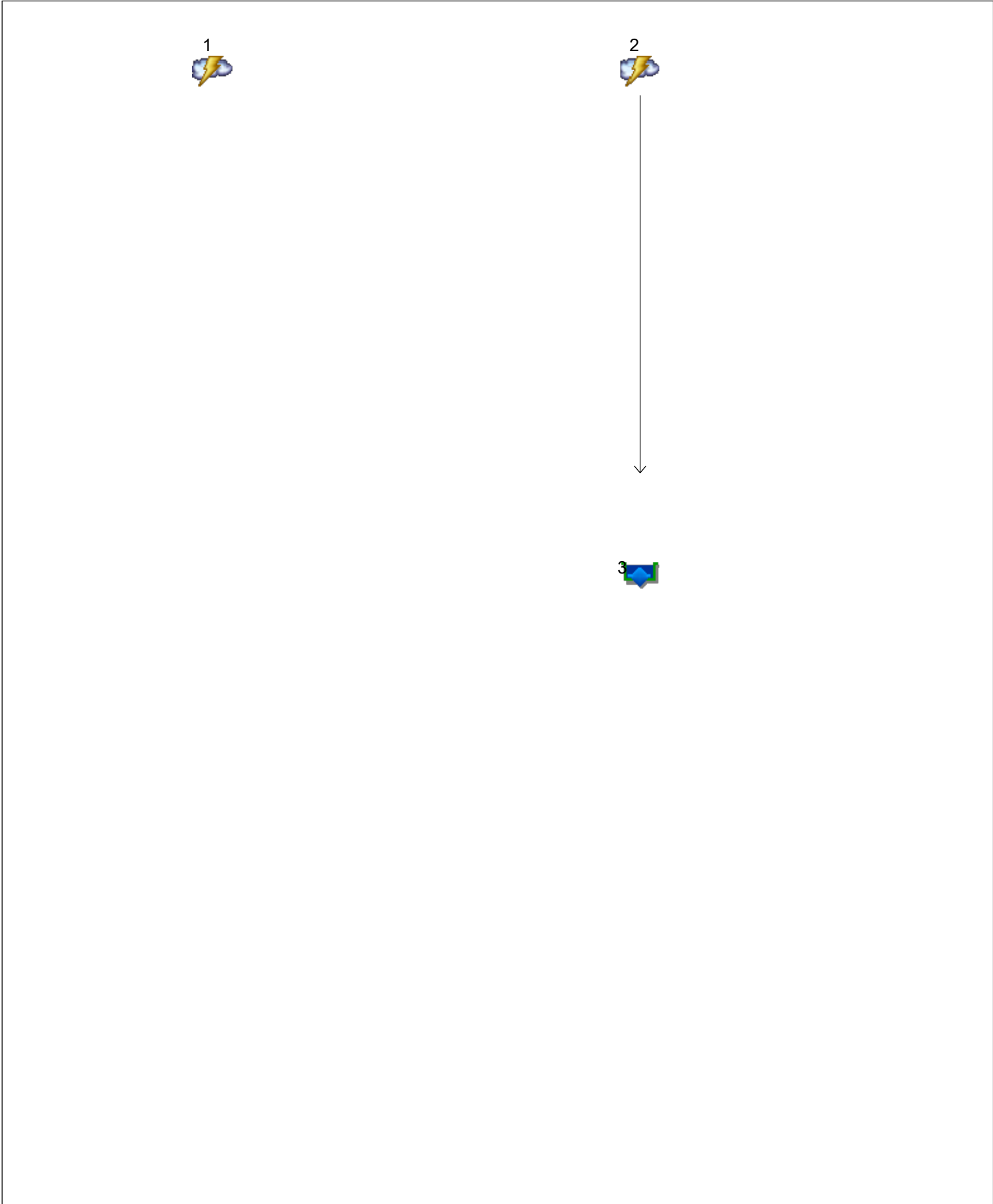


Watershed Model Schematic

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



Hydrograph Summary Report

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

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	Rational	17.06	1	14	14,330	-----	-----	-----	PRE
2	Rational	45.97	1	5	13,792	-----	-----	-----	POST
3	Reservoir	13.30	1	9	13,787	2	382.08	10,153	2 NW POND 1
VERNIA PH 1 NW POND.gpw					Return Period: 2 Year			Tuesday, 11 / 23 / 2021	

Hydrograph Report

Hyd. No. 1

PRE

Hydrograph type	= Rational	Peak discharge	= 17.06 cfs
Storm frequency	= 2 yrs	Time to peak	= 14 min
Time interval	= 1 min	Hyd. volume	= 14,330 cuft
Drainage area	= 8.500 ac	Runoff coeff.	= 0.5*
Intensity	= 4.014 in/hr	Tc by User	= 14.00 min
IDF Curve	= Littlerock.IDF	Asc/Rec limb fact	= 1/1

* Composite (Area/C) = [(1.600 x 0.40) + (0.160 x 0.95)] / 8.500



Hydrograph Report

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

Tuesday, 11 / 23 / 2021

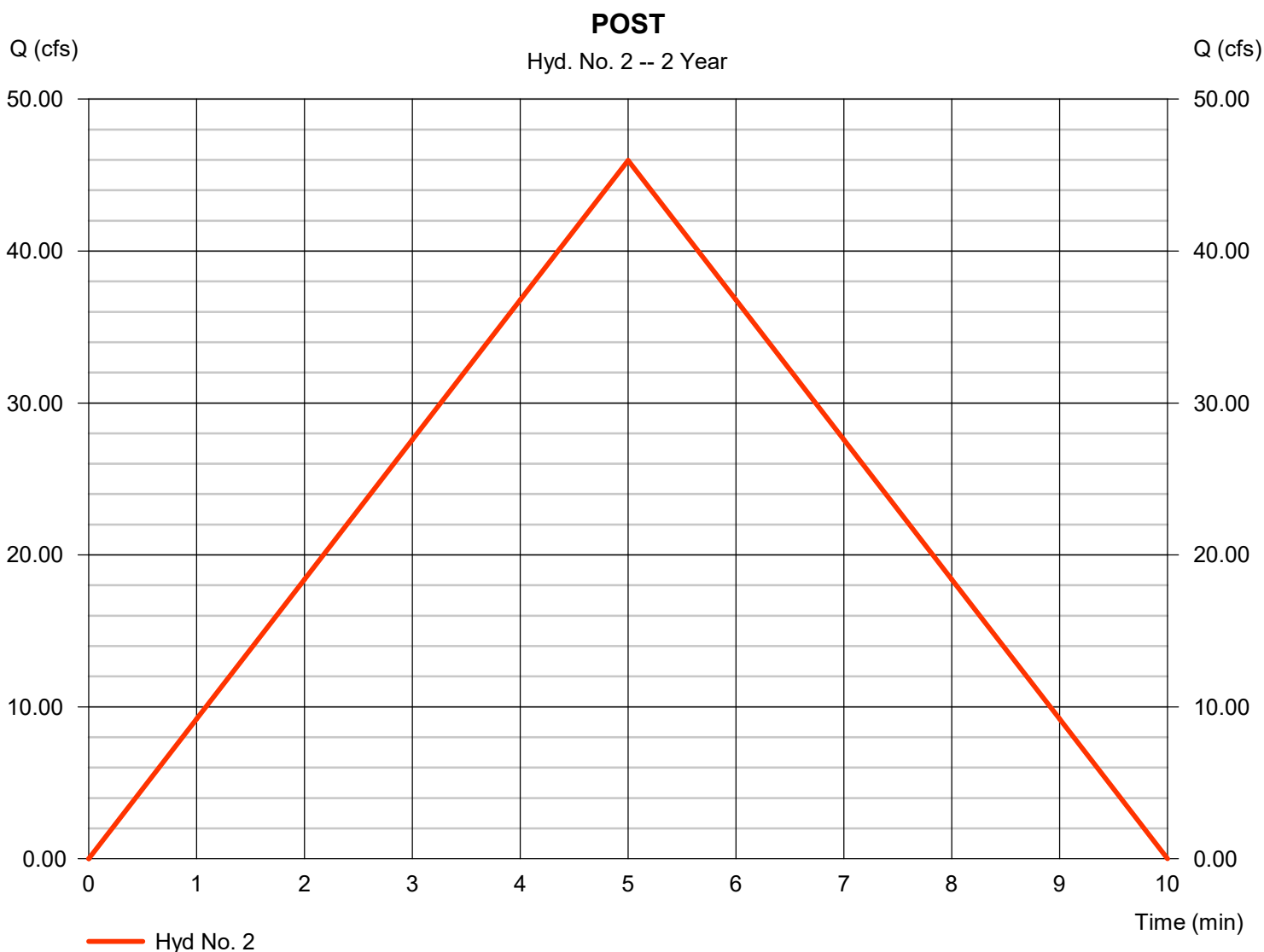
Hyd. No. 2

POST

Hydrograph type = Rational
 Storm frequency = 2 yrs
 Time interval = 1 min
 Drainage area = 8.500 ac
 Intensity = 5.693 in/hr
 IDF Curve = Littlerock.IDF

Peak discharge = 45.97 cfs
 Time to peak = 5 min
 Hyd. volume = 13,792 cuft
 Runoff coeff. = 0.95*
 Tc by User = 5.00 min
 Asc/Rec limb fact = 1/1

* Composite (Area/C) = $[(0.300 \times 0.40) + (1.460 \times 0.95)] / 8.500$



Hydrograph Report

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

Tuesday, 11 / 23 / 2021

Hyd. No. 3

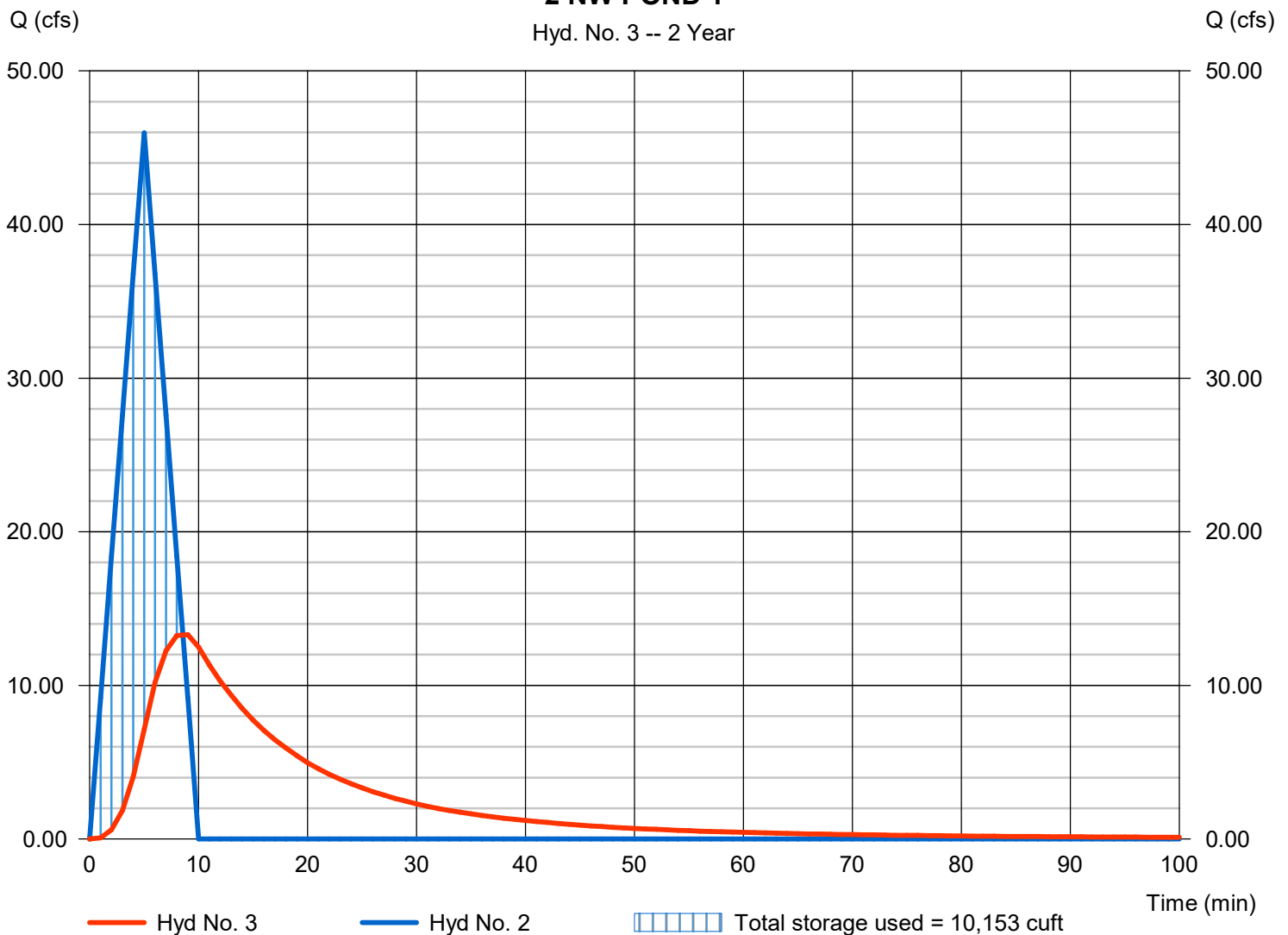
2 NW POND 1

Hydrograph type	= Reservoir	Peak discharge	= 13.30 cfs
Storm frequency	= 2 yrs	Time to peak	= 9 min
Time interval	= 1 min	Hyd. volume	= 13,787 cuft
Inflow hyd. No.	= 2 - POST	Max. Elevation	= 382.08 ft
Reservoir name	= NW POND 1	Max. Storage	= 10,153 cuft

Storage Indication method used.

2 NW POND 1

Hyd. No. 3 -- 2 Year



Pond Report

7

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

Tuesday, 11 / 23 / 2021

Pond No. 2 - NW POND 1

Pond Data

Trapezoid -Bottom L x W = 80.0 x 50.0 ft, Side slope = 3.00:1, Bottom elev. = 380.00 ft, Depth = 4.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	380.00	4,000	0	0
0.40	380.40	4,318	1,663	1,663
0.80	380.80	4,647	1,793	3,456
1.20	381.20	4,988	1,927	5,382
1.60	381.60	5,340	2,065	7,448
2.00	382.00	5,704	2,208	9,656
2.40	382.40	6,079	2,356	12,012
2.80	382.80	6,466	2,509	14,521
3.20	383.20	6,865	2,666	17,187
3.60	383.60	7,275	2,827	20,014
4.00	384.00	7,696	2,994	23,008

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 0.00	0.00	0.00	0.00
Span (in)	= 0.00	0.00	0.00	0.00
No. Barrels	= 0	0	0	0
Invert El. (ft)	= 380.00	0.00	0.00	0.00
Length (ft)	= 0.00	0.00	0.00	0.00
Slope (%)	= 0.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 1.70	20.00	0.00	0.00
Crest El. (ft)	= 380.00	383.10	0.00	0.00
Weir Coeff.	= 2.60	2.60	3.33	3.33
Weir Type	= Broad	Broad	---	---
Multi-Stage	= No	No	No	No
Exfil.(in/hr)	= 0.000 (by Wet area)			
TW Elev. (ft)	= 0.00			

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

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0	380.00	---	---	---	---	0.00	0.00	---	---	---	---	0.000
0.40	1,663	380.40	---	---	---	---	1.12	0.00	---	---	---	---	1.118
0.80	3,456	380.80	---	---	---	---	3.16	0.00	---	---	---	---	3.163
1.20	5,382	381.20	---	---	---	---	5.81	0.00	---	---	---	---	5.810
1.60	7,448	381.60	---	---	---	---	8.95	0.00	---	---	---	---	8.946
2.00	9,656	382.00	---	---	---	---	12.50	0.00	---	---	---	---	12.50
2.40	12,012	382.40	---	---	---	---	16.43	0.00	---	---	---	---	16.43
2.80	14,521	382.80	---	---	---	---	20.71	0.00	---	---	---	---	20.71
3.20	17,187	383.20	---	---	---	---	25.30	1.64	---	---	---	---	26.95
3.60	20,014	383.60	---	---	---	---	30.19	18.38	---	---	---	---	48.58
4.00	23,008	384.00	---	---	---	---	35.36	44.40	---	---	---	---	79.76

Hydrograph Summary Report

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

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	Rational	20.35	1	14	17,096	-----	-----	-----	PRE
2	Rational	53.05	1	5	15,916	-----	-----	-----	POST
3	Reservoir	15.70	1	9	15,911	2	382.33	11,589	2 NW POND 1
VERNIA PH 1 NW POND.gpw					Return Period: 5 Year			Tuesday, 11 / 23 / 2021	

Hydrograph Report

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

Tuesday, 11 / 23 / 2021

Hyd. No. 1

PRE

Hydrograph type = Rational
 Storm frequency = 5 yrs
 Time interval = 1 min
 Drainage area = 8.500 ac
 Intensity = 4.789 in/hr
 IDF Curve = Littlerock.IDF

Peak discharge = 20.35 cfs
 Time to peak = 14 min
 Hyd. volume = 17,096 cuft
 Runoff coeff. = 0.5*
 Tc by User = 14.00 min
 Asc/Rec limb fact = 1/1

* Composite (Area/C) = $[(1.600 \times 0.40) + (0.160 \times 0.95)] / 8.500$



Hydrograph Report

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

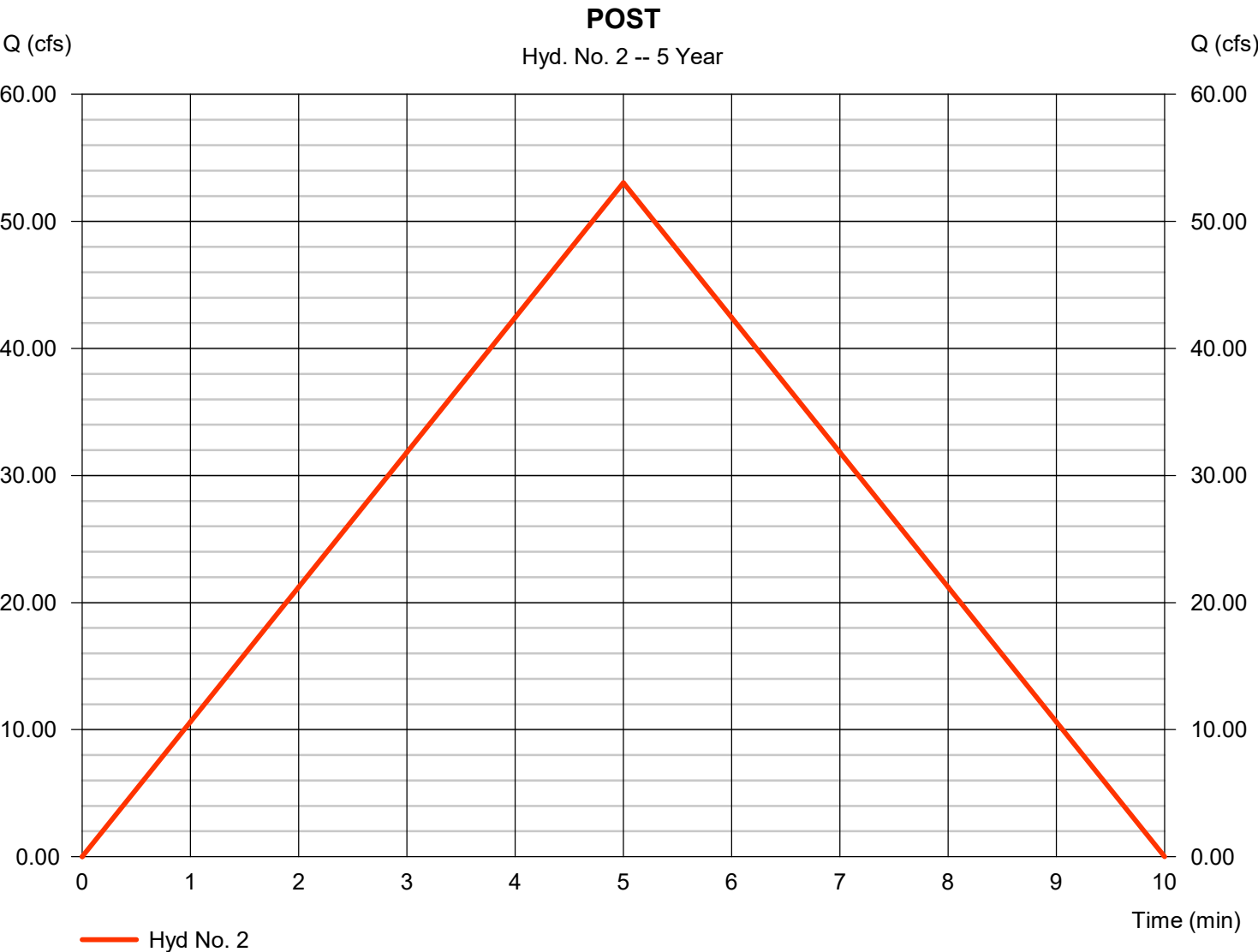
Tuesday, 11 / 23 / 2021

Hyd. No. 2

POST

Hydrograph type	= Rational	Peak discharge	= 53.05 cfs
Storm frequency	= 5 yrs	Time to peak	= 5 min
Time interval	= 1 min	Hyd. volume	= 15,916 cuft
Drainage area	= 8.500 ac	Runoff coeff.	= 0.95*
Intensity	= 6.570 in/hr	Tc by User	= 5.00 min
IDF Curve	= Littlerock.IDF	Asc/Rec limb fact	= 1/1

* Composite (Area/C) = [(0.300 x 0.40) + (1.460 x 0.95)] / 8.500



Hydrograph Report

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

Tuesday, 11 / 23 / 2021

Hyd. No. 3

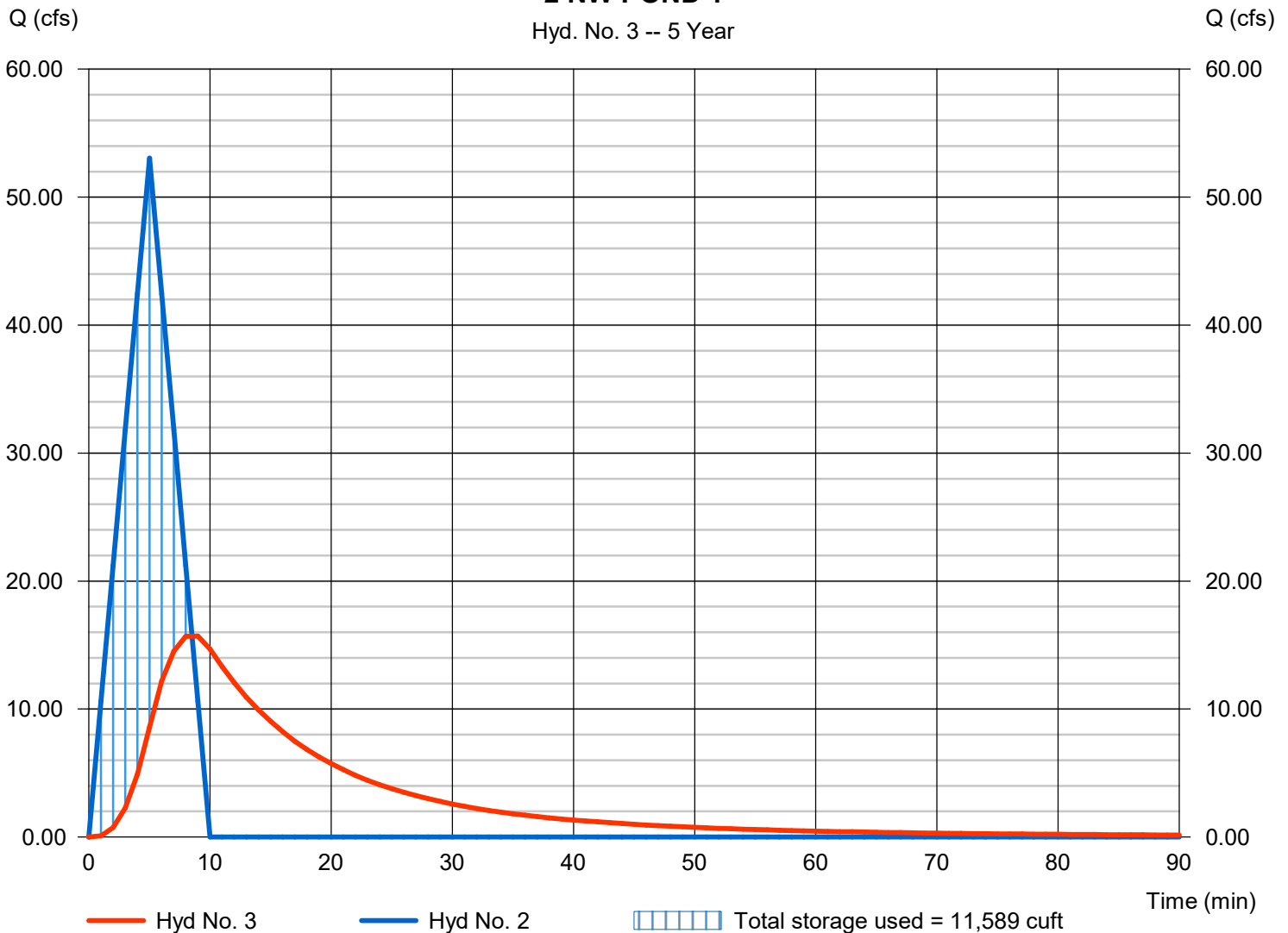
2 NW POND 1

Hydrograph type	= Reservoir	Peak discharge	= 15.70 cfs
Storm frequency	= 5 yrs	Time to peak	= 9 min
Time interval	= 1 min	Hyd. volume	= 15,911 cuft
Inflow hyd. No.	= 2 - POST	Max. Elevation	= 382.33 ft
Reservoir name	= NW POND 1	Max. Storage	= 11,589 cuft

Storage Indication method used.

2 NW POND 1

Hyd. No. 3 -- 5 Year



Hydrograph Summary Report

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

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	Rational	22.76	1	14	19,117	-----	-----	-----	PRE
2	Rational	58.45	1	5	17,534	-----	-----	-----	POST
3	Reservoir	17.53	1	8	17,530	2	382.51	12,677	2 NW POND 1
VERNIA PH 1 NW POND.gpw					Return Period: 10 Year			Tuesday, 11 / 23 / 2021	

Hydrograph Report

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

Tuesday, 11 / 23 / 2021

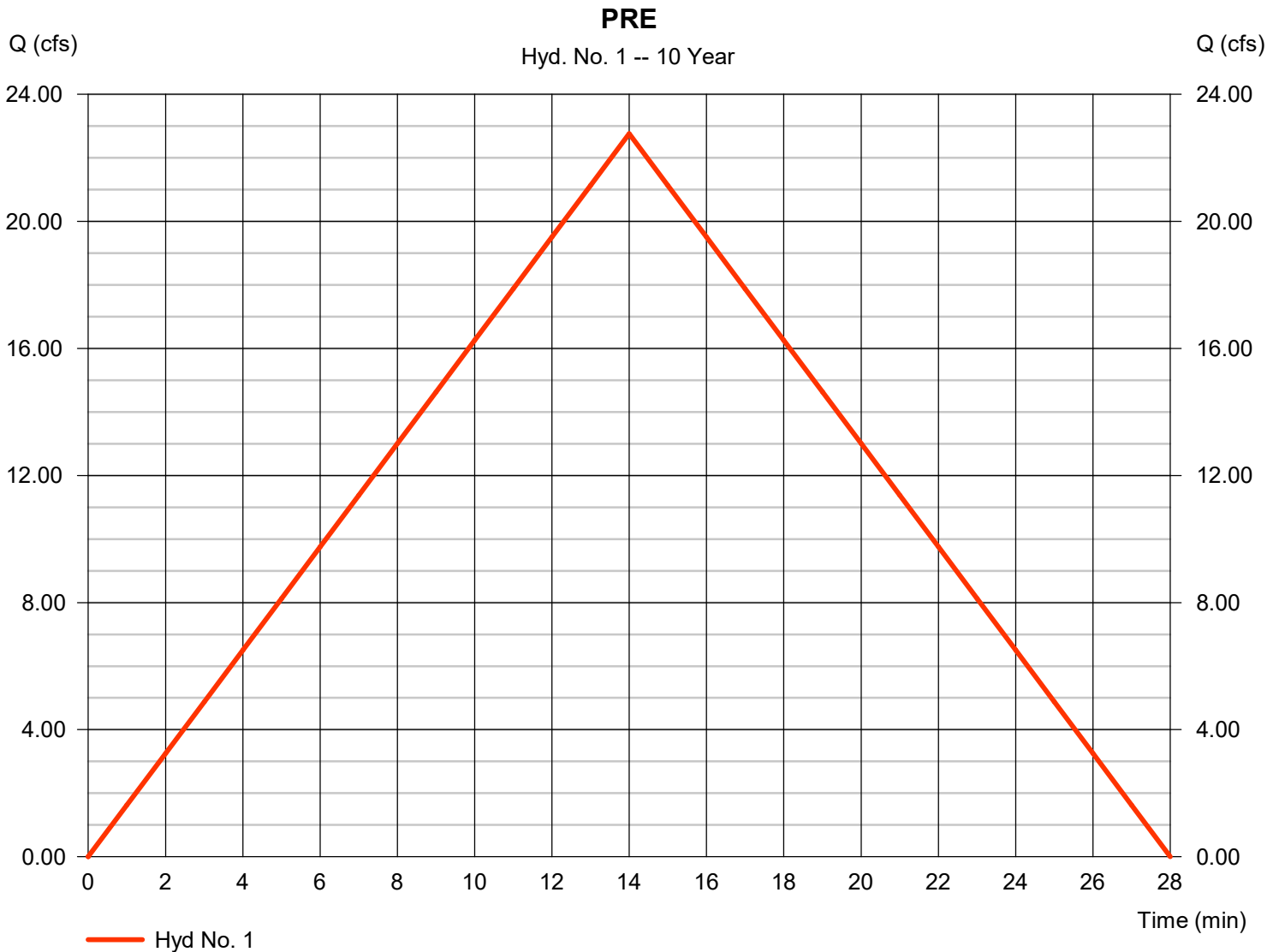
Hyd. No. 1

PRE

Hydrograph type = Rational
 Storm frequency = 10 yrs
 Time interval = 1 min
 Drainage area = 8.500 ac
 Intensity = 5.355 in/hr
 IDF Curve = Littlerock.IDF

Peak discharge = 22.76 cfs
 Time to peak = 14 min
 Hyd. volume = 19,117 cuft
 Runoff coeff. = 0.5*
 Tc by User = 14.00 min
 Asc/Rec limb fact = 1/1

* Composite (Area/C) = $[(1.600 \times 0.40) + (0.160 \times 0.95)] / 8.500$



Hydrograph Report

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

Tuesday, 11 / 23 / 2021

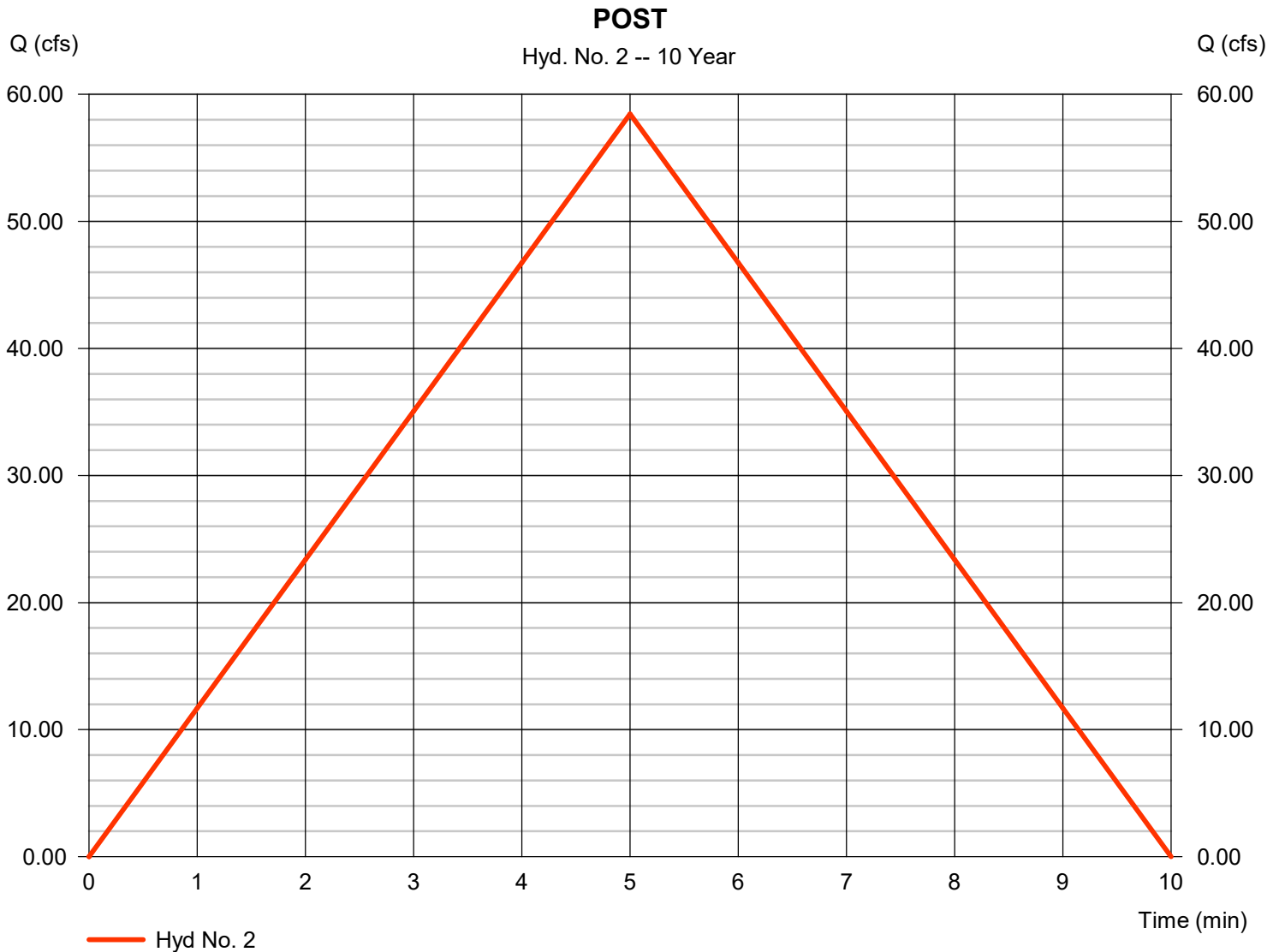
Hyd. No. 2

POST

Hydrograph type = Rational
 Storm frequency = 10 yrs
 Time interval = 1 min
 Drainage area = 8.500 ac
 Intensity = 7.238 in/hr
 IDF Curve = Littlerock.IDF

Peak discharge = 58.45 cfs
 Time to peak = 5 min
 Hyd. volume = 17,534 cuft
 Runoff coeff. = 0.95*
 Tc by User = 5.00 min
 Asc/Rec limb fact = 1/1

* Composite (Area/C) = $[(0.300 \times 0.40) + (1.460 \times 0.95)] / 8.500$



Hydrograph Report

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

Tuesday, 11 / 23 / 2021

Hyd. No. 3

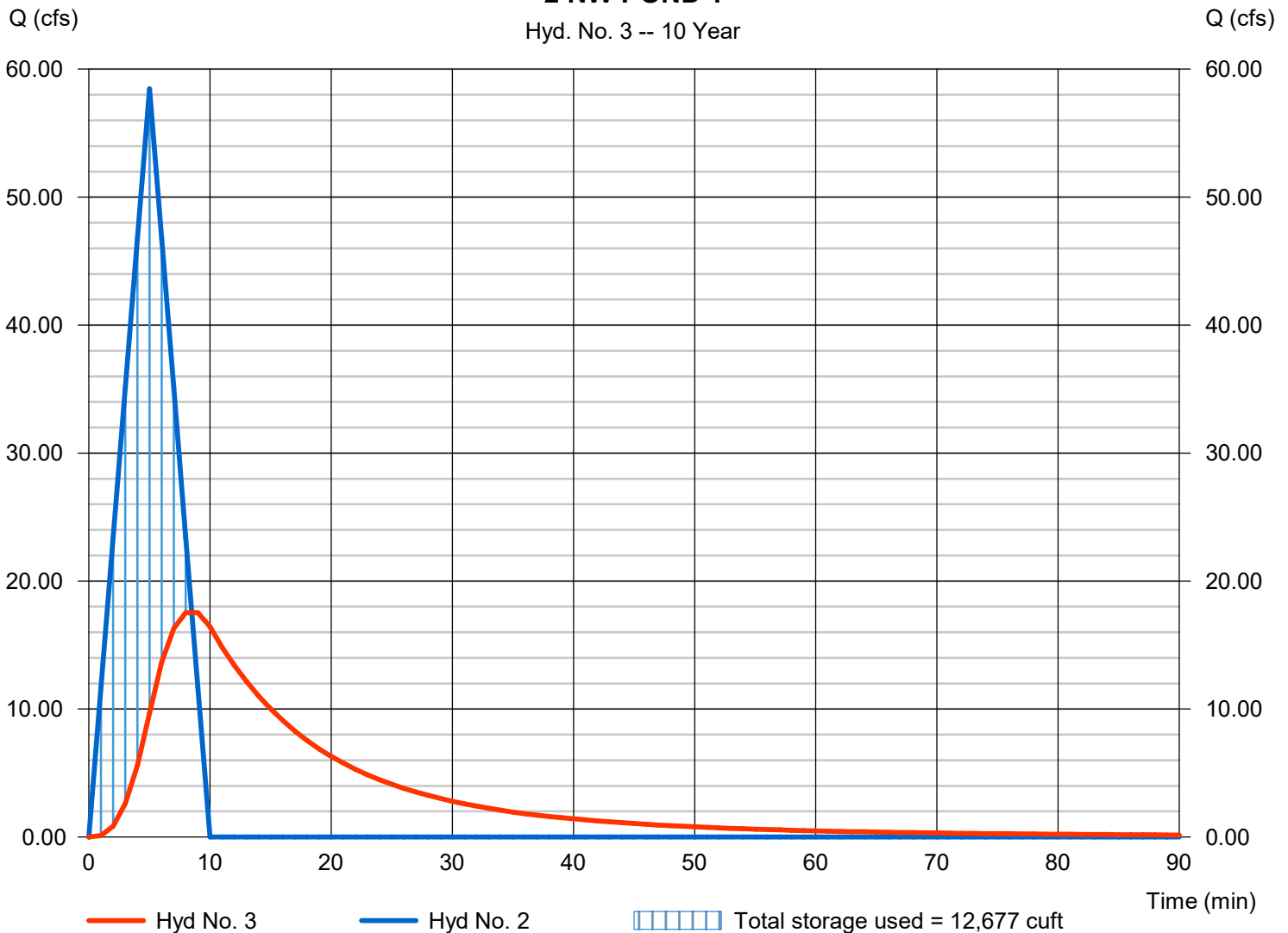
2 NW POND 1

Hydrograph type	= Reservoir	Peak discharge	= 17.53 cfs
Storm frequency	= 10 yrs	Time to peak	= 8 min
Time interval	= 1 min	Hyd. volume	= 17,530 cuft
Inflow hyd. No.	= 2 - POST	Max. Elevation	= 382.51 ft
Reservoir name	= NW POND 1	Max. Storage	= 12,677 cuft

Storage Indication method used.

2 NW POND 1

Hyd. No. 3 -- 10 Year



Hydrograph Summary Report

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

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	Rational	26.30	1	14	22,090	-----	-----	-----	PRE
2	Rational	66.60	1	5	19,979	-----	-----	-----	POST
3	Reservoir	20.38	1	8	19,974	2	382.77	14,334	2 NW POND 1
VERNIA PH 1 NW POND.gpw					Return Period: 25 Year			Tuesday, 11 / 23 / 2021	

Hydrograph Report

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

Tuesday, 11 / 23 / 2021

Hyd. No. 1

PRE

Hydrograph type	= Rational	Peak discharge	= 26.30 cfs
Storm frequency	= 25 yrs	Time to peak	= 14 min
Time interval	= 1 min	Hyd. volume	= 22,090 cuft
Drainage area	= 8.500 ac	Runoff coeff.	= 0.5*
Intensity	= 6.188 in/hr	Tc by User	= 14.00 min
IDF Curve	= Littlerock.IDF	Asc/Rec limb fact	= 1/1

* Composite (Area/C) = $[(1.600 \times 0.40) + (0.160 \times 0.95)] / 8.500$



Hydrograph Report

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

Tuesday, 11 / 23 / 2021

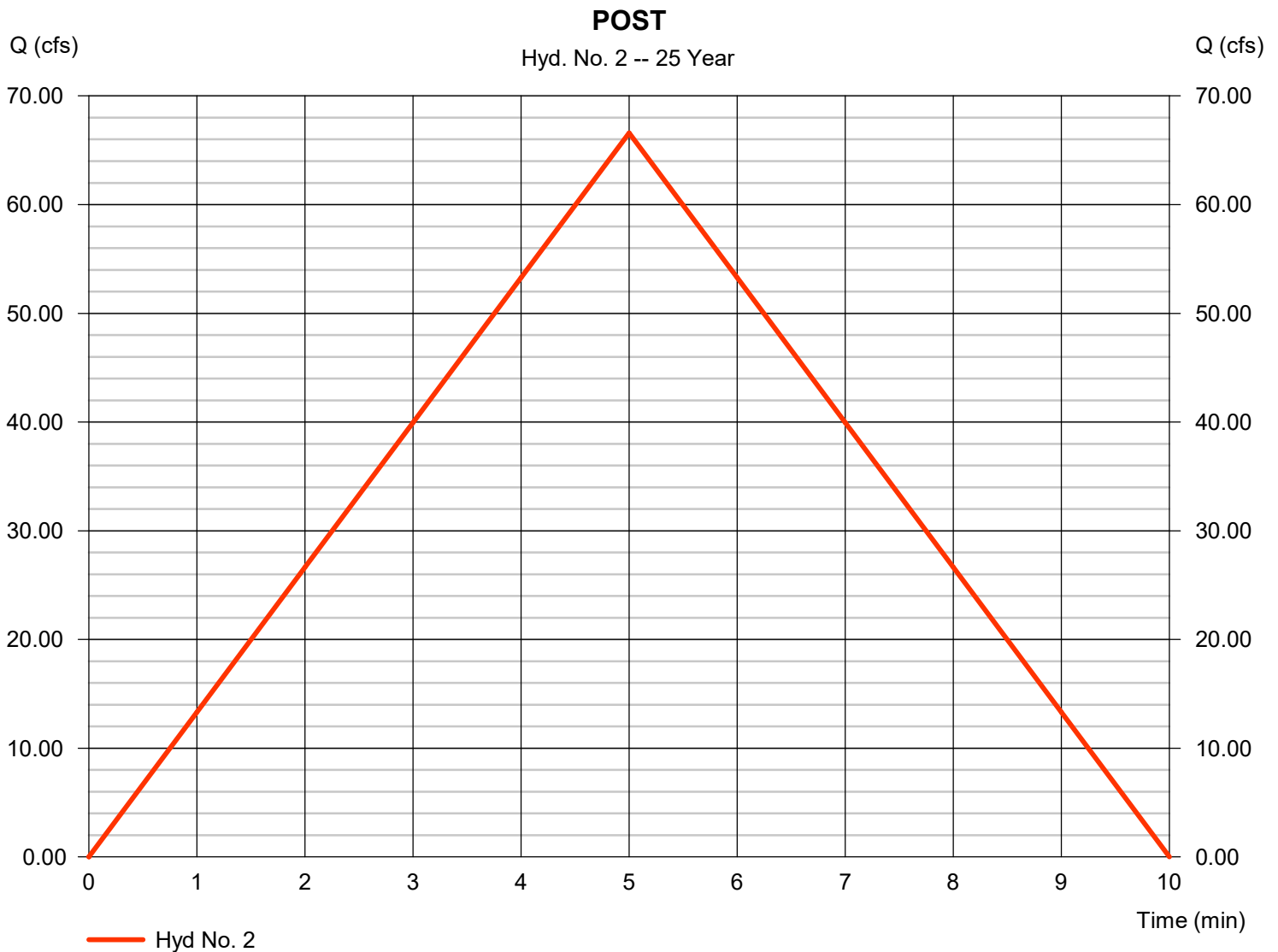
Hyd. No. 2

POST

Hydrograph type = Rational
 Storm frequency = 25 yrs
 Time interval = 1 min
 Drainage area = 8.500 ac
 Intensity = 8.247 in/hr
 IDF Curve = Littlerock.IDF

Peak discharge = 66.60 cfs
 Time to peak = 5 min
 Hyd. volume = 19,979 cuft
 Runoff coeff. = 0.95*
 Tc by User = 5.00 min
 Asc/Rec limb fact = 1/1

* Composite (Area/C) = $[(0.300 \times 0.40) + (1.460 \times 0.95)] / 8.500$



Hydrograph Report

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

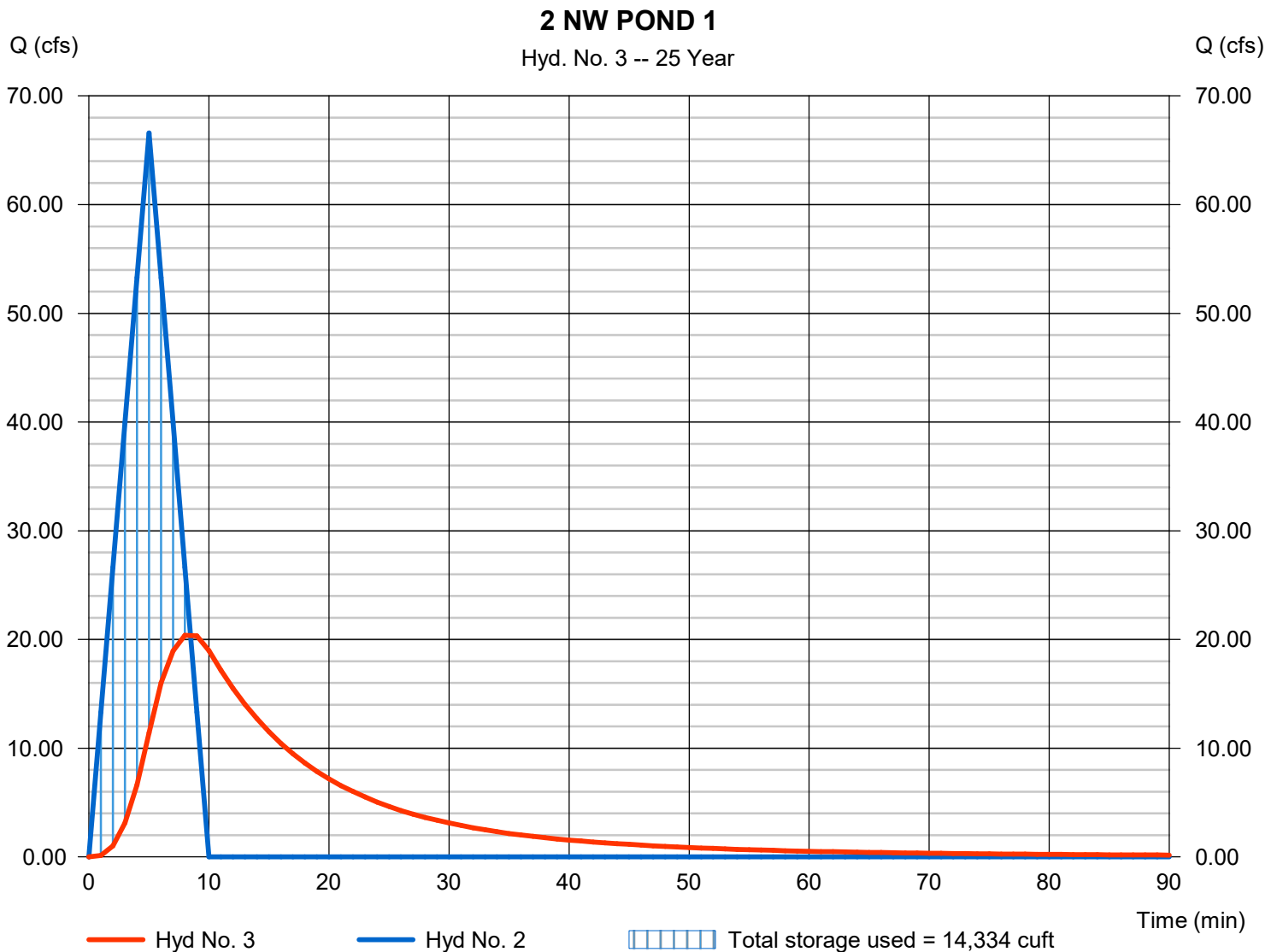
Tuesday, 11 / 23 / 2021

Hyd. No. 3

2 NW POND 1

Hydrograph type	= Reservoir	Peak discharge	= 20.38 cfs
Storm frequency	= 25 yrs	Time to peak	= 8 min
Time interval	= 1 min	Hyd. volume	= 19,974 cuft
Inflow hyd. No.	= 2 - POST	Max. Elevation	= 382.77 ft
Reservoir name	= NW POND 1	Max. Storage	= 14,334 cuft

Storage Indication method used.



Hydrograph Summary Report

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

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	Rational	29.07	1	14	24,417	-----	-----	-----	PRE
2	Rational	73.00	1	5	21,901	-----	-----	-----	POST
3	Reservoir	22.58	1	8	21,896	2	382.97	15,631	2 NW POND 1
VERNIA PH 1 NW POND.gpw					Return Period: 50 Year			Tuesday, 11 / 23 / 2021	

Hydrograph Report

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

Tuesday, 11 / 23 / 2021

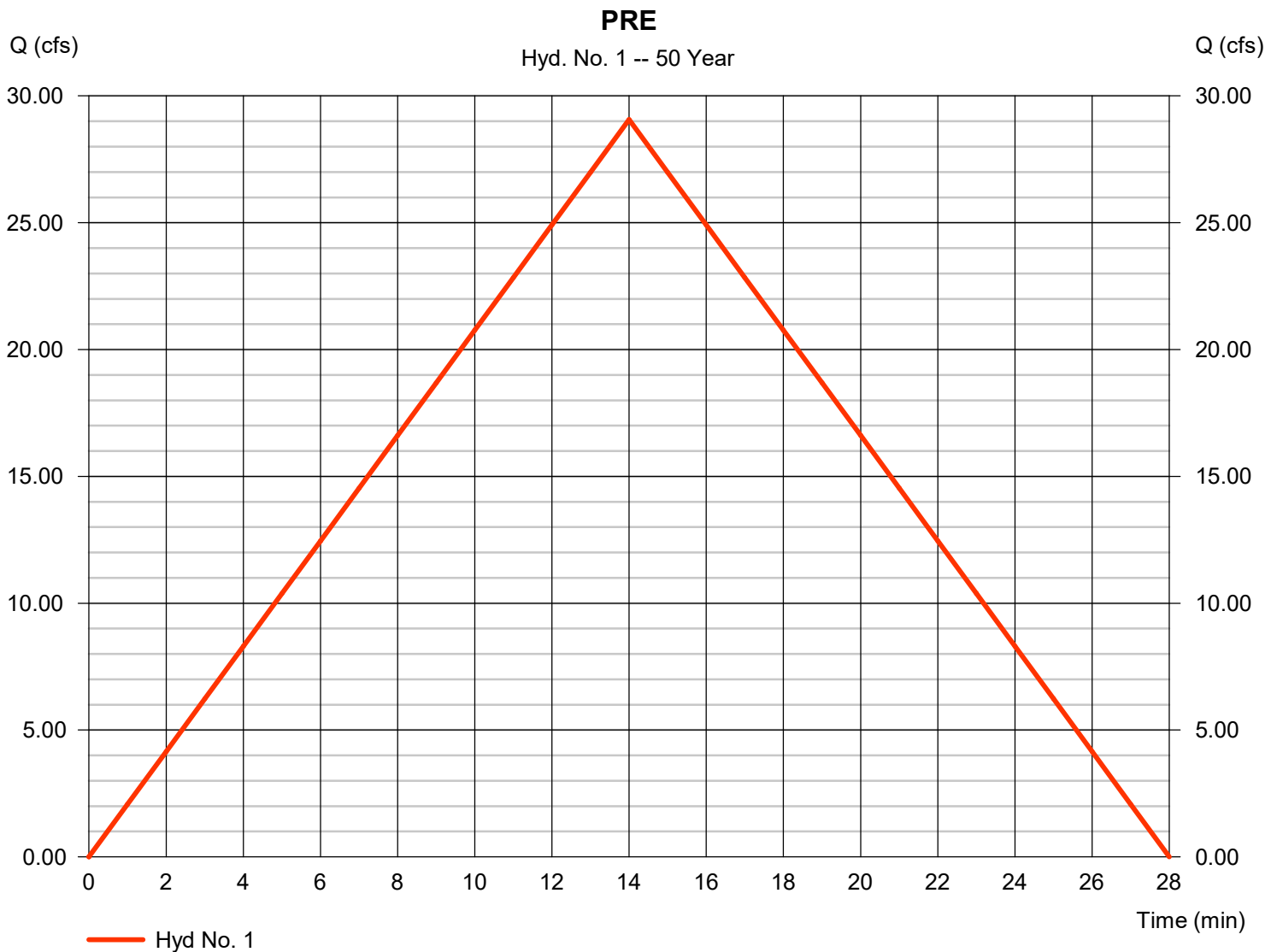
Hyd. No. 1

PRE

Hydrograph type = Rational
 Storm frequency = 50 yrs
 Time interval = 1 min
 Drainage area = 8.500 ac
 Intensity = 6.840 in/hr
 IDF Curve = Littlerock.IDF

Peak discharge = 29.07 cfs
 Time to peak = 14 min
 Hyd. volume = 24,417 cuft
 Runoff coeff. = 0.5*
 Tc by User = 14.00 min
 Asc/Rec limb fact = 1/1

* Composite (Area/C) = $[(1.600 \times 0.40) + (0.160 \times 0.95)] / 8.500$



Hydrograph Report

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

Tuesday, 11 / 23 / 2021

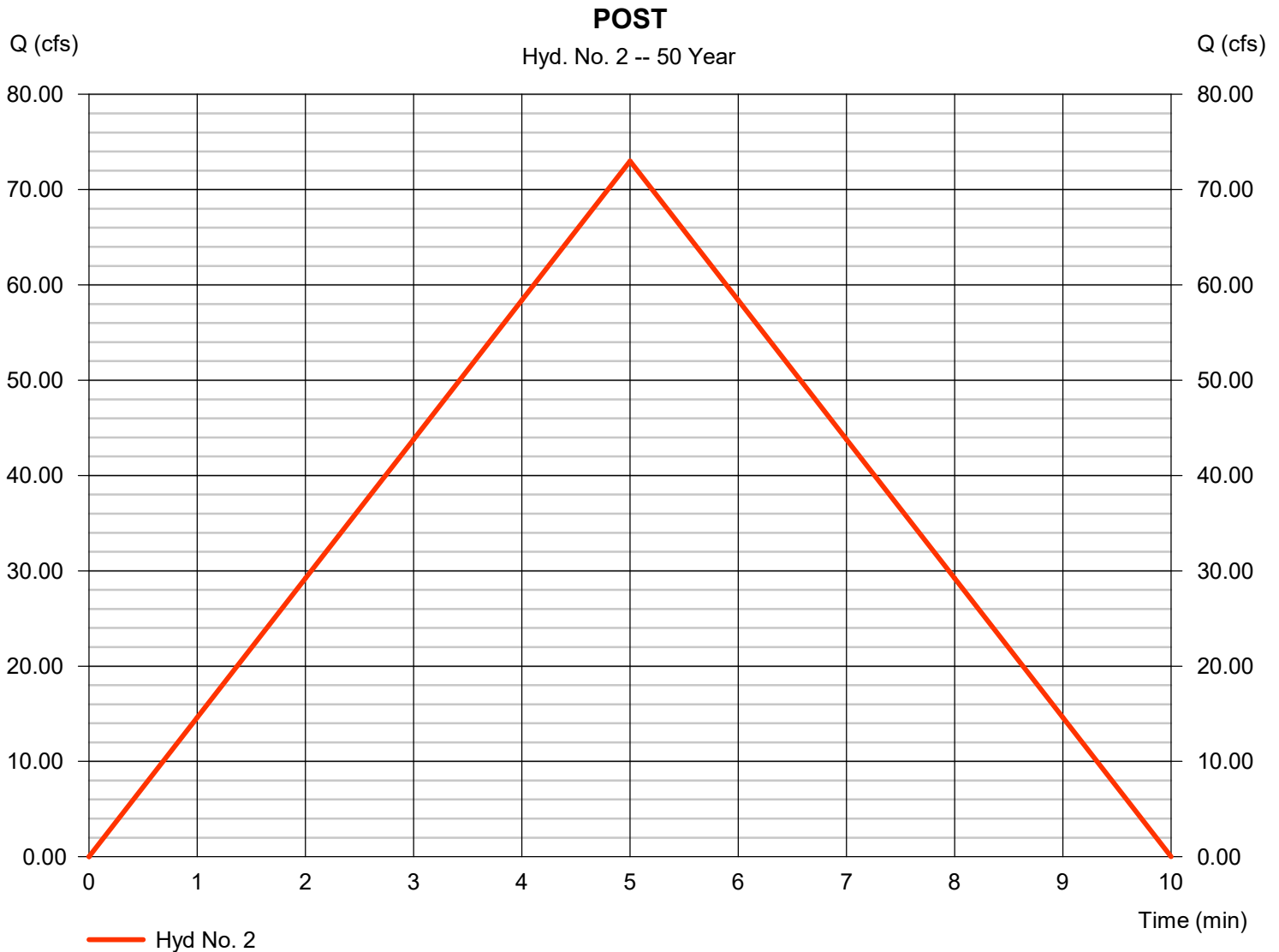
Hyd. No. 2

POST

Hydrograph type = Rational
 Storm frequency = 50 yrs
 Time interval = 1 min
 Drainage area = 8.500 ac
 Intensity = 9.041 in/hr
 IDF Curve = Littlerock.IDF

Peak discharge = 73.00 cfs
 Time to peak = 5 min
 Hyd. volume = 21,901 cuft
 Runoff coeff. = 0.95*
 Tc by User = 5.00 min
 Asc/Rec limb fact = 1/1

* Composite (Area/C) = $[(0.300 \times 0.40) + (1.460 \times 0.95)] / 8.500$



Hydrograph Report

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

Tuesday, 11 / 23 / 2021

Hyd. No. 3

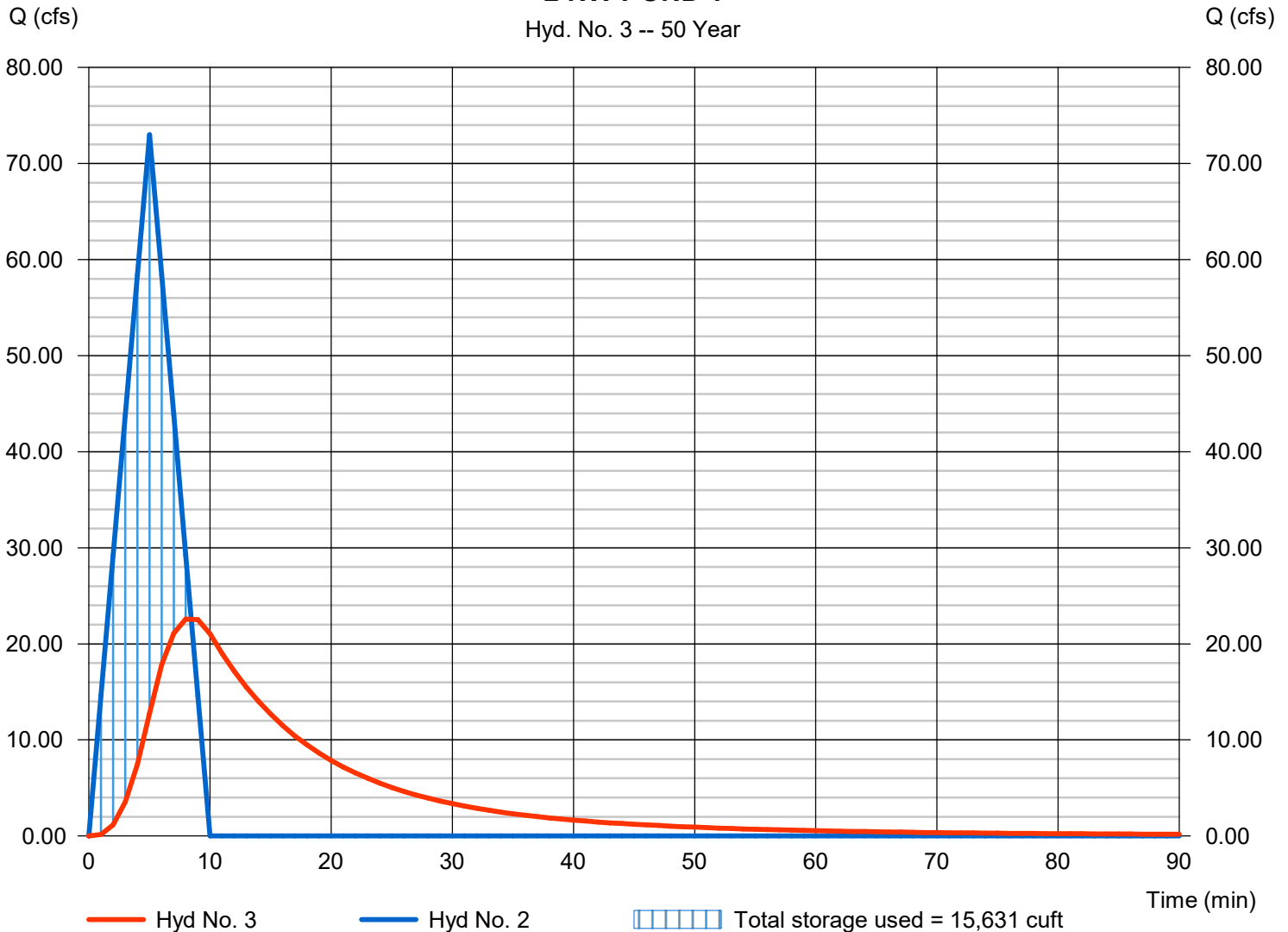
2 NW POND 1

Hydrograph type	= Reservoir	Peak discharge	= 22.58 cfs
Storm frequency	= 50 yrs	Time to peak	= 8 min
Time interval	= 1 min	Hyd. volume	= 21,896 cuft
Inflow hyd. No.	= 2 - POST	Max. Elevation	= 382.97 ft
Reservoir name	= NW POND 1	Max. Storage	= 15,631 cuft

Storage Indication method used.

2 NW POND 1

Hyd. No. 3 -- 50 Year



Hydrograph Summary Report

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

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	Rational	31.83	1	14	26,734	-----	-----	-----	PRE
2	Rational	79.40	1	5	23,820	-----	-----	-----	POST
3	Reservoir	25.53	1	8	23,815	2	383.16	16,904	2 NW POND 1
VERNIA PH 1 NW POND.gpw					Return Period: 100 Year			Tuesday, 11 / 23 / 2021	

Hydrograph Report

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

Tuesday, 11 / 23 / 2021

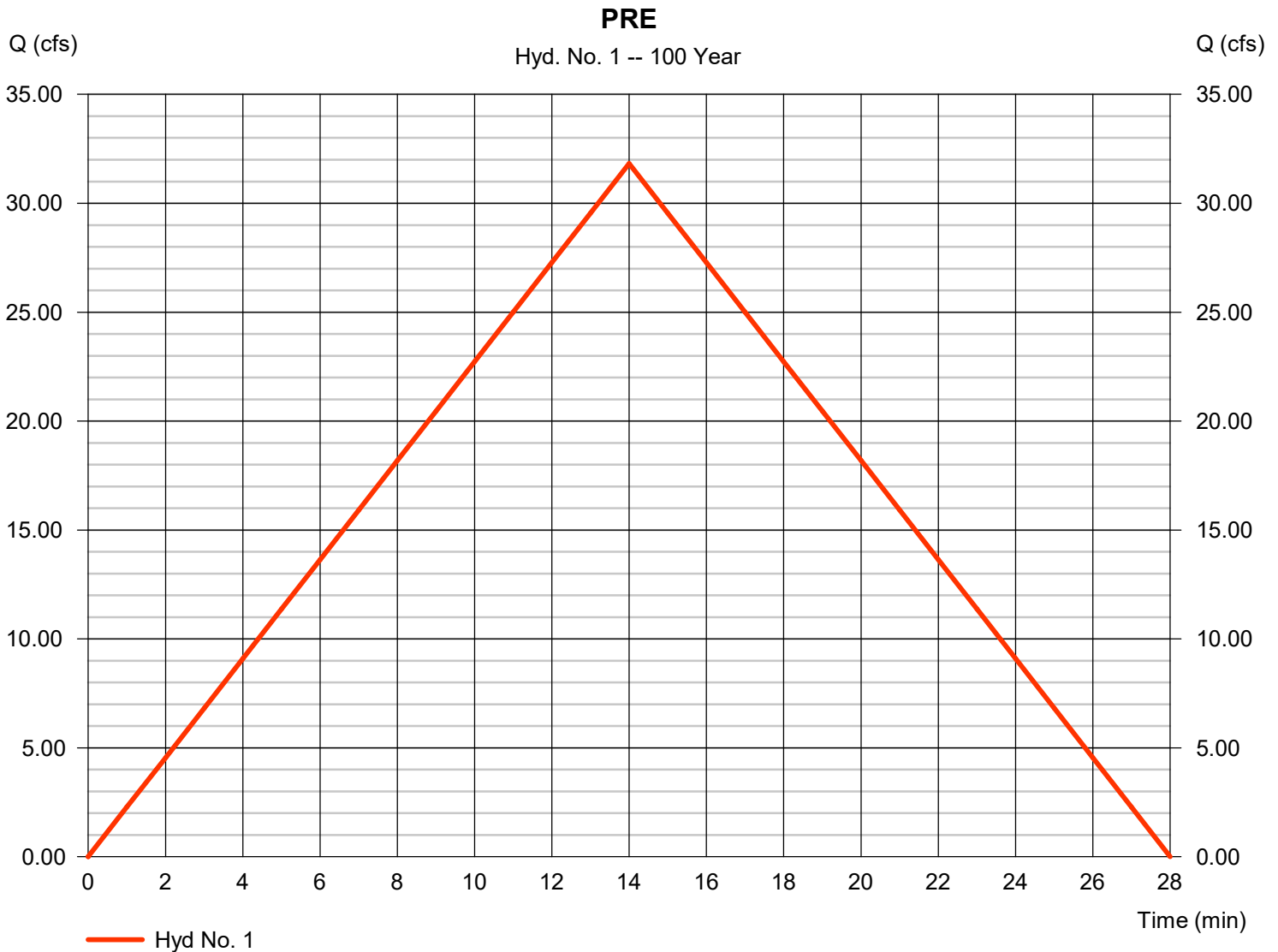
Hyd. No. 1

PRE

Hydrograph type = Rational
 Storm frequency = 100 yrs
 Time interval = 1 min
 Drainage area = 8.500 ac
 Intensity = 7.488 in/hr
 IDF Curve = Littlerock.IDF

Peak discharge = 31.83 cfs
 Time to peak = 14 min
 Hyd. volume = 26,734 cuft
 Runoff coeff. = 0.5*
 Tc by User = 14.00 min
 Asc/Rec limb fact = 1/1

* Composite (Area/C) = [(1.600 x 0.40) + (0.160 x 0.95)] / 8.500



Hydrograph Report

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

Tuesday, 11 / 23 / 2021

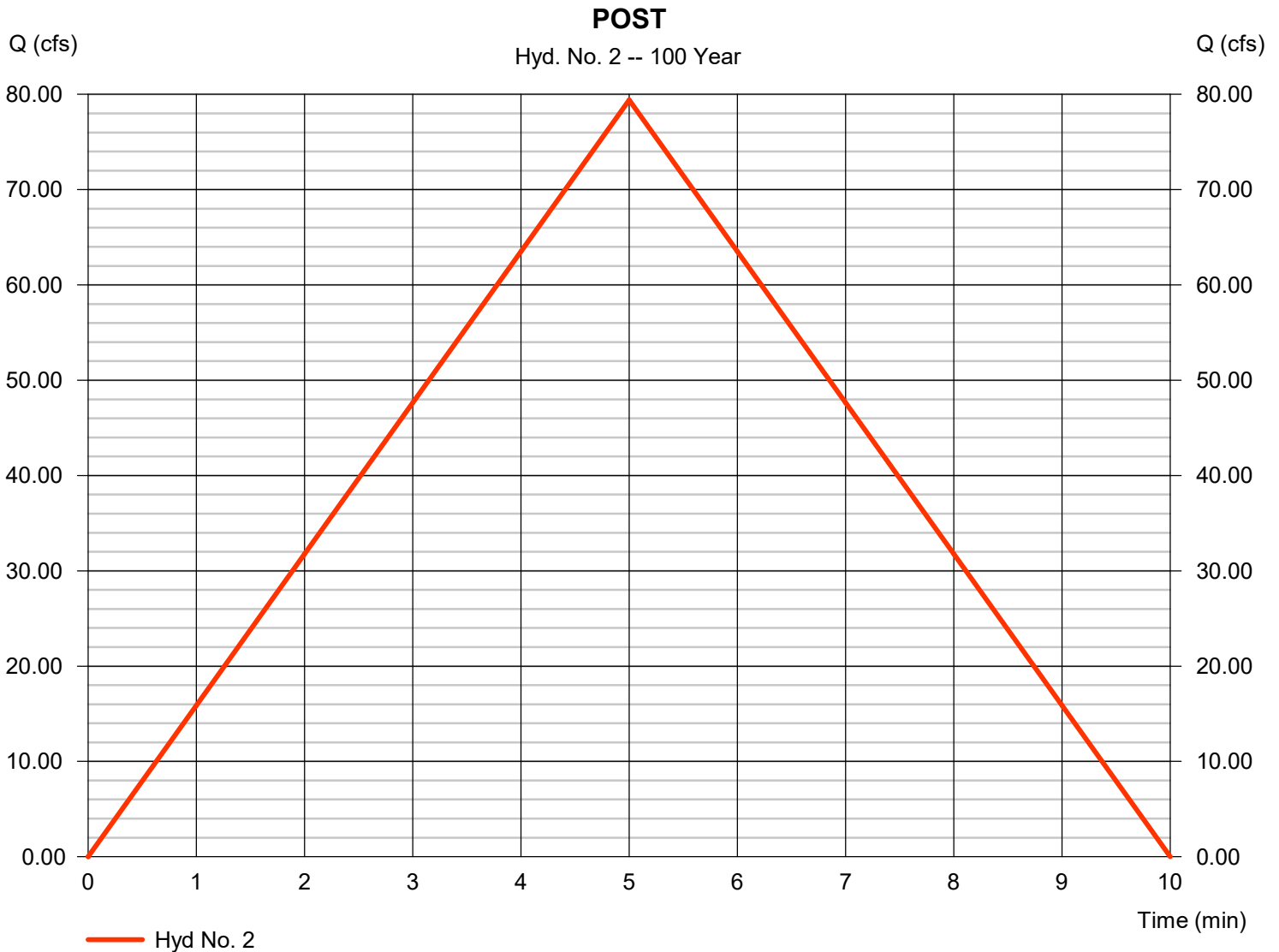
Hyd. No. 2

POST

Hydrograph type = Rational
 Storm frequency = 100 yrs
 Time interval = 1 min
 Drainage area = 8.500 ac
 Intensity = 9.833 in/hr
 IDF Curve = Littlerock.IDF

Peak discharge = 79.40 cfs
 Time to peak = 5 min
 Hyd. volume = 23,820 cuft
 Runoff coeff. = 0.95*
 Tc by User = 5.00 min
 Asc/Rec limb fact = 1/1

* Composite (Area/C) = $[(0.300 \times 0.40) + (1.460 \times 0.95)] / 8.500$



Hydrograph Report

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

Tuesday, 11 / 23 / 2021

Hyd. No. 3

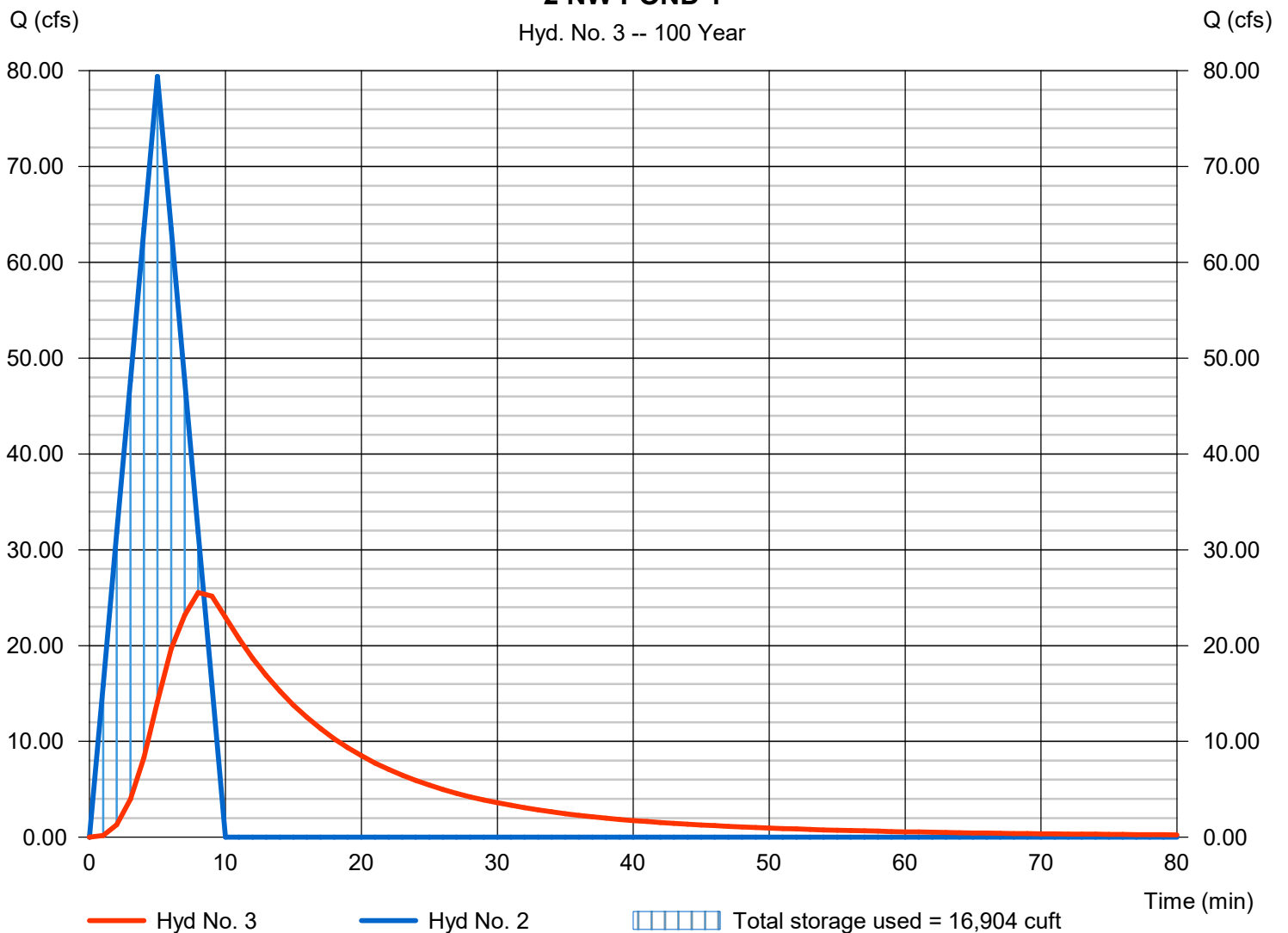
2 NW POND 1

Hydrograph type	= Reservoir	Peak discharge	= 25.53 cfs
Storm frequency	= 100 yrs	Time to peak	= 8 min
Time interval	= 1 min	Hyd. volume	= 23,815 cuft
Inflow hyd. No.	= 2 - POST	Max. Elevation	= 383.16 ft
Reservoir name	= NW POND 1	Max. Storage	= 16,904 cuft

Storage Indication method used.

2 NW POND 1

Hyd. No. 3 -- 100 Year



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