STORM WATER MANAGEMENT REPORT

Retail Development
NE Douglas St.
Lee Summit, Missouri

Pickering Job Number:
27480.00

Prepared for:

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Project Description

The proposed sites are located as follows Site 1 is located at the NW corner of NE Douglas Street and E Chipman Road in Lee Summit, Jackson County, Missouri and Site 2 is located at the SW corner of NE Tudor Rd and NW Commerce Dr in Lee Summit, Jackson County, Missouri. Site 1 is a 19.1-acre property will be a commercial development consisting of a grocery store, retail store, Parking lot, utilities, and ancillary stormwater facilities. Site 2 is a 2.45-acre property will be a commercial development consisting of a commercial store, Parking lot, utilities, and ancillary stormwater facilities. The Property's are in section 31, Township 48 North, Range 31 West.

Floodplain Information

Site 1:
According to the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) map number 29095C0417G (dated: January 20, 2017) the site lies outside of the 100-year inundation zone, Zone X, defined to be an area of minimal flood hazard. Refer to Appendix A for site location map and Appendix B for the FEMA Firm Panel.

Site 2:
According to the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) map number 29095C0417G (dated: January 20, 2017) the site lies outside of the 100-year inundation zone, Zone X, defined to be an area of minimal flood hazard. Refer to Appendix A for site location map and Appendix B for the FEMA Firm Panel.

Soil Classification
Site 1:
Soil classification published by the Unted States Department of Agriculture/Natural Resources Conservation Service (USDA/NRCS) website for Jackson County, MO on January 20, 2026, indicate the existing site is made up of two soil types:

10082	Arisburg-Urban land complex, 1 to 5 percent slopes
10180	Udarents- Urban land-Sampsel complex, 2 to 5 percent slopes

Refer to Appendix C for a detailed soil report.

Site 2:
Soil classification published by the Unted States Department of Agriculture/Natural Resources Conservation Service (USDA/NRCS) website for Jackson County, MO on March 2, 2026, indicate the existing site is made up of three soil types:

10120	Sharpsburg silt loam, 2 to 5 percent slopes

10128	Sharpsburg-Urban land complex, 2 to 5 percent slopes
10129	Sharpsburg-Urban land complex, 5 to 9 percent slopes

Refer to Appendix C for a detailed soil report.

Site Hydrology

Site 1:
On-site stormwater runoff is collected on the property in an on-site dry detention basin on the west of the site. From there, runoff discharges into the existing storm pipe system that crosses NW Commerce drive on the west side of the lot. According to the Missouri Department of conversation, the entire property and contributing drainage areas are tributary to Blue River watershed.

Site 2:
On-site stormwater runoff is collected on the property in an on-site dry detention basin on the south of the site. From there, runoff discharges into the existing ditch that follows NW Main St. on the west side of the lot. According to the Missouri Department of conversation, the entire property and contributing drainage areas are tributary to Blue River watershed.

Additional Permit Requirements

USACE Jurisdictional Determination was not completed for this project; according to the EPA watershed map, there are no “Waters of the United States” on the property or adjacent properties. As referenced above, the site is not located within any Special Flood Hazard Areas (SFHA).

DESIGN METHODOLOGY

Storm water runoff volumes and peak flow rates were calculated using the procedure defined in Technical Release 55 (TR-55) by the United States Department of Agriculture (USDA) Soil Conservation Service (SCS), now Natural Resources Conservation Service (NRCS). Hydraflow Hydrographs was also utilized to establish the distribution of precipitation rates for the various design storms as well as the detention pond design. Hydraulic soil group determinations for the contributing drainage area were determined using the Web Soil Survey internet service provided by the USDA.

Existing Conditions

Site 1:

The 19.1-acre property is undeveloped, grassland and woodland area. Stormwater runoff currently flows from the east side of the property to either the north or the west sides of the property where it is collected by existing storm sewer crossing NW Main Street, respectively – drainage areas, time of concentration path, and discharge point are identified on the Pre-Development Drainage Map on Appendix D. There is a small stream located on the property but the stream is not subject to the stream buffer requirements.

According to NRCS Web Soil Survey, 34.3% of the property consists of 10082 – Arisburg-Urban land complex, 1 to 5 percent slopes in Hydrologic Soil Group (HSG) C, and 65.7% of the property consists of Udarents-Urban land-Sampsel complex, 2 to 5 percents slopes (HSG C). The existing site was broken into one drainage area. A CN was calculated for the pre-development area using the following land type: woods & grass combination with good coverage and a soil HSG Type C having a CN of 74. The existing conditions calculations are summarized in Tables 2 and 3 below.

Table 2 – Existing Site Conditions

	West
Area (Ac)	19.1
CN	74
Time of Concentration (Tc) (min)	9.00

Table 3 – Existing Peak Runoff Summary

Storm Event	**Peak Discharge (cfs)**
2-yr	10.48
10-yr	25.78
100-yr	59.32

Following the 6-hr storm method of mitigating additional runoff, the proposed development must meet the allowable release rate requirements. The requirements for the site are 0.2 cfs of runoff per acre for the 2-year storm, 0.6 cfs per acre for the 10-year storm, and 3.0 cfs per acre for the 100-year storm. The allowable release rates for the 19.1 acre site where 19.1 acres is being disturbed can be seen in table 4 below.

Table 4 – Allowable Peak Runoff Summary

Storm Event	Peak Discharge (cfs)
2-yr	3.82
10-yr	11.46
100-yr	57.30

Site 2:

The 2.45-acre property is undeveloped, grassland and woodland area. Stormwater runoff currently flows from the north side of the property to the south where it is collected in a ditch that runs along NW Main St, respectively – drainage areas, time of concentration path, and discharge point are identified on the Pre- and Post-Detention Basin Map on Appendix D.

According to NRCS Web Soil Survey, 11.5% of the property consists of 10120 – Sharpsburg silt loam, 2 to 5 percent slopes in Hydrologic Soil Group (HSG) C, 7.3% of the property consists of 10128 – Sharpsburg-Urban land complex, 2 to 5 percents slopes in HSG D, and 81.2% of the property consists of 10129 – Sharpsburg-Urban land complex, 2 to 5 percent slopes in HSG D. The existing site was broken into one drainage area. A CN was calculated for the pre-development area using the following land type: woods & grass combination with good coverage and a soil HSG Type D having a CN of 74. The existing conditions calculations are summarized in Tables 2 and 3 below.

Table 2 – Existing Site Conditions

	West
Area (Ac)	2.45
CN	74
Time of Concentration (Tc) (min)	5.00

Table 3 – Existing Peak Runoff Summary

Storm Event	Peak Discharge (cfs)
2-yr	4.16
10-yr	6.64
100-yr	11.10

Following the 6-hr storm method of mitigating additional runoff, the proposed development must meet the allowable release rate requirements. The requirements for the site are 0.2 cfs of runoff per acre for the 2-year storm, 0.6 cfs per acre for the 10-year storm, and 3.0 cfs per acre for the 100-year storm. The allowable release rates for the 2.45 acre site can be seen in table 4 below.

Table 4 – Allowable Peak Runoff Summary

Storm Event	Peak Discharge (cfs)
2-yr	0.49
10-yr	1.47
100-yr	7.35

Proposed Conditions

Site 1:

Construction generated by the proposed project consists of a grocery store, fuel station and retail store buildings with associated parking infrastructure, utilities, and drainage facilities. The 19.1-acre contributing drainage area is divided into two drainage types, detained and undetained. The undetained drainage area is 2.1 acres draining on to NW Main Street and existing storm systems. There will also be a conveyance of 8.6 acres of offsite drainage area to the existing storm system that crosses NW Main Street.

Stormwater runoff generated on site will be collected by curb and gutter, conveyed through a proposed storm pipe network and eventually discharging into a dry detention basin on the west side of the property. Runoff will ultimately be released into the existing storm system crossing NW Main Street. The proposed conditions calculations are summarized in Tables 5 and 6.

The proposed dry detention basin has one outfall. Proposed detention has been designed to meet the requirements for the 6-hr method prior to discharging into the existing storm sewer system. Composite CNs were utilized for the proposed site; land cover description for the proposed site is a combination of impervious area which has a CN of 98 for Soil HSG Type C and new grass cover which has a CN of 74 for Soil HSG Type C. The roofs of the buildings will route through downspouts, which are collected by pipes and into the proposed pipe network. Time of concentration for the site was set at the minimum of 5 minutes to obtain the most conservative values. The tables below show the peak runoff generated from the site for each design storm.

Table 5 – Proposed Site Conditions

	West
Area (Ac)	19.1
CN	87.6
Time of Concentration (Tc) (min)	5.00

Table 6 – Proposed Peak Runoff Summary

Storm Event	Peak Discharge (cfs)
2-yr Q_{out} (cfs)	2.15
10-yr Q_{out} (cfs)	4.29
100-yr Q_{out} (cfs)	14.09

Refer to Appendix G for supporting runoff calculations for proposed conditions.

Detention

The proposed detention will include a single dry detention basin with forebay. Runoff accumulated into the dry detention basin will exit the system through a control structure. The control structure will be a riser top set at 1005.00'. The Riser will have 4 windows 12"x24" set at the elevation 1001.40. The riser will also have a 6" in diameter hole set at 1001.00. It will also have a 11' tall perforated riser set at 994.00 with 6 holes 3" in diameter. The runoff will exit the control structure through a proposed 42" concrete pipe connecting to the existing storm system crossing NW Main Street. There will also be a 20' wide emergency spillway set at 1002.80.

Table 7 outlines the stage-storage volume for the proposed dry detention basin:

Table 7 – Dry Detention Basin Volume

Elevation (FT)	Area (SF)	Cumulative Vol (CF)
994.00	0.00	0.00
995.00	2,821.00	940.00
996.00	12,955.00	8,213.00
997.00	18,659.00	23,932.00

998.00	23,887.00	45,149.00
999.00	29,035.00	71,566.00
1000.00	33,525.00	102,816.00
1001.00	37,955.00	138,530.00
1002.00	42,109.00	178,540.00
1003.00	46,476.00	222,810.00
1004.00	51,034.00	271,543.00
1005.00	55,707.00	324,891.00

Stormwater Report

Below is a summary of the dry detention basin characteristics:

Bottom Elevation – 994.00' **Top Elevation** – 1005.00'

Outlet –Riser structure with 4 windows 12"x24" set at the elevation 1001.40. The riser will also have a 6" in diameter hole on the riser set at 1001. The runoff will exit the control structure through a proposed 42" concrete pipe leading to the existing storm system.

Primary Outfall – 42" RCP, 73 LF @ 6.79% FL Upstream – 994.00'

FL Downstream – 989.05'

Tables 8 below give a summary of the peak basin stages for each design storm. Refer to the attached storm modeling results in Appendix G for supporting basin routing calculations.

Table 8 – Dry Detention Basin Routing Results

Storm Event	Max Water Depth (ft)	WSE Proposed	Freeboard (ft)	Peak Qin (cfs)	Peak Qout (cfs)
1.37" Storm	2.53	996.53	8.47	13.65	**0.71**
2-yr	5.13	999.13	5.87	21.72	**2.15**
10-yr	6.97	1000.97	4.09	38.86	**4.29**
100-yr	7.93	1001.93	3.07	70.53	**14.09**

Detention Analysis

The results of the dry detention basin routing were analyzed for the 2-yr, 10-yr and 100-yr design storms. The following Table 9 compares peak flows for the Allowable Release Rate requirements and Proposed Conditions. Detailed results of the routing analysis can be found in Appendix G. Proposed Out includes a combination of the peak outflows from the dry detention basin and the undetained areas.

Table 9 - Release Rate Summary

StormEvent	Allowable Peak Runoff – Total Site(cfs)	Proposed Peak Runoff – Total Site(cfs)	Net Discharge Pre vs. Post – Total Site (cfs)
2-yr	3.82	2.15	**-1.67**
10-yr	11.46	4.29	**-7.17**
100-yr	57.30	14.09	**-43.21**

Water Quality – Macro Analysis

Along with the detention analysis, the site was also analyzed per the MARC BMP Manual to ensure that the quality of the stormwater would also be considered. The existing conditions of the site consist of woodlands and grass, with soil condition of HSG C, producing an existing area-weighted curve number for the property of 74. The proposed conditions of the site include urban commercial development leading to the detention basin and areas of undetained grass cover, both with soil conditions of HSG C, producing a proposed area-weighted curve number of 87.61. To meet water quality requirements the use of a forebay that drains into a dry detention basin and the planting of native vegetation. See Appendix H to see the BMP Worksheets.

The outlet structure for the detention basin was designed using the Design Procedure Form: Dry Detention Basin Main Worksheet to ensure that the basin met water quality storage volume and release rates. Using the design storm of 1.37”, the outlet structure was designed to release the storm. See Appendix G for the analysis of the 1.37” storm event and Appendix H.

Proposed Conditions

Site 2:

Construction generated by the proposed project consists of a commercial building with associated parking infrastructure, utilities, and drainage facilities. The 2.45-acre contributing drainage area is detained drainage area in a dry detention basin at the south of the site.

Stormwater runoff generated on site will be collected by curb and gutter, conveyed through a proposed storm pipe network eventually discharged into a dry detention basin on the south side of the property. Runoff will ultimately be released into the existing ditch running alonf NW Main Street. The proposed conditions calculations are summarized in Tables 5 and 6.

The proposed dry detention basin has one outfall. Proposed detention has been designed to meet the requirements for the 6-hr method prior to discharging into the existing storm sewer system. Composite CNs were utilized for the proposed site; land cover description for the proposed site is a combination of impervious area which has a CN of 98 and new grass cover which has a CN of 74. The roofs of the buildings will route through downspouts, which are collected by pipes and into the proposed pipe network. Time of concentration for the site was set at the minimum of 5 minutes to obtain the most conservative values. The tables below show the peak runoff generated from the site for each design storm.

Table 5 – Proposed Site Conditions

	West
Area (Ac)	2.45
CN	94
Time of Concentration (Tc) (min)	5.00

Table 6 – Proposed Peak Runoff Summary

Storm Event	**Peak Discharge (cfs)**
2-yr Q_{out} (cfs)	0.361
10-yr Q_{out} (cfs)	0.801
100-yr Q_{out} (cfs)	4.752

Refer to Appendix G for supporting runoff calculations for proposed conditions.

Detention

The proposed detention will include a single dry detention basin. Runoff accumulated into the dry detention basin will exit the system through a control structure. The control structure will be a riser top set at 1002.50’. The Riser will have 3 windows 6”x12” set at the elevation 999.00. It

will also have a 8.5’ tall perforated riser set at 994.00 with 6 holes 2” in diameter. The runoff will exit the control structure through a proposed 12” concrete pipe discharging into an existing ditch running along NW Main St.. There will also be a 20’ wide emergency spillway set at 1001.00.

Table 7 outlines the stage-storage volume for the proposed dry detention basin:

Table 7 – Dry Detention Basin Volume

Elevation (FT)	Area (SF)	Cumulative Vol (CF)
994.00	0.00	0.00
995.00	1,893.00	631.00
996.00	3,106.00	3,105.00
997.00	4,377.00	6,828.00
998.00	5,703.00	11,853.00
999.00	7,087.00	18,235.00
1000.00	8,527.00	26,030.00
1001.00	10,028.00	35,296.00
1002.00	11,582.00	46,091.00
1002.50	12,380.00	52,079.00

Stormwater Report

Below is a summary of the dry detention basin characteristics:

Bottom Elevation – 994.00’ **Top Elevation** – 1002.50’

Outlet –Riser structure with 3 windows 6”x12” set at the elevation 999.00. The runoff will exit the control structure through a proposed 12” concrete pipe leading to the existing ditch.

Primary Outfall – 12” RCP, 46.91 LF @ 1.00% FL Upstream – 994.00’

FL Downstream – 993.50’

Tables 8 below give a summary of the peak basin stages for each design storm. Refer to the attached storm modeling results in Appendix G for supporting basin routing calculations.

Table 8 – Dry Detention Basin Routing Results

Storm Event	Max Water Depth (ft)	WSE Proposed	Freeboard (ft)	Peak Qin (cfs)	Peak Qout (cfs)
1.37" Storm	2.21	996.21	6.29	3.35	**0.14**
2-yr	4.06	998.06	4.44	4.16	**0.36**
10-yr	5.10	999.10	3.40	6.64	**0.80**
100-yr	5.63	999.63	2.87	11.10	**4.75**

Detention Analysis

The results of the dry detention basin routing were analyzed for the 2-yr, 10-yr and 100-yr design storms. The following Table 9 compares peak flows for the Allowable Release Rate requirements and Proposed Conditions. Detailed results of the routing analysis can be found in Appendix G. Proposed Out includes a combination of the peak outflows from the dry detention basin and the undetained areas.

Table 9 - Release Rate Summary

StormEvent	Allowable Peak Runoff – Total Site(cfs)	Proposed Peak Runoff – Total Site(cfs)	Net Discharge Pre vs. Post – Total Site (cfs)
2-yr	0.49	0.36	**-0.13**
10-yr	1.47	0.80	**-0.67**
100-yr	7.35	4.75	**-2.6**

Water Quality – Macro Analysis

Along with the detention analysis, the site was also analyzed per the MARC BMP Manual to ensure that the quality of the stormwater would also be considered. The existing conditions of the site consist of woodlands and grass, with soil condition of HSG C and HSG D, producing an existing area-weighted curve number for the property of 74. The proposed conditions of the site include urban commercial development leading to the detention basin and areas of undetained grass cover, both with soil conditions of HSG C and HSG D, producing a proposed area-

weighted curve number of 94. To meet water quality requirements the use of a combination of a BMP train of two Contech Hydrodynamic Separators running into a dry detention basin and the planting of native vegetation. See Appendix H to see the BMP Worksheets.

The outlet structure for the detention basin was designed using the Design Procedure Form: Dry Detention Basin Main Worksheet to ensure that the basin met water quality storage volume and release rates. Using the design storm of 1.37", the outlet structure was designed to release the storm. See Appendix G for the analysis of the 1.37" storm event and Appendix H.

Conclusion & Recommendations

Site 1:

The proposed commercial development consists of a grocery store, fuel station, retail store buildings, associated parking lots, utilities, and drainage facilities. The total property area consists of 19.1 acres of total area. Installation of a dry detention basin on the site is recommended to meet release rate and BMP requirements. As shown in Table 9 above and the supporting detention calculations, release rate is reduced for the 2-yr, 10-yr, and 100-yr storm events when comparing the post-development versus pre-development conditions and meets the allowable release rate requirements for detention as outlined in the 6-hr storm detention method found in APWA 5600. Therefore, we recommend approval of this Storm Drainage Study

Site 2:

The proposed commercial development consists of a commercial buildings, associated parking lots, utilities, and drainage facilities. The total property area consists of 2.45 acres of total area. Installation of an dry detention basin on the site is recommended to meet release rate and BMP requirements. As shown in Table 9 above and the supporting detention calculations, release rate is reduced for the 2-yr, 10-yr, and 100-yr storm events when comparing the post-development versus pre-development conditions and meets the allowable release rate requirements for detention as outlined in the 6-hr storm detention method found in APWA 5600. Therefore, we recommend approval of this Storm Drainage Study

Appendix A – Site Location Map

NORTH

0 500 1000 2000

1 INCH = 1000 FEET

Pickering

Pickering Firm, Inc.
Architecture • Engineering
Planning • Surveying

1700 Kirk Road, Suite 120
Little Rock, AR 72223
501.246.3578

PROJECT NO: 27480.00

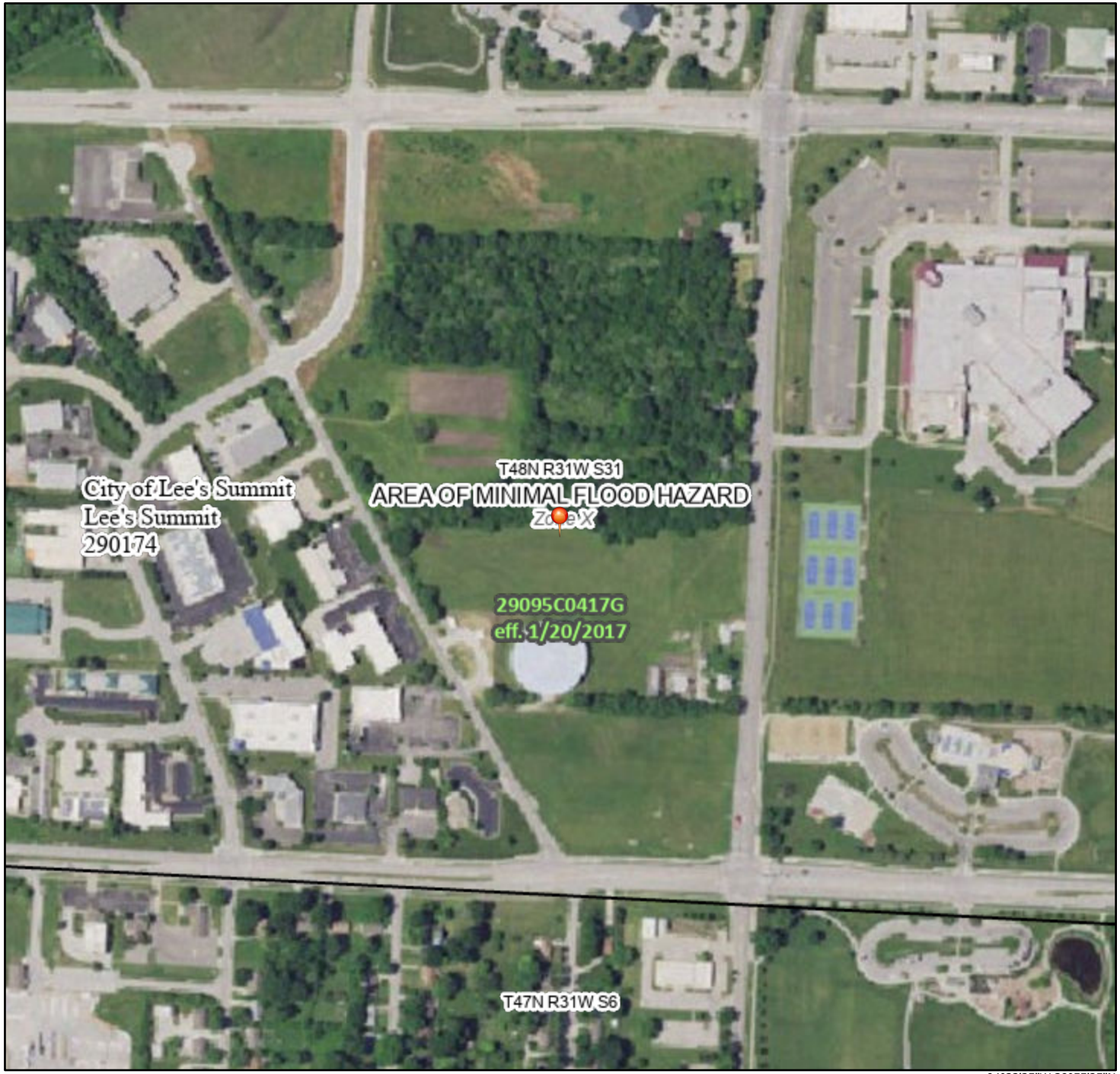
SITE LOCATION
EXHIBIT A.1

LEE SUMMIT, JACKSON CO., MO
04/08/2025

Appendix B – FEMA Firmette

National Flood Hazard Layer FIRMette

94°23'12"W 38°55'53"N



94°22'35"W 38°55'25"N

Feet

0 250 500 1,000 1,500 2,000

1:6,000

Basemap Imagery Source: USGS National Map 2023

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 / 17.5 Cross Sections with 1% Annual Chance / Water Surface Elevation
- Coastal Transect
- Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 1/16/2026 at 2:22 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

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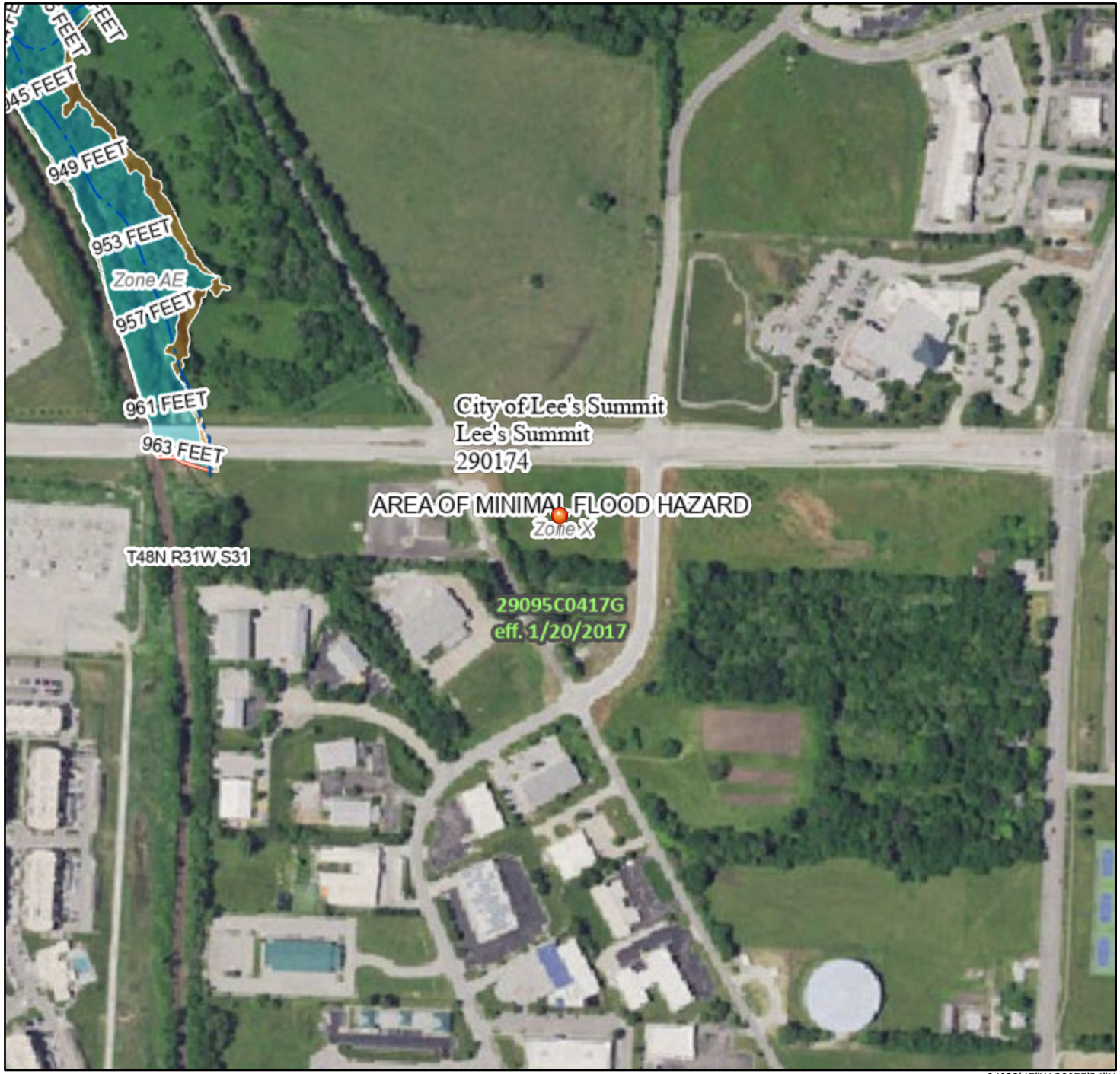
National Flood Hazard Layer FIRMette

FEMA

94°23'22"W 38°56'2"N



94°22'45"W 38°55'34"N

Feet

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1:6,000

Basemap Imagery Source: USGS National Map 2023

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 / 17.5 Cross Sections with 1% Annual Chance Water Surface Elevation
- Coastal Transect
- Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 3/2/2026 at 8:28 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

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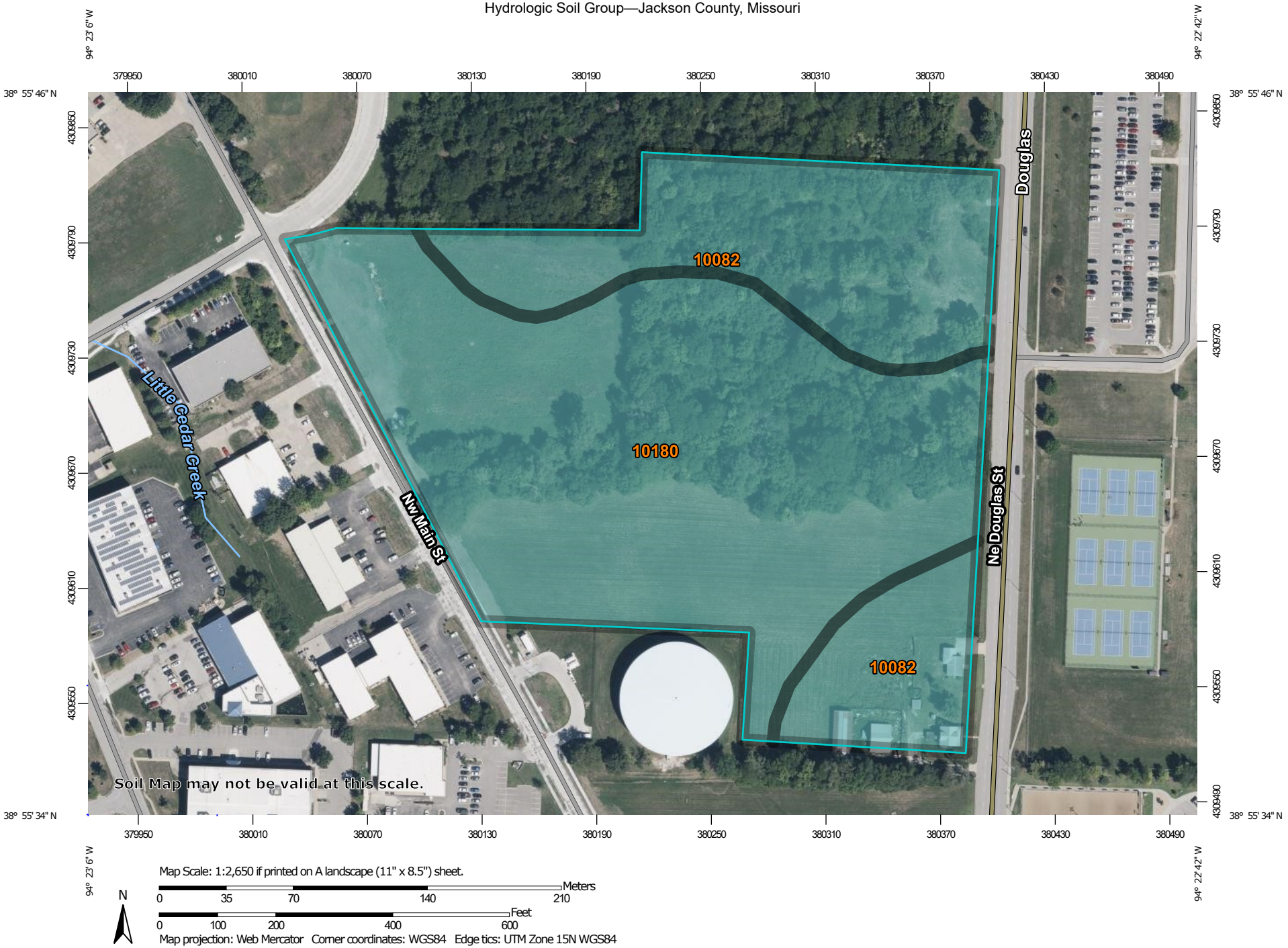
Appendix C – NRCS Soils Report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94° 22' 42" W
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380130
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380250
380310
380370
380430
380490
38° 55' 46" N
38° 55' 34" N
4309850
4309790
4309730
4309670
4309610
4309550
4309490
10082
10180
10082
Douglas
Ne Douglas St
Nw Main St
Little Cedar Creek
Soil Map may not be valid at this scale.
Map Scale: 1:2,650 if printed on A landscape (11" x 8.5") sheet.
N
Meters
0 35 70 140 210
Feet
0 100 200 400 600
Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 15N WGS84

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

Soil Rating Polygons

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Jackson County, Missouri
Survey Area Data: Version 28, Sep 2, 2025

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Aug 30, 2022—Sep 8, 2022

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
10082	Arisburg-Urban land complex, 1 to 5 percent slopes	C	6.7	34.3%
10180	Udarents-Urban land-Sampsel complex, 2 to 5 percent slopes	C	12.9	65.7%
Totals for Area of Interest			**19.7**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

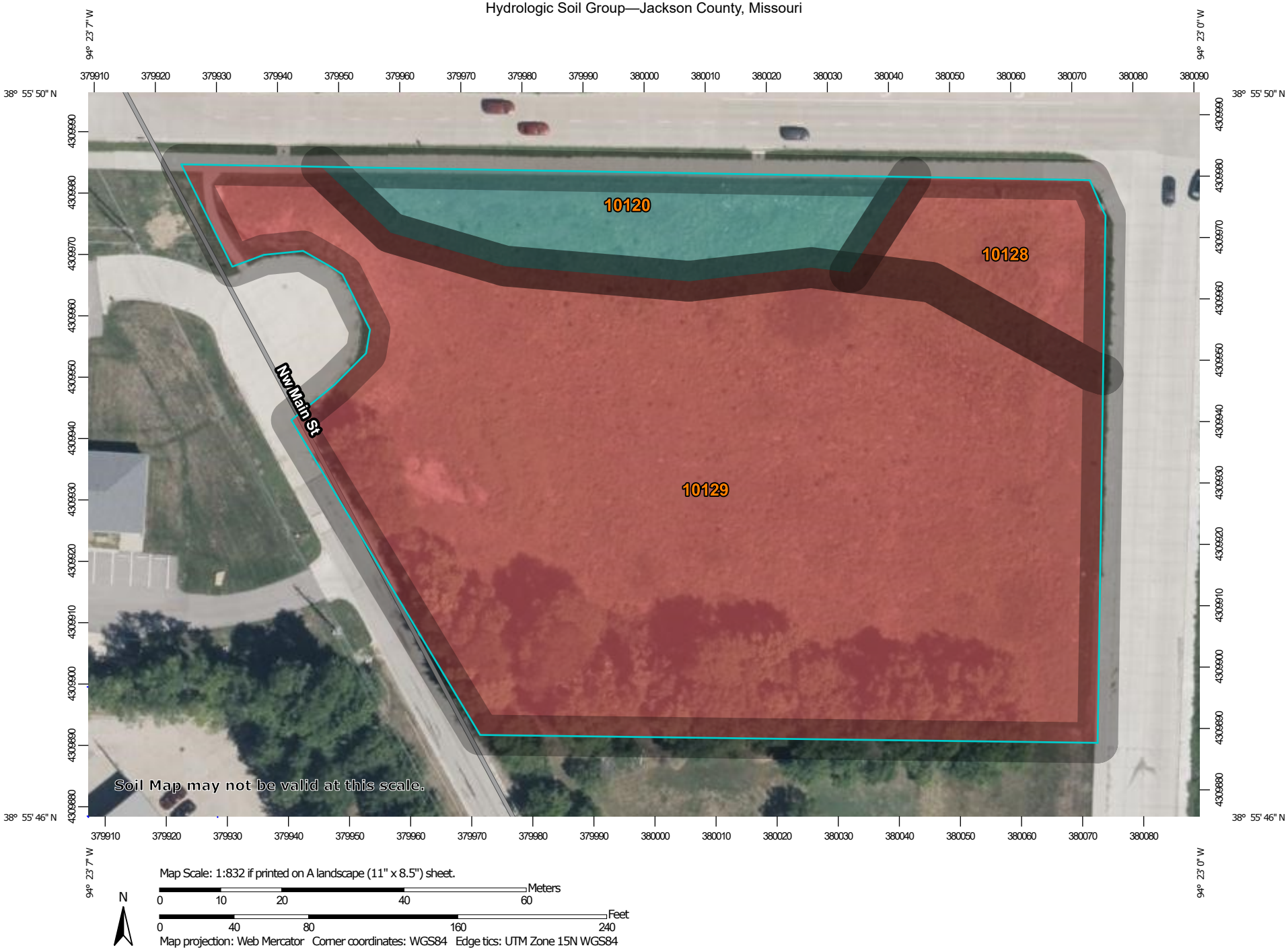
If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher



Map Scale: 1:832 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 10 20 40 60

Feet
0 40 80 160 240

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 15N WGS84

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

Soil Rating Polygons

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

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Soil Survey Area: Jackson County, Missouri
Survey Area Data: Version 28, Sep 2, 2025

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

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The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
10120	Sharpsburg silt loam, 2 to 5 percent slopes	C	0.3	11.5%
10128	Sharpsburg-Urban land complex, 2 to 5 percent slopes	D	0.2	7.3%
10129	Sharpsburg-Urban land complex, 5 to 9 percent slopes	D	2.3	81.2%
Totals for Area of Interest			**2.8**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Appendix D – Pre-Development Drainage map

OFFSITE NORTH
AREA=2.0 AC
CN=74
TC=5 MIN

NE DOUGLAS STREET (VARIABLE WIDTH PUBLIC ROW)

OFFSITE ROAD
AREA=2.4 AC
CN=98
TC=5 MIN

EX-WEST
AREA=19.1 AC
CN=74
TC=9 MIN

OFFSITE EAST
AREA=6.2 AC
CN=74
TC=10 MIN

PRIMARY
DISCHARGE POINT
(EX-EST) EXISTING
STORM SYSTEM

NORTH
0 30 60 120
1 INCH = 60 FEET

REVISIONS:

1		
2		
3		
4		
5		

PROJECT #:	27480
DATE:	APRIL 08, 2026
DRAWN BY:	EJH
DESIGNER:	JPM
CHECKED BY:	MLB

Pickering
Pickering Firm, Inc.
Architecture • Engineering
Planning • Surveying
6363 Poplar Avenue, Suite 300
Memphis, TN 38119
901.726.0810

DILLONS
NE DOUGLAS ST.
LEE'S SUMMIT, MO

PHILLIPS EDISON & COMPANY

SEAL:

PRELIMINARY
- NOT FOR
CONSTRUCTION

SHEET NUMBER:

C-1

DESCRIPTION:
EXISTING DRAINAGE BASIN PLAN

K:\27480.00\CAD\PLANS\PRE AND POST DETENTION.DWG

Appendix E – Post-Development Drainage Map

OFFSITE NORTH
AREA=2.0 AC
CN=74
TC 5 MIN

UNDETAINED
WEST
AREA=2.1 AC
CN=80
TC=5 MIN

WEST POND
AREA=17.0 AC
CN=87.76
TC=5 MIN

OFFSITE
ROAD
AREA=2.4 AC
CN=98
TC=5 MIN

OFFSITE EAST
AREA=6.2 AC
CN=74
TC=10 MIN

PROPOSED BASIN OUTLET STRUCTURE (SEE REPORT FOR DETAILS)

PRIMARY DISCHARGE POINT (DETAINED) EXISTING STORM SYSTEM

NE DOUGLAS STREET (VARIABLE WIDTH PUBLIC ROW)

NE MAIN STREET (50' PUBLIC ROW)

NORTH
0 30 60 120
1 INCH = 60 FEET

REVISIONS:

1		
2		
3		
4		
5		

PROJECT #: 27480
DATE: APRIL 08, 2026
DRAWN BY: EJH
DESIGNER: JPM
CHECKED BY: MLB

Pickering
Pickering Firm, Inc.
Architecture * Engineering
Planning * Surveying
6363 Poplar Avenue, Suite 300
Memphis, TN 38119
901.726.0810

DILLONS
NE DOUGLAS ST.
LEE'S SUMMIT, MO

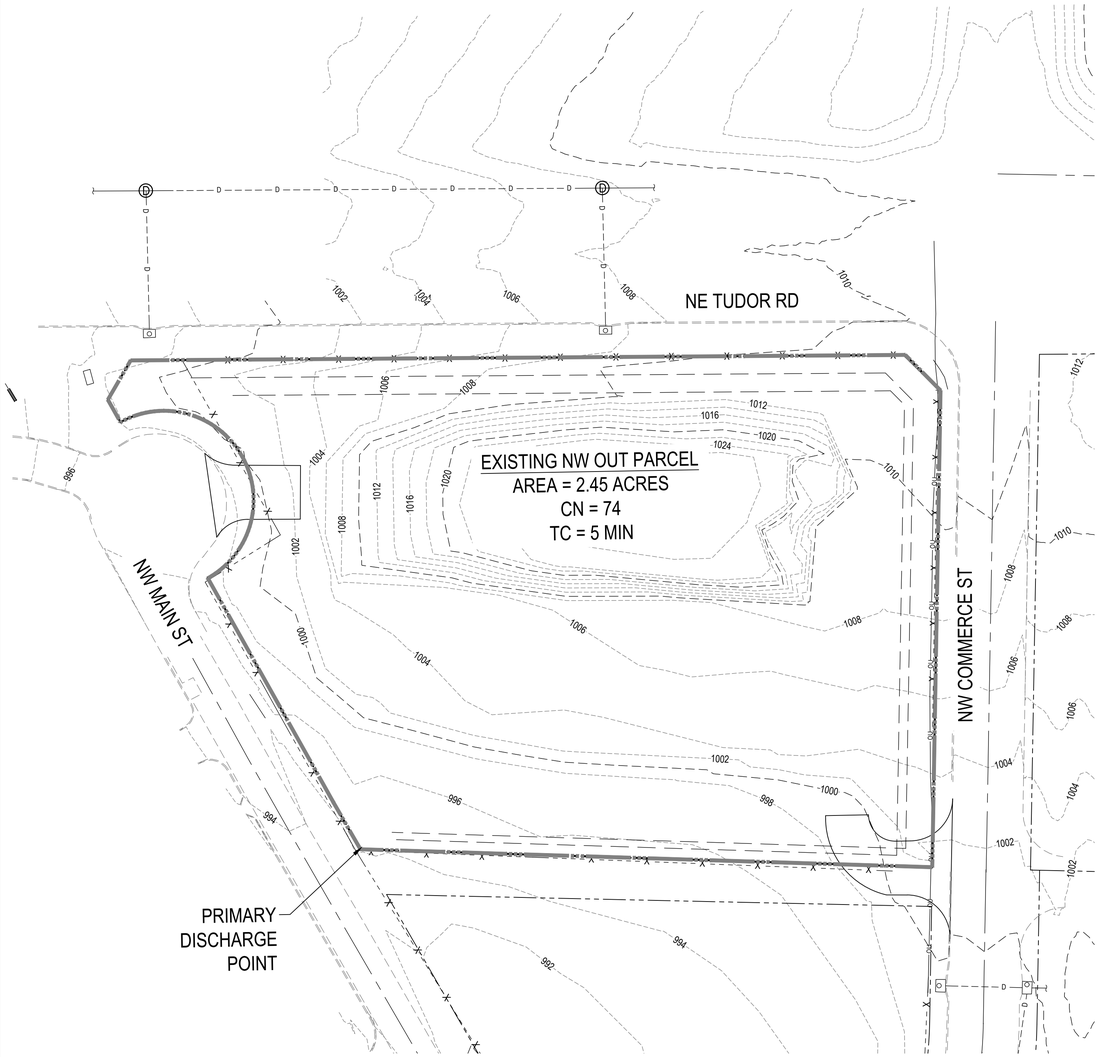
PHILLIPS EDISON & COMPANY

SEAL:
PRELIMINARY - NOT FOR CONSTRUCTION

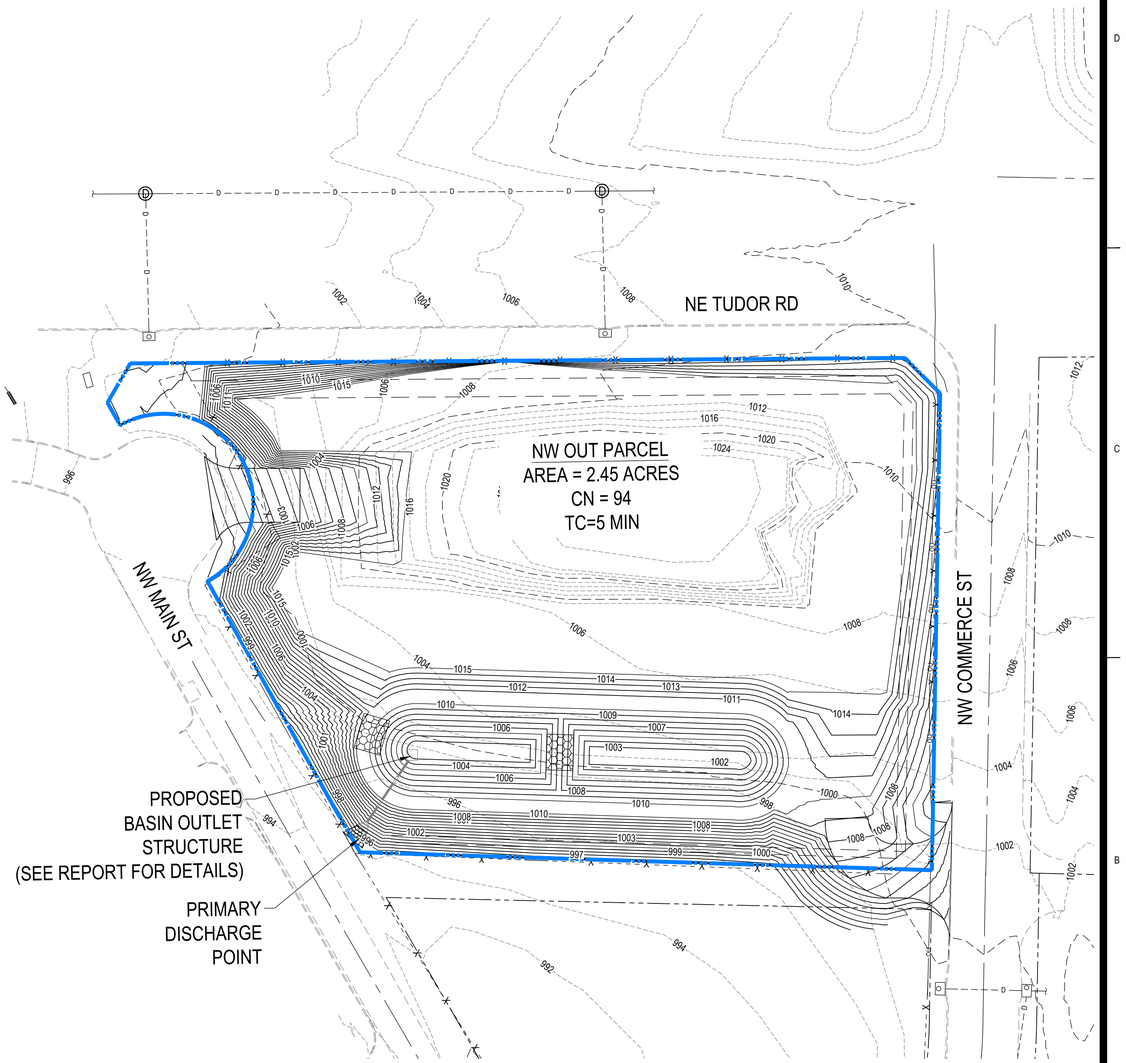
SHEET NUMBER:
C-2

DESCRIPTION:
PROPOSED DRAINAGE BASIN PLAN

K:\27480.000\CAD\PLANS\PRE AND POST DETENTION.DWG



1 NW OUTPARCEL PRE DRAINAGE BASINS
1"=40'



2 NW OUTPARCEL POST DRAINAGE BASINS
1"=40'

NORTH
0 20 40 80
1 INCH = 40 FEET

REVISIONS:

1		
2		
3		
4		
5		

PROJECT #: 27480
DATE: APRIL 08, 2026
DRAWN BY: EJH
DESIGNER: JPM
CHECKED BY: MLB

Pickering
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NE DOUGLAS ST.
LEE'S SUMMIT, MO

PHILLIPS EDISON & COMPANY

SEAL:
PRELIMINARY - NOT FOR CONSTRUCTION

SHEET NUMBER:
C-3

DESCRIPTION:
OUT PARCEL DRAINAGE BASIN PLAN

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Appendix F – Existing and Proposed Conditions Analysis

Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2026

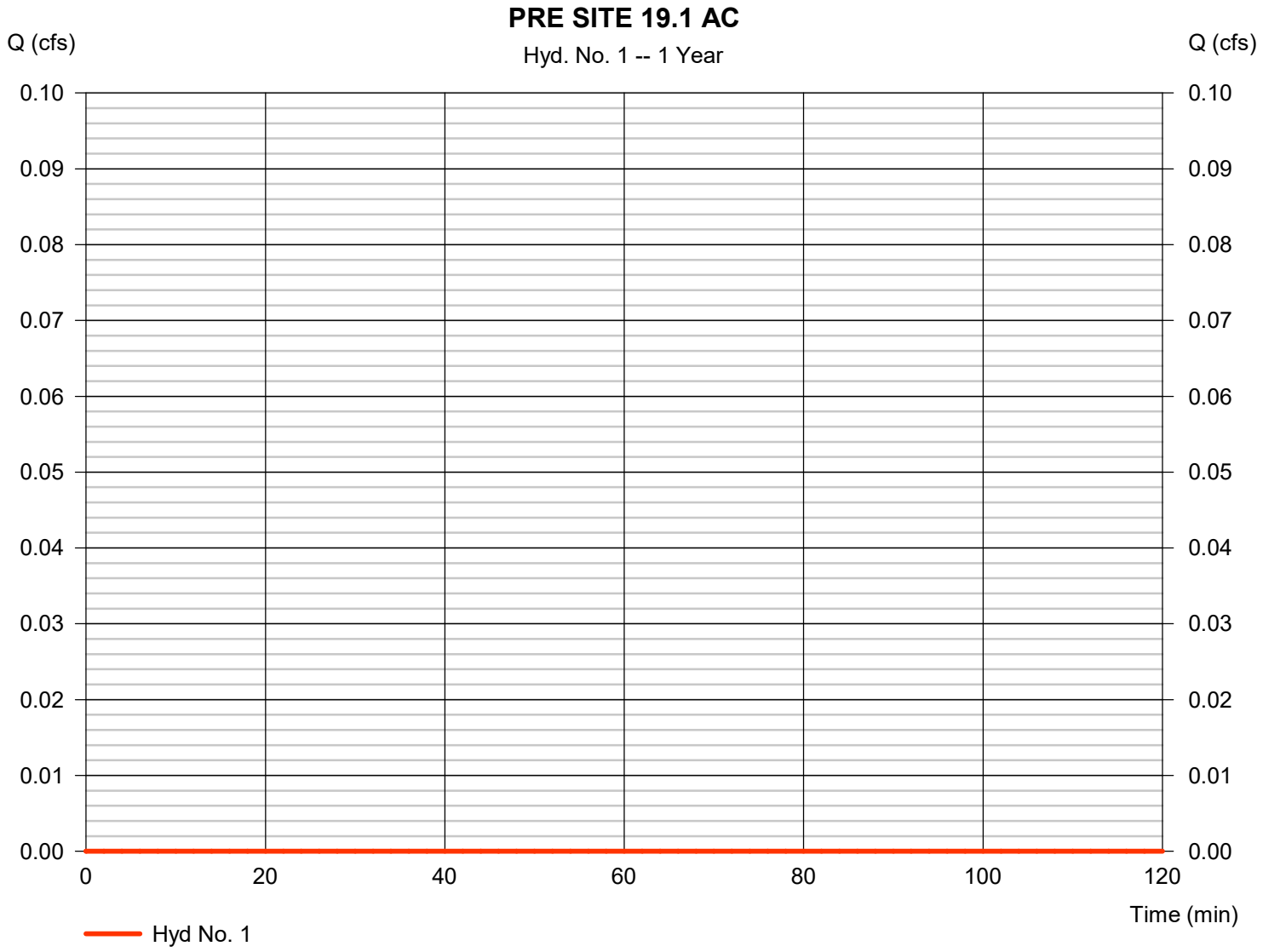
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	0.000	2	n/a	0	------	------	------	PRE SITE 19.1 AC
2	SCS Runoff	0.000	2	n/a	0	------	------	------	OFFSITE EAST 6.2 AC
3	SCS Runoff	0.000	2	n/a	0	------	------	------	OFFSITE ROAD 2.4 AC
4	SCS Runoff	0.000	2	n/a	0	------	------	------	OFFSITE NORTH 2 AC
5	Combine	0.000	2	n/a	0	2, 3, 4	------	------	OFFSITE
6	SCS Runoff	0.000	2	n/a	0	------	------	------	PRE NW OUTPARCEL 2.45 AC
8	SCS Runoff	0.000	2	n/a	0	------	------	------	direct west 2.1 AC 6hr
9	SCS Runoff	0.000	2	n/a	0	------	------	------	POST WEST 17.0 AC 6 hr
12	Reservoir	0.000	2	n/a	0	9	994.00	0.000	WEST POND
13	Combine	0.000	2	n/a	0	8, 12	------	------	POST WEST TOTAL
15	Combine	0.000	2	n/a	0	2, 3, 4, 8, 9,	------	------	TOTAL POST BEFORE DETENTION
17	Reservoir	0.000	2	n/a	0	9	1002.80	213,956	EMERGENCY SPILLWAY
20	SCS Runoff	0.710	2	718	1,605	------	------	------	direct west 2.1 AC 24 hr
21	SCS Runoff	13.65	2	718	27,311	------	------	------	POST WEST 17 AC 24 hr
23	Combine	13.65	2	718	27,311	21,	------	------	TO WEST POND 24HR WQ
24	Reservoir	0.309	2	988	27,268	23	996.53	16,618	WQ DESIGN 24HR
25	Combine	0.710	2	718	1,605	8, 12, 20,	------	------	POST WEST TOTAL 24HR WQ
27	SCS Runoff	0.000	2	n/a	0	------	------	------	NW OUT PARCEL 2.45 AC 6-HR
28	Reservoir	0.000	2	n/a	0	27	994.00	0.000	NW OUT PARCEL POND 6HR
30	Reservoir	0.000	2	n/a	0	27	999.00	0.000	NW EMERGENCY SPILLEAY

Hydrograph Report

Hyd. No. 1

PRE SITE 19.1 AC

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.000 cfs
Storm frequency	=	1 yrs	Time to peak	=	n/a
Time interval	=	2 min	Hyd. volume	=	0 cuft
Drainage area	=	19.100 ac	Curve number	=	74
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	9.00 min
Total precip.	=	0.00 in	Distribution	=	SCS 6-Hr
Storm duration	=	6.00 hrs	Shape factor	=	484

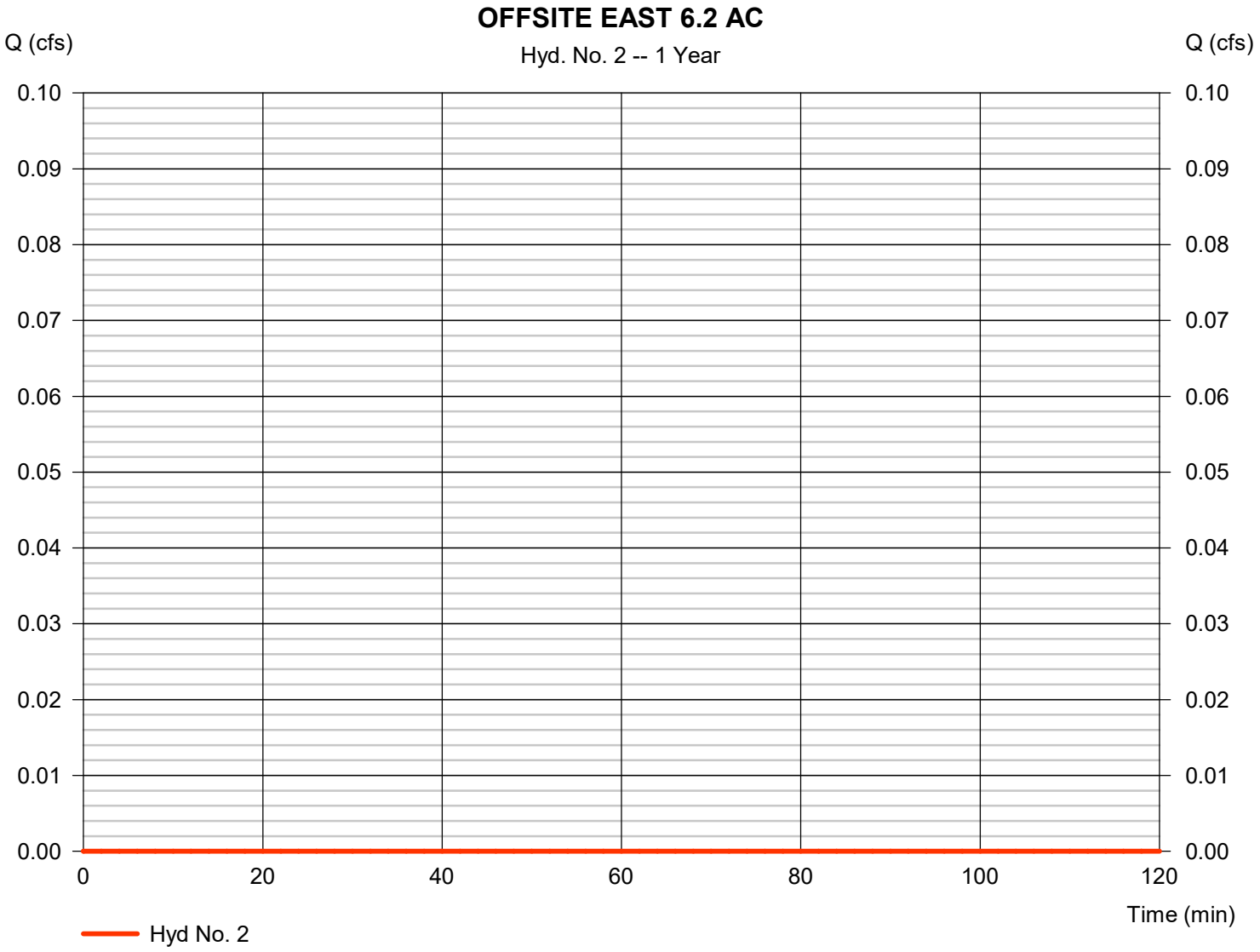


Hydrograph Report

Hyd. No. 2

OFFSITE EAST 6.2 AC

Hydrograph type	= SCS Runoff	Peak discharge	= 0.000 cfs
Storm frequency	= 1 yrs	Time to peak	= n/a
Time interval	= 2 min	Hyd. volume	= 0 cuft
Drainage area	= 6.200 ac	Curve number	= 74
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.00 min
Total precip.	= 0.00 in	Distribution	= SCS 6-Hr
Storm duration	= 6.00 hrs	Shape factor	= 484

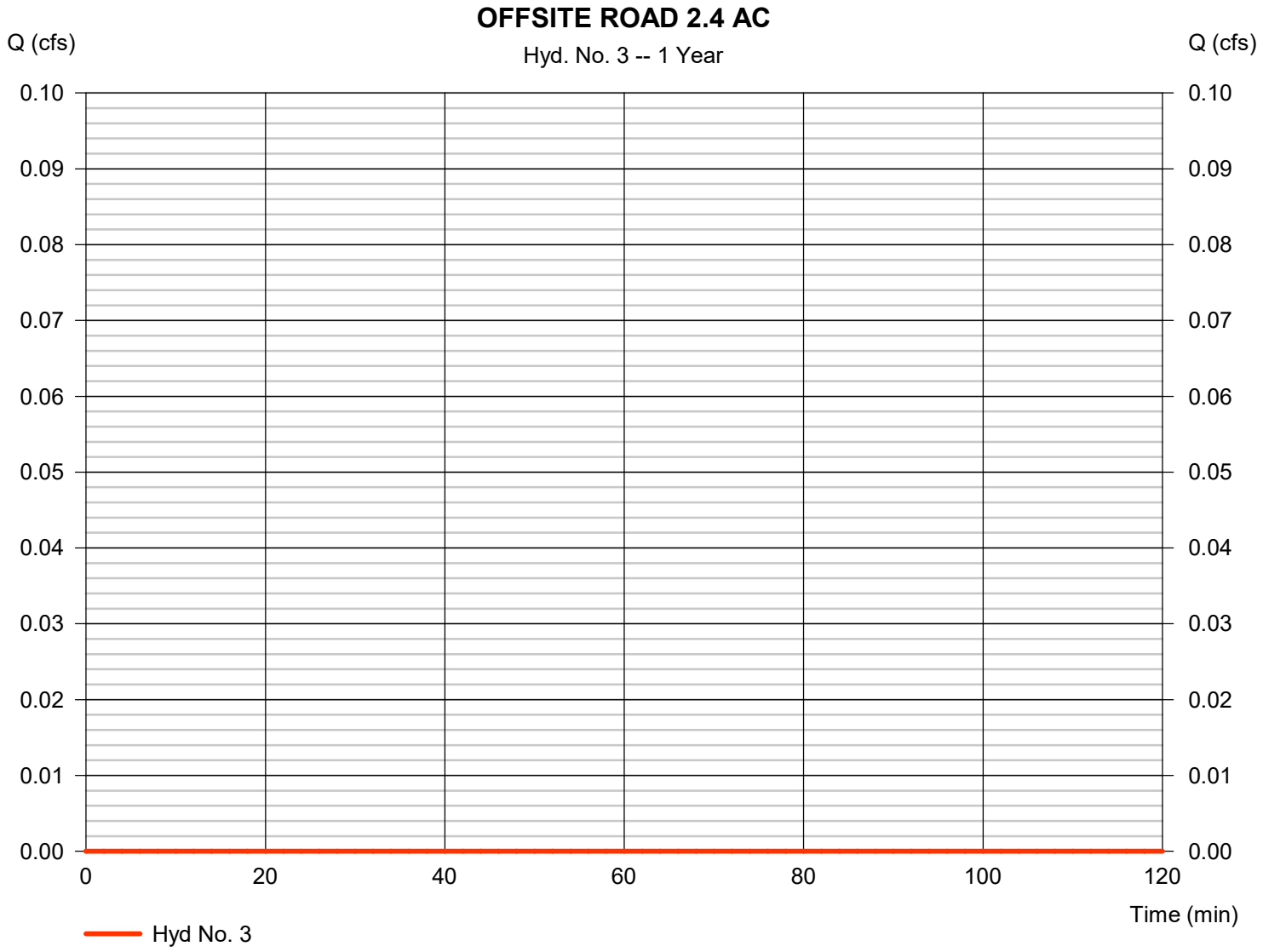


Hydrograph Report

Hyd. No. 3

OFFSITE ROAD 2.4 AC

Hydrograph type	= SCS Runoff	Peak discharge	= 0.000 cfs
Storm frequency	= 1 yrs	Time to peak	= n/a
Time interval	= 2 min	Hyd. volume	= 0 cuft
Drainage area	= 2.400 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 0.00 in	Distribution	= SCS 6-Hr
Storm duration	= 6.00 hrs	Shape factor	= 484

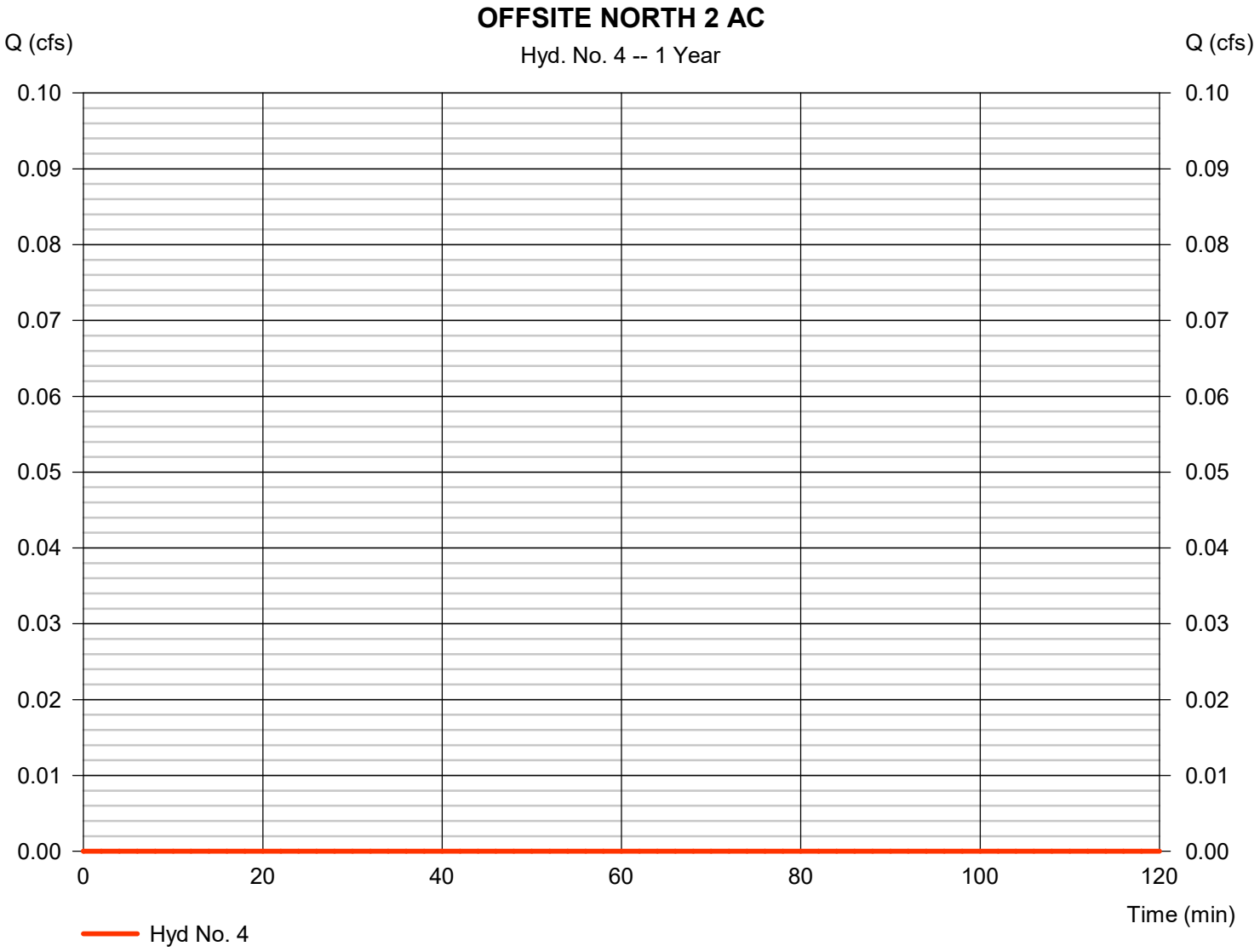


Hydrograph Report

Hyd. No. 4

OFFSITE NORTH 2 AC

Hydrograph type	= SCS Runoff	Peak discharge	= 0.000 cfs
Storm frequency	= 1 yrs	Time to peak	= n/a
Time interval	= 2 min	Hyd. volume	= 0 cuft
Drainage area	= 2.000 ac	Curve number	= 74
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 0.00 in	Distribution	= SCS 6-Hr
Storm duration	= 6.00 hrs	Shape factor	= 484

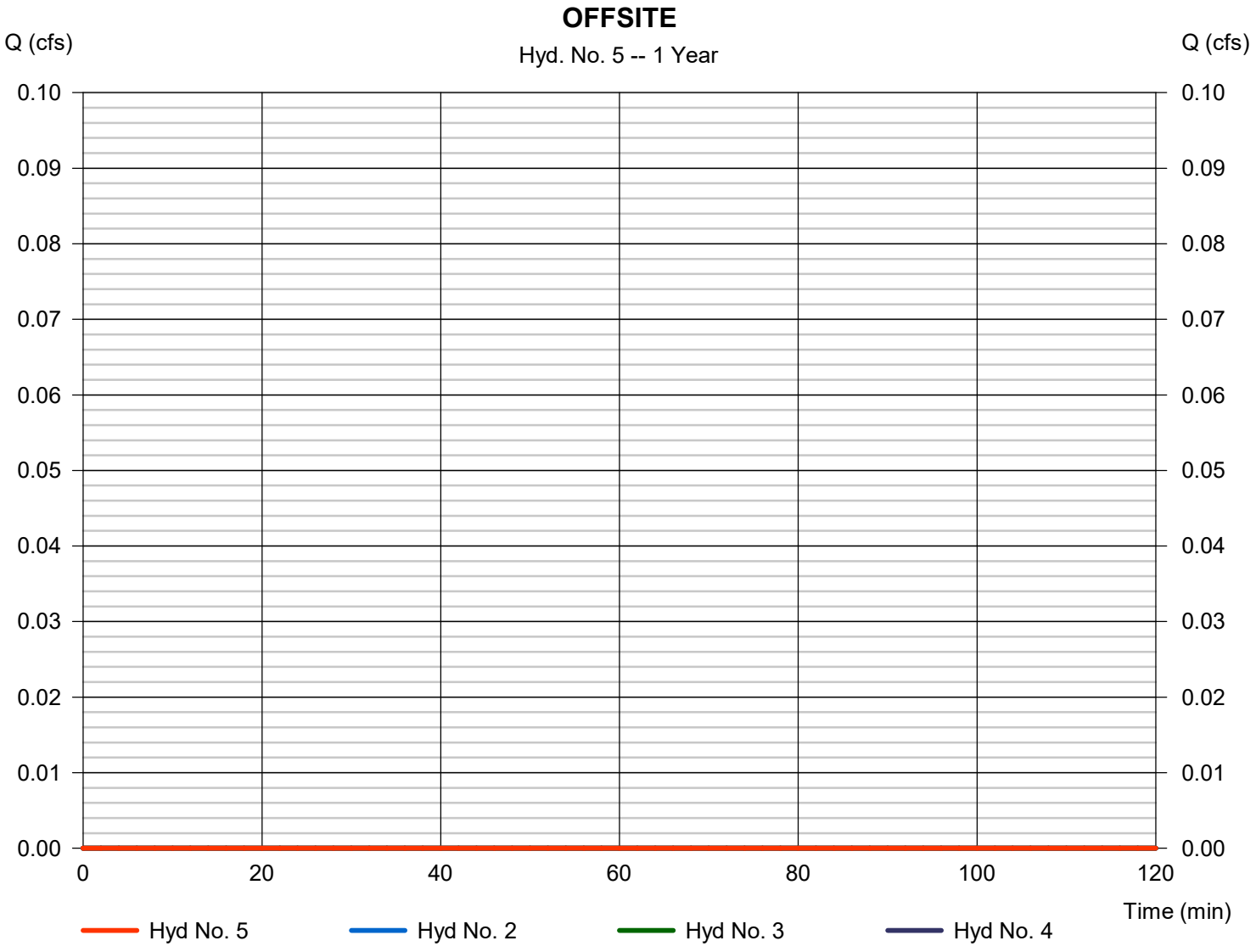


Hydrograph Report

Hyd. No. 5

OFFSITE

Hydrograph type	= Combine	Peak discharge	= 0.000 cfs
Storm frequency	= 1 yrs	Time to peak	= n/a
Time interval	= 2 min	Hyd. volume	= 0 cuft
Inflow hyds.	= 2, 3, 4	Contrib. drain. area	= 10.600 ac

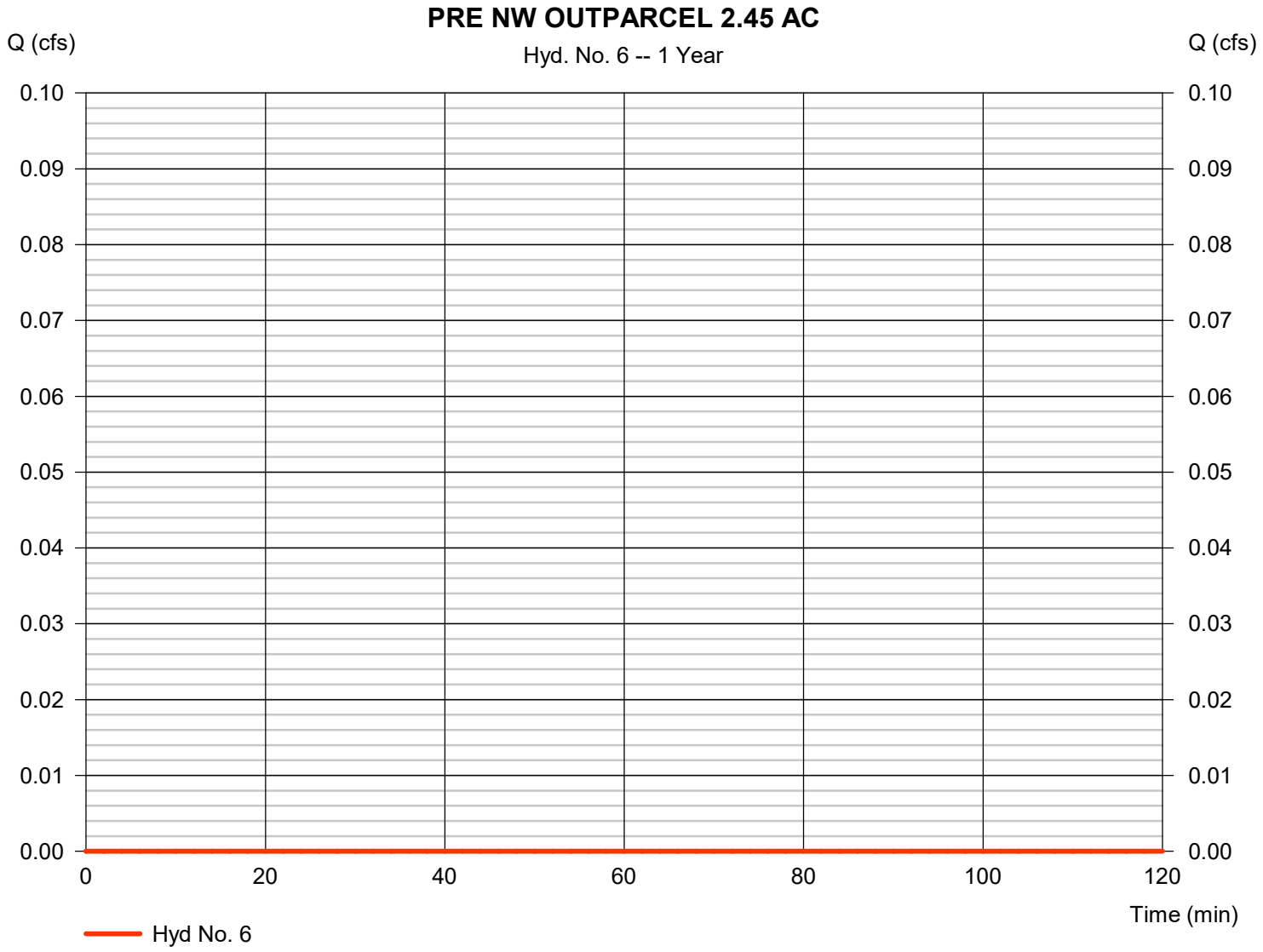


Hydrograph Report

Hyd. No. 6

PRE NW OUTPARCEL 2.45 AC

Hydrograph type	= SCS Runoff	Peak discharge	= 0.000 cfs
Storm frequency	= 1 yrs	Time to peak	= n/a
Time interval	= 2 min	Hyd. volume	= 0 cuft
Drainage area	= 2.450 ac	Curve number	= 74
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 0.00 in	Distribution	= SCS 6-Hr
Storm duration	= 6.00 hrs	Shape factor	= 484

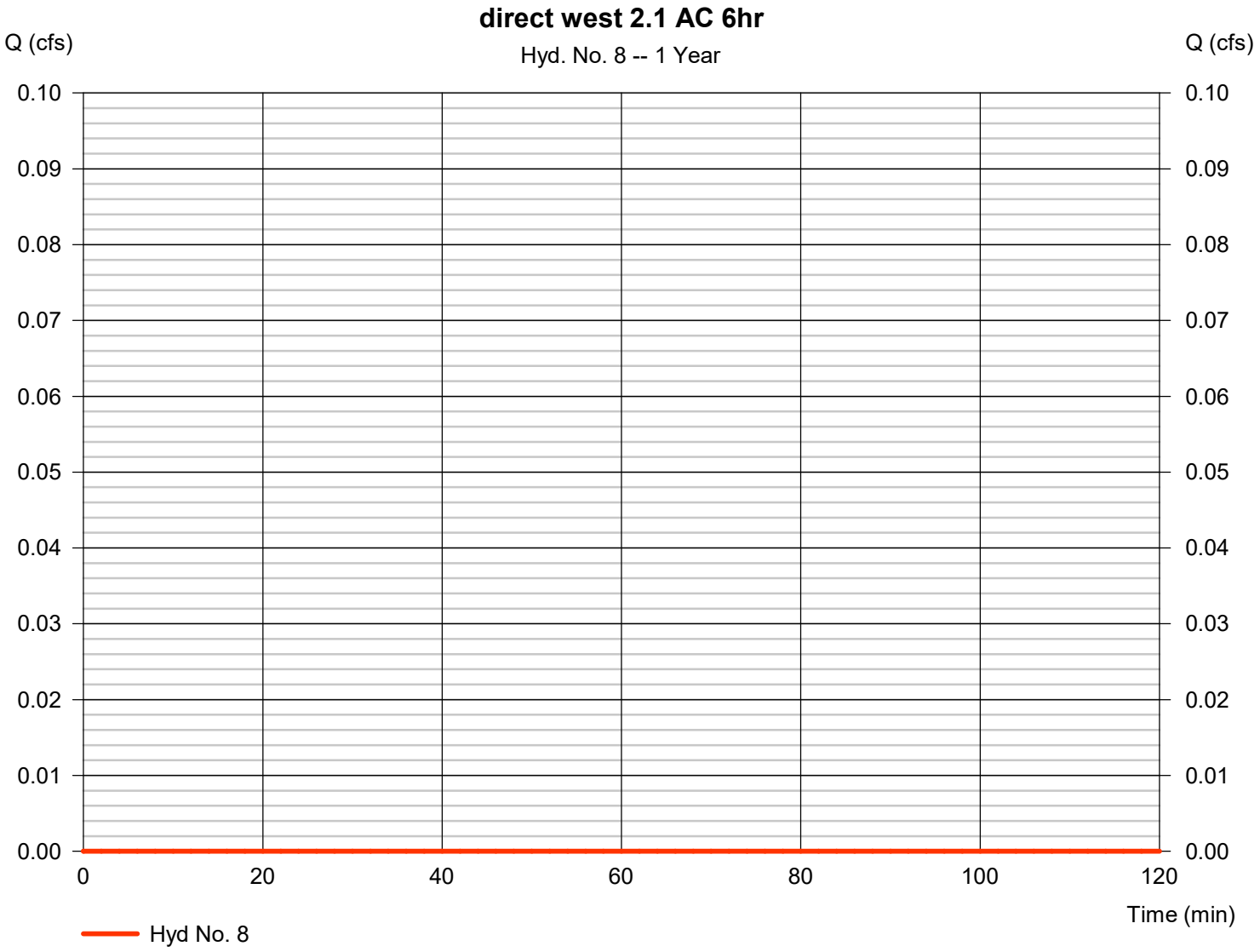


Hydrograph Report

Hyd. No. 8

direct west 2.1 AC 6hr

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.000 cfs
Storm frequency	=	1 yrs	Time to peak	=	n/a
Time interval	=	2 min	Hyd. volume	=	0 cuft
Drainage area	=	2.100 ac	Curve number	=	80
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	0.00 in	Distribution	=	SCS 6-Hr
Storm duration	=	6.00 hrs	Shape factor	=	484

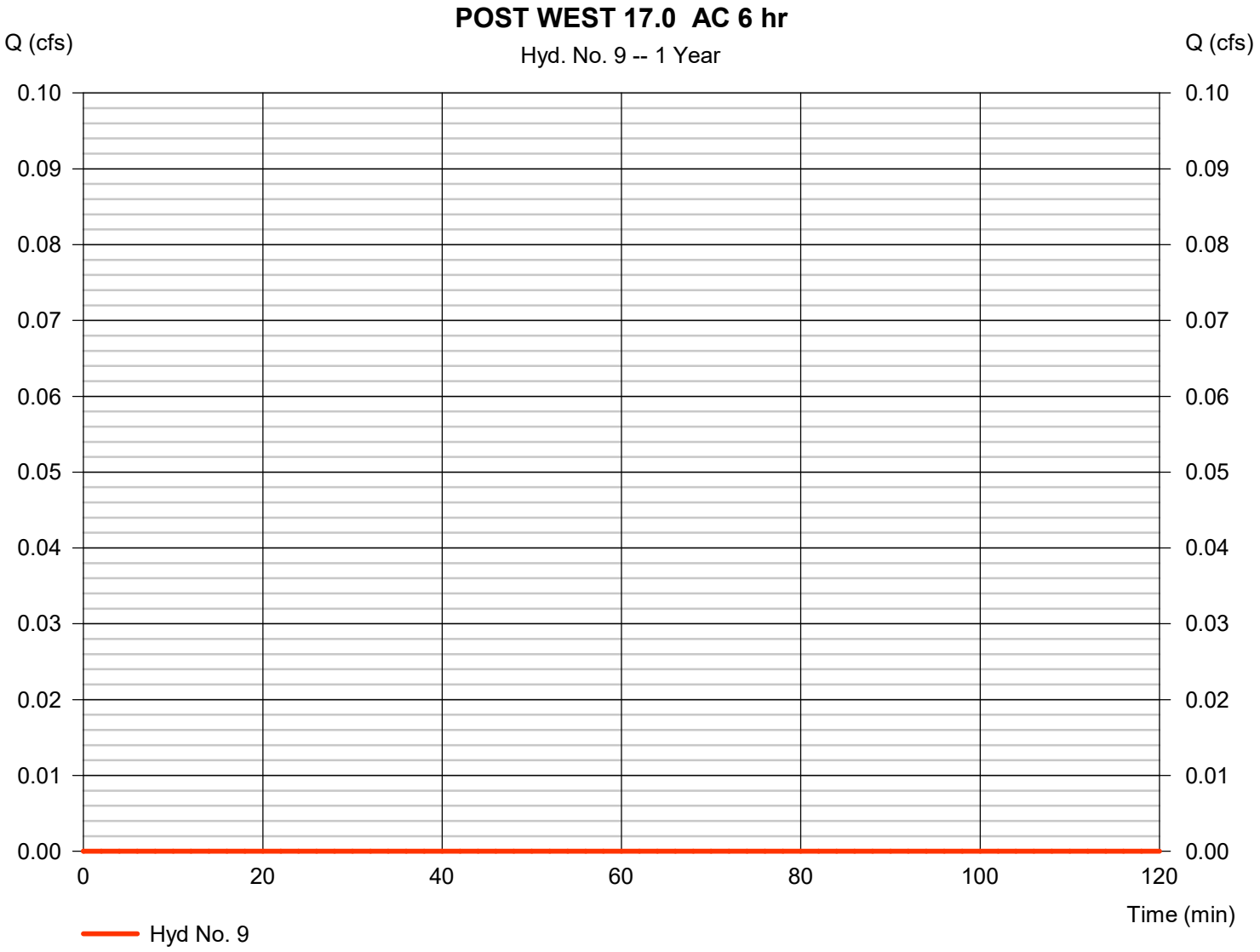


Hydrograph Report

Hyd. No. 9

POST WEST 17.0 AC 6 hr

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.000 cfs
Storm frequency	=	1 yrs	Time to peak	=	n/a
Time interval	=	2 min	Hyd. volume	=	0 cuft
Drainage area	=	17.000 ac	Curve number	=	87.6
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	0.00 in	Distribution	=	SCS 6-Hr
Storm duration	=	6.00 hrs	Shape factor	=	484



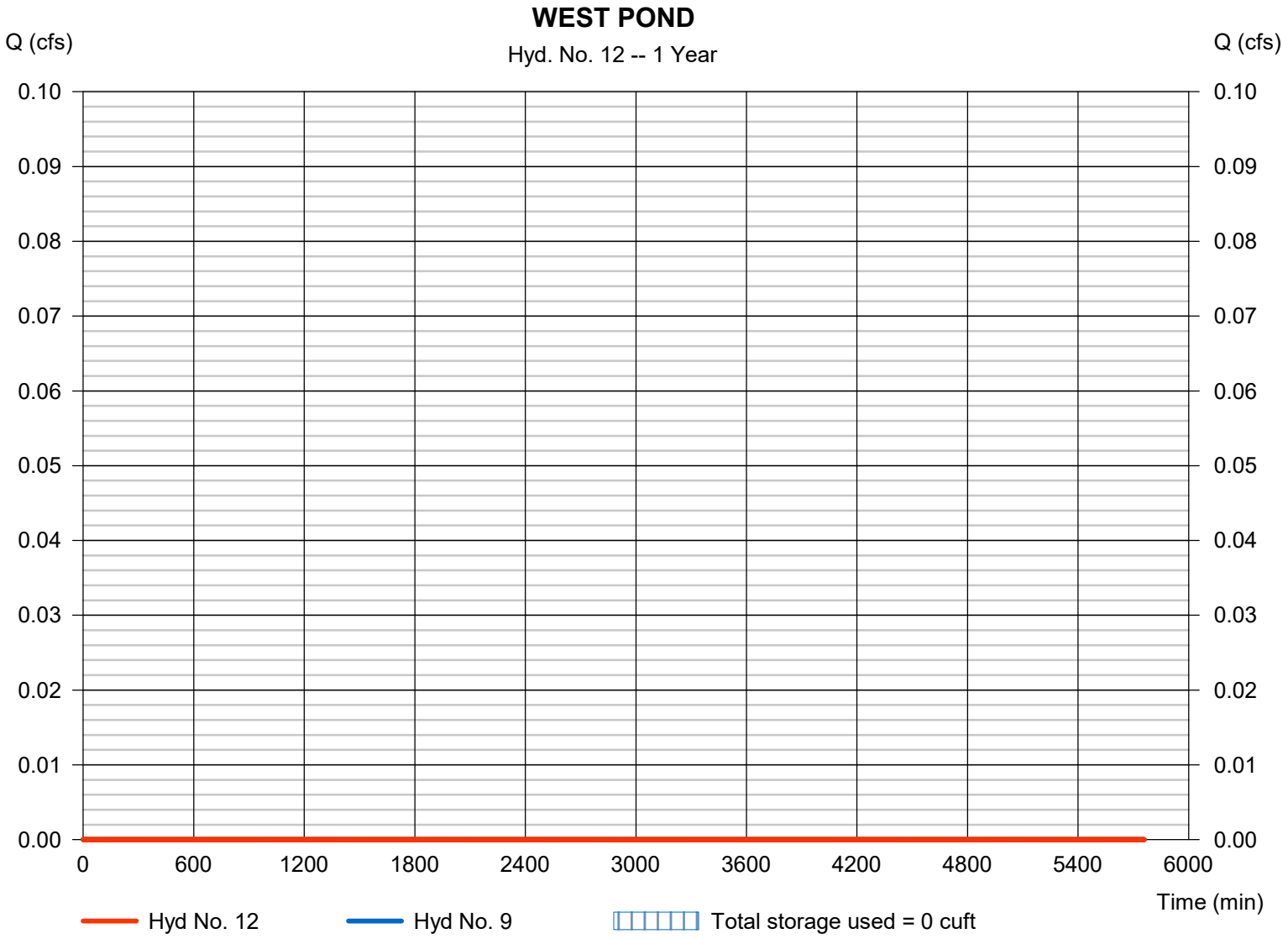
Hydrograph Report

Hyd. No. 12

WEST POND

Hydrograph type	=	Reservoir	Peak discharge	=	0.000 cfs
Storm frequency	=	1 yrs	Time to peak	=	n/a
Time interval	=	2 min	Hyd. volume	=	0 cuft
Inflow hyd. No.	=	9 - POST WEST 17.0 AC 6 hr	Max. Elevation	=	994.00 ft
Reservoir name	=	WEST POND retention	Max. Storage	=	0 cuft

Storage Indication method used.



Pond Report

Pond No. 6 - WEST POND retention

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 994.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	994.00	00	0	0
1.00	995.00	2,821	940	940
2.00	996.00	12,955	7,273	8,213
3.00	997.00	18,659	15,719	23,932
4.00	998.00	23,887	21,218	45,149
5.00	999.00	29,035	26,417	71,566
6.00	1000.00	33,525	31,250	102,816
7.00	1001.00	37,955	35,713	138,530
8.00	1002.00	42,109	40,010	178,540
9.00	1003.00	46,476	44,270	222,810
10.00	1004.00	51,034	48,732	271,543
11.00	1005.00	55,707	53,348	324,891

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 42.00	6.00	12.00	3.00
Span (in)	= 42.00	6.00	24.00	3.00
No. Barrels	= 1	1	4	6
Invert El. (ft)	= 994.00	1001.00	1001.40	994.00
Length (ft)	= 25.00	0.00	0.00	11.00
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	Yes

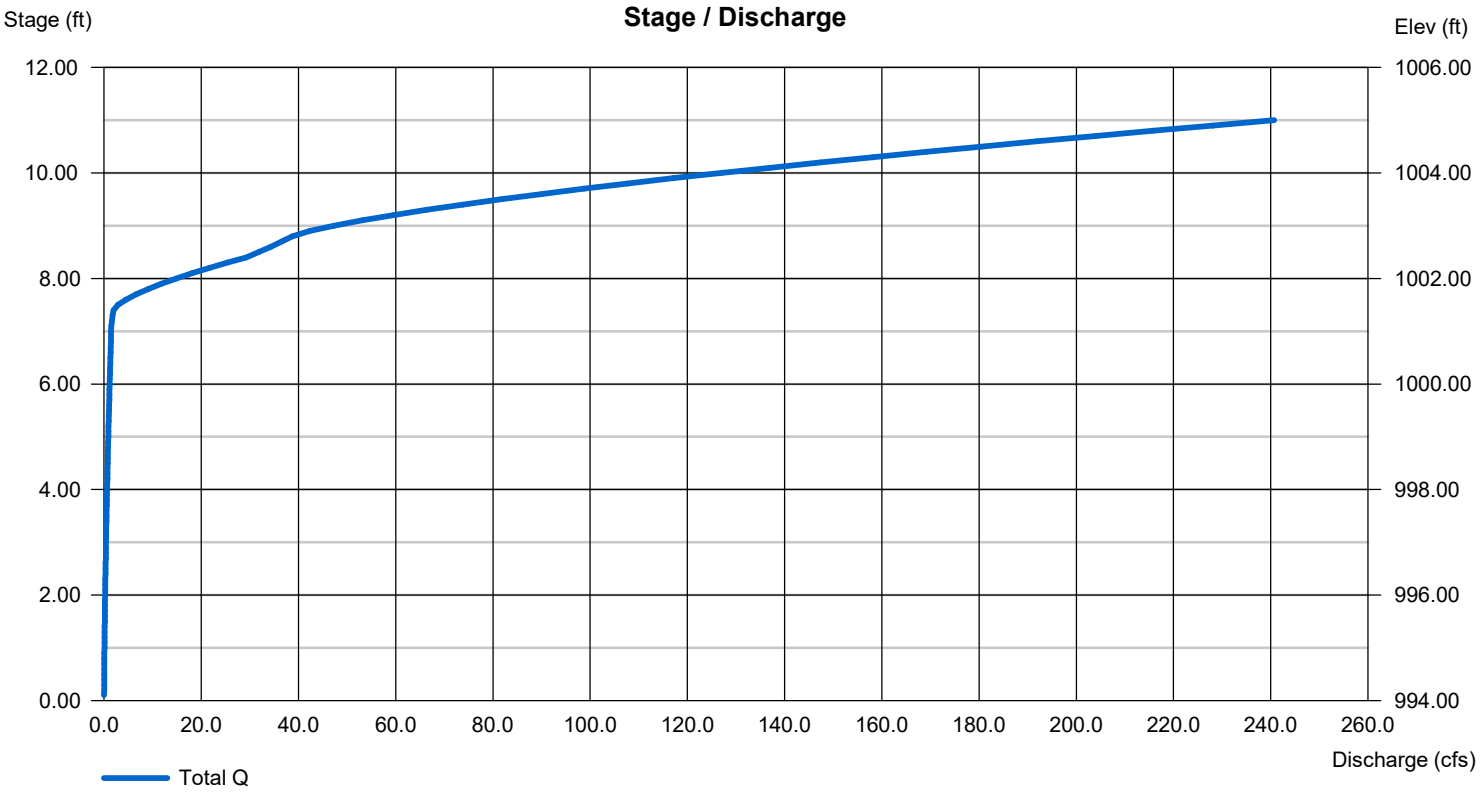
Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 20.00	20.00	0.00	0.00
Crest El. (ft)	= 1005.00	1002.80	0.00	0.00
Weir Coeff.	= 3.33	2.60	3.33	3.33
Weir Type	= 1	Broad	---	---
Multi-Stage	= Yes	No	No	No

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

TW Elev. (ft) = 0.00

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

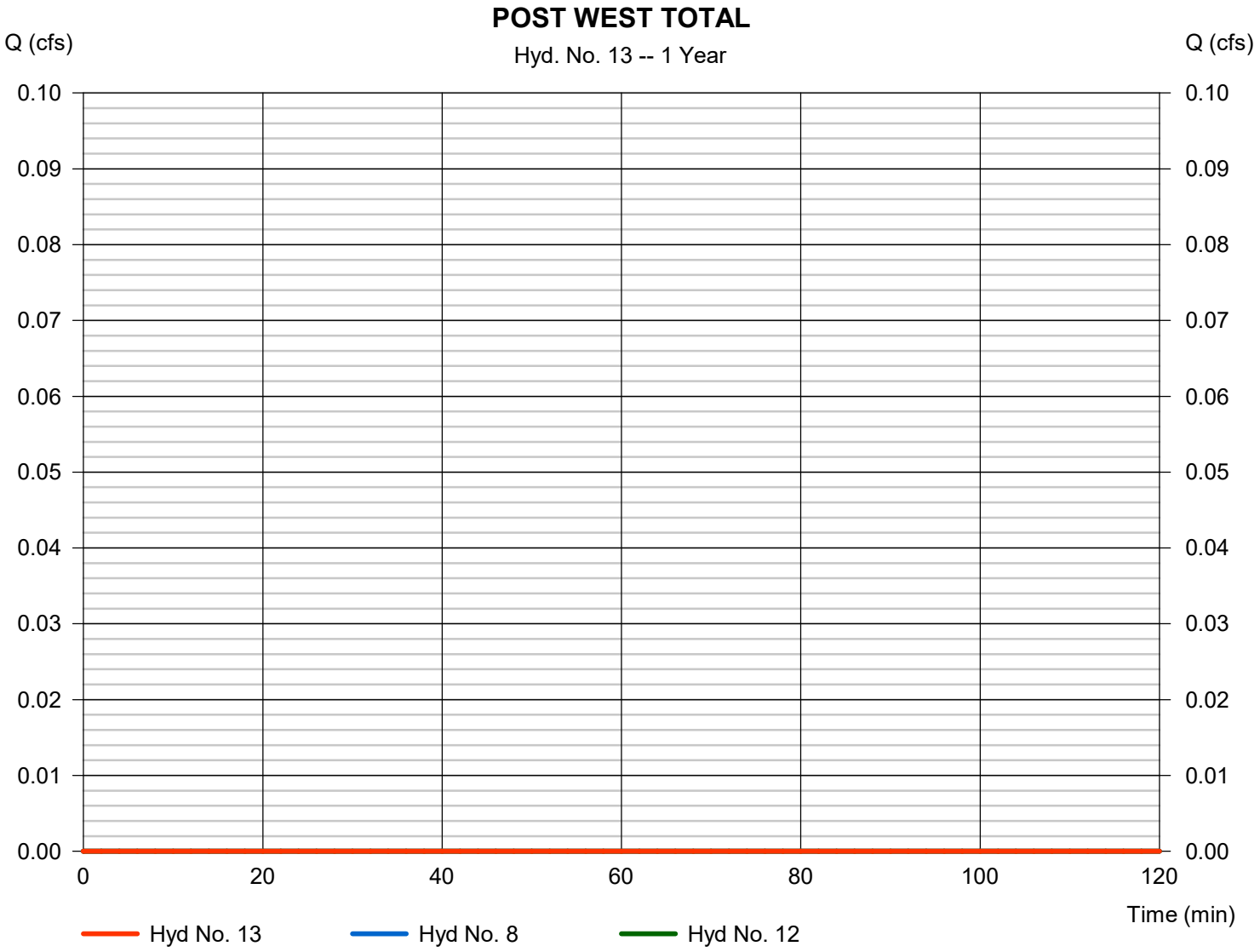


Hydrograph Report

Hyd. No. 13

POST WEST TOTAL

Hydrograph type	=	Combine	Peak discharge	=	0.000 cfs
Storm frequency	=	1 yrs	Time to peak	=	n/a
Time interval	=	2 min	Hyd. volume	=	0 cuft
Inflow hyds.	=	8, 12	Contrib. drain. area	=	2.100 ac

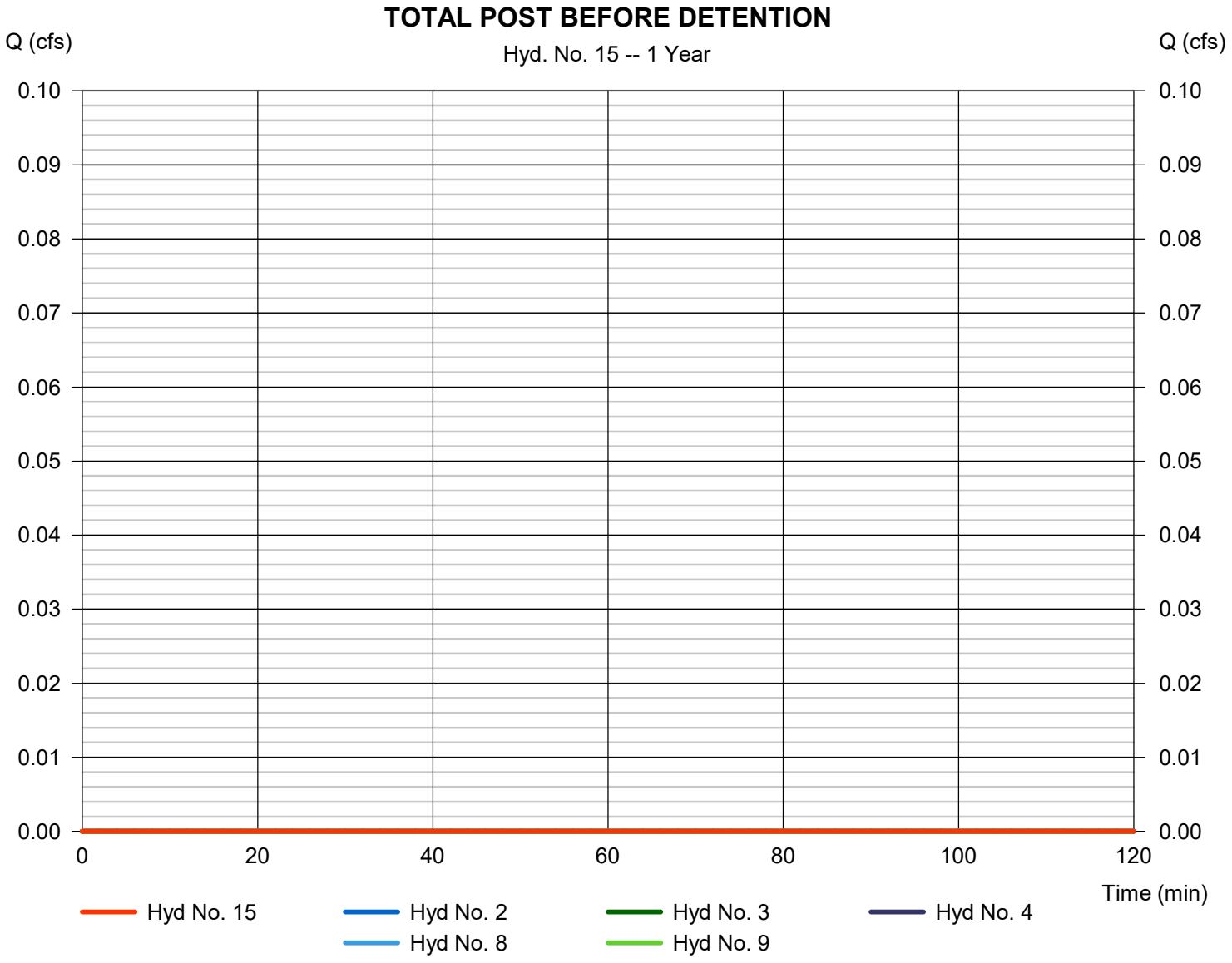


Hydrograph Report

Hyd. No. 15

TOTAL POST BEFORE DETENTION

Hydrograph type	= Combine	Peak discharge	= 0.000 cfs
Storm frequency	= 1 yrs	Time to peak	= n/a
Time interval	= 2 min	Hyd. volume	= 0 cuft
Inflow hyds.	= 2, 3, 4, 8, 9	Contrib. drain. area	= 29.700 ac



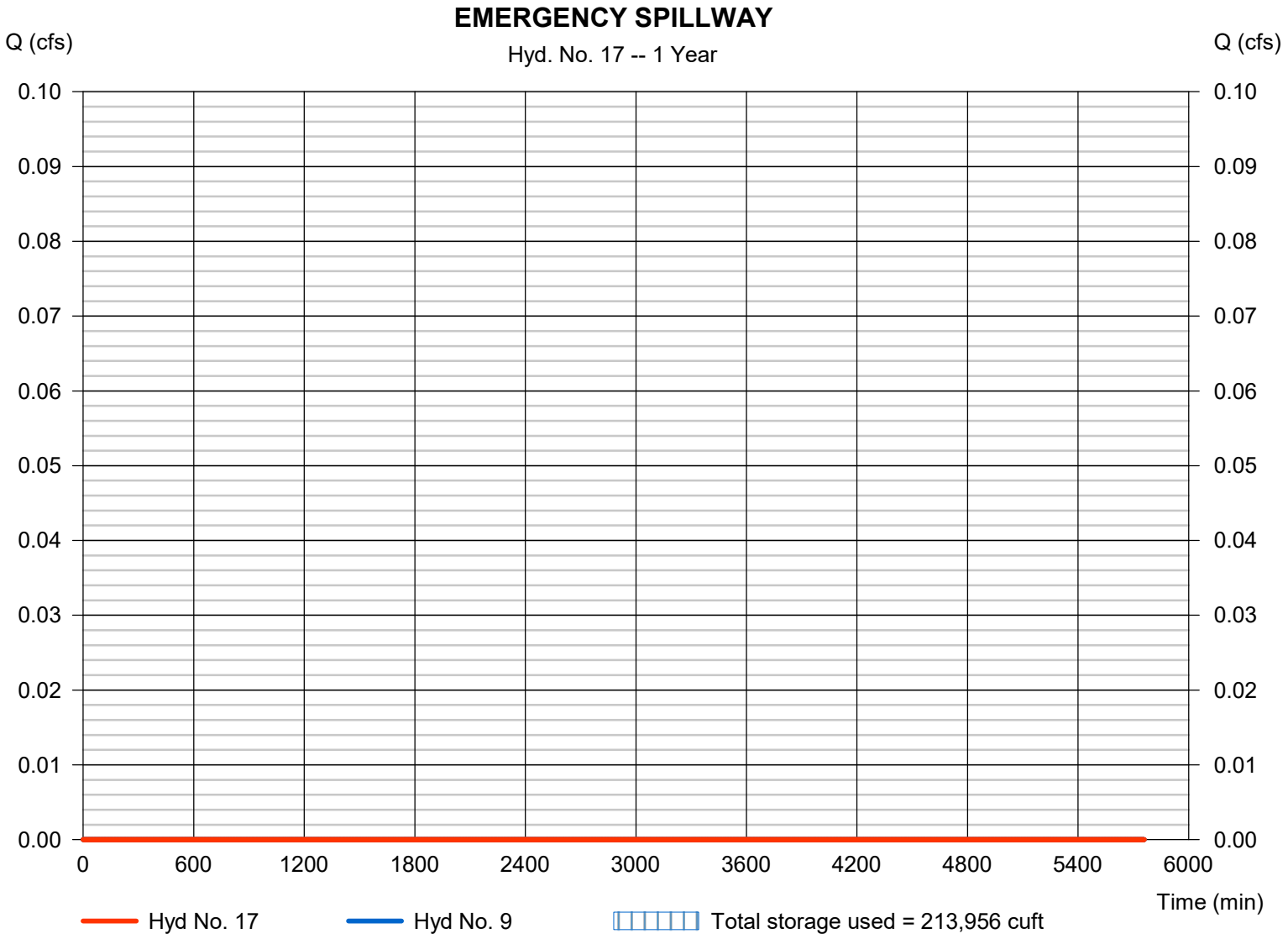
Hydrograph Report

Hyd. No. 17

EMERGENCY SPILLWAY

Hydrograph type	=	Reservoir	Peak discharge	=	0.000 cfs
Storm frequency	=	1 yrs	Time to peak	=	n/a
Time interval	=	2 min	Hyd. volume	=	0 cuft
Inflow hyd. No.	=	9 - POST WEST 17.0 AC 6 hr	Max. Elevation	=	1002.80 ft
Reservoir name	=	EMERGENCY SPILLWAY	Max. Storage	=	213,956 cuft

Storage Indication method used. Wet pond routing start elevation = 1002.80 ft.



Pond Report

Pond No. 4 - EMERGENCY SPILLWAY

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 994.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	994.00	00	0	0
1.00	995.00	2,821	940	940
2.00	996.00	12,955	7,273	8,213
3.00	997.00	18,659	15,719	23,932
4.00	998.00	23,887	21,218	45,149
5.00	999.00	29,035	26,417	71,566
6.00	1000.00	33,525	31,250	102,816
7.00	1001.00	37,955	35,713	138,530
8.00	1002.00	42,109	40,010	178,540
9.00	1003.00	46,476	44,270	222,810
10.00	1004.00	51,034	48,732	271,543
11.00	1005.00	55,707	53,348	324,891

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 42.00	Inactive	Inactive	Inactive
Span (in)	= 42.00	6.00	24.00	3.00
No. Barrels	= 1	1	4	6
Invert El. (ft)	= 994.00	1001.00	1001.40	994.00
Length (ft)	= 25.00	0.00	0.00	11.00
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	Yes

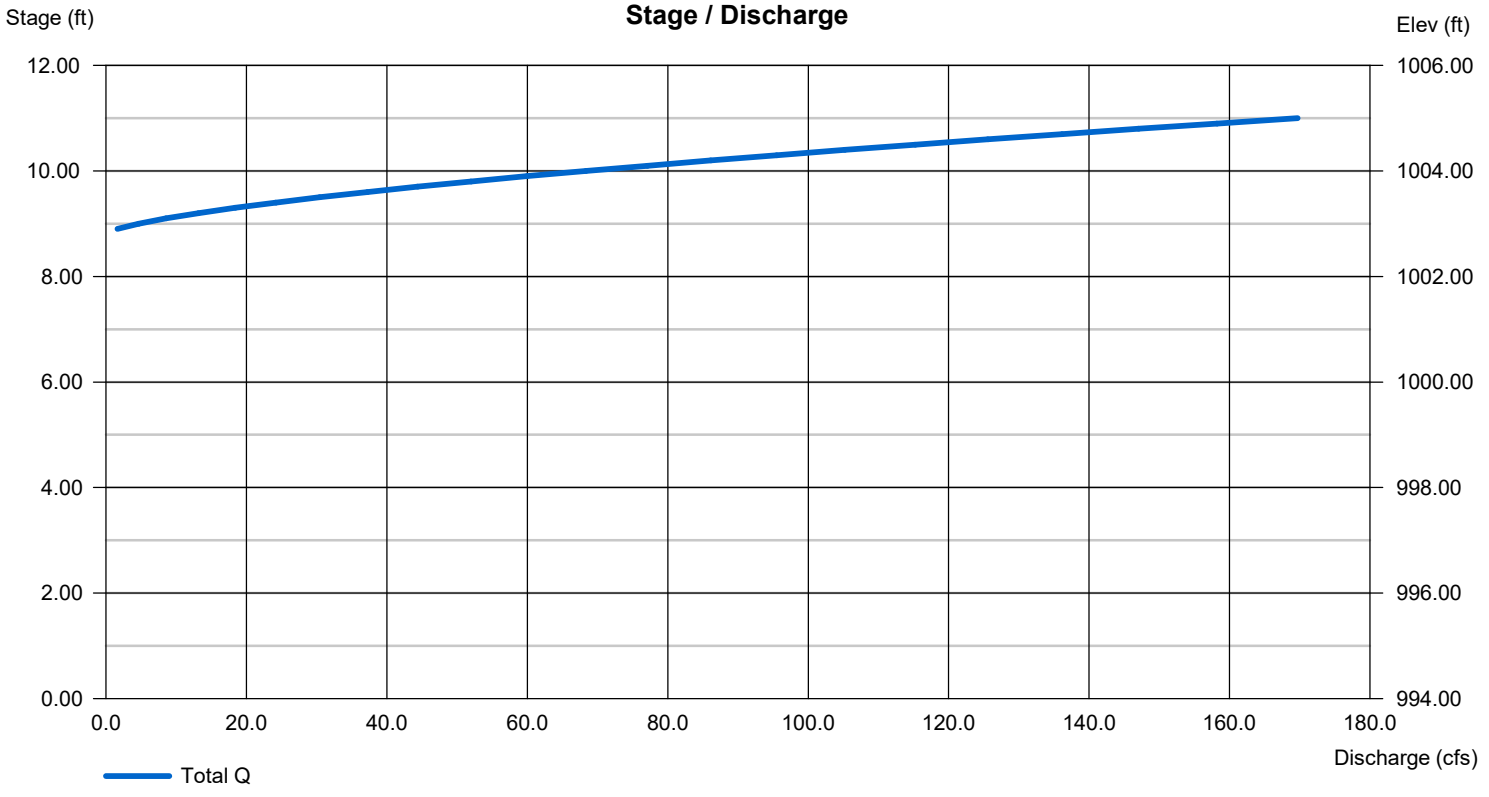
Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 20.00	20.00	0.00	0.00
Crest El. (ft)	= 1005.00	1002.80	0.00	0.00
Weir Coeff.	= 3.33	2.60	3.33	3.33
Weir Type	= 1	Broad	---	---
Multi-Stage	= Yes	No	No	No

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

TW Elev. (ft) = 0.00

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

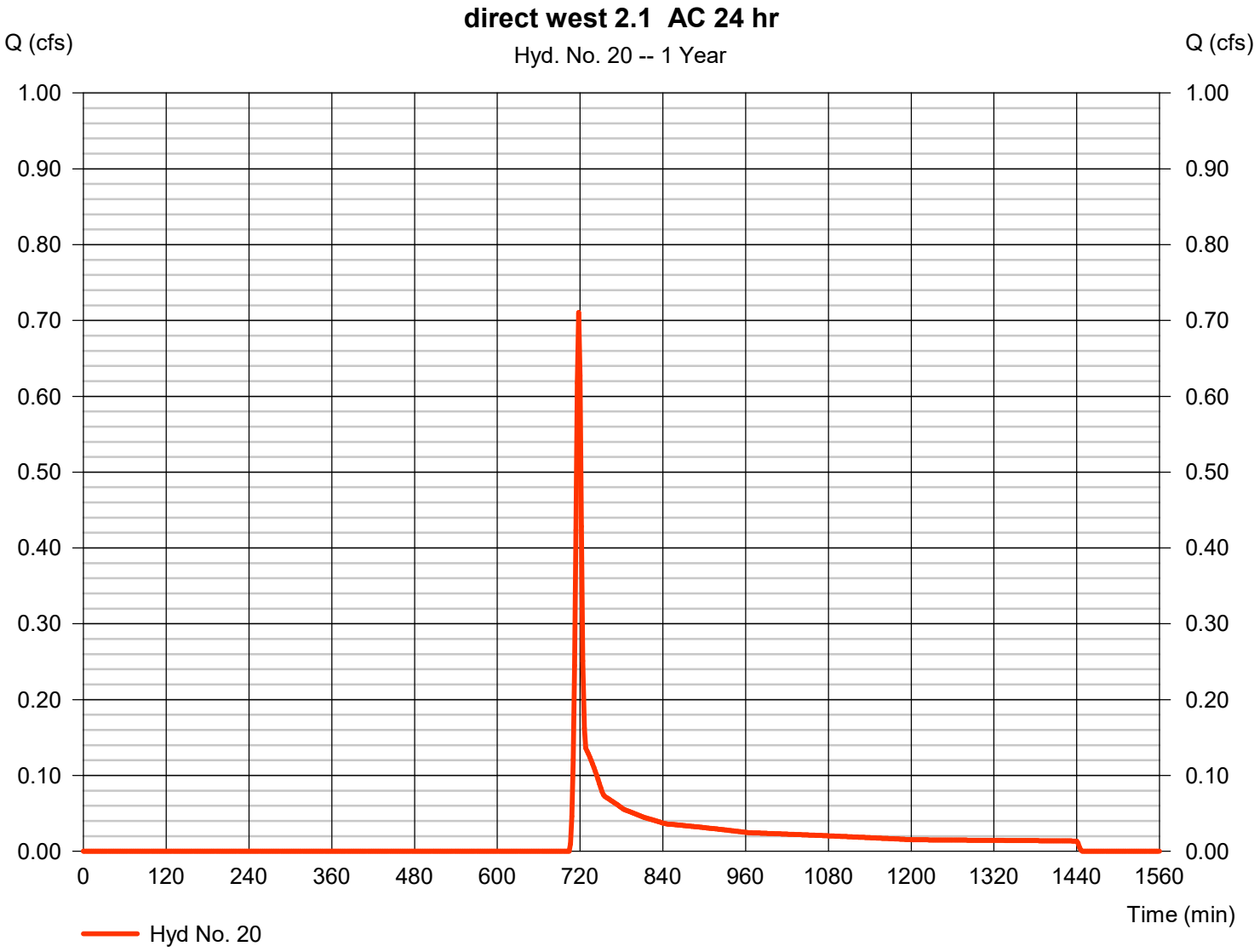


Hydrograph Report

Hyd. No. 20

direct west 2.1 AC 24 hr

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.710 cfs
Storm frequency	=	1 yrs	Time to peak	=	718 min
Time interval	=	2 min	Hyd. volume	=	1,605 cuft
Drainage area	=	2.100 ac	Curve number	=	80
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	1.37 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

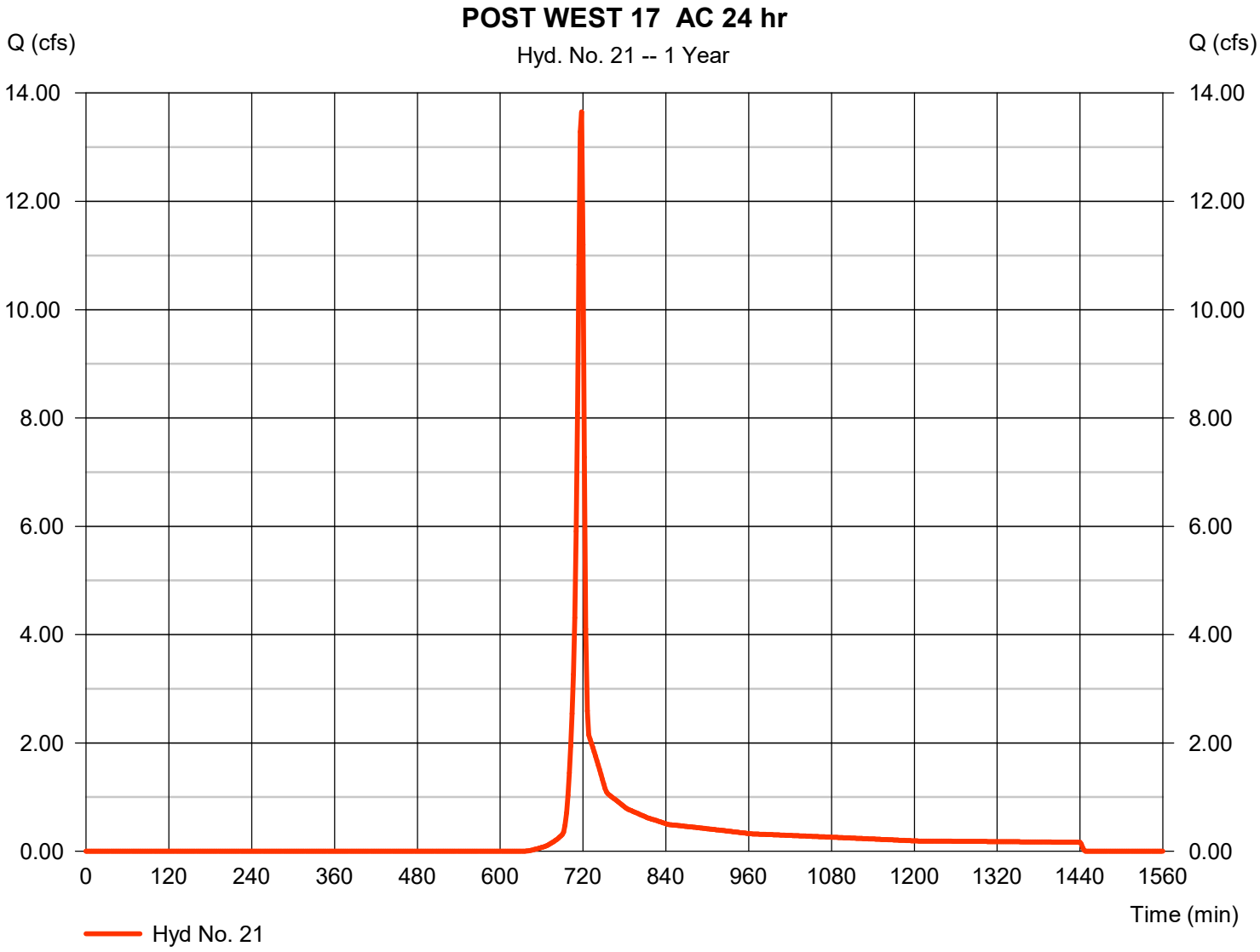


Hydrograph Report

Hyd. No. 21

POST WEST 17 AC 24 hr

Hydrograph type	= SCS Runoff	Peak discharge	= 13.65 cfs
Storm frequency	= 1 yrs	Time to peak	= 718 min
Time interval	= 2 min	Hyd. volume	= 27,311 cuft
Drainage area	= 17.000 ac	Curve number	= 87.6
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 1.37 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

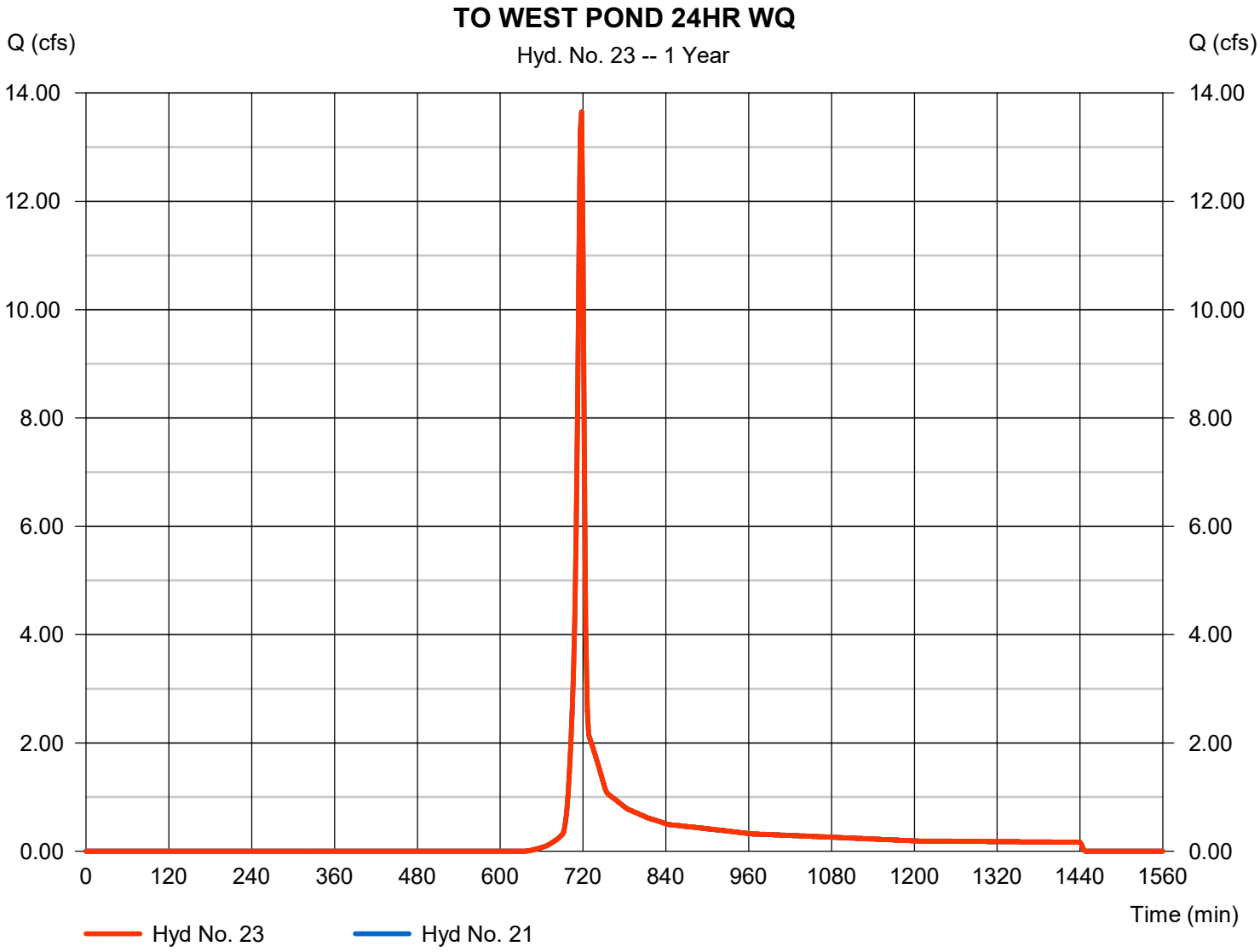


Hydrograph Report

Hyd. No. 23

TO WEST POND 24HR WQ

Hydrograph type	= Combine	Peak discharge	= 13.65 cfs
Storm frequency	= 1 yrs	Time to peak	= 718 min
Time interval	= 2 min	Hyd. volume	= 27,311 cuft
Inflow hyds.	= 21	Contrib. drain. area	= 17.000 ac



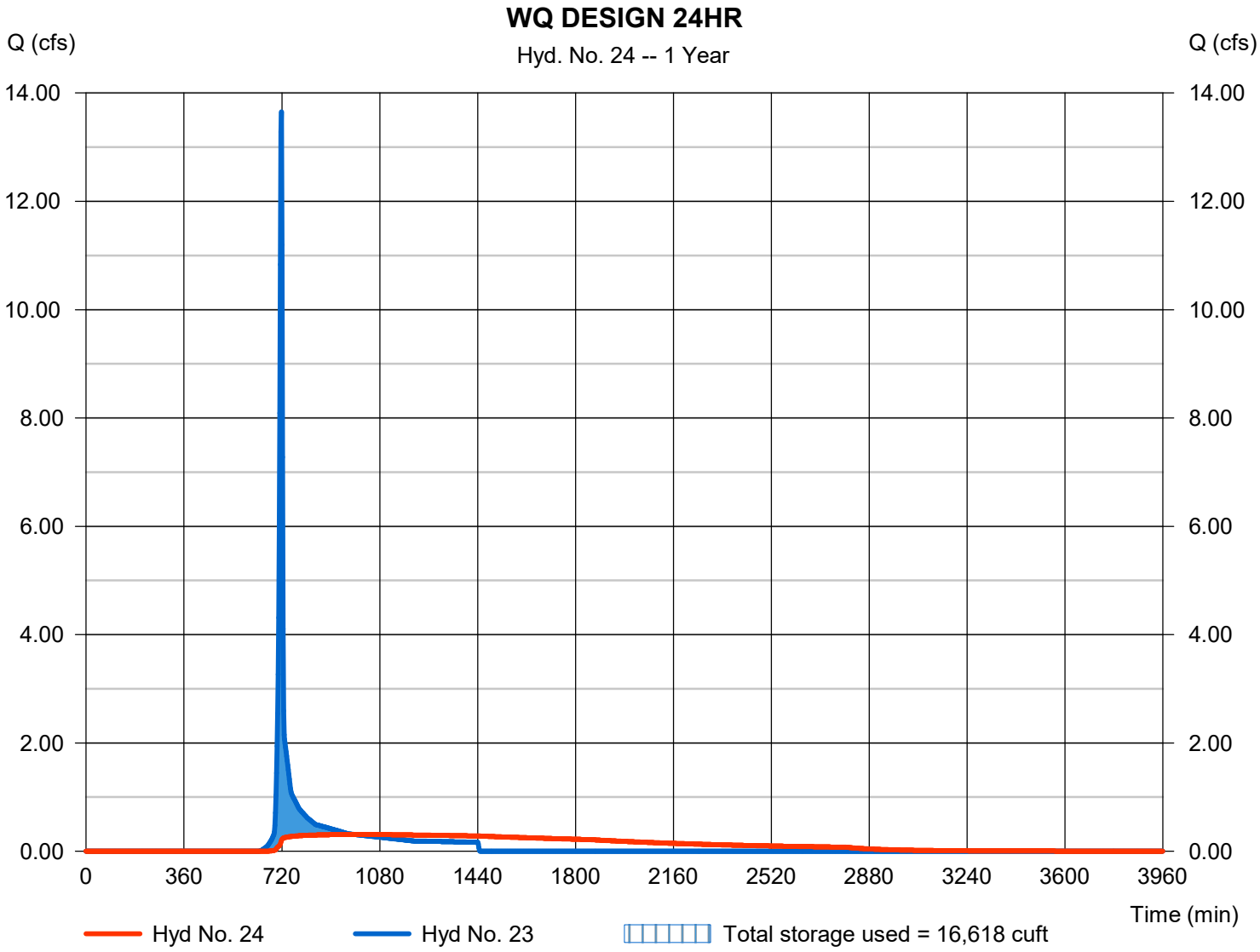
Hydrograph Report

Hyd. No. 24

WQ DESIGN 24HR

Hydrograph type	=	Reservoir	Peak discharge	=	0.309 cfs
Storm frequency	=	1 yrs	Time to peak	=	988 min
Time interval	=	2 min	Hyd. volume	=	27,268 cuft
Inflow hyd. No.	=	23 - TO WEST POND 24HR WQ	Max. Elevation	=	996.53 ft
Reservoir name	=	WEST POND retention	Max. Storage	=	16,618 cuft

Storage Indication method used.



Pond No. 6 - WEST POND retention

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 994.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	994.00	00	0	0
1.00	995.00	2,821	940	940
2.00	996.00	12,955	7,273	8,213
3.00	997.00	18,659	15,719	23,932
4.00	998.00	23,887	21,218	45,149
5.00	999.00	29,035	26,417	71,566
6.00	1000.00	33,525	31,250	102,816
7.00	1001.00	37,955	35,713	138,530
8.00	1002.00	42,109	40,010	178,540
9.00	1003.00	46,476	44,270	222,810
10.00	1004.00	51,034	48,732	271,543
11.00	1005.00	55,707	53,348	324,891

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 42.00	6.00	12.00	3.00
Span (in)	= 42.00	6.00	24.00	3.00
No. Barrels	= 1	1	4	6
Invert El. (ft)	= 994.00	1001.00	1001.40	994.00
Length (ft)	= 25.00	0.00	0.00	11.00
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	Yes

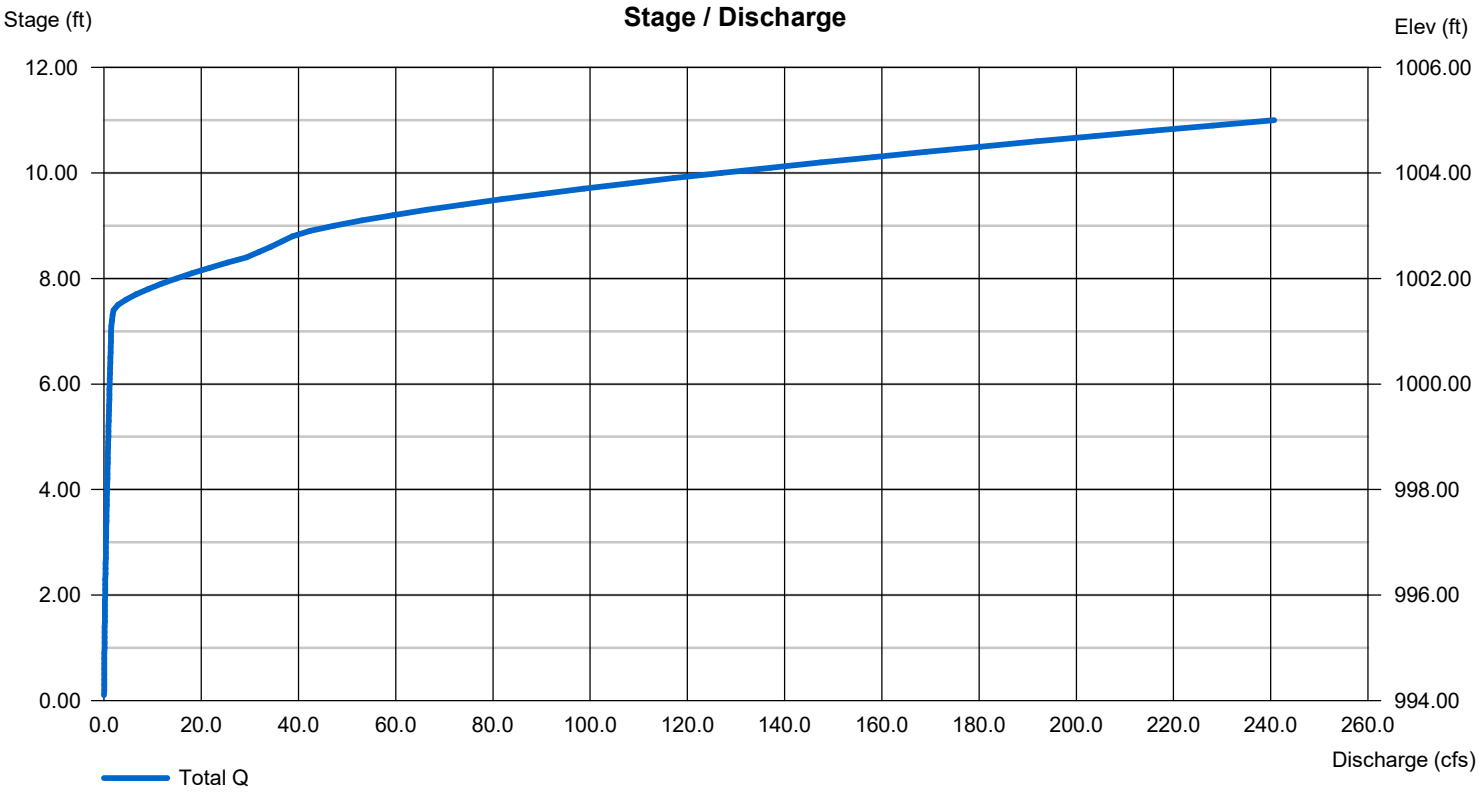
Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 20.00	20.00	0.00	0.00
Crest El. (ft)	= 1005.00	1002.80	0.00	0.00
Weir Coeff.	= 3.33	2.60	3.33	3.33
Weir Type	= 1	Broad	---	---
Multi-Stage	= Yes	No	No	No

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

TW Elev. (ft) = 0.00

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

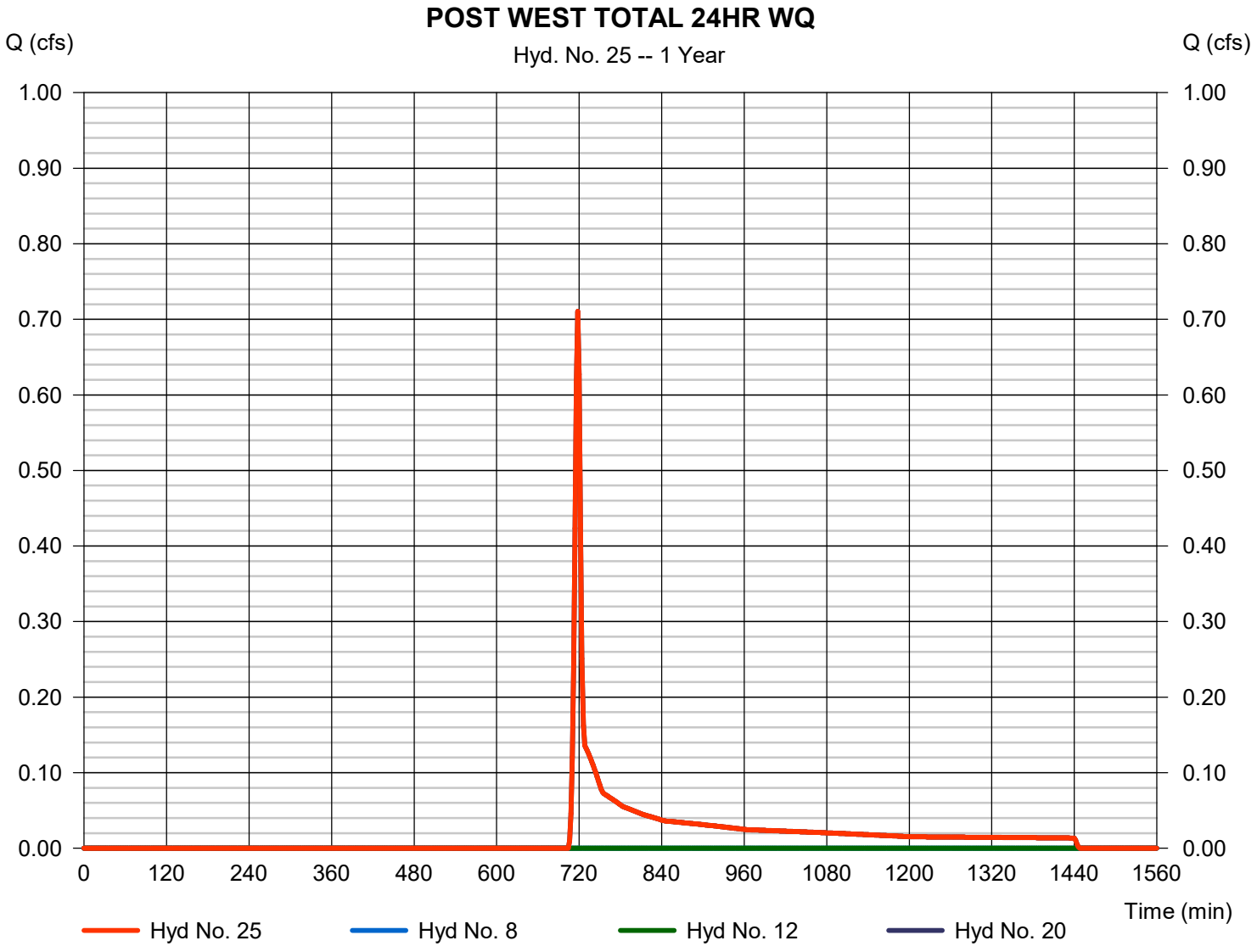


Hydrograph Report

Hyd. No. 25

POST WEST TOTAL 24HR WQ

Hydrograph type	= Combine	Peak discharge	= 0.710 cfs
Storm frequency	= 1 yrs	Time to peak	= 718 min
Time interval	= 2 min	Hyd. volume	= 1,605 cuft
Inflow hyds.	= 8, 12, 20	Contrib. drain. area	= 4.200 ac

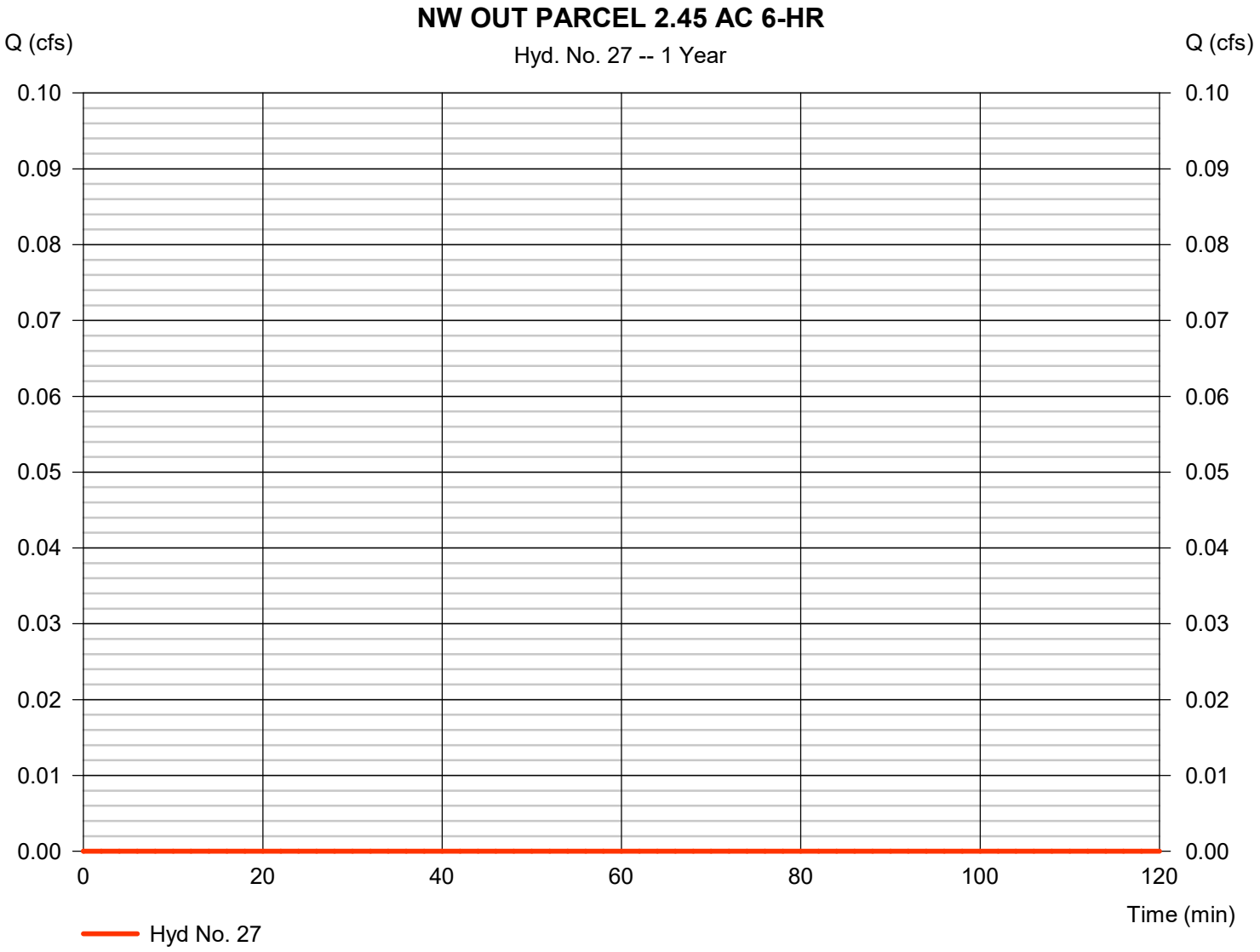


Hydrograph Report

Hyd. No. 27

NW OUT PARCEL 2.45 AC 6-HR

Hydrograph type	= SCS Runoff	Peak discharge	= 0.000 cfs
Storm frequency	= 1 yrs	Time to peak	= n/a
Time interval	= 2 min	Hyd. volume	= 0 cuft
Drainage area	= 2.450 ac	Curve number	= 94
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 0.00 in	Distribution	= SCS 6-Hr
Storm duration	= 6.00 hrs	Shape factor	= 484



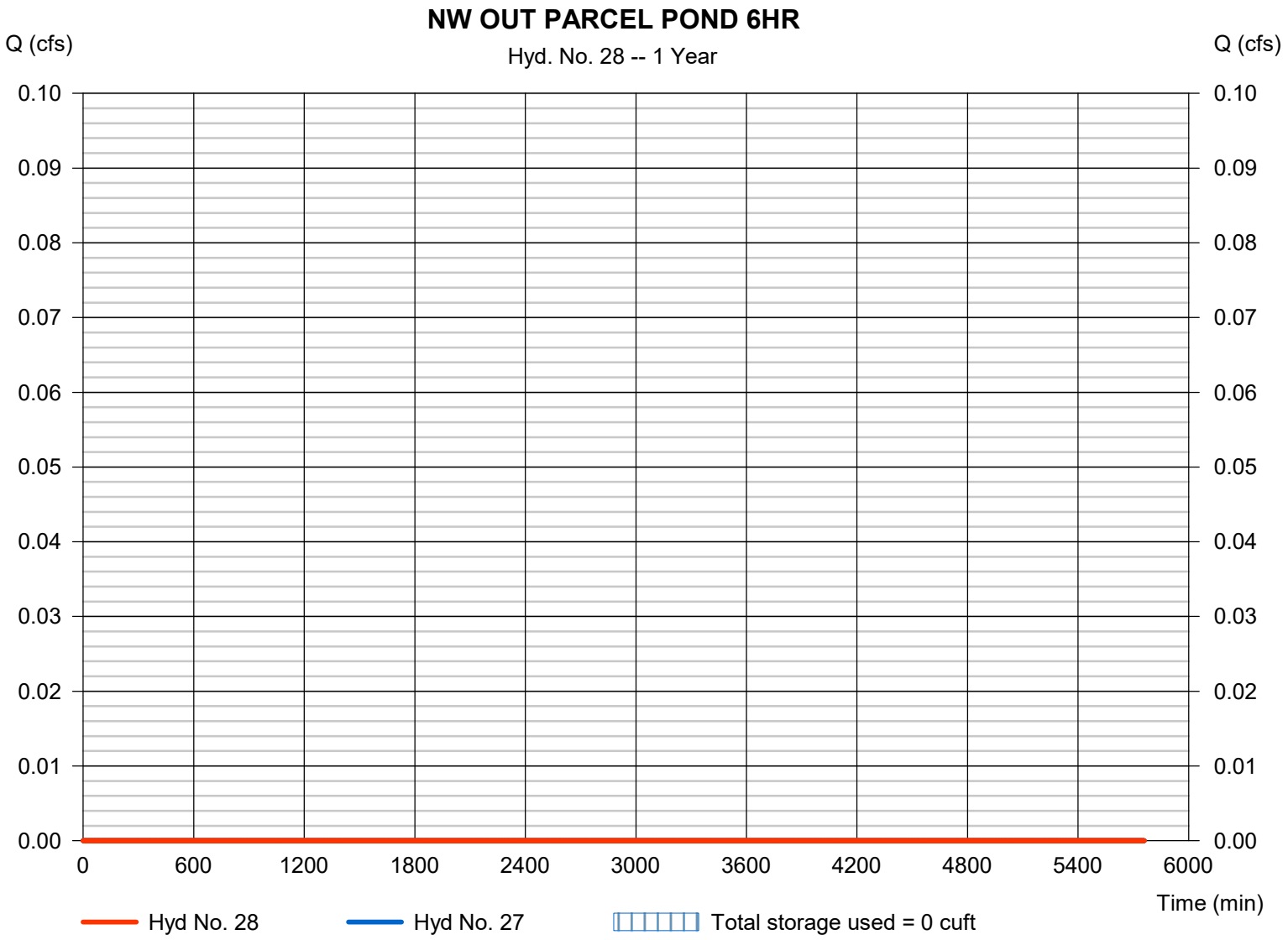
Hydrograph Report

Hyd. No. 28

NW OUT PARCEL POND 6HR

Hydrograph type	=	Reservoir	Peak discharge	=	0.000 cfs
Storm frequency	=	1 yrs	Time to peak	=	n/a
Time interval	=	2 min	Hyd. volume	=	0 cuft
Inflow hyd. No.	=	27 - NW OUT PARCEL 2.45 AC 6HR	Max. Elevation	=	994.00 ft
Reservoir name	=	NW OUT PARCEL POND	Max. Storage	=	0 cuft

Storage Indication method used.



Pond Report

Pond No. 8 - NW OUT PARCEL POND

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 994.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	994.00	00	0	0
1.00	995.00	1,893	631	631
2.00	996.00	3,106	2,474	3,105
3.00	997.00	4,377	3,723	6,828
4.00	998.00	5,703	5,025	11,853
5.00	999.00	7,087	6,382	18,235
6.00	1000.00	8,527	7,795	26,030
7.00	1001.00	10,028	9,266	35,296
8.00	1002.00	11,582	10,795	46,091
8.50	1002.50	12,380	5,989	52,079

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 12.00	Inactive	6.00	2.00
Span (in)	= 12.00	4.00	12.00	2.00
No. Barrels	= 1	1	3	6
Invert El. (ft)	= 994.00	995.00	999.00	994.00
Length (ft)	= 50.00	0.00	0.00	8.50
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	Yes

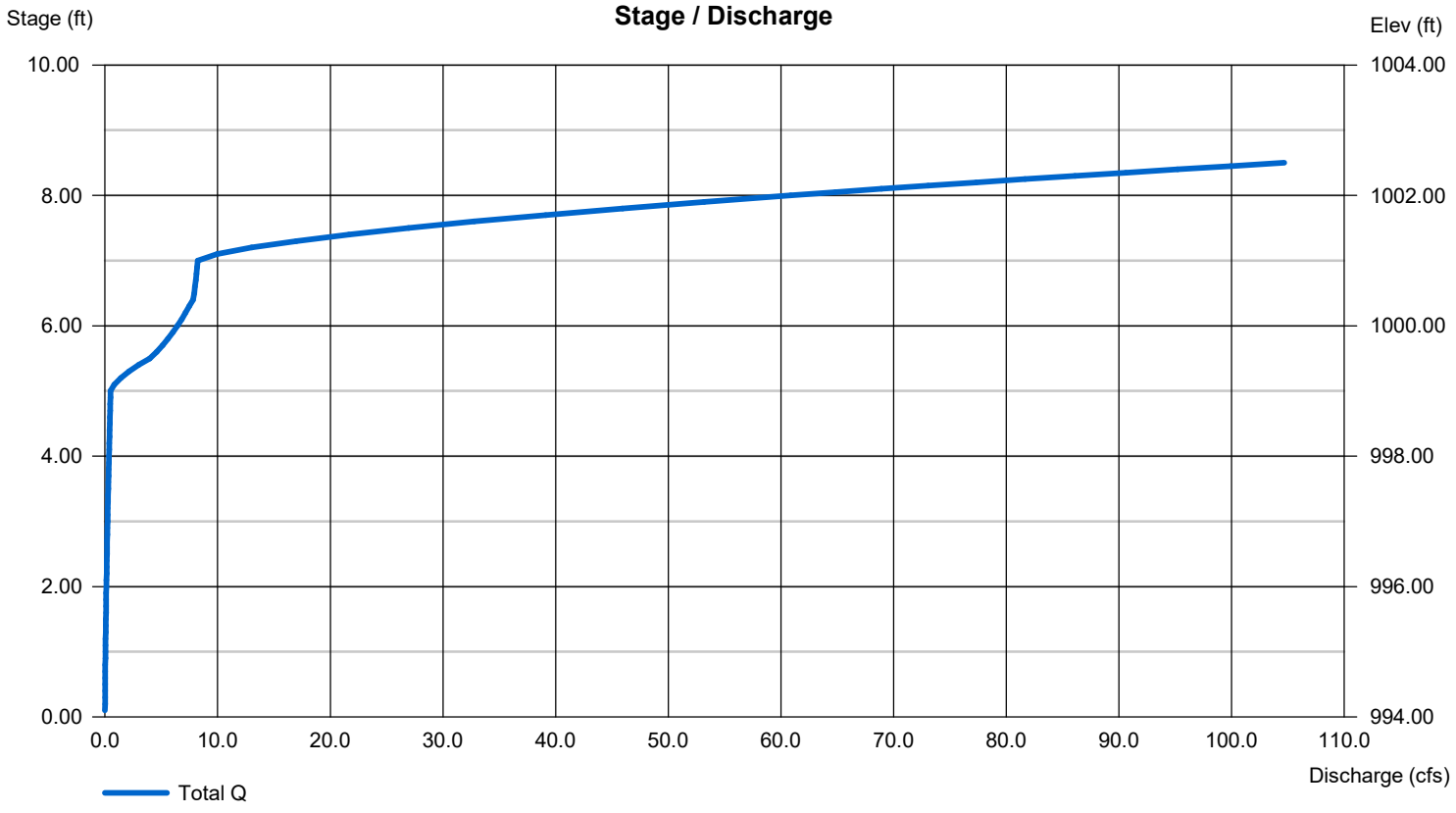
Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 20.00	20.00	0.00	0.00
Crest El. (ft)	= 1002.50	1001.00	0.00	0.00
Weir Coeff.	= 3.33	2.60	3.33	3.33
Weir Type	= 1	Broad	---	---
Multi-Stage	= Yes	No	No	No

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

TW Elev. (ft) = 0.00

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



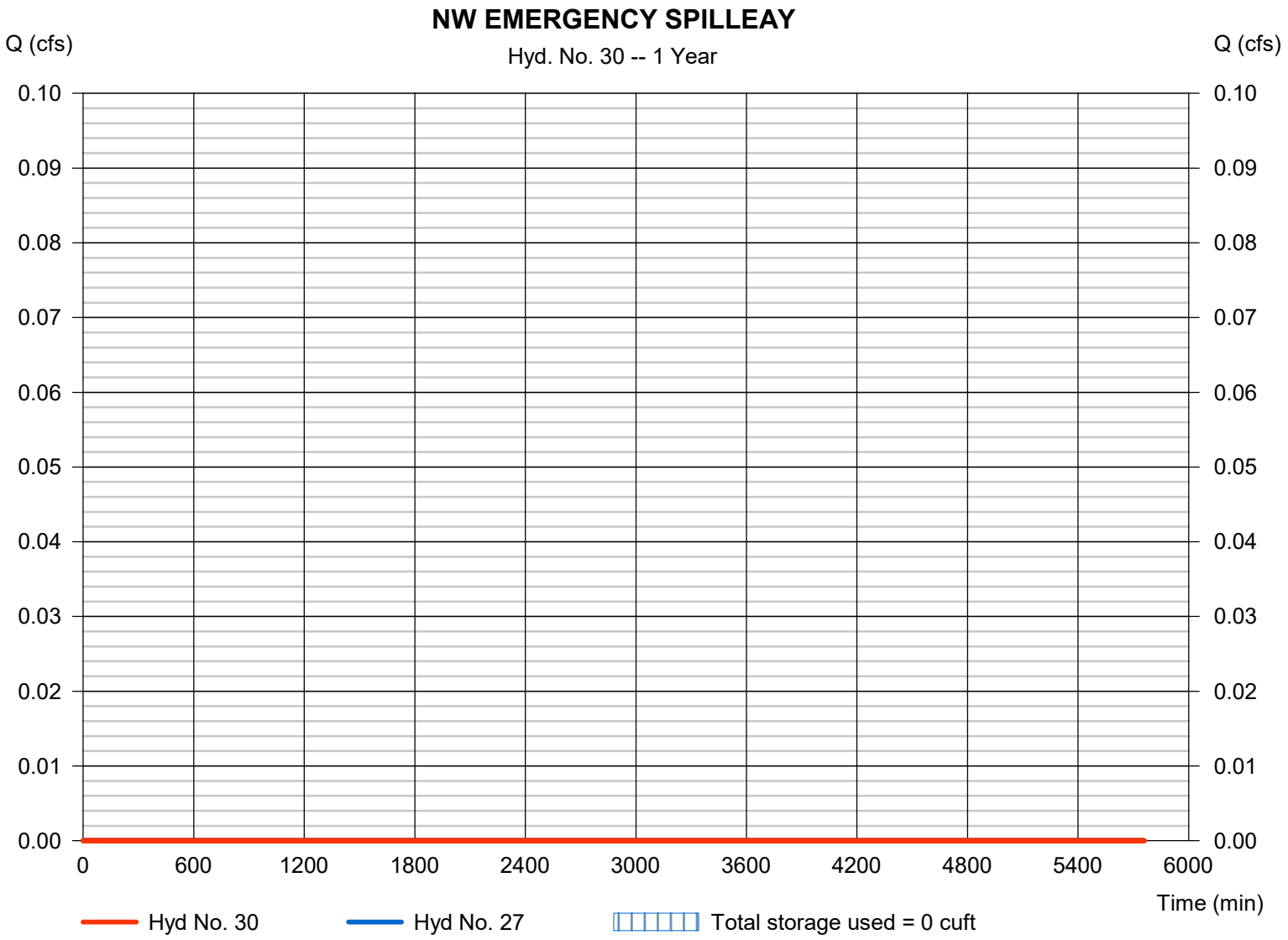
Hydrograph Report

Hyd. No. 30

NW EMERGENCY SPILLEAY

Hydrograph type	=	Reservoir	Peak discharge	=	0.000 cfs
Storm frequency	=	1 yrs	Time to peak	=	n/a
Time interval	=	2 min	Hyd. volume	=	0 cuft
Inflow hyd. No.	=	27 - NW OUT PARCEL 2.45 AC 6 HR	Max. Elevation	=	999.00 ft
Reservoir name	=	NW EMERGENCY SPILLWAY	Max. Storage	=	0 cuft

Storage Indication method used.



Pond Report

Pond No. 10 - NW EMERGENCY SPILLWAY

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 999.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	999.00	00	0	0
1.00	1000.00	1,893	631	631
2.00	1001.00	3,106	2,474	3,105
3.00	1002.00	4,377	3,723	6,828
4.00	1003.00	5,703	5,025	11,853
5.00	1004.00	7,087	6,382	18,235
6.00	1005.00	8,527	7,795	26,030
7.00	1006.00	10,028	9,266	35,296
8.00	1007.00	11,582	10,795	46,091
8.50	1007.50	12,380	5,989	52,079

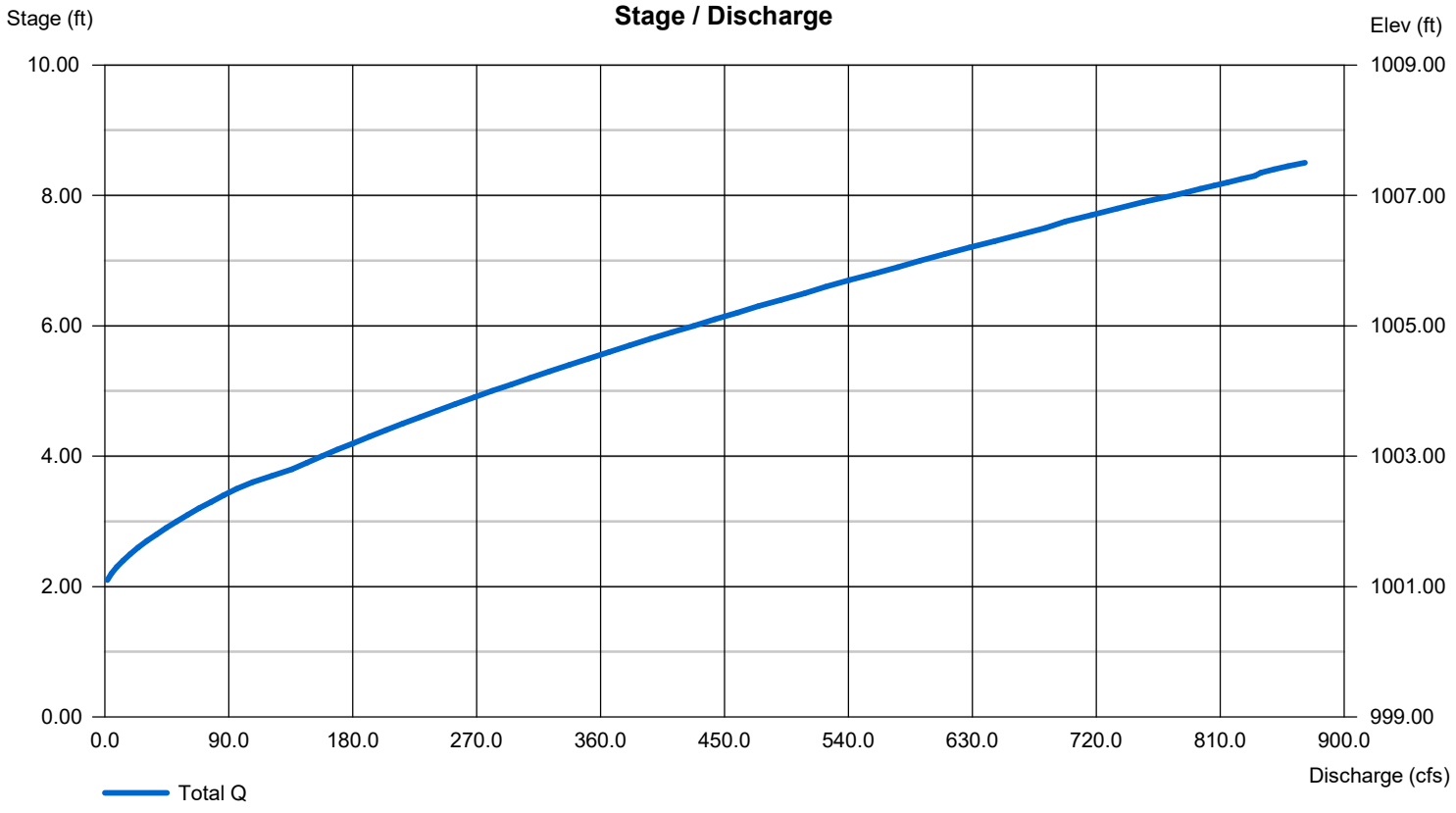
Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 12.00	Inactive	Inactive	0.00
Span (in)	= 12.00	4.00	12.00	0.00
No. Barrels	= 1	1	3	0
Invert El. (ft)	= 994.00	995.00	999.00	0.00
Length (ft)	= 50.00	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)	= 20.00	20.00	0.00	0.00
Crest El. (ft)	= 1002.50	1001.00	0.00	0.00
Weir Coeff.	= 3.33	2.60	3.33	3.33
Weir Type	= 1	Broad	---	---
Multi-Stage	= Yes	No	No	No
Exfil.(in/hr)	= 0.000 (by Wet area)			
TW Elev. (ft)	= 0.00			

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



Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2026

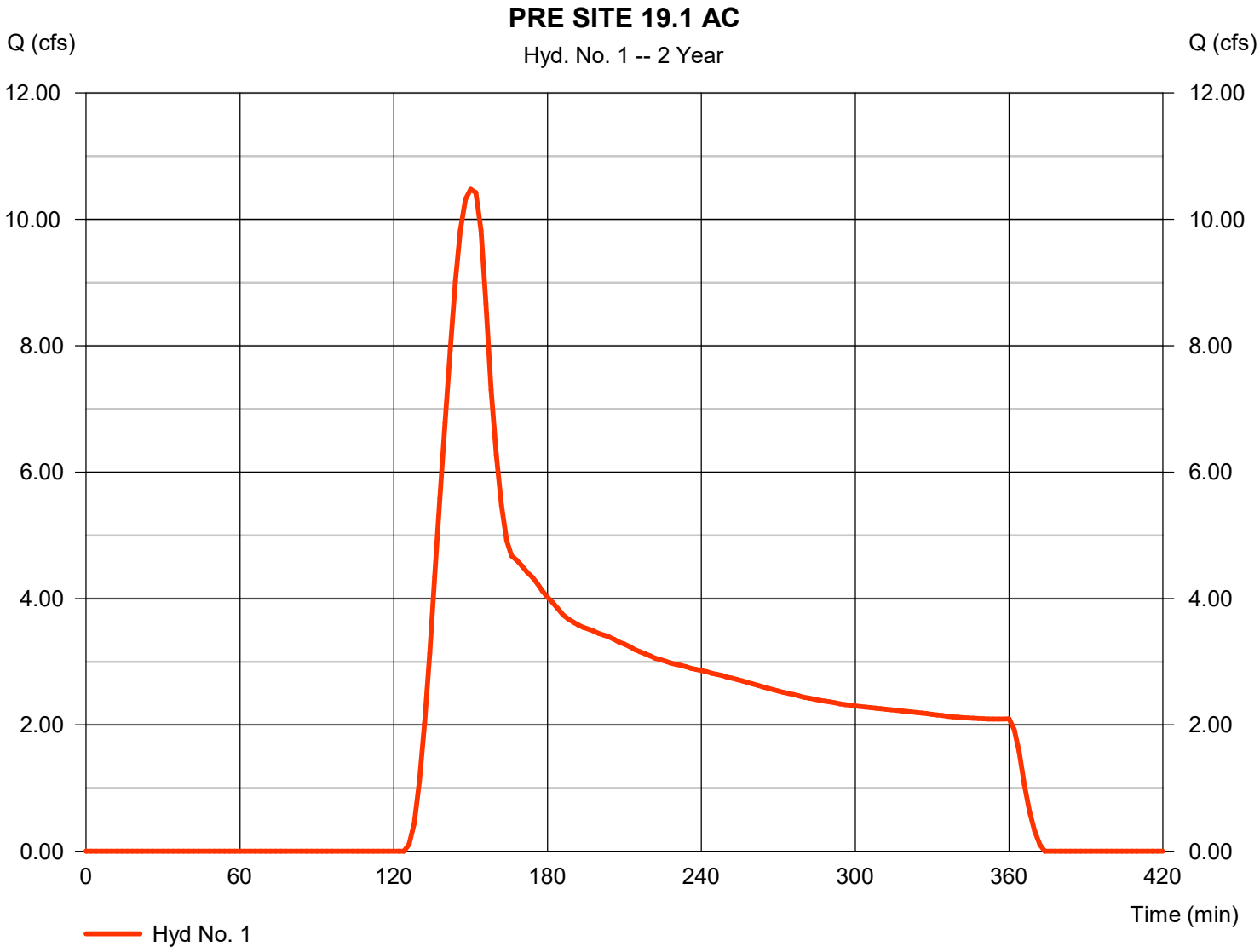
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	10.48	2	150	48,535	------	------	------	PRE SITE 19.1 AC
2	SCS Runoff	3.373	2	152	16,247	------	------	------	OFFSITE EAST 6.2 AC
3	SCS Runoff	4.581	2	144	19,846	------	------	------	OFFSITE ROAD 2.4 AC
4	SCS Runoff	1.065	2	146	4,765	------	------	------	OFFSITE NORTH 2 AC
5	Combine	8.294	2	146	40,858	2, 3, 4	------	------	OFFSITE
6	SCS Runoff	1.304	2	146	5,837	------	------	------	PRE NW OUTPARCEL 2.45 AC
8	SCS Runoff	1.729	2	146	7,155	------	------	------	direct west 2.1 AC 6hr
9	SCS Runoff	21.72	2	144	86,185	------	------	------	POST WEST 17.0 AC 6 hr
12	Reservoir	0.906	2	364	86,142	9	999.13	75,712	WEST POND
13	Combine	2.151	2	146	93,297	8, 12	------	------	POST WEST TOTAL
15	Combine	31.55	2	144	134,197	2, 3, 4, 8, 9,	------	------	TOTAL POST BEFORE DETENTION
17	Reservoir	14.71	2	154	86,182	9	1003.23	234,008	EMERGENCY SPILLWAY
20	SCS Runoff	6.387	2	716	12,896	------	------	------	direct west 2.1 AC 24 hr
21	SCS Runoff	68.00	2	716	140,303	------	------	------	POST WEST 17 AC 24 hr
23	Combine	68.00	2	716	140,303	21,	------	------	TO WEST POND 24HR WQ
24	Reservoir	1.114	2	1018	140,193	23	999.88	99,147	WQ DESIGN 24HR
25	Combine	7.130	2	716	106,193	8, 12, 20,	------	------	POST WEST TOTAL 24HR WQ
27	SCS Runoff	4.165	2	144	16,863	------	------	------	NW OUT PARCEL 2.45 AC 6-HR
28	Reservoir	0.361	2	362	16,811	27	998.06	12,234	NW OUT PARCEL POND 6HR
30	Reservoir	4.096	2	146	13,758	27	1001.18	3,781	NW EMERGENCY SPILLEAY

Hydrograph Report

Hyd. No. 1

PRE SITE 19.1 AC

Hydrograph type	=	SCS Runoff	Peak discharge	=	10.48 cfs
Storm frequency	=	2 yrs	Time to peak	=	150 min
Time interval	=	2 min	Hyd. volume	=	48,535 cuft
Drainage area	=	19.100 ac	Curve number	=	74
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	9.00 min
Total precip.	=	2.66 in	Distribution	=	SCS 6-Hr
Storm duration	=	6.00 hrs	Shape factor	=	484

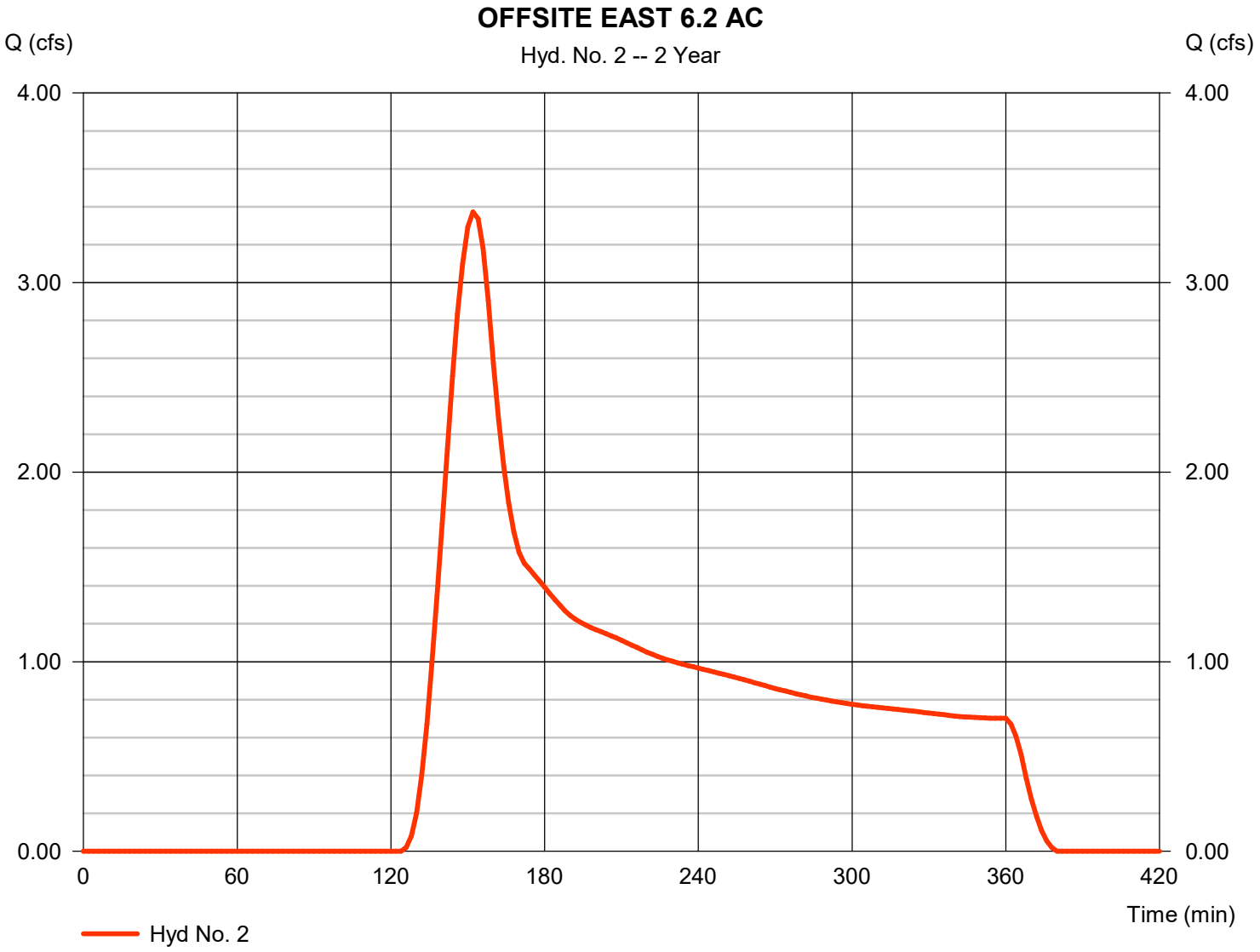


Hydrograph Report

Hyd. No. 2

OFFSITE EAST 6.2 AC

Hydrograph type	=	SCS Runoff	Peak discharge	=	3.373 cfs
Storm frequency	=	2 yrs	Time to peak	=	152 min
Time interval	=	2 min	Hyd. volume	=	16,247 cuft
Drainage area	=	6.200 ac	Curve number	=	74
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	10.00 min
Total precip.	=	2.66 in	Distribution	=	SCS 6-Hr
Storm duration	=	6.00 hrs	Shape factor	=	484

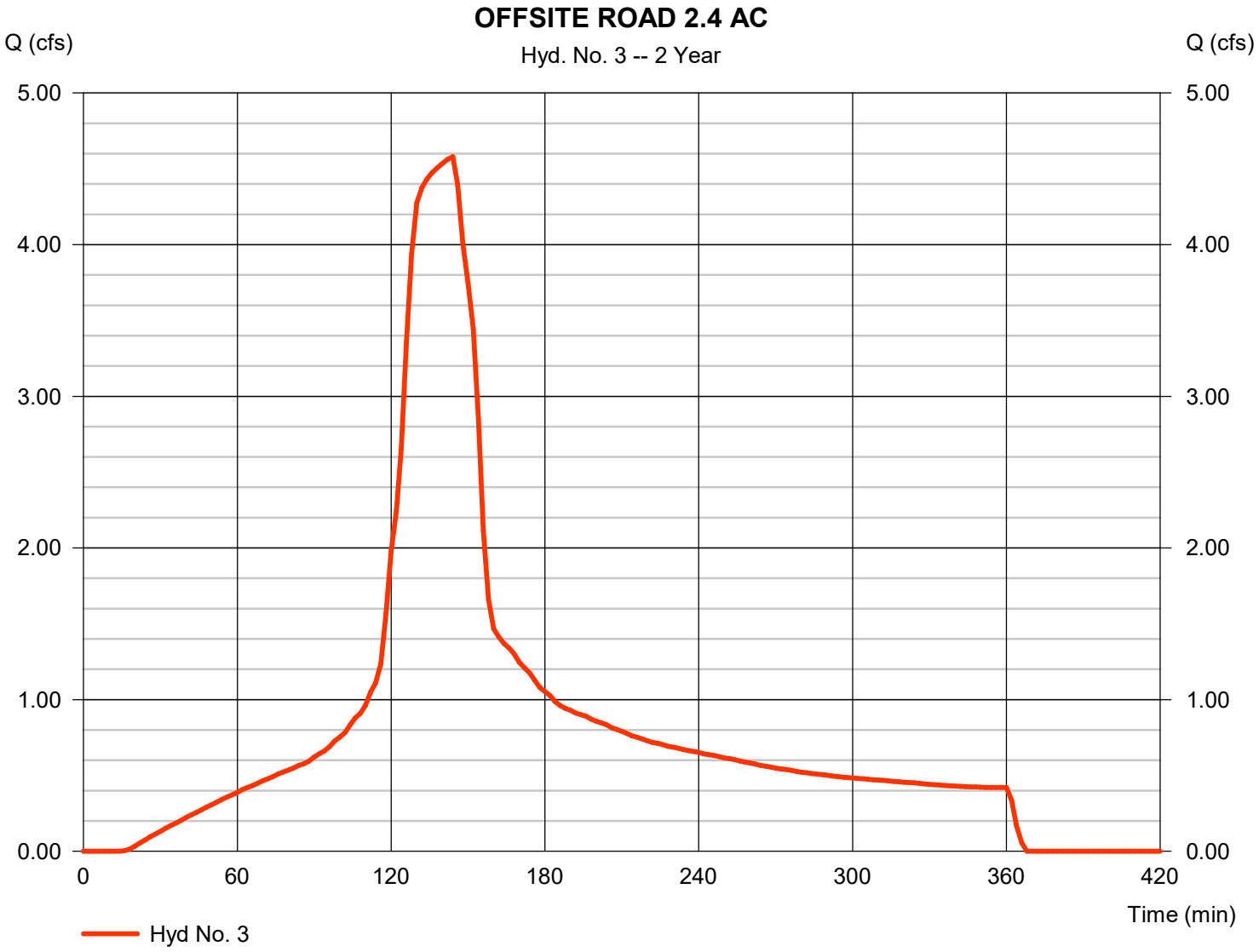


Hydrograph Report

Hyd. No. 3

OFFSITE ROAD 2.4 AC

Hydrograph type	= SCS Runoff	Peak discharge	= 4.581 cfs
Storm frequency	= 2 yrs	Time to peak	= 144 min
Time interval	= 2 min	Hyd. volume	= 19,846 cuft
Drainage area	= 2.400 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 2.66 in	Distribution	= SCS 6-Hr
Storm duration	= 6.00 hrs	Shape factor	= 484

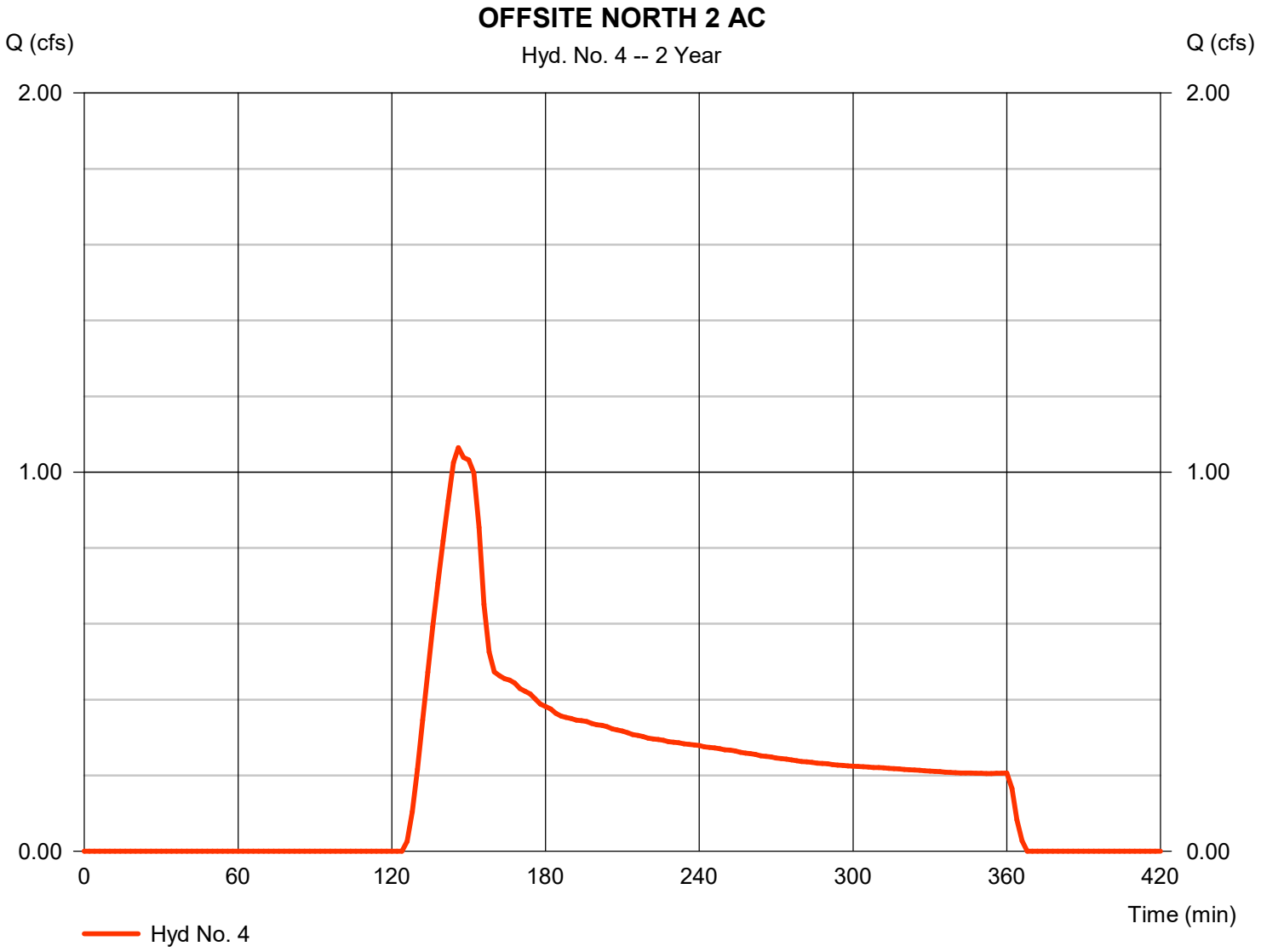


Hydrograph Report

Hyd. No. 4

OFFSITE NORTH 2 AC

Hydrograph type	=	SCS Runoff	Peak discharge	=	1.065 cfs
Storm frequency	=	2 yrs	Time to peak	=	146 min
Time interval	=	2 min	Hyd. volume	=	4,765 cuft
Drainage area	=	2.000 ac	Curve number	=	74
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	2.66 in	Distribution	=	SCS 6-Hr
Storm duration	=	6.00 hrs	Shape factor	=	484

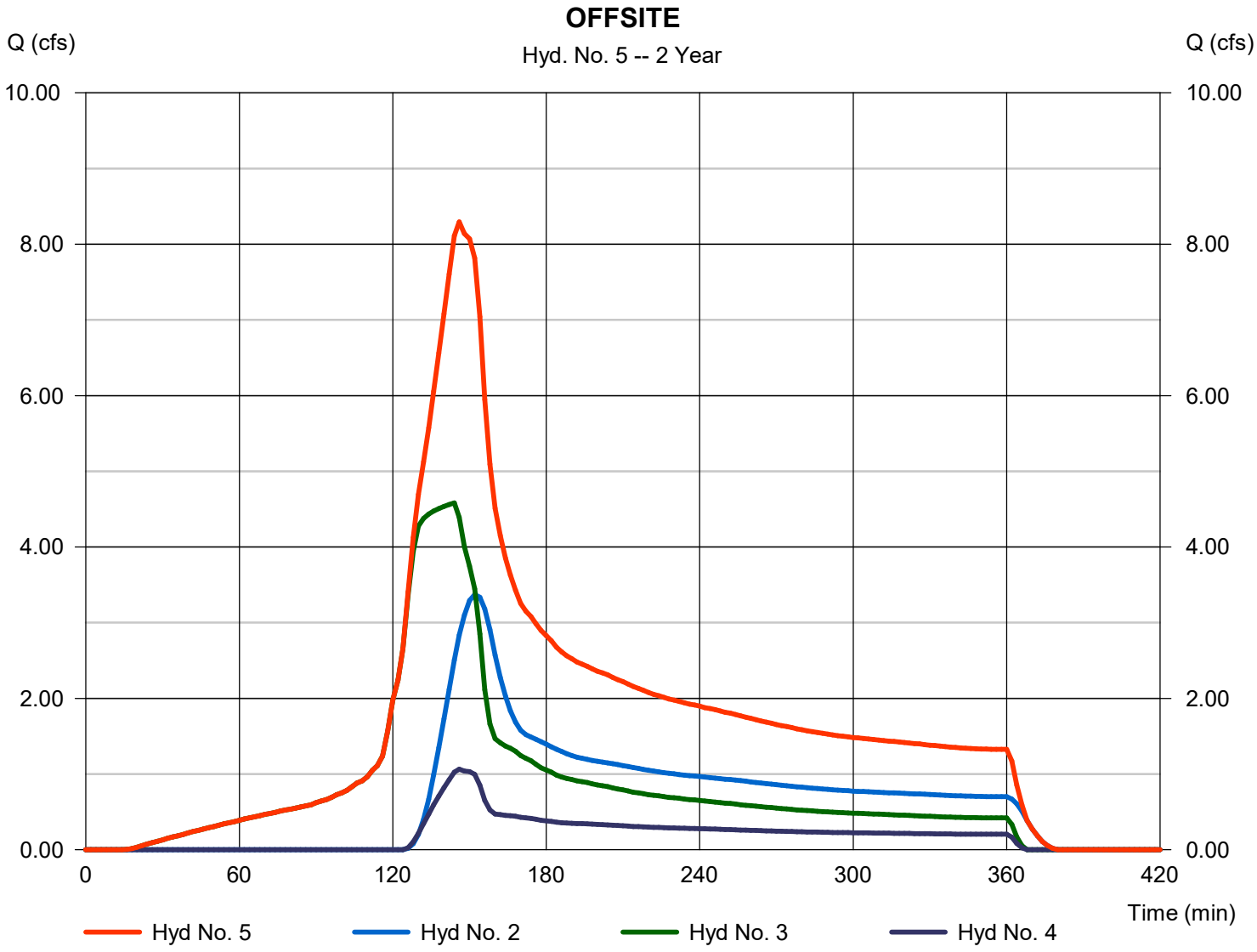


Hydrograph Report

Hyd. No. 5

OFFSITE

Hydrograph type	= Combine	Peak discharge	= 8.294 cfs
Storm frequency	= 2 yrs	Time to peak	= 146 min
Time interval	= 2 min	Hyd. volume	= 40,858 cuft
Inflow hyds.	= 2, 3, 4	Contrib. drain. area	= 10.600 ac

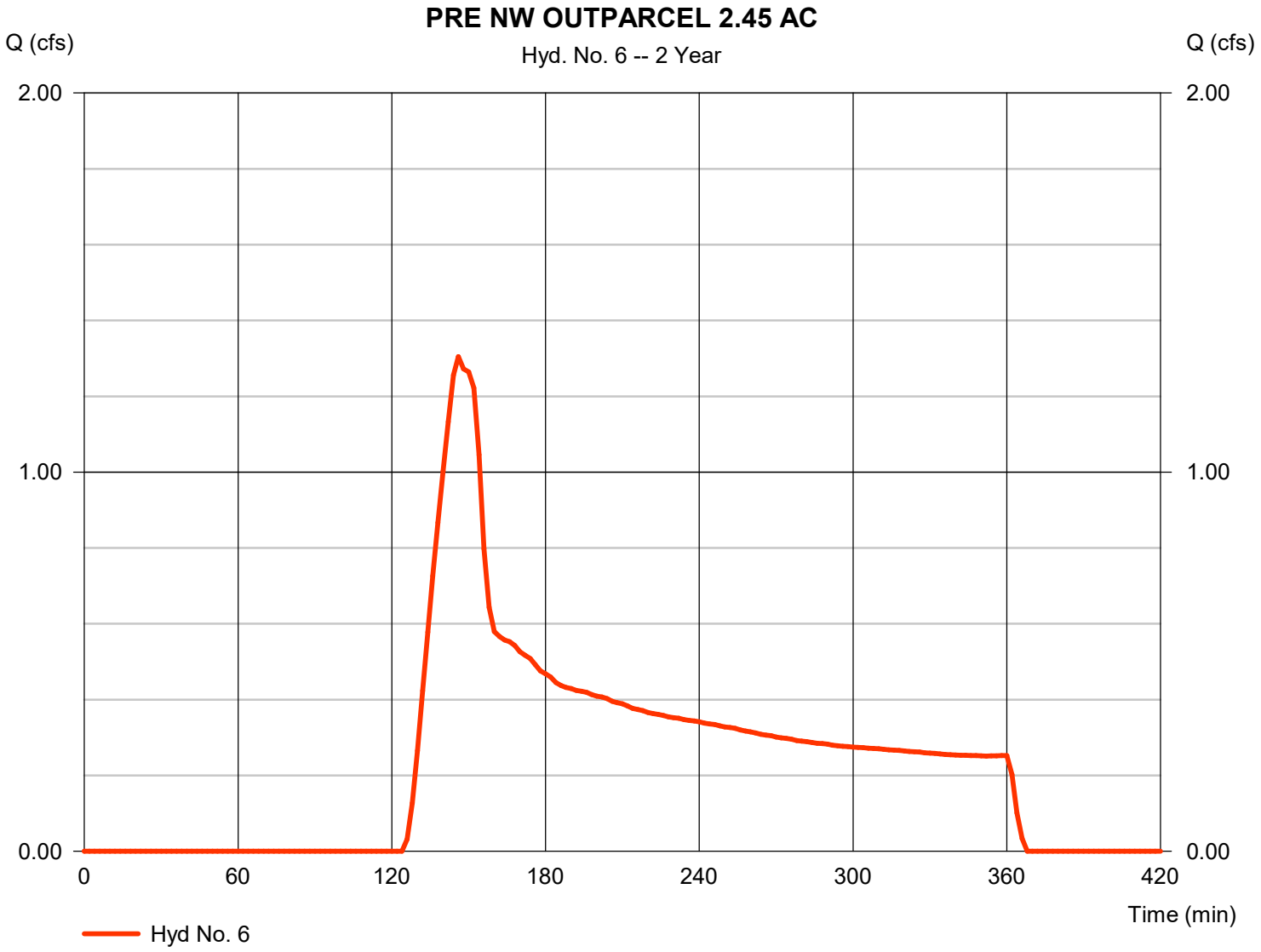


Hydrograph Report

Hyd. No. 6

PRE NW OUTPARCEL 2.45 AC

Hydrograph type	=	SCS Runoff	Peak discharge	=	1.304 cfs
Storm frequency	=	2 yrs	Time to peak	=	146 min
Time interval	=	2 min	Hyd. volume	=	5,837 cuft
Drainage area	=	2.450 ac	Curve number	=	74
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	2.66 in	Distribution	=	SCS 6-Hr
Storm duration	=	6.00 hrs	Shape factor	=	484

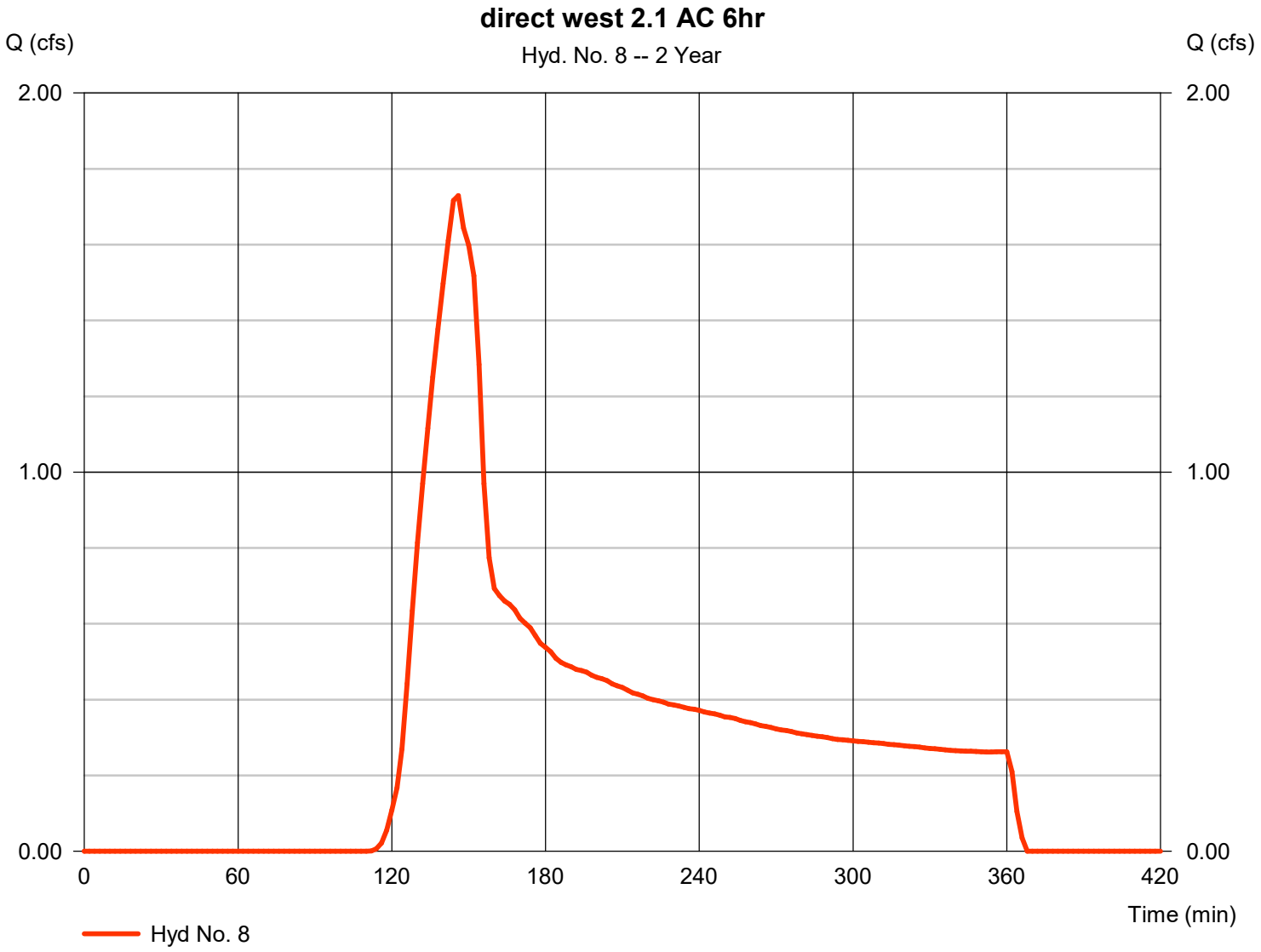


Hydrograph Report

Hyd. No. 8

direct west 2.1 AC 6hr

Hydrograph type	=	SCS Runoff	Peak discharge	=	1.729 cfs
Storm frequency	=	2 yrs	Time to peak	=	146 min
Time interval	=	2 min	Hyd. volume	=	7,155 cuft
Drainage area	=	2.100 ac	Curve number	=	80
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	2.66 in	Distribution	=	SCS 6-Hr
Storm duration	=	6.00 hrs	Shape factor	=	484

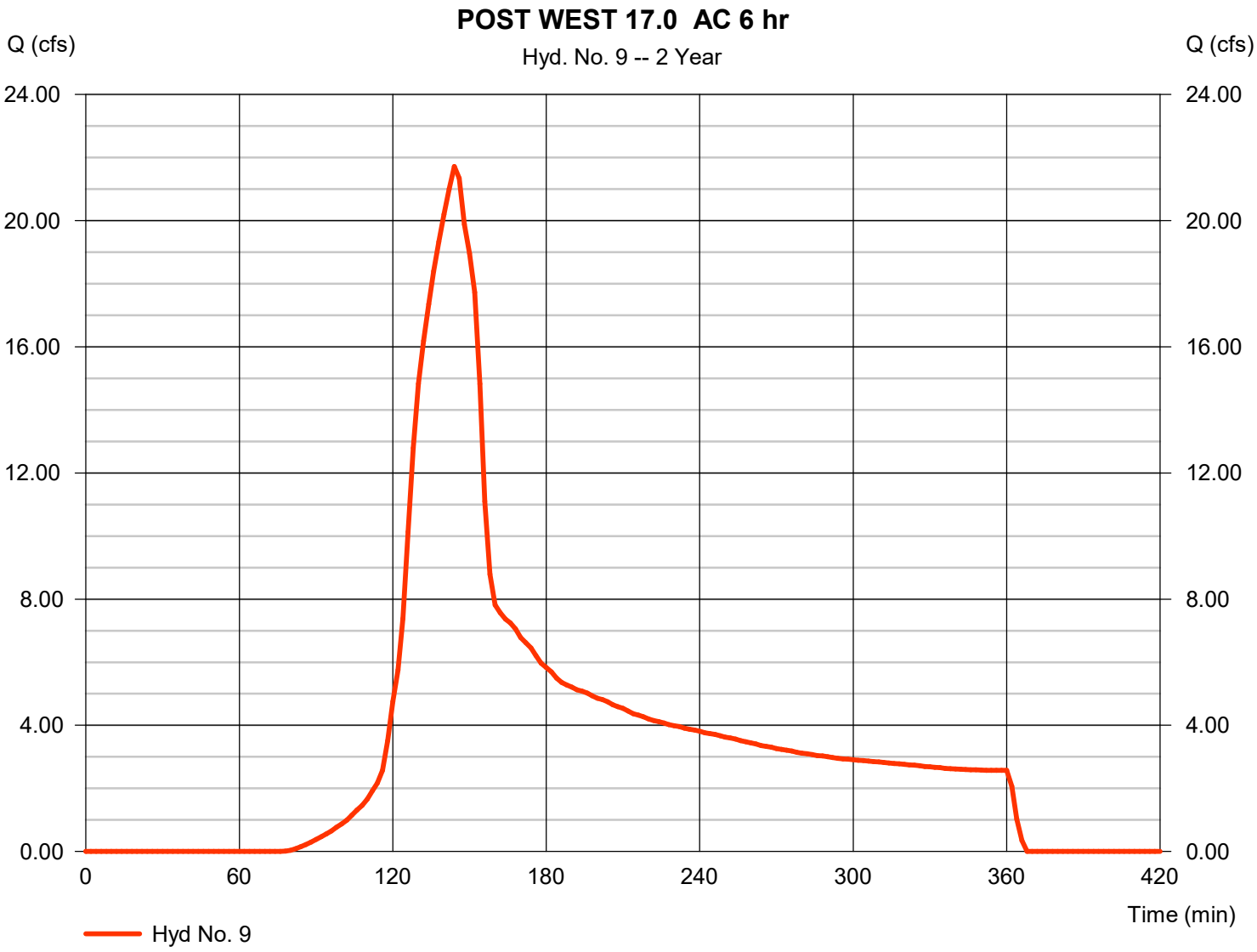


Hydrograph Report

Hyd. No. 9

POST WEST 17.0 AC 6 hr

Hydrograph type	=	SCS Runoff	Peak discharge	=	21.72 cfs
Storm frequency	=	2 yrs	Time to peak	=	144 min
Time interval	=	2 min	Hyd. volume	=	86,185 cuft
Drainage area	=	17.000 ac	Curve number	=	87.6
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	2.66 in	Distribution	=	SCS 6-Hr
Storm duration	=	6.00 hrs	Shape factor	=	484



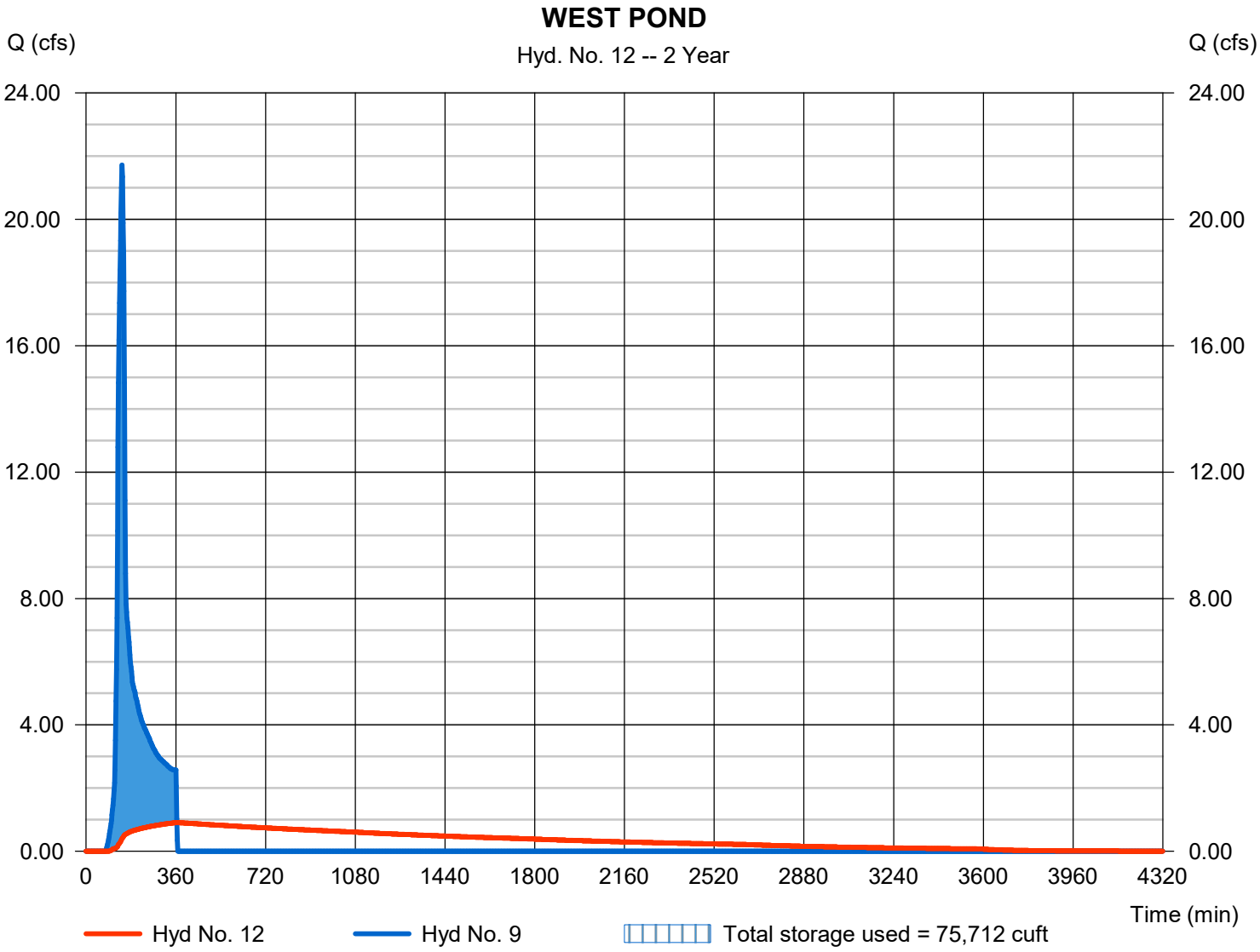
Hydrograph Report

Hyd. No. 12

WEST POND

Hydrograph type	=	Reservoir	Peak discharge	=	0.906 cfs
Storm frequency	=	2 yrs	Time to peak	=	364 min
Time interval	=	2 min	Hyd. volume	=	86,142 cuft
Inflow hyd. No.	=	9 - POST WEST 17.0 AC 6 hr	Max. Elevation	=	999.13 ft
Reservoir name	=	WEST POND retention	Max. Storage	=	75,712 cuft

Storage Indication method used.

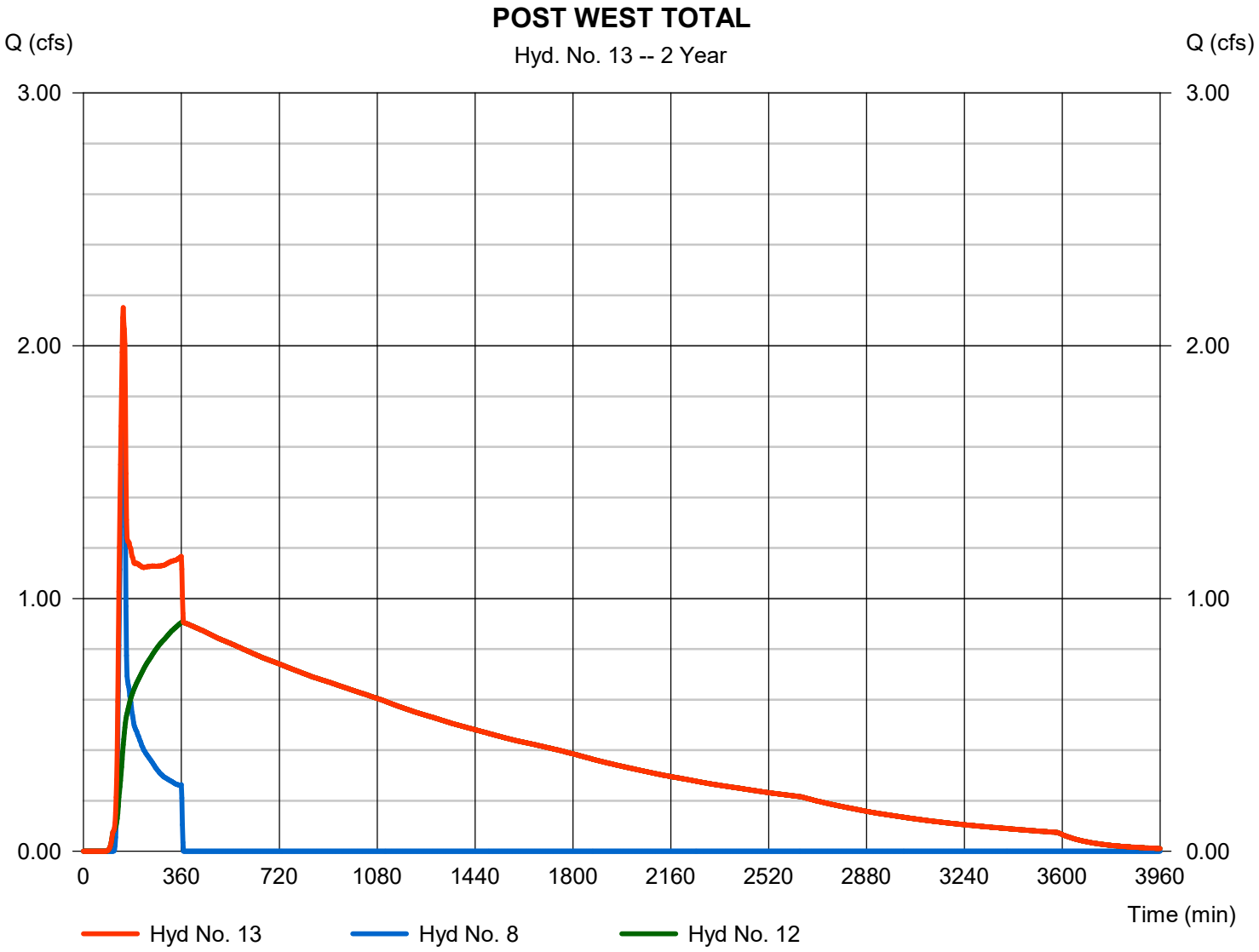


Hydrograph Report

Hyd. No. 13

POST WEST TOTAL

Hydrograph type	= Combine	Peak discharge	= 2.151 cfs
Storm frequency	= 2 yrs	Time to peak	= 146 min
Time interval	= 2 min	Hyd. volume	= 93,297 cuft
Inflow hyds.	= 8, 12	Contrib. drain. area	= 2.100 ac

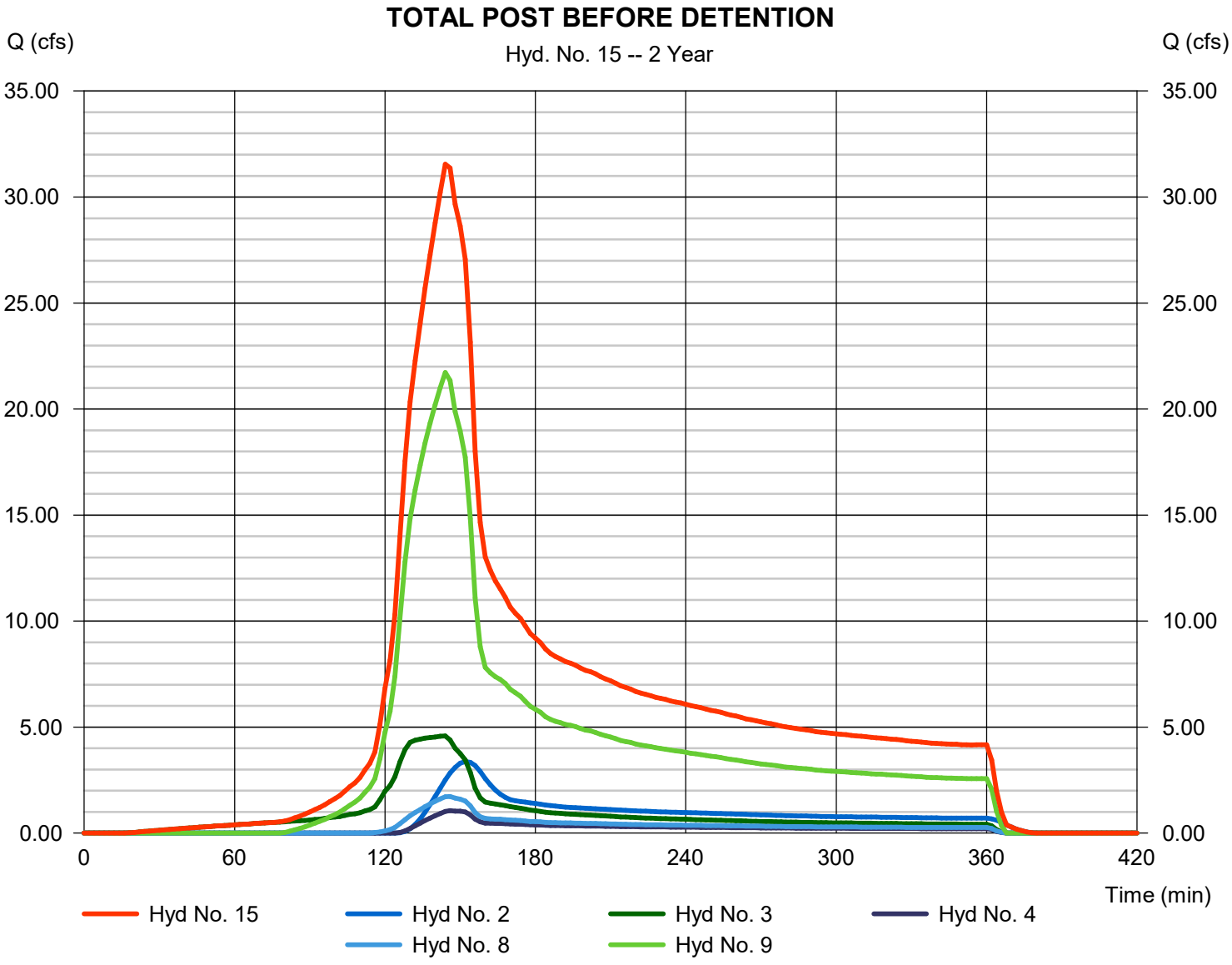


Hydrograph Report

Hyd. No. 15

TOTAL POST BEFORE DETENTION

Hydrograph type	=	Combine	Peak discharge	=	31.55 cfs
Storm frequency	=	2 yrs	Time to peak	=	144 min
Time interval	=	2 min	Hyd. volume	=	134,197 cuft
Inflow hyds.	=	2, 3, 4, 8, 9	Contrib. drain. area	=	29.700 ac



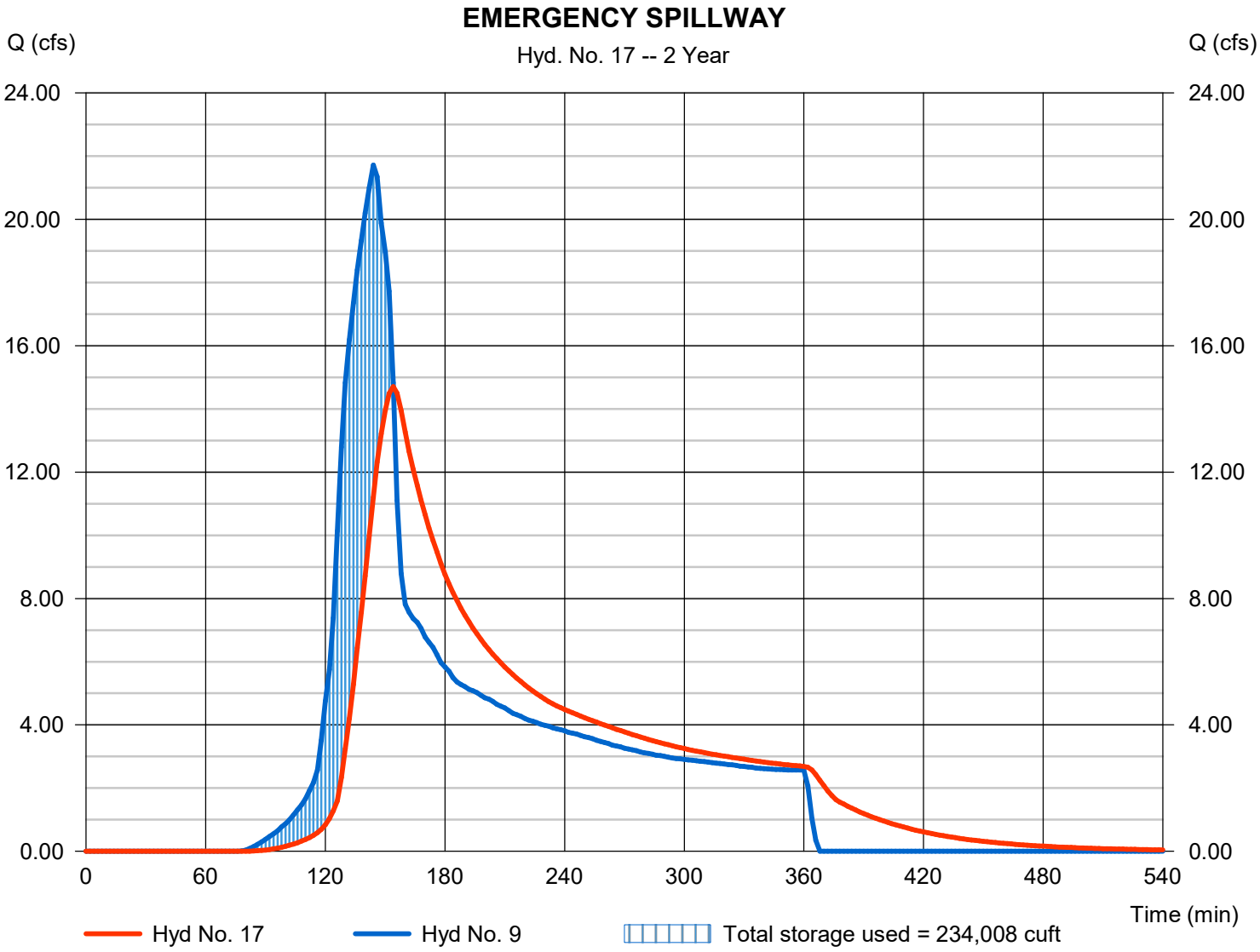
Hydrograph Report

Hyd. No. 17

EMERGENCY SPILLWAY

Hydrograph type	=	Reservoir	Peak discharge	=	14.71 cfs
Storm frequency	=	2 yrs	Time to peak	=	154 min
Time interval	=	2 min	Hyd. volume	=	86,182 cuft
Inflow hyd. No.	=	9 - POST WEST 17.0 AC 6 hr	Max. Elevation	=	1003.23 ft
Reservoir name	=	EMERGENCY SPILLWAY	Max. Storage	=	234,008 cuft

Storage Indication method used. Wet pond routing start elevation = 1002.80 ft.

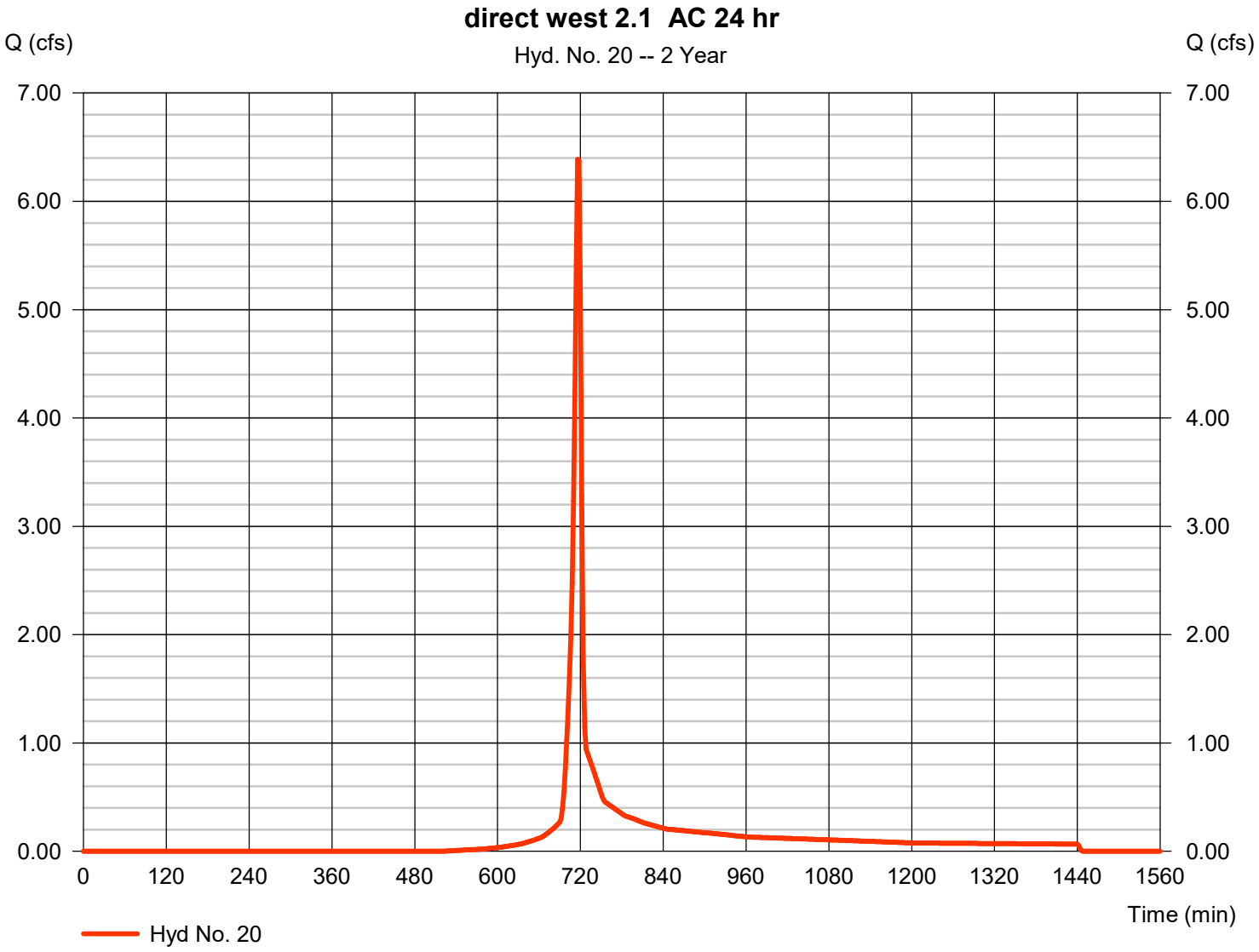


Hydrograph Report

Hyd. No. 20

direct west 2.1 AC 24 hr

Hydrograph type	= SCS Runoff	Peak discharge	= 6.387 cfs
Storm frequency	= 2 yrs	Time to peak	= 716 min
Time interval	= 2 min	Hyd. volume	= 12,896 cuft
Drainage area	= 2.100 ac	Curve number	= 80
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 3.71 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

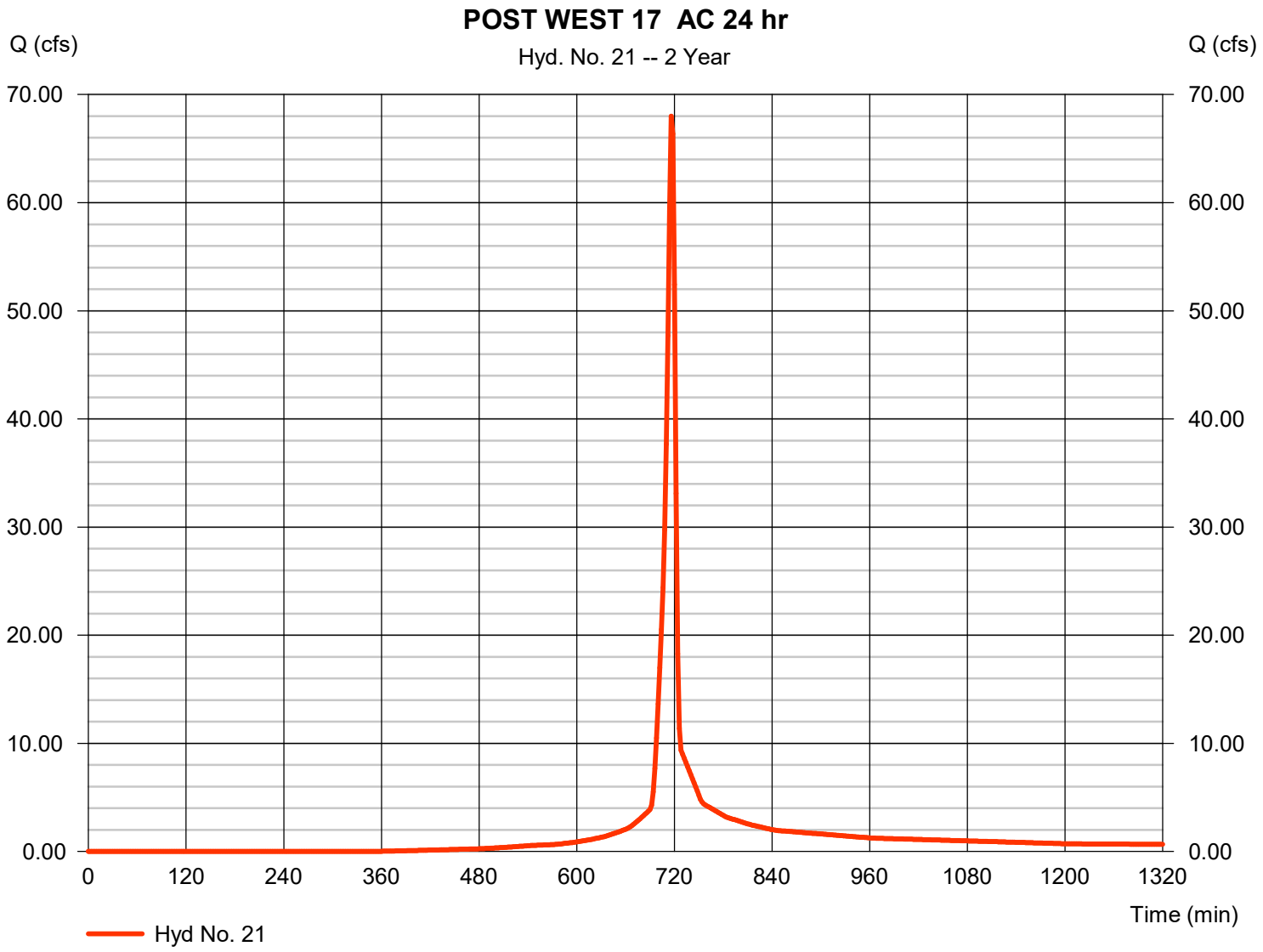


Hydrograph Report

Hyd. No. 21

POST WEST 17 AC 24 hr

Hydrograph type	= SCS Runoff	Peak discharge	= 68.00 cfs
Storm frequency	= 2 yrs	Time to peak	= 716 min
Time interval	= 2 min	Hyd. volume	= 140,303 cuft
Drainage area	= 17.000 ac	Curve number	= 87.6
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 3.71 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

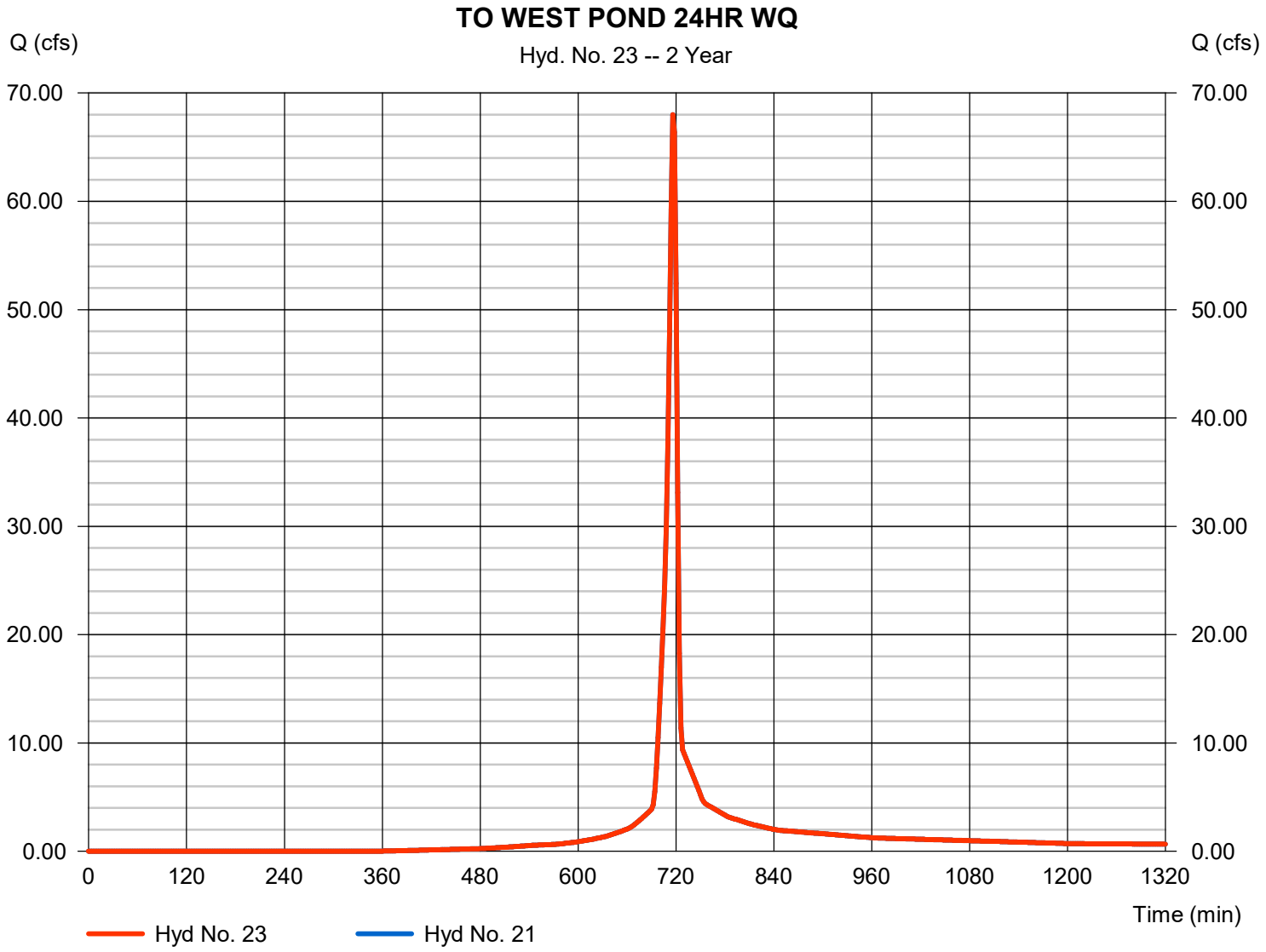


Hydrograph Report

Hyd. No. 23

TO WEST POND 24HR WQ

Hydrograph type	= Combine	Peak discharge	= 68.00 cfs
Storm frequency	= 2 yrs	Time to peak	= 716 min
Time interval	= 2 min	Hyd. volume	= 140,303 cuft
Inflow hyds.	= 21	Contrib. drain. area	= 17.000 ac



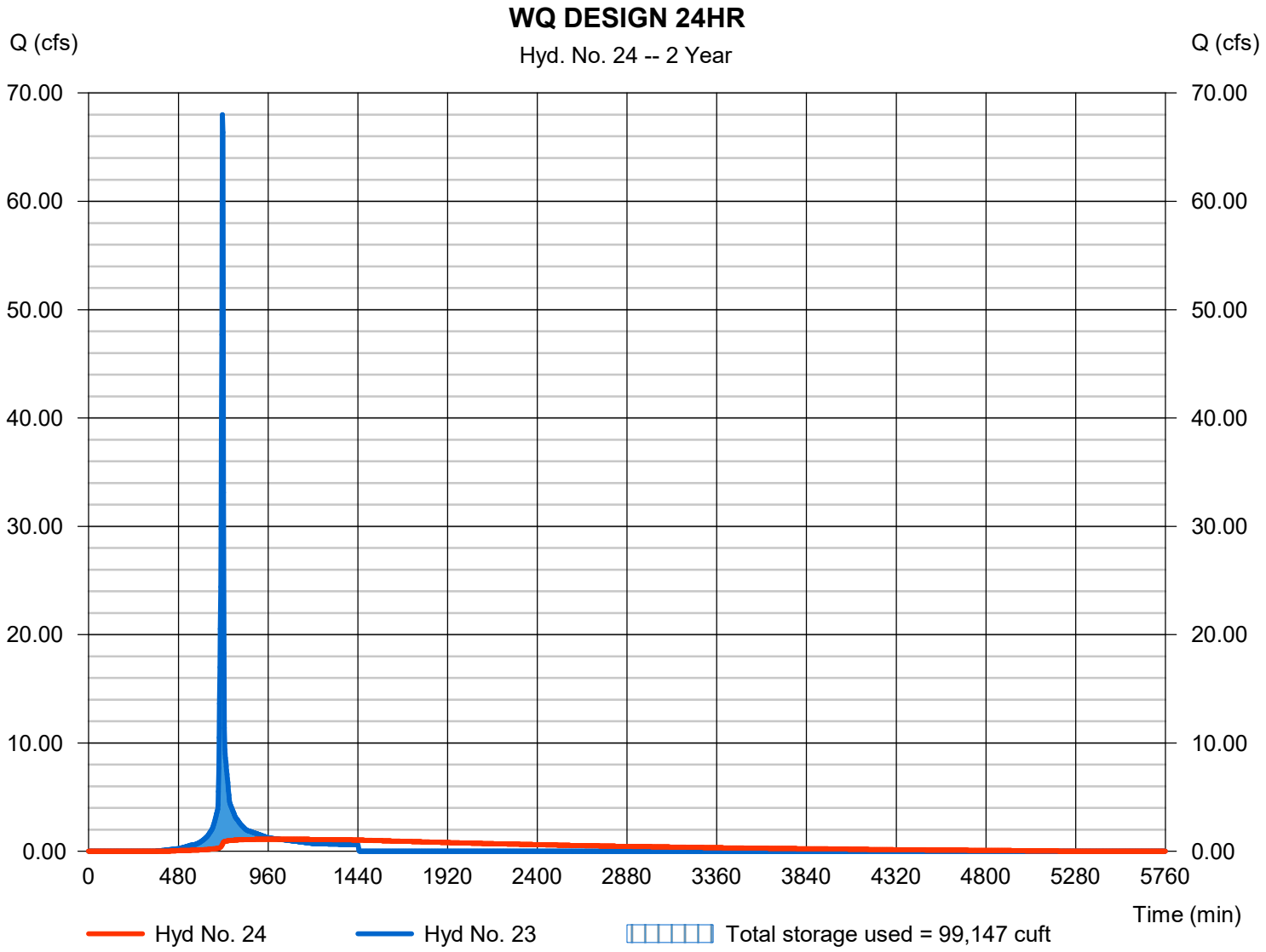
Hydrograph Report

Hyd. No. 24

WQ DESIGN 24HR

Hydrograph type	=	Reservoir	Peak discharge	=	1.114 cfs
Storm frequency	=	2 yrs	Time to peak	=	1018 min
Time interval	=	2 min	Hyd. volume	=	140,193 cuft
Inflow hyd. No.	=	23 - TO WEST POND 24HR WQ	Max. Elevation	=	999.88 ft
Reservoir name	=	WEST POND retention	Max. Storage	=	99,147 cuft

Storage Indication method used.

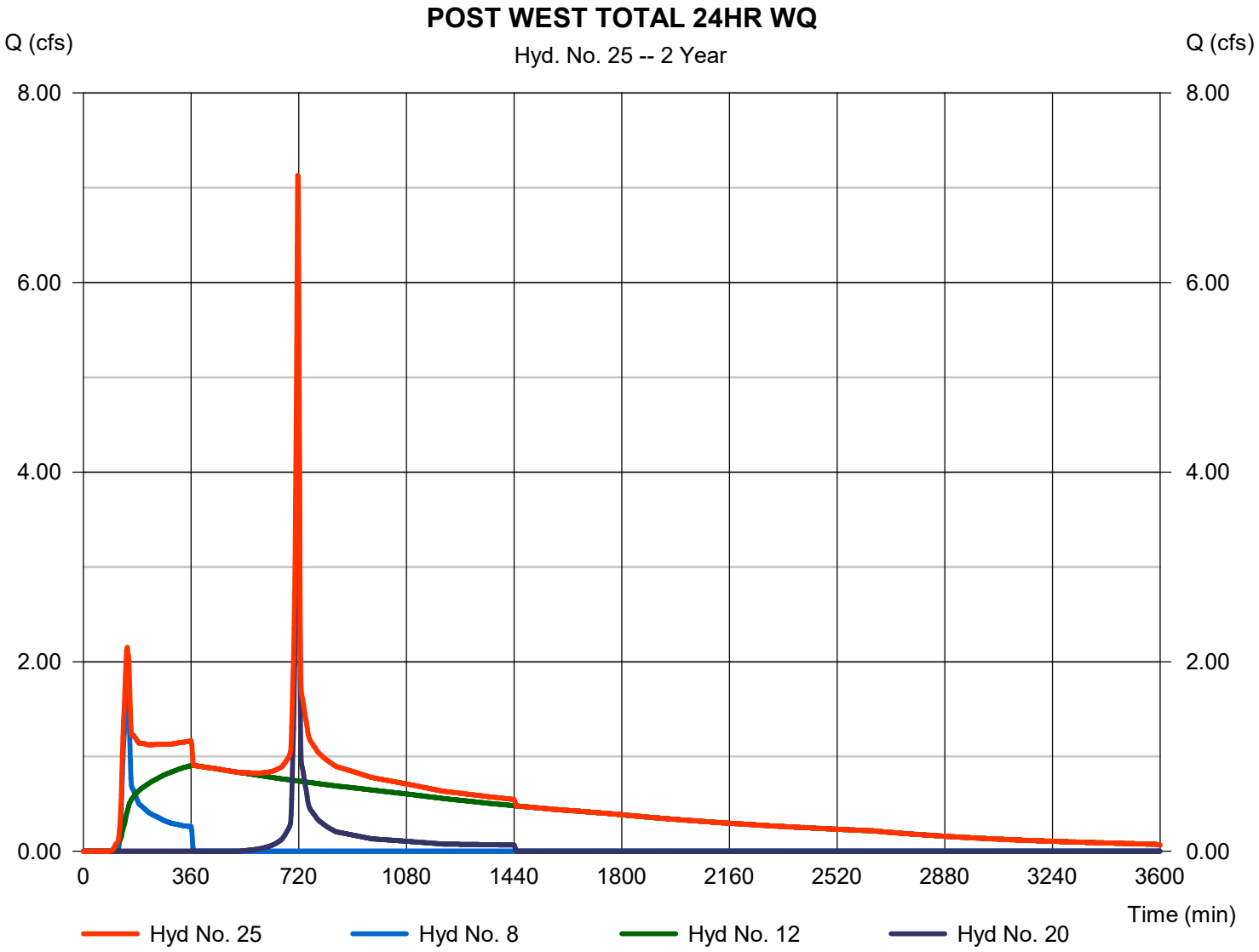


Hydrograph Report

Hyd. No. 25

POST WEST TOTAL 24HR WQ

Hydrograph type	= Combine	Peak discharge	= 7.130 cfs
Storm frequency	= 2 yrs	Time to peak	= 716 min
Time interval	= 2 min	Hyd. volume	= 106,193 cuft
Inflow hyds.	= 8, 12, 20	Contrib. drain. area	= 4.200 ac

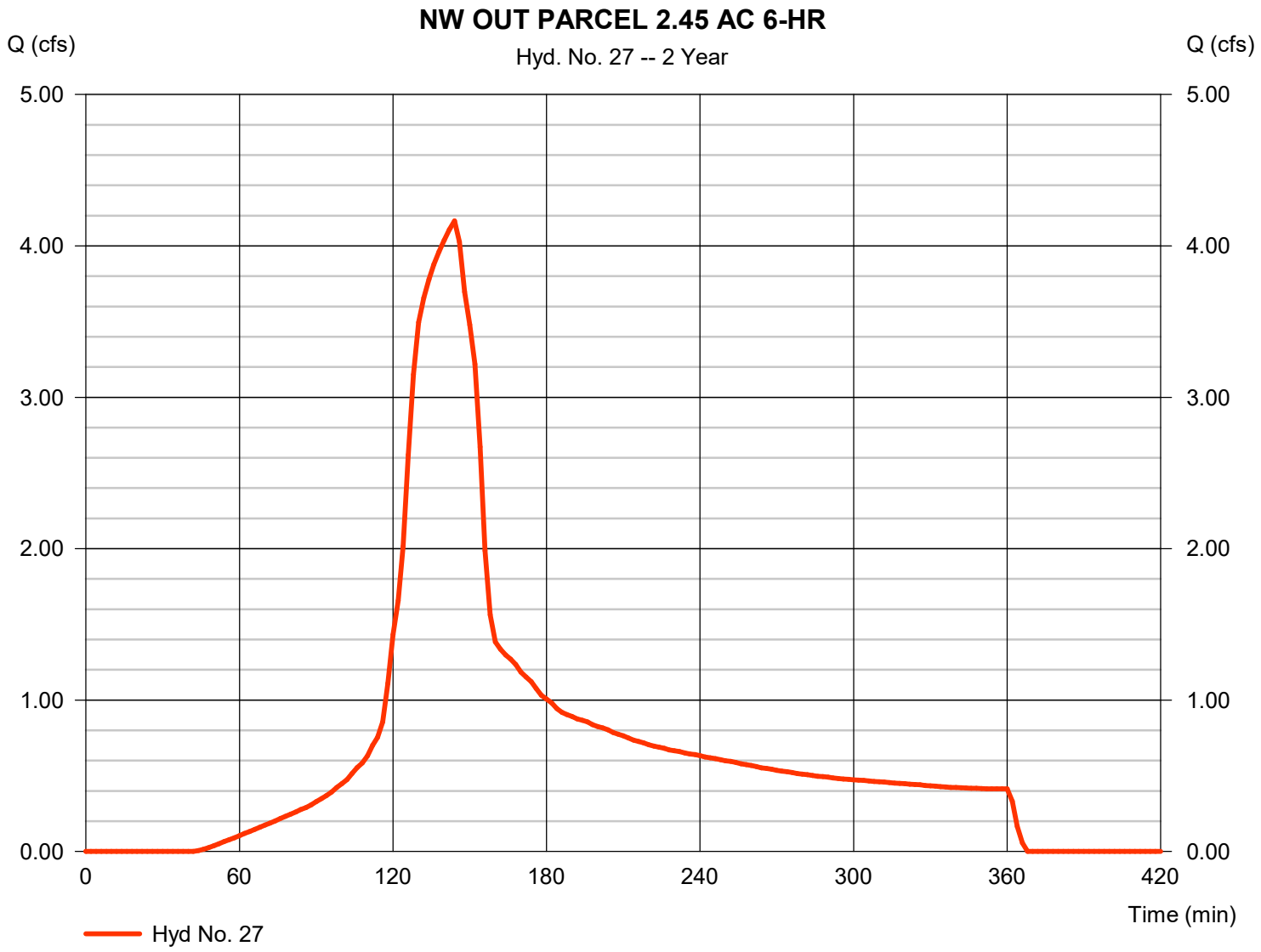


Hydrograph Report

Hyd. No. 27

NW OUT PARCEL 2.45 AC 6-HR

Hydrograph type	= SCS Runoff	Peak discharge	= 4.165 cfs
Storm frequency	= 2 yrs	Time to peak	= 144 min
Time interval	= 2 min	Hyd. volume	= 16,863 cuft
Drainage area	= 2.450 ac	Curve number	= 94
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 2.66 in	Distribution	= SCS 6-Hr
Storm duration	= 6.00 hrs	Shape factor	= 484



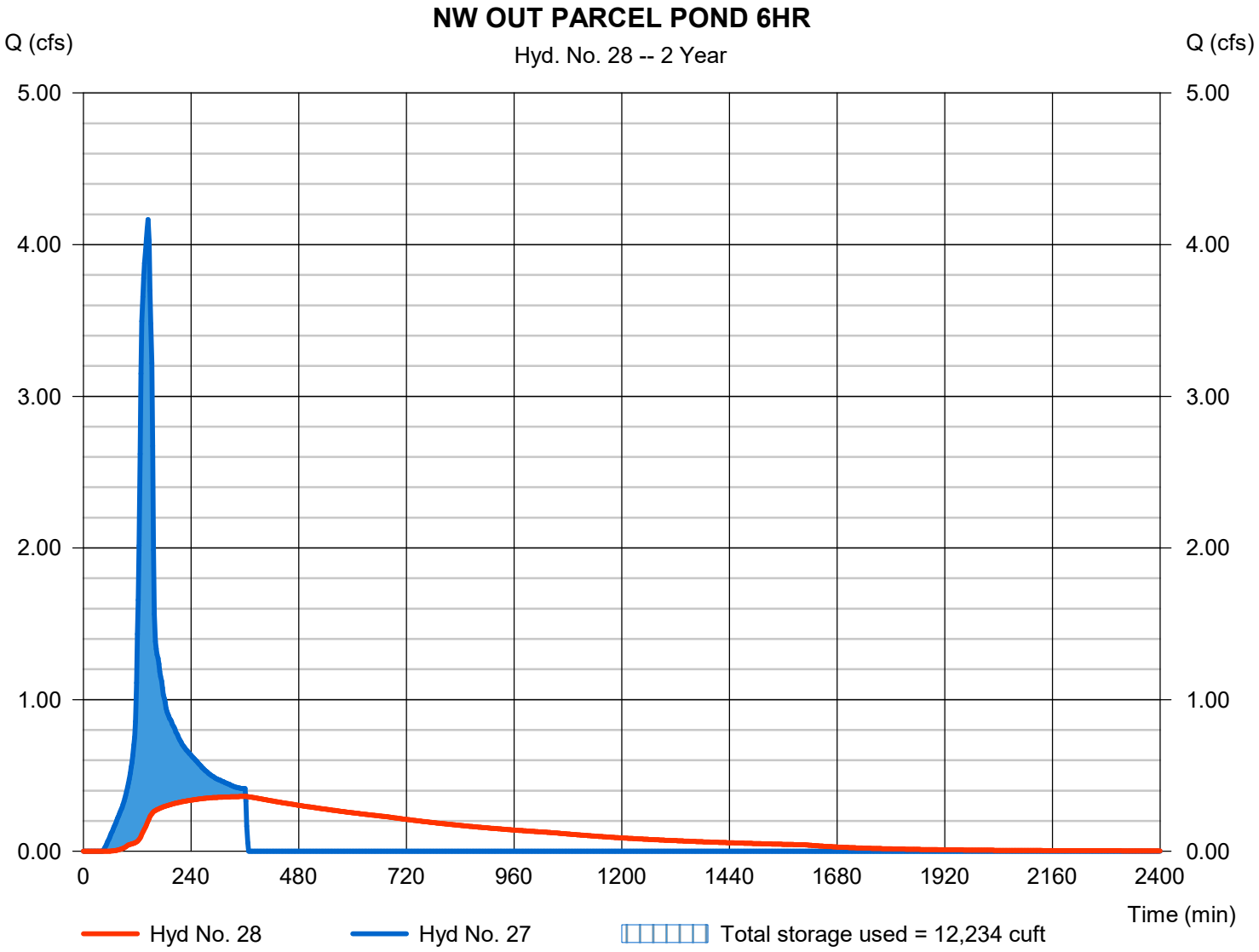
Hydrograph Report

Hyd. No. 28

NW OUT PARCEL POND 6HR

Hydrograph type	=	Reservoir	Peak discharge	=	0.361 cfs
Storm frequency	=	2 yrs	Time to peak	=	362 min
Time interval	=	2 min	Hyd. volume	=	16,811 cuft
Inflow hyd. No.	=	27 - NW OUT PARCEL 2.45 AC 6HR	Max. Elevation	=	998.06 ft
Reservoir name	=	NW OUT PARCEL POND	Max. Storage	=	12,234 cuft

Storage Indication method used.



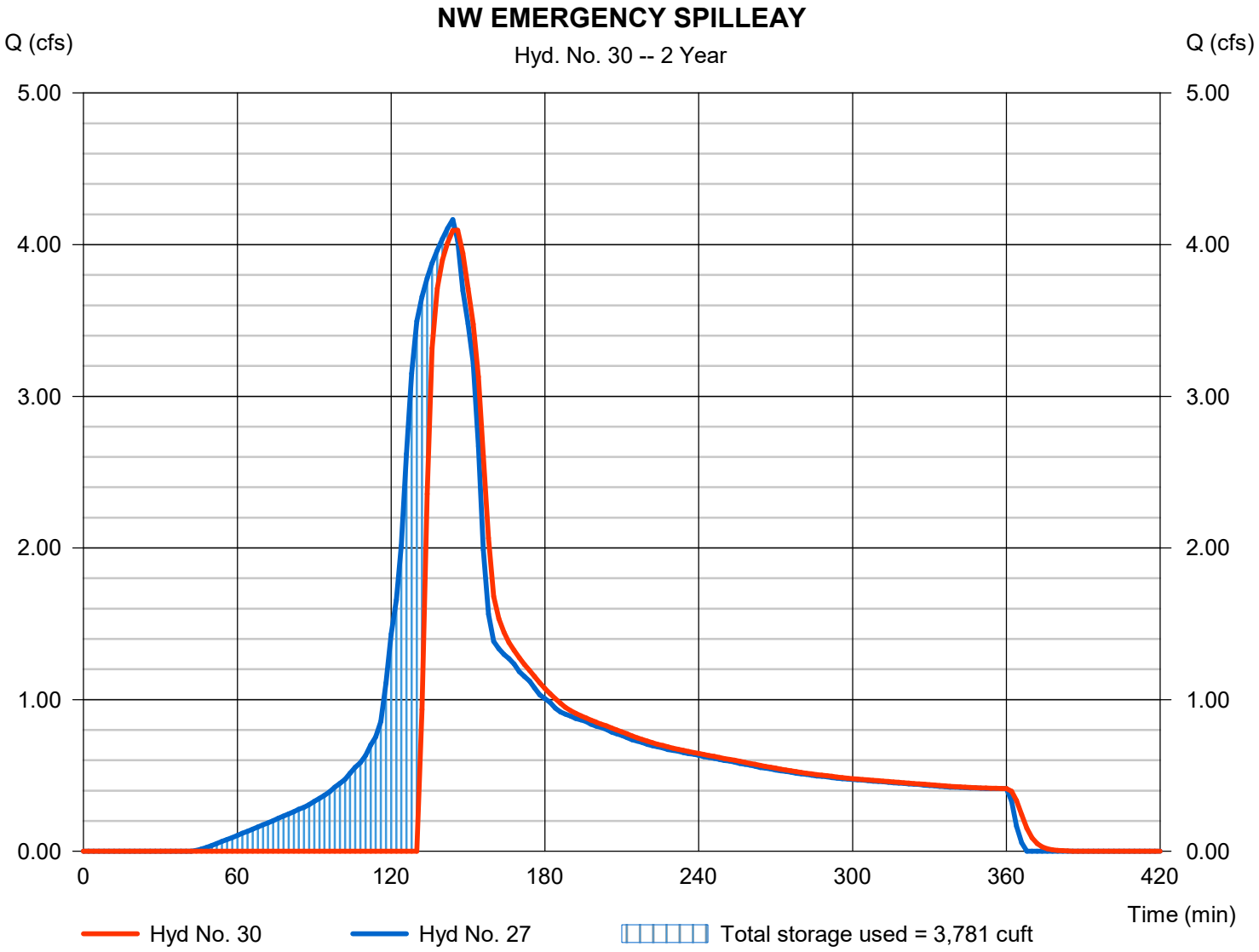
Hydrograph Report

Hyd. No. 30

NW EMERGENCY SPILLEAY

Hydrograph type	=	Reservoir	Peak discharge	=	4.096 cfs
Storm frequency	=	2 yrs	Time to peak	=	146 min
Time interval	=	2 min	Hyd. volume	=	13,758 cuft
Inflow hyd. No.	=	27 - NW OUT PARCEL 2.45 AC 26 HR	Max. Elevation	=	1001.18 ft
Reservoir name	=	NW EMERGENCY SPILLWAY	Max. Storage	=	3,781 cuft

Storage Indication method used.



Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2026

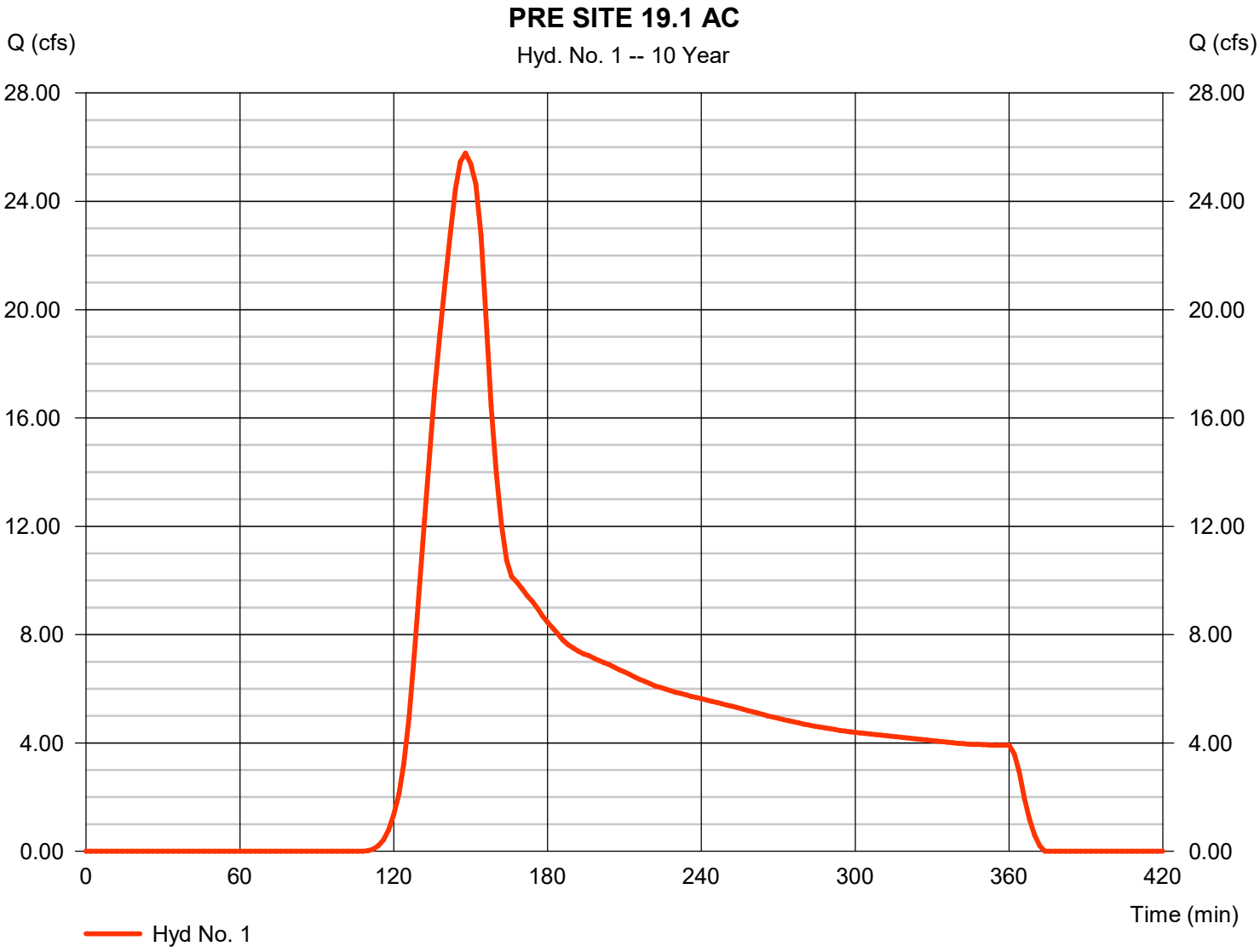
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	25.78	2	148	109,659	------	------	------	PRE SITE 19.1 AC
2	SCS Runoff	8.366	2	150	36,708	------	------	------	OFFSITE EAST 6.2 AC
3	SCS Runoff	6.926	2	144	30,588	------	------	------	OFFSITE ROAD 2.4 AC
4	SCS Runoff	2.620	2	146	10,765	------	------	------	OFFSITE NORTH 2 AC
5	Combine	17.11	2	146	78,061	2, 3, 4	------	------	OFFSITE
6	SCS Runoff	3.209	2	146	13,187	------	------	------	PRE NW OUTPARCEL 2.45 AC
8	SCS Runoff	3.627	2	144	14,473	------	------	------	direct west 2.1 AC 6hr
9	SCS Runoff	38.86	2	144	154,658	------	------	------	POST WEST 17.0 AC 6 hr
12	Reservoir	1.443	2	364	154,600	9	1000.97	137,567	WEST POND
13	Combine	4.291	2	144	169,073	8, 12	------	------	POST WEST TOTAL
15	Combine	59.40	2	144	247,193	2, 3, 4, 8, 9,	------	------	TOTAL POST BEFORE DETENTION
17	Reservoir	29.87	2	152	154,656	9	1003.49	246,730	EMERGENCY SPILLWAY
20	SCS Runoff	12.20	2	716	24,969	------	------	------	direct west 2.1 AC 24 hr
21	SCS Runoff	116.32	2	716	247,351	------	------	------	POST WEST 17 AC 24 hr
23	Combine	116.32	2	716	247,351	21,	------	------	TO WEST POND 24HR WQ
24	Reservoir	4.385	2	804	246,845	23	1001.59	162,171	WQ DESIGN 24HR
25	Combine	13.41	2	716	194,042	8, 12, 20,	------	------	POST WEST TOTAL 24HR WQ
27	SCS Runoff	6.645	2	144	27,554	------	------	------	NW OUT PARCEL 2.45 AC 6-HR
28	Reservoir	0.801	2	276	27,502	27	999.10	18,977	NW OUT PARCEL POND 6HR
30	Reservoir	6.596	2	144	24,449	27	1001.25	4,036	NW EMERGENCY SPILLEAY

Hydrograph Report

Hyd. No. 1

PRE SITE 19.1 AC

Hydrograph type	=	SCS Runoff	Peak discharge	=	25.78 cfs
Storm frequency	=	10 yrs	Time to peak	=	148 min
Time interval	=	2 min	Hyd. volume	=	109,659 cuft
Drainage area	=	19.100 ac	Curve number	=	74
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	9.00 min
Total precip.	=	3.98 in	Distribution	=	SCS 6-Hr
Storm duration	=	6.00 hrs	Shape factor	=	484

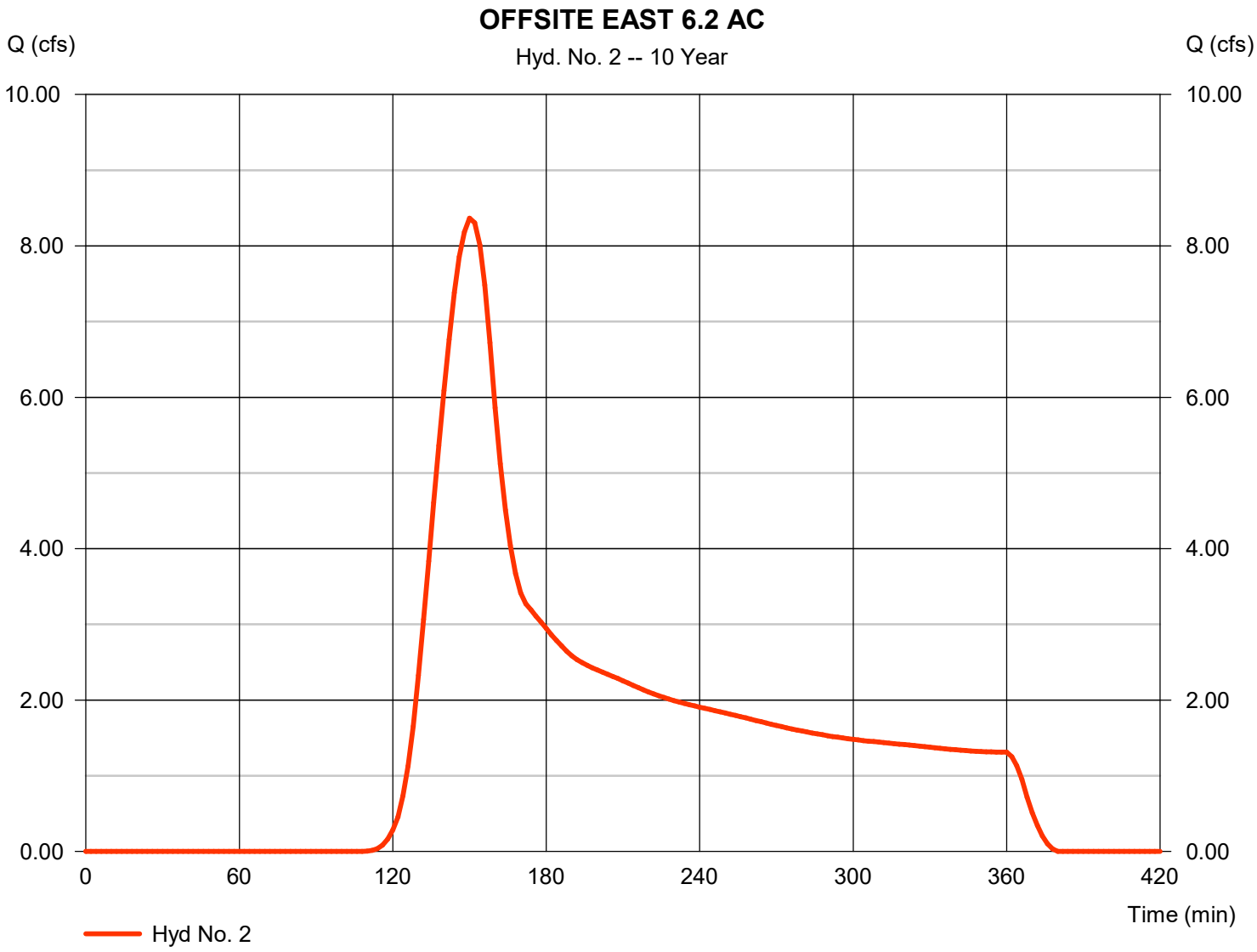


Hydrograph Report

Hyd. No. 2

OFFSITE EAST 6.2 AC

Hydrograph type	=	SCS Runoff	Peak discharge	=	8.366 cfs
Storm frequency	=	10 yrs	Time to peak	=	150 min
Time interval	=	2 min	Hyd. volume	=	36,708 cuft
Drainage area	=	6.200 ac	Curve number	=	74
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	10.00 min
Total precip.	=	3.98 in	Distribution	=	SCS 6-Hr
Storm duration	=	6.00 hrs	Shape factor	=	484

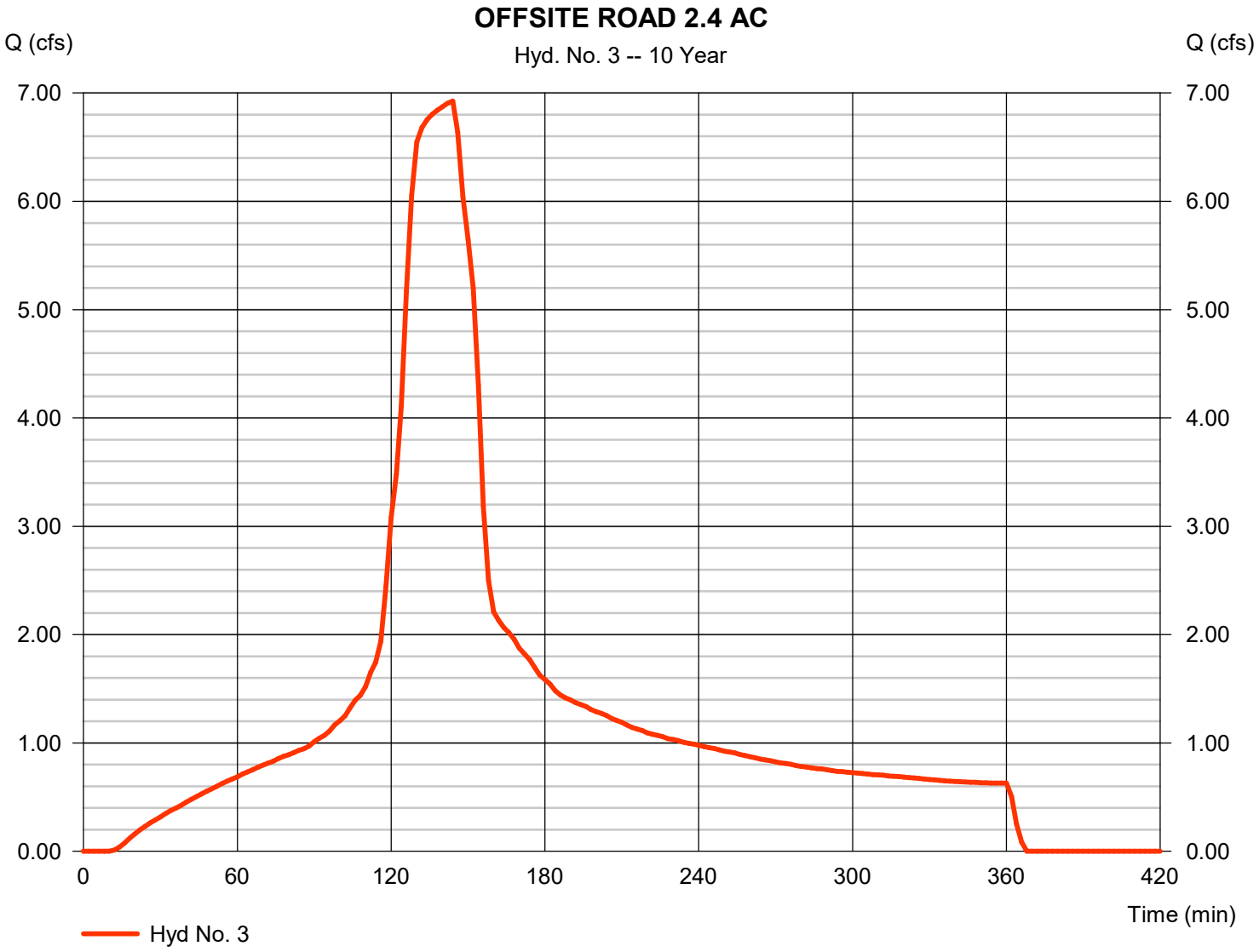


Hydrograph Report

Hyd. No. 3

OFFSITE ROAD 2.4 AC

Hydrograph type	= SCS Runoff	Peak discharge	= 6.926 cfs
Storm frequency	= 10 yrs	Time to peak	= 144 min
Time interval	= 2 min	Hyd. volume	= 30,588 cuft
Drainage area	= 2.400 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 3.98 in	Distribution	= SCS 6-Hr
Storm duration	= 6.00 hrs	Shape factor	= 484

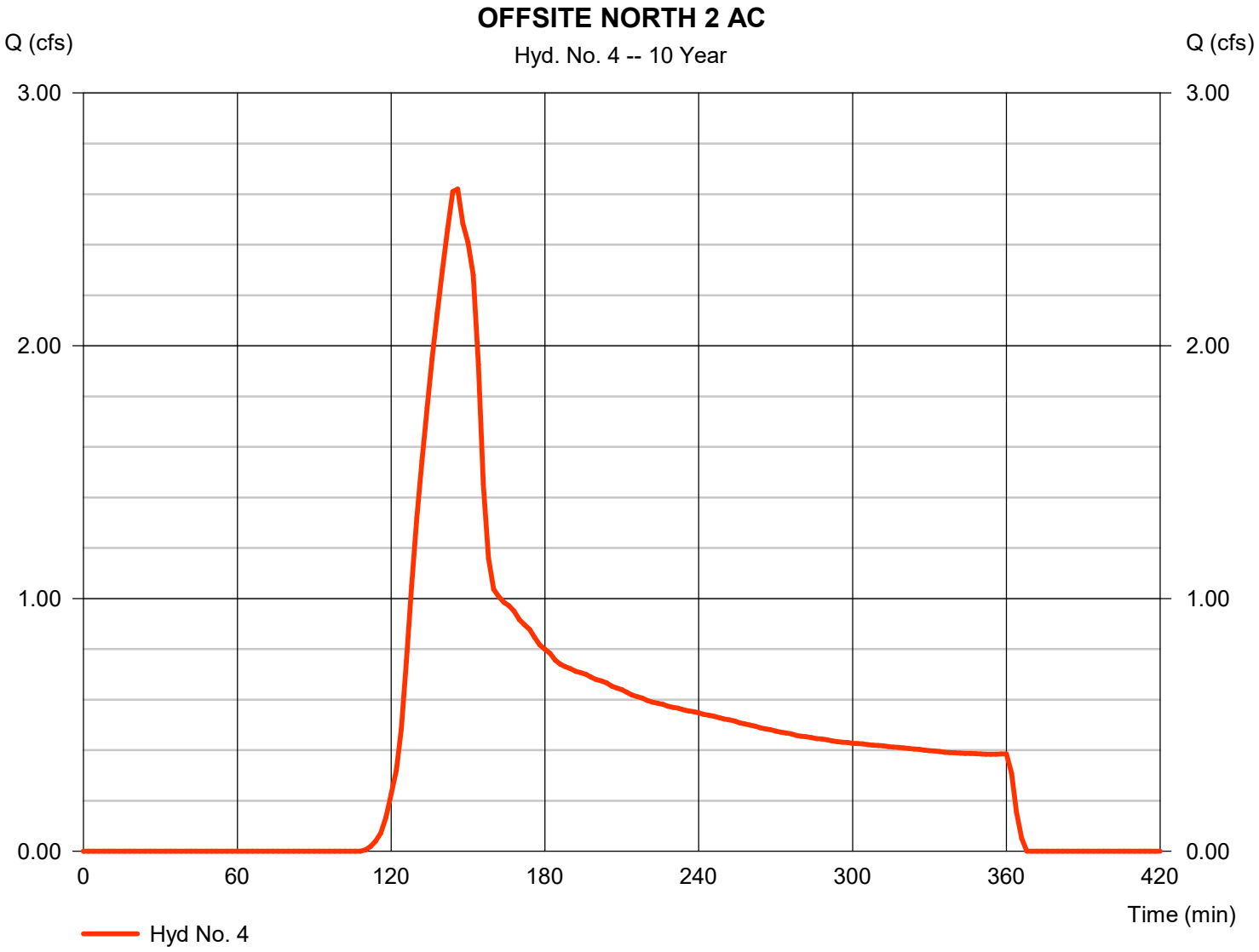


Hydrograph Report

Hyd. No. 4

OFFSITE NORTH 2 AC

Hydrograph type	= SCS Runoff	Peak discharge	= 2.620 cfs
Storm frequency	= 10 yrs	Time to peak	= 146 min
Time interval	= 2 min	Hyd. volume	= 10,765 cuft
Drainage area	= 2.000 ac	Curve number	= 74
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 3.98 in	Distribution	= SCS 6-Hr
Storm duration	= 6.00 hrs	Shape factor	= 484

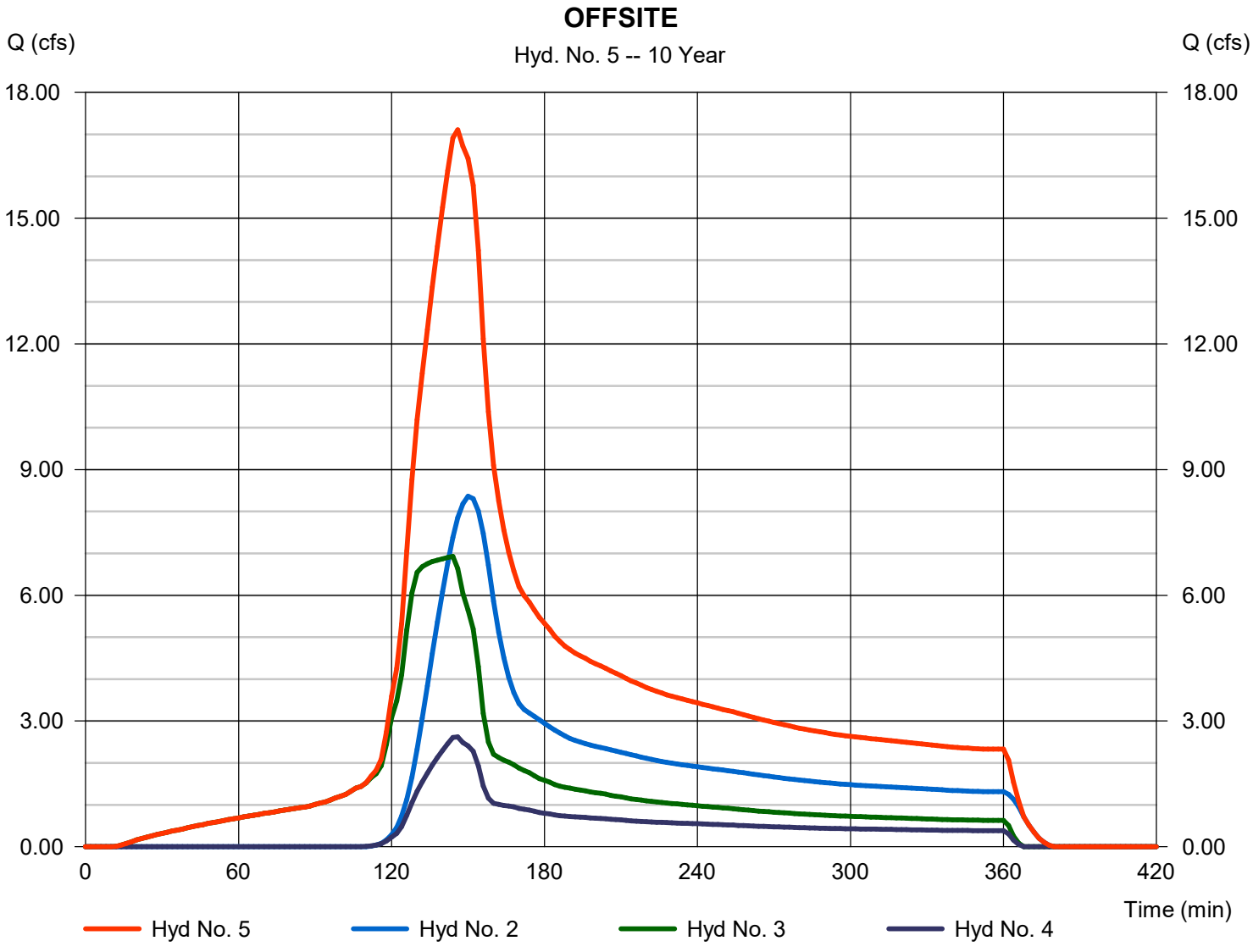


Hydrograph Report

Hyd. No. 5

OFFSITE

Hydrograph type	= Combine	Peak discharge	= 17.11 cfs
Storm frequency	= 10 yrs	Time to peak	= 146 min
Time interval	= 2 min	Hyd. volume	= 78,061 cuft
Inflow hyds.	= 2, 3, 4	Contrib. drain. area	= 10.600 ac

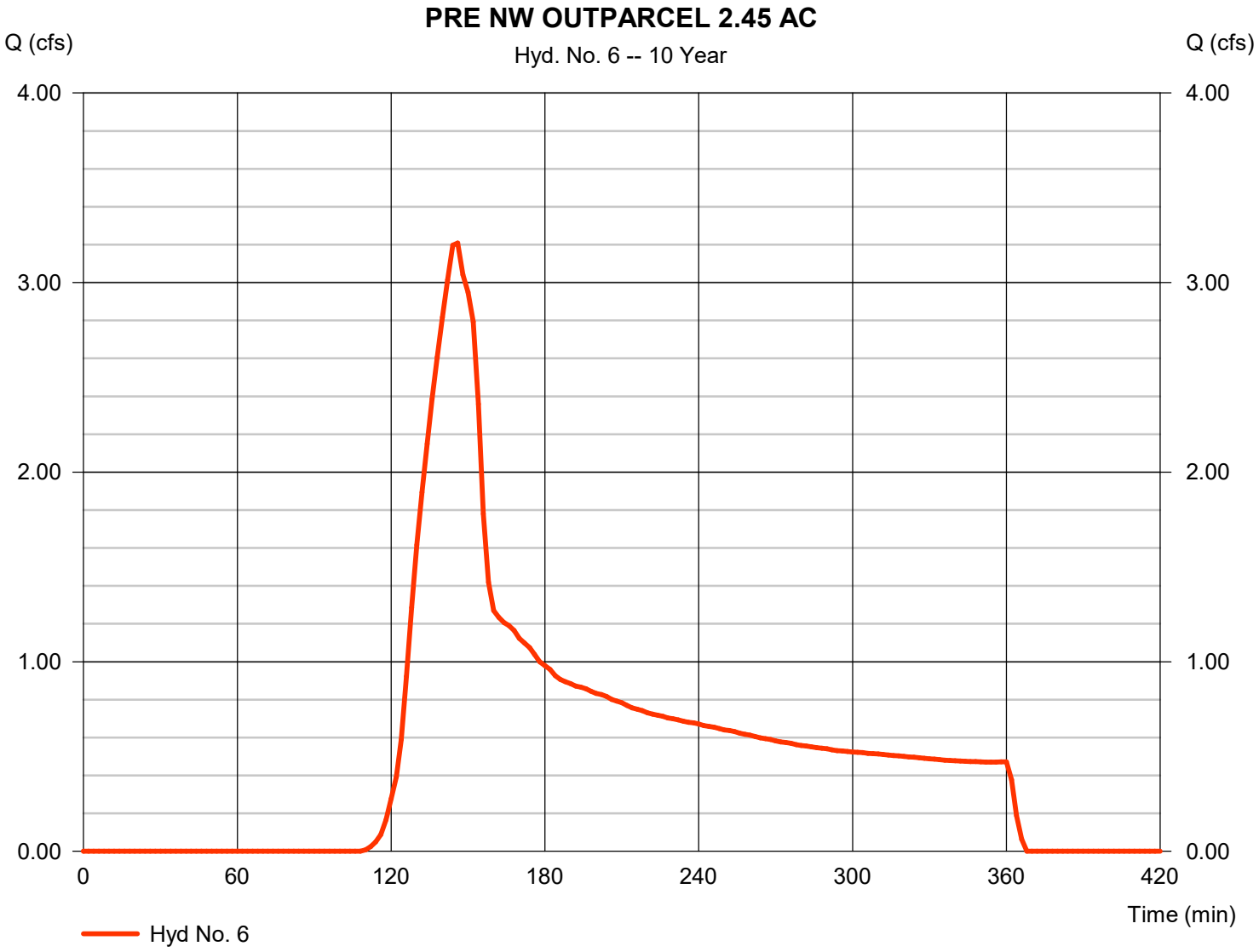


Hydrograph Report

Hyd. No. 6

PRE NW OUTPARCEL 2.45 AC

Hydrograph type	= SCS Runoff	Peak discharge	= 3.209 cfs
Storm frequency	= 10 yrs	Time to peak	= 146 min
Time interval	= 2 min	Hyd. volume	= 13,187 cuft
Drainage area	= 2.450 ac	Curve number	= 74
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 3.98 in	Distribution	= SCS 6-Hr
Storm duration	= 6.00 hrs	Shape factor	= 484

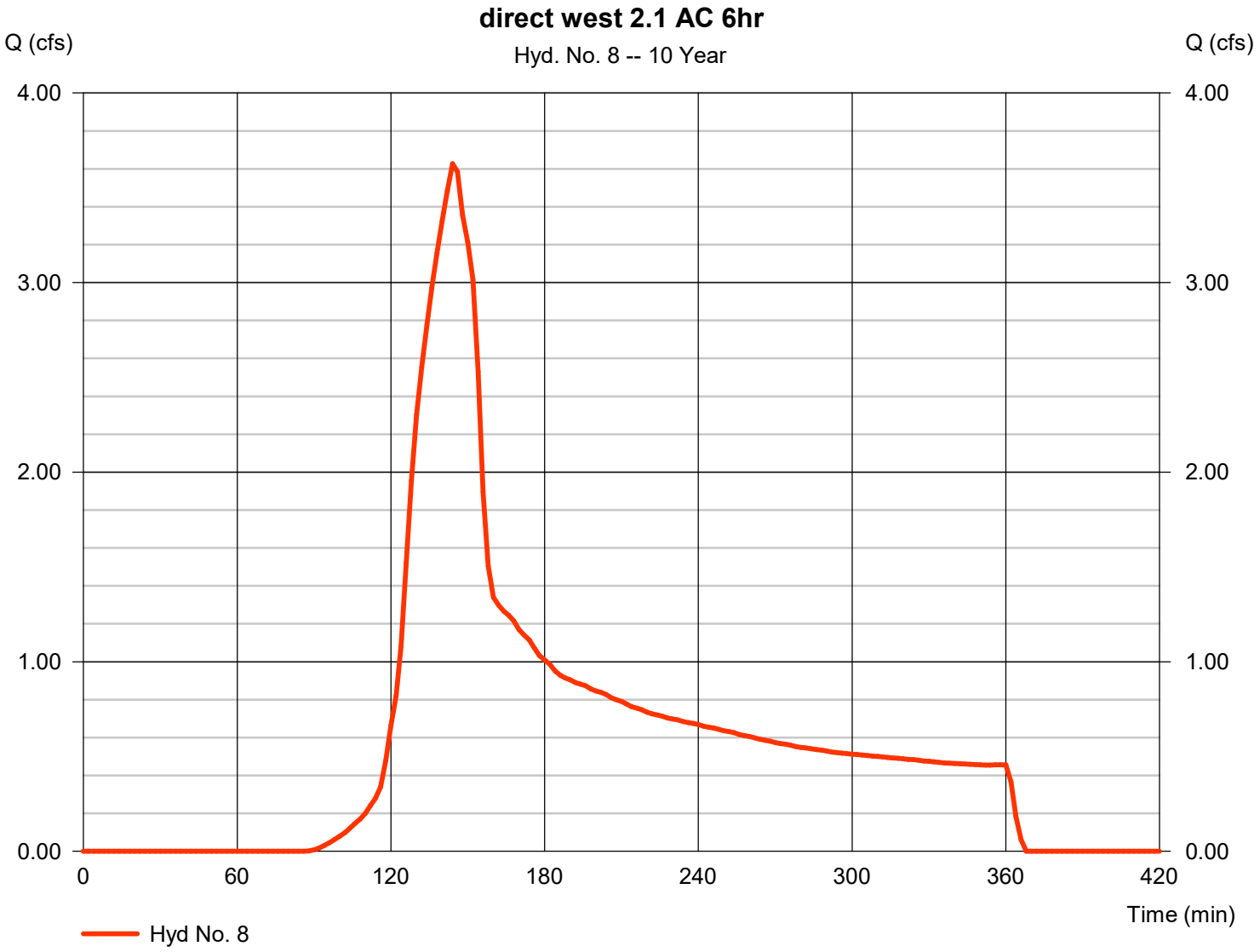


Hydrograph Report

Hyd. No. 8

direct west 2.1 AC 6hr

Hydrograph type	= SCS Runoff	Peak discharge	= 3.627 cfs
Storm frequency	= 10 yrs	Time to peak	= 144 min
Time interval	= 2 min	Hyd. volume	= 14,473 cuft
Drainage area	= 2.100 ac	Curve number	= 80
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 3.98 in	Distribution	= SCS 6-Hr
Storm duration	= 6.00 hrs	Shape factor	= 484

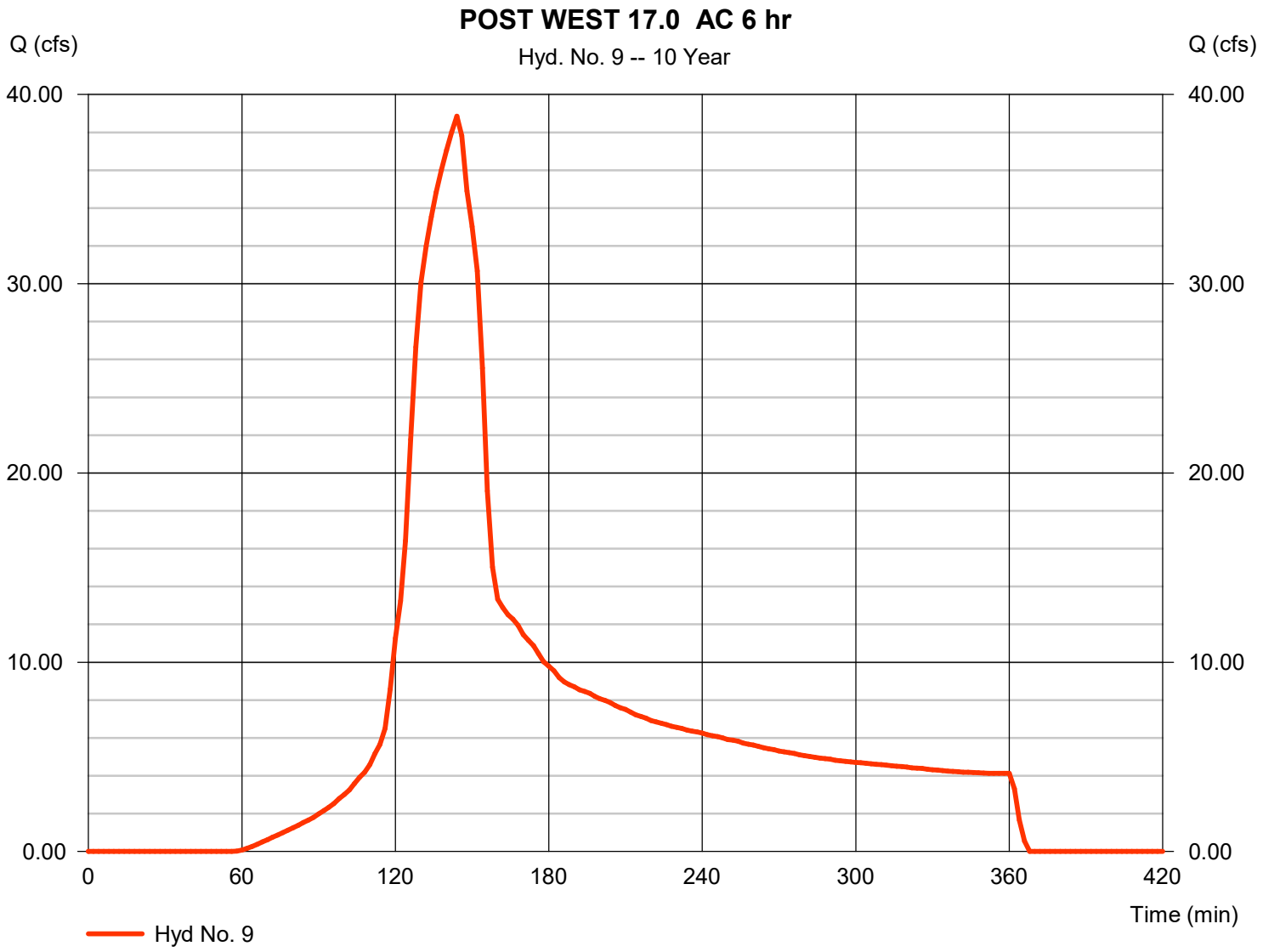


Hydrograph Report

Hyd. No. 9

POST WEST 17.0 AC 6 hr

Hydrograph type	= SCS Runoff	Peak discharge	= 38.86 cfs
Storm frequency	= 10 yrs	Time to peak	= 144 min
Time interval	= 2 min	Hyd. volume	= 154,658 cuft
Drainage area	= 17.000 ac	Curve number	= 87.6
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 3.98 in	Distribution	= SCS 6-Hr
Storm duration	= 6.00 hrs	Shape factor	= 484



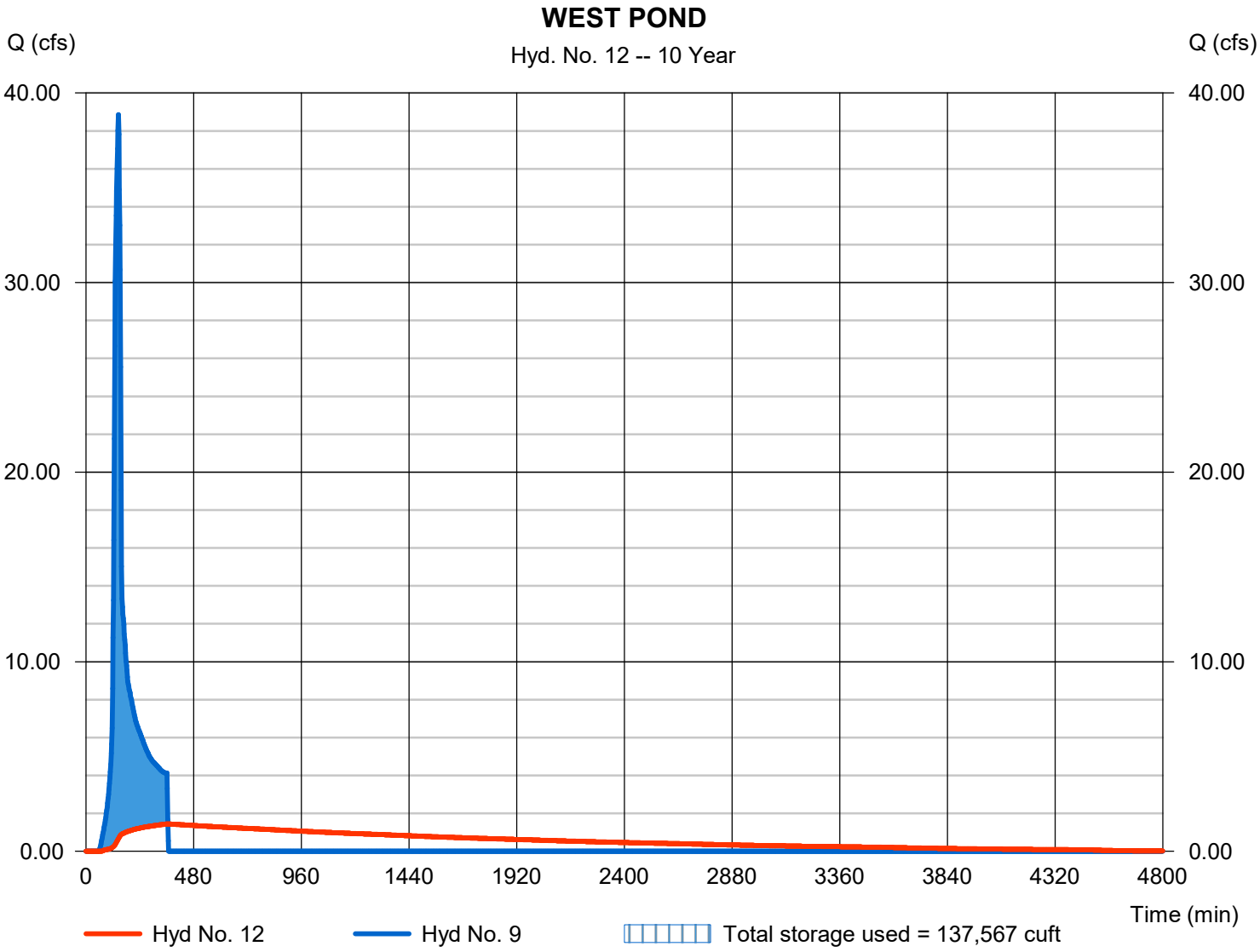
Hydrograph Report

Hyd. No. 12

WEST POND

Hydrograph type	=	Reservoir	Peak discharge	=	1.443 cfs
Storm frequency	=	10 yrs	Time to peak	=	364 min
Time interval	=	2 min	Hyd. volume	=	154,600 cuft
Inflow hyd. No.	=	9 - POST WEST 17.0 AC 6 hr	Max. Elevation	=	1000.97 ft
Reservoir name	=	WEST POND retention	Max. Storage	=	137,567 cuft

Storage Indication method used.

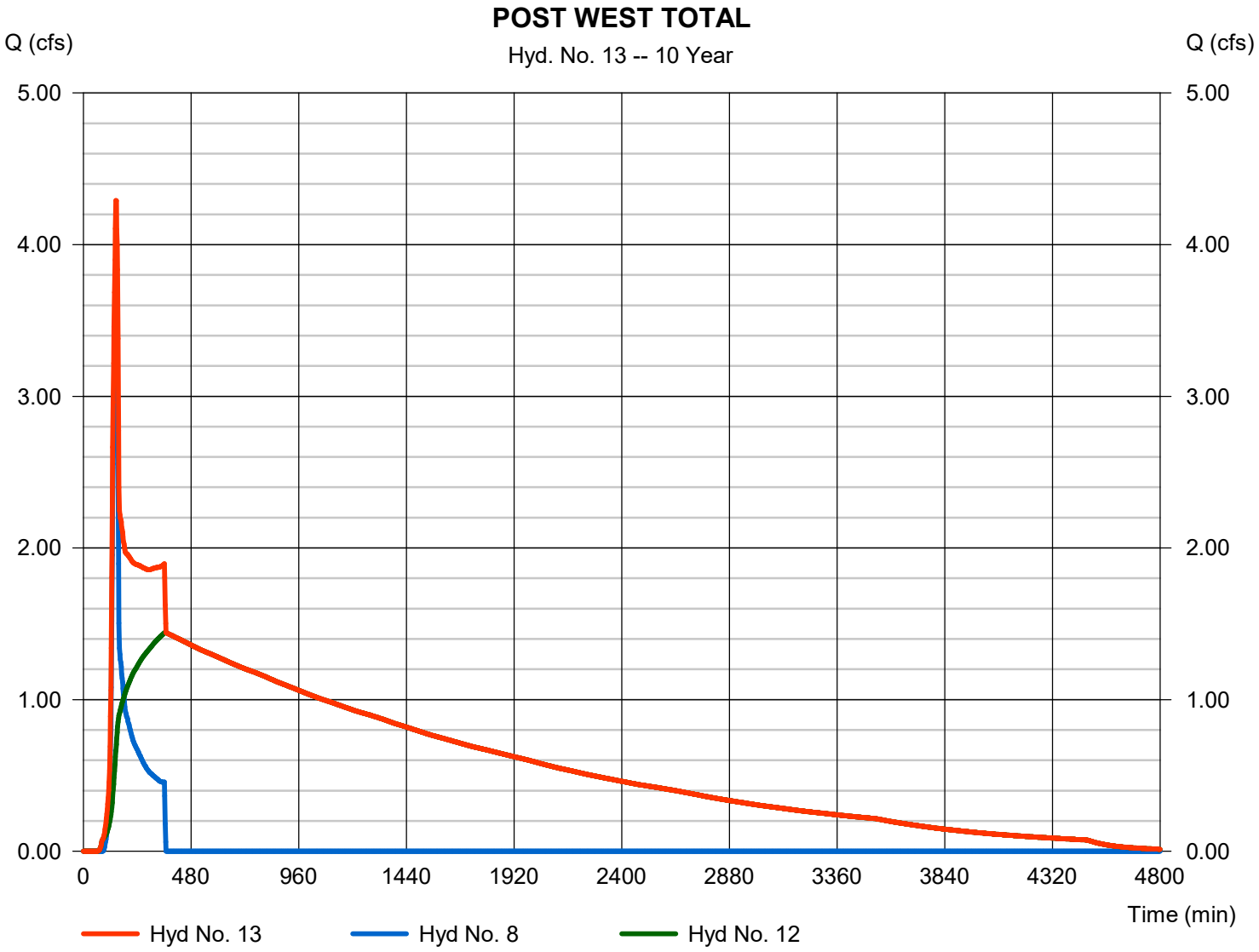


Hydrograph Report

Hyd. No. 13

POST WEST TOTAL

Hydrograph type	= Combine	Peak discharge	= 4.291 cfs
Storm frequency	= 10 yrs	Time to peak	= 144 min
Time interval	= 2 min	Hyd. volume	= 169,073 cuft
Inflow hyds.	= 8, 12	Contrib. drain. area	= 2.100 ac

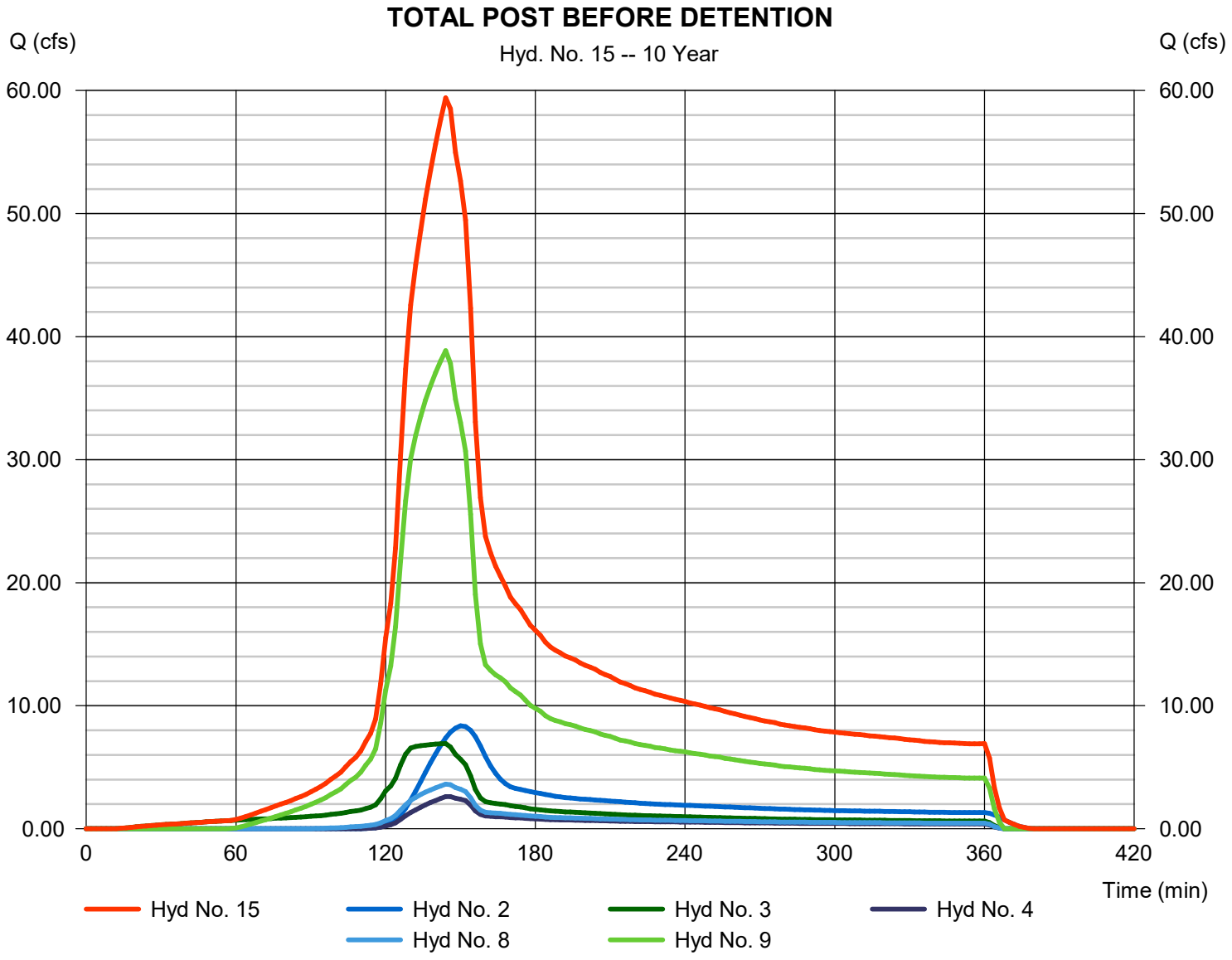


Hydrograph Report

Hyd. No. 15

TOTAL POST BEFORE DETENTION

Hydrograph type	= Combine	Peak discharge	= 59.40 cfs
Storm frequency	= 10 yrs	Time to peak	= 144 min
Time interval	= 2 min	Hyd. volume	= 247,193 cuft
Inflow hyds.	= 2, 3, 4, 8, 9	Contrib. drain. area	= 29.700 ac



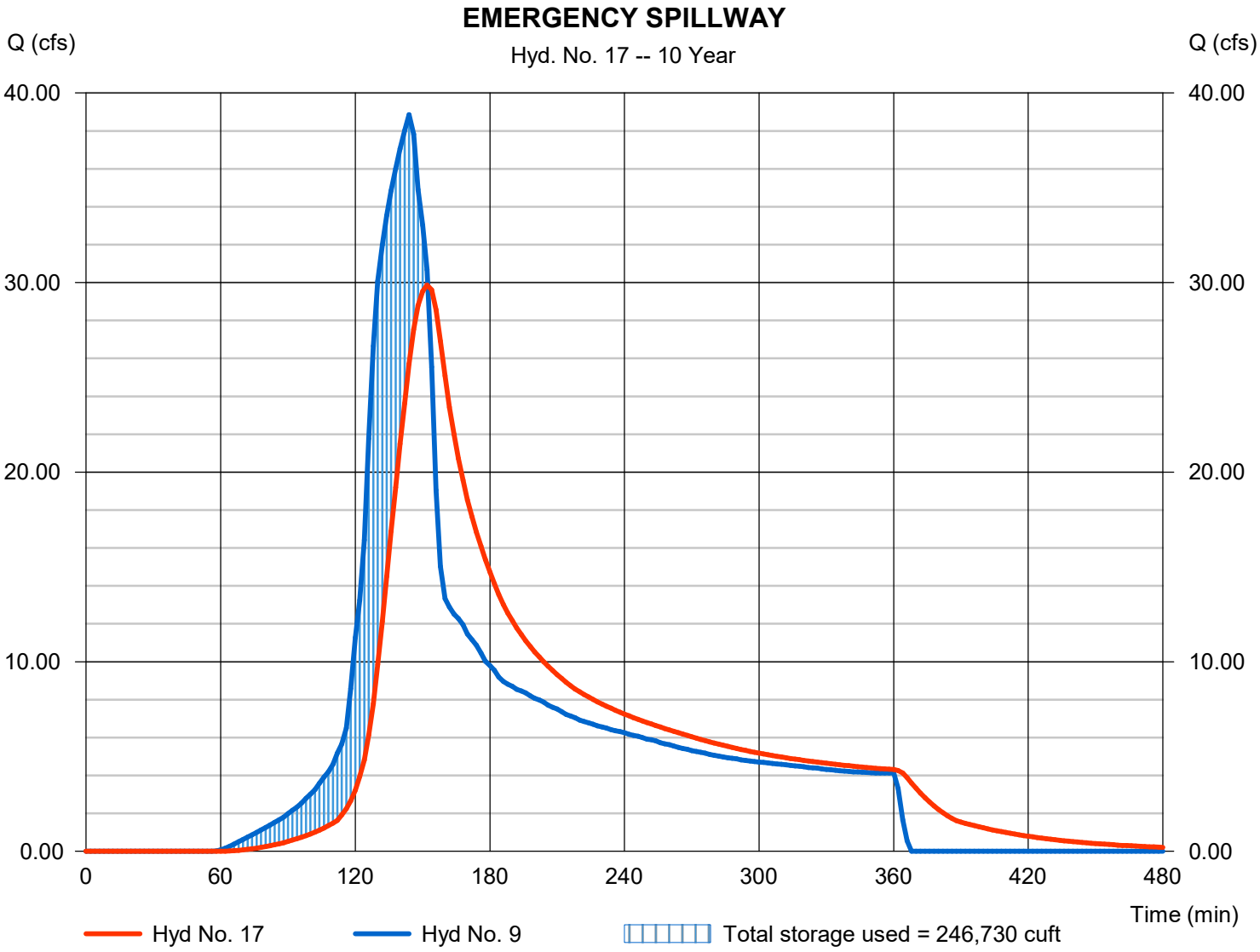
Hydrograph Report

Hyd. No. 17

EMERGENCY SPILLWAY

Hydrograph type	=	Reservoir	Peak discharge	=	29.87 cfs
Storm frequency	=	10 yrs	Time to peak	=	152 min
Time interval	=	2 min	Hyd. volume	=	154,656 cuft
Inflow hyd. No.	=	9 - POST WEST 17.0 AC 6 hr	Max. Elevation	=	1003.49 ft
Reservoir name	=	EMERGENCY SPILLWAY	Max. Storage	=	246,730 cuft

Storage Indication method used. Wet pond routing start elevation = 1002.80 ft.

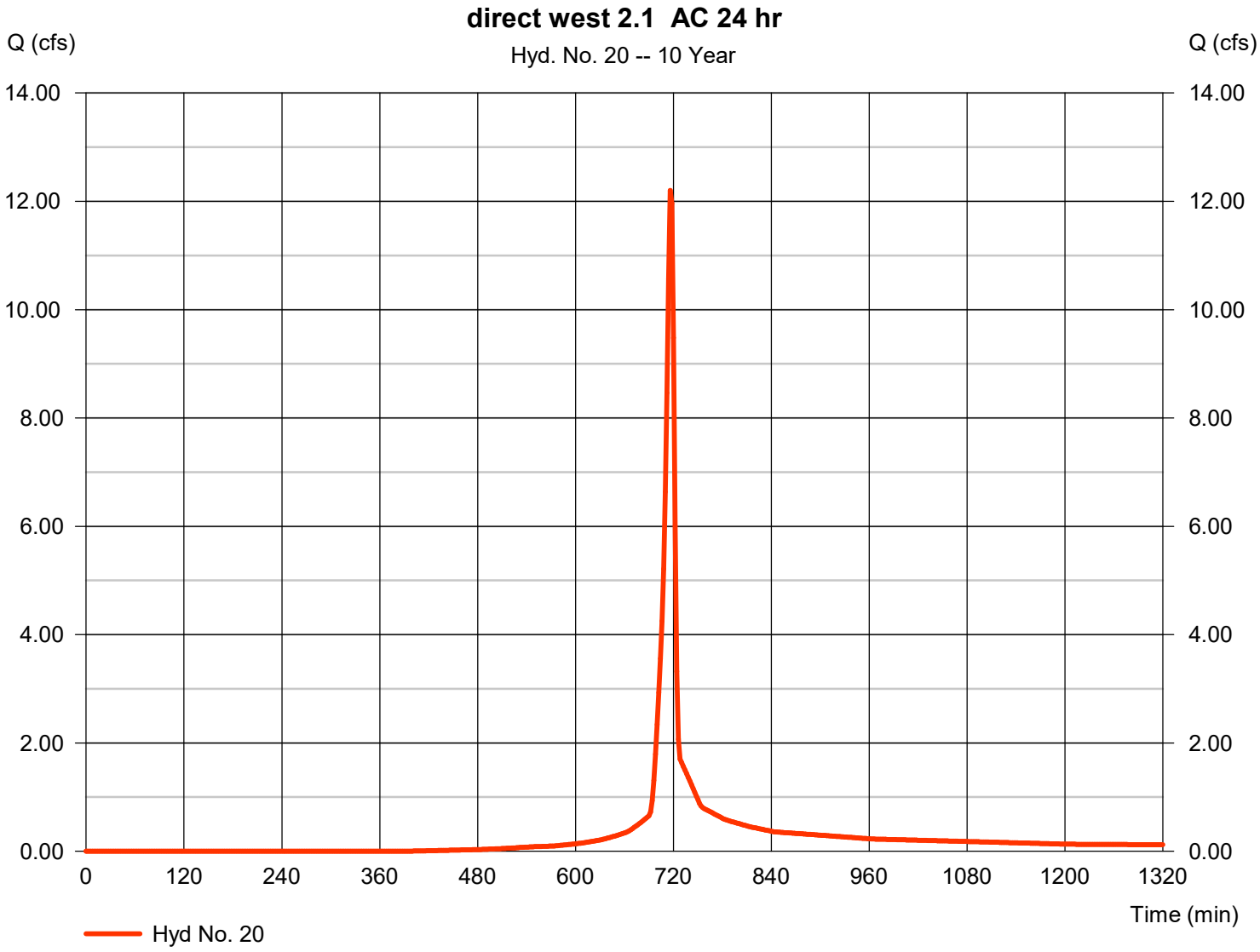


Hydrograph Report

Hyd. No. 20

direct west 2.1 AC 24 hr

Hydrograph type	= SCS Runoff	Peak discharge	= 12.20 cfs
Storm frequency	= 10 yrs	Time to peak	= 716 min
Time interval	= 2 min	Hyd. volume	= 24,969 cuft
Drainage area	= 2.100 ac	Curve number	= 80
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 5.68 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

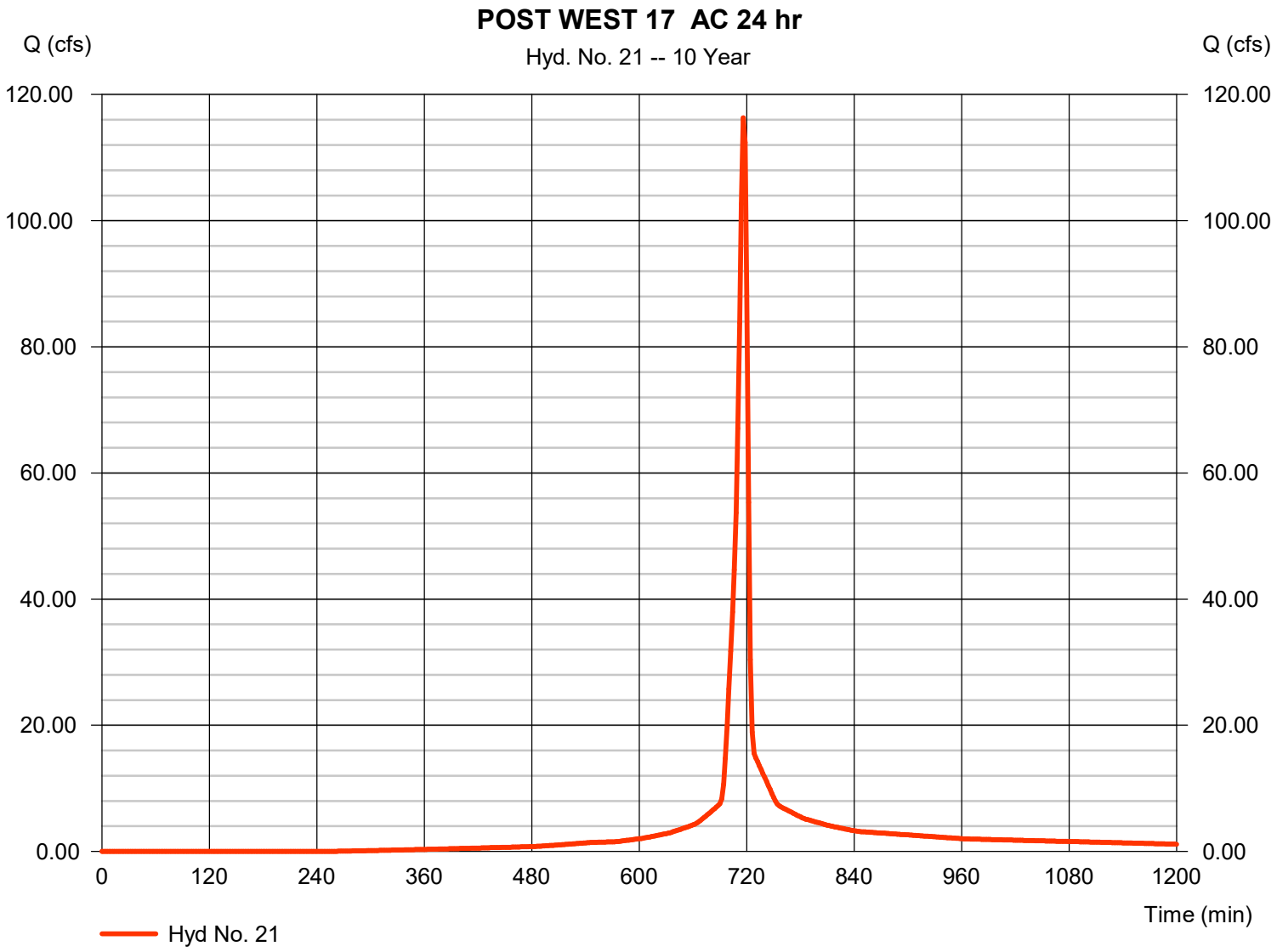


Hydrograph Report

Hyd. No. 21

POST WEST 17 AC 24 hr

Hydrograph type	= SCS Runoff	Peak discharge	= 116.32 cfs
Storm frequency	= 10 yrs	Time to peak	= 716 min
Time interval	= 2 min	Hyd. volume	= 247,351 cuft
Drainage area	= 17.000 ac	Curve number	= 87.6
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 5.68 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

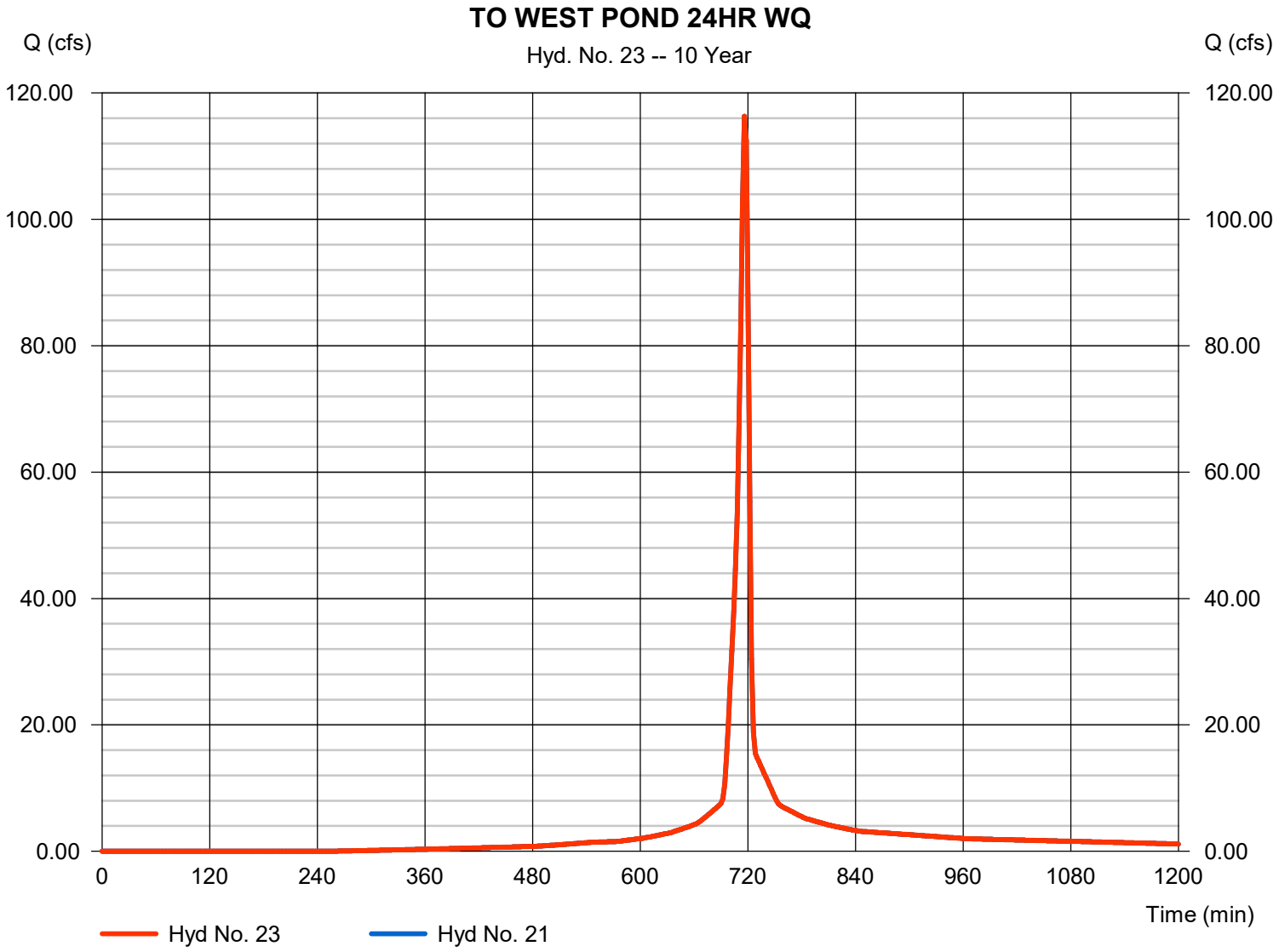


Hydrograph Report

Hyd. No. 23

TO WEST POND 24HR WQ

Hydrograph type	= Combine	Peak discharge	= 116.32 cfs
Storm frequency	= 10 yrs	Time to peak	= 716 min
Time interval	= 2 min	Hyd. volume	= 247,351 cuft
Inflow hyds.	= 21	Contrib. drain. area	= 17.000 ac



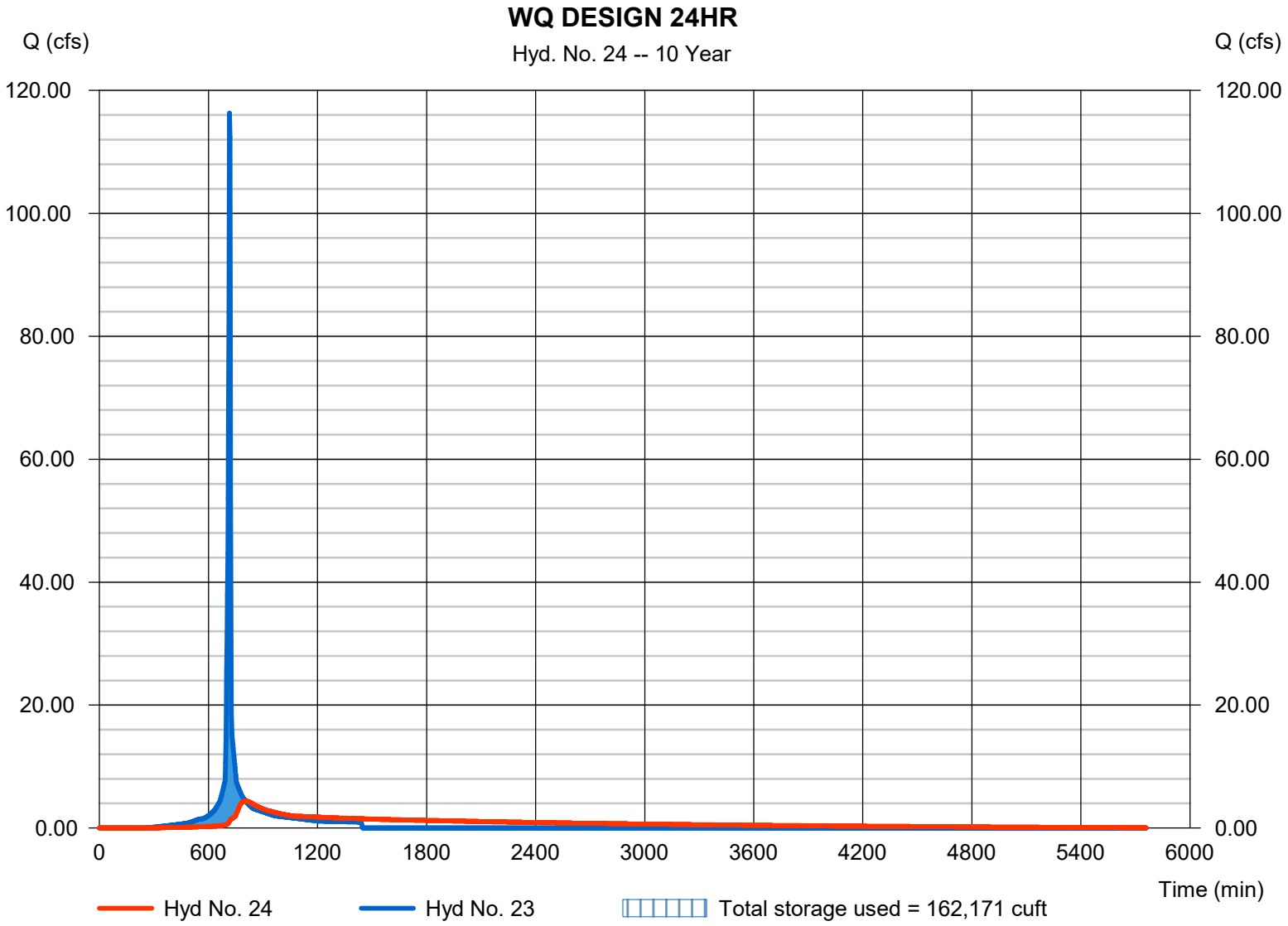
Hydrograph Report

Hyd. No. 24

WQ DESIGN 24HR

Hydrograph type	=	Reservoir	Peak discharge	=	4.385 cfs
Storm frequency	=	10 yrs	Time to peak	=	804 min
Time interval	=	2 min	Hyd. volume	=	246,845 cuft
Inflow hyd. No.	=	23 - TO WEST POND 24HR WQ	Max. Elevation	=	1001.59 ft
Reservoir name	=	WEST POND retention	Max. Storage	=	162,171 cuft

Storage Indication method used.

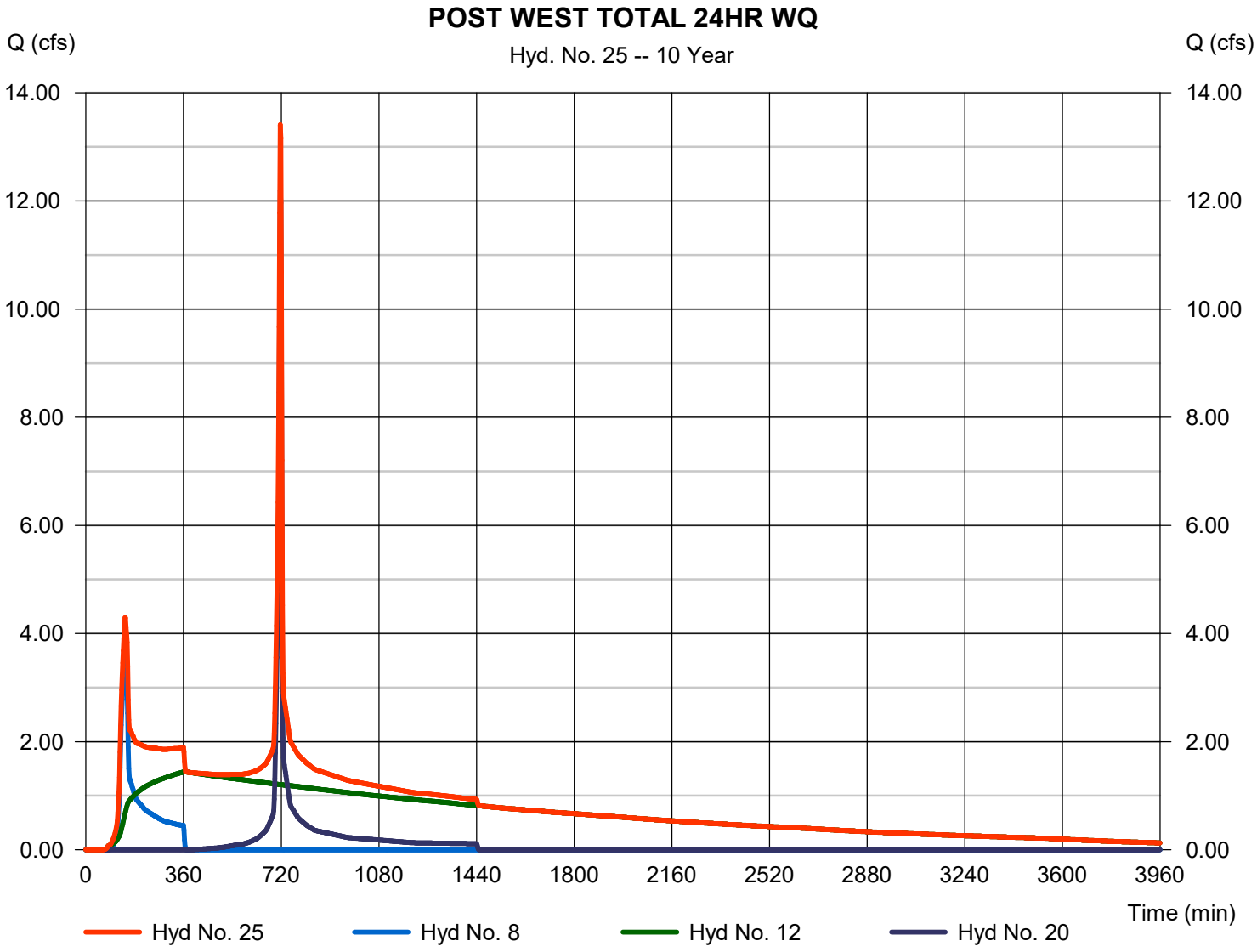


Hydrograph Report

Hyd. No. 25

POST WEST TOTAL 24HR WQ

Hydrograph type	= Combine	Peak discharge	= 13.41 cfs
Storm frequency	= 10 yrs	Time to peak	= 716 min
Time interval	= 2 min	Hyd. volume	= 194,042 cuft
Inflow hyds.	= 8, 12, 20	Contrib. drain. area	= 4.200 ac

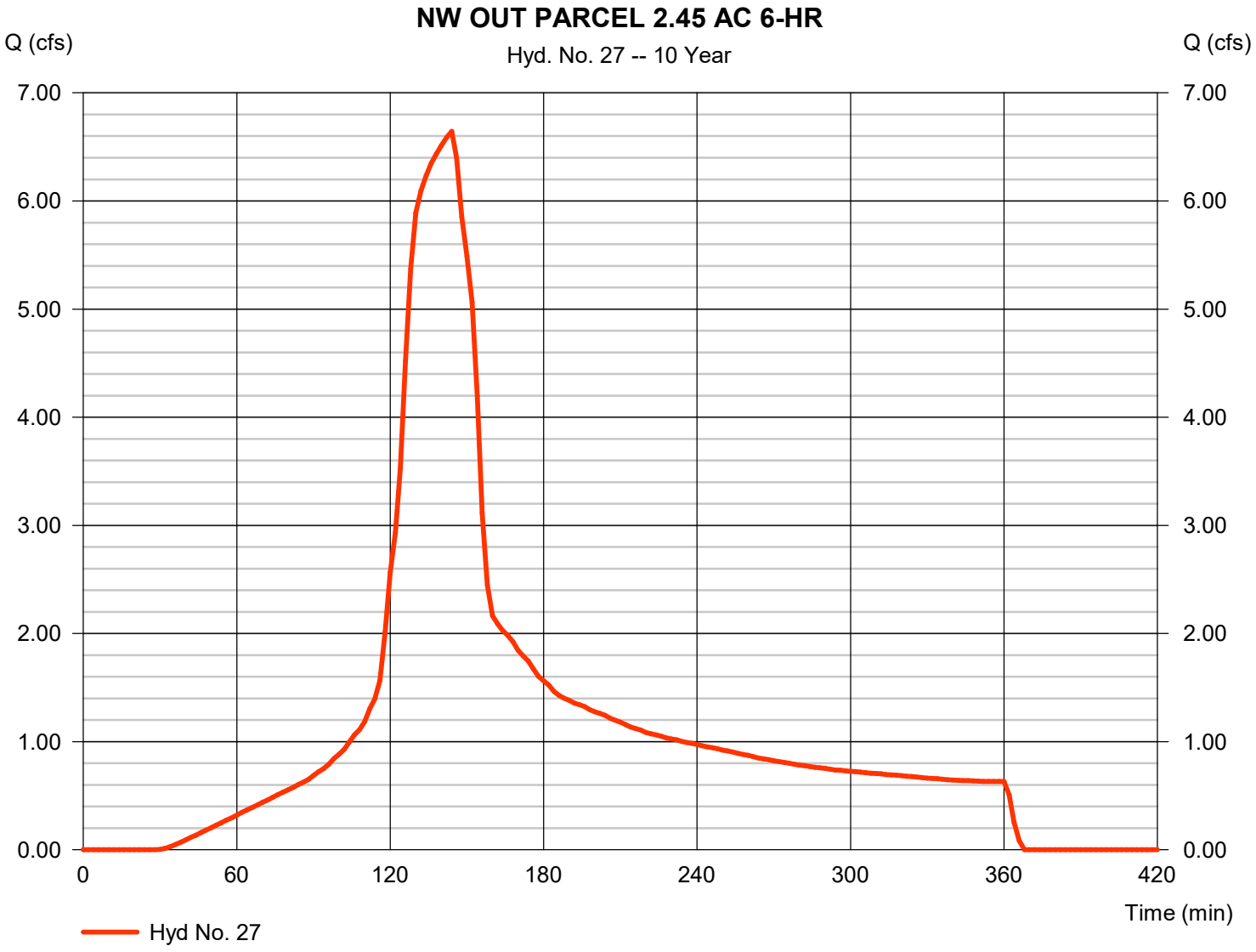


Hydrograph Report

Hyd. No. 27

NW OUT PARCEL 2.45 AC 6-HR

Hydrograph type	= SCS Runoff	Peak discharge	= 6.645 cfs
Storm frequency	= 10 yrs	Time to peak	= 144 min
Time interval	= 2 min	Hyd. volume	= 27,554 cuft
Drainage area	= 2.450 ac	Curve number	= 94
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 3.98 in	Distribution	= SCS 6-Hr
Storm duration	= 6.00 hrs	Shape factor	= 484



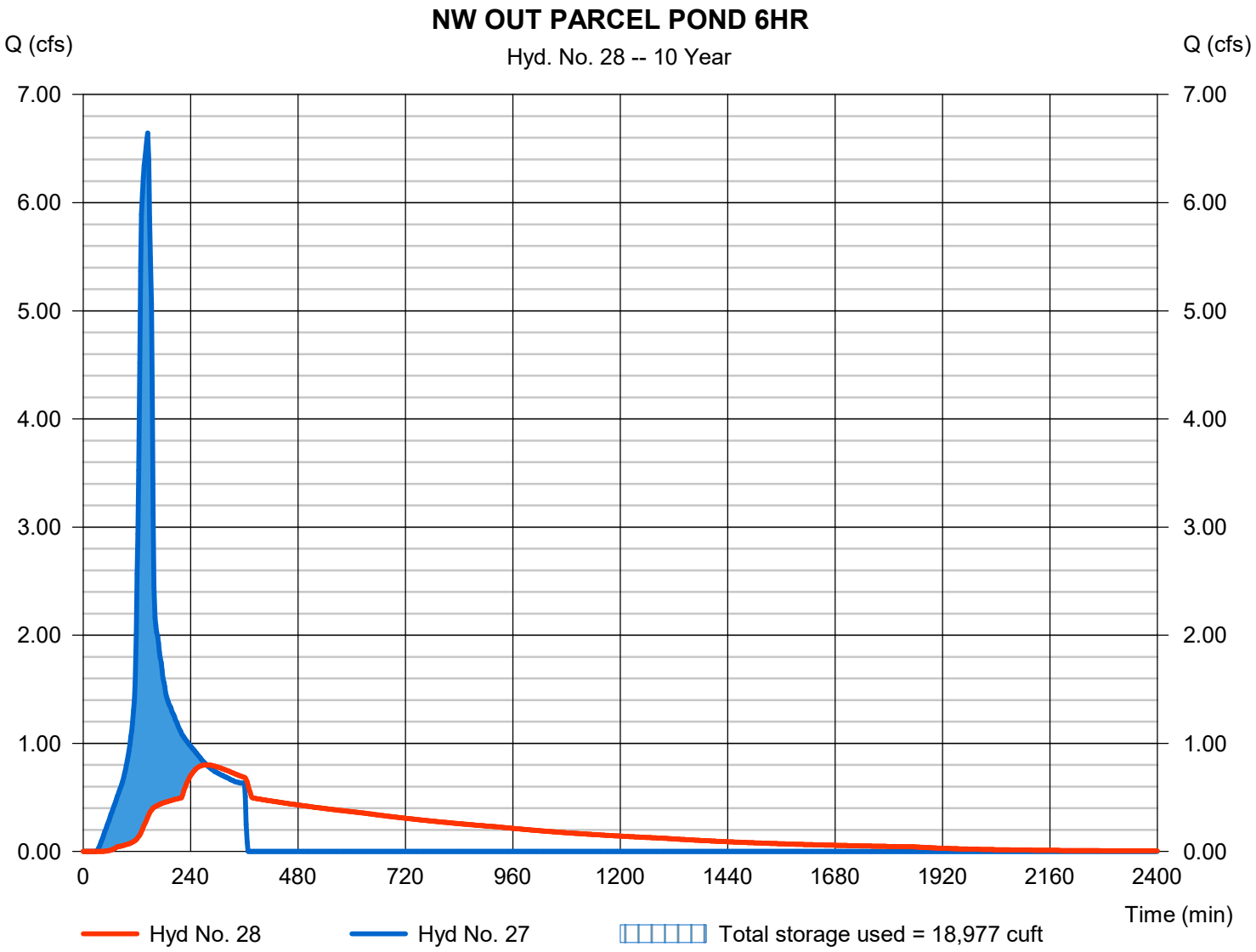
Hydrograph Report

Hyd. No. 28

NW OUT PARCEL POND 6HR

Hydrograph type	=	Reservoir	Peak discharge	=	0.801 cfs
Storm frequency	=	10 yrs	Time to peak	=	276 min
Time interval	=	2 min	Hyd. volume	=	27,502 cuft
Inflow hyd. No.	=	27 - NW OUT PARCEL 2.45 AC 6HR	Max. Elevation	=	999.10 ft
Reservoir name	=	NW OUT PARCEL POND	Max. Storage	=	18,977 cuft

Storage Indication method used.



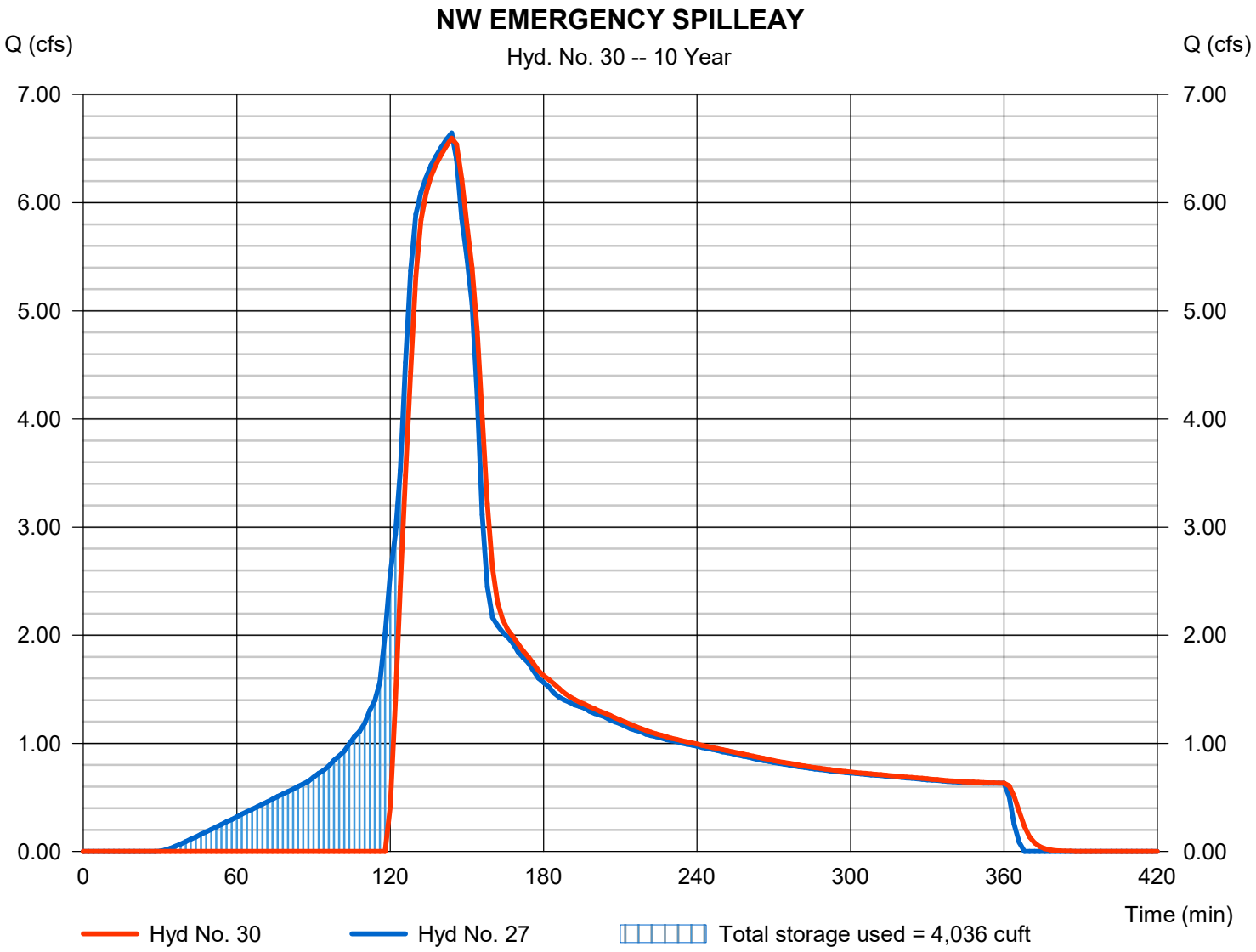
Hydrograph Report

Hyd. No. 30

NW EMERGENCY SPILLEAY

Hydrograph type	=	Reservoir	Peak discharge	=	6.596 cfs
Storm frequency	=	10 yrs	Time to peak	=	144 min
Time interval	=	2 min	Hyd. volume	=	24,449 cuft
Inflow hyd. No.	=	27 - NW OUT PARCEL 2.45 AC 6x HR	Max. Elevation	=	1001.25 ft
Reservoir name	=	NW EMERGENCY SPILLWAY	Max. Storage	=	4,036 cuft

Storage Indication method used.



Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2026

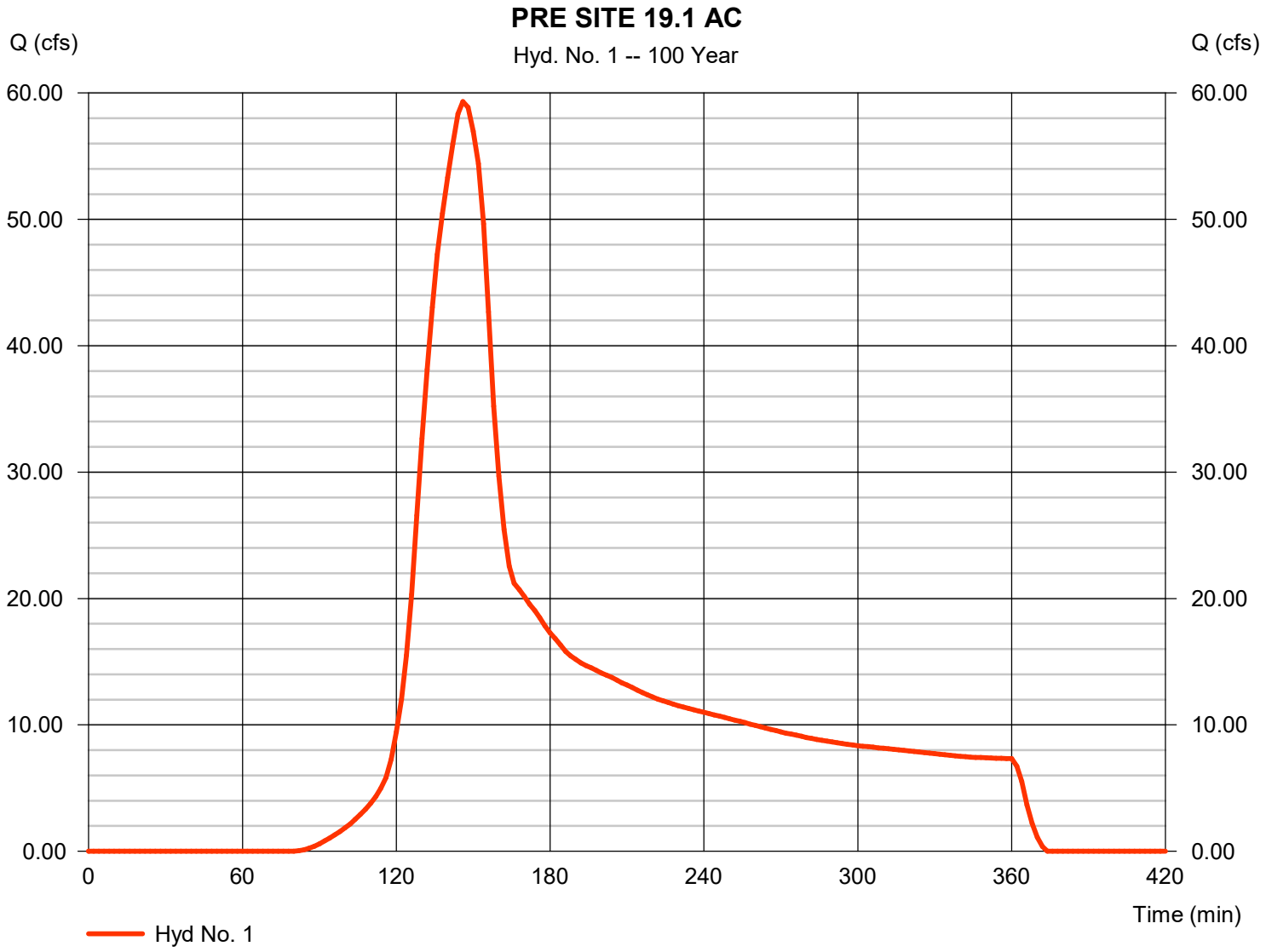
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	59.32	2	146	243,739	------	------	------	PRE SITE 19.1 AC
2	SCS Runoff	19.29	2	150	81,592	------	------	------	OFFSITE EAST 6.2 AC
3	SCS Runoff	11.18	2	144	50,242	------	------	------	OFFSITE ROAD 2.4 AC
4	SCS Runoff	6.026	2	144	23,927	------	------	------	OFFSITE NORTH 2 AC
5	Combine	35.60	2	146	155,761	2, 3, 4	------	------	OFFSITE
6	SCS Runoff	7.382	2	144	29,311	------	------	------	PRE NW OUTPARCEL 2.45 AC
8	SCS Runoff	7.442	2	144	29,551	------	------	------	direct west 2.1 AC 6hr
9	SCS Runoff	70.53	2	144	286,819	------	------	------	POST WEST 17.0 AC 6 hr
12	Reservoir	12.63	2	212	286,738	9	1001.93	175,648	WEST POND
13	Combine	14.09	2	210	316,289	8, 12	------	------	POST WEST TOTAL
15	Combine	113.53	2	144	472,131	2, 3, 4, 8, 9,	------	------	TOTAL POST BEFORE DETENTION
17	Reservoir	59.65	2	150	286,816	9	1003.90	266,470	EMERGENCY SPILLWAY
20	SCS Runoff	23.01	2	716	48,636	------	------	------	direct west 2.1 AC 24 hr
21	SCS Runoff	202.84	2	716	448,035	------	------	------	POST WEST 17 AC 24 hr
23	Combine	202.84	2	716	448,035	21,	------	------	TO WEST POND 24HR WQ
24	Reservoir	63.23	2	724	447,281	23	1003.25	235,208	WQ DESIGN 24HR
25	Combine	24.37	2	716	364,925	8, 12, 20,	------	------	POST WEST TOTAL 24HR WQ
27	SCS Runoff	11.10	2	144	47,384	------	------	------	NW OUT PARCEL 2.45 AC 6-HR
28	Reservoir	4.752	2	156	47,331	27	999.63	23,145	NW OUT PARCEL POND 6HR
30	Reservoir	11.06	2	144	44,278	27	1001.35	4,425	NW EMERGENCY SPILLEAY

Hydrograph Report

Hyd. No. 1

PRE SITE 19.1 AC

Hydrograph type	=	SCS Runoff	Peak discharge	=	59.32 cfs
Storm frequency	=	100 yrs	Time to peak	=	146 min
Time interval	=	2 min	Hyd. volume	=	243,739 cuft
Drainage area	=	19.100 ac	Curve number	=	74
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	9.00 min
Total precip.	=	6.39 in	Distribution	=	SCS 6-Hr
Storm duration	=	6.00 hrs	Shape factor	=	484

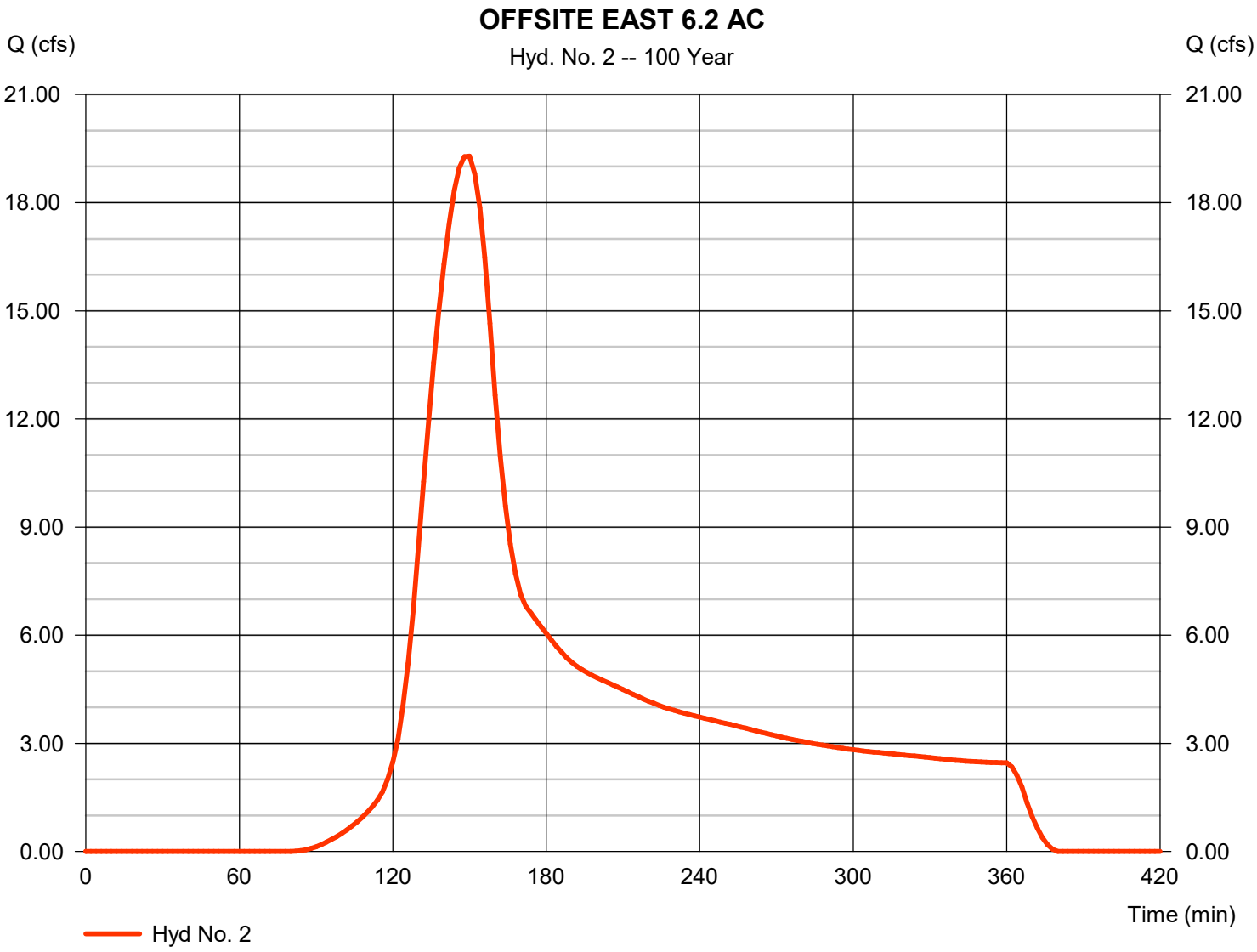


Hydrograph Report

Hyd. No. 2

OFFSITE EAST 6.2 AC

Hydrograph type	=	SCS Runoff	Peak discharge	=	19.29 cfs
Storm frequency	=	100 yrs	Time to peak	=	150 min
Time interval	=	2 min	Hyd. volume	=	81,592 cuft
Drainage area	=	6.200 ac	Curve number	=	74
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	10.00 min
Total precip.	=	6.39 in	Distribution	=	SCS 6-Hr
Storm duration	=	6.00 hrs	Shape factor	=	484

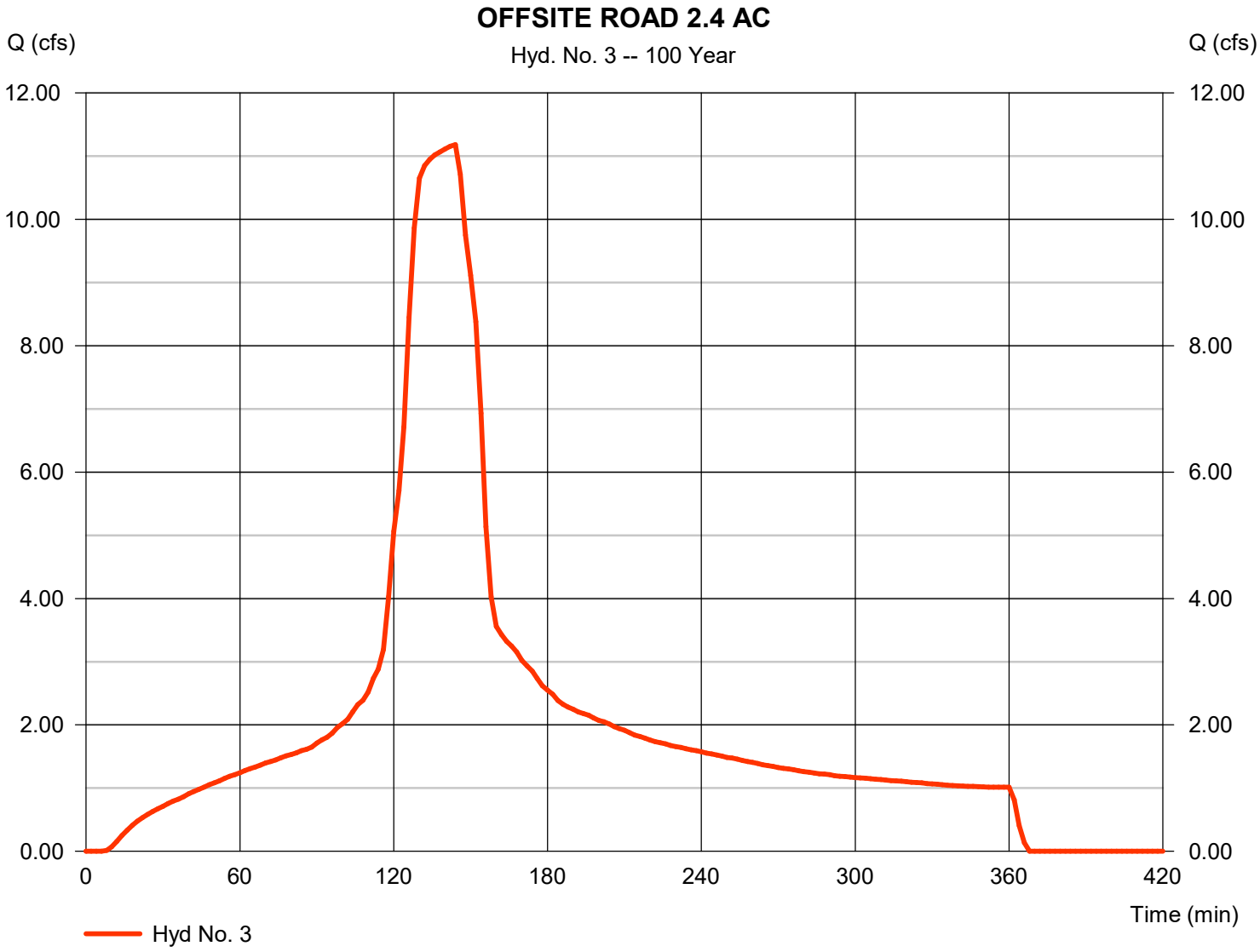


Hydrograph Report

Hyd. No. 3

OFFSITE ROAD 2.4 AC

Hydrograph type	=	SCS Runoff	Peak discharge	=	11.18 cfs
Storm frequency	=	100 yrs	Time to peak	=	144 min
Time interval	=	2 min	Hyd. volume	=	50,242 cuft
Drainage area	=	2.400 ac	Curve number	=	98
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	6.39 in	Distribution	=	SCS 6-Hr
Storm duration	=	6.00 hrs	Shape factor	=	484

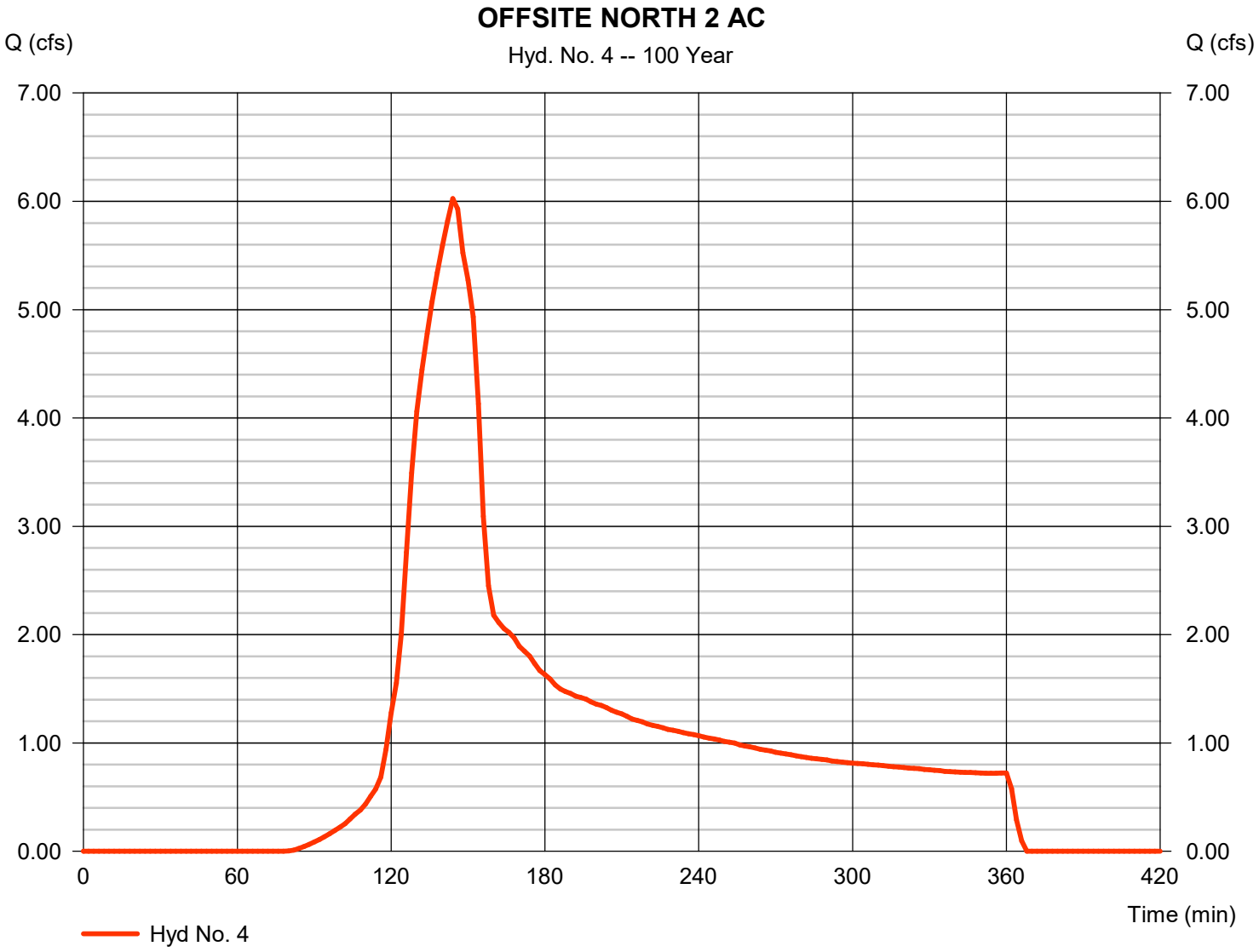


Hydrograph Report

Hyd. No. 4

OFFSITE NORTH 2 AC

Hydrograph type	= SCS Runoff	Peak discharge	= 6.026 cfs
Storm frequency	= 100 yrs	Time to peak	= 144 min
Time interval	= 2 min	Hyd. volume	= 23,927 cuft
Drainage area	= 2.000 ac	Curve number	= 74
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 6.39 in	Distribution	= SCS 6-Hr
Storm duration	= 6.00 hrs	Shape factor	= 484

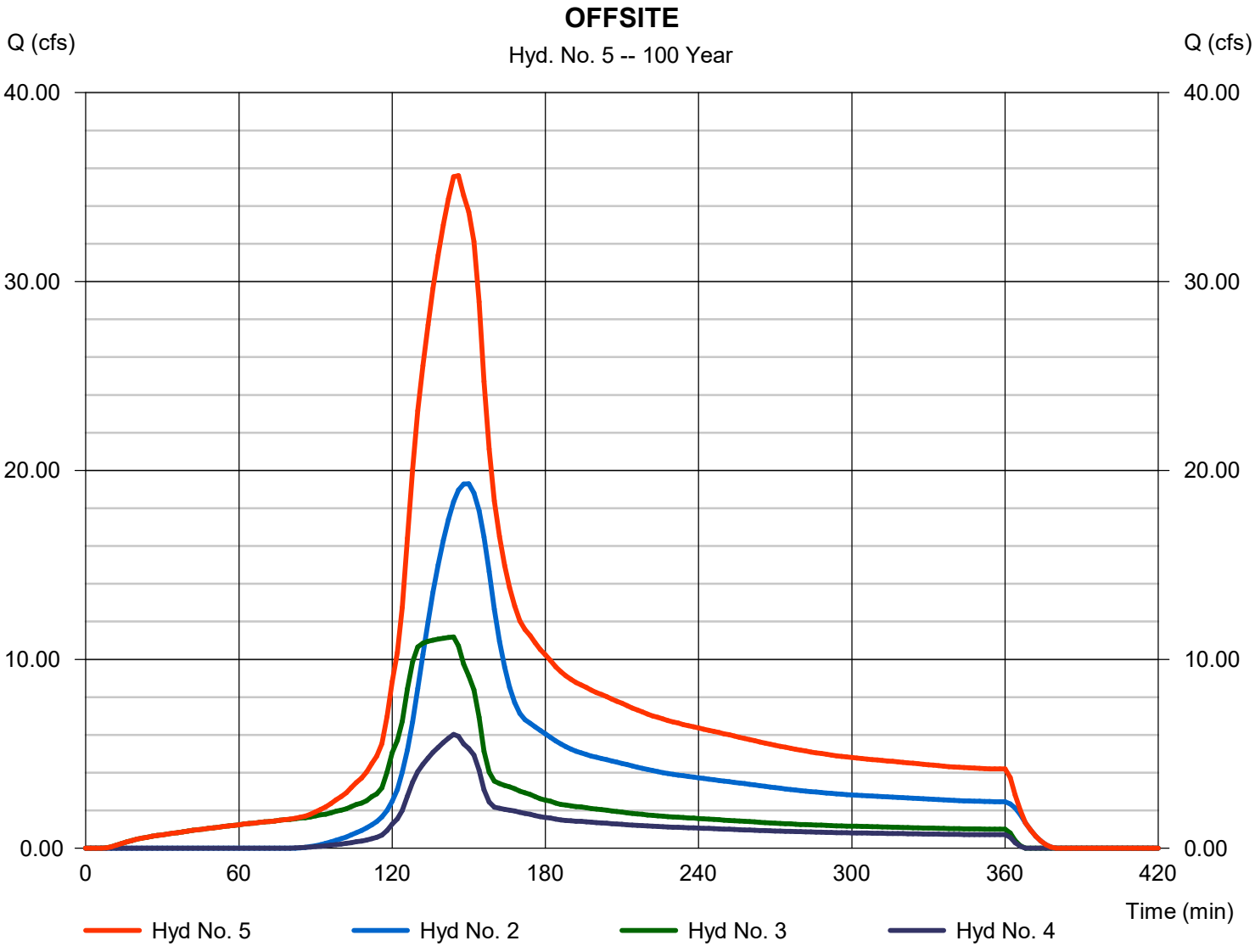


Hydrograph Report

Hyd. No. 5

OFFSITE

Hydrograph type	=	Combine	Peak discharge	=	35.60 cfs
Storm frequency	=	100 yrs	Time to peak	=	146 min
Time interval	=	2 min	Hyd. volume	=	155,761 cuft
Inflow hyds.	=	2, 3, 4	Contrib. drain. area	=	10.600 ac

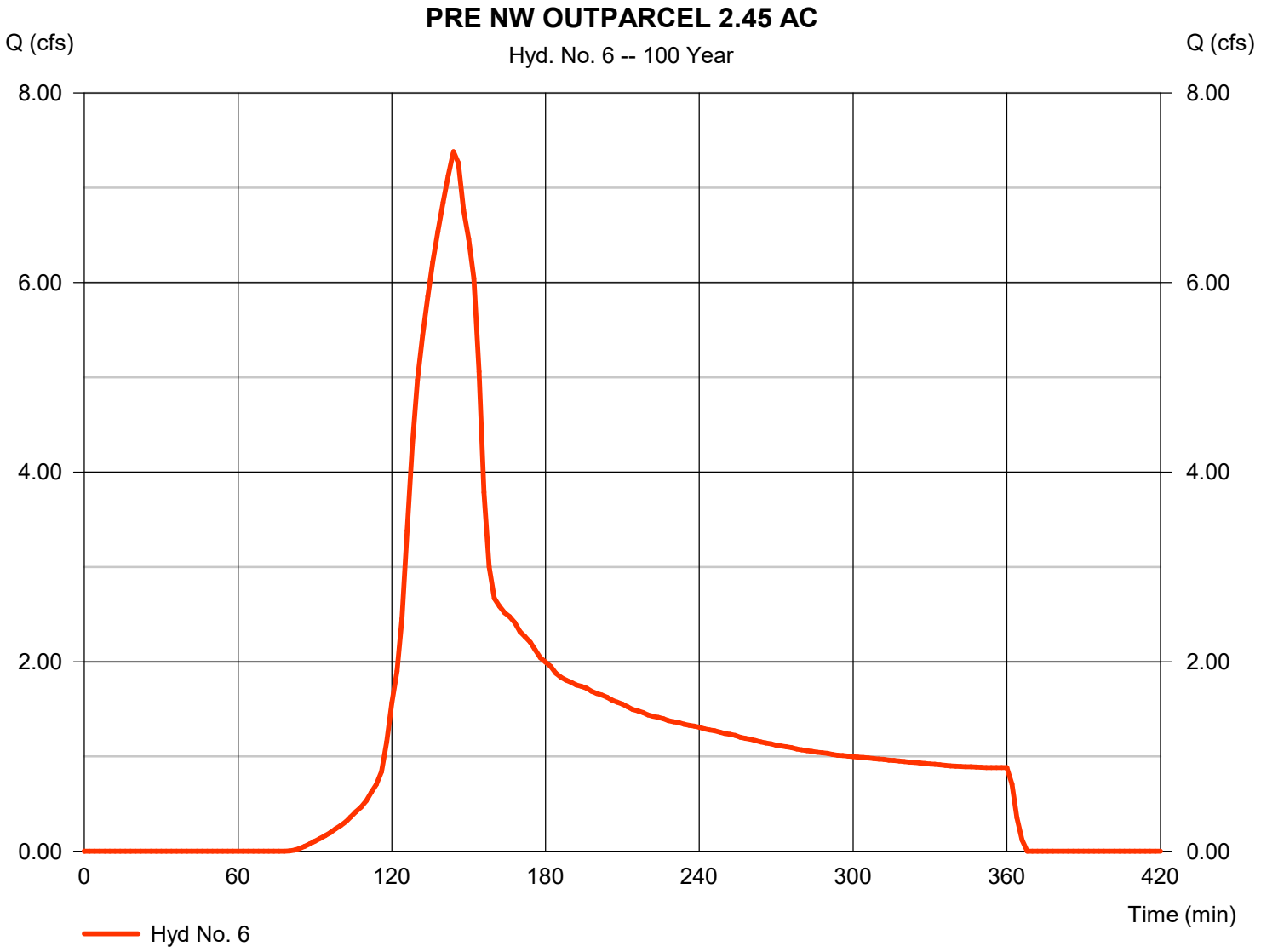


Hydrograph Report

Hyd. No. 6

PRE NW OUTPARCEL 2.45 AC

Hydrograph type	=	SCS Runoff	Peak discharge	=	7.382 cfs
Storm frequency	=	100 yrs	Time to peak	=	144 min
Time interval	=	2 min	Hyd. volume	=	29,311 cuft
Drainage area	=	2.450 ac	Curve number	=	74
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	6.39 in	Distribution	=	SCS 6-Hr
Storm duration	=	6.00 hrs	Shape factor	=	484

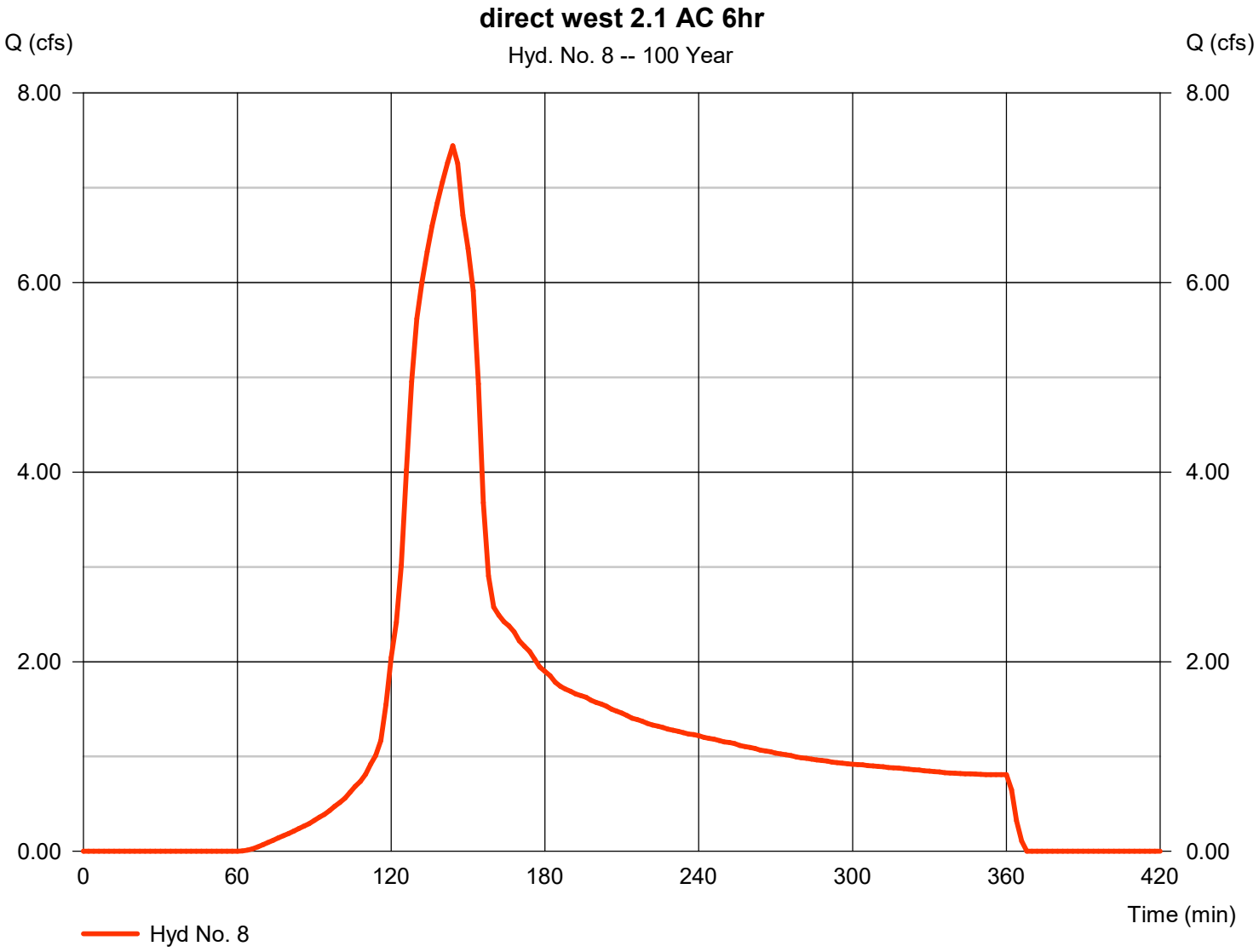


Hydrograph Report

Hyd. No. 8

direct west 2.1 AC 6hr

Hydrograph type	= SCS Runoff	Peak discharge	= 7.442 cfs
Storm frequency	= 100 yrs	Time to peak	= 144 min
Time interval	= 2 min	Hyd. volume	= 29,551 cuft
Drainage area	= 2.100 ac	Curve number	= 80
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 6.39 in	Distribution	= SCS 6-Hr
Storm duration	= 6.00 hrs	Shape factor	= 484

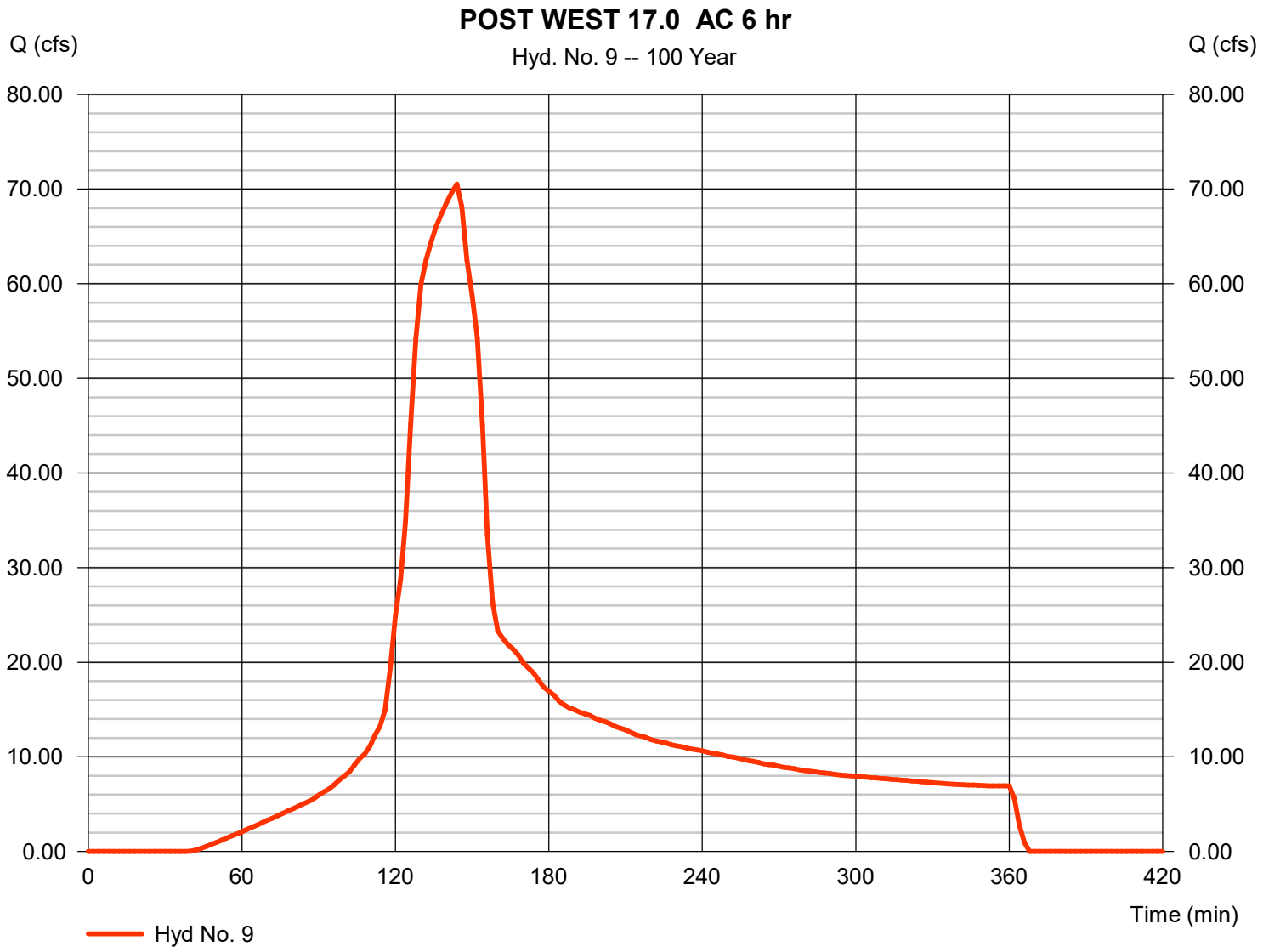


Hydrograph Report

Hyd. No. 9

POST WEST 17.0 AC 6 hr

Hydrograph type	=	SCS Runoff	Peak discharge	=	70.53 cfs
Storm frequency	=	100 yrs	Time to peak	=	144 min
Time interval	=	2 min	Hyd. volume	=	286,819 cuft
Drainage area	=	17.000 ac	Curve number	=	87.6
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	6.39 in	Distribution	=	SCS 6-Hr
Storm duration	=	6.00 hrs	Shape factor	=	484



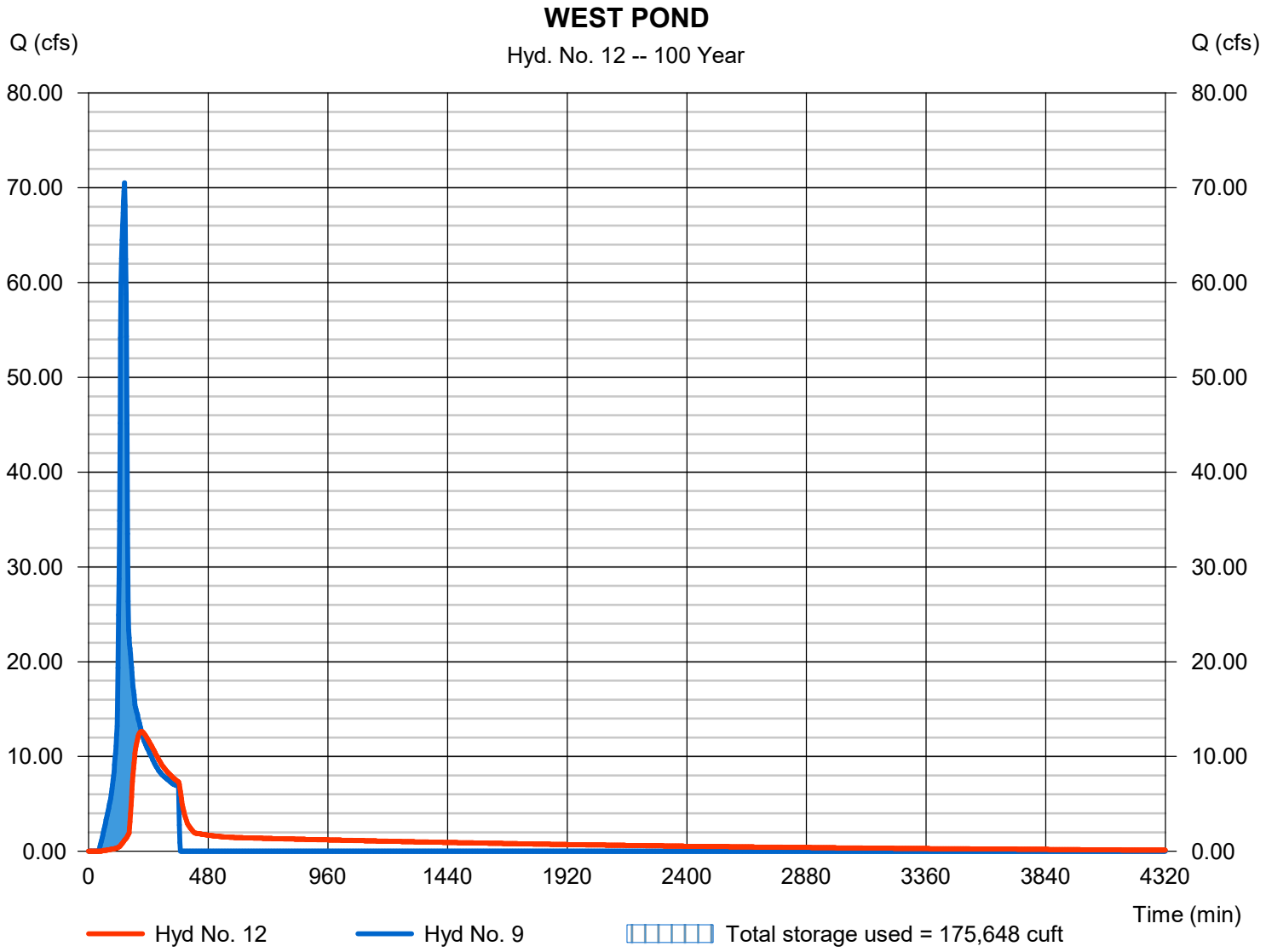
Hydrograph Report

Hyd. No. 12

WEST POND

Hydrograph type	=	Reservoir	Peak discharge	=	12.63 cfs
Storm frequency	=	100 yrs	Time to peak	=	212 min
Time interval	=	2 min	Hyd. volume	=	286,738 cuft
Inflow hyd. No.	=	9 - POST WEST 17.0 AC 6 hr	Max. Elevation	=	1001.93 ft
Reservoir name	=	WEST POND retention	Max. Storage	=	175,648 cuft

Storage Indication method used.

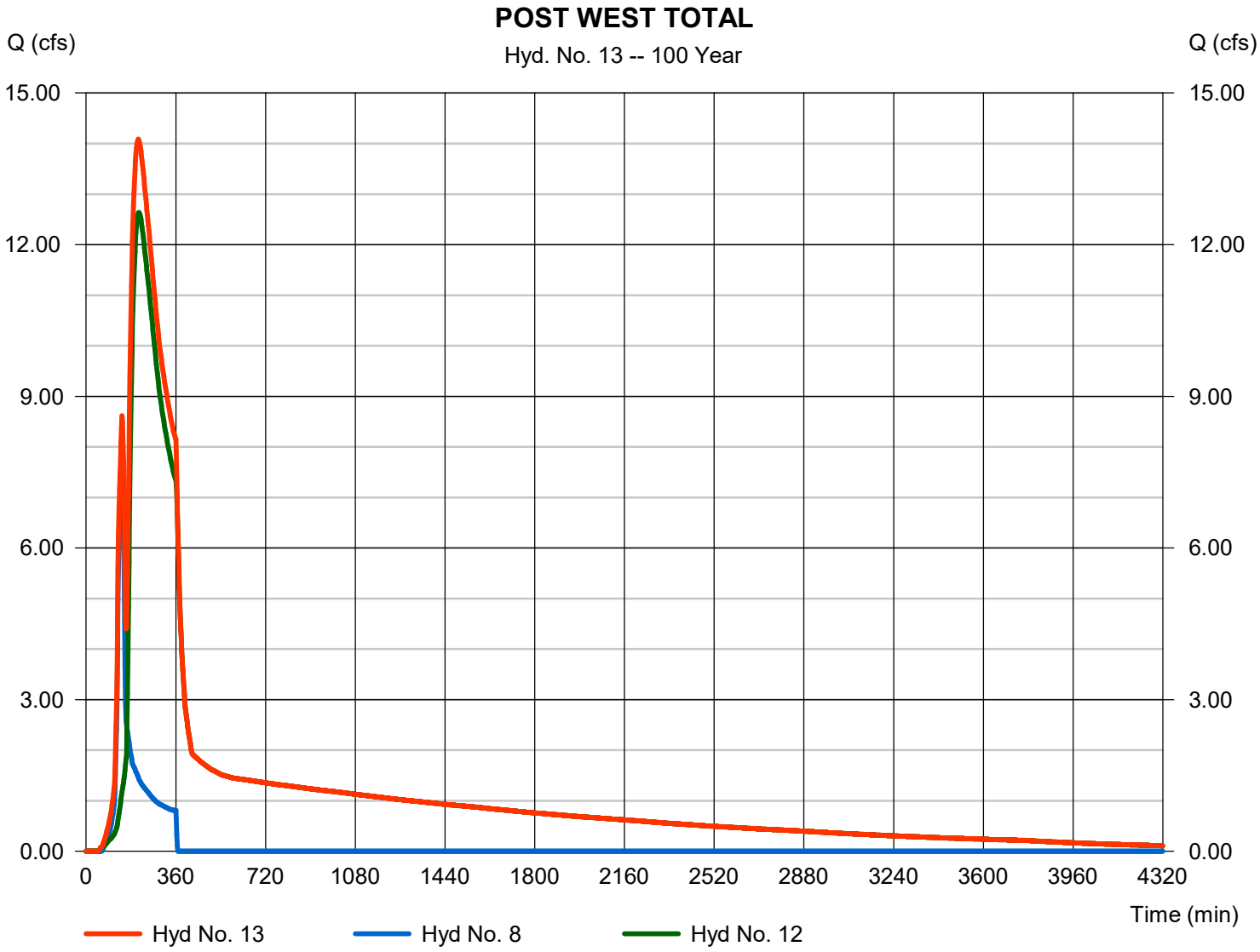


Hydrograph Report

Hyd. No. 13

POST WEST TOTAL

Hydrograph type	= Combine	Peak discharge	= 14.09 cfs
Storm frequency	= 100 yrs	Time to peak	= 210 min
Time interval	= 2 min	Hyd. volume	= 316,289 cuft
Inflow hyds.	= 8, 12	Contrib. drain. area	= 2.100 ac

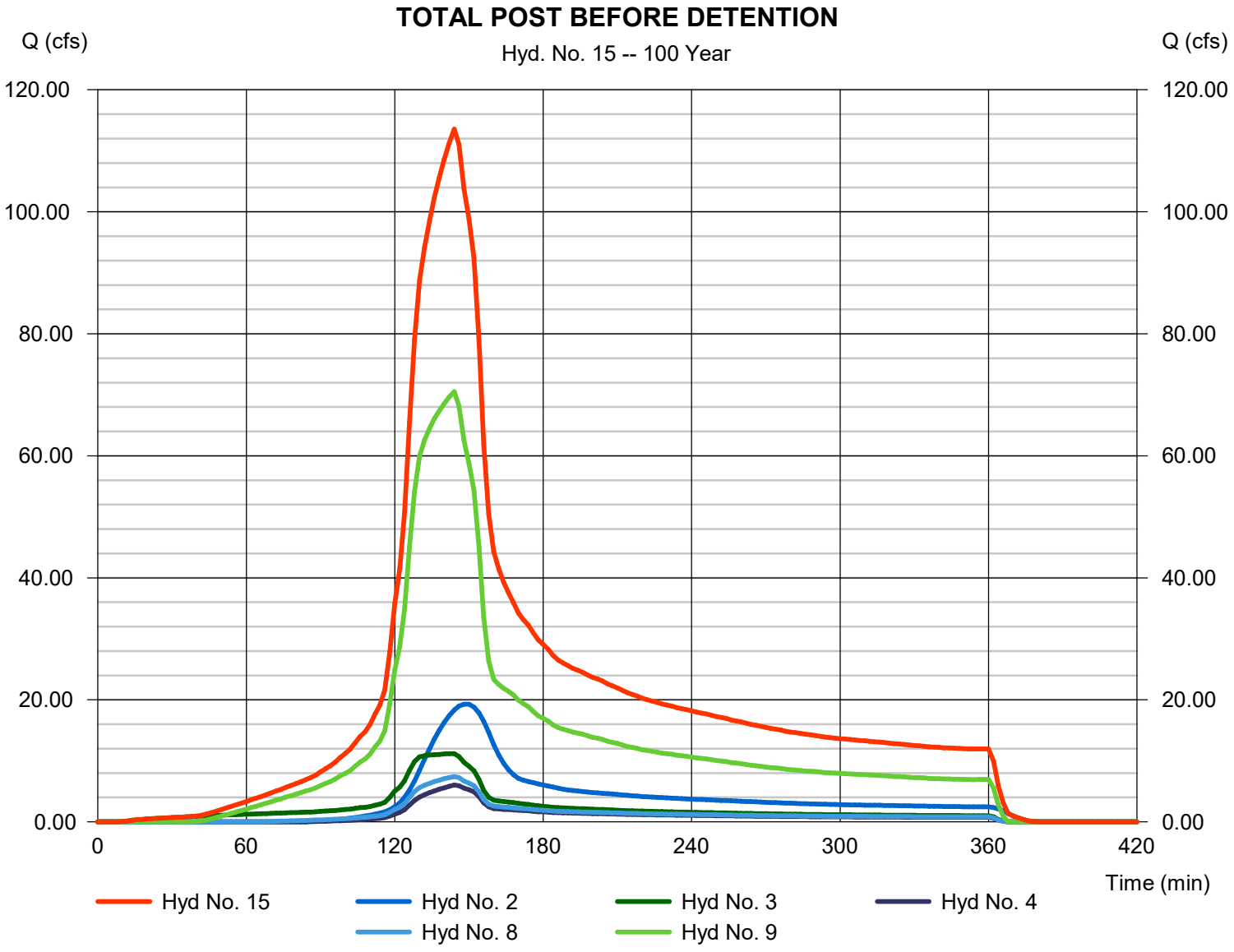


Hydrograph Report

Hyd. No. 15

TOTAL POST BEFORE DETENTION

Hydrograph type	= Combine	Peak discharge	= 113.53 cfs
Storm frequency	= 100 yrs	Time to peak	= 144 min
Time interval	= 2 min	Hyd. volume	= 472,131 cuft
Inflow hyds.	= 2, 3, 4, 8, 9	Contrib. drain. area	= 29.700 ac



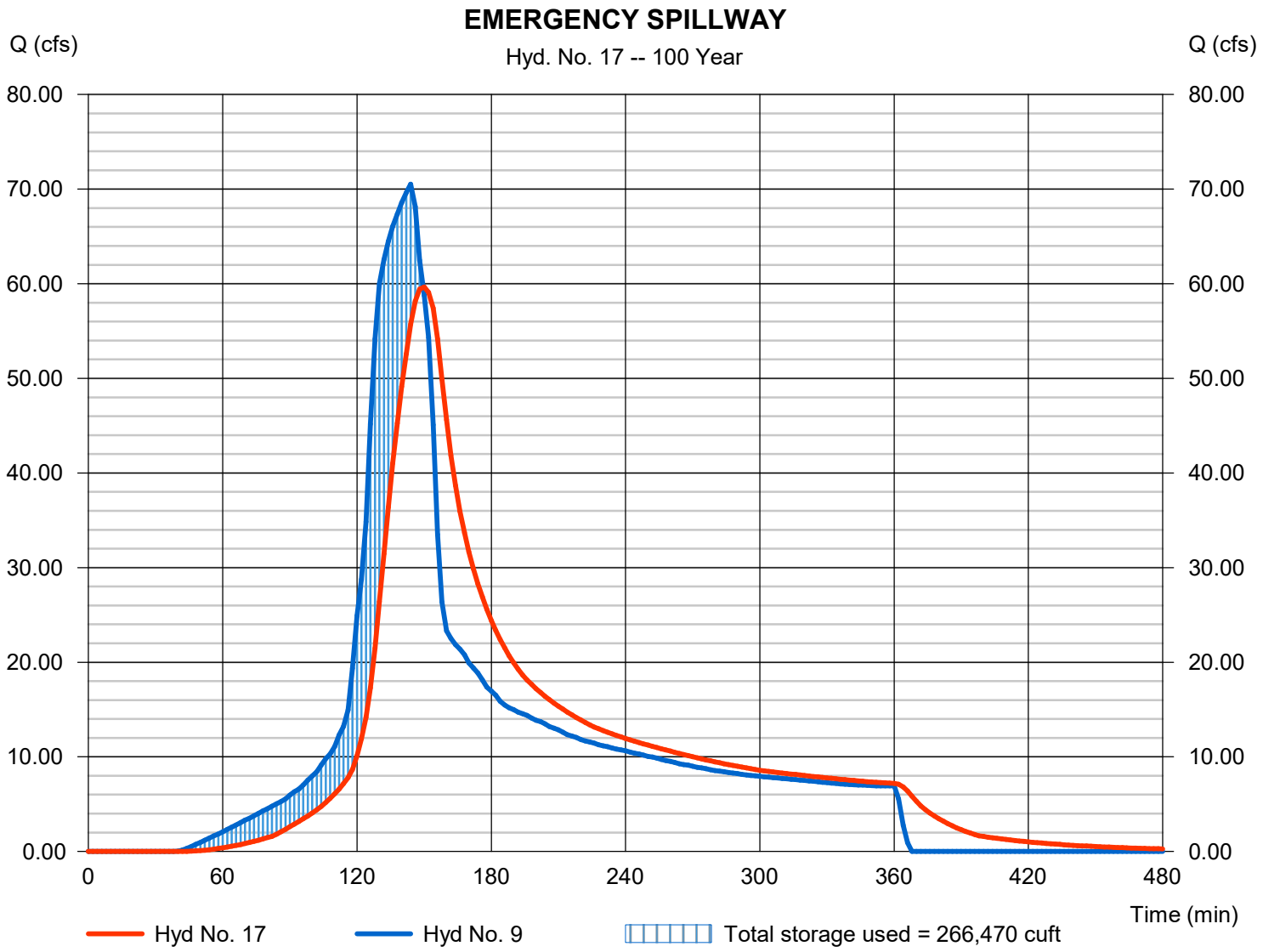
Hydrograph Report

Hyd. No. 17

EMERGENCY SPILLWAY

Hydrograph type	=	Reservoir	Peak discharge	=	59.65 cfs
Storm frequency	=	100 yrs	Time to peak	=	150 min
Time interval	=	2 min	Hyd. volume	=	286,816 cuft
Inflow hyd. No.	=	9 - POST WEST 17.0 AC 6 hr	Max. Elevation	=	1003.90 ft
Reservoir name	=	EMERGENCY SPILLWAY	Max. Storage	=	266,470 cuft

Storage Indication method used. Wet pond routing start elevation = 1002.80 ft.

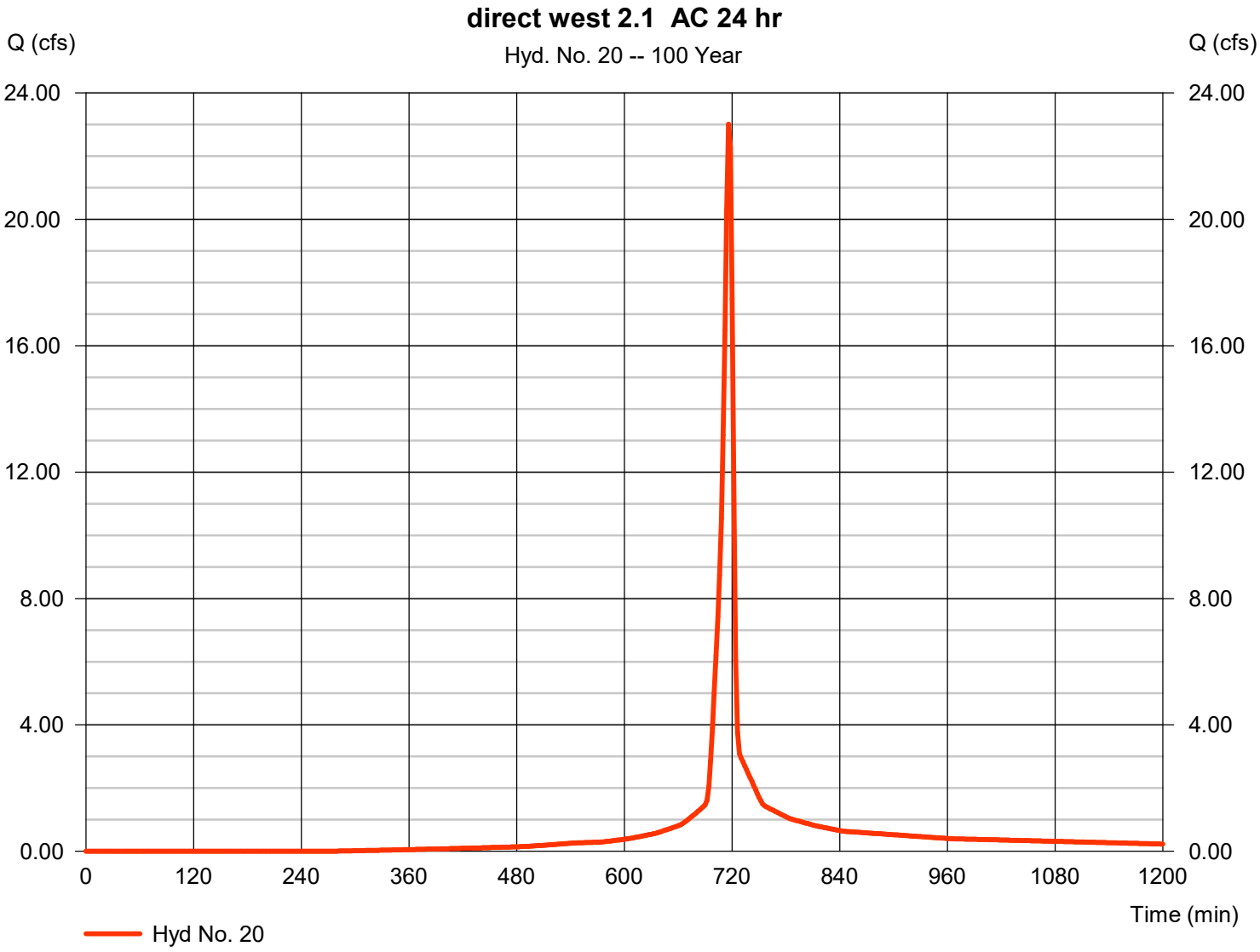


Hydrograph Report

Hyd. No. 20

direct west 2.1 AC 24 hr

Hydrograph type	= SCS Runoff	Peak discharge	= 23.01 cfs
Storm frequency	= 100 yrs	Time to peak	= 716 min
Time interval	= 2 min	Hyd. volume	= 48,636 cuft
Drainage area	= 2.100 ac	Curve number	= 80
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 9.25 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

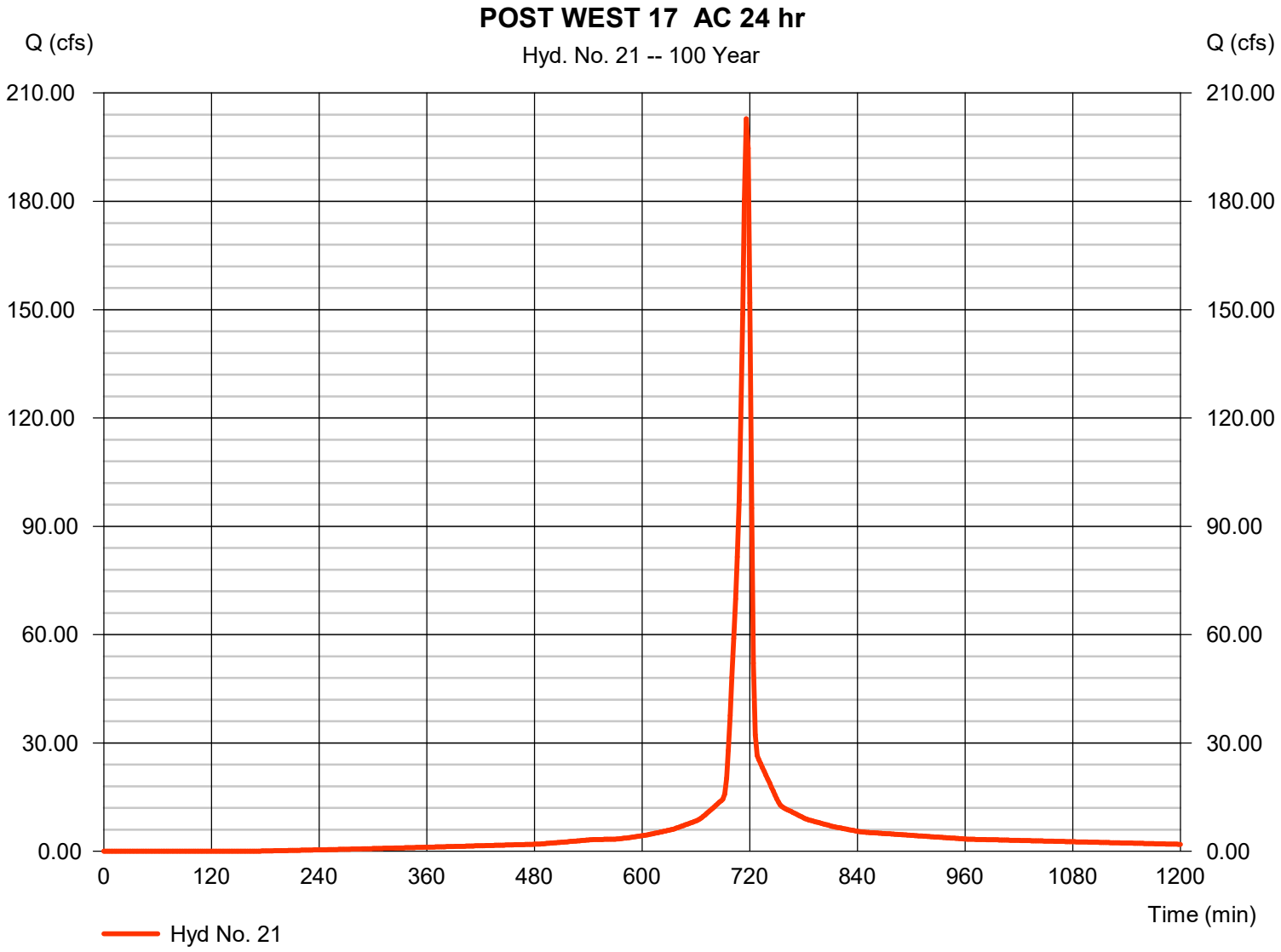


Hydrograph Report

Hyd. No. 21

POST WEST 17 AC 24 hr

Hydrograph type	=	SCS Runoff	Peak discharge	=	202.84 cfs
Storm frequency	=	100 yrs	Time to peak	=	716 min
Time interval	=	2 min	Hyd. volume	=	448,035 cuft
Drainage area	=	17.000 ac	Curve number	=	87.6
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	9.25 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

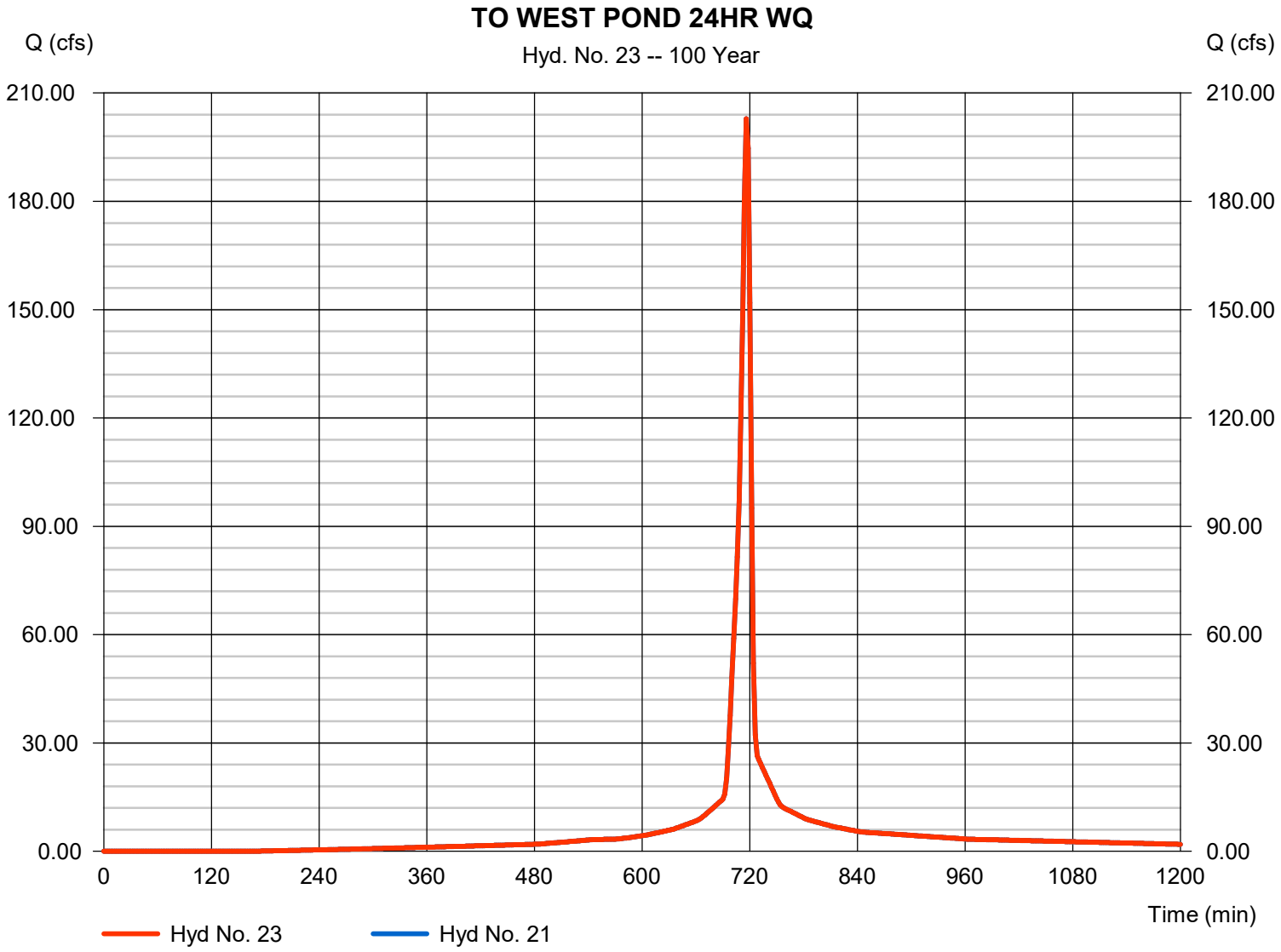


Hydrograph Report

Hyd. No. 23

TO WEST POND 24HR WQ

Hydrograph type	= Combine	Peak discharge	= 202.84 cfs
Storm frequency	= 100 yrs	Time to peak	= 716 min
Time interval	= 2 min	Hyd. volume	= 448,035 cuft
Inflow hyds.	= 21	Contrib. drain. area	= 17.000 ac



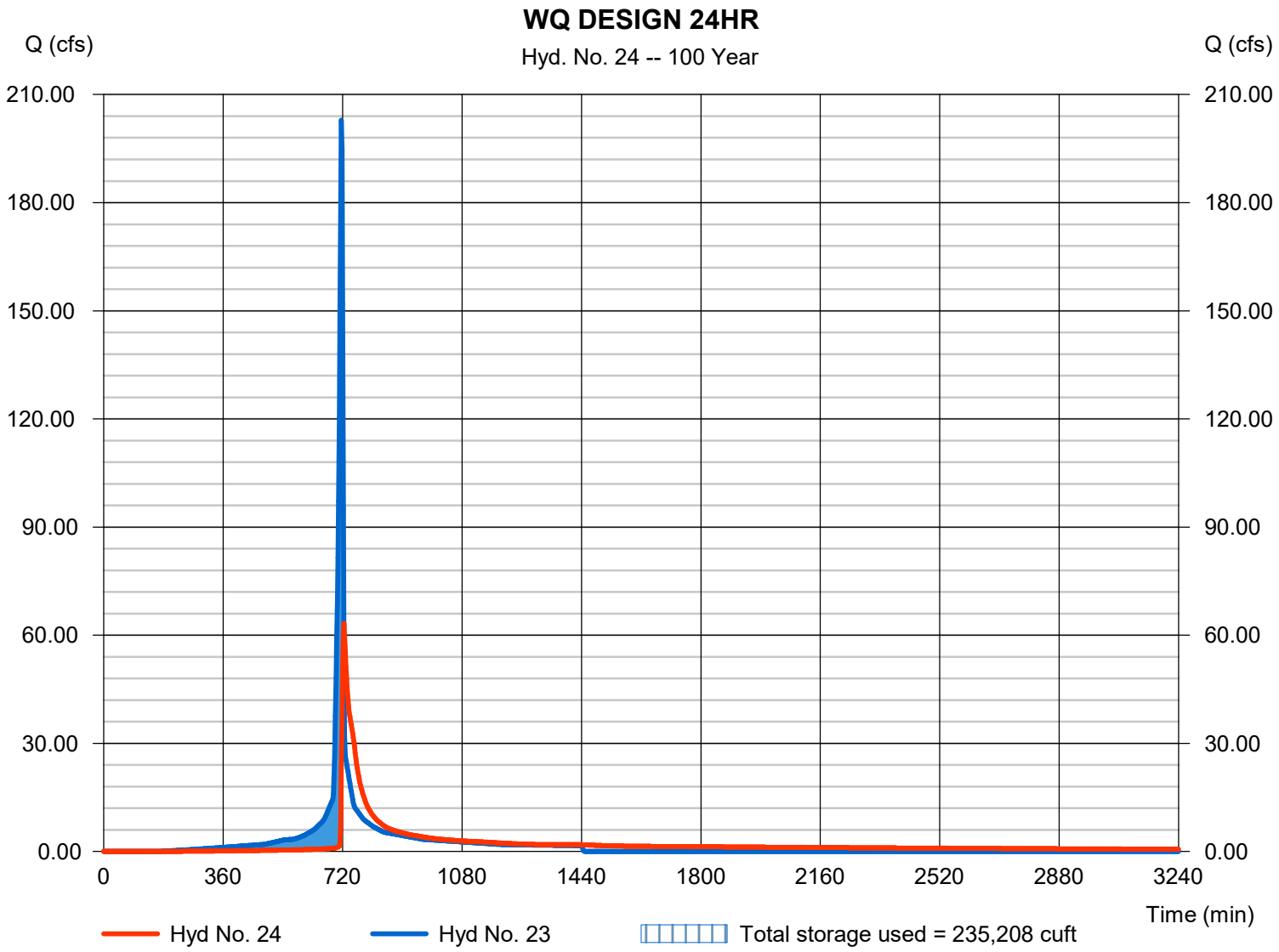
Hydrograph Report

Hyd. No. 24

WQ DESIGN 24HR

Hydrograph type	=	Reservoir	Peak discharge	=	63.23 cfs
Storm frequency	=	100 yrs	Time to peak	=	724 min
Time interval	=	2 min	Hyd. volume	=	447,281 cuft
Inflow hyd. No.	=	23 - TO WEST POND 24HR WQ	Max. Elevation	=	1003.25 ft
Reservoir name	=	WEST POND retention	Max. Storage	=	235,208 cuft

Storage Indication method used.

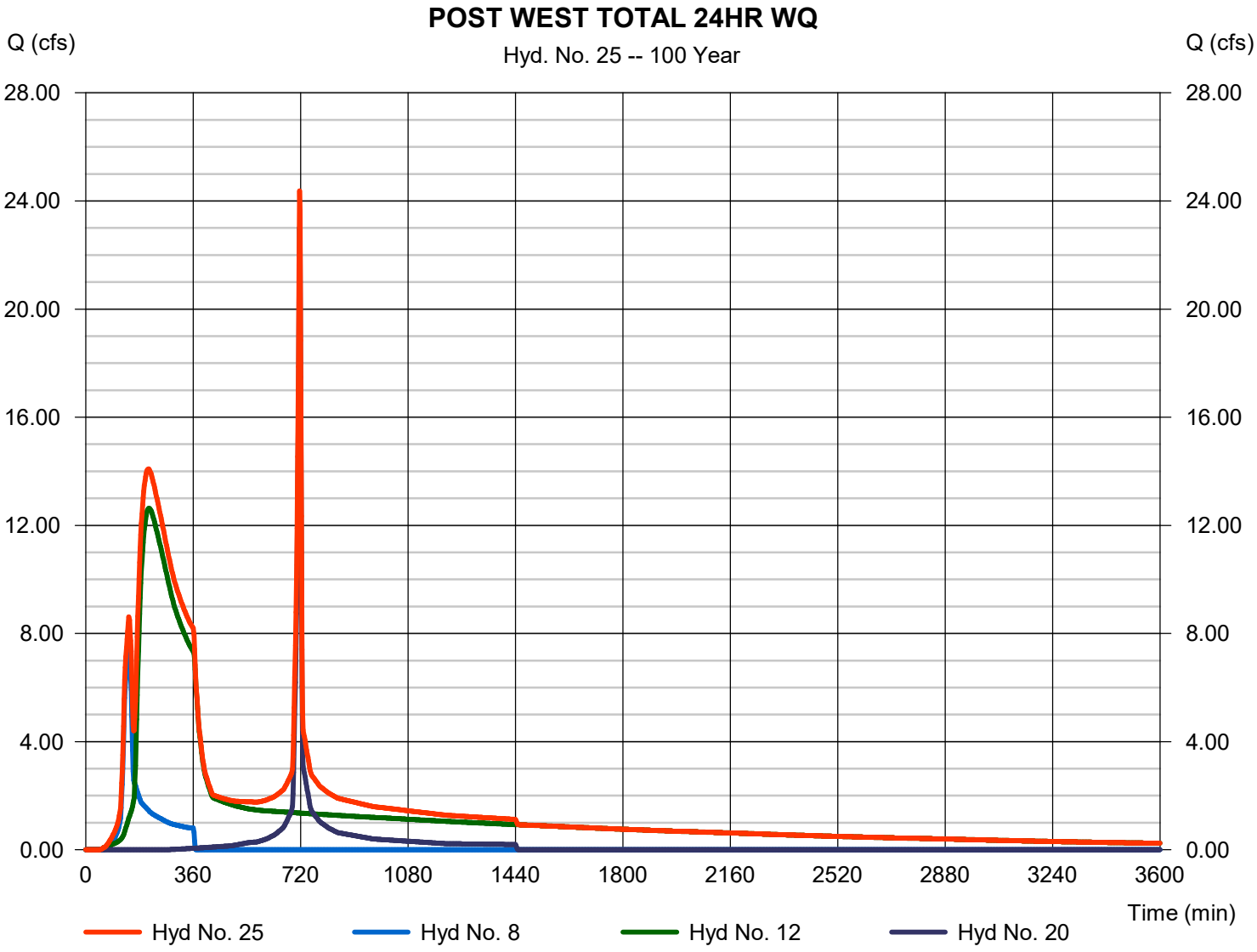


Hydrograph Report

Hyd. No. 25

POST WEST TOTAL 24HR WQ

Hydrograph type	= Combine	Peak discharge	= 24.37 cfs
Storm frequency	= 100 yrs	Time to peak	= 716 min
Time interval	= 2 min	Hyd. volume	= 364,925 cuft
Inflow hyds.	= 8, 12, 20	Contrib. drain. area	= 4.200 ac

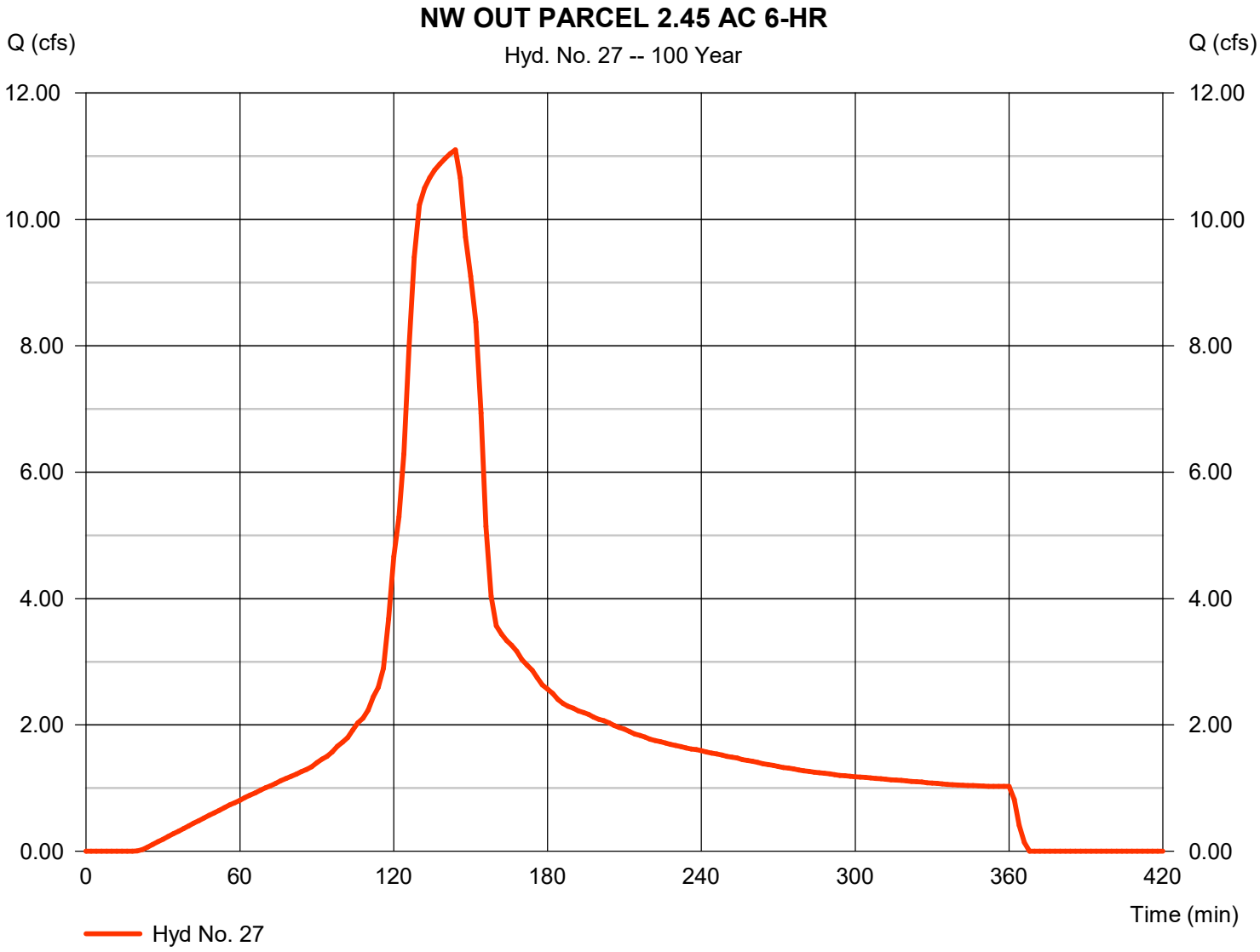


Hydrograph Report

Hyd. No. 27

NW OUT PARCEL 2.45 AC 6-HR

Hydrograph type	= SCS Runoff	Peak discharge	= 11.10 cfs
Storm frequency	= 100 yrs	Time to peak	= 144 min
Time interval	= 2 min	Hyd. volume	= 47,384 cuft
Drainage area	= 2.450 ac	Curve number	= 94
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 6.39 in	Distribution	= SCS 6-Hr
Storm duration	= 6.00 hrs	Shape factor	= 484



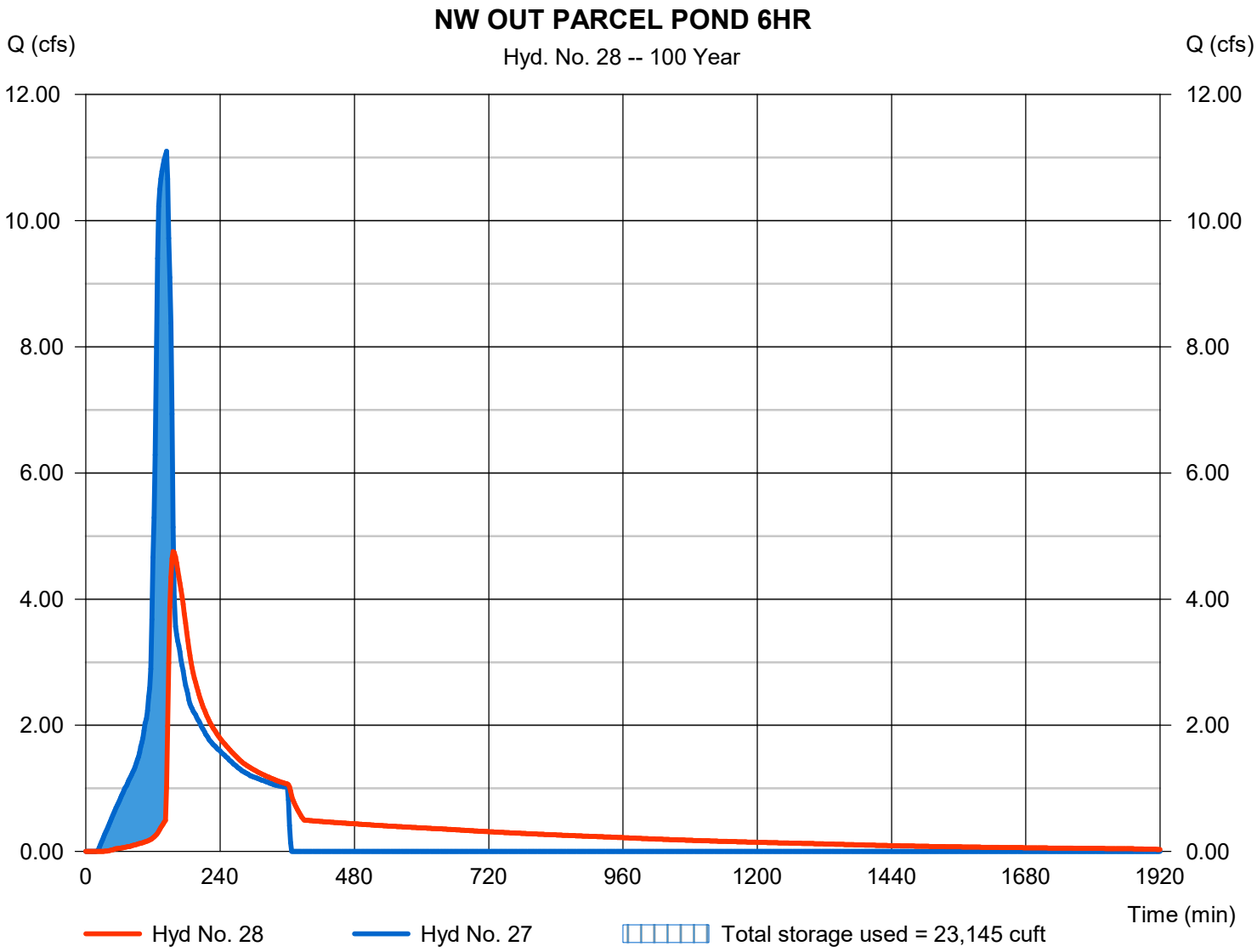
Hydrograph Report

Hyd. No. 28

NW OUT PARCEL POND 6HR

Hydrograph type	=	Reservoir	Peak discharge	=	4.752 cfs
Storm frequency	=	100 yrs	Time to peak	=	156 min
Time interval	=	2 min	Hyd. volume	=	47,331 cuft
Inflow hyd. No.	=	27 - NW OUT PARCEL 2.45 AC 6HR	Max. Elevation	=	999.63 ft
Reservoir name	=	NW OUT PARCEL POND	Max. Storage	=	23,145 cuft

Storage Indication method used.



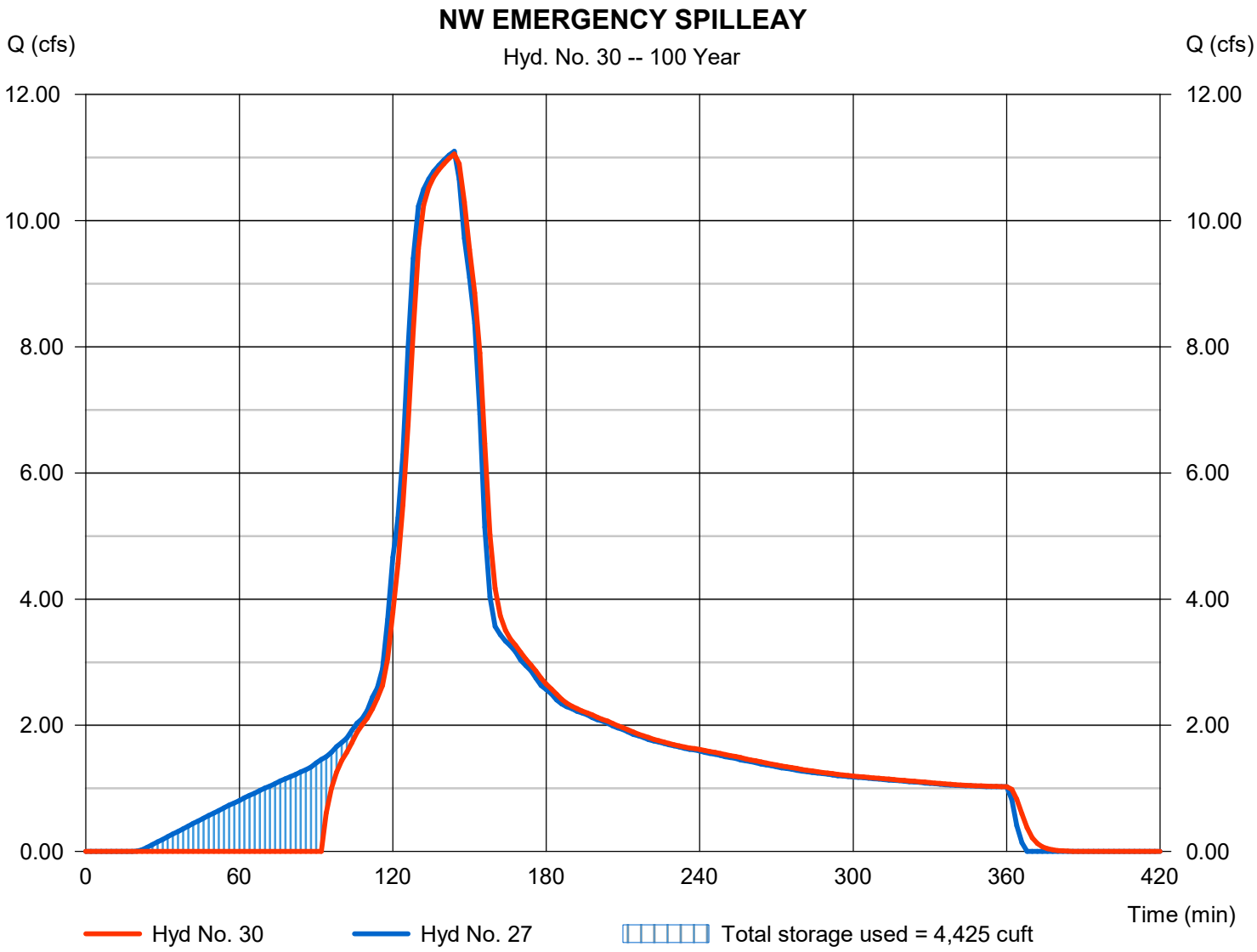
Hydrograph Report

Hyd. No. 30

NW EMERGENCY SPILLEAY

Hydrograph type	=	Reservoir	Peak discharge	=	11.06 cfs
Storm frequency	=	100 yrs	Time to peak	=	144 min
Time interval	=	2 min	Hyd. volume	=	44,278 cuft
Inflow hyd. No.	=	27 - NW OUT PARCEL 2.45 AC 6 HR	Max. Elevation	=	1001.35 ft
Reservoir name	=	NW EMERGENCY SPILLWAY	Max. Storage	=	4,425 cuft

Storage Indication method used.



Appendix G – Water Quality Worksheets

General Requirements

Project Information

Project Name:	Grocery store
Date:	8-Apr-26
Address:	NE DOUGLAS ST
Nearest Intersection:	NE DOUGLAS ST AND NW CHIPMAN RD
Project Type:	Site Development - New Development
System Type:	Separate Storm Sewer System
Proposed Land Use:	Commercial
Input Value Basis:	Actual measured values based on improvement plans

Site Parameters

Total Disturbed Area of Site	19.10	acres
Total Proposed Impervious Area	418,176	square feet
Effective FEMA floodplain?	Yes	*(Select Yes/No)*

Describe Known Stormwater Issues (if any):

Stormwater Management Requirements/Variance

Project required to meet stormwater management criteria?	Yes	
Request for Variance?	No	*(Select Yes/No)*

Why? Explain:

Landscape Professional Verification of Compliance with Design Criteria

Preservation/Restoration

Requirements Met?						Design Criteria
FALSE	Yes	FALSE	No	TRUE	N/A	Stream setbacks meet requirements of Section 5604 and placed within a separate dedicated tract of land restricted from future development?
TRUE	Yes	FALSE	No			Project incorporates preservation or restoration of Natural Areas?
TRUE	Yes	FALSE	No	FALSE	N/A	Natural Area meets requirements of Section 5604?
FALSE	Yes	FALSE	No	TRUE	N/A	Natural Area placed within a separate dedicated tract of land restricted from future development?
FALSE	Yes	FALSE	No	FALSE	N/A	Project incorporates the following Sustainable Stormwater Management Practices and RRV reductions meeting requirements of Section 5602 and 5604 (select all that apply):
FALSE	Yes	FALSE	No	TRUE	N/A	Sheetflow to Natural Areas
FALSE	Yes	FALSE	No	TRUE	N/A	Sheetflow to Natural Areas
FALSE	Yes	FALSE	No	TRUE	N/A	Downspout Disconnection (not applicable for residential developments)
TRUE	Yes	FALSE	No	FALSE	N/A	Preservation of Existing Trees or Planting New Trees?

Total RRV Reductions: 1,000 (cf)

I hereby certify, as a Landscape Professional, that the information in the Preservation/Restoration section of this form was assembled under my direct personal charge and is in compliance with the Stormwater Management Criteria.

Professional Name	License Number	State

Professional Engineer Verification of Compliance with Design Criteria

Retention

Requirements Met?						Design Criteria	Retention Volume (cf)	
TRUE	Yes	FALSE	No	FALSE	N/A	Required Retention Volume met per Section 5602?		
FALSE	Yes	FALSE	No	FALSE	N/A	Easement(s) provided?	***Required***	***Designed***
						RRV (prior to RRV Reductions)	48,591	194,700
						RRV (with RRV Reductions)	47,591	

Detention

Requirements Met?						Design Criteria	Release Rates (cfs)	
FALSE	Yes	FALSE	No	TRUE	N/A	Easement(s) provided?	***Maximum Allowable***	***Designed***
TRUE	Yes	FALSE	No	FALSE	N/A	2-year peak outflow control achieved?	3.82	2.15
TRUE	Yes	FALSE	No	FALSE	N/A	10-year peak outflow control achieved?	11.46	4.29
TRUE	Yes	FALSE	No	FALSE	N/A	100-year peak outflow control achieved?	57.3	14.09

Collection

Requirements Met?						Design Criteria
TRUE	Yes	FALSE	No	FALSE	N/A	Inlet placement and gutter spread per requirements of Section 5607?

Conveyance

Requirements Met?						Design Criteria
FALSE	Yes	FALSE	No	TRUE	N/A	Easement(s) provided?
TRUE	Yes	FALSE	No	FALSE	N/A	Enclosed pipe systems per requirements of 5608.2?
FALSE	Yes	FALSE	No	TRUE	N/A	Minor drainage systems per requirements of 5608.3 A?
TRUE	Yes	FALSE	No	FALSE	N/A	Designated overflow routes for 100-year design storm per requirements of Section 5608.3 B?
FALSE	Yes	FALSE	No	TRUE	N/A	Channel stabilization per requirements of 5608.4?
TRUE	Yes	FALSE	No	FALSE	N/A	Road crossings per requirements of 5608.5?

I hereby certify, as a Professional Engineer, that the information in the Retention, Detention, Collection, and Conveyance sections of this form were assembled under my direct personal charge and is in compliance with the Stormwater Management Criteria.

Professional Name	License Number	State

Required Maps	
TRUE	**Watershed Location Map.** Describes the project's location within the greater watershed depicting:
1.	Watershed boundary and area (acres)
2.	Delineated drainage area tributary to the project site (acres)
3.	Natural overland drainage paths to, through and downstream of the project site to the downstream destination of runoff (whether open channel or enclosed system)
4.	Water bodies & regulatory floodplain (lakes, rivers, streams, creeks, wetlands, etc.)
5.	Existing stormwater retention/detention facility location(s) in upstream or downstream watershed affecting stormwater management at project site (if applicable)
TRUE	**Existing Site Conditions Map.** Demonstrates existing conditions of the site depicting:
1.	Existing contours
2.	Aerial imagery
3.	Water bodies & regulatory floodplain (lakes, rivers, streams, creeks, wetlands, etc.)
4.	Natural overland drainage paths and discharge points from the site
5.	Existing utilities, including existing stormwater infrastructure
6.	Parcel boundaries
7.	Existing impervious surfaces and types (i.e. building, parking lot, gravel, etc.)
8.	Key statistics including total disturbed area, total impervious area, and lot size (if applicable)
TRUE	**Proposed Site Conditions Map.** Demonstrates proposed conditions of the site depicting:
1.	Proposed contours including finished floor elevation (FFE) and lowest opening elevation (LOE) information
2.	Existing and proposed utilities, including existing stormwater infrastructure overland drainage paths
3.	Designated overflow routes and discharge points from the site
4.	Proposed drainage areas labeled with IDs and acreages correlating to the stormwater management calculator inputs, including uncontrolled drainage area
5.	Parcel boundaries depicting required utility easements, stream setbacks identifying key features and statistics (top of bank or bank-full extents, centerline, Zone 1, and Zone 2, and dimensional offset), and Natural Areas with key statistics (total footprint, minimum length and width).
6.	Impervious surfaces and types (i.e. building, parking lot, gravel, etc.)
7.	Stormwater improvements including Natural Areas of preservation or restoration, preserved trees, new trees, retention practices, detention practices, collection and conveyance practices with labels correlating to the stormwater management calculator inputs

Site Summary

Project and Development Type:	Site Development - New Development
System Type:	Separate Storm Sewer System
Proposed Land Use:	Commercial
Input Value Basis:	Actual measured values based on improvement plans
Assumed Percent Impervious Coverage:	NA
Total Disturbed Area (sf):	831,996

Treatment Summary Table

Water Quality Storm Event (in) (P_{WQ})	1.37
Percent of Water Quality Storm to be Retained (PT%)	85%
Total Controlled Disturbed Area (sf)	831,996
Controlled Area Rv ($Rv_{controlled}$)	0.60
Total Uncontrolled Disturbed Area (sf)	0
Total Required Retention Volume (cf) (RRV)	48,591
Uncontrolled Retention Volume (cf)	0
Adjusted PT% within Controlled Drainage Areas	NA

☑ ***Uncontrolled area is within the limit to achieve the total site retention requirements.***

Drainage Areas Worksheet

View Instructions

How many total drainage areas are included on the site? 1

Drainage Area Summary Table		
Unique Drainage Area Identifier (ID)	**Can this drainage area be feasibly controlled?**	**Disturbed Drainage Area (sf)**
1	Yes	831,996

Select post-development cover types within the disturbed area:	
Natural Area	FALSE
Pervious Area	TRUE
Impervious Area	TRUE
Solar Farm - Native	FALSE
Solar Farm - Gravel	FALSE
Gravel - Overflow Parking Lots, Trails/Maintenance Paths, Substations	FALSE
Gravel - Primary Parking Lots, Access Driveways, Railroad Ballasts	FALSE
Gravel - Public Road with Compacted Subgrade Material	FALSE
Artificial Turf - No Underdrain System	FALSE
Artificial Turf - Underdrain System	FALSE
Water Surfaces	FALSE

Generate Detailed Drainage Area Tables

Filter Cover Types

Generate Design Sheets

Site Summary

Summary Table for Drainage Area ID:	1
Is this drainage area controlled?	Yes
Disturbed drainage area (sf)	831,996
RRV Prior to Reductions (cf)	**48,591**
Pervious Area Weighted Rv	0.25
Impervious Area Weighted Rv	0.95
Post-Development Condition Weighted CN	86.06

Cover Type Area Table for Drainage Area 1	Area (sf)										
Cover Type	Soil Type A	CN	Soil Type B	CN	Soil Type C	CN	Soil Type D	CN	**Total**	**% Cover**	Rv
Natural Area		30		55		70		77	**0**	0%	0.00
Pervious Area		39		61	413,820	74		80	**413,820**	50%	0.25
Impervious Area		98		98	418,176	98		98	**418,176**	50%	0.95
Solar Farm - Native		62		76		84		88	**0**	0%	0.40
Solar Farm - Gravel		75		84		89		92	**0**	0%	0.60
Gravel - Overflow Parking Lots, Trails/Maintenance Paths, Substations		75		84		89		92	**0**	0%	0.60
Gravel - Primary Parking Lots, Access Driveways, Railroad Ballasts		88		92		94		96	**0**	0%	0.80
Gravel - Public Road with Compacted Subgrade Material		98		99		98		98	**0**	0%	0.95
Artificial Turf - No Underdrain System		66		78		85		89	**0**	0%	0.45
Artificial Turf - Underdrain System		88		92		94		96	**0**	0%	0.80
Water Surfaces		100		100		100		99	**0**	0%	1.00
Total	**0**		**0**		**831,996**		**0**		**831,996**	**100%**	**0.60**

Design for Drainage Area 1

Drainage Area ID	1
Is this drainage area controlled?	Yes
Disturbed drainage area (sf)	831,996
RRV Prior to Reductions (cf)	**48,591**
Pervious Area Weighted Rv	0.25
Impervious Area Weighted Rv	0.95
Post-Development Condition Weighted CN	86.06

Required Retention Volume Reductions ($RRV_{Reductions}$)

View Instructions

Preservation/Restoration, & Disconnection $RRV_{reductions}$	Natural or Pervious Area Footprint (sf)	Pervious Tributary Area (sf) ($P_{Tributary\ Area}$)	Impervious Tributary Area (sf) ($I_{Tributary\ Area}$)	Runoff Reduction Credit	Retention Volume Credited (cf) $RRV_{reduction}$
Sheetflow to Natural Area				100%	0
Sheetflow to Pervious Area				50%	0
Downspout Disconnection				25%	0

Tree $RRV_{reductions}$	Number of Trees (Each)	Runoff Reduction Credit (cf/tree)	Retention Volume Credited (cf) $RRV_{reduction}$
Existing Trees (Preserved)		20	0
New Trees	100	10	1,000

Total $RRV_{reductions}$ (cf)	**1,000**
RRV After Reductions (cf)	**47,591**
% Reduction in RRV	**2.1%**

Retention Practices

Select material types and storage layers used for this design:	
Open Storage (Ponding Area)	TRUE
Bioretention Soil	FALSE
Structural Soil	FALSE
Sand	FALSE
Storage Aggregate Media	FALSE
Choker Course	FALSE
Green Roof Drainage Layer	FALSE
Green Roof Growing Media	FALSE
Storage Chamber(s)	FALSE

Hide Blank Rows Show Blank Rows

PT% 85.00%

Retention Facility ID	Practice	Downstream Retention Facility ID	Pervious Drainage Area	Impervious Drainage Area	Approx. Target Retention Volume (cf)	Retention Volume Provided (cf) (V_R)	Bypass RRV (cf)	Open Storage (Ponding)			Total Storage Volume (cf)	Runoff Reduction Factor (%)	Retention Volume Provided (cf)	Maximum Retention Credit
1	Dry Detention Basin, Controlled Release	1	413,820	418,176	**48,592**	**194,700**		29,500	11.0	324,500	324,500	60%	194,700	57,166

Required Retention Volume (cf)	47,591
Retention Volume Achieved (cf)	194,700

☑ *You met the Required Retention Volume.*

Design for Drainage Area 1

Detention Calculations

	2-year storm	10-year storm	25-year storm	50-year storm	100-year storm
Required Rainfall Event (in) - 6 hour Events	2.66	4.04	4.96	5.70	6.47

Post-Development Conditions

Weighted CN	86.06
S	1.62
Ia	0.08

	2-year storm	10-year storm	25-year storm	50-year storm	100-year storm
Pre-Development Runoff Volume (in)	0.14	0.75	1.31	1.81	2.38
Post Development Runoff Volume (in) with no Retention	1.58	2.81	3.66	4.36	5.10
Post-Development Runoff Volume (in) with Retention	0.00	0.00	0.00	0.00	0.42
Retention Adjusted CN	0.0	0.0	0.0	0.0	36.1
Additional Detention Required?	**No**	**No**	**No**	**No**	**No**

Design Storm	Required Release Rate (cfs/acre)	Allowable Site Release (cfs)	Peak Outflow (cfs)	Max Ponding Depth (ft)	Achieved Release Rate (cfs/acre)	
2-Year, NOAA Atlas14 Median, First Quartile	0.20	3.82	2.15	5.13	0.11	***Required release rate met.***
10-Year, NOAA Atlas14 Median, First Quartile	0.60	11.46	4.29	6.97	0.22	***Required release rate met.***
100-Year, NOAA Atlas14 Median, First Quartile	3.00	57.30	14.09	7.93	0.74	***Required release rate met.***

Verification of Required Retention Volume (RRV)

Total Site Summary	**Total Disturbed Area (sf):**	831,996	
	Total Site Rv:	0.60	
	Total RRV Prior to Reductions (cf)	48,591	
	Total RRV Reductions (cf)	1,000	
	Total RRV After Reductions (cf)	47,591	
	Total Retention Volume Achieved (cf)	194,700	☑ *Total Required Retention Volume achiev*
	Percent WQv Control Achieved	342.3%	☑ *Required percent site control achieved!*

General Requirements

Project Information

Project Name:	Commercial store
Date:	April 8,2026
Address:	NW Commerce Dr
Nearest Intersection:	NE Tudor Rd and NW Commerce Dr
Project Type:	Site Development - New Development
System Type:	Separate Storm Sewer System
Proposed Land Use:	Commercial
Input Value Basis:	Actual measured values based on improvement plans

Site Parameters

Total Disturbed Area of Site	2.45	acres
Total Proposed Impervious Area	80,042	square feet
Effective FEMA floodplain?	Yes	*(Select Yes/No)*

Describe Known Stormwater Issues (if any):

Stormwater Management Requirements/Variance

Project required to meet stormwater management criteria?	Yes	
Request for Variance?	No	*(Select Yes/No)*

Why? Explain:

Landscape Professional Verification of Compliance with Design Criteria

Preservation/Restoration

Requirements Met?						Design Criteria
FALSE	Yes	FALSE	No	TRUE	N/A	Stream setbacks meet requirements of Section 5604 and placed within a separate dedicated tract of land restricted from future development?
TRUE	Yes	FALSE	No			Project incorporates preservation or restoration of Natural Areas?
TRUE	Yes	FALSE	No	FALSE	N/A	Natural Area meets requirements of Section 5604?
FALSE	Yes	FALSE	No	TRUE	N/A	Natural Area placed within a separate dedicated tract of land restricted from future development?
FALSE	Yes	FALSE	No	FALSE	N/A	Project incorporates the following Sustainable Stormwater Management Practices and RRV reductions meeting requirements of Section 5602 and 5604 (select all that apply):
FALSE	Yes	FALSE	No	TRUE	N/A	Sheetflow to Natural Areas
FALSE	Yes	FALSE	No	TRUE	N/A	Sheetflow to Natural Areas
FALSE	Yes	FALSE	No	TRUE	N/A	Downspout Disconnection (not applicable for residential developments)
TRUE	Yes	FALSE	No	FALSE	N/A	Preservation of Existing Trees or Planting New Trees?

Total RRV Reductions: 150 (cf)

I hereby certify, as a Landscape Professional, that the information in the Preservation/Restoration section of this form was assembled under my direct personal charge and is in compliance with the Stormwater Management Criteria.

Professional Name	License Number	State

Professional Engineer Verification of Compliance with Design Criteria

Retention

Requirements Met?						Design Criteria	Retention Volume (cf)	
TRUE	Yes	FALSE	No	FALSE	N/A	Required Retention Volume met per Section 5602?		
FALSE	Yes	FALSE	No	FALSE	N/A	Easement(s) provided?	***Required***	***Designed***
						RRV (prior to RRV Reductions)	8,026	15,480
						RRV (with RRV Reductions)	7,876	

Detention

Requirements Met?						Design Criteria	Release Rates (cfs)	
FALSE	Yes	FALSE	No	TRUE	N/A	Easement(s) provided?	***Maximum Allowable***	***Designed***
TRUE	Yes	FALSE	No	FALSE	N/A	2-year peak outflow control achieved?	0.49	0.361
TRUE	Yes	FALSE	No	FALSE	N/A	10-year peak outflow control achieved?	1.47	0.801
TRUE	Yes	FALSE	No	FALSE	N/A	100-year peak outflow control achieved?	7.35	4.752

Collection

Requirements Met?						Design Criteria
TRUE	Yes	FALSE	No	FALSE	N/A	Inlet placement and gutter spread per requirements of Section 5607?

Conveyance

Requirements Met?						Design Criteria
FALSE	Yes	FALSE	No	TRUE	N/A	Easement(s) provided?
TRUE	Yes	FALSE	No	FALSE	N/A	Enclosed pipe systems per requirements of 5608.2?
FALSE	Yes	FALSE	No	TRUE	N/A	Minor drainage systems per requirements of 5608.3 A?
TRUE	Yes	FALSE	No	FALSE	N/A	Designated overflow routes for 100-year design storm per requirements of Section 5608.3 B?
FALSE	Yes	FALSE	No	TRUE	N/A	Channel stabilization per requirements of 5608.4?
TRUE	Yes	FALSE	No	FALSE	N/A	Road crossings per requirements of 5608.5?

I hereby certify, as a Professional Engineer, that the information in the Retention, Detention, Collection, and Conveyance sections of this form were assembled under my direct personal charge and is in compliance with the Stormwater Management Criteria.

Professional Name	License Number	State

Required Maps	
TRUE	**Watershed Location Map.** Describes the project's location within the greater watershed depicting:
1.	Watershed boundary and area (acres)
2.	Delineated drainage area tributary to the project site (acres)
3.	Natural overland drainage paths to, through and downstream of the project site to the downstream destination of runoff (whether open channel or enclosed system)
4.	Water bodies & regulatory floodplain (lakes, rivers, streams, creeks, wetlands, etc.)
5.	Existing stormwater retention/detention facility location(s) in upstream or downstream watershed affecting stormwater management at project site (if applicable)
TRUE	**Existing Site Conditions Map.** Demonstrates existing conditions of the site depicting:
1.	Existing contours
2.	Aerial imagery
3.	Water bodies & regulatory floodplain (lakes, rivers, streams, creeks, wetlands, etc.)
4.	Natural overland drainage paths and discharge points from the site
5.	Existing utilities, including existing stormwater infrastructure
6.	Parcel boundaries
7.	Existing impervious surfaces and types (i.e. building, parking lot, gravel, etc.)
8.	Key statistics including total disturbed area, total impervious area, and lot size (if applicable)
TRUE	**Proposed Site Conditions Map.** Demonstrates proposed conditions of the site depicting:
1.	Proposed contours including finished floor elevation (FFE) and lowest opening elevation (LOE) information
2.	Existing and proposed utilities, including existing stormwater infrastructure overland drainage paths
3.	Designated overflow routes and discharge points from the site
4.	Proposed drainage areas labeled with IDs and acreages correlating to the stormwater management calculator inputs, including uncontrolled drainage area
5.	Parcel boundaries depicting required utility easements, stream setbacks identifying key features and statistics (top of bank or bank-full extents, centerline, Zone 1, and Zone 2, and dimensional offset), and Natural Areas with key statistics (total footprint, minimum length and width).
6.	Impervious surfaces and types (i.e. building, parking lot, gravel, etc.)
7.	Stormwater improvements including Natural Areas of preservation or restoration, preserved trees, new trees, retention practices, detention practices, collection and conveyance practices with labels correlating to the stormwater management calculator inputs

Site Summary

Project and Development Type:	Site Development - New Development
System Type:	Separate Storm Sewer System
Proposed Land Use:	Commercial
Input Value Basis:	Actual measured values based on improvement plans
Assumed Percent Impervious Coverage:	NA
Total Disturbed Area (sf):	106,722

Treatment Summary Table

Water Quality Storm Event (in) (P_{WQ})	1.37
Percent of Water Quality Storm to be Retained (PT%)	85%
Total Controlled Disturbed Area (sf)	106,722
Controlled Area Rv ($Rv_{controlled}$)	0.78
Total Uncontrolled Disturbed Area (sf)	0
Total Required Retention Volume (cf) (RRV)	8,026
Uncontrolled Retention Volume (cf)	0
Adjusted PT% within Controlled Drainage Areas	NA

☑ ***Uncontrolled area is within the limit to achieve the total site retention requirements.***

Drainage Areas Worksheet

View Instructions

How many total drainage areas are included on the site? 1

Drainage Area Summary Table		
Unique Drainage Area Identifier (ID)	Can this drainage area be feasibly controlled?	Disturbed Drainage Area (sf)
1	Yes	106,722

Select post-development cover types within the disturbed area:	
Natural Area	FALSE
Pervious Area	TRUE
Impervious Area	TRUE
Solar Farm - Native	FALSE
Solar Farm - Gravel	FALSE
Gravel - Overflow Parking Lots, Trails/Maintenance Paths, Substations	FALSE
Gravel - Primary Parking Lots, Access Driveways, Railroad Ballasts	FALSE
Gravel - Public Road with Compacted Subgrade Material	FALSE
Artificial Turf - No Underdrain System	FALSE
Artificial Turf - Underdrain System	FALSE
Water Surfaces	FALSE

Generate Detailed Drainage Area Tables

Filter Cover Types

Generate Design Sheets

Site Summary

Summary Table for Drainage Area ID:	1
Is this drainage area controlled?	Yes
Disturbed drainage area (sf)	106,722
RRV Prior to Reductions (cf)	**8,026**
Pervious Area Weighted Rv	0.25
Impervious Area Weighted Rv	0.95
Post-Development Condition Weighted CN	93.50

Cover Type Area Table for Drainage Area 1	Area (sf)										
Cover Type	Soil Type A	CN	Soil Type B	CN	Soil Type C	CN	Soil Type D	CN	**Total**	**% Cover**	Rv
Natural Area		30		55		70		77	**0**	0%	0.00
Pervious Area		39		61		74	26,681	80	**26,681**	25%	0.25
Impervious Area		98		98	9,605	98	70,437	98	**80,042**	75%	0.95
Solar Farm - Native		62		76		84		88	**0**	0%	0.40
Solar Farm - Gravel		75		84		89		92	**0**	0%	0.60
Gravel - Overflow Parking Lots, Trails/Maintenance Paths, Substations		75		84		89		92	**0**	0%	0.60
Gravel - Primary Parking Lots, Access Driveways, Railroad Ballasts		88		92		94		96	**0**	0%	0.80
Gravel - Public Road with Compacted Subgrade Material		98		99		98		98	**0**	0%	0.95
Artificial Turf - No Underdrain System		66		78		85		89	**0**	0%	0.45
Artificial Turf - Underdrain System		88		92		94		96	**0**	0%	0.80
Water Surfaces		100		100		100		99	**0**	0%	1.00
Total	**0**		**0**		**9,605**		**97,117**		**106,722**	**100%**	**0.78**

Design for Drainage Area 1

Drainage Area ID	1
Is this drainage area controlled?	Yes
Disturbed drainage area (sf)	106,722
RRV Prior to Reductions (cf)	**8,026**
Pervious Area Weighted Rv	0.25
Impervious Area Weighted Rv	0.95
Post-Development Condition Weighted CN	93.50

Required Retention Volume Reductions ($RRV_{Reductions}$)

View Instructions

Preservation/Restoration, & Disconnection $RRV_{reductions}$	Natural or Pervious Area Footprint (sf)	Pervious Tributary Area (sf) ($P_{Tributary\ Area}$)	Impervious Tributary Area (sf) ($I_{Tributary\ Area}$)	Runoff Reduction Credit	Retention Volume Credited (cf) $RRV_{reduction}$
Sheetflow to Natural Area				100%	0
Sheetflow to Pervious Area				50%	0
Downspout Disconnection				25%	0

Tree $RRV_{reductions}$	Number of Trees (Each)	Runoff Reduction Credit (cf/tree)	Retention Volume Credited (cf) $RRV_{reduction}$
Existing Trees (Preserved)		20	0
New Trees	15	10	150

Total $RRV_{reductions}$ (cf)	**150**
RRV After Reductions (cf)	**7,876**
% Reduction in RRV	**1.9%**

Retention Practices

Select material types and storage layers used for this design:	
Open Storage (Ponding Area)	TRUE
Bioretention Soil	FALSE
Structural Soil	FALSE
Sand	FALSE
Storage Aggregate Media	FALSE
Choker Course	FALSE
Green Roof Drainage Layer	FALSE
Green Roof Growing Media	FALSE
Storage Chamber(s)	FALSE

Hide Blank Rows Show Blank Rows

PT% 85.00%

Retention Facility ID	Practice	Downstream Retention Facility ID	Pervious Drainage Area	Impervious Drainage Area	Approx. Target Retention Volume (cf)	Retention Volume Provided (cf) (V_R)	Bypass RRV (cf)	Open Storage (Ponding)			Total Storage Volume (cf)	Runoff Reduction Factor (%)	Retention Volume Provided (cf)	Maximum Retention Credit
1	Dry Detention Basin, Controlled Release	1	26,681	80,042	**8,027**	**15,480**		4,300	6.0	25,800	25,800	60%	15,480	9,443

Required Retention Volume (cf)	7,876
Retention Volume Achieved (cf)	15,480

☑ *You met the Required Retention Volume.*

Design for Drainage Area 1

Detention Calculations

	2-year storm	10-year storm	25-year storm	50-year storm	100-year storm
Required Rainfall Event (in) - 6 hour Events	2.66	4.04	4.96	5.70	6.47

Post-Development Conditions

Weighted CN	93.50
S	0.70
Ia	0.03

	2-year storm	10-year storm	25-year storm	50-year storm	100-year storm
Pre-Development Runoff Volume (in)	0.14	0.75	1.31	1.81	2.38
Post Development Runoff Volume (in) with no Retention	2.08	3.41	4.32	5.05	5.81
Post-Development Runoff Volume (in) with Retention	0.00	0.51	1.42	2.15	2.91
Retention Adjusted CN	0.0	54.2	62.0	65.1	67.1
Additional Detention Required?	**No**	**No**	**No**	**No**	**No**

Design Storm	Required Release Rate (cfs/acre)	Allowable Site Release (cfs)	Peak Outflow (cfs)	Max Ponding Depth (ft)	Achieved Release Rate (cfs/acre)	
2-Year, NOAA Atlas14 Median, First Quartile	0.20	0.49	0.361	4.06	0.15	***Required release rate met.***
10-Year, NOAA Atlas14 Median, First Quartile	0.60	1.47	0.801	5.1	0.33	***Required release rate met.***
100-Year, NOAA Atlas14 Median, First Quartile	3.00	7.35	4.752	5.63	1.94	***Required release rate met.***

Verification of Required Retention Volume (RRV)

Total Site Summary	**Total Disturbed Area (sf):**	106,722	
	Total Site Rv:	0.78	
	Total RRV Prior to Reductions (cf)	8,026	
	Total RRV Reductions (cf)	150	
	Total RRV After Reductions (cf)	7,876	
	Total Retention Volume Achieved (cf)	15,480	☑ *Total Required Retention Volume achiev*
	Percent WQv Control Achieved	165.5%	☑ *Required percent site control achieved!*