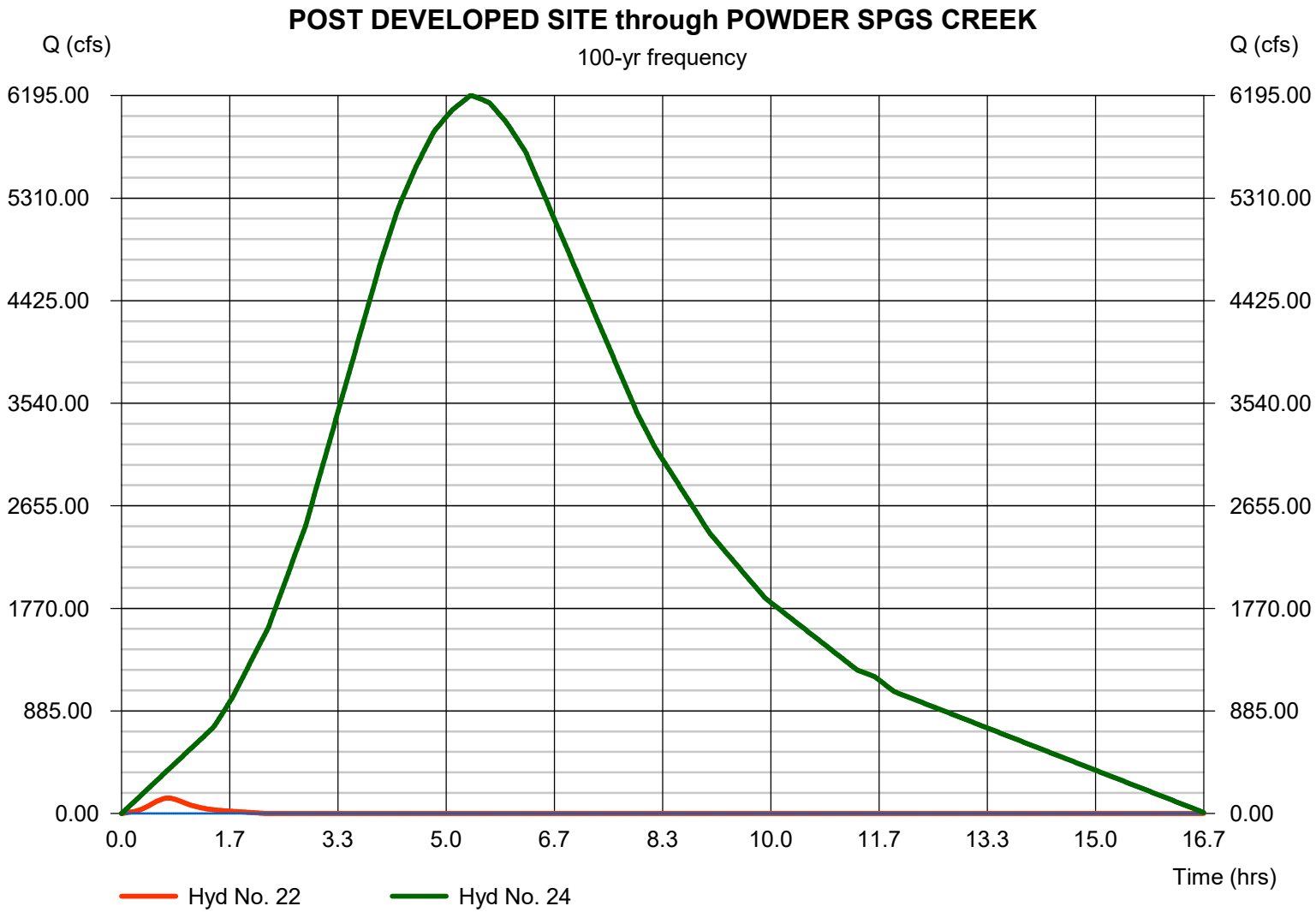
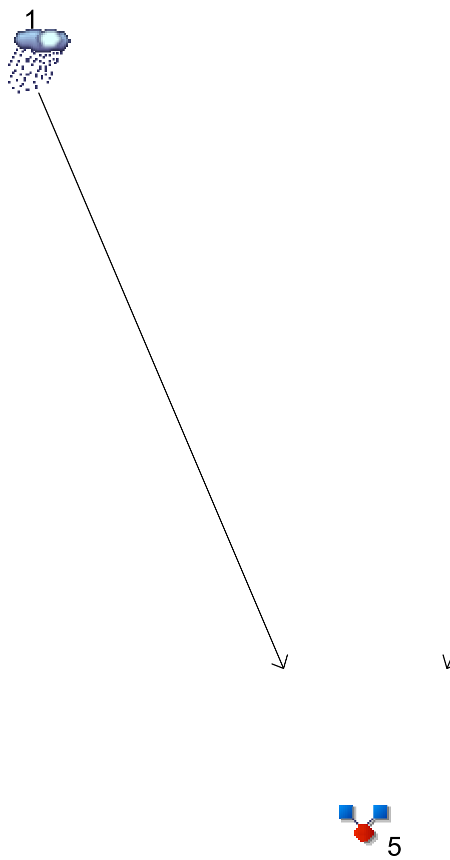


Figure 3 - Post-Developed Site & Powder Springs Creek Basin - 100 Year Rainfall Event

Hydraflow Table of Contents

Watershed Model Schematic

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



Legend

Hyd.	Origin	Description
1	Manual	POST DEVELOPED SITE
3	Manual	POWDER SPGS CREEK
5	Combine	COMBINE (SITE & CREEK)

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	Manual	------	0.000	0.000	-------	0.000	34.20	0.000	100.54	131.96	POST DEVELOPED SITE
3	Manual	------	0.000	0.000	-------	0.000	3628.29	0.000	5655.77	6193.37	POWDER SPGS CREEK
5	Combine	1, 3,	0.000	0.000	-------	0.000	3628.29	0.000	5655.77	6193.37	COMBINE (SITE & CREEK)

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	Manual	34.20	2	44	100,948	------	------	------	POST DEVELOPED SITE
3	Manual	3628.29	2	324	80,412,464	------	------	------	POWDER SPGS CREEK
5	Combine	3628.29	2	324	80,513,408	1, 3,	------	------	COMBINE (SITE & CREEK)

Hydrograph Report

Hyd. No. 1

POST DEVELOPED SITE

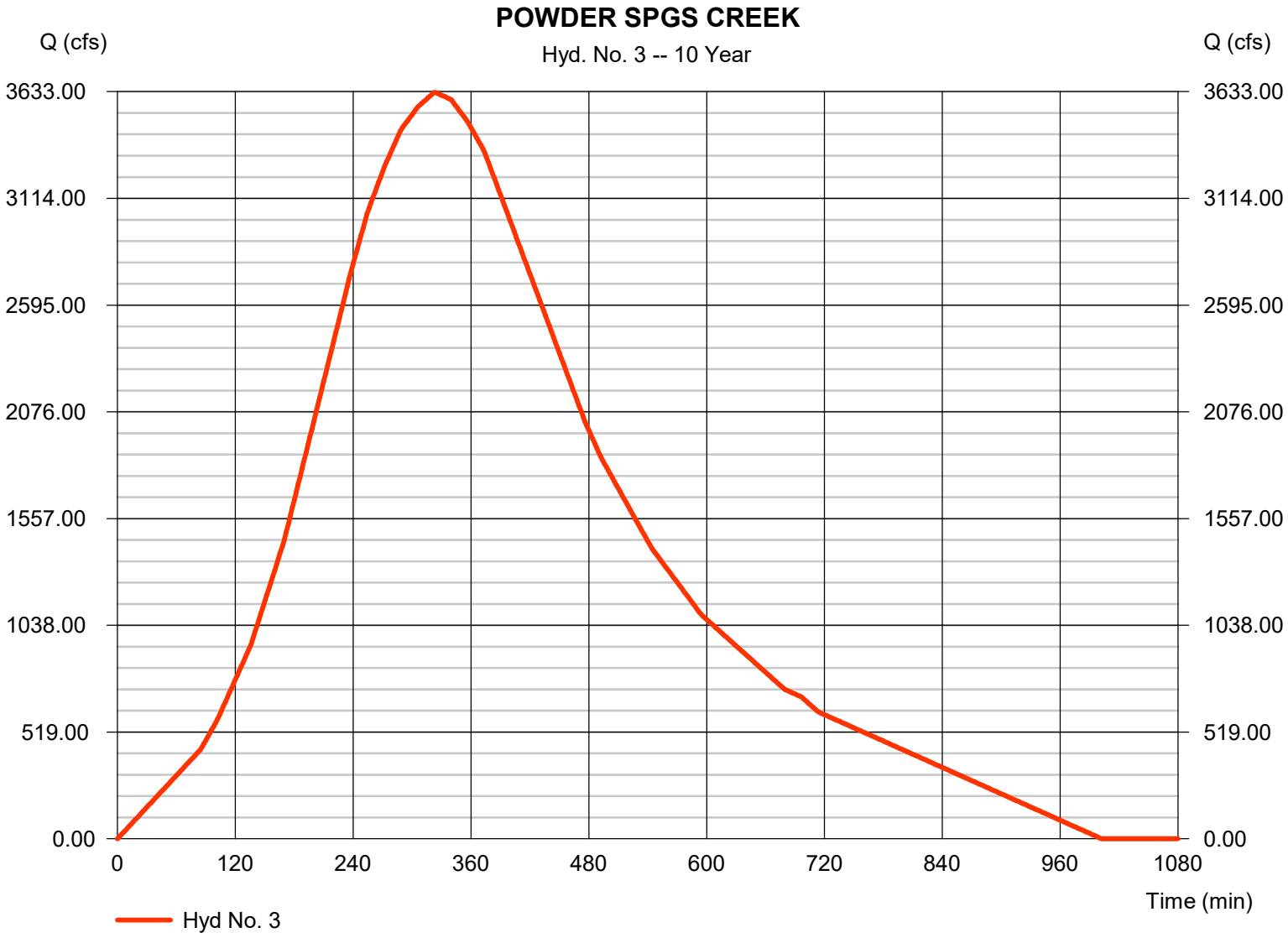
Hydrograph type	= Manual	Peak discharge	= 34.20 cfs
Storm frequency	= 10 yrs	Time to peak	= 44 min
Time interval	= 2 min	Hyd. volume	= 100,948 cuft

Hydrograph Report

Hyd. No. 3

POWDER SPGS CREEK

Hydrograph type	= Manual	Peak discharge	= 3628.29 cfs
Storm frequency	= 10 yrs	Time to peak	= 324 min
Time interval	= 2 min	Hyd. volume	= 80,412,464 cuft

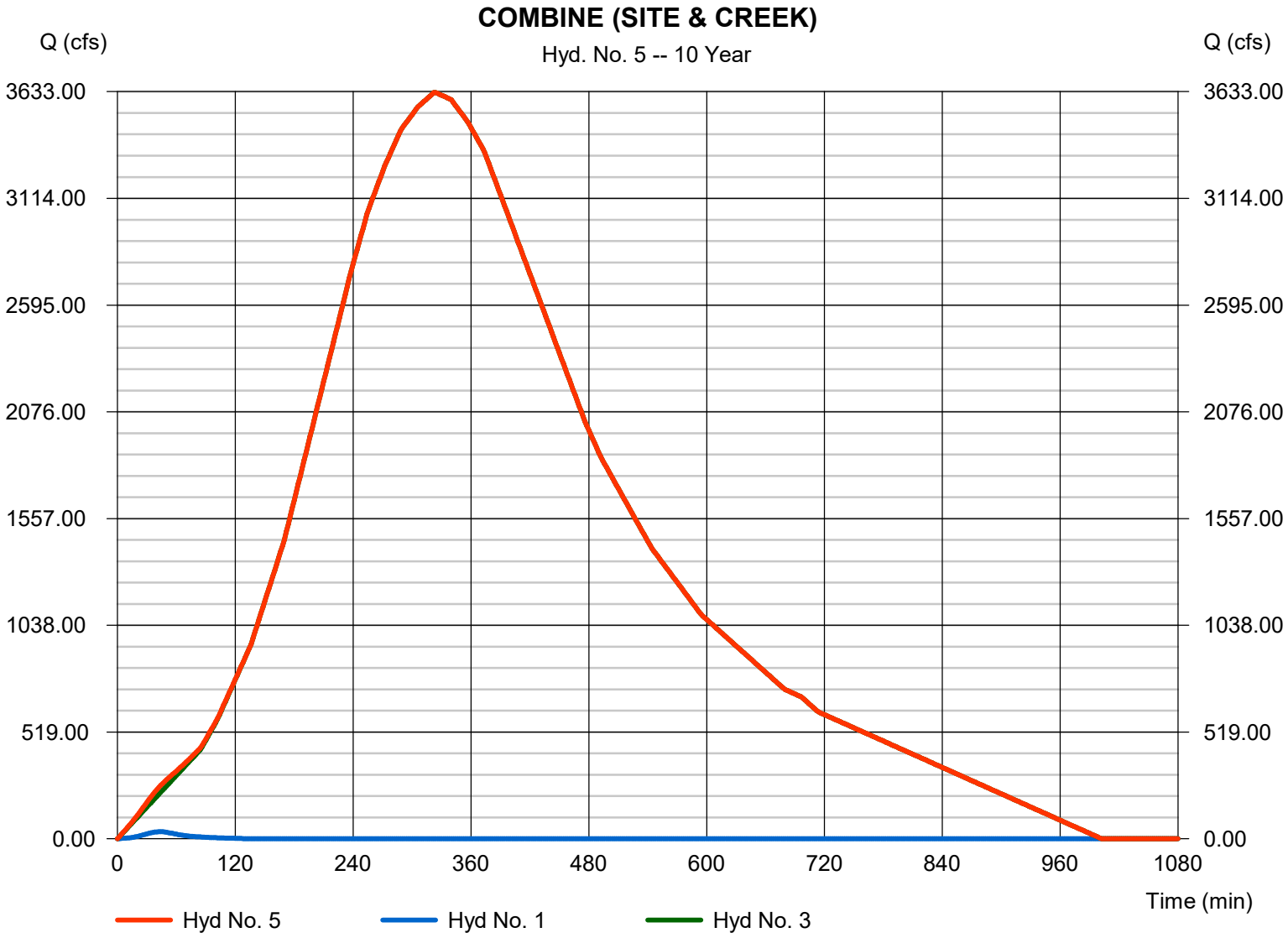


Hydrograph Report

Hyd. No. 5

COMBINE (SITE & CREEK)

Hydrograph type	=	Combine	Peak discharge	=	3628.29 cfs
Storm frequency	=	10 yrs	Time to peak	=	324 min
Time interval	=	2 min	Hyd. volume	=	80,513,408 cuft
Inflow hyds.	=	1, 3	Contrib. drain. area	=	0.000 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	Manual	100.54	2	44	296,789	------	------	------	POST DEVELOPED SITE
3	Manual	5655.77	2	324	125,346,800	------	------	------	POWDER SPGS CREEK
5	Combine	5655.77	2	324	125,643,584	1, 3,	------	------	COMBINE (SITE & CREEK)

Hydrograph Report

Hyd. No. 1

POST DEVELOPED SITE

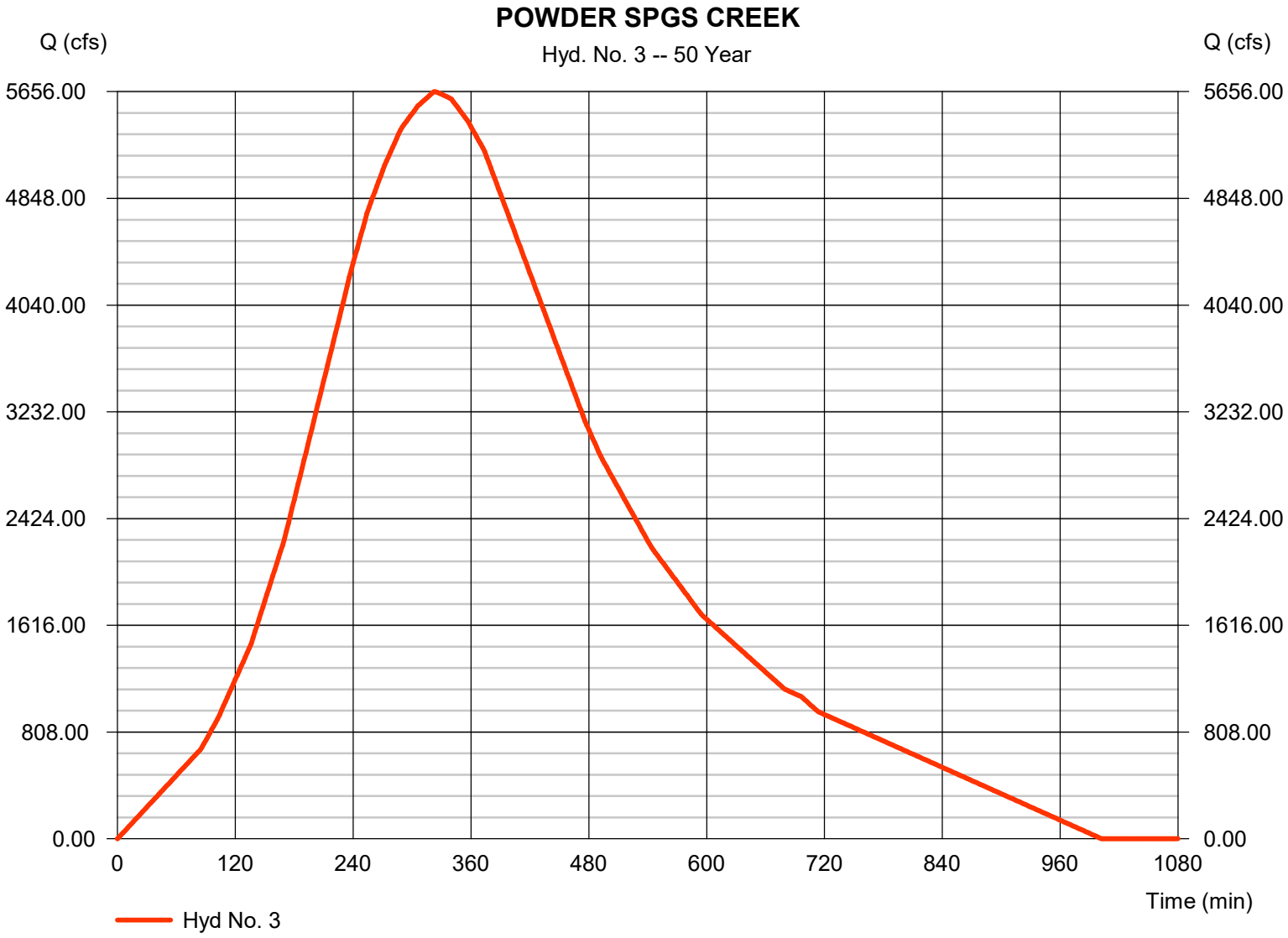
Hydrograph type	= Manual	Peak discharge	= 100.54 cfs
Storm frequency	= 50 yrs	Time to peak	= 44 min
Time interval	= 2 min	Hyd. volume	= 296,789 cuft

Hydrograph Report

Hyd. No. 3

POWDER SPGS CREEK

Hydrograph type	=	Manual	Peak discharge	=	5655.77 cfs
Storm frequency	=	50 yrs	Time to peak	=	324 min
Time interval	=	2 min	Hyd. volume	=	125,346,800 cuft

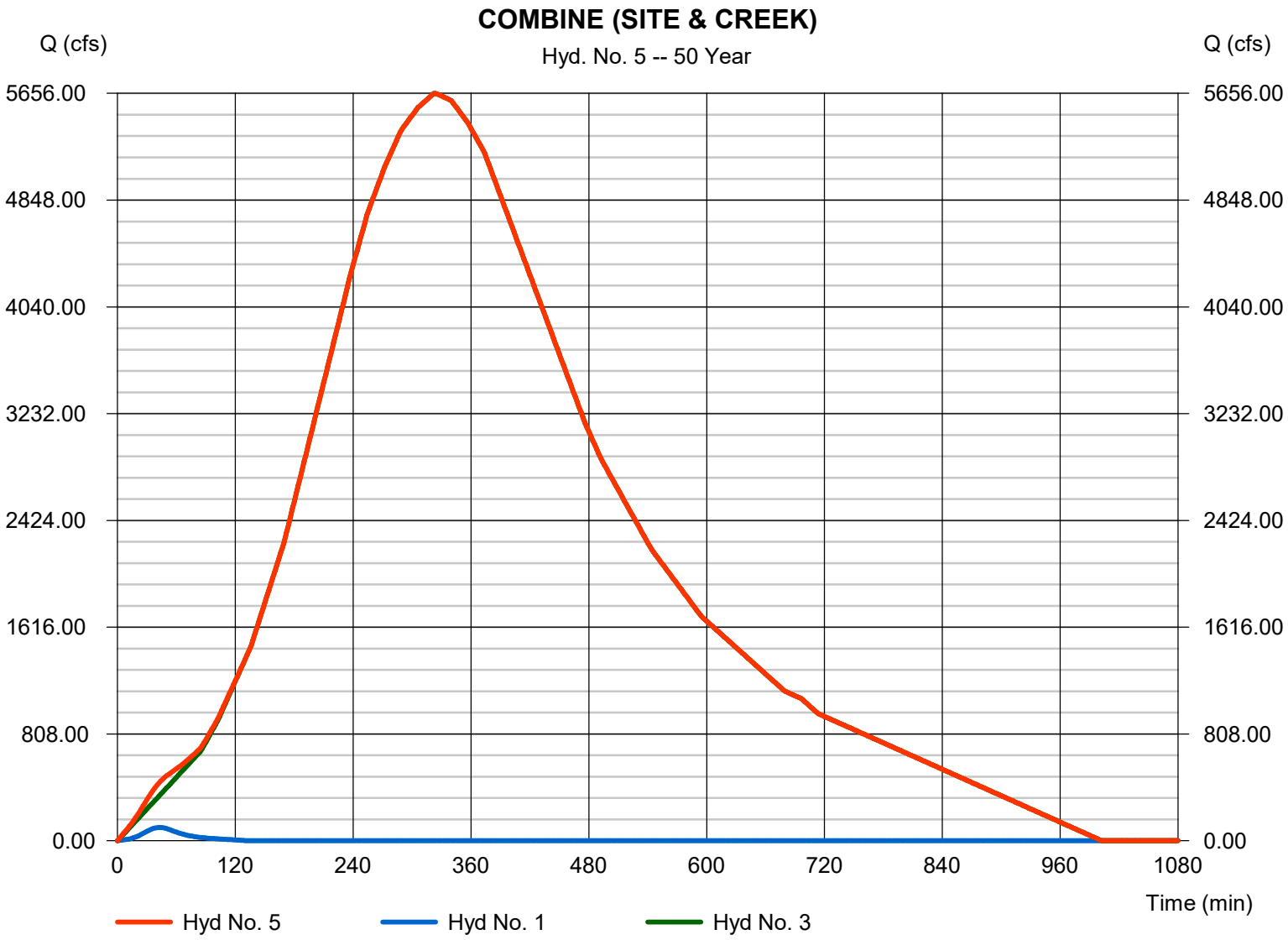


Hydrograph Report

Hyd. No. 5

COMBINE (SITE & CREEK)

Hydrograph type	=	Combine	Peak discharge	=	5655.77 cfs
Storm frequency	=	50 yrs	Time to peak	=	324 min
Time interval	=	2 min	Hyd. volume	=	125,643,584 cuft
Inflow hyds.	=	1, 3	Contrib. drain. area	=	0.000 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	Manual	131.96	2	44	389,549	------	------	------	POST DEVELOPED SITE
3	Manual	6193.37	2	324	137,261,376	------	------	------	POWDER SPGS CREEK
5	Combine	6193.37	2	324	137,650,944	1, 3,	------	------	COMBINE (SITE & CREEK)

Hydrograph Report

Hyd. No. 1

POST DEVELOPED SITE

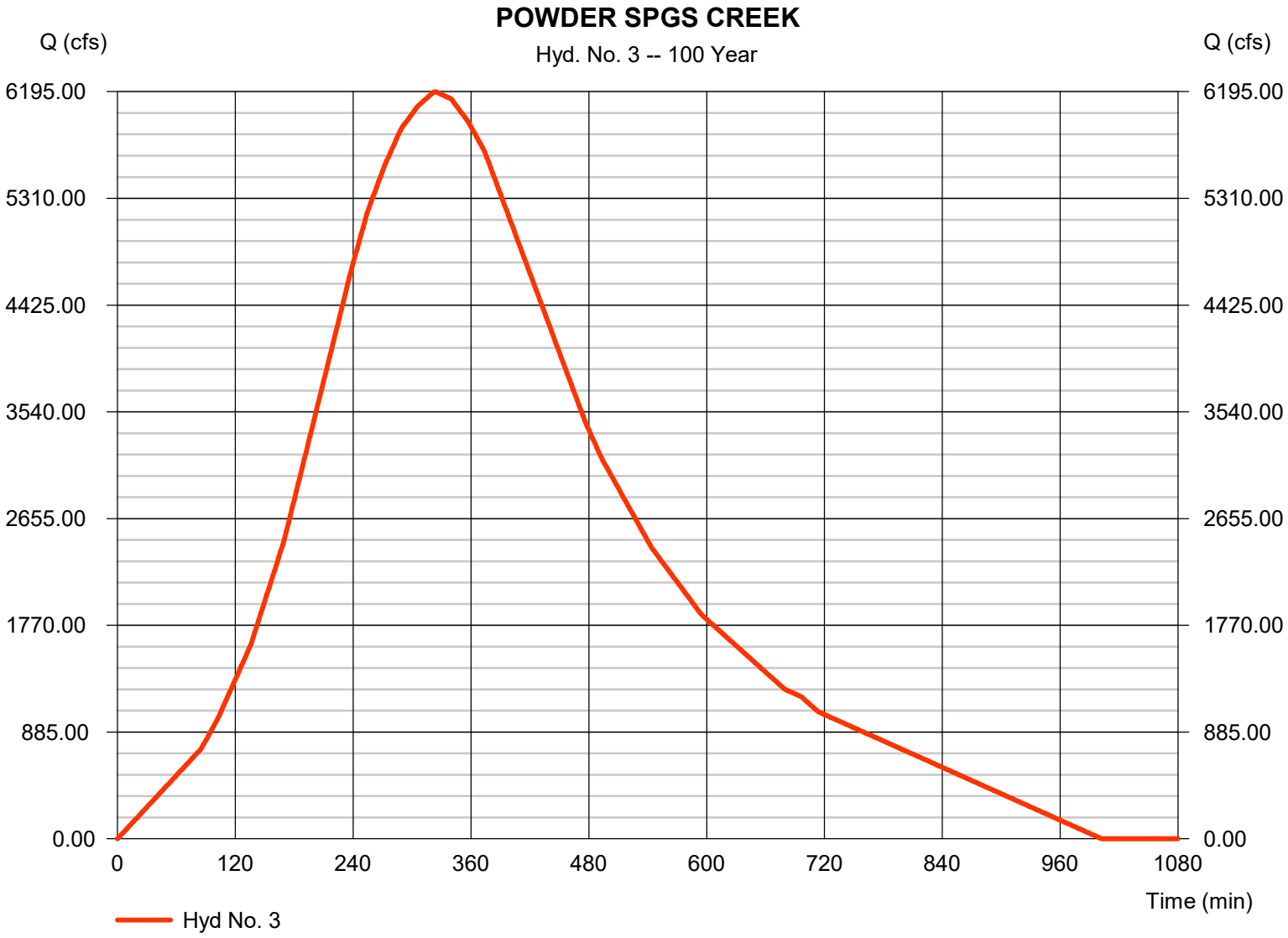
Hydrograph type	= Manual	Peak discharge	= 131.96 cfs
Storm frequency	= 100 yrs	Time to peak	= 44 min
Time interval	= 2 min	Hyd. volume	= 389,549 cuft

Hydrograph Report

Hyd. No. 3

POWDER SPGS CREEK

Hydrograph type	= Manual	Peak discharge	= 6193.37 cfs
Storm frequency	= 100 yrs	Time to peak	= 324 min
Time interval	= 2 min	Hyd. volume	= 137,261,376 cuft

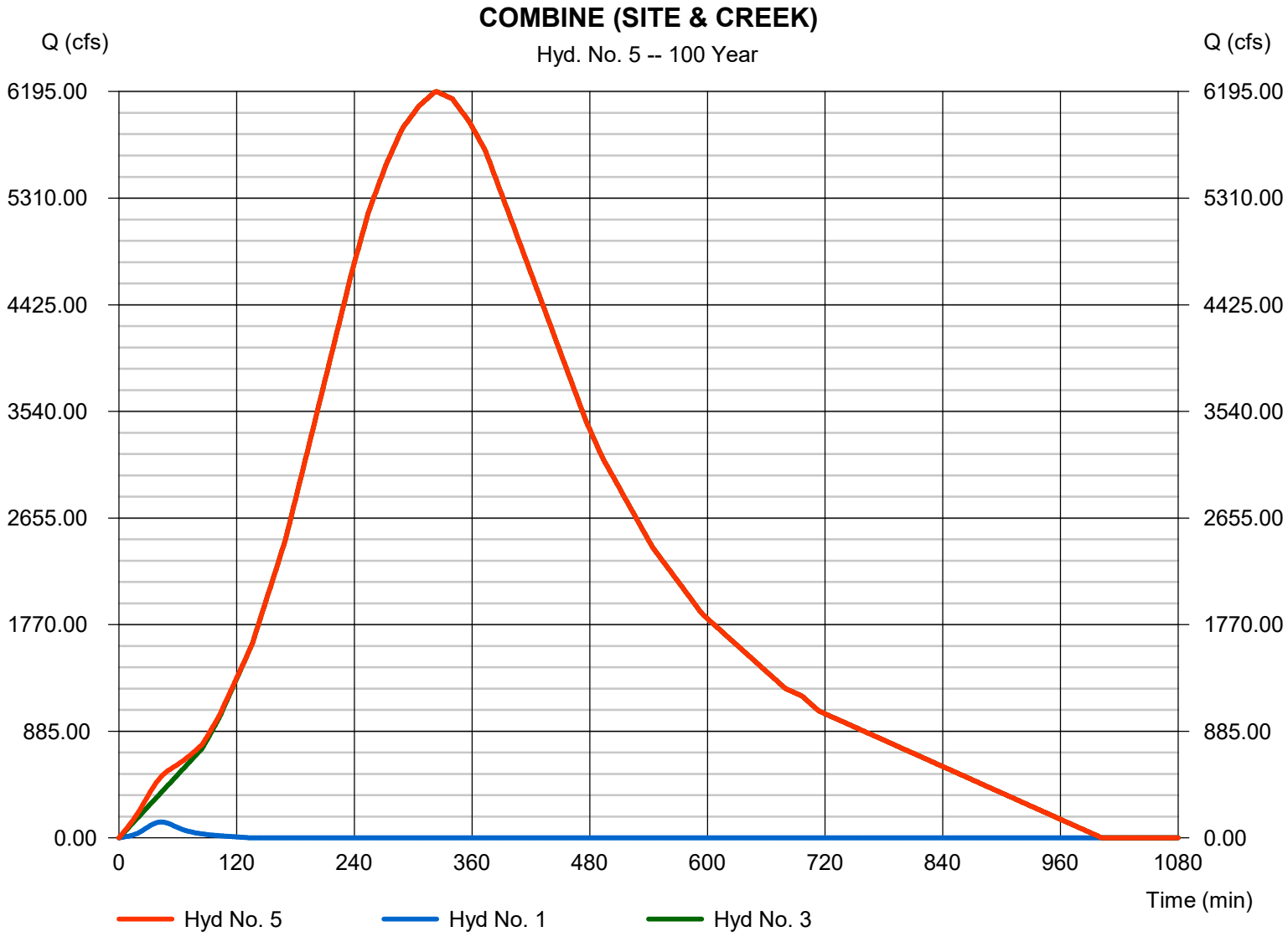


Hydrograph Report

Hyd. No. 5

COMBINE (SITE & CREEK)

Hydrograph type	=	Combine	Peak discharge	=	6193.37 cfs
Storm frequency	=	100 yrs	Time to peak	=	324 min
Time interval	=	2 min	Hyd. volume	=	137,650,944 cuft
Inflow hyds.	=	1, 3	Contrib. drain. area	=	0.000 ac



Hydraflow Rainfall Report

Return Period (Yrs)	Intensity-Duration-Frequency Equation Coefficients (FHA)			
	B	D	E	(N/A)
1	25.3548	5.7000	0.7008	--------
2	27.9480	5.4000	0.6918	--------
3	0.0000	0.0000	0.0000	--------
5	35.6652	5.7000	0.7019	--------
10	41.0022	5.6000	0.7003	--------
25	50.3784	5.8000	0.7052	--------
50	57.0172	5.8000	0.7042	--------
100	63.0604	5.6000	0.7002	--------

File name: POWDER SPRINGS.IDF

Intensity = B / (Tc + D)^E

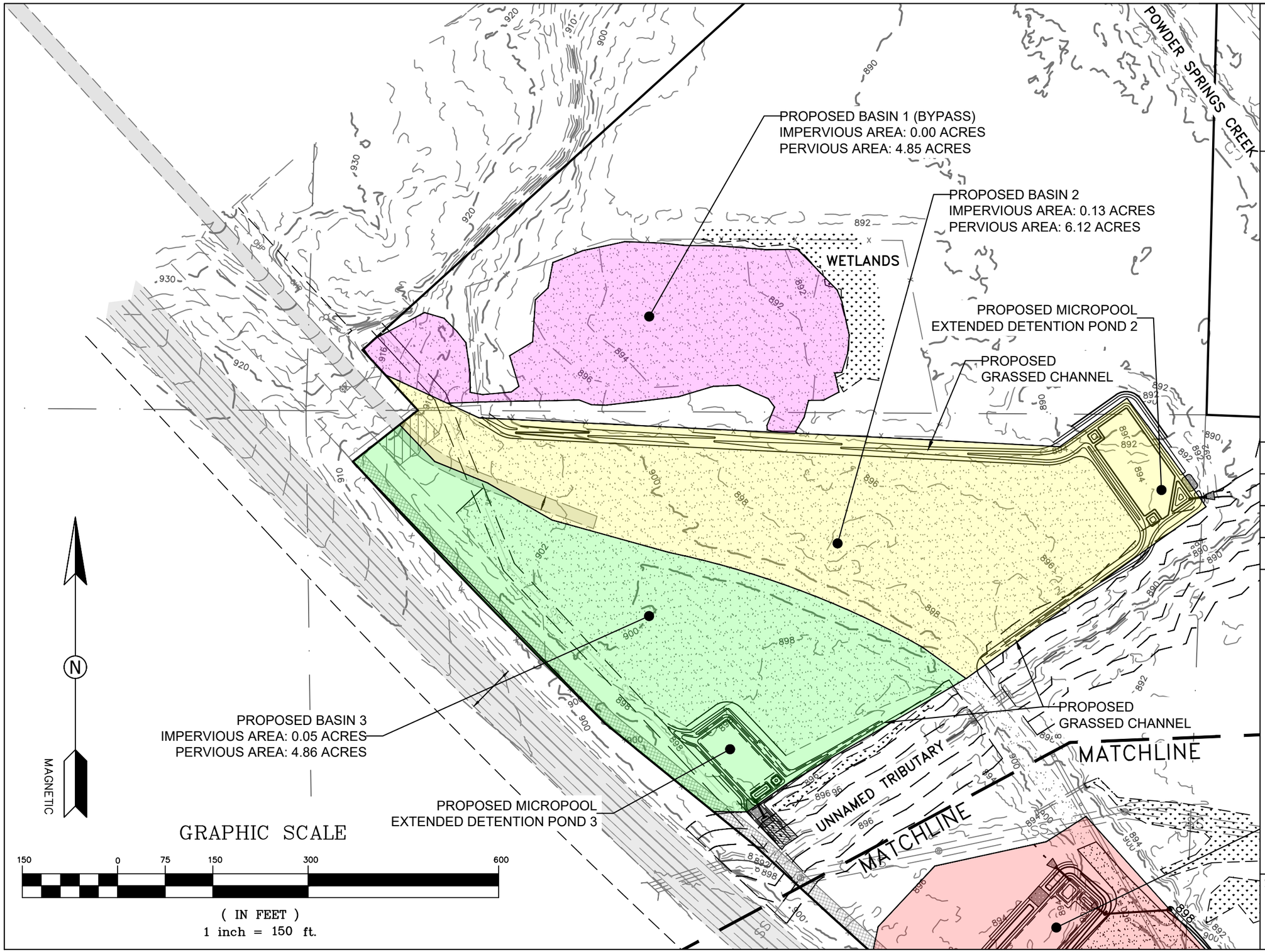
Return Period (Yrs)	Intensity Values (in/hr)											
	5 min	10	15	20	25	30	35	40	45	50	55	60
1	4.82	3.68	3.03	2.61	2.30	2.07	1.89	1.74	1.62	1.52	1.43	1.35
2	5.53	4.22	3.47	2.98	2.63	2.37	2.16	2.00	1.86	1.74	1.64	1.55
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	6.76	5.16	4.25	3.65	3.22	2.90	2.65	2.44	2.27	2.12	2.00	1.89
10	7.85	5.99	4.93	4.23	3.74	3.36	3.06	2.83	2.63	2.46	2.32	2.19
25	9.41	7.19	5.93	5.09	4.49	4.04	3.68	3.40	3.16	2.95	2.78	2.63
50	10.67	8.16	6.73	5.78	5.10	4.59	4.19	3.86	3.59	3.36	3.16	2.99
100	12.07	9.21	7.58	6.51	5.75	5.17	4.72	4.35	4.04	3.78	3.56	3.37

Tc = time in minutes. Values may exceed 60.

east Civil Group\SEC Group - Documents\Design\RAINFALL-IDF CURVES\PRECIPITATION-POWDER SPRINGS.pcp

Storm Distribution	Rainfall Precipitation Table (in)							
	1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr
SCS 24-hour	3.43	3.91	0.00	4.71	5.38	6.32	7.07	7.82
SCS 6-Hr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-1st	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-2nd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-3rd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-4th	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-Indy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Custom	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Appendix E – Water Quality Design



GEORGIA
REGISTERED
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8665 BALDWIN PARKWAY
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PHONE: [redacted]
EMAIL: [redacted]

JOB #: 220702

SCALE: 1"=150'

DATE: 02/06/2023

DRAWN BY: MGF

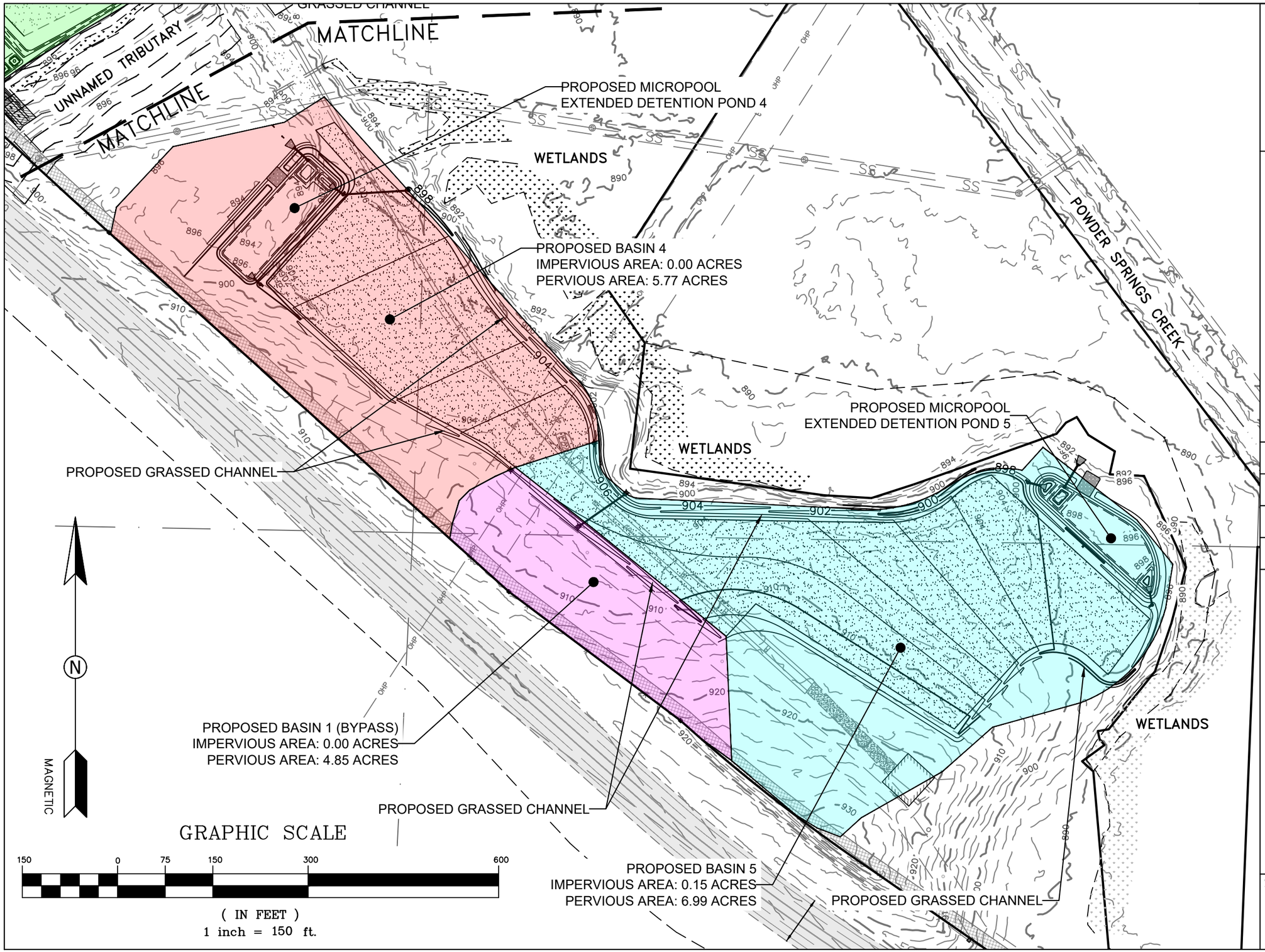
WATER QUALITY DRAINAGE BASIN MAP

20 WEST TRANSPORT PARTNERS, LLC

LOCATED IN LL 1096, 1125, 1126, 1127, 1169, DISTRICT 19, SECTION 2 CITY OF POWDER SPRINGS, COBB COUNTY, GEORGIA

SHEET:

SHEET 1 of 2



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SHEET:

SHEET 2 of 2

20 WEST TRANSPORT PARTNERS, LLC
PROPOSED BASIN 2
MICROPOOL ED POND

Water Quality and Runoff Reduction Design

I =	2	% Impervious	RV =	0.05 + I x (0.009)
R_V =	0.07	Runoff Coefficient		
A_S =	6.25	(Acres)Onsite Area to be treated	WQ_V =	$\frac{1.2 \times RV \times A_S}{12}$
WQ_V =	0.04	(Ac-ft)Water Quality Volume		
WQ_V =	1,856	(cu-ft)Water Quality Volume REQUIRED		
RR_V =	0.04	(Ac-ft)Water Quality Volume	RR_V =	$\frac{1.0 \times RV \times A_S}{12}$
RR_V =	1,547	(cu-ft)Water Quality Volume REQUIRED		

Pretreatment

Pretreatment Volume (Storm Run A)

IA =	0.20	Impervious Area	V_{pre}= (0.1") x (IA) x (43560 sf/ac) x (1'/12")
V_{pre}=	73	Sediment Forebay Volume (c.f.)	

Pretreatment Volume (Storm Run B)

IA =	0.00	Impervious Area	V_{pre}= (0.1") x (IA) x (43560 sf/ac) x (1'/12")
V_{pre}=	0	Sediment Forebay Volume (c.f.)	

Micropool (Permanent Pool)

$0.3*WQ_V$ = 557 Permanent Pool Volume (30% WQv)

Stage-Storage Data for Permanent Pool

ELEV.	STORAGE			
888.57	573			
X	557	X	=	888.54
888.76	664		**USE**	890.00

Extended Detention

Average Release Rate

WQ_V =	1,856	Water Quality Volume REQUIRED	
Time =	24.0	hrs	
t =	86,400	sec	Avg. Rel. = WQV / (hours) x (3600 sec/hr)
Avg. Rel. =	0.02	cfs	

Water Quality Orifice Design

g =	32.2	ft/sec^2	$A = Q/C \times (2gh)^{0.5}$
C =	0.6	Discharge Coefficient	
h =	0.25	ft (avg. head)	$Dia\ (in) = ((4 \times A)/PI)^{0.5} \times 12in/ft$
Area req. =	0.0089	Sq. ft.	
Dia. Req. =	**1.28**	Inches	USE = 3.00 Inch OrifIce **(3" MIN PER GSWMM)**

Stage-Storage Data for Extended Detention

ELEV.	STORAGE			
890	1,783			
X	1,856	X	=	890.01
890.2	4,646		**USE**	890.5

Channel Protection

Post CN= 81
P (1-yr)= 3.43 in
S = 1000 / CN - 10
2.35
Post Q (1-yr)= $\frac{(P - 0.2 \times S)^2}{(P + 0.2 \times S)}$ *(Equation 3.1.5 of Georgia Stormwater Management Manual)*
= 2.25 in
BMP RRv % = 0
RR_V(provided)= 0 cf
R= RR_V(provided)/ basin area
= 0.00 in

Q - R = $\frac{(P - 0.2 \times S)^2}{(P + 0.2 \times S)}$ *(Modified Equation 3.1.5 of Georgia Stormwater Management Manual)*

Adjusted CN = 81
Adjusted S = 2.33

Ia = 0.439 *(Table 3.1.5-3 of Georgia Stormwater Management Manual)*
Ia/P = 0.13
qu = 1,000 csm/in *(Figure 3.1.5-6 of Georgia Stormwater Management Manual)*
qo/qi = 0.025 *(Figure 3.3.5-1 of Georgia Stormwater Management Manual)*
Vs/Vr = 0.65 $Vs/Vr = 0.682 - 1.43 \times (qo/qi) + 1.64 \times (qo/qi)^2 - 0.804 \times (qo/qi)^3$
(Equation 3.3.9 of Georgia Stormwater Management Manual)
Qd = 1.66 in $Qd = (P - 0.2 \times S)^2 / (P + 0.8 \times S)$
(Equation 3.1.5 of Georgia Stormwater Management Manual)
CPv = 0.56 ac-ft $CPv = (Vs / Vr) \times Qd \times A / 12$
CPv = 24369 cu-ft *(Equation 3.3.10 of Georgia Stormwater Management Manual)*

Stage-Storage Data for Channel Protection

ELEV.	STORAGE
891.6	24,685
X	24,926
891.8	27,547

X	=	891.62
	USE	891.7

Channel Protection Orifice Design

Qavg = 0.27 cfs Qavg = CPv / (24 hrs x 3600 sec)
g = 32.2 ft/sec^2 $A = Q/C \times (2gh)^{0.5}$
C = 0.6 Discharge Coefficient
h = 0.60 ft (avg. head) $Dia\ (in) = ((4 \times A)/PI)^{0.5} \times 12in/ft$
Area req. = 0.0716 Sq. ft.
Dia. Req. = **3.62** Inches USE = 3.00 Inch OrifIce **(3" MIN PER GSWMM)**

20 WEST TRANSPORT PARTNERS, LLC
PROPOSED BASIN 3
MICROPOOL ED POND

Water Quality and Runoff Reduction Design

I =	1	% Impervious	RV =	0.05 + I x (0.009)
R_V =	0.06	Runoff Coefficient		
A_S =	4.91	(Acres)Onsite Area to be treated	WQ_V =	1.2 x RV x A_S / 12
WQ_V =	0.03	(Ac-ft)Water Quality Volume		
WQ_V =	1,266	(cu-ft)Water Quality Volume REQUIRED		
RR_V =	0.02	(Ac-ft)Water Quality Volume	RR_V =	1.0 x RV x A_S / 12
RR_V =	1,055	(cu-ft)Water Quality Volume REQUIRED		

Pretreatment

Pretreatment Volume (Storm Run C)

IA =	0.30	Impervious Area	V_{pre}= (0.1") x (IA) x (43560 sf/ac) x (1'/12")
V_{pre}=	109	Sediment Forebay Volume (c.f.)	

Micropool (Permanent Pool)

$0.3*WQ_V$ = 380 Permanent Pool Volume (30% WQv)

Stage-Storage Data for Permanent Pool

ELEV.	STORAGE			
889.6	372			
X	380	X	=	889.64
889.8	415		**USE**	891.00

Extended Detention

Average Release Rate

WQ_V =	1,266	Water Quality Volume REQUIRED	
Time =	24.0	hrs	
t =	86,400	sec	Avg. Rel. = WQV / (hours) x (3600 sec/hr)
Avg. Rel. =	0.01	cfs	

Water Quality Orifice Design

g =	32.2	ft/sec^2			$A = Q/C \times (2gh)^{0.5}$
C =	0.6	Discharge Coefficient			
h =	0.25	ft (avg. head)			Dia (in) = $((4 \times A)/PI)^{0.5}$ x 12in/ft
Area req. =	0.0061	Sq. ft.			
Dia. Req. =	**1.06**	Inches	USE =	3.00 Inch Orifice	**(3" MIN PER GSWMM)**

Stage-Storage Data for Extended Detention

ELEV.	STORAGE			
891	1,157			
X	1,266	X	=	891.02
891.1	1,857		**USE**	891.5

Channel Protection

Post CN= 76
P (1-yr)= 3.43 in
S = 1000 / CN - 10
= 3.16
Post Q (1-yr)= $\frac{(P - 0.2 \times S)^2}{(P + 0.2 \times S)}$ *(Equation 3.1.5 of Georgia Stormwater Management Manual)*
= 1.93 in
BMP RRv % = 0
RR_V(provided)= 0 cf
R= RR_V(provided)/ basin area
= 0.00 in

Q - R = $\frac{(P - 0.2 \times S)^2}{(P + 0.2 \times S)}$ *(Modified Equation 3.1.5 of Georgia Stormwater Management Manual)*

Adjusted CN = 76
Adjusted S = 3.15

Ia = 0.632 *(Table 3.1.5-3 of Georgia Stormwater Management Manual)*
Ia/P = 0.18
qu = 1,000 csm/in *(Figure 3.1.5-6 of Georgia Stormwater Management Manual)*
qo/qi = 0.025 *(Figure 3.3.5-1 of Georgia Stormwater Management Manual)*
Vs/Vr = 0.65 $Vs/Vr = 0.682 - 1.43 \times (qo/qi) + 1.64 \times (qo/qi)^2 - 0.804 \times (qo/qi)^3$
(Equation 3.3.9 of Georgia Stormwater Management Manual)
Qd = 1.32 in $Qd = (P - 0.2 \times S)^2 / (P + 0.8 \times S)$
(Equation 3.1.5 of Georgia Stormwater Management Manual)
CPv = 0.35 ac-ft $CPv = (Vs / Vr) \times Qd \times A / 12$
CPv = 15201 cu-ft *(Equation 3.3.10 of Georgia Stormwater Management Manual)*

Stage-Storage Data for Channel Protection

ELEV.	STORAGE
892.8	15,146
X	15,581
893	16,892

X	=	892.85
	USE	892.9

Channel Protection Orifice Design

Qavg = 0.17 cfs $Qavg = CPv / (24 \text{ hrs} \times 3600 \text{ sec})$
g = 32.2 ft/sec^2 $A = Q/C \times (2gh)^{0.5}$
C = 0.6 Discharge Coefficient
h = 0.70 ft (avg. head) $Dia (in) = ((4 \times A)/PI)^{0.5} \times 12in/ft$
Area req. = 0.0411 Sq. ft.
Dia. Req. = **2.75** Inches USE = 3.00 Inch Orifice **(3" MIN PER GSWMM)**

20 WEST TRANSPORT PARTNERS, LLC
PROPOSED BASIN 4
MICROPOOL ED POND

Water Quality and Runoff Reduction Design

I =	0	% Impervious	RV =	0.05 + I x (0.009)
R_V =	0.05	Runoff Coefficient		
A_S =	5.77	(Acres)Onsite Area to be treated	WQ_V =	$\frac{1.2 \times RV \times A_S}{12}$
WQ_V =	0.03	(Ac-ft)Water Quality Volume		
WQ_V =	1,257	(cu-ft)Water Quality Volume REQUIRED		
RR_V =	0.02	(Ac-ft)Water Quality Volume	RR_V =	$\frac{1.0 \times RV \times A_S}{12}$
RR_V =	1,047	(cu-ft)Water Quality Volume REQUIRED		

Pretreatment

Pretreatment Volume (Storm Run D)

IA =	0.00	Impervious Area	V_{pre}= (0.1") x (IA) x (43560 sf/ac) x (1'/12")
V_{pre}=	0	Sediment Forebay Volume (c.f.)	

Micropool (Permanent Pool)

$0.3*WQ_V$ = 377 Permanent Pool Volume (30% WQv)

Stage-Storage Data for Permanent Pool

ELEV.	STORAGE			
892.2	574			
X	377	X	=	891.92
892.4	717		**USE**	895.00

Extended Detention

Average Release Rate

WQ_V =	1,257	Water Quality Volume REQUIRED	
Time =	24.0	hrs	
t =	86,400	sec	Avg. Rel. = WQV / (hours) x (3600 sec/hr)
Avg. Rel. =	0.01	cfs	

Water Quality Orifice Design

g =	32.2	ft/sec^2			$A = Q/C \times (2gh)^{0.5}$
C =	0.6	Discharge Coefficient			
h =	0.25	ft (avg. head)			Dia (in) = $((4 \times A)/PI)^{0.5}$ x 12in/ft
Area req. =	0.0060	Sq. ft.			
Dia. Req. =	**1.05**	Inches	USE =	3.00 Inch Orifice	**(3" MIN PER GSWMM)**

Stage-Storage Data for Extended Detention

ELEV.	STORAGE			
894	1,861			
X	1,257	X	=	893.89
894.1	2,393		**USE**	895.5

Channel Protection

Post CN= 72
P (1-yr)= 3.43 in
S = 1000 / CN - 10
= 3.89
Post Q (1-yr)= $\frac{(P - 0.2 \times S)^2}{(P + 0.2 \times S)}$ *(Equation 3.1.5 of Georgia Stormwater Management Manual)*
= 1.67 in
BMP RRv % = 0
RR_V(provided)= 0 cf
R= RR_V(provided)/ basin area
= 0.00 in

Q - R = $\frac{(P - 0.2 \times S)^2}{(P + 0.2 \times S)}$ *(Modified Equation 3.1.5 of Georgia Stormwater Management Manual)*

Adjusted CN = 72
Adjusted S = 3.90

Ia = 0.597 *(Table 3.1.5-3 of Georgia Stormwater Management Manual)*
Ia/P = 0.17
qu = 1,000 csm/in *(Figure 3.1.5-6 of Georgia Stormwater Management Manual)*
qo/qi = 0.025 *(Figure 3.3.5-1 of Georgia Stormwater Management Manual)*
Vs/Vr = 0.65 $Vs/Vr = 0.682 - 1.43 \times (qo/qi) + 1.64 \times (qo/qi)^2 - 0.804 \times (qo/qi)^3$
(Equation 3.3.9 of Georgia Stormwater Management Manual)
Qd = 1.07 in $Qd = (P - 0.2 \times S)^2 / (P + 0.8 \times S)$
(Equation 3.1.5 of Georgia Stormwater Management Manual)
CPv = 0.33 ac-ft $CPv = (Vs / Vr) \times Qd \times A / 12$
CPv = 14535 cu-ft *(Equation 3.3.10 of Georgia Stormwater Management Manual)*

Stage-Storage Data for Channel Protection

ELEV.	STORAGE
896.6	28,165
X	14,912
896.8	30,986

X	=	895.66
	USE	896.7

Channel Protection Orifice Design

Qavg = 0.16 cfs Qavg = CPv / (24 hrs x 3600 sec)
g = 32.2 ft/sec^2 $A = Q/C \times (2gh)^{0.5}$
C = 0.6 Discharge Coefficient
h = 0.60 ft (avg. head) $Dia\ (in) = ((4 \times A)/PI)^{0.5} \times 12in/ft$
Area req. = 0.0424 Sq. ft.
Dia. Req. = **2.79** Inches USE = 3.00 Inch Orifice **(3" MIN PER GSWMM)**

20 WEST TRANSPORT PARTNERS, LLC
PROPOSED BASIN 5
MICROPOOL ED POND

Water Quality and Runoff Reduction Design

I =	2	% Impervious	RV =	0.05 + I x (0.009)
R_V =	0.06	Runoff Coefficient		
A_S =	8.96	(Acres)Onsite Area to be treated	WQ_V =	$\frac{1.2 \times RV \times A_S}{12}$
WQ_V =	0.06	(Ac-ft)Water Quality Volume		
WQ_V =	2,524	(cu-ft)Water Quality Volume REQUIRED		
RR_V =	0.05	(Ac-ft)Water Quality Volume	RR_V =	$\frac{1.0 \times RV \times A_S}{12}$
RR_V =	2,103	(cu-ft)Water Quality Volume REQUIRED		

Pretreatment

Pretreatment Volume (Storm Run E)

IA =	0.15	Impervious Area	V_{pre}= (0.1") x (IA) x (43560 sf/ac) x (1'/12")
V_{pre}=	54	Sediment Forebay Volume (c.f.)	

Pretreatment Volume (Storm Run F)

IA =	0.15	Impervious Area	V_{pre}= (0.1") x (IA) x (43560 sf/ac) x (1'/12")
V_{pre}=	54	Sediment Forebay Volume (c.f.)	

Micropool (Permanent Pool)

$0.3*WQ_V$ = 757 Permanent Pool Volume (30% WQv)

Stage-Storage Data for Permanent Pool

ELEV.	STORAGE			
890.6	494			
X	757	X	=	891.18
890.8	585		**USE**	893.00

JOB NAME: 20 WEST TRANSPORT PARTNERS, LLC
JOB NUMBER: 220702

Extended Detention

Average Release Rate

WQ_V =	2,524	Water Quality Volume REQUIRED	
Time =	24.0	hrs	
t =	86,400	sec	Avg. Rel. = WQV / (hours) x (3600 sec/hr)
Avg. Rel. =	0.03	cfs	

Water Quality Orifice Design

g =	32.2	ft/sec^2	$A = Q/C \times (2gh)^{0.5}$
C =	0.6	Discharge Coefficient	
h =	0.25	ft (avg. head)	Dia (in) = $((4 \times A)/PI)^{0.5} \times 12in/ft$
Area req. =	0.0121	Sq. ft.	
Dia. Req. =	**1.49**	Inches	USE = 3.00 Inch Orifice **(3" MIN PER GSWMM)**

Stage-Storage Data for Extended Detention

ELEV.	STORAGE			
892.1	1,578			
X	2,524	X	=	892.31
892.2	2,025		**USE**	893.5

JOB NAME: 20 WEST TRANSPORT PARTNERS, LLC
JOB NUMBER: 220702

Channel Protection

Post CN= 72
P (1-yr)= 3.43 in
S = 1000 / CN - 10
= 3.89
Post Q (1-yr)= $\frac{(P - 0.2 \times S)^2}{(P + 0.2 \times S)}$ *(Equation 3.1.5 of Georgia Stormwater Management Manual)*
= 1.67 in
BMP RRv % = 0
RR_V(provided)= 0 cf
R= RR_V(provided)/ basin area
= 0.00 in

Q - R = $\frac{(P - 0.2 \times S)^2}{(P + 0.2 \times S)}$ *(Modified Equation 3.1.5 of Georgia Stormwater Management Manual)*

Adjusted CN = 72
Adjusted S = 3.90

Ia = 0.532 *(Table 3.1.5-3 of Georgia Stormwater Management Manual)*
Ia/P = 0.16
qu = 1,000 csm/in *(Figure 3.1.5-6 of Georgia Stormwater Management Manual)*
qo/qi = 0.025 *(Figure 3.3.5-1 of Georgia Stormwater Management Manual)*
Vs/Vr = 0.65 $Vs/Vr = 0.682 - 1.43 \times (qo/qi) + 1.64 \times (qo/qi)^2 - 0.804 \times (qo/qi)^3$
(Equation 3.3.9 of Georgia Stormwater Management Manual)
Qd = 1.07 in $Qd = (P - 0.2 \times S)^2 / (P + 0.8 \times S)$
(Equation 3.1.5 of Georgia Stormwater Management Manual)
CPv = 0.52 ac-ft $CPv = (Vs / Vr) \times Qd \times A / 12$
CPv = 22571 cu-ft *(Equation 3.3.10 of Georgia Stormwater Management Manual)*

Stage-Storage Data for Channel Protection

ELEV.	STORAGE
894.2	18,845
X	23,328
894.4	21,322

X	=	894.56
	USE	894.6

Channel Protection Orifice Design

Qavg = 0.24 cfs $Qavg = CPv / (24 \text{ hrs} \times 3600 \text{ sec})$
g = 32.2 ft/sec^2 $A = Q/C \times (2gh)^{0.5}$
C = 0.6 Discharge Coefficient
h = 0.55 ft (avg. head) $Dia (in) = ((4 \times A)/PI)^{0.5} \times 12in/ft$
Area req. = 0.0674 Sq. ft.
Dia. Req. = **3.52** Inches USE = 3.00 Inch Orifice **(3" MIN PER GSWMM)**

Georgia Stormwater Management Manual
Stormwater Quality Site Development Review Tool
Version 2.2

General Information

Name of Developer:	20 WEST TRANSPORT PARTNERS	**Date Submitted:**	2/6/2023
Development Name:	20 WEST TRANSPORT PARTNERS	**Permit Number:**	
Site Location / Address:	BURROW TRAIL	**Developer Contact:**	MARK HAWKS
		Phone Number:	[redacted]
		Name of Engineer(s):	The Southeast Civil Group
Development Type:	Light Industry	**Maintenance Responsibility:**	Owner

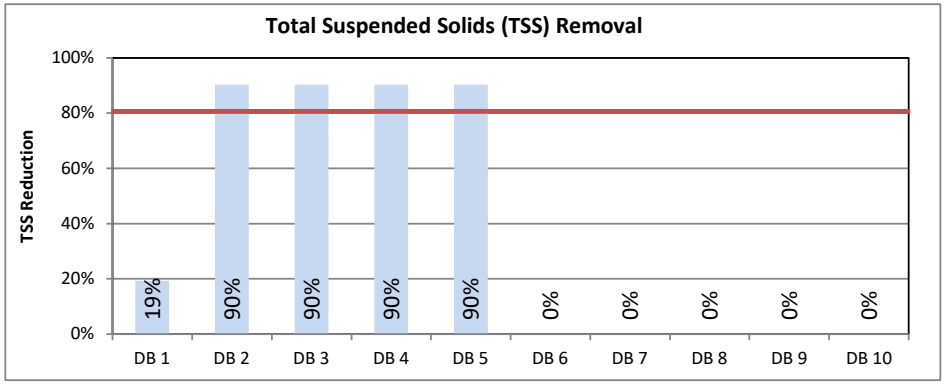
Site Summary

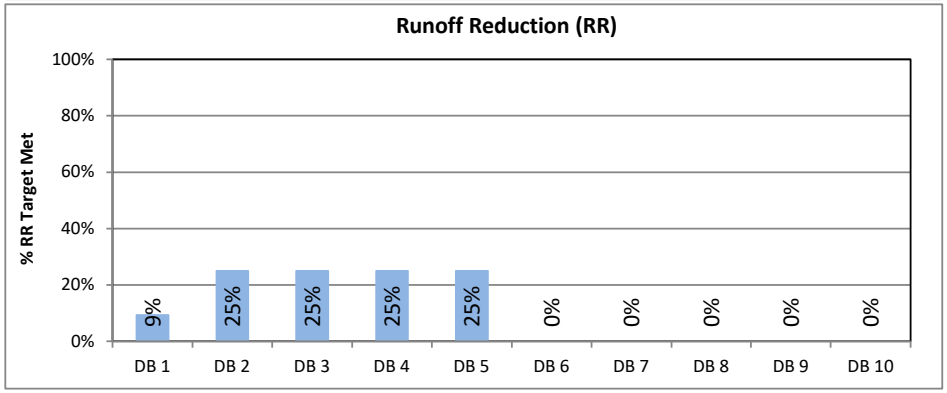
Total Pre-Development Area (ac):	**28.92**
Total Post-Development Area (ac):	**28.92**
Total Treated Area (ac):	**25.89**
Total Untreated Area (ac):	**3.03**

		I (ac)	P (ac)	CA (ac)
PROPOSED BASIN 1	**DB 1**	0.00	4.85	0.00
PROPOSED BASIN 2	**DB 2**	0.13	6.12	0.00
PROPOSED BASIN 3	**DB 3**	0.05	4.86	0.00
PROPOSED BASIN 4	**DB 4**	0.00	5.77	0.00
PROPOSED BASIN 5	**DB 5**	0.15	6.99	0.00
Drainage Basin 6	**DB 6**	0.00	0.00	0.00
Drainage Basin 7	**DB 7**	0.00	0.00	0.00
Drainage Basin 8	**DB 8**	0.00	0.00	0.00
Drainage Basin 9	**DB 9**	0.00	0.00	0.00
Drainage Basin 10	**DB 10**	0.00	0.00	0.00
	TOTAL	**0.33**	**28.59**	**0.00**

I = Impervious Area, P = Pervious Area, CA = Conservation Area

Target Runoff Reduction Volume Achieved?	**No**
Target TSS Removal Achieved?	**Yes**
Total Target Runoff Reduction Volume (cf)	6,327
Runoff Reduction Volume Achieved (cf)	1,444
Total Target Water Quality Volume (cf)	7,593
% TSS Removal Achieved	80%





Official Use Only

Tracking #:		**Conditions of Approval:**	
Reviewed By:			
Date Approved:			

Georgia Stormwater Management Manual
Stormwater Quality Site Development Review Tool, v2.2
Runoff Reduction and TSS Removal Efficiencies

data input cells constant values

	Runoff Reduction %	Effective TSS Removal %	Runoff Reduction Method	Drainage Area Restrictions	Units	Min/Max
Bioretention Basin (w/ underdrain)	50%	85%	Storage	5	acres	Max
Bioretention Basin (w/ upturned underdrain)	75%	85%	Storage	5	acres	Max
Bioretention Basin (w/o underdrain)	100%	100%	Storage	5	acres	Max
Bioslope (A & B hydrologic soils)	50%	85%	Storage	--	--	--
Bioslope (C & D hydrologic soils)	25%	85%	Storage	--	--	--
Downspout Disconnect (A & B hydrologic soils)	50%	80%	Convey	2500	ft^2	Max
Downspout Disconnect (C & D hydrologic soils)	25%	80%	Convey	2500	ft^2	Max
Dry Detention Basin	0%	60%	Storage	75	acres	Max
Dry Extended Detention Basin	0%	60%	Storage	--	--	--
Dry Well	100%	100%	Storage	2500	ft^2	Max
Enhanced Dry Swale (w/ underdrain)	50%	80%	Storage	5	acres	Max
Enhanced Dry Swale (w/o underdrain)	100%	100%	Storage	5	acres	Max
Enhanced Wet Swale	0%	80%	Storage	5	acres	Max
Grass Channel (A & B hydrologic soils)	25%	50%	Convey	5	acres	Max
Grass Channel (C & D hydrologic soils)	10%	50%	Convey	5	acres	Max
Gravity (oil-grit) Separator	0%	40%	Convey	5	acres	Max
Green Roof	60%	80%	Storage	--	--	--
Infiltration Trench	100%	100%	Storage	5	acres	Max
Multi-Purpose Detention Basin	0%		Storage	--	--	--
Organic Filter	0%	80%	Storage	10	acres	Max
Permeable Paver System (w/ underdrain)	50%	80%	Storage	--	--	--
Permeable Paver System (w/ upturned underdrain)	75%	80%	Storage	--	--	--
Permeable Paver System (w/o underdrain)	100%	100%	Storage			
Pervious Concrete (w/ underdrain)	50%	80%	Storage	--	--	--
Pervious Concrete (w/ upturned underdrain)	75%	80%	Storage			
Pervious Concrete (w/o underdrain)	100%	100%	Storage	--	--	--
Porous Asphalt (w/ underdrain)	50%	50%	Storage	--	--	--
Porous Asphalt (w/ upturned underdrain)	75%	50%	Storage			
Porous Asphalt (w/o underdrain)	100%	100%	Storage	--	--	--
Porous Asphalt (OGFC, PEM)	0%	50%	Convey	--	--	--
Proprietary System						
Rainwater Harvesting			Storage			
Regenerative Stormwater Conveyance	0%	80%	Storage	50	acres	Max
Sand Filter	0%	80%	Storage	10	acres	Max
Site Reforestation/Revegetation	0%	0%	Convey	--	--	--
Soil Restoration (can be used to remediate C & D soils)	0%	0%	Convey	--	--	--
Stormwater Planter / Tree Box	50%	80%	Storage	2500	ft^2	Max
Stormwater Pond	0%	80%	Storage	10-25	acres	Min
Stormwater Wetlands – Level 1	0%	80%	Convey	5	acres	Min
Stormwater Wetlands – Level 2	0%	85%	Convey	5	acres	Min
Submerged Gravel Wetlands	0%	80%	Convey	5	acres	Min
Underground Detention	0%	0%	Convey	--	--	--
Vegetated Filter Strip (A & B hydrologic soils)	50%	60%	Convey	--	--	--
Vegetated Filter Strip (C & D hydrologic soils)	25%	60%	Convey	--	--	--
[User Input 1]						
[User Input 2]						
[User Input 3]						

Georgia Stormwater Management Manual
Stormwater Quality Site Development Review Tool, v2.2

Development Name: 20 WEST TRANSPORT PARTNERS LLC
Drainage Basin Name: PROPOSED BASIN 1

data input cells
calculation cells
constant values

Site Data

Indicate Pre-Development Land Cover and Runoff Curve Numbers in the Site's Disturbed Area

Cover Type	HSG* A (acres)	CN	HSG B (acres)	CN	HSG C (acres)	CN	HSG D (acres)	CN	Total	% Cover
Woods - Good Condition		30	4.85	55		70		77	4.85	100%
Select a land cover type…		0		0		0		0	0.00	0%
Select a land cover type…		0		0		0		0	0.00	0%
Select a land cover type…		0		0		0		0	0.00	0%
Select a land cover type…		0		0		0		0	0.00	0%
Local Jurisdiction Input									0.00	0%
Other									0.00	0%
Total	0.00		4.85		0.00		0.00		4.85	100%

*HSG = hydrologic soil group

Impervious (ac)	0.00
Weighted CN	55
Potential Max Soil Retention, S_{pre} (in)	8.18

Indicate Post-Development Land Cover and Runoff Curve Numbers in the Site's Disturbed Area

Cover Type	HSG A (acres)	CN	HSG B (acres)	CN	HSG C (acres)	CN	HSG D (acres)	CN	Total	% Cover
Open space - Good condition (grass cover > 75%)		39	1.82	61		74		80	1.82	38%
Select a land cover type…		0		0		0		0	0.00	0%
Select a land cover type…		0		0		0		0	0.00	0%
Select a land cover type…		0		0		0		0	0.00	0%
Select a land cover type…		0		0		0		0	0.00	0%
Local Jurisdiction Input									0.00	0%
GRAVEL			3.03	85					3.03	62%
Total	0.00		4.85		0.00		0.00		4.85	100%

Impervious (ac)	0.00
Rv	0.05
Weighted CN	76
Potential Max Soil Retention, S_{post} (in)	3.16

Conservation Area Credits

Scenario 1: Natural Conservation Area **See the GSMM Volume 2, Section 2.3.3.3 for more information.*

☐ Check the box if a portion of the post-developed area is protected by a conservation easement or equivalent form of protection.

Area (ac) of development protected by a conservation easement or equivalent form of protection.

Note: The green cell will unlock if the Scenario 1 box above is checked

Scenario 2: Site Reforestation/Revegetation **See the GSMM Volume 2, Section 4.22 for more information.*

☐ Check the box if a portion of the post-developed area employs site reforestation/revegetation and is protected by a conservation easement or equivalent form of protection.

Area (ac) of development reforested/revegetated and protected by a conservation easement or equivalent form of protection.

Note: The green cell will unlock if the Scenario 2 box above is checked

Scenario 3: Soil Restoration **See the GSMM Volume 2, Section 4.23 for more information.*

☐ Check the box if a portion of the post-developed area employs soil restoration and is protected by a conservation easement or equivalent form of protection.

Area (ac) of development with restored soils and protected by a conservation easement or equivalent form of protection.

Note: The green cell will unlock if the Scenario 3 box above is checked

Scenario 4: Site Reforestation/Revegetation & Soil Restoration **See the GSMM Volume 2, Section 4.22 and 4.23 for more information.*

☐ Check the box if the same portion of the post-developed area employs site reforestation/revegetation and soil restoration, and is protected by a conservation easement or equivalent form of protection.

Area (ac) with restored soils in a reforested & revegetated area and protected by a conservation easement or equivalent form of protection.

Note: The green cell will unlock if the Scenario 4 box above is checked

Total Conservation Area Credit (acres) **0.00**

Georgia Stormwater Management Manual
Stormwater Quality Site Development Review Tool, v2.2

Development Name: 20 WEST TRANSPORT PARTNERS LLC
Drainage Basin Name: PROPOSED BASIN 1

data input cells
calculation cells
constant values

Water Quality Goals

Target Runoff Reduction Storm (in)	1.00
Total Site Area for Water Quality Volume (acres)	4.85
Target Runoff Reduction Volume (cf)	880
Target Water Quality Volume (cf)	1,056

Select BMPs for Runoff Reduction and Water Quality

		Area Draining to Each BMP			Storage Volume Provided by BMP (cf)	RR Conveyance Volume Provided by BMP (cf)	Down-stream BMP	Runoff Reduction Calculations						WQ Calculations	
		On-site Pervious Area (acres)	On-site Impervious Area (acres)	Offsite Area (acres)				RR Volume from Direct Drainage (cf)	RR Volume from Upstream Practices (cf)	Total RR Volume Received by BMP (cf)	Runoff Reduction %	RR Achieved (cf)	Remaining RR Volume (cf)	WQ$_v$ from Direct Drainage (cf)	Effective TSS Removal %
BMP 1	Grass Channel (A & B hydrologic soils)	1.82				330		330	0	330	25%	83	248	396	50%
BMP 2	Select a BMP…							0	0	0	N/A	0	0	0	N/A
BMP 3	Select a BMP…							0	0	0	N/A	0	0	0	N/A
BMP 4	Select a BMP…							0	0	0	N/A	0	0	0	N/A
BMP 5	Select a BMP…							0	0	0	N/A	0	0	0	N/A
BMP 6	Select a BMP…							0	0	0	N/A	0	0	0	N/A
BMP 7	Select a BMP…							0	0	0	N/A	0	0	0	N/A
BMP 8	Select a BMP…							0	0	0	N/A	0	0	0	N/A
BMP 9	Select a BMP…							0	0	0	N/A	0	0	0	N/A
BMP 10	Select a BMP…							0	0	0	N/A	0	0	0	N/A
	TOTAL	1.82	0.00	0.00				330				83		396	
	UNTREATED AREA (acres)	3.03	0.00												

Target Runoff Reduction Volume (cf)	880
Target Achieved?	No
Remaining Runoff Reduction Volume (cf)	798

Target Water Quality Volume (cf)	1,056
% TSS Removal Achieved	19%
Target Achieved?	No
Remaining TSS Removal %	61%

Georgia Stormwater Management Manual
Stormwater Quality Site Development Review Tool, v2.2

Development Name: 20 WEST TRANSPORT PARTNERS LLC
Drainage Basin Name: PROPOSED BASIN 1

data input cells
calculation cells
constant values

Channel and Flood Protection Calculations

	1-yr, 24-hr storm	2-yr, 24-hr storm	25-yr, 24-hr storm	100-yr, 24-hr storm
Target Rainfall Event (in)				

	1-yr, 24-hr storm	2-yr, 24-hr storm	25-yr, 24-hr storm	100-yr, 24-hr storm
Pre-Development Runoff Volume (in)	0.00	0.00	0.00	0.00
Post Development Runoff Volume (in) with no BMPs	0.00	0.00	0.00	0.00
Post-Development Runoff Volume (in) with BMPs	0.00	0.00	0.00	0.00
Adjusted CN	**0**	**0**	**0**	**0**

*See Stormwater Management Standards to Determine Detention Requirements.

Comments

Georgia Stormwater Management Manual
Stormwater Quality Site Development Review Tool, v2.2

Development Name: 20 WEST TRANSPORT PARTNERS LLC
Drainage Basin Name: PROPOSED BASIN 2

data input cells
calculation cells
constant values

Site Data

Indicate Pre-Development Land Cover and Runoff Curve Numbers in the Site's Disturbed Area

Cover Type	HSG* A (acres)	CN	HSG B (acres)	CN	HSG C (acres)	CN	HSG D (acres)	CN	Total	% Cover
Woods - Good Condition		30	6.25	55		70		77	6.25	100%
Select a land cover type…		0		0		0		0	0.00	0%
Select a land cover type…		0		0		0		0	0.00	0%
Select a land cover type…		0		0		0		0	0.00	0%
Select a land cover type…		0		0		0		0	0.00	0%
Local Jurisdiction Input									0.00	0%
Other									0.00	0%
Total	0.00		6.25		0.00		0.00		6.25	100%

*HSG = hydrologic soil group

Impervious (ac)	0.00
Weighted CN	55
Potential Max Soil Retention, S_{pre} (in)	8.18

Indicate Post-Development Land Cover and Runoff Curve Numbers in the Site's Disturbed Area

Cover Type	HSG A (acres)	CN	HSG B (acres)	CN	HSG C (acres)	CN	HSG D (acres)	CN	Total	% Cover
Impervious		98	0.13	98		98		98	0.13	2%
Open space - Good condition (grass cover > 75%)		39	1.24	61		74		80	1.24	20%
Select a land cover type…		0		0		0		0	0.00	0%
Select a land cover type…		0		0		0		0	0.00	0%
Select a land cover type…		0		0		0		0	0.00	0%
Local Jurisdiction Input									0.00	0%
GRAVEL			4.88	85					4.88	78%
Total	0.00		6.25		0.00		0.00		6.25	100%

Impervious (ac)	0.13
Rv	0.07
Weighted CN	81
Potential Max Soil Retention, S_{post} (in)	2.42

Conservation Area Credits

Scenario 1: Natural Conservation Area **See the GSMM Volume 2, Section 2.3.3.3 for more information.*

☐ Check the box if a portion of the post-developed area is protected by a conservation easement or equivalent form of protection.

Area (ac) of development protected by a conservation easement or equivalent form of protection.

Note: The green cell will unlock if the Scenario 1 box above is checked

Scenario 2: Site Reforestation/Revegetation **See the GSMM Volume 2, Section 4.22 for more information.*

☐ Check the box if a portion of the post-developed area employs site reforestation/revegetation and is protected by a conservation easement or equivalent form of protection.

Area (ac) of development reforested/revegetated and protected by a conservation easement or equivalent form of protection.

Note: The green cell will unlock if the Scenario 2 box above is checked

Scenario 3: Soil Restoration **See the GSMM Volume 2, Section 4.23 for more information.*

☐ Check the box if a portion of the post-developed area employs soil restoration and is protected by a conservation easement or equivalent form of protection.

Area (ac) of development with restored soils and protected by a conservation easement or equivalent form of protection.

Note: The green cell will unlock if the Scenario 3 box above is checked

Scenario 4: Site Reforestation/Revegetation & Soil Restoration **See the GSMM Volume 2, Section 4.22 and 4.23 for more information.*

☐ Check the box if the same portion of the post-developed area employs site reforestation/revegetation and soil restoration, and is protected by a conservation easement or equivalent form of protection.

Area (ac) with restored soils in a reforested & revegetated area and protected by a conservation easement or equivalent form of protection.

Note: The green cell will unlock if the Scenario 4 box above is checked

Total Conservation Area Credit (acres) **0.00**

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Stormwater Quality Site Development Review Tool, v2.2

Development Name: 20 WEST TRANSPORT PARTNERS LLC
Drainage Basin Name: PROPOSED BASIN 2

data input cells
calculation cells
constant values

Water Quality Goals

Target Runoff Reduction Storm (in): 1.00

Total Site Area for Water Quality Volume (acres)	6.25
Target Runoff Reduction Volume (cf)	1,559
Target Water Quality Volume (cf)	1,871

Select BMPs for Runoff Reduction and Water Quality

		Area Draining to Each BMP			Storage Volume Provided by BMP (cf)	RR Conveyance Volume Provided by BMP (cf)	Down-stream BMP	Runoff Reduction Calculations						WQ Calculations	
		On-site Pervious Area (acres)	On-site Impervious Area (acres)	Offsite Area (acres)				RR Volume from Direct Drainage (cf)	RR Volume from Upstream Practices (cf)	Total RR Volume Received by BMP (cf)	Runoff Reduction %	RR Achieved (cf)	Remaining RR Volume (cf)	WQ_v from Direct Drainage (cf)	Effective TSS Removal %
BMP 1	Grass Channel (A & B hydrologic soils)	6.12	0.13			1,559	BMP 2	1,559	0	1,559	25%	390	1,169	1,871	50%
BMP 2	Stormwater Pond							0	1,169	1,169	0%	0	1,169	0	80%
BMP 3	Select a BMP…							0	0	0	N/A	0	0	0	N/A
BMP 4	Select a BMP…							0	0	0	N/A	0	0	0	N/A
BMP 5	Select a BMP…							0	0	0	N/A	0	0	0	N/A
BMP 6	Select a BMP…							0	0	0	N/A	0	0	0	N/A
BMP 7	Select a BMP…							0	0	0	N/A	0	0	0	N/A
BMP 8	Select a BMP…							0	0	0	N/A	0	0	0	N/A
BMP 9	Select a BMP…							0	0	0	N/A	0	0	0	N/A
BMP 10	Select a BMP…							0	0	0	N/A	0	0	0	N/A
	TOTAL	6.12	0.13	0.00				1,559				390		1,871	
	UNTREATED AREA (acres)	0.00	0.00												

Target Runoff Reduction Volume (cf)	1,559
Target Achieved?	No
Remaining Runoff Reduction Volume (cf)	1,169

Target Water Quality Volume (cf)	1,871
% TSS Removal Achieved	90%
Target Achieved?	Yes!
Remaining TSS Removal %	0%

Georgia Stormwater Management Manual
Stormwater Quality Site Development Review Tool, v2.2

Development Name: 20 WEST TRANSPORT PARTNERS LLC
Drainage Basin Name: PROPOSED BASIN 2

data input cells
calculation cells
constant values

Channel and Flood Protection Calculations

	1-yr, 24-hr storm	2-yr, 24-hr storm	25-yr, 24-hr storm	100-yr, 24-hr storm
Target Rainfall Event (in)				

	1-yr, 24-hr storm	2-yr, 24-hr storm	25-yr, 24-hr storm	100-yr, 24-hr storm
Pre-Development Runoff Volume (in)	0.00	0.00	0.00	0.00
Post Development Runoff Volume (in) with no BMPs	0.00	0.00	0.00	0.00
Post-Development Runoff Volume (in) with BMPs	0.00	0.00	0.00	0.00
Adjusted CN	**0**	**0**	**0**	**0**

*See Stormwater Management Standards to Determine Detention Requirements.

Comments

Georgia Stormwater Management Manual
Stormwater Quality Site Development Review Tool, v2.2

Development Name: 20 WEST TRANSPORT PARTNERS LLC
Drainage Basin Name: PROPOSED BASIN 3

data input cells
calculation cells
constant values

Site Data

Indicate Pre-Development Land Cover and Runoff Curve Numbers in the Site's Disturbed Area

Cover Type	HSG* A (acres)	CN	HSG B (acres)	CN	HSG C (acres)	CN	HSG D (acres)	CN	Total	% Cover
Woods - Good Condition		30	4.91	55		70		77	4.91	100%
Select a land cover type…		0		0		0		0	0.00	0%
Select a land cover type…		0		0		0		0	0.00	0%
Select a land cover type…		0		0		0		0	0.00	0%
Select a land cover type…		0		0		0		0	0.00	0%
Local Jurisdiction Input									0.00	0%
Other									0.00	0%
Total	0.00		4.91		0.00		0.00		4.91	100%

*HSG = hydrologic soil group

Impervious (ac)	0.00
Weighted CN	55
Potential Max Soil Retention, S_{pre} (in)	8.18

Indicate Post-Development Land Cover and Runoff Curve Numbers in the Site's Disturbed Area

Cover Type	HSG A (acres)	CN	HSG B (acres)	CN	HSG C (acres)	CN	HSG D (acres)	CN	Total	% Cover
Impervious		98	0.05	98		98		98	0.05	1%
Open space - Good condition (grass cover > 75%)		39	1.59	61		74		80	1.59	32%
Select a land cover type…		0		0		0		0	0.00	0%
Select a land cover type…		0		0		0		0	0.00	0%
Select a land cover type…		0		0		0		0	0.00	0%
Local Jurisdiction Input									0.00	0%
GRAVEL			3.27	85					3.27	67%
Total	0.00		4.91		0.00		0.00		4.91	100%

Impervious (ac)	0.05
Rv	0.06
Weighted CN	77
Potential Max Soil Retention, S_{post} (in)	2.93

Conservation Area Credits

Scenario 1: Natural Conservation Area **See the GSMM Volume 2, Section 2.3.3.3 for more information.*

☐ Check the box if a portion of the post-developed area is protected by a conservation easement or equivalent form of protection.

Area (ac) of development protected by a conservation easement or equivalent form of protection.

Note: The green cell will unlock if the Scenario 1 box above is checked

Scenario 2: Site Reforestation/Revegetation **See the GSMM Volume 2, Section 4.22 for more information.*

☐ Check the box if a portion of the post-developed area employs site reforestation/revegetation and is protected by a conservation easement or equivalent form of protection.

Area (ac) of development reforested/revegetated and protected by a conservation easement or equivalent form of protection.

Note: The green cell will unlock if the Scenario 2 box above is checked

Scenario 3: Soil Restoration **See the GSMM Volume 2, Section 4.23 for more information.*

☐ Check the box if a portion of the post-developed area employs soil restoration and is protected by a conservation easement or equivalent form of protection.

Area (ac) of development with restored soils and protected by a conservation easement or equivalent form of protection.

Note: The green cell will unlock if the Scenario 3 box above is checked

Scenario 4: Site Reforestation/Revegetation & Soil Restoration **See the GSMM Volume 2, Section 4.22 and 4.23 for more information.*

☐ Check the box if the same portion of the post-developed area employs site reforestation/revegetation and soil restoration, and is protected by a conservation easement or equivalent form of protection.

Area (ac) with restored soils in a reforested & revegetated area and protected by a conservation easement or equivalent form of protection.

Note: The green cell will unlock if the Scenario 4 box above is checked

Total Conservation Area Credit (acres) 0.00

Georgia Stormwater Management Manual
Stormwater Quality Site Development Review Tool, v2.2

Development Name: 20 WEST TRANSPORT PARTNERS LLC
Drainage Basin Name: PROPOSED BASIN 3

data input cells
calculation cells
constant values

Water Quality Goals

Target Runoff Reduction Storm (in)	1.00
Total Site Area for Water Quality Volume (acres)	4.91
Target Runoff Reduction Volume (cf)	1,055
Target Water Quality Volume (cf)	1,265

Select BMPs for Runoff Reduction and Water Quality

		Area Draining to Each BMP			Storage Volume Provided by BMP (cf)	RR Conveyance Volume Provided by BMP (cf)	Down-stream BMP	Runoff Reduction Calculations						WQ Calculations	
		On-site Pervious Area (acres)	On-site Impervious Area (acres)	Offsite Area (acres)				RR Volume from Direct Drainage (cf)	RR Volume from Upstream Practices (cf)	Total RR Volume Received by BMP (cf)	Runoff Reduction %	RR Achieved (cf)	Remaining RR Volume (cf)	WQ$_v$ from Direct Drainage (cf)	Effective TSS Removal %
BMP 1	Grass Channel (A & B hydrologic soils)	4.86	0.05			1,055	BMP 2	1,055	0	1,055	25%	264	791	1,265	50%
BMP 2	Stormwater Pond							0	791	791	0%	0	791	0	80%
BMP 3	Select a BMP…							0	0	0	N/A	0	0	0	N/A
BMP 4	Select a BMP…							0	0	0	N/A	0	0	0	N/A
BMP 5	Select a BMP…							0	0	0	N/A	0	0	0	N/A
BMP 6	Select a BMP…							0	0	0	N/A	0	0	0	N/A
BMP 7	Select a BMP…							0	0	0	N/A	0	0	0	N/A
BMP 8	Select a BMP…							0	0	0	N/A	0	0	0	N/A
BMP 9	Select a BMP…							0	0	0	N/A	0	0	0	N/A
BMP 10	Select a BMP…							0	0	0	N/A	0	0	0	N/A
	TOTAL	4.86	0.05	0.00				1,055				264		1,265	
	UNTREATED AREA (acres)	0.00	0.00												

Target Runoff Reduction Volume (cf)	1,055
Target Achieved?	No
Remaining Runoff Reduction Volume (cf)	791

Target Water Quality Volume (cf)	1,265
% TSS Removal Achieved	90%
Target Achieved?	Yes!
Remaining TSS Removal %	0%

Georgia Stormwater Management Manual
Stormwater Quality Site Development Review Tool, v2.2

Development Name: 20 WEST TRANSPORT PARTNERS LLC
Drainage Basin Name: PROPOSED BASIN 3

data input cells
calculation cells
constant values

Channel and Flood Protection Calculations

	1-yr, 24-hr storm	2-yr, 24-hr storm	25-yr, 24-hr storm	100-yr, 24-hr storm
Target Rainfall Event (in)				

	1-yr, 24-hr storm	2-yr, 24-hr storm	25-yr, 24-hr storm	100-yr, 24-hr storm
Pre-Development Runoff Volume (in)	0.00	0.00	0.00	0.00
Post Development Runoff Volume (in) with no BMPs	0.00	0.00	0.00	0.00
Post-Development Runoff Volume (in) with BMPs	0.00	0.00	0.00	0.00
Adjusted CN	**0**	**0**	**0**	**0**

*See Stormwater Management Standards to Determine Detention Requirements.

Comments

Georgia Stormwater Management Manual
Stormwater Quality Site Development Review Tool, v2.2

Development Name: 20 WEST TRANSPORT PARTNERS LLC
Drainage Basin Name: PROPOSED BASIN 4

data input cells
calculation cells
constant values

Site Data

Indicate Pre-Development Land Cover and Runoff Curve Numbers in the Site's Disturbed Area

Cover Type	HSG* A (acres)	CN	HSG B (acres)	CN	HSG C (acres)	CN	HSG D (acres)	CN	Total	% Cover
Woods - Good Condition		30	5.77	55		70		77	5.77	100%
Select a land cover type…		0		0		0		0	0.00	0%
Select a land cover type…		0		0		0		0	0.00	0%
Select a land cover type…		0		0		0		0	0.00	0%
Select a land cover type…		0		0		0		0	0.00	0%
Local Jurisdiction Input									0.00	0%
Other									0.00	0%
Total	0.00		5.77		0.00		0.00		5.77	100%

*HSG = hydrologic soil group

Impervious (ac)	0.00
Weighted CN	55
Potential Max Soil Retention, S_{pre} (in)	8.18

Indicate Post-Development Land Cover and Runoff Curve Numbers in the Site's Disturbed Area

Cover Type	HSG A (acres)	CN	HSG B (acres)	CN	HSG C (acres)	CN	HSG D (acres)	CN	Total	% Cover
Impervious		98		98		98		98	0.00	0%
Open space - Good condition (grass cover > 75%)		39	3.23	61		74		80	3.23	56%
Select a land cover type…		0		0		0		0	0.00	0%
Select a land cover type…		0		0		0		0	0.00	0%
Select a land cover type…		0		0		0		0	0.00	0%
Local Jurisdiction Input									0.00	0%
GRAVEL			2.54	85					2.54	44%
Total	0.00		5.77		0.00		0.00		5.77	100%

Impervious (ac)	0.00
Rv	0.05
Weighted CN	72
Potential Max Soil Retention, S_{post} (in)	3.97

Conservation Area Credits

Scenario 1: Natural Conservation Area **See the GSMM Volume 2, Section 2.3.3.3 for more information.*

☐ Check the box if a portion of the post-developed area is protected by a conservation easement or equivalent form of protection.

Area (ac) of development protected by a conservation easement or equivalent form of protection.

Note: The green cell will unlock if the Scenario 1 box above is checked

Scenario 2: Site Reforestation/Revegetation **See the GSMM Volume 2, Section 4.22 for more information.*

☐ Check the box if a portion of the post-developed area employs site reforestation/revegetation and is protected by a conservation easement or equivalent form of protection.

Area (ac) of development reforested/revegetated and protected by a conservation easement or equivalent form of protection.

Note: The green cell will unlock if the Scenario 2 box above is checked

Scenario 3: Soil Restoration **See the GSMM Volume 2, Section 4.23 for more information.*

☐ Check the box if a portion of the post-developed area employs soil restoration and is protected by a conservation easement or equivalent form of protection.

Area (ac) of development with restored soils and protected by a conservation easement or equivalent form of protection.

Note: The green cell will unlock if the Scenario 3 box above is checked

Scenario 4: Site Reforestation/Revegetation & Soil Restoration **See the GSMM Volume 2, Section 4.22 and 4.23 for more information.*

☐ Check the box if the same portion of the post-developed area employs site reforestation/revegetation and soil restoration, and is protected by a conservation easement or equivalent form of protection.

Area (ac) with restored soils in a reforested & revegetated area and protected by a conservation easement or equivalent form of protection.

Note: The green cell will unlock if the Scenario 4 box above is checked

Total Conservation Area Credit (acres) **0.00**

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Stormwater Quality Site Development Review Tool, v2.2

Development Name: 20 WEST TRANSPORT PARTNERS LLC
Drainage Basin Name: PROPOSED BASIN 4

data input cells
calculation cells
constant values

Water Quality Goals

Target Runoff Reduction Storm (in): 1.00

Total Site Area for Water Quality Volume (acres): 5.77
Target Runoff Reduction Volume (cf): 1,047
Target Water Quality Volume (cf): 1,257

Select BMPs for Runoff Reduction and Water Quality

		Area Draining to Each BMP			Storage Volume Provided by BMP (cf)	RR Conveyance Volume Provided by BMP (cf)	Down-stream BMP	Runoff Reduction Calculations						WQ Calculations	
		On-site Pervious Area (acres)	On-site Impervious Area (acres)	Offsite Area (acres)				RR Volume from Direct Drainage (cf)	RR Volume from Upstream Practices (cf)	Total RR Volume Received by BMP (cf)	Runoff Reduction %	RR Achieved (cf)	Remaining RR Volume (cf)	WQ$_v$ from Direct Drainage (cf)	Effective TSS Removal %
BMP 1	Grass Channel (A & B hydrologic soils)	5.77				1,047	BMP 2	1,047	0	1,047	25%	262	785	1,257	50%
BMP 2	Stormwater Pond							0	785	785	0%	0	785	0	80%
BMP 3	Select a BMP…							0	0	0	N/A	0	0	0	N/A
BMP 4	Select a BMP…							0	0	0	N/A	0	0	0	N/A
BMP 5	Select a BMP…							0	0	0	N/A	0	0	0	N/A
BMP 6	Select a BMP…							0	0	0	N/A	0	0	0	N/A
BMP 7	Select a BMP…							0	0	0	N/A	0	0	0	N/A
BMP 8	Select a BMP…							0	0	0	N/A	0	0	0	N/A
BMP 9	Select a BMP…							0	0	0	N/A	0	0	0	N/A
BMP 10	Select a BMP…							0	0	0	N/A	0	0	0	N/A
	TOTAL	5.77	0.00	0.00				1,047				262		1,257	
	UNTREATED AREA (acres)	0.00	0.00												

Target Runoff Reduction Volume (cf)	1,047
Target Achieved?	No
Remaining Runoff Reduction Volume (cf)	785

Target Water Quality Volume (cf)	1,257
% TSS Removal Achieved	90%
Target Achieved?	Yes!
Remaining TSS Removal %	0%

Georgia Stormwater Management Manual
Stormwater Quality Site Development Review Tool, v2.2

Development Name: 20 WEST TRANSPORT PARTNERS LLC
Drainage Basin Name: PROPOSED BASIN 4

data input cells
calculation cells
constant values

Channel and Flood Protection Calculations

	1-yr, 24-hr storm	2-yr, 24-hr storm	25-yr, 24-hr storm	100-yr, 24-hr storm
Target Rainfall Event (in)				

	1-yr, 24-hr storm	2-yr, 24-hr storm	25-yr, 24-hr storm	100-yr, 24-hr storm
Pre-Development Runoff Volume (in)	0.00	0.00	0.00	0.00
Post Development Runoff Volume (in) with no BMPs	0.00	0.00	0.00	0.00
Post-Development Runoff Volume (in) with BMPs	0.00	0.00	0.00	0.00
Adjusted CN	**0**	**0**	**0**	**0**

*See Stormwater Management Standards to Determine Detention Requirements.

Comments

Georgia Stormwater Management Manual
Stormwater Quality Site Development Review Tool, v2.2

Development Name: 20 WEST TRANSPORT PARTNERS LLC
Drainage Basin Name: PROPOSED BASIN 5

data input cells
calculation cells
constant values

Site Data

Indicate Pre-Development Land Cover and Runoff Curve Numbers in the Site's Disturbed Area

Cover Type	HSG* A (acres)	CN	HSG B (acres)	CN	HSG C (acres)	CN	HSG D (acres)	CN	Total	% Cover
Woods - Good Condition		30	7.14	55		70		77	7.14	100%
Select a land cover type…		0		0		0		0	0.00	0%
Select a land cover type…		0		0		0		0	0.00	0%
Select a land cover type…		0		0		0		0	0.00	0%
Select a land cover type…		0		0		0		0	0.00	0%
Local Jurisdiction Input									0.00	0%
Other									0.00	0%
Total	0.00		7.14		0.00		0.00		7.14	100%

*HSG = hydrologic soil group

Impervious (ac)	0.00
Weighted CN	55
Potential Max Soil Retention, S_{pre} (in)	8.18

Indicate Post-Development Land Cover and Runoff Curve Numbers in the Site's Disturbed Area

Cover Type	HSG A (acres)	CN	HSG B (acres)	CN	HSG C (acres)	CN	HSG D (acres)	CN	Total	% Cover
Impervious		98	0.15	98		98		98	0.15	2%
Open space - Good condition (grass cover > 75%)		39	2.99	61		74		80	2.99	42%
Select a land cover type…		0		0		0		0	0.00	0%
Select a land cover type…		0		0		0		0	0.00	0%
Select a land cover type…		0		0		0		0	0.00	0%
Local Jurisdiction Input									0.00	0%
GRAVEL			4.00	85					4.00	56%
Total	0.00		7.14		0.00		0.00		7.14	100%

Impervious (ac)	0.15
Rv	0.07
Weighted CN	75
Potential Max Soil Retention, S_{post} (in)	3.29

Conservation Area Credits

Scenario 1: Natural Conservation Area **See the GSMM Volume 2, Section 2.3.3.3 for more information.*

☐ Check the box if a portion of the post-developed area is protected by a conservation easement or equivalent form of protection.

Area (ac) of development protected by a conservation easement or equivalent form of protection.

Note: The green cell will unlock if the Scenario 1 box above is checked

Scenario 2: Site Reforestation/Revegetation **See the GSMM Volume 2, Section 4.22 for more information.*

☐ Check the box if a portion of the post-developed area employs site reforestation/revegetation and is protected by a conservation easement or equivalent form of protection.

Area (ac) of development reforested/revegetated and protected by a conservation easement or equivalent form of protection.

Note: The green cell will unlock if the Scenario 2 box above is checked

Scenario 3: Soil Restoration **See the GSMM Volume 2, Section 4.23 for more information.*

☐ Check the box if a portion of the post-developed area employs soil restoration and is protected by a conservation easement or equivalent form of protection.

Area (ac) of development with restored soils and protected by a conservation easement or equivalent form of protection.

Note: The green cell will unlock if the Scenario 3 box above is checked

Scenario 4: Site Reforestation/Revegetation & Soil Restoration **See the GSMM Volume 2, Section 4.22 and 4.23 for more information.*

☐ Check the box if the same portion of the post-developed area employs site reforestation/revegetation and soil restoration, and is protected by a conservation easement or equivalent form of protection.

Area (ac) with restored soils in a reforested & revegetated area and protected by a conservation easement or equivalent form of protection.

Note: The green cell will unlock if the Scenario 4 box above is checked

Total Conservation Area Credit (acres) 0.00

Georgia Stormwater Management Manual
Stormwater Quality Site Development Review Tool, v2.2

Development Name: 20 WEST TRANSPORT PARTNERS LLC
Drainage Basin Name: PROPOSED BASIN 5

data input cells
calculation cells
constant values

Water Quality Goals

Target Runoff Reduction Storm (in)	1.00

Total Site Area for Water Quality Volume (acres)	7.14
Target Runoff Reduction Volume (cf)	1,786
Target Water Quality Volume (cf)	2,143

Select BMPs for Runoff Reduction and Water Quality

		Area Draining to Each BMP			Storage Volume Provided by BMP (cf)	RR Conveyance Volume Provided by BMP (cf)	Down-stream BMP	Runoff Reduction Calculations						WQ Calculations	
		On-site Pervious Area (acres)	On-site Impervious Area (acres)	Offsite Area (acres)				RR Volume from Direct Drainage (cf)	RR Volume from Upstream Practices (cf)	Total RR Volume Received by BMP (cf)	Runoff Reduction %	RR Achieved (cf)	Remaining RR Volume (cf)	WQ_v from Direct Drainage (cf)	Effective TSS Removal %
BMP 1	Grass Channel (A & B hydrologic soils)	6.99	0.15			1,786	BMP 2	1,786	0	1,786	25%	446	1,339	2,143	50%
BMP 2	Stormwater Pond							0	1,339	1,339	0%	0	1,339	0	80%
BMP 3	Select a BMP…							0	0	0	N/A	0	0	0	N/A
BMP 4	Select a BMP…							0	0	0	N/A	0	0	0	N/A
BMP 5	Select a BMP…							0	0	0	N/A	0	0	0	N/A
BMP 6	Select a BMP…							0	0	0	N/A	0	0	0	N/A
BMP 7	Select a BMP…							0	0	0	N/A	0	0	0	N/A
BMP 8	Select a BMP…							0	0	0	N/A	0	0	0	N/A
BMP 9	Select a BMP…							0	0	0	N/A	0	0	0	N/A
BMP 10	Select a BMP…							0	0	0	N/A	0	0	0	N/A
	TOTAL	6.99	0.15	0.00				1,786				446		2,143	
	UNTREATED AREA (acres)	0.00	0.00												

Target Runoff Reduction Volume (cf)	1,786
Target Achieved?	No
Remaining Runoff Reduction Volume (cf)	1,339

Target Water Quality Volume (cf)	2,143
% TSS Removal Achieved	90%
Target Achieved?	Yes!
Remaining TSS Removal %	0%

Georgia Stormwater Management Manual
Stormwater Quality Site Development Review Tool, v2.2

Development Name: 20 WEST TRANSPORT PARTNERS LLC
Drainage Basin Name: PROPOSED BASIN 5

data input cells
calculation cells
constant values

Channel and Flood Protection Calculations

	1-yr, 24-hr storm	2-yr, 24-hr storm	25-yr, 24-hr storm	100-yr, 24-hr storm
Target Rainfall Event (in)				

	1-yr, 24-hr storm	2-yr, 24-hr storm	25-yr, 24-hr storm	100-yr, 24-hr storm
Pre-Development Runoff Volume (in)	0.00	0.00	0.00	0.00
Post Development Runoff Volume (in) with no BMPs	0.00	0.00	0.00	0.00
Post-Development Runoff Volume (in) with BMPs	0.00	0.00	0.00	0.00
Adjusted CN	**0**	**0**	**0**	**0**

*See Stormwater Management Standards to Determine Detention Requirements.

Comments

Appendix F – BMP Data

Pond Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023 Monday, 02 / 6 / 2023

Pond No. 1 - PROPOSED POND 2

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 886.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	886.00	46	0	0
2.00	888.00	286	298	298
3.90	889.90	710	916	1,214
4.00	890.00	13,302	569	1,783
6.00	892.00	15,352	28,627	30,410
8.00	894.00	17,501	32,826	63,236

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 24.00	3.00	3.00	0.00
Span (in)	= 24.00	3.00	3.00	0.00
No. Barrels	= 1	1	1	0
Invert El. (ft)	= 889.90	890.00	890.50	0.00
Length (ft)	= 24.00	0.00	0.00	0.00
Slope (%)	= 1.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	Yes	Yes	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 10.56	2.00	0.00	25.00
Crest El. (ft)	= 893.00	891.70	0.00	892.20
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= 1	Rect	---	Ciplti
Multi-Stage	= Yes	Yes	No	No

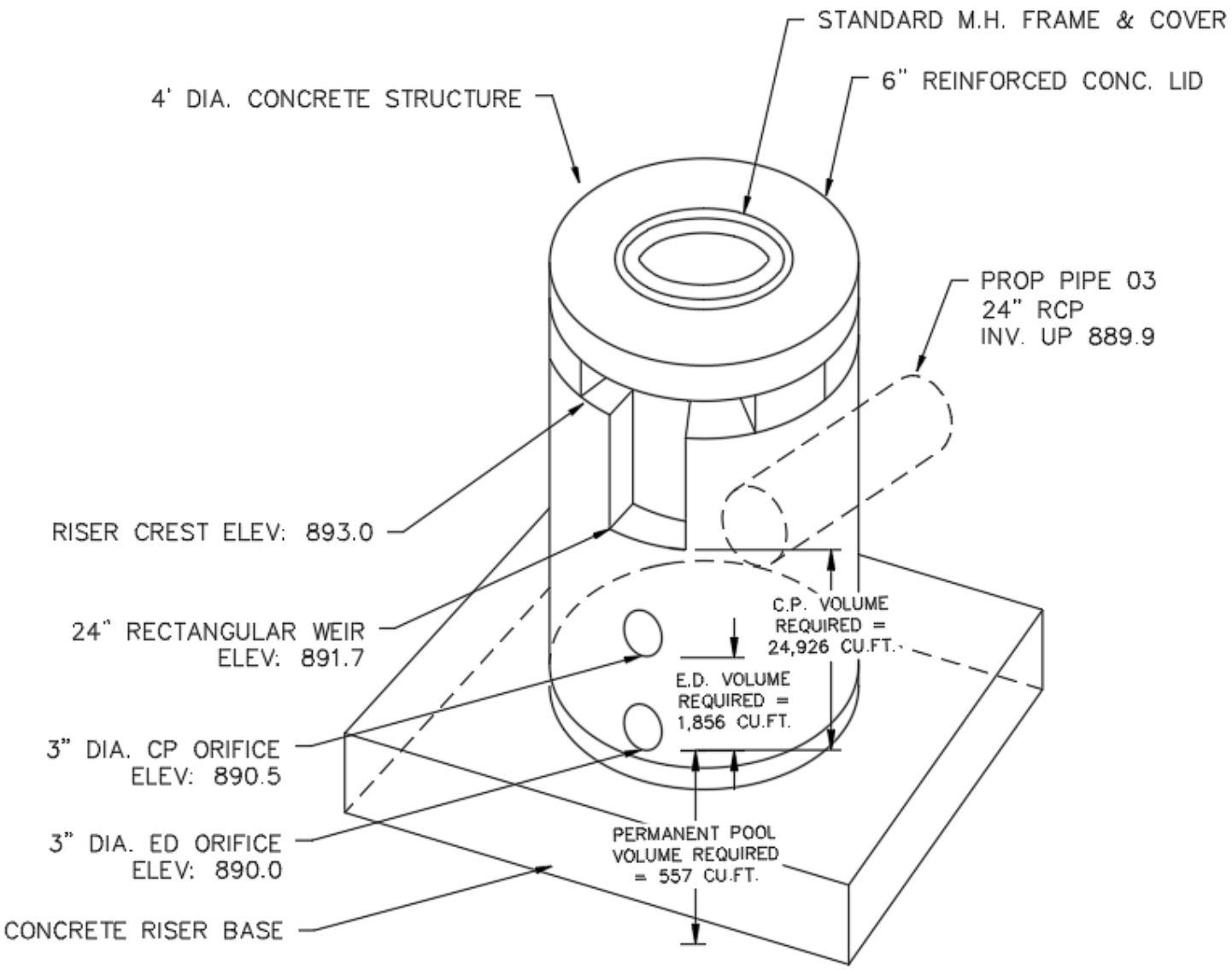
Exfil.(in/hr) = 0.000 (by Contour)

TW Elev. (ft) = 0.00

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

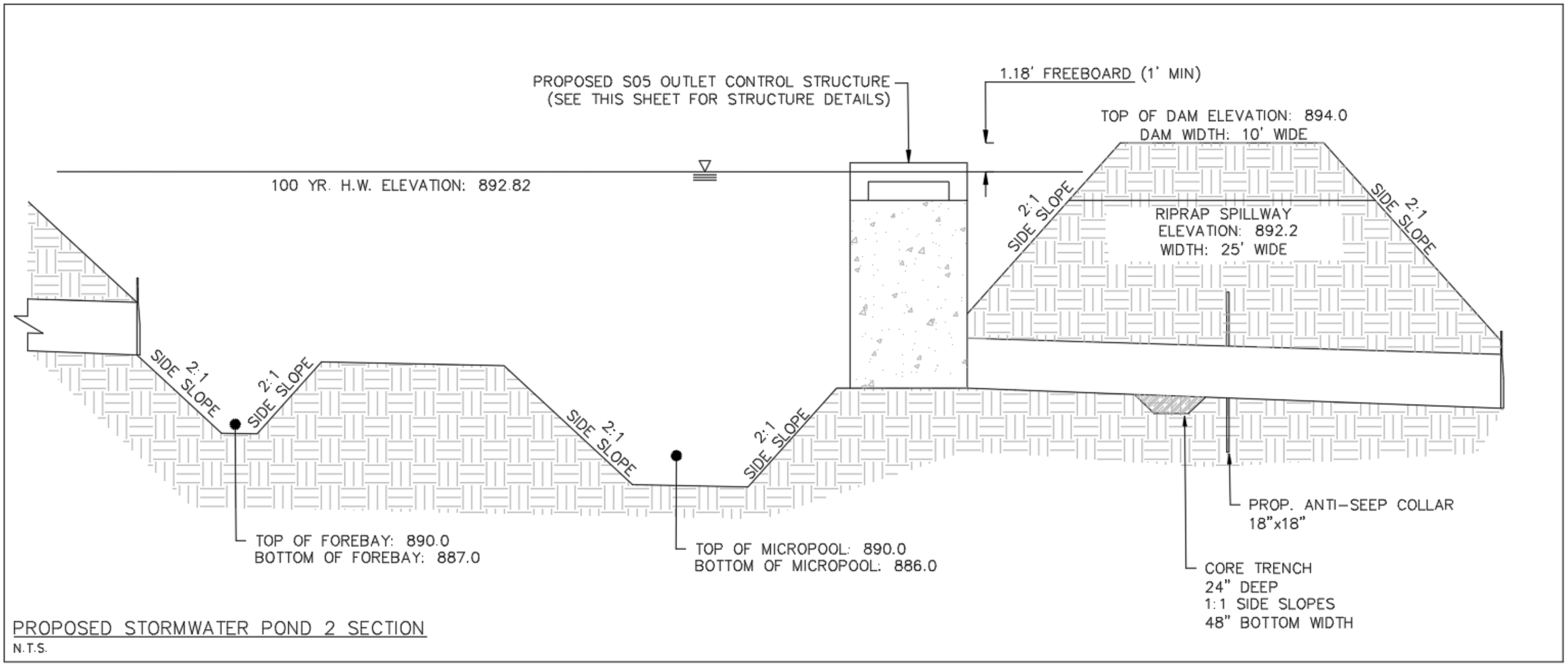
Stage / Storage / Discharge Table

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	886.00	0.00	0.00	0.00	---	0.00	0.00	---	0.00	---	---	0.000
2.00	298	888.00	0.00	0.00	0.00	---	0.00	0.00	---	0.00	---	---	0.000
3.90	1,214	889.90	0.00	0.00	0.00	---	0.00	0.00	---	0.00	---	---	0.000
4.00	1,783	890.00	0.00	0.00	0.00	---	0.00	0.00	---	0.00	---	---	0.000
6.00	30,410	892.00	1.73 ic	0.30 ic	0.28 ic	---	0.00	1.09	---	0.00	---	---	1.667
8.00	63,236	894.00	26.14 ic	0.08 ic	0.08 ic	---	17.53 s	8.46 s	---	201.04	---	---	227.18



PROPOSED STORMWATER POND 2 OUTLET DETAIL

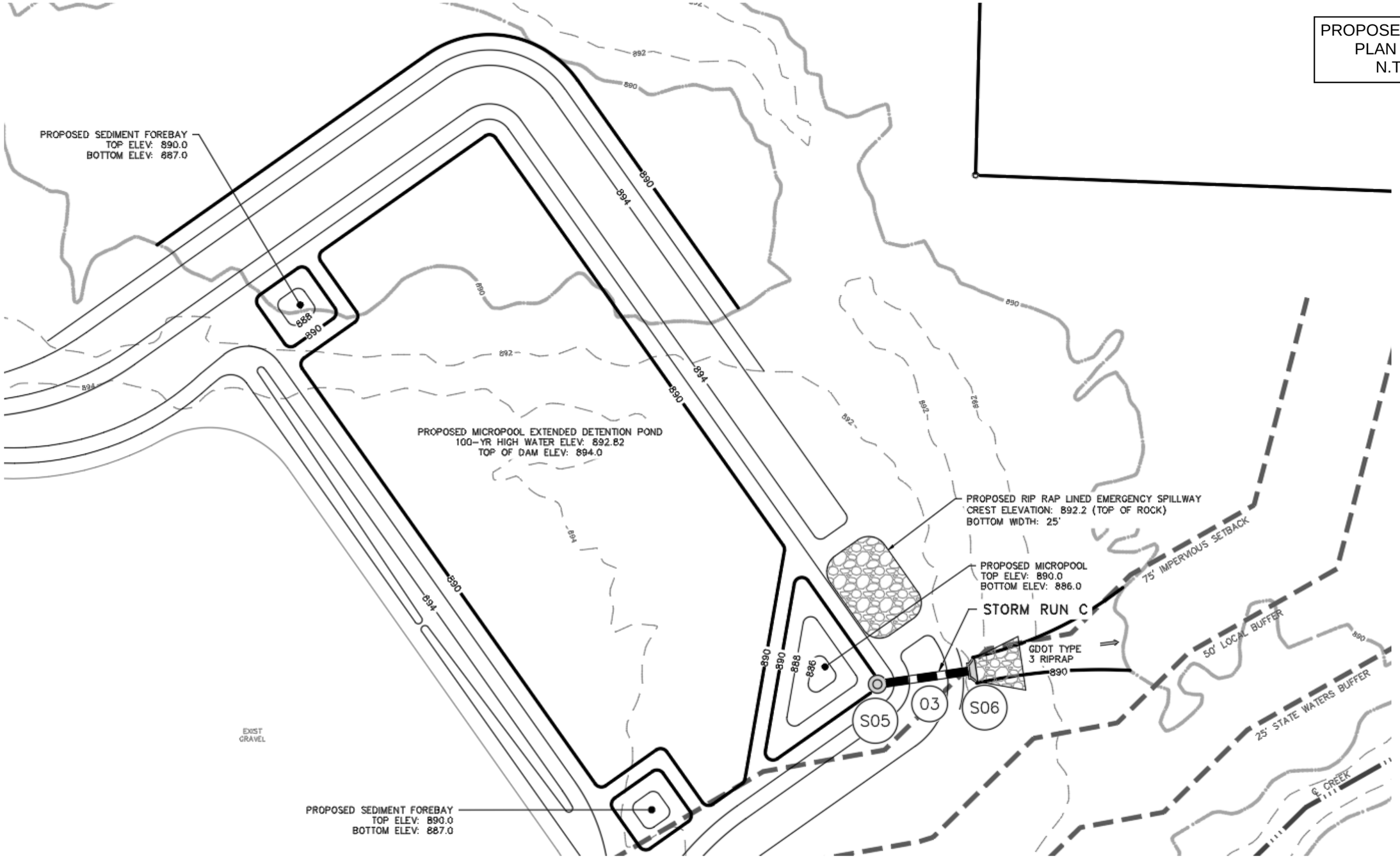
N.T.S.



PROPOSED STORMWATER POND 2 SECTION

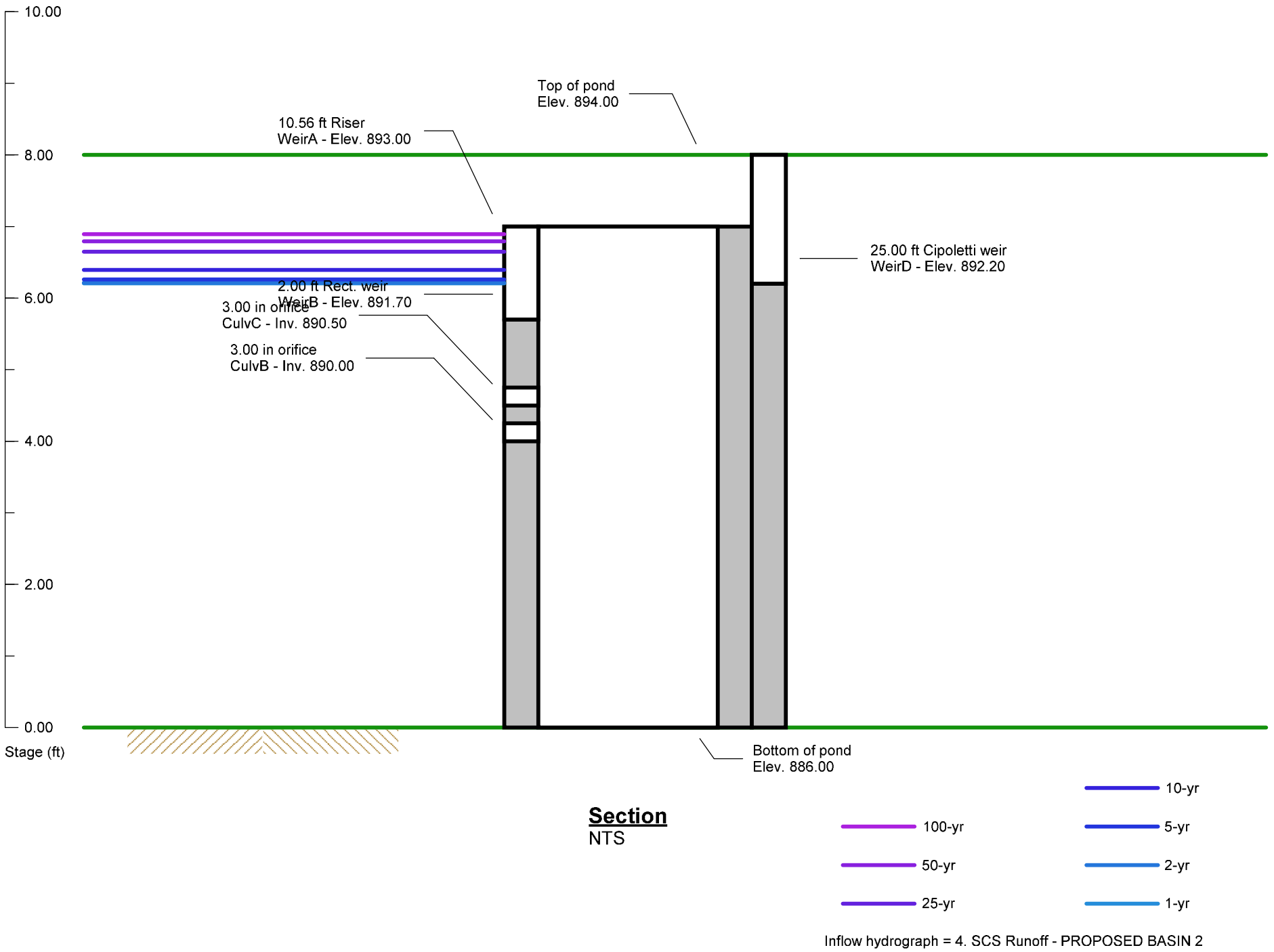
N.T.S.

PROPOSED POND 2
PLAN VIEW
N.T.S.



Pond No. 1 - PROPOSED POND 2

CLOGGED CONDITION



Section
NTS

Inflow hydrograph = 4. SCS Runoff - PROPOSED BASIN 2

Pond Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023 Monday, 02 / 6 / 2023

Pond No. 3 - PROPOSED POND 3

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 887.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	887.00	00	0	0
1.00	888.00	89	30	30
3.00	890.00	371	428	457
3.90	890.90	560	416	873
4.00	891.00	6,095	283	1,157
5.00	892.00	7,955	7,004	8,161
7.00	894.00	9,534	17,463	25,624
9.00	896.00	11,212	20,721	46,345

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 24.00	3.00	3.00	0.00
Span (in)	= 24.00	3.00	3.00	0.00
No. Barrels	= 1	1	1	0
Invert El. (ft)	= 890.90	891.00	891.50	0.00
Length (ft)	= 28.00	0.00	0.00	0.00
Slope (%)	= 0.50	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	Yes	Yes	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 10.56	2.00	0.00	20.00
Crest El. (ft)	= 894.00	892.90	0.00	893.50
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= 1	Rect	---	Ciplti
Multi-Stage	= Yes	Yes	No	No

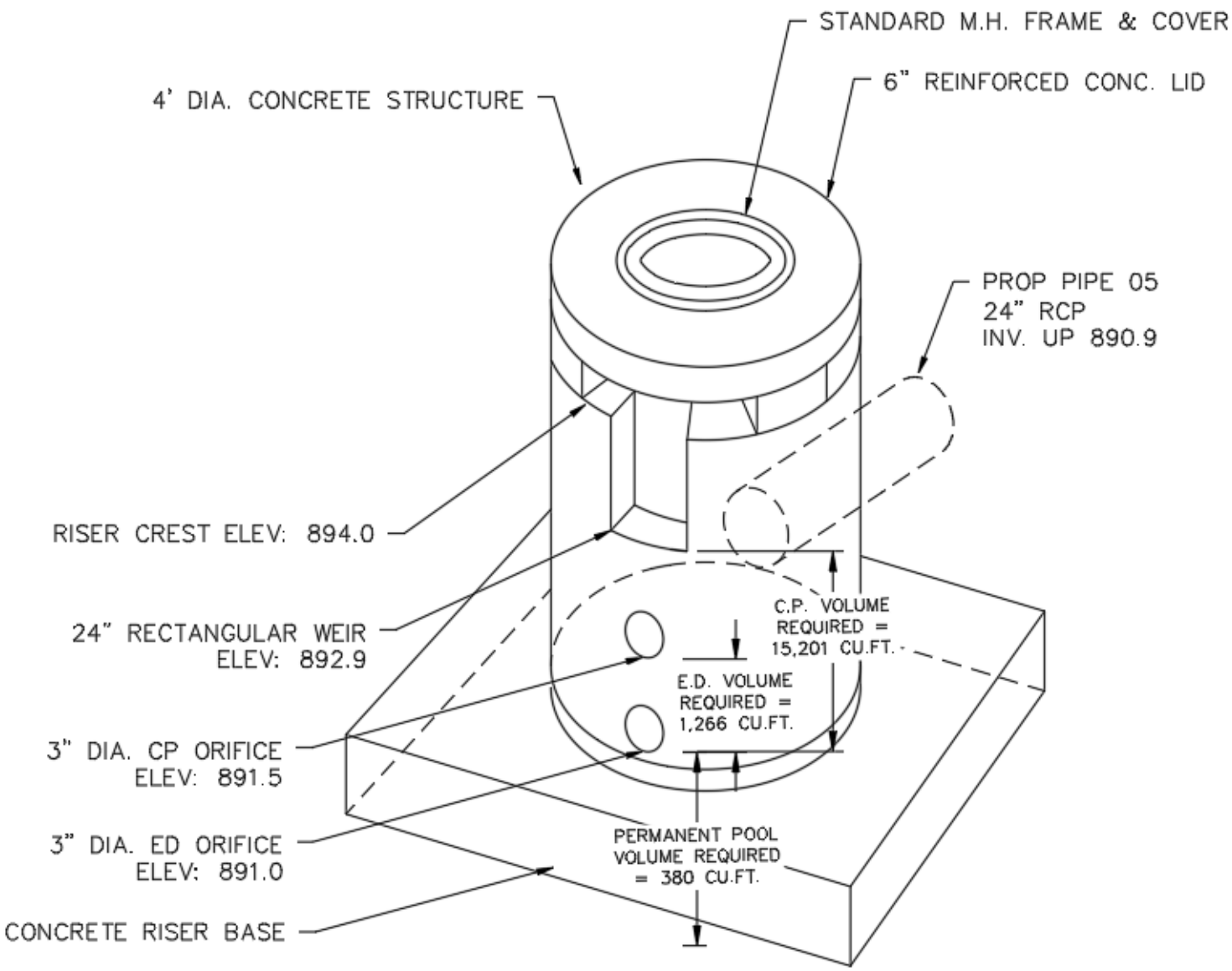
Exfil.(in/hr) = 0.000 (by Contour)

TW Elev. (ft) = 0.00

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

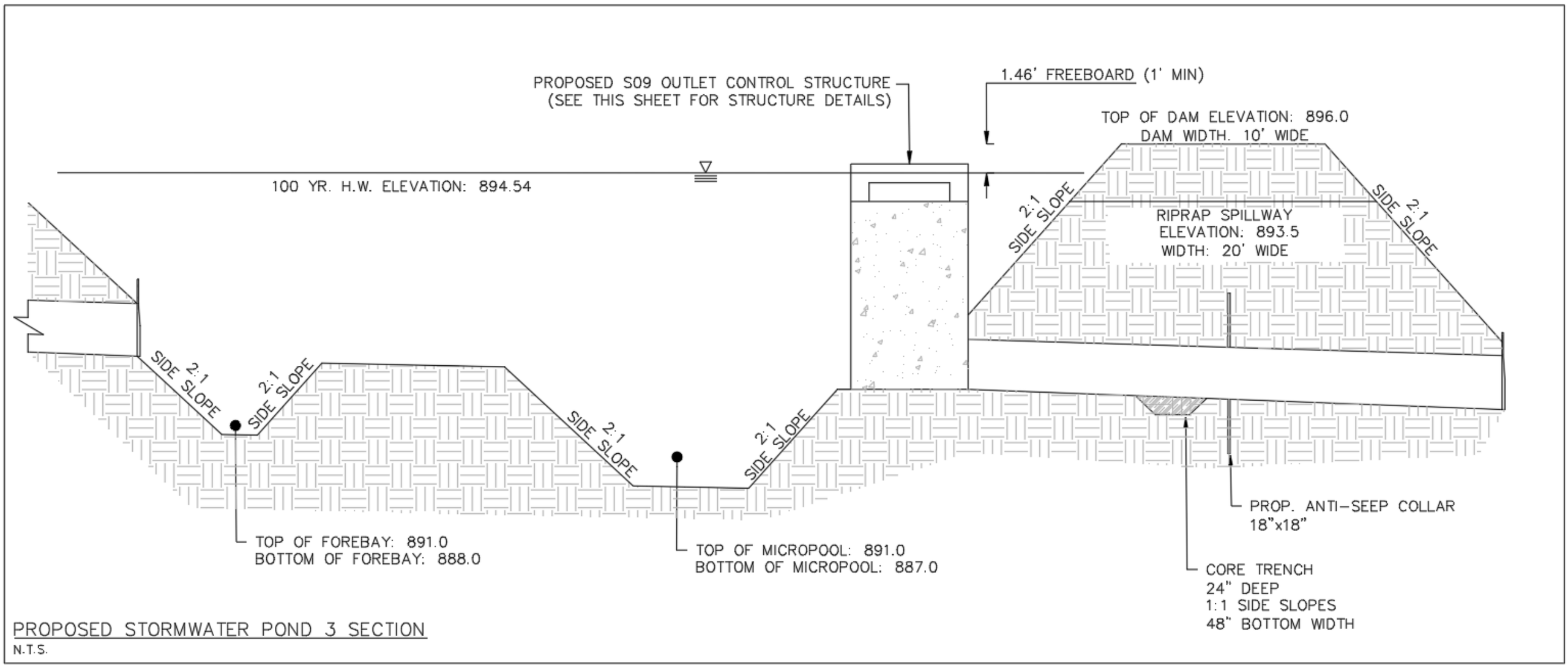
Stage / Storage / Discharge Table

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	887.00	0.00	0.00	0.00	---	0.00	0.00	---	0.00	---	---	0.000
1.00	30	888.00	0.00	0.00	0.00	---	0.00	0.00	---	0.00	---	---	0.000
3.00	457	890.00	0.00	0.00	0.00	---	0.00	0.00	---	0.00	---	---	0.000
3.90	873	890.90	0.00	0.00	0.00	---	0.00	0.00	---	0.00	---	---	0.000
4.00	1,157	891.00	0.00	0.00	0.00	---	0.00	0.00	---	0.00	---	---	0.000
5.00	8,161	892.00	0.38 ic	0.22 ic	0.14 ic	---	0.00	0.00	---	0.00	---	---	0.364
7.00	25,624	894.00	8.14 oc	0.24 ic	0.24 ic	---	0.00	7.65 s	---	23.55	---	---	31.68
9.00	46,345	896.00	30.51 ic	0.04 ic	0.04 ic	---	23.22 s	7.17 s	---	263.26	---	---	293.74



PROPOSED STORMWATER POND 3 OUTLET DETAIL

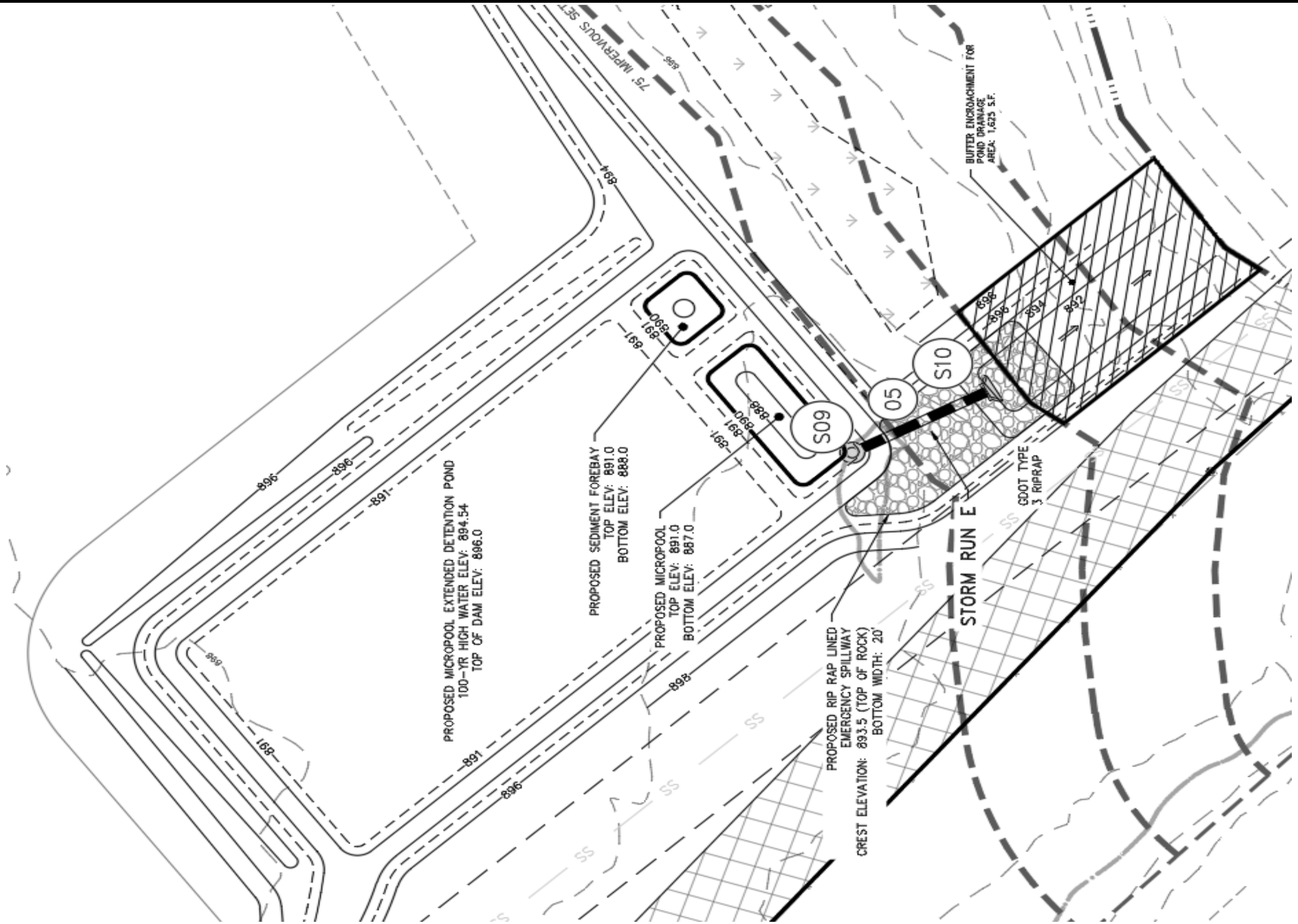
N.T.S.



PROPOSED STORMWATER POND 3 SECTION

N.T.S.

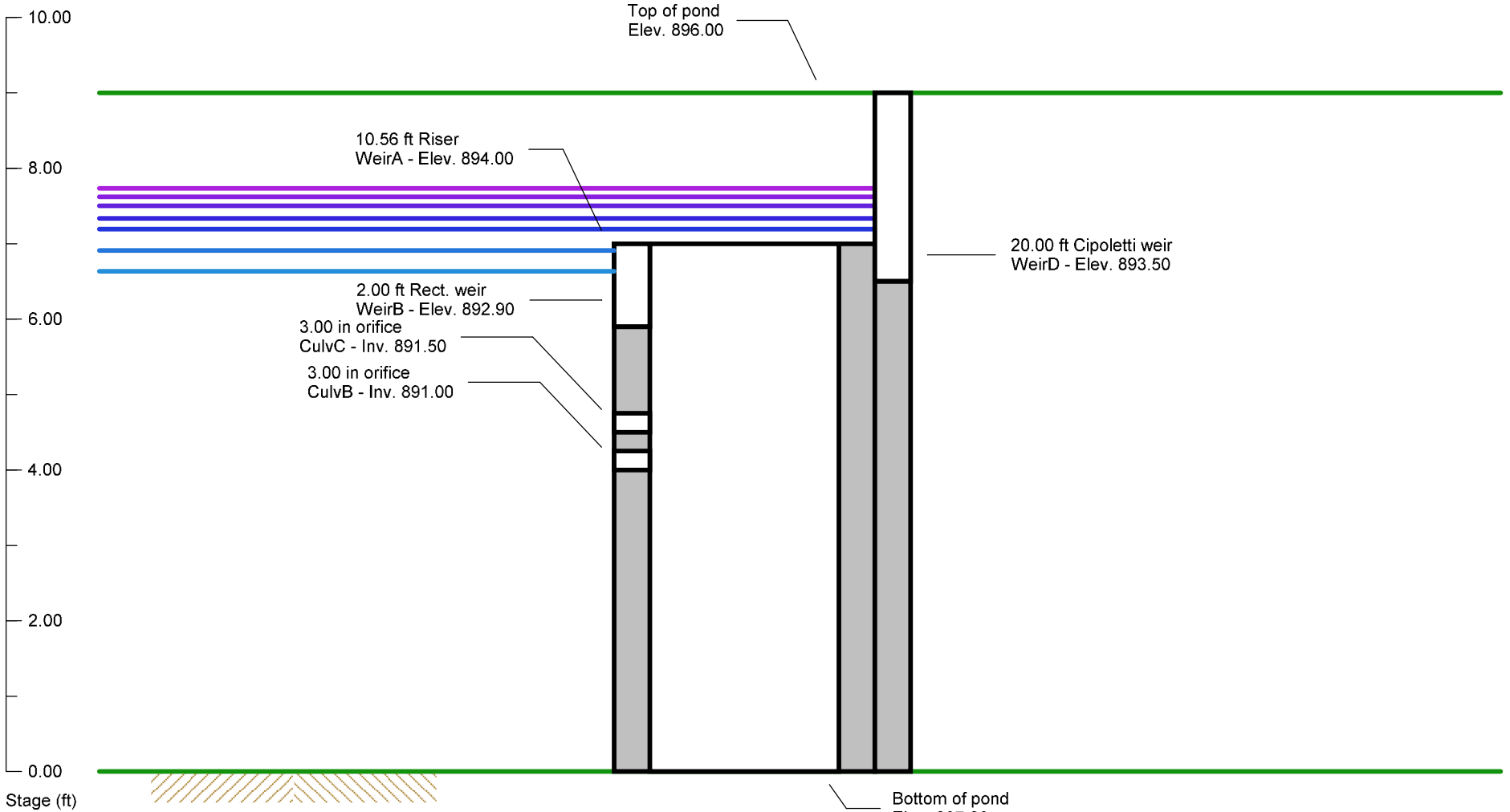
PROPOSED POND 3
PLAN VIEW
N.T.S.



Pond No. 3 - PROPOSED POND 3

CLOGGED CONDITION

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



Section
NTS

10-yr
100-yr
5-yr
50-yr
2-yr
25-yr
1-yr

Inflow hydrograph = 8. SCS Runoff - PROPOSED BASIN 3

Pond Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023 Monday, 02 / 6 / 2023

Pond No. 5 - PROPOSED POND 4

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 891.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	891.00	275	0	0
1.00	892.00	610	431	431
3.00	894.00	825	1,429	1,861
4.00	895.00	12,002	5,324	7,185
5.00	896.00	13,042	12,517	19,702
7.00	898.00	15,198	28,210	47,912
9.00	900.00	17,453	32,622	80,534

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 24.00	3.00	3.00	0.00
Span (in)	= 24.00	3.00	3.00	0.00
No. Barrels	= 1	1	1	0
Invert El. (ft)	= 894.90	895.00	895.50	0.00
Length (ft)	= 28.00	0.00	0.00	0.00
Slope (%)	= 1.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	Yes	Yes	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 10.56	2.00	0.00	25.00
Crest El. (ft)	= 898.00	896.70	0.00	898.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= 1	Rect	---	Ciplti
Multi-Stage	= Yes	Yes	No	No

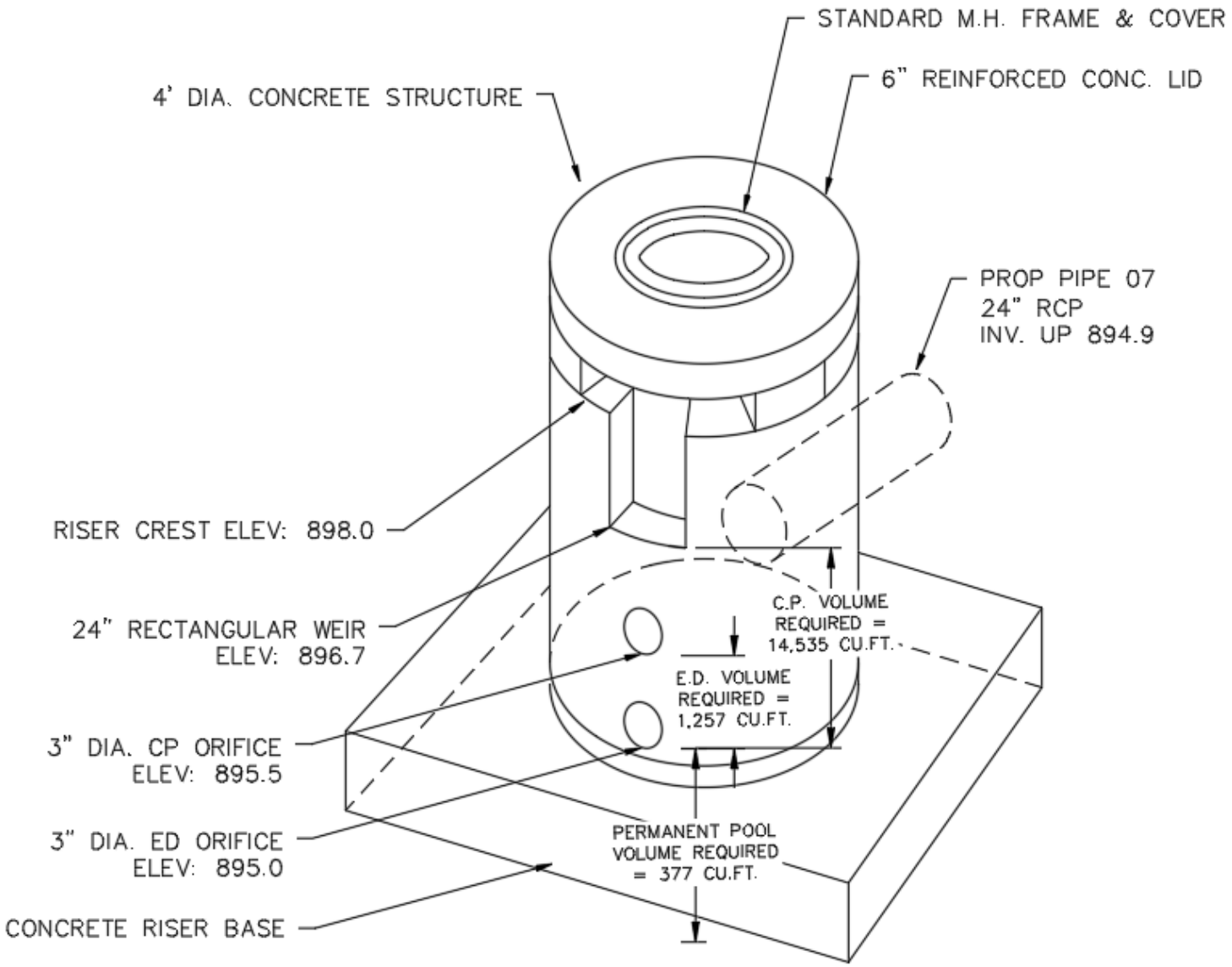
Exfil.(in/hr) = 0.000 (by Wet area)

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).

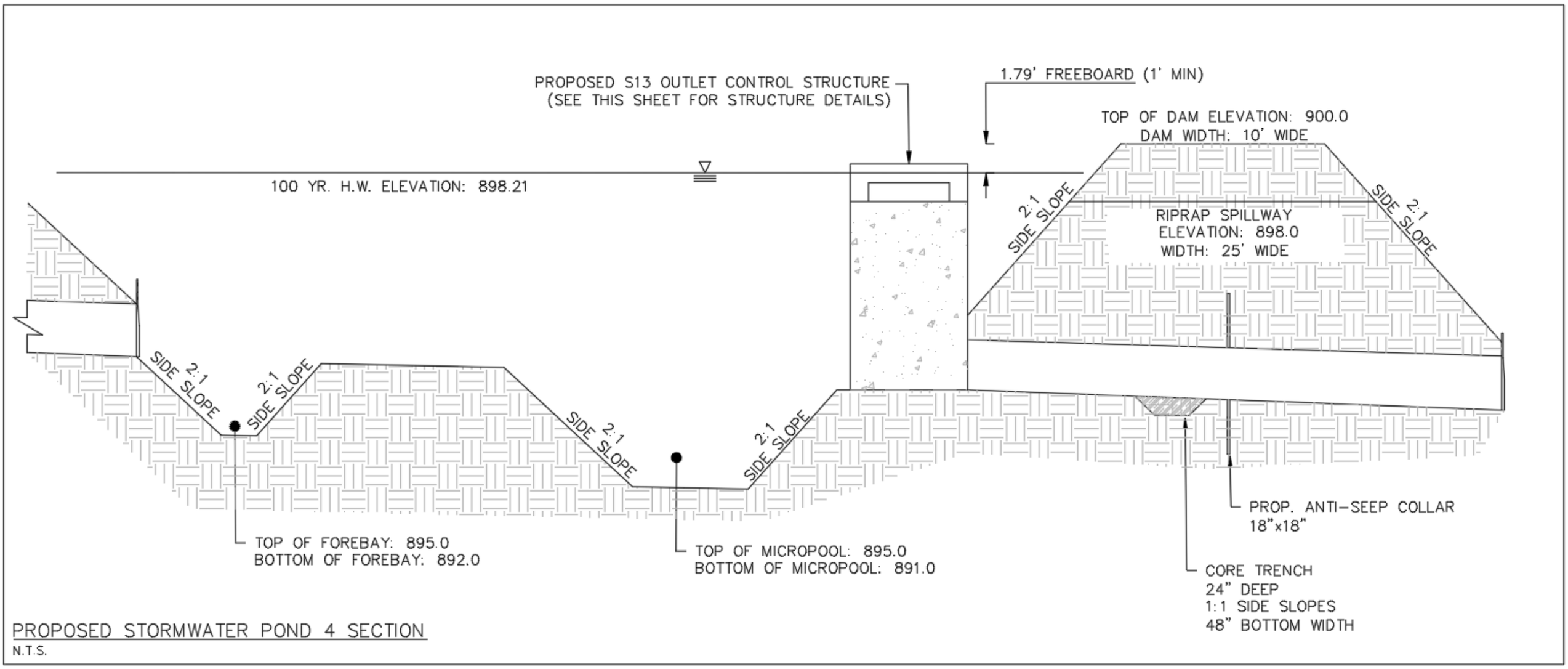
Stage / Storage / Discharge Table

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	891.00	0.00	0.00	0.00	---	0.00	0.00	---	0.00	---	---	0.000
1.00	431	892.00	0.00	0.00	0.00	---	0.00	0.00	---	0.00	---	---	0.000
3.00	1,861	894.00	0.00	0.00	0.00	---	0.00	0.00	---	0.00	---	---	0.000
4.00	7,185	895.00	0.00	0.00	0.00	---	0.00	0.00	---	0.00	---	---	0.000
5.00	19,702	896.00	0.38 ic	0.22 ic	0.14 ic	---	0.00	0.00	---	0.00	---	---	0.364
7.00	47,912	898.00	10.10 oc	0.25 ic	0.25 ic	---	0.00	9.61 s	---	0.00	---	---	10.10
9.00	80,534	900.00	30.52 ic	0.04 ic	0.04 ic	---	22.85 s	7.57 s	---	235.47	---	---	265.96



PROPOSED STORMWATER POND 4 OUTLET DETAIL

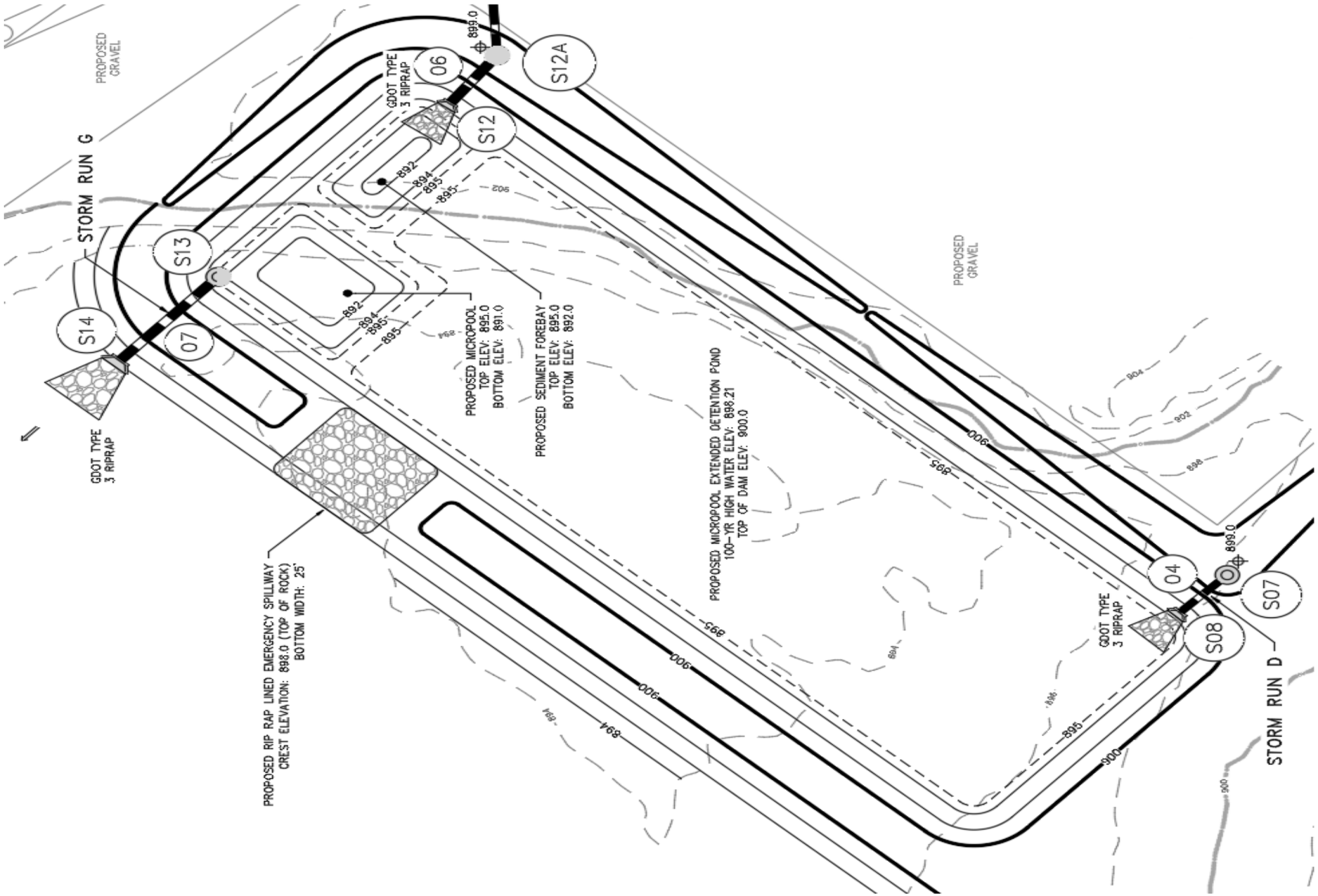
N.T.S.



PROPOSED STORMWATER POND 4 SECTION

N.T.S.

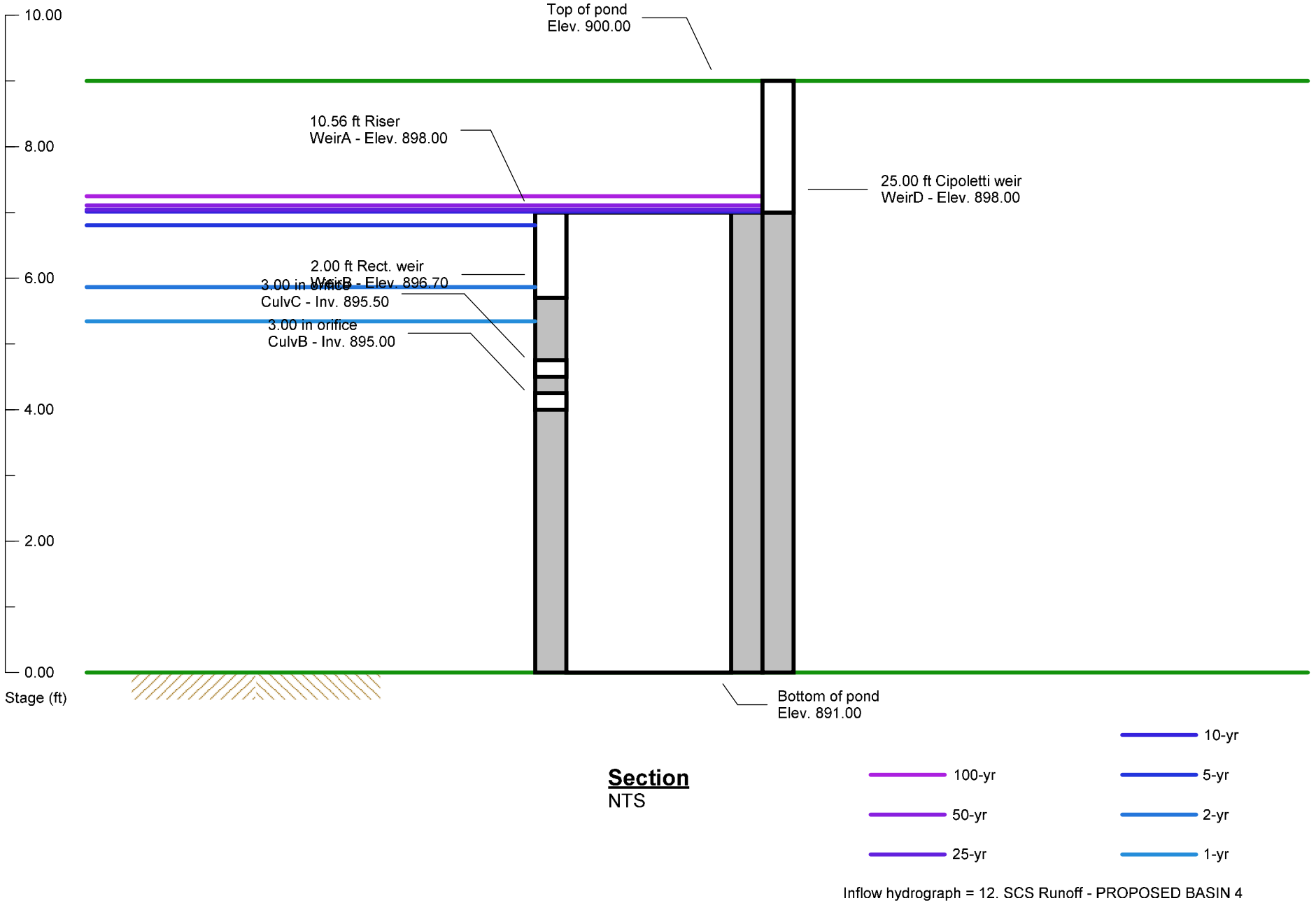
PROPOSED POND 4
PLAN VIEW
N.T.S.



Pond No. 5 - PROPOSED POND 4

CLOGGED CONDITION

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



Section
NTS

Inflow hydrograph = 12. SCS Runoff - PROPOSED BASIN 4

Pond Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023 Monday, 02 / 6 / 2023

Pond No. 7 - PROPOSED POND 5

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 889.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	889.00	160	0	0
1.00	890.00	290	222	222
3.00	892.00	641	908	1,130
4.00	893.00	10,233	4,478	5,608
5.00	894.00	11,299	10,761	16,368
7.00	896.00	13,507	24,771	41,139
9.00	898.00	15,815	29,289	70,428

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 24.00	3.00	3.00	0.00
Span (in)	= 24.00	3.00	3.00	0.00
No. Barrels	= 1	1	1	0
Invert El. (ft)	= 892.90	893.00	893.50	0.00
Length (ft)	= 40.00	0.00	0.00	0.00
Slope (%)	= 1.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	Yes	Yes	No

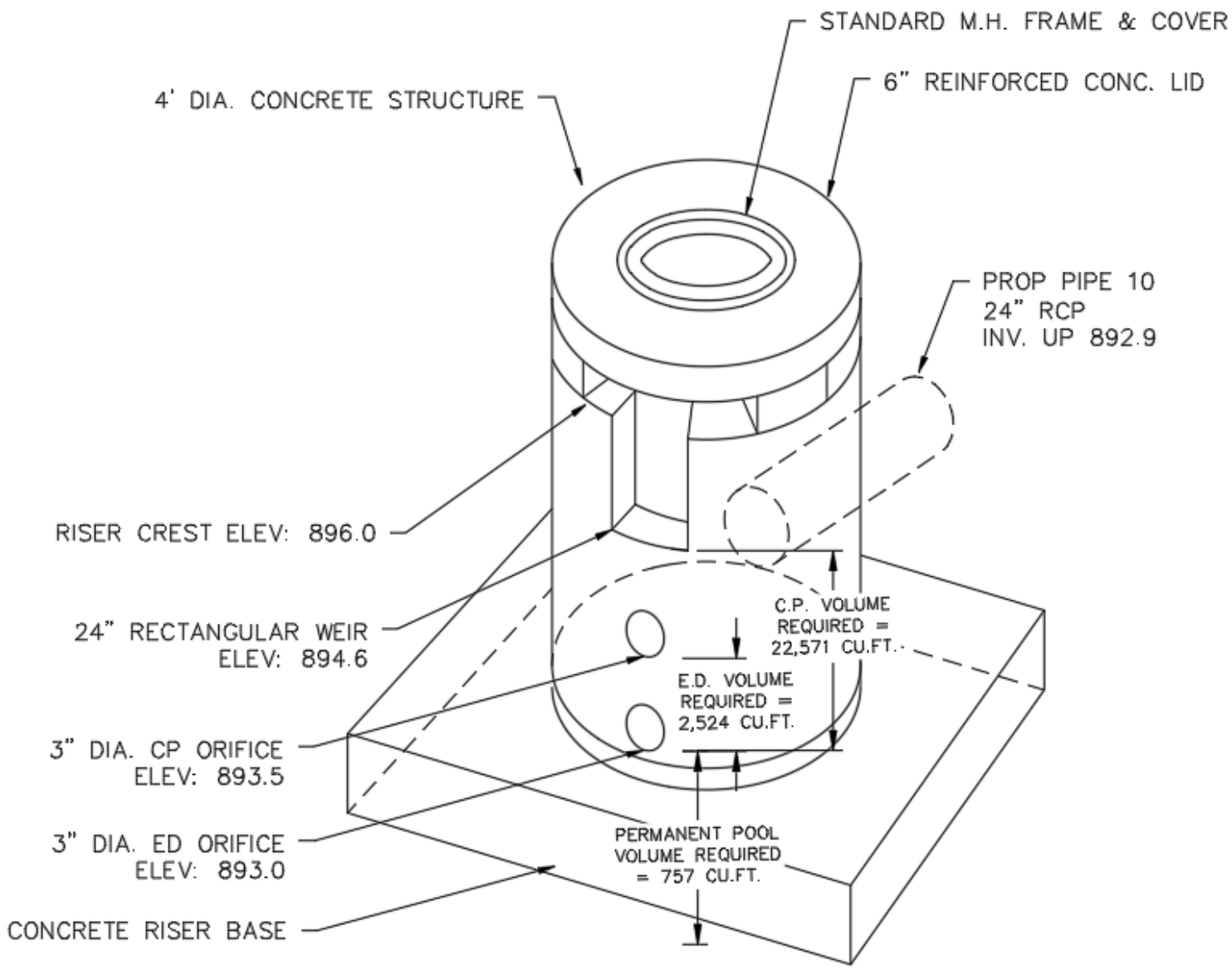
Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 10.56	2.00	0.00	25.00
Crest El. (ft)	= 896.00	894.60	0.00	896.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= 1	Rect	---	Ciplti
Multi-Stage	= Yes	Yes	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).

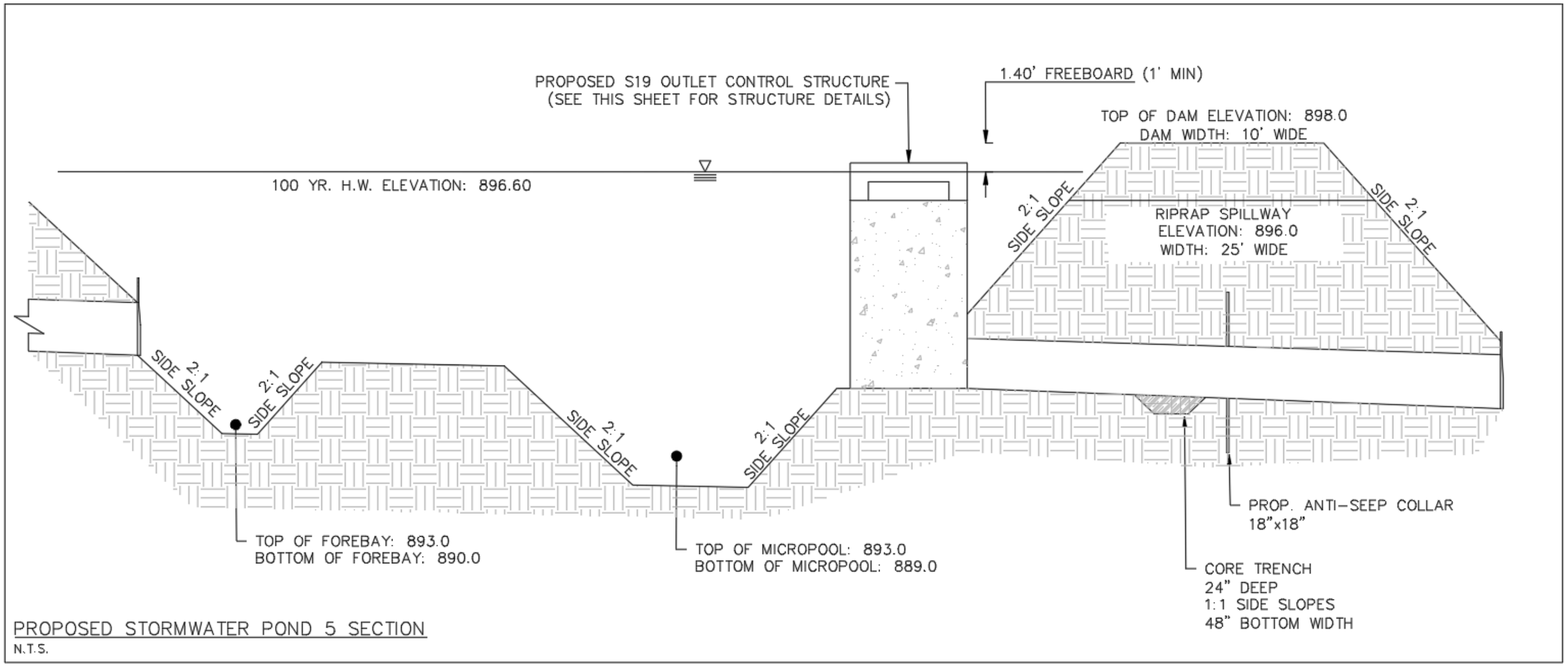
Stage / Storage / Discharge Table

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	889.00	0.00	0.00	0.00	---	0.00	0.00	---	0.00	---	---	0.000
1.00	222	890.00	0.00	0.00	0.00	---	0.00	0.00	---	0.00	---	---	0.000
3.00	1,130	892.00	0.00	0.00	0.00	---	0.00	0.00	---	0.00	---	---	0.000
4.00	5,608	893.00	0.00	0.00	0.00	---	0.00	0.00	---	0.00	---	---	0.000
5.00	16,368	894.00	0.38 ic	0.22 ic	0.14 ic	---	0.00	0.00	---	0.00	---	---	0.364
7.00	41,139	896.00	11.33 oc	0.26 ic	0.26 ic	---	0.00	10.80 s	---	0.00	---	---	11.32
9.00	70,428	898.00	30.52 ic	0.04 ic	0.04 ic	---	22.66 s	7.76 s	---	235.47	---	---	265.96



PROPOSED STORMWATER POND 5 OUTLET DETAIL

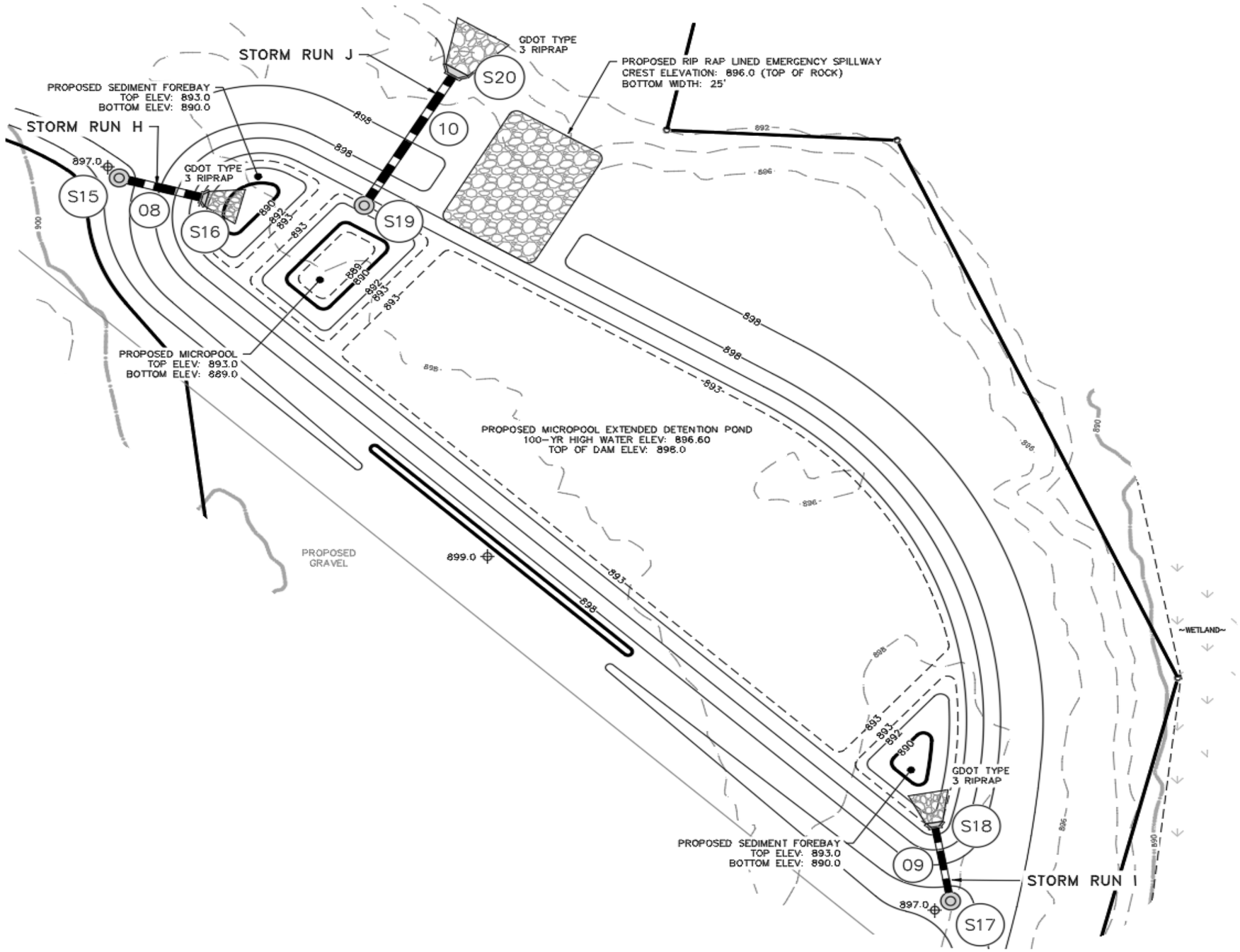
N.T.S.



PROPOSED STORMWATER POND 5 SECTION

N.T.S.

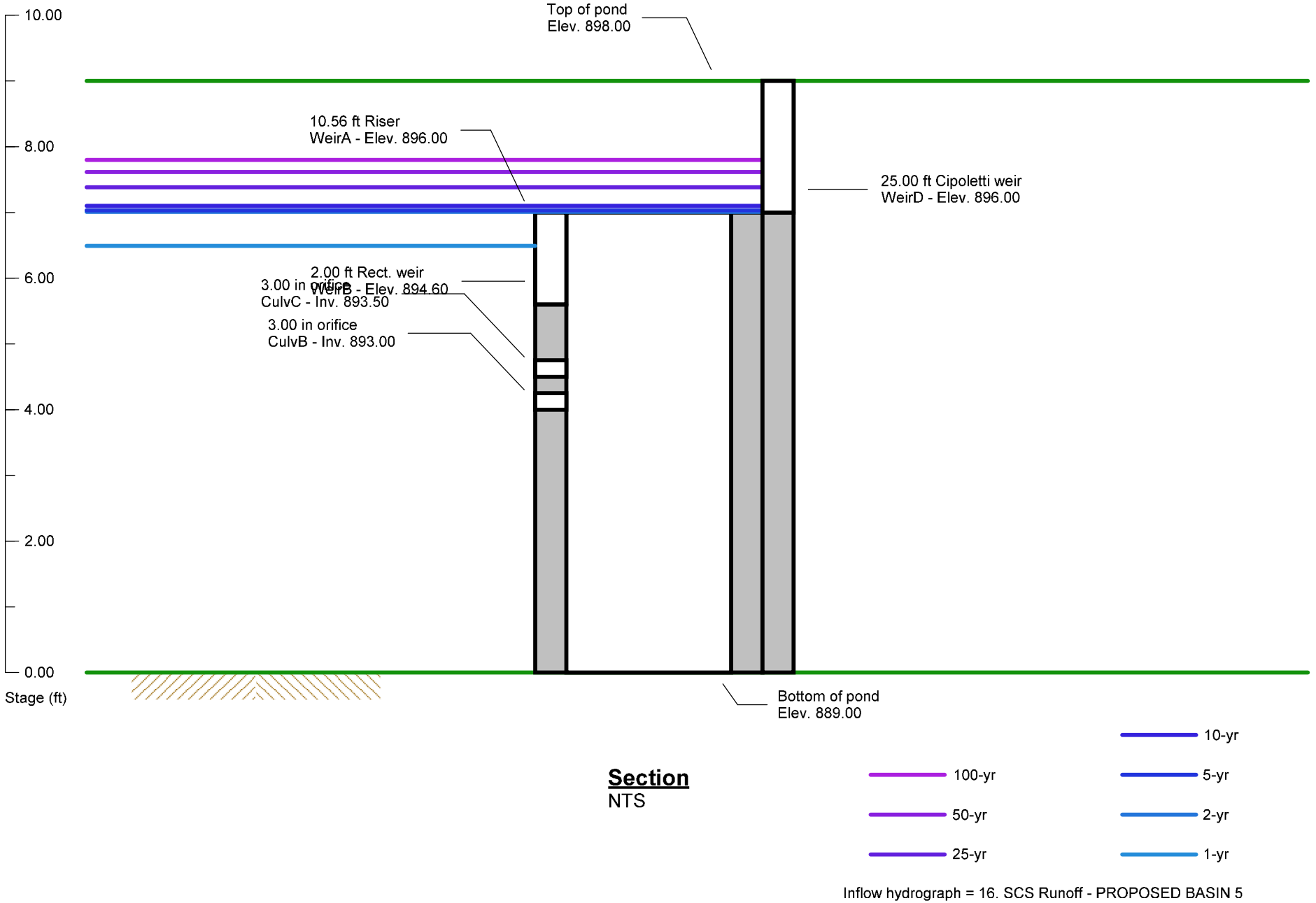
PROPOSED POND 5
PLAN VIEW
N.T.S.



Pond No. 7 - PROPOSED POND 5

CLOGGED CONDITION

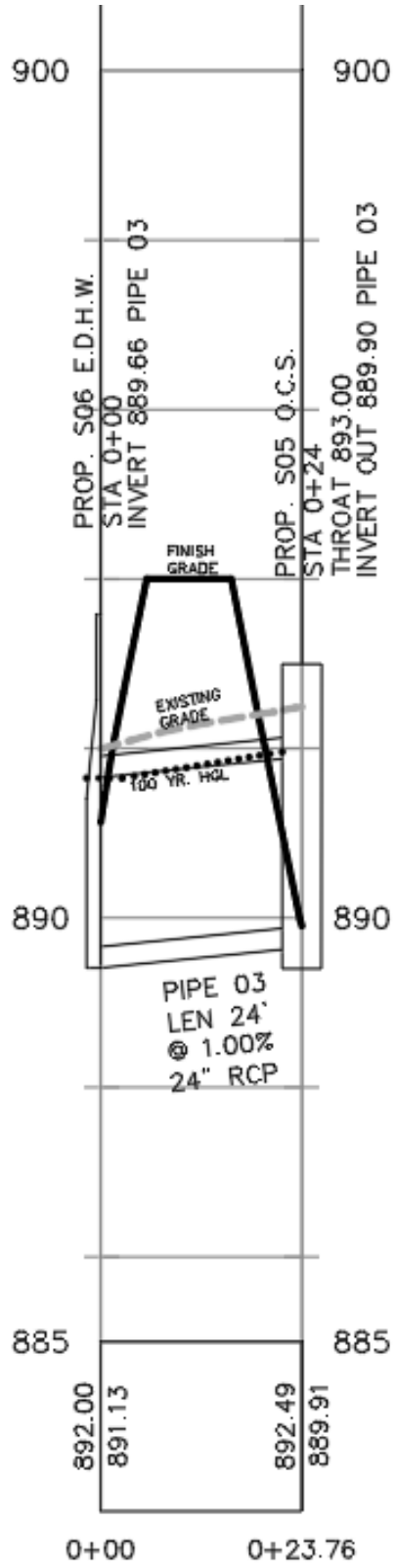
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023



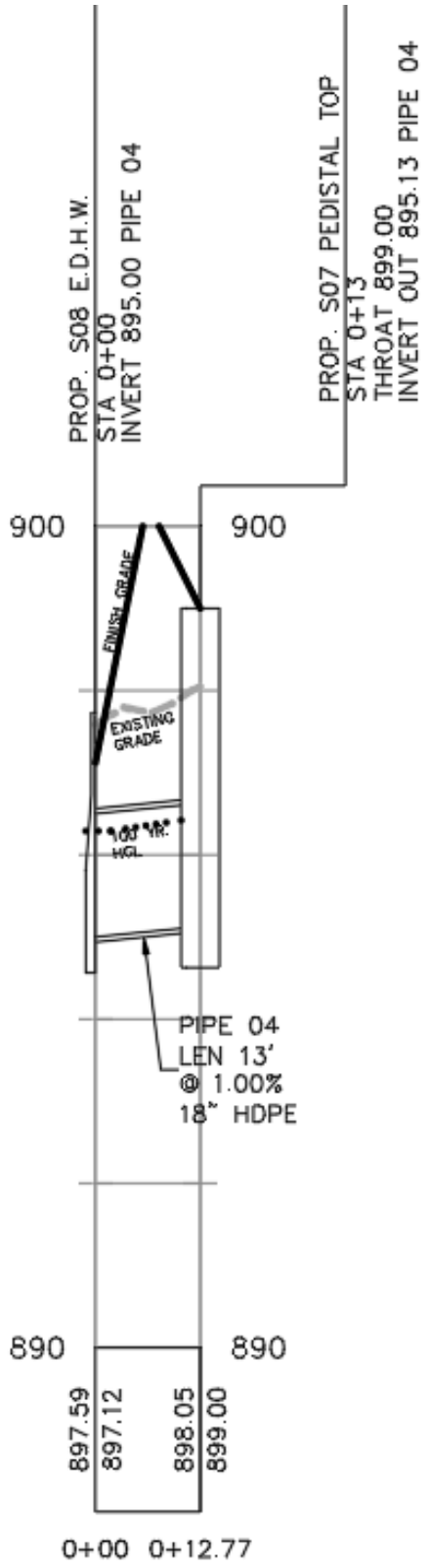
Section
NTS

Inflow hydrograph = 16. SCS Runoff - PROPOSED BASIN 5

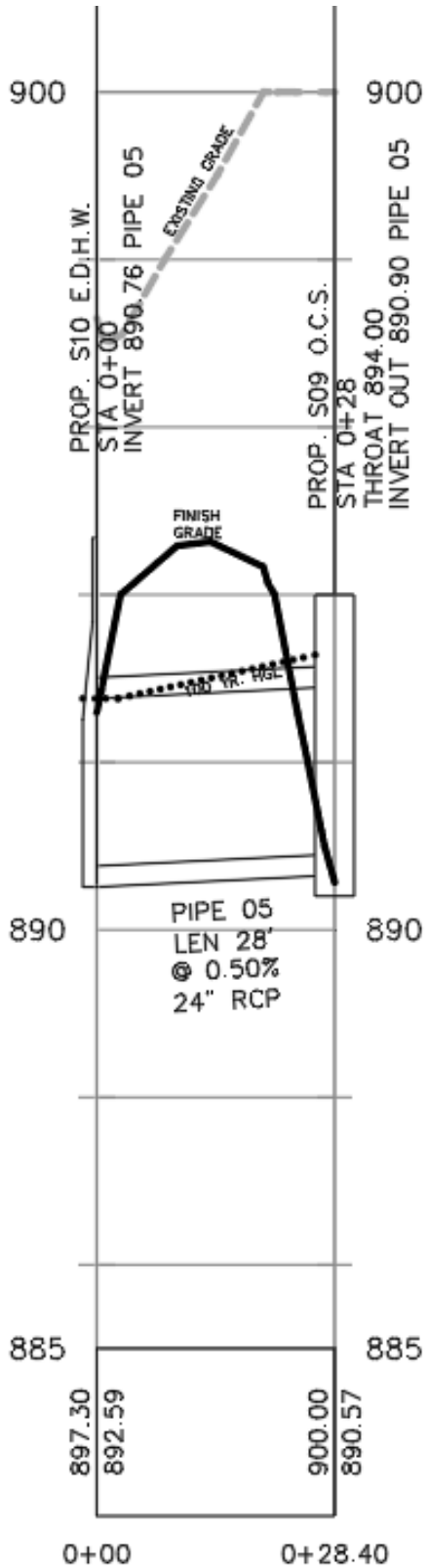
Appendix G – Storm Sewer Design



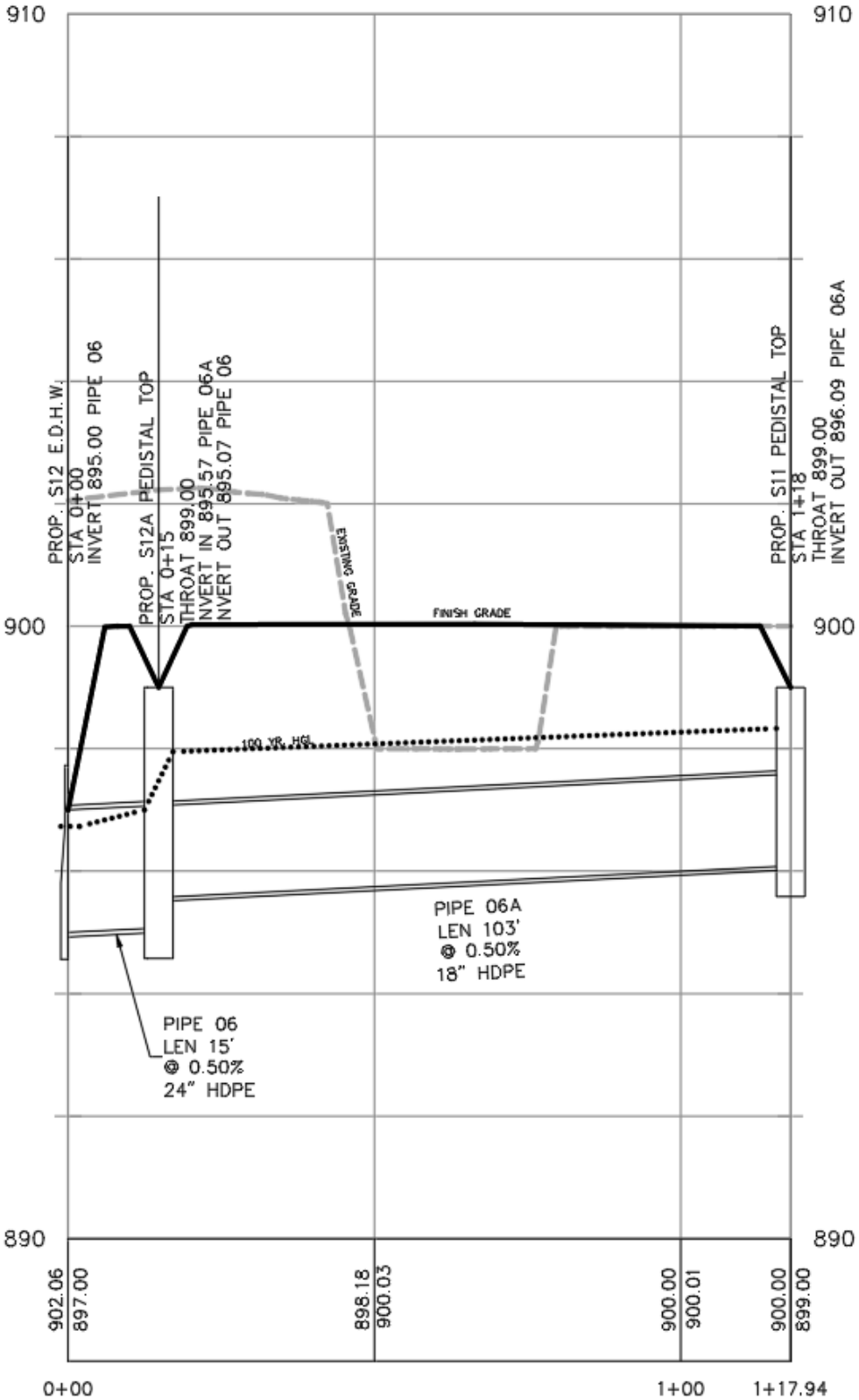
STORM RUN A PROFILE



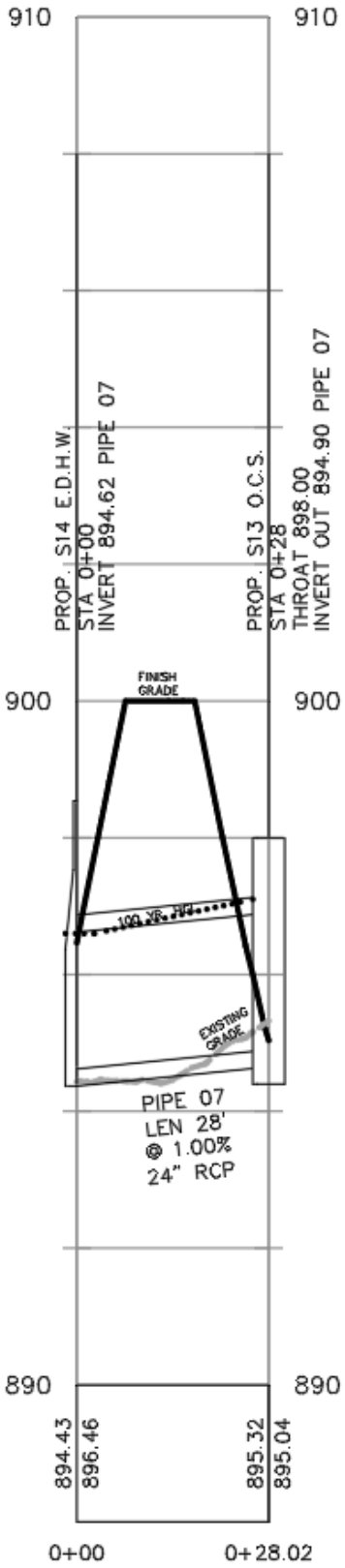
STORM RUN B PROFILE



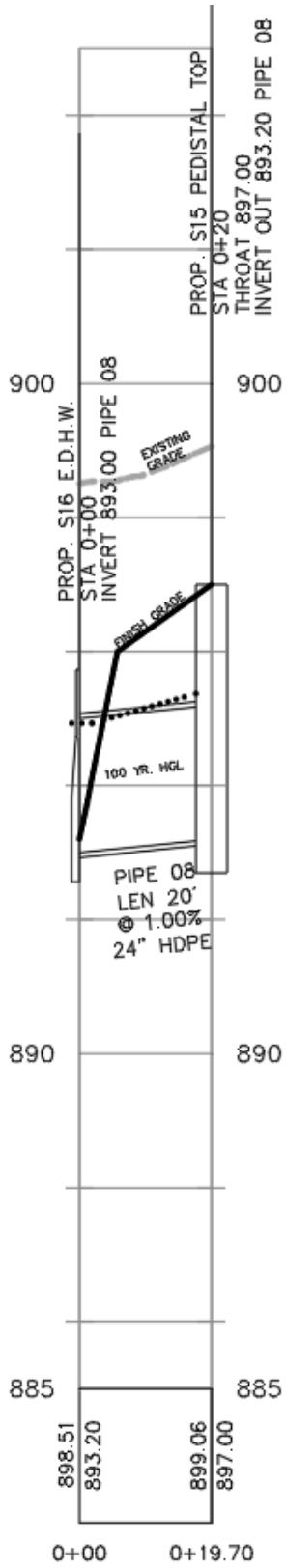
STORM RUN C PROFILE



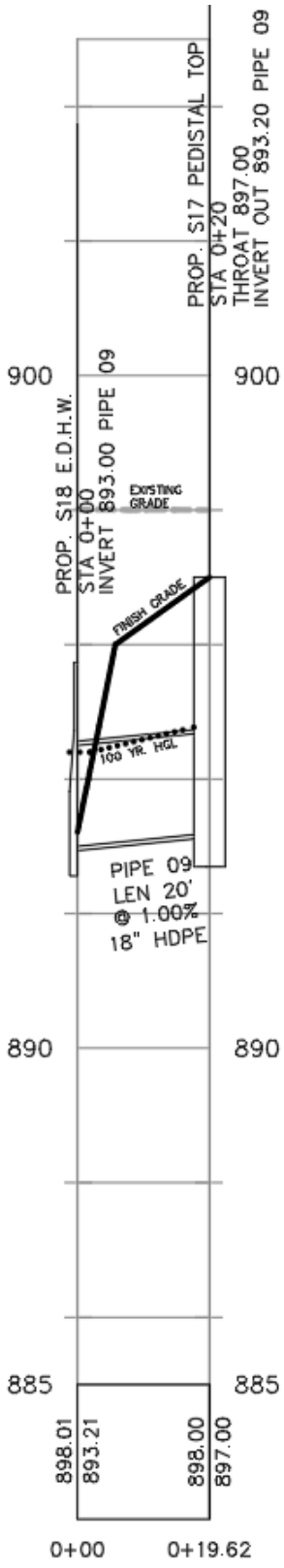
STORM RUN D PROFILE



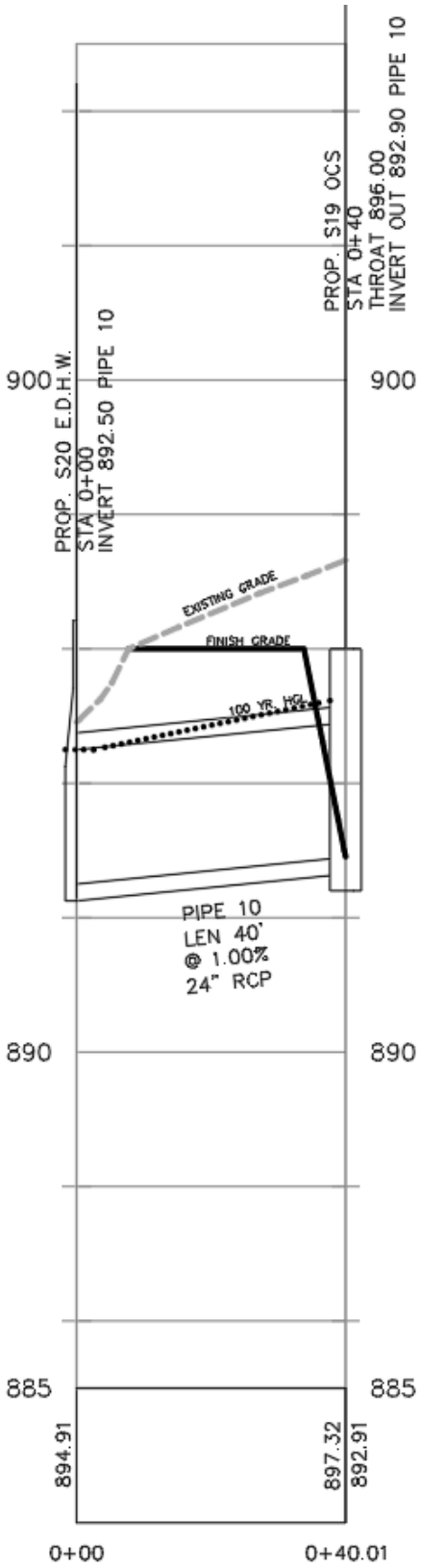
STORM RUN E PROFILE



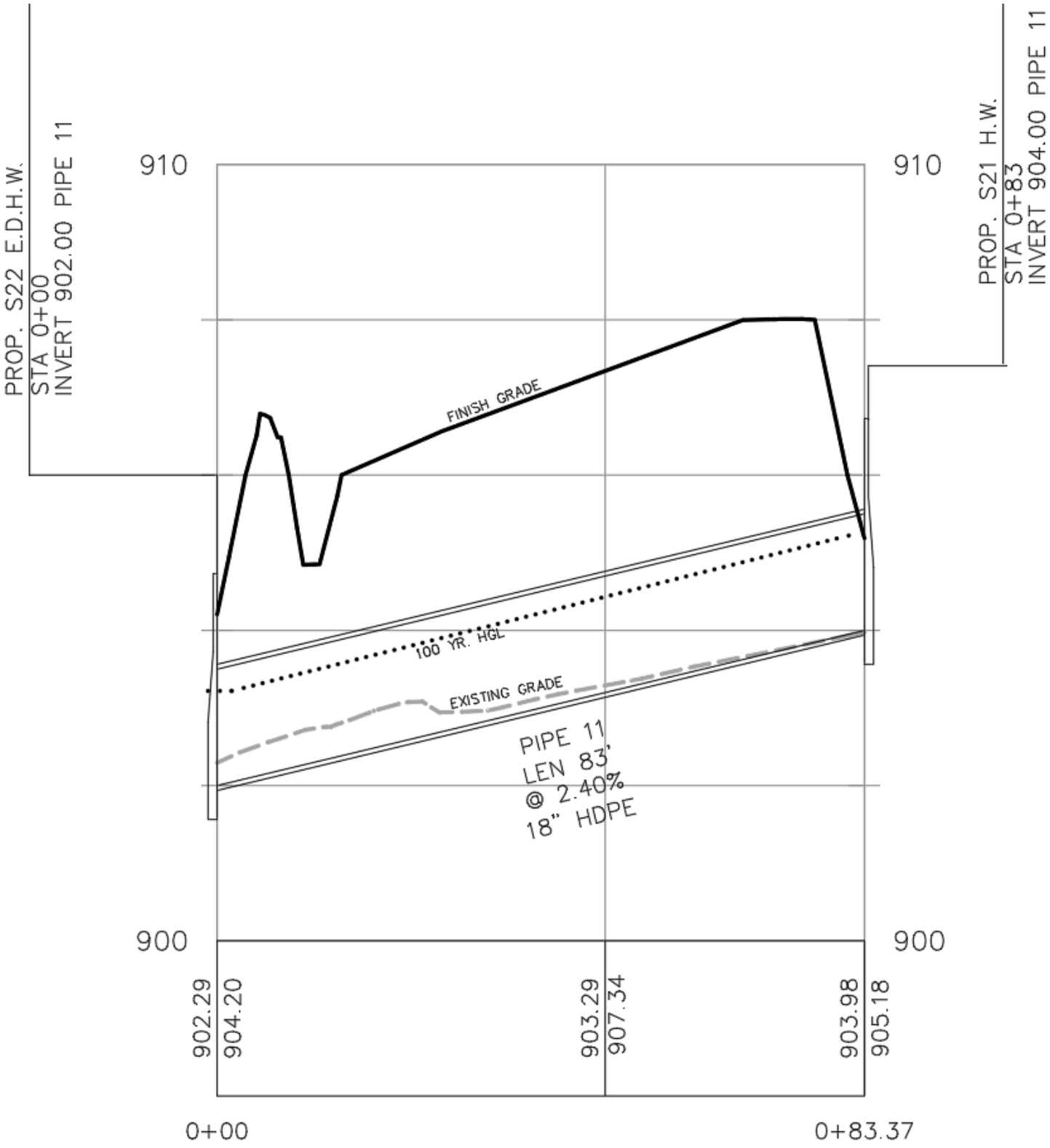
STORM RUN F PROFILE



STORM RUN G PROFILE



STORM RUN H PROFILE



STORM RUN I PROFILE

Storm Sewer Tabulation - 02 Year

Structure		Len	Drng	Area	Rnoff	Area x	C	Tc		Rain (I)	Total	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Pipe ID
ID	To ID	(ft)	Incr (ac)	Total (ac)	coeff (C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	flow (cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	
S21	S22	83.37	2.38	2.38	0.35	0.83	0.83	5.0	5.0	5.5	4.61	17.62	3.81	18	2.40	902.00	904.00	903.22	904.82	904.06	906.06	11
S05	S06	23.76	0.00	0.00	0.00	0.00	0.00	5.0	5.0	0.0	1.55	22.73	1.81	24	1.00	889.66	889.90	891.65	890.33	892.41	893.00	03
S07	S08	12.77	2.24	2.24	0.42	0.94	0.94	5.0	5.0	5.5	5.20	11.48	4.03	18	1.00	895.00	895.13	896.29	896.01	897.06	899.00	04
S09	S10	28.40	0.00	0.00	0.00	0.00	0.00	5.0	5.0	0.0	7.36	15.88	2.37	24	0.50	890.76	890.90	892.76	892.78	893.51	894.00	05
S12A	S12	14.78	1.80	2.59	0.81	1.46	2.03	5.0	6.0	5.2	10.54	16.86	4.61	24	0.50	895.00	895.07	896.73	896.23	897.06	899.00	06
S11	S12A	103.15	0.79	0.79	0.72	0.57	0.57	5.0	5.0	5.5	3.15	8.08	4.13	18	0.50	895.57	896.09	896.23	896.76	899.00	899.00	06A
S13	S14	28.02	0.00	0.00	0.00	0.00	0.00	5.0	5.0	0.0	2.32	22.61	2.11	24	1.00	894.62	894.90	896.60	895.43	897.37	898.00	07
S15	S16	19.70	4.63	4.63	0.64	2.96	2.96	5.0	5.0	5.5	16.39	24.69	5.98	24	1.00	893.00	893.20	894.93	894.66	898.00	897.00	08
S17	S18	19.62	1.80	1.80	0.68	1.22	1.22	5.0	5.0	5.5	6.77	11.49	4.66	18	1.00	893.00	893.20	894.40	894.21	897.00	897.00	09
S19	S20	40.01	0.00	0.00	0.00	0.00	0.00	5.0	5.0	0.0	5.30	22.61	1.82	24	1.00	892.50	892.90	894.50	894.51	895.25	896.00	10

Project File: STORM RUNS MINUS A & B (2023.02.01).stm — Number of lines: 10 — Run Date: 2/1/2023

NOTES:Intensity = 27.95 / (Inlet time + 5.40) " 0.69; Return period =Yrs. 2

Storm Sewers v2023.00

Storm Sewer Tabulation - 100 Year

Structure		Len	Drng	Area	Rnoff	Area x	C	Tc		Rain (I)	Total	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Pipe ID
ID	To ID	(ft)	Incr (ac)	Total (ac)	coeff (C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	flow (cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	
S21	S22	83.37	2.38	2.38	0.35	0.83	0.83	5.0	5.0	12.1	10.06	17.62	6.53	18	2.40	902.00	904.00	903.22	905.22	904.06	906.06	11
S05	S06	23.76	0.00	0.00	0.00	0.00	0.00	5.0	5.0	0.0	26.14	22.73	8.32	24	1.00	889.66	889.90	891.65	891.96	892.41	893.00	03
S07	S08	12.77	2.24	2.24	0.42	0.94	0.94	5.0	5.0	12.1	11.36	11.48	7.04	18	1.00	895.00	895.13	896.29	896.42	897.06	899.00	04
S09	S10	28.40	0.00	0.00	0.00	0.00	0.00	5.0	5.0	0.0	30.51	15.88	9.71	24	0.50	890.76	890.90	892.76	893.28	893.51	894.00	05
S12A	S12	14.78	1.80	2.59	0.81	1.46	2.03	5.0	5.4	11.7	23.78	16.86	7.95	24	0.50	895.00	895.07	896.73	897.00	897.06	899.00	06
S11	S12A	103.15	0.79	0.79	0.72	0.57	0.57	5.0	5.0	12.1	6.87	8.08	3.89	18	0.50	895.57	896.09	897.95	898.33	899.00	899.00	06A
S13	S14	28.02	0.00	0.00	0.00	0.00	0.00	5.0	5.0	0.0	30.52	22.61	9.72	24	1.00	894.62	894.90	896.60	897.10	897.37	898.00	07
S15	S16	19.70	4.63	4.63	0.64	2.96	2.96	5.0	5.0	12.1	35.78	24.69	11.45	24	1.00	893.00	893.20	894.93	895.37	898.00	897.00	08
S17	S18	19.62	1.80	1.80	0.68	1.22	1.22	5.0	5.0	12.1	14.78	11.49	8.49	18	1.00	893.00	893.20	894.40	894.77	897.00	897.00	09
S19	S20	40.01	0.00	0.00	0.00	0.00	0.00	5.0	5.0	0.0	30.52	22.61	9.72	24	1.00	892.50	892.90	894.50	895.23	895.25	896.00	10

Project File: STORM RUNS MINUS A & B (2023.02.01).stm — Number of lines: 10 — Run Date: 2/1/2023

NOTES:Intensity = 63.06 / (Inlet time + 5.60) " 0.70; Return period =Yrs. 100

Storm Sewers v2023.00

Appendix H – No-Rise Report

Contents

Powder Springs Creek (FEMA Zone AE)
Cobb County, GA (City of Austell)
No-rise Certification
January 2023

Methodology

HEC-RAS 6.2

Effective Model
Project: Powder Spring Creek 2023
Plan: asbuilt CLOMR
Geometry: As-built CLOMR
Flow: Revised Existing (2003) Conditions

Corrected Effective Model
Project: Powder Spring Creek 2023
Plan: Corr Eff
Geometry: As-built CLOMR
Flow: Revised Existing (2003) Conditions
(No changes)

Existing Conditions Model
Project: Powder Spring Creek 2023
Plan: Existing Conditions1
Geometry: Existing Conditions1
Flow: Revised Existing (2003) Conditions

Existing Geometry:
Cross section 6136.29 was re-extracted with existing terrain. The effective bathymetry was 881.1 and 40 feet wide. The existing geometry bathymetry data was hand edited to 881.1 and 33 feet wide.

Cross section 5144.74 was re-extracted with existing terrain. The effective bathymetry was 881.1 and 40 feet wide. The existing geometry bathymetry data was hand edited to 881.1 and 10 feet wide.

Cross sections 7811, 7419, 6800 were added as shown on the Working Map. The bathymetry data was hand edited to fall approx. 0.4 feet lower at each successive downstream cross section.

Proposed Conditions Model
Project: Powder Spring Creek 2023
Plan: Proposed Conditions1
Geometry: Proposed Conditions1
Flow: Revised Existing (2003) Conditions

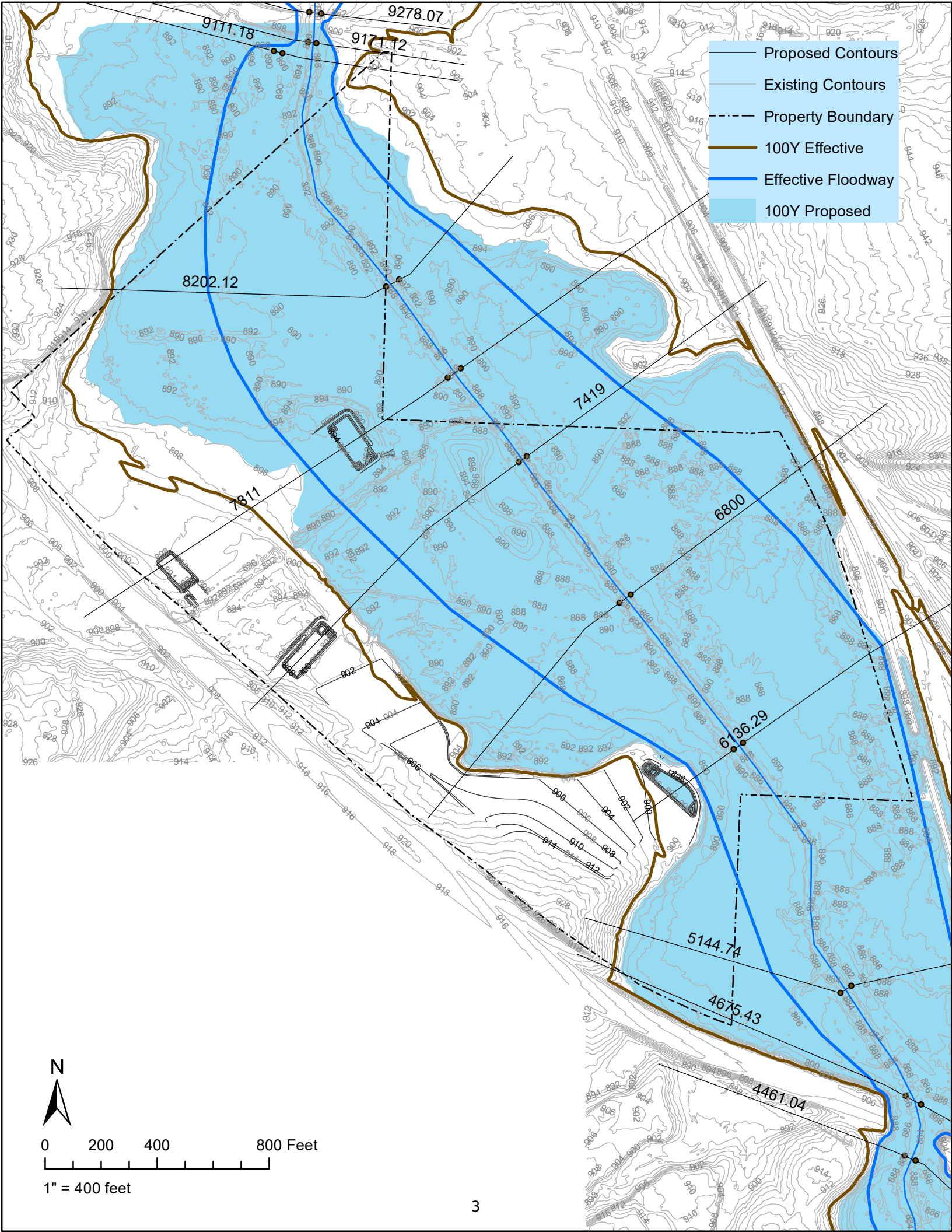
Proposed Geometry:
The right bank only was re-extracted with proposed terrain for cross sections 7811, 7419, 6800, and 6136.29

Results

See Water Surface Elevation (WSEL) Comparison Table for results of this no-rise certification.

Proposed Floodway:
Project: Powder Spring Creek 2023
Plan: Proposed Floodway1
Geometry: Proposed Conditions1
Flow: Floodway (effective)

The proposed floodway would move encroachments inward 14 feet (7 on each side) at the downstream bounding cross section (9171.12) of the culvert at the road crossing just upstream of the proposed project (Oglesby Road). See Floodway Table1. Otherwise the surcharge at cross section 9171.12 goes to 1.1 feet. If cross section 9111.18 is re-exacted with existing terrain to correct the fact that both of the bank stations are located on the right bank of the stream centerline in the effective model, the floodway encroachments would move on ***three*** bounding cross sections around the same road crossing. See Floodway Table2 and the Comparison WSEL Table between conditions 1 and 2.


Proposed Contours
Existing Contours
Property Boundary
100Y Effective
Effective Floodway
100Y Proposed
9278.07
9111.18
9171.12
8202.12
7419
7811
6800
6136.29
5144.74
4675.43
4461.04
N
0
200
400
800 Feet
1" = 400 feet

Water Surface Elevation Data

XS	Effective WSEL	Vel	Re-extract? Entire XS	Exist Cond WSEL		Vel	Re-extract? Right bank only	Proposed WSEL		Vel	Rounded Diff. from Eff/Exist
9171.12	895.57	14.81		895.57	0	14.81		895.53	-0.04	14.89	0.0
9111.18	896.49	6.03		896.49	0	6.04		896.46	-0.03	6.07	0.0
8202.12	896.07	2.41		896.06	-0.01	2.42		896.03	-0.03	2.43	0.0
7811	(added)			895.9		2.59	x	895.89	-0.01	2.38	0.0
7419	(added)			895.71		2.5	x	895.7	-0.01	2.53	0.0
6800	(added)			895.58		1.42	x	895.58	0	1.42	0.0
6136.29	895.58	1.89	x	895.4	-0.18	2.86	x	895.4	0	2.83	-0.2
5144.74	895.15	3.86	x	895.1	-0.05	1.96		895.1	0	1.96	0.0
4675.43	894.81	3.68		894.81	0	3.68		894.81	0	3.68	0.0

Floodway Data1

XS	Effective WSEL	Surcharge	Proposed1 WSEL (Natural / FW)	Surcharge	**Proposed Encroach.**		Effective Encroachment	
9278.07	898.31		898.31					
	898.3	-0.01	898.3	-0.01				
Road Crossing								
9171.12	895.57		895.53		**1443**	**1561**	1436	1568
	896.3	0.73	896.53	1	(Surcharge = 1.1 under proposed conditions)			
9111.18	896.49		896.46					
	896.9	0.41	897.17	0.71				
8202.12	896.07		896.03					
	896.42	0.35	896.77	0.74				
7811			895.89		**806.9**	**1788.4**	On the effective	
(New XS)			896.61	0.72			floodway line	
7419			895.7		**639.7**	**1648.6**	On the effective	
(New XS)			896.44	0.74			floodway line	
6800			895.58		**576**	**1576**	On the effective	
(New XS)			896.27	0.69			floodway line	
6136.29	895.58		895.4					
(Re-extracted)	895.89	0.31	896.05	0.65				
5144.74	895.15		895.1					
(Re-extracted)	895.51	0.36	895.52	0.42				
4675.43	894.81		894.81					
	895.2	0.39	895.2	0.39				

Floodway Data2

XS	Effective		Proposed2		**Proposed Encroach.**		Effective Encroachment	
	WSEL	Surcharge	WSEL (Natural / FW)	Surcharge	Left	Right	Left	Right
14987.46	904.38		904.38					
	905.25	0.87	905.25	0.87				
13118.86	902.88		902.88					
	903.37	0.49	903.39	0.51				
13083.81	902.81		902.81					
	903.22	0.41	903.24	0.43				
12970	902.2		902.2					
	902.76	0.56	902.79	0.59				
12928.53	902.2		902.2					
	902.79	0.59	902.82	0.62				
11512.45	900.89		900.89					
	901.47	0.58	901.51	0.62				
9438.85	899.25		899.25					
	899.25	0	899.36	0.11				
9278.07	898.31		898.31		**1442**	**1563**	1436	1568
	898.3	-0.01	898.28	-0.03				
9171.12	895.57		895.49		**1458**	**1547**	1436	1568
	896.3	0.73	896.49	1				
9111.18	896.49		896.54		**1268**	**1569**	1400	1700
(Re-extracted)	896.9	0.41	897.26	0.72				
8202.12	896.07		896.03					
	896.42	0.35	896.77	0.74				
7811			895.89		**806.9**	**1788.4**	On the effective	
(New XS)			896.61	0.72			floodway line	
7419			895.7		**639.7**	**1648.6**	On the effective	
(New XS)			896.44	0.74			floodway line	
6800			895.58		**576**	**1576**	On the effective	
(New XS)			896.27	0.69			floodway line	
6136.29	895.58		895.4					
(Re-extracted)	895.89	0.31	896.05	0.65				
5144.74	895.15		895.1					
(Re-extracted)	895.51	0.36	895.52	0.42				
4675.43	894.81		894.81					
	895.2	0.39	895.2	0.39				

Water Surface Elevation Data

XS	Effective WSEL	Vel	Re-extract	Exist Cond2 WSEL		Vel	Re-extract	Proposed2 WSEL		Vel	Rounded Diff from Eff/Exist
9171.12	895.57	14.81		895.49	-0.08	15		895.49	0	15	-0.1
9111.18	896.49	6.03	**x**	896.56	0.07	4.08		896.54	-0.02	4.1	0.0
8202.12	896.07	2.41		896.06	-0.01	2.42		896.03	-0.03	2.43	0.0
7811				895.9		2.59	x	895.89	-0.01	2.38	0.0
7419				895.71		2.5	x	895.7	-0.01	2.53	0.0
6800				895.58		1.42	x	895.58	0	1.42	0.0
6136.29	895.58	1.89	x	895.4	-0.18	2.86	x	895.4	0	2.83	-0.2
5144.74	895.15	3.86	x	895.1	-0.05	1.96		895.1	0	1.96	0.0
4675.43	894.81	3.68		894.81	0	3.68		894.81	0	3.68	0.0

XS	Effective WSEL	Vel	Re-extract	Exist Cond1 WSEL		Vel	Re-extract	Proposed1 WSEL		Vel	Rounded Diff from Eff/Exist
9171.12	895.57	14.81		895.57	0	14.81		895.53	-0.04	14.89	0.0
9111.18	896.49	6.03	**no extract**	896.49	0	6.04		896.46	-0.03	6.07	0.0
8202.12	896.07	2.41		896.06	-0.01	2.42		896.03	-0.03	2.43	0.0
7811				895.9		2.59	x	895.89	-0.01	2.38	0.0
7419				895.71		2.5	x	895.7	-0.01	2.53	0.0
6800				895.58		1.42	x	895.58	0	1.42	0.0
6136.29	895.58	1.89	x	895.4	-0.18	2.86	x	895.4	0	2.83	-0.2
5144.74	895.15	3.86	x	895.1	-0.05	1.96		895.1	0	1.96	0.0
4675.43	894.81	3.68		894.81	0	3.68		894.81	0	3.68	0.0

HEC-RAS Plan: Exist Cond1 River: RIVER-1 Reach: Reach-1 Profile: 100-yr

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach-1	43944.16	100-yr	2830.00	938.00	947.34		947.55	0.001351	4.10	1327.49	446.17	0.25
Reach-1	43809.34	100-yr	2830.00	937.50	947.10	945.73	947.28	0.003026	4.89	1495.95	518.11	0.34
Reach-1	43475.28	100-yr	2830.00	936.46	944.64	944.64	945.47	0.011310	9.01	839.93	524.51	0.65
Reach-1	42101.69	100-yr	2830.00	931.66	942.36		942.40	0.000716	2.78	2703.93	669.30	0.17
Reach-1	41583.57	100-yr	2830.00	930.49	941.80		941.89	0.001431	4.57	2245.88	654.36	0.25
Reach-1	40922.19	100-yr	3494.00	928.61	941.53		941.57	0.000244	2.14	3563.75	656.18	0.11
Reach-1	39905.41	100-yr	3721.00	924.53	940.96		941.13	0.000895	4.66	2219.06	407.26	0.21
Reach-1	39877.93	100-yr	3721.00	924.40	939.40	937.92	940.72	0.008067	11.30	628.75	279.39	0.52
Reach-1	39845.43		Bridge									
Reach-1	39780.42	100-yr	3721.00	924.40	938.08	936.00	939.40	0.007193	10.20	569.55	356.46	0.56
Reach-1	39730.93	100-yr	3721.00	924.40	938.26	937.45	938.70	0.004088	7.69	1590.06	564.34	0.40
Reach-1	38980.62	100-yr	3721.00	923.28	934.01	931.16	934.97	0.006156	8.25	739.22	319.56	0.50
Reach-1	38186.36	100-yr	3860.00	922.06	933.17		933.19	0.000922	2.28	4552.20	1476.18	0.16
Reach-1	37647.29	100-yr	3860.00	921.00	932.86		932.88	0.000366	2.20	5171.72	1288.27	0.12
Reach-1	36111.29	100-yr	3860.00	918.50	931.79		931.92	0.001227	4.16	2569.98	664.98	0.22
Reach-1	36077.48	100-yr	3860.00	918.50	931.69	926.98	931.87	0.001131	4.36	2128.66	467.47	0.23
Reach-1	36059.98		Bridge									
Reach-1	35961.54	100-yr	3860.00	918.50	931.36	927.12	931.48	0.000954	3.98	2826.96	752.36	0.21
Reach-1	35926.80	100-yr	3860.00	918.20	931.24		931.42	0.001714	4.74	2218.08	632.95	0.26
Reach-1	34813.74	100-yr	3860.00	915.70	928.75		929.12	0.002620	6.23	1736.92	610.24	0.33
Reach-1	34781.20	100-yr	3860.00	915.70	928.86	921.52	928.95	0.000439	3.05	3145.80	590.01	0.15
Reach-1	34751.20		Culvert									
Reach-1	34679.65	100-yr	3860.00	915.71	928.56	921.64	928.71	0.000685	3.53	2267.72	578.32	0.18
Reach-1	34633.42	100-yr	3860.00	915.69	927.74		928.46	0.004910	8.04	1191.48	505.69	0.44
Reach-1	32168.69	100-yr	5111.00	911.06	925.43		925.46	0.000571	2.65	5337.45	1337.37	0.15
Reach-1	30960.21	100-yr	5111.00	908.97	924.27		924.43	0.001365	4.62	3104.66	803.75	0.23
Reach-1	30904.46	100-yr	5111.00	908.90	924.23	920.92	924.34	0.000861	4.29	3956.41	938.29	0.21
Reach-1	30886.46		Bridge									
Reach-1	30803.00	100-yr	5111.00	908.90	923.58	920.42	923.97	0.002141	6.59	2333.30	733.01	0.32
Reach-1	30713.78	100-yr	5111.00	908.89	923.44		923.72	0.002276	5.70	2455.65	752.83	0.29
Reach-1	29349.80	100-yr	5149.00	906.10	923.04		923.06	0.000175	1.89	8866.61	1657.66	0.09
Reach-1	29107.28	100-yr	5149.00	905.60	922.47	915.27	922.85	0.001316	5.72	1503.33	1825.22	0.26
Reach-1	29047.28		Culvert									
Reach-1	28914.34	100-yr	5149.00	905.40	921.73	916.23	922.42	0.002686	7.59	1151.65	1883.18	0.35
Reach-1	28622.47	100-yr	5149.00	905.15	921.93		921.94	0.000199	2.05	8320.98	1772.51	0.10
Reach-1	28516.68	100-yr	5149.00	905.00	921.55	916.34	921.83	0.001225	5.22	1956.88	1237.30	0.25
Reach-1	28505.18		Bridge									
Reach-1	28387.51	100-yr	5149.00	905.00	918.84	917.46	919.81	0.005096	9.05	1116.02	1065.63	0.48
Reach-1	28357.92	100-yr	5149.00	905.01	919.23		919.31	0.000851	3.63	4664.48	1322.08	0.20
Reach-1	27682.80	100-yr	5149.00	903.86	918.49		918.62	0.001424	4.53	3752.26	1257.88	0.25
Reach-1	26944.13	100-yr	5108.00	903.20	917.86		917.91	0.000606	3.22	4909.57	1047.93	0.17
Reach-1	26070.40	100-yr	5108.00	902.30	917.75		917.75	0.000081	1.19	11209.86	1487.84	0.06
Reach-1	25555.50	100-yr	5108.00	901.50	917.64		917.67	0.000289	2.26	7207.00	1587.24	0.11
Reach-1	25415.97	100-yr	5108.00	901.50	917.22	910.39	917.52	0.001126	5.21	1828.02	1565.41	0.24
Reach-1	25397.47		Bridge									
Reach-1	25254.46	100-yr	5108.00	901.50	916.45	909.13	916.69	0.000900	4.50	1870.81	982.38	0.22
Reach-1	25230.74	100-yr	5108.00	901.50	916.44	908.89	916.66	0.000819	4.31	1877.37	922.71	0.21
Reach-1	25218.24		Bridge									
Reach-1	25132.03	100-yr	5108.00	901.50	914.90	911.02	915.40	0.002497	6.75	1448.40	936.20	0.35
Reach-1	25084.68	100-yr	5108.00	901.51	915.06		915.14	0.000588	3.16	4080.80	810.43	0.17
Reach-1	24474.86	100-yr	5108.00	900.65	914.71		914.78	0.000647	3.23	4034.67	751.25	0.17
Reach-1	23904.21	100-yr	5108.00	899.49	914.58		914.59	0.000176	1.85	7146.08	980.37	0.09
Reach-1	22850.91	100-yr	5108.00	897.20	914.32		914.36	0.000283	2.41	6342.24	1199.65	0.11
Reach-1	20798.84	100-yr	5108.00	895.20	913.14		913.34	0.000985	4.40	2686.21	613.55	0.21
Reach-1	20747.39	100-yr	5108.00	895.10	913.18	904.57	913.25	0.000346	3.05	4387.92	759.44	0.14
Reach-1	20697.39		Bridge									
Reach-1	20554.27	100-yr	5108.00	895.09	911.52	907.55	911.80	0.001622	5.31	2037.00	530.22	0.27
Reach-1	20415.24	100-yr	5108.00	895.10	910.50	905.12	911.31	0.003818	7.55	953.24	228.97	0.40
Reach-1	19422	100-yr	5108.00	896.00	909.84		909.88	0.000581	2.65	5071.08	1147.73	0.16
Reach-1	19008	100-yr	5108.00	896.00	909.50		909.60	0.000823	3.66	3616.72	697.37	0.19
Reach-1	18742	100-yr	5108.00	894.00	908.92	903.53	909.28	0.000939	5.46	1611.52	324.38	0.28
Reach-1	18653		Bridge									
Reach-1	18537	100-yr	5108.00	894.00	908.44	903.69	908.79	0.001029	5.39	1741.26	351.26	0.29
Reach-1	18128.35	100-yr	6189.00	892.80	908.30		908.36	0.000530	3.05	5583.65	975.55	0.14
Reach-1	16876.93	100-yr	6211.00	892.30	907.52		907.59	0.000716	3.63	5120.71	1023.07	0.17
Reach-1	16860.73	100-yr	6211.00	892.30	907.52	902.10	907.58	0.000520	3.52	5557.04	952.66	0.16
Reach-1	16836.73		Bridge									
Reach-1	16735.08	100-yr	6211.00	892.30	907.05	902.62	907.13	0.000580	3.68	5369.12	1040.72	0.17
Reach-1	16698.19	100-yr	6211.00	892.20	906.99		907.10	0.001006	4.18	4336.37	905.38	0.20
Reach-1	14987.46	100-yr	6178.00	889.50	904.38		904.70	0.002032	5.94	2801.65	743.07	0.29
Reach-1	13118.86	100-yr	6178.00	885.60	902.88		902.95	0.000507	3.62	5549.15	1013.06	0.16
Reach-1	13083.81	100-yr	6178.00	885.60	902.81	896.93	902.92	0.000622	3.92	4758.58	920.49	0.18
Reach-1	13065.81		Bridge									
Reach-1	12970.00	100-yr	6178.00	885.60	902.20	896.20	902.37	0.000905	4.63	4187.01	976.93	0.22
Reach-1	12928.53	100-yr	6178.00	885.60	902.20		902.31	0.000685	4.08	4885.27	956.82	0.19
Reach-1	11512.45	100-yr	6178.00	884.50	900.89		901.06	0.001193	4.83	3159.77	500.62	0.22
Reach-1	9438.85	100-yr	6198.00	883.21	899.25		899.34	0.000626	3.66	5124.12	1082.78	0.17
Reach-1	9278.07	100-yr	6198.00	883.00	898.31	893.46	898.98	0.002911	7.63	1266.23	1041.66	0.37
Reach-1	9260.07		Bridge									

HEC-RAS Plan: Exist Cond1 River: RIVER-1 Reach: Reach-1 Profile: 100-yr (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach-1	9171.12	100-yr	6198.00	883.00	895.57	895.49	898.28	0.013533	14.81	707.15	757.36	0.79
Reach-1	9111.18	100-yr	6198.00	883.00	896.49		896.83	0.002169	6.04	2683.28	729.31	0.31
Reach-1	8202.12	100-yr	6198.00	882.67	896.06		896.09	0.000332	2.42	7431.20	1327.42	0.13
Reach-1	7811	100-yr	6198.00	882.30	895.90		895.93	0.000501	2.59	6490.15	1281.74	0.15
Reach-1	7419	100-yr	6198.00	881.90	895.71		895.73	0.000517	2.50	6920.92	1462.65	0.14
Reach-1	6800	100-yr	6198.00	881.50	895.58		895.59	0.000121	1.42	11502.62	1651.85	0.07
Reach-1	6136.29	100-yr	6313.00	881.10	895.40		895.44	0.000475	2.86	5627.08	826.76	0.14
Reach-1	5144.74	100-yr	6313.00	880.10	895.10		895.12	0.000230	1.96	8646.97	1333.04	0.10
Reach-1	4675.43	100-yr	6313.00	878.90	894.81	888.87	894.92	0.000604	3.68	3576.69	1471.67	0.18
Reach-1	4625.43		Bridge									
Reach-1	4461.04	100-yr	6313.00	878.90	894.39	889.50	894.56	0.001105	4.78	2982.41	1231.90	0.23
Reach-1	3867.21	100-yr	6313.00	878.90	894.17		894.20	0.000335	2.60	5544.00	604.95	0.12
Reach-1	2017.05	100-yr	6313.00	877.40	894.05		894.06	0.000032	0.90	17229.37	1578.86	0.04
Reach-1	196.89	100-yr	6313.00	875.10	893.72		893.88	0.000702	4.47	3752.87	591.14	0.19
Reach-1	171.03	100-yr	6313.00	875.10	893.60	887.36	893.84	0.001070	5.42	3329.44	597.00	0.24
Reach-1	153.03		Bridge									
Reach-1	82.48	100-yr	6313.00	875.10	893.39	886.27	893.42	0.000205	2.39	6603.40	687.90	0.10
Reach-1	35.84	100-yr	6313.00	875.10	893.18	886.08	893.36	0.000800	4.67	3548.95	572.70	0.20

HEC-RAS Plan: Proposed Cond1 River: RIVER-1 Reach: Reach-1 Profile: 100-yr

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach-1	43944.16	100-yr	2830.00	938.00	947.34		947.55	0.001351	4.10	1327.49	446.17	0.25
Reach-1	43809.34	100-yr	2830.00	937.50	947.10	945.73	947.28	0.003026	4.89	1495.95	518.11	0.34
Reach-1	43475.28	100-yr	2830.00	936.46	944.64	944.64	945.47	0.011310	9.01	839.93	524.51	0.65
Reach-1	42101.69	100-yr	2830.00	931.66	942.36		942.40	0.000716	2.78	2703.93	669.30	0.17
Reach-1	41583.57	100-yr	2830.00	930.49	941.80		941.89	0.001431	4.57	2245.88	654.36	0.25
Reach-1	40922.19	100-yr	3494.00	928.61	941.53		941.57	0.000244	2.14	3563.75	656.18	0.11
Reach-1	39905.41	100-yr	3721.00	924.53	940.96		941.13	0.000895	4.66	2219.06	407.26	0.21
Reach-1	39877.93	100-yr	3721.00	924.40	939.40	937.92	940.72	0.008067	11.30	628.75	279.39	0.52
Reach-1	39845.43		Bridge									
Reach-1	39780.42	100-yr	3721.00	924.40	938.08	936.00	939.40	0.007193	10.20	569.55	356.46	0.56
Reach-1	39730.93	100-yr	3721.00	924.40	938.26	937.45	938.70	0.004088	7.69	1590.06	564.34	0.40
Reach-1	38980.62	100-yr	3721.00	923.28	934.01	931.16	934.97	0.006156	8.25	739.22	319.56	0.50
Reach-1	38186.36	100-yr	3860.00	922.06	933.17		933.19	0.000922	2.28	4552.20	1476.18	0.16
Reach-1	37647.29	100-yr	3860.00	921.00	932.86		932.88	0.000366	2.20	5171.72	1288.27	0.12
Reach-1	36111.29	100-yr	3860.00	918.50	931.79		931.92	0.001227	4.16	2569.98	664.98	0.22
Reach-1	36077.48	100-yr	3860.00	918.50	931.69	926.98	931.87	0.001131	4.36	2128.66	467.47	0.23
Reach-1	36059.98		Bridge									
Reach-1	35961.54	100-yr	3860.00	918.50	931.36	927.12	931.48	0.000954	3.98	2826.96	752.36	0.21
Reach-1	35926.80	100-yr	3860.00	918.20	931.24		931.42	0.001714	4.74	2218.08	632.95	0.26
Reach-1	34813.74	100-yr	3860.00	915.70	928.75		929.12	0.002620	6.23	1736.92	610.24	0.33
Reach-1	34781.20	100-yr	3860.00	915.70	928.86	921.52	928.95	0.000439	3.05	3145.80	590.01	0.15
Reach-1	34751.20		Culvert									
Reach-1	34679.65	100-yr	3860.00	915.71	928.56	921.64	928.71	0.000685	3.53	2267.72	578.32	0.18
Reach-1	34633.42	100-yr	3860.00	915.69	927.74		928.46	0.004910	8.04	1191.48	505.69	0.44
Reach-1	32168.69	100-yr	5111.00	911.06	925.43		925.46	0.000571	2.65	5337.45	1337.37	0.15
Reach-1	30960.21	100-yr	5111.00	908.97	924.27		924.43	0.001365	4.62	3104.66	803.75	0.23
Reach-1	30904.46	100-yr	5111.00	908.90	924.23	920.92	924.34	0.000861	4.29	3956.41	938.29	0.21
Reach-1	30886.46		Bridge									
Reach-1	30803.00	100-yr	5111.00	908.90	923.58	920.42	923.97	0.002141	6.59	2333.30	733.01	0.32
Reach-1	30713.78	100-yr	5111.00	908.89	923.44		923.72	0.002276	5.70	2455.65	752.83	0.29
Reach-1	29349.80	100-yr	5149.00	906.10	923.04		923.06	0.000175	1.89	8866.61	1657.66	0.09
Reach-1	29107.28	100-yr	5149.00	905.60	922.47	915.27	922.85	0.001316	5.72	1503.33	1825.22	0.26
Reach-1	29047.28		Culvert									
Reach-1	28914.34	100-yr	5149.00	905.40	921.73	916.23	922.42	0.002686	7.59	1151.65	1883.18	0.35
Reach-1	28622.47	100-yr	5149.00	905.15	921.93		921.94	0.000199	2.05	8320.98	1772.51	0.10
Reach-1	28516.68	100-yr	5149.00	905.00	921.55	916.34	921.83	0.001225	5.22	1956.88	1237.30	0.25
Reach-1	28505.18		Bridge									
Reach-1	28387.51	100-yr	5149.00	905.00	918.84	917.46	919.81	0.005096	9.05	1116.02	1065.63	0.48
Reach-1	28357.92	100-yr	5149.00	905.01	919.23		919.31	0.000851	3.63	4664.48	1322.08	0.20
Reach-1	27682.80	100-yr	5149.00	903.86	918.49		918.62	0.001424	4.53	3752.26	1257.88	0.25
Reach-1	26944.13	100-yr	5108.00	903.20	917.86		917.91	0.000606	3.22	4909.57	1047.93	0.17
Reach-1	26070.40	100-yr	5108.00	902.30	917.75		917.75	0.000081	1.19	11209.86	1487.84	0.06
Reach-1	25555.50	100-yr	5108.00	901.50	917.64		917.67	0.000289	2.26	7207.00	1587.24	0.11
Reach-1	25415.97	100-yr	5108.00	901.50	917.22	910.39	917.52	0.001126	5.21	1828.02	1565.41	0.24
Reach-1	25397.47		Bridge									
Reach-1	25254.46	100-yr	5108.00	901.50	916.45	909.13	916.69	0.000900	4.50	1870.81	982.38	0.22
Reach-1	25230.74	100-yr	5108.00	901.50	916.44	908.89	916.66	0.000819	4.31	1877.37	922.71	0.21
Reach-1	25218.24		Bridge									
Reach-1	25132.03	100-yr	5108.00	901.50	914.90	911.02	915.40	0.002497	6.75	1448.40	936.20	0.35
Reach-1	25084.68	100-yr	5108.00	901.51	915.06		915.14	0.000588	3.16	4080.80	810.43	0.17
Reach-1	24474.86	100-yr	5108.00	900.65	914.71		914.78	0.000647	3.23	4034.67	751.25	0.17
Reach-1	23904.21	100-yr	5108.00	899.49	914.58		914.59	0.000176	1.85	7146.08	980.37	0.09
Reach-1	22850.91	100-yr	5108.00	897.20	914.32		914.36	0.000283	2.41	6342.24	1199.65	0.11
Reach-1	20798.84	100-yr	5108.00	895.20	913.14		913.34	0.000985	4.40	2686.21	613.55	0.21
Reach-1	20747.39	100-yr	5108.00	895.10	913.18	904.57	913.25	0.000346	3.05	4387.92	759.44	0.14
Reach-1	20697.39		Bridge									
Reach-1	20554.27	100-yr	5108.00	895.09	911.52	907.55	911.80	0.001622	5.31	2037.00	530.22	0.27
Reach-1	20415.24	100-yr	5108.00	895.10	910.50	905.12	911.31	0.003818	7.55	953.24	228.97	0.40
Reach-1	19422	100-yr	5108.00	896.00	909.84		909.88	0.000581	2.65	5071.08	1147.73	0.16
Reach-1	19008	100-yr	5108.00	896.00	909.50		909.60	0.000823	3.66	3616.72	697.37	0.19
Reach-1	18742	100-yr	5108.00	894.00	908.92	903.53	909.28	0.000939	5.46	1611.52	324.38	0.28
Reach-1	18653		Bridge									
Reach-1	18537	100-yr	5108.00	894.00	908.44	903.69	908.79	0.001029	5.39	1741.26	351.26	0.29
Reach-1	18128.35	100-yr	6189.00	892.80	908.30		908.36	0.000530	3.05	5583.65	975.55	0.14
Reach-1	16876.93	100-yr	6211.00	892.30	907.52		907.59	0.000716	3.63	5120.71	1023.07	0.17
Reach-1	16860.73	100-yr	6211.00	892.30	907.52	902.10	907.58	0.000520	3.52	5557.04	952.66	0.16
Reach-1	16836.73		Bridge									
Reach-1	16735.08	100-yr	6211.00	892.30	907.05	902.62	907.13	0.000580	3.68	5369.12	1040.72	0.17
Reach-1	16698.19	100-yr	6211.00	892.20	906.99		907.10	0.001006	4.18	4336.37	905.38	0.20
Reach-1	14987.46	100-yr	6178.00	889.50	904.38		904.70	0.002032	5.94	2801.65	743.07	0.29
Reach-1	13118.86	100-yr	6178.00	885.60	902.88		902.95	0.000507	3.62	5549.15	1013.06	0.16
Reach-1	13083.81	100-yr	6178.00	885.60	902.81	896.93	902.92	0.000622	3.92	4758.58	920.49	0.18
Reach-1	13065.81		Bridge									
Reach-1	12970.00	100-yr	6178.00	885.60	902.20	896.20	902.37	0.000905	4.63	4187.01	976.93	0.22
Reach-1	12928.53	100-yr	6178.00	885.60	902.20		902.31	0.000685	4.08	4885.27	956.82	0.19
Reach-1	11512.45	100-yr	6178.00	884.50	900.89		901.06	0.001193	4.83	3159.77	500.62	0.22
Reach-1	9438.85	100-yr	6198.00	883.21	899.25		899.34	0.000626	3.66	5124.12	1082.78	0.17
Reach-1	9278.07	100-yr	6198.00	883.00	898.31	893.46	898.98	0.002911	7.63	1266.23	1041.66	0.37
Reach-1	9260.07		Bridge									

HEC-RAS Plan: Proposed Cond1 River: RIVER-1 Reach: Reach-1 Profile: 100-yr (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach-1	9171.12	100-yr	6198.00	883.00	895.53	895.49	898.28	0.013739	14.89	702.44	755.21	0.79
Reach-1	9111.18	100-yr	6198.00	883.00	896.46		896.81	0.002198	6.07	2665.41	727.18	0.32
Reach-1	8202.12	100-yr	6198.00	882.67	896.03		896.06	0.000337	2.43	7389.08	1326.53	0.13
Reach-1	7811	100-yr	6198.00	882.30	895.89		895.91	0.000421	2.38	7087.26	1355.95	0.13
Reach-1	7419	100-yr	6198.00	881.90	895.70		895.73	0.000526	2.53	6832.78	1503.91	0.14
Reach-1	6800	100-yr	6198.00	881.50	895.58		895.59	0.000121	1.42	11495.16	1651.82	0.07
Reach-1	6136.29	100-yr	6313.00	881.10	895.40		895.44	0.000465	2.83	5777.21	894.88	0.14
Reach-1	5144.74	100-yr	6313.00	880.10	895.10		895.12	0.000230	1.96	8646.97	1333.04	0.10
Reach-1	4675.43	100-yr	6313.00	878.90	894.81	888.87	894.92	0.000604	3.68	3576.69	1471.67	0.18
Reach-1	4625.43		Bridge									
Reach-1	4461.04	100-yr	6313.00	878.90	894.39	889.50	894.56	0.001105	4.78	2982.41	1231.90	0.23
Reach-1	3867.21	100-yr	6313.00	878.90	894.17		894.20	0.000335	2.60	5544.00	604.95	0.12
Reach-1	2017.05	100-yr	6313.00	877.40	894.05		894.06	0.000032	0.90	17229.37	1578.86	0.04
Reach-1	196.89	100-yr	6313.00	875.10	893.72		893.88	0.000702	4.47	3752.87	591.14	0.19
Reach-1	171.03	100-yr	6313.00	875.10	893.60	887.36	893.84	0.001070	5.42	3329.44	597.00	0.24
Reach-1	153.03		Bridge									
Reach-1	82.48	100-yr	6313.00	875.10	893.39	886.27	893.42	0.000205	2.39	6603.40	687.90	0.10
Reach-1	35.84	100-yr	6313.00	875.10	893.18	886.08	893.36	0.000800	4.67	3548.95	572.70	0.20

HEC-RAS Plan: Proposed FW1 River: RIVER-1 Reach: Reach-1 (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach-1	20554.27	Natural	5108.00	895.09	911.52	907.55	911.80	0.001622	5.31	2037.00	530.22	0.27
Reach-1	20554.27	FW	5108.00	895.09	911.61	906.93	912.21	0.002672	6.85	1130.48	150.00	0.35
Reach-1	20415.24	Natural	5108.00	895.10	910.50	905.12	911.31	0.003818	7.55	953.24	228.97	0.40
Reach-1	20415.24	FW	5108.00	895.10	911.15	905.12	911.81	0.002943	6.89	1085.41	208.00	0.35
Reach-1	19422	Natural	5108.00	896.00	909.84		909.88	0.000581	2.65	5071.08	1147.73	0.16
Reach-1	19422	FW	5108.00	896.00	910.58		910.63	0.000502	2.60	4266.82	655.00	0.15
Reach-1	19008	Natural	5108.00	896.00	909.50		909.60	0.000823	3.66	3616.72	697.37	0.19
Reach-1	19008	FW	5108.00	896.00	910.21		910.34	0.000911	4.01	2699.47	375.00	0.21
Reach-1	18742	Natural	5108.00	894.00	908.92	903.53	909.28	0.000939	5.46	1611.52	324.38	0.28
Reach-1	18742	FW	5108.00	894.00	909.57	903.51	910.01	0.000953	5.71	1307.89	150.00	0.29
Reach-1	18653		Bridge									
Reach-1	18537	Natural	5108.00	894.00	908.44	903.69	908.79	0.001029	5.39	1741.26	351.26	0.29
Reach-1	18537	FW	5108.00	894.00	909.19	903.45	909.79	0.001313	6.37	954.02	105.00	0.33
Reach-1	18128.35	Natural	6189.00	892.80	908.30		908.36	0.000530	3.05	5583.65	975.55	0.14
Reach-1	18128.35	FW	6189.00	892.80	909.12		909.19	0.000580	3.32	4273.25	530.00	0.15
Reach-1	16876.93	Natural	6211.00	892.30	907.52		907.59	0.000716	3.63	5120.71	1023.07	0.17
Reach-1	16876.93	FW	6211.00	892.30	908.21		908.33	0.000887	4.18	3582.91	500.00	0.19
Reach-1	16860.73	Natural	6211.00	892.30	907.52	902.10	907.58	0.000520	3.52	5557.04	952.66	0.16
Reach-1	16860.73	FW	6211.00	892.30	908.21	902.10	908.30	0.000561	3.77	4165.58	500.00	0.17
Reach-1	16836.73		Bridge									
Reach-1	16735.08	Natural	6211.00	892.30	907.05	902.62	907.13	0.000580	3.68	5369.12	1040.72	0.17
Reach-1	16735.08	FW	6211.00	892.30	908.04	902.62	908.17	0.000687	4.19	3749.32	500.00	0.19
Reach-1	16698.19	Natural	6211.00	892.20	906.99		907.10	0.001006	4.18	4336.37	905.38	0.20
Reach-1	16698.19	FW	6211.00	892.20	907.99		908.13	0.001028	4.44	3392.14	500.00	0.21
Reach-1	14987.46	Natural	6178.00	889.50	904.38		904.70	0.002032	5.94	2801.65	743.07	0.29
Reach-1	14987.46	FW	6178.00	889.50	905.25		905.67	0.002114	6.32	1799.66	245.00	0.30
Reach-1	13118.86	Natural	6178.00	885.60	902.88		902.95	0.000507	3.62	5549.15	1013.06	0.16
Reach-1	13118.86	FW	6178.00	885.60	903.37		903.51	0.000679	4.28	3333.57	350.00	0.19
Reach-1	13083.81	Natural	6178.00	885.60	902.81	896.93	902.92	0.000622	3.92	4758.58	920.49	0.18
Reach-1	13083.81	FW	6178.00	885.60	903.22	896.93	903.45	0.000938	4.91	2771.24	350.00	0.22
Reach-1	13065.81		Bridge									
Reach-1	12970.00	Natural	6178.00	885.60	902.20	896.20	902.37	0.000905	4.63	4187.01	976.93	0.22
Reach-1	12970.00	FW	6178.00	885.60	902.76	896.20	903.06	0.001232	5.54	2479.14	350.00	0.25
Reach-1	12928.53	Natural	6178.00	885.60	902.20		902.31	0.000685	4.08	4885.27	956.82	0.19
Reach-1	12928.53	FW	6178.00	885.60	902.79		902.95	0.000821	4.58	3123.75	350.00	0.21
Reach-1	11512.45	Natural	6178.00	884.50	900.89		901.06	0.001193	4.83	3159.77	500.62	0.22
Reach-1	11512.45	FW	6178.00	884.50	901.47		901.63	0.001093	4.74	2882.64	350.00	0.22
Reach-1	9438.85	Natural	6198.00	883.21	899.25		899.34	0.000626	3.66	5124.12	1082.78	0.17
Reach-1	9438.85	FW	6198.00	883.21	899.25		899.45	0.001055	4.75	2711.86	350.00	0.23
Reach-1	9278.07	Natural	6198.00	883.00	898.31	893.46	898.98	0.002911	7.63	1266.23	1041.66	0.37
Reach-1	9278.07	FW	6198.00	883.00	898.30	893.49	899.03	0.003100	7.87	1264.82	132.00	0.38
Reach-1	9260.07		Bridge									
Reach-1	9171.12	Natural	6198.00	883.00	895.53	895.49	898.28	0.013739	14.89	702.44	755.21	0.79
Reach-1	9171.12	FW	6198.00	883.00	896.53	895.46	898.71	0.009887	13.39	783.77	118.00	0.68
Reach-1	9111.18	Natural	6198.00	883.00	896.46		896.81	0.002198	6.07	2665.41	727.18	0.32
Reach-1	9111.18	FW	6198.00	883.00	897.17		897.58	0.002171	6.28	1927.91	300.00	0.32
Reach-1	8202.12	Natural	6198.00	882.67	896.03		896.06	0.000337	2.43	7389.08	1326.53	0.13
Reach-1	8202.12	FW	6198.00	882.67	896.77		896.80	0.000352	2.59	6325.65	940.00	0.13
Reach-1	7811	Natural	6198.00	882.30	895.89		895.91	0.000421	2.38	7087.26	1355.95	0.13
Reach-1	7811	FW	6198.00	882.30	896.61		896.65	0.000457	2.60	6028.53	981.50	0.14
Reach-1	7419	Natural	6198.00	881.90	895.70		895.73	0.000526	2.53	6832.78	1503.91	0.14

HEC-RAS Plan: Proposed FW1 River: RIVER-1 Reach: Reach-1 (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach-1	7419	FW	6198.00	881.90	896.44		896.46	0.000472	2.51	6282.78	1008.90	0.14
Reach-1	6800	Natural	6198.00	881.50	895.58		895.59	0.000121	1.42	11495.16	1651.82	0.07
Reach-1	6800	FW	6198.00	881.50	896.27		896.29	0.000180	1.80	8284.39	1000.00	0.09
Reach-1	6136.29	Natural	6313.00	881.10	895.40		895.44	0.000465	2.83	5777.21	894.88	0.14
Reach-1	6136.29	FW	6313.00	881.10	896.05		896.08	0.000627	2.70	4916.71	645.57	0.13
Reach-1	5144.74	Natural	6313.00	880.10	895.10		895.12	0.000230	1.96	8646.97	1333.04	0.10
Reach-1	5144.74	FW	6313.00	880.10	895.52		895.56	0.000448	2.80	5347.32	685.00	0.14
Reach-1	4675.43	Natural	6313.00	878.90	894.81	888.87	894.92	0.000604	3.68	3576.69	1471.67	0.18
Reach-1	4675.43	FW	6313.00	878.90	895.20	888.86	895.31	0.000538	3.54	3749.95	436.00	0.17
Reach-1	4625.43		Bridge									
Reach-1	4461.04	Natural	6313.00	878.90	894.39	889.50	894.56	0.001105	4.78	2982.41	1231.90	0.23
Reach-1	4461.04	FW	6313.00	878.90	894.84	889.50	894.99	0.000951	4.54	3156.05	387.00	0.22
Reach-1	3867.21	Natural	6313.00	878.90	894.17		894.20	0.000335	2.60	5544.00	604.95	0.12
Reach-1	3867.21	FW	6313.00	878.90	894.56		894.62	0.000430	3.00	4542.09	450.00	0.14
Reach-1	2017.05	Natural	6313.00	877.40	894.05		894.06	0.000032	0.90	17229.37	1578.86	0.04
Reach-1	2017.05	FW	6313.00	877.40	894.27		894.28	0.000096	1.57	9510.58	850.00	0.07
Reach-1	196.89	Natural	6313.00	875.10	893.72		893.88	0.000702	4.47	3752.87	591.14	0.19
Reach-1	196.89	FW	6313.00	875.10	893.72		893.89	0.000699	4.46	3114.79	335.00	0.19
Reach-1	171.03	Natural	6313.00	875.10	893.60	887.36	893.84	0.001070	5.42	3329.44	597.00	0.24
Reach-1	171.03	FW	6313.00	875.10	893.60	887.36	893.85	0.001097	5.49	2721.85	340.00	0.24
Reach-1	153.03		Bridge									
Reach-1	82.48	Natural	6313.00	875.10	893.39	886.27	893.42	0.000205	2.39	6603.40	687.90	0.10
Reach-1	82.48	FW	6313.00	875.10	893.38	886.38	893.42	0.000230	2.52	5583.18	460.00	0.11
Reach-1	35.84	Natural	6313.00	875.10	893.18	886.06	893.36	0.000800	4.67	3548.95	572.70	0.20
Reach-1	35.84	FW	6313.00	875.10	893.17	886.06	893.36	0.000800	4.67	3547.48	571.97	0.20

Cut/Fill Report

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Volume Summary

Name	Type	Cut Factor	Fill Factor	2d Area (Sq. Ft.)	Cut (Cu. Yd.)	Fill (Cu. Yd.)	Net (Cu. Yd.)
TOTAL SITE CUT-FILL	full	1.000	1.100	454020.20	15642.85	13835.53*	1807.32*
ONLY FLOODPLAIN CUT-FILL	bounded	1.000	1.100	185130.37	8383.25	6448.29*	1934.96*

Totals

	2d Area (Sq. Ft.)	Cut (Cu. Yd.)	Fill (Cu. Yd.)	Net (Cu. Yd.)
Total	639150.56	24026.10	20283.82*	3742.27*

* Value adjusted by cut or fill factor other than 1.0

NOTE:

1. BOUNDARY INFORMATION SHOWN OBTAINED FROM A BOUNDARY RETRACEMENT & TOPOGRAPHIC SURVEY FOR 20 WEST TRANSPORT PARTNERS LLC PREPARED BY GASKINS AND DATED 07/17/2022.
2. TOPOGRAPHIC DATA OBTAINED FROM A BOUNDARY RETRACEMENT & TOPOGRAPHIC SURVEY FOR 20 WEST TRANSPORT PARTNERS LLC PREPARED BY GASKINS AND DATED 07/17/2022.
3. THE F.I.R.M. PANEL 13067C0183H DATE 08/31/2022 INDICATES THIS PROPERTY OR A PORTION IS LOCATED IN A FLOOD HAZARD AREA.
4. THE U.S. FISH & WILDLIFE NATIONAL WETLANDS INVENTORY MAP HAS BEEN CONSULTED, AND WETLANDS ARE SHOWN TO BE PRESENT WITHIN PROJECT LIMITS.

CREEK & FLOODPLAIN LEGEND	
CENTER LINE OF CREEK	
BUFFERS & SETBACKS (PER FIELD RUN SURVEY)	
FLOOD PLAIN DELINEATION	
WETLAND AREA (PER FIELD RUN SURVEY)	

LEGEND

R/W RIGHT OF WAY	EXISTING FIRE HYDRANT	OHP OVERHEAD POWER	
I.P.F. IRON PIN FOUND	PROPOSED FIRE HYDRANT	UGT UNDERGROUND TELEPHONE	
I.P.P. IRON PIN PLACED	LIGHT POLE	OHT OVERHEAD TELEPHONE	
C.T. CRIMPED TOP PIPE	GUY POLE	W WATER	
R.B. REINFORCING BAR	UTILITY POLE	SS SANITARY SEWER	
O.T. OPEN TOP PIPE	UNDERGROUND DOWNSPOUT	FM FORCE MAIN	
N/F NOW OR FORMERLY	OVERGROUND DOWNSPOUT	G GAS	
B.L. BUILDING LINE	WATER VALVE	SD STORM DRAIN	
1033 CATCH BASIN	GAS VALVE	SB SEDIMENT BARRIER	
1034 CATCH BASIN	HANDICAPPED PARKING	TP TREE PROTECTION FENCE	
1019A DROP INLET	TRAFFIC FLOW	PROPOSED FENCE	
1011A JUNCTION BOX	UNDERGROUND POWER	EXISTING FENCE	
1019A TYPE E CURB INLET	EXISTING WATER METER	PROPERTY LINE	
HEADWALL	PROPOSED WATER METER	EXISTING CONTOUR	
DRAINAGE SLOPE	GAS METER	PROPOSED CONTOUR	
SEWER MANHOLE	POWER METER	EXISTING CURB & GUTTER	
		PROPOSED CURB & GUTTER	
		X 1010 EXISTING SPOT ELEVATION	
		1010 PROPOSED SPOT ELEVATION	

24-HR CONTACT

20 WEST TRANSPORT PARTNERS, LLC.
ATTN: MARK HAWKS
910 DAVIS BEND ALPHARETTA, GA 30004
[redacted]

GEORGIA811 Utilities Protection Center, Inc.
Know what's below. Call before you dig.

GRAPHIC SCALE
80 0 40 80 160 320
(IN FEET)
1 inch = 80 ft.

N
MAGNETIC

REV.	DATE	DESCRIPTION

GEORGIA REGISTERED No. 041025 PROFESSIONAL ENGINEER MICHAEL G. FORLAW

THE SOUTHEAST CIVIL GROUP
ENGINEERING • CONSULTING
8605 BILLING PARKWAY
DOUGLASVILLE, GEORGIA 30134
EMAIL: [redacted]

JOB #: 220702
SCALE: 1"=80'
DATE: 02/02/2023
DESIGN BY: MGF

CUT & FILL ANALYSIS

20 WEST TRANSPORT PARTNERS LLC

LOCATED IN LL 1096, 1125, 1126, 1127, 1169, DISTRICT 19 CITY OF POWDER SPRINGS, COBB COUNTY, GEORGIA

SHEET:
C-2.8

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Volume Summary

Name	Type	Cut Factor	Fill Factor	2d Area (Sq. Ft.)	Cut (Cu. Yd.)	Fill (Cu. Yd.)	Net (Cu. Yd.)
TOTAL SITE CUT-FILL	full	1.000	1.100	454020.20	15642.85	13835.53*	1807.32*
ONLY FLOODPLAIN CUT-FILL	bounded	1.000	1.100	185130.37	8383.25	6448.29*	1934.96*

Totals

	2d Area (Sq. Ft.)	Cut (Cu. Yd.)	Fill (Cu. Yd.)	Net (Cu. Yd.)
Total	639150.56	24026.10	20283.82*	3742.27*

* Value adjusted by cut or fill factor other than 1.0

Elevations Table

Number	Minimum Elevation	Maximum Elevation	Area	Color
1	-12.00	-10.00	227.21	
2	-10.00	-8.00	1116.51	
3	-8.00	-6.00	7546.58	
4	-6.00	-4.00	20440.42	
5	-4.00	-2.00	48631.78	
6	-2.00	0.00	166002.51	
7	0.00	2.00	138806.84	
8	2.00	4.00	55742.10	
9	4.00	6.00	14533.68	
10	6.00	8.00	972.55	

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GRAPHIC SCALE

80 0 40 80 160 320

(IN FEET)
1 inch = 80 ft.

GEORGIA811
Utilities Protection Center, Inc.
Know what's below. Call before you dig.

24-HR CONTACT

20 WEST TRANSPORT PARTNERS, LLC.
ATTN: MARK HAWKS
910 DAVIS BEND ALPHARETTA, GA 30004
[redacted]

CREEK & FLOODPLAIN LEGEND	
CENTER LINE OF CREEK	
BUFFERS & SETBACKS (PER FIELD RUN SURVEY)	
FLOOD PLAIN DELINEATION	
WETLAND AREA (PER FIELD RUN SURVEY)	

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Volume Summary

Name	Type	Cut Factor	Fill Factor	2d Area (Sq. Ft.)	Cut (Cu. Yd.)	Fill (Cu. Yd.)	Net (Cu. Yd.)
TOTAL SITE CUT-FILL	full	1.000	1.100	454020.20	15642.85	13835.53*	1807.32*
ONLY FLOODPLAIN CUT-FILL	bounded	1.000	1.100	185130.37	8383.25	6448.29*	1934.96*

Totals

	2d Area (Sq. Ft.)	Cut (Cu. Yd.)	Fill (Cu. Yd.)	Net (Cu. Yd.)
Total	639150.56	24026.10	20283.82*	3742.27*

* Value adjusted by cut or fill factor other than 1.0

Elevations Table

Number	Minimum Elevation	Maximum Elevation	Area	Color
1	-12.00	-10.00	227.21	
2	-10.00	-8.00	1116.51	
3	-8.00	-6.00	7546.58	
4	-6.00	-4.00	20440.42	
5	-4.00	-2.00	48631.78	
6	-2.00	0.00	166002.51	
7	0.00	2.00	138806.84	
8	2.00	4.00	55742.10	
9	4.00	6.00	14533.68	
10	6.00	8.00	972.55	

file:///C:/Users/evan/AppData/Local/Temp/CutFillReport.html 1/1

NOTE:
1. BOUNDARY INFORMATION SHOWN OBTAINED FROM A BOUNDARY RETRACEMENT & TOPOGRAPHIC SURVEY FOR 20 WEST TRANSPORT PARTNERS LLC PREPARED BY GASKINS AND DATED 07/17/2022.
2. TOPOGRAPHIC DATA OBTAINED FROM A BOUNDARY RETRACEMENT & TOPOGRAPHIC SURVEY FOR 20 WEST TRANSPORT PARTNERS LLC PREPARED BY GASKINS AND DATED 07/17/2022.
3. THE F.I.R.M. PANEL 13067C0183H DATE 08/31/2022 INDICATES THIS PROPERTY OR A PORTION IS LOCATED IN A FLOOD HAZARD AREA.
4. THE U.S. FISH & WILDLIFE NATIONAL WETLANDS INVENTORY MAP HAS BEEN CONSULTED, AND WETLANDS ARE SHOWN TO BE PRESENT WITHIN PROJECT LIMITS.

LEGEND

R/W RIGHT OF WAY	EXISTING FIRE HYDRANT	OHP OVERHEAD POWER
I.P.F. IRON PIN FOUND	PROPOSED FIRE HYDRANT	UGT UNDERGROUND TELEPHONE
I.P.P. IRON PIN PLACED	LIGHT POLE	OHT OVERHEAD TELEPHONE
C.T. CRIMPED TOP PIPE	GUY POLE	W WATER
R.B. REINFORCING BAR	UTILITY POLE	S SANITARY SEWER
O.T. OPEN TOP PIPE	UNDERGROUND DOWNSPOUT	FM FORCE MAIN
N/F NOW OR FORMERLY	OVERGROUND DOWNSPOUT	G GAS
B.L. BUILDING LINE	WATER VALVE	SD STORM DRAIN
1033 CATCH BASIN	GAS VALVE	SB SEDIMENT BARRIER
1034 CATCH BASIN	HANDICAPPED PARKING	TP TREE PROTECTION FENCE
1018A DROP INLET	TRAFFIC FLOW	PROPOSED FENCE
1011A JUNCTION BOX	UNDERGROUND POWER	EXISTING FENCE
1019A TYPE E CURB INLET	EXISTING WATER METER	PROPERTY LINE
HEADWALL	PROPOSED WATER METER	EXISTING CONTOUR
DRAINAGE SLOPE	GAS METER	PROPOSED CONTOUR
SEWER MANHOLE	POWER METER	EXISTING CURB & GUTTER
		PROPOSED CURB & GUTTER
		X 1010 EXISTING SPOT ELEVATION
		◆ 1010 PROPOSED SPOT ELEVATION

REV.	DATE	DESCRIPTION

GEORGIA REGISTERED No. 041025 PROFESSIONAL ENGINEER MICHAEL G. FORLAW

THE SOUTHEAST CIVIL GROUP
ENGINEERING • DESIGN
8565 BAILEY PARKWAY
DOUGLASVILLE, GEORGIA 30134 EMAIL: [redacted]

JOB #: 220702
SCALE: 1"=80'
DATE: 02/02/2023
DESIGN BY: MGF

CUT & FILL ANALYSIS

20 WEST TRANSPORT PARTNERS LLC

LOCATED IN LL 1096, 1125, 1126, 1127, 1169, DISTRICT 19 CITY OF POWDER SPRINGS, COBB COUNTY, GEORGIA

SHEET: C-2.9

Appendix I – Operation & Maintenance

Grass Channel

Grass channels are vegetated open channels designed to enhance water quality by settling suspended solids through filtration, infiltration, and biofiltration. This practice offers a method to manage pollution while also conveying stormwater runoff. Grass channels are well suited to a number of applications and land uses, including treating runoff from roads and highways and pervious surfaces. Grass channels are broad and shallow channels that are generally positioned parallel to roadways or other impervious areas. They can also be used as a single BMP, a pretreatment to another BMP, or as a link between other BMPs.

There are some common problems to be aware of when maintaining a grass channel. They include, but are not limited to, the following:

- Trash, litter, and debris accumulation
- Watering the practice during dry periods
- Establishing vegetation within the grass channel
- Clogging in the inlet and outlet pipes
- Ant mounds
- Erosion

Routine inspection and maintenance should be performed on the grass channels to ensure that the practice is functioning properly. Routine maintenance tasks include removing trash from the grass channel and ensuring that grass clippings and other debris are removed from the channel.

In order to keep the water that exits the grass channel clean, fertilizers should only be used sparingly during the establishment of the practice. Once the vegetation in the practice has been established, fertilizers should not be used. While vegetation in the grass channel is important, a primary purpose of a grass channel is to act as a water quality device and introducing fertilizers into the grass channel introduces nutrients such as phosphorus and nitrogen that can pollute downstream waters. To control animal nuisances and invasive species, pesticides (including herbicides, fungicides, insecticides, or nematode control agents) should be used sparingly and only if necessary.

The table on the following page show routine maintenance activities typically associated with grass channels.

Grass Channel Typical Routine Maintenance Activities and Schedule

Activity	Schedule
• Mow grass to maintain a height of 3 to 4 inches. Remove grass clippings. • Repair eroded or bare spots. • Remove accumulated sediment, trash, and debris. • Water the practice during dry condition while vegetation is establishing.	As needed
• Inspect grass alongside slopes for erosion and formation of rills or gullies and correct. • Remove sediment from bottom of channel once sediment is 25% of the original design volume. • Remove trash and debris accumulated in the inflow forebay. • Inspect and correct erosion problems in the sand/soil bed of dry swales. • Based on inspection, plant an alternative grass species if the original grass cover has not been successfully established. • Inspect pea gravel diaphragm for clogging and correct the problem.	Annually (Semi-annually the first year and then annually thereafter)

Grass Channel					
Maintenance Item	Condition				Comment
	Good	Marginal	Poor	N/A*	
General Inspection					
Access to the site is adequately maintained for inspection and maintenance.					
Area is clean (trash, debris, grass clippings, etc. removed).					
Inlet					
Drainage ways (overland flow or pipes) to the practice are free of trash, debris, large branches, etc.					
Area around the inlet is mowed and grass clippings are removed.					
No evidence of gullies, rills, or excessive erosion around the inlet.					
No signs of clogging or damage around the inlet.					
Pretreatment (choose one)					
Forebay – area is free of trash, debris, and sediment.					
Filter Strip or Grass Channels – area is free of trash debris and sediment. Area has been mowed and grass clippings are removed. No evidence of erosion.					
Main Treatment					
Main treatment area is free of trash, debris, and sediment.					
No evidence of erosion in the practice.					
No evidence of long-term ponding or standing water in the ponding area of the practice (examples include: stains, odors, mosquito larvae, etc).					
No undesirable vegetation located within the practice.					
No evidence of use of fertilizer on plants (fertilizer crusting on the surface of the soil, blackened roots, etc.).					
Grass within and around practice is maintained at the proper height (3-4 inches). Grass clippings are removed.					
Grass cover seems healthy with no bare spots or dying grass.					

Grass Channel					
Maintenance Item	Condition				Comment
	Good	Marginal	Poor	N/A*	
No accumulating sediment within the grass channel.					
Outlet					
Outlet is free of trash, debris, and sediment.					
No evidence of erosion, scour, or flooding.					
Results					
Overall condition of Grass Channel:					
Additional Comments					
Notes: * If a specific maintenance item was not checked, please check N/A and explain why in the appropriate comment box.					

Stormwater Ponds

A stormwater pond is a constructed, shallow stormwater retention basin or landscaped area with a permanent pool of water. Stormwater runoff collected in the pool is treated through settling. In addition, the aquatic bench (fringe wetlands), safety bench, side slopes, and shallow areas of the pond include plants to aid in the filtration and infiltration of the stormwater runoff flowing through the practice.

There are some common problems to be aware of when maintaining a stormwater pond. They include, but are not limited to, the following:

- Sediment build-up
- Clogging in the inlet and outlet structure
- Establishing vegetation within the stormwater pond
- Pruning and weeding to maintain appearance
- Eutrophic conditions indicated by excessive algae growth or fish kills
- Creating a mosquito habitat

Routine inspection and maintenance should be performed on stormwater ponds to ensure that the structure is functioning properly. Note that during the first year the stormwater pond is built, maintenance may be required at a higher frequency to ensure the proper establishment of vegetation in the practice. For more information on vegetation in stormwater ponds, see Appendix D: Planting and Soil Guidance.

In addition to routine maintenance, stormwater ponds have seasonal and intermittent maintenance requirements. During the winter months, the stormwater pond should be inspected after a snow event (this is specific to northern areas of Georgia) to make sure that the materials used to de-ice the surrounding areas stay out of the practice to avoid further pollution. In addition, planting material should be trimmed during the winter, when the plants are dormant.

Inspect the stormwater pond after a large rainstorm. Keep drainage paths (both to and from the BMP) clean so that the water can properly flow into the stormwater pond. If the stormwater pond is not draining properly, check for clogging in the inflow and outflow structures.

If the forebay or stormwater pond has received a significant amount of sediment over a period of time, then the sediment at the bottom of the forebay or pond may need to be removed. Accumulated sediment in the practice decreases the available storage volume and affects the pond's ability to function as it was designed. A sediment marker should be placed in the forebay to determine when sediment removal is required. It important to note that sediment excavated from stormwater ponds

that does not receive stormwater runoff from stormwater hotspots are typically not considered to be toxic and can be safely disposed through either land application or landfilling. Stormwater hotspots are areas that produce higher concentrations of metals, hydrocarbons, or other pollutants than normally found in urban runoff. Examples of operations performed in potential stormwater hotspots include vehicle maintenance and repair, vehicle washing, landscaping/grounds care, and outdoor material and product storage. Check with the local development review authority to identify any additional constraints on the disposal of sediments excavated from stormwater ponds.

Periodic mowing of the pond buffer is only required along maintenance right-of-way and the embankment. The remaining buffer can be managed as a meadow (mowing every other year) or a forest.

In order to keep the water that exits the stormwater pond clean, fertilizers should be used sparingly during establishment. Once the vegetation in the practice has been established, fertlizers should not be used. While vegetation in the stormwater pond is important, the primary purpose of a stormwater pond is to act as a water quantity and quality device, and introducing fertilizers into the stormwater pond introduces nutrients such as phosphorus and nitrogen that can pollute downstream waters. In addition, stormwater ponds should already be nutrient rich environments that do not require fertilization. To control animal nuisances and invasive species, pesticides (including herbicides, fungicides, insecticides, or nematode control agents) should be used sparingly and only if necessary.

Stormwater ponds create a challenge for controlling mosquitos, because some types of vegetation, such as cattails, can create an environment that allows mosquitoes to breed both in the pond and along the shoreline. Keeping the practice free of trash will help the practice from becoming a mosquito habitat. Another method to control mosquitoes is to place fish, such as the mosquitofish (Gambusia affinis), in the pond to help with controlling the mosquitoes. Animals such as dragonflies, diving beetles, birds, and bats may aid on controlling mosquitoes, however it is likely that additional measures, such as chemicals, may be required to control the mosquitoes (using chemicals should be a last resort). Keeping the pond at a depth of four feet or greater can aid in mosquito control by limiting vegetation growing around the pond. If mosquitoes begin to pose a problem, consult a qualified professional.

Pond dam inspection and maintenance is also very important. The pond dam should be inspected for seepage and structural integrity. Look for saturated soil, sediment deposits, and flowing water at the base of an earthen dam and on the rear face of the dam. On concrete dams, look for seepage, cracks, leaks and rust stains, or bulges. If any signs of seepage are found, consult a Professional Engineer. Pests such as burrowing animals and fire ants can pose a major threat to dam safety. Fire ant tunnels and animal burrows can weaken the dam structure and create an undesired water pathway through the dam. In addition, tree roots are another source of potential damage and failure. Woody vegetation may not be planted on the embankment or allowed to grow within 15 feet of the toe of the embankment and 25 feet from the principal spillway structure. If you have a large dam that is subject to regulations by the state, other maintenance items may be required. Please consult a Professional Engineer for additional guidance.

Ponds can be an attractive nuisance, so security and safety should be taken into consideration. Fencing requirements are at the discretion of the local government. If security measures such as a fence and gate are present, ensure that they are functional and locked.

It is important that the embankment for a pond be inspected regularly for trees and animal activity. Trees growing on the top or sides of the embankment should be removed. The roots of trees grow into the embankment and will weaken the structure of the embankment by creating passage ways that allow water to flow through the embankment. Trees that are blown over or damaged by storms can loosen or remove soil which weakens the strength of the embankment. In the same way animals can burrow holes weakening the structure of the embankment. These holes act as a passage way for the water to travel through the embankment, increasing the potential for the embankment to fail.

Geese are attracted to open water, clean lines of sight, and grass. They can become a nuisance to stormwater ponds if they are causing damage to plants or the banks, or if they are 'loading' the pond with nutrients and bacteria. Geese can be discouraged from using a stormwater pond by planting the buffer with shrubs and native ground covers or installing an aquatic shelf, but ensure that access points are maintained.

The table below shows a schedule for when different maintenance activities should be performed on a stormwater pond.

Stormwater Ponds Typical Routine Maintenance Activities and Schedule

Activity	Schedule
• Inspect inlets, outlets and overflow spillway to ensure good condition and no evidence of erosion. • Clean and remove debris from inlet and outlet structures. • Mow side slopes. • Inspect pond dam for structural integrity. • Remove trash from the area around the pond.	Monthly
• If wetland components are included, inspect for invasive vegetation.	Semiannual Inspection
• Inspect for damage, paying particular attention to the control structure. • Check for signs of eutrophic conditions (e.g., algal blooms and fish kills). • Note signs of hydrocarbon build-up (e.g., an oil sheen), and remove appropriately. • Monitor for sediment accumulation in the facility and forebay. • Check all control gates, valves, or other mechanical devices.	Annual Inspection
• Repair undercut or eroded areas.	As Needed
• Perform wetland plant management and harvesting.	Annually (if needed)
• Remove sediment from the forebay.	5 to 7 years or after 50% of the total forebay capacity has been lost

Activity	Schedule
• Monitor sediment accumulations, and remove sediment when the pool volume has become reduced significantly, or the pond becomes eutrophic.	10 to 20 years or after 25% of the permanent pool volume has been lost

(Source: WMI, 1997)

Stormwater Pond					
Maintenance Item	Condition				Comment
	Good	Marginal	Poor	N/A*	
General Inspection					
Access to the site is adequately maintained for inspection and maintenance.					
Area is clean (trash, debris, grass clippings, etc. removed).					
Inlet Structure					
Drainage ways (overland flow or pipes) to the practice are free of trash, debris, large branches, etc.					
Area around the inlet structure is mowed and grass clippings are removed.					
No evidence of gullies, rills, or excessive erosion around the inlet structure.					
Inlet pipe is in good condition, and water is going through the structure (i.e. no evidence of water going around the structure).					
Diversion structure (high flow bypass structure or other) is free of trash, debris, or sediment. Comment on overall condition of diversion structure and list type.					
Pretreatment (choose one)					
Forebay – area is free of trash, debris, and sediment.					
Filter Strip or Grass Channels – area is free of trash debris and sediment. Area has been mowed and grass clippings are removed. No evidence of erosion.					
Rock Lined Plunge Pools – area is free of trash debris and sediment. Rock thickness in pool is adequate.					
Main Treatment					
Main treatment area is free of trash, debris, and sediment.					
Erosion protection is present on site (i.e. turf reinforcement mats). Comment on types of erosion protection and evaluate condition.					
No algal growth along or within the pond.					
Native plants were used in the practice according to the planting plan. No undesirable vegetation.					
Practice seems to be working properly. No settling around the stormwater pond.					

Stormwater Pond					
Maintenance Item	Condition				Comment
	Good	Marginal	Poor	N/A*	
Comment on overall condition of stormwater pond.					
Vegetation within and around practice is maintained per landscaping plan. Grass clippings are removed.					
No significant sediment accumulation within the practice.					
No evidence of use of fertilizer on plants (fertilizer crusting on the surface of the soil, tips of leaves turning brown or yellow, blackened roots, etc.).					
Plants seem to be healthy and in good condition. Comment on condition of plants.					
Emergency Overflow					
Emergency overflow is free of trash, debris, and sediment.					
No evidence of erosion, scour, flooding, or animal activity around the structure.					
No evidence of erosion, scour, or flooding around the structure.					
Outlet Structure					
Outlet structure is free of trash, debris, and sediment.					
No evidence of erosion, scour, or flooding around the structure.					
Outlet structure does not appear to be blocked.					
No evidence of animal activity.					
No evidence of seepage on the downstream face.					
Results					
Overall condition of Stormwater Pond:					
Additional Comments					
Notes: * If a specific maintenance item was not checked, please check N/A and explain why in the appropriate comment box.					